2004 Mazda6 Sport Sedan 5-Door Sport Wagon Workshop Manual

FOREWORD

This manual contains on-vehicle service and diagnosis procedures for the Mazda6.

A thorough familiarization with this manual is important for proper repair and maintenance. It should always be kept in a handy place for quick and easy reference.

The contents of this manual, including drawings and specifications, are the latest available at the time of printing.
As modifications affecting repair or maintenance occur, relevant information supplementary to this volume will be made available at Mazda dealers. This manual should be kept up-to-date.

Mazda North American Operations reserves the right to alter the specifications and contents of this manual without obligation or advance notice.

Mazda North American Operations
U.S.A.

APPLICATION:
This manual is applicable to vehicles beginning with the Vehicle Identification Numbers (VIN), and related materials shown on the following page.

CONTENTS

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VEHICLE IDENTIFICATION NUMBERS (VIN)

1YV HP80C*45	N00001—
1YV FP80C*45	N00001—
1YV HP81C*45	N00001—
1YV FP81C*45	N00001—
1YV HP80D*45	N00001—
1YV FP80D*45	N00001—
1YV HP81D*45	N00001—
1YV FP81D*45	N00001—
1YV HP84C*45	M00001—
1YV HP85C*45	M00001—
1YV FP84C*45	M00001—
1YV FP85C*45	M00001—
1YV HP82D*45	M00001—
1YV HP83D*45	M00001—
1YV FP82D*45	M00001—
1YV FP83D*45	M00001—
1YV HP84D*45	M00001—
1YV HP85D*45	M00001—
1YV FP84D*45	M00001—
1YV FP85D*45	M00001—

RELATED MATERIALS

Material Name	MNAO Part No.	Mazda Material No.
2004 Mazda MX-5 Miata/MX-5, Mazda6, MPV Service Highlights	9999–95–MODL–04	3384–1U–03H
2003 (U.S.A.)/2004 (Canada) Mazda6 Service Highlights	9999–95–101F–03	3372–1U–02I
2004 Mazda6 5-Door Sport Wagon Service Highlights Supplement	9999–95–101F–04	3394–1U–04A
1995, 1996, 1997, 1998, 1999, 2000 OBD-II Service Highlights	9999–95–OBD2–00	3334–1U–99K
Engine Workshop Manual AJ with Variable Valve Timing	9999–95–EAJV–03	1766–1U–02I
Engine Workshop Manual LF L3	9999–95–LFL3–04	1792–1U–03I
Automatic Transaxle Workshop Manual FN4A-EL	9999–95–FN4A–04	1793–1U–03I
Automatic Transaxle Workshop Manual JA5A-EL	9999–95–JA5A–EL	1727–1U–01L
Manual Transaxle Workshop Manual A65M-R	9999–95–0A65–03	1755–1U–02I
Manual Transaxle Workshop Manual G35M-R	9999–95–0G35–03	1756–1U–02I
2003 (U.S.A.)/2004 (Canada) Mazda6 Bodyshop Manual	9999–95–099F–03	3373–1U–02I
2004 Mazda6 5-Door Sport Wagon Bodyshop Manual Supplement	9999–95–099F–04	3393–1U–04A
2004 Mazda6 Sport Sedan 5-Door Sport Wagon Wiring Diagram	9999–95–039G–04R	5608–1U–04A

GENERAL INFORMATION

00
SECTION

00–00 GENERAL INFORMATION

HOW TO USE THIS MANUAL

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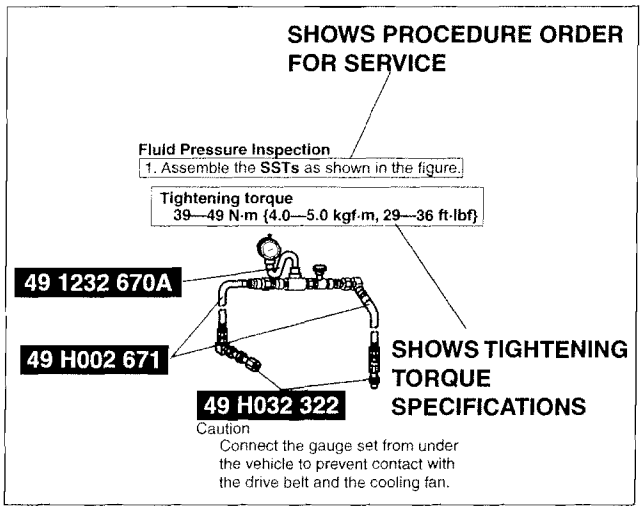
Range of Topics

- This manual contains procedures for performing all required service operations. The procedures are divided into the following five basic operations:
  - — Removal/Installation
  - — Disassembly/Assembly
  - — Replacement
  - — Inspection
  - — Adjustment
- Simple operations which can be performed easily just by looking at the vehicle (i.e., removal/installation of parts, jacking, vehicle lifting, cleaning of parts, and visual inspection) have been omitted.

Service Procedure

Inspection, adjustment

- Inspection and adjustment procedures are divided into steps. Important points regarding the location and contents of the procedures are explained in detail and shown in the illustrations.



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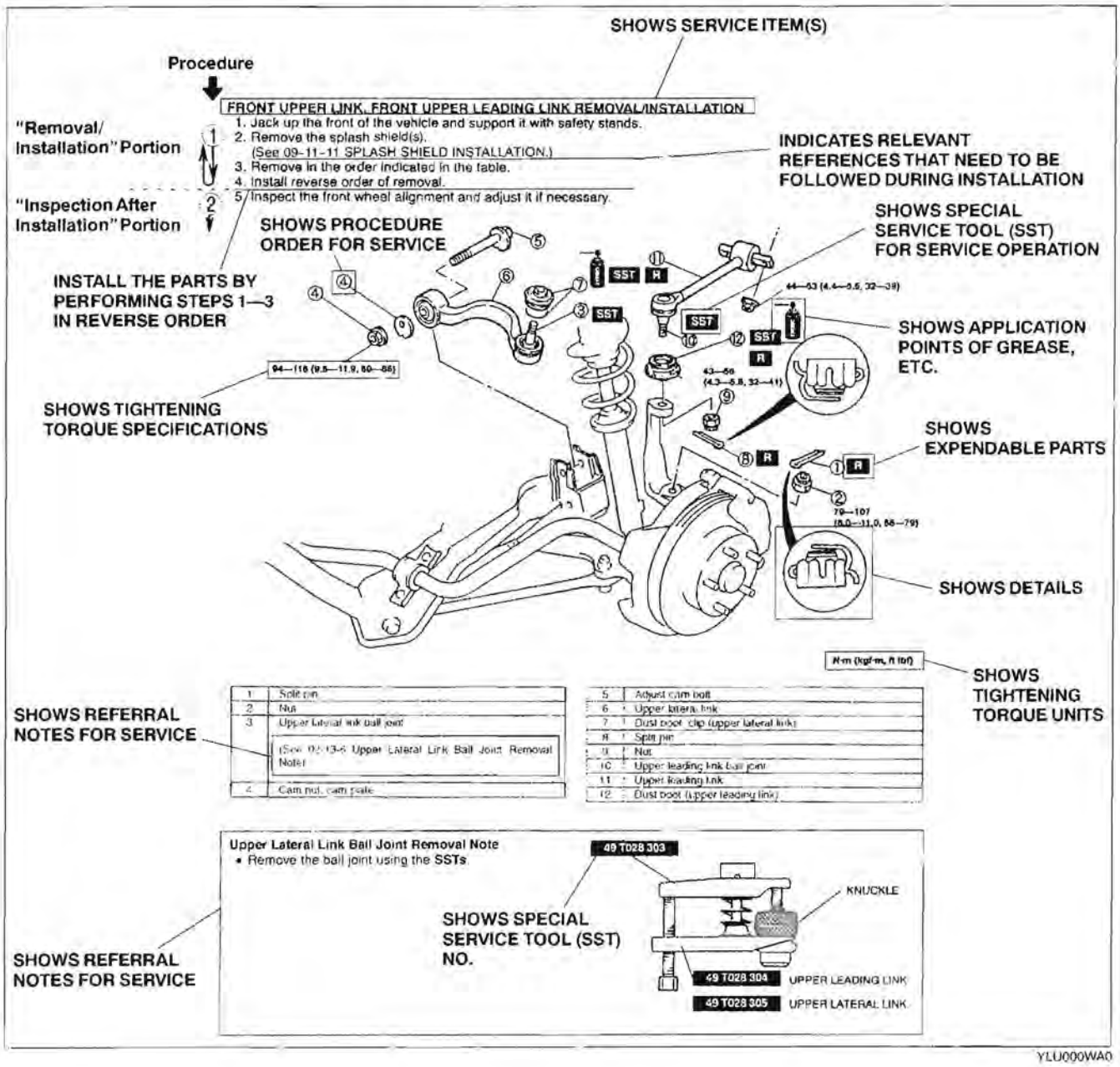
Repair procedure

1. Most repair operations begin with an overview illustration. It identifies the components, shows how the parts fit together, and describes visual part inspection. However, only removal/installation procedures that need to be performed methodically have written instructions.
2. Expendable parts, tightening torques, and symbols for oil, grease, and sealant are shown in the overview illustration. In addition, symbols indicating parts requiring the use of special service tools or equivalent are also shown.
3. Procedure steps are numbered and the part that is the main point of that procedure is shown in the illustration with the corresponding number. Occasionally, there are important points or additional information concerning a procedure. Refer to this information when servicing the related part.


SHOWS SERVICE ITEM(S)
Procedure
FRONT UPPER LINK, FRONT UPPER LEADING LINK REMOVAL/INSTALLATION
1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the splash shield(s).
(See 09-11-11 SPLASH SHIELD INSTALLATION.)
3. Remove in the order indicated in the table.
4. Install reverse order of removal.
5. Inspect the front wheel alignment and adjust it if necessary.
"Removal/ Installation" Portion
"Inspection After Installation" Portion
INDICATES RELEVANT REFERENCES THAT NEED TO BE FOLLOWED DURING INSTALLATION
SHOWS PROCEDURE ORDER FOR SERVICE
SHOWS SPECIAL SERVICE TOOL (SST) FOR SERVICE OPERATION
INSTALL THE PARTS BY PERFORMING STEPS 1—3 IN REVERSE ORDER
SHOWS APPLICATION POINTS OF GREASE, ETC.
SHOWS TIGHTENING TORQUE SPECIFICATIONS
SHOWS EXPENDABLE PARTS
SHOWS DETAILS
N·m (kgf-m, ft·lbf)
SHOWS TIGHTENING TORQUE UNITS
SHOWS REFERRAL NOTES FOR SERVICE
1 Split pin
2 Nut
3 Upper lateral link ball joint
(See 09-13-6 Upper Lateral Link Ball Joint Removal Note)
4 Cam nut, cam plate
5 Adjust cam bolt
6 * Upper lateral link
7 * Dust boot clip (upper lateral link)
8 * Split pin
9 * Nut
10 * Upper leading link ball joint
11 * Upper leading link
12 * Dust boot (upper leading link)
Upper Lateral Link Ball Joint Removal Note
• Remove the ball joint using the SSTs.
SHOWS REFERRAL NOTES FOR SERVICE
SHOWS SPECIAL SERVICE TOOL (SST) NO.
49 T028 303
KNUCKLE
49 T028 304 UPPER LEADING LINK
49 T028 305 UPPER LATERAL LINK

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Symbols

- There are eight symbols indicating oil, grease, fluids, sealant, and the use of **SST** or equivalent. use. These symbols show application points or use of these materials during service.

Symbol	Meaning	Kind
	Apply oil	New appropriate engine oil or gear oil
	Apply brake fluid	New appropriate brake fluid
	Apply automatic transaxle/ transmission fluid	New appropriate automatic transaxle/ transmission fluid
	Apply grease	Appropriate grease
	Apply sealant	Appropriate sealant
	Apply petroleum jelly	Appropriate petroleum jelly
	Replace part	O-ring, gasket, etc.
	Use SST or equivalent	Appropriate tools

Advisory Messages

- You will find several **Warnings**, **Cautions**, **Notes**, **Specifications** and **Upper and Lower Limits** in this manual.

Warning

- A Warning indicates a situation in which serious injury or death could result if the warning is ignored.

Caution

- A Caution indicates a situation in which damage to the vehicle or parts could result if the caution is ignored.

Note

- A Note provides added information that will help you to complete a particular procedure.

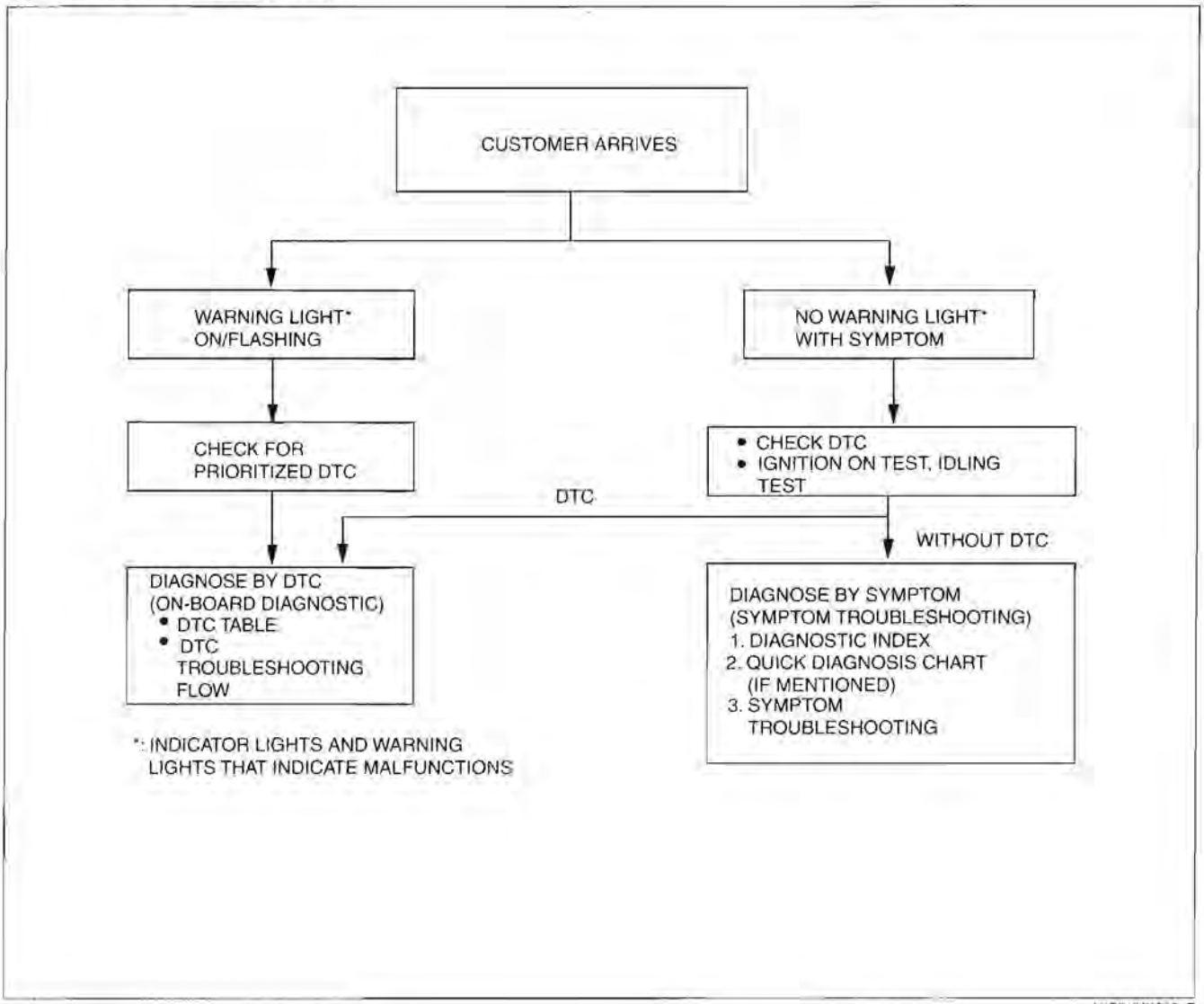
Specification

- The values indicate the allowable range when performing inspections or adjustments.

Upper and lower limits

- The values indicate the upper and lower limits that must not be exceeded when performing inspections or adjustments.

Troubleshooting Procedure
Basic flow of troubleshooting



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DTC troubleshooting flow (on-board diagnostic)

- Diagnostic trouble codes (DTCs) are important hints for repairing malfunctions that are difficult to simulate. Perform the specific DTC diagnostic inspection to quickly and accurately diagnose the malfunction.
- The on-board diagnostic function is used during inspection. When a DTC is shown specifying the cause of a malfunction, continue the diagnostic inspection according to the items indicated by the on-board diagnostic function.

Diagnostic index

- The diagnostic index lists the symptoms of specific malfunctions. Select the symptoms related or most closely relating to the malfunction.

Quick diagnosis chart (If mentioned)

- The quick diagnosis chart lists diagnosis and inspection procedures to be performed specifically relating to the cause of the malfunction.

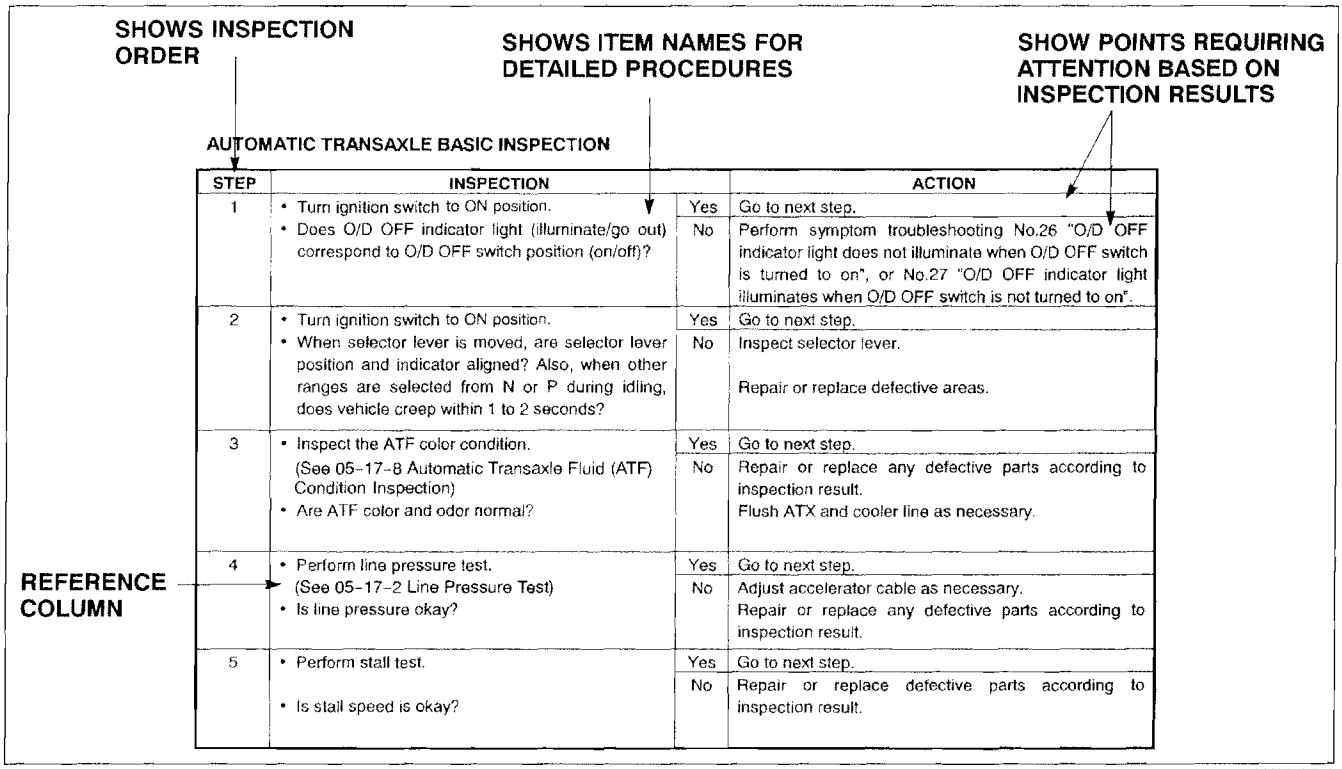
Symptom troubleshooting

- Symptom troubleshooting quickly determines the location of the malfunction according to symptom type.

Procedures for Use

Using the basic inspection (section 05)

- Perform the basic inspection procedure before symptom troubleshooting.
- Perform each step in the order shown.
- The reference column lists the location of the detailed procedure for each basic inspection.
- Although inspections and adjustments are performed according to the reference column procedures, if the cause of the malfunction is discovered during basic inspection, continue the procedures as indicated in the action column.



AUTOMATIC TRANSAXLE BASIC INSPECTION

STEP	INSPECTION		ACTION
1	• Turn ignition switch to ON position. • Does O/D OFF indicator light (illuminate/go out) correspond to O/D OFF switch position (on/off)?	Yes	Go to next step.
		No	Perform symptom troubleshooting No.26 "O/D OFF indicator light does not illuminate when O/D OFF switch is turned to on", or No.27 "O/D OFF indicator light illuminates when O/D OFF switch is not turned to on".
2	• Turn ignition switch to ON position. • When selector lever is moved, are selector lever position and indicator aligned? Also, when other ranges are selected from N or P during idling, does vehicle creep within 1 to 2 seconds?	Yes	Go to next step.
		No	Inspect selector lever. Repair or replace defective areas.
3	• Inspect the ATF color condition. (See 05-17-8 Automatic Transaxle Fluid (ATF) Condition Inspection) • Are ATF color and odor normal?	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection result. Flush ATX and cooler line as necessary.
4	• Perform line pressure test. (See 05-17-2 Line Pressure Test) • Is line pressure okay?	Yes	Go to next step.
		No	Adjust accelerator cable as necessary. Repair or replace any defective parts according to inspection result.
5	• Perform stall test. • Is stall speed is okay?	Yes	Go to next step.
		No	Repair or replace defective parts according to inspection result.

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Using the DTC troubleshooting flow

- DTC troubleshooting flow shows diagnostic procedures, inspection methods, and proper action to take for each DTC.

TROUBLE CONDITION

DETECTION CONDITION describes the condition under which the DTC is detected.

DTC P0103

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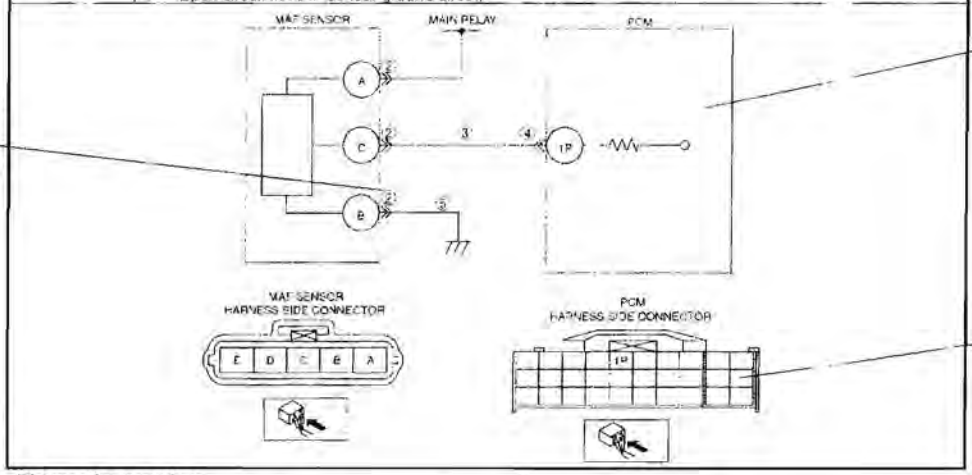
DTC P0103	MAF circuit high input
DETECTION CONDITION	PCM monitors input voltage from TP sensor after ignition key is turned on. If input voltage at PCM terminal 68 is above 8.25 V, PCM determines that TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Open circuit in wiring between MAF sensor terminal D and PCM terminal 36 • Open circuit in MAF sensor ground circuit

POSSIBLE CAUSE describes possible point(s) of malfunction.



Indicates the circuit to be inspected (section 01 and 05)

Indicates the inspection step No. to be performed (section 01 and 05)

Indicates the connector related to the inspection

STEP shows the order of troubleshooting

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Are related Service Bulletins and/or on-line repair information available?	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT** • Connect WDS to DLC-2. • Start engine. • Access MAF V PID using WDS. • Is MAF V PID within 0.2 - 8.3 V?	Yes	Intermittent concern is existing. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01-03-33 INTERMITTENT CONCERN TROUBLESHOOTING)
		No	Go to next step.
4	**INSPECT POOR CONNECTION OF MAF SENSOR CONNECTOR** • Turn ignition key to OFF. • Disconnect MAF sensor connector. • Check for poor connection (damaged, pulled-out terminals, corrosion etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 8.

ACTION describes the appropriate action to take as according to the result (Yes/No).

Reference item(s) to perform ACTION

INSPECTION describes the method to quickly determine the failed part(s).

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Using the diagnostic index

- The symptoms of the malfunctions are listed in the diagnostic index for symptom troubleshooting.
- The exact malfunction symptoms can be selected by following the index.

NO.	TROUBLESHOOTING ITEM		DESCRIPTION	PAGE
1	Melts main or other fuse			(See 01-03-6 MELT NO.1 MAIN OR OTHER FUSE)
2	MIL comes on		MIL is illuminated incorrectly.	(See 01-03-7 NO.2 MIL COMES ON)
3	Will not crank		Starter does not work.	(See 01-03-8 NO.3 WILL NOT CRANK)
4	Hard start/long crank/erratic crank		Starter cranks engine at normal speed but engine requires excessive cranking time before starting.	(See 01-03-9 NO.4 HARD START/LONG CRANK/ERRATIC CRANK)
5	Engine stalls	After start/at idle	Engine stops unexpectedly at idel and/or after start.	(See 01-03-11 NO.5 ENGINE STALLS-AFTER START/AT IDLE)
6	Cranks normally but will not start		Starter cranks engine at normal speed but engine will not run	(See 01-03-15 NO.5 CRANKS NORMALY BUT WILL NOT START)
7	Slow return to idle		Engine takes more time than normal to return to idle speed.	(See 01-03-19 NO.7 SLOW RETURN TO IDLE)
8	Engine runs rough/rolling idle		Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively.	(See 01-03-20 NO.8 ENGINE RUNS ROUGH/ROLLING IDLE)
9	Fast idle/runs on		Engine speed continues at fast idle after warm-up. Engine runs after ignition switch is turned off	(See 01-03-23 NO.9 FAST IDLE/RUNS ON)
10	Low idle/stalls during deceleration		Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.	(See 01-03-24 NO.10 LOW IDLE/STALLS DURING DECELERATION)

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Using the quick diagnosis chart

- The chart lists the relation between the symptom and the cause of the malfunction.
- The chart is effective in quickly narrowing down the relation between symptom and cause of the malfunction. It also specifies the area of the common cause when multiple malfunction symptoms occur.
- The appropriate diagnostic inspection relating to malfunction cause as specified by the symptoms can be selected by looking down the diagnostic inspection column of the chart.

2 **PARTS WHICH MAY BE THE CAUSE OF PROBLEMS**

SYMPTOM QUICK DIAGNOSTIC CHART

PART WHICH MAY BE THE SYMPTOM

1 **CHOOSE THE ACTUAL SYMPTOM**

Troubleshooting item \ Possible factor			Starter motor malfunction (Mechanical or electrical)	Starter circuit including ignition switch open	Improper engine oil level	Low or dead battery	Charging system malfunction	Improper engine compression	Improper valve timing	Hydrolocked engine	Improper engine oil viscosity	Improper dipstick	Base engine malfunction	Drive plate or flywheel seized	Improper tension or damaged drive belts	Improper engine coolant level	Water and anti-freeze mixture improperly	Cooling system malfunction (Radiator, hoses, overflow system, thermostat, etc.)	Cooling fan system malfunction	Engine or transaxle mounts improperly installed	Cooling fan or condenser fan seal improperly	Accelerator cable free play mis adjustment	Fuel quality
1	Melts main or other fuse																						
2	MIL comes on																						
3	Will not crank		×	×		×	×			×				×									
4	Hard start / long crank / erratic start / erratic crank																						×
5	Engine stalls	After start / at idle						×	×	×													×
6	Cranks normally but will not start							×	×	×													×
7	Slow return to idle																		×				
8	Engine runs rough / rolling idle							×	×														×
9	Fast idle / runs on																					×	
10	Low idle / stalls during deceleration																						
11	Engine stalls / quits	Acceleration / cruise						×	×														×
	Engine runs rough	Acceleration / cruise						×	×														×
	Misses	Acceleration / cruise						×	×														×
	Buck / jerk	Acceleration / cruise / deceleration						×	×														×
	Hesitation / stumble	Acceleration						×	×														×
	Surges	Acceleration / cruise						×	×														×
12	Lack / loss of power	Acceleration / cruise						×	×														×
13	Knocking / pinging	Acceleration / cruise						×										×					
14	Poor fuel economy							×	×						×			×	×				×
15	Emissions compliance							×	×				×					×					
16	High oil consumption/leakage										×	×	×										
17	Cooling system concerns	Overheating													×	×	×	×	×				
18	Cooling system concerns	Runs cold																×	×				
19	Exhaust smoke												×					×					
20	Fuel odor (in engine compartment)																						
21	Engine noise				×								×		×								
22	Vibration concerns (engine)														×					×	×		
23	A/C does not work sufficiently																						
24	A/C always on / A/C compressor runs continuously																						
25	A/C does not cut off under wide open throttle conditions																						
26	Exhaust sulphur smell																						×
27	Fuel refill concerns																						
28	Fuel filling shut off issues																						
29	Intermittent concerns					×																	
30	Constant voltage																						
31	Spark plug condition							×			×		×				×						×
32	Automatic transaxle concerns	Upshift / downshift / engagement	(See 05-01 AUTOMATIC TRANSAXLE SYMPTOM TROUBLESOOTING)																				

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Using the symptom troubleshooting

- Symptom troubleshooting shows diagnostic procedures, inspection methods, and proper action to take for each trouble symptom.

DESCRIPTION describes what kind of TROUBLE SYMPTOM

TROUBLE SYMPTOM

14	Engine flares up or slips when upshifting or down shifting
DESCRIPTION	• When accelerator pedal is depressed for driveway, engine speed increase but vehicle speed increase slowly. • When accelerator is depressed while driving,engine speed increases but vehicle not.
POSSIBLE CAUSE	• There is clutch slip because clutch is stuck or line pressure is low. — Clutch stuck, slippage (forward clutch, 3-4 clutch, 2-4 brake band, one-way clutch 1, one-way clutch 2) • Line pressure low • Malfunction or mis-adjustment of TP sensor • Malfunction of VSS • Malfunction of input/turbine speed sensor • Malfunction of sensor ground • Malfunction of shift solenoid A, B or C • Malfunction of TCC solenoid valve • Malfunction of body ground • Malfunction of throttle cable • Malfunction of throttle valve body — Poor operating of mechanical pressure • Selector lever position disparity • TR switch position disparity
	Note • Before following troubleshooting steps, make sure that Automatic Transaxle On-board Diagnostic and Automatic Transaxle Basic inspection are conducted.

POSSIBLE CAUSE describes possible point of malfunction

STEP shows the order of troubleshooting.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is line pressure okay?	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection results.
2	• Is shift point okay? (See 05-17-5 ROAD TEST)	Yes	Go to next step.
		No	Go to symptom troubleshooting No.9 "Abnormal shift".
3	• Stop engine and turn ignition switch on. • Connect WDS to DLC-2. • Simulate SHIFT A, SHIFT B and SHIFT C PIDs for ON. • Is operating sound of shift solenoids heard?	Yes	• Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual GF4A-EL (1666-1A-99F)) • If problem remains, replace or overhaul transaxle and repair or replace defective parts. (See 05-17-15 AUTOMATIC TRANSAXLE REMOVEVAL/INSTALLATION)
		No	• Inspect for bend, damage, corrosion or loose connection if shift solenoid A, B, or C terminal on ATX. • Inspect for shift solenoid mechanical stuck. (See 05-17-14 Inspection of Operation) • If shift solenoids are okay, inspect for open or short circuit between PCM connector terminal A, B or C.
4	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. — If vehicle is repaired, troubleshooting completed. — If vehicle is not repaired or additional diagnostic information is not available, replace or reprogram PCM.		

Reference item (s) for additional information to perform INSPECTION.

INSPECTION describes the method to quickly detemine the failed part.

ACTION describes the approriate action to take as a result (YES/NO) of INSPECTION.

How to perform ACTION is described in the relative material shown.

Reference item(s) to perform ACTION.

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UNITS

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Electric current	A (ampere)
Electric power	W (watt)
Electric resistance	ohm
Electric voltage	V (volt)
Length	mm (millimeter)
	in (inch)
Negative pressure	kPa (kilo pascal)
	mmHg (millimeters of mercury)
	inHg (inches of mercury)
Positive pressure	kPa (kilo pascal)
	kgf/cm^2 (kilogram force per square centimeter)
	psi (pounds per square inch)
Number of revolutions	rpm (revolutions per minute)
Torque	N·m (Newton meter)
	kgf·m (kilogram force meter)
	kgf·cm (kilogram force centimeter)
	ft·lbf (foot pound force)
	in·lbf (inch pound force)
Volume	L (liter)
	US qt (U.S. quart)
	Imp qt (Imperial quart)
	ml (milliliter)
	cc (cubic centimeter)
	cu in (cubic inch)
	fl oz (fluid ounce)
Weight	g (gram)
	oz (ounce)

Conversion to SI Units (Système International d'Unités)

- All numerical values in this manual are based on SI units. Numbers shown in conventional units are converted from these values.

Rounding Off

- Converted values are rounded off to the same number of places as the SI unit value. For example, if the SI unit value is 17.2 and the value after conversion is 37.84, the converted value will be rounded off to 37.8.

Upper and Lower Limits

- When the data indicates upper and lower limits, the converted values are rounded down if the SI unit value is an upper limit and rounded up if the SI unit value is a lower limit. Therefore, converted values for the same SI unit value may differ after conversion. For example, consider 2.7 kgf/cm^2 in the following specifications:

  210—260 kPa {2.1—2.7 kgf/cm^2, 30—38 psi}
  270—310 kPa {2.7—3.2 kgf/cm^2, 39—45 psi}

- The actual converted values for 2.7 kgf/cm^2 are 264 kPa and 38.4 psi. In the first specification, 2.7 is used as an upper limit, so the converted values are rounded down to 260 and 38. In the second specification, 2.7 is used as a lower limit, so the converted values are rounded up to 270 and 39.

SAE STANDARDS

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- In accordance with new regulations, SAE (Society of Automotive Engineers) standard names and abbreviations are now used in this manual. The table below lists the names and abbreviations that have been used in Mazda manuals up to now and their SAE equivalents.

SAE Standard		Remark
Abbreviation	Name	
AP	Accelerator Pedal	
ACL	Air Cleaner	
A/C	Air Conditioning	
BARO	Barometric Pressure	
B+	Battery Positive Voltage	
CMP sensor	Camshaft Position Sensor	
CAC	Charge Air Cooler	
CLS	Closed Loop System	
CTP	Closed Throttle Position	
CPP	Clutch Pedal Position	
CIS	Continuous Fuel Injection System	
CKP sensor	Crankshaft Position Sensor	
DLC	Data Link Connector	
DTM	Diagnostic Test Mode	#1
DTC	Diagnostic Test Code(s)	
DI	Distributor Ignition	
DLI	Distributorless Ignition	
EI	Electronic Ignition	#2
ECT	Engine Coolant Temperature	
EM	Engine Modification	
EVAP	Evaporative Emission	
EGR	Exhaust Gas Recirculation	
FC	Fan Control	
FF	Flexible Fuel	
4GR	Fourth Gear	
GEN	Generator	
GND	Ground	
HO2S	Heated Oxygen Sensor	With heater
IAC	Idle Air Control	
IAT	Intake Air Temperature	
KS	Knock Sensor	
MIL	Malfunction Indicator Lamp	

SAE Standard		Remark
Abbreviation	Name	
MAP	Manifold Absolute Pressure	
MAF sensor	Mass Air Flow Sensor	
MFL	Multiport Fuel Injection	
OBD	On-board Diagnostic System	
OL	Open Loop	
OC	Oxidation Catalytic Converter	
O2S	Oxygen sensor	
PNP	Park/Neutral Position	
PSP	Power Steering Pressure	
PCM	Powertrain Control Module	#3
PAIR	Pulsed Secondary Air Injection	Pulsed injection
AIR	Secondary Air Injection	Injection with air pump
SAPV	Secondary Air Pulse Valve	
SFI	Sequential Multiport Fuel Injection	
3GR	Third Gear	
TWC	Three Way Catalytic Converter	
TB	Throttle Body	
TP sensor	Throttle Position Sensor	
TCC	Torque Converter Clutch	
TCM	Transmission (Transaxle) Control Module	
TR	Transmission (Transaxle) Range	
TC	Turbocharger	
VSS	Vehicle Speed Sensor	
VR	Voltage Regulator	
VAF sensor	Volume Air Flow Sensor	
WU-TWC	Warm Up Three Way Catalytic Converter	#4
WOP	Wide Open Throttle	

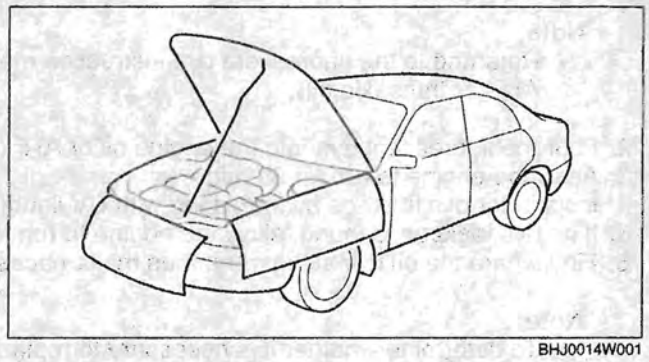
#1 : Diagnostic trouble codes depend on the diagnostic test mode.
#2 : Controlled by the PCM
#3 : Device that controls engine and powertrain
#4 : Directly connected to exhaust manifold

SERVICE CAUTIONS

C6U000000004W01

Protection of the Vehicle

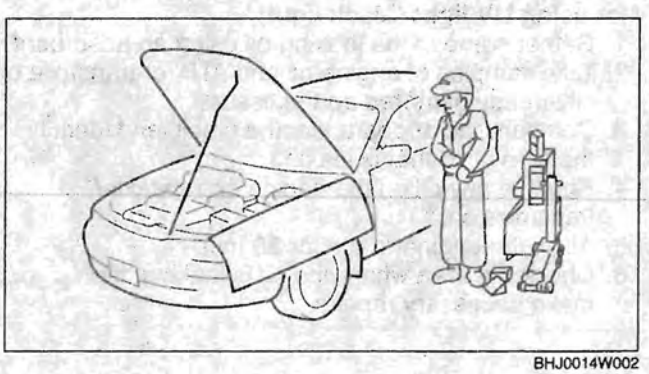
- Always be sure to cover fenders, seats and floor areas before starting work.



BHJ0014W001

Preparation of Tools and Measuring Equipment

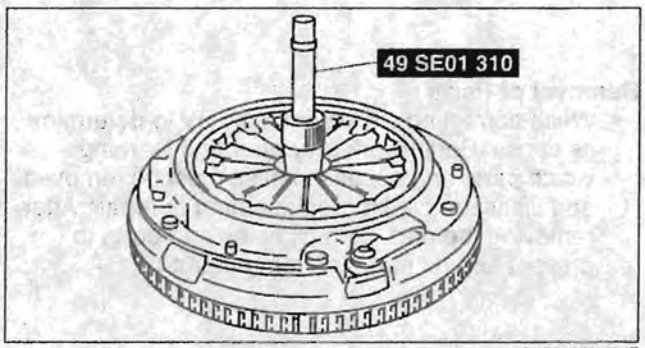
- Be sure that all necessary tools and measuring equipment are available before starting any work.



BHJ0014W002

Special Service Tools

- Use special service tools or equivalent when they are required.



WGIWXX0024E

Disconnection of the Negative Battery Cable

- Before beginning any work, turn the ignition switch to LOCK position, then disconnect the negative battery cable and wait for more than 1 min. to allow the backup power supply of the SAS control module to deplete its stored power. Disconnecting the battery cable will delete the memories of the clock, audio, and DTCs, etc. Therefore, it is necessary to verify those memories before disconnecting the cable.

Oil Leakage Inspection

- Use either of the following procedures to identify the type of oil that is leaking:

Using UV light (black light)

1. Remove any oil on the engine or transaxle.

Note

- Referring to the fluorescent dye instruction manual, mix the specified amount of dye into the engine oil or ATF (or transaxle oil).

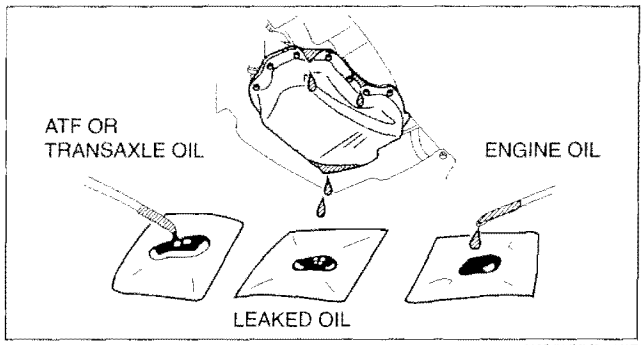
2. Pour the fluorescent dye into the engine oil or ATF (or transaxle oil).
3. Allow the engine to run for 30 min.
4. Inspect for dye leakage by irradiating with UV light (black light), and identify the type of oil that is leaking.
5. If no dye leakage is found, allow the engine to run for another 30 min. or drive the vehicle then reinspect.
6. Find where the oil is leaking from, then make necessary repairs.

Note

- To determine whether it is necessary to replace the oil after adding the fluorescent dye, refer to the fluorescent dye instruction manual.

Not using UV light (black light)

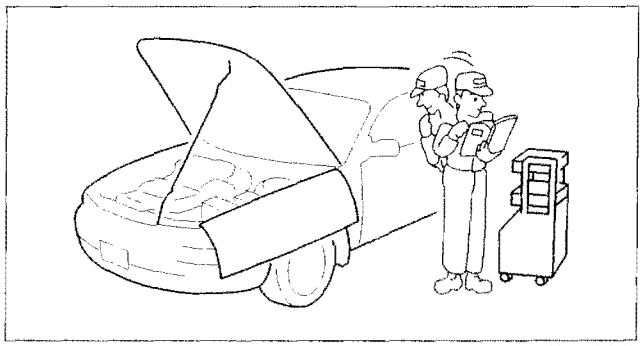
1. Gather some of the leaking oil using an absorbent white tissue.
2. Take samples of engine oil and ATF (or transaxle oil), both from the dipstick, and place them next to the leaked oil already gathered on the tissue.
3. Compare the appearance and smell, and identify the type of oil that is leaking.
4. Remove any oil on the engine or transaxle/ transmission.
5. Allow the engine to run for 30 min.
6. Check the area where the oil is leaking, then make necessary repairs.



WGIWXX0025E

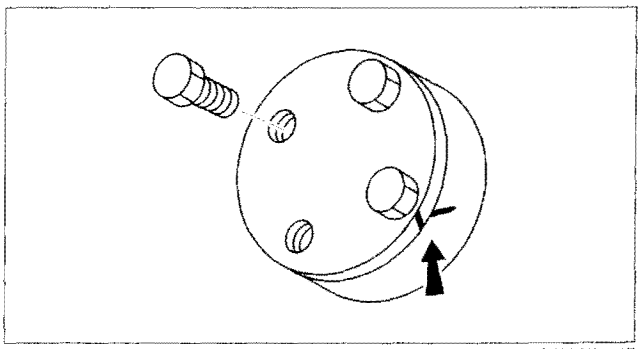
Removal of Parts

- While correcting a problem, also try to determine its cause. Begin work only after first learning which parts and subassemblies must be removed and disassembled for replacement or repair. After removing the part, plug all holes and ports to prevent foreign material from entering.


BHJ0014W005

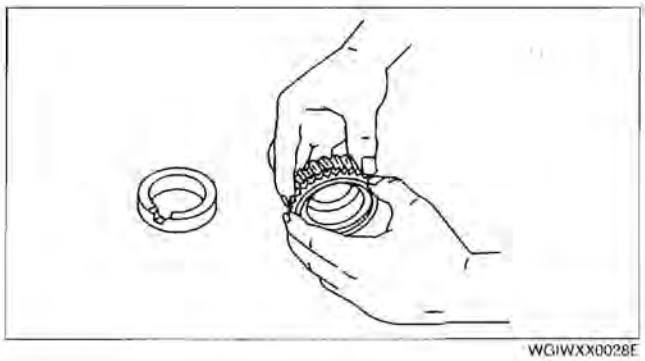
Disassembly

- If the disassembly procedure is complex, requiring many parts to be disassembled, all parts should be marked in a place that will not affect their performance or external appearance and identified so that reassembly can be performed easily and efficiently.


WGIWXX0027E

Inspection During Removal, Disassembly

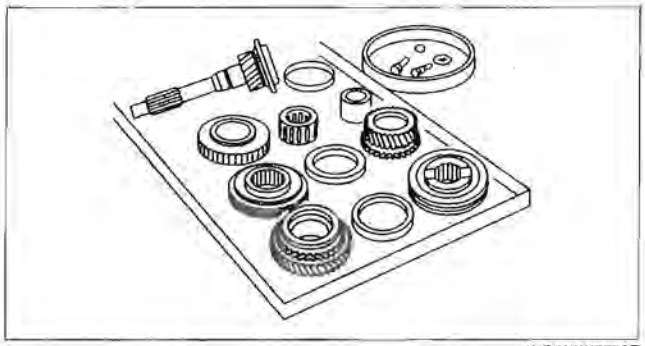
- When removed, each part should be carefully inspected for malfunction, deformation, damage and other problems.



WGIWXX0028E

Arrangement of Parts

- All disassembled parts should be carefully arranged for reassembly.
- Be sure to separate or otherwise identify the parts to be replaced from those that will be reused.



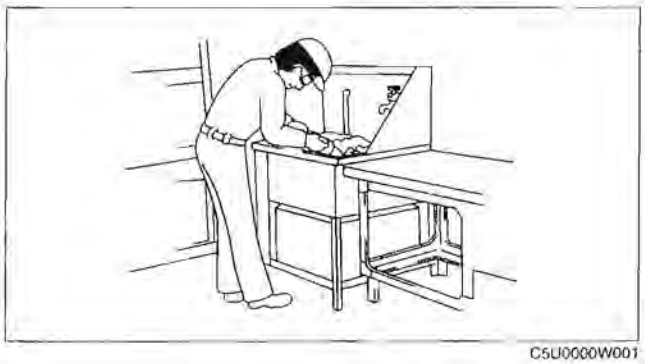
WGIWXX0029E

Cleaning of Parts

- All parts to be reused should be carefully and thoroughly cleaned in the appropriate method.

  Warning

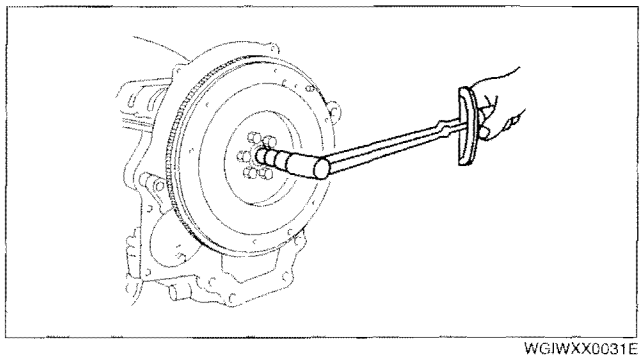
  - **Using compressed air can cause dirt and other particles to fly out causing injury to the eyes. Wear protective eye wear whenever using compressed air.**



C5U0000W001

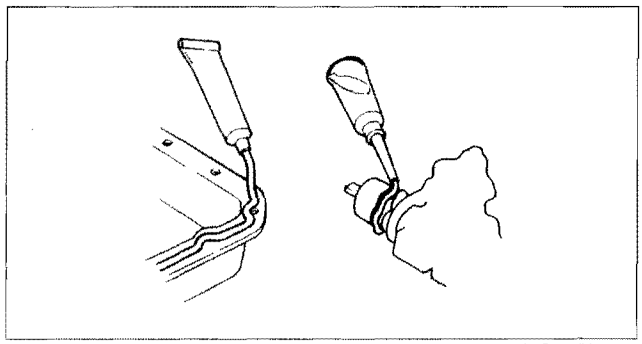
Reassembly

- Standard values, such as torques and certain adjustments, must be strictly observed in the reassembly of all parts.
- If removed, these parts should be replaced with new ones:
  - — Oil seals
  - — Gaskets
  - — O-rings
  - — Lockwashers
  - — Cotter pins
  - — Nylon nuts



WGIWXX0031E

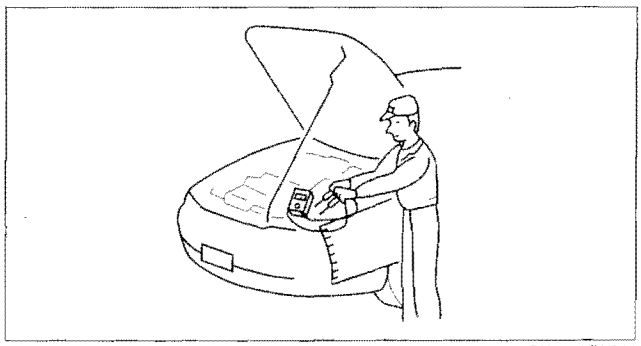
- Depending on location:
  - — Sealant and gaskets, or both, should be applied to specified locations. When sealant is applied, parts should be installed before sealant hardens to prevent leakage.
  - — Oil should be applied to the moving components of parts.
  - — Specified oil or grease should be applied at the prescribed locations (such as oil seals) before reassembly.



WGIWXX0032E

Adjustment

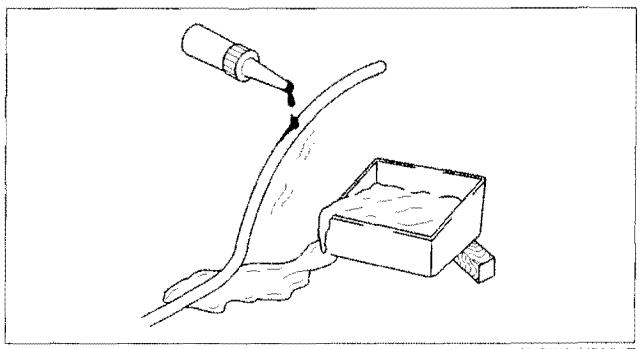
- Use suitable gauges and testers when making adjustments.



BHJ0014W012

Rubber Parts and Tubing

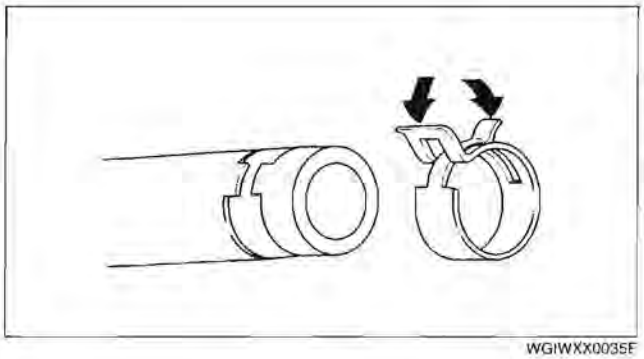
- Prevent gasoline or oil from getting on rubber parts or tubing.



WGIWXX0034E

Hose Clamps

- When reinstalling, position the hose clamp in the original location on the hose and squeeze the clamp lightly with large pliers to ensure a good fit.

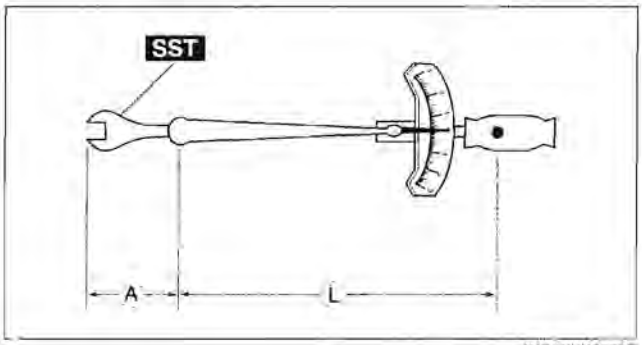


WGIWXX0035E

Torque Formulas

- When using a torque wrench-**SST** or equivalent combination, the written torque must be recalculated due to the extra length that the **SST** or equivalent adds to the torque wrench. Recalculate the torque by using the following formulas. Choose the formula that applies to you.

Torque Unit	Formula
N·m	N·m × [L/(L+A)]
kgf·m	kgf·m × [L/(L+A)]
kgf·cm	kgf·cm × [L/(L+A)]
ft·lbf	ft·lbf × [L/(L+A)]
in·lbf	in·lbf × [L/(L+A)]

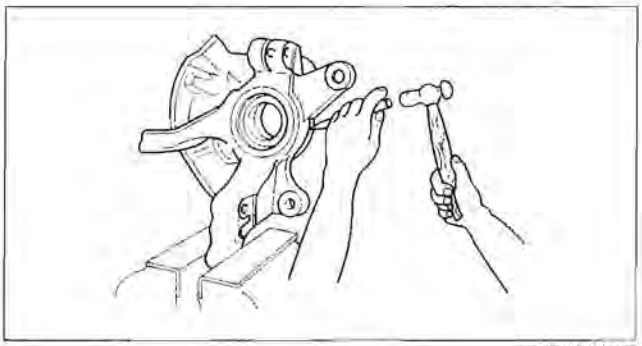


WGIWXX0036E

A : The length of the **SST** past the torque wrench drive.
L : The length of the torque wrench.

Vise

- When using a vise, put protective plates in the jaws of the vise to prevent damage to parts.



WGIWXX0037E

Dynamometer

- When inspecting and servicing the power train on the dynamometer or speed meter tester, pay attention to the following:
  - — Place a fan, preferably a vehicle-speed proportional type, in front of the vehicle.
  - — Make sure the vehicle is in a facility with an exhaust gas ventilation system.
  - — Since the rear bumper might deform from the heat, cool the rear with a fan. (Surface of the bumper must be below **70 degrees**.)
  - — Keep the area around the vehicle uncluttered so that heat does not build up.
  - — Watch the water temperature gauge and don't overheat the engine.
  - — Avoid added load to the engine and maintain normal driving conditions as much as possible.

Note

- When only the front wheels are being rotated on the dynamometer, the ABS warning light could illuminate. If the ABS warning light illuminates, turn the ignition switch to the LOCK position, then turn it back to the ON position, run the vehicle at **10 km/h** and check that the ABS warning light goes off. (In this case, a DTC will be stored in the memory. To delete this data from the memory, follow the procedure for deleting DTCs (ABS) from memory.) (See 04-10-1 PRECAUTION (BRAKES) to turn off the warning light.)

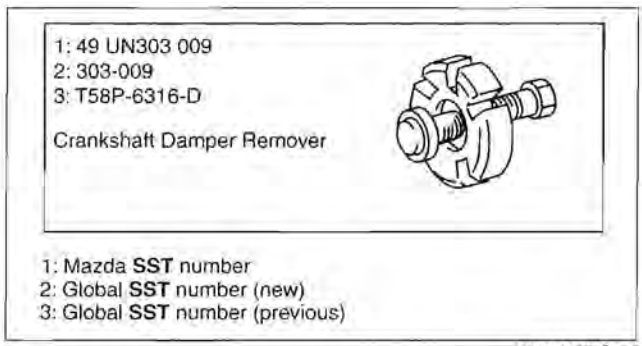
SST

- Some global **SST** or equivalent are used as **SSTs** necessary for engine repair. Note that these **SSTs** are marked with global **SST** numbers.
- **SST** numbers are indicated in two ways, as shown in the following examples.
  - — 01–60 section: Both MAZDA and global **SST** numbers are indicated for reference.
  - — Except 01–60 section: Either only the MAZDA **SST** number or both the MAZDA **SST** and global **SST** numbers are shown.

Example (01–60 section)

C6U000ZWC001

Example (except 01–60 section)



C6U000ZWC002

INSTALLATION OF RADIO SYSTEM

C6U000000005W01

- If a radio system is installed improperly or if a high-powered type is used, the CIS and other systems may be affected. When the vehicle is to be equipped with a radio, observe the following precautions:
  - — Install the antenna at the farthest point from control modules.
  - — Install the antenna feeder as far as possible from the control module harnesses.
  - — Ensure that the antenna and feeder are properly adjusted.
  - — Do not install a high-powered radio system.

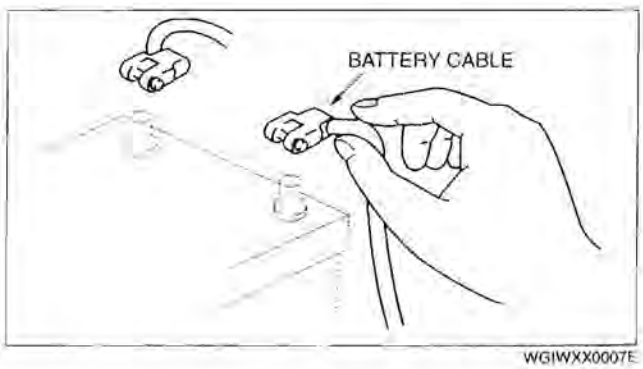
ELECTRICAL SYSTEM

C6U000000006W01

Electrical Parts

Battery cable

- Before disconnecting connectors or removing electrical parts, disconnect the negative battery cable.



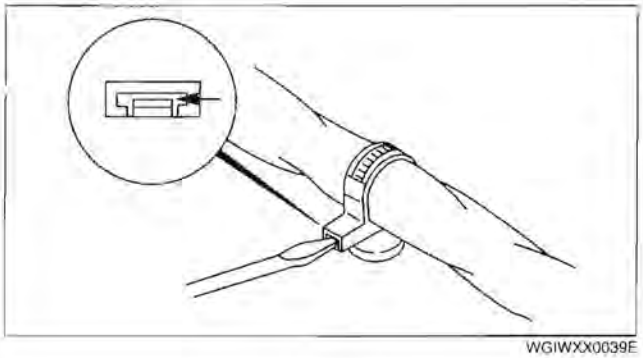
WGIWXX0007E

Wiring harness

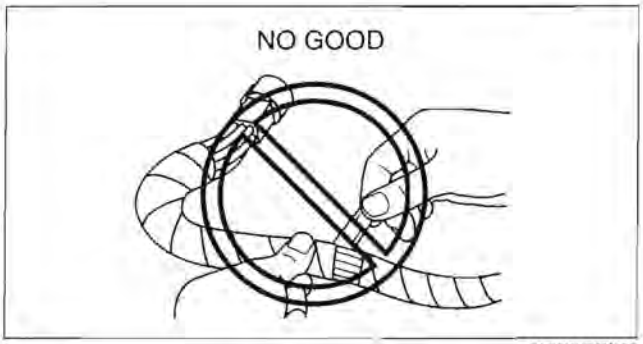
- To remove the wiring harness from the clip in the engine room, pry up the hook of the clip using a flathead screwdriver.

Caution

- **Do not remove the harness protective tape. Otherwise, the wires could rub against the body, which could result in water penetration and electrical shorting.**



WGIWXX0039E

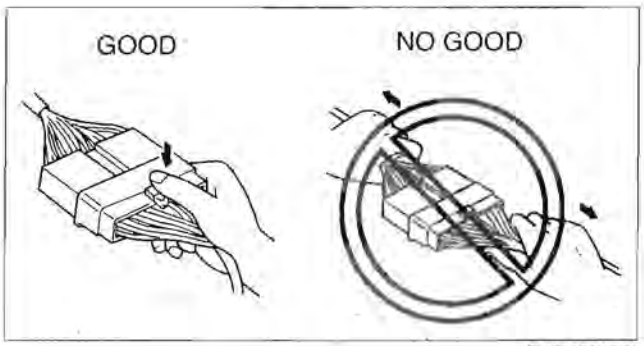


CHU0000W010

Connectors

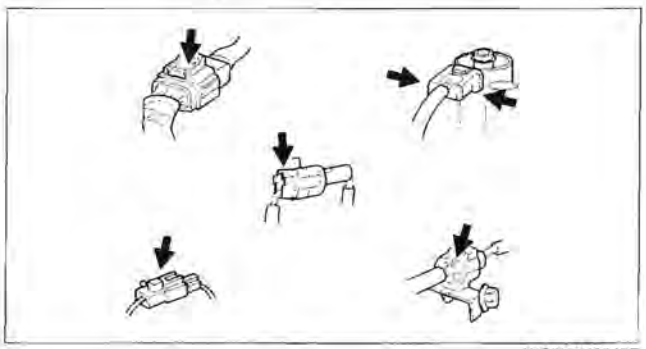
Disconnecting connectors

- When disconnecting connector, grasp the connectors, not the wires.



CHU0000W014

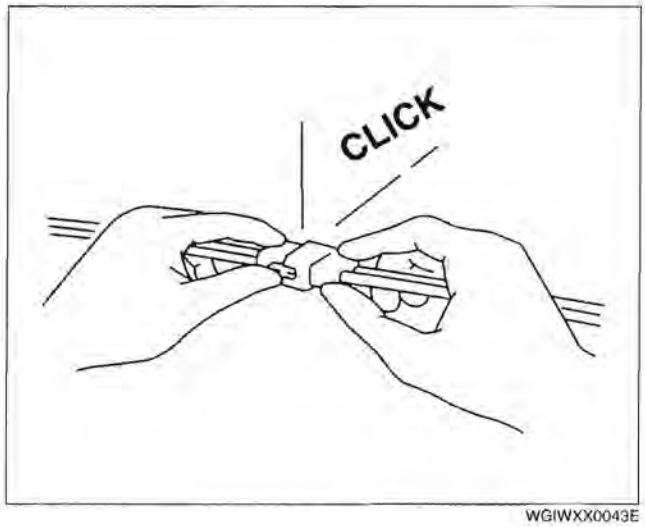
- Connectors can be disconnected by pressing or pulling the lock lever as shown.



WGIWXX0042E

Locking connector

- When locking connectors, listen for a click indicating they are securely locked.



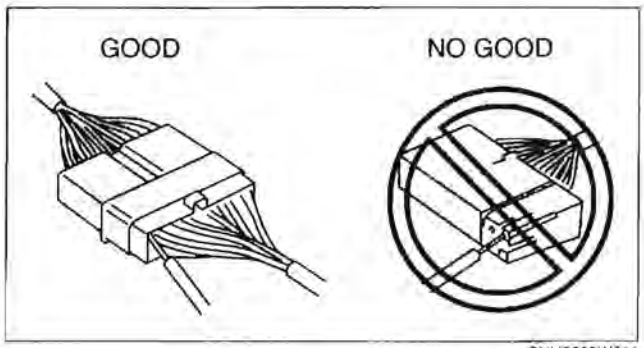
WGIWXX0043E

Inspection

Caution

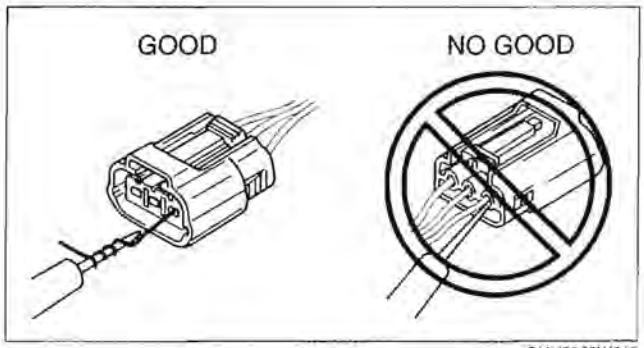
- **To prevent damage to the terminal, wrap a thin wire around the tester probe before inserting into terminal.**

- When a tester is used to inspect for continuity or measuring voltage, insert the tester probe from the wiring harness side.



CHU0000W011

- Inspect the terminals of waterproof connectors from the connector side since they cannot be accessed from the wiring harness side.

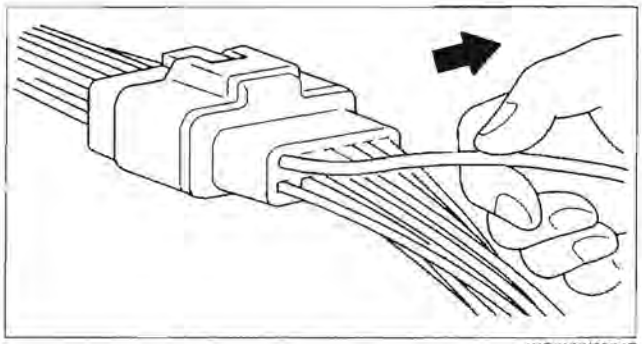


CHU0000W012

Terminals

Inspection

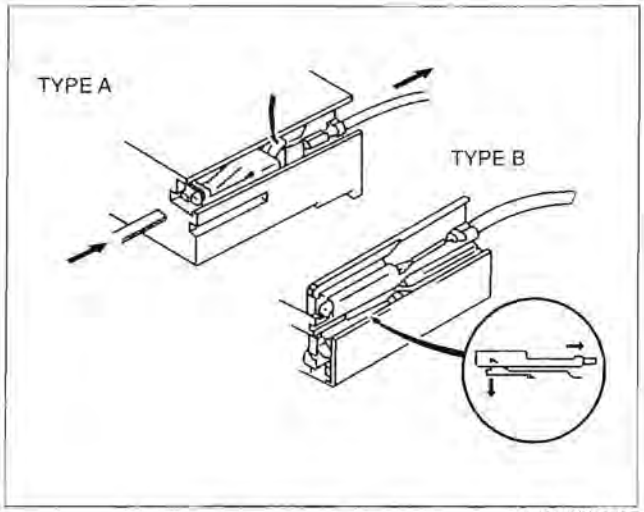
- Pull lightly on individual wires to verify that they are secured in the terminal.



WGIWXX0064E

Replacement

- Use the appropriate tools to remove a terminal as shown. When installing a terminal, be sure to insert it until it locks securely.
- Insert a thin piece of metal from the terminal side of the connector and with the terminal locking tab pressed down, pull the terminal out from the connector.



WGIWXX0046E

Sensors, Switches, and Relays

- Handle sensors, switches, and relays carefully. Do not drop them or strike them against other objects.

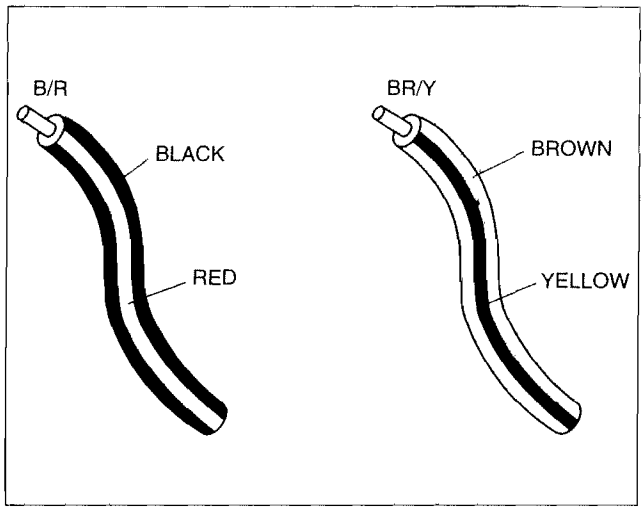
CHU0000W013

Wiring Harness

Wiring color codes

- Two-color wires are indicated by a two-color code symbol.
- The first letter indicates the base color of the wire and the second the color of the stripe.

CODE	COLOR	CODE	COLOR
B	Black	O	Orange
BR	Brown	P	Pink
G	Green	R	Red
GY	Gray	V	Violet
L	Blue	W	White
LB	Light Blue	Y	Yellow
LG	Light Green	–	–

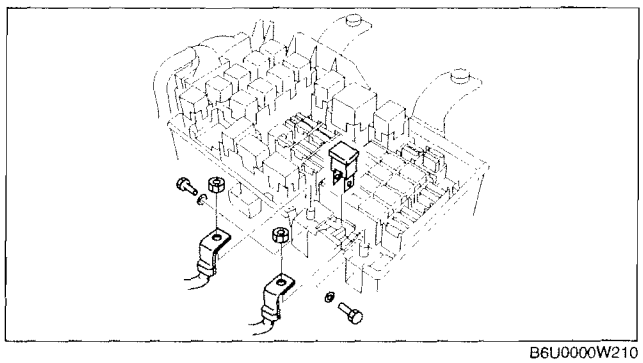


WGIWXX0048E

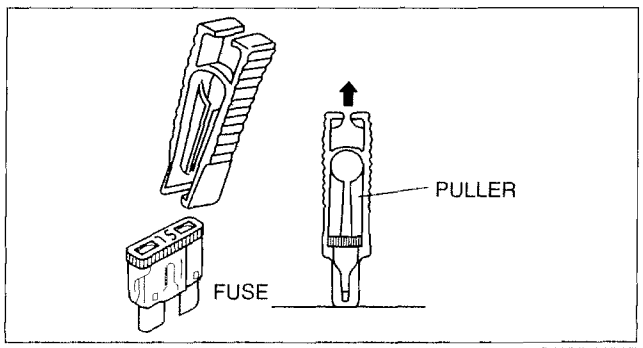
Fuse

Replacement

- When replacing a fuse, be sure to replace it with one of the same capacity. If a fuse fails again, the circuit probably has a short and the wiring should be inspected.
- Be sure the negative battery terminal is disconnected before replacing a main fuse.


B6U0000W210

- When replacing a pullout fuse, use the fuse puller.



WGIWXX0050E

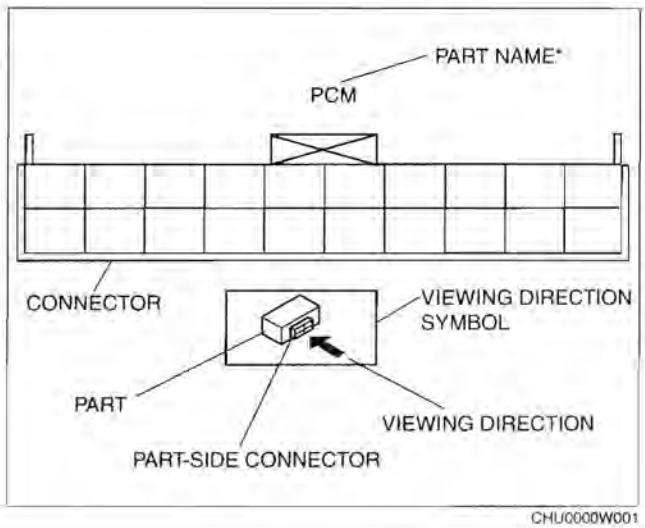
Direction of View for Connector

- The viewing direction of connectors is indicated with a symbol.
- The figures showing the viewing direction are the same as those used in Wiring Diagrams.
- The viewing directions are shown in the following three ways:

Part-side connector

The viewing direction of part-side connectors is from the terminal side.

* : Part names are shown only when there are multiple connector drawings.

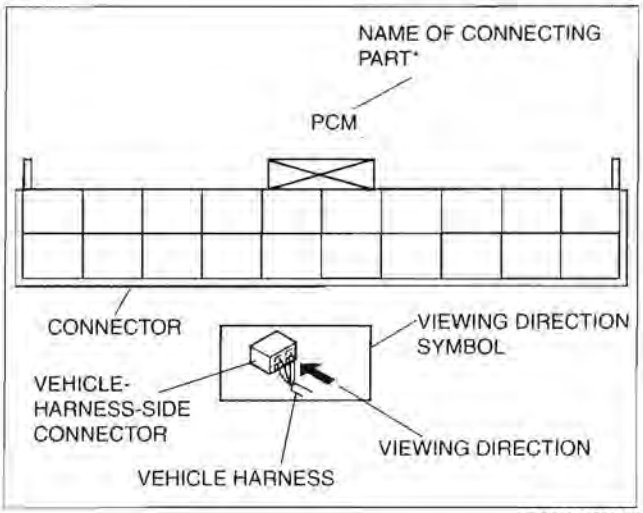


CHU0000W001

Vehicle harness-side connector

The viewing direction of vehicle harness-side connectors is from the harness side.

* : Part names are shown only when there are multiple connector drawings.

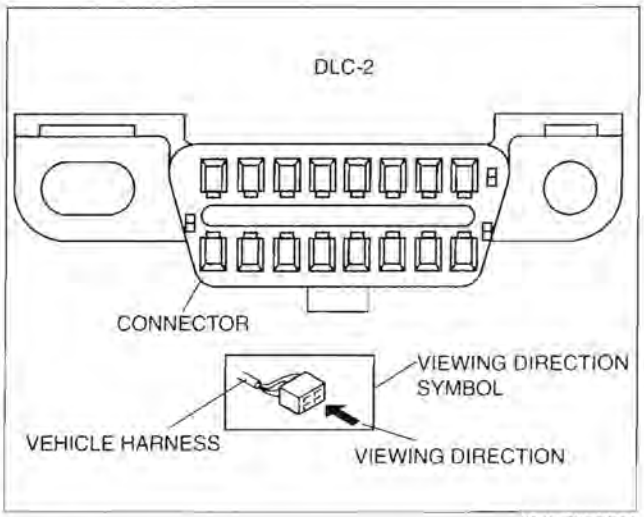


CHU0000W002

Other

When it is necessary to show the terminal side of vehicle harness-side connectors, such as the following connectors, the viewing direction is from the terminal side.

- Main fuse block and the main fuse block relays
- Data link connector
- Check connector
- Relay box

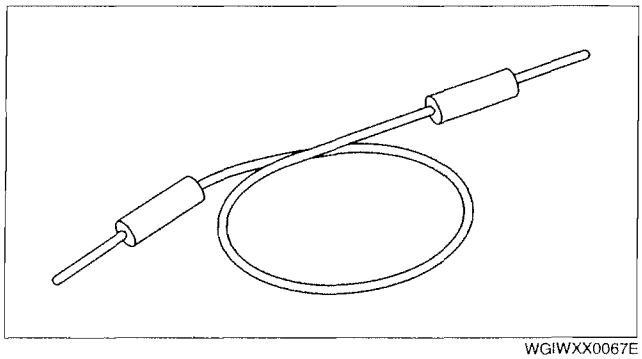


CHU0000W003

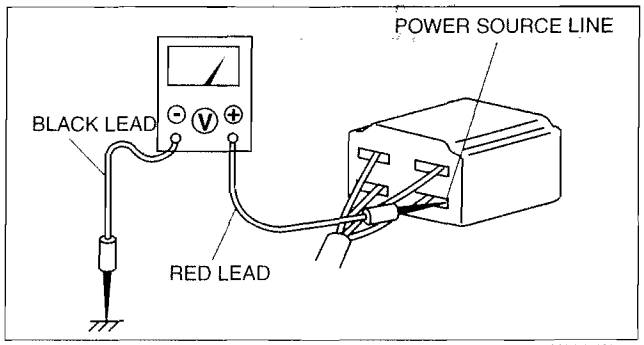
Electrical Troubleshooting Tools
Jumper wire

Caution
- **Do not connect a jumper wire from the power source line to a body ground. This may cause burning or other damage to wiring harnesses or electronic components.**

- A jumper wire is used to create a temporary circuit. Connect the jumper wire between the terminals of a circuit to bypass a switch.


WGIWXX0067E

Voltmeter
- The DC voltmeter is used to measure circuit voltage. A voltmeter with a range of **15 V or more** is used by connecting the positive (+) probe (red lead wire) to the point where voltage will be measured and the negative (-) probe (black lead wire) to a body ground.

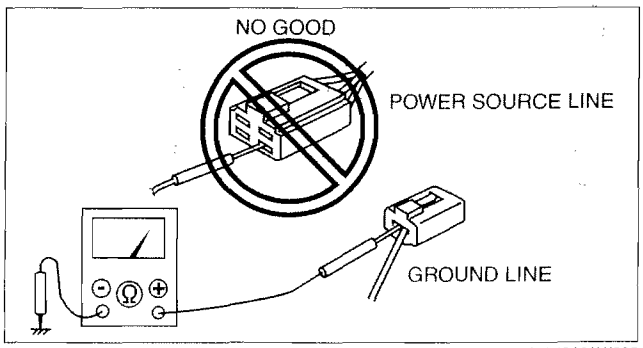


CHU0000W004

Ohmmeter

Caution
- **Do not connect the ohmmeter to any circuit where voltage is applied. This will damage the ohmmeter.**

- The ohmmeter is used to measure the resistance between two points in a circuit and to inspect for continuity and short circuits.

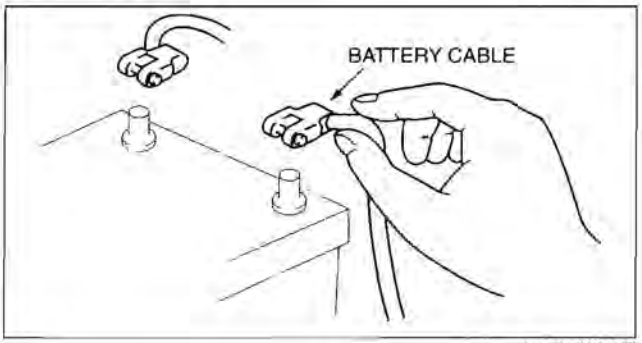


CHU0000W005

Precautions Before Welding

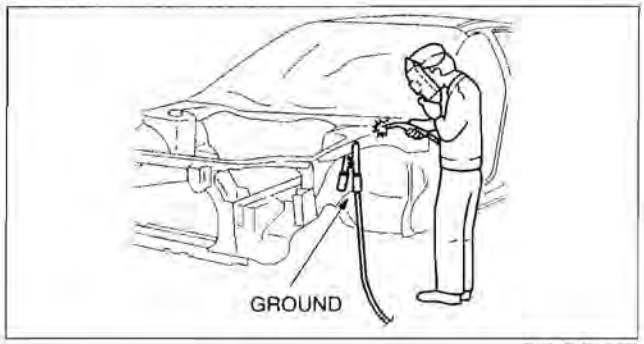
A vehicle has various electrical parts. To protect the parts from excessive current generated when welding, be sure to perform the following procedure.

1. Turn the ignition switch to the LOCK position.
2. Disconnect the battery cables.



WGIWXX0007E

3. Securely connect the welding machine ground near the welding area.
4. Cover the peripheral parts of the welding area to protect them from weld spatter.



WGIWXX0008E

JACKING POSITIONS, VEHICLE LIFT (2 SUPPORTS) AND SAFETY STAND (RIGID RACK) POSITIONS

C6U000000007W01

Jacking Positions

Warning

- **Improperly jacking a vehicle is dangerous. The vehicle can slip off the jack and cause serious injury. Use only the correct front and rear jacking points and block the wheels.**

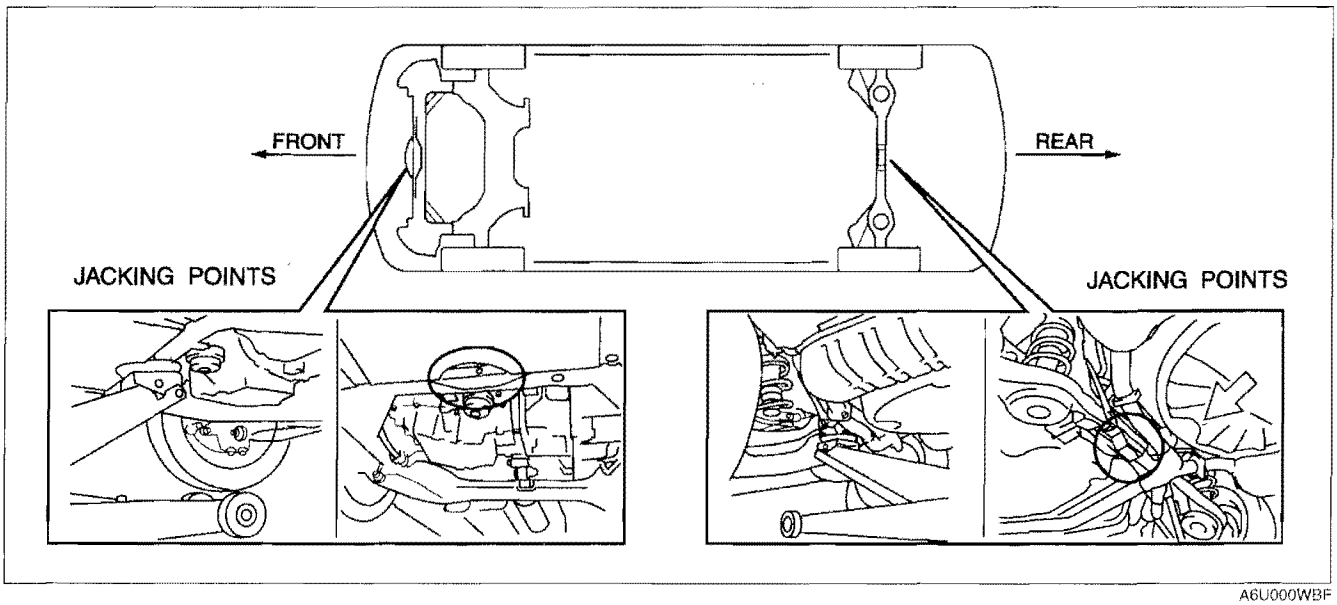
- Use safety stands to support the vehicle after it has been lifted.

Front

- At the jacking plate of the front crossmember.

Rear

- At the center of torsion beam axle.



A6U000WBF

Vehicle Lift Positions
Front and rear

Warning

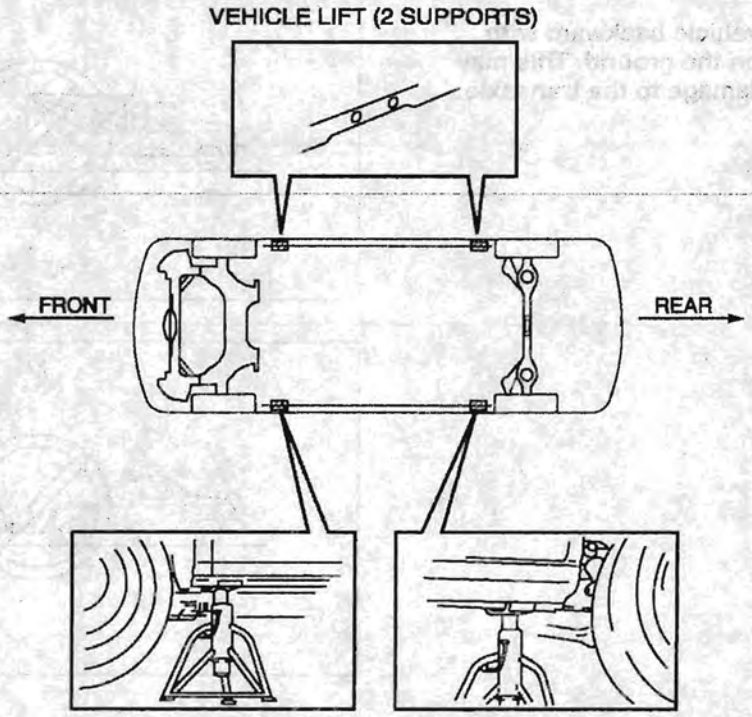
- **Unstably lifting a vehicle is dangerous. The vehicle can slip off the lift and cause serious injury and/or vehicle damage. Make sure that the vehicle is on the lift horizontally by adjusting the height of support at the end of the arm of the lift.**

Safety Stand Positions
Front

- Both sides of the vehicle, on side sills.

Rear

- Both sides of the vehicle, on side sills.



SAFETY STAND (RIGID RACK) POSITIONS

▨ :VEHICLE LIFT (2 SUPPORTS) AND SAFETY STAND (RIGID RACK) POSITIONS

B6U000WBG

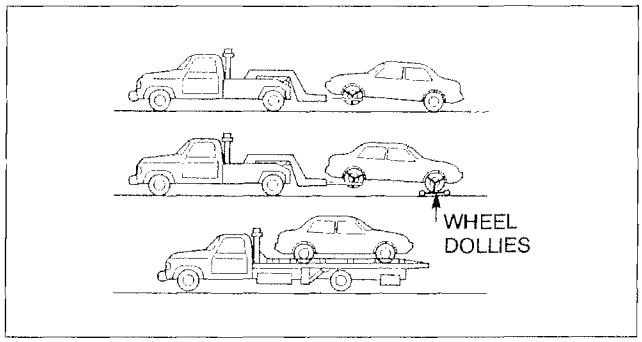
TOWING

- Proper lifting and towing are necessary to prevent damage to the vehicle. State and local laws must be followed.
- A towed vehicle usually should have its front wheels off the ground. If excessive damage or other conditions prevent this, use wheel dollies.
- When towing with the rear wheels on the ground, release the parking brake.

Caution

- **Do not tow with sling-type equipment. This could damage your vehicle. Use wheel-lift or flatbed equipment.**

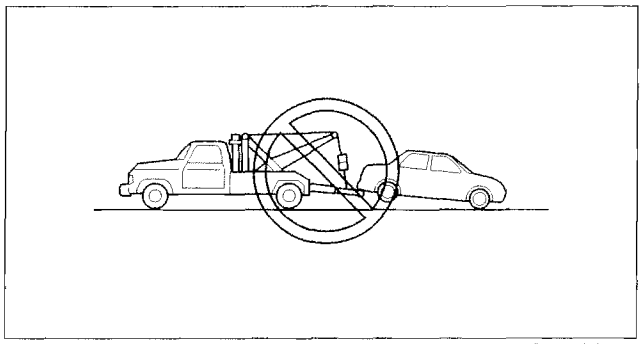
C6U000000009W01



YLU000WA5

Caution

- **Do not tow the vehicle backward with driving wheels on the ground. This may cause internal damage to the transaxle.**



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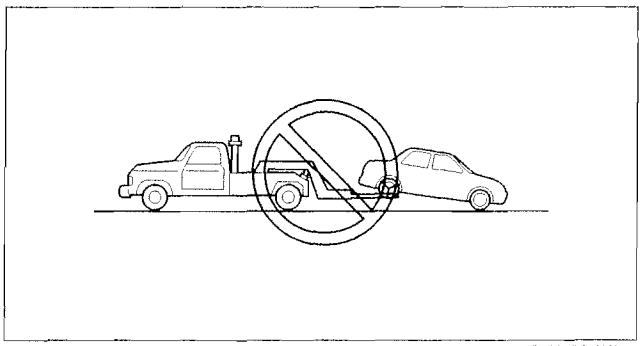


C6U0000W002

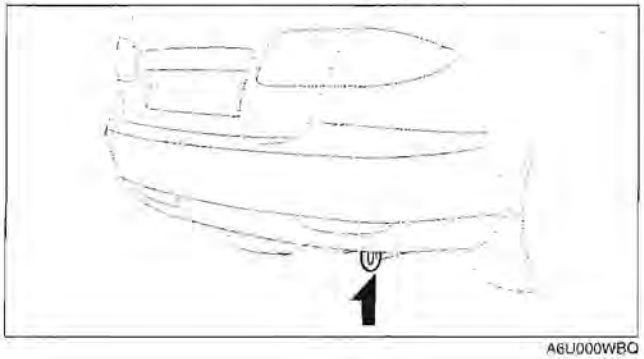
TIEDOWN HOOK

C6U000000009W02

Caution

- **Do not use the hook loops under the rear bumper for towing. It is designed ONLY for tying down the vehicle when it is being transported. Using them for towing will damage the bumper.**

Rear

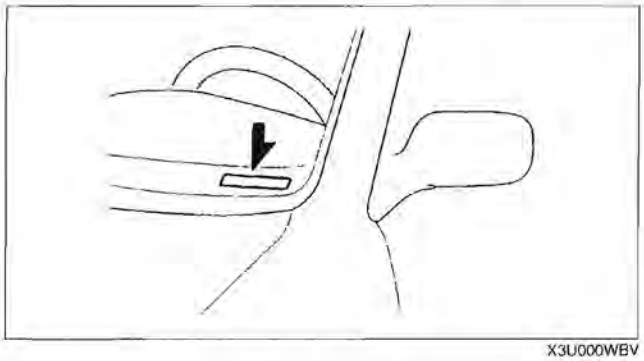


A6U000WBQ

IDENTIFICATION NUMBER LOCATIONS

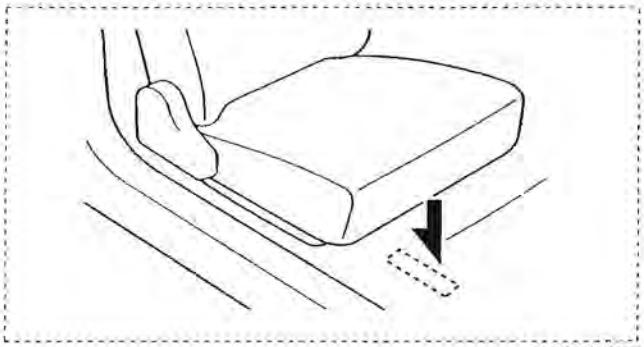
C6U000000010W01

Vehicle Identification Number (VIN)



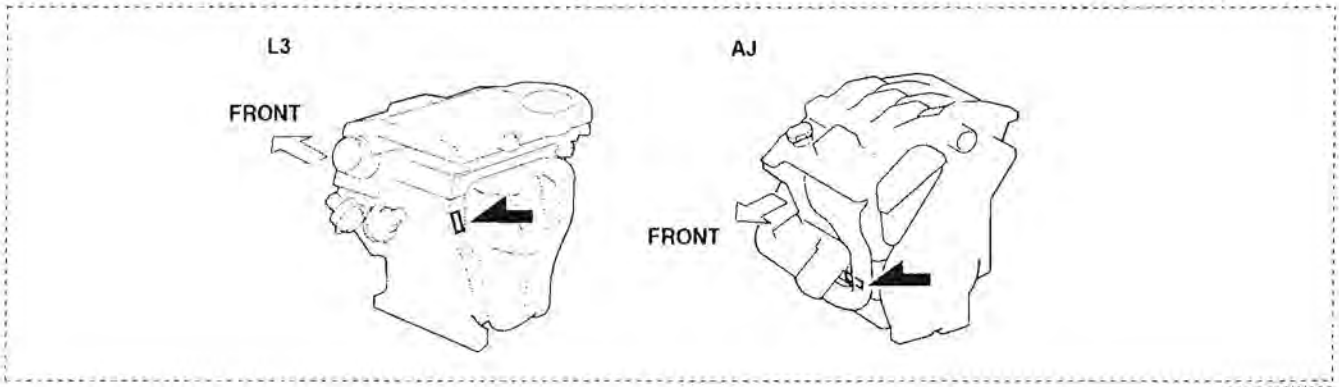
X3U000WBV

Chassis Number



A6U0000W115

Engine Identification Number



A6U0000W002

ABBREVIATIONS

C6U000000011W01

ABS	Antilock Brake System
ACC	Accessories
ALR	Automatic Locking Retractor
ATF	Automatic Transaxle Fluid
ATX	Automatic Transaxle
BTDC	Before Top Dead Center
CAL	Calibration ID
CAN	Controller Area Network
CCM	Comprehensive Component Monitor
CM	Control Module
CPU	Central Processing Unit
DC	Drive Cycle
DEF	Defroster
DRL	Daytime Running Lamp
E/L	Electrical Load
ELR	Emergency Locking Retractor
HI	High
HU	Hydraulic Unit
HVAC	Heater, Ventilation And Air Conditioning
IG	Ignition
INT	Intermittent
KOEO	Key On Engine Off
KOER	Key On Engine Running
LCD	Liquid Crystal Display
LF	Left Front
LH	Left Hand
LO	Low
LR	Left Rear
M	Motor
MAX	Maximum
MIN	Minimum
MTX	Manual Transaxle
OCV	Oil Control Valve
P/S	Power Steering
PID	Parameter Identification
RF	Right Front
RH	Right Hand
RPM	Engine Speed
RR	Right Rear
SAS	Sophisticated Air Bag Sensor
SST	Special Service Tool
SW	Switch
TDC	Top Dead Center
TFT	Transaxle Fluid Temperature
TNS	Tail Number Side Lights
VAD	Variable Air Duct
VENT	Ventilation
VTC	Variable Tumble Control
WDS	Worldwide Diagnostic System
WGN	Wagon
4SD	4 Door Sedan
5HB	5 Door Hatchback

PRE-DELIVERY INSPECTION

C6U000000012W01

Pre-Delivery Inspection Table

Exterior

INSPECT and **ADJUST**, if necessary, the following items to specification:

- ❑ Glass, exterior bright metal and paint for damage
- ❑ Wheel lug nuts
- ❑ All weatherstrips for damage or detachment
- ❑ Tire pressures
- ❑ Headlight cleaner and fluid level (if equipped)
- ❑ Operation of hood release and lock
- ❑ Operation of trunk lid and fuel-filler lid opener
- ❑ Door operation and alignment including side door and back door
- ❑ Headlight aiming

INSTALL the following parts:

- ❑ Flap (front)
- ❑ Wheel caps or rings (if equipped)

Under hood—engine off

INSPECT and **ADJUST**, if necessary, the following items to specification:

- ❑ Fuel, engine coolant, and hydraulic lines, fittings, connections, and components for leaks
- ❑ Engine oil level
- ❑ Power steering fluid level
- ❑ Brake and clutch fluid level
- ❑ Windshield washer reservoir fluid level
- ❑ Manual transaxle oil level
- ❑ Radiator coolant level and specific gravity
- ❑ Tightness of water hose clamps
- ❑ Tightness of battery terminals, electrolyte level and specific gravity

Interior
INSTALL the following items:
❑ Fuse for accessories
INSPECT the operations of the following items:
❑ Seat controls (slide and recline) and headrests
❑ Folding rear seat
❑ Door locks, including childproof door locks
❑ Seat belts and warning system
❑ Ignition switch and steering lock
❑ Transaxle range switch
❑ Warning buzzers
❑ Ignition key reminder alarm
❑ Air bag system using warning light
❑ Cruise control system (if equipped)
❑ Power door lock
❑ Shift-lock system (if equipped)
❑ Starter interlock
❑ All lights including warning, and indicator lights
❑ Horn, wipers, and washers
❑ Wiper blades performance
Clean wiper blades and windshield, if necessary
❑ Antenna
❑ Audio system
❑ Cigarette lighter and clock
❑ Power windows (if equipped)
❑ Heater, defroster, and air conditioner at various mode selections (if equipped)
INSPECT the following items:
❑ Presence of spare fuse
❑ Upholstery and interior finish
INSPECT and **ADJUST**, if necessary, the following items:
❑ Operation and fit of windows
❑ Pedal height and free play of clutch pedal
❑ Parking brake

Under hood—engine running at operating temperature
INSPECT the following items:
❑ Automatic transaxle fluid level
❑ Operation of idle-up system for electrical load, air conditioner or power steering (if equipped)
❑ Ignition timing
❑ Idle speed
❑ Operation of throttle position sensor
❑ Operation of EGR valve

On hoist
INSPECT the following items:
❑ Manual transaxle oil level
❑ Underside fuel, coolant and hydraulic lines, fittings, connections, and components for leaks
❑ Tires for cuts or bruises
❑ Steering linkage, suspension, exhaust system, and all underside hardware for looseness or damage

Road test
INSPECT the following items:
❑ Brake operation
❑ Clutch operation
❑ Steering control
❑ Operation of gauges
❑ Squeaks, rattles, and unusual noises
❑ Engine general performance
❑ Emergency locking retractors and automatic locking retractors
❑ Cruise control system (if equipped)
❑ Operation of meters and gauges, squeaks, rattles, and abnormal noises

After road test
INSPECT for necessary owner information materials, tools, and spare tire in vehicle
The following items must be completed just before delivery to your customer.
❑ Load test battery and charge if necessary (Load test result: Volts)
❑ Adjust tire pressure to specification (Specified tire pressure is indicated on the door label.)
❑ Clean outside of vehicle
❑ Install fuses for accessories
❑ Remove seat and cabin carpet protective covers
❑ Vacuum inside of vehicle

SCHEDULED MAINTENANCE

C6U000000013W01

Scheduled Maintenance Table
Schedule 1 : (Normal driving conditions) for U.S.A.
- The vehicle is mainly operated where none of the "unique driving conditions" apply.

Maintenance Item		Number of months or kilometers (miles), whichever comes first							
	Months	6	12	18	24	30	36	42	48
	× 1000 km	12	24	36	48	60	72	84	96
	× 1000 miles	7.5	15	22.5	30	37.5	45	52.5	60
ENGINE									
Drive belts (tension)	L3 engine model					I			
	AJ engine model				I				I
Engine valve clearance (for L3 engine)		Audible inspect every 120,000 km (75,000 miles), if noisy, adjust							
Engine oil		R	R	R	R	R	R	R	R
Engine oil filter		R	R	R	R	R	R	R	R
COOLING SYSTEM									
Cooling system					I				I
Engine coolant		Replace at first 168,000 km (105,000 miles) or 60 months; after that, every 48,000 km (30,000 miles) or 24 months							
FUEL SYSTEM									
Air cleaner element						R			
Fuel lines and hoses	*1				I				I
Hoses and tubes for emission	*1								I
IGNITION SYSTEM									
Spark plugs		Replace every 120,000 km (75,000 miles)							
CHASSIS and BODY									
Brake lines, hoses and connections					I				I
Disc brakes			I		I		I		I
Tire (Rotation)		Rotate every 12,000 km (7,500 miles)							
Steering operation and linkages					I				I
Front suspension ball joints					I				I
Driveshaft dust boots					I				I
Exhaust system and heat shields		Inspect every 72,000 km (45,000 miles) or 60 months							
All locks and hinges		L	L	L	L	L	L	L	L
AIR CONDITIONER SYSTEM (IF INSTALLED)									
Cabin air filter		Replace every 40,000 km (25,000 miles) or 24 months							

Chart symbols :
I : Inspect and repair, clean, adjust, or replace if necessary.
R : Replace
L : Lubricate
Remarks
- After the prescribed period, continue to follow the described maintenance at the recommended intervals.
- Refer below for a description of items marked* in the maintenance chart.
  *1: According to state / provincial and federal regulations, failure to perform maintenance on these items will not void your emissions warranties. However, Mazda recommends that all maintenance services be performed at the recommended time or mileage / kilometer period to ensure long-term reliability.

Schedule 2 : (Unique Driving Conditions) for USA, CANADA, and Puerto Rico

- Repeated short-distance driving
- Driving in dusty conditions
- Driving with extended use of brakes
- Driving in areas where salt or other corrosive materials are used
- Driving on rough or muddy roads
- Extended periods of idling or low-speed operation
- Driving for long periods in cold temperatures or extremely humid climates

Maintenance Interval		Number of months or kilometers (miles), whichever comes first											
	Months	4	8	12	16	20	24	28	32	36	40	44	48
Maintenance Item	× 1000 km	8	16	24	32	40	48	56	64	72	80	88	96
	× 1000 miles	5	10	15	20	25	30	35	40	45	50	55	60
ENGINE													
Drive belts (tension)	L3 engine model							I					
	AJ engine model						I						I
Engine valve clearance (for L3 engine)		Audible inspect every 120,000 km (75,000 miles), if noisy, adjust											
Engine oil	Puerto Rico	Replace every 5,000 km (3,000 miles) or 3 months											
	Others	R	R	R	R	R	R	R	R	R	R	R	R
Engine oil filter		R	R	R	R	R	R	R	R	R	R	R	R
COOLING SYSTEM													
Cooling system							I						I
Engine coolant		Replace at first 168,000 km (105,000 miles) or 60 months; after that, every 48,000 km (30,000 miles) or 24 months.											
Engine coolant level		I	I	I	I	I	I	I	I	I	I	I	I
FUEL SYSTEM													
Air cleaner element	Puerto Rico						R						R
	Others							R					
Fuel lines and hoses	*1						I						I
Hoses and tubes for emission	*1												I
IGNITION SYSTEM													
Spark plugs	U.S.A.	Replace every 96,000 km (60,000 miles)											
	Others *2	Replace every 120,000 km (75,000 miles)											
ELECTRICAL SYSTEM													
Function of all lights		I	I	I	I	I	I	I	I	I	I	I	I
CHASSIS and BODY													
Brake lines, hoses and connections							I						I
Brake and clutch fluid level		I	I	I	I	I	I	I	I	I	I	I	I
Disc brakes				I			I			I			I
Tire (Rotation)		Rotate every 8,000 km (5,000 miles)											
Tire inflation pressure and tire wear		I	I	I	I	I	I	I	I	I	I	I	I
Steering operation and linkages							I						I
Power steering fluid level		I	I	I	I	I	I	I	I	I	I	I	I
Front suspension ball joints							I						I
Driveshaft dust boots							I						I
Exhaust system and heat shields		Inspect every 72,000 km (45,000 miles) or 60 months											
All locks and hinges		L	L	L	L	L	L	L	L	L	L	L	L
Washer fluid level		I	I	I	I	I	I	I	I	I	I	I	I
AIR CONDITIONER SYSTEM (IF INSTALLED)													
Cabin air filter		Replace every 40,000 km (25,000 miles) or 24 months											

Chart symbols :
I : Inspect and repair, clean, adjust, or replace if necessary.
R : Replace
L : Lubricate
Remarks

- After the prescribed period, continue to follow the described maintenance at the recommended intervals.
- Refer below for a description of items marked* in the maintenance chart.

*1: According to state / provincial and federal regulations, failure to perform maintenance on these items will not void your emissions warranties. However, Mazda recommends that all maintenance services be performed at the recommended time or mileage / kilometer period to ensure long-term reliability.

*2: If the vehicle is operated under any of the following conditions, change the spark plugs every 96,000 km (60,000 miles) or shorter.

a. Repeated short-distance driving
b. Extended periods of idling or low-speed operation
c. Driving for long periods in cold temperatures or extremely humid climates

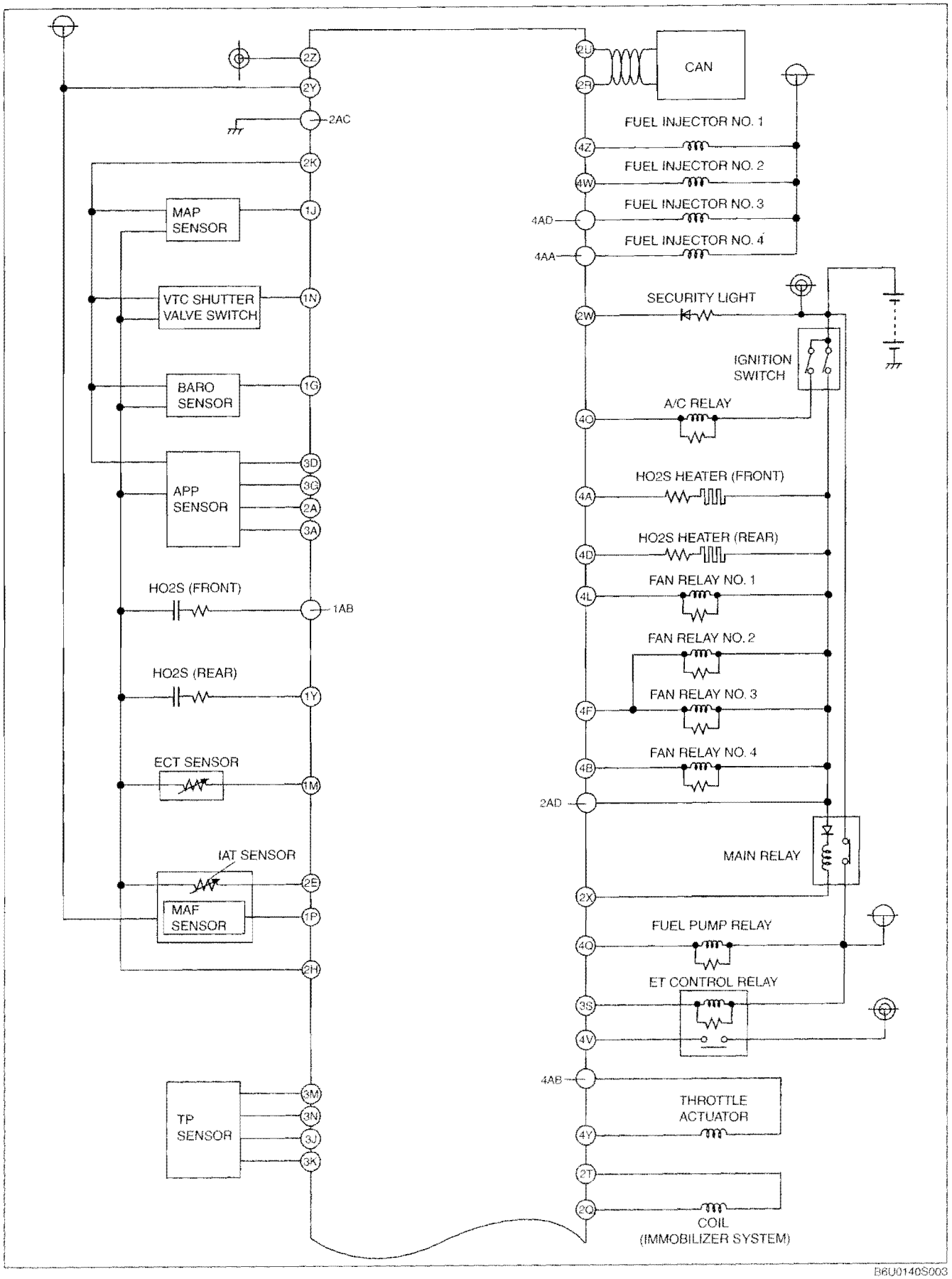
ENGINE

01 SECTION

01–02A ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (L3)]

CONTROL SYSTEM WIRING DIAGRAM [L3]

C6U010200102W01



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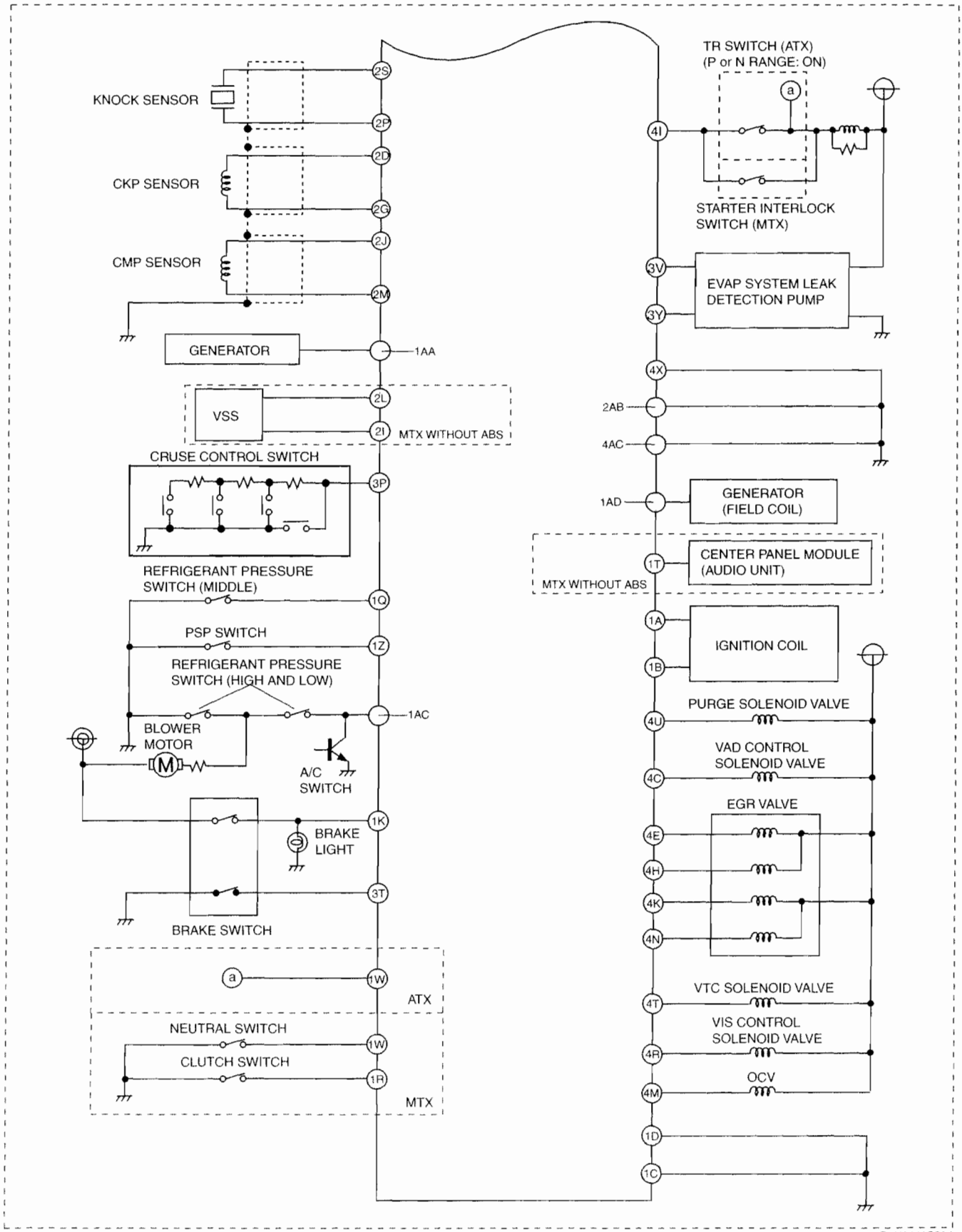

TR SWITCH (ATX)
(P or N RANGE: ON)
a
4I
STARTER INTERLOCK
SWITCH (MTX)
KNOCK SENSOR
2S
2P
CKP SENSOR
2D
2G
CMP SENSOR
2J
2M
3V
EVAP SYSTEM LEAK
DETECTION PUMP
3Y
GENERATOR
1AA
4X
2AB
4AC
VSS
2L
2I
MTX WITHOUT ABS
CRUSE CONTROL SWITCH
3P
1AD
GENERATOR
(FIELD COIL)
REFRIGERANT PRESSURE
SWITCH (MIDDLE)
1T
CENTER PANEL MODULE
(AUDIO UNIT)
MTX WITHOUT ABS
1Q
PSP SWITCH
1Z
1A
IGNITION COIL
1B
REFRIGERANT PRESSURE
SWITCH (HIGH AND LOW)
PURGE SOLENOID VALVE
4U
1AC
BLOWER
MOTOR
M
A/C
SWITCH
VAD CONTROL
SOLENOID VALVE
4C
EGR VALVE
1K
BRAKE
LIGHT
4E
4H
4K
4N
3T
BRAKE SWITCH
a
1W
ATX
VTC SOLENOID VALVE
4T
NEUTRAL SWITCH
1W
VIS CONTROL
SOLENOID VALVE
4R
CLUTCH SWITCH
1R
OCV
4M
MTX
1D
1C
B6U0140S004

MONITORING SYSTEM AND CONTROL SYSTEM DEVICE RELATIONSHIP CHART [L3]

C6U010200102W02

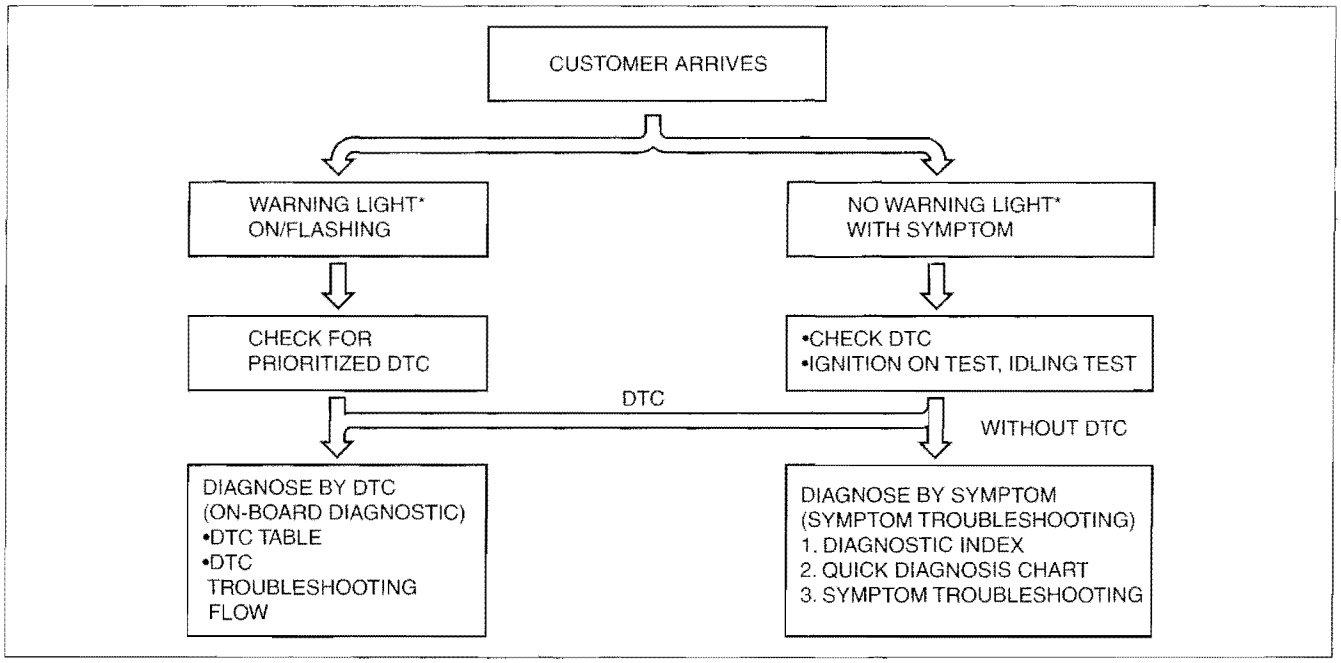
×: Applicable

Component	Oxygen sensor monitor	Oxygen sensor heater monitor	Catalyst monitor	Misfire monitor	Fuel system monitor	EGR system monitor	Evaporative system monitor	Thermostat monitor
Input								
PSP switch						×		
A/C switch, refrigerant pressure switch (high, low pressure)						×		×
TP sensor	×		×	×	×	×	×	
ECT sensor	×	×	×	×	×	×		×
IAT sensor	×		×	×	×	×		×
MAF sensor	×	×	×	×	×	×		×
HO2S (front)	×	×	×					
HO2S (rear)	×	×	×		×			
BARO sensor							×	
MAP sensor						×		
CMP sensor				×	×			
CKP sensor	×	×	×	×	×	×	×	×
VSS	×		×	×	×	×	×	×
Fuel gauge sender unit							×	
Output								
Fuel injector					×			
EGR valve						×		
Purge solenoid valve	×				×		×	
EVAP system leak detection pump							×	
MIL	×	×	×	×	×	×	×	×
DLC-2	×	×	×	×	×	×	×	×

FOREWORD [L3]

C6U010200102W03

- When the customer reports a vehicle malfunction, check the malfunction indicator lamp (MIL) indication and diagnostic trouble code (DTC), then diagnose the malfunction according to following flowchart.
  - — If the DTC exists, diagnose the applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
  - — If the DTC does not exist and the MIL does not illuminate or flash, diagnose the applicable symptom troubleshooting. (See 01–03A–6 QUICK DIAGNOSTIC CHART [L3].)



C6U0103W500

*: Malfunction Indicator Lamp (MIL), Generator Warning Light, Security Light

OBD-II PENDING TROUBLE CODE [L3]

C6U010200102W15

- These appear when a problem is detected in a monitored system. The code for a failed system is stored in the PCM memory in the first drive cycle. This code is called the pending code. If the PCM judges that the system returned to normal or the problem was mistakenly detected, deletes the pending code. If the problem is found in the second drive cycle too, the PCM judges that the system has failed, and the DTC is stored.

OBD-II FREEZE FRAME DATA [L3]

C6U010200102W04

- This is the technical data which indicates the engine condition at the time of the first malfunction. This data will remain in the memory even if another emission-related DTC is stored, with the exception of the Misfire or Fuel System DTCs. Once freeze frame data for the Misfire or Fuel System DTC is stored, it will overwrite any previous data and the freeze frame will not be overwritten again.

OBD-II ON-BOARD SYSTEM READINESS TEST [L3]

C6U010200102W05

- This shows OBD-II systems operating status. If any monitor function is incomplete, WDS or equivalent will identify which monitor function has not been completed. Misfires, Fuel System and Comprehensive Components (CCM) are continuous monitoring-type functions. The catalyst, EGR system, evaporation system and oxygen sensor will be monitored under drive cycles. The OBD-II diagnostic system is initialized by performing the DTC cancellation procedure or disconnecting the negative battery cable.

OBD-II DIAGNOSTIC MONITORING TEST RESULTS [L3]

C6U010200102W06

- These results from the intermittent monitor system technical data, which are used to determine whether the system is normal or not. They also display the system's thresholds and diagnostic results. The intermittent monitor system monitors the oxygen sensor, evaporative purge system, catalyst and the EGR system.

OBD-II READ/CLEAR DIAGNOSTIC TEST RESULTS [L3]

C6U010200102W07

- This retrieves all stored DTCs in the PCM and clears the DTC, Freeze Frame Data, On-Board Readiness Test Results, Diagnostic Monitoring Test Results and Pending Trouble Codes.

OBD-II PARAMETER IDENTIFICATION (PID) ACCESS [L3]

C6U010200102W08

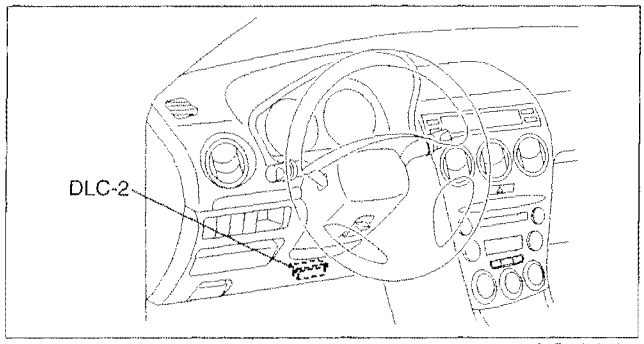
- The PID mode allows access to certain data values, analog and digital inputs and outputs, calculated values and system status information. Since PID values for output devices are PCM internal data values, inspect each device to identify which output devices are malfunctioning.

ON-BOARD DIAGNOSTIC TEST [L3]

C6U010200102W09

DTCs Reading Procedure

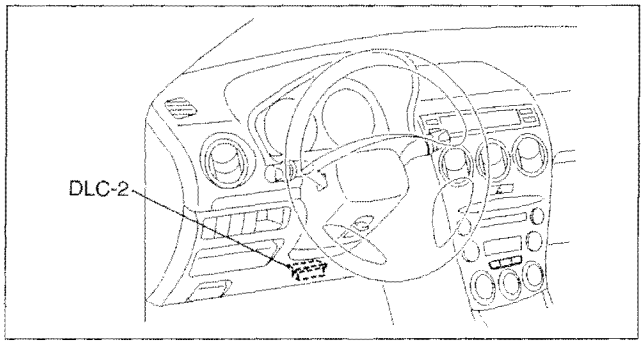
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located at the left side of the center console.
3. Retrieve DTCs by WDS or equivalent.



A6E3970W002

Pending Trouble Code Access Procedure

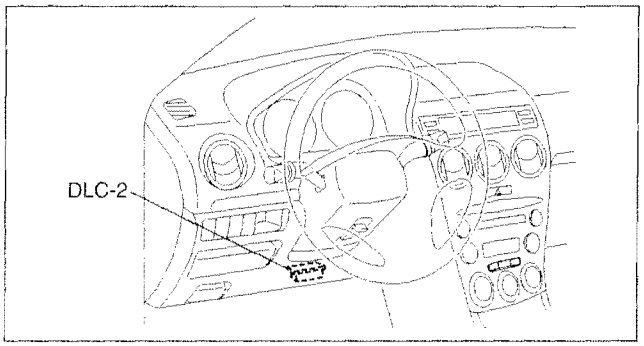
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located at the left side of the center console.
3. Retrieve **PENDING trouble codes** by WDS or equivalent.



A6E3970W002

Freeze Frame PID Data Access Procedure

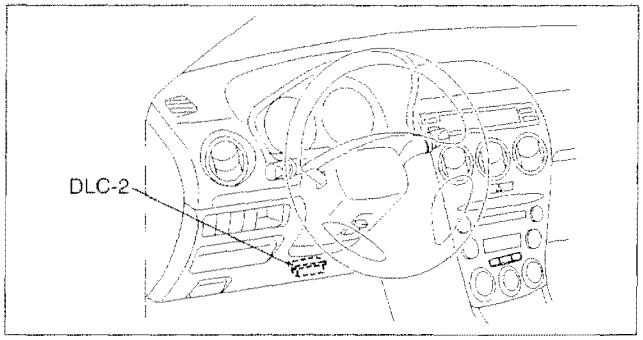
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located at the left side of the center console.
3. Record the FREEZE FRAME PID DATA by WDS or equivalent.



A6E3970W002

On-Board System Readiness Tests Access Procedure

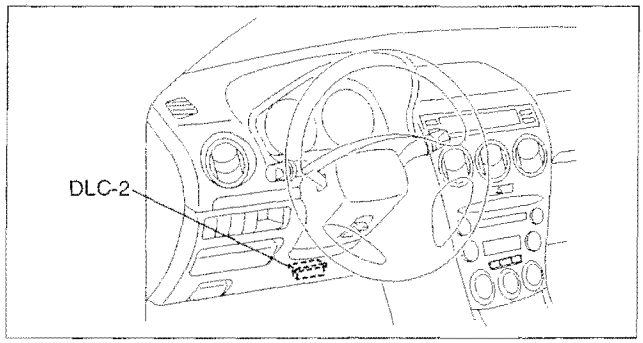
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located at the left side of the center console.
3. Monitor the OBD-II systems operating status by WDS or equivalent.



A6E3970W002

PID/DATA Monitor and Record Procedure

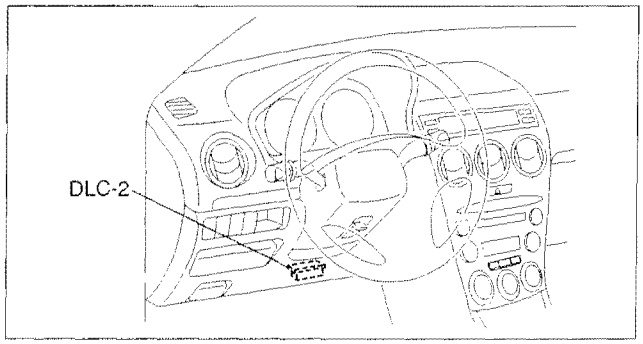
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located at the left side of the center console.
3. Access and monitor PIDs by WDS or equivalent.



A6E3970W002

Diagnostic Monitoring Test Results Access Procedure

1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located at the left side of the center console.
3. Access to the DIAGNOSTIC MONITORING TEST RESULTS and read the test results by WDS or equivalent.

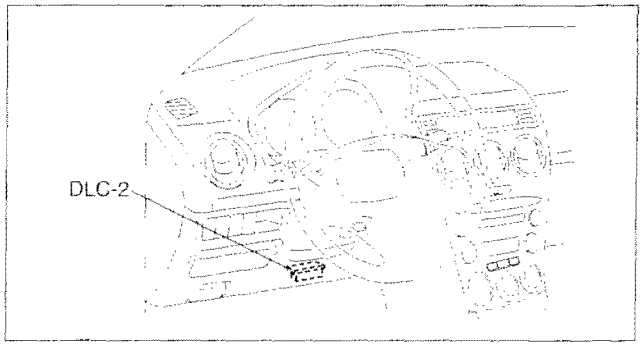


A6E3970W002

AFTER REPAIR PROCEDURE [L3]

C6U0102001021W10

1. Connect WDS or equivalent.
2. Cycle the ignition key from OFF to ON.
3. Record DTC if retrieved.
4. Clear all diagnostic data by WDS or equivalent.



A6E3970W002

OBD-II DRIVE MODE [L3]

C6U010200102W16

- Using the OBD-II drive mode, the monitoring item requested by OBD-II regulations can be easily diagnosed.
- Performing the Drive Mode inspects the OBD-II system for proper operation and must be performed to ensure that no additional DTCs are present.
- The OBD-II drive mode is divided into the specific drive mode and single drive mode.
- For the specific drive mode, specified drive modes have been set for each individual monitoring item requested by OBD-II regulations, and they can be diagnosed individually. For the single drive mode, the entire monitoring item requested by OBD-II regulations can be diagnosed.
- The following modes are in the specific drive mode. The applicable system is diagnosed by driving in the following drive modes.
  - — PCM Adaptive Memory Produce Drive Mode
  - — EGR System Repair Verification Drive Mode
  - — HO2S heater, HO2S, and TWC Repair Verification Drive Mode
  - — EVAP System Repair Verification Drive Mode
- The following systems are diagnosed with the single drive mode.
  - — EGR system
  - — Oxygen sensor (HO2S)
  - — Oxygen sensor heater
  - — Catalytic converter (TWC)
  - — Fuel, misfire and evaporative (EVAP) system

Caution

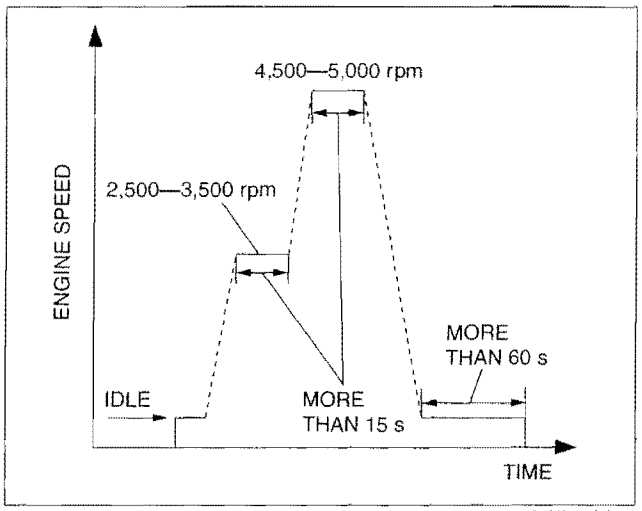
- **While performing the Drive Mode, always operate the vehicle in a safe and lawful manner.**
- **When the WDS or equivalent is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the WDS or equivalent using the PID/DATA MONITOR AND RECORD function and inspect later.**

Note

- Vehicle speed and engine speed detected by the PCM may differ from that indicated by the speedometer and tachometer. Use the WDS or equivalent to monitor vehicle speed.
- If the OBD-II system inspection is not completed during the Drive Mode, the following causes are considered:
  - — The OBD-II system detects the malfunction.
  - — The Drive Mode procedure is not completed correctly.
- Disconnecting the battery will reset the memory. Do not disconnect the battery during and after Drive Mode.
- The WDS or equivalent can be used at anytime through the course of the Drive Mode to monitor the completion status. Monitoring can be done by viewing the ON BOARD SYSTEM READINESS menu.
- The OBD monitoring status can be confirmed with the ignition switch operation. During KOEO, the MIL illuminates for a fail-light inspection for **approx. 17 s**. The OBD monitoring status is confirmed after the fail-light inspection.
  - — If all of the diagnosis is completed even one time, the MIL will continue to illuminate.
  - — If all of the diagnosis is not completed, the MIL flashes for **approx. 7 s**, and then it illuminates until the engine is started.

PCM Adaptive Memory Production Drive Mode

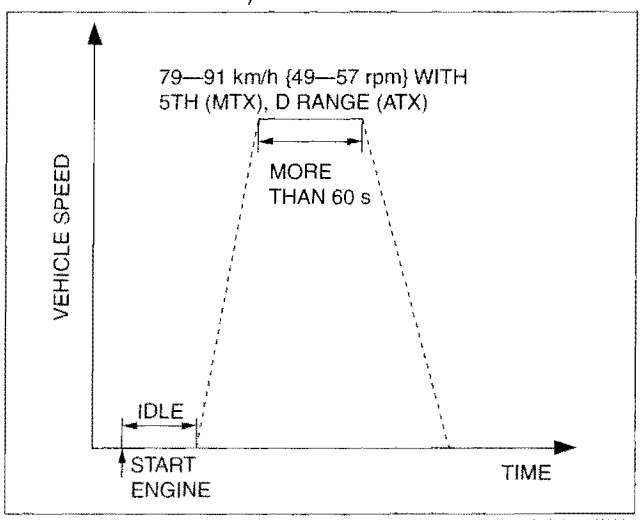
1. Start the engine and warm it up completely.
2. Verify the following conditions and correct if necessary:
   - All accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
   - Initial ignition timing and idle speed are within the specification.
3. Perform no load racing at the engine speed shown in the graph, then idle the engine for more than **20 s** after the cooling fan has stopped. If possible, monitor RPM PID for engine speed during this procedure.



C6U0102W501

EGR System Repair Verification Drive Mode

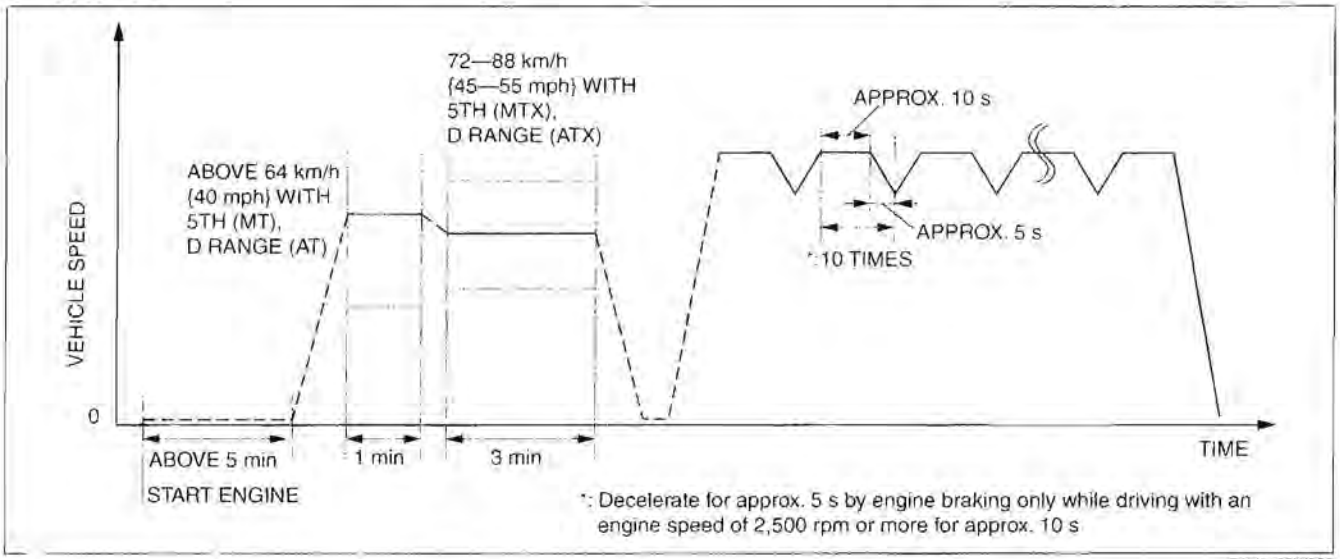
1. Perform "PCM Adaptive Memory Production Drive Mode" first.
2. Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive the vehicle as shown in the graph.
4. Stop the vehicle and access ON BOARD SYSTEM READINESS menu of GENERIC OBD-II FUNCTION to verify the OBD monitoring status.
   - If completed, the OBD monitoring status items change from non-completed to completed.
   - If not completed, turn the ignition key off then repeat from Step 3.
5. Access DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD-II FUNCTIONS to verify the monitor results.
   - If detected values are not within specification, repair has not been completed.
6. Verify no DTCs are available.



C6U0102W502

HO2S heater, HO2S, and TWC Repair Verification Drive Mode

1. Perform "PCM Adaptive Memory Production Drive Mode" first.
2. Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive the vehicle as shown in the graph. The driving conditions before driving at constant speed are not specified.



C6U0102W503

4. Stop the vehicle and access ON BOARD SYSTEM READINESS menu of GENERIC OBD-II FUNCTION to verify the OBD monitoring status.
   - If completed, the OBD monitoring status items change from non-completed to completed.
   - If not completed, turn the ignition key off then repeat from Step 3.
5. Access DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD-II FUNCTIONS to verify the monitor results.
   - If detected values are not within the specification, repair has not been completed.
6. Verify no DTCs are available.

EVAP System Repair Verification Drive Mode

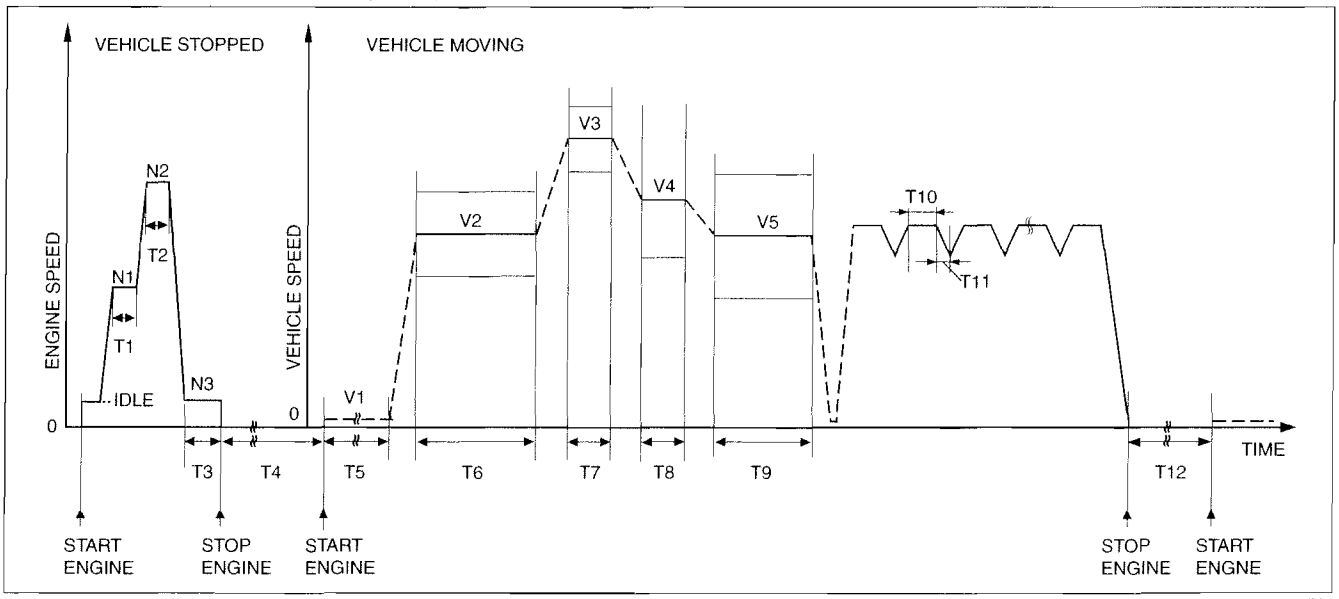
Note

- If "EVAP System Repair Verification Drive Mode" cannot be performed (it is impossible to drive the vehicle under this drive mode condition), perform evaporative system test procedure as an alternative. (See 01–03A–58 ENGINE CONTROL SYSTEM OPERATION INSPECTION [L3].)

1. Verify that all of the following PIDs are within the following specifications. All PIDs must be within specifications before engine is started to initiate the evaporative system test.
   - BARO: **72.3 kPa {542 mmHg, 21.3 inHg}** or higher
   - IAT: **5—35 °C {41—95 °F}**
   - FTL: **15—85%**
   - B+: **above 10.9 V**
2. Clear DTC from PCM memory using WDS or equivalent.
3. Start the engine and idle it for **more than 10 s**, then turn ignition key to OFF.
4. Leave vehicle for **5 hours or more**.
5. Start the engine and idle for **more than 15 min**.
6. Drive the vehicle at an engine speed of **65—80 km/h {40—50 mph}** for **more than 5 min**.
7. Stop the vehicle and turn ignition key to OFF.
8. Leave vehicle as it is for **10 min or more**.
9. Start the engine.
10. Access the ON BOARD SYSTEM READINESS to verify the OBD monitoring status.
    - If completed, the OBD monitoring status items change from non-completed to completed.
    - If not completed, turn the ignition key off then go back to Step 1.
11. Access the DIAGNOSTIC MONITORING TEST RESULTS to verify the monitor results.
    - If detected values are not within specification, repair has not completed.
12. Verify no DTCs are available.

PCM Adaptive Memory Production, EGR, HO2S heater, HO2S, TWC, and EVAP System Repair Verification Drive Mode

1. Start the engine and warm it up completely.
2. Clear the DTC from the PCM memory using the WDS or equivalent.
3. Verify the following conditions and correct if necessary:
   - All accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
   - Initial ignition timing and idle speed are within the specification.
4. Verify that all of the following PIDs are within the following specifications. All PIDs must be within specifications from Step 5 to Step 6.
   - BARO: **more than 72.3 kPa {542 mmHg, 21.3 inHg}**
   - IAT: **5—35 °C {41—95 °F}**
   - FTL: **15—85%**
   - B+: **above 10.9 V**
5. With the vehicle stopped, race the engine at the engine speed indicated, and then drive the vehicle as shown in the graph. The driving conditions before driving at constant speed are not specified. If possible, monitor RPM PID for engine speed during this procedure.



C6U0102W504

Step	Time	Engine speed (rpm)	Vehicle speed (km/h {mph})	Vehicle condition
1	T1: More than 15 s	N1: 2,500—3,500	0 {0}	—
2	T2: More than 15 s	N2: 4,500—5,000	0 {0}	—
3	T3: More than 60 s	N3: Idle	0 {0}	Idle the engine after the cooling fan has stopped
4	T4: More than 5 h	0	0 {0}	Keep the ignition switch off
5	T5: More than 15 min	Idle	V1: 0 {0}	—
6	T6: 5 min	—	V2: 65—80 {40—50}	—
7	T7: 1 min	—	V3: 79—91 {49—57}	MTX: 5TH ATX: D range
8	T8: 1 min	—	V4: Above 64 {40}	MTX: 5TH ATX: D range
9	T9: 3 min	—	V5: 72—88 {45—55}	MTX: 5TH ATX: D range
10	T10: Approx. 10 s	Above 2,500	—	—
11	T11: Approx. 5 s	0	0 {0}	Decelerate by engine braking only (10 times)
12	T12: More than 10 min	0	0 {0}	Keep the ignition switch off

6. Turn the ignition switch off.
7. Access the ON BOARD SYSTEM READINESS to verify the OBD monitoring status.
   - If completed, all of the OBD monitoring status items change from non-completed to completed.
   - If not completed, turn the ignition switch off, then perform the applicable specific drive mode for any monitoring item that was not in the detection condition.

8. Access the DIAGNOSTIC MONITORING TEST RESULTS to verify the monitor results.
   - If detected values are not within specification, repair has not been completed.

DIAGNOSTIC MONITORING TEST RESULTS [L3]

C6U010200102W12

- The purpose of this test mode is to confirm the result of OBD-II monitor diagnostic test results. The result values stored when particular monitor is completed are displayed. If the monitor is not completed, initial value is displayed.

TEST ID	Description	Related system
10:01:01	HO2S (Front) rich-to-lean sensor threshold voltage (constant)	HO2S
10:01:02	HO2S (Front) lean-to-rich sensor threshold voltage (constant)	
10:01:03	Low HO2S (Front) voltage for switch time calculation (constant)	
10:01:04	High HO2S (Front) voltage for switch time calculation (constant)	
10:01:05	HO2S (Front) rich-to-lean response time (calculated)	
10:01:06	HO2S (Front) rich-to-lean response time (calculated)	
10:01:0A	HO2S (Front) period (calculated)	
10:21:80	Front and HO2S (Rear) switching time ratio	Catalyst
10:31:83	EGR pressure variation	EGR
10:3A:80	EVAP system leak detection pump gross leak check	EVAP
10:3B:80	EVAP system leak detection pump small leak check	
10:3C:80	EVAP system leak detection pump very small leak check	
10:3D:80	Purge flow monitor	
10:E1:80	Heat radiation ratio	Engine cooling system
10:E1:81	Engine coolant temperature	

DTC TABLE [L3]

C6U010200102W14

×: Applicable
—: Not applicable

DTC No.	Condition	MIL	DC	Monitor item	Memory function	Page
P0011	CMP timing over-advanced	ON	1	CCM	×	(See 01–02A–19 DTC P0011 [L3].)
P0012	CMP timing over-retarded	ON	2	CCM	×	(See 01–02A–20 DTC P0012 [L3].)
P0031	Front HO2S heater circuit low input	ON	2	O_2 sensor heater	×	(See 01–02A–21 DTC P0031 [L3].)
P0032	Front HO2S heater circuit high input	ON	2	O_2 sensor heater	×	(See 01–02A–24 DTC P0032 [L3].)
P0037	Rear HO2S heater circuit low input	ON	2	O_2 sensor heater	×	(See 01–02A–26 DTC P0037 [L3].)
P0038	Rear HO2S heater circuit high input	ON	2	O_2 sensor heater	×	(See 01–02A–28 DTC P0038 [L3].)
P0101	MAF sensor inconsistent with TP sensor or engine speed	ON	2	CCM	×	(See 01–02A–30 DTC P0101 [L3].)
P0102	MAF circuit low input	ON	1	CCM	×	(See 01–02A–32 DTC P0102 [L3].)
P0103	MAF circuit high input	ON	1	CCM	×	(See 01–02A–34 DTC P0103 [L3].)
P0106	MAP sensor performance problem	ON	2	CCM	×	(See 01–02A–36 DTC P0106 [L3].)

DTC No.	Condition	MIL	DC	Monitor item	Memory function	Page
P0107	MAP sensor circuit low input	ON	1	CCM	×	(See 01–02A–37 DTC P0107 [L3].)
P0108	MAP sensor circuit high input	ON	1	CCM	×	(See 01–02A–39 DTC P0108 [L3].)
P0111	IAT circuit performance problem	ON	2	CCM	×	(See 01–02A–41 DTC P0111 [L3].)
P0112	IAT circuit low input	ON	1	CCM	×	(See 01–02A–42 DTC P0112 [L3].)
P0113	IAT circuit high input	ON	1	CCM	×	(See 01–02A–44 DTC P0113 [L3].)
P0117	ECT circuit low input	ON	1	Engine cooling system	×	(See 01–02A–46 DTC P0117 [L3].)
P0118	ECT circuit high input	ON	1	Engine cooling system	×	(See 01–02A–48 DTC P0118 [L3].)
P0122	TP sensor No.1 circuit low input	ON	1	CCM	×	(See 01–02A–50 DTC P0122 [L3].)
P0123	TP sensor No.1 circuit high input	ON	1	CCM	×	(See 01–02A–52 DTC P0123 [L3].)
P0125	Excessive time to enter closed loop fuel control	ON	2	Engine cooling system	×	(See 01–02A–54 DTC P0125 [L3].)
P0126	Coolant thermostat stuck open	ON	2	Engine cooling system	×	(See 01–02A–55 DTC P0126, P0128 [L3].)
P0128	Coolant thermostat stuck open	ON	2	Engine cooling system	×	(See 01–02A–55 DTC P0126, P0128 [L3].)
P0132	Front HO2S circuit high input	ON	2	O_2 sensor	×	(See 01–02A–58 DTC P0132 [L3].)
P0133	Front HO2S circuit slow response	ON	2	O_2 sensor	×	(See 01–02A–60 DTC P0133 [L3].)
P0134	Front HO2S circuit no activity detected	ON	2	O_2 sensor	×	(See 01–02A–63 DTC P0134 [L3].)
P0138	Rear HO2S circuit high input	ON	2	O_2 sensor	×	(See 01–02A–66 DTC P0138 [L3].)
P0139	Rear HO2S circuit malfunction	ON	2	O_2 sensor	×	(See 01–02A–68 DTC P0139 [L3].)
P0140	Rear HO2S circuit no activity detected	ON	2	O_2 sensor	×	(See 01–02A–73 DTC P0140 [L3].)
P0222	TP sensor No.2 circuit low input	ON	1	CCM	×	(See 01–02A–76 DTC P0222 [L3].)
P0223	TP sensor No.2 circuit high input	ON	1	CCM	×	(See 01–02A–78 DTC P0223 [L3].)
P0300	Random misfire detected	Flash / ON	1 or 2	Misfire	×	(See 01–02A–80 DTC P0300 [L3].)

DTC No.	Condition	MIL	DC	Monitor item	Memory function	Page
P0301	Cylinder No.1 misfire detected	Flash / ON	1 or 2	Misfire	×	(See 01–02A–83 DTC P0301, P0302, P0303, P0304 [L3].)
P0302	Cylinder No.2 misfire detected	Flash / ON	1 or 2	Misfire	×	(See 01–02A–83 DTC P0301, P0302, P0303, P0304 [L3].)
P0303	Cylinder No.3 misfire detected	Flash / ON	1 or 2	Misfire	×	(See 01–02A–83 DTC P0301, P0302, P0303, P0304 [L3].)
P0304	Cylinder No.4 misfire detected	Flash / ON	1 or 2	Misfire	×	(See 01–02A–83 DTC P0301, P0302, P0303, P0304 [L3].)
P0327	Knock sensor circuit low input	ON	1	CCM	×	(See 01–02A–85 DTC P0327 [L3].)
P0328	Knock sensor circuit high input	ON	1	CCM	×	(See 01–02A–87 DTC P0328 [L3].)
P0335	CKP sensor circuit malfunction	ON	1	CCM	×	(See 01–02A–89 DTC P0335 [L3].)
P0340	CMP sensor circuit malfunction	ON	1	CCM	×	(See 01–02A–91 DTC P0340 [L3].)
P0401	EGR flow insufficient detected	ON	2	EGR	×	(See 01–02A–94 DTC P0401 [L3].)
P0403	EGR valve (stepper motor) circuit malfunction	ON	2	CCM	×	(See 01–02A–96 DTC P0403 [L3].)
P0420	Catalyst system efficiency below threshold	ON	2	Catalyst	×	(See 01–02A–98 DTC P0420 [L3].)
P0441	Evaporative emission control system incorrect purge flow	ON	2	Evaporative	×	(See 01–02A–100 DTC P0441 [L3].)
P0442	Evaporative emission control system leak detected (small leak)	ON	2	Evaporative	×	(See 01–02A–102 DTC P0442 [L3].)
P0443	Evaporative emission control system purge control valve circuit malfunction	ON	2	CCM	×	(See 01–02A–104 DTC P0443 [L3].)
P0446	Change over valve (COV) (EVAP system leak detection pump) stuck close	ON	2	CCM	×	(See 01–02A–106 DTC P0446 [L3].)
P0455	Evaporative emission control system leak detected (gross leak)	ON	2	Evaporative	×	(See 01–02A–107 DTC P0455 [L3].)
P0456	Evaporative emission control system leak detected (very small leak)	ON	2	Evaporative	×	(See 01–02A–109 DTC P0456 [L3].)
P0461	Fuel gauge sender unit circuit range/ performance	ON	2	CCM	×	(See 01–02A–111 DTC P0461 [L3].)
P0462	Fuel gauge sender unit circuit low input	ON	2	CCM	×	(See 01–02A–112 DTC P0462 [L3].)

DTC No.	Condition	MIL	DC	Monitor item	Memory function	Page
P0463	Fuel gauge sender unit circuit high input	ON	2	CCM	×	(See 01–02A–113 DTC P0463 [L3].)
P0480	Fan relay No.1 control circuit malfunction	OFF	1	Other	×	(See 01–02A–114 DTC P0480 [L3].)
P0481	Fan relay No.2 and No.3 control circuit malfunction	OFF	1	Other	×	(See 01–02A–116 DTC P0481 [L3].)
P0482	Fan relay No.4 control circuit malfunction	OFF	1	Other	×	(See 01–02A–118 DTC P0482 [L3].)
P0500	Vehicle speed sensor (VSS) circuit malfunction	ON	2	CCM	×	(See 01–02A–121 DTC P0500 [L3].)
P0505	Idle control system malfunction	OFF	–	–	–	(See 01–02A–123 DTC P0505 [L3].)
P0506	Idle control system RPM lower than expected	ON	2	CCM	×	(See 01–02A–124 DTC P0506 [L3].)
P0507	Idle control system RPM higher than expected	ON	2	CCM	×	(See 01–02A–126 DTC P0507 [L3].)
P0550	PSP switch circuit malfunction	ON	2	CCM	×	(See 01–02A–127 DTC P0550 [L3].)
P0564	Cruise control switch circuit malfunction	OFF	1	Other	×	(See 01–02A–129 DTC P0564 [L3].)
P0571	Brake switch circuit malfunction	OFF	1	Other	×	(See 01–02A–131 DTC P0571 [L3].)
P0601	Internal control module memory check sum error	ON	1	CCM	×	(See 01–02A–133 DTC P0601 [L3].)
P0602	PCM programming error	ON	1	CCM	×	(See 01–02A–134 DTC P0602 [L3].)
P0604	PCM RAM error	ON	1	CCM	×	(See 01–02A–135 DTC P0604 [L3].)
P0606	ECM/PCM processor	ON	1	CCM	×	(See 01–02A–136 DTC P0606 [L3].)
P0607	Control module performance	OFF	1	CCM	×	(See 01–02A–137 DTC P0607 [L3].)
P0610	Control module vehicle options error	ON	1	Other	×	(See 01–02A–138 DTC P0610 [L3].)
P0638	Throttle actuator control range/performance	ON	1	CCM	×	(See 01–02A–139 DTC P0638 [L3].)
P0661	Variable intake-air system (VIS) control solenoid valve circuit low input	OFF	1	Other	×	(See 01–02A–140 DTC P0661 [L3].)
P0662	Variable intake-air system (VIS) control solenoid valve circuit high input	OFF	1	Other	×	(See 01–02A–142 DTC P0662 [L3].)
P0703	Brake switch No.1 circuit malfunction	ON	2	CCM	×	(See 01–02A–144 DTC P0703 [L3].)

DTC No.	Condition	MIL	DC	Monitor item	Memory function	Page
P0704	Clutch switch circuit malfunction	ON	2	CCM	×	(See 01–02A–146 DTC P0704 [L3 MTX].)
P0850	Neutral switch circuit malfunction	ON	2	CCM	×	(See 01–02A–148 DTC P0850 [L3 MTX].)
P2004	Variable tumble control system (VTCS) shutter valve stuck open	ON	2	CCM	×	(See 01–02A–151 DTC P2004 [L3].)
P2006	Variable tumble control system (VTCS) shutter valve stuck closed	ON	2	CCM	×	(See 01–02A–153 DTC P2006 [L3].)
P2009	Variable tumble control solenoid valve circuit low input	ON	2	CCM	×	(See 01–02A–154 DTC P2009 [L3].)
P2010	Variable tumble control solenoid valve circuit high input	ON	2	CCM	×	(See 01–02A–157 DTC P2010 [L3].)
P2088	OCV actuator circuit low	ON	1	CCM	×	(See 01–02A–159 DTC P2088 [L3].)
P2089	OCV actuator circuit high	ON	1	CCM	×	(See 01–02A–161 DTC P2089 [L3].)
P2096	Target A/F feedback system too lean	ON	2	Fuel system	×	(See 01–02A–163 DTC P2096 [L3].)
P2097	Target A/F feedback system too rich	ON	2	Fuel system	×	(See 01–02A–165 DTC P2097 [L3].)
P2100	Throttle actuator circuit open	ON	1	CCM	×	(See 01–02A–167 DTC P2100 [L3].)
P2101	Throttle actuator circuit range/performance	ON	1	CCM	×	(See 01–02A–169 DTC P2101 [L3].)
P2102	Throttle actuator circuit low input	ON	1	CCM	×	(See 01–02A–172 DTC P2102 [L3].)
P2103	Throttle actuator control motor circuit high input	ON	1	CCM	×	(See 01–02A–174 DTC P2103 [L3].)
P2107	Throttle actuator control module processor	ON	1	CCM	×	(See 01–02A–176 DTC P2107 [L3].)
P2108	Throttle actuator control module performance	ON	1	CCM	×	(See 01–02A–176 DTC P2108 [L3].)
P2119	Throttle actuator control throttle body range/ performance	ON	2	CCM	×	(See 01–02A–178 DTC P2119 [L3].)
P2122	Accelerator pedal position (APP) sensor No.1 circuit low input	ON	1	CCM	×	(See 01–02A–179 DTC P2122 [L3].)
P2123	Accelerator pedal position (APP) sensor No.1 circuit high input	ON	1	CCM	×	(See 01–02A–181 DTC P2123 [L3].)
P2127	Accelerator pedal position (APP) sensor No.2 circuit low input	ON	1	CCM	×	(See 01–02A–183 DTC P2127 [L3].)
P2128	Accelerator pedal position (APP) sensor No.2 circuit high input	ON	1	CCM	×	(See 01–02A–185 DTC P2128 [L3].)

DTC No.	Condition	MIL	DC	Monitor item	Memory function	Page
P2135	Throttle position sensor No.1/No.2 voltage correlation	ON	1	CCM	×	(See 01–02A–187 DTC P2135 [L3].)
P2138	Accelerator pedal position (APP) sensor No.1/No.2 voltage correlation	ON	1	CCM	×	(See 01–02A–188 DTC P2138 [L3].)
P2177	Fuel system too lean at off idle	ON	2	Fuel system	×	(See 01–02A–189 DTC P2177 [L3].)
P2178	Fuel system too rich at off idle	ON	2	Fuel system	×	(See 01–02A–191 DTC P2178 [L3].)
P2187	Fuel system too lean at idle	ON	2	Fuel system	×	(See 01–02A–194 DTC P2187 [L3].)
P2188	Fuel system too rich at idle	ON	2	Fuel system	×	(See 01–02A–196 DTC P2188 [L3].)
P2195	Front HO2S signal stuck lean	ON	2	O_2 sensor	×	(See 01–02A–199 DTC P2195 [L3].)
P2196	Front HO2S signal stuck rich	ON	2	O_2 sensor	×	(See 01–02A–201 DTC P2196 [L3].)
P2228	BARO sensor circuit low input	ON	1	CCM	×	(See 01–02A–203 DTC P2228 [L3].)
P2229	BARO sensor circuit high input	ON	1	CCM	×	(See 01–02A–205 DTC P2229 [L3].)
P2401	Evaporative emission system leak detection pump control circuit low	ON	2	CCM	×	(See 01–02A–207 DTC P2401 [L3].)
P2402	Evaporative emission system leak detection pump control circuit high	ON	2	CCM	×	(See 01–02A–209 DTC P2402 [L3].)
P2404	Evaporative emission system leak detection pump sense circuit malfunction	ON	2	CCM	×	(See 01–02A–211 DTC P2404 [L3].)
P2405	Evaporative emission system leak detection pump sense circuit low input	ON	2	CCM	×	(See 01–02A–212 DTC P2405 [L3].)
P2407	Evaporative emission system leak detection pump sense circuit intermittent	ON	2	CCM	×	(See 01–02A–213 DTC P2407 [L3].)
P2502	Generator terminal B circuit open	OFF	1	Other	×	(See 01–02A–214 DTC P2502 [L3].)
P2503	Generator output voltage signal no electricity	OFF	1	Other	×	(See 01–02A–215 DTC P2503 [L3].)
P2504	Battery overcharge	OFF	1	Other	×	(See 01–02A–217 DTC P2504 [L3].)
P2507	PCM +BB (back-up battery) voltage low	ON	1	CCM	×	(See 01–02A–219 DTC P2507 [L3].)
P2676	Variable air duct (VAD) control solenoid valve circuit low input	OFF	1	Other	×	(See 01–02A–221 DTC P2676 [L3].)
P2677	Variable air duct (VAD) solenoid valve circuit high input	OFF	1	Other	×	(See 01–02A–222 DTC P2677 [L3].)

DTC P0011 [L3]

C6U010200001W01

DTC P0011	CMP Timing over-advanced
DETECTION CONDITION	• Actual valve timing is over-advanced by **17 deg.** from target valve timing when the OCV is controlled in the maximum valve timing retard condition. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• OCV malfunction • Spool valve in OCV is stuck in advance position. • Variable valve timing actuator is stuck in advance position. • Loose timing belt or improper valve timing due to timing belt slippage • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT OCV FOR MALFUNCTION** • Start engine. • Increase engine speed. • Stop engine. • Remove the OCV. • Inspect the position of spool valve in OCV. • Is spool valve located at valve retard position?	Yes	Go to next step.
		No	Replace OCV, then go to Step 6.
4	**INSPECT STOPPER PIN MECHANISM** • Remove timing belt. • Inspect stopper pin. (See 01–10A–32 VARIABLE VALVE TIMING ACTUATOR INSPECTION [L3].) • Is stopper pin mechanism okay?	Yes	Go to next step.
		No	Replace variable valve timing actuator, then go to Step 6.
5	**INSPECT ROTOR POSITION** • Remove variable valve timing actuator. • Is rotor position at maximum valve timing retard?	Yes	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC detected by intermittent concern. • Intermittent concern might be removed by cleaning mode of variable valve timing control function. Go to next step.
		No	Replace variable valve timing actuator, go to next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0011 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0012 [L3]

C6U010200001W02

DTC P0012	CMP Timing over-retarded
DETECTION CONDITION	• Actual valve timing is over-retarded by **5 deg.** from target valve timing for **5 s** when the OCV system control is within feed-back range. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• OCV (oil control valve) malfunction • Low engine oil pressure • Spool valve in OCV (oil control valve) is stuck in retard position. • Variable valve timing actuator is stuck in retard position. • Following oil runners are clogged or have leakage. **Oil runners** • Between oil pressure switch and OCV (oil control valve) • Between OCV (oil control valve) and variable valve timing actuator • In variable valve timing actuator • Loose timing belt or improper valve timing due to timing belt slippage • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Is DTC P2088 or P2089 present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01–02A–159 DTC P2088 [L3] or 01–02A–161 DTC P2089 [L3].)
		No	Go to next step.
4	**VERIFY ENGINE OIL PRESSURE** • Start engine. • Does oil pressure warning light illuminate?	Yes	Inspect engine oil pressure. (See 01–11–4 OIL PRESSURE INSPECTION.)
		No	Go to next step.
5	**VERIFY TIMING BELT INSTALLATION** • Stop engine. • Remove timing belt cover. • Is camshaft timing mark at correct point? (See 01–10A–11 TIMING CHAIN REMOVAL/INSTALLATION [L3].)	Yes	Go to next step.
		No	Reinstall timing belt, then go to Step 8.
6	**INSPECT OCV FOR MALFUNCTION** • Stop engine. • Remove OCV. • Inspect position of spool valve in OCV. • Is spool valve located at valve retard position?	Yes	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC detected by intermittent concern. • Intermittent concern might be removed by cleaning mode of variable valve timing control function. Go to next step.
		No	Replace OCV, then go to Step 8.
7	**INSPECT ENGINE OIL RUNNER** • Inspect following engine oil runners for clogging or leakage. — Between oil pressure switch and OCV — Between OCV and variable valve timing actuator — In variable valve timing actuator • Is there any clogging or leakage?	Yes	Repair or replace suspected runner, then go to next step.
		No	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC is detected by intermittent concern. • Intermittent concern might be removed by cleaning mode of variable valve timing control function. Go to next step.

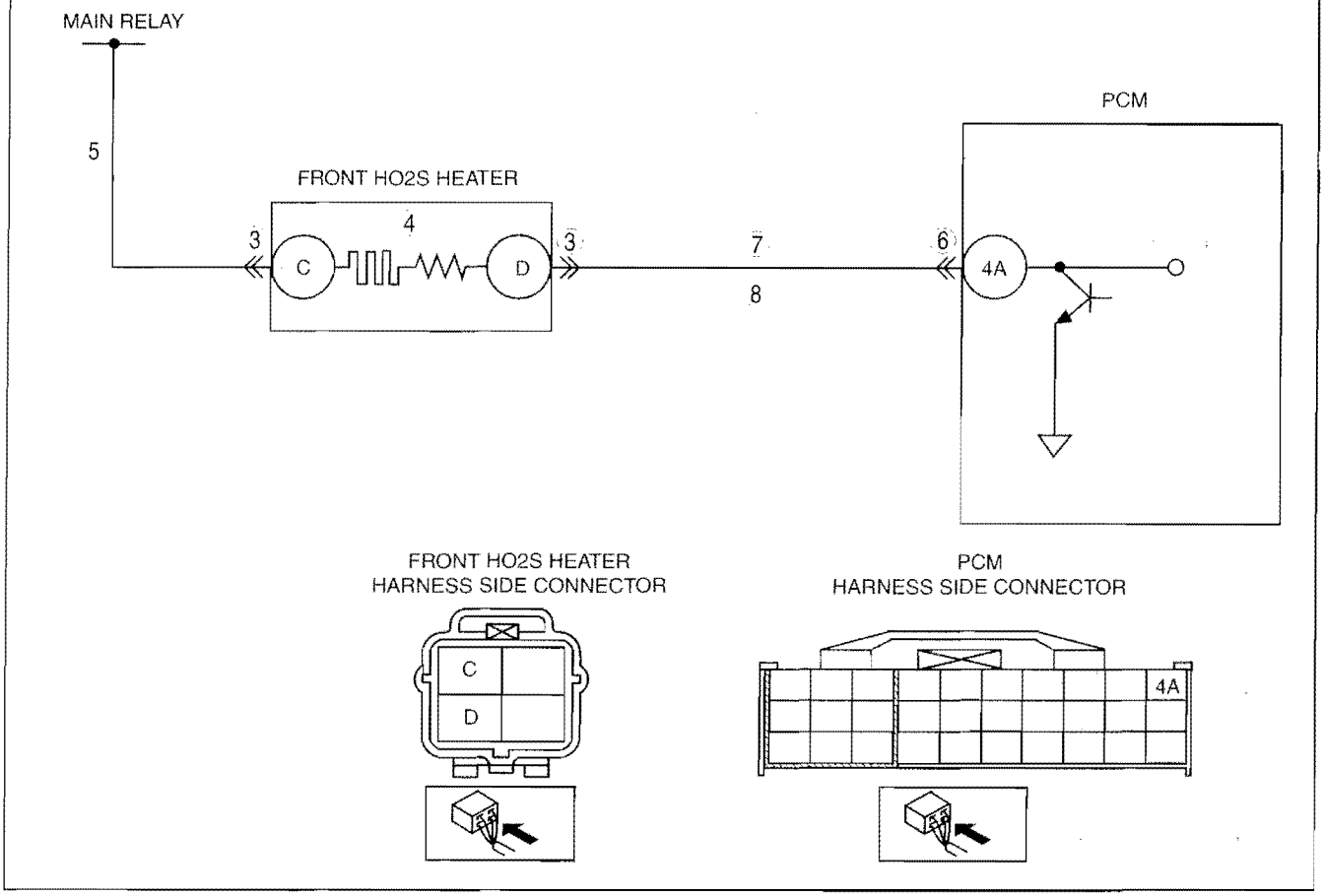
STEP	INSPECTION		ACTION
8	**VERIFY TROUBLESHOOTING OF DTC P0012 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0031 [L3]

C6U010200001W03

DTC P0031	Front HO2S heater circuit low input
DETECTION CONDITION	• PCM monitors front HO2S heater control signal at PCM terminal 4A. If PCM turns front HO2S heater off but front HO2S heater circuit has low voltage, PCM determines that front HO2S heater circuit has malfunction. **Note** • Front HO2S heater is controlled by duty signal. **Diagnostic support note** • This is a continuous monitor (O_2 sensor heater). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Open circuit between ignition switch and front HO2S terminal C • Open circuit between front HO2S terminal D and PCM terminal 4A • Short to ground between front HO2S terminal D and PCM terminal 4A • Poor connection at front HO2S or PCM connector • PCM malfunction

DTC P0031	Front HO2S heater circuit low input



Diagnostic procedure

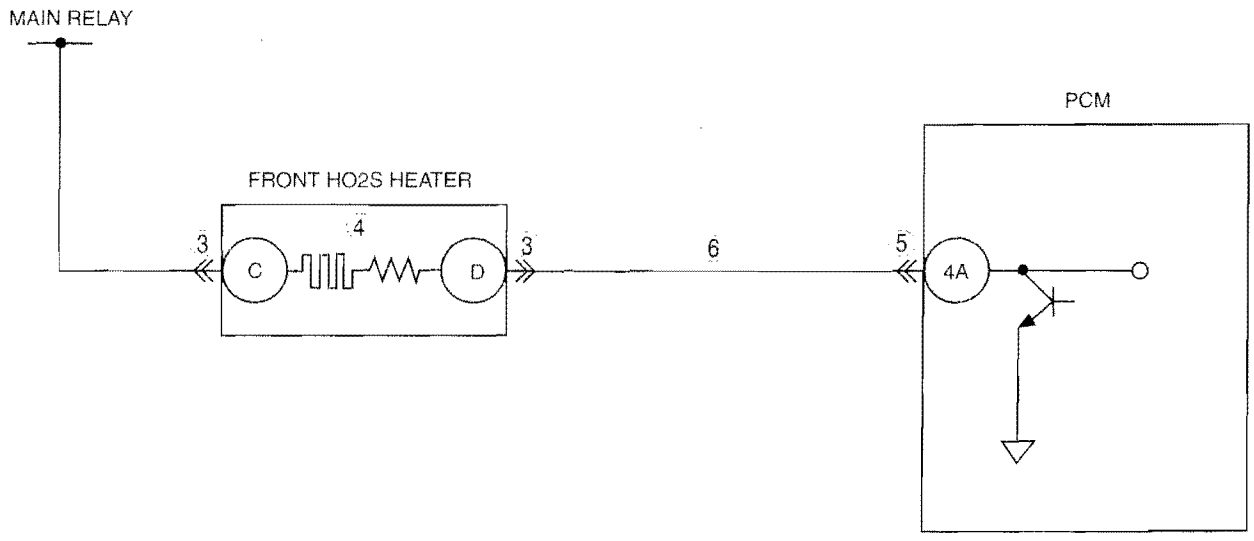
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect front HO2S connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT FRONT HO2S HEATER** • Inspect front HO2S heater. (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3].) • Is front HO2S heater okay?	Yes	Go to next step.
		No	Replace front HO2S, then go to Step 9.
5	**INSPECT POWER CIRCUIT OF FRONT HO2S HEATER FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between front HO2S terminal C (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.

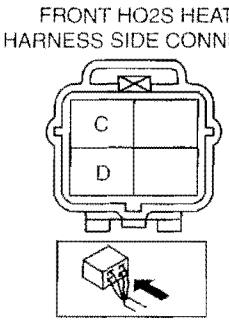
STEP	INSPECTION		ACTION
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
7	**INSPECT CONTROL CIRCUIT OF FRONT HO2S HEATER FOR SHORT TO GROUND** • Inspect continuity between front HO2S terminal D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 9.
		No	Go to next step.
8	**INSPECT CONTROL CIRCUIT OF FRONT HO2S HEATER FOR OPEN CIRCUIT** • Remove PCM with PCM connector connected. • Inspect continuity between front HO2S terminal D (harness-side) and PCM terminal 4A (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0031 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

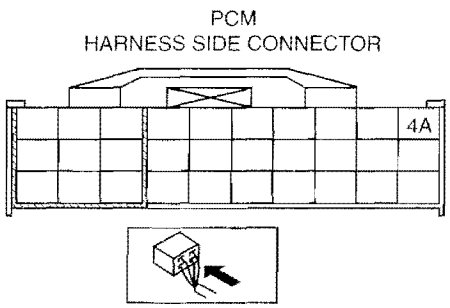
DTC P0032 [L3]

C6U010200001W04

DTC P0032	Front HO2S heater circuit high input
DETECTION CONDITION	• PCM monitors front HO2S heater control signal at PCM terminal 4A. If PCM turns front HO2S heater on but front HO2S heater circuit has high voltage, PCM determines that front HO2S heater circuit has malfunction. **Note** • Front HO2S heater is controlled by a duty signal. **Diagnostic support note** • This is a continuous monitor (O_2 sensor heater). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Short to power supply between front HO2S terminal D and PCM terminal 4A • Front HO2S or PCM terminal is shorted. • Front HO2S heater malfunction • PCM malfunction







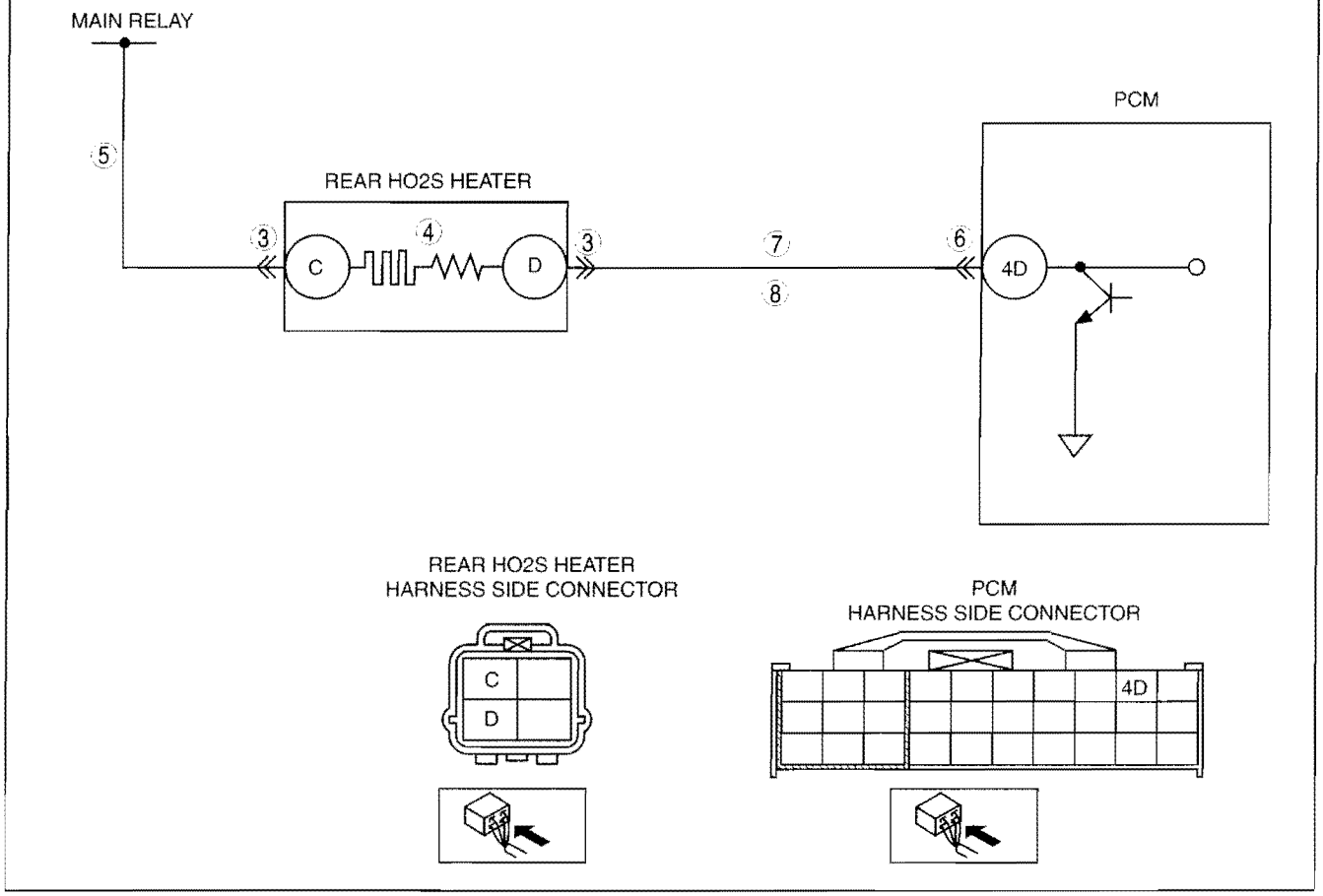
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FRONT HO2S TERMINALS** • Turn ignition key to OFF. • Disconnect front HO2S connector. • Inspect for bent terminals. • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**INSPECT FRONT HO2S HEATER** • Inspect front HO2S heater. (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3].) • Is front HO2S heater okay?	Yes	Go to next step.
		No	Replace the front HO2S, then go to Step 7.
5	**INSPECT PCM TERMINAL** • Disconnect PCM connector. • Inspect for bent terminals. • Is there any malfunction?	Yes	Repair terminal, then go to Step 7.
		No	Go to next step.
6	**INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key to ON (Engine OFF). • Measure voltage between front HO2S terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for shot to power circuit, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0032 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0037 [L3]

C6U010200001W05

DTC P0037	Rear HO2S heater circuit low input
DETECTION CONDITION	• PCM monitors rear HO2S heater control signal at PCM terminal 4D. If PCM turns rear HO2S heater off but rear HO2S heater circuit has low voltage, PCM determines that rear HO2S heater circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (O_2 sensor heater). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Rear HO2S malfunction • Open circuit between the ignition switch and rear HO2S terminal C • Open circuit between the rear HO2S terminal D and PCM terminal 4D • Short to ground between rear HO2S terminal D and PCM terminal 4D • Poor connection at rear HO2S or PCM connector • PCM malfunction



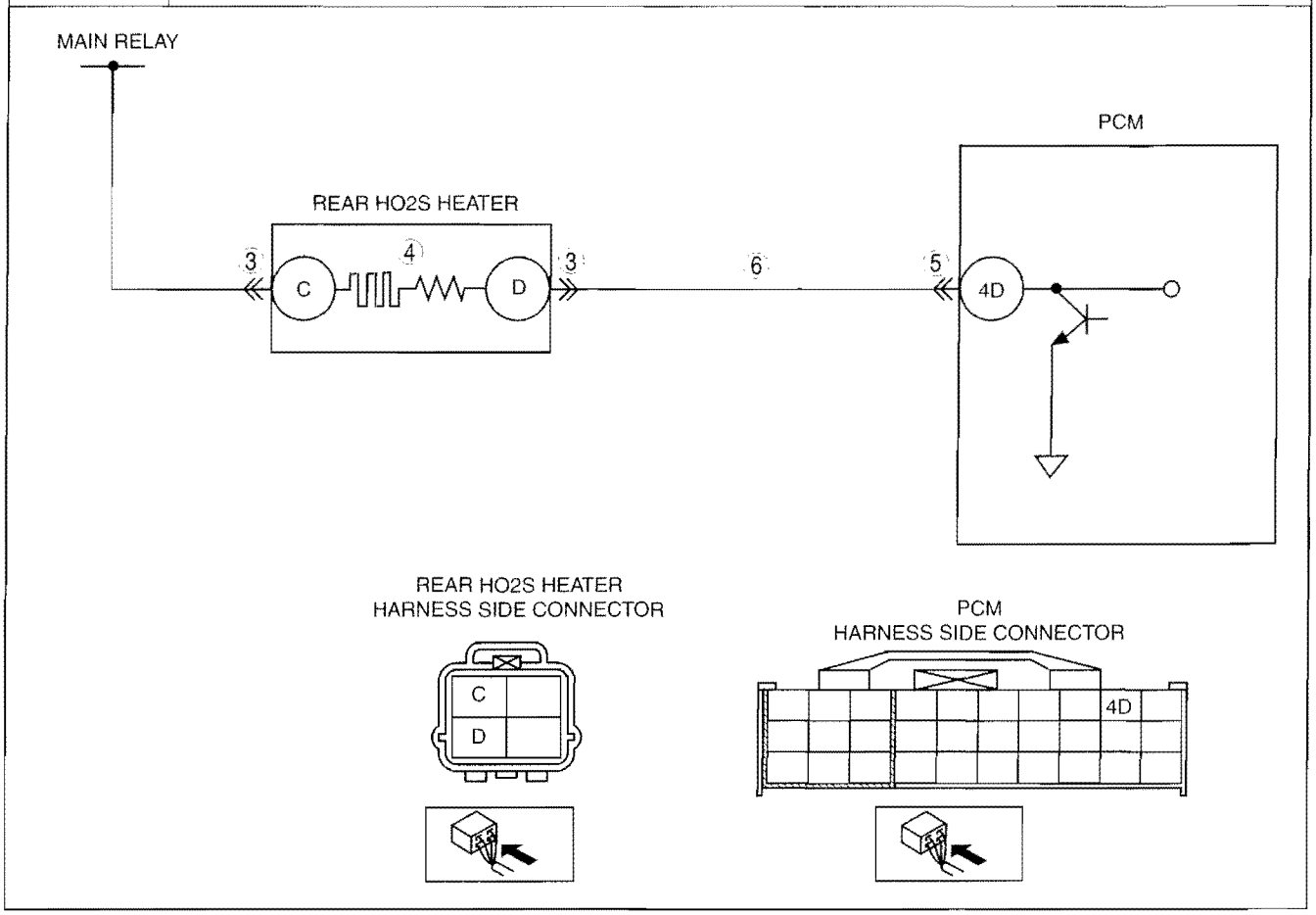
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT REAR HO2S CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect rear HO2S connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT REAR HO2S HEATER** • Inspect rear HO2S heater. (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3].) • Is rear HO2S heater okay?	Yes	Go to next step.
		No	Replace rear HO2S, then go to Step 9.
5	**INSPECT REAR HO2S HEATER POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between rear HO2S terminal C (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
7	**INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between rear HO2S terminal D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 9.
		No	Go to next step.
8	**INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR OPEN CIRCUIT** • Remove PCM with PCM connector connected. • Inspect continuity between rear HO2S terminal D (harness-side) and PCM terminal 4D (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0037 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0038 [L3]

C6U010200001W06

DTC P0038	Rear HO2S heater circuit high input
DETECTION CONDITION	• PCM monitors rear HO2S heater control signal at PCM terminal 4D. If PCM turns rear HO2S heater on but rear HO2S heater circuit has high voltage, PCM determines that rear HO2S heater circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (O_2 sensor heater). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Short to power supply between rear HO2S terminal D and PCM terminal 4D • Rear HO2S or PCM terminal is shorted • Rear HO2S heater malfunction • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT REAR HO2S TERMINAL** • Turn ignition key to OFF. • Disconnect rear HO2S connector. • Inspect for bent terminals • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**INSPECT REAR HO2S HEATER** • Inspect rear HO2S heater. (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3].) • Is rear HO2S heater okay?	Yes	Go to next step.
		No	Replace the rear HO2S, then go to Step 7.
5	**INSPECT PCM TERMINAL** • Disconnect PCM connector. • Inspect for bent terminals. • Is there any malfunction?	Yes	Repair terminal, then go to Step 7.
		No	Go to next step.
6	**INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key to ON (Engine OFF). • Measure voltage between rear HO2S terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power supply, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0038 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and warm it up completely. • Is PENDING CODE of for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0101 [L3]

C6U010200100W01

DTC P0101	MAF circuit range/performance problem
DETECTION CONDITION	• PCM compares actual MAF amount with expected MAF amount when the engine is running. — If mass intake air amount is **above 50 l/s** for **5 s** and engine speed is **below 2,000 rpm** with engine running and engine coolant temperature is **above 70°C {158°F}**, PCM determines that detected mass intake air flow amount is too high. — If mass intake air flow amount is **below 5—43 l/s** (The value depends on engine speed.) for **5 s** and engine speed is **above 1,000 rpm** with engine running and throttle opening angle is **above 50%**, PCM determines that detected mass intake air flow amount is too low. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Electrical corrosion in MAF RETURN circuit • Voltage drops in GND circuit

Diagnostic procedure

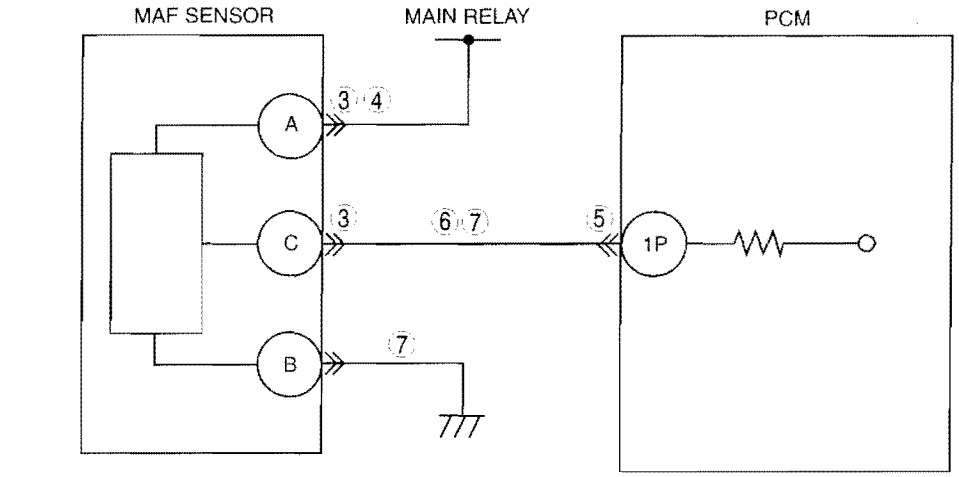
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT** • Connect WDS or equivalent to DLC-2. • Start the engine. • Access ECT, MAF, TP and RPM PIDs using WDS or equivalent. • Warm-up engine until ECT PID is **above 70°C {158°F}**. • Idle engine for **5 s or more**. **Caution** • **While driving, always operate the vehicle in a safe and lawful manner.** • Drive the vehicle under the following two conditions: **Condition 1** — TP PID: **50—87.5%** — RPM PID: **above 1,000 rpm** — 4th gear (MT), D range (AT) **Condition 2** — TP PID: **above 80%** — RPM PID: **below 2,000 rpm** — gear in • Is PENDING CODE for this DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01–03A–2 INTERMITTENT CONCERN TROUBLESHOOTING [L3])
4	**CHECK MAF SENSOR TERMINALS FOR ELECTRICAL CORROSION** • Turn ignition key to OFF. • Disconnect MAF sensor connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is any problem corrosion found?	Yes	Repair or replace suspected terminal or MAF sensor, then go to Step 6.
		No	Go to next step.

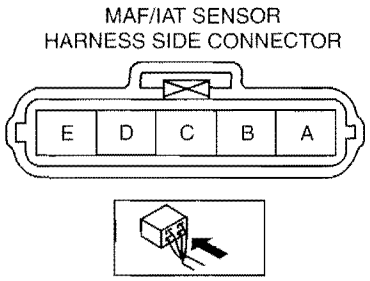
STEP	INSPECTION		ACTION
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair terminal, then go to next step.
		No	Go to next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0101 COMPLETED** • Make sure to connect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start the engine. • Warm-up engine until ECT PID is **above 70°C {158°F}**. • Idle engine for **5 s or more**. **Caution** • **While performing the Drive Mode, always operate the vehicle in a safe and lawful manner.** • Drive the vehicle under the following two conditions: **Condition 1** — TP PID: **50—87.5%** — RPM PID: **above 1,000 rpm** — 4th gear (MT), D range (AT) **Condition 2** — TP PID: **above 80%** — RPM PID: **below 2,000 rpm** — gear in • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3]) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3])
		No	Troubleshooting completed.

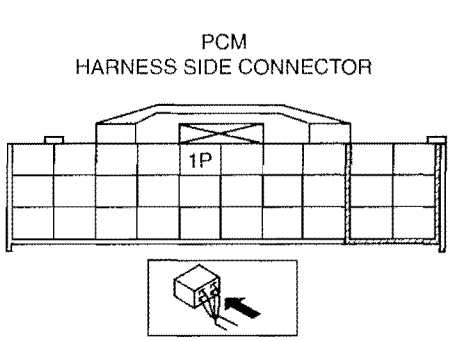
DTC P0102 [L3]

C6U010200100W02

DTC P0102	MAF circuit low input
DETECTION CONDITION	• PCM monitors input voltage from MAF sensor when engine is running. If input voltage at PCM terminal 1P is **below 0.21 V**, PCM determines that MAF circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Short to ground in wiring harness between MAF/IAT sensor terminal C and PCM terminal 1P • Open circuit in wiring harness between MAF/IAT sensor terminal C and PCM terminal 1P • Open circuit in wiring harness between main relay and MAF/IAT sensor terminal A







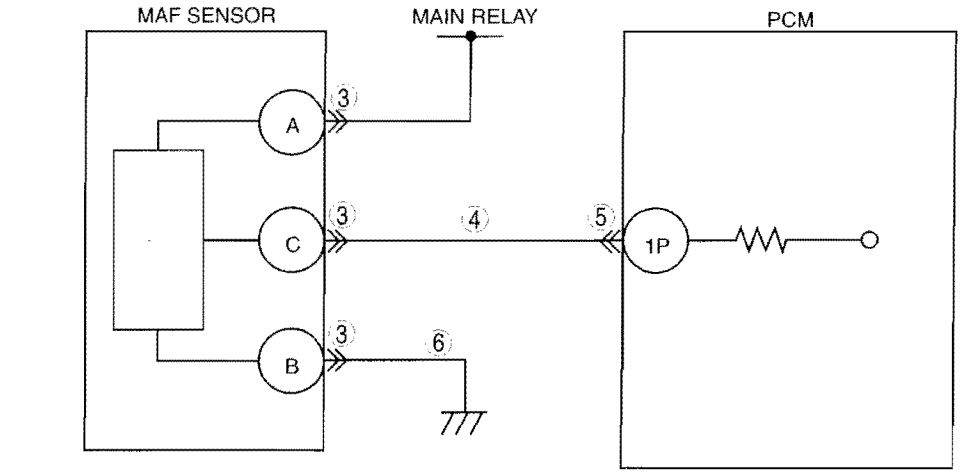
Diagnostic procedure

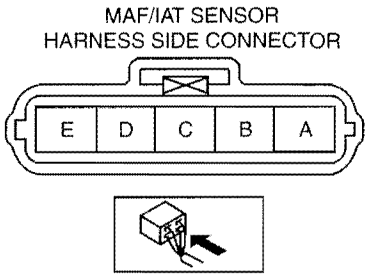
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT MAF SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminals, then go to Step 8.
		No	Go to next step.
4	**INSPECT POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Inspect voltage at MAF/IAT sensor terminal A (harness-side). • Is voltage **B+**?	Yes	Go to next step.
		No	Inspect for open circuit in wiring harness between MAF/IAT sensor terminal A (harness-side) and main relay. Repair or replace harness, then go to Step 8.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 8.
		No	Go to next step.
6	**INSPECT MAF SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Remove PCM with PCM connector connected. • Inspect for continuity between MAF/IAT sensor terminal C (harness-side) and PCM terminal 1P (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 8.
7	**INSPECT MAF SENSOR SIGNAL CIRCUIT FOR SHORTS** • Inspect continuity between following circuits: — MAF/IAT sensor terminal C (harness-side) and body ground — MAF/IAT sensor connector terminal C and B (harness-side) • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Replace MAF/IAT sensor, then go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0102 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

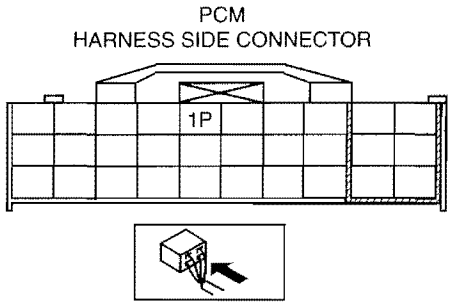
DTC P0103 [L3]

C6U010200100W03

DTC P0103	MAF circuit high input
DETECTION CONDITION	• PCM monitors input voltage from MAF sensor when engine is running. If input voltage at PCM terminal 1P is **above 4.9 V**, PCM determines that MAF circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between MAF/IAT sensor terminal C and PCM terminal 1P • Open circuit in MAF/IAT sensor ground circuit







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT MAF SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminals, then go to Step 7.
		No	Go to next step.
4	**INSPECT MAF SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key to ON (Engine OFF). • Measure voltage between MAF/IAT sensor terminal C (harness-side) and body ground. • Is voltage **0 V**?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 7.
		No	Go to next step.
6	**INSPECT MAF SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Remove PCM with PCM connector connected. • Inspect for continuity between MAF/IAT sensor terminal B (harness-side) and GND. • Is there continuity?	Yes	Replace MAF/IAT sensor, then go to next step.
		No	Repair or replace suspected harness, then go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0103 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0106 [L3]

C6U010200100W04

DTC P0106	MAP sensor performance problem
DETECTION CONDITION	• PCM monitors differences between intake manifold vacuum and atmospheric pressure. If difference is **below -17 kPa {-128 mmHg, -5.1 inHg}** or **above 17 kPa {128 mmHg, 5.1 inHg}** when the following conditions are met, PCM determines that there is a MAP sensor performance problem. **MONITORING CONDITION** — **12—15 s** from when ignition switch is turned to OFF. — Intake air temperature is **above -10°C {14°F}**. — Engine coolant temperature is **above 70°C {158°F}**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAP sensor malfunction or substandard performance

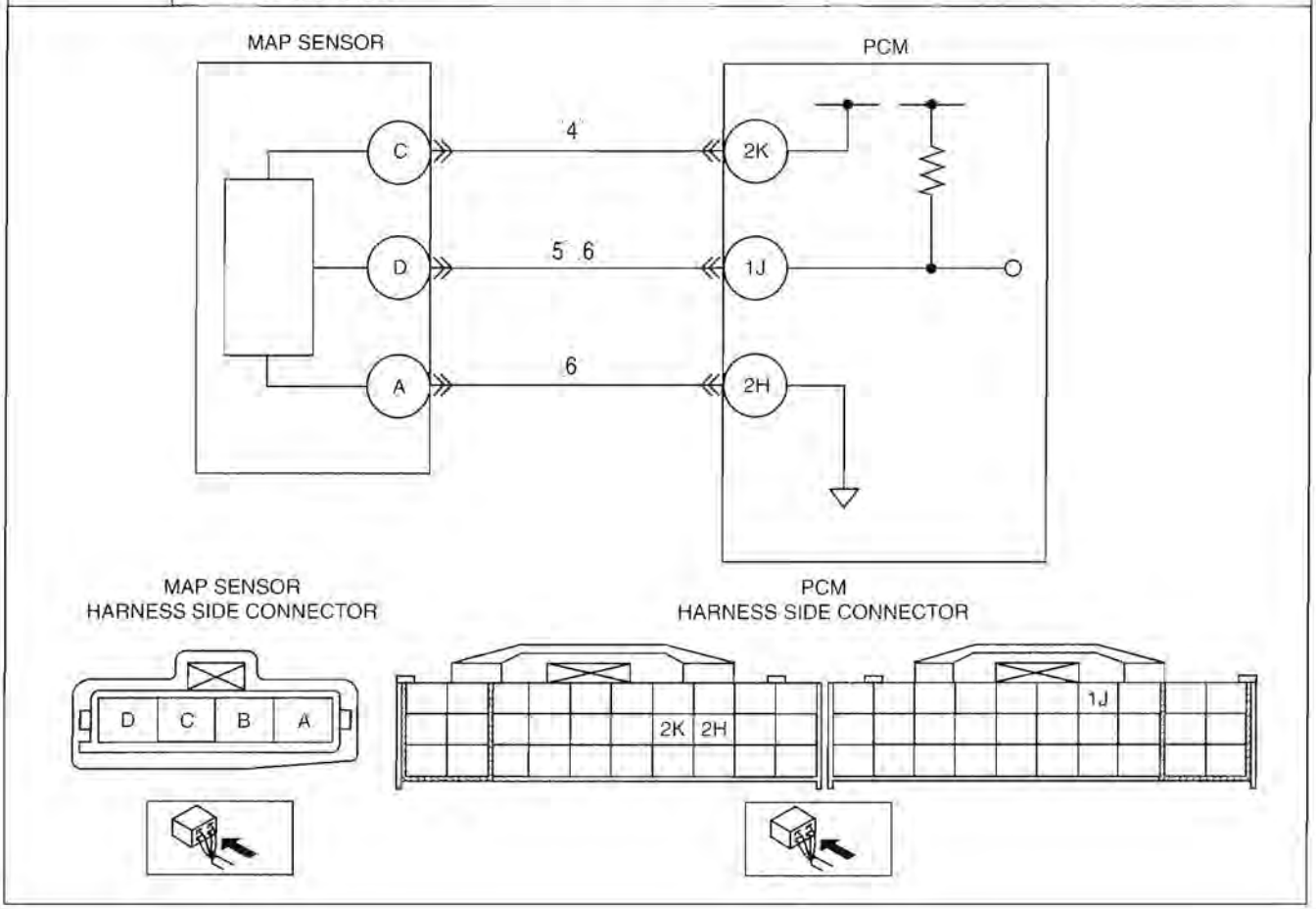
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY STORED DTC** • Turn ignition key to OFF then start the engine. • Have DTC P0107, P0108, P2228 or P2229 been stored?	Yes	Inspect and repair DTC P0107, P0108, P2228 or P2229.
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0106 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**INSPECT MAP SENSOR STUCK OPEN OR CLOSE** • Inspect MAP sensor. (See 01–40A–38 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION [L3].) • Is EGR boost sensor okay?	Yes	Go to next step.
		No	Replace MAP sensor, then go to next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0106 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start the engine. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0107 [L3]

C6U010200100W05

DTC P0107	MAP sensor circuit low input
DETECTION CONDITION	• PCM monitors input voltage from MAP sensor when intake air temperature is **above 10 °C {50 °F}**. If input voltage at PCM terminal 1J is **below 0.10 V**, PCM determines that MAP sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAP sensor malfunction • Connector or terminal malfunction • Short to ground in wiring harness between MAP sensor terminal D and PCM terminal 1J • Open circuit in wiring harness between MAP sensor terminal C and PCM terminal 2K • MAP sensor signal circuit and MAP sensor ground circuit are shorted each other. • PCM malfunction



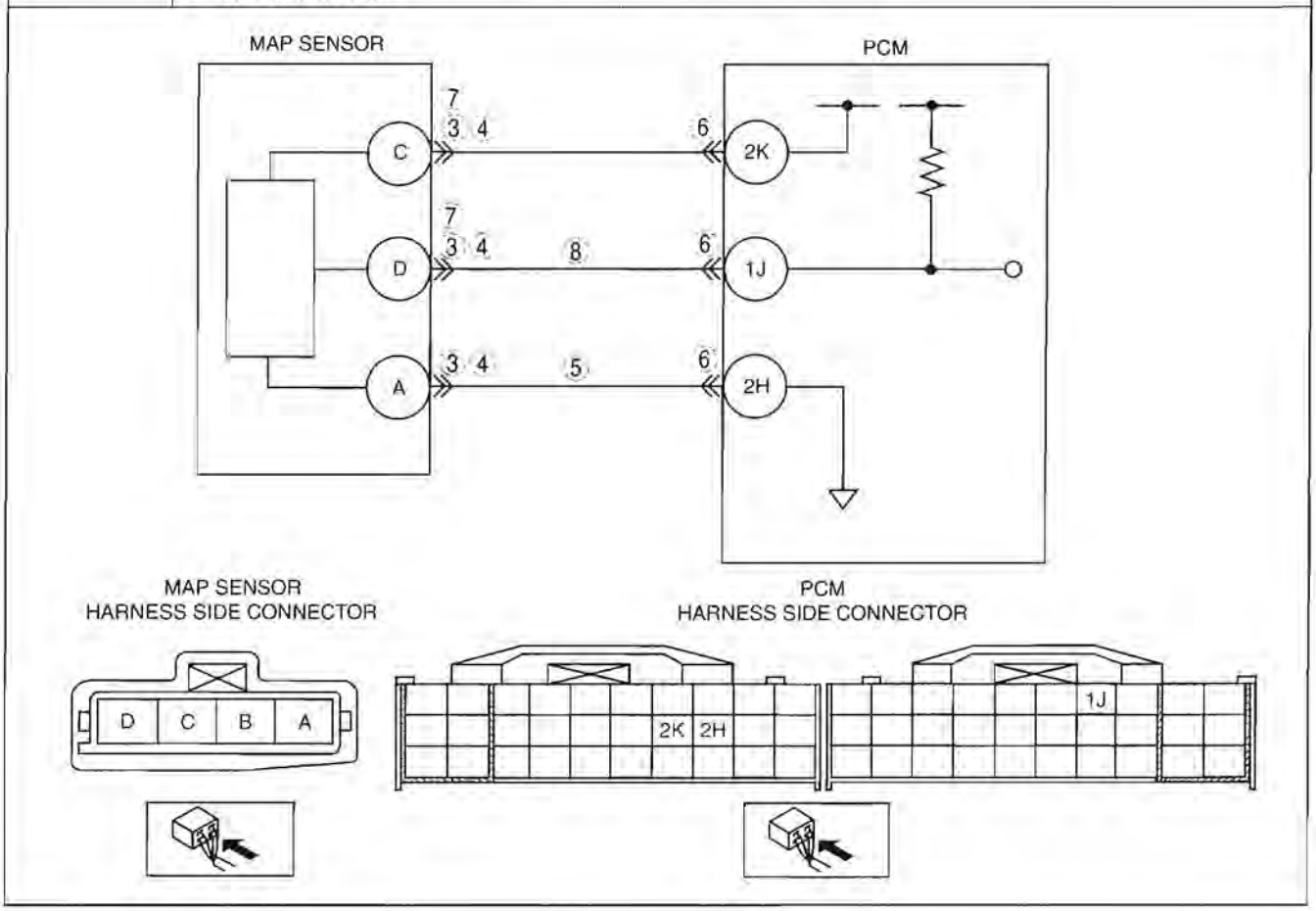
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Recorded FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY MAP PID WHEN MAP SENSOR CONNECTOR IS DISCONNECTED** • Disconnect MAP sensor connector. • Is voltage **above 4.9 V**?	Yes	Go to next step.
		No	Go to step 5.
4	**INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT MAP SENSOR CONNECTOR** **Note** • If DTC P0122 and P2228 are also retrieved with P0107, go to CONSTANT VOLTAGE troubleshooting procedure. • Turn ignition key to ON (Engine OFF). • Measure voltage between MAP sensor terminal C (harness-side) and body ground. • Is voltage **within 4.5—5.5 V?**	Yes	Check for poor connection of MAP sensor terminal C (harness-side). • Repair or replace terminal if necessary. • If okay, replace MAP sensor. Then go to Step 7.
		No	Check for open circuit between PCM terminal 2K (harness-side) and MAP sensor terminal C (harness-side). Repair or replace suspected harness, then go to Step 7.
5	**INSPECT MAP SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect continuity between MAP sensor terminal D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 7.
		No	Go to next step.
6	**INSPECT MAP SENSOR SIGNAL AND GROUND CIRCUIT FOR SHORT EACH OTHER** • Check continuity between MAP sensor terminals D and A (harness-side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0107 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0108 [L3]

C6LJ010200100W06

DTC P0108	MAP sensor circuit high input
DETECTION CONDITION	• PCM monitors input voltage from MAP sensor when intake air temperature is **above 10 °C {50 °F}**. If input voltage at PCM terminal 1J is **above 4.92 V**, PCM determines that MAP sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAP sensor malfunction • Connector or terminal malfunction • Open circuit in wiring harness between MAP sensor terminal A and PCM terminal 2H • Open circuit in wiring harness between MAP sensor terminal D and PCM terminal 1J • MAP sensor signal circuit short to constant voltage supply circuit • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT CONNECTION OF MAP SENSOR CONNECTOR** • Turn ignition key to OFF. • Verify that the MAP sensor connector is connected securely. • Is connection okay?	Yes	Go to next step.
		No	Reconnect the connector, then go to Step 9.
4	**INSPECT MAP SENSOR CONNECTOR FOR POOR CONNECTION** • Disconnect the MAP sensor connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace suspected terminal, then go to Step 9.
		No	Go to next step.
5	**VERIFY MAP SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between MAP sensor terminal A (harness-side) and body ground. • Is there continuity?	Yes	Go to next step.
		No	Inspect for open circuit between PCM terminal 2H (harness-side) and MAP sensor terminal A (harness-side). Repair or replace suspected harness, then go to Step 9.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Inspect for poor connection at terminal 2H (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
7	**VERIFY MAP SENSOR SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT** • Inspect for continuity between MAP sensor terminal D and C (harness-side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 9.
		No	Go to next step.
8	**VERIFY MAP SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between MAP sensor terminal D (harness-side) and PCM terminal 1J (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0108 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0111 [L3]

C6U010200100W07

DTC P0111	IAT circuit performance problem
DETECTION CONDITION	• Intake air temperature is higher than engine coolant temperature by **40 °C {104 °F}** and ignition key is ON. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Poor connection at MAF/IAT sensor or PCM connector • PCM malfunction

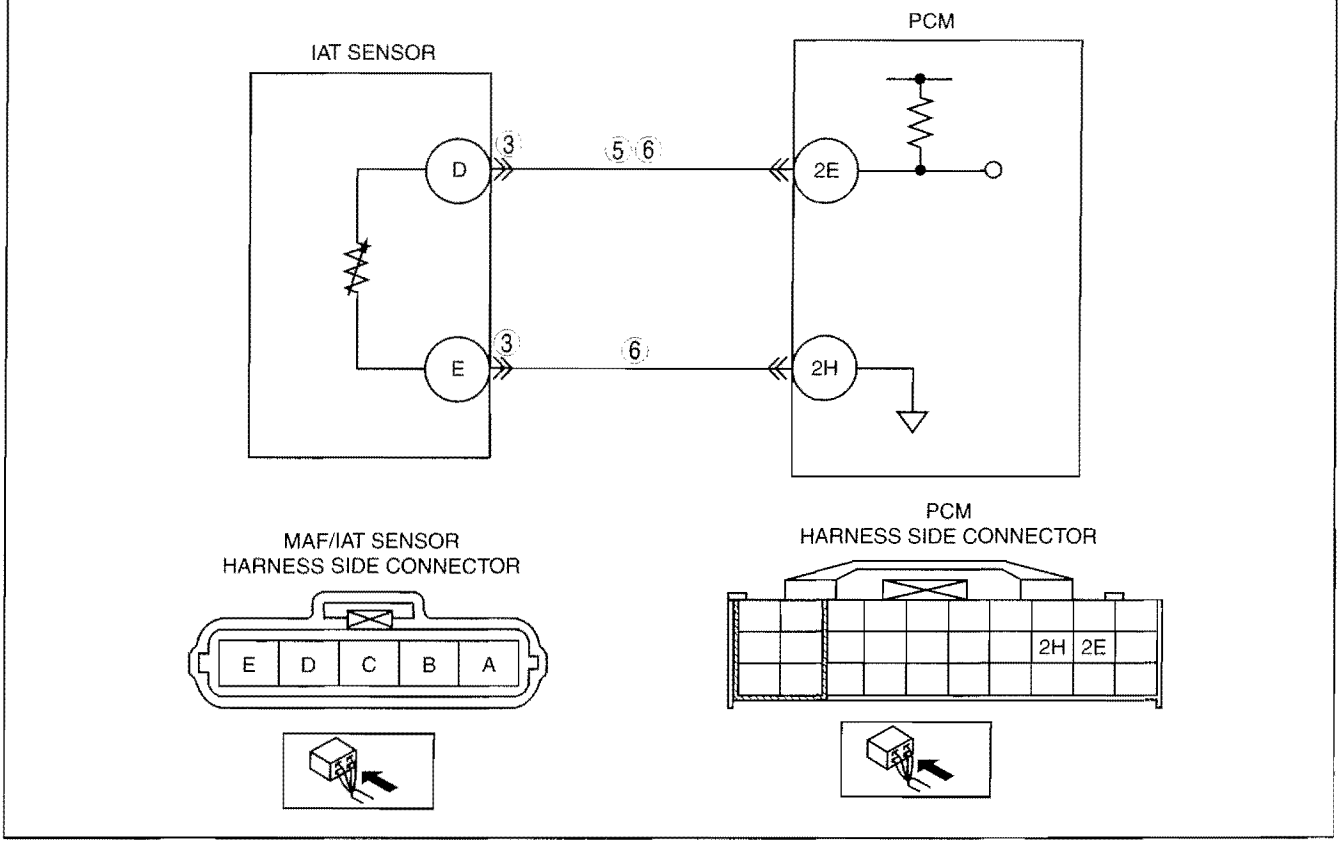
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect MAF/IAT sensor connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 6.
		No	Go to next step.
4	**INSPECT IAT SENSOR** • Inspect IAT sensor. (See 01–40A–34 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [L3].) • Is IAT sensor okay?	Yes	Replace MAF/IAT sensor, then go to Step 6.
		No	Go to next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 6.
		No	Go to next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0111 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and run engine under FREEZE FRAME DATA condition. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0112 [L3]

C6U010200100W08

DTC P0112	IAT circuit low input
DETECTION CONDITION	• The PCM monitors IAT sensor signal at PCM terminal 2E. If the PCM detected IAT sensor voltage **below 0.16 V**, the PCM determines that the IAT sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Short to ground between MAF/IAT sensor terminal D and PCM terminal 2E • Short each harness IAT signal circuit and IAT ground circuit. • PCM malfunction



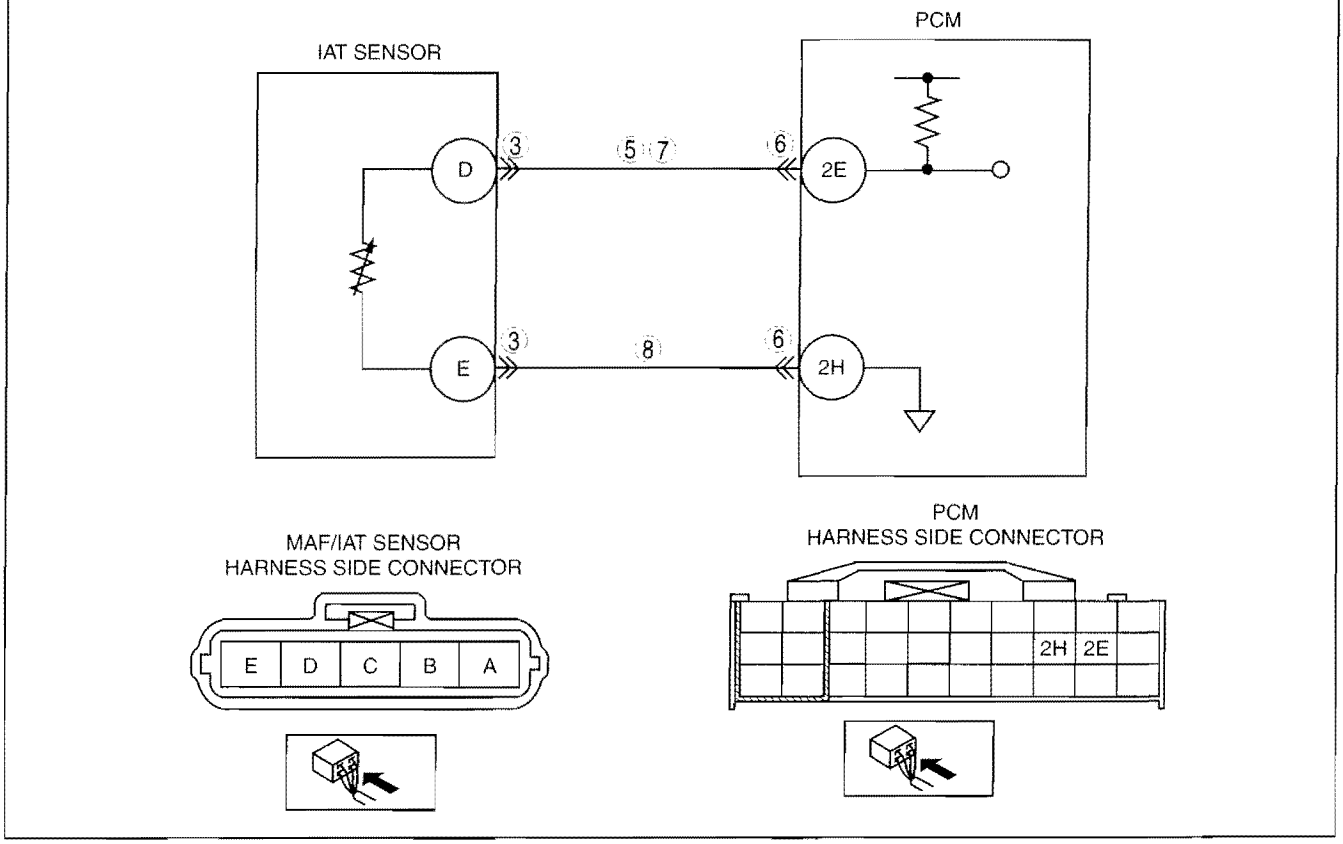
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT IAT SENSOR TERMINAL** • Turn ignition key to OFF. • Disconnect MAF/IAT sensor connector. • Inspect for bent terminal of MAF/IAT sensor terminals D and E (part-side). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**CLASSIFY IAT SENSOR MALFUNCTION OR HARNESS MALFUNCTION** • Connect WDS or equivalent to DLC-2. • Access IAT PID. • Verify IAT value when disconnecting MAF/IAT sensor connector. • Does IAT value change?	Yes	Replace MAF/IAT sensor, then go to Step 7.
		No	Go to next step.
5	**INSPECT IAT SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect continuity between MAF/IAT sensor terminal D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 7.
		No	Go to next step.
6	**INSPECT IAT CIRCUITS FOR SHORT** • Inspect continuity between MAF/IAT sensor terminals D and E (harness-side). • Is there continuity?	Yes	Repair or replace harness for short, then go to Step 7.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0112 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0113 [L3]

C6U010200100W09

DTC P0113	IAT circuit high input
DETECTION CONDITION	• The PCM monitors IAT sensor signal at PCM terminal 2E. If the PCM detected IAT sensor voltage **above 4.84 V**, the PCM determines that the IAT sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Open circuit between MAF/IAT sensor terminal D and PCM terminal 2E • Short to power supply between MAF/IAT sensor terminal D and PCM terminal 2E • Open circuit between MAF/IAT sensor terminal E and PCM terminal 2H • Poor connection at MAF/IAT sensor or PCM connector. • PCM malfunction



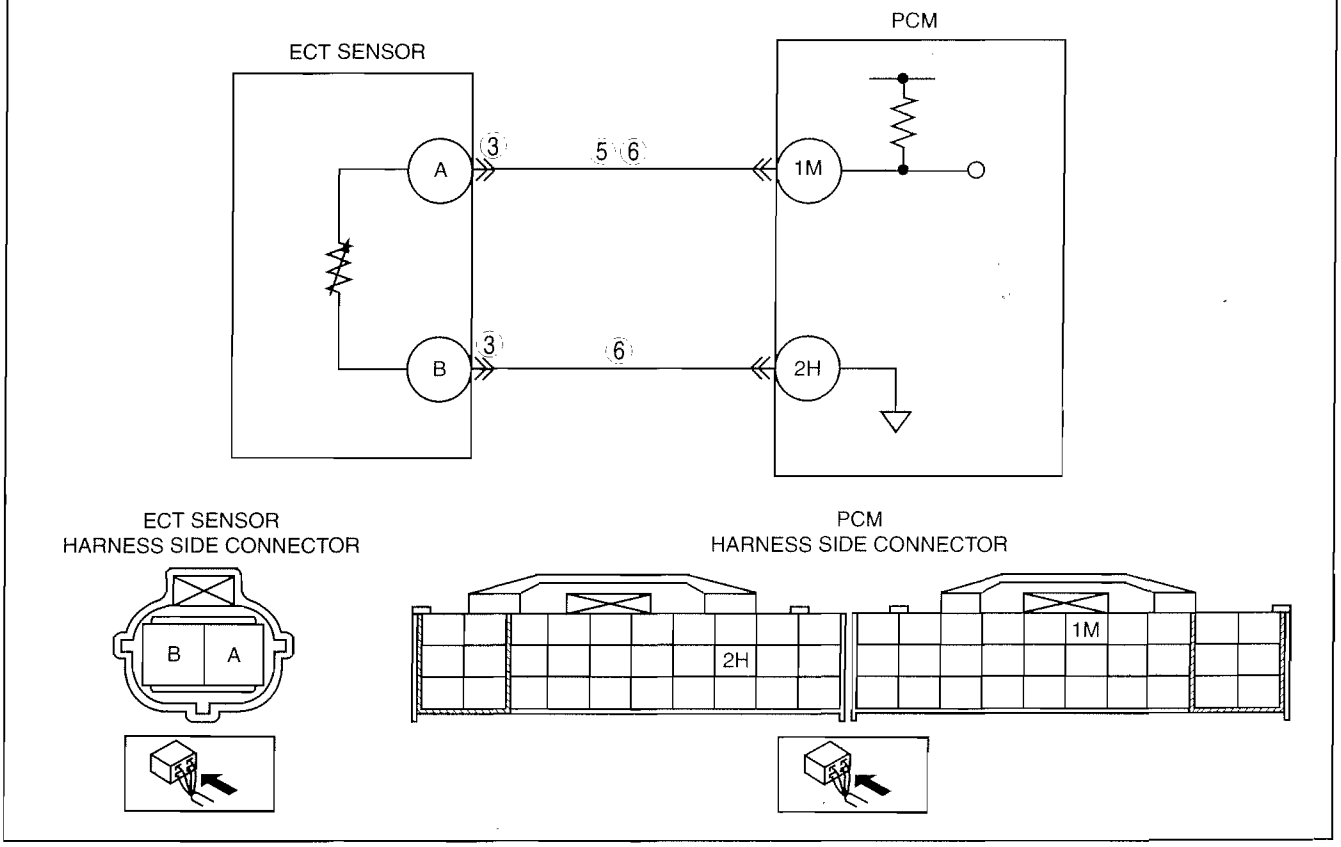
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT IAT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect MAF/IAT sensor connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**CLASSIFY IAT SENSOR MALFUNCTION OR HARNESS MALFUNCTION** • Connect WDS or equivalent to DLC-2. • Access IAT PID. • Connect a jumper wire between MAF/IAT sensor terminals D and E (harness-side). • Verify IAT value. • Is voltage **below 4.84 V**?	Yes	Replace MAF/IAT sensor, then go to Step 9.
		No	Go to next step.
5	**INSPECT IAT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key to ON (Engine OFF). • Measure voltage between MAF/IAT sensor terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power supply, then go to Step 9.
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect PCM terminals 2E and 2H (harness-side) for tightness using feeler tool. • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
7	**INSPECT IAT SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between MAF/IAT sensor terminal D (harness-side) and PCM terminal 2E (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
8	**INSPECT IAT SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between MAF/IAT sensor terminal E (harness-side) and PCM terminal 2H (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0113 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0117 [L3]

C6U010200100W10

DTC P0117	ECT circuit low input
DETECTION CONDITION	• The PCM monitors ECT sensor signal at PCM terminal 1M. If the PCM detected ECT sensor voltage **below 0.20 V** the PCM determines that the ECT sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (Engine cooling system). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Connect or terminal malfunction • Short to ground circuit between ECT sensor terminal A and PCM connector terminal 1M. • Short each harness ECT signal circuit and ECT ground circuit. • PCM malfunction



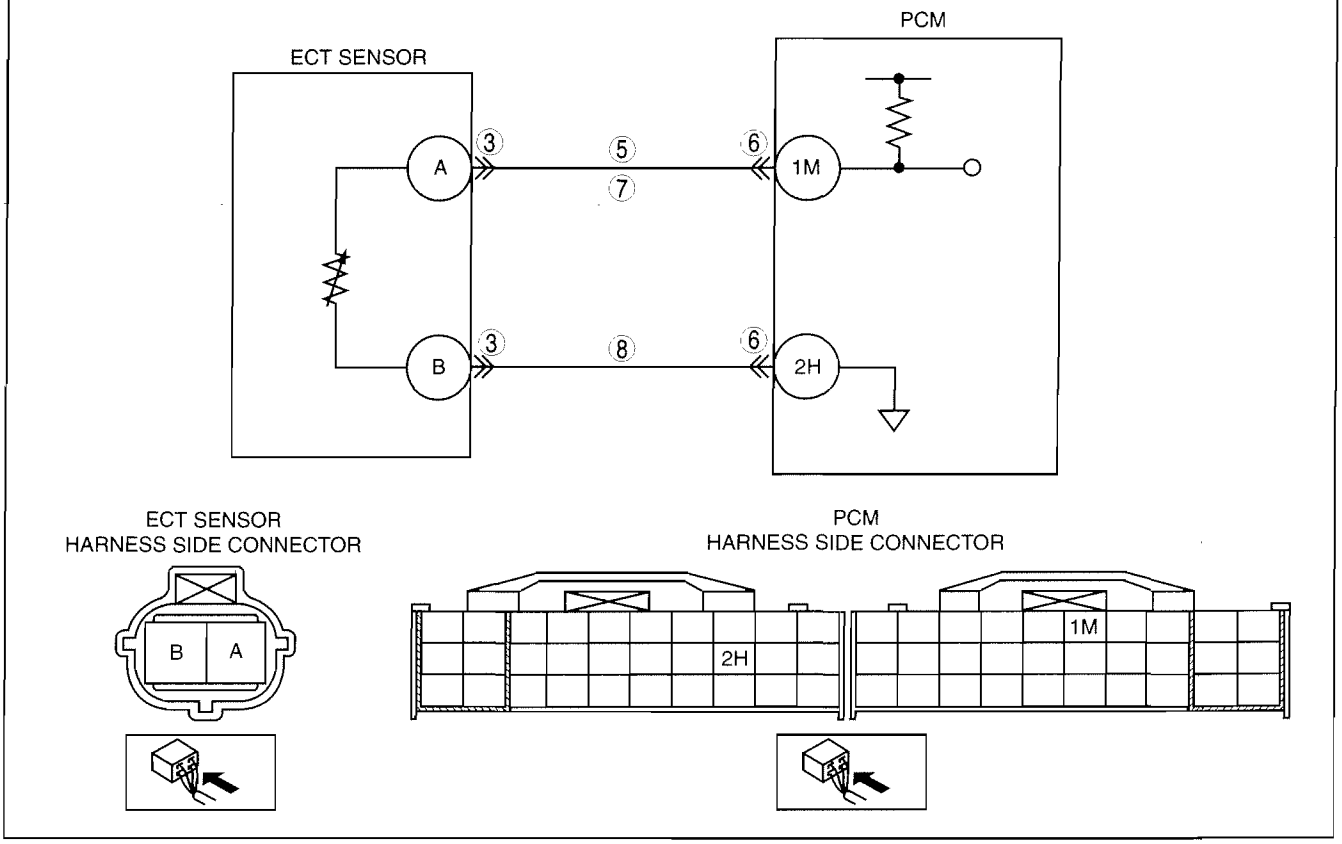
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT TERMINAL BENT** • Turn ignition key to OFF. • Disconnect ECT sensor connector. • Inspect for bent of ECT sensor terminals A and B (part-side). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**CLASSIFY ECT SENSOR MALFUNCTION OR HARNESS MALFUNCTION** • Connect WDS or equivalent to DLC-2. • Access ECT PID. • Verify ECT value when disconnecting ECT sensor connector. • Does ECT value change?	Yes	Replace ECT sensor, then go to Step 7.
		No	Go to next step.
5	**INSPECT ECT SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Inspect continuity between ECT sensor terminal A (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 7.
		No	Go to next step.
6	**INSPECT IAT CIRCUIT FOR SHORT HARNESSES** • Inspect continuity between ECT sensor terminal A and B (harness-side). • Is there continuity?	Yes	Repair or replace harness for short, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0117 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0118 [L3]

C6U010200100W11

DTC P0118	ECT circuit high input
DETECTION CONDITION	• The PCM monitors ECT sensor signal at PCM terminal 1M. If the PCM detected ECT sensor voltage **above 4.58 V**, the PCM determines that the ECT sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (Engine cooling system). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Open circuit between ECT sensor terminal A and PCM terminal 1M • Short to power supply between ECT sensor terminal A and PCM terminal 1M • Open circuit between ECT sensor terminal B and PCM terminal 2H • Poor connection of ECT sensor or PCM connectors • PCM malfunction



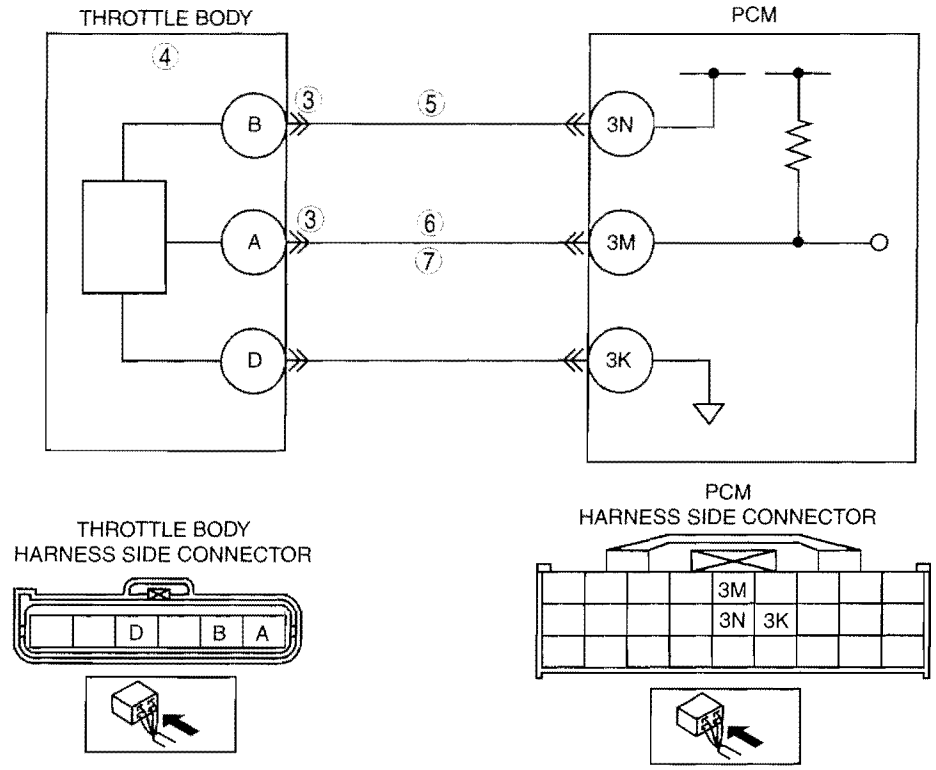
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect ECT sensor connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**CLASSIFY ECT SENSOR MALFUNCTION OR HARNESS MALFUNCTION** • Connect WDS or equivalent to DLC-2. • Access ECT PID. • Connect a jumper wire between ECT sensor terminals A and B (harness-side). • Verify ECT value • Is voltage **below 4.58 V**?	Yes	Replace ECT sensor, then go to Step 9.
		No	Go to next step.
5	**INSPECT ECT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key to ON (Engine OFF). • Measure voltage between ECT sensor terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power supply, then go to Step 9.
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
7	**INSPECT ECT SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between ECT sensor terminal A (harness-side) and PCM terminal 1M (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
8	**INSPECT ECT SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between ECT sensor terminal B (harness-side) and PCM terminal 2H (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0118 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01-40A-6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01-02A-8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0122 [L3]

C6U010200100W12

DTC P0122	TP sensor No.1 circuit low input
DETECTION CONDITION	• If PCM detects TP sensor No.1 voltage at PCM terminal 3M **below 0.2 V** after ignition key to ON, PCM determines that TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions in first drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor malfunction • Connector or terminal malfunction • Open circuit between throttle body terminal A and PCM terminal 3M • Short to ground between throttle body terminal A and PCM terminal 3M • Open circuit between throttle body terminal E and PCM terminal 3N



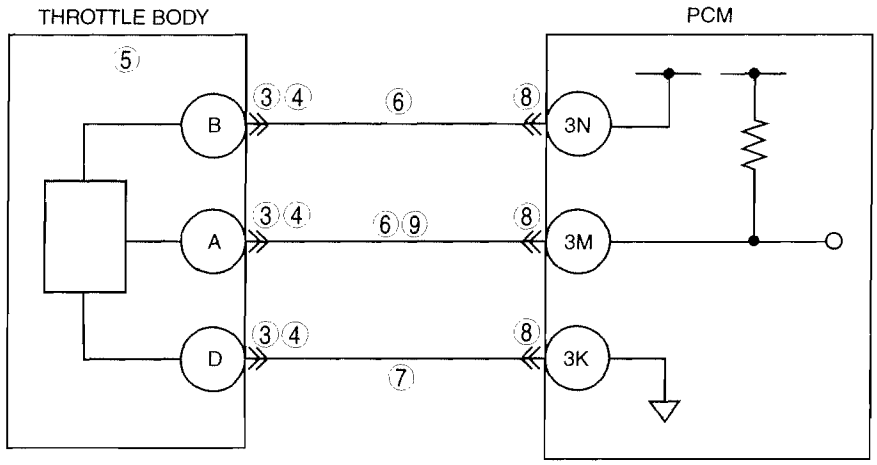
Diagnostic procedure

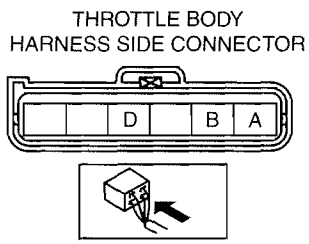
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY TP SENSOR OR HARNESS MALFUNCTION** • Connect WDS or equivalent. • Access TP1 PID. • Disconnect throttle body connector. • Connect a jumper wire between throttle body terminals A and B (harness-side). • Is voltage **above 4.9 V**?	Yes	Go to next step.
		No	Go to step 5.
4	**INSPECT TP SENSOR** • Perform TP sensor inspection. (See 01–40A–32 THROTTLE POSITION (TP) SENSOR INSPECTION [L3].) • Is TP sensor okay?	Yes	Inspect for poor throttle body connector terminal B connection. Repair or replace if necessary, then go to Step 8.
		No	Replace throttle body, then go to Step 8.
5	**INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT THROTTLE BODY CONNECTOR** **Note** • If DTC P0107 and P2228 are also retrieved with P0122, go to CONSTANT VOLTAGE troubleshooting procedure. • Turn ignition key to ON (Engine OFF). • Measure voltage at throttle body terminal B (harness-side). • Is voltage **within 4.5—5.5 V**?	Yes	Go to next step.
		No	Repair or replace open circuit between throttle body connector terminal B (harness-side) and PCM connector terminal 3N (harness-side). Then, then go to Step 8.
6	**VERIFY TP1 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Inspect continuity between throttle body terminal A (harness-side) and PCM terminal 3M (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 8.
7	**VERIFY TP1 SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between throttle body terminal A (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0122 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

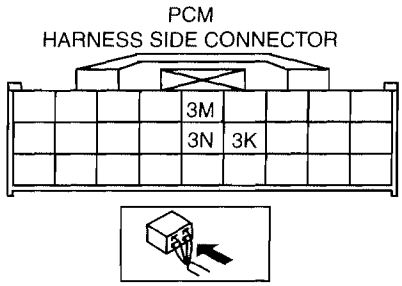
DTC P0123 [L3]

C6U010200100W13

DTC P0123	TP sensor No.1 circuit high input
DETECTION CONDITION	• If PCM detects TP sensor No.1 voltage at PCM terminal 3M is **above 4.85 V** after ignition key to ON, PCM determines that TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions in first drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor malfunction • Connector or terminal malfunction • Open circuit between throttle body terminal D and PCM terminal 3K • Short to constant voltage supply circuit between throttle body terminal A and PCM terminal 3M







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT THROTTLE BODY CONNECTOR** • Turn ignition key to OFF. • Verify that the throttle body connector is connected securely. • Is connector okay?	Yes	Go to next step.
		No	Connect the connector securely, then go to Step 10.
4	**INSPECT THROTTLE BODY CONNECTION FOR POOR CONNECTION** • Disconnect throttle body connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace suspected terminal, then go to Step 10.
		No	Go to next step.
5	**INSPECT TP SENSOR** • Perform TP sensor inspection. (See 01–40A–32 THROTTLE POSITION (TP) SENSOR INSPECTION [L3]) • Is TP sensor okay?	Yes	Go to next step.
		No	Replace throttle body, then go to Step 10.
6	**INSPECT TP1 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key to ON (Engine OFF). • Measure voltage between throttle body terminal A (harness-side) and body ground. • Is voltage **above 4.9 V**?	Yes	Repair or replace short to power supply. Then, go to Step 10.
		No	Go to next step.
7	**VERIFY TP SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between throttle body connector terminal D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace open circuit between TP sensor connector terminal A (harness-side) and PCM connector terminal 2H (harness-side). Then, go to Step 10.
		No	Go to next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 10.
		No	Go to Step 10.
9	**VERIFY TP SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT** • Inspect continuity between throttle body terminals A and B (harness-side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0123 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0125 [L3]

C6U010200100W14

DTC P0125	Excessive time to enter closed loop fuel control
DETECTION CONDITION	• The PCM monitor ECT sensor signal at PCM terminal 1M after engine is started at the engine is cold. If ECT voltage does not reach the expected temperature for specified period, PCM determines that it has taken an excessive amount of time for the engine coolant temperature to reach the temperature necessary to start closed-loop fuel control. **Diagnostic support note** • This is a continuous monitor (Engine cooling system). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Poor connection of connectors • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT** • Start engine. • Warm up engine completely. • Access ECT PID using WDS or equivalent. • Is ECT PID **above 60 °C {140 °F}**?	Yes	Intermittent concern exists. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01–03A–2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].)
		No	Go to next step.
4	**INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect ECT sensor connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
5	**INSPECT ECT SENSOR** • Inspect ECT sensor. (See 01–40A–36 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [L3].) • Is it okay?	Yes	Go to next step.
		No	Replace ECT sensor, then go to Step 7.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0125 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to ON (Engine OFF). • Access ECT PID using WDS or equivalent. • Wait until ECT PID **below 20 °C {68 °F}**. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.

STEP	INSPECTION		ACTION
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0126, P0128 [L3]

C6U010200100W15

DTC P0126 DTC P0128	**Coolant thermostat stuck open**
DETECTION CONDITION	**DTC P0126** • If the ECT signal never exceeds **71 °C {160 °F}** after engine start for specified period, PCM determines that the coolant thermostat is stuck open. **MONITORING CONDITIONS** — IAT: **above –10 °C {14 °F}** — Vehicle speed: **over 32 km/h {20 mph}** **DTC P0128** • PCM monitors MAF, IAT, VSS and EAT signals and calculate radiator heat radiation ratio while following monitoring conditions are met. If calculated value exceeds threshold, PCM determines that the coolant thermostat is stuck open. **MONITORING CONDITIONS** — ECT at engine start: **Below 36 °C {97 °F}** — IAT: **above –10 °C {14 °F}** — Difference between ECT at engine start and minimum IAT: **Below 6 °C {43 °F}** — Vehicle speed: **over 9.5 km/h {5.9 mph} [ATX], over 6.3 km/h {3.9mph} [MTX]** **Diagnostic support note** • This is a continuous monitor (Engine cooling system). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory. • DIAGNOSTIC MONITORING TEST RESULTS is available.
POSSIBLE CAUSE	• ECT sensor malfunction • Coolant thermostat malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FOR OTHER DTCS** • Have other DTCs been stored?	Yes	Repair circuit malfunction for applicable DTCs.
		No	Go to next step.
4	**INSPECT COOLANT THERMOSTAT FOR WHETHER STUCK OPEN** • Perform coolant thermostat inspection. (See 01–12–10 THERMOSTAT INSPECTION.) • Is coolant thermostat okay?	Yes	Inspect ECT sensor. Replace ECT sensor if necessary, then go to next step.
		No	Replace coolant thermostat, then go to next step.

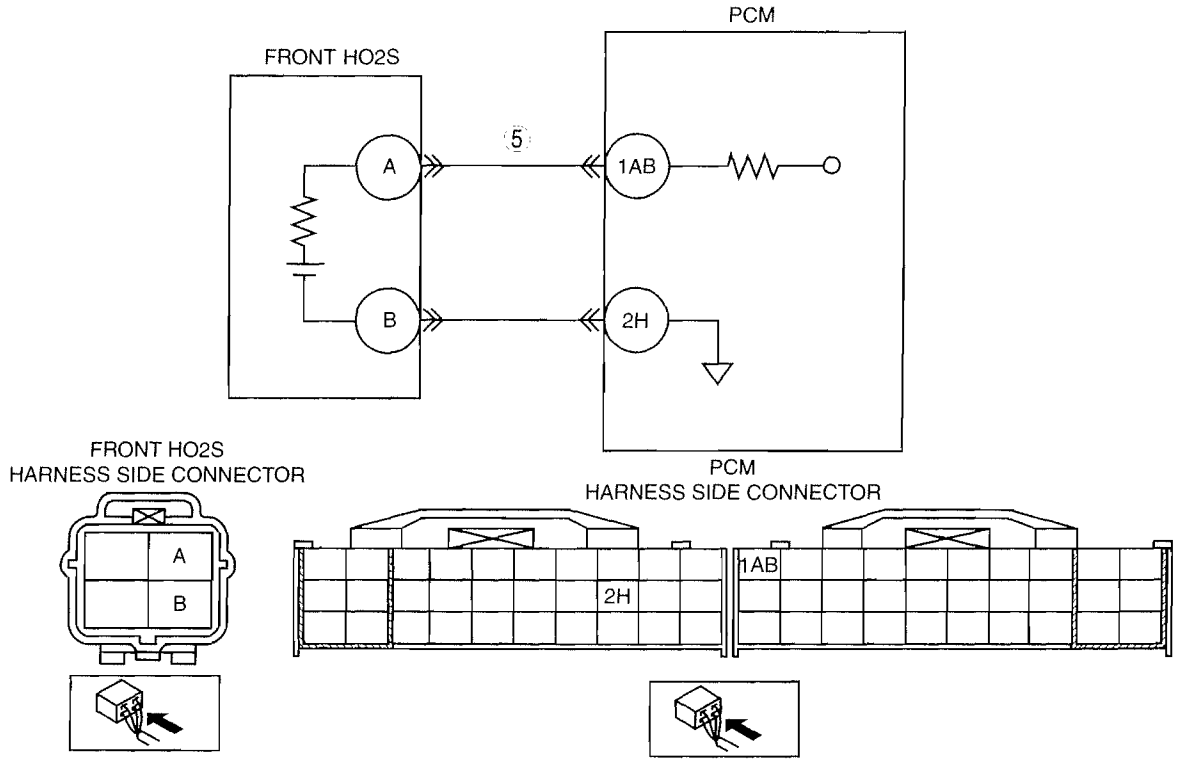
STEP	INSPECTION		ACTION
5	**VERIFY MONITORING CONDITION FOR REPAIR VERIFICATION** • Make sure to reconnect all disconnected connectors. • Cool down engine. **Note** • If workshop inside and outside temperature difference is significant, PCM might not operate thermostat monitor. Therefore, it is recommended to cool down engine out of workshop. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Access ECT, IAT PIDs and make sure that each value is within following specifications. — ECT: **below 36 °C {97 °F}** (for P0128 only) — IAT: **Above –10°C {14°F}** — Difference between ECT and IAT: **Below 6°C {43°F}** • Is there any PID that is out of specification?	Yes	Take corrective action (e.g. cool down engine), then repeat this step.
		No	Go to next step for DTC P0126 or go to step 7 for DTC P0128.
6	**VERIFY TROUBLESHOOTING OF DTC P0126 COMPLETED** • Start engine and turn off E/L and A/C. • Access DIAGNOSTIC MONITORING TEST RESULTS using WDS or equivalent and monitor TEST #10:E1:81 (ECT). **Note** • This test requires actual driving. Chassis roller cannot be used for this test. • During test drive, constant speed should be maintained, although 2 or 3 stops during every **5 minutes** of driving time (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period. • Test period depends on ECT at engine start. (e.g. if ECT is **–10°C {14°F}**, monitoring period is **38 minutes** and ECT is **30 °C {86 °F}**, monitoring period is **8 minutes**) • Verify TEST #10:E1:81 (ECT) value. • Is value above minimum value?	Yes	Go to Step 8.
		No	Replace PCM, then go to Step 8.

STEP	INSPECTION		ACTION
7	**VERIFY TROUBLESHOOTING OF DTC P0128 COMPLETED** • Start engine and turn off E/L and A/C. • Access DIAGNOSTIC MONITORING TEST RESULTS using WDS or equivalent and monitor TEST #10:E1:80 (Heat radiation ratio) or #10:E1:81 (ECT). **Note** • This test requires actual driving. Chassis roller cannot be used for this test. • During test drive, constant speed should be maintained, although 2 or 3 stops (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period. • Verify TEST #10:E1:80 (Heat radiation ratio) and #10:EI:81 (ECT) value. • Are value of TEST #10:E1:80 (Heat radiation ratio) below maximum value and value of TEST #10:E1:81 (ECT) above minimum value?	Yes	Go to next step.
		No	Replace PCM, then go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0132 [L3]

C6U010200100W16

DTC P0132	Front HO2S circuit high input
DETECTION CONDITION	• PCM monitors input voltage from front HO2S at PCM terminal 1AB. If the PCM detected front HO2S voltage **above 1.2 V** for **0.8 s**, PCM determines that the circuit input is high. **Diagnostic support note** • This is a continuous monitor (O_2 sensor). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Short to power supply in wiring harness between front HO2S terminal A and PCM terminal 1AB • From HO2S or PCM terminal is shorted • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING OR STORED DTCS** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending code or stored DTCs using WDS or equivalent. • Is other DTC present?	Yes	Go to appropriate DTC troubleshooting procedures. (See 01-02A-13 DTC TABLE [L3].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0132 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01-02A-13 DTC TABLE [L3].)
5	**INSPECT FRONT HO2S SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key to OFF. • Disconnect front HO2S connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between front HO2S terminal A (harness-side) and body ground. • Is there any voltage?	Yes	Replace short to power supply, then go to Step 7.
		No	Go to next step.
6	**INSPECT FRONT HO2S** • Perform "HEATED OXYGEN SENSOR (HO2S) INSPECTION". (See 01-40A-43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3].) • Is the front HO2S normal?	Yes	Go to next step.
		No	Replace the sensor, then go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0132 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Run "PCM Adaptive Memory Procedure Drive Mode" and "HO2S Heater, HO2S, and TWC Repair Verification Drive Mode". (See 01-02A-9 OBD-II DRIVE MODE [L3].) • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01-40A-6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01-02A-8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0133 [L3]

C6U010200100W17

DTC P0133	Front HO2S circuit slow response
DETECTION CONDITION	• The PCM monitors the inversion cycle period, lean-to-rich response time and rich-to-lean response time of the sensor when the following monitoring conditions are met. If any exceeds the threshold, the PCM determines that the circuit has a malfunction. — The PCM calculates average response time from lean-to-rich, and from rich-to-lean. If any exceeds the threshold, the PCM determines that the circuit has a malfunction. — The HO2S (RF, LF) voltage does not rise **above 0.58 V** for **12 s or more** after the HO2S (RF, LF) voltage has risen **above 0.32 V**. (CAL: Except for L392EB000L3V5010 (MT), L393EB000L3VN010 (AT)) — The HO2S (RF, LF) voltage does not go **below 0.32 V** for **12 s or more** after the HO2S (RF, LF) voltage has gone **below 0.58 V**. (CAL: Except for L392EB000L3V5010 (MT), L393EB000L3VN010 (AT)) — The HO2S (RF, LF) voltage has not deviated from **between 0.32—0.58 V for 12 s or more**. (CAL: Except for L392EB000L3V5010 (MT), L393EB000L3VN010 (AT)) **MONITORING CONDITIONS** — HO2S heater, HO2S, and TWC Repair Verification Drive Mode — All of the Following conditions are met: • Calculation load **20—59%** (Maximum value depends on engine speed.) • Engine speed **1,410—4,000 rpm** • Vehicle speed is **above 3.75 km/h {2.33 mph}** • Engine coolant temperature is **above –10 °C {14 °F}**. **Diagnostic support note** • This is an intermittent monitor. (O_2 sensor) • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory. • Diagnostic monitoring test results is available.
POSSIBLE CAUSE	• Front HO2S deterioration • Front HO2S heater malfunction • Pressure regulator malfunction • Fuel pump malfunction • Fuel filter clogged or restricted • Fuel leakage on fuel line from fuel distribution pipe and fuel pump • Leakage exhaust system • Purge solenoid valve malfunction • Purge solenoid hoses improper connection • Insufficient compression • Engine malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING AND STORED DTCS** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending and /or stored DTCs using WDS or equivalent. • Is DTC P0443 also present?	Yes	Go to DTC P0443 troubleshooting procedures, then go to Step 13.
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0133 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01-02A-13 DTC TABLE [L3].)

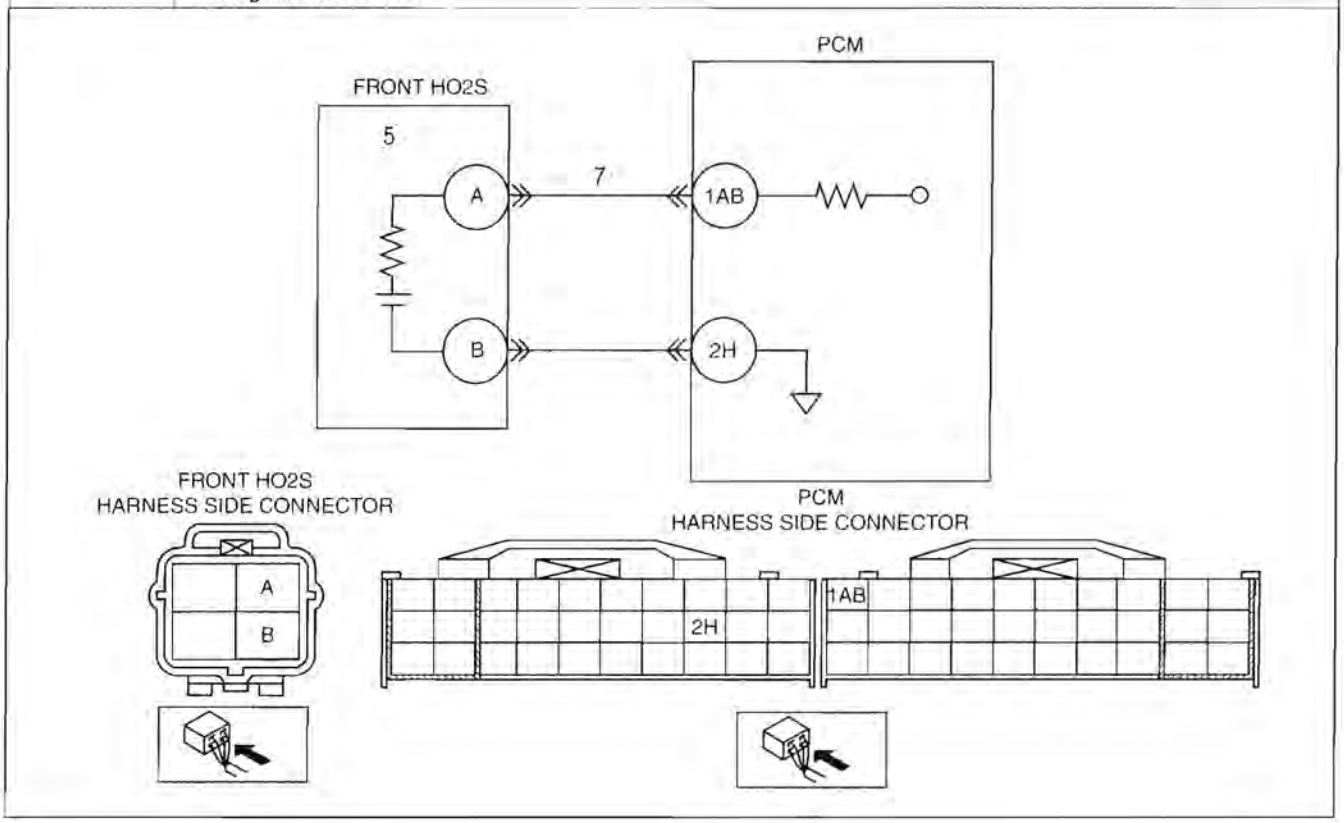
STEP	INSPECTION		ACTION
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up engine. • Access O2S11 PID using WDS or equivalent. • Inspect PID under following accelerator pedal conditions (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading okay? — **More than 0.55 V** when suddenly depress accelerator pedal (rich condition). — **Less than 0.55 V** just after release of accelerator pedal (lean condition).	Yes	Go to step 8.
		No	Go to next step.
6	**INSPECT INSTALLATION OF FRONT HO2S** • Inspect if front HO2S is loosely installed. • Is front HO2S installed securely?	Yes	Go to next step.
		No	Retighten front HO2S, then go to Step 13.
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually check if any gas leakage is found between exhaust manifold and front HO2S. • Is there any gas leakage?	Yes	Repair or replace any faulty exhaust parts, then go to Step 13.
		No	Replace sensor, then go to Step 13.
8	**INSPECT LONG TERM FUEL TRIM** • Access LONGFT1 PIDs. • Compare it with FREEZE FRAME DATA recorded at Step 1. • Is it below FFD value?	Yes	Engine is driven under rich condition. Go to next step.
		No	Engine is driven under lean condition. Go to step 10.
9	**INSPECT FUEL LINE PRESSURE (EXCESSIVE FUEL LINE PRESSURE)** • Turn ignition key to OFF. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure okay?	Yes	Go to next step.
		No	Replace fuel pump unit, then go to Step 13.
10	**INSPECT FUEL LINE PRESSURE (LOW FUEL LINE PRESSURE)** • Turn ignition key to OFF. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure okay?	Yes	Go to step 13.
		No	Go to next step.
11	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for any leakage. • Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 13.
		No	Inspect low-pressure side fuel filter for following: • Foreign materials or stain inside fuel filter Perform following actions according to result. • If foreign material or stain is found inside fuel filter (low-pressure side), clean of fuel tank and filter. • If okay, replace fuel pump unit. Then go to Step 13.

STEP	INSPECTION		ACTION
12	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap a thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Is there any small bubble, which makes engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to next step.
		No	Go to next step.
13	**VERIFY TROUBLESHOOTING OF DTC P0133 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF) • Clear DTC from memory using WDS or equivalent. • Run "PCM Adaptive Memory Produce Drive Mode" and "HO2S heater, HO2S, and TWC Repair Verification Drive Mode". • Stop vehicle and access ON BOARD SYSTEM READINESS TEST to inspect DRIVE MODE completion status. • Verify O2S_EVAL PID to Yes. — If not, run DRIVE MODE again. • Access following item (TEST #) values. — TEST #10:01:05 (Front HO2S rich-to-lean response time) — TEST #10:01:06 (Front HO2S lean-to-rich response time) — TEST #10:01:0A (Front HO2S inversion cycles) • Are they all below maximum value?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0134 [L3]

C6U010200100W18

DTC P0134	Front HO2S circuit no activity detected
DETECTION CONDITION	• PCM monitors input voltage from front HO2S when the following monitoring conditions are met. If input voltage from sensor never **exceed 0.55 V** for **83.2 s**, PCM determines that sensor circuit is not activated. **MONITORING CONDITIONS** — Drive mode 3 — Following conditions are met • Engine speed is **above 1,500 rpm.** • Engine coolant temperature is **above 70 °C {158 °F}.** **Diagnostic support note** • This is a continuous monitor (O_2 sensor). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S deterioration • Front HO2S heater malfunction • Exhaust system leakage • Open or short circuit to ground circuit between front HO2S terminal A and PCM terminal 1AB • Insufficient compression • Engine malfunction



Diagnostic procedure

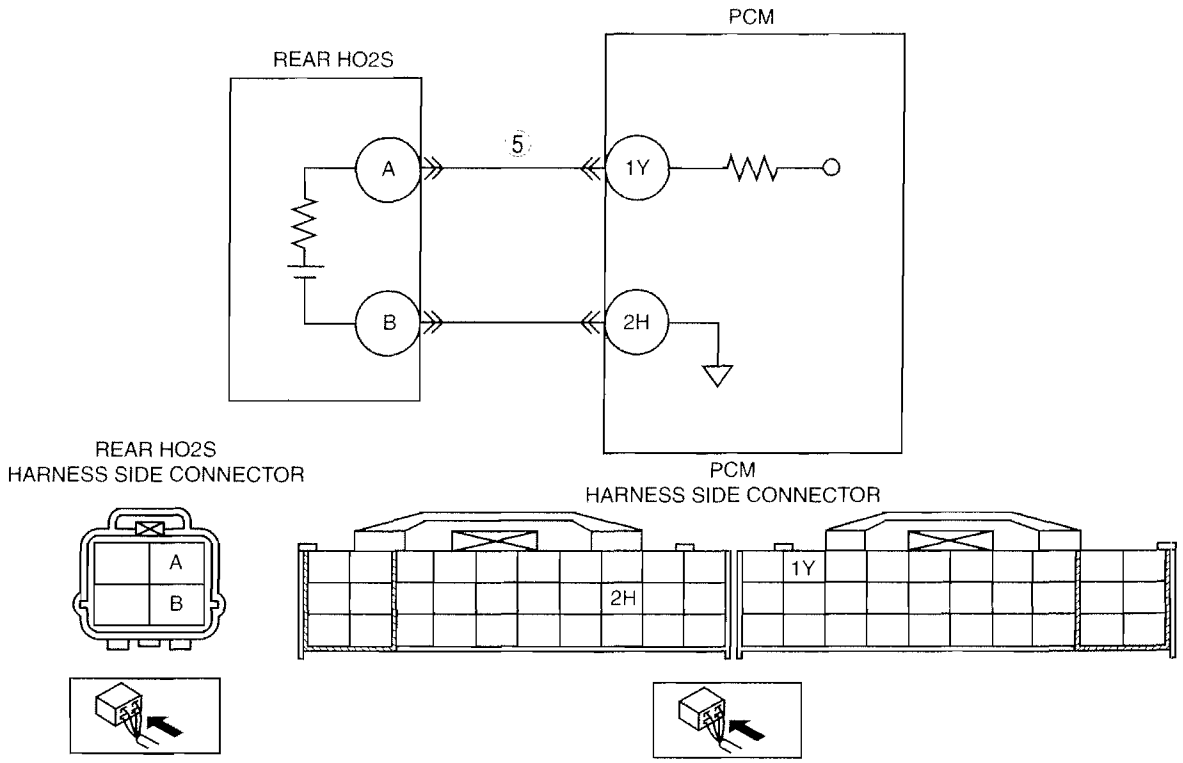
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING AND STORED DTCS** **Note** • If fuel monitor DTC, DTC P0131or P0132 is retrieved, ignore it until P0134 is fixed. • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending and stored DTCs using WDS or equivalent. • Is other DTC present?	Yes	Go to appropriate DTC troubleshooting procedures.
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0134 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01–02A–13 DTC TABLE [L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up engine. • Access O2S11 PID using WDS or equivalent. • Verify PID while racing engine (in NEUTRAL (MTX) or PARK (ATX)). • Is PID reading okay? — **More than 0.55 V** when suddenly depress accelerator pedal (rich condition). — **Less than 0.55 V** just after release of accelerator pedal (lean condition)	Yes	Go to step 8.
		No	Go to next step.
6	**INSPECT INSTALLATION OF FRONT HO2S** • Check if front HO2S is loosely installed. • Is front HO2S installed securely?	Yes	Go to next step.
		No	Install front HO2S securely, then go to Step 10.
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually check if any gas leakage is found between exhaust manifold and front HO2S. • Is there any gas leakage?	Yes	Repair or replace any faulty exhaust parts, then go to Step 10.
		No	• Inspect the following harnesses for open or short to ground circuit, repair or replace harness if necessary — Front HO2S terminal A (harness-side) to PCM terminal 1AB (harness-side) • Repair or replace harness if necessary. • If all items above are okay, replace faulty sensor. Then go to Step 10.

STEP	INSPECTION		ACTION
8	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap a thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Is there any small bubble, which makes engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace malfunctioning parts, then go to Step 10.
		No	Go to next step.
9	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10A–5 COMPRESSION INSPECTION [L3].) • Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0134 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0138 [L3]

C6U010200100W19

DTC P0138	Rear HO2S circuit high input
DETECTION CONDITION	• PCM monitors input voltage from rear HO2S at PCM terminal 1Y. If PCM detected rear HO2S voltage **above 1.2 V for 0.8s**, PCM determines that the circuit input is high. **Diagnostic support note** • This is a continuous monitor (O_2 sensor). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S malfunction • Short to power supply in wiring harness between rear HO2S terminal A and PCM terminal 1Y • Rear HO2S or PCM terminal is shorted. • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING OR STORED DTCS** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending code or stored DTCs using WDS or equivalent. • Is other DTC present?	Yes	Go to appropriate DTC troubleshooting procedures. (See 01–02A–13 DTC TABLE [L3].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0138 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01–02A–13 DTC TABLE [L3].)
5	**INSPECT REAR HO2S SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key to OFF. • Disconnect rear HO2S connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between rear HO2S terminal A (harness-side) and body ground. • Is there any voltage?	Yes	Replace short to power supply, then go to Step 7.
		No	Go to next step.
6	**INSPECT REAR HO2S** • Perform "HEATED OXYGEN SENSOR (HO2S) INSPECTION". (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3].) • Is the rear HO2S normal?	Yes	Go to next step.
		No	Replace the sensor, then go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0138 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Run "PCM Adaptive Memory Procedure Drive Mode" and "HO2S Heater, HO2S, and TWC Repair Verification Drive Mode". (See 01–02A–9 OBD-II DRIVE MODE [L3].) • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0139 [L3]

C6U010200100W25

CAL: L392EB000L3V5010 (MT), L393EB000L3VN010 (AT) Only

DTC P0139	Rear HO2S circuit slow response
DETECTION CONDITION	• The PCM monitors inversion cycle period, rich-to-lean response time of the sensor. The PCM detects the rich-to-lean response time slower than threshold consecutive **5 times** when following conditions are met, the PCM determines that circuit has malfunction. **MONITORING CONDITIONS** — HO2S heater, HO2S, and TWC Repair Verification Drive Mode — All of the Following conditions are met: • Engine speed is **above 500 rpm**. • Engine coolant temperature is **above 70°C {158 °F}**. • Rear HO2S output voltage is **above 0.4 V**. **Diagnostic support note** • This is an intermittent monitor. (O_2 sensor) • MIL illuminates if the PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULTS is available.
POSSIBLE CAUSE	• Rear HO2S deterioration • Rear HO2S heater malfunction • Rear HO2S looseness • Pressure regulator malfunction • Fuel pump malfunction • Clogged or restricted fuel filter • Fuel leakage from fuel line between fuel distribution pipe and fuel pump • Exhaust system leakage • Purge solenoid valve malfunction • Purge solenoid hoses improper connection • Insufficient compression • Engine malfunction (Leakage engine coolant)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTCS** • Turn the ignition switch off, then to the ON position (Engine off). • Verify pending and/or stored DTCs using the WDS or equivalent. • Is DTC P0443 also present?	Yes	Go to DTC P0443 troubleshooting procedures, then go to Step 13.
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0139 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01–02A–13 DTC TABLE [L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up engine. • Access O2S12 PID using WDS or equivalent. • Inspect PID under following accelerator pedal conditions (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading normal? — **More than 0.55 V** when suddenly depress accelerator pedal (rich condition). — **Less than 0.55 V** just after release of accelerator pedal (lean condition).	Yes	Go to step 8.
		No	Go to the next step.

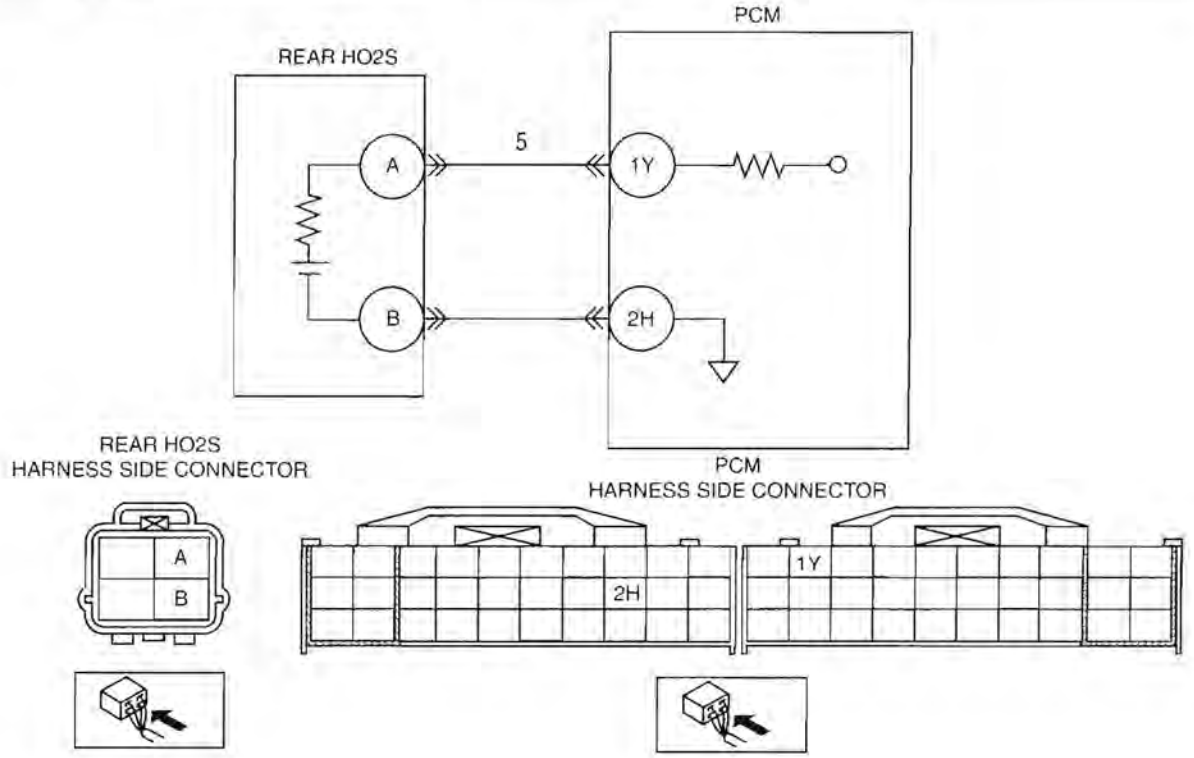
STEP	INSPECTION		ACTION
6	**INSPECT INSTALLATION OF REAR HO2S** • Inspect if rear HO2S is loosely installed. • Is rear HO2S installed securely?	Yes	Go to the next step.
		No	Retighten rear HO2S, then go to Step 13.
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually check if any gas leakage is found between exhaust manifold and rear HO2S. • Is there any gas leakage?	Yes	Repair or replace any malfunctioning exhaust parts, then go to Step 13.
		No	Replace sensor, then go to Step 13.
8	**INSPECT LONG TERM FUEL TRIM** • Access LONGFT1 PIDs • Compare it with FREEZE FRAME DATA recorded at Step 1. • Is it below FFD value?	Yes	Engine is driven under rich condition. Go to the next step.
		No	Engine is driven under lean condition. Go to step 10.
9	**INSPECT FUEL LINE PRESSURE (EXCESSIVE FUEL LINE PRESSURE)** • Turn the ignition switch off. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure normal?	Yes	Go to the next step.
		No	Replace fuel pump unit, then go to Step 13.
10	**INSPECT FUEL LINE PRESSURE (LOW FUEL LINE PRESSURE)** • Turn the ignition switch off. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure normal?	Yes	Go to step 12.
		No	Go to the next step.
11	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for any leakage. • Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 13.
		No	Inspect low-pressure side fuel filter for following: • Foreign materials or stain inside fuel filter Perform following actions according to result. • If foreign material or stain is found inside fuel filter (low-pressure side), clean of fuel tank and filter. • If okay, replace fuel pump unit. Then go to Step 13.
12	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform ENGINE COOLANT LEAKAGE INSPECTION. (See 01–12–5 ENGINE COOLANT LEAKAGE INSPECTION.) • Is there any malfunction?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to inspection result. Then go to the next step.
13	**VERIFY TROUBLESHOOTING OF DTC P0139 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off) • Clear the DTC from the memory using the WDS or equivalent. • Run "PCM Adaptive Memory Produce Drive Mode" and "HO2S heater, HO2S, and TWC Repair Verification Drive Mode". • Stop vehicle and access ON BOARD SYSTEM READINESS TEST to inspect DRIVE MODE completion status. • Verify O2S_EVAL PID to Yes. — If not, run DRIVE MODE again. • Access following item (TEST #) values. — TEST #10: 02: 03 (Low rear HO2S voltage for switch time calculation) — TEST #10: 02: 04 (High rear HO2S voltage for switch time calculation) — TEST #10: 02: 05 (Rear HO2S rich-to-lean response time) • Are they all below maximum value?	Yes	Replace the PCM, then go to the next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

CAL: Except for L392EB000L3V5010 (MT), L393EB000L3VN010 (AT)

DTC P0139	Rear HO2S circuit slow response
DETECTION CONDITION	• The PCM determines that circuit has malfunction if any one or both of the following conditions are met. — The PCM monitors inversion cycle period, rich-to-lean response time of the sensor. The PCM detects the rich-to-lean response time slower than **0.08 s** consecutive **5 times** when following monitoring conditions are met. — The PCM monitors the input voltage from the rear HO2S when the following monitoring conditions are met. If the input voltage from the sensor is for during deceleration fuel cut. **MONITORING CONDITIONS** • HO2S heater, HO2S, and TWC Repair Verification Drive Mode • All of the Following conditions are met: — Engine speed is **above 500 rpm**. — Engine coolant temperature is **above 70°C {158 °F}**. — Rear HO2S output voltage is **above 0.4 V**. **Diagnostic support note** • This is an intermittent monitor. (O_2 sensor) • MIL illuminates if the PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULTS is available.
POSSIBLE CAUSE	• Rear HO2S deterioration • Rear HO2S heater malfunction • Rear HO2S looseness • Pressure regulator malfunction • Fuel pump malfunction • Clogged or restricted fuel filter • Fuel leakage from fuel line between fuel distribution pipe and fuel pump • Exhaust system leakage • Purge solenoid valve malfunction • Purge solenoid hoses improper connection • Insufficient compression • Engine malfunction (Leakage engine coolant) • Short to power circuit between rear HO2S terminal A and PCM terminal 1Y • PCM malfunction

DTC P0139	Rear HO2S circuit slow response



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTCS** • Turn the ignition switch off, then to the ON position (Engine off). • Verify pending and/or stored DTCs using the WDS or equivalent. • Is DTC P0443 also present?	Yes	Go to DTC P0443 troubleshooting procedures, then go to Step 14.
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0139 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01–02A–13 DTC TABLE [L3].)
5	**INSPECT REAR HO2S SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition key to the off. • Disconnect rear HO2S connector. • Turn the ignition key to the ON position (Engine OFF). • Measure voltage between following terminal rear HO2S terminal A (harness-side) and body ground. • Is there any voltage?	Yes	Replace short to power supply, then go to Step 14.
		No	Go to next step.

STEP	INSPECTION		ACTION
6	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up engine. • Access O2S12 PID using WDS or equivalent. • Inspect PID under following accelerator pedal conditions (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading normal? — **More than 0.55 V** when suddenly depress accelerator pedal (rich condition). — **Less than 0.55 V** just after release of accelerator pedal (lean condition).	Yes	Go to step 9.
		No	Go to the next step.
7	**INSPECT INSTALLATION OF REAR HO2S** • Inspect if rear HO2S is loosely installed. • Is rear HO2S installed securely?	Yes	Go to the next step.
		No	Retighten rear HO2S, then go to Step 14.
8	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually check if any gas leakage is found between exhaust manifold and rear HO2S. • Is there any gas leakage?	Yes	Repair or replace any malfunctioning exhaust parts, then go to Step 14.
		No	Replace sensor, then go to Step 14.
9	**INSPECT LONG TERM FUEL TRIM** • Access LONGFT1 PIDs • Compare it with FREEZE FRAME DATA recorded at Step 1. • Is it below FFD value?	Yes	Engine is driven under rich condition. Go to the next step.
		No	Engine is driven under lean condition. Go to step 11.
10	**INSPECT FUEL LINE PRESSURE (EXCESSIVE FUEL LINE PRESSURE)** • Turn the ignition switch off. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure normal?	Yes	Go to the next step.
		No	Replace fuel pump unit, then go to Step 14.
11	**INSPECT FUEL LINE PRESSURE (LOW FUEL LINE PRESSURE)** • Turn the ignition switch off. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure normal?	Yes	Go to step 13.
		No	Go to the next step.
12	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for any leakage. • Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 14.
		No	Inspect low-pressure side fuel filter for following: • Foreign materials or stain inside fuel filter Perform following actions according to result. • If foreign material or stain is found inside fuel filter (low-pressure side), clean of fuel tank and filter. • If okay, replace fuel pump unit. Then go to Step 14.
13	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform ENGINE COOLANT LEAKAGE INSPECTION. (See 01–12–5 ENGINE COOLANT LEAKAGE INSPECTION.) • Is there any malfunction?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to inspection result. Then go to the next step.

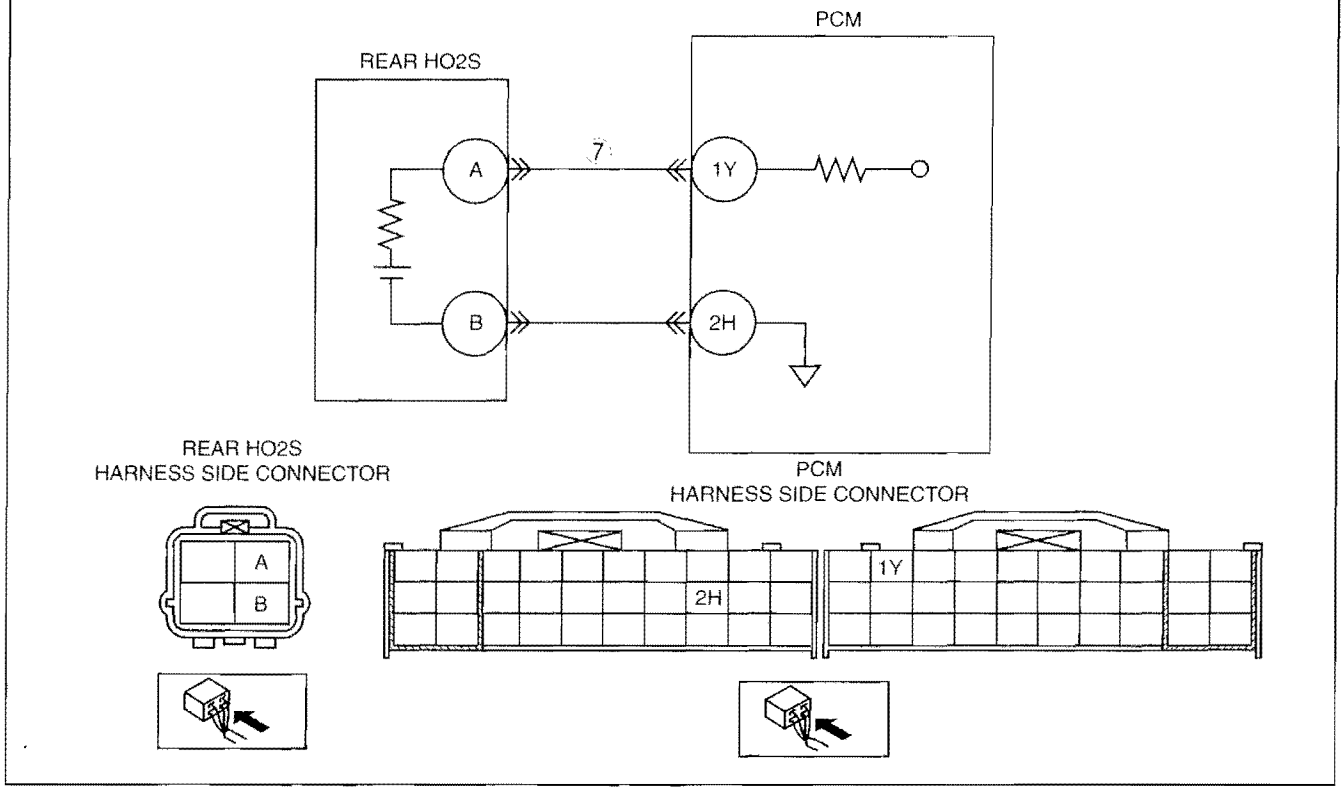
STEP	INSPECTION		ACTION
14	**VERIFY TROUBLESHOOTING OF DTC P0139 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off) • Clear the DTC from the memory using the WDS or equivalent. • Run "PCM Adaptive Memory Produce Drive Mode" and "HO2S heater, HO2S, and TWC Repair Verification Drive Mode". • Stop vehicle and access ON BOARD SYSTEM READINESS TEST to inspect DRIVE MODE completion status. • Verify O2S_EVAL PID to Yes. — If not, run DRIVE MODE again. • Access following item (TEST #) values. — TEST #10: 02: 03 (Low rear HO2S voltage for switch time calculation) — TEST #10: 02: 04 (High rear HO2S voltage for switch time calculation) — TEST #10: 02: 05 (Rear HO2S rich-to-lean response time) • Are they all below maximum value?	Yes	Replace the PCM, then go to the next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to the next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0140 [L3]

C6U010200100W21

DTC P0140	Rear HO2S circuit no activity detected
DETECTION CONDITION	• PCM monitors input voltage from rear HO2S when the following monitoring conditions are met. If input voltage from sensor never **exceed 0.55 V** for **30 s**, PCM determines that sensor circuit is not activated. **MONITORING CONDITIONS** — Drive mode 3 — Following conditions are met: • Engine speed is **above 1,500 rpm**. • Engine coolant temperature is **above 70°C {158 °F}**. **Diagnostic support note** • This is a continuous monitor (O_2 sensor). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S deterioration • Rear HO2S heater malfunction • Exhaust system leakage • Open or short to ground circuit between rear HO2S terminal A and PCM terminal 1Y • Insufficient compression • Engine malfunction

DTC P0140	Rear HO2S circuit no activity detected



Diagnostic procedure

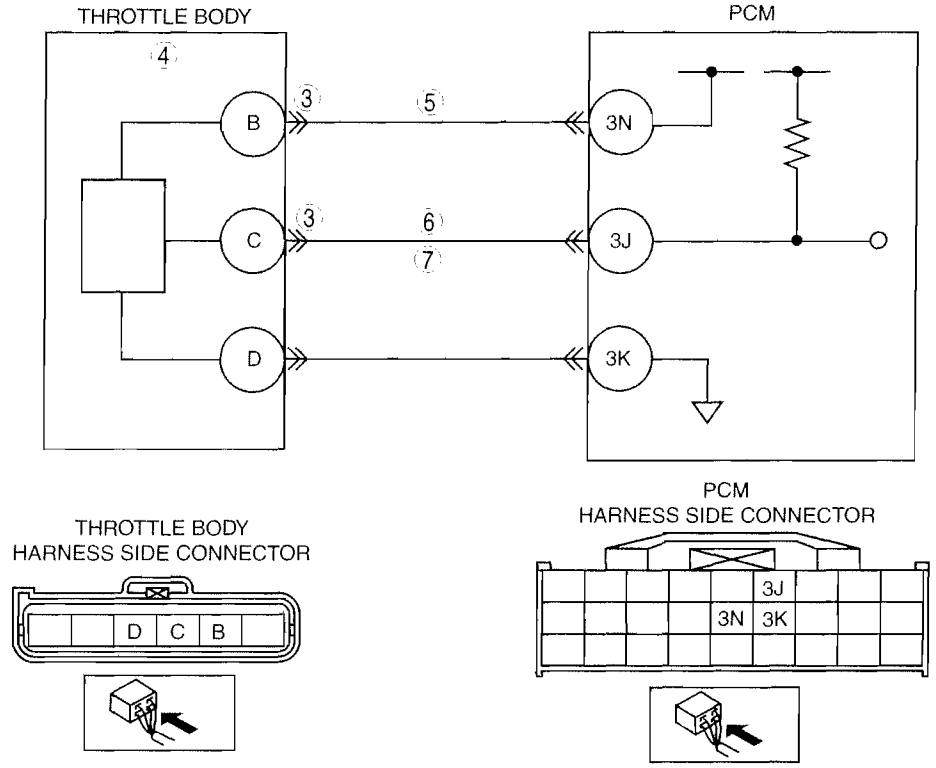
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING AND STORED DTCS** **Note** • If fuel monitor DTC, DTC P0131or P0132 is retrieved, ignore it until P0140 is fixed. • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending and stored DTCs using WDS or equivalent. • Is other DTC present?	Yes	Go to appropriate DTC troubleshooting procedures. (See 01–02A–13 DTC TABLE [L3].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0140 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01–02A–13 DTC TABLE [L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up engine. • Access O2S12 for P0140 or O2S22 for P0160 PID using WDS or equivalent. • Verify PID while racing engine at least **10 times** (in NEUTRAL (MTX) or PARK (ATX)). • Is PID reading okay? — **More than 0.55 V** at least once during engine racing.	Yes	Go to step 8.
		No	Go to next step.

STEP	INSPECTION		ACTION
6	**INSPECT INSTALLATION OF REAR HO2S** • Check if rear HO2S is loosely installed. • Is sensor installed securely?	Yes	Go to next step.
		No	Install sensor securely, then go to Step10.
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually check if any gas leakage is found between exhaust pipe and rear HO2S. • Is there any gas leakage?	Yes	Repair or replace any malfunctioning exhaust parts, then go to Step 10.
		No	• Inspect the following harnesses for open or short to ground circuit, repair or replace harness if necessary. — Rear HO2S terminal A (harness-side) to PCM terminal 1Y (harness-side) • Repair or replace harness if necessary. • If all items above are okay, replace faulty sensor. Then go to Step 10.
8	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap a thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Is there any small bubble, which makes engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to Step 10.
		No	Go to next step.
9	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10A–5 COMPRESSION INSPECTION [L3].) • Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0140 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0222 [L3]

C6U010200200W01

DTC P0222	TP sensor No.2 circuit low input
DETECTION CONDITION	• If PCM detects TP sensor No.2 voltage at PCM terminal 3J **below 0.2 V** after ignition key to ON, PCM determines that TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions in first drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor malfunction • Connector or terminal malfunction • Open circuit between throttle body terminal A and PCM terminal 3M • Short to ground between throttle body terminal A and PCM terminal 3M • Open circuit between throttle body terminal E and PCM terminal 3N



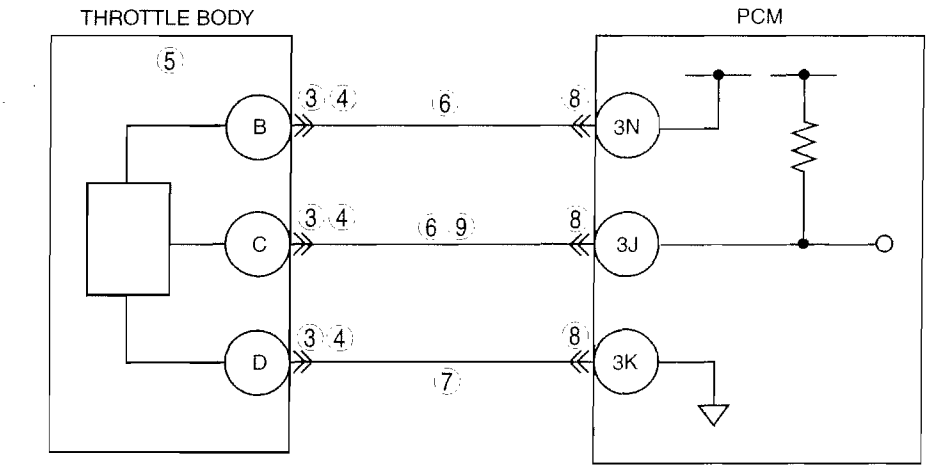
Diagnostic procedure

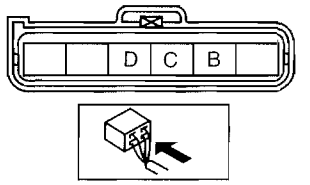
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY TP SENSOR OR HARNESS MALFUNCTION** • Connect WDS or equivalent. • Access TP2 PID. • Disconnect throttle body connector. • Connect a jumper wire between throttle body terminals B and C (harness-side). • Is voltage **above 4.9 V**?	Yes	Go to next step.
		No	Go to step 5.
4	**INSPECT TP SENSOR** • Perform TP sensor inspection. (See 01–40A–32 THROTTLE POSITION (TP) SENSOR INSPECTION [L3].) • Is TP sensor okay?	Yes	Inspect for poor throttle body connector terminal B connection. Repair or replace as necessary, then go to Step 8.
		No	Replace throttle body, then go to Step 8.
5	**INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT THROTTLE BODY CONNECTOR** **Note** • If DTC P0107 and P2228 are also retrieved with P0122, go to CONSTANT VOLTAGE troubleshooting procedure. • Turn ignition key to ON (Engine OFF). • Measure voltage at throttle body terminal B (harness-side). • Is voltage **within 4.5—5.5 V**?	Yes	Go to next step.
		No	Repair or replace open circuit between throttle body connector terminal B and PCM connector terminal 3N (harness-side). Then, then go to Step 8.
6	**VERIFY TP2 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Inspect continuity between throttle body terminal C (harness-side) and PCM terminal 3J. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 8.
7	**VERIFY TP2 SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between throttle body terminal C (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0222 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

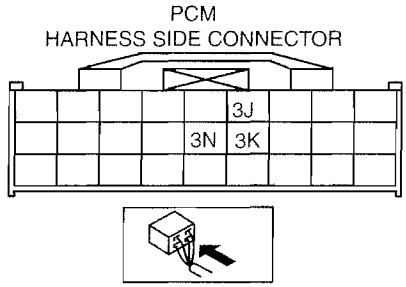
DTC P0223 [L3]

C6U010200200W02

DTC P0223	TP sensor No.2 circuit high input
DETECTION CONDITION	• If PCM detects TP sensor No.2 voltage at PCM terminal 3J is **above 4.85 V** after ignition key to ON, PCM determines that TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions in first drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor malfunction • Connector or terminal malfunction • Open circuit between throttle body terminal D and PCM terminal 3K • Short to constant voltage supply between throttle body terminal C and PCM terminal 3J







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT THROTTLE BODY CONNECTOR** • Turn ignition key to OFF. • Verify that the throttle body connector is connected securely. • Is connector okay?	Yes	Go to next step.
		No	Connect the connector securely, then go to Step 10.
4	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Disconnect throttle body connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace suspected terminal, then go to Step 10.
		No	Go to next step.
5	**INSPECT TP SENSOR** • Perform TP sensor inspection. (See 01–40A–32 THROTTLE POSITION (TP) SENSOR INSPECTION [L3]) • Is TP sensor okay?	Yes	Go to next step.
		No	Replace throttle body, then go to Step 10.
6	**INSPECT TP2 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key to ON (Engine OFF). • Measure voltage between throttle body terminal C (harness-side) and body ground. • Is voltage **above 4.9 V**?	Yes	Repair or replace short to power supply. Then, go to Step 10.
		No	Go to next step.
7	**VERIFY TP SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between throttle body connector terminal D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace open circuit between throttle body terminal D (harness-side) and PCM connector terminal 3K (harness-side). Then, go to Step 10.
		No	Go to next step.
8	**INSPECT PCM CONNECTOR** • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 10.
		No	Go to Step 10.
9	**VERIFY TP SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT** • Inspect continuity between throttle body terminals A and B (harness-side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0223 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0300 [L3]

C6U010200300W01

DTC P0300	Random misfire detection
DETECTION CONDITION	• PCM monitors CKP sensor input signal interval time. PCM calculates the change of the interval time for each cylinder. If the change of interval time exceeds the preprogrammed criteria, PCM detects a misfire in the corresponding cylinder. While the engine is running, PCM counts the number of misfires that occurred at **200 crankshaft revolutions** and **1,000 crankshaft revolutions** and calculates misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, PCM determines that a misfire, which can damage the catalytic converter or affect emission performance, has occurred. **Diagnostic support note** • This is a continuous monitor (MISFIRE). • MIL illuminates if PCM detects the misfire which affects emission performance in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the misfire which affects emission performance during first drive cycle. • MIL flashes if PCM detects the misfire which can damage the catalytic converter during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• CKP sensor malfunction • CMP sensor malfunction • Ignition coil malfunction • High-tension lead malfunction • MAF sensor contamination • Excess air suction in intake air system (between MAF sensor and intake manifold) • Fuel pump malfunction • Fuel pressure regulator malfunction • Clogged fuel line • Clogged fuel filter • Fuel leakage in fuel line • Fuel runout • Poor quality fuel • Purge control solenoid valve malfunction • PCV valve malfunction • EGR valve malfunction • Vacuum hose damage or improper connection • Related connector and terminal malfunction • Related wiring harness malfunction • Insufficient compression • Variable valve timing control system improper

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF, then ON (Engine OFF). • Verify related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to appropriate DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3].)
		No	Go to next step.
4	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE)** • Access APP1, APP2, ECT, IAT, MAF, RPM, TP_REL, and VSS PIDs using WDS or equivalent. (See 01–40A–7 PCM INSPECTION [L3].) • Is there any signal that is far out of specification when ignition switch is ON and engine runs at idle?	Yes	Inspect suspected circuit and/or part according to inspection results. (See 01–40A–7 PCM INSPECTION [L3].) Then go to Step 22.
		No	Go to next step.

STEP	INSPECTION		ACTION
5	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as in Step 4 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect suspected circuit and/or part according to inspection results. (See 01–40A–7 PCM INSPECTION [L3].) Then go to Step 22.
		No	Go to next step.
6	**INSPECT CMP SENSOR** • Inspect CMP sensor. (See 01–40A–40 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [L3].) • Is CMP sensor okay?	Yes	Go to next step.
		No	Inspect installation condition and damage on timing belt and gears, repair faulty parts. • If it is okay, replace CMP sensor. Then go to Step 22.
7	**VERIFY CKP SENSOR INSTALLATION CONDITION** • Inspect for CKP sensor looseness. • Is CKP sensor loose?	Yes	Retighten CKP sensor, then go to Step 22.
		No	Go to next step.
8	**INSPECT IGNITION COIL OPERATION AND HIGH-TENSION LEAD WITH TIMING LIGHT** • Verify blinking condition on each cylinders using timing light at idle. • Do all cylinders show blinking condition?	Yes	Go to Step 12.
		No	Go to next step.
9	**INSPECT HIGH-TENSION LEADS OF NO BLINKING CYLINDER** • Turn ignition key to OFF. • Inspect high-tension leads for improper installation, corrosion on terminal, open lead and damaged cover. • Is condition of high-tension lead okay?	Yes	Go to next step.
		No	Replace faulty high-tension lead, then go to Step 22.
10	**INSPECT POWER SUPPLY TERMINAL AT IGNITION COIL CONNECTOR** • Disconnect ignition coil connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between ignition coil terminal B (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Inspect for open circuit between ignition coil connector and ignition switch. Repair or replace wiring harness, then go to Step 22.
11	**INSPECT IGNITION COIL RESISTANCE** • Inspect ignition coil resistance. (See 01–18–2 IGNITION COIL INSPECTION.) • Is coil resistance okay?	Yes	Go to step 22.
		No	Replace ignition coil, then go to Step 22.
12	**INSPECT MAF PID** • Start engine. • Access MAF PID using WDS or equivalent. • Verify that MAF PID changes quickly according to race engine RPM. • Is MAF PID response okay?	Yes	Go to next step.
		No	Replace MAF sensor, then go to Step 22.
13	**INSPECT EXCESSIVE AIR SUCTION IN INTAKE AIR SYSTEM** • Inspect for air leakage at following: — Between MAF sensor and throttle body — Between throttle body and intake manifold • Is there any malfunction?	Yes	Repair or replace suspected part, then go to Step 22.
		No	Go to next step.
14	**INSPECT FUEL LINE PRESSURE** • Inspect fuel line pressure. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure okay?	Yes	Go to step 16.
		No	If fuel line pressure is too low, go to next step. If fuel line pressure is excess high, replace fuel pump unit, then go to Step 22.
15	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect for fuel leakage in fuel line for any leakage. • Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 22.
		No	Inspect low-pressure side fuel filter for following: • Foreign materials or stain inside fuel filter Perform following actions depend on the result above. • If foreign materials or stain is found inside fuel filter (low-pressure side), clean of fuel tank and filter (low-pressure side). • If okay, replace fuel pump unit. Then, go to Step 22.

STEP	INSPECTION		ACTION
16	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10A–5 COMPRESSION INSPECTION [L3].) • Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to Step 22.
17	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect variable valve timing control system operation. (See 01–03A–69 Variable Valve Timing Control System Operation Inspection.) • Does variable valve timing control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to variable valve timing control system inspection results, then go to Step 22.
18	**INSPECT OPERATION OF PURGE CONTROL SOLENOID VALVE** • Inspect purge control system operation. (See 01–03A–67 Purge Control System Inspection.) • Does purge control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to purge control system inspection results, then go to Step 22.
19	**INSPECT PCV VALVE OPERATION** • Turn ignition key to OFF. • Remove PCV valve and inspect valve operation. (See 01–16–25 PCV VALVE INSPECTION [L3].) • Is PCV valve operation okay?	Yes	Replace PCV valve, then go to Step 22.
		No	Go to next step.
20	**INSPECT OPERATION OF EGR VALVE** • Remove EGR valve. • Visually inspect for stuck to open. • Is EGR valve stuck to open?	Yes	Repair or replace EGR valve, then go to Step 22.
		No	Go to next step.
21	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Is there any small bubble which makes engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to next step.
		No	Go to next step.
22	**VERIFY TROUBLESHOOTING OF MISFIRE DTC COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine and perform DRIVE MODE 1. (See 01–02A–9 OBD-II DRIVE MODE [L3].) • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
23	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0301, P0302, P0303, P0304 [L3]

C6U010200300W02

DTC P0301 **DTC P0302** **DTC P0303** **DTC P0304**	**Cylinder No.1 misfire detection** **Cylinder No.2 misfire detection** **Cylinder No.3 misfire detection** **Cylinder No.4 misfire detection**
DETECTION CONDITION	• PCM monitors crankshaft position sensor input signal interval time. PCM calculates the change of the interval time for each cylinder. If the change of interval time exceeds the preprogrammed criteria, PCM detects a misfire in the corresponding cylinder. While the engine is running, PCM counts the number of misfires that occurred at **200 crankshaft revolutions** and **1,000 crankshaft revolutions** and calculates misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, PCM determines that a misfire, which can damage the catalytic converter or affect emission performance, has occurred. **Diagnostic support note** • This is a continuous monitor (MISFIRE). • MIL illuminates if PCM detects the misfire which affects emission performance in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the misfire which affects emission performance during first drive cycle. • MIL flashes if PCM detects the misfire which can damage the catalytic converter during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Spark plug malfunction • High-tension lead malfunction • Fuel injector malfunction • Air suction in intake air system (between dynamic chamber and cylinder head) • Inadequate engine compression due to engine internal malfunction • Related connector or terminal malfunction • Related wiring harness malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn ignition key to OFF, then ON (Engine OFF). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to appropriate DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Go to next step.
4	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON /IDLE)** • Access APP1, APP2, ECT, IAT, MAF, RPM, TP_REL and VSS PIDs using WDS or equivalent. (See 01–40A–7 PCM INSPECTION [L3].) • Is there any signal that is far out of specification when ignition switch is ON and engine runs at idle?	Yes	Inspect suspected circuit and/or part according to inspection results. Then go to Step 12. (See 01–40A–7 PCM INSPECTION [L3].)
		No	Go to next step.
5	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as in Step 4 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect suspected circuit and/or part according to inspection results. Then go to Step 12. (See 01–40A–7 PCM INSPECTION [L3].)
		No	Go to next step.

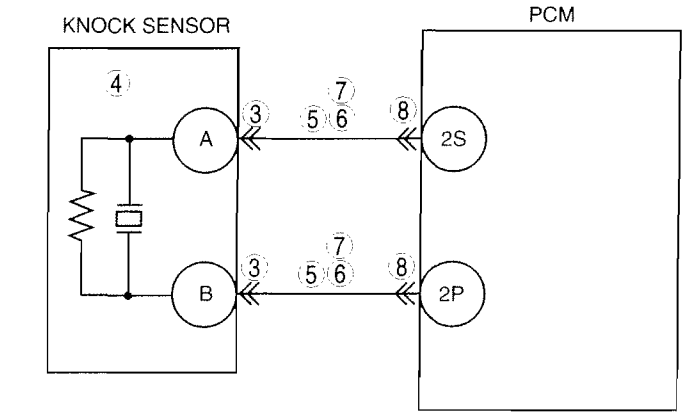
STEP	INSPECTION		ACTION
6	**INSPECT SPARK PLUG CONDITION** • Turn ignition key to OFF. • Remove spark plug from suspected cylinder. • Inspect spark plug condition: — Cracks — Excess wear — Gap — Wet • Is any problem found on spark plug?	Yes	• If spark plug is wet, fuel flooding is suspected. Go to step 12. • If spark plug has a cracks, excessive wear or improper gap, replace faulty spark plug. Then go to Step 12.
		No	Go to next step.
7	**VERIFY HIGH-TENSION LEAD CONDITION** • Remove high-tension lead. • Inspect high-tension lead condition and resistance. — Cracks — Spark shorts to cylinder head through high-tension lead insulator • Is high-tension lead okay?	Yes	Go to next step.
		No	Replace high-tension lead, then go to Step 12.
8	**INSPECT FOR AIR SUCTION AT INTAKE-AIR SYSTEM** • Inspect for air leakage at following: — Around connection of dynamic chamber and intake manifold — Around connection of intake manifold and cylinder head • Is air leakage found?	Yes	Repair or replace suspected part, then go to Step 12.
		No	Go to next step.
9	**INSPECT FUEL INJECTOR HARNESS** • Remove intake air system parts. • Disconnect fuel injector connector on suspected cylinder. • Connect NOID LIGHT to fuel injector connector terminals. • Inspect light dimness during cranking. • Does noid light illuminate?	Yes	Go to next step.
		No	Inspect fuel injector harnesses. Repair or replace it if necessary, then go to Step 12.
10	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous, Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Is there any small bubble which makes engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to Step 12.
		No	Go to next step.
11	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10A–5 COMPRESSION INSPECTION [L3].) • Is engine compression okay?	Yes	Go to next step.
		No	Overhaul the engine, then go to next step.
12	**INSPECT FUEL INJECTOR OPERATION** • Remove fuel injector from suspected cylinder. • Swap injector with injector on other cylinder. • Start engine and run it at idle. • Is misfire DTC for cylinder which has a suspected fuel injector?	Yes	Replace injector, then go to step 13.
		No	Go to next step.

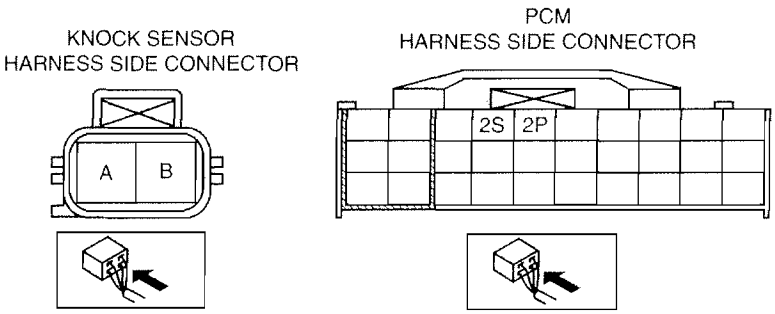
STEP	INSPECTION		ACTION
13	**VERIFY TROUBLESHOOTING OF MISFIRE DTC COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and perform DRIVE MODE 1. (See 01–02A–9 OBD-II DRIVE MODE [L3].) • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0327 [L3]

C6U010200300W03

DTC P0327	Knock sensor circuit low input
DETECTION CONDITION	• PCM monitors input signal from knock sensor when engine is running. If input voltage at PCM terminals between 2P and 2S is **below 0.9 V**, PCM determines that knock sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Knock sensor malfunction • Connector or terminal malfunction • Open or short to ground circuit between knock sensor connector terminal A and PCM terminal 2S • Open or short to ground circuit between knock sensor connector terminal B and PCM terminal 2P • Shorted knock sensor two wires





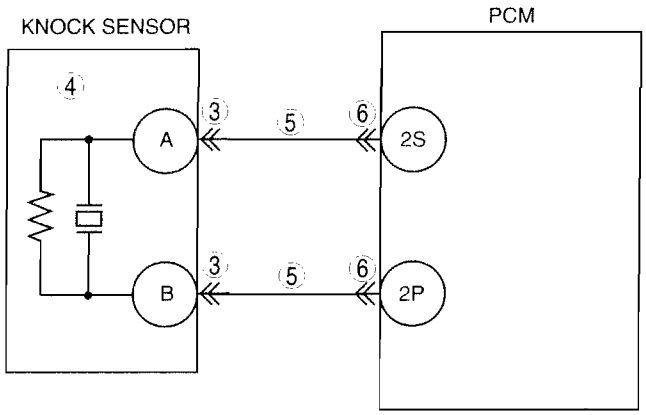
Diagnostic procedure

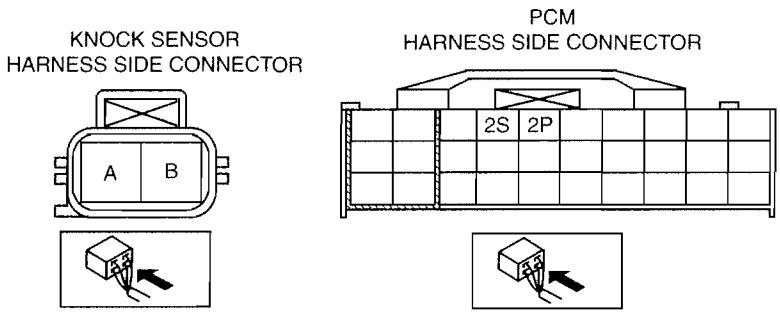
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT KNOCK SENSOR CONNECTOR TERMINAL FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect knock sensor connector. • Check for poor connection at terminals A and B (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT KNOCK SENSOR** • Perform knock sensor inspection. (See 01–40A–39 KNOCK SENSOR (KS) INSPECTION [L3]) • Is knock sensor okay?	Yes	Go to next step.
		No	Replace knock sensor, then go to next step.
5	**INSPECT KNOCK SENSOR CIRCUITS FOR OPEN CIRCUIT** • Disconnect knock sensor connector. • Inspect continuity between the following circuits: — Knock sensor female terminal A (harness-side) and PCM terminal 2S (harness-side) — Knock sensor female terminal B (harness-side) and PCM terminal 2P (harness-side) • Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected wiring harness, then go to Step 9.
6	**INSPECT KNOCK SENSOR CIRCUITS FOR SHORT TO GROUND** • Inspect continuity between following circuits: — Knock sensor female terminal A (harness-side) and body ground — Knock sensor female terminal B (harness-side) and body ground • Is there continuity?	Yes	Repair or replace suspected wiring harness, then go to Step 9.
		No	Go to next step.
7	**INSPECT FOR SHORT CIRCUITS** • Inspect continuity between knock sensor female terminals A and B (harness-side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 9.
		No	Go to next step.
8	**INSPECT PCM CONNECTOR TERMINAL FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection at terminals 2P and 2S (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to next step.
		No	Go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0327 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0328 [L3]

C6U010200300W04

DTC P0328	Knock sensor circuit high input
DETECTION CONDITION	• PCM monitors input signal from knock sensor when engine is running. If input voltage at PCM terminals between 2P and 2S is **above 4.9 V**, PCM determines that knock sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Knock sensor malfunction • Connector or terminal malfunction • Short to power supply in wiring between knock sensor terminal A and PCM terminal 2S • Short to power supply in wiring between knock sensor terminal B and PCM terminal 2P





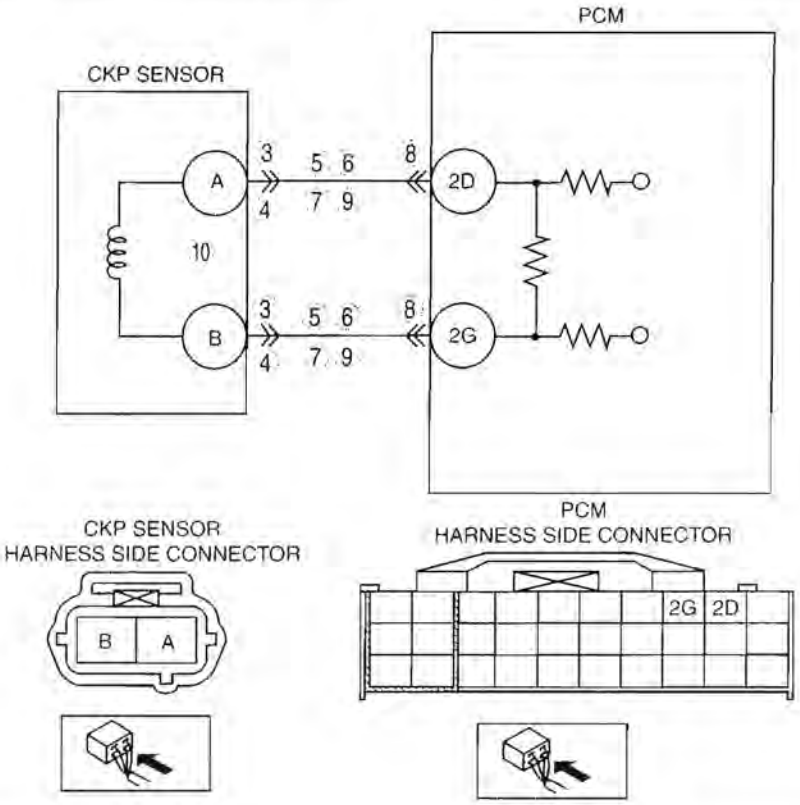
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT KNOCK SENSOR CONNECTOR TERMINAL FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect knock sensor connector. • Inspect for poor connection at terminals A and B (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to step 7.
		No	Go to next step.
4	**INSPECT KNOCK SENSOR** • Perform knock sensor inspection. (See 01–40A–39 KNOCK SENSOR (KS) INSPECTION [L3]) • Is knock sensor okay?	Yes	Go to next step.
		No	Replace knock sensor, then go to step 7.
5	**INSPECT KNOCK SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key ON (Engine OFF). • Measure voltage between knock sensor terminal A (harness-side) and body GND and knock sensor terminal B (harness-side) and body GND. • Is there any voltage?	Yes	Repair or replace harness for short to power supply, then go to step 7.
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0328 COMPLETED** • Make sure to connect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0335 [L3]

C6U010200300W05

DTC P0335	CKP sensor circuit malfunction
DETECTION CONDITION	• If PCM does not receive input voltage from CKP sensor for **4.2 s** while MAF is **2.0 g/s {0.26 lb/min.} or above**, PCM determines that CKP sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• CKP sensor malfunction • Connector or terminal malfunction • CKP sensor is dirty. • Short to power supply between CKP sensor terminal A to PCM terminal 2D • Short to power supply between CKP sensor terminal B to PCM terminal 2G • Short to ground between CKP sensor terminal A to PCM terminal 2D • Short to ground between CKP sensor terminal B to PCM terminal 2G • Open circuit between CKP sensor terminal A to PCM terminal 2D • Open circuit between CKP sensor terminal B to PCM terminal 2G • CKP sensor pulse wheel malfunction • Both CKP sensor wires are shorted each other



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CKP SENSOR VOLTAGE** • Disconnect CKP sensor connector. • Connect voltmeter between CKP sensor connector terminals A and B (sensor-side). • Inspect the voltage in AC range while cranking the engine. • Is there any voltage?	Yes	Go to next step.
		No	Go to step 10.
4	**INSPECT CKP SENSOR CONNECTOR FOR POOR CONNECTION** • Verify that the CKP sensor connector is connected securely. • Is connector okay?	Yes	Go to next step.
		No	Reconnect the connector, then go to Step 11.
5	**INSPECT CKP CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key OFF • Disconnect CKP sensor connector. • Turn ignition key ON (Engine OFF). • Measure voltage between following terminals (harness-side): — CKP sensor terminal A — CKP sensor terminal B • Is there any voltage?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to next step.
6	**INSPECT CKP CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between following terminal and body ground: — CKP sensor connector terminal A (harness-side) — CKP sensor connector terminal B (harness-side) • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to next step.
7	**INSPECT CKP CIRCUITS FOR SHORTS** • Inspect continuity between CKP sensor connector terminals A and B (harness-side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
9	**INSPECT CKP CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between following circuits: — CKP sensor terminal A (harness-side) and PCM terminal 2D (harness-side) — CKP sensor terminal B (harness-side) and PCM terminal 2G (harness-side) • Is there continuity?	Yes	Go to Step 11.
		No	Repair or replace suspected harness, then go to Step 11.
10	**INSPECT CKP SENSOR** • Turn ignition key to OFF. • Perform CKP sensor inspection. (See 01–40A–41 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [L3]) • Is CKP sensor okay?	Yes	Go to next step.
		No	Inspect CKP sensor pulse wheel for damage. Replace CKP sensor pulse wheel and go to next step.

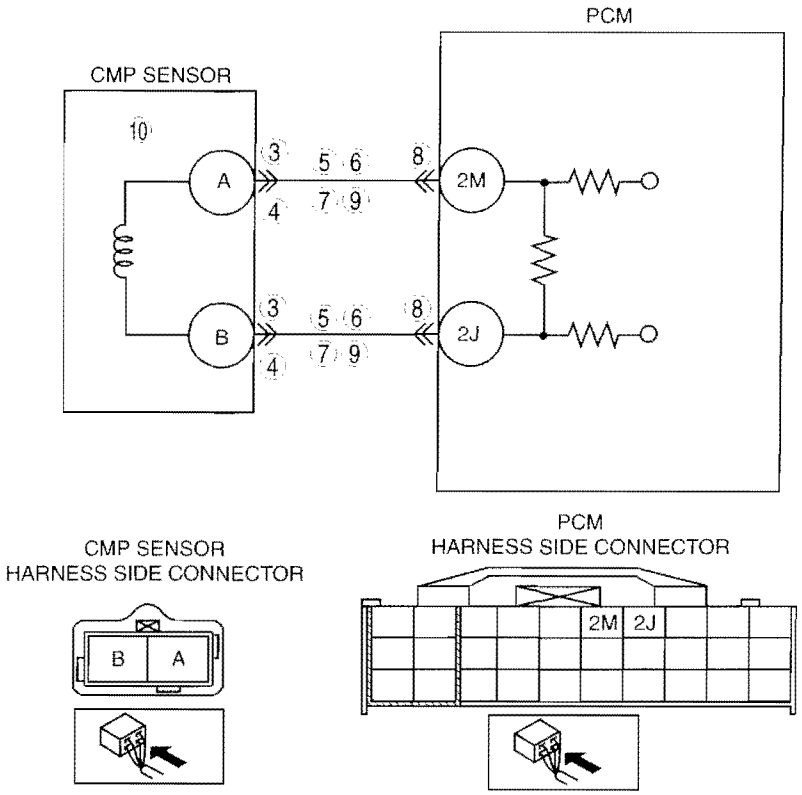
STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0335 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Access MAF PID using WDS or equivalent. **Note** • MAF PID should indicate **2.0 g/s {0.26 lb/min.} or above** during this test • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0340 [L3]

C6U010200300W06

DTC P0340	Camshaft position (CMP) sensor circuit malfunction
DETECTION CONDITION	• PCM monitors input voltage from CMP sensor when engine is running. If PCM does not receive input voltage from CMP sensor while PCM receives input signal from CKP sensor, PCM determines that CMP circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• CMP sensor malfunction • Connector or terminal malfunction • CMP sensor is dirty • Short to power circuit between CMP sensor terminal A and PCM terminal 2M • Short to power circuit between CMP sensor terminal B and PCM terminal 2J • Short to ground circuit between CMP sensor terminal A and PCM terminal 2M • Short to ground circuit between CMP sensor terminal B and PCM terminal 2J • Open circuit between CMP sensor terminal A and PCM terminal 2M • Open circuit between CMP sensor terminal B and PCM terminal 2J • Both CMP sensor wires are shorted each other • CKP sensor pulse wheel malfunction • CKP sensor misinstallation • Timing chain misinstallation • Loose timing belt or improper valve timing due to jumping

DTC P0340	Camshaft position (CMP) sensor circuit malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CMP SENSOR VOLTAGE** • Disconnect CMP sensor connector. • Connect voltmeter between CMP sensor connector terminals A and B (sensor-side). • Inspect the voltage in AC range while cranking the engine. • Is there any voltage?	Yes	Go to next step.
		No	Go to step 10.
4	**INSPECT CMP SENSOR CONNECTOR FOR POOR CONNECTION** • Verify that the CMP sensor connector is connected securely. • Is connector okay?	Yes	Go to next step.
		No	Reconnect the connector, then go to Step 15.
5	**INSPECT CMP CIRCUIT FOR SHORT TO POWER** • Turn ignition key OFF. • Disconnect CMP sensor connector. • Turn ignition key ON (Engine OFF) • Measure voltage at CMP sensor terminals A and B. • Is there any voltage?	Yes	Repair or replace suspected harness, then go to Step 15.
		No	Go to next step.

STEP	INSPECTION		ACTION
6	**INSPECT CMP CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between following terminal and body ground: — CMP sensor connector terminal A (harness-side) — CMP sensor connector terminal B (harness-side) • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 15.
		No	Go to next step.
7	**INSPECT CMP CIRCUITS FOR SHORTS** • Inspect continuity between CMP sensor connector terminals A and B (harness-side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 15.
		No	Go to next step.
8	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair terminal, then go to Step 15.
		No	Go to next step.
9	**INSPECT CMP CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between following circuits: — CMP sensor terminal A (harness-side) and PCM terminal 2M (harness-side) — CMP sensor terminal B (harness-side) and PCM terminal 2J (harness-side) • Is there continuity?	Yes	Go to Step 15.
		No	Repair or replace suspected harness, then go to Step 15.
10	**INSPECT CMP SENSOR** • Turn ignition key to OFF. • Perform CMP sensor inspection. (See 01–40A–40 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [L3].) • Is CMP sensor okay?	Yes	Go to next step.
		No	Inspect CKP sensor pulse wheel for damage. Replace CKP sensor pulse wheel and go to Step 15.
11	**VERIFY CKP SENSOR INSTALLATION** • Verify CMP sensor installation. (See 01–40A–42 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [L3].) • Is CMP sensor installed correctly?	Yes	Go to next step.
		No	Reinstall CKP sensor and go to Step 15.
12	**VERIFY TIMING CHAIN INSTALLATION** • Verify timing chain installation. (See 01–10A–11 TIMING CHAIN REMOVAL/INSTALLATION [L3].) • Is timing chain installed correctly?	Yes	Go to next step.
		No	Reinstall timing chain and go to Step 15.
13	**INSPECT STOPPER PIN MECHANISM** • Remove timing belt. • Inspect stopper pin. (See 01–10A–32 VARIABLE VALVE TIMING ACTUATOR INSPECTION [L3].) • Is stopper pin mechanism okay?	Yes	Go to next step.
		No	Replace variable valve timing actuator, then go to Step 15.
14	**INSPECT ROTOR POSITION** • Remove variable valve timing actuator. • Is rotor position at maximum valve timing retard?	Yes	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC detected by intermittent concern. • Intermittent concern might be removed by cleaning mode of variable valve timing control function. Go to next step.
		No	Replace variable valve timing actuator, then go to next step.

STEP	INSPECTION		ACTION
15	**VERIFY TROUBLESHOOTING OF DTC P0340 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Access MAF PID using WDS or equivalent. **Note** • MAF PID should indicate **1.95 g/s {0.25 lb/min.} or above** during this test • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
16	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0401 [L3]

C6U010200400W01

DTC P0401	EGR flow insufficient detected
DETECTION CONDITION	• PCM monitors difference in intake manifold pressures when EGR is operated and when it is stopped. If the difference is too small, PCM determines that EGR flow insufficient. **Diagnostic support note** • This is an intermittent monitor (EGR). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EGR valve malfunction • EGR boost sensor malfunction • EGR boost sensor solenoid valve malfunction • EGR gasket malfunction • PCM malfunction

Diagnostic procedure

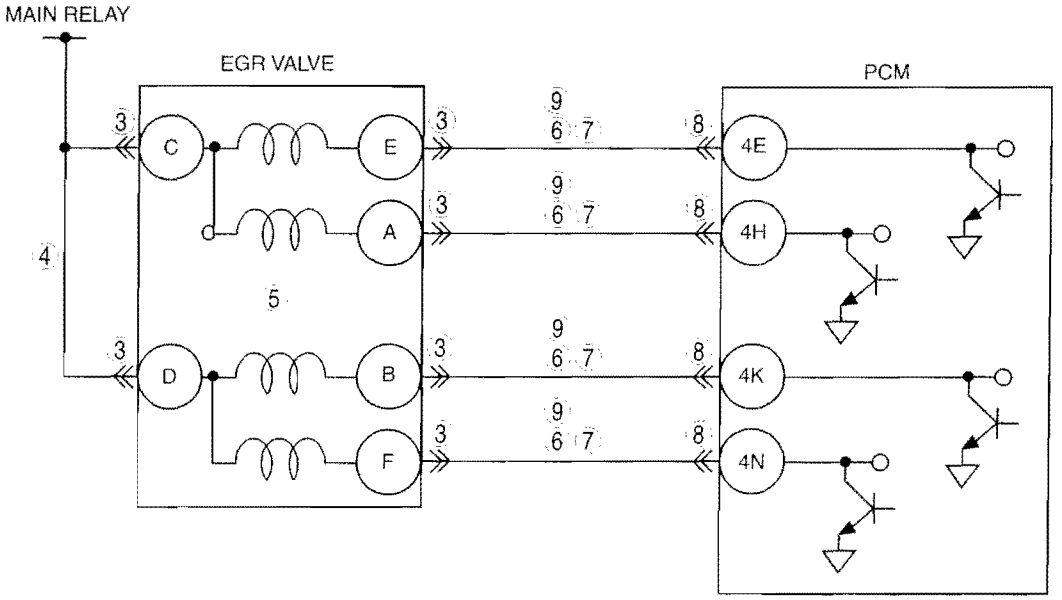
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FOR OTHER DTCS** • Turn ignition key to OFF then ON (Engine OFF). • Have other DTCs been stored?	Yes	Repair circuit malfunction for applicable DTCs.
		No	Go to next step.
4	**INSPECT VACUUM HOSE CONDITION** • Inspect vacuum hoses for clogs, any damages, frozen, or vacuum leakage. • Is there any malfunction?	Yes	Replace vacuum hoses, then go to Step 8.
		No	Go to next step.
5	**INSPECT EGR VALVE MALFUNCTION** • Perform EGR valve inspection. (See 01–16–19 EGR VALVE INSPECTION [L3].) • Is EGR valve okay?	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 8.

STEP	INSPECTION		ACTION
6	**INSPECT MAP SENSOR MALFUNCTION** • Perform MAP sensor inspection. (See 01–40A–38 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION [L3].) • Is EGR valve okay?	Yes	Go to next step.
		No	Replace MAP sensor, then go to Step 8.
7	**INSPECT EGR VALVE PASSAGE** • Turn ignition key to OFF. • Remove EGR valve. • Is gasket installation normal?	Yes	Go to next step.
		No	Install gasket correctly, then go to next step.
8	**MONITOR EGR SYSTEM BY DRIVE MODE** • Clear DTC from PCM memory using WDS or equivalent. • Run DRIVE MODE 1. (See 01–02A–10 PCM Adaptive Memory Production Drive Mode.) • Stop vehicle and access ON BOARD READINESS TEST to inspect DRIVE MODE completion status. • Verify FUEL_EVAL PID status. • Does FUEL_EVAL PID change to Yes?	Yes	Retry this step.
		No	Go to next step.
9	**MONITOR EGR SYSTEM BY DRIVE MODE** • Run DRIVE MODE 2. (See 01–02A–10 EGR System Repair Verification Drive Mode.) • Stop vehicle and access ON BOARD SYSTEM READINESS TEST to inspect DRIVE MODE completion status. • Verify EGR_EVAL PID status. • Does EGR_EVAL PID change to Yes?	Yes	Go to next step.
		No	Retry this step.
10	**VERIFY TROUBLESHOOTING OF DTC P0401 COMPLETED** • Make sure to reconnect all disconnected connectors. • Access DIAGNOSTIC MONITORING TEST RESULTS. (See 01–02A–8 Diagnostic Monitoring Test Results Access Procedure.) • Verify TEST #10:31:83 (EGR pressure variation) value. • Is value within specification?	Yes	Go to next step.
		No	Replace PCM, then go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

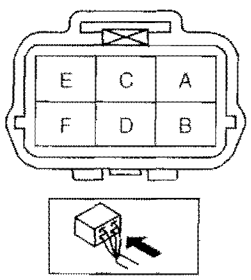
DTC P0403 [L3]

C6U010200400W02

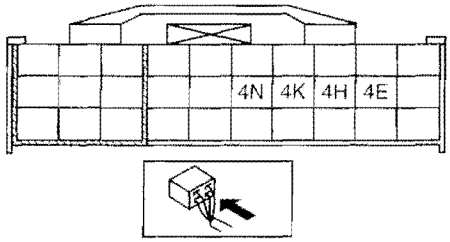
DTC P0403	EGR valve (stepper motor) circuit malfunction
DETECTION CONDITION	• PCM monitors input voltage from EGR valve. If voltage at PCM terminals 4E, 4H, 4K and/or 4N remain low or high, PCM determines that EGR valve circuit has malfunction. **Diagnostic support note** • This is a continuous monitor. (CCM) • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is not available. • DTC is not stored in the PCM memory.
POSSIBLE CAUSE	• EGR valve malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between EGR valve terminal E and PCM terminal 4E • Short to power supply in wiring harness between EGR valve terminal A and PCM terminal 4H • Short to power supply in wiring harness between EGR valve terminal B and PCM terminal 4K • Short to power supply in wiring harness between EGR valve terminal F and PCM terminal 4N • Short to ground circuit in wiring harness between EGR valve terminal E and PCM terminal 4E • Short to ground circuit in wiring harness between EGR valve terminal A and PCM terminal 4H • Short to ground circuit in wiring harness between EGR valve terminal B and PCM terminal 4K • Short to ground circuit in wiring harness between EGR valve terminal F and PCM terminal 4N • Open circuit in wiring harness between EGR valve terminal E and PCM terminal 4E • Open circuit in wiring harness between EGR valve terminal A and PCM terminal 4H • Open circuit in wiring harness between EGR valve terminal B and PCM terminal 4K • Open circuit in wiring harness between EGR valve terminal F and PCM terminal 4N • Open circuit in wiring harness between main relay terminal D and EGR valve terminal C • Open circuit in wiring harness between main relay terminal D and EGR valve terminal D • PCM malfunction



EGR VALVE
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT EGR VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminals and/or connector, then go to Step 10.
		No	Go to next step.
4	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage following terminal and body ground. — EGR valve terminal C (harness-side) — EGR valve terminal D (harness-side) • Is voltage B+?	Yes	Go to next step.
		No	Repair or replace harness for open circuit then go to Step 10.
5	**INSPECT EGR VALVE** • Perform EGR valve inspection. (See 01–16–19 EGR VALVE INSPECTION [L3].) • Is EGR valve okay?	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 10.
6	**INSPECT FOR CONTROL CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Inspect continuity following terminal and body ground: — EGR valve terminal E (harness-side) — EGR valve terminal A (harness-side) — EGR valve terminal B (harness-side) — EGR valve terminal F (harness-side) • is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 10.
		No	Go to next step.
7	**INSPECT FOR CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition switch key to ON (Engine OFF). • Measure voltage following terminal and body ground: — EGR valve terminal E (harness-side) — EGR valve terminal A (harness-side) — EGR valve terminal B (harness-side) — EGR valve terminal F (harness-side) • Is voltage B+?	Yes	Repair or replace harness for short to power supply, then go to Step 10.
		No	Go to next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminals and/or connector, then go to Step 10.
		No	Go to next step.

STEP	INSPECTION		ACTION
9	**INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Remove PCM with PCM connector connected. • Inspect continuity following terminals (harness-side): — Between EGR valve terminal E and PCM terminal 4E — Between EGR valve terminal A and PCM terminal 4H — Between EGR valve terminal B and PCM terminal 4K — Between EGR valve terminal F and PCM terminal 4N • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0403 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0420 [L3]

C6U010200400W03

DTC P0420	Catalyst system efficiency below threshold
DETECTION CONDITION	• PCM compares number of front HO2S and rear HO2S inversions for a predetermined time. PCM monitors number of inversions rear side performs while front side inverts for a specified number of times when the following monitoring conditions are met. PCM detects inversion ratio. If inversion ratio is below threshold, PCM determines that catalyst system has deteriorated. **MONITORING CONDITION** — Engine speed **1,500—3,000 rpm** — Calculated load **15—50%** (at engine speed **2,000 rpm**) *1: Maximum calculated load value varies depending on engine speed. **Diagnostic support note** • This is an intermittent monitor. (CATALYST) • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULTS is available.
POSSIBLE CAUSE	• TWC deterioration or malfunction • Exhaust gas leakage • Looseness of front HO2S • Looseness of rear HO2S

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn ignition key to OFF then ON (Engine OFF). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to appropriate DTC inspection.
		No	Go to next step.
4	**INSPECT GAS LEAKAGE OF EXHAUST SYSTEM** • Visually inspect exhaust gas leakage in exhaust system. • Is there any gas leakage?	Yes	Repair or replace faulty exhaust parts, then go to Step 7.
		No	Go to next step.
5	**INSPECT INSTALLATION OF FRONT AND REAR OXYGEN SENSORS** • Inspect for looseness of front and rear oxygen sensors. • Is it okay?	Yes	Go to next step.
		No	Retighten sensor, then go to Step 7.
6	**INSPECT TWC** • Clear DTC using WDS or equivalent. • Cycle ignition key to OFF then back to ON. • Inspect TWC. (See 01-16-25 THREE-WAY CATALYTIC CONVERTER (TWC) INSPECTION.) • Is it okay?	Yes	Replace suspected oxygen sensor, then go to next step.
		No	Replace TWC, then go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0420 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine and perform "PCM Adaptive Memory Procedure Drive Mode" and "EGR System Repair Verification Drive Mode". (See 01-02A-9 OBD-II DRIVE MODE [L3].) • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01-40A-6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01-02A-8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0441 [L3]

C6U010200400W04

DTC P0441	Evaporative emission control system incorrect purge flow
DETECTION CONDITION	• PCM measures the purge line pressure, which is the vacuum when a following condition. If vacuum between charcoal canister and intake manifold does not reach the specified, PCM determines that the EVAP system has clogging. **MONITORING CONDITION** — Engine speed: **1,500—3.450 rpm** [MTX], **1,220—3.550 rpm** [ATX] — Throttle opening angle: **16.8—27.8%** — Vehicle speed: **69.5—136 km/h {43.2—84.5 mph}** [MTX], **34.5—136 km/h {21.4—84.5 mph}** [ATX] **Diagnostic support note** • This is an intermittent monitor (Evaporative system monitor). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULTS is available.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Evaporative emission system leak detection pump malfunction • Charcoal canister malfunction • Catch tank malfunction • Damaged or loose EVAP hose • EVAP pipe damaged • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn ignition key to OFF then ON (Engine OFF). • Verify related pending code or stored DTCs. • Is DTC P0443 present?	Yes	Go to appropriate DTC inspection.
		No	Go to next step.
4	**DETERMINE IF LEAK CONCERN OR BLOCKAGE CONCERN** • Perform evaporative system leak inspection. (See 01–03A–69 Evaporative System Test.) • Is system test result failed?	Yes	Go to Step 6.
		No	Go to next step.
5	**INSPECT PURGE SOLENOID VALVE STUCK CLOSED** • Inspect purge solenoid valve for stuck closed. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.) • Is purge solenoid valve okay?	Yes	Inspect following parts for clogging. • Vacuum hoses between intake manifold to charcoal canister • Catch tank • Charcoal canister Repair or replace part, then go to Step 11.
		No	Replace purge solenoid valve, then go to Step 11.
6	**LOCATE LEAK POINT** • Check the following for leakage using Ultrasonic leak detector. — Charcoal canister — Catch tank — Fuel filler cap — EVAP hoses and pipes — Fuel tank • Is leakage found?	Yes	Repair leakage or replace part, then go to Step 10.
		No	Go to next step.

STEP	INSPECTION		ACTION
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Connect all disconnected connectors and hoses. • Place clamp on EVAP system leak detection pump hose between EVAP system leak detection pump and air filter. • Perform evaporative system leak inspection. (See 01–03A–69 Evaporative System Test.) • Is test result failed (red light turns on)?	Yes	Go to Step 9.
		No	Go to next step.
8	**CONFIRM EVAP SYSTEM LEAK DETECTION PUMP LEAKAGE** • Remove clamp. • Perform evaporative system leak inspection. (See 01–03A–69 Evaporative System Test.) • Is test result failed (red light turns on)?	Yes	Replace EVAP system leak detection pump, then go to Step 10.
		No	Go to next step.
9	**INSPECT FUEL PUMP UNIT INSTALLATION** • Remove fuel tank. • Visually inspect for damage, insufficient sealing or poorly installed pump unit. • Is it okay?	Yes	Go to next step.
		No	Repair or replace fuel tank or sealing, then go to next step.
10	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors and hoses. • Perform evaporative system leak inspection. (See 01–03A–69 Evaporative System Test.) • Is test result failed (red light turns on)?	Yes	Leakage still exists. Locate leak point and repair. Then go to next step.
		No	Go to next step
11	**VERIFY TROUBLESHOOTING OF DTC P0441 COMPLETED** • Start the engine and let it idle. • Clear DTC using WDS or equivalent. • Turn ignition switch OFF. • Perform "EVAP System Repair Verification Drive Mode". (See 01–02A–9 OBD-II DRIVE MODE [L3]) • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0442 [L3]

C6U010200400W05

DTC P0442	Evaporative emission control system leak detected (small leak)
DETECTION CONDITION	• PCM measures the pump load current (EVAP line pressure) when the specified period has passed after EVAP system is sealed when monitoring conditions are met. If the load does not reach the reference current value within the specified period, PCM determines that the EVAP system has small leak. **MONITORING CONDITION** — IG switch OFF — IAT: **5—45 °C {41—113 °F}** — Battery voltage: **11V or above** — Atmospheric pressure: **72.2 kPa {542 mmHg, 21.33 inHg}** — Fuel tank level: **15—85%** **Diagnostic support note** • This is an intermittent monitor (Evaporative system monitor). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULTS is available.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • EVAP system leak detection pump malfunction • Charcoal canister malfunction • Catch tank malfunction • Fuel filler cap malfunction • Fuel tank malfunction • Poor seal fuel pump unit • Damaged or loose EVAP hose • Damaged EVAP pipe

Diagnostic procedure

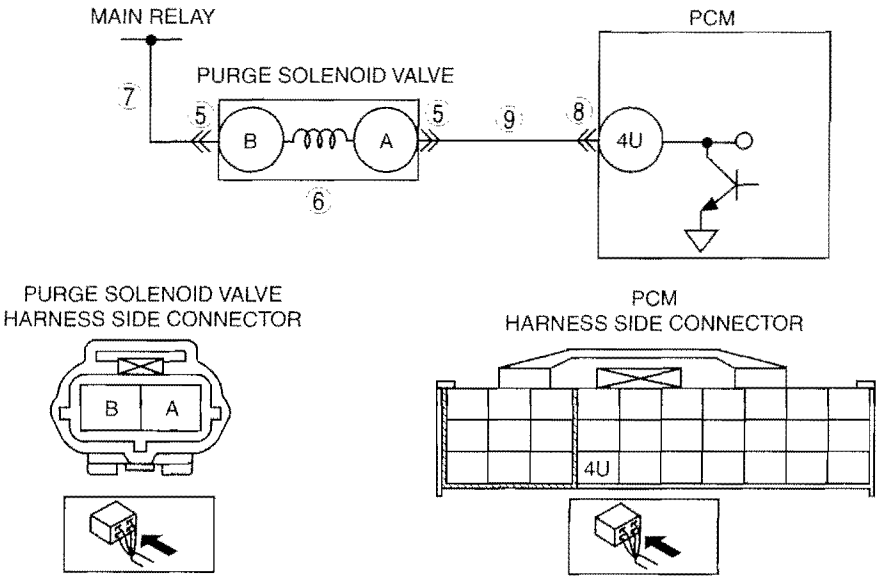
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn ignition key to OFF then ON (Engine OFF). • Verify related PENDING CODE or stored DTCs. • Is other DTC present?	Yes	Go to appropriate DTC inspection.
		No	Go to next step.
4	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Perform evaporative system leak inspection. (See 01–03A–69 Evaporative System Test.) • Is system test result failed (red light turn on)?	Yes	Go to next step.
		No	Intermittent concern exists. Inspect purge solenoid valve and EVAP system leak detection pump circuit for intermittent concern. (See 01–03A–2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].)
5	**LOCATE LEAK POINT** • Check leakage for the following using Ultrasonic leak detector. — Charcoal canister — Catch tank — Fuel filler cap — EVAP hoses and pipes — Fuel tank • Is leakage found?	Yes	Repair leakage or replace part, then go to Step 10.
		No	Go to next step.

STEP	INSPECTION		ACTION
6	**INSPECT PURGE SOLENOID VALVE** • Inspect the purge solenoid valve is stuck closed. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.) • Is purge solenoid valve okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 10.
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Connect all disconnected connectors and hoses. • Place clamp on EVAP system leak detection pump hose between EVAP system leak detection pump and air filter. • Perform evaporative system leak inspection. (See 01–03A–70 Evaporative system leak inspection using leak tester.) • Is test result failed (red light turns on)?	Yes	Go to Step 9.
		No	Go to next step.
8	**CONFIRM EVAP SYSTEM LEAK DETECTION PUMP LEAKAGE** • Remove clamp. • Perform evaporative system leak inspection. (See 01–03A–70 Evaporative system leak inspection using leak tester.) • Is test result failed (red light turns on)?	Yes	Replace EVAP system leak detection pump, then go to Step 10.
		No	Go to next step.
9	**INSPECT FUEL PUMP UNIT INSTALLATION** • Remove fuel tank. • Visually inspect for damage, insufficient sealing or poorly installed pump unit. • Is it okay?	Yes	Go to next step.
		No	Repair or replace fuel tank or sealing, then go to next step.
10	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors and hoses. • Perform evaporative system leak inspection. (See 01–03A–70 Evaporative system leak inspection using leak tester.) • Is test result failed (red light turns on)?	Yes	Leakage still exists. Locate leak point and repair. Then go to next step.
		No	Go to next step
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0443 [L3]

C6U010200400W06

DTC P0443	Evaporative emission control system purge control valve circuit malfunction
DETECTION CONDITION	• PCM monitors input voltages from purge solenoid valve. If voltage at PCM terminal 4U remains low or high, PCM determines that purge solenoid valve circuit has malfunction. **Diagnostic support note** • This is an continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Connector or terminal malfunction • Short to ground in wiring harness between purge solenoid valve terminal A and PCM terminal 4U • Open circuit in wiring harness between main relay and purge solenoid valve terminal B • Open circuit in wiring harness between purge solenoid valve terminal A and PCM terminal 4U • Short to power supply between purge solenoid valve terminal A and PCM terminal 4U • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION** • Disconnect purge solenoid valve tube that is connected to intake manifold. • Connect vacuum pump to purge solenoid valve. • Pump vacuum pump several times and stop. • Wait **a few seconds**. • Is vacuum maintained?	Yes	Go to Step 5.
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**INSPECT PASSAGE CONTROL OF PURGE SOLENOID VALVE** • Turn ignition key to OFF. • Disconnect purge solenoid valve connector. • Pump vacuum pump several times and wait **a few seconds**. • Is vacuum maintained?	Yes	Repair or replace harness for short to ground, then go to Step 10.
		No	Replace purge solenoid valve, then go to Step 10.
5	**INSPECT PURGE SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
6	**INSPECT PURGE SOLENOID VALVE** • Perform purge solenoid valve inspection. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.) • Is purge solenoid valve okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 10.
7	**INSPECT PURGE SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between purge solenoid valve connector terminal B and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 10.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
9	**INSPECT PURGE SOLENOID VALVE CONTROL CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between purge solenoid valve terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power supply, then go to next step.
		No	Inspect for continuity between purge solenoid valve terminal A (harness-side) and PCM terminal 4U (harness-side). • If there is continuity, go to next step. • If there is no continuity, repair or replace harness for open open, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0443 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0446 [L3]

C6U010200400W07

DTC P0446	Change over valve (COV) (EVAP system leak detection pump) stuck close
DETECTION CONDITION	• The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. When the decrease in pump load current is less than the specification after the reference current value has been obtained, the PCM determines change over valve (COV) in EVAP system leak detection pump has a malfunction. **Diagnostic support note** • This is an continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Damaged COV (in EVAP system leak detection pump) • Short to power supply between the EVAP system leak detection pump terminal C and PCM terminal 3V • Damaged PCM

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**CHECK EVAP SYSTEM LEAK DETECTION PUMP CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key to ON (engine OFF). • Disconnect EVAP system leak detection pump connector. • Measure voltage between EVAP system leak detection pump connector terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace wiring harness, then go to Step 5.
		No	Go to next step.
4	**INSPECT COV (EVAP SYSTEM LEAK DETECTION PUMP)** • Perform EVAP system leak detection pump inspection. (See 01–16–12 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION.) • Is COV (EVAP system leak detection pump) okay?	Yes	Go to next step.
		No	Replace EVAP system leak detection pump, then go to next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0446 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Perform "EVAP System Repair Verification Drive Mode". (See 01–02A–9 OBD-II DRIVE MODE [L3]) • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0455 [L3]

C6U010200400W08

DTC P0455	Evaporative emission control system leak detected (gross leak)
DETECTION CONDITION	• PCM measures the pump load current (EVAP line pressure) when the specified period has passed after EVAP system is sealed when monitoring conditions are met. If the load does not reach the reference current value within the specified period, PCM determines that the EVAP system has large leak. **MONITORING CONDITION** — IG switch OFF — IAT: **5—45 °C {41—113 °F}** — Battery voltage: **11V or above** — Atmospheric pressure: **72.2 kPa {542 mmHg, 21.33 inHg}** — Fuel tank level: **15—85%** **Diagnostic support note** • This is an intermittent monitor (Evaporative system monitor). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULTS is available.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • EVAP system leak detection pump malfunction • Loose, missing or defective fuel filler cap • Charcoal canister malfunction • Fuel tank malfunction • Damaged or loose EVAP hose • Poor connection or damaged vacuum hose

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn ignition key to OFF then ON (Engine OFF). • Verify related pending code or stored DTCs. • Is DTCs P0443 and/or P0446 present?	Yes	Go to appropriate DTC troubleshooting procedure.
		No	Go to next step.
4	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Perform Evaporative System Leak Inspection. (See 01–03A–69 Evaporative System Test.) • Is test result failed (red light turns on)?	Yes	Go to next step.
		No	Intermittent concern exists. Inspect purge solenoid valve and EVAP system leak detection pump circuit for intermittent concern. (See 01–03A–2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].)
5	**INSPECT FUEL FILLER CAP** • Verify fuel-filler cap is not either disconnected, loose or damaged. • Is it okay? **Note** • When fuel-filler caps other than OEM caps are attached, it is considered malfunction.	Yes	Go to next step.
		No	Retighten fuel-filler cap or replace it, if it is damaged. Go to Step 18.
6	**INSPECT PURGE SOLENOID VALVE FOR BEING STUCK** • Inspect purge solenoid valve. • Is purge solenoid valve okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 18.

STEP	INSPECTION		ACTION
7	**INSPECT COV (EVAP SYSTEM LEAK DETECTION PUMP)** • Perform EVAP system leak detection pump inspection. • Is COV (EVAP leak detection pump) okay?	Yes	Go to next step.
		No	Replace EVAP system leak detection pump, then go to Step 18.
8	**DETERMINE IF EVAP CONTROL SYSTEM FOR LEAKAGE OR BLOCKAGE** **Note** • If evaporative emission tester is not available, then go to next step. • Perform Evaporative System Leak Inspection. (See 01–03A–69 Evaporative System Test.) • Is system test okay?	Yes	Repair or replace faulty area, then go to Step 18.
		No	Go to next step.
9	**INSPECT LEAKAGE OF CHARCOAL CANISTER TO FUEL PUMP** • Disconnect fuel tank side vacuum hose at charcoal canister. • Apply vacuum **1.7 kPa {13 mmHg, 0.5 inHg}** to disconnected vacuum hose using vacuum pump. • Does vacuum hold for minimum of **2 min**?	Yes	Go to Step 13.
		No	Go to next step.
10	**VERIFY POOR CONNECTION OF VACUUM HOSE** • Verify vacuum hose installation condition between fuel tank and charcoal canister. • Is poor connection detected?	Yes	Connect vacuum hose correctly, then go to Step 18.
		No	Go to next step
11	**INSPECT FUEL TANK INSTALLATION** • Remove fuel tank. • Visually inspect for damage, insufficient sealing or poorly installed fuel pump unit. • Is it okay?	Yes	Go to next step.
		No	Repair or replace fuel tank or sealing, then go to Step 18.
12	**INSPECT FUEL TANK** • Inspect fuel tank. • Is it okay?	Yes	Replace vacuum hose from charcoal canister and fuel tank, then go to next step.
		No	Replace fuel tank, then go to next step.
13	**INSPECT LEAKAGE FROM CHARCOAL CANISTER TO PURGE SOLENOID VALVE** • Disconnect purge solenoid valve side vacuum hose at charcoal canister. • Apply vacuum **3.3 kPa {25 mmHg, 1.0 inHg}** to disconnected vacuum hose using vacuum pump. • Does vacuum hold for minimum of **2 min**?	Yes	Go to Step 18.
		No	Go to next step.
14	**VERIFY POOR CONNECTION OF VACUUM HOSE** • Verify vacuum hose installation condition between purge solenoid valve and charcoal canister. • Is poor connection detected?	Yes	Connect vacuum hose correctly, then go to Step 18.
		No	Go to next step.
15	**INSPECT PURGE SOLENOID VALVE FOR DAMAGE OR AIR LEAK** • Remove purge solenoid valve and inspect for damage and air leak. • Is it okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step18.
16	**INSPECT CATCH TANK** • Remove catch tank and inspect for plugging, damages and pinhole using vacuum pump. • Is it okay?	Yes	Go to next step.
		No	Replace catch tank, then go to Step 18.
17	**INSPECT CHARCOAL CANISTER** • Remove charcoal canister and inspect for plugging, damage and pinhole. • Is it okay?	Yes	Replace vacuum hose from charcoal canister to purge solenoid valve, then go to next step.
		No	Replace charcoal canister, then go to next step.

STEP	INSPECTION		ACTION
18	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors. • Perform Evaporative System Leak Inspection. (See 01–03A–69 Evaporative System Test.) • Is test result failed (red light turns on)?	Yes	Leakage still exists. Locate leak point and repair. Then go to next step.
		No	Go to next step.
19	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0456 [L3]

C6U010200400W09

DTC P0456	Evaporative emission control system leak detected (very small leak)
DETECTION CONDITION	• PCM measure the pump load current (EVAP line pressure) when a specified period has passed after EVAP system is sealed after IG switch is turned OFF. If the load does not reach the reference load value or rate of the load increase lower than the specified within a specified period, PCM determines that the EVAP system has very small leak. **MONITORING CONDITION** — IG switch OFF — IAT: **5—45°C {41—113 °F}** — Battery voltage: **11V or above** — Atmospheric pressure: **72.2 kPa {542 mmHg, 21.33 inHg}** — Fuel tank level: **15—85%** **Diagnostic support note** • This is an intermittent monitor (Evaporative system monitor). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULTS is available.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Change over valve (COV) in EVAP system leak detection pump malfunction • Charcoal canister malfunction • Catch tank malfunction • Fuel cap malfunction • Fuel tank malfunction • Poor seal fuel pump unit • Damaged or loose EVAP hose • Damaged EVAP pipe

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn ignition key to OFF then ON (Engine OFF). • Verify related PENDING CODE or stored DTCs. • Is other DTC present?	Yes	Go to appropriate DTC inspection.
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Perform evaporative system leak inspection. (See 01–03A–69 Evaporative System Test.) • Is system test result failed (red light turns on)?	Yes	Go to next step.
		No	Intermittent concern exists. Inspect purge solenoid valve and EVAP system leak detection pump circuit for intermittent concern. (See 01–03A–2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].)
5	**LOCATE LEAK POINT** • Check leakage for the following using Ultrasonic leak detector. — Charcoal canister — Catch tank — Fuel filler cap — EVAP hoses and pipes — Fuel tank • Is leakage found?	Yes	Repair leakage or replace part, then go to Step 10.
		No	Go to next step.
6	**INSPECT PURGE SOLENOID VALVE** • Inspect if purge solenoid valve is stuck closed. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.) • Is purge solenoid valve okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 10.
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Connect all disconnected connectors and hoses. • Place clamp on EVAP system leak detection pump hose between EVAP system leak detection pump and air filter. • Perform evaporative system leak inspection. (See 01–03A–69 Evaporative System Test.) • Is test result failed (red light turns on)?	Yes	Go to Step 9.
		No	Go to next step.
8	**CONFIRM EVAP SYSTEM LEAK DETECTION PUMP LEAKAGE** • Remove clamp. • Perform evaporative system leak inspection. (See 01–03A–69 Evaporative System Test.) • Is test result failed (red light turns on)?	Yes	Replace EVAP system leak detection pump, then go to Step 10.
		No	Go to next step.
9	**INSPECT FUEL PUMP UNIT INSTALLATION** • Remove fuel tank. • Visually inspect for damage, insufficient sealing or poorly installed pump unit. • Is it okay?	Yes	Go to next step.
		No	Repair or replace fuel tank or sealing, then go to next step.
10	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors and hoses. • Perform evaporative system leak inspection. (See 01–03A–69 Evaporative System Test.) • Is test result failed (red light turns on)?	Yes	Leakage still exists. Locate leak point and repair. Then go to next step.
		No	Go to next step
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0461 [L3]

C6U010200400W10

DTC P0461	Fuel gauge sender unit circuit range/performance
DETECTION CONDITION	• PCM monitors fuel gauge sender unit input voltage difference before and after PCM-calculated fuel consumption has reached **24.5 liters {25.9 US qt., 21.6 Imp qt.}**. If fuel gauge sender unit operation reflects **5%** less than PCM-calculated fuel consumption, PCM determines that fuel gauge sender unit range/performance is in error. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction or substandard performance

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FUEL GAUGE SENDER UNIT** • Turn ignition key to OFF. • Inspect fuel gauge sender unit. (See 09-22-14 FUEL GAUGE SENDER UNIT INSPECTION.) • Is fuel gauge sender unit okay?	Yes	Replace PCM, then go to next step.
		No	Repair or replace fuel gauge sender unit, then go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01-02A-8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0462 [L3]

C6U010200400W11

DTC P0462	Fuel gauge sender unit circuit low input
DETECTION CONDITION	• The PCM monitors the signal of the fuel level and fuel gauge sender unit output voltage from instrument cluster. If the PCM detects fuel level or fuel gauge sender unit output voltage is too low, the PCM determines that the fuel gauge sender unit circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Instrument cluster malfunction • Fuel gauge sender unit malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT INSTRUMENT CLUSTER** • Perform "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE" procedure. (See 09–22–6 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is there any malfunction?	Yes	Repair or replace suspected malfunction, then go to Step 4.
		No	Go to next step.
4	**VERIFY TROUBLESHOOTING OF DTC P0462 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start the engine. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0463 [L3]

C6U010200400W12

DTC P0463	Fuel gauge sender unit circuit high input
DETECTION CONDITION	• The PCM monitors the signal of the fuel level and fuel gauge sender unit output voltage from instrument cluster. If the PCM detects fuel level or fuel gauge sender unit output voltage is too high, the PCM determines that the fuel gauge sender unit circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Instrument cluster malfunction • Fuel gauge sender unit malfunction • PCM malfunction

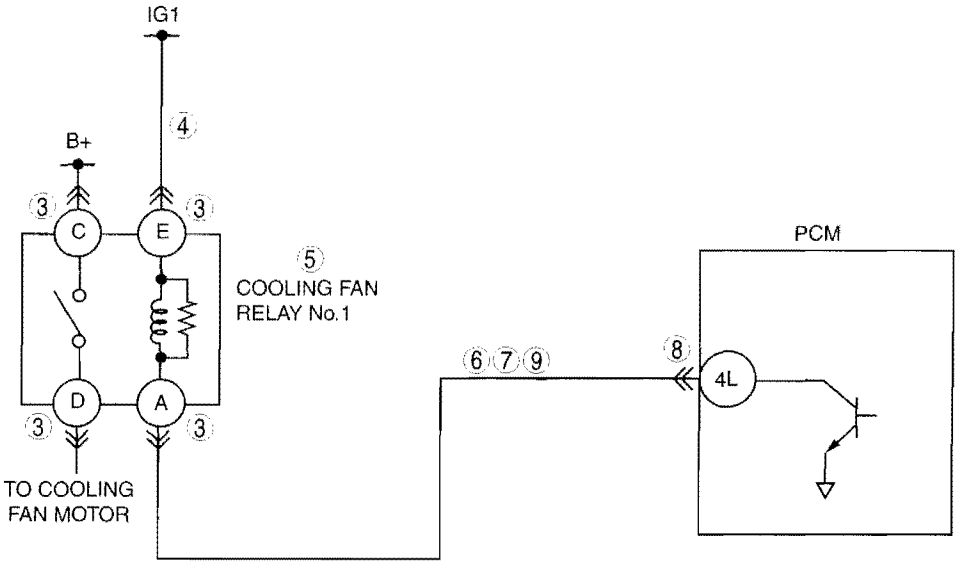
Diagnostic procedure

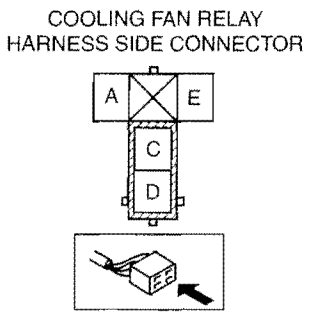
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT INSTRUMENT CLUSTER** • Perform "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE" procedure. (See 09–22–6 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is there any malfunction?	Yes	Repair or replace suspected malfunction, then go to Step 4.
		No	Go to next step.
4	**VERIFY TROUBLESHOOTING OF DTC P0463 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start the engine. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

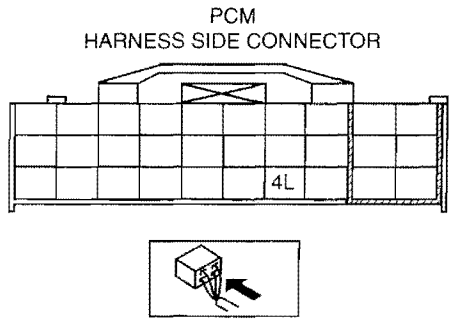
DTC P0480 [L3]

C6U010200400W13

DTC P0480	Fan relay No.1 control circuit malfunction
DETECTION CONDITION	• PCM monitors cooling fan relay No.1 control signal at PCM terminal 4L. If voltage at PCM terminal 4L remains low or high, PCM determines that fan relay No.1 circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Cooling fan relay No.1 malfunction • Connector or terminal malfunction • Open circuit in wiring harness between ignition switch and cooling fan relay No.1 terminal E • Open circuit in wiring harness between cooling fan relay No.1 terminal A and PCM terminal 4L • Short to ground in wiring harness between cooling fan relay No.1 terminal A and PCM terminal 4L • Short to power supply between cooling fan relay No.1 terminal A and PCM terminal 4L • PCM malfunction







Diagnostic procedure

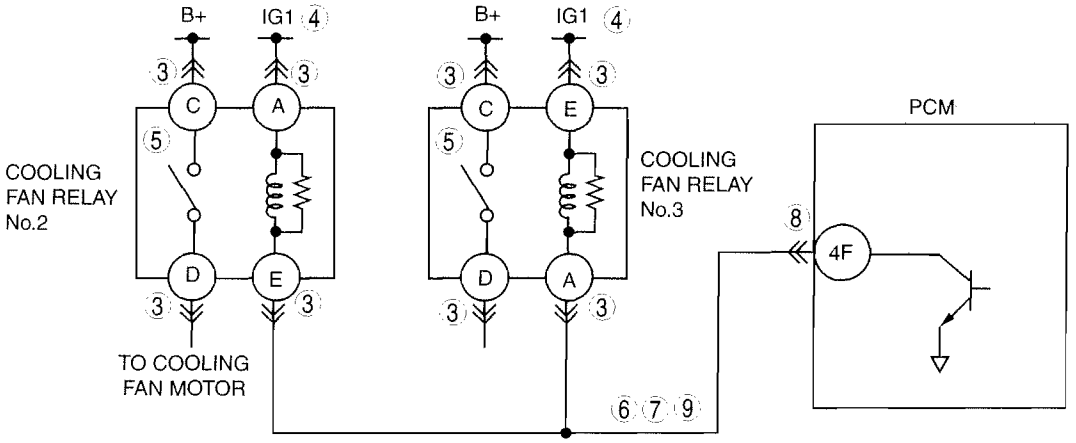
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.

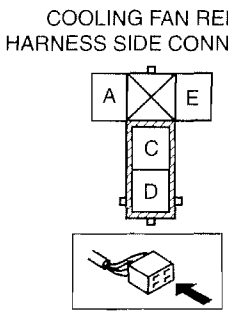
STEP	INSPECTION		ACTION
3	**INSPECT COOLING FAN RELAY NO.1 CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect cooling fan relay No.1 connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace terminal and/or connector, then go to Step 10.
		No	Go to next step.
4	**INSPECT COOLING FAN RELAY NO.1 POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between cooling fan relay No.1 terminal E (harness side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Replace or replace harness for open circuit, then go to Step 10.
5	**INSPECT COOLING FAN RELAY NO.1** • Inspect cooling fan relay No.1. (See 09–21–6 RELAY INSPECTION.) • Is cooling fan relay No.1 okay?	Yes	Go to next step.
		No	Replace cooling fan relay No.1, then go to Step 10.
6	**INSPECT COOLING FAN RELAY NO.1 CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Measure voltage between cooling fan relay No.1 terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power supply, then go to Step 10.
		No	Go to next step.
7	**INSPECT COOLING FAN RELAY NO.1 CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between cooling fan relay No.1 terminal A (harness side) and body ground. • Is there continuity?	Yes	Repair or replace harness for open circuit, then go to Step 10.
		No	Go to next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal and/or connector, then go to Step 10.
		No	Go to next step.
9	**INSPECT COOLING FAN RELAY NO.1 CONTROL CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between cooling fan relay No.1 terminal A (harness-side) and PCM terminal 4L (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0480 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Access ECT PID. • Start engine and warm up it until ECT PID **above 100 °C {212 °F}** • Retrieve any DTC. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

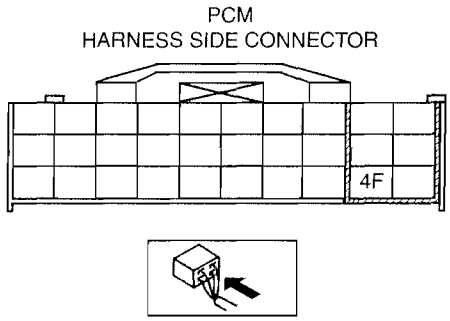
DTC P0481 [L3]

C6U010200400W14

DTC P0481	Fan relay No.2 and No.3 control circuit malfunction
DETECTION CONDITION	• PCM monitors cooling fan relay No.2 and No.3 control signal at PCM terminal 4F. If voltage at PCM terminal 4F remains low or high, PCM determines that fan relay No.2 and No.3 circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Cooling fan relay No.2 malfunction • Cooling fan relay No.3 malfunction • Connector or terminal malfunction • Open circuit in wiring harness between ignition switch and cooling fan relay No.2 terminal A • Open circuit in wiring harness between cooling fan relay No.2 terminal E and PCM terminal 4F • Open circuit in wiring harness between ignition switch and cooling fan relay No.3 terminal E • Open circuit in wiring harness between ignition switch and cooling fan relay No.3 terminal A and PCM terminal 4F • Short to ground in wiring harness between cooling fan relay No.2 terminal E and PCM terminal 4F • Short to power supply between cooling fan relay No.2 terminal E and PCM terminal 4F • Short to ground in wiring harness between cooling fan relay No.3 terminal E and PCM terminal 4F • Short to power supply in wiring harness between cooling fan relay No.3 terminal E and PCM terminal 4F • PCM malfunction







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT COOLING FAN RELAY NO.2 AND NO.3 CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect cooling fan relay No.2 and 3 connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal and/or connector, then go to Step 10.
		No	Go to next step.
4	**INSPECT COOLING FAN RELAY NO.2 AND NO.3 POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between following terminals and body ground. — Cooling fan relay No.2 terminal A (harness side) — Cooling fan relay No.3 terminal E (harness side) • Is voltage **B+**?	Yes	Go to next step.
		No	Replace or replace harness for open circuit, then go to Step 10.
5	**INSPECT COOLING FAN RELAY NO.2 AND NO.3** • Inspect cooling fan relay No.2 and No.3. (See 09–21–6 RELAY INSPECTION.) • Are cooling fan relay No.2 and No.3 okay?	Yes	Go to next step.
		No	Replace cooling fan relay No.2 or No.3, then go to Step 10.
6	**INSPECT COOLING FAN RELAY NO.2 AND NO.3 CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Measure voltage between following terminals and body ground. — Cooling fan relay No.2 terminal E (harness side) — Cooling fan relay No.3 terminal A (harness side) • Is voltage **B+**?	Yes	Repair or replace harness for short to power supply, then go to Step 10.
		No	Go to next step.
7	**INSPECT COOLING FAN RELAY NO.2 AND NO.3 CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between following terminals and body ground. — Cooling fan relay No.2 terminal E (harness side) — Cooling fan relay No.3 terminal A (harness side) • Is there continuity?	Yes	Repair or replace harness for open circuit, then go to Step 10.
		No	Go to next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace terminal and/or connector, then go to Step 10.
		No	Go to next step.

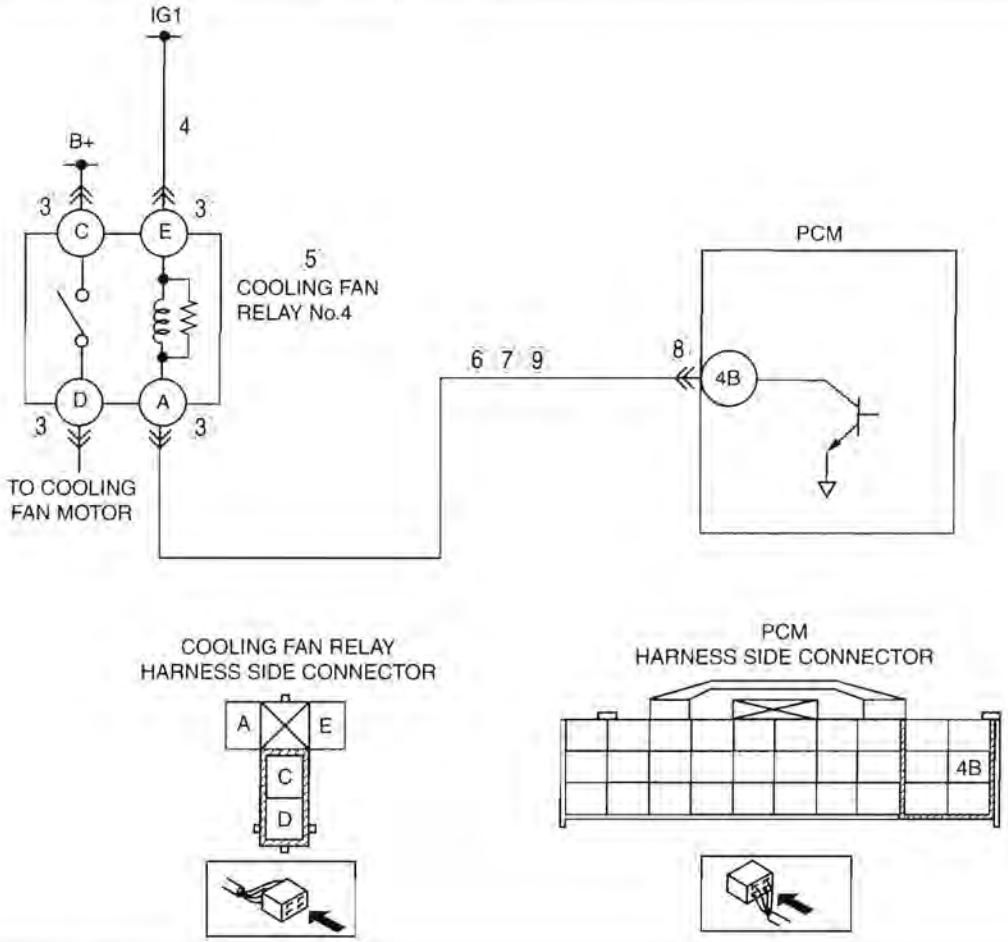
STEP	INSPECTION		ACTION
9	**INSPECT COOLING FAN RELAY NO.2 AND NO.3 CONTROL CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between following terminals and PCM terminal 4F (harness side). — Cooling fan relay No.2 terminal E (harness side) — Cooling fan relay No.3 terminal A (harness side) • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0481 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and turn on A/C switch and fan switch. • Retrieve any DTC. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0482 [L3]

C6U010200400W15

DTC P0482	Fan relay No.4 control circuit malfunction
DETECTION CONDITION	• PCM monitors cooling fan relay No.4 control signal at PCM terminal 4B. If voltage at PCM terminal 4B remains low or high, PCM determines that fan relay No.4 circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Cooling fan relay No.4 malfunction • Connector or terminal malfunction • Open circuit in wiring harness between ignition switch and cooling fan relay No.4 terminal E • Open circuit in wiring harness between cooling fan relay No.4 terminal A and PCM terminal 4B • Short to ground in wiring harness between cooling fan relay No.4 terminal A and PCM terminal 4B • Short to power supply between cooling fan relay No.4 terminal A and PCM terminal 4B • PCM malfunction

DTC P0482	Fan relay No.4 control circuit malfunction



Diagnostic procedure

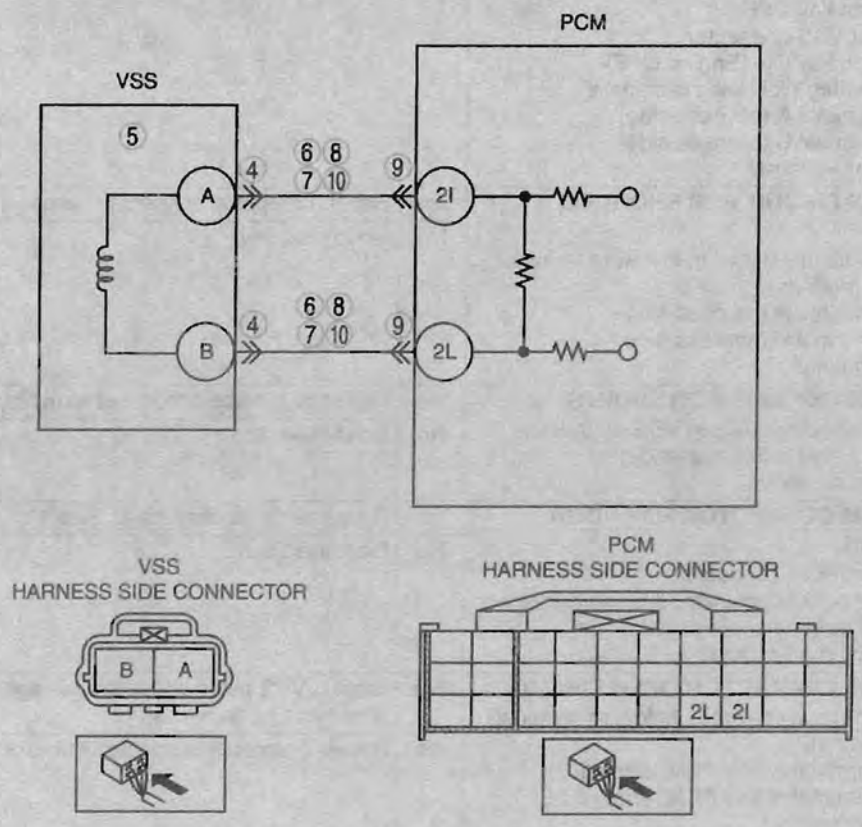
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT COOLING FAN RELAY NO.4 CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect cooling fan relay No.4 connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal and/or connector, then go to Step 10.
		No	Go to next step.
4	**INSPECT COOLING FAN RELAY NO.4 POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between cooling fan relay No.4 terminal E (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Replace or replace harness for open circuit, then go to Step 10.
5	**INSPECT COOLING FAN RELAY NO.4** • Inspect cooling fan relay No.4. (See 09–21–6 RELAY INSPECTION.) • Is cooling fan relay No.4 okay?	Yes	Go to next step.
		No	Replace cooling fan relay No.4, then go to Step 10.

STEP	INSPECTION		ACTION
6	**INSPECT COOLING FAN RELAY NO.4 CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Measure voltage between cooling fan relay No.4 terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power supply, then go to Step 10.
		No	Go to next step.
7	**INSPECT COOLING FAN RELAY NO.4 CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between cooling fan relay No.4 terminal A (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for open circuit, then go to Step 10.
		No	Go to next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal and/or connector, then go to Step 10.
		No	Go to next step.
9	**INSPECT COOLING FAN RELAY NO.4 CONTROL CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between cooling fan relay No.4 terminal A (harness-side) and PCM terminal 4B (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0482 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Access ECT PID. • Start engine and warm up it until ECT PID **above 100 °C {212 °F}** • Retrieve any DTC. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0500 [L3]

C6U01020500W01

DTC P0500	Vehicle speed sensor (VSS) circuit malfunction
DETECTION CONDITION	**With ABS/TCS** • Wheel speed signal from ABS/DSC HU/CM is **below 3.7 km/h {2.3 mph}** when following conditions are met: — Shift range in except P, N or R range (ATX) — Neutral switch and clutch switch are OFF (MTX) — Load is above **40%** — Engine speed is **2,000 rpm or above** **MTX without ABS/TCS** • Vehicle speed signal from vehicle speed sensor is **below 3.7 km/h {2.3 mph}** when following conditions are met: — Neutral switch and clutch switch are OFF — Load is above **40%** — Engine speed is **2,000 rpm or above** **ATX without ABS/TCS** • Vehicle speed signal from TCM is incorrect. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• VSS malfunction • ABS/TCS/DCS malfunction • Connector or terminal malfunction • Open circuit between PCM terminal 2I and VSS terminal A • Open circuit between PCM terminal 2L and VSS terminal B • Short to ground between PCM terminal 2I and VSS terminal A • Short to ground between PCM terminal 2L and VSS terminal B • Short to power supply between PCM terminal 2I and VSS terminal A • Short to power supply between PCM terminal 2L and VSS terminal B • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME PID DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT** • Connect WDS or equivalent to DLC-2. • Start engine. • Access VSS PID using WDS or equivalent. — Vehicle speed **20 km/h {12.4 mph}: 20km/h {12.4 mph}** — Vehicle speed **40 km/h {24.8 mph}: 40km/h {24.8 mph}** • Are PID readings within specification?	Yes	Go to intermittent concern troubleshooting procedure. (See 01–03A–2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].)
		No	Go to next step.
4	**INSPECT VSS CONNECTOR FOR POOR CONNECTION** • Verify that the VSS connector is connected securely. • Is connector okay?	Yes	Go to next step.
		No	Reconnect the connector, then go to Step 11.
5	**INSPECT VSS** • Perform VSS inspection. (See 05–15A–3 VEHICLE SPEEDOMETER SENSOR INSPECTION (WITHOUT ABS) [G35M-R].) • Is VSS okay?	Yes	Go to next step.
		No	Replace VSS, then go to Step 11.
6	**INSPECT VSS CIRCUIT FOR SHORT TO POWER** • Turn ignition key OFF • Disconnect VSS connector. • Turn ignition key ON (Engine OFF) • Measure voltage following terminals: — VSS terminal A (harness-side) — VSS terminal B (harness-side) • Is there any voltage?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to next step.
7	**INSPECT VSS CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between following terminal and body ground: — VSS terminal A (harness-side) — VSS terminal B (harness-side) • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to next step.
8	**INSPECT VSS CIRCUITS FOR SHORTS** • Inspect continuity between VSS connector terminals A and B (harness-side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to next step.
9	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
10	**INSPECT VSS CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between following terminals (harness-side): — VSS terminal A and PCM terminal 2I — VSS terminal B and PCM terminal 2L • Is there continuity?	Yes	Inspect VSS pulse wheel for damage. Replace VSS pulse wheel and go to next step.
		No	Repair or replace suspected harness, then go to next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0500 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Warm up engine. • Access RPM and LOAD PID using WDS or equivalent. • Drive vehicle under following conditions for **18s**. — Engine speed: **2,000 rpm or above** — Gear: Gear is in other than NEUTRAL — Load: **40% or above** • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0505 [L3]

C6U010200500W02

DTC P0505	Idle control system malfunction
DETECTION CONDITION	• PCM cannot control idle speed toward target idle speed while KOER self test.
POSSIBLE CAUSE	• Electronic throttle control system malfunction • Clogged air cleaner element • Clogged air intake passage • A/C relay control circuit malfunction • Generator control circuit malfunction • Low engine compression (Over capacity of blow-by gas) • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**VERIFY RELATED PENDING OR STORED DTCS** • Turn ignition key to OFF, then ON. (Engine OFF) • Verify PENDING CODE or stored DTCs using WDS or equivalent. • Is DTC P0506, P0507, P2100, P2101, P2102, P2103, P2107, P2108 or P2119 present?	Yes	Perform applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Go to next step.
3	**INSPECT ELECTRONIC THROTTLE CONTROL SYSTEM OPERATION** • Perform electronic throttle control system operation inspection. (See 01–03A–62 Electronic Throttle Control System Inspection.) • Does electronic throttle control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts according to electronic throttle control system operation inspection results, then go to Step 9.

STEP	INSPECTION		ACTION
4	**INSPECT A/C MAGNETIC CLUTCH OPERATION** **Note** • The following test should be performed for A/C. Go to next step for vehicles without A/C. • Turn blower motor switch to off. • Is magnetic clutch still on?	Yes	Go to "A/C ALWAYS ON / A/C COMPRESSOR RUNS CONTINUOUSLY." of ENGINE SYMPTOM TROUBLESHOOTING then go to step 9. (See 01–03A–5 ENGINE SYMPTOM TROUBLESHOOTING [L3].)
		No	Go to next step.
5	**INSPECT GENERATOR CONTROL CIRCUIT MALFUNCTION** • Apply electrical load at idle. • Is engine speed increased?	Yes	Go to next step.
		No	Repair short to power circuit in generator control circuit, then go to Step 9.
6	**INSPECT AIR CLEANER ELEMENT** • Remove air cleaner element with engine running. • Does engine speed increase?	Yes	Clean or replace air cleaner element, then go to Step 9.
		No	Go to next step.
7	**INSPECT THROTTLE BODY PASSAGE** • Is throttle body clogged?	Yes	Clean or replace throttle body passage, then go to Step 9.
		No	Go to next step.
8	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10A–5 COMPRESSION INSPECTION [L3].) • Is engine compression okay?	Yes	Go to next step.
		No	Overhaul engine, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0505 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC using WDS or equivalent. • Perform vehicle self-test. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0506 [L3]

C6U010200500W03

DTC P0506	Idle control system RPM lower than expected
DETECTION CONDITION	• Actual idle speed is lower than expected by **100 rpm** for **14 seconds**, when brake pedal is depressed (brake switch is ON) and steering wheel is held straight ahead (power steering pressure switch is OFF). **Note** • If atmospheric pressure is **less than 72.3 kPa {542 mmHg, 21.3 inHg}** or intake air temperature is **below –10 °C {14 °F}**, PCM cancels diagnosis of P0506. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Air cleaner element clogged • Air intake passage clogged • A/C relay control circuit malfunction • Generator malfunction • Purge solenoid valve malfunction • Low engine compression (Over capacity of blow-by gas) • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING OR STORED DTCS** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending code or stored DTCs using WDS or equivalent. • Is other DTC present?	Yes	Repair applicable DTCs. (See 01–02A–13 DTC TABLE [L3].)
		No	Go to next step.
4	**INSPECT A/C MAGNET CLUTCH OPERATION** • Turn blower motor switch off. • Is magnet clutch still on?	Yes	Refer to "A/C is always on or A/C compressor runs continuously." of ENGINE SYMPTOM TROUBLESHOOTING, then go to Step 9. (See 01–03A–50 NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY [L3].)
		No	Go to next step.
5	**INSPECT PURGE SOLENOID VALVE MALFUNCTION** • Perform purge solenoid valve inspection. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.) • Is purge solenoid valve okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 9.
6	**INSPECT AIR CLEANER ELEMENT** • Remove air cleaner element with engine running. • Does engine speed increase?	Yes	Replace air cleaner element, then go to Step 9.
		No	Go to next step.
7	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10A–5 COMPRESSION INSPECTION [L3].) • Is engine compression okay?	Yes	Go to next step.
		No	Overhaul engine, then go to Step 9.
8	**INSPECT GENERATOR** • Perform generator inspection. (See 01–17–5 GENERATOR INSPECTION.) • Is generator okay?	Yes	Go to next step.
		No	Repair or replace related part, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0506 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Depress brake pedal for **14.1 seconds or more**. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0507 [L3]

C6U010200500W04

DTC P0507	Idle control system RPM higher than expected
DETECTION CONDITION	• Actual idle speed is higher than expected by **200 rpm** for **14 seconds**, when brake pedal is depressed (brake switch is ON) and steering wheel is held straight ahead (power steering pressure switch is OFF). **Note** • If atmospheric pressure is **less than 72.3 kPa {542 mmHg, 21.3 inHg}** or intake air temperature is **below –10 °C {14 °F}**, PCM cancels diagnosis of P0507. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Vacuum hose misconnection • PCM malfunction

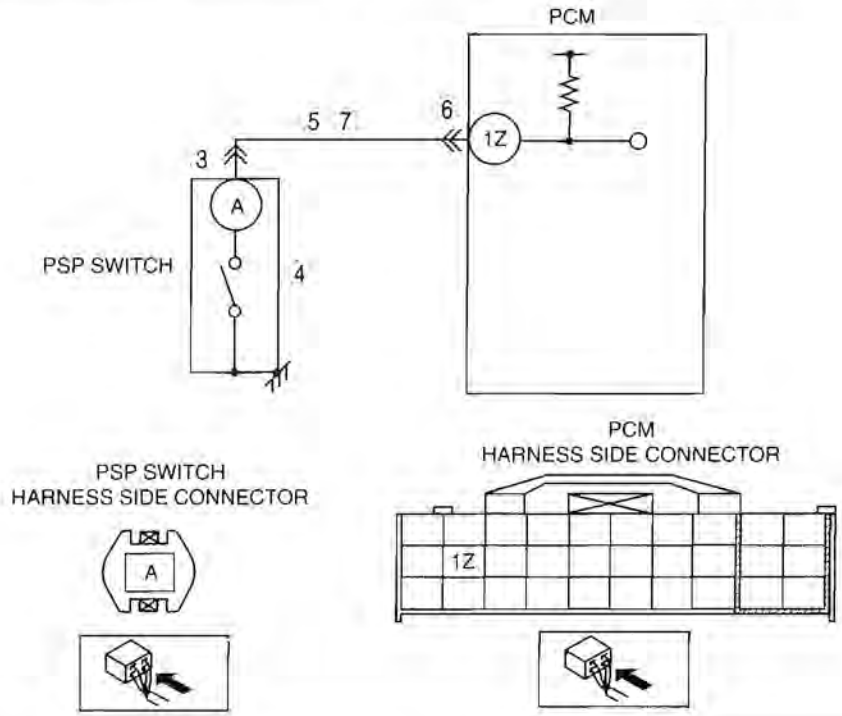
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING OR STORED DTCS** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending code or stored DTCs using WDS or equivalent. • Is other DTC present?	Yes	Repair applicable DTCs. (See 01–02A–13 DTC TABLE [L3].)
		No	Go to next step.
4	**INSPECT VACUUM HOSE CONNECTION** • Are vacuum hoses connecting accurately? (See 01–13A–3 VACUUM HOSE ROUTING DIAGRAM [L3].)	Yes	Go to next step.
		No	Reconnect vacuum hose accurately, then go to step 5.
5	**VERIFY TROUBLESHOOTING OF DTC P0507 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Depress brake pedal for **14.1 seconds or more**. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0550 [L3]

C6U01020500W05

DTC P0550	PSP switch circuit malfunction
DETECTION CONDITION	• The PCM monitors PSP switch signal at PCM terminal 1Z. If input voltage is low voltage (switch stays on) for **1 min.** when the VSS is **above 60.0 km/h {37.4 mph}** and ECT is **above 60 °C {140 °F}**, the PCM determines that PSP switch circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• PSP switch malfunction • Connector or terminal malfunction • Short to ground in wiring harness between PSP switch terminal and PCM terminal 1Z • Open circuit in wiring harness between PSP switch terminal and PCM terminal 1Z • PCM malfunction



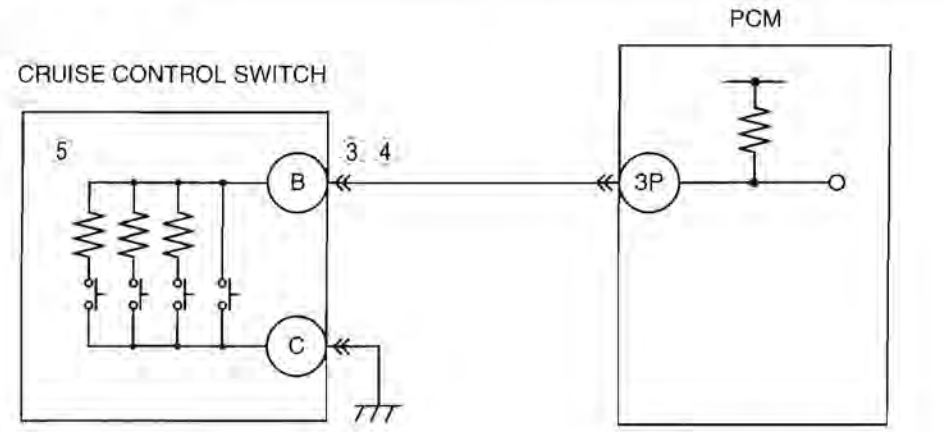
Diagnostic procedure

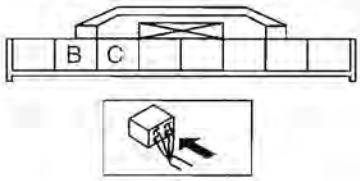
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair formation availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT PSP CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PSP connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
4	**INSPECT PSP SWITCH** • Perform PSP switch inspection. (See 01–40A–29 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [L3].) • Is PSP switch okay?	Yes	Go to next step.
		No	Replace PSP switch, then go to Step 8.
5	**INSPECT PSP SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Disconnect PCM connector. • Inspect continuity between PSP switch terminal (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 8.
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 8.
		No	Go to next step.
7	**INSPECT SIGNAL CIRCUIT MALFUNCTION FOR OPEN CIRCUIT** • Inspect continuity between PSP terminal A (harness-side) and PCM terminal 1Z (harness-side). • Is there continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0550 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Drive vehicle **above 60 km/h {37.3 mph}** for **1 min.** • Verify that ECT PID **above 60 °C {140 °F}** using WDS or equivalent. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

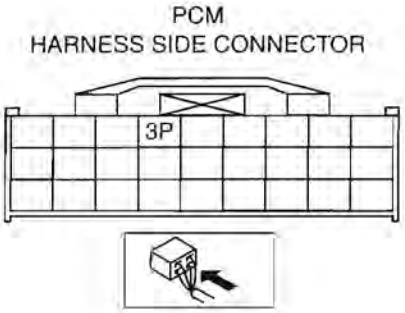
DTC P0564 [L3]

C6U010200500W06

DTC P0564	Cruise control switch circuit malfunction
DETECTION CONDITION	• The PCM monitors the cruise control switch signal at PCM terminal 3P. If the PCM detects that any one of following switches (Main, CANCEL, SET/COAST, RESUME/ACCEL) remains on for **2 min**, the PCM determines that the cruise control switch circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not illuminate. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Cruise control switch malfunction • Connector or terminal malfunction • Short to power supply in wiring harness from cruise control switch terminal B and PCM terminal 3P. • Short to GND in wiring harness from cruise control switch terminal B and PCM terminal 3P. • PCM malfunction







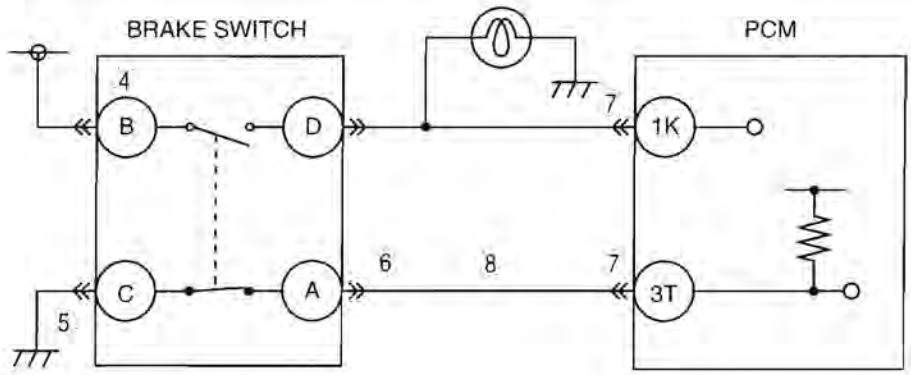
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**INSPECT CRUISE CONTROL SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Inspect for poor connection (such as damaged, pulled-put terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace suspected terminal, then go to Step 6.
		No	Go to next step.
3	**INSPECT CRUISE CONTROL SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Disconnect cruise control switch and PCM connectors. • Inspect continuity between cruise control switch terminal B (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace short to GND, then go to Step 6.
		No	Go to next step.
4	**INSPECT CRUISE CONTROL SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Inspect voltage between cruise control switch terminal (harness-side) and body GND. • Is voltage **below 1.0 V**?	Yes	Go to next step.
		No	Repair or replace short to power supply, then go to Step 6.
5	**INSPECT CRUISE CONTROL SWITCH OPERATION** • Inspect cruise control switch. (See 01–20–1 CRUISE CONTROL SWITCH INSPECTION.) • Is cruise control switch okay?	Yes	Go to next step.
		No	Replace cruise control switch, then go to next step.
6	**VERIFY TROUBLESHOOTING OF P0564 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Drive vehicle with cruise control **2 min. or more**. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

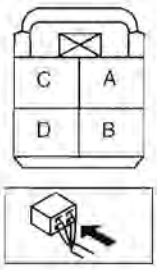
DTC P0571 [L3]

C6U010200500W07

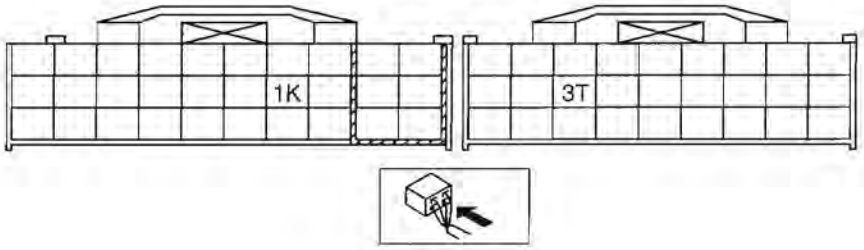
DTC P0571	Brake switch circuit malfunction
DETECTION CONDITION	• The PCM monitors changes in input voltage for brake switch No.1 and No.2. If the PCM detects that both brake switches No.1 and No.2 remain on or off for **15 s**, it determines that the brake switch circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not comes on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Brake switch malfunction • Open circuit between brake switch terminal A and PCM terminal 3T • Open circuit between brake switch terminal C and body ground • Short to power supply between brake switch terminal A and PCM terminal 3T • Short to GND between brake switch terminal A and PCM terminal 3T • PCM malfunction



BRAKE SWITCH
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect brake switch connector. • Inspect for poor connection (such as damaged, pull-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal then go to Step 10.
		No	Go to next step.
4	**INSPECT BRAKE SWITCH** • Inspect brake switch. • Is brake switch okay?	Yes	Go to next step.
		No	Replace brake switch, then go to Step 10.
5	**INSPECT GND CIRCUIT OF BRAKE SWITCH NO.2 FOR OPEN CIRCUIT** • Inspect continuity between brake switch terminal C (harness-side) and body ground. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 10.
6	**INSPECT SIGNAL CIRCUIT OF BRAKE SWITCH NO.2 FOR SHORT TO GROUND** • Inspect continuity between brake switch terminal A (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground circuit, then go to Step 10.
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pull-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
8	**INSPECT SIGNAL CIRCUIT OF BRAKE SWITCH NO.2 FOR OPEN CIRCUIT** • Inspect continuity between brake switch terminal A (harness-side) and PCM terminal 3T (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 10.
9	**INSPECT SIGNAL CIRCUIT OF BRAKE SWITCH NO.2 FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between brake switch terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power supply, then go to next step.
		No	Go to next step.
10	**VERIFY TROUBLESHOOTING OF P0571 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to ON (Engine OFF). • Depress and release brake pedal **more than 5 times**. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0601 [L3]

C6U01020600W01

DTC P0601	Internal control module memory check sum error
DETECTION CONDITION	• PCM internal ROM malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Reprogramming has not been completed properly. • PCM internal ROM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY TROUBLESHOOTING OF P0601 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0602 [L3]

C6U010200600W02

DTC P0602	PCM programming error
DETECTION CONDITION	• No configuration data in PCM **Note** • If "PCM CONFIGURATION" is successful, the PCM stored DTC P0602 and illuminates the MIL (System is normal) Clear the DTC P0602 using WDS or equivalent after "PCM CONFIGURATION". • MIL goes off after three drive cycles with no failure (DTCs remain in PCM).
POSSIBLE CAUSE	• Complete configuration has not been completed. • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Perform PCM configuration procedure, then go to next step. (See 01–40A–26 PCM REPLACEMENT [L3].)
3	**VERIFY TROUBLESHOOTING OF DTC P0602 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0604 [L3]

C6U01020600W03

DTC P0604	PCM RAM error
DETECTION CONDITION	• PCM internal RAM malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Reprogramming has not been completed properly. • PCM internal RAM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY TROUBLESHOOTING OF P0604 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0606 [L3]

C6U010200600W04

DTC P0606	ECM/PCM processor
DETECTION CONDITION	• PCM internal CPU malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• PCM internal CPU malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY TROUBLESHOOTING OF P0606 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0607 [L3]

C6U010200600W05

DTC P0607	Control module performance
DETECTION CONDITION	• PCM internal malfunction. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not illuminate. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• PCM internal malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY TROUBLESHOOTING OF P0607 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0610 [L3]

C6U010200600W06

DTC P0610	Control module vehicle options error
DETECTION CONDITION	• PCM data configuration error
POSSIBLE CAUSE	• Configuration procedure has not been completed. • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Perform PCM configuration procedure, then go to next step. (See 01–40A–26 PCM REPLACEMENT [L3].)
3	**VERIFY TROUBLESHOOTING OF DTC P0610 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0638 [L3]

C6U01020600W07

DTC P0638	Throttle actuator control range/performance
DETECTION CONDITION	• If the PCM detects that actual throttle opening angle is smaller or larger than the target throttle opening angle, the PCM determines that the throttle actuator control system has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Throttle body malfunction • PCM malfunction

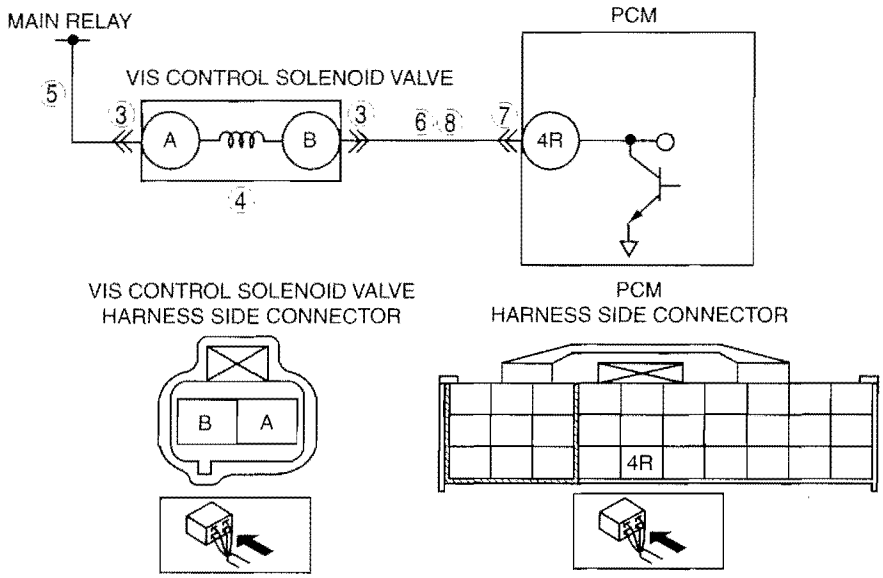
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FOR OTHER DTCS** • Have other DTCs been stored?	Yes	Perform diagnostic procedure for applicable DTCs.
		No	Go to next step.
4	**VERIFY TROUBLESHOOTING OF P0638 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start the engine and let it idle. • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0661 [L3]

C6U010200600W08

DTC P0661	Variable intake-air system (VIS) control solenoid valve circuit low input
DETECTION CONDITION	• PCM monitors VIS control solenoid valve control signal at PCM terminal 4R. If PCM turns VIS control solenoid valve off but voltage at PCM terminal 4R still remains low, PCM determines that VIS control solenoid valve circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not come on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• VIS control solenoid valve malfunction • Open circuit in wiring harness between main relay and VIS control solenoid valve terminal A • Open circuit in wiring harness between VIS control solenoid valve terminal B and PCM terminal 4R • Short to ground in wiring harness between VIS control solenoid valve terminal B and PCM terminal 4R • Connector or terminal malfunction • PCM malfunction



Diagnostic procedure

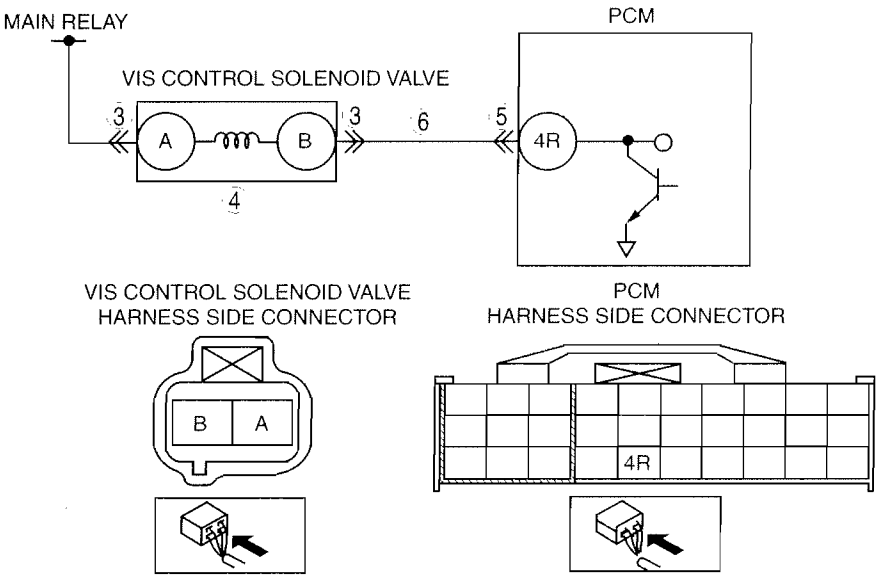
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT VIS CONTROL SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect VIS control solenoid valve connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**INSPECT VIS CONTROL SOLENOID VALVE MALFUNCTION** • Perform VIS control solenoid valve inspection. (See 01–13A–10 VARIABLE INTAKE-AIR SYSTEM (VIS) CONTROL SOLENOID VALVE INSPECTION [L3].) • Is VIS control solenoid valve okay?	Yes	Go to next step.
		No	Replace VIS control solenoid valve, then go to step 9.
5	**INSPECT VIS CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between VIS control solenoid valve terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
6	**INSPECT VIS CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between VIS control solenoid valve terminal B (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 9.
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Inspect for poor connection at terminal 4R. (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
8	**INSPECT VIS CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between VIS control solenoid valve terminal A (harness-side) and PCM terminal 4R (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0661 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and run engine speed **above 4,400 rpm** few times. • Retrieve any DTC. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0662 [L3]

C6U010200600W09

DTC P0662	Variable intake-air system (VIS) control solenoid valve circuit high input
DETECTION CONDITION	• PCM monitors VIS control solenoid valve control signal at PCM terminal 4R. If PCM turns VIS control solenoid valve on but voltage at PCM terminal 4R still remains high, PCM determines that VIS control solenoid valve circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not come on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• VIS control solenoid valve malfunction • Short to power supply between VIS control solenoid valve terminal A and PCM terminal 4R • Shorted VIS control solenoid valve or PCM connector • PCM malfunction



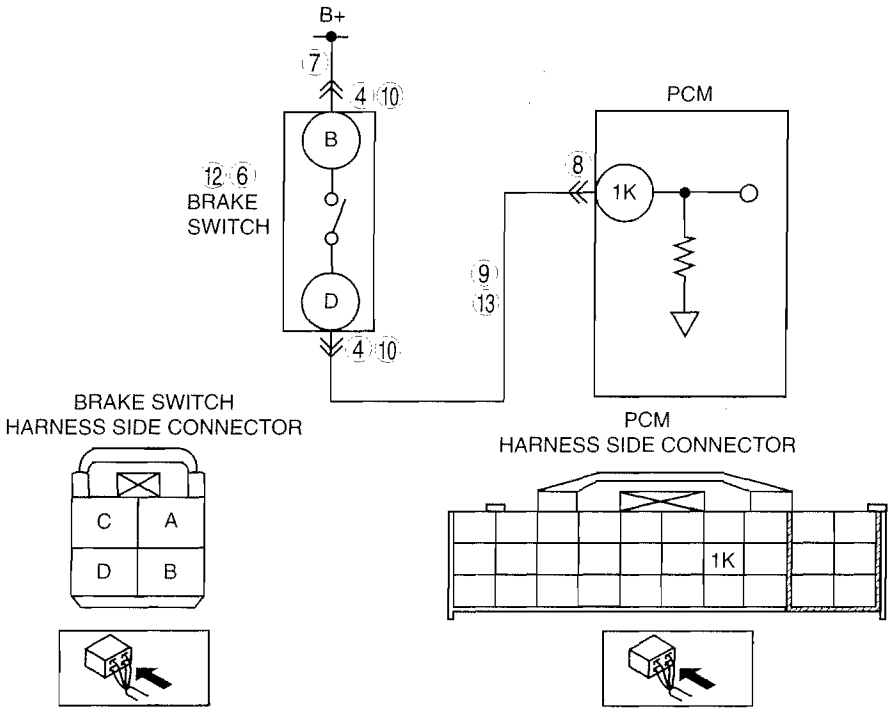
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT VIS CONTROL SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect VIS control solenoid valve connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**INSPECT VIS CONTROL SOLENOID VALVE MALFUNCTION** • Perform VIS control solenoid valve inspection. (See 01–13A–10 VARIABLE INTAKE-AIR SYSTEM (VIS) CONTROL SOLENOID VALVE INSPECTION [L3].) • Is VIS solenoid valve okay?	Yes	Go to next step.
		No	Replace VIS control solenoid valve, then go to Step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection at terminal 4R. (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 7.
		No	Go to next step.
6	**INSPECT VIS CONTROL SOLENOID VALVE CONTROL CIRCUIT SHORT TO POWER SUPPLY** • Turn ignition key to ON (Engine OFF). • Measure voltage between VIS control solenoid valve terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for open circuit, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0662 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition switch to OFF. • Start engine and run engine speed **above 4,400 rpm** few times. • Retrieve any DTC. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0703 [L3]

C6U010200700W01

DTC P0703	Brake switch No.1 circuit malfunction
DETECTION CONDITION	• PCM monitors changes in input voltage from brake switch. If PCM does not detect PCM terminal 1K voltage changes while alternately accelerating and decelerating **8 times**, PCM determines that neutral switch circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Brake switch malfunction • Poor connection of brake switch connector or PCM connector • Short to power supply between brake switch terminal D and PCM connector terminal 1K • Open circuit between brake switch terminal D and PCM connector terminal 1K • Open circuit between battery positive terminal and brake switch terminal B • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY HIGH INPUT OR LOW INPUT** • Connect WDS or equivalent to DLC-2. • Access BOO PID. • Verify BOO PID during brake pedal operation. • Is BOO PID always OFF?	Yes	Go to Next step.
		No	Go to Step 10.

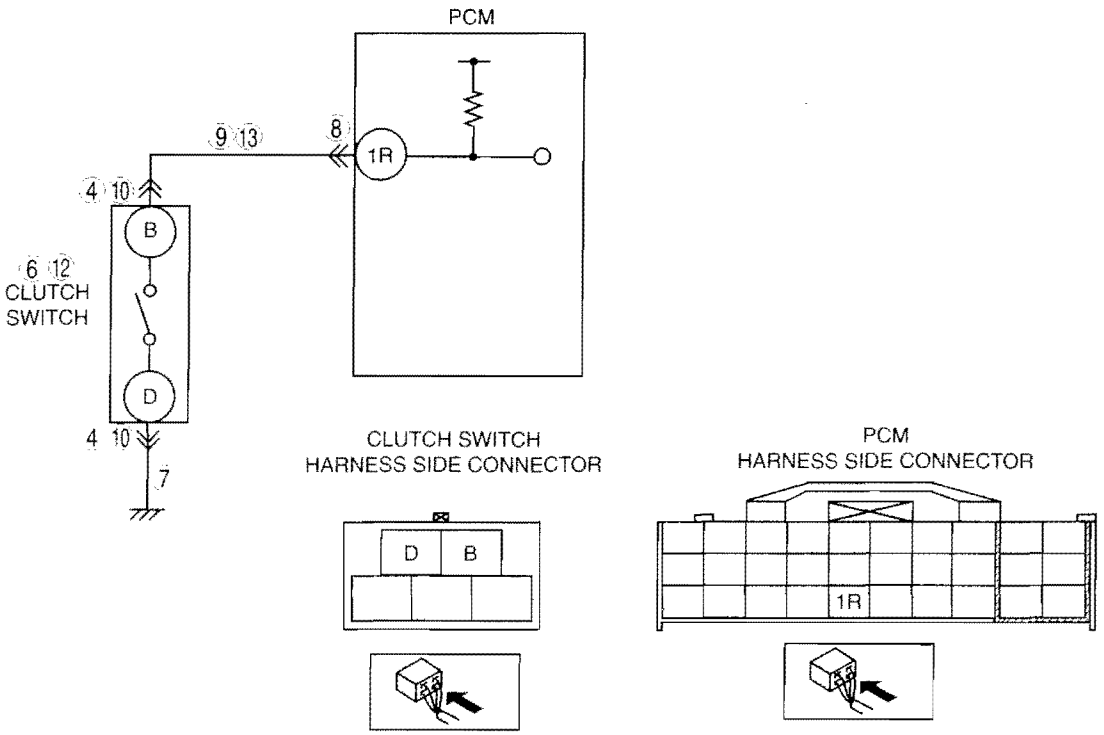
STEP	INSPECTION		ACTION
4	**INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect brake switch connector. • Inspect for poor connection (such as damaged pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
5	**CLASSIFY BRAKE SWITCH OR CIRCUIT** • Connect WDS or equivalent to DLC-2. • Access BOO PID. • Connect a jumper wire between brake switch terminal A and B (harness-side). • Is BOO PID on?	Yes	Go to next step.
		No	Go to Step 7.
6	**INSPECT BRAKE SWITCH** • Perform brake switch inspection. (See 04–11–7 BRAKE SWITCH INSPECTION.) • Is brake switch okay?	Yes	Go to Step 14.
		No	Replace brake switch, then go to Step 14.
7	**INSPECT BRAKE SWITCH POWER CIRCUIT FOR OPEN CIRCUIT** • Measure voltage between brake switch connector terminal B (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace brake switch power circuit for open circuit, then Go to Step 14.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
9	**INSPECT BRAKE SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between brake switch terminal D (harness-side) and PCM terminal 1K (harness-side). • Is there continuity?	Yes	Repair or replace harness for open circuit, then go to Step 14.
		No	Go to Step 14.
10	**INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect brake switch connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
11	**CLASSIFY BRAKE SWITCH OR CIRCUIT** • Connect WDS or equivalent to DLC-2. • Access BOO PID. • Verify that BOO PID changes from ON to OFF when brake switch connector disconnected. • Does BOO PID change from ON to OFF?	Yes	Go to next step.
		No	Go to Step 13.
12	**INSPECT BRAKE SWITCH** • Perform brake switch inspection. (See 04–11–7 BRAKE SWITCH INSPECTION.) • Is brake switch okay?	Yes	Go to Step 14.
		No	Replace brake switch, then go to Step 14.
13	**INSPECT BRAKE SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Measure voltage between brake switch connector terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power supply, then go to Step 14.
		No	Go to next step.

STEP	INSPECTION		ACTION
14	**VERIFY TROUBLESHOOTING OF DTC P0703 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle **30 km/h {18.6 mph} or more**. • Depress and release brake pedal **more than 8 times** while driving vehicle. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0704 [L3 MTX]

C6U010200700W02

DTC P0704	Clutch switch circuit malfunction
DETECTION CONDITION	• PCM monitors changes in input voltage from clutch switch. If PCM does not detect PCM terminal 1R voltage changes while vehicle runs with vehicle speed **30 km/h** or over and stops **8 times** alternately, PCM determines that clutch switch circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Clutch switch malfunction • Poor connection of clutch switch connector or PCM connector • Short to ground between clutch switch terminal B and PCM connector terminal 1R • Open circuit between clutch switch terminal B and PCM connector terminal 1R • Open circuit between ground and clutch switch terminal D • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY HIGH INPUT OR LOW INPUT** • Connect WDS or equivalent to DLC-2. • Access CPP PID. • Verify CPP PID during clutch pedal operation. • Is CPP PID always OFF?.	Yes	Go to Next step.
		No	Go to Step 10.
4	**INSPECT CLUTCH SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect clutch switch connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
5	**CLASSIFY CLUTCH SWITCH OR CIRCUIT** • Connect WDS or equivalent to DLC-2. • Access CPP PID. • Connect a jumper wire between clutch switch terminal B and D (harness-side). • Is CPP PID on?	Yes	Go to next step.
		No	Go to Step 7.
6	**INSPECT CLUTCH SWITCH** • Perform clutch switch inspection. (See 01–40A–27 CLUTCH SWITCH INSPECTION [L3].) • Is clutch switch okay?	Yes	Go to Step 14.
		No	Replace clutch switch, then go to Step 14.
7	**INSPECT CLUTCH SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between clutch switch terminal D (harness-side) and ground. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace clutch switch power circuit for open circuit, then Go to Step 14.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
9	**INSPECT CLUTCH SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between clutch switch terminal B (harness-side) and PCM terminal 1R (harness-side). • Is there continuity?	Yes	Repair or replace harness for open circuit, then go to Step 14.
		No	Go to Step 14.
10	**INSPECT CLUTCH SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect clutch switch connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
11	**CLASSIFY CLUTCH SWITCH OR CIRCUIT** • Connect WDS or equivalent to DLC-2. • Access CPP PID. • Verify that CPP PID changes from ON to OFF when clutch switch connector disconnected. • Does CPP PID change from ON to OFF?	Yes	Go to next step.
		No	Go to Step 13.

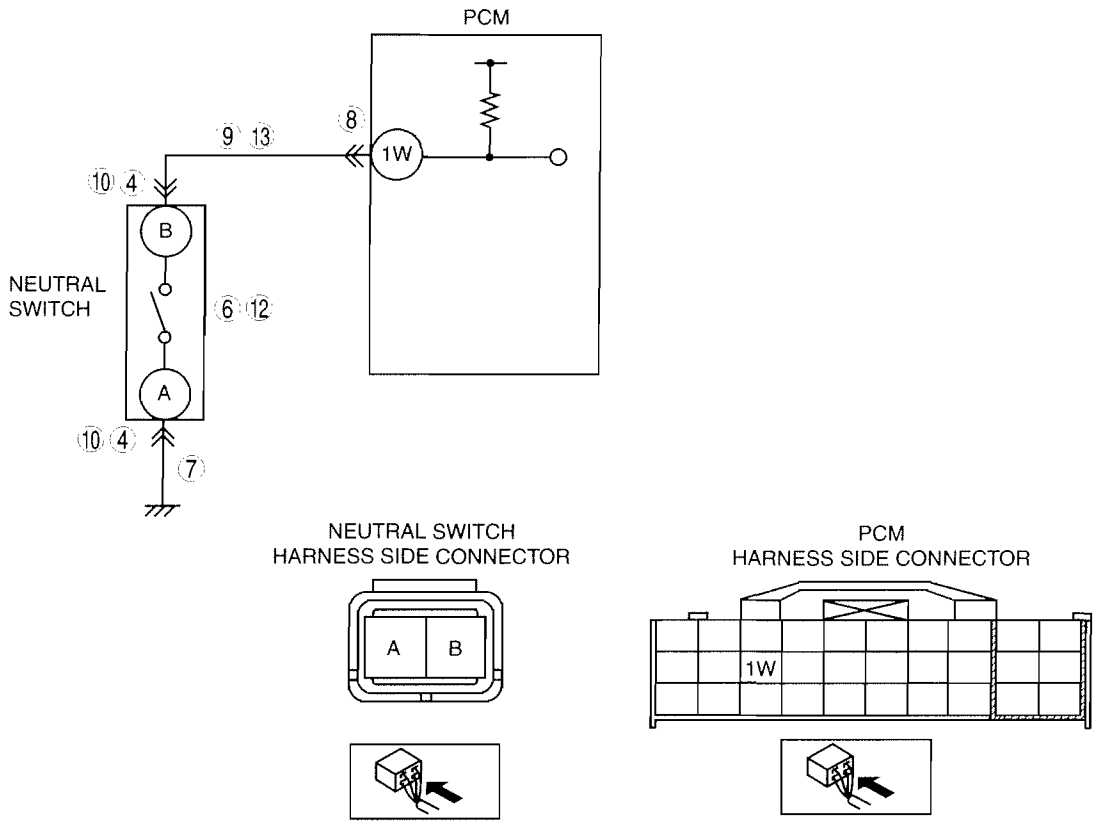
STEP	INSPECTION		ACTION
12	**INSPECT CLUTCH SWITCH** • Perform clutch switch inspection. (See 01–40A–27 CLUTCH SWITCH INSPECTION [L3].) • Is clutch switch okay?	Yes	Go to Step 14.
		No	Replace clutch switch, then go to Step 14.
13	**INSPECT CLUTCH SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between clutch switch terminal B and ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 14.
		No	Go to Next step.
14	**VERIFY TROUBLESHOOTING OF DTC P0704 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Operate clutch pedal during drive vehicle **below 30 km/h {19 mph} 8 times** alternately. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P0850 [L3 MTX]

C6U010200800W01

DTC P0850	Neutral switch circuit malfunction
DETECTION CONDITION	• PCM monitors changes in input voltage from neutral switch. If PCM does not detect PCM terminal 1W voltage changes while running vehicle with vehicle speed **above 30 km/h {19 mph}** and clutch pedal turns press and depress **10 times** repeatedly, PCM determines that neutral switch circuit has malfunction **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Neutral switch malfunction • Poor connection of neutral switch connector or PCM connector • Short to ground between neutral switch terminal B and PCM connector terminal 1W • Open circuit in wiring harness between neutral switch terminal B and PCM connector terminal 1W • Open circuit in wiring harness between ground and brake switch terminal A. • PCM malfunction

DTC P0850	Neutral switch circuit malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY HIGH INPUT OR LOW INPUT** • Connect WDS or equivalent to DLC-2. • Access CPP/PNP PID. • Verify CPP/PNP PID when gear is neutral position. • Is CPP/PNP PID always OFF?.	Yes	Go to Next step.
		No	Go to Step 10.
4	**INSPECT NEUTRAL SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect neutral switch connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
5	**CLASSIFY NEUTRAL SWITCH OR CIRCUIT** • Connect WDS or equivalent to DLC-2. • Access CPP/PNP PID. • Connect a jumper wire between neutral switch terminal A and B (harness-side). • Is CPP/PNP PID on?	Yes	Go to next step.
		No	Go to Step 7.

STEP	INSPECTION		ACTION
6	**INSPECT NEUTRAL SWITCH** • Perform neutral switch inspection. (See 01–40A–28 NEUTRAL SWITCH INSPECTION [L3].) • Is neutral switch okay?	Yes	Go to Step 14.
		No	Replace neutral switch, then go to Step 14.
7	**INSPECT NEUTRAL SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between neutral switch terminal A (harness-side) and body ground. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace neutral switch power circuit for open circuit, then Go to Step 14.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
9	**INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between neutral switch terminal B (harness-side) and PCM terminal 1W (harness-side). • Is there continuity?	Yes	Repair or replace harness for open circuit, then go to Step 14.
		No	Go to Step 14.
10	**INSPECT NEUTRAL SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect neutral switch connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
11	**CLASSIFY NEUTRAL SWITCH OR CIRCUIT** • Connect WDS or equivalent to DLC-2. • Access CPP/PNP PID. • Verify that CPP/PNP PID changes from ON to OFF when neutral switch connector disconnected. • Does CPP/PNP PID change from ON to OFF?	Yes	Go to next step.
		No	Go to Step 13.
12	**INSPECT NEUTRAL SWITCH** • Perform neutral switch inspection. (See 01–40A–28 NEUTRAL SWITCH INSPECTION [L3].) • Is neutral switch okay?	Yes	Go to Step 14.
		No	Replace neutral switch, then go to Step 14.
13	**INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between neutral switch terminal B (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness for short to ground, then go to Step 14.
		No	Go to next step.
14	**VERIFY TROUBLESHOOTING OF DTC P0850 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Drive vehicle **above 30 km/h {19 mph}** and stop vehicle. • Depress and release clutch pedal **more than 10 times** during drive cycle. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2004 [L3]

C6U010202000W01

DTC P2004	Variable tumble control system (VTCS) shutter valve stuck open
DETECTION CONDITION	• PCM monitors mass VTCS shutter valve position using VTCS position sensor. If PCM turns VTCS solenoid valve on but VTCS position still remain open (VTC shutter valve switch output: approx. 5.0 V), PCM determines that VTCS shutter valve has been stuck open. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• VTC shutter valve actuator malfunction (stuck open) • Misconnected or pulled out vacuum hose • Variable tumble control solenoid valve malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear DTC from PCM memory using WDS or equivalent. • Drive vehicle under following conditions: — Engine coolant temperature is **above 63 °C {145 °F}**. — Engine speed: **below 3,750 rpm** — Throttle opening angle is below as followings • Engine speed **below 1,500 rpm: above 35%** • Engine speed **between 1,500–2,500 rpm: between 25–35%** • Engine speed **above 2,500: below 25%** • Is PENDING CODE for this DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01–03A–2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].)
4	**VERIFY STORED OTHER DTCS** • Verify stored DTCs using WDS or equivalent. • Is DTC P2088 or P2089 present?	Yes	Go to appropriate DTC troubleshooting procedures.
		No	Go to next step.
5	**INSPECT VARIABLE TUMBLE CONTROL SOLENOID VALVE** • Perform "VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION". (See 01–13A–12 VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION [L3].) • Is variable tumble control solenoid valve okay?	Yes	Go to next step.
		No	Replace variable tumble control solenoid valve, then go to Step 9.
6	**INSPECT VTCS SHUTTER VALVE ACTUATOR** • Perform "VTC SHUTTER VALVE ACTUATOR INSPECTION". (See 01–13A–11 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SHUTTER VALVE ACTUATOR INSPECTION [L3].) • Is VTCS shutter valve actuator okay?	Yes	Go to next step.
		No	Replace Intake manifold, then go to Step 9.

STEP	INSPECTION		ACTION
7	**INSPECT VTC SHUTTER VALVE SWITCH** • Perform "VARIABLE TUMBLE CONTROL (VTC) SHUTTER VALVE SWITCH INSPECTION". (See 01–40A–30 VARIABLE TUMBLE CONTROL (VTC) SHUTTER VALVE SWITCH INSPECTION [L3].) • Is VTC shutter valve switch okay?	Yes	Go to next step.
		No	Replace intake manifold, then go to Step 9.
8	**VERIFY CONNECTION OF VACUUM HOSE ROUTING** • Verify that the vacuum hoses are connected properly. (See 01–13A–3 VACUUM HOSE ROUTING DIAGRAM [L3].) • Are vacuum hoses connected properly?	Yes	Go to next step.
		No	Connect the vacuum hoses properly, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2004 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Drive vehicle under following conditions: — Engine coolant temperature is **above 63 °C {145 °F}**. — Engine speed: **below 3,750 rpm** — Throttle opening angle is below as followings • Engine speed **below 1,500 rpm**: **above 35%** • Engine speed **between 1,500–2,500 rpm**: **between 25–35%** • Engine speed **above 2,500**: **below 25%** • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2006 [L3]

C6U010202000W02

DTC P2006	Variable tumble control system (VTCS) shutter valve stuck closed
DETECTION CONDITION	• PCM monitors mass VTCS shutter valve position using VTCS position sensor. If PCM turns VTCS solenoid valve off but VTCS position still remain close (VTCS position sensor on), PCM determines that VTCS shutter valve has been stuck closed. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • TP sensor malfunction • CKP sensor malfunction • Variable tumble control solenoid valve malfunction • VTCS shutter valve malfunction (stuck closed) • VTCS shutter valve actuator malfunction (stuck closed). • Short to ground circuit between variable tumble control solenoid valve terminal B and PCM terminal 4T • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear DTC from PCM memory using WDS or equivalent. • Drive vehicle under following conditions: — Engine coolant temperature is **above 63 °C {145 °F}**. — Engine speed: **below 3,750 rpm** — Throttle opening angle is below as followings • Engine speed **below 1,500 rpm**: **above 35%** • Engine speed **between 1,500–2,500 rpm**: **between 25–35%** • Engine speed **above 2,500**: **below 25%** • Is PENDING CODE for this DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01–03A–2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].)
4	**VERIFY STORED OTHER DTCS** • Verify stored DTCs using WDS or equipment. • Is other DTC present except P0117, P0118, P0121, P0122, P0123 and/or P0335?	Yes	Go to appropriate DTC troubleshooting procedures.
		No	Go to next step.
5	**INSPECT VTCS SHUTTER VALVE ACTUATOR** • Perform "VTCS operation inspection". (See 01–03A–64 Variable Tumble Control System (VTCS) Operation Inspection.) • Is VTCS shutter valve actuator okay?	Yes	Go to next step.
		No	Replace VTCS shutter valve actuator, then go to Step 8.
6	**INSPECT VTCS SOLENOID VALVE** • Perform "VTCS solenoid valve airflow inspection". (See 01–13A–12 VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION [L3].) • Is variable tumble control solenoid valve okay?	Yes	Go to next step.
		No	Replace variable tumble control solenoid valve, then go to Step 8.

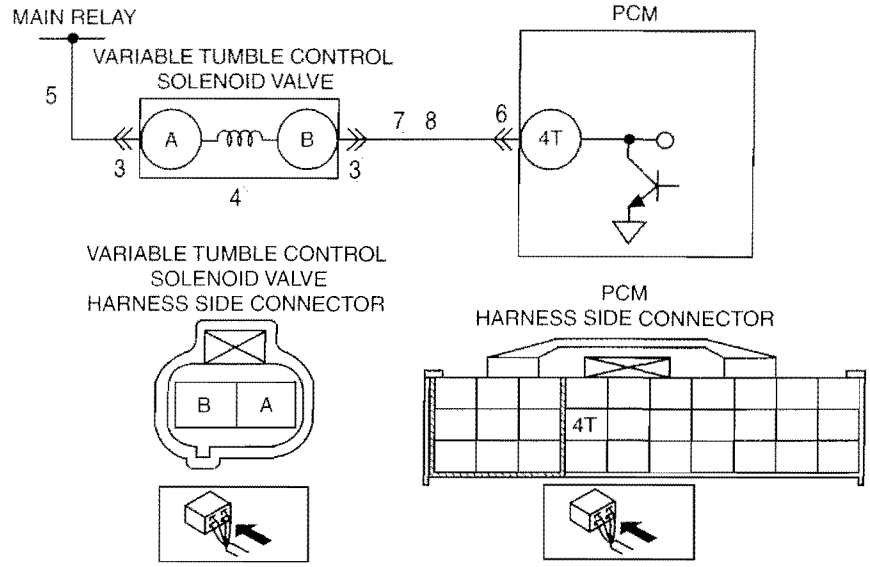
STEP	INSPECTION		ACTION
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Inspect for poor connection at PCM terminal 4T (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to next step.
		No	Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2006 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Drive vehicle under following conditions: — Engine coolant temperature is **above 63 °C {145 °F}**. — Engine speed: **below 3,750 rpm** — Throttle opening angle is below as followings • Engine speed **below 1,500 rpm**: **above 35%** • Engine speed **between 1,500–2,500 rpm**: **between 25–35%** • Engine speed **above 2,500**: **below 25%** • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2009 [L3]

C6U010202000W03

DTC P2009	Variable tumble control solenoid valve circuit low input
DETECTION CONDITION	• PCM monitors variable tumble control solenoid valve control signal at PCM terminal 4T. If PCM turns variable tumble control solenoid valve off but voltage at PCM terminal 4T still remains low, PCM determines that VTCS solenoid valve circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Poor connection of connectors at PCM and/or variable tumble control solenoid valve • Short to ground in wiring between variable tumble control solenoid valve terminal B and PCM terminal 4T • Open circuit in wiring between main relay and variable tumble control solenoid valve terminal A • Open circuit in wiring between variable tumble control solenoid valve terminal B and PCM terminal 4T • Variable tumble control solenoid valve malfunction • PCM malfunction

DTC P2009	Variable tumble control solenoid valve circuit low input



Diagnostic procedure

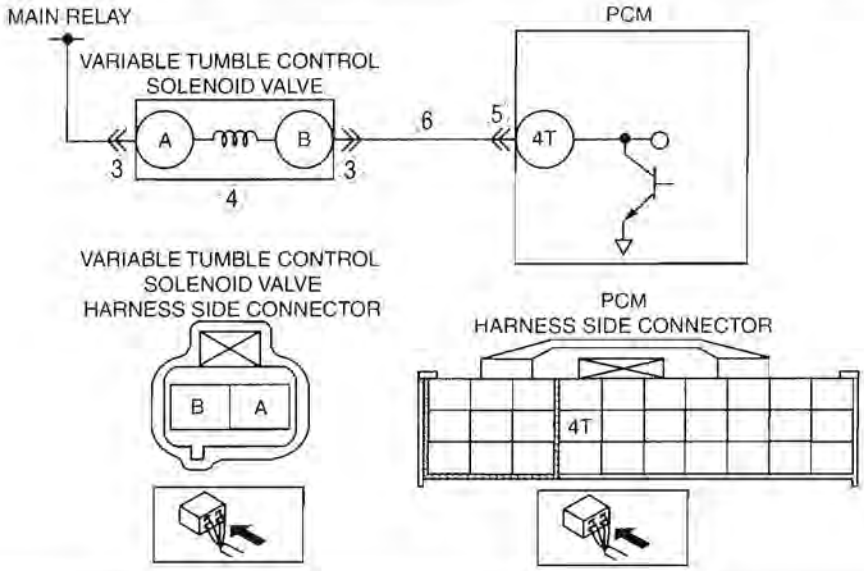
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT VTCS SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT VARIABLE TUMBLE CONTROL SOLENOID VALVE** • Perform variable tumble control solenoid valve inspection. (See 01–13A–12 VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION [L3].) • Is VTCS solenoid valve okay?	Yes	Go to next step.
		No	Replace variable tumble control solenoid valve, then go to Step 9.
5	**INSPECT VARIABLE TUMBLE CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Disconnect variable tumble control solenoid valve connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between variable tumble control solenoid valve terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection at PCM terminal 4T. (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.

STEP	INSPECTION		ACTION
7	**INSPECT VARIABLE TUMBLE CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between variable tumble control solenoid valve terminal B (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 9.
		No	Go to next step.
8	**INSPECT VARIABLE TUMBLE CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT** • Connect variable tumble control solenoid valve connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between PCM terminal 4T (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open or short to ground circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2009 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2010 [L3]

C6U010202000W04

DTC P2010	Variable tumble control solenoid valve circuit high input
DETECTION CONDITION	• PCM monitors variable tumble control solenoid valve control signal at PCM terminal 4T. If PCM turns variable tumble control solenoid valve on but voltage at PCM terminal 4T still remains high, PCM determines that variable tumble control solenoid valve circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Poor connection of connectors at PCM and/or variable tumble control solenoid valve • Short to power supply in wiring between variable tumble control solenoid valve terminal B and PCM terminal 4T • Variable tumble control solenoid valve malfunction • PCM malfunction



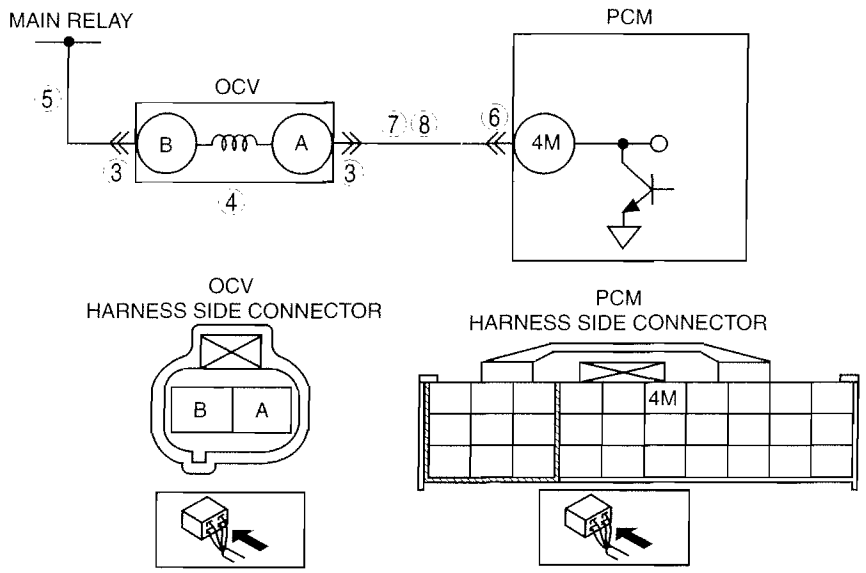
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT VARIABLE TUMBLE CONTROL SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**INSPECT VARIABLE TUMBLE CONTROL SOLENOID VALVE** • Perform variable tumble control solenoid valve inspection. (See 01–13A–12 VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION [L3].) • Is variable tumble control solenoid valve okay?	Yes	Go to next step.
		No	Replace variable tumble control solenoid valve, then go to Step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection at PCM terminal 4T. (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 7.
		No	Go to next step.
6	**INSPECT VARIABLE TUMBLE CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Remove variable tumble control solenoid valve. • Turn ignition key to ON (Engine OFF). • Measure voltage between PCM terminal 4T (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power supply, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2010 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2088 [L3]

C6U010202000W05

DTC P2088	OCV actuator circuit low
DETECTION CONDITION	• PCM monitors OCV voltage. If PCM detects OCV control voltage (calculated from OCV) is below the threshold voltage (calculated from battery positive voltage), PCM determines that OCV circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Poor connection of connectors at PCM and/or OCV • Short to ground in wiring harness between OCV terminal A and PCM terminal 4M • Open circuit in wiring harness between main relay and OCV terminal B • Open circuit in wiring harness between OCV terminal A and PCM terminal 4M • OCV malfunction • PCM malfunction



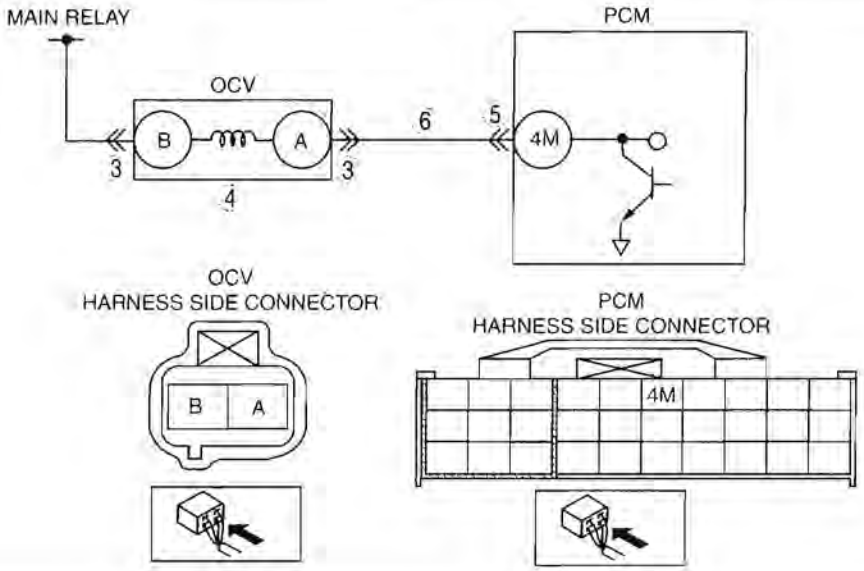
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT OCV CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT OCV** • Perform OCV inspection. (See 01–10A–34 OIL CONTROL VALVE (OCV) INSPECTION [L3].) • Is OCV okay?	Yes	Go to next step.
		No	Replace OCV, then go to Step 9.
5	**INSPECT OCV POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Disconnect OCV connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between variable tumble control solenoid valve terminal B (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection at PCM terminal 4M. (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
7	**INSPECT OCV CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between OCV terminal A (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 9.
		No	Go to next step.
8	**INSPECT OCV CONTROL CIRCUIT FOR OPEN CIRCUIT** • Connect OCV connector. • Turn ignition key to ON (Engine OFF). • Check continuity between OCV terminal A (harness-side) and PCM terminal 4M (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open or short to ground circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2088 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2089 [L3]

C6U010202000W06

DTC P2089	OMP actuator circuit high
DETECTION CONDITION	• PCM monitors OCV voltage. If PCM detects OCV control voltage (calculated from OCV) is above the threshold voltage (calculated from battery positive voltage), PCM determines that OCV circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Poor connection at PCM and/or OCV connectors • Short to power supply in wiring between OCV terminal A and PCM terminal 4M • OCV malfunction • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT OCV CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**INSPECT OCV** • Perform OCV inspection. (See 01–10A–34 OIL CONTROL VALVE (OCV) INSPECTION [L3].) • Is OCV okay?	Yes	Go to next step.
		No	Replace OCV, then go to Step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection at PCM terminal 4M. (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 7.
		No	Go to next step.
6	**INSPECT OCV CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Remove OCV. • Turn ignition key to ON (Engine OFF). • Measure voltage between PCM terminal 4M and body ground. • Is voltage B+?	Yes	Repair or replace harness for short to power supply, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2089 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2096 [L3]

C6U010202000W07

DTC P2096	Target A/F feedback system too lean
DETECTION CONDITION	• The PCM monitors the target A/F fuel trim when under the target A/F feedback control. If the fuel trim is more than the specification, the PCM determines that the target A/F feedback system too lean. **Diagnostic support note** • This is a continuous monitor. (FUEL SYSTEM) • MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Exhaust gas leakage • Rear HO2S malfunction • IAT sensor malfunction • ECT sensor malfunction • Air suction in intake-air system • Front HO2S malfunction • MAF sensor malfunction • Insufficient fuel line pressure • Fuel pump unit malfunction • Fuel leakage • Improper operation ignition system • Insufficient engine compression • Fuel injector malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then ON position (Engine off). • Verify the related pending code or stored DTCs using WDS or equivalent. • Is the DTC P2177 or P2187 also present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01–02A–13 DTC TABLE [L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2096 on freeze frame data?	Yes	Go to the next step.
		No	Go to troubleshooting for DTC on FREEZE FRAME DATA. (See 01–02A–13 DTC TABLE [L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS OF REAR HO2S** • Start the engine and warm it up completely. • Access O2S12 PID using WDS or equivalent. • Read O2S12 PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading okay? — **More than 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Less than 0.45 V** just after release of accelerator pedal (lean condition).	Yes	Go to the next step.
		No	Visually inspect for the exhaust gas leakage between TWC and rear HO2S. • If there is no leakage, replace rear HO2S. (See 01–15A–1 EXHAUST SYSTEM REMOVAL/ INSTALLATION [L3].) Then go to Step 17.
6	**VERIFY CURRENT INPUT SIGNAL STATUS (KEY TO ON/IDLE)** • Access APP, APP1, APP2, ECT, MAF, TP and VSS PIDs using WDS or equivalent. • Is there any signal that is far out of specification when key is ON and engine runs?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 17.
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as Step 6 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes? • Turn key to OFF. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 17.
		No	Go to the next step.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Start the engine and warm it up completely. • Access O2S11 PID using WDS or equivalent. • Read O2S11 PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading okay? — **More than 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Less than 0.45 V** just after release of accelerator pedal (lean condition).	Yes	Go to the next step.
		No	Visually inspect for the exhaust gas leakage between exhaust manifold and front HO2S. • If there is no leakage, replace front HO2S. (See 01–15A–1 EXHAUST SYSTEM REMOVAL/ INSTALLATION [L3].)
9	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Start the engine. • Access the MAF PID using WDS or equivalent. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace MAF/IAT sensor, then go to Step 17.
10	**INSPECT INTAKE-AIR SYSTEM FOR EXCESSIVE AIR SUCTION** • Visually inspect for loosen, cracks or damages hose in intake-air system. • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 17.
		No	Go to the next step
11	**INSPECT FUEL LINE PRESSURE** • Perform the "fuel line pressure inspection". (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 13.
12	**INSPECT FUEL SYSTEM FOR FUEL LEAKAGE** • Visually inspect fuel leakage in the fuel system. • Is there fuel leakage?	Yes	Repair or replace the malfunctioning part, then go to Step 17.
		No	Replace the fuel pump unit, then go to Step 17. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
13	**INSPECT IGNITION COIL HARNESSES** • Inspect the ignition coil related harness condition (intermittent open or short) for all cylinders. • Are harness conditions normal?	Yes	Go to the next step.
		No	Repair suspected wiring harnesses, then go to Step 17.
14	**INSPECT IGNITION SYSTEM OPERATION** • Carry out spark test. (See 01–03A–66 Spark Test.) • Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to spark test result. Then go to Step 17.
15	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See 01–10A–5 COMPRESSION INSPECTION [L3].) • Is there any malfunction?	Yes	Go to the next step.
		No	Overhaul engine, then go to Step 17.
16	**INSPECT FUEL INJECTOR** • Inspect fuel injector. (See 01–14–27 FUEL INJECTOR INSPECTION [L3].) • Is there any malfunction?	Yes	Replace suspected fuel injector, then go to the next step. (See 01–14–20 FUEL INJECTOR REMOVAL/ INSTALLATION [L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
17	**VERIFY TROUBLESHOOTING OF DTC P2096 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Run "PCM Adaptive Memory Procedure Drive Mode" and "HO2S heater, HO2S and TWC Repair Verification Drive Mode". • Stop vehicle and access on board readiness test to inspect drive mode completion status. • Verify FUEL_EVAL PID changes to yes. — If not, run "HO2S heater, HO2S and TWC Repair Verification Drive Mode" again. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to the next step.
18	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2097 [L3]

C6U010202000W08

DTC P2097	Target A/F feedback system too rich
DETECTION CONDITION	• The PCM monitors the target A/F fuel trim when under the target A/F feedback control. If the fuel trim is less than specification, the PCM determines that the target A/F feedback system is too rich. **Diagnostic support note** • This is a continuous monitor. (FUEL SYSTEM) • MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Exhaust gas leakage • Rear HO2S malfunction • IAT sensor malfunction • ECT sensor malfunction • Front HO2S malfunction • Excessive fuel line pressure • Fuel pump unit malfunction • Purge solenoid valve malfunction • Insufficient engine compression • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the freeze frame data on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then ON position (Engine off). • Verify the related PENDING CODE or stored DTCs using WDS or equivalent. • Is DTC P2178 or P2188 also present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01–02A–13 DTC TABLE [L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is there DTC P2097 on freeze frame data?	Yes	Go to the next step.
		No	Go to troubleshooting for DTC on FREEZE FRAME DATA. (See 01–02A–13 DTC TABLE [L3].)

STEP	INSPECTION		ACTION
5	**VERIFY CURRENT INPUT SIGNAL STATUS OF REAR HO2S** • Start the engine and warm it up completely. • Access O2S12 PID WDS or equivalent. • Read O2S12 PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading okay? — **More than 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Less than 0.45 V** just after release of accelerator pedal (lean condition).	Yes	Go to the next step.
		No	Visually inspect for the exhaust gas leakage between TWC and rear HO2S. • If there is no leakage, replace rear HO2S. (See 01–15A–1 EXHAUST SYSTEM REMOVAL/ INSTALLATION [L3].) Then go to Step 11.
6	**VERIFY CURRENT INPUT SIGNAL STATUS (KEY TO ON/IDLE)** • Access APP, APP1, APP2, ECT, MAF, TP and VSS PIDs using WDS or equivalent. • Is there any signal that is far out of specification when key is ON and engine runs?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 11.
		No	Go to the next step.
7	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as Step 6 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step
		No	Go to the next step.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Start the engine and warm it up completely. • Access O2S11 PID using WDS or equivalent. • Read O2S11 PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading normal? — **More than 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Less than 0.45 V** just after release of accelerator pedal (lean condition).	Yes	Go to the next step.
		No	Visually inspect for the exhaust gas leakage between exhaust manifold and front HO2S. • If there is no leakage, replace front HO2S. (See 01–15A–1 EXHAUST SYSTEM REMOVAL/ INSTALLATION [L3].) Then go to Step 11.
9	**INSPECT FUEL LINE PRESSURE** • Perform the "fuel line pressure inspection". (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is there any malfunction?	Yes	Replace the fuel pump unit, then go to Step 11. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
		No	Go to the next step.
10	**INSPECT LONG TERM FUEL TRIM** • Access LONGFT1 PID using WDS or equivalent. • Compare the LONGFT1 PID with recorded freeze frame data at Step1. • Is the LONGFT1 PID above freeze frame data?	Yes	Inspect purge solenoid valve. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.) • If there is any malfunction, replace purge solenoid valve. (See 01–13A–3 VACUUM HOSE ROUTING DIAGRAM [L3].) Then go to Step 11.
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P2097 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Run "PCM Adaptive Memory Procedure Drive Mode" and "HO2S heater, HO2S and TWC Repair Verification Drive Mode". • Stop vehicle and access on board readiness test to inspect drive mode completion status. • Verify FUEL_EVAL PID changes to yes. — If not, run "HO2S heater, HO2S and TWC Repair Verification Drive Mode" again • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2100 [L3]

C6U010202100W01

DTC P2100	Throttle actuator circuit open
DETECTION CONDITION	• PCM monitors electronic throttle valve motor current. If PCM detects electronic throttle valve motor current is below the threshold current, PCM determines that electronic throttle valve motor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Throttle valve motor malfunction • Open circuit between throttle body terminal F and PCM terminal 4Y • Short to ground between throttle body terminal F and PCM terminal 4Y • Open circuit between throttle body terminal E and PCM terminal 4AB • Short to ground between throttle body terminal E and PCM terminal 4AB • Short to power supply between throttle body terminal E and PCM terminal 4AB • Poor connection of throttle body connector or PCM connector • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear DTC using WDS or equivalent. • Start the engine and let it idle. • Is same PENDING CODE present?	Yes	Go to next step.
		No	Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01–03A–2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].)
4	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect throttle body connector. • Check for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
5	**INSPECT THROTTLE VALVE ELECTRICAL MALFUNCTION** • Measure resistance between throttle body terminal E and F (part-side). • Is resistance approx. **1.3 ohms**?	Yes	Go to next step.
		No	Replace throttle body, then go to Step 14.
6	**CLASSIFY MALFUNCTION ET POWER SUPPLY CIRCUIT OR CONTROL CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between throttle body terminal F (harness-side) and body ground. • Is voltage **B+**?	Yes	Malfunction at control circuit. Go to Step 10.
		No	Malfunction at power supply circuit. Go to next step.

STEP	INSPECTION		ACTION
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 14.
		No	Go to next step.
8	**INSPECT POWER CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Check continuity between throttle body terminal F (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 14.
		No	Go to next step.
9	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between throttle body terminal F (harness-side) and PCM terminal 4Y (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 14.
10	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 14.
		No	Go to next step.
11	**INSPECT CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key to ON (Engine OFF). • Measure voltage between throttle body terminal E (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power supply, then go to Step 14.
		No	Go to next step.
12	**INSPECT CONTROL CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Check continuity between throttle body terminal E (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 14.
		No	Go to next step.
13	**INSPECT CONTROL CIRCUIT MALFUNCTION FOR OPEN CIRCUIT** • Check continuity between throttle body terminal E (harness-side) and PCM terminal 4AB (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
14	**VERIFY TROUBLESHOOTING OF DTC P2100 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2101 [L3]

C6U010202100W02

DTC P2101	Throttle actuator circuit range/performance
DETECTION CONDITION	• If the PCM detects any of the following conditions, PCM determines that throttle circuit has malfunction. — Default throttle angle that PCM memorized and the throttle angle with ET control relay OFF is not much. — Voltage from ET control relay is too high or too low — PCM detects big voltage difference between from ET control relay and from main relay — PCM internal malfunction **Diagnostic support note** • This is a continuous monitor. • MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• ET control relay and related circuit malfunction • Main relay and related circuit malfunction • Throttle position sensor No.1 and related circuit malfunction • Throttle position sensor No.2 and related circuit malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING AND STORED DTCS** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending and stored DTCs using WDS or equivalent. • Is any DTC present?	Yes	Go to appropriate DTC troubleshooting procedure.
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2101 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 22.
		No	Go to next step.
6	**INSPECT MAIN RELAY OUTPUT VOLTAGE** • Turn ignition key to OFF. • Connect PCM connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between PCM terminal 2Y and body ground. • Is voltage **B+**?	Yes	Go to Step 13.
		No	Go to next step.
7	**INSPECT MAIN RELAY CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect main relay. • Inspect for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 22.
		No	Go to next step.

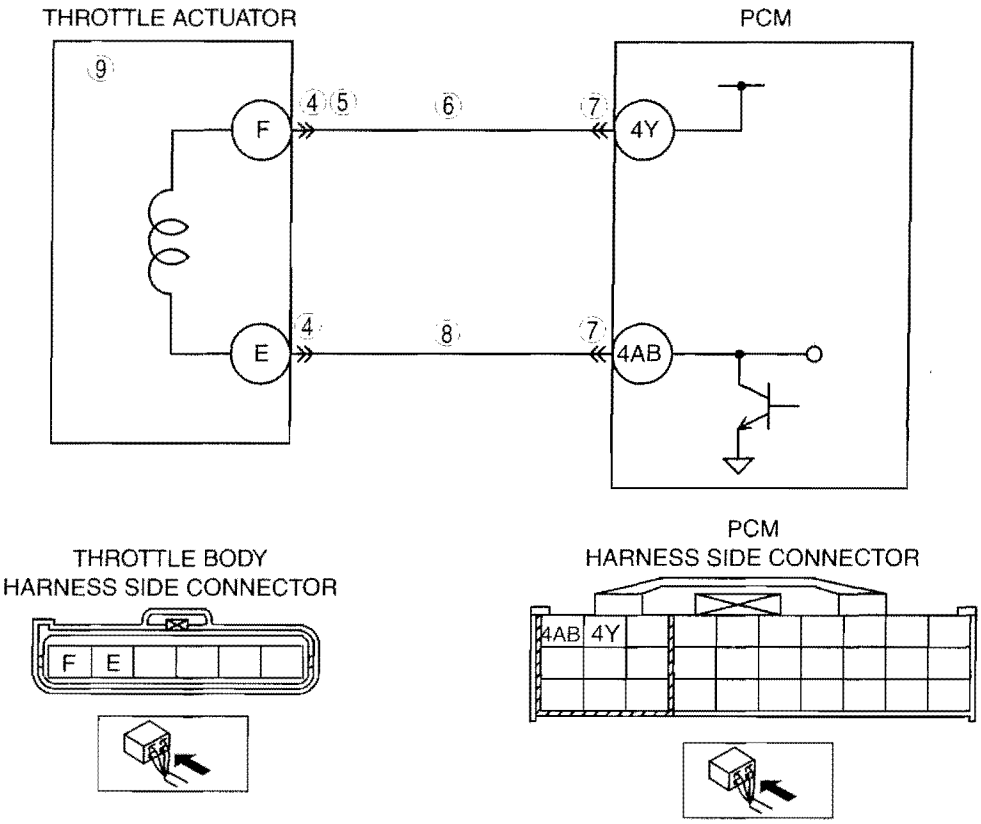
STEP	INSPECTION		ACTION
8	**INSPECT POWER SUPPLY OF MAIN RELAY** • Turn ignition key to ON (Engine OFF). • Measure voltage between main relay terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 22.
9	**INSPECT POWER SUPPLY FOR CONTROL CIRCUIT OF MAIN RELAY** • Turn ignition key to ON (Engine OFF). • Measure voltage between main relay terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Go to Step 22.
10	**INSPECT MAIN RELAY** • Inspect main relay. (See 09–21–6 RELAY INSPECTION.) • Is main relay okay?	Yes	Go to next step.
		No	Replace main relay, then go to Step 22.
11	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Disconnect main relay and PCM connector. • Check continuity between main relay terminal C (harness-side) and PCM terminal 2Y (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 22.
12	**INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Check continuity between main relay terminal E (harness-side) and PCM terminal 2X (harness-side). • Is there continuity?	Yes	Repair or replace harness for open circuit, then go to Step 22.
		No	Go to Step 22.
13	**INSPECT ET CONTROL RELAY OUTPUT VOLTAGE** • Turn ignition key to ON (Engine OFF). • Measure voltage between PCM terminal 4V (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to Step 20.
		No	Go to next step.
14	**INSPECT POOR CONNECTION OF ET CONTROL RELAY CONNECTOR** • Turn ignition key to OFF. • Disconnect ET control relay. • Check ET control relay connector (harness-side) for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 22.
		No	Go to next step.
15	**INSPECT POWER SUPPLY OF ET CONTROL RELAY** • Turn ignition key to ON (Engine OFF). • Measure voltage between ET control relay terminal D (harness-side) and body ground.	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 22.
16	**INSPECT POWER SUPPLY FOR CONTROL CIRCUIT OF ET CONTROL RELAY** • Turn ignition key to ON (Engine OFF). • Measure voltage between ET control relay terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit between ET control relay terminal A and main relay terminal C, then go to Step 22.
17	**INSPECT ET CONTROL RELAY** • Inspect ET control relay. (See 09–21–6 RELAY INSPECTION.) • Is ET control relay okay?	Yes	Go to next step.
		No	Replace ET control relay, then go to Step 22.
18	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between ET control relay terminal C (harness-side) and PCM terminal 4V (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 22.

STEP	INSPECTION		ACTION
19	**INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Check continuity between ET control relay E (harness-side) and PCM terminal 3S (harness-side).	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 22.
20	**INSPECT THROTTLE POSITION SENSOR NO.1 OUTPUT VOLTAGE** • Turn ignition key to OFF. • Connect PCM connector. • Turn ignition key to ON (Engine OFF). • Check voltage between PCM terminal 3M and body ground. • Is voltage **0.40—0.60 V**?	Yes	Go to next step.
		No	Check throttle position sensor No.1 and related circuits and terminal. (See 01–40A–32 THROTTLE POSITION (TP) SENSOR INSPECTION [L3].) Repair or replace if necessary, then go to Step 22.
21	**INSPECT THROTTLE POSITION SENSOR NO.2 OUTPUT VOLTAGE** • Turn ignition key to ON (Engine OFF). • Check voltage between PCM terminal 3J and body ground. • Is voltage **4.40—4.60 V**?	Yes	Go to next step.
		No	Check throttle position sensor No.2 and related circuits and terminal. (See 01–40A–32 THROTTLE POSITION (TP) SENSOR INSPECTION [L3].) Repair or replace as necessary, then go to next step.
22	**VERIFY TROUBLESHOOTING OF DTC P2101 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and run it at idle. • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
23	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2102 [L3]

C6U010202100W03

DTC P2102	Throttle actuator circuit low input
DETECTION CONDITION	• PCM monitors the throttle actuator circuit current. PCM detects throttle actuator circuit current excessive low, PCM determines that the throttle actuator circuit malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Open circuit between throttle body terminal F and PCM terminal 4Y • Open circuit between throttle body terminal E and PCM terminal 4AB • Short to ground circuit between throttle body terminal F and PCM terminal 4Y • Short to ground circuit between throttle body terminal E and PCM terminal 4AB • Poor connection of throttle body or PCM connector • Throttle valve motor malfunction • PCM malfunction



Diagnostic procedure

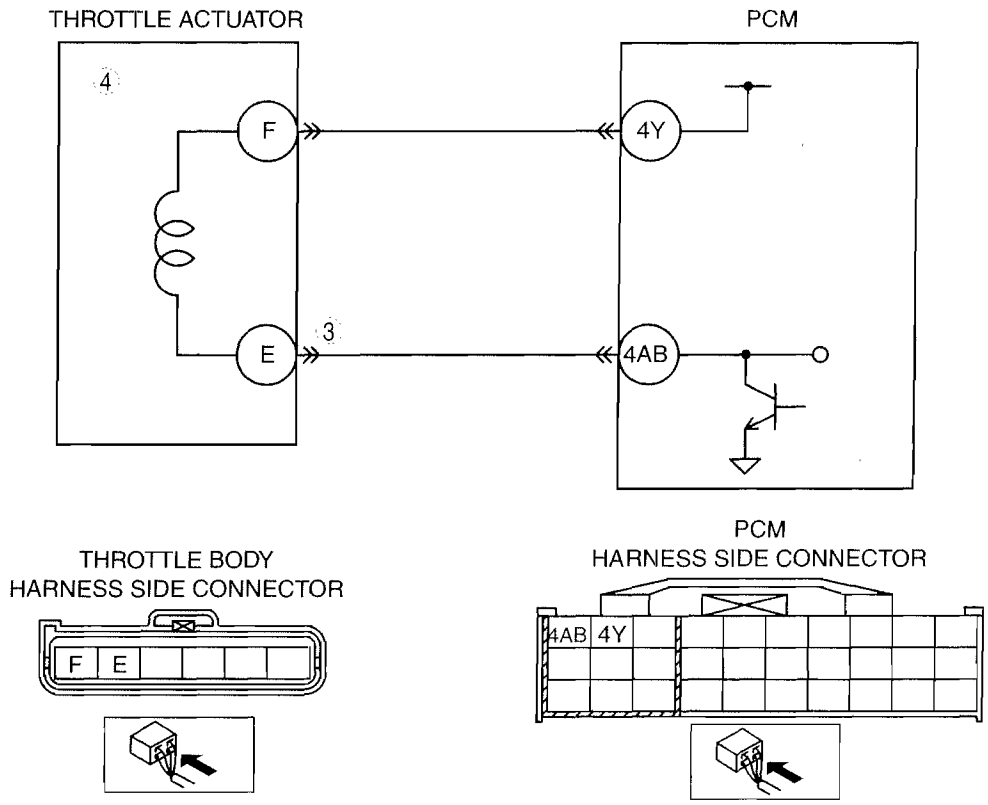
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.

STEP	INSPECTION		ACTION
3	**VERIFY RELATED PENDING CODE AND STORED DTCS** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending and/or stored DTCs using WDS or equivalent. • Is the DTC P2100 also present?	Yes	Go to appropriate DTC troubleshooting procedure, then go to Step 10.
		No	Go to next step.
4	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect throttle body connector. • Inspect for poor connection (such as damaged, pulled-put pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
5	**INSPECT POWER SUPPLY CIRCUIT OF THROTTLE ACTUATOR FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between throttle body terminal F (harness-side) and body ground. • Is voltage B+?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 10.
6	**INSPECT POWER SUPPLY CIRCUIT OF THROTTLE ACTUATOR FOR SHORT TO GROUND** • Turn ignition key to OFF. • Check continuity between throttle body terminal F (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground circuit, then go to Step 10.
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
8	**INSPECT CONTROL CIRCUIT OF THROTTLE ACTUATOR FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between throttle body terminal E (harness-side) and PCM terminal 4AB (harness-side). • Is there continuity?	Yes	Repair or replace harness for open circuit, then go to Step 10.
		No	Go to next step.
9	**INSPECT THROTTLE ACTUATOR** • Inspect throttle actuator. (See 01–13A–8 THROTTLE ACTUATOR INSPECTION [L3].) • Is it okay?	Yes	Go to next step.
		No	Replace throttle body, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P2102 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2103 [L3]

C6U010202100W04

DTC P2103	Throttle actuator circuit high input
DETECTION CONDITION	• PCM monitors the throttle actuator circuit current. PCM detects throttle actuator circuit current excessive high, PCM determines that the electronic throttle actuator circuit malfunction. **Diagnostic support note** • This is a continuous monitor (other). • MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Short to power supply between throttle body terminal E and PCM terminal 4AB • Throttle valve motor malfunction • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT CONTROL CIRCUIT OF THROTTLE ACTUATOR FOR SHORT TO POWER SUPPLY** • Turn ignition key to OFF. • Disconnect throttle body and PCM connectors. • Turn ignition key to ON (Engine OFF). • Measure voltage between throttle body terminal E (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power supply, then go to Step 5.
		No	Go to next step.
4	**INSPECT THROTTLE ACTUATOR** • Inspect throttle actuator. (See 01–13A–8 THROTTLE ACTUATOR INSPECTION [L3].) • Is it okay?	Yes	Go to next step.
		No	Replace throttle body, then go to next step.
5	**VERIFY TROUBLESHOOTING OF DTC P2103 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2107 [L3]

C6U010202100W05

DTC P2107	Throttle actuator control module processor
DETECTION CONDITION	• If the PCM detects any of the following conditions, PCM determines that throttle actuator control module processor has malfunction. — Electronic throttle control has malfunction. — Target throttle opening angle is more than actual throttle opening angle. **Diagnostic support note** • This is an intermittent monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear DTC using WDS or equivalent. • Start the engine and let it idle. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2108 [L3]

C6U010202100W06

DTC P2108	Throttle actuator control module performance
DETECTION CONDITION	• PCM detects either following conditions, PCM determines that throttle actuator control system has malfunction. — TP sensor power supply voltage **below 4.4 V** — TP sensor No.1 output voltage **below 0.20 V or above 4.85 V** (DTC P0122 or P0123) — TP sensor No.2 output voltage **below 0.20 V or above 4.85 V** (DTC P0222 or P0223) — PCM internal circuit for TP sensor No.1 input circuit malfunction. — Wrong communication between main CPU and throttle control system CPU in PCM internal **Diagnostic support note** • This is an intermittent monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• TP sensor No.1 malfunction • TP sensor No.2 malfunction • Connector or terminal malfunction • Open circuit between throttle body terminal A and PCM terminal 3M • Short to ground between throttle body terminal A and PCM terminal 3M • Open circuit between throttle body terminal E and PCM terminal 3N • Open circuit between throttle body terminal D and PCM terminal 3K • Short to constant voltage supply between throttle body terminal A and PCM terminal 3M • Short to constant voltage supply between throttle body terminal C and PCM terminal 3J • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE AND STORED DTCS** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending and/or stored DTCs using WDS or equivalent. • Is the DTC P0122, P0123, P0222 or P0223 also present?	Yes	Go to appropriate DTC troubleshooting procedure, then go to Step 7.
		No	Go to next step.
4	**VERIFY INTERMITTENT MALFUNCTION AT TP SENSOR NO.1 CIRCUIT** • Perform INTERMITTENT TROUBLESHOOTING procedure to TP sensor No.1 related harnesses and connectors. (See 01-03A-2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].) • Is there any malfunction?	Yes	Repair or replace malfunctioning part, according to inspection result, the go to Step 7.
		No	Go to next step.
5	**VERIFY INTERMITTENT MALFUNCTION AT TP SENSOR NO.2 CIRCUIT** • Perform INTERMITTENT TROUBLESHOOTING procedure to TP sensor No.2 related harnesses and connectors. (See 01-03A-2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].) • Is there any malfunction	Yes	Repair or replace malfunctioning part, according to inspection result, the go to Step 7.
		No	Go to next step.
6	**INSPECT TP SENSOR** • Inspect TP sensor. • Is TP sensor okay?	Yes	Go to next step.
		No	Replace throttle body, then go to nest step.
7	**VERIFY TROUBLESHOOTING OF DTC P2108 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to ON (Engine OFF). • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01-40A-6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01-02A-8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2119 [L3]

C6U010202100W07

DTC P2119	Throttle actuator control throttle body range/performance
DETECTION CONDITION	• If the PCM detects that actual throttle angle signal voltage is higher than default throttle angle voltage after turn ignition key to OFF, PCM determines that throttle actuator control throttle body has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Damaged throttle valve return spring (in throttle body) • Stuck throttle valve • PCM malfunction

Diagnostic procedure

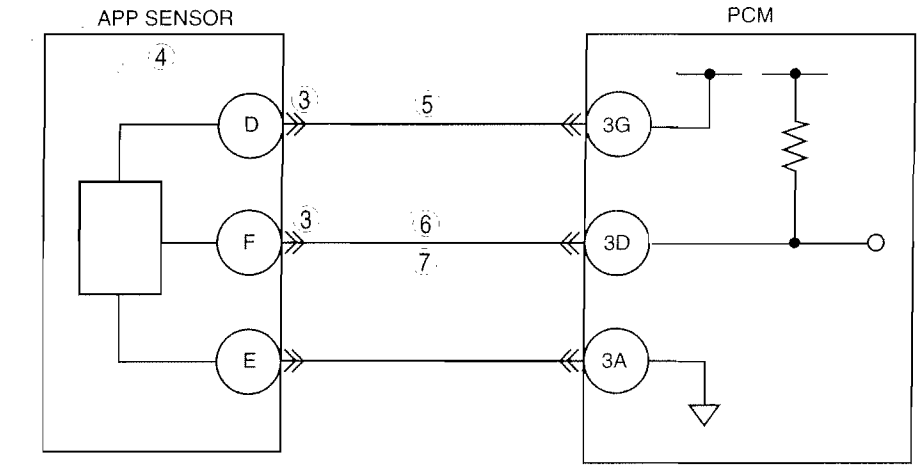
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING AND STORED DTCS** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending and stored DTCs using WDS or equivalent. • Is any DTC present?	Yes	Go to appropriate DTC troubleshooting procedure.
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2119 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**INSPECT OPENING ANGLE OF THROTTLE VALVE** • Remove air hose from throttle body. • Visually inspect throttle valve opening angle. **Default angle:** **Approx. 7 degree** • Is throttle valve opened widely?	Yes	Replace throttle valve body, then go to Step 8.
		No	Go to next step.
6	**INSPECT FOREIGN MATERIAL ON THE THROTTLE VALVE** • Remove air hose from throttle body. • Visually inspect throttle valve. • Is there any contamination or foreign material around throttle valve?	Yes	Clean throttle valve, then go to next step.
		No	Go to next step.
7	**INSPECT THROTTLE VALVE STUCK** • Turn ignition key to ON (Engine OFF). • Clear DTC using WDS or equivalent. • Proceed Throttle Position (TP) Sweep Inspection. (See 01–03A–63 Throttle position (TP) sweep inspection.) • Does throttle valve open smoothly?	Yes	Clean throttle valve, then go to next step.
		No	Replace throttle valve body, then go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2119 COMPLETED** • Clear DTC using WDS or equivalent. • Start the engine and race the engine several times. • Turn ignition key to OFF then ON (Engine OFF). • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.

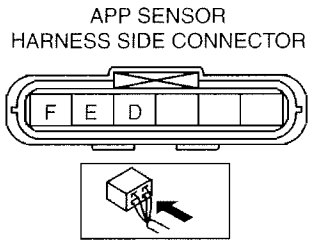
STEP	INSPECTION		ACTION
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

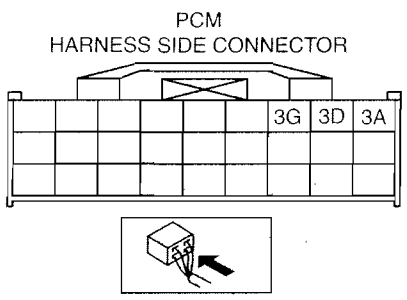
DTC P2122 [L3]

C6U010202100W08

DTC P2122	Accelerator pedal position (APP) sensor No.1 circuit low input
DETECTION CONDITION	• The PCM monitors APS No.1 signal at PCM terminal 3D. If the PCM detected APP sensor No.1 voltage **below 0.2 V**, the PCM determines that the APP sensor No.1 circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor malfunction • Connector or terminal malfunction • Open circuit between APP sensor terminal F and PCM terminal 3D • Short to ground circuit between APP sensor terminal F and PCM terminal 3D • Open circuit between APP sensor terminal D and PCM terminal 3G







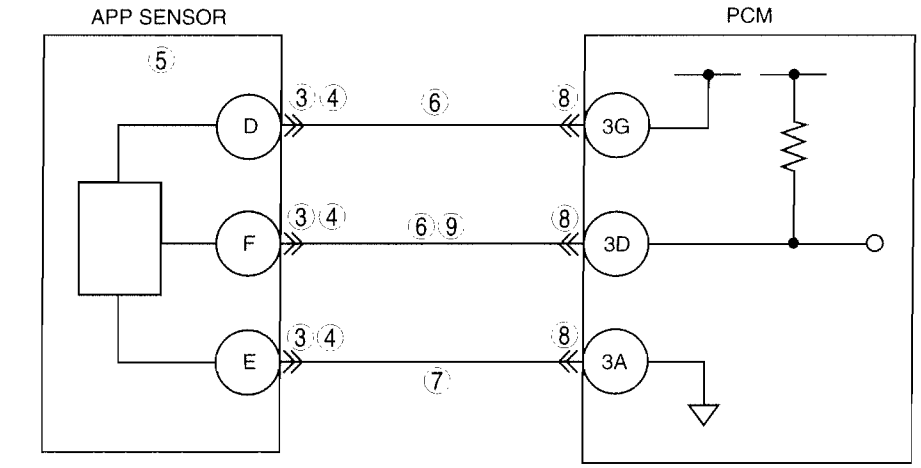
Diagnostic procedure

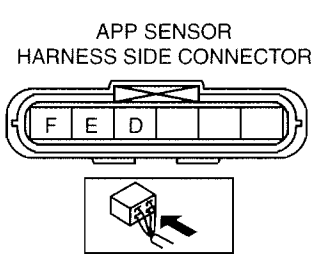
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY APP SENSOR OR HARNESS MALFUNCTION** • Connect WDS or equivalent. • Access APP1 PID. • Disconnect throttle body connector. • Connect a jumper wire between APP sensor terminals D and F (harness-side). • Is PID **approx. 100%**?	Yes	Go to next step.
		No	Go to step 5.
4	**INSPECT APP SENSOR** • Perform APP sensor inspection. (See 01–40A–31 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [L3].) • Is APP sensor okay?	Yes	Inspect for poor APP sensor connector terminal D connection. Repair or replace if necessary, then go to Step 8.
		No	Replace APP sensor, then go to Step 8.
5	**INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT APP SENSOR CONNECTOR** • Turn ignition key to ON (Engine OFF). • Measure voltage at APP sensor terminal D (harness-side). • Is voltage **within 4.5—5.5 V**?	Yes	Go to next step.
		No	Repair or replace open circuit between APP sensor connector terminal D and PCM connector terminal 3G (harness-side). Then, then go to Step 8.
6	**VERIFY APP1 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Inspect continuity between APP sensor terminal F (harness-side) and PCM terminal 3D (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 8.
7	**VERIFY APP1 SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between APP sensor terminal F (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2122 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

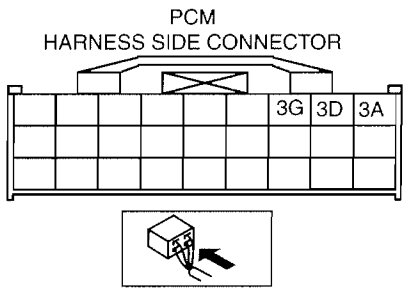
DTC P2123 [L3]

C6U010202100W09

DTC P2123	Accelerator pedal position (APP) sensor No.1 circuit high input
DETECTION CONDITION	• The PCM monitors APP sensor No.1 signal at PCM terminal 3D. If the PCM detected APP sensor No.1 voltage **above 4.5 V**, the PCM determines that the APP sensor No.1 circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor malfunction • Connector or terminal malfunction • Open circuit between APP sensor terminal E and PCM terminal 3A • Open circuit between APP sensor terminal F and PCM terminal 3D • Short to constant voltage supply circuit between APP sensor terminal F and PCM terminal 3D







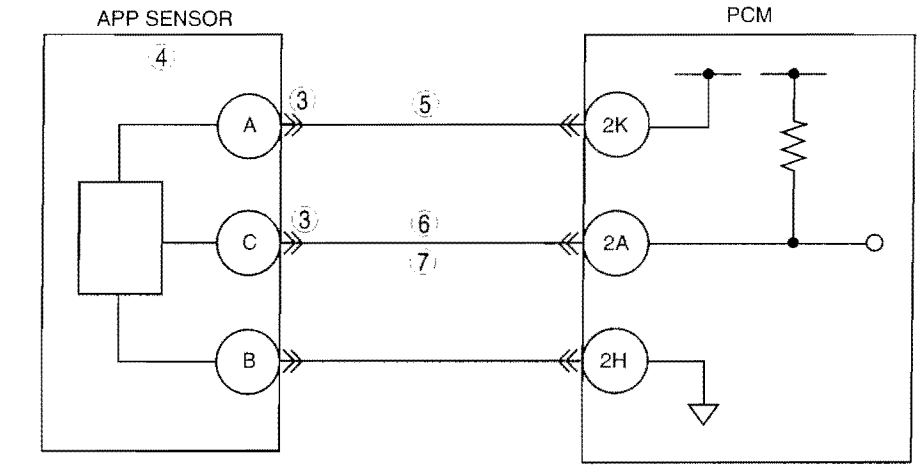
Diagnostic procedure

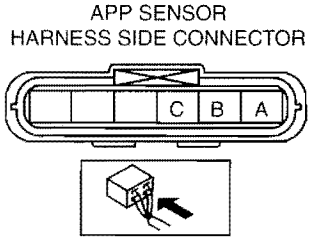
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT APP SENSOR CONNECTOR** • Turn ignition key to OFF. • Verify that the APP sensor connector is connected securely. • Is connector okay?	Yes	Go to next step.
		No	Connect the connector securely, then go to Step 10.
4	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Disconnect APP sensor connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace suspected terminal, then go to Step 10.
		No	Go to next step.
5	**INSPECT APP SENSOR** • Perform APP sensor inspection. (See 01–40A–31 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [L3].) • Is APP sensor okay?	Yes	Go to next step.
		No	Replace APP sensor, then go to Step 10.
6	**INSPECT APP1 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key to ON (Engine OFF). • Measure voltage between APP sensor terminal F (harness-side) and body ground. • Is voltage **above 4.9**?	Yes	Repair or replace short to power supply. Then, go to Step 10.
		No	Go to next step.
7	**VERIFY APP SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Disconnect PCM connector. • Inspect continuity between APP sensor terminal E (harness side) and PCM terminal 3A (harness side). • Is there continuity?	Yes	Repair or replace open circuit between APP sensor terminal F (harness-side) and PCM connector terminal 3D (harness-side). Then, go to Step 10.
		No	Go to next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 10.
		No	Go to next step.
9	**VERIFY TP SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT** • Inspect continuity between throttle body terminals D and F (harness side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P2123 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

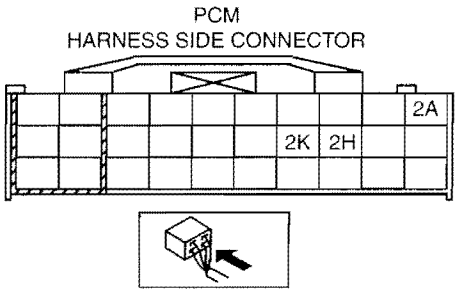
DTC P2127 [L3]

C6U010202100W10

DTC P2127	Accelerator pedal position (APP) sensor No.2 circuit low input
DETECTION CONDITION	• The PCM monitors APP sensor No.2 signal at PCM terminal 2A. If the PCM detected APP sensor No.2 voltage **below 0.2 V**, the PCM determines that the APP sensor No.2 circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor malfunction • Connector or terminal malfunction • Open circuit between APP sensor terminal C and PCM terminal 2A • Short to ground circuit between APP sensor terminal C and PCM terminal 2A • Open circuit between APP sensor terminal A and PCM terminal 2K







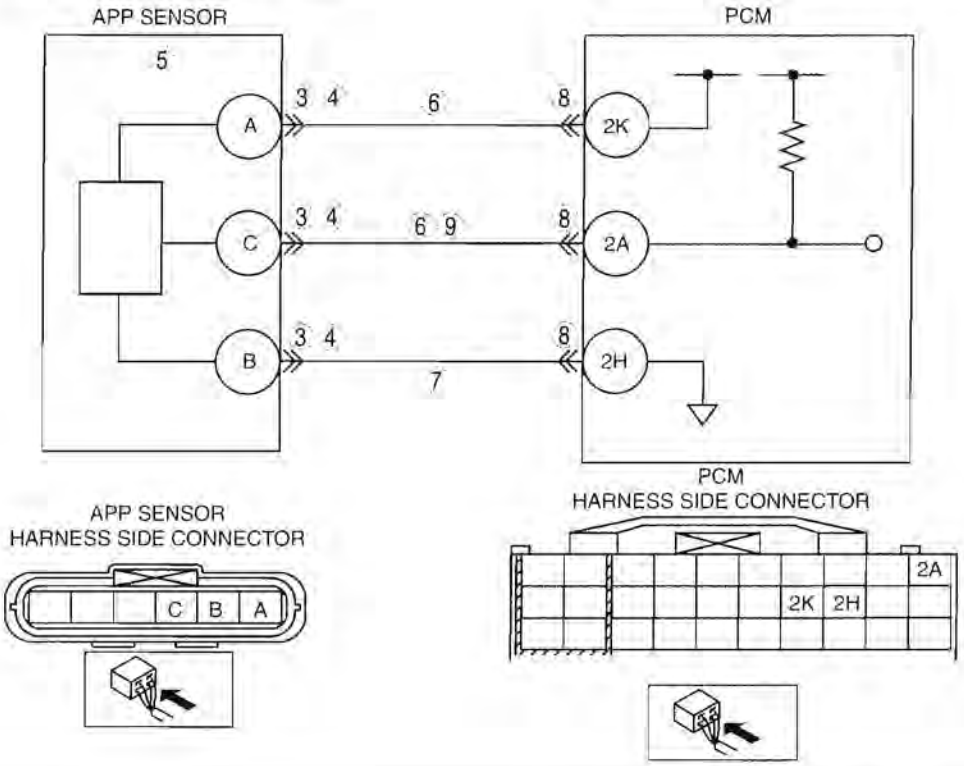
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY APP SENSOR OR HARNESS MALFUNCTION** • Connect WDS or equivalent. • Access APP2 PID. • Disconnect throttle body connector. • Connect a jumper wire between APP sensor terminals A and C (harness-side). • Is PID **approx. 100%**?	Yes	Go to next step.
		No	Go to step 5.
4	**INSPECT APP SENSOR** • Perform APP sensor inspection. (See 01–40A–31 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [L3].) • Is APP sensor okay?	Yes	Inspect for poor APP sensor connector terminal A connection. Repair or replace if necessary, then go to Step 8.
		No	Replace APP sensor, then go to Step 8.
5	**INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT APP SENSOR CONNECTOR** • Turn ignition key to ON (Engine OFF). • Measure voltage at APP sensor terminal A (harness-side). • Is voltage **within 4.5—5.5 V**?	Yes	Go to next step.
		No	Repair or replace open circuit between APP sensor connector terminal A and PCM connector terminal 2K (harness-side). Then, then go to Step 8.
6	**VERIFY APP2 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Inspect continuity between APP sensor terminal C (harness-side) and PCM terminal 2A (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 8.
7	**VERIFY APP2 SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between APP sensor terminal C (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2127 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2128 [L3]

C6U01020100W11

DTC P2128	Accelerator pedal position (APP) sensor No.2 circuit high input
DETECTION CONDITION	• The PCM monitors APP sensor No.2 signal at PCM terminal 2A. If the PCM detected APP sensor No.2 voltage **above 4.5 V**, the PCM determines that the APP sensor No.2 circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor malfunction • Connector or terminal malfunction • Open circuit between APP sensor terminal B and PCM terminal 2H • Open circuit between APP sensor terminal C and PCM terminal 2A • Short to constant voltage supply circuit between APP sensor terminal C and PCM terminal 2A



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT APP SENSOR CONNECTOR** • Turn ignition key to OFF. • Verify that the APP sensor connector is connected securely. • Is connector okay?	Yes	Go to next step.
		No	Connect the connector securely, then go to Step 10.
4	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Disconnect APP sensor connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace suspected terminal, then go to Step 10.
		No	Go to next step.
5	**INSPECT APP SENSOR** • Perform APP sensor inspection. (See 01–40A–31 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [L3].) • Is APP sensor okay?	Yes	Go to next step.
		No	Replace APP sensor, then go to Step 10.
6	**INSPECT APP2 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key to ON (Engine OFF). • Measure voltage between APP sensor terminal C (harness-side) and body ground. • Is voltage **above 4.9 V**?	Yes	Repair or replace short to power supply. Then, go to Step 10.
		No	Go to next step.
7	**VERIFY APP SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Disconnect PCM connector. • Inspect continuity between APP sensor terminal B (harness-side) and PCM terminal 2H (harness-side). • Is there continuity?	Yes	Repair or replace open circuit between APP sensor terminal C (harness-side) and PCM connector terminal 2A (harness-side). Then, go to Step 10.
		No	Go to next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 10.
		No	Go to next step.
9	**VERIFY APP SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT** • Inspect continuity between throttle body terminals A and C (harness-side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P2128 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2135 [L3]

C6U010202100W12

DTC P2135	TP sensor No.1/No.2 voltage correlation
DETECTION CONDITION	• PCM compare throttle position sensor No.1 signal value and throttle position sensor No.2 signal value and if the both signal correlation is out of specification, PCM determines that the throttle position sensor has malfunction. **Diagnostic support note** • This is a continuous monitor. • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• TP sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING AND STORED DTCS** • Turn ignition key to OFF, then ON (Engine OFF). • Verify opening and stored DTCs using WDS or equivalent. • Is any DTC present?	Yes	Go to appropriate DTC troubleshooting procedure.
		No	Go to next step.
4	**IDENTIFY TRIGGER TC FOR FREEZE FRAME DATA** • Is DTC P2135 on FREEZE FRAME DATA?	Yes	Inspect TP sensor and replace it if necessary, then go to next step.
		No	Go to troubleshooting procedures fro DTC on FREEZE FRAME DATA.
5	**VERIFY TROUBLESHOOTING OF DTC P2135 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start the engine and race the engine several times. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2138 [L3]

C6U010202100W13

DTC P2138	Accelerator pedal position (APP) sensor No.1/No.2 voltage correlation
DETECTION CONDITION	• PCM compare accelerator pedal position sensor No.1 signal value and accelerator pedal position sensor No.2 signal value and if the both signal correlation is out of specification, PCM determines that the accelerator pedal position sensors have malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Accelerator position sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING AND STORED DTCS** • Turn ignition key to OFF, then ON (Engine OFF). • Verify opening and stored DTCs using WDS or equivalent. • Is any DTC present?	Yes	Go to appropriate DTC troubleshooting procedure.
		No	Go to next step.
4	**IDENTIFY TRIGGER TC FOR FREEZE FRAME DATA** • Is DTC P2138 on FREEZE FRAME DATA?	Yes	Inspect accelerator position sensor No.1/No.2 and replace it if necessary, then go to next step.
		No	Go to troubleshooting procedures fro DTC on FREEZE FRAME DATA.
5	**VERIFY TROUBLESHOOTING OF DTC P2138 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Depress accelerator pedal several times. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2177 [L3]

C6U010202100W14

DTC P2177	Fuel system too lean at off idle
DETECTION CONDITION	• PCM monitors short term fuel trim (SHRTFT), long term fuel trim (LONGFT) during closed loop fuel control at off-idle. If the LONGFT or the sum total of these fuel trims exceed preprogrammed criteria. PCM determines that fuel system is too lean at off-idle. **Diagnostic support note** • This is a continuous monitor. (FUEL SYSTEM) • MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Misfire • Front HO2S deterioration • Front HO2S heater malfunction • MAF sensor malfunction • Pressure regulator (built-in fuel pump unit) malfunction • Fuel pump malfunction • Clogged or restricted fuel filter • Fuel leakage from fuel line between fuel delivery pipe and fuel pump • Exhaust system leakage • Purge solenoid valve improper operation • Purge solenoid valve malfunction (stuck open) • Purge solenoid hoses improper connection • Air suction in intake-air system • Insufficient engine compression • Variable valve timing control system improper operation • PCM malfunction

01–02A

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTCs** • Turn ignition switch to OFF, then ON (Engine OFF). • Verify related pending code or stored DTCs. • Is other DTC present?	Yes	If misfire DTC is present, go to Step 8. If other DTC is present, go to appropriate DTC troubleshooting procedure. (See 01–02A–13 DTC TABLE [L3].)
		No	If driveability concern is present, go to Step 8. If not, go to the next step.
4	**IDENTIFY TRIGGER TC FOR FREEZE FRAME DATA** • Is DTC P2177 on freeze frame data?	Yes	Go to the next step.
		No	Go to troubleshooting procedures fro DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (KEY TO ON/IDLE)** • Access APP, APP1, APP2, ECT, MAF, TP and VSS PIDs using WDS or equivalent. • Is there any signal that is far out of specification when key is ON and engine runs?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair or if necessary. Then go to Step 17.
		No	Go to the next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as Step 5 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect suspected sensor and related wiring harnesses repair or replace it. Then go to Step 17.
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Access O2S11 PID using WDS or equivalent. • Check PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading okay? — **Above 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Below 0.45 V** just after release of accelerator pedal (lean condition)	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between exhaust manifold and front HO2S. Then go to Step 17.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace MAF/IAT sensor, then go to Step 15.
9	**INSPECT FOR EXCESSIVE AIR SUCTION OF INTAKE AIR SYSTEM** • Visually inspect for loosen, cracks or damages hoses on intake-air system. • Is there any malfunction?	Yes	Repair or replace source of air suction, then go to Step 17.
		No	Go to the next step.
10	**INSPECT PURGE SOLENOID OPERATION** • Carry out Purge Control System Inspection. (See 01–03A–67 Purge Control System Inspection.) • Does purge control system work properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to inspection result, then go to Step 17.
11	**INSPECT FUEL LINE PRESSURE** • Turn key to OFF. **Note** • If engine will not start, inspect fuel line pressure with key ON. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure okay?	Yes	Go to Step 13.
		No	If fuel pressure is too high, replace fuel pump unit, then go to Step 17. If fuel line pressure is low, go to the next step.
12	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for any leakage. • Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 16.
		No	Inspect for foreign materials or stain inside fuel filter (low-pressure). If for foreign materials or stain inside fuel filter (low-pressure), clean of fuel tank and filter. Then go to Step 17.
13	**INSPECT IGNITION SYSTEM** • Carry out spark test. (See 01–03A–66 Spark Test.) • Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to spark test results, then go to Step 17.
14	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10A–5 COMPRESSION INSPECTION [L3].) • Is it okay?	Yes	Go to the next step.
		No	Implement engine overhaul for repairs, then go to Step 17.
15	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect variable valve timing control system operation. (See 01–03A–69 Variable Valve Timing Control System Operation Inspection.) • Does variable valve timing control system work properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to inspection results, then go to Step 17.

STEP	INSPECTION		ACTION
16	**INSPECT FUEL INJECTOR OPERATION** • Remove fuel injector. • Inspect fuel injector (resistance, injection amount). (See 01–14–27 FUEL INJECTOR INSPECTION [L3].) • Is fuel injector okay?	Yes	Go to the next step.
		No	Replace suspected fuel injector, then go to the next step.
17	**VERIFY TROUBLESHOOTING OF DTC P2177 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Run "PCM Adaptive Memory Procedure Drive Mode" and "HO2S heater, HO2S and TWC Repair Verification Drive Mode". • Stop vehicle and access on board readiness test to inspect drive mode completion status. • Verify FUEL_EVAL PID changes to yes. — If not, run "HO2S heater, HO2S and TWC Repair Verification Drive Mode" again. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to the next step.
18	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2178 [L3]

C6U010202100W15

DTC P2178	Fuel system too rich at off idle
DETECTION CONDITION	• PCM monitors short term fuel trim (SHRTFT), long term fuel trim (LONGFT) during closed loop fuel control at off-idle. If the LONGFT or the sum total of these fuel trims exceed preprogrammed criteria. PCM determines that fuel system is too rich at off-idle. **Diagnostic support note** • This is a continuous monitor. (FUEL SYSTEM) • MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Misfire • Front HO2S deterioration • Front HO2S heater malfunction • MAF sensor malfunction • Pressure regulator (built-in fuel pump unit) malfunction • Fuel pump malfunction • EGR valve improper operation • VTCS improper operation • Purge solenoid valve improper operation • Purge solenoid valve malfunction (stuck open) • Purge solenoid hoses improper connection. • Variable valve timing control system improper operation • PCV valve malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTCs** • Turn ignition switch to OFF, then ON (Engine OFF). • Verify related pending code or stored DTCs using WDS or equivalent. • Is other DTC present?	Yes	If misfire DTC is present, go to Step 8. If other DTC is present, go to appropriate DTC troubleshooting procedure. (See 01–02A–13 DTC TABLE [L3].)
		No	If driveability concern is present, go to Step 8. If not, go to the next step.
4	**IDENTIFY TRIGGER TC FOR FREEZE FRAME DATA** • Is DTC P2178 on freeze frame data?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on freeze frame data.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (KEY TO ON/IDLE)** • Access APP, APP1, APP2, ECT, MAF, TP and VSS PIDs using WDS or equivalent. • Is there any signal that is far out of specification when key is ON and engine runs?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 16.
		No	Go to the next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as Step 5 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect suspected sensor and related wiring harnesses repair or replace it. Then go to Step 16.
		No	Go to the next step.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Access O2S11 for P2178 PID using WDS or equivalent. • Check PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading okay? — **Above 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Below 0.45 V** just after release of accelerator pedal (lean condition)	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between exhaust manifold and front HO2S. Then go to Step 16.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Start the engine. • Access the MAF PID using WDS or equivalent. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace MAF/IAT sensor, then go to Step 16.
9	**INSPECT PURGE SOLENOID OPERATION** • Carry out Purge Control System Inspection. (See 01–03A–67 Purge Control System Inspection.) • Does purge control system work properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to inspection result, then go to Step 16.
10	**INSPECT PCV VALVE OPERATION** • Inspect PCV valve operation. (See 01–16–25 PCV VALVE INSPECTION [L3].) • Is PCV valve okay?	Yes	Go to the next step.
		No	Replace PCV valve, then go to Step 16.
11	**INSPECT EGR VALVE OPERATION** • Carry out EGR Control System Inspection. (See 01–03A–67 EGR Control System Inspection.) • Does EGR control system work properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to inspection result, then go to Step 16.

STEP	INSPECTION		ACTION
12	**INSPECT VTCS OPERATION** • Carry out Variable Tumble Control System (VTCS) Operation Inspection. (See 01–03A–64 Variable Tumble Control System (VTCS) Operation Inspection.) • Does VTCS work properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to inspection result, then go to Step 16.
13	**INSPECT FUEL LINE PRESSURE** • Turn key to OFF. **Note** • If engine will not start, inspect fuel line pressure with key ON. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure okay?	Yes	Go to the next step.
		No	If fuel pressure is too high, replace fuel pump unit, then go to Step 16. If fuel line pressure is low, go to the next step.
14	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for any leakage. • Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 16.
		No	Inspect for foreign materials or stain inside fuel filter (low-pressure). If for foreign materials or stain inside fuel filter (low-pressure), clean of fuel tank and filter. Then go to Step 16.
15	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect variable valve timing control system operation. (See 01–03A–69 Variable Valve Timing Control System Operation Inspection.) • Does variable valve timing control system work properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to inspection results, then go to the next step.
16	**VERIFY TROUBLESHOOTING OF DTC P2178 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Run "PCM Adaptive Memory Procedure Drive Mode" and "HO2S heater, HO2S and TWC Repair Verification Drive Mode". • Stop vehicle and access on board readiness test to inspect drive mode completion status. • Verify FUEL_EVAL PID changes to yes. — If not, run "HO2S heater, HO2S and TWC Repair Verification Drive Mode" again. • Is the PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to the next step.
17	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2187 [L3]

C6U010202100W17

DTC P2187	Fuel system too lean at idle
DETECTION CONDITION	• PCM monitors short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) during closed loop fuel control at idle. If the LONGFT or the sum total of these fuel terms exceed preprogrammed criteria. PCM determines that fuel system is too lean at idle. **Diagnostic support note** • This is a continuous monitor. (FUEL SYSTEM) • MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• PCM malfunction • Misfire • Front HO2S deterioration • Front HO2S heater malfunction • MAF sensor malfunction • Pressure regulator (built-in fuel pump unit) malfunction • Fuel pump malfunction • Clogged or restricted fuel filter • Fuel leakage from fuel line between fuel delivery pipe and fuel pump • Leakage exhaust system • Purge solenoid valve malfunction • Purge solenoid hoses improper connection • Air suction in intake-air system • Insufficient engine compression • Variable valve timing control system improper operation

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTCs** • Turn ignition switch to OFF, then ON (Engine OFF). • Verify related pending code or stored DTCs using WDS or equivalent. • Is other DTC present?	Yes	If misfire DTC is present, go to Step 8. If other DTC is present, go to appropriate DTC troubleshooting procedure. (See 01–02A–13 DTC TABLE [L3].)
		No	If driveability concern is present, go to Step 8. If not, go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2187 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures fro DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (KEY TO ON/IDLE)** • Access ECT, MAF and TP PIDs using WDS or equivalent.) • Is there any signal that is far out of specification when key is ON and engine runs?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 17.
		No	Go to the next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as Step 5 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect suspected sensor and related wiring harnesses, repair or replace it. Then go to Step 17.
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Access O2S11 for P2187 PID using WDS or equivalent. • Check PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading okay? — **Above 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Below 0.45 V** just after release of accelerator pedal (lean condition)	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between exhaust manifold and front HO2S. Then go to Step 17.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace MAF/IAT sensor, then go to Step 17.
9	**INSPECT FOR EXCESSIVE AIR SUCTION OF INTAKE AIR SYSTEM** • Visually inspect for loosen, cracks or damages hoses on intake-air system. • Is there any malfunction?	Yes	Repair or replace source of air suction, then go to Step 17.
		No	Go to the next step.
10	**INSPECT PURGE SOLENOID VALVE STUCK OPEN** • Turn key to OFF. • Disconnect both hoses from purge solenoid valve. • Blow air through purge solenoid valve. • Does air blow through?	Yes	Replace purge solenoid valve. Then go to Step 17.
		No	Go to the next step.
11	**INSPECT FUEL LINE PRESSURE** • Turn key to OFF. **Note** • If engine will not start, inspect fuel line pressure with key ON. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure okay?	Yes	Go to Step 13.
		No	If fuel pressure is too high, replace fuel pump unit, then go to Step 17. If fuel line pressure is low, go to the next step.
12	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for any leakage. • Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 17.
		No	Inspect for foreign materials or stain inside fuel filter (low-pressure). If for foreign materials or stain inside fuel filter (low-pressure), clean of fuel tank and filter. Then go to Step 17.
13	**INSPECT IGNITION SYSTEM** • Carry out spark test. (See 01–03A–66 Spark Test.) • Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to spark test results, then go to Step 17.
14	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10A–5 COMPRESSION INSPECTION [L3].) • Is it okay?	Yes	Go to the next step.
		No	Implement engine overhaul for repairs, then go to Step 17.
15	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect variable valve timing control system operation. (See 01–03A–69 Variable Valve Timing Control System Operation Inspection.) • Does variable valve timing control system work properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to inspection results, then go to Step 17.

STEP	INSPECTION		ACTION
16	**INSPECT FUEL INJECTOR OPERATION** • Remove fuel injector. • Inspect fuel injector (resistance, injection amount). (See 01–14–27 FUEL INJECTOR INSPECTION [L3].) • Is fuel injector okay?	Yes	Go to the next step.
		No	Replace suspected fuel injector, then go to the next step.
17	**VERIFY TROUBLESHOOTING OF DTC P2187 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Run "PCM Adaptive Memory Procedure Drive Mode" and "HO2S heater, HO2S and TWC Repair Verification Drive Mode". • Stop vehicle and access on board readiness test to inspect drive mode completion status. • Verify FUEL_EVAL PID changes to yes. — If not, run "HO2S heater, HO2S and TWC Repair Verification Drive Mode" again. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to the next step.
18	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2188 [L3]

C6U010202100W16

DTC P2188	Fuel system too rich at idle
DETECTION CONDITION	• PCM monitors short term fuel trim (SHRTFT), long term fuel trim (LONGFT) during closed loop fuel control at idle. If the LONGFT or the sum total of these fuel terms exceed preprogrammed criteria. PCM determines that fuel system is too rich at idle. **Diagnostic support note** • This is a continuous monitor. (FUEL SYSTEM) • MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory. • PCM malfunction
POSSIBLE CAUSE	• Misfire • Front HO2S deterioration • Front HO2S heater malfunction • MAF sensor malfunction • Pressure regulator (built-in fuel pump unit) malfunction • Fuel pump malfunction • Stuck open EGR valve • VTCS improper operation • Purge solenoid valve improper operation • Purge solenoid valve malfunction (stuck open) • Purge solenoid hoses improper connection. • Variable valve timing control system improper operation • PCV valve malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record the freeze frame data on the repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. If the vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING OR STORED DTCS** • Turn ignition switch off, then to the ON position (Engine off). • Verify related pending code or stored DTCs using WDS or equivalent. • Is other DTC present?	Yes	If misfire DTC is present, go to Step 8. If other DTC is present, go to appropriate DTC troubleshooting procedure. (See 01–02A–13 DTC TABLE [L3].)
		No	If driveability concern is present, go to Step 8. If not, go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2188 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on freeze frame data.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE)** • Access ECT, MAF, TP and VSS PIDs using WDS or equivalent.) • Is there any signal that is far out of specification when ignition key is ON and engine runs?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 16.
		No	Go to next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as Step 4 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect suspected sensor and related wiring harnesses, repair or replace it. Then go to Step 16.
		No	Go to next step.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Access O2S11 for P2177 PID using WDS or equivalent. • Check PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading okay? — **Above 0.45V** when accelerator pedal is suddenly depressed (rich condition). — **Below 0.45V** just after release of accelerator pedal (lean condition)	Yes	Go to next step.
		No	Visually inspect for any gas leakage between exhaust manifold and front HO2S. Then go to Step 16.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to next step.
		No	Replace MAF/IAT sensor, then go to Step 16.
9	**INSPECT PURGE SOLENOID OPERATION** • Carry out Purge Control System Inspection. (See 01–03A–67 Purge Control System Inspection.) • Does purge control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to inspection result, then go to Step 16.
10	**INSPECT PCV VALVE OPERATION** • Inspect PCV valve operation. (See 01–16–25 PCV VALVE INSPECTION [L3].) • Is PCV valve okay?	Yes	Go to next step.
		No	Replace PCV valve, then go to Step 16.

STEP	INSPECTION		ACTION
11	**INSPECT VTCS OPERATION** • Carry out Variable Tumble Control System (VTCS) Operation Inspection. (See 01–03A–64 Variable Tumble Control System (VTCS) Operation Inspection.) • Does VTCS work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to inspection result, then go to Step 16.
12	**INSPECT FUEL LINE PRESSURE** • Turn ignition key to OFF. **Note** • If engine will not start, inspect fuel line pressure with ignition key ON. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure okay?	Yes	Go to Step 14.
		No	If fuel pressure is too high, replace fuel pump unit, then go to Step 16. If fuel line pressure is low, go to next step.
13	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for any leakage. • Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 16.
		No	Inspect for foreign materials or stain inside fuel filter (low-pressure). If for foreign materials or stain inside fuel filter (low-pressure), clean of fuel tank and filter. Then go to Step 16.
14	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect variable valve timing control system operation. (See 01–03A–69 Variable Valve Timing Control System Operation Inspection.) • Does variable valve timing control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to inspection results, then go to Step 16.
15	**INSPECT EGR VALVE STUCK OPEN** • Remove EGR valve. • Does EGR valve stuck open?	Yes	Clean or replace EGR valve, then go to next step.
		No	Go to next step.
16	**VERIFY TROUBLESHOOTING OF DTC P2188 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Run "PCM Adaptive Memory Procedure Drive Mode" and "HO2S heater, HO2S and TWC Repair Verification Drive Mode". • Stop vehicle and access on board readiness test to inspect drive mode completion status. • Verify FUEL_EVAL PID changes to yes. — If not, run "HO2S heater, HO2S and TWC Repair Verification Drive Mode" again. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
17	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2195 [L3]

C6U010202100W18

DTC P2195	Front HO2S signal stuck lean
DETECTION CONDITION	• The PCM monitors the front HO2S output voltage when the following conditions are met. If output voltage is **less than 0.45 V** for **41 s**, the PCM determines that the front HO2S signal remains lean. **MONITORING CONDITION** — Fuel injection control system status: feedback zone — ECT: **more than 70 deg.C {158 deg.F}** — Engine speed: **more than 1,500 rpm** **Diagnostic support note** • This is a continuous monitor. (HO2S) • MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Fuel injector malfunction • Insufficient fuel line pressure • Exhaust gas leakage • Air suction at intake-air system • Fuel leakage • MAF sensor malfunction • ECT sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has freeze frame data been recorded?	Yes	Go to next step.
		No	Record the freeze frame data on the repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. If the vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then ON position (Engine off). • Verify the related PENDING CODE or stored DTCs using WDS or equivalent. • Is the DTC P2177 or P2187 also present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01–02A–13 DTC TABLE [L3].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2195 on freeze frame data?	Yes	Go to next step.
		No	Go to troubleshooting for DTC on FREEZE FRAME DATA. (See 01–02A–13 DTC TABLE [L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE)** • Access APP, APP1, APP2, ECT, MAF, TP and VSS PIDs using WDS or equivalent. • Is there any signal that is far out of specification when ignition key is ON and engine runs?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 13.
		No	Go to next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as Step 5 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 13.
		No	Go to next step.
7	**INSPECT INTAKE-AIR SYSTEM FOR EXCESSIVE AIR SUCTION** • Visually inspect for loosen, cracks or damages hose in intake-air system. • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 13.
		No	Go to next step.

STEP	INSPECTION		ACTION
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Start the engine. • Access the MAF PID or WDS or equivalent. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to next step.
		No	Replace MAF/IAT sensor, then go to Step 13.
9	**INSPECT FRONT HO2S** • Inspect front HO2S. (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3].) • Is there any malfunction?	Yes	Replace front HO2S, then go to Step 13. (See 01–15A–1 EXHAUST SYSTEM REMOVAL/ INSTALLATION [L3].)
		No	Go to next step.
10	**INSPECT FUEL INJECTOR** • Inspect fuel injector. (See 01–14–27 FUEL INJECTOR INSPECTION [L3].) • Is there any malfunction?	Yes	Replace suspected fuel injector, then go to Step 13. (See 01–14–20 FUEL INJECTOR REMOVAL/ INSTALLATION [L3].)
		No	Go to next step.
11	**INSPECT FUEL LINE PRESSURE** • Perform the "fuel line pressure inspection". (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is there any malfunction?	Yes	Go to next step.
		No	Go to Step 13.
12	**INSPECT FUEL SYSTEM FOR FUEL LEAKAGE** • Visually inspect fuel leakage in the fuel system. • Is there fuel leakage?	Yes	Repair or replace the malfunctioning part, then go to next step.
		No	Replace the fuel pump unit, then go to next step. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
13	**VERIFY TROUBLESHOOTING OF DTC P2195 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Run "PCM Adaptive Memory Procedure Drive Mode" and "HO2S heater, HO2S and TWC Repair Verification Drive Mode". • Stop vehicle and access on board readiness test to inspect drive mode completion status. • Verify FUEL_EVAL PID changes to yes. — If not, run "HO2S heater, HO2S and TWC Repair Verification Drive Mode" again. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2196 [L3]

C6U010202100W19

DTC P2196	Front HO2S signal stuck rich
DETECTION CONDITION	• The PCM monitors the front HO2S output voltage when the following conditions are met. If output voltage is **more than 0.45 V** for **41 s**, the PCM determines that the front HO2S signal remains rich. **MONITORING CONDITION** — Fuel injection control system status: feedback zone — ECT: **more than 70 deg.C {158 deg.F}** — Engine speed: **more than 1,500 rpm** **Diagnostic support note** • This is a continuous monitor. (HO2S). • MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Fuel injector malfunction • Excessive fuel pressure • Restriction in intake-air system • MAF sensor malfunction • ECT sensor malfunction • PCM malfunction

Diagnostic procedure

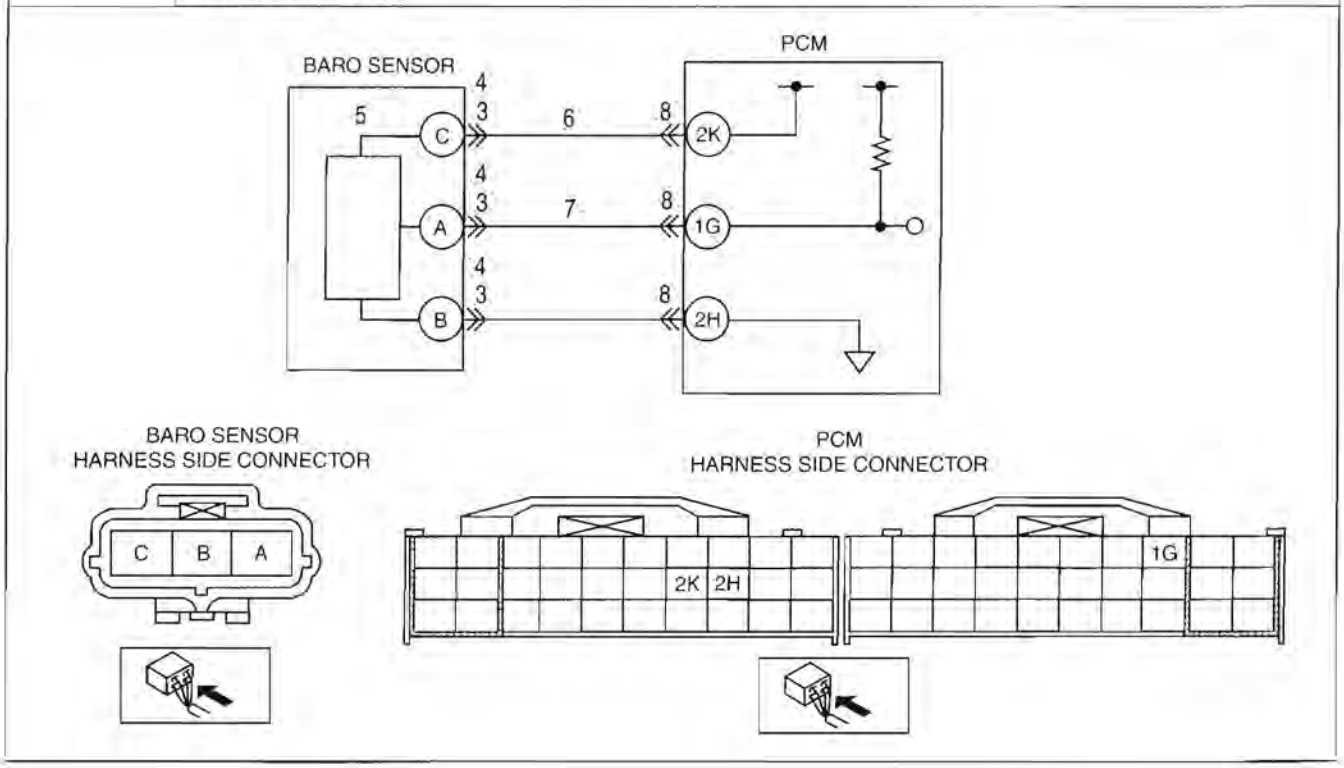
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has freeze frame data been recorded?	Yes	Go to next step.
		No	Record the freeze frame data on the repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. If the vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then ON position (Engine off). • Verify the related PENDING CODE or stored DTCs using WDS or equivalent. • Is the DTC P2177 or P2187 also present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01–02A–13 DTC TABLE [L3])
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2196 on freeze frame data?	Yes	Go to next step.
		No	Go to troubleshooting for DTC on FREEZE FRAME DATA. (See 01–02A–13 DTC TABLE [L3])
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE)** • Access APP, APP1, APP2, ECT, MAF, TP and VSS PIDs using WDS or equivalent. • Is there any signal that is far out of specification when ignition key is ON and engine runs?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 11.
		No	Go to next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as Step 5 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 11.
		No	Go to next step.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to next step.
		No	Replace MAF/IAT sensor, then go to Step 11.

STEP	INSPECTION		ACTION
8	**INSPECT FRONT HO2S** • Inspect front HO2S. (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3].) • Is there any malfunction?	Yes	Replace front HO2S, then go to Step 11. (See 01–15A–1 EXHAUST SYSTEM REMOVAL/ INSTALLATION [L3].)
		No	Go to next step.
9	**INSPECT FUEL INJECTOR** • Inspect fuel injector. (See 01–14–27 FUEL INJECTOR INSPECTION [L3].) • Is there any malfunction?	Yes	Replace suspected fuel injector, then go to Step 11. (See 01–14–20 FUEL INJECTOR REMOVAL/ INSTALLATION [L3].)
		No	Go to next step.
10	**INSPECT FUEL LINE PRESSURE** • Perform the "fuel line pressure inspection". (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is there any malfunction?	Yes	Replace the fuel pump unit, then go to next step. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
		No	Go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P2196 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Run "PCM Adaptive Memory Procedure Drive Mode" and "HO2S heater, HO2S and TWC Repair Verification Drive Mode". • Stop vehicle and access on board readiness test to inspect drive mode completion status. • Verify FUEL_EVAL PID changes to yes. — If not, run "HO2S heater, HO2S and TWC Repair Verification Drive Mode" again. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2228 [L3]

C6J010202200W01

DTC P2228	BARO sensor circuit low input
DETECTION CONDITION	• PCM monitors input voltage from BARO sensor. If input voltage at PCM terminal 1G is **below 1.99 V**, PCM determines that BARO sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• BARO sensor malfunction • Connector or terminal malfunction • Short to ground in wiring harness between BARO sensor terminal A and PCM terminal 1G • Open circuit in wiring harness between BARO sensor terminal C and PCM terminal 2K • PCM malfunction



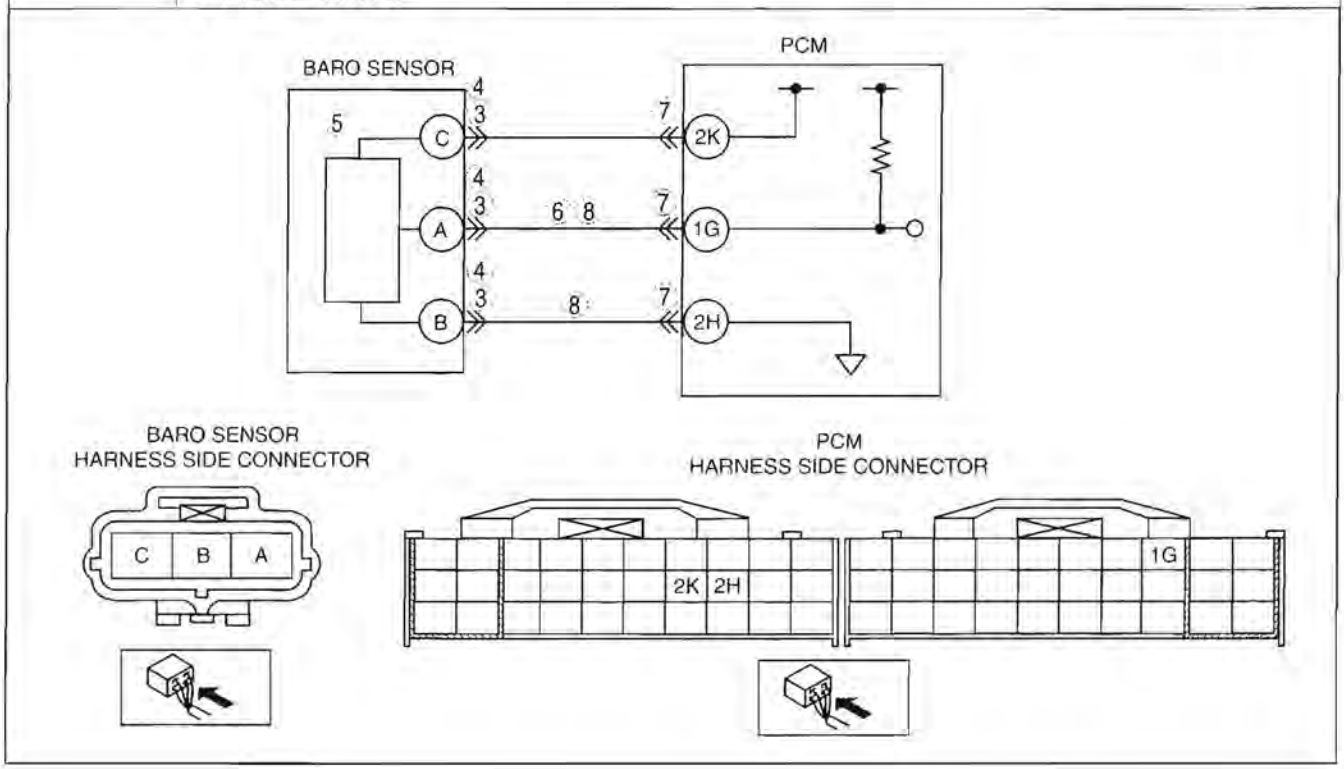
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT CONNECTION OF BARO SENSOR CONNECTOR** • Turn ignition key to OFF. • Verify that BARO sensor connector is connected securely. • Is connection okay?	Yes	Go to next step.
		No	Reconnect the connector, then go to Step 9.
4	**INSPECT BARO SENSOR CONNECTOR FOR POOR CONNECTION** • Disconnect the BARO sensor connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace suspected terminal, then go to Step 9.
		No	Go to next step.
5	**INSPECT BARO SENSOR MALFUNCTION** • Perform BARO sensor inspection. (See 01–40A–37 BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION [L3].) • Is BARO sensor okay?	Yes	Go to next step.
		No	Replace BARO sensor, then go to Step 9.
6	**INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT BARO SENSOR CONNECTOR** **Note** • If DTCs P0107 and P0122 are also retrieved with P2228, go to CONSTANT VOLTAGE troubleshooting procedure. • Measure voltage between BARO sensor terminal C (harness-side) and body ground. • Is voltage **within 4.5—5.5 V?**	Yes	Go to next step.
		No	Inspect for open circuit between PCM terminal 2K (harness-side) and BARO sensor terminal C (harness-side). Repair or replace suspected harness, then go to Step 9.
7	**INSPECT BARO SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for continuity between BARO sensor terminal B (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 9.
		No	Go to next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Inspect for poor connection at PCM terminal 2H (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to next step.
		No	Go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2228 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	No concern is detected. Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2229 [L3]

C6U010202200W02

DTC P2229	BARO sensor circuit high input
DETECTION CONDITION	• PCM monitors input voltage from BARO sensor. If input voltage at PCM terminal 1G is **above 4.43 V**, PCM determines that BARO sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• BARO sensor malfunction • Connector or terminal malfunction • Open circuit in wiring harness between BARO sensor terminal A and PCM terminal 1G • Open circuit in wiring harness between BARO sensor terminal B and PCM terminal 2H • Short to power supply in wiring harness between BARO sensor terminal A and PCM terminal 1G • PCM malfunction



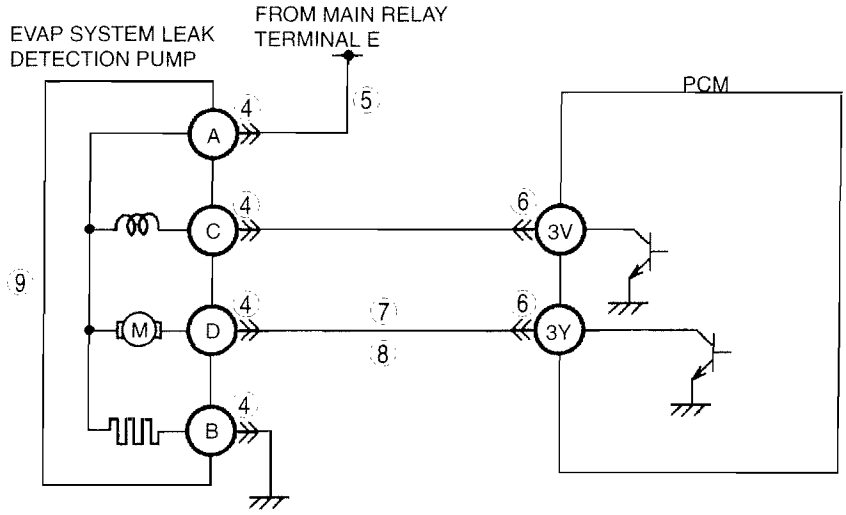
Diagnostic procedure

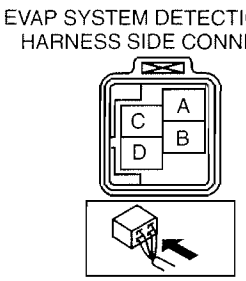
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT CONNECTION OF BARO SENSOR CONNECTOR** • Turn ignition key to OFF. • Verify that BARO sensor connector is connected securely. • Is connection okay?	Yes	Go to next step.
		No	Reconnect the connector, then go to Step 9.
4	**INSPECT BARO SENSOR CONNECTOR FOR POOR CONNECTION** • Disconnect the BARO sensor connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace suspected terminal, then go to Step 9.
		No	Go to next step.
5	**INSPECT BARO SENSOR MALFUNCTION** • Perform BARO sensor inspection. (See 01–40A–37 BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION [L3].) • Is BARO sensor okay?	Yes	Go to next step.
		No	Replace BARO sensor, then go to Step 9.
6	**VERIFY BARO SENSOR SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT** • Measure voltage between BARO sensor terminal A and body ground. • Is voltage **above 4.43 V?**	Yes	Repair or replace harness for short to power supply, then go to Step 9.
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Inspect for poor connection at terminal 2H (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
8	**VERIFY BARO SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity following terminals (harness-side): — Between BARO sensor terminal A and PCM terminal 1G — Between BARO sensor terminal B and PCM terminal 2H • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2229 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	No concern is detected. Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

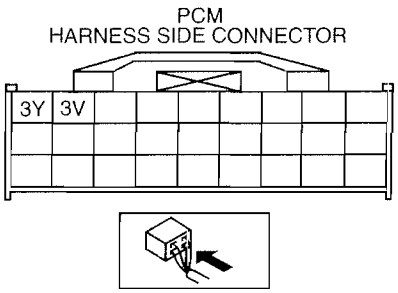
DTC P2401 [L3]

C6U010202400W01

DTC P2401	EVAP system leak detection pump motor circuit low
DETECTION CONDITION	• The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. If the pump load current is lower than specified, the PCM determines EVAP system leak detection pump motor circuit has a malfunction. **Diagnostic support note** • This is a intermittent monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Open circuit between main relay terminal E and EVAP system leak detection pump terminal A • Open circuit between EVAP system leak detection pump terminal D and PCM terminal 3Y • Short to ground circuit between EVAP system leak detection pump terminal D and PCM terminal 3Y • Poor connection at EVAP system leak detection pump or PCM connector • PCM malfunction







Diagnostic procedure

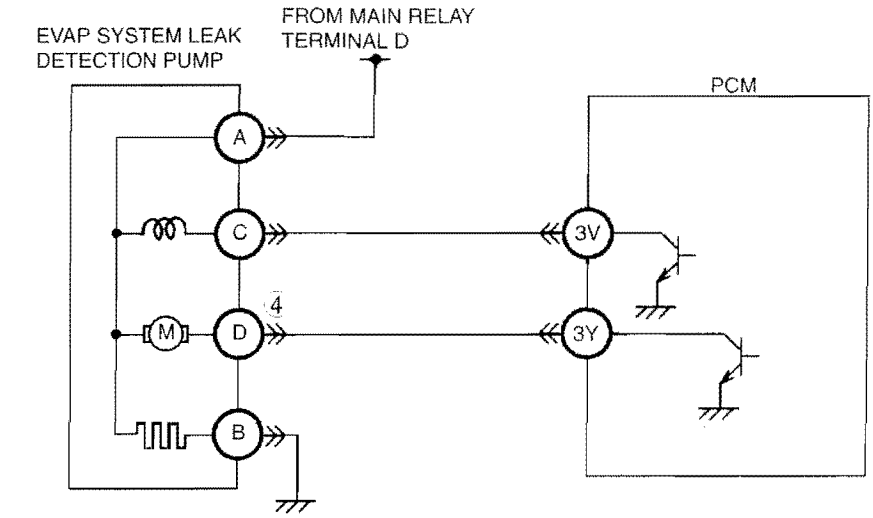
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn ignition key to OFF then ON (Engine OFF). • Verify related PENDING CODE or stored DTC. • Is DTC P2405 present?	Yes	Go to appropriate DTC inspection. (See 01–02A–212 DTC P2405 [L3].)
		No	Go to next step.

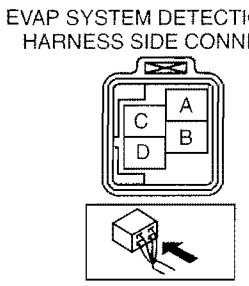
STEP	INSPECTION		ACTION
4	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect EVAP system leak detection pump connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
5	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP MOTOR CIRCUIT FOR OPEN CIRCUIT** • Disconnect main relay. • Inspect continuity between EVAP system leak detection pump terminal A (harness-side) and main relay terminal E (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 10.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 10.
		No	Go to next step.
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP MOTOR CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between EVAP system leak detection pump terminal D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 10.
		No	Go to next step.
8	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP MOTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between EVAP system leak detection pump terminal D (harness-side) and PCM terminal 3Y (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 10.
9	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Perform EVAP system leak detection pump inspection. (See 01–16–12 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION.) • Is EVAP system leak detection pump okay?	Yes	Go to next step.
		No	Replace EVAP system leak detection pump, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P2401 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and perform "EVAP System Repair Verification Drive Mode". (See 01–02A–9 OBD-II DRIVE MODE [L3].) • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

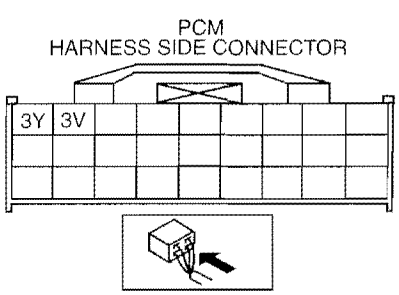
DTC P2402 [L3]

C6U01020200W02

DTC P2402	EVAP system leak detection pump motor circuit high
DETECTION CONDITION	• The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. If the pump load current is higher than specified, the PCM determines EVAP system leak detection pump motor circuit has a malfunction. **Diagnostic support note** • This is a intermittent monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Short to power supply between the EVAP system leak detection pump terminal D and PCM terminal 3Y • Damaged PCM







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn ignition key to OFF then ON (Engine OFF). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to appropriate DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Go to next step.
4	**CHECK EVAP SYSTEM LEAK DETECTION PUMP CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key to ON. • Disconnect EVAP system leak detection pump connector. • Measure voltage between EVAP system leak detection pump terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace wiring harness, then go to next step.
		No	Go to next step.
5	**VERIFY TROUBLESHOOTING OF DTC P2402 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and perform "EVAP System Repair Verification Drive Mode". (See 01–02A–9 OBD-II DRIVE MODE [L3].) • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2404 [L3]

C6U010202400W03

DTC P2404	EVAP system leak detection pump sense circuit malfunction
DETECTION CONDITION	• The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. After obtaining the reference current value, if the time in which the pump load current reaches the reference current value is less than the specification, the PCM determines air filter has a malfunction. **Diagnostic support note** • This is a intermittent monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Air filter clogging • EVAP hose bending • Damaged PCM

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**CHECK EVAP HOSE BENDING** • Inspect EVAP hose for bending. • Is EVAP hose okay?	Yes	Go to next step.
		No	Repair or replace suspected hose, then go to Step 5.
4	**CHECK AIR FILTER FOR CLOGGING** • Inspect air filter for clogging. • Is air filter okay?	Yes	Go to next step.
		No	Replace air filter, then go to next step.
5	**VERIFY TROUBLESHOOTING OF DTC P2404 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2405 [L3]

C6U010202400W04

DTC P2405	EVAP system leak detection pump sense circuit low input
DETECTION CONDITION	• The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. If the current is lower than the specification while the PCM obtains the reference current value, the PCM determines EVAP system leak detection pump orifice has a malfunction. **Diagnostic support note** • This is a intermittent monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump orifice fallen off • EVAP system leak detection pump motor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Replace EVAP system leak detection pump, then go to next step.
3	**VERIFY TROUBLESHOOTING OF DTC P2405 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and perform "EVAP System Repair Verification Drive Mode". (See 01–02A–9 OBD-II DRIVE MODE [L3].) • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2407 [L3]

C6U010202400W06

DTC P2407	EVAP system leak detection pump sense circuit intermittent
DETECTION CONDITION	• The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. When either of the following is detected 28 times or more successively, the PCM determines EVAP system leak detection pump heater has a malfunction: — While obtaining the reference current value, the change in pump load current exceeds the specification. — After obtaining the reference current value, the pump load current is kept lower than the maximum pump load current for more than the specified time. **Diagnostic support note** • This is a intermittent monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump heater malfunction • PCM malfunction

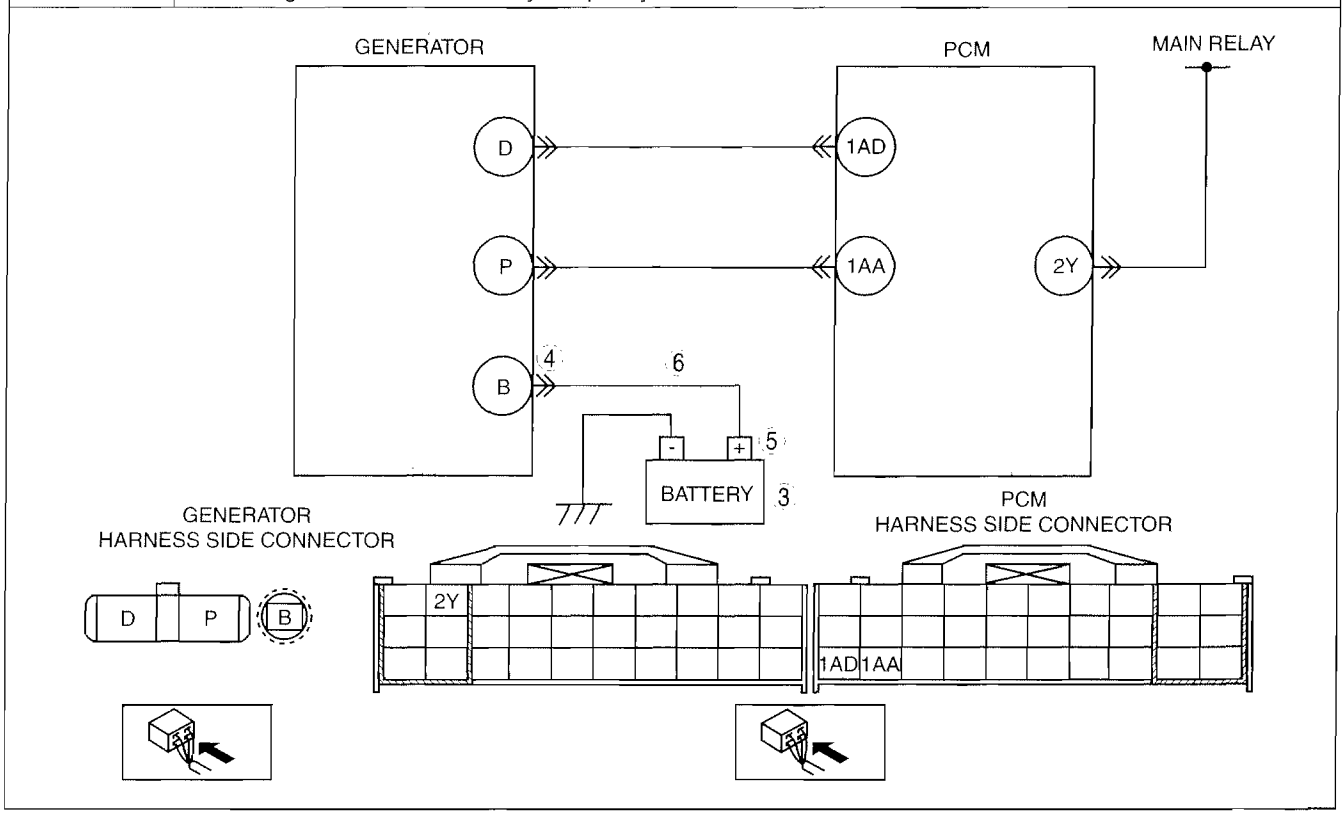
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP HEATER** • Perform EVAP system leak detection pump inspection. (See 01–16–12 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION) • Is EVAP system leak detection pump okay?	Yes	Replace EVAP system leak detection pump, then go to next step.
		No	Go to next step.
4	**VERIFY TROUBLESHOOTING OF DTC P2407 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and perform "EVAP System Repair Verification Drive Mode". (See 01–02A–9 OBD-II DRIVE MODE [L3].) • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2502 [L3]

C6U010202500W01

DTC P2502	Generator terminal B circuit open
DETECTION CONDITION	• PCM judges generator output voltage is **above 17 V** or battery voltage is **below 11 V** during engine running.
POSSIBLE CAUSE	• Open circuit between generator terminal B and battery positive terminal • Battery malfunction • Generator malfunction • PCM is poorly connected. • PCM, generator and/or battery are poorly connected.



Diagnostic procedure

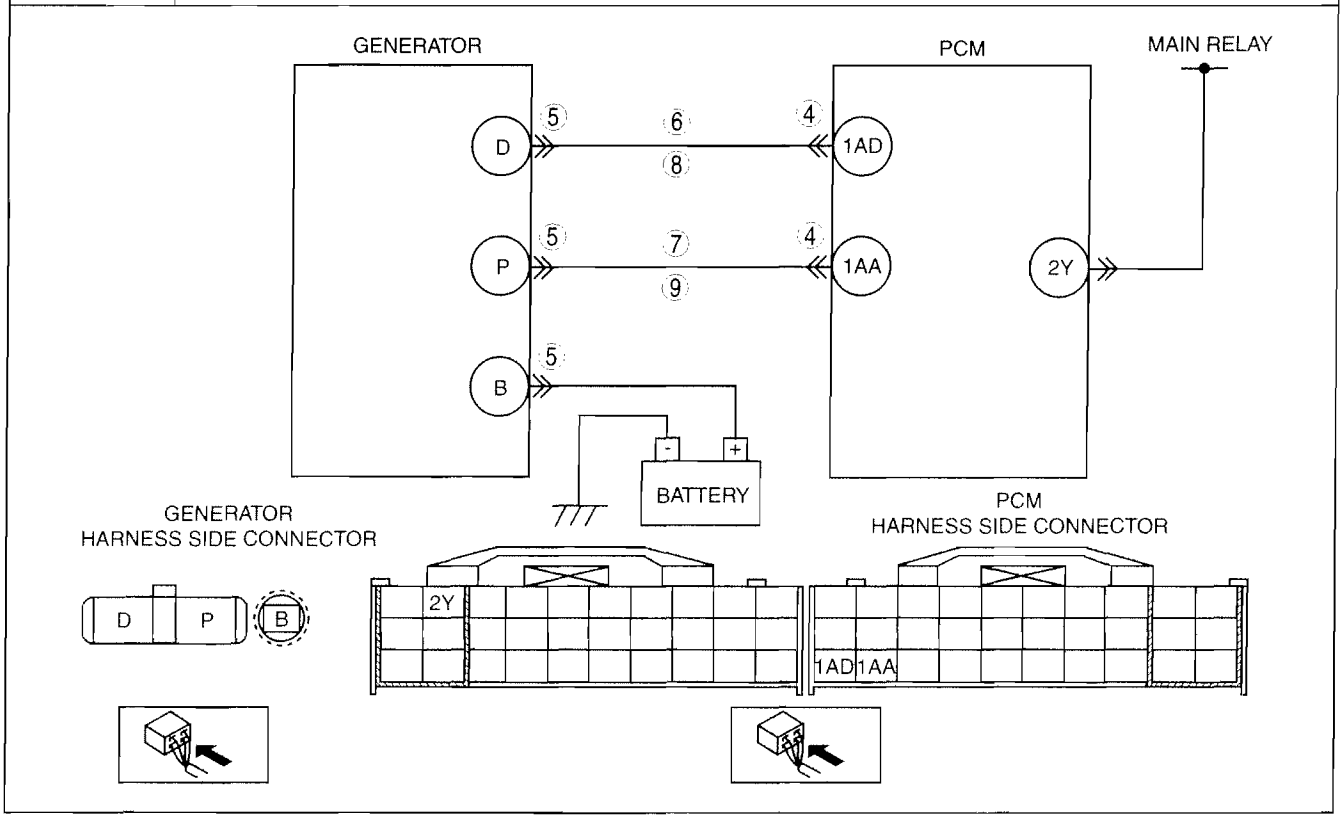
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**INSPECT BATTERY** • Turn ignition key to OFF. • Inspect battery. • Is battery okay?	Yes	Replace battery, then go to Step 7.
		No	Go to next step.
4	**INSPECT POOR INSTALLATION OF GENERATOR TERMINAL** • Turn ignition key to OFF. • Inspect generator terminal B installation nut for looseness. • Is nut loose?	Yes	Tighten generator terminal B installation nut, then go to Step 7.
		No	Go to next step.
5	**INSPECT POOR INSTALLATION OF BATTERY POSITIVE TERMINAL** • Inspect battery positive terminal for looseness. • Is terminal loose?	Yes	Connect battery positive terminal correctly, then go to Step 7.
		No	Go to next step.

STEP	INSPECTION		ACTION
6	**INSPECT BATTERY CHARGING CIRCUIT** • Start engine. • Disconnect battery positive terminal. • Does engine stall?	Yes	Repair or replace harness between generator terminal B and battery positive terminal, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2502 COMPLETED** • Make sure to reconnect all connectors. • Clear DTC from memory using WDS or equivalent. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2503 [L3]

C6U010202500W02

DTC P2503	Generator output voltage signal no electricity
DETECTION CONDITION	• PCM needs **more than 20 A** from generator, and judges generator output voltage to be **below 8.5 V** during engine running. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not come on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Generator malfunction • PCM and/or generator are poorly connected. • Open and/or short to GND in wiring harness from between generator terminal P and PCM terminal 1AA • Open and/or short to GND in wiring harness from between generator terminal D and PCM terminal 1AD • Drive belt misadjustment



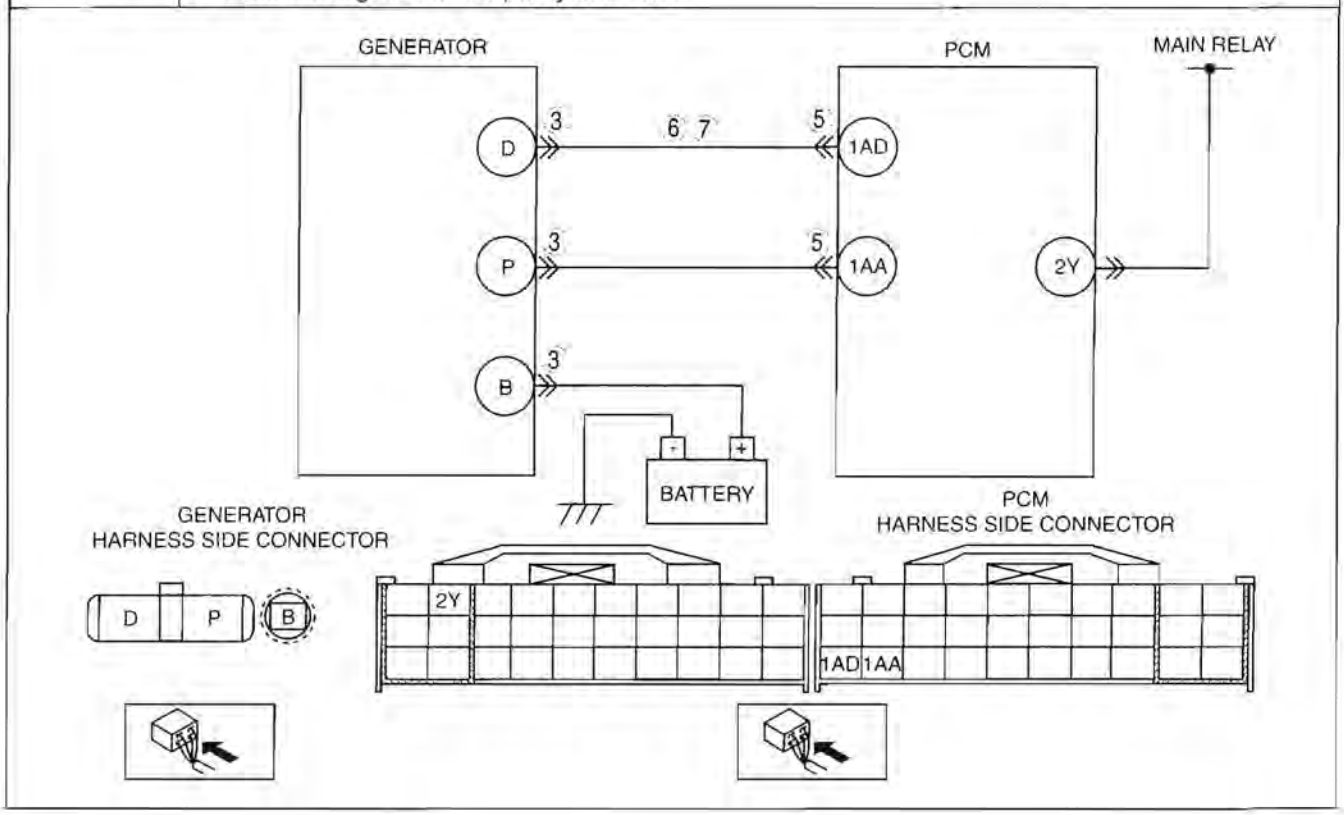
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**INSPECT DRIVE BELT CONDITION** • Verify that drive belt auto tensioner indicator mark does not exceed limit. • Is front drive belt okay?	Yes	Go to next step.
		No	Replace and/or adjust drive belt, then go to Step 10.
4	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminals, then go to Step 10.
		No	Go to next step.
5	**INSPECT GENERATOR CONNECTOR FOR POOR CONNECTION** • Disconnect generator connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminals, then go to Step 10.
		No	Go to next step.
6	**INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between generator terminal D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 10.
		No	Go to next step.
7	**INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between generator terminal P (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 10.
		No	Go to next step.
8	**INSPECT GENERATOR CONTROL CIRCUIT FOR OPEN CIRCUIT** • Measure resistance between generator terminal D (harness-side) and PCM terminal 1AD (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 10.
9	**INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR OPEN CIRCUIT** • Measure resistance between generator terminal P (harness-side) and PCM terminal 1AA (harness-side). • Is there continuity?	Yes	Repair or replace generator, then go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P2503 COMPLETED** • Make sure to reconnect all connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF, then start engine. • Is the same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2504 [L3]

CGU010202500W03

DTC P2504	Battery overcharge
DETECTION CONDITION	• PCM judges generator output voltage is **above 18.5 V** or battery voltage is **above 16.0 V** during engine running. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not come on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Short to power supply between generator connector terminal D and PCM connector terminal 1AD • Generator malfunction • PCM and/or generator are poorly connected.



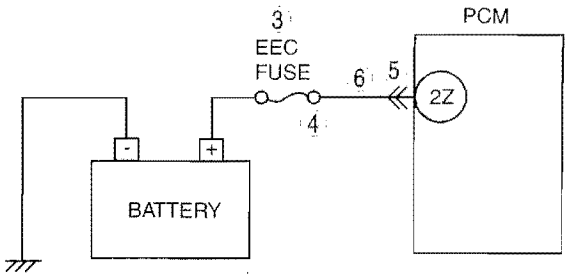
Diagnostic procedure

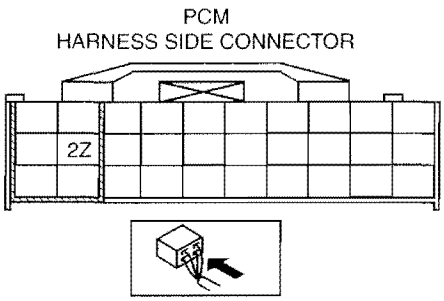
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**INSPECT GENERATOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect generator connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace terminals, then go to Step 8.
		No	Go to next step.
4	**CLASSIFY GENERATOR MALFUNCTION OR OTHER MALFUNCTION** • Turn ignition key to ON (Engine OFF). • Measure voltage between generator terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Malfunction at generator. Go to Step 7.
5	**INSPECT PCM GENERATOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace pins, then go to Step 8.
		No	Go to next step.
6	**INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition key to ON (engine OFF). • Measure voltage between generator terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power supply, then go to Step 8.
		No	Go to Step 8.
7	**INSPECT GENERATOR CONTROL TERMINAL FOR SHORT TO POWER SUPPLY** • Measure resistance between generator terminal D (part-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace generator, then go to next step.
		No	Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2504 COMPLETED** • Make sure to reconnect all connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2507 [L3]

C6U010202500W04

DTC P2507	PCM +BB (back-up battery) voltage low
DETECTION CONDITION	• The PCM monitors the voltage of back-up battery positive terminal at PCM terminal 2Z. If the PCM detected battery positive terminal voltage **below 2.5 V** for **2 s**, the PCM determines that the backup voltage circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Melt down EEC fuse • Open circuit in wiring harness between EEC fuse and PCM terminal 2Z • Short to ground between EEC fuse and PCM terminal 2Z • Poor connection of PCM connector. • PCM malfunction





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT EEC FUSE** • Turn ignition key to OFF. • Inspect EEC fuse for failure and proper. • Is it okay?	Yes	Go to step 6.
		No	• If EEC fuse has been melt down, then go to next step. • If EEC fuse is not installed correctly, install it correctly then go to Step 7.
4	**INSPECT MONITOR CIRCUIT FOR SHORT TO GROUND** • Disconnect battery cables. • Inspect continuity between EEC fuse terminal and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground and install new fuse, then go to Step 7.
		No	Go to step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminals, then go to Step 7.
		No	Go to next step.
6	**INSPECT MONITOR CIRCUIT FOR OPEN CIRCUIT** • Disconnect battery cables. • Inspect continuity between EEC fuse terminal and PCM terminal 2Z (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2507 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2676 [L3]

C6U01020600W01

DTC P2676	Variable air duct (VAD) control solenoid valve circuit low input
DETECTION CONDITION	• The PCM monitors VAD solenoid valve control signal at PCM terminal 4C. If the PCM turns VAD solenoid valve off but voltage at PCM terminal 4C still remains low, the PCM determines that VAD solenoid valve circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not come on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• VAD solenoid valve malfunction • Open circuit in wiring between main relay and VAD solenoid valve terminal A • Open circuit in wiring between VAD solenoid valve terminal B and PCM terminal 4C • Short to ground in wiring between VAD solenoid valve terminal B and PCM terminal 4C • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

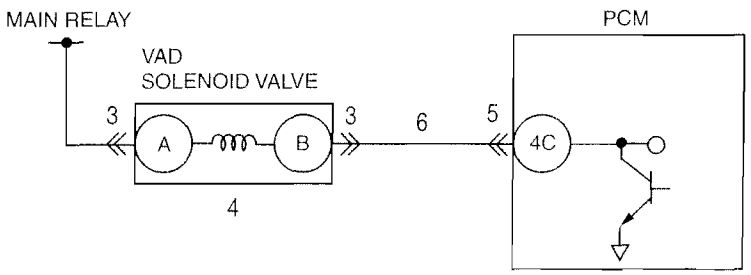
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT VAD SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect VAD solenoid valve connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to the next step.
4	**INSPECT VAD SOLENOID VALVE MALFUNCTION** • Perform VAD solenoid valve inspection. (See 01–13A–7 VARIABLE AIR DUCT (VAD) CONTROL SOLENOID VALVE INSPECTION [L3].) • Is VAD solenoid valve okay?	Yes	Go to the next step.
		No	Replace VAD solenoid valve, then go to step 9.
5	**INSPECT VAD SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch to the ON position (Engine off). • Measure voltage between VAD solenoid valve terminal A (wiring harness-side) and body ground. • Is voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace wiring harness for open circuit, then go to Step 9.
6	**INSPECT VAD SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between VAD solenoid valve terminal B (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace wiring harness for short to ground, then go to Step 9.
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection at terminal 4C. (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to the next step.

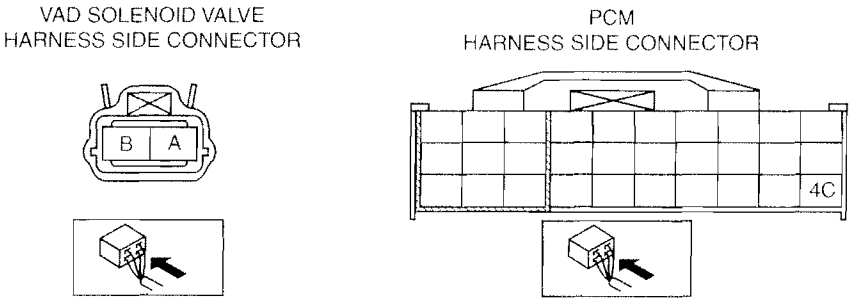
STEP	INSPECTION		ACTION
8	**INSPECT VAD SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between VAD solenoid valve terminal B (wiring harness-side) and PCM terminal 4C (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace wiring harness for open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2676 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the WDS or equivalent. • Turn the ignition switch off. • Start engine and run engine speed **above 4,400 rpm** few times. • Retrieve any DTC. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

DTC P2677 [L3]

C6U010202600W02

DTC P2677	Variable air duct (VAD) solenoid valve circuit high input
DETECTION CONDITION	• The PCM monitors VAD solenoid valve control signal at PCM terminal 4C. If the PCM turns VAD solenoid valve on but voltage at PCM terminal 4C still remains high, the PCM determines that VAD solenoid valve circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not come on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• VAD solenoid valve malfunction • Short to power supply between VAD solenoid valve terminal B and PCM terminal 4C • Shorted VAD solenoid valve or PCM connector • PCM malfunction





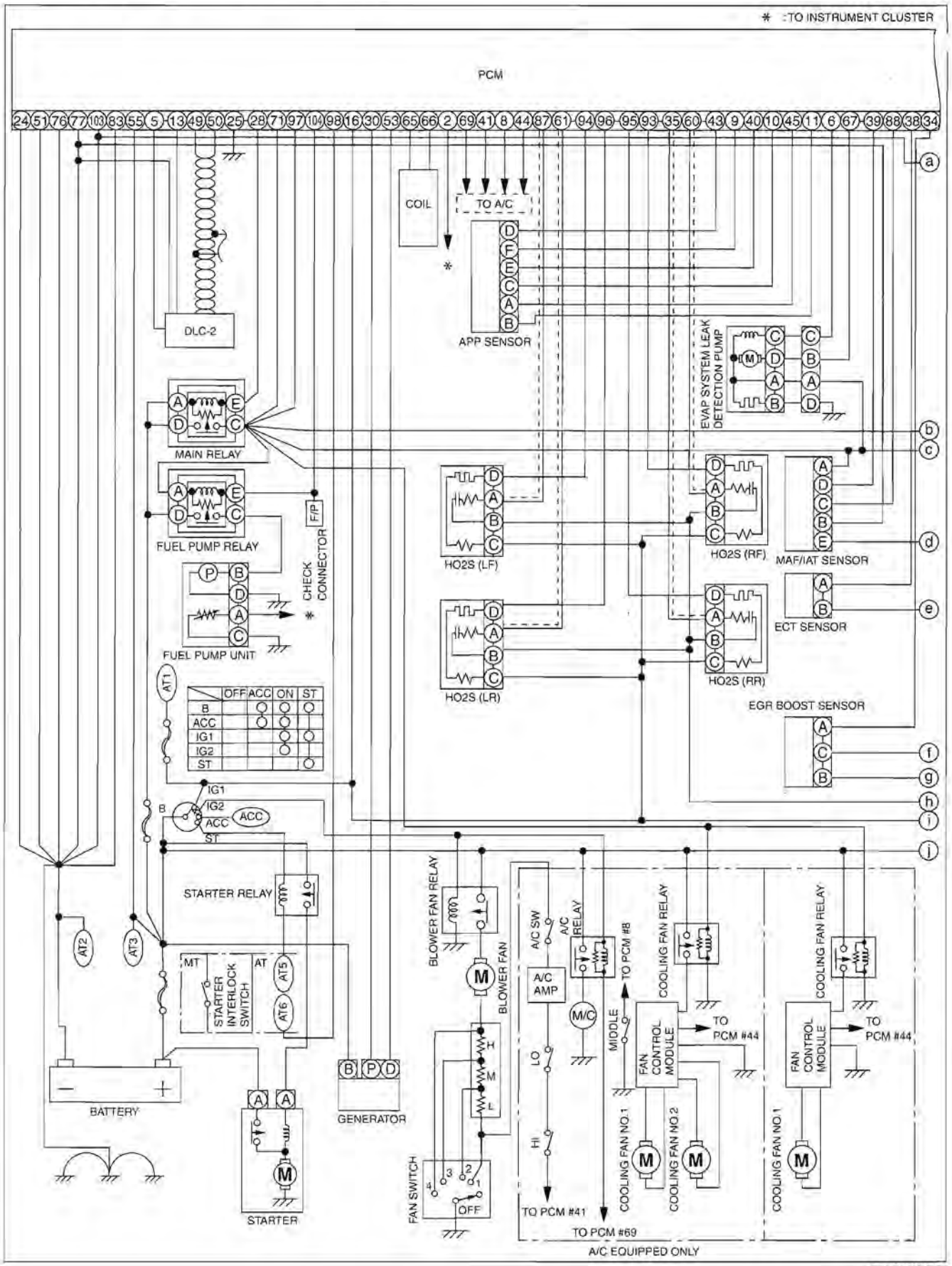
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT VAD SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect VAD solenoid valve connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT VAD SOLENOID VALVE MALFUNCTION** • Perform VAD solenoid valve inspection. (See 01–13A–7 VARIABLE AIR DUCT (VAD) CONTROL SOLENOID VALVE INSPECTION [L3].) • Is VIS solenoid valve okay?	Yes	Go to the next step.
		No	Replace VAD solenoid valve, then go to Step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection at terminal 4C. (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 7.
		No	Go to the next step.
6	**INSPECT VAD SOLENOID VALVE CONTROL CIRCUIT SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure voltage between VAD solenoid valve terminal B (wiring harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace wiring harness for open circuit, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2677 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the WDS or equivalent. • Turn the ignition switch off. • Start engine and run engine speed a**bove 4,400 rpm** few times. • Retrieve any DTC. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 01–02A–8 AFTER REPAIR PROCEDURE [L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
		No	Troubleshooting completed.

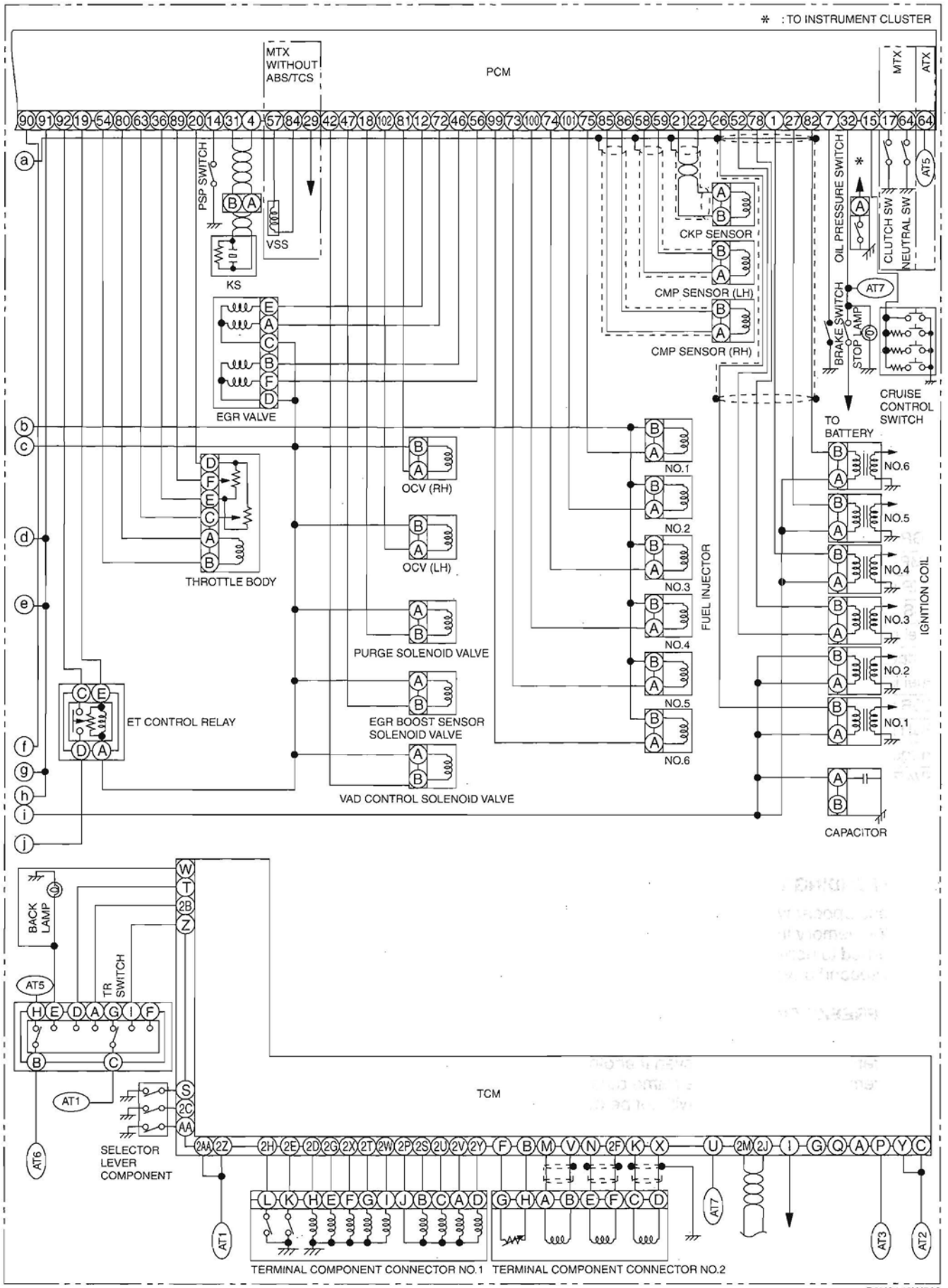
01–02B ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (AJ)]

CONTROL SYSTEM WIRING DIAGRAM [AJ]

C6U010218881W01



B6U0140W529


* : TO INSTRUMENT CLUSTER
MTX WITHOUT ABS/TCS
PCM
MTX
ATX
PSP SWITCH
VSS
KS
EGR VALVE
CKP SENSOR
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CMP SENSOR (RH)
OIL PRESSURE SWITCH
CLUTCH SW
NEUTRAL SW
BRAKE SWITCH
STOP LAMP
CRUISE CONTROL SWITCH
TO BATTERY
THROTTLE BODY
OCV (RH)
OCV (LH)
PURGE SOLENOID VALVE
EGR BOOST SENSOR SOLENOID VALVE
VAD CONTROL SOLENOID VALVE
ET CONTROL RELAY
FUEL INJECTOR
NO.1
NO.2
NO.3
NO.4
NO.5
NO.6
IGNITION COIL
CAPACITOR
BACK LAMP
TR SWITCH
SELECTOR LEVER COMPONENT
TCM
TERMINAL COMPONENT CONNECTOR NO.1
TERMINAL COMPONENT CONNECTOR NO.2
B6U0140W528

MONITORING SYSTEM AND CONTROL SYSTEM DEVICE RELATIONSHIP CHART [AJ]

C6U010218881W02

×: Applicable

Component	Oxygen sensor monitor	Oxygen sensor heater monitor	Catalyst monitor	Misfire monitor	Fuel system monitor	EGR system monitor	Evaporative system monitor	Thermostat monitor
Input								
PSP switch					×	×		
A/C switch, refrigerant pressure switch (high, low pressure)					×	×		×
TP sensor	×		×	×	×	×	×	
ECT sensor	×	×	×	×	×	×	×	×
IAT sensor	×		×	×	×	×	×	×
MAF sensor	×	×	×	×	×	×		×
HO2S (FR, FL)	×		×					
HO2S (RR, RL)	×		×					
EGR boost sensor						×		
CMP sensor (RH, LH)				×	×			
CKP sensor	×	×	×	×	×	×	×	×
VSS	×		×	×	×	×	×	×
Fuel gauge sender unit							×	
Output								
Fuel injector					×			
EGR valve						×		
EGR boost sensor solenoid valve						×		
Purge solenoid valve	×				×		×	
EVAP system leak detection pump							×	
MIL	×	×	×	×	×	×	×	×
DLC-2	×	×	×	×	×	×	×	×

OBD-II PENDING TROUBLE CODES [AJ]

C6U010218881W03

- These appear when a problem is detected in a monitored system. The code for a failed system is stored in the PCM memory in the first drive cycle. This code is called the pending code. If the PCM judges that the system returned to normal or the problem was mistakenly detected, deletes the pending code. If the problem is found in the second drive cycle too, the PCM judges that the system has failed, and the DTC is stored.

OBD-II FREEZE FRAME DATA [AJ]

C6U010218881W04

- This is the technical data which indicates the engine's condition at the time of the first malfunction. This data will remain in the memory even if another emission-related DTC is stored, with the exception of Misfire or Fuel System DTCs. Once freeze frame data for Misfire or Fuel System DTC is stored, it will overwrite any previous data and the freeze frame will not be overwritten again.

OBD-II ON-BOARD SYSTEM READINESS TEST [AJ]

C6U010218881W05

- This shows the OBD-II systems operating status. If any monitor function is incomplete, WDS or equivalent will identify which monitor function has not been completed. Misfires, Fuel System and Comprehensive Components (CCM) are continuous monitoring-type functions. The catalyst, EGR system, evaporation system and oxygen sensor will be monitored under drive cycles. The OBD-II diagnostic system is initialized by performing the DTC cancellation procedure or disconnecting the negative battery cable.

OBD-II DIAGNOSTIC MONITORING TEST RESULTS [AJ]

C6U010218881W06

- The results from the intermittent monitor system's technical data are used to determine whether the system is normal or not. They also display the system's thresholds and diagnostic results. The intermittent monitor system monitors the oxygen sensor, evaporative purge system, catalyst and the EGR system.

OBD-II READ/CLEAR DIAGNOSTIC TEST RESULTS [AJ]

C6U010218881W07

- This retrieves all stored DTCs in the PCM and clears the DTC, Freeze Frame Data, On-Board Readiness Test Results, Diagnostic Monitoring Test Results and Pending Trouble Codes.

OBD-II PARAMETER IDENTIFICATION (PID) ACCESS [AJ]

C6U010218881W08

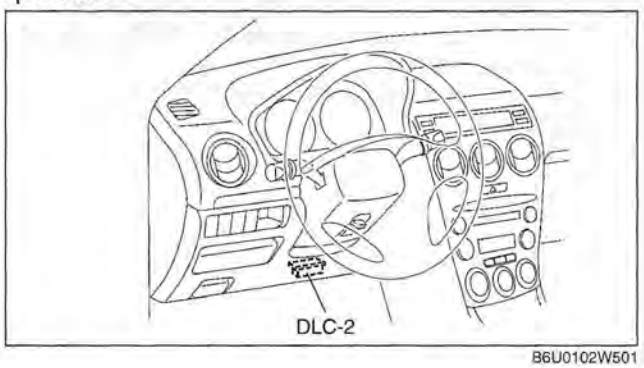
- The PID mode allows access to certain data values, analog and digital inputs and outputs, calculated values and system status information. Since PID values for output devices are PCM internal data values, inspect each device to identify which output devices are malfunctioning.

ON-BOARD DIAGNOSTIC TEST [AJ]

C6U010218881W09

DTC Reading Procedure

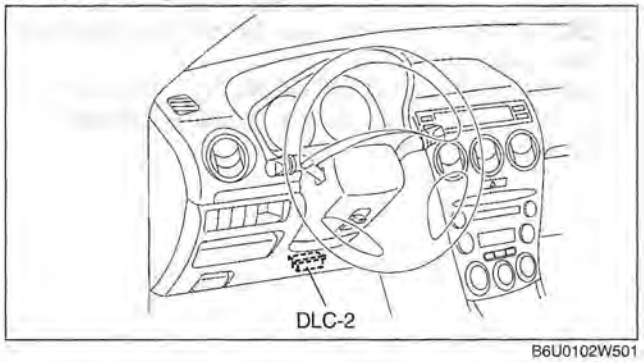
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect the WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the center console.
3. Retrieve DTCs using the WDS or equivalent.



B6U0102W501

Pending Trouble Code Access Procedure

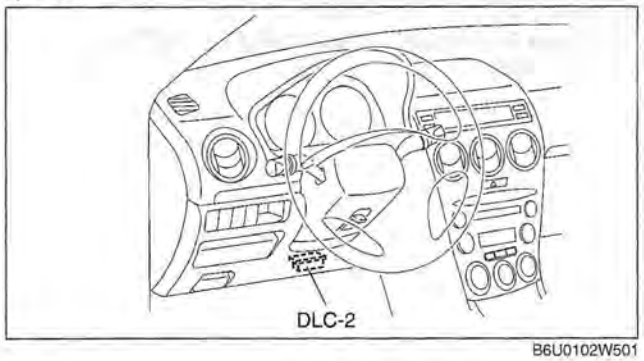
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect the WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the center console.
3. Retrieve **Pending trouble codes** using the WDS or equivalent.



B6U0102W501

Freeze Frame PID Data Access Procedure

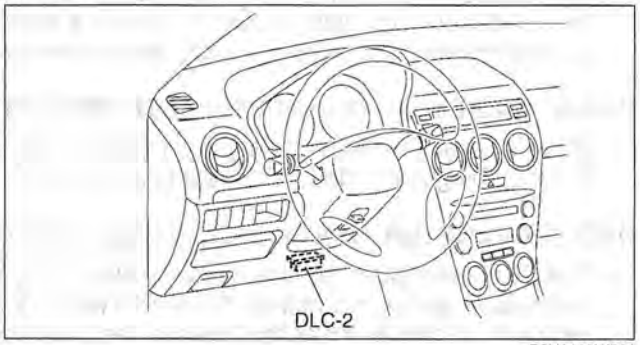
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect the WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the center console.
3. Record the FREEZE FRAME PID DATA using the WDS or equivalent.



B6U0102W501

On-Board System Readiness Tests Access Procedure

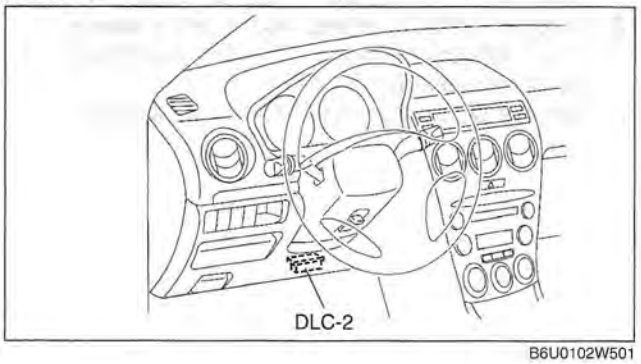
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect the WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the center console.
3. Monitor the OBD-II systems operating status using the WDS or equivalent.



B6U0102W501

PID/DATA Monitor and Record Procedure

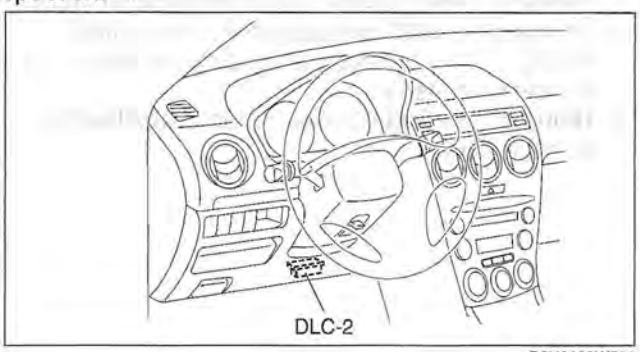
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect the WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the center console.
3. Access and monitor PIDs using the WDS or equivalent.



B6U0102W501

Diagnostic Monitoring Test Results Access Procedure

1. Perform the necessary vehicle preparation and visual inspection.
2. Connect the WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the center console.
3. Access to the DIAGNOSTIC MONITORING TEST RESULTS and read the test results using the WDS or equivalent.



B6U0102W501

AFTER REPAIR PROCEDURE [AJ]

1. Connect the WDS or equivalent to the DLC-2.
2. Cycle the ignition key from OFF to ON.
3. Record DTC if retrieved.
4. Erase all diagnostic data using the WDS or equivalent.

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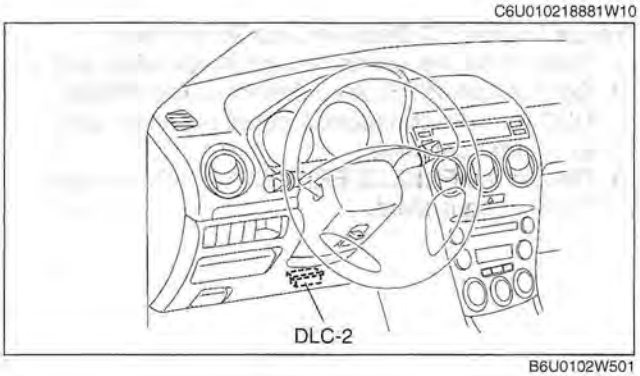


B6U0102W501

OBD-II DRIVE MODE [AJ]

C6U010218881W11

- Using the OBD-II drive mode, the monitoring item requested by OBD-II regulations can be easily diagnosed.
- Performing the Drive Mode inspects the OBD-II system for proper operation and must be performed to ensure that no additional DTCs are present.
- The OBD-II drive mode is divided into the specific drive mode and single drive mode.
- For the specific drive mode, specified drive modes have been set for each individual monitoring item requested by OBD-II regulations, and they can be diagnosed individually. For the single drive mode, the entire monitoring item requested by OBD-II regulations can be diagnosed.
- The following modes are in the specific drive mode. The applicable system is diagnosed by driving in the following drive modes.
  - — PCM Adaptive Memory Produce Drive Mode
  - — EGR System Repair Verification Drive Mode
  - — HO2S heater, HO2S, and TWC Repair Verification Drive Mode
  - — EVAP System Repair Verification Drive Mode
- The following systems are diagnosed with the single drive mode.
  - — EGR system
  - — Oxygen sensor (HO2S)
  - — Oxygen sensor (HO2S) heater
  - — Catalytic converter (TWC)
  - — Fuel, misfire and evaporative (EVAP) system

Caution

- **While performing the Drive Mode, always operate the vehicle in a safe and lawful manner.**
- **When the WDS or equivalent is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the WDS or equivalent using the PID/DATA MONITOR AND RECORD function and inspect later.**

Note

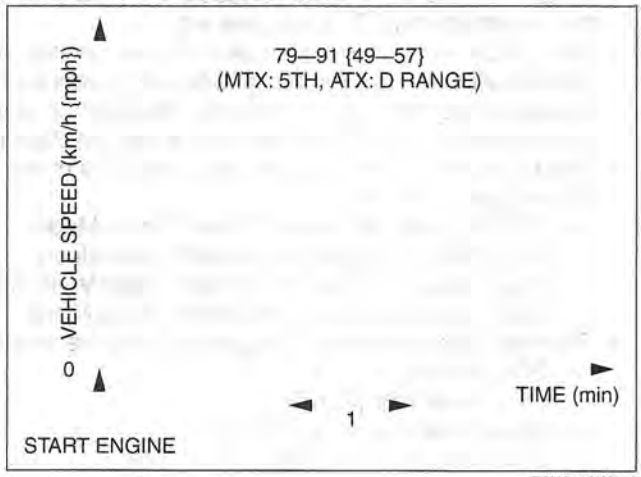
- Vehicle speed and engine speed detected by the PCM may differ from that indicated by the speedometer and tachometer. Use the WDS or equivalent to monitor vehicle speed.
- If the OBD-II system inspection is not completed during the Drive Mode, the following causes are considered:
  - — The OBD-II system detects the malfunction.
  - — The Drive Mode procedure is not completed correctly.
- Disconnecting the battery will reset the memory. Do not disconnect the battery during and after Drive Mode.
- The WDS or equivalent can be used at anytime through the course of the Drive Mode to monitor the completion status. Monitoring can be done by viewing the ON BOARD SYSTEM READINESS menu.
- The OBD monitoring status can be confirmed with the ignition switch operation. During KOEO, the MIL illuminates for a fail-light inspection for **approx. 17 s**. The OBD monitoring status is confirmed after the fail-light inspection.
  - — If all of the diagnosis is completed even one time, the MIL will continue to illuminate.
  - — If all of the diagnosis is not completed, the MIL flashes for **approx. 7 s**, and then it illuminates until the engine is started.

Mode 1 (PCM Adaptive Memory Produce Drive Mode)

1. Start the engine and warm up completely.
2. Verify the following conditions and correct if necessary:
   - All accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
   - Initial ignition timing and idle speed are within the specification.
3. Perform no load racing at the engine speed of **2,500—3,500 rpm** for **15 s or more**, then idle the engine for **60 s or more** after the cooling fan stopped. If possible, monitor RPM PID for engine speed during this procedure.

Mode 2 (EGR System Repair Verification Drive Mode)

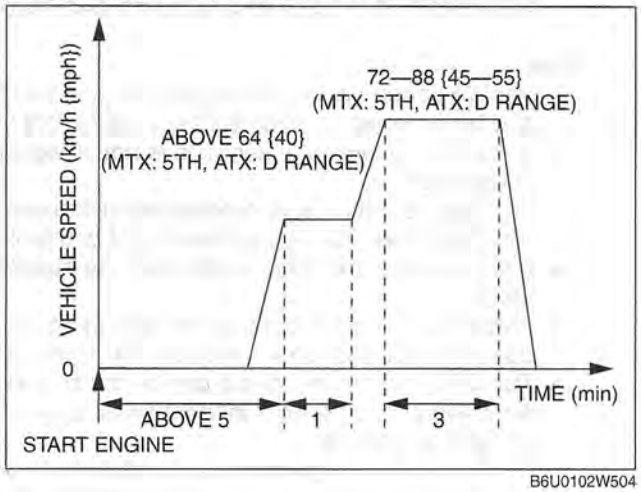
1. Perform "PCM Adaptive Memory Produce Drive Mode "first.
2. Verify that all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive the vehicle as shown in the graph.
4. Stop the vehicle and access the ON BOARD SYSTEM READINESS menu of GENERIC OBD-II FUNCTION to verify the OBD monitoring status.
   - If completed, the OBD monitoring status items change from non-completed to completed.
   - If not completed, turn the ignition switch off, then repeat from Step 3.
5. Access the DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD-II FUNCTIONS to verify the monitor results.
   - If detected values are not within the specification, the repair has not been completed.
6. Verify the no DTCs are available.



B6U0102W503

Mode 3 (HO2S heater, HO2S, and TWC Repair Verification Drive Mode) (CAL: AJ57EM060AJV5010 (MT), AJ58EM060AJVN010 (AT) Only)

1. Perform "PCM Adaptive Memory Produce Drive Mode" first.
2. Verify that all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive the vehicle as shown in the graph. The driving condition before driving at constant speed is not specified.
4. Stop the vehicle and access the ON BOARD SYSTEM READINESS menu of GENERIC OBD-II FUNCTION to verify the OBD monitoring status.
   - If completed, the OBD monitoring status items change from non-completed to completed.
   - If not completed, turn the ignition switch off, then repeat from Step 3.
5. Access the DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD-II FUNCTIONS to verify the monitor results.
   - If the detected values are not within the specification, the repair has not been completed.
6. Verify that no DTCs are available.



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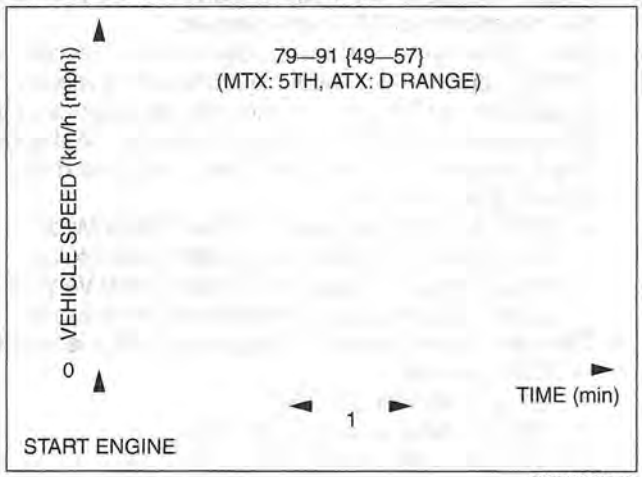
Mode 2 (EGR System Repair Verification Drive Mode)

1. Perform "PCM Adaptive Memory Produce Drive Mode "first.
2. Verify that all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive the vehicle as shown in the graph.
4. Stop the vehicle and access the ON BOARD SYSTEM READINESS menu of GENERIC OBD-II FUNCTION to verify the OBD monitoring status.
   - If completed, the OBD monitoring status items change from non-completed to completed.
   - If not completed, turn the ignition switch off, then repeat from Step 3.
5. Access the DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD-II FUNCTIONS to verify the monitor results.
   - If detected values are not within the specification, the repair has not been completed.
6. Verify the no DTCs are available.



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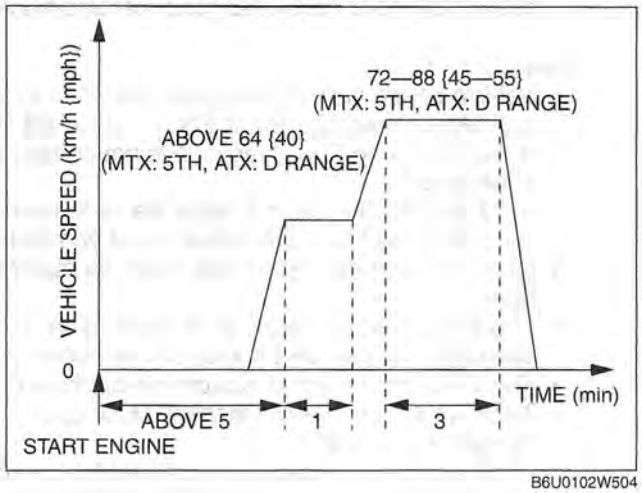
Mode 3 (HO2S heater, HO2S, and TWC Repair Verification Drive Mode) (CAL: AJ57EM060AJV5010 (MT), AJ58EM060AJVN010 (AT) Only)

1. Perform "PCM Adaptive Memory Produce Drive Mode" first.
2. Verify that all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive the vehicle as shown in the graph. The driving condition before driving at constant speed is not specified.
4. Stop the vehicle and access the ON BOARD SYSTEM READINESS menu of GENERIC OBD-II FUNCTION to verify the OBD monitoring status.
   - If completed, the OBD monitoring status items change from non-completed to completed.
   - If not completed, turn the ignition switch off, then repeat from Step 3.
5. Access the DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD-II FUNCTIONS to verify the monitor results.
   - If the detected values are not within the specification, the repair has not been completed.
6. Verify that no DTCs are available.



B6U0102W504

DTC TABLE [AJ]

C6U010218881W13

×: Applicable
—: Not applicable

DTC No.	Condition	MIL	DC	Monitor item	Memory function	Page
P0011	CMP timing over-advanced (RH)	ON	1	CCM	×	(See 01–02B–20 DTC P0011 [AJ].)
P0012	CMP timing over-retarded (RH)	ON	1	CCM	×	(See 01–02B–21 DTC P0012 [AJ].)
P0021	CMP timing over-advanced (LH)	ON	1	CCM	×	(See 01–02B–22 DTC P0021 [AJ].)
P0022	CMP timing over-retarded (LH)	ON	1	CCM	×	(See 01–02B–23 DTC P0022 [AJ].)
P0031	HO2S heater (RF) circuit low	ON	2	HO2S heater	×	(See 01–02B–25 DTC P0031 [AJ].)
P0032	HO2S heater (RF) circuit high	ON	2	HO2S heater	×	(See 01–02B–27 DTC P0032 [AJ].)
P0037	HO2S heater (RR) circuit low	ON	2	HO2S heater	×	(See 01–02B–29 DTC P0037 [AJ].)
P0038	HO2S heater (RR) circuit high	ON	2	HO2S heater	×	(See 01–02B–31 DTC P0038 [AJ].)
P0051	HO2S heater (LF) circuit low	ON	2	HO2S heater	×	(See 01–02B–33 DTC P0051 [AJ].)
P0052	HO2S heater (LF) circuit high	ON	2	HO2S heater	×	(See 01–02B–35 DTC P0052 [AJ].)
P0057	HO2S heater (LR) circuit low	ON	2	HO2S heater	×	(See 01–02B–37 DTC P0057 [AJ].)
P0058	HO2S heater (LR) circuit high	ON	2	HO2S heater	×	(See 01–02B–39 DTC P0058 [AJ].)
P0101	MAF sensor inconsistent with TP sensor	ON	2	CCM	×	(See 01–02B–41 DTC P0101 [AJ].)
P0102	MAF circuit low input	ON	1	CCM	×	(See 01–02B–43 DTC P0102 [AJ].)
P0103	MAF circuit high input	ON	1	CCM	×	(See 01–02B–45 DTC P0103 [AJ].)
P0111	IAT circuit performance problem	ON	2	CCM	×	(See 01–02B–47 DTC P0111 [AJ].)
P0112	IAT circuit low input	ON	1	CCM	×	(See 01–02B–48 DTC P0112 [AJ].)
P0113	IAT circuit high input	ON	1	CCM	×	(See 01–02B–50 DTC P0113 [AJ].)
P0117	ECT circuit low input	ON	1	Engine cooling system	×	(See 01–02B–52 DTC P0117 [AJ].)
P0118	ECT circuit high input	ON	1	Engine cooling system	×	(See 01–02B–54 DTC P0118 [AJ].)
P0122	TP sensor No.1 circuit low input	ON	1	CCM	×	(See 01–02B–56 DTC P0122 [AJ].)
P0123	TP sensor No.1 circuit high input	ON	1	CCM	×	(See 01–02B–58 DTC P0123 [AJ].)
P0125	Excessive time to enter closed loop fuel control	ON	2	Engine cooling system	×	(See 01–02B–60 DTC P0125 [AJ].)
P0126	Coolant thermostat	ON	2	Engine cooling system	×	(See 01–02B–61 DTC P0126, P0128 [AJ].)
P0128	Coolant thermostat	ON	2	Engine cooling system	×	(See 01–02B–61 DTC P0126, P0128 [AJ].)

DTC No.	Condition	MIL	DC	Monitor item	Memory function	Page
P0131	HO2S (RF) circuit low input	ON	2	HO2S	×	(See 01–02B–64 DTC P0131, P0151 [AJ].)
P0132	HO2S (RF) circuit high input	ON	2	HO2S	×	(See 01–02B–66 DTC P0132, P0152 [AJ].)
P0133	HO2S (RF) circuit malfunction	ON	2	HO2S	×	(See 01–02B–68 DTC P0133, P0153 [AJ].)
P0134	HO2S (RF) circuit no activity detected	ON	2	HO2S	×	(See 01–02B–71 DTC P0134, P0154 [AJ].)
P0138	HO2S (RR) circuit high input	ON	2	HO2S	×	(See 01–02B–73 DTC P0138, P0158 [AJ].)
P0139	HO2S (RR) circuit problem	ON	2	HO2S	×	(See 01–02B–75 DTC P0139, P0159 [AJ].)
P0140	HO2S (RR) circuit no activity detected	ON	2	HO2S	×	(See 01–02B–77 DTC P0140, P0160 [AJ].)
P0151	HO2S (LF) circuit low input	ON	2	HO2S	×	(See 01–02B–64 DTC P0131, P0151 [AJ].)
P0152	HO2S (LF) circuit high input	ON	2	HO2S	×	(See 01–02B–66 DTC P0132, P0152 [AJ].)
P0153	HO2S (LF) circuit malfunction	ON	2	HO2S	×	(See 01–02B–68 DTC P0133, P0153 [AJ].)
P0154	HO2S (LF) circuit no activity detected	ON	2	HO2S	×	(See 01–02B–71 DTC P0134, P0154 [AJ].)
P0158	HO2S (LR) circuit high input	ON	2	HO2S	×	(See 01–02B–73 DTC P0138, P0158 [AJ].)
P0159	HO2S (LR) circuit problem	ON	2	HO2S	×	(See 01–02B–75 DTC P0139, P0159 [AJ].)
P0160	HO2S (LR) circuit no activity detected	ON	2	HO2S	×	(See 01–02B–77 DTC P0140, P0160 [AJ].)
P0171	Fuel trim system (RH) too lean	ON	2	Fuel	×	(See 01–02B–79 DTC P0171, P0174 [AJ].)
P0172	Fuel trim system (RH) too rich	ON	2	Fuel	×	(See 01–02B–81 DTC P0172, P0175 [AJ].)
P0174	Fuel trim system (LH) too lean	ON	2	Fuel	×	(See 01–02B–79 DTC P0171, P0174 [AJ].)
P0175	Fuel trim system (LH) too rich	ON	2	Fuel	×	(See 01–02B–81 DTC P0172, P0175 [AJ].)
P0222	TP sensor No.2 circuit low input	ON	1	CCM	×	(See 01–02B–83 DTC P0222 [AJ].)
P0223	TP sensor No.2 circuit high input	ON	1	CCM	×	(See 01–02B–86 DTC P0223 [AJ].)
P0300	Random misfire detected	Flash / ON	1 or 2	Misfire	×	(See 01–02B–88 DTC P0300 [AJ].)

DTC No.	Condition	MIL	DC	Monitor item	Memory function	Page
P0301	Cylinder No.1 misfire detected	Flash / ON	1 or 2	Misfire	×	(See 01–02B–91 DTC P0301, P0302, P0303, P0304, P0305, P0306 [AJ].)
P0302	Cylinder No.2 misfire detected	Flash / ON	1 or 2	Misfire	×	
P0303	Cylinder No.3 misfire detected	Flash / ON	1 or 2	Misfire	×	
P0304	Cylinder No.4 misfire detected	Flash / ON	1 or 2	Misfire	×	
P0305	Cylinder No.5 misfire detected	Flash / ON	1 or 2	Misfire	×	
P0306	Cylinder No.6 misfire detected	Flash / ON	1 or 2	Misfire	×	
P0325	KS circuit	ON	1	CCM	×	(See 01–02B–93 DTC P0325 [AJ].)
P0335	CKP sensor circuit malfunction	ON	1	CCM	×	(See 01–02B–95 DTC P0335 [AJ].)
P0340	CMP sensor (RH) circuit malfunction	ON	1	CCM	×	(See 01–02B–97 DTC P0340 [AJ].)
P0345	CMP sensor (LH) circuit malfunction	ON	1	CCM	×	(See 01–02B–100 DTC P0345 [AJ].)
P0401	EGR flow insufficient detected	ON	2	EGR	×	(See 01–02B–103 DTC P0401 [AJ].)
P0403	EGR valve (stepper motor) circuit malfunction	ON	2	CCM	×	(See 01–02B–105 DTC P0403 [AJ].)
P0421	Warm-up catalyst system (RH) efficiency below threshold	ON	2	Catalyst	×	(See 01–02B–107 DTC P0421, P0431 [AJ].)
P0431	Warm-up catalyst system (LH) efficiency below threshold	ON	2	Catalyst	×	(See 01–02B–107 DTC P0421, P0431 [AJ].)
P0441	EVAP control system incorrect purge flow	ON	2	Evaporative	×	(See 01–02B–109 DTC P0441 [AJ].)
P0442	EVAP control system leak detected (small leak)	ON	2	Evaporative	×	(See 01–02B–111 DTC P0442 [AJ].)
P0443	EVAP control system purge control valve circuit malfunction	ON	2	CCM	×	(See 01–02B–113 DTC P0443 [AJ].)
P0446	Change-over valve (EVAP system leak detection pump) stuck closed	ON	2	CCM	×	(See 01–02B–115 DTC P0446 [AJ].)
P0455	EVAP control system leak detected (large leak)	ON	2	Evaporative	×	(See 01–02B–116 DTC P0455 [AJ].)
P0456*1	EVAP control system leak detected (very small leak)	ON	2	Evaporative	×	(See 01–02B–118 DTC P0456 [AJ].)
P0461	Fuel gauge sender unit circuit range/ performance	ON	2	CCM	×	(See 01–02B–120 DTC P0461 [AJ].)
P0462	Fuel gauge sender unit circuit low input	ON	2	CCM	×	(See 01–02B–121 DTC P0462 [AJ].)
P0463	Fuel gauge sender unit circuit high input	ON	2	CCM	×	(See 01–02B–122 DTC P0463 [AJ].)
P0480	Fan control circuit malfunction	OFF	2	Other	×	(See 01–02B–123 DTC P0480 [AJ].)
P0500	VSS circuit malfunction	ON	2	CCM	×	(See 01–02B–125 DTC P0500 [AJ].)
P0505	Idle control system malfunction	OFF	–	–	–	(See 01–02B–128 DTC P0505 [AJ].)
P0506	Idle control system RPM lower than expected	ON	2	CCM	×	(See 01–02B–129 DTC P0506 [AJ].)
P0507	Idle control system RPM higher than expected	ON	2	CCM	×	(See 01–02B–131 DTC P0507 [AJ].)
P0550	PSP switch circuit malfunction	ON	2	CCM	×	(See 01–02B–132 DTC P0550 [AJ].)

DTC No.	Condition	MIL	DC	Monitor item	Memory function	Page
P0564	Cruise control switch circuit malfunction	OFF	1	Other	×	(See 01–02B–134 DTC P0564 [AJ].)
P0571	Brake switch circuit malfunction	OFF	1	Other	×	(See 01–02B–136 DTC P0571 [AJ].)
P0602	PCM programming error	ON	1	CCM	×	(See 01–02B–138 DTC P0602 [AJ].)
P0606	ECM/PCM processor	OFF	1	Other	×	(See 01–02B–139 DTC P0606 [AJ].)
P0610	Control module vehicle options error	ON	1	CCM	×	(See 01–02B–140 DTC P0610 [AJ].)
P0703	Brake switch No.1 input malfunction	ON	2	CCM	×	(See 01–02B–141 DTC P0703 [AJ].)
P0704	Clutch switch input malfunction	ON	2	CCM	×	(See 01–02B–143 DTC P0704 [AJ].)
P0850	Neutral switch input malfunction	ON	2	CCM	×	(See 01–02B–145 DTC P0850 [AJ].)
P1309	PCM IC for misfire detection	ON	2	CCM	×	(See 01–02B–147 DTC P1309 [AJ].)
P1410	VAD control system circuit malfunction	OFF	2	Other	×	(See 01–02B–148 DTC P1410 [AJ].)
P1487	EGR boost sensor solenoid valve circuit malfunction	ON	2	CCM	×	(See 01–02B–150 DTC P1487 [AJ].)
P1562	PCM +BB voltage low	ON	1	CCM	×	(See 01–02B–152 DTC P1562 [AJ].)
P2088	CMP actuator (RH) circuit low	ON	1	CCM	×	(See 01–02B–154 DTC P2088 [AJ].)
P2089	CMP actuator (RH) circuit high	ON	1	CCM	×	(See 01–02B–156 DTC P2089 [AJ].)
P2092	CMP actuator (LH) circuit low	ON	1	CCM	×	(See 01–02B–158 DTC P2092 [AJ].)
P2093	CMP actuator (LH) circuit high	ON	1	CCM	×	(See 01–02B–160 DTC P2093 [AJ].)
P2100	Throttle actuator control motor circuit/open	ON	1	CCM	×	(See 01–02B–162 DTC P2100 [AJ].)
P2101	Throttle actuator control motor circuit range/performance	ON	1	CCM	×	(See 01–02B–165 DTC P2101 [AJ].)
P2105	Throttle actuator control system - forced engine shutdown	OFF	1	Other	×	(See 01–02B–168 DTC P2105 [AJ].)
P2107	Throttle actuator control module processor	ON	1	CCM	×	(See 01–02B–169 DTC P2107 [AJ].)
P2110	Throttle actuator control system - forced limited RPM	ON	1	CCM	×	(See 01–02B–170 DTC P2110 [AJ].)
P2111	Throttle actuator control system - stuck open	ON	1	CCM	×	(See 01–02B–172 DTC P2111, P2112 [AJ].)
P2112	Throttle actuator control system - stuck closed	ON	1	CCM	×	(See 01–02B–172 DTC P2111, P2112 [AJ].)
P2119	Throttle actuator control throttle body range/performance	ON	2	CCM	×	(See 01–02B–173 DTC P2119 [AJ].)
P2122	APP sensor No.1 circuit low input	ON	1	CCM	×	(See 01–02B–174 DTC P2122 [AJ].)
P2123	APP sensor No.1 circuit high input	ON	1	CCM	×	(See 01–02B–176 DTC P2123 [AJ].)
P2127	APP sensor No.2 circuit low input	ON	1	CCM	×	(See 01–02B–178 DTC P2127 [AJ].)
P2128	APP sensor No.2 circuit high input	ON	1	CCM	×	(See 01–02B–180 DTC P2128 [AJ].)
P2135	TP sensor No.1/No.2 voltage correlation	ON	1	CCM	×	(See 01–02B–182 DTC P2135 [AJ].)

DTC No.	Condition	MIL	DC	Monitor item	Memory function	Page
P2138	APP sensor No.1/No.2 voltage correlation	ON	1	CCM	×	(See 01–02B–183 DTC P2138 [AJ].)
P2195	HO2S (RF) signal stuck lean	ON	2	HO2S	×	(See 01–02B–184 DTC P2195, P2197 [AJ].)
P2196	HO2S (RF) signal stuck rich	ON	2	HO2S	×	(See 01–02B–186 DTC P2196, P2198 [AJ].)
P2197	HO2S (LF) signal stuck lean	ON	2	HO2S	×	(See 01–02B–184 DTC P2195, P2197 [AJ].)
P2198	HO2S (LF) signal stuck rich	ON	2	HO2S	×	(See 01–02B–186 DTC P2196, P2198 [AJ].)
P2227	EGR boost sensor circuit performance problem	ON	2	CCM	×	(See 01–02B–188 DTC P2227 [AJ].)
P2228	EGR boost sensor circuit low input	ON	1	CCM	×	(See 01–02B–189 DTC P2228 [AJ].)
P2229	EGR boost sensor circuit high input	ON	1	CCM	×	(See 01–02B–192 DTC P2229 [AJ].)
P2271	HO2S (RR) signal stuck rich	ON	2	HO2S	×	(See 01–02B–194 DTC P2271, P2273 [AJ].)
P2273	HO2S (LR) signal stuck rich	ON	2	HO2S	×	(See 01–02B–194 DTC P2271, P2273 [AJ].)
P2401	EVAP system leak detection pump control circuit low	ON	2	CCM	×	(See 01–02B–196 DTC P2401 [AJ].)
P2402	EVAP system leak detection pump control circuit high	ON	2	CCM	×	(See 01–02B–198 DTC P2402 [AJ].)
P2404	EVAP system leak detection pump sense circuit malfunction	ON	2	CCM	×	(See 01–02B–201 DTC P2404 [AJ].)
P2405	EVAP system leak detection pump sense circuit low input	ON	2	CCM	×	(See 01–02B–202 DTC P2405 [AJ].)
P2407	EVAP system leak detection pump sense circuit intermittent	ON	2	CCM	×	(See 01–02B–203 DTC P2407 [AJ].)
P2502	Generator terminal B circuit open	OFF	1	Other	×	(See 01–02B–204 DTC P2502 [AJ].)
P2503	Generator output voltage signal no electricity	OFF	1	Other	×	(See 01–02B–205 DTC P2503 [AJ].)
P2504	Battery overcharge	OFF	1	Other	×	(See 01–02B–207 DTC P2504 [AJ].)
U0073	CAN system communication error	(See 09–02C–1 MULTIPLEX COMMUNICATION SYSTEM.)				
U0101	Communication error to TCM	(See 09–02C–1 MULTIPLEX COMMUNICATION SYSTEM.)				
U0121	Communication error to ABS/TCS HU/CM	(See 09–02C–1 MULTIPLEX COMMUNICATION SYSTEM.)				
U0155	Communication error to instrument cluster	(See 09–02C–1 MULTIPLEX COMMUNICATION SYSTEM.)				

*1 : California emission regulation applicable model

DTC P0011 [AJ]

C6U010201084W01

DTC P0011	CMP timing over-advanced (RH)
DETECTION CONDITION	• The actual valve timing is over-advanced by **20°** from the target valve timing for **5 s**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Spool valve in OCV (RH) is stuck in advance position. • Variable valve timing actuator (RH) is stuck in advance position. • Loose timing chain or improper valve timing • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT OCV (RH) FOR MALFUNCTION** • Start engine. • Increase engine speed. • Stop engine. • Remove OCV (RH). (See 01–10B–47 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [AJ].) • Inspect position of spool valve in OCV (RH). • Is spool valve located at valve retard position?	Yes	Go to next step.
		No	Replace OCV (RH), then go to Step 6. (See 01–10B–47 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [AJ].)
4	**INSPECT STOPPER PIN MECHANISM** • Remove timing chain. • Inspect stopper pin. (See 01–10B–45 VARIABLE VALVE TIMING ACTUATOR INSPECTION [AJ].) • Is stopper pin mechanism okay?	Yes	Go to next step.
		No	Replace variable valve timing actuator (RH), then go to Step 6. (See 01–10B–46 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [AJ].)
5	**INSPECT ROTOR POSITION** • Remove variable valve timing actuator (RH). (See 01–10B–46 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [AJ].) • Is rotor position at maximum valve timing retard?	Yes	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC is detected by intermittent concern. • Intermittent concern might be removed by cleaning mode of variable valve timing control function. Go to next step.
		No	Replace variable valve timing actuator (RH), go to next step. (See 01–10B–46 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [AJ].)
6	**VERIFY TROUBLESHOOTING OF DTC P0011 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC troubleshooting. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0012 [AJ]

C6U010201084W02

DTC P0012	CMP timing over-retarded (RH)
DETECTION CONDITION	• The actual valve timing is over-retarded by **10°** from the target valve timing for **4 s**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Low engine oil pressure • Loose timing chain or improper valve timing • Spool valve in OCV (RH) is stuck in retard position • The following oil runners are clogged or have leakage: — Between oil pressure switch and OCV (RH) — Between OCV (RH) and variable valve timing actuator (RH) — In variable valve timing actuator (RH) • Variable valve timing actuator (RH) is stuck in retard position • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Is DTC P2088 or P2089 present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**VERIFY ENGINE OIL PRESSURE** • Start engine. • Does oil pressure warning light illuminate?	Yes	Inspect engine oil pressure. (See 01–11–4 OIL PRESSURE INSPECTION.)
		No	Go to next step.
5	**VERIFY TIMING CHAIN INSTALLATION** • Stop engine. • Remove timing chain cover. • Is camshaft timing mark at correct point? (See 01–10B–8 TIMING CHAIN REMOVAL/ INSTALLATION [AJ].)	Yes	Go to next step.
		No	Reinstall timing chain, then go to Step 8. (See 01–10B–8 TIMING CHAIN REMOVAL/ INSTALLATION [AJ].)
6	**INSPECT OCV (RH) FOR MALFUNCTION** • Stop engine. • Remove OCV (RH). (See 01–10B–47 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [AJ].) • Inspect position of spool valve in OCV (RH). • Is spool valve located at valve retard position?	Yes	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC is detected by intermittent concern. • Intermittent concern might be removed by cleaning mode of variable valve timing control function. Go to next step.
		No	Replace OCV, then go to Step 8. (See 01–10B–47 OIL CONTROL VALVE (OCV) REMOVAL/ INSTALLATION [AJ].)
7	**INSPECT ENGINE OIL RUNNER** • Inspect the following engine oil runners for clogging or leakage: — Between oil pressure switch and OCV (RH) — Between OCV (RH) and variable valve timing actuator (RH) — In variable valve timing actuator (RH) • Is there any clogging or leakage?	Yes	Repair or replace suspected runner, then go to next step.
		No	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC is detected by intermittent concern. • Intermittent concern might be removed by cleaning mode of variable valve timing control function. Go to next step.

STEP	INSPECTION		ACTION
8	**VERIFY TROUBLESHOOTING OF DTC P0012 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC troubleshooting. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0021 [AJ]

C6U010201084W03

DTC P0021	CMP timing over-advanced (LH)
DETECTION CONDITION	• The actual valve timing is over-advanced by **20°** from the target valve timing for **5 s.** **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Spool valve in OCV (LH) is stuck in advance position. • Variable valve timing actuator (LH) is stuck in advance position. • Loose timing chain or improper valve timing • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT OCV (LH) FOR MALFUNCTION** • Start engine. • Increase engine speed. • Stop engine. • Remove OCV (LH). (See 01–10B–47 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [AJ].) • Inspect position of spool valve in OCV (LH). • Is spool valve located at valve retard position?	Yes	Go to next step.
		No	Replace OCV (LH), then go to Step 6. (See 01–10B–47 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [AJ].)
4	**INSPECT STOPPER PIN MECHANISM** • Remove timing chain. • Inspect stopper pin. (See 01–10B–45 VARIABLE VALVE TIMING ACTUATOR INSPECTION [AJ].) • Is stopper pin mechanism okay?	Yes	Go to next step.
		No	Replace variable valve timing actuator (LH), then go to Step 6. (See 01–10B–46 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [AJ].)

STEP	INSPECTION		ACTION
5	**INSPECT ROTOR POSITION** • Remove variable valve timing actuator (LH). (See 01–10B–46 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [AJ].) • Is rotor position at maximum valve timing retard?	Yes	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC is detected by intermittent concern. • Intermittent concern might be removed by cleaning mode of variable valve timing control function. Go to next step.
		No	Replace variable valve timing actuator, go to next step. (See 01–10B–46 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [AJ].)
6	**VERIFY TROUBLESHOOTING OF DTC P0021 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC troubleshooting. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0022 [AJ]

C6U010201084W04

DTC P0022	CMP timing over-retarded (LH)
DETECTION CONDITION	• The actual valve timing is over-retarded by **10°** from the target valve timing for **4 s**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Low engine oil pressure • Loose timing chain or improper valve timing • Spool valve in OCV (LH) is stuck in retard position. • The following oil runners are clogged or have leakage: — Between oil pressure switch and OCV (LH) — Between OCV (LH) and variable valve timing actuator (LH) — In variable valve timing actuator (LH) • Variable valve timing actuator (LH) is stuck in retard position. • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Is DTC P2092 or P2093 present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**VERIFY ENGINE OIL PRESSURE** • Start engine. • Does oil pressure warning light illuminate?	Yes	Inspect engine oil pressure. (See 01–11–4 OIL PRESSURE INSPECTION.)
		No	Go to next step.

STEP	INSPECTION		ACTION
5	**VERIFY TIMING CHAIN INSTALLATION** • Stop engine. • Remove timing chain cover. • Is camshaft timing mark at correct point? (See 01–10B–8 TIMING CHAIN REMOVAL/ INSTALLATION [AJ].)	Yes	Go to next step.
		No	Reinstall timing chain, then go to Step 8. (See 01–10B–8 TIMING CHAIN REMOVAL/ INSTALLATION [AJ].)
6	**INSPECT OCV (LH) FOR MALFUNCTION** • Stop engine. • Remove OCV (LH). (See 01–10B–47 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [AJ].) • Inspect position of spool valve in OCV (LH). • Is spool valve located at valve retard position?	Yes	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC is detected by intermittent concern. • Intermittent concern might be removed by cleaning mode of variable valve timing control function. Go to next step.
		No	Replace OCV (LH), then go to Step 8. (See 01–10B–47 OIL CONTROL VALVE (OCV) REMOVAL/ INSTALLATION [AJ].)
7	**INSPECT ENGINE OIL RUNNER** • Inspect the following engine oil runners for clogging or leakage: — Between oil pressure switch and OCV (LH) — Between OCV (LH) and variable valve timing actuator (LH) — In variable valve timing actuator (LH) • Is there any clogging or leakage?	Yes	Repair or replace suspected runner, then go to next step.
		No	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC is detected by intermittent concern. • Intermittent concern might be removed by cleaning mode of variable valve timing control function. Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0022 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC troubleshooting. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

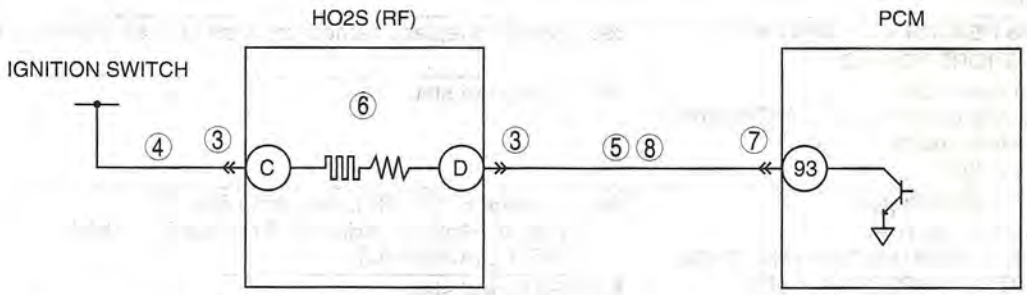
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT HO2S (RF) CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect HO2S (RF) connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT HO2S HEATER (RF) POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between HO2S (RF) terminal C (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
5	**INSPECT HO2S HEATER (RF) CONTROL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between HO2S (RF) terminal D (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
6	**INSPECT HO2S HEATER (RF)** • Inspect HO2S heater (RF). (See 01–40B–32 HEATED OXYGEN SENSOR (HO2S) HEATER INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace HO2S (RF), then go to Step 9. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**INSPECT HO2S HEATER (RF) CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between HO2S (RF) terminal D (harness-side) and PCM terminal 93 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
9	**VERIFY TROUBLESHOOTING OF DTC P0031 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm up it completely. • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

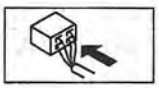
DTC P0031 [AJ]

C6U010201084W05

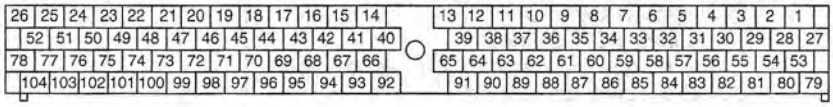
DTC P0031	HO2S heater (RF) circuit low
DETECTION CONDITION	• The PCM monitors the HO2S heater (RF) control signal at PCM terminal 93. If the PCM turns the HO2S heater (RF) off but the HO2S heater (RF) circuit has low voltage, the PCM determines that the HO2S heater (RF) circuit has a malfunction. **Note** • HO2S heater (RF) is controlled by a duty signal. **Diagnostic support note** • This is a continuous monitor (O_2 sensor heater). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• HO2S heater (RF) malfunction • Connector or terminal malfunction • Open circuit between ignition switch and HO2S (RF) terminal C • Short to GND circuit between HO2S (RF) terminal D and PCM terminal 93 • Open circuit between HO2S (RF) terminal D and PCM terminal 93 • PCM malfunction



HO2S (RF)
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR



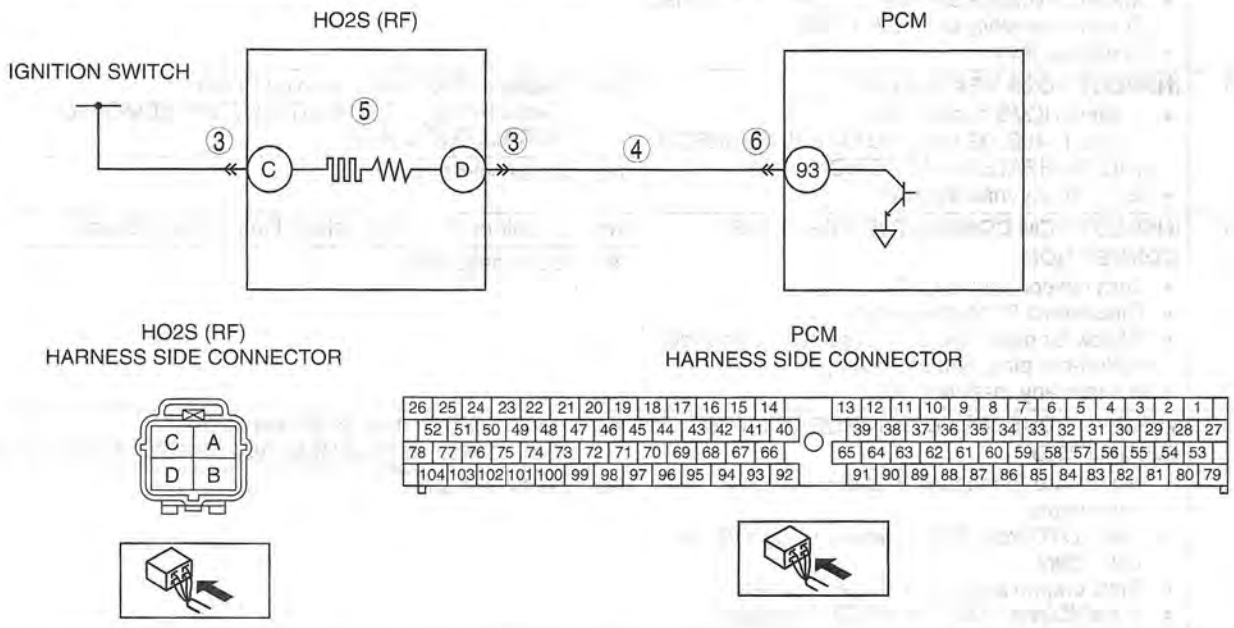
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT HO2S (RF) CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect HO2S (RF) connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT HO2S HEATER (RF) POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between HO2S (RF) terminal C (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
5	**INSPECT HO2S HEATER (RF) CONTROL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between HO2S (RF) terminal D (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
6	**INSPECT HO2S HEATER (RF)** • Inspect HO2S heater (RF). (See 01–40B–32 HEATED OXYGEN SENSOR (HO2S) HEATER INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace HO2S (RF), then go to Step 9. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**INSPECT HO2S HEATER (RF) CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between HO2S (RF) terminal D (harness-side) and PCM terminal 93 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
9	**VERIFY TROUBLESHOOTING OF DTC P0031 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm up it completely. • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0032 [AJ]

C6U010201084W06

DTC P0032	HO2S heater (RF) circuit high
DETECTION CONDITION	• The PCM monitors the HO2S heater (RF) control signal at PCM terminal 93. If the PCM turns the HO2S heater (RF) on but the HO2S heater (RF) circuit has high voltage, the PCM determines that the HO2S heater (RF) circuit has a malfunction. **Note** • HO2S heater (RF) is controlled by a duty signal. **Diagnostic support note** • This is a continuous monitor (O_2 sensor heater). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• HO2S heater (RF) malfunction • Connector or terminal malfunction • Short to power circuit between HO2S (RF) terminal D and PCM terminal 93 • PCM malfunction



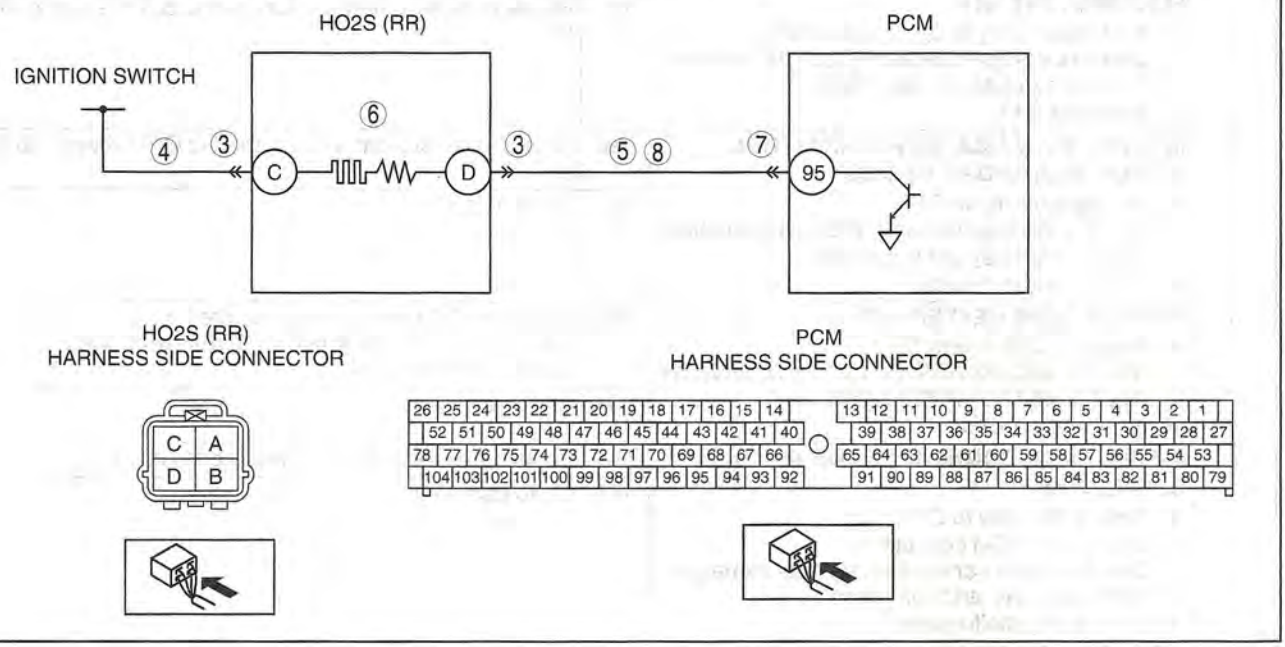
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT HO2S (RF) CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect HO2S (RF) connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**INSPECT HO2S HEATER (RF) CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between HO2S (RF) terminal D (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for shot to power, then go to Step 7.
		No	Go to next step.
5	**INSPECT HO2S HEATER (RF)** • Inspect HO2S heater (RF). (See 01–40B–32 HEATED OXYGEN SENSOR (HO2S) HEATER INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace HO2S (RF), then go to Step 7. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0032 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0037 [AJ]

C6U010201084W07

DTC P0037	HO2S heater (RR) circuit low
DETECTION CONDITION	• The PCM monitors the HO2S heater (RR) control signal at PCM terminal 95. If the PCM turns the HO2S heater (RR) off but the HO2S heater (RR) circuit has low voltage, the PCM determines that the HO2S heater (RR) circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (O_2 sensor heater). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• HO2S heater (RR) malfunction • Connector or terminal malfunction • Open circuit between ignition switch and HO2S (RR) terminal C • Short to GND circuit between HO2S (RR) terminal D and PCM terminal 95 • Open circuit between HO2S (RR) terminal D and PCM terminal 95 • PCM malfunction



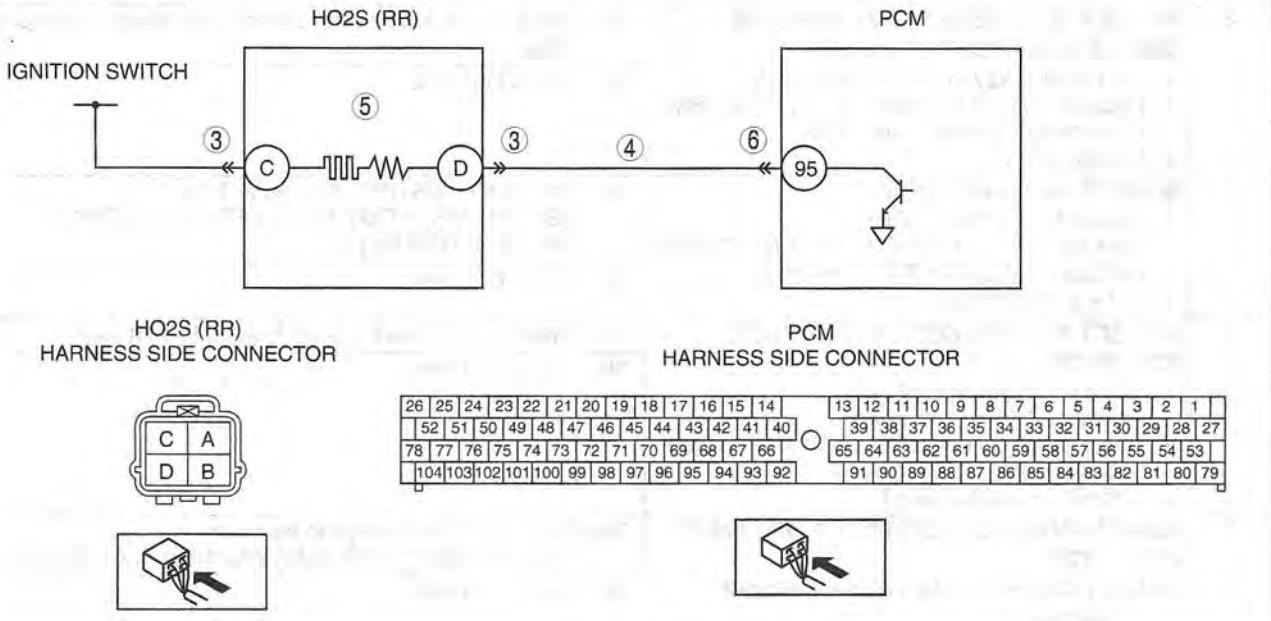
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT HO2S (RR) CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect HO2S (RR) connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT HO2S HEATER (RR) POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between HO2S (RR) terminal C (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
5	**INSPECT HO2S HEATER (RR) CONTROL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between HO2S (RR) terminal D (harness-side) and body GND. • Is there any continuity?	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
6	**INSPECT HO2S HEATER (RR)** • Inspect HO2S heater (RR). (See 01–40B–32 HEATED OXYGEN SENSOR (HO2S) HEATER INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace HO2S (RR), then go to Step 9. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**INSPECT HO2S HEATER (RR) CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between HO2S (RR) terminal D (harness-side) and PCM terminal 95 (harness-side). • Is there any continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0037 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0038 [AJ]

C6U010201084W08

DTC P0038	HO2S heater (RR) circuit high
DETECTION CONDITION	• The PCM monitors the HO2S heater (RR) control signal at PCM terminal 95. If the PCM turns the HO2S heater (RR) on but the HO2S heater (RR) circuit has high voltage, the PCM determines that the HO2S heater (RR) circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (O_2 sensor heater). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• HO2S heater (RR) malfunction • Connector or terminal malfunction • Short to power circuit between HO2S (RR) terminal D and PCM terminal 95 • PCM malfunction



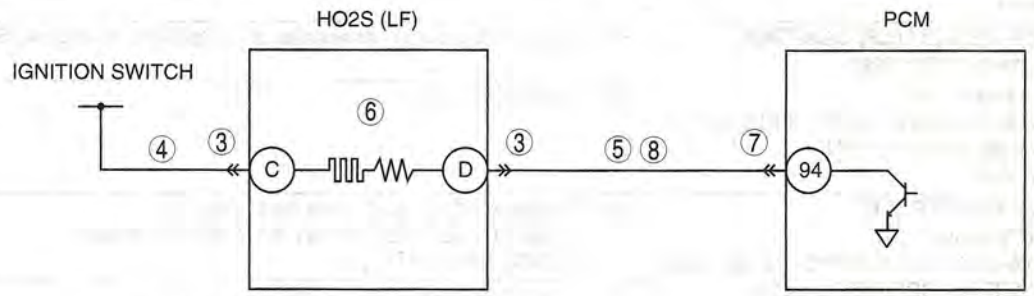
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT HO2S (RR) CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect HO2S (RR) connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**INSPECT HO2S HEATER (RR) CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between HO2S (RR) terminal D (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 7.
		No	Go to next step.
5	**INSPECT HO2S HEATER (RR)** • Inspect HO2S heater (RR). (See 01–40B–32 HEATED OXYGEN SENSOR (HO2S) HEATER INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace HO2S (RR), then go to Step 7. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0038 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

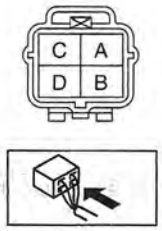
DTC P0051 [AJ]

C6U010201084W09

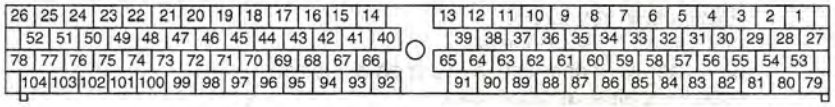
DTC P0051	HO2S heater (LF) circuit low
DETECTION CONDITION	• The PCM monitors the HO2S heater (LF) control signal at PCM terminal 94. If the PCM turns the HO2S heater (LF) off but the HO2S heater (LF) circuit has low voltage, the PCM determines that the HO2S heater (LF) circuit has a malfunction. **Note** • HO2S heater (LF) is controlled by a duty signal. **Diagnostic support note** • This is a continuous monitor (O_2 sensor heater). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• HO2S heater (LF) malfunction • Connector or terminal malfunction • Open circuit between ignition switch and HO2S (LF) terminal C • Short to GND circuit between HO2S (LF) terminal D and PCM terminal 94 • Open circuit between HO2S (LF) terminal D and PCM terminal 94 • PCM malfunction



HO2S (LF)
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR



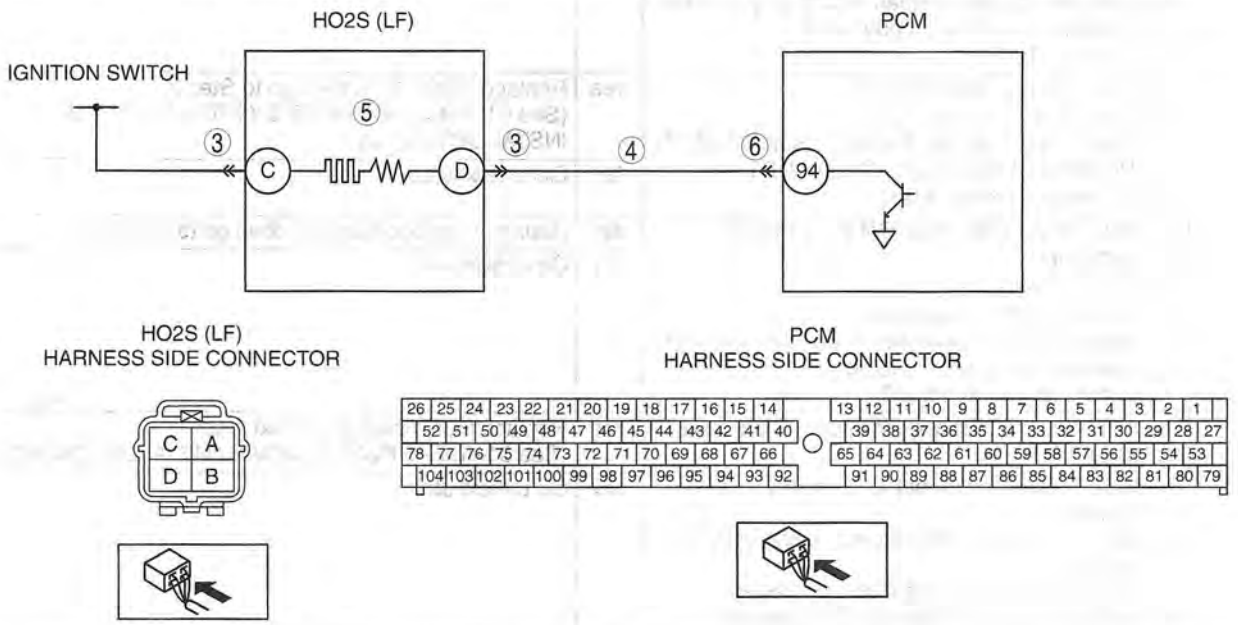
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT HO2S (LF) CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect HO2S (LF) connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT HO2S HEATER (LF) POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between HO2S (LF) terminal C (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
5	**INSPECT HO2S HEATER (LF) CONTROL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between HO2S (LF) terminal D (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
6	**INSPECT HO2S HEATER (LF)** • Inspect HO2S heater (LF). (See 01–40B–32 HEATED OXYGEN SENSOR (HO2S) HEATER INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace HO2S (LF), then go to Step 9. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**INSPECT HO2S HEATER (LF) CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between HO2S (LF) terminal D (harness-side) and PCM terminal 94 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
9	**VERIFY TROUBLESHOOTING OF DTC P0051 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm up it completely. • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0052 [AJ]

C6U010201084W10

DTC P0052	HO2S heater (LF) circuit high
DETECTION CONDITION	• The PCM monitors the HO2S heater (LF) control signal at PCM terminal 94. If the PCM turns the HO2S heater (LF) on but the HO2S heater (LF) circuit has high voltage, the PCM determines that the HO2S heater (LF) circuit has a malfunction. **Note** • HO2S heater (LF) is controlled by a duty signal. **Diagnostic support note** • This is a continuous monitor (O_2 sensor heater). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• HO2S heater (LF) malfunction • Connector or terminal malfunction • Short to power circuit between HO2S (LF) terminal D and PCM terminal 94 • PCM malfunction



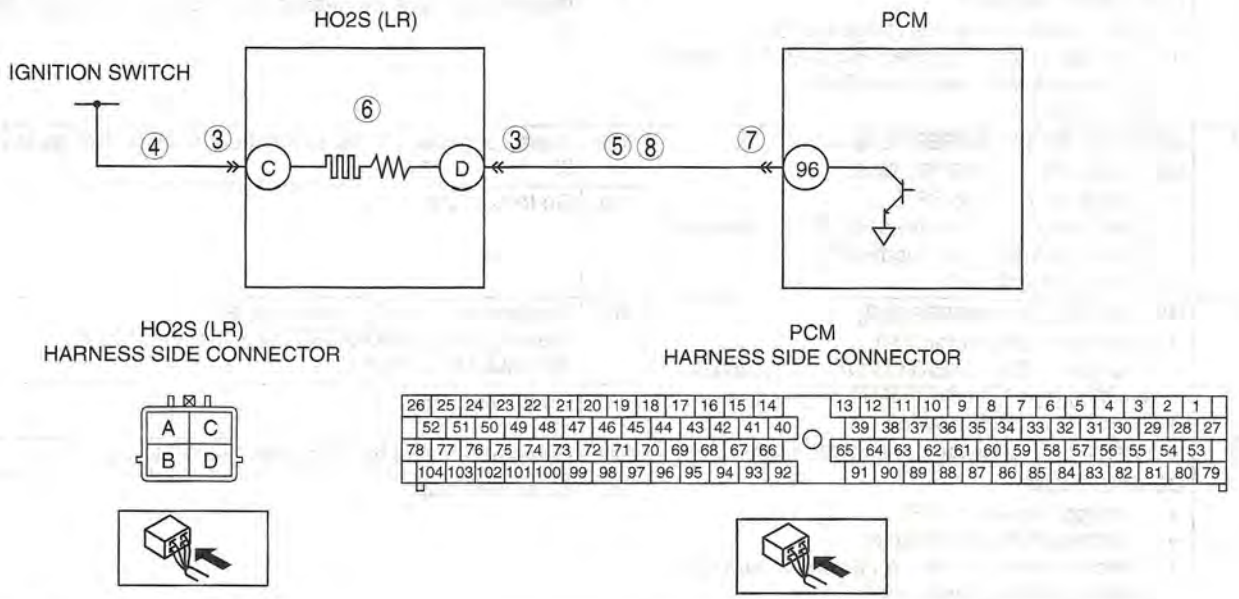
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT HO2S (LF) CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect HO2S (LF) connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**INSPECT HO2S HEATER (LF) CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between HO2S (LF) terminal D (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 7.
		No	Go to next step.
5	**INSPECT HO2S HEATER (LF)** • Inspect HO2S heater (LF). (See 01–40B–32 HEATED OXYGEN SENSOR (HO2S) HEATER INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace HO2S (LF), then go to Step 7. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0052 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0057 [AJ]

C6U010201084W11

DTC P0057	HO2S heater (LR) circuit low
DETECTION CONDITION	• The PCM monitors the HO2S heater (LR) control signal at PCM terminal 96. If the PCM turns the HO2S heater (LR) off but the HO2S heater (LR) circuit has low voltage, the PCM determines that the HO2S heater (LR) circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (O_2 sensor heater). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• HO2S heater (LR) malfunction • Connector or terminal malfunction • Open circuit between ignition switch and HO2S (LR) terminal C • Short to GND circuit between HO2S (LR) terminal D and PCM terminal 96 • Open circuit between HO2S (LR) terminal D and PCM terminal 96 • PCM malfunction



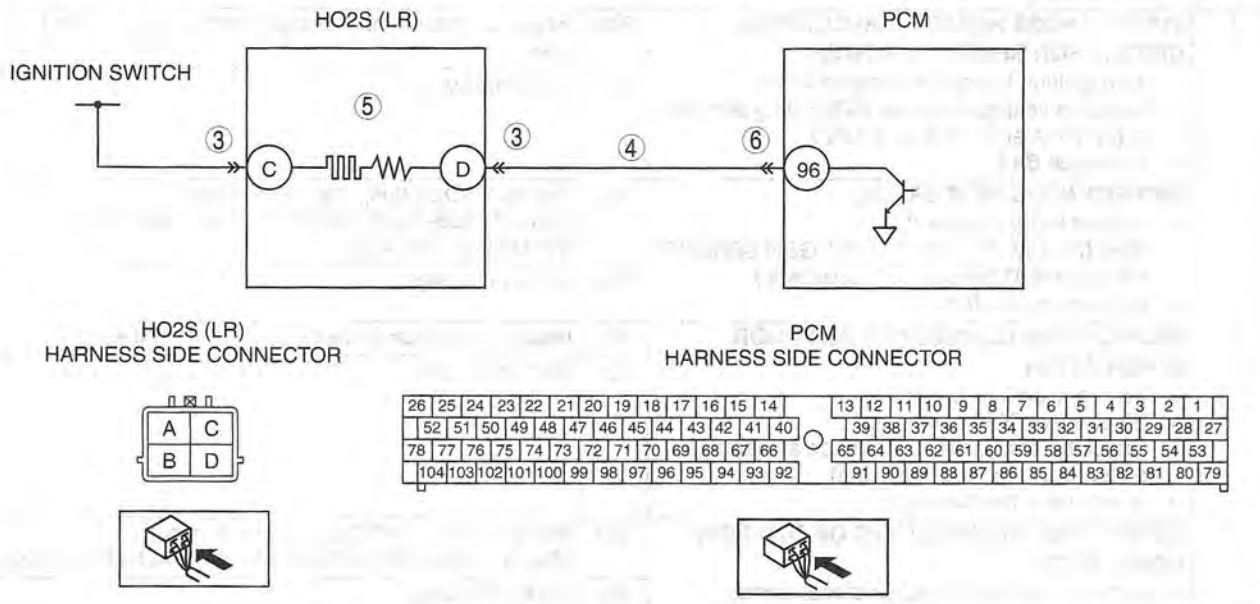
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT HO2S (LR) CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect HO2S (LR) connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT HO2S HEATER (LR) POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between HO2S (LR) terminal C (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
5	**INSPECT HO2S HEATER (LR) CONTROL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between HO2S (LR) terminal D (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
6	**INSPECT HO2S HEATER (LR)** • Inspect HO2S heater (LR). (See 01–40B–32 HEATED OXYGEN SENSOR (HO2S) HEATER INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace HO2S (LR), then go to Step 9. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**INSPECT HO2S HEATER (LR) CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between HO2S (LR) terminal D (harness-side) and PCM terminal 96 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0057 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0058 [AJ]

C6U010201084W12

DTC P0058	HO2S heater (LR) circuit high
DETECTION CONDITION	• The PCM monitors the HO2S heater (LR) control signal at PCM terminal 96. If the PCM turns the HO2S heater (LR) on but the rear heater circuit has high voltage, the PCM determines that the HO2S heater (LR) circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (O_2 sensor heater). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• HO2S heater (LR) malfunction • Connector or terminal malfunction • Short to power circuit between HO2S (LR) terminal D and PCM terminal 96 • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**INSPECT HO2S (LR) CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect HO2S (LR) connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**INSPECT HO2S HEATER (LR) CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between HO2S (LR) terminal D (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 7.
		No	Go to next step.
5	**INSPECT HO2S HEATER (LR)** • Inspect HO2S heater (LR). (See 01–40B–32 HEATED OXYGEN SENSOR (HO2S) HEATER INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace HO2S (LR), then go to Step 7. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0058 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace or repair PCM, go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0101 [AJ]

C6U010201084W13

DTC P0101	MAF sensor inconsistent with TP sensor
DETECTION CONDITION	• The PCM compares the actual input signal from the MAF sensor with the expected input signal from the MAF sensor which the PCM calculates by the input voltage from the throttle position sensor or engine speed. — If the mass intake airflow amount is **6.8 g/s {0.90 lb/min} or below** for **5 s** and the throttle opening angle is **50% or above** with the engine speed is **above 500 rpm**, the PCM determines that the detected mass intake airflow amount is too low. — If the mass intake airflow amount is **80 g/s {10.59 lb/min} or above** for **5 s** and the engine speed is **2,000 rpm or below** when the following conditions are met, the PCM determines that the detected mass intake airflow amount is too high. • Engine running • Engine coolant temperature is **above 70 °C {158 °F}** **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • TP sensor malfunction • Voltage drops in MAF signal circuit • Electrical corrosion in MAF signal circuit • Electrical corrosion in MAF RETURN circuit • Voltage drops in GND circuit • PCM malfunction

Diagnostic procedure

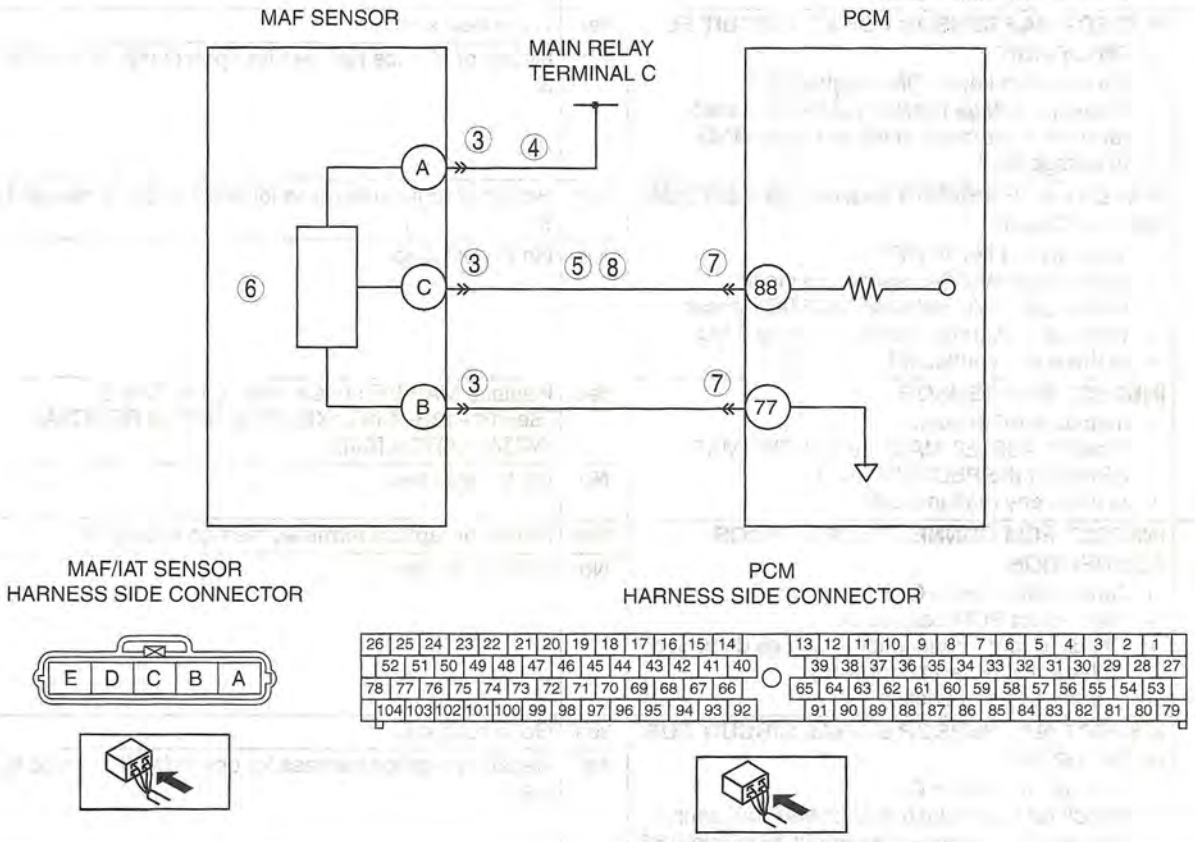
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT** • Connect WDS or equivalent to DLC-2. • Start engine. • Access ECT, TP1 and MAF PIDs. • Warm up engine until ECT PID is **80 °C {176 °F} or above**. • Drive vehicle. • Read MAF PID when TP1 PID is **50% or above**. • Is MAF PID reading **6.8 g/s {0.90 lb/min} or below**?	Yes	Make sure that TP1 PID changes smoothly when gradually opening throttle valve. • If not, replace throttle body and go to Step 5. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [AJ].) • For other, go to next step.
		No	Go to next step.
4	**VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT** • Connect WDS or equivalent to DLC-2. • Start engine. • Access ECT, MAF and RPM PIDs. • Warm up engine until ECT PID is **70 °C {158 °F} or above**. • Read MAF PID when RPM PID is **2,000 rpm or below**. • Is MAF PID reading **80 g/s {10.59 lb/min} or above**?	Yes	Go to Step 6.
		No	Intermittent concern exists. Go to "INTERMITTENT CONCERNS TROUBLESHOOTING". (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)

STEP	INSPECTION		ACTION
5	**VERIFY TROUBLESHOOTING OF DTC P0101 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Access ECT, TP1 and MAF PIDs. • Warm up engine until ECT PID is reading **80°C {176°F} or above**. • Drive vehicle and read TP1 and MAF PIDs. **Note** • Verify PIDs reading are within specifications for **5 s or more.** — MAF PID: **6.8 g/s {0.90 lb/min} or above** — TP1 PID: **50% or above** • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to Step 9. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to Step 9.
6	**INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect MAF/IAT sensor connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to next step.
		No	Replace MAF/IAT sensor, then go to next step. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
8	**VERIFY TROUBLESHOOTING OF DTC P0101 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up engine until ECT PID is **70 °C {158 °F} or above**. • Read MAF and RPM PIDs. **Note** • MAF PID should indicate **80 g/s {10.59 lb/min} or below** when RPM PID is **2,000 rpm or below**. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0102 [AJ]

C6U010201084W14

DTC P0102	MAF circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the MAF sensor when the engine is running. If the input voltage at PCM terminal 88 is **0.21 V or below**, the PCM determines that the MAF circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Open circuit between main relay terminal C and MAF/IAT sensor terminal A • Open circuit between MAF/IAT sensor terminal C and PCM terminal 88 • Short to GND circuit between MAF/IAT sensor terminal C and PCM terminal 88 • PCM malfunction



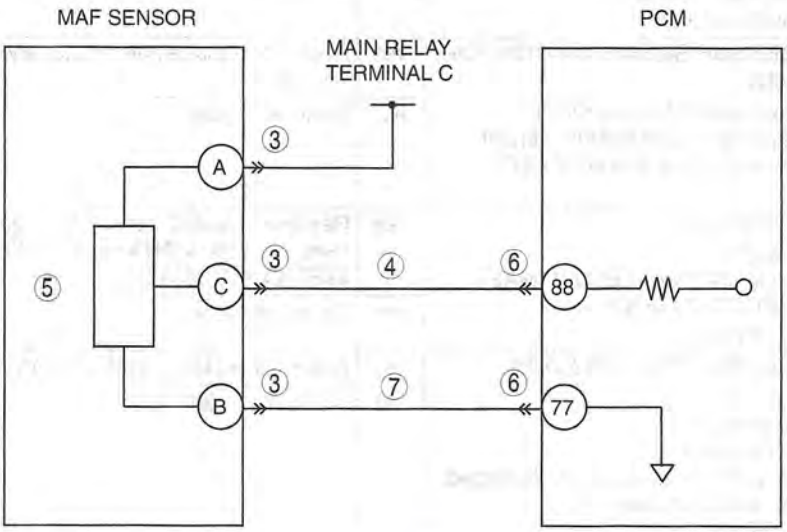
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect the MAF/IAT sensor connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT MAF SENSOR POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between MAF/IAT sensor terminal A (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
5	**INSPECT MAF SENSOR SIGNAL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Disconnect MAF/IAT sensor connector. • Check continuity between MAF/IAT sensor terminal C (harness-side) and body GND. • Is there any continuity?	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
6	**INSPECT MAF SENSOR** • Inspect MAF sensor. (See 01–40B–30 MASS AIR FLOW (MAF) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace MAF/IAT sensor, then go to Step 9. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**INSPECT MAF SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check for continuity between MAF/IAT sensor terminal C (harness-side) and PCM terminal 88 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0102 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

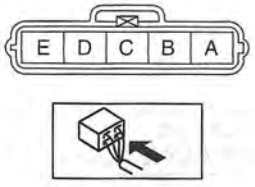
DTC P0103 [AJ]

C6U010201084W15

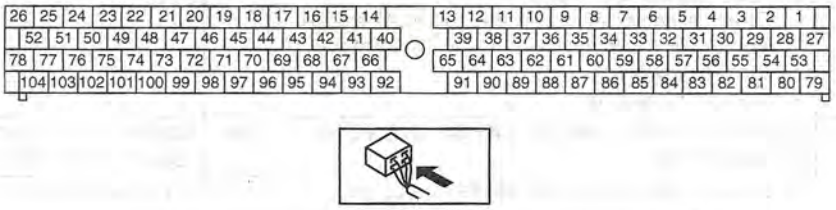
DTC P0103	MAF circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the MAF sensor when the engine is running. If the input voltage at PCM terminal 88 is **4.9 V or above**, the PCM determines that the MAF circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Short to power circuit between MAF/IAT sensor terminal C and PCM terminal 88 • Open circuit between MAF/IAT sensor terminal B and PCM terminal 77 • PCM malfunction



MAF/IAT SENSOR
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect the MAF/IAT sensor connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
4	**INSPECT MAF SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between MAF/IAT sensor terminal C (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 8.
		No	Go to next step.
5	**INSPECT MAF SENSOR** • Inspect MAF sensor. (See 01–40B–30 MASS AIR FLOW (MAF) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace MAF/IAT sensor, then go to Step 8. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
7	**INSPECT MAF SENSOR GND CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check for continuity between MAF/IAT sensor terminal B (harness-side) and PCM terminal 77 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0103 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0111 [AJ]

C6U010201084W16

DTC P0111	IAT circuit performance problem
DETECTION CONDITION	• The intake air temperature is higher than the engine coolant temperature by **40 °C {104 °F}** and the ignition switch is ON. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Connector or terminal malfunction • PCM malfunction

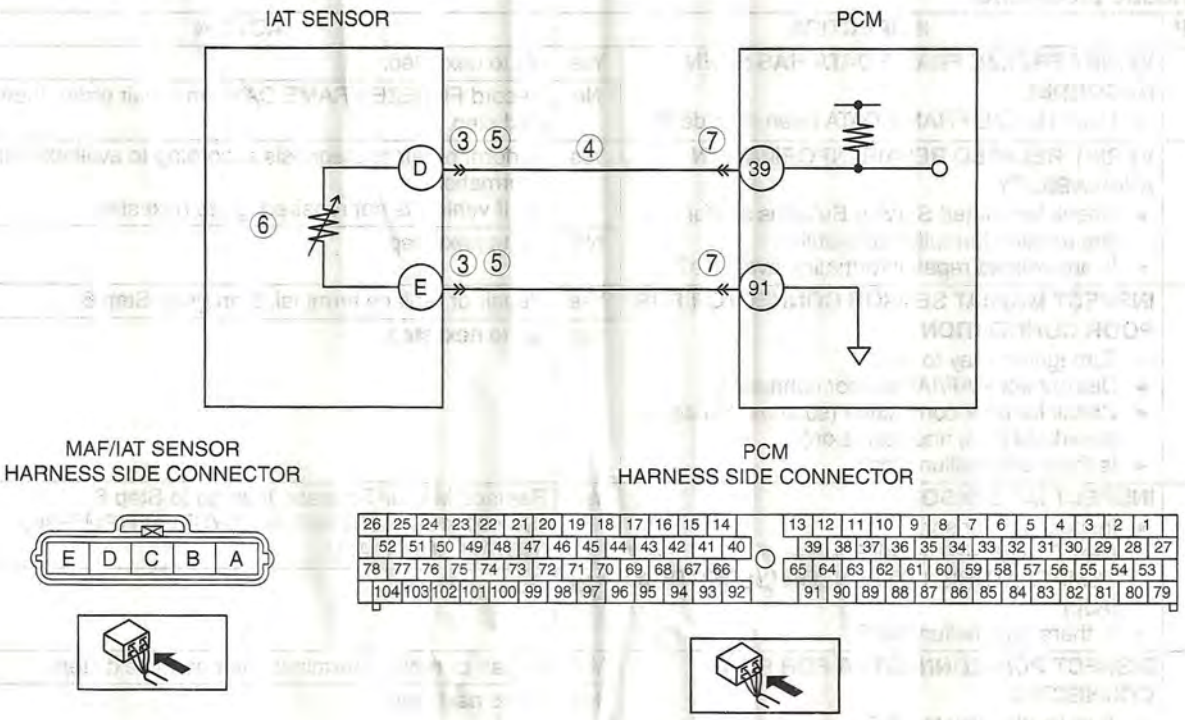
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect MAF/IAT sensor connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 6.
		No	Go to next step.
4	**INSPECT IAT SENSOR** • Inspect IAT sensor. (See 01–40B–29 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace MAF/IAT sensor, then go to Step 6. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0111 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and run engine under FREEZE FRAME DATA condition. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0112 [AJ]

C6U010201084W17

DTC P0112	IAT circuit low input
DETECTION CONDITION	• The PCM monitors the IAT sensor signal at PCM terminal 39. If the PCM detects IAT sensor voltage of **0.16 V or below**, the PCM determines that the IAT sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Connector or terminal malfunction • Short to GND circuit between MAF/IAT sensor terminal D and PCM terminal 39 • Short each harness IAT sensor terminal D and E • PCM malfunction



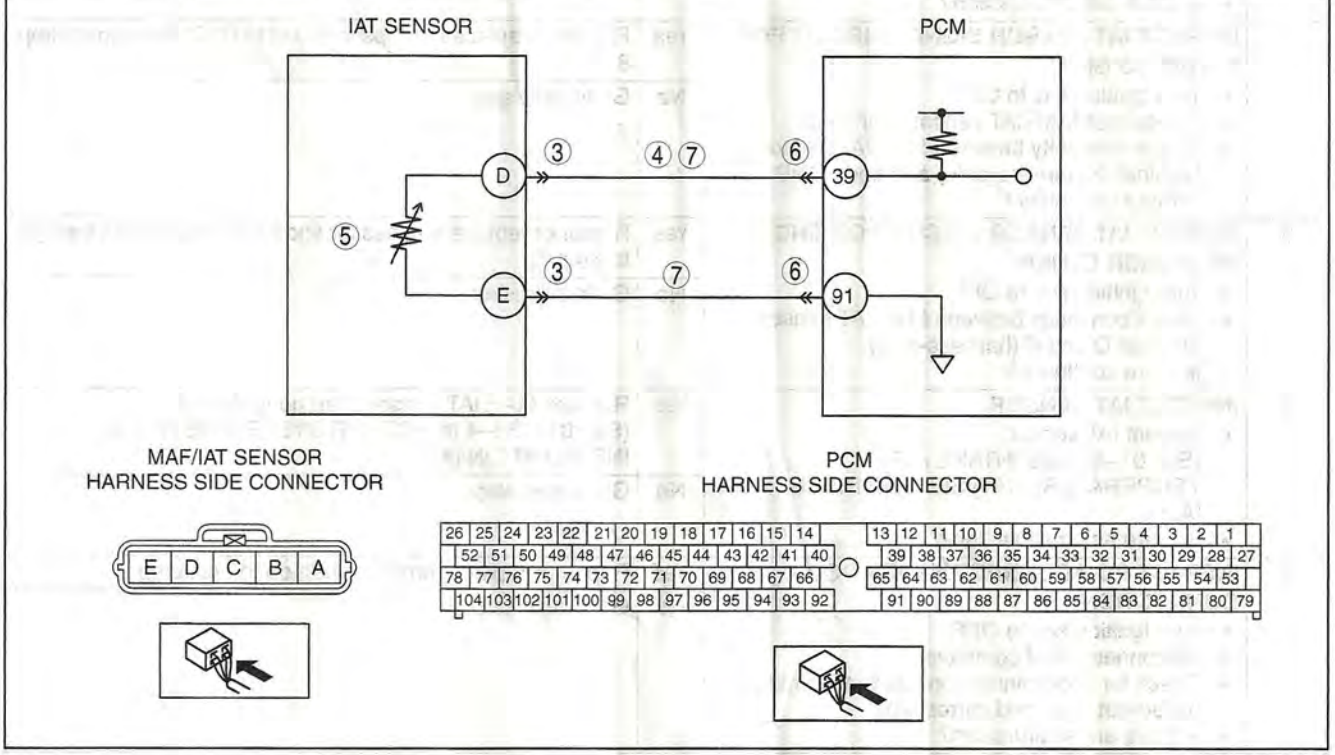
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect MAF/IAT sensor connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
4	**INSPECT IAT SENSOR SIGNAL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Disconnect MAF/IAT sensor connector. • Check continuity between MAF/IAT sensor terminal D (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 8.
		No	Go to next step.
5	**INSPECT IAT SENSOR CIRCUIT FOR SHORT WITH EACH OTHER** • Turn ignition key to OFF. • Check continuity between MAF/IAT sensor terminal D and E (harness-side). • Is there continuity?	Yes	Repair or replace harness for short with each other, then go to Step 8.
		No	Go to next step.
6	**INSPECT IAT SENSOR** • Inspect IAT sensor. (See 01–40B–29 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace MAF/IAT sensor, then go to Step 8. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0112 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0113 [AJ]

C6U010201084W18

DTC P0113	IAT circuit high input
DETECTION CONDITION	• The PCM monitors the IAT sensor signal at PCM terminal 39. If the PCM detects IAT sensor voltage **of 4.84 V or above**, the PCM determines that the IAT sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Connector or terminal malfunction • Short to power circuit between MAF/IAT sensor terminal D and PCM terminal 39 • Open circuit between MAF/IAT sensor terminal D and PCM terminal 39 • Open circuit between MAF/IAT sensor terminal E and PCM terminal 91 • PCM malfunction



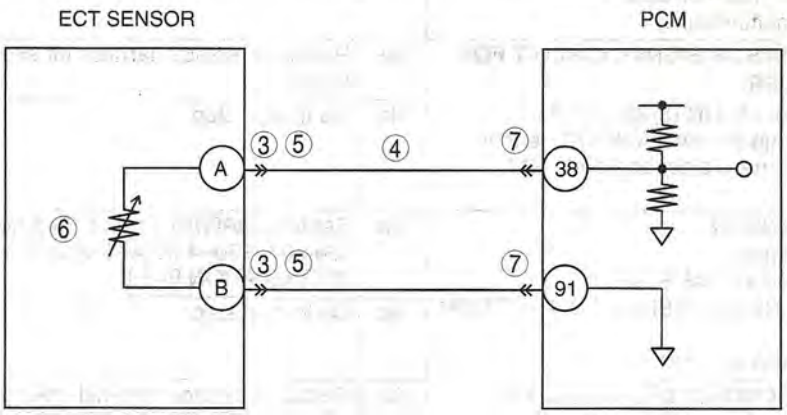
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect MAF/IAT sensor connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
4	**INSPECT IAT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between MAF/IAT sensor terminal D (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 8.
		No	Go to next step.
5	**INSPECT IAT SENSOR** • Inspect IAT sensor. (See 01–40B–29 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace MAF/IAT sensor, then go to Step 8. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
7	**INSPECT IAT SENSOR CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between the following circuits: — MAF/IAT sensor terminal D (harness-side) and PCM terminal 39 (harness-side) — MAF/IAT sensor terminal E (harness-side) and PCM terminal 91 (harness-side) • Is there continuity?	Yes	Repair or replace harness for open circuit, then go to next step.
		No	Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0113 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

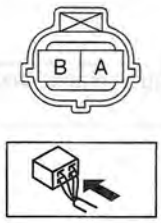
DTC P0117 [AJ]

C6U010201084W19

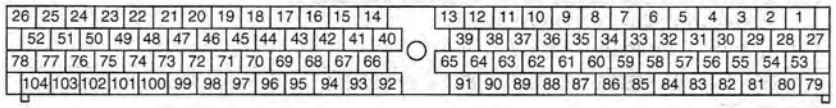
DTC P0117	ECT circuit low input
DETECTION CONDITION	• The PCM monitors the ECT sensor signal at PCM terminal 38. If the PCM detects ECT sensor voltage of **0.14 V or below**, the PCM determines that the ECT sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (Engine cooling system). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Connector or terminal malfunction • Short to GND circuit between ECT sensor terminal A and PCM terminal 38 • Short each harness ECT sensor terminal A and B • PCM malfunction



ECT SENSOR
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR



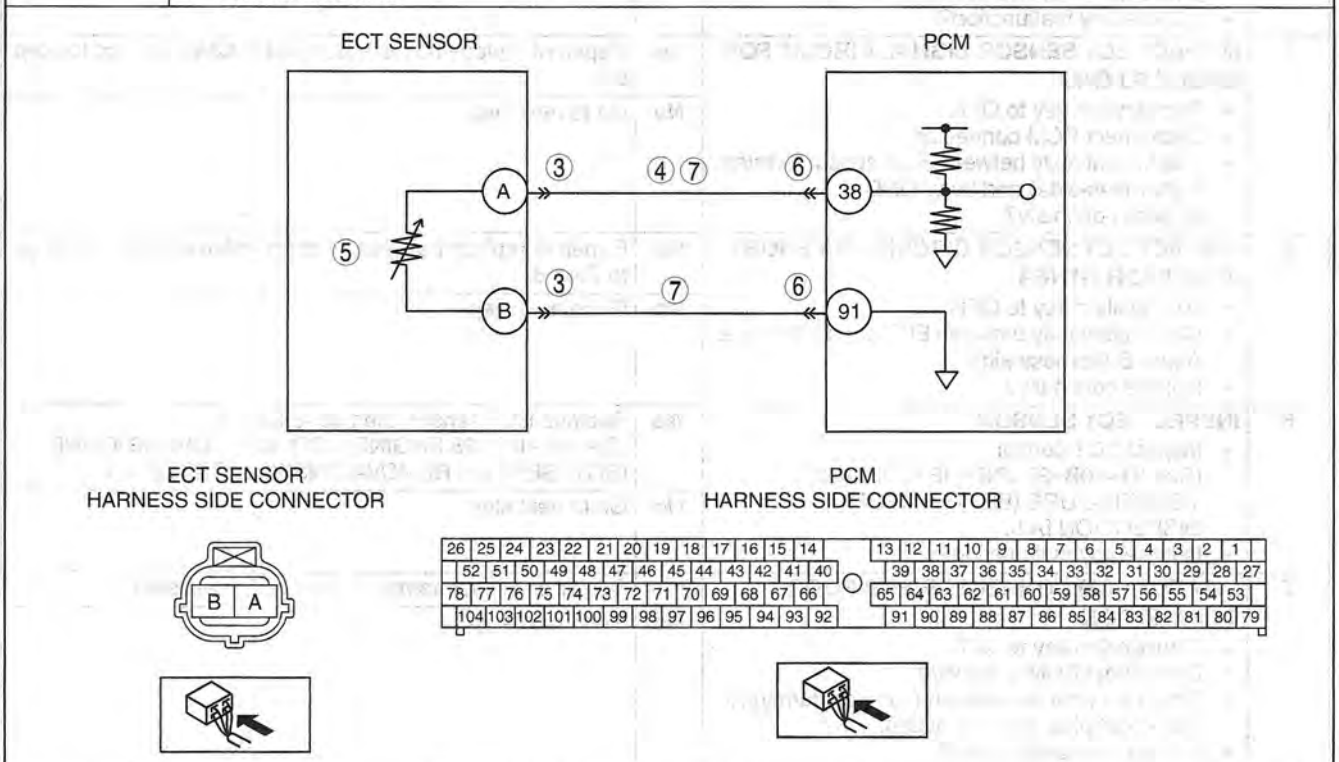
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect ECT sensor connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
4	**INSPECT ECT SENSOR SIGNAL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Disconnect PCM connector. • Check continuity between ECT sensor terminal A (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 8.
		No	Go to next step.
5	**INSPECT ECT SENSOR CIRCUIT FOR SHORT WITH EACH OTHER** • Turn ignition key to OFF. • Check continuity between ECT sensor terminal A and B (harness-side). • Is there continuity?	Yes	Repair or replace harness for short with each other, then go to Step 8.
		No	Go to next step.
6	**INSPECT ECT SENSOR** • Inspect ECT sensor. (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace ECT sensor, then go to Step 8. (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0117 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0118 [AJ]

C6U010201084W20

DTC P0118	ECT circuit high input
DETECTION CONDITION	• The PCM monitors the ECT sensor signal at PCM terminal 38. If the PCM detects ECT sensor voltage **of 4.57 V or above**, the PCM determines that the ECT sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (Engine cooling system). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Connector or terminal malfunction • Open circuit between ECT sensor terminal A and PCM terminal 38 • Short to power circuit between ECT sensor terminal A and PCM terminal 38 • Open circuit between ECT sensor terminal B and PCM terminal 91 • PCM malfunction



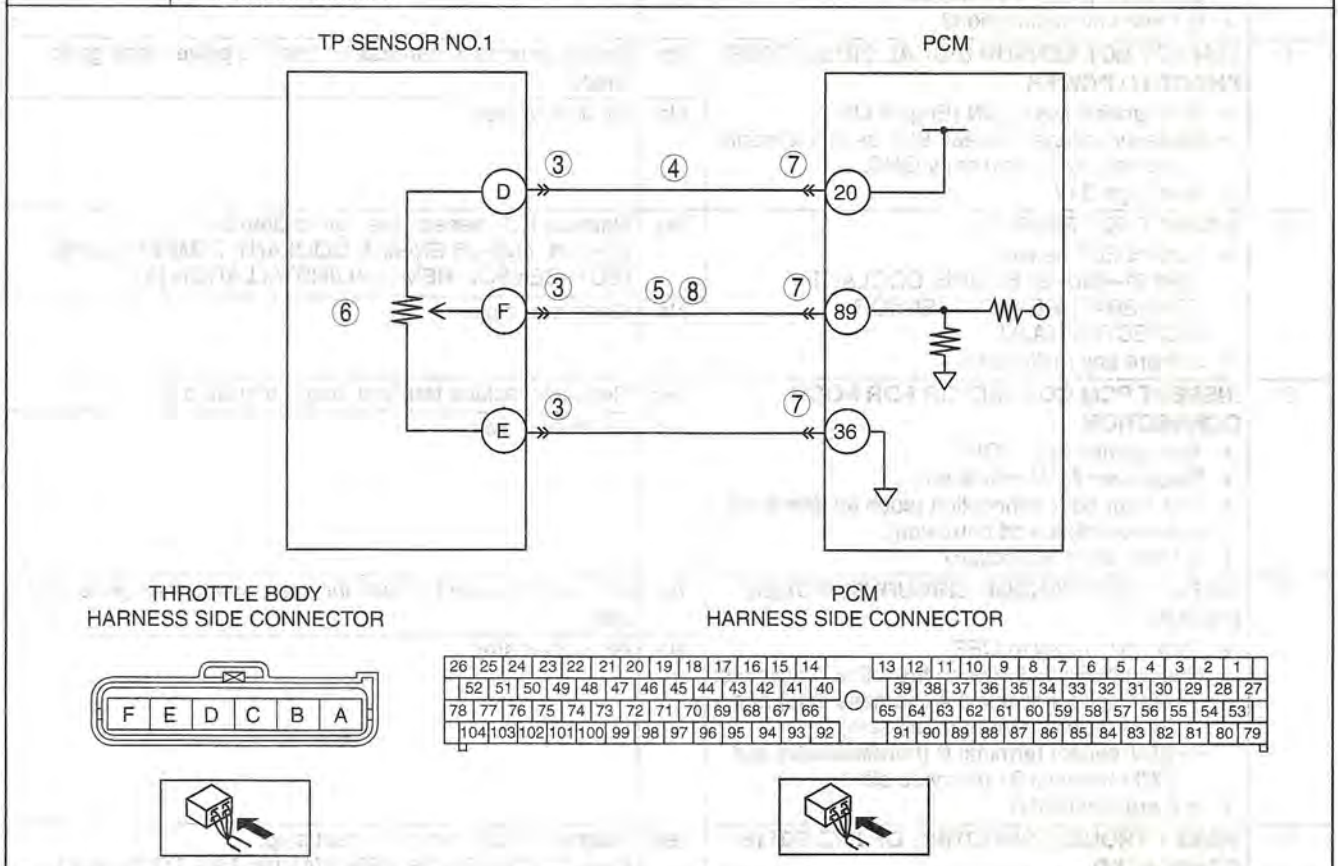
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect ECT sensor connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
4	**INSPECT ECT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between ECT sensor terminal A (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 8.
		No	Go to next step.
5	**INSPECT ECT SENSOR** • Inspect ECT sensor. (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace ECT sensor, then go to Step 8. (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
7	**INSPECT ECT SENSOR CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between the following circuits: — ECT sensor terminal A (harness-side) and PCM terminal 38 (harness-side) — ECT sensor terminal B (harness-side) and PCM terminal 91 (harness-side) • Is there continuity?	Yes	Repair or replace harness for open circuit, then go to next step.
		No	Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0118 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0122 [AJ]

C6U010201084W21

DTC P0122	TP sensor No.1 circuit low input
DETECTION CONDITION	• If the PCM detects that TP sensor No.1 voltage at PCM terminal 89 is **0.255 V or below** after the ignition switch is ON, the PCM determines that the TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions in first drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor No.1 malfunction • Connector or terminal malfunction • Open circuit between throttle body terminal D and PCM terminal 20 • Short to GND circuit between throttle body terminal F and PCM terminal 89 • Open circuit between throttle body terminal F and PCM terminal 89 • PCM malfunction



Diagnostic procedure

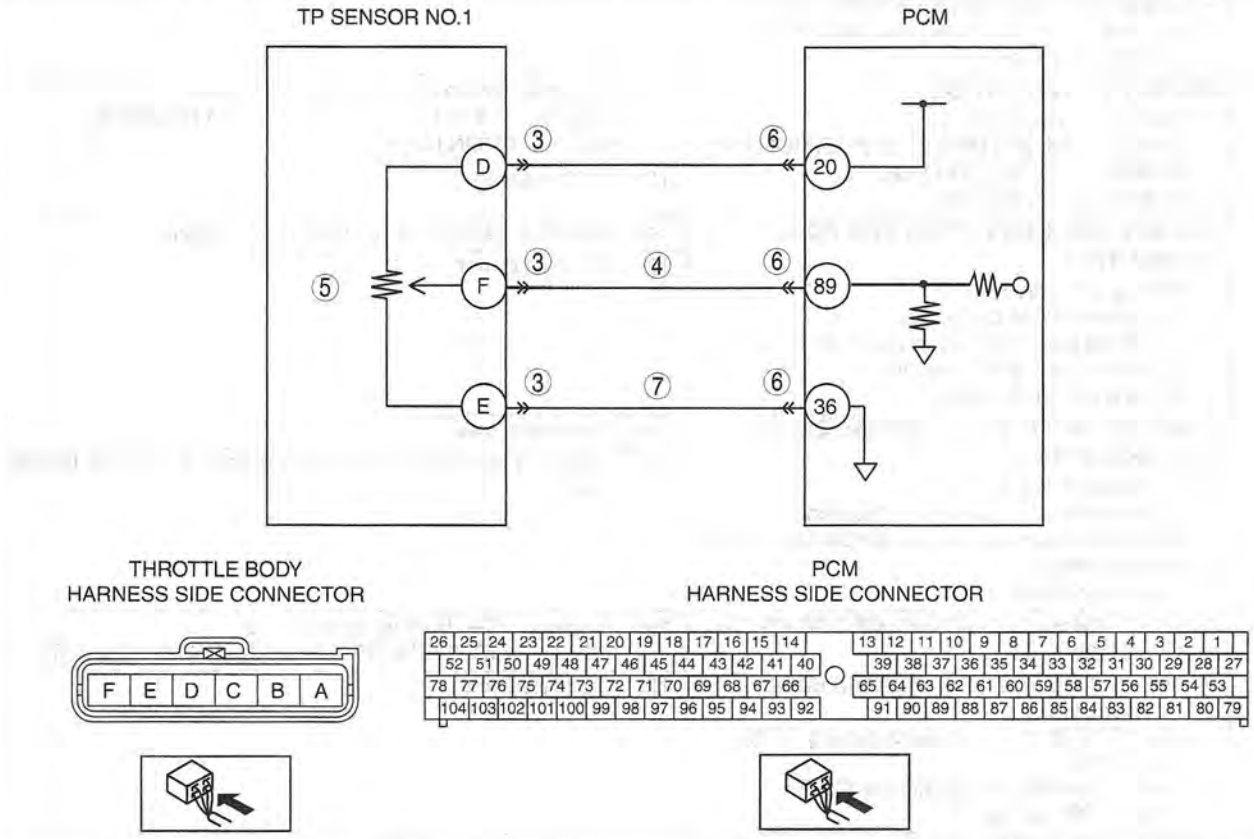
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect throttle body connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**INSPECT TP SENSOR NO.1 POWER CIRCUIT FOR OPEN CIRCUIT** **Note** • If DTC P0222 is also retrieved with P0122, then go to CONSTANT VOLTAGE troubleshooting procedure. • Turn ignition key to ON (Engine OFF). • Measure voltage between throttle body terminal D (harness-side) and body GND. • Is voltage **within 4.5—5.5 V**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
5	**VERIFY TP SENSOR NO.1 SIGNAL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between throttle body terminal F (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness, then go to Step 9.
		No	Go to next step.
6	**INSPECT TP SENSOR NO.1** • Inspect TP sensor No.1. (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace throttle body, then go to Step 9. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**VERIFY TP SENSOR NO.1 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between throttle body terminal F (harness-side) and PCM terminal 89 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0122 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0123 [AJ]

C6U010201084W22

DTC P0123	TP sensor No.1 circuit high input
DETECTION CONDITION	• If the PCM detects that TP sensor No.1 voltage at PCM terminal 89 is **4.72 V or above** after ignition switch is ON, the PCM determines that the TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions in first drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor No.1 malfunction • Connector or terminal malfunction • Short to power circuit between throttle body terminal F and PCM terminal 89 • Open circuit between throttle body terminal E and PCM terminal 36 • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect throttle body connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
4	**INSPECT TP SENSOR NO.1 SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between throttle body terminal F (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 8.
		No	Go to next step.
5	**INSPECT TP SENSOR NO.1** • Inspect TP sensor No.1. (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace throttle body, then go to Step 8. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
7	**INSPECT TP SENSOR NO.1 GND CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between throttle body terminal E (harness-side) and PCM terminal 36 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0123 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0125 [AJ]

C6U010201084W23

DTC P0125	Excessive time to enter closed loop fuel control
DETECTION CONDITION	• The PCM monitors the ECT sensor signal at PCM terminal 38 after the engine is cold started. If the ECT voltage does not reach the expected temperature in a certain period, the PCM determines that it has taken an excessive amount of time for the engine coolant temperature to reach the temperature necessary to start the closed-loop fuel control. **Diagnostic support note** • This is a continuous monitor (Engine cooling system). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT** • Start engine. • Warm up engine completely. • Access ECT PID using WDS or equivalent. • Is ECT PID **60 °C {140 °F} or above**?	Yes	Intermittent concern exists. Go to "INTERMITTENT CONCERNS TROUBLESHOOTING". (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)
		No	Go to next step.
4	**INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect ECT sensor connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
5	**INSPECT ECT SENSOR** • Inspect ECT sensor. (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace ECT sensor, then go to Step 7. (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0125 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Access ECT PID using WDS or equivalent. • Wait until ECT PID **20 °C {68 °F} or below**. • Start engine and warm up it completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.

STEP	INSPECTION		ACTION
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0126, P0128 [AJ]

C6U010201084W24

DTC P0126 DTC P0128	Coolant thermostat
DETECTION CONDITION	**DTC P0126** • If the ECT signal never exceeds **71 °C {160 °F}** after the engine runs for a certain period, the PCM determines that the coolant thermostat is stuck open. **MONITORING CONDITIONS** — IAT: **–10 °C {14 °F} or above** — Difference between ECT at engine start and minimum IAT: **6 °C {43 °F} or below** — Vehicle speed: **6.0 km/h {3.7 mph} or above** (MTX) — Vehicle speed: **9.4 km/h {5.8 mph} or above** (ATX) **DTC P0128** • The PCM monitors MAF, IAT, VSS and ECT signals and calculates the radiator heat radiation ratio when the following monitoring conditions are met. If the calculated value exceeds the threshold, the PCM determines that the coolant thermostat is stuck open. **MONITORING CONDITIONS** — ECT at engine start: **36 °C {97 °F} or below** — IAT: **–10 °C {14 °F} or above** — Difference between ECT at engine start and minimum IAT: **6 °C {43 °F} or below** — Vehicle speed: **30 km/h {18.6 mph} or above** (MTX) — Vehicle speed: **20 km/h {12.4 mph} or above** (ATX) **Diagnostic support note** • This is a continuous monitor (Engine cooling system). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • DIAGNOSTIC MONITORING TEST RESULTS is available. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Coolant thermostat malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FOR OTHER DTCS** • Have other DTCs been stored?	Yes	Go to appropriate DTC troubleshooting procedure, then go to next step. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**INSPECT COOLANT THERMOSTAT IS WHETHER STUCK OPEN** • Inspect coolant thermostat. (See 01–12–10 THERMOSTAT INSPECTION.) • Is there any malfunction?	Yes	Replace coolant thermostat, then go to next step. (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [AJ].)
		No	Inspect ECT sensor. (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [AJ].) • Replace ECT sensor if necessary, then go to next step. (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [AJ].)

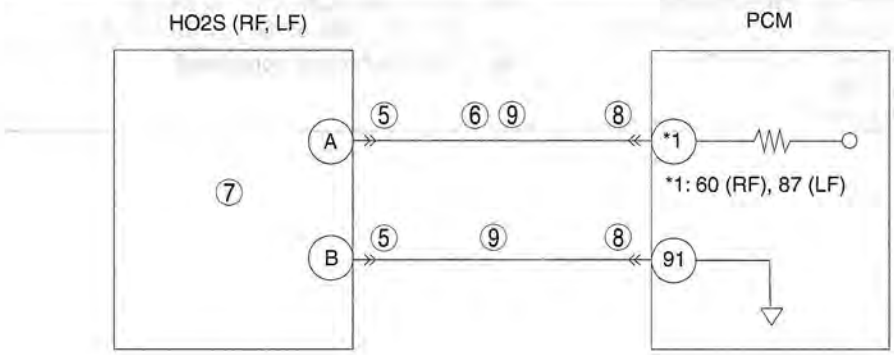
STEP	INSPECTION		ACTION
5	**VERIFY MONITORING CONDITION FOR REPAIR VERIFICATION** • Make sure to reconnect all disconnected connectors. • Cool down engine. **Note** • If temperature difference inside/ outside workshop is significant, PCM might not operate thermostat monitor. Therefore, it is recommended to cool down engine out of workshop. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Access ECT, IAT PIDs and make sure that each value is within following specifications. — ECT: **36 °C {97 °F} or below** (for P0128 only) — IAT: **–10°C {14°F} or above** — Difference between ECT and IAT: **6°C {43°F} or below** • Is there any PID that is out of specification?	Yes	Take corrective action (e.g. cool down engine), then repeat this step.
		No	Go to next step for DTC P0126 or go to step 7 for DTC P0128.
6	**VERIFY TROUBLESHOOTING OF DTC P0126 COMPLETED** • Start engine and turn off E/L and A/C. • Access DIAGNOSTIC MONITORING TEST RESULTS using WDS or equivalent and monitor TEST#10:E1:81(ECT). **Note** • This test requires actual driving. Chassis roller cannot be used for this test. • During test drive, constant speed should be maintained, although 2 or 3 stops during every **5 min** of driving time (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period. • Test period depends on ECT at engine start. (e.g. if ECT is **–10°C {14°F}**, monitoring period is **38 min** and ECT is **30 °C {86 °F}**, monitoring period is **8 min**) • Verify TEST #10:E1:81 (ECT) value. • Is value above minimum value?	Yes	Go to Step 8.
		No	Replace PCM, then go to Step 8. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)

STEP	INSPECTION		ACTION
7	**VERIFY TROUBLESHOOTING OF DTC P0128 COMPLETED** • Start engine and turn off E/L and A/C. • Access DIAGNOSTIC MONITORING TEST RESULTS using WDS or equivalent and monitor TEST #10:E1:80 (Heat radiation ratio) or #10:E1:1 (ECT). **Note** • This test requires actual driving. Chassis roller cannot be used for this test. • During test drive, constant speed should be maintained, although 2 or 3 stops (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period. • Verify TEST#10:E1:80 (Heat radiation ratio) or #10:E2:81 (ECT) value. • Are value of TEST#10:E1:80 (Heat radiation ratio) below maximum value and value of TEST#10:E1:81 (ECT) above minimum value?	Yes	Go to next step.
		No	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

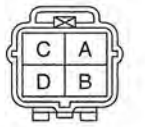
DTC P0131, P0151 [AJ]

C6U010200000W11

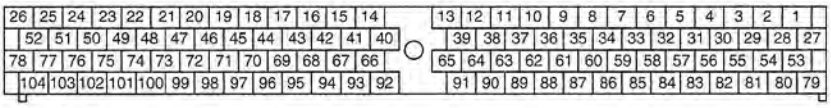
DTC P0131 **DTC P0151**	**HO2S (RF) circuit low input** **HO2S (LF) circuit low input**
DETECTION CONDITION	• The PCM monitors input voltage from the HO2S (RF, LF). If the PCM detected HO2S (RF, LF) voltage is **0.45 V or below** for **34 s**, the PCM determines that the circuit input is low. **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• HO2S (RF, LF) malfunction • Connector or terminal malfunction • Open circuit in wiring harness between following terminals — For P0131:HO2S (RF) terminal A and PCM terminal 60 — For P0151:HO2S (LF) terminal A and PCM terminal 87 • Short to ground in wiring harness between following terminals — For P0131:HO2S (RF) terminal A and PCM terminal 60 — For P0151:HO2S (LF) terminal A and PCM terminal 87 • Open circuit in wiring harness between HO2S (RF, LF) terminal B and PCM terminal 91 • PCM malfunction



HO2S (RF, LF)
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR



Diagnostic procedure

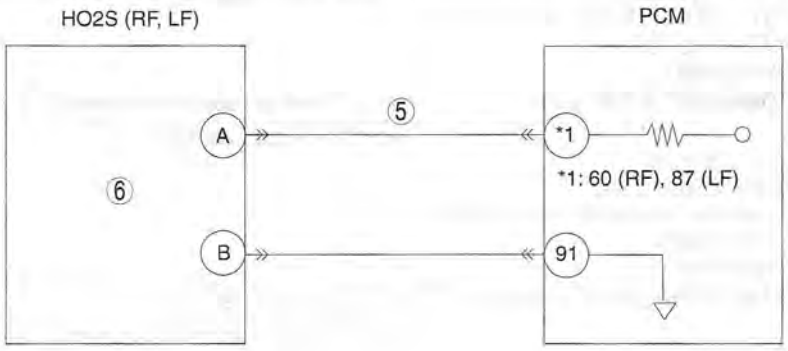
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform the repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING OR STORED DTC** • Turn the ignition switch off, then ON (Engine off). • Verify the pending code or stored DTCs using the WDS or equivalent. • Are other DTCs present?	Yes	Go to the appropriate DTC troubleshooting procedures. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0131 or P0151 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01–02B–15 DTC TABLE [AJ].)
5	**INSPECT HO2S (RF, LF) CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the HO2S (RF) for P0131 or HO2S (LF) for P0151 connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
6	**INSPECT HO2S (RF, LF) CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the following terminals and body ground: — For P0131:HO2S (RF) terminal A — For P0151:HO2S (LF) terminal A • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 10.
		No	Go to the next step.
7	**INSPECT HO2S (RF, LF)** • Inspect the HO2S (RF, LF). (See 01–40B–31 HEATED OXYGEN SENSOR (HO2S) INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 10.
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
9	**INSPECT FRONT HO2S CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following circuits: — For P0131:HO2S (RF) terminal A and PCM terminal 60 — For P0151:HO2S (LF) terminal A and PCM terminal 87 — HO2S (RF, LF) terminal B and PCM terminal 91 • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P0131 OR P0151 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the WDS or equivalent. • Run Drive Mode 1 and 3 (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Is PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	DTC troubleshooting completed.

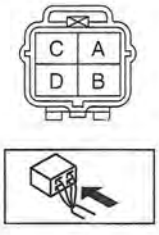
DTC P0132, P0152 [AJ]

C6U010200000W09

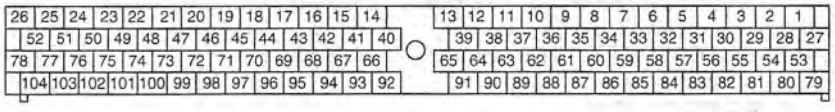
DTC P0132 DTC P0152	**HO2S (RF) circuit high input** **HO2S (LF) circuit high input**
DETECTION CONDITION	• PCM monitors the input voltage the from HO2S (RF, LF). If the PCM detected HO2S (RF, LF) voltage **above 1.2 V** for **0.8 s**, the PCM determines that the circuit input is high. **Diagnostic support note** • This is a continuous monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• HO2S (RF, LF) malfunction • Short to power supply in the wiring harness between the following terminals: — For P0132: HO2S (RF) terminal A and PCM terminal 60 — For P0152: HO2S (LF) terminal A and PCM terminal 87 • HO2S (RF, LF) or the PCM terminal is shorted • PCM malfunction



HO2S (RF, LF)
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR



DTC P0133, P0153 [AJ]

C6U010201084W26

DTC P0133 DTC P0153	HO2S (RF) circuit malfunction HO2S (LF) circuit malfunction
DETECTION CONDITION	• The PCM monitors the inversion cycle period, lean-to-rich response time and rich-to-lean response time of the sensor when the following monitoring conditions are met. If any exceeds the threshold, the PCM determines that the circuit has a malfunction. — The PCM calculates average response time from lean-to-rich, and from rich-to-lean. If any exceeds the threshold, the PCM determines that the circuit has a malfunction. — The HO2S (RF, LF) voltage does not rise **above 0.58 V** for **12 s or more** after the HO2S (RF, LF) voltage has risen **above 0.32 V**. (CAL: Except for AJ57EM060AJV5010 (MT), AJ58EM060AJVN010 (AT)) — The HO2S (RF, LF) voltage does not go **below 0.32 V** for **12 s or more** after the HO2S (RF, LF) voltage has gone **below 0.58 V**. (CAL: Except for AJ57EM060AJV5010 (MT), AJ58EM060AJVN010 (AT)) — The HO2S (RF, LF) voltage has not deviated from **between 0.32—0.58 V for 12 s or more**. (CAL: Except for AJ57EM060AJV5010 (MT), AJ58EM060AJVN010 (AT)) **MONITORING CONDITIONS** — Drive mode 3 — The following conditions are to be met: • Calculation load **18—58%**, (at engine speed **2,000 rpm**) • Engine speed **1,400—2,500 rpm** (MTX) • Engine speed **1,200—2,500 rpm** (ATX) • Engine coolant temperature is **–10 °C {14 °F} or above** **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • DIAGNOSTIC MONITORING TEST RESULTS is available. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• HO2S (RF, LF) deterioration • HO2S (RF, LF) heater malfunction • Leakage exhaust system • Fuel filter clogged or restricted • Fuel pump malfunction • Fuel leakage on fuel line from fuel distribution pipe and fuel pump • Pressure regulator malfunction • Fuel return hose clogged • Purge solenoid hoses improper connection • Purge solenoid valve malfunction • Insufficient compression • Engine malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform the repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn the ignition switch to off, then ON (Engine OFF). • Verify pending codes or stored DTCs using the WDS or equivalent. • Are the following DTCs also present? — P0442 or P0443 with P0133 — P0442 or P0443 with P0153	Yes	Go to the appropriate DTC troubleshooting procedures, then go to Step 13. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0133 or P0153 in the FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the troubleshooting procedures for the DTC in the FREEZE FRAME DATA. (See 01–02B–15 DTC TABLE [AJ].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up the engine. • Access the O2S11 for P0133 or O2S21 for P0153 PID using the WDS or equivalent. • Check the PID under the following accelerator pedal conditions (in PARK or NEUTRAL). • Is the PID reading normal? — **0.55 V or more** when the accelerator pedal is suddenly depressed (rich condition). — **0.55 V or less** just after release of accelerator pedal (lean condition).	Yes	Go to step 8.
		No	Go to the next step.
6	**INSPECT INSTALLATION OF HO2S (RF, LF)** • Check if the HO2S (RF, LF) is loosely installed. • Is the sensor installed securely?	Yes	Go to the next step.
		No	Retighten the HO2S (RF, LF), then go to Step 13. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually check if any gas leakage is found between the exhaust manifold and the HO2S (RF, LF). (See 01–15B–1 EXHAUST SYSTEM INSPECTION [AJ].) • Is there any gas leakage?	Yes	Repair or replace any faulty exhaust parts, then go to Step 13. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Replace the HO2S (RF, LF), then go to Step 13. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
8	**INSPECT LONG TERM FUEL TRIM** • Access the following PIDs: — For P0133: LONGFT1 — For P0153: LONGFT2 • Compare it with the FREEZE FRAME DATA recorded in Step 1. • Is it below the FFD value?	Yes	Engine is driven under a rich condition. Go to the next step.
		No	Engine is driven under a lean condition. Go to Step 10.
9	**INSPECT FUEL LINE PRESSURE (EXCESSIVE FUEL LINE PRESSURE)** • Turn the ignition switch off. • Inspect fuel line pressure when engine running. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is there any malfunction?	Yes	Replace the fuel pump unit, then go to Step 13. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
		No	Go to the next step.
10	**INSPECT FUEL LINE PRESSURE (LOW FUEL LINE PRESSURE)** • Turn the ignition switch off. • Inspect the fuel line pressure when the engine is running. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to step 13.
11	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for any leakage. • Is any fuel leakage found?	Yes	Replace the suspected fuel line, then go to Step 13.
		No	Inspect the low-pressure side fuel filter for the following: • Foreign material or staining inside fuel filter Perform the following actions as result. • If foreign material or staining is found inside fuel filter (low-pressure side), clean the fuel tank and filter. • If normal, replace the fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.) Then go to Step 13.

STEP	INSPECTION		ACTION
12	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing the radiator cap when the radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing the radiator cap, wrap a thick cloth around it and turn it slowly.** • Remove radiator cap. • Bleed air from the engine coolant, then run the engine at idle. • Are there any small bubbles, which make engine coolant white at the filler opening? **Note** • Large bubbles are normal since they are remaining air coming from the engine coolant passage.	Yes	Air penetrates due to poor sealing on the head gasket or other areas between the combustion chamber and the engine coolant passage. Repair or replace malfunctioning parts, then go to the next step.
		No	Go to the next step.
13	**VERIFY TROUBLESHOOTING OF DTC P0133 or P0153 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from memory using WDS or equivalent. • Start the engine. • Run DRIVE MODE 1 and 3. (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Stop the vehicle and access the ON BOARD SYSTEM READINESS TEST (Mode 1) to inspect the DRIVE MODE completion status. • Verify 02S_EVAL PID changes to Yes. — If not, run the DRIVE MODE again. • Access the DIAGNOSTIC MONITORING TEST RESULTS. • Verify the following TEST # values: (See 01–02B–14 DIAGNOSTIC MONITORING TEST RESULTS [AJ].) — For P0133: • 10:01:05 (HO2S (RF) rich-to-lean response time). • 10:01:06 (HO2S (RF) lean-to-rich response time). • 10:01:0A (HO2S (RF) inversion cycles) — For P0153: • 10:05:05 (HO2S (LF) rich-to-lean response time • 10:05:05 (HO2S (LF) lean-to-rich response time • 10:05:0A (HO2S (LF) inversion cycles • Are they all below the MAX value?	Yes	Replace the PCM, then go to the next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to the next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0134, P0154 [AJ]

C6U010201084W27

DTC P0134 DTC P0154	HO2S (RF) circuit no activity detected HO2S (LF) circuit no activity detected
DETECTION CONDITION	• The PCM monitors the input voltage from the HO2S (RF, LF) when the following monitoring conditions are met. If the input voltage from the sensor never **exceeds 0.55 V** for **94 s**, the PCM determines that the sensor circuit is not activated. **MONITORING CONDITIONS** — Drive mode 3 — The following conditions are to be met: • The engine speed is **1,500 rpm or above.** • The engine coolant temperature is **70 °C {158 °F} or above.** **Diagnostic support note** • This is a continuous monitor (O_2 sensor). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• HO2S (RF, LF) deterioration • HO2S heater (RF, LF) malfunction • Leakage exhaust system • Open or short to GND circuit between HO2S (RF, LF) terminal and PCM terminal — For P0134: HO2S (RF) terminal A and PCM terminal 60 — For P0154: HO2S (LF) terminal A and PCM terminal 87 • Insufficient compression • Engine malfunction • PCM malfunction

Diagnostic procedure

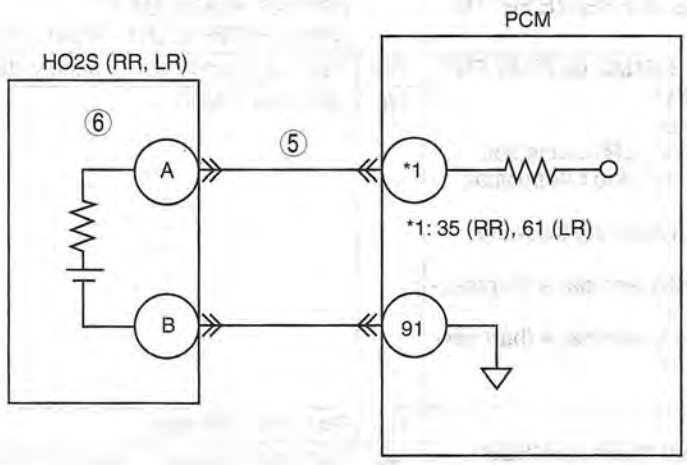
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** **Note** • If fuel monitor DTC, DTC P0131, P0132, P0151 or P0152 is retrieved, ignore it until P0134 or P0154 is fixed. • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending code or stored DTCs using WDS or equivalent. • Is other DTC present?	Yes	Go to appropriate DTC troubleshooting procedures. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0134 or P0154 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01–02B–15 DTC TABLE [AJ].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up engine. • Access O2S11 for P0134 or O2S21 for P0154 PID using WDS or equivalent. • Verify PID when racing engine (in PARK or NEUTRAL). • Is PID reading okay? — **0.55 V or more** when the accelerator pedal is suddenly depressed (rich condition). — **0.55 V or less** just after release of accelerator pedal (lean condition)	Yes	Go to step 8.
		No	Go to next step.

STEP	INSPECTION		ACTION
6	**INSPECT INSTALLATION OF HO2S (RF, LF)** • Check if HO2S (RF, LF) is loosely installed. • Is HO2S (RF, LF) installed securely?	Yes	Go to next step.
		No	Install HO2S (RF, LF) securely, then go to Step 10. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually check if any gas leakage is found between exhaust manifold and HO2S (RF, LF). (See 01–15B–1 EXHAUST SYSTEM INSPECTION [AJ].) • Is there any gas leakage?	Yes	Repair or replace any faulty exhaust parts, then go to Step 10. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	• Inspect the following harnesses for open or short to GND, repair or replace harness if necessary: — HO2S (RF) terminal A (harness-side) to PCM terminal 60 (harness-side) — HO2S (LF) terminal A (harness-side) to PCM terminal 87 (harness-side) • Repair or replace harness if necessary. • If all items above are okay, replace faulty sensor. Then go to Step 10.
8	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap a thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Are there any small bubbles, which make engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to Step 10.
		No	Go to next step.
9	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10B–7 COMPRESSION INSPECTION [AJ].) • Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0134 or P0154 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Run Drive Mode 1 and 3. • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0138, P0158 [AJ]

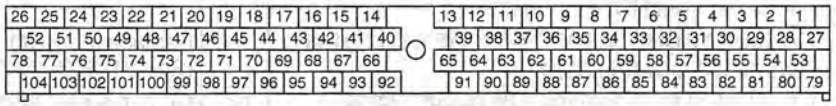
C6U010200000W10

DTC P0138 **DTC P0158**	**HO2S (RR) circuit high input** **HO2S (LR) circuit high input**
DETECTION CONDITION	• The PCM monitors input voltage from front HO2S (RR, LR). If the PCM detected HO2S (RR, LR) voltage **above 1.2 V** for **0.8 s**, the PCM determines that the circuit input is high. **Diagnostic support note** • This is a continuous monitor (HO2S). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• HO2S (RR, LR) malfunction • Short to power supply in the wiring harness between the following terminals: — For P0138: HO2S (RR) terminal A and PCM terminal 35 — For P0158: HO2S (LR) terminal A and PCM terminal 61 • HO2S (RR, LR) or PCM terminal is shorted • PCM malfunction



HO2S (RR, LR)
HARNESS SIDE CONNECTOR

PCM
HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform the repair or diagnosis according to available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING OR STORED DTCS** • Turn the ignition switch off, then ON (Engine off). • Verify pending code or stored DTCs using the WDS or equivalent. • Are other DTCs present?	Yes	Go to the appropriate DTC troubleshooting procedures. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0138 or P0158 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the troubleshooting procedures for the DTC in the FREEZE FRAME DATA. (See 01–02B–15 DTC TABLE [AJ].)
5	**INSPECT HO2S (RR, LR) SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch off. • Disconnect the HO2S (RR, LR) connector. • Turn the ignition switch to the to ON position (Engine off). • Measure the voltage between the following terminals. — For P0138: HO2S (RR) terminal A (harness-side) and body ground — For P0158: HO2S (LR) terminal A (harness-side) and body ground • Is there any voltage?	Yes	Replace short to power supply, then go to Step 7.
		No	Go to the next step.
6	**INSPECT HO2S (RR, LR)** • Perform the "HEATED OXYGEN SENSOR (HO2S) INSPECTION". (See 01–40B–31 HEATED OXYGEN SENSOR (HO2S) INSPECTION [AJ].) • Is the front HO2S normal?	Yes	Go to the next step.
		No	Replace the sensor, then go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0138 OR P0158 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the to ON position (Engine off). • Clear the DTC from the PCM memory using the WDS or equivalent. • Run Drive Mode 1 and 3 (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0139, P0159 [AJ]

C6U010200000W06

DTC P0139 DTC P0159	HO2S (RR) circuit problem HO2S (LR) circuit problem
DETECTION CONDITION	• The PCM monitors the inversion cycle period, rich-to-lean response time of the sensor. The PCM detects the rich-to-lean response time slower than **0.18 s** consecutive **5 times** when following conditions are met, the PCM determines that circuit has a malfunction. **MONITORING CONDITIONS** — Drive mode 3 — The following conditions are met: • Fuel cut during deceleration. • Engine speed is **above 500 rpm**. • Engine coolant temperature is **above 70 °C {158 °F}**. • HO2S (LR, RR) output voltage is **above 0.4 V**. **Diagnostic support note** • This is an intermittent monitor. (HO2S) • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULT is available.
POSSIBLE CAUSE	• HO2S (LR, RR) deterioration • HO2S (LR, RR) malfunction • Loose HO2S (LR, RR) • Pressure regulator (built-in fuel pump unit) malfunction • Fuel pump malfunction • Fuel filter (built-in fuel pump unit) clogged or restricted • Purge solenoid valve malfunction • Improper connection of purge solenoid hoses • Insufficient compression • Engine malfunction (Engine coolant leakage)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Verify related Service Information availability. • Is any related Service Information available?	Yes	Perform the repair or diagnosis according to the available Service Information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTC** • Turn the ignition switch off, then ON (Engine off). • Verify pending and /or stored DTCs using the WDS or equivalent. • Is DTC P0443 also present?	Yes	Go to the DTC P0443 troubleshooting procedures, then go to Step 11.
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0139 or P0159 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the troubleshooting procedures for the DTC in the FREEZE FRAME DATA. (See 01–02B–15 DTC TABLE [AJ].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up the engine. • Access O2S12 (with DTC P0139) or O2S22 (with DTC P0159) PID using the WDS or equivalent. • Inspect the PID under the following accelerator pedal conditions in PARK (ATX) or NEUTRAL (MTX). • Is the PID normal? — **More than 0.55 V** when accelerator pedal is suddenly depressed (rich condition). — **Less than 0.55 V** just after release of the accelerator pedal (lean condition).	Yes	Go to step 7.
		No	Go to the next step.

STEP	INSPECTION		ACTION
6	**INSPECT INSTALLATION OF REAR HO2S** • Inspect for loose the HO2S (LR, RR) installation. • Is the sensor installed securely?	Yes	Inspect the HO2S (LR with DTC P0139 or RR with DTC P0159). • If normal, go to step 11 • If there is a malfunction, replace suddenly depress HO2S, then go to Step 11
		No	Retighten the sensor, then go to Step 11.
7	**INSPECT LONG TERM FUEL TRIM** • Access the LONGFT1 (with DTC P0139) or LONGFT2 (with DTC P0159) PID • Compare it with the FREEZE FRAME DATA recorded in Step 1. • Is it below the FFD value?	Yes	Engine is driven under a rich condition. Go to the next step.
		No	Engine is driven under a lean condition. Go to step 9.
8	**INSPECT FUEL LINE PRESSURE (Excessive fuel line pressure)** • Turn the ignition switch off. • Inspect fuel line pressure while the engine is running. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is the fuel line pressure normal?	Yes	Go to step 10.
		No	Inspect the fuel pump maximum pressure and the fuel return pipe for clogging. (See 01–14–17 FUEL PUMP UNIT INSPECTION.) • If there is any problem, repair or replace the parts. • If all items above are normal, replace the fuel pump unit. Then go to Step 11.
9	**INSPECT FUEL LINE PRESSURE (Low fuel line pressure)** • Turn the ignition switch off. • Inspect the fuel line pressure while the engine is running. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is the fuel line pressure normal?	Yes	Go to step 10.
		No	Inspect the fuel filters for the following: • Foreign material or staining inside the fuel filter (low-pressure side) Perform the following actions according to the result. • If foreign material or staining is found inside the fuel filter (low-pressure side), clean the fuel tank and filter. • If normal, replace fuel pump unit. Then go to Step 11.
10	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform "ENGINE COOLANT LEAKAGE INSPECTION." (See 01–12–5 ENGINE COOLANT LEAKAGE INSPECTION.) • Is there any malfunction?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection results. Then go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0139 OR P0159 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. (Engine off) • Clear the DTC from the memory using the WDS or equivalent. • Run Drive Mode 1 and 3 (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0140, P0160 [AJ]

C6U010201084W29

DTC P0140 **DTC P0160**	**HO2S (RR) circuit no activity detected** **HO2S (LR) circuit no activity detected**
DETECTION CONDITION	• The PCM monitors the input voltage from the HO2S (RR, LR) when the following monitoring conditions are met. If the input voltage from the sensor never **exceeds 0.55 V** for **42 s**, the PCM determines that the sensor circuit is not activated. **MONITORING CONDITIONS** — Drive mode 3 — The following conditions are to be met: • The engine speed is **1,500 rpm or above.** • The engine coolant temperature is **70 °C {158 °F} or above.** **Diagnostic support note** • This is a continuous monitor (O_2 sensor). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• HO2S (RR, LR) deterioration • HO2S heater (RR, LR) malfunction • Leakage exhaust system • Open or short circuit to GND circuit between HO2S (RR, LR) terminal and PCM terminal — For P0140: HO2S (RR) terminal A and PCM terminal 35 — For P0160: HO2S (LR) terminal A and PCM terminal 61 • Insufficient compression • Engine malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** **Note** • If fuel monitor DTC, DTC P0131, P0132, P0151 or P0152 is retrieved, ignore it until P0140 or P0160 is fixed. • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending code or stored DTCs using WDS or equivalent. • Is other DTC present?	Yes	Go to appropriate DTC troubleshooting procedures. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0140 or P0160 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01–02B–15 DTC TABLE [AJ].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up engine. • Access O2S12 for P0140 or O2S22 for P0160 PID using WDS or equivalent. • Verify PID when racing engine at least **10 times** (in PARK or NEUTRAL). • Is PID reading okay? — **0.55 V or more** at least once during engine racing.	Yes	Go to step 8.
		No	Go to next step.

STEP	INSPECTION		ACTION
6	**INSPECT INSTALLATION OF HO2S (RR, LR)** • Check if HO2S (RR, LR) is loosely installed. • Is sensor installed securely?	Yes	Go to next step.
		No	Install HO2S (RR, LR) securely, then go to Step 10. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually check if any gas leakage is found between exhaust pipe and HO2S (RR, LR). (See 01–15B–1 EXHAUST SYSTEM INSPECTION [AJ].) • Is there any gas leakage?	Yes	Repair or replace any faulty exhaust parts, then go to Step 10. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	• Inspect the following harnesses for open or short circuit to GND circuit, repair or replace harness if necessary. — HO2S (RR) terminal A (harness-side) to PCM terminal 35 (harness-side) — HO2S (LR) terminal A (harness-side) to PCM terminal 61 (harness-side) • Repair or replace harness if necessary. • If all items above are okay, replace faulty sensor. Then go to Step 10.
8	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap a thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Are there any small bubbles, which make engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing of head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to Step 10.
		No	Go to next step.
9	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10B–7 COMPRESSION INSPECTION [AJ].) • Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0140 or P0160 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Run Drive Mode 1 and 3. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0171, P0174 [AJ]

C6U010201084W30

DTC P0171 **DTC P0174**	**Fuel trim system (RH) too lean** **Fuel trim system (LH) too lean**
DETECTION CONDITION	• The PCM monitors the short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) values when under closed loop fuel control. If the LONGFT or the sum total of these fuel trims exceeds the pre programmed criteria, the PCM determines that the fuel system is too lean. **Diagnostic support note** • This is a continuous monitor (fuel). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Misfire • HO2S (RF, LF) deterioration • HO2S (RF, LF) heater malfunction • Leakage exhaust system • MAF/IAT sensor malfunction • Air suction in intake-air system • Fuel filter clogged or restricted • Fuel pump malfunction • Fuel leakage on fuel line from fuel delivery pipe and fuel pump • Pressure regulator malfunction • Fuel return hose clogged • Fuel injector malfunction • Variable valve timing control system improper operation • Purge solenoid valve malfunction • Purge solenoid hise improper connection • Insufficient compression • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF, then ON (Engine OFF). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	If misfire DTC is present, go to step 8. If other DTC is present, go to appropriate DTC troubleshooting procedures. (See 01–02B–15 DTC TABLE [AJ].)
		No	If drive ability concern is present, go to Step 8. If not, go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0171 or P0174 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE)** • Access APP1, APP2, ECT, MAF, TP_REL and VSS PIDs using WDS or equivalent. (See 01–40B–6 PCM INSPECTION [AJ].) • Is there any signal that is far out of specification when ignition key is ON and engine runs?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair or replace if necessary. Then go to Step 16.
		No	Go to next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as Step 5 when simulating FREEZE FRAME DATA condition. • Is there any input signal which causes drastic changes?	Yes	Inspect suspected sensor and related wiring harnesses, and repair or replace it. Then go to Step 16.
		No	Go to next step.

STEP	INSPECTION		ACTION
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF HO2S (RF, LF)** • Access O2S11 for P0171 or O2S21 for P0174 PID using WDS or equivalent. • Check PID under following accelerator pedal condition (in PARK or NEUTRAL). • Is PID reading okay? — **0.45 V or more** when the accelerator pedal is suddenly depressed (rich condition). — **0.45 V or less** just after release of accelerator pedal (lean condition)	Yes	Inspect for air suction at the following locations due to cracks, damage or loose parts: • From air cleaner to throttle body • From throttle body to dynamic chamber • From dynamic chamber to intake manifold • Vacuum hoses **Note** • Engine speed may change when rust penetrating agent is sprayed on the air suction area. Repair or replace any faulty part, then go to Step 16.
		No	Visually inspect for any gas leakage between exhaust manifold and HO2S (RF, LF). • If there is no leakage, replace HO2S (RF, LF). (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].) Then go to Step 16.
8	**INSPECT MAF PID** • Start engine. • Access MAF PID using WDS or equivalent. • Verify that MAF PID changes quickly according to RPM when racing engine. • Is MAF PID response okay?	Yes	Go to next step.
		No	Replace MAF/IAT sensor, then go to Step 16. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [AJ].)
9	**INSPECT FOR EXCESSIVE AIR SUCTION OF INTAKE AIR SYSTEM** • Visually inspect for loose, cracked or damage hoses on intake air system. • Is there any malfunction?	Yes	Repair or replace source of air suction, then go to Step 16.
		No	Go to next step.
10	**INSPECT FUEL LINE PRESSURE** • Turn ignition key to OFF. **Note** • If engine will not start, inspect fuel line pressure with ignition key ON. • Inspect fuel line pressure when engine is running. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure okay?	Yes	Go to step 13.
		No	• If fuel line pressure is excessively high: Replace fuel pump unit, then go to Step 16. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.) • If fuel line pressure is too low: Go to next step.
11	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for any leakage. • Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 19.
		No	Inspect low-pressure side fuel filter for the following: • Foreign material or stain inside fuel filter Perform following actions as result. • If foreign material or stain is found inside fuel filter (low-pressure side), clean of fuel tank and filter. • If okay, replace fuel pump unit. Then go to Step 19.
12	**INSPECT FUEL INJECTOR OPERATION** • Remove fuel injector from suspected bank. • Switch injector with injector on other bank. • Start engine. • Is there a DTC for fuel trim system lean for the bank which has a suspected fuel injector?	Yes	Replace fuel injector, then go to Step 16. (See 01–14–24 FUEL INJECTOR REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
13	**INSPECT IGNITION SYSTEM OPERATION** • Perform Spark Test. (See 01–03B–66 Spark Test.) • Is result of Spark Test Okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to spark test results, then go to Step 16.
14	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect variable timing control system operation. • Does variable timing control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to variable valve timing control system inspection results, then go to Step 16.

STEP	INSPECTION		ACTION
15	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10B–7 COMPRESSION INSPECTION [AJ].) • Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to next step.
16	**VERIFY TROUBLESHOOTING OF DTC P0171 or P0174 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Run DRIVE MODE except for Mode 4. • Stop vehicle and access ON BOARD READINESS TEST to inspect DRIVE MODE completion status. • Verify FUEL_EVAL PID changes to Yes — If not, run DRIVE MODE again. • Access PENDING CODE. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
17	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0172, P0175 [AJ]

C6U010201084W31

DTC P0172 DTC P0175	**Fuel trim system (RH) too rich** **Fuel trim system (LH) too rich**
DETECTION CONDITION	• The PCM monitors the short fuel trim (SHRTFT) and long fuel trim (LONGFT) values when under closed loop fuel control. If the LONGFT or the sum total of these fuel trims exceeds the pre programed criteria, the PCM determines that the fuel system is too rich. **Diagnostic support note** • This is a continuous monitor (fuel). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Misfire • HO2S (RF, LF) deterioration • HO2S (RF, LF) heater malfunction • MAF/IAT sensor malfunction • Pressure regulator malfunction • Fuel pump malfunction • Fuel return hose clogged • Variable valve timing control system improper operation • Purge solenoid valve malfunction • Purge solenoid hoses improper connection • PCV valve malfunction • EGR valve improper operation • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn ignition key to OFF, then ON (Engine OFF). • Verify related pending code or stored DTCs. • Is other DTCs present?	Yes	Go to appropriate DTC troubleshooting procedures. (See 01–02B–15 DTC TABLE [AJ].)
		No	If drive ability concern is present, go to Step 9. If not, go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0172 or P0175 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE)** • Access ECT, MAF, TP_REL and VSS PIDs using WDS or equivalent. • Is there any signal that is far out of specification when ignition key is ON and engine runs?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair or replace if necessary. Then go to Step 11.
		No	Go to next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect PID data when simulating FREEZE FRAME DATA condition. • Is there any input signal which causes drastic changes?	Yes	Inspect suspected sensor and related wiring harnesses, and repair or replace it. Then go to Step 11.
		No	Go to next step.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Access O2S11 for P0172 or O2S21 for P0175 PID using WDS or equivalent. • Verify PID when racing engine (in PARK or NEUTRAL). • Is PID reading okay? — **0.45 V or more** when the accelerator pedal is suddenly depressed (rich condition). — **0.45 V or less** just after release of accelerator pedal (lean condition)	Yes	Go to next step.
		No	Replace suspected HO2S, then go to Step 11. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
8	**INSPECT FUEL LINE PRESSURE** • Turn ignition key to OFF. • Connect fuel gauge on the fuel pipe. • Start engine and run it at idle. • Inspect fuel line pressure. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure okay?	Yes	Go to next step.
		No	Replace fuel pump unit, then go to Step 11. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
9	**INSPECT LONG TERM FUEL TRIM** • Turn ignition key to OFF. • Disconnect purge hose from intake manifold and plug opening end of hose and intake manifold. • Access the following PIDs: — For P0172: LONGFT1 — For P0175: LONGFT2 • Does it shift to positive value?	Yes	Inspect purge solenoid valve. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.) Repair or replace it if necessary, then go to Step 11.
		No	Go to next step.
10	**INSPECT PCV VALVE OPERATION** • Inspect PCV valve operation. (See 01–16–25 PCV VALVE INSPECTION [AJ].) • Is PCV valve okay?	Yes	Go to next step.
		No	Replace PCV valve, then go to next step.

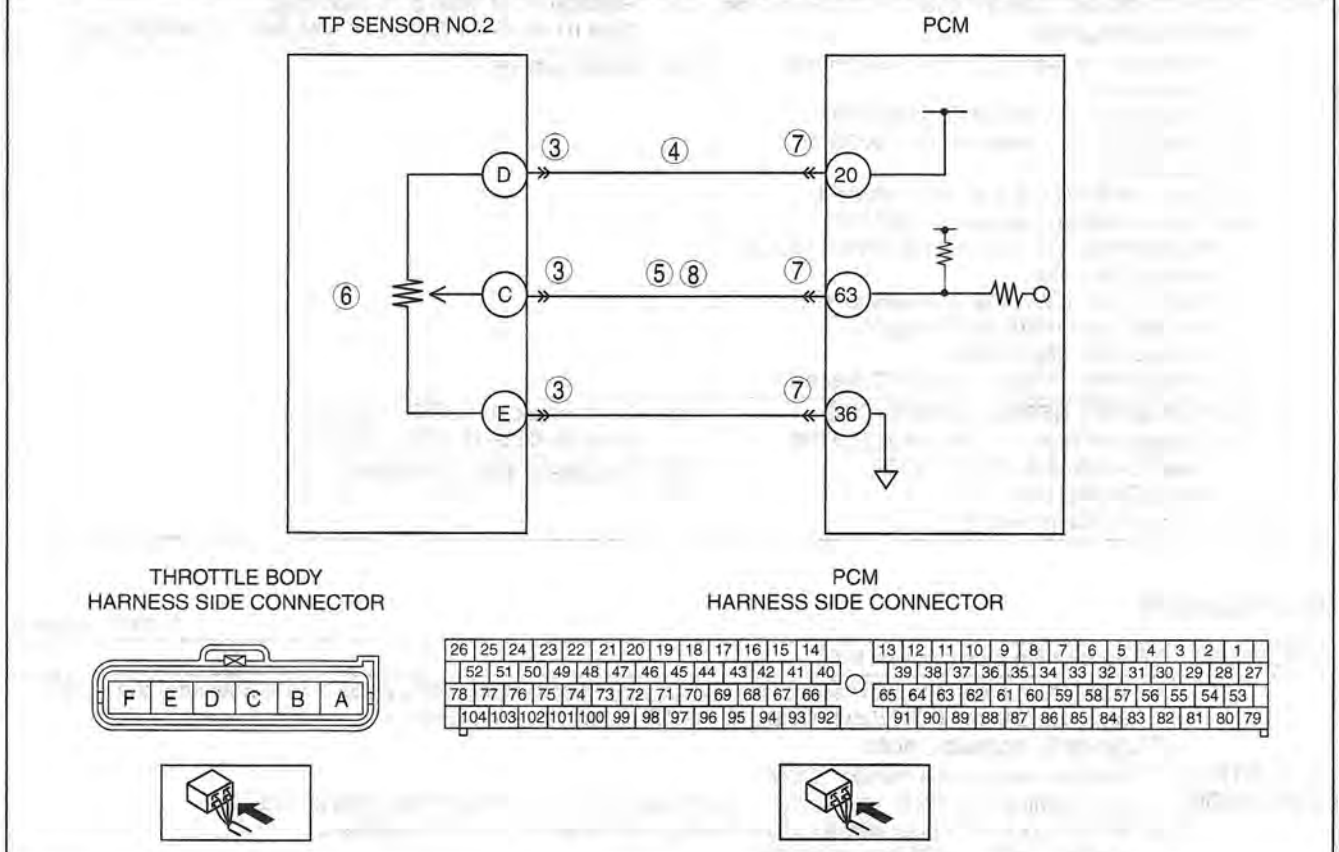
STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0172 or P0175 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Run DRIVE MODE except for Mode 4. • Stop vehicle and access ON BOARD READINESS TEST to inspect DRIVE MODE completion status. • Verify FUEL_EVAL PID changes to YES — If not, run DRIVE MODE again. • Access PENDING CODE. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0222 [AJ]

C6U010201084W32

DTC P0222	TP sensor No.2 circuit low input
DETECTION CONDITION	• If the PCM detects that TP sensor No.2 voltage at PCM terminal 63 is **0.255 V or below** after the ignition switch is ON, the PCM determines that the TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions in first drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor No.2 malfunction • Connector or terminal malfunction • Open circuit between throttle body terminal D and PCM terminal 20 • Short to GND circuit between throttle body terminal C and PCM terminal 63 • PCM malfunction

DTC P0222	TP sensor No.2 circuit low input



Diagnostic procedure

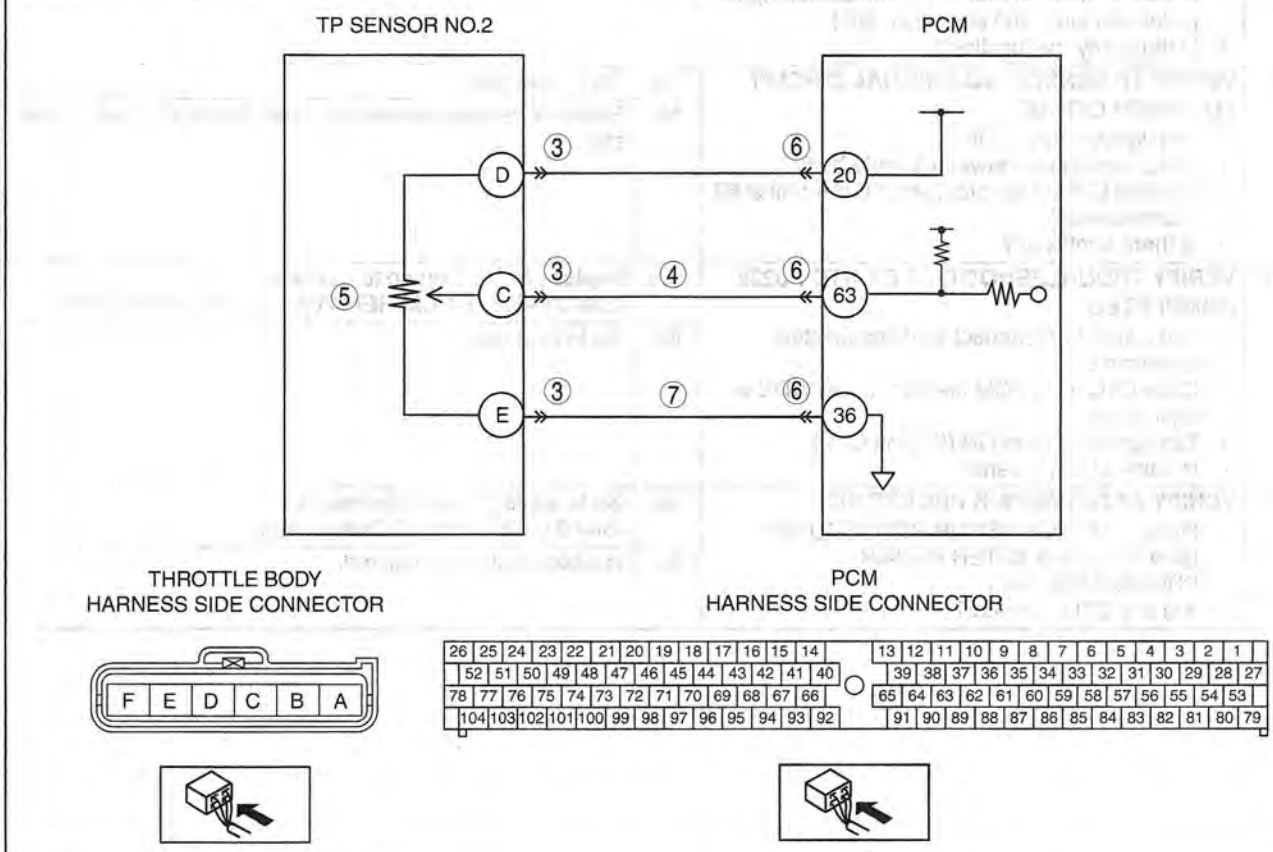
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect throttle body connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT TP SENSOR NO.2 POWER CIRCUIT FOR OPEN CIRCUIT** **Note** • If DTC P0122 is also retrieved with P0222, then go to CONSTANT VOLTAGE troubleshooting procedure. • Turn ignition key to ON (Engine OFF). • Measure voltage between throttle body terminal D (harness-side) and body GND. • Is voltage **within 4.5—5.5 V**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.

STEP	INSPECTION		ACTION
5	**VERIFY TP SENSOR NO.2 SIGNAL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between throttle body terminal C (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness, then go to Step 9.
		No	Go to next step.
6	**INSPECT TP SENSOR NO.2** • Inspect TP sensor No.2. (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace throttle body, then go to Step 9. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**VERIFY TP SENSOR NO.2 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between throttle body terminal C (harness-side) and PCM terminal 63 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0222 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0223 [AJ]

C6U010201084W33

DTC P0223	TP sensor No.2 circuit high input
DETECTION CONDITION	• If the PCM detects that TP sensor No.2 voltage at PCM terminal 63 is **4.72 V or above** after the ignition switch is ON, the PCM determines that the TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions in first drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor No.2 malfunction • Connector or terminal malfunction • Short to power circuit between throttle body terminal C and PCM terminal 63 • Open circuit between throttle body terminal E and PCM terminal 36 • Open circuit between throttle body terminal C and PCM terminal 63 • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect throttle body connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
4	**INSPECT TP SENSOR NO.2 SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between throttle body terminal C (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 8.
		No	Go to next step.
5	**INSPECT TP SENSOR NO.2** • Inspect TP sensor No.2. (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace throttle body, then go to Step 8. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
7	**INSPECT TP SENSOR NO.2 GND CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check for continuity between throttle body terminal E (harness-side) and PCM terminal 36 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0223 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0300 [AJ]

C6U010201085W01

DTC P0300	Random misfire detected
DETECTION CONDITION	• The PCM monitors the CKP sensor input signal interval time. The PCM calculates the change of the interval time for each cylinder. If the change of interval time exceeds the pre programmed criteria, the PCM detects a misfire in the corresponding cylinder. when the engine is running, the PCM counts the number of misfires that occurred at **200 crankshaft revolutions** and **1,000 crankshaft revolutions** and calculates the misfire ratio for each crankshaft revolution. If the ratio exceeds the pre programmed criteria, the PCM determines that a misfire, which can damage the catalytic converter or affect emission performance, has occurred. **Diagnostic support note** • This is a continuous monitor (misfire). • MIL illuminates if PCM detects the misfire which affects emission performance in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • MIL flashes if PCM detects the misfire which can damage the catalytic converter during first drive cycle. • PENDING CODE is available if PCM detects the misfire which affects emission performance during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• CMP sensor malfunction • CKP sensor malfunction • Ignition coil malfunction • High-tension lead malfunction • MAF sensor contamination • Excess air suction in intake air system (between MAF/IAT sensor and dynamic chamber) • Vacuum hoses damages or improper connection • Fuel pump malfunction • Fuel pressure regulator malfunction • Fuel line clogged • Fuel filter clogged • Fuel leakage in fuel line • Insufficient compression • Engine malfunction • Variable valve timing control system improper operation • Purge control solenoid valve malfunction • PCV valve malfunction • EGR valve malfunction • Related connector and terminal malfunction • Related wiring harness malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF, then ON (Engine OFF). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to appropriate DTC troubleshooting. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE)** • Access APP1, APP2, ECT, IAT, MAF, RPM, TP_REL and VSS PIDs using WDS or equivalent. (See 01–40B–6 PCM INSPECTION [AJ].) • Is there any signal that is far out of specification when ignition switch is ON and engine runs at idle?	Yes	Inspect suspected circuit or part or both according to inspection results. (See 01–40B–6 PCM INSPECTION [AJ].) Then go to Step 19.
		No	Go to next step.

STEP	INSPECTION		ACTION
5	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as in Step 4 when simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect suspected circuit or part or both according to inspection results. (See 01–40B–6 PCM INSPECTION [AJ].) Then go to Step 19.
		No	Go to next step.
6	**INSPECT CMP SENSOR** • Inspect CMP sensor. (See 01–40B–36 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Inspect installation condition and damages on timing belt and gears, repair faulty parts. • If it is okay, replace CMP sensor. (See 01–40B–36 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [AJ].) Then go to Step 19.
		No	Go to next step.
7	**VERIFY CKP SENSOR INSTALLATION CONDITION** • Check for CKP sensor looseness. • Is CKP sensor loose?	Yes	Retighten CKP sensor, then go to Step 19. (See 01–40B–37 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
8	**INSPECT IGNITION SYSTEM OPERATION** • Perform Spark Test. (See 01–03B–66 Spark Test.) • Is result of Spark Test okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to spark test result, then go to Step 19.
9	**INSPECT MAF PID** • Start engine. • Access MAF PID using WDS or equivalent. • Verify that MAF PID changes quickly according to race engine RPM. • Is MAF PID response okay?	Yes	Go to next step.
		No	Replace MAF/IAT sensor, then go to Step 19. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
10	**INSPECT EXCESSIVE AIR SUCTION IN INTAKE AIR SYSTEM** • Inspect for air leakage at the following: — Between MAF/IAT sensor and throttle body — Between throttle body and dynamic chamber • Is there any malfunction?	Yes	Repair or replace suspected part, then go to Step 19.
		No	Go to next step.
11	**INSPECT FUEL LINE PRESSURE** • Turn ignition key to OFF. • Inspect fuel line pressure. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is there any malfunction?	Yes	If fuel line pressure is too low, go to next step. If fuel line pressure is excessively high, check as follows: • Fuel pump maximum pressure • Fuel return line for clogging — If all above are okay, replace pressure regulator. (See 01–14–32 PRESSURE REGULATOR INSPECTION.) Then go to Step 19.
		No	Go to step 18.
12	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect for fuel leakage in fuel line for any leakage. • Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 19.
		No	Inspect low-pressure side fuel filter for the following: • Foreign material or stain inside fuel filter Perform the following actions as result: • If foreign material or stain is found inside fuel filter (low-pressure side), clean of fuel tank and filter. • If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.) Then, go to Step 22.
13	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10B–7 COMPRESSION INSPECTION [AJ].) • Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to Step 19.

STEP	INSPECTION		ACTION
14	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect variable valve timing control system operation. (See 01–03B–70 Variable Valve Timing Control System Operation Inspection.) • Does variable timing control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to variable valve timing control system inspection results, then go to Step 19.
15	**INSPECT OPERATION OF PURGE CONTROL SOLENOID VALVE** • Inspect purge control system operation. (See 01–03B–67 Purge Control System Inspection.) • Does purge control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to purge control system inspection results, then go to Step 19.
16	**INSPECT PCV VALVE OPERATION** • Turn ignition key to OFF. • Remove PCV valve and check valve operation. (See 01–16–25 PCV VALVE INSPECTION [AJ].) • Is PCV valve operation okay?	Yes	Replace PCV valve, then go to Step 19.
		No	Go to next step.
17	**INSPECT OPERATION OF EGR VALVE** • Remove EGR valve. (See 01–16–19 EGR VALVE REMOVAL/INSTALLATION [AJ].) • Visually check whether it is stuck to open. • Is EGR valve stuck to open?	Yes	Go to next step.
		No	Repair or replace EGR valve, then go to Step 19. (See 01–16–19 EGR VALVE REMOVAL/INSTALLATION [AJ].)
18	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Are there any small bubbles which make engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing of head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to next step.
		No	Go to next step.
19	**VERIFY TROUBLESHOOTING OF DTC P3000 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine and perform DRIVE MODE 1. (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
20	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0301, P0302, P0303, P0304, P0305, P0306 [AJ]

C6U010201085W02

DTC P0301 **DTC P0302** **DTC P0303** **DTC P0304** **DTC P0305** **DTC P0306**	**Cylinder No.1 misfire detected** **Cylinder No.2 misfire detected** **Cylinder No.3 misfire detected** **Cylinder No.4 misfire detected** **Cylinder No.5 misfire detected** **Cylinder No.6 misfire detected**
DETECTION CONDITION	• The PCM monitors the crankshaft position sensor input signal interval time. The PCM calculates the change of the interval time for each cylinder. If the change of interval time exceeds the pre programmed criteria, the PCM detects a misfire in the corresponding cylinder. when the engine is running, the PCM counts the number of misfires that occurred at **200 crankshaft revolutions** and **1,000 crankshaft revolutions** and calculates the misfire ratio for each crankshaft revolution. If the ratio exceeds the pre programmed criteria, the PCM determines that a misfire, which can damage the catalytic converter or affect emission performance, has occurred. **Diagnostic support note** • This is a continuous monitor (misfire). • MIL illuminates if PCM detects the misfire which affects emission performance in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • MIL flashes if PCM detects the misfire which can damage the catalytic converter during first drive cycle. • PENDING CODE is available if PCM detects the misfire which affects emission performance during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Spark plug malfunction • High-tension lead malfunction • Fuel injector malfunction • Air suction in intake air system (between dynamic chamber and cylinder head) • Inadequate engine compression due to engine internal malfunction • Related connector or terminal malfunction • Related wiring harness malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF then ON (Engine OFF). • Verify related pending code or stored DTCs. • Is other DTCs present?	Yes	Go to appropriate DTC troubleshooting. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON /IDLE)** • Access APP1, APP2, ECT, IAT, MAF, RPM TP_REL and VSS PIDs using WDS or equivalent. (See 01–40B–6 PCM INSPECTION [AJ].) • Is there any signal that is far out of specification when ignition switch is ON and engine runs at idle?	Yes	Inspect suspected circuit or part or both according to inspection results. Then go to Step 13. (See 01–40B–6 PCM INSPECTION [AJ].)
		No	Go to next step.
5	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as in Step 4 when simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect suspected circuit or part or both according to inspection results. Then go to Step 13. (See 01–40B–6 PCM INSPECTION [AJ].)
		No	Go to next step.

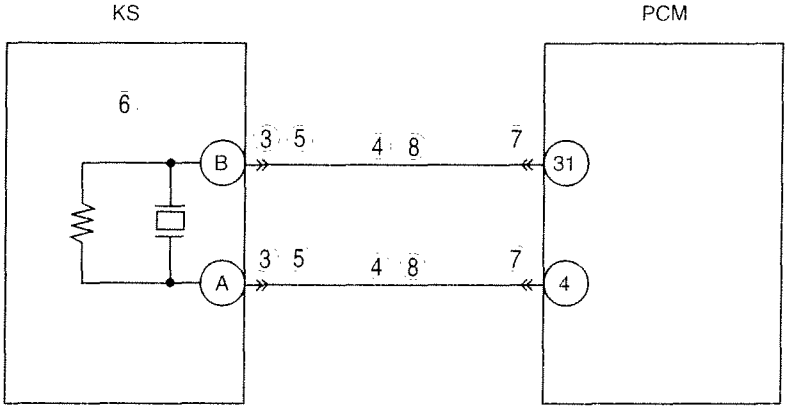
STEP	INSPECTION		ACTION
6	**INSPECT SPARK PLUG CONDITION** • Turn ignition key to OFF. • Remove spark plug from suspected cylinder. • Check spark plug condition: — Cracks — Excess wear — Gap — Wet • Is any problem found on spark plug?	Yes	• If spark plug is wet, fuel flooding is suspected. Go to step 9. • If spark plug has a crack, excess wear or improper gap, replace faulty spark plug. Then go to Step 13. (See 01–18–4 SPARK PLUG REMOVAL/ INSTALLATION.)
		No	Go to next step.
7	**INSPECT IGNITION SYSTEM OPERATION FOR SUSPECTED CYLINDER** • Perform Spark Test for suspected cylinder. (See 01–03B–66 Spark Test.) • Is result of Spark Test okay?	Yes	Go to next step.
		No	Replace or replace malfunctioning part according to spark test results, then go to Step 13.
8	**INSPECT FUEL INJECTOR HARNESS** • Remove intake air system parts. • Disconnect fuel injector connector on suspected cylinder. • Connect noid light to fuel injector connector terminals. • Check light dimness during cranking. • Does noid light illuminate?	Yes	Go to next step.
		No	Check fuel injector harnesses. Repair or replace it if necessary, then go to Step 13.
9	**INSPECT FUEL INJECTOR OPERATION** • Remove fuel injector from suspected cylinder. (See 01–14–24 FUEL INJECTOR REMOVAL/ INSTALLATION [AJ].) • Swap injector with injector on other cylinder. • Start engine and run it at idle. • Is there misfire DTC for the cylinder which has a suspected fuel injector?	Yes	Replace injector, then go to step 13. (See 01–14–24 FUEL INJECTOR REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
10	**INSPECT FOR AIR SUCTION AT INTAKE AIR SYSTEM** • Inspect for air leakage at the following: — Around connection of dynamic chamber and intake manifold — Around connection of intake manifold and cylinder head • Is air leakage found?	Yes	Repair or replace suspected part, then go to Step 13.
		No	Go to next step.
11	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous, Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Are there any small bubbles which make engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing of head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to Step 13.
		No	Go to next step.
12	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10B–7 COMPRESSION INSPECTION [AJ].) • Is engine compression okay?	Yes	Go to next step.
		No	Overhaul the engine, then go to next step.

STEP	INSPECTION		ACTION
13	**VERIFY TROUBLESHOOTING OF MISFIRE DTC COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Perform DRIVE MODE 1. (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

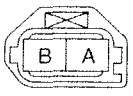
DTC P0325 [AJ]

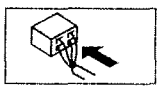
C6U010201085W03

DTC P0325	KS circuit
DETECTION CONDITION	• The PCM monitors the input signal from the knock sensor when the engine is running. If the input voltage at PCM terminal 31 and 4 is excessively low or high, the PCM determines that the knock sensor circuit is malfunctioning. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• KS malfunction • Connector or terminal malfunction • Short to GND circuit between KS terminal A and PCM terminal 4 • Short to GND circuit between KS terminal B and PCM terminal 31 • Short each harness KS terminal A and B • Open circuit between KS terminal A and PCM terminal 4 • Open circuit between KS terminal B and PCM terminal 31 • PCM malfunction

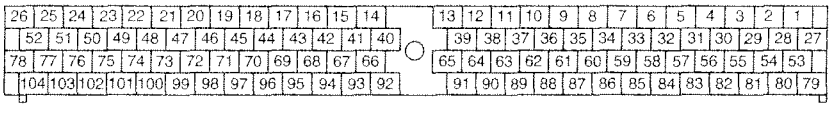


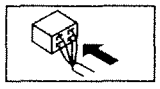
KS
HARNESS SIDE CONNECTOR





PCM
HARNESS SIDE CONNECTOR





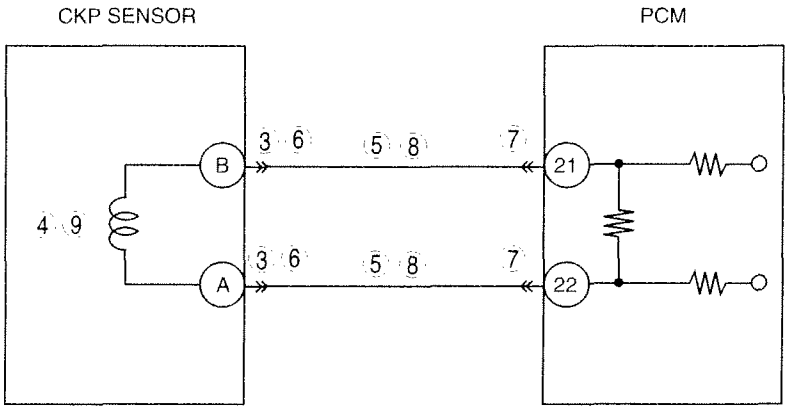
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT KS CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect KS connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT KS CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between the following circuits: — KS terminal A (harness-side) and body GND — KS terminal B (harness-side) and body GND • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
5	**INSPECT KS CIRCUIT FOR SHORT WITH EACH OTHER** • Turn ignition key to OFF. • Disconnect KS connector. • Check continuity between KS terminal A and B (harness-side). • Is there continuity?	Yes	Repair or replace harness for short with each other, then go to Step 9.
		No	Go to next step.
6	**INSPECT KS** • Inspect KS. (See 01–40B–35 KNOCK SENSOR (KS) INSPECTION [AJ]) • Is there any malfunction?	Yes	Replace KS, then go to Step 9.
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**INSPECT KS CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between the following circuits: — KS terminal A (harness-side) and PCM terminal 4 (harness-side) — KS terminal B (harness-side) and PCM terminal 31 (harness-side) • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0327 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM. Then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

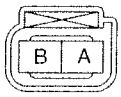
DTC P0335 [AJ]

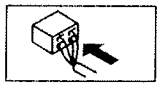
C6U010201085W04

DTC P0335	CKP sensor circuit malfunction
DETECTION CONDITION	• If the PCM does not receive the input voltage from the CKP sensor for **4.2 s** when MAF is **2.7 g/s {0.36 lb/min} or above**, the PCM determines that the CKP sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• CKP sensor malfunction • Connector or terminal malfunction • CKP sensor is dirty • CKP sensor pulse wheel malfunction • Short to GND circuit between CKP sensor terminal A and PCM terminal 22 • Short to GND circuit between CKP sensor terminal B and PCM terminal 21 • Short each harness CKP sensor terminal A and B • Open circuit between CKP sensor terminal A and PCM terminal 22 • Open circuit between CKP sensor terminal B and PCM terminal 21 • PCM malfunction

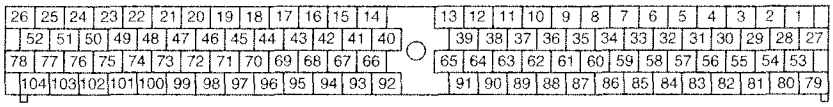


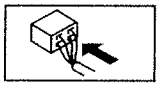
CKP SENSOR HARNESS SIDE CONNECTOR





PCM HARNESS SIDE CONNECTOR





Diagnostic procedure

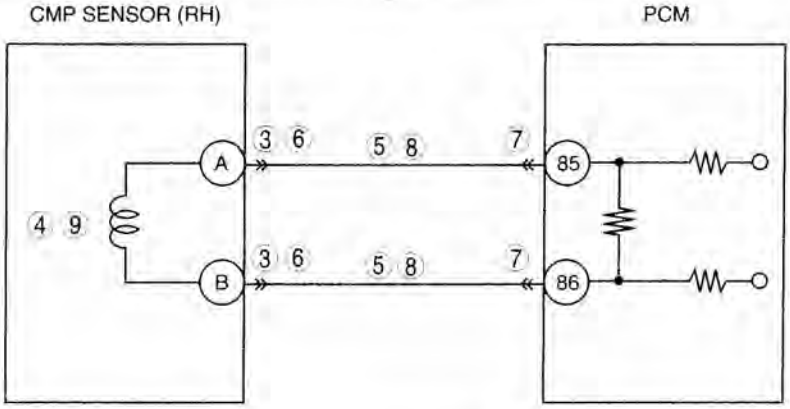
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CKP SENSOR VOLTAGE** • Disconnect CKP sensor connector. • Connect voltmeter between CKP sensor connector terminals A and B (sensor-side). • Check the voltage in AC range when cranking the engine. • Is there a voltage reading?	Yes	Go to next step.
		No	Go to step 9.

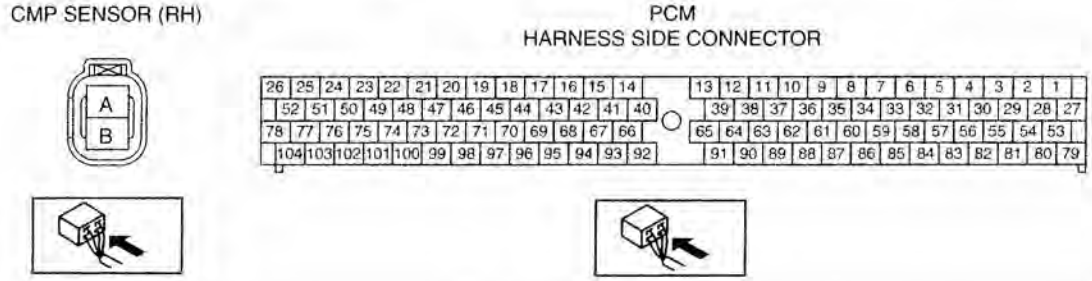
STEP	INSPECTION		ACTION
4	**VERIFY CKP SENSOR RESISTANCE** • Measure CKP sensor resistance. (See 01–40B–37 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [AJ].) • Is resistance okay?	Yes	Check CKP sensor pulse wheel for damage. • If there is any malfunction, replace CKP sensor pulse wheel and go to Step 10 (See 01–10B–8 TIMING CHAIN REMOVAL/ INSTALLATION [AJ].)
		No	If resistance is **0 ohm**, then go to next step. If resistance is infinity, then go to Step 7.
5	**INSPECT CKP SENSOR CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between the following circuits: — CKP sensor terminal A (harness-side) and body GND — CKP sensor terminal B (harness-side) and body GND • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 10.
		No	Go to next step.
6	**INSPECT CKP SENSOR CIRCUIT FOR SHORT WITH EACH OTHER** • Turn ignition key to OFF. • Disconnect CKP sensor connector. • Check continuity between CKP sensor terminal A and B (harness-side). • Is there continuity?	Yes	Repair or replace harness for short with each other, then go to Step 10.
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
8	**INSPECT CKP SENSOR CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between the following circuits: — CKP sensor terminal A (harness-side) and PCM terminal 22 (harness-side) — CKP sensor terminal B (harness-side) and PCM terminal 21 (harness-side) • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 10.
9	**INSPECT CKP SENSOR** • Inspect CKP sensor. (See 01–40B–37 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [AJ]) • Is there any malfunction?	Yes	Replace CKP sensor, then go to next step. (See 01–40B–37 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0335 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Access MAF PID using WDS or equivalent. **Note** • MAF PID should indicate **2.7 g/s {0.36 lb/min} or above** during this test • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0340 [AJ]

C6U010201085W05

DTC P0340	CMP sensor (RH) circuit malfunction
DETECTION CONDITION	• The PCM monitors input voltage from the CMP sensor (RH) when the engine is running. If the CMP sensor (RH) signal timing inferred from the CKP sensor signal has deviated, PCM determines that CMP sensor (RH) circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• CMP sensor (RH) malfunction • Connector or terminal malfunction • CMP sensor (RH) is dirty • CMP sensor (RH) malfunction • Short to GND circuit between CMP sensor (RH) terminal A and PCM terminal 85 • Short to GND circuit between CMP sensor (RH) terminal B and PCM terminal 86 • Short each harness CMP sensor (RH) terminal A and B • Open circuit between CMP sensor (RH) terminal A and PCM terminal 85 • Open circuit between CMP sensor (RH) terminal B and PCM terminal 86 • Improper installation of timing chain or improper value timing • PCM malfunction





Diagnostic procedure

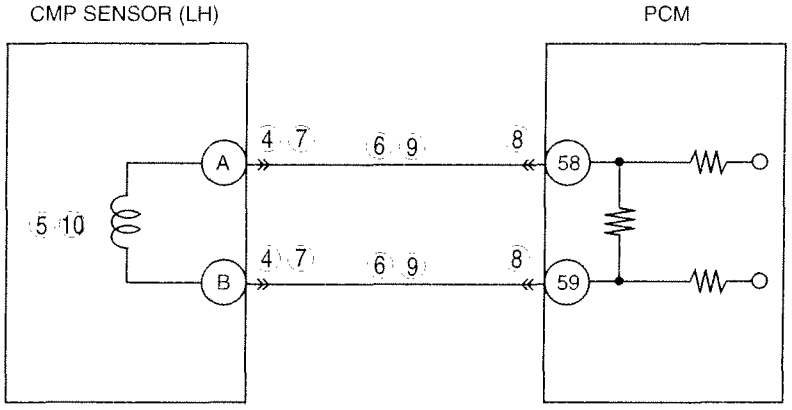
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CMP SENSOR (RH) VOLTAGE** • Disconnect CMP sensor (RH) connector. • Connect voltmeter between CMP sensor (RH) connector terminals A and B (sensor-side). • Check the voltage in AC range when cranking the engine. • Is there a voltage reading?	Yes	Go to next step.
		No	Go to step 9.
4	**VERIFY CMP SENSOR (RH) RESISTANCE** • Measure CMP sensor (RH) resistance. (See 01–40B–36 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [AJ].) • Is resistance okay?	Yes	Check CMP sensor (RH) pulse wheel for damage. • If there is any malfunction, replace CMP sensor (RH) pulse wheel and go to Step 12. (See 01–10B–8 TIMING CHAIN REMOVAL/INSTALLATION [AJ].)
		No	If resistance is **0 ohm**, then go to next step. If resistance is infinity, then go to Step 7.
5	**INSPECT CMP SENSOR (RH) CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between the following circuits: — CMP sensor (RH) terminal A (harness-side) and body GND — CMP sensor (RH) terminal B (harness-side) and body GND • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 12.
		No	Go to next step.
6	**INSPECT CMP SENSOR (RH) CIRCUIT FOR SHORT WITH EACH OTHER** • Turn ignition key to OFF. • Disconnect CMP sensor (RH) connector. • Check continuity between CMP sensor (RH) terminal A and B (harness-side). • Is there continuity?	Yes	Repair or replace harness for short with each other, then go to Step 12.
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 12.
		No	Go to next step.
8	**INSPECT CMP SENSOR (RH) CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between the following circuits: — CMP sensor (RH) terminal A (harness-side) and PCM terminal 85 (harness-side) — CMP sensor (RH) terminal B (harness-side) and PCM terminal 86 (harness-side) • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 12.
9	**INSPECT CMP SENSOR (RH)** • Inspect CMP sensor (RH). (See 01–40B–36 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace CMP sensor (RH), then go to next step. (See 01–40B–36 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.

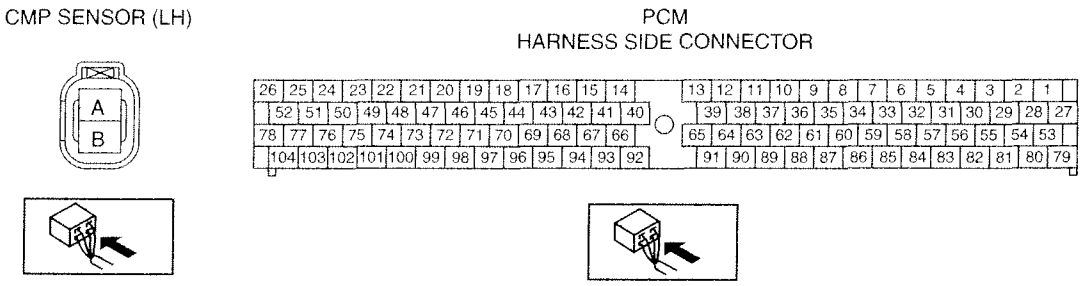
STEP	INSPECTION		ACTION
10	**INSPECT STOPPER PIN MECHANISM** • Remove timing chain. • Inspect stopper pin. (See 01–10B–45 VARIABLE VALVE TIMING ACTUATOR INSPECTION [AJ].) • Is stopper pin mechanism okay?	Yes	Go to next step.
		No	Replace variable valve timing actuator (RH), then go to Step 12. (See 01–10B–46 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [AJ].)
11	**TIMING CHAIN INSTALLATION** • Verify timing chain installtion. (See 01–10B–8 TIMING CHAIN REMOVAL/INSTALLATION [AJ].) • Is timing chain installed properly?	Yes	Go to next step.
		No	Reinstall timing chain, then go to next step.
12	**VERIFY TROUBLESHOOTING OF DTC P0340 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Access MAF PID using WDS or equivalent. **Note** • MAF PID should indicate **2.7 g/s {0.36 lb/min} or above** during this test • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0345 [AJ]

C6U010201085W06

DTC P0345	CMP sensor (LH) circuit malfunction
DETECTION CONDITION	• The PCM monitors the input voltage from the CMP sensor (LH) when the engine is running. If the PCM does not receive the input voltage from the CMP sensor (LH) when the PCM receives the input signal from the CKP sensor, the PCM determines that the CMP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• CMP sensor (LH) malfunction • Connector or terminal malfunction • CMP sensor (LH) is dirty • CMP sensor (LH) malfunction • Short to GND circuit between CMP sensor (LH) terminal A and PCM terminal 58 • Short to GND circuit between CMP sensor (LH) terminal B and PCM terminal 59 • Short each harness CMP sensor (LH) terminal A and B • Open circuit between CMP sensor (LH) terminal A and PCM terminal 58 • Open circuit between CMP sensor (LH) terminal B and PCM terminal 59 • Improper installation of timing chain or improper value timing • PCM malfunction





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P0340 also present?	Yes	Go to the DTC P0340 inspection. (See 01–02B–97 DTC P0340 [AJ].) • If the DTC P0340 dose not stored, go to next step.
		No	Go to next step.
4	**VERIFY CMP SENSOR (LH) VOLTAGE** • Disconnect CMP sensor (LH) connector. • Connect voltmeter between CMP sensor (LH) connector terminals A and B (sensor-side). • Check the voltage in AC range when cranking the engine. • Is there a voltage reading?	Yes	Go to next step.
		No	Go to step 10.
5	**VERIFY CMP SENSOR (LH) RESISTANCE** • Measure CMP sensor (LH) resistance. (See 01–40B–36 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [AJ].) • Is resistance okay?	Yes	Check CMP sensor (LH) pulse wheel for damage. • If there is any malfunction, replace CMP sensor (LH) pulse wheel and go to Step 13. (See 01–10B–8 TIMING CHAIN REMOVAL/ INSTALLATION [AJ].)
		No	If resistance is **0 ohm**, then go to next step. If resistance is infinity, then go to Step 8.
6	**INSPECT CMP SENSOR (LH) CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between the following circuits: — CMP sensor (LH) terminal A (harness-side) and body GND — CMP sensor (LH) terminal B (harness-side) and body GND • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 13.
		No	Go to next step.
7	**INSPECT CMP SENSOR (LH) CIRCUIT FOR SHORT WITH EACH OTHER** • Turn ignition key to OFF. • Disconnect CMP sensor (LH) connector. • Check continuity between CMP sensor (LH) terminal A and B (harness-side). • Is there continuity?	Yes	Repair or replace harness for short with each other, then go to Step 13.
		No	Go to next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 13.
		No	Go to next step.
9	**INSPECT CMP SENSOR (LH) CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between the following circuits: — CMP sensor (LH) terminal A (harness-side) and PCM terminal 58 (harness-side) — CMP sensor (LH) terminal B (harness-side) and PCM terminal 59 (harness-side) • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 13.

STEP	INSPECTION		ACTION
10	**INSPECT CMP SENSOR (LH)** • Inspect CMP sensor (LH). (See 01–40B–36 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace CMP sensor (LH), then go to Step 13. (See 01–40B–36 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
11	**INSPECT STOPPER PIN MECHANISM** • Remove timing chain. • Inspect stopper pin. (See 01–10B–45 VARIABLE VALVE TIMING ACTUATOR INSPECTION [AJ].) • Is stopper pin mechanism okay?	Yes	Go to next step.
		No	Replace variable valve timing actuator (LH), then go to Step 13. (See 01–10B–46 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [AJ].)
12	**INSPECT ROTOR POSITION** • Remove variable valve timing actuator (LH). (See 01–10B–46 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [AJ].) • Is rotor position at maximum valve timing retard?	Yes	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC is detected by intermittent concern. • Intermittent concern might be removed by cleaning mode of variable valve timing control function. Go to next step.
		No	Replace variable valve timing actuator, go to next step. (See 01–10B–46 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [AJ].)
13	**VERIFY TROUBLESHOOTING OF DTC P0345 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Access MAF PID using WDS or equivalent. **Note** • MAF PID should indicate **2.7 g/s {0.36 lb/min} or above** during this test • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0401 [AJ]

C6U010201086W01

DTC P0401	EGR flow insufficient detected
DETECTION CONDITION	• The PCM monitors the difference in intake manifold pressures when the EGR is operated and when it is stopped. If the difference is too small, the PCM determines that the EGR flow is insufficient. **Diagnostic support note** • This is an intermittent monitor (EGR). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EGR valve malfunction • EGR boost sensor malfunction • EGR boost sensor solenoid valve malfunction • EGR valve gasket malfunction • PCM malfunction

Diagnostic procedure

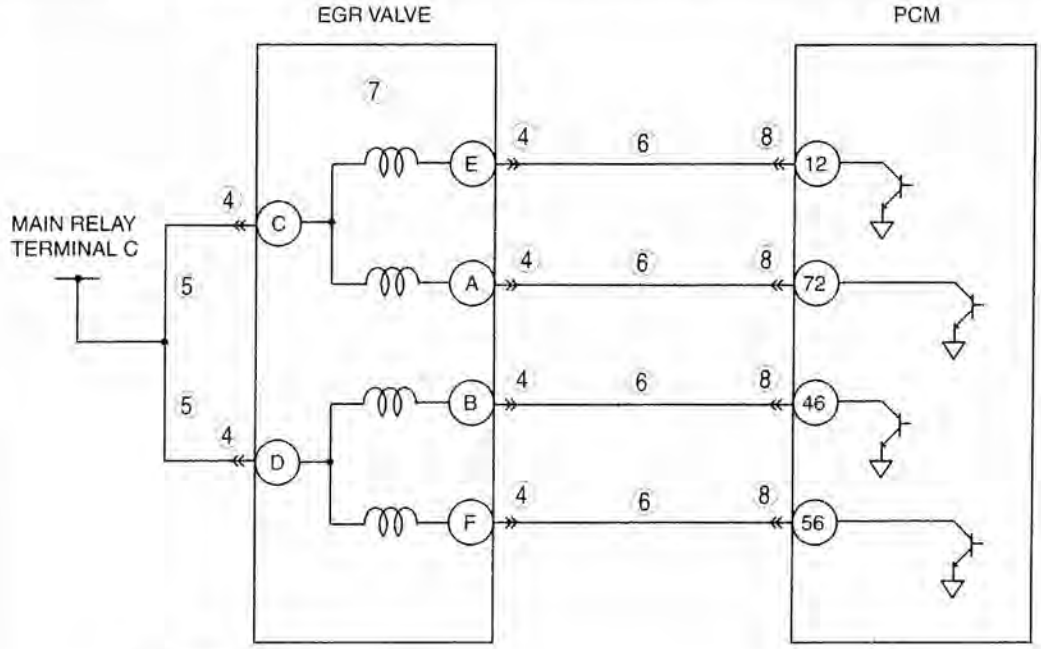
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FOR OTHER DTCs** • Turn ignition key to OFF then ON (Engine OFF). • Have other DTCs been stored?	Yes	Repair circuit malfunction for applicable DTCs. (See 01-02B-15 DTC TABLE [AJ].)
		No	Go to next step.
4	**INSPECT VACUUM HOSE CONDITION** • Inspect vacuum hoses for clogs, damage, freezing, or vacuum leakage. • Is there any malfunction?	Yes	Replace vacuum hoses, then go to Step 9.
		No	Go to next step.
5	**INSPECT EGR VALVE** • Inspect EGR valve. (See 01-16-21 EGR VALVE INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace EGR valve, then go to Step 9. (See 01-16-19 EGR VALVE REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
6	**INSPECT EGR BOOST SENSOR** • Inspect EGR boost sensor. (See 01-40B-34 EGR BOOST SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace EGR boost sensor, then go to Step 9.
		No	Go to next step.
7	**INSPECT EGR BOOST SENSOR SOLENOID VALVE** • Inspect EGR boost sensor solenoid valve. (See 01-16-22 EGR BOOST SENSOR SOLENOID VALVE INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace EGR boost sensor solenoid valve, then go to Step 9.
		No	Go to next step.
8	**INSPECT EGR VALVE GASKET** • Turn ignition key to OFF. • Remove EGR valve. (See 01-16-19 EGR VALVE REMOVAL/INSTALLATION [AJ].) • Is EGR valve gasket normal?	Yes	Go to next step.
		No	Replace EGR valve gasket, then go to next step. (See 01-16-19 EGR VALVE REMOVAL/INSTALLATION [AJ].)

STEP	INSPECTION		ACTION
9	**MONITOR EGR SYSTEM BY DRIVE MODE** • Clear DTC from PCM memory using WDS or equivalent. • Run Drive Mode 1 (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Stop vehicle and access ON BOARD READINESS TEST to inspect DRIVE MODE completion status. • Verify FUEL_EVAL PID status. • Does FUEL_EVAL PID change to Yes?	Yes	Retry this step.
		No	Go to next step.
10	**MONITOR EGR SYSTEM BY DRIVE MODE** • Run Drive Mode 2. (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Stop vehicle and access ON BOARD SYSTEM READINESS TEST to input DRIVE MODE completion status. • Verify EGR_EVAL PID status. • Does EGR_EVAL PID change to Yes?	Yes	Go to next step.
		No	Retry this step.
11	**VERIFY TROUBLESHOOTING OF DTC P0401 COMPLETED** • Make sure to reconnect all disconnected connectors. • Access DIAGNOSTIC MONITORING TEST RESULTS (Mode 6). (See 01–02B–14 DIAGNOSTIC MONITORING TEST RESULTS [AJ].) • Verify TEST # 10:41:00 (EGR pressure variation) value. • Is value within specification?	Yes	Go to next step.
		No	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

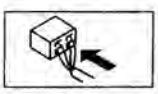
DTC P0403 [AJ]

C6U010201086W02

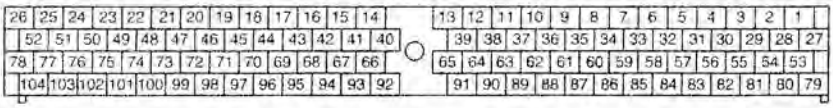
DTC P0403	EGR valve (stepper motor) circuit malfunction
DETECTION CONDITION	• The PCM monitors the input voltages from the EGR valve control signals. If the voltage is below or above the specification, the PCM determines that the EGR valve circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EGR valve malfunction • Connector or terminal malfunction • Open circuit between main relay terminal C and EGR valve terminal C • Open circuit between main relay terminal C and EGR valve terminal D • Short to GND circuit between EGR valve terminal A and PCM terminal 72 • Short to GND circuit between EGR valve terminal B and PCM terminal 46 • Short to GND circuit between EGR valve terminal E and PCM terminal 12 • Short to GND circuit between EGR valve terminal F and PCM terminal 56 • Open circuit between EGR valve terminal A and PCM terminal 72 • Open circuit between EGR valve terminal B and PCM terminal 46 • Open circuit between EGR valve terminal E and PCM terminal 12 • Open circuit between EGR valve terminal F and PCM terminal 56 • PCM malfunction

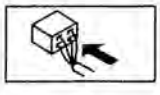


EGR VALVE HARNESS SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service bulletins and/or on-line repair information availability. • Is any repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Go to next step.
		No	Go to intermittent concern. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)
4	**INSPECT EGR VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
5	**INSPECT EGR VALVE POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between following circuits: — EGR valve terminal C (harness-side) and body GND — EGR valve terminal D (harness-side) and body GND • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 10.
6	**INSPECT EGR VALVE CONTROL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between the following circuits: — EGR valve terminal A (harness-side) and body GND — EGR valve terminal B (harness-side) and body GND — EGR valve terminal E (harness-side) and body GND — EGR valve terminal F (harness-side) and body GND • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 10.
		No	Go to next step.
7	**INSPECT EGR VALVE** • Inspect EGR valve. (See 01–16–21 EGR VALVE INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace EGR valve, then go to Step 10. (See 01–16–19 EGR VALVE REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.

STEP	INSPECTION		ACTION
9	**INSPECT EGR VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between the following circuits: — EGR valve terminal A (harness-side) and PCM terminal 72 (harness-side) — EGR valve terminal B (harness-side) and PCM terminal 46 (harness-side) — EGR valve terminal E (harness-side) and PCM terminal 12 (harness-side) — EGR valve terminal F (harness-side) and PCM terminal 56 (harness-side) • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step
10	**VERIFY TROUBLESHOOTING OF DTC P0403 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0421, P0431 [AJ]

C6U010201086W03

DTC P0421 **DTC P0431**	**Warm-up catalyst system (RH) efficiency below threshold** **Warm-up catalyst system (LH) efficiency below threshold**
DETECTION CONDITION	• The PCM compares the number of HO2S (Front) and HO2S (Rear) inversions for a predetermined time. The PCM monitors the number of inversions the rear side performs while the front side inverts for a specified number of times when the following monitoring conditions are met. The PCM detects the inversion ratio. If inversion ratio is below the threshold, the PCM determines that the catalyst system has deteriorated. **MONITORING CONDITION** — The engine speed is **1,250—2,750 rpm**. — The calculated load is **15—44%**, depending on engine speed. **Diagnostic support note** • This is an intermittent monitor (catalyst). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • DIAGNOSTIC MONITORING TEST RESULTS is available. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• WU-TWC deterioration or malfunction • Exhaust gas leakage • Looseness of HO2S (RF, LF, RR, LR) • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF then ON (Engine OFF). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to appropriate DTC troubleshooting. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**INSPECT EXHAUST SYSTEM FOR EXHAUST GAS LEAKAGE** • Visually inspect for exhaust gas leakage in exhaust system. (See 01–15B–1 EXHAUST SYSTEM INSPECTION [AJ].) • Is there any exhaust gas leakage?	Yes	Repair or replace faulty exhaust system parts, then go to Step 7. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
5	**INSPECT HO2S INSTALLATION** • Inspect for looseness of HO2S (RF, LF, RR, LR). • Is HO2S installation normal?	Yes	Go to next step.
		No	Retighten HO2S, then go to Step 7. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
6	**INSPECT WU-TWC** • Clear DTC from PCM memory using WDS or equivalent. • Cycle ignition key to OFF, then back to ON. • Inspect WU-TWCs each bank. (See 01–16–25 THREE-WAY CATALYTIC CONVERTER (TWC) INSPECTION.) • Is there any malfunction?	Yes	Replace malfunctioning WU-TWC, then go to next step. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0421 OR P0431 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine and perform DRIVE MODE except for DRIVE MODE 6. (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0441 [AJ]

C6U010201086W04

DTC P0441	EVAP control system incorrect purge flow
DETECTION CONDITION	• The PCM measures the purge line pressure, which is the vacuum, when the following conditions are met. If the vacuum between the charcoal canister and intake manifold does not reach the specification, the PCM determines that the EVAP system is clogged. **MONITORING CONDITION** — Engine speed: **1,500—3,550 rpm** (MTX) — Engine speed: **1,220—3,000 rpm** (ATX) — Throttle opening angle: **10.2—27.8%** — Vehicle speed: **69.5—136 km/h {43.1—84.3 mph}** (MTX) — Vehicle speed: **34.5—136 km/h {21.4—84.3 mph}** (ATX) **Diagnostic support note** • This is an intermittent monitor (evaporative). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • DIAGNOSTIC MONITORING TEST RESULTS is available. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Catch tank malfunction • Charcoal canister malfunction • Purge solenoid valve malfunction • EVAP system leak detection pump malfunction • EVAP hose damaged or loose • EVAP pipe damaged • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF then ON (Engine OFF). • Verify related pending code or stored DTCs. • Is DTC P0443 present?	Yes	Go to appropriate DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**DETERMINE IF LEAK CONCERN OR BLOCKAGE CONCERN** • Perform evaporative system leak inspection. (See 01–03B–68 Evaporative System Test.) • Is system test result failed?	Yes	Go to Step 6.
		No	Go to next step.
5	**INSPECT PURGE SOLENOID VALVE** • Inspect purge solenoid valve. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.) • Is there any malfunction?	Yes	Replace purge solenoid valve, then go to Step 11.
		No	Inspect following parts for clogging. • Vacuum hoses between intake manifold and charcoal canister • Catch tank • Charcoal canister Repair or replace part, then go to Step 11.
6	**LOCATE LEAK POINT** • Check the following for leakage using ultrasonic leak detector: — Charcoal canister — Catch tank — Fuel filler cap — EVAP hoses and pipes — Fuel tank • Is leakage found?	Yes	Repair leakage or replace part, then go to Step 10.
		No	Go to next step.

STEP	INSPECTION		ACTION
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Connect all disconnected connectors and hoses. • Place clamp on EVAP system leak detection pump hose between EVAP system leak detection pump and air filter. • Perform evaporative system leak inspection. (See 01–03B–68 Evaporative System Test.) • Does it fail test (red light turns on)?	Yes	Go to Step 9.
		No	Go to next step.
8	**CONFIRM EVAP SYSTEM LEAK DETECTION PUMP LEAKAGE** • Remove clamp. • Perform evaporative system leak inspection. (See 01–03B–68 Evaporative System Test.) • Does it fail test (red light turns on)?	Yes	Replace EVAP system leak detection pump, then go to Step 10. (See 01–16–4 EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM COMPONENT REMOVAL/ INSTALLATION.)
		No	Go to next step.
9	**INSPECT FUEL PUMP UNIT INSTALLATION** • Remove fuel tank. (See 01–14–10 FUEL TANK REMOVAL/ INSTALLATION.) • Visually inspect for damage, insufficient sealing or poorly installed pump unit. • Is it okay?	Yes	Go to next step.
		No	Repair or replace fuel tank or sealing, then go to next step.
10	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors and hoses. • Perform evaporative system leak inspection. (See 01–03B–68 Evaporative System Test.) • Does it fail test (red light turns on)?	Yes	Leakage still exists. Locate leak point and repair. Then go to next step.
		No	Go to next step
11	**VERIFY TROUBLESHOOTING OF DTC P0441 COMPLETED** • Start the engine and let it idle. • Clear DTC using WDS or equivalent. • Turn ignition switch OFF. • Perform DRIVE MODE 6. (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0442 [AJ]

C6U01020108GW05

DTC P0442	EVAP control system leak detected (small leak)
DETECTION CONDITION	• The PCM measures the pump load current (EVAP line pressure) when a certain period has passed after the EVAP system is sealed when the following monitoring conditions are met. If the load does not reach the reference current value within a certain period, PCM determines that the EVAP system has a small leak. **MONITORING CONDITION** — Ignition switch OFF — IAT: **5—45 °C {41—113 °F}** — Battery voltage: **11—14.6 V** — Atmospheric pressure: **72.2 kPa {542 mmHg, 21.3 inHg} or above** — Fuel tank level: **15—85%** **Diagnostic support note** • This is an intermittent monitor (evaporative). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • DIAGNOSTIC MONITORING TEST RESULTS is available. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • EVAP system leak detection pump malfunction • Charcoal canister malfunction • Catch tank malfunction • Fuel filler cap malfunction • Fuel tank malfunction • Fuel pump unit poor seal • EVAP hose damaged or loose • EVAP pipe damaged

Diagnostic procedure

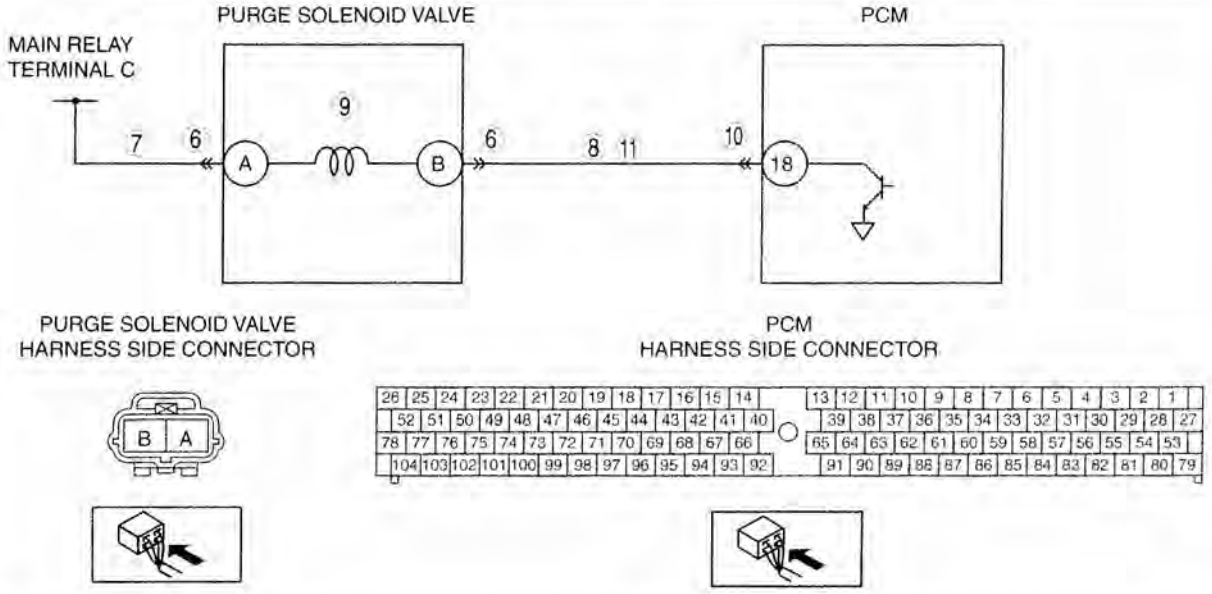
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF then ON (Engine OFF). • Verify related pending code or stored DTCs. • Is other DTC present?	Yes	Go to appropriate DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Perform evaporative system leak inspection. (See 01–03B–68 Evaporative System Test.) • Does it fail test (red light turn on)?	Yes	Go to next step.
		No	Intermittent concern exists. Inspect purge solenoid valve and EVAP system leak detection pump circuit for intermittent concern. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)
5	**LOCATE LEAK POINT** • Check leakage for the following using ultrasonic leak detector: — Charcoal canister — Catch tank — Fuel filler cap — EVAP hoses and pipes — Fuel tank • Is leakage found?	Yes	Repair leakage or replace part, then go to Step 11.
		No	Go to next step.
6	**INSPECT PURGE SOLENOID VALVE** • Inspect purge solenoid valve. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.) • Is there any malfunction?	Yes	Replace purge solenoid valve, then go to Step 11.
		No	Go to next step.

STEP	INSPECTION		ACTION
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Connect all disconnected connectors and hoses. • Place clamp on EVAP system leak detection pump hose between EVAP system leak detection pump and air filter. • Perform evaporative system leak inspection. (See 01–03B–68 Evaporative System Test.) • Does it fail test (red light turns on)?	Yes	Go to Step 9.
		No	Go to next step.
8	**CONFIRM EVAP SYSTEM LEAK DETECTION PUMP LEAKAGE** • Remove clamp. • Perform evaporative system leak inspection. (See 01–03B–68 Evaporative System Test.) • Does it fail test (red light turns on)?	Yes	Replace EVAP system leak detection pump, then go to Step 11. (See 01–16–4 EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM COMPONENT REMOVAL/ INSTALLATION.)
		No	Go to next step.
9	**INSPECT FUEL TANK INSTALLATION** • Remove fuel tank. (See 01–14–10 FUEL TANK REMOVAL/ INSTALLATION.) • Visually inspect for damage, insufficient sealing or poorly installed pump unit. • Is it okay?	Yes	Go to next step.
		No	Repair or replace fuel tank or sealing, then go to next step.
10	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors and hoses. • Perform evaporative system leak inspection. (See 01–03B–68 Evaporative System Test.) • Does it fail test (red light turns on)?	Yes	Leakage still exists. Locate leak point and repair. Then go to next step.
		No	Go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0442 COMPLETED** • Start the engine and let it idle. • Clear DTC using WDS or equivalent. • Turn ignition switch OFF. • Perform DRIVE MODE 6. (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0443 [AJ]

C6U010201086W06

DTC P0443	EVAP control system purge control valve circuit malfunction
DETECTION CONDITION	• The PCM monitors the input voltages from the purge solenoid valve. If the voltage at PCM terminal 18 remains low or high, the PCM determines that the purge solenoid valve circuit has a malfunction. **Diagnostic support note** • This is an continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Connector or terminal malfunction • Short to GND between purge solenoid valve terminal B and PCM terminal 18 • Open circuit between main relay terminal C and purge solenoid valve terminal A • Short to power circuit between purge solenoid valve terminal B and PCM terminal 18 • Open circuit between purge solenoid valve terminal B and PCM terminal 18 • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service bulletins and/or on-line repair information availability. • Is any repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to "INTERMITTENT CONCERNS TROUBLESHOOTING". (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)
4	**CLASSIFY OPEN CIRCUIT OR SHORT TO GND MALFUNCTION** • Disconnect purge solenoid valve tube that is connected to intake manifold. • Connect vacuum pump to purge solenoid valve. • Pump vacuum pump several times and stop. • Wait **a few seconds**. • Is vacuum maintained?	Yes	Go to Step 6.
		No	Go to next step.

STEP	INSPECTION		ACTION
5	**INSPECT PASSAGE CONTROL OF PURGE SOLENOID VALVE** • Turn ignition key to OFF. • Disconnect purge solenoid valve connector. • Pump vacuum pump several times and wait **a few seconds**. • Is vacuum maintained?	Yes	Repair or replace the following harness for short to GND, then go to Step 12. — Purge solenoid valve terminal B to PCM terminal 18
		No	Replace purge solenoid valve, then go to Step 12.
6	**INSPECT PURGE SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect purge solenoid valve connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 12.
		No	Go to next step.
7	**INSPECT PURGE SOLENOID VALVE POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Measure voltage between purge solenoid valve terminal A (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 12.
8	**INSPECT PURGE SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to OFF. • Measure voltage between purge solenoid valve terminal B (harness-side) and body GND. • Is voltage reading?	Yes	Repair or replace harness for short to power, then go to Step 12.
		No	Go to next step.
9	**INSPECT PURGE SOLENOID VALVE** • Inspect purge solenoid valve. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.) • Is there any malfunction?	Yes	Replace purge solenoid valve, then go to Step 12.
		No	Go to next step.
10	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 12.
		No	Go to next step.
11	**INSPECT PURGE SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between purge solenoid valve terminal B (harness-side) and PCM terminal 18 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
12	**VERIFY TROUBLESHOOTING OF DTC P0443 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0446 [AJ]

C6U010201086W07

DTC P0446	Change over valve (EVAP system leak detection pump) stuck close
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure), while the evaporative leak monitor is operating. When the decrease in pump load current is less than the specification after the reference current value has been obtained, the PCM determines that the change over valve in the EVAP system leak detection pump has a malfunction. **Diagnostic support note** • This is an continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Change over valve (in EVAP system leak detection pump) malfunction. • Short to power circuit between EVAP system leak detection pump terminal C and PCM terminal 6 • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (Engine OFF). • Disconnect EVAP system leak detection pump connector. • Measure voltage between EVAP system leak detection pump terminal C (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 5.
		No	Go to next step.
4	**INSPECT CHANGE OVER VALVE (IN EVAP SYSTEM LEAK DETECTION PUMP)** • Perform EVAP system leak detection pump inspection. (See 01–16–12 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION.) • Is there any malfunction?	Yes	Replace EVAP system leak detection pump, then go to next step. (See 01–16–4 EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM COMPONENT REMOVAL/ INSTALLATION.)
		No	Go to next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0446 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine and perform DRIVE MODE 6. (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0455 [AJ]

C6U010201086W08

DTC P0455	EVAP control system leak detected (large leak)
DETECTION CONDITION	• The PCM measures the pump load current (EVAP line pressure) when a certain period has passed after the EVAP system is sealed when the following monitoring conditions are met. If the load does not reach the reference current value within a certain period, the PCM determines that the EVAP system has a large leak. **MONITORING CONDITION** — Ignition switch OFF — IAT: **5—45 °C {41—113 °F}** — Battery voltage: **11—14.6 V** — Atmospheric pressure: **72.2 kPa {542 mmHg, 21.3 inHg} or above** — Fuel tank level: **15—85%** **Diagnostic support note** • This is an intermittent monitor (Evaporative). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • DIAGNOSTIC MONITORING TEST RESULTS is available. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Loose, missing or defective fuel filler cap • Purge solenoid valve malfunction • EVAP system leak detection pump malfunction • EVAP hose damaged or loose • Fuel tank malfunction • Catch tank malfunction • Charcoal canister malfunction • Poor connection or damaged vacuum hose • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF then ON (Engine OFF). • Verify related pending code or stored DTCs. • Is DTC P0443 or P0446 or both present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Perform Evaporative System Leak Inspection. (See 01–03B–68 Evaporative System Test.) • Does it fail test (red light turns on)?	Yes	Intermittent concern exists. Inspect purge solenoid valve and EVAP system leak detection pump circuit for intermittent concern. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)
		No	Go to next step.
5	**INSPECT FUEL FILLER CAP** **Note** • When fuel-filler caps other than OEM caps are attached, it is considered a malfunction. • Verify that fuel-filler cap is neither disconnected nor loose or damaged. • It is okay?	Yes	Go to next step.
		No	Retighten fuel-filler cap or replace it, if it is damaged. Go to Step 18.

STEP	INSPECTION		ACTION
6	**INSPECT PURGE SOLENOID VALVE** • Inspect purge solenoid valve. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.) • Is there any malfunction?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 18.
7	**INSPECT CHANGE OVER VALVE (IN EVAP SYSTEM LEAK DETECTION PUMP)** • Perform EVAP system leak detection pump inspection. (See 01–16–12 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION.) • Is there any malfunction?	Yes	Replace EVAP system leak detection pump, then go to Step 18. (See 01–16–4 EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM COMPONENT REMOVAL/ INSTALLATION.)
		No	Go to next step.
8	**INSPECT IF EVAP CONTROL SYSTEM FOR LEAKAGE OR BLOCKAGE** **Note** • If evaporative emission tester is not available, then go to next step. • Perform Evaporative System Leak Inspection. (See 01–03B–68 Evaporative System Test.) • Is system test okay?	Yes	Go to next step.
		No	Repair or replace faulty area, then go to Step 18.
9	**INSPECT CHARCOAL CANISTER TO FUEL PUMP FOR LEAKAGE** • Disconnect fuel tank side vacuum hose at charcoal canister. • Apply vacuum **1.7 kPa (13 mmHg, 0.5 inHg)** to disconnected vacuum hose using vacuum hose. • Does vacuum hold for minimum of **2 min**?	Yes	Go to Step 13.
		No	Go to next step.
10	**VERIFY VACUUM HOSE FOR POOR CONNECTION** • Verify vacuum hose installation condition between fuel tank and charcoal canister. • Is there poor connection detected?.	Yes	Connect vacuum hose correctly, then go to Step 18.
		No	Go to next step
11	**INSPECT FUEL PUMP UNIT INSTALLATION** • Remove fuel tank. (See 01–14–10 FUEL TANK REMOVAL/ INSTALLATION.) • Visually inspect for damage, insufficient sealing or poorly installed pump unit. • Is it okay?	Yes	Go to next step.
		No	Repair or replace fuel tank or sealing, then go to next step.
12	**INSPECT FUEL TANK** • Inspect fuel tank. • Is it okay?	Yes	Replace vacuum hose from charcoal canister to fuel tank, then go to next step.
		No	Replace fuel tank, then go to next step. (See 01–14–10 FUEL TANK REMOVAL/INSTALLATION.)
13	**INSPECT LEAKAGE FROM CHARCOAL CANISTER TO PURGE SOLENOID VALVE** • Disconnect purge solenoid valve side vacuum hose to at charcoal canister. • Apply vacuum **3.3 kPa {25 mmHg, 1.0 inHg}** to disconnected vacuum hose using vacuum hose. • Does vacuum hold for minimum of **2 min**?	Yes	Go to Step 18.
		No	Go to next step.
14	**VERIFY VACUUM HOSE FOR POOR CONNECTION** • Verify vacuum hose installation condition between purge solenoid valve and charcoal canister. • Is there poor connection detected?	Yes	Connect vacuum hose correctly, then go to Step 18.
		No	Go to next step.

STEP	INSPECTION		ACTION
15	**INSPECT PURGE SOLENOID VALVE FOR DAMAGE OR AIR LEAK** • Remove purge solenoid valve and inspect for damage and air leak. • Is it okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 18.
16	**INSPECT CATCH TANK** • Remove catch tank and inspect for plugging, damage or pinhole using vacuum pump. • Is it okay?	Yes	Go to next step.
		No	Replace catch tank, then go to Step 18.
17	**INSPECT CHARCOAL CANISTER** • Remove charcoal canister and inspect for plugging, damage or pinhole. • Is it okay?	Yes	Replace vacuum hose from charcoal canister to purge solenoid valve, then go to next step.
		No	Replace charcoal canister, then go to next step.
18	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors. • Perform Evaporative System Leak Inspection. (See 01–03B–68 Evaporative System Test.) • Does it fail test (red light turns on)?	Yes	Leakage still exists. Locate leak point and repair. Then go to next step.
		No	Go to next step.
19	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0456 [AJ]

C6U010201086W09

DTC P0456	EVAP control system leak detected (very small leak)
DETECTION CONDITION	• The PCM measures the pump load current (EVAP line pressure) when a certain period has passed after the EVAP system is sealed and after the ignition switch is turned to OFF. If the load does not reach the reference load value or a rate of load increase lower than specified within a certain period, the PCM determines that the EVAP system has a very small leak. **MONITORING CONDITION** — Ignition switch OFF — IAT: **5—45 °C {41—113 °F}** — Battery voltage: **11—14.6 V** — Atmospheric pressure: **72.2 kPa {542 mmHg, 21.3 inHg} or above** — Fuel tank level: **15—85%** **Diagnostic support note** • This is an intermittent monitor (Evaporative). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EVAP pipe damaged • Purge solenoid valve malfunction • EVAP system leak detection pump malfunction • Fuel pump unit poor seal • EVAP hose damaged or loose • Charcoal canister malfunction • Catch tank malfunction • Fuel cap malfunction • Fuel tank malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.

STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF then ON (Engine OFF). • Verify related pending code or stored DTCs. • Is other DTC present?	Yes	Go to appropriate DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Perform evaporative system leak inspection. (See 01–03B–68 Evaporative System Test.) • Does it fail test (red light turns on)?	Yes	Go to next step.
		No	Intermittent concern exists. Inspect purge solenoid valve and EVAP system leak detection pump circuit for intermittent concern. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)
5	**LOCATE LEAK POINT** • Check leakage for the following using ultrasonic leak detector: — Charcoal canister — Catch tank — Fuel filler cap — EVAP hoses and pipes — Fuel tank • Is leakage found?	Yes	Repair leakage or replace part, then go to Step 10.
		No	Go to next step.
6	**INSPECT PURGE SOLENOID VALVE** • Inspect purge solenoid valve. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.) • Is there any malfunction?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 10.
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Connect all disconnected connectors and hoses. • Place clamp on EVAP system leak detection pump hose between EVAP system leak detection pump and air filter. • Perform evaporative system leak inspection. (See 01–03B–68 Evaporative System Test.) • Does it fail test (red light turns on)?	Yes	Go to Step 9.
		No	Go to next step.
8	**CONFIRM EVAP SYSTEM LEAK DETECTION PUMP LEAKAGE** • Remove clamp. • Perform evaporative system leak inspection. (See 01–03B–68 Evaporative System Test.) • Does it fail test (red light turns on)?	Yes	Replace EVAP system leak detection pump, then go to Step 10. (See 01–16–4 EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM COMPONENT REMOVAL/ INSTALLATION.)
		No	Go to next step.
9	**INSPECT FUEL PUMP UNIT INSTALLATION** • Remove fuel tank. (See 01–14–10 FUEL TANK REMOVAL/ INSTALLATION.) • Visually inspect for damage, insufficient sealing or poorly installed pump unit. • Is it okay?	Yes	Go to next step.
		No	Repair or replace fuel tank or sealing, then go to next step.
10	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors and hoses. • Perform evaporative system leak inspection. (See 01–03B–68 Evaporative System Test.) • Is test result failed (red light turns on)?	Yes	Leakage still exists. Locate leak point and repair. Then go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0461 [AJ]

C6U010201086W10

DTC P0461	Fuel gauge sender unit circuit range/performance
DETECTION CONDITION	• The PCM monitors the fuel gauge sender unit input voltage difference before and after the PCM-calculated fuel consumption has reached **24.5 L {25.9 US qt., 21.6 Imp qt.}**. If the fuel gauge sender unit operation reflects **5%** less than the PCM-calculated fuel consumption, the PCM determines that the fuel gauge sender unit range/performance is in error. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction or substandard performance • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FUEL GAUGE SENDER UNIT** • Turn ignition key to OFF. • Inspect fuel gauge sender unit. (See 09–22–14 FUEL GAUGE SENDER UNIT INSPECTION.) • Is fuel gauge sender unit okay?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Repair or replace fuel gauge sender unit, then go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0462 [AJ]

C6U010201086W11

DTC P0462	Fuel gauge sender unit circuit low input
DETECTION CONDITION	• The PCM monitors the fuel level signal and fuel gauge sender unit output voltage from the instrument cluster. If the PCM detects a fuel level or fuel gauge sender unit output voltage that is too low, the PCM determines that the fuel gauge sender unit circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction • Instrument cluster malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT INSTRUMENT CLUSTER** • Perform "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE" procedure. (See 09–22–6 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is there any malfunction?	Yes	Repair or replace suspected malfunction, then go to next step.
		No	Go to next step.
4	**VERIFY TROUBLESHOOTING OF DTC P0462 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start the engine. • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0463 [AJ]

C6U010201086W12

DTC P0463	Fuel gauge sender unit circuit high input
DETECTION CONDITION	• The PCM monitors the fuel level signal and fuel gauge sender unit output voltage from the instrument cluster. If the PCM detects a fuel level or fuel gauge sender unit output voltage that is too high, the PCM determines that the fuel gauge sender unit circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction • Instrument cluster malfunction • PCM malfunction

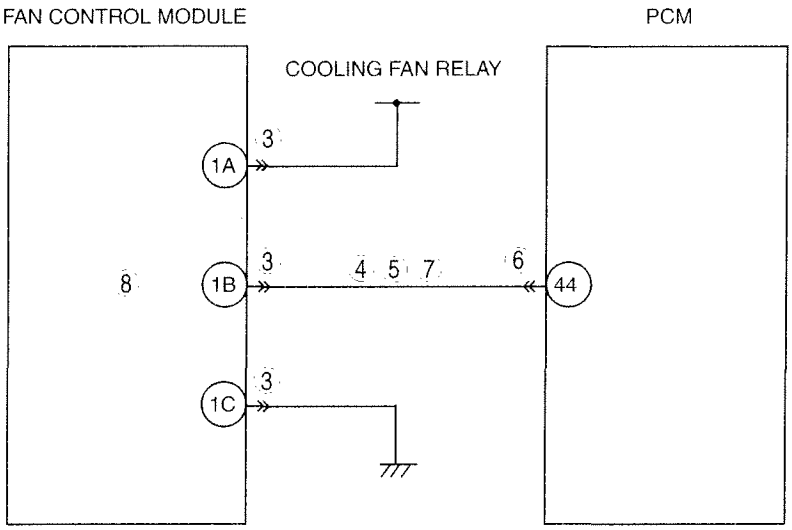
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT INSTRUMENT CLUSTER** • Perform "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE" procedure. (See 09–22–6 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is there any malfunction?	Yes	Repair or replace suspected malfunction, then go to next step.
		No	Go to next step.
4	**VERIFY TROUBLESHOOTING OF DTC P0463 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start the engine. • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

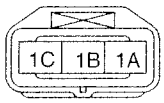
DTC P0480 [AJ]

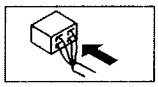
C6U010201086W13

DTC P0480	Fan control circuit malfunction
DETECTION CONDITION	• The PCM monitors the input voltages from the fan control module. If the voltage at PCM terminal 44 remains low or high, the PCM determines that the fan control circuit has a malfunction. **Diagnostic support note** • This is an continuous monitor (other). • MIL does not come on. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Fan control module malfunction • Connector or terminal malfunction • Open circuit between fan control module terminal 1B and PCM terminal 44 • Short to power circuit between fan control module terminal 1B and PCM terminal 44 • Short to GND circuit between fan control module terminal 1B and PCM terminal 44 • PCM malfunction

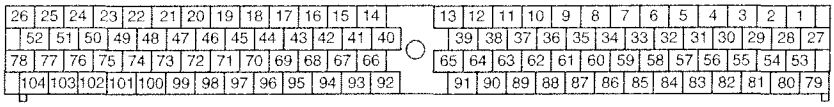


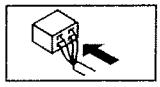
FAN CONTROL MODULE HARNESS SIDE CONNECTOR





PCM HARNESS SIDE CONNECTOR





Diagnostic procedure

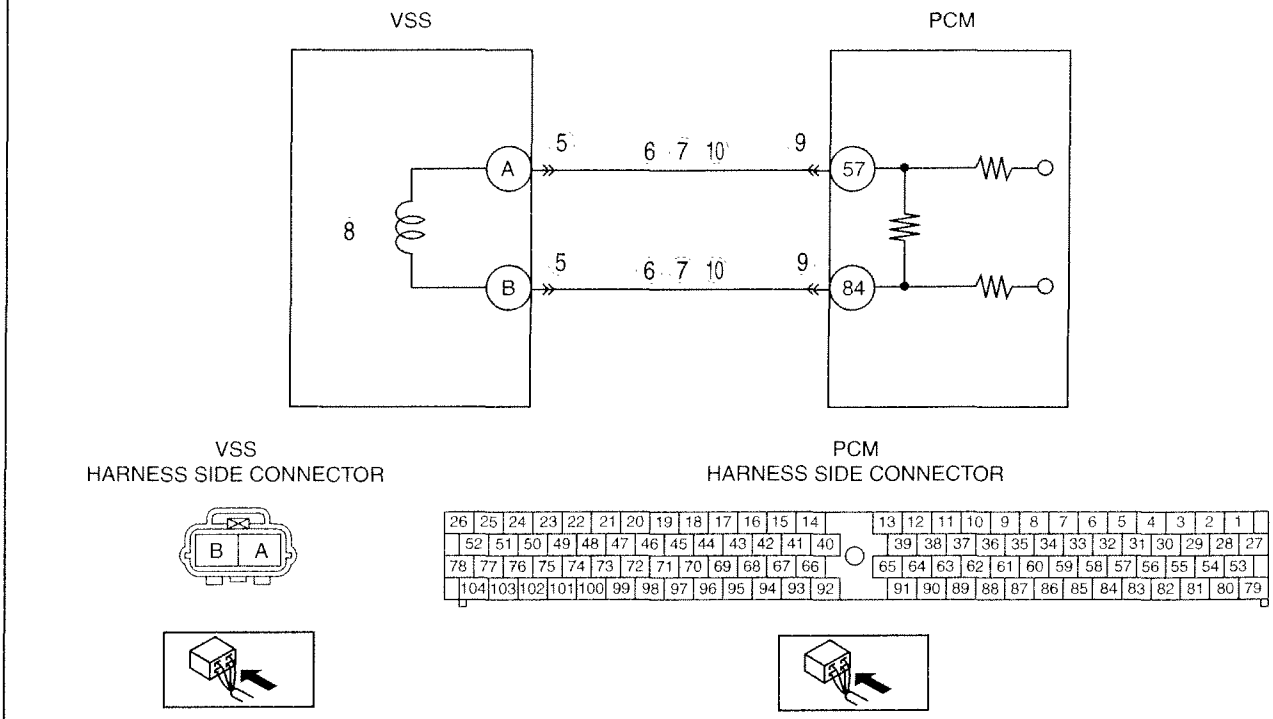
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FAN CONTROL MODULE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect fan control module connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT FAN CONTROL MODULE SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between fan control module connector terminal 1B (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 9.
		No	Go to next step.
5	**INSPECT FAN CONTROL MODULE SIGNAL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between fan control module terminal 1B (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
7	**INSPECT FAN CONTROL MODULE SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between fan control module terminal 1B (harness-side) and PCM terminal 44 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
8	**INSPECT FAN CONTROL MODULE** • Inspect fan control module. (See 01–12–15 FAN CONTROL MODULE INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace fan control module, then go to next step.
		No	Go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0480 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0500 [AJ]

C6U010201087W01

DTC P0500	VSS circuit malfunction
DETECTION CONDITION	• The PCM determines that the vehicle speed sensor circuit has a malfunction when the following conditions are detected: **With ABS/TCS** • The wheel speed signal from the ABS/TCS HU/CM is **3.7 km/h {2.3 mph} or below** when the following conditions are met: — In a shift range other than P, N or R range (ATX). — The neutral switch and clutch switch are OFF (MTX). — The load is **40% or above.** — The engine speed is **2,000 rpm or above**. **MTX without ABS/TCS** • The vehicle speed signal from the vehicle speed sensor is **3.7 km/h {2.3 mph} or below** when the following conditions are met: — The neutral switch and clutch switch are OFF. — The load is **40% or above**. — The engine speed is **2,000 rpm or above**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	**With ABS/TCS** • ABS/TCS HU/CM malfunction • Connector or terminal malfunction • PCM malfunction **MTX without ABS/TCS** • VSS malfunction • Connector or terminal malfunction • Short to GND circuit between VSS terminal A and PCM terminal 57 • Short to GND circuit between VSS terminal B and PCM terminal 84 • Short to power circuit between VSS terminal A and PCM terminal 57 • Short to power circuit between VSS terminal B and PCM terminal 84 • Open circuit between VSS terminal A and PCM terminal 57 • Open circuit between VSS terminal B and PCM terminal 84 • PCM malfunction **ATX without ABS/TCS** • TCM malfunction • Connector or terminal malfunction • PCM malfunction

DTC P0500	VSS circuit malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT** • Connect WDS or equivalent to DLC-2. • Start engine. • Access VSS PID using WDS or equivalent. — Vehicle speed **20 km/h {12.4 mph}: 20km/h {12.4 mph}** — Vehicle speed **40 km/h {24.8 mph}: 40km/h {24.8 mph}** • Are PID readings within specification?	Yes	Intermittent concern exists. Go to "INTERMITTENT CONCERNS TROUBLESHOOTING". (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)
		No	Go to next step.
4	**VERIFY VEHICLE TYPE** • Verify the vehicle type. • Is the vehicle MTX without ABS/TCS?	Yes	Go to next step.
		No	**ATX without ABS/TCS** • Go to applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].) **With ABS/TCS** • Go to applicable DTC inspection. (See 04–02–3 ABS/TCS ON-BOARD DIAGNOSIS.)
5	**INSPECT VSS CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect VSS connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 11.
		No	Go to next step.

STEP	INSPECTION		ACTION
6	**INSPECT VSS CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between the following circuits: — VSS terminal A (harness-side) and body GND — VSS terminal B (harness-side) and body GND • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 11.
		No	Go to next step.
7	**INSPECT VSS CIRCUIT FOR SHORT TO POWER** • Turn ignition key to OFF. • Disconnect VSS connector. • Measure voltage between the following circuits: — VSS terminal A (harness-side) and body GND — VSS terminal B (harness-side) and body GND • Is voltage reading?	Yes	Repair or replace harness for short to power, then go to Step 11.
		No	Go to next step.
8	**INSPECT VSS** • Inspect VSS. (See 05–15B–4 VEHICLE SPEEDOMETER SENSOR INSPECTION (WITHOUT ABS) [A65M-R].) • Is there any malfunction?	Yes	Replace VSS, then go to Step 11. (See 05–15B–4 VEHICLE SPEEDOMETER SENSOR REMOVAL/INSTALLATION (WITHOUT ABS) [A65M-R].)
		No	Go to next step.
9	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 11.
		No	Go to next step.
10	**INSPECT VSS CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between the following harnesses: — VSS terminal A (harness-side) and PCM terminal 57 (harness-side) — VSS terminal B (harness-side) and PCM terminal 84 (harness-side) • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0500 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Warm-up engine. • Access RPM and LOAD PID using WDS or equivalent. • Drive vehicle under following conditions for **18 s**. — Engine speed: **2,000 rpm or above** — Gear: Gear is in other than NEUTRAL — Load: **40% or above** • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0505 [AJ]

C6U010201087W02

DTC P0505	Idle control system malfunction
DETECTION CONDITION	• The PCM cannot control idle speed at the target idle speed during the self test.
POSSIBLE CAUSE	• Electronic throttle control system malfunction • Air cleaner element clogged • Air intake passage clogged • A/C relay control circuit malfunction • Generator control circuit malfunction • Low engine compression (Over capacity of blow-by gas) • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair Information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**VERIFY RELATED PENDING OR STORED DTCs** • Turn ignition switch to OFF, then ON. (Engine OFF) • Verify pending code or stored DTCs using WDS or equivalent. • Does DTC P0506, P0507, P2100, P2101, P2105, P2107, P2110, P2111, P2112 or P2119 present?	Yes	Perform applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
3	**INSPECT ELECTRONIC THROTTLE CONTROL SYSTEM OPERATION** • Perform electronic throttle control system operation inspection. (See 01–03B–63 Electronic Throttle Control Inspection.) • Does electronic throttle control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to electronic throttle control system operation inspection results, then go to Step 9.
4	**INSPECT A/C MAGNETIC CLUTCH OPERATION** **Note** • The following test should be performed for A/C.go to next step for vehicles without A/C • Turn blower motor switch to off. • Is magnetic clutch still on?	Yes	Go to "A/C ALWAYS ON / A/C COMPRESSOR RUNS CONTINUOUSLY" of ENGINE SYMPTOM TROUBLESHOOTING, then go to step 9. (See 01–03B–52 NO.24 A/C ALWAYS ON/A/C COMPRESSOR RUNS CONTINUOUSLY [AJ].)
		No	Go to next step.
5	**INSPECT GENERATOR CONTROL CIRCUIT MALFUNCTION** • Apply electrical load at idle. • Is engine speed increased?	Yes	Go to next step.
		No	Repair short to power circuit in generator control circuit, then go to Step 9.
6	**INSPECT AIR CLEANER ELEMENT** • remove air cleaner element with engine running. • Is engine speed increased?	Yes	Clean or replace air cleaner element, then go to Step 9.
		No	Go to next step.
7	**INSPECT THROTTLE BODY PASSAGE** • Is throttle body clogged?	Yes	Clean or replace throttle body passage, then go to Step 9.
		No	Go to next step.
8	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10B–7 COMPRESSION INSPECTION [AJ].) • Is engine compression okay?	Yes	Go to next step.
		No	Overhaul engine, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0505 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC using WDS or equivalent. • Perform KOER self-test. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.

STEP	INSPECTION		ACTION
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0506 [AJ]

C6U010201087W03

DTC P0506	Idle control system RPM lower than expected
DETECTION CONDITION	• The actual idle speed is lower than expected by **100 rpm** for **14 s** when the brake pedal is depressed (brake switch is ON) and the steering wheel is held straight ahead (power steering pressure switch is OFF). **Note** • If the atmospheric pressure is **72.2 kPa {542 mmHg, 21.3 inHg} or below**, or the intake air temperature is **–10 °C {14 °F} or below**, the PCM cancels diagnosis of P0506. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Electronic throttle control system malfunction • Air cleaner element clogged • Air intake passage clogged • A/C relay control circuit malfunction • Generator malfunction • Purge solenoid valve malfunction • Low engine compression (Over capacity of blow-by gas) • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING OR STORED DTCs** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending code or stored DTCs using WDS or equivalent. • Is other DTC present?	Yes	Repair applicable DTCs. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**INSPECT A/C MAGNET CLUTCH OPERATION** • Turn blower motor switch off. • Is magnet clutch still on?	Yes	Refer to "A/C is always on or A/C compressor runs continuously." of ENGINE SYMPTOM TROUBLESHOOTING, then go to Step 9. (See 01–03B–52 NO.24 A/C ALWAYS ON/A/C COMPRESSOR RUNS CONTINUOUSLY [AJ].)
		No	Go to next step.
5	**INSPECT PURGE SOLENOID VALVE** • Inspect purge solenoid valve. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.) • Is there any malfunction?	Yes	Replace purge solenoid valve, then go to Step 9.
		No	Go to next step.
6	**INSPECT AIR CLEANER ELEMENT** • Remove air cleaner element with engine running. • Is engine speed increased?	Yes	Replace air cleaner element, then go to Step 9.
		No	Go to next step.

STEP	INSPECTION		ACTION
7	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10B–7 COMPRESSION INSPECTION [AJ].) • Is engine compression okay?	Yes	Go to next step.
		No	Overhaul engine, then go to Step 9.
8	**INSPECT GENERATOR** • Inspect generator. (See 01–17–5 GENERATOR INSPECTION.) • Is there any malfunction?	Yes	Replace generator, then go to next step. (See 01–17–3 GENERATOR REMOVAL/INSTALLATION.)
		No	Go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0506 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Depress brake pedal for **14 s or more**. • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0507 [AJ]

C6U0102001087W04

DTC P0507	Idle control system RPM higher than expected
DETECTION CONDITION	• The actual idle speed is higher than expected by **200 rpm** for **14 s** when the brake pedal is depressed (brake switch is ON) and the steering wheel is held straight ahead (power steering pressure switch is OFF). **Note** • If the atmospheric pressure is **72.2 kPa {542 mmHg, 21.3 inHg} or below,** or the intake air temperature is **–10 °C {14 °F} or below**, the PCM cancels diagnosis of P0507. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Electronic throttle control system malfunction • Vacuum hose misconnection • PCM malfunction

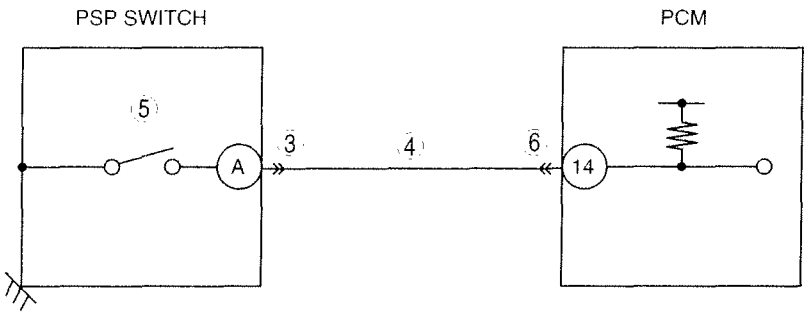
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING OR STORED DTCs** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending code or stored DTCs using WDS or equivalent. • Is other DTC present?	Yes	Repair applicable DTCs. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**INSPECT VACUUM HOSE CONNECTION** • Are vacuum hoses connecting accurately? (See 01–13B–3 VACUUM HOSE ROUTING DIAGRAM [AJ].)	Yes	Go to next step.
		No	Reconnect vacuum hose accurately, then go to next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0507 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Depress brake pedal for **14 s or more**. • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

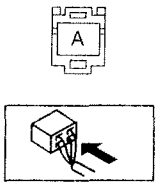
DTC P0550 [AJ]

C6U010201087W05

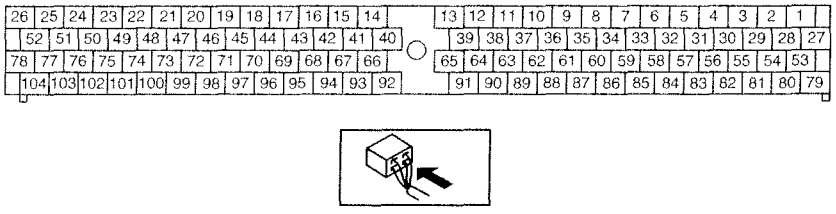
DTC P0550	PSP switch circuit malfunction
DETECTION CONDITION	• The PCM monitors the PSP switch signal at PCM terminal 14. If the input voltage is low (switch stays on) for **1 min** when the VSS is **60.0 km/h {37.2 mph} or above** and the ECT is **60 °C {140 °F} or above**, the PCM determines that the PSP switch circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• PSP switch malfunction • Connector or terminal malfunction • Short to GND circuit between PSP switch terminal A and PCM terminal 14 • PCM malfunction



PSP SWITCH
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR



Diagnostic procedure

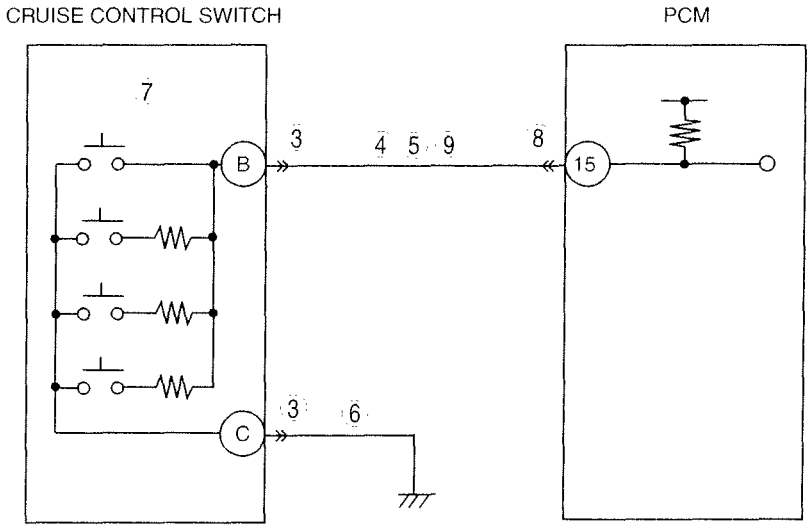
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT PSP SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PSP switch connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**INSPECT PSP SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between PSP switch terminal A (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 7.
		No	Go to next step.

STEP	INSPECTION		ACTION
5	**INSPECT PSP SWITCH** • Inspect PSP switch. (See 01–40B–25 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace PSP switch, then go to Step 7. (See 06–12–29 POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY [AJ].)
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0550 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Drive vehicle **60.0 km/h {37.2 mph} or above** for **1 min**. • Verify that ECT PID **60 °C {140 °F} or above** using WDS or equivalent. • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

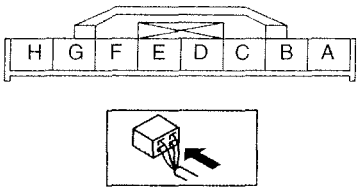
DTC P0564 [AJ]

C6U010201087W06

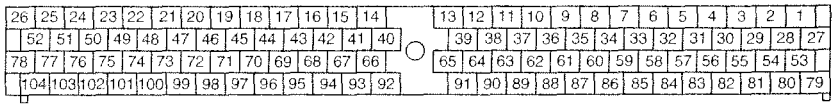
DTC P0564	Cruise control switch circuit malfunction
DETECTION CONDITION	• The PCM monitors the cruise control switch signal at PCM terminal 15. If the PCM detects that any one of following switches (Main, CANCEL, SET/COAST, RESUME/ACCEL) remains on for **2 min**, the PCM determines that the cruise control switch circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not comes on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Cruise control switch malfunction • Connector or terminal malfunction • Short to power circuit between cruise control switch terminal B and PCM terminal 15 • Short to GND circuit between cruise control switch terminal B and PCM terminal 15 • Open circuit between cruise control switch terminal C and body GND • Open circuit between cruise control switch terminal B and PCM terminal 15 • PCM malfunction



CRUISE CONTROL SWITCH HARNESS SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR



Diagnostic procedure

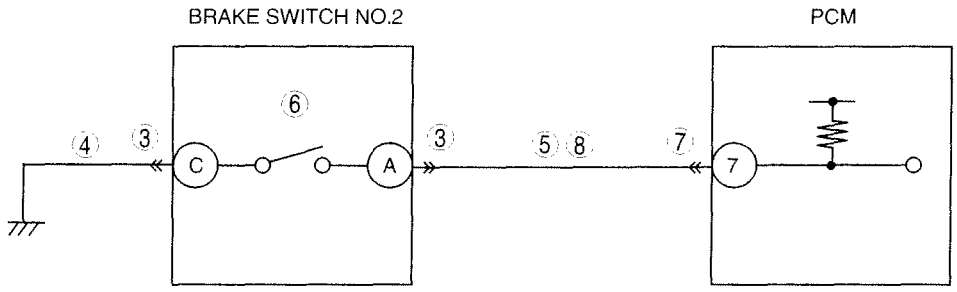
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.

STEP	INSPECTION		ACTION
3	**INSPECT CRUISE CONTROL SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect cruise control switch connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
4	**INSPECT CRUISE CONTROL SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between cruise control switch terminal B (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 10.
		No	Go to next step.
5	**INSPECT CRUISE CONTROL SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between cruise control switch terminal B (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 10.
		No	Go to next step.
6	**INSPECT CRUISE CONTROL SWITCH GND CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between cruise control switch terminal C (harness-side) and body GND. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 10.
7	**INSPECT CRUISE CONTROL SWITCH** • Inspect cruise control switch. (See 01–20–1 CRUISE CONTROL SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace cruise control switch, then go to Step 10.
		No	Go to next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
9	**INSPECT CRUISE CONTROL SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between cruise control switch terminal B (harness-side) and PCM terminal 15 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
10	**VERIFY TROUBLESHOOTING OF P0564 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Drive vehicle with cruise control **2 min or more**. • Is same DTC present?	Yes	Replace PCM go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

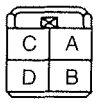
DTC P0571 [AJ]

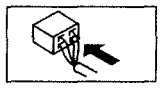
C6U010201087W07

DTC P0571	Brake switch circuit malfunction
DETECTION CONDITION	• The PCM monitors changes the input voltage for brake switch No.1 and No.2. If the PCM detects that both brake switches No.1 and No.2 remain on or off for **15 s**, the PCM determines that the brake switch circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not comes on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Brake switch malfunction • Connector or terminal malfunction • Open circuit between brake switch terminal C and body GND • Short to GND circuit between brake switch terminal A and PCM terminal 7 • Open circuit between brake switch terminal A and PCM terminal 7 • PCM malfunction

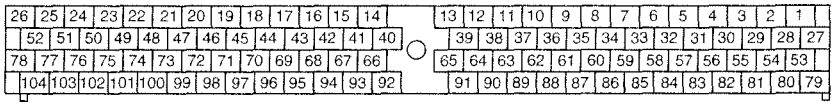


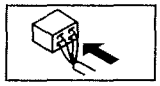
BRAKE SWITCH
HARNESS SIDE CONNECTOR





PCM
HARNESS SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect brake switch connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT BRAKE SWITCH NO.2 GND CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Check continuity between brake switch terminal C (harness-side) and body GND. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.

STEP	INSPECTION		ACTION
5	**INSPECT BRAKE SWITCH NO.2 SIGNAL CIRCUIT FOR SHORT TO GND** • Turn ignition key to ON (Engine OFF). • Check continuity between brake switch terminal A (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
6	**INSPECT BRAKE SWITCH NO.2** • Inspect brake switch No.2. (See 04–11–7 BRAKE SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace brake switch, then go to Step 9. (See 04–11–6 BRAKE PEDAL REMOVAL/INSTALLATION.)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**INSPECT BRAKE SWITCH NO.2 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between brake switch terminal A (harness-side) and PCM terminal 7 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF P0571 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to ON (Engine OFF). • Depress and release brake pedal **5 times or more**. • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0602 [AJ]

C6U010201088W01

DTC P0602	PCM programming error
DETECTION CONDITION	• No configuration data in PCM. **Note** • If the PCM is replaced with a new one, the PCM stores DTC P0602 and illuminates the MIL even though no malfunction is detected. After completing the "PCM CONFIGURATION" procedure, clear DTC P0602 using the WDS or equivalent. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Complete configuration has not been completed • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Perform PCM configuration procedure, then go to next step. (See 01–40B–23 PCM REPLACEMENT [AJ].)
3	**VERIFY TROUBLESHOOTING OF DTC P0602 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm up it completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0606 [AJ]

C6U010201088W02

DTC P0606	ECM/PCM processor
DETECTION CONDITION	• PCM internal ROM/RAM malfunction. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not come on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• PCM internal ROM/RAM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY TROUBLESHOOTING OF P0606 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF, then ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P0610 [AJ]

C6U010201088W03

DTC P0610	Control module vehicle options error
DETECTION CONDITION	• PCM data configuration error **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Configuration procedure has not been completed • PCM malfunction

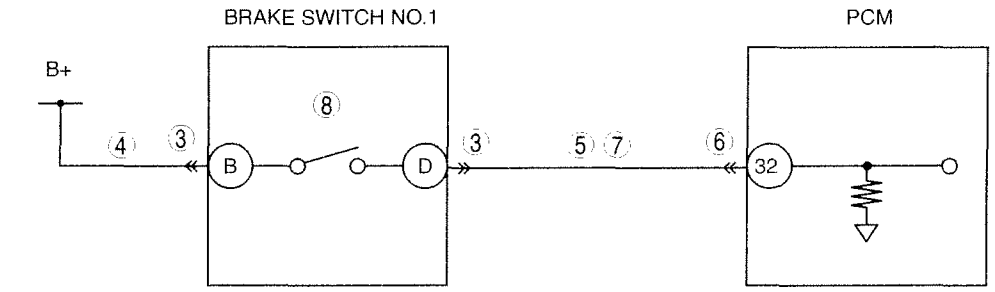
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Perform PCM configuration procedure, then go to next step. (See 01–40B–23 PCM REPLACEMENT [AJ].)
3	**VERIFY TROUBLESHOOTING OF DTC P0610 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm up it completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

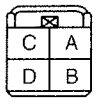
DTC P0703 [AJ]

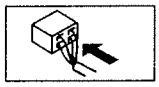
C6U010201089W01

DTC P0703	Brake switch No.1 input malfunction
DETECTION CONDITION	• The PCM monitors changes in input voltage from brake switch No.1. If the PCM does not detect voltage changes at PCM terminal 32 when alternately accelerated and decelerated **8 times**, the PCM determines that brake switch No.1 circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Brake switch malfunction • Connector or terminal malfunction • Open circuit between battery positive terminal and brake switch terminal B • Short to power circuit between brake switch terminal D and PCM terminal 32 • Open circuit between brake switch terminal D and PCM terminal 32 • PCM malfunction

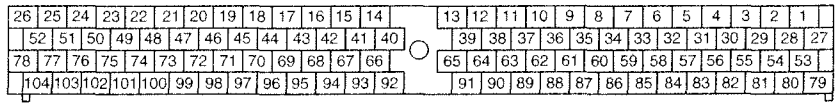


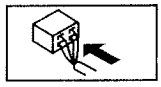
BRAKE SWITCH
HARNESS SIDE CONNECTOR





PCM
HARNESS SIDE CONNECTOR





Diagnostic procedure

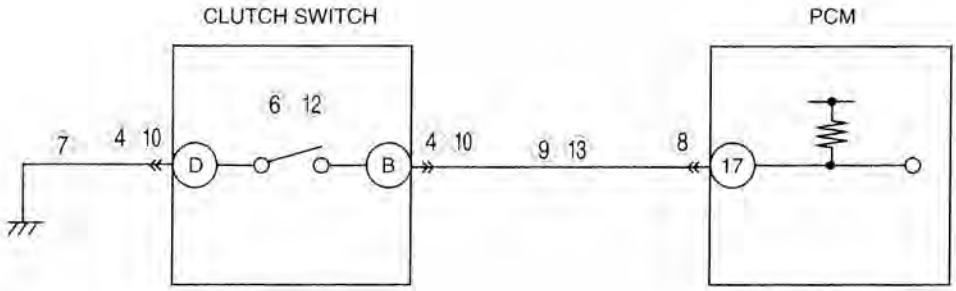
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT BRAKE SWITCH CONNECTOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect brake switch connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT BRAKE SWITCH NO.1 POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between brake switch terminal B (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.

STEP	INSPECTION		ACTION
5	**INSPECT BRAKE SWITCH NO.1 SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between brake switch terminal D (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 9.
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
7	**INSPECT BRAKE SWITCH NO.1 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between brake switch terminal D (harness-side) and PCM terminal 32 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
8	**INSPECT BRAKE SWITCH NO.1** • Inspect brake switch No.1. (See 04–11–7 BRAKE SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace brake switch, then go to next step. (See 04–11–6 BRAKE PEDAL REMOVAL/INSTALLATION.)
		No	Go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0703 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle **30 km/h {18.6 mph} or more**. • Depress and release brake pedal **8 times or more** when driving vehicle. • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

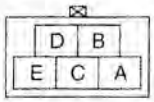
DTC P0704 [AJ]

C6U010201089W02

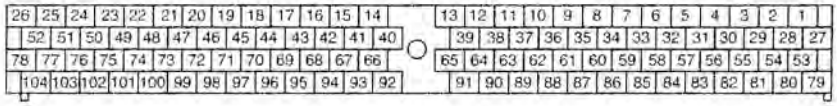
DTC P0704	Clutch switch input malfunction
DETECTION CONDITION	• The PCM monitors changes in input voltage from the clutch switch. If the PCM does not detect voltage changes at PCM terminal 17 when the vehicle run and stop **8 times** alternately, the PCM determines that the clutch switch circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Clutch switch malfunction • Connector or terminal malfunction • Open circuit between clutch switch terminal D and GND • Open circuit between clutch switch terminal B and PCM terminal 17 • Short to GND circuit between clutch switch terminal B and PCM terminal 17 • PCM malfunction



CLUTCH SWITCH HARNESS SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY HIGH INPUT OR LOW INPUT** • Connect WDS or equivalent to DLC-2. • Access CPP PID. • Verify CPP PID during clutch pedal operation. • Is CPP PID always OFF?.	Yes	Go to next step.
		No	Go to Step 10.
4	**INSPECT CLUTCH SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect clutch switch connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.

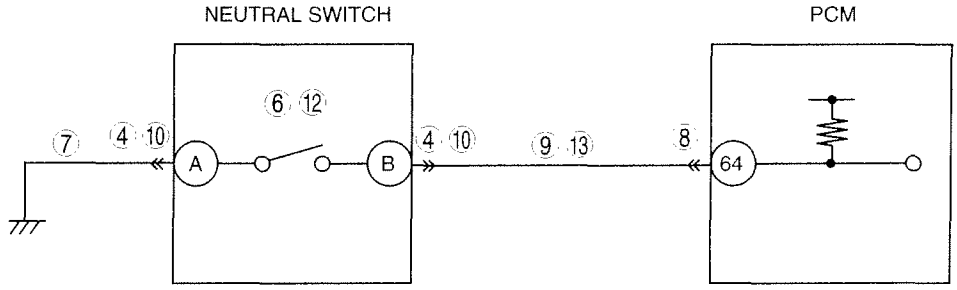
STEP	INSPECTION		ACTION
5	**CLASSIFY CLUTCH SWITCH OR CIRCUIT** • Connect WDS or equivalent to DLC-2. • Access CPP PID. • Connect a jumper wire between clutch switch terminals B and D. • Is CPP PID on?	Yes	Go to next step.
		No	Go to Step 7.
6	**INSPECT CLUTCH SWITCH** • Inspect clutch switch. (See 01–40B–23 CLUTCH SWITCH INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace clutch switch, then go to Step 14. (See 05–10–6 CLUTCH PEDAL REMOVAL/ INSTALLATION.)
		No	Go to Step 14.
7	**INSPECT CLUTCH SWITCH GND CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between clutch switch terminal D (harness-side) and body GND. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 14.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
9	**INSPECT CLUTCH SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between clutch switch terminal B (harness-side) and PCM terminal 17 (harness-side). • Is there continuity?	Yes	Go to Step 14.
		No	Repair or replace harness for open circuit, then go to Step 14.
10	**INSPECT CLUTCH SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect clutch switch connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
11	**CLASSIFY CLUTCH SWITCH OR CIRCUIT** • Connect WDS or equivalent to DLC-2. • Access CPP PID. • Verify that CPP PID changes from ON to OFF when clutch switch connector is disconnected. • Does CPP PID change from ON to OFF?	Yes	Go to next step.
		No	Go to Step 13.
12	**INSPECT CLUTCH SWITCH** • Inspect clutch switch. (See 01–40B–23 CLUTCH SWITCH INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace clutch switch, then go to Step 14. (See 05–10–6 CLUTCH PEDAL REMOVAL/ INSTALLATION.)
		No	Go to Step 14.
13	**INSPECT CLUTCH SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between clutch switch terminal B (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to next step.
		No	Go to next step.
14	**VERIFY TROUBLESHOOTING OF DTC P0704 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Operate clutch pedal when the vehicle run and stop **8 times** alternately. • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.

STEP	INSPECTION		ACTION
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

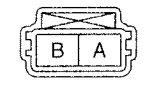
DTC P0850 [AJ]

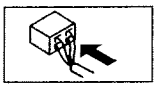
C6U010201089W03

DTC P0850	Neutral switch input malfunction
DETECTION CONDITION	• The PCM monitors changes in input voltage from the neutral switch. If the PCM does not detect voltage changes at PCM terminal 64 voltage when running the vehicle at a vehicle speed of **30 km/h {18.6 mph} or above** and depressing and releasing the clutch pedal **10 times** repeatedly, the PCM determines that the neutral switch circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Neutral switch malfunction • Connector or terminal malfunction • Open circuit between neutral switch terminal A and GND • Open circuit between neutral switch terminal B and PCM terminal 64 • Short to GND circuit between neutral switch terminal B and PCM terminal 64 • PCM malfunction

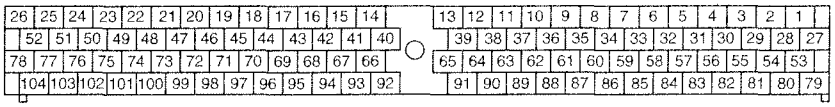


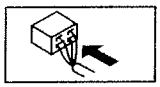
NEUTRAL SWITCH HARNESS SIDE CONNECTOR





PCM HARNESS SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.

STEP	INSPECTION		ACTION
3	**CLASSIFY HIGH INPUT OR LOW INPUT** • Connect WDS or equivalent to DLC-2. • Access CPP/PNP PID. • Verify CPP/PNP PID when gear in neutral position. • Is CPP/PNP PID always OFF?.	Yes	Go to next step.
		No	Go to Step 10.
4	**INSPECT NEUTRAL SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect neutral switch connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
5	**CLASSIFY NEUTRAL SWITCH OR CIRCUIT** • Connect WDS or equivalent to DLC-2. • Access CPP/PNP PID. • Connect a jumper wire between neutral switch terminals A and B. • Is CPP/PNP PID on?	Yes	Go to next step.
		No	Go to Step 7.
6	**INSPECT NEUTRAL SWITCH** • Inspect neutral switch. (See 01–40B–24 NEUTRAL SWITCH INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace neutral switch, then go to Step 14. (See 05–15B–4 NEUTRAL SWITCH REMOVAL/ INSTALLATION [A65M-R].)
		No	Go to Step 14.
7	**INSPECT NEUTRAL SWITCH GND CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between neutral switch terminal A (harness-side) and body GND. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 14.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
9	**INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between neutral switch terminal B (harness-side) and PCM terminal 64 (harness-side). • Is there continuity?	Yes	Go to Step 14.
		No	Repair or replace harness for open circuit, then go to Step 14.
10	**INSPECT NEUTRAL SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect neutral switch connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
11	**CLASSIFY NEUTRAL SWITCH OR CIRCUIT** • Connect WDS or equivalent to DLC-2. • Access CPP/PNP PID. • Verify that CPP/PNP PID changes from ON to OFF when neutral switch connector is disconnected. • Does CPP/PNP PID change from ON to OFF?	Yes	Go to next step.
		No	Go to Step 13.
12	**INSPECT NEUTRAL SWITCH** • Inspect neutral switch. (See 01–40B–24 NEUTRAL SWITCH INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace neutral switch, then go to Step 14. (See 05–15B–4 NEUTRAL SWITCH REMOVAL/ INSTALLATION [A65M-R].)
		No	Go to Step 14.

STEP	INSPECTION		ACTION
13	**INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between neutral switch terminal B (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to next step.
		No	Go to next step.
14	**VERIFY TROUBLESHOOTING OF DTC P0850 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Operate clutch pedal when driving vehicle **30 km/h {18.6 mph} or below 10 times** alternately. • Is PENDING CODE same as DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P1309 [AJ]

C6U010201083W01

DTC P1309	PCM IC for misfire detection
DETECTION CONDITION	• When the IC, which detects misfire, sends an extraordinary signal to the PCM, the PCM determines that the IC has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• IC which is detecting misfire malfunction

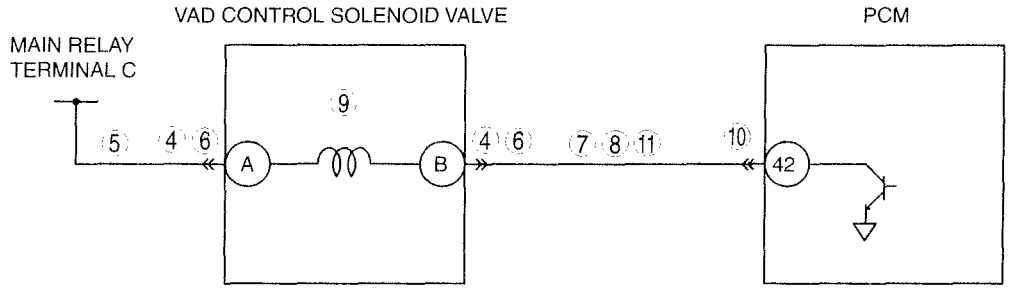
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service bulletins and/or on-line repair information availability. • Is any repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY DTC P1309 DETECTED AGAIN** • Clear DTC from memory using WDS or equivalent. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

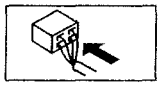
DTC P1410 [AJ]

C6U010201083W02

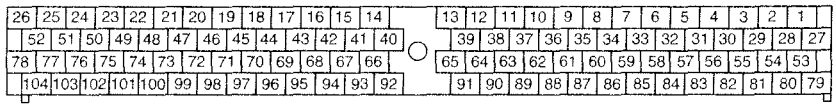
DTC P1410	VAD control system circuit malfunction
DETECTION CONDITION	• The PCM monitors the VAD solenoid control signal at PCM terminal 42. If the PCM detects that the VAD solenoid control signal does not change when the VAD solenoid valve is switched to ON or OFF, the PCM determines that the VAD solenoid control circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not comes on. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• VAD control solenoid valve malfunction • Connector or terminal malfunction • Open circuit between main relay terminal C and VAD control solenoid valve terminal A • Short to power circuit between VAD control solenoid valve terminal B and PCM terminal 42 • Short to GND circuit between VAD control solenoid valve terminal B and PCM terminal 42 • Open circuit between VAD control solenoid valve terminal B and PCM terminal 42 • PCM malfunction

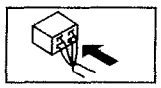


VAD CONTROL SOLENOID VALVE HARNESS SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**CLASSIFY POWER CIRCUIT OR CONTROL CIRCUIT MALFUNCTION** • Is the same DTC present or P0102, P0103 and P0403?	Yes	Repair power circuit, then go to next step.
		No	Repair VAD control solenoid valve or control circuit, then go to Step 6.
4	**INSPECT VAD CONTROL SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect VAD control solenoid valve connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 12.
		No	Go to next step.

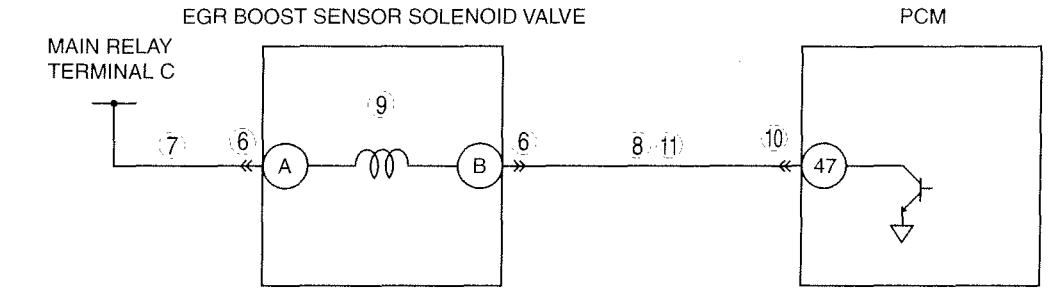
STEP	INSPECTION		ACTION
5	**INSPECT VAD CONTROL SOLENOID VALVE POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition switch to ON (Engine OFF). • Measure voltage between VAD control solenoid valve terminal A (harness-side) and body GND. • Is voltage **B+**?	Yes	Inspect VAD solenoid valve. (See 01–13B–7 VARIABLE AIR DUCT (VAD) CONTROL SOLENOID VALVE INSPECTION [AJ].) • If there is a malfunction, replace VAD solenoid valve, then go to Step 12 • If there is no malfunction, go to Step 13
		No	Repair or replace harness for open circuit, then go to Step 12.
6	**INSPECT VAD CONTROL SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect VAD control solenoid valve connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 12.
		No	Go to next step.
7	**INSPECT VAD CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (Engine OFF). • Measure voltage between VAD control solenoid valve terminal B (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 12.
		No	Go to next step.
8	**INSPECT VAD CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between VAD control solenoid valve terminal B (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 12.
		No	Go to next step.
9	**INSPECT VAD CONTROL SOLENOID VALVE** • Inspect VAD control solenoid valve. (See 01–13B–7 VARIABLE AIR DUCT (VAD) CONTROL SOLENOID VALVE INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace VAD control solenoid valve, then go to Step 12.
		No	Go to next step.
10	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 12.
		No	Go to next step.
11	**INSPECT VAD CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between fan control module terminal B (harness-side) and PCM terminal 42 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
12	**VERIFY TROUBLESHOOTING OF DTC P1410 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Access RPM, ECT and TP_REL PIDs. • Start engine and warm it up until the ECT PID is above **70 °C {158 °F} or over**. • Race engine a few times as follows: — RPM PID **above 5,800 rpm** — TP_REL PID **above 50%** • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.

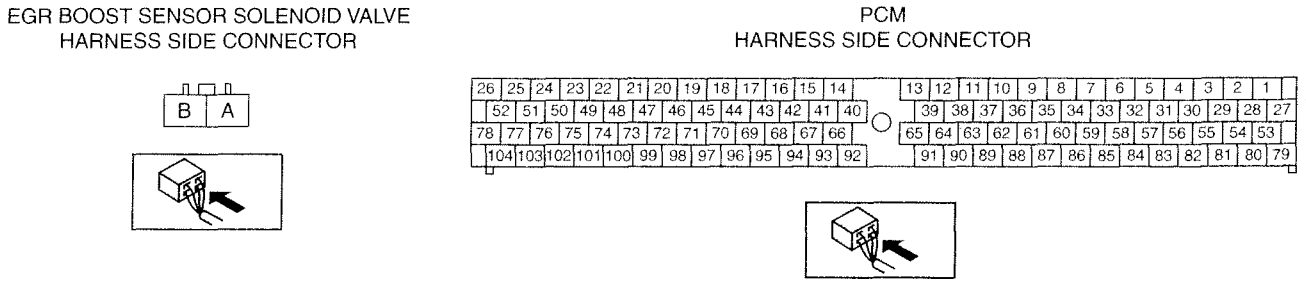
STEP	INSPECTION		ACTION
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P1487 [AJ]

C6U010201083W03

DTC P1487	EGR boost sensor solenoid valve circuit malfunction
DETECTION CONDITION	• The PCM monitors the EGR boost sensor solenoid valve control signal. If the PCM terminal 47 voltage does not change when the EGR boost sensor solenoid valve is switched to ON or OFF, the PCM determines that the EGR boost sensor solenoid valve circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• EGR boost sensor solenoid valve malfunction • Connector or terminal malfunction • Short to GND circuit between EGR boost sensor solenoid valve terminal B and PCM terminal 47 • Open circuit between main relay terminal C and EGR boost sensor solenoid valve terminal A • Short to power circuit between EGR boost sensor solenoid valve terminal B and PCM terminal 47 • Open circuit between EGR boost sensor solenoid valve terminal B and PCM terminal 47 • PCM malfunction





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service bulletins and/or on-line repair information availability. • Is any repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.

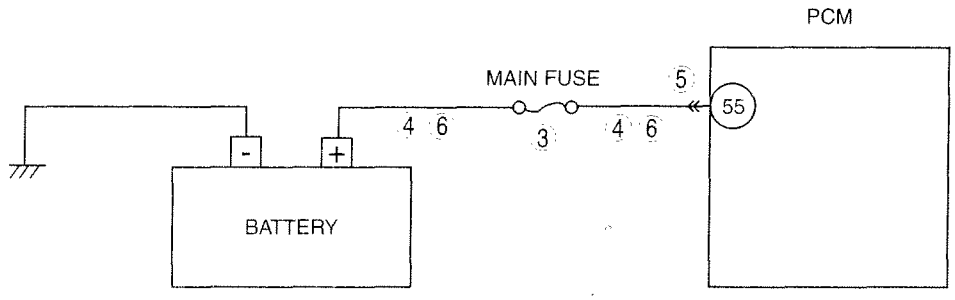
STEP	INSPECTION		ACTION
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF. • Clear DTC from memory using WDS or equivalent. • Turn ignition key to OFF, then ON (Engine OFF). • Is PENDING CODE for this DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to "INTERMITTENT CONCERNS TROUBLESHOOTING". (See 01-03B-4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)
4	**CLASSIFY OPEN CIRCUIT OR SHORT TO GND MALFUNCTION** • Disconnect EGR boost sensor solenoid valve tube that is connected to intake manifold. • Connect vacuum pump to EGR boost sensor solenoid valve. • Pump vacuum pump several times. • Wait **a few seconds**. • Is vacuum maintained?	Yes	Go to Step 6.
		No	Go to next step.
5	**INSPECT PASSAGE CONTROL OF EGR BOOST SENSOR SOLENOID VALVE** • Turn ignition key to OFF. • Disconnect EGR boost sensor solenoid valve connector. • Pump vacuum pump several times and stop, then wait **a few seconds**. • Is vacuum maintained?	Yes	Repair or replace the following harness for short to GND, then go to Step 12. — EGR boost sensor solenoid valve terminal B to PCM terminal 47
		No	Replace EGR boost sensor solenoid valve, then go to Step 12.
6	**INSPECT EGR BOOST SENSOR SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect EGR boost sensor solenoid valve connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 12.
		No	Go to next step.
7	**INSPECT EGR BOOST SENSOR SOLENOID VALVE POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Measure voltage between EGR boost sensor solenoid valve terminal A (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 12.
8	**INSPECT EGR BOOST SENSOR SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to OFF. • Measure voltage between EGR boost sensor solenoid valve terminal B (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 12.
		No	Go to next step.
9	**INSPECT EGR BOOST SENSOR SOLENOID VALVE** • Inspect EGR boost sensor solenoid valve. (See 01-16-22 EGR BOOST SENSOR SOLENOID VALVE INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace EGR boost sensor solenoid valve, then go to Step 12.
		No	Go to next step.
10	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 12.
		No	Go to next step.

STEP	INSPECTION		ACTION
11	**INSPECT EGR BOOST SENSOR SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between EGR boost sensor solenoid valve terminal B (harness-side) and PCM terminal 47 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
12	**VERIFY TROUBLESHOOTING OF DTC P1487 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Turn ignition key to OFF, then ON (Engine OFF). • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

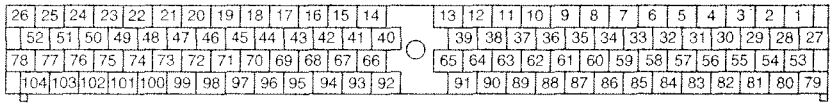
DTC P1562 [AJ]

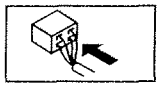
C6U010201083W04

DTC P1562	PCM +BB voltage low
DETECTION CONDITION	• The PCM monitors the voltage of the back-up battery positive terminal at PCM terminal 55. If the PCM detects battery positive terminal voltage of **2.5 V or below** for **2 s**, the PCM determines that the backup voltage circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Meltdown MAIN fuse • Connector or terminal malfunction • Short to GND circuit between battery positive terminal and PCM terminal 55 • Open circuit between battery positive terminal and PCM terminal 55 • PCM malfunction



PCM
HARNESS SIDE CONNECTOR





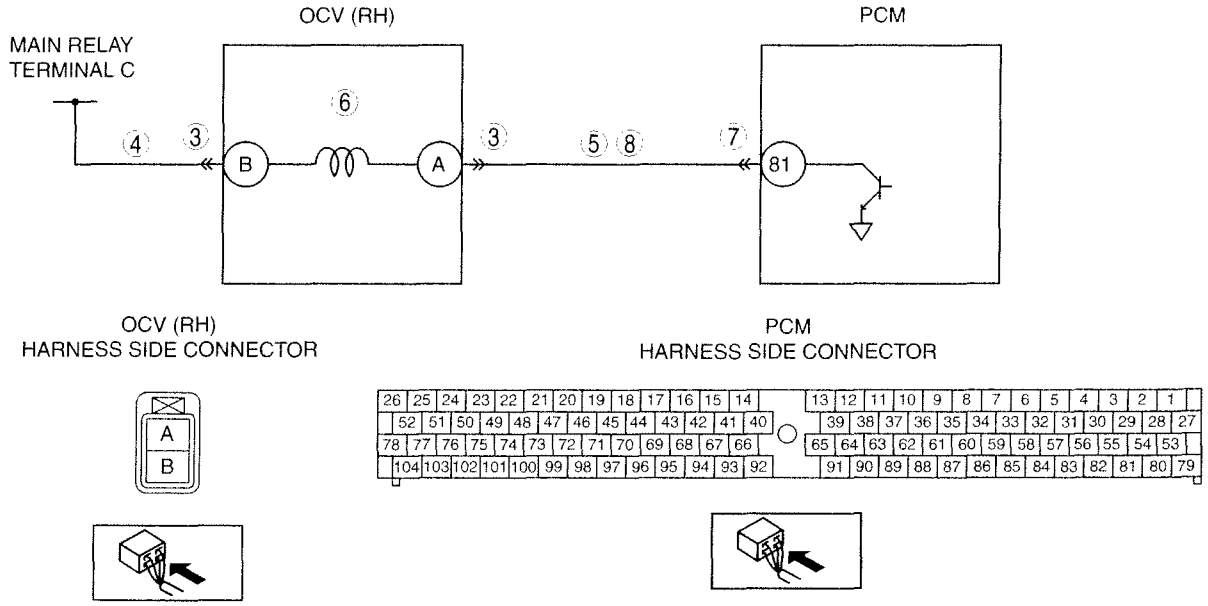
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service bulletins and/or on-line repair information availability. • Is any repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT MAIN FUSE** • Turn ignition key to OFF. • Inspect MAIN fuse for failure and proper. • Is it okay?	Yes	Go to step 5.
		No	• If MAIN fuse has melted, go to next step. • If MAIN fuse is not installed correctly, install it correctly then go to Step 7.
4	**INSPECT MONITOR CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Disconnect battery cables. • Check continuity between MAIN fuse terminals (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND and install new fuse, then go to Step 7.
		No	Go to step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
6	**INSPECT MONITOR CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Disconnect battery cables. • Disconnect PCM connector. • Check continuity between battery positive terminal (harness-side) and PCM terminal 55 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P1562 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2088 [AJ]

C6U010201083W05

DTC P2088	CMP actuator (RH) circuit low
DETECTION CONDITION	• The PCM monitors the OCV (RH) voltage. If PCM detects that the OCV control voltage (calculated from OCV) is below the threshold voltage (calculated from battery positive voltage), the PCM determines that the OCV circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• OCV (RH) malfunction • Connector or terminal malfunction • Open circuit between main relay terminal C and OCV (RH) terminal B • Short to GND circuit between OCV (RH) terminal A and PCM terminal 81 • Open circuit between OCV (RH) terminal A and PCM terminal 81 • PCM malfunction



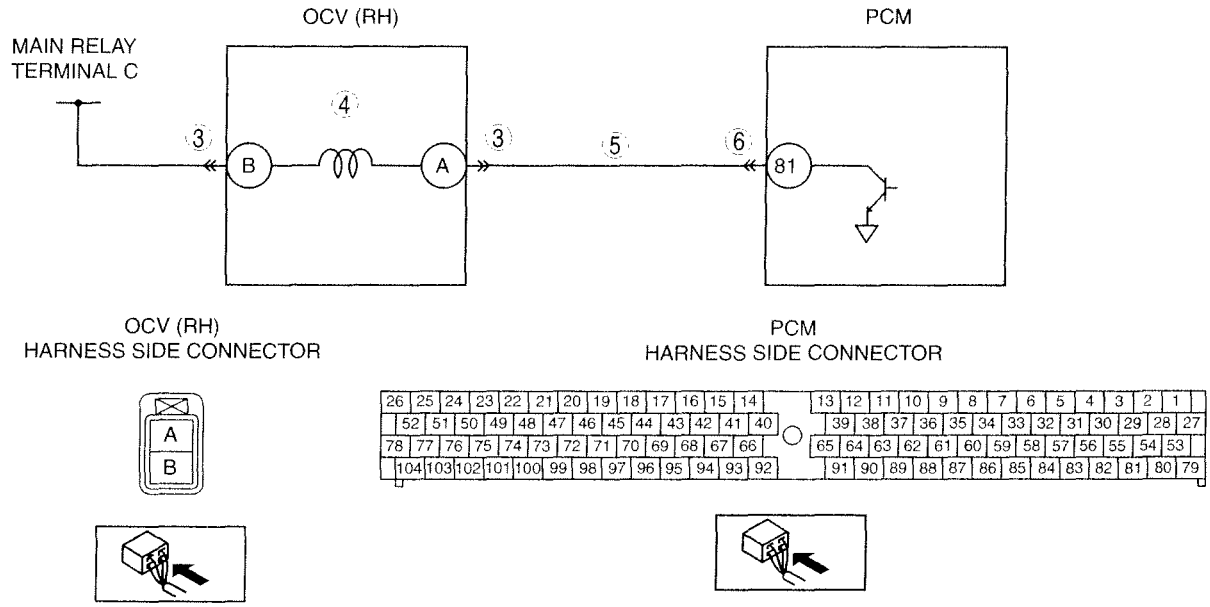
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT OCV (RH) CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect OCV (RH) connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT OCV (RH) POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between OCV (RH) terminal B (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
5	**INSPECT OCV (RH) CONTROL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Disconnect OCV (RH) connector. • Check continuity between OCV (RH) terminal A (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
6	**INSPECT OCV (RH)** • Inspect OCV (RH). (See 01–10B–48 OIL CONTROL VALVE (OCV) INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace OCV (RH), then go to Step 9. (See 01–10B–47 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**INSPECT OCV (RH) CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between OCV (RH) terminal A (harness-side) and PCM terminal 81 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2088 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm up it completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2089 [AJ]

C6U010201083W06

DTC P2089	CMP actuator (RH) circuit high
DETECTION CONDITION	• The PCM monitors the OCV (RH) voltage. If the PCM detects that the OCV control voltage (calculated from OCV) is above the threshold voltage (calculated from battery positive voltage), the PCM determines that the OCV circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• OCV (RH) malfunction • Connector or terminal malfunction • Short to power circuit between OCV (RH) terminal A and PCM terminal 81 • PCM malfunction



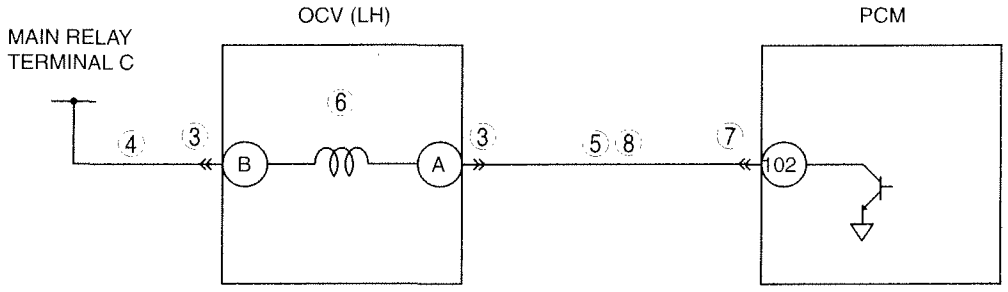
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT OCV (RH) CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect OCV (RH) connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**INSPECT OCV (RH)** • Inspect OCV (RH). (See 01–10B–48 OIL CONTROL VALVE (OCV) INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace OCV (RH), then go to Step 7. (See 01–10B–47 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
5	**INSPECT OCV (RH) CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between OCV (RH) terminal A (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 7.
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2089 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

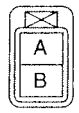
DTC P2092 [AJ]

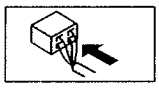
C6U010201083W07

DTC P2092	CMP actuator (LH) circuit low
DETECTION CONDITION	• The PCM monitors the OCV (LH) voltage. If the PCM detects that the OCV control voltage (calculated from OCV) is below the threshold voltage (calculated from battery positive voltage), the PCM determines that the OCV circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• OCV (LH) malfunction • Connector or terminal malfunction • Open circuit between main relay terminal C and OCV (LH) terminal B • Short to GND circuit between OCV (LH) terminal A and PCM terminal 102 • Open circuit between OCV (LH) terminal A and PCM terminal 102 • PCM malfunction

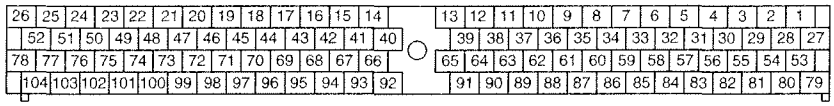


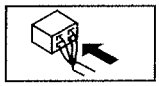
OCV (LH) HARNESS SIDE CONNECTOR





PCM HARNESS SIDE CONNECTOR





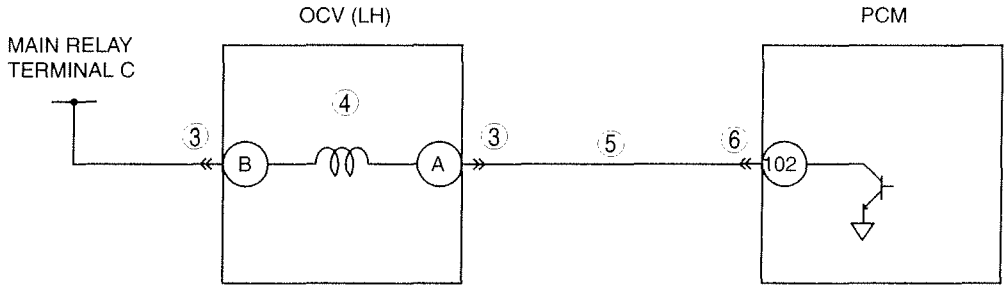
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT OCV (LH) CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect OCV (LH) connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion.). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT OCV (LH) POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between OCV (LH) terminal B (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
5	**INSPECT OCV (LH) CONTROL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Disconnect OCV (LH) connector. • Check continuity between OCV (LH) terminal A (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
6	**INSPECT OCV (LH)** • Inspect OCV (LH). (See 01–10B–48 OIL CONTROL VALVE (OCV) INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace OCV (LH), then go to Step 9. (See 01–10B–47 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**INSPECT OCV (LH) CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between OCV (LH) terminal A (harness-side) and PCM terminal 102 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2092 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm up it completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

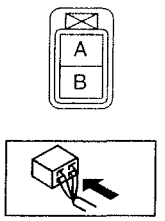
DTC P2093 [AJ]

C6U010201083W08

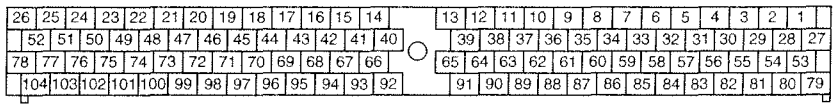
DTC P2093	CMP actuator (LH) circuit high
DETECTION CONDITION	• The PCM monitors the OCV (LH) voltage. If the PCM detects that the OCV control voltage (calculated from OCV) is above the threshold voltage (calculated from battery positive voltage), the PCM determines that the OCV circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• OCV (LH) malfunction • Connector or terminal malfunction • Short to power circuit between OCV (LH) terminal A and PCM terminal 102 • PCM malfunction

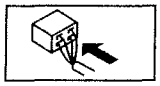


OCV (LH)
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR





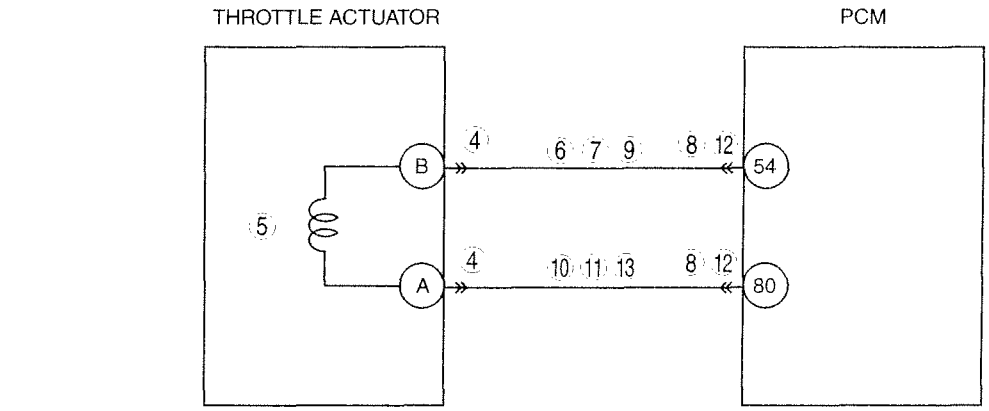
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT OCV (LH) CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect OCV (LH) connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**INSPECT OCV (LH)** • Inspect OCV (LH). (See 01–10B–48 OIL CONTROL VALVE (OCV) INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace OCV (LH), then go to Step 7. (See 01–10B–47 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
5	**INSPECT OCV (LH) CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between OCV (LH) terminal A (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 7.
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2093 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

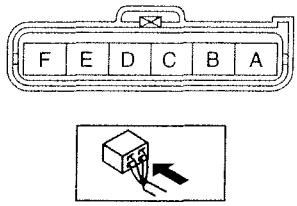
DTC P2100 [AJ]

C6U010201083W09

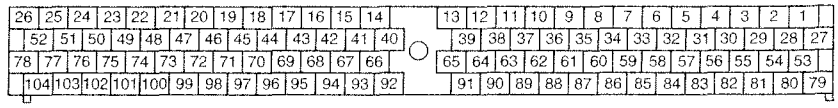
DTC P2100	Throttle actuator control motor circuit/open
DETECTION CONDITION	• The PCM monitors the throttle actuator motor current. If the PCM detects that the throttle actuator motor current is below the threshold current, the PCM determines that throttle actuator motor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Throttle actuator malfunction • Connector or terminal malfunction • Short to GND circuit between throttle body terminal B and PCM terminal 54 • Open circuit between throttle body terminal B and PCM terminal 54 • Short to power circuit between throttle body terminal A and PCM terminal 80 • Short to GND circuit between throttle body terminal A and PCM terminal 80 • Open circuit between throttle body terminal A and PCM terminal 80 • PCM malfunction

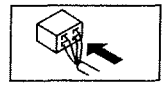


THROTTLE BODY HARNESS SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR





Diagnostic procedure

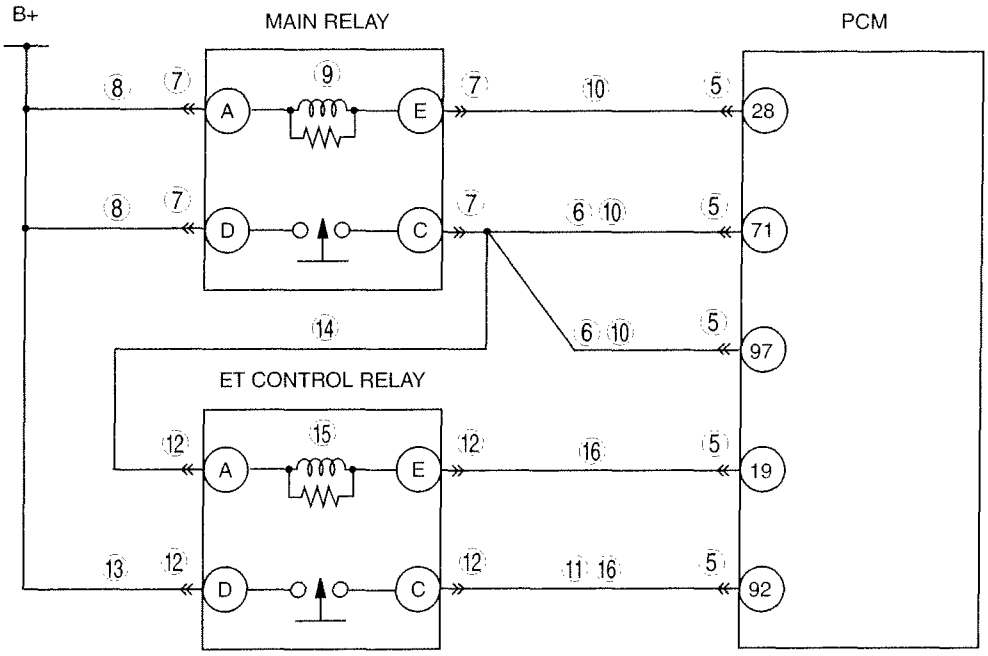
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear DTC using WDS or equivalent. • Start the engine and let it idle. • Is same DTC present?	Yes	Go to next step.
		No	Go to intermittent concern. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)
4	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect throttle body connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
5	**INSPECT THROTTLE ACTUATOR** • Inspect throttle actuator. (See 01–13B–8 THROTTLE ACTUATOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace throttle body, then go to Step 14. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
6	**CLASSIFY MALFUNCTION AT POWER SUPPLY CIRCUIT OR CONTROL CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between throttle body terminal B (harness-side) and body GND. • Is voltage **B+**?	Yes	Malfunction at control circuit. Go to Step 10.
		No	Malfunction at power supply circuit. Go to next step.
7	**INSPECT THROTTLE ACTUATOR POWER CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between throttle body terminal B (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 14.
		No	Go to next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 14.
		No	Go to next step.
9	**INSPECT THROTTLE ACTUATOR POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between throttle body terminal B (harness-side) and PCM terminal 54 (harness-side). • Is there continuity?	Yes	Go to Step 14.
		No	Repair or replace harness for open circuit, then go to Step 14.
10	**INSPECT THROTTLE ACTUATOR CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON. (Engine OFF). • Measure voltage between throttle body terminal A (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 14.
		No	Go to next step.
11	**INSPECT THROTTLE ACTUATOR CONTROL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between throttle body terminal A (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 14.
		No	Go to next step.

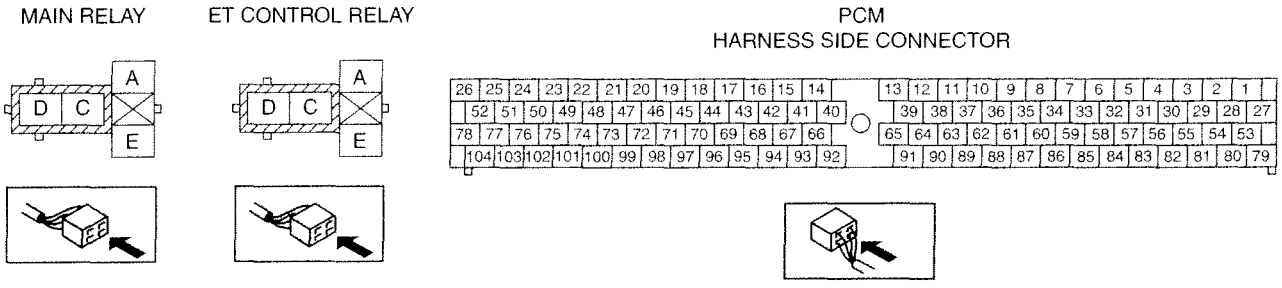
STEP	INSPECTION		ACTION
12	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
13	**INSPECT THROTTLE ACTUATOR CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between throttle body terminal A (harness-side) and PCM terminal 80 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
14	**VERIFY TROUBLESHOOTING OF DTC P2100 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2101 [AJ]

C6U010201083W10

DTC P2101	Throttle actuator control motor circuit range/performance
DETECTION CONDITION	• If the PCM detects any of the following conditions, the PCM determines that throttle actuator motor circuit has a malfunction. — The fully closed throttle angle detected by each TP sensor No.1 and No.2 is 1° or larger than the default throttle opening angle. — The difference in the default throttle opening angle from the fully closed throttle angle detected by TP sensor No. 1 is 1.5 times larger or more than that of No.2. — The voltage from the ET control relay is too low. — The PCM detects large voltage differences from the ET control relay and from the main relay. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Main relay and related circuit malfunction • ET control relay and related circuit malfunction • Connector or terminal malfunction • PCM malfunction





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.

STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repair, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending code or stored DTCs using WDS or equivalent. • Is any DTC present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2101 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 17.
		No	Go to next step.
6	**INSPECT MAIN RELAY OUTPUT VOLTAGE** • Turn ignition key to OFF. • Connect PCM connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between the following harnesses: — PCM terminal 71 (harness-side) and body GND — PCM terminal 97 (harness-side) and body GND • Is voltage **B+**?	Yes	Go to step 11.
		No	Go to next step.
7	**INSPECT MAIN RELAY CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect main relay. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 17.
		No	Go to next step.
8	**INSPECT MAIN RELAY POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between the following harnesses: — Main relay terminal A (harness-side) and body GND — Main relay terminal D (harness-side) and body GND • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 17.
9	**INSPECT MAIN RELAY** • Inspect main relay. (See 09–21–6 RELAY INSPECTION.) • Is there any malfunction?	Yes	Replace main relay, then go to Step 17.
		No	Go to next step.

STEP	INSPECTION		ACTION
10	**INSPECT MAIN RELAY CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between the following harnesses: — Main relay terminal C (harness-side) and PCM terminal 71 (harness-side) — Main relay terminal C (harness-side) and PCM terminal 97 (harness-side) — Main relay terminal E (harness-side) and PCM terminal 28 (harness-side) • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 17.
11	**INSPECT ET CONTROL RELAY OUTPUT VOLTAGE** • Turn ignition key to ON (Engine OFF). • Measure voltage between PCM terminal 92 (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to Step 17.
		No	Go to next step.
12	**INSPECT ET CONTROL RELAY CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect ET control relay. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 17.
		No	Go to next step.
13	**INSPECT ET CONTROL RELAY CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between ET control relay terminal D (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 17.
14	**INSPECT ET CONTROL RELAY CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between ET control relay terminal A (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace the following harness for open circuit, then go to Step 17: • ET control relay terminal A to main relay terminal C
15	**INSPECT ET CONTROL RELAY** • Inspect ET control relay. (See 09–21–6 RELAY INSPECTION.) • Is there any malfunction?	Yes	Replace ET control relay, then go to Step 17.
		No	Go to next step.
16	**INSPECT ET CONTROL RELAY CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between the following harnesses: — ET control relay terminal C (harness-side) and PCM terminal 92 (harness-side) — ET control relay terminal E (harness-side) and PCM terminal 19 (harness-side) • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
17	**VERIFY TROUBLESHOOTING OF DTC P2101 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and run it at idle. • Turn ignition key to OFF, then ON (Engine OFF). • Is PENDING CODE for this DTC present?	Yes	Replace PCM, go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.

STEP	INSPECTION		ACTION
18	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2105 [AJ]

C6U010201083W11

DTC P2105	Throttle actuator control system - forced engine shutdown
DETECTION CONDITION	• If the PCM detects any of the following conditions, the PCM determines that the throttle actuator control system has a malfunction. — The engine speed exceeds the threshold value. — An internal malfunction of the PCM. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not comes on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY TROUBLESHOOTING OF DTC P2105 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine and run it at idle. • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2107 [AJ]

C6U010201083W12

DTC P2107	Throttle actuator control module processor
DETECTION CONDITION	• If the PCM detects internal failure or an abnormal output signal for the throttle actuator control system, the PCM determines that the throttle actuator control module processor has a malfunction. **Diagnostic support note** • This is an intermittent monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear DTC using WDS or equivalent. • Start the engine and let it idle. • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2110 [AJ]

C6U010201083W13

DTC P2110	Throttle actuator control system - forced limited RPM
DETECTION CONDITION	• If the PCM detects failure to turn off the ET control relay (fail safe mode), the PCM determines that the throttle actuator control system has a malfunction. — TP sensor No.1 output voltage **is 0.255 V or below**, or **4.72 V or above.** — TP sensor No.2 output voltage **is 0.255 V or below**, or **4.72 V or above**. — TP sensor No.1 signal value and TP sensor No.2 signal value correlation is out of specification. — The throttle actuator motor current is below the threshold current. — The actual throttle opening angle is too large as compared to the target opening angle (open too much). — The target throttle opening angle is too large as compared to the actual opening angle (closed too much). — The fully closed throttle angle detected by each TP sensor No.1 and No.2 is **1**° or larger than the default throttle opening angle. — The difference in the default throttle opening angle from the fully closed throttle angle detected by TP sensor No. 1 is 1.5 times larger or more than that of No.2. — The voltage from the ET control relay is too low or too high. — The PCM detects large voltage differences from the ET control relay and from the main relay. — The PCM detects internal failure or an abnormal output signal for the throttle actuator control system. — The PCM detects that actual throttle opening angle is larger than the target throttle opening angle by **2.5**° **or more** during closing throttle valve. — The PCM detects that actual throttle opening angle is smaller than the target throttle opening angle by **2.5**° **or more** during closing throttle valve. — The accelerator pedal position (APP) sensor No.1 output voltage **is 1.19 V or below**, or **4.3 V or above**. — The APP sensor No.2 output voltage **is 0.54 V or below**, or **3.8 V or above**. — The APP sensor No.1 signal value and APP sensor No.2 signal value correlation is out of specification. — A difference exists in APP sensor No.1 or No.2 voltage between the PCM main CPU and sub-CPU. — When idling, a difference exists between the actual and target idling speeds. — During dash pot correction, a difference exists between the actual and target throttle valve opening angles. — During normal driving, a difference exists between the actual and target throttle valve opening angles. **Diagnostic support note** • This is an intermittent monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Throttle valve stuck • TP sensor and related circuit malfunction • APP sensor and related circuit malfunction • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending code or stored DTCs using WDS or equivalent. • Is any DTC present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2110 on FREEZE FRAME DATA?.	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.

STEP	INSPECTION		ACTION
5	**INSPECT THROTTLE VALVE FOR FOREIGN MATERIAL** • Remove air hose from throttle body. • Visually inspect throttle valve. • Is there any contamination or foreign material around throttle valve?	Yes	Clean throttle valve, then go to next step.
		No	Go to next step.
6	**INSPECT TP SENSOR** • Inspect TP sensor. (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace throttle body, then go to Step 8. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
7	**INSPECT APP SENSOR SIGNAL CIRCUIT FOR SHORT WITH EACH OTHER** • Turn ignition key to OFF. • Check continuity between APP sensor terminals C and F (harness-side). • Is there continuity?	Yes	Repair or replace harness for short with each other, then go to next step.
		No	Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2110 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC using WDS or equivalent. • Start the engine and race the engine several times. • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2111, P2112 [AJ]

C6U010201083W14

DTC P2111 DTC P2112	**Throttle actuator control system - stuck open** **Throttle actuator control system - stuck close**
DETECTION CONDITION	**DTC P2111** • If the PCM detects that actual throttle opening angle is larger than the target throttle opening angle by **2.5° or more** during closing throttle valve, PCM determines that throttle actuator control system has malfunction. **DTC P2112** • If the PCM detects that actual throttle opening angle is smaller than the target throttle opening angle by **2.5° or more** during closing throttle valve, PCM determines that throttle actuator control system has malfunction. **Diagnostic support note** • This is an intermittent monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• ET control relay and related circuit malfunction • Throttle actuator and related circuit malfunction • TP sensor and related circuit malfunction • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF then ON (Engine OFF). • Verify pending and stored DTCs using WDS or equivalent. • Is any DTC present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2111 / P2112 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**INSPECT THROTTLE VALVE FOR FOREIGN MATERIAL** • Remove air hose from throttle body. • Visually inspect throttle valve. • Is there any contamination or foreign material around throttle valve?	Yes	Clean throttle valve, then go to next step.
		No	Go to next step.
6	**INSPECT TP SENSOR** • Inspect TP sensor. (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace throttle body, then go to next step. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC using WDS or equivalent. • Start the engine and race the engine several times. • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.

STEP	INSPECTION		ACTION
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2119 [AJ]

C6U010201083W15

DTC P2119	Throttle actuator control throttle body range/performance
DETECTION CONDITION	• If the PCM detects that the throttle opening angle signal voltage is higher than the default throttle opening angle voltage after the ignition switch is turned to OFF, the PCM determines that the throttle actuator has a malfunction. **Diagnostic support note** • This is an intermittent monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Throttle valve return spring (in throttle body) broken • Throttle valve stuck • PCM malfunction

Diagnostic procedure

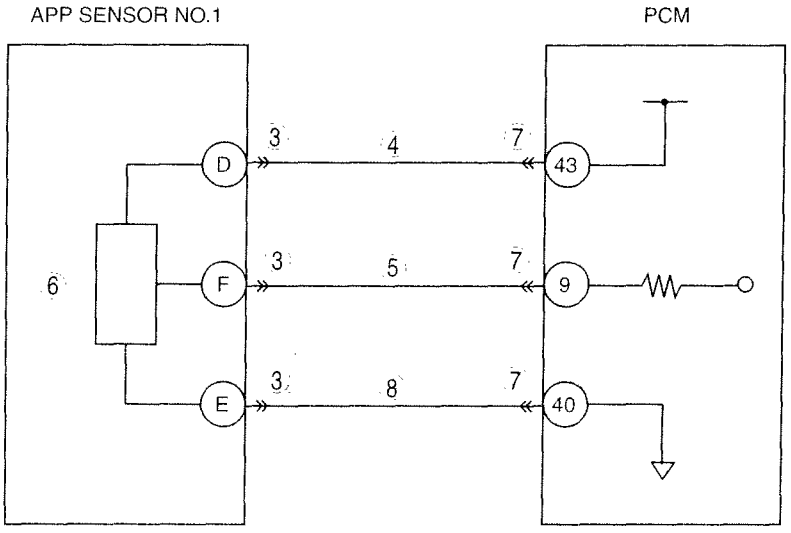
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending code or stored DTCs using WDS or equivalent. • Is any DTC present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2119 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**INSPECT THROTTLE VALVE OPENING ANGLE** • Remove air hose from throttle body. • Visually inspect throttle valve opening angle. **Default angle: Approx. 7°** • Is throttle valve opened widely?	Yes	Replace throttle body, then go to Step 8. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
6	**INSPECT THROTTLE VALVE FOR FOREIGN MATERIAL** • Remove air hose from throttle body. • Visually inspect throttle valve. • Is there any contamination or foreign material around throttle valve?	Yes	Clean throttle valve, then go to next step.
		No	Go to next step.
7	**INSPECT TP SENSOR** • Inspect TP sensor. (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace throttle body, then go to next step. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.

STEP	INSPECTION		ACTION
8	**VERIFY TROUBLESHOOTING OF DTC P2119 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC using WDS or equivalent. • Start the engine and race it several times. • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

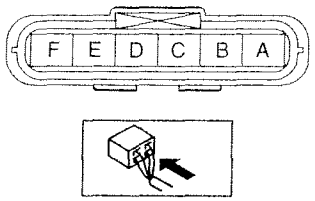
DTC P2122 [AJ]

C6U010201083W16

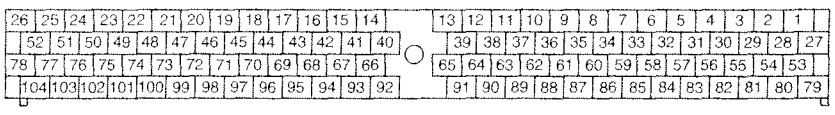
DTC P2122	APP sensor No.1 circuit low input
DETECTION CONDITION	• The PCM monitors the APP sensor No.1 signal at PCM terminal 9. If the PCM detects APP sensor No.1 voltage of **1.19 V or below**, the PCM determines that the APP sensor No.1 circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.1 malfunction • Connector or terminal malfunction • Open circuit between APP sensor terminal D and PCM terminal 43 • Short to GND circuit between APP sensor terminal F and PCM terminal 9 • Open circuit between APP sensor terminal F and PCM terminal 9 • PCM malfunction



APP SENSOR HARNESS SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR



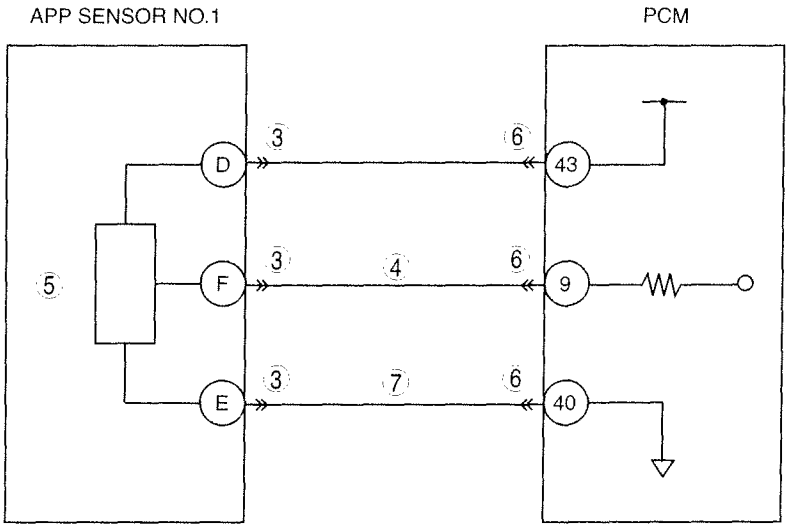
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect APP sensor connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT APP SENSOR NO.1 POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between APP sensor terminal D (harness-side) and body GND. • Is voltage **within 4.5—5.5 V**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
5	**VERIFY APP SENSOR NO.1 SIGNAL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between APP sensor terminal F (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness, then go to Step 9.
		No	Go to next step.
6	**INSPECT APP SENSOR NO.1** • Inspect APP sensor No.1. (See 01–40B–26 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace accelerator pedal, then go to Step 9. (See 01–13B–9 ACCELERATOR PEDAL REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**VERIFY APP SENSOR NO.1 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between APP sensor terminal F (harness-side) and PCM terminal 9. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2122 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

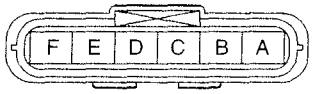
DTC P2123 [AJ]

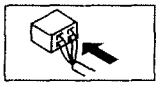
C6U010201083W17

DTC P2123	APP sensor No.1 circuit high input
DETECTION CONDITION	• The PCM monitors the APP sensor No.1 signal at PCM terminal 9. If the PCM detects APP sensor No.1 voltage of **4.3 V or above**, the PCM determines that the APP sensor No.1 circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.1 malfunction • Connector or terminal malfunction • Short to power circuit between APP sensor terminal F and PCM terminal 9 • Open circuit between APP sensor terminal E and PCM terminal 40 • PCM malfunction

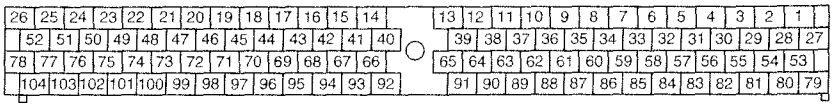


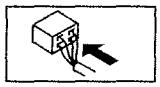
APP SENSOR
HARNESS SIDE CONNECTOR





PCM
HARNESS SIDE CONNECTOR





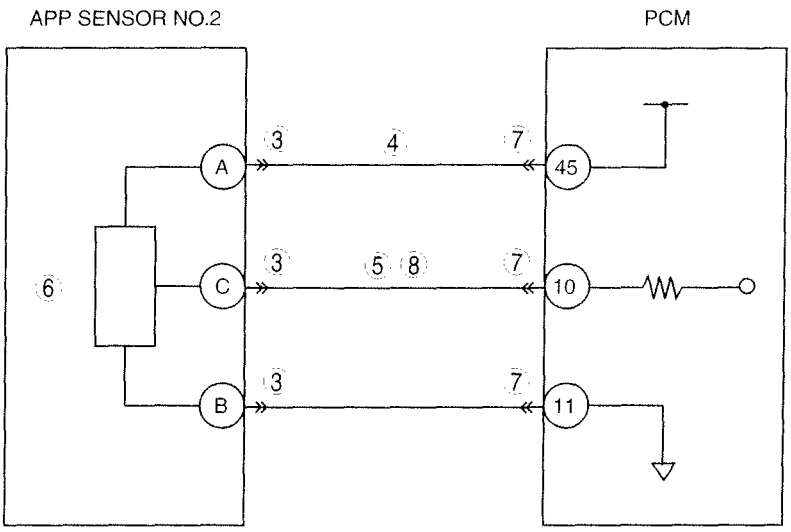
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect APP sensor connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
4	**INSPECT APP SENSOR NO.1 SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between APP sensor terminal F (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 8.
		No	Go to next step.
5	**INSPECT APP SENSOR NO.1** • Inspect APP sensor No.1. (See 01–40B–26 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace accelerator pedal, then go to Step 8. (See 01–13B–9 ACCELERATOR PEDAL REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
7	**INSPECT APP SENSOR NO.1 GND CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between APP sensor terminal E (harness-side) and PCM terminal 40 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2123 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

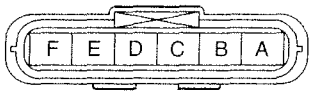
DTC P2127 [AJ]

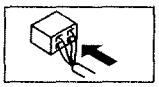
C6U010201083W18

DTC P2127	APP sensor No.2 circuit low input
DETECTION CONDITION	• The PCM monitors the APP sensor No.2 signal at PCM terminal 10. If the PCM detects APP sensor No.2 voltage of **0.54 V or below**, the PCM determines that the APP sensor No.2 circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.2 malfunction • Connector or terminal malfunction • Open circuit between APP sensor terminal A and PCM terminal 45 • Short to GND circuit between APP sensor terminal C and PCM terminal 10 • Open circuit between APP sensor terminal C and PCM terminal 10 • PCM malfunction

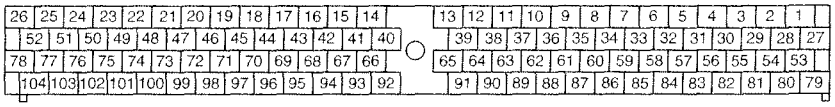


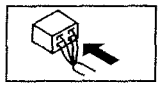
APP SENSOR
HARNESS SIDE CONNECTOR





PCM
HARNESS SIDE CONNECTOR





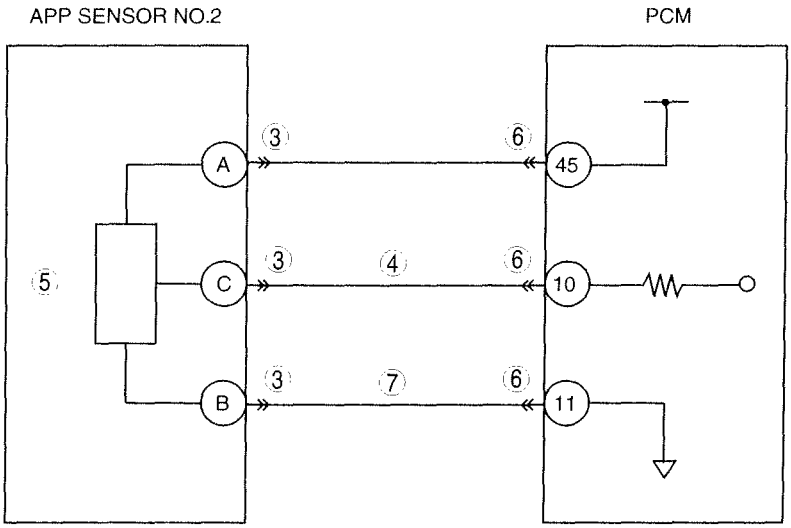
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect APP sensor connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT APP SENSOR NO.2 POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between APP sensor terminal A (harness-side) and body GND. • Is voltage **within 4.5—5.5 V**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
5	**VERIFY APP SENSOR NO.2 SIGNAL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between APP sensor terminal C (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness, then go to Step 9.
		No	Go to next step.
6	**INSPECT APP SENSOR NO.2** • Inspect APP sensor No.2. (See 01–40B–26 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace accelerator pedal, then go to Step 9. (See 01–13B–9 ACCELERATOR PEDAL REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**VERIFY APP SENSOR NO.2 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between APP sensor terminal C (harness-side) and PCM terminal 10. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2127 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

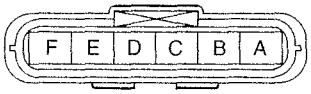
DTC P2128 [AJ]

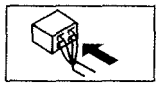
C6U010201083W19

DTC P2128	APP sensor No.2 circuit high input
DETECTION CONDITION	• The PCM monitors the APP sensor No.2 signal at PCM terminal 10. If the PCM detects APP sensor No.2 voltage of **3.8 V or above**, the PCM determines that the APP sensor No.2 circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.2 malfunction • Connector or terminal malfunction • Short to power circuit between APP sensor terminal C and PCM terminal 10 • Open circuit between APP sensor terminal B and PCM terminal 11 • PCM malfunction

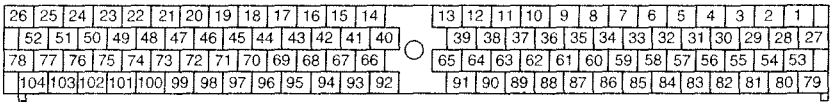


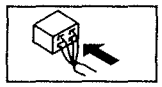
APP SENSOR
HARNESS SIDE CONNECTOR





PCM
HARNESS SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect APP sensor connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
4	**INSPECT APP SENSOR NO.2 SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between APP sensor terminal C (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 8.
		No	Go to next step.
5	**INSPECT APP SENSOR NO.2** • Inspect APP sensor No.2. (See 01–40B–26 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace accelerator pedal, then go to Step 8. (See 01–13B–9 ACCELERATOR PEDAL REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
7	**INSPECT APP SENSOR NO.2 GND CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between APP sensor terminal B (harness-side) and PCM terminal 11 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2128 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2135 [AJ]

C6U010201083W20

DTC P2135	TP sensor No.1/No.2 voltage correlation
DETECTION CONDITION	• The PCM compares the TP sensor No.1 signal value and TP sensor No.2 signal value. If the signal correlation for both is out of specification, the PCM determines that the TP sensor has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending code or stored DTCs using WDS or equivalent. • Is any DTC present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2135 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to trouble shooting procedures for DTC on FREEZE FRAME DATA.
5	**INSPECT TP SENSOR** • Inspect TP sensor. (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace throttle body, then go to next step. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to next step.
6	**VERIFY TROUBLESHOOTING OF DTC P2135 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start the engine and race the engine several times. • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2138 [AJ]

C6U010201083W21

DTC P2138	APP sensor No.1/No.2 voltage correlation
DETECTION CONDITION	• The PCM compares the APP sensor No.1 signal value and APP sensor No.2 signal value. If the correlation for both signals is out of specification, the PCM determines that the APP sensor has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending code or stored DTCs using WDS or equivalent. • Is any DTC present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2138 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**INSPECT APP SENSOR** • Inspect APP sensor. (See 01–40B–26 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace accelerator pedal, then go to next step. (See 01–13B–9 ACCELERATOR PEDAL REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
6	**VERIFY TROUBLESHOOTING OF DTC P2138 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Turn ignition key to ON (Engine OFF). • Depress accelerator pedal several times. • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2195, P2197 [AJ]

C6U010200000W07

DTC P2195 DTC P2197	**HO2S (RF) signal stuck lean** **HO2S (LF) signal stuck lean**
DETECTION CONDITION	• The PCM monitors the HO2S (RF, LF) output voltage when the following conditions are met. If output voltage is less than **0.45 V** for **34 s**, the PCM determines that the HO2S (RF, LF) signal remains lean. **MONITORING CONDITION** — Fuel injection control system status: feedback zone — ECT: **more than 70 °C {158 °F}** — Engine speed: **more than 1,500 rpm** **Diagnostic support note** • This is a continuous monitor. (HO2S) • The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• HO2S (RF, LF) malfunction • Fuel injector malfunction • Insufficient fuel line pressure • Leakage exhaust gas • Air suction at intake-air system malfunction • Leakage fuel • MAF sensor malfunction • ECT sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform the repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then ON (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P0171 (with DTC P2195) or P0174 (with DTC P2197) also present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2195 or P2197 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the FREEZE FRAME DATA DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs. (See 01–40B–6 PCM INSPECTION [AJ].) — APP1 — APP2 — ECT — MAF — TP_REL — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 13.

STEP	INSPECTION		ACTION
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION** • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. (See 01–40B–6 PCM INSPECTION [AJ].) — APP1 — APP2 — ECT — MAF — TP_REL — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 13.
7	**INSPECT INTAKE-AIR SYSTEM FOR EXCESSIVE AIR SUCTION** • Visually inspect for looseness, cracks or damage to the hoses in intake-air system. • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 13.
		No	Go to the next step.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 13.
9	**INSPECT HO2S (RF, LF)** • Inspect the HO2S (RF) (with DTC P2195) or the HO2S (LF) (with DTC P2197). (See 01–40B–31 HEATED OXYGEN SENSOR (HO2S) INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace the malfunctioning HO2S, then go to Step 13.
		No	Go to the next step.
10	**INSPECT FUEL INJECTOR** • Inspect the fuel injector for the right bank (with DTC P2195) or the left bank (with DTC P2197). (See 01–14–30 FUEL INJECTOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace the suspected fuel injector, then go to Step 13. (See 01–14–24 FUEL INJECTOR REMOVAL/ INSTALLATION [AJ].)
		No	Go to the next step.
11	**INSPECT FUEL LINE PRESSURE** • Perform the "FUEL LINE PRESSURE INSPECTION". (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 13.
12	**INSPECT FUEL SYSTEM FOR FUEL LEAKAGE** • Visually inspect for fuel leakage in the fuel system. • Is there fuel leakage?	Yes	Repair or replace the malfunctioning part, then go to the next step.
		No	Replace the fuel pump unit, then go to the next step. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
13	**VERIFY TROUBLESHOOTING OF DTC P2195 AND P2197 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Run Drive Mode 1 and 3 (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to the next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2196, P2198 [AJ]

C6U010200000W08

DTC P2196 DTC P2198	**HO2S (RF) signal stuck rich** **HO2S (LF) signal stuck rich**
DETECTION CONDITION	• The PCM monitors the HO2S (RF, LF) output voltage when the following conditions are met. If output voltage is more than **0.45 V** for **34 s**, the PCM determines that the HO2S (RF, LF) signal remains rich. **MONITORING CONDITION** — Fuel injection control system status: feedback zone — ECT: **more than 70 °C {158 °F}** — Engine speed: **more than 1,500 rpm** **Diagnostic support note** • This is a continuous monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• HO2S (RF, LF) malfunction • Fuel injector malfunction • Excessive fuel pressure • Restriction in intake-air system • MAF sensor malfunction • ECT sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform the repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then ON (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P0172 (with DTC P2196) or P0175 (with DTC P2198) also present?	Yes	Go to the appropriate DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2196 or P2198 in the FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the FREEZE FRAME DATA DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs. (See 01–40B–6 PCM INSPECTION [AJ].) — APP1 — APP2 — ECT — MAF — TP_REL — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 11.

STEP	INSPECTION		ACTION
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION** • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. — APP1 — APP2 — ECT — MAF — TP_REL — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 11.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to the engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 11.
8	**INSPECT HO2S (RF, LF)** • Inspect the HO2S (RF) (with DTC P2196) or HO2S (LF) (with DTC P2198). (See 01–40B–31 HEATED OXYGEN SENSOR (HO2S) INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace HO2S malfunction, then go to Step 11.
		No	Go to the next step.
9	**INSPECT FUEL INJECTOR** • Inspect fuel injector for the right bank (with DTC P2196) or the left bank (with DTC P2198). (See 01–14–30 FUEL INJECTOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace the suspected fuel injector, then go to Step 11. (See 01–14–24 FUEL INJECTOR REMOVAL/INSTALLATION [AJ].)
		No	Go to the next step.
10	**INSPECT FUEL LINE PRESSURE** • Perform the "FUEL LINE PRESSURE INSPECTION". (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is there any malfunction?	Yes	Replace the fuel pump unit, then go to the next step. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.)
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P2196 AND P2198 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Run Drive Mode 1 and 3 (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2227 [AJ]

C6U010201083W22

DTC P2227	EGR boost sensor circuit performance problem
DETECTION CONDITION	• The PCM monitors the differences between the intake manifold vacuum and atmospheric pressure at idle, which the EGR boost sensor detects by switching the EGR boost sensor solenoid. If the difference is **6.4 kPa {48 mmHg, 1.9 inHg} or below**, the PCM determines that there is a EGR boost sensor performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EGR boost sensor malfunction or substandard performance • EGR boost sensor solenoid valve malfunction • Loosed, damaged, misconnected, clogged or frozen moisture in vacuum hose from EGR boost sensor solenoid valve to EGR boost sensor • Loosed, damaged, misconnected, clogged or frozen moisture in vacuum hose from EGR boost sensor solenoid valve to EGR pipe • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY STORED DTC** • Turn ignition key to OFF, then ON (Engine OFF). • Has DTC P1487 been stored?	Yes	Inspect and repair DTC P1487. (See 01–02B–150 DTC P1487 [AJ].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2227 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**INSPECT CONNECTION OF EGR BOOST SENSING RELATED VACUUM HOSES** • Inspect the following vacuum hoses for loose, damage, improper connection and clogging. — From EGR boost sensor to EGR boost sensor solenoid valve — From EGR boost sensor solenoid valve to EGR pipe. • Are they okay?	Yes	Go to next step.
		No	Repair or replace vacuum hose, then go to Step 9.
6	**INSPECT EGR BOOST SENSOR SOLENOID VALVE AIR FILTER FOR CLOG** • Is EGR boost sensor solenoid valve air filter clogged?	Yes	Repair air clogging, then go to Step 9.
		No	Go to next step.
7	**INSPECT EGR BOOST SENSOR SOLENOID VALVE** • Inspect EGR boost sensor solenoid valve. (See 01–16–22 EGR BOOST SENSOR SOLENOID VALVE INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace EGR boost sensor solenoid valve, then go to Step 9.
		No	Go to next step.
8	**INSPECT EGR BOOST SENSOR** • Inspect EGR boost sensor. (See 01–40B–34 EGR BOOST SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace EGR boost sensor, then go to next step.
		No	Go to next step.

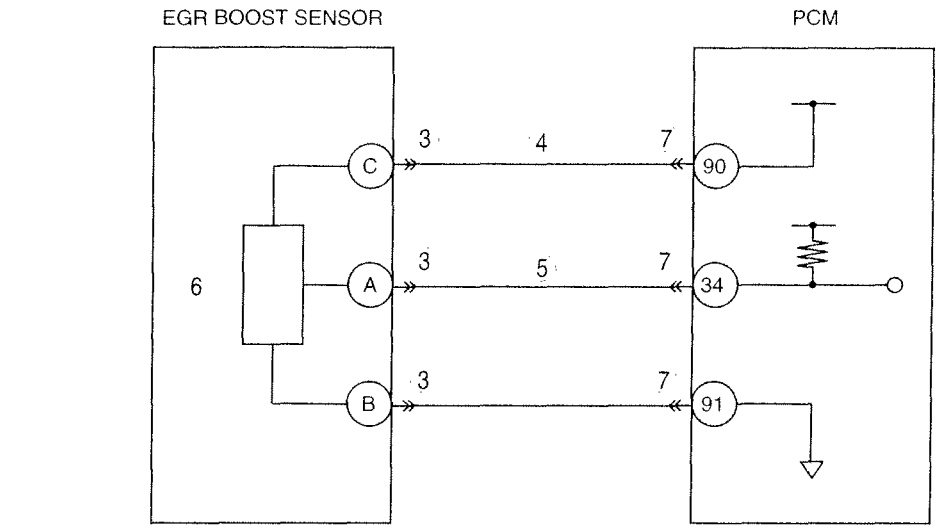
STEP	INSPECTION		ACTION
9	**VERIFY TROUBLESHOOTING OF DTC P2227 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Run DRIVE MODE except MODE 4. (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Stop vehicle. • Is same DTC present?	Yes	Replace PCM, go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2228 [AJ]

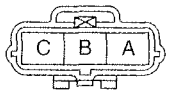
C6U010201083W23

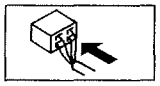
DTC P2228	EGR boost sensor circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the EGR boost sensor when the following monitoring conditions are met. If the input voltage at PCM terminal 34 is **0.35 V or below**, the PCM determines that the EGR boost circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EGR boost sensor malfunction • Connector or terminal malfunction • Open circuit between EGR boost sensor terminal C and PCM terminal 90 • Open circuit between EGR boost sensor terminal A and PCM terminal 34 • Short to GND circuit between EGR boost sensor terminal A and PCM terminal 34 • PCM malfunction

DTC P2228	EGR boost sensor circuit low input

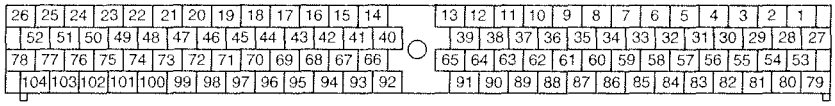


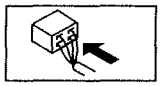
EGR BOOST SENSOR
HARNESS SIDE CONNECTOR





PCM
HARNESS SIDE CONNECTOR





Diagnostic procedure

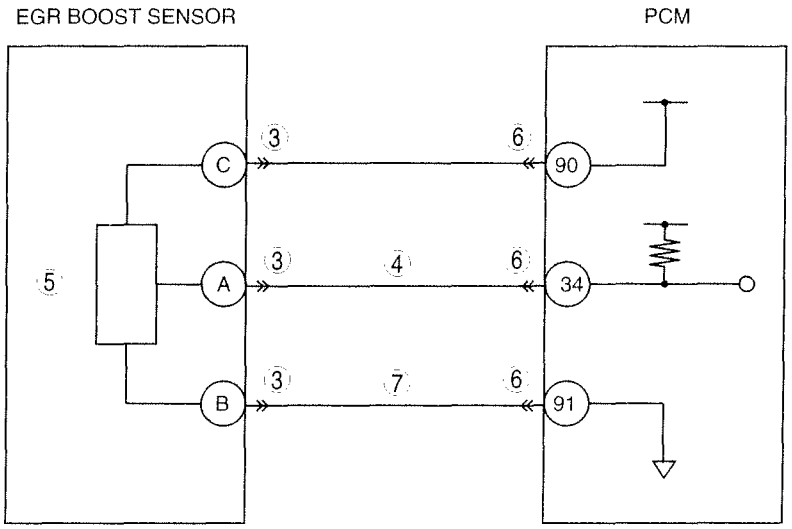
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT GR BOOST SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect the EGR boost sensor connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT EGR BOOST SENSOR POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between EGR boost sensor terminal C (harness-side) and body GND. • Is there voltage?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
5	**INSPECT EGR BOOST SENSOR SIGNAL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between EGR boost sensor terminal A (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.

STEP	INSPECTION		ACTION
6	**INSPECT EGR BOOST SENSOR** • Inspect EGR boost sensor. (See 01–40B–34 EGR BOOST SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace EGR boost sensor, then go to Step 9.
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**INSPECT EGR BOOST SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check for continuity between EGR boost sensor terminal A (harness-side) and PCM terminal 34 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2228 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

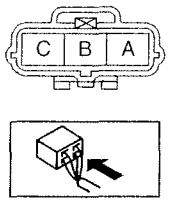
DTC P2229 [AJ]

C6U010201083W24

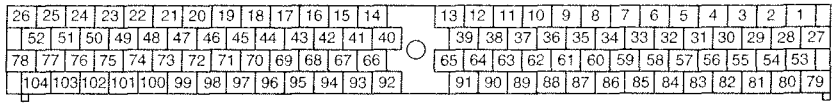
DTC P2229	EGR boost sensor circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the EGR boost sensor when the following monitoring conditions are met. If the input voltage at PCM terminal 34 is **4.9 V or above**, the PCM determines that EGR boost sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EGR boost sensor malfunction • Connector or terminal malfunction • Short to power circuit between EGR boost sensor terminal A and PCM terminal 34 • Open circuit between EGR boost sensor terminal B and PCM terminal 91 • PCM malfunction



EGR BOOST SENSOR HARNESS SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR



Diagnostic procedure

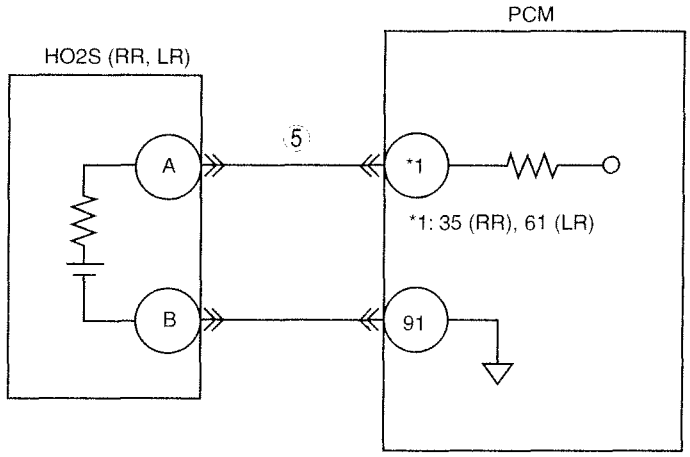
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT EGR BOOST SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect the EGR boost sensor connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**INSPECT EGR BOOST SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between EGR boost sensor terminal A (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 8.
		No	Go to next step.
5	**INSPECT EGR BOOST SENSOR** • Inspect EGR boost sensor. (See 01–40B–34 EGR BOOST SENSOR INSPECTION [AJ].) • Is there any malfunction?	Yes	Replace EGR boost sensor, then go to Step 8.
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
7	**INSPECT EGR BOOST SENSOR GND CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check for continuity between EGR boost sensor terminal B (harness-side) and PCM terminal 91 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2229 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

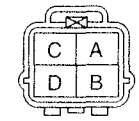
DTC P2271, P2273 [AJ]

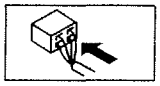
C6U010200000W05

DTC P2271 DTC P2273	**HO2S (RR) signal stuck rich** **HO2S (LR) signal stuck rich**
DETECTION CONDITION	• The PCM monitors the input voltage from the HO2S (RR, LR) when the following monitoring conditions are met. If the input voltage from the sensor is **above 0.3 V** for **6 s** during deceleration fuel cut, the PCM determines that the circuit input is high. **Diagnostic support note** • This is a continuous monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• HO2S (RR, LR) malfunction • Short to power circuit between the HO2S (RR, LR) terminal and the PCM terminal — For P2271: HO2S (RR) terminal A and PCM terminal 35 — For P2273: HO2S (LR) terminal A and PCM terminal 61 • PCM malfunction

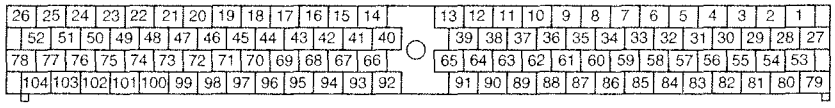


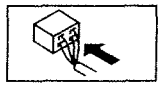
HO2S (RR, LR)
HARNESS SIDE CONNECTOR





PCM
HARNESS SIDE CONNECTOR





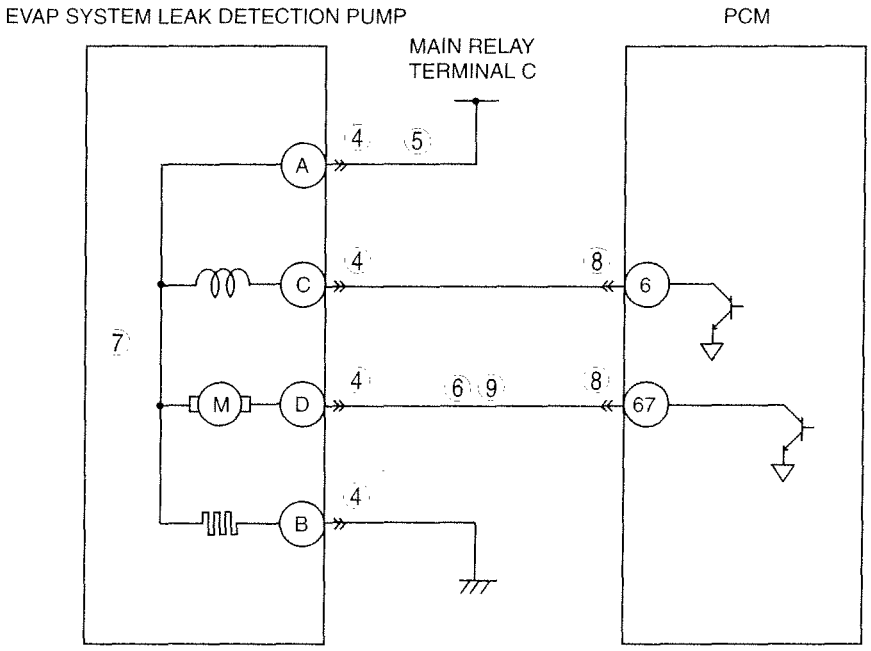
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform the repair or diagnosis according to available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn the ignition switch off, then ON (Engine off). • Verify the pending code or stored DTCs using the WDS or equivalent. • Are other DTCs present?	Yes	Go to the appropriate DTC troubleshooting procedures. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2271 (HO2S (RR)) or P2273 (HO2S (LR)) in the FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the troubleshooting procedures for the DTC in the FREEZE FRAME DATA. (See 01–02B–15 DTC TABLE [AJ].)
5	**INSPECT HO2S (RR, LR) SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn the ignition switch to off. • Disconnect the HO2S (RR) for P2271 or the HO2S (LR) for P2273 connector. • Turn the ignition switch to the ON position (Engine off). • Measure voltage between the following harnesses. — HO2S (RR) terminal A and body ground — HO2S (LR) terminal A and body ground • Is there any voltage reading?	Yes	Repair or replace the harness for a short to power, then go to Step 7.
		No	Go to the next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS** • Start engine. • Access O2S12 for P2271 or O2S22 for P2273 PID using the WDS or equivalent. • Verify the PID when racing the engine at least **10 times** (in PARK or NEUTRAL). • Does the PID reading stay **above 0.3 V**?	Yes	Replace the HO2S (RR, LR), then go to the next step. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2271 or P2273 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the memory using the WDS or equivalent. • Run DRIVE MODE except for Mode 4. • Is PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

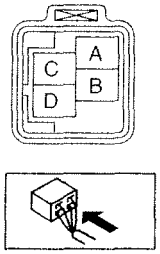
DTC P2401 [AJ]

C6U010201083W25

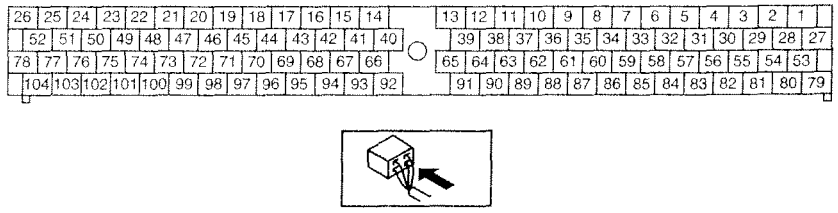
DTC P2401	EVAP system leak detection pump control circuit low
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure) when the evaporative leak monitor is operating. If the pump load current is lower than specified, the PCM determines that the EVAP system leak detection pump motor circuit has a malfunction. **Diagnostic support note** • This is an intermittent monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump malfunction • Connector or terminal malfunction • Open circuit between main relay terminal C and EVAP system leak detection pump terminal A • Short to GND circuit between the EVAP system leak detection pump terminal D and PCM terminal 67 • Open circuit between EVAP system leak detection pump terminal D and PCM terminal 67 • PCM malfunction



EVAP SYSTEM LEAK DETECTION PUMP HARNESS SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF, then ON (Engine OFF). • Verify related pending code or stored DTCs. • Is DTC P2405 present?	Yes	Go to appropriate DTC inspection. (See 01–02B–202 DTC P2405 [AJ].)
		No	Go to next step.
4	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect the EVAP system leak detection pump connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
5	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Disconnect main relay. • Disconnect EVAP system leak detection pump connector. • Check continuity between EVAP system leak detection pump terminal A (harness-side) and main relay terminal C (harness-side). • Is there continuity?	Yes	Repair or replace harness for open circuit, then go to Step 10.
		No	Go to next step.
6	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP SIGNAL CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Disconnect EVAP system leak detection pump connector. • Check continuity between EVAP system leak detection pump terminal D (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 10.
		No	Go to next step.
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Inspect EVAP system leak detection pump. (See 01–16–12 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION.) • Is there any malfunction?	Yes	Replace EVAP system leak detection pump, then go to Step 10. (See 01–16–4 EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM COMPONENT REMOVAL/ INSTALLATION.)
		No	Go to next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
9	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Disconnect EVAP system leak detection pump connector. • Check continuity between EVAP system leak detection pump terminal D (harness-side) and PCM terminal 67 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 10.

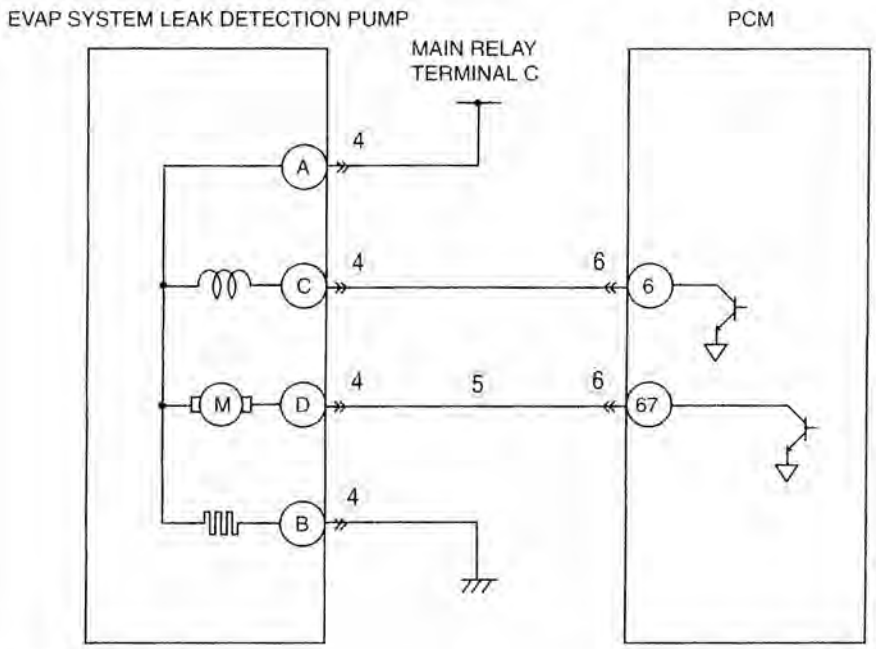
STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P2401 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and perform DRIVE MODE except for DRIVE MODE 4. (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2402 [AJ]

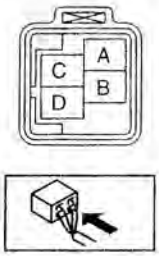
C6U010201083W26

DTC P2402	EVAP system leak detection pump control circuit high
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure) when the evaporative leak monitor is operating. If the pump load current is higher than specified, the PCM determines that the EVAP system leak detection pump motor circuit has a malfunction. **Diagnostic support note** • This is an intermittent monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump malfunction • Connector or terminal malfunction • Short to power circuit between EVAP system leak detection pump terminal D and PCM terminal 67 • PCM malfunction

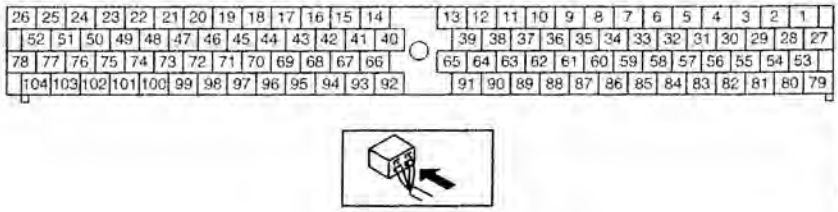
DTC P2402	EVAP system leak detection pump control circuit high



EVAP SYSTEM LEAK DETECTION PUMP HARNESS SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF then ON (Engine OFF). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to appropriate DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Go to next step.
4	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect the EVAP system leak detection pump connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.

STEP	INSPECTION		ACTION
5	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between EVAP system leak detection pump terminal D (harness-side) and body GND. • Is voltage reading?	Yes	Repair or replace harness for short to power, then go to Step 7.
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2402 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and perform DRIVE MODE except for DRIVE MODE 4. (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2404 [AJ]

C6U010201083W27

DTC P2404	EVAP system leak detection pump sense circuit malfunction
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure) when the evaporative leak monitor is operating. After obtaining the reference current value, if the time in which the pump load current reaches the reference current value is less than the specification, the PCM determines that the air filter is clogged. **Diagnostic support note** • This is an intermittent monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Air filter clogging • EVAP hose bending • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**CHECK EVAP HOSE BENDING** • Inspect EVAP hose for bending. • Is EVAP hose okay?	Yes	Go to next step.
		No	Repair or replace hose, then go to Step 5.
4	**CHECK AIR FILTER FOR CLOGGING** • Inspect air filter for clogging. • Is air filter okay?	Yes	Go to next step.
		No	Replace air filter, then go to next step.
5	**VERIFY TROUBLESHOOTING OF DTC P2404 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2405 [AJ]

C6U010201083W28

DTC P2405	EVAP system leak detection pump sense circuit low input
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure) when the evaporative leak monitor is operating. If the current is lower than the specification when the PCM obtains the reference current value, the PCM determines that the EVAP system leak detection pump orifice has fallen off. **Diagnostic support note** • This is an intermittent monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump orifice fallen off • EVAP system leak detection pump motor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Replace EVAP system leak detection pump, then go to next step. (See 01–16–4 EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM COMPONENT REMOVAL/ INSTALLATION.)
3	**VERIFY TROUBLESHOOTING OF DTC P2405 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and perform DRIVE MODE except for DRIVE MODE 4. (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2407 [AJ]

C6U010201083W30

DTC P2407	EVAP system leak detection pump sense circuit intermittent
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure) when the evaporative leak monitor is operating. When either of the following is detected **8 times or more** successively, the PCM determines that the EVAP system leak detection pump heater has a malfunction: — When obtaining the reference current value, the change in pump load current exceeds the specification. — After obtaining the reference current value, the pump load current is kept lower than the maximum pump load current for more than the specified time. **Diagnostic support note** • This is an intermittent monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump heater malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP HEATER** • Inspect EVAP system leak detection pump. (See 01–16–12 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION.) • Is there any malfunction?	Yes	Replace EVAP system leak detection pump, then go to next step. (See 01–16–4 EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM COMPONENT REMOVAL/ INSTALLATION.)
		No	Go to next step.
4	**VERIFY TROUBLESHOOTING OF DTC P2407 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and perform DRIVE MODE except for DRIVE MODE 4. (See 01–02B–9 OBD-II DRIVE MODE [AJ].) • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2502 [AJ]

C6U010201083W31

DTC P2502	Generator terminal B circuit open
DETECTION CONDITION	• The PCM determines that the generator output voltage is **17 V or above**, or the battery voltage is **11 V or below** when the engine is running. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not come on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Open circuit between generator terminal B and the battery positive terminal • Battery malfunction • PCM malfunction

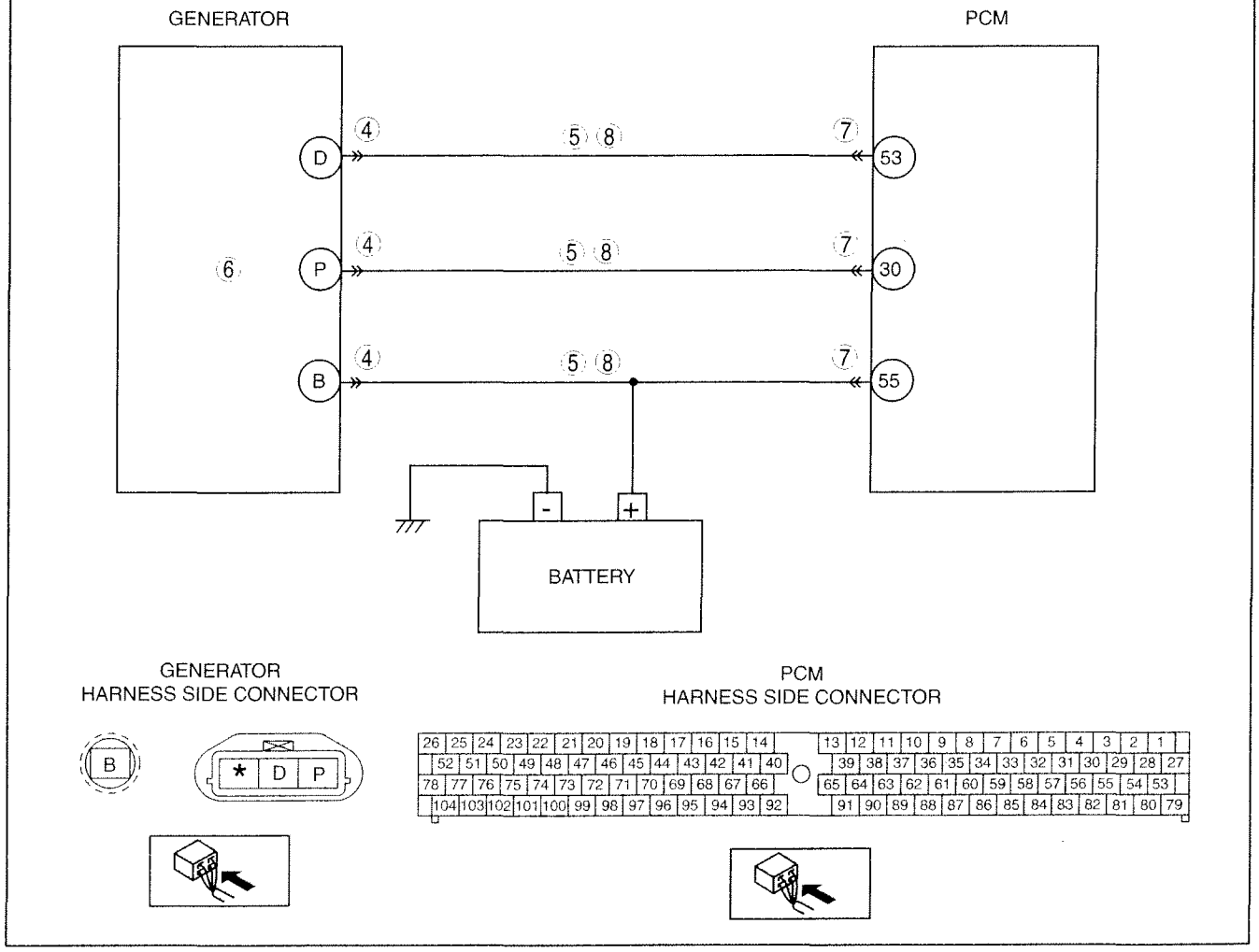
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT BATTERY** • Turn ignition key to OFF. • Inspect battery. (See 01–17–1 BATTERY INSPECTION.) • Is there any malfunction?	Yes	Replace battery, then go to Step 7. (See 01–17–1 BATTERY REMOVAL/INSTALLATION.)
		No	Go to next step.
4	**INSPECT GENERATOR TERMINAL FOR POOR INSTALLATION** • Turn ignition key to OFF. • Check for looseness of generator terminal B installation nut. • Is nut loose?	Yes	Tighten generator terminal B installation nut, then go to Step 7.
		No	Go to next step.
5	**INSPECT BATTERY POSITIVE TERMINAL FOR POOR INSTALLATION** • Turn ignition key to OFF. • Check for looseness of battery positive terminal. • Is terminal loose?	Yes	Connect battery positive terminal correctly, then go to Step 7.
		No	Go to next step.
6	**INSPECT BATTERY CHARGING CIRCUIT** • Start engine. • Disconnect battery positive terminal. • Does engine stall?	Yes	Repair or replace harness between generator terminal B and battery positive terminal, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2502 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2503 [AJ]

C6U010201083W32

DTC P2503	Generator output voltage signal no electricity
DETECTION CONDITION	• The PCM needs **20 A or more** from the generator, and determines the generator output voltage to be **8.5 V or below** when the engine is running. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not come on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Generator malfunction — Rectifier circuit malfunction — Brush abrasion • Connector or terminal malfunction • Open or short to GND circuit between generator terminal D and PCM terminal 53 • Open or short to GND circuit between generator terminal P and PCM terminal 30 • Cut drive belt off or came drive belt off • PCM malfunction



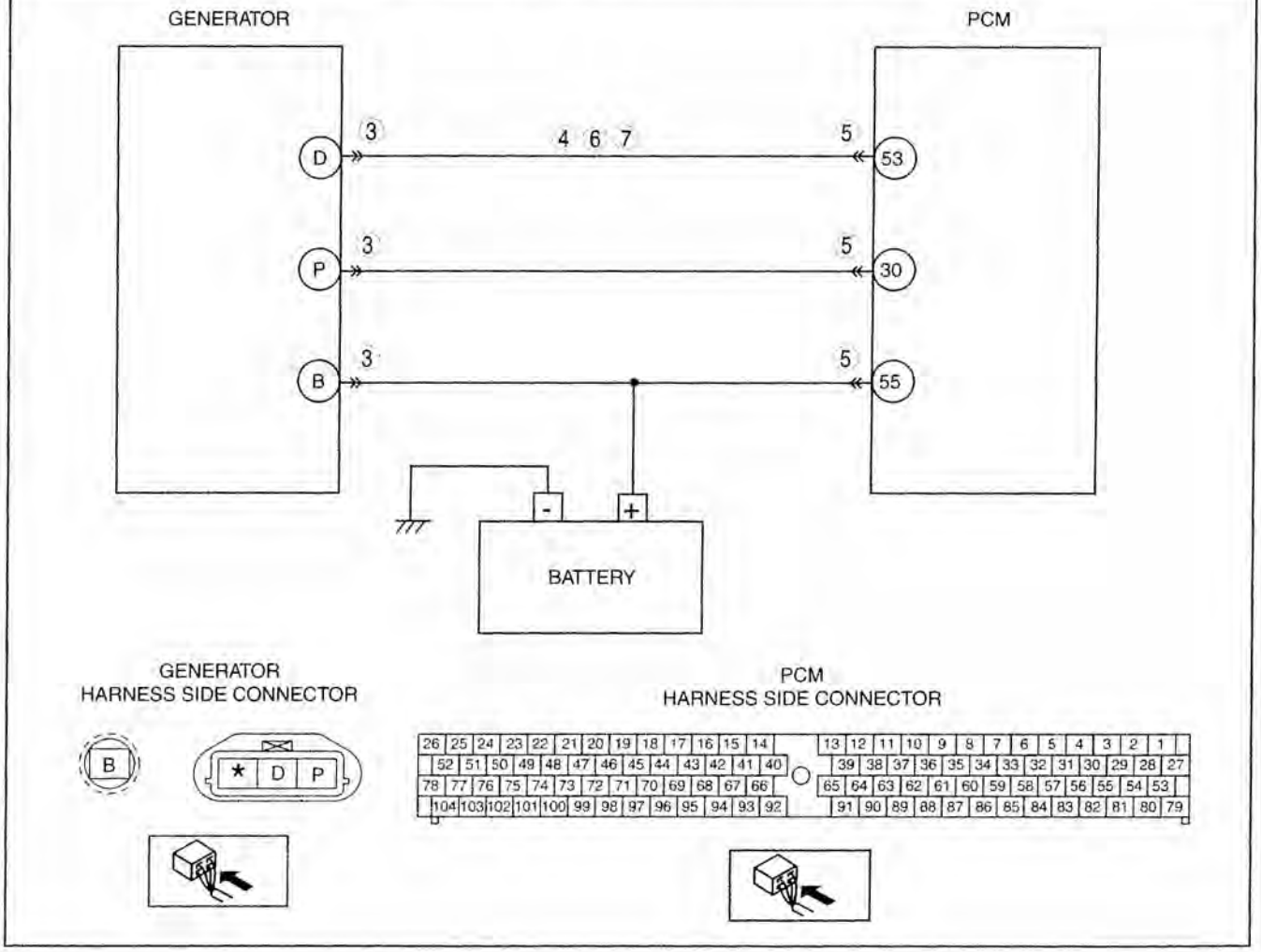
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT DRIVE BELT CONDITION** • Verify that drive belt auto tensioner indicator mark in not exceeding limit. (See 01–10B–3 DRIVE BELT INSPECTION [AJ].) • Is front drive belt okay?	Yes	Go to next step.
		No	Replace or adjust drive belt, then go to Step 9.
4	**INSPECT GENERATOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect generator connector. • Check for poor connection (damaged, pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
5	**INSPECT GENERATOR CIRCUIT FOR SHORT TO GND** • Turn ignition key to OFF. • Check continuity between the following circuits: — Generator terminal D (harness-side) and body GND — Generator terminal P (harness-side) and body GND • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
6	**INSPECT GENERATOR** • Inspect generator. (See 01–17–5 GENERATOR INSPECTION.) • Is there any malfunction?	Yes	Replace generator, then go to Step 9. (See 01–17–3 GENERATOR REMOVAL/INSTALLATION.)
		No	Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	**INSPECT GENERATOR CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check continuity between the following circuits: — Generator terminal D (harness-side) and PCM terminal 53 (harness-side) — Generator terminal P (harness-side) and PCM terminal 30 (harness-side) • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2503 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Turn ignition switch to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

DTC P2504 [AJ]

C6U010201083W33

DTC P2504	Battery overcharge
DETECTION CONDITION	• The PCM determines that the generator output voltage is **18.5 V or above**, or the battery voltage is **16.0 V or above** when the engine is running. **Diagnostic support note** • This is a continuous monitor (other). • MIL does not come on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Generator malfunction • Connector or terminal malfunction • Short to power circuit between generator connector terminal D and PCM terminal 53 • PCM malfunction



Diagnostic procedure

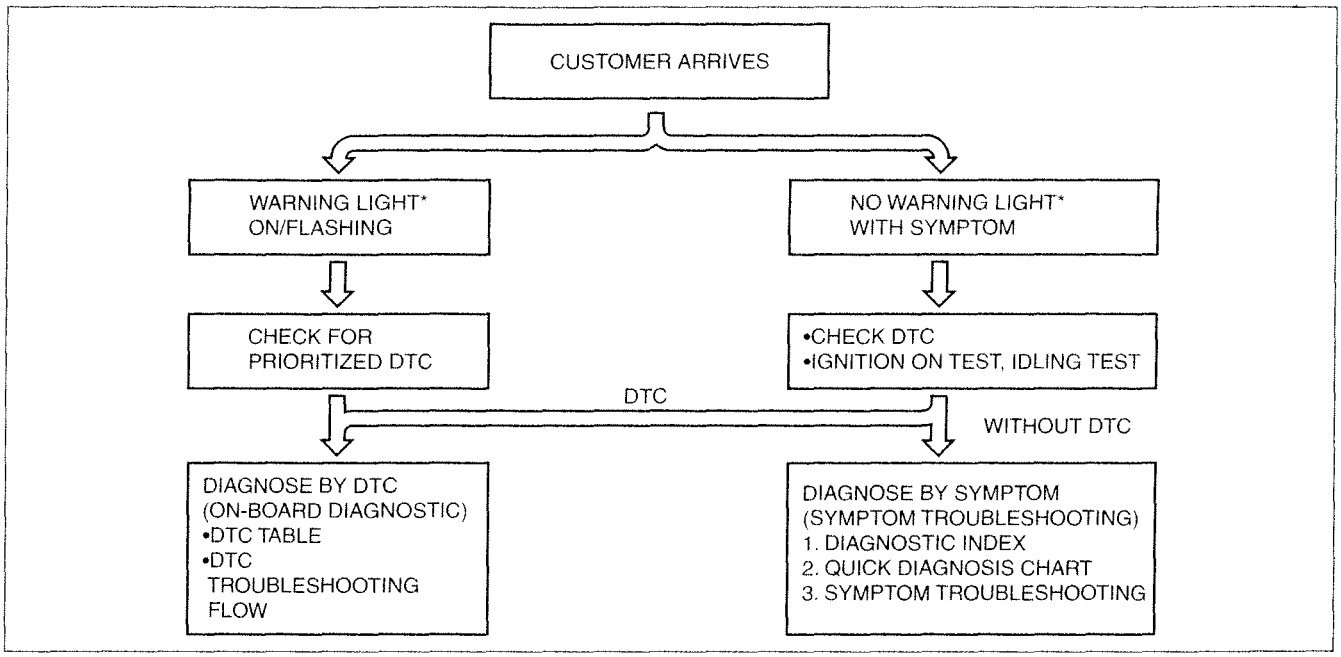
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT GENERATOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect generator connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
4	**CLASSIFY GENERATOR MALFUNCTION OR OTHER MALFUNCTION** • Turn ignition key to ON (Engine OFF). • Measure voltage between generator terminal D (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Malfunction at the generator. Go to step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (such as damaged, pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
6	**INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between generator terminal D (harness-side) and body GND. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 8.
		No	Go to step 8.
7	**INSPECT GENERATOR CONTROL TERMINAL FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between generator terminal D (part-side) and body GND. • Is voltage **B+**?	Yes	Replace generator, then go to next step. (See 01–17–3 GENERATOR REMOVAL/INSTALLATION.)
		No	Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2504 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS equivalent. • Turn ignition switch to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01–02B–8 AFTER REPAIR PROCEDURE [AJ].) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
		No	Troubleshooting completed.

01–03A SYMPTOM TROUBLESHOOTING [ENGINE CONTROL SYSTEM (L3)]

FOREWORD [L3]

C6U010318881W36

- When the customer reports a vehicle malfunction, check the malfunction indicator lamp (MIL) indication and diagnostic trouble code (DTC), then diagnose the malfunction according to the following flowchart:
  —If a DTC exists, diagnose the applicable DTC inspection. (See 01-02A-13 DTC TABLE [L3].)
  —If no DTC exists and the MIL does not illuminate or flash, diagnose the applicable symptom troubleshooting. (See 01-03A-6 QUICK DIAGNOSTIC CHART [L3].)



C6U0103W500

*: Malfunction Indicator Lamp (MIL), Generator Warning Light, Security Light

INTERMITTENT CONCERN TROUBLESHOOTING [L3]

C6U010318881W37

Vibration Method

- If malfunction occurs or becomes worse while driving on a rough road or when engine is vibrating, perform the steps below.

Note

- There are several reasons vehicle or engine vibration could cause an electrical malfunction. Check the following:
  —Connectors not fully seated.
  —Wiring harnesses not having full play.
  —Wires laying across brackets or moving parts.
  —Wires routed too close to hot parts.
- An improperly routed, improperly clamped, or loose harness can cause wiring harness to become pinched between parts.
- The connector joints, points of vibration, and places where wiring harnesses pass through the firewall and body panels are the major areas to be checked.

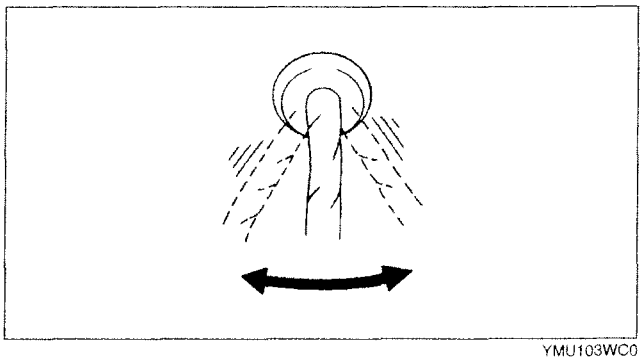
Inspection Method for Switch Connectors or Wires

1. Connect WDS or equivalent to DLC-2.
2. Turn ignition switch to ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps during idle.

3. Access PIDs for the switch you are inspecting.
4. Turn switch on manually.
5. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If PID value is unstable, check for poor connection.



YMU103WC0

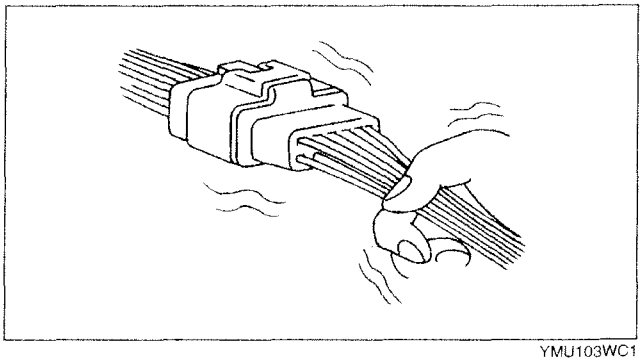
Inspection Method for Sensor Connectors or Wires

1. Connect WDS or equivalent to DLC-2.
2. Turn ignition switch to ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps during idle.

3. Access PIDs for the switch you are inspecting.
4. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If PID value is unstable, check for poor connection.



YMU103WC1

Inspection Method for Sensors

1. Connect WDS or equivalent to DLC-2.
2. Turn ignition switch to ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps during idle.

3. Access PIDs for the switch you are inspecting.
4. Vibrate the sensor slightly with your finger.
   - If PID value is unstable or malfunction occurs, check for poor connection or poorly mounted sensor or both.

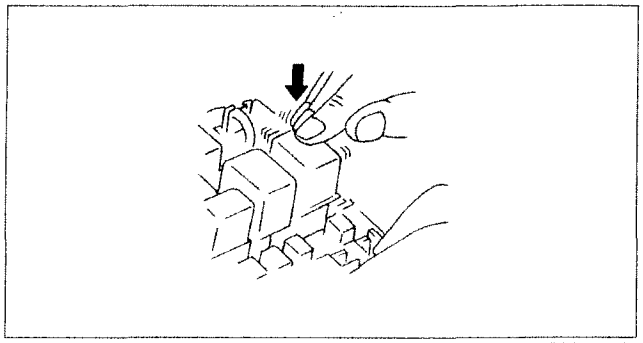
Inspection Method for Actuators or Relays

1. Connect WDS or equivalent to DLC-2.
2. Turn ignition switch to ON position (Engine OFF).

Note
- If engine starts and runs, perform the following steps during idle.

3. Prepare the output state control function for actuators or relays that you are inspecting.
4. Vibrate the actuator or relay with your finger for 3 seconds after output state control function is activated.
   - If variable click sound is heard, check for poor connection or poorly mounted actuator or both, or the relay.

Note
- Vibrating relays too strongly may result in open relays.



YMU103WC2

Water Sprinkling Method

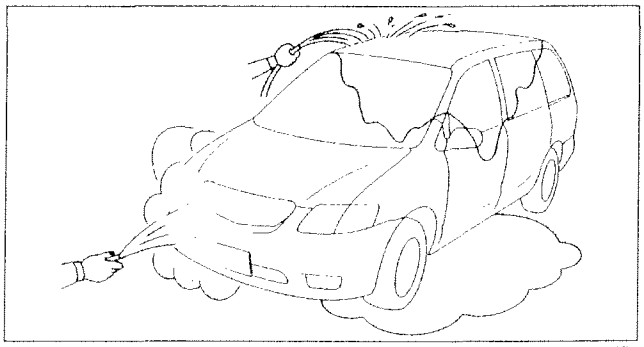
If malfunction occurs only during high humidity or rainy/snowy weather, perform the following steps:

Caution
- **Indirectly change the temperature and humidity by spraying water onto the front of the radiator.**
- **If a vehicle is subject to water leakage, the leakage may damage the control module. When testing a vehicle with a water leakage problem, special caution must be used.**

1. Connect WDS or equivalent to DLC-2 if you are inspecting sensors or switches.
2. Turn ignition switch to ON position (Engine OFF).

Note
- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for sensor or switch if you are inspecting sensors or switches.
4. If you are inspecting the switch, turn it on manually.
5. Spray water onto the vehicle or run it through a car wash.
   - If PID value is unstable or malfunction occurs, repair or replace part if necessary.



YMU103WC3

ENGINE SYMPTOM TROUBLESHOOTING [L3]

C6U010318881W38

- Confirm trouble symptom using the following diagnostic index, then go to appropriate troubleshooting chart.

Diagnostic Index

No.	TROUBLESHOOTING ITEM		DESCRIPTION
1	Melting of main or other fuses		—
2	MIL illuminates		MIL is illuminated.
3	Will not crank		Starter does not work.
4	Hard to start/long crank/erratic start/erratic crank		Starter cranks engine at normal speed but engine requires excessive cranking time before starting.
5	Engine stalls.	After start/at idle	Engine stops unexpectedly at idle or after start or both.
6	Cranks normally but will not start		Starter cranks engine at normal speed but engine will not run.
7	Slow return to idle		Engine takes more time than normal to return to idle speed.
8	Engine runs rough/rolling idle		Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively.
9	Fast idle/runs on		Engine speed continues at fast idle after warm-up. Engine runs after ignition switch is turned to OFF.
10	Low idle/stalls during deceleration		Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.
11	Engine stalls/quits.	Acceleration/cruise	Engine stops unexpectedly at beginning of acceleration or during acceleration. Engine stops unexpectedly while cruising.
	Engine runs rough.	Acceleration/cruise	Engine speed fluctuates during acceleration or cruising.
	Misses	Acceleration/cruise	Engine misses during acceleration or cruising.
	Buck/jerk	Acceleration/cruise/deceleration	Vehicle bucks/jerks during acceleration, cruising, or deceleration.
	Hesitation/stumble	Acceleration	Momentary pause at beginning of acceleration or during acceleration
	Surges	Acceleration/cruise	Momentary minor irregularity in engine output
12	Lack/loss of power	Acceleration/cruise	Performance is poor under load. (e.g., power down when climbing hills)
13	Knocking/pinging	Acceleration/cruise	Sound is produced when air/fuel mixture is ignited by something other than spark plug. (e.g., hot spot in combustion chamber)
14	Poor fuel economy		Fuel economy is unsatisfactory.
15	Emission compliance		Fails emissions test.
16	High oil consumption/leakage		Oil consumption is excessive.
17	Cooling system concerns	Overheating	Engine runs at higher than normal temperature/overheats.
18	Cooling system concerns	Runs cold	Engine does not reach normal operating temperature.
19	Exhaust smoke		Blue, black, or white smoke from exhaust system
20	Fuel odor (in engine compartment)		Gasoline fuel smell or visible leakage
21	Engine noise		Engine noise from under hood
22	Vibration concerns (engine)		Vibration from under hood or driveline
23	A/C does not work sufficiently.		A/C compressor magnetic clutch does not engage when A/C is turned on.
24	A/C is always on or A/C compressor runs continuously.		A/C compressor magnetic clutch does not disengage.
25	A/C is not cut off under WOT conditions.		A/C compressor magnetic clutch does not disengage under WOT.
26	Exhaust sulphur smell		Rotten egg smell (sulphur) from exhaust
27	Fuel refill concerns		Fuel tank does not fill smoothly.
28	Fuel filling shut off issues		Fuel does not shut off properly.
29	Constant voltage		Incorrect constant voltage
30	Spark plug condition		Incorrect spark plug condition
31	ATX concerns	Upshift/downshift engagement	ATX concerns not related to engine performance

QUICK DIAGNOSTIC CHART [L3]

C6U010318881W39

X: Applied

	Possible factor / Troubleshooting item		Starter motor malfunction (Mechanical or electrical)	Starter circuit including ignition switch is open.	Starter interlock switch malfunction (MTX)	Improper engine oil level	Low or dead battery	Charging system malfunction	Improper engine compression	Improper valve timing	Hydrolocked engine	Improper engine oil viscosity	Improper dipstick	Base engine malfunction	Drive plate or flywheel are seized.	Improper tension or damaged drive belts	Improper engine coolant level	Water and anti-freeze mixture is improper.	Cooling system malfunction (Radiator, hoses, overflow system, thermostat, etc.)	Cooling fan system malfunction	Engine or transaxle mounts are improperly installed.	Cooling fan or condenser fan seat are improper.	Accelerator position sensor misadjustment	Cruise control system operation improperly	Fuel quality
1	Melting of main or other fuses																								
2	MIL illuminates																								
3	Will not crank		x	x	x		x	x			x				x										
4	Hard to start/long crank/erratic start/erratic crank		x																						x
5	Engine stalls.	After start/at idle							x	x															x
6	Cranks normally but will not start								x	x															x
7	Slow return to idle																		x						
8	Engine runs rough/rolling idle								x	x															x
9	Fast idle/runs on																						x	x	
10	Low idle/stalls during deceleration																						x		
11	Engine stalls/quits.	Acceleration/cruise							x	x													x		x
	Engine runs rough.	Acceleration/cruise							x	x															x
	Misses	Acceleration/cruise							x	x															x
	Buck/jerk	Acceleration/cruise/ deceleration							x	x															x
	Hesitation/stumble	Acceleration							x	x															x
	Surges	Acceleration/cruise							x	x															x
12	Lack/loss of power	Acceleration/cruise							x	x															x
13	Knocking/pinging	Acceleration/cruise							x										x						
14	Poor fuel economy								x	x									x	x					x
15	Emission compliance								x	x				x					x						
16	High oil consumption/leakage											x	x	x											
17	Cooling system concerns	Overheating														x	x	x	x	x					
18	Cooling system concerns	Runs cold																	x	x					
19	Exhaust smoke								x					x					x						
20	Fuel odor (in engine compartment)																								
21	Engine noise					x								x		x									
22	Vibration concerns (engine)															x					x	x			
23	A/C does not work sufficiently.																								
24	A/C is always on or A/C compressor runs continuously.																								
25	A/C is not cut off under WOT conditions.																						x		
26	Exhaust sulphur smell																								x
27	Fuel refill concerns																								
28	Fuel filling shut off issues																								
29	Constant voltage																								
30	Spark plug condition								x																
31	ATX concerns	Upshift/downshift engagement	See Section 05-03A, TROUBLESHOOTING																						

B6U0103W002

X: Applied

Troubleshooting item		Possible factor	Variable valve timing system malfunction	VTCS malfunction	Engine overheating	Air cleaner element clogging or restriction	Air leakage from intake-air system (Loose tubes, cracks, gaskets breakage)	Electronic throttle control improper operation	Throttle body malfunction	VIS malfunction	VAD malfunction	Vacuum leakage (Vacuum hose damage, misrouting)	Ignition coil malfunction (e.g. open, short or cracks)	Initial ignition timing misadjustment (CKP sensor & crankshaft pulley misadjustment)	Spark plug malfunction	High-tension leads malfunction (Cracks, open)	CKP sensor is damaged. (e.g. open or short circuit)	Crankshaft pulley is damaged	Improper gap between CKP sensor and crankshaft	Fuel pump malfunction (Mechanically or electrically)	Pressure regulator malfunction	Fuel hoses restriction or clogging
1	Melting of main or other fuses																					
2	MIL illuminates		x	x				x		x							x					
3	Will not crank																					
4	Hard to start/long crank/erratic start/erratic crank					x	x	x				x			x	x	x	x	x	x	x	x
5	Engine stalls.	After start/at idle	x		x	x	x	x				x	x	x	x	x	x	x	x	x	x	x
6	Cranks normally but will not start		x		x	x	x	x				x	x	x	x	x	x	x	x	x	x	x
7	Slow return to idle								x													
8	Engine runs rough/rolling idle		x		x	x	x	x				x		x	x	x	x	x	x	x	x	x
9	Fast idle/runs on						x	x	x													
10	Low idle/stalls during deceleration						x	x				x										
11	Engine stalls/quits.	Acceleration/cruise		x	x	x	x	x	x			x			x	x	x	x	x	x	x	x
	Engine runs rough.	Acceleration/cruise		x	x	x	x	x	x			x			x	x	x	x	x	x	x	x
	Misses	Acceleration/cruise		x	x	x	x	x	x			x			x	x	x	x	x	x	x	x
	Buck/jerk	Acceleration/cruise/deceleration		x	x	x	x	x	x			x			x	x	x	x	x	x	x	x
	Hesitation/stumble	Acceleration		x	x	x	x	x	x			x			x	x	x	x	x	x	x	x
	Surges	Acceleration/cruise		x	x	x	x	x	x			x			x	x	x	x	x	x	x	x
12	Lack/loss of power	Acceleration/cruise	x	x	x	x	x	x	x	x		x			x	x	x	x	x	x	x	x
13	Knocking/pinging	Acceleration/cruise			x															x	x	
14	Poor fuel economy		x	x		x				x					x	x					x	
15	Emission compliance					x	x		x			x			x	x				x	x	x
16	High oil consumption/leakage																					
17	Cooling system concerns	Overheating																				
18	Cooling system concerns	Runs cold																				
19	Exhaust smoke					x							x		x	x				x	x	x
20	Fuel odor (in engine compartment)																				x	
21	Engine noise						x				x	x										
22	Vibration concerns (engine)																					
23	A/C does not work sufficiently.																					
24	A/C is always on or A/C compressor runs continuously.																					
25	A/C is not cut off under WOT conditions.																					
26	Exhaust sulphur smell											x								x	x	x
27	Fuel refill concerns																					
28	Fuel filling shut off issues																					
29	Constant voltage																					
30	Spark plug condition					x									x	x				x	x	x
31	ATX concerns	Upshift/downshift engagement	See Section 05-03A, TROUBLESHOOTING																			

B6U0103W003

X: Applied

	Possible factor / Troubleshooting item		Injectors malfunction (Leakage or clogging, inoperative)	Fuel leakage from fuel system (including insulator, injector O-ring)	Fuel filters restriction or clogging	CMP sensor is damaged. (e.g. open or short circuit)	Camshaft is damaged	Improper air/fuel mixture ratio control	Exhaust system restriction or clogging	Catalytic converter malfunction	EGR system malfunction	EVAP control system malfunction	PCV valve malfunction	Constant voltage supply circuit malfunction	Main relay malfunction (Mechanically or electrically)	ECT sensor malfunction	TR sensor misadjustment (ATX)	TR sensor malfunction (ATX)	Brake switch and related circuit malfunction	Manifold absolute pressure sensor and related circuit malfunction	HO2S and related circuit malfunction
1	Melting of main or other fuses																				
2	MIL illuminates					x		x								x	x		x	x	x
3	Will not crank																x	x			
4	Hard to start/long crank/erratic start/erratic crank				x	x	x	x	x		x	x	x								x
5	Engine stalls.	After start/at idle	x	x		x	x	x	x		x	x	x		x						x
6	Cranks normally but will not start		x	x				x	x		x	x	x	x	x						x
7	Slow return to idle															x					
8	Engine runs rough/rolling idle		x		x	x	x	x	x		x	x	x								x
9	Fast idle/runs on															x					
10	Low idle/stalls during deceleration							x				x						x	x		x
11	Engine stalls/quits.	Acceleration/cruise	x		x	x	x	x	x		x	x	x	x	x					x	x
	Engine runs rough.	Acceleration/cruise	x		x	x	x	x	x		x	x	x	x	x					x	x
	Misses	Acceleration/cruise	x		x	x	x	x	x		x	x	x	x	x					x	x
	Buck/jerk	Acceleration/cruise/deceleration	x		x	x	x	x	x		x	x	x	x	x					x	x
	Hesitation/stumble	Acceleration	x		x	x	x	x	x		x	x	x	x	x					x	x
	Surges	Acceleration/cruise	x		x	x	x	x	x		x	x	x	x	x					x	x
12	Lack/loss of power	Acceleration/cruise	x			x	x		x		x	x	x								
13	Knocking/pinging	Acceleration/cruise				x										x					
14	Poor fuel economy				x	x	x		x				x								
15	Emission compliance				x	x	x	x	x	x	x	x	x								x
16	High oil consumption/leakage												x								
17	Cooling system concerns	Overheating																			
18	Cooling system concerns	Runs cold																			
19	Exhaust smoke		x		x								x								
20	Fuel odor (in engine compartment)			x								x									
21	Engine noise																				
22	Vibration concerns (engine)																				
23	A/C does not work sufficiently.																				
24	A/C is always on or A/C compressor runs continuously.																				
25	A/C is not cut off under WOT conditions.																				
26	Exhaust sulphur smell				x							x									
27	Fuel refill concerns											x									
28	Fuel filling shut off issues											x									
29	Constant voltage													x					x		
30	Spark plug condition		x	x				x	x			x				x					x
31	ATX concerns	Upshift/downshift engagement	See Section 05-03A, TROUBLESHOOTING																		

B6U0103W004

X: Applied

	Possible factor / Troubleshooting item		IAT sensor and related circuit malfunction	Barometric pressure sensor malfunction	Neutral or clutch switch and related circuit malfunction (MTX)	MAF sensor and related circuit malfunction	Knock sensor and related circuit malfunction	TP sensor and related circuit malfunction	Accelerator position sensor and related circuit malfunction	P/S pressure switch and related circuit malfunction	Improper refrigerant charging amount	A/C relay (A/C control signal circuit malfunction)	A/C compressor magnetic clutch malfunction	Condenser fan system malfunction	Improper load signal input	Clutch slippage (MTX)	ATX related parts malfunction (ATX)	VSS and related circuit malfunction	Improper ATF level (ATX)	Brake dragging	Loose parts	Improper balance of wheels and tires	Drive line malfunction	Suspension malfunction	PATS operating	PATS or related circuit malfunction
1	Melting of main or other fuses																									
2	MIL illuminates		x	x	x	x	x	x		x								x								
3	Will not crank																								x	x
4	Hard to start/long crank/erratic start/erratic crank					x		x																		
5	Engine stalls.	After start/at idle		x							x	x													x	x
6	Cranks normally but will not start																								x	x
7	Slow return to idle																									
8	Engine runs rough/rolling idle			x						x	x	x		x	x											
9	Fast idle/runs on														x											
10	Low idle/stalls during deceleration				x	x		x	x			x	x													
11	Engine stalls/quits.	Acceleration/cruise		x		x		x	x		x	x				x	x	x								
	Engine runs rough.	Acceleration/cruise		x		x		x	x		x	x				x	x	x								
	Misses	Acceleration/cruise				x		x	x		x	x				x	x	x								
	Buck/jerk	Acceleration/cruise/deceleration				x		x	x		x	x				x	x	x								
	Hesitation/stumble	Acceleration		x		x		x	x		x	x				x	x	x								
	Surges	Acceleration/cruise				x		x	x		x	x				x	x	x								
12	Lack/loss of power	Acceleration/cruise				x		x	x		x	x				x	x	x		x						
13	Knocking/pinging	Acceleration/cruise	x			x	x																			
14	Poor fuel economy					x										x			x	x						
15	Emission compliance																									
16	High oil consumption/leakage																									
17	Cooling system concerns	Overheating									x	x		x												
18	Cooling system concerns	Runs cold												x												
19	Exhaust smoke																									
20	Fuel odor (in engine compartment)																									
21	Engine noise																				x					
22	Vibration concerns (engine)																				x	x	x	x		
23	A/C does not work sufficiently.										x	x	x													
24	A/C is always on or A/C compressor runs continuously.											x	x													
25	A/C is not cut off under WOT conditions.								x																	
26	Exhaust sulphur smell																									
27	Fuel refill concerns																									
28	Fuel filling shut off issues																									
29	Constant voltage			x					x																	
30	Spark plug condition					x																				
31	ATX concerns	Upshift/downshift engagement	See Section 05-03A, TROUBLESHOOTING																							

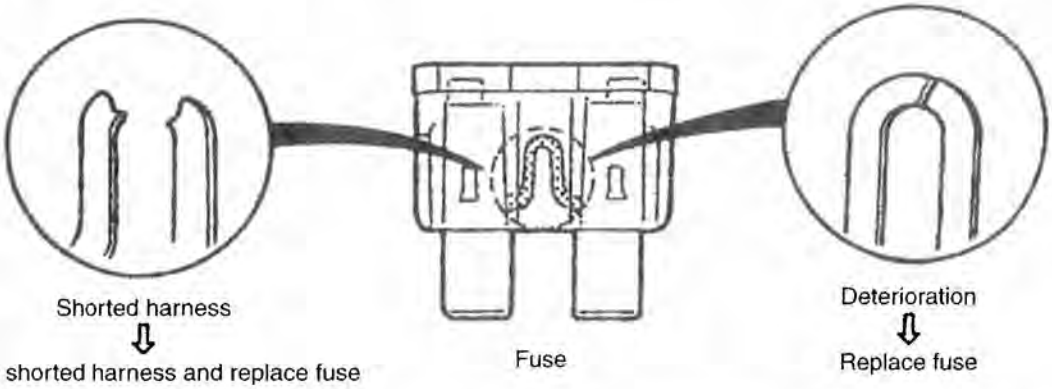
B6U0103W005

NO.1 MELTING OF MAIN OR OTHER FUSES [L3]

C6U010318881W40

1	MELTING OF MAIN OR OTHER FUSES

[TROUBLESHOOTING HINTS]
Inspect condition of fuse.



Damaged fuse	Related wiring harness
MAIN (100A)	**MAIN fuse** • IG KEY2 fuse • AD FAN fuse • FAN fuse • BTN fuse • Generator
ENG +B (10A)	**ENG +B fuse** • PCM
IG KEY1 (40A)	**IG KEY1 fuse** • Ignition switch — ENGINE IG fuse — METER IG fuse
IG KEY2 (30A)	**IG KEY2 fuse** • Ignition switch • Starter relay
ETC (7.5A)	**ETC fuse** • ETC relay — PCM
AD FAN (30A)	**AD FAN fuse** • Cooling fan relay No.1 — Cooling fan motor No.1 — Cooling fan motor No.2
FAN (30A)	**FAN fuse** • Cooling fan relay No.2 — Cooling fan motor No.1 • Cooling fan relay No.3 — Cooling fan motor No.1 — Cooling fan relay No.2
ENGINE IG (15A)	**ENGINE IG fuse** • PCM • Ignition coil • Capacitor
METER IG (15A)	**METER IG fuse** • Cooling fan relay No.1 — PCM • Cooling fan relay No.2 — PCM • Cooling fan relay No.3 — PCM • Cooling fan relay No.4 — PCM

Damaged fuse	Related wiring harness
ENG BAR (10A)	**ENG BAR fuse** • EGR valve • Purge solenoid valve • MAF/IAT sensor • Variable air duct control solenoid valve • OCV • Variable intake-air system control solenoid valve • Variable tumble control solenoid valve • EVAP system leak detection pump
ENG BAR2 (15A)	**ENG BAR2 fuse** • Heated oxygen sensor heater (front) • Heated oxygen sensor heater (rear)
INJ (15A)	**INJ fuse** • PCM • Fuel pump relay — PCM — Check connector • Fuel injectors • ETC relay — PCM
FUEL PUMP (20A)	**FUEL PUMP fuse** • Main relay — PCM • Fuel pump relay — Fuel pump
BTN (40A)	**BTN fuse** • ROOM fuse
ROOM (15A)	**ROOM fuse** • DLC

NO.2 MIL ILLUMINATES [L3]

C6U010318881W41

2	MIL ILLUMINATES
DESCRIPTION	MIL is illuminated.
POSSIBLE CAUSE	• PCM illuminates for emission-related concern (DTC is stored in PCM) • Instrument cluster malfunction **Note** • If MIL blinks at steady rate, misfire condition could possibly exist.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Inspect for short to GND circuit between instrument cluster and PCM terminal 2W. • Inspect instrument cluster operation. See Section T.
2	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.3 WILL NOT CRANK [L3]

C6U010318881W42

3	WILL NOT CRANK
DESCRIPTION	Starter does not work.
POSSIBLE CAUSE	• Open starter circuit between ignition switch and starter • TR switch malfunction (ATX) • TR switch misadjustment (ATX) • Low or dead battery. • Charging system malfunction. • Starter interlock switch malfunction (MTX). • Starter malfunction • Seized/hydrolocked engine, flywheel or drive plate • Immobilizer system (PATS) and/or circuit malfunction.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect WDS or equivalent to DLC-2. Do the following conditions appear? • Engine is not completely started. • DTC B1681 is displayed.	Yes	**Both conditions appear:** Go to Step 4.
		No	**Either or other condition appears:** Go to next step.
2	Is coil connector securely connected to coil?	Yes	Go to next step.
		No	Connect coil connector securely. Return to Step 1.
3	Does security light illuminate?	Yes	Go to next step.
		No	Inspect instrument cluster and wiring harness.
4	Connect WDS or equivalent to DLC-2 and retrieve DTC. **DTC** **B1213, B1342, B1600, B1601, B1602, B1681, B2103, B2431**	Yes	Go to appropriate DTC test.
		No	Go to next step.
5	Is there continuity between PCM GND terminals 4X, 2AB, 2AC and GND?	Yes	Go to next step.
		No	Repair or replace wiring harness.
6	Measure voltage between PCM GND terminals 4X, 2AB, 2AC and coil terminal C. Is the voltage **below 1.0 V**?	Yes	Go to next step.
		No	Repair or replace wiring harness.
7	Turn ignition switch to ON position. Access VPWR PID. Is VPWR PID okay? **Specification** **Battery voltage**	Yes	Go to next step.
		No	Repair or replace wiring harness.
8	Disconnect coil connector. Turn ignition switch to ON position. Is there battery voltage at coil connector terminal D (harness-side)?	Yes	Go to next step.
		No	Repair or replace wiring harness between coil connector terminal D and fuse panel.
9	Inspect for the following wiring harnesses and connectors: • Between coil terminal A and PCM terminal 2Q. • Between coil terminal B and PCM terminal 2T. Are there any malfunctions?	Yes	Repair or replace wiring harness.
		No	Go to next step.
10	Is there continuity between PCM terminal 4I and starter relay with clutch pedal depressed (MTX with starter interlock system), P or N position (ATX)?	Yes	Go to next step.
		No	Repair or replace wiring harness.
11	Inspect the following: • Battery connection • Battery condition • Transaxle is in Park or Neutral. (ATX) • Clutch is fully depressed. (MTX) • Fuses Are all items okay?	Yes	Go to next step.
		No	Service if necessary. Repeat Step 11.
12	Is clicking sound heard from starter when ignition switch is turned to START?	Yes	Go to next step.
		No	Go to Step 14.

STEP	INSPECTION	RESULTS	ACTION
13	Inspect starting system. (See 01–19–2 STARTER INSPECTION.) Is starting system okay?	Yes	Inspect for seized/hydrolocked engine, flywheel or drive plate. (See 05–10–18 FLYWHEEL INSPECTION.)
		No	Repair or replace components if required.
14	Do any other electrical accessories work?	Yes	Go to next step.
		No	Inspect charging system. (See 01–17–1 BATTERY INSPECTION.) (See 01–17–5 GENERATOR INSPECTION.)
15	**Note** • The following test should be performed on ATX only. For MTX, go to next step. Connect WDS or equivalent to DLC-2. Access TR PID. Turn ignition switch to ON position. Is TR PID indicated P/N when selecting P or N position?	Yes	Go to next step.
		No	Inspect adjustment of TR switch. If TR switch is adjusted properly, inspect for open circuit between TR switch and PCM terminal 1W or starter.
16	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test. **Communication error message is displayed:** Inspect for the following: • Open circuit between main relay and PCM terminal 2Y or 4V • Open circuit between main relay terminal E and PCM terminal 2X • Main relay is stuck open. • Open or poor GND circuit (PCM terminal 4X, 2AB or 2AC) • Poor connection of vehicle body GND
		No	**No DTC is displayed:** Inspect the following: • START circuit in ignition switch • Open circuit between ignition switch and starter • Starter interlock switch (MTX)
17	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.4 HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK [L3]

C6U010318881W43

4	HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK
DESCRIPTION	• Starter cranks engine at normal speed but engine requires excessive cranking time before starting. • Battery is in normal condition.
POSSIBLE CAUSE	• Spark leakage from high-tension leads • Vacuum leakage • Poor fuel quality • Starting system malfunction • Spark plug malfunction • Air leakage from intake-air system • Erratic signal from CKP sensor • Erratic signal from CMP sensor • Improper air/fuel mixture ratio control • Air cleaner restriction • Improper operation of electronic throttle control system • PCV valve malfunction • Inadequate fuel pressure • Purge solenoid valve malfunction • MAF sensor contamination • Restriction in exhaust system • EGR valve malfunction • Pressure regulator malfunction **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for the following: • Vacuum leakage • Proper fuel quality (e.g. proper octane, contamination, winter/summer blend) • Loose bands on intake-air system • Cracks on intake-air system parts • Air cleaner restriction Are all items okay?	Yes	Go to next step.
		No	Service if necessary. Repeat Step 1.
2	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
3	Is engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns – Overheating".
		No	Go to next step.
4	Inspect for cracks on high-tension leads. Are there any cracks on high-tension leads?	Yes	Repair suspected high-tension leads.
		No	Go to next step.
5	Inspect spark plug conditions. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from fuel injector. **Spark plug is grayish white:** Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.

STEP	INSPECTION	RESULTS	ACTION
6	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
7	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
8	Attempt to start engine at part throttle. Does engine run smoothly at part throttle?	Yes	Inspect electronic throttle control system operation.
		No	Go to next step.
9	Install fuel pressure gauge between fuel pipe and fuel distributor. Short check connector terminal F/P to body GND using a jumper wire. Turn ignition switch to ON position. Is fuel line pressure correct with ignition switch ON? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump relay and fuel pump circuit. Inspect for clogged fuel line. If okay, replace fuel pump unit. **High:** Replace fuel pump unit.
10	Is fuel line pressure held after ignition switch is turned OFF? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Go to next step.
		No	Inspect fuel injector. If fuel injector is okay, replace fuel pump unit.
11	Disconnect a vacuum hose from purge solenoid valve and plug opening end of vacuum hose. Attempt to start engine. Is starting condition improved?	Yes	Inspect if purge solenoid valve is stuck open.
		No	Go to next step.
12	Inspect MAF sensor for contamination. Is there any contamination?	Yes	Replace MAF sensor.
		No	Go to next step.
13	Is there restriction in exhaust system?	Yes	Inspect exhaust system.
		No	Go to next step.
14	Inspect engine condition while tapping EGR valve housing. Does engine condition improve?	Yes	Replace EGR valve.
		No	Go to next step.
15	Inspect starting system. (See 01–19–2 STARTER INSPECTION.) Is starting system normal?	Yes	Inspect for loose connectors or poor terminal contact. If okay, remove EGR valve and visually inspect for mechanically stuck EGR valve.
		No	Repair or replace components as required.
16	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.5 ENGINE STALLS-AFTER START/AT IDLE [L3]

C6U010318881W44

5	ENGINE STALLS—AFTER START/AT IDLE
DESCRIPTION	• Engine stops unexpectedly.
POSSIBLE CAUSE	• A/C system operation is improper • Air leakage from intake-air system parts • Purge solenoid valve malfunction • Improper operation of electronic throttle control system • EGR valve malfunction • No signal from CKP sensor due to sensor, related wire or wrong installation • Vacuum leakage • Engine overheating • Low engine compression • Spark leakage from high-tension leads • Poor fuel quality • PCV valve malfunction • Air cleaner restriction • Restriction in exhaust system • Electrical connector disconnection • Open or short circuit in fuel pump body and related harness • No battery power supply to PCM or poor GND • Inadequate fuel pressure • Fuel pump body mechanical malfunction • Fuel leakage from fuel injector • Fuel injector clogging • Ignition coil malfunction • Improper air/fuel mixture ratio control • Improper valve timing • Improper operation variable valve timing control system • Immobilizer system (PATS) and/or circuit malfunction • Pressure regulator malfunction **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect WDS or equivalent to DLC-2. Do the following conditions appear? • Engine is not completely started. • DTC B1681 is displayed.	Yes	**Both conditions appear:** Go to Step 3.
		No	**Either or other condition appears:** Go to next step.
2	Does engine stall after **approx. 2 seconds** since engine is started?	Yes	Go to next step.
		No	Immobilizer system is okay. Go to Step 10.
3	Is coil connector securely connected to coil?	Yes	Go to next step.
		No	Connect coil connector securely. Return to Step 2.
4	Does security light illuminate?	Yes	Go to next step.
		No	Inspect instrument cluster and wiring harness.

STEP	INSPECTION	RESULTS	ACTION
5	Connect WDS or equivalent to DLC-2 and retrieve DTC. Are any of the following DTCs displayed? **DTC** **B1213, B1342, B1600, B1602, B1681, B2103, B2431**	Yes	Go to appropriate DTC test.
		No	Go to next step.
6	Is there continuity between PCM GND terminals 4X, 2AB, 2AC and GND?	Yes	Go to next step.
		No	Repair or replace wiring harness.
7	Measure voltage between PCM GND terminals 4X, 2AB, 2AC and coil terminal C. Is voltage **below 1.0 V**?	Yes	Go to next step.
		No	Repair or replace wiring harness.
8	Turn ignition switch to ON position. Access VPWR PID. Is VPWR PID okay? **VPWR PID** **Battery voltage**	Yes	Go to next step.
		No	Repair or replace wiring harness.
9	Disconnect coil connector. Turn ignition switch to ON position. Is there battery voltage at coil connector terminal D?	Yes	Inspect for the following: • Open or short circuit between coil terminal A and PCM terminal 2Q. • Open or short circuit between coil terminal B and PCM terminal 2T.
		No	Repair or replace wiring harness between coil connector terminal D and fuse panel.
10	Verify the following: • Vacuum connection • Air cleaner element • No air leakage from intake-air system • No restriction of intake-air system • Proper sealing of intake manifold and components attached to intake manifold: EGR valve • Ignition wiring • Fuel quality: proper octane, contamination, winter/summer blend • Electrical connections • Smooth operation of throttle valve Are all items okay?	Yes	Go to next step.
		No	Service if necessary. Repeat Step 10.
11	Turn ignition switch to OFF position. Disconnect TP sensor connector. Measure voltage at TP sensor connector VREF terminals with ignition switch ON. **Voltage** **4.5—5.5 V** Is voltage okay?	Yes	Go to next step.
		No	Inspect and repair open or short circuit between PCM terminal 3N and TP sensor VREF terminals.
12	Turn ignition switch to OFF position. Disconnect accelerator position sensor connector. Measure voltage at accelerator position sensor connector VREF terminals with ignition switch to ON position. **Voltage** **4.5—5.5 V** Is voltage okay?	Yes	Go to next step.
		No	Inspect and repair open or short circuit for the following: • PCM terminal 2K and accelerator position sensor terminal A • PCM terminal 3G and accelerator position sensor terminal D

STEP	INSPECTION	RESULTS	ACTION
13	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test. **Communication error message is displayed:** Inspect for the following: • Open circuit between main relay and PCM terminal 2Y or 4V • Open main relay GND circuit • Main relay is stuck open. • Open or poor GND circuit (PCM terminal 4X, 2AB or 2AC) • Poor connection of vehicle body GND
		No	**No DTC is displayed:** Go to next step.
14	Start engine at part throttle. Does engine run smoothly at part throttle?	Yes	Inspect electronic throttle control system operation. (See 01–03A–62 Electronic Throttle Control System Inspection.)
		No	Go to next step.
15	Connect WDS or equivalent to DLC-2. Access RPM PID. Is RPM PID indicating engine speed during engine cranking?	Yes	Go to next step.
		No	Inspect for the following: • Open or short circuit in CKP sensor • Open or short circuit between CKP sensor and PCM terminal 2C or 2D • Open or short circuit in CKP sensor harnesses If CKP sensor and harness are okay, go to next step.
16	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
17	Inspect for cracks on high-tension leads. Are there any cracks on high-tension leads?	Yes	Repair suspected high-tension leads.
		No	Go to next step.
18	Is strong blue spark visible at each disconnected high-tension lead while cranking engine?	Yes	Go to next step. If symptom occurs with A/C on, go to Step 23.
		No	Inspect for the following: • Open or short circuit in ignition coil • Open circuit in high-tension leads • Open circuit between ignition coil connector GND terminal and body GND • Open circuit between ignition switch and ignition coil • Open circuit between ignition coil and PCM terminal 1A or 1B
19	Inspect spark plug condition. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from injector. **Spark plug is grayish white:** Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
20	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
21	Inspect for restriction in the exhaust system. Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.
22	Install fuel pressure gauge between fuel pipe and fuel distributor. Short check connector terminal F/P to body GND using a jumper wire. Turn ignition switch to ON position. Is fuel line pressure correct with ignition switch ON? (See 01–14–6 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump relay and fuel pump circuit. Inspect for clogged fuel line. If okay, replace fuel pump unit. **High:** Replace fuel pump unit.

STEP	INSPECTION	RESULTS	ACTION
23	Visually inspect for fuel leakage at fuel injector O-ring and fuel line. Service if necessary. Is fuel line pressure held after ignition switch is turned off? (See 01–14–6 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Inspect fuel injector. If fuel injector is okay, replace fuel pump unit.
24	**Note** • The following test is for stall concerns with A/C on. If other symptoms exist, go to next step. Connect pressure gauges to A/C low and high pressure side lines. Turn A/C on and measure low side and high side pressures. Are pressures within specifications? (See 07–10–3 REFRIGERANT PRESSURE CHECK.)	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously". For other symptoms, inspect the following: • Refrigerant charging amount • Condenser fan operation
25	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid side. Plug opening end of vacuum hose. Start engine. Is engine stall now eliminated?	Yes	Inspect if purge solenoid valve sticks open. Inspect evaporative emission control system.
		No	Go to next step.
26	Is air leakage felt or heard at intake-air system components while racing engine to higher speed?	Yes	Repair or replace.
		No	Go to next step.
27	Inspect engine condition while tapping EGR valve housing. Does engine condition improve?	Yes	Replace EGR valve.
		No	Go to next step.
28	Inspect variable valve timing control system operation. (See 01–03A–69 Variable Valve Timing Control System Operation Inspection.) Does variable valve timing control work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts according to variable valve timing control system operation inspection results.
29	Is engine compression correct?	Yes	Inspect valve timing.
		No	Inspect for cause.
30	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.6 CRANKS NORMALLY BUT WILL NOT START [L3]

C6U010318881W45

6	CRANKS NORMALLY BUT WILL NOT START
DESCRIPTION	• Starter cranks engine at normal speed but engine will not run. • Refer to symptom troubleshooting "No.5 Engine stalls" if this symptom appears after engine stall. • Fuel is in tank. • Battery is in normal condition.
POSSIBLE CAUSE	• No battery power supply to PCM • Air leakage from intake-air system • Open PCM GND or vehicle body GND • Improper operation of electronic throttle control system • EGR valve malfunction • No signal from CKP sensor due to sensor, related wire or incorrect installation • No signal from CMP sensor due to sensor, related wire or incorrect installation • Low engine compression • Engine overheating • Vacuum leakage • Spark leakage from high-tension leads • Improper air/fuel mixture ratio control • Poor fuel quality • PCV valve malfunction • Air cleaner restriction • Restriction in exhaust system • Disconnected electrical connector • Open or short circuit in fuel pump body and related harness • Inadequate fuel pressure • Fuel pump mechanical malfunction • Fuel leakage from injector • Fuel injector is clogged. • Purge solenoid valve malfunction • Spark plug malfunction • Ignition coil malfunction • Improper variable valve timing control system operation • Improper valve timing • Immobilizer system (PATS) and/or circuit malfunction • Pressure regulator malfunction **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect WDS or equivalent to DLC-2. Do any of the following conditions appear? • Engine does not completely start. • DTC B1681 is displayed.	Yes	**Both conditions appear:** Go to Step 3.
		No	**Either or other condition appears:** Go to next step.
2	Does engine stall after **approx. 2 s** from when it is started?	Yes	Go to next step.
		No	Immobilizer system is okay. Go to Step 10.
3	Is coil connector securely connected to coil?	Yes	Go to next step.
		No	Connect coil connector securely. Return to Step 2.
4	Does security light illuminate?	Yes	Go to next step.
		No	Inspect instrument cluster and wiring harness.
5	Connect WDS equivalent to DLC-2 and retrieve DTC. Are any of the following DTCs displayed? **DTC** **B1213, B1342, B1600, B1601, B1602, B1681, B2103, B2431**	Yes	Go to appropriate DTC test.
		No	Go to next step.
6	Is there continuity between PCM GND terminals 4X, 2AB, 2AC and GND?	Yes	Go to next step.
		No	Repair or replace wiring harness.
7	Measure voltage between PCM GND terminals 4X, 2AB, 2AC and coil terminal C. Is voltage **below 1.0 V**?	Yes	Go to next step.
		No	Repair or replace wiring harness.
8	Turn ignition switch to ON position. Access VPWR PID. Is VPWR PID okay? **VPWR PID** **Battery voltage**	Yes	Go to next step.
		No	Repair or replace wiring harness.
9	Disconnect coil connector. Turn ignition switch to ON position. Is there battery voltage at coil connector terminal D?	Yes	Inspect for the following: • Open or short circuit between coil terminal A and PCM terminal 2Q • Open or short circuit between coil terminal B and PCM terminal 2T
		No	Repair or replace wiring harness between coil connector terminal D and fuse panel.
10	Verify the following: • Vacuum connection • External fuel shut off or accessory (such as kill switch, alarm) • Fuel quality: proper octane, contamination, winter/summer blend • No air leakage from intake-air system • Proper sealing of intake manifold and components attached to intake manifold: EGR valve • Ignition wiring • Electrical connections • Fuses • Smooth operation of throttle valve Are all items okay?	Yes	Go to next step.
		No	Service if necessary. Repeat Step 10.
11	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test. **Communication error message is displayed:** Inspect for the following: • Open circuit between main relay and PCM terminal 2Y or 4V • Open main relay GND circuit • Main relay is stuck open. • Open or poor GND circuit (PCM terminal 4X, 2AB, or 2AC) • Poor connection of vehicle body GND
		No	**No DTC is displayed:** Go to next step.

STEP	INSPECTION	RESULTS	ACTION
12	Turn ignition switch to OFF position. Disconnect TP sensor connector. Measure voltage at TP sensor connector VREF terminal with ignition switch to ON position. **Voltage** **4.5—5.5 V** Is voltage okay?	Yes	Go to next step.
		No	Inspect and repair open or short circuit between PCM terminal 3N and TP sensor VREF terminals.
13	Turn ignition switch to OFF position. Disconnect accelerator position sensor connector. Measure voltage at accelerator position sensor connector VREF terminals with ignition switch to ON position. **Voltage** **4.5—5.5 V** Is voltage okay?	Yes	Go to next step.
		No	Inspect and repair open or short circuit for the following: • PCM terminal 2K and accelerator position sensor terminal A • PCM terminal 3G and accelerator position sensor terminal D
14	Does engine start with throttle closed?	Yes	Go to Step 29.
		No	Go to next step.
15	Will engine start and run smoothly at part throttle?	Yes	Inspect electronic throttle control system operation. (See 01–03A–62 Electronic Throttle Control System Inspection.)
		No	Go to next step.
16	Connect WDS or equivalent to DLC-2. Access RPM PID. Is RPM PID indicating engine speed when cranking engine?	Yes	Go to next step.
		No	Inspect for the following: • Open or short circuit in CKP sensor • Open or short circuit between CKP sensor and PCM terminal 1A or 1B • Open or short circuit in CKP sensor harnesses If CKP sensor and harness are okay, go to next step.
17	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
18	Inspect for cracks on high-tension leads. Is there any crack on high-tension leads?	Yes	Repair suspected high-tension leads.
		No	Go to next step.
19	Is strong blue spark visible at each disconnected high-tension lead while cranking engine?	Yes	Go to next step.
		No	Inspect for the following: • Open or short circuit in ignition coil • Open circuit in high-tension leads • Open circuit between ignition coil connector GND terminal and GND • Open circuit between ignition switch and ignition coil • Open circuit between ignition coil and PCM terminal 1A or 1B
20	Inspect spark plug conditions. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from injector. **Spark plug is grayish white:** Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
21	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
22	Inspect for restriction in exhaust system.	Yes	Inspect exhaust system.
		No	Go to next step.

STEP	INSPECTION	RESULTS	ACTION
23	Install fuel pressure gauge between fuel pipe and fuel distributor. Short check connector terminal F/P to body GND using a jumper wire. Turn ignition switch to ON position. Is fuel line pressure correct when ignition switch is turned on/off **five times**? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump relay and fuel pump circuit. Inspect for clogged fuel line. If okay, replace fuel pump unit. **High:** Replace fuel pump unit.
24	Visually inspect for fuel leakage at fuel injector O-ring and fuel line. Service if necessary. Is fuel line pressure held after ignition switch is turned off? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Go to next step.
		No	Inspect fuel injector. If fuel injector is okay, replace fuel pump unit.
25	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Attempt to start engine. Is starting condition improved?	Yes	Inspect if purge solenoid valve sticks open mechanically. Inspect evaporative emission control system.
		No	Go to next step.
26	Is air leakage felt or heard at intake-air system components while racing engine to higher speed?	Yes	Repair or replace.
		No	Go to next step.
27	Inspect engine condition while tapping EGR valve housing. Is engine condition improved?	Yes	Replace EGR valve.
		No	Go to next step.
28	Inspect variable valve timing control system operation. (See 01–03A–69 Variable Valve Timing Control System Operation Inspection.) Does variable valve timing control work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
29	Is engine compression correct?	Yes	Inspect valve timing.
		No	Inspect for causes.
30	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.7 SLOW RETURN TO IDLE [L3]

C6U010318881W46

7	SLOW RETURN TO IDLE
DESCRIPTION	Engine takes more time than normal to return to idle speed.
POSSIBLE CAUSE	• ECT sensor malfunction • Thermostat is stuck open. • Throttle body malfunction • Air leakage from intake-air system

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
2	Remove thermostat and inspect operation. (See 01–12–9 THERMOSTAT REMOVAL/ INSTALLATION.) (See 01–12–10 THERMOSTAT INSPECTION.) Is thermostat okay?	Yes	ECT and thermostat are okay. Go to next step.
		No	Access ECT PID on WDS or equivalent. Inspect for both ECT PID and temperature gauge on instrument cluster readings. If temperature gauge on instrument cluster indicates normal range but ECT PID is not same as temperature gauge reading, inspect ECT sensor. If temperature gauge on instrument cluster indicates cold range but ECT PID is normal, inspect temperature gauge and heat gauge unit.
3	Is throttle body free of contamination?	Yes	Inspect for air leakage from intake-air system components while racing engine to higher speed.
		No	Clean or replace throttle body.
4	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.8 ENGINE RUNS ROUGH/ROLLING IDLE [L3]

C6U010318881W47

8	ENGINE RUNS ROUGH/ROLLING IDLE
DESCRIPTION	• Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively. • Idle speed is too slow and engine shakes excessively.
POSSIBLE CAUSE	• Air leakage from intake-air system parts • A/C system operation is improper • Spark leakage from high-tension leads • Spark plug malfunction • Purge solenoid valve malfunction • Improper operation of electronic throttle control system • EGR valve malfunction • Erratic or no signal from CMP sensor • Low engine compression • Improper valve timing • Improper variable valve timing control system operation • Erratic signal from CKP sensor • Poor fuel quality • PCV valve malfunction • Air cleaner restriction • Restriction in exhaust system • Disconnected electrical connectors • Inadequate fuel pressure • Fuel pump body mechanical malfunction • Improper load signal input • Fuel line restriction or clogging • Improper fuel injection control operation • Fuel leakage from fuel injector • Fuel injector clogging • Engine overheating • Vacuum leakage • Pressure regulator malfunction **Warning** **The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing the fuel system:** **• Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **• Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** **• Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Verify the following: • External fuel shut off or accessory (such as kill switch, alarm.) • Fuel quality (e.g. proper octane, contamination, winter/summer blend) • No air leakage from intake-air system • Proper sealing of intake manifold and components attached to intake manifold: EGR valve • Ignition wiring • Electrical connections • Fuses • Smooth operation of throttle valve Are all items okay?	Yes	Go to next step.
		No	Service if necessary. Repeat Step 1.
2	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
3	Is engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating".
		No	Go to next step.
4	**Note** • The following test is for engine running at rough idle with A/C on. If other symptoms exist, go to next step. Connect pressure gauge to A/C low and high pressure side lines. Start engine and idle it. Turn A/C switch on. Measure low side and high side pressures. Are pressures within specifications? (See 07–10–3 REFRIGERANT PRESSURE CHECK.)	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously". For other symptoms, inspect the following: • Refrigerant charging amount • Condenser fan operation
5	**Note** • The following test is for engine running rough with P/S on. If other symptoms exist, go to next step. Start engine and idle it. • Measure voltage at PCM terminal 1Z. (See 01–40A–7 PCM INSPECTION [L3].) • Is voltage okay?	Yes	Go to next step.
		No	Inspect power steering pressure switch operation and wiring harness between P/S pressure switch connector and PCM terminal 1Z.
6	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
7	Inspect for cracks on high-tension leads. Are there any cracks on high-tension leads?	Yes	Repair suspected high-tension leads.
		No	Go to next step.
8	Inspect spark plug condition. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from injector. **Spark plug is grayish white:** Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
9	Perform electronic throttle control system operation inspection. (See 01–03A–62 Electronic Throttle Control System Inspection.) Does electronic throttle control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to electronic throttle control system operation inspection results.

STEP	INSPECTION	RESULTS	ACTION
10	Install fuel pressure gauge between fuel pipe and fuel distributor. Start engine and idle it. Measure fuel line pressure during idle. Is fuel line pressure correct during idle? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Go to next step.
		No	**Zero or low:** Inspect for clogged fuel line. If okay, replace fuel pump unit. **High:** Replace fuel pump unit.
11	Visually inspect for fuel leakage at fuel injector, O-ring, and fuel line. Service if necessary. Does fuel line pressure hold after ignition switch is turned off? (See 01–14–6 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Inspect fuel injector. If fuel injector is okay, replace fuel pump unit.
12	Connect WDS or equivalent to DLC-2. Start the engine and idle it. Access LONG FT1 PID. Measure LONG FT1 PID during idle. Is PID value between **–14% and +14%**?	Yes	Go to next step.
		No	LONG FT1 PID is out of specification. Less than specification (too rich): • Inspect EVAP control system. — If system is okay, go to Step 14. Greater than specification (too lean): • Inspect for air leakage at intake-air system components. — If system is okay, go to next step.
13	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Start engine. Does engine condition improve?	Yes	Check if purge solenoid valve sticks open mechanically. Inspect EVAP control system.
		No	Go to next step.
14	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
15	Inspect for restriction in exhaust system. Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.
16	Visually inspect CMP sensor and teeth of camshaft. Are CMP sensor and teeth of camshaft okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
17	Inspect engine condition while tapping EGR valve housing. Does engine condition improve?	Yes	Replace EGR valve.
		No	Go to next step.
18	Inspect variable valve timing control system operation. (See 01–03A–69 Variable Valve Timing Control System Operation Inspection.) Does variable valve timing control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
19	Is engine compression correct?	Yes	Inspect valve timing.
		No	Inspect for causes.
20	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.9 FAST IDLE/RUNS ON [L3]

C6U010318881W48

9	FAST IDLE/RUNS ON
DESCRIPTION	• Engine speed continues during fast idle after warm-up. • Engine runs after ignition switch is turned off.
POSSIBLE CAUSE	• ECT sensor malfunction • Air leakage from intake-air system • Throttle body malfunction • Accelerator position sensor misadjustment • Cruise control system operation improperly • Improper load signal input • Improper operation of electronic throttle control system

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect WDS or equivalent to DLC-2. Access ECT PID. Start and warm up engine to normal operating temperature. Is ECT PID reading between **82—112°C {180—234°F}**?	Yes	Go to next step.
		No	**ECT PID is higher than 112°C {234°F}:** Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating". **ECT PID is less than 82°C {180°F}:** Go to symptom troubleshooting "No.18 Cooling system concerns - Runs cold".
2	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
3	Measure voltages at PCM terminal 1AC, 1Q, 1R (MTX), 1W and 1Z. (See 01–40A–7 PCM INSPECTION [L3].) Is voltage okay?	Yes	Go to next step.
		No	**If PCM terminal 1AC voltage is not specified:** Inspect A/C switch, refrigerant pressure switch and fan switch. **If PCM terminal 1Q voltage is not specified:** Inspect refrigerant pressure switch (middle pressure). **If PCM terminal 1R voltage is not specified:** Inspect clutch switch. **If PCM terminal 1W voltage is not specified:** Inspect neutral switch (MTX), TR switch (ATX). **If PCM terminal 1Z voltage is not specified:** Inspect P/S pressure switch.
4	Is there air leakage felt or heard at intake-air system components while racing engine to higher speed?	Yes	Repair or replace parts if necessary.
		No	Inspect the following: • Electronic throttle control system operation • Accelerator position sensor adjustment
5	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.10 LOW IDLE/STALLS DURING DECELERATION [L3]

C6U010318881W49

10	LOW IDLE/STALLS DURING DECELERATION
DESCRIPTION	• Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.
POSSIBLE CAUSE	• Vacuum leakage • Improper operation of electronic throttle control system • Air leakage from intake-air system • Improper air/fuel mixture ratio control • Evaporative emission control system malfunction • Accelerator position sensor or related circuit malfunction • Accelerator position sensor misadjustment • TP sensor or related circuit malfunction • MAF sensor or related circuit malfunction • Brake switch or related circuit malfunction • Neutral/clutch switch or related circuit malfunction (MTX) • TR switch or related circuit malfunction (ATX) • Improper A/C magnetic clutch operation

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Does engine idle roughly?	Yes	Go to symptom troubleshooting "No.8 Engine runs rough/rolling idle".
		No	Go to next step.
2	Turn off A/C switch and fan switch. Does A/C magnetic clutch engage?	Yes	Go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously."
		No	Go to next step.
3	Verify the following: • Proper routing of and no damage to vacuum lines • No air leakage from intake-air system Are all items okay?	Yes	Go to next step.
		No	Service if necessary. Repeat Step 3.
4	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
5	Perform electronic throttle control system operation inspection. (See 01–03A–62 Electronic Throttle Control System Inspection.) Does electronic throttle control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to electronic throttle control system operation inspection results.
6	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Drive vehicle. Does engine condition improve?	Yes	Inspect evaporative emission control system.
		No	Go to next step.
7	Connect WDS or equivalent to DLC-2. Access APP1, APP2, TP_REL, MAF and VSS PIDs. Monitor each PID while driving vehicle. (See 01–40A–7 PCM INSPECTION [L3].) Are PIDs okay?	Yes	Go to next step.
		No	**APP1, APP2 PIDs:** Inspect accelerator position sensor. **TP_REL PID:** Inspect TP sensor. **MAF PID:** Inspect MAF sensor. **VSS PID:** Inspect VSS.
8	Measure voltage at PCM terminal 1K, 1R (MTX) and 1W. (See 01–40A–7 PCM INSPECTION [L3].) Is voltage okay?	Yes	Intermittent concern exists. (See 01–03A–2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].)
		No	**If PCM terminal 1K voltage is not as specified:** Inspect brake switch. **If PCM terminal 1R voltage is not as specified:** Inspect clutch switch. **If PCM terminal 1W voltage is not as specified:** Inspect neutral switch (MTX), TR switch (ATX).

STEP	INSPECTION	RESULTS	ACTION
9	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.11 ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES [L3]

C6U010318881W50

11	**ENGINE STALLS/QUITS — ACCELERATION/CRUISE** **ENGINE RUNS ROUGH — ACCELERATION/CRUISE** **MISSES — ACCELERATION/CRUISE** **BUCK/JERK — ACCELERATION/CRUISE/DECELERATION** **HESITATION/STUMBLE — ACCELERATION** **SURGES — ACCELERATION/CRUISE**
DESCRIPTION	• Engine stops unexpectedly at beginning of acceleration or during acceleration. • Engine stops unexpectedly while cruising. • Engine speed fluctuates during acceleration or cruising. • Engine misses during acceleration or cruising. • Vehicle bucks/jerks during acceleration, cruising, or deceleration. • Momentary pause at beginning of acceleration or during acceleration • Momentary minor irregularity in engine output

11	**ENGINE STALLS/QUITS — ACCELERATION/CRUISE** **ENGINE RUNS ROUGH — ACCELERATION/CRUISE** **MISSES — ACCELERATION/CRUISE** **BUCK/JERK — ACCELERATION/CRUISE/DECELERATION** **HESITATION/STUMBLE — ACCELERATION** **SURGES — ACCELERATION/CRUISE**
POSSIBLE CAUSE	• A/C system operation is improper. • Erratic signal or no signal from CMP sensor • Air leakage from intake-air system parts • Purge solenoid valve malfunction • Improper operation of electronic throttle control system • EGR valve malfunction • Erratic signal from CKP sensor • Low engine compression • Vacuum leakage • Poor fuel quality • Main relay intermittent malfunction • Throttle body malfunction • Engine overheating • Spark plug malfunction • Improper air/fuel mixture ratio control operation • Improper VTCS operation • Spark leakage from high-tension leads • Air cleaner restriction • PCV valve malfunction • Improper valve timing due to jumping out timing belt • Restriction in exhaust system • Intermittent open or short in fuel body pump circuit • Inadequate fuel pressure • Fuel pump mechanical malfunction • Fuel leakage from fuel injector • Fuel injector clogging • Fuel line restriction or clogging • Pressure regulator malfunction • Accelerator position sensor misadjustment • TP sensor misadjustment • Intermittent open or short of MAF sensor, TP sensor, Accelerator position sensor and VSS • ATX malfunction (ATX) • Clutch slippage (MTX) • Improper VIS operation **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Verify the following: • Vacuum connection • Air cleaner element • No air leakage from intake-air system • No restriction of intake-air system • Proper sealing of intake manifold and components attached to intake manifold: such as EGR valve • Ignition wiring • Fuel quality (e.g. proper octane, contamination, winter/summer blend) • Electrical connections • Smooth operation of throttle valve Are all items okay?	Yes	Go to next step.
		No	Service if necessary. Repeat Step 1.
2	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
3	Is engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating".
		No	Go to next step.
4	Connect WDS or equivalent to DLC-2. Access APP1, APP2, RPM, VPWR, MAF, TP_REL and VSS PIDs. Drive vehicle with monitoring PIDs. Are PIDs within specifications? (See 01–40A–7 PCM INSPECTION [L3].)	Yes	Go to next step.
		No	**APP1, APP2 PIDs:** Inspect if output signal from accelerator position sensor changes smoothly. **RPM PID:** Inspect CKP sensor and related harness for vibration or intermittent open/short circuit. **VPWR PID:** Inspect for open circuit intermittently. **MAF PID:** Inspect for open circuit of MAF sensor and related wire harness intermittently. **TP_REL PID:** Inspect if output signal from TP sensor changes smoothly. **VSS PID:** Inspect for open circuit of VSS and related wire harness intermittently.
5	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
6	Inspect spark plug conditions. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from fuel injector. **Spark plug is grayish white:** Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
7	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
8	Perform electronic throttle control system operation inspection. (See 01–03A–62 Electronic Throttle Control System Inspection.) Does electronic throttle control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to electronic throttle system operation inspection results.
9	Inspect for restriction in the exhaust system. Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.

STEP	INSPECTION	RESULTS	ACTION
10	Install fuel pressure gauge between fuel pipe and fuel distributor. Short check connector terminal F/P to body GND using a jumper wire. Turn ignition switch to ON position. Is fuel line pressure correct with ignition switch to ON position? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump relay and fuel pump circuit. Inspect for clogged fuel line. If okay, replace fuel pump unit. **High:** Replace fuel pump unit.
11	Visually inspect for fuel leakage at fuel injector O-ring and fuel line. Service if necessary. Is fuel line pressure held after ignition switch is turned off? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Go to next step.
		No	Inspect fuel injector. If fuel injector is okay, replace fuel pump unit.
12	**Note** • The following test is for engine stalling with A/C on. If other symptom exists, go to next step. Connect a pressure gauge to A/C low and high pressure side lines. Turn A/C on and measure low side and high side pressure. Are pressures within specifications? (See 07–10–3 REFRIGERANT PRESSURE CHECK.)	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously". For other symptoms, inspect the following: • Refrigerant charging amount • Condenser fan operation
13	**Note** • The following test should be performed for symptom with cruise control ON. If other symptoms exist, go to next step. Inspect cruise control system. Is cruise control system okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
14	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Drive vehicle. Does engine condition improve?	Yes	Go to next step. Inspect if purge solenoid valve sticks open mechanically. Inspect evaporative emission control system.
		No	Go to next step.
15	Visually inspect CMP sensor and projections of camshaft pulley. Are CMP sensor and projections of camshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
16	Inspect VTCS operation. (See 01–03A–64 Variable Tumble Control System (VTCS) Operation Inspection.) Is VTCS okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
17	Inspect EGR system. (See 01–03A–67 EGR Control System Inspection.) Is EGR system okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
18	Is engine compression correct?	Yes	Inspect the following: • Valve timing • Internal transaxle part (ATX) • Clutch (MTX)
		No	Inspect for cause.
19	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.12 LACK/LOSS OF POWER-ACCELERATION/CRUISE [L3]

C6U010318881W51

12	LACK/LOSS OF POWER — ACCELERATION/CRUISE
DESCRIPTION	Performance is poor under load (e.g., power down when climbing hills).
POSSIBLE CAUSE	• Improper A/C system operation • Erratic signal or no signal from CMP sensor • Air leakage from intake-air system parts • Improper VIS operation • Improper VTCS operation • Improper operation of electronic throttle control system • Purge control solenoid malfunction • EGR valve malfunction • Brake dragging • Erratic signal from CKP sensor • Low engine compression • Vacuum leakage • Poor fuel quality • Spark leakage from high-tension leads • Engine overheating • Throttle body malfunction • Spark plug malfunction • Air cleaner restriction • PCV valve malfunction • Improper valve timing due to jumping out of timing belt • Improper variable valve timing control operation • Restriction in exhaust system • Intermittent open or short in fuel pump related circuit • Inadequate fuel pressure • Fuel pump mechanical malfunction • Fuel line restriction or clogging • Fuel leakage from fuel injector • Fuel injector clogging • Intermittent open or short circuit in MAF sensor, Accelerator position sensor, TP sensor and VSS • ATX malfunction (ATX) • Clutch slippage (MTX) **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Verify the following: • Vacuum connection • Air cleaner element • No air leakage from intake-air system • No restriction of intake-air system • Proper sealing of intake manifold and components attached to intake manifold; such as EGR valve • Fuel quality (e.g. proper octane, contamination, winter/summer blend) Are all items okay?	Yes	Go to next step.
		No	Service if necessary. Repeat Step 1.
2	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
3	Is engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating".
		No	Go to next step.
4	Connect WDS or equivalent to DLC-2. Access APP1, APP2, RPM, MAF, TP_REL and VSS PIDs. Drive vehicle while monitoring PIDs. Are PIDs within specifications? (See 01–40A–7 PCM INSPECTION [L3].)	Yes	Go to next step.
		No	**APP1, APP2 PIDs:** Inspect if output signal accelerator position sensor changes smoothly. **RPM PID:** Inspect CKP sensor and related wiring harness for vibration or intermittent open/short circuit or both. **MAF PID:** Inspect for intermittent open circuit of MAF sensor and related wiring harness. **TP_REL PID:** Inspect if output signal TP sensor changes smoothly. **VSS PID:** Inspect for intermittent open circuit of VSS and related wiring harness.
5	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
6	Inspect spark plug condition. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from fuel injector. Inspect spark plug and high-tension lead. **Spark plug is grayish white:** Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
7	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
8	Perform electronic throttle control system operation inspection. (See 01–03A–62 Electronic Throttle Control System Inspection.) Does electronic throttle control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to electronic throttle control system operation inspection results.
9	Inspect for restriction in exhaust system. Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.
10	Install fuel pressure gauge between fuel pipe and fuel distributor. Short check connector terminal F/P to body GND using a jumper wire. Turn ignition switch to ON position. Is fuel line pressure correct with ignition switch to ON position? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump relay and fuel pump circuit. Inspect for clogged fuel line. If okay, replace fuel pump unit. **High:** Replace fuel pump unit.

STEP	INSPECTION	RESULTS	ACTION
11	Inspect VTCS operation. (See 01–03A–64 Variable Tumble Control System (VTCS) Operation Inspection.) Does VTCS work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
12	Inspect VIS operation. (See 01–03A–64 VIS Operation Inspection.) Does VIS work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
13	**Note** • The following test is for engine stalling with A/C on concern. If other symptoms exist, go to next step. Connect pressure gauge to A/C low and high side pressure lines. Turn A/C on and measure low side and high side pressures. Are pressures within specifications? (See 07–10–3 REFRIGERANT PRESSURE CHECK.)	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously". For other symptoms, inspect the following: • Refrigerant charging amount • Condenser fan operation
14	Inspect for A/C cut-off operation. (See 01–03A–67 A/C Cut-off Control System Inspection.) Does A/C cut-off work properly?	Yes	Go to next step.
		No	Inspect A/C cut-off system components.
15	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Drive vehicle. Does engine condition improve?	Yes	Inspect if purge solenoid valve is stuck open mechanically. Inspect evaporative emission control system.
		No	Go to next step.
16	Visually inspect CMP sensor and projections of camshaft pulley. Are CMP sensor and projections of camshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
17	Inspect EGR system. (See 01–03A–67 EGR Control System Inspection.) Is EGR system okay?	Yes	Go to next step.
		No	Replace malfunctioning parts according to EGR control system operation inspection results.
18	Inspect variable valve timing control system operation. (See 01–03A–69 Variable Valve Timing Control System Operation Inspection.) Does variable valve timing control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts according to variable valve timing control system inspection results.
19	Is engine compression correct?	Yes	Inspect the following: • Valve timing • Internal transaxle components (ATX) • Clutch (MTX) • Brake system for dragging
		No	Inspect for cause.
20	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.13 KNOCKING/PINGING-ACCELERATION/CRUISE [L3]

C6U010318881W52

13	KNOCKING/PINGING - ACCELERATION/CRUISE
DESCRIPTION	Sound is produced when air/fuel mixture is ignited by something other than spark plug (e.g., hot spot in combustion chamber).
POSSIBLE CAUSE	• Engine overheating due to cooling system malfunction • ECT sensor malfunction • IAT sensor malfunction • MAF sensor malfunction • Knock sensor malfunction • Erratic signal from CMP sensor • Inadequate engine compression • Inadequate fuel pressure **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

01–03A

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect WDS or equivalent to DLC-2. Access ECT PID. Verify ECT PID is **less than 116°C {241°F}** during driving. Is ECT PID less than specification?	Yes	Go to next step.
		No	Inspect cooling system for cause of overheating.
2	Connect WDS or equivalent to DLC-2. Access IAT and MAF PIDs. Monitor each PID. (See 01–40A–7 PCM INSPECTION [L3].) Are PIDs okay?	Yes	Go to next step.
		No	**IAT PID**: Inspect IAT sensor **MAF PID**: Inspect MAF sensor
3	Connect WDS or equivalent to DLC-2. Turn ignition key to ON (engine off). Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
4	Is engine compression correct?	Yes	Go to next step.
		No	Inspect for cause.
5	Install fuel pressure gauge between fuel pipe and fuel distributor. Start engine and idle it. Measure fuel line pressure during idle. Is fuel line pressure correct during idle? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Inspect ignition timing.
		No	**Zero or low:** Inspect fuel pump relay and fuel pump circuit. Inspect for clogged fuel line. If okay, replace fuel pump unit. **High:** Replace fuel pump unit.
6	Inspect knock sensor. Is knock sensor okay?	Yes	Inspect ignition timing.
		No	Replace knock sensor.
7	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.14 POOR FUEL ECONOMY [L3]

C6U010318881W53

14	POOR FUEL ECONOMY
DESCRIPTION	Fuel economy is unsatisfactory.
POSSIBLE CAUSE	• Contaminated air cleaner element • VIS malfunction • Engine cooling system malfunction • Improper ATF level (ATX) • Weak spark • Poor fuel quality • Erratic or no signal from CMP sensor • Clutch slippage (MTX) • VTCS malfunction • Improper variable valve timing control system operation • Improper coolant level • Inadequate fuel pressure • Spark plug malfunction • PCV valve malfunction • Brake dragging • Improper valve timing due to jumping out of timing belt • Contaminated MAF sensor • Improper engine compression • Exhaust system clogging **Warning** **The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for the following: • Air cleaner element for contamination • ATF level (ATX) • Fuel quality • Coolant level • Brake dragging • Clutch slippage (MTX) Are all items okay?	Yes	Go to next step.
		No	Service if necessary. Repeat Step 1.
2	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
3	Access ECT PID. Drive vehicle while monitoring PID. (See 01–40A–7 PCM INSPECTION [L3].) Is PID within specification?	Yes	Go to next step.
		No	Inspect for coolant leakage, cooling fan and condenser fan operations or thermostat operation.

STEP	INSPECTION	RESULTS	ACTION
4	Is strong blue spark visible at each disconnected high-tension lead while cranking engine?	Yes	Inspect for the following: • Spark plugs malfunction • CMP sensor is improperly installed. • Trigger wheel damage on camshaft • Open or short circuit on CMP sensor • Open or short circuit between CMP sensor and PCM terminal 2J or 2M Repair or replace malfunctioning parts. If okay, go to next step.
		No	Inspect following: • High-tension leads • Ignition coil and connector
5	Install fuel pressure gauge between fuel pipe and fuel distributor. Start engine and idle it. Measure fuel line pressure during idle. Is fuel line pressure correct during idle? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump relay and fuel pump circuit. Inspect for clogged fuel line. If okay, replace fuel pump unit **High:** Replace fuel pump unit.
6	Inspect for VTCS operation. (See 01–03A–64 Variable Tumble Control System (VTCS) Operation Inspection.) Does VTCS work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
7	Inspect for variable valve timing control system operation. (See 01–03A–69 Variable Valve Timing Control System Operation Inspection.) Does variable valve timing control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
8	Inspect for VIS operation. (See 01–03A–64 VIS Operation Inspection.) Does VIS work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
9	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
10	Inspect for restriction in the exhaust system. Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.
11	Inspect for contaminated MAF sensor. Is there any contamination?	Yes	Go to next step.
		No	Inspect for cause.
12	Inspect MAF sensor for contamination. Is there any contamination?	Yes	Replace MAF sensor.
		No	Go to next step.
13	Is engine compression correct?	Yes	Inspect valve timing.
		No	Inspect for cause.
14	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.15 EMISSION COMPLIANCE [L3]

C6U010318881W54

15	EMISSION COMPLIANCE
DESCRIPTION	Fails emissions test.
POSSIBLE CAUSE	• Vacuum lines leakage or blockage • Cooling system malfunction • Spark plug malfunction • Leakage from intake manifold • Erratic or no signal from CMP sensor • Inadequate fuel pressure • PCV valve malfunction or incorrect valve installation • EGR valve malfunction • Exhaust system clogging • Fuel tank ventilation system malfunction • Charcoal canister damage • Air cleaner element clogging or restriction • Throttle body malfunction • Spark leakage from high-tension leads • Improper air/fuel mixture ratio control operation • Catalyst converter malfunction • Engine internal parts malfunction • Excessive carbon is built up in combustion chamber • Improper engine compression • Improper valve timing **Warning** **The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for following: • Vacuum lines for leakage or blockage • Electrical connections • Proper maintenance schedule followed • Intake-air system and air cleaner element concerns: obstructions, leakage or dirtiness Are all items okay?	Yes	Go to next step.
		No	Service if necessary. Repeat Step 1.
2	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
3	Is any other driveability concern present?	Yes	Go to appropriate symptom troubleshooting.
		No	Go to next step.
4	Connect WDS or equivalent to DLC-2. Access ECT PID. Warm up engine and idle it. Verify ECT PID is correct. (See 01–40A–7 PCM INSPECTION [L3].) Is ECT PID correct?	Yes	Go to next step.
		No	Inspect for coolant leakage, cooling fan and condenser fan operation or thermostat operation.
5	Is strong blue spark visible at each disconnected high-tension lead while cranking engine?	Yes	Inspect for the following: • Spark plugs malfunction • Improperly installed CMP sensor • Damage of trigger wheel on camshaft • Open or short circuit on CMP sensor • Open or short circuit between CMP sensor and PCM terminal 2J or 2M Repair or replace malfunctioning parts. If okay, go to next step.
		No	Inspect the following: • High-tension leads • Ignition coil and connector
6	Install fuel pressure gauge between fuel pipe and fuel distributor. Start engine and idle it. Measure fuel line pressure during idle. Is fuel line pressure correct during idle? (See 01–14–6 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	**Zero or low:** Inspect for clogged fuel line. If okay, replace fuel pump unit. **High:** Replace fuel pump unit.
7	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
8	Inspect for fuel saturation inside charcoal canister. Is excess amount of liquid fuel present in canister?	Yes	Replace charcoal canister.
		No	Inspect fuel tank vent system. Then, go to next step.
9	Is there restriction in exhaust system?	Yes	Inspect exhaust system.
		No	Go to next step.
10	Inspect three-way catalytic converter. (See 01–16–25 THREE-WAY CATALYTIC CONVERTER (TWC) INSPECTION.) Is three-way catalytic converter okay?	Yes	Inspect EGR system. (See 01–03A–67 EGR Control System Inspection.)
		No	Replace three-way catalytic converter.
11	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.16 HIGH OIL CONSUMPTION/LEAKAGE [L3]

C6U010318881W55

16	HIGH OIL CONSUMPTION/LEAKAGE
DESCRIPTION	Oil consumption is excessive.
POSSIBLE CAUSE	• PCV valve malfunction • Improper dipstick • Improper engine oil viscosity • Engine internal parts malfunction

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
2	Inspect for the following: • External leakage • Proper dipstick • Proper engine oil viscosity Are all items okay?	Yes	Inspect internal engine parts such as valves, valve guides, valve stem seals, cylinder head drain passage, and piston rings.
		No	Service if necessary. Repeat Step 2.
3	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [L3]

C6U010318881W56

17	COOLING SYSTEM CONCERNS -OVERHEATING
DESCRIPTION	Engine runs at higher than normal temperature/overheats.
POSSIBLE CAUSE	• Improper coolant level • Blown fuses • Coolant leakage • Excessive A/C system pressure • A/C system operation is improper • Improper water/anti-freeze mixture • Fans reverse rotation • Poor radiator condition • Thermostat malfunction • Radiator hoses damage • Condenser fan is inoperative. • Improper or damaged radiator cap • Cooling fan is inoperative. • Coolant overflow system malfunction • Improper tension of drive belt • Drive belt damage

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect the following: • Engine coolant level • Coolant leakage • Water and anti-freeze mixture • Radiator condition • Collapsed or restricted radiator hoses • Radiator pressure cap • Overflow system • Fan rotational direction • Fuses Are all items okay?	Yes	Go to next step.
		No	Service if necessary. Repeat Step 1.
2	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
3	Start engine and run it at idle speed. Turn A/C switch on and set blower fan to any speed. Does A/C compressor engage?	Yes	Go to Step 5.
		No	Inspect for the following and repair or replace if necessary: • Refrigerant charging amount • Open circuit between A/C relay and PCM terminal 4O • Seized A/C magnetic clutch • A/C magnetic clutch malfunction If all items are okay, go to next step.
4	Start the engine and run it at idle speed. Turn A/C switch on and set blower fan any speed. Measure voltage at PCM terminal 1AC. (See 01–40A–7 PCM INSPECTION [L3].) Is voltage okay?	Yes	Go to next step.
		No	Inspect the following: • Refrigerant pressure switch operation • A/C switch is stuck open. • Open or short circuit between refrigerant pressure switch and PCM terminal 1AC • Open circuit of blower motor fan switch and resistor (if blower motor does not operate) • Evaporator temperature sensor and A/C amplifier
5	Inspect cooling fan control system operation. (See 01–03A–68 Cooling Fan Control System Inspection.) Does cooling fan control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
6	Is drive belt okay?	Yes	Go to next step.
		No	Replace drive belt.
7	Is there any leakage around heater unit in passenger compartment?	Yes	Inspect and service heater for leakage.
		No	Go to next step.
8	Is there any leakage at coolant hoses and/or radiator?	Yes	Replace malfunctioning part.
		No	Go to next step.
9	Cool down the engine. Remove thermostat and inspect operation. (See 01–12–9 THERMOSTAT REMOVAL/INSTALLATION.) (See 01–12–10 THERMOSTAT INSPECTION.) Is thermostat okay?	Yes	Engine coolant temperature and thermostat are okay, inspect engine block for leakage or blockage.
		No	Access ECT PID. Inspect for both ECT PID and temperature gauge readings. If temperature gauge on instrument cluster indicates normal range but ECT PID is not same as temperature gauge reading, inspect ECT sensor. If temperature gauge on instrument cluster indicates overheating but ECT PID is normal, inspect temperature gauge and heat gauge unit.
10	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.18 COOLING SYSTEM CONCERNS-RUNS COLD [L3]

C6U010318881W57

18	COOLING SYSTEM CONCERNS -RUNS COLD
DESCRIPTION	Engine takes excessive time to reach normal operating temperature.
POSSIBLE CAUSE	• Thermostat malfunction • Condenser fan system malfunction • Cooling fan system malfunction

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Is customer complaint "Lack of passenger compartment heat" only?	Yes	Inspect A/C and heater system.
		No	Go to next step.
2	Does engine speed continue during fast idle?	Yes	Go to symptom troubleshooting "No.9 Fast idle/runs on".
		No	Go to next step.
3	Remove thermostat and inspect operation. (See 01–12–9 THERMOSTAT REMOVAL/ INSTALLATION.) (See 01–12–10 THERMOSTAT INSPECTION.) Is thermostat okay?	Yes	Go to next step.
		No	Replace thermostat.
4	Inspect cooling fan control system operation. (See 01–03A–68 Cooling Fan Control System Inspection.) Does cooling fan control system work properly?	Yes	Access ECT PID. Inspect for both ECT PID and temperature gauge on instrument cluster readings. If temperature gauge on instrument cluster indicates normal range but ECT PID is not same as temperature gauge reading, inspect ECT sensor. If temperature gauge on instrument cluster indicates cold range but ECT PID is normal, inspect temperature gauge and heat gauge unit.
		No	Repair or replace malfunctioning part.
5	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.19 EXHAUST SMOKE [L3]

C6U01031881W58

19	EXHAUST SMOKE
DESCRIPTION	Blue, black, or white smoke from exhaust system
POSSIBLE CAUSE	**Blue smoke (Burning oil):** • PCV valve malfunction • Engine internal oil leakage **White smoke (Water in combustion):** • Cooling system malfunction (coolant loss) • Engine internal coolant leakage **Black smoke (Rich fuel mixture):** • Air cleaner restriction • Intake-air system is collapsed or restricted. • Fuel return line is restricted. • Excessive fuel pressure • Improper engine compression • Injector fuel leakage • Ignition system malfunction **Warning** **The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	What color is smoke coming from exhaust system?	Blue	Burning oil is indicated. Go to next step.
		White	Water in combustion is indicated. Go to Step 3.
		Black	Rich fuel mixture is indicated. Go to Step 4.
2	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Inspect for the following: • Damaged valve guide, stems or valve seals • Blocked oil drain passage in cylinder head • Piston ring is not seated, seized or worn. • Damaged cylinder bore If other driveability symptoms are present, return to diagnostic index to service any additional symptoms.
		No	Replace PCV valve.
3	Does cooling system hold pressure?	Yes	Inspect for the following: • Cylinder head gasket leakage • Intake manifold gasket leakage • Cracked or porous engine block If other driveability symptoms are present, return to diagnostic index to service any additional symptoms.
		No	Inspect for cause.
4	Inspect for the following: • Air cleaner restriction • Collapsed or restricted intake-air system • Restricted fuel return line Are all items okay?	Yes	Go to next step.
		No	Service if necessary. Repeat Step 4.

STEP	INSPECTION	RESULTS	ACTION
5	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
6	Install fuel pressure gauge between fuel pipe and fuel distributor. Start engine and idle it. Measure fuel line pressure during idle. Is fuel line pressure correct during idle? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Go to next step.
		No	**Zero or low:** • Inspect for clogged fuel line. • If okay, replace fuel pump unit. **High:** • Replace fuel pump unit.
7	Is strong blue spark visible at each disconnected high-tension lead while cranking engine?	Yes	Inspect spark plugs and CMP sensor.
		No	Inspect the following: • High-tension leads • Ignition coil and connector
8	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.20 FUEL ODOR (IN ENGINE COMPARTMENT) [L3]

C6U010318881W59

20	FUEL ODOR (IN ENGINE COMPARTMENT)
DESCRIPTION	Gasoline fuel smell or visible leakage
POSSIBLE CAUSE	• Excessive fuel pressure • Purge solenoid valve malfunction • Fuel tank vent system blockage • Charcoal canister malfunction • Fuel leakage from fuel system **Warning** **The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Visually inspect for fuel leakage at fuel injector O-ring and fuel line. Service if necessary. Install fuel pressure gauge between fuel pipe and fuel distributor. Start engine and idle it. Measure fuel line pressure during idle. Is fuel line pressure correct during idle? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Go to next step.
		No	Replace fuel pump unit.
2	Inspect for blockage/restriction or opening between engine vacuum port and charcoal canister. Inspect for blockage in fuel tank vent system. Is fault indicated?	Yes	Replace vacuum hose.
		No	Go to next step.
3	Inspect purge solenoid valve. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.) Is solenoid operating properly?	Yes	Go to next step.
		No	Replace purge solenoid valve.
4	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Inspect charcoal canister for fuel saturation. If excess amount of liquid fuel is present, replace charcoal canister.
5	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.21 ENGINE NOISE [L3]

C6U010318881W60

21	ENGINE NOISE
DESCRIPTION	Engine noise from under hood
POSSIBLE CAUSE	**Squeal, click or chirp noise:** • Improper engine oil level • Improper drive belt tension **Rattle sound noise:** • Loose parts **Hiss sound noise:** • Vacuum leakage • Loose spark plug • Air leakage from intake-air system • Improper variable air duct (VAD) control system operation **Rumble or grind noise:** • Improper drive belt tension **Rap or roar noise:** • Exhaust system looseness **Other noise:** • Camshaft friction gear noise or MLA noise • Timing chain noise

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Is squeal, click or chirp sound present?	Yes	Inspect engine oil level or drive belts.
		No	Go to next step.
2	Is rumble or grinding noise present?	Yes	Inspect drive belts.
		No	Go to next step.
3	Is rattle noise present?	Yes	Inspect location of rattle for loose parts.
		No	Go to next step.
4	Is hissing noise present?	Yes	Inspect for following: • Vacuum leakage • Spark plug looseness • Intake-air system leakage • Variable air duct (VAD) control system operation (See 01–03A–69 Variable Air Duct (VAD) Control System Operation Inspection.)
		No	Go to next step.
5	Is rap or roar noise present?	Yes	Inspect exhaust system for loose parts.
		No	Go to next step.
6	Is knocking noise present?	Yes	Go to symptom troubleshooting "No.11 Knocking/ pinging".
		No	If noise comes from engine internal, inspect for friction gear, timing chain or MLA noise.
7	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.22 VIBRATION CONCERNS (ENGINE) [L3]

C6U010318881W61

22	VIBRATION CONCERNS (ENGINE)
DESCRIPTION	• Vibration from under hood or driveline
POSSIBLE CAUSE	• Loose attaching bolts or worn parts • Components malfunction such as worn parts

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect the following components for loose attaching bolts or worn parts: • Cooling fan • Condenser fan • Drive belt and pulleys • Engine mounts All items okay?	Yes	Inspect the following systems: • Wheels • ATX • Driveline • Suspension
		No	Readjust or retighten engine mount installation position. Service if necessary for other parts.
2	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.23 A/C DOES NOT WORK SUFFICIENTLY [L3]

C6U010318881W62

23	A/C DOES NOT WORK SUFFICIENTLY.
DESCRIPTION	A/C compressor magnetic clutch does not engage when A/C switch is turned on.
POSSIBLE CAUSE	• Improper refrigerant charging amount • Open A/C magnetic clutch • Open circuit between A/C relay and A/C magnetic clutch • Poor GND of A/C magnetic clutch • Refrigerant pressure switch is stuck open. • A/C relay is stuck open. • Seized A/C compressor • Open circuit between A/C switch and PCM through both refrigerant pressure switch and A/C amplifier

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
2	Disconnect A/C compressor connector. Start engine and turn A/C switch on. Is there correct voltage at terminal of A/C compressor magnetic clutch connector? **Specification** **10.5 V or more**	Yes	Inspect for GND condition of magnetic clutch on A/C compressor. If GND condition is okay, inspect for open circuit magnetic clutch coil.
		No	Go to next step.
3	Disconnect refrigerant pressure switch connector. Connect jumper wire between terminals of A/C high pressure switch connector. Connect jumper wires between terminals of refrigerant pressure switch connector. Turn ignition switch to ON position. Turn A/C switch on and set blower fan to any speed. Does A/C work?	Yes	Inspect refrigerant pressure switch operation. If switch is okay, go to next step.
		No	Inspect for the following: • A/C switch is stuck open. • Open circuit between refrigerant pressure switch and PCM terminal 1AC • Open circuit between blower motor fan switch and resistor (if blower motor does not operate) • Evaporator temperature sensor and A/C amplifier
4	Remove jumper wire from switch connector. Reconnect connector to refrigerant pressure switch. Start engine and turn A/C switch on. Does fan operate?	Yes	Inspect whether A/C relay is stuck open. Replace if necessary.
		No	Inspect the following and repair or replace if necessary: • Refrigerant charging amount • A/C compressor for seizure
5	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY [L3]

C6U010318881W63

24	A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY.
DESCRIPTION	A/C compressor magnetic clutch does not disengage.
POSSIBLE CAUSE	• A/C compressor magnetic clutch engagement is stuck. • A/C relay is stuck closed. • Short to GND between A/C switch and PCM • Short to GND circuit between A/C relay and PCM • A/C relay to magnetic clutch circuit shorted to battery power

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
2	Start engine and idle it. Turn A/C switch on. Remove A/C relay. Does A/C magnetic clutch disengage?	Yes	Inspect for the following: • A/C relay is stuck closed. • Short to GND circuit between A/C relay and PCM terminal 4O. If both items okay, go to next step.
		No	Inspect if circuit between A/C relay and magnetic clutch shorts to battery power circuit. If circuit is okay, inspect magnetic clutch for stuck engagement or clearance.
3	Disconnect refrigerant pressure switch connector. Start engine and turn A/C switch on. **Note** • A/C should not work when disconnecting connector. If A/C remains working, short to GND circuit may be present. Does A/C remain working?	Yes	Inspect for short to GND circuit between refrigerant pressure switch and PCM terminal 1AC.
		No	Go to next step.
4	Reconnect refrigerant pressure switch connector. Turn off A/C switch. **Note** • A/C should not work when turning A/C switch off. If A/C remains working, short to GND circuit may be present. Does A/C remain working?	Yes	Inspect following: • Short to GND circuit between A/C switch and A/C amplifier • Short to GND circuit between A/C amplifier and refrigerant pressure switch
		No	Inspect whether A/C switch is stuck closed.
5	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.25 A/C IS NOT CUT OFF UNDER WIDE OPEN THROTTLE CONDITIONS [L3]

C6U010318881W64

25	A/C IS NOT CUT OFF UNDER WOT CONDITIONS.
DESCRIPTION	A/C compressor magnetic clutch does not disengage under WOT.
POSSIBLE CAUSE	• Accelerator position sensor malfunction • Accelerator position sensor misadjustment • Loosely installed accelerator position sensor.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Does A/C compressor disengage when A/C switch is turned off?	Yes	Go to next step.
		No	Go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously".
2	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Inspect accelerator position sensor.
3	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.26 EXHAUST SULPHUR SMELL [L3]

C6U010318881W65

26	EXHAUST SULPHUR SMELL
DESCRIPTION	Rotten egg smell (sulphur) from exhaust
POSSIBLE CAUSE	• Electrical connectors are disconnected or connected poorly • Charcoal canister malfunction • Vacuum lines are disconnected or connected improperly. • Improper fuel pressure • Poor fuel quality **Warning** **The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:** **• Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **• Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14-5 BEFORE REPAIR PROCEDURE.)** **(See 01-14-6 AFTER REPAIR PROCEDURE.)** **Caution** **• Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Are any driveability or exhaust smoke concerns present?	Yes	Go to appropriate flow chart.
		No	Go to next step.
2	Inspect the following: • Electrical connections • Vacuum lines • Fuel quality Are all items okay?	Yes	Go to next step.
		No	Service if necessary. Repeat Step 2.
3	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
4	Install fuel pressure gauge between fuel pipe and fuel distributor. Start engine and idle it. Is fuel line pressure correct during idle? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump relay and fuel pump circuit. Inspect for clogged fuel line. If okay, replace fuel pump unit. **High:** Replace fuel pump unit.
5	Inspect charcoal canister for fuel saturation. Is excess amount of liquid fuel present in canister?	Yes	Replace charcoal canister.
		No	Inspect fuel tank vent system. If fuel tank vent system is okay, suggest trying a different brand since sulfur content can vary in different fuels. If fuel tank vent system is not okay, repair or replace malfunctioning parts.
6	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.27 FUEL REFILL CONCERNS [L3]

C6U010318881W66

27	Fuel refill concerns
DESCRIPTION	• Fuel tank does not fill smoothly.
POSSIBLE CAUSE	• Clogged EVAP pipes • Nonreturn valve malfunction • Improper use of fuel nozzle • Inadequate fuel filling speed **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
2	Remove fuel-filler pipe. Make sure nonreturn valve is installed properly. Inspect nonreturn valve operation. Is nonreturn valve okay?	Yes	Inspect for the following: • Improper use of fuel nozzle • Inadequate fuel filling speed
		No	**Nonreturn valve is installed improperly:** • Reinstall nonreturn valve to proper position. **Nonreturn valve does not operate properly:** • Replace nonreturn valve.
3	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.28 FUEL FILLING SHUT OFF ISSUES [L3]

C6U01031881W67

28	Fuel filling shut off issues
DESCRIPTION	• Fuel does not shut off properly.
POSSIBLE CAUSE	• Clogged EVAP pipes • Nonreturn valve malfunction • Fuel shut-off valve malfunction • Fuel nozzle malfunction • Fuel nozzle is not inserted correctly. **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Connect WDS or equivalent to DLC-2. Turn ignition switch to ON position (Engine OFF). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
2	Remove fuel-filler pipe. Make sure nonreturn valve is installed properly. Inspect nonreturn valve operation. Is nonreturn valve okay?	Yes	Inspect for the following: • Improper use of fuel nozzle • Fuel is not inserted correctly. • Inspect fuel shut-off valve.
		No	**Nonreturn valve is installed improperly:** • Reinstall nonreturn valve to proper position. **Nonreturn valve does not operate properly:** • Replace nonreturn valve.

STEP	INSPECTION	ACTION
3	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.	

NO.29 CONSTANT VOLTAGE [L3]

C6U010318881W68

29	CONSTANT VOLTAGE
DESCRIPTION	Incorrect constant voltage
POSSIBLE CAUSE	• Constant voltage circuit malfunction **Note** • BARO sensor uses constant voltage.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Disconnect BARO sensor connector where constant voltage circuit inspection failed. Turn ignition switch to ON position. Measure voltage between the following BARO sensor connector terminals: • Constant voltage terminal - GND terminal Is constant voltage **greater than 6.0 V**?	Yes	Go to Step 13.
		No	Go to next step.
2	Is voltage across battery terminals **greater than 10.5 V**?	Yes	Go to next step.
		No	Inspect charging system.
3	Turn ignition switch to OFF position. Leave BARO sensor connector disconnected. Measure voltage between battery positive terminal and GND (between PCM and BARO sensor) circuit at appropriate sensor connector. Is voltage **greater than 10.5 V** and **within 1.0 V** of battery voltage?	Yes	Go to next step.
		No	Go to Step 8.
4	**Note** • Purpose of this step is to determine if WDS or equivalent is communicating with PCM. Turn ignition switch to ON position. Attempt to access ECT PID. Can ECT PID be accessed?	Yes	Go to Step 7.
		No	Go to next step.
5	Turn ignition switch off. Disconnect BARO sensor and PCM connectors. Turn ignition switch to ON position. Measure voltage between PCM terminals 2Y and 2AB. Is voltage **greater than 10.5 V**?	Yes	Go to next step.
		No	Repair open circuit between PCM terminal 2Y and main relay.
6	Leave BARO sensor and PCM connectors disconnected. Measure resistance between PCM terminals 2Y and 2AB. Is resistance **greater than 10,000 ohms**?	Yes	Inspect for constant voltage at suspect sensor connector again.
		No	Repair constant voltage circuit short to GND.
7	Turn ignition switch to OFF position. Leave BARO sensor disconnected. Disconnect PCM connector. Measure resistance between PCM terminal 2K and constant voltage circuit at appropriate sensor connector. Is resistance **less than 5.0 ohms**?	Yes	Inspect for constant voltage at suspect sensor connector again.
		No	Repair open constant voltage circuit.

STEP	INSPECTION	RESULTS	ACTION
8	**Note** • Purpose of this step is to determine if WDS or equivalent is communicating with PCM. Reconnect BARO sensor connector. Turn ignition switch to ON position. Access ECT PID. Can ECT PID be accessed?	Yes	Go to next step.
		No	Go to Step 11.
9	Are DTCs present for two or more sensors connected to PCM terminal 2H? Sensor connected to PCM terminal 2H: • IAT sensor (P0112, P0113) • FHO2S (P0131, P0132) • RHO2S (P0138) • BARO sensor (P2228, P2229) • Manifold absolute pressure sensor (P0107, P0108) • ECT sensor (P0117, P0118) • Accelerator position sensor (P2122, P2123, P2127, P2128)	Yes	Go to next step.
		No	Repair open GND circuit to sensor where constant voltage circuit inspection failed.
10	Turn ignition switch to OFF position. Disconnect WDS or equivalent from DLC-2. Disconnect PCM connector. Measure resistance between GND circuit at appropriate sensor connector and PCM terminal 2H. Is resistance **less than 5.0 ohms**?	Yes	Reconnect sensor connector. Go to appropriate DTC test.
		No	Repair open GND circuit.
11	Turn ignition switch to OFF position. Disconnect PCM connector. Measure resistance between battery negative terminal and PCM terminals 4X, 2AB, and 2AC. Is each resistance **less than 5.0 ohms**?	Yes	Go to next step.
		No	Repair open GND circuit.
12	Turn ignition switch to OFF position. Measure resistance between GND circuit at the following sensor connectors and GND: • IAT sensor (integrated in MAF sensor) • FHO2S • RHO2S • BARO sensor • MAP sensor • ECT sensor • APP sensor	Yes	GND circuits are okay. Inspect for constant voltage at suspect sensor connector again.
		No	Inspect for open GND circuit.
13	Turn ignition switch to OFF position. Disconnect BARO sensor and PCM connectors. Turn ignition switch to ON position. Measure voltage between constant voltage circuit at BARO sensor connector and battery negative terminal. Is voltage **less than 0.5 V**?	Yes	Inspect for constant voltage at suspect sensor connector again.
		No	Repair constant voltage circuit shorted to power in harness.
14	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.30 SPARK PLUG CONDITION [L3]

C6U010318881W69

30	SPARK PLUG CONDITION
DESCRIPTION	Incorrect spark plug condition
POSSIBLE CAUSE	**Note** • Inspecting spark plugs condition can determine whether problem is related to a specific cylinder or possibly all cylinders. **Wet/carbon stuck on specific plug:** • Spark—Weak, not visible • Air/fuel mixture—Excessive fuel injection volume • Compression—No compression, low compression • Faulty spark plug **Grayish white with specific plug:** • Air/fuel mixture—Insufficient fuel injection volume • Faulty spark plug **Wet/carbon is stuck on all plugs:** • Spark—Spark weak • Air/fuel mixture—Too rich • Compression—Low compression • Clogging in intake/exhaust system **Grayish white with all plugs:** • Air/fuel mixture—Too lean **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14-5 BEFORE REPAIR PROCEDURE.)** **(See 01-14-6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Remove all spark plugs. Inspect spark plug condition. Is spark plug condition okay?	Yes	Troubleshooting completed.
		No	**Specific plug is wet or covered with carbon:** Go to next step. **Specific plug looks grayish white:** Go to Step 7. **All plugs are wet or covered with carbon:** Go to Step 9. **All plugs look grayish white:** Go to Step 15.
2	Is spark plug wet/covered with carbon by engine oil?	Yes	Working up and down inspect all areas related to oil.
		No	Go to next step.
3	Inspect spark plug for the following: • Cracked insulator • Heat range • Air gap • Worn electrode Is spark plug okay?	Yes	Go to next step.
		No	Replace spark plug.
4	Inspect compression pressure at suspected faulty cylinder. Is compression pressure correct? (See 01-10A-5 COMPRESSION INSPECTION [L3].)	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.

STEP	INSPECTION	RESULTS	ACTION
5	Install all spark plugs. Perform spark test at suspected faulty cylinder. Is strong blue spark visible? (Compare with normal cylinder.)	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
6	Install fuel pressure gauge between fuel filter and fuel distributor. Short check connector terminal F/P to body GND using a jumper wire. Turn ignition switch to ON position (Engine OFF). Is fuel line pressure correct with ignition switch at ON? **Fuel line pressure** **375—450 kPa {3.9—4.5 kgf/cm^2, 55—65 psi}**	Yes	Inspect fuel injector for the following: • Open or short in injector • Leakage • Injection volume
		No	**Zero or low:** Inspect fuel pump relay and fuel pump circuit. Inspect for clogged fuel line. If okay, replace fuel pump unit. **High:** Replace fuel pump unit.
7	Inspect spark plug for the following. • Heat range • Air gap Is spark plug okay?	Yes	Go to next step.
		No	Replace spark plug.
8	Remove suspected fuel injector. Inspect the following: • Resistance (See 01–14–27 FUEL INJECTOR INSPECTION [L3].) • Fuel injection volume (See 01–14–27 FUEL INJECTOR INSPECTION [L3].) Are all above items okay?	Yes	Inspect for open circuit between suspected fuel injector connector terminal and PCM connector at the following terminals: • **For #1 or #4 cylinder: 1A** • **For #2 or #3 cylinder: 1B**
		No	Replace fuel injector.
9	Is air cleaner element free of restrictions?	Yes	Go to next step.
		No	Replace air cleaner element.
10	Perform spark test. Is strong blue spark visible at each cylinder?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
11	Install fuel pressure gauge between fuel filter and fuel distributor. Short check connector terminal F/P to body GND using a jumper wire. Turn ignition switch to ON position (Engine OFF). Is fuel line pressure correct with ignition switch at ON? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) **Fuel line pressure** **375—450 kPa {3.9—4.5 kgf/cm^2, 55—65 psi}**	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump relay and fuel pump circuit. Inspect for clogged fuel line. If okay, replace fuel pump unit. **High:** Replace fuel pump unit.
12	Inspect the following PIDs: • ECT • O2S11 (When engine can be started) • MAF (See 01–40A–7 PCM INSPECTION [L3].) Are PIDs okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
13	Perform purge control inspection. (When engine can be started) (See 01–03A–67 Purge Control System Inspection.) Is purge control correct?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
14	Perform compression inspection. Is compression correct?	Yes	Inspect for clogging in exhaust system.
		No	Repair or replace malfunctioning parts.
15	When engine cannot be started, inspect intake-air system for air leakage. When engine can be started, perform intake manifold vacuum inspection. Is air sucked in from intake-air system?	Yes	Repair or replace malfunctioning part.
		No	Go to next step.

STEP	INSPECTION	RESULTS	ACTION
16	Install fuel pressure gauge between fuel filter and fuel distributor. Short check connector terminal F/P to body GND using a jumper wire. Turn ignition switch to ON position (Engine OFF). Is fuel line pressure correct with ignition switch at ON? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) **Fuel line pressure** **420—460 kPa {4.3—4.6 kgf/cm^2, 61—66 psi}**	Yes	Inspect the following PIDs: • ECT • O2S11 • MAF (See 01–40A–7 PCM INSPECTION [L3].) Inspect PCM GND condition.
		No	**Zero or low:** Inspect fuel pump relay and fuel pump circuit. Inspect for clogged fuel line. If okay, replace fuel pump unit. **High:** Replace fuel pump unit.
17	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

ENGINE CONTROL SYSTEM OPERATION INSPECTION [L3]

C6U010318881W70

Input Signal System Investigation Procedure

1. Find an unusual signal. (See 01–03A–58 Finding unusual signals.)
2. Locate the source. (See 01–03A–58 Locating the source of unusual signals.)
3. Repair or replace the defective part.
4. Confirm that the unusual signal has been erased.

Finding unusual signals

While referring to 01–02A–7 ON-BOARD DIAGNOSTIC TEST [L3], use the PID/DATA monitor and record function to inspect the input signal system relating to the problem.

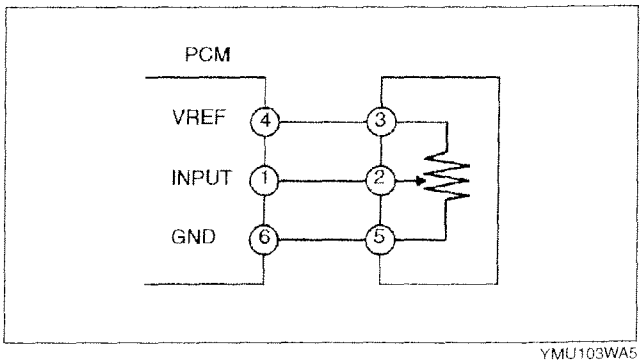
1. Start the engine and idle the vehicle. You can assume that any signals that are out of specifications by a wide margin are unusual.
2. When recreating the problem, any sudden change in monitor input signals that is not consciously created by the driver can be judged as unusual.

Locating the source of unusual signals

Caution

- **Compare the WDS or equivalent monitor voltage with the measurement voltage using the digital measurement system function. If you use another tester, misreading may occur.**
- **When measuring voltage, attach the tester GND to the GND of the PCM that is being tested, or to the engine itself. If this is not done, the measured voltage and actual voltage may differ.**
- **After connecting the pin to a waterproof coupler, confirming continuity and measuring the voltage, inspect the waterproof connector for cracks. If there are any, use sealant to fix them. Failure to do this may result in deterioration of the harness or terminal from water damage, leading to problems with the vehicle.**

Variable resistance type 1 (TP sensor and EGR boost sensor)



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Investigate the input signal system for variable resistance type 1

1. When an unusual signal is received, measure the #1 PCM terminal voltage.
   - If the #1 terminal voltage and the WDS or equivalent monitor voltage are the same, proceed to the next step.
   - If there is a difference of **0.5 V or more**, inspect for the following points concerning the PCM connector:
     — Female terminal opening is loose.
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage.
   - If there is a **0.5 V or more** difference between the sensor and WDS or equivalent voltages, inspect the harness for open or short circuits.
   - If the sensor and WDS or equivalent voltages are the same, inspect for the following points concerning the sensor connector:
     — Female terminal opening is loose.
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
   - If there are no problems, proceed to next investigation below.

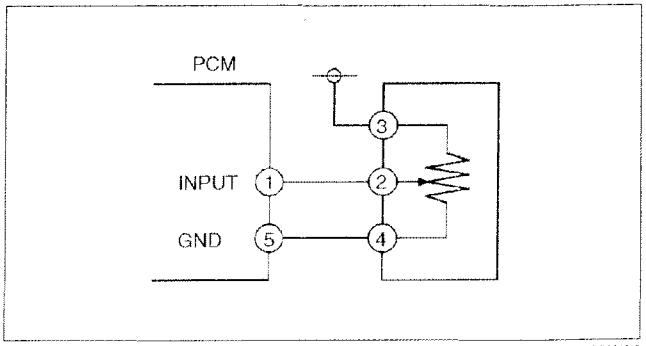
Investigate the standard power supply system for variable resistance type 1

- Confirm that the #3 terminal is at **5 V**.
  — If the measured voltage on the #3 terminal is **5 V**, inspect the following points on the sensor connector.
  — If there is no problem, inspect for the following:
    - Female terminal opening loose
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
  — If the #3 terminal measures other than **5 V**, inspect for the following:
    - Open or short circuit in harness
    - Harness/pin crimp is loose or disconnected.

Investigate the GND system for variable resistance type 1

- Confirm that terminal sensor #5 is at **0 V**.
  — If it is at **0 V**, inspect the sensor.
    - If necessary, replace the sensor.
  — If not, inspect for the following:
    - Open or short circuit in harness
    - Female terminal opening is loose causing an open or short circuit in harness
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Harness/pin crimp is loose or disconnected.

Variable resistance type 2 (fuel tank level sensor and mass air flow (MAF) sensor)



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Investigate the GND system for variable resistance type 2

- Confirm that terminal sensor #4 is at **0 V**.
  - — If it is at **0 V**, inspect the sensor.
    - If necessary, replace the sensor.
  - — If not at **0 V**, inspect for the following:
    - Open circuit in harness
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Harness/pin crimp is loose or disconnected.

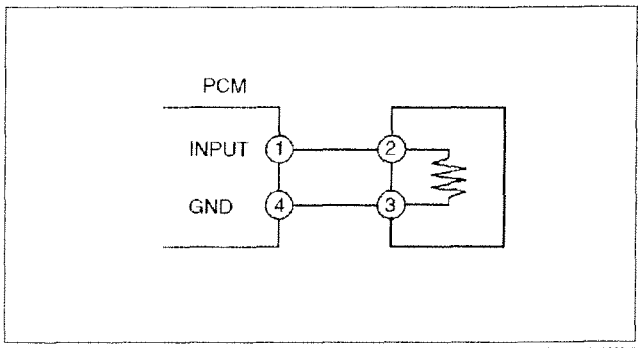
Investigate the input signal system for variable resistance type 2

1. When an unusual signal is received, measure the #1 PCM terminal voltage.
   - If the #1 terminal voltage and the WDS or equivalent monitor voltage are the same, proceed to the next step.
   - If there is a difference of **0.5 V or more**, inspect for the following points concerning the PCM connector:
     - — Female terminal opening is loose.
     - — Coupler (pin holder) damage
     - — Pin discoloration (blackness)
     - — Harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage.
   - If there is a **0.5 V or more** difference between the sensor and WDS or equivalent voltages, inspect the harness for open or short circuits.
   - If the sensor and WDS or equivalent voltages are the same, inspect the following points concerning the sensor connector:
     - — Female terminal opening is loose.
     - — Coupler (pin holder) damage
     - — Pin discoloration (blackness)
     - — Harness/pin crimp is loose or disconnected.
   - If there are no problems, proceed to next investigation below.

Investigate the electrical supply system for variable resistance type 2

- Confirm that the sensor #3 terminal is **B+**.
  - — If the measured voltage on the #3 terminal is **B+**, inspect the following points on the sensor connector.
  - — If there is no problem, inspect for the following:
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
  - — If the #3 terminal measures other than **B+**, inspect the following:
    - Open or short circuit in harness
    - Harness/pin crimp is loose or disconnected.

Thermistor type (IAT sensor and ECT sensor)



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Investigate the input signal system for thermistor type

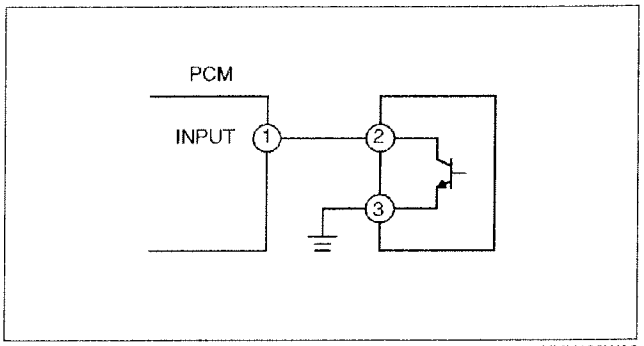
1. When an unusual signal is received, measure the #1 PCM terminal voltage.
   - If the #1 terminal voltage and the WDS or equivalent monitor voltage are the same, proceed to the next step.
   - If there is a difference of **0.5 V or more**, inspect the following points concerning the PCM connector:
     — Female terminal opening loose
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage.
   - If there is a **0.5 V or more** difference between the sensor and WDS or equivalent voltages, inspect the harness for open or short circuits.
   - If the sensor and WDS or equivalent voltages are the same, inspect the following points concerning the sensor connector:
     — Female terminal opening is loose.
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.
   - If there are no problems, proceed to next investigation below.

Investigate the GND system for thermistor type

- Confirm that terminal sensor #3 is at **0 V**.
  — If it is at **0 V**, inspect the sensor. If necessary, replace the sensor.
  — If not, inspect for the following:
    - Open circuit in harness
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Harness/pin crimp is loose or disconnected.

VSS

1. Measure the #1 PCM terminal voltage and confirm that it is at 0 V or 5 V when the ignition switch at ON and the engine at idle.
   - If it is at **0 V** or **5 V**, intermittent concern exists. (See 01–03A–2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].)
   - If not, inspect the following points concerning the PCM connector.
   - If there is no problem, inspect for the following:
     — Female terminal opening is loose.
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.



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2. Measure the #2 sensor terminal voltage and confirm that it is at **0 V** or **5 V** when the ignition switch at ON and the engine at idle.
   - If it is at **0 V** or **5 V**, intermittent concern exists. (See 01–03A–2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].)
   - If not, inspect the following points concerning the sensor connector:
   - If there is no problem, inspect for the following.
     — Female terminal opening is loose.
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.

3. Confirm that the #3 terminal switch voltage is at **0 V**.
   - If it is at **0 V**, inspect the sensor. If necessary, replace the sensor.
     — If necessary, replace the sensor.
   - If not, inspect for the following:
     — Open circuit in harness
     — Female terminal opening is loose.
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.

Main Relay Operation Inspection

1. Verify that the main relay clicks when the ignition switch is turned to ON position and off.
   - If there is no operation sound, inspect the following:
     — Main relay (See 09–21–6 RELAY INSPECTION.)
     — Harness and connector between ignition switch and main relay terminal A.
     — Harness and connector between PCM terminal 2X and main relay terminal E.

Intake Manifold Vacuum Inspection

1. Verify air intake hoses are installed properly.
2. Start the engine and run it at idle.
3. Disconnect the vacuum hose between the intake manifold and purge solenoid valve from the intake manifold side.
4. Connect a vacuum gauge to the intake manifold and measure the intake manifold vacuum.
   - If not as specified, inspect the following:

Specification
More than 60 kPa {450 mmHg, 18 inHg}

Note
- Air suction can be located by engine speed change when lubricant is sprayed on the area where suction is occurring.
  — Air suction at throttle body, intake manifold and PCV valve installation points
  — EGR valve (stuck open)
  — Fuel injector insulator
  — Engine compression
  (See 01–10A–5 COMPRESSION INSPECTION [L3].)

Electronic Throttle Control System Inspection
Engine coolant temperature compensation inspection

1. Connect WDS or equivalent to the DLC-2.
2. Select the following PIDs:
   - ECT
   - IAT
   - RPM
3. Verify that the engine is cold, then start the engine.
4. Verify that the engine speed decreases as the engine warms up.
   - If the engine speed does not decrease or decreases slowly, inspect the following:
     — ECT sensor and related harness
     (See 01–40A–36 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [L3].)
     — Electronic throttle body and related harness
     (See 01–13A–8 THROTTLE ACTUATOR INSPECTION [L3].)

Load compensation inspection

1. Start the engine and run it at idle.
2. Connect WDS or equivalent to the DLC-2.
3. Verify that P0506 or P0507 is not displayed.
   - If P0506, or P0507 is displayed, perform DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
4. Select the RPM PID.

Note

- Excludes temporary idle speed drop just after the loads are turned on.

5. Verify that the engine speed is within the specification under each load condition.
   - If load condition is not as specified, inspect the following:
     — A/C switch and related harness (See 07–40–18 CLIMATE CONTROL UNIT INSPECTION.)
     — Fan switch and related harness (See 07–40–18 CLIMATE CONTROL UNIT INSPECTION.)
     — PSP switch and related harness (See 01–40A–29 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [L3].)

Engine speed

Load condition		Engine speed (rpm)*1
No load		650—750
E/L operating		650—750
P/S operating		650—750
A/C operating*2	Refrigerant pressure low*3	750—850
	Refrigerant pressure high*4	750—850

*1 : Neutral or P position
*2 : A/C switch and fan switch are on.
*3 : Refrigerant pressure switch (middle pressure) is off.
*4 : Refrigerant pressure switch (middle pressure) is on.

Throttle position (TP) sweep inspection

1. Connect the WDS or equivalent to DLC-2.
2. Turn the ignition switch to ON position.
3. Verify that none of the following DTC are displayed:
   - P0122, P0123, P0222, P0223, P2100, P2101, P2102, P2103, P2107, P2108, P2119, P2122, P2123, P2127, P2128, P2135, P2138
     — If any one DTC is displayed, perform DTC inspection.
4. Access TP_REL PID.
5. Verify that the PID reading is within the CTP value. (See 01–40A–7 PCM INSPECTION [L3].)
   - If the PID reading is out of range, perform the following:
     — Remove the air duct from throttle valve body.
     — Verify that the throttle valve opens when accelerator pedal is depressed.
       - If the throttle valve opens, inspect the throttle position sensor and related harness.
       - If the throttle valve does not open, inspect the throttle actuator control motor and related harness.
6. Gradually depress the throttle pedal and verify that the PID reading increases lineally.
   - If the PID reading drops momentarily, inspect the following:
     — Throttle position sensor
7. Fully depress the throttle pedal and verify that the PID reading is within WOT value. (See 01–40A–7 PCM INSPECTION [L3].)
   - If the PID reading is out of range, perform the followings:
     — Remove the air duct from throttle valve body.
     — Verify that the throttle valve opens when throttle pedal is depressed.
       - If the throttle valve opens, inspect the throttle position sensor and related harness.
       - If the throttle valve does not open, inspect the throttle actuator control motor and related harness.

VIS Operation Inspection

1. Start the engine.
2. Inspect the rod operation under the following condition:

Rod operation

Engine speed	Approx. 4,500 rpm	
	Below	Above
Shutter valve actuator	Operate	Not operate

- If the rod operation is not as specified, inspect as follows:

(1) Stop the engine.
(2) Connect WDS or equivalent to the DLC-2.
(3) Verify that DTC P0661 or P0662 is not displayed.
- If DTC P0661 or P0662 is shown, perform DTC inspection. (See 01–02A–13 DTC TABLE [L3].)

(4) Inspect VIS control solenoid valve. (See 01–13A–10 VARIABLE INTAKE-AIR SYSTEM (VIS) CONTROL SOLENOID VALVE INSPECTION [L3].)
- If the VIS control solenoid valve is not okay, replace VIS control solenoid valve.
- If the VIS control solenoid valve is okay, inspect the following:
  - — Vacuum hose and vacuum chamber for looseness or damage
  - — Shutter valve actuator (See 01–13A–9 VARIABLE INTAKE-AIR SYSTEM (VIS) SHUTTER VALVE ACTUATOR INSPECTION [L3].)
  - — Shutter valve stuck open or closed

Variable Tumble Control System (VTCS) Operation Inspection

1. Connect the WDS or equivalent to the DLC-2.
2. Access ECT PID.
3. Verify that ECT PID is **below 60°C {140°F}**.
4. Start the engine.
5. Inspect rod operation under the following conditions:

Rod operation

Engine speed	3,750 rpm	
	Below	Above
Shutter valve actuator	Operate	Not operate

- If the rod operation is not specified, inspect as follows:

(1) Verify that DTC No. P2009 or P2010 is not displayed.
- If DTC No. P2009 or P2010 are shown, perform DTC inspection. (See 01–02A–13 DTC TABLE [L3].)

(2) Inspect VTCS control solenoid valve. (See 01–13A–12 VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION [L3].)
- If the VTCS control solenoid valve is not okay, replace VTCS control solenoid valve.
- If the VTCS control solenoid valve is okay, inspect the following:
  - — Vacuum hose and vacuum chamber for looseness or damage
  - — Shutter valve actuator (See 01–13A–11 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SHUTTER VALVE ACTUATOR INSPECTION [L3].)
  - — Shutter valve stuck open or closed

Fuel Injector Operation Inspection

STEP	INSPECTION	RESULTS	ACTION
1	While cranking engine, inspect for fuel injector operation sound at each cylinder using a soundscope. Is operation sound heard?	Yes	Fuel injector operation is okay.
		No	**Not heard in any cylinders:** Go to next step. **Heard in some cylinders:** Go to Step 3.
2	Perform main relay operation inspection. Is main relay operation normal?	Yes	Inspect the following: • Fuel injector power system related wiring harness and connectors • PCM connectors • Fuel injector GND and related wiring harness and connectors
		No	Repair or replace malfunctioning parts.
3	Change fuel injector connector of not operating fuel injector and operating fuel injector. Is operation sound heard?	Yes	Go to next step.
		No	Replace fuel injector.
4	Are wiring harness and connectors of not operation fuel injector okay? (Open or short circuit)	Yes	Inspect PCM terminal voltage of fuel injector signal.
		No	Repair or replace malfunctioning parts.

Fuel Cut Control System Inspection

1. Warm up engine and idle it.
2. Turn off the electrical loads and A/C switch.
3. Connect WDS or equivalent to the DLC-2.
4. Select RPM PID.
5. Listen for the fuel injector operation sound at all cylinders using the soundscope and monitor both PIDs while performing the following steps:
   (1) Depress the accelerator pedal and increase the engine speed to **4,000 rpm**.
   (2) Quickly release the accelerator pedal (brake pedal is not depressed) and verify that the fuel injector operation sound stops, and starts again when the engine speed drops below **1,200 rpm**.
   - If not as specified, inspect the following:
     — ECT sensor and related harness
     (See 01–40A–36 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [L3].)
     — Neutral/clutch switch and related harness (MTX)
     (See 01–40A–27 CLUTCH SWITCH INSPECTION [L3].)
     — TR switch and related harness (ATX)
     (See 05–17A–9 TRANSAXLE RANGE (TR) SWITCH INSPECTION [FN4A-EL].)

Fuel Pump Operation Inspection

Caution
- **Connecting the wrong check connector terminal may possibly cause malfunction. Carefully connect the specified terminal only.**

1. Short the check connector terminal F/P to body GND using a jumper wire.
2. Remove the fuel-filler cap.
3. Turn the ignition switch to ON position.
4. Verify that the fuel pump operation sound is heard.
   - If no operation sound heard, proceed to next step.
5. Measure voltage at harness side fuel pump connector terminal B.

Specification
B+ (Ignition switch at on)

- If the voltage is as specified, inspect the following:
  — Fuel pump continuity
  — Fuel pump GND
  — Wiring harness between fuel pump relay and PCM terminal 4P
- If not as specified, inspect the following:
  — Fuel pump relay
  — Wiring harness connector (Main relay – fuel pump relay – fuel pump.)

Fuel Pump Control System Inspection

1. Crank the engine and verify that fuel pump relay operation sound is heard.
2. If operation sound is not heard, inspect the following:
   - Fuel pump relay
   - Wiring harness and connectors (Main relay – fuel pump relay – PCM terminal 4P)

Spark Test

1. Remove the fuel pump relay.
2. Verify that each high-tension lead and connector is connected properly.
3. Inspect the ignition system using the following procedure:

Warning

- **High voltage in the ignition system can cause strong electrical shock which can result in serious injury. Avoid direct contact to the vehicle body during the following spark test.**

STEP	INSPECTION	RESULTS	ACTION
1	**Note** • No.1 and No.4 cylinders and No.2 and No.3 cylinders are ignited simultaneously. Disconnect high-tension lead from spark plugs. Remove spark plugs. Reconnect spark plugs to high-tension lead. Ground spark plugs to engine. Is strong blue spark visible at each cylinder while cranking?	Yes	Ignition system is okay.
		No	**Some cylinders do not spark:** Go to next step. **All cylinders do not spark:** Go to Step 5.
2	Inspect spark plugs for damage, wear, carbon deposits and proper plug gap. Are spark plugs okay?	Yes	Go to next step.
		No	Replace spark plugs, then go to Step 1.
3	Inspect high-tension leads for insulation damage, looseness, shorting or other damage. Are high-tension leads okay?	Yes	Go to next step.
		No	Replace high-tension leads, then go to Step 1.
4	Inspect the following wiring harnesses for open or short circuit: • Ignition coil terminal A-PCM terminal 1A • Ignition coil terminal C-PCM terminal 1B Are wiring harnesses okay?	Yes	Inspect and replace ignition coil. See 01–18–2 IGNITION COIL INSPECTION.
		No	Repair or replace malfunctioning parts, then go to Step 1.
5	Measure voltage at terminal B in ignition coil. Is voltage reading **B+**?	Yes	Go to next step.
		No	Inspect power supply circuit of ignition coil.
6	Does PCM connector or ignition coil connector have poor connection?	Yes	Repair or replace connector, then go to Step 1.
		No	Go to next step.
7	Are the following items okay? • CKP sensor and crankshaft pulley • PCM terminal 1A/1B voltage **Specification** **Approx. 1.5 V**	Yes	Inspect for open or short circuit in wiring harness and connector of CKP sensor.
		No	Repair or replace malfunctioning parts, then go to Step 1.

EGR Control System Inspection

1. Verify that EGR valve operation (initial operation) sound is heard when the ignition switch is turned to ON position.
   - If the operation sound is not heard, connect WDS or equivalent to the DLC-2 and verify that the DTC P0403 is shown. Perform DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
2. Start the engine and idle it.
3. Warm up the engine to normal operating temperature.
4. Select the following PIDs:
   - ECT, RPM, SEGRP, APP1, APP2, TP_REL, VSS
5. Let the vehicle idle and verify that the SEGRP value is 0.
6. Put the vehicle in drive.
7. Depress the accelerator pedal and verify that the SEGRP value is increased.
   - If the EGR valve will increase, inspect the following:
     — EGR valve (stuck open or close)
     — Wiring harness and connectors (Main relay – EGR valve – PCM)
   - If the SEGRP value does not increase, inspect the VSS, APP1, APP2, TP_REL and ECT PIDs. (See 01–40A–7 PCM INSPECTION [L3].)
8. Stop the vehicle and verify that the SEGRP value returns to 0.

Purge Control System Inspection

1. Start the engine.
2. Disconnect the vacuum hose between the purge solenoid valve and the charcoal canister.
3. Put a finger to the purge solenoid valve and verify that there is no vacuum applied when the engine is cold.
   - If there is a vacuum, inspect the following:
     — Wiring harness and connectors (Purge solenoid valve-PCM terminal 4U)
     — Purge solenoid valve
4. Warm up the engine to the normal operating temperature.
5. Stop the engine.
6. Connect WDS or equivalent to the DLC-2 and verify that the DTC P0443 is shown. Perform DTC inspection. (See 01–02A–13 DTC TABLE [L3].)
7. Turn the ignition switch to ON position.
8. Select ECT PID.
9. Verify that the engine coolant temperature is above **60°C {140°F}**.
   - If WDS or equivalent indicates below **60°C {140°F}**, perform the ECT sensor inspection.
10. Set the vehicle on the dynamometer or chassis roller.

Warning

- **When the dynamometer or chassis roller is operating, there is a possibility that the operator may come into contact with or be caught up in the rotating parts, leading to serious injuries or death. When performing work while the dynamometer or chassis roller is operating, be careful not to contact or be caught up in any of the rotating parts.**

11. Drive vehicle at engine speed **approx. 2000 rpm** for **30 s or more.**
12. Put a finger to the purge solenoid valve and verify that there is no vacuum applied while step 2.
    - If there is no vacuum, inspect the following:
      — Wiring harness and connector (Main relay – purge solenoid valve – PCM terminal 4U)
      — Purge solenoid valve
      — MAF, APP1, APP2, TP_REL and LOAD PIDs
    - If there is vacuum, inspect the following:
      — Vacuum hose (Purge solenoid valve – charcoal canister)

A/C Cut-off Control System Inspection

1. Start the engine.
2. Turn the A/C switch and fan switch on.
3. Verify that the A/C compressor magnetic clutch actuates.
   - If it does not actuate, go to symptom troubleshooting "No.23 A/C does not work sufficiently".
4. Fully open the throttle valve and verify that the A/C compressor magnetic clutch does not actuate for **2—5 s**.
   - If it actuates, inspect as follows:
     — A/C relay
     — Open or short to GND circuit in wiring harness and connectors (Ignition switch-A/C relay-PCM terminal 4O)
     — A/C related parts
     — APP1, APP2 PIDs

Cooling Fan Control System Inspection
Cooling fan system operation (at idle)

Engine condition		Fan relay No.1	Fan relay No.2	Fan relay No.3	Fan relay No.4	Cooling fan motor No.1	Cooling fan motor No.2
Engine coolant temperature below 100°C {212°F}		OFF	OFF	OFF	OFF	OFF	OFF
Engine coolant temperature above 100°C {212°F} (until 97°C {208°F})		ON	OFF	OFF	ON	Low speed	Low speed
Engine coolant temperature above 108°C {233°F} (until 105°C {221°F})		ON	ON	ON	ON	High speed	High speed
A/C and fan switches are on.	Refrigerant pressure switch (middle pressure) is off.	ON	OFF	OFF	ON	Low speed	Low speed
	Refrigerant pressure switch (middle pressure) is on.	ON	ON	ON	OFF	High speed	Middle speed
ECT sensor malfunction		ON	ON	ON	ON	High speed	High speed

1. Connect WDS or equivalent to DLC-2.
2. Verify that DTC P0480, P0481, and P0482 are not displayed.
   - If DTC P0480, P0481 or P0482 are displayed, perform DTC inspection.
3. Verify that ECT PID is below cooling fan operating temperature.
4. Verify that the A/C switch and fan switch are off.
5. Start the engine and idle it.
6. Verify that the cooling fans are not operating.
   - If cooling fan No.1 is operating, inspect whether cooling fan relay No.2 is stuck in the closed position.
   - If the cooling fans are operating, inspect whether cooling fan relay No.1 is stuck in the closed position.
   - If the cooling fans are operating at high speed, inspect DTC for ECT sensor (P0117, P0118).
   - If cooling fan No.1 does not operate and cooling fan No.2 is operating, inspect whether cooling fan relay No.3 is stuck in the closed.
7. Start the engine.
8. Verify that the cooling fans are low speed when ECT PID is **100°C {212°F} or above**.
   - If cooling fan No.1 does not operate, verify that DTC P0480 is not detected.
     — If DTC P0480 is detected, perform DTC inspection.
     — If DTC P0480 is not detected, inspect for the following:
       - Cooling fan relay No.2 is stuck in open position.
       - Open circuit in wiring harnesses or connectors or both between cooling fan relay No.2 and cooling fan motor No.1.
   - If the cooling fan No.2 does not operate, verify that DTC P0482 is not detected.
     — If DTC P0482 is detected, perform DTC inspection.
     — If DTC P0482 is not detected, inspect the following:
       - Cooling fan relay No.3 is stuck in open position.
       - Open circuit in wiring harnesses or connectors or both between cooling fan relay No.3 and cooling fan motor No.2
   - If cooling fan No.1 or cooling fan No.2 or both are operating at high speed, verify that DTC P0481 is not detected.
     — If DTC P0481 is detected, perform DTC inspection.
     — If DTC P0481 is not detected, inspect the following:
       - Cooling fan relay No.1 is stuck in closed position.
       - Cooling fan relay No.4 is stuck in closed position.
9. Turn A/C switch and fan switch on.
10. Verify that A/C is operating.
    - If A/C is not operating, inspect the following:
      — A/C switch
      — Fan switch
      — Refrigerant pressure switch
11. Verify that cooling fan No.1 is operating at high speed and cooling fan No.2 is operating other than at low speed (high or middle speed).
    - If the cooling fan relay does not operate high speed and cooling fan No.2 is operating low speed, inspect the following:
      — Cooling fan relay No.1 is stuck in open position.
      — Cooling fan relay No.4 is stuck in open position.

Variable Air Duct (VAD) Control System Operation Inspection

1. Connect WDS or equivalent to DLC-2.
2. Access ECT, TP_REL and RPM PIDs.
3. Start the engine.
4. Verify ECT PID is **70°C {158°F} or over**.
5. Inspect shutter valve operation under the following conditions.

VAD shutter valve operation

Engine speed	5,800 rpm with TP_REL PIDs 50% or over	
	Below	Above
Shutter valve	Close	Open

- If the shutter valve operation is not as specified, inspect as follows:

(1) Verify that DTC P2676 or P2677 is not displayed.
- If DTC P2676 or P2677 is shown, perform DTC inspection. (See 01–02A–13 DTC TABLE [L3].)

(2) Inspect VAD control solenoid valve. (See 01–13A–7 VARIABLE AIR DUCT (VAD) CONTROL SOLENOID VALVE INSPECTION [L3].)
- If the VAD control solenoid valve is not okay, replace VAD control solenoid valve.
- If the VAD control solenoid valve is okay, inspect the following:
  - — Vacuum hose looseness or damage
  - — Vacuum chamber cracks or damage
  - — Shutter valve actuator. (See 01–13A–6 VARIABLE AIR DUCT (VAD) SHUTTER VALVE INSPECTION [L3].)
  - — Shutter valve is stuck open or closed.

Variable Valve Timing Control System Operation Inspection

When idling cannot be continued

1. Remove the oil control valve (OCV) and verify that the spool valve is at maximum retard position.
2. Connect the oil control valve (OCV).
3. Turn the ignition switch to ON position.
4. Verify that the spool valve is at maximum retard position.
   - If the spool valve is stuck in the advance direction, inspect for the following:
     - — Short circuit in harnesses or connectors between the oil control valve (OCV) and the PCM.
5. Inspect the variable timing actuator.

When idling can be continued

1. Disconnect oil control valve (OCV) connector.
2. Warm up the engine and idle it.
3. Apply battery voltage to the oil control valve (OCV) and verify that the engine idles roughly or stalls.
   - If the engine idles roughly or stalls, inspect the timing belt component (valve timing deviation).
   - If the engine does not idle roughly or stalls, go to next step.
4. Remove the oil control valve (OCV) and perform spool valve operation inspection. (See 01–10A–34 OIL CONTROL VALVE (OCV) INSPECTION [L3].)
   - If not as specified, inspect the following:
     - — Oil control valve (OCV)
     - — Harnesses and connectors between oil control valve (OCV) and PCM open or short.
   - If as specified, inspect the following hydraulic passages for clogging or leakage or both:
     - — Oil pressure switch – oil control valve (OCV)
     - — Oil control valve (OCV) – camshaft
     - — Camshaft internal passage
5. If they are okay, replace the camshaft pulley (with built-in variable valve timing actuator).

Evaporative System Test

Evaporative system test outline

- To verify that the problem has been fixed properly after repairs, the run Drive Cycle or evaporative system test must be performed.

Evaporative system leak inspection using leak tester

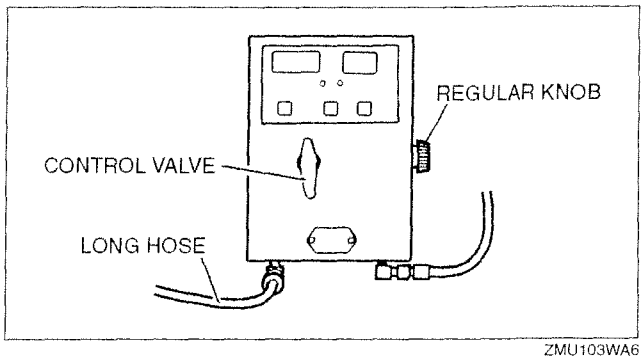
1. Perform the following **SST** (Evaporative Emission System Tester MZ254AT3641) self-test:

Note

- If the tester does not work correctly during the self-test, refer to the tester operators manual for more detailed self test procedures.

(1) Verify that the gas cylinder valve is closed and the control valve located on the tester is in the TEST position. All tester displays should be off at this time.

(2) Connect the long hose (part of **SST**) to the tester.



ZMU103WA6

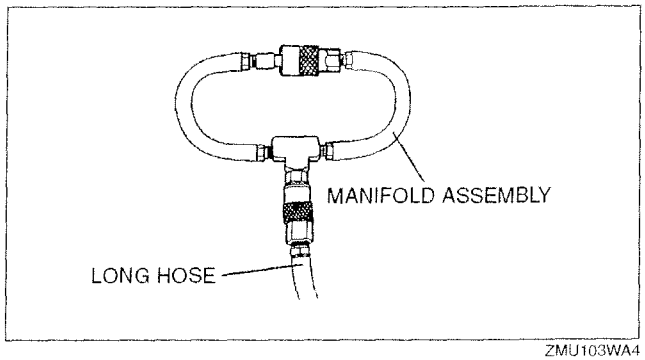
(3) Connect the manifold assembly (part of **SST**) to the long hose as shown.

(4) Open the gas cylinder valve and verify the gas cylinder regulator left gauge reads **10 to 12 psi** (preset at factory).
- If not, refer to the tester operators manual to contact tester manufacturer.

(5) Press the ON/OFF switch to turn on the **SST** and make sure the left display reads **0.0**.

(6) Turn the control valve on the tester to the FILL position.

(7) Verify the left display reading is within **13.9 to 14.0 inches of water.**
- If not, adjust the pressure using the regulator knob located on the right side of the tester.



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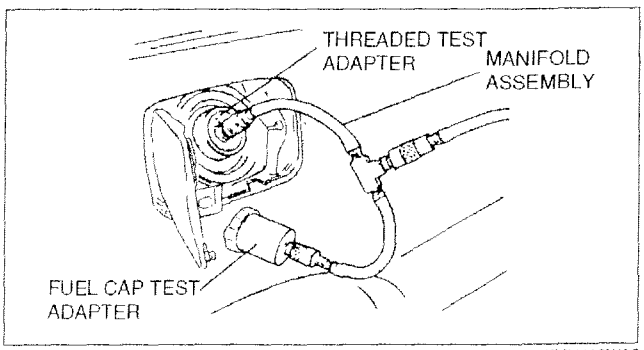
(8) Turn the control valve to TEST position and press the START switch.

(9) After the **2-minute** countdown (left display) is completed, the right display shows the total pressure loss for that period. A **0.5 inch of water** loss is acceptable on the self-test.
- If the loss is **0.5 inch or more** of water, do one or more self-tests. If the test repeatedly fails, check for leaks using the ultrasonic leak detector (part of **SST**).

2. Press the RESET switch to set the left display reading to **0.0**.
3. Connect the fuel cap test adapter (part of **SST**) to the manifold assembly and fuel-filler cap from the vehicle.
   - If the fuel-filler cap is not a genuine part, replace it.
4. Connect the threaded test adapter (part of **SST**) to the manifold assembly and fuel-filler neck.
5. Connect the WDS or equivalent to DLC-2.
6. Turn the ignition switch to ON position (Engine OFF).
7. Request the PCM for on-board device control (Mode 08) using the WDS or equivalent to close the change-over valve (COV) in EVAP system leak detection pump.



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Note

- The COV is closed for **10 minutes unless** the following any actions are done:
  — The engine is started.
  — The ignition switch is turned to OFF position.

8. Turn the control valve to the FILL position.

9. Wait (**maximum 40 seconds**) until the left display reads **13.5 to 14 inches of water.**
   - If the reading is slightly below, adjust it using the regulator knob.
   - If the reading is far below, the EVAP system has a large leak. Check for leaks (using the ultrasonic leak detector if necessary) and repair.
10. Turn the control valve to the TEST position and press the START switch.
11. After the **2-minute** countdown (left display) is completed, check the test result (the failed/passed light on the tester).
    - If the green light illuminates, the EVAP system is OK.
    - If the red light illuminates, the EVAP system has leakage. Check for leaks using the ultrasonic leak detector and repair.
12. Close the gas cylinder valve.
13. Turn the control valve to the FILL position.
14. Press the ON/OFF switch to turn off the tester.

01–03B SYMPTOM TROUBLESHOOTING [ENGINE CONTROL SYSTEM (AJ)]

CONTROL SYSTEM DEVICE AND CONTROL RELATIONSHIP CHART [AJ]

C6U010318881W01

×: Applicable

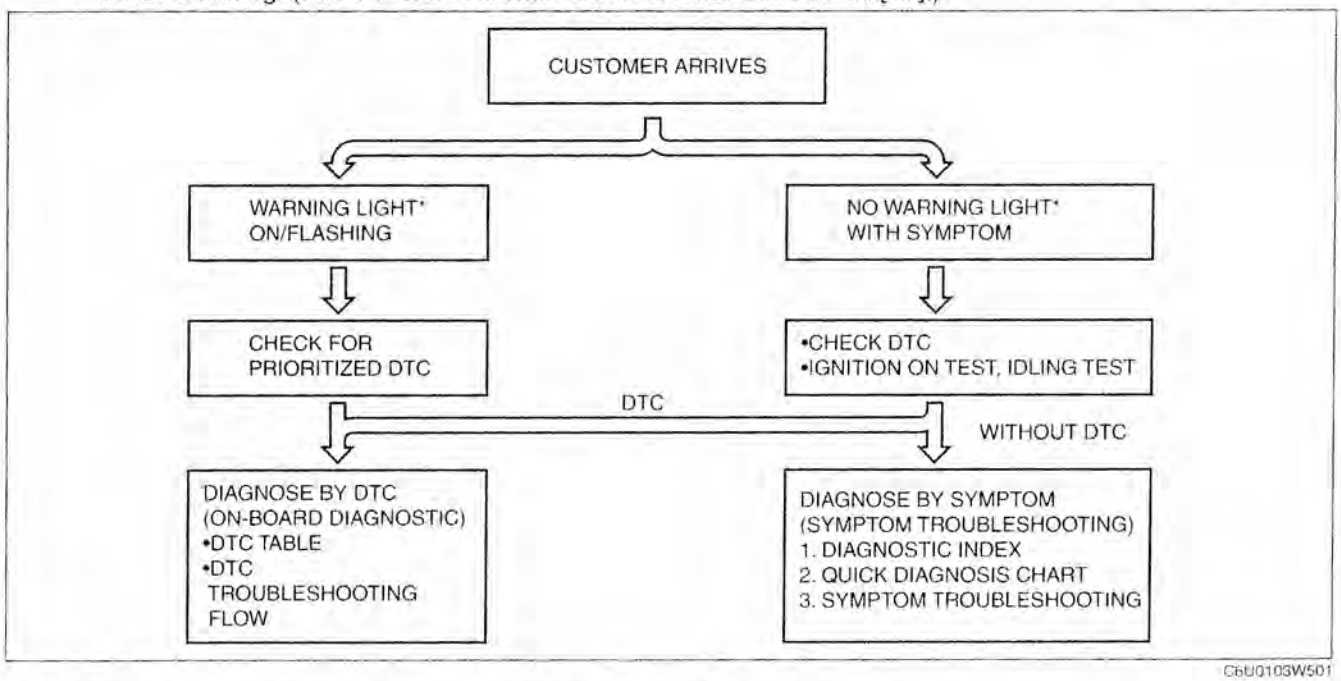
Item	IAC	VAD control	Throttle actuator control	Variable valve timing control	Fuel pump control	Fuel injection control	ESA control	HO2S heater (RF, LF) control	HO2S heater (RR, LR) control	EGR control	Purge control	Electrical fan control	Generator control	Cruise control	A/C cut off control	Immobilizer system
Input device																
Battery voltage			×			×	×				×	×	×			
Brake switch			×			×								×		
Clutch switch	×					×	×									
Neutral switch	×					×	×									
TR switch	×					×	×									
Cruise control switch														×		
PSP switch	×					×	×								×	
A/C switch, refrigerant pressure switch (high, low pressure)	×					×						×			×	
Refrigerant pressure switch (middle pressure)												×				
APP sensor			×											×		
TP sensor	×	×	×	×		×	×	×	×				×		×	
ECT sensor	×			×		×	×	×	×	×	×	×	×		×	
IAT sensor	×					×	×			×	×		×			
MAF sensor	×			×		×	×	×	×	×	×					
HO2S (RF, LF)						×										
HO2S (RR, LR)						×										
EGR boost sensor	×					×					×					
KS							×									
CMP sensor (RH, LH)				×		×	×									
CKP sensor	×	×	×	×	×	×	×	×	×	×	×		×		×	
VSS	×		×			×	×			×			×	×		
Generator terminal P	×												×			
ABS/TCS HU/CM	×		×			×	×									
Coil																×
Output device																
VAD control solenoid valve		×														
Throttle actuator	×		×											×		
OCV (RH, LH)				×												
Fuel injector						×										×
Ignition coil							×									×
HO2S heater (RF, LF)								×								
HO2S heater (RR, LR)									×							
EGR valve										×						
Purge solenoid valve											×					
Fan control module												×				
Generator terminal D (field coil)													×			
Generator warning light													×			
Cruise main indicator light														×		
Cruise set indicator light														×		

Item	IAC	VAD control	Throttle actuator control	Variable valve timing control	Fuel pump control	Fuel injection control	ESA control	HO2S heater (RF, LF) control	HO2S heater (RR, LR) control	EGR control	Purge control	Electrical fan control	Generator control	Cruise control	A/C cut off control	Immobilizer system
Fuel pump relay					×											
A/C relay															×	
ET control relay			×													

FOREWORD [AJ]

C6U010318881W02

- When the customer reports a vehicle malfunction, check the malfunction indicator lamp (MIL) indication and diagnostic trouble code (DTC), then diagnose the malfunction according to the following flowchart:
  - — If a DTC exists, diagnose the applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
  - — If no DTC exists and the MIL does not illuminate or flash, diagnose the applicable symptom troubleshooting. (See 01–03B–6 SYMPTOM DIAGNOSTIC INDEX [AJ].)



C6U0103W501

*: Malfunction Indicator Lamp (MIL), Generator Warning Light, Security Light

INTERMITTENT CONCERN TROUBLESHOOTING [AJ]

C6U010318881W03

Vibration Method

- If malfunction occurs or becomes worse while driving on a rough road or when engine is vibrating, perform the steps below.

Note

- There are several reasons vehicle or engine vibration could cause an electrical malfunction. Some of the things to check for are:
  - — Connectors not fully seated.
  - — Wire harnesses not having full play.
  - — Wires laying across brackets or moving parts.
  - — Wires routed too close to hot parts.
- An improperly routed, improperly clamped, or loose harness can cause wiring to become pinched between parts.
- The connector joints, points of vibration, and places such as where wire harnesses pass through the firewall, body panels are the major areas to be checked.

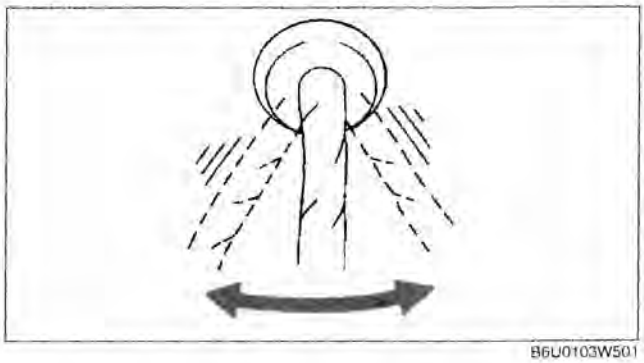
Inspection Method for Switch Connectors or Wires

1. Connect the WDS or equivalent to the DLC-2.
2. Turn ignition switch to ON position (Engine OFF).

Note

- If the engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Turn switch on manually.
5. Shake each connector or wire harness a little vertically and horizontally while monitoring the PID.
   - If PID value is unstable, check for poor connection.



B6U0103W501

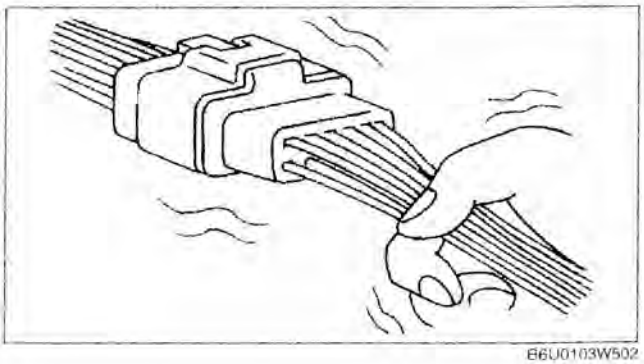
Inspection Method for Sensor Connectors or Wires

1. Connect the WDS or equivalent to the DLC-2.
2. Turn ignition switch to ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Shake each connector or wire harness a little vertically and horizontally while monitoring the PID.
   - If PID value is unstable, check for poor connection.



B6U0103W502

Inspection Method for Sensors

1. Connect the WDS or equivalent to the DLC-2.
2. Turn ignition switch to ON position (Engine OFF).

Note
- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Vibrate the sensor slightly with your finger.
   - If PID value is unstable or malfunction occurs, check for poor connection or poorly mounted sensor, or both.

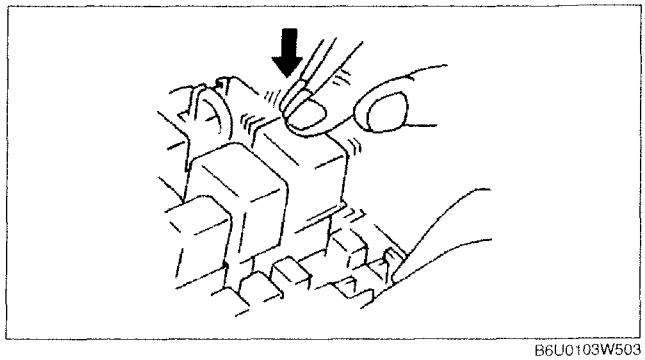
Inspection Method for Actuators or Relays

1. Connect the WDS or equivalent to the DLC-2.
2. Turn ignition switch to ON position (Engine OFF).

Note
- If engine starts and runs, perform the following steps at idle.

3. Prepare the output device control function for actuators or relays that you are inspecting.
4. Vibrate the actuator or relay with your finger for 3 s after output device control function is activated.
   - If a variable click sound is heard, check for poor connection or poorly mounted actuator/ relay, or both.

Note
- Vibrating relays too strongly may result in open relays.



B6U0103W503

Water Sprinkling Method

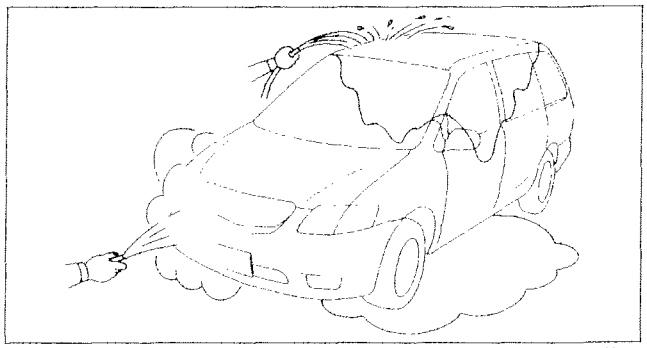
If malfunction occurs only during high humidity or rainy/snowy weather, perform the following steps.

Caution
- **Indirectly change the temperature and humidity by spraying water onto the front of the radiator.**
- **If a vehicle is subject to water leakage, the leakage may damage the control module. When testing a vehicle with a water leakage problem, special caution must be used.**

1. Connect the WDS or equivalent to the DLC-2 if you are inspecting sensors or switches.
2. Turn ignition switch to ON position (Engine OFF).

Note
- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for sensor or switch if you are inspecting sensors or switches.
4. If you are inspecting the switch, turn it on manually.
5. Spray water onto the vehicle or run it through a car wash.
   - If the PID value is unstable or malfunction occurs, repair or replace part as necessary.



B6U0103W504

SYMPTOM DIAGNOSTIC INDEX [AJ]

C6U010318881W04

No.	TROUBLESHOOTING ITEM		DESCRIPTION	PAGE
1	Melting of main or other fuses		—	(See 01–03B–12 NO.1 MELTING OF MAIN OR OTHER FUSES [AJ].)
2	MIL illuminates		MIL is illuminated incorrectly.	(See 01–03B–13 NO.2 MIL ILLUMINATES [AJ].)
3	Will not crank		Starter does not work.	(See 01–03B–14 NO.3 WILL NOT CRANK [AJ].)
4	Hard start/long crank/erratic start/erratic crank		Starter cranks engine at normal speed but engine requires excessive cranking time before starting.	(See 01–03B–16 NO.4 HARD START/LONG CRANK/ERRATIC START/ ERRATIC CRANK [AJ].)
5	Engine stalls	After start/at idle	Engine stops unexpectedly at idle and/or after start.	(See 01–03B–18 NO.5 ENGINE STALLS-AFTER START/AT IDLE [AJ].)
6	Cranks normally but will not start		Starter cranks engine at normal speed but engine will not run.	(See 01–03B–22 NO.6 CRANKS NORMALLY BUT WILL NOT START [AJ].)
7	Slow return to idle		Engine takes more time than normal to return to idle speed.	(See 01–03B–26 NO.7 SLOW RETURN TO IDLE [AJ].)
8	Engine runs rough/rolling idle		Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively.	(See 01–03B–27 NO.8 ENGINE RUNS ROUGH/ ROLLING IDLE [AJ].)
9	Fast idle/runs on		Engine speed continues at fast idle after warm-up. Engine runs after ignition switch is turned to off.	(See 01–03B–30 NO.9 FAST IDLE/RUNS ON [AJ].)
10	Low idle/stalls during deceleration		Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.	(See 01–03B–31 NO.10 LOW IDLE/STALLS DURING DECELERATION [AJ].)
11	Engine stalls/quits	Acceleration/cruise	Engine stops unexpectedly at beginning of acceleration or during acceleration. Engine stops unexpectedly while cruising.	(See 01–03B–32 NO.11 ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES [AJ].)
	Engine runs rough	Acceleration/cruise	Engine speed fluctuates during acceleration or cruising.	
	Misses	Acceleration/cruise	Engine misses during acceleration or cruising.	
	Buck/jerk	Acceleration/cruise/ deceleration	Vehicle bucks/jerks during acceleration, cruising, or deceleration.	
	Hesitation/stumble	Acceleration	Momentary pause at beginning of acceleration, or during acceleration	
	Surges	Acceleration/cruise	Momentary minor irregularity in engine output	
12	Lack/loss of power	Acceleration/cruise	Performance poor under load (e.g. power down when climbing hills).	(See 01–03B–36 NO.12 LACK/LOSS OF POWER-ACCELERATION /CRUISE [AJ].)
13	Knocking/pinging	Acceleration/cruise	Sound is produced when air/fuel mixture is ignited by something other than spark plug (e.g. hot spot in combustion chamber).	(See 01–03B–39 NO.13 KNOCKING/ PINGING-ACCELERATIO N/CRUISE [AJ].)
14	Poor fuel economy		Fuel economy is unsatisfactory.	(See 01–03B–40 NO.14 POOR FUEL ECONOMY [AJ].)
15	Emissions compliance		Fails emissions test	(See 01–03B–42 NO.15 EMISSION COMPLIANCE [AJ].)
16	High oil consumption/leakage		Oil consumption is excessive.	(See 01–03B–44 NO.16 HIGH OIL CONSUMPTION/ LEAKAGE [AJ].)

SYMPTOM TROUBLESHOOTING [ENGINE CONTROL SYSTEM (AJ)]

No.	TROUBLESHOOTING ITEM		DESCRIPTION	PAGE
17	Cooling system concerns	Overheating	Engine runs at higher than normal temperature/overheats.	(See 01-03B-44 NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [AJ].)
18	Cooling system concerns	Runs cold	Engine does not reach normal operating temperature.	(See 01-03B-46 NO.18 COOLING SYSTEM CONCERNS-RUNS COLD [AJ].)
19	Exhaust smoke		Blue, black, or white smoke from exhaust system	(See 01-03B-47 NO.19 EXHAUST SMOKE [AJ].)
20	Fuel odor (in engine compartment)		Gasoline fuel smell or visible leakage	(See 01-03B-48 NO.20 FUEL ODOR (IN ENGINE COMPARTMENT) [AJ].)
21	Engine noise		Engine noise from under hood	(See 01-03B-49 NO.21 ENGINE NOISE [AJ].)
22	Vibration concerns (engine)		Vibration from under hood or driveline	(See 01-03B-50 NO.22 VIBRATION CONCERNS (ENGINE) [AJ].
23	A/C does not work sufficiently		A/C compressor magnetic clutch does not engage when A/C is turned on.	(See 01-03B-51 NO.23 A/C DOES NOT WORK SUFFICIENTLY [AJ].)
24	A/C always on or A/C compressor runs continuously.		A/C compressor magnetic clutch does not disengage.	(See 01-03B-52 NO.24 A/C ALWAYS ON/A/C COMPRESSOR RUNS CONTINUOUSLY [AJ].)
25	A/C does not cut off under wide open throttle conditions.		A/C compressor magnetic clutch does not disengage under wide open throttle.	(See 01-03B-53 NO.25 A/C DOES NOT CUT OFF UNDER WIDE OPEN THROTTLE CONDITIONS [AJ].)
26	Exhaust sulphur smell		Rotten egg smell (sulphur) from exhaust	(See 01-03B-53 NO.26 EXHAUST SULPHUR SMELL [AJ].)
27	Fuel refill concerns		Fuel tank does not fill smoothly.	(See 01-03B-54 NO.27 FUEL REFILL CONCERNS [AJ].)
28	Fuel filling shut off issues		Fuel does not shut off properly.	(See 01-03B-55 NO.28 FUEL FILLING SHUT OFF ISSUES [AJ].)
29	Spark plug condition		Incorrect spark plug condition	(See 01-03B-56 NO.29 SPARK PLUG CONDITION [AJ].)
30	ATX concerns	Upshift/downshift/ engagement	ATX concerns not related to engine performance	(See 05-03B-4 SYMPTOM TROUBLESHOOTING ITEM TABLE [JA5A-EL].)

SYMPTOM QUICK DIAGNOSIS CHART [AJ]

C6U010318881W05

X: Applicable

	Troubleshooting item / Possible factor		Starter motor malfunction (Mechanical or electrical)	Starter circuit including ignition switch is open	Improper engine oil level	Low or dead battery	Charging system malfunction	Improper engine compression	Improper valve timing	Hydrolocked engine	Improper engine oil viscosity	Improper dipstick	Base engine malfunction	Flywheel or drive plate is seized.	Improper tension or damaged drive belts	Improper engine coolant level	Water and anti-freeze mixture are improper.	Cooling fan system malfunction	Engine or transaxle mounts improperly installed.	Cooling fan seat improper.	Accelerator position sensor play misadjustment
1	Melting of main or other fuses																				
2	MIL illuminates																				
3	Will not crank		x	x		x	x			x				x							
4	Hard to start/long crank/erratic start/erratic crank																				
5	Engine stalls.	After start/at idle						x	x												
6	Cranks normally but will not start							x	x												
7	Slow return to idle																	x			
8	Engine runs rough/rolling idle							x	x												
9	Fast idle/runs on																				x
10	Low idle/stalls during deceleration																				x
11	Engine stalls/quits	Acceleration/cruise						x	x												x
	Engine runs rough	Acceleration/cruise						x	x												x
	Misses	Acceleration/cruise						x	x												x
	Buck/jerk	Acceleration/cruise/deceleration						x	x												x
	Hesitation/stumble	Acceleration						x	x												x
	Surges	Acceleration/cruise						x	x												x
12	Lack/loss of power	Acceleration/cruise						x	x												
13	Knocking/pinging	Acceleration/cruise						x													
14	Poor fuel economy							x	x							x		x			
15	Emissions compliance							x	x				x					x			
16	High oil consumption/leakage										x	x	x								
17	Cooling system concerns	Overheating													x	x	x	x			
18	Cooling system concerns	Runs cold																x			
19	Exhaust smoke							x					x								
20	Fuel odor (in engine compartment)																				
21	Engine noise				x								x		x						
22	Vibration concerns (engine)														x				x	x	
23	A/C does not work sufficiently.																				
24	A/C always on or A/C compressor runs continuously																				
25	A/C does not cut off under wide open throttle conditions																				x
26	Exhaust sulfur smell																				
27	Fuel refill concerns																				
28	Fuel filling shut off issues																				
29	Spark plug condition							x													
30	ATX concerns	Upshift/downshift/engagement	(See 05-03 SYMPTOM TROUBLESHOOTING.)																		

B6U0103W530

X: Applicable

	Possible factor / Troubleshooting item		Cruise control system operation improperly	Fuel quality	Engine overheating	Air cleaner element clogging or restriction	Air leakage from intake-air system (Loose tubes, cracks, gaskets breakage)	Electronic throttle control system improper operation	Throttle body malfunction	Variable valve timing control system	VAD malfunction	Vacuum leakage (Vacuum hose damage, misrouting)	Ignition coil malfunction (e.g. open, short circuit or cracks)	Spark plug malfunction	CKP sensor damaged (e.g. open or short circuits)	Crankshaft pulley damaged	Fuel pump malfunction (Mechanically or electrically)	Pressure regulator malfunction	Fuel hoses restriction or clogging	Injectors malfunction (Leakage or clogging, inoperative)	Fuel leakage from fuel system (including insulator, injector O-ring)
1	Melting of main or other fuses															x						
2	MIL illuminates																					
3	Will not crank																					
4	Hard to start/long crank/erratic start/erratic crank			x		x	x	x				x	x	x	x	x	x	x	x			
5	Engine stalls.	After start/at idle		x	x	x	x	x		x		x	x	x	x	x	x	x	x	x	x	x
6	Cranks normally but will not start			x	x	x	x	x				x	x	x	x	x	x	x	x	x	x	x
7	Slow return to idle								x													
8	Engine runs rough/rolling idle			x	x	x	x	x		x		x	x	x	x	x	x	x	x	x	x	
9	Fast idle/runs on		x				x	x	x													
10	Low idle/stalls during deceleration						x	x				x										
11	Engine stalls/quits	Acceleration/cruise		x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x	
	Engine runs rough	Acceleration/cruise		x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x	
	Misses	Acceleration/cruise		x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x	
	Buck/jerk	Acceleration/cruise/deceleration		x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x	
	Hesitation/stumble	Acceleration		x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x	
	Surges	Acceleration/cruise		x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x	
12	Lack/loss of power	Acceleration/cruise		x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	
13	Knocking/pinging	Acceleration/cruise			x														x			
14	Poor fuel economy			x		x		x		x			x	x			x	x	x			
15	Emissions compliance					x	x		x			x		x			x	x	x			
16	High oil consumption/leakage																					
17	Cooling system concerns	Overheating																				
18	Cooling system concerns	Runs cold																				
19	Exhaust smoke					x							x	x			x	x	x	x		
20	Fuel odor (in engine compartment)																	x				x
21	Engine noise						x				x	x										
22	Vibration concerns (engine)																					
23	A/C does not work sufficiently.																					
24	A/C always on or A/C compressor runs continuously																					
25	A/C does not cut off under wide open throttle conditions																					
26	Exhaust sulfur smell			x								x					x	x				
27	Fuel refill concerns																					
28	Fuel filling shut off issues																					
29	Spark plug condition			x		x								x			x	x	x	x	x	
30	ATX concerns	Upshift/downshift/engagement	(See 05-03 SYMPTOM TROUBLESHOOTING.)																			

B6U0103W531

X: Applicable

	Possible factor / Troubleshooting item		Injectors malfunction (Leakage or clogging, inoperative)	Fuel leakage from fuel system (including insulator, injector O-ring)	Fuel filters restriction or clogging	CMP sensor damaged (e.g. open or short circuit).	Camshaft is damaged.	improper air/fuel mixture ratio control	Exhaust system restriction or clogging	Catalytic converter malfunction	EGR system malfunction	EVAP control system malfunction	PCV valve malfunction	V-reference supply circuit malfunction	Main relay malfunction (Mechanically or electrically)	IAT sensor malfunction	ECT sensor malfunction	Neutral/clutch switch or related circuit malfunction (MTX)	TR switch misadjustment (ATX)	P/N position switch in TR switch open. (ATX)	Starter interlock switch misadjustment (MTX)	Brake switch and related circuit malfunction	MAF sensor and related circuit malfunction
1	Melting of main or other fuses																						
2	MIL illuminates					x				x	x	x											x
3	Will not crank																		x	x	x		
4	Hard to start/long crank/erratic start/erratic crank				x	x		x	x			x	x										x
5	Engine stalls.	After start/at idle	x	x				x	x		x	x	x	x									
6	Cranks normally but will not start		x	x		x		x	x		x	x	x	x	x								
7	Slow return to idle																x						
8	Engine runs rough/rolling idle		x		x	x	x	x	x		x	x	x										
9	Fast idle/runs on																x						
10	Low idle/stalls during deceleration							x				x						x		x		x	x
11	Engine stalls/quits	Acceleration/cruise	x		x	x	x	x	x		x	x	x		x								x
	Engine runs rough	Acceleration/cruise	x		x	x	x	x	x		x	x	x		x								x
	Misses	Acceleration/cruise	x		x	x	x	x	x		x	x	x		x								x
	Buck/jerk	Acceleration/cruise/deceleration	x		x	x	x	x	x		x	x	x		x								x
	Hesitation/stumble	Acceleration	x		x	x	x	x	x		x	x	x		x								x
	Surges	Acceleration/cruise	x		x	x	x	x	x		x	x	x		x								x
12	Lack/loss of power	Acceleration/cruise	x		x	x	x		x		x	x	x										x
13	Knocking/pinging	Acceleration/cruise				x	x									x	x						x
14	Poor fuel economy				x	x	x		x				x										
15	Emissions compliance				x	x	x	x	x	x	x	x	x										
16	High oil consumption/leakage												x										
17	Cooling system concerns	Overheating																					
18	Cooling system concerns	Runs cold																					
19	Exhaust smoke		x										x										
20	Fuel odor (in engine compartment)			x								x											
21	Engine noise																						
22	Vibration concerns (engine)																						
23	A/C does not work sufficiently.																						
24	A/C always on or A/C compressor runs continuously																						
25	A/C does not cut off under wide open throttle conditions																						
26	Exhaust sulfur smell											x											
27	Fuel refill concerns											x											
28	Fuel filling shut off issues											x											
29	Spark plug condition		x	x				x									x						x
30	ATX concerns	Upshift/downshift/engagement	(See 05-03 SYMPTOM TROUBLESHOOTING.)																				

B6U0103W532

X: Applicable

	Possible factor / Troubleshooting item		TP sensor and related circuit malfunction	Accelerator position sensor related circuit malfunction	Knock sensor and related circuit malfunction	P/S pressure switch and related circuit malfunction	Improper refrigerant charging amount	A/C relay (A/C control signal) circuit malfunction	Cooling system malfunction (Radiator, hoses, overflow system, thermostat, etc.)	Improper load signal input	Clutch slippage (MTX)	ATX related parts malfunction (ATX)	VSS and related circuit malfunction	Immobilizer system (PATS) operating	Immobilizer system (PATS) malfunction	Improper ATF level (ATX)	Brake dragging	Loosen parts	Improper balance of wheels and tires	Drive line malfunction	Suspension malfunction
1	Melting of main or other fuses																				
2	MIL illuminates		x		x	x															
3	Will not crank													x	x						
4	Hard to start/long crank/erratic start/erratic crank																				
5	Engine stalls.	After start/at idle	x	x			x	x						x	x						
6	Cranks normally but will not start		x	x										x	x						
7	Slow return to idle								x												
8	Engine runs rough/rolling idle					x	x	x		x											
9	Fast idle/runs on									x											
10	Low idle/stalls during deceleration		x	x																	
11	Engine stalls/quits	Acceleration/cruise	x				x	x			x	x	x								
	Engine runs rough	Acceleration/cruise	x				x	x			x	x	x								
	Misses	Acceleration/cruise	x				x	x			x	x	x								
	Buck/jerk	Acceleration/cruise/deceleration	x				x	x			x	x	x								
	Hesitation/stumble	Acceleration	x				x	x			x	x	x								
	Surges	Acceleration/cruise	x				x	x			x	x	x								
12	Lack/loss of power	Acceleration/cruise	x				x	x			x	x	x				x				
13	Knocking/pinging	Acceleration/cruise			x				x												
14	Poor fuel economy								x		x					x	x				
15	Emissions compliance								x												
16	High oil consumption/leakage																				
17	Cooling system concerns	Overheating					x	x	x												
18	Cooling system concerns	Runs cold							x												
19	Exhaust smoke								x												
20	Fuel odor (in engine compartment)																				
21	Engine noise																	x			
22	Vibration concerns (engine)																	x	x	x	x
23	A/C does not work sufficiently.						x	x													
24	A/C always on or A/C compressor runs continuously							x													
25	A/C does not cut off under wide open throttle conditions		x																		
26	Exhaust sulfur smell																				
27	Fuel refill concerns																				
28	Fuel filling shut off issues																				
29	Spark plug condition																				
30	ATX concerns	Upshift/downshift/engagement	(See 05-03 SYMPTOM TROUBLESHOOTING.)																		

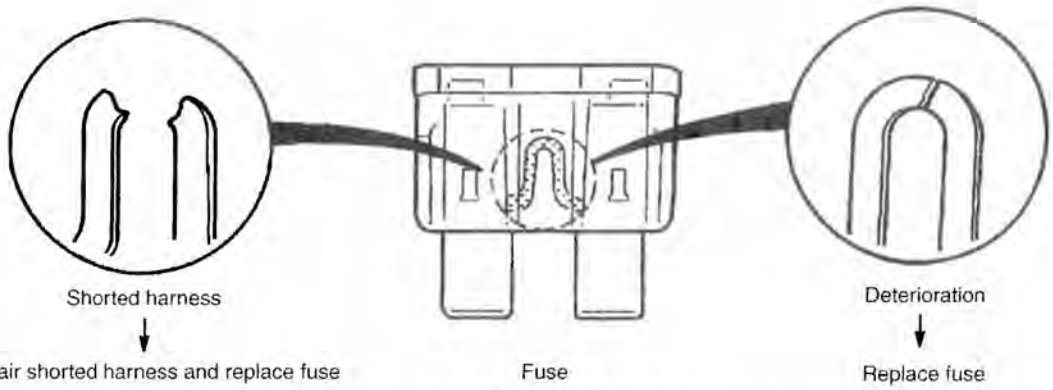
B6U0103W533

NO.1 MELTING OF MAIN OR OTHER FUSES [AJ]

C6U010318881W06

1	Melting of main or other fuses

[TROUBLESHOOTING HINTS]
Inspect condition of fuse.



Damaged fuse	Related wiring harness
MAIN	**MAIN fuse** • IG KEY2 fuse • AD FAN fuse • FAN1 fuse • FAN2 fuse • BTN fuse • Generator
ENG +B	**ENG +B fuse** • PCM
IG KEY1	**IG KEY1 fuse** • Ignition switch — ENGINE IG fuse — METER IG fuse
IG KEY1	**IG KEY1 fuse** • Ignition switch — ENGINE IG fuse — METER IG fuse
ETC	**ETC fuse** • ETC relay — PCM
FAN1	**FAN1 fuse** • Cooling fan relay — Cooling fan control module
FAN2	**FAN2 fuse** • Cooling fan relay — Cooling fan control module
ENGINE IG	**ENGINE IG fuse** • PCM • Ignition coil • Capacitor
METER IG	**METER IG fuse** • IG1 relay
ENG BAR	**ENG BAR fuse** • Purge solenoid valve • VAD control solenoid valve • EGR boost sensor solenoid valve • MAF/IAT sensor • EGR valve • OCV (RH) • OCV (LH) • EVAP system leak detection pump

IG1	**IG1 fuse** • IG1 relay — HO2S (RF) — HO2S (LF) — HO2S (RR) — HO2S (LR)
ENG BB	**ENG BB fuse** • Cooling fan relay
If malfunction remains, refer to related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.	

NO.2 MIL ILLUMINATES [AJ]

C6U010318881W07

2	**MIL illuminates**
DESCRIPTION	• MIL illuminates.
POSSIBLE CAUSE	• PCM illuminates MIL for emission-related concern (DTCs are stored in PCM) • Short to GND circuit between MIL (located on instrument cluster) and PCM **Note** • If MIL blinks at steady rate, misfire condition could possibly exist.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Connect WDS or equivalent to DLC-2. • Turn ignition switch to ON position. • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Inspect for short to GND circuit between instrument cluster and PCM terminal 2. • Inspect instrument cluster operation (See 09–22–4 INSTRUMENT CLUSTER INSPECTION.)
2	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.3 WILL NOT CRANK [AJ]

C6U010318681W08

3	Will not crank
DESCRIPTION	• Starter does not work.
POSSIBLE CAUSE	• Open starter circuit between ignition switch and starter • TR switch malfunction (ATX) • TR switch misadjustment (ATX) • Low or dead battery • Charging system malfunction • Starter interlock switch malfunction (MTX) • Starter malfunction • Seized/hydro locked engine, flywheel or drive plate • Immobilizer system (PATS) and / or circuit malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Connect WDS or equivalent to DLC-2. • Do following conditions appear? — Engine is not completely started. — DTC B1681 is displayed.	Yes	**Both conditions appear:** Go to Step 4.
		No	**Either or other condition appears:** Go to next step.
2	• Is coil connector securely connected to coil?	Yes	Go to next step.
		No	Connect coil connector securely. Return to step 1.
3	• Does security light illuminate?	Yes	Go to next step.
		No	Inspect instrument cluster and wiring harness. (See 09–22–4 INSTRUMENT CLUSTER INSPECTION.)
4	• Connect WDS or equivalent to DLC-2 and retrieve DTC. **DTC** **B1213, B1342, B1600, B1601, B1602, B1681, B2103, B2431**	Yes	Go to appropriate DTC test.
		No	Go to next step.
5	• Is there continuity between PCM GND terminals 24, 51, 76, 77, 103 and GND?	Yes	Go to next step.
		No	Repair or replace wiring harness.
6	• Measure voltage between PCM GND terminal 24, 51, 76, 77, 103 and coil terminal C • Is voltage **below 1.0 V**?	Yes	Go to next step.
		No	Repair or replace wiring harness.
7	• Turn ignition switch to ON position. • Measure voltage PCM terminal 71 and 97. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace wiring harness.
8	• Disconnect coil connector. • Turn ignition switch to ON position. • Is there battery voltage at coil connector terminal D (harness-side)?	Yes	Go to next step.
		No	Repair or replace wiring harness between coil connector terminal D and fuse panel.
9	• Inspect for following wiring harnesses and connectors: — Between coil terminal A and PCM terminal 66 — Between coil terminal B and PCM terminal 65 • Is there any malfunction?	Yes	Repair or replace wiring harness.
		No	Go to next step.
10	• Is there continuity between PCM terminal 98 and starter relay with clutch pedal depressed (MTX), P or N position (ATX)?	Yes	Go to next step.
		No	Repair or replace wiring harness.
11	• Verify the following: — Battery connection — Battery condition — Transaxle is in Park or Neutral. (ATX) — Clutch is fully depressed. (MTX) — Fuses • Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 11.
12	• Is clicking sound heard from starter when ignition switch is turned to START position?	Yes	Go to next step.
		No	Go to Step 14.

STEP	INSPECTION		ACTION
13	• Inspect starting system. (See 01–19–2 STARTER INSPECTION.) (See 01–19–9 STARTER INTERLOCK SWITCH INSPECTION (MTX).) • Is starting system okay?	Yes	Inspect for seized/hydrologic engine, flywheel or drive plate.
		No	Repair or replace components as required.
14	• Do any other electrical accessories work?	Yes	Go to next step.
		No	Inspect charging system. (See 01–17–1 BATTERY INSPECTION.) (See 01–17–5 GENERATOR INSPECTION.)
15	**Note** • The following test should be performed on ATX only. For MTX, go to next step. • Inspect adjustment of TR switch. (See 05–17B–11 TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL].) • Is TR switch adjusted properly?	Yes	Go to next step.
		No	If TR switch is adjusted properly, inspect for open circuit between TR switch and PCM terminal 64 or starter.
16	• Connect WDS or equivalent to DLC-2. • Turn ignition switch to ON position. • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriated DTC test. **Communication error message is displayed:** • Inspect for following — Open circuit between main relay terminal C (harness-side) and PCM terminal 71 or 97 (harness-side) — Open main relay GND circuit — Main relay is stuck open. — Open or poor GND circuit (PCM terminal 24, 51, 76, 77 or 103) — Poor connection of vehicle body GND
		No	**No DTC displayed:** • Inspect START circuit in ignition switch. (See 09–21–3 IGNITION SWITCH INSPECTION.) • Inspect for open circuit between ignition switch and starter.
17	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM later calibration is available. Retest.		

NO.4 HARD START/LONG CRANK/ERRATIC START/ERRATIC CRANK [AJ]

C6U010318881W09

4	Hard start/long crank/erratic start/erratic crank
DESCRIPTION	• Starter cranks engine at normal speed but engine requires excessive cranking time before start. • Battery is in normal condition.
POSSIBLE CAUSE	• Erratic signal to ignition coil • Vacuum leakage • Poor fuel quality • Starting system malfunction • Spark plug malfunction • Air leakage from intake-air system • Erratic signal from CKP sensor • Erratic signal from CMP sensor • Improper air/fuel mixture ratio control • Air cleaner restriction • Improper operation of electronic throttle control system • PCV valve malfunction • Inadequate fuel pressure • Purge solenoid valve malfunction • MAF sensor contamination • Restriction in exhaust system • EGR valve malfunction • Pressure regulator malfunction **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Inspect for the following: — Vacuum leakage — Proper fuel quality (e.g. proper octane, contamination, winter/summer blend) — Loose bands on intake-air system — Cracks on intake-air system parts — Air cleaner restriction • Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	• Connect WDS or equivalent to DLC–2. • Turn ignition switch to ON position. • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Go to next step.
3	• Is engine overheating?	Yes	Go to flowchart "No.17 Cooling system concerns—Overheating".
		No	Go to next step.
4	• Inspect ignition coil related harnesses condition (intermittent open or short circuit) for all cylinders. • Are all harnesses condition okay?	Yes	Go to next step.
		No	Repair suspected wiring harness.

STEP	INSPECTION		ACTION
5	• Inspect spark plug conditions. • Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** • Inspect for fuel leakage from fuel injector. **Spark plug is grayish white:** • Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
6	• Visually inspect CKP sensor and teeth of crankshaft pulley. • Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning part.
7	• Remove and shake PCV valve. • Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
8	• Install fuel pressure gauge between pulsation damper and fuel distributor. • Short check connector terminal F/P to body GND using a jumper wire. (See 01–14–6 AFTER REPAIR PROCEDURE.) • Turn ignition switch to ON position (Engine OFF). • Inspect fuel line pressure. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure correct?	Yes	Go to next step.
		No	**Zero or low:** • Inspect fuel pump relay and fuel pump related circuit. • Inspect for clogged fuel line. — If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.) **High:** • Replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.)
9	• Attempt to start engine at part throttle. • Does engine run smoothly at part throttle?	Yes	Inspect electronic throttle control system operation.
		No	Go to next step.
10	• Is fuel line pressure held after ignition switch is turned to OFF position?	Yes	Go to next step.
		No	Inspect fuel injector. (See 01–14–30 FUEL INJECTOR INSPECTION [AJ].) • If fuel injector is okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.)
11	• Disconnect vacuum hose from purge solenoid valve and plug opening end of vacuum hose. • Attempt to start engine. • Is starting condition improved?	Yes	Inspect if purge solenoid valve sticks open. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.)
		No	Go to next step.
12	• Inspect MAF sensor for contamination. (See 01–40B–30 MASS AIR FLOW (MAF) SENSOR INSPECTION [AJ].) • Is there any contamination?	Yes	Replace MAF/IAT sensor.
		No	Go to next step.
13	• Inspect for restriction in the exhaust system. • Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.
14	• Inspect engine condition while tapping EGR valve housing. • Does engine condition improve?	Yes	Replace EGR valve. (See 01–16–19 EGR VALVE REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
15	• Inspect starting system. (See 01–19–2 STARTER INSPECTION.) (See 01–19–9 STARTER INTERLOCK SWITCH INSPECTION (MTX).) • Is starting system normal?	Yes	Inspect for loose connectors or poor terminal contact. • If okay, remove EGR valve and visually inspect for mechanically stuck EGR valve. (See 01–16–21 EGR VALVE INSPECTION [AJ].)
		No	Repair or replace components as required.
16	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.5 ENGINE STALLS-AFTER START/AT IDLE [AJ]

C6U010318881W10

5	Engine stalls—after start/at idle
DESCRIPTION	• Engine stops unexpectedly.
POSSIBLE CAUSE	• A/C system operation is improper • Air leakage from intake-air system parts • Purge solenoid valve malfunction • Improper operation of electronic throttle control system • EGR valve malfunction • No signal from CKP sensor due to sensor or related wire • Vacuum leakage • Low engine compression • Erratic signal to ignition coil • Poor fuel quality • PCV valve malfunction • Air cleaner restriction • Restriction in exhaust system • Electrical connector disconnection • Open or short circuit in fuel pump body and related harness • No battery power supply to PCM or poor GND • Inadequate fuel pressure • Fuel pump body mechanical malfunction • Fuel leakage from fuel injector • Fuel injector clogging • Immobilizer system (PATS) and/or circuit malfunction • Ignition coil malfunction • Improper air/fuel ratio control • Improper valve timing • Improper operation of variable valve timing control system. • Pressure regulator malfunction **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Connect WDS or equivalent to DLC–2. • Do the following conditions appear? — Engine is not completely started. — DTC B1681 is displayed.	Yes	**Both conditions appear:** • Go to Step 3.
		No	**Either or other condition appear:** • Go to next step.
2	• Does engine stall **after approx. 2 s** from when engine is started?	Yes	Go to next step.
		No	Immobilizer system is okay. Go to Step 10.
3	• Is coil connector securely connected to coil?	Yes	Go to next step.
		No	Connect coil connector securely. Return to Step 2.
4	• Does security light illuminate?	Yes	Go to next step.
		No	Inspect instrument cluster and wiring harness.
5	• Connect WDS or equivalent to DLC–2 and retrieve DTC. • Are the following DTCs displayed? **DTC** **B1213, B1342, B1600, B1601, B1602, B1681, B2103, B2431**	Yes	Go to appropriate DTC test.
		No	Go to next step.
6	• Is there continuity between PCM GND terminals 24/51/76/77/103 and GND?	Yes	Go to next step.
		No	Repair or replace wiring harness.
7	• Measure voltage between PCM GND terminal 24/51/76/77/103 and coil terminal C. • Is voltage **below 1.0 V**?	Yes	Go to next step.
		No	Repair or replace wiring harness.
8	• Turn ignition switch to ON position. • Measure voltage PCM terminal 71 and 97. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace wiring harness.
9	• Disconnect coil connector. • Turn ignition switch to ON position (Engine OFF). • Is there battery voltage at coil connector terminal D?	Yes	Inspect for following: • Open or short circuit between coil terminal A and PCM terminal 66 • Open or short circuit between coil terminal B and PCM terminal 65
		No	Repair or replace wiring harness between coil connector terminal D and fuse panel.
10	• Verify following: — Vacuum connection — Air cleaner element — No air leakage from intake-air system — No restriction of intake-air system — Proper sealing of intake manifold and components attached to intake manifold: EGR valve — Ignition wiring — Fuel quality: proper octane, contamination, winter/summer blend — Electrical connections — Smooth operation of throttle valve • Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 10.
11	• Turn ignition switch to ON position (Engine OFF). • Disconnect throttle body connector. • Measure voltage at throttle body VREF terminal with ignition switch at ON position. • Is voltage **4.5—5.5 V**?	Yes	Go to next step.
		No	Inspect and repair open or short circuit between PCM terminal 20 and throttle body VREF terminal.
12	• Turn ignition switch to OFF position. • Disconnect APP sensor connector. • Measure voltage at APP sensor VREF terminal with ignition switch at ON position. • Is voltage **4.5—5.5 V**?	Yes	Go to next Step.
		No	Repair or replace open or short circuit for the following: • PCM terminal 43 and APP sensor terminal D • PCM terminal 45 and APP sensor terminal A

STEP	INSPECTION		ACTION
13	• Connect WDS or equivalent to DLC–2. • Turn ignition switch to ON position (Engine OFF). • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test. **Communication error message is displayed:** • Inspect for following: — Open circuit between main relay terminal C and PCM terminal 71 or 97 — Open main relay GND circuit — Main relay is stuck open. — Open or poor GND circuit (PCM terminal 24, 51, 76, 77 or 103) — Poor connection of vehicle body GND
		No	**No DTC is displayed:** • Go to next step.
14	• Attempt to start engine at part throttle. • Does engine run smoothly at part throttle?	Yes	Inspect electronic throttle control system operation.
		No	Go to next step.
15	• Connect WDS or equivalent to DLC–2. • Access RPM PID. • Is RPM PID indicating engine speed during engine cranking?	Yes	Go to next step.
		No	Inspect for the following: • Open or short circuit in CKP sensor • Open or short circuit between CKP sensor and PCM terminal 21 or 22 • Open or short circuit in CKP sensor harnesses — If CKP sensor and harness are okay, go to next step.
16	• Visually inspect CKP sensor and teeth of crankshaft pulley. • Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning part.
17	• Inspect ignition coil related harness condition (intermittent open or short) for all cylinders. • Are all harnesses condition okay?	Yes	Go to next step.
		No	Repair suspected wiring harness.
18	• Perform spark test. (See 01–03B–66 Spark Test.) • Is strong blue spark visible at each cylinder?	Yes	Go to next step. • If symptom occurs with A/C on, go to Step 24.
		No	Repair or replace malfunctioning part according to spark test results.
19	• Inspect spark plug conditions. • Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** • Inspect for fuel leakage from injector. **Spark plug is grayish white:** • Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
20	• Remove and shake PCV valve. • Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
21	• Inspect for restriction in the exhaust system. • Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.
22	• Install fuel pressure gauge between fuel filter and fuel distributor. • Short the check connector terminal F/P to body GND using a jumper wire. (See 01–14–6 AFTER REPAIR PROCEDURE.) • Turn ignition switch to ON position (Engine OFF). • Inspect fuel line pressure. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure correct?	Yes	Go to next step.
		No	**Zero or low:** • Inspect fuel pump relay and fuel pump related circuit. • Inspect for clogged fuel line. — If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.) **High:** • Replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
23	• Visually inspect for fuel leakage at fuel injector O-ring and fuel line. • Service if necessary. • Turn OFF fuel pump using FP PID in output state control of datalogger function. • Does fuel line pressure hold after ignition switch is turned to OFF position?	Yes	Go to next step.
		No	Inspect fuel injector. (See 01–14–30 FUEL INJECTOR INSPECTION [AJ].) • If fuel injector is okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)

STEP	INSPECTION		ACTION
24	**Note** • The following test is for stall concerns with A/C on. If other symptoms exist, go to next step: • Connect pressure gauges to A/C low and high pressure side lines. • Turn A/C on and measure low side and high side pressure. • Are pressures within specifications? (See 07–10–3 REFRIGERANT PRESSURE CHECK.)	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting "No.24 A/C always on/A/C compressor runs continuously". For other symptoms, inspect following: • Refrigerant charging amount • Condenser fan operation
25	• Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid side. • Plug opening end of vacuum hose. • Start engine. • Is engine stall now eliminated?	Yes	Inspect if purge solenoid valve is stuck open. Inspect EVAP control system.
		No	Go to next step.
26	• Is air leakage felt or heard at intake-air system components while racing engine to higher speed?	Yes	Repair or replace.
		No	Go to next step.
27	• Inspect engine condition while tapping EGR valve housing. • Does engine condition improve?	Yes	Replace EGR valve. (See 01–16–19 EGR VALVE REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
28	• Perform variable valve timing control system operation inspection. (See 01–03B–70 Variable Valve Timing Control System Operation Inspection.) • Does variable valve timing control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to variable valve timing system operation inspection results.
29	• Is engine compression correct? (See 01–10B–7 COMPRESSION INSPECTION [AJ].)	Yes	Inspect valve timing.
		No	Inspect for cause.
30	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.6 CRANKS NORMALLY BUT WILL NOT START [AJ]

C6U010318881W11

6	Cranks normally but will not start
DESCRIPTION	• Starter cranks engine at normal speed but engine will not run. • Refer to symptom troubleshooting "No.5 Engine stalls" if this symptom appears after engine stall. • Fuel in tank. • Battery is in normal condition.
POSSIBLE CAUSE	• No battery power supply to PCM • Air leakage from intake-air system • Open PCM GND or vehicle body GND • Improper operation of electronic throttle control system • EGR valve malfunction • No signal from CKP sensor due to sensor or related wire • No signal from CMP sensor due to sensor or related wire • Low engine compression • Vacuum leakage • Spark leakage from high-tension leads • Poor fuel quality • PCV valve malfunction • Air cleaner restriction • Restriction in exhaust system • Disconnected electrical connector • Open or short circuit in fuel pump and related harness • Inadequate fuel pressure • Fuel pump mechanical malfunction • Fuel leakage from injector • Fuel injector clogging • Purge solenoid valve malfunction • Ignition coil malfunction • Improper air/fuel ratio control • Improper valve timing • Improper operation of variable valve timing control system • Immobilizer system (PATS) and/or circuit malfunction • Pressure regulator malfunction **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**Note** • The following test should be performed on vehicles with immobilizer system. Go to Step 12 for vehicles without immobilizer system. • Connect WDS or equivalent to DLC–2. — Do the following conditions appear? — Engine is not completely started. — DTC B1681 is displayed.	Yes	**Both conditions appear:** • Go to Step 3.
		No	**Either or other condition appear:** • Go to next step.
2	• Does engine stall after **approx. 2 s** from when engine is started?	Yes	Go to next step.
		No	Immobilizer system is okay. Go to Step 10.
3	• Is coil connector securely connected to coil?	Yes	Go to next step.
		No	Connect coil connector securely. Return to Step 2.
4	• Does security light illuminate?	Yes	Go to next step.
		No	Inspect instrument cluster and wiring harness.
5	• Connect WDS or equivalent to DLC-2 and retrieve DTC. • Are the following DTCs displayed? **DTC** **B1602, B1603, B1604, B1621, B1622, B1624**	Yes	Go to appropriate DTC test.
		No	Go to next step.
6	• Is there continuity between PCM GND terminals 24/51/76/77/103 and GND?	Yes	Go to next step.
		No	Repair or replace wiring harness.
7	• Measure voltage between PCM GND terminals 24/51/76/77/103 and coil terminal C. • Is voltage **below 1.0 V**?	Yes	Go to next step.
		No	Repair or replace wiring harness.
8	• Turn ignition switch to ON position. • Measure voltage PCM terminal 71 and 97. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace wiring harness.
9	• Disconnect coil connector. • Turn ignition switch to ON position (Engine OFF). • Is there battery voltage at coil connector terminal D?	Yes	Inspect for following: • Open or short circuit between coil terminal A (harness-side) and PCM terminal 66 (harness-side) • Open or short circuit between coil terminal B (harness-side) and PCM terminal 65 (harness-side)
		No	Repair or replace wiring harness between coil connector terminal D and fuse panel.
10	• Verify following: — Vacuum connection — External fuel shut off or accessory (kill switch, alarm etc.) — Fuel quality: proper octane, contamination, winter/summer blend — No air leakage from intake-air system — Proper sealing of intake manifold and components attached to intake manifold: EGR valve — Ignition wiring — Electrical connections — Fuses — Smooth operation of throttle valve • Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 10.

STEP	INSPECTION		ACTION
11	• Connect WDS or equivalent to DLC–2. • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test. **Communication error message is displayed:** • Inspect for the following: — Open circuit between main relay terminal C and PCM terminal 71 or 97 — Open main relay GND circuit — Main relay is stuck open. — Open or poor GND circuit (PCM terminal 24, 51, 76, 77 or 103) — Poor connection of vehicle body GND
		No	**No DTC is displayed:** • Go to next step.
12	• Turn ignition switch to ON position (Engine OFF). • Disconnect throttle body connector. • Measure voltage at throttle body VREF terminal with ignition switch at ON position. • Is voltage **4.5—5.5 V**?	Yes	Go to next step.
		No	Inspect and repair open or short circuit between PCM terminal 20 and throttle body VREF terminal.
13	• Turn ignition switch to OFF position. • Disconnect APP sensor connector. • Measure voltage at APP sensor VREF terminal with ignition switch at ON position. • Is voltage **4.5—5.5 V**?	Yes	Go to next step.
		No	Repair or replace open or short circuit for the following: • PCM terminal 43 and APP sensor terminal D • PCM terminal 45 and APP sensor terminal A
14	• Will engine start and run smoothly at part throttle?	Yes	Inspect electronic throttle control system operation (See 01–03B–63 Electronic Throttle Control Inspection.)
		No	Go to next step.
15	• Connect WDS or equivalent to DLC–2. • Access RPM PID. • Is RPM PID indicating engine speed when cranking engine?	Yes	Go to next step.
		No	Inspect for the following: • Open or short circuit in CKP sensor • Open or short circuit between CKP sensor and PCM terminal 21 or 22 • Open or short circuit in CKP sensor harnesses — If CKP sensor and harness are okay, go to next step.
16	• Visually inspect CKP sensor and teeth of crankshaft pulley. • Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning part.
17	• Inspect ignition coil related harnesses condition (intermittent open or short) for all cylinders. • Are all harnesses condition okay?	Yes	Go to next step.
		No	Repair suspected wiring harness.
18	• Perform spark test. (See 01–03B–66 Spark Test.) • Is strong blue spark visible at each cylinder?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to malfunction results.
19	• Inspect spark plug conditions. • Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** • Inspect for fuel leakage from injector. **Spark plug is grayish white:** • Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
20	• Remove and shake PCV valve. • Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
21	• Inspect for restriction in the exhaust system. • Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.

STEP	INSPECTION		ACTION
22	• Install fuel pressure gauge between pulsation damper and fuel distributor. • Short check connector terminal F/P to body GND using a jumper wire. (See 01–14–6 AFTER REPAIR PROCEDURE.) • Turn ignition switch to ON (Engine OFF). • Is fuel line pressure correct when ignition switch is cycled ON/OFF five times? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Go to next step.
		No	**Zero or low:** • Inspect fuel pump relay and fuel pump circuit. • Inspect for clogged fuel line. — If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.) **High:** • Replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.)
23	• Visually inspect for fuel leakage at fuel injector O-ring and fuel line. • Service as necessary. • Is fuel line pressure held after ignition switch is turned to OFF position?	Yes	Go to next step.
		No	Inspect fuel injector. (See 01–14–30 FUEL INJECTOR INSPECTION [AJ].) • If fuel injector is okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.)
24	• Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. • Plug opening end of vacuum hose. • Attempt to start engine. • Is starting condition improved?	Yes	Inspect if purge solenoid valve is stuck open mechanically. Inspect EVAP control system.
		No	Go to next step.
25	• Is air leakage felt or heard at intake-air system components while racing engine to higher speed?	Yes	Repair or replace.
		No	Go to next step.
26	• Inspect engine condition while tapping EGR valve housing. • Does engine condition improve?	Yes	Replace EGR valve. (See 01–16–19 EGR VALVE REMOVAL/INSTALLATION [AJ].)
		No	Go to next step.
27	• Perform variable valve timing control system operation inspection. (See 01–03B–70 Variable Valve Timing Control System Operation Inspection.) • Does variable valve timing control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to variable valve timing control system operation inspection results.
28	• Is engine compression correct? (See 01–10B–7 COMPRESSION INSPECTION [AJ].)	Yes	Inspect valve timing.
		No	Inspect for causes.
29	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.7 SLOW RETURN TO IDLE [AJ]

C6U010318881W12

7	Slow return to idle
DESCRIPTION	• Engine takes more time than normal to return to idle speed.
POSSIBLE CAUSE	• ECT sensor malfunction • Thermostat is stuck open. • Throttle body malfunction • Air leakage from intake-air system

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Connect WDS or equivalent to DLC–2. • Turn ignition switch to ON position (Engine OFF). • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Go to next step.
2	• Remove thermostat and inspect operation. (See 01–12–9 THERMOSTAT REMOVAL/ INSTALLATION.) (See 01–12–10 THERMOSTAT INSPECTION.) • Is thermostat okay?	Yes	ECT and thermostat are okay. Go to next step.
		No	Access ECT PID. Inspect for both ECT PID and temperature gauge on instrument cluster readings. • If temperature gauge on instrument cluster indicates normal range but ECT PID is not same as temperature gauge reading, inspect ECT sensor. • If temperature gauge on instrument cluster indicates cold range but ECT PID is normal, inspect temperature gauge and heat gauge unit.
3	• Is throttle body free of contaminations?	Yes	Inspect for air leakage from intake-air system components while racing engine to higher speed.
		No	Clean or replace throttle body.
4	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.8 ENGINE RUNS ROUGH/ROLLING IDLE [AJ]

C6U010318881W13

8	Engine runs rough/rolling idle
DESCRIPTION	• Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively. • Idle speed is too slow and engine shakes excessively.
POSSIBLE CAUSE	• Air leakage from intake-air system parts • A/C system improper operation • Spark plug malfunction • Erratic signal to ignition coil • Purge solenoid valve malfunction • Improper operation of electronic throttle control system • EGR valve malfunction • Erratic or no signal from CMP sensor • Low engine compression • Improper valve timing • Improper operation of valve timing control system • Erratic signal from CKP sensor • Poor fuel quality • PCV valve malfunction • Air cleaner restriction • Restriction in exhaust system • Disconnected electrical connectors • Inadequate fuel pressure • Fuel pump mechanical malfunction • Improper load signal input • Fuel line restriction or clogging • Improper operation or fuel injection control • Fuel leakage from fuel injector • Fuel injector clogging • Engine overheating • Vacuum leakage • Pressure regulator malfunction **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Verify the following: — External fuel shut off or accessory (kill switch, alarm etc.) — Fuel quality: proper octane, contamination, winter/summer blend — No air leakage from intake-air system — Proper sealing of intake manifold and components attached to intake manifold: EGR valve — Ignition wiring — Electrical connections — Fuses — Smooth operation of throttle valve • Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	• Connect WDS or equivalent to DLC–2. • Turn ignition switch to ON position (Engine OFF). • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Go to next step.
3	• Is engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns — Overheating".
		No	Go to next step.
4	**Note** • The following test is for engine running at rough idle with A/C on. If other symptoms exist, go to next step. • Connect pressure gauge to A/C low and high pressure side lines. • Start engine and run it at idle. • Turn A/C switch on. • Measure low side and high side pressures. • Are reading pressures within specifications? (See 07–10–3 REFRIGERANT PRESSURE CHECK.)	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting "No.24 A/C always on/A/C compressor runs continuously". For other symptoms, inspect the following: • Refrigerant charging amount • Condenser fan operation
5	**Note** • The following test is for engine running rough with P/S on. If other symptoms exist, go to next step. • Start engine and run it at idle • Measure voltage at PSP switch terminal A. • Is voltage okay?	Yes	Go to next step.
		No	Inspect PSP switch operation and wiring harness between PSP switch terminal A and PCM terminal 14.
6	• Visually inspect CKP sensor and teeth of crankshaft pulley. • Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning part.
7	• Inspect ignition coil related harnesses condition (intermittent open or short circuit) for all cylinders. • Are all harnesses condition okay?	Yes	Go to next step.
		No	Repair suspected wiring harness.
8	• Inspect spark plug conditions. • Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** • Inspect for fuel leakage from injector. **Spark plug is grayish white:** • Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
9	• Perform electronic throttle control system operation inspection. (See 01–03B–63 Electronic Throttle Control Inspection.) • Does electronic throttle control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to electronic throttle control system operation inspection results.

STEP	INSPECTION		ACTION
10	• Install fuel pressure gauge between pulsation damper and fuel distributor. • Start engine and run it at idle. • Measure fuel line pressure at idle. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure correct at idle?	Yes	Go to next step.
		No	**Zero or low:** • Inspect fuel pump relay and fuel pump circuit. • Inspect for clogged fuel line. • If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.) **High:** • Replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.)
11	• Visually inspect for fuel leakage at fuel injector, O-ring, and fuel line. • Service if necessary. • Does fuel line pressure hold after ignition switch is turned to OFF position?	Yes	Go to next step.
		No	Inspect fuel injector. (See 01–14–30 FUEL INJECTOR INSPECTION [AJ].) • If fuel injector is okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.)
12	• Connect WDS or equivalent to DLC–2. • Start the engine and run it at idle. • Access LONGFT1 and LONGFT2 PID. • Measure LONGFT1 and LONGFT2 PID at idle. • Is PID value **within -15% — +15%**?	Yes	Go to next step.
		No	LONGFT1 and LONGFT2 PID is out of specification. **Less than specification (too rich):** • Inspect EVAP control system. — If system is okay, go to Step 14. **Greater than specification (too lean):** • Inspect for air leakage at intake-air system components. — If system okay, go to next step.
13	• Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. • Plug opening end of vacuum hose. • Start engine. • Does engine condition improve?	Yes	Inspect if purge solenoid valve sticks open mechanically. Inspect EVAP control system.
		No	Go to next step.
14	• Remove and shake PCV valve. • Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve. (See 01–16–19 EGR VALVE REMOVAL/INSTALLATION [AJ].)
15	• Inspect for restriction in the exhaust system. • Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.
16	• Visually inspect CMP sensor and tooth of camshaft pulley. • Are CMP sensor and tooth of camshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning part.
17	• Inspect engine condition while tapping EGR valve housing. • Does engine condition improve?	Yes	Replace EGR valve.
		No	Go to next step.
18	• Perform variable valve timing control system inspection. (See 01–03B–70 Variable Valve Timing Control System Operation Inspection.) • Does variable valve timing control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to variable valve timing control system inspection results.
19	• Is engine compression correct? (See 01–10B–7 COMPRESSION INSPECTION [AJ].)	Yes	Inspect valve timing.
		No	Inspect for causes.
20	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.9 FAST IDLE/RUNS ON [AJ]

C6U010318881W14

9	Fast idle/runs on
DESCRIPTION	• Engine speed continues at fast idle after warm-up. • Engine runs after ignition switch is turned to OFF position.
POSSIBLE CAUSE	• ECT sensor malfunction • Air leakage from intake-air system • Throttle body malfunction • APP sensor misadjustment • Cruise control system operation improperly • Improper operation of electronic throttle control system

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Connect WDS or equivalent to DLC–2. • Access ECT PID. • Start and warm-up engine to normal operating temperature. • Is ECT PID reading between **82—112 °C {180—234 °F}**?	Yes	Go to next step.
		No	**ECT PID is higher than 112 °C {234 °F}:** • Go to symptom troubleshooting "No.17 Cooling system concerns—Overheating". **ECT PID is less than 82 °C {180 °F}:** • Go to symptom troubleshooting "No.18 Cooling system concerns—Runs cold".
2	• Connect WDS or equivalent to DLC–2. • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Go to next step.
3	• Measure voltage at PCM terminal 41, 8, 17 (MTX), 64 and 14. • Are voltage okay?	Yes	Go to next step.
		No	**If PCM terminal 41 voltage is not as specified:** • Inspect A/C switch, refrigerant pressure switch and fan switch. **If PCM terminal 8 voltage is not as specified:** • Inspect refrigerant pressure switch (middle pressure). **If PCM terminal 17 voltage is not as specified:** • Inspect clutch switch. **If PCM terminal 64 voltage is not as specified:** • Inspect neutral switch (MTX), TR switch (ATX). **If PCM terminal 14 voltage is not as specified:** • Inspect PSP switch.
4	• Is there air leakage felt or heard at intake-air system components while racing engine to higher speed?	Yes	Repair or replace parts as necessary.
		No	Inspect following: • Electronic throttle control system operation • Accelerator position sensor adjustment
5	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.10 LOW IDLE/STALLS DURING DECELERATION [AJ]

C6U010318881W15

10	Low idle/stalls during deceleration
DESCRIPTION	• Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.
POSSIBLE CAUSE	• Vacuum leakage • Improper operation of electronic throttle control system • Air leakage from intake-air system • Improper air/fuel ratio mixture control • EVAP control system malfunction • APP sensor or related circuit malfunction • APP sensor misadjustment • Neutral/clutch switch or related circuit malfunction (MTX) • TR switch or related circuit malfunction (ATX) • TP sensor or related circuit malfunction • MAF sensor or related circuit malfunction • Brake switch or related circuit malfunction • Improper operation of A/C magnetic clutch

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Does engine idle rough?	Yes	Go to symptom troubleshooting "No.8 Engine runs rough/ rolling idle".
		No	Go to next step.
2	• Turn off A/C switch and fan switch. • Does A/C magnetic clutch engage?	Yes	Go to symptom troubleshooting "No.24 A/C always on or A/C compressor runs continuously"?
		No	Go to next step.
3	• Verify following: — Proper routing and no damage to vacuum lines — No air leakage from intake-air system • Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 3.
4	• Connect WDS or equivalent to DLC–2. • Turn ignition switch to ON position (Engine OFF). • Retrieve any DTC. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Go to next step.
5	• Perform electronic throttle control system operation inspection. (See 01–03B–63 Electronic Throttle Control Inspection.) • Does electronic controlled throttle work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to electronic throttle control system operation inspection results.
6	• Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. • Plug opening end of vacuum hose. • Drive vehicle. • Does engine condition improve?	Yes	Inspect EVAP control system.
		No	Go to next step.

STEP	INSPECTION		ACTION
7	• Connect WDS or equivalent to DLC–2. • Access APP1, APP2, TP_REL, MAF and VSS PIDs. • Monitor each PID while driving vehicle. (See 01–40B–6 PCM INSPECTION [AJ].) • Are PIDs okay?	Yes	Intermittent concern exists. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)
		No	**APP1 or APP2 PIDs:** • Inspect APP sensor. (See 01–40B–26 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [AJ].) **TP_REL PID:** • Inspect TP sensor. (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].) **MAF PID:** • Inspect MAF sensor. (See 01–40B–30 MASS AIR FLOW (MAF) SENSOR INSPECTION [AJ].) **VSS PID:** • Inspect VSS. (See 05–15B–4 VEHICLE SPEEDOMETER SENSOR INSPECTION (WITHOUT ABS) [A65M-R].)
8	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.11 ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES [AJ]

C6U010318881W16

11	**Engine stalls/quits—acceleration/cruise** **Engine runs rough—acceleration/cruise** **Misses—acceleration/cruise** **Buck/jerk—acceleration/cruise/deceleration** **Hesitation/stumble—acceleration** **Surges—acceleration/cruise**
DESCRIPTION	• Engine stops unexpectedly at beginning of acceleration or during acceleration. • Engine stops unexpectedly while cruising. • Engine speed fluctuates during acceleration or cruising. • Engine misses during acceleration or cruising. • Vehicle bucks/jerks during acceleration, cruising or deceleration. • Momentary pause at beginning of acceleration or during acceleration • Momentary minor irregularity in engine output

POSSIBLE CAUSE	• A/C system improper operation • Erratic signal or no signal from CMP sensor • Air leakage from intake-air system parts • Purge solenoid valve malfunction • Improper operation of electronic throttle control system • EGR valve malfunction • Erratic signal from CKP sensor • Low engine compression • Vacuum leakage • Poor fuel quality • Main relay intermittent malfunction • Throttle body malfunction • Engine overheating • Spark plug malfunction • Improper air/fuel mixture control operation • Erratic signal to ignition coil • Air cleaner restriction • PCV valve malfunction • Improper valve timing due to jumping out of timing belt • Restriction in exhaust system • Intermittent open or short in fuel pump circuit • Inadequate fuel pressure • Fuel line and/or fuel filter restriction or clogging • Pressure regulator malfunction • APP sensor misadjustment • TP sensor misadjustment • Fuel pump mechanical malfunction • Fuel leakage from fuel injector • Fuel injector clogging • Intermittent open or short of MAF sensor, APP sensor, TP sensor and VSS • ATX malfunction (ATX) • Clutch slippage (MTX) **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Verify following: — Vacuum connection — Air cleaner element — No air leakage from intake-air system — No restriction of intake-air system — Proper sealing of intake manifold and components attached to intake manifold: EGR valve — Ignition wiring — Fuel quality: proper octane, contamination, winter/summer blend — Electrical connections — Smooth operation of throttle valve • Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.

STEP	INSPECTION		ACTION
2	• Connect WDS or equivalent DLC–2. • Turn ignition switch to ON position (Engine OFF). • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Go to next step.
3	• Is engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns—Overheating".
		No	Go to next step.
4	• Connect WDS or equivalent to DLC–2. • Access APP1, APP2, RPM, MAF, TP_REL and VSS PIDs. • Drive vehicle while monitoring PIDs. • Are PIDs within specification? (See 01–40B–6 PCM INSPECTION [AJ].)	Yes	Go to next step.
		No	**APP1, APP2, PIDs:** • Inspect if output signal APP sensor changes smoothly. (See 01–40B–26 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [AJ].) **RPM PID:** • Inspect CKP sensor and related harness for vibration or intermittent open/short circuit, or both. (See 01–40B–37 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [AJ].) **MAF PID:** • Inspect for intermittent open circuit between MAF sensor and related wire harness. (See 01–40B–30 MASS AIR FLOW (MAF) SENSOR INSPECTION [AJ].) **TP_REL PID:** • Inspect if output signal from TP sensor changes smoothly. (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].) **VSS PID:** • Inspect for intermittent open circuit between VSS and related wire harness. (See 05–15B–4 VEHICLE SPEEDOMETER SENSOR INSPECTION (WITHOUT ABS) [A65M-R].)
5	• Visually inspect CKP sensor and teeth of crankshaft pulley. • Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning part.
6	• Inspect spark plug conditions. • Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** • Inspect for fuel leakage from fuel injector. **Spark plug is grayish white:** • Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
7	• Remove and shake PCV valve. • Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
8	• Perform electronic throttle control system operation inspection. (See 01–03B–63 Electronic Throttle Control Inspection.) • Does electronic controlled throttle work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to electronic throttle control system operation inspection results.
9	• Inspect for restriction in the exhaust system. • Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.

STEP	INSPECTION		ACTION
10	• Install fuel pressure gauge between pulsation damper and fuel distributor. • Short the check connector terminal F/P to body GND using a jumper wire. (See 01–14–6 AFTER REPAIR PROCEDURE.) • Turn ignition switch to ON position (Engine OFF). • Inspect fuel line pressure. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure correct with ignition switch at ON position?	Yes	Go to next step.
		No	**Zero or low:** • Inspect fuel pump relay and fuel pump. • Inspect for clogged fuel line. — If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.) **High:** • Replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
11	• Visually inspect for fuel leakage at fuel injector O-ring and fuel line. • Service if necessary. • Does fuel line pressure hold after ignition switch is turned to OFF position? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Go to next step.
		No	Inspect fuel injector. (See 01–14–30 FUEL INJECTOR INSPECTION [AJ].) • If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
12	**Note** • The following test is for engine stall with A/C on. If other symptom exists, go to next step. • Connect a pressure gauge to A/C low and high pressure side lines. • Turn A/C on and measure low side and high side pressures. • Are pressures within specifications? (See 07–10–3 REFRIGERANT PRESSURE CHECK.)	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting "No.24 A/C always on/A/C compressor runs continuously". For other symptoms, inspect following: • Refrigerant charging amount • Condenser fan operation
13	**Note** • Following test is performed for symptom with cruise control on. If other symptom exists, go to next step. • Inspect cruise control system. • Is cruise control system okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning part.
14	• Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. • Plug opening end of vacuum hose. • Drive vehicle. • Does engine condition improve?	Yes	Inspect if purge solenoid valve is stuck open mechanically. Inspect EVAP control system.
		No	Go to next step.
15	• Visually inspect CMP sensor and projections of camshaft pulley. • Are CMP sensor and projections of camshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
16	• Inspect EGR system. • Is EGR system okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
17	• Is engine compression correct? (See 01–10B–7 COMPRESSION INSPECTION [AJ].)	Yes	Inspect following: • Valve timing • Internal transaxle part
		No	Inspect for cause.
18	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.12 LACK/LOSS OF POWER-ACCELERATION/CRUISE [AJ]

C6U010318881W17

12	Lack/loss of power—acceleration/cruise
DESCRIPTION	• Performance is poor under load (e.g. power down when climbing hills).
POSSIBLE CAUSE	• Improper A/C system operation • Erratic signal or no signal from CMP sensor • Air leakage from intake-air system parts • Improper operation of electronic throttle control system • Purge control solenoid malfunction • EGR valve malfunction • Brake dragging • Erratic signal from CKP sensor • Low engine compression • Vacuum leakage • Poor fuel quality • Erratic signal ignition coil • Engine overheating • Throttle body malfunction • Spark plug malfunction • Air cleaner restriction • PCV valve malfunction • Improper valve timing due to jumping out of timing belt • Improper operation of variable valve timing control system • Restriction in exhaust system • Intermittent open or short in fuel pump circuit • Inadequate fuel pressure • Fuel pump mechanical malfunction • Fuel line restriction or clogging • Fuel leakage from fuel injector • Fuel injector clogging • Intermittent open or short of MAF sensor, APP sensor, TP sensor and VSS • ATX malfunction (ATX) • Clutch slippage (MTX) **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Verify the following: — Vacuum connection — Air cleaner element — No air leakage from intake-air system — No restriction of intake-air system — Proper sealing of intake manifold and components attached to intake manifold: EGR valve — Fuel quality: proper octane, contamination, winter/summer blend • Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	• Connect WDS or equivalent to DLC–2. • Tun ignition switch to ON position (Engine OFF). • Retrieve any DTCs. • Are there any DTCs displayed?.	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Go to next step.
3	Is engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns—Overheating".
		No	Go to next step.
4	• Connect WDS or equivalent to DLC–2. • Access APP1, APP2, RPM, MAF,TP_REL and VSS PIDs. • Drive vehicle with monitoring PIDs. • Are PIDs within specification? (See 01–40B–6 PCM INSPECTION [AJ].)	Yes	Go to next step.
		No	**APP1, APP2, PIDs:** • Inspect if output signal from APP sensor changes smoothly. (See 01–40B–26 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [AJ].) **RPM PID:** • Inspect CKP sensor and related harness for vibration or intermittent open/short circuit, or both. (See 01–40B–37 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [AJ].) **MAF PID:** • Inspect for intermittent open circuit between MAF sensor and related wire harness. (See 01–40B–30 MASS AIR FLOW (MAF) SENSOR INSPECTION [AJ].) **TP_REL PID:** • Inspect if output signal from TP sensor changes smoothly. (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].) **VSS PID:** • Inspect for intermittent open circuit between VSS and related wire harness. (See 05–15B–4 VEHICLE SPEEDOMETER SENSOR INSPECTION (WITHOUT ABS) [A65M-R].)
5	• Visually inspect CKP sensor and teeth of crankshaft pulley. • Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning part.
6	• Inspect spark plug conditions. • Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** • Inspect for fuel leakage from fuel injector. • Inspect ignition system for suspect cylinder. **Spark plug is grayish white:** • Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
7	• Remove and shake PCV valve. • Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
8	• Perform electronic throttle control system operation inspection. (See 01–03B–63 Electronic Throttle Control Inspection.) • Does electronic controlled throttle work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to electronic throttle control system operation inspection results.

STEP	INSPECTION		ACTION
9	• Inspect for restriction in the exhaust system. • Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.
10	• Install fuel pressure gauge between pulsation damper and fuel distributor. • Short the check connector terminal F/P to body GND using a jumper wire. (See 01–14–6 AFTER REPAIR PROCEDURE.) • Turn ignition switch to ON position (Engine OFF). • Inspect fuel line pressure. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure correct with ignition switch at ON position?	Yes	Go to next step.
		No	**Zero or low:** • Inspect fuel pump relay and fuel pump circuit. • Inspect for clogged fuel line. — Inspect okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.) **High:** • Replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
11	**Note** • The following test is for engine stall with A/C on. If other symptom exists, go to next step. • Connect pressure gauge to A/C low and high side pressure lines. • Turn A/C on and measure low side and high side pressures. • Are pressures within specifications? (See 07–10–3 REFRIGERANT PRESSURE CHECK.)	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting "No.24 A/C always on/A/C compressor runs continuously". For other symptoms, inspect following: • Refrigerant charging amount • Condenser fan operation
12	• Inspect A/C cut-off operation. • Does A/C cut-off work properly?	Yes	Go to next step.
		No	Inspect A/C cut-off system components.
13	• Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. • Plug opened end of vacuum hose. • Drive vehicle. • Does engine condition improve?	Yes	Inspect if purge solenoid valve is stuck open mechanically. Inspect EVAP control system.
		No	Go to next step.
14	• Visually inspect CMP sensor and projections of camshaft pulley. • Are CMP sensor and projections of camshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning part.
15	• Inspect EGR system. • Is EGR system okay?	Yes	Go to next step.
		No	Replace malfunctioning part.
16	• Perform Variable Valve Timing Control System Inspection. (See 01–03B–70 Variable Valve Timing Control System Operation Inspection.) • Does variable valve timing control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to Variable Valve Timing Control System Inspection results.
17	• Is engine compression correct? (See 01–10B–7 COMPRESSION INSPECTION [AJ].)	Yes	Inspect following: • Valve timing • Internal transaxle components (ATX) • Clutch (MTX) • Brake system for dragging
		No	Inspect for cause.
18	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.13 KNOCKING/PINGING-ACCELERATION/CRUISE [AJ]

C6U010318881W18

13	Knocking/pinging—acceleration/cruise
DESCRIPTION	• Sound is produced when air/fuel mixture is ignited by something other than spark plug (e.g. hot spot in combustion chamber).
POSSIBLE CAUSE	• Engine overheating due to cooling system malfunction • ECT sensor malfunction • IAT sensor malfunction • MAF sensor malfunction • Erratic signal from CMP sensor • Inadequate engine compression • Inadequate fuel pressure • KS and related circuit malfunction **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Connect WDS or equivalent to DLC–2. • Access ECT PID. • Verify ECT PID is **less than 116 °C {241 °F}** during driving. • Is ECT PID less than specification?	Yes	Go to next step.
		No	Inspect cooling system for cause of overheating.
2	• Access IAT, MAF PIDs. • Monitor each PID. • Are PIDs okay?	Yes	Go to next step.
		No	**IAT PID:** • Inspect IAT sensor. (See 01–40B–29 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [AJ].) **MAF PID:** • Inspect MAF sensor. (See 01–40B–30 MASS AIR FLOW (MAF) SENSOR INSPECTION [AJ].)
3	• Connect WDS or equivalent to DLC–2. • Turn ignition switch to ON position (Engine OFF). • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Go to next step.
4	• Is engine compression correct? (See 01–10B–7 COMPRESSION INSPECTION [AJ].)	Yes	Go to next step.
		No	Inspect for cause.
5	• Install fuel pressure gauge between pulsation damper and fuel distributor. • Start engine and run it at idle. • Measure fuel line pressure at idle. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure correct at idle?	Yes	Go to next step.
		No	**Zero or low:** • Inspect fuel pump relay fuel pump circuit. • Inspect for clogged fuel line. — If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.) **High:** • Replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.)

STEP	INSPECTION		ACTION
6	• Inspect KS. (See 01–40B–35 KNOCK SENSOR (KS) INSPECTION [AJ].) • Is KS okay?	Yes	Inspect ignition timing. (See 01–10B–44 ENGINE TUNE-UP [AJ].)
		No	Replace KS. (See 01–40B–35 KNOCK SENSOR (KS) REMOVAL/ INSTALLATION [AJ].)
7	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.14 POOR FUEL ECONOMY [AJ]

C6U010318881W19

14	Poor fuel economy
DESCRIPTION	• Fuel economy is unsatisfactory.
POSSIBLE CAUSE	• Contaminated air cleaner element • Engine cooling system malfunction • Improper ATF level (ATX) • Weak spark • Poor fuel quality • Erratic or no signal from CMP sensor • Clutch slippage (MTX) • Improper operation of variable valve timing control system • Improper coolant level • Inadequate fuel pressure • Spark plug malfunction • PCV valve malfunction • Brake dragging • Improper valve timing due to jumping out of timing belt • Contaminated MAF sensor • Improper engine compression • Exhaust system clogging **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Inspect following: — Air cleaner element for contamination — ATF level (ATX) — Fuel quality — Coolant level — Clutch slippage (MTX) • Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	• Connect WDS or equivalent to DLC–2. • Tun ignition switch to ON position (Engine OFF). • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Go to next step.

STEP	INSPECTION		ACTION
3	• Access ECT PID. • Drive vehicle while monitoring PID. (See 01–40B–6 PCM INSPECTION [AJ].) • Is PID within specification?	Yes	Go to next step.
		No	Inspect for coolant leakage. Inspect cooling fan operations or thermostat operations.
4	• Perform spark test. (See 01–03B–66 Spark Test.) • Is strong blue spark visible at each cylinder?	Yes	Inspect for following: • Spark plugs malfunction • CMP sensor is installed improperly. • Trigger wheel damage on camshaft • Open or short circuit on CMP sensor • Open or short circuit between CMP sensor and PCM terminal 58, 59, 85 or 86 Repair or replace malfunctioning part. • If okay, go to next step.
		No	Repair or replace malfunctioning part according to spark test results.
5	• Install fuel pressure gauge between fuel filter and fuel distributor. • Start engine and run it at idle. • Measure fuel line pressure at idle. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure correct at idle?	Yes	Go to next step.
		No	**Zero or low:** • Inspect fuel pump relay and fuel pump circuit. • Inspect for clogged fuel line. — If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.) **High:** • Replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.)
6	• Remove and shake PCV valve. • Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
7	• Inspect for restriction in the exhaust system. • Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.
8	• Is brake system functioning properly?	Yes	Go to next step.
		No	Inspect for cause.
9	• Inspect MAF sensor for contamination. (See 01–40B–30 MASS AIR FLOW (MAF) SENSOR INSPECTION [AJ].) • Is there any contamination?	Yes	Replace MAF/IAT sensor.
		No	Go to next step.
10	• Perform variable valve timing control system inspection. (See 01–03B–70 Variable Valve Timing Control System Operation Inspection.) • Does variable valve timing control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to variable valve timing control system inspection results.
11	• Is engine compression correct? (See 01–10B–7 COMPRESSION INSPECTION [AJ].)	Yes	Inspect valve timing.
		No	Inspect for cause.
12	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.15 EMISSION COMPLIANCE [AJ]

C6U010318881W20

15	Emission compliance
DESCRIPTION	• Emission compliance test failed.
POSSIBLE CAUSE	• Vacuum lines leakage or blockage • Cooling system malfunction • Spark plug malfunction • Air leakage from intake manifold • Erratic or no signal from CMP sensor • Inadequate fuel pressure • PCV valve malfunction or incorrect valve installation • EGR valve malfunction • Exhaust system clogging • Fuel tank ventilation system malfunction • Charcoal canister damage • Air cleaner element clogging or restriction • Throttle body malfunction • Ignition coil or related circuit malfunction. • Improper air/fuel mixture ratio control operation • Excessive carbon built up in combustion chamber • Improper engine compression • Improper valve timing • Catalyst converter malfunction • Engine internal parts malfunction **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Inspect the following: — Vacuum lines for leakage or blockage — Electrical connections — Proper maintenance schedule followed — Intake-air system and air cleaner element concerns: obstructions, leakage or dirtiness • Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	• Connect WDS or equivalent to DLC–2. • Turn ignition switch to ON position (Engine OFF). • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Go to next step.
3	• Is any other drivability concern present?	Yes	Go to appropriate symptom troubleshooting.
		No	Go to next step.
4	• Connect WDS or equivalent to DLC–2. • Access ECT PID. • Warm up engine and run it at idle. • Verify ECT PID is correct. (See 01–40B–6 PCM INSPECTION [AJ].) • Is ECT PID correct?	Yes	Go to next step.
		No	Inspect for coolant leakage. Inspect cooling fan and operation or thermostat operation.
5	• Perform spark test. (See 01–03B–66 Spark Test.) • Is strong blue spark visible at each cylinder?	Yes	Inspect for the following: • Spark plugs malfunction • CMP sensor is installed improperly. • Damage of trigger wheel on camshaft • Open or short circuit on CMP sensor • Open or short circuit between CMP sensor and PCM terminal 58, 59, 85 or 86 Repair or replace malfunctioning part. • If okay, go to next step.
		No	Repair or replace malfunctioning part according to spark test results.
6	• Install fuel pressure gauge between pulsation damper and fuel distributor. • Start engine and run it at idle. • Measure fuel line pressure at idle. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure correct at idle?	Yes	Go to next step.
		No	**Zero or low:** • Inspect fuel pump relay and fuel pump circuit. • Inspect for clogged fuel line. — If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.) **High:** • Replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
7	• Remove and shake PCV valve. • Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
8	• Inspect for fuel saturation inside charcoal canister. • Is excess amount of liquid fuel present in canister?	Yes	Replace charcoal canister.
		No	Inspect fuel tank vent system. Then, go to next step.
9	• Inspect WU–TWC. • Is WU–TWC okay?	Yes	Inspect EGR system.
		No	Replace WU–TWC.
10	• Inspect for restriction in the exhaust system. • Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.
11	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.16 HIGH OIL CONSUMPTION/LEAKAGE [AJ]

C6U010318881W21

16	High oil consumption/leakage
DESCRIPTION	• Oil consumption is excessive.
POSSIBLE CAUSE	• PCV valve malfunction • Improper dipstick • Improper engine oil viscosity • Engine internal part malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Remove and shake PCV valve. • Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
2	• Verify following: — No external leakage — Proper dipstick — Proper engine oil viscosity • Are all items okay?	Yes	Inspect internal engine parts such as valves, valve guides, valve stem seals, cylinder head drain passage, and piston rings.
		No	Service as necessary. Repeat Step 2.
3	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [AJ]

C6U010318881W22

17	Cooling system concerns—overheating
DESCRIPTION	• Engine runs at higher than normal temperature/overheats.
POSSIBLE CAUSE	• Improper coolant level • Blown fuses • Coolant leakage • Excessive A/C system pressure • A/C system operation is improper. • Improper water/anti-freeze mixture • Fans reverse rotation • Poor radiator condition • Thermostat malfunction • Radiator hoses damage • Condenser fan is inoperative. • Improper or damaged radiator cap • Cooling fan is inoperative. • Coolant overflow system malfunction • Improper tension of drive belt • Drive belt damage • Fan control module malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Inspect the following: — Engine coolant level — Coolant leakage — Water and anti-freeze mixture — Radiator condition — Collapsed or restricted radiator hoses — Radiator pressure cap — Overflow system — Fan rotational direction — Fuses • Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	• Connect WDS or equivalent to DLC–2. • Turn ignition switch to ON position (Engine OFF). • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Go to next step.

STEP	INSPECTION		ACTION
3	• Start engine and run it at idle speed. • Turn A/C switch on. • Does A/C compressor engage?	Yes	Go to step 5.
		No	Inspect the following and repair or replace as necessary: • Refrigerant charging amount • Open circuit between A/C relay and PCM terminal 69 • Seized A/C magnetic clutch • A/C magnetic clutch malfunction — If all items are okay, Inspect the following: • Refrigerant pressure switch operation • Evaporator temperature sensor and A/C amplifier • A/C switch is stuck open. • Open or short circuit between refrigerant pressure switch and PCM terminal 41 • Open circuit of blower motor fan switch and resistor (if blower motor does not operate)
4	• Start engine and run it at idle speed. • Turn A/C switch on and set blower fan any speed. • Do cooling fan and condenser fan operate?	Yes	Go to next step.
		No	**Cooling fan motor does not operate:** • Inspect for following: — Cooling fan motor malfunction — Cooling fan motor GND open circuit — Open circuit between cooling fan motor and fan control module **Condenser fan motor does not operate:** • Inspect for the following: — Condenser fan motor malfunction — Condenser fan motor GND open circuit — Open circuit between condenser fan motor and fan control module **Both cooling fan and condenser fan do not operate:** • Inspect for the following: — Fan control module malfunction — Fan control module GND open circuit — Open circuit between fan control module and cooling fan relay
5	• Is drive belt okay?	Yes	Go to next step.
		No	Replace drive belt.
6	• Is there any leakage around heater unit in passenger compartment?	Yes	Inspect and service heater for leakage.
		No	Go to next step.
7	• Is there any leakage at coolant hoses and/or radiator?	Yes	Replace malfunctioning part.
		No	Go to next step.
8	• Cool down engine. • Remove thermostat and inspect operation. (See 01–12–9 THERMOSTAT REMOVAL/ INSTALLATION.) (See 01–12–10 THERMOSTAT INSPECTION.) • Is thermostat okay?	Yes	Engine coolant temperature and thermostat are okay. Inspect engine block for leakage or blockage.
		No	Access ECT PID on WDS or equivalent. Inspect both ECT PID and temperature gauge readings. • If temperature gauge on instrument cluster indicates normal range but ECT PID is not same as temperature gauge reading, inspect ECT sensor. • If temperature gauge on instrument cluster indicates overheating but ECT PID is normal, inspect temperature gauge and heat gauge unit.
9	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.18 COOLING SYSTEM CONCERNS-RUNS COLD [AJ]

C6U010318881W23

18	Cooling system concerns—runs cold
DESCRIPTION	• Engine takes excessive time to reach normal operating temperature.
POSSIBLE CAUSE	• Thermostat malfunction • Condenser fan system malfunction • Cooling fan system malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is customer complaint "Lack of passenger compartment heat" only?	Yes	Inspect A/C and heater systems.
		No	Go to next step.
2	• Does engine speed continue at fast idle?	Yes	Go to symptom troubleshooting "No.9 Fast idle/runs on".
		No	Go to next step.
3	• Remove thermostat and inspect operation. (See 01–12–9 THERMOSTAT REMOVAL/INSTALLATION.) (See 01–12–10 THERMOSTAT INSPECTION.) • Is thermostat okay?	Yes	Go to next step.
		No	Replace thermostat. (See 01–12–9 THERMOSTAT REMOVAL/INSTALLATION.)
4	• Inspect fan control system operation. • Does fan control system work properly?	Yes	Access ECT PID using WDS or equivalent. Inspect for both ECT PID and temperature gauge on instrument cluster readings. • If temperature gauge on instrument cluster indicates normal range but ECT PID is not same as temperature gauge reading, inspect ECT sensor. • If temperature gauge on instrument cluster indicates cold range but ECT PID is normal, inspect instrument cluster and related harnesses.
		No	Repair or replace malfunctioning part.
5	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.19 EXHAUST SMOKE [AJ]

C6U010318881W24

19	Exhaust smoke
DESCRIPTION	• Blue, black, or white smoke from exhaust system
POSSIBLE CAUSE	**Blue smoke (Burning oil):** • PCV valve malfunction • Engine internal oil leakage **White smoke (Water in combustion):** • Cooling system malfunction (coolant loss) • Engine internal coolant leakage **Black smoke (Rich fuel mixture):** • Air cleaner is restricted. • Intake-air system collapsed or restricted. • Fuel return line is restricted. • Excessive fuel pressure • Improper engine compression • Injector fuel leakage • Ignition system malfunction **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14-5 BEFORE REPAIR PROCEDURE.)** **(See 01-14-6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• What color is smoke coming from exhaust system?	Blue	Burning oil is indicated. Go to next step.
		White	Water in combustion is indicated. Go to Step 3.
		Black	Rich fuel mixture is indicated. Go to Step 4.
2	• Remove and shake PCV valve. • Does PCV valve rattle?	Yes	Inspect for the following: • Damaged valve guide, stems or valve seals • Blocked oil drain passage in cylinder head • Piston rings are not seated, seized or worn. • Damaged cylinder bore — If other drivability symptoms are present, return to diagnostic index to service any additional symptoms.
		No	Replace PCV valve.
3	• Does cooling system hold pressure?	Yes	Inspect for the following: • Cylinder head gasket leakage • Intake manifold gasket leakage • Engine block cracks or porosity — If other drivability symptoms are present, return to diagnostic index to service any additional symptoms.
		No	Inspect for cause.
4	• Inspect for the following: — Air cleaner restriction — Collapsed or restricted intake-air system — Restricted fuel return line • Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 4.

STEP	INSPECTION		ACTION
5	• Connect WDS or equivalent to DLC–2. • Turn ignition switch to ON position. • Retrieve any DTC. • Are there any DTCs displayed?	Yes	**DTC displayed:** • Go to appropriate DTC test.
		No	**No DTC displayed:** • Go to next step.
6	• Install fuel pressure gauge between fuel filter and fuel distributor. • Start engine and run it at idle. • Measure fuel line pressure at idle. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure correct at idle?	Yes	Go to next step.
		No	**Zero or low:** • Inspect fuel pump relay and fuel pump circuit. • Inspect for clogged fuel line. — If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.) **High:** • Replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
7	• Perform spark test. (See 01–03B–66 Spark Test.) • Is strong blue spark visible at each cylinder?	Yes	Inspect spark plugs and CMP sensor. (See 01–40B–36 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [AJ].)
		No	Repair or replace malfunctioning part according to results of spark test.
8	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.20 FUEL ODOR (IN ENGINE COMPARTMENT) [AJ]

C6U010318881W25

20	Fuel odor (in engine compartment)
DESCRIPTION	• Gasoline fuel smell or visible leakage
POSSIBLE CAUSE	• Excessive fuel pressure • Purge solenoid valve malfunction • Fuel tank vent system blockage • Charcoal canister malfunction • Fuel leakage from fuel system **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Visually inspect for fuel leakage at fuel injector O-ring, and fuel line. • Service if necessary. • Is fuel line pressure held after ignition switch is turned to OFF position?	Yes	Go to next step.
		No	Inspect fuel injector. (See 01–14–30 FUEL INJECTOR INSPECTION [AJ].) • If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
2	• Inspect for blockage/restriction or open circuit between engine vacuum port and charcoal canister. • Inspect for blockage in fuel tank vent system. • Is fault indicated?	Yes	Replace vacuum hose.
		No	Go to next step.
3	• Inspect purge solenoid valve. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION.) • Is solenoid operating properly?	Yes	Go to next step.
		No	Replace purge solenoid valve.
4	• Connect WDS or equivalent to DLC–2. • Turn ignition switch to ON position (Engine OFF). • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Inspect charcoal canister for fuel saturation. — If excess amount of liquid fuel present, replace charcoal canister.
5	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.21 ENGINE NOISE [AJ]

C6U010318881W26

21	Engine noise
DESCRIPTION	• Engine noise from under hood
POSSIBLE CAUSE	**Squeal, click or chirp noise:** • Improper engine oil level • Improper drive belt tension **Rattle sound noise:** • Loose parts **Hiss sound noise:** • Vacuum leakage • Loose spark plug • Air leakage from intake-air system • Improper VAD control system operation **Rumble or grind noise:** • Improper drive belt tension **Rap or roar sound noise:** • Exhaust system looseness **Other noise:** • Camshaft friction gear noise or HLA noise • Timing chain noise

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is squeal, click or chirp sound present?	Yes	Inspect engine oil level or drive belts.
		No	Go to next step.
2	• Is rumble or grind sound present?	Yes	Inspect drive belt.
		No	Go to next step.
3	• Is rattle sound present?	Yes	Inspect location of rattle for loose parts.
		No	Go to next step.
4	• Is hiss sound present?	Yes	Inspect for the following: • Vacuum leakage • Spark plug loose • Intake-air system leakage • VAD control system operation
		No	Go to next step.
5	• Is rap or roar sound present?	Yes	Inspect exhaust system for loose parts.
		No	Go to next step.
6	• Is knock sound present?	Yes	Go to symptom troubleshooting "No.13 Knocking/ pinging".
		No	If noise comes from engine internal, inspect for friction gear, timing chain or HLA noise.
7	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.22 VIBRATION CONCERNS (ENGINE) [AJ]

C6U010318881W27

22	Vibration concerns (engine)
DESCRIPTION	• Vibration from under hood or driveline
POSSIBLE CAUSE	• Loose attaching bolts or worn parts • Components malfunction such as worn parts

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Inspect the following components for loose attaching bolts or worn parts: — Cooling fan — Condenser fan — Drive belt and pulleys — Engine mounts • All items okay?	Yes	Inspect the following systems: • Wheels • ATX • Driveline • Suspension
		No	Readjust or retighten engine mount installation position. Service if necessary for other parts.
2	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.25 A/C DOES NOT CUT OFF UNDER WIDE OPEN THROTTLE CONDITIONS [AJ]

C6U010318881W30

25	**A/C does not cut off under wide open throttle conditions.**
DESCRIPTION	• A/C compressor magnetic clutch does not disengage under wide open throttle.
POSSIBLE CAUSE	• Accelerator position sensor malfunction • Accelerator position sensor misadjustment • Loosely installed accelerator position sensor

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Does A/C compressor disengage when A/C switch is turned off?	Yes	Go to next step.
		No	Go to symptom troubleshooting "No.24 A/C always on/ A/C compressor runs continuously".
2	• Connect WDS or equivalent to DLC–2. • Turn ignition switch to ON position (Engine OFF). • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Inspect accelerator position sensor for proper adjustment.
3	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.26 EXHAUST SULPHUR SMELL [AJ]

C6U010318881W31

26	**Exhaust sulphur smell**
DESCRIPTION	• Rotten egg smell (sulphur) from exhaust
POSSIBLE CAUSE	• Electrical connectors are disconnected or connected poorly. • Charcoal canister malfunction • Vacuum lines are disconnected or connected improperly. • Improper fuel pressure • Poor fuel quality **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Are any drivability or exhaust smoke concerns present?	Yes	Go to appropriate flow chart.
		No	Go to next step.
2	• Inspect the following: — Electrical connections — Vacuum lines — Fuel quality • Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 2.
3	• Connect WDS or equivalent to DLC–2. • Turn ignition switch to ON position (Engine OFF). • Retrieve any DTC. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Go to next step.
4	• Install fuel pressure gauge between pulsation damper and fuel distributor. • Start engine and run it at idle. • Inspect fuel line pressure. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure correct at idle?	Yes	Go to next step.
		No	**Zero or low:** • Inspect fuel pump relay and fuel pump circuit. • Inspect for clogged fuel line. — If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.) **High:** • Replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
5	• Inspect charcoal canister for fuel saturation. • Is excess amount of liquid fuel present in canister?	Yes	Replace charcoal canister.
		No	Inspect fuel tank vent system. • If fuel tank vent system is okay, since sulfur content can vary in different fuels, try a different brand. • If fuel tank vent system is not okay, repair or replace malfunctioning part.
6	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.27 FUEL REFILL CONCERNS [AJ]

C6U010318881W32

27	Fuel refill concerns
DESCRIPTION	• Fuel tank does not fill smoothly.
POSSIBLE CAUSE	• Clogged EVAP pipes • Nonreturn valve malfunction • Improper use of fuel nozzle • Inadequate fuel filling speed **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** Caution • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Connect WDS or equivalent to DLC-2 • Turn ignition switch to ON position (Engine OFF). • Retrieve DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC is displayed:** • Go to next step.
2	• Remove fuel-filler pipe. • Make sure nonreturn valve is installed properly. • Inspect nonreturn valve operation. • Is nonreturn valve okay?	Yes	Inspect for the following: • Improper use of fuel nozzle • Inadequate fuel filling speed
		No	**Nonreturn valve is installed improperly:** • Reinstall nonreturn valve to proper position. **Nonreturn valve does not operate properly:** • Replace nonreturn valve.
3	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.28 FUEL FILLING SHUT OFF ISSUES [AJ]

C6U010318881W33

28	Fuel filling shut off issues
DESCRIPTION	• Fuel does not shut off properly.
POSSIBLE CAUSE	• Clogged EVAP pipes • Nonreturn valve malfunction • Fuel shut-off valve malfunction • Fuel nozzle malfunction • Fuel nozzle is not inserted correctly. **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01–14–5 BEFORE REPAIR PROCEDURE.)** **(See 01–14–6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Connect WDS or equivalent to DLC-2. • Turn ignition switch to ON position (Engine OFF). • Retrieve any DTCs. • Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate DTC test.
		No	**No DTC displayed:** • Go to next step.
2	• Remove fuel-filler pipe. • Make sure nonreturn valve is installed properly. • Inspect nonreturn valve operation. • Is nonreturn valve okay?	Yes	Inspect for the following: • Improper use of fuel nozzle • Fuel-filler pipe is not inserted correctly. • Inspect fuel shut-off valve.
		No	**Nonreturn valve is installed improperly:** • Reinstall nonreturn valve to proper position. **Nonreturn valve does not operate properly:** • Replace nonreturn valve.
3	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

NO.29 SPARK PLUG CONDITION [AJ]

C6U010318881W34

29	Spark plug condition
DESCRIPTION	• Incorrect spark plug condition
POSSIBLE CAUSE	**Note** • Inspecting spark plugs condition can determine whether problem is related to a specific cylinder or to all cylinders. **Wet/carbon is stuck on specific plug:** • Spark—Weak, not visible • Air/fuel mixture—Excessive fuel injection volume • Compression—No compression, low compression • Faulty spark plug **Grayish white with specific plug:** • Air/fuel mixture—Insufficient fuel injection volume • Faulty spark plug **Wet/carbon stuck on all plugs:** • Spark—Weak • Air/fuel mixture—Too rich • Compression—Low compression • Clogging in intake/exhaust system **Grayish white with all plugs:** • Air/fuel mixture—Too lean **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14-5 BEFORE REPAIR PROCEDURE.)** **(See 01-14-6 AFTER REPAIR PROCEDURE.)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Remove all spark plugs. • Inspect spark plug condition. • Is spark plug condition okay?	Yes	Troubleshooting completed.
		No	**Specific plug is wet or covered with carbon:** • Go to next step. **Specific plug looks grayish white:** • Go to Step 7. **All plugs are wet or covered with carbon:** • Go to Step 9. **All plugs look grayish white:** • Go to Step 15.
2	• Is spark plug wet/covered with carbon by engine oil?	Yes	Working up and down inspect all areas related to oil.
		No	Go to next step.
3	• Inspect spark plug for the following: — Cracked insulator — Heat range — Air gap — Worn electrode • Is spark plug okay?	Yes	Go to next step.
		No	Replace spark plug.
4	• Inspect compression pressure at suspected faulty cylinder. • Is engine compression correct? (See 01–10B–7 COMPRESSION INSPECTION [AJ].)	Yes	Go to next step.
		No	Repair or replace malfunctioning part.
5	• Install all spark plugs. • Perform spark test at suspected faulty cylinder. • Is strong blue spark visible? (Compare with normal cylinder.)	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
6	• Install fuel pressure gauge between fuel filter and fuel distributor. • Short check connector terminal F/P to body GND using a jumper wire. (See 01–14–6 AFTER REPAIR PROCEDURE.) • Turn ignition switch to ON position (Engine OFF). • Inspect fuel line pressure. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.) • Is fuel line pressure correct with ignition switch at ON position?	Yes	Inspect fuel injector for the following: • Open or short in injector • Leakage • Injection volume
		No	**Zero or low:** • Inspect fuel pump relay and fuel pump circuit. • Inspect for clogged fuel line. — If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.) **High:** • Replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
7	• Inspect spark plug for the following: — Heat range — Air gap • Is spark plug okay?	Yes	Go to next step.
		No	Replace spark plug. (See 01–18–4 SPARK PLUG INSPECTION.)
8	• Remove suspected fuel injector. • Inspect for the following: — Resistance (See 01–14–30 FUEL INJECTOR INSPECTION [AJ].) — Fuel injection volume (See 01–14–30 FUEL INJECTOR INSPECTION [AJ].) • Are all above items okay?	Yes	Inspect for open circuit between suspected fuel injector terminals and PCM at the following terminals: • **For #1 cylinder:** 75 • **For #2 cylinder:** 101 • **For #3 cylinder:** 74 • **For #4 cylinder:** 100 • **For #5 cylinder:** 73 • **For #6 cylinder:** 99
		No	Replace fuel injector. (See 01–14–24 FUEL INJECTOR REMOVAL/ INSTALLATION [AJ].)
9	• Is air cleaner element free of restriction?	Yes	Go to next step.
		No	Replace air cleaner element.
10	• Perform spark test. • Is strong blue spark visible at each cylinder?	Yes	Go to next step.
		No	Repair or replace malfunctioning part.

STEP	INSPECTION		ACTION
11	• Install fuel pressure gauge between fuel filter and fuel distributor. • Short check connector terminal F/P to body GND using a jumper wire. (See 01–14–6 AFTER REPAIR PROCEDURE.) • Turn ignition switch to ON position (Engine OFF). • Is fuel line pressure correct with ignition switch at ON position. (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Go to next step.
		No	**Zero or low:** • Inspect fuel pump relay and fuel pump circuit. • Inspect for clogged fuel line. — If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.) **High:** • Replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
12	• Inspect the following PIDs: — ECT — O2S11 — O2S21 — MAF — O2S12 — O2S22 (See 01–40B–6 PCM INSPECTION [AJ].) • Are PIDs okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning part.
13	• Perform purge control inspection (when engine can be started). • Is purge control correct?	Yes	Go to next step.
		No	Repair or replace malfunctioning part.
14	• Perform compression inspection. (See 01–10B–7 COMPRESSION INSPECTION [AJ].) • Is compression correct?	Yes	Inspect for clogging in exhaust system.
		No	Repair or replace malfunctioning part.
15	• When engine cannot be started, inspect intake-air system for air leakage. • When engine can be started, perform intake manifold vacuum inspection. • Is air sucked in from intake-air system?	Yes	Repair or replace malfunctioning part.
		No	Go to next step.
16	• Install fuel pressure gauge between fuel filter and fuel distributor. • Short check connector terminal F/P to body GND using a jumper wire. (See 01–14–6 AFTER REPAIR PROCEDURE.) • Turn ignition switch to ON position (Engine OFF). • Is fuel line pressure correct with ignition switch at ON position? (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)	Yes	Inspect the following PIDs: • ECT • O2S11 • O2S21 • MAF • O2S12 • O2S22 (See 01–40B–6 PCM INSPECTION [AJ].) Inspect PCM GND condition.
		No	**Zero or low:** • Inspect fuel pump relay and fuel pump related circuit. • Inspect for clogged fuel line. — If okay, replace fuel pump unit. (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.) **High:** • Replace fuel pump unit (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION.)
17	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, reprogram PCM if later calibration is available. Retest.		

ENGINE CONTROL SYSTEM OPERATION INSPECTION [AJ]

C6U01031881W35

Input Signal System Investigation Procedure

1. Find an unusual signal. (See 01–03B–59 Finding unusual signals.)
2. Locate its source. (See 01–03B–59 Locating the source of unusual signals.)
3. Repair or replace the defective part.
4. Confirm that the unusual signal has been erased.

Finding unusual signals

While referring to 01–02B–7 ON-BOARD DIAGNOSTIC TEST [AJ], use the PID/DATA monitor and record function to inspect the input signal system relating to the problem.

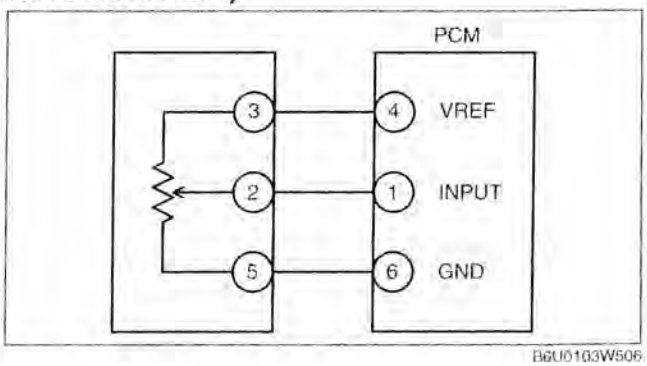
1. Start the engine and idle the vehicle. You can assume that any signals that are out of specification by a wide margin are unusual.
2. When recreating the problem, any sudden change in monitor input signals that is not consciously created by the driver can be judged as unusual.

Locating the source of unusual signals

Caution

- **Compare the WDS or equivalent monitor voltage with the measurement voltage using the digital measurement system function. If you use another tester, misreading may occur.**
- **When measuring voltage, attach the tester GND to the GND of the PCM that is being tested, or to the engine itself. If this is not done, the measured voltage and actual voltage may differ.**
- **After connecting the pin to a waterproof coupler, confirming continuity and measuring the voltage, inspect the waterproof connector for cracks. If there are any, use sealant to fix them. Failure to do this may result in deterioration of the harness or terminal from water damage, leading to problems with the vehicle.**

Variable resistance type 1 (APP sensor, TP sensor and EGR boost sensor)



B6U0103W506

Investigate the input signal system for variable resistance type 1

1. When you get an unusual signal, measure the #1 PCM terminal voltage.
   - If the #1 terminal voltage and the WDS or equivalent monitor voltage are the same, proceed to the next step.
   - If there is a difference of **0.5 V or more**, inspect for the following points concerning the PCM connector.
     — Female terminal opening is loose.
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage.
   - If there is a **0.5 V or more** difference between the sensor and WDS or equivalent voltages, inspect the harness for open or short circuits.
   - If the sensor and WDS or equivalent voltages are the same, inspect for the following points concerning the sensor connector.
   - If there are no problems, proceed to next investigation below.
     — Female terminal opening is loose.
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)

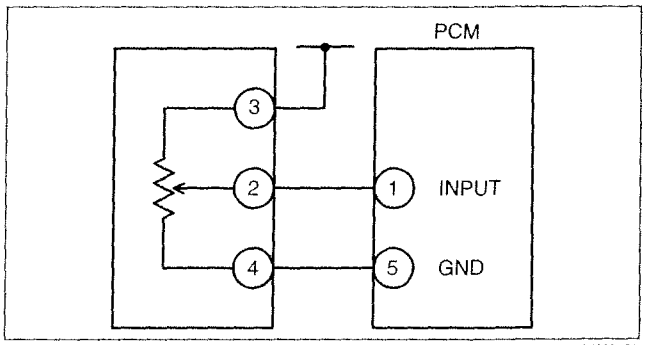
Investigate the standard power supply system for variable resistance type 1

- Confirm that the #3 terminal is at **5 V**.
  - — If the measured voltage on the #3 terminal is **5 V**, inspect the following points on the sensor connector.
  - — If there is no problem, inspect for the following:
    - Female terminal opening loose
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
  - — If the #3 terminal measures other than **5 V**, inspect for the following:
    - Open or short circuit in harness
    - Harness/pin crimp is loose or disconnected.

Investigate the GND system for variable resistance type 1

- Confirm that terminal sensor #5 is at **0 V**.
  - — If it is at **0 V**, inspect the sensor.
    - If necessary, replace the sensor.
  - — If not, inspect for the following:
    - Open or short circuit in harness
    - Female terminal opening is loose open or short circuit in harness
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Harness/pin crimp is loose or disconnected.

Variable resistance type 2 (MAF sensor)



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Investigate the GND system for variable resistance type 2

- Confirm that terminal sensor #4 is at **0 V**.
  - — If it is at **0 V**, inspect the sensor.
    - If necessary, replace the sensor.
  - — If not at **0 V**, inspect for the following:
    - Open circuit in harness
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Harness/pin crimp is loose or disconnected.

Investigate the input signal system for variable resistance type 2

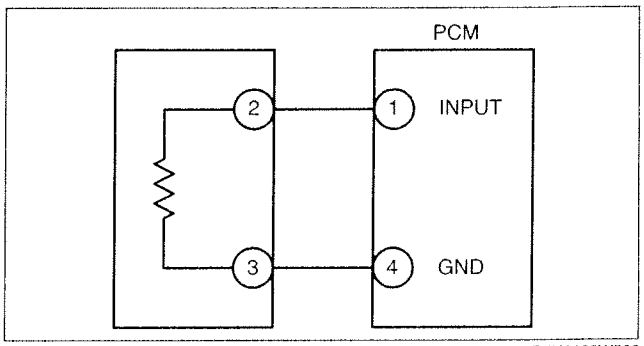
1. When you get an unusual signal, measure the #1 PCM terminal voltage.
   - If the #1 terminal voltage and the WDS or equivalent monitor voltage are the same, proceed to the next step.
   - If there is a difference of **0.5 V or more**, inspect for the following points concerning the PCM connector.
     - — Female terminal opening is loose.
     - — Coupler (pin holder) damage
     - — Pin discoloration (blackness)
     - — Harness/pin crimp is loose or disconnected.

2. Measure the #2 sensor terminal voltage.
   - If there is a **0.5 V or more** difference between the sensor and WDS or equivalent voltages, inspect the harness for open or short circuits.
   - If the sensor and WDS or equivalent voltages are the same, inspect the following points concerning the sensor connector.
     — Female terminal opening is loose.
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.
   - If there are no problems, proceed to next investigation below.

Investigate the electrical supply system for variable resistance type 2

- Confirm that the sensor #3 terminal is **B+**.
  — If the measured voltage on the #3 terminal is **B+**, inspect the following points on the sensor connector.
  — If there is no problem, inspect for the following:
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
  — If the #3 terminal measures other than **B+**, inspect the following:
    - Open or short circuit in harness
    - Harness/pin crimp is loose or disconnected.

Thermistor type (IAT sensor and ECT sensor)



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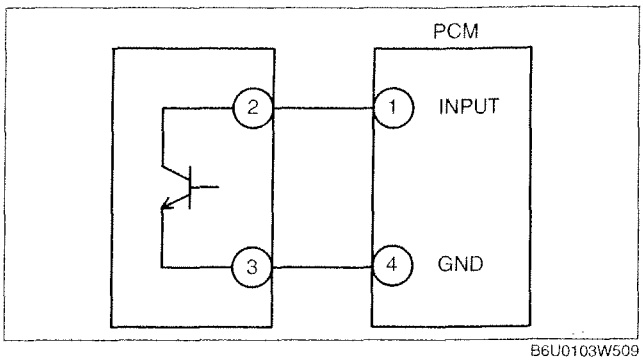
Investigate the input signal system for thermistor type

1. When you get an unusual signal, measure the #1 PCM terminal voltage.
   - If the #1 terminal voltage and the WDS or equivalent monitor voltage are the same, proceed to the next step.
   - If there is a difference of **0.5 V or more**, inspect the following points concerning the PCM connector.
     — Female terminal opening loose
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage.
   - If there is a **0.5 V or more** difference between the sensor and WDS or equivalent voltages, inspect the harness for open or short circuits.
   - If the sensor and WDS or equivalent voltages are the same, inspect the following points concerning the sensor connector.
     — Female terminal opening is loose.
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.
   - If there are no problems, proceed to next investigation below.

Investigate the GND system for thermistor type

- Confirm that terminal sensor #3 is at **0 V**.
  - — If it is at **0 V**, inspect the sensor. If necessary, replace the sensor.
  - — If not, inspect for the following:
    - Open circuit in harness
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Harness/pin crimp is loose or disconnected.

VSS



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1. Measure the #1 PCM terminal voltage and confirm that it is at **0 V** or **5 V** when the ignition switch at ON position and the engine at idle.
   - If it is at **0 V** or **5 V**, intermittent concern exists. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)
   - If not, inspect the following points concerning the PCM connector.
   - If there is no problem, inspect for the following:
     - — Female terminal opening is loose.
     - — Coupler (pin holder) damage
     - — Pin discoloration (blackness)
     - — Harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage and confirm that it is at **0 V** or **5 V** when the ignition switch at ON and the engine at idle.
   - If it is at **0 V** or **5 V**, intermittent concern exists. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)
   - If not, inspect the following points concerning the sensor connector.
   - If there is no problem, inspect for the following:
     - — Female terminal opening is loose.
     - — Coupler (pin holder) damage
     - — Pin discoloration (blackness)
     - — Harness/pin crimp is loose or disconnected.
3. Confirm that the #3 terminal switch voltage is at **0 V**.
   - If it is at **0 V**, inspect the sensor. If necessary, replace the sensor.
     - — If necessary, replace the sensor.
   - If not, inspect for the following:
     - — Open circuit in harness
     - — Female terminal opening is loose.
     - — Coupler (pin holder) damage
     - — Pin discoloration (blackness)
     - — Harness/pin crimp is loose or disconnected.

Main Relay Operation Inspection

1. Verify that the main relay clicks when the ignition switch is turned to ON position and off.
   - If there is no operation sound, inspect the following:
     - — Main relay (See09–21–6 RELAY INSPECTION.)
     - — Harness and connector between ignition switch and main relay terminal A.
     - — Harness and connector between PCM terminal 28 and main relay terminal E.

Intake Manifold Vacuum Inspection

1. Verify air intake hoses are installed properly.
2. Start the engine and run it at idle.
3. Measure the manifold vacuum using a vacuum gauge.
   - If not as specified, inspect following:
     — Air suction at throttle body, intake manifold and PCV valve installation points
     — EGR valve (struck open)
     — Fuel injector insulator
     — Engine compression (See 01–10B–7 COMPRESSION INSPECTION [AJ].)

Specification
More than 60 kPa {450 mmHg, 18 inHg}

Note
- Air suction can be located by engine speed change when lubricant is sprayed on the area where suction occurs.

Electronic Throttle Control Inspection
Engine coolant temperature compensation inspection

1. Connect the WDS or equivalent to the DLC-2.
2. Select the PID/DATA MONITOR AND RECORD function on the WDS or equivalent display.
3. Select the following PIDs.
   - ECT
   - IAT
   - RPM
4. Verify that the engine is in cold condition, then start the engine.
5. Verify that the engine speed decreases as the engine warm-up.
   - If the engine speed does not decrease or decreases slowly, inspect the following:
     — ECT sensor and related harness (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [AJ].)
     — Throttle body and related harness (See 01–13B–8 THROTTLE ACTUATOR INSPECTION [AJ].) (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].)

Load compensation inspection

1. Start the engine and run is at idle.
2. Connect the WDS or equivalent to the DLC-2.
3. Verify that P0506, P0507 or P0511 are not displayed.
   - If P0506, P0507 or P0511 are displayed, perform DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
4. Select the RPM PID.

Note
- Excludes temporary idle speed drop just after the loads are turned on.

5. Verify that the engine speed is within the specification under each load condition.
   - If not as specified at specific load condition, inspect the following:
     — A/C switch and related harness (See 07–40–18 CLIMATE CONTROL UNIT INSPECTION.)
     — Fan switch and related harness (See 07–40–18 CLIMATE CONTROL UNIT INSPECTION.)
     — PSP switch and related harness (See 01–40B–25 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [AJ].)

Idle speed

Condition	Engine speed (rpm)*1
No load	700—800
Electrical loads*2 ON	700—800
P/S ON	700—800
A/C ON	700—800

*1 : Excludes temporary idle speed drop just after the electrical loads are turned on.

*2 : Blower motor is operating at high speed. Headlight switch is turned on. Rear window defroster switch is turned on. Cooling fans are operating.

Throttle position (TP) sweep inspection

1. Connect the WDS or equivalent to the DLC-2.
2. Turn ignition switch to ON position.
3. Verify that following DTCs are not displayed:
   - P0121, P0122, P0123, P0221, P0222, P0223, P2100, P2101, P2102, P2103, P2107, P2108, P2119, P2122, P2123, P2127, P2128, P2135, P2136
     - — If any DTC is displayed, perform DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
4. Access TP_REL PID.
5. Verify that the PID reading is within the CTP value. (See 01–40B–6 PCM INSPECTION [AJ].)
   - If the PID reading is out of range, perform the following:
     - — Remove air duct from throttle body.
     - — Verify that throttle valve moves when the accelerator pedal is depressed.
       - If the throttle valve moves, inspect the following:
     - — TP sensor and related harness
       - If the throttle valve does not move, inspect the following:
     - — Throttle actuator control motor and related harness
6. Gradually move the throttle valve and verify that the PID reading increases linearly.
   - If the PID reading drops momentarily, inspect the following:
     - — TP sensor
7. Fully depress the accelerator pedal and verify that the PID reading is within the WOT value. (See 01–40B–6 PCM INSPECTION [AJ].)
   - If the PID reading is out of range, perform the following:
     - — Remove air duct from throttle valve body.
     - — Verify that the throttle valve moves when the accelerator pedal is depressed.
       - If the throttle valve moves, inspect the TP sensor and related harness.
       - If the throttle valve does not move, inspect the throttle actuator control motor and related harness.

Fuel Injector Operation Inspection

STEP	INSPECTION	RESULTS	ACTION
1	While cranking engine, inspect for fuel injector operation sound at each cylinder using a soundscope. Is operation sound heard?	Yes	Fuel injector operation is okay.
		No	**Not heard in any cylinders:** Go to next step. **Heard in some cylinders:** Go to Step 3.
2	Perform main relay operation inspection. Is main relay operation normal?	Yes	Inspect the following: • Fuel injector power system related wiring harness and connectors • PCM connectors • Fuel injector GND and related wiring harness and connectors
		No	Repair or replace malfunctioning parts.
3	Change fuel injector connector of not operating fuel injector and operating fuel injector. Is operation sound heard?	Yes	Go to next step.
		No	Replace fuel injector.
4	Are wiring harness and connectors of not operation fuel injector okay? (Open or short circuit)	Yes	Inspect PCM terminal voltage of fuel injector signal.
		No	Repair or replace malfunctioning parts.

Fuel Cut Control System Inspection

1. Warm-up engine and let it idle.
2. Turn off the electrical loads and A/C switch.
3. Connect the WDS or equivalent to the DLC-2.
4. Select RPM PID.
5. Listen for the fuel injector operation sound at all cylinders using the soundscope and monitor PID while performing the following steps:
   (1) Depress the accelerator pedal and increase the engine speed to **4,000 rpm**.
   (2) Quickly release the accelerator pedal (brake pedal is not depressed) and verify that the fuel injector operation sound stops when the accelerator pedal is released and starts again when the engine speed drops **below 1,200 rpm**.
   - If not as specified, inspect the following:
     — ECT sensor and related harness (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [AJ].)
     — Neutral/clutch switch and related harness (MTX) (See 01–40B–23 CLUTCH SWITCH INSPECTION [AJ].)
     — TR switch and related harness (ATX) (See 05–17B–11 TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL].)

Fuel Pump Operation Inspection

Caution
- **Connecting the wrong check connector terminal may possibly cause malfunction. Carefully connect the specified terminal only.**

1. Short the check connector terminal F/P to body GND using a jumper wire. (See 01–14–6 AFTER REPAIR PROCEDURE.)
2. Remove the fuel-filler cap.
3. Turn ignition switch to ON position.
4. Verify that the fuel pump operation sound is heard.
   - If no operation sound is heard, proceed to next step.
5. Measure the voltage at harness side fuel pump connector terminal B.

Specification
B+ (Ignition switch at ON)

- If the voltage is as specified, inspect the following:
  — Fuel pump continuity
  — Fuel pump GND
  — Wiring harness between fuel pump relay and PCM terminal 104
- If not as specified, inspect the following:
  — Fuel pump relay
  — Wiring harness connector (Main relay—fuel pump relay—fuel pump)

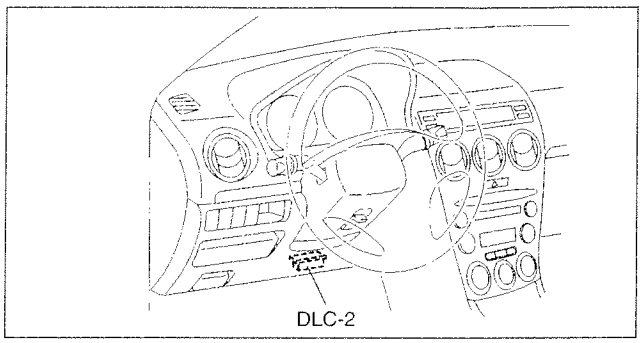
Fuel Pump Control System Inspection

1. Crank the engine and verify that fuel pump relay operation sound is heard.
   - If operation sound is not heard, inspect the following:
     — Fuel pump relay
     — Wiring harness and connectors (Main relay—fuel pump relay—PCM terminal 104)
2. If operation sound is not heard, inspect the following:

Ignition Timing Control Inspection

1. Start the engine and run it at idle.
2. Warm up the engine to normal operating temperature.

3. Connect the WDS or equivalent to the DLC–2.



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4. Select the PID/DATA MONITOR AND RECORD function on the WDS or equivalent display.
5. Select the SPARKADV PID.
6. Verify that SPARKADV PID is within the specification.

Specification
Approx. BTDC 10°

7. Increase the engine speed and verify that the SPARKADV PID value is advanced.
   - If it is not advanced, inspect the following:
     — CKP sensor and related harness (See 01–40B–37 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [AJ].)
     — MAF sensor and related harness (See 01–40B–30 MASS AIR FLOW (MAF) SENSOR INSPECTION [AJ].)
     — CMP sensors (left and right bank) and related harness (See 01–40B–36 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [AJ]

Spark Test
1. Disconnect the fuel pump relay.
2. Verify that each high-tension lead and connector is connected properly.
3. Inspect the ignition system in the following procedure:

Warning
- **High voltage in the ignition system can cause strong electrical shock which can result in serious injury. Avoid direct contact to the vehicle body during the following spark test.**

STEP	INSPECTION		ACTION
1	• Disconnect ignition coil from spark plugs. • Remove spark plugs. • Reconnect spark plugs to ignition coil. • Ground spark plugs to engine. • Is strong blue spark visible at each cylinder while cranking?	Yes	Ignition system is okay.
		No	**Some cylinders do not spark:** • Go to next step. **All cylinders do not spark:** • Go to Step 4.
2	• Inspect spark plugs for damage, wear, carbon deposits and proper plug gap. • Are spark plugs okay?	Yes	Go to next step.
		No	Replace spark plugs, then go to Step.1.
3	• Inspect the following wiring harnesses for open or short circuit: — Ignition coil No.1 terminal B (harness-side)—PCM terminal 26 (harness-side) — Ignition coil No.2 terminal B (harness-side)—PCM terminal 52 (harness-side) — Ignition coil No.3 terminal B (harness-side)—PCM terminal 78 (harness-side) — Ignition coil No.4 terminal B (harness-side)—PCM terminal 1 (harness-side) — Ignition coil No.5 terminal B (harness-side)—PCM terminal 27 (harness-side) — Ignition coil No.6 terminal B (harness-side)—PCM terminal 82 (harness-side) • Are wiring harnesses okay?	Yes	Inspect and replace ignition coil. (See 01–18–2 IGNITION COIL INSPECTION.)
		No	Repair or replace malfunctioning part, then go to Step.1.

STEP	INSPECTION		ACTION
4	• Measure voltage at terminal A in each ignition coil. • Is voltage **B+**?	Yes	Go to next step.
		No	Inspect power supply circuit of ignition coils.
5	• Do PCM connector or ignition coil connectors have poor connection?	Yes	Repair or replace connector, then go to Step.1.
		No	Go to next step.
6	• Are the following parts okay? — CKP sensor and crankshaft pulley — PCM terminal 21 or 22 voltage **Specification** **Approx. 1.5 V**	Yes	Inspect for open or short in wiring harness and connector of CKP sensor.
		No	Repair or replace malfunctioning part, then go to Step.1.

EGR Control System Inspection

1. Verify that EGR valve operation (initial operation) sound is heard when the ignition switch is turned to ON position.
   - If the operation sound is not heard, connect WDS or equivalent to the DLC-2 and verify that the DTC P0403 is shown. Perform DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
2. Start the engine and run it at idle.
3. Warm-up the engine to normal operating temperature.
4. Select the following PIDs:
   - ECT
   - RPM
   - SEGRP
   - APP1
   - APP2
   - TP_REL
   - VSS
5. Let the vehicle idle and verify that the SEGRP value is **0**.
6. Put the vehicle in drive.
7. Depress the accelerator pedal and verify that the SEGRP value increases.
   - If the SEGRP value does not increase, inspect the VSS, APP1, APP2, TP_REL and ECT PIDs. (See 01–40B–6 PCM INSPECTION [AJ].)
   - If the SEGRP value does increases, inspect the following:
     — EGR valve (Stuck open or close)
     — Wiring harness and connectors (Main relay—EGR valve—PCM)
8. Stop the vehicle and verify that the SEGRP value returns to **0**.

Purge Control System Inspection

1. Start the engine.
2. Disconnect the vacuum hose between the purge solenoid valve and the charcoal canister.
3. Put a finger to the purge solenoid valve and verify that there is no vacuum applied when the engine is cold.
   - If there is a vacuum, inspect the following:
     — Wiring harness and connectors (Purge solenoid valve - PCM terminal 18)
     — Purge solenoid valve
4. Warm-up the engine to the normal operating temperature.
5. Stop the engine.
6. Connect the WDS or equivalent to the DLC-2 and verify that the DTC P0443 is displayed. Perform DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
7. Turn ignition switch to ON position.
8. Select ECT PID.
9. Verify that the engine coolant temperature is **60°C {140 °F} or above**.
   - If WDS or equivalent indicates **less than 60°C {140 °F}**, perform the ECT sensor inspection. (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [AJ].)
10. Set the vehicle on the dynamometer or chassis roller.

Warning

- **When the dynamometer or chassis roller is operating, there is a possibility that the operator may come into contact with or be caught up in the rotating parts, leading to serious injuries or death. When performing work while the dynamometer or chassis roller is operating, be careful not to come into contact with or be caught up in any of the rotating parts.**

11. Drive vehicle with engine speed at **approx. 2,000 rpm** for **more than 30 s**.
12. Put a finger to the purge solenoid valve and verify that there is no vacuum applied.
    - If there is no vacuum, inspect the following:
      — Wiring harness and connector (Main relay— purge solenoid valve—PCM terminal 18)
      — Purge solenoid valve
      — MAF, APP1, APP2, TP_REL and LOAD PIDs
    - If there is vacuum, inspect the following:
      — Vacuum hose (Purge Solenoid valve - charcoal canister)

A/C Cut-off Control System Inspection

1. Start the engine.
2. Turn the A/C switch and fan switch on.
3. Verify that the A/C compressor magnetic clutch actuates.
    - If it does not actuate, go to symptom troubleshooting "No.23 A/C does not work sufficiently".
4. Fully open the throttle valve and verify that the A/C compressor magnetic clutch does not actuate for **2—5 s**.
    - If it actuates, inspect the following:
      — A/C relay
      — Open or short to GND circuit in wiring harness and connectors (Ignition switch— A/C relay—PCM terminal 69)
      — A/C related parts
      — APP1, APP2 PIDs

Variable Air Duct (VAD) Control System Operation Inspection

1. Connect the WDS or equivalent to DLC-2.
2. Access ECT, TP_REL and RPM PIDs.
3. Start the engine.
4. Verify ECT PID is **70°C {158°F} or over**.
5. Inspect shutter valve operation under the following conditions:

VAD shutter valve operation

Engine speed	Above 6,000 rpm with TP_REL PID less than 60%	
	Below	Above
Shutter valve	Close	Open

- If the shutter valve operation is not as specified, inspect the following:

(1) Verify that DTC P1410 is not displayed.
    - If DTC P1410 is displayed, perform DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)

(2) Inspect VAD control solenoid valve. (See 01–13B–7 VARIABLE AIR DUCT (VAD) CONTROL SOLENOID VALVE INSPECTION [AJ].)
    - If the VAD control solenoid valve is not okay, replace VAD control solenoid valve.
    - If the VAD control solenoid valve is okay, inspect the following:
      — Vacuum hose looseness or damage
      — Vacuum chamber crack or damage
      — Shutter valve actuator. (See 01–13B–6 VARIABLE AIR DUCT (VAD) SHUTTER VALVE INSPECTION [AJ].)
      — Shutter valve stuck open or close

Evaporative System Test

Evaporative system test outline

- To verify that the problem has been fixed properly after repairs, the Run Drive Cycle or Evaporative System test must be performed.

Evaporative system leak inspection using leak tester

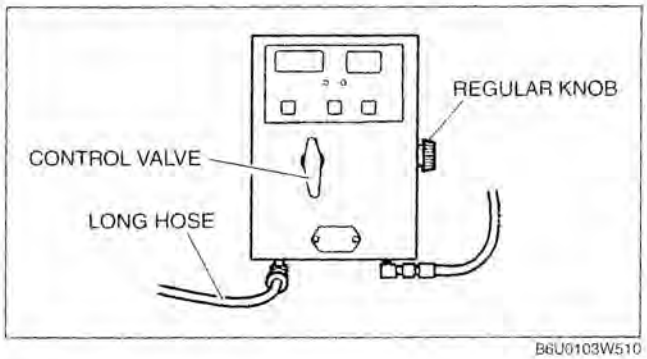
1. Perform the following **SST** (Evaporative Emission System Tester 134-01049) self-test:

Note

- If the tester does not work correctly during self-test, refer to the tester operators manual for more detailed self test procedures.

(1) Verify the gas cylinder valve is closed and the control valve located on the tester is in the TEST position. All tester displays should be off at this time.

(2) Connect the long hose (part of **SST**) to the tester.



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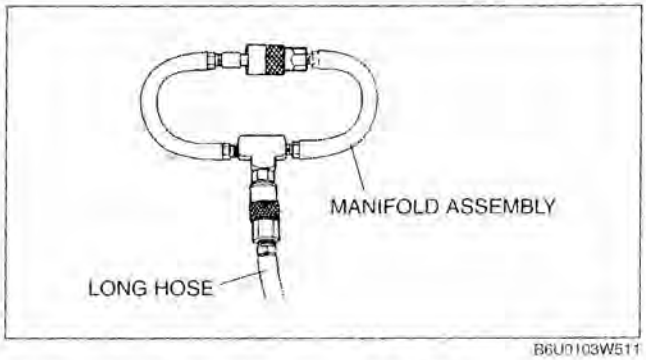
(3) Connect the manifold assembly (part of **SST**) to the long hose as shown.



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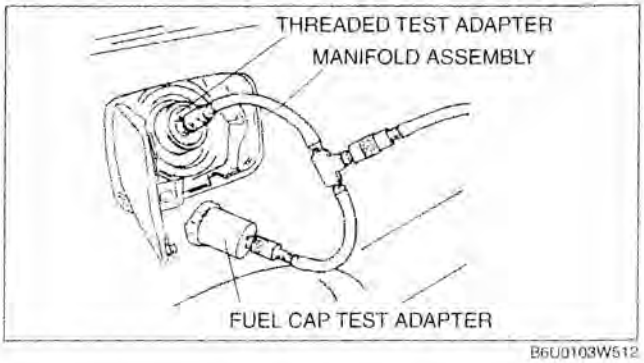
(4) Open the gas cylinder valve and verify the gas cylinder regulator left gauge reads **10 to 12 psi** (preset at factory).
- If not, refer to the tester operators manual to contact tester manufacturer.

(5) Press the ON/OFF switch to turn on the **SST** and make sure the left display reads **0.0**.
(6) Turn the control valve on the tester to the FILL position.
(7) Verify the left display reading is within **13.9 to 14.0 in** of water.
- If not, adjust the pressure using the regulator knob located on the right side of the tester.

(8) Turn the control valve to TEST position and press the START switch.
(9) After the **2 min** countdown (left display) is completed, the right display shows the total pressure loss for that period. A **0.5 inch** of water loss is acceptable on the self-test.
- If the loss is **more than 0.5 inch** of water, do one or more self-test. If the failed test repeats, check for leak using the ultrasonic leak detector (part of **SST**).

2. Press the RESET switch to set the left display reading to **0.0**.
3. Connect the fuel cap test adapter (part of **SST**) to the manifold assembly and fuel-filler cap from the vehicle.
- If the fuel-filler cap is not a genuine part, replace it.

4. Connect the threaded test adapter (part of **SST**) to the manifold assembly and fuel-filler neck.



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5. Connect the WDS or equivalent to DLC-2.
6. Turn ignition switch to ON position (engine OFF).
7. Request the PCM for on-board device control (Mode 08) using WDS or equivalent to close change over valve in EVAP system leak detection pump.

Note
- The change over valve is closed for **10 min unless** one of the following actions is completed:
  — The engine is started.
  — The ignition switch is turned to OFF position.

8. Turn the control valve to the FILL position.
9. Wait (**max. 40 s**) until the left display reads **13.5 to 14 inches** of water.
   - If the reading is slightly below, adjust it using the regulator knob.
   - If the reading is far below, the EVAP system has large leak. Check for leak (using the ultrasonic leak detector if necessary) and repair.
10. Turn the control valve to the TEST position and press the START switch.
11. After the **2 min** countdown (left display) is completed, check the test result (the failed/passed light on the tester).
    - If the green light turns on, the EVAP system is OK.
    - If the red light turns on, the EVAP system has leakage. Check for leak using the ultrasonic leak detector and repair.
12. Close the gas cylinder valve.
13. Turn the control valve to the FILL position.
14. Press the ON/OFF switch to turn off the tester.

Main Fan/Additional Fan Motor Operation Inspection

1. Connect WDS or equivalent to DLC-2.
2. Warm-up the engine.
3. Access ECT PID.
4. Measure voltage fan control module connector terminal B at 2-pin connector with monitoring ECT PID.

Specification

Engine condition	A/C operation	ECT PID (°C {°F}	Voltage (V)
Ignition switch at ON or idle	Not operating	Below 95 {203}	0
Idle	Operating*		6.9—12.1
	Not operating	Above 100 {212}	0.6—14.6

* : A/C pressure switch (middle pressure) is on.

- If not as specified, inspect the following:
  - — CKP sensor
  - — ECT sensor
  - — APP sensor
  - — TP sensor
  - — A/C pressure switch (middle pressure)

5. If all items are okay, replace fan control module.

Variable Valve Timing Control System Operation Inspection
When idling cannot be continued

Note
- Inspect for each bank

1. Remove the OCV and verify that the spool valve is at maximum retard position.
   - If the spool valve is stuck in advance direction, replace the OCV. (See 01–10B–47 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [AJ].)
2. Connect the OCV.
3. Turn the ignition switch to ON position.
4. Verify that the spool valve is at max. retard position.
   - If the spool valve is stuck in advance direction, inspect the following:
     - — Short circuit in harnesses or connectors between the OCV and the PCM.
5. Inspect the variable valve timing actuator.

When idling can be continued
For right bank

1. Disconnect OCV (RH) connector.
2. Warm up the engine and it at idle.
3. Apply the battery voltage to the OCV and verify that the engine idles roughly or stalls.
   - If the engine idles roughly or stalls, inspect the timing belt component (valve timing deviation).
   - If the engine does not idle roughly or stall, go to next step.

4. Remove the OCV (RH) and perform spool valve operation inspection. (See 01–10B–48 OIL CONTROL VALVE (OCV) INSPECTION [AJ].)
   - If not as specified, inspect the following:
     — OCV (RH)
     — Harnesses and connectors between OCV (RH) and PCM have an open or short circuit.
   - If as specified, inspect the following right bank hydraulic passages for clogging or leakage, or both.
     — Oil pressure switch - OCV
     — OCV - camshaft
     — Camshaft internal passage
5. If they are okay, replace the right bank camshaft pulley (with built-in variable valve timing actuator).

When idling can be continued
For left bank

1. Disconnect OCV (LH) connector.
2. Warm up the engine to idle.
3. Apply the battery voltage to the OCV and verify that the engine idles roughly or stalls.
   - If the engine idles roughly or stalls, inspect the timing belt component (valve timing deviation).
   - If the engine does not idle roughly or stall, go to next step.
4. Remove the OCV (LH) and perform spool valve operation inspection. (See 01–10B–48 OIL CONTROL VALVE (OCV) INSPECTION [AJ].)
   - If not as specified, inspect the following:
     — OCV (LH)
     — Harnesses and connectors between OCV (LH) and PCM have an open or short circuit.
   - If as specified, inspect the following left bank hydraulic passages for clogging or leakage or both.
     — Oil pressure switch - OCV
     — OCV - camshaft
     — Camshaft internal passage
5. If they are okay, replace the left bank camshaft pulley (with built-in variable valve timing actuator).

01–10A MECHANICAL [L3]

MECHANICAL LOCATION INDEX [L3]

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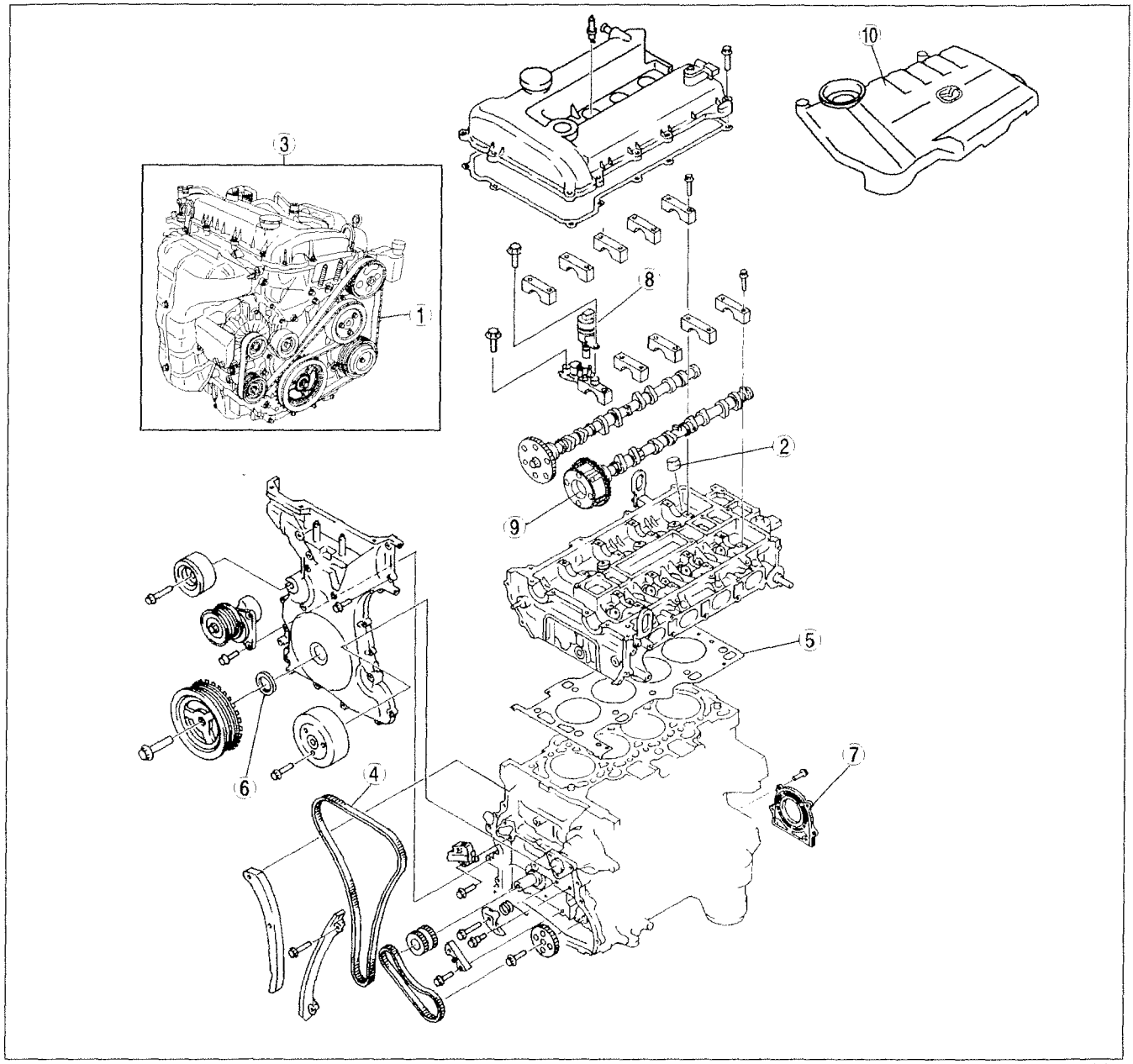

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1	Drive belt (See 01–10A–3 DRIVE BELT INSPECTION [L3]) (See 01–10A–3 DRIVE BELT REPLACEMENT [L3]) (See 01–10A–4 DRIVE BELT AUTO TENSIONER INSPECTION [L3])
2	Tappet (See 01–10A–6 VALVE CLEARANCE INSPECTION [L3]) (See 01–10A–7 VALVE CLEARANCE ADJUSTMENT [L3])
3	Engine (See 01–10A–5 COMPRESSION INSPECTION [L3]) (See 01–10A–26 ENGINE REMOVAL/ INSTALLATION [L3]) (See 01–10A–30 ENGINE DISASSEMBLY/ ASSEMBLY [L3])

4	Timing chain (See 01–10A–11 TIMING CHAIN REMOVAL/ INSTALLATION [L3])
5	Cylinder head gasket (See 01–10A–18 CYLINDER HEAD GASKET REPLACEMENT [L3])
6	Front oil seal (See 01–10A–21 FRONT OIL SEAL REPLACEMENT [L3])
7	Rear oil seal (See 01–10A–25 REAR OIL SEAL REPLACEMENT [L3])
8	Oil control valve (OCV) (See 01–10A–34 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [L3]) (See 01–10A–34 OIL CONTROL VALVE (OCV) INSPECTION [L3])

9	Variable valve timing actuator (See 01–10A–33 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [L3]) (See 01–10A–32 VARIABLE VALVE TIMING ACTUATOR INSPECTION [L3])
10	Plug hole plate (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3])

DRIVE BELT INSPECTION [L3]

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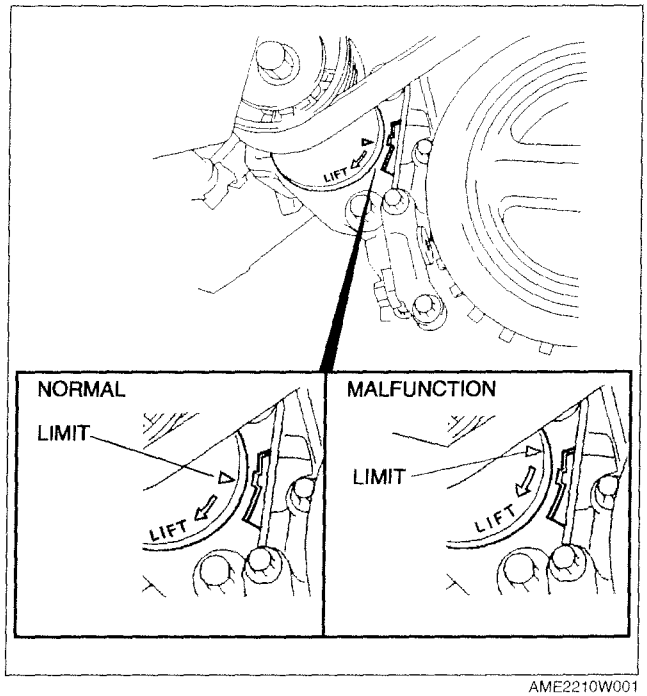
Note
- Front and water pump drive belt deflection/tension inspection is not necessary because of the use of the front drive belt auto tensioner.

Front Drive Belt

1. Verify that the drive belt auto tensioner indicator mark does not exceed the limit.
   - If it exceeds the limit, replace the drive belt. (See 01–10A–3 DRIVE BELT REPLACEMENT [L3].)



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DRIVE BELT REPLACEMENT [L3]

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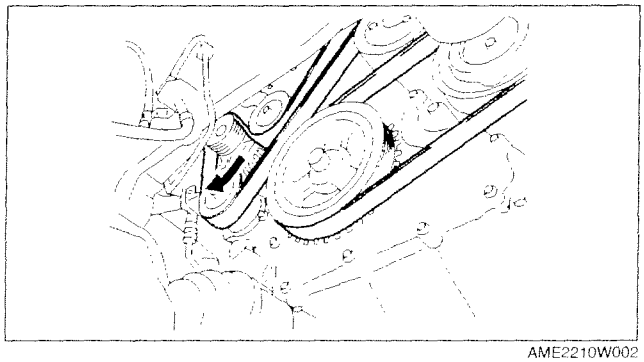
1. Remove the splash shield (RH).
2. Turn the center of the tensioner pulley clockwise to release tension to the drive belt.



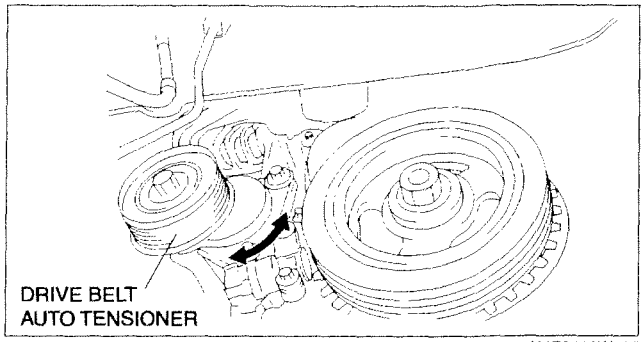
AME2210W002

3. Remove the drive belt.
4. Reinstall the drive belt or install a new drive belt.
5. Verify that the drive belt auto tensioner indicator mark does not exceed the limit. (See 01–10A–3 DRIVE BELT INSPECTION [L3].)
   - If it exceeds the limit, replace the drive belt.
6. Install the splash shield (RH).

DRIVE BELT AUTO TENSIONER INSPECTION [L3]

C6U011015980W01

1. Remove the drive belt. (See 01–10A–3 DRIVE BELT REPLACEMENT [L3].)
2. Verify that the drive belt auto tensioner moves smoothly in the operational direction.
   - Replace the drive belt auto tensioner if necessary.



AME2210W003

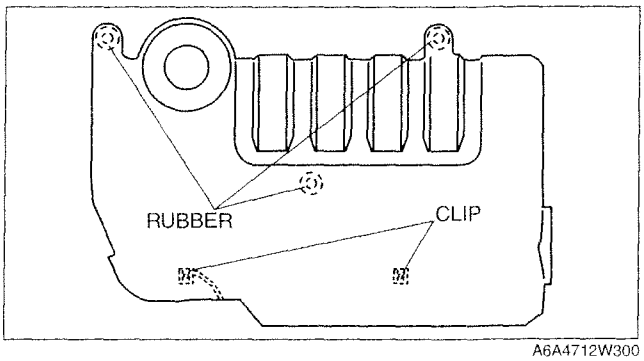
3. Turn the drive belt auto tensioner pulley by hand and verify that it rotates smoothly.
   - Replace the drive belt auto tensioner if necessary.
4. Install the drive belt. (See 01–10A–3 DRIVE BELT REPLACEMENT [L3].)

PLUG HOLE PLATE REMOVAL/INSTALLATION [L3]

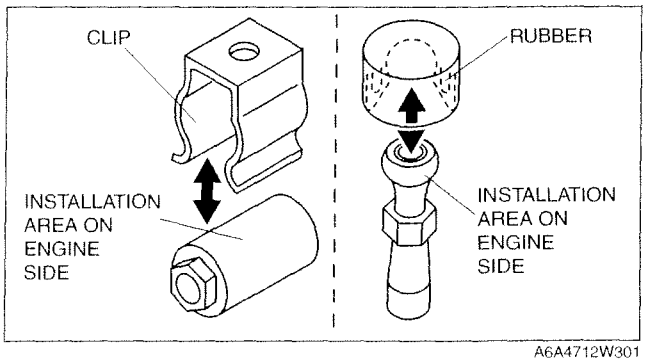
C6U011000149W01

1. Remove the plug hole plate.

Note
- Lift off and remove the plug hole plate from the installation areas (rubber and clips) as shown in the figure.

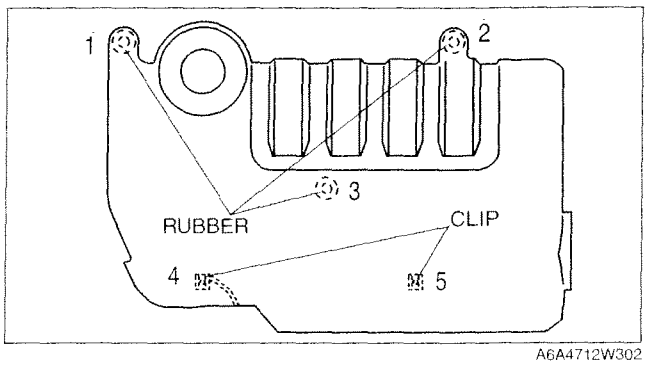


A6A4712W300



A6A4712W301

2. Install the plug hole plate.
   (1) To position the plug hole plate, grasp rubber 1 and 2, as shown in the figure, with your hands and press them in.
   (2) Grasp rubber 3 with your hand and press it in.
   (3) Grasp clips 4 and 5 with your hands and press them in.



A6A4712W302

COMPRESSION INSPECTION [L3]

C6U011002000W01

Warning

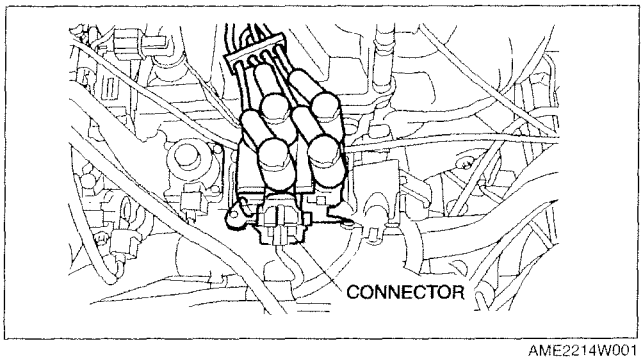
- **Hot engines and oil can cause severe burns. Be careful not to burn yourself during removal/ installation of each component.**

1. Verify that the battery is fully charged.
   - Recharge it if necessary. (See 01–17–1 BATTERY INSPECTION.)
2. Warm up the engine to the normal operating temperature.
3. Stop the engine and allow it to cool down for **about 10 min**.
4. Perform "Fuel Line Safety Procedures". Leave the fuel pump relay removed. (See 01–14–5 BEFORE REPAIR PROCEDURE.)

Warning

- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01–14–5 Fuel Line Safety Procedure.)**

5. Remove the plug hole plate.
   (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
6. Disconnect the ignition coil connector.



AME2214W001

7. Remove the spark plugs. (See 01–18–4 SPARK PLUG REMOVAL/INSTALLATION.)
8. Connect a compression gauge into the spark plug hole.
9. Fully depress the accelerator pedal and crank the engine.
10. Note down the maximum gauge reading.
11. Inspect each cylinder as above.
    - If the measured value is less than the limited value, or there is a cylinder whose compression value varies from that of other cylinders by **196.1 kPa {2.0 kgf/cm^2, 28.5 psi} or more**, add a small amount of engine oil through the spark plug hole. Then measure the compression pressure and perform the respective operations for the following cases.
      — If the compression increases, the piston, the piston rings, or cylinder wall may be worn and overhaul is required.
      — If the compression stays low, a valve may be stuck or improperly seated and overhaul is required.
      — If the compression in adjacent cylinders stays low, the cylinder head gasket may be damaged or the cylinder head distorted and overhaul is required.

Compression

kPa {kgf/cm^2, psi} [rpm]

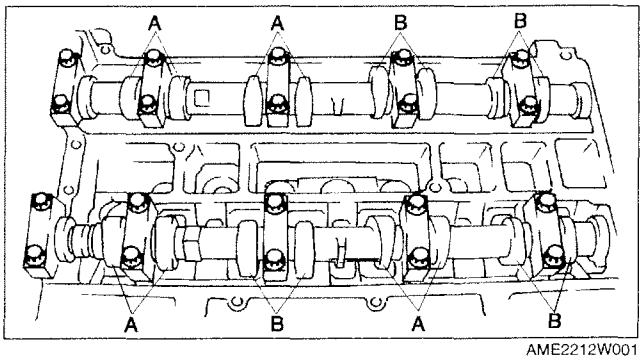
Item	Specification
Standard	1,372 {14.0, 199.08} [285]
Minimum	960 {9.79, 139.21} [285]
Maximum difference between cylinders	196.1 {2.0, 28.5}

12. Disconnect the compression gauge.
13. Install the spark plugs. (See 01–18–4 SPARK PLUG REMOVAL/INSTALLATION.)
14. Connect the ignition coil connector.
15. Install the plug hole plate.
    (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
16. Install the fuel pump relay. (See 01–14–5 BEFORE REPAIR PROCEDURE.)

VALVE CLEARANCE INSPECTION [L3]

C6U011012111W01

1. Disconnect the negative battery cable.
2. Remove the tire (RH).
3. Remove the splash shield (RH).
4. Remove the plug hole plate.
   (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
5. Remove the spark plugs. (See 01–18–4 SPARK PLUG REMOVAL/INSTALLATION.)
6. Remove the oil control valve (OCV) connector.
7. Remove the ventilation hose.
8. Remove the cylinder head cover.
9. Verify that the engine is in cold condition.
10. Measure the valve clearance.
    (1) Turn the crankshaft clockwise so that the No.1 piston is at TDC of the compression stroke.
    (2) Measure the valve clearance at A in the figure.
        - If the valve clearance is out of the standard value, adjust it. (See 01–10A–7 VALVE CLEARANCE ADJUSTMENT [L3].)



AME2212W001

Note
- Make sure to note down the measured values for choosing the suitable replacement tappets.

Standard [Engine cold]
IN: 0.22—0.28 mm {0.0087—0.0110 in}
EX: 0.27—0.33 mm {0.0107—0.0129 in}

    (3) Rotate the crankshaft **360°** clockwise so that the No.4 piston is at TDC of the compression stroke.
    (4) Measure the valve clearance at B in the figure.
        - If the valve clearance is out of the standard value, adjust it. (See 01–10A–7 VALVE CLEARANCE ADJUSTMENT [L3].)

Note
- Make sure to note down the measured values for choosing the suitable replacement tappets.

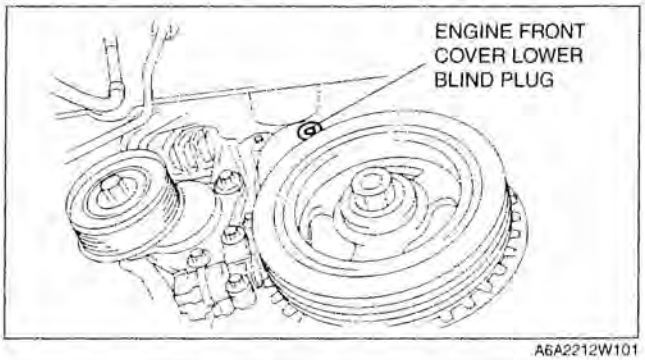
Standard [Engine cold]
IN: 0.22—0.28 mm {0.0087—0.0110 in}
EX: 0.27—0.33 mm {0.0107—0.0129 in}

11. Install the cylinder head cover. (See 01–10A–18 Cylinder Head Cover Installation Note.)
12. Install the ventilation hose.
13. Install the oil control valve (OCV) connector.
14. Install the high-tension lead. (See 01–18–4 HIGH-TENSION LEAD (L3) REMOVAL/INSTALLATION.)
15. Install the spark plugs. (See 01–18–4 SPARK PLUG REMOVAL/INSTALLATION.)
16. Install the plug hole plate.
    (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
17. Install the splash shield (RH).
18. Install the tire (RH).

VALVE CLEARANCE ADJUSTMENT [L3]

C6U011012111W02

1. Disconnect the negative battery cable.
2. Remove the tire (RH).
3. Remove the splash shield (RH).
4. Remove the plug hole plate.
   (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
5. Remove the high-tension lead. (See 01–18–4 HIGH-TENSION LEAD (L3) REMOVAL/INSTALLATION.)
6. Remove the spark plugs. (See 01–18–4 SPARK PLUG REMOVAL/INSTALLATION.)
7. Remove the oil control valve (OCV) connector.
8. Remove the ventilation hose.
9. Remove the cylinder head cover.
10. Remove the drive belt. (See 01–10A–3 DRIVE BELT REPLACEMENT [L3].)
11. Remove the front drive shaft (RH) from the joint shaft. (See 03–13–12 DRIVE SHAFT REMOVAL/INSTALLATION [L3].)
12. Remove the engine front cover lower blind plug.



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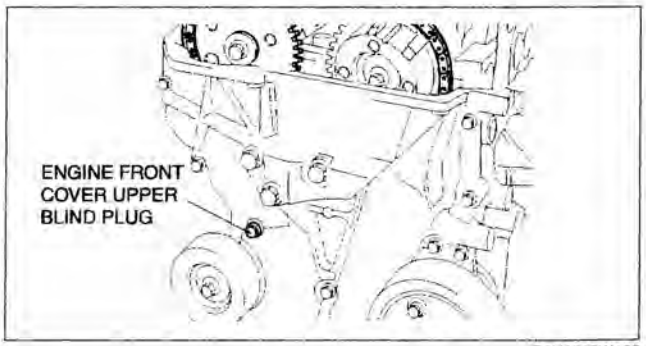
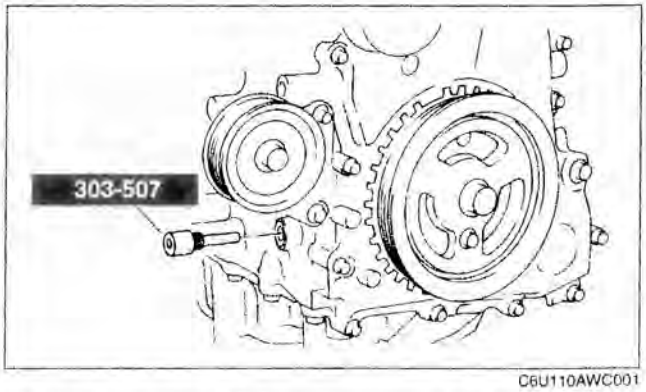
13. Remove the engine front cover upper blind plug.



B6U2212W102

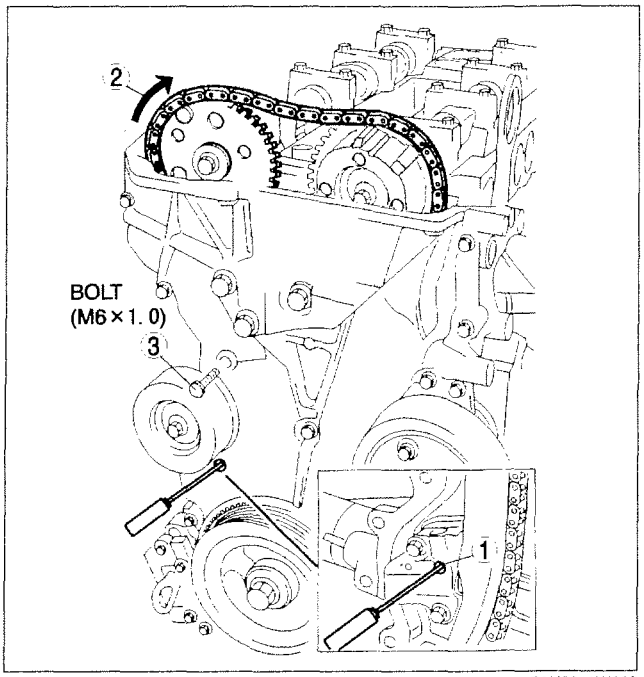
14. Remove the cylinder block lower blind plug.
15. Install the **SST** as shown in the figure.



C6U110AWC001

16. Rotate the crankshaft clockwise until the crankshaft is in the No.1 cylinder TDC position (until the balance weight is contacting the **SST**).

17. Loosen the timing chain.
    (1) Unlock the chain tensioner ratchet using a suitable screwdriver or equivalent tool.
    (2) Rotate the exhaust camshaft clockwise using a suitable wrench on the cast hexagon and loosen a timing chain.
    (3) Placing the suitable bolt **(M6 X 1.0 length 25—35 mm {0.99—1.37 in})** at the engine front cover upper blind plug, secure the chain guide at the position where the tension is released.



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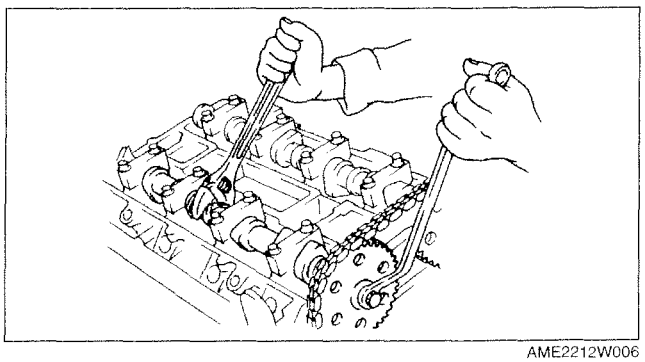
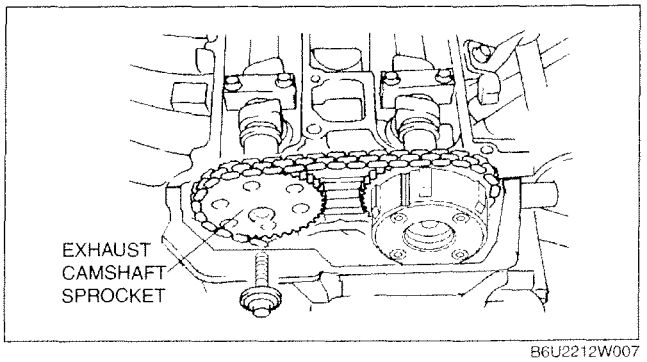
18. Hold the exhaust camshaft using a suitable wrench on the cast hexagon as shown in the figure.


AME2212W006

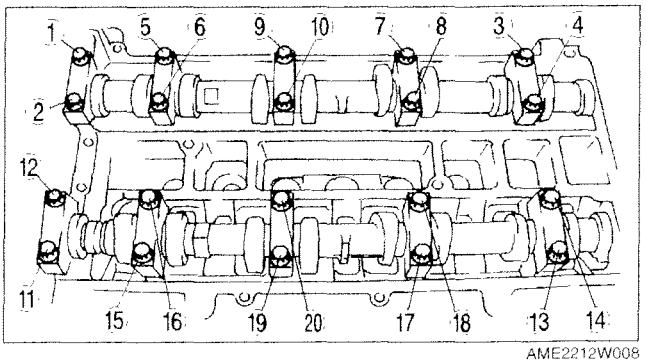
19. Remove the exhaust camshaft sprocket.



B6U2212W007

20. Loosen the camshaft cap bolts in two or three steps in the order shown in the figure.

Note
- The cylinder head and the camshaft caps are numbered to be reassembled in their original position correctly. When removed, keep the caps with the cylinder head from where they were removed. Do not mix the caps.



AME2212W008

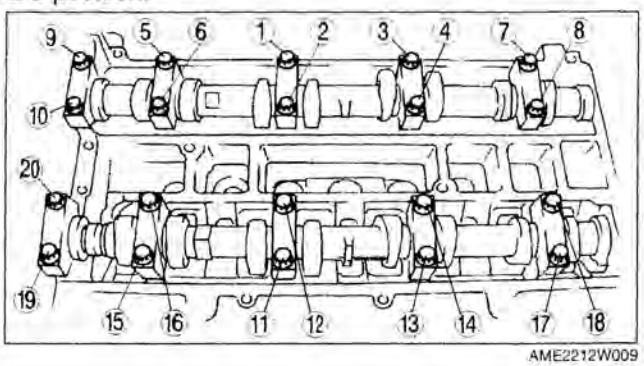
21. Remove the camshaft.
22. Remove the tappet.

23. Select proper adjustment shim.

New adjustment shim
= Removed shim thickness + Measured valve clearance - Standard valve clearance (IN: 0.25 mm {0.0098 in}, EX: 0.30 mm {0.0118 in})

Standard [Engine cold]
IN: 0.22—0.28 mm {0.0087—0.0110 in}
EX: 0.27—0.33 mm {0.0107—0.0129 in}

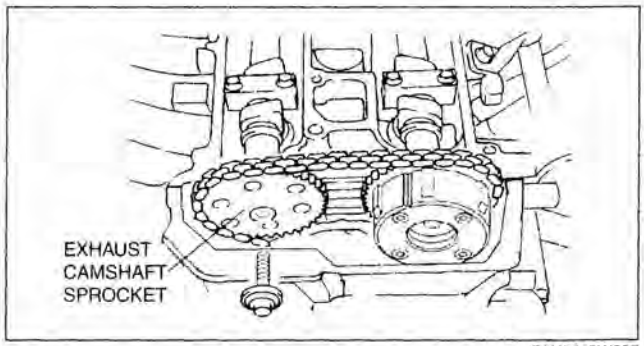
24. Install the camshaft and No.1 cylinder aligned with the TDC position.
25. Tighten the camshaft cap bolt in the following two steps.
    (1) Tighten to **5.0—9.0 N·m {51.0—91.7 kgf·cm, 44.3—79.6 in·lbf}**.
    (2) Tighten to **14.0—17.0 N·m {1.5—1.7 kgf·m, 10.4—12.5 ft·lbf}**.



AME2212W009

26. Install the exhaust camshaft sprocket.

Note
- Do not tighten the bolt for the camshaft sprocket during this step. First confirm the valve timing, then tighten the bolt.



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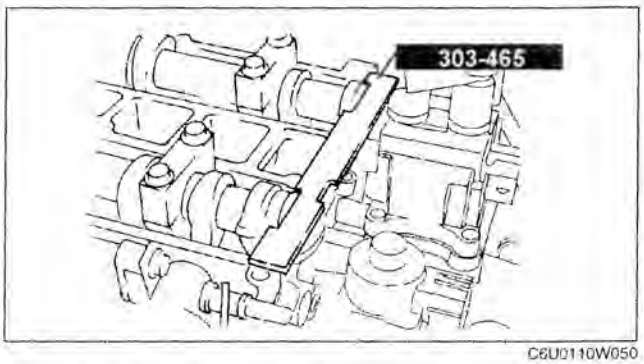
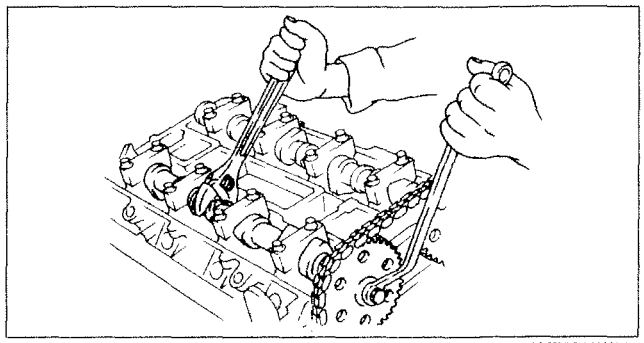
27. Install the **SST** to the camshaft as shown in the figure.



C6U0110W050

28. Remove the **(M6 X 1.0 length 25mm—35mm {0.99—1.37in})** bolt from the engine front cover to apply tension to the timing chain.
29. Turn the crankshaft clockwise until the crankshaft is in the No.1 cylinder TDC position (until the balance weight is contacting to the **SST**).

30. Hold the exhaust camshaft using a suitable wrench on the cast hexagon as shown in the figure.

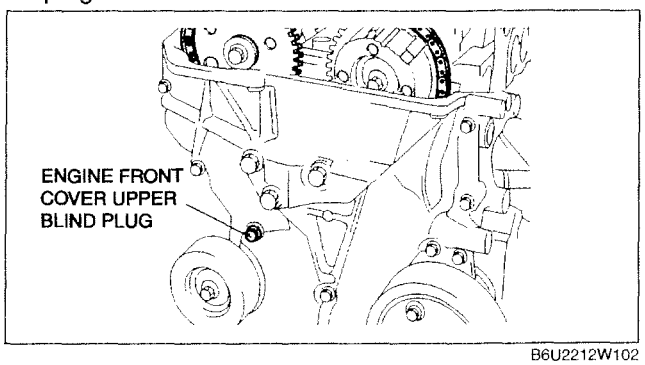

AME2212W006

31. Tighten the exhaust camshaft sprocket lock bolt.

Tightening torque
89—95 N·m {9.1—9.6 kgf·m, 65.7—70.0 ft·lbf}

32. Remove the **SST** from the camshaft.
33. Remove the **SST** from the block lower blind plug.
34. Rotate the crankshaft two times clockwise until the crankshaft is in the TDC position, reinstall the **SSTs** to the camshaft and cylinder block, and inspect the valve timing.
    - If not aligned, loosen the crankshaft pulley lock bolt and repeat from Step 16.
35. Apply silicone sealant to the engine front cover upper blind plug.
36. Install the engine front cover upper blind plug.

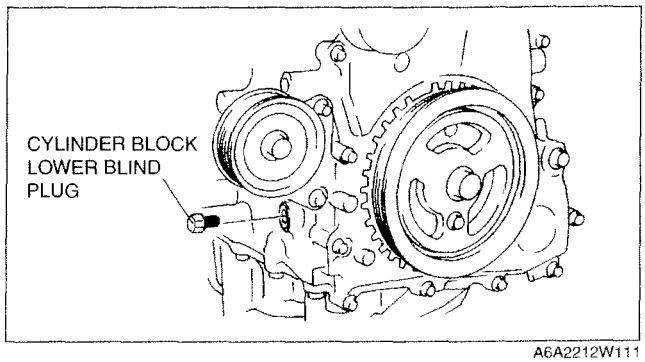
Tightening torque
8.0—11.5 N·m {81.6—117.2 kgf·cm, 70.9—101.7 in·lbf}



B6U2212W102

37. Install the cylinder block lower blind plug.

Tightening torque
18—22 N·m {1.9—2.2 kgf·m, 13.3—16.2 ft·lbf}



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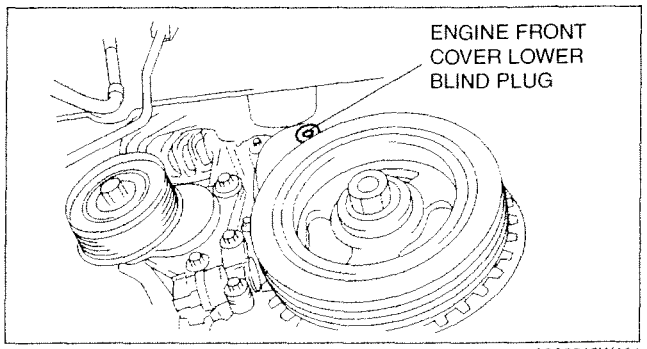
38. Install the new engine front cover lower blind plug.

Tightening torque
10.0—14.0 N·m {102.0—142.7 kgf·cm, 73.8—103.2 in·lbf}



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39. Connect the front drive shaft (RH) and the joint shaft. (See 03–13–12 DRIVE SHAFT REMOVAL/INSTALLATION [L3].)
40. Install the drive belt. (See 01–10A–3 DRIVE BELT REPLACEMENT [L3].)
41. Install the cylinder head cover. (See 01–10A–18 Cylinder Head Cover Installation Note.)
42. Install the ventilation hose.
43. Install the oil control valve (OCV) connector.
44. Install the high-tension lead. (See 01–18–4 HIGH-TENSION LEAD (L3) REMOVAL/INSTALLATION.)
45. Install the spark plugs. (See 01–18–4 SPARK PLUG REMOVAL/INSTALLATION.)
46. Install the plug hole plate.
    (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
47. Install the splash shield (RH).
48. Install the tire (RH).

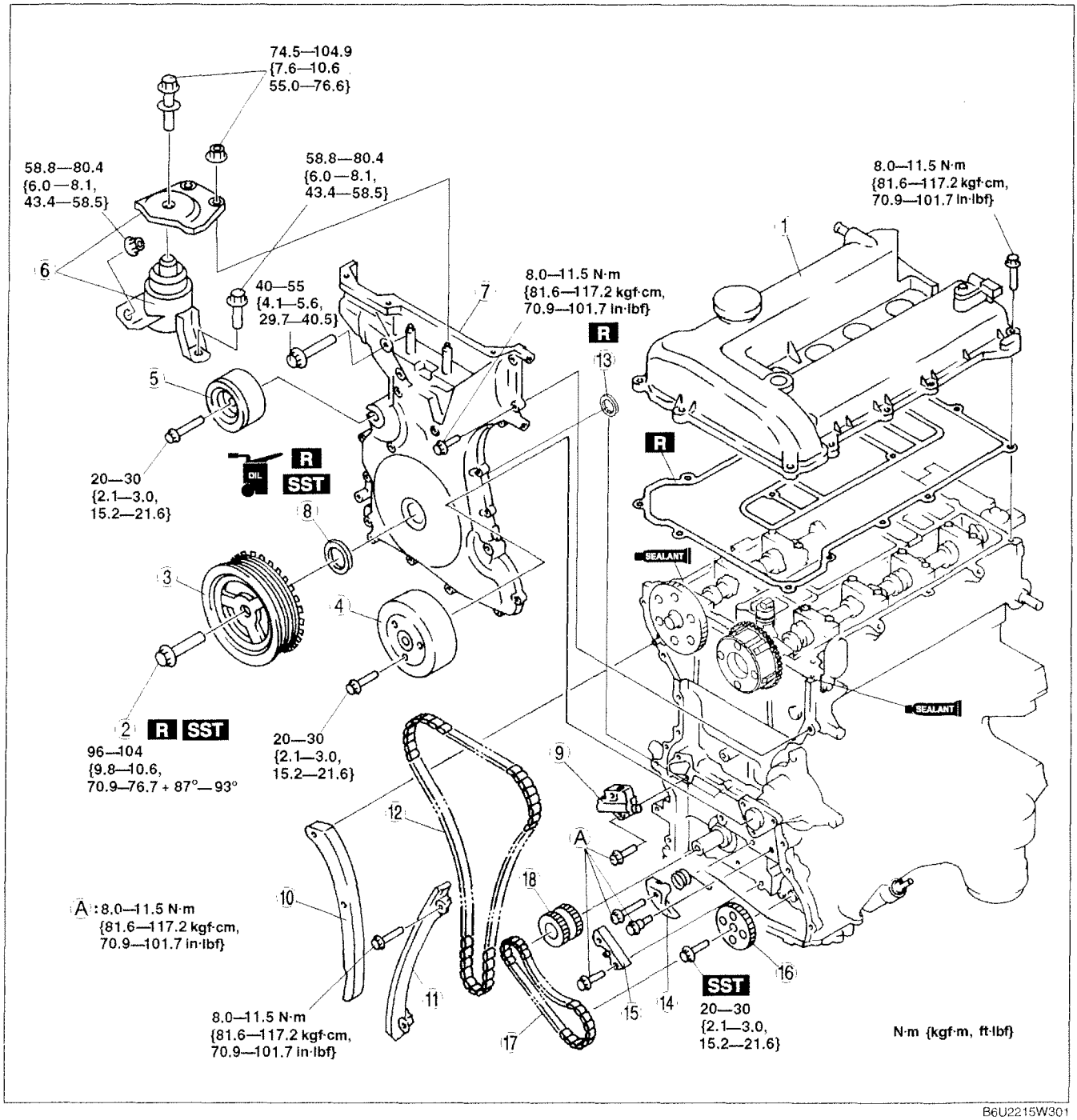
TIMING CHAIN REMOVAL/INSTALLATION [L3]

C6U011012201W01

Warning

- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01–14–5 Fuel Line Safety Procedure.)**

1. Disconnect the negative battery cable.
2. Remove the plug hole plate.
   (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
3. Remove the spark plugs. (See 01–18–4 SPARK PLUG REMOVAL/INSTALLATION.)
4. Remove the tire (RH).
5. Remove the under cover.
6. Loosen the water pump pulley bolt and removal the drive belt. (See 01–10A–3 DRIVE BELT REPLACEMENT [L3].)
7. Remove the crankshaft position (CKP) sensor. (See 01–40A–42 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [L3].)
8. Drain the engine oil. (See 01–11–3 ENGINE OIL REPLACEMENT.)
9. Remove the P/S oil pump with the oil hose still connected and position the P/S oil pump so that it is out of the way. (See 06–12–24 POWER STEERING OIL PUMP REMOVAL/INSTALLATION [L3].)
10. Remove the front drive shaft (RH) from the joint shaft. (See 03–13–12 DRIVE SHAFT REMOVAL/INSTALLATION [L3].)
11. Remove in the order indicated in the table.
12. Install in the reverse order of removal.
13. Start the engine and:
    - Inspect for the engine oil, engine coolant, transaxle oil and fuel leakage.
    - Verify the ignition timing, idle speed and idle mixture. (See 01–10A–31 Ignition Timing Inspection.) (See 01–10A–31 Idle Speed Inspection.) (See 01–10A–31 Idle Mixture Inspection.)
14. Perform a road test.



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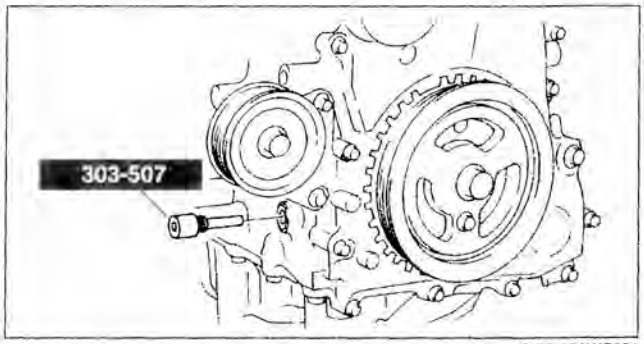
1	Cylinder head cover (See 01–10A–18 Cylinder Head Cover Installation Note)
2	Crankshaft pulley lock bolt (See 01–10A–13 Crankshaft Pulley Lock Bolt Removal Note) (See 01–10A–17 Crankshaft Pulley Lock Bolt Installation Note)
3	Crankshaft pulley
4	Water pump pulley
5	Drive belt idler pulley

6	No.3 engine mount rubber and No.3 engine joint bracket (See 01–10A–14 No.3 Engine Mount Rubber and No.3 Engine Joint Bracket Removal Note) (See 01–10A–16 No.3 Engine Mount Rubber and No.3 Engine Joint Bracket Installation Note)
7	Engine front cover (See 01–10A–15 Engine Front Cover Installation Note)
8	Front oil seal (See 01–10A–14 Engine Front Cover Removal Note) (See 01–10A–16 Front Oil Seal Installation Note)
9	Chain tensioner (See 01–10A–13 Chain Tensioner Removal Note)

10	Tensioner arm
11	Chain guide
12	Timing chain (See 01–10A–15 Timing Chain Installation Note)
13	Seal
14	Oil pump chain tensioner
15	Oil pump chain guide
16	Oil pump sprocket (See 01–10A–14 Oil Pump Sprocket Removal Note) (See 01–10A–14 Oil Pump Sprocket Installation Note)
17	Oil pump chain
18	Crankshaft sprocket

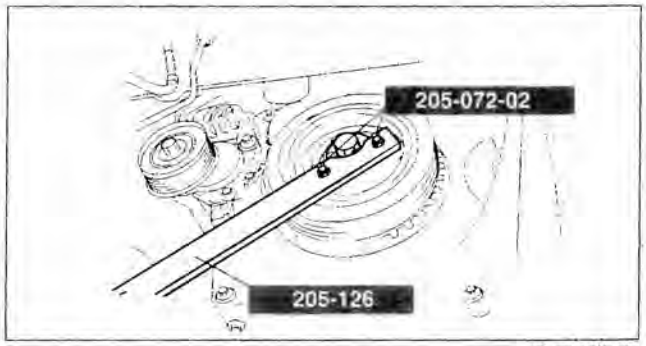
Crankshaft Pulley Lock Bolt Removal Note

1. Remove the cylinder block lower blind plug.
2. Install the **SST**.



C6U110AWC001

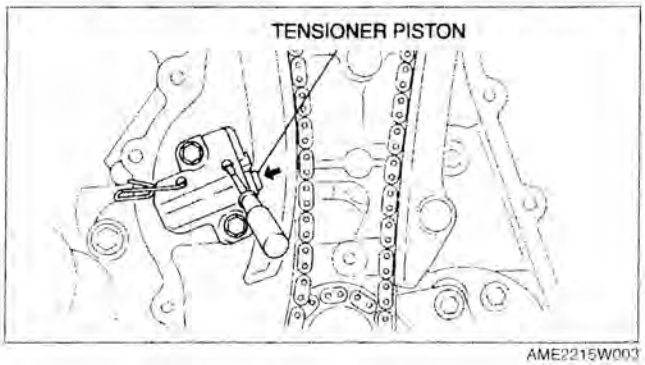
3. Rotate the crankshaft clockwise until the crankshaft is in the No.1 cylinder TDC position (until the balance weight is contacting to the **SST**).
4. Hold the crankshaft pulley using the **SSTs**.



B6U2215W100

Chain Tensioner Removal Note

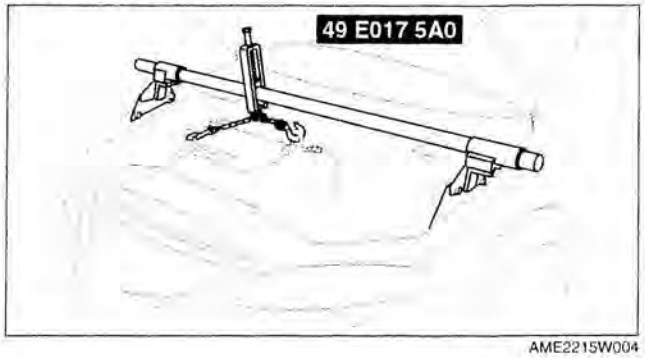
1. Hold the chain tensioner ratchet lock mechanism away from the ratchet stem using a thin screwdriver.
2. Slowly compress the tensioner piston.
3. Hold the tensioner piston using a **1.5 mm {0.059 in}** wire or paper clip.



AME2215W003

No.3 Engine Mount Rubber and No.3 Engine Joint Bracket Removal Note

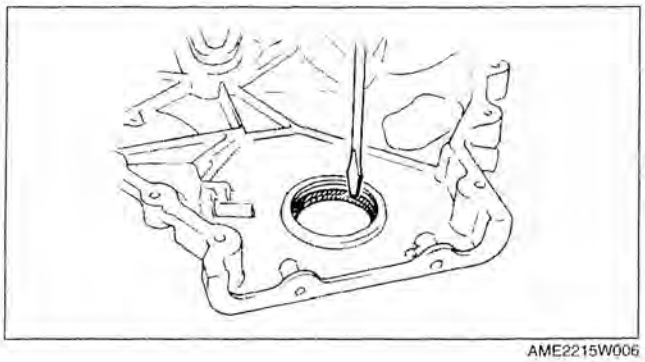
1. Suspend the engine using the **SST**.



AME2215W004

Engine Front Cover Removal Note

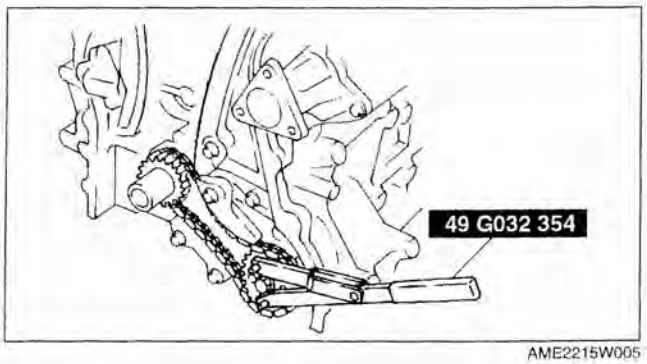
1. Remove the oil seal using a screwdriver as shown in the figure.



AME2215W006

Oil Pump Sprocket Removal Note

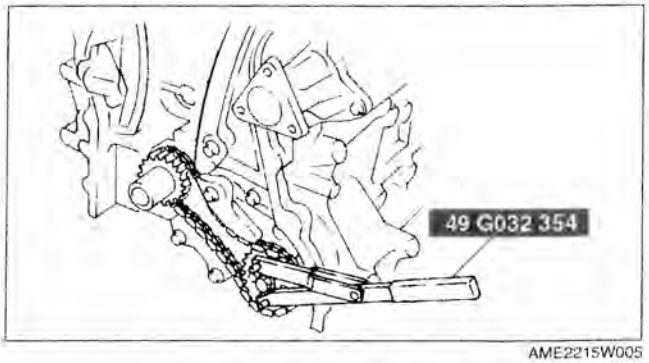
1. Hold the oil pump sprocket using the **SST**.



AME2215W005

Oil Pump Sprocket Installation Note

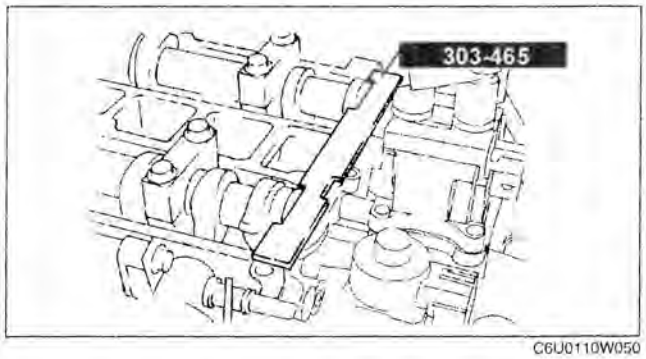
1. Hold the oil pump sprocket using the **SST**.



AME2215W005

Timing Chain Installation Note

1. Install the **SST** to the camshaft as shown in the figure.



C6U0110W050

2. Install the timing chain.
3. Remove the retaining wire or paper clip from the auto tensioner to apply tension to the timing chain.

Engine Front Cover Installation Note

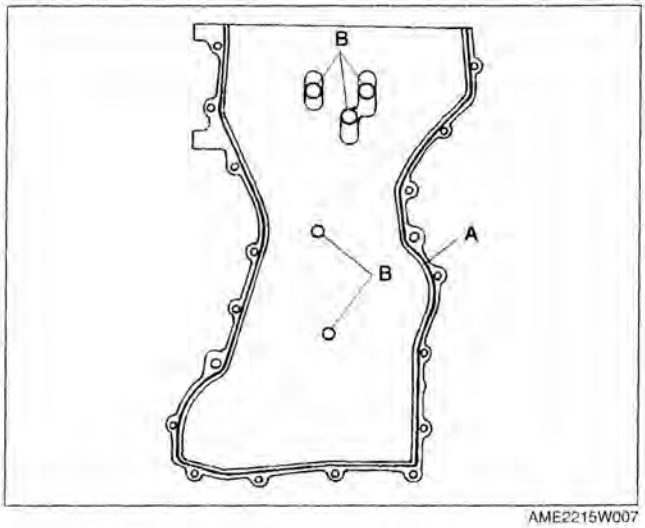
1. Apply silicone sealant to the engine front cover as shown in the figure.

Caution

- **Install the engine front cover within 10 min of applying the silicone sealant.**
- **Silicone sealant is not needed in the area indicated by C as shown in the figure as it is a seal.**

Thickness

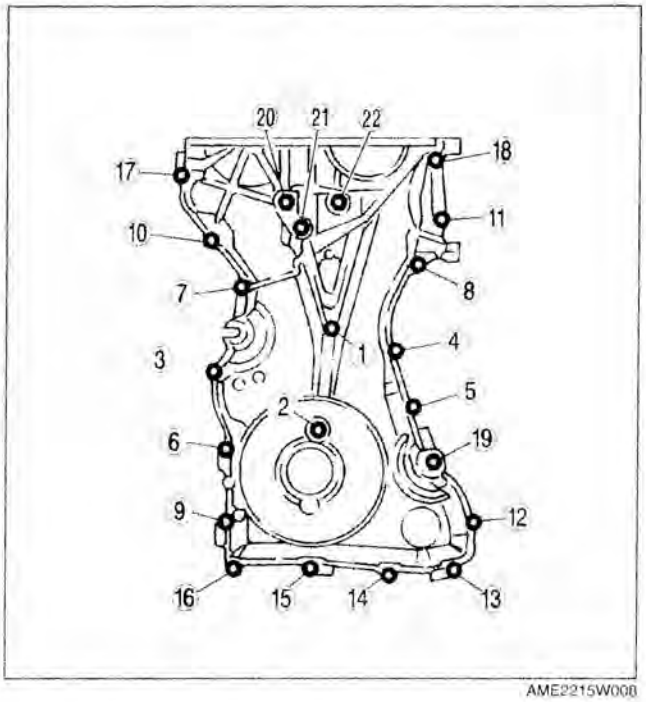
A: 2.0—3.0 mm {0.079—0.118 in}
B: 1.5—2.5 mm {0.059—0.098 in}



AME2215W007

2. Install the engine front cover bolts in the order as shown in the figure.

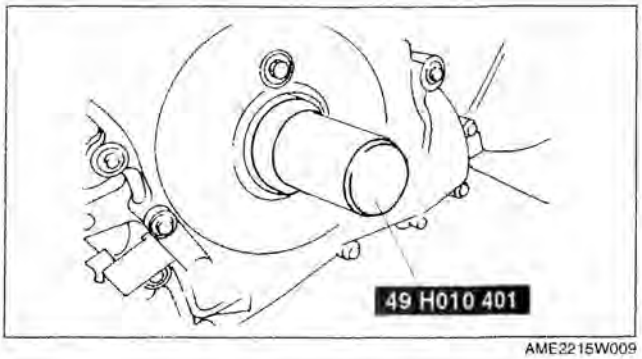
Bolt No.	Tightening torque
1—18	8.0—11.5 N·m {81.6—117.2 kgf·cm, 70.9—101.7 in·lbf}
19—22	40—55 N·m {4.1—5.6 kgf·m, 29.7—40.5 ft·lbf}



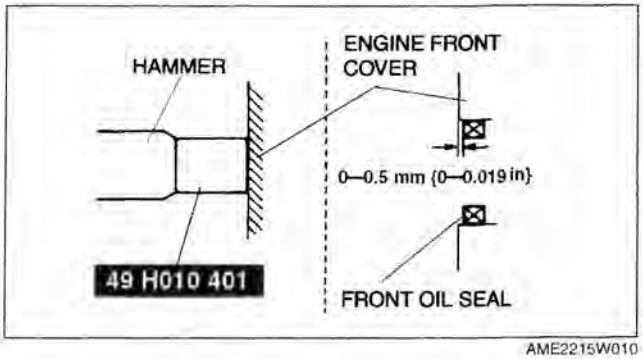
AME2215W008

Front Oil Seal Installation Note

1. Apply clean engine oil to the oil seal.
2. Push the oil seal slightly in by hand.
3. Compress the oil seal using the **SST** and a hammer.



AME2215W009

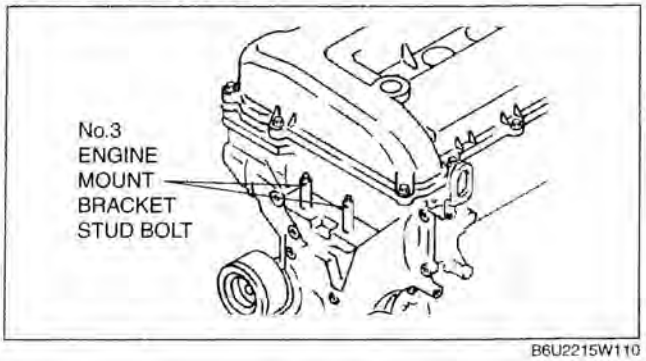


AME2215W010

No.3 Engine Mount Rubber and No.3 Engine Joint Bracket Installation Note

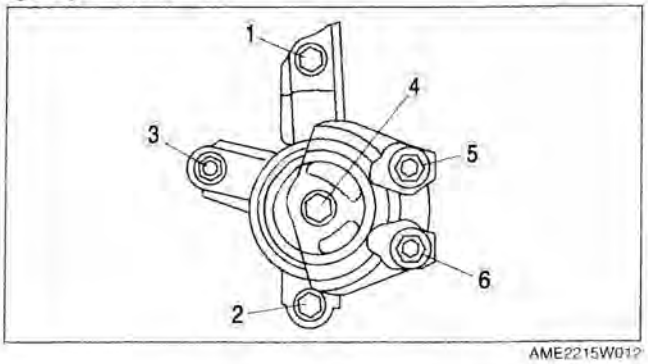
1. Tighten the stud bolt of the No.3 engine mount bracket.

   Tightening torque
   7.0—13 N·m {71.4—132.5 kgf·cm, 62.0—115.0 in·lbf}



B6U2215W110

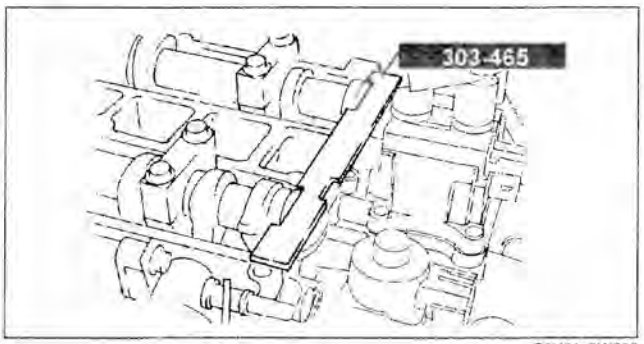
2. Hand-tighten the No.3 engine mount rubber and No.3 engine joint bracket.
3. Tighten the bolts and nuts in the order shown in the figure.



AME2215W012

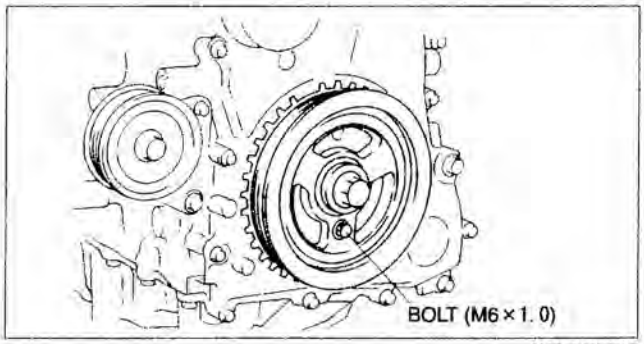
Crankshaft Pulley Lock Bolt Installation Note

1. Install the **SST** to the camshaft as shown in the figure.



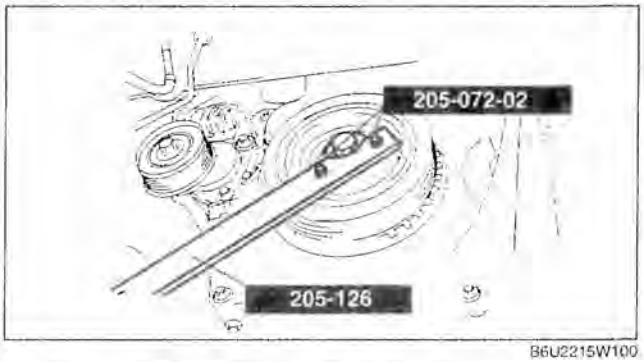
C6U0110W050

2. Install the **M6 x 1.0** bolt in by hand.



AME2215W013

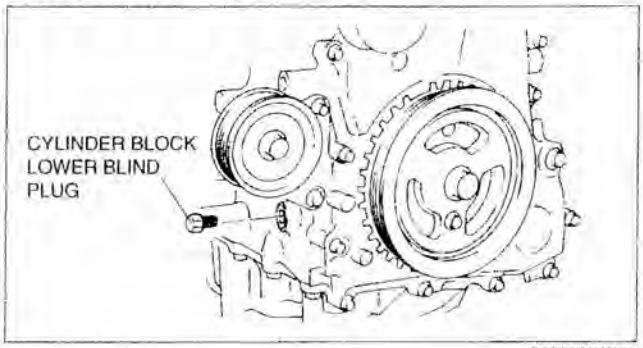
3. Rotate the crankshaft clockwise until the crankshaft is in the No.1 cylinder TDC position (until the balance weight is contacting to the **SST**).
4. Hold the crankshaft pulley using the **SST**.



B6U2215W100

5. Tighten the crankshaft pulley lock bolt in the following two steps using the **SST (49 D032 316)**.
   (1) Tighten to **96—104 N·m {9.8—10.6 kgf·m, 70.9—76.7 ft·lbf}**
   (2) Tighten **87°▽93°**
6. Remove the **M6 x 1.0** bolt.
7. Remove the **SST** from the camshaft.
8. Remove the **SST** from the cylinder block lower blind plug.
9. Rotate the crankshaft two times clockwise until the crankshaft is in the TDC position, reinstall the **SSTs** to the camshaft and cylinder block, and inspect the valve timing.
   - If not aligned, loosen the crankshaft pulley lock bolt and repeat from Step 1.
10. Install the cylinder block lower blind plug.

Tightening torque
18—22 N·m {1.9—2.2 kgf·m, 13.3—16.2 ft·lbf}



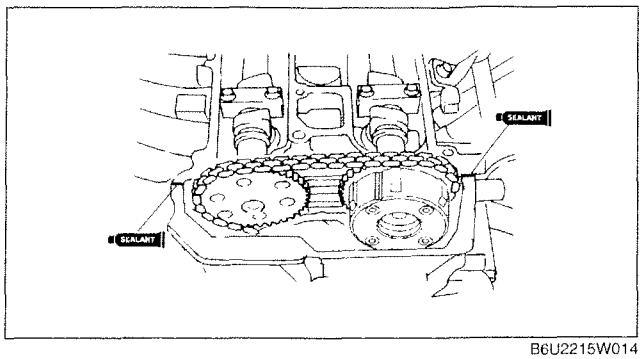
A6A2212W111

Cylinder Head Cover Installation Note

1. Apply silicone sealant to the mating faces as shown in the figure.

Caution
- **Install the cylinder head cover within 10 min of applying the silicone sealant.**

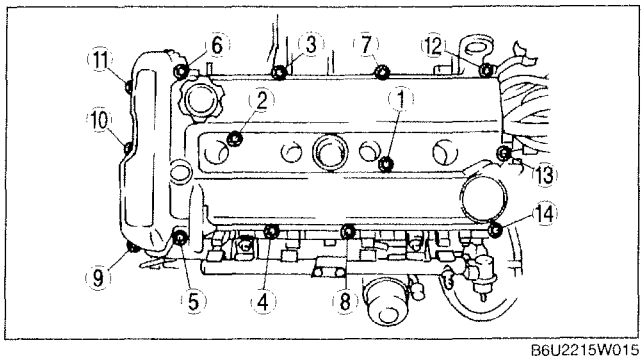
Thickness
4.0—6.0 mm {0.16—0.23 in}



B6U2215W014

2. Install the cylinder head cover with a new gasket.
3. Tighten the bolts in the order shown in the figure.

Tightening torque
8.0—11.5 N·m {81.6—117.2 kgf·cm, 70.9—101.7 in·lbf}



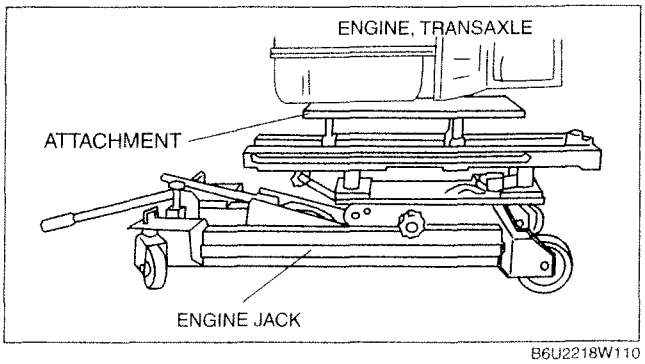
B6U2215W015

CYLINDER HEAD GASKET REPLACEMENT [L3]

C6U011010271W01

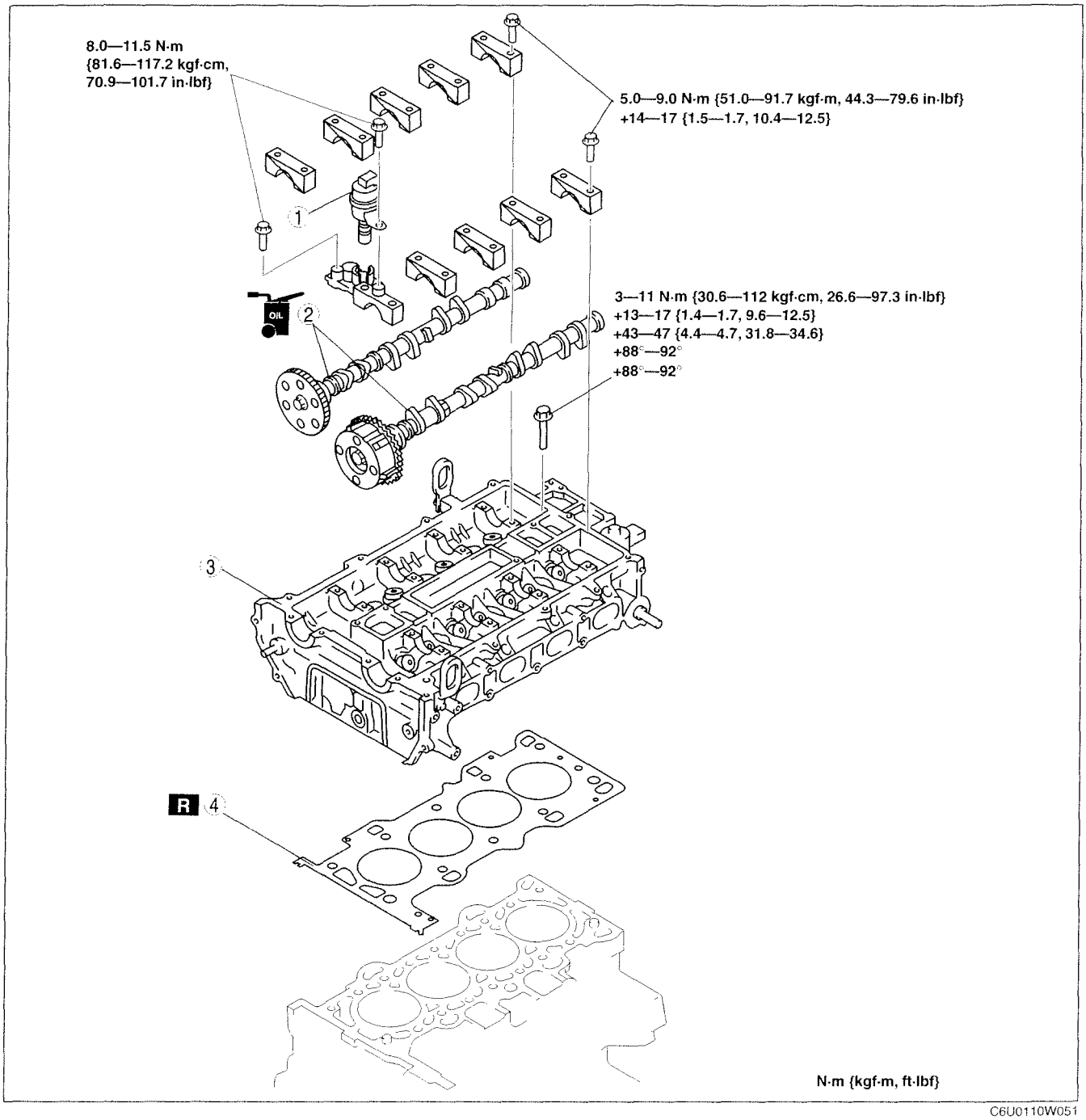
Warning
- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01–14–5 Fuel Line Safety Procedure.)**

1. Remove the timing chain. (See 01–10A–11 TIMING CHAIN REMOVAL/INSTALLATION [L3].)
2. Remove the ignition coil. (See 01–18–1 IGNITION COIL REMOVAL/INSTALLATION.)
3. Remove the high-tension lead. (See 01–18–4 HIGH-TENSION LEAD (L3) REMOVAL/INSTALLATION.)
4. Disconnect the generator, but do not remove it from the vehicle. Fix the generator using a rope to prevent it from falling. (See 01–17–3 GENERATOR REMOVAL/INSTALLATION.)
5. Remove the front pipe. (See 01–15A–1 EXHAUST SYSTEM REMOVAL/INSTALLATION [L3].)
6. Remove the intake manifold. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
7. Disconnect the heater hose, bypass hose, and radiator hose.
8. To firmly support the engine, first set the engine jack and attachment to the oil pan.



B6U2218W110

9. Remove in the order indicated in the table.
10. Install in the reverse order of removal.
11. Inspect the compression. (See 01–10A–5 COMPRESSION INSPECTION [L3].)



C6U0110W051

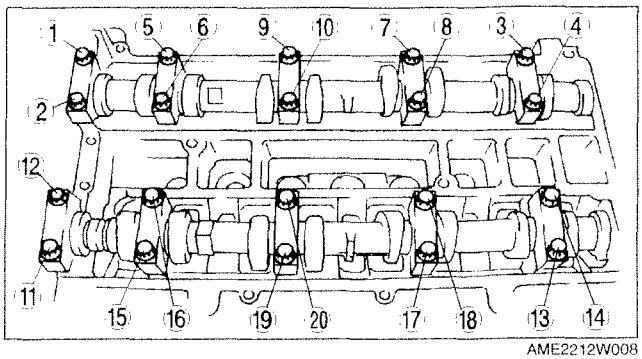
1	Oil control valve (OCV)
2	Camshaft (See 01–10A–20 Camshaft Removal Note) (See 01–10A–21 Camshaft Installation Note)

3	Cylinder head (See 01–10A–20 Cylinder Head Removal Note) (See 01–10A–20 Cylinder Head Installation Note)
4	Cylinder head gasket

Camshaft Removal Note

Note
- The cylinder head and the camshaft caps are numbered to be reassembled in their original position correctly. When removed, keep the caps with the cylinder head they were removed from. Do not mix the caps.

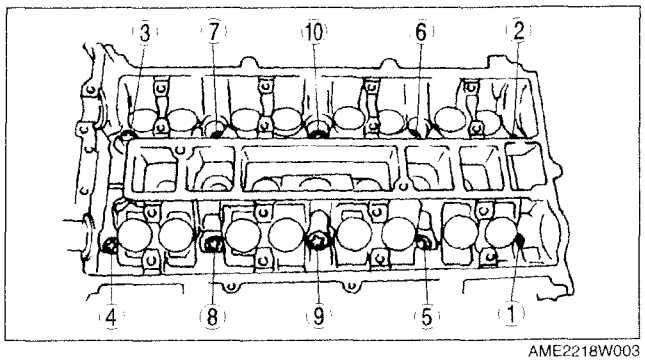
1. Loosen the camshaft cap bolts in two or three steps in the order shown in the figure.



AME2212W008

Cylinder Head Removal Note

1. Loosen the cylinder head bolts in two or three steps in the order shown in the figure.



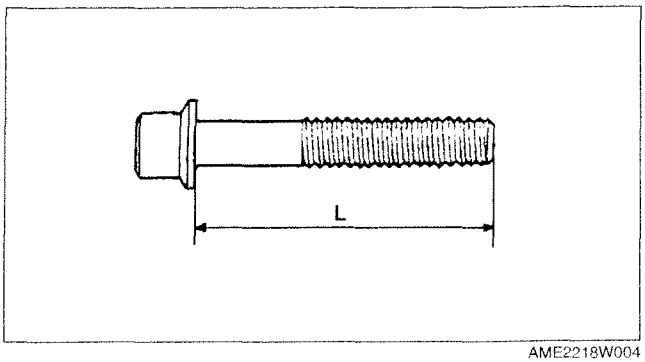
AME2218W003

Cylinder Head Installation Note

1. Measure the length of each cylinder head bolt.
   - Replace any that exceeds maximum length.

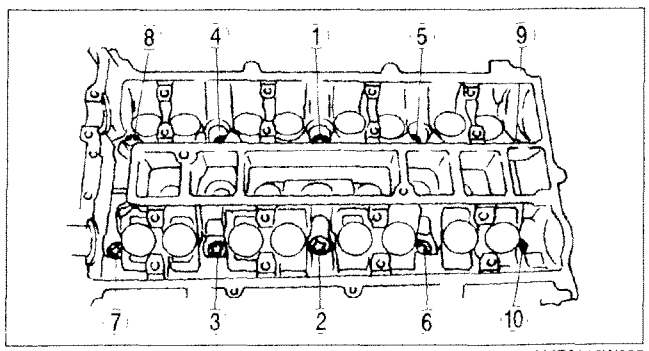
   Length L
   145.2—145.8 mm {5.717—5.740 in}

   Maximum
   146.5 mm {5.767 in}



AME2218W004

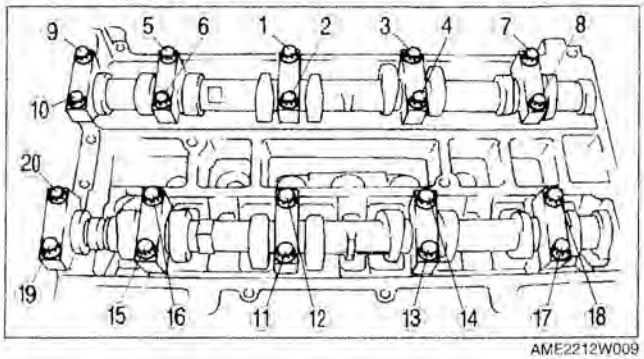
2. Tighten the cylinder head bolts in the order shown following 5 steps.
   (1) Tighten to **3—11 N·m {30.6—112 kgf·cm, 27.6—97.3 in·lbf}**
   (2) Tighten **13—17 N·m {1.4—1.7 kgf·m, 9.6—12.5 ft·lbf}**
   (3) Tighten **43—47 N·m {4.4—4.7 kgf·m, 31.8—34.6 ft·lbf}**
   (4) Tighten **88°▽92°**
   (5) Tighten **88°▽92°**



AME2218W005

Camshaft Installation Note

1. Set the cam position of No.1 cylinder at the top dead center (TDC) and install the camshaft.
2. Temporarily tighten the camshaft bearing caps evenly in two or three steps.
3. Tighten the camshaft cap bolts in the order shown with the following two steps.
   (1) Tighten to **5.0—9.0 N·m {51.0—91.7 kgf·cm, 44.3—79.6 in·lbf}**
   (2) Tighten to **14—17 N·m {1.5—1.7 kgf·m, 10.4—12.5 ft·lbf}**

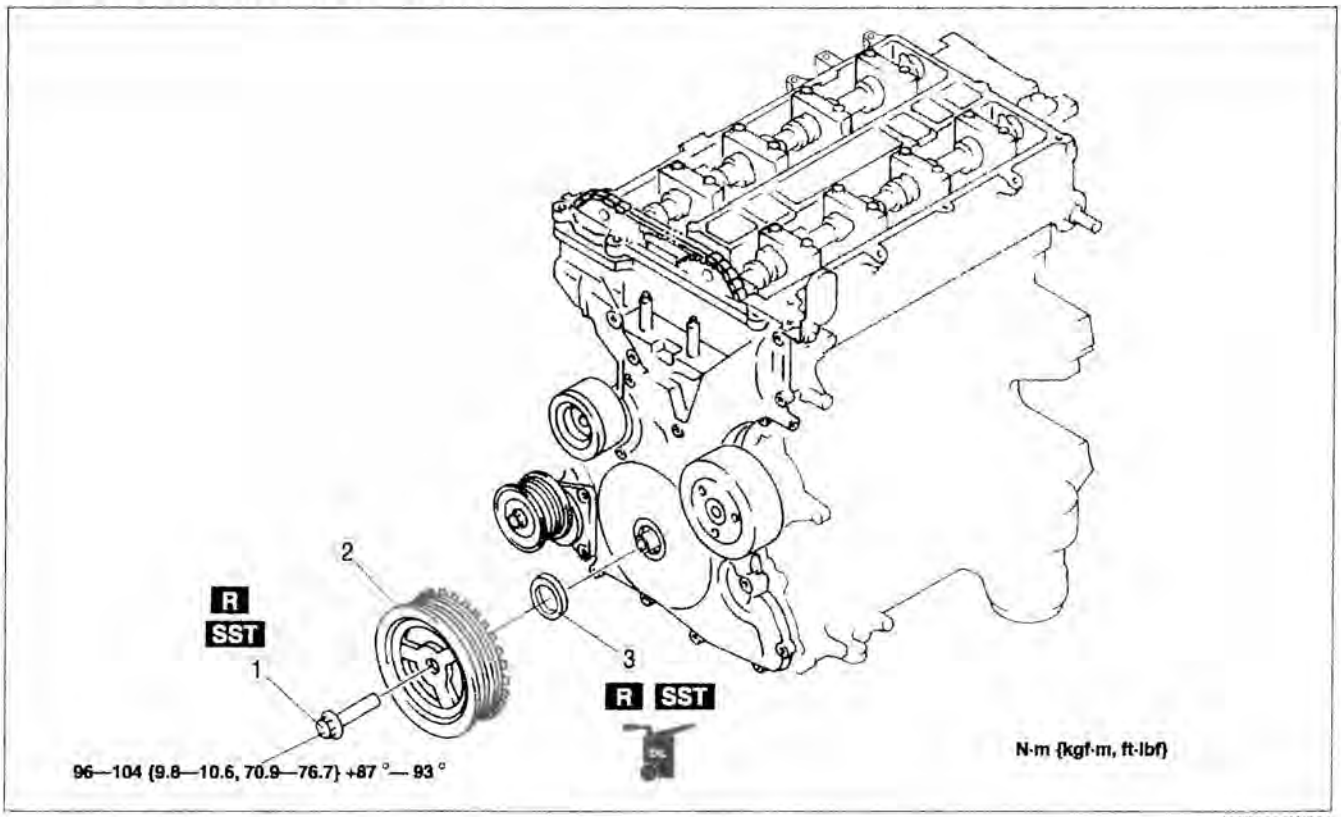


AME2212W009

FRONT OIL SEAL REPLACEMENT [L3]

C6U011010602W01

1. Disconnect the negative battery cable.
2. Remove the plug hole plate.
   (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
3. Remove the spark plugs. (See 01–18–4 SPARK PLUG REMOVAL/INSTALLATION.)
4. Remove the cylinder head cover. (See 01–10A–18 Cylinder Head Cover Installation Note.)
5. Remove the drive belt. (See 01–10A–3 DRIVE BELT REPLACEMENT [L3].)
6. Remove the front drive shaft (RH) from the joint shaft. (See 03–13–12 DRIVE SHAFT REMOVAL/INSTALLATION [L3].)
7. Remove the crankshaft position (CKP) sensor.
   (See 01–40A–42 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [L3].)
8. Remove in the order indicated in the table.
9. Install in the reverse order of removal.



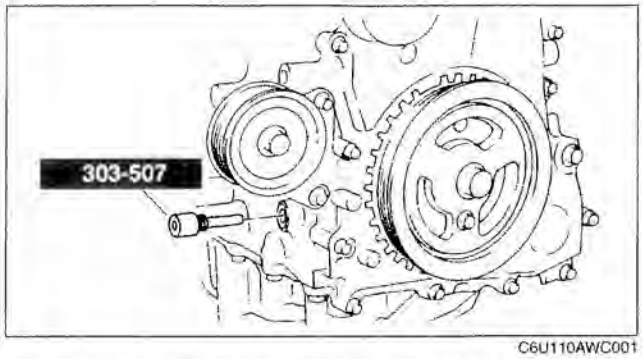
AME2220W001

1	Crankshaft pulley lock bolt (See 01–10A–22 Crankshaft Pulley Lock Bolt Removal Note) (See 01–10A–23 Crankshaft Pulley Lock Bolt Installation Note)

2	Crankshaft pulley
3	Front oil seal (See 01–10A–22 Front Oil Seal Removal Note) (See 01–10A–23 Front Oil Seal Installation Note)

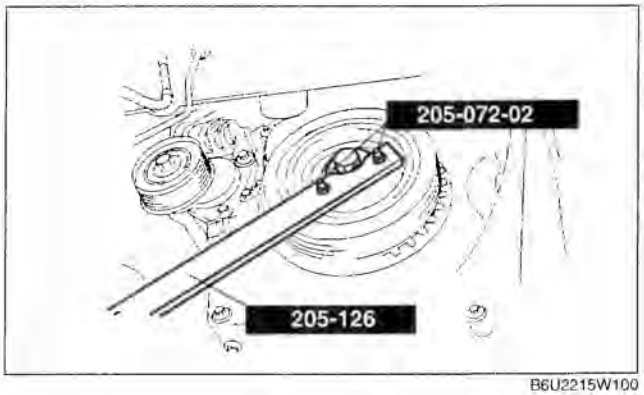
Crankshaft Pulley Lock Bolt Removal Note

1. Remove the cylinder block lower blind plug.
2. Install the **SST**.



C6U110AWC001

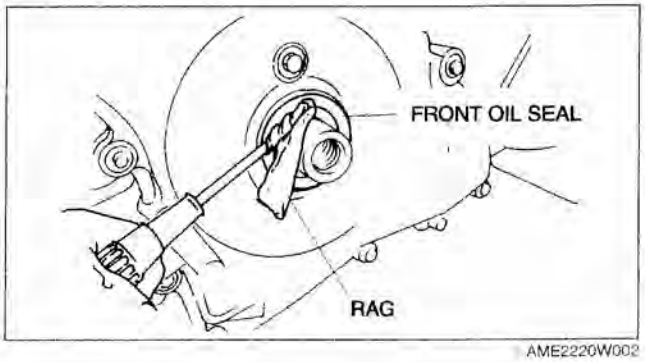
3. Rotate the crankshaft clockwise until the crankshaft is in the No.1 cylinder TDC position (until the balance weight is contacting to the **SST**).
4. Hold the crankshaft pulley using the **SSTs**.



B6U2215W100

Front Oil Seal Removal Note

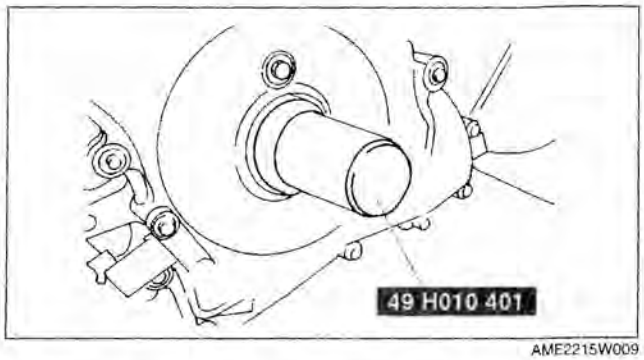
1. Cut the oil seal lip using a razor knife.
2. Remove the oil seal using a screwdriver wrapped with a rag.



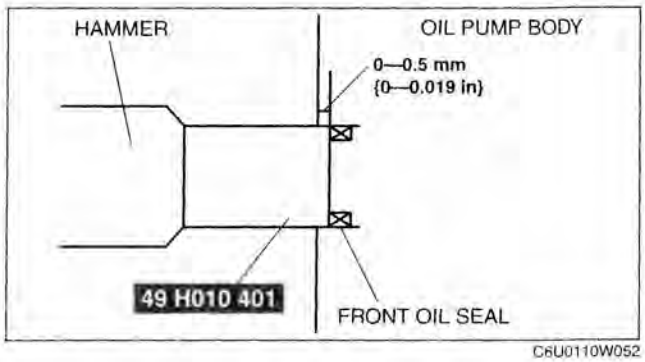
AME2220W002

Front Oil Seal Installation Note

1. Apply clean engine oil to the oil seal lip.
2. Push the oil seal slightly in by hand.
3. Tap the oil seal in evenly using the **SST** and a hammer.



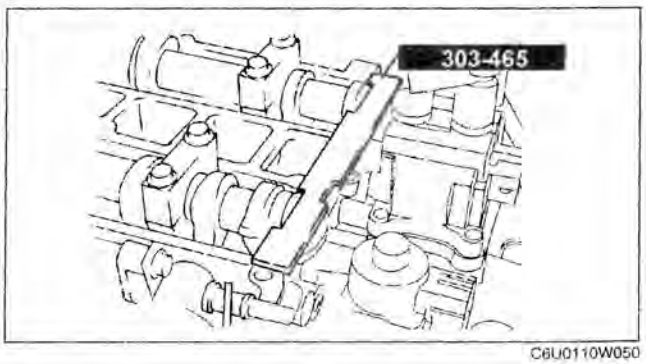
AME2215W009



C6U0110W052

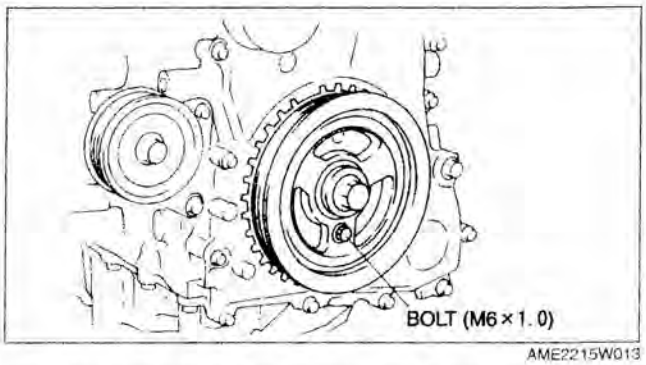
Crankshaft Pulley Lock Bolt Installation Note

1. Install the **SST** on the camshaft as shown in the figure.



C6U0110W050

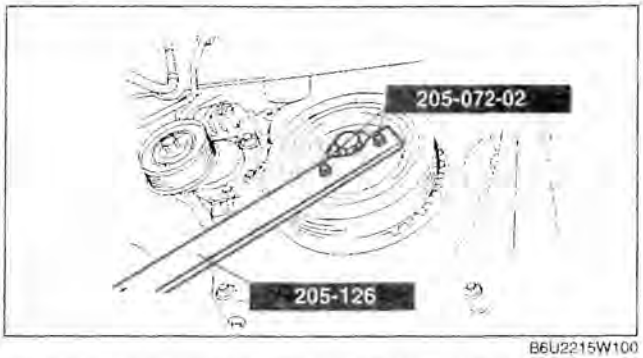
2. Install the **M6 x 1.0** bolt by hand.



AME2215W013

3. Rotate the crankshaft clockwise until the crankshaft is in the No.1 cylinder TDC position (until the balance weight is contacting to the **SST**).

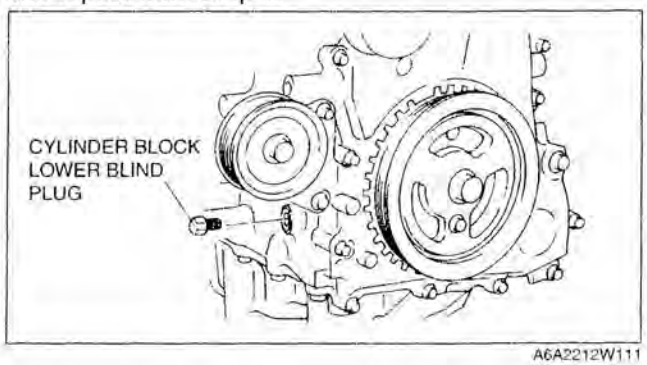
4. Hold the crankshaft pulley using the **SSTs**.



B6U2215W100

5. Tighten the crankshaft pulley lock bolt in the order shown following two steps using the **SST (49 D032 316)**.
   (1) Tighten to **96—104 N·m {9.8—10.6 kgf·m, 70.9—76.7 ft·lbf}**
   (2) Tighten **87°▽93°**
6. Remove the **M6 x 1.0** bolt.
7. Remove the **SST** from the camshaft.
8. Remove the **SST** from the cylinder block lower blind plug.
9. Rotate the crankshaft two times clockwise until the crankshaft is in the TDC position, reinstall the **SSTs** to the camshaft and cylinder block, and inspect the valve timing.
   - If not aligned, loosen the crankshaft pulley lock bolt and repeat from Step 1.
10. Install the cylinder block lower blind plug.

Tightening torque
18—22 N·m {1.9—2.2 kgf·m, 13.3—16.2 ft·lbf}



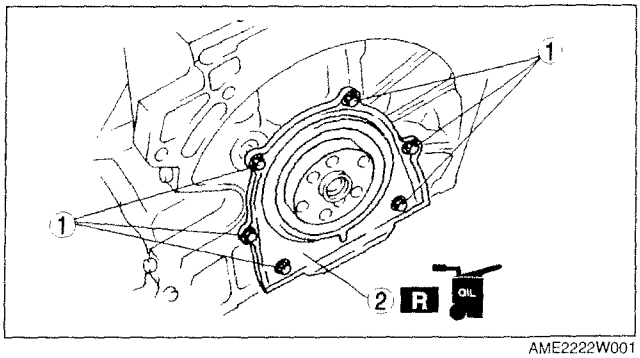
A6A2212W111

REAR OIL SEAL REPLACEMENT [L3]

C6U011011399W01

1. Remove the flywheel. (MTX) (See 05–10–12 CLUTCH UNIT REMOVAL/INSTALLATION.)
2. Remove the drive plate. (ATX) (See 05–17A–44 DRIVE PLATE REMOVAL/INSTALLATION [FN4A-EL].)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.

1	Bolt
2	Rear oil seal (See 01–10A–25 Rear Oil Seal Installation Note)

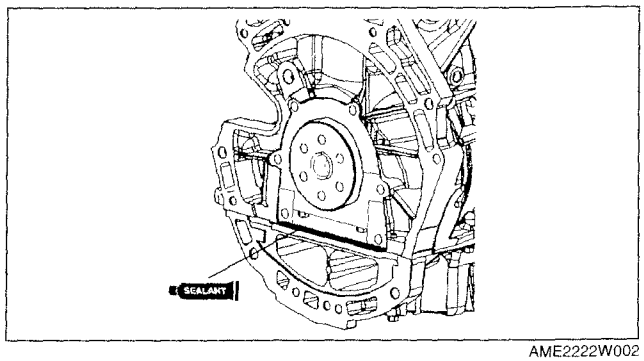


AME2222W001

Rear Oil Seal Installation Note

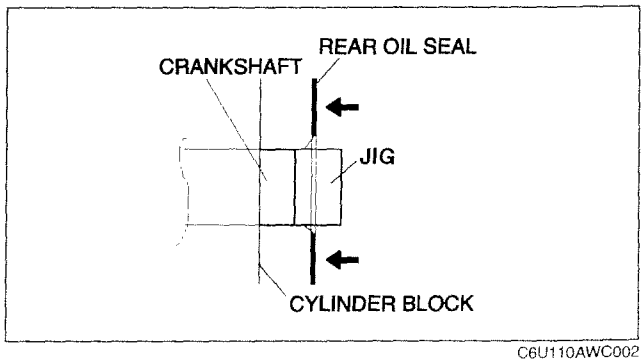
1. Apply silicone sealant to the mating faces as shown in the figure.

   Thickness
   4.0—6.0 mm {0.16—0.23 in}



AME2222W002

2. Apply clean engine oil to the new oil seal lip.
3. Install the rear oil seal using the jig as shown in the figure.



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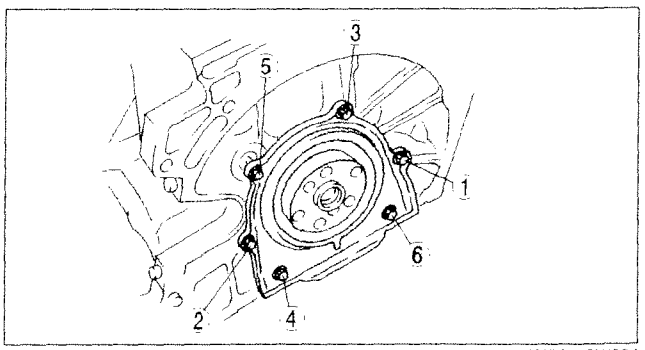
4. Tighten the rear oil seal bolts in the order as shown.

   Tightening torque
   8.0—11.5 N·m {81.6—117.2 kgf·cm, 70.9—101.7 in·lbf}



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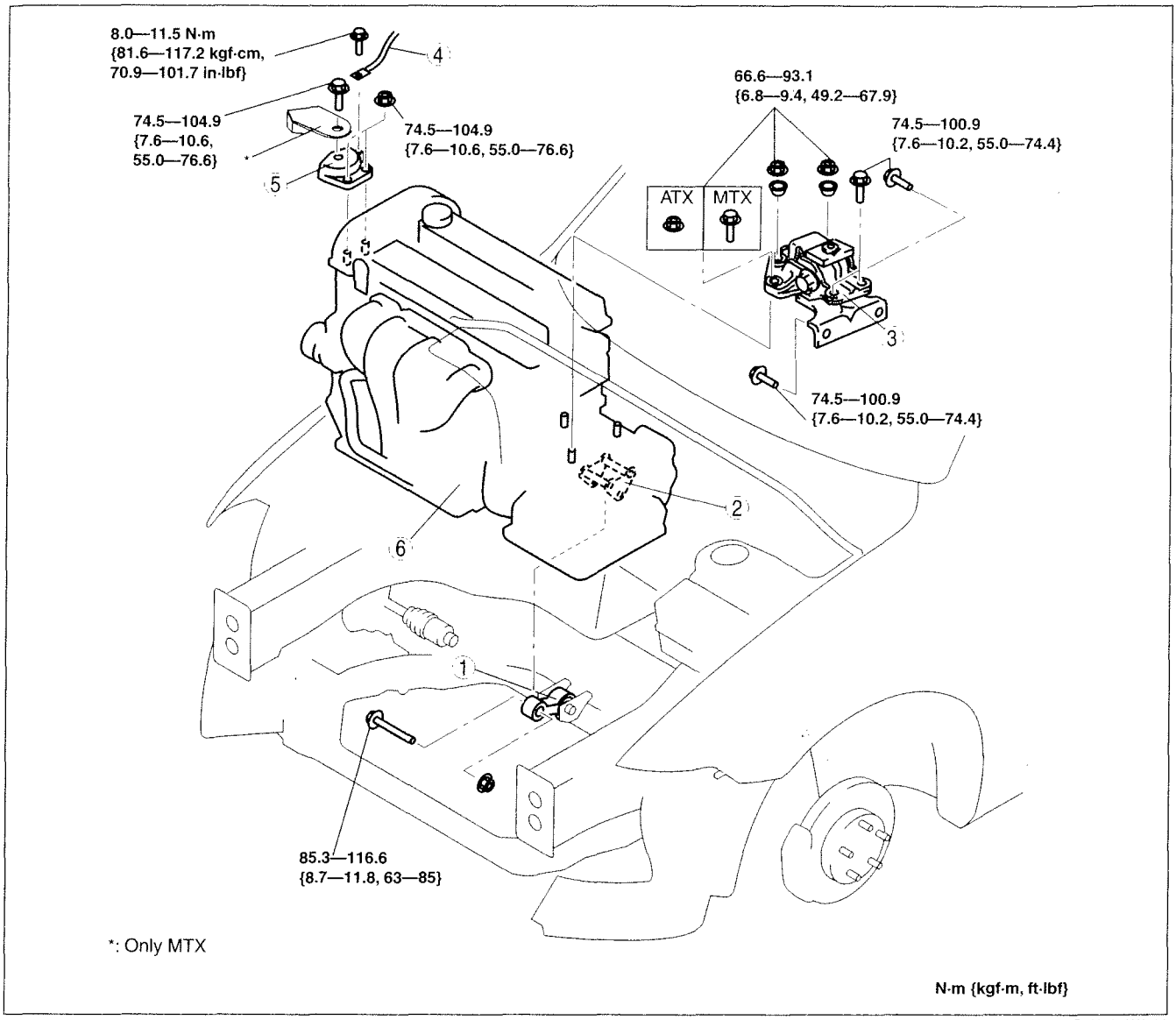
ENGINE REMOVAL/INSTALLATION [L3]

C6U011001001W01

Warning

- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01–14–5 Fuel Line Safety Procedure.)**

1. Remove the battery. (See 01–17–1 BATTERY REMOVAL/INSTALLATION.)
2. Remove the battery tray. (See 01–17–1 BATTERY REMOVAL/INSTALLATION.)
3. Remove the shroud panel. (See 09–10–11 SHROUD PANEL REMOVAL/INSTALLATION.)
4. Remove the radiator. (See 01–12–8 RADIATOR REMOVAL/INSTALLATION.)
5. Drain the transaxle oil.
6. Remove the plug hole plate.
   (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
7. Remove the P/S oil pump with the oil hose still connected and position the P/S oil pump so that it is out of the way. (See 06–12–24 POWER STEERING OIL PUMP REMOVAL/INSTALLATION [L3])
8. Remove the A/C compressor with the pipes still connected. Position the A/C compressor so that it is out of the way. Use wire or rope to secure.
9. Remove the joint shaft. (See 03–13–3 JOINT SHAFT REMOVAL/INSTALLATION [L3].)
10. Remove the front drive shaft (LH) from the transaxle. (See 03–13–12 DRIVE SHAFT REMOVAL/INSTALLATION [L3].)
11. Remove the air cleaner, intake air duct and bracket, and vacuum hose. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
12. Remove the ATF hose and selector cable. (ATX) (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].)
13. Remove the vacuum hose and heater hose.
14. Remove the release cylinder and control cable. (MTX) (See 05–15B–5 MANUAL TRANSAXLE REMOVAL/INSTALLATION [A65M-R].)
15. Remove the fuel hose. (See 01–14–14 Plastic Fuel Hose Removal Note.) (See 01–14–16 Plastic Fuel Hose Installation Note.)
16. Disconnect the wiring harness from the engine side.
17. Remove the front pipe. (See 01–15A–1 EXHAUST SYSTEM REMOVAL/INSTALLATION [L3].)
18. Remove in the order indicated in the table.
19. Install in the reverse order of removal.
20. Start the engine and:
    - Inspect for the engine oil, engine coolant, transaxle oil and fuel leakage.
    - Verify the ignition timing, idle speed and idle mixture. (See 01–10A–31 Ignition Timing Inspection.) (See 01–10A–31 Idle Speed Inspection.) (See 01–10A–31 Idle Mixture Inspection.)
21. Perform a road test.



B6U2213W100

1	No.1 Engine mount rubber (See 01–10A–28 No.1 Engine Mount Rubber Removal Note) (See 01–10A–30 No.1 Engine Mount Rubber Installation Note)
2	No.1 Engine mount bracket (See 01–10A–30 No.1 Engine Mount Bracket Installation Note)

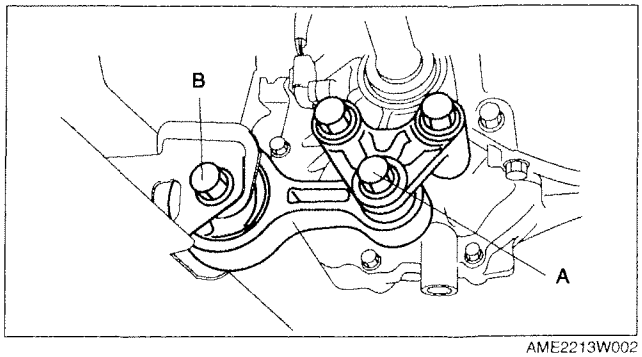
3	No.4 Engine mount bracket and No.4 Engine mount rubber (See 01–10A–28 No.4 Engine Mount Bracket and No.4 Engine Mount Rubber Removal Note) (See 01–10A–29 No.4 Engine Mount Bracket and No.4 Engine Mount Rubber Installation Note)
4	Engine ground
5	No.3 Engine joint bracket (See 01–10A–29 No.3 Engine Joint Bracket Installation Note)
6	Engine, transaxle

No.1 Engine Mount Rubber Removal Note

1. Remove through bolt A on the No.1 engine mount bracket side.
2. Loosen through bolt B on the crossmember side until approximately three pitches are showing.

Note

- Do not remove the No.1 engine mount rubber from the vehicle.



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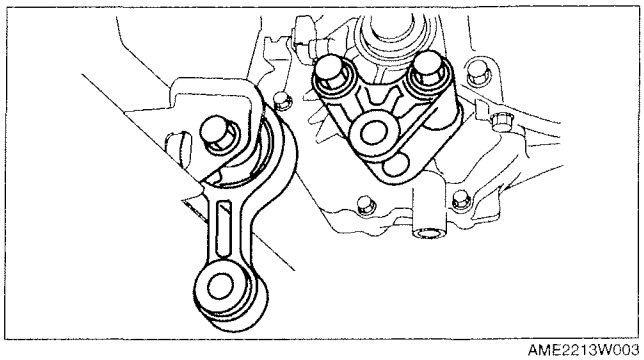

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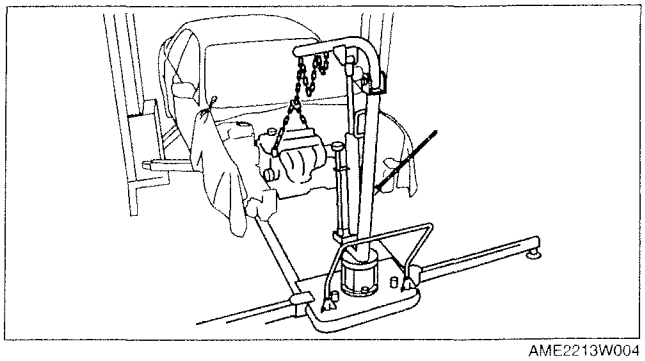
No.4 Engine Mount Bracket and No.4 Engine Mount Rubber Removal Note

1. Secure the engine and the transaxle using a hoist.



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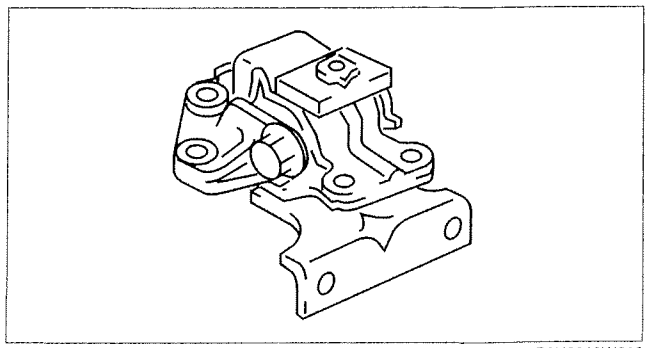
2. Remove the No.4 engine mount bracket and engine mount rubber together as a unit.



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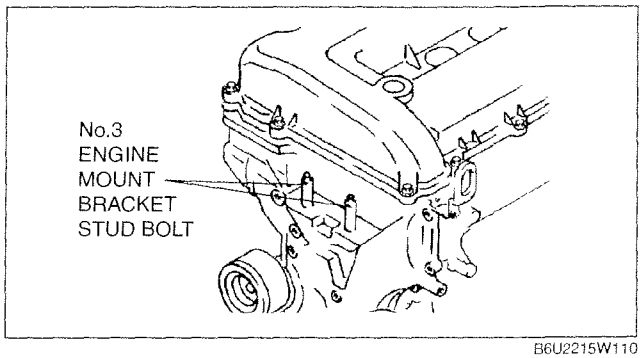
No.3 Engine Joint Bracket Installation Note

1. Tighten the No.3 engine mount bracket stud bolt.

   Tightening torque
   7.0—13 N·m {71.4—132.5 kgf·cm, 62.0—115.0 in·lbf}



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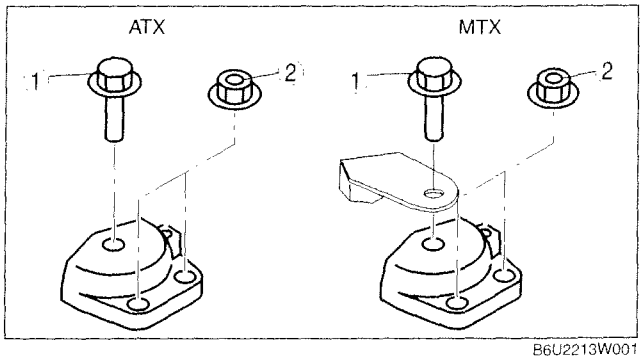
2. Tighten the No.3 engine joint bracket bolt and nut in the order as shown.



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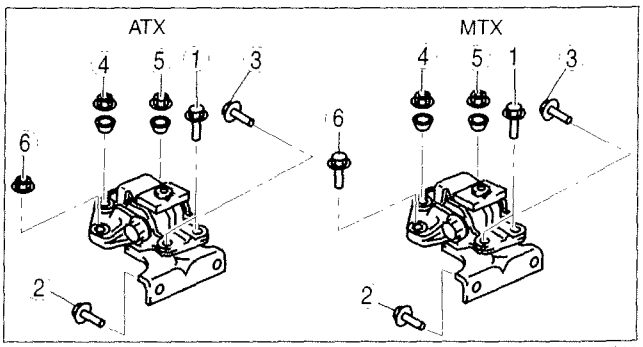
Tightening torque
74.5—104.9 N·m {7.6—10.6 kgf·m, 55.0—76.6 ft·lbf}

No.4 Engine Mount Bracket and No.4 Engine Mount Rubber Installation Note

1. Tighten the No.4 engine mount bracket and No.4 engine mount rubber bolt and nut in the order as shown.

Bolt and nut No.	Tightening torque (N·m {kgf·m, ft·lbf})
1, 2, 3	58.8—80.4 {6.0—8.1, 43.3—58.5}
4, 5, 6	66.6—93.1 {6.80—9.49, 49.2—68.6}



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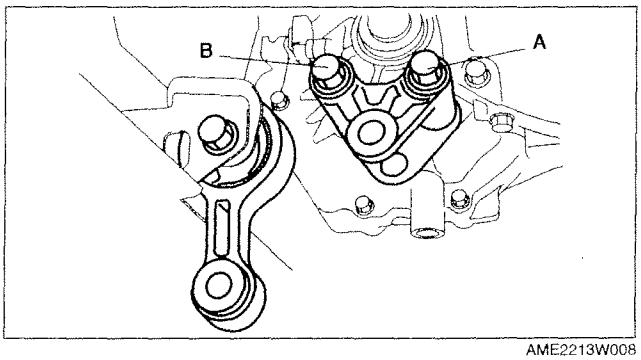
No.1 Engine Mount Bracket Installation Note

1. Tighten No.1 engine mount bracket bolt A.

   Tightening torque
   93.1—116.6 N·m {9.5—11.8 kgf·m, 68.7—85.9 ft·lbf}

2. Tighten No.1 engine mount bracket bolt B.

   Tightening torque
   93.1—116.6 N·m {9.5—11.8 kgf·m, 68.7—85.9 ft·lbf}



AME2213W008

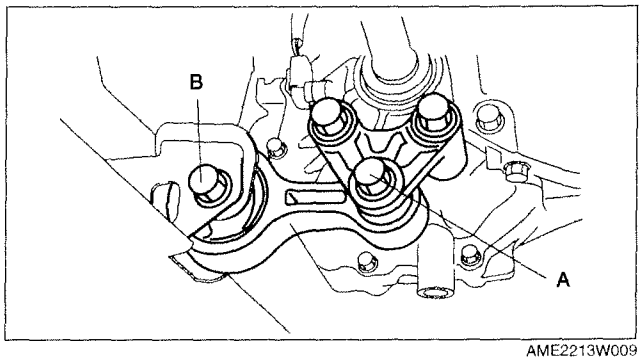
No.1 Engine Mount Rubber Installation Note

1. Tighten through bolt A on the No.1 engine mount bracket.

   Tightening torque
   85.3—116.6 N·m {8.7—11.8 kgf·m, 63—85 ft·lbf}

2. Tighten through bolt B on the crossmember side.

   Tightening torque
   93.1—116.6 N·m {9.5—11.8 kgf·m, 68.7—85.9 ft·lbf}



AME2213W009

ENGINE DISASSEMBLY/ASSEMBLY [L3]

C6U011001001W02

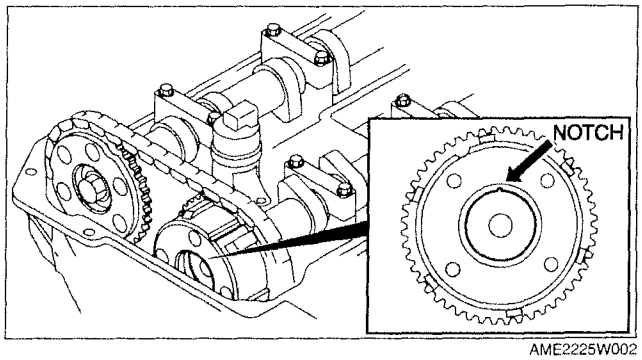
1. Disconnect the engine and automatic transaxle. (ATX) (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].)
2. Disconnect the engine and manual transaxle. (MTX) (See 05–15B–5 MANUAL TRANSAXLE REMOVAL/INSTALLATION [A65M-R].)
3. Remove the intake-air system. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
4. Remove the exhaust system. (See 01–15A–1 EXHAUST SYSTEM REMOVAL/INSTALLATION [L3].)
5. Remove the generator. (See 01–17–3 GENERATOR REMOVAL/INSTALLATION.)
6. Remove the ignition coils. (See 01–18–1 IGNITION COIL REMOVAL/INSTALLATION.)
7. Remove the crankshaft position (CKP) sensor. (See 01–40A–42 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [L3].)
8. Assemble in the reverse order of disassembly.

VARIABLE VALVE TIMING ACTUATOR INSPECTION [L3]

C6U011000142W01

Caution
- **The variable valve timing actuator cannot be disassembled because it is a precision unit.**

1. Disconnect the negative battery cable.
2. Remove the plug hole plate. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
3. Remove the high-tension lead. (See 01–18–4 HIGH-TENSION LEAD (L3) REMOVAL/INSTALLATION.)
4. Remove the oil control valve (OCV) connector.
5. Remove the ventilation hose.
6. Remove the cylinder head cover.
7. Confirm that the groove on the rotor and the notch on the cover of the variable valve timing actuator are aligned and fitted.
   - If the groove and the notch are not aligned, turn the crankshaft clockwise two rotations. Verify that the groove and the notch are aligned.
   - If the groove and notch are still not aligned, replace the variable valve timing actuator.
   - If, when turning the crankshaft, there is a hitting noise from the variable valve timing actuator each time the cam passes the fully lifted position, it means that the actuator is not secured. Replace the actuator.



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8. Install the cylinder head cover. (See 01–10A–18 Cylinder Head Cover Installation Note.)
9. Install the ventilation hose.
10. Install the oil control valve (OCV) connector.
11. Install the high-tension lead. (See 01–18–4 HIGH-TENSION LEAD (L3) REMOVAL/INSTALLATION.)
12. Install the plug hole plate. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)

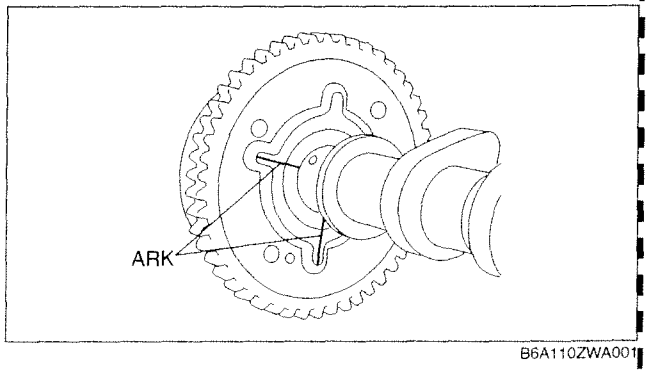
VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [L3]

C6U011000142W02

Caution
- **The variable valve timing actuator cannot be disassembled because it is a precision unit.**

Note
- Intake camshaft sprocket is integrated with the variable valve timing actuator and cannot be disassembled.

1. Follow the valve clearance adjustment procedure from 1 to 20 and remove the intake camshaft and variable valve timing actuator as a single unit.
   (See 01–10A–7 VALVE CLEARANCE ADJUSTMENT [L3].)
2. Remove the variable valve timing actuator.
   (1) Mark the camshaft and variable valve timing actuator as shown in the figure to make sure they are installed in their original position.
   (2) Secure the camshaft in a vise.
   (3) Loosen the variable valve timing actuator tightening bolt.
3. Install the variable valve timing actuator.
   (1) Secure the camshaft in a vise.
   (2) Align the marks of the camshaft and variable valve timing actuator.



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Caution
- **When the variable valve timing actuator is replaced with a new one, mark it in the same location as the old one.**

   (3) Tighten the variable valve timing actuator tightening bolt.

Tightening torque
69—75N·m {7.1—7.6 kgf·m, 50.9—55.3 ft·lbf}

4. Follow the valve clearance adjustment procedure from 24 to 48 and install the intake camshaft and variable valve timing actuator.(See 01–10A–7 VALVE CLEARANCE ADJUSTMENT [L3].)

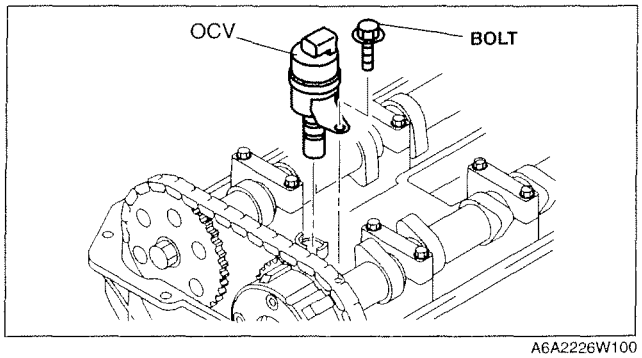
OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [L3]

C6U011014420W01

1. Disconnect the negative battery cable.
2. Remove the plug hole plate. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
3. Remove the high-tension lead. (See 01–18–4 HIGH-TENSION LEAD (L3) REMOVAL/INSTALLATION.)
4. Remove the OCV connector.
5. Remove the ventilation hose.
6. Remove the cylinder head cover.
7. Remove the OCV.
8. Install the OCV.

   Tightening torque
   8.0—11.5 N·m {81.6—117.2 kgf·cm, 70.9—101.7 in·lbf}

9. Install the cylinder head cover. (See 01–10A–18 Cylinder Head Cover Installation Note.)
10. Install the ventilation hose.
11. Install the OCV connector.
12. Install the high-tension lead. (See 01–18–4 HIGH-TENSION LEAD (L3) REMOVAL/INSTALLATION.)
13. Install the plug hole plate. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)



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OIL CONTROL VALVE (OCV) INSPECTION [L3]

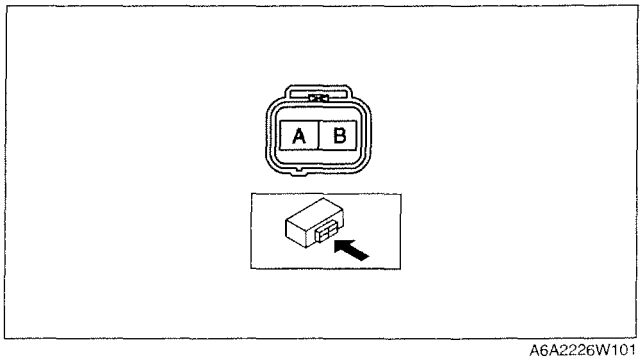
C6U011014420W02

Coil Resistance Inspection

1. Disconnect the negative battery cable.
2. Remove the plug hole plate. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
3. Disconnect the OCV connector.
4. Measure the resistance between terminals A and B using an ohmmeter.
   - If not as specified, replace the OCV.

   Specification
   6.9—7.9 ohms

5. Connect the OCV connector.
6. Install the plug hole plate. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)



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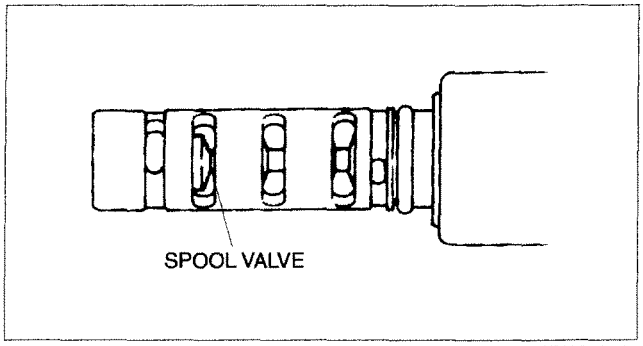
Spool Valve Operation Inspection

1. Disconnect the negative battery cable.
2. Remove the plug hole plate. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
3. Remove the OCV. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
4. Verify that the spool valve in the OCV is in the maximum valve timing retard position as indicated in the figure.
   - If not as specified, replace the OCV.
5. Verify that the battery is fully charged.
   - If not as specified, recharge the battery.



AME2226W003

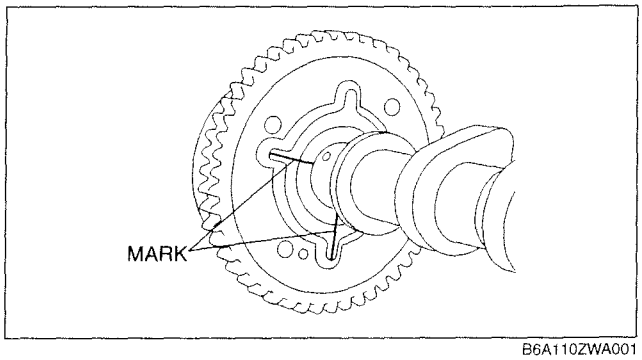
VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [L3]

C6U011000142W02

Caution
- **The variable valve timing actuator cannot be disassembled because it is a precision unit.**

Note
- Intake camshaft sprocket is integrated with the variable valve timing actuator and cannot be disassembled.

1. Follow the valve clearance adjustment procedure from 1 to 20 and remove the intake camshaft and variable valve timing actuator as a single unit.
   (See 01–10A–7 VALVE CLEARANCE ADJUSTMENT [L3].)
2. Remove the variable valve timing actuator.
   (1) Mark the camshaft and variable valve timing actuator as shown in the figure to make sure they are installed in their original position.
   (2) Secure the camshaft in a vise.
   (3) Loosen the variable valve timing actuator tightening bolt.



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3. Install the variable valve timing actuator.
   (1) Secure the camshaft in a vise.
   (2) Align the marks of the camshaft and variable valve timing actuator.

Caution
- **When the variable valve timing actuator is replaced with a new one, mark it in the same location as the old one.**

   (3) Tighten the variable valve timing actuator tightening bolt.

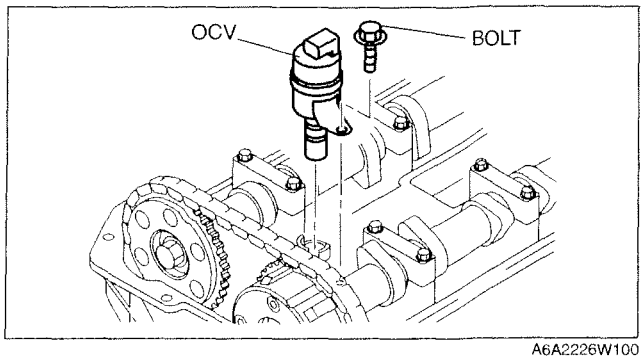
Tightening torque
69—75N·m {7.1—7.6 kgf·m, 50.9—55.3 ft·lbf}

4. Follow the valve clearance adjustment procedure from 24 to 48 and install the intake camshaft and variable valve timing actuator. (See 01–10A–7 VALVE CLEARANCE ADJUSTMENT [L3].)

OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [L3]

C6U011014420W01

1. Disconnect the negative battery cable.
2. Remove the plug hole plate. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
3. Remove the high-tension lead. (See 01–18–4 HIGH-TENSION LEAD (L3) REMOVAL/INSTALLATION.)
4. Remove the OCV connector.
5. Remove the ventilation hose.
6. Remove the cylinder head cover.
7. Remove the OCV.



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8. Install the OCV.

Tightening torque
8.0—11.5 N·m {81.6—117.2 kgf·cm, 70.9—101.7 in·lbf}

9. Install the cylinder head cover. (See 01–10A–18 Cylinder Head Cover Installation Note.)
10. Install the ventilation hose.
11. Install the OCV connector.
12. Install the high-tension lead. (See 01–18–4 HIGH-TENSION LEAD (L3) REMOVAL/INSTALLATION.)
13. Install the plug hole plate. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)

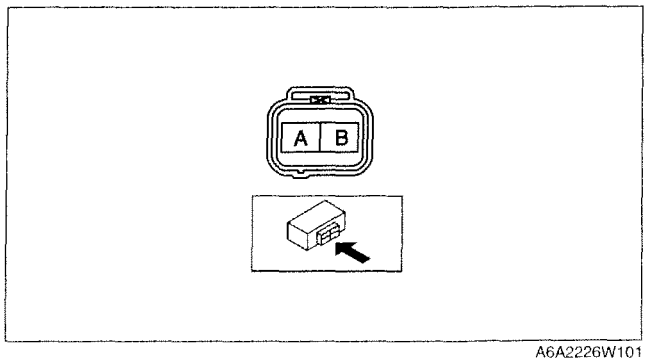
OIL CONTROL VALVE (OCV) INSPECTION [L3]

C6U011014420W02

Coil Resistance Inspection

1. Disconnect the negative battery cable.
2. Remove the plug hole plate. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
3. Disconnect the OCV connector.
4. Measure the resistance between terminals A and B using an ohmmeter.
   - If not as specified, replace the OCV.

Specification
6.9—7.9 ohms



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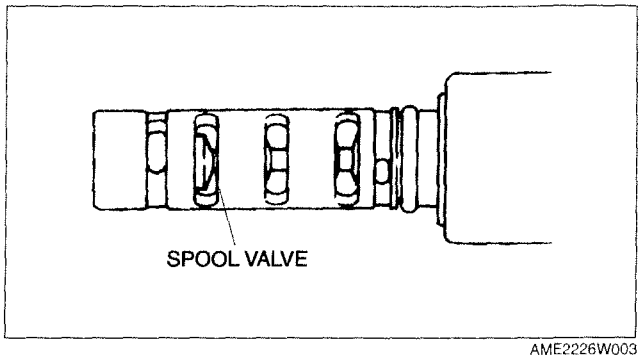
5. Connect the OCV connector.
6. Install the plug hole plate. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)

Spool Valve Operation Inspection

1. Disconnect the negative battery cable.
2. Remove the plug hole plate. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
3. Remove the OCV. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
4. Verify that the spool valve in the OCV is in the maximum valve timing retard position as indicated in the figure.
   - If not as specified, replace the OCV.



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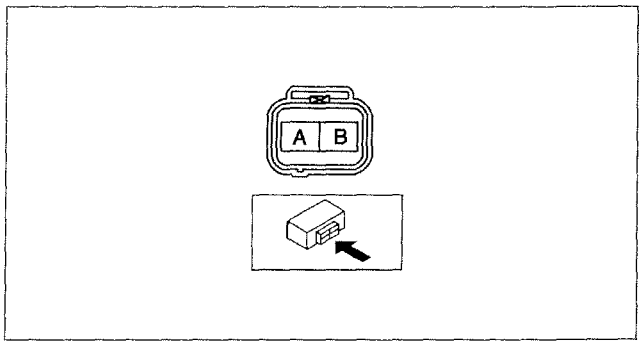
5. Verify that the battery is fully charged.
   - If not as specified, recharge the battery.
6. Apply battery positive voltage between the OCV terminals and verify that the spool valve operates and moves to the maximum valve timing advance position.
   - If not as specified, replace the OCV.

   Note
   - When applying battery positive voltage between the OCV terminals, the connection can be either of the following:
     — Positive battery cable to terminal A, negative battery cable to terminal B
     — Positive battery cable to terminal B, negative battery cable to terminal A



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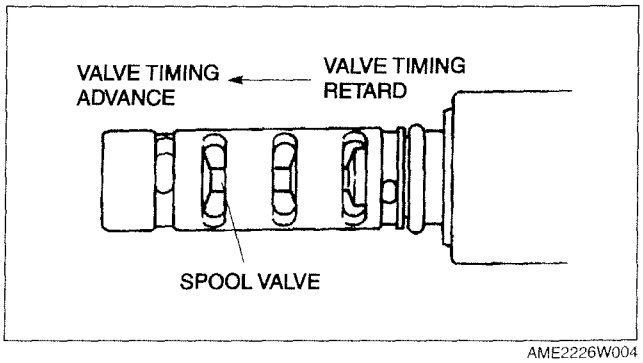

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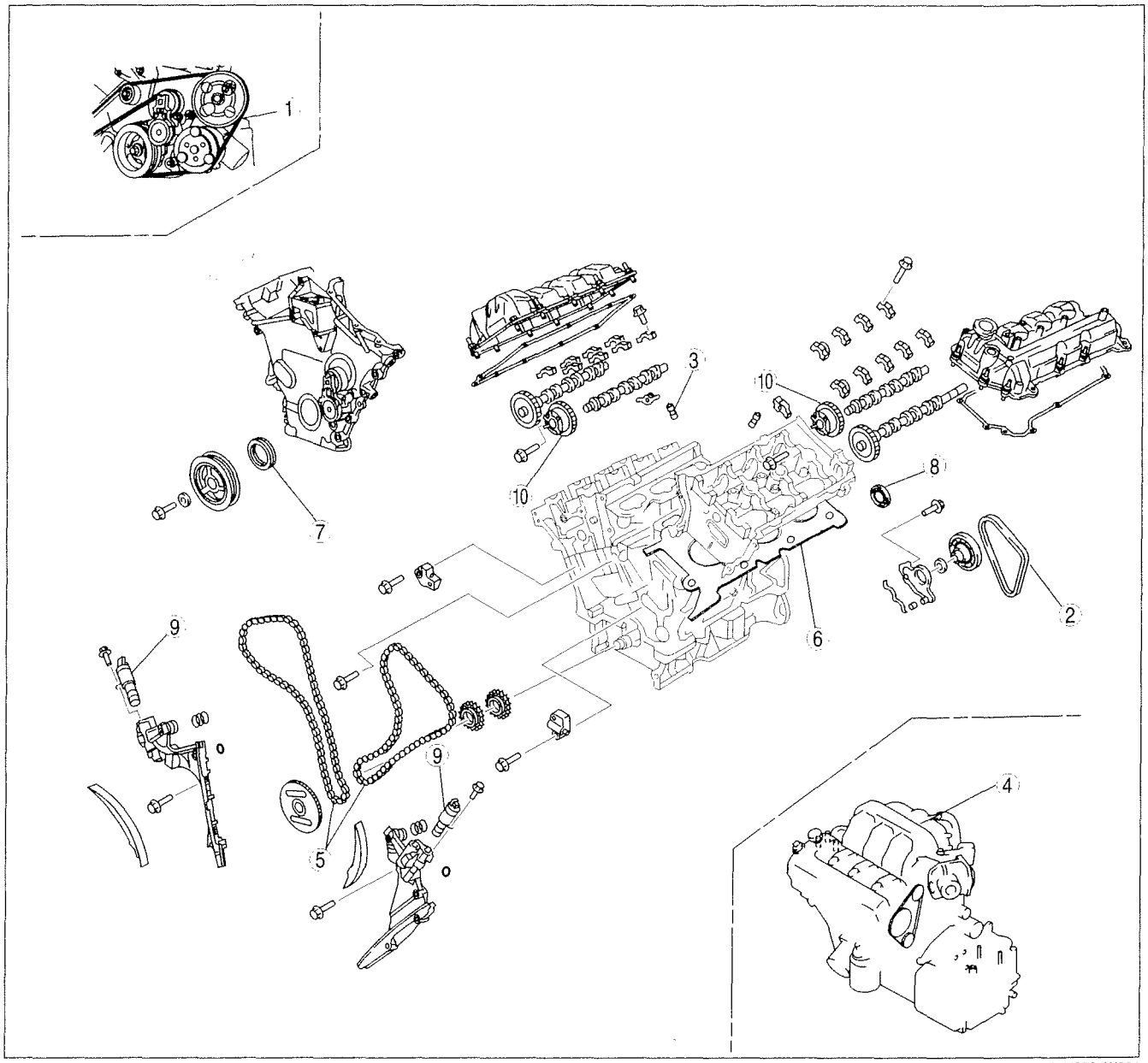
7. Stop applying battery positive voltage and verify that the spool valve returns to the maximum valve timing retard position.
   - If not as specified, replace the OCV.
8. Install the OCV. (See 01–10A–34 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [L3].)
9. Install the plug hole plate. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)

01–10B MECHANICAL [AJ]

ENGINE LOCATION INDEX [AJ]

C6U011001002W02



B6U2224W201

1	Front drive belt (See 01–10B–3 DRIVE BELT INSPECTION [AJ].) (See 01–10B–5 DRIVE BELT REPLACEMENT [AJ].) (See 01–10B–6 DRIVE BELT AUTO TENSIONER INSPECTION [AJ].)
2	Water pump drive belt (See 01–10B–3 DRIVE BELT INSPECTION [AJ].) (See 01–10B–5 DRIVE BELT REPLACEMENT [AJ].) (See 01–10B–6 DRIVE BELT AUTO TENSIONER INSPECTION [AJ].)
3	Hydraulic lash adjuster (HLA) (See 01–10B–33 HYDRAULIC LASH ADJUSTER (HLA) REMOVAL/INSTALLATION [AJ].)

4	Engine (See 01–10B–7 COMPRESSION INSPECTION [AJ].) (See 01–10B–40 ENGINE REMOVAL/INSTALLATION [AJ].) (See 01–10B–44 ENGINE DISASSEMBLY/ASSEMBLY [AJ].)
5	Timing chain (See 01–10B–8 TIMING CHAIN REMOVAL/INSTALLATION [AJ].)
6	Cylinder head gasket (See 01–10B–28 CYLINDER HEAD GASKET REPLACEMENT [AJ].)
7	Front oil seal (See 01–10B–36 FRONT OIL SEAL REPLACEMENT [AJ].)
8	Rear oil seal (See 01–10B–39 REAR OIL SEAL REPLACEMENT [AJ].)

9	Oil control valve (OCV) (See 01–10B–47 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [AJ].) (See 01–10B–48 OIL CONTROL VALVE (OCV) INSPECTION [AJ].)
10	Variable valve timing actuator (See 01–10B–46 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [AJ].) (See 01–10B–45 VARIABLE VALVE TIMING ACTUATOR INSPECTION [AJ].)

DRIVE BELT INSPECTION [AJ]

C6U011015800W03

Symptom Chart

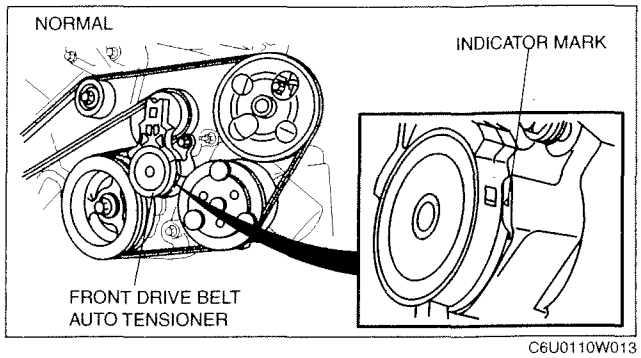
Condition	Possible Source	Action
• Drive belt cracking	• Front and water pump drive belt.	• Replace drive belt. (See 01–10B–5 DRIVE BELT REPLACEMENT [AJ])
• Drive belt chunking	• Front and water pump drive belt.	• Replace drive belt. (See 01–10B–5 DRIVE BELT REPLACEMENT [AJ])
• Drive belt noise or squeal	• Front and water pump drive belt. • Pulley(s).	• Determine what area of pulley(s) noise is coming from, then check that area with straight edge and see if each pulley is out of position in fore or aft direction, or at an angle to the straight edge.
• Drive belt does not hold tension (See 01–10B–4 Front Drive Belt)	• Front and water pump drive belt cracking or damaged. • Front and water pump drive belt auto tensioners worn or damaged.	• Inspect drive belt for cracking parallel with and through to the backing. Replace drive belt if necessary. • Check drive belt tensioner for damage and correct operation. Replace drive belt auto tensioner if necessary.
• Drive belt squeal or chirp	• Incorrect front and water pump drive belt installed. • Lubricant or other contamination on front and water pump drive belt. • Each pulley not aligned properly, damaged or not rotating freely.	• Check drive belt for correct part application. • Check drive belt for oil, coolant, power steering fluid, brake fluid or other contamination. Remove drive belt and wash with detergent and water. If drive belt cannot be cleaned or is damaged (softened) by contamination, replace drive belt. • Check each pulley for proper alignment, pulleys and related parts for proper freedom of rotation and damage. Repair pulleys and related parts if necessary.

Note

- Front and water pump drive belt deflection/tension inspection is not necessary because of the use of the drive belt auto tensioner.

Front Drive Belt

1. Verify that the front drive belt auto tensioner indicator mark does not exceeds the limit.
   - If it exceeds the limit, replace the front drive belt.(See01–10B–5 Front Drive Belt.)



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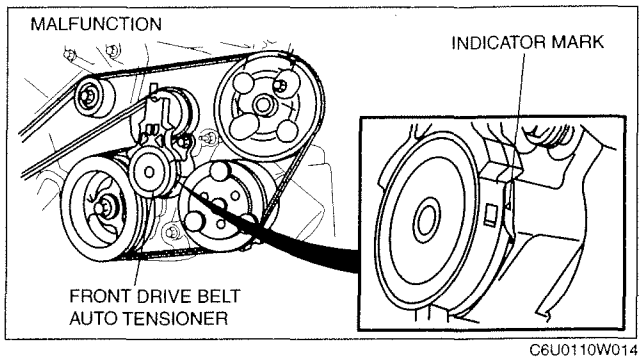
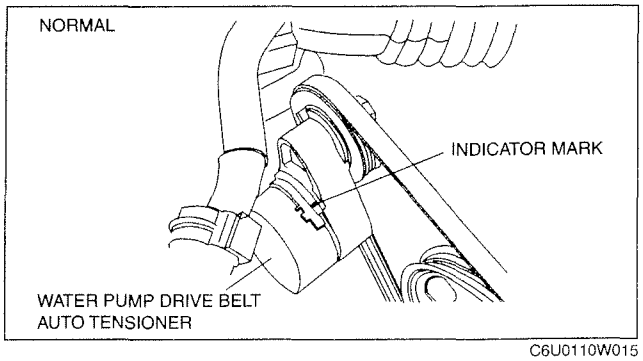


C6U0110W014

Water Pump Drive Belt

1. Verify that the water pump drive belt auto tensioner indicator mark does not exceeds the limit.
   - If it exceeds the limit, replace the water pump drive belt.(See01–10B–5 Water Pump Drive Belt.)



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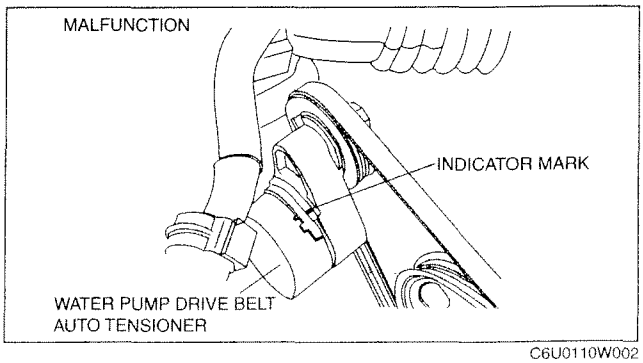


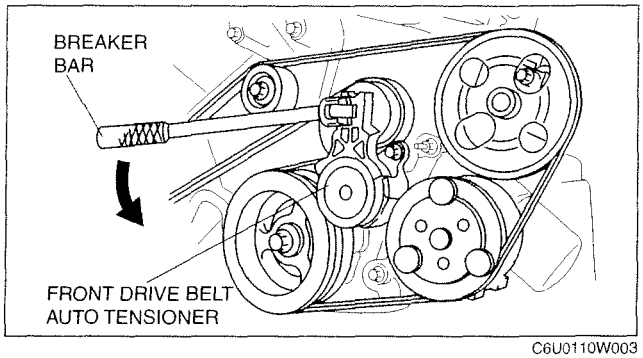
C6U0110W002

DRIVE BELT REPLACEMENT [AJ]

C6U011015800W04

Front Drive Belt

1. Remove the under cover and splash shield (RH).
2. Set a breaker bar on the center of the front drive belt auto tensioner pulley as shown.

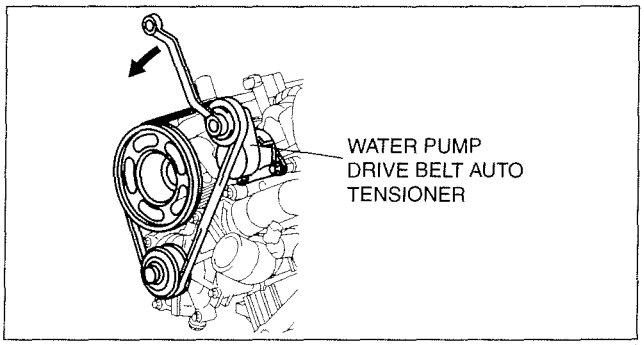


C6U0110W003

3. Using the breaker bar, turn the center of the front drive belt auto tensioner pulley clockwise to release tension to the drive belt.
4. Remove the front drive belt.
5. Reinstall the front drive belt or install a new front drive belt.
6. Verify that the front drive belt auto tensioner indicator mark does not exceed the limit. (See 01–10B–4 Front Drive Belt.)
   - If it exceeds the limit, replace the front drive belt.
7. Install the splash shield (RH).

Water Pump Drive Belt

1. Remove the plug hole plate.
2. Rotate the water pump drive belt auto tensioner counterclockwise to release the drive belt tension and remove the water pump drive belt.



C6U0110W004

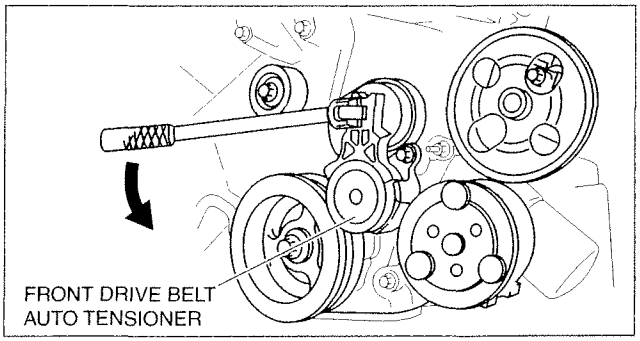
3. Reinstall the water pump drive belt or install a new water pump drive belt.

DRIVE BELT AUTO TENSIONER INSPECTION [AJ]

C6U011015980W02

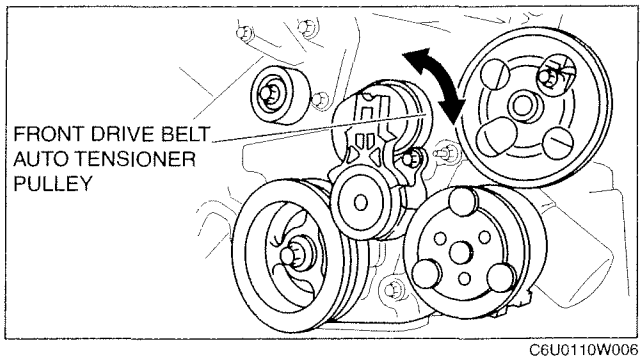
Front Drive Belt Auto Tensioner

1. Remove the front drive belt. (See 01–10B–5 Front Drive Belt.)
2. Verify that the front drive belt auto tensioner moves smoothly in the operational direction.
   - Replace the front drive belt auto tensioner if necessary.



C6U0110W005

3. Turn the front drive belt auto tensioner pulley and verify that it rotates smoothly.
   - Replace the front drive belt auto tensioner if necessary.

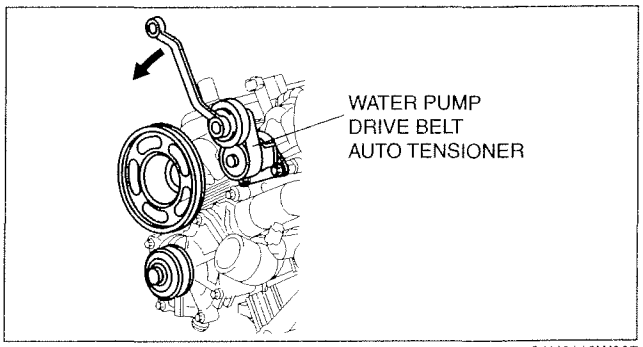


C6U0110W006

4. Install the front drive belt.

Water Pump Drive Belt Auto Tensioner

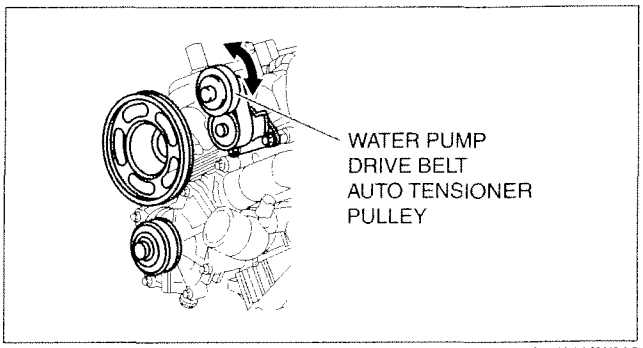
1. Remove the water pump drive belt. (See 01–10B–5 Water Pump Drive Belt.)
2. Verify that the water pump drive belt auto tensioner moves smoothly in the operational direction.
   - Replace the water pump drive belt auto tensioner if necessary.



C6U0110W007

3. Turn the water pump drive belt auto tensioner pulley and verify that it rotates smoothly.
   - Replace the water pump drive belt auto tensioner if necessary.

Tightening torque
8—12 N·m {82—122 kgf·cm, 71—106 in·lbf}



C6U0110W008

4. Install the water pump drive belt.

COMPRESSION INSPECTION [AJ]

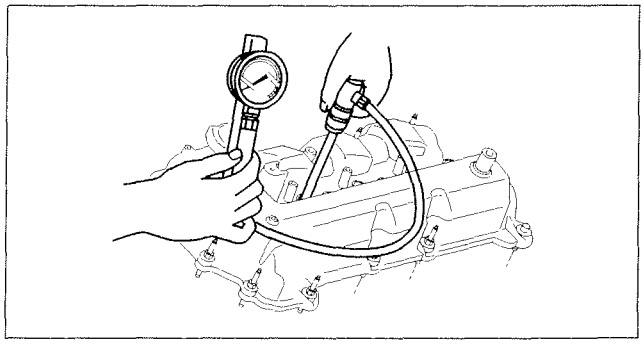
C6U011002000W02

Warning
- **Hot engines and engine oil can cause severe burns. Turn off the engine and wait until it and the engine have cooled.**

1. Verify that the battery is fully charged.
   - Recharge it if necessary. (See 01–17–2 BATTERY RECHARGING.)
2. Warm up the engine to the normal operating temperature.
3. Perform "Fuel Line Safety Procedure". Leave the fuel pump relay removed. (See 01–14–5 Fuel Line Safety Procedure.)

Warning
- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injures or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01–14–5 Fuel Line Safety Procedure.)**

4. Remove the ignition coils. (See 01–18–1 IGNITION COIL REMOVAL/INSTALLATION.)
5. Remove the spark plugs.
6. Install the compression gauge into the spark plug hole.



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7. Crank the engine a minimum of five compression strokes and record the highest reading. Note the approximate number of compression strokes required to obtain the highest reading.
8. Repeat the test on each cylinder, cranking the engine approximately the same number of compression strokes.
9. The indicated compression pressures are considered within specification if the lowest reading cylinder is within **75%** of the highest reading.
   - If the compression in one or more cylinders is low or the compression difference between cylinders exceeds the maximum, pour a small amount of clean engine oil into the cylinder and recheck the compression.
     — If the compression increases, the piston, the piston rings, or cylinder wall may be worn and overhaul is required.
     — If the compression stays low, a valve may be stuck or improperly seated and overhaul is required.
     — If two adjacent cylinders indicate low compression pressures and squirting oil on piston does not increase compression, the head gasket may be leaking between cylinders. Engine oil and/or coolant in the cylinders could result from this condition.
10. Remove the compression gauge.
11. Install the spark plugs.

Tightening torque
9—20 N·m {91—204 kgf·cm, 79—177 in·lbf}

12. Install the ignition coils. (See 01–18–1 IGNITION COIL REMOVAL/INSTALLATION.)
13. Install the fuel pump relay.

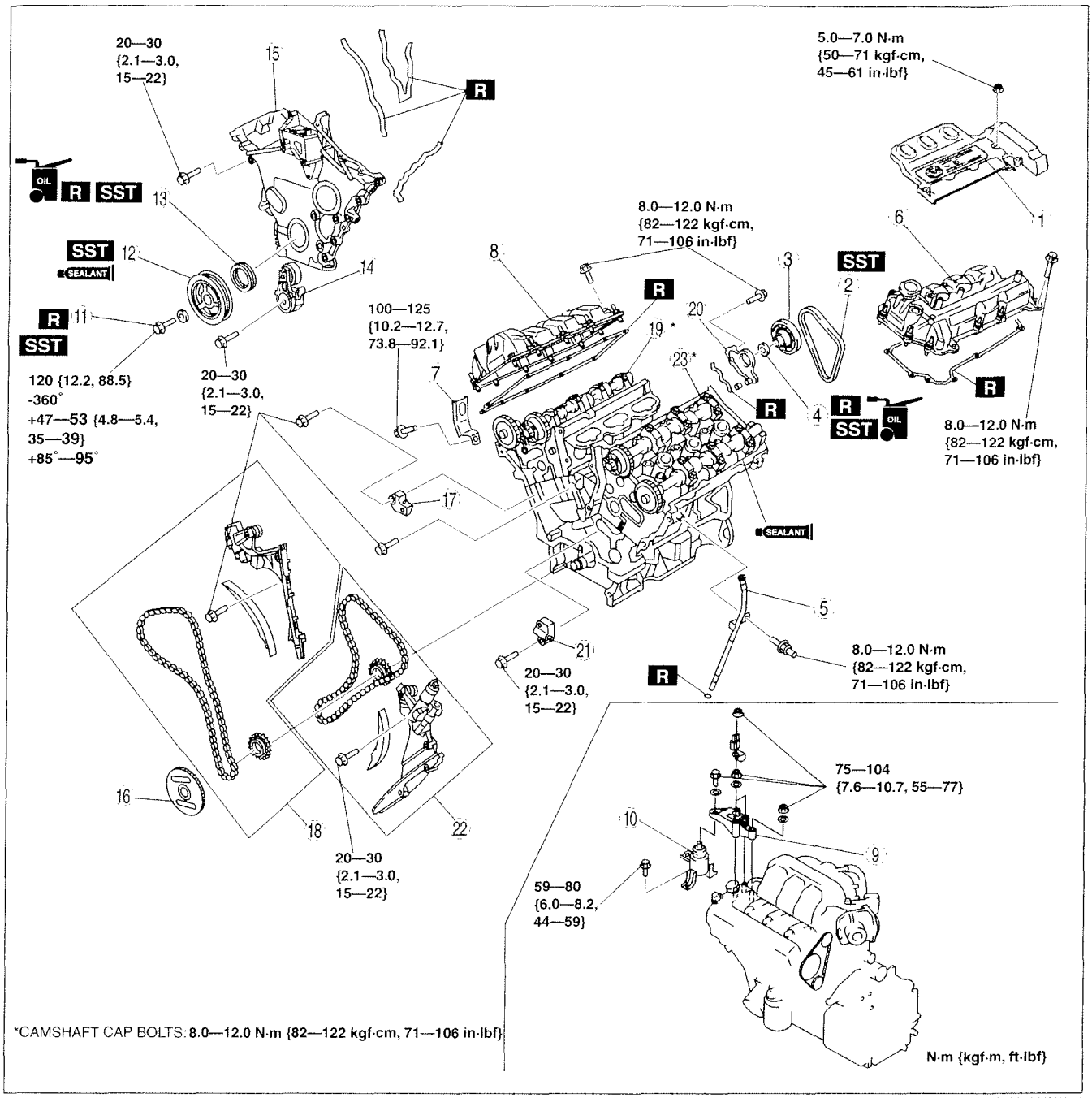
TIMING CHAIN REMOVAL/INSTALLATION [AJ]

C6U011012201W02

Warning

- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injures or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01–14–5 Fuel Line Safety Procedure.)**

1. Disconnect the negative battery cable.
2. Remove the dynamic chamber. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
3. Remove the ignition coils. (See 01–18–1 IGNITION COIL REMOVAL/INSTALLATION.)
4. Remove the front drive belt. (See 01–10B–5 Front Drive Belt.)
5. Remove the P/S oil pump and bracket with the P/S pipe connected, and fix the P/S oil pump using a rope to prevent it from falling. (See 06–12–25 POWER STEERING OIL PUMP REMOVAL/INSTALLATION [AJ].)
6. Remove the A/C compressor with the A/C pipe connected, and fix the A/C compressor using a rope to prevent it from falling.
7. Disconnect the generator, but do not remove it from the vehicle. After disconnection, fix the generator using a rope to prevent it from falling. (See 01–17–3 GENERATOR REMOVAL/INSTALLATION.)
8. Remove the drive shaft (RH). (See 03–13–14 DRIVE SHAFT REMOVAL/INSTALLATION [AJ].)
9. Remove the front crossmember. (See 02–13–18 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
10. Remove the TWC (LH). (See 01–15B–2 EXHAUST SYSTEM REMOVAL/INSTALLATION [AJ].)
11. Remove the oil pan. (See 01–11–8 OIL PAN REMOVAL/INSTALLATION.)
12. Remove in the order indicated in the table.
13. Install in the reverse order of removal.
14. Start the engine and:
    - Inspect for the engine oil, engine coolant, transaxle oil and fuel leakage.
    - Verify the ignition timing, idle speed and idle mixture. (See 01–10B–45 Ignition Timing Inspection.) (See 01–10B–45 Idle Speed Inspection.) (See 01–10B–45 Idle Mixture Inspection.)
15. Perform a road test.



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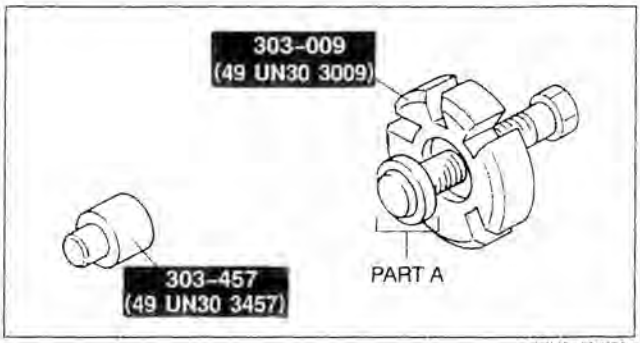
1	Plug hole plate
2	Water pump drive belt (See 01–10B–5 Water Pump Drive Belt.)
3	Water pump drive belt pulley (See 01–10B–11 Water Pump Drive Belt Pulley Removal Note.) (See 01–10B–27 Water Pump Drive Belt Pulley Installation Note.)
4	Camshaft oil seal (See 01–10B–11 Camshaft Oil Seal Removal Note.) (See 01–10B–27 Camshaft Oil Seal Installation Note.)
5	Oil level gauge pipe

6	Cylinder head cover (LH) (See 01–10B–11 Cylinder Head Cover (LH) Removal Note.) (See 01–10B–27 Cylinder Head Cover (LH) Installation Note.)
7	Engine hanger (RH) (See 01–10B–11 Engine Hanger Removal Note.) (See 01–10B–27 Engine Hanger Installation Note.)
8	Cylinder head cover (RH) (See 01–10B–12 Cylinder Head Cover (RH) Removal Note.) (See 01–10B–26 Cylinder Head Cover (RH) Installation Note.)

9	No.3 engine joint bracket (See 01–10B–12 No.3 Engine Joint Bracket Removal Note.) (See 01–10B–42 No.3 Engine Joint Bracket Installation Note.)
10	No.3 engine mount rubber
11	Crankshaft pulley lock bolt (See 01–10B–13 Crankshaft Pulley Lock Bolt Removal Note.) (See 01–10B–26 Crankshaft Pulley Lock Bolt Installation Note.)
12	Crankshaft pulley (See 01–10B–13 Crankshaft Pulley Removal Note.) (See 01–10B–25 Crankshaft Pulley Installation Note.)
13	Front oil seal (See 01–10B–13 Front Oil Seal Removal Note.) (See 01–10B–25 Front Oil Seal Installation Note.)
14	Front drive belt auto tensioner
15	Engine front cover (See 01–10B–13 Engine Front Cover Removal Note.) (See 01–10B–24 Engine Front Cover Installation Note.)
16	CKP sensor pulse wheel (See 01–10B–24 Crankshaft Position (CKP) Sensor Pulse Wheel Installation Note.)
17	Chain tensioner (RH) (See 01–10B–23 Chain Tensioner (RH) Installation Note.)
18	Timing chain component (RH) (See 01–10B–14 Timing Chain Component (RH) Removal Note.) (See 01–10B–21 Timing Chain Component (RH) Installation Note.)
19	Camshaft cap (RH) (See 01–10B–15 Camshaft Caps (RH) Removal Note.)
20	Camshaft oil seal housing
21	Chain tensioner (LH) (See 01–10B–20 Chain Tensioner (LH) Installation Note)
22	Timing chain component (LH) (See 01–10B–16 Timing Chain Component (LH) Removal Note.) (See 01–10B–18 Timing Chain Component (LH) Installation Note.)
23	Camshaft cap (LH) (See 01–10B–17 Camshaft Caps (LH) Removal Note.)

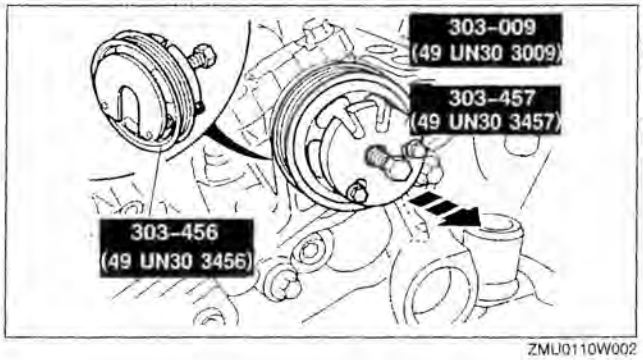
Water Pump Drive Belt Pulley Removal Note

1. Replace part A of the **SST** [303-009 (49 UN30 3009)] with the **SST** [303-457 (49 UN30 3457)].



ZMU0110W001

2. Remove the water pump pulley using the **SSTs**.



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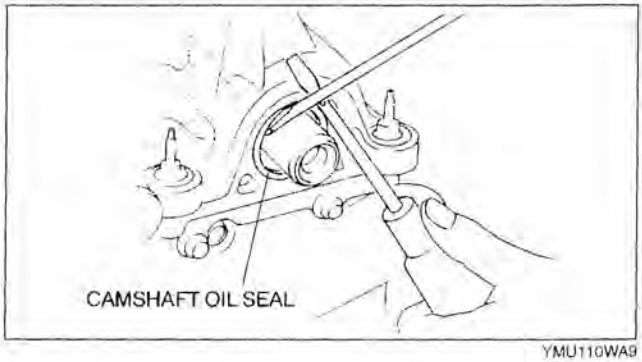
Camshaft Oil Seal Removal Note

1. Cut the oil seal lip using a razor knife.
2. Remove the oil seal using a screwdriver as shown.



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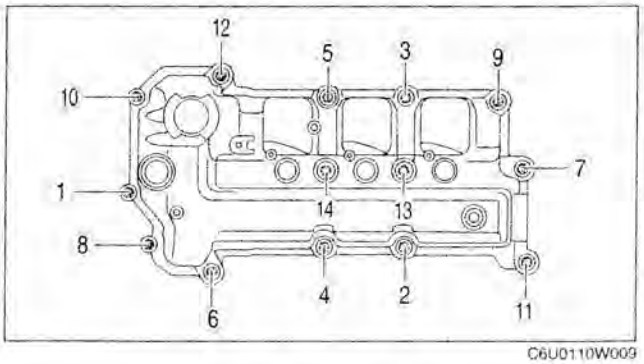
Cylinder Head Cover (LH) Removal Note

1. Remove the cylinder head cover bolts in the order shown.



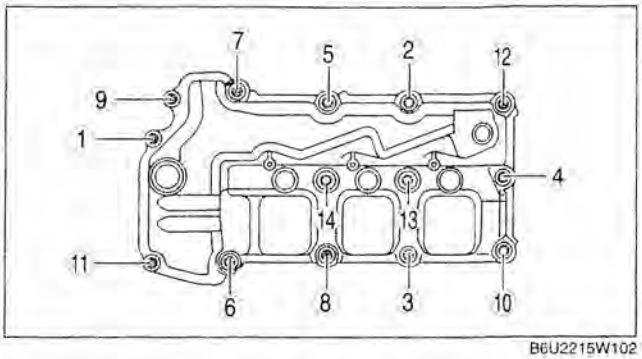
C6U0110W009

Engine Hanger Removal Note

1. Lift up the vehicle and loosen the engine hanger installation bolts from under the vehicle.

Cylinder Head Cover (RH) Removal Note

1. Remove the cylinder head cover bolts in the order shown.

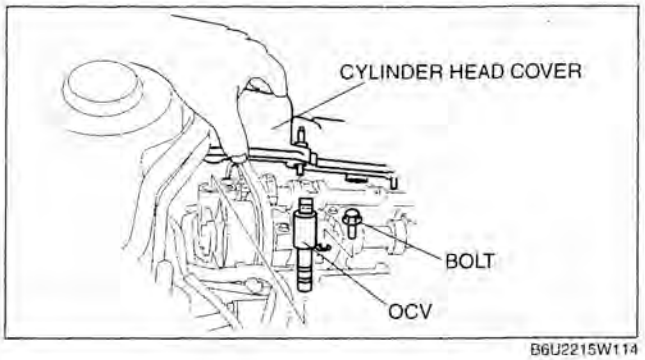


B6U2215W102

2. Remove the oil control valve (OCV) with cylinder head cover raised as shown in the figure.

Note

- Take care not to let the OCV tightening bolt slip into the timing chain cover when removing the OCV tightening bolt from engine front.



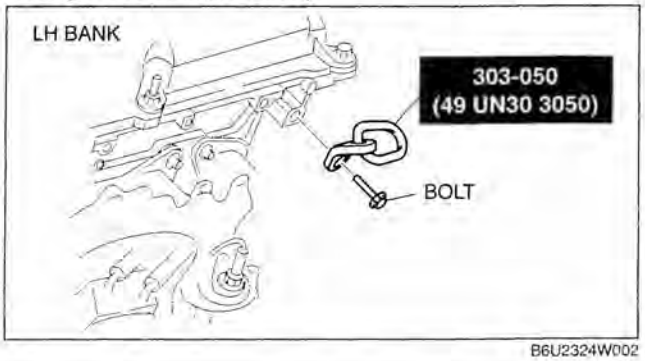
B6U2215W114

3. Remove the cylinder head cover.

No.3 Engine Joint Bracket Removal Note

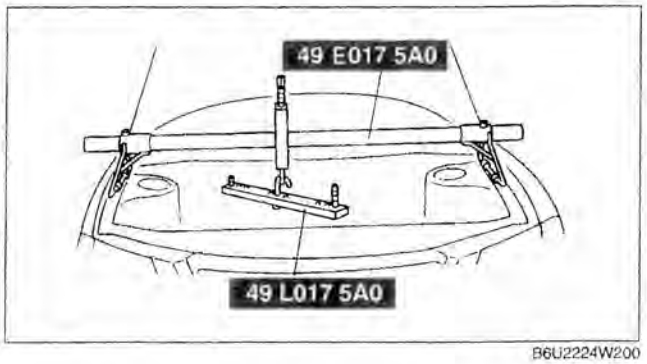
1. Install the engine hanger (RH). (See 01–10B–27 Engine Hanger Installation Note.)
2. Using the bolts **part number 99794 1025** or **M10×1.25, length 25 mm {0.984 in}** to Install the **SST** as shown (LH Bank).

Tightening torque
100—125 N·m {10.2—12.7 kgf·m, 73.8—92.1 ft·lbf}



B6U2324W002

3. Suspend the engine using the **SSTs**.
4. Remove the No.3 engine joint bracket.



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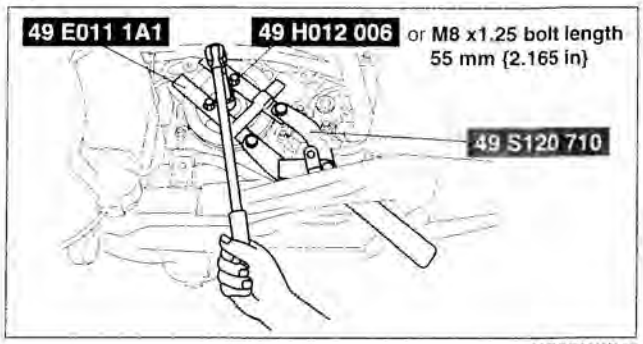
Crankshaft Pulley Lock Bolt Removal Note

1. Remove the A/C compressor with the pipes still connected.
2. Hold the crankshaft pulley using the **SSTs**.



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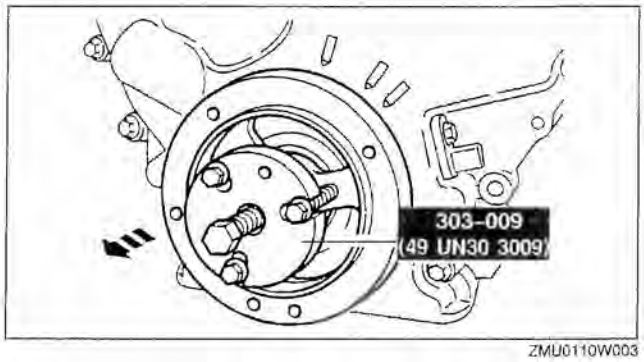
Crankshaft Pulley Removal Note

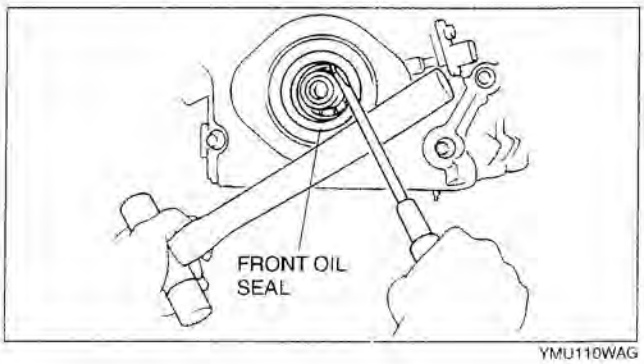
1. Remove the crankshaft pulley using the **SST**.



ZMU0110W003

Front Oil Seal Removal Note

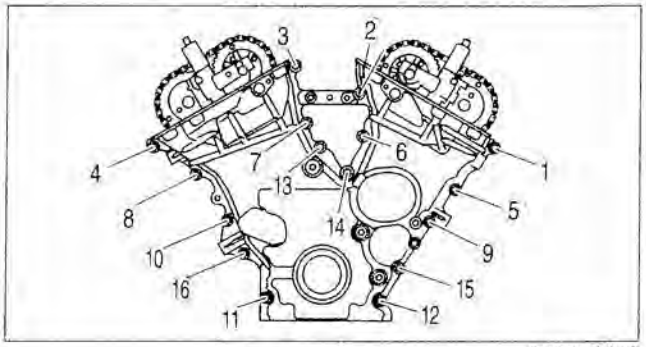
1. Remove the front oil seal using a screwdriver as shown.



YMU110WAG

Engine Front Cover Removal Note

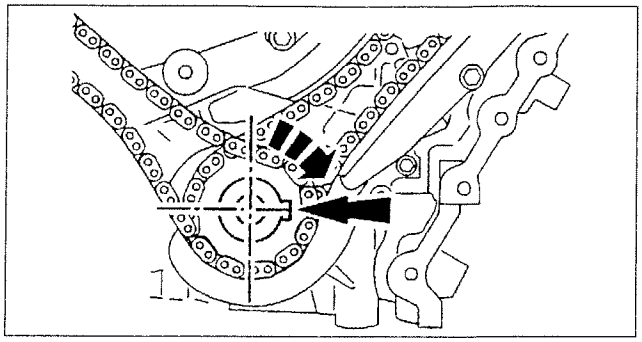
1. Remove the engine front cover bolts and studs in the order shown.



B6U2215W117

Timing Chain Component (RH) Removal Note

1. Rotate the crankshaft clockwise so that the crankshaft keyway is in the 3 o'clock position. (The camshafts (RH) are in the neutral position.)

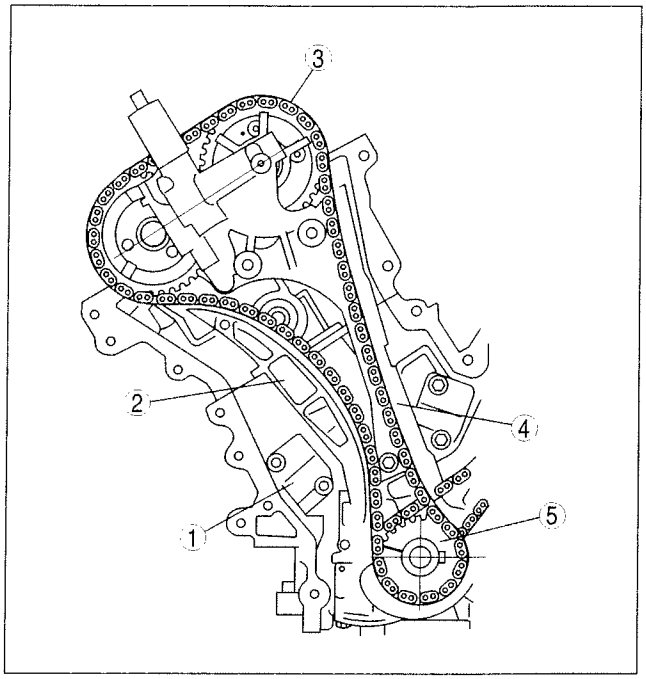


YMU110WAL

Caution

- **Do not rotate the crankshaft counterclockwise. The timing chains may bind, causing engine damage.**

2. Remove the timing chain (RH) in the following order.
   (1) Chain tensioner
   (2) Tensioner arm
   (3) Timing chain
   (4) Chain guide
   (5) Timing chain crankshaft sprocket



B6U2215W002

Camshaft Caps (RH) Removal Note

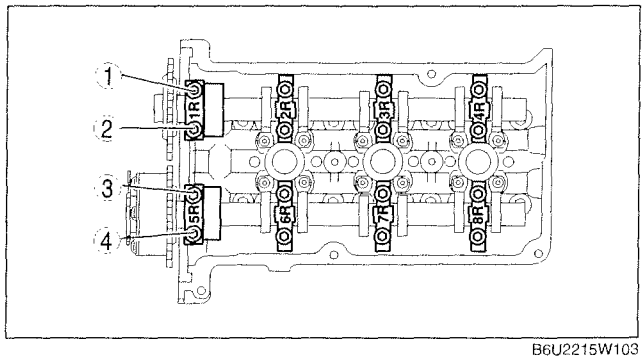
Caution
- **Remove the camshaft bearing thrust caps No. 1R and 5R first. Do not loosen any of the other bolts until the thrust caps are removed, or damage to the thrust caps may occur.**

Note
- Cylinder head and the camshaft bearing caps are numbered to make sure they are assembled in their original position. When removed, keep the bearing caps with the cylinder head from where they were removed together. Do not mix the caps.

1. Loosen bolts in several passes.

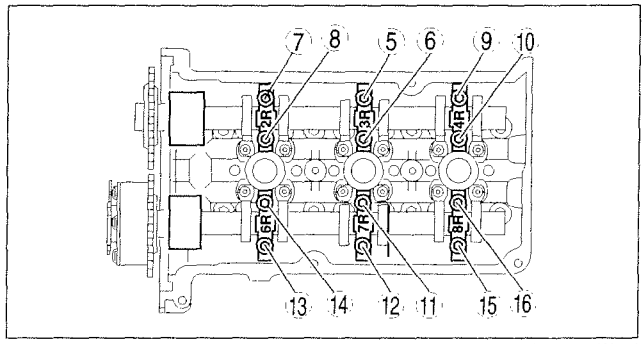
Note
- Do not remove bolts completely.

2. Remove the RH camshaft thrust caps 1R and 5R.



B6U2215W103

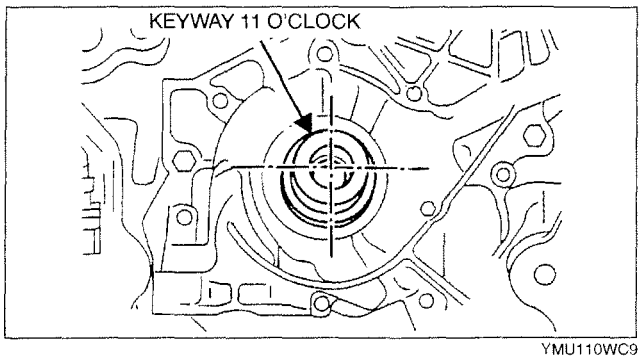
3. Loosen the remaining bolts 7–8 turns in the indicated sequence in several passes to allow the camshafts (RH) to be slowly raised.



B6U2215W104

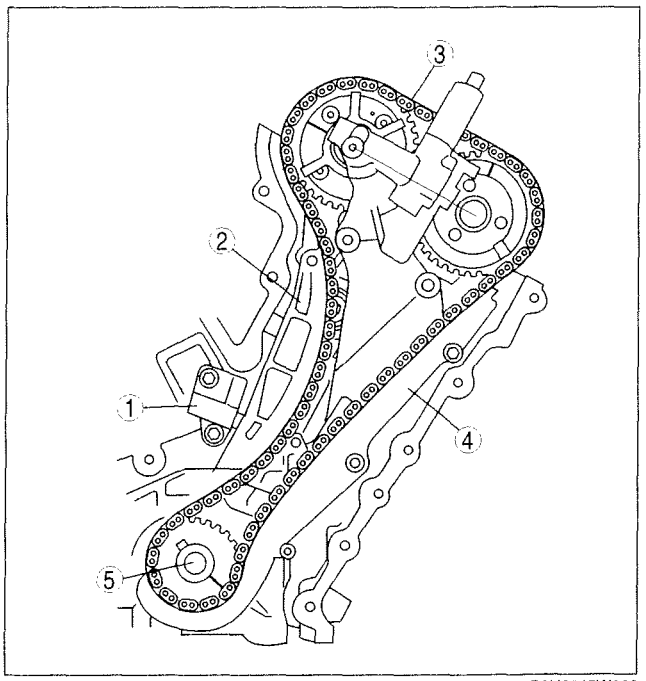
Timing Chain Component (LH) Removal Note

1. Rotate the crankshaft clockwise 1 and 2/3 turns until the keyway is in the 11 o'clock position.



YMU110WC9

2. Remove the timing chain (LH) in the following order.
   (1) Chain tensioner
   (2) Tensioner arm
   (3) Timing chain
   (4) Chain guide
   (5) Timing chain crankshaft sprocket



B6U2215W003

Camshaft Caps (LH) Removal Note

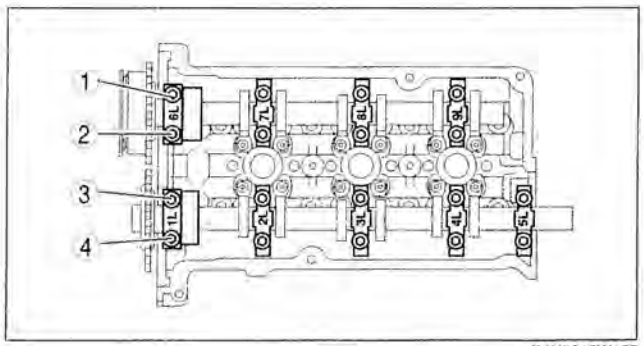
Caution
- **Remove the camshaft bearing thrust caps No. 1L and 6L first. Do not loosen any of the other bolts until the thrust caps are removed, or damage to the thrust caps may occur.**

Note
- Cylinder head and the camshaft bearing caps are numbered to make sure they are assembled in their original position. When removed, keep the bearing caps with the cylinder head from where they were removed together. Do not mix the caps.

1. Loosen bolts in several passes.

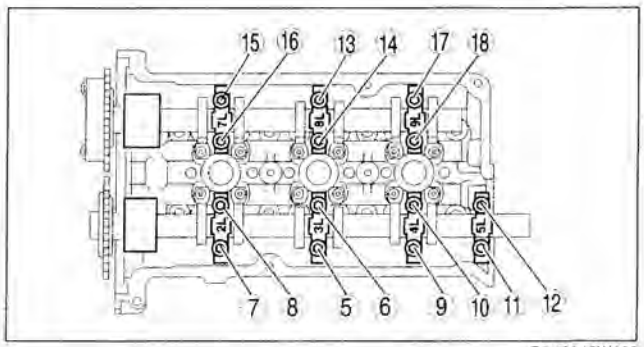
Note
- Do not remove bolts completely.

2. Remove the camshaft (LH) thrust caps 1L and 6L.



B6U2215W105

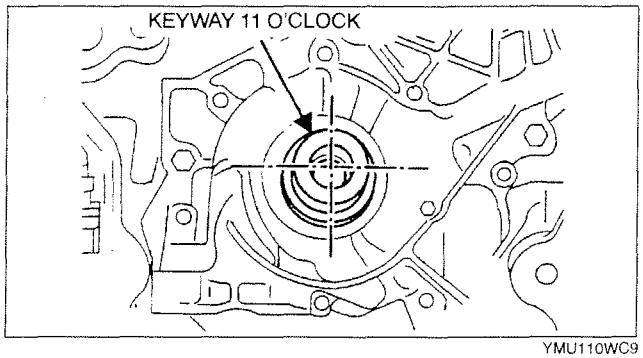
3. Loosen the remaining bolts 7—8 turns in the indicated sequence to allow the camshaft (LH) to rise.



B6U2215W106

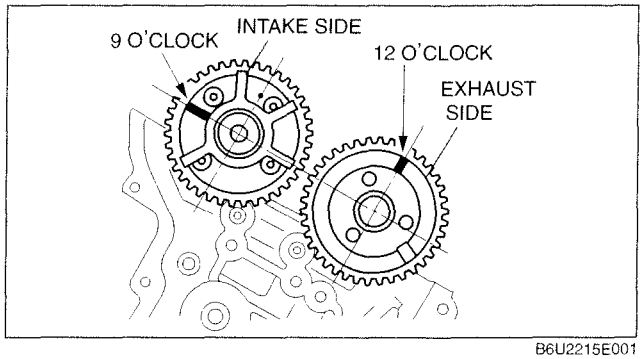
Timing Chain Component (LH) Installation Note

1. Verify that the crankshaft keyway is at 11 o'clock position.



YMU110WC9

2. Position the mark on the intake camshaft to 9 o'clock position.



B6U2215E001

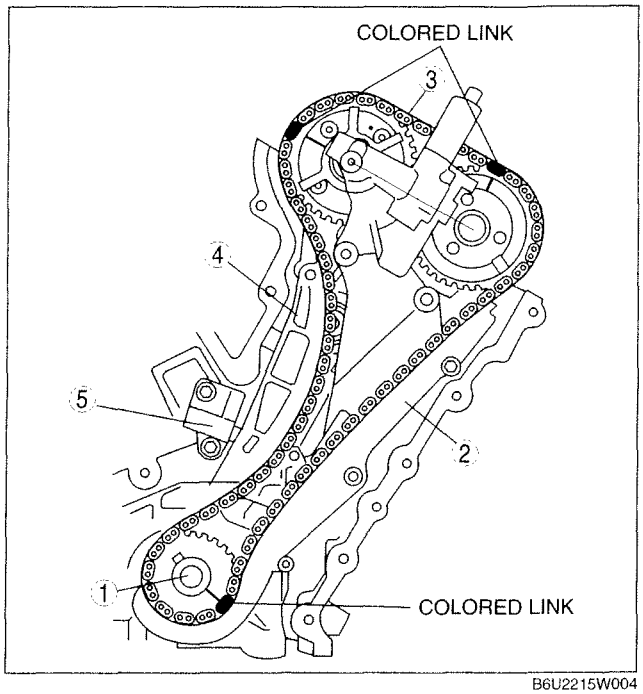
3. Position the mark on the exhaust camshaft to 12 o'clock position.

Note

- Install the timing chain by aligning the colored links on the timing chain with the marks on the timing sprockets.

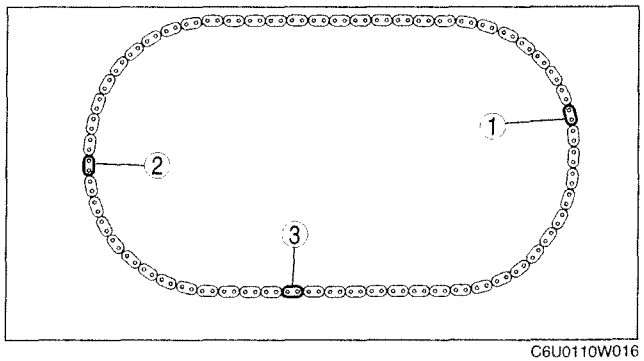
4. Install the timing chain (LH) in the following order.
   (1) Timing chain crankshaft sprocket
   (2) Chain guide
   (3) Timing chain
   (4) Tensioner arm
   (5) Chain tensioner

Note
- The chain guide should be installed to the actuator and allowed to hang freely when the bolts are installed. Do not hold the chain guide in an upward position when the bolts are installed. The actuator causes a wear O-ring and this installation method will allow that wear to continue.



B6U2215W004

Note
- If timing marks in the timing chains are not evident, use a permanent-type marker to mark the crankshaft and camshaft timing marks on the timing chain.
  1. Mark any link to use as the crankshaft timing mark.
  2. Count 29 links from the crankshaft timing mark and mark as the exhaust camshaft sprocket timing mark.
  3. Continue counting to 42 mark the link as the intake camshaft sprocket timing mark.

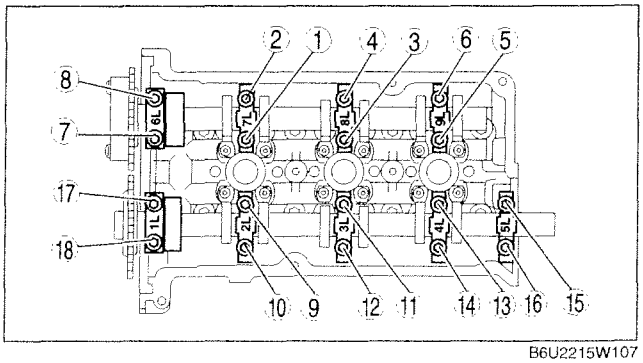


C6U0110W016

Caution
- **Install the camshaft journal thrust caps last, or damage to the thrust caps may occur.**

5. Tighten the bearing caps evenly in the order shown in several passes.

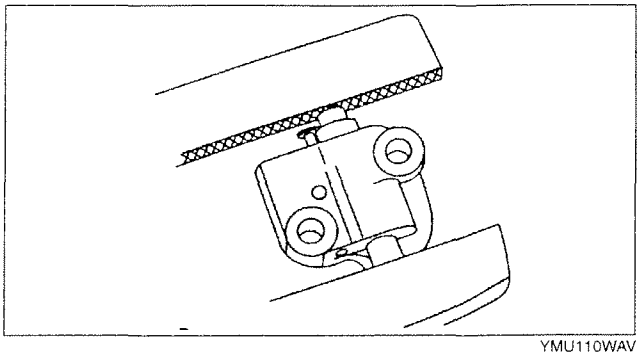
Note
- After adjusting the camshaft end play using the thrust caps 1L and 6L, tighten the other bearing caps.



B6U2215W107

Chain Tensioner (LH) Installation Note

1. Set the chain tensioner (LH) in a vise with jaw protectors.

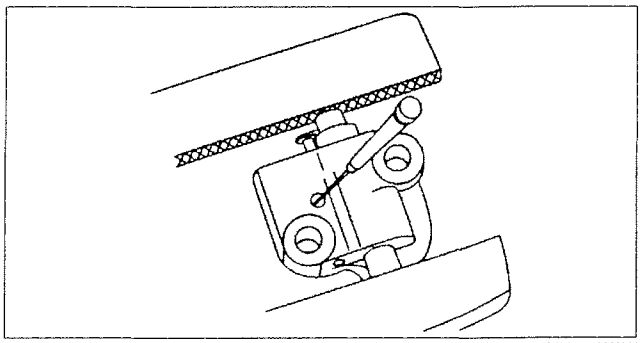


YMU110WAV

2. Using a thin screwdriver, hold the chain tensioner (LH) ratchet lock mechanism away from the ratchet stem.

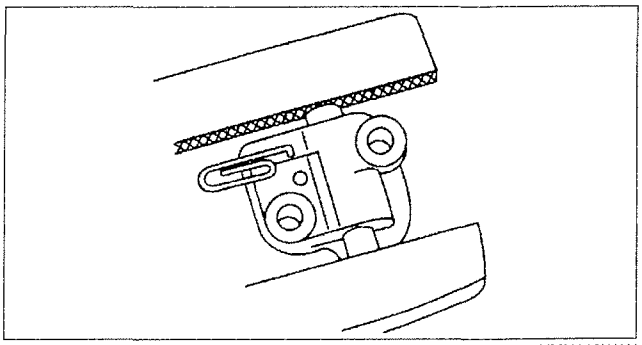
Note

- The piston should retract with minimal force. If binding occurs, remove the tensioner from the vise and reset it in the vise.



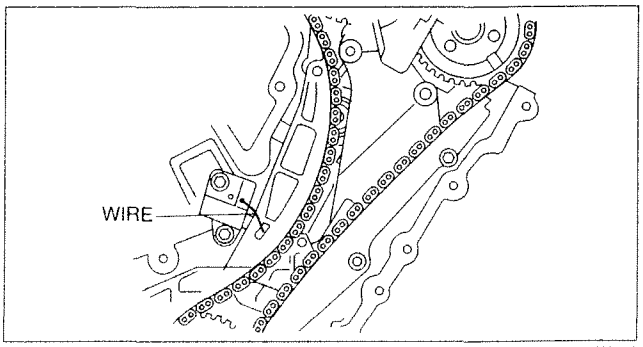
YMU110WAW

3. Slowly compress the tensioner piston.
4. Hold the tensioner piston using a **1.5 mm {0.059 in}** wire or paper clip.



YMU110WAX

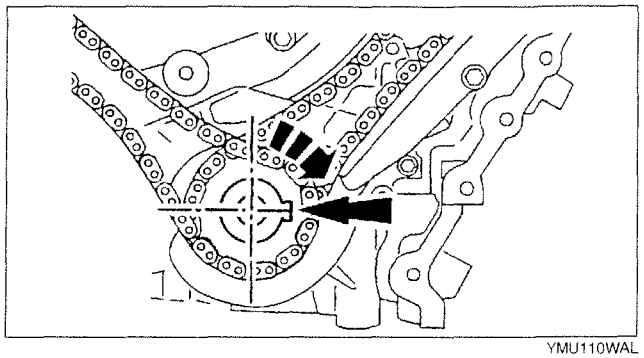
5. Install the chain tensioner (LH) and remove the retaining wire.



B6U2215W006

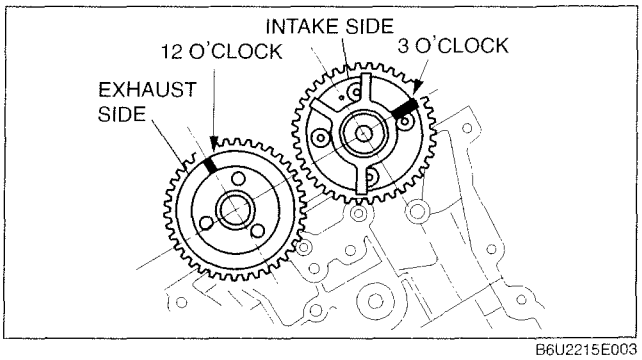
Timing Chain Component (RH) Installation Note

1. Rotate the crankshaft clockwise until the keyway is in the 3 o'clock position.



YMU110WAL

2. Position the mark on the exhaust camshaft to 12 o'clock position.



B6U2215E003

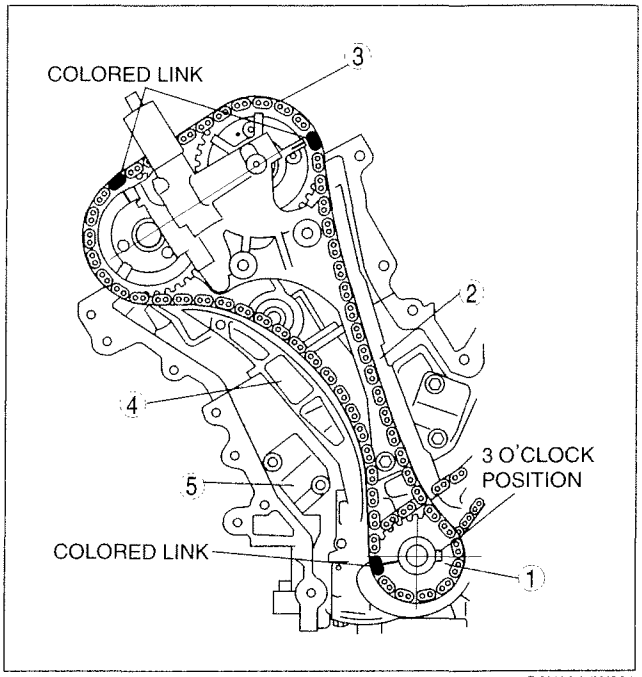
3. Position the mark on the intake camshaft to 3 o'clock position.

Note

- Install the timing chain (RH) by aligning the colored links on the timing chain (RH) with the marks on the timing sprockets.

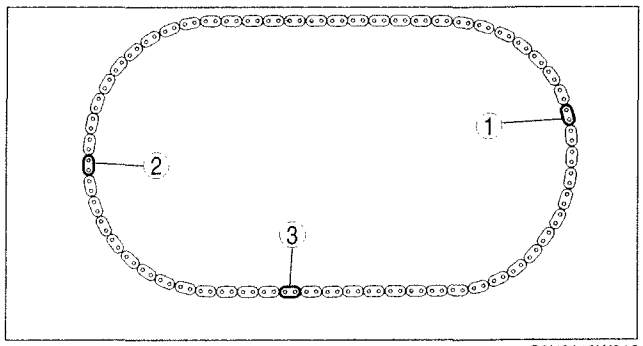
4. Install the timing chain (RH) in the following order.
   (1) Timing chain crankshaft sprocket
   (2) Chain guide
   (3) Timing chain
   (4) Tensioner arm
   (5) Chain tensioner

Note
- The chain guide should be installed to the actuator and allowed to hang freely when the bolts are installed. Do not hold the chain guide in an upward position when the bolts are installed. The actuator causes a wear O-ring and this installation method will allow that wear to continue.



B6U2215W005

Note
- If timing marks in the timing chains are not evident, use a permanent-type marker to mark the crankshaft and camshaft timing marks on the timing chain.
  1. Mark any link to use as the crankshaft timing mark.
  2. Count 29 links from the crankshaft timing mark and mark as the exhaust camshaft sprocket timing mark.
  3. Continue counting to 42 mark the link as the intake camshaft sprocket timing mark.

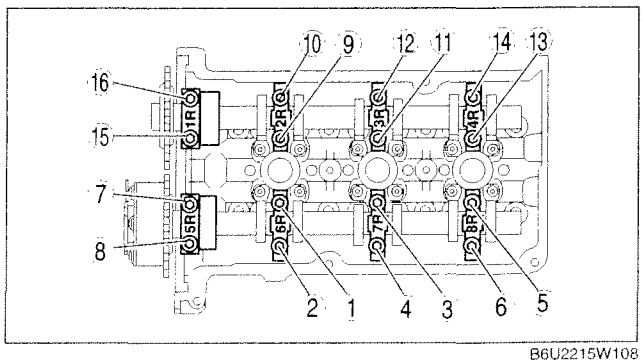


C6U0110W016

Caution
- **Install the camshaft journal thrust caps last, or damage to the thrust caps may occur.**

5. Tighten the bearing caps evenly in several passes in the order shown.

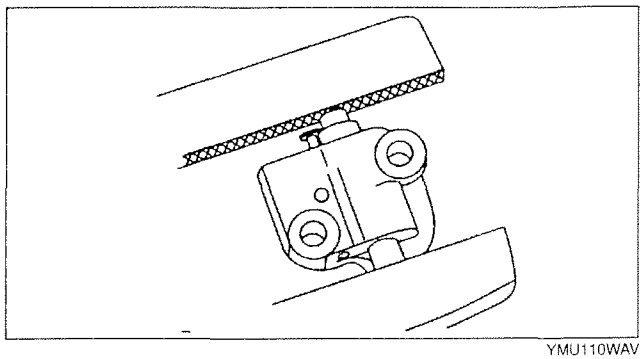
Note
- After adjusting the camshaft end play using the thrust caps 1R and 5R, tighten the other bearing caps.



B6U2215W108

Chain Tensioner (RH) Installation Note

1. Set the chain tensioner (RH) in a vise with jaw protectors.

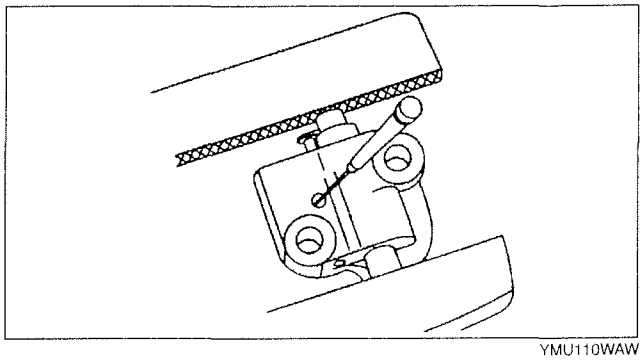


YMU110WAV

2. Using a thin screwdriver, hold the chain tensioner (RH) ratchet lock mechanism away from the ratchet stem.

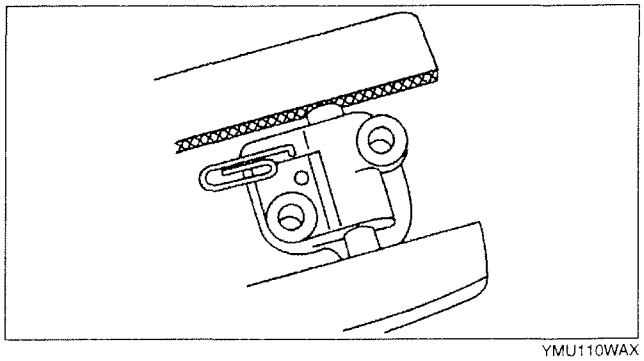
Note

- The piston should retract with minimal force. If binding occurs, remove the tensioner from the vise and reset it in the vise.



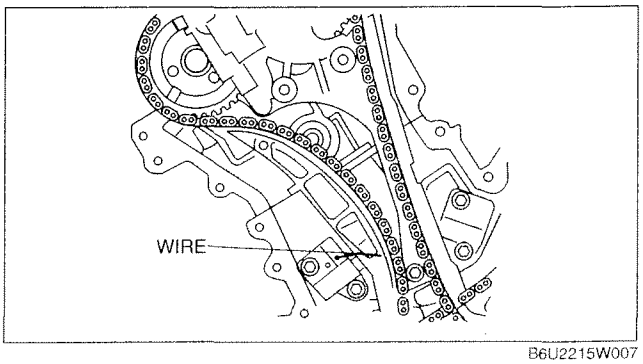
YMU110WAW

3. Slowly compress the tensioner piston.
4. Hold the tensioner piston using a **1.5 mm {0.059 in}** wire or paper clip.



YMU110WAX

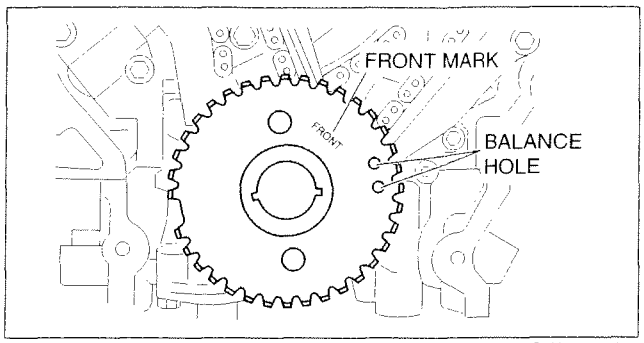
5. Install the chain tensioner (RH) and remove the retaining wire.



B6U2215W007

Crankshaft Position (CKP) Sensor Pulse Wheel Installation Note

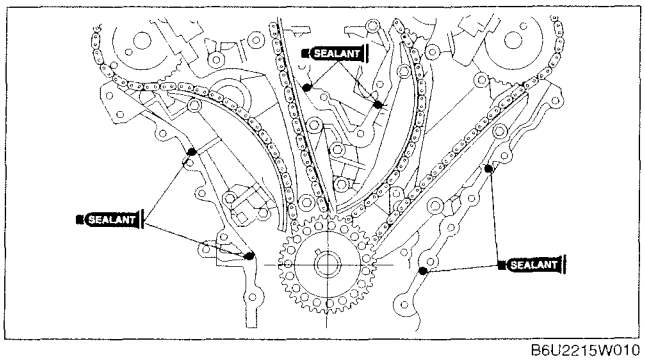
1. With the "FRONT" mark of the pulse wheel facing you, install the crankshaft position (CKP) sensor pulse wheel using the keyway on the same side as the empty space shown in figure.



C6U0110W001

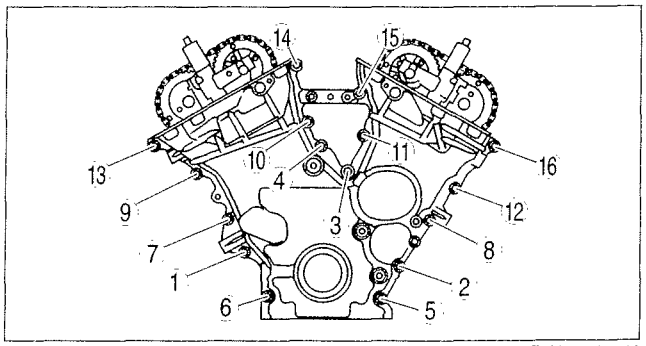
Engine Front Cover Installation Note

1. Apply a **6 mm {0.24 in}** dot of silicone sealant at the indicated location.



B6U2215W010

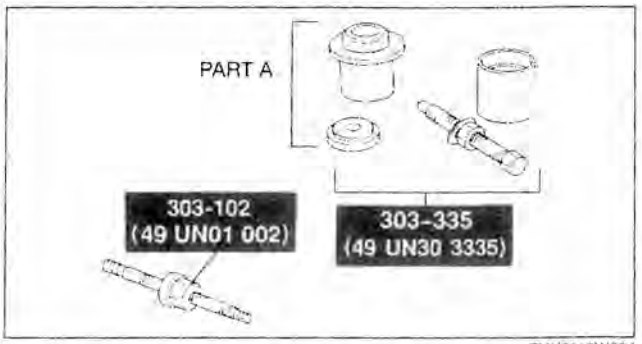
2. Install the remaining bolts and studs, and then tighten all bolts and studs in the order shown.



B6U2215W116

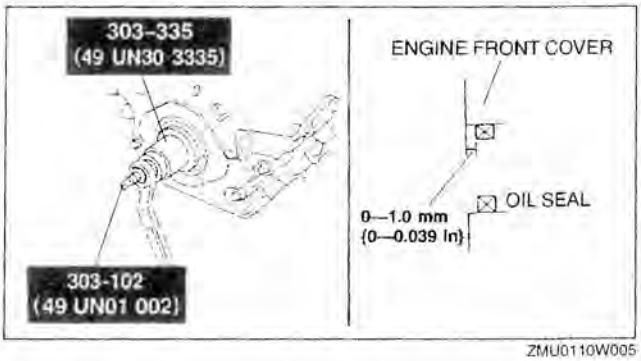
Front Oil Seal Installation Note

1. Assemble the front oil seal using part A of the **SST** [303-335 (49 UN30 3335)] and the **SST** [303-102 (49 UN01 002)].



ZMU0110W004

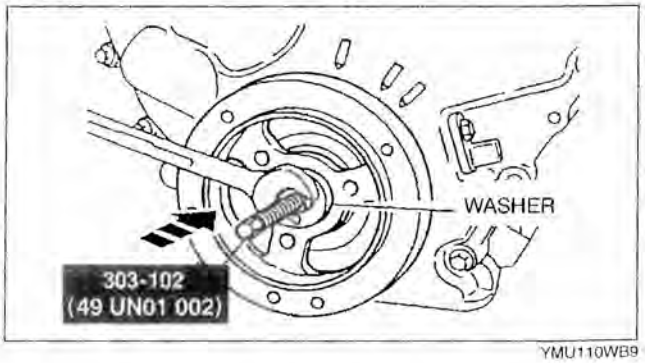
2. Apply clean engine oil to the oil seal.
3. Push the oil seal slightly in by hand.
4. Compress the oil seal using the **SSTs**.



ZMU0110W005

Crankshaft Pulley Installation Note

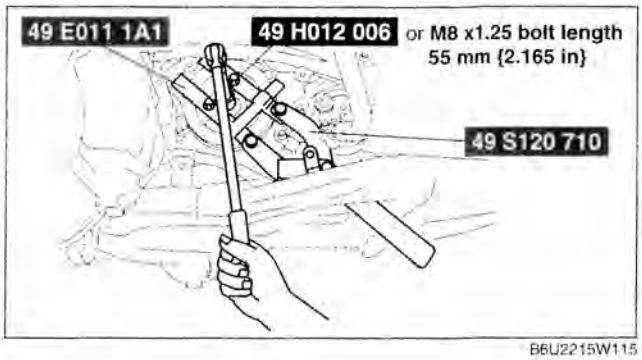
1. Seal the keyway in the crankshaft pulley using silicone sealant.
2. Install the crankshaft pulley using the **SST** and the crankshaft pulley lock bolt washer.



YMU110WB9

Crankshaft Pulley Lock Bolt Installation Note

1. Hold the crankshaft pulley using the **SSTs**.

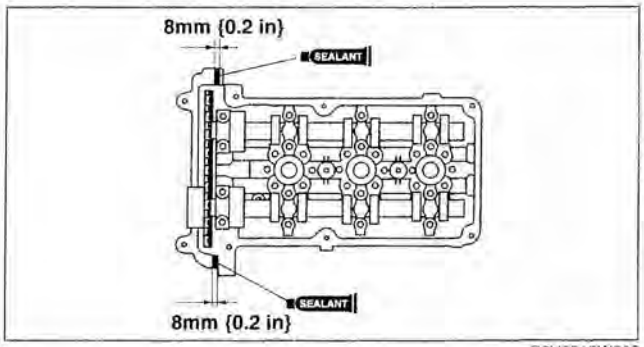


B6U2215W115

2. Tighten the new crankshaft pulley lock bolt in four steps.
   (1) Tighten to **120 N·m {12.2 kgf·m, 88.5 ft·lbf}**.
   (2) Loosen **360°** (one full turn) in reverse order.
   (3) Tighten to **47—53 N·m {4.8—5.4 kgf·m, 35—39 ft·lbf}**.
   (4) Tighten **85°▽95°**.
3. Install the A/C compressor.

Cylinder Head Cover (RH) Installation Note

1. Apply silicone sealant to the mating faces as shown.



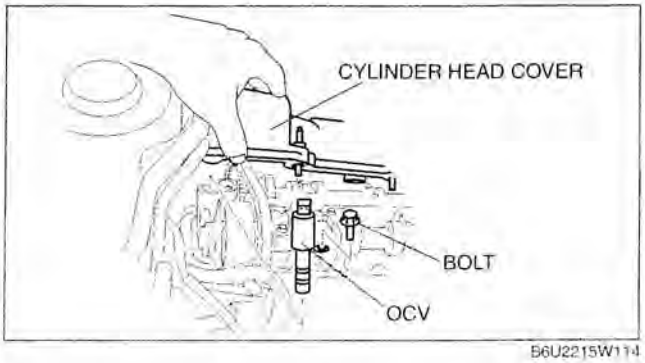
B6U2215W008

2. Install the cylinder head cover with a new gasket.
3. Install the oil control valve (OCV) with cylinder head cover raised as shown in the figure.

Note

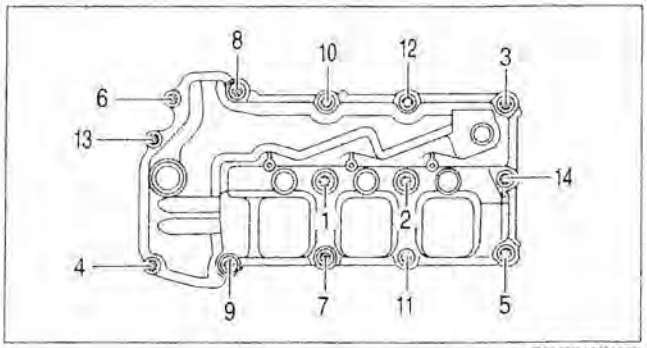
- Take care not to let the OCV tightening bolt slip into the timing chain cover when Installing the OCV tightening bolt from engine front.

Tightening torque
8.0—12.0 N·m {82—122 kgf·cm, 71—106 in·lbf}



B6U2215W114

4. Install the cylinder head cover.
5. Tighten the bolts in the order shown.



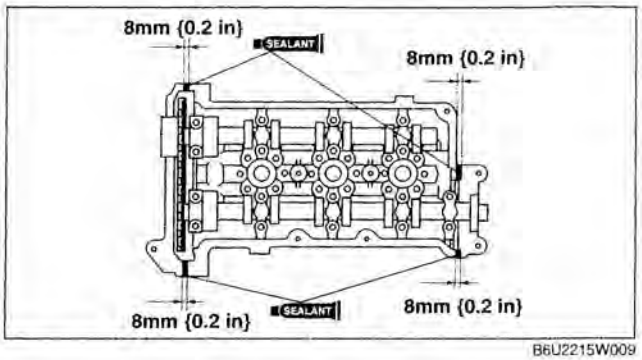
B6U2215W109

Engine Hanger Installation Note

1. Lift up the vehicle and tighten the engine hanger installation bolts from under the vehicle.

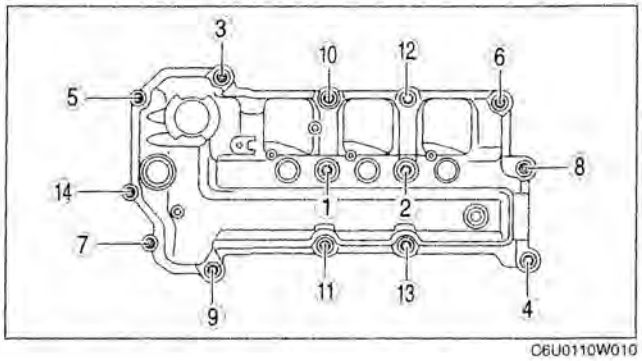
Cylinder Head Cover (LH) Installation Note

1. Apply silicone sealant to the mating faces as shown.
2. Install the cylinder head cover with a new gasket.



B6U2215W009

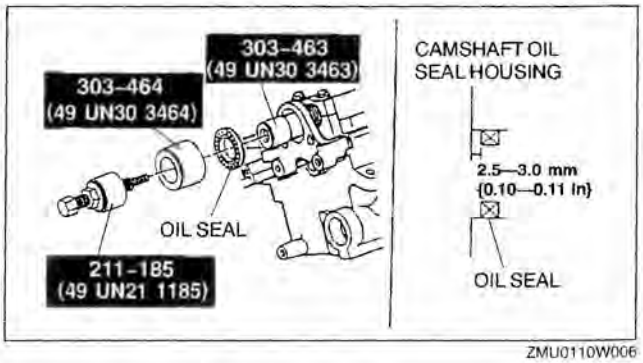
3. Tighten the bolts in the order shown.



C6U0110W010

Camshaft Oil Seal Installation Note

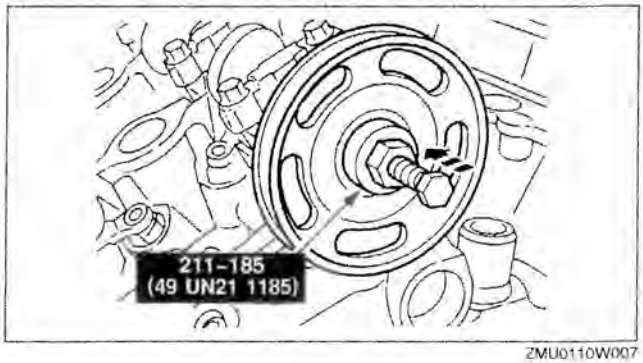
1. Apply clean engine oil to the camshaft oil seal.
2. Install the camshaft oil seal using the **SSTs**.



ZMU0110W006

Water Pump Drive Belt Pulley Installation Note

1. Install the water pump pulley using the **SST**.



ZMU0110W007

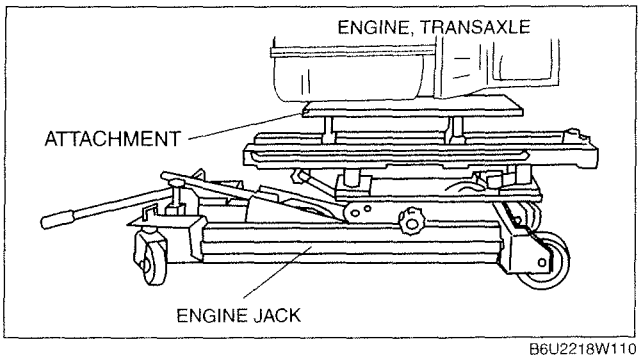
CYLINDER HEAD GASKET REPLACEMENT [AJ]

C6U011010271W02

Warning

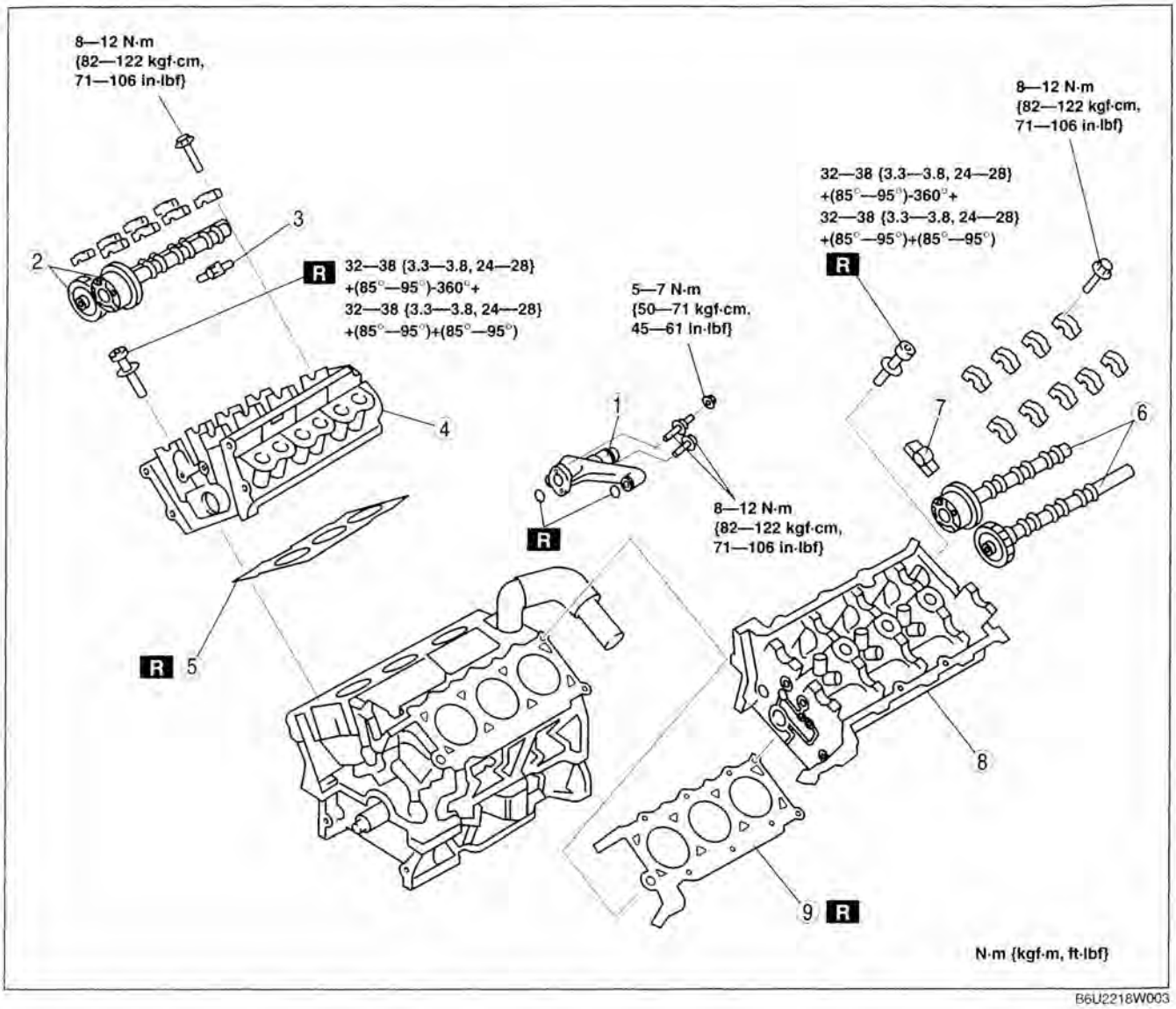
- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01–14–5 Fuel Line Safety Procedure.)**

1. Drain the engine coolant. (See 01–12–2 COOLING SYSTEM SERVICE WARNINGS.)
2. Remove the water pump. (See 01–12–11 WATER PUMP REMOVAL/INSTALLATION.)
3. Remove the timing chain. (See 01–10B–8 TIMING CHAIN REMOVAL/INSTALLATION [AJ].)
4. Install the oil pan. (See 01–11–8 OIL PAN REMOVAL/INSTALLATION.)
5. Secure the engine and the transaxle using an engine jack and attachment as shown.



B6U2218W110

6. Remove in the order indicated in the table.
7. Install in the reverse order of removal.



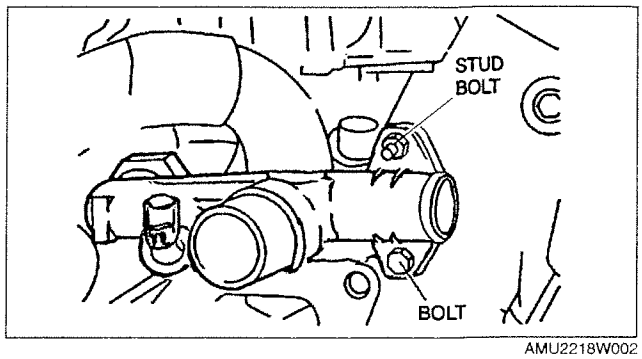
B6U2218W003

1	Water bypass tube (See 01–10B–30 Water Bypass Tube Removal Note)
2	Camshaft (RH) (See 01–10B–30 Camshaft (RH) Removal Note) (See 01–10B–33 Camshaft (RH) Installation Note)
3	Rocker arm (RH)
4	Cylinder head (RH) (See 01–10B–31 Cylinder Head (RH) Removal Note) (See 01–10B–32 Cylinder Head (RH) Installation Note)
5	Cylinder head gasket (RH)

6	Camshaft (LH) (See 01–10B–31 Camshaft (LH) Removal Note) (See 01–10B–32 Camshaft (LH) Installation Note)
7	Rocker arm (LH)
8	Cylinder head (LH) (See 01–10B–32 Cylinder Head (LH) Removal Note) (See 01–10B–32 Cylinder Head (LH) Installation Note)
9	Cylinder head gasket (LH)

Water Bypass Tube Removal Note

1. Remove the water bypass tube installation stud bolt and bolt, and disconnect the water bypass tube from the cylinder head.



AMU2218W002

Camshaft (RH) Removal Note

Caution

- **Remove the camshaft bearing thrust caps No. 1R and 5R first. Do not loosen any of the other bolts until the thrust caps are removed, or damage to the thrust caps may occur.**

Note

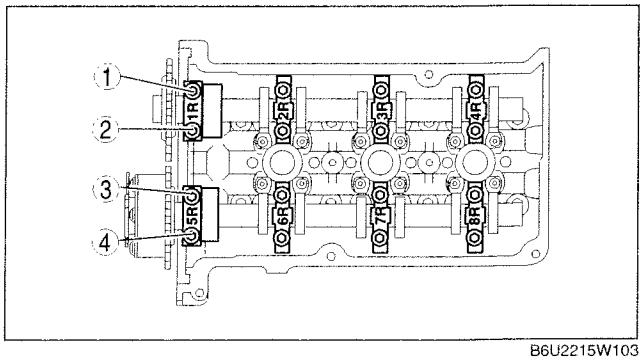
- Cylinder head and the camshaft bearing caps are numbered to make sure they are assembled in their original position. When removed, keep the bearing caps with the cylinder head from where they were removed together. Do not mix the caps.

1. Loosen bolts in several passes.

Note

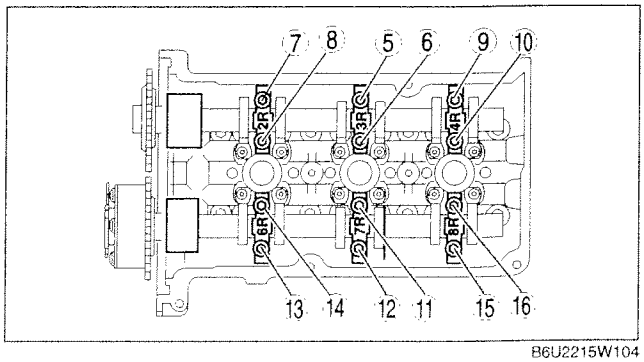
- Do not remove bolts completely.

2. Remove the RH camshaft thrust caps 1R and 5R.



B6U2215W103

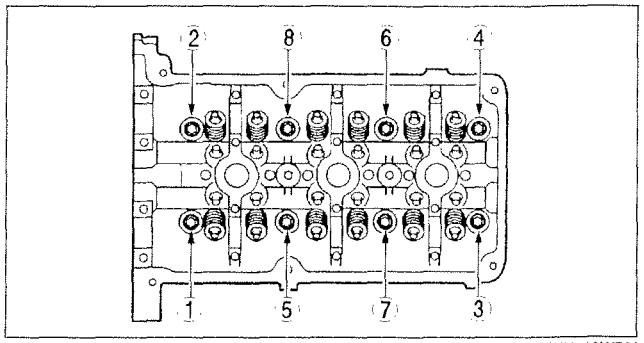
3. Loosen the remaining bolts 7–8 turns in the indicated sequence in several passes to allow the camshafts (RH) to be slowly raised.



B6U2215W104

Cylinder Head (RH) Removal Note

1. Loosen the cylinder head bolts in several passes in the order shown.



YMU110WBM

Camshaft (LH) Removal Note

Caution

- **Remove the camshaft bearing thrust caps No. 1L and 6L first. Do not loosen any of the other bolts until the thrust caps are removed, or damage to the thrust caps may occur.**

Note

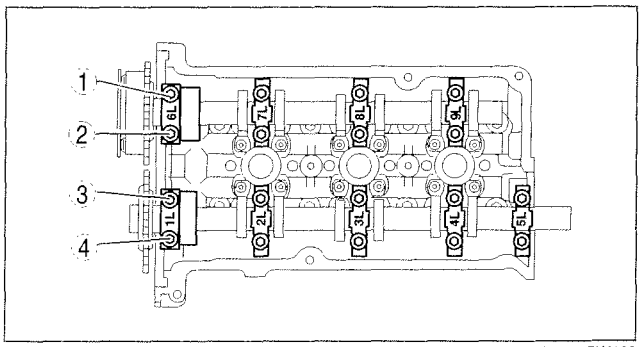
- Cylinder head and the camshaft bearing caps are numbered to make sure they are assembled in their original position. When removed, keep the bearing caps with the cylinder head from where they were removed together. Do not mix the caps.

1. Loosen bolts in several passes.

Note

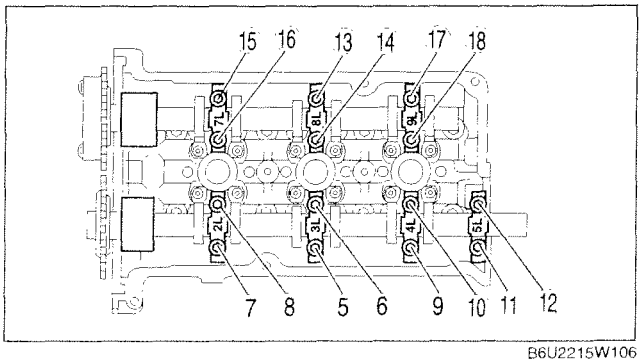
- Do not remove bolts completely.

2. Remove the camshaft (LH) thrust caps 1L and 6L.



B6U2215W105

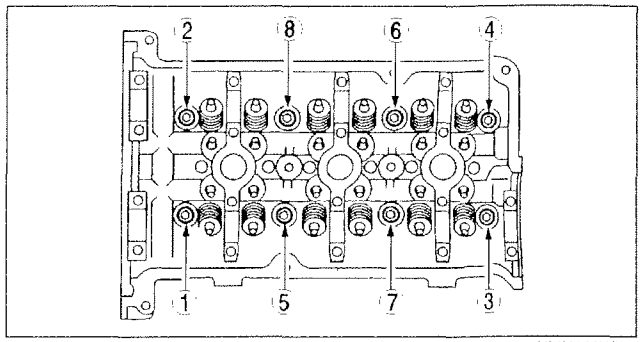
3. Loosen the remaining bolts 7—8 turns in the indicated sequence to allow the camshaft (LH) to rise.



B6U2215W106

Cylinder Head (LH) Removal Note

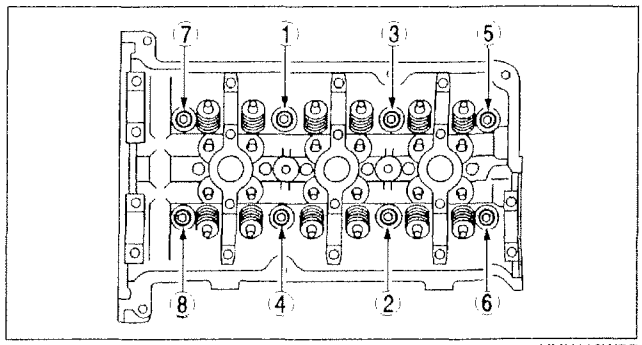
1. Loosen the cylinder head bolts in several passes in the order shown.



YMU110WBN

Cylinder Head (LH) Installation Note

1. Tighten the cylinder head bolts in the order shown using the following 6 steps.
   (1) Tighten to **32—38 N·m {3.3—3.8 kgf·m, 24—28 ft·lbf}**.
   (2) Tighten **85°▽95°**.
   (3) Loosen **360°** (one full turn) in reverse order.
   (4) Tighten to **32—38 N·m {3.3—3.8 kgf·m, 24—28 ft·lbf}**.
   (5) Tighten **85°▽95°**.
   (6) Tighten **85°▽95°**.



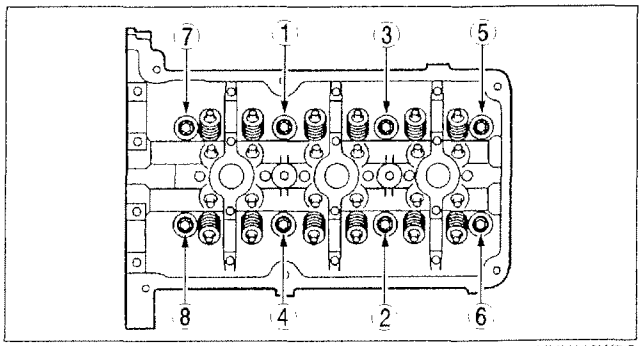
YMU110WBP

Camshaft (LH) Installation Note

1. Install the camshaft (LH) referring to Timing Chain Component (LH) Installation Note in TIMING CHAIN REMOVAL/INSTALLATION. (See 01–10B–18 Timing Chain Component (LH) Installation Note.)

Cylinder Head (RH) Installation Note

1. Tighten the cylinder head bolts in the order shown using the following 6 steps.
   (1) Tighten to **32—38 N·m {3.3—3.8 kgf·m, 24—28 ft·lbf}**.
   (2) Tighten **85°▽95°**.
   (3) Loosen **360°** (one full turn) in reverse order.
   (4) Tighten to **32—38 N·m {3.3—3.8 kgf·m, 24—28 ft·lbf}**.
   (5) Tighten **85°▽95°**.
   (6) Tighten **85°▽95°**.



YMU110WBQ

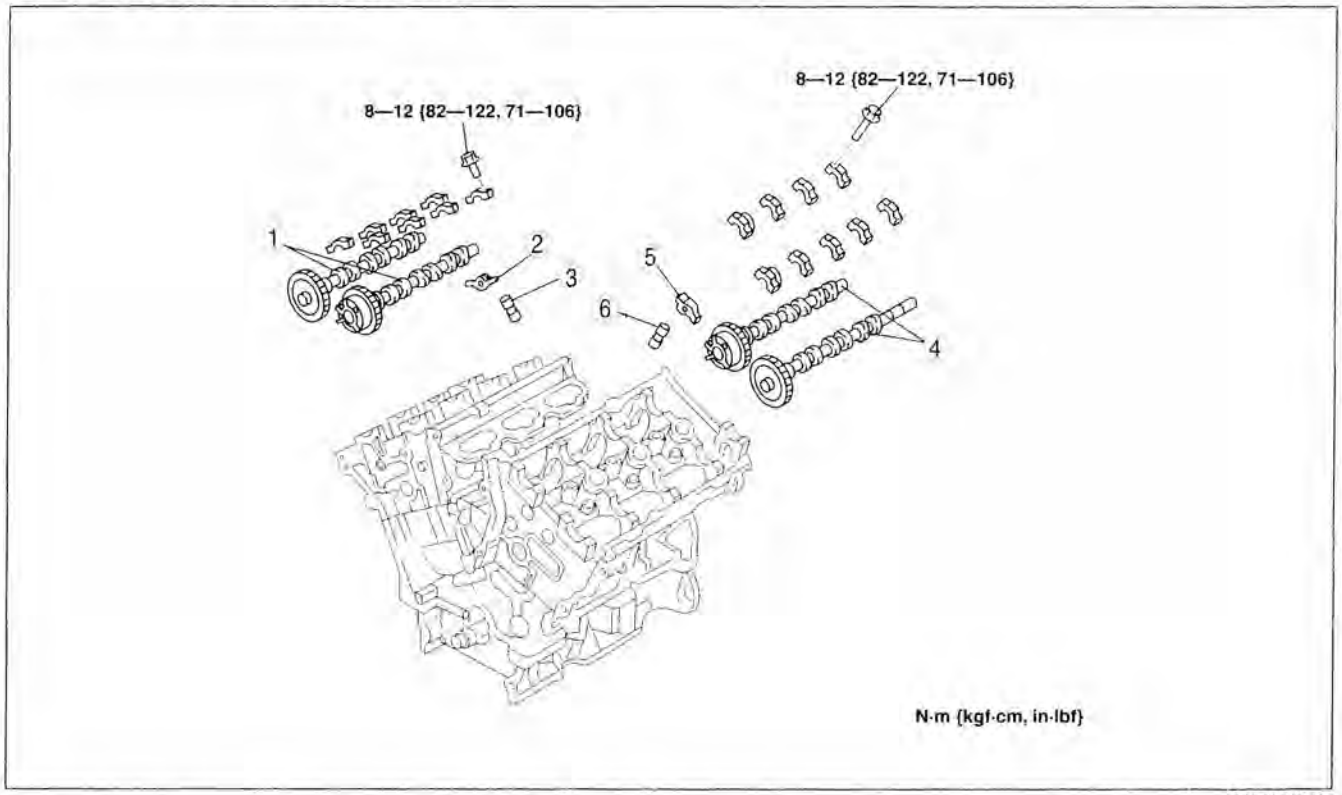
Camshaft (RH) Installation Note

1. Install the camshaft (RH) referring to Timing Chain Component (RH) Installation Note in TIMING CHAIN REMOVAL/INSTALLATION. (See 01–10B–21 Timing Chain Component (RH) Installation Note.)

HYDRAULIC LASH ADJUSTER (HLA) REMOVAL/INSTALLATION [AJ]

C6U011012100W01

1. Remove the timing chain. (See 01–10B–8 TIMING CHAIN REMOVAL/INSTALLATION [AJ].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



B6U2224W215

1	Camshaft (RH) (See 01–10B–34 Camshaft (RH) Removal Note) (See 01–10B–35 Camshaft (RH) Installation Note)
2	Rocker arm (RH) (See 01–10B–34 Rocker Arm (RH) Removal Note)
3	HLA (RH)

4	Camshaft (LH) (See 01–10B–35 Camshaft (LH) Removal Note) (See 01–10B–35 Camshaft (LH) Installation Note)
5	Rocker arm (LH) (See 01–10B–35 Rocker Arm (LH) Removal Note)
6	HLA (LH)

Camshaft (RH) Removal Note

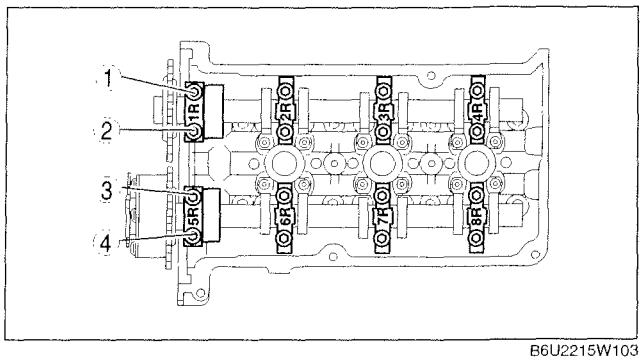
Caution
- **Remove the camshaft bearing thrust caps No. 1R and 5R first. Do not loosen any of the other bolts until the thrust caps are removed, or damage to the thrust caps may occur.**

Note
- Cylinder head and the camshaft bearing caps are numbered to make sure they are assembled in their original position. When removed, keep the bearing caps with the cylinder head from where they were removed together. Do not mix the caps.

1. Loosen bolts in several passes.

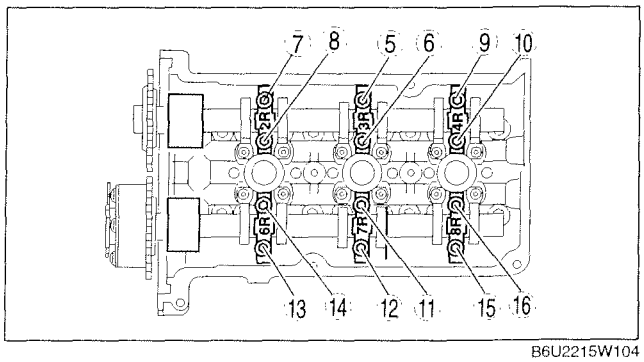
Note
- Do not remove bolts completely.

2. Remove the RH camshaft thrust caps 1R and 5R.



B6U2215W103

3. Loosen the remaining bolts 7–8 turns in the indicated sequence in several passes to allow the camshafts (RH) to be slowly raised.



B6U2215W104

Rocker Arm (RH) Removal Note

Note
- If the rocker arm and HLA are to be reused, mark their positions to make sure they are assembled in the original location.
- Take care not to let the rocker arm slip into the timing chain cover when removing the rocker arm from engine front.

Camshaft (LH) Removal Note

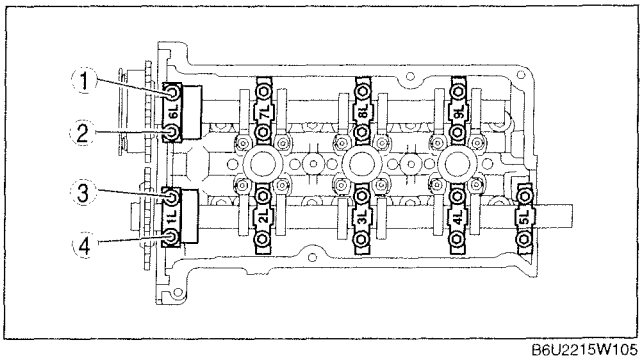
Caution
- **Remove the camshaft bearing thrust caps No. 1L and 6L first. Do not loosen any of the other bolts until the thrust caps are removed, or damage to the thrust caps may occur.**

Note
- Cylinder head and the camshaft bearing caps are numbered to make sure they are assembled in their original position. When removed, keep the bearing caps with the cylinder head from where they were removed together. Do not mix the caps.

1. Loosen bolts in several passes.

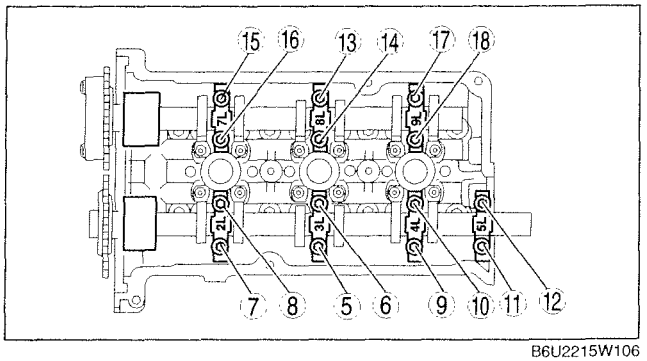
Note
- Do not remove bolts completely.

2. Remove the camshaft (LH) thrust caps 1L and 6L.



B6U2215W105

3. Loosen the remaining bolts 7—8 turns in the indicated sequence to allow the camshaft (LH) to rise.



B6U2215W106

Rocker Arm (LH) Removal Note

Note
- If the rocker arm and HLA are to be reused, mark their positions to make sure they are assembled in the original location.
- Take care not to let the rocker arm slip into the timing chain cover when removing the rocker arm from engine front.

Camshaft (LH) Installation Note

1. Install the camshaft (LH) referring to Timing Chain Component (LH) Installation Note in TIMING CHAIN REMOVAL/INSTALLATION. (See 01–10B–18 Timing Chain Component (LH) Installation Note.)

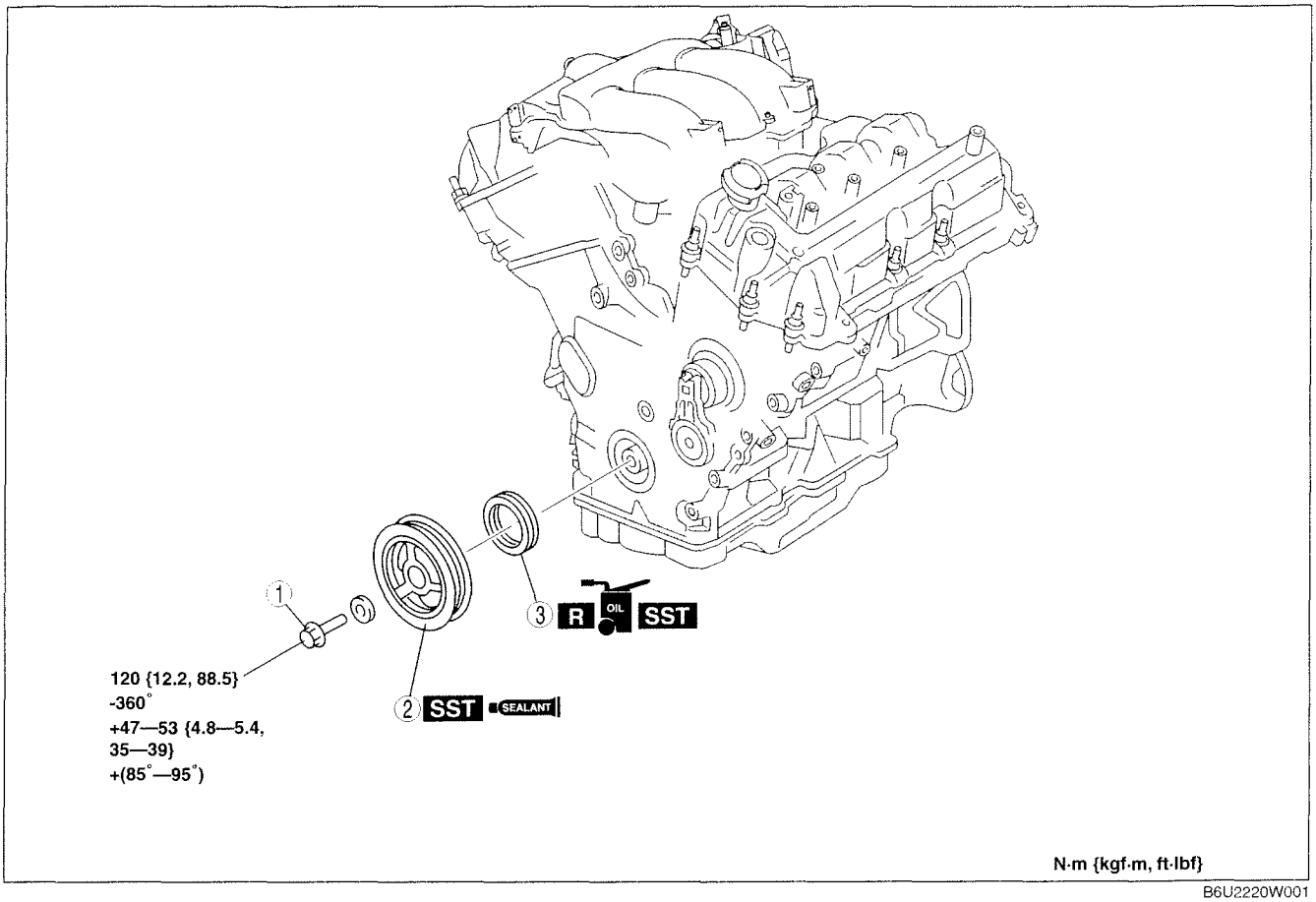
Camshaft (RH) Installation Note

1. Install the camshaft (RH) referring to Timing Chain Component (RH) Installation Note in TIMING CHAIN REMOVAL/INSTALLATION. (See 01–10B–21 Timing Chain Component (RH) Installation Note.)

FRONT OIL SEAL REPLACEMENT [AJ]

C6U011010602W02

1. Disconnect the negative battery cable.
2. Remove the drive belt. (See 01–10B–5 DRIVE BELT REPLACEMENT [AJ].)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



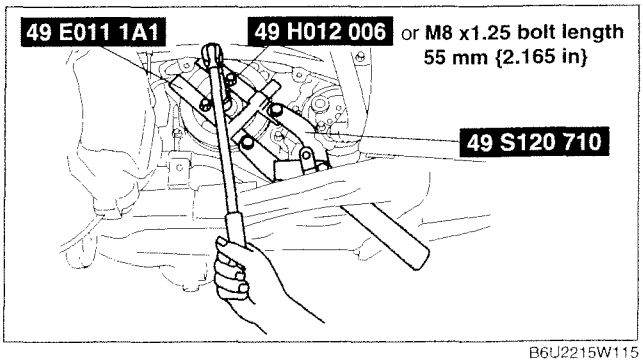
B6U2220W001

1	Crankshaft pulley lock bolt (See 01–10B–36 Crankshaft Pulley Lock Bolt Removal Note) (See 01–10B–38 Crankshaft Pulley Lock Bolt Installation Note)

2	Crankshaft pulley
3	Front oil seal (See 01–10B–37 Front Oil Seal Removal Note) (See 01–10B–37 Front Oil Seal Installation Note)

Crankshaft Pulley Lock Bolt Removal Note

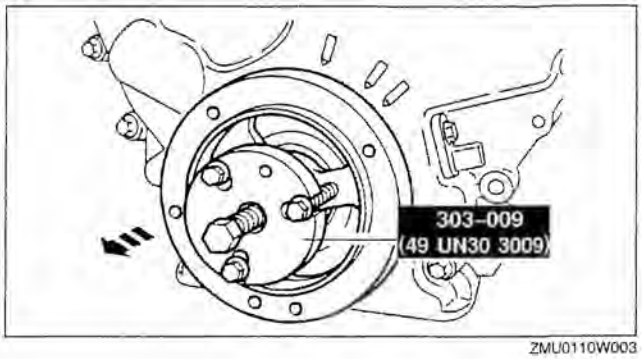
1. Hold the crankshaft pulley using the **SSTs**.



B6U2215W115

Crankshaft Pulley Removal Note

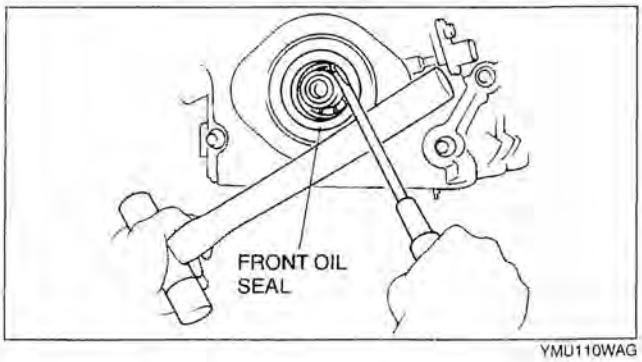
1. Remove the A/C compressor with the pipes still connected.
2. Remove the crankshaft pulley using the **SST**.



ZMU0110W003

Front Oil Seal Removal Note

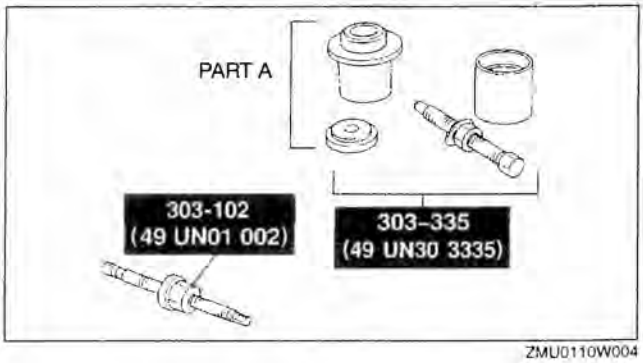
1. Remove the front oil seal using a screwdriver as shown.



YMU110WAG

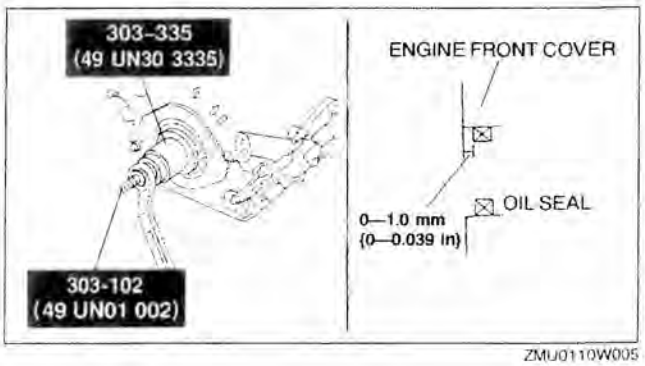
Front Oil Seal Installation Note

1. Assemble the front oil seal using part A of the **SST** [303-335 (49 UN30 3335)] and the **SST** [303-102 (49 UN01 002)].



ZMU0110W004

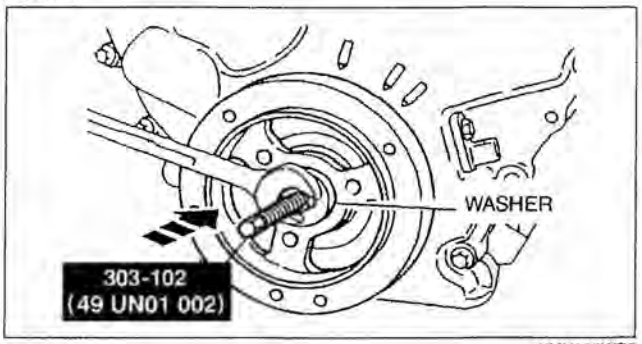
2. Apply clean engine oil to the oil seal.
3. Push the oil seal slightly in by hand.
4. Compress the oil seal using the **SSTs**.



ZMU0110W005

Crankshaft Pulley Installation Note

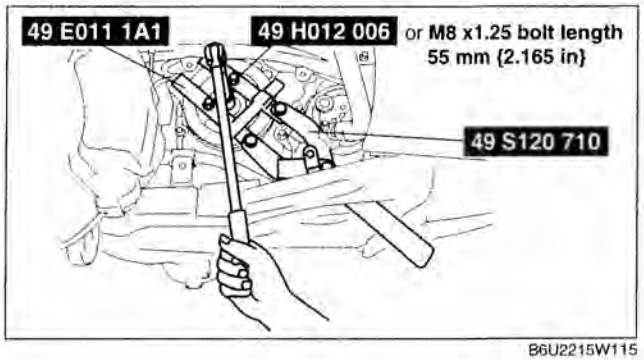
1. Seal the keyway in the crankshaft pulley using silicone sealant.
2. Install the crankshaft pulley using the **SST** and the crankshaft pulley lock bolt washer.



YMU110WB9

Crankshaft Pulley Lock Bolt Installation Note

1. Hold the crankshaft pulley using the **SSTs**.



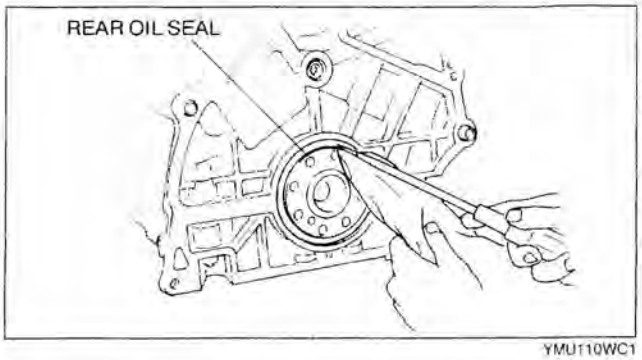
B6U2215W115

2. Tighten the new crankshaft pulley lock bolt in four steps.
   (1) Tighten to **120 N·m {12.2 kgf·m, 88.5 ft·lbf}**.
   (2) Loosen **360°** (one full turn) in reverse order.
   (3) Tighten to **47—53 N·m {4.8—5.4 kgf·m, 35—39 ft·lbf}**.
   (4) Tighten **85°∇95°**.
3. Install the A/C compressor.

REAR OIL SEAL REPLACEMENT [AJ]

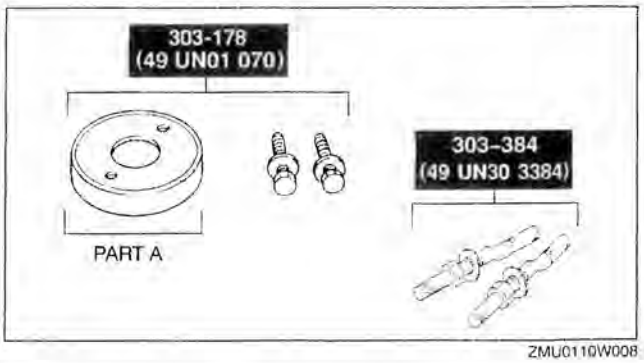
C6U01101399W02

1. Remove the flywheel. (MTX) (See 05–10–12 CLUTCH UNIT REMOVAL/INSTALLATION.)
2. Remove the drive plate. (ATX) (See 05–17A–44 DRIVE PLATE REMOVAL/INSTALLATION [FN4A-EL].)
3. Cut the oil seal lip using a razor knife.
4. Remove the rear oil seal using a screwdriver as shown.



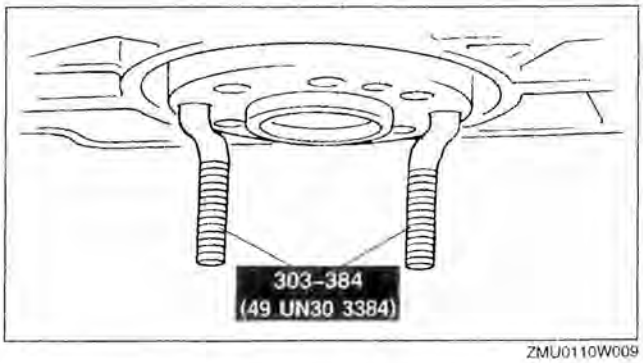
YMU110WC1

5. Install the rear oil seal with part A of the **SST** [303-178 (49 UN01 070)] and the **SST** [303-384 (49 UN30 3384)].



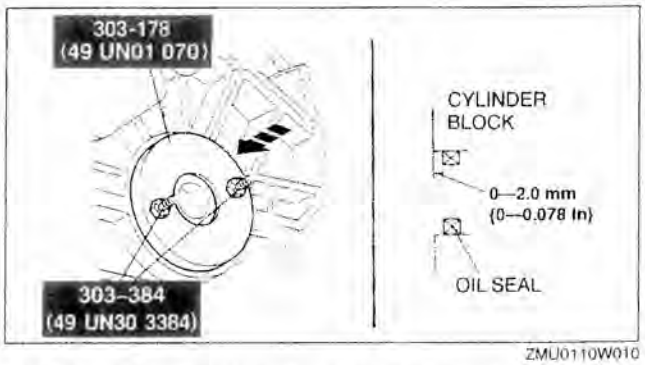
ZMU0110W008

6. Install the studs of the **SST** [303-384 (49 UN30 3384)] as indicated in the figure.



ZMU0110W009

7. Apply clean engine oil to the new oil seal.
8. Push the oil seal slightly in by hand.
9. Install part A of the **SST** [303-178 (49 UN01 070)] and compress the oil seal with the nuts of the **SST** [303-384 (49 UN30 3384)].



ZMU0110W010

10. Install the drive plate. (ATX) (See 05–17A–44 DRIVE PLATE REMOVAL/INSTALLATION [FN4A-EL].)
11. Install the flywheel. (MTX) (See 05–10–12 CLUTCH UNIT REMOVAL/INSTALLATION.)

ENGINE REMOVAL/INSTALLATION [AJ]

C6U011002000W03

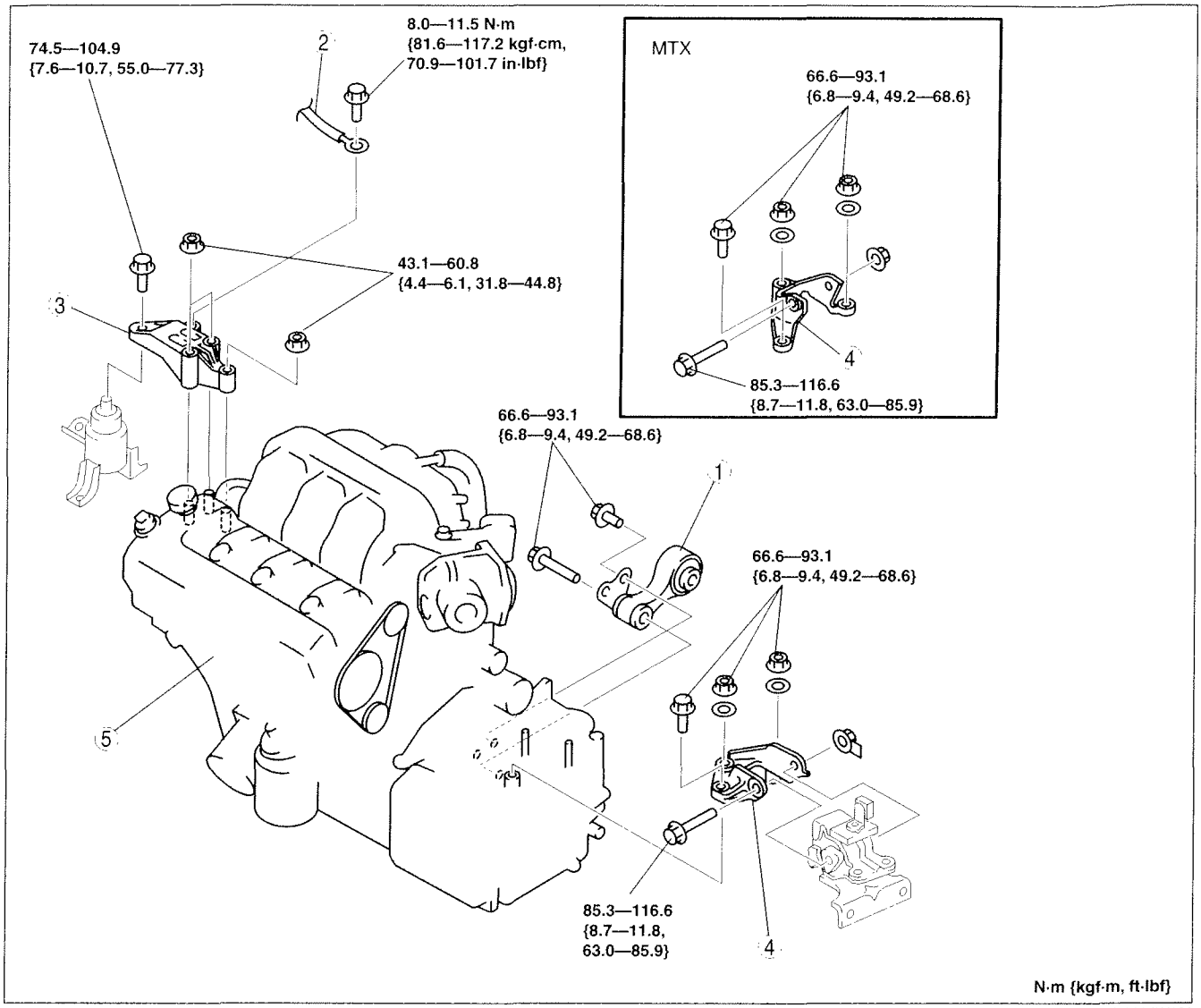
Warning

- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01–14–5 Fuel Line Safety Procedure.)**

1. Remove the under cover.
2. Drain the engine coolant. (See 01–12–2 COOLING SYSTEM SERVICE WARNINGS.)
3. Drain the ATF (ATX). (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)
4. Remove the plug hole plate. (See 01–10B–8 TIMING CHAIN REMOVAL/INSTALLATION [AJ].)
5. Remove the battery and battery tray. (See 01–17–1 BATTERY REMOVAL/INSTALLATION.)
6. Remove the air cleaner, intake air duct and vacuum hose. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
7. Disconnect the ATF hose and selector cable (ATX). (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].)
8. Disconnect the shift cable, selector cable and clutch release cylinder (MTX). (See 05–15B–5 MANUAL TRANSAXLE REMOVAL/INSTALLATION [A65M-R].)
9. Disconnect the plastic fuel hose. (See 01–14–24 Plastic Fuel Hose Removal Note.) (See 01–14–26 Plastic Fuel Hose Installation Note.)
10. Disconnect the engine and PCM wiring harness
11. Remove the joint shaft (RH). (See 03–13–5 JOINT SHAFT REMOVAL/INSTALLATION [AJ].)
12. Disconnect the drive shaft (LH) from the transaxle. (See 03–13–14 DRIVE SHAFT REMOVAL/INSTALLATION [AJ].)
13. Remove the front crossmember. (See 02–13–18 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
14. Remove the front drive belt. (See 01–10B–5 DRIVE BELT REPLACEMENT [AJ].)
15. Remove the oil level gauge pipe. (See 01–10B–8 TIMING CHAIN REMOVAL/INSTALLATION [AJ].)
16. Disconnect the P/S oil pump pipes and drain the P/S fluid reservoir. (See 06–12–29 POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY [AJ].)
17. Remove the A/C compressor. (See 07–11–6 A/C COMPRESSOR REMOVAL/INSTALLATION.)
18. Remove the TWC (LH) (See 01–15B–2 EXHAUST SYSTEM REMOVAL/INSTALLATION [AJ].)
19. Remove the front pipe. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/INSTALLATION [AJ].)
20. Disconnect the radiator hose and heater hose.
21. Remove in the order indicated in the table.
22. Install in the reverse order of removal.
23. Start the engine and:
    (1) Inspect for the engine oil, engine coolant, transaxle oil and fuel leakage.
    (2) Verify the ignition timing, idle speed and idle mixture. (See 01–10B–45 Ignition Timing Inspection.) (See 01–10B–45 Idle Speed Inspection.) (See 01–10B–45 Idle Mixture Inspection.)

Note

- If the engine is overhauled and installed to the vehicle, perform the road test and verify that there is no abnormality.



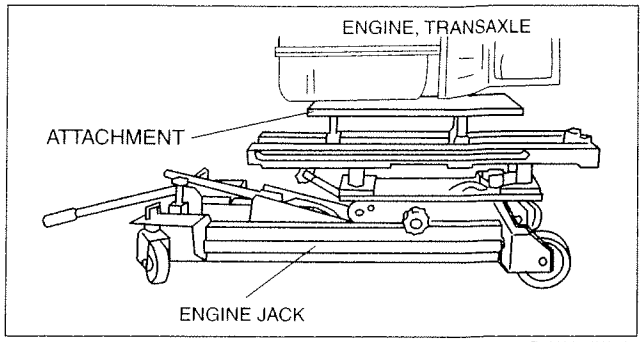
B6U2224W122

1	No.1 engine mount rubber
2	Engine ground
3	No.3 engine joint bracket (See 01–10B–42 No.3 Engine Joint Bracket and No.4 Engine Mount Bracket Removal Note) (See 01–10B–42 No.3 Engine Joint Bracket Installation Note)

4	No.4 engine mount bracket (See 01–10B–42 No.3 Engine Joint Bracket and No.4 Engine Mount Bracket Removal Note) (See 01–10B–43 No.4 Engine Mount Bracket Installation Note)
5	Engine, transaxle

No.3 Engine Joint Bracket and No.4 Engine Mount Bracket Removal Note

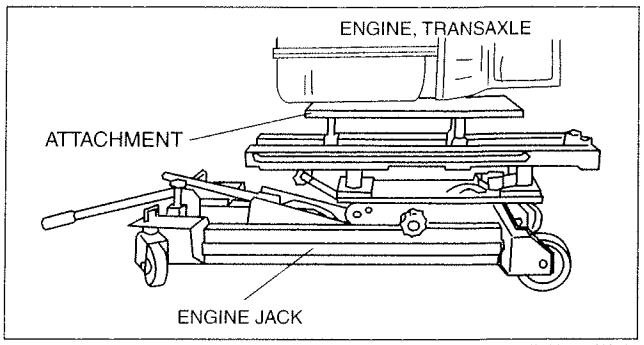
1. Secure the engine and the transaxle using an engine jack and attachment as shown.



B6U2218W110

No.3 Engine Joint Bracket Installation Note

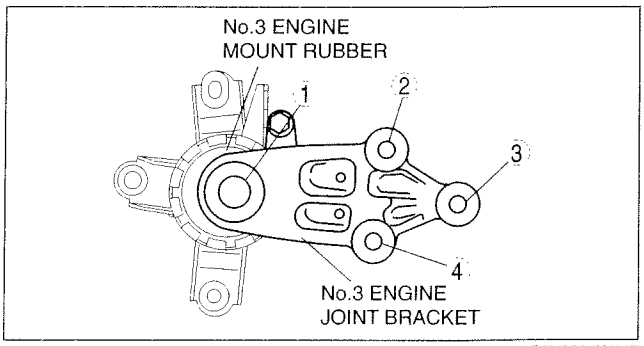
1. Secure the engine and the transaxle using an engine jack and attachment as shown.



B6U2218W110

2. Tighten the No.3 engine joint bracket bolts and nuts in the order shown.

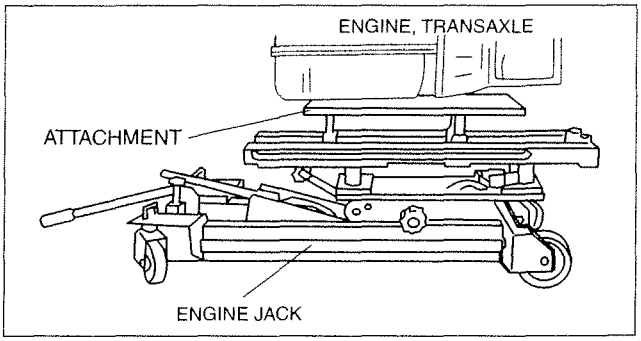
Bolt and nut No.	Tightening torque (N·m {kgf·m, ft·lbf})
1	74.5—104.9 {7.6—10.7, 55.0—77.3}
2, 3, 4	43.1—60.8 {4.4—6.1, 31.8—44.8}



B6U2224W117

No.4 Engine Mount Bracket Installation Note

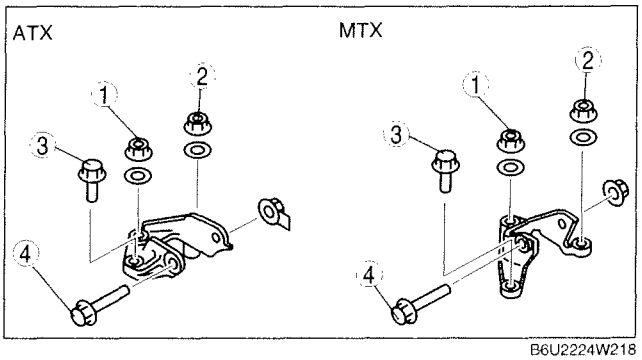
1. Secure the engine and the transaxle using an engine jack and attachment as shown.



B6U2218W110

2. Tighten the No.4 engine joint bracket bolts and nuts in the order shown.

Bolt and nut No.	Tightening torque (N·m {kgf·m, ft·lbf})
1, 2, 3	66.6—93.1 {6.8—9.4, 49.2—68.6}
4	85.3—116.6 {8.7—11.8, 63.0—85.9}



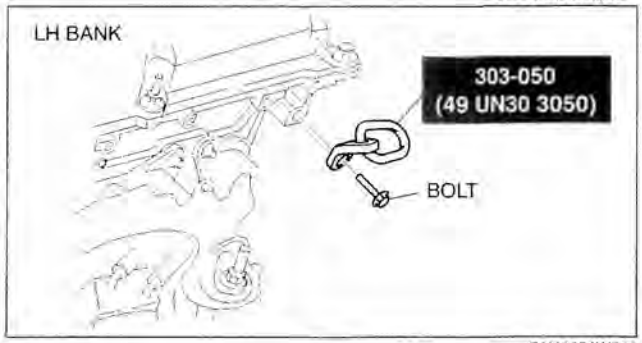
B6U2224W218

ENGINE DISASSEMBLY/ASSEMBLY [AJ]

C6U011002000W04

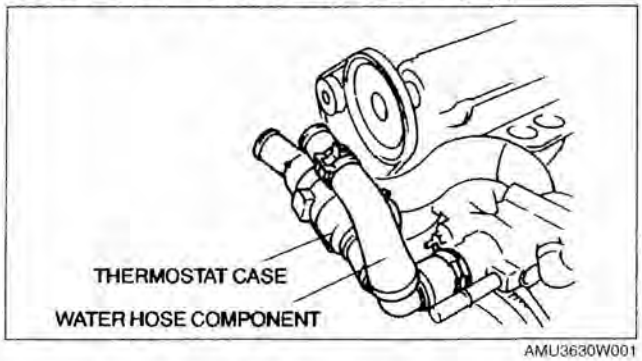
1. Using the bolts **part number 99794 1025** or **M10×1.25, length 25 mm {0.984 in}** to Install the **SST** as shown.

   Tightening torque
   100—125 N·m {10.2—12.7 kgf·m, 73.8—92.1 ft·lbf}



B6U2324W002

2. Remove the engine and transaxle from the engine jack.
3. Disconnect the engine and transaxle. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].)
4. Remove the generator. (See 01–17–3 GENERATOR REMOVAL/INSTALLATION.)
5. Remove the P/S oil pump. (See 06–12–29 POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY [AJ].)
6. Remove the intake-air system. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
7. Remove the exhaust system. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/INSTALLATION [AJ].)
8. Remove the thermostat case and water hose component.



AMU3630W001

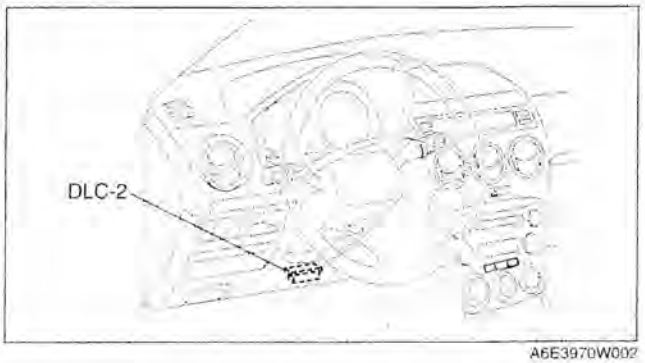
9. Remove the water bypass tube. (See 01–10B–30 Water Bypass Tube Removal Note.)
10. Remove the Ignition coils. (See 01–18–1 IGNITION COIL REMOVAL/INSTALLATION.)
11. Assemble in the reverse order of disassembly.

ENGINE TUNE-UP [AJ]

C6U011002000W05

Engine Tune-up Preparation

1. Turn off the electrical loads.
2. Warm up the engine as follows.
   (1) Start the engine.
   (2) Maintain the engine speed **2,500—3,000 rpm** until the cooling fans start to operate.
   (3) Release the accelerator pedal.
   (4) Wait until the cooling fans stop.
3. Connect the **SST** (WDS or equivalent) to the DLC-2.



A6E3970W002

Ignition Timing Inspection

Note
- Ignition timing is not adjustable.
- Ignition timing verification requires WDS or equivalent.

1. Verify that the ignition timing (WDS: SPARKADV PID) is within the specification using WDS or equivalent.

Ignition timing
Approx. BTDC 10°

2. Verify that ignition timing advances when the engine speed increases gradually.

Idle Speed Inspection

Note
- Idle speed is not adjustable.
- Idle speed verification requires WDS or equivalent.

1. Verify that the idle speed (WDS: RPM PID) is within the specification using WDS or equivalent.

Idle speed

Condition	Engine speed (rpm)*1
No load	700—800
Electrical loads*2 ON	700—800
P/S ON	700—800
A/C ON	700—800

*1 : Excludes temporary idle speed drop just after the electrical loads are turned on.
*2 : Blower motor is operating at high speed. Headlight switch is turned on. Rear window defroster switch is turned on. Cooling fans are operating.

Idle Mixture Inspection

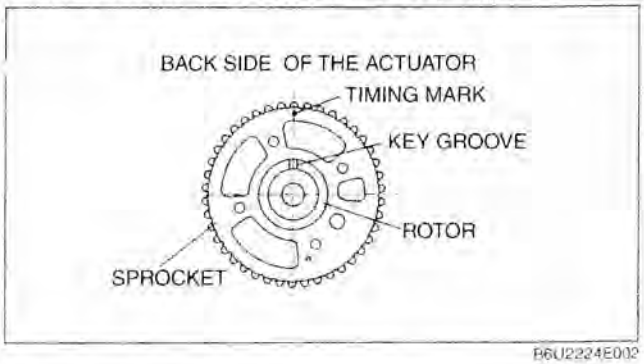
1. Verify that the idle speed and ignition timing are within the specification. (See 01–10B–45 Idle Speed Inspection.) (See 01–10B–45 Ignition Timing Inspection.)
2. Insert an exhaust gas analyzer to the tailpipe.
3. Verify that the CO and HC concentrations are within the regulation.

VARIABLE VALVE TIMING ACTUATOR INSPECTION [AJ]

C6U01100014 2W03

Caution
- **The variable valve timing actuator cannot be disassembled because it is a precision unit.**

1. Remove the cylinder head cover.(See 01–10B–8 TIMING CHAIN REMOVAL/INSTALLATION [AJ].)
2. Confirm that the key groove on the rotor and the timing mark on the sprocket of the variable valve timing actuator are aligned and fitted.
   - If the key groove and the timing mark are not aligned, rotate the crankshaft clockwise one rotation and then counterclockwise one rotation. Verify that the key groove and the timing mark are aligned.
   - If the key groove and timing mark are still not aligned, replace the variable valve timing actuator.
   - If, when rotating the crankshaft, there is a hitting noise from the variable valve timing actuator each time the cam passes the fully lifted position, it means that the actuator is not secured. Replace the actuator.



B6U2224E002

3. Install the cylinder head cover. (See 01–10B–8 TIMING CHAIN REMOVAL/INSTALLATION [AJ].)

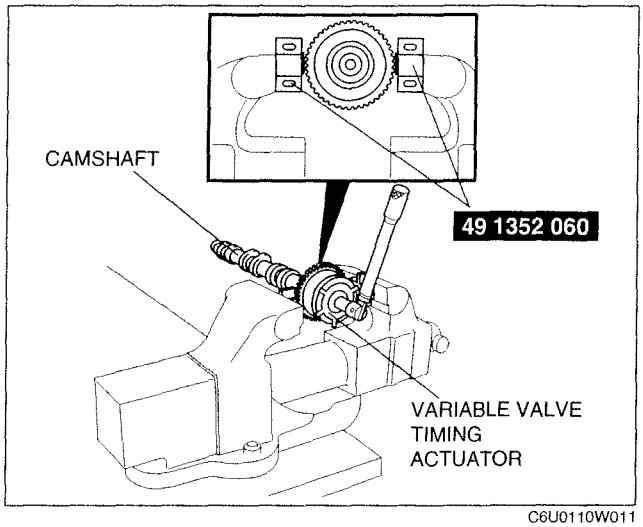
VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [AJ]

C6U011000142W04

Caution
- **The variable valve timing actuator cannot be disassembled because it is a precision unit.**

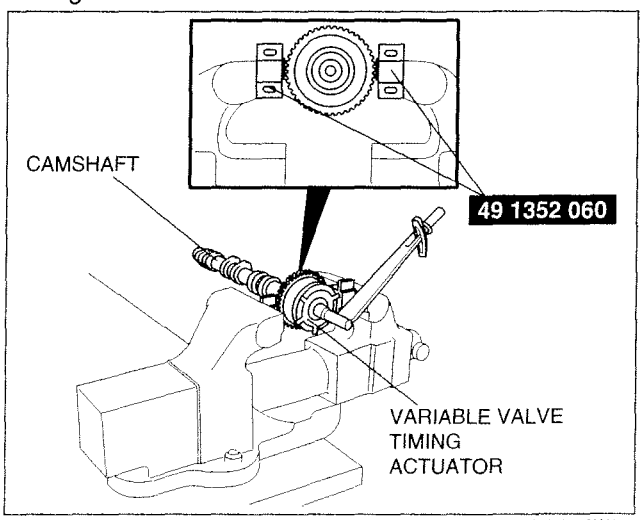
Note
- The camshaft sprocket is integrated with the variable valve timing actuator and cannot be disassembled.

1. Remove the camshaft component. (See 01–10B–33 HYDRAULIC LASH ADJUSTER (HLA) REMOVAL/INSTALLATION [AJ].)
2. Secure the camshaft sprocket in a vise using the **SST**.



C6U0110W011

3. Loosen the variable valve timing actuator tightening bolt.
4. Remove the variable valve timing actuator.
5. Install the variable valve timing actuator using a new tightening bolt.
6. Secure the camshaft sprocket in a vise using the **SST**.



C6U0110W012

7. Tighten the variable valve timing actuator tightening bolt in two steps.
   (1) Tighten to **40 N·m {4.1 kgf·m, 29.5 ft·lbf}**.
   (2) Tighten **90°**.

OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [AJ]

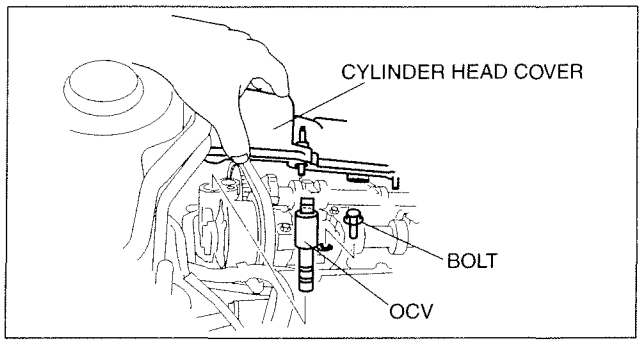
C6U011014420W03

RH bank

1. Disconnect the negative battery cable.
2. Remove the plug hole plate.
3. Remove the dynamic chamber. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
4. Remove the ignition coil. (See 01–18–1 IGNITION COIL REMOVAL/INSTALLATION.)
5. Remove the OCV connector.
6. Remove the ventilation hose.
7. Remove the cylinder head cover tightening bolt.
8. Remove the OCV with cylinder head cover raised as shown in the figure.

Note

- Take care not to let the OCV tightening bolt slip into the timing chain cover when removing the OCV tightening bolt from engine front.



B6U2215W114

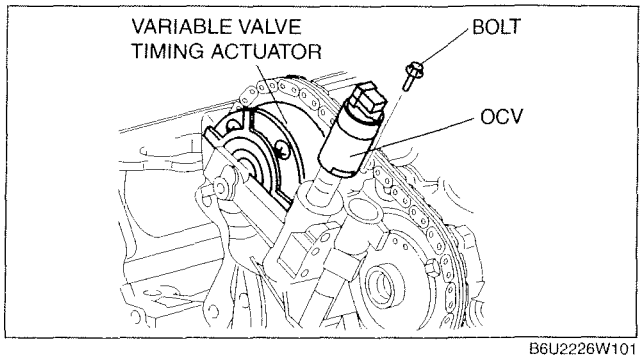
9. Install the OCV.

Tightening torque
8.0—12.0 N·m {82—122 kgf·cm, 71—106 in·lbf}

10. Install the cylinder head cover. (See 01–10B–26 Cylinder Head Cover (RH) Installation Note.)
11. Install the ventilation hose.
12. Install the OCV connector.
13. Install the ignition coil. (See 01–18–1 IGNITION COIL REMOVAL/INSTALLATION.)
14. Install the plug hole plate.
15. Install the dynamic chamber. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)

LH bank

1. Disconnect the negative battery cable.
2. Remove the plug hole plate.
3. Remove the ignition coil. (See 01–18–1 IGNITION COIL REMOVAL/INSTALLATION.)
4. Remove the OCV connector.
5. Remove the ventilation hose.
6. Remove the cylinder head cover.
7. Remove the OCV.



B6U2226W101

8. Install the OCV.

Tightening torque
8.0—12.0 N·m {82—122 kgf·cm, 71—106 in·lbf}

9. Install the cylinder head cover. (See 01–10B–26 Cylinder Head Cover (RH) Installation Note.)
10. Install the ventilation hose.
11. Install the OCV connector.
12. Install the ignition coil. (See 01–18–1 IGNITION COIL REMOVAL/INSTALLATION.)
13. Install the plug hole plate.

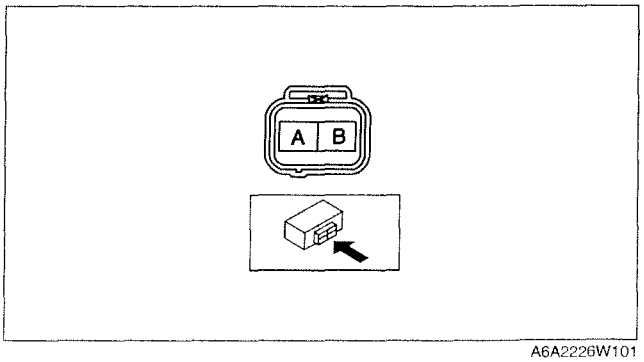
OIL CONTROL VALVE (OCV) INSPECTION [AJ]

C6U011014420W04

Coil Resistance Inspection

1. Disconnect the negative battery cable.
2. Disconnect the oil control valve (OCV) connector.
3. Measure the resistance between terminals A and B using an ohmmeter.
   - If not as specified, replace the oil control valve (OCV).

Specification
7.05—7.95 ohms

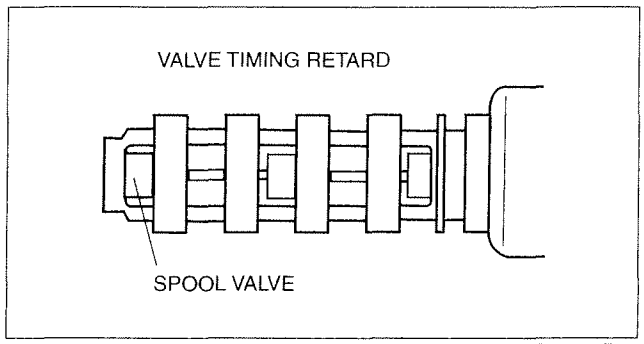


A6A2226W101

4. Connect the oil control valve (OCV) connector.

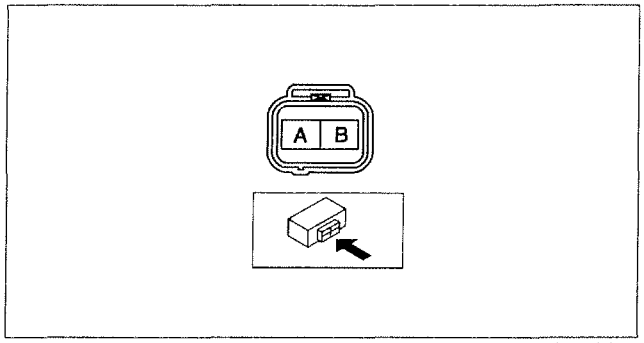
Spool Valve Operation Inspection

1. Disconnect the negative battery cable.
2. Remove the oil control valve (OCV).
3. Verify that the spool valve in the oil control valve (OCV) is in the maximum valve timing retard position as indicated in the figure.
   - If not as specified, replace the oil control valve (OCV).



B6U2424E001

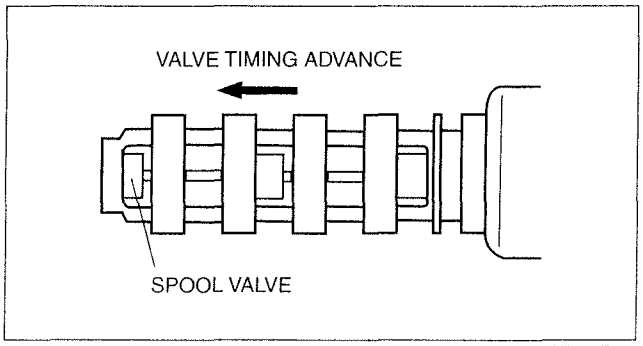
4. Verify that the battery is fully charged.
   - If not as specified, recharge the battery.
5. Apply battery positive voltage between the oil control valve (OCV) terminals and verify that the spool valve operates and moves to the maximum valve timing advance position.
   - If not as specified, replace the oil control valve (OCV).



A6A2226W101

Note

- When applying battery positive voltage between the oil control valve (OCV) terminals, the connection can be either of the following:
  - — Positive battery cable to terminal A, negative battery cable to terminal B
  - — Positive battery cable to terminal B, negative battery cable to terminal A



B6U2424E002

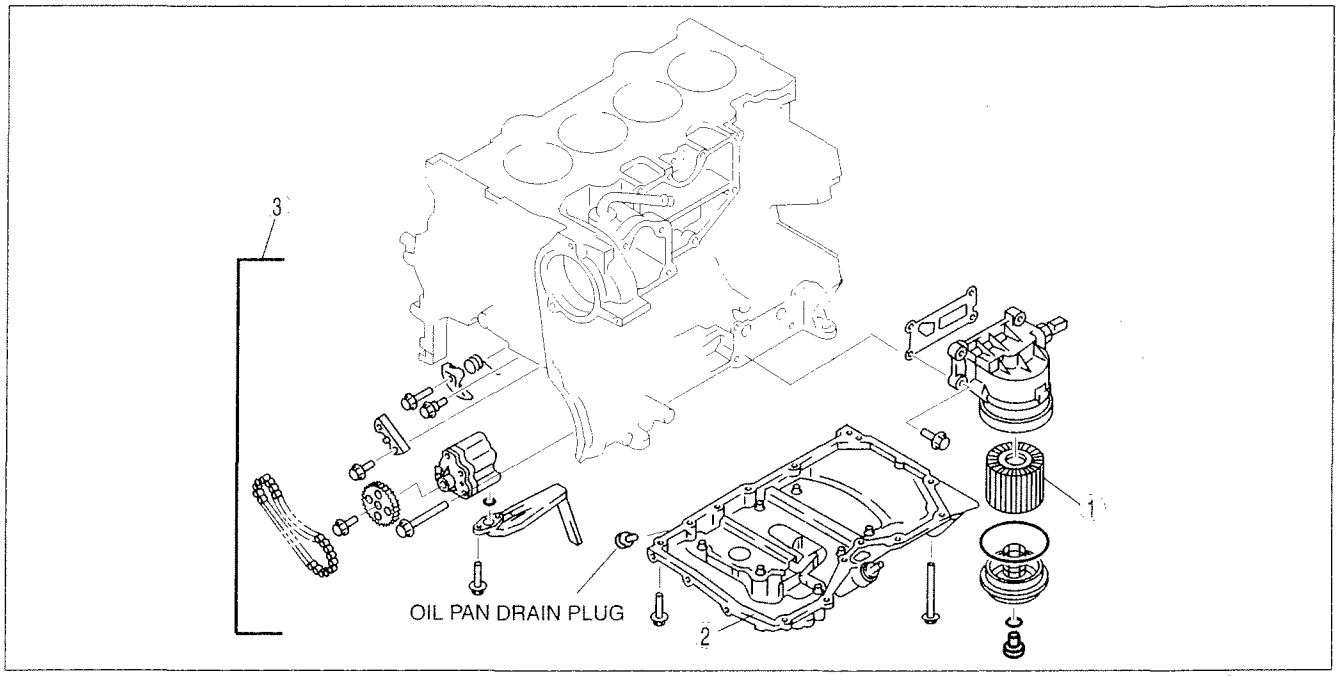
6. Stop applying battery positive voltage and verify that the spool valve returns to the maximum valve timing retard position.
   - If not as specified, replace the oil control valve (OCV).

01–11 LUBRICATION

LUBRICATION SYSTEM LOCATION INDEX

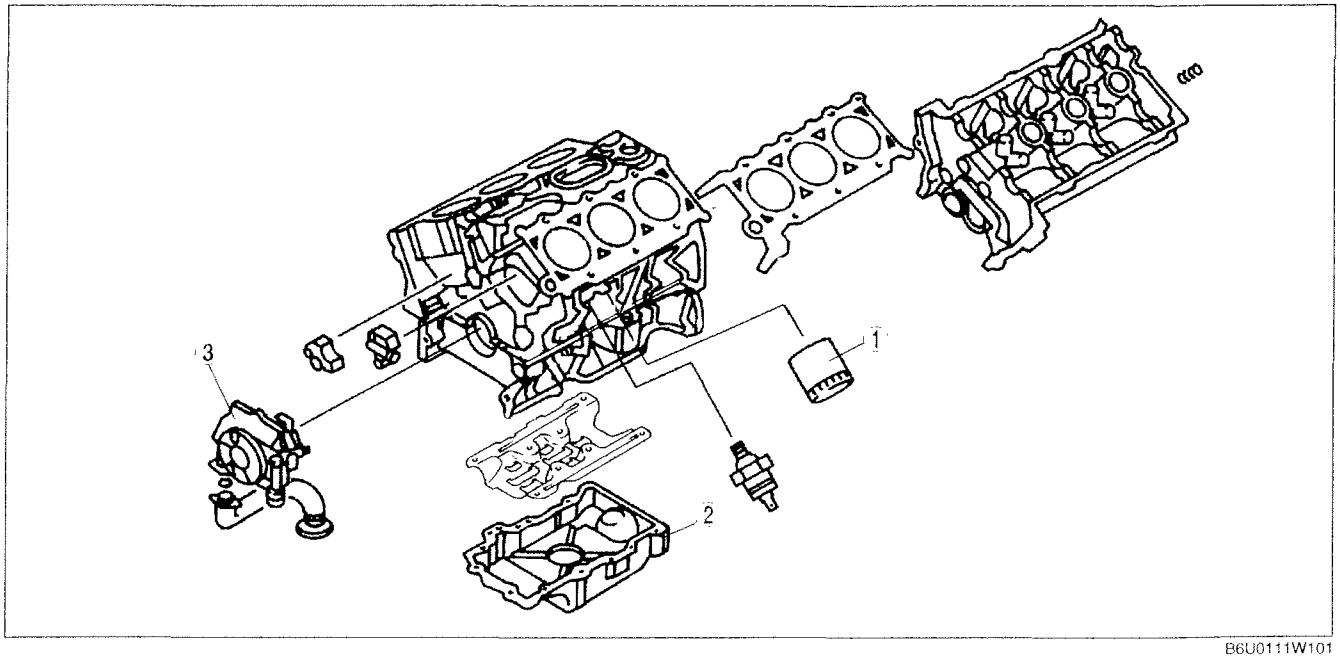
C6U011101003W01

L3



C6U0111W001

AJ



B6U0111W101

1	Oil filter (See 01–11–7 OIL FILTER REPLACEMENT.)
2	Oil pan (See 01–11–8 OIL PAN REMOVAL/ INSTALLATION.)

3	Oil pump (See 01–11–13 OIL PUMP REMOVAL/ INSTALLATION.)

ENGINE OIL LEVEL INSPECTION

C6U011114001W01

1. Position the vehicle on level ground.
2. Warm up the engine to normal operating temperature.
3. Stop the engine and wait for 5 min.
4. Remove the dipstick and verify that the oil level is between the MIN and MAX marks on the dipstick and inspect the engine oil condition.
   - If the oil level is below the MIN mark, add the recommended engine oil.
   - If necessary, replace with the recommended engine oil.

ENGINE OIL REPLACEMENT

C6U011114001W02

Warning

- **Hot engines and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.**
- **A vehicle that is lifted but not securely suppported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.**
- **Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.**

Caution

- **In case you spill the engine oil on the exhaust system, wipe it off completely. If you fail to wipe the spilled engine oil, it will produce fumes because of the heat.**

L3

1. Position the vehicle on level ground.
2. Remove the oil filler cap.
3. Remove the under cover.
4. Remove the oil pan drain plug.
5. Drain the engine oil into a container.
6. Inspect the rubber seal of the oil pan drain plug and make sure there are no cracks or damage.
   - If necessary, replace the oil pan drain plug.
7. Clean the flange surface (seal rubber) on the oil pan drain plug, then install the oil pan drain plug.

Oil pan drain plug tightening torque
25—30 N·m {2.6—3.0 kgf·m, 19—22 ft·lbf}

Note

- The amount of residual oil in the engine can vary according to factors such as the replacement method, oil temperature. Verify the oil level after engine oil replacement.

8. Refill the engine with the type and amount of engine oil specified in the table.

Oil capacity

L {US qt, Imp qt}

Item	Specification
	L3
Oil replacement	3.9 {4.1, 3.4}
Oil and oil filter replacement	4.3 {4.5, 3.8}
Total (dry engine)	4.6 {4.8, 4.0}

Recommended engine oil

Item	Specification
Grade (API)	SL
ILSAC	GF–3
Viscosity (SAE)	5W–20

9. Install the oil filler cap.
10. Start the engine and confirm that there is no oil leakage.
    - If there is oil leakage, find the cause and repair or replace the applicable part.
11. Inspect the oil level. (See 01–11–3 ENGINE OIL LEVEL INSPECTION.)
12. Install the under cover.

AJ

1. Position the vehicle on level ground.
2. Remove the oil filler cap.
3. Remove the under cover.
4. Remove the oil pan drain plug.
5. Drain the engine oil into a container.
6. Inspect the rubber seal of the oil pan drain plug and make sure there are no cracks or damage.
   - If necessary, replace the oil pan drain plug.
7. Clean the flange surface (seal rubber) on the oil pan drain plug, then install the oil pan drain plug.

Tightening torque
22—30 N·m {2.2—3.0 kgf·m, 16.3—21.6 ft·lbf}

Note
- The amount of residual oil in the engine can vary according to the replacement method, oil temperature, etc. Verify the oil level after engine oil replacement.

8. Refill the engine oil with the specified type and amount, then install the oil filler cap.

Oil capacity

L {US qt, Imp qt}

Item	Specifications
	AJ
Oil replacement	5.2 {5.5, 4.6}
Oil and oil filter replacement	5.7 {6.0, 5.0}
Total (dry engine)	6.2 {6.6, 5.5}

Recommended engine oil

Item	Specification
Grade (API)	SL
ILSAC	GF–3
Viscosity (SAE)	5W–20

9. Start the engine and inspect for oil leakage.
   - If the oil leaks, specify the faulty part and repair or replace it.
10. Inspect the oil level.
    - If necessary, add oil. (See 01–11–3 ENGINE OIL LEVEL INSPECTION.)
11. Install the under cover.

OIL PRESSURE INSPECTION

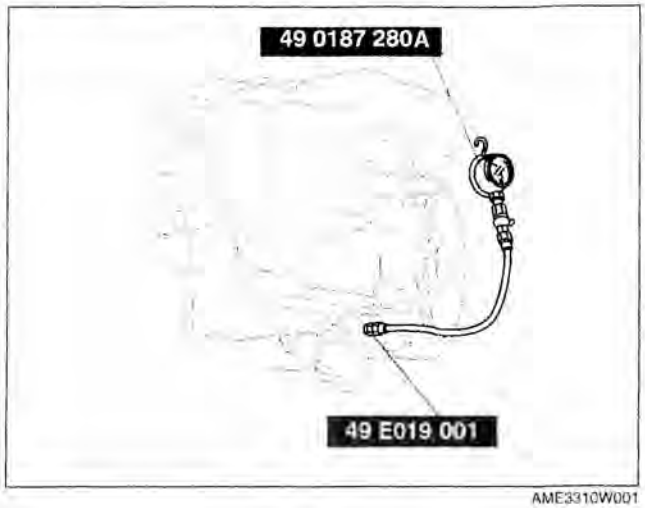
C6U011118500W01

L3

Warning
- **Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.**
- **Hot engines and the engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.**

1. Remove the under cover.
2. Remove the oil pressure switch.

3. Screw the **SSTs** into the oil pressure switch installation hole.



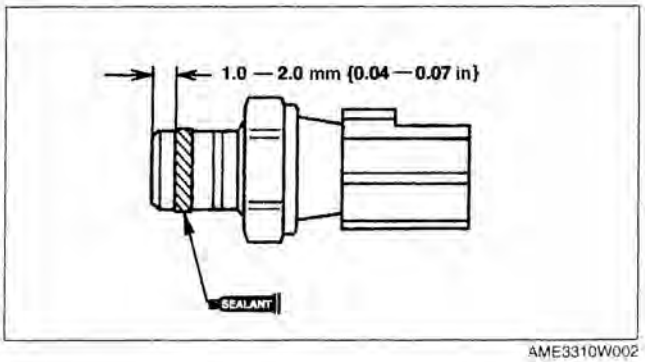
AME3310W001

4. Warm up the engine to normal operating temperature.
5. Run the engine at the specified speed, and note the gauge readings.
   - If not within the specification, inspect for the cause and repair or replace as necessary.

Note
- The oil pressure can vary with oil viscosity and temperature.

Oil pressure
395—649 kPa {4.03—6.61 kgf/cm^2, 57.3—94.1 psi} [3,000 rpm]

6. Stop the engine and wait until it is cool.
7. Remove the **SSTs**.
8. Apply silicone sealant to the oil pressure switch threads as shown in the figure.



AME3310W002

9. Install the oil pressure switch.

Tightening torque
12—16 N·m {1.2—1.7 kgf·m, 9—12 ft·lbf}

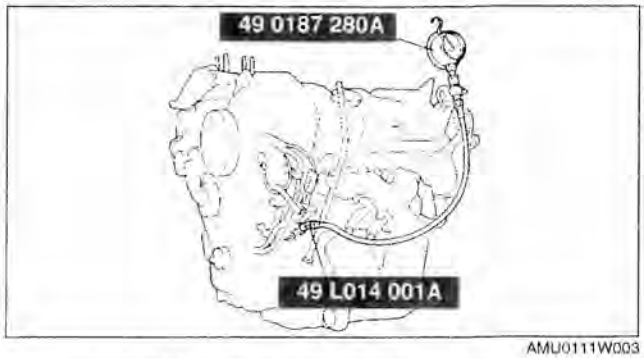
10. Start the engine and inspect for oil leakage.
    - If the oil leaks, specify the faulty part and repair or replace it.
11. Install the under cover.

AJ

Warning
- **Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.**
- **Hot engines and the engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.**

1. Remove the under cover.
2. Remove the drive belt. (See 01–10B–5 DRIVE BELT REPLACEMENT [AJ].)
3. Remove the A/C compressor with the pipe still connected. Position the A/C compressor so that it is out of the way. (See 07–11–6 A/C COMPRESSOR REMOVAL/INSTALLATION.)

4. Remove the oil pressure switch.
5. Screw the **SSTs** into the oil pressure switch installation hole.



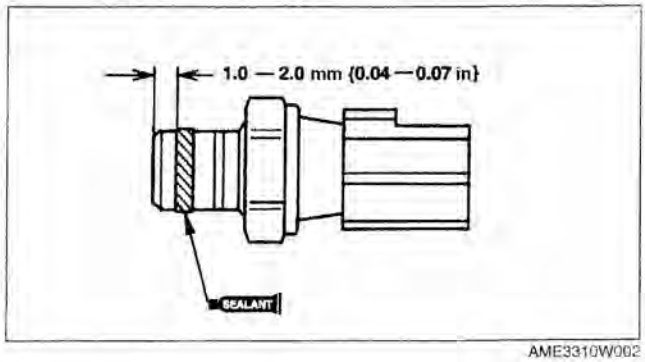
AMU0111W003

6. Install the A/C compressor. (See 07–11–6 A/C COMPRESSOR REMOVAL/INSTALLATION.)
7. Install the drive belt. (See 01–10B–5 DRIVE BELT REPLACEMENT [AJ].)
8. Warm up the engine to normal operating temperature.
9. Run the engine at the specified speed, and note the gauge readings.
   - If not within the specification, inspect for the cause and repair or replace as necessary.

Note
- The oil pressure can vary with oil viscosity and temperature.

Oil pressure
138—310 kPa {1.40—3.17 kgf/cm^2, 20—45 psi} [1,500 rpm]

10. Stop the engine and wait until it is cool.
11. Remove the drive belt. (See 01–10B–5 DRIVE BELT REPLACEMENT [AJ].)
12. Remove the A/C compressor with the pipe still connected. Position the A/C compressor so that it is out of the way. (See 07–11–6 A/C COMPRESSOR REMOVAL/INSTALLATION.)
13. Remove the **SSTs**.
14. Apply silicone sealant to the oil pressure switch threads as shown in the figure.



AME3310W002

15. Install the oil pressure switch.

Tightening torque
12—16 N·m {1.2—1.7 kgf·m, 9—12 ft·lbf}

16. Install the A/C compressor. (See 07–11–6 A/C COMPRESSOR REMOVAL/INSTALLATION.)
17. Install the drive belt. (See 01–10B–5 DRIVE BELT REPLACEMENT [AJ].)
18. Start the engine and inspect for oil leakage.
    - If the oil leaks, specify the faulty part and repair or replace it.
19. Install the under cover.

OIL FILTER REPLACEMENT

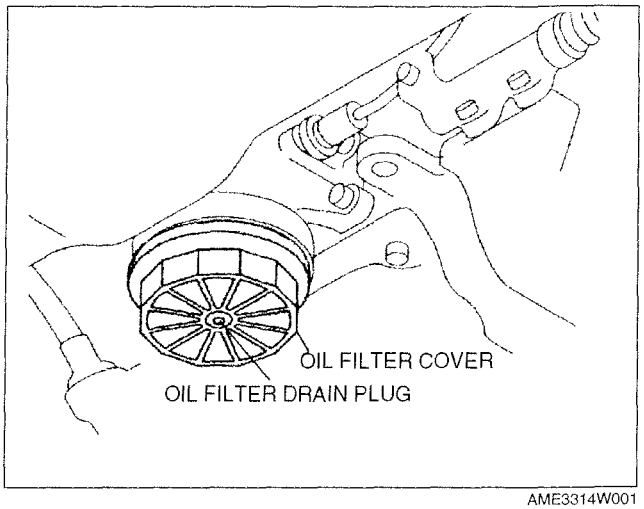
C6U011114300W01

Warning
- **Continuous exposure with USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after this work.**
- **Hot engines and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.**

L3

Caution
- **To avoid damage to the oil filter, use only specified oil filter.**

1. Remove the under cover.
2. Loosen the oil filter drain plug. (Do not remove.)

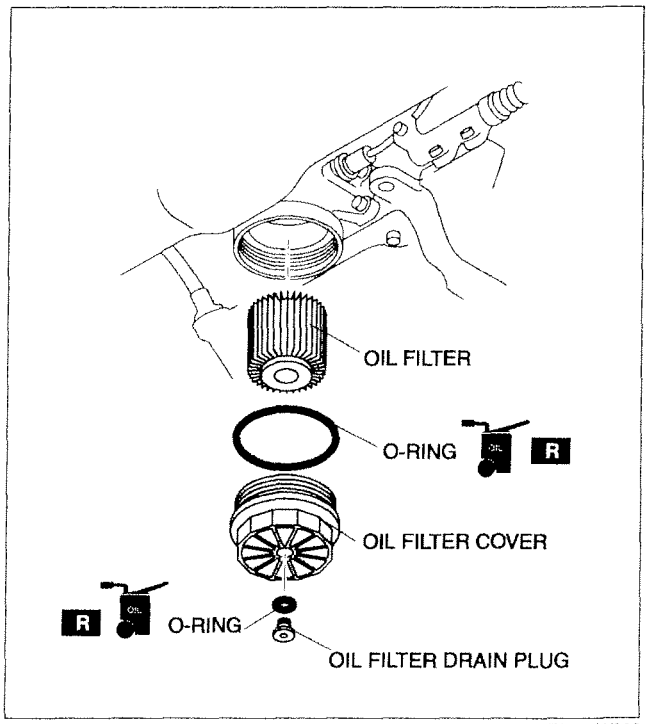


AME3314W001

3. Loosen the filter cover for 1 turn using a commercially available, cap-type oil filter wrench (diameter- **74 mm {2.9 in}**).
4. Remove the oil filter drain plug, and drain the engine oil.

Note
- Oil could be easily drained when the air is in the filter.

5. Loosen the oil filter cover for another 1 turn.
6. Remove the oil filter cover and the oil filter.



AME3314W002

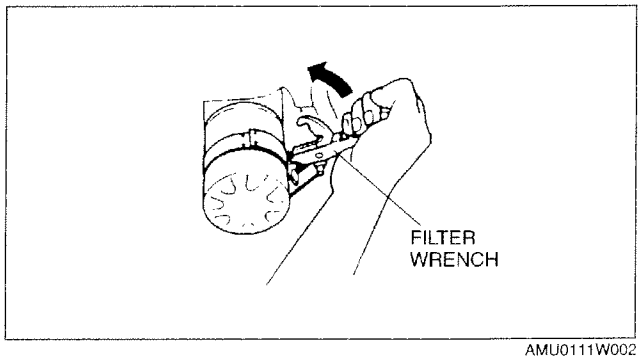
7. Use a clean rag to wipe off the mounting surface on the oil filter adapter and the oil filter cover.
8. Apply clean oil to a new O-ring of the oil filter cover.
9. Apply clean oil to a new O-ring of the oil filter drain plug.
10. Install the oil filter, oil filter drain plug, and oil filter cover.
11. Tighten the oil filter cover and the oil filter drain plug.

Tightening torque
Oil filter cover:
30—35 N·m {3.1—3.5 kgf·m, 22.2—25.8 ft·lbf}
Oil filter drain plug:
9—10 N·m {91.8—101.9 kgf·cm, 79.6—88.4 in·lbf}

12. Remove the dipstick and verify that the oil level is between the MIN and MAX marks on the dipstick.
    - If the oil is below MIN mark, add oil.
13. Start the engine and inspect for oil leakage.
    - If the oil leaks, specify the faulty part and repair or replace it.
14. Inspect the oil level.
    - If necessary, add oil. (See 01–11–3 ENGINE OIL LEVEL INSPECTION.)
15. Install the under cover.

AJ

1. Remove the under cover.
2. Remove the oil filter from above using a filter wrench.



AMU0111W002

3. Use a clean rag to wipe off the mounting surface.
4. Apply clean engine oil to the O-ring of new oil filter.
5. Install the oil filter until the O-ring contacts the sealing surface.
6. Tighten the filter 3/4 turns by hand.

Caution
- **In case you spill engine oil on the exhaust system or the engine, wipe it off completely. If you fail to wipe the spilled engine oil, it will produce fumes because of the heat.**

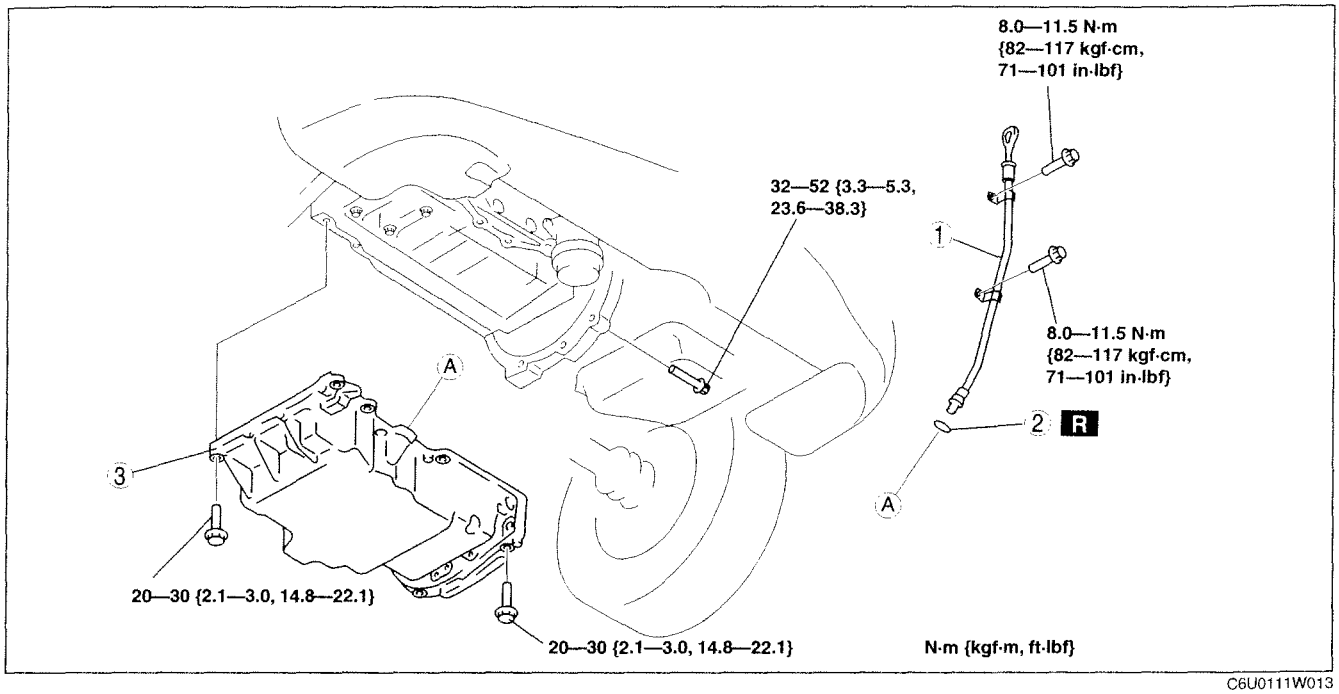
7. Start the engine and inspect for oil leakage.
8. Inspect the oil level.
    - Add oil if necessary. (See 01–11–3 ENGINE OIL LEVEL INSPECTION.)
9. Install the under cover.

OIL PAN REMOVAL/INSTALLATION

C6U011110040W01

L3

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Drain the engine oil. (See 01–11–3 ENGINE OIL REPLACEMENT.)
4. Remove the engine front cover. (See 01–10A–11 TIMING CHAIN REMOVAL/INSTALLATION [L3].)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Refill the engine oil with the specified type and amount. (See 01–11–3 ENGINE OIL REPLACEMENT.)
8. Start the engine and inspect for oil leakage.
    - If the oil leaks, specify the faulty part and repair or replace it.
9. Inspect the oil level. (See 01–11–3 ENGINE OIL REPLACEMENT.)



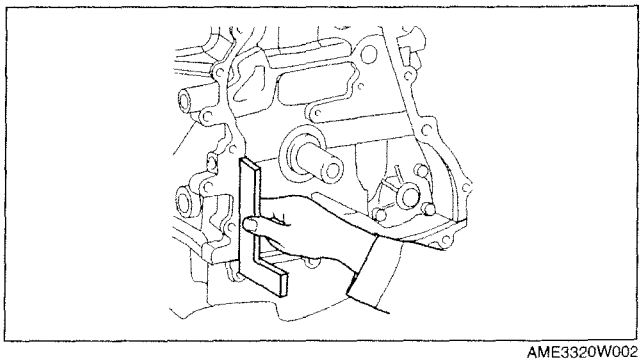
C6U0111W013

1	Oil level gauge pipe

2	Oil pan (See 01–11–9 Oil Pan Installation Note (L3).)

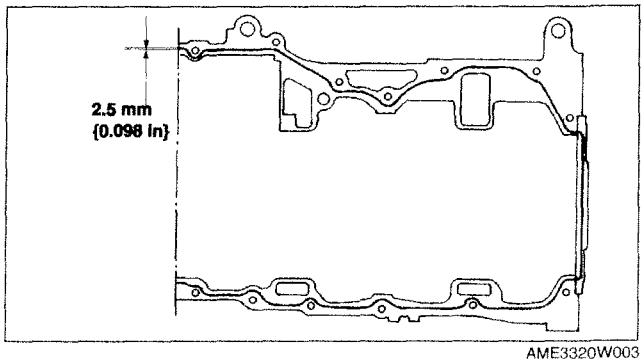
Oil Pan Installation Note (L3)

1. Use a square ruler to align the junction of the oil pan and the cylinder block on the engine front cover side.



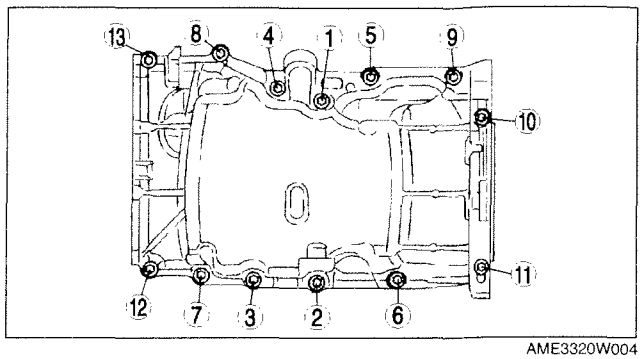
AME3320W002

2. Apply silicone sealant to the oil pan along the inside of the bolt holes.



AME3320W003

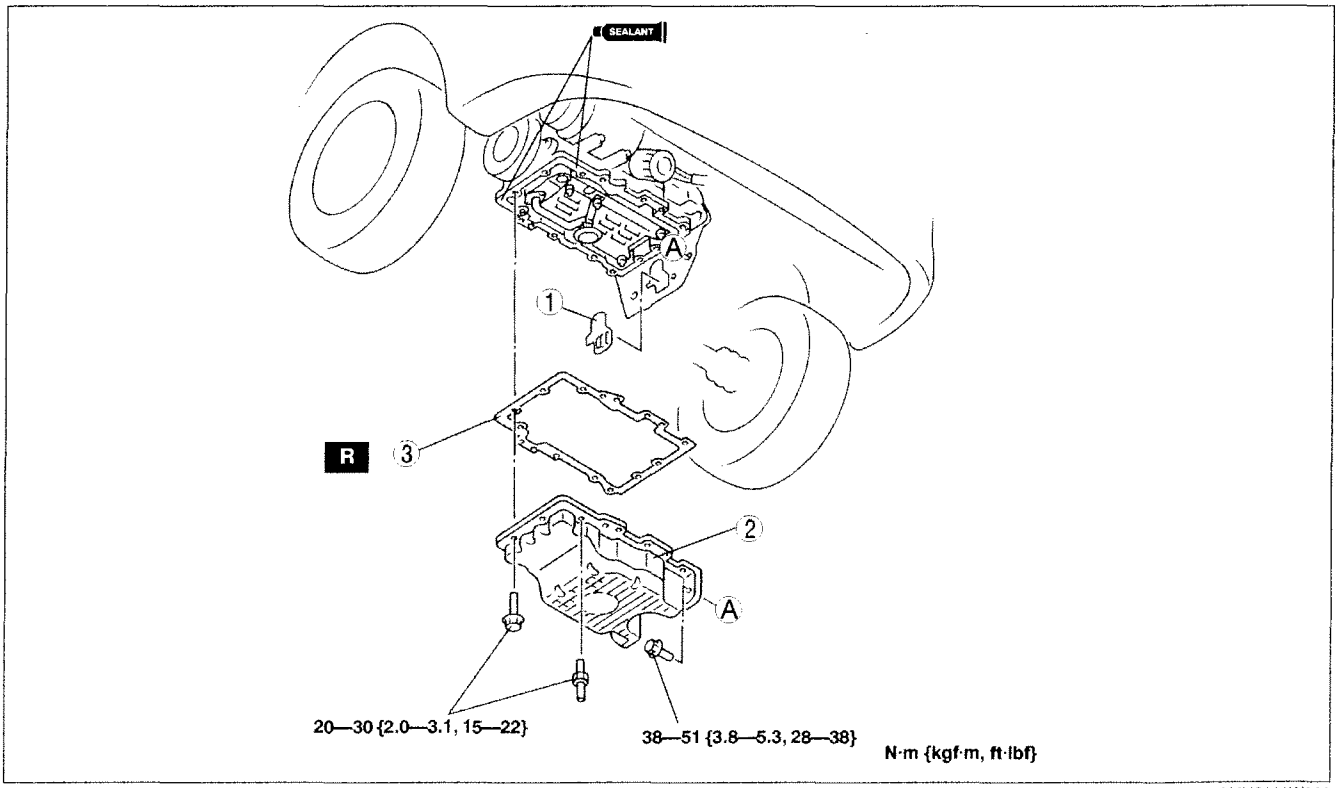
3. Tighten the bolts in the order as shown in the figure.



AME3320W004

AJ

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Drain the engine oil. (See 01–11–3 ENGINE OIL REPLACEMENT.)
4. Remove the TWC (RH). (See 01–15B–2 EXHAUST SYSTEM REMOVAL/INSTALLATION [AJ].)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Refill the engine oil with the specified type and amount. (See 01–11–3 ENGINE OIL REPLACEMENT.)
8. Start the engine and inspect for oil leakage.
   - If the oil leaks, specify the faulty part and repair or replace it.
9. Inspect the oil level. (See 01–11–3 ENGINE OIL REPLACEMENT.)

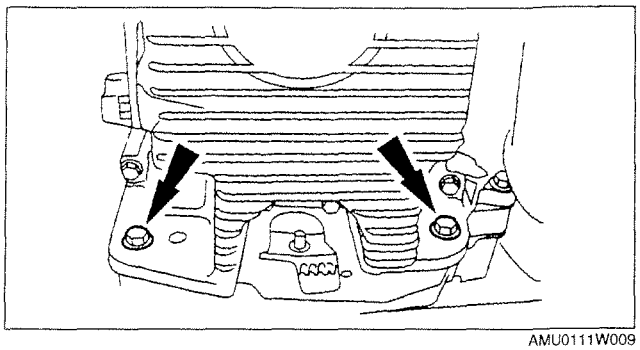


AMU0111W008

1	End plate cover
2	Oil Pan (See 01–11–11 Oil Pan Removal Note (AJ).) (See 01–11–12 Oil Pan Installation Note (AJ).)
3	Oil pan gasket (See 01–11–11 Oil Pan Gasket Installation Note (AJ).)

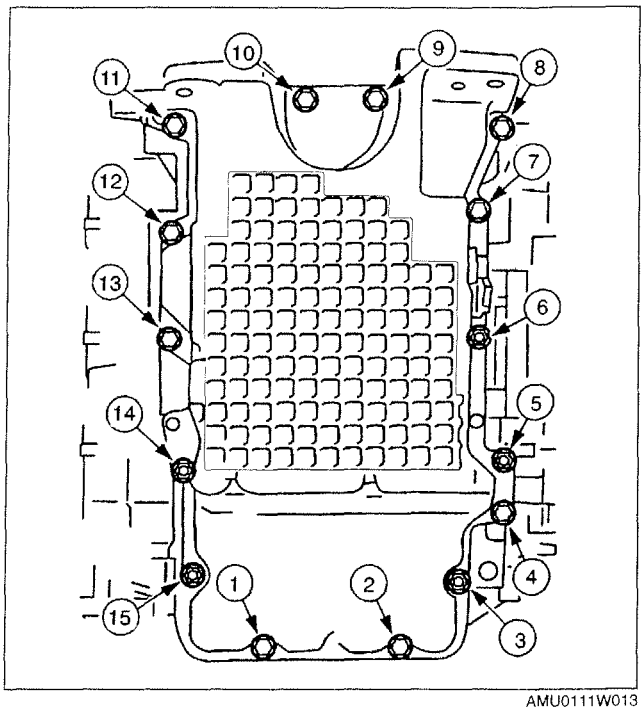
Oil Pan Removal Note (AJ)

1. Remove the transaxle housing bolts from oil pan.



AMU0111W009

2. Loosen the oil pan bolts and studs in two or three passes in the order as shown in the figure.

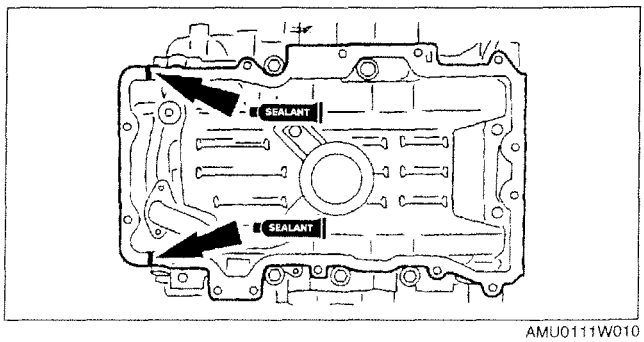


AMU0111W013

Oil Pan Gasket Installation Note (AJ)

1. Apply silicone sealant to the cylinder block as shown in the figure.

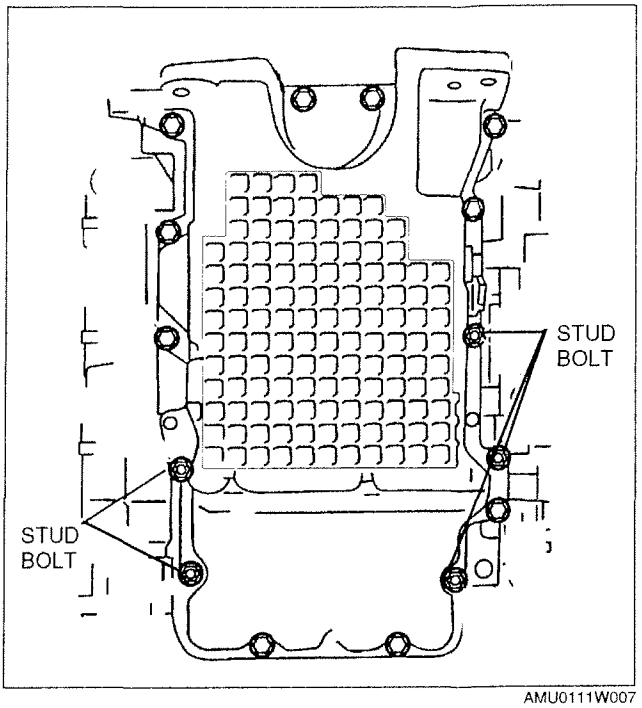
   Dot diameter
   10 mm {0.39 in}



AMU0111W010

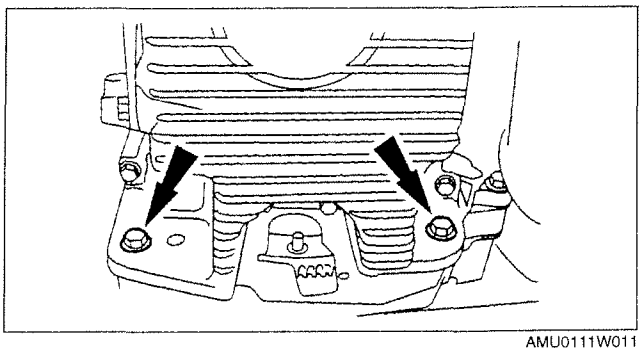
Oil Pan Installation Note (AJ)

1. Install the oil pan bolts and studs as shown in the figure.

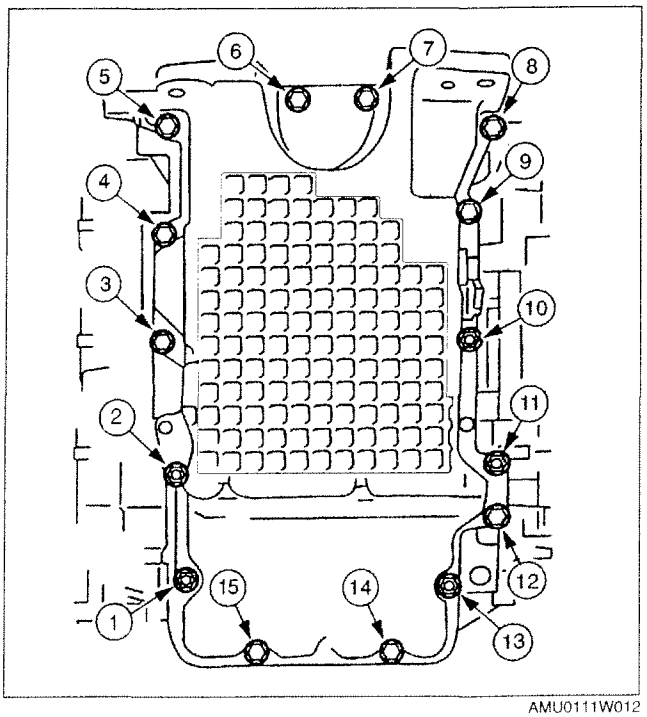


AMU0111W007

2. Tighten the transaxle housing bolts to oil pan.


AMU0111W011

3. Tighten the oil pan bolts and studs in several passes in the order as shown in the figure.



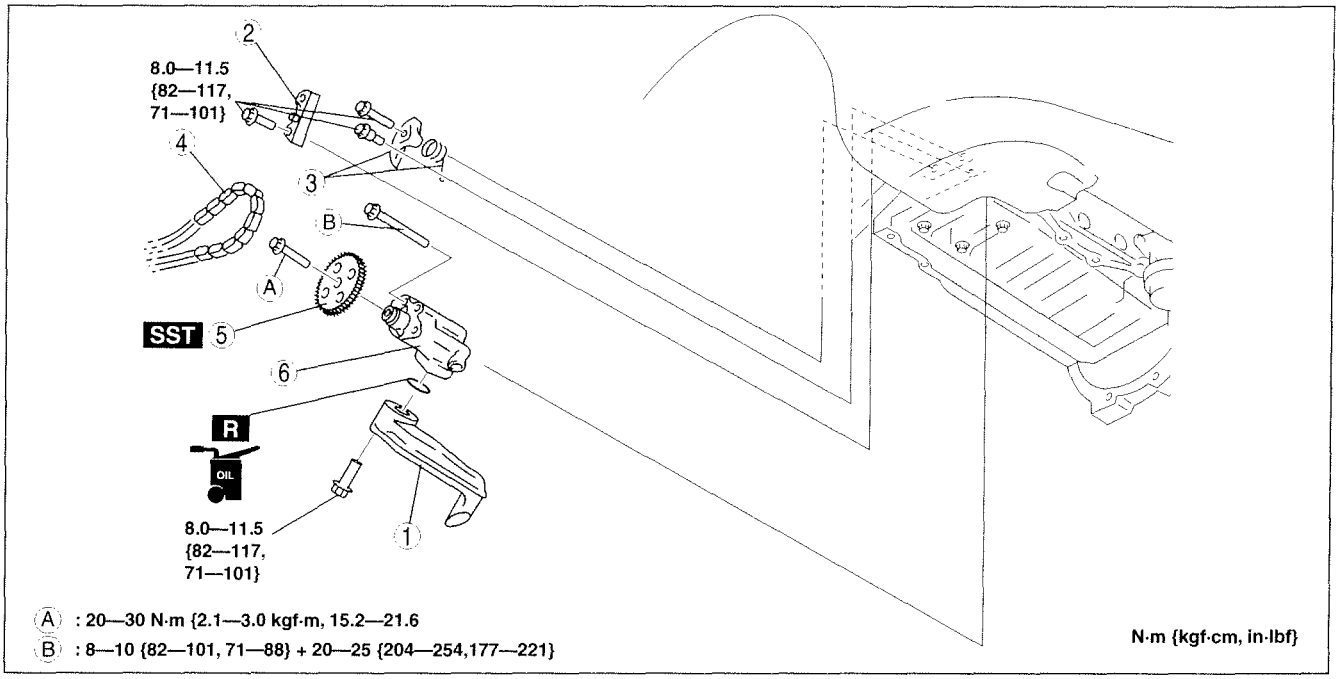
AMU0111W012

OIL PUMP REMOVAL/INSTALLATION

C6U011119220W01

L3

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Remove the oil pan. (See 01–11–8 OIL PAN REMOVAL/INSTALLATION.)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Start the engine and inspect for oil leakage.
   - If the oil leaks, specified the faulty part and repair or replace it.
7. Inspect the oil level. (See 01–11–3 ENGINE OIL REPLACEMENT.)
8. Inspect the oil pressure. (See 01–11–4 OIL PRESSURE INSPECTION.)



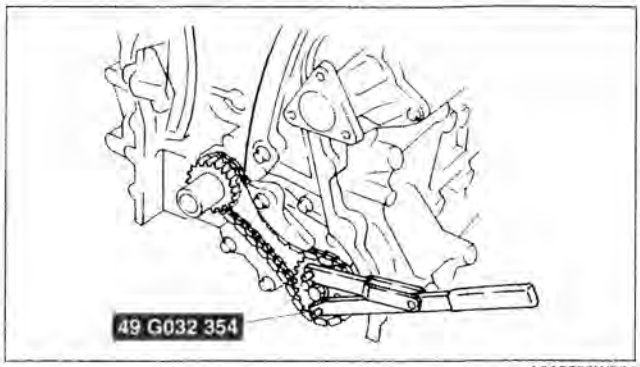
B3E0111W016

1	Oil strainer
2	Oil pump chain guide
3	Oil pump chain tensioner and spring component
4	Oil pump chain

5	Oil pump sprocket (See 01–11–14 Oil Pump Sprocket Removal/ Installation Note (L3).)
6	Oil pump (See 01–11–14 Oil Pump Installation Note (L3).)

Oil Pump Sprocket Removal/Installation Note (L3)

1. Install the **SST** to the oil pump sprocket to stop the oil pump from rotating.

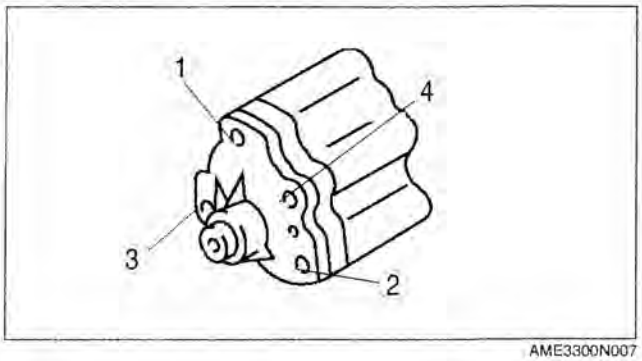


A6A3322W201

Oil Pump Installation Note (L3)

1. Tighten the oil pump bolts in two steps in the order indicated in the figure.

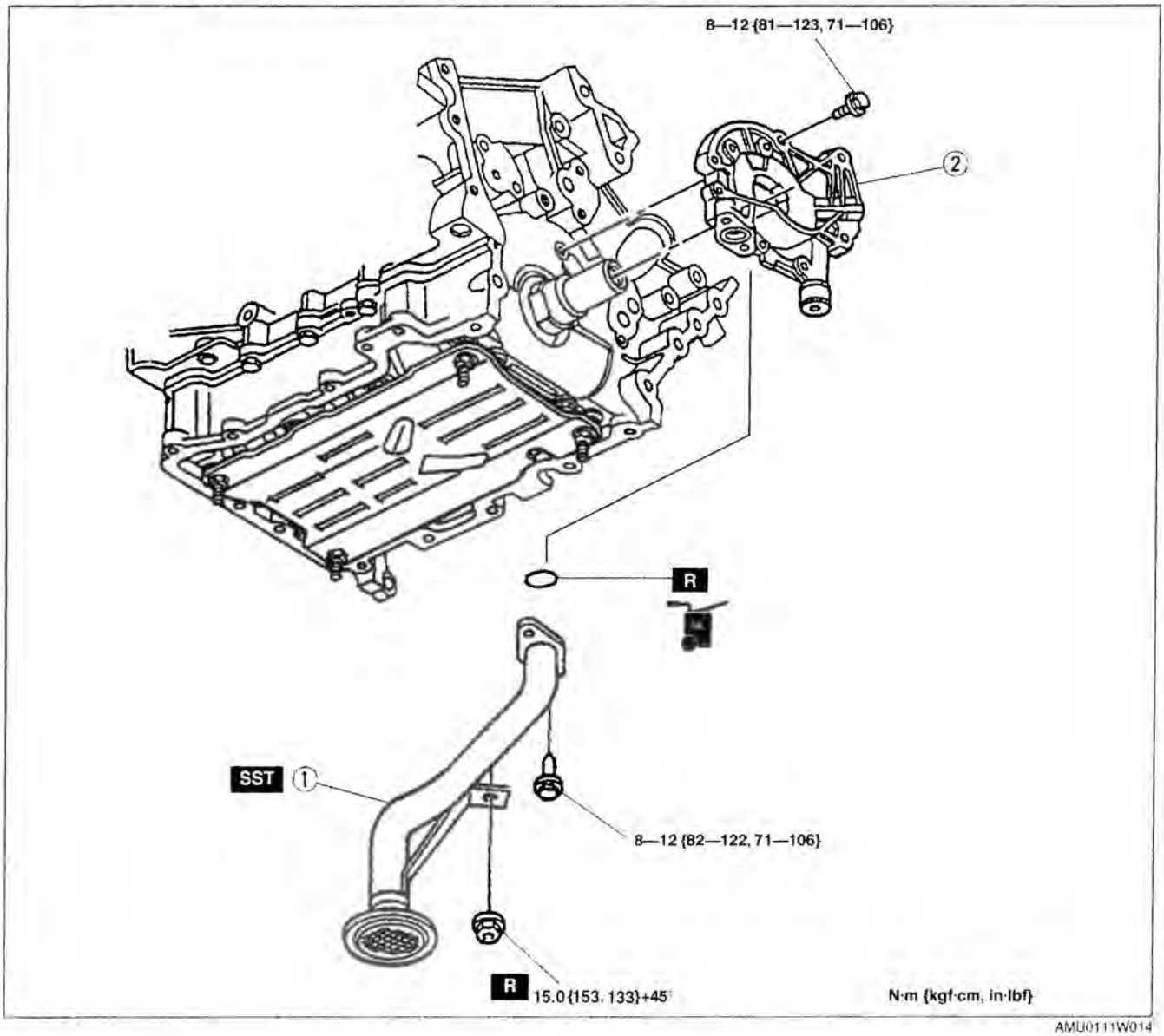
   Tightening torque:
   1) 8—10 N·m {82—101 kgf·cm, 71—88 in·lbf}
   2) 20—25 N·m {2.1—2.5 kgf·m, 15.2—18.4 ft·lbf}



AME3300N007

AJ

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Remove the oil pan. (See 01–11–8 OIL PAN REMOVAL/INSTALLATION.)
4. Remove the timing chain. (See 01–10B–8 TIMING CHAIN REMOVAL/INSTALLATION [AJ].)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Start the engine and inspect for oil leakage.
   - If the oil leaks, specified the faulty part and repair or replace it.
8. Inspect the oil level. (See 01–11–3 ENGINE OIL REPLACEMENT.)
9. Inspect the oil pressure. (See 01–11–4 OIL PRESSURE INSPECTION.)



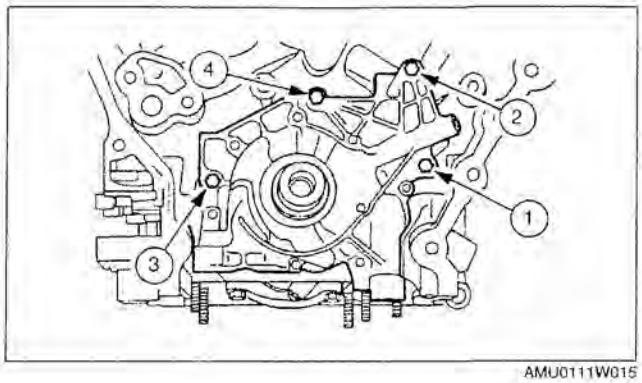
AMU0111W014

1	Oil strainer (See 01–11–16 Oil Strainer Installation Note (AJ).)

2	Oil pump (See 01–11–16 Oil Pump Removal Note (AJ).) (See 01–11–16 Oil Pump Installation Note (AJ).)

Oil Pump Removal Note (AJ)

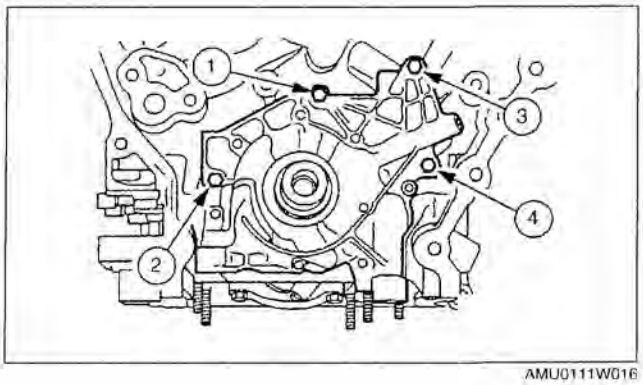
1. Loosen the oil pump bolts in the order as shown in the figure.



AMU0111W015

Oil Pump Installation Note (AJ)

1. Tighten the oil pump bolts in the order as shown in the figure.



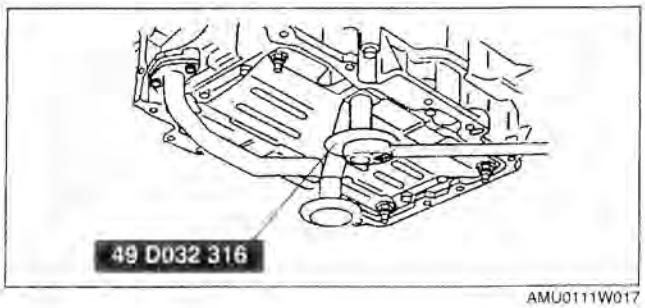
AMU0111W016

Oil Strainer Installation Note (AJ)

1. Tighten the oil strainer bolts.

   Tightening torque
   8—12 N·m {82—122 kgf·cm, 71—106 in·lbf}

2. Tighten the oil strainer stay nut to **15.0 N·m {153 kgf·cm, 133 in·lbf}**, then tighten it further **45°** using the **SST**.



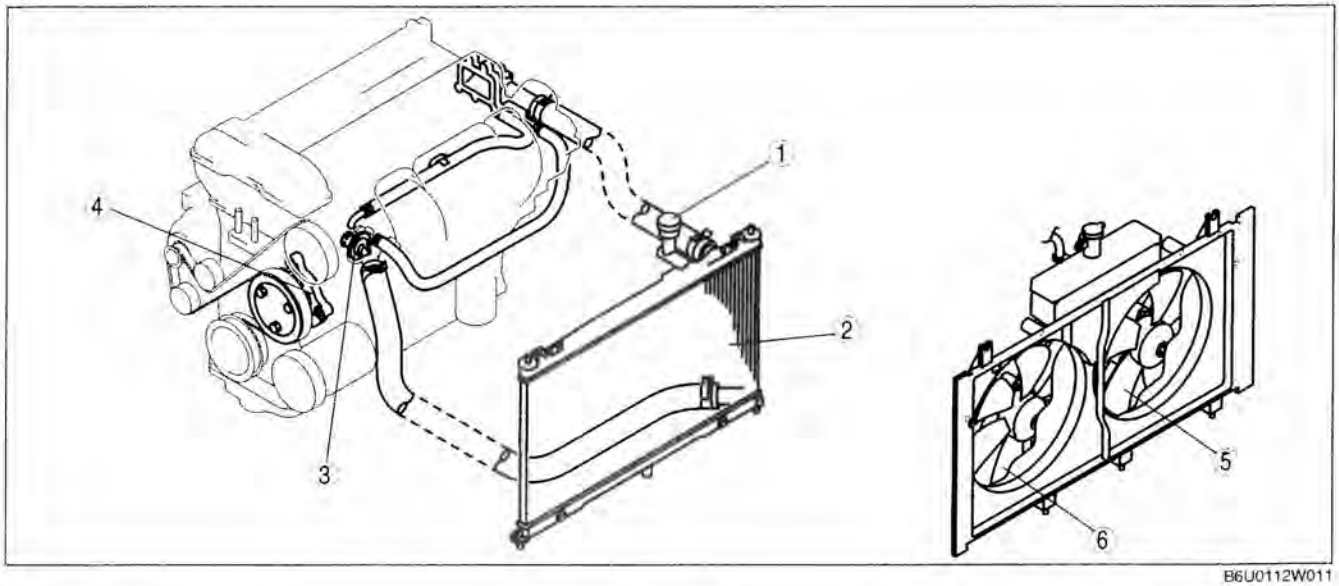
AMU0111W017

01–12 COOLING SYSTEM

COOLING SYSTEM LOCATION INDEX

C6U011201004W01

L3

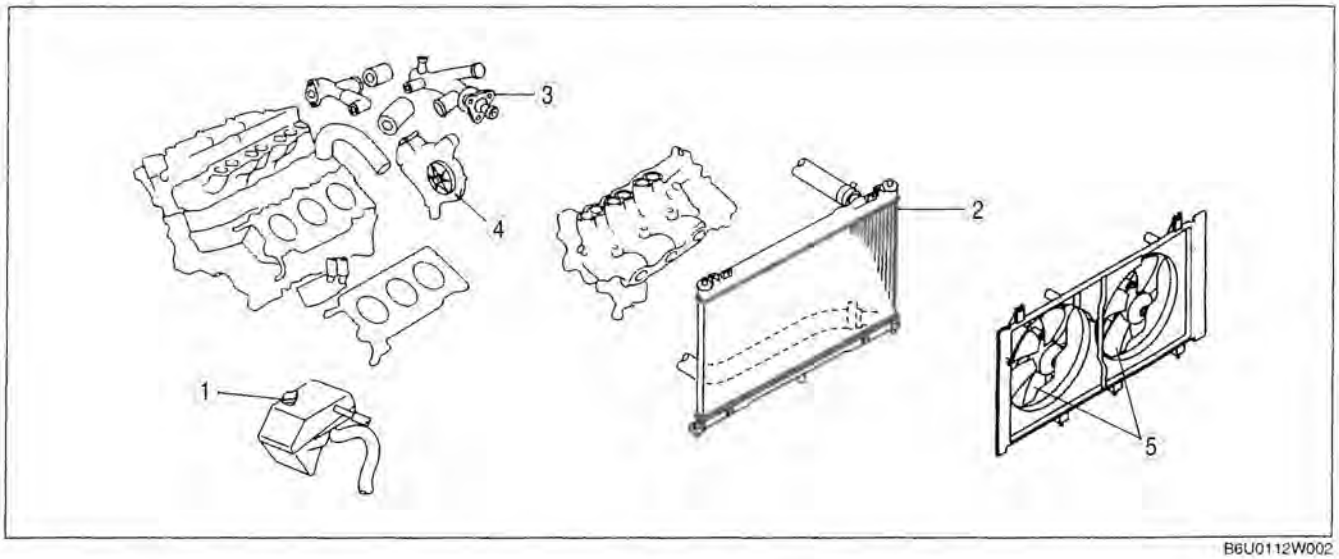


B6U0112W011

1	Cooling system cap (See 01–12–7 COOLING SYSTEM CAP INSPECTION.)
2	Radiator (See 01–12–8 RADIATOR REMOVAL/INSTALLATION.)
3	Thermostat (See 01–12–9 THERMOSTAT REMOVAL/INSTALLATION.) (See 01–12–10 THERMOSTAT INSPECTION.)

4	Water pump (See 01–12–11 WATER PUMP REMOVAL/INSTALLATION.)
5	Cooling fan No.1 (See 01–12–12 COOLING FAN REMOVAL/INSTALLATION.) (See 01–12–14 COOLING FAN MOTOR INSPECTION.)
6	Cooling fan No.2 (See 01–12–12 COOLING FAN REMOVAL/INSTALLATION.) (See 01–12–14 COOLING FAN MOTOR INSPECTION.)

AJ



B6U0112W002

1	Cooling system cap (See 01–12–7 COOLING SYSTEM CAP INSPECTION.)
2	Radiator (See 01–12–8 RADIATOR REMOVAL/ INSTALLATION.)
3	Thermostat (See 01–12–9 THERMOSTAT REMOVAL/ INSTALLATION.) (See 01–12–10 THERMOSTAT INSPECTION.)
4	Water pump (See 01–12–11 WATER PUMP REMOVAL/ INSTALLATION.)
5	Cooling fan (See 01–12–12 COOLING FAN REMOVAL/ INSTALLATION.) (See 01–12–14 COOLING FAN MOTOR INSPECTION.) (See 01–12–15 FAN CONTROL MODULE INSPECTION [AJ].)

COOLING SYSTEM SERVICE WARNINGS

C6U011201004W02

Warning

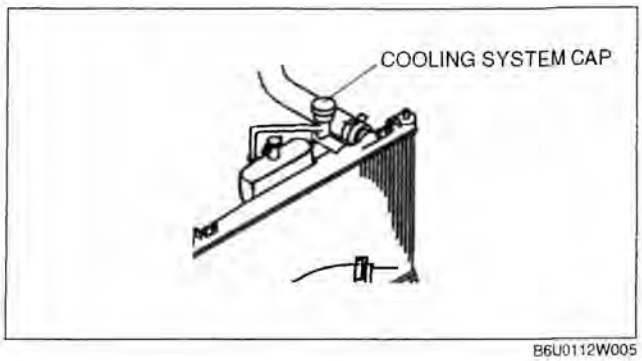
- **Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it has cooled. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes. (L3)**
- **When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it. (L3)**
- **Turn off the engine and wait until it has cooled. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes. (AJ)**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it. (AJ)**

ENGINE COOLANT LEVEL INSPECTION

C6U011215001W05

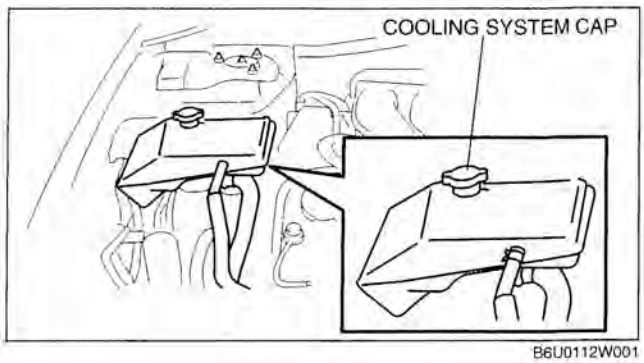
1. Verify that the engine coolant level in the engine coolant reserve tank is between the F and L marks.
   - If the engine coolant level is below L, remove the cooling system cap and add engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)

L3



B6U0112W005

AJ



B6U0112W001

ENGINE COOLANT PROTECTION INSPECTION

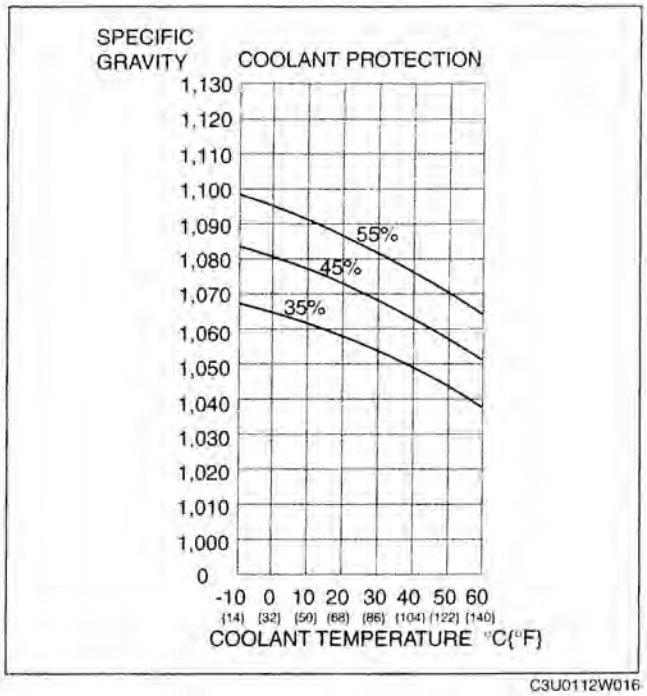
C6U011215001W06

1. Measure the engine coolant temperature and specific gravity with a thermometer and a hydrometer.

Caution

- **The engine has aluminum parts that can be damaged by alcohol or methanol antifreeze. Do not use alcohol or methanol in the cooling system. Use only ethylene-glycol-based engine coolant.**
- **Use only soft (demineralized) water in the engine coolant mixture. Water that contains minerals will reduce the engine coolant's effectiveness.**

2. Determine the engine coolant protection by referring to the graph shown.
   - If the engine coolant protection is not proper, add water or engine coolant.



C3U0112W016

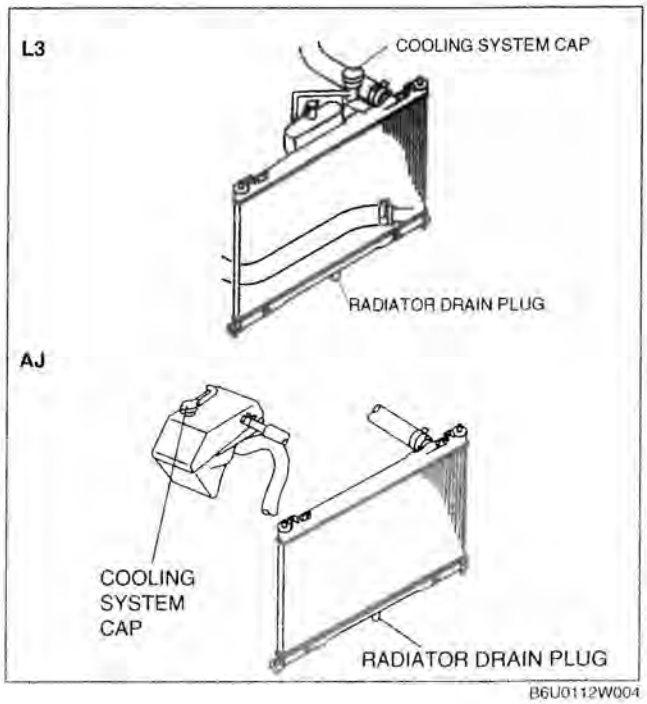
ENGINE COOLANT REPLACEMENT

C6U011215001W07

Warning

- **Drain the engine coolant when the engine is cold, otherwise it may burn you and cause serious injury.**

1. Remove the cooling system cap and the radiator drain plug.



B6U0112W004

2. Drain the engine coolant into a container.
3. Flush the cooling system with water until all traces of color are gone.
4. Let the system drain completely.
5. Tighten the radiator drain plug.

Caution
- **The engine has aluminum parts that can be damaged by alcohol or methanol antifreeze. Do not use alcohol or methanol in the cooling system. Use only ethylene-glycol-based engine coolant.**
- **Use only soft (demineralized) water in the engine coolant mixture. Water that contains minerals will reduce the engine coolant's effectiveness.**
- **Engine coolant damages paint. If engine coolant does get on a painted surface, rinse it off quickly.**

6. Referring to the following chart, select proper volume percentage of the water and engine coolant.

Antifreeze solution mixture percentage

Engine coolant protection	Volume percentage (%)		Gravity at 20 °C {68 °F}
	Water	Coolant	
Above -16 °C {3 °F}	65	35	1.057
Above -26 °C {-15 °F}	55	45	1.072
Above -40 °C {-40 °F}	45	55	1.086

7. Slowly pour the engine coolant into the radiator up to the engine coolant filler port. (L3 engine model)
8. Fill the engine coolant into the engine coolant reserve tank up to the F mark on the engine coolant reserve tank.
9. Tighten the cooling system cap.

Caution
- **If the engine coolant temperature becomes too high, stop the engine to prevent it from overheating.**

10. Start the engine and idle it until the cooling fan operates.
11. After engine warms up, perform the following steps.
    (1) Run the engine at **2,500 rpm** for **5 min**.
    (2) Run the engine at **3,000 rpm** for **5 s**, then idle.
    (3) Repeat steps (2) several times.
    (4) Idle the engine for **1 min**.
12. Stop the engine and wait until it is cool.
13. Inspect the engine coolant level.
    - If it is low, repeat Steps 7—13 (L3 engine model), Steps 8—13 (AJ engine model).
14. Install the cooling system cap.
15. Inspect for engine coolant leakage. (See 01-12-5 ENGINE COOLANT LEAKAGE INSPECTION.)

ENGINE COOLANT LEAKAGE INSPECTION

C6U011215001W08

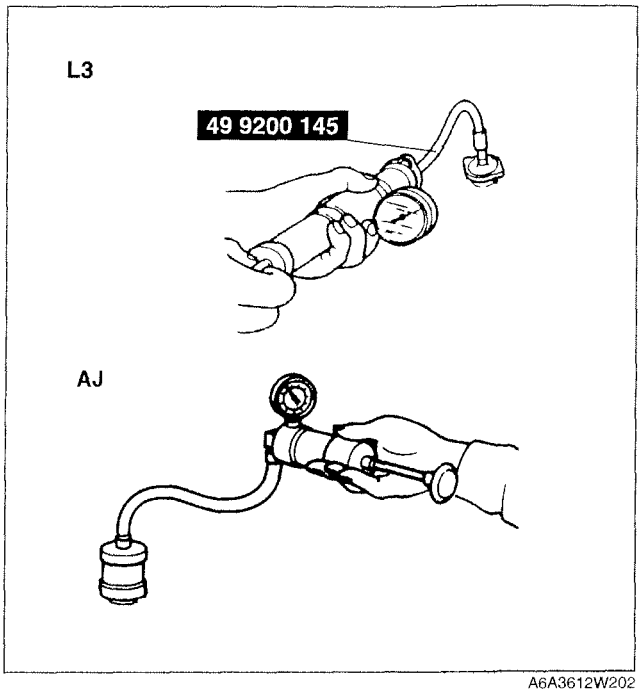
Warning
- **Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it has cooled. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes. (L3)**
- **When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it. (L3)**
- **Turn off the engine and wait until it has cooled. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes. (AJ)**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it. (AJ)**

1. Inspect the engine coolant level. (See 01-12-3 ENGINE COOLANT LEVEL INSPECTION.)
2. Remove the cooling system cap.
3. L3: Clean the mounting surface of the cooling system cap and the upper radiator hose.
   AJ: Clean the mounting surface of the cooling system cap.
4. Connect the **SST** (L3 engine model), commercially available radiator cap tester (AJ engine model) to the engine coolant filler port.

5. Apply specified pressure to the radiator.

Caution
- **Applying more than 127 kPa {1.3 kgf/cm^2, 18 psi} (L3 engine model), 107.9 kPa {1.1 kgf/cm^2, 15.6 psi} (AJ engine model), can damage the hoses, fittings, and other components, and cause leaks.**

Pressure
L3: 127 kPa {1.3 kgf/cm^2, 18 psi}
AJ: 107.9 kPa {1.1 kgf/cm^2, 15.6 psi}



A6A3612W202

6. Verify that the pressure is held.
   - If not as specified, inspect the system for engine coolant leakage.
     — If the engine coolant leaks from the upper hose attachment part, replace the upper hose and the clamp.
     — If the engine coolant leaks from the main body of the radiator (caulked part), replace the radiator.

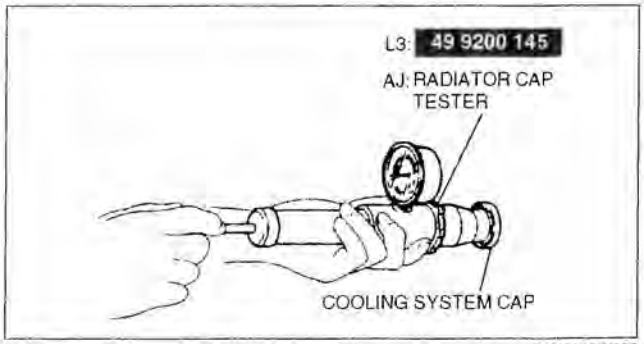
COOLING SYSTEM CAP INSPECTION

C6U011215201W02

Warning

- **Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it has cooled. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes. (L3)**
- **When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it. (L3)**
- **Turn off the engine and wait until it has cooled. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes. (AJ)**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it. (AJ)**

1. Clean the cooling system cap and the sealed part.
2. Inspect the crack or turn over on the sealed part of the cooling system cap.
   - If not as specified, replace the cooling system cap.
3. Fill the **SST** (L3 engine model), commercially available radiator cap tester (AJ engine model) with the water or the engine coolant to the full level and attach the cooling system cap to the **SST** (L3 engine model), radiator cap tester (AJ engine model).



B6U0112W050

4. Hold the cooling system cap downward and apply pressure gradually. Verify that the pressure become held for **10 s** within the specification.
   - If the pressure is not held stable within the specification, replace the cooling system cap.

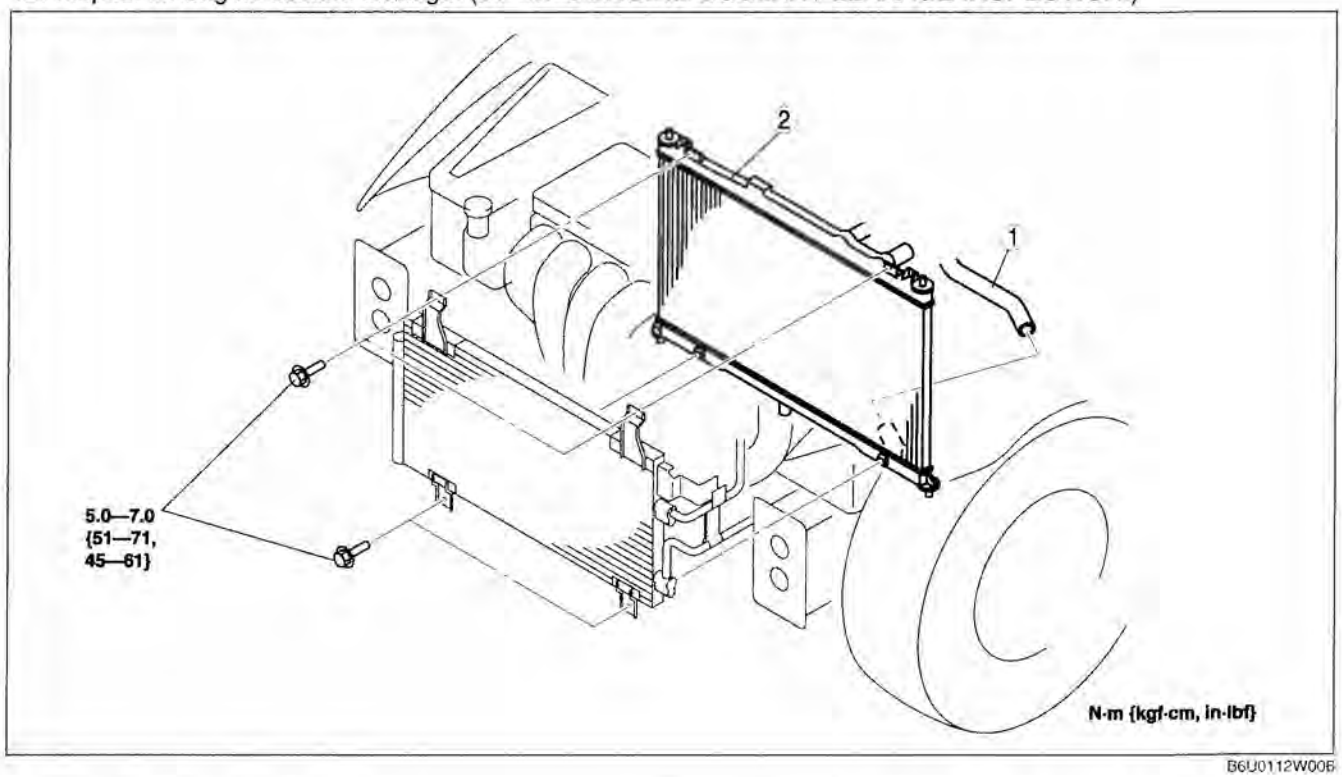
Pressure

L3: 113—142 kPa {1.15—1.44 kgf/cm^2, 16.4—20.4 psi}
AJ: 94—122 kPa {0.95—1.25 kgf/cm^2, 13.6—17.7 psi}

RADIATOR REMOVAL/INSTALLATION

C6U011215200W01

1. Disconnect the negative battery cable.
2. Drain the engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)
3. Remove the air cleaner. (See L3: 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3], AJ: 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
4. Remove the shroud panel. (See 09–10–11 SHROUD PANEL REMOVAL/INSTALLATION.)
5. Remove the cooling fan. (See 01–12–12 COOLING FAN REMOVAL/INSTALLATION.)
6. Disconnect the upper radiator hose from the radiator. (L3 engine model)
7. Disconnect the oil hose from the radiator. (ATX)
8. Remove the engine coolant reserve hose. (AJ engine model)
9. Remove in the order indicated in the table.
10. Install in the reverse order of the removal.
11. Add the engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)
12. Inspect for engine coolant leakage. (01–12–5 ENGINE COOLANT LEAKAGE INSPECTION.)



B6U0112W006

1	Lower radiator hose	2	Radiator

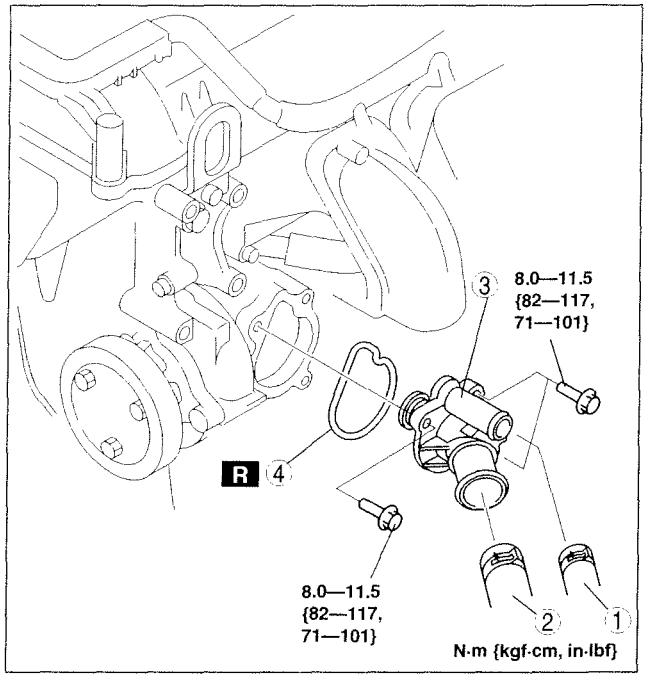
THERMOSTAT REMOVAL/INSTALLATION

C6U011215171W01

L3

1. Disconnect the negative battery cable.
2. Drain the engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)
3. Remove the drive belt. (See 01–10A–3 DRIVE BELT REPLACEMENT [L3].)
4. Remove the P/S oil pump with hoses and pipe still connected. Position the P/S oil pump out of the way. (See 06–12–24 POWER STEERING OIL PUMP REMOVAL/INSTALLATION [L3].)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Add the engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)
8. Inspect the engine coolant leakage. (See 01–12–5 ENGINE COOLANT LEAKAGE INSPECTION.)

1	Hose
2	Lower radiator hose
3	Thermostat
4	Gasket

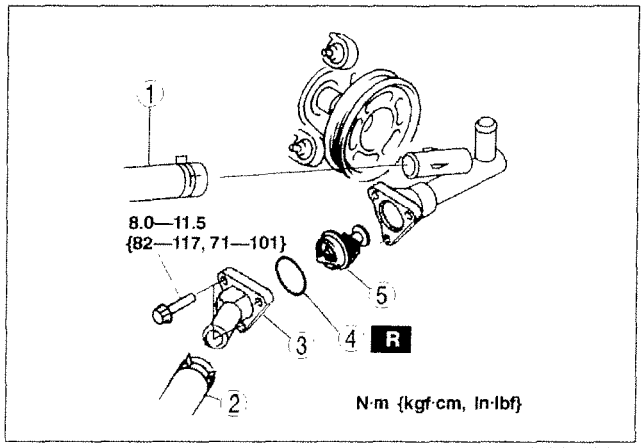


B3E0112W017

AJ

1. Disconnect the negative battery cable.
2. Remove the air cleaner. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
3. Drain the engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Add the engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)
7. Inspect the engine coolant leakage. (See 01–12–5 ENGINE COOLANT LEAKAGE INSPECTION.)

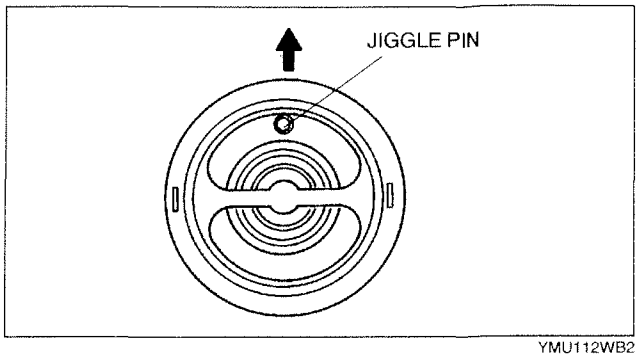
1	Upper radiator hose
2	Lower radiator hose
3	Thermostat cover
4	O-ring
5	Thermostat (See 01–12–10 Thermostat Installation Note (AJ).)



B6U0112W010

Thermostat Installation Note (AJ)

1. Install the thermostat into the thermostat case with the jiggle pin at the top.



YMU112WB2

THERMOSTAT INSPECTION

C6U011215171W02

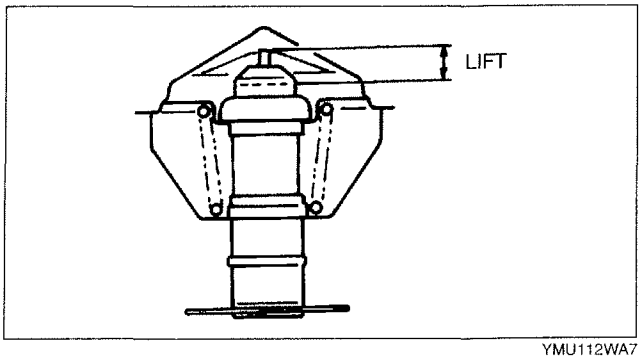
1. Visually inspect that the thermostat valve is closed.
2. Place the thermostat and a thermometer in water.

Warning

- **During inspection, the thermostat and water are extremely hot and they can badly burn. Do not touch the thermostat and water directly.**

3. Heat the water and inspect the following.
   - If not as specified, replace the thermostat.

Condition	Engine	
	L3	AJ
Initial-opening temperature (°C {°F})	80—84 {176—183}	84—88 {184—190}
Full-open temperature (°C {°F})	97 {206}	99 {210}
Full-open lift (mm {in})	More than 8.0 {0.31}	More than 7.3 {0.29}



YMU112WA7

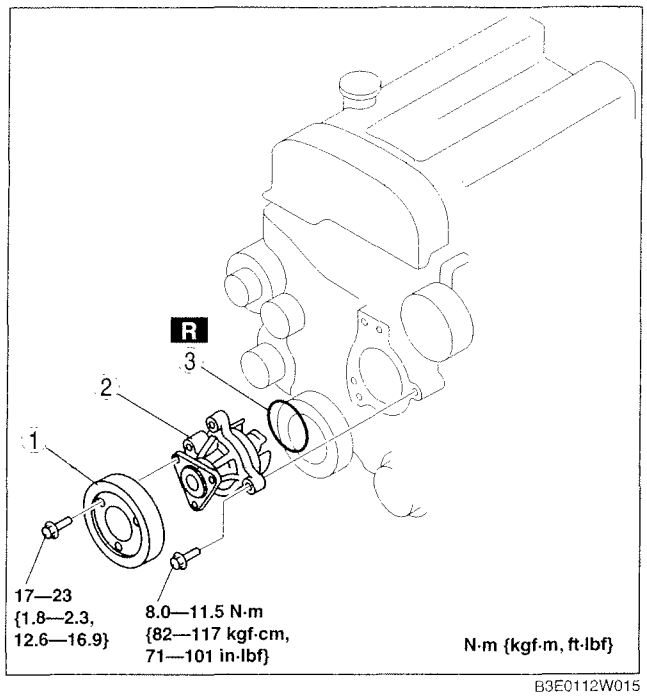
WATER PUMP REMOVAL/INSTALLATION

C6U011215010W01

L3

1. Disconnect the negative battery cable.
2. Drain the engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)
3. Remove the drive belt. (See 01–10A–3 DRIVE BELT REPLACEMENT [L3].)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Add the engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)

1	Water pump pulley
2	Water pump
3	O-ring

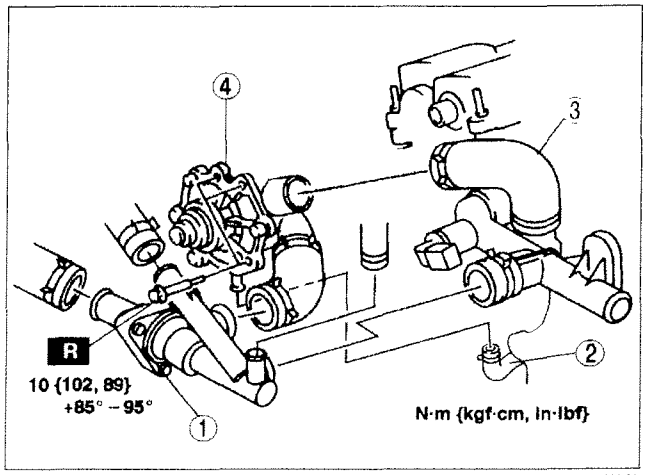


B3E0112W015

AJ

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Remove the air cleaner. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
4. Drain the engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)
5. Remove the water pump drive belt pulley. (See 01–10B–11 Water Pump Drive Belt Pulley Removal Note.)
6. Remove in the order indicated in the table.
7. Install in the reverse order of removal.
8. Install the new water pump drive belt pulley. (See 01–10B–27 Water Pump Drive Belt Pulley Installation Note.)
9. Add the engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)

1	Thermostat case
2	Heater hose
3	Water outlet pipe
4	Water pump (See 01–12–12 Water Pump Installation Note (AJ).)



B6U0112W007

Water Pump Installation Note (AJ)

1. Tighten the bolts to the specified torque, then tighten them further **85°—95°**.

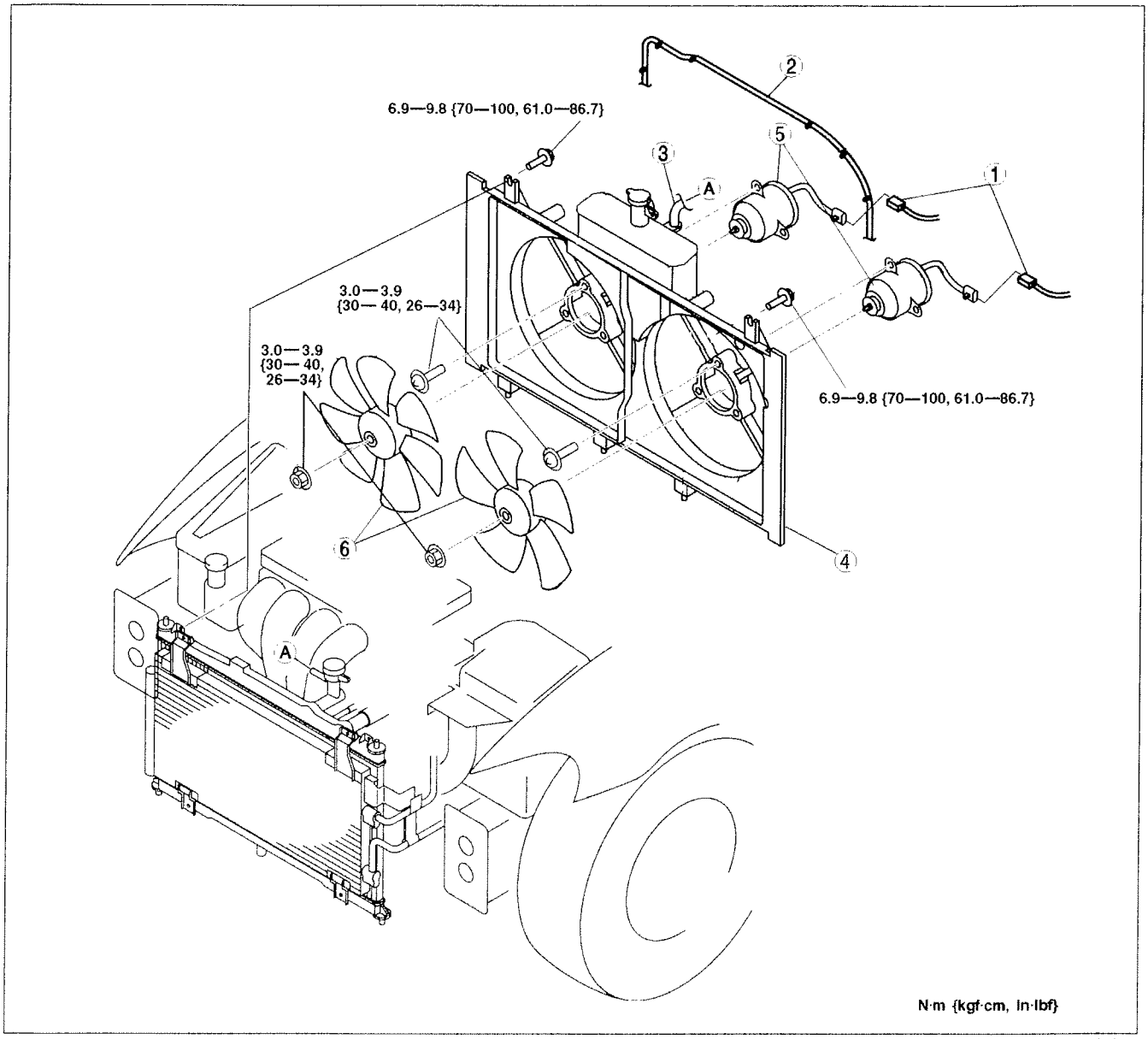
Tightening torque
10 N·m {102 kgf·cm, 89 In·lbf}

COOLING FAN REMOVAL/INSTALLATION

C6U011215025W01

L3

1. Disconnect the negative battery cable.
2. Remove the shroud panel. (See 09–10–11 SHROUD PANEL REMOVAL/INSTALLATION.)
3. Remove the cooler pipe stay. (See 07–11–7 CONDENSER REMOVAL/INSTALLATION.)
4. Remove the oil hose stay. (ATX)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.



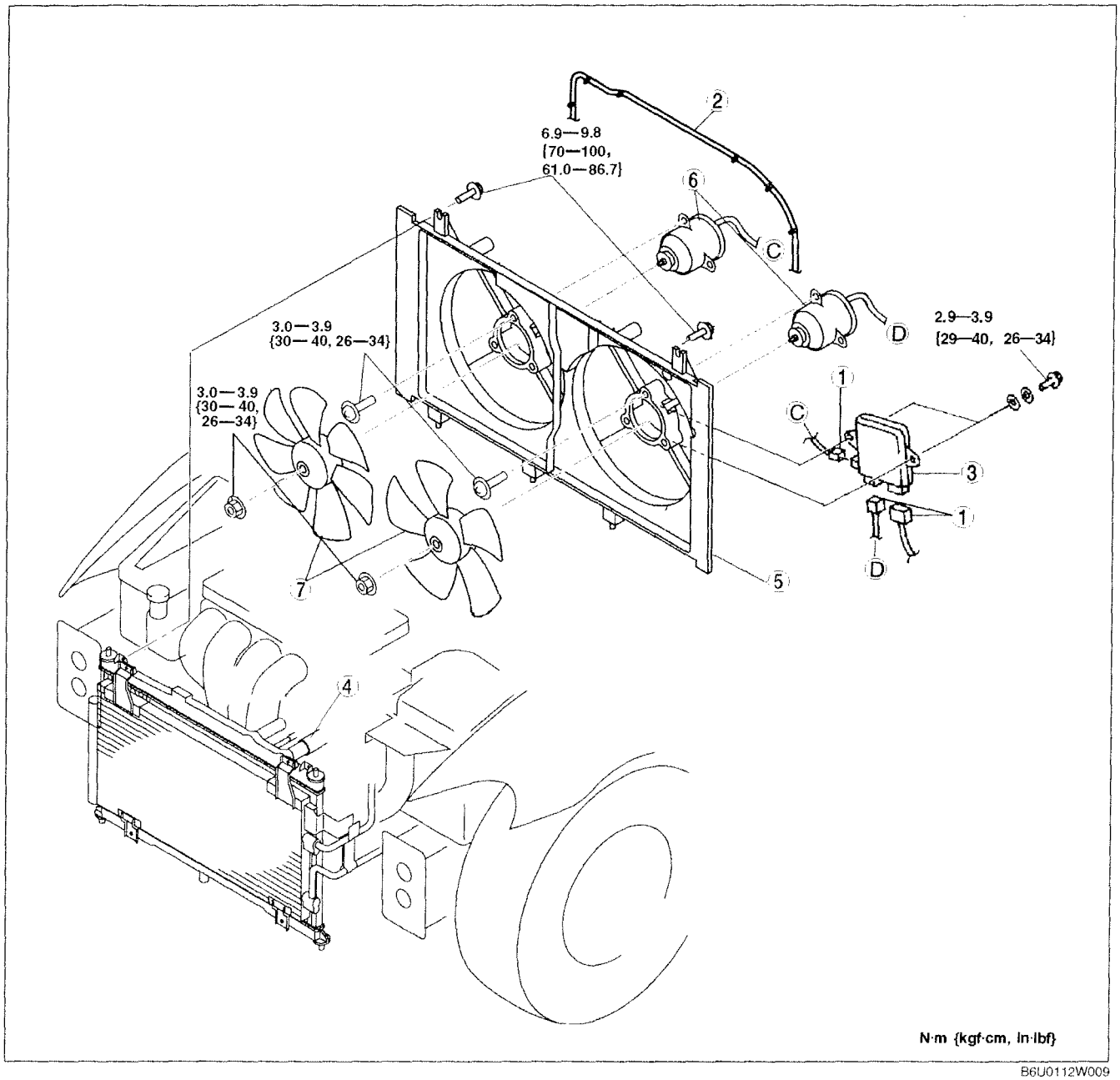
B6U0112W008

1	Cooling fan motor connector
2	Cooling fan wiring harness
3	Engine coolant reserve hose

4	Cooling fan component
5	Cooling fan motor
6	Cooling fan blades

AJ

1. Disconnect the negative battery cable.
2. Drain the engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)
3. Remove the shroud panel. (See 09–10–11 SHROUD PANEL REMOVAL/INSTALLATION.)
4. Remove the cooler pipe stay. (See 07–11–7 CONDENSER REMOVAL/INSTALLATION.)
5. Remove the oil hose stay. (ATX)
6. Disconnect the engine coolant reserve hose from the radiator.
7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.
9. Add the engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)



B6U0112W009

1	Fan control module connectors
2	Cooling fan wiring harness
3	Fan control module
4	Radiator upper hose

5	Cooling fan component
6	Cooling fan motor
7	Cooling fan blades

COOLING FAN MOTOR INSPECTION

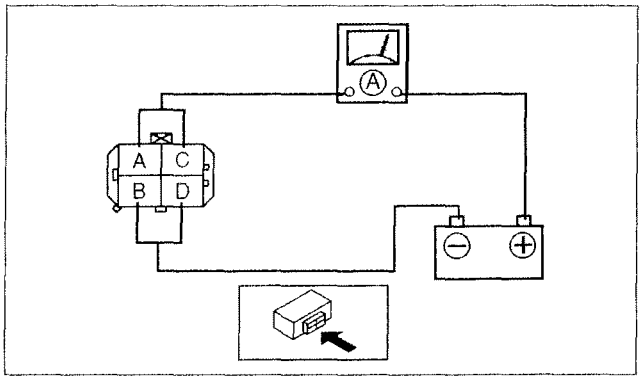
C6U011215025W02

L3

1. Verify that the battery is fully charged. (See 01–17–1 BATTERY INSPECTION.)
2. Connect the battery positive voltage and an ammeter to the fan motor connector.
3. Verify that the fan motor operates smoothly at the standard current draw.
   - If not within the specification, replace the fan motor.

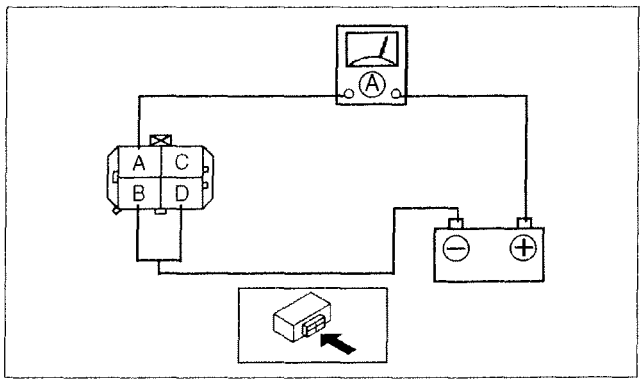
Standard current [12 V]
8.5—11.5 (A)

High (Cooling fan motor No.1 and No.2)



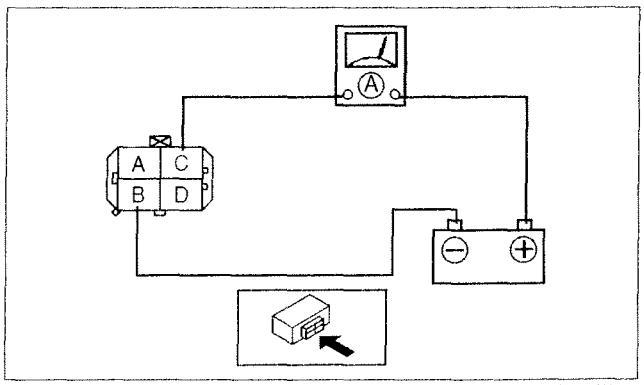
B6U0112W012

Middle (Cooling fan motor No.2)



B6U0112W013

Low (Cooling fan motor No.1 and No.2)



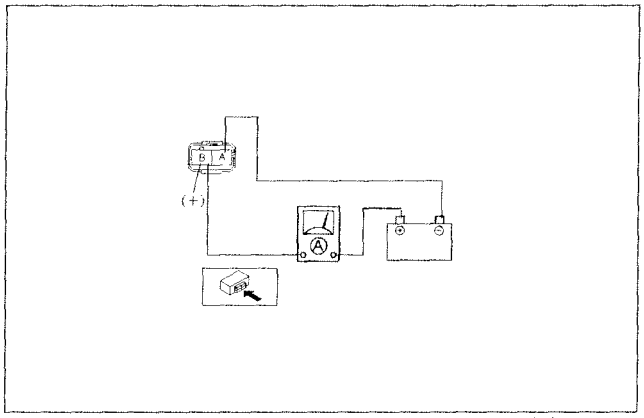
B6U0112W014

AJ

1. Verify that the battery is fully charged. (See 01–17–1 BATTERY INSPECTION.)
2. Disconnect the fan control module connector (3 terminals).
3. Connect the positive battery voltage and an ammeter to the fan control module connector on fan motor side. (2 terminals)
4. Verify that the fan motor operates smoothly at the standard current draw.
   - If not within the specification, replace the fan motor.

Standard current [12 V]
11.8—14.8 (A)

5. Perform the same procedure as Step 2 for the cooling fan motor No.2.

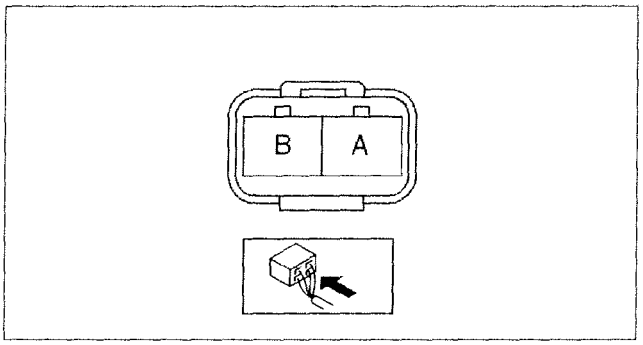


B6U0112W030

FAN CONTROL MODULE INSPECTION [AJ]

C6U011200164W01

1. Remove the two bolts from the fan control module with the connectors still connected.
2. Start and warm up the engine.
3. Monitor the engine coolant temperature with the WDS or equivalent.
4. Measure the voltage at the terminal B of fan control module connector (2 terminals) as shown in the table.
   - If there is any malfunction, replace the fan control module.



B6U0112W100

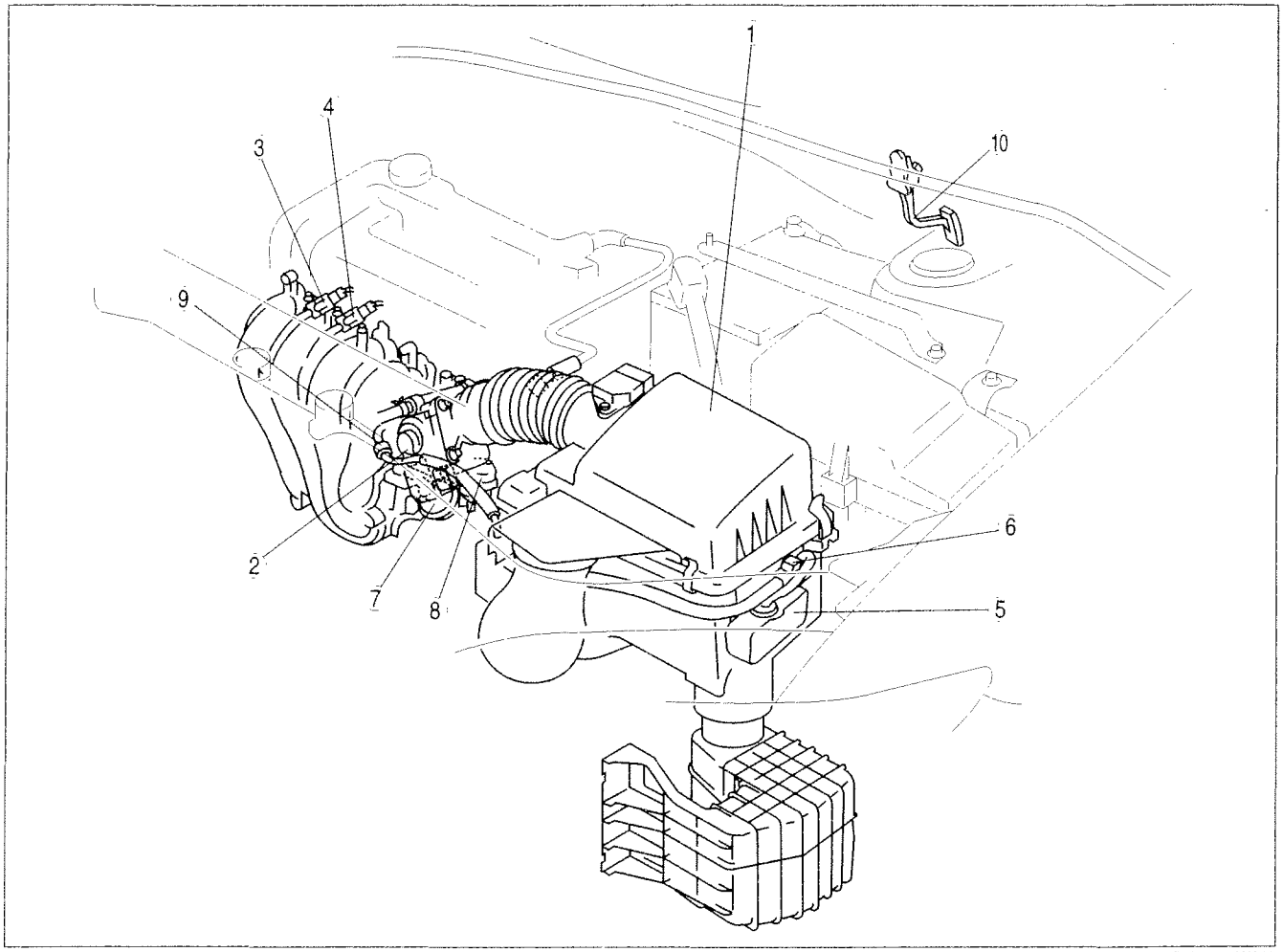
Inspection			Result
Condition	A/C	Engine coolant temp.	
IG SW ON	OFF	95 °C {203 °F} or less	Fan stops
IG SW ON (Idling)	OFF	95 °C {203 °F} or less	Fan stops
IG SW ON (Idling)	ON*	95 °C {203 °F} or less	6.9V—12.1V
IG SW ON (Idling)	OFF	100 °C {212 °F} or more	0.6V—14.6V

* : When the magnetic clutch and the middle pressure SW are on.

01–13A INTAKE-AIR SYSTEM [L3]

INTAKE-AIR SYSTEM LOCATION INDEX [L3]

C6U011300113W01



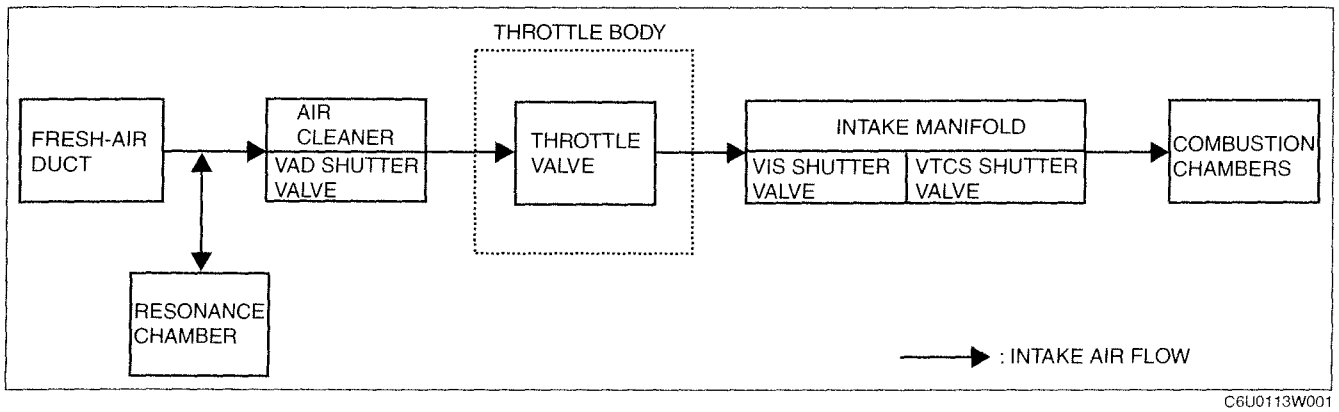
B6U0113W015

1	Air cleaner (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [L3])
2	Throttle body (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [L3])
3	VIS control solenoid valve (See 01–13A–10 VARIABLE INTAKE-AIR SYSTEM (VIS) CONTROL SOLENOID VALVE INSPECTION [L3])
4	Variable tumble control solenoid valve (See 01–13A–12 VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION [L3])
5	VAD shutter valve (See 01–13A–6 VARIABLE AIR DUCT (VAD) SHUTTER VALVE INSPECTION [L3])

6	VAD control solenoid valve (See 01–13A–7 VARIABLE AIR DUCT (VAD) CONTROL SOLENOID VALVE INSPECTION [L3])
7	VIS shutter valve actuator (See 01–13A–9 VARIABLE INTAKE-AIR SYSTEM (VIS) SHUTTER VALVE ACTUATOR INSPECTION [L3])
8	VTCS shutter valve actuator (See 01–13A–11 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SHUTTER VALVE ACTUATOR INSPECTION [L3])
9	VAD check valve (one-way) (See 01–13A–8 VARIABLE AIR DUCT (VAD) CHECK VALVE (ONE-WAY) INSPECTION [L3])
10	Accelerator pedal (See 01–13A–13 ACCELERATOR PEDAL REMOVAL/INSTALLATION [L3])

INTAKE-AIR SYSTEM FLOW DIAGRAM [L3]

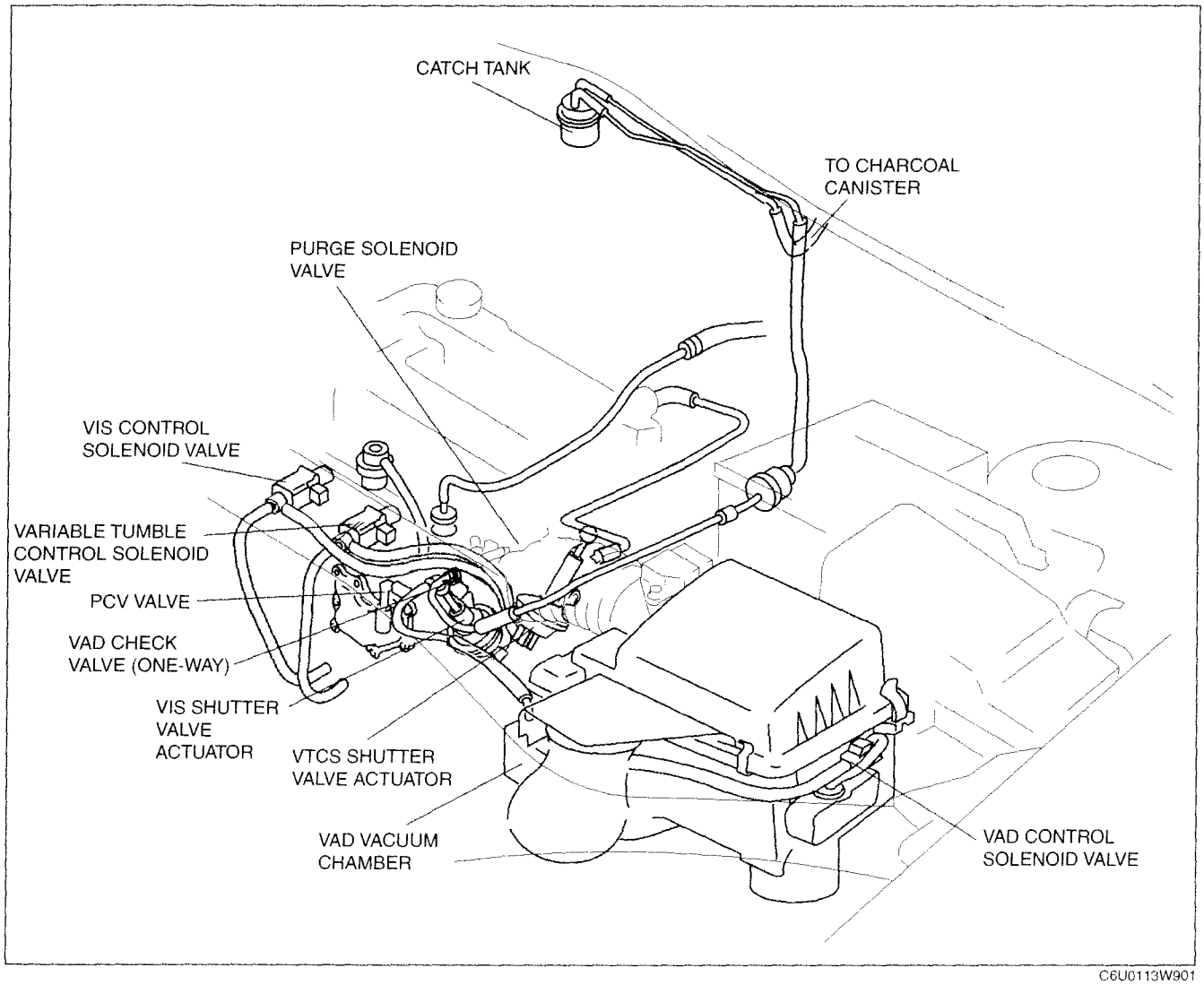
C6U011300113W02



C6U0113W001

VACUUM HOSE ROUTING DIAGRAM [L3]

C6U011300113W03



C6U0113W901

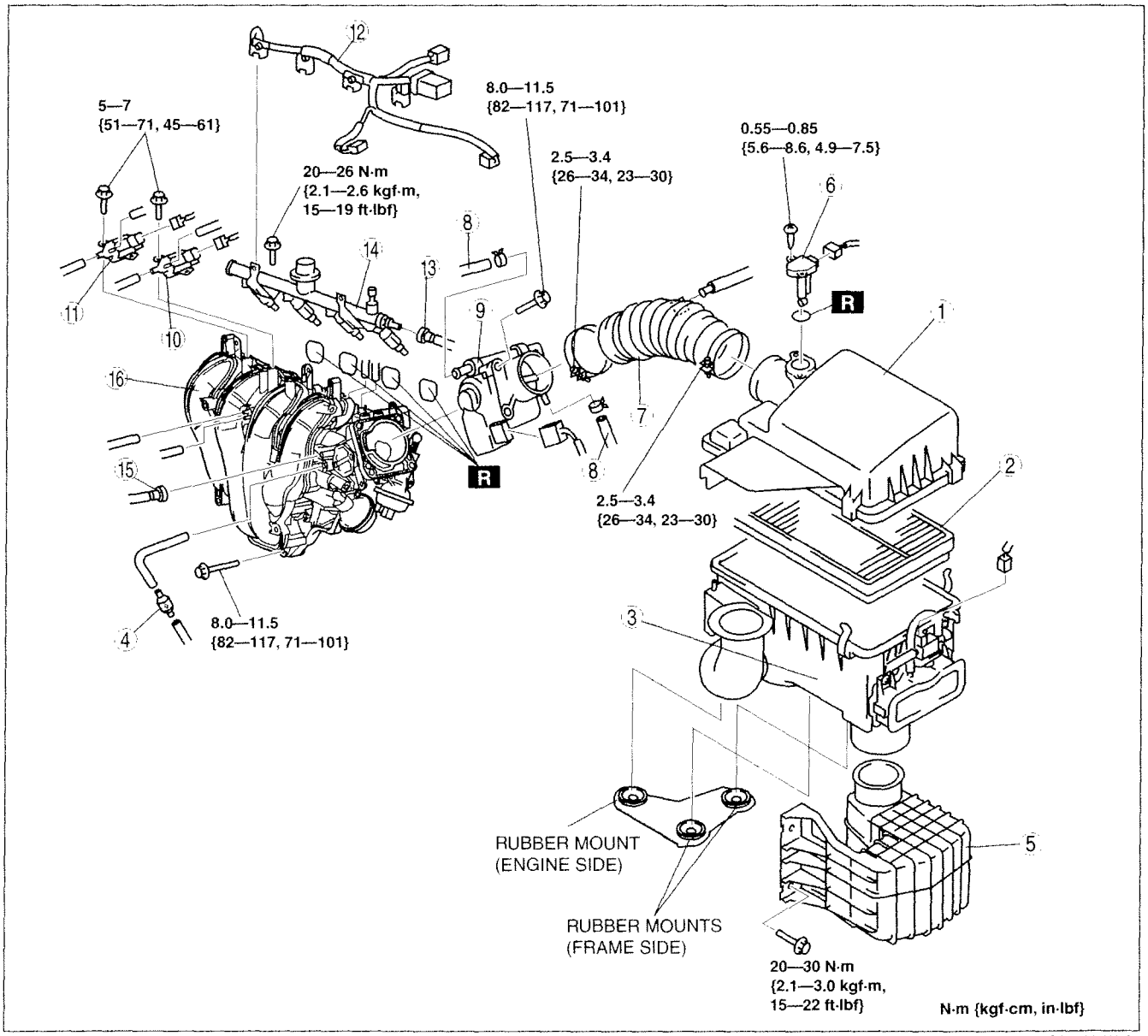
INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3]

C6U011300113W04

Warning

- **A hot engine and intake-air system can cause severe burns. Turn off the engine and wait until they are cool before removing the intake-air system.**
- **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01–14–5 BEFORE REPAIR PROCEDURE.)**

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Complete the "AFTER REPAIR PROCEDURE". (See 01–14–6 AFTER REPAIR PROCEDURE.)



C6U0113W902

1	Air cleaner cover
2	Air cleaner element
3	Air cleaner case (See 01–13A–5 Air Cleaner Case Installation Note)
4	VAD check valve (one-way)

5	Resonance chamber (See 01–13A–5 Resonance Chamber Removal Note)
6	MAF/IAT sensor
7	Air hose

8	Water hose (See 01–13A–5 Water Hose Removal Note)
9	Throttle body
10	Variable tumble control solenoid valve
11	VIS control solenoid valve
12	Fuel injector connector
13	Plastic fuel hose (See 01–14–21 Plastic Fuel Hose Removal Note) (See 01–14–23 Plastic Fuel Hose Installation Note)
14	Fuel distributor
15	Evaporative hose (See 01–16–8 Evaporative Hose Removal Note (Type A)) (See 01–16–9 Evaporative Hose Installation Note)
16	Intake manifold

Resonance Chamber Removal Note

1. Remove the front mudguard (LH) before removing the resonance chamber.

Water Hose Removal Note

1. Drain the engine coolant before removing the water hose. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)

Air Cleaner Case Installation Note

Caution

- **Before assembling the air cleaner, verify that the rubber mounts have not fallen off from the air cleaner bracket (3 locations).**
- **Always install the air cleaner case using the following procedure.**

Note

- When inserting the rubber mounts into the air cleaner case, soapy water can be applied.

1. Verify that the rubber mounts are set in the air cleaner bracket (3 locations).
2. Install the projections on the frame side (2 locations).
3. Verify that the projections on the frame side are installed securely.
4. Install the projection on the engine side (remaining location).
5. Verify that the projection on the engine side installed securely.

AIR CLEANER ELEMENT INSPECTION [L3]

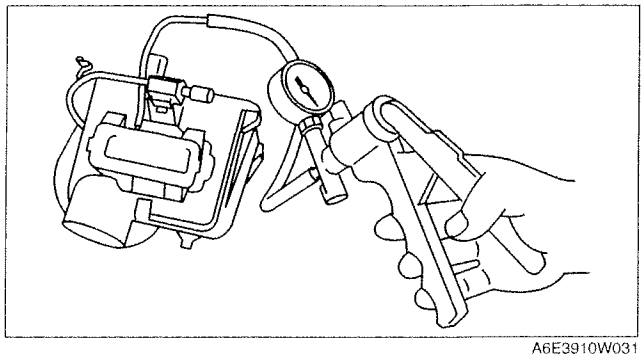
C6U011313300W01

1. Remove the air cleaner element. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
2. Verify that the air cleaner element surface is free of dirt.
   - If there is dirt, use an air gun or similar tool to clean the element.
   - If the replacement time limit has passed, replace the element.

VARIABLE AIR DUCT (VAD) SHUTTER VALVE INSPECTION [L3]

C6U011320130W01

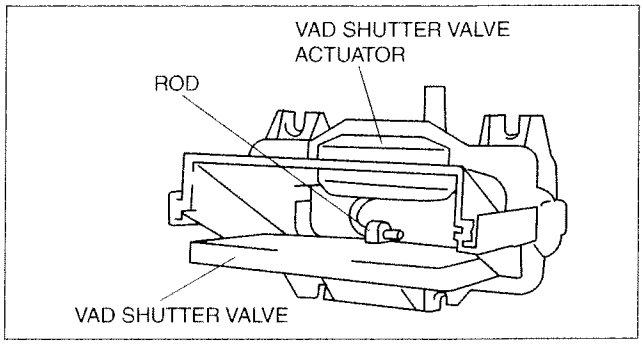
1. Remove the air cleaner case. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
2. Disconnect the vacuum hose from the VAD shutter valve actuator.
3. Connect a vacuum pump to the VAD shutter valve actuator.



A6E3910W031

4. Apply vacuum and verify that the rod moves.
   - If the rod dose not move, replace the air cleaner.

Vacuum kPa {mmHg, inHg}	Rod movement
Below –10 {–75, –3.0}	Not move
Above –35 {–263, –10.4}	Fully pulled

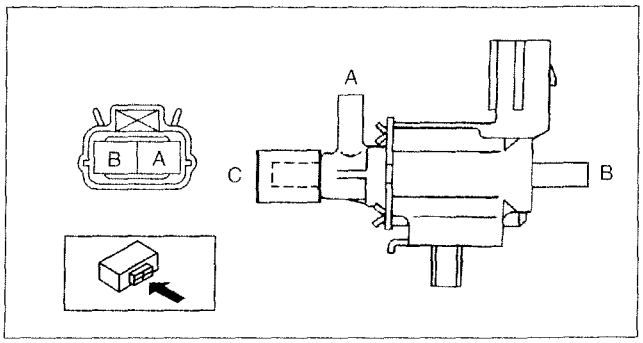


A6E3910W032

VARIABLE AIR DUCT (VAD) CONTROL SOLENOID VALVE INSPECTION [L3]

C6U011318740W01

1. Remove the VAD control solenoid valve. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
2. Inspect airflow between the ports under the following conditions.
   - If not as specified, replace the VAD control solenoid valve.
   - If as specified, carry out the "Circuit Open/Short Inspection".



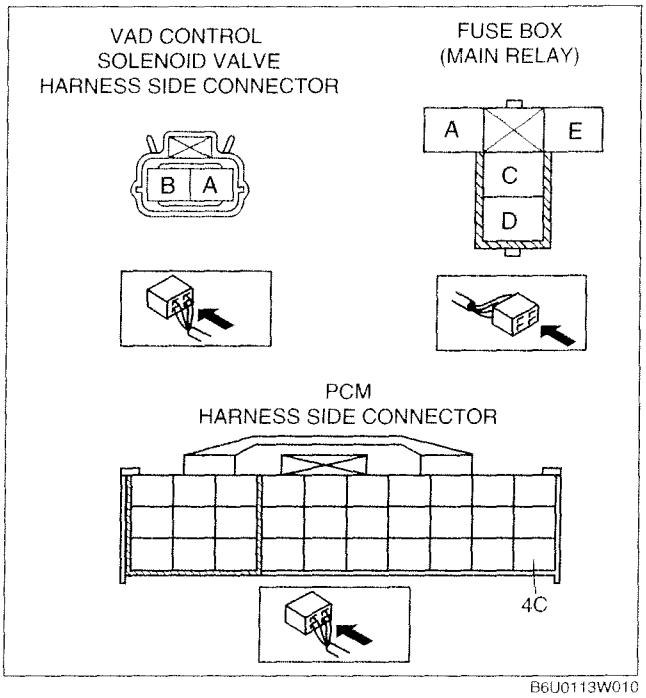
B6U0113W009

○—○ : Continuity ○=○ : Airflow

Step	Terminal		Port		
	A	B	A	B	C
1	○—○		○=○		
2	B+	GND	○=========○		

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harness for open or short circuit (continuity check).



B6U0113W010

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the harness.
  - — VAD control solenoid valve terminal B (harness-side) and PCM terminal 4C
  - — VAD control solenoid valve terminal A (harness-side) and main relay terminal C (harness-side)

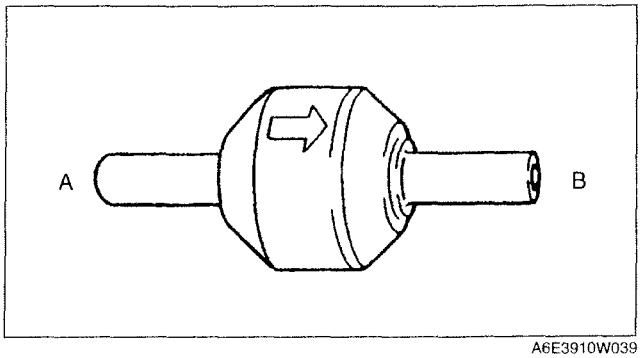
Short circuit

- If there is continuity, there is a short circuit. Repair or replace the harness.
  - — VAD control solenoid valve terminal B (harness-side) and body GND
  - — VAD control solenoid valve terminal A (harness-side) and power supply

VARIABLE AIR DUCT (VAD) CHECK VALVE (ONE-WAY) INSPECTION [L3]

C6U011342910W01

1. Remove the VAD check valve (one-way). (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
2. Blow through A and verify that air flows from B.
3. Blow through B and verify that air does not flow from A.
   - If not as specified, replace the VAD check valve (one-way).



A6E3910W039

THROTTLE ACTUATOR INSPECTION [L3]

C6U011320663W01

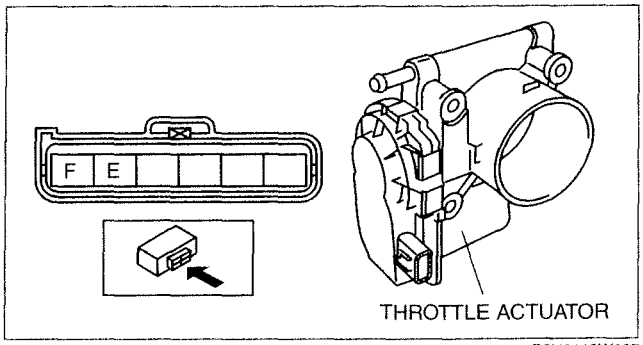
Note
- Perform the following inspection only when directed.

Resistance Inspection

1. Disconnect the negative battery cable.
2. Disconnect the throttle body connector.
3. Measure the resistance between the throttle actuator terminals using an ohmmeter.
   - If not as specified, replace the throttle body. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
   - If as specified, carry out the "Circuit Open/ Short Inspection".

Specification

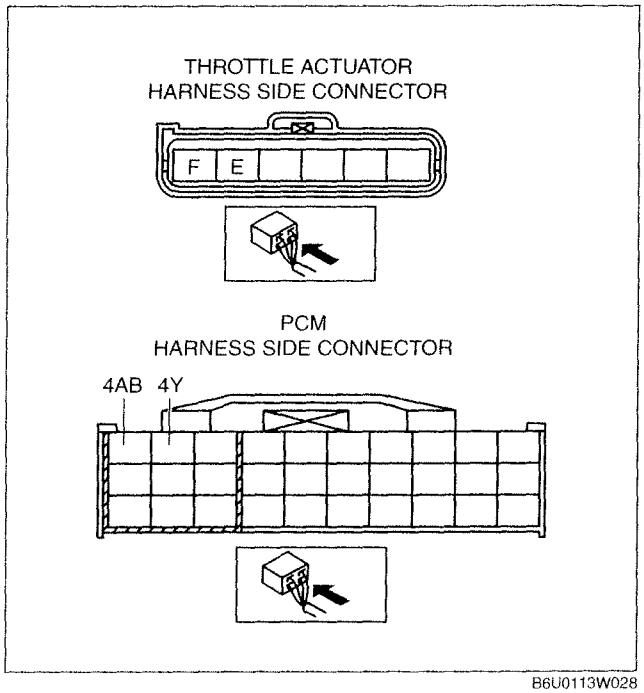
Ambient temperature (°C {°F})	Resistance (ohm)
Approx. 20 {68}	0.3—100



B6U0113W027

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit (continuity check).



B6U0113W028

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the harness.
  - — Throttle actuator terminal F (harness-side) and PCM terminal 4Y
  - — Throttle actuator terminal E (harness-side) and PCM terminal 4AB

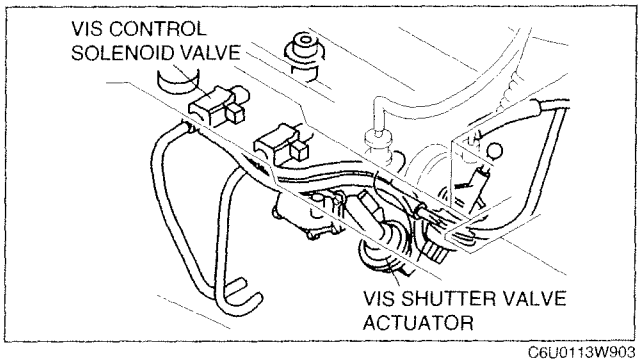
Short circuit

- If there is continuity, there is a short circuit. Repair or replace the harness.
  - — Throttle actuator terminal F (harness-side) and power supply
  - — Throttle actuator terminal F (harness-side) and GND
  - — Throttle actuator terminal E (harness-side) and power supply
  - — Throttle actuator terminal E (harness-side) and GND

VARIABLE INTAKE-AIR SYSTEM (VIS) SHUTTER VALVE ACTUATOR INSPECTION [L3]

C6U011320130W02

1. Remove the air hose. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
2. Disconnect the vacuum hose from the VIS control solenoid valve.



C6U0113W903

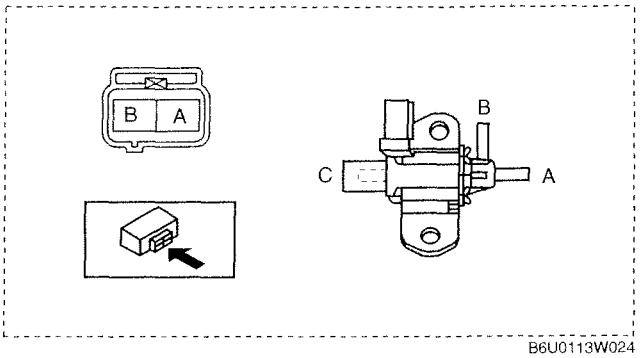
3. Connect a vacuum pump to the VIS shutter valve actuator.
4. Apply vacuum and verify that the rod moves.
   - If the rod dose not move, replace the intake manifold.

Vacuum kPa {mmHg, inHg}	Rod movement
Below –2.7 {–20, –0.7}	Not move
Above –33.4 {–250, –9.9}	Fully pulled

VARIABLE INTAKE-AIR SYSTEM (VIS) CONTROL SOLENOID VALVE INSPECTION [L3]

C6U011318740W02

1. Remove the VIS control solenoid valve. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
2. Inspect airflow between the ports under the following conditions.
   - If not as specified, replace the VIS control solenoid valve.
   - If as specified, carry out the "Circuit Open/Short Inspection".



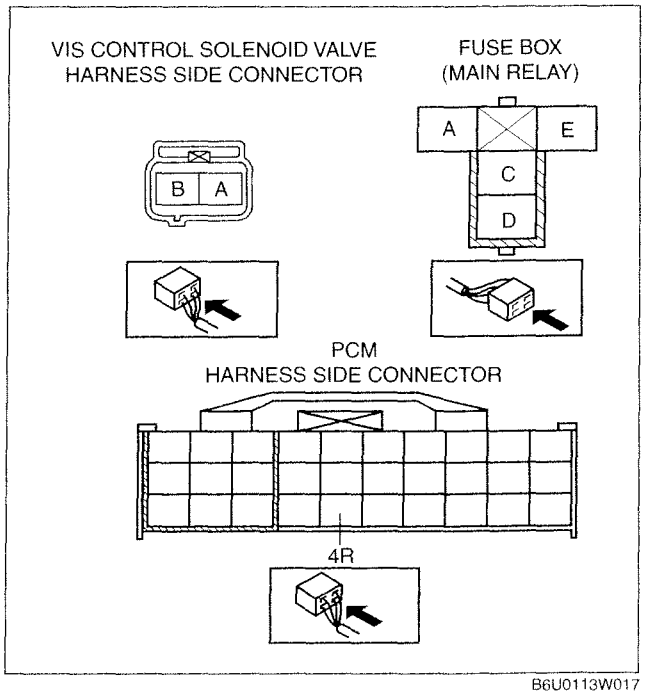
B6U0113W024

○—○ : Continuity ○=○ : Airflow

Step	Terminal		Port		
	A	B	A	B	C
1	○—○			○=○	
2	B+	GND	○=○		

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harness for open or short circuit (continuity check).



B6U0113W017

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the harness.
  - — VIS control solenoid valve terminal B (harness-side) and PCM terminal 4R
  - — VIS control solenoid valve terminal A (harness-side) and main relay terminal C (harness-side)

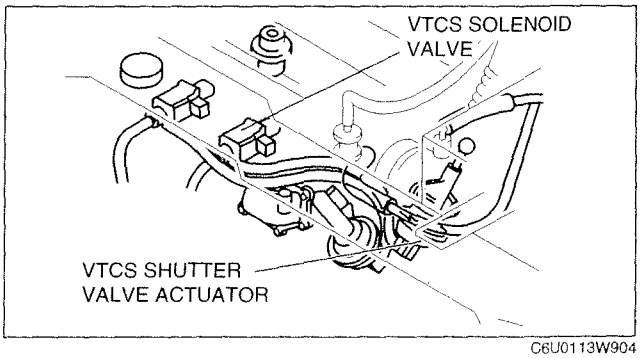
Short circuit

- If there is continuity, there is a short circuit. Repair or replace the harness.
  - — VIS control solenoid valve terminal B (harness-side) and body GND
  - — VIS control solenoid valve terminal A (harness-side) and power supply

VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SHUTTER VALVE ACTUATOR INSPECTION [L3]

C6U011320130W03

1. Remove the air hose. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
2. Disconnect the vacuum hose from the variable tumble control solenoid valve.



C6U0113W904

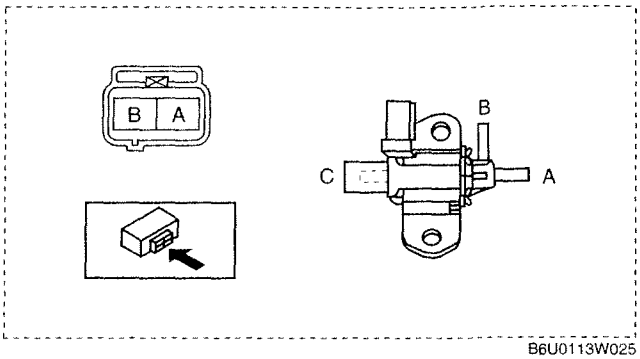
3. Connect a vacuum pump to the VTCS shutter valve actuator.
4. Apply vacuum and verify that the rod moves.
   - If the rod dose not move, replace the intake manifold.

Vacuum kPa {mmHg, inHg}	Rod movement
Below –2.7 {–20, –0.7}	Starts to move
Above –33.4 {–250, –9.9}	Fully pulled

VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION [L3]

C6U011318740W03

1. Remove the variable tumble control solenoid valve. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
2. Inspect airflow between the ports under the following conditions.
   - If not as specified, replace the variable tumble control solenoid valve.
   - If as specified, carry out the "Circuit Open/Short Inspection".



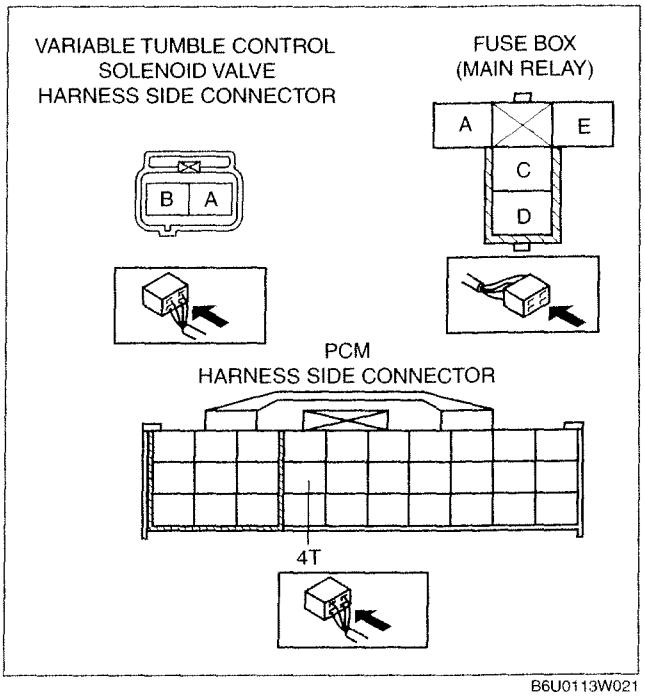
B6U0113W025

○—○ : Continuity ○=○ : Airflow

Step	Terminal		Port		
	A	B	A	B	C
1	○—○			○=○	
2	B+	GND	○=○		

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harness for open or short circuit (continuity check).



B6U0113W021

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the harness.
  - — Variable tumble control solenoid valve terminal B (harness-side) and PCM terminal 4T
  - — Variable tumble control solenoid valve terminal A (harness-side) and main relay terminal C (harness-side)

Short circuit

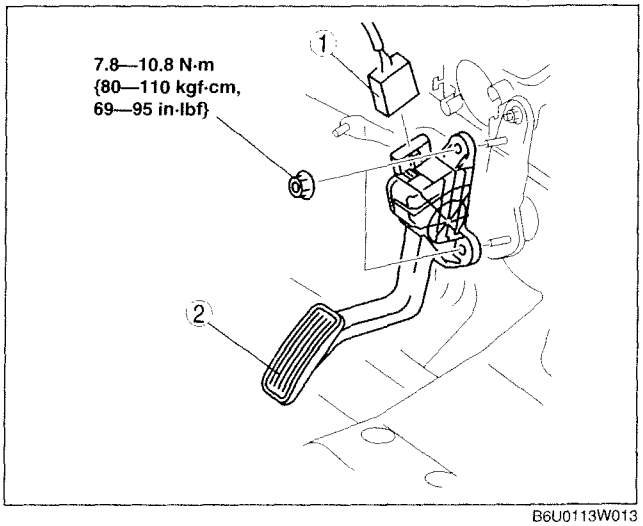
- If there is continuity, there is a short circuit. Repair or replace the harness.
  - — Variable tumble control solenoid valve terminal B (harness-side) and body GND
  - — Variable tumble control solenoid valve terminal A (harness-side) and power supply

ACCELERATOR PEDAL REMOVAL/INSTALLATION [L3]

C6U011341600W01

1. Remove in the order indicated in the table.

1	Connector
2	Accelerator pedal



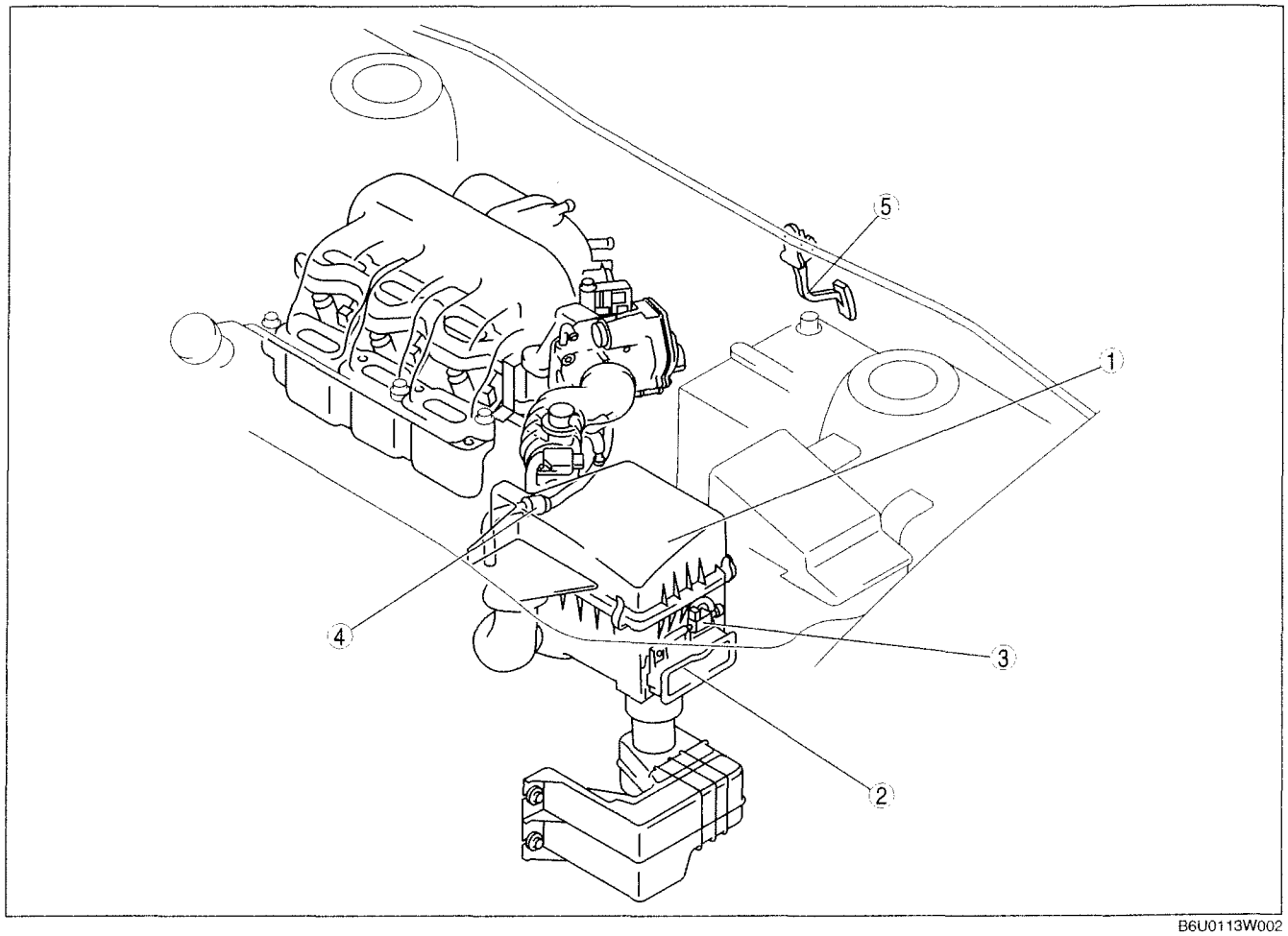
B6U0113W013

2. Install in the reverse order of removal.

01–13B INTAKE-AIR SYSTEM [AJ]

INTAKE-AIR SYSTEM LOCATION INDEX [AJ]

C6U011313000W01



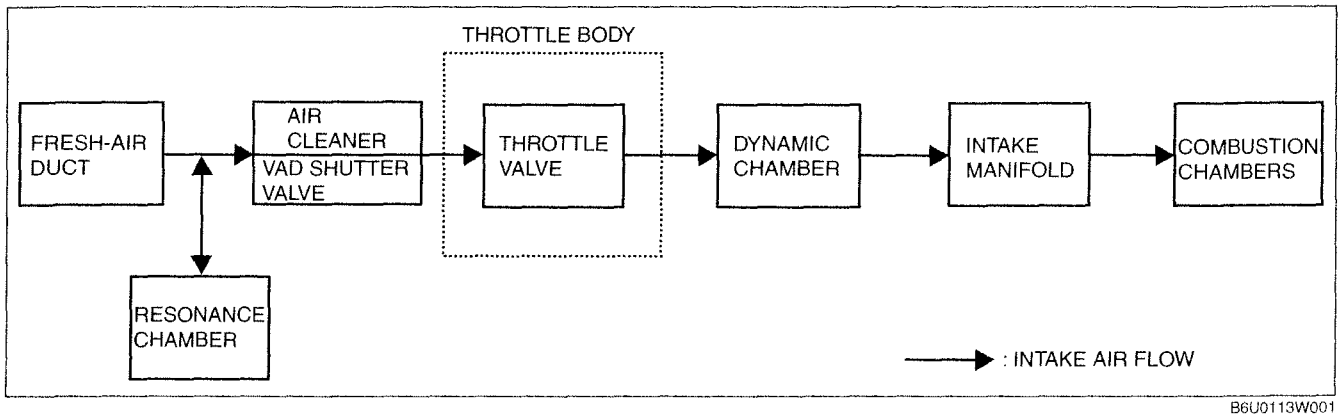
B6U0113W002

1	Air cleaner (See 01–13B–5 AIR CLEANER ELEMENT INSPECTION [AJ])
2	VAD shutter valve (See 01–13B–6 VARIABLE AIR DUCT (VAD) SHUTTER VALVE INSPECTION [AJ])
3	VAD control solenoid valve (See 01–13B–7 VARIABLE AIR DUCT (VAD) CONTROL SOLENOID VALVE INSPECTION [AJ])

4	VAD check valve (one-way) (See 01–13B–8 VARIABLE AIR DUCT (VAD) CHECK VALVE (ONE-WAY) INSPECTION [AJ])
5	Accelerator pedal (See 01–13B–9 ACCELERATOR PEDAL REMOVAL/INSTALLATION [AJ])

INTAKE-AIR SYSTEM FLOW DIAGRAM [AJ]

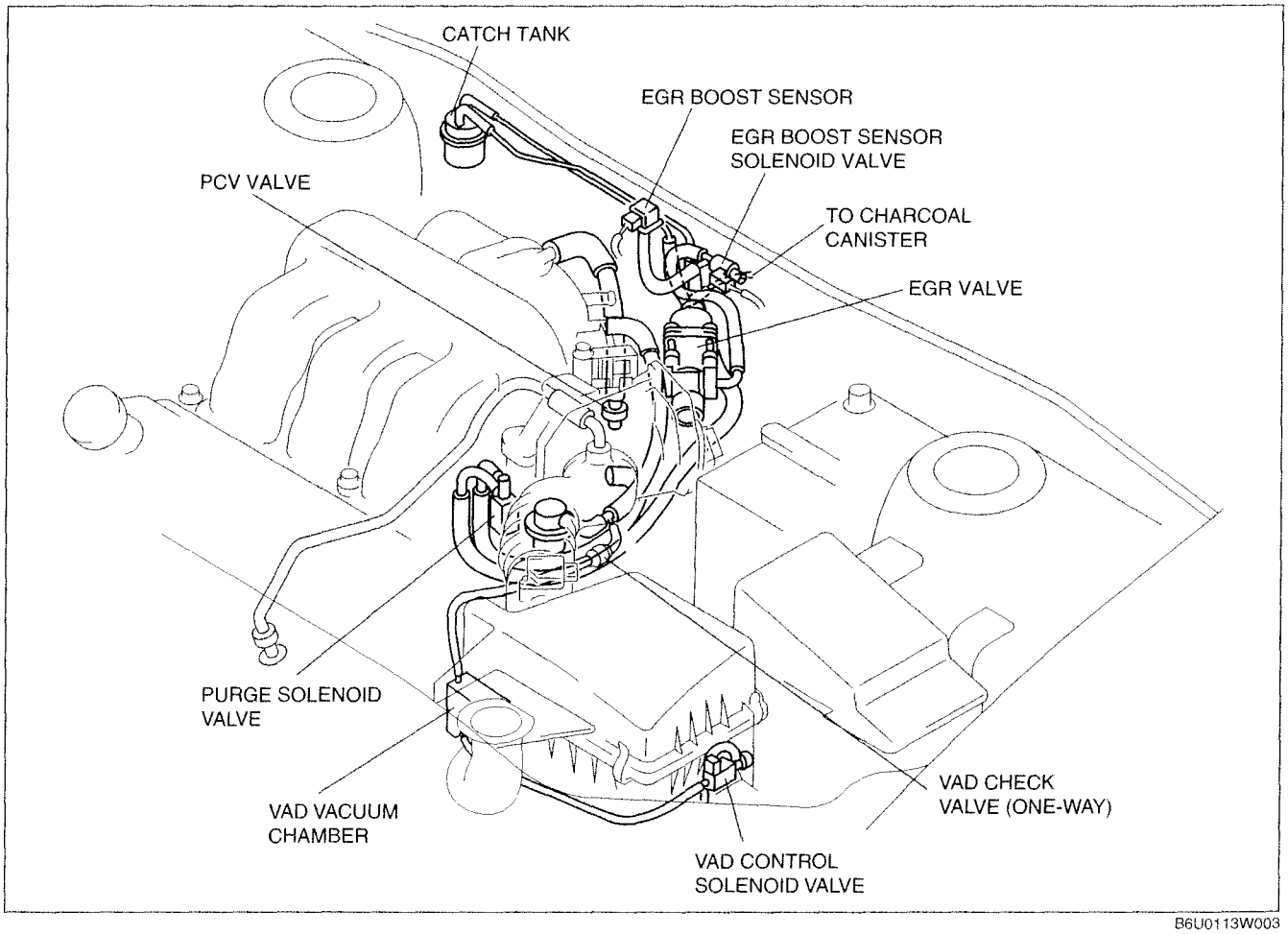
C6U011313000W02



B6U0113W001

VACUUM HOSE ROUTING DIAGRAM [AJ]

C6U011320030W01



B6U0113W003

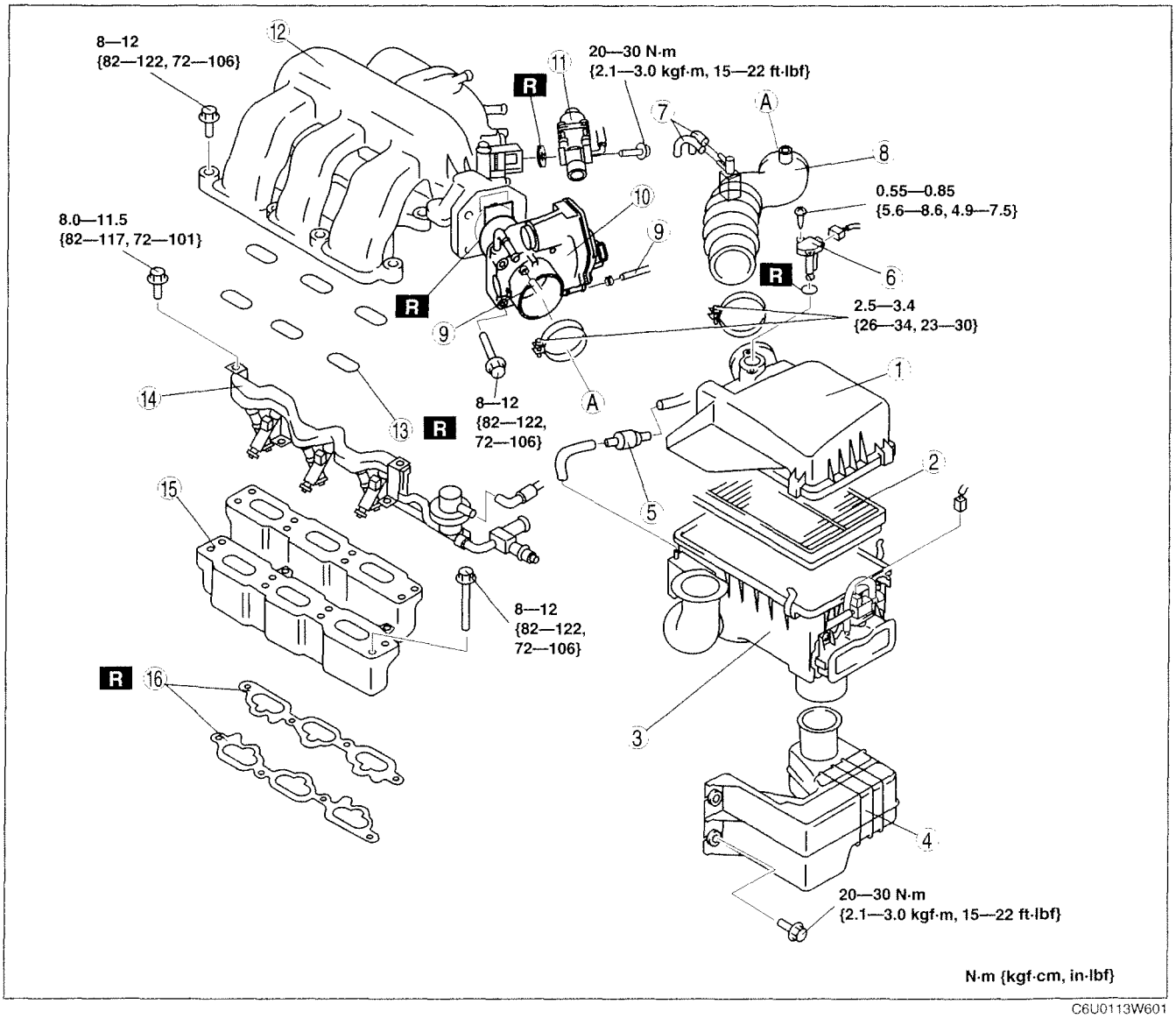
INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ]

C6U011313000W03

Warning

- **When the engine and intake-air system are hot, they can badly burn. Turn off the engine and wait until they are cool before removing the intake-air system.**
- **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01–14–5 BEFORE REPAIR PROCEDURE.)**

1. Disconnect the negative battery cable.
2. Drain the engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



C6U0113W601

1	Air cleaner cover
2	Air cleaner element
3	Air cleaner case
4	Resonance chamber (See 01–13B–5 Resonance Chamber Removal Note)
5	VAD check valve (one-way)

6	MAF/IAT sensor
7	Vacuum hose (purge solenoid valve)
8	Air hose
9	Water hose (See 01–13B–5 Water Hose Removal Note)
10	Throttle body

11	EGR valve (See 01–16–19 EGR VALVE REMOVAL/ INSTALLATION [AJ])
12	Dynamic chamber (See 01–13B–5 Dynamic Chamber Installation Note)
13	Dynamic chamber gasket
14	Fuel distributor (See 01–14–24 FUEL INJECTOR REMOVAL/ INSTALLATION [AJ])
15	Intake manifold (See 01–13B–5 Intake Manifold Installation Note)
16	Intake manifold gasket

Resonance Chamber Removal Note

1. Remove the front mudguard (LH) before removing the resonance chamber.

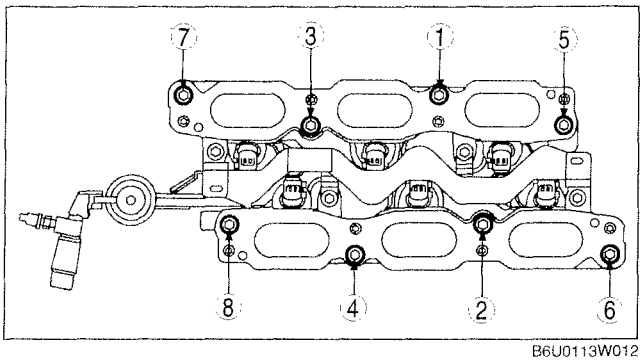
Water Hose Removal Note

1. Drain the engine coolant before removing the water hose. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)

Intake Manifold Installation Note

1. Tighten the intake manifold installation bolts in the order indicated.

   Tightening torque
   8—12 N·m {82—122 kgf·cm, 72—106 in·lbf}

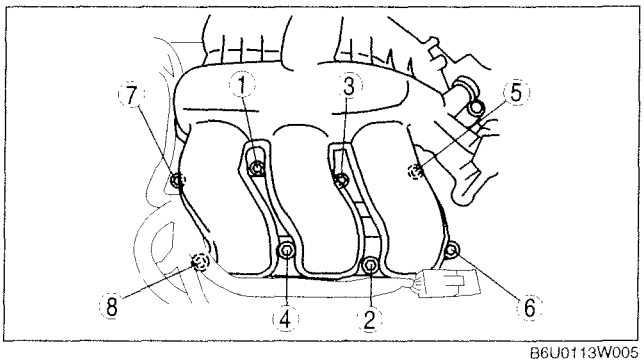


B6U0113W012

Dynamic Chamber Installation Note

1. Tighten the dynamic chamber installation bolts in the order indicated.

   Tightening torque
   8—12 N·m {82—122 kgf·cm, 72—106 in·lbf}



B6U0113W005

AIR CLEANER ELEMENT INSPECTION [AJ]

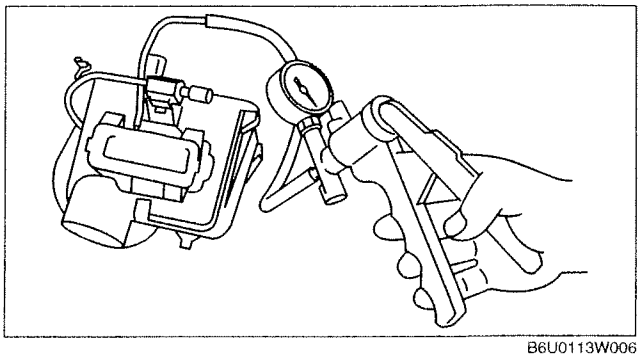
C6U011313000W04

1. Remove the air cleaner element. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
2. Verify that the air cleaner element surface is free of dirt.
   - If there is dirt present, use an air gun or similar tool to clean the element.
   - If the replacement time limit has passed, replace the element.

VARIABLE AIR DUCT (VAD) SHUTTER VALVE INSPECTION [AJ]

C6U011313000W05

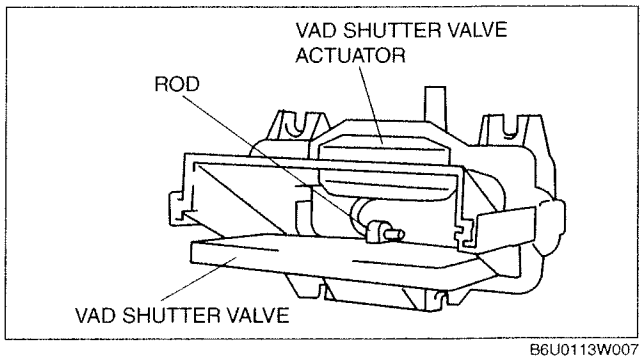
1. Remove the air cleaner case. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
2. Disconnect the vacuum hose from the VAD shutter valve actuator.
3. Connect a vacuum pump to the VAD shutter valve actuator.



B6U0113W006

4. Apply vacuum and verify that the rod moves.
   - If the rod does not move, replace the air cleaner case.

Vacuum kPa {mmHg, inHg}	Rod movement
Below –10 {–75, –3.0}	Starts to move
Above –35 {–263, –10.4}	Fully pulled

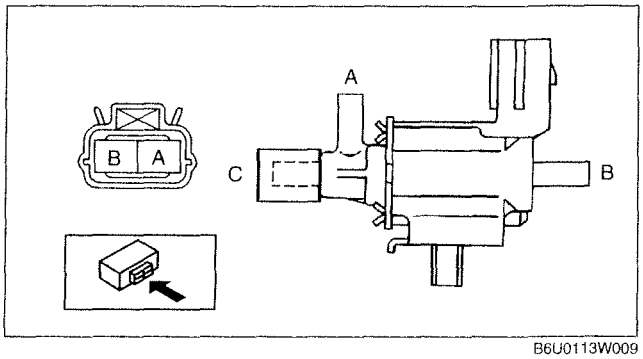


B6U0113W007

VARIABLE AIR DUCT (VAD) CONTROL SOLENOID VALVE INSPECTION [AJ]

C6U011313000W06

1. Remove the VAD control solenoid valve. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
2. Inspect airflow between the ports under the following conditions.
   - If not as specified, replace the VAD control solenoid valve.
   - If as specified, carry out the "Circuit Open/ Short Inspection".



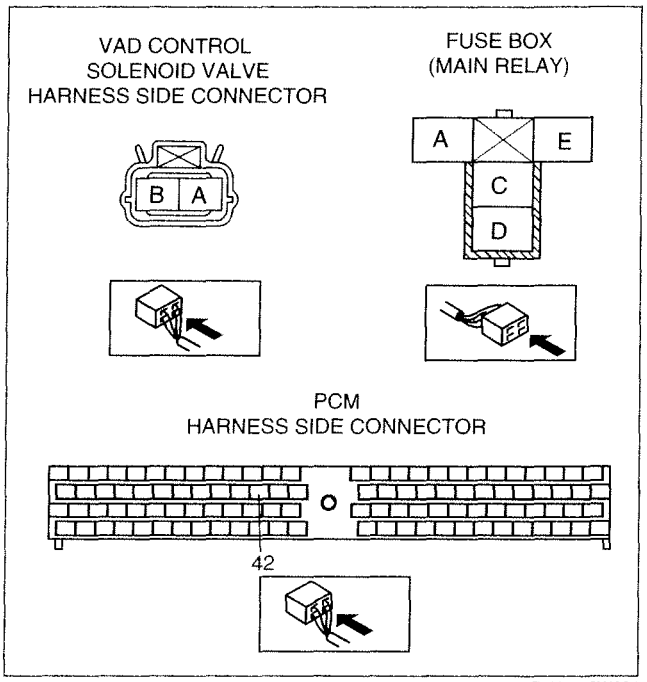
B6U0113W009

○—○ : Continuity ○═○ : Airflow

Step	Terminal		Port		
	A	B	A	B	C
1	○—○		○═○		
2	B+	GND	○═══○		

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following wiring harness for open or short circuit (continuity check).



B6U0113W026

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the harness.
  - — VAD control solenoid valve terminal B (harness-side) and PCM terminal 42
  - — VAD control solenoid valve terminal A (harness-side) and main relay terminal C (harness-side)

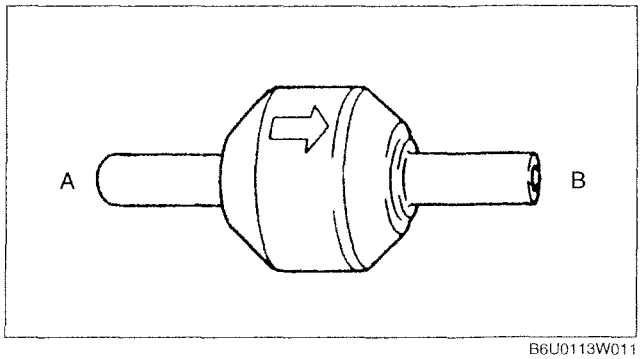
Short circuit

- If there is continuity, there is a short circuit. Repair or replace the harness.
  - — VAD control solenoid valve terminal B (harness-side) and body GND
  - — VAD control solenoid valve terminal A (harness-side) and power supply

VARIABLE AIR DUCT (VAD) CHECK VALVE (ONE-WAY) INSPECTION [AJ]

C6U011313000W07

1. Remove the VAD check valve (one-way). (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
2. Blow through A and verify that air flows from B.
3. Blow through B and verify that air does not flow from A.
   - If not as specified, replace the VAD check valve (one-way).



B6U0113W011

THROTTLE ACTUATOR INSPECTION [AJ]

C6U011320661W01

Caution

- **When the ignition switch is turned to the ON position, the PCM operates the throttle actuator to adjust the throttle valve position. At this time, do not touch the valve to open or close it because your fingers could be pinched.**

Note

- Perform the following inspection only when directed.

Visual Inspection

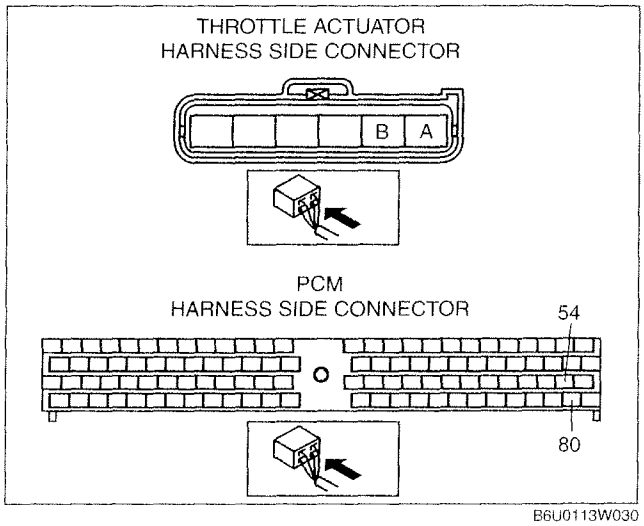
1. Verify that no DTCs related stored to the TP or APP sensors have been stored.
   - If any DTCs have been stored, perform the applicable DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
2. Remove the air hose from the throttle body. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
3. Turn the ignition switch to the ON position.
4. Operate the accelerator pedal and verify that the throttle valve opens and closes in accordance with the pedal movement.
   - If it cannot be verified, perform the "Continuity Inspection".

Continuity Inspection

1. Disconnect the negative battery cable.
2. Disconnect the throttle actuator connector.
3. Inspect for continuity between the throttle actuator terminals A and B using an ohmmeter.
   - If not as specified, replace the throttle body. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
   - If as specified, perform the "Circuit Open/Short Inspection".

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following wiring harnesses for open or short circuit (continuity check).



B6U0113W030

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the harness.
  - — Throttle actuator terminal B (harness-side) and PCM terminal 54
  - — Throttle actuator terminal A (harness-side) and PCM terminal 80

Short circuit

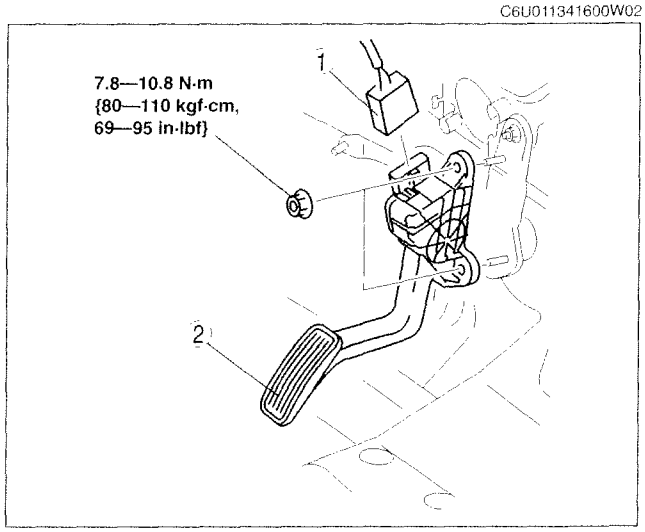
- If there is continuity, there is a short circuit. Repair or replace the harness.
  - — Throttle actuator terminal B (harness-side) and power supply
  - — Throttle actuator terminal B (harness-side) and GND
  - — Throttle actuator terminal A (harness-side) and power supply
  - — Throttle actuator terminal A (harness-side) and GND

ACCELERATOR PEDAL REMOVAL/INSTALLATION [AJ]

1. Remove in the order indicated in the table.

1	Connector
2	Accelerator pedal

C6U011341600W02



B6U0113W013

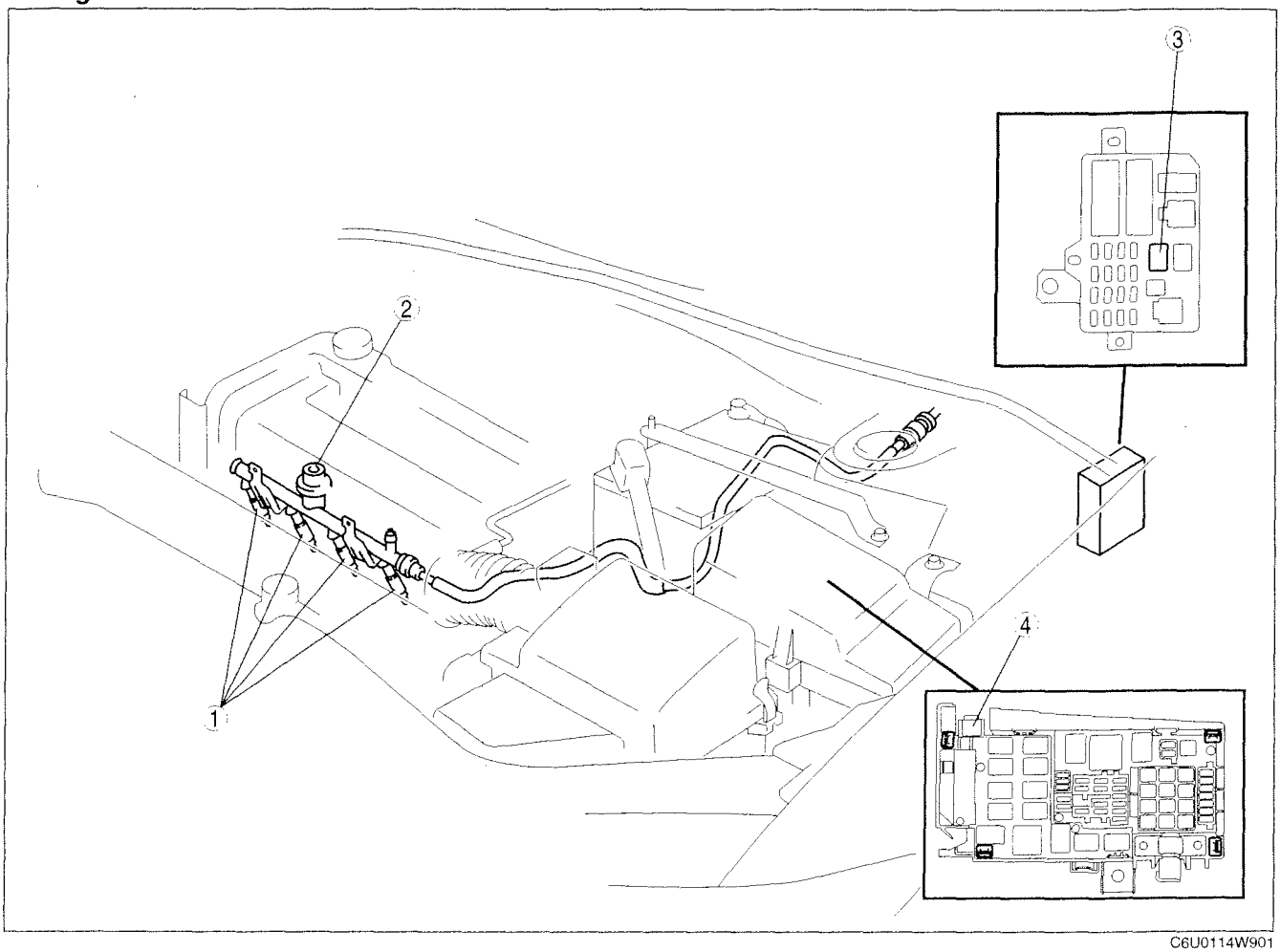
2. Install in the reverse order of removal.

01–14 FUEL SYSTEM

FUEL SYSTEM LOCATION INDEX

C6U011400114W01

Engine Room Side
L3 engine models

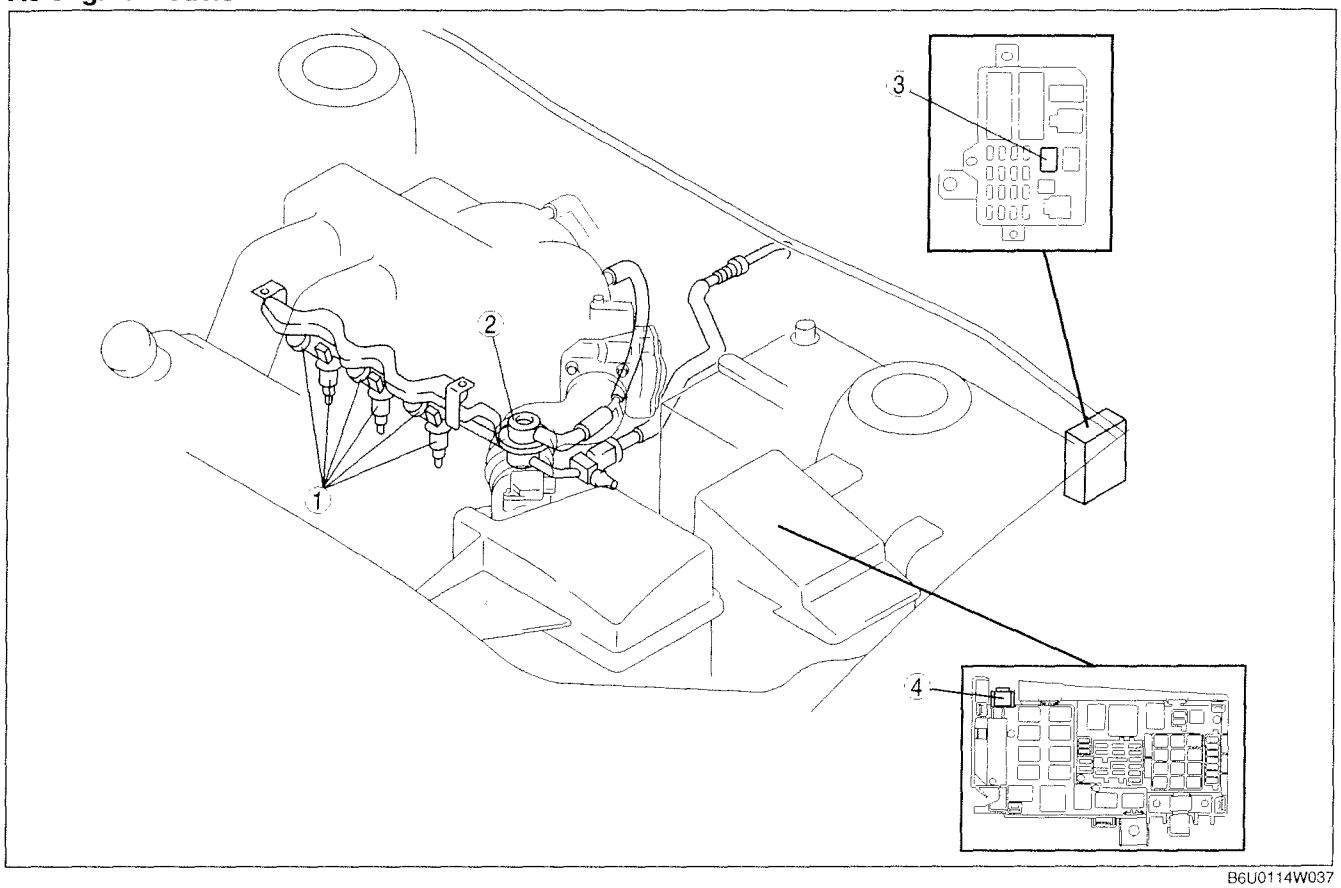


C6U0114W901

1	Fuel injector (See 01–14–20 FUEL INJECTOR REMOVAL/ INSTALLATION [L3]) (See 01–14–27 FUEL INJECTOR INSPECTION [L3])

2	Pulsation damper (See 01–14–32 PULSATION DAMPER REMOVAL/ INSTALLATION) (See 01–14–33 PULSATION DAMPER INSPECTION)
3	Fuel pump relay (See 09–21–6 RELAY INSPECTION)
4	Check connector

AJ engine models

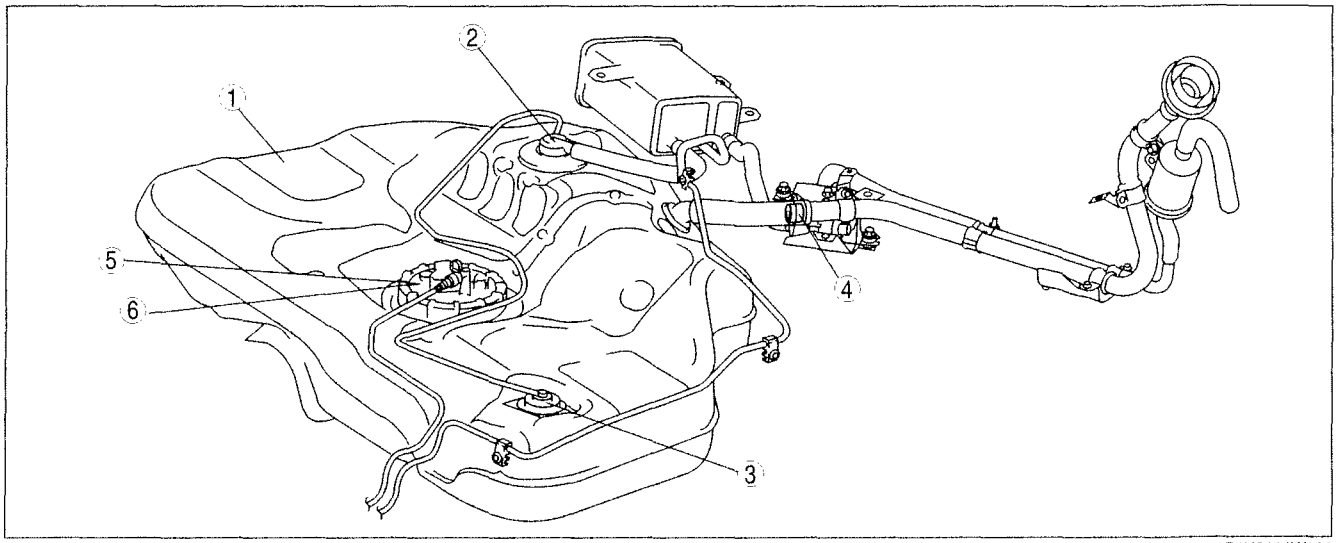


B6U0114W037

1	Fuel injector (See 01–14–24 FUEL INJECTOR REMOVAL/ INSTALLATION [AJ]) (See 01–14–30 FUEL INJECTOR INSPECTION [AJ])

2	Pulsation damper (See 01–14–32 PULSATION DAMPER REMOVAL/ INSTALLATION) (See 01–14–33 PULSATION DAMPER INSPECTION)
3	Fuel pump relay (See 09–21–6 RELAY INSPECTION)
4	Check connector

Fuel Tank Side



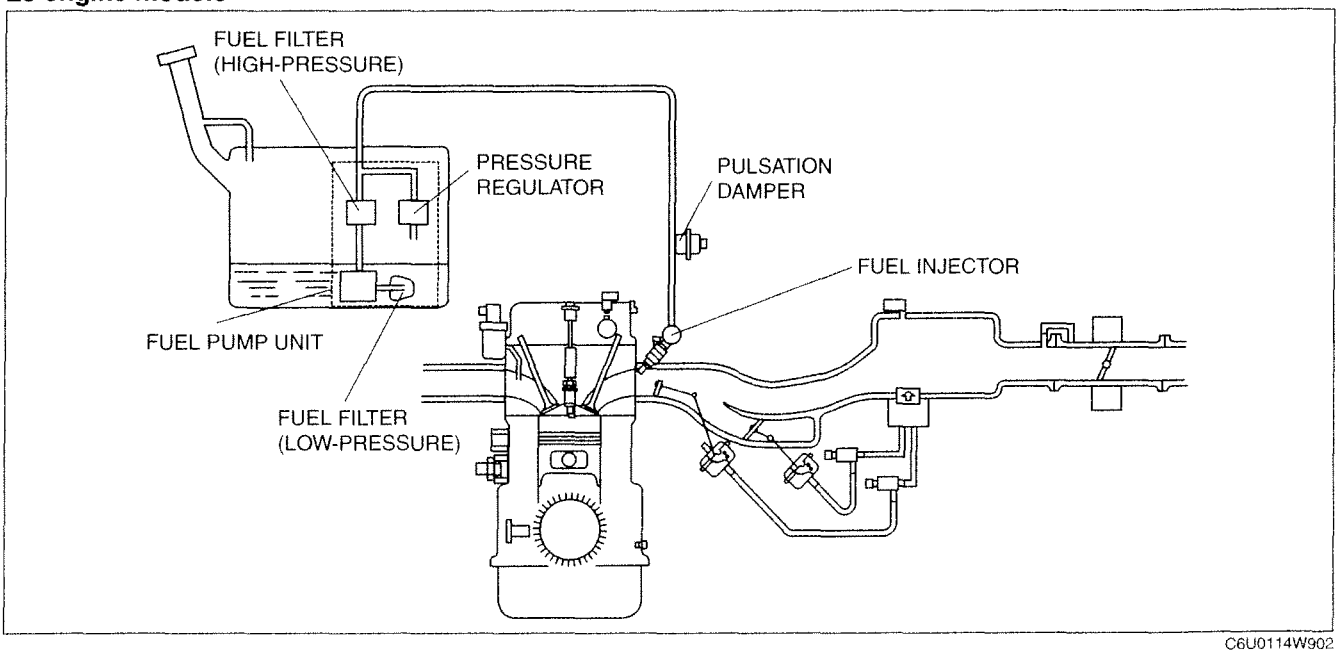
B6U0114W038

1	Fuel tank (See 01–14–10 FUEL TANK REMOVAL/ INSTALLATION)
2	Fuel shut-off valve (See 01–14–12 FUEL SHUT-OFF/ROLLOVER VALVE INSPECTION)
3	Rollover valve (See 01–14–12 FUEL SHUT-OFF/ROLLOVER VALVE INSPECTION)
4	Nonreturn valve (See 01–14–12 NONRETURN VALVE INSPECTION)
5	Fuel pump unit (See 01–14–13 FUEL PUMP UNIT REMOVAL/ INSTALLATION) (See 01–14–16 FUEL PUMP UNIT DISASSEMBLY/ ASSEMBLY) (See 01–14–17 FUEL PUMP UNIT INSPECTION)
6	Pressure regulator (See 01–14–32 PRESSURE REGULATOR INSPECTION)

FUEL SYSTEM DIAGRAM

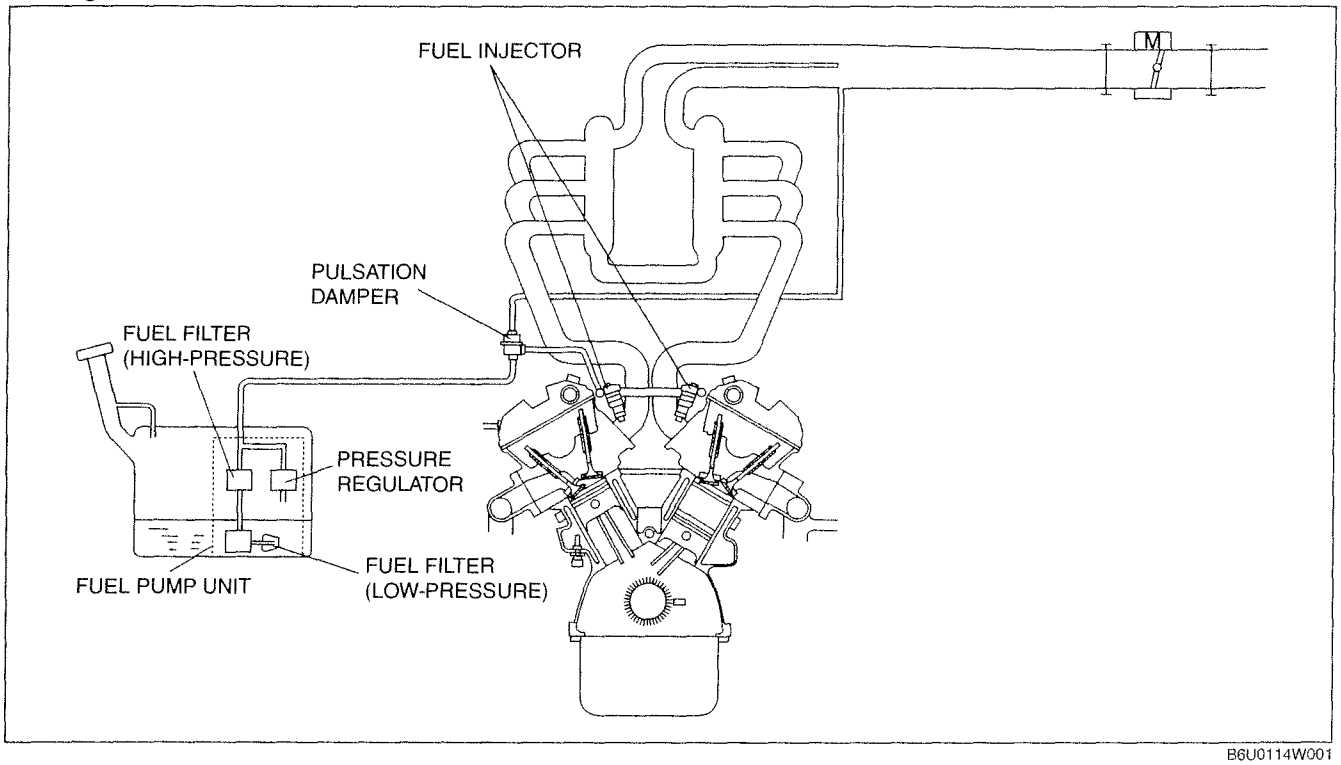
C6U011400114W02

L3 engine models



C6U0114W902

AJ engine models



B6U0114W001

BEFORE REPAIR PROCEDURE

C6U011400114W03

Warning

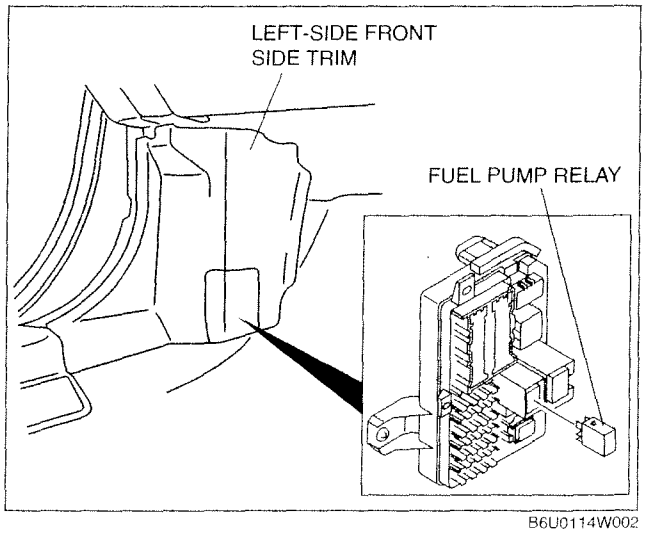
- **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the following "Fuel Line Safety Procedure".**

Fuel Line Safety Procedure

Note

- Fuel in the fuel system is under high pressure even when the engine is not running.

1. Remove the fuel-filler cap and release the pressure in the fuel tank.
2. Remove the fuel pump relay.
3. Start the engine.
4. After the engine stalls, crank the engine several times.
5. Turn the ignition switch to the LOCK position.
6. Install the fuel pump relay.



B6U0114W002

AFTER REPAIR PROCEDURE

C6U011400114W04

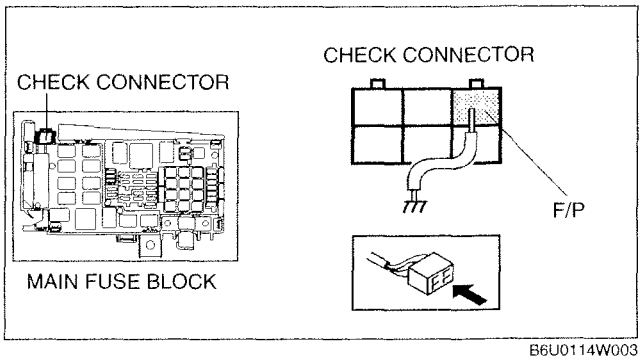
Warning
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. When installing the fuel hose, perform "Fuel Leakage Inspection" described below.**

Fuel Leakage Inspection

Warning
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.**

Caution
- **Connecting to the wrong check connector terminal may cause a malfunction. Carefully connect only to the specified terminal.**

1. Short the check connector terminal F/P to body GND using a jumper wire.
2. Turn the ignition switch to the ON position to operate the fuel pump.
3. Pressurize the system in this manner for **at least 5 min** to be sure there is no leakage.
   - If there is fuel leakage, inspect the fuel hoses, hose clamps, and fuel pipe sealing surface, and replace if necessary.
4. After repair, assemble the system and repeat Steps 1 to 3.



B6U0114W003

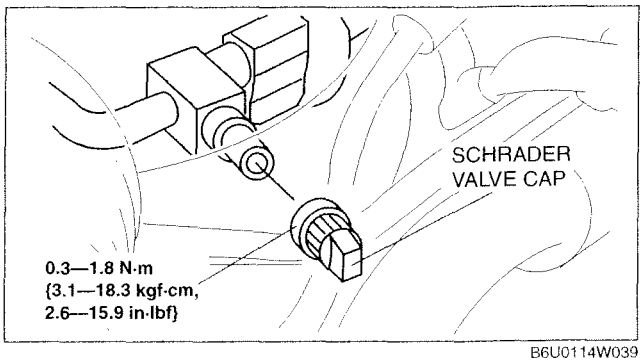
FUEL LINE PRESSURE INSPECTION

C6U011400114W05

With Using Schrader Valve

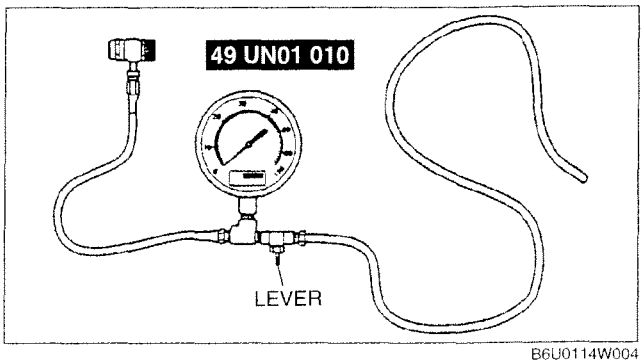
Warning
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death. Fuel can also irritate skin and eyes. To prevent this, always complete the "BEFORE REPAIR PROCEDURE". (See 01–14–5 BEFORE REPAIR PROCEDURE.)**

1. Disconnect the negative battery cable.
2. Remove the fuel line schrader valve cap located under the throttle body.



B6U0114W039

3. Make sure the lever of **SST** is turned fully clockwise, then connect **SST** (Fuel pressure gauge) to the schrader valve.
4. Connect the negative battery cable.
5. Verify that the shift lever is in N position for ATX vehicles, or neutral position for MTX vehicles.
6. Start the engine and idle it.



B6U0114W004

7. Measure the fuel line pressure.
   - If not as specified, inspect the following:
     Zero or low
     — FP circuit
     — FP
     — Fuel line (clogging)
     — Fuel leakage inside pressure regulator
     High
     — Pressure regulator

Fuel line pressure
L3: 375—450 kPa {3.9—4.5 kgf/cm^2, 55—65 psi}
AJ: 430—510 kPa {4.4—5.2 kgf/cm^2, 63—73 psi}

8. Observe the fuel pressure gauge indicator during heavy acceleration.
9. Verify that the fuel pressure fluctuation is within the specification during the test.
   - If not as specified, inspect the following:
     — PCM
     — FP
     — Pulsation damper
     — Fuel line for improper routing, kinks or leakage

Fuel pressure fluctuation
L3: 365—450 kPa {3.8—4.5 kgf/cm^2, 53—65 psi}
AJ: 420—510 kPa {4.3—5.2 kgf/cm^2, 61—73 psi}

10. Turn the ignition switch to the LOCK position.
11. Measure the fuel hold pressure **after 5 min**.
    - If not as specified, inspect the following:
      — FP hold pressure
      — Fuel injector for leakage
      — Fuel line for improper routing, kinks or leakage

Fuel hold pressure
L3: More than 200 kPa {2.0 kgf/cm^2, 29 psi}
AJ: More than 250 kPa {2.5 kgf/cm^2, 36 psi}

12. Disconnect the **SST** and connect the fuel pipe. (See 01–14–20 FUEL INJECTOR REMOVAL/INSTALLATION [L3].) (See 01–14–24 FUEL INJECTOR REMOVAL/INSTALLATION [AJ].)
13. Complete the "AFTER REPAIR PROCEDURE". (See 01–14–6 AFTER REPAIR PROCEDURE.)

AJ Without Using Schrader Valve

Warning

- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death. Fuel can also irritate skin and eyes. To prevent this, always complete the "BEFORE REPAIR PROCEDURE". (See 01–14–5 BEFORE REPAIR PROCEDURE.)**

Caution

- **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using cloth or soft brush, and make sure that it is free of foreign material.**

1. Complete the "BEFORE REPAIR PROCEDURE".
   (See 01–14–5 BEFORE REPAIR PROCEDURE)
2. Disconnect the vacuum hose from the intake manifold that connecting to the brake booster.
3. Disconnect the negative battery cable.

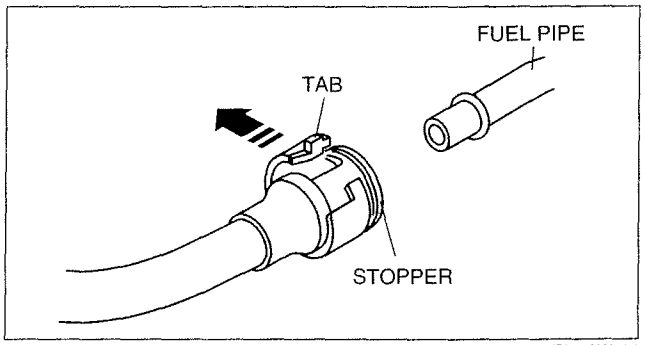
Caution

- **The quick release connector may be damaged if the tab is turned too far. Do not turn the tab over the stopper.**

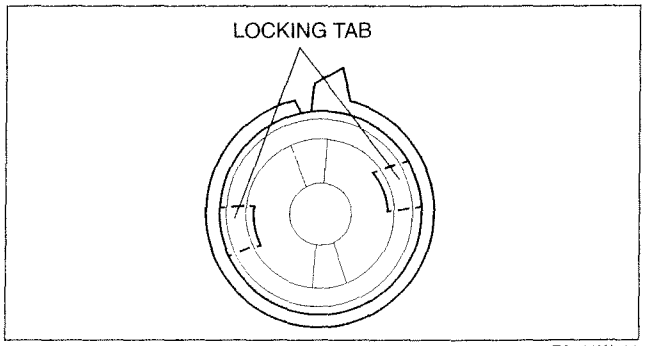
4. Disconnect the quick release connector from the fuel tank as follows:
   (1) Push the tab on the locking coupler **90 degrees** until it stops.
   (2) Pull the fuel hose straight back.

Note

- The stopper may be removed from the quick connector. Take care not to loose it. Reinstall it to the quick release connector before reconnecting the fuel line.
- The locking coupler has two internal locking tabs which retain the pulsation damper pipe. Be sure that the tab on the locking coupler is rotated until it stops to release two internal locking tabs.



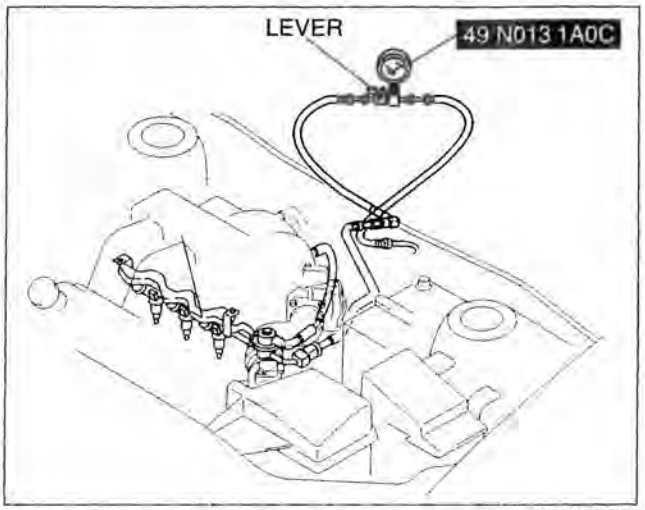
A6E3912W001



A6E3912W002

5. Push the **SST** quick release connector into the fuel pipe and plastic fuel hose into the **SST** until a click is heard.

6. Turn the lever parallel to the hose of the **SST** as shown.
7. Connect the vacuum hose from the intake manifold that connecting to the brake booster.
8. Connect the negative battery cable.
9. Verify that the vehicles for AT is at N range and MT is at neutral position.
10. Start the engine and let it idle. Measure the fuel line pressure.
    - If not as specified, inspect the following:
      Zero or low
      — FP circuit
      — FP
      — Fuel line (clogged)
      — Fuel leakage inside pressure regulator
      High
      — Pressure regulator for high pressure cause



C6U0114W999

Fuel line pressure
430—510 kPa {4.4—5.2 kgf/cm^2, 63—73 psi}

11. Observe the fuel pressure gauge indicator during heavy acceleration.
12. Verify that the fuel pressure fluctuation is within the specification during the test.
    - If not as specified, inspect the following:
      — PCM
      — FP
      — Pulsation damper
      — Fuel line for improper routing, kinks or leakage

Fuel pressure fluctuation
420—510 kPa {4.3—5.2 kgf/cm^2,61—73 psi}

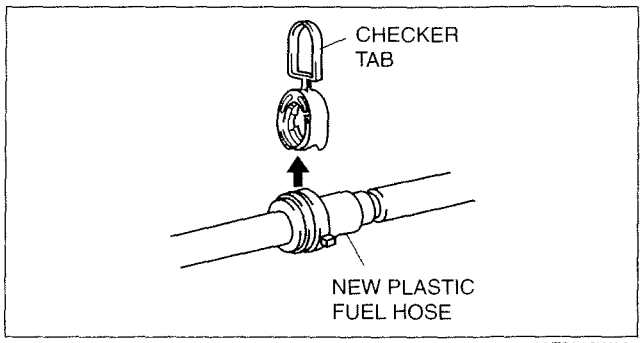
13. Turn the ignition switch to the LOCK position.
14. Measure the fuel hold pressure **after 5 min**.
    - If not as specified, inspect the following:
      — FP hold pressure
      — Fuel injector for leakage
      — Fuel line for improper routing, kinks or leakage

Fuel hold pressure
More than 250 kPa {2.5 kgf/cm^2, 36 psi}

15. Complete the "BEFORE REPAIR PROCEDURE".
    (See 01–14–5 BEFORE REPAIR PROCEDURE)
16. Disconnect the vacuum hose from the intake manifold that connecting to the brake booster.
17. Disconnect the **SST**.

Note
- A checker tab is integrated with quick release connector for new plastic fuel hoses. The checker tab will be released from the quick release connector after it is completely engaged with the fuel pipe.

18. Inspect the plastic fuel hose and fuel pipe sealing surface for damage and deformation, and replace as necessary.
    - If the quick release connector O-ring is damaged or has slipped, replace the plastic fuel hose.
19. Apply a small amount of clean engine oil to the sealing surface of the fuel pipe.
20. Reconnect the fuel main hose to the fuel distributor until a click is heard.
21. Lightly pull and push the quick release connector a few times by hand and verify that it can move **2.0—3.0 mm {0.08—0.11 in}** and it is connected securely.
    - If quick release connector does not move at all, verify that O-ring is not damaged and slipped, and reconnect the quick release connector.
22. Connect the vacuum hose from the intake manifold that connecting to the brake booster.
23. Complete the "AFTER REPAIR PROCEDURE". (See 01–14–6 AFTER REPAIR PROCEDURE.)



A6E3912W004

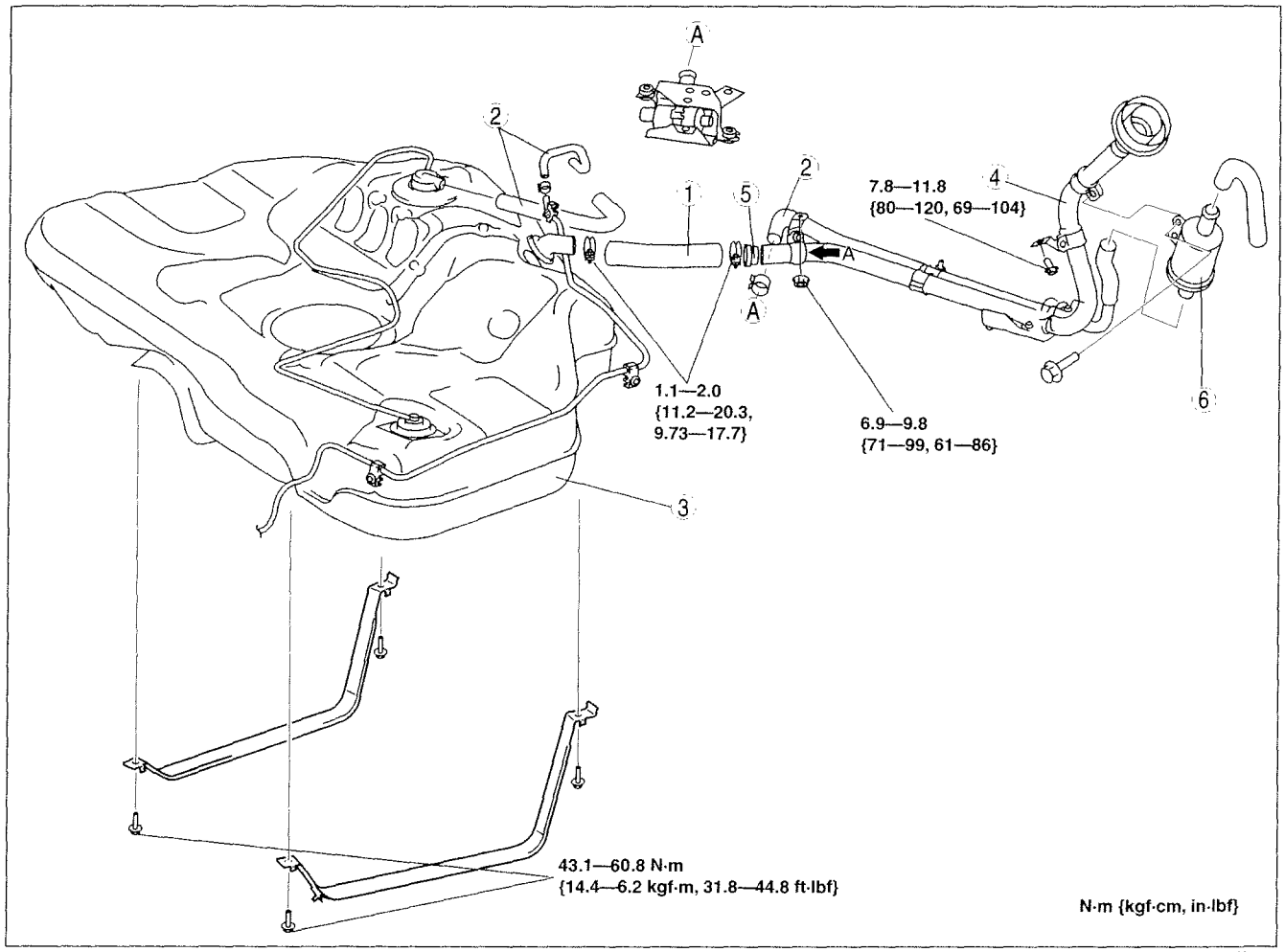
FUEL TANK REMOVAL/INSTALLATION

C6U011442110W01

Warning
- **Repairing a fuel tank that has not been properly steam-cleaned can be dangerous. Explosion or fire may cause death or serious injury. Always properly steam clean a fuel tank before repairing it.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, do not damage the sealing surface of the fuel pump unit when removing or installing.**

Caution
- **Disconnecting/connecting the quick release connector without cleaning it may cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using a cloth or soft brush, and make sure that it is free of foreign material.**

1. Level the vehicle.
2. Complete the "BEFORE REPAIR PROCEDURE". (See 01–14–5 BEFORE REPAIR PROCEDURE.)
3. Disconnect the negative battery cable.
4. Remove the fuel pump unit. (See01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.)
5. Siphon the fuel from the fuel tank.
6. Remove in the order indicated in the table.
7. Install in the reverse order of removal.
8. Complete the "AFTER REPAIR PROCEDURE". (See 01–14–6 AFTER REPAIR PROCEDURE.)



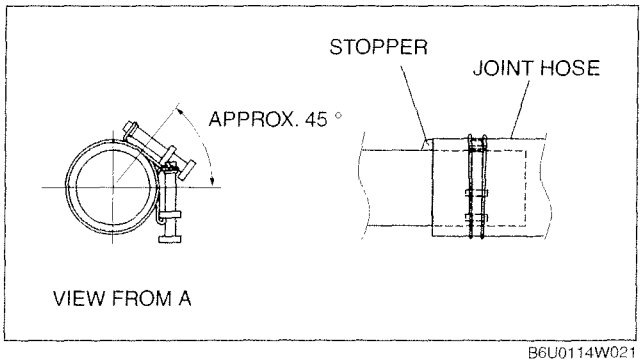
B6U0114W005

1	Joint hose (See 01–14–11 Joint Hose Installation Note)
2	Evaporative hose (See 01–16–8 Evaporative Hose Removal Note (Type A)) (See 01–16–9 Evaporative Hose Installation Note)
3	Fuel tank

4	Fuel-filler pipe
5	Nonreturn valve
6	Air filter

Joint Hose Installation Note

1. Fit the joint hose onto the respective fittings, and install clamps as shown.



B6U0114W021

FUEL SHUT-OFF/ROLLOVER VALVE INSPECTION

C6U011442990W01

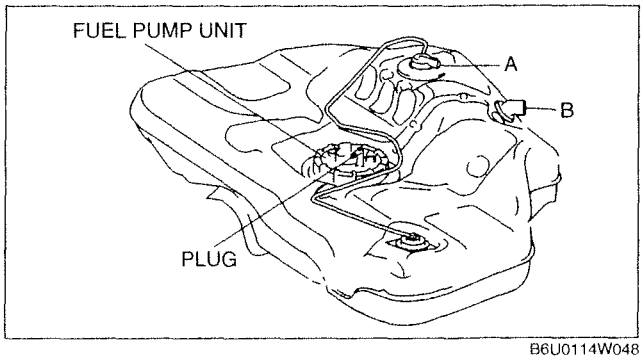
Caution

- **Disconnecting/connecting the quick release connector without cleaning it may cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using a cloth or soft brush, and make sure that it is free of foreign material.**

Note

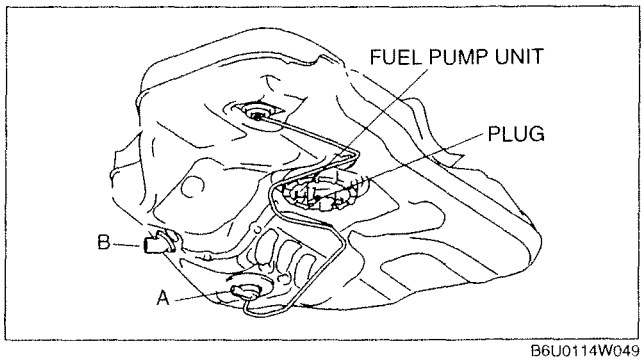
- This inspection is for fuel shut-off valve and two rollover valves integrated in the fuel tank.

1. Disconnect the plastic fuel hose and the fuel pump unit connector. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.)
2. Remove the fuel tank with the fuel pump unit. (See 01–14–10 FUEL TANK REMOVAL/INSTALLATION.)
3. Plug the fuel pipe of the fuel pump unit.
4. Level the fuel tank.



B6U0114W048

5. Blow through port B and verify that there is airflow from port A.
   - If there is no airflow, replace the fuel tank.
   - If there is airflow, turn the fuel tank upside down, and proceed to Step 6.
6. Blow through port B and verify that there is no airflow from port A.
   - If there is airflow, replace the fuel tank.

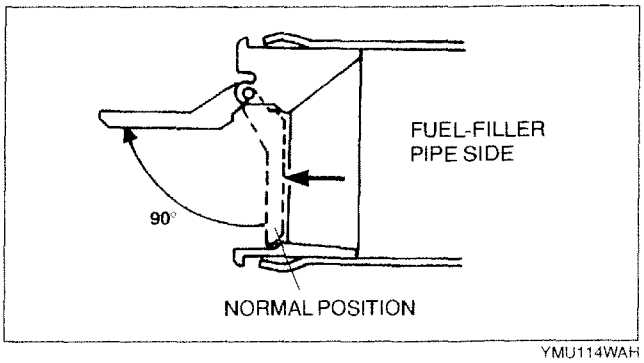


B6U0114W049

NONRETURN VALVE INSPECTION

C6U011442270W01

1. Remove the nonreturn valve. (See 01–14–10 FUEL TANK REMOVAL/INSTALLATION.)
2. Verify that the nonreturn valve opens up to **90°** when it is pushed from the fuel-filler pipe side, and it returns to the normal position by the spring force.
   - If the nonreturn valve does not open up to **90°** or does not return to the normal position, replace the nonreturn valve.



YMU114WAH

FUEL PUMP UNIT REMOVAL/INSTALLATION

C6U011413350W01

Warning

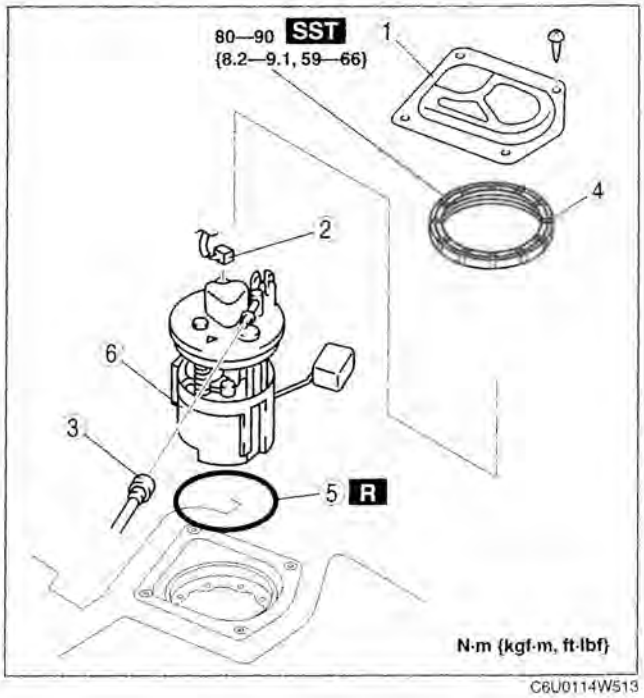
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, do not damage the sealing surface of the fuel pump unit when removing or installing.**

Caution

- **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using a cloth or soft brush, and make sure that it is free of foreign material.**

1. Complete the "BEFORE REPAIR PROCEDURE". (See 01–14–5 BEFORE REPAIR PROCEDURE.)
2. Disconnect the negative battery cable.
3. Remove the rear seat cushion.
4. Remove in the order indicated in the table.

1	Service hole cover
2	Connector
3	Plastic fuel hose (See 01–14–14 Plastic Fuel Hose Removal Note) (See 01–14–16 Plastic Fuel Hose Installation Note)
4	Fuel pump cap (See 01–14–14 Fuel Pump Cap Removal Note) (See 01–14–15 Fuel Pump Cap Installation Note)
5	Packing
6	Fuel pump unit



C6U0114W513

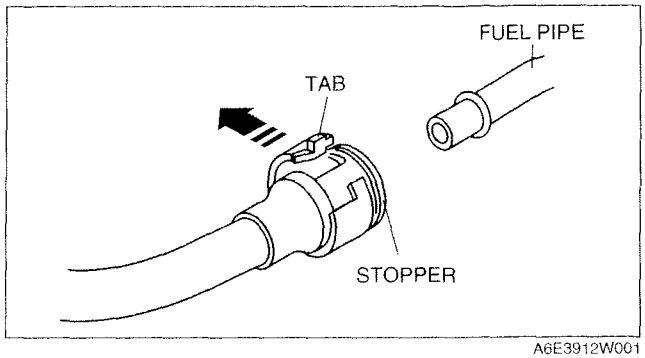
5. Install in the reverse order of removal.
6. Complete the "AFTER REPAIR PROCEDURE". (See 01–14–6 AFTER REPAIR PROCEDURE.)

Plastic Fuel Hose Removal Note

Caution
- **The quick release connector may be damaged if the tab is bent excessively. Do not expand the tab over the stopper.**

1. Disconnect the quick release connector.
   (1) Push the tab on the locking coupler **90** ° until it stops.
   (2) Pull the fuel hose straight back.

Note
- The stopper may be removed from the quick connector. Take care not to lose it. Reinstall it to the quick release connector before reconnecting the fuel line.
- The locking coupler has two internal locking tabs which retain the fuel pipe. Be sure that the tab on the locking coupler is rotated until it stops to release two internal locking tabs.



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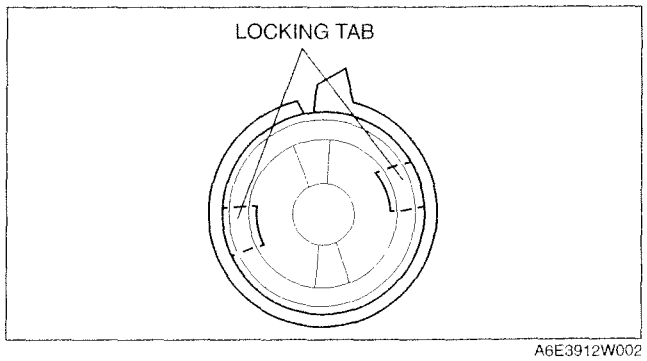


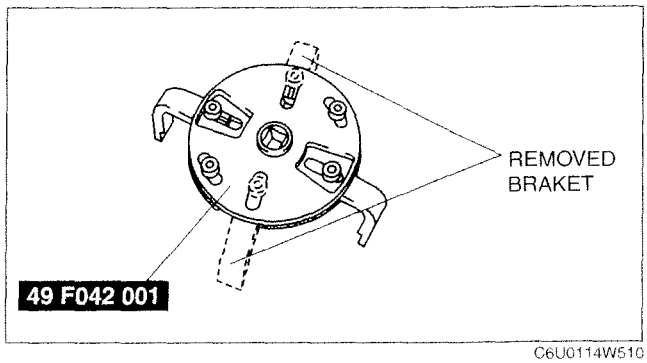
A6E3912W002

2. Cover the disconnected quick release connector and fuel pipe with vinyl sheets or the like to prevent them from being scratched or contaminated with foreign material.

Fuel Pump Cap Removal Note

Caution
- **The cap could be damaged if the SST is used with any play between the cap and the SST. Securely attach the SST so that there is no gap between the SST tabs and the side of the cap.**

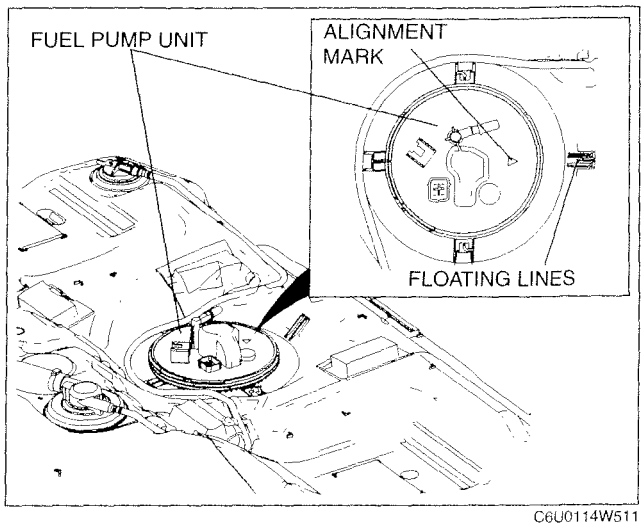
1. Remove the fuel pump cap using the **SST** with two of the four brackets removed.



C6U0114W510

Fuel Pump Cap Installation Note

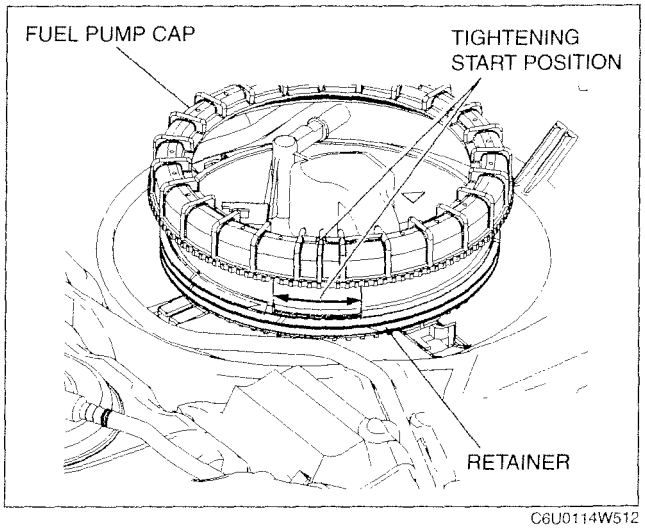
1. Align the fuel pump unit alignment marks and the floating lines as shown in the figure.



C6U0114W511

2. Align the tightening start positions of the fuel pump cap and the retainer notch as shown in the figure, and tighten them **one full rotation** by hand.
   - If the fuel pump cap cannot be tighten by hand, remove the fuel pump cap, verify that there is no damage or misalignment on the retainer and fuel pump cap, and then tighten again.

   Caution
   - **The fuel pump cap could be damaged if the SST is used with any play between the fuel pump cap and the SST. Securely attach the SST so that there is no gap between the SST brackets and the side of the cap.**



C6U0114W512

3. While keeping the alignment mark and the floating lines aligned, tighten the fuel pump cap to the rotation angle and specified torque using the **SST**.
   - If the specified torque cannot be obtained even when the fuel pump cap is rotated to the specified rotation angle, replace with a new fuel pump cap and repeat Step 3.

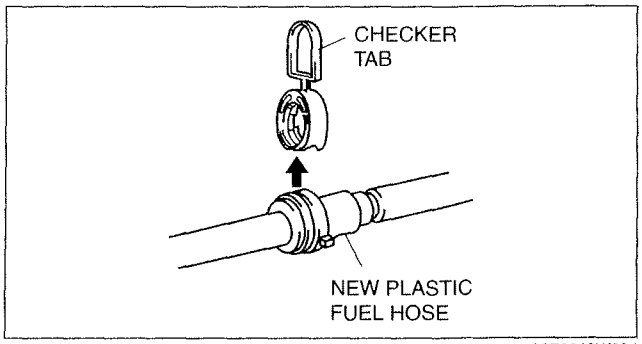
Rotation angle
50—140°
(Total angle for Step 2 and Step 3 is 410—500°.)
Cap tightening torque
80—135 N· m {8.2—13.7 kgf·m, 59—99 ft·lbf}

Plastic Fuel Hose Installation Note

Note

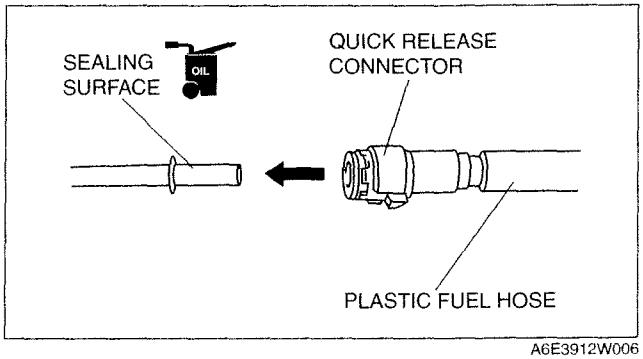
- A checker tab is integrated with quick release connector for new plastic fuel hoses. The checker tab will be released from the quick release connector after it is completely engaged with the fuel pipe.

1. Inspect the fuel pump unit sealing surface for damage and deformation, and replace if necessary.
   - If the quick release connector O-ring is damaged, replace the plastic fuel hose.



A6E3912W004

2. Slightly apply clean engine oil to the sealing surface of the fuel pump unit.
3. Align the fuel pipe on the fuel pump unit and quick release connector so that the tabs of the retainer are correctly fitted into the quick release connector. Push the quick release connector straight into the retainer until a click is heard.
4. Lightly pull and push the quick release connector a few times by hand and verify that it can move **2.0—3.0 mm {0.08—0.11 in}** and it is connected securely.
   - If the quick release connector does not move at all, verify that O-ring is not damaged and slipped, and reconnect the quick release connector.



A6E3912W006

FUEL PUMP UNIT DISASSEMBLY/ASSEMBLY

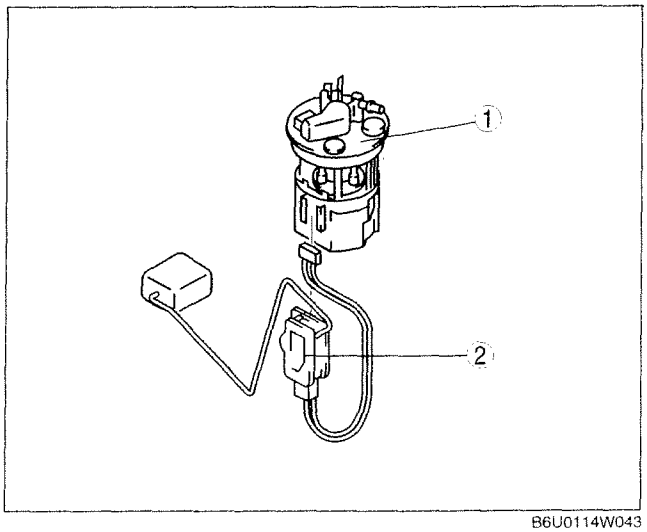
C6U011413350W02

Warning

- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, do not damage the sealing surface of the fuel pump unit when removing or installing.**

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

1	Fuel pump unit
2	Fuel gauge sender unit



B6U0114W043

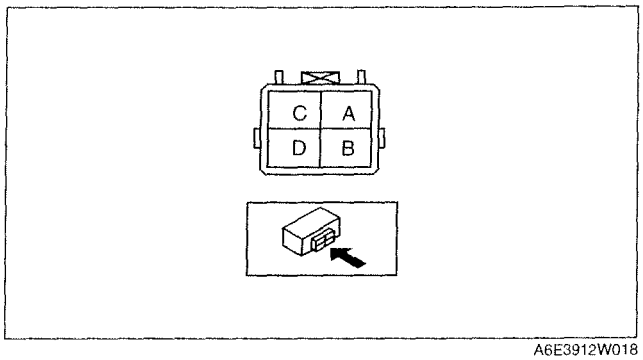
FUEL PUMP UNIT INSPECTION

C6U011413350W03

Continuity Inspection

Note
- Perform the following test only when directed.

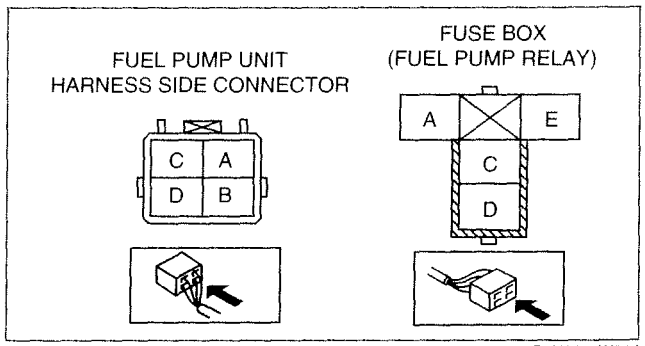
1. Disconnect the negative battery cable.
2. Remove the service hole cover. (See 01–14–13 FUEL PUMP UNIT REMOVAL/INSTALLATION.)
3. Disconnect the fuel pump unit connector.
4. Inspect for continuity between fuel pump unit connector terminals B and D.
   - If there is no continuity, replace the fuel pump body.
   - If as specified, carry out the "Circuit Open/ Short Inspection".



A6E3912W018

Circuit Open/Short Inspection

1. Inspect the following wiring harnesses as for open or short circuit (continuity check).



B6U0114W014

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Fuel pump unit terminal D (harness-side) and body GND.
  - — Fuel pump unit terminal B (harness-side) and fuel pump relay terminal C (harness-side).

Short circuit
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — Fuel pump unit terminal D (harness-side) and power supply.
  - — Fuel pump unit terminal B (harness-side) and body GND.

Fuel Pump Hold Pressure Inspection

Warning

- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.**

Caution

- **Disconnecting/connecting the quick release connector without cleaning it may cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using a cloth or soft brush, and make sure that it is free of foreign material.**

Note

- Perform the following test only when directed.

1. Complete the "BEFORE REPAIR PROCEDURE". (See 01–14–5 BEFORE REPAIR PROCEDURE.)
2. Disconnect the negative battery cable.
3. Remove the battery and battery tray.

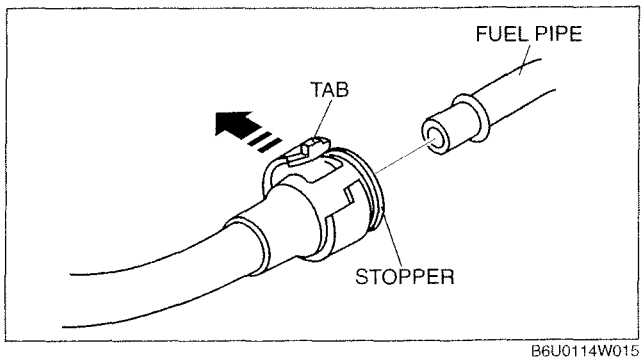
Caution

- **The quick release connector may be damaged if the tab is bent excessively. Do not expand the tab over the stopper.**

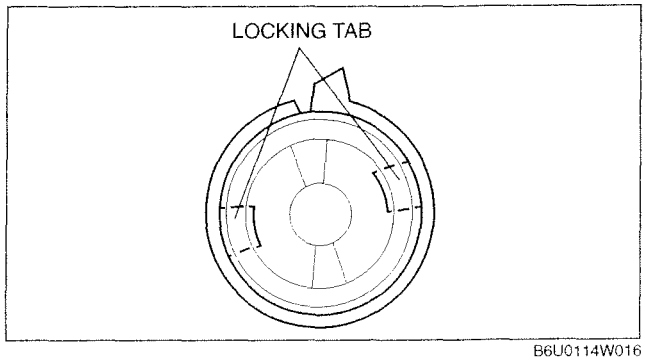
4. Disconnect the quick release connector from the fuel tank as follows:
   (1) Push the tab on the locking coupler **90°** until it stops.
   (2) Pull the fuel hose straight back.

Note

- The stopper may be removed from the quick connector. Take care not to lose it. Reinstall it to the quick release connector before reconnecting the fuel line.
- The locking coupler has two internal locking tabs which retain the pulsation damper pipe. Be sure that the tab on the locking coupler is rotated until it stops to release two internal locking tabs.

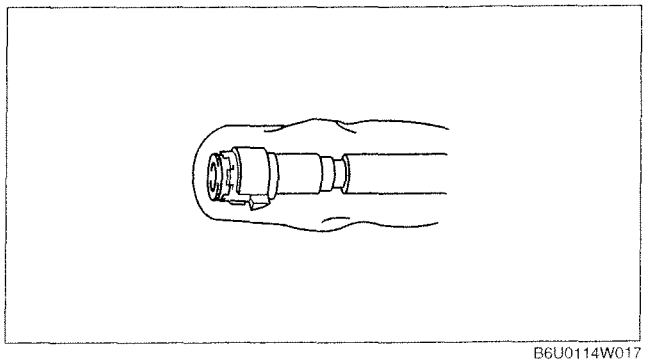


B6U0114W015

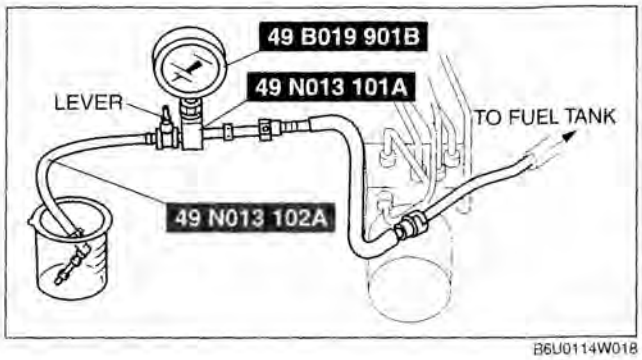


B6U0114W016

5. Cover the disconnected quick release connector with vinyl sheet or the like to prevent it from being scratched or contaminated with foreign material.


B6U0114W017

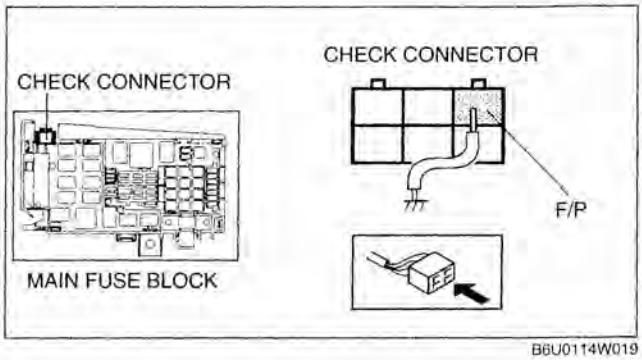
6. Turn the lever **90°** against the hose of the **SST** to plug the **SST** outlet.
7. Push the **SST** quick release connector into the fuel pipe until a click is heard.
8. Set the fuel hose into a container to avoid fuel spills.
9. Connect the negative battery cable.



B6U0114W018

Caution
- **Connecting to the wrong check connector terminal may cause malfunction. Carefully connect only to the specified terminal.**

10. Short the check connector terminal F/P to body GND using a jumper wire.
11. Turn the ignition switch to the ON position to operate the fuel pump.
12. Turn the ignition switch to the LOCK position.
13. Measure the fuel pump hold pressure **after 5 min**.
    - If not as specified, replace the fuel pump after inspecting the following:
      — Fuel line for clogging or leakage

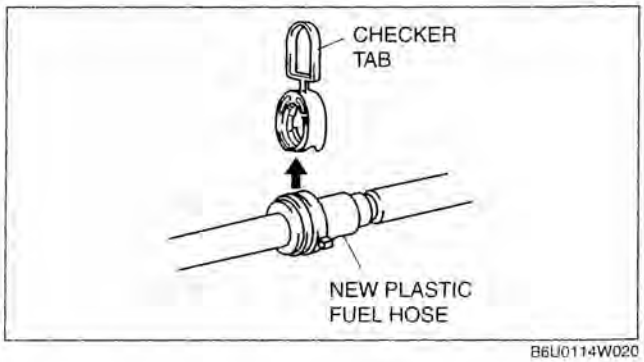


B6U0114W019

Fuel pump hold pressure
L3: More than 200 kPa {2.0 kgf/cm^2, 29 psi}
AJ: More than 250 kPa {2.5 kgf/cm^2, 36 psi}

14. Disconnect the jumper wire.
15. Disconnect the SST.

Note
- A checker tab is integrated with the quick release connector for new plastic fuel hoses. The checker tab will be released from the quick release connector after it is completely engaged with the fuel pipe.



B6U0114W020

16. Inspect the plastic fuel hose and fuel pipe sealing surface for damage and deformation, and replace if necessary.
    - If the quick release connector O-ring is damaged or has slipped, replace the plastic fuel hose.
17. Apply a small amount of clean engine oil to the sealing surface of the fuel pipe.
18. Reconnect the plastic fuel hose straight to the fuel pipe until a click is heard.
19. Lightly pull and push the quick release connector a few times by hand and verify that it can move **2.0—3.0 mm {0.08—0.11 in}** and it is connected securely.
    - If quick release connector does not move at all, verify that O-ring is not damaged or slipped, and reconnect the quick release connector.
20. Complete the "AFTER REPAIR PROCEDURE". (See 01–14–6 AFTER REPAIR PROCEDURE.)

FUEL INJECTOR REMOVAL/INSTALLATION [L3]

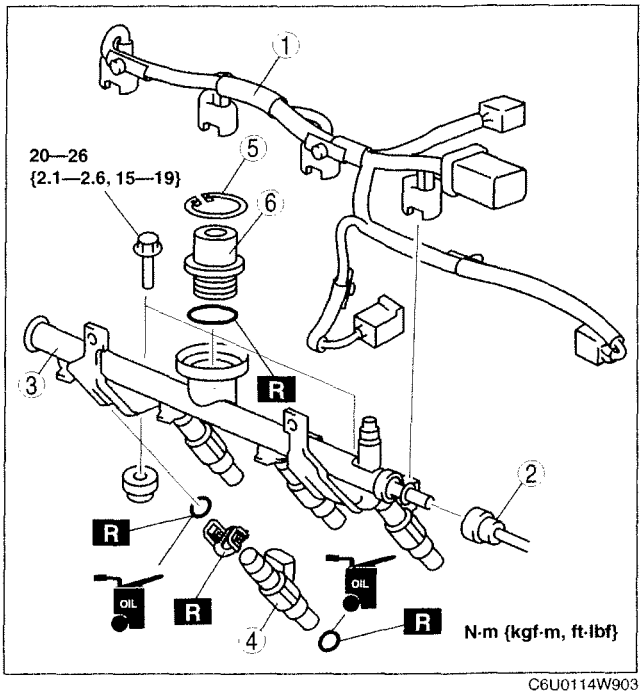
C6U011413250W01

Caution

- **Disconnecting/connecting the quick release connector without cleaning it may cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using a cloth or soft brush, and make sure that it is free of foreign material.**

1. Complete the "BEFORE REPAIR PROCEDURE". (See 01–14–5 BEFORE REPAIR PROCEDURE.)
2. Disconnect the negative battery cable.
3. Remove in the order indicated in the table.

1	Fuel injector connectors
2	Plastic fuel hose (See 01–14–21 Plastic Fuel Hose Removal Note) (See 01–14–23 Plastic Fuel Hose Installation Note)
3	Fuel distributor
4	Fuel injector (See 01–14–22 Fuel Injector Removal Note) (See 01–14–23 Fuel Injector Installation Note)
5	Snap ring
6	Pulsation damper



C6U0114W903

4. Install in the reverse order of removal.
5. Complete the "AFTER REPAIR PROCEDURE". (See 01–14–6 AFTER REPAIR PROCEDURE.)

Plastic Fuel Hose Removal Note

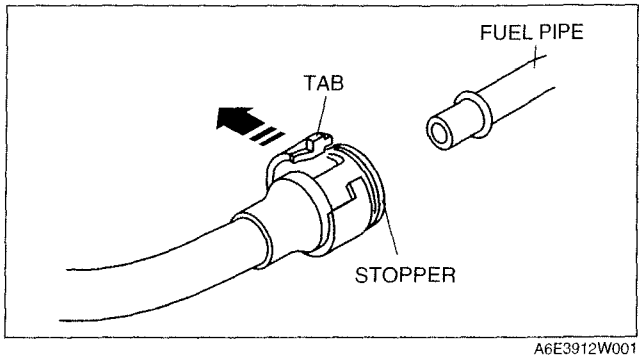
Caution

- **The quick release connector may be damaged if the tab is bent excessively. Do not expand the tab over the stopper.**

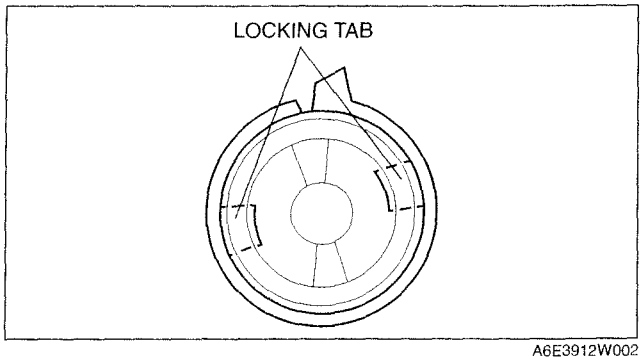
1. Disconnect the quick release connector.
   (1) Push the tab on the locking coupler **90°** until it stops.
   (2) Pull the fuel hose straight back.

Note

- The stopper may be removed from the quick connector. Take care not to lose it. Reinstall it to the quick release connector before reconnecting the fuel line.
- The locking coupler has two internal locking tabs which retain the fuel pipe. Be sure that the tab on the locking coupler is rotated until it stops to release two internal locking tabs.

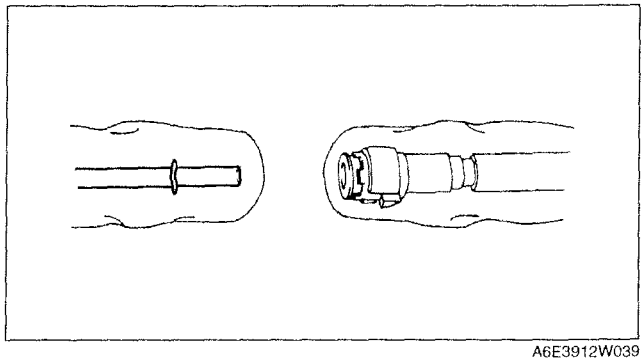


A6E3912W001



A6E3912W002

2. Cover the disconnected quick release connector and fuel pipe with vinyl sheets or the like to prevent them from being scratched or contaminated with foreign material.



A6E3912W039

Fuel Injector Removal Note

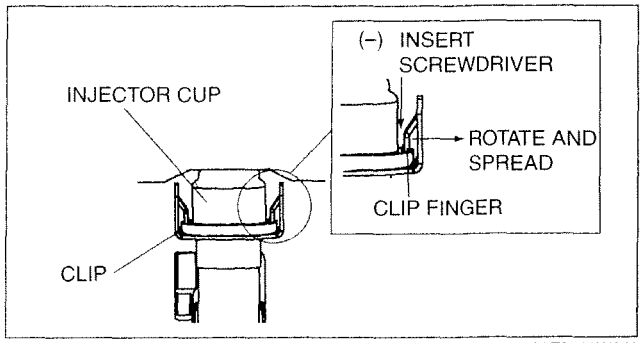
Caution

- **Use of a deformed injector retaining clip will cause the injector to not engage correctly. Always use a new clip when reattaching the injector, otherwise it may cause the injector to rotate.**

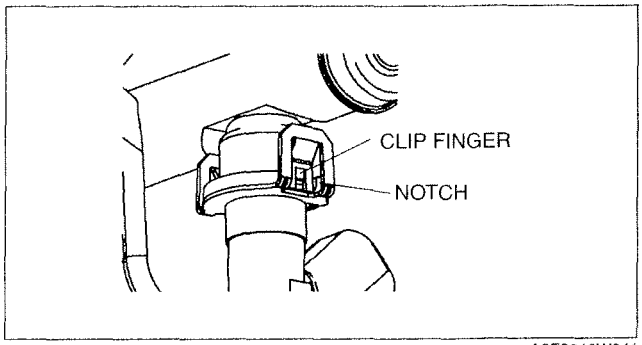
1. Insert a screwdriver between the injector cup and the clip fingers.

Note

- When rotating the screwdriver to spread the clip fingers, bend them sufficiently to make sure they release from the notched edge of the injector cup.

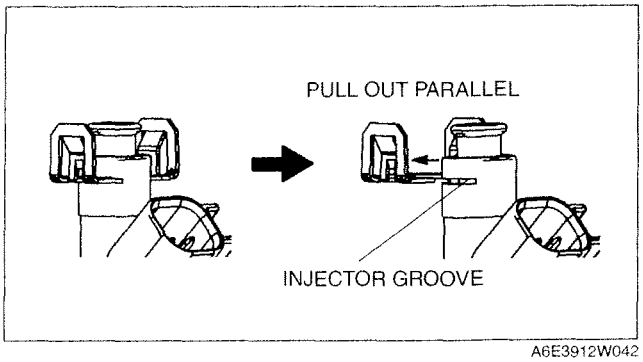


A6E3912W040



A6E3912W041

2. Rotate the screwdriver to spread the clip fingers and remove them from the injector cup.
3. Pull the injector and clip out of the rail.
4. Remove the clip from the injector according to the following steps:
   (1) Grasp the clip with a pair of pliers.
   (2) Pull the clip parallel to the injector groove, and remove it from the injector.
   (3) Discard the clip.



A6E3912W042

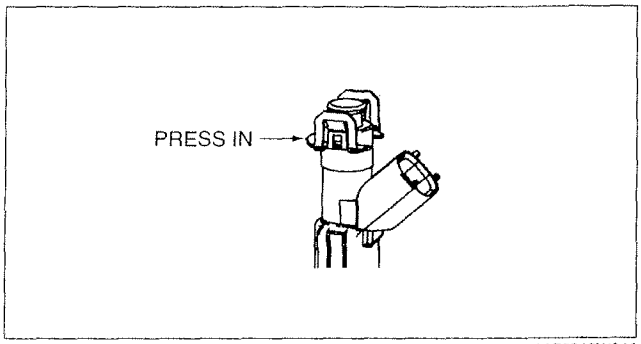
Fuel Injector Installation Note

1. Lightly lubricate the injector groove and O-ring.
2. Pre-attach a new clip in the injector groove.

Note

- When the clip is attached correctly, the central area of the injector and the clip finger positions are aligned.

3. Hold the injector firmly, and press the clip into the injector until the clip stops sliding.
4. Verify that the injector connector position is correct, and press the injector and clip into the injector cup. Continue pressing until the clip contacts the lower surface of the injector cup.
5. Verify that the injector and clip are correctly attached with the clip locked onto the injector cup notch.



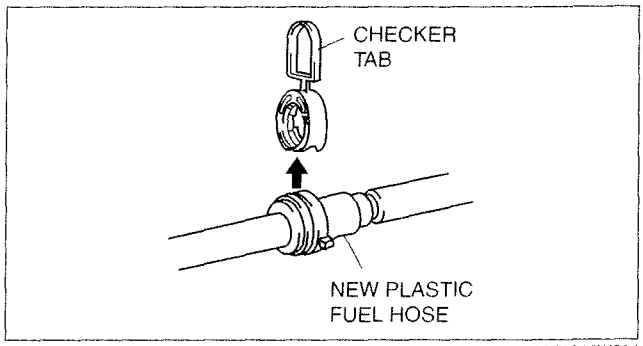
A6E3912W043

Plastic Fuel Hose Installation Note

Note

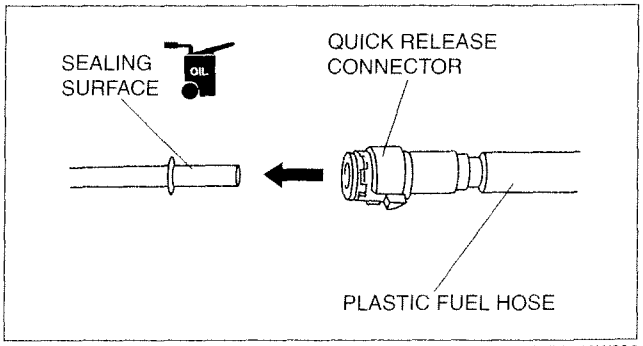
- A checker tab is integrated with quick release connector for new plastic fuel hoses. The checker tab will be released from the quick release connector after it is completely engaged with the fuel pipe.

1. When the retainer is not removed, perform the following procedure.
   (1) Inspect the fuel pump unit sealing surface for damage and deformation, and replace if necessary.
   - If the quick release connector O-ring is damaged, replace the plastic fuel hose.



A6E3912W004

   (2) Slightly apply clean engine oil to the sealing surface of the fuel pump unit.
   (3) Align the fuel pipe on the fuel pump unit with quick release connector so that the tabs of the retainer are correctly fitted into the quick release connector. Push the quick release connector straight into the retainer until a click is heard.
   (4) Lightly pull and push the quick release connector a few times by hand and verify that it can move **2.0—3.0 mm {0.08—0.11 in}** and it is connected securely.
   - If the quick release connector does not move at all, verify that O-ring is not damaged and slipped, and reconnect the quick release connector.



A6E3912W006

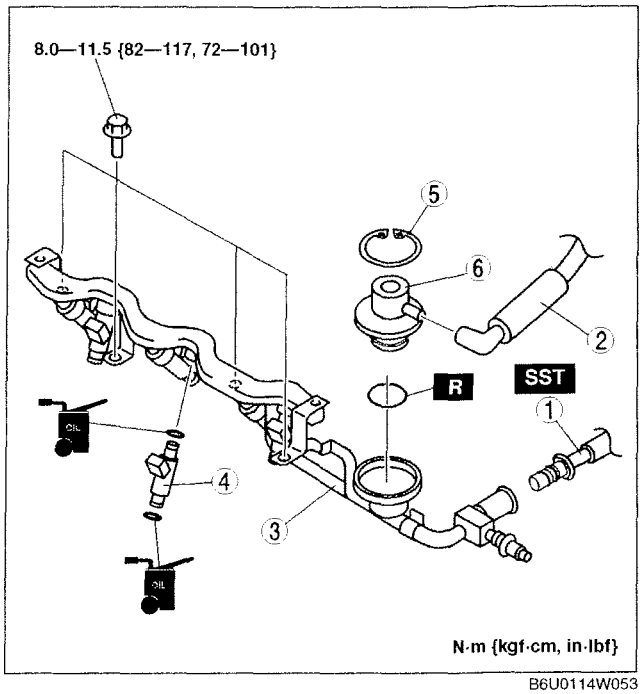
2. When the retainer is removed, perform the following procedure.

FUEL INJECTOR REMOVAL/INSTALLATION [AJ]

C6U011413250W02

1. Complete the "BEFORE REPAIR PROCEDURE". (See 01–14–5 BEFORE REPAIR PROCEDURE.)
2. Disconnect the negative battery cable.
3. Remove the dynamic chamber. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
4. Disconnect the fuel injector connectors and remove the wiring harness from the fuel distributor.
5. Remove in the order indicated in the table.

1	Plastic fuel hose (See 01–14–24 Plastic Fuel Hose Removal Note) (See 01–14–26 Plastic Fuel Hose Installation Note)
2	Hose
3	Fuel distributor
4	Fuel injector (See 01–14–25 Fuel Injector Installation Note)
5	Snap ring
6	Pulsation damper



B6U0114W053

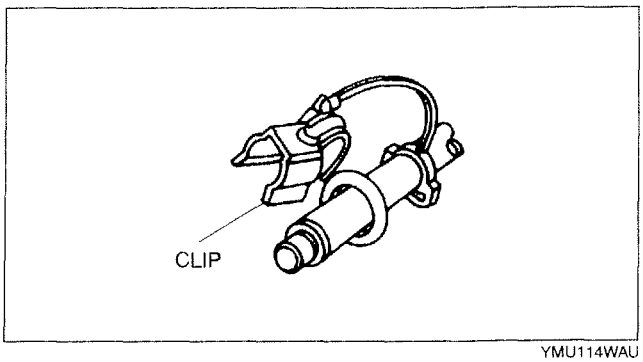
Caution

- **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using a cloth or soft brush, and make sure that it is free of foreign material.**

6. Install in the reverse order of removal.
7. Complete the "AFTER REPAIR PROCEDURE". (See 01–14–6 AFTER REPAIR PROCEDURE.)

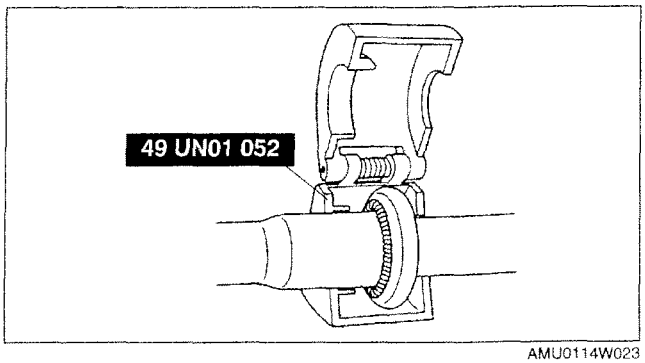
Plastic Fuel Hose Removal Note

1. Remove the clip from the quick release connector.



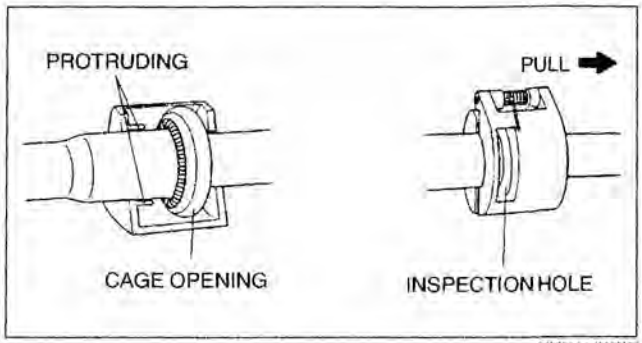
YMU114WAU

2. Set the **SST** (49 UN01 052) for 1/2 inch hose onto the quick release connector.



AMU0114W023

3. While looking through the inspection hole of the **SST**, insert the protruding part of the **SST** until it makes contact the cage opening.



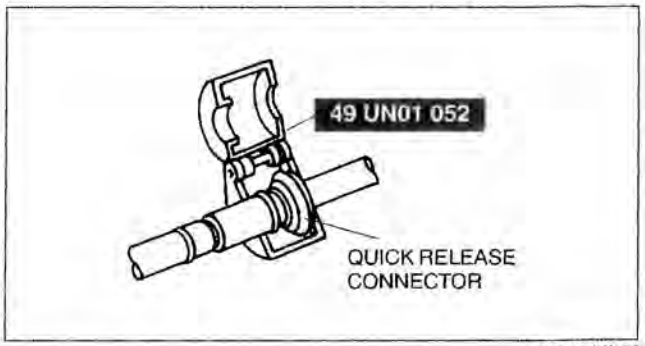
YMU114WAW

4. Use the **SST** to disconnect the plastic fuel hose from the fuel distributor by pulling the plastic fuel hose side.

Note
- The plastic fuel hose can be disconnected easily from the fuel distributor by pulling the plastic fuel hose while maintaining the pressure of the protruding part of the **SST**.

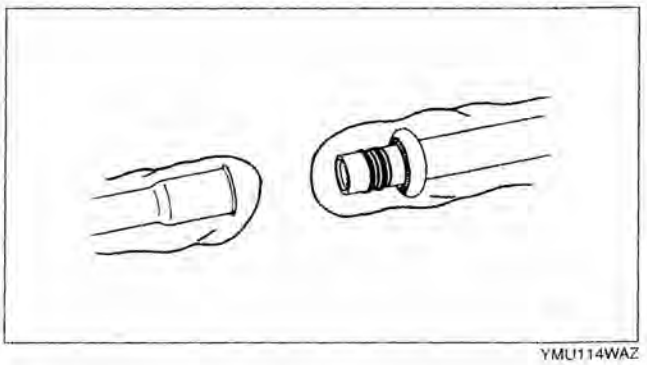
B6U0114W054

5. Remove the **SST** from the disconnected quick release connector.



B6U0114W055

6. Cover the disconnected quick release connector and fuel distributor with the vinyl sheets or the like to prevent it from being scratched or contaminated with foreign material.



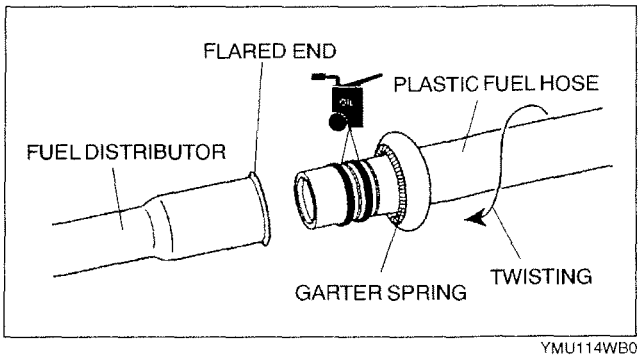
YMU114WAZ

Fuel Injector Installation Note

1. Inspect the O-rings for damage.
   - If the O-ring is damaged, replace the fuel injector.
2. Apply clean engine oil to the O-rings.

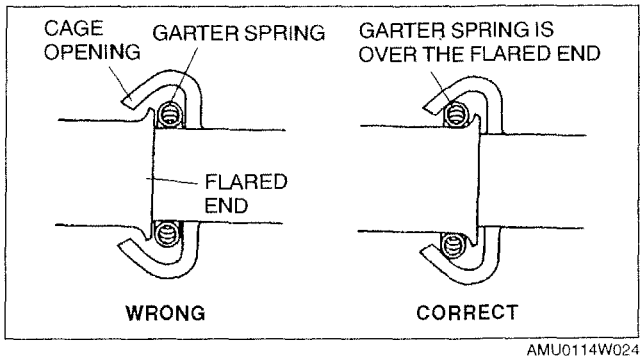
Plastic Fuel Hose Installation Note

1. Inspect the plastic fuel hose and fuel distributor sealing surface for damage and deformation, and replace if necessary.
   - If the quick release connector O-ring is damaged or has slipped, replace the plastic fuel hose.
2. Apply clean engine oil to the O-rings.
3. Connect the plastic fuel hose by twisting it onto the fuel distributor until the garter spring at the plastic fuel hose is over the flared end of the fuel distributor.



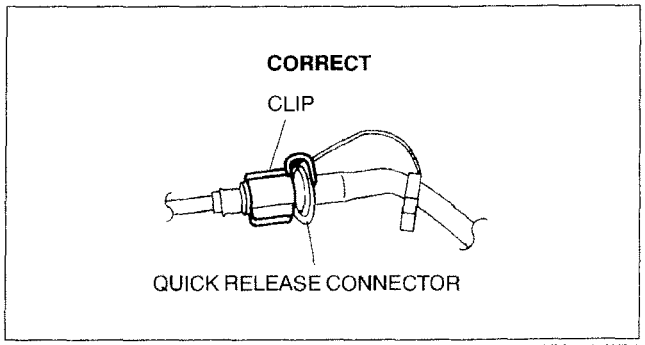
YMU114WB0

4. Lightly pull and push the quick release connector by hand and verify that it is installed securely.

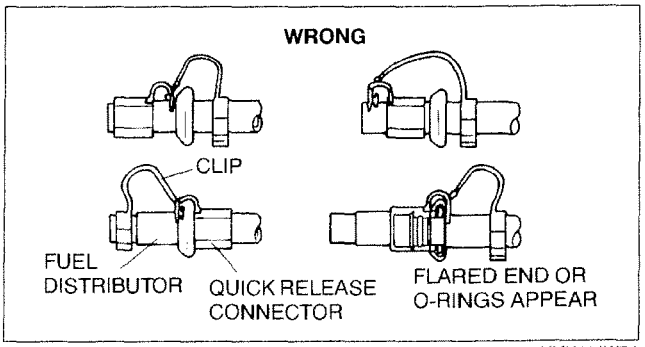


AMU0114W024

5. Install the clip to the quick release connector.



YMU114WB2



YMU114WBA

FUEL INJECTOR INSPECTION [L3]

C6U011413250W03

Operation Test

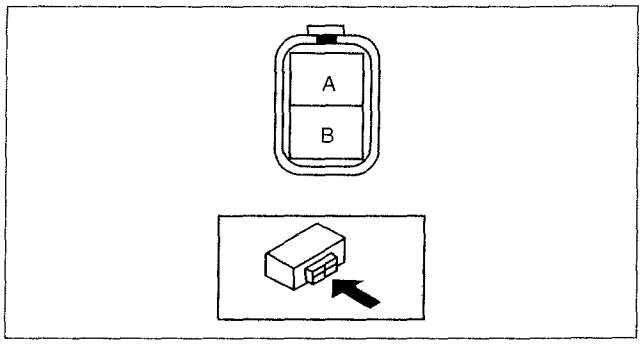
1. Carry out the "Fuel Injector Operation Inspection". (See 01–03A–65 Fuel Injector Operation Inspection.)
   - If not as specified, perform the further inspection for the fuel injectors.

Resistance Inspection

Note
- Perform the following procedure only when directed.

1. Turn the ignition switch to LOCK position.
2. Disconnect the negative battery cable.
3. Disconnect the fuel injector connectors.
4. Measure the resistance of the fuel injector using an ohmmeter.
   - If not as specified, replace the fuel injector. (See 01–14–20 FUEL INJECTOR REMOVAL/INSTALLATION [L3].)
   - If as specified but "Operation Test" is failed, carry out the "Circuit Open/Short Inspection". Inspect for open or short circuit.

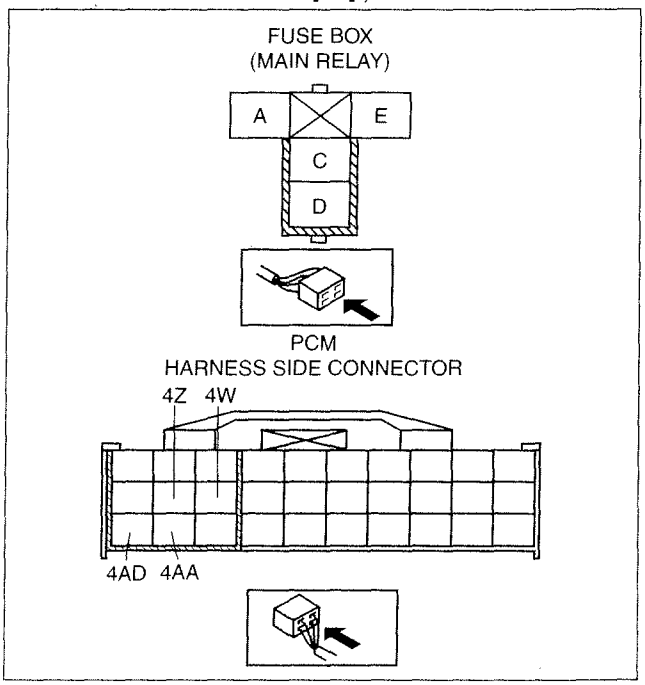
Resistance
11.4—12.6 ohms [20 °C {68 °F}]



A6E3912W007

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit (continuity check).



B6U0114W046

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — No.1 cylinder fuel injector terminal B (harness-side) and PCM terminal 4Z.
  - — No.2 cylinder fuel injector terminal B (harness-side) and PCM terminal 4W.
  - — No.3 cylinder fuel injector terminal B (harness-side) and PCM terminal 4AD.
  - — No.4 cylinder fuel injector terminal B (harness-side) and PCM terminal 4AA.
  - — No.1 cylinder fuel injector terminal A (harness-side) and main relay (harness-side) terminal C through common connector.
  - — No.2 cylinder fuel injector terminal A (harness-side) and main relay (harness-side) terminal C through common connector.
  - — No.3 cylinder fuel injector terminal A (harness-side) and main relay (harness-side) terminal C through common connector.
  - — No.4 cylinder fuel injector terminal A (harness-side) and main relay (harness-side) terminal C through common connector.

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the harness.
  - — No.1 cylinder fuel injector terminal B (harness-side) and body GND.
  - — No.2 cylinder fuel injector terminal B (harness-side) and body GND.
  - — No.3 cylinder fuel injector terminal B (harness-side) and body GND.
  - — No.4 cylinder fuel injector terminal B (harness-side) and body GND.
  - — No.1 cylinder fuel injector terminal A (harness-side) and power supply.
  - — No.2 cylinder fuel injector terminal A (harness-side) and power supply.
  - — No.3 cylinder fuel injector terminal A (harness-side) and power supply.
  - — No.4 cylinder fuel injector terminal A (harness-side) and power supply.

Fuel Leakage Inspection

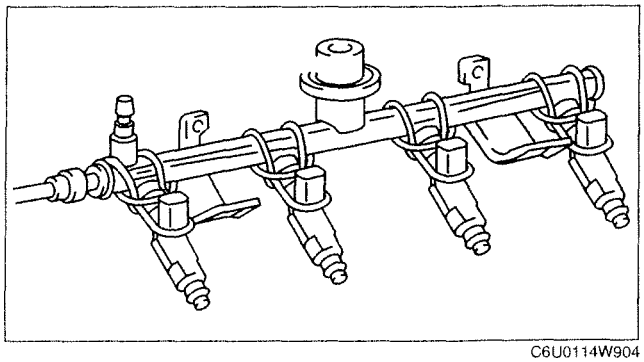
Warning

- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.**

Note

- Perform the following procedure only when directed.

1. Complete the "BEFORE REPAIR PROCEDURE". (See 01–14–5 BEFORE REPAIR PROCEDURE.)
2. Disconnect the negative battery cable.
3. Remove the fuel injectors together with the fuel distributor with the fuel hose connected. (See 01–14–20 FUEL INJECTOR REMOVAL/INSTALLATION [L3].)
4. Fasten the fuel injectors firmly to the fuel distributor with wire.
5. Connect the negative battery cable.

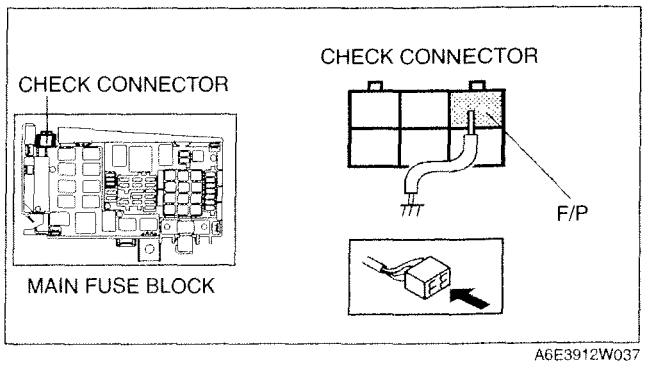


C6U0114W904

Caution

- **Connecting to the wrong check connector terminal may only to cause malfunction. Carefully connect the specified terminal.**

6. Short the check connector terminal F/P to body GND using a jumper wire.
7. Turn the ignition switch to ON position to operate the fuel pump.

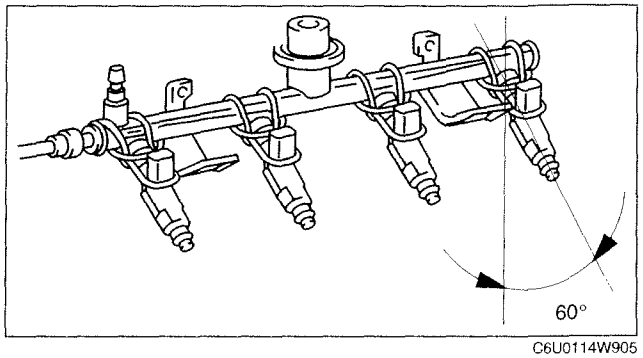


A6E3912W037

8. Tilt the fuel injectors **approx. 60°.**
9. Verify that fuel leakage from the fuel injector nozzles is within the specification.
   - If not as specified, replace the fuel injector.

Fuel leakage
Less than 1 drop/2 min

10. Turn the ignition switch to LOCK position and remove the jumper wire.
11. Complete the "AFTER REPAIR PROCEDURE". (See 01–14–6 AFTER REPAIR PROCEDURE.)



C6U0114W905

Volume Inspection

Warning
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.**

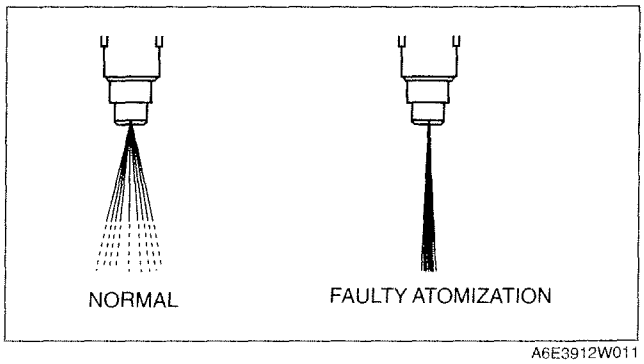
Note
- If there is an after market fuel injector tester, perform the following procedure.
- If there is no an aftermarket fuel injector tester, perform "Operation Test", "Resistance Inspection", and "Fuel Leakage Test" to verify the fuel injector is okay or not.

1. Complete the "BEFORE REPAIR PROCEDURE". (See 01–14–5 BEFORE REPAIR PROCEDURE.)
2. Disconnect the negative battery cable.
3. Remove the fuel injectors. (See 01–14–20 FUEL INJECTOR REMOVAL/INSTALLATION [L3].)
4. Connect the fuel injector to the fuel injector tester.
5. Measure the injection volume of each fuel injector using a graduated container.
   - If not as specified, replace the fuel injector.

Injection volume
61—79 ml {61—79 cc, 2.2—2.7 fl oz}/15 s

6. Turn the ignition switch to the LOCK position and disconnect the jumper wire.
7. Complete the "AFTER REPAIR PROCEDURE". (See 01–14–6 AFTER REPAIR PROCEDURE.)

Atomization
1. Inspect atomization pattern.
   - If the atomization is faulty, replace the fuel injector.



A6E3912W011

FUEL INJECTOR INSPECTION [AJ]

C6U011413250W04

Operation Test

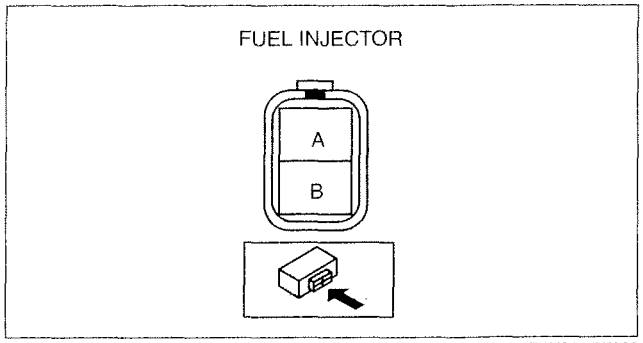
1. Carry out the "Fuel Injector Operation Inspection". (See 01–03B–64 Fuel Injector Operation Inspection.)
   - If not as specified, perform following inspections for the fuel injectors.

Resistance Inspection

Note
- Perform the following procedure only when directed.

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable.
3. Disconnect the fuel injector connectors.
4. Measure the resistance of the fuel injector using an ohmmeter.
   - If not as specified, replace the fuel injector. (See 01–14–24 FUEL INJECTOR REMOVAL/INSTALLATION [AJ].)
   - If as specified but "Operation Test" is failed, carry out the "Circuit Open/Short Inspection". Inspect for open or short circuit.

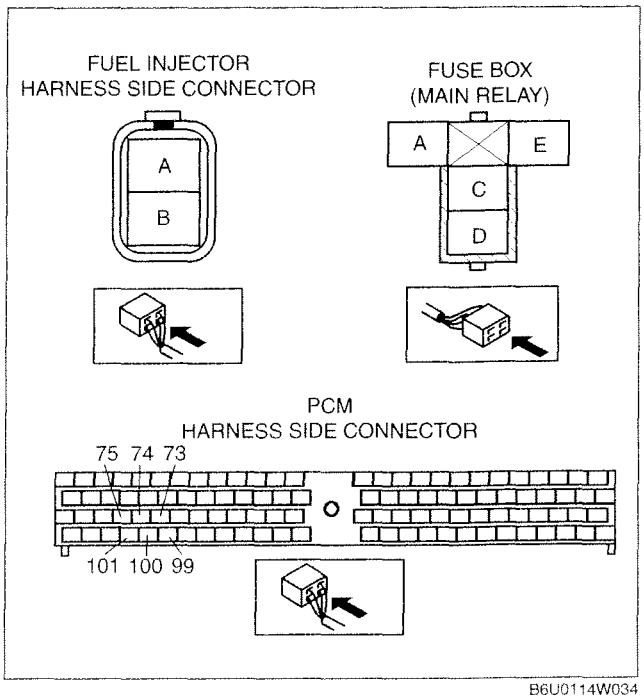
Resistance
13.1—14.5 ohms [20 °C {68 °F}]



B6U0114W033

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following wiring harnesses for open or short circuit (continuity check).



B6U0114W034

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — No.1 cylinder fuel injector terminal A (harness-side) and PCM terminal 75.
  - — No.2 cylinder fuel injector terminal A (harness-side) and PCM terminal 101.
  - — No.3 cylinder fuel injector terminal A (harness-side) and PCM terminal 74.
  - — No.4 cylinder fuel injector terminal A (harness-side) and PCM terminal 100.
  - — No.5 cylinder fuel injector terminal A (harness-side) and PCM terminal 73.
  - — No.6 cylinder fuel injector terminal A (harness-side) and PCM terminal 99.
  - — No.1 cylinder fuel injector terminal B (harness-side) and main relay (harness-side) terminal C through common connector.

— No.2 cylinder fuel injector terminal B (harness-side) and main relay (harness-side) terminal C through common connector.
— No.3 cylinder fuel injector terminal B (harness-side) and main relay (harness-side) terminal C through common connector.
— No.4 cylinder fuel injector terminal B (harness-side) and main relay (harness-side) terminal C through common connector.
— No.5 cylinder fuel injector terminal B (harness-side) and main relay (harness-side) terminal C through common connector.
— No.6 cylinder fuel injector terminal B (harness-side) and main relay (harness-side) terminal C through common connector.

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  — No.1 cylinder fuel injector terminal A (harness-side) and body GND.
  — No.2 cylinder fuel injector terminal A (harness-side) and body GND.
  — No.3 cylinder fuel injector terminal A (harness-side) and body GND.
  — No.4 cylinder fuel injector terminal A (harness-side) and body GND.
  — No.5 cylinder fuel injector terminal A (harness-side) and body GND.
  — No.6 cylinder fuel injector terminal A (harness-side) and body GND.
  — No.1 cylinder fuel injector terminal B (harness-side) and power supply.
  — No.2 cylinder fuel injector terminal B (harness-side) and power supply.
  — No.3 cylinder fuel injector terminal B (harness-side) and power supply.
  — No.4 cylinder fuel injector terminal B (harness-side) and power supply.
  — No.5 cylinder fuel injector terminal B (harness-side) and power supply.
  — No.6 cylinder fuel injector terminal B (harness-side) and power supply.

Fuel Leakage Test

Warning

- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.**

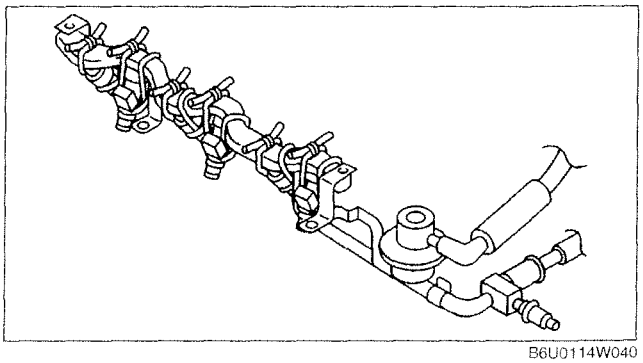
Note

- Perform the following test only when directed.

1. Complete the "BEFORE REPAIR PROCEDURE". (See 01–14–5 BEFORE REPAIR PROCEDURE.)
2. Disconnect the negative battery cable.
3. Remove the fuel injectors together with the fuel distributor connected to fuel hose. (See 01–14–24 FUEL INJECTOR REMOVAL/INSTALLATION [AJ].)
4. Fasten the fuel injectors firmly to the fuel distributor with wire.
5. Connect the negative battery cable.

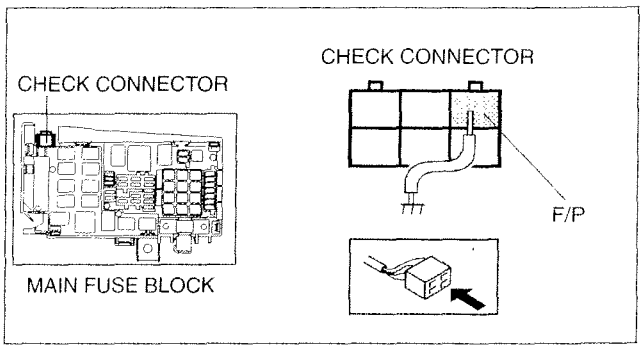
Caution

- **Connecting to the wrong check connector terminal may cause a malfunction. Carefully connect only to the specified terminal.**



B6U0114W040

6. Short the check connector terminal F/P to body GND using a jumper wire.
7. Turn the ignition switch to the ON position to operate the fuel pump.

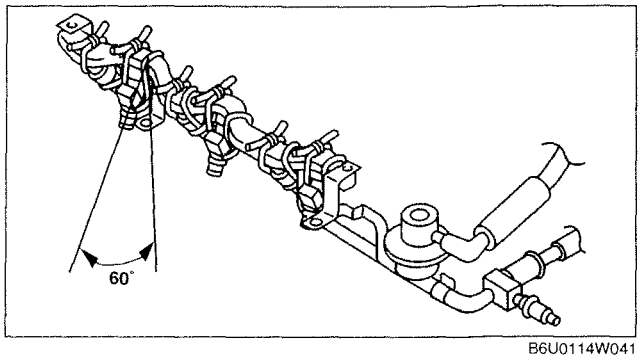


B6U0114W035

8. Tilt the fuel injectors **approx. 60°.**
9. Verify that fuel leakage from the fuel injector nozzles is within the specification.
   - If not as specified, replace the fuel injector.

Fuel leakage
Less than 1 drop/2 min

10. Turn the ignition switch to the LOCK position and remove the jumper wire.
11. Complete the "AFTER REPAIR PROCEDURE". (See 01–14–6 AFTER REPAIR PROCEDURE.)



B6U0114W041

Volume Test

Warning
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.**

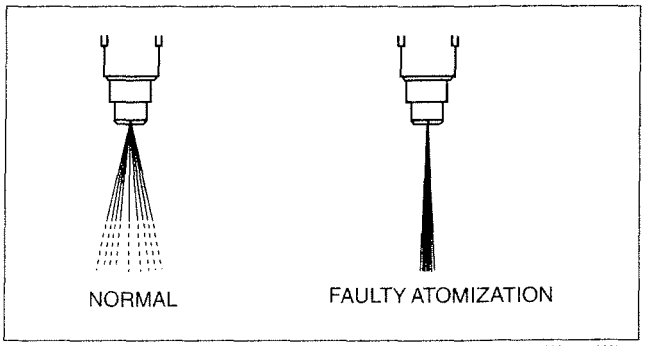
Note
- If there is an after market fuel injector tester, perform the following procedure.
- If there is no an aftermarket fuel injector tester, perform "Operation Test", "Resistance Inspection", and "Fuel Leakage Test" to verify the fuel injector is okay or not.

1. Complete the "BEFORE REPAIR PROCEDURE". (See 01–14–5 BEFORE REPAIR PROCEDURE.)
2. Disconnect the negative battery cable.
3. Remove the fuel injectors. (See 01–14–24 FUEL INJECTOR REMOVAL/INSTALLATION [AJ].)
4. Connect the fuel injector to the fuel injector tester.
5. Measure the injection volume of each fuel injector using a graduated container.
   - If not as specified, replace the fuel injector.

Injection volume
49—65 ml {49—65 cc, 1.7—2.1 fl oz.}/15 s

6. Turn the ignition switch to the LOCK position and disconnect the jumper wire.
7. Complete the "AFTER REPAIR PROCEDURE". (See 01–14–6 AFTER REPAIR PROCEDURE.)

Atomization
1. Inspect atomization pattern.
   - If the atomization is faulty, replace the fuel injector.



B6U0114W036

PRESSURE REGULATOR INSPECTION

C6U011413280W01

Note
- Due to the adoption of the mechanical returnless fuel system, the pressure regulator cannot be inspected separately.

1. Perform "FUEL LINE PRESSURE INSPECTION". (See 01–14–6 FUEL LINE PRESSURE INSPECTION.)

PULSATION DAMPER REMOVAL/INSTALLATION

C6U011420180W01

1. Remove and install the pressure regulator. (See 01–14–20 FUEL INJECTOR REMOVAL/INSTALLATION [L3].) (See 01–14–24 FUEL INJECTOR REMOVAL/INSTALLATION [AJ].)

PULSATION DAMPER INSPECTION

C6U011420180W02

1. Complete the "BEFORE REPAIR PROCEDURE". (See 01–14–5 BEFORE REPAIR PROCEDURE.)
2. Remove the pulsation damper. (See 01–14–32 PULSATION DAMPER REMOVAL/INSTALLATION.)
3. Visually inspect the pulsation damper for damage and cracks. Also inspect if there is no extreme rust which will cause fuel leakage.
   - If any of the above-mentioned malfunction is observed, replace the pulsation damper.
4. Complete the "AFTER REPAIR PROCEDURE". (See 01–14–6 AFTER REPAIR PROCEDURE.)

01–15A EXHAUST SYSTEM [L3]

EXHAUST SYSTEM INSPECTION [L3]

C6U011500115W01

1. Start the engine and inspect each exhaust system component for exhaust gas leakage.
   - If there is leakage, repair or replace if necessary.

EXHAUST SYSTEM REMOVAL/INSTALLATION [L3]

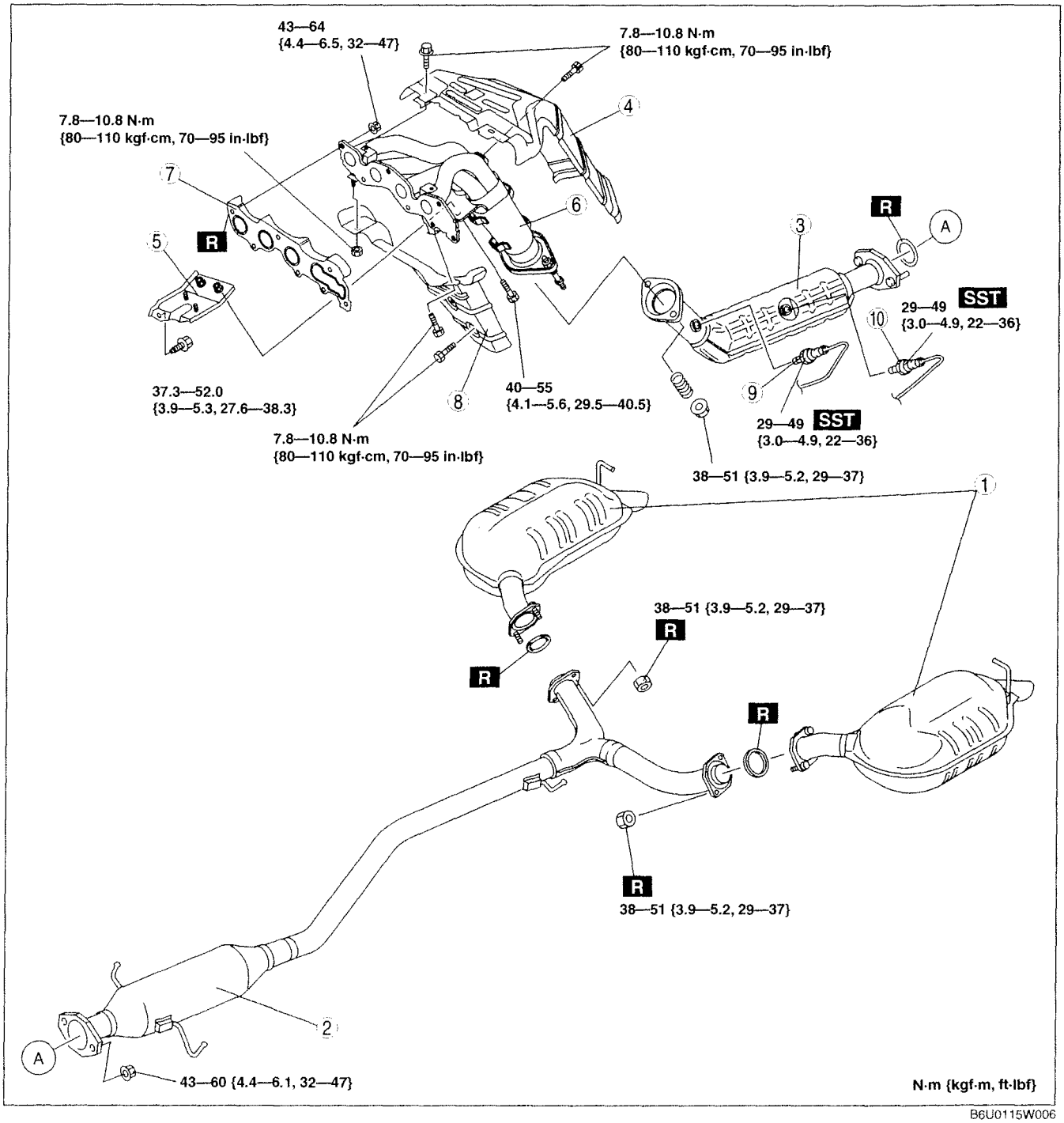
C6U011500115W02

Warning

- **A hot engine and exhaust system can cause severe burns. Turn off the engine and wait until they are cool before removing the exhaust system.**

EXHAUST SYSTEM [L3]

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



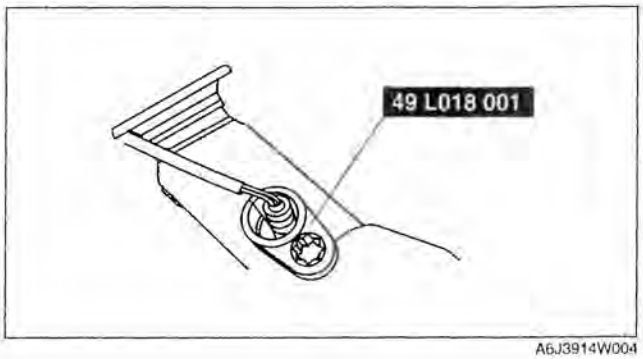
B6U0115W006

1	Main silencer
2	Presilencer
3	TWC
4	Exhaust manifold insulator (upper) (See 01–15A–4 Exhaust Manifold Insulator (Upper) Installation Note)
5	Bracket (See 01–15A–4 Bracket Installation Note)

6	Exhaust manifold (See 01–15A–3 Exhaust Manifold Installation Note)
7	Exhaust manifold gasket
8	Exhaust manifold insulator (lower) (See 01–15A–3 Exhaust Manifold Insulator (Lower) Installation Note)
9	HO2S (front) (See 01–15A–3 HO2S Removal Note)
10	HO2S (rear) (See 01–15A–3 HO2S Removal Note)

HO2S Removal Note

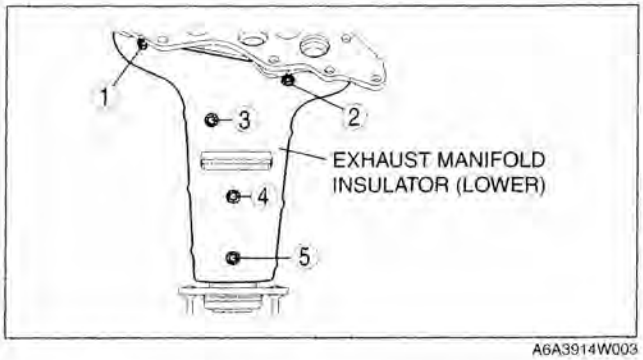
1. Remove the HO2S using the **SST** before removing the exhaust manifold.



A6J3914W004

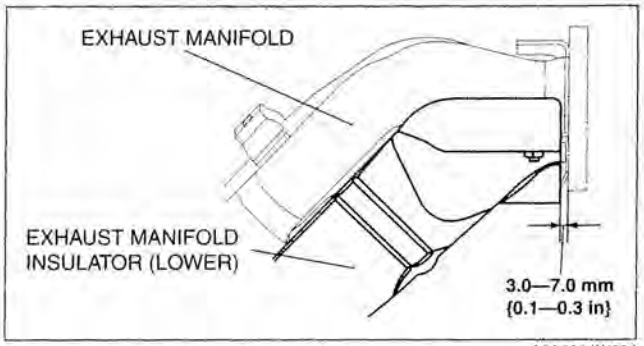
Exhaust Manifold Insulator (Lower) Installation Note

1. Tighten the exhaust manifold insulator (lower) installation bolts in the order shown.



A6A3914W003

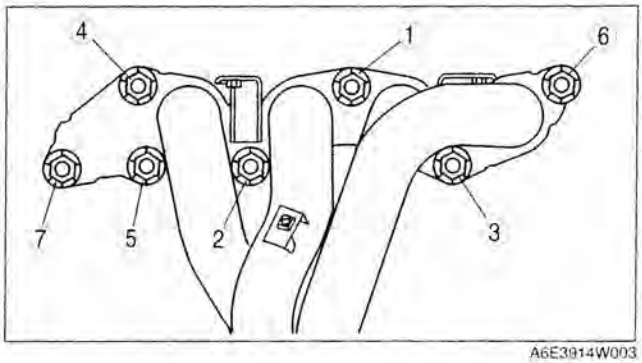
2. Verify that the insulator is installed as shown.



A6A3914W004

Exhaust Manifold Installation Note

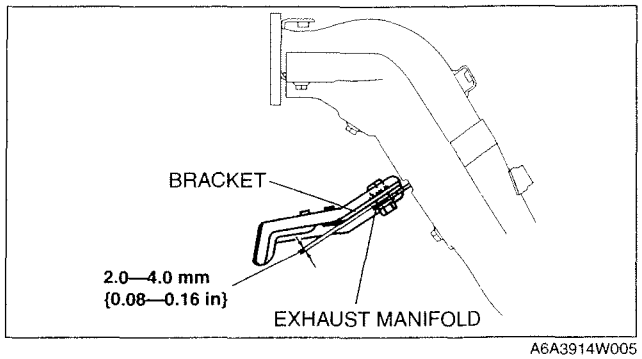
1. Tighten the exhaust manifold installation nuts in the order shown.



A6E3914W003

Bracket Installation Note

1. Temporarily tighten the exhaust manifold side bolts.
2. Verify that the gap between the exhaust manifold and the bracket is **2.0—4.0 mm {0.08—0.16 in}**.



A6A3914W005

3. Fully tighten the cylinder block side bolt.

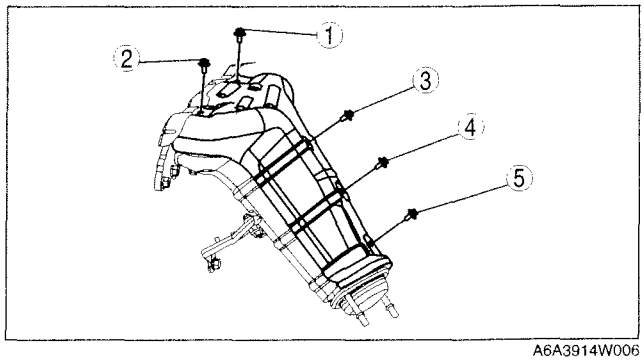
   Tightening torque
   37.3—52.0 N·m {3.9—5.3 kgf·m, 27.6—38.3 ft·lbf}

4. Fully tighten the exhaust manifold side bolts.

   Tightening torque
   40—55 N·m {4.1—5.6 kgf·m, 29.5—40.5 ft·lbf}

Exhaust Manifold Insulator (Upper) Installation Note

1. Tighten the exhaust manifold insulator (upper) installation bolts in the order shown.



A6A3914W006

01–15B EXHAUST SYSTEM [AJ]

EXHAUST SYSTEM INSPECTION [AJ]

C6U011540000W01

1. Start the engine and inspect each exhaust system component for exhaust gas leakage.
   - If there is leakage, repair or replace if necessary.

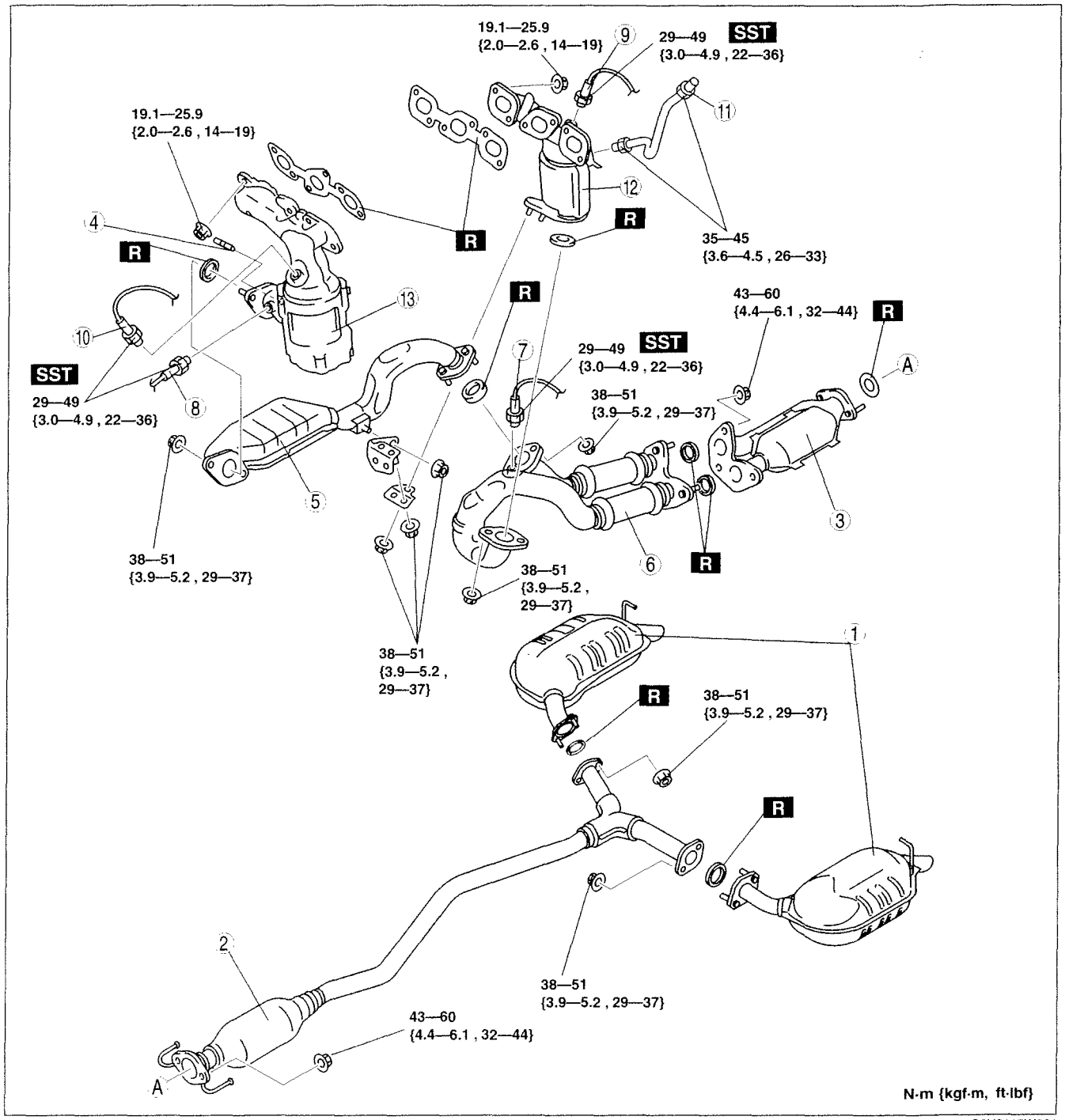
EXHAUST SYSTEM REMOVAL/INSTALLATION [AJ]

C6U011540000W02

Warning

- **When the engine and exhaust system are hot, they can badly burn. Turn off the engine and wait until they are cool before removing the exhaust system.**

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



C6U0115W601

1	Main silencer
2	Presilencer
3	TWC (RH)
4	Stud bolt

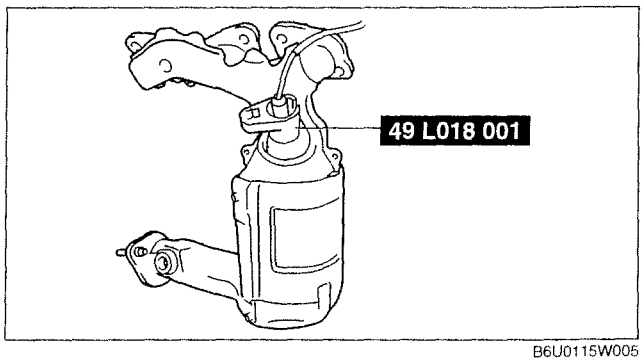
5	TWC (LH)
6	Front pipe
7	HO2S (RR) (See 01–15B–3 HO2S Removal Note)

8	HO2S (LR) (See 01–15B–3 HO2S Removal Note)
9	HO2S (RF) (See 01–15B–3 HO2S Removal Note)
10	HO2S (LF) (See 01–15B–3 HO2S Removal Note)
11	EGR pipe

12	Exhaust manifold (RH) (See 01–15B–3 Exhaust Manifold (RH) Removal Note) (See 01–15B–3 Exhaust Manifold (RH) Installation Note)
13	Exhaust manifold (LH) (See 01–15B–3 Exhaust Manifold (LH) Installation Note)

HO2S Removal Note

1. Remove the HO2S using the **SST**.



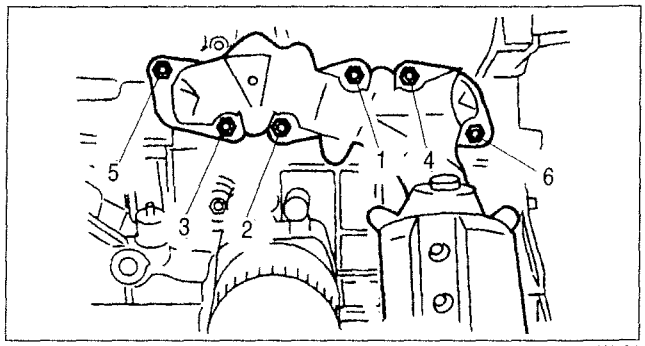
B6U0115W005

Exhaust Manifold (RH) Removal Note

1. Disconnect the generator bracket before removing the exhaust manifold (RH). (See 01–17–3 GENERATOR REMOVAL/INSTALLATION.)

Exhaust Manifold (LH) Installation Note

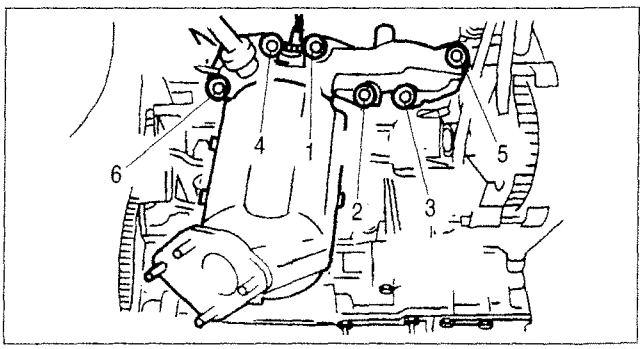
1. Tighten the exhaust manifold installation nuts in the order shown.



B6U0115W001

Exhaust Manifold (RH) Installation Note

1. Tighten the exhaust manifold installation nuts in the order shown.



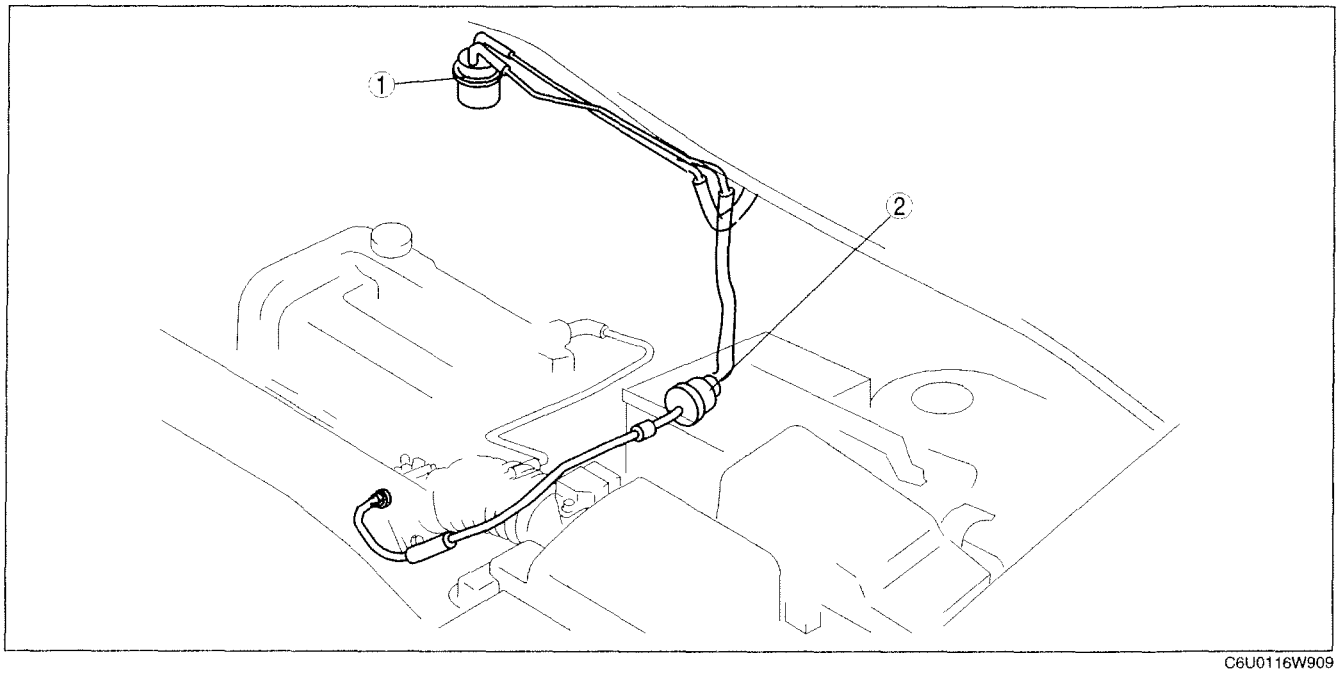
B6U0115W002

01–16 EMISSION SYSTEM

EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM LOCATION INDEX

C6U011600116W01

Engine Room Side
L3 engine models

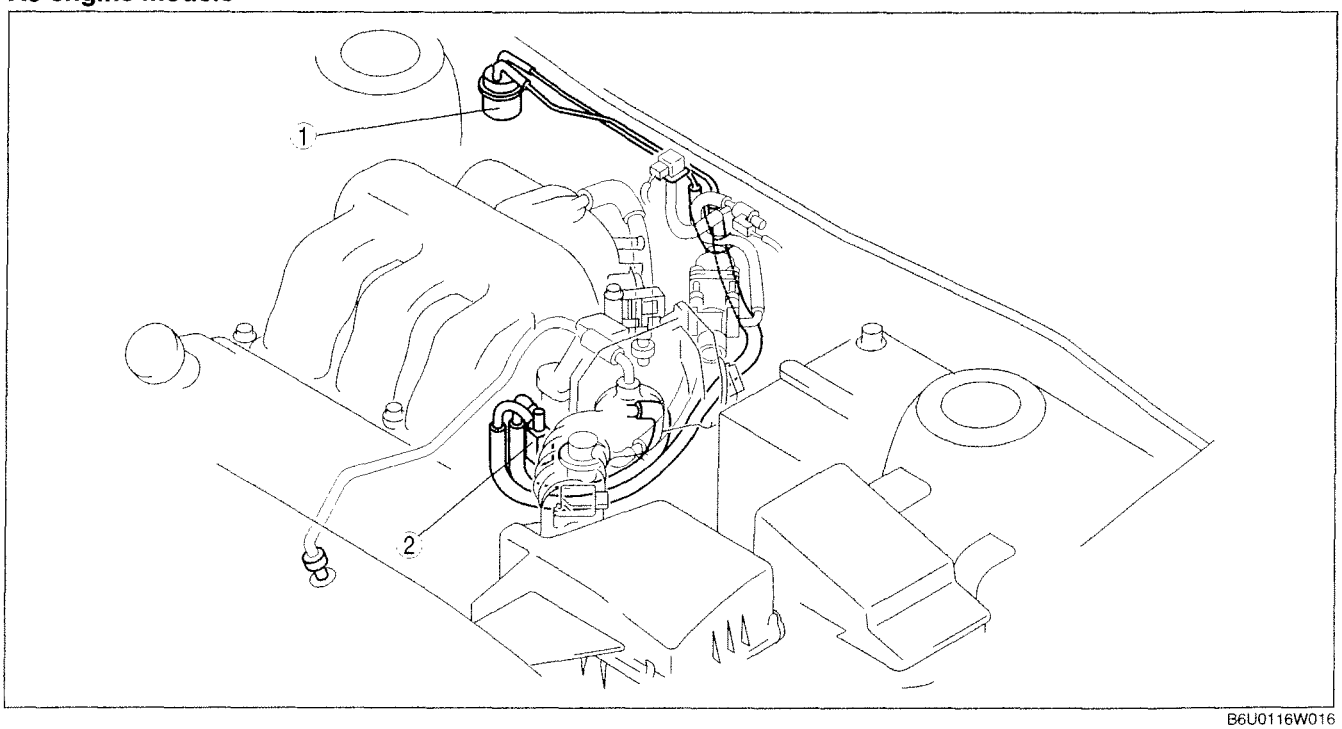


C6U0116W909

1	Catch tank (See 01–16–14 CATCH TANK INSPECTION)

2	Purge solenoid valve (See 01–16–15 PURGE SOLENOID VALVE INSPECTION)

AJ engine models

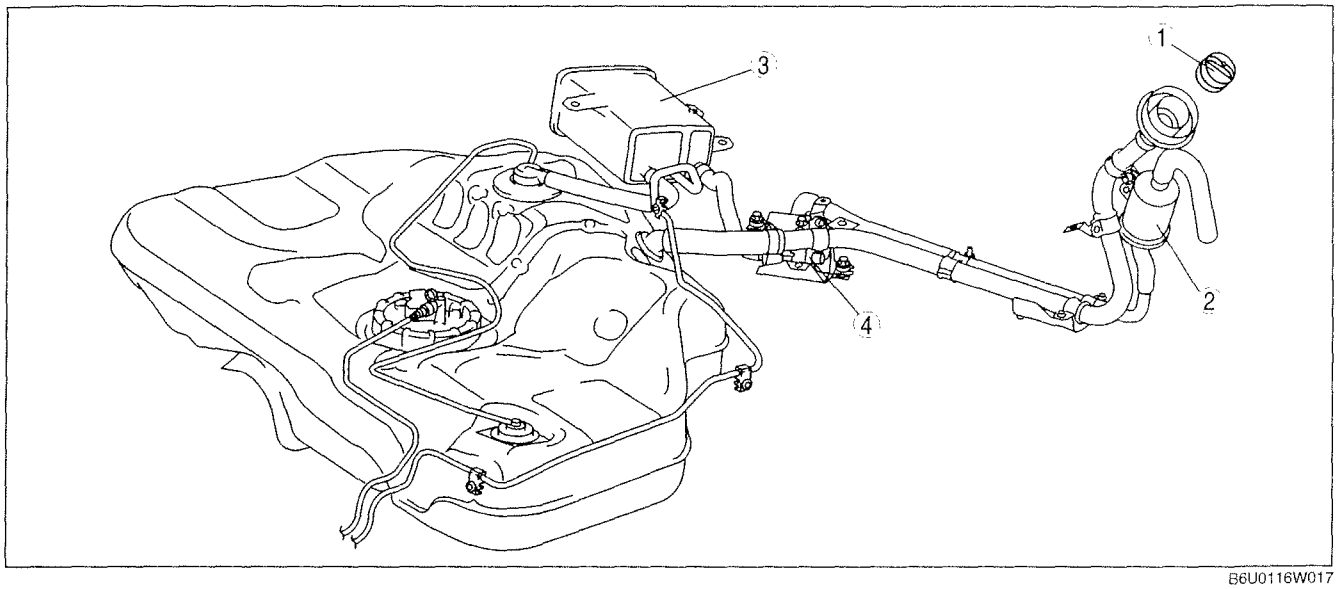


B6U0116W016

1	Catch tank (See 01–16–14 CATCH TANK INSPECTION)

2	Purge solenoid valve (See 01–16–15 PURGE SOLENOID VALVE INSPECTION)

Fuel Tank Side



B6U0116W017

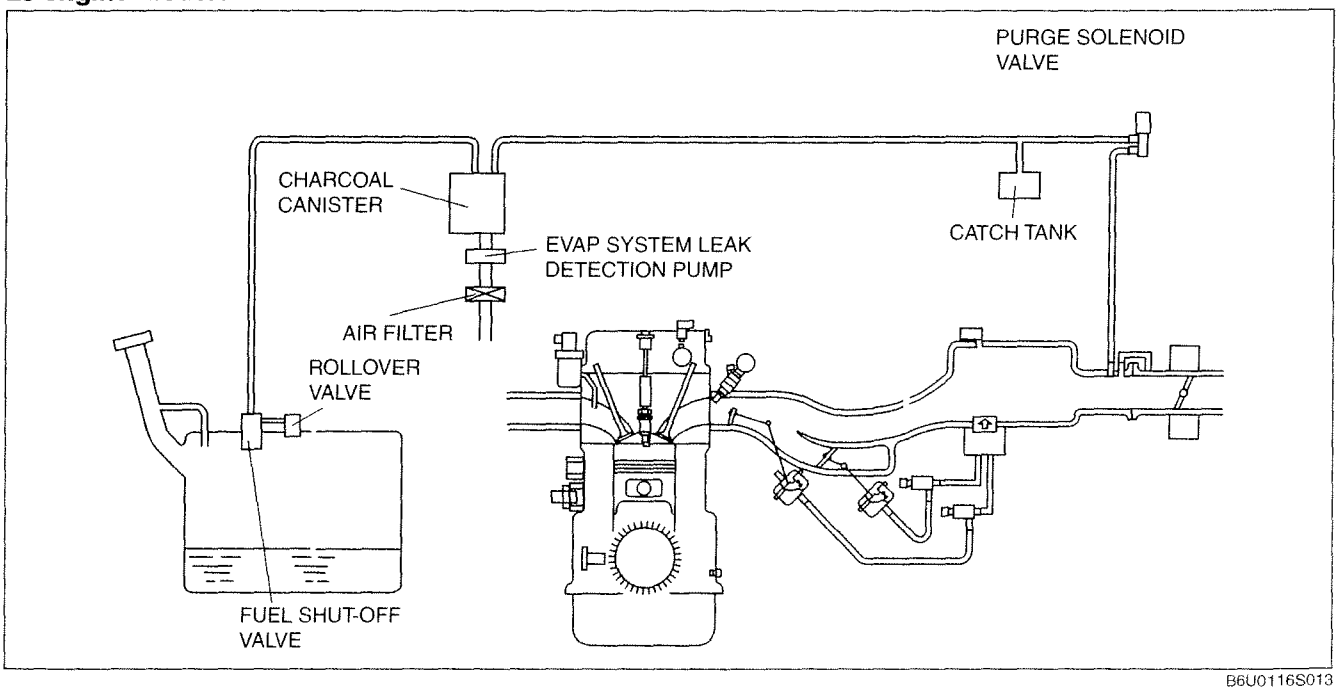
1	Fuel-filler cap (See 01–16–10 FUEL-FILLER CAP INSPECTION)
2	Air filter (See 01–16–11 AIR FILTER INSPECTION)

3	Charcoal canister (See 01–16–11 CHARCOAL CANISTER INSPECTION)
4	EVAP system leak detection pump (See 01–16–12 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION)

EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM DIAGRAM

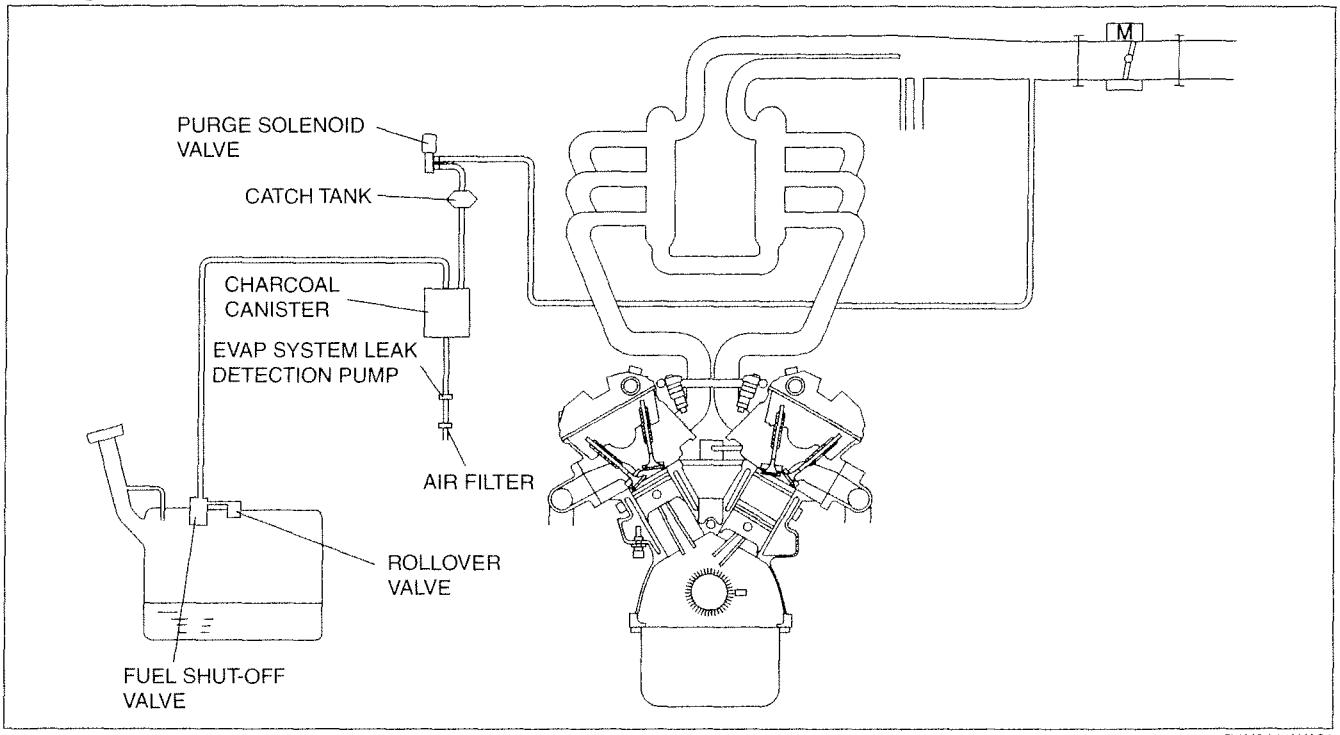
C6U011600116W02

L3 engine models



B6U0116S013

AJ engine models



B6U0116W001

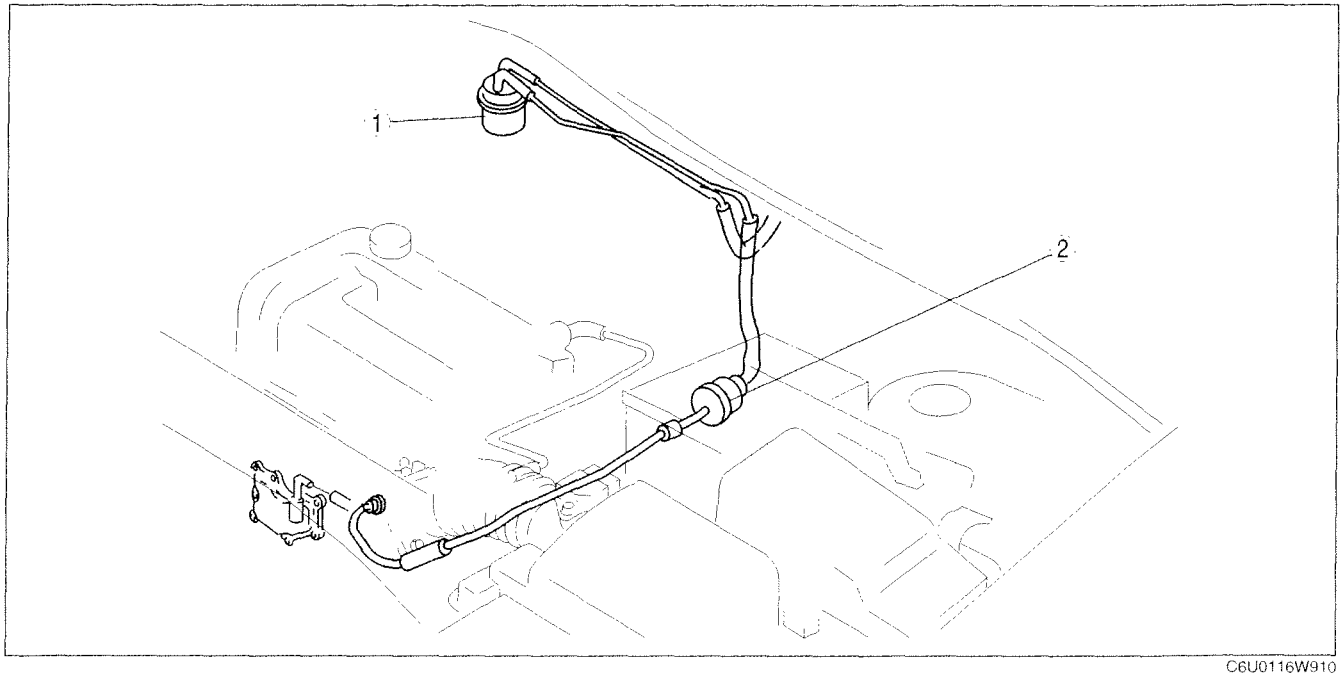
EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM COMPONENT REMOVAL/INSTALLATION

C6U011600116W03

Engine Room Side

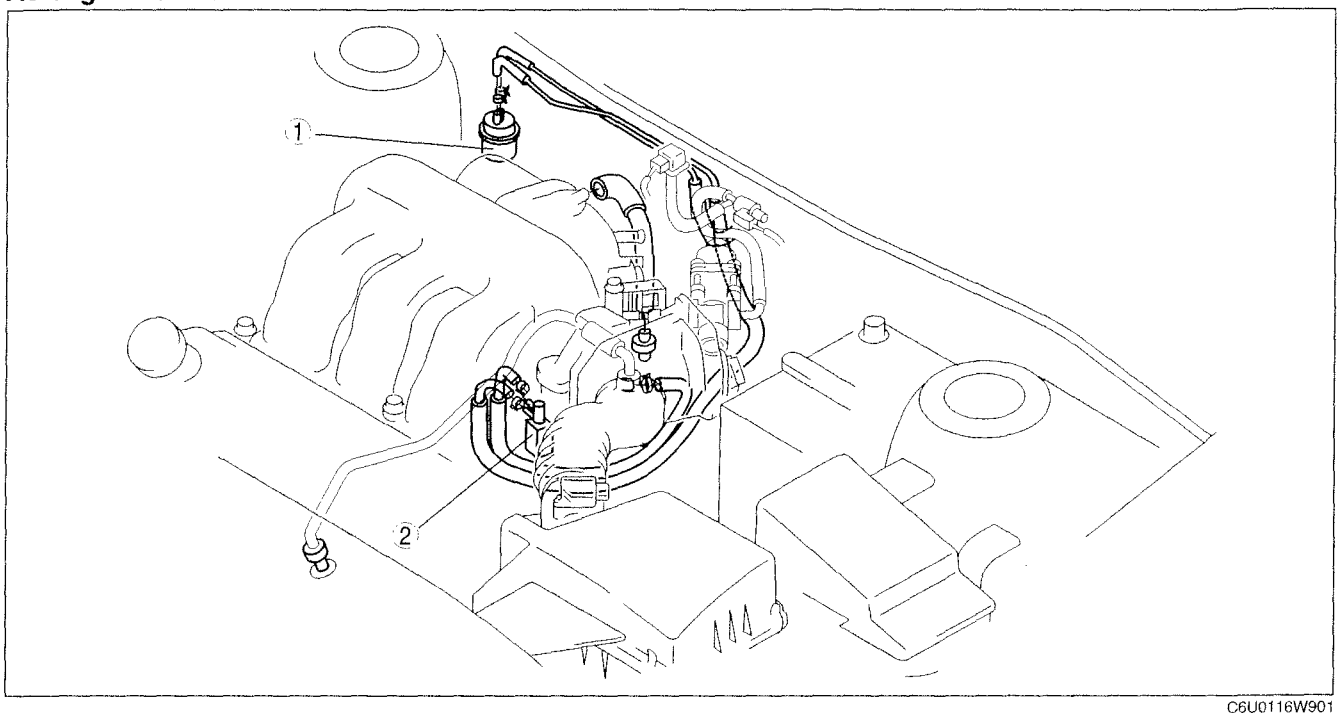
1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.

L3 engine models



C6U0116W910

AJ engine models



C6U0116W901

1	Catch tank (AJ) Catch tank (L3) (See 01–16–5 Catch Tank Removal Note (L3)) (See 01–16–5 Catch Tank Installation Note (L3))

2	Purge solenoid valve (AJ) (See 01–16–6 Purge Solenoid Valve (AJ) Installation Note) Purge solenoid valve (L3) (See 01–16–5 Purge Solenoid Valve (L3) Installation Note)

Catch Tank Removal Note (L3)

- Refer to the "Evaporative Hose Removal Note" to disconnect the evaporative hose from the catch tank. (See 01–16–8 Evaporative Hose Removal Note (Type A).)

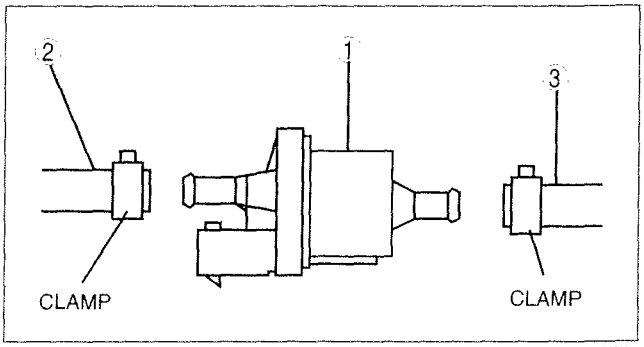
Catch Tank Installation Note (L3)

- Refer to the "Evaporative Hose Installation Note" to connect the evaporative hose from the catch tank. (See 01–16–9 Evaporative Hose Installation Note.)

Purge Solenoid Valve (L3) Installation Note

1. Install in the order indicated in the table.

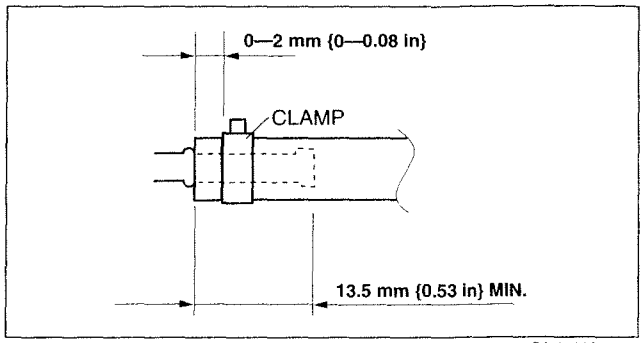
1	Purge solenoid valve
2	Vacuum hose (See 01–16–6 Hose (purge solenoid valve) installation note)
3	Evaporative hose (See 01–16–6 Hose (purge solenoid valve) installation note)



C6U0116W911

Hose (purge solenoid valve) installation note

1. Fit the vacuum hose (purge solenoid valve) onto the respective fittings, and install clamps as shown.

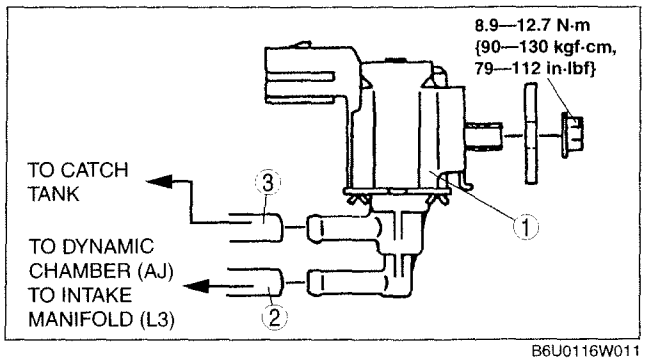


C6U0116W902

Purge Solenoid Valve (AJ) Installation Note

1. Install in the order indicated in the table.

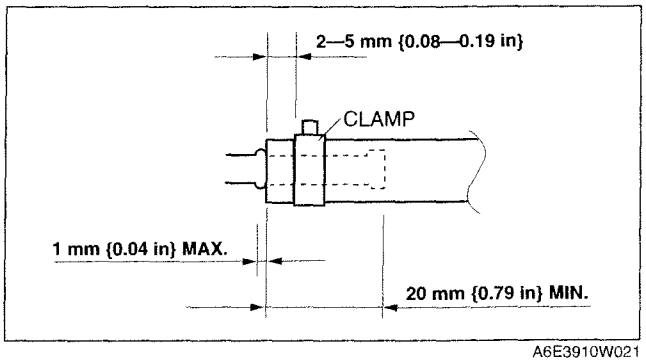
1	Purge solenoid valve
2	Vacuum hose (See 01–16–6 Hose (purge solenoid valve) installation note)
3	Evaporative hose (See 01–16–6 Hose (purge solenoid valve) installation note)



B6U0116W011

Hose (purge solenoid valve) installation note

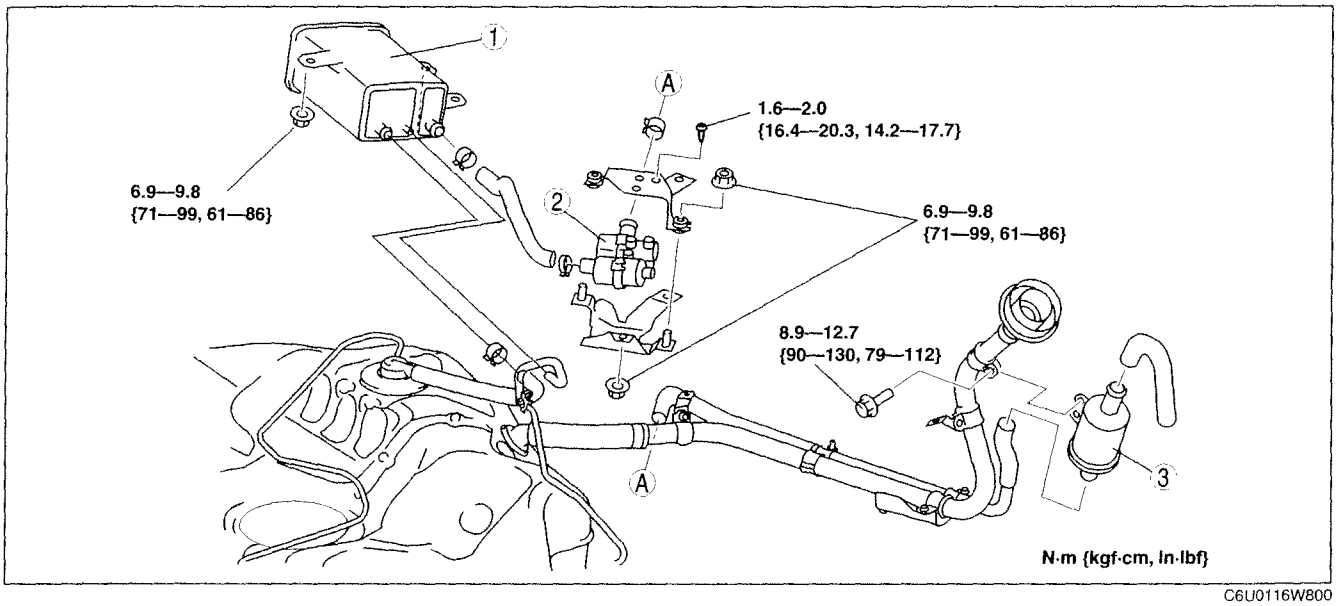
1. Fit the vacuum hose (purge solenoid valve) onto the respective fittings, and install clamps as shown.



A6E3910W021

Fuel Tank Side

1. Raise the rear of the vehicle and support it with safety stands.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



C6U0116W800

1	Charcoal canister (See 01–16–7 Charcoal Canister Removal Note) (See 01–16–7 Charcoal Canister Installation Note)
2	EVAP system leak detection pump
3	Air filter

Charcoal Canister Removal Note

- Refer to the "Evaporative Hose Removal Note" to disconnect the evaporative hose (to the purge solenoid valve) from the charcoal canister. (See 01–16–8 Evaporative Hose Removal Note (Type A).)
- For California emission regulation applicable model, refer to the "Evaporative Hose Removal Note" to disconnect evaporative hose (to the fuel tank) from the charcoal canister. (See 01–16–8 Evaporative Hose Removal Note (Type B).)

Charcoal Canister Installation Note

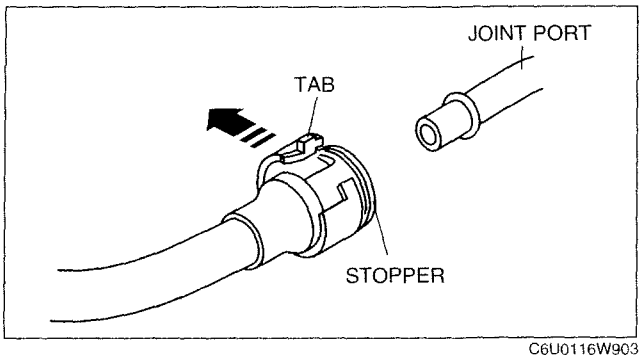
- Refer to the "Evaporative Hose Installation Note" to connect the evaporative hose from the charcoal canister. (See 01–16–9 Evaporative Hose Installation Note.)

Evaporative Hose Removal Note (Type A)

Caution
- **The quick release connector may be damaged if the tab is bent excessively. Do not expand the tab over the stopper.**

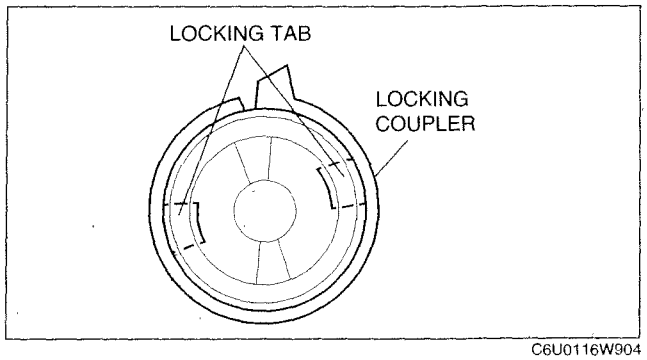
1. Disconnect the quick release connector.
   (1) Push the tab on the locking coupler **90** ° until it stops.
   (2) Pull the evaporative hose straight back.

Note
- The stopper may be removed from the quick connector. Take care not to lose it. Reinstall it to the quick release connector before reconnecting the joint port.



C6U0116W903

- The locking coupler has two internal locking tabs which retain the joint port. Be sure that the tab on the locking coupler is rotated until it stops to release two internal locking tabs.



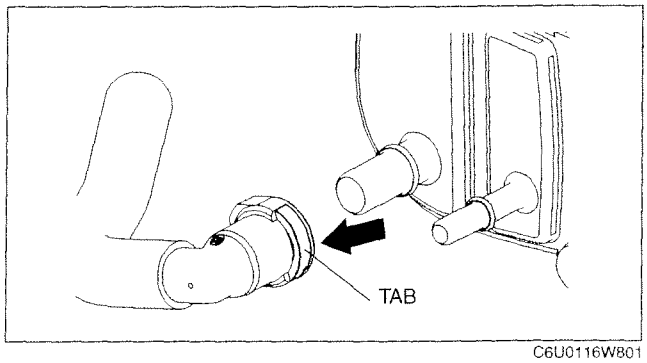
C6U0116W904

2. Cover the disconnected quick release connector and joint port with vinyl sheets or the like to prevent them from being scratched or contaminated with foreign material.

Evaporative Hose Removal Note (Type B)

Caution
- **The quick release connector may be damaged if the tab is bent excessively. Do not expand the tab over the stopper.**

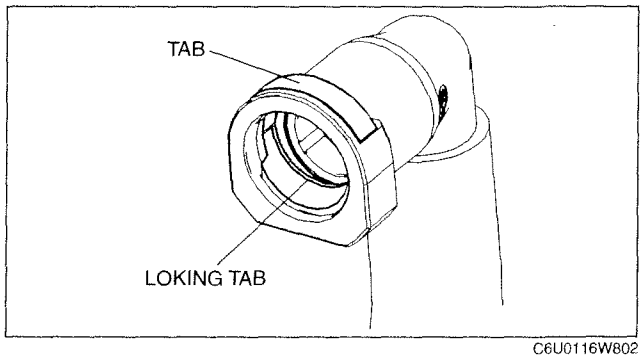
1. Disconnect the quick release connector.
   (1) Push the tab on the locking coupler until it stops.
   (2) Pull the evaporative hose straight back.



C6U0116W801

Note

- The locking coupler has the internal locking tab which retain the joint port. Be sure that the tab on the locking coupler is pushed until it stops to release the internal locking tab.



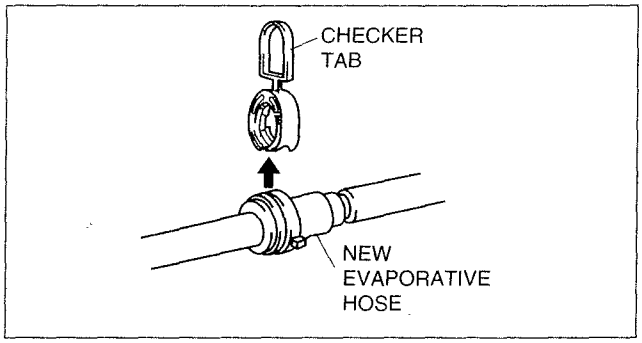
C6U0116W802

2. Cover the disconnected quick release connector and joint port with vinyl sheets or the like to prevent them from being scratched or contaminated with foreign material.

Evaporative Hose Installation Note

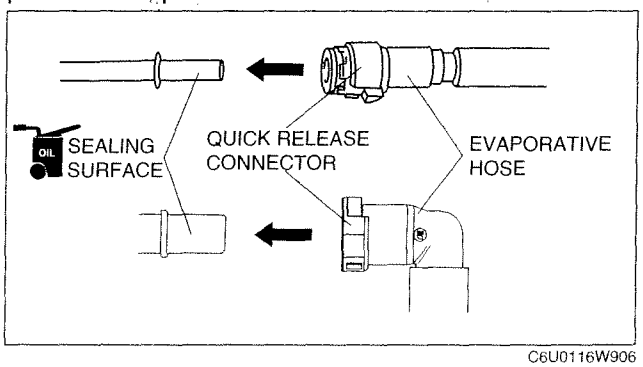
Note

- For type A, a checker tab is integrated with the quick release connector for new evaporative hoses. The checker tab will be released from the quick release connector after it is completely engaged with the joint port.



C6U0116W905

1. Inspect the joint port sealing surface for damage and deformation, and replace if necessary.
   - If the quick release connector O-ring is damaged, replace the evaporative hose.
2. Slightly apply clean engine oil to the sealing surface of the joint port.



C6U0116W906

3. Align the joint port with quick release connector so that the tabs of the retainer are correctly fitted into the quick release connector. Push the quick release connector straight into the joint port until a click is heard.
4. Lightly pull and push the quick release connector a few times by hand and verify that it can move **2.0—3.0 mm {0.08—0.11 in}** and it is connected securely.
   - If the quick release connector does not move at all, verify that O-ring is not damaged and slipped, and reconnect the quick release connector.

FUEL-FILLER CAP INSPECTION

C6U011642250W01

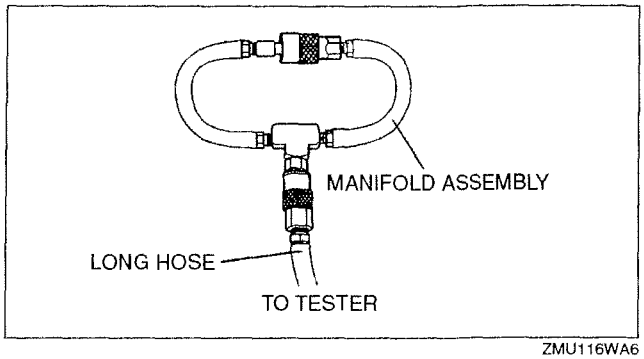
Leakage Inspection

1. Perform the following **SST** (Evaporative Emission System Tester 134-01049) self-test:

Note

- If the tester does not work correctly during self-test, refer to the tester operators manual for more detailed procedures.

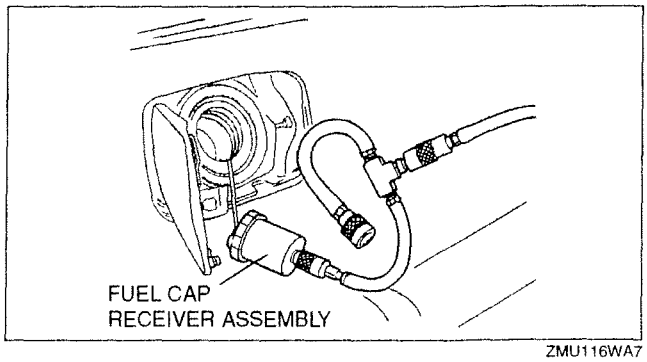
(1) Verify the gas cylinder valve is closed and the control valve located on the tester is in the TEST position. All tester display should be off at this time.
(2) Connect the long hose (part of **SST**) to the tester.
(3) Connect the manifold assembly (part of **SST**) to the long hose as shown.



ZMU116WA6

(4) Open the gas cylinder valve and verify the gas cylinder regulator left gauge reads **10 to 12 psi** (preset at factory).
  - If not, refer to the tester operators manual to contact tester manufacturer.
(5) Press the ON/OFF switch to turn on the **SST** and make sure the left display reads **0.0**.
(6) Turn the control valve on the tester to the FILL position.
(7) Verify the left display reading is **within 13.9 to 14.0 in of water.**
  - If not, adjust the pressure using the regulator knob located on the right side of the tester.
(8) Turn the control valve to TEST position and press the START switch.
(9) After the **2-min** countdown (left display) is completed, the right display shows the total pressure loss for that period. A **0.5 in** of water loss is acceptable on the self-test.
  - If the loss is **more than 0.5 in** of water, do one or more self-test. If the failed test repeats, check for leak using the ultrasonic leak detector (part of **SST**).

2. Press the RESET switch to set the left display reading to **0.0**.
3. Connect the fuel cap receiver assembly (part of **SST**) to the manifold assembly and fuel-filler cap from the vehicle.
  - If the fuel-filler cap is not a genuine part, replace it.



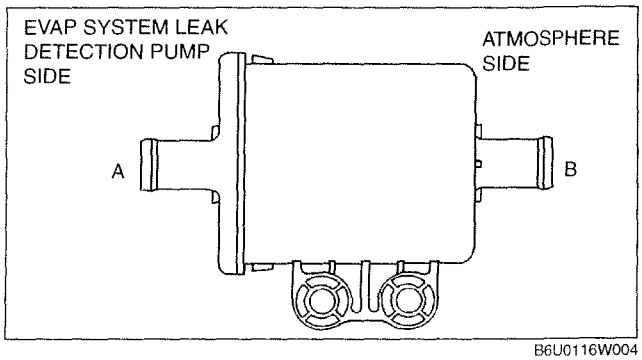
ZMU116WA7

4. Turn the control valve to the FILL position.
5. Wait (**maximum 20 s**) until the left display reads **13.9 to 14 in of water.**
  - If the reading is slightly below the specification, adjust it using the regulator knob.
  - If the reading is far below, the fuel-filler cap has leak. Replace it.
6. Turn the control valve to the TEST position and press the START switch.
7. After the **2-min** countdown (left display) is completed, check the test result (the failed/passed light on the tester).
  - If the green light turns on, the fuel-filler cap is OK.
  - If the red light turns on, the fuel-filler cap has leakage. Replace it.
8. Close the gas cylinder valve.
9. Turn the control valve to the FILL position.
10. Press the ON/OFF switch to turn off the tester.

AIR FILTER INSPECTION

C6U011613988W01

1. Remove the air filter.
2. Blow from port A and verify that there is airflow from port B.
   - If not as specified, replace the air filter.
3. Blow from port B and verify that there is airflow from port A.
   - If not as specified, replace the air filter.



B6U0116W004

CHARCOAL CANISTER INSPECTION

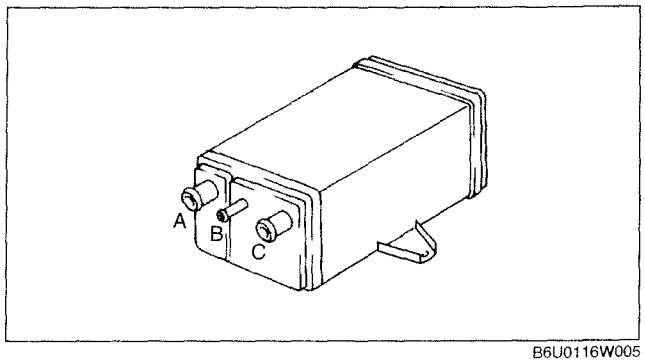
C6U011613970W01

1. Remove the charcoal canister. (See 01–16–4 EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM COMPONENT REMOVAL/INSTALLATION.)
2. Plug ports A and C, then blow air into port B.

Caution

- **Do not apply the pressure more than 20 kPa {0.2 kgf/cm^2, 2.8 psi} to the charcoal canister. Doing so will damage the charcoal canister.**

3. Verify that there is no air leakage from the case.
   - If not as specified, replace the charcoal canister.



B6U0116W005

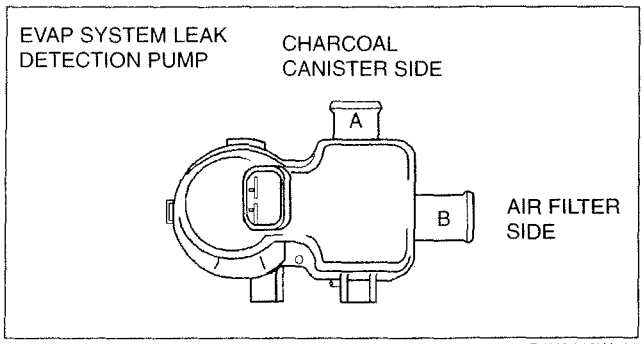
EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION

C6U011618581W01

Airflow Inspection

Note
- Perform the following test only when directed.

1. Disconnect the negative battery cable.
2. Remove the EVAP system leak detection pump. (See 01–16–4 EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM COMPONENT REMOVAL/INSTALLATION.)
3. Blow air into port A and verify that there is airflow from port B.
   - If not as specified, replace the EVAP system leak detection pump.
4. Blow air into port B and verify that there is airflow from port A.
   - If not as specified, replace the EVAP system leak detection pump.
   - If as specified, perform the following "Resistance Inspection".



B6U0116W006

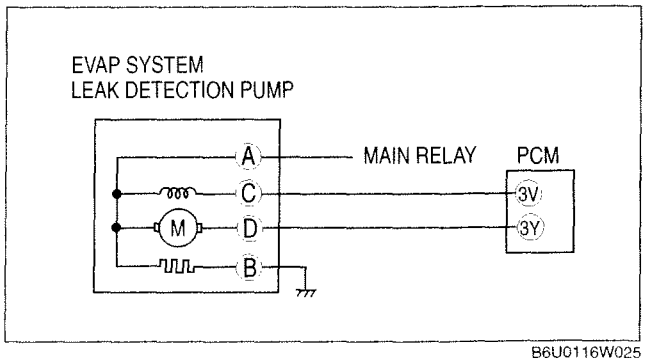
Resistance Inspection

Note
- Perform the following procedure only when directed.

1. Disconnect the negative battery cable.
2. Inspect resistance of the EVAP system leak detection pump.
   - If not as specified, replace the EVAP system leak detection pump.
   - If as specified, carry out the "Circuit Open/Short Inspection".

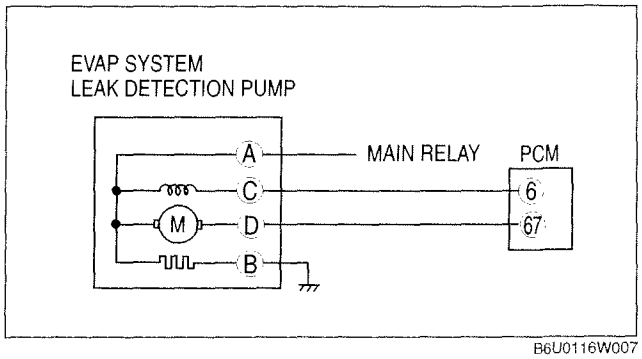
Terminals	Resistance (ohm)
A—B	20—50
A—C	26.6—32.4
A—D	MAX. 118

L3 engine models

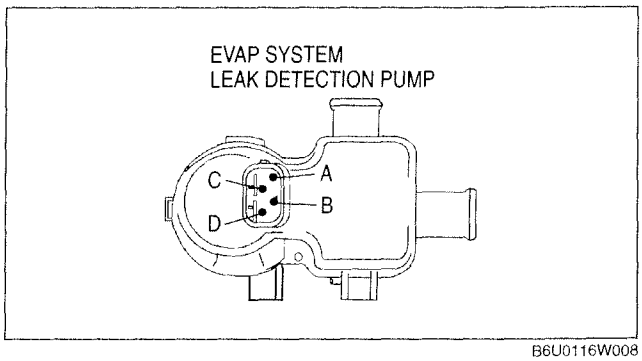


B6U0116W025

AJ engine models



B6U0116W007



B6U0116W008

Circuit Open/Short Inspection [L3]

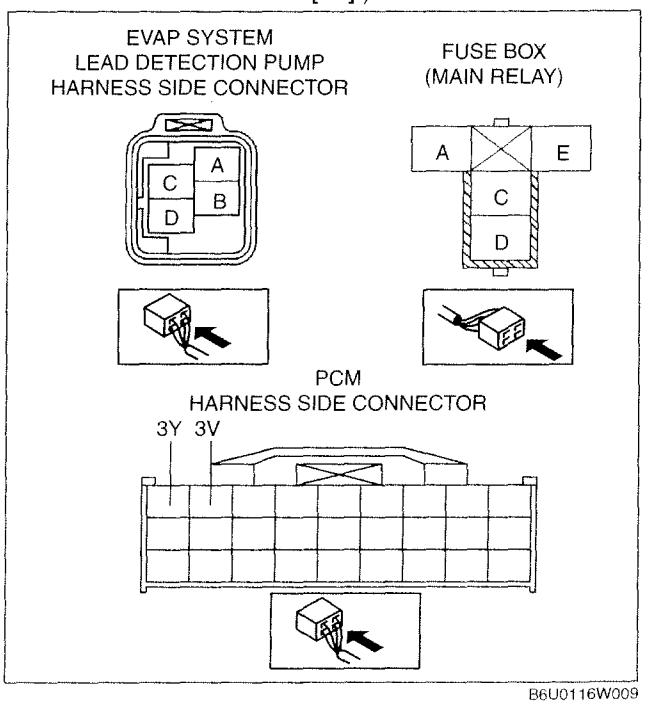
1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit (continuity check).

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — EVAP system leak detection pump terminal C (harness-side) and PCM terminal 3V
  - — EVAP system leak detection pump terminal D (harness-side) and PCM terminal 3Y
  - — EVAP system leak detection pump terminal A (harness-side) and main relay terminal C (harness-side)
  - — EVAP system leak detection pump terminal B (harness-side) and the body GND

Short circuit

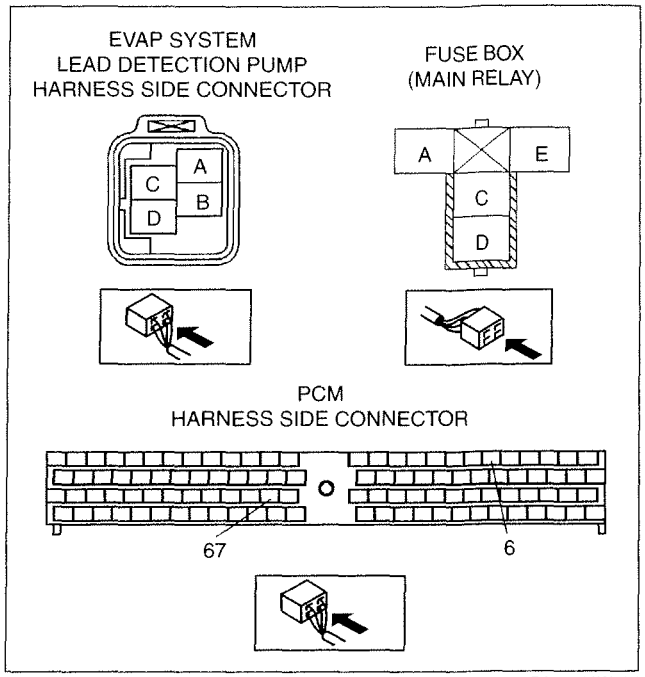
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — EVAP system leak detection pump terminal C (harness-side) and power supply
  - — EVAP system leak detection pump terminal D (harness-side) and power supply
  - — EVAP system leak detection pump terminal A (harness-side) and the body GND
  - — EVAP system leak detection pump terminal B (harness-side) and power supply



B6U0116W009

Circuit Open/Short Inspection [AJ]

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following wiring harnesses for open or short circuit (continuity check).



B6U0116W024

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — EVAP system leak detection pump terminal C (harness-side) and PCM terminal 6
  - — EVAP system leak detection pump terminal D (harness-side) and PCM terminal 67
  - — EVAP system leak detection pump terminal A (harness-side) and main relay terminal C (harness-side)
  - — EVAP system leak detection pump terminal B (harness-side) and the body GND

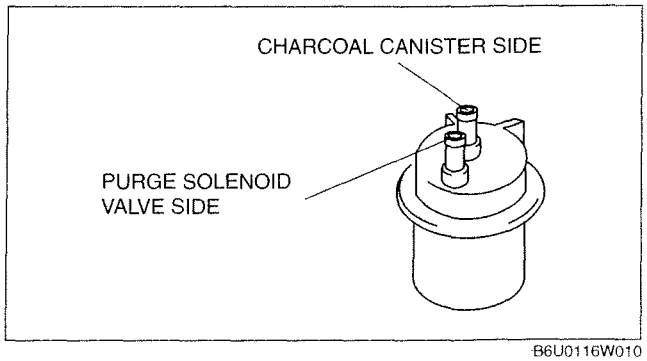
Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — EVAP system leak detection pump terminal C (harness-side) and power supply
  - — EVAP system leak detection pump terminal D (harness-side) and power supply
  - — EVAP system leak detection pump terminal A (harness-side) and the body GND
  - — EVAP system leak detection pump terminal B (harness-side) and power supply

CATCH TANK INSPECTION

C6U011613978W01

1. Remove the catch tank.
2. Plug the purge solenoid valve side port of the catch tank.
3. Blow from the charcoal canister side port and verify that there is no air leakage from the case.
   - If not as specified, replace the catch tank.



B6U0116W010

PURGE SOLENOID VALVE INSPECTION

C6U011618740W01

Airflow Inspection

Note
- Perform the following test only when directed.

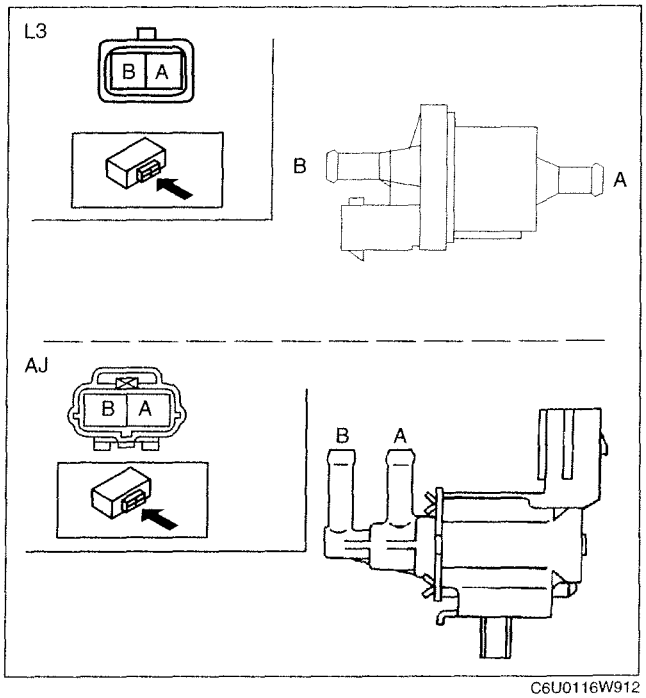
1. Disconnect the negative battery cable.
2. Remove the purge solenoid valve. (See 01–16–5 Purge Solenoid Valve (L3) Installation Note.)
3. Inspect airflow between the ports under the following conditions.

○—○ : Continuity ○═○ : Airflow

Step	Terminal		Port	
	A	B	A	B
1	○—○			
2	B+	GND	○═○	

B6U0116W014

- If not as specified, replace the purge solenoid valve.
- If as specified, carry out the "Circuit Open/ Short Inspection".



C6U0116W912

Circuit Open/Short Inspection [L3]

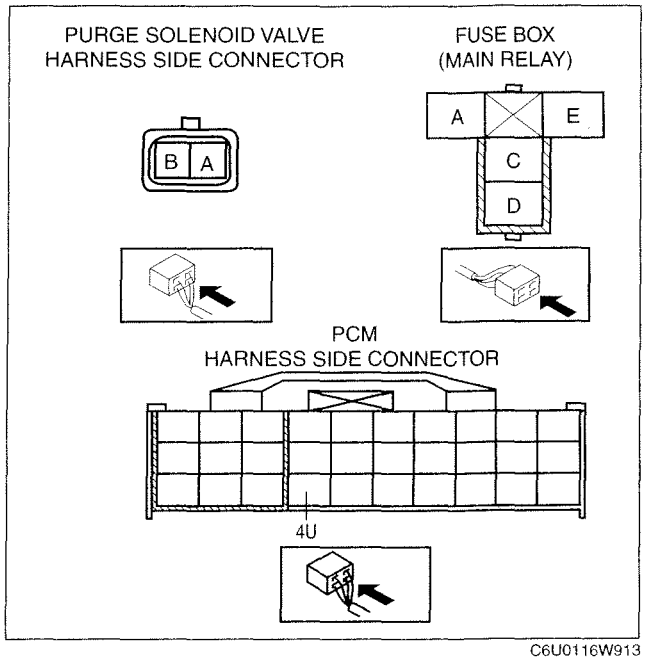
1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit (continuity check).

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Purge solenoid valve terminal A (harness-side) and PCM terminal 4U
  - — Purge solenoid valve terminal B (harness-side) and main relay terminal C (harness-side)

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — Purge solenoid valve terminal A (harness-side) and body GND
  - — Purge solenoid valve terminal B (harness-side) and power supply



C6U0116W913

Circuit Open/Short Inspection [AJ]

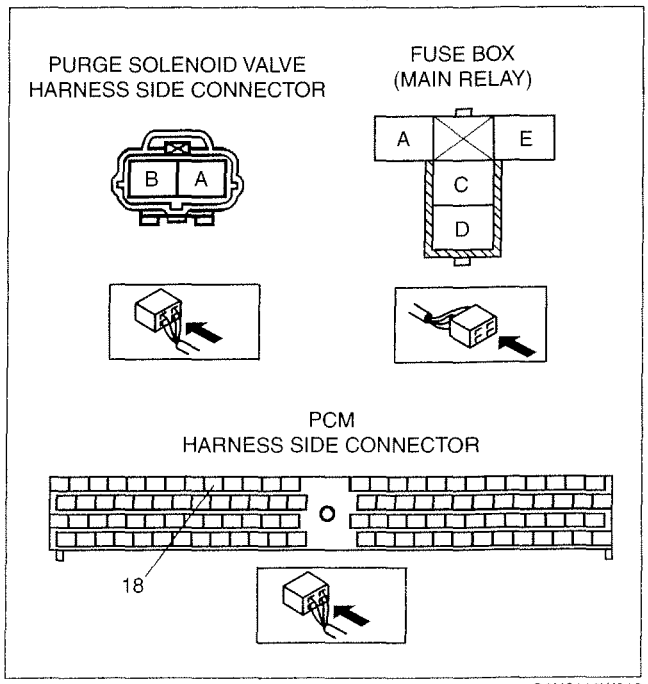
1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following wiring harnesses for open or short circuit (continuity check).

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Purge solenoid valve terminal B (harness-side) and PCM terminal 18
  - — Purge solenoid valve terminal A (harness-side) and main relay terminal C (harness-side)

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — Purge solenoid valve terminal B (harness-side) and body GND
  - — Purge solenoid valve terminal A (harness-side) and power supply

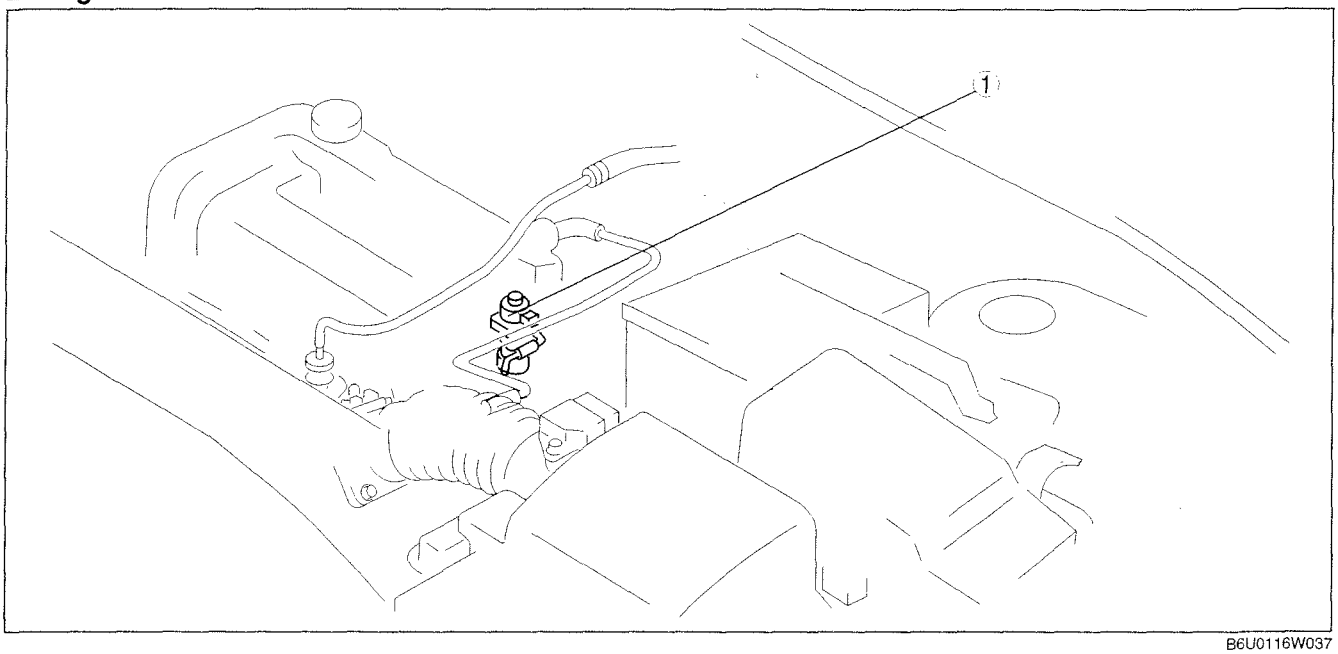


B6U0116W012

EGR SYSTEM LOCATION INDEX

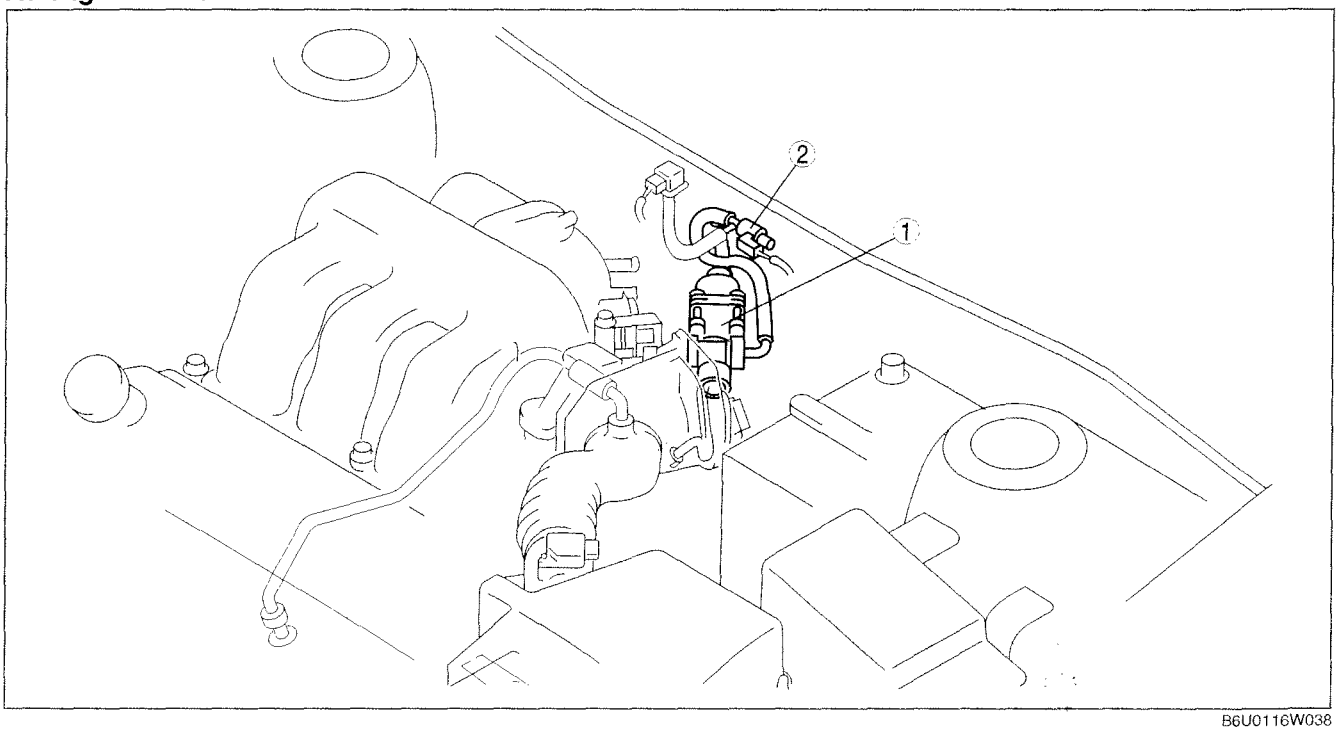
C6U011600116W04

L3 engine models



B6U0116W037

AJ engine models



B6U0116W038

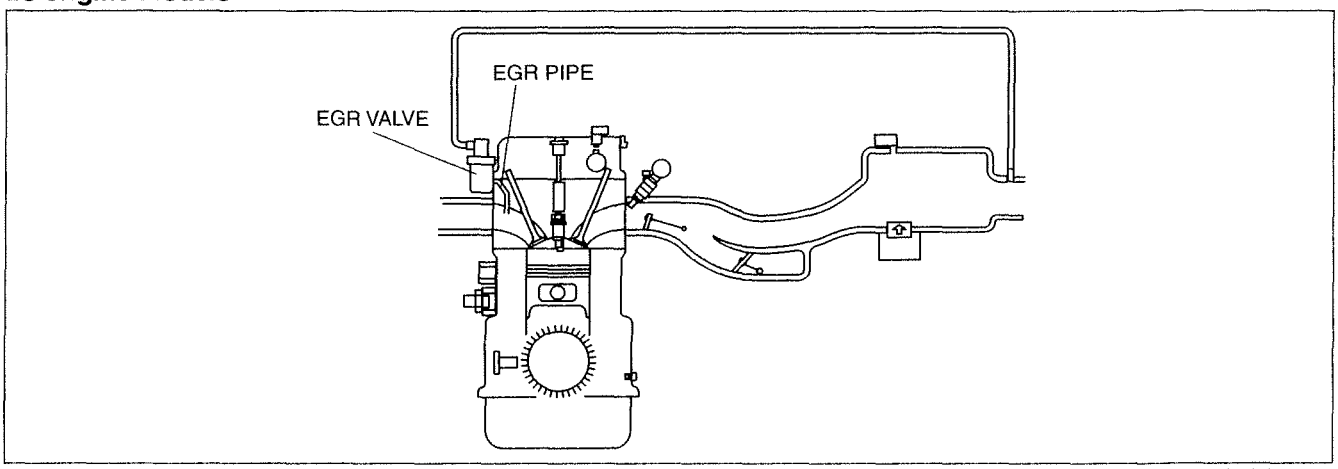
1	EGR valve (See 01–16–18 EGR VALVE REMOVAL/ INSTALLATION [L3]) (See 01–16–19 EGR VALVE REMOVAL/ INSTALLATION [AJ] (See 01–16–19 EGR VALVE INSPECTION [L3]) (See 01–16–21 EGR VALVE INSPECTION [AJ])

2	EGR boost sensor solenoid valve (See 01–16–22 EGR BOOST SENSOR SOLENOID VALVE INSPECTION [AJ])

EGR SYSTEM DIAGRAM

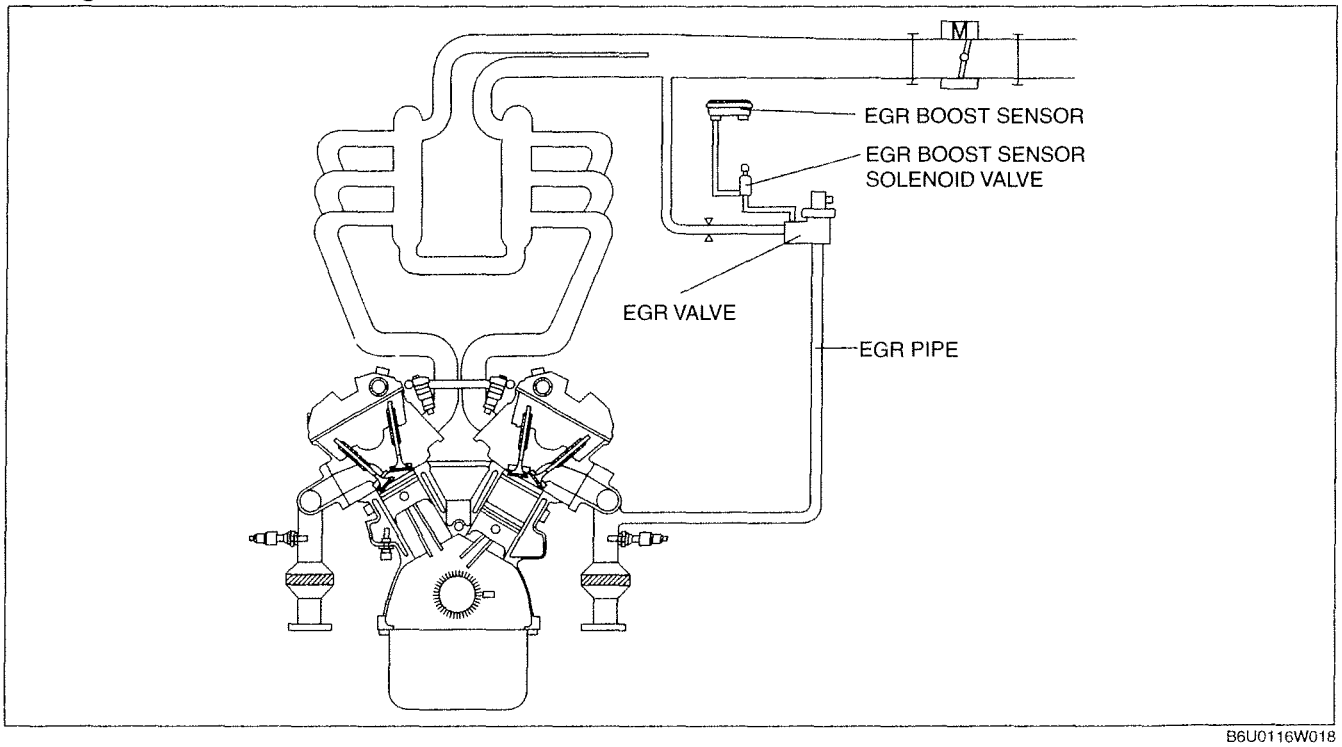
C6U011600116W05

L3 engine models



B6U0116W027

AJ engine models



B6U0116W018

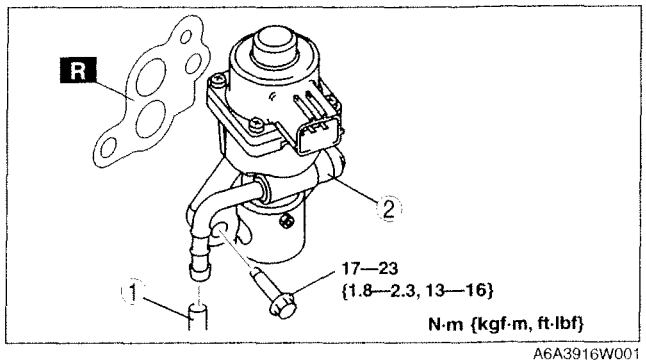
EGR VALVE REMOVAL/INSTALLATION [L3]

C6U011620300W01

1. Disconnect the negative battery cable.
2. Disconnect the EGR valve connector.
3. Remove in the order indicated in the table.

1	Water hose (See 01–16–19 Water Hose Removal Note)
2	EGR valve (See 01–16–19 EGR Valve Removal Note)

4. Install in the reverse order of removal.



A6A3916W001

Water Hose Removal Note
- Drain the engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)

EGR Valve Removal Note
1. Remove the air hose. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3])
2. Remove the upper radiator hose. (See 01–12–8 RADIATOR REMOVAL/INSTALLATION.)

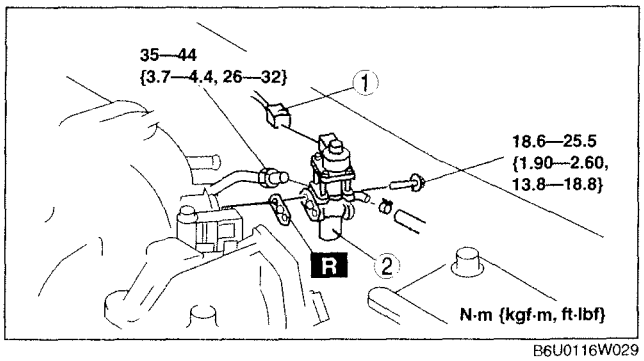
EGR VALVE REMOVAL/INSTALLATION [AJ]

C6U011620300W02

1. Disconnect the negative battery cable.
2. Disconnect the vacuum hose.
3. Disconnect the EGR pipe.
4. Remove in the order indicated in the table.

1	EGR valve connector
2	EGR valve

5. Install in the reverse order of removal.



B6U0116W029

EGR VALVE INSPECTION [L3]

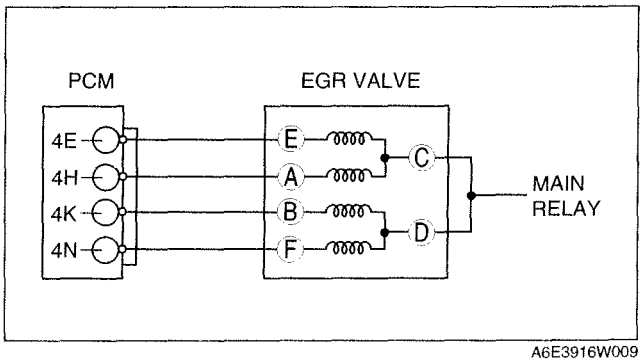
C6U011620300W03

Resistance Inspection

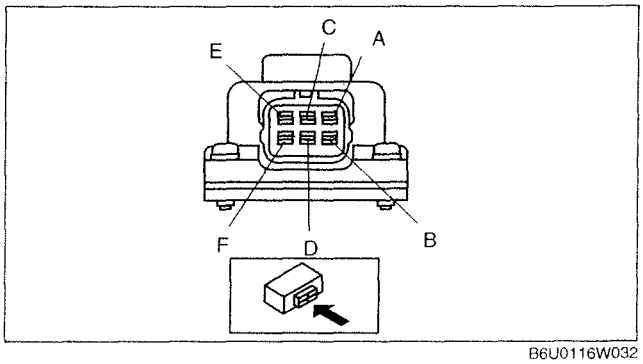
Note
- Perform the following test only when directed.

1. Disconnect the negative battery cable.
2. Inspect resistance of the EGR valve coils.
   - If not as specified, replace the EGR valve.
   - If as specified, carry out the "Circuit Open/ Short Inspection".

Terminals	Resistance (ohm)
C—E C—A D—B D—F	12—16



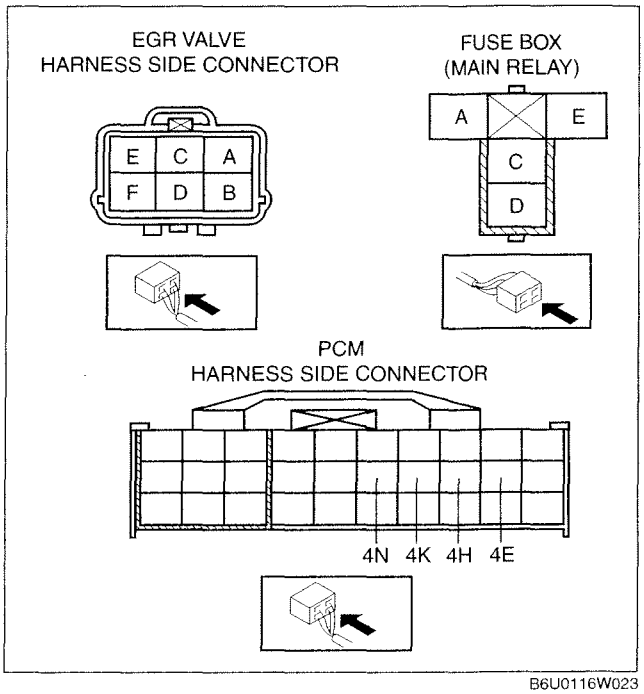
A6E3916W009



B6U0116W032

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit (continuity check).



B6U0116W023

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — EGR valve terminal E (harness-side) and PCM terminal 4E
  - — EGR valve terminal A (harness-side) and PCM terminal 4H
  - — EGR valve terminal B (harness-side) and PCM terminal 4K
  - — EGR valve terminal F (harness-side) and PCM terminal 4N
  - — EGR valve terminal C or D (harness-side) and main relay terminal C (harness-side)

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — EGR valve terminal E (harness-side) and GND
  - — EGR valve terminal A (harness-side) and GND
  - — EGR valve terminal B (harness-side) and GND
  - — EGR valve terminal F (harness-side) and GND
  - — EGR valve terminal C or D (harness-side) and power supply

3. Remove the EGR valve, and inspect for any damage or clogging.
   - If there is no damage or no clogging, replace the EGR valve.

EGR VALVE INSPECTION [AJ]

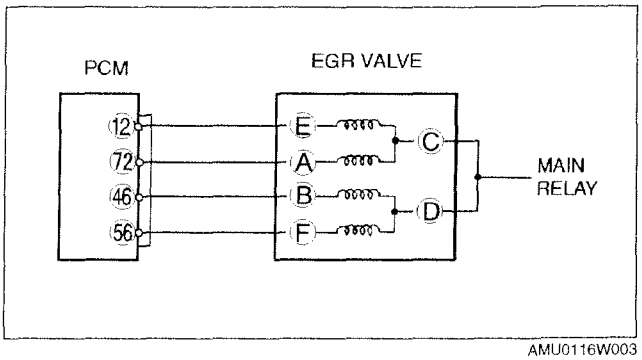
C6U011620300W04

Resistance Inspection

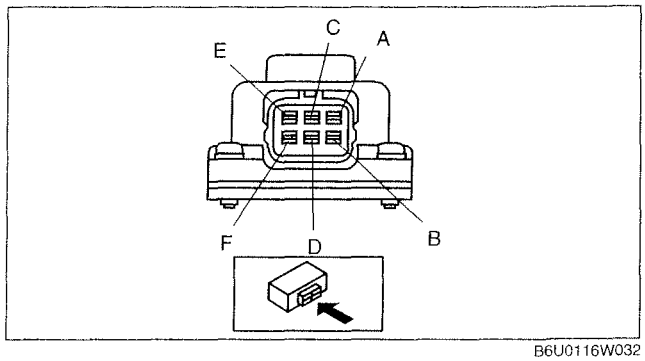
Note
- Perform the following test only when directed.

1. Disconnect the negative battery cable.
2. Inspect resistance of the EGR valve coils.
   - If not as specified, replace the EGR valve.
   - If as specified, carry out the "Circuit Open/ Short Inspection".

Terminals	Resistance (ohm)
C—E C—A D—B D—F	Approx. 22



AMU0116W003



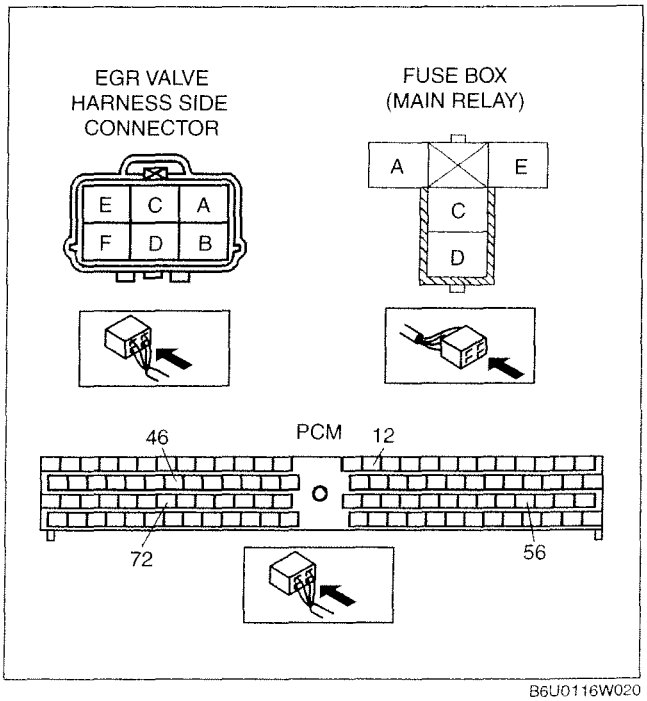
B6U0116W032

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following wiring harness for open or short circuit (continuity check).

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — EGR valve terminal E (harness-side) and PCM terminal 12
  - — EGR valve terminal A (harness-side) and PCM terminal 72
  - — EGR valve terminal B (harness-side) and PCM terminal 46
  - — EGR valve terminal F (harness-side) and PCM terminal 56
  - — EGR valve terminal C or D (harness-side) and main relay terminal C (harness-side)

Short circuit
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — EGR valve terminal E (harness-side) and GND
  - — EGR valve terminal A (harness-side) and GND
  - — EGR valve terminal B (harness-side) and GND
  - — EGR valve terminal F (harness-side) and GND
  - — EGR valve terminal C or D (harness-side) and power supply



B6U0116W020

3. Remove the EGR valve, and inspect for any damage or clogging.
   - If there is no damage or no clogging, replace the EGR valve.

EGR BOOST SENSOR SOLENOID VALVE INSPECTION [AJ]

C6U011618740W02

Airflow Inspection

Note
- Perform the following procedure only when directed.

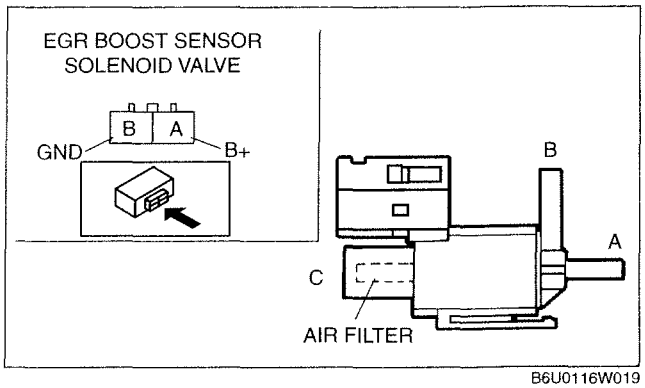
1. Disconnect the negative battery cable.
2. Remove the EGR boost sensor solenoid valve.
3. Inspect airflow between each port under the following conditions.

○—○ : Continuity ○═○ : Airflow

Step	Terminal		Port		
	A	B	A	B	C
1	○—○			○═○	
2	B+	GND	○═○		

X3U116WCB

- If not as specified, replace the EGR boost sensor solenoid valve.
- If as specified, carry out the "Circuit Open/ Short Inspection".



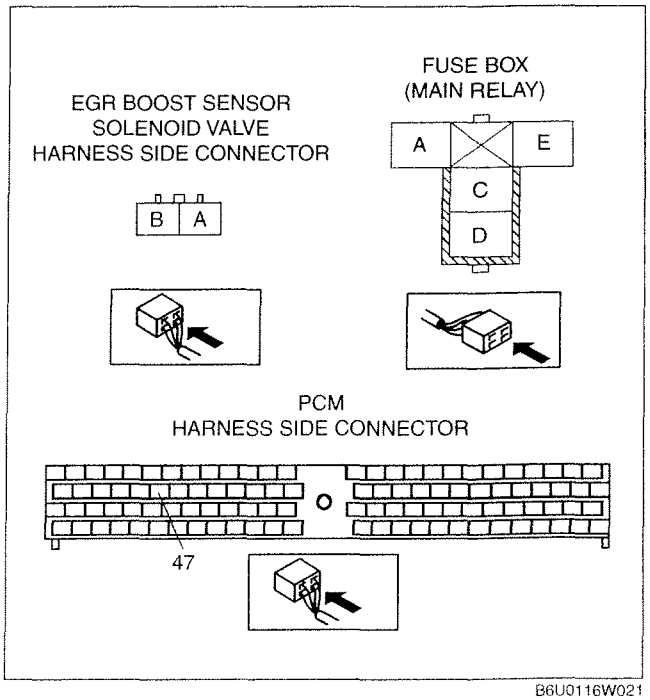
B6U0116W019

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following wiring harnesses for open or short circuit (Continuity check).

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — EGR boost sensor solenoid valve terminal B (harness-side) and PCM terminal 47
  - — EGR boost sensor solenoid valve terminal A (harness-side) and main relay terminal C (harness-side)

Short circuit
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — EGR boost sensor solenoid valve terminal B (harness-side) and body GND
  - — EGR boost sensor solenoid valve terminal A (harness-side) and power supply

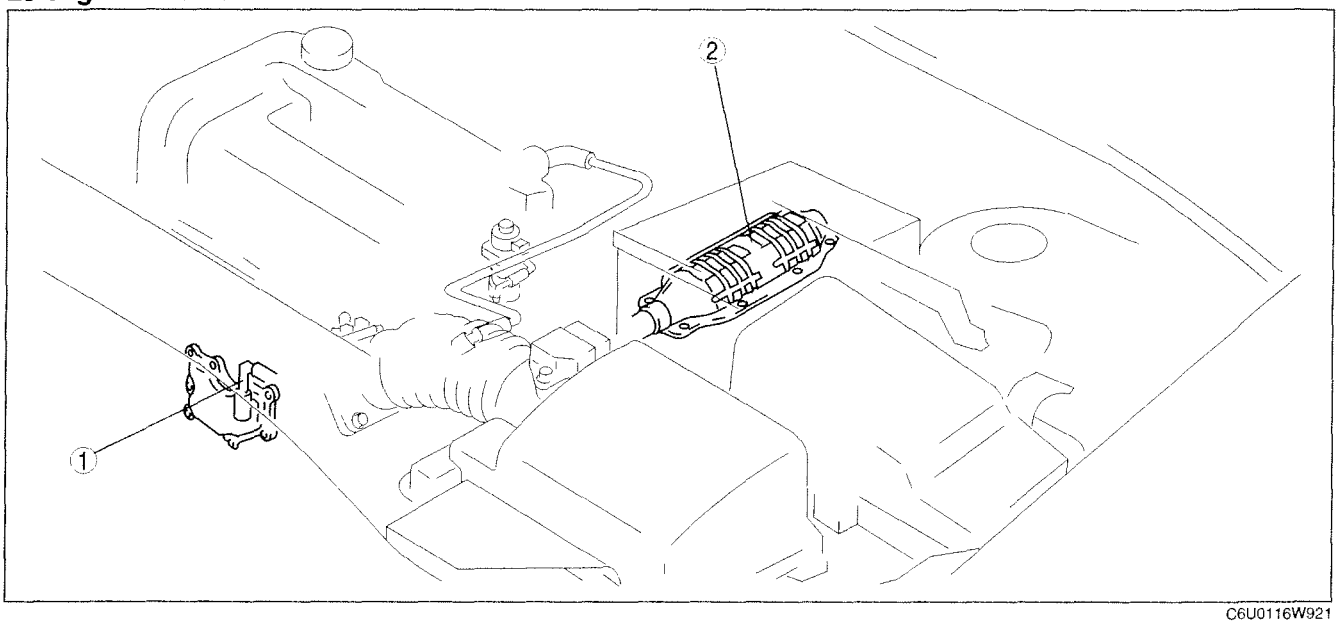


B6U0116W021

POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM AND CATALYTIC CONVERTER SYSTEM LOCATION INDEX

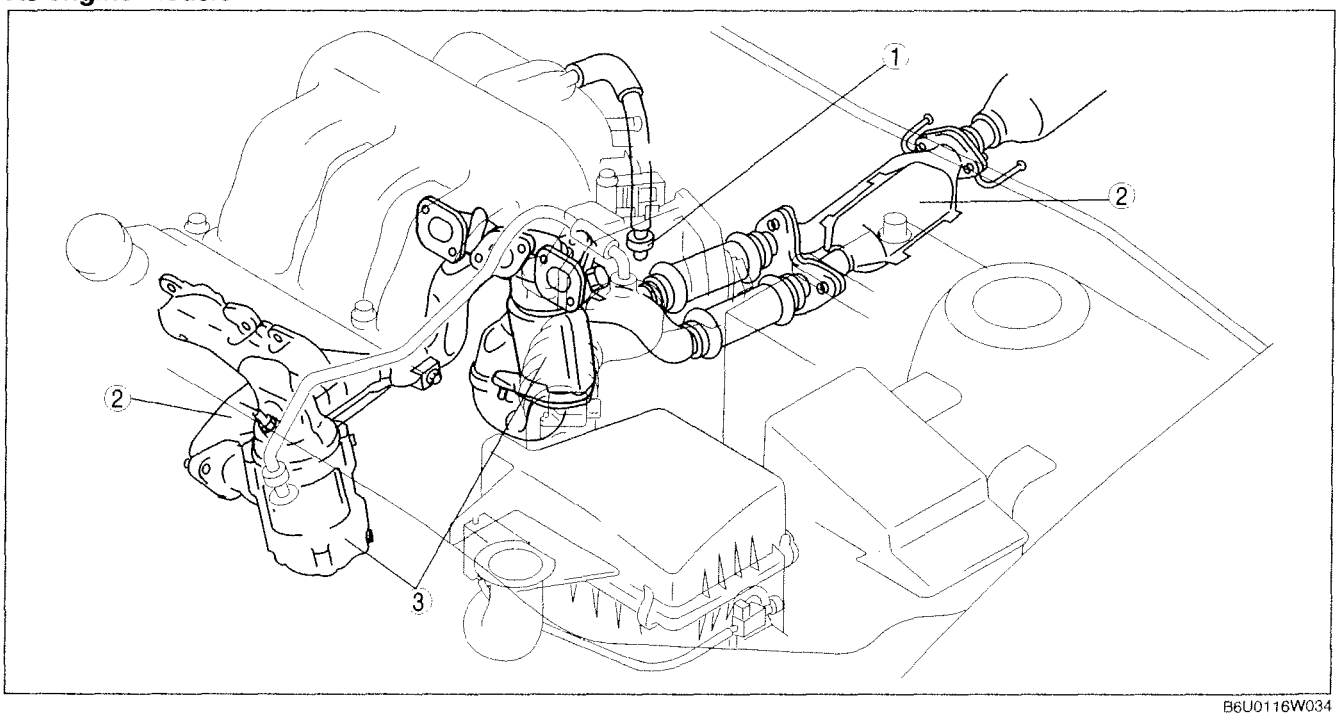
C6U011600116W06

L3 engine models



C6U0116W921

AJ engine models



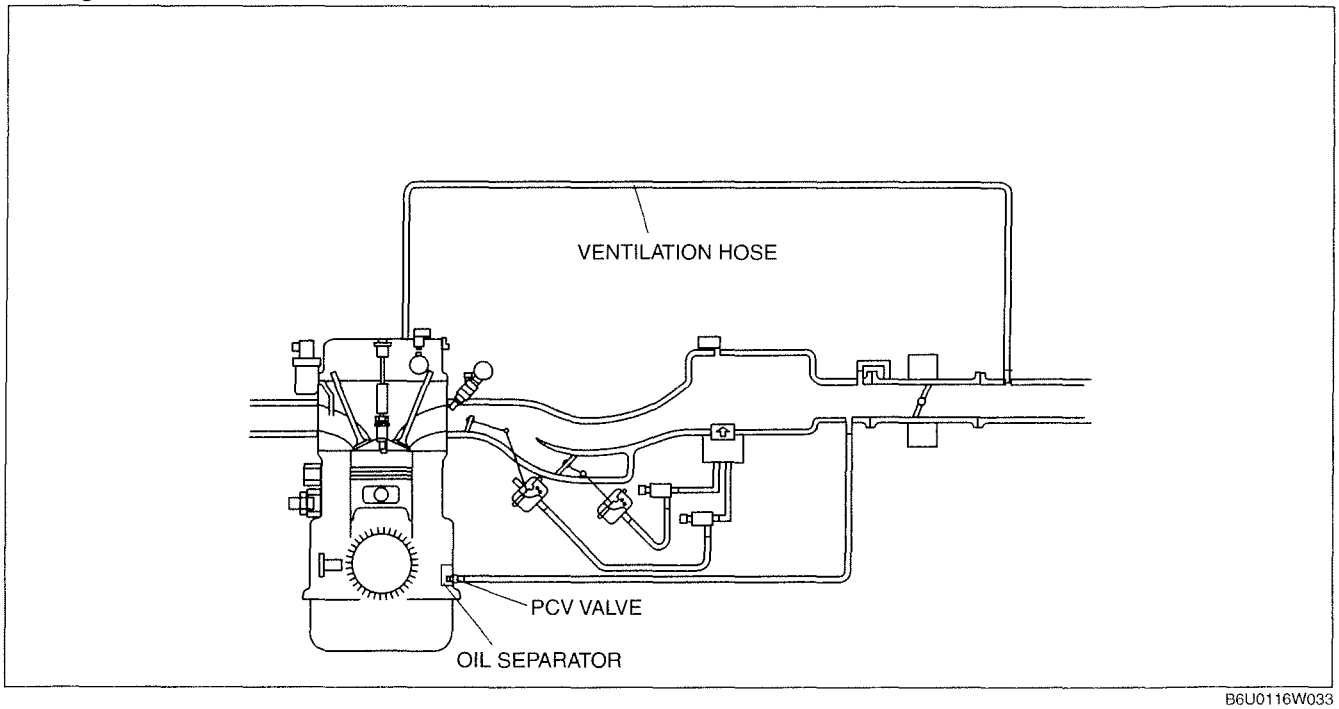
B6U0116W034

1	PCV valve (See 01–16–25 PCV VALVE INSPECTION [L3]) (See 01–16–25 PCV VALVE INSPECTION [AJ])
2	Three way catalytic converter (TWC)
3	Warm-up three way catalytic converter (WU-TWC) (See 01–16–25 THREE-WAY CATALYTIC CONVERTER (TWC) INSPECTION)

POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM FLOW DIAGRAM

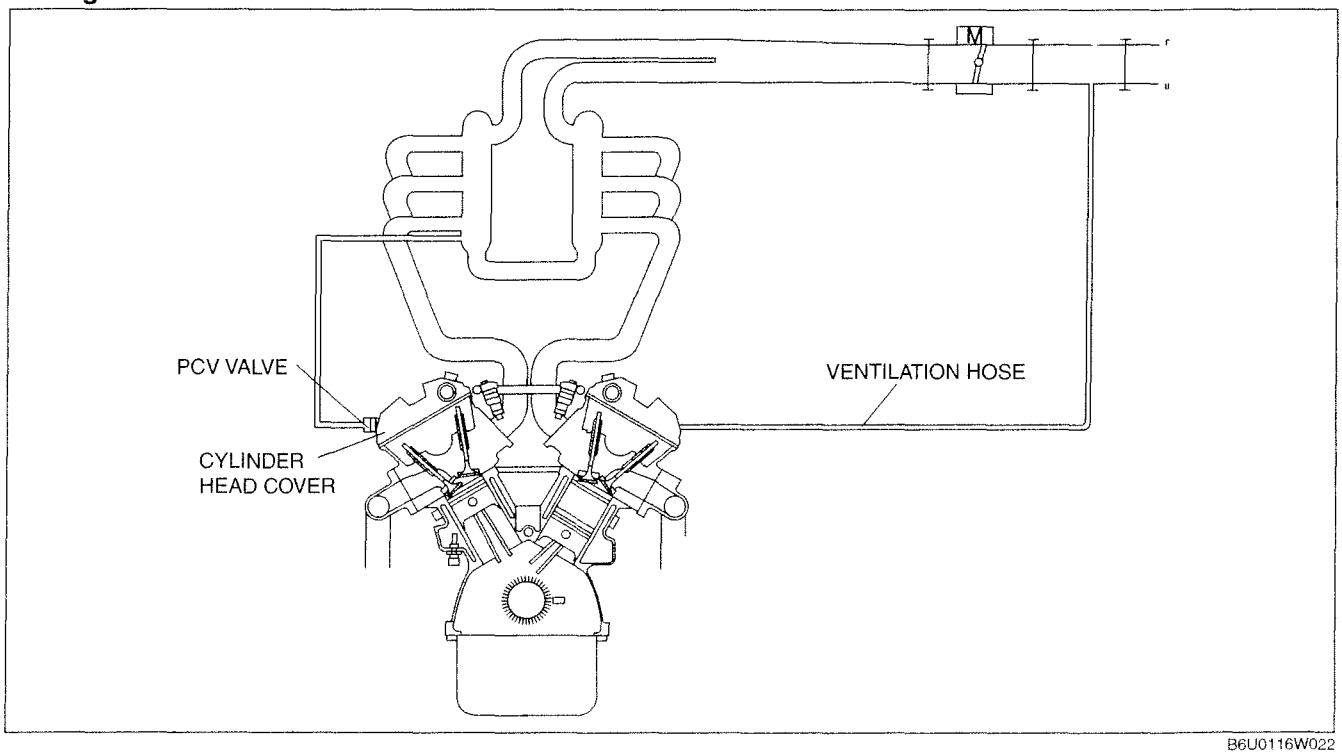
C6U011600116W07

L3 engine models



B6U0116W033

AJ engine models



B6U0116W022

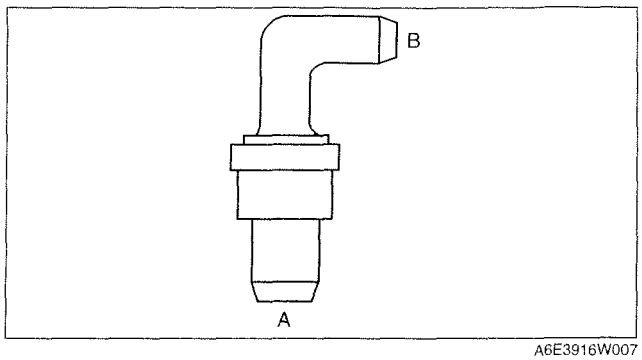
PCV VALVE INSPECTION [L3]

C6U011613890W01

1. Disconnect the negative battery cable.
2. Remove the intake manifold. (see 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
3. Remove the PCV valve.
4. Blow through the valve and verify that air flows as specified.
   - If not as specified, replace the PCV valve.

Specification

Condition	Airflow
Air applied from port A to B	Yes
Air applied from port B to A	No



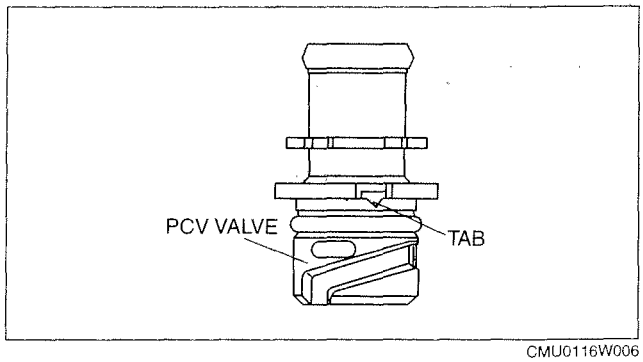
A6E3916W007

PCV VALVE INSPECTION [AJ]

C6U011613890W02

Note

- Removing the PCV valve might damage to the tab of the PCV valve and it will not be able to be reinstalled. Due to this, inspect the PCV valve with it installed on the vehicle.



CMU0116W006

1. Disconnect the negative battery cable.
2. Disconnect the PCV hose from the PCV valve.
3. Apply pressure to the PCV valve and verify that there is no airflow.
   - If there is airflow, replace the PCV valve.
4. Apply vacuum to the PCV valve and verify that there is airflow.
   - If there is no airflow, replace the PCV valve.

THREE-WAY CATALYTIC CONVERTER (TWC) INSPECTION

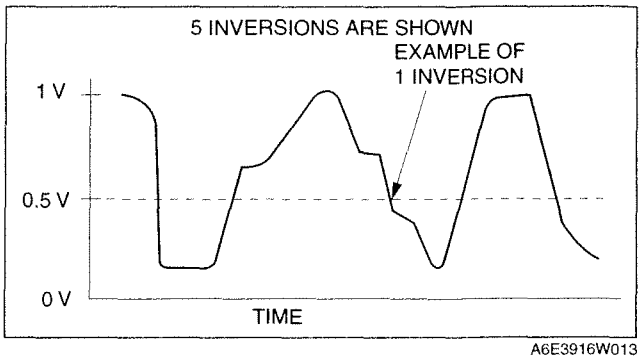
C6U011620500W01

Note

- Make sure that no HO2S DTCs have been detected. If detected, this inspection is not applicable for TWC inspection.

1. Connect the WDS or equivalent and monitor the following PIDs.
   - Monitor the right TWC using O2S11 PID for upstream HO2S and O2S12 PID for downstream HO2S.
2. Begin to monitor the appropriate PIDs.
3. Drive the vehicle for **10 min** at **65—96 km/h {40—60 mph}** to allow the front catalytic converter to reach operating temperature.
4. Stop the vehicle and leave it in a safe place.
5. Idle the engine.

6. Record PIDs for **1 min.**



A6E3916W013

7. Select the appropriate PIDs and read the graph.
8. Count the number of times (inversions) that the upstream HO2S graph line actually crosses the **0.5 V** line.
9. Count the number of times (inversions) that the downstream HO2S graph line actually crosses the **0.5 V** line.

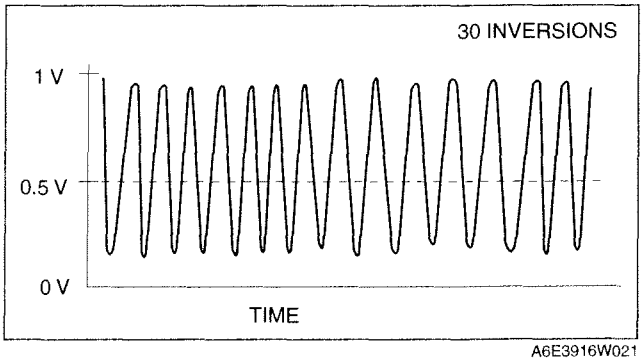
Note
- Do not count the number of peaks. Refer to the graph.

10. Using the following equation, calculate the value of ratio.

Equation
RATIO = Upstream HO2S inversion ÷ downstream HO2S inversion

- If the ratio is **1.5** or more, or there is no downstream HO2S inversion, the TWC is functioning properly.
- If the ratio is **less than 1.5**, the TWC is not functioning properly. Replace the TWC.

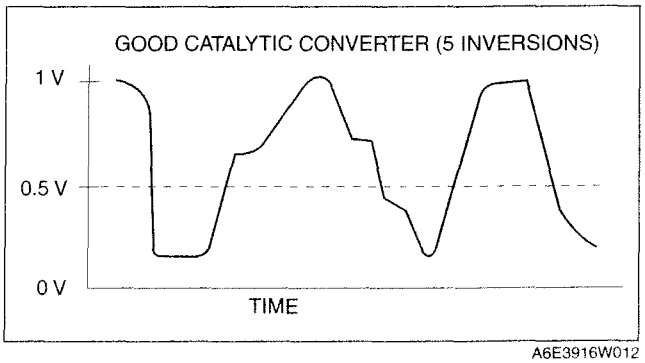
Upstream HO2S graph line example



A6E3916W021

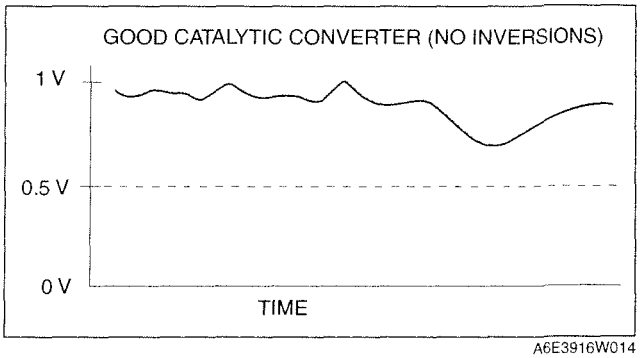
Downstream HO2S graph line example 1

Equation
RATIO = 30 inversions (upstream HO2S inversions) ÷ 5 inversions (downstream HO2S inversions) = 6.0 (good WU-TWC)



A6E3916W012

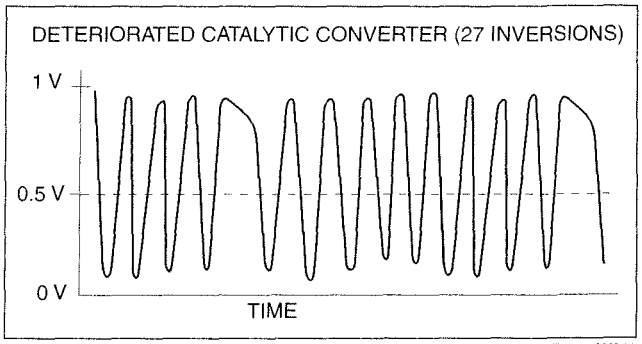
Downstream HO2S graph line example 2



A6E3916W014

Downstream HO2S graph line example 3

Equation
RATIO = 30 inversions (upstream HO2S inversions) ÷ 27 inversions (downstream HO2S inversions) = 1.1 (bad converter)



A6E3916W015

01–17 CHARGING SYSTEM

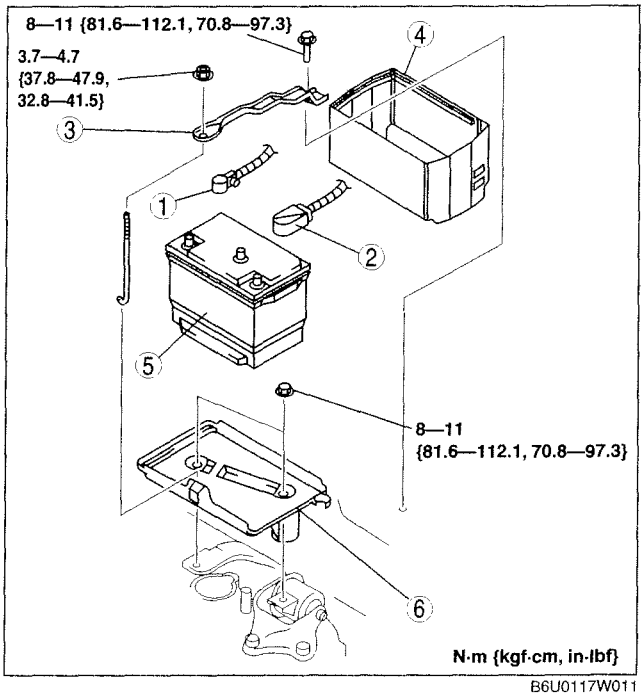
BATTERY REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.

1	Negative battery cable
2	Positive battery cable
3	Battery clamp
4	Battery box
5	Battery
6	Battery tray

2. Install in the reverse order of removal.

C6U011718520W01



B6U0117W011

BATTERY INSPECTION

C6U011718520W02

Warning

- **Since battery acid is toxic, be careful when handling the battery.**
- **Since battery acid is highly corrosive, be careful not to allow it to contact clothing or the vehicle.**
- **In case battery acid contacts skin, eyes, or clothing, flush it immediately with running water. Especially if the acid gets in the eyes, flush with water for more than 15 min and get prompt medical attention.**

Electrolyte gravity

1. Measure the electrolyte gravity using a hydrometer.
   - If it is less than the specification, recharge the battery. (See 01–17–2 BATTERY RECHARGING.)

Standard electrolyte gravity
1.22—1.29 [20 °C {68 °F}]

Inspection and Verification

1. Verify that the customer concern by operating the system.
2. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
• Battery • Battery mounting	• Battery cables • Battery posts

3. If an obvious cause for a concern is found, correct the cause before proceeding to the next step.
4. If the fault is not visually evident, proceed to the pin point test.

Battery Condition Test

Note
- Failure to fully charge the battery before retesting may cause false readings.

Pin point test
1. Verify the battery condition using the Battery Analyzer.
   - If the meter read, GOOD BATTERY, inspect the generator. (See 01–17–5 GENERATOR INSPECTION.)
   - If the meter read, GOOD-RECHARGE, charge the battery and inspect the generator. (See 01–17–5 GENERATOR INSPECTION.)
   - If the meter read, CHARGE & RETEST, fully charge the battery and retest.
   - If the meter read, REPLACE BATTERY, install a new battery.
   - If the meter read, BAD CELL-REPLACE, install a new battery.

Back-up Current
1. Verify that the ignition switch is off and that the ignition switch has been removed.
2. Leave the vehicle for **more than 10 min.**
3. Disconnect the negative battery cable.

Caution
- **Operating electrical loads while measuring the back-up current can damage the circuit tester.**

4. Measure the back-up current between the negative battery terminal and the negative battery cable.
   (1) If the current exceeds the maximum, remove the fuse in the main fuse block and the fuse block one by one while measuring the back-up current.
   (2) Inspect and repair wiring harnesses and connectors of the fuse at which the current reduces.

Maximum back-up current
20 mA

BATTERY RECHARGING

C6U011718520W03

Warning
- **Hydrogen and oxygen gases are produced during normal battery operation. This gas mixture can explode if flames, sparks, or lighted tobacco are brought near the battery. When charging or using a battery in an enclosed space, always provide ventilation and shield your face and eyes. Failure to follow these instructions may result in personal injury.**
- **Batteries contain sulfuric acid. Avoid contact with skin or eyes. Also, shield your eyes when working near the battery to protect against possible splashing of the acid solution. In case contact with the skin, eyes, or clothing, flush immediately with water for a period of 15 min and get prompt medical attention. If acid is swallowed, call physician immediately. Failure to follow these instructions may result in personal injury.**
- **Wear safety glasses. Battery charging can be dangerous. While being charged, the battery produces a potentially explosive mixture of hydrogen and oxygen gases. Keep sparks, flames and lighted cigarettes away from batteries. In case of acid contact with skin, eyes or clothing, flush immediately with large amounts of water. Get medical attention. Failure to follow these instructions may result in personal injury.**

Caution
- **Keep the battery and the surrounding parts, particularly the top, clean and dry. If electrolyte is evident on the top of the battery, clean it immediately. Even a weak electrolyte quickly attacks and corrodes the cable connections, battery hold-down clamp and battery ground cable. Use a rag soaked in a weak solution of water and braking soda to counteract the action the action of spilled electrolyte.**

Note
- If excessive gassing of electrolyte spewing occurs during the charge, discontinue charging. The battery has reached usable charge. If the battery will not accept at least **5 A** after **20 min** of charging, install a new battery.

1. Before recharging a discharged battery, inspect and repair the following conditions, if they exist:
   (1) Loose drive belt
   (2) Pinched or grounded generator voltage regulator wiring
   (3) Loose connections of generator voltage regulator wiring at the generator or voltage regulator
   (4) Loose or corroded connections at battery, grounded starter motor relay or engine
2. Excessive battery drain due to:
   (1) Interior lamps remaining energized (damaged or misadjusted switch, door ajar, etc.)
   (2) Lamp switch continuously on

Note
- Cold batteries will not readily accept a charge. Therefore, batteries should be allowed to warm up to approx. **5 °C {41 °F}** before charging. This may require four to eight hours at room temperature depending on the initial temperature and battery size.
- A battery which has been completely discharged may be slow to accept a charge initially, and in some cases may not accept a charge at the normal charger setting. When batteries are in this condition, charging can be started by use of the dead battery switch on charger setting. When batteries are in this condition, charging can be started by use of the dead battery switch on chargers so equipped.
- To determine whether a battery is accepting a charge, follow charger manufacturer's instructions for use of dead battery switch. If switch is the spring-loaded type, it should be held in the ON position for up to **3 min**.
- After releasing switch and with charger still on, measure battery voltage using tester. If it shows **12 V** or higher, the battery is accepting a charge and is capable of being recharged. However, it may require up to **2 h** of charging with batteries colder than **5 °C {41 °F}** before the charge rate is high enough to show on the charger ammeter. All non-damaged batteries that cannot be charged by this procedure, install a new one.
- A rapid recharge procedure has been developed for recharging batteries that have passed the Load Test and only need a recharge. This can be due to: in-use no start battery failures (vehicle will not crank due to low battery state of charge), or battery discharged in vehicle due to key-off drains; refer to component test.

3. The battery can be rapidly recharged by using either of the following method:
   (1) Perform a **2 h** charge using **20 A** constant current (manual setting on charger)
   (2) Perform a **2 h** charge using a constant potential (automatic setting on charger)

GENERATOR REMOVAL/INSTALLATION

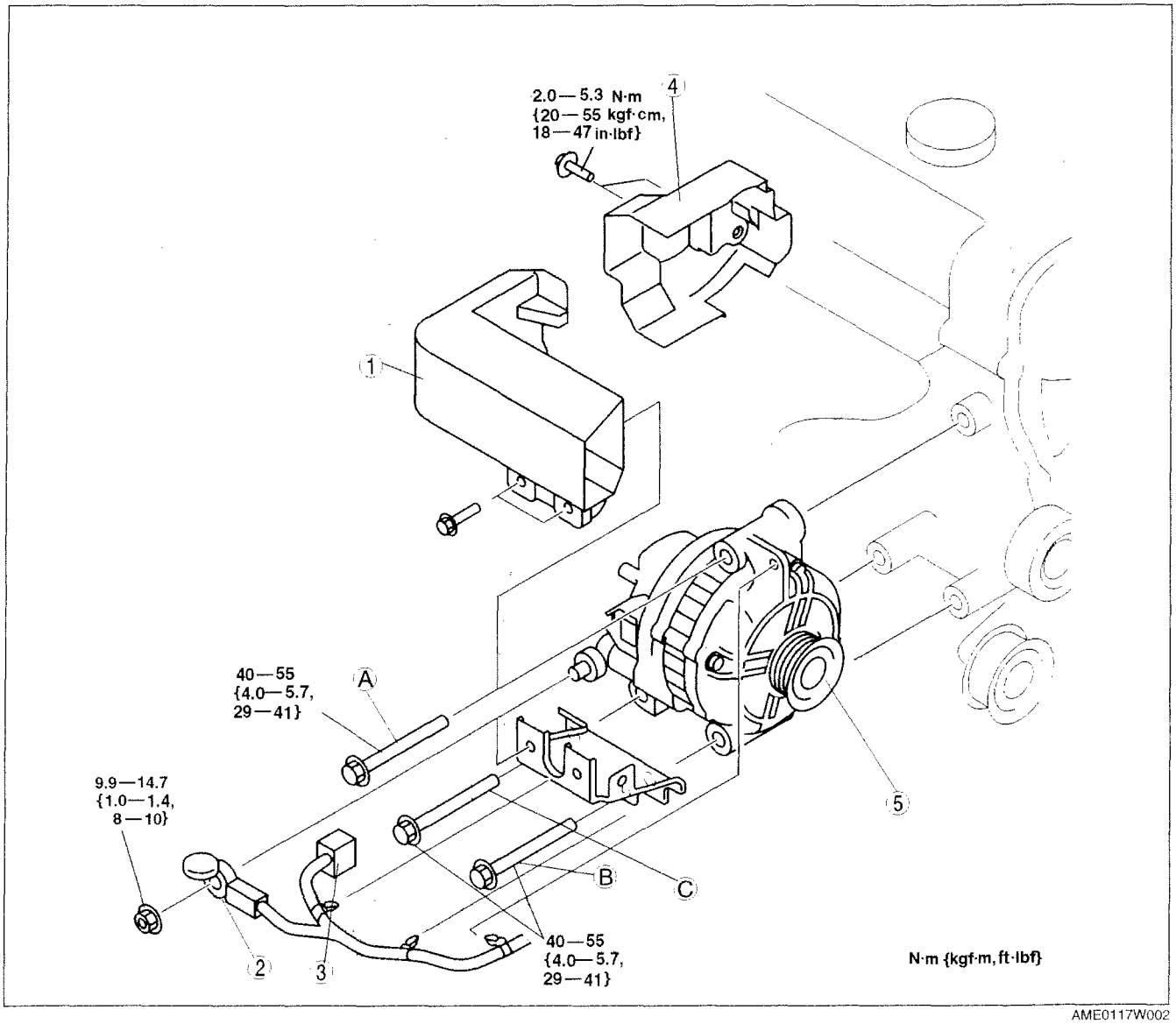
C6U011718300W01

Warning
- **When the battery cables are connected, touching the vehicle body with generator terminal B generates sparks. This can cause personal injury, fire, and damage to the electrical components. Always disconnect the battery before performing the following operation.**

Caution
- **The generator can be damaged by the heat from the exhaust manifold. Make sure the generator duct and the generator heat insulator are installed securely. (L3 engine model)**

L3

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Remove the drive belt. (See 01–10A–3 DRIVE BELT REPLACEMENT [L3].)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.



AME0117W002

1	Generator duct
2	Terminal B wire
3	Generator connector

4	Generator heat insulator
5	Generator (See 01–17–4 Generator removal note.) (See 01–17–4 Generator installation note.)

Generator removal note

1. Remove the generator from above.

Generator installation note

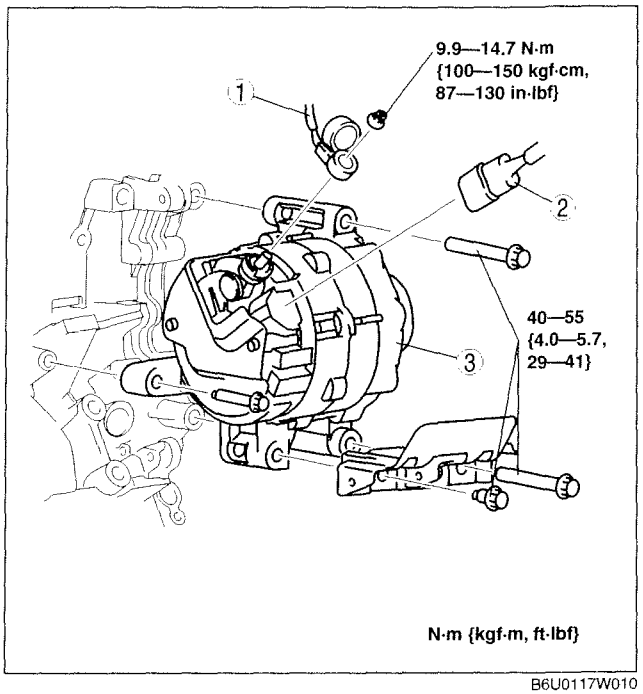
1. Tighten the bolt A temporary.
2. Tighten the bolt in the order B, A, and C.

AJ

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Remove the drive belt. (See 01–10B–5 DRIVE BELT REPLACEMENT [AJ].)
4. Remove the TWC (RH) and the front pipe. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/INSTALLATION [AJ].)
5. Remove in the order indicated in the table.

1	Terminal B wire
2	Connector
3	Generator

6. Install in the reverse order of removal.



B6U0117W010

GENERATOR INSPECTION

C6U011718300W02

Generator Warning Light

1. Verify that the battery is fully charged.
   - Charge if necessary.
2. Verify that the drive belt deflection/tension is within the specification. (L3) (See 01–10A–3 DRIVE BELT INSPECTION [L3].)
3. Turn the ignition switch on and verify that the generator warning light illuminates.
   - If not as specified, inspect generator warning light, wiring harnesses between the battery and the generator warning light.
4. Verify that the generator warning light goes out after the engine is started.
   - If not as specified, inspect if any of the following DTCs are displayed: P0112, P0113, P2502, P2503, P2504. (See 01–02A–7 ON-BOARD DIAGNOSTIC TEST [L3].) (See 01–02B–7 ON-BOARD DIAGNOSTIC TEST [AJ].)

Generator Voltage

1. Verify that the battery is fully charged.
   - Charge if necessary.
2. Verify that the drive belt deflection/tension is within the specification. (L3) (See 01–10A–3 DRIVE BELT INSPECTION [L3].)
3. Turn off all electrical loads.
4. Turn the ignition switch to start the engine and verify that the generator rotates smoothly without any noise while the engine is running.

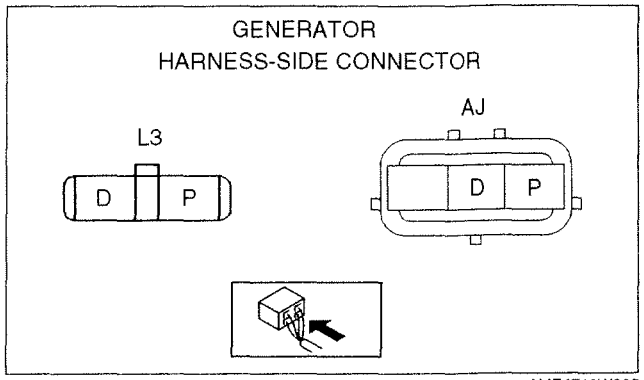
5. Measure the voltage at the terminals shown in the table.
   - If not as specified, repair or replace the generator if necessary.

Standard voltage

Terminal	Ignition switch ON (V)	Idle (V) [20 °C {68 °F}]
B	B+	13—15
P	Approx. 1	Approx. 3—8
D	Approx. 0	*

* : Turn the following electrical loads on and verify that the voltage reading increases.

- Headlights
- Blower motor
- Rear window defroster



AME4710W005

Current

Note
- Since the charging current decreases rapidly after starting the engine, perform the following procedure quickly, and read the maximum current value.

1. Verify that the battery is fully charged.
   - Charge if necessary.
2. Verify that the drive belt deflection/tension is within the specification. (L3) (See 01–10A–3 DRIVE BELT INSPECTION [L3].)
3. Disconnect the negative battery cable.
4. Connect a tester cable of reading **120 A or more** between generator terminal B and the wiring harness.
5. Turn off all electrical loads.
6. Start the engine and increase the engine speed to **2,000—2,500 rpm**.
7. Turn the following electrical loads on and verify that the current reading increases.
   (1) Headlights
   (2) Blower motor
   (3) Rear window defroster
   - If generator terminal B current does not increase, repair or replace the generator if necessary.

Note
- Current required for generating power varies with electrical loads applied.

Standard current (Reference)
Measuring conditions:
Room temperature: 20 °C {68 °F}
Voltage: 13.5 V
Engine hot

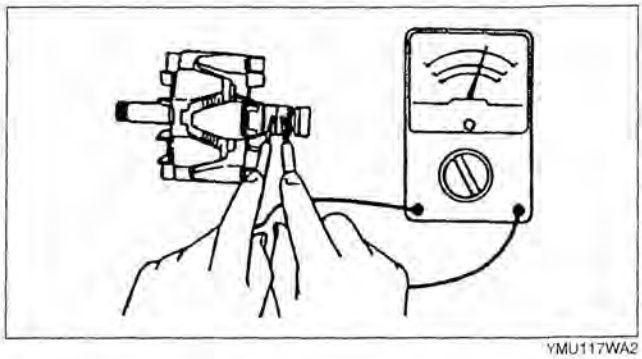
Engine speed (rpm)	Terminal B current (A)*	
	L3	AJ
1,000	0*—80	0*—90
2,000	0*—100	0*—105

* : Lower limit of current must be more than 0 A.

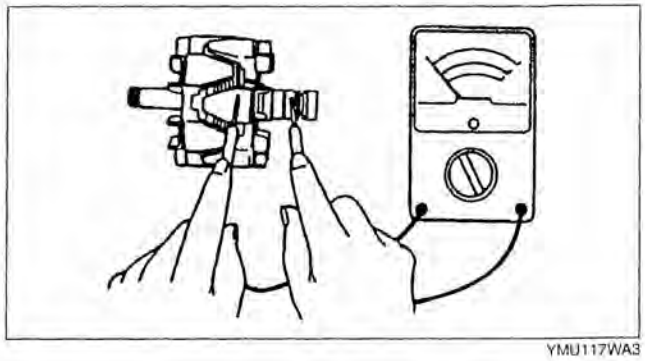
Generator Inner Parts
Rotor

1. Measure the resistance between the slip rings using an ohmmeter.
   - If not within the specification, replace the rotor.

   Specification [20 °C {68 °F}]
   L3: 1.6—2.0 ohm
   AJ: 2.4—2.9 ohm


YMU117WA2

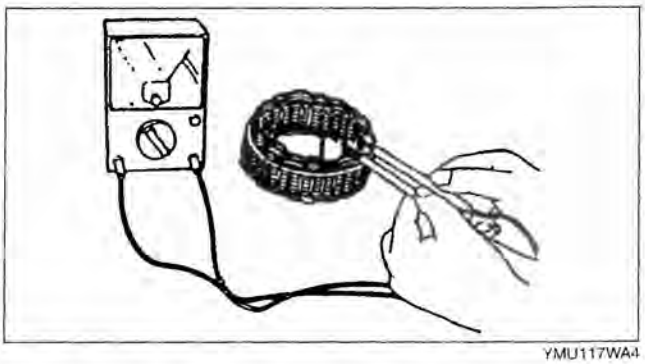
2. Verify that there is no continuity between the slip ring and core using an ohmmeter.
   - If there is continuity, replace the rotor.


YMU117WA3

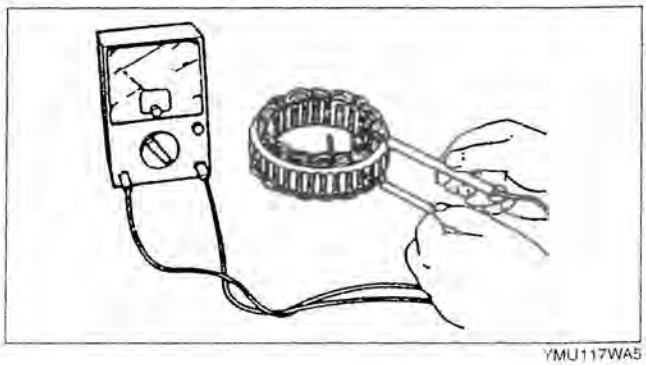
3. Inspect the slip ring surface condition.
   - If the slip ring surface is rough, use a lathe or fine sandpaper to repair it.

Stator coil (L3)

1. Inspect for continuity between the stator coil leads using an ohmmeter.
   - If there is no continuity, replace the stator.

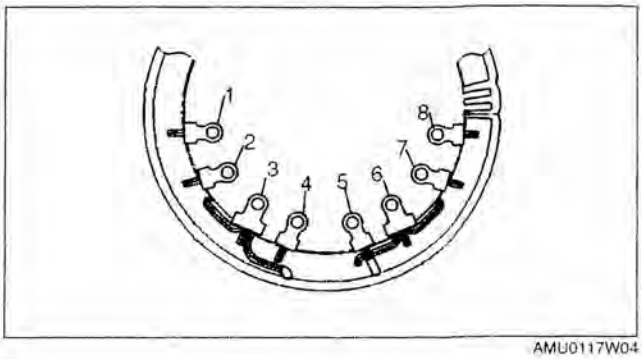

YMU117WA4

2. Verify that there is no continuity between the stator coil leads and the core using an ohmmeter.
   - If there is continuity, replace the stator coil.


YMU117WA5

Stator coil (AJ)

1. Verify that the continuity is as indicated in the table.
   - If there is any malfunction, replace the stator.



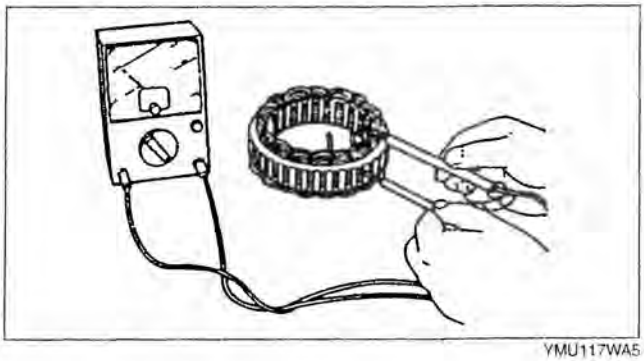
AMU0117W04

○—○ : Continuity

Terminal							
1	2	3	4	5	6	7	8
○		○					
	○	○					
		○		○			
			○		○		
					○	○	
					○		○

B6U0117W01

2. Verify that there is no continuity between the stator coil leads and core using an ohmmeter.
   - If there is continuity, replace the stator coil.

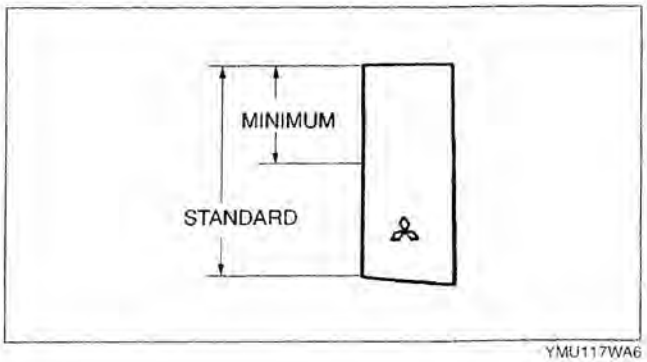


YMU117WA5

Brush

1. Inspect brushes for wear.
   - If any brush is worn almost to or beyond the limit, replace all of the brushes.

Standard
L3: 18.5 mm {0.73 in}
AJ: 22.5 mm {0.89 in}
Minimum
5.0 mm {0.20 in}

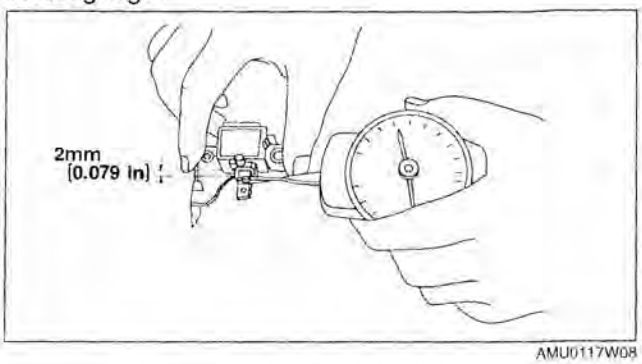


YMU117WA6

Brush spring

1. Measure the force of the brush spring using a spring pressure gauge.
2. Read the spring pressure gauge at the brush tip projection of **2 mm {0.079 in}**.
   - Replace the brush spring if necessary.

Standard force
L3: 4.8—6.0 N {0.49—0.61 kgf, 1.08—1.35 lbf}
AJ: 4.1—5.3 N {0.42—0.54 kgf, 0.92—1.19 lbf}
Minimum
L3: 2.2 N {0.22 kgf, 0.49 lbf}
AJ: 1.7 N {0.17 kgf, 0.38 lbf}



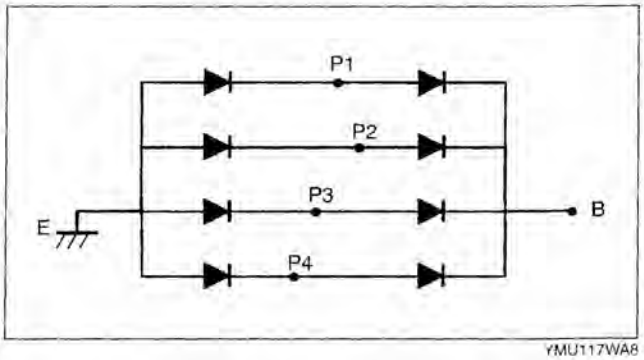
AMU0117W08

Rectifier (L3)

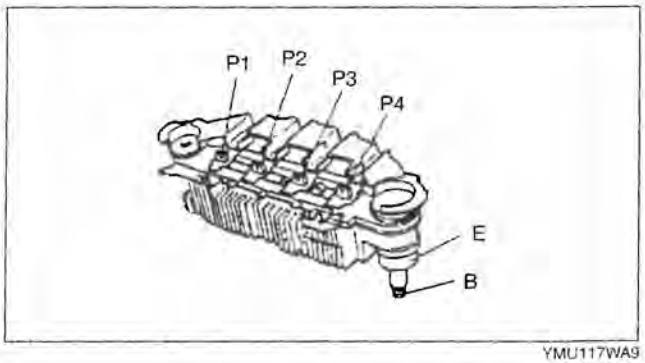
1. Inspect for continuity of the diodes using an ohmmeter.
   - If not as specified, replace the rectifier.

Specification

Negative	Positive	Continuity
E	P1, P2, P3, P4	Yes
B		No
P1, P2, P3, P4	E	No
	B	Yes



YMU117WA8



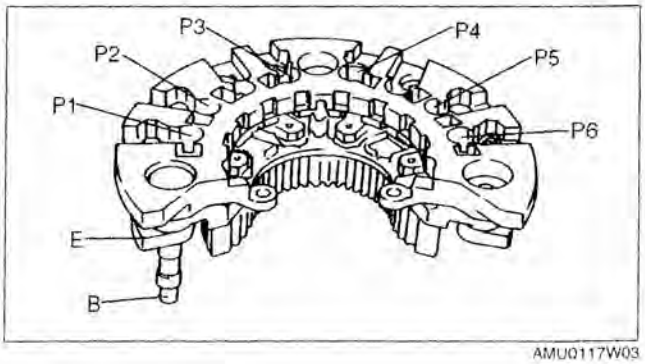
YMU117WA9

Rectifier (AJ)

1. Inspect for continuity of the diodes using an analog circuit tester.
   - If not as specified, replace the rectifier.

Specification

Negative	Positive	Continuity
E	P1, P2, P3, P4, P5, P6	Yes
B		No
P1, P2, P3, P4, P5, P6	E	No
	B	Yes



AMU0117W03

2. Inspect for continuity of the diodes using an digital circuit tester.
   - If not as specified, replace the rectifier.

Diode inspection mode

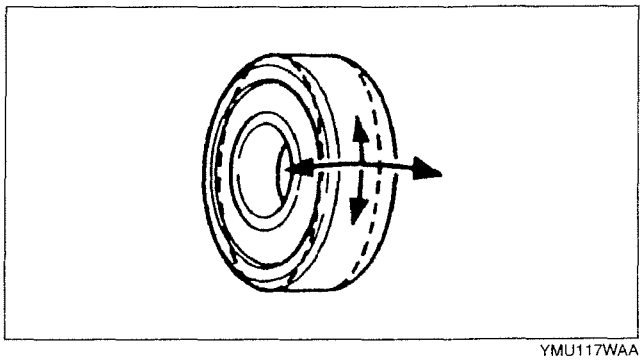
Negative	Positive	Continuity
B	P1, P2, P3, P4, P5, P6	Yes
P1, P2, P3, P4, P5, P6	E	Yes

Low resistance inspection mode

Negative	Positive	Continuity
E	P1, P2, P3, P4, P5, P6	No
P1, P2, P3, P4, P5, P6	B	No

Bearing

1. Inspect for abnormal noise, looseness, and sticking.
   - Replace the bearing if necessary.



YMU117WAA

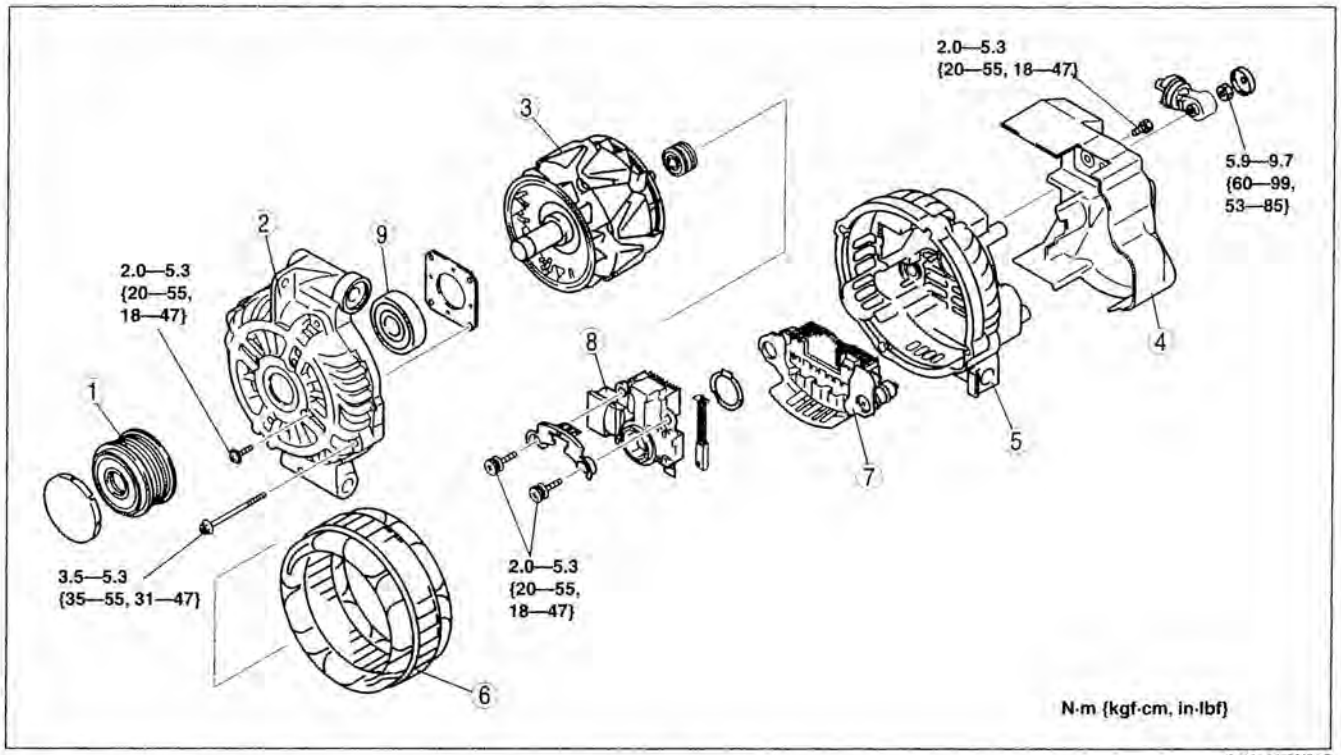
GENERATOR DISASSEMBLY/ASSEMBLY

C6U011718300W03

Caution
- **Melt the solder quickly, otherwise the diodes (rectifier) and regulator will be damaged by excessive heat.**

L3 (ATX)

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



B6U0117W003

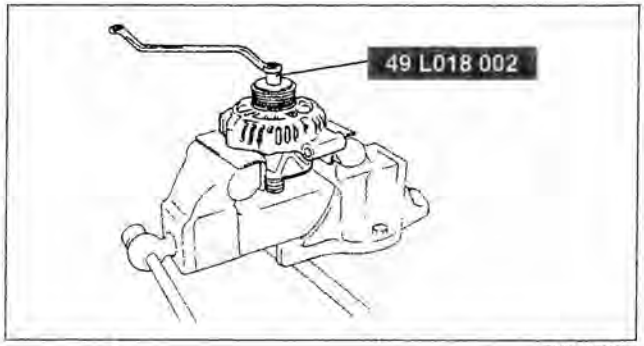
1	Pulley (See 01–17–11 Pulley disassembly/assembly note.)
2	Front cover
3	Rotor
4	Generator heat insulator

5	Rear bracket
6	Stator coil
7	Rectifier
8	Brush holder
9	Bearing

Pulley disassembly/assembly note

1. Disassemble/assemble the pulley using the **SST**.

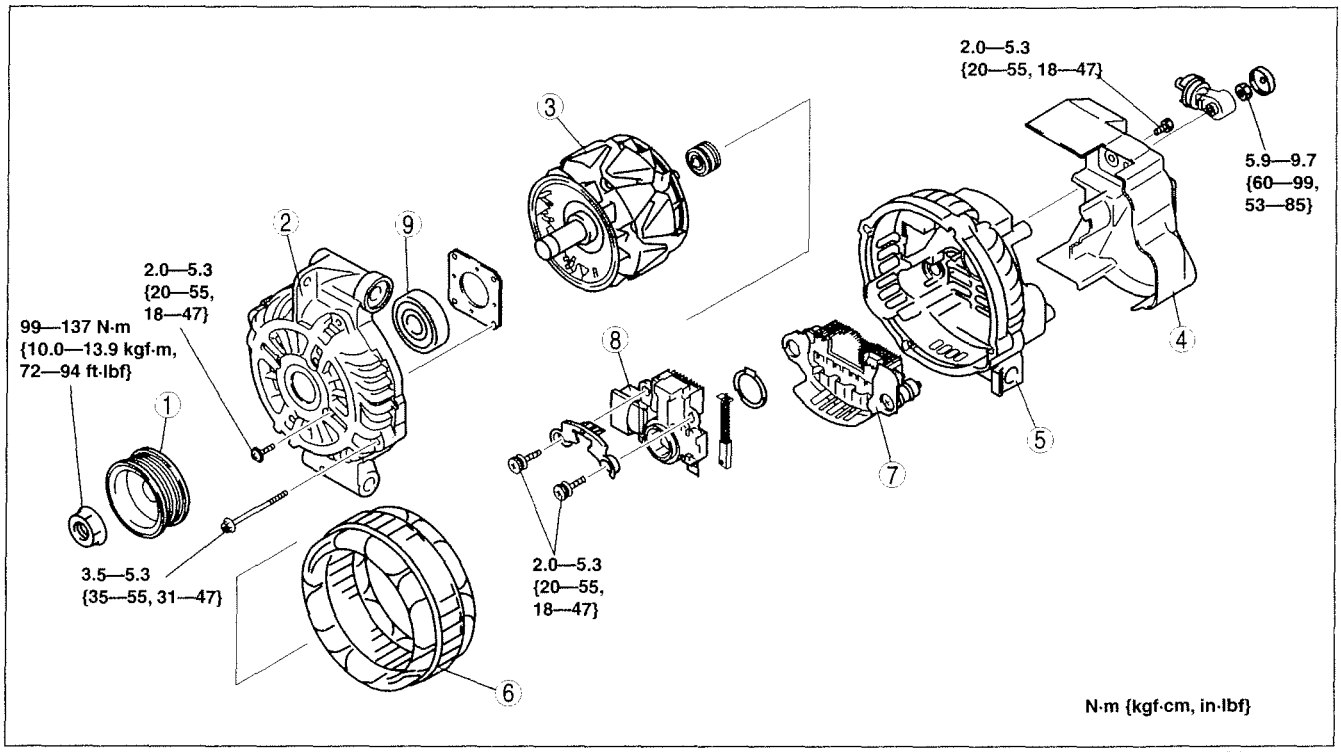
Tightening torque
60—85 N·m {6.1—8.7 kgf·m, 45—62 ft·lbf}



ZMU117WA1

L3 (MTX)

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



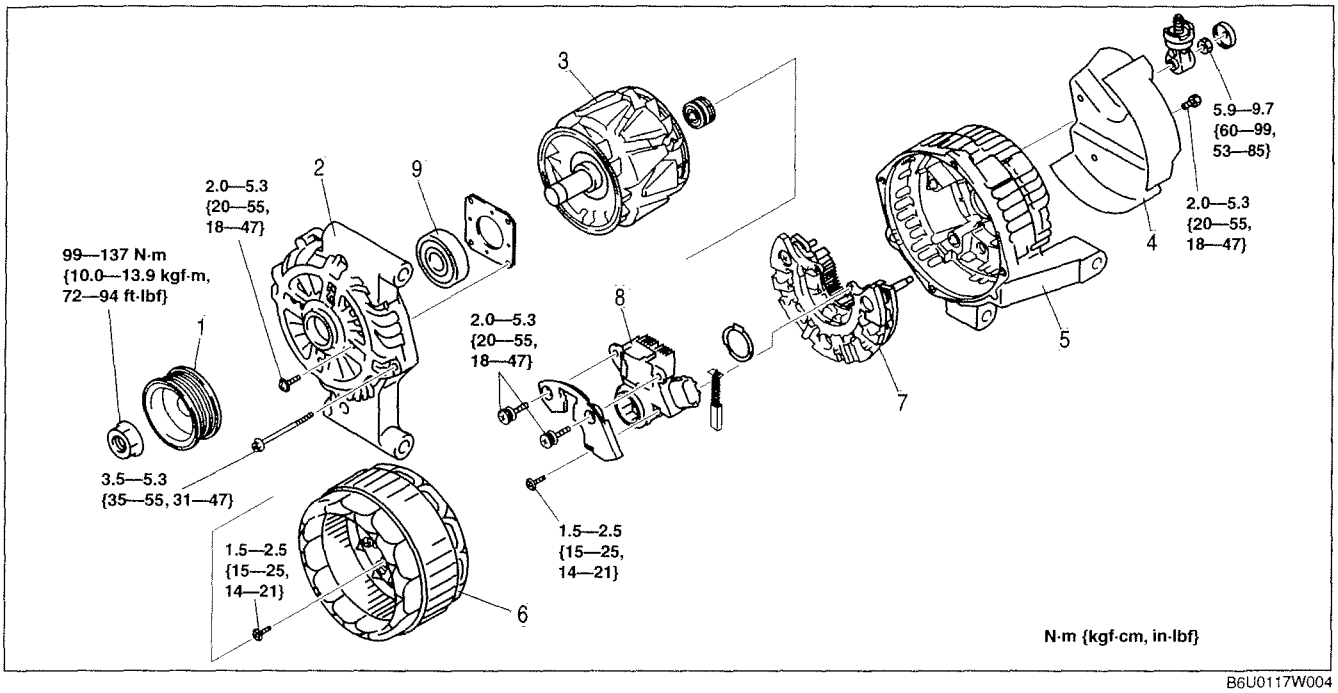
B6U0117W005

1	Pulley
2	Front cover
3	Rotor
4	Generator heat insulator
5	Rear bracket

6	Stator coil
7	Rectifier
8	Brush holder
9	Bearing

AJ

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



B6U0117W004

1	Pulley
2	Front cover
3	Rotor
4	Generator heat insulator
5	Rear bracket

6	Stator coil
7	Rectifier
8	Brush holder
9	Bearing

01–18 IGNITION SYSTEM

IGNITION COIL REMOVAL/INSTALLATION

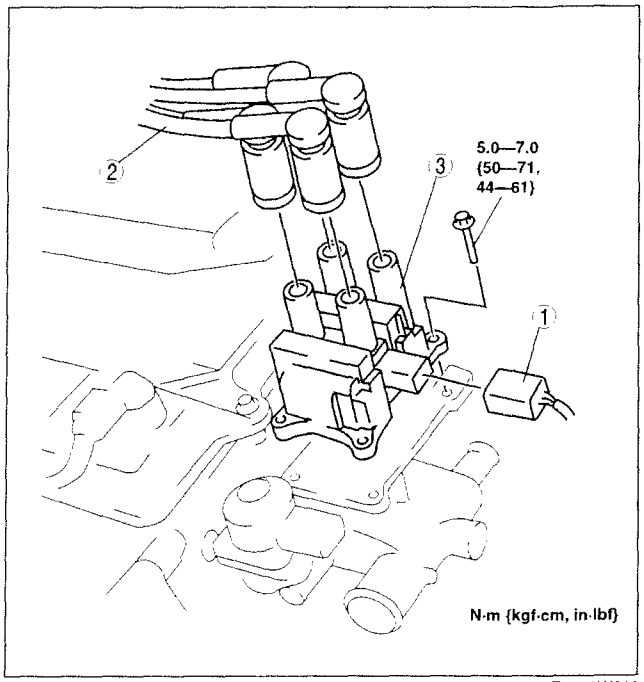
C6U011818100W01

L3

1. Disconnect the negative battery cable.
2. Remove the plug hole plate. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
3. Remove in the order indicated in the table.

1	Connector
2	High-tension lead (L3 engine model) (See 01–18–4 HIGH-TENSION LEAD (L3) REMOVAL/INSTALLATION.)
3	Ignition coil

4. Install in the reverse order of removal.



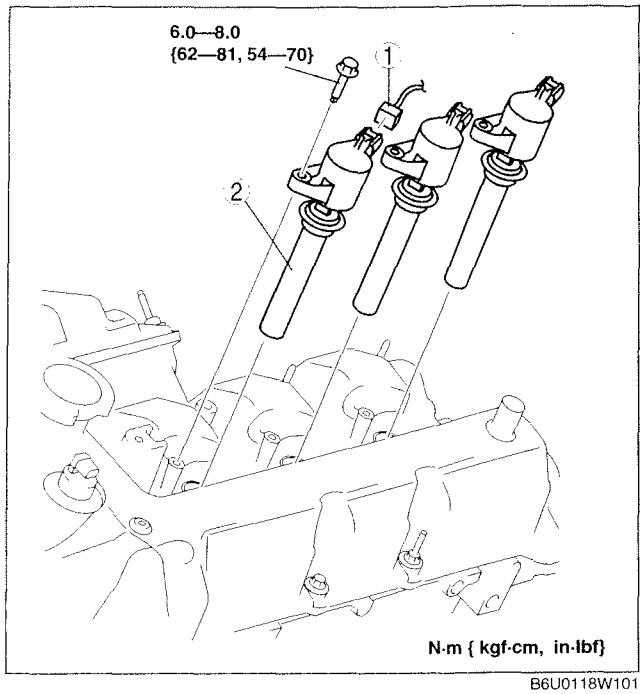
AME4712W010

AJ

1. Disconnect the negative battery cable.
2. LH: Remove the plug hole plate. (See 01–10B–8 TIMING CHAIN REMOVAL/INSTALLATION [AJ].)
   RH: Remove the dynamic chamber. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
3. Remove in the order indicated in the table.

1	Connector
2	Ignition coil

4. Install in the reverse order of removal.



B6U0118W101

IGNITION COIL INSPECTION

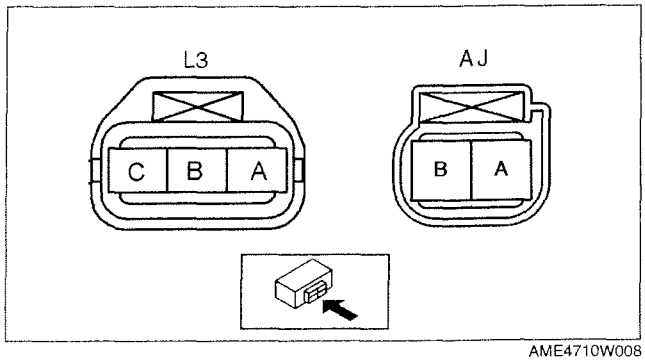
C6U011818100W02

Primary Coil Winding

1. Disconnect the ignition coil connector.
2. Measure the resistance between the following terminals using an ohmmeter:
   - L3: A and B, B and C
   - AJ: A and B
     — If not within the specification, replace the ignition coil.

Specification

L3: 0.49—0.57 ohms [20 °C {68 °F}]
AJ: 0.45—1.15 ohms [25 °C {77 °F}]

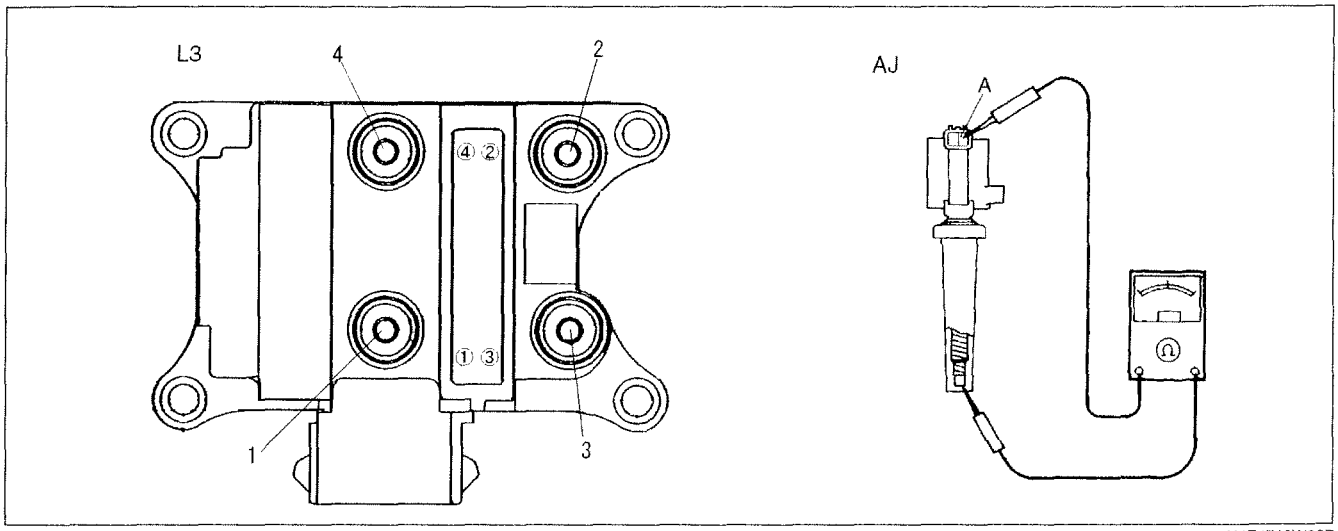


AME4710W008

Secondary Coil Winding

1. Disconnect the ignition coil connector.
2. Remove the ignition coil. (See 01–18–1 IGNITION COIL REMOVAL/INSTALLATION.)
3. Measure the resistance between the following using an ohmmeter.
   - L3: Lead hole 1 to 4, 2 to 3
   - AJ: Terminal A to coil boot socket
     — If not within the specification, replace the ignition coil.

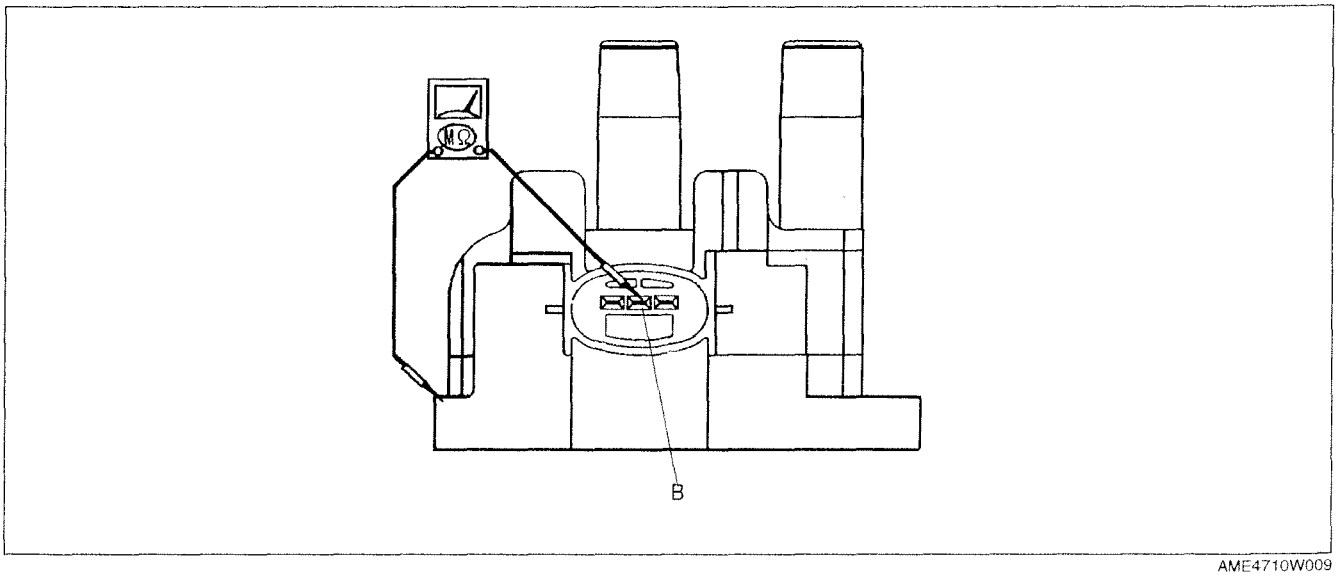
Specification
L3: 9.5—11.1 kilohms [20 °C {68 °F}]
AJ: 5.0—6.0 kilohms [25 °C {77 °F}]



AME4710W007

Insulation Resistance of Case

1. Remove the high-tension lead. (L3 engine model) (See 01–18–4 HIGH-TENSION LEAD (L3) REMOVAL/INSTALLATION.)
2. Disconnect the ignition coil connector.
3. Measure the insulation resistance from terminal B (L3 engine model), terminal A (AJ engine model) to ignition coil case using an ohmmeter.



AME4710W009

- If not as specified, replace the ignition coil.

Specification
10 megohms or more

SPARK PLUG REMOVAL/INSTALLATION

C6U011818110W01

Caution
- **If a spark plug that is not as specified is installed, sealing performance will be deteriorated. Install only the specified spark plug when replacing.**

1. Disconnect the negative battery cable.
2. Remove the ignition coil. (AJ engine model) (See 01–18–1 IGNITION COIL REMOVAL/INSTALLATION.)
3. Remove the high-tension leads. (L3 engine model) (See 01–18–4 HIGH-TENSION LEAD (L3) REMOVAL/INSTALLATION.)
4. Remove the spark plug using the plug-wrench.
5. Install in the reverse order of removal.

Tightening torque
L3: 10—14 N·m {1.1—1.4 kgf·m, 8.0—10.3 ft·lbf}
AJ: 9—20 N·m {91—204 kgf·cm, 79—177 in·lbf}

SPARK PLUG INSPECTION

C6U011818110W02

Caution
- **Be sure to follow the instructions below. Otherwise, the electrode can be damaged.**
  - **— Do not use a wire brush to clean the electrode.**
  - **— Use a plug cleaner for a maximum of 20 s and air pressure below 588 kPa {6.00 kgf/cm^2, 85.3 psi}.**
  - **— Do not adjust the plug gap.**

HIGH-TENSION LEAD (L3) REMOVAL/INSTALLATION

C6U011818110W03

Caution
- **The high-tension leads must be reinstalled to their original positions. Incorrect installation can damage the leads and cause power loss, and negatively affect the electronic components.**

1. Disconnect the negative battery cable.
2. Remove the plug hole plate. (See 01–10A–4 PLUG HOLE PLATE REMOVAL/INSTALLATION [L3].)
3. Remove the high-tension leads.
4. Install in the reverse order of removal.

01–19 STARTING SYSTEM

STARTER REMOVAL/INSTALLATION

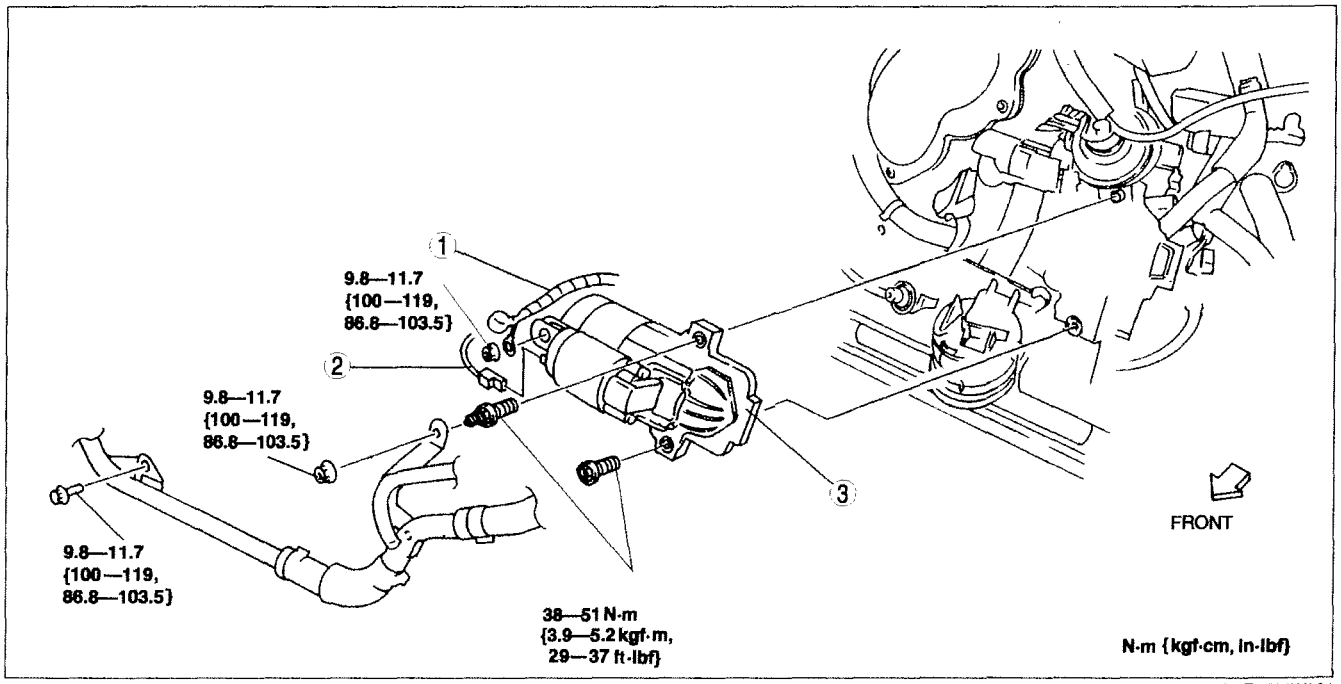
C6U011918400W01

Warning

- **When the battery cables are connected, touching the vehicle body with starter terminal B generates sparks. This can cause personal injury, fire, and damage to the electrical components. Always disconnect the battery before performing the following operation.**

L3

1. Disconnect the negative battery cable.
2. Remove the air cleaner. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
3. Remove the under cover.
4. Remove the clutch release cylinder. (See 05–10–8 CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION.)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.



AME4714W001

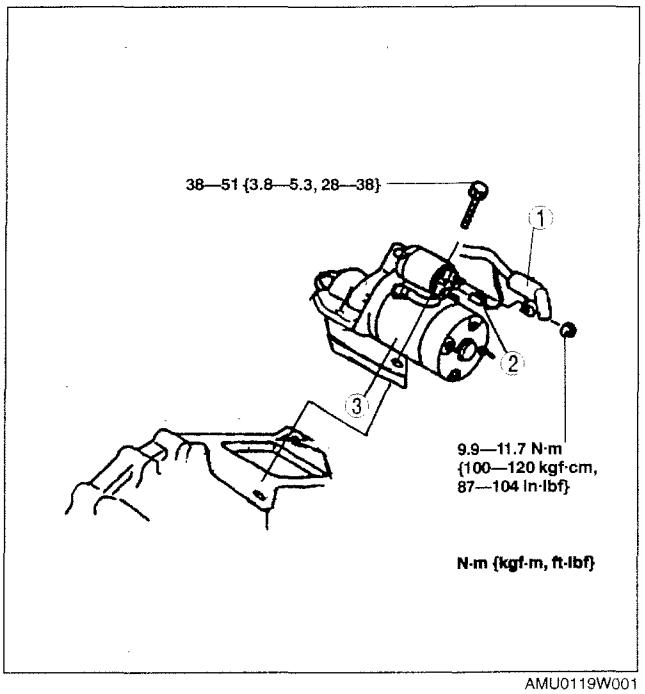
1	Terminal B wire
2	Terminal S wire
3	Starter

AJ

1. Remove the battery and the battery tray. (See 01–17–1 BATTERY REMOVAL/INSTALLATION.)
2. Remove the air cleaner. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
3. Disconnect the selector cable and the selector cable bracket. (See 05–18–6 SELECTOR LEVER REMOVAL/INSTALLATION.)
4. Remove in the order indicated in the table.

1	Terminal B wire
2	Terminal S wire
3	Starter

5. Install in the reverse order of removal.



AMU0119W001

STARTER INSPECTION

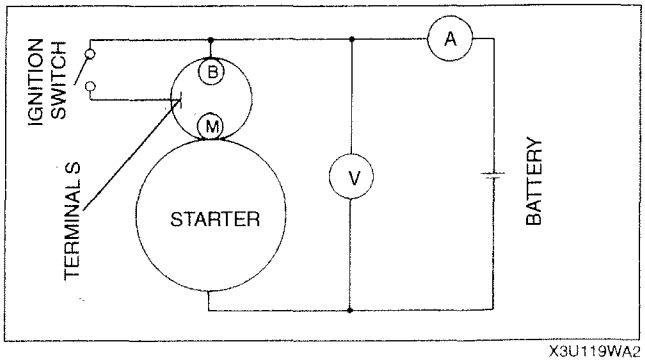
C6U011918400W02

On-vehicle Inspection

1. Verify that the battery is fully charged.
2. The starter is normal if it rotates smoothly and without any noise when the engine is cranked.
   - If the starter does not operate, inspect the following:
     — Remove the starter, and inspect the starter unit.
     — Inspect the related wiring harnesses, the ignition switch, and the transaxle range switch (ATX).

No Load Test

1. Verify that the battery is fully charged.
2. Connect the starter, battery, voltmeter and ammeter as shown.



X3U119WA2

3. Operate the starter and verify that it rotates smoothly.
4. Measure the voltage and current while the starter is operating.
   - If not as specified, repair or replace the starter if necessary.

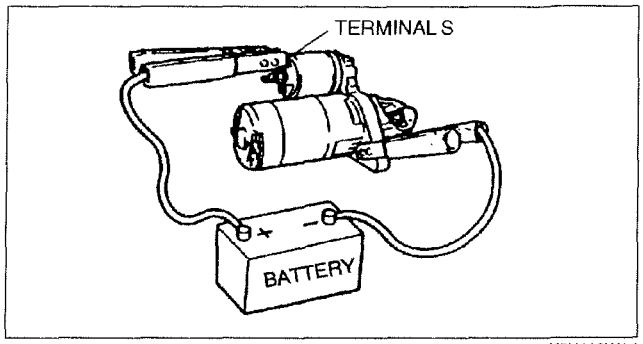
Specification

Voltage (V)	11
Current (A)	90 or less

Magnetic Switch Operation Inspection
Pull-out test

Note
- In case the battery is being charged, the pinion may turn during a protruded state. This is normal because the current flows to the motor through the pull-in coil and the motor turns.

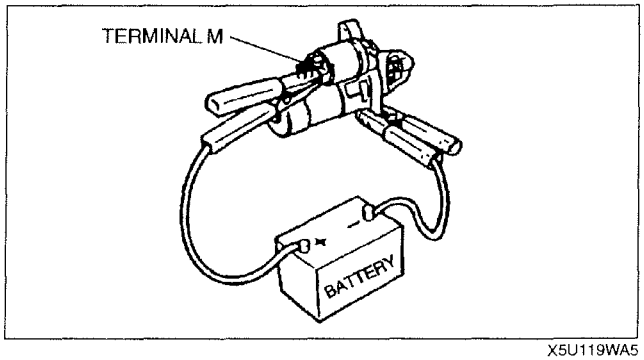
1. Verify that the drive pinion is pulled out with battery positive voltage connected to terminal S and the starter body grounded.
   - If not pulled out, repair or replace the starter.



X5U119WA4

Return test

1. Disconnect the motor wire from terminal M.
2. Connect battery positive voltage to terminal M and ground the starter body.



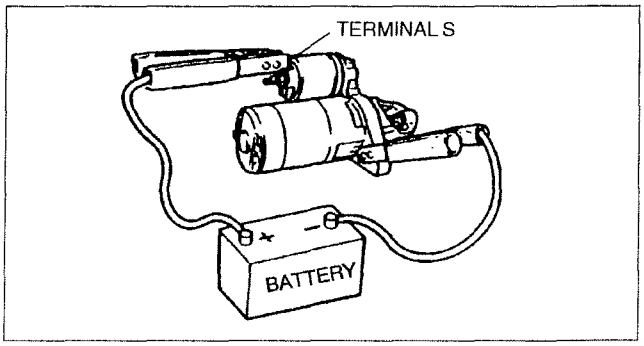
X5U119WA5

3. Pull out the drive pinion with a flathead screwdriver. Verify that it returns to its original position when released.
   - If does not return, repair or replace the starter.

Pinion Gap Inspection

1. Pull out the drive pinion with battery positive voltage connected to terminal S and the starter body grounded.

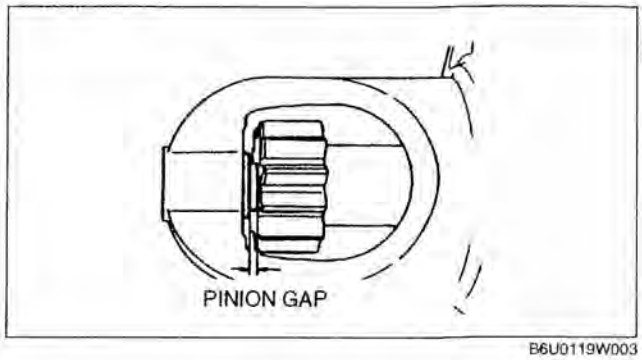
Caution
- **Applying power for more than 10 s can damage the starter. Do not apply power for more than the aforementioned time.**



X5U119WA6

2. Measure the pinion gap while the drive pinion is pulled.
   - If not as specified, adjust with an adjustment washer (between drive housing front cover and magnetic switch).

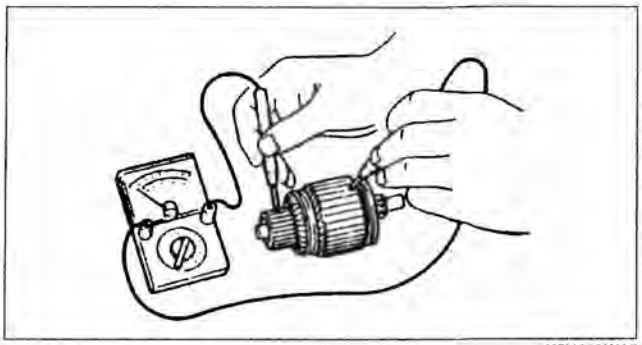
Specification
L3: 0.5—2.0 mm {0.02—0.08 in}
AJ: 0 mm {0 in}



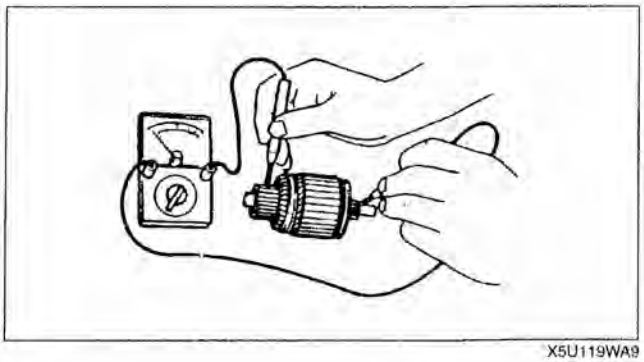
B6U0119W003

Starter Inner Parts Inspection
Armature

1. Verify that there is no continuity between the commutator and the core at each segment using an ohmmeter.
   - If there is continuity, replace the armature.

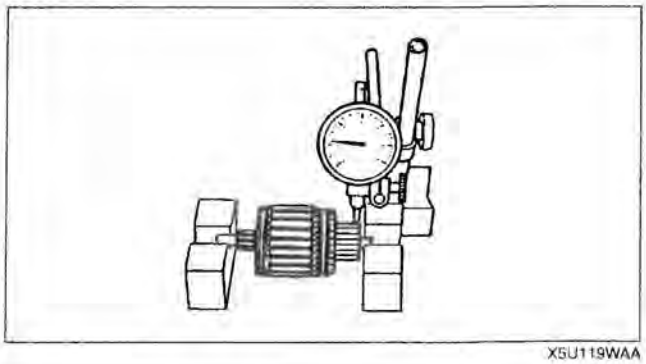

X5U119WA8

2. Verify that there is no continuity between the commutator and the shaft using an ohmmeter.
   - If there is continuity, replace the armature.


X5U119WA9

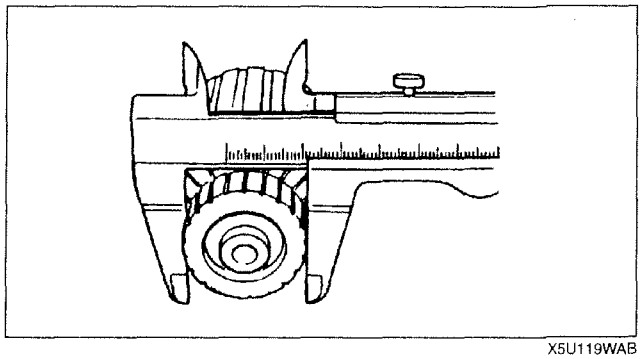
3. Place the armature on V-blocks, and measure the runout using a dial indicator.

Maximum runout
0.05 mm {0.002 in}


X5U119WAA

4. Measure the commutator diameter.
   - If it is less than the minimum specification, replace the armature.

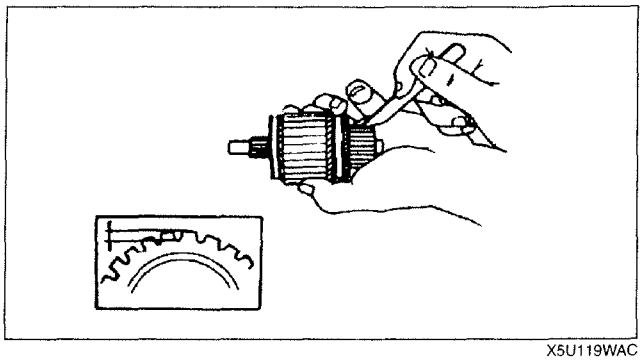
Standard commutator diameter
29.4 mm {1.16 in}
Minimum commutator diameter
28.8 mm {1.13 in}



X5U119WAB

5. Measure the segment groove depth of commutator.
   - If it is less than the minimum specification, undercut the grooves to the standard depth.

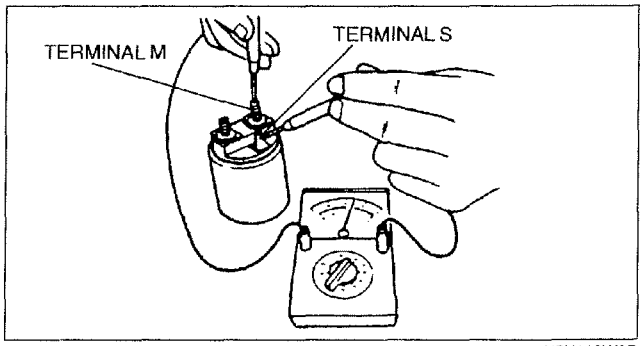
Standard depth
0.4—0.6 mm {0.016—0.023 in}
Minimum depth
0.2 mm {0.008 in}



X5U119WAC

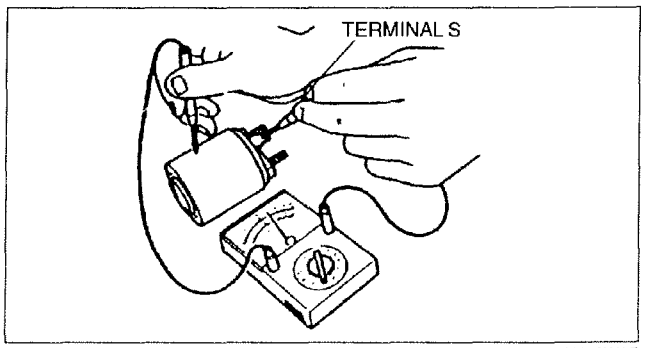
Magnetic switch

1. Inspect for continuity between terminals S and M using an ohmmeter.
   - If there is no continuity, replace the magnetic switch.



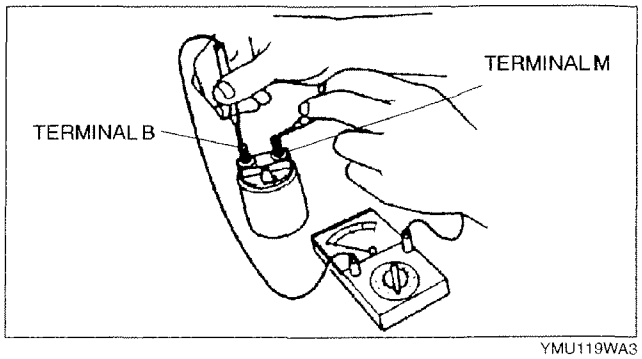
X5U119WAD

2. Inspect for continuity between terminal S and the body using an ohmmeter.
   - If there is no continuity, replace the magnetic switch.



X5U119WAE

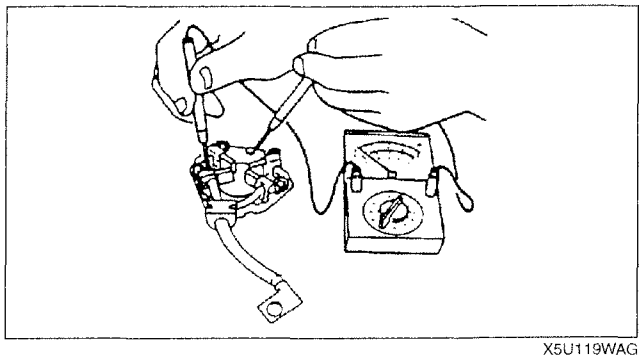
3. Verify that there is no continuity between terminals M and B using an ohmmeter.
   - If there is continuity, replace the magnetic switch.



YMU119WA3

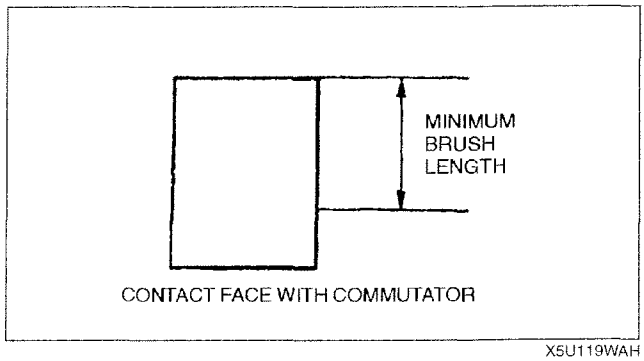
Brush and brush holder

1. Verify that there is no continuity between each insulated brush and plate using an ohmmeter.
   - If there is continuity, replace the brush holder.


X5U119WAG

2. Measure the brush length.
   - If any brush is worn almost to or beyond the minimum specification, replace all the brushes.

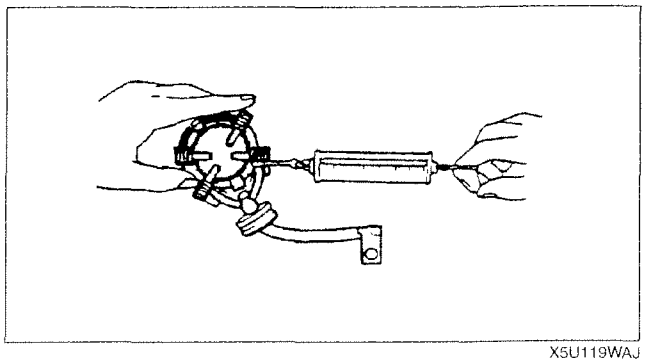
Standard brush length
12.3 mm {0.48 in}
Minimum brush length
7.0 mm {0.28 in}



X5U119WAH

3. Measure the brush spring force using a spring balance.
   - If it is less than the minimum specification, replace the brush spring.

Standard spring force
21.6 N {2.20 kgf, 4.84 lbf}
Minimum spring force
5.9 N {0.6 kgf, 1.3 lbf}

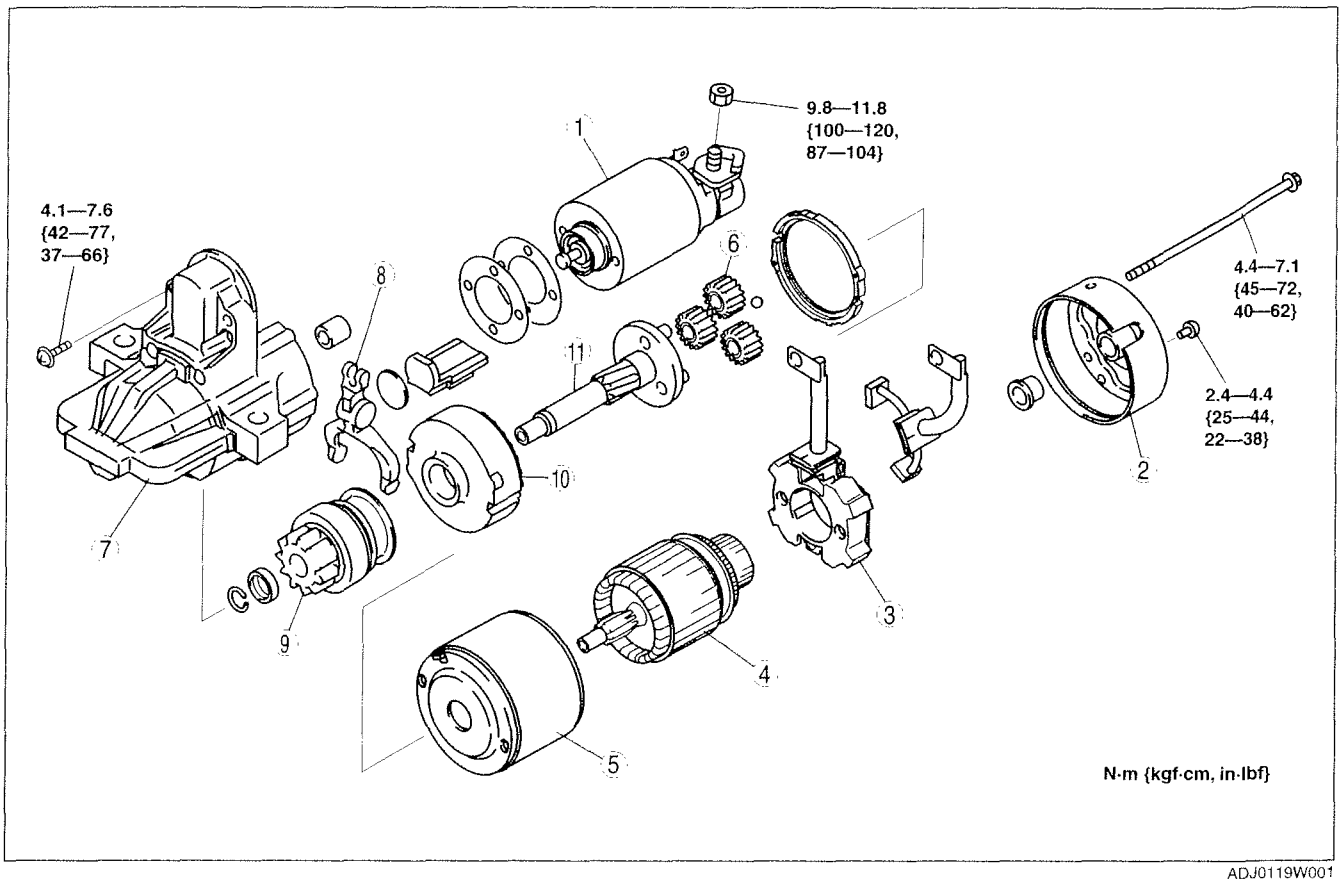

X5U119WAJ

STARTER DISASSEMBLY/ASSEMBLY

C6U011918400W03

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

L3

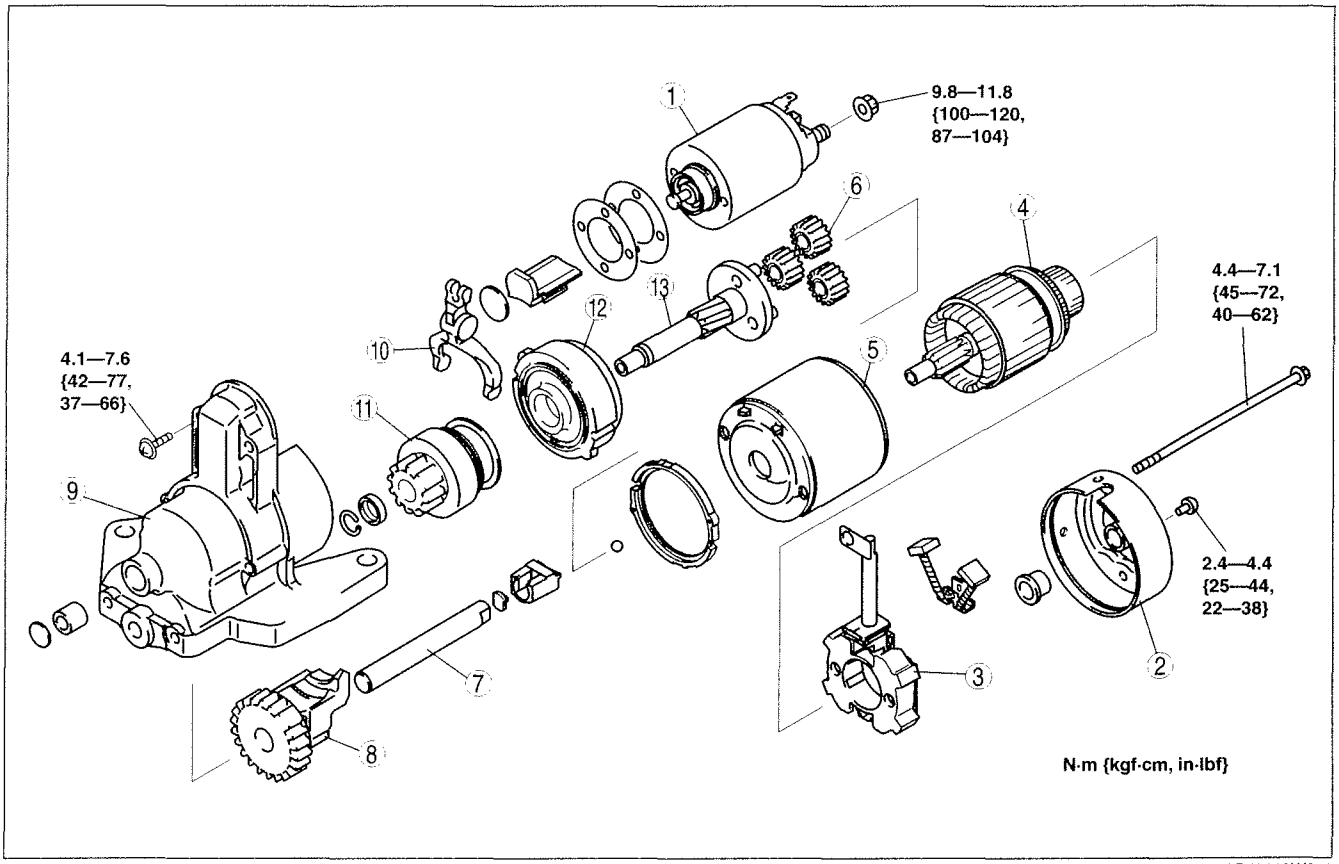


ADJ0119W001

1	Magnetic switch
2	Rear housing
3	Brush and brush holder
4	Armature
5	Yoke
6	Planetary gear

7	Front cover
8	Lever
9	Drive pinion
10	Internal gear
11	Gear shaft

AJ



ADJ0119W002

1	Magnetic switch
2	Rear housing
3	Brush and brush holder
4	Armature
5	Yoke
6	Planetary gear
7	Pinion shaft

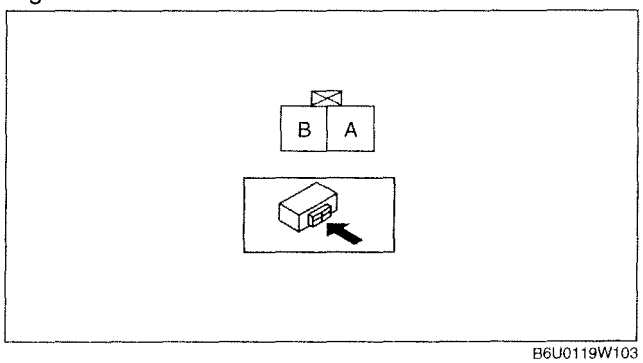
8	Pinion
9	Front cover
10	Lever
11	Drive pinion
12	Internal gear
13	Gear shaft

STARTER INTERLOCK SWITCH INSPECTION (MTX)

C6U011918400W04

On-vehicle Inspection

1. Inspect the following.
   - With the clutch pedal not depressed, verify that the engine does not start.
   - With the clutch pedal fully depressed, verify that the engine starts.
     — If not as specified, perform continuity inspection.



B6U0119W103

Continuity Inspection

1. Disconnect the starter interlock switch connector.
2. Verify that the continuity is as indicated in the table.
   - If there is any malfunction, replace the starter interlock switch.

O—O : Continuity

Condition	Terminal	
	A	B
Clutch pedal not depressed		
Clutch pedal depressed	O	O

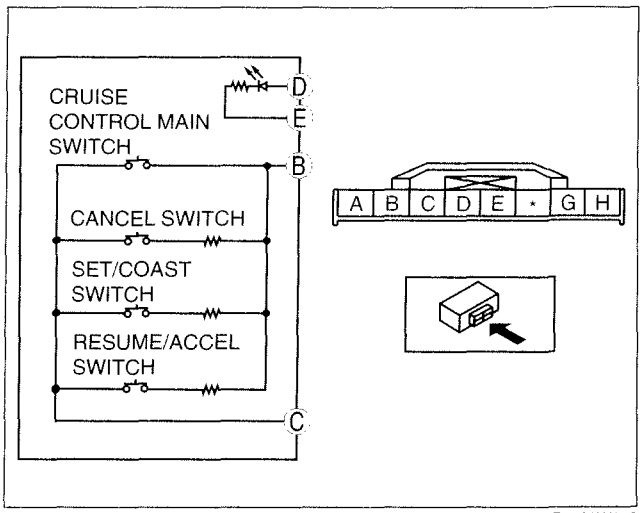
X3U119WA3

01–20 CRUISE CONTROL SYSTEM

CRUISE CONTROL SWITCH INSPECTION

C6U012066341W01

1. Disconnect the negative battery cable.
2. Remove the driver-side air bag module. (See 08–10–6 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
3. Disconnect the cruise control switch connector.
4. Inspect for resistance and continuity between the cruise control switch terminals using an ohmmeter.
   - If not as specified, replace the cruise control switch.



A6E8128W012

○—○: Continuity ○-w-○: Resistance ○-▶|-○: Diode

Switch position	Terminal			
	B	C	D	E
Cruise control main switch held at on	○—○		○-▶|-○	
CANCEL switch held at on	○-w-○ R_1		○-▶|-○	
SET/COAST switch held at on	○-w-○ R_2		○-▶|-○	
RESUME/ACCEL switch held at on	○-w-○ R_3		○-▶|-○	
Neutral			○-▶|-○	

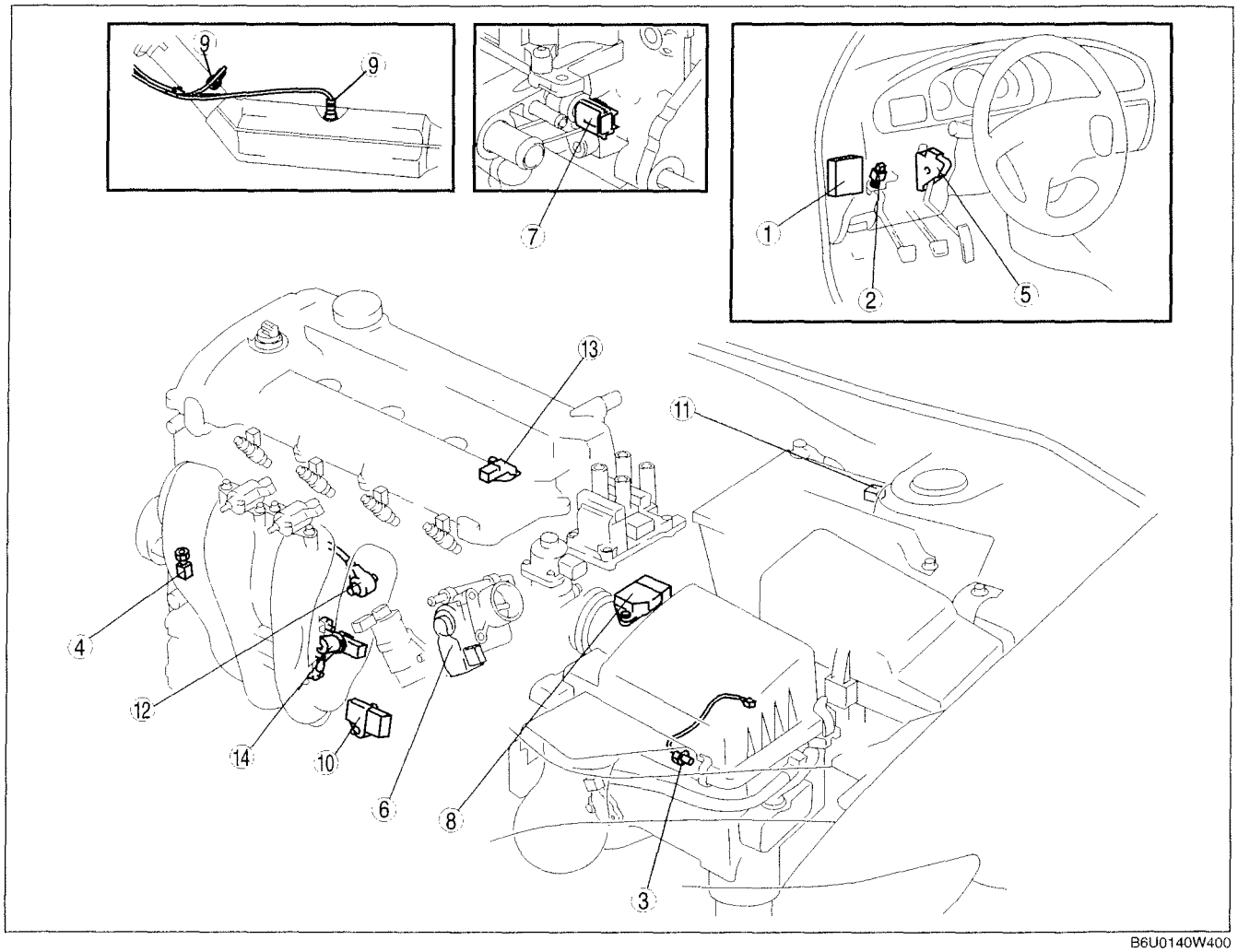
R_1: 120—122 ohms R_2: 677—693 ohms
R_3: 2.16—2.24 kilohms

A6E8128W006

01–40A CONTROL SYSTEM [L3]

CONTROL SYSTEM COMPONENT LOCATION INDEX [L3]

C6U014018881W01



B6U0140W400

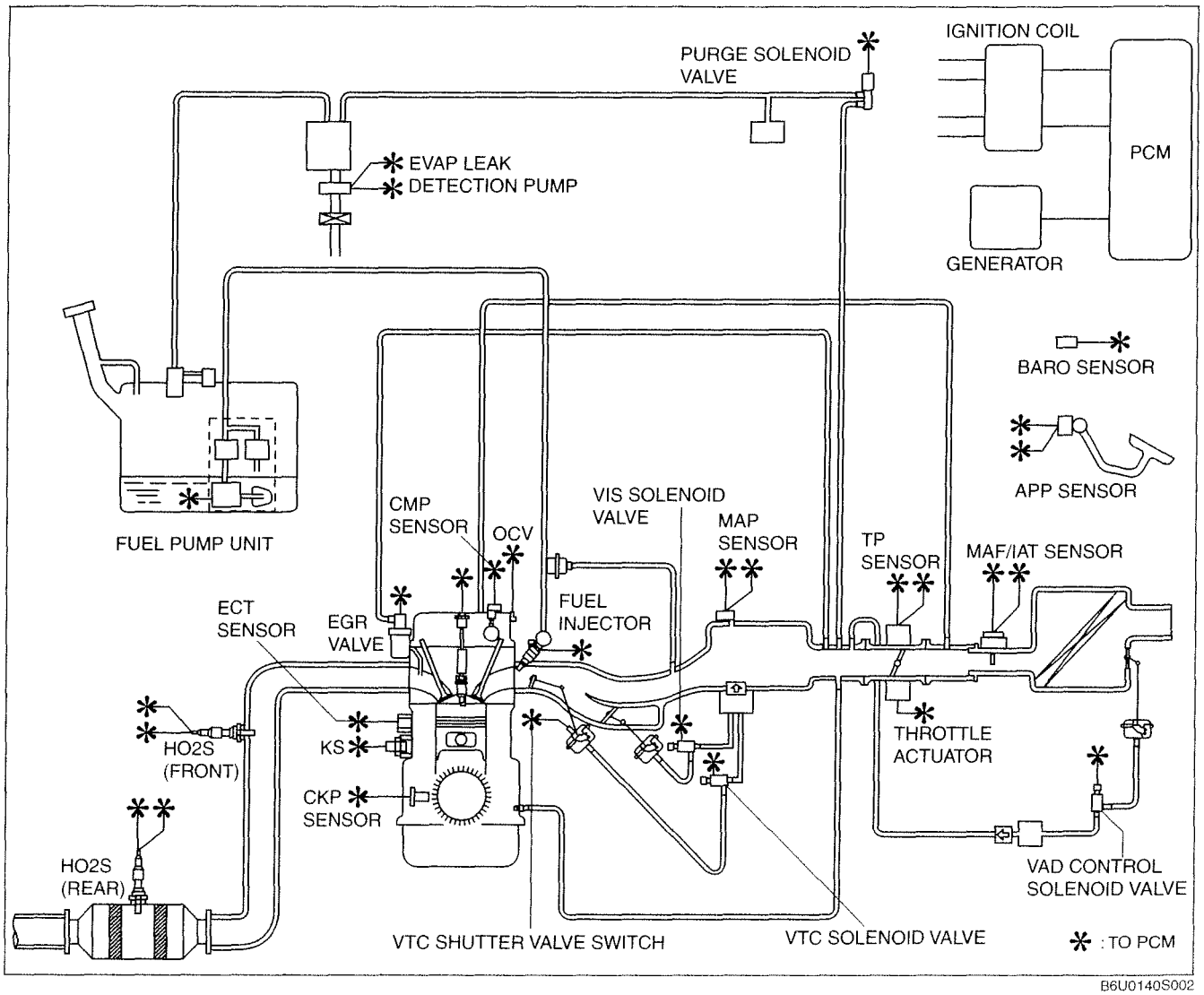
1	PCM (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].) (See 01–40A–7 PCM INSPECTION [L3].) (See 01–40A–26 PCM REPLACEMENT [L3].)
2	Clutch switch (See 01–40A–27 CLUTCH SWITCH INSPECTION [L3].)
3	Neutral switch (See 01–40A–28 NEUTRAL SWITCH INSPECTION [L3].)
4	PSP switch (See 01–40A–29 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [L3].)
5	APP sensor (See 01–40A–31 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [L3].)
6	TP sensor and throttle actuator (See 01–40A–32 THROTTLE POSITION (TP) SENSOR INSPECTION [L3].) (See 01–13A–8 THROTTLE ACTUATOR INSPECTION [L3].) (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)

7	ECT sensor (See 01–40A–35 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [L3].) (See 01–40A–36 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [L3].)
8	MAF/IAT sensor (See 01–40A–34 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [L3].) (See 01–40A–33 MASS AIR FLOW (MAF) SENSOR INSPECTION [L3].)
9	HO2S (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3].)
10	MAP sensor (See 01–40A–38 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION [L3].)
11	BARO sensor (See 01–40A–37 BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION [L3].)
12	KS (See 01–40A–39 KNOCK SENSOR (KS) REMOVAL/INSTALLATION [L3].) (See 01–40A–39 KNOCK SENSOR (KS) INSPECTION [L3].)

13	CMP sensor (See 01–40A–40 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [L3].) (See 01–40A–40 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [L3].)
14	CKP sensor (See 01–40A–42 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [L3].) (See 01–40A–41 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [L3].)

CONTROL SYSTEM DIAGRAM [L3]

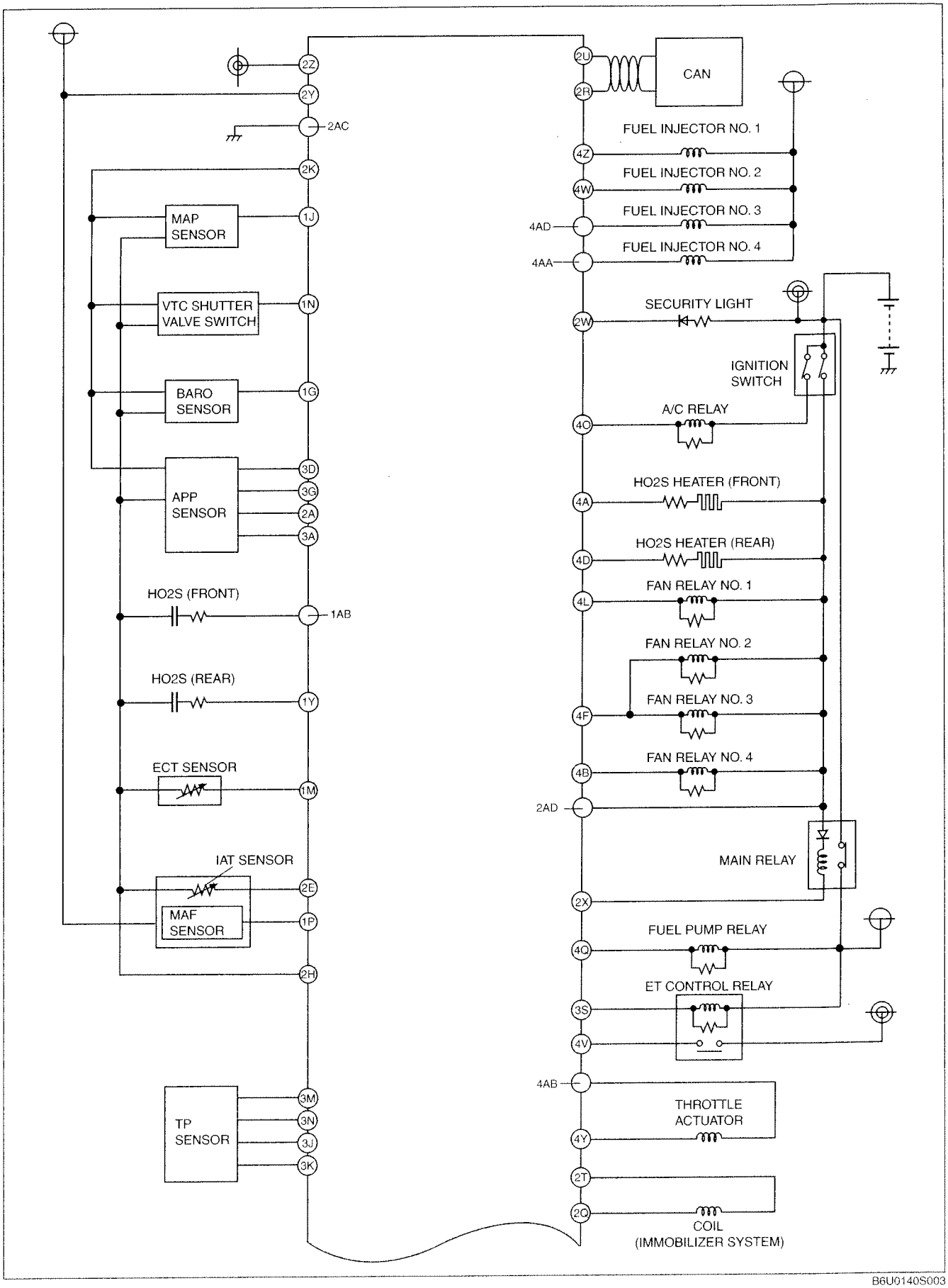
C6U0140188881W02



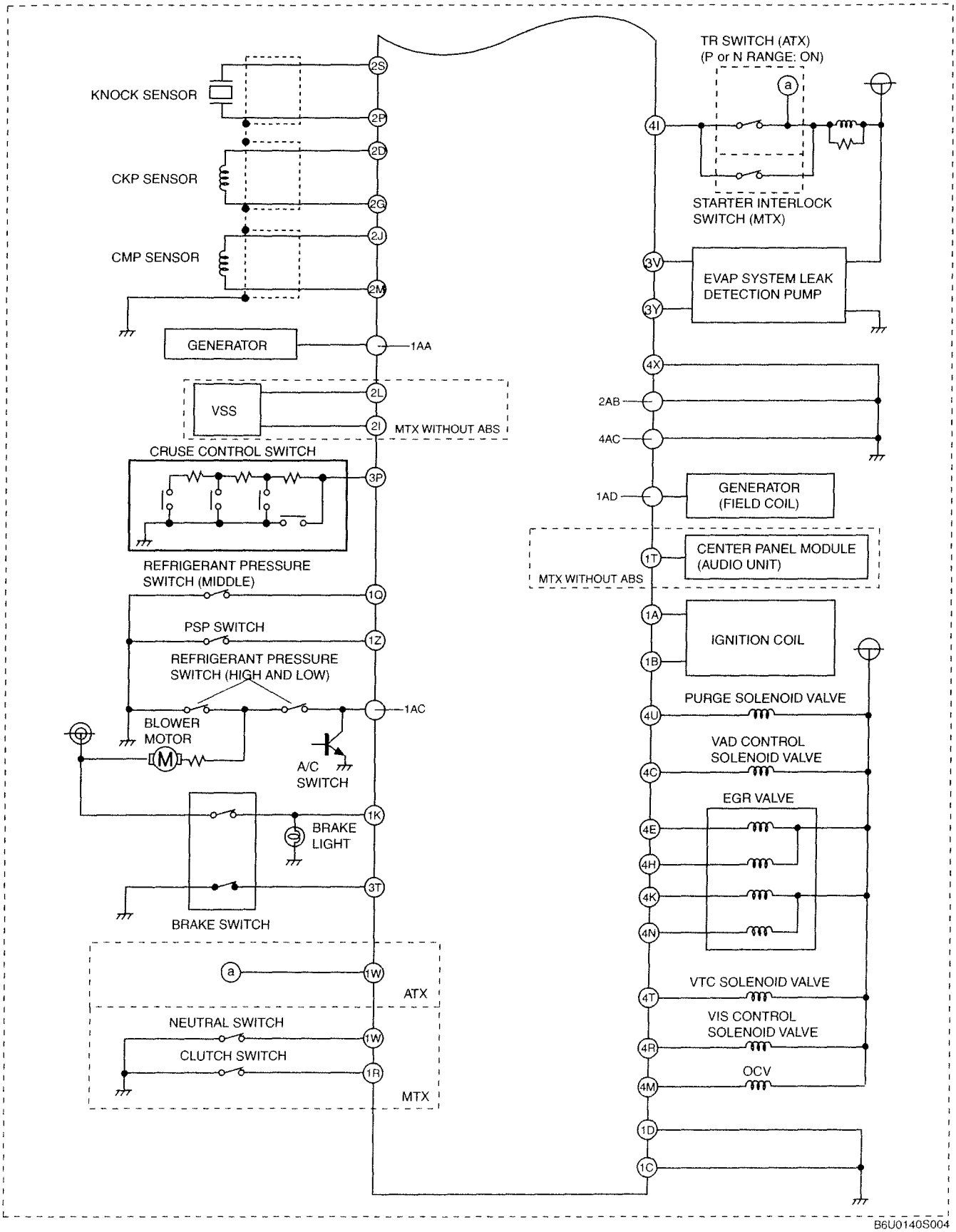
B6U0140S002

CONTROL SYSTEM WIRING DIAGRAM [L3]

C6U014018881W03



B6U0140S003



B6U0140S004

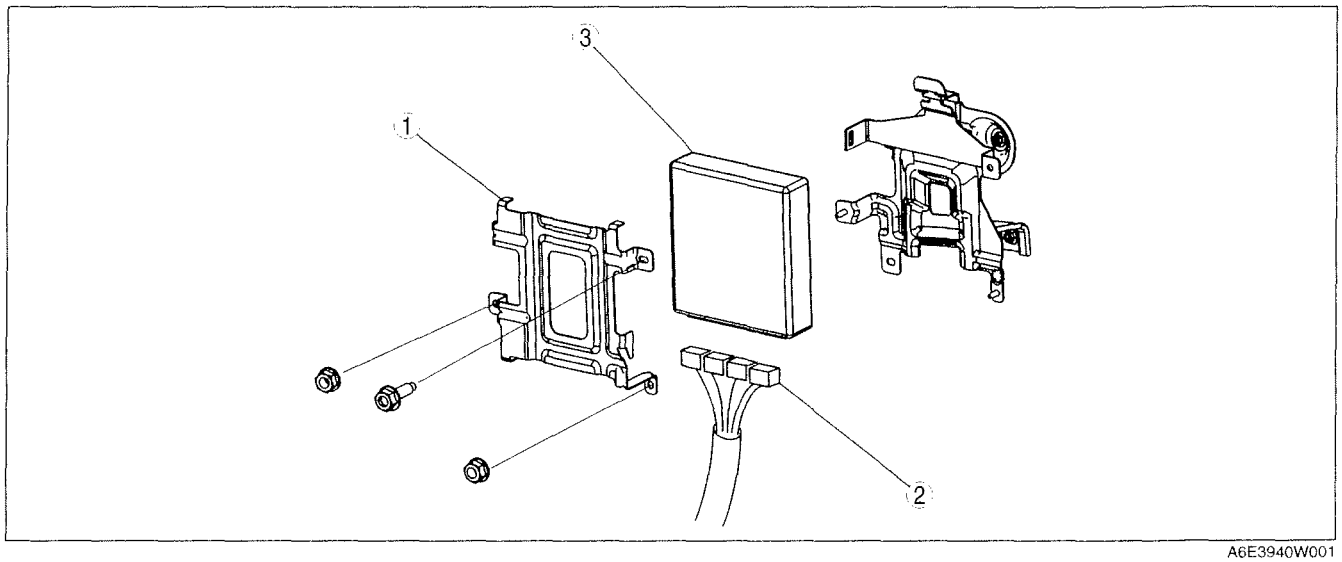
PCM REMOVAL/INSTALLATION [L3]

C6U014018880W01

Note

- For PCM replacement, setup the WDS and perform the PCM configuration. (See 01–40A–26 PCM REPLACEMENT [L3].)

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



A6E3940W001

1	PCM cover
2	PCM connector

3	PCM

PCM INSPECTION [L3]

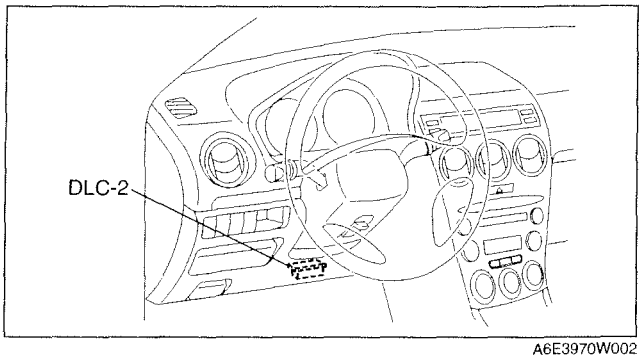
Using the WDS or Equivalent

C6U014018880W02

Note

- PIDs for the following parts are not available on this model. Perform the specific inspections for the following parts:
  - — CMP sensor (See 01–40A–40 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [L3].)
  - — Main relay (See 09–21–6 RELAY INSPECTION.)

1. Connect the WDS or equivalent to the DLC-2.
2. Turn the ignition switch to ON position.
3. Measure the PID value.
   - If PID value is not within the specification, follow the instructions in Action column.



A6E3970W002

Note

- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the PCM. Therefore, an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device. If a monitored value of an output device is out of specification, inspect the monitored value of the input device related to the output control.
- For input/output signals except those of the monitoring items, use a voltmeter to measure the PCM terminal voltage.
- The simulation items that are used in the ENGINE CONTROL SYSTEM OPERATION INSPECTION are as follows.
  - — ACCS, ALTF, ARPMDES, ETC_DSD, EVAPCP, FAN1, FAN2, FAN3, FP, FUELPW1, GENVDSD, HTR11, HTR12, IAC, IASV, IMRC, IMTV, INJ_1, INJ_2, INJ_3, INJ_4, SEGRP, test, VT DUTY1

PID/DATA monitor table (reference)

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Action	PCM terminal
AC REQ (A/C switch)	ON/OFF	A/C switch and fan switch ON at ignition switch ON: On A/C switch OFF at ignition switch ON: Off	Inspect A/C switch. (See 07–40–18 CLIMATE CONTROL UNIT INSPECTION)	1AC
ACCS (A/C relay)	On/Off	Ignition switch ON: Off A/C switch ON and fan switch ON at idle: On	Inspect following PIDs: RPM, TP, ECT, ACSW. Inspect A/C relay. (See 07–40–18 CLIMATE CONTROL UNIT INSPECTION)	4O
ALTF (Generator field coil control duty value)	%	Ignition switch ON: 0% Idle: 0—100% Just after A/C switch ON and fan switch ON at idle: Duty value rises	Inspect following PIDs: IAT, ECT, RPM, VPWR, ALTT V. Inspect generator. (See 01–17–5 GENERATOR INSPECTION)	1AD
ALTT V (Generator output voltage)	V	Ignition switch ON: 0 V Idle: Approx. 14.5 V*1 (E/L not operating)	Inspect generator. (See 01–17–5 GENERATOR INSPECTION)	1AA
APP (Accelerator pedal position)	%	APP closed: 0% APP open: 100%	Inspect following PIDs: APP1, APP2. Inspect accelerator pedal position sensor. (See 01–40A–31 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [L3])	2A, 3D
APP1 (Accelerator pedal position)	%	APP closed: 31.0—32.4% APP open: 69.8—81.8%	Inspect accelerator pedal position sensor. (See 01–40A–31 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [L3])	3D
	V	APP closed: 1.55—1.62 V APP open: 3.49—4.09 V		
APP2 (Accelerator pedal position)	%	APP closed: 20.2—21.4% APP open: 58.8—70.8%	Inspect accelerator pedal position sensor. (See 01–40A–31 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [L3])	2A
	V	APP closed: 1.01—1.07 V APP open: 2.94—3.54 V		
ARPMDES (Target engine speed)	RPM	No load: 700 rpm E/L operating: 700 rpm P/S operating: 700 rpm A/C ON: 750 rpm	Inspect following PIDs: IAT, RPM, MAP, ECT, MAF, TP, INGEAR, ACSW, PSP, ALTT V. Inspect CKP sensor. (See 01–40A–41 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [L3])	—
B+ (Battery positive voltage)	V	Ignition switch ON: B+	Inspect main relay. (See 09–21–6 RELAY INSPECTION) Inspect battery. (See 01–17–1 BATTERY INSPECTION)	2Y, 2Z
BARO (Barometric pressure)	kPa, Bar, psi	Ignition switch ON: Indicate the atmospheric pressure	Inspect BARO sensor. (See 01–40A–37 BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION [L3])	1G
	V	Ignition switch ON (at sea level): Approx. 4.0 V		
BOO (Brake switch)	On/Off	Brake pedal depressed: On Brake pedal released: Off	Inspect brake switch. (See 04–11–7 BRAKE SWITCH INSPECTION)	1K
BPA (Brake pressure applied switch)	On/Off	Brake pedal depressed: Off Brake pedal released: On	Inspect brake switch. (See 04–11–7 BRAKE SWITCH INSPECTION)	—
CATT11_DSD (Estimated catalytic converter temperature)	°C / °F	Indicate the estimated catalytic converter temperature	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
CHRGLP (Generator warning light)	On/Off	Ignition switch ON: On Idle: Off	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Action	PCM terminal
COLP (Refrigerant pressure switch (middle))	ON/OFF	Refrigerant pressure switch (middle) ON*2 at idle: ON Refrigerant pressure switch (middle) OFF*3 at idle: OFF	Inspect refrigerant pressure switch. (See 07–40–15 REFRIGERANT PRESSURE SWITCH INSPECTION)	1Q
CPP*4 (Clutch pedal position)	On/Off	Clutch pedal depressed: On Clutch pedal released: Off	Inspect clutch switch. (See 01–40A–27 CLUTCH SWITCH INSPECTION [L3])	1R
CPP/PNP*5 (Shift lever position)	Drive/ Neutral	Neutral position: Neutral Others: Drive	Inspect neutral switch. (See 01–40A–28 NEUTRAL SWITCH INSPECTION [L3])	1W
DTC_CNT (Number of DTC detected)	—	—	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
ECT (Engine coolant temperature)	°C / °F	Ignition switch at ON position: Indicate the ECT	Inspect ECT sensor. (See 01–40A–36 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [L3])	1M
	V	ECT 20 °C {68 °F}: 3.04—3.14 V ECT 60 °C {140 °F}: 1.29—1.39 V		
EQ RAT DSD (Front oxygen sensor)	—	Idling after warm-up: Approx. 1	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
ETC_DSD (Electronic throttle control desired)	%	Indicate the desired TP by percent	Inspect following PIDs:APP1, APP2, ETC_ACT. Inspect TP sensor. (See 01–40A–32 THROTTLE POSITION (TP) SENSOR INSPECTION [L3])	—
	°	Indicate the desired TP by angle		
EVAPCP (Purge solenoid valve duty value)	%	Ignition switch ON: 0% Idle: 0%	Inspect following PIDs: IAT, RPM, ECT, MAF, O2S11,BARO, INGEAR, VPWR. Inspect purge solenoid valve. (See 01–16–15 PURGE SOLENOID VALVE INSPECTION)	4U
FAN1 (Cooling fan control)	On/Off	ECT below 100 °C {212 °F}: Off Others: On	Inspect following PIDs: RPM, TP, ECT, ACSW, COLP, TEST. Inspect cooling fan relay. (See 09–21–6 RELAY INSPECTION)	4L
FAN2 (Cooling fan control)	On/Off	ECT below 108 °C {226 °F}: Off A/C operating, refrigerant pressure switch (middle) is OFF, and ECT below 108 °C {226 °F}: Off Others: On	Inspect following PIDs: RPM, TP, ECT, ACSW, COLP, TEST. Inspect cooling fan relay. (See 09–21–6 RELAY INSPECTION)	4F
FAN3 (Cooling fan control)	On/Off	ECT below 100 °C {212 °F}: Off A/C operating, refrigerant pressure switch (middle) is ON, and ECT below 108 °C {226 °F}: Off Other: On	Inspect following PIDs: RPM, TP, ECT, ACSW, COLP, TEST. Inspect cooling fan relay. (See 09–21–6 RELAY INSPECTION)	4B
FLI (Fuel level)	%	Fuel gauge level F: Approx. 100% Fuel gauge level E: Approx. 0%	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
FP (Fuel pump relay)	On/Off	Idle: On Cranking: On	Inspect following PIDs: RPM. Inspect fuel pump relay. (See 09–21–6 RELAY INSPECTION)	4Q
FUELPW (Fuel injector duration)	ms	Ignition switch ON: 0 ms Idle (after warm up): Approx. 2.5 ms	Inspect following PIDs: IAT, MAF, TP, MAP, ECT, RPM, O2S11, O2S12, INGEAR, PSP, ACSW, VPWR, ALTT V. Inspect fuel injector. (See 01–14–27 FUEL INJECTOR INSPECTION [L3])	4W, 4Z, 4AA, 4AD

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Action	PCM terminal
FUELSYS (Fuel system status)	OL/CL/ OL Drive/ OL Fault/ CL Fault	Ignition switch ON: OL_Drive Idle (after warm up): CL	Inspect following PIDs: IAT, MAF, TP, MAP, ECT, RPM, O2S11, O2S12, INGEAR, PSP, ACSW, VPWR, ALTT V. Inspect fuel injector. (See 01–14–27 FUEL INJECTOR INSPECTION [L3])	—
GENVDSD (Generator voltage desired)	V	Idle: Approx. 13.83 V*1 (E/L not operating)	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
HTR11 (HO2S heater (front))	On/Off	Idle (after warm up): On⇔Off	Inspect following PIDs: IAT, MAF, TP, ECT, RPM, ACSW. (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3])	4A
HTR12 (HO2S heater (rear))	On/Off	Idle: On Engine speed is above 4,000 rpm: off	Inspect following PIDs: IAT, MAF, ECT, RPM, ACSW. (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3])	4D
IASV (Variable air duct control solenoid valve)	On/Off	ECT is above 70 °C {158 °F}, engine speed is above 5,800 rpm, and TP opening angle is above 50%: On Others: Off	Inspect following PIDs: ECT, RPM, TP. Inspect VAD control solenoid valve. (See 01–13A–7 VARIABLE AIR DUCT (VAD) CONTROL SOLENOID VALVE INSPECTION [L3])	4C
IAT (Intake air temperature)	°C / °F	Ignition switch at ON position: Indicate the IAT	Inspect IAT sensor. (See 01–40A–34 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [L3])	2E
	V	IAT 20 °C {68 °F}: 2.4—2.6 V IAT 30 °C {86 °F}: 1.7—1.9 V		
IMRC (Variable tumble control solenoid valve)	On/Off	Engine speed is below Approx. 3,750 rpm and ECT is below 60 °C {140 °F}: On Others: Off	Inspect following PIDs: TP, ECT, RPM. Inspect Variable tumble control solenoid valve. (See 01–13A–12 VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION [L3])	4T
IMTV (Variable Intake-air control solenoid valve)	On/Off	Engine speed is below Approx. 4,500 rpm: On Others: Off	Inspect following PIDs: RPM. Inspect VIS control solenoid valve. (See 01–13A–10 VARIABLE INTAKE-AIR SYSTEM (VIS) CONTROL SOLENOID VALVE INSPECTION [L3])	4R
INGEAR (Load/no load condition)	On/Off	CPP or CPP/PNP is On: Off Others: On	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	1R, 1W
IVS (CTP condition)	Idle/ Off Idle	APP closed: Idle Others: Off Idle	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	3M
KNOCKR (Knocking retard)	°	Ignition switch ON: 0 ° Idle: 0 °	Inspect knock sensor. (See 01–40A–39 KNOCK SENSOR (KS) INSPECTION [L3])	2P, 2S
LDP EVAPCP (EVAP system leak detection pump detect incorrect purge flow)	mA	—	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
LDP IDL (EVAP system leak detection pump idle current)	mA	—	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
LDP IDL (EVAP system leak detection pump idle current)	mA	—	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
LDP MON (EVAP system leak detection pump monitoring current)	mA	—	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Action	PCM terminal
LDP REF (EVAP system leak detection pump reference current)	mA	—	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
LDP SLDV (EVAP system small leak detection value)	mA	—	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
LDP VSLDV (EVAP system small leak detection value)	mA	—	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
LOAD (Engine load)	%	Ignition switch ON: 0% Idle (after warm up): 15.9—17.1%*4, 17.1—18.5%*5	Inspect MAF sensor. (See 01–40A–33 MASS AIR FLOW (MAF) SENSOR INSPECTION [L3])	—
LONGFT1 (long term fuel trim)	%	Idle (after warm up):–14—14%	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
MAF (Mass airflow)	g/s	Ignition switch ON: Approx. 0 g/s Idle (after warm up): 2.50—2.70 g/s*4, ATX: 2.71—2.94 g/s*5	Inspect MAF sensor. (See 01–40A–33 MASS AIR FLOW (MAF) SENSOR INSPECTION [L3])	1P
	V	Ignition switch ON: Approx. 0.7 V Idle (after warm up): 1.15—1.28 V*4, 1.18—1.31 V*5		
MAP (Manifold absolute pressure)	kPa, Bar, psi	Ignition switch at ON position: Indicate the atmospheric pressure	Inspect MAP sensor. (See 01–40A–38 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION [L3])	1J
	V	Ignition switch ON (at sea level): Approx. 4.1 V		
MIL (Malfunction indicator lamp)	On/Off	Ignition switch ON: On Idle: Off	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
MIL DIS (Traveled distance since the MIL illuminated)	km / mile	No DTC: 0 km {0 mile} DTC detected: Not 0 km {0 mile}	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
NUMKEYS (Number of keys stored in PCM)	—	—	—	—
O2S11 (Front oxygen sensor)	V	Ignition switch ON: 0—1.0 V Idle (after warm up): 0—1.0 V Acceleration (after warm up): 0.5—1.0 V Deceleration (after warm up): 0—0.5 V	Inspect HO2S (front). (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3])	1AB
O2S12 (Rear oxygen sensor)	V	Idle (after warm up): 0—1.0 V Acceleration (after warm up): 0.5—1.0 V Deceleration (after warm up): 0—0.5 V	Inspect HO2S (rear). (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3])	1Y
PSP (Power steering pressure switch)	High/Low	Steering wheel in straight ahead position: Low Others: High	Inspect PSP switch. (See 01–40A–29 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [L3])	1Z
RFCFLAG (Readness function code)	Learnt/ Not Learnt	Before running PCM adaptive memory procedure drive mode: Not Learnt After running PCM adaptive memory procedure drive mode: Learnt	Run PCM adaptive memory procedure drive mode. (See 01–02A–9 OBD-II DRIVE MODE [L3])	—
RPM (Engine speed)	RPM	No load: 650—750 rpm E/L operating: 650—750 rpm P/S operating: 650—750 rpm A/C ON: 700—800 rpm	Inspect CKP sensor. (See 01–40A–41 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [L3])	2D, 2G

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Action	PCM terminal
SEGRP (EGR valve (stepping motor) position)	NO. of step	Idle: 0 step Cranking: 0—60 steps	Inspect following PIDs: MAF, TP, ECT, RPM, VSS. Inspect EGR valve. (See 01–16–19 EGR VALVE INSPECTION [L3])	4E, 4H, 4K, 4N
SEGRP DSD (Desired EGR valve (stepping motor) position)	%	Idle: 0%	Inspect following PIDs: MAF, TP, ECT, RPM, VSS.	—
SELTESTDTC (DTC of KOEO/KOER self-test)	—	—	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
SHRTFT1 (Short term fuel trim [front HO2S])	%	Idle (after warm up): Approx.–30—25%	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
SHRTFT11 (Short term fuel trim [rear HO2S])	%	Idle (after warm up): Approx.–30—25%	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
SHRTFT12 (Short term fuel trim)	%	Idle (after warm up): Approx.–30—25%	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	—
SPARKADV (Ignition timing)	°(BTDC)	Idle: BTDC Approx. 8°	Inspect following PIDs: MAF, TP, ECT, RPM, INGEAR, PSP, ACSW, VPWR. Inspect ignition timing. (See 01–10A–31 ENGINE TUNE-UP [L3])	2J, 2M
test (Test mode)	On/Off	—	—	—
TIRESIZE (Tire revolution per mile)	rev/mile	Indicate the tire circumference length	—	—
TP_REL (Relative TP)	%	APP closed: Approx. 7%*4, Approx. 14%*5 APP open: Approx. 99%	Inspect TP sensor. (See 01–40A–32 THROTTLE POSITION (TP) SENSOR INSPECTION [L3])	3M
TP1 (TP sensor 1)	%	APP closed: 10.6—20.1% APP open: 85—95%	Inspect TP sensor. (See 01–40A–32 THROTTLE POSITION (TP) SENSOR INSPECTION [L3])	3M
	V	APP closed: 0.53—1.00 V APP open: 4.25—4.75 V		
TP2 (TP sensor 2)	%	APP closed: 10.6—20.1% APP open: 85—95%	Inspect TP sensor. (See 01–40A–32 THROTTLE POSITION (TP) SENSOR INSPECTION [L3])	3J
	V	APP closed: 4.00—4.47 V APP open: 0.25—0.75 V		
Vref (Power circuit voltage of the)	V	Ignition switch ON: Approx.5 V	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	2K
TPCT (TP sensor voltage at CTP)	V	Ignition switch ON: 0.53—1.00 V	Inspect TP sensor. (See 01–40A–32 THROTTLE POSITION (TP) SENSOR INSPECTION [L3])	3M
VSS (Vehicle speed)	km/h | MPH	Indicate the vehicle speed	Perform applicable DTC troubleshooting. (See 01–02A–13 DTC TABLE [L3])	2I, 2L (MTX without ABS/ TCS)
VT ACT1 (Actual valve timing)	°	Idle: Approx. 0°	Inspect following PIDs: TP, ECT, RPM. Inspect OCV. (See 01–10A–34 OIL CONTROL VALVE (OCV) INSPECTION [L3])	2J, 2M

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Action	PCM terminal
VT DIFF1 (Difference between actual valve timing and target valve timing)	°	Idle: Approx. 0°	Inspect following PIDs: TP, ECT, RPM. Inspect OCV. (See 01–10A–34 OIL CONTROL VALVE (OCV) INSPECTION [L3])	—
VT DUTY1	%	Idle: Approx. 11.5%	Inspect following PIDs: TP, ECT, RPM. Inspect OCV. (See 01–10A–34 OIL CONTROL VALVE (OCV) INSPECTION [L3])	4M

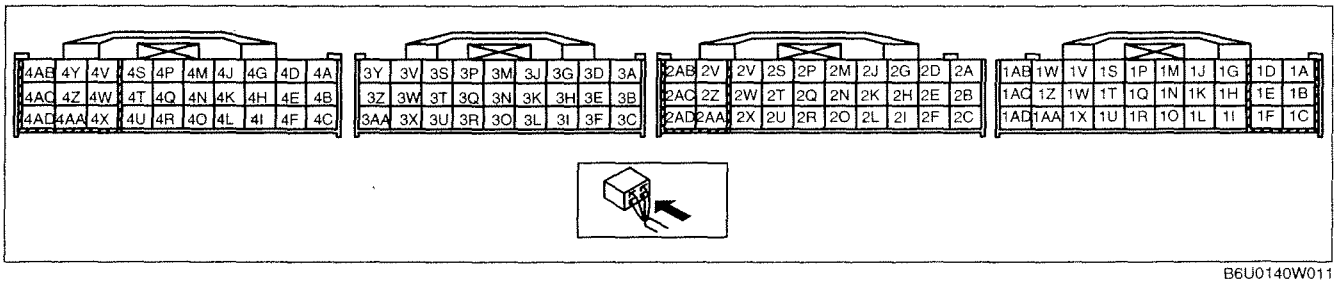
*1 : Calculated value; differs from terminal voltage
*2 : Refrigerant pressure switch (middle) turns off when the refrigerant pressure is 1.26—1.49 MPa {12.9—15.1 kgf/cm^2, 184—214 psi}
*3 : Refrigerant pressure switch (middle) turns on when the refrigerant pressure is 1.69—1.84 MPa {17.3—18.7 kgf/cm^2, 247—265 psi}
*4 : MTX
*5 : ATX

Without Using the SST

Caution
- **The PCM terminal voltages vary with change in measuring conditions and vehicle conditions. Always carry out a total inspection of the input systems, output systems, and PCM to determine the cause of trouble. Otherwise, a wrong diagnosis will be made.**

1. Measure the voltage at each terminal.
   - If any incorrect voltage is detected, inspect the related system(s), wiring harnesses and connector(s) referring to the Action column in the terminal voltage table.

Terminal voltage table (Reference)



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Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
1A	IGT1	Ignition coil (No. 1, 4 cylinders)	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)			• Inspect ignition coil (See 01–18–2 IGNITION COIL INSPECTION) • Inspect related harness
1B	IGT2	Ignition coil (No. 2, 3 cylinders)	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)			• Inspect ignition coil (See 01–18–2 IGNITION COIL INSPECTION) • Inspect related harness
1C	GND	GND	Under any condition		Below 1.0	• Inspect related harness
1D	GND	GND	Under any condition		Below 1.0	• Inspect related harness
1E	—	—	—		—	—
1F	—	—	—		—	—
1G	Barometric pressure	BARO sensor	Ignition switch ON (Engine OFF) at sea level		Approx. 4.0	• Inspect BARO sensor (See 01–40A–37 BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION [L3]) • Inspect related harness
1H	—	—	—		—	
1I	—	—	—		—	—
1J	Manifold absolute pressure	MAP sensor	Ignition switch ON (Engine OFF) at sea level		Approx. 4.1	• Inspect MAP sensor (See 01–40A–38 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION [L3]) • Inspect related harness
1K	Brake (No. 1)	Brake switch No. 1	Brake pedal depressed		B+	• Inspect brake switch • Inspect related harness
			Brake pedal released		Below 1.0	
1L	—	—	—		—	—
1M	ECT	ECT sensor	Ignition switch ON	ECT 20 °C {68 °F}	3.04—3.14	• Inspect ECT sensor (See 01–40A–36 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [L3]) • Inspect related harness
				ECT 60 °C {140 °F}	1.29—1.39	

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
1N	VTC shutter valve monitor	VTC shutter valve switch	ECT above 63 °C {145 °F} while idling.		Below 1.0	• Inspect VTC shutter valve switch (See 01–40A–30 VARIABLE TUMBLE CONTROL (VTC) SHUTTER VALVE SWITCH INSPECTION [L3]) • Inspect related harness
			ECT below 63 °C {145 °F} and engine speed below 3,750 rpm		Approx. 5.0	
1O	—	—	—		—	—
1P	MAF	MAF sensor	Ignition switch ON		Approx. 0.7	• Inspect MAF sensor (See 01–40A–33 MASS AIR FLOW (MAF) SENSOR INSPECTION [L3]) • Inspect related harness
			Idle (after warm up)	MTX	1.15—1.28	
				ATX	1.18—1.31	
1Q	A/C compressor load	Refrigerant pressure switch (middle)	A/C ON	Refrigerant pressure is above 1.52 MPa {15.5 kgf/cm^2, 220 psi}	Below 1.0	• Inspect refrigerant pressure switch • Inspect related harness
				Refrigerant pressure is below 1.23 MPa {12.5 kgf/cm^2, 178 psi}	B+	
1R*1	Clutch operation	Clutch switch	Clutch pedal depressed		Below 1.0	• Inspect clutch switch (See 01–40A–27 CLUTCH SWITCH INSPECTION [L3]) • Inspect related harness
			Clutch pedal released		B+	
1S	—	—	—		—	—
1T	—	—	—		—	—
1U	—	—	—		—	—
1V	—	—	—		—	—
1W	Neutral position*1	Neutral switch	Shift lever is at neutral position		Below 1.0	• Inspect neutral switch (See 01–40A–28 NEUTRAL SWITCH INSPECTION [L3]) • Inspect related harness
			Shift lever is not at neutral position		B+	
	Selector lever position*2	TR switch (terminal C)	Ignition switch at START	P or N range	Below 1.0	• Inspect TR switch • Inspect related harness
				Other	Below 1.0	
1X	—	—	—		—	—
1Y	HO2S (rear)	HO2S (rear)	Ignition switch ON		Approx. 0	• Inspect HO2S (rear) (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3]) • Inspect related harness
			Idle (after warm up)		Approx. 0.6	

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
1Z	PSP	PSP switch	Idle	Steering wheel at straight ahead position	B+	• Inspect PSP switch (See 01–40A–29 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [L3]) • Inspect power steering system • Inspect related harness
				While turning steering wheel	Below 1.0	
1AA	Generator output voltage	Generator (terminal P)	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)			• Inspect generator • Inspect related harness
1AB	HO2S (front)	HO2S (front)	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)			• Inspect HO2S (front) (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3]) • Inspect related harness
1AC	A/C operation	Refrigerant pressure switch	Idle	A/C switch and fan switch on	Below 1.0	• Inspect refrigerant pressure switch • Inspect related harness
				A/C switch off	B+	
1AD	Generator field coil control	Generator (terminal D)	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)			• Inspect following PIDs: IAT, ECT, RPM, VPWR, ALTT V. • Inspect generator • Inspect related harness
2A	APP position (No. 2)	APP sensor No. 2	Ignition switch ON	APP closed	1.01—1.07	• Inspect APP sensor (See 01–40A–31 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [L3]) • Inspect related harness
				APP open	2.94—3.54	
2B	—	—	—		—	—
2C	—	—	—		—	—
2D	CKP (+)	CKP sensor	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)			• Inspect CKP sensor (See 01–40A–41 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [L3]) • Inspect related harness
2E	IAT	MAF/IAT sensor	Ignition switch ON	IAT 20 °C {68 °F}	2.4—2.6	• Inspect IAT sensor (See 01–40A–34 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [L3]) • Inspect related harness
				IAT 30 °C {86 °F}	1.7—1.9	
2F	—	—	—		—	—
2G	CKP (–)	CKP sensor	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)			• Inspect CKP sensor (See 01–40A–41 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [L3]) • Inspect related harness

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
2H	Sensor GND	MAF/IAT sensor, HO2S (Front, Rear), APP sensor, BARO sensor, ECT sensor, TP sensor, MAP sensor, VTC shutter valve switch	Under any condition	Below 1.0	• Inspect related harness
2I*3	VSS (–)	VSS	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)		• Inspect VSS sensor (See 05–15A–3 VEHICLE SPEEDOMETER SENSOR INSPECTION (WITHOUT ABS) [G35M-R]) • Inspect related harness
2J	CMP (+)	CMP sensor	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)		• Inspect CMP sensor (See 01–40A–40 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [L3]) • Inspect related harness
2K	Constant voltage (Vref)	MAP sensor, BARO sensor, APP sensor, VTC shutter valve switch	Ignition switch ON	Approx. 5.0	• Inspect related harness
2L*3	VSS (+)	VSS	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)		• Inspect VSS sensor (See 05–15A–3 VEHICLE SPEEDOMETER SENSOR INSPECTION (WITHOUT ABS) [G35M-R]) • Inspect related harness
2M	CMP (–)	CMP sensor	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)		• Inspect CMP sensor (See 01–40A–40 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [L3]) • Inspect related harness
2N	—	—	—	—	—
2O	—	—	—	—	—
2P	Knocking (–)	Knock sensor	Ignition switch ON (Use digital type voltmeter, because measurement voltage will be detected less than true voltage when using analog type voltmeter)	Below 1.0	• Perform "On-Board Diagnostic Test" (See 01–02A–7 ON-BOARD DIAGNOSTIC TEST [L3]) • Inspect related harness
2Q	Coil (Immobilizer system)	Coil	Because this terminal is for communication, good/no good judgment by terminal voltage is not possible.		• Inspect coil • Inspect related harness

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
2R	CAN (–)	Instrument cluster, ABS/TCS HU/CM, DSC HU/CM	Because this terminal is for CAN, good/no good judgment by terminal voltage is not possible.			• Inspect related harness
2S	Knocking (+)	Knock sensor	Ignition switch ON (Use digital type voltmeter, because measurement voltage will be detected less than true voltage when using analog type voltmeter)		Approx. 4.3	• Perform "On-Board Diagnostic Test" (See 01–02A–7 ON-BOARD DIAGNOSTIC TEST [L3]) • Inspect related harness
2T	Coil (Immobilizer system)	Coil	Because this terminal is for communication, good/no good judgment by terminal voltage is not possible.			• Inspect coil • Inspect related harness
2U	CAN (+)	Instrument cluster, ABS/TCS HU/CM, DSC HU/CM	Because this terminal is for CAN, good/no good judgment by terminal voltage is not possible.			• Inspect related harness
2V	—	—	—		—	—
2W	Security light control	Instrument cluster (Security light)	Security light illuminate		Below 1.0	• Inspect related harness
			Others		B+	
2X	Main relay control	Main relay	Ignition switch OFF		B+	• Inspect main relay (See 09–21–6 RELAY INSPECTION) • Inspect related harness
			Ignition switch ON		Below 1.0	
2Y	B+	Main relay	Ignition switch OFF		Below 1.0	• Inspect battery • Inspect related harness
			Ignition switch ON		B+	
2Z	Back-up power supply	Battery (positive terminal)	Under any condition		B+	• Inspect battery • Inspect related harness
2AA	—	—	—		—	—
2AB	GND	GND	Under any condition		Below 1.0	• Inspect related harness
2AC	GND	GND	Under any condition		Below 1.0	• Inspect related harness
2AD	Ignition switch (IG1)	Ignition switch	Ignition switch OFF		Below 1.0	• Inspect ignition switch • Inspect related harness
			Ignition switch ON		B+	
3A	APP sensor GND	APP sensor	Under any condition		Below 1.0	• Inspect related harness
3B	—	—	—		—	—
3C	—	—	—		—	—
3D	APP position (No. 1)	APP sensor No. 1	Ignition switch ON	APP closed	1.55—1.62	• Inspect APP sensor (See 01–40A–31 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [L3]) • Inspect related harness
				APP open	3.49—4.09	
3E	—	—	—		—	—
3F	—	—	—		—	—
3G	Constant voltage (Vref)	APP sensor	Ignition switch ON		Approx. 5.0	• Inspect related harness
3H	—	—	—		—	—
3I	—	—	—		—	—

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
3J	TP position (No. 2)	TP sensor No. 2	Ignition switch ON	APP closed	4.00—4.47	• Inspect TP sensor (See 01–40A–32 THROTTLE POSITION (TP) SENSOR INSPECTION [L3]) • Inspect related harness
				APP open	0.25—0.75	
3K	TP sensor GND	Throttle body (TP sensor)	Under any condition		Below 1.0	• Inspect related harness
3L	—	—	—		—	—
3M	TP position (No. 1)	TP sensor No. 1	Ignition switch ON	APP closed	0.53—1.00	• Inspect TP sensor (See 01–40A–32 THROTTLE POSITION (TP) SENSOR INSPECTION [L3]) • Inspect related harness
				APP open	4.25—4.75	
3N	Constant voltage (Vref)	Throttle body (TP sensor)	Ignition switch ON		Approx. 5.0	• Inspect related harness
3O	—	—	—		—	—
3P	Cruise control	Cruise control switch	Ignition switch ON	Depressing ON/OFF	Approx. 0	• Inspect cruise control switch (See 01–20–1 CRUISE CONTROL SWITCH INSPECTION) • Inspect related harness
				Depressing CANCEL	Approx. 1.2	
				Depressing SET/COAST	Approx. 3.2	
				Depressing RES/ACCEL	Approx. 4.2	
				Others	Approx. 5.0	
3Q	—	—	—		—	—
3R	—	—	—		—	—
3S	ET control relay	ET control relay	Ignition switch OFF		B+	• Inspect ET control relay (See 09–21–6 RELAY INSPECTION) • Inspect related harness
			Ignition switch ON		Below 1.0	
3T	Brake (No. 2)	Brake switch No. 2	Brake pedal depressed		B+	• Inspect brake switch (See 04–11–7 BRAKE SWITCH INSPECTION) • Inspect related harness
			Brake pedal released		Below 1.0	
3U	—	—	—		—	—
3V	EVAP leak detection pump (solenoid)	EVAP leak detection pump	Ignition switch ON		B+	• Inspect EVAP leak detection pump • Inspect related harness
			Idle		B+	
3W	—	—	—		—	—
3X	—	—	—		—	—
3Y	EVAP leak detection pump (pump)	EVAP leak detection pump	Ignition switch ON		B+	• Inspect EVAP leak detection pump • Inspect related harness
			Idle		B+	
3Z	—	—	—		—	—
3AA	—	—	—		—	—

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
4A	HO2S (Front) heater control	HO2S (Front) heater	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)			• Inspect HO2S (Front) heater. (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3]) • Inspect related harness
4B	Cooling fan control	Cooling fan relay	Idling	ECT below 100 °C {212 °F}	B+	• Inspect cooling fan relay • Inspect related harness
				A/C operating	Below 1.0	
4C	VAD control	VAD control solenoid valve	Idle after warm up	Engine speed below 5,800 rpm	B+	• Inspect VAD control solenoid valve • Inspect related harness
				Engine speed above 5,800 rpm	Below 1.0	
4D	HO2S (Rear) heater control	HO2S (Rear) heater	Ignition switch ON	Engine speed below 4,000 rpm	B+	• Inspect HO2S (Front) heater. (See 01–40A–43 HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3]) • Inspect related harness
				Engine speed above 4,000 rpm and TP angle above 50%	Below 1.0	
4E	EGR valve #1 coil control	EGR valve (terminal E)	Ignition switch ON		Below 1.0	• Inspect EGR valve (See 01–16–19 EGR VALVE INSPECTION [L3]) • Inspect related harness
			Idle		Below 1.0	
4F	Cooling fan control	Cooling fan relay	Idling	ECT below 100 °C {212 °F}	B+	• Inspect cooling fan relay • Inspect related harness
				A/C operating and refrigerant pressure switch (middle) ON	Below 1.0	
4G	—	—	—		—	—
4H	EGR valve #2 coil control	EGR valve (terminal A)	Ignition switch ON		B+	• Inspect EGR valve (See 01–16–19 EGR VALVE INSPECTION [L3]) • Inspect related harness
			Idle		B+	
4I	Starter relay control	Starter relay (MTX) TR switch (ATX)	Under any condition		Below 1.0	• Perform "On-Board Diagnostic Test" (See 01–02A–7 ON-BOARD DIAGNOSTIC TEST [L3]) • Inspect related harness
4J	—	—	—		—	—
4K	EGR valve #3 coil control	EGR valve (terminal B)	Ignition switch ON		B+	• Inspect EGR valve (See 01–16–19 EGR VALVE INSPECTION [L3]) • Inspect related harness
			Idle		B+	
4L	Cooling fan control	Cooling fan relay	Idling	ECT below 100 °C {212 °F}	B+	• Inspect cooling fan relay • Inspect related harness
				A/C operating	Below 1.0	

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
4M	OCV control	OCV	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)		• Inspect OCV valve (See 01–10A–34 OIL CONTROL VALVE (OCV) INSPECTION [L3]) • Inspect related harness
4N	EGR valve #4 coil control	EGR valve (terminal F)	Ignition switch ON	Below 1.0	• Inspect EGR valve (See 01–16–19 EGR VALVE INSPECTION [L3]) • Inspect related harness
			Idle	Below 1.0	
4O	A/C	A/C relay	A/C operating	Below 1.0	• Inspect A/C relay • Inspect related harness
			A/C not operating	B+	
4P	—	—	—	—	—
4Q	Fuel pump control	Fuel pump relay	Ignition switch ON	B+	• Inspect fuel pump relay • Inspect related harness
			Cranking	Below 1.0	
			Idle	Below 1.0	
4R	VIS control	VIS control solenoid valve	Engine speed: above 4,500 rpm	B+	• Inspect VIS solenoid valve (See 01–13A–10 VARIABLE INTAKE-AIR SYSTEM (VIS) CONTROL SOLENOID VALVE INSPECTION [L3]) • Inspect related harness
			Engine speed: below 4,500 rpm	Below 1.0	
4S	—	—	—	—	—
4T	Variable tumble control	Variable tumble control solenoid valve	ECT above 60 °C {140 °F} while idling.	B+	• Inspect VIS solenoid valve (See 01–13A–12 VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION [L3]) • Inspect related harness
			ECT below 60 °C {140 °F} and engine speed below 3,750 rpm	Below 1.0	
4U	Purge control	Purge solenoid valve	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)		• Inspect purge solenoid valve (See 01–16–15 PURGE SOLENOID VALVE INSPECTION) • Inspect related harness
4V	ET control power supply	ET control relay	Ignition switch OFF	Below 1.0	• Inspect battery • Inspect related harness
			Ignition switch ON	B+	
4W	Fuel injection (#2)	Fuel injector No.2	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)		• Inspect fuel injector No.2 (See 01–14–27 FUEL INJECTOR INSPECTION [L3]) • Inspect related harness
4X	GND	GND	Under any condition	Below 1.0	• Inspect related harness

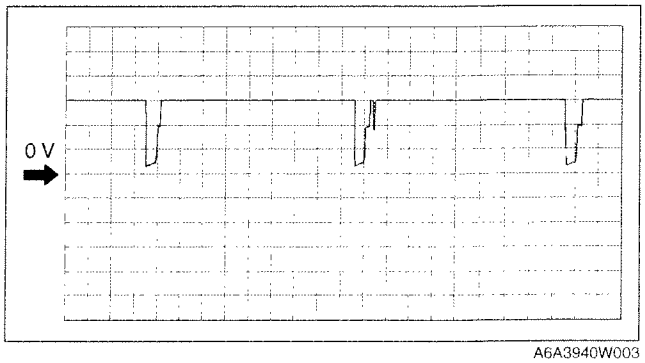
Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
4Y	Throttle actuator control (+)	Throttle body	Ignition switch ON	B+	• Inspect throttle actuator (See 01–13A–8 THROTTLE ACTUATOR INSPECTION [L3]) • Inspect related harness
4Z	Fuel injection (#1)	Fuel injector No.1	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)		• Inspect fuel injector No.1 (See 01–14–27 FUEL INJECTOR INSPECTION [L3]) • Inspect related harness
4AA	Fuel injection (#4)	Fuel injector No.4	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)		• Inspect fuel injector No.4 (See 01–14–27 FUEL INJECTOR INSPECTION [L3]) • Inspect related harness
4AB	Throttle actuator control (–)	Throttle body	Idle (after warm up)	3.5—5.5	• Inspect throttle actuator (See 01–13A–8 THROTTLE ACTUATOR INSPECTION [L3]) • Inspect related harness
4AC	GND	GND	Under any condition	Below 1.0	• Inspect related harness
4AD	Fuel injection (#3)	Fuel injector No.3	• Inspect using the wave profile. (See 01–40A–22 Inspection Using An Oscilloscope (Reference).)		• Inspect fuel injector No.3 (See 01–14–27 FUEL INJECTOR INSPECTION [L3]) • Inspect related harness

*1 : MTX models
*2 : ATX models
*3 : MTX, without ABS models

Inspection Using An Oscilloscope (Reference)
IGT1, IGT2 control signals
PCM terminals
- IGT1(No.1 and No.4): 1A(+)—1D(–)
- IGT2(No.2 and No.3): 1B(+)—1C(–)

Oscilloscope setting
- 4 V/DIV (Y), 0.01 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

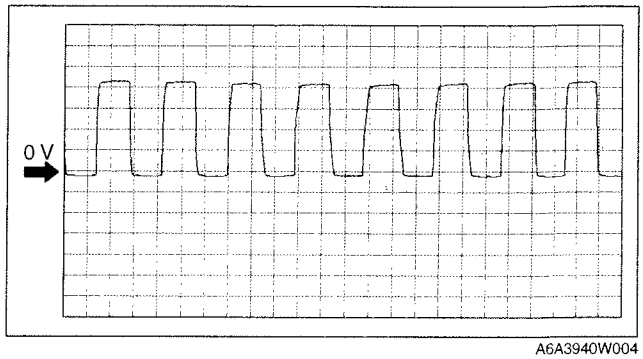


A6A3940W003

Generator output voltage signal
PCM terminals
- 1AA(+)—2AC(–)

Oscilloscope setting
- 2 V/DIV (Y), 2 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

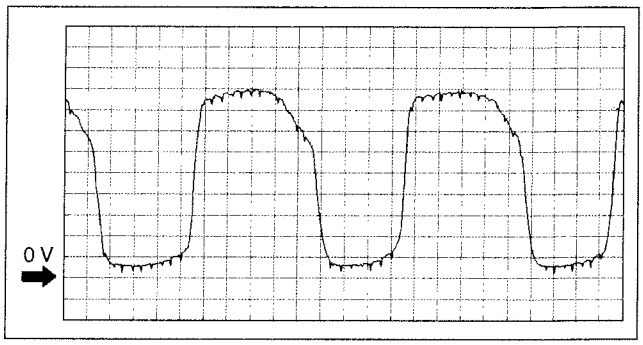


A6A3940W004

HO2S (front) signal
PCM terminals
- 1AB(+)—2H(–)

Oscilloscope setting
- 0.1 V/DIV (Y), 400 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

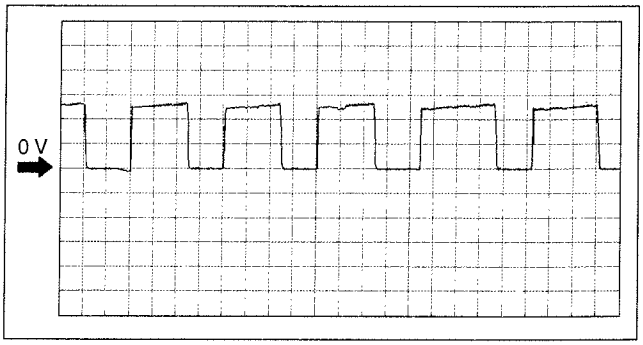


A6A3940W005

Generator field coil control signal
PCM terminals
- 1AD(+)—1C(–)

Oscilloscope setting
- 0.5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

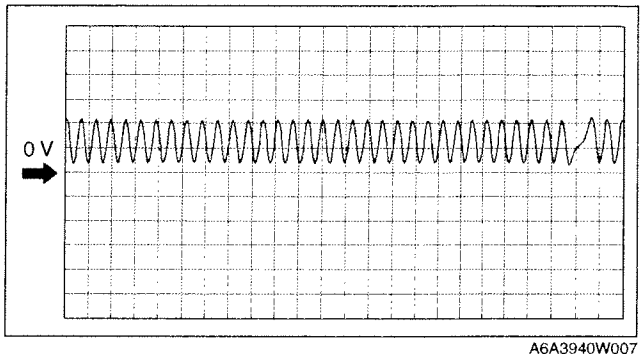


A6A3940W006

CKP sensor signal
(+)
PCM terminals
- 2D(+)—2H(–)

Oscilloscope setting
- 2 V/DIV (Y), 4 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

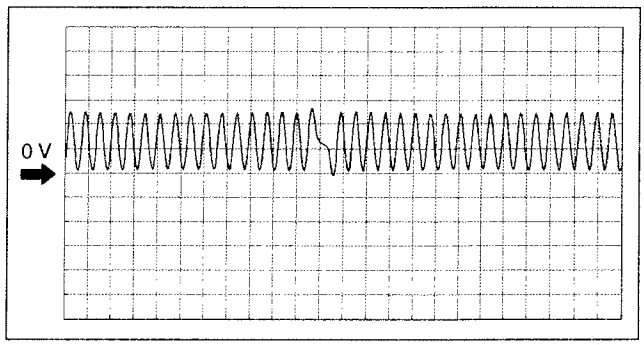


A6A3940W007

(–)
PCM terminals
- 2G(+)—2H(–)

Oscilloscope setting
- 2 V/DIV (Y), 4 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

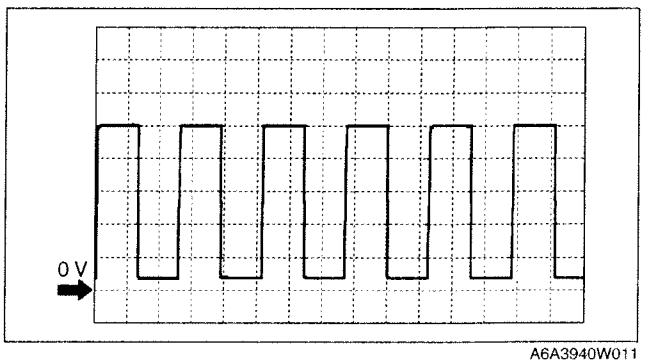


A6A3940W008

VSS signal
PCM terminals
- 2I(+)—2AC(–)

Oscilloscope setting
- 1 V/DIV (Y), 10 ms/DIV (X), DC range

Vehicle condition
- Drive the vehicle with approx. 10 km/h {6.2 mph}

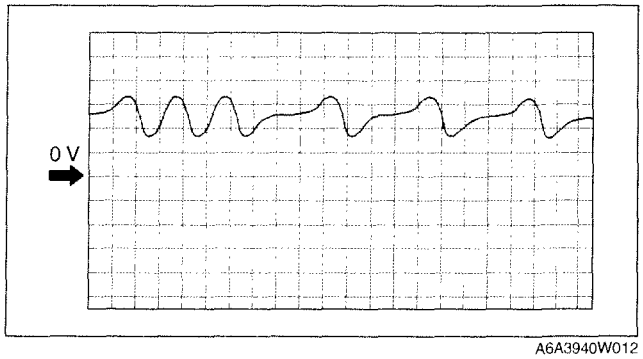


A6A3940W011

CMP sensor signal
(+)
PCM terminals
- 2J(+)—2H(–)

Oscilloscope setting
- 1 V/DIV (Y), 10 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

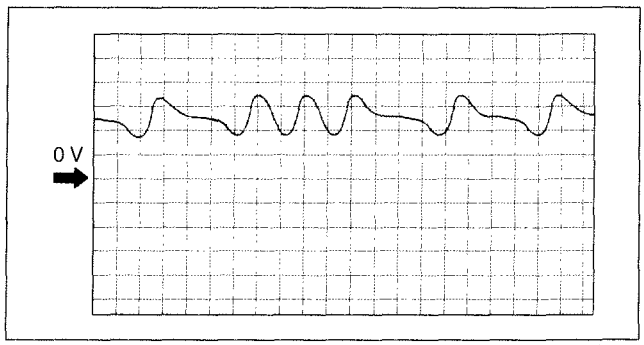


A6A3940W012

(–)
PCM terminals
- 2M(+)—2H(–)

Oscilloscope setting
- 1 V/DIV (Y), 10 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

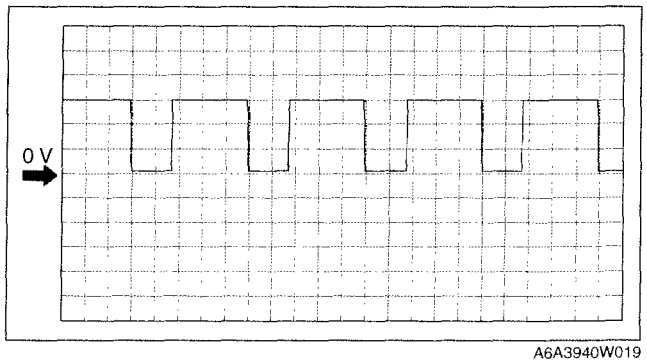


A6A3940W014

HO2S (front) heater control signal
PCM terminals
- 4A(+)—1C(–)

Oscilloscope setting
- 4 V/DIV (Y), 200 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

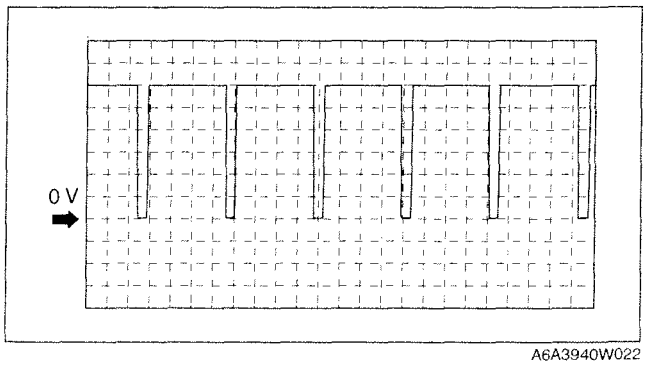


A6A3940W019

OCV control signal
PCM terminals
- 4M(+)—1C(–)

Oscilloscope setting
- 2 V/DIV (Y), 0.8 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

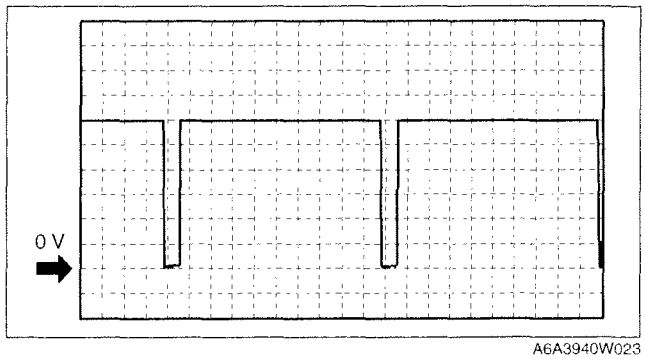


A6A3940W022

Purge control signal
PCM terminals
- 4U(+)—1C(–)

Oscilloscope setting
- 2 V/DIV (Y), 10 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

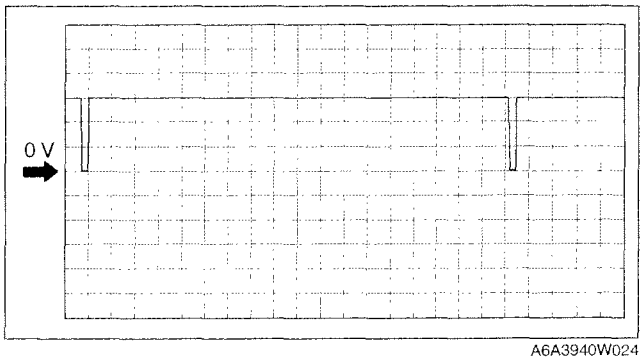


A6A3940W023

Fuel injection control
PCM terminals
- Fuel Injection No.1: 4Z(+)—1C(–)
- Fuel Injection No.2: 4W(+)—1C(–)
- Fuel Injection No.3: 4AD(+)—1C(–)
- Fuel Injection No.4: 4AA(+)—1C(–)

Oscilloscope setting
- 4 V/DIV (Y), 10 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

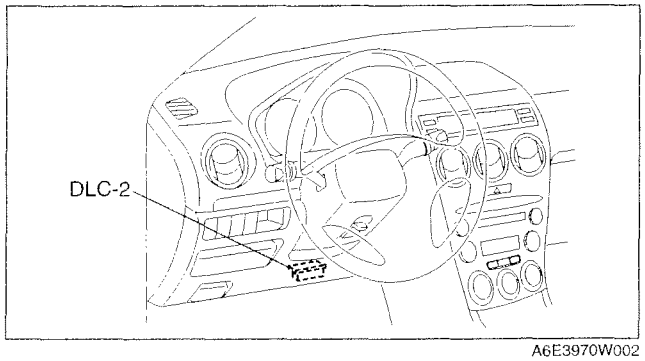


A6A3940W024

PCM REPLACEMENT [L3]

1. Connect the WDS (or equivalent) to the DLC-2.

C6U014018880W03



A6E3970W002

2. Set up the WDS or equivalent (including the vehicle recognition.)
3. Peform the normal vehicle identification procedure.
4. Select "Module Programming", or with WDS select "toolbox" and "module programming".
5. Select “Programmable Module Installation”.
6. Select “PCM” and perform procedures according to directions on the WDS (or equivalent) screen.

Note
- If the PCM is replaced with a new one without performing "Programmable Module Installation" procedure, the PCM stores DTC P0602 and illuminates the MIL. This is because the vehicle information was not programmed in the PCM. After completing the "Programmable Module Installation" procedure, various U**** DTCs are stored, which is normal.

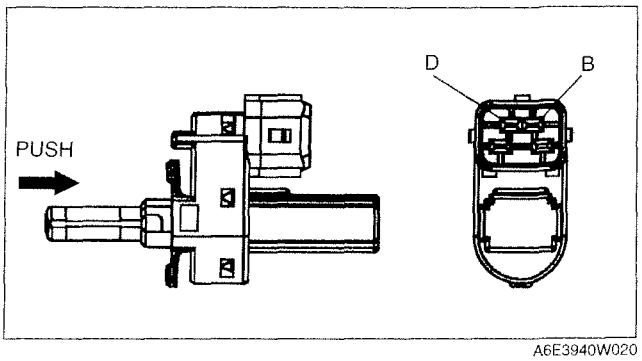
7. Retrieve DTCs with the WDS (or equivalent), erase them, and verify that there are no DTCs present and the MIL is off.
   - If DTCs are still present, perform applicable DTC inspection.

CLUTCH SWITCH INSPECTION [L3]

C6U014018660W01

Note
- Perform the following inspection only when directed.

Continuity Inspection
1. Verify that the clutch switch is installed properly.
2. Disconnect the negative battery cable.
3. Remove the clutch switch.
4. Inspect for continuity between the clutch switch terminals using an ohmmeter.
   - If the clutch switch is okay, but PID value is out of specification, perform the "Circuit Open/ Short Inspection".
   - If not as specified, replace the clutch switch.



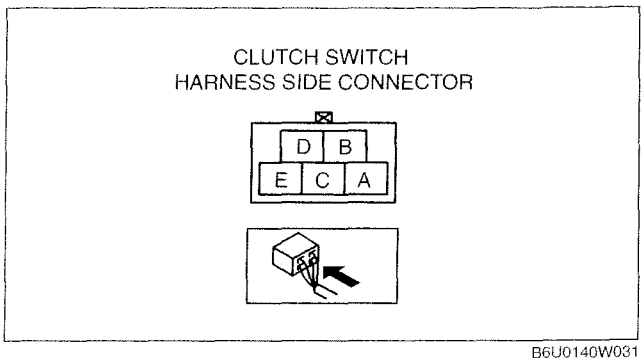
A6E3940W020

Specification

○—○ :Continuity

Rod condition	Terminal	
	B	D
Released	○	○
Pushed		

Circuit Open/Short Inspection
1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following harnesses for open or short circuit. (Continuity check)



B6U0140W031

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the harness.
  - — Clutch switch terminal B (harness-side) and PCM terminal 1R
  - — Clutch switch terminal D and body GND

Short circuit
- If there is continuity, there is a short circuit. Repair or replace the harness.
  - — Clutch switch terminal B (harness-side) and power supply
  - — Clutch switch terminal B (harness-side) and body GND

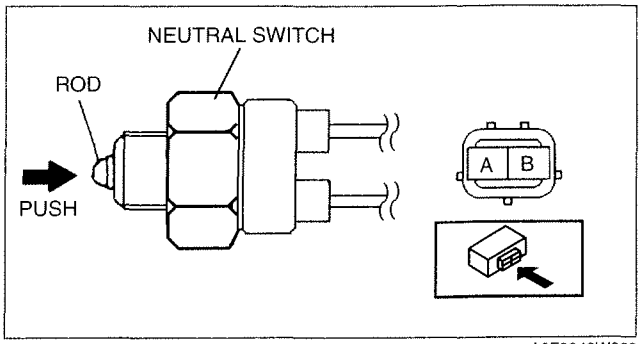
NEUTRAL SWITCH INSPECTION [L3]

C6U014017640W01

Note
- Perform the following inspection only when directed.

Continuity Inspection

1. Disconnect the negative battery cable.
2. Remove the neutral switch. (See 05–15A–4 MANUAL TRANSAXLE REMOVAL/INSTALLATION [G35M-R].)
3. Inspect for continuity between the neutral switch terminals using an ohmmeter.
   - If the neutral switch is okay, but PID value is out of specification, perform the "Circuit Open/ Short Inspection".
   - If not as specified, replace the neutral switch.



A6E3940W023

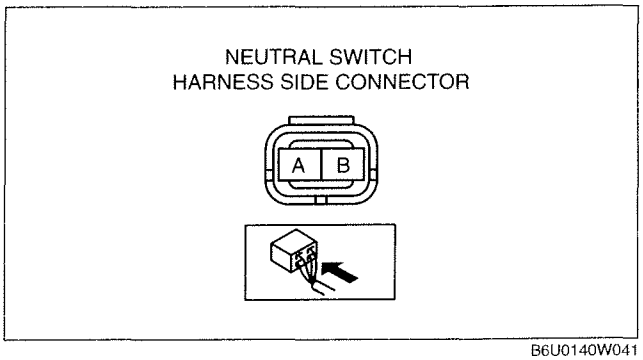
Specification

O—O : Continuity

Condition	Terminal	
	A	B
Rod pushed	O	O
Except above		

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following harnesses for open or short circuit. (Continuity check)



B6U0140W041

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the harness.
  - — Neutral switch terminal B (harness-side) and PCM terminal 1W (harness-side)
  - — Neutral switch terminal A (harness-side) and body GND

Short circuit

- If there is no continuity, there is a short circuit. Repair or replace the harness.
  - — Neutral switch terminal B (harness-side) and body GND

POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [L3]

C6U014032230W01

Note
- Perform the following inspection only when directed.

Continuity Inspection

1. Inspect the following if the power steering is inoperative (See 06–12–3 POWER STEERING FLUID INSPECTION.):
   - Power steering fluid level
   - Power steering fluid leakage
   - Power steering fluid pressure
2. Disconnect the PSP switch connector.
3. Start the engine.
4. Inspect for continuity between the PSP switch terminal and GND using an ohmmeter.
   - If not as specified, replace the PSP switch.
   - If the PSP switch is okay, but PID value is out of specification, perform the "Circuit Open/Short Inspection".

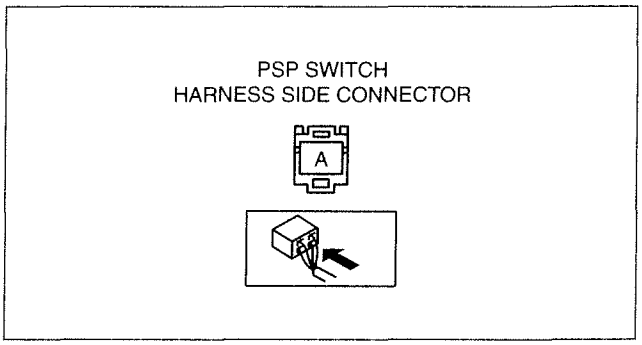
Specification

○——○ :Continuity

Condition	Terminal	GND
Steering wheel in straight ahead position		
While turning steering wheel	○	○

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following harnesses for open or short circuit. (Continuity check)



B6U0140W051

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the harness.
  — PSP switch terminal (harness-side) and PCM terminal 1Z (harness-side)

Short circuit

- If there is no continuity, there is a short circuit. Repair or replace the harness.
  — PSP switch terminal (harness-side) and body GND

VARIABLE TUMBLE CONTROL (VTC) SHUTTER VALVE SWITCH INSPECTION [L3]

C6U014020153W01

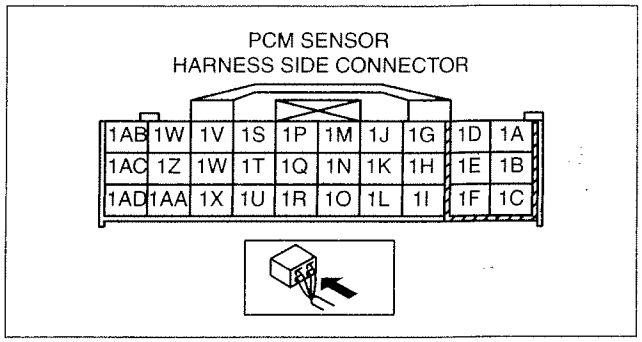
Note
- Perform the following inspection only when directed.

Voltage Inspection

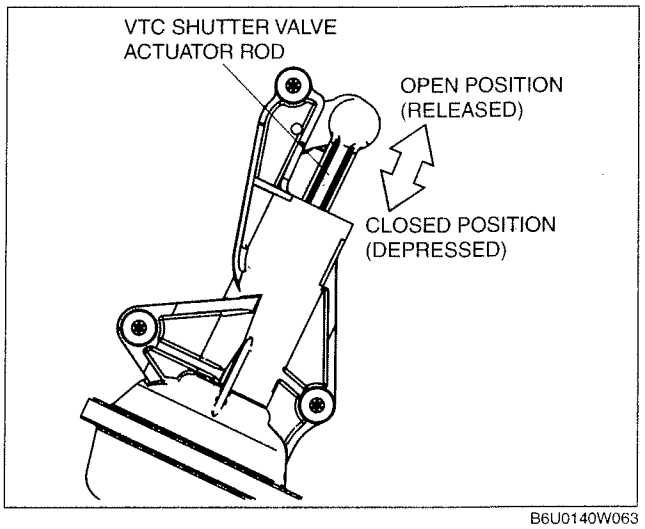
1. Turn the ignition switch to ON position (Engine OFF).
2. Verify that the PCM terminal 1N voltage is as shown in the following table when the VTC shutter valve actuator rod is depressed and released by hand.
   - If not as specified, perform the "Circuit Open/Short Inspection".
     — If there is no open or short circuit, replace the intake manifold.

VTC shutter valve switch output voltage

Condition	PCM terminal 1N
Released (Open position)	Approx. 5.0 V
Depressed (Closed position)	Less than 0.4 V



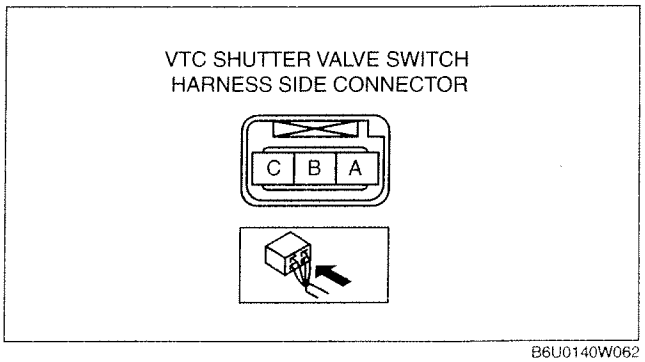
B6U0140W061



B6U0140W063

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following harnesses for open or short circuit. (Continuity check)



B6U0140W062

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the harness.
  — VTC shutter valve switch terminal A (harness-side) and PCM terminal 2K (harness-side)
  — VTC shutter valve switch terminal B (harness-side) and PCM terminal 2H (harness-side)
  — VTC shutter valve switch terminal C (harness-side) and PCM terminal 1N (harness-side)

Short circuit
- If there is continuity, there is a short circuit. Repair or replace the harness.
  - — VTC shutter valve switch terminal A (harness-side) and power supply
  - — VTC shutter valve switch terminal A (harness-side) and body GND
  - — VTC shutter valve switch terminal B (harness-side) and power supply
  - — VTC shutter valve switch terminal C (harness-side) and power supply
  - — VTC shutter valve switch terminal C (harness-side) and body GND

ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [L3]

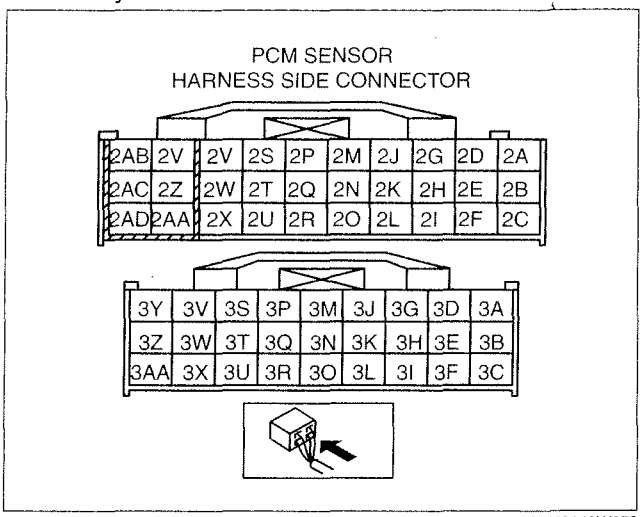
C6U014041609W01

Note
- Perform the following inspection only when directed.

Voltage Inspection
1. Turn the ignition key to ON position (Engine OFF).
2. Verify that the PCM terminal 2A and 3D change smoothly while throttle valve is gradually opened.
   - If as verified, go to next step.
   - If not as verified, perform the "Circuit Open/Short Inspection".
     - — If there is no open or short circuit, replace the throttle body.
3. Verify that the PCM terminal 2A and 3D voltages are as shown in the following table.
   - If voltage is not as following table, perform the "Circuit Open/Short Inspection".
     - — If there is no open or short circuit, replace accelerator pedal. (See 01–13A–13 ACCELERATOR PEDAL REMOVAL/INSTALLATION [L3].)

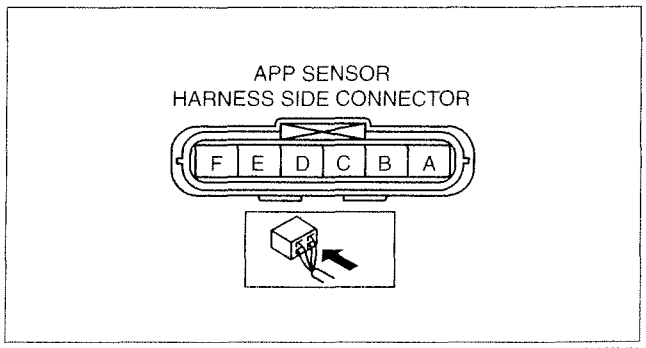
APP sensor output voltage

Condition	PCM terminal 3D (APP sensor No.1)	PCM terminal 2A (APP sensor No.2)
Accelerator pedal released	1.55—1.62 V	1.01—1.07 V
Accelerator pedal depressed	3.49—4.09 V	2.94—3.54 V



B6U0140W072

Circuit Open/Short Inspection
1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit. (Continuity check)



B6U0140W071

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — APP sensor terminal A (harness-side) and PCM terminal 2K (harness-side)
  - — APP sensor terminal B (harness-side) and PCM terminal 2H (harness-side)
  - — APP sensor terminal C (harness-side) and PCM terminal 2A (harness-side)
  - — APP sensor terminal D (harness-side) and PCM terminal 3G (harness-side)
  - — APP sensor terminal E (harness-side) and PCM terminal 3A (harness-side)
  - — APP sensor terminal F (harness-side) and PCM terminal 3D (harness-side)

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — APP sensor terminal A (harness-side) and power supply
  - — APP sensor terminal A (harness-side) and body GND
  - — APP sensor terminal B (harness-side) and power supply
  - — APP sensor terminal C (harness-side) and power supply
  - — APP sensor terminal C (harness-side) and body GND
  - — APP sensor terminal D (harness-side) and power supply
  - — APP sensor terminal D (harness-side) and body GND
  - — APP sensor terminal E (harness-side) and power supply
  - — APP sensor terminal F (harness-side) and power supply
  - — APP sensor terminal F (harness-side) and body GND

THROTTLE POSITION (TP) SENSOR INSPECTION [L3]

C6U014018910W01

Note

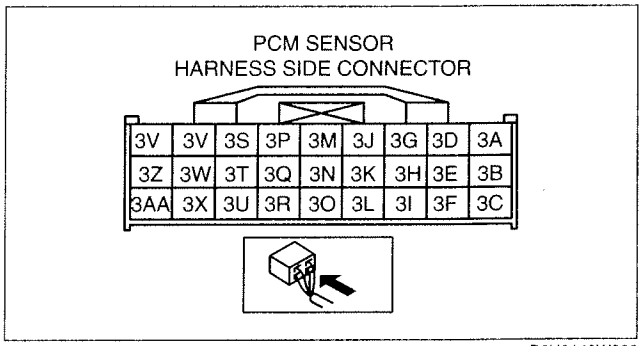
- Perform the following inspection only when directed.

Voltage Inspection

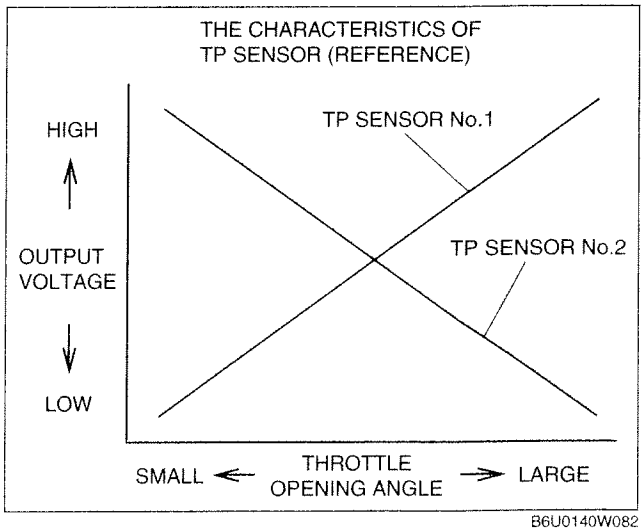
1. Verify that no DTC related to APP sensor has been detected.
   - If any DTCs related to APP sensor have been detected, perform the DTC inspection. (See 01–02A–13 DTC TABLE [L3])
2. Start the engine and warm it up (ECT: **more than 80°C {176 °F}**.
3. Turn the ignition switch to ON position (Engine OFF).
4. Verify that the PCM terminal 3M and 3J change smoothly while throttle valve is gradually opened.
   - If as verified, go to next step.
   - If not as verified, perform the "Circuit Open/Short Inspection".
     - — If there is no open or short circuit, replace the throttle body.
5. Verify that the PCM terminal 3M and 3J voltages are as shown in the following table.
   - If voltage is not as following table, perform the "Circuit Open/Short Inspection".
     - — If there is no open or short circuit, replace the throttle body.

TP sensor output voltage

Condition	PCM terminal 3M (TP sensor No.1)	PCM terminal 3J (TP sensor No.2)
APP close	0.53—1.00 V	4.00—4.47 V
APP open	4.25—4.75 V	0.25—0.75 V



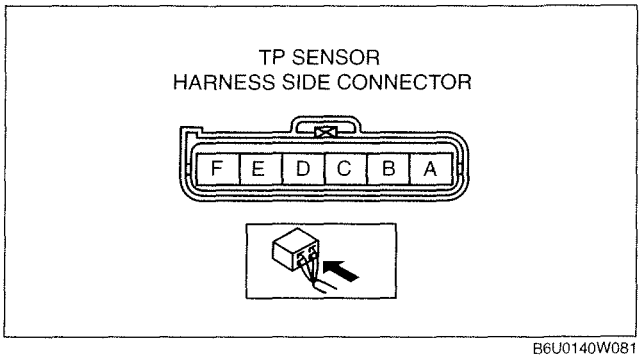
B6U0140W083



B6U0140W082

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit. (Continuity check)



B6U0140W081

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Throttle body terminal A (harness-side) and PCM terminal 3M (harness-side)
  - — Throttle body terminal B (harness-side) and PCM terminal 3N (harness-side)
  - — Throttle body terminal C (harness-side) and PCM terminal 3J (harness-side)
  - — Throttle body terminal D (harness-side) and PCM terminal 3K (harness-side)

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — Throttle body terminal A (harness-side) and power supply
  - — Throttle body terminal A (harness-side) and body GND
  - — Throttle body terminal B (harness-side) and power supply
  - — Throttle body terminal B (harness-side) and body GND
  - — Throttle body terminal C (harness-side) and power supply
  - — Throttle body terminal C (harness-side) and body GND
  - — Throttle body terminal D (harness-side) and power supply

MASS AIR FLOW (MAF) SENSOR INSPECTION [L3]

C6U014013210W01

Visual Inspection

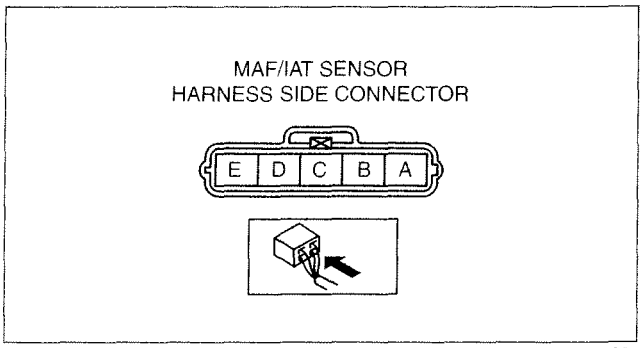
Note

- Perform the following inspection only when directed.

1. Visually inspect for the following on the MAF sensor.
   - Damage
   - Cracks
   - Bent terminals
   - Terminal rust
     - — If any of the above are found, replace the MAF sensor.
     - — If the MAF PID value is out of specification, carry out the "Circuit Open/Short Inspection".

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Disconnect the MAF sensor connector.
3. Inspect the following wiring harnesses for open or short circuit. (Continuity check)



B6U0140W091

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — MAF sensor terminal A (harness-side) and main relay terminal C (harness-side)
  - — MAF sensor terminal B (harness-side) and PCM terminal 2AC (harness-side)
  - — MAF sensor terminal C (harness-side) and PCM terminal 1P (harness-side)

Short circuit
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — MAF sensor terminal A (harness-side) and body GND
  - — MAF sensor terminal C (harness-side) and power supply
  - — MAF sensor terminal C (harness-side) and body GND
  - — MAF sensor terminal B (harness-side) and power supply

Specification

Condition	Intake MAF (g/s)		Engine load calculated value (%)	
	MTX	ATX	MTX	ATX
Idle*1	2.50—2.70	2.72—2.94	15.9—17.1	17.1—18.5
Engine Speed 2,500 rpm*2	7.56—8.18	8.00—8.66	13.3—14.3	14.2—15.2

*1 : 650—750 rpm
*2 : No load or neutral position

INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [L3]

C6U014018845W01

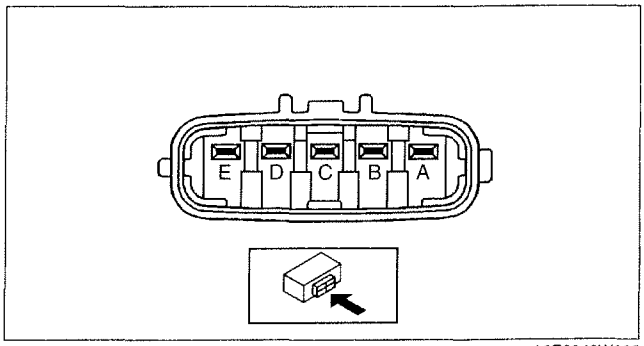
Resistance Inspection

Note
- Perform the following inspection only when directed.

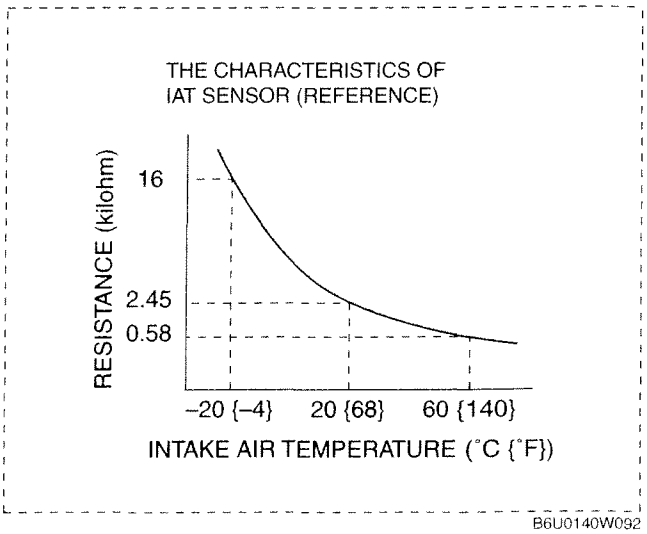
1. Disconnect MAF/IAT sensor.
2. Measure the resistance between the MAF/IAT sensor terminals D and E using an ohmmeter.
   - If not as specified, replace the MAF/IAT sensor.
   - If the MAF/IAT sensor is okay, but PID are out of specification, perform the "Circuit Open/ Short Inspection".

Specification

Ambient temperature (°C {°F})	Resistance (kilohm)
–20 {–4}	13.6—18.4
20 {68}	2.21—2.69
60 {140}	0.493—0.667



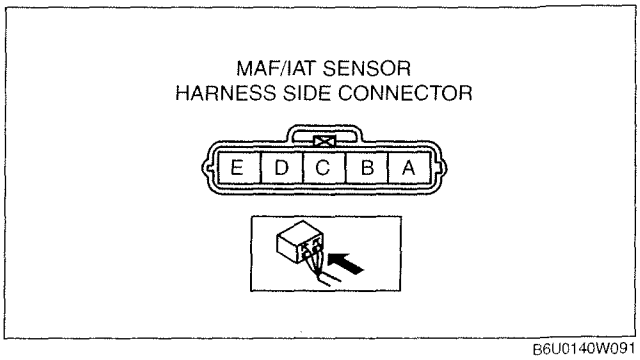
A6E3940W005



B6U0140W092

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit. (Continuity check)



B6U0140W091

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — MAF/IAT sensor terminal D (harness-side) and PCM terminal 2E (harness-side)
  - — MAF/IAT sensor terminal E (harness-side) and PCM terminal 2H (harness-side)

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — MAF/IAT sensor terminal E (harness-side) and power supply
  - — MAF/IAT sensor terminal D (harness-side) and power supply
  - — MAF/IAT sensor terminal D (harness-side) and body GND

ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [L3]

C6U014018840W01

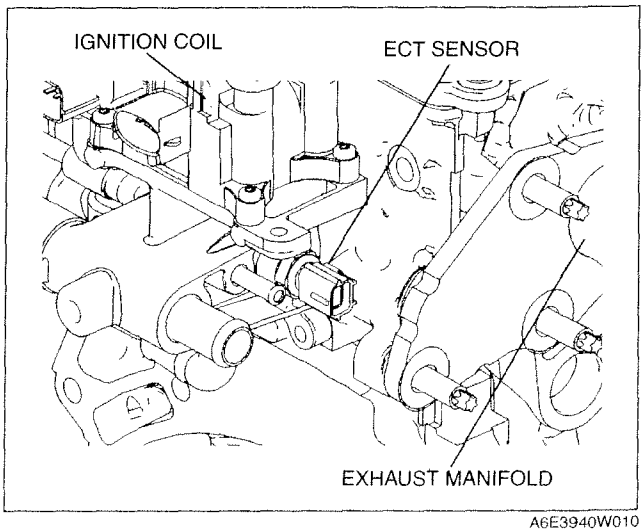
Warning

- **A hot engine can cause severe burns. Turn off the engine and wait until it is cool before removing the ECT sensor.**

1. Drain the engine coolant. (See 01–12–2 COOLING SYSTEM SERVICE WARNINGS.)
2. Disconnect the ECT sensor connector.
3. Remove the ECT sensor.
4. Install in the reverse order of removal.

Tightening torque
10—14 N·m
{1.02—1.42 kgf·m, 7.38—10.32 ft·lbf}

5. Refill the engine coolant. (See 01–12–2 COOLING SYSTEM SERVICE WARNINGS.)



A6E3940W010

ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [L3]

C6U014018840W02

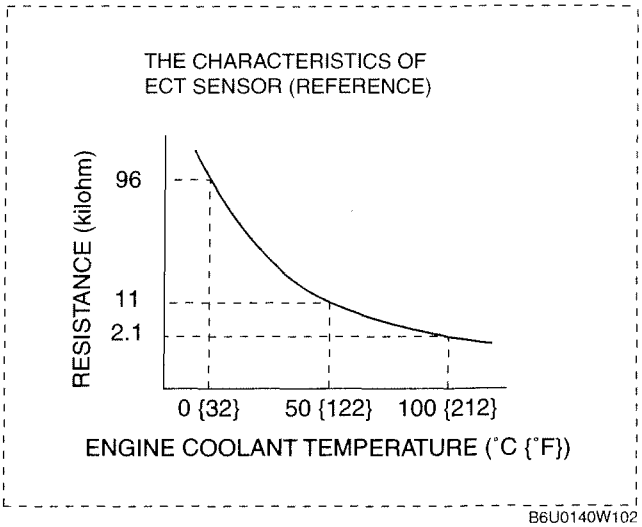
Note
- Perform the following inspection only when directed.

ECT Sensor Resistance Inspection

1. Drain the engine coolant. (See 01–12–2 COOLING SYSTEM SERVICE WARNINGS.)
2. Remove the ECT sensor (located above the starter).
3. Place the ECT sensor in water with a thermometer, and heat the water gradually.
4. Measure the resistance between the ECT sensor terminals A and B using an ohmmeter.
   - If not as specified, replace the ECT sensor.
   - If the ECT sensor is okay, but PID value is out of specification, perform the "Circuit Open/ Short Inspection".

Specification

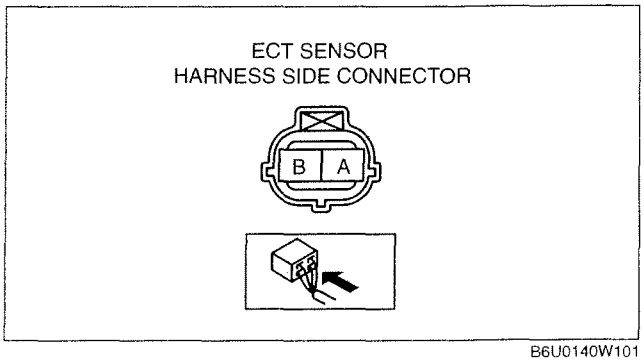
Water temperature (°C {°F})	Resistance (kilohms)
20 {68}	35.48—39.20
70 {158}	5.07—5.60
80 {176}	3.65—4.02



B6U0140W102

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit. (Continuity check)



B6U0140W101

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — ECT sensor terminal A (harness-side) and PCM terminal 1M (harness-side)
  - — ECT sensor terminal B (harness-side) and PCM terminal 2H (harness-side)

Short circuit
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — ECT sensor terminal A (harness-side) and power supply
  - — ECT sensor terminal A (harness-side) and body GND
  - — ECT sensor terminal B (harness-side) and power supply

BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION [L3]

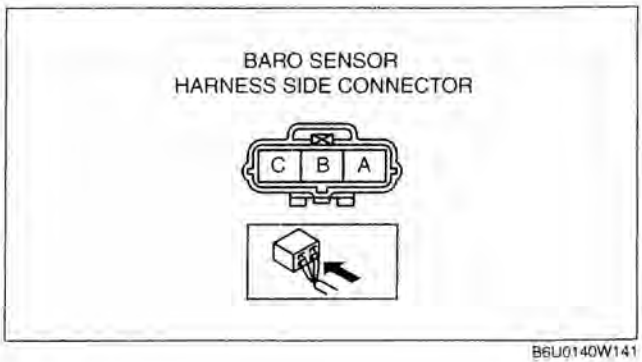
C6U014018211W01

Note
- Perform the following inspection only when directed.
- The following vacuum values are indicated by relative pressure from the BARO sensor.

1. Connect the WDS or equivalent to the DLC-2.
2. Turn the ignition switch to ON.
3. Select BARO on the WDS or equivalent.
4. Verify that the BARO PID (pressure) and barometric pressure are practically equal.
   - If not as verified, perform the "Circuit Open/Short Inspection".
     — If there is no open or short circuit, replace the BARO sensor.
   - If as verified, go to next step.
5. Apply vacuum of **–25.0 kPa {–187 mmHg, –7.38 inHg}** to the BARO sensor, and verify that the BARO variation from that of Step 4 is approx. **25.0 kPa {187 mmHg, 7.38 inHg}**.
   - If not as verified, perform the "Circuit Open/Short inspection".
     — If there is no open or short circuit, replace the BARO sensor.

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit. (Continuity check)



B6U0140W141

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  — BARO sensor terminal A (harness-side) and PCM terminal 1G
  — BARO sensor terminal B (harness-side) and PCM terminal 2H
  — BARO sensor terminal C (harness-side) and PCM terminal 2K

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  — BARO sensor terminal C (harness-side) and power supply
  — BARO sensor terminal C (harness-side) and body GND
  — BARO sensor terminal A (harness-side) and power supply
  — BARO sensor terminal A (harness-side) and body GND

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION [L3]

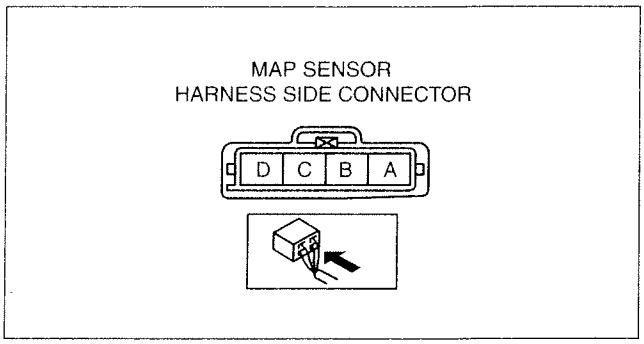
C6U014018211W02

Note
- Perform the following inspection only when directed.
- The following vacuum values are indicated by relative pressure from the MAP sensor.

1. Connect the WDS or equivalent to the DLC-2.
2. Turn the ignition switch to ON (Engine OFF).
3. Select MAP PID on the WDS or equivalent.
4. Verify that the MAP PID (pressure) and barometric pressure are practically equal.
   - If not as verified, perform the "Circuit Open/Short Inspection".
     — If there is no open or short circuit, replace the MAP sensor.
   - If as verified, go to next step.
5. Apply vacuum of **–25.0 kPa {–187 mmHg, –7.38 inHg}** to the MAP sensor, and verify that the MAP variation from that of Step 4 is approx. **25.0 kPa {187 mmHg, 7.38 inHg}**.
   - If not as verified, perform the "Circuit Open/Short inspection".
     — If there is no open or short circuit, replace the barometric pressure sensor.

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit. (Continuity check)



B6U0140W151

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  — MAP sensor terminal A (harness-side) and PCM terminal 2H
  — MAP sensor terminal D (harness-side) and PCM terminal 1J
  — MAP sensor terminal C (harness-side) and PCM terminal 2K

Short circuit
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  — MAP sensor terminal C (harness-side) and power supply.
  — MAP sensor terminal C (harness-side) and body GND.
  — MAP sensor terminal D (harness-side) and power supply.
  — MAP sensor terminal D (harness-side) and body GND

KNOCK SENSOR (KS) INSPECTION [L3]

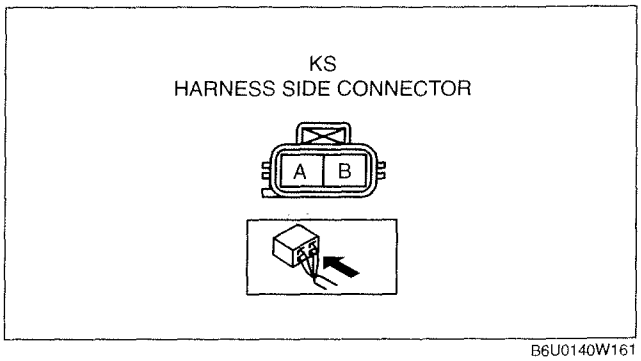
C6U014018921W01

Note
- Perform the following test only when directed.

Resistance Inspection
1. Turn the ignition switch to LOCK.
2. Disconnect the KS connector.
3. Measure the resistance between the KS terminals A and B using an ohmmeter.
   - If not as specified, replace the KS.
   - If the KS is okay, but PID value is out of specification, perform the "Circuit Open/Short Inspection".

Specification
Approx. 4.87 megohms

Circuit Open/Short Inspection
1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit. (Continuity check)



B6U0140W161

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  — KS terminal A (harness-side) and PCM terminal 2S (harness-side)
  — KS terminal B (harness-side) and PCM terminal 2P (harness-side)

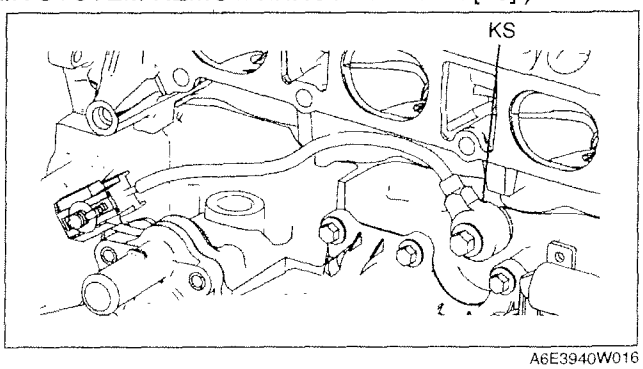
Short circuit
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  — KS terminal A (harness-side) and power supply
  — KS terminal A (harness-side) and body GND
  — KS terminal B (harness-side) and power supply
  — KS terminal B (harness-side) and body GND

KNOCK SENSOR (KS) REMOVAL/INSTALLATION [L3]

C6U014018921W02

1. Remove the intake manifold. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
2. Remove the KS attachment bolt to remove the KS.
3. Install in the reverse order of removal.

Tightening torque
16.2—23.8 N·m
{1.66—2.42 kgf·m, 12.0—17.5 ft·lbf}



A6E3940W016

CAMSHAFT POSITION (CMP) SENSOR INSPECTION [L3]

C6U014018200W01

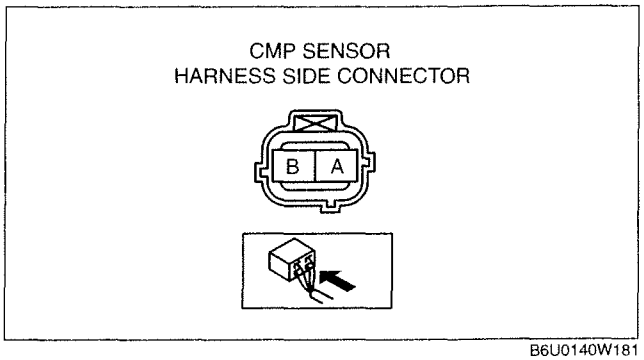
Caution
- **When foreign material such as an iron chip is on the CMP sensor, it can cause abnormal output from the sensor because of flux turbulence and adversely affect the engine control. Be sure there is no foreign material on the CMP sensor when replacing.**

Note
- Perform the following inspection only when directed.

Resistance Inspection
1. Disconnect the CMP sensor connector.
2. Measure the resistance between CMP sensor terminals A and B using an ohmmeter.
   - If not as specified, replace the CMP sensor.
   - If CMP sensor resistance is okay, perform the "Circuit Open/Short Inspection".

Specification
400—550 ohms

Circuit Open/Short Inspection
1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit. (Continuity check)



B6U0140W181

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  — CMP sensor terminal A (harness-side) and PCM terminal 2M (harness-side)
  — CMP sensor terminal B (harness-side) and PCM terminal 2J (harness-side)

Short circuit
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  — CMP sensor terminal A (harness-side) and power supply
  — CMP sensor terminal A (harness-side) and body GND
  — CMP sensor terminal B (harness-side) and power supply
  — CMP sensor terminal B (harness-side) and body GND

CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [L3]

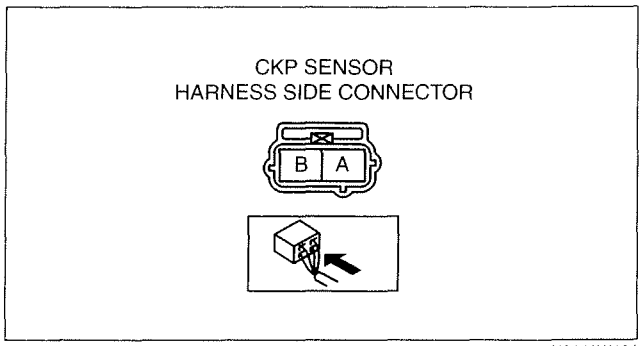
C6U014018230W01

Note
- Perform the following inspection only when directed.

Resistance Inspection
1. Disconnect the CKP sensor connector.
2. Measure the resistance between CKP sensor terminals A and B using an ohmmeter.
   - If not as specified, replace the CKP sensor.
   - If CKP sensor resistance is okay, but RPM PID value is out of specification, perform the "Circuit Open/Short Inspection".

Specification
400—550 ohms

Circuit Open/Short Inspection
1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit. (Continuity check)



B6U0140W191

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — CKP sensor terminal A (harness-side) and PCM terminal 2D (harness-side)
  - — CKP sensor terminal B (harness-side) and PCM terminal 2G (harness-side)

Short circuit
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — CKP sensor terminal A (harness-side) and power supply
  - — CKP sensor terminal A (harness-side) and body GND
  - — CKP sensor terminal B (harness-side) and power supply
  - — CKP sensor terminal B (harness-side) and body GND

CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [L3]

C6U014018230W02

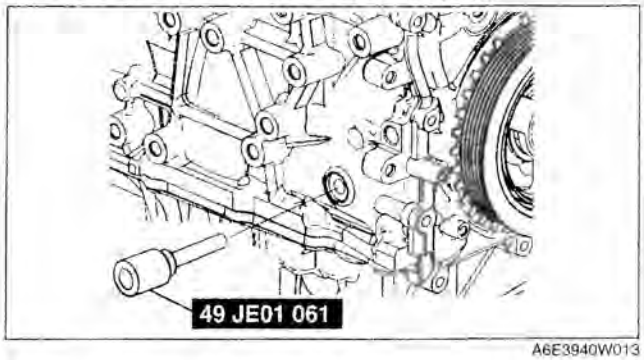
Removal

1. Perform the following procedure to making the working space.
   (1) Remove the Front wheel (RH).
   (2) Remove the splash shield.
2. Disconnect the CKP sensor connector.
3. Remove the installation bolts to remove the CKP sensor.

Installation

Caution
- **When foreign material, such as an iron chips, gets on the CKP sensor, it can cause abnormal output from the sensor because of flux turbulence and adversely affect engine control. Be sure there is no foreign material on the CKP sensor when replacing.**

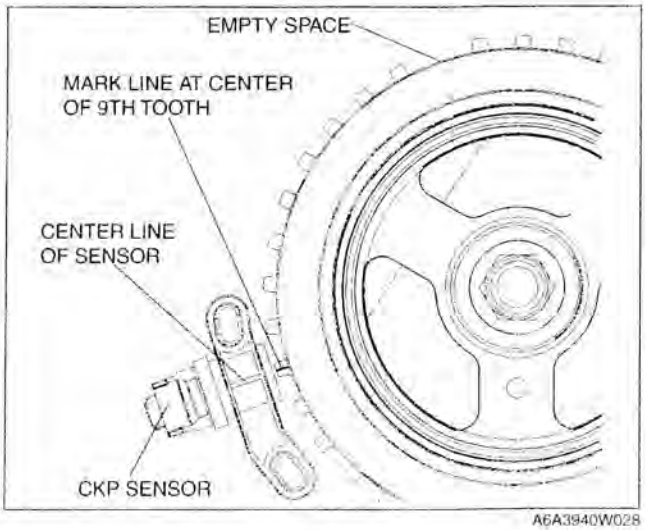
1. Perform the following procedure so that piston No.1 is at the top dead center.
   (1) Remove the drive shaft (RH). (See 03–13–12 DRIVE SHAFT REMOVAL/INSTALLATION [L3].)
   (2) Remove the cylinder block lower blind plug and install the **SST**.
   (3) Turn the crankshaft pulley to the clockwise until it stops.



A6E3940W013

2. Using a straight edge, draw a straight line directly in the center of the ninth tooth of the crankshaft pulley pulse wheel (counting counterclockwise from the empty space).

Caution
- **If the line is not accurately drawn, ignition timing, fuel injection and other engine control systems will be adversely effected. Draw the straight line carefully using a straight edge.**



A6A3940W028

3. Align the center line of the crankshaft position sensor and the line drawn in Step 2, then install the sensor.
4. Install the CKP sensor fitting bolts.

Tightening torque
5.5—7.5 N·m {56—76 kgf·cm, 4.1—5.5 ft·lbf}

5. Remove the **SST** then install the cylinder block lower blind plug.

Tightening torque
20 N·m {2.0 kgf·m, 15 ft·lbf}

6. Install the front drive shaft (RH). (See 03–13–12 DRIVE SHAFT REMOVAL/INSTALLATION [L3].)

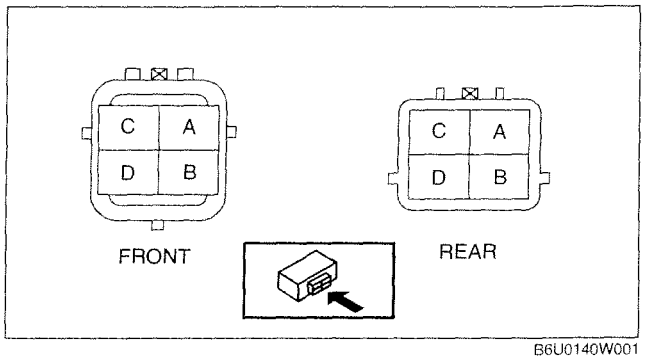
HEATED OXYGEN SENSOR (HO2S) INSPECTION [L3]

C6U014018861W01

HO2S Voltage Inspection

Note
- Perform the following inspection only when directed.

1. Warm up the engine and idle it.
2. Disconnect the HO2S connector.
3. Connect the voltmeter test leads to the following HO2S terminals:
   - HO2S (front and rear)
     - — (+) lead—terminal A
     - — (–) lead—terminal B
4. With the vehicle stopped, run the engine at **3,000 rpm** until the voltmeter moves between **0.5 and 0.7 V**.
5. Verify that the measurement voltage changes when the engine speed increases and decreases suddenly several times.
   - If not as specified, replace the HO2S.
   - If the HO2S is okay, but PIDs value are out of specification, perform the "Circuit Open/Short Inspection".



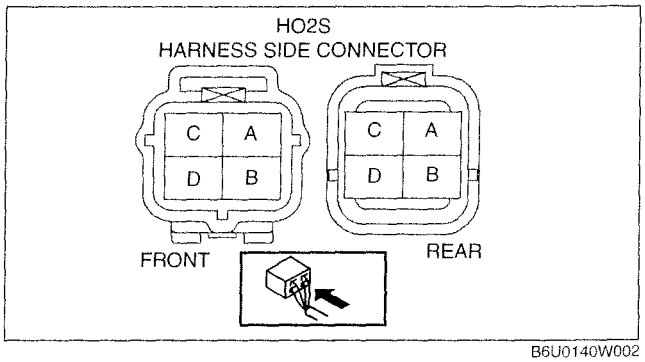
B6U0140W001

Specification

Engine speed	Voltage (V)
Acceleration	0.5—1.0
Deceleration	0—0.5

Circuit Open/Short Inspection (Sensor)

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit. (Continuity check)



B6U0140W002

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.

  Front
  - — HO2S terminal A (harness-side) and PCM terminal 1AB (harness-side)
  - — HO2S terminal B (harness-side) and PCM terminal 2H (harness-side)

  Rear
  - — HO2S terminal A (harness-side) and PCM terminal 1Y (harness-side)
  - — HO2S terminal B (harness-side) and PCM terminal 2H (harness-side)

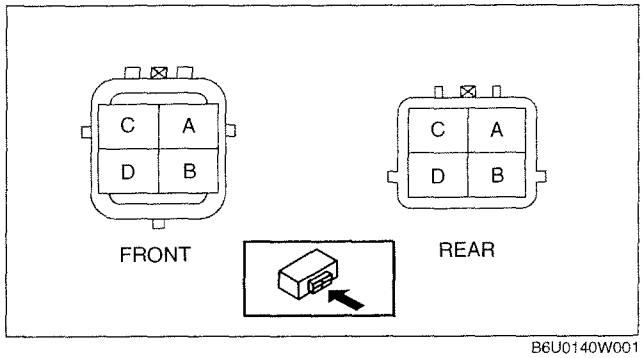
Short circuit
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.

  Front and Rear
  - — HO2S terminal A (harness-side) and body GND
  - — HO2S terminal A (harness-side) and power supply
  - — HO2S terminal B (harness-side) and power supply

HO2S Heater Resistance Inspection

1. Disconnect the HO2S connector.
2. Measure the resistance between the HO2S terminals C and D.
   - If not as specified, replace the HO2S.
   - If the HO2S heater is okay, but PID value is out of specification, perform the "Circuit Open/Short Inspection".

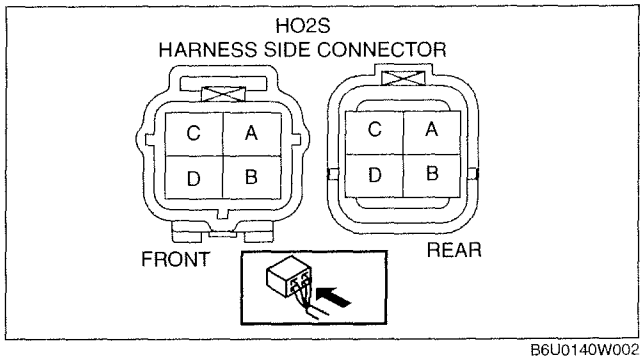
Specification
Front: 3.0—3.6 ohms
Rear: 5—7 ohms



B6U0140W001

Circuit Open/Short Inspection (Heater)

1. Disconnect the PCM connector. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3].)
2. Inspect the following wiring harnesses for open or short circuit. (Continuity check)



B6U0140W002

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  Front
  — HO2S terminal C (harness-side) and main relay terminal C (harness-side)
  — HO2S terminal D (harness-side) and PCM terminal 4A (harness-side)
  Rear
  — HO2S terminal C (harness-side) and main relay terminal C (harness-side)
  — HO2S terminal D (harness-side) and PCM terminal 4D (harness-side)

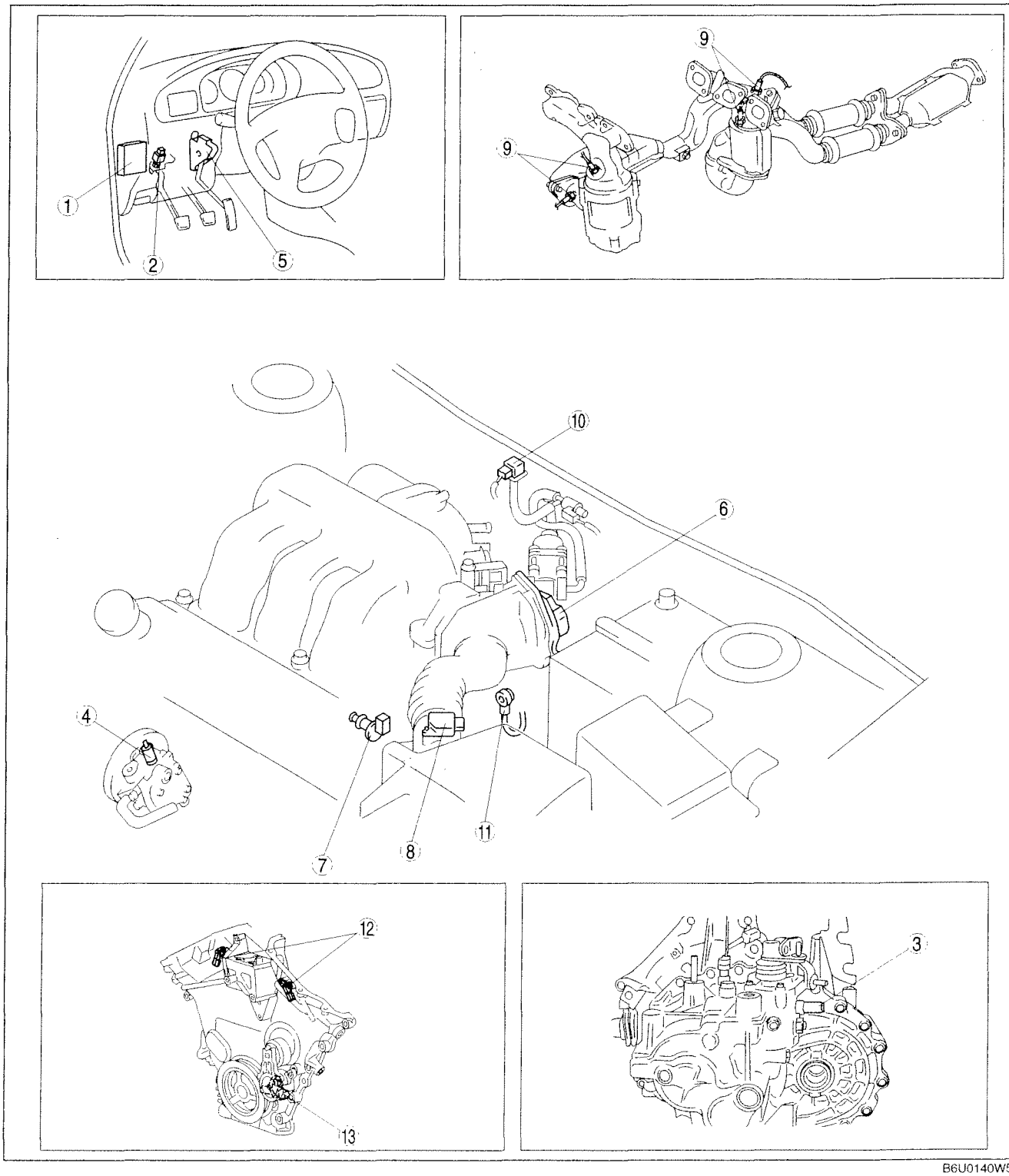
Short circuit

- If there is no continuity, there is a short circuit. Repair or replace the wiring harness.
  Front and rear
  — HO2S terminal C (harness-side) and body GND
  — HO2S terminal D (harness-side) and power supply
  — HO2S terminal D (harness-side) and body GND

01–40B CONTROL SYSTEM [AJ]

CONTROL SYSTEM COMPONENT LOCATION INDEX [AJ]

C6U014018881W04



B6U0140W534

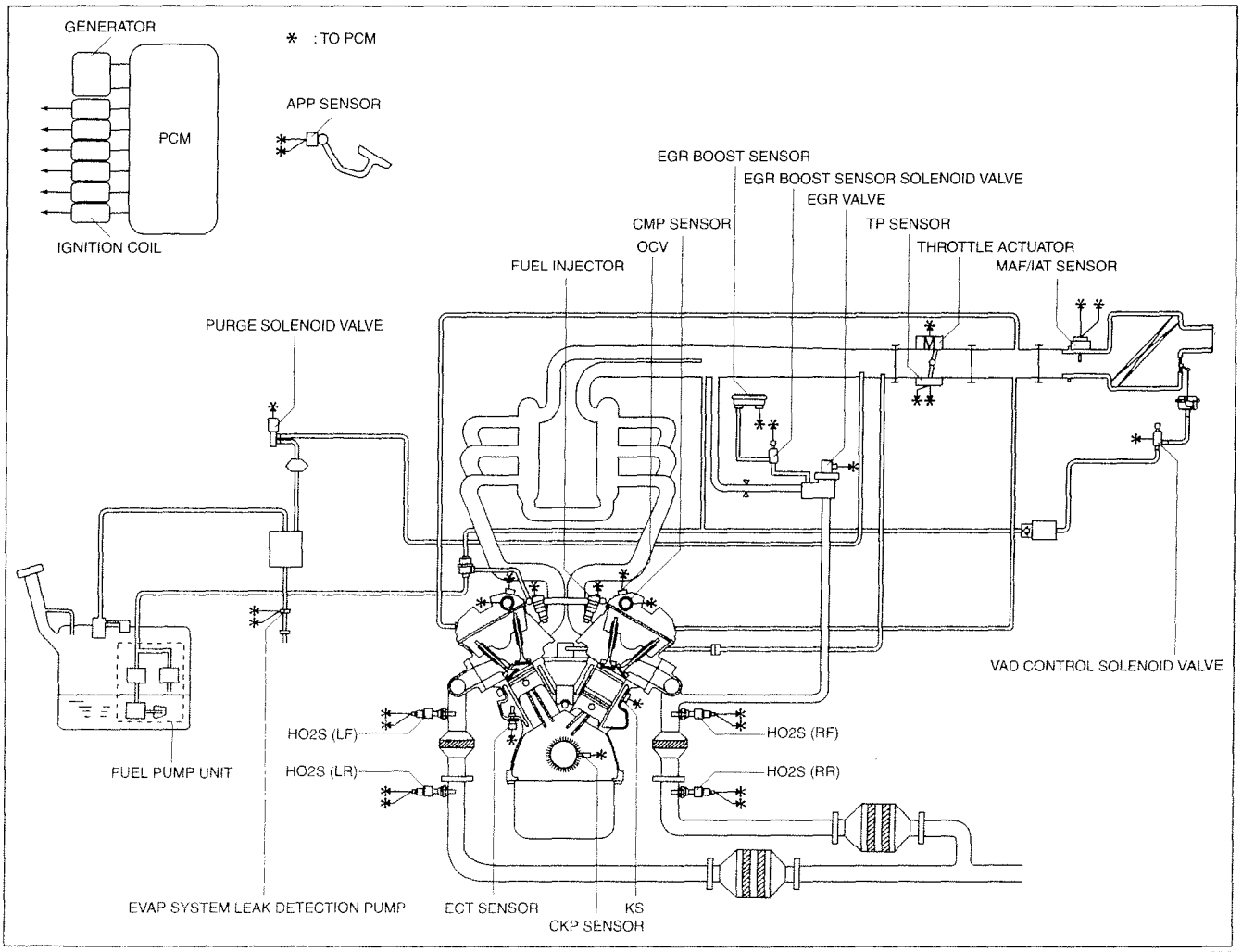
1	PCM (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].) (See 01–40B–6 PCM INSPECTION [AJ].) (See 01–40B–23 PCM REPLACEMENT [AJ].)
2	Clutch switch (See 01–40B–23 CLUTCH SWITCH INSPECTION [AJ].)

3	Neutral switch (See 01–40B–24 NEUTRAL SWITCH INSPECTION [AJ].)
4	PSP switch (See 01–40B–25 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [AJ].)
5	APP sensor (See 01–40B–26 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [AJ].)

6	TP sensor and throttle actuator (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].) (See 01–13B–8 THROTTLE ACTUATOR INSPECTION [AJ].)
7	ECT sensor (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [AJ].) (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [AJ].)
8	MAF/IAT sensor (See 01–40B–29 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [AJ].) (See 01–40B–30 MASS AIR FLOW (MAF) SENSOR INSPECTION [AJ].)
9	HO2S (See 01–40B–31 HEATED OXYGEN SENSOR (HO2S) INSPECTION [AJ].) (See 01–40B–32 HEATED OXYGEN SENSOR (HO2S) HEATER INSPECTION [AJ].)
10	EGR boost sensor (See 01–40B–34 EGR BOOST SENSOR INSPECTION [AJ].)
11	KS (See 01–40B–35 KNOCK SENSOR (KS) REMOVAL/INSTALLATION [AJ].) (See 01–40B–35 KNOCK SENSOR (KS) INSPECTION [AJ].)
12	CMP sensor (See 01–40B–36 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [AJ].) (See 01–40B–36 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [AJ].)
13	CKP sensor (See 01–40B–37 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [AJ].) (See 01–40B–37 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [AJ].)

CONTROL SYSTEM DIAGRAM [AJ]

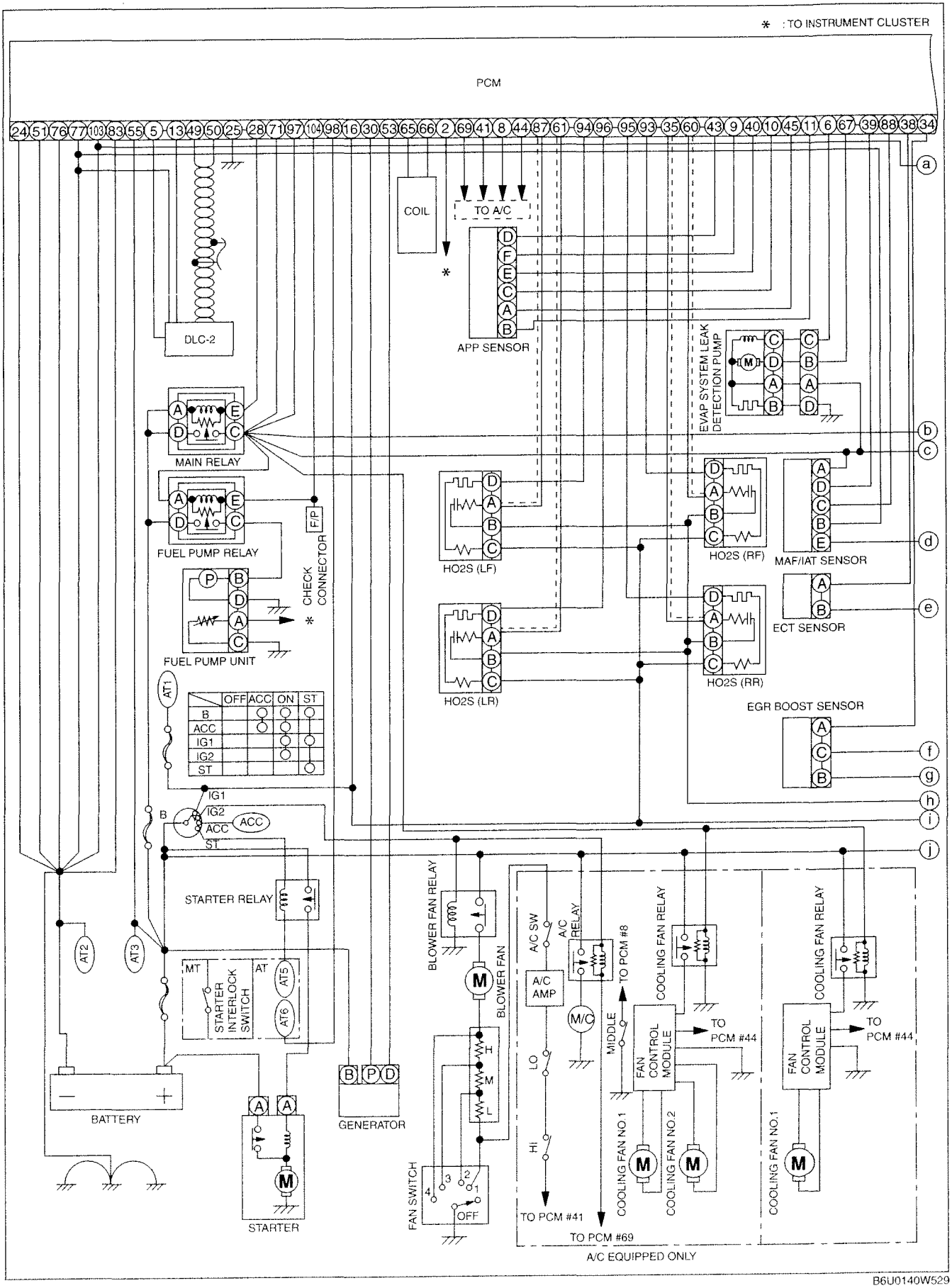
C6U014018881W05



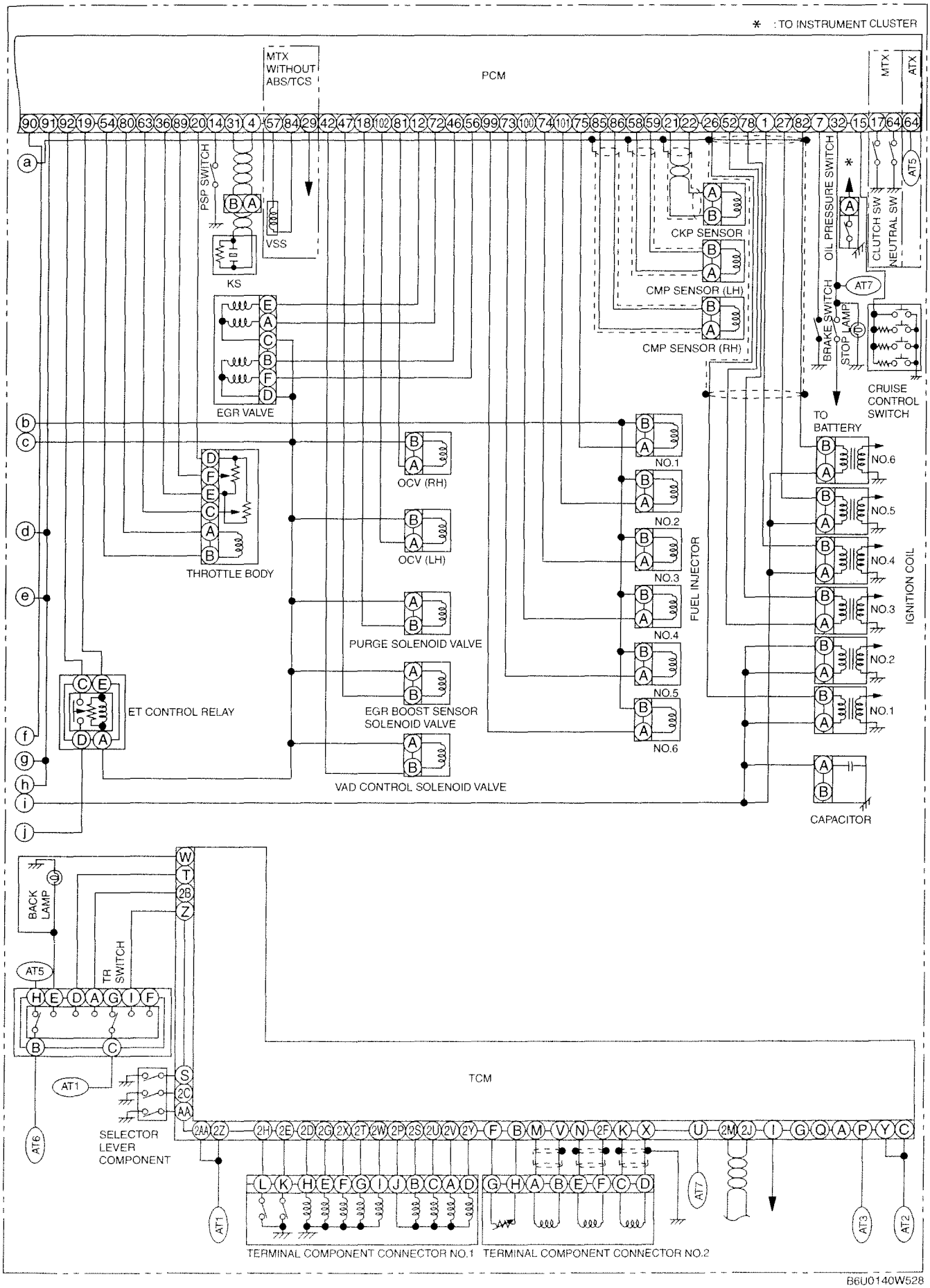
B6U0140W532

CONTROL SYSTEM WIRING DIAGRAM [AJ]

C6U014018881W06



B6U0140W529


* : TO INSTRUMENT CLUSTER
MTX WITHOUT ABS/TCS
PCM
MTX
ATX
PSP SWITCH
VSS
KS
EGR VALVE
CKP SENSOR
CMP SENSOR (LH)
CMP SENSOR (RH)
OIL PRESSURE SWITCH
CLUTCH SW
NEUTRAL SW
BRAKE SWITCH
STOP LAMP
CRUISE CONTROL SWITCH
TO BATTERY
THROTTLE BODY
OCV (RH)
OCV (LH)
PURGE SOLENOID VALVE
EGR BOOST SENSOR SOLENOID VALVE
VAD CONTROL SOLENOID VALVE
ET CONTROL RELAY
FUEL INJECTOR
NO.1
NO.2
NO.3
NO.4
NO.5
NO.6
IGNITION COIL
CAPACITOR
BACK LAMP
TR SWITCH
SELECTOR LEVER COMPONENT
TCM
TERMINAL COMPONENT CONNECTOR NO.1
TERMINAL COMPONENT CONNECTOR NO.2
B6U0140W528

PCM REMOVAL/INSTALLATION [AJ]

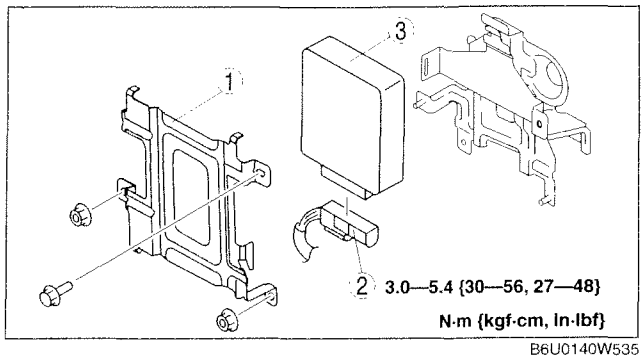
C6U014018880W04

Note

- To replace the PCM, connect the WDS and perform the PCM configuration. (See 01–40B–23 PCM REPLACEMENT [AJ].)

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.

1	PCM cover
2	PCM connector
3	PCM

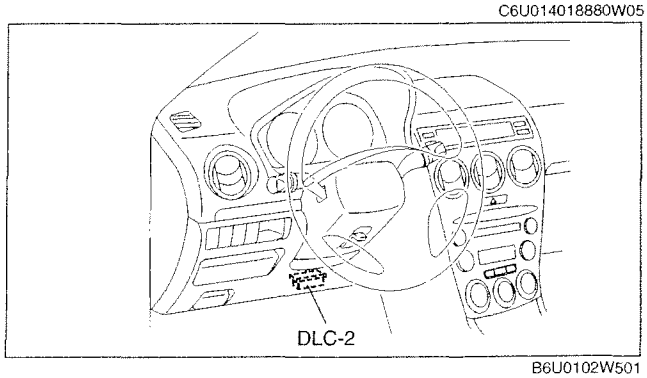


B6U0140W535

PCM INSPECTION [AJ]

C6U014018880W05

1. Connect the WDS or equivalent to the DLC-2.
2. Turn the ignition switch to ON position.
3. Measure the PID value.
   - If PID value is not within the specification, follow the instructions in Action column.



B6U0102W501

PID/DATA MONITOR table (Reference)

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item (s)	PCM terminal
ACCS (A/C relay)	On/Off	A/C is operating: On Ignition switch is ON: Off	• Inspect following PIDs: ACSW, ECT, RPM, TP REL • A/C switch (See 07–40–18 CLIMATE CONTROL UNIT INSPECTION.)	69
ACSW (A/C switch)	On/Off	A/C switch and fan switch are on: On A/C switch is off: Off	• A/C switch (See 07–40–18 CLIMATE CONTROL UNIT INSPECTION.)	41
ALTF (Generator field coil control duty value)	%	Ignition switch is ON: 0% Idling, E/L is operating: Duty value rises	• Inspect following PIDs: ALTT V, ECT, IAT, RPM, VBAT	53
ALTT V (Generator output voltage)	V	Ignition switch is ON: 0 V Idling: 14—16 V	• Generator (See 01–17–5 GENERATOR INSPECTION.)	30
APP (Accelerator pedal position)	%	CTP: Approx. 0% WOT: Approx. 99.2%	• Inspect following PIDs: APP1, APP2 • APP sensor (See 01–40B–26 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [AJ].)	—
APP1 (APP sensor No.1)	%	Accelerator pedal is released: 31.0—32.4% Accelerator pedal is depressed: 69.8—81.8%	• APP sensor (See 01–40B–26 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [AJ].)	9
	V	Accelerator pedal is released: 1.55—1.62 V Accelerator pedal is depressed: 3.49—4.09 V		
APP2 (APP sensor No.2)	%	Accelerator pedal is released: 20.2—21.4% Accelerator pedal is depressed: 58.8—70.8%	• APP sensor (See 01–40B–26 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [AJ].)	10
	V	Accelerator pedal is released: 1.01—1.07 V Accelerator pedal is depressed: 2.94—3.54 V		
ARPMDES (Target engine speed)	RPM	Idling (no load): 700—800 RPM	• Inspect following PIDs: ACSW, ALTT V, ECT, IAT, INGEAR, MAF, MAP, RPM, PSP, TP REL • CKP sensor (See 01–40B–37 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [AJ].)	—
B+ (Battery positive voltage)	V	Ignition switch is ON: B+	• Main relay (See 09–21–6 RELAY INSPECTION.) • Battery (See 01–17–1 BATTERY INSPECTION.)	55, 71, 97
BARO (Barometric pressure)	kPa, Bar, psi	Ignition switch is ON at sea level: Approx. 101 kPa {1.01 Bar, 14.6 psi}	• EGR boost sensor (See 01–40B–34 EGR BOOST SENSOR INSPECTION [AJ].)	34
	V	Ignition switch is ON at sea level: Approx. 4.1 V		

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item (s)	PCM terminal
BARO/EGR (EGR boost sensor solenoid valve)	On/Off	Ignition switch is ON: Off Idling: Off	• EGR boost sensor solenoid valve (See 01–16–22 EGR BOOST SENSOR SOLENOID VALVE INSPECTION [AJ].)	47
BOO (Brake switch No.1)	On/Off	Brake pedal is depressed: On Brake pedal is released: Off	• Brake switch (See 04–11–7 BRAKE SWITCH INSPECTION.)	32
BPA (Brake switch No.2)	On/Off	Brake pedal is depressed: Off Brake pedal is released: On	• Brake switch (See 04–11–7 BRAKE SWITCH INSPECTION.)	7
CATT11 (Estimated catalytic converter temperature)	°C or °F	Idling after warm-up: Approx. 450 °C {840 °F}	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	—
CATT21 (Estimated catalytic converter temperature)	°C or °F	Idling after warm-up: Approx. 450 °C {840 °F}	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	—
CHRGLP (Generator warning light)	On/Off	Ignition switch is ON: On Idling: Off	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	—
COLP (Refrigerant pressure switch (middle))	On/Off	Idling, refrigerant pressure switch (middle) is on: On Idling, refrigerant pressure switch (middle) is off: Off	• Refrigerant pressure switch (See 07–10–3 REFRIGERANT PRESSURE CHECK.)	8
CPP*1 (Clutch pedal position)	On/Off	Clutch pedal is depressed: On Clutch pedal is released: Off	• Clutch switch (See 01–40B–23 CLUTCH SWITCH INSPECTION [AJ].)	17
CPP/PNP*1 (Shift lever position)	Neutral/ Drive	Gear is neutral position: Neutral Gear is not neutral position: Drive	• Neutral switch (See 01–40B–24 NEUTRAL SWITCH INSPECTION [AJ].)	64
CPP/PNP*2 (Selector lever position)	Neutral/ Drive	P or N position: Neutral Others: Drive	• TR switch (See 05–17B–11 TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL].)	64
DTCCNT (Number of DTC detected)	—	—	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	—
ECT (Engine coolant temperature)	°C or °F	ECT is 20 °C {68 °F}: 20 °C {68 °F} ECT is 60 °C {140 °F}: 60 °C {140 °F}	• ECT sensor (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [AJ].)	38
	V	ECT is 20 °C {68 °F}: 2.9—3.1 V After warm-up: 0.2—1.0 V		
ETC_ACT (Electronic throttle control actual)	°	Accelerator pedal is released: Approx. 7.4° Accelerator pedal is released: Approx. 74.3°	• TP sensor (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].)	89
ETC_DSD (Electronic throttle control desired)	%	Throttle valve is closed → open: PID value changes smoothly	• Inspect following PIDs: APP1, APP2, ETC ACT • TP sensor (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].)	89
	°	Accelerator pedal is released: Approx. 0° Accelerator pedal is released: Approx. 74°		
EVAPCP (Purge solenoid valve duty value)	%	Ignition switch is ON: 0%	• Inspect following PIDs: BARO, ECT, IAT, MAF, O2S11, O2S21, RPM, TP REL, VBAT	18

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item (s)	PCM terminal
FAN_DUTY (Fan control signal)	%	ECT is below 100 °C {212 °F}: 0% ECT is above 100 °C {212 °F}: 50—100%	• Inspect following PIDs: ACSW, COLP, ECT, VBAT	44
FDPDTC (Pending code caused FFD storage)	—	—	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	—
FLI (Fuel level)	%	—	—	—
FP (Fuel pump relay)	On/Off	Ignition switch is ON: Off Idling: On Cranking: On	• Inspect following PID: RPM • Fuel pump relay (See 09–21–6 RELAY INSPECTION.)	104
FUEL SYS1 (Fuel system status)	OL/CL/ OL Drive/ OL Fault/ CL Fault	Ignition switch is ON: CL Idling after warm-up: CL	• Inspect following PIDs: ACSW, ALTT V, ECT, IAT, INGEAR, MAF, MAP, O2S11, O2S12, O2S21, O2S22, PSP, RPM, TP REL, VBAT • Fuel injector (See 01–14–30 FUEL INJECTOR INSPECTION [AJ].)	—
FUEL SYS2 (Fuel system status)	OL/CL/ OL Drive/ OL Fault/ CL Fault	Ignition switch is ON: CL Idling after warm-up: CL	• Inspect following PIDs: ACSW, ALTT V, ECT, IAT, INGEAR, MAF, MAP, O2S11, O2S12, O2S21, O2S22, PSP, RPM, TP REL, VBAT • Fuel injector (See 01–14–30 FUEL INJECTOR INSPECTION [AJ].)	—
FUELPW1 (Fuel injection duration)	ms	Ignition switch is ON: 0 ms Idling: 1.5—3.0 ms	• Inspect following PIDs: ACSW, ALTT V, ECT, IAT, INGEAR, MAF, MAP, O2S11, O2S12, O2S21, O2S22, PSP, RPM, TP REL, VBAT • Fuel injector (See 01–14–30 FUEL INJECTOR INSPECTION [AJ].)	74, 75, 101
FUELPW2 (Fuel injection duration)	ms	Ignition switch is ON: 0 ms Idling: 1.5—3.0 ms	• Inspect following PIDs: ACSW, ALTT V, ECT, IAT, INGEAR, MAF, MAP, O2S11, O2S12, O2S21, O2S22, PSP, RPM, TP REL, VBAT • Fuel injector (See 01–14–30 FUEL INJECTOR INSPECTION [AJ].)	73, 99, 100
GENVDSD (Generator voltage desired)	V	Ignition switch is ON: 0 V Idling, E/L is not operating: Approx. 14.9 V	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	—
HTR11 (HO2S heater (RF))	On/Off	Idle after warm-up: On and Off	• Inspect following PIDs: ECT, MAF, RPM, TP REL	93
HTR12 (HO2S heater (RR))	On/Off	Idling: On Engine speed is above 4,000 rpm: Off	• Inspect following PIDs: ECT, MAF, RPM, TP REL	95
HTR21 (HO2S heater (LF))	On/Off	Idle after warm-up: On and Off	• Inspect following PIDs: ECT, MAF, RPM, TP REL	94
HTR22 (HO2S heater (LR))	On/Off	Idling: On Engine speed is above 4,000 rpm: Off	• Inspect following PIDs: ECT, MAF, RPM, TP REL	96

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item (s)	PCM terminal
IASV (VAD control solenoid valve)	On/Off	TP opening angle is less than 60% and engine speed is 6,000 rpm or above: On TP opening angle is 60% or above and engine speed is 4,800 rpm or above: On Others: Off	• Inspect following PIDs: ECT, RPM, TP REL	42
IAT (Intake air temperature)	°C or °F	IAT is 20 °C {68 °F}: 20 °C {68 °F} IAT is 30 °C {86 °F}: 30 °C {86 °F}	• IAT sensor (See 01–40B–29 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [AJ].)	39
	V	IAT is 20 °C {68 °F}: 2.4—2.6 V IAT is 30 °C {86 °F}: 1.7—1.9 V		
INGEAR (Load/no load condition)	On/Off	Gear is not neutral position and clutch pedal is released: On Gear is neutral position: Off Clutch pedal is depressed: Off	• Inspect following PIDs: CPP, CPP/PNP • DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	17, 64
IVS (CTP condition)	Idle/Off Idle	CTP: Idle Others: Off Idle	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	89
KNOCKR (Knocking retard)	°	Ignition switch is ON: 0 ° Idling: 0 °	• KS (See 01–40B–35 KNOCK SENSOR (KS) INSPECTION [AJ].)	4, 31
LOAD (Engine load)	%	**MTX** Idling: Approx. 16.8% Engine speed is 2,500 rpm: Approx. 14.6% **ATX** Idling: Approx. 17.5% Engine speed is 2,500 rpm: Approx. 15.2%	• Inspect following PIDs: ECT, IAT, MAF, MAP, RPM, TP REL	—
LONGFT1 (Long term fuel trim (RH))	%	Idling: –20—20%	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	—
LONGFT2 (Long term fuel trim (LH))	%	Idling: –20—20%	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	—
MAF (Mass airflow)	g/s	**MTX** Idling: 3.6—3.8 g/s Engine speed is 2,500 rpm: 10.5—11.2 g/s **ATX** Idling: 3.8—4.0 g/s Engine speed is 2,500 rpm: 10.6—11.4 g/s	• MAF sensor 01–40B–30 MASS AIR FLOW (MAF) SENSOR INSPECTION [AJ].)	88
	V	Idling: Approx. 1.3 V Engine speed is 2,500 rpm: Approx. 1.9 V		
MAINRLY (Main relay control)	On/Off	Ignition switch is ON: On	• Main relay (See 09–21–6 RELAY INSPECTION.)	28
MAP (Manifold absolute pressure)	kPa, Bar, psi	Ignition switch is ON at sea level: Approx. 101 kPa {1.01 Bar, 14.6 psi}	• EGR boost sensor (See 01–40B–34 EGR BOOST SENSOR INSPECTION [AJ].)	34
	V	Ignition switch is ON at sea level: Approx. 4.1 V		
MIL (Malfunction indicator light)	On/Off	Ignition switch is ON: On Idling: Off	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	—
MIL_DIS (Travelled distance since the MIL illuminated)	km or mile	No DTC: 0 km {0 mile} DTC detected: Not 0 km {0 mile}	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	—

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item (s)	PCM terminal
NUMKEYS (Number of keys stored in PCM)	—	—	—	—
O2S11 (HO2S (RF))	V	Ignition switch is ON: 0—1.0 V Idling after warm-up: 0—1.0 V Acceleration: 0.5—1.0 V Deceleration: 0—0.5 V	• HO2S (RF) (See 01–40B–31 HEATED OXYGEN SENSOR (HO2S) INSPECTION [AJ].)	60
O2S12 (HO2S (RR))	V	Idling after warm-up: Approx. 0.6 V	• HO2S (RR) (See 01–40B–31 HEATED OXYGEN SENSOR (HO2S) INSPECTION [AJ].)	35
O2S21 (HO2S (LF))	V	Ignition switch is ON: 0—1.0 V Idling after warm-up: 0—1.0 V Acceleration: 0.5—1.0 V Deceleration: 0—0.5 V	• HO2S (LF) (See 01–40B–31 HEATED OXYGEN SENSOR (HO2S) INSPECTION [AJ].)	87
O2S22 (HO2S (LR))	V	Idling after warm-up: Approx. 0.6 V	• HO2S (LR) (See 01–40B–31 HEATED OXYGEN SENSOR (HO2S) INSPECTION [AJ].)	61
PSP (PSP switch)	High/Low	Steering wheel is in straight ahead position: Low Steering wheel is turned: High	• PSP switch (See 01–40B–25 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [AJ].)	14
RFCFLAG (Readiness Function Code)	Learnt/Not Learnt	RFC exists: Learnt No RFC: Not Learnt	• Perform DRIVE MODE 1 (See 01–02B–9 OBD-II DRIVE MODE [AJ].)	—
RO2FT1 (HO2S (RR) fuel trim)	—	Idling after warm-up: Approx. –0.03—0.03	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	—
RO2FT2 (HO2S (RL) fuel trim)	—	Idling after warm-up: Approx. –0.03—0.03	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	—
RPM (Engine speed)	RPM	Idling (no load): 700—800 RPM	• CKP sensor (See 01–40B–37 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [AJ].)	21, 22
SC_ON (Cruise main indicator light)	On/Off	Cruise main indicator light is on: On Cruise main indicator light is off: Off	• Inspect following PID: SCCS • Cruise control switch (See 01–20–1 CRUISE CONTROL SWITCH INSPECTION.)	—
SC_SET (Cruise set indicator light)	On/Off	Cruise set indicator light is on: On Cruise set indicator light is off: Off	• Inspect following PID: SCCS • Cruise control switch (See 01–20–1 CRUISE CONTROL SWITCH INSPECTION.)	—
SCCS (Cruise control switch)	V	Press ON/OFF: Approx. 0 V Press CALCEL: Approx. 1.2 V Press SET/COAST: Approx. 3.2 V Press RES/ACCEL: Approx. 4.2 V Others: Approx. 5.0 V	• Cruise control switch (See 01–20–1 CRUISE CONTROL SWITCH INSPECTION.)	15
SEGRP (EGR valve position)	No. of step	Ignition switch is ON: 0 step Idling: 0 step Cranking: 0—60 steps	• Inspect following PIDs: ECT, IAT, MAF, RPM, VSS • EGR valve (See 01–16–21 EGR VALVE INSPECTION [AJ].)	12, 46, 56, 72
SEGRP DSD (Desired EGR valve position)	%	Ignition switch is ON: 0% Idling: 0% Cranking: 0—100%	• Inspect following PIDs: ECT, IAT, MAF, RPM, VSS	—
SELTESTDTC (KOEO/KOER DTC)	—	—	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	—

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item (s)	PCM terminal
SHRTFT1 (Short term fuel trim (RH))	%	Idling: –20—20%	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	—
SHRTFT2 (Short term fuel trim (LH))	%	Idling: –20—20%	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	—
SPARKADV (Ignition timing)	° (BTDC)	Ignition switch is ON: 0° (BTDC) Idling: Approx. 10° (BTDC)	• Inspect following PIDs: ACSW, ALTT V, CPP, CPP/ PNP, ECT, KNOCKR, MAF, PSP, RPM, TP REL, VSS • Perform engine tune-up (See 01–10B–44 ENGINE TUNE-UP [AJ].)	26, 52, 78, 1, 27, 82
test (Test mode)	On/Off	—	—	—
TIRESIZE (Tire revolution per mile)	rev/mile	808 is displayed	—	—
TP REL (Relative throttle position)	%	Throttle valve is closed → open: PID value changes smoothly	• TP sensor (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].)	63, 89
TP1 (TP sensor No.1 signal voltage)	%	Ignition switch is ON and accelerator pedal not depressed: 13—24% Ignition switch is ON and WOT: Approx. 78%	• TP sensor (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].)	89
	V	Ignition switch is ON and accelerator pedal not depressed: 3.8—4.35 V Ignition switch is ON and WOT: Approx. 1.1 V		
TP2 (TP sensor No.2 signal voltage)	%	Ignition switch is ON and accelerator pedal not depressed: 15—36% Ignition switch is ON and WOT: Approx. 88%	• TP sensor (See 01–40B–27 THROTTLE POSITION (TP) SENSOR INSPECTION [AJ].)	63
	V	Ignition switch is ON and accelerator pedal not depressed: 0.75—1.8 V Ignition switch is ON and WOT: Approx. 4.4 V		
TPCT (Relative throttle position)	V	Ignition switch is ON: 0 V	—	—
VSS (Vehicle speed)	KPH or MPH	Vehicle speed is 20 km/h {12 mph}: 20 KPH {12 MPH} Vehicle speed is 40 km/h {25 mph}: 40 KPH {25 MPH}	• DTC inspection (See 01–02B–15 DTC TABLE [AJ].)	57, 84 (MTX without ABS/TCS)
VT ACT1 (Actual valve timing (RH))	°	Idling: 0°	• Inspect following PIDs: ECT, RPM, TP REL • OCV (RH) (See 01–10B–48 OIL CONTROL VALVE (OCV) INSPECTION [AJ].)	85, 86
VT ACT2 (Actual valve timing (LH))	°	Idling: 0°	• Inspect following PIDs: ECT, RPM, TP REL • OCV (LH) (See 01–10B–48 OIL CONTROL VALVE (OCV) INSPECTION [AJ].)	58, 59

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item (s)	PCM terminal
VT DIFF1 (Difference between actual and target valve timing (RH))	°	Idling: 0°	• Inspect following PIDs: ECT, RPM, TP REL • OCV (RH) (See 01–10B–48 OIL CONTROL VALVE (OCV) INSPECTION [AJ].)	85, 86
VT DIFF2 (Difference between actual and target valve timing (LH))	°	Idling: 0°	• Inspect following PIDs: ECT, RPM, TP REL • OCV (LH) (See 01–10B–48 OIL CONTROL VALVE (OCV) INSPECTION [AJ].)	58, 59
VT DUTY1 (OCV control signal (RH))	%	Idling: 0%	• Inspect following PIDs: ECT, RPM, TP REL • OCV (RH) (See 01–10B–48 OIL CONTROL VALVE (OCV) INSPECTION [AJ].)	81
VT DUTY2 (OCV control signal (LH))	%	Idling: 0%	• Inspect following PIDs: ECT, RPM, TP REL • OCV (LH) (See 01–10B–48 OIL CONTROL VALVE (OCV) INSPECTION [AJ].)	102

*1 : MTX
*2 : ATX

Freeze Frame Data Monitor Table

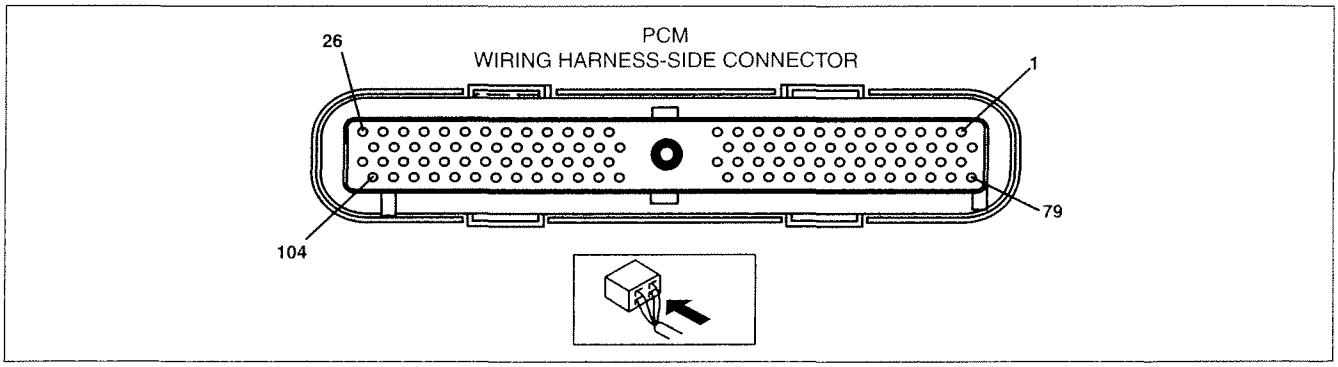
- Retrieve the following FFD.

Note

- FFD is a snapshot of the conditions that are present when DTC or PENDING CODE is stored. Once FFD is stored, this data will remain in PCM memory even if another emission related DTC or PENDING CODE is stored additionally, except for Misfire or Fuel System related DTC or PENDING CODE. Once Misfire or Fuel System related DTC or PENDING CODE is stored, it will overwrite any previous data and the FFD will not be further overwritten. When DTC associated with the FFD is erased or PCM is reset, new FFD can be stored.

Definition	Unit/Condition
Fuel system feedback control status (RH)	OL, CL, OL DRIVE, OL Fault, CL Fault
Fuel system feedback control status (RH)	OL, CL, OL DRIVE, OL Fault, CL Fault
DTC that caused required FFD	—
Spark advance (BTDC)	°
Mass air flow	g/s
EGR valve opening angle	%
Purge solenoid valve duty value in PCM	%
Fuel tank level	%
Number of warm-ups since DTCs cleared	—
Distance since DTCs cleared	km, miles
Barometric pressure	kPa
Assumed catalytic converter temperature	°C, °F
Battery positive voltage	V
Accelerator pedal depressing angle (No.1, No.2)	%
Desired throttle opening angle	%
Relative throttle opening angle	%

Terminal Voltage Table (Reference)



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Terminal	Signal	Connected to	Measurement condition		Voltage (V)	Inspection item
1	IGT2	Ignition coil (No.2 cylinders)	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Ignition coil • Related wiring harness
2	Security light control	Instrument cluster (Security light)	While the security light is illuminated		1.0 or less	• Instrument cluster • Related wiring harness
			Except above		B+	
3	Test	DLC-2	—		—	• Related wiring harness
4	Knock (–)	KS	Ignition switch at ON (Use digital voltmeter. Low voltage may be detected with analog type voltmeter.)		1.0 or less	• KS • Related wiring harness
5	—	—	—		—	—
6	EVAP leak detection pump (pump)	EVAP leak detection pump	Ignition switch to the ON position		B+	• EVAP leak detection pump • Related wiring harnesses
			Idling		B+	
7	Brake No.2	Brake switch	Brake pedal depressed		B+	• Brake switch • Related wiring harness
			Brake pedal released		1.0 or less	
8	Refrigerant pressure signal (medium pressure)	Refrigerant pressure switch (medium pressure)	While idling	Refrigerant pressure is 2.06 MPa or more	1.0 or less	• Refrigerant pressure switch (medium pressure) • Related wiring harness
				Refrigerant pressure is 1.77 MPa or less	B+	
9	APP sensor (No. 1)	APP sensor No. 1	Ignition switch ON	APP closed	1.55—1.62	• APP sensor • Related wiring harness
				APP open	3.49—4.09	
10	APP sensor (No. 2)	APP sensor No. 2	Ignition switch ON	APP closed	1.01—1.07	• APP sensor • Related wiring harness
				APP open	2.94—3.54	
11	APP sensor GND (No. 2)	APP sensor No. 2	Ignition switch ON		1.0 or less	• APP sensor • Related wiring harness
12	EGR valve #1 coil control	EGR valve (terminal E)	Ignition switch to the ON position		1.0 or less	• EGR valve • Related wiring harness
			Idle		1.0 or less	
13	FEPS	DLC-2	Ignition switch to the ON position		Approx. 3.22	• Related wiring harness
			Idle		Approx. 3.16	

Terminal	Signal	Connected to	Measurement condition		Voltage (V)	Inspection item
14	PSP	PSP switch	While idling	Steering wheel neutral	B+	• PSP switch • Related wiring harness
				While steering wheel is turned	1.0 or less	
15	Cruise control switch	Cruise control switch	Ignition switch to the ON position	ON/OFF switch pressed in	Approx. 0	• Cruise control switch • Related wiring harnesses
				CANCEL switch pressed in	Approx. 1.2	
				SET/COAST switch pressed in	Approx. 3.2	
				RES/ACCEL switch pressed in	Approx. 4.2	
				Except above	Approx. 5.0	
16	Battery voltage input	Ignition switch	Ignition switch is off.		1.0 or less	• Main relay • Related wiring harness
			Ignition switch at ON		B+	
17	Clutch operation*1	CPP switch	Clutch pedal depressed		1.0 or less	• CPP • Related wiring harness
			Clutch pedal released		B+	
	—*2	—	—		—	—
18	Purge control	Purge solenoid valve	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Purge solenoid valve • Related wiring harness
19	ET control relay	ET control relay	Ignition switch to the ON position		1.0 or less	• Related wiring harness
20	Constant voltage (Vref)	TP sensor	Ignition switch to the ON position		Approx. 5.0	• TP sensor • Related wiring harness
21	CKP (+)	CKP sensor	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• CKP sensor • Related wiring harness
22	CKP (–)	CKP sensor	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• CKP sensor • Related wiring harness
23	—	—	—		—	—
24	GND	GND	Under any condition		1.0 or less	• Related wiring harness
25	GND	GND	Under any condition		1.0 or less	• Related wiring harness
26	IGT1	Ignition coil (No.1 cylinders)	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Ignition coil • Related wiring harness
27	IGT4	Ignition coil (No.4 cylinders)	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Ignition coil • Related wiring harness
28	Battery voltage input	Main relay	Ignition switch is off.		B+	• Main relay • Related wiring harness
			Ignition switch at ON		B+	
29	Vehicle speed output*1*3	Instrument cluster (Speedometer)	Because this terminal is for communication, good/no good judgment by terminal voltage is not possible.			• Instrument cluster • Related wiring harness
30	Generator output voltage	Generator (Terminal P)	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Generator • Related wiring harness

Terminal	Signal	Connected to	Measurement condition		Voltage (V)	Inspection item
31	Knock (+)	KS	Ignition switch at ON (Use digital voltmeter. Low voltage may be detected with analog type voltmeter.)		1.0 or less	• KS • Related wiring harness
32	Brake No.1	Brake switch	Brake pedal depressed		B+	• Brake switch • Related wiring harness
			Brake pedal released		1.0 or less	
33	—	—	—		—	—
34	Atmospheric pressure	BARO sensor	Ignition switch to the ON position (at sea level)		Approx. 4.1	• BARO sensor • Related wiring harness
35	Rear HO2S (Right bank)	HO2S (RR)	Idling after warm up		0—1.0	• HO2S (RR) • Related wiring harness
			Acceleration		0.5—1.0	
			Deceleration		0—0.5	
36	TP sensor GND	TP sensor	Under any condition		1.0 or less	• TP sensor • Related wiring harness
37	—	—	—		—	—
38	ECT	ECT sensor	Ignition switch at ON	ECT is 20°C{68°F}	2.9—3.1	• ECT sensor • Related wiring harness
				After warm-up	0.2—1.0	
39	Intake air temperature	IAT sensor	Ignition switch at ON	At IAT 20°C{68°F}	2.4—2.6	• IAT sensor • Related wiring harness
				At IAT 30°C{86°F}	1.7—1.9	
40	APP sensor GND (No. 1)	APP sensor No. 1	Ignition switch ON		1.0 or less	• APP sensor • Related wiring harness
41	A/C signal	Refrigerant pressure switch (low, high pressure), A/C switch	While idling	A/C switch off	B+	• A/C switch • Refrigerant pressure switch (low, high pressure) • Related wiring harness
				A/C switch and pressure switch on	1.0 or less	
42	VAD control	VAD control solenoid valve	Idle after warm up	Engine speed below 6,300 rpm	B+	• VAD control solenoid valve • Related wiring harness
				Engine speed above 6,300 rpm	1.0 or less	
43	APP sensor voltage (No. 1)	APP sensor No. 1	Ignition switch ON		Approx. 5.0	• APP sensor • Related wiring harness
44	Fan control	Fan control module	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Fan control module • Related wiring harness
45	APP sensor voltage (No. 2)	APP sensor No. 2	Ignition switch ON		Approx. 5.0	• APP sensor • Related wiring harness
46	EGR valve #3 coil control	EGR valve (terminal B)	Ignition switch to the ON position		B+	• EGR valve • Related wiring harness
			Idle		B+	
47	EGR boost sensor solenoid valve	EGR boost sensor solenoid valve	Idle after warm up		B+	• EGR boost sensor solenoid valve • Related wiring harness
48	—	—	—		—	—
49	CAN (L)	WDS or equivalent	Because this terminal is for CAN, good/no good judgment by terminal voltage is not possible.			• Related wiring harness

Terminal	Signal	Connected to	Measurement condition		Voltage (V)	Inspection item
50	CAN (H)	WDS or equivalent	Because this terminal is for CAN, good/no good judgment by terminal voltage is not possible.			• Related wiring harness
51	GND	GND	Under any condition		1.0 or less	• Related wiring harness
52	IGT3	Ignition coil (No.3 cylinders)	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Ignition coil • Related wiring harness
53	Field coil control	Generator (Terminal D)	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Generator • Related wiring harness
54	TP (No.1)	TP sensor No.1	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• TP sensor • Related wiring harness
55	Back-up power supply	Battery (positive terminal)	Under any condition		B+	• Battery • Related wiring harness
56	EGR valve #4 coil control	EGR valve (terminal F)	Ignition switch to the ON position		1.0 or less	• EGR valve • Related wiring harness
			Idle		1.0 or less	
57	VSS (+)*1*3	VSS	Verify that the voltage changes when the engine is started and the front wheel is being driven.			• VSS • Related wiring harness
58	CMP (+)	CMP sensor (left bank)	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• CMP sensor • Related wiring harness
59	CMP (–)	CMP sensor (left bank)	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• CMP sensor • Related wiring harness
60	Front HO2S (Right bank)	HO2S (RF)	Idling after warm up		0—1.0	• HO2S (RF) • Related wiring harness
			Acceleration		0.5—1.0	
			Deceleration		0—0.5	
61	Rear HO2S (left bank)	HO2S (LR)	Idling after warm up		Approx. 0.6	• HO2S (LR) • Related wiring harness
62	—	—	—		—	—
63	TP (No. 2)	TP sensor No. 2	Ignition switch to the ON position	APP closed	0.75—1.8	• TP sensor • Related wiring harness
				APP open	Approx. 4.4	
64	Neutral position*1	Neutral switch	Ignition switch is turned to the ON position	Shift lever is at neutral position	1.0 or less	• Neutral switch • Related wiring harness
				Shift lever is not at neutral position	B+	
	Selector lever position*2	TR switch	Ignition switch is turned to the ON position	N position	1.0 or less	• TR switch • Related wiring harness
				Other	B+	
65	Immobilizer system	Coil antenna	Because this terminal is for communication, good/no good judgment by terminal voltage is not possible.			• Related wiring harness
65	Immobilizer system	Coil antenna	Because this terminal is for communication, good/no good judgment by terminal voltage is not possible.			• Related wiring harness
66	—	—	—		—	—
67	EVAP leak detection pump (solenoid)	EVAP leak detection pump	Idle		B+	• EVAP leak detection pump • Related wiring harnesses
68	—	—	—		—	—

Terminal	Signal	Connected to	Measurement condition		Voltage (V)	Inspection item
69	A/C control	A/C relay	A/C on		1.0 or less	• A/C relay • Related wiring harness
			A/C off		B+	
70	—	—	—		—	—
71	B+	Main relay	Ignition switch off after 5 min		1.0 or less	• Battery • Related wiring harness
			Ignition switch to the ON position		B+	
72	EGR valve #2 coil control	EGR valve (terminal A)	Ignition switch to the ON position		B+	• EGR valve • Related wiring harness
			Idle		B+	
73	Fuel injection (#5)	Fuel injector No.5	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Fuel injector No.5 • Related wiring harness
74	Fuel injection (#3)	Fuel injector No.3	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Fuel injector No.3 • Related wiring harness
75	Fuel injection (#1)	Fuel injector No.1	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Fuel injector No.1 • Related wiring harness
76	GND	GND	Under any condition		1.0 or less	• Related wiring harness
77	GND	GND	Under any condition		1.0 or less	• Related wiring harness
78	IGT5	Ignition coil (No.5 cylinders)	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Ignition coil • Related wiring harness
79	—	—	—		—	—
80	TP	TP sensor	Ignition switch to the ON position	APP closed	0.53—1.00	• TP sensor • Related wiring harness
				APP open	4.25—4.75	
81	OCV control	OCV No.1	Ignition switch to the ON position		B+	• OCV valve • Related wiring harness
82	IGT6	Ignition coil (No.6 cylinders)	• Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Ignition coil • Related wiring harness
83	GND	GND	Under any condition		1.0 or less	• Related wiring harness
84	VSS (–)*1*3	VSS	Verify that the voltage changes when the engine is started and the front wheel is being driven.			• VSS • Related wiring harness
85	CMP (+)	CMP sensor (right bank)	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• CMP sensor • Related wiring harness
86	CMP (–)	CMP sensor (right bank)	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• CMP sensor • Related wiring harness
87	Front HO2S (left bank)	HO2S (LF)	Idling after warm up		Approx. 0.6	• HO2S (LF) • Related wiring harness
88	Intake air amount	MAF sensor	Engine speed is 2,500 rpm.		Approx. 1.9	• MAF sensor • Related wiring harness
			After warm-up, while idling (no electrical load, A/C off, P/S off)		Approx. 1.3	
89	TP (No. 1)	TP sensor No. 1	Ignition switch to the ON position	APP closed	3.8—4.35	• TP sensor • Related wiring harness
				APP open	Approx. 1.1	
90	Constant voltage (Vref)	BARO sensor	Ignition switch to the ON position		Approx. 5.0	• Related wiring harness

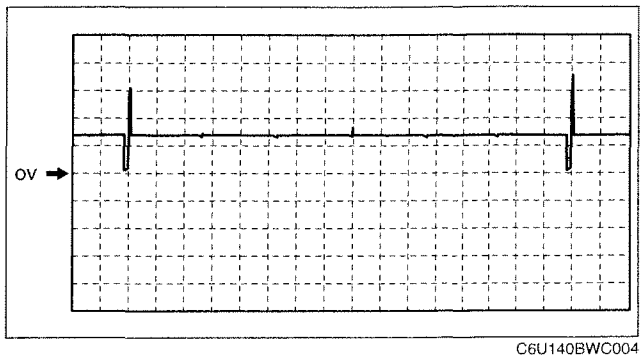
Terminal	Signal	Connected to	Measurement condition		Voltage (V)	Inspection item
91	Sensor GND	MAF/IAT sensor, BARO sensor, ECT sensor, HO2S (LF, LR, RF, RR)	Under any condition		1.0 or less	• Related wiring harness
92	ET control relay	ET control relay	Ignition switch off		B+	• Related wiring harness
			Ignition switch to the ON position		1.0 or less	
93	Front HO2S heater control (right bank)	HO2S (RF) heater	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• HO2S (RF) • Related wiring harness
94	Front HO2S heater control (left bank)	HO2S (LF) heater	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• HO2S (LF) • Related wiring harness
95	Rear HO2S heater control (right bank)	HO2S (RR) heater	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• HO2S (RR) • Related wiring harness
96	Rear HO2S heater control (left bank)	HO2S (LR) heater	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• HO2S (LR) • Related wiring harness
97	B+	Main relay	Ignition switch off after 5 min		1.0 or less	• Battery • Related wiring harness
			Ignition switch to the ON position		B+	
98	Starter cut control*1	Starter relay	Cranking	Clutch pedal depressed	1.0 or less	• Starter relay • Related wiring harness
				Clutch pedal released	B+	
	Starter cut control*2	Starter relay	Cranking	P or N position	1.0 or less	
				Except above	B+	
99	Fuel injection (#6)	Fuel injector No.6	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Fuel injector No.6 • Related wiring harness
100	Fuel injection (#4)	Fuel injector No.4	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Fuel injector No.4 • Related wiring harness
101	Fuel injection (#2)	Fuel injector No.2	Inspect using the wave profile. (See 01–40B–20 Inspection Using An Oscilloscope (Reference).)			• Fuel injector No.2 • Related wiring harness
102	OCV control	OCV No.2	Ignition switch to the ON position		B+	• OCV valve • Related wiring harness
103	GND	GND	Under any condition		1.0 or less	• Related wiring harness
104	Fuel pump control	Fuel pump relay	Ignition switch at ON		B+	• Fuel pump relay • Related wiring harness
			Cranking		1.0 or less	
			While idling			

*1 : MTX
*2 : ATX
*3 : Without ABS HU/CM

Inspection Using An Oscilloscope (Reference)
Ignition coil control signals
PCM terminals
- No.1 cylinders: 26 (+) — 25 (–)
- No.2 cylinders: 1 (+) — 25 (–)
- No.3 cylinders: 52 (+) — 25 (–)
- No.4 cylinders: 27 (+) — 25 (–)
- No.5 cylinders: 78 (+) — 25 (–)
- No.6 cylinders: 82 (+) — 25 (–)

Oscilloscope setting
- 5 V/DIV (Y), 20 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load)

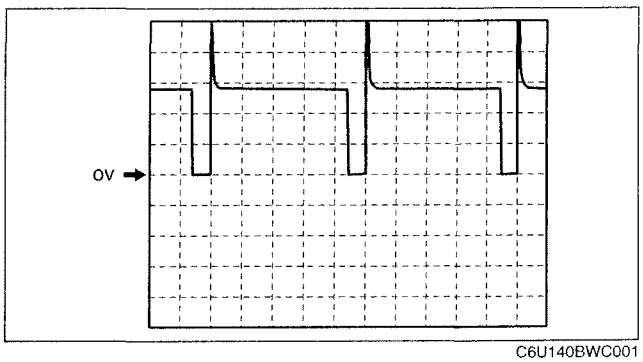


C6U140BWC004

Purge solenoid valve control signal
PCM terminals
- 18 (+)—25 (–)

Oscilloscope setting
- 5 V/DIV (Y), 20 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, during purge control)

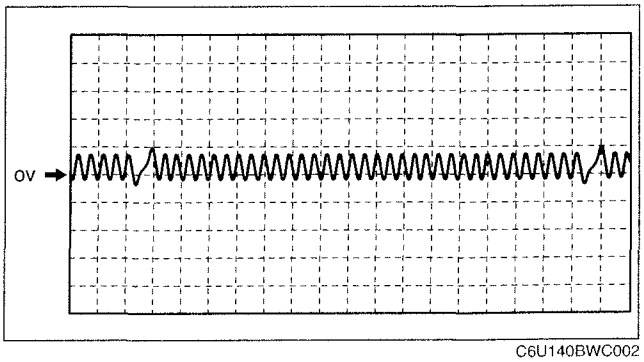


C6U140BWC001

CKP sensor signal
(+)
PCM terminals
- 21 (+)—25 (–)

Oscilloscope setting
- 2 V/DIV (Y), 10 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load)

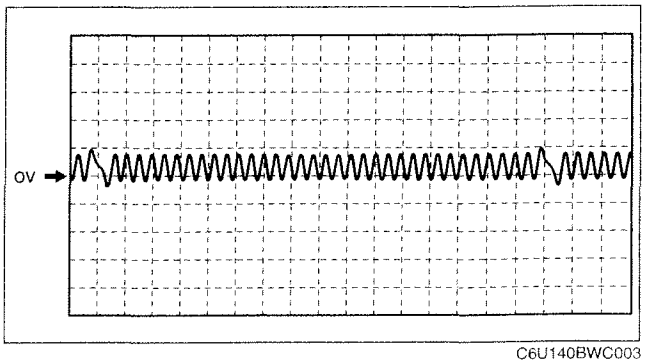


C6U140BWC002

(–)
PCM terminals
- 22 (+)—25 (–)

Oscilloscope setting
- 5 V/DIV (Y), 5 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load)

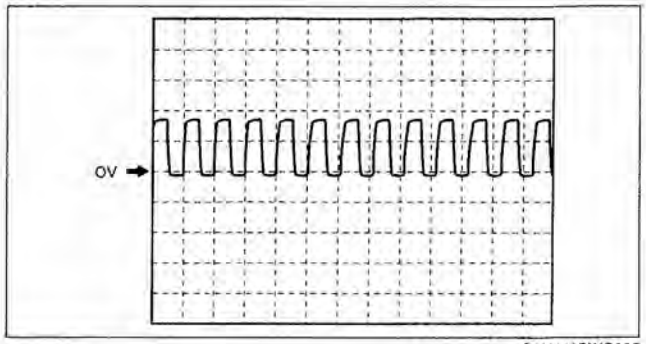


C6U140BWC003

Generator output voltage signal
PCM terminals
- 30 (+)—25 (–)

Oscilloscope setting
- 5V/DIV (Y), 5ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load)

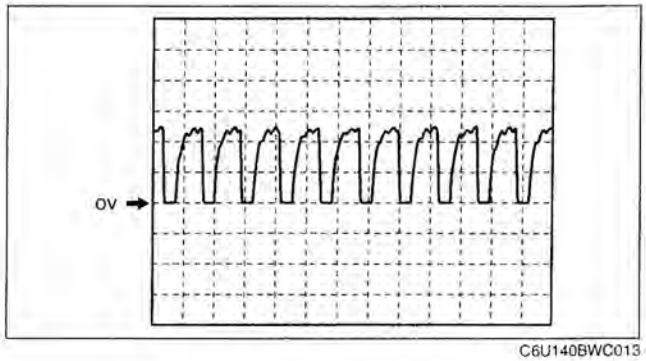


C6U140BWC005

Fan control signal
PCM terminals
- 44 (+)—25 (–)

Oscilloscope setting
- 2 V/DIV (Y), 0.2ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load)

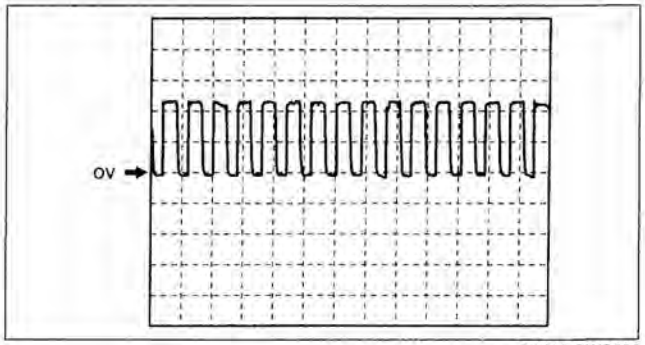


C6U140BWC013

Field coil control signal
PCM terminals
- 53 (+)—25 (–)

Oscilloscope setting
- 0.5V/DIV (Y), 5ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load)

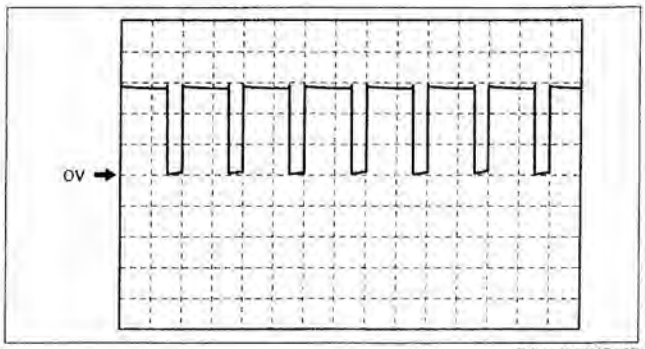


C6U140BWC006

TP signal
PCM terminals
- 54 (+)—25 (–)

Oscilloscope setting
- 5V/DIV (Y), 1ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load)

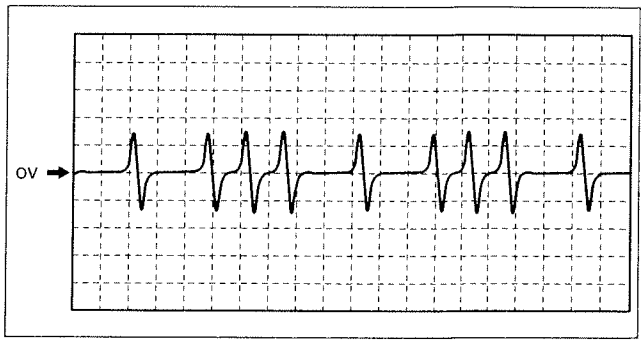


C6U140BWC007

CMP sensor signal
(+)
PCM terminals
- CMP sensor (left bank): 58 (+)—25 (–)
- CMP sensor (right bank): 85 (+)—25 (–)

Oscilloscope setting
- 1 V/DIV (Y), 20 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load)

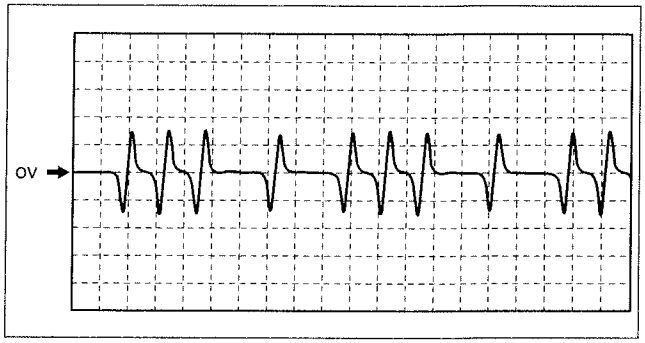


C6U140BWC009

(–)
PCM terminals
- CMP sensor (left bank): 59 (+)—25 (–)
- CMP sensor (right bank): 86 (+)—25 (–)

Oscilloscope setting
- 1 V/DIV (Y), 20 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load)

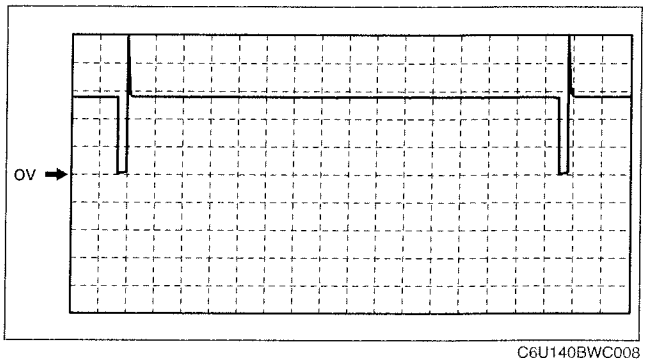


C6U140BWC010

Fuel injection signals
PCM terminals
- No.1: 82 (+) — 25 (–)
- No.2: 83 (+) — 25 (–)
- No.3: 84 (+) — 25 (–)
- No.4: 85 (+) — 25 (–)

Oscilloscope setting
- 5 V/DIV (Y), 10 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load)

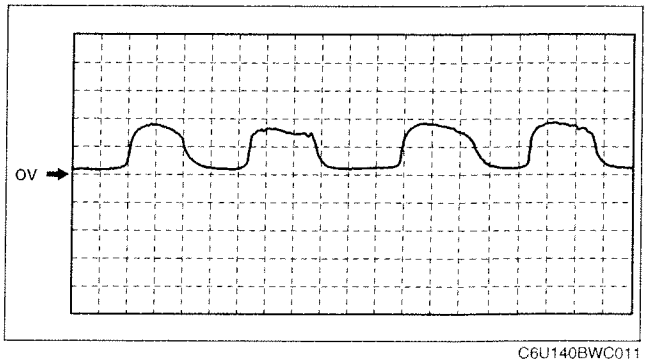


C6U140BWC008

HO2S signal
PCM terminals
- Front HO2S (right bank): 60 (+)—25 (–)
- Front HO2S (left bank): 87 (+)—25 (–)
- Rear HO2S (right bank): 35 (+)—25 (–)
- Rear HO2S (left bank): 61 (+)—25 (–)

Oscilloscope setting
- 0.5V/DIV (Y), 500ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load)

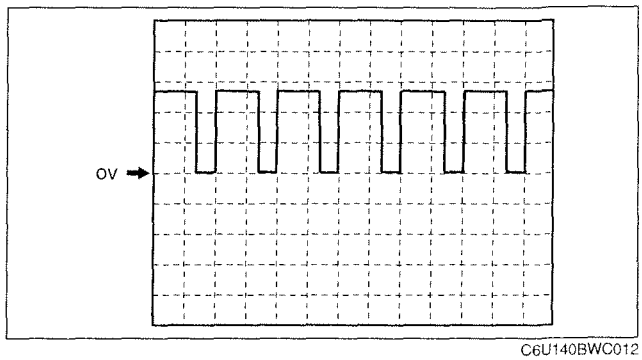


C6U140BWC011

HO2S heater control signal
PCM terminals
- Front HO2S heater (right bank): 93 (+)—25 (–)
- Front HO2S heater (left bank): 94 (+)—25 (–)
- Rear HO2S heater (right bank): 95 (+)—25 (–)
- Rear HO2S heater (left bank): 96 (+)—25 (–)

Oscilloscope setting
- 5V/DIV (Y), 500ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load)

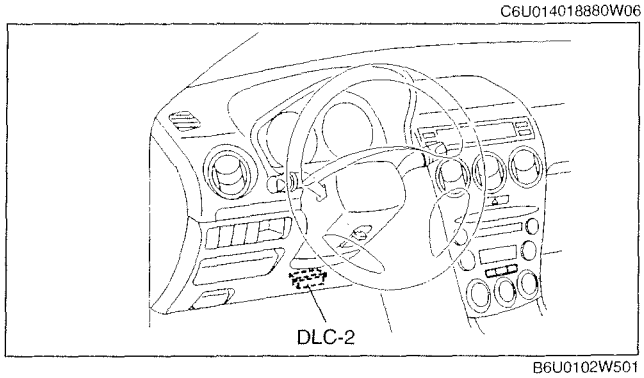


C6U140BWC012

PCM REPLACEMENT [AJ]

C6U014018880W06

1. Connect the WDS (or equivalent) to the DLC-2.
2. Peform the normal vehicle identification procedure.
3. Select "Module Programming", or with WDS select "toolbox" and "module programming".
4. Select “Programmable Module Installation”.
5. Select “PCM” and perform procedures according to directions on the WDS (or equivalent) screen.



B6U0102W501

Note
- If the PCM is replaced with a new one without performing "Programmable Module Installation" procedure, the PCM stores DTC P0602 and illuminates the MIL. This is because the vehicle information was not programmed in the PCM. After completing the "Programmable Module Installation" procedure, various U**** DTCs are stored, which is normal.

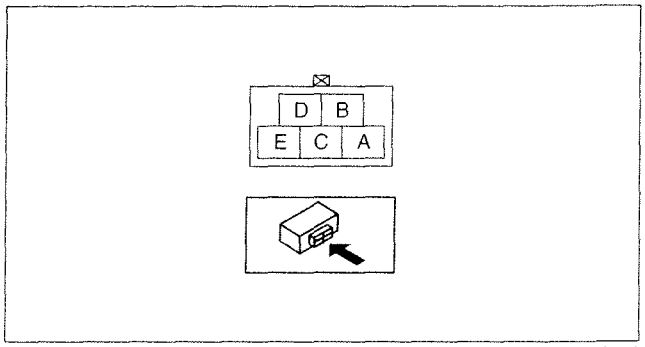
6. Retrieve DTCs with the WDS (or equivalent), erase them, and verify that there are no DTCs present and the MIL is off.
   - If DTCs are still present, perform applicable DTC inspection.

CLUTCH SWITCH INSPECTION [AJ]

C6U014018660W02

Note
- Perform the following inspection only when directed.

Continuity Inspection
1. Disconnect the negative battery cable.
2. Remove the clutch switch. (See 05–10–6 CLUTCH PEDAL REMOVAL/INSTALLATION.)
3. Inspect for continuity between the clutch switch terminals B and D using an ohmmeter.
   - If the clutch switch is okay, but the PID value is out of specification, perform the “Circuit Open/Short Inspection”.
   - If not as specified, replace the clutch switch. (See 05–10–6 CLUTCH PEDAL REMOVAL/INSTALLATION.)



B6U0140W502

Specification

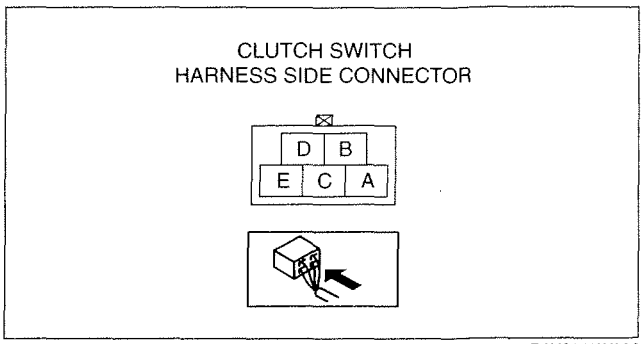
O—O : Continuity

Condition	Terminal B	Terminal D
Rod pushed		
Except above	O	O

B6U0140W523

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following harness for open or short circuit. (Continuity check)



B6U0140W503

Open circuit

- Clutch switch terminal B (harness-side) and PCM terminal 17 (harness-side)
- Clutch switch terminal D (harness-side) and body GND

Short circuit

- Clutch switch terminal B (harness-side) and power supply
- Clutch switch terminal B (harness-side) and body GND

NEUTRAL SWITCH INSPECTION [AJ]

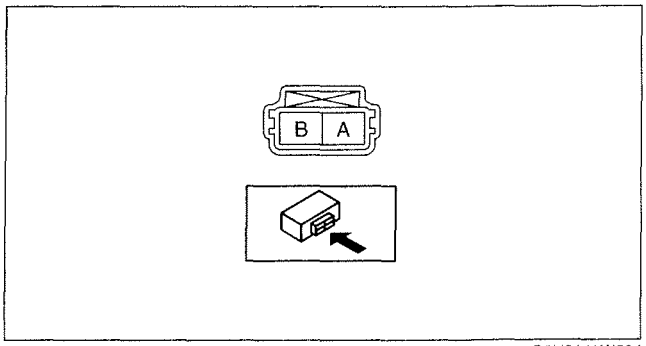
C6U014017640W02

Note

- Perform the following inspection only when directed.

Continuity Inspection

1. Disconnect the negative battery cable.
2. Remove the neutral switch. (See 05–15B–4 NEUTRAL SWITCH REMOVAL/INSTALLATION [A65M-R].)
3. Inspect for continuity between the neutral switch terminals A and B using an ohmmeter.
   - If the neutral switch is okay, but the PID value is out of specification, perform the "Circuit Open/Short Inspection".
   - If not as specified, replace the neutral switch. (See 05–15B–4 NEUTRAL SWITCH REMOVAL/INSTALLATION [A65M-R].)



B6U0140W504

Specification

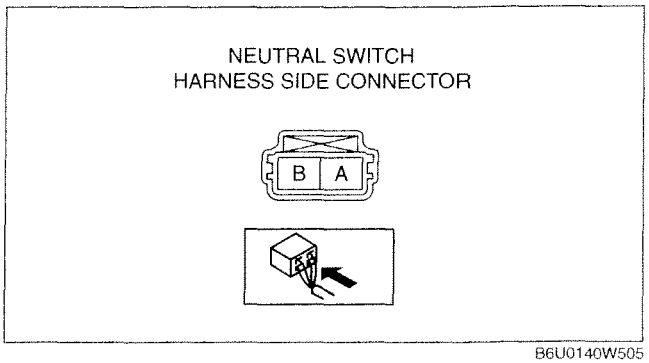
O—O : Continuity

Condition	Transmission	Terminal A	Terminal B
Rod pushed	In neutral	O	O
Except above	Other		

B6U0140W524

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following harness for open or short circuit. (Continuity check)



B6U0140W505

Open circuit
- Neutral switch terminal A (harness-side) and PCM terminal 64 (harness-side)
- Neutral switch terminal B (harness-side) and body GND

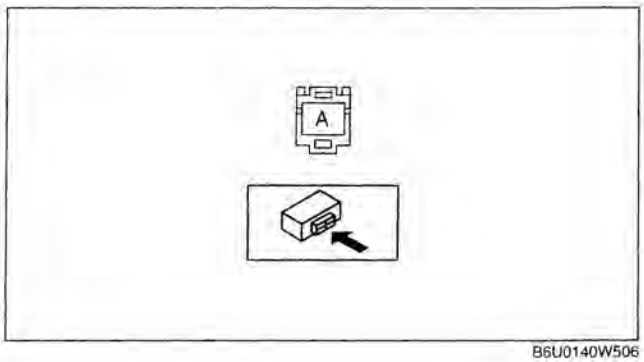
Short circuit
- Neutral switch terminal A (harness-side) and power supply
- Neutral switch terminal A (harness-side) and body GND

POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [AJ]

C6U014032230W02

Note
- Perform the following inspection only when directed.

Continuity Inspection
1. Inspect the following if the power steering is inoperative:
   - Power steering fluid level
   - Power steering fluid leakage
   - Power steering fluid pressure
2. Disconnect the PSP switch connector.
3. Start the engine.
4. Inspect for continuity between PSP switch terminal A and body GND using an ohmmeter.
   - If the PSP switch is okay, but the PID value is out of specification, perform the "Circuit Open/ Short Inspection".
   - If not as specified, replace the PSP switch. (See 06–12–25 POWER STEERING OIL PUMP REMOVAL/INSTALLATION [AJ].)



B6U0140W506

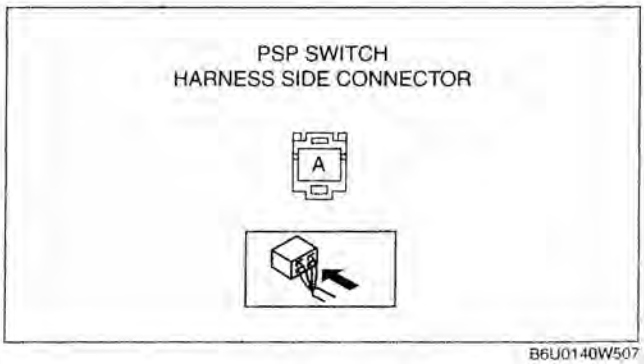
Specification

O—O : Continuity

Condition	Terminal A	Body GND
Steering wheel in straight ahead position		
While turning steering wheel	O————	————O

C6U0140W525

Circuit Open/Short Inspection
1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following harnesses for open or short circuit. (Continuity check)



B6U0140W507

Open circuit
- PSP switch terminal A (harness-side) and PCM terminal 14 (harness-side)

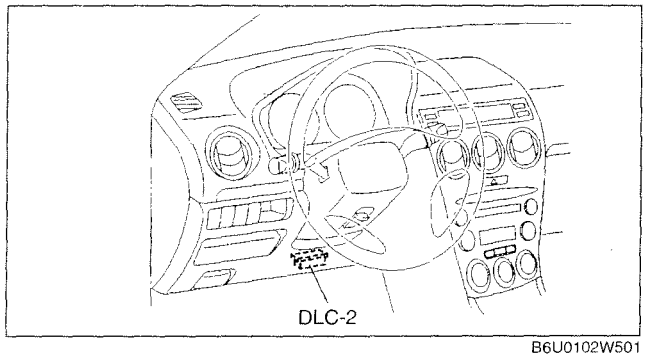
Short circuit
- PSP switch terminal A (harness-side) and power supply
- PSP switch terminal A (harness-side) and body GND

ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [AJ]

C6U014041609W02

Note
- Perform the following inspection only when directed.

1. Connect the WDS or equivalent to the DLC-2.
2. Turn the ignition switch to ON position.
3. Select APP1 or APP2 PID (percentage) on the WDS or equivalent.
4. Verify that the APP1 or APP2 PID (percentage) changes smoothly while accelerator pedal is gradually depressed.
   - If as verified, go to next step.
   - If not as verified, perform the "Circuit Open/Short Inspection".
5. Verify that the APP1 or APP2 PID (percentage) is as indicated in the table below according to the condition of the accelerator pedal.
   - If not verified, perform the "Circuit Open/Short Inspection".
     — If there is no open or short circuit, replace the APP sensor. (See 01–13B–9 ACCELERATOR PEDAL REMOVAL/INSTALLATION [AJ].)



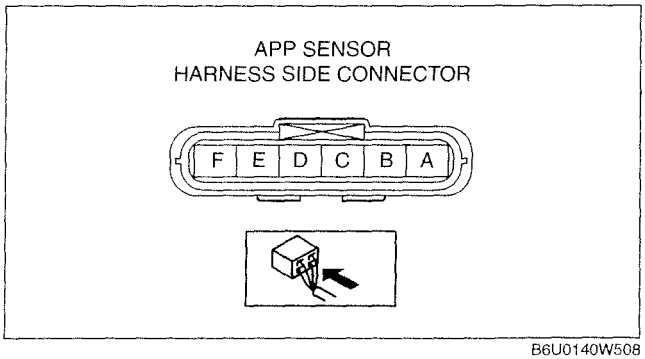
B6U0102W501

Specification

Condition	APP1 PID (%)	APP1 PID (V)	APP2 PID (%)	APP2 PID (V)
Accelerator pedal is released	31.0—32.4	1.55—1.62	20.2—21.4	1.01—1.07
Accelerator pedal is depressed	69.8—81.8	3.49—4.09	58.8—70.8	2.94—3.54

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following harness for open or short circuit. (Continuity check)



B6U0140W508

Open circuit
- APP sensor terminal A (harness-side) and PCM terminal 45 (harness-side)
- APP sensor terminal B (harness-side) and PCM terminal 11 (harness-side)
- APP sensor terminal C (harness-side) and PCM terminal 10 (harness-side)
- APP sensor terminal D (harness-side) and PCM terminal 43 (harness-side)
- APP sensor terminal E (harness-side) and PCM terminal 40 (harness-side)
- APP sensor terminal F (harness-side) and PCM terminal 9 (harness-side)

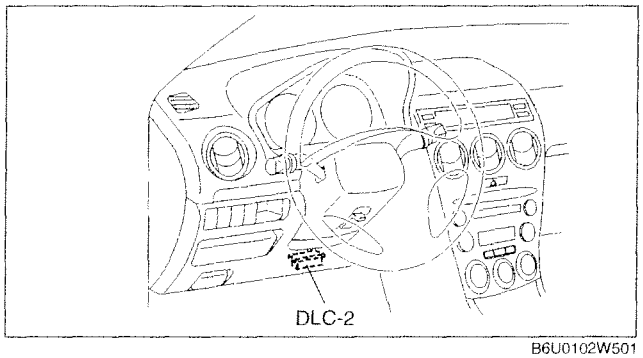
Short circuit
- APP sensor terminal A (harness-side) and power supply
- APP sensor terminal A (harness-side) and body GND
- APP sensor terminal B (harness-side) and power supply
- APP sensor terminal C (harness-side) and power supply
- APP sensor terminal C (harness-side) and body GND
- APP sensor terminal D (harness-side) and power supply
- APP sensor terminal D (harness-side) and body GND
- APP sensor terminal E (harness-side) and power supply
- APP sensor terminal F (harness-side) and power supply
- APP sensor terminal F (harness-side) and body GND

THROTTLE POSITION (TP) SENSOR INSPECTION [AJ]

C6U014018910W02

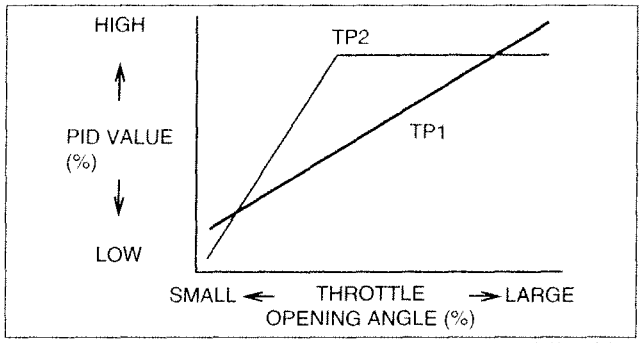
Note
- Perform the following inspection only when directed.

1. Verify that no DTC related to APP sensor has been detected.
   - If any DTCs related to APP sensor have been detected, perform the DTC inspection. (See 01–02B–15 DTC TABLE [AJ].)
2. Connect the WDS or equivalent to the DLC-2.
3. Turn the ignition switch to ON position.
4. Select TP1 or TP2 PID (percentage) on the WDS or equivalent.
5. Verify that the TP1 or TP2 PID is within the specification when the accelerator pedal not depressed. (See 01–40B–6 PCM INSPECTION [AJ].)



B6U0102W501

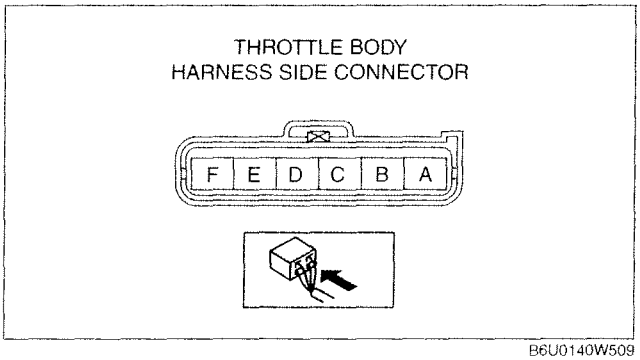
6. Operate the accelerator pedal and verify that the TP1 or TP2 PID (percentage) changes as shown in the following graph.
   - If not verified, perform the "Circuit Open/Short Inspection".
     — If there is no open or short circuit, replace the throttle body. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)



C6U0140W701

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following harnesses for open or short circuit. (Continuity check)



B6U0140W509

Open circuit
- Throttle body terminal C (harness-side) and PCM terminal 63 (harness-side)
- Throttle body terminal D (harness-side) and PCM terminal 20 (harness-side)
- Throttle body terminal E (harness-side) and PCM terminal 36 (harness-side)
- Throttle body terminal F (harness-side) and PCM terminal 89 (harness-side)

Short circuit
- Throttle body terminal C (harness-side) and power supply
- Throttle body terminal C (harness-side) and body GND
- Throttle body terminal D (harness-side) and power supply
- Throttle body terminal D (harness-side) and body GND
- Throttle body terminal E (harness-side) and power supply
- Throttle body terminal F (harness-side) and power supply
- Throttle body terminal F (harness-side) and body GND

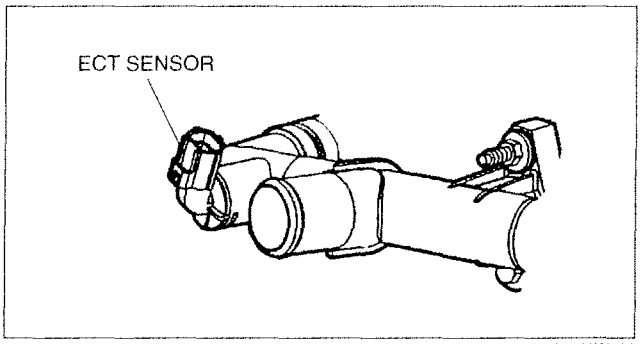
ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [AJ]

C6U014018840W03

Warning

- **A hot engine can cause severe burns. Turn off the engine and wait until it is cool before removing the ECT sensor.**

1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Disconnect the ECT sensor connector.
4. Remove the ECT sensor.
5. Replace the gasket.
6. Install in the reverse order of removal.
7. Refill the engine coolant.



B6U0140W530

ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [AJ]

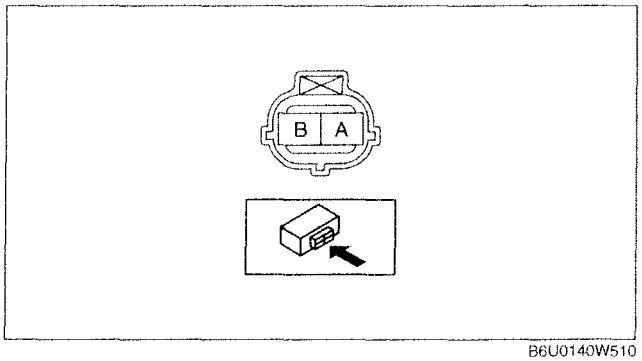
C6U014018840W04

Note

- Perform the following inspection only when directed.

Resistance Inspection

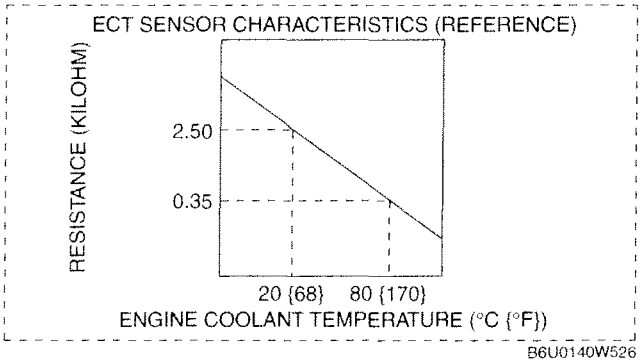
1. Remove the ECT sensor. (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [AJ].)
2. Place the ECT sensor in water with a thermometer, and heat the water gradually.
3. Measure the resistance between ECT sensor terminals A and B using an ohmmeter.
   - If the ECT sensor is okay, but the PID value is out of specification, perform the "Circuit Open/Short Inspection".
   - If not as specified, replace the ECT sensor. (See 01–40B–28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [AJ].)



B6U0140W510

Specification

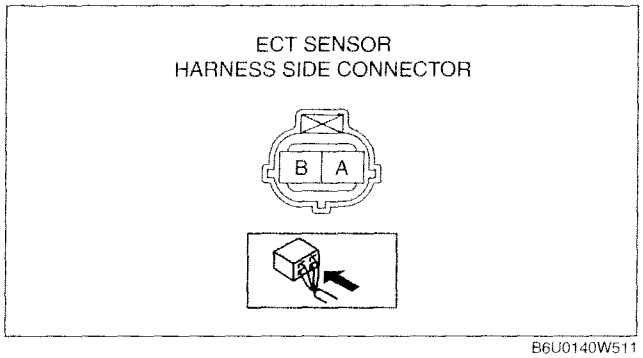
Water temperature (°C {°F})	Resistance (kilohm)
20 {68}	2.2—2.8
80 {176}	0.29—0.40



B6U0140W526

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following harnesses for open or short circuit. (Continuity check)



B6U0140W511

Open circuit

- ECT sensor terminal A (harness-side) and PCM terminal 38 (harness-side)
- ECT sensor terminal B (harness-side) and PCM terminal 91 (harness-side)

Short circuit

- ECT sensor terminal A (harness-side) and power supply
- ECT sensor terminal A (harness-side) and body GND
- ECT sensor terminal B (harness-side) and power supply

INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [AJ]

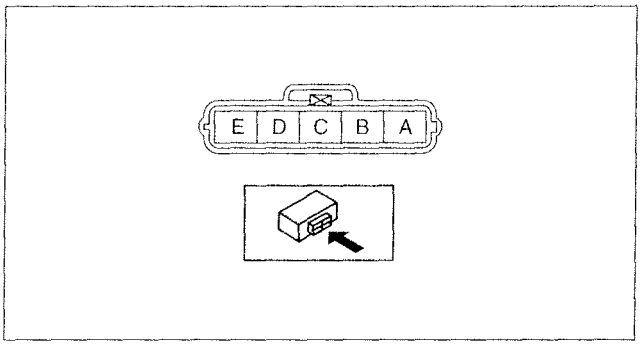
C6U014018845W02

Note

- Perform the following inspection only when directed.

Resistance Inspection

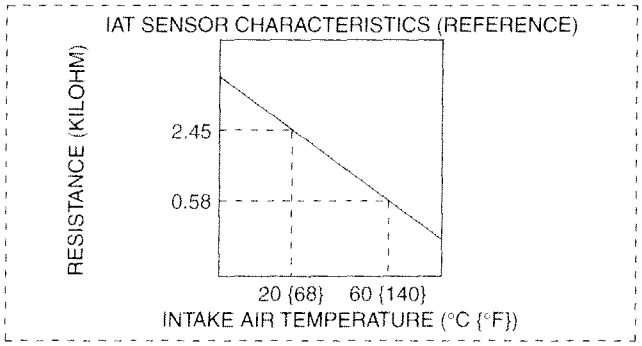
1. Disconnect the negative battery cable.
2. Disconnect the MAF/IAT sensor connector.
3. Measure the resistance between the MAF/IAT sensor terminals D and E using an ohmmeter.
   - If the IAT sensor is okay, but the PID value is out of specification, perform the "Circuit Open/ Short Inspection".
   - If not as specified, replace the MAF/IAT sensor. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)



B6U0140W512

Specification

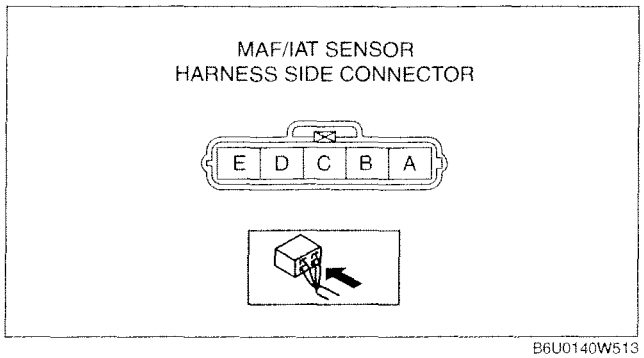
Ambient temperature (°C {°F})	Resistance (kilohm)
-20 {-4}	13.6—18.4
20 {68}	2.21—2.69
60 {140}	0.493—0.667



B6U0140W527

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following harnesses for open or short circuit. (Continuity check)



B6U0140W513

Open circuit

- MAF/IAT sensor terminal D (harness-side) and PCM terminal 39 (harness-side)
- MAF/IAT sensor terminal E (harness-side) and PCM terminal 91 (harness-side)

Short circuit

- MAF/IAT sensor terminal D (harness-side) and power supply
- MAF/IAT sensor terminal D (harness-side) and body GND
- MAF/IAT sensor terminal E (harness-side) and power supply

MASS AIR FLOW (MAF) SENSOR INSPECTION [AJ]

C6U014013210W02

Note

- Perform the following inspection only when directed.

Visual Inspection

1. Visually inspect for the following on the MAF/IAT sensor.
   - Damage
   - Cracks
   - Bent terminals
   - Terminal rust
     — If any of the above are found, replace the MAF/IAT sensor. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)

MAF Rate and Load Value

Note

- The scan tool shows the MAF rate and load value.

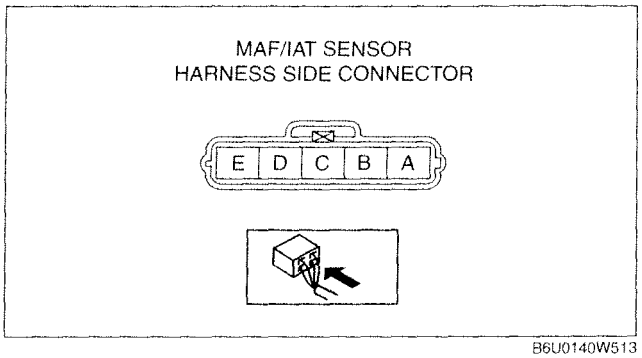
Specification

Item	Intake MAF (g/s)		Engine load calculated value (%)	
	MTX	ATX	MTX	ATX
Idle*1	3.6—3.8	3.8—4.0	Approx. 16.8	Approx. 17.5
Engine speed 2,500 rpm*2	10.5—11.2	10.6—11.4	Approx. 14.6	Approx. 15.2

*1 : 700—800 rpm
*2 : No load, N position or P position

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following harnesses for open or short circuit. (Continuity check)



B6U0140W513

Open circuit

- MAF/IAT sensor terminal A (harness-side) and main relay terminal C (harness-side)
- MAF/IAT sensor terminal B (harness-side) and PCM terminal 77 (harness-side)
- MAF/IAT sensor terminal C (harness-side) and PCM terminal 88 (harness-side)

Short circuit

- MAF/IAT sensor terminal A (harness-side) and body GND
- MAF/IAT sensor terminal B (harness-side) and power supply
- MAF/IAT sensor terminal C (harness-side) and power supply
- MAF/IAT sensor terminal C (harness-side) and body GND

HEATED OXYGEN SENSOR (HO2S) INSPECTION [AJ]

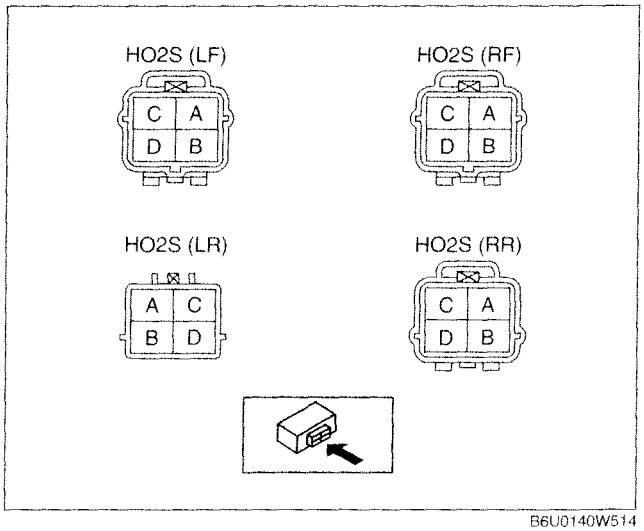
C6U014018861W02

Note

- Perform the following inspection only when directed.

Voltage Inspection

1. Warm-up the engine and run it at idle.
2. Disconnect the HO2S connector.
3. Connect the voltmeter test leads to the following HO2S terminals:
   - (+) lead—terminal A
   - (–) lead—terminal B
4. Run the engine at **3,000 rpm** until the voltmeter moves between **approx. 0** and **1.0 V**.
5. Verify that the measurement voltage changes when the engine speed increases and decreases suddenly several times.
   - If the HO2S is okay, but the PID value is out of specification, perform the "Circuit Open/Short Inspection".
   - If not as specified, replace the HO2S. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)



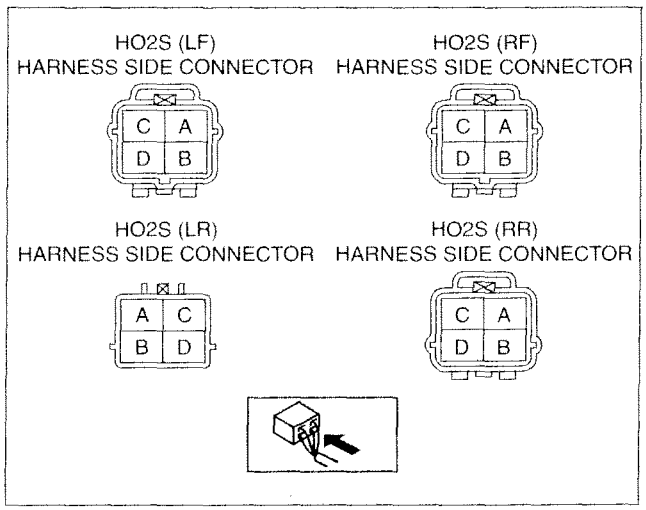
B6U0140W514

Specification

Engine speed	Voltage (V)
Increase	0.5—1.0
Decrease	0—0.5

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following harness for open or short circuit. (Continuity check)



B6U0140W515

Open circuit

- HO2S (RF) terminal A (harness-side) and PCM terminal 60 (harness-side)
- HO2S (RF) terminal B (harness-side) and PCM terminal 91 (harness-side)
- HO2S (LF) terminal A (harness-side) and PCM terminal 87 (harness-side)
- HO2S (LF) terminal B (harness-side) and PCM terminal 91 (harness-side)
- HO2S (RR) terminal A (harness-side) and PCM terminal 35 (harness-side)
- HO2S (RR) terminal B (harness-side) and PCM terminal 91 (harness-side)
- HO2S (LR) terminal A (harness-side) and PCM terminal 61 (harness-side)
- HO2S (LR) terminal B (harness-side) and PCM terminal 91 (harness-side)

Short circuit

- HO2S (RF) terminal A (harness-side) and power supply
- HO2S (RF) terminal A (harness-side) and body GND
- HO2S (RF) terminal B (harness-side) and power supply
- HO2S (LF) terminal A (harness-side) and power supply
- HO2S (LF) terminal A (harness-side) and body GND
- HO2S (LF) terminal B (harness-side) and power supply
- HO2S (RR) terminal A (harness-side) and power supply
- HO2S (RR) terminal A (harness-side) and body GND
- HO2S (RR) terminal B (harness-side) and power supply
- HO2S (LR) terminal A (harness-side) and power supply
- HO2S (LR) terminal A (harness-side) and body GND
- HO2S (LR) terminal B (harness-side) and power supply

HEATED OXYGEN SENSOR (HO2S) HEATER INSPECTION [AJ]

C6U014018861W03

Note

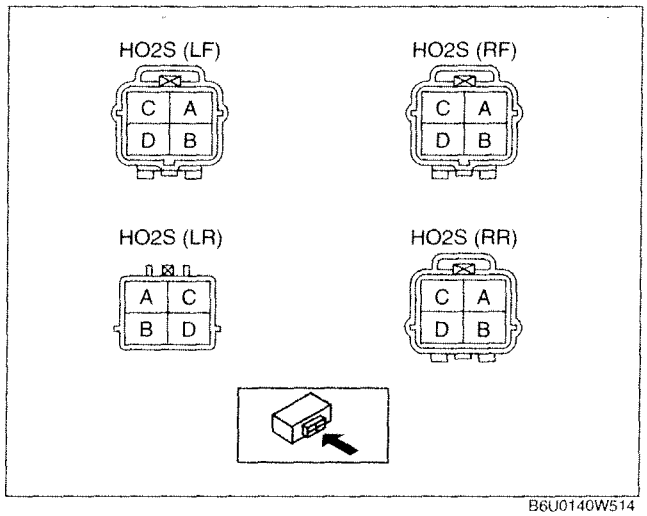
- Perform the following inspection only when directed.

Resistance Inspection

1. Disconnect the negative battery cable.
2. Disconnect the HO2S connector.

3. Measure the resistance between the HO2S terminals C and D using an ohmmeter.
   - If the HO2S heater is okay, but the PID value is out of specification, perform the "Circuit Open/Short Inspection".
   - If not as specified, replace the HO2S. (See 01–15B–2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [AJ].)

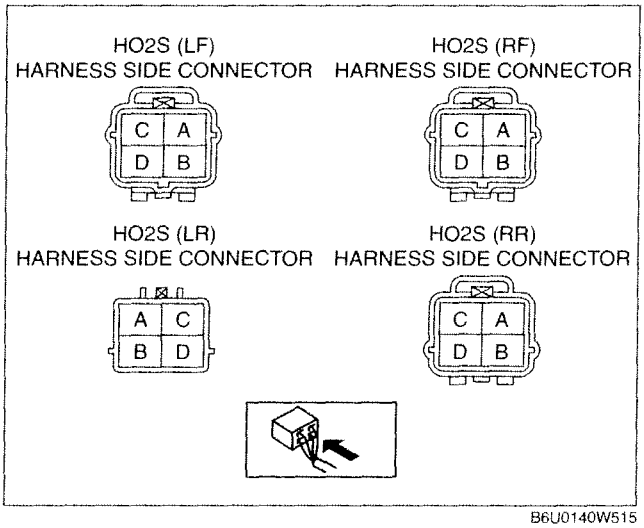
Specification
HO2S (RF, LF): 3.0—3.6 ohms (20°C {68°F})
HO2S (RR, LR): 5.0—7.0 ohms (20°C {68°F})



B6U0140W514

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following harness for open or short circuit. (Continuity check)



B6U0140W515

Open circuit
- HO2S (RF) terminal C (harness-side) and ignition switch
- HO2S (RF) terminal D (harness-side) and PCM terminal 93 (harness-side)
- HO2S (LF) terminal C (harness-side) and ignition switch
- HO2S (LF) terminal D (harness-side) and PCM terminal 94 (harness-side)
- HO2S (RR) terminal C (harness-side) and ignition switch
- HO2S (RR) terminal D (harness-side) and PCM terminal 95 (harness-side)
- HO2S (LR) terminal C (harness-side) and ignition switch
- HO2S (LR) terminal D (harness-side) and PCM terminal 96 (harness-side)

Short circuit
- HO2S (RF) terminal C (harness-side) and body GND
- HO2S (RF) terminal D (harness-side) and power supply
- HO2S (RF) terminal D (harness-side) and body GND
- HO2S (LF) terminal C (harness-side) and body GND
- HO2S (LF) terminal D (harness-side) and power supply
- HO2S (LF) terminal D (harness-side) and body GND
- HO2S (RR) terminal C (harness-side) and body GND
- HO2S (RR) terminal D (harness-side) and power supply
- HO2S (RR) terminal D (harness-side) and body GND
- HO2S (LR) terminal C (harness-side) and body GND
- HO2S (LR) terminal D (harness-side) and power supply
- HO2S (LR) terminal D (harness-side) and body GND

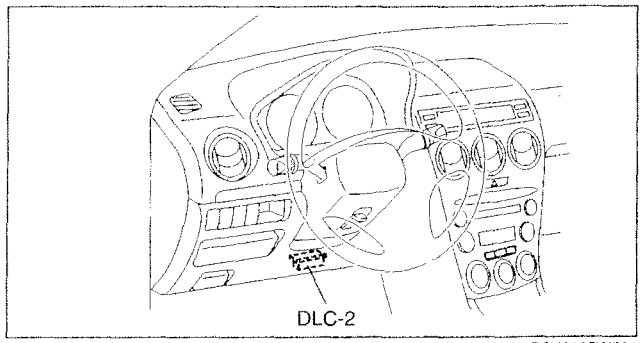
EGR BOOST SENSOR INSPECTION [AJ]

C6U014018211W03

Note
- Perform the following inspection only when directed.
- The following vacuum values are indicated by relative pressure from the EGR boost sensor.

Voltage Inspection
1. Connect the WDS or equivalent to the DLC-2.
2. Turn the ignition switch to the ON position.
3. Select BARO PID on the WDS or equivalent.
4. Verify that the BARO PID (pressure) and barometric pressure are practically equal.
   - If verified, go to next step.
   - If not verified, perform the "Circuit Open/Short Inspection".

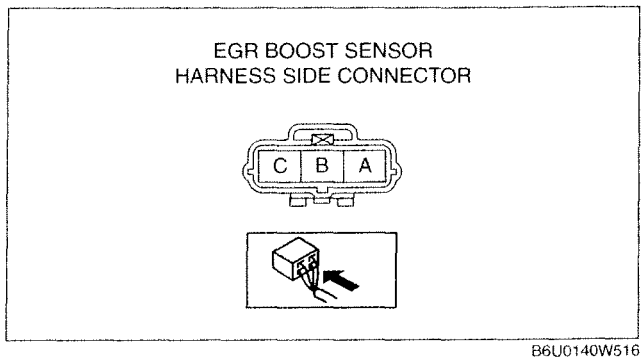
Caution
- **Do not apply vacuum out of specification. Doing so will damage the EGR boost sensor.**



B6U0102W501

5. Apply vacuum of **–25.0 kPa {–187 mmHg, –7.38 inHg}** to the EGR boost sensor, and verify that the BARO PID variation from that of Step 4 is **approx. 25.0 kPa {187 mmHg, 7.38 inHg}**.
   - If verified, replace the EGR boost sensor.
   - If not verified, perform the "Circuit Open/Short inspection".

Circuit Open/Short Inspection
1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following harnesses for open or short circuit. (Continuity check)



B6U0140W516

Open circuit
- EGR boost sensor terminal A (harness-side) and PCM terminal 34 (harness-side)
- EGR boost sensor terminal B (harness-side) and PCM terminal 91 (harness-side)
- EGR boost sensor terminal C (harness-side) and PCM terminal 90 (harness-side)

Short circuit
- EGR boost sensor terminal A (harness-side) and power supply
- EGR boost sensor terminal A (harness-side) and body GND
- EGR boost sensor terminal B (harness-side) and power supply
- EGR boost sensor terminal C (harness-side) and power supply
- EGR boost sensor terminal C (harness-side) and body GND

KNOCK SENSOR (KS) REMOVAL/INSTALLATION [AJ]

C6U014018921W03

1. Disconnect the negative battery cable.
2. Disconnect the KS connector.
3. Remove the KS.
4. Install in the reverse order of removal.

Tightening torque
21.2—28.8 N·m {2.17—2.93 kgf·m, 15.7—21.2 ft·lbf}

KNOCK SENSOR (KS) INSPECTION [AJ]

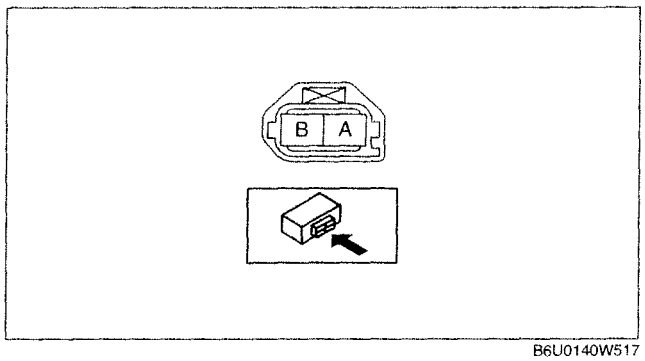
C6U014018921W04

Note
- Perform the following inspection only when directed.

Resistance Inspection

1. Disconnect the negative battery cable.
2. Disconnect the KS connector.
3. Measure the resistance between KS terminals A and B using an ohmmeter.
   - If the KS is okay, but the PID value is out of specification, perform the "Circuit Open/Short Inspection".
   - If not as specified, replace the KS. (See 01–40B–35 KNOCK SENSOR (KS) REMOVAL/INSTALLATION [AJ].)

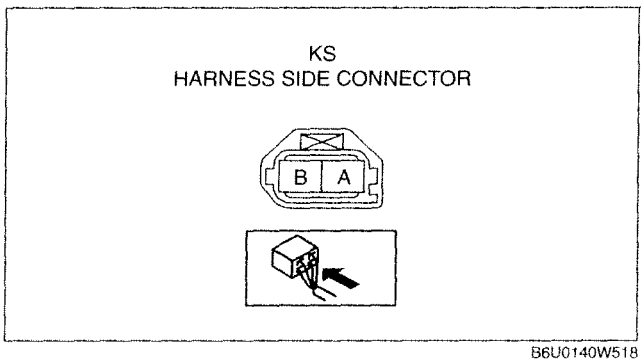
Specification
Approx. 4.87 megohms (20°C {68°F})



B6U0140W517

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following harness for open or short circuit. (Continuity check)



B6U0140W518

Open circuit
- KS terminal B (harness-side) and PCM terminal 31 (harness-side)
- KS terminal A (harness-side) and PCM terminal 4 (harness-side)

Short circuit
- KS terminal A (harness-side) and power supply
- KS terminal A (harness-side) and body GND
- KS terminal B (harness-side) and power supply
- KS terminal B (harness-side) and body GND

CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [AJ]

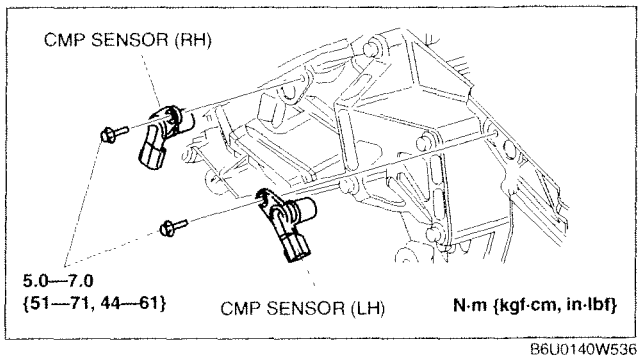
C6U014018200W02

Caution
- **Do not forcefully pull the wiring harness of the CMP sensor. Doing so will break the harness.**

1. Disconnect the negative battery cable.
2. Disconnect the CMP sensor connector.
3. Remove the CMP sensor.

Caution
- **When foreign material such as an iron chip is on the CMP sensor, it can cause abnormal output from the sensor because of flux turbulence and adversely affect the engine control. Be sure there is no foreign material on the CMP sensor when replacing.**

4. Install in the reverse order of removal.



B6U0140W536

CAMSHAFT POSITION (CMP) SENSOR INSPECTION [AJ]

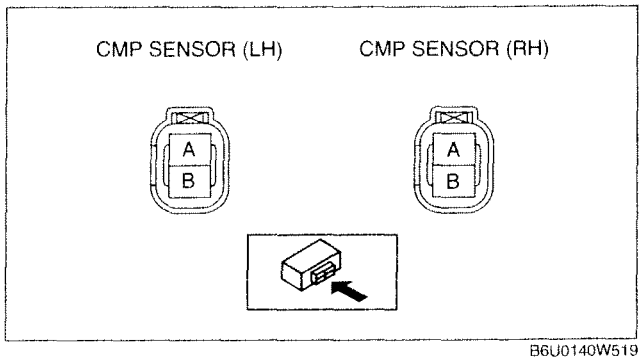
C6U014018200W03

Note
- Perform the following inspection only when directed.

Resistance Inspection

1. Disconnect the negative battery cable.
2. Disconnect the CMP sensor connector.
3. Measure the resistance between the CMP sensor terminals A and B using an ohmmeter.
   - If the CMP sensor is okay, but the PID value is out of specification, perform the "Circuit Open/Short Inspection".
   - If not as specified, replace the CMP sensor. (See 01–40B–36 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [AJ].)

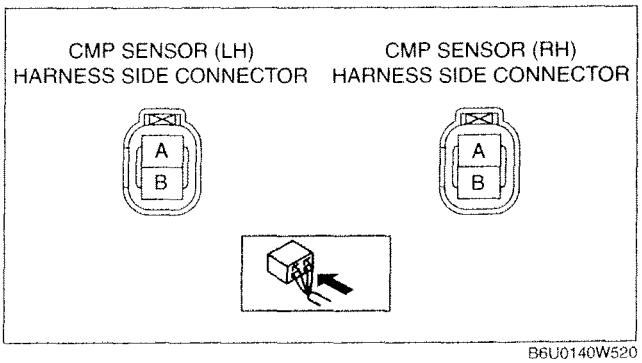
Specification
467—571 ohms



B6U0140W519

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following harness for open or short circuit. (Continuity check)



B6U0140W520

Open circuit
- CMP sensor (RH) terminal A (harness-side) and PCM terminal 85 (harness-side)
- CMP sensor (RH) terminal B (harness-side) and PCM terminal 86 (harness-side)
- CMP sensor (LH) terminal A (harness-side) and PCM terminal 58 (harness-side)
- CMP sensor (LH) terminal B (harness-side) and PCM terminal 59 (harness-side)

Short circuit
- CMP sensor (RH) terminal A (harness-side) and power supply
- CMP sensor (RH) terminal A (harness-side) and body GND
- CMP sensor (RH) terminal B (harness-side) and power supply
- CMP sensor (RH) terminal B (harness-side) and body GND
- CMP sensor (LH) terminal A (harness-side) and power supply
- CMP sensor (LH) terminal A (harness-side) and body GND
- CMP sensor (LH) terminal B (harness-side) and power supply
- CMP sensor (LH) terminal B (harness-side) and body GND

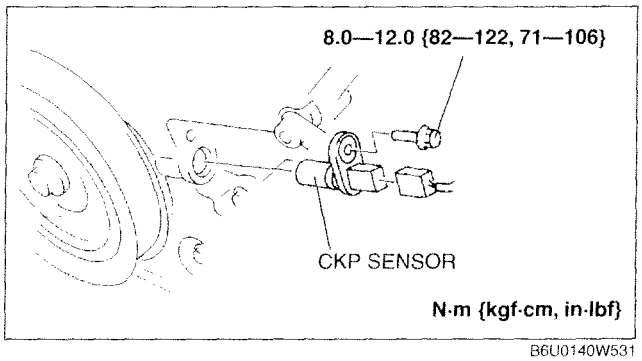
CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [AJ]

C6U014018230W03

Caution
- **Do not forcefully pull the wiring harness of the CKP sensor. Doing so will break the harness.**

1. Disconnect the negative battery cable.
2. Disconnect the CKP sensor connector.
3. Remove the CKP sensor.

Caution
- **When foreign material such as an iron chip is on the CKP sensor, it can cause abnormal output from the sensor because of flux turbulence and adversely affect the engine control. Be sure there is no foreign material on the CKP sensor when replacing.**



B6U0140W531

4. Install in the reverse order of removal.

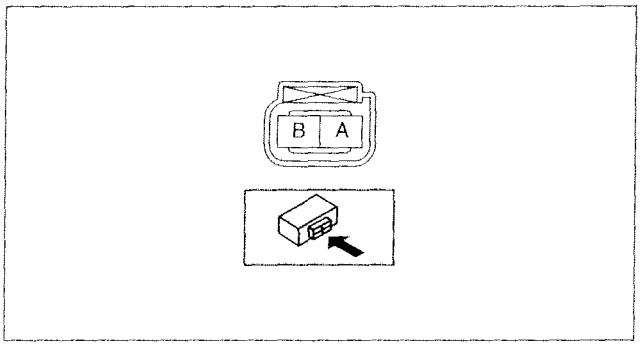
CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [AJ]

C6U014018230W04

Note
- Perform the following inspection only when directed.

Resistance Inspection
1. Disconnect the negative battery cable.
2. Disconnect the CKP sensor connector.
3. Measure the resistance between CKP sensor terminals A and B using an ohmmeter.
   - If the CKP sensor is okay, but the PID value is out of specification, perform the "Circuit Open/ Short Inspection".
   - If not as specified, replace the CKP sensor. (See 01–40B–37 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [AJ].)

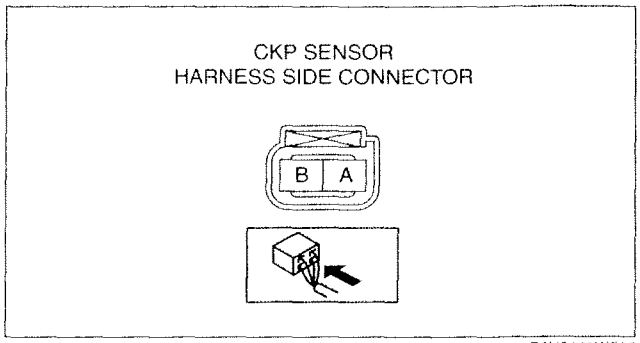
Specification
267—325 ohms



B6U0140W521

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ].)
2. Inspect the following harness for open or short circuit. (Continuity check)



B6U0140W522

Open circuit

- CKP sensor terminal A (harness-side) and PCM terminal 22 (harness-side)
- CKP sensor terminal B (harness-side) and PCM terminal 21 (harness-side)

Short circuit

- CKP sensor terminal A (harness-side) and power supply
- CKP sensor terminal A (harness-side) and body GND
- CKP sensor terminal B (harness-side) and power supply
- CKP sensor terminal B (harness-side) and body GND

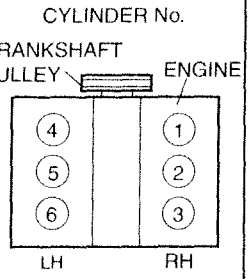
01–50 TECHNICAL DATA

ENGINE TECHNICAL DATA

C6U015001001W01

Item				Specifications	
Engine type				L3	AJ
MECHANICAL					
Valve clearance [engine cold]	(mm {in})	IN		0.22—0.28 {0.0087—0.0110}	—
		EX		0.27—0.33 {0.0107—0.0129}	—
Compression pressure	(kPa {kgf/cm^2, psi}) [rpm]	Standard		1,372 {14.0, 199.08} [285]	Compression pressure of lowest cylinder must be within 75% of highest (See 01–10B–7 COMPRESSION INSPECTION [AJ])
		Minimum		960 {9.79, 139.21} [285]	
		Maximum difference between cylinders		196.1 {2.0, 28.5}	
Cylinder head bolt length	(mm {in})	Standard		145.2—145.8 {5.717—5.740}	—
		Maximum		146.5 {5.767}	
Pushing distance of the camshaft oil seal	(mm {in})			—	2.5—3.0 {0.10—0.11} (from the edge of the camshaft oil seal housing)
Pushing distance of the front oil seal	(mm {in})			0—0.5 {0—0.019} (from the edge of the engine front cover)	0—1.0 {0—0.039} (from the edge of the engine front cover)
Pushing distance of the rear oil seal	(mm {in})			—	0—2.0 {0—0.078} (from the edge of the cylinder block)
Idle speed	(rpm)	ATX		650—750	700—800
		MTX		650—750	700—800
Ignition timing	BTDC (°)			8	10
Idle-up speed*1	(rpm)	E/L ON*2		650—750	700—800
		A/C ON*3		700—800	700—800
		P/S ON*4		650—750	700—800
Idle mixture		HC concentration		Within the regulation	
		CO concentration		Within the regulation	
Oil control valve (OCV)	Resistance (ohm)			6.9—7.9	7.05—7.95
LUBRICATION SYSTEM					
Oil pressure	(kPa {kgf/cm^2, psi} [rpm]			395—649 {4.03—6.61, 57.3—94.1} [3,000]	138—310 {1.40—3.17, 20—45} [1,500]
Oil capacity	Total (dry engine)	(L {US qt, Imp qt})		4.6 {4.8, 4.0}	6.2 {6.6, 5.5}
	Oil replacement	(L {US qt, Imp qt})		3.9 {4.1, 3.4}	5.2 {5.5, 4.6}
	Oil and oil filter replacement	(L {US qt, Imp qt})		4.3 {4.5, 3.8}	5.7 {6.0, 5.0}
Engine oil	Grade (API)			SL	
	ILSAC			GF–3	
	Viscosity (SAE)			5W–20	

Item					Specifications	
Engine type					L3	AJ
COOLING SYSTEM						
Coolant capacity				(L {US qt, Imp qt})	7.0 {7.4, 6.2}	8.5 {9.0, 7.5}
Radiator cap valve opening pressure				(kPa {kgf/cm^2, psi})	113—142 {1.15—1.44, 16.4—20.4}	94—122 {0.95—1.25, 13.6—17.7}
Thermostat	Initial-opening temperature			(°C {°F})	80—84 {176—183}	84—88 {184—190}
	Full-opening temperature			(°C {°F})	97 {206}	99 {210}
	Full-open lift			(mm {in})	More than 8.0 {0.31}	More than 7.3 {0.29}
Cooling fan motor current				[12 V] (A)	8.5—11.5	11.8—14.8
FUEL SYSTEM						
Fuel line hold pressure				(kPa {kgf/cm^2, psi})	More than 200 {2.0, 29}	More than 250 {2.5, 36}
Fuel injector	Leakage				Less than 1 drop/2 min	Less than 1 drop/2 min
	Volume			(ml {cc, fl oz.}/15 s)	61—79 {61—79, 2.2—2.7}	49—65 {49—65, 1.7—2.1}
	Resistance [20°C {68°F}]			(ohm)	11.4—12.6	13.1—14.5
CHARGING SYSTEM						
Battery	Electrolyte gravity				1.22—1.29 [20 °C {68 °F}]	
	Back-up current*5			(mA)	Max. 20	
	Test load chart (A)	Battery type (5-hour rate)	GROUP 40R (50)		240	
	Slow charge (A)	Battery type (5-hour rate)	GROUP 40R (50)		5.0—6.0	
	Quick charge (A/30 min.)	Battery type (5-hour rate)	GROUP 40R (50)		30	
Generator	Rotor resistance (Between slip rings)			(ohm)	1.6—2.0	2.4—2.9
	Brush length	Standard		(mm {in})	18.5 {0.73}	22.5 {0.89}
		Minimum		(mm {in})	5.0 {0.20}	
	Brush spring force	Standard		(N {kgf, lbf})	4.8—6.0 {0.49—0.61, 1.08—1.35}	4.1—5.3 {0.42—0.54, 0.92—1.19}
		Minimum		(N {kgf, lbf})	2.2 {0.22, 0.49}	1.7 {0.17, 0.38}
	Standard voltage (V)	Ignition switch ON	Terminal	B	B+	
				P	Approx. 1	
				D	Approx. 0	
		Idle [20 °C {68 °F}]	Terminal	B	13—15	
				P	Approx. 3—8	
				D	*7	
	Generated current (A) (Reference)	Terminal B current [Engine speed 1000 rpm]			0*6—80	0*6—90
		Terminal B current [Engine speed 2000 rpm]			0*6—100	0*6—105

Item				Specifications	
Engine type				L3	AJ
IGNITION SYSTEM					
Ignition coil	Resistance	Primary coil	(ohm)	0.49—0.57 [20 °C {68 °F}]	0.45—1.15 [25 °C {77 °F}]
		Secondary coil	(kilohm)	9.5—11.1 [20 °C {68 °F}]	5.0—6.0 [25 °C {77 °F}]
		Insulation resistance of case	(megohm)	10 or more	
Firing order				1-3-4-2	1-4-2-5-3-6 
Spark plug	Type	Motorcraft		—	AGSF 22FSCM
		NGK		ITR6F13	—
	Resistance (kilohm)	Motorcraft		—	2—20
		NGK		3.0—7.5	—
	Tightening torque		(N·m {kgf·cm, in·lbf})	10—14 {1.1—1.4 kgf·m, 8.0—10.3 ft·lbf}	9—20 {91—204, 79—177}
STARTING SYSTEM					
Starter	Commutator diameter	Standard	(mm {in})	29.4 {1.16}	
		Minimum	(mm {in})	28.8 {1.13}	
	Brush length	Standard	(mm {in})	12.3 {0.48}	
		Minimum	(mm {in})	7.0 {0.28}	
	Brush spring force	Standard	(N {kgf, lbf})	21.6 {2.20, 4.84}	
		Minimum	(N {kgf, lbf})	5.9 {0.6, 1.3}	
	Pinion gap		(mm {in})	0.5—2.0 {0.02—0.08}	0 {0}
	No load test	Voltage	(V)	11	
		Current	(A)	90 or less	

*1 : Excludes temporary idle speed drop just after the electrical loads (E/L) are turned on.
*2 : Headlight is on, Fan switch is above 1st, Cooling fan is operating, Rear window defroster is on.
*3 : A/C switch and fan switch are turned on.
*4 : Steering wheel fully turned.
*5 : Back-up current is the constant flow of current present (for the audio unit, clock, PCM, etc.) when the ignition switch is off and with the ignition key removed.
*6 : Lower limit of the current must be more than 0 A.
*7 : Turn the following electrical loads on and verify that the voltage reading increases.

- Headlights
- Blower motor
- Rear window defroster

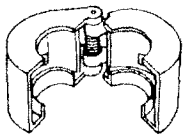
01–60 SERVICE TOOLS

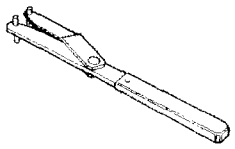
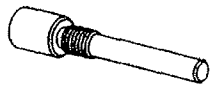
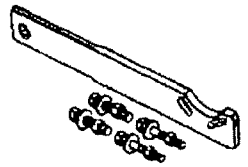
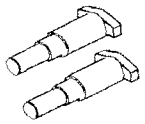
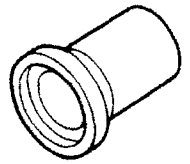
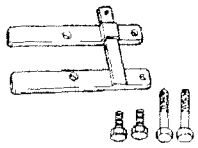
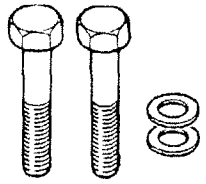
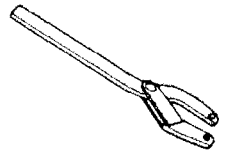
ENGINE SST

C6U016001001W01

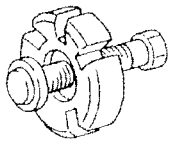
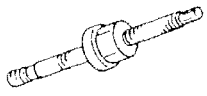
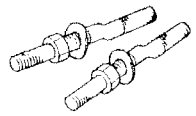
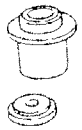
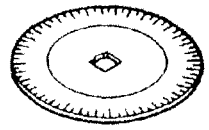
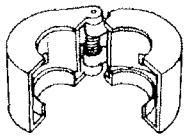
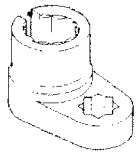
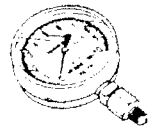
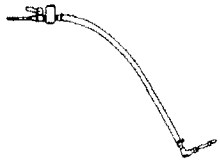
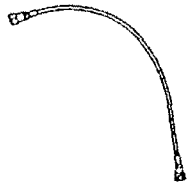
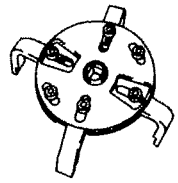
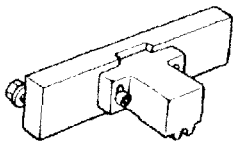
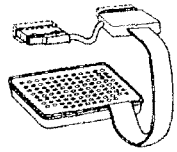
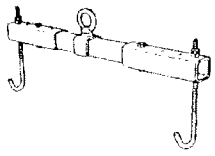
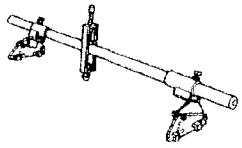
1: Mazda SST number
2: Global SST number

Example

1:49 UN01 052 2:310–D005 Spring lock coupler tool (green)	

1:49 G032 354 2:– Adjusting wrench (L3) 	1:– 2:303–507 Crankshaft TDC timing peg (L3) 	1:– 2:205-126 Holding tool (L3) 
1:– 2:205–072–02 Crankshaft holding tool pins (L3) 	1:– 2:303–465 Camshaft alignment timing tool (L3) 	1:49 H010 401 2:– Oil seal installer (L3) 
1:49 E011 1A1 2:– Holder set (AJ) 	1:49 H012 006 2:– Bolt (AJ) 	1:49 S120 710 2:– Coupling flange holder (AJ) 
1:49 UN30 3464 2:303–464 Camshaft seal replacer (AJ) 	1:49 UN30 3463 2:303–463 Camshaft seal protector (AJ) 	1:49 UN30 3456 2:303–456 Water pump pulley plate (AJ) 
1:49 UN30 3457 2:303–457 Shaft protector 	1:MZ254AT364 1 2:– Evaporative emission system tester 	1:49 UN21 1185 2:211–185 Pump pulley replacer (AJ) 

SERVICE TOOLS

1:49 UN30 3009 2:303–009 Crankshaft damper remover (AJ) 	1:49 UN01 002 2:303–102 Crankshaft damper replacer (AJ) 	1:49 UN30 3384 2:303–384 Rear crankshaft adapter bolts (AJ) 
1:49 UN30 3335 2:303–335 Crankshaft seal installer/aligner (AJ) 	1:49 UN01 070 2:303–178 Crankshaft seal installer (AJ) 	1:49 D032 316 2:– Protractor 
1:49 UN01 052 2:310–D005 Spring lock coupler tool (green) 	1:49 L018 001 2:– O2 sensor wrench 	1:49 B019 901B 2:– Gauge 
1:49 N013 101A 2:– Body 	1:49 N013 102A 2:– Adapter Hose 	1:49 F042 001 2:– Wrench 
1:49 1352 060 2:– Ring gear brake (AJ) 	1:49 UN01 130 2: – EEC-V 104-pin breakout box 	1:– 2:418-FS475 WDS 
1:49 L017 5A0 2:– Support hanger (AJ) 	1:49 E017 5A0 2:– Engine support 	1:49 UN30 3050 2:303-050 Engine lifting bracket (AJ) 

SUSPENSION

02 SECTION

02–10 GENERAL PROCEDURES

PRECAUTION (SUSPENSION)

C6U021001013W01

Wheels and Tires Removal/Installation

1. When a wheel is installed, tighten it to **88—118 N·m {9.0—12.0 kgf·m, 65.0—87.0 ft·lbf}**.

Suspension Links Removal/Installation

1. Tighten any part of the suspension that uses rubber bushings only after the vehicle has been lowered to the ground and unloaded.

Note

- Unloaded: Fuel tank is full. Engine coolant and engine oil are at specified levels. Spare tire, jack and tools are in designated position.

Brake Lines Disconnection/Connection

Caution

- **Brake fluid will damage painted surfaces. If brake fluid does get on a painted surface, wipe it off immediately.**

1. Tighten the brake pipe flare nut using the **SST** (49 0259 770B). Be sure to modify the brake pipe flare nut tightening torque to allow for use of a torque wrench-**SST** combination. (See 00–00–17 Torque Formulas.)
2. If any brake line has been disconnected anytime during the procedure, add brake fluid, bleed the brakes, and inspect for leakage after the procedure has been completed.

Power Steering Components Removal/Installation

1. If any power steering fluid line has been disconnected anytime during the procedure, add ATF M-III, M-V, or equivalent (e.g. Dexron®III), bleed the fluid line, and inspect for leakage after the procedure has been completed.

02–11 WHEEL ALIGNMENT

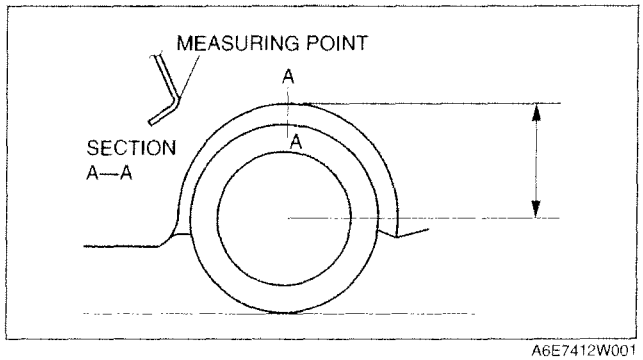
WHEEL ALIGNMENT PRE-INSPECTION

C6U021101013W01

1. Inspect the tire inflation, and adjust to the recommended pressure as necessary.
2. Inspect the front wheel bearing play and correct it if necessary. (See 03–11–1 Wheel Bearing Play Inspection.)
3. Inspect the wheel and tire runouts. (See 02–50–1 SUSPENSION.)
4. Inspect the ball joints and steering linkage for excessive looseness.
5. Shake the vehicle up and down to inspect the operation of the shock absorbers.

Note
- The vehicle must be on level ground and unloaded.
- Unloaded: Fuel tank is full. Engine coolant and engine oil are at specified level. Spare tire, jack and tools are in designated position.

6. Measure the height from the center of the wheel to the fender brim. The difference between the left and right measurement must not exceed **10 mm {0.39 in}**.



A6E7412W001

FRONT WHEEL ALIGNMENT

C6U021101015W01

Specification (Unloaded)*1

4SD, 5HB

Item		Specification				
Fuel gauge indication		Empty	1/4	1/2	3/4	Full
Maximum steering angle	Inner	34°±3°				
	Outer	29°±3°				
Total toe-in	(mm {in})	Tire: 2±4 {0.08±0.16}, Rim inner: 1.4±2.8 {0.06±0.12}				
	(degree)	0°11′±0°22′				
Caster angle*2 (Reference value)		3°37′±1°	3°39′±1°	3°41′±1°	3°44′±1°	3°47′±1°
Camber angle*2 (Reference value)	L3	−0°16′±1°			−0°17′±1°	
	AJ	−0°17′±1°			−0°18′±1°	
Steering axis inclination (Reference value)	L3	5°26′			5°28′	
	AJ	5°30′			5°29′	

WGN

Item		Specification				
Fuel gauge indication		Empty	1/4	1/2	3/4	Full
Maximum steering angle	Inner	34°±3°				
	Outer	29°±3°				
Total toe-in	(mm {in})	Tire: 2±4 {0.08±0.16}, Rim inner: 1.4±2.8 {0.06±0.12}				
	(degree)	0°11′±0°22′				
Caster angle*2 (Reference value)		3°29′±1°	3°32′±1°	3°34′±1°	3°37′±1°	3°39′±1°
Camber angle*2 (Reference value)		−0°16′±1°			−0°17′±1°	
Steering axis inclination (Reference value)		5°28′			5°27′	

*1 : Engine coolant and engine oil are at specified level. Spare tire, jack and tools are in designated position.
*2 : Difference between left and right must not exceed **1°30′**.

Maximum Steering Angle Adjustment

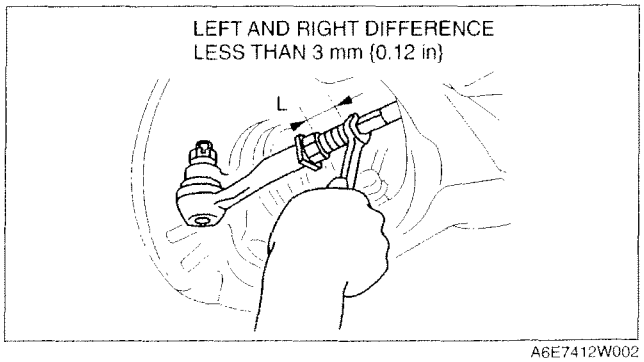
1. Loosen the tie-rod end locknuts.
2. Remove the steering gear boot clamp.
3. Turn the tie rods to equalize the length L.

   Maximum left/right difference
   3 mm {0.12 in}

4. Turn the tie rods equally to provide the correct maximum steering angle.
5. Tighten the tie-rod end locknuts.

   Tightening torque
   68.6—98.0 N·m {7.00—9.99 kgf·m, 50.6—72.2 ft·lbf}

6. Verify that the boot is not twisted, and install the boot clamp.
7. Adjust the toe-in after adjusting the steering angle.



A6E7412W002

Total Toe-in Adjustment

1. Center the steering wheel and confirm that the vehicle wheels/tires are pointing straight.
2. Loosen the left and right tie-rod end locknuts and turn the tie-rods equally. Both tie rods are right threaded, so turning the right tie-rod toward the front of the vehicle and the left toward the rear increases toe-in.

Note
- Turning both tie-rods one complete turn changes toe-in by **about 6 mm {0.24 in} (0°36')**.

3. Tighten the tie-rod end locknuts to the specified torque.

Tightening torque
68.6—98.0 N·m {7.00—9.99 kgf·m, 50.6—72.2 ft·lbf}

4. Verify that the boot is not twisted, and install the boot clamp.

REAR WHEEL ALIGNMENT

C6U021101016W01

Specification (Unloaded)*1

4SD, 5HB

Item		Specification				
Fuel gauge indication		Empty	1/4	1/2	3/4	Full
Total toe-in	(mm {in})	Tire: 2±4 {0.08±0.16}, Rim inner: 1.4±2.8 {0.06±0.12}				
	(degree)	0°11'±0°22'				
Camber angle*2		−1°05'±1°	−1°07'±1°	−1°09'±1°	−1°11'±1°	−1°13'±1°
Thrust angle		0°±0°48'				

WGN

Item		Specification				
Fuel gauge indication		Empty	1/4	1/2	3/4	Full
Total toe-in	(mm {in})	Tire: 2±4 {0.08±0.16}, Rim inner: 1.4±2.8 {0.06±0.12}				
	(degree)	0°11'±0°22'				
Camber angle*2		−0°59'±1°	−1°00'±1°	−1°02'±1°	−1°04'±1°	−1°06'±1°
Thrust angle		0°±0°48'				

*1 : Engine coolant and engine oil are at specified level. Spare tire, jack and tools are in designated position.
*2 : Difference between left and right must not exceed **1°30'**.

Note
- Adjust the toe-in after adjusting the camber.

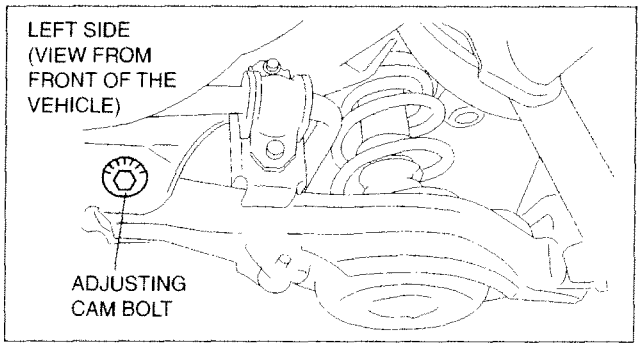
Camber Adjustment

1. Loosen the cam nut on the lower arm.
2. Turn the adjusting cam bolt to provide the correct camber angles as indicated.

	Left wheel	Right wheel
Positive direction	Clockwise	Counter-clockwise
Negative direction	Counter-clockwise	Clockwise

3. Tighten the cam nut.

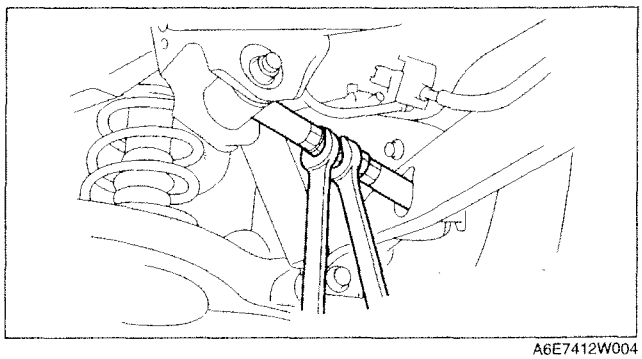
Tightening torque
86.2—116.6 N·m {8.79—11.88 kgf·m, 63.58—85.99 ft·lbf}



A6E7412W003

Total Toe-in Adjustment

1. Loosen the locknut of the lateral link.

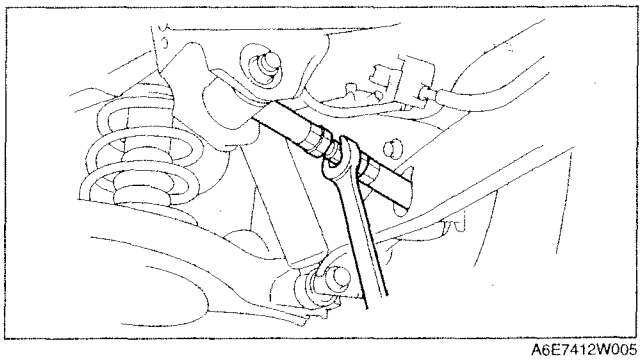


A6E7412W004

2. Adjust the toe-in turning the adjusting link.

Specification
Total Toe-in: 2±4 mm {0.08±0.16 in}

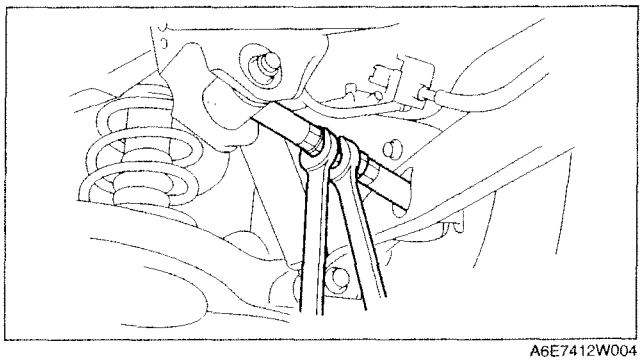
Note
- Toe change amount: **0°43′** / one rotation



A6E7412W005

3. Tighten the locknut.

Tightening torque
68.6—98.1 N·m {7.0—10.0 kgf·m, 50.6—72.3 ft·lbf}



A6E7412W004

02–12 WHEEL AND TIRES

WHEEL BALANCE ADJUSTMENT (ALUMINUM ALLOY WHEEL)

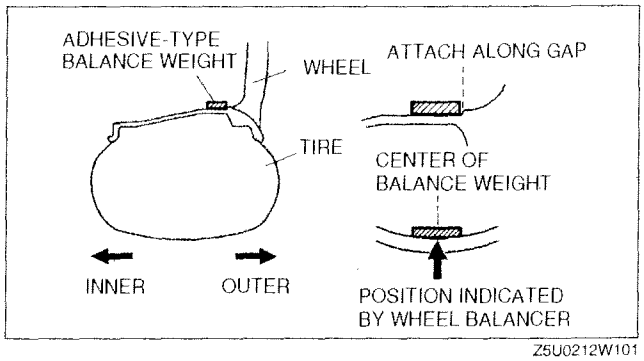
C6U021201014W01

Caution
- **Adjust the outer wheel balance first, then the inner wheel balance.**
- **Be careful not to scratch the wheels.**

Adhesive-type Balance Weight (Outer)

1. Remove the old balance weight from the wheel.
2. Remove the double-sided adhesive tape remaining on the wheel, then clean and degrease the bonding area.
3. Set the wheel on a wheel balancer, measure the amount of unbalance and the position with the mode set for knock-type balance weight.
4. Multiply the amount of unbalance by **1.6** to get the balance weight value.
5. Select a balance weight closest to the weight value and attach the balance weight on the position (outer) indicated by the wheel balancer.

Example calculation of balance weight value
Indicated amount of unbalance: 23 g {0.81 oz}
23 g {0.81 oz}×1.6 = 36.8 g {1.30 oz}
Selected balance weight value: 35 g {1.24 oz}



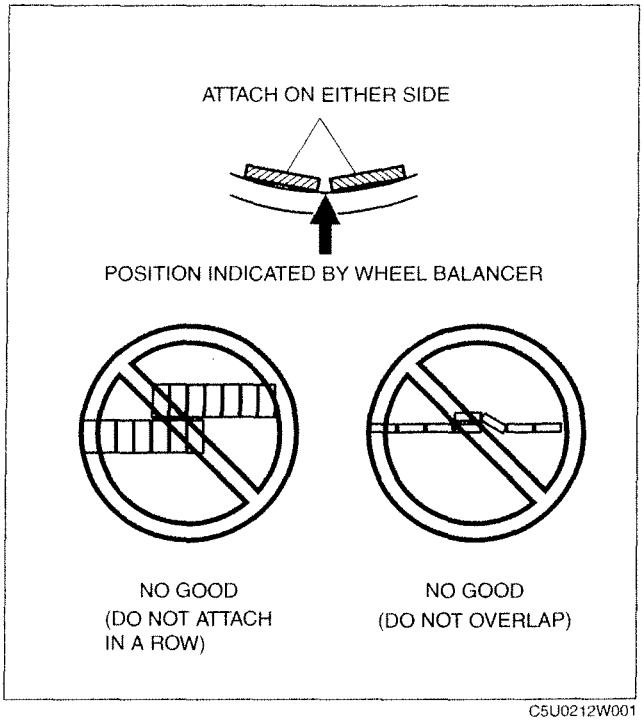
Z5U0212W101

Note
- When selecting a balance weight, select one closest to the calculated value.
  Example: **32.4 g {1.14 oz}= 30 g {1.06 oz}, 32.5 g {1.15 oz}= 35 g {1.24 oz}**

Caution
- **Use a genuine balance weight or equivalent (steel).**
- **When attaching the weight balance, press the balance weight with a force of 25 N {2.5 kgf, 5.5 lbf} per 5 g for 2 seconds or more.**

6. If attaching 2 balance weights, position them so that each is on either side of the position indicated by the wheel balancer.

Caution
- **Do not attach weight balances in a row.**
- **Do not overlap the balance weights.**
- **Total weight must not exceed 160g {5.65 oz}.**

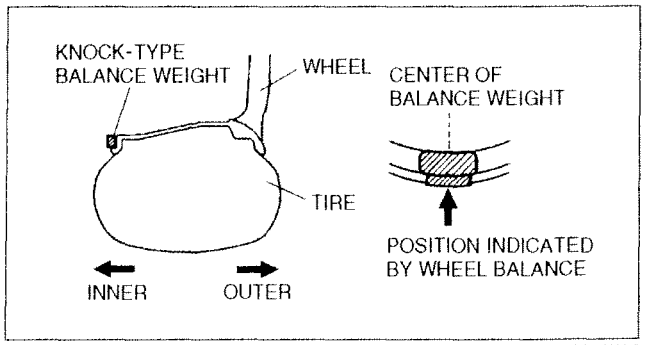


C5U0212W001

Knock-type Balance Weight (Inner)

1. Measure the amount of unbalance with a wheel balancer.
2. Attach a balance weight corresponding to the measured weight value on the position (inner) indicated by the wheel balancer.

Caution
- **Do not attach 3 or more balance weights.**
- **One balance weight must not exceed 60g {2.12 oz}, and a total of 2 balance weights must not exceed 100g {3.53 oz}.**



Z5U0212W103

Remaining Amount of Unbalance Confirmation

1. After installing the outer and inner balance weights, operate the wheel balancer again.
2. Confirm that the remaining unbalance does not exceed the following on either side.

	Outer	Inner
16 inch wheel	10 g {0.35 oz}	8 g {0.28 oz}
17 inch wheel	9 g {0.32 oz}	7 g {0.25 oz}

- If the remaining unbalance exceeds **10 g {0.35 oz}** (16 inch wheel) or **9g {0.32 oz}** (17 inch wheel), perform wheel balance adjustment again.

Allowable remaining unbalance value

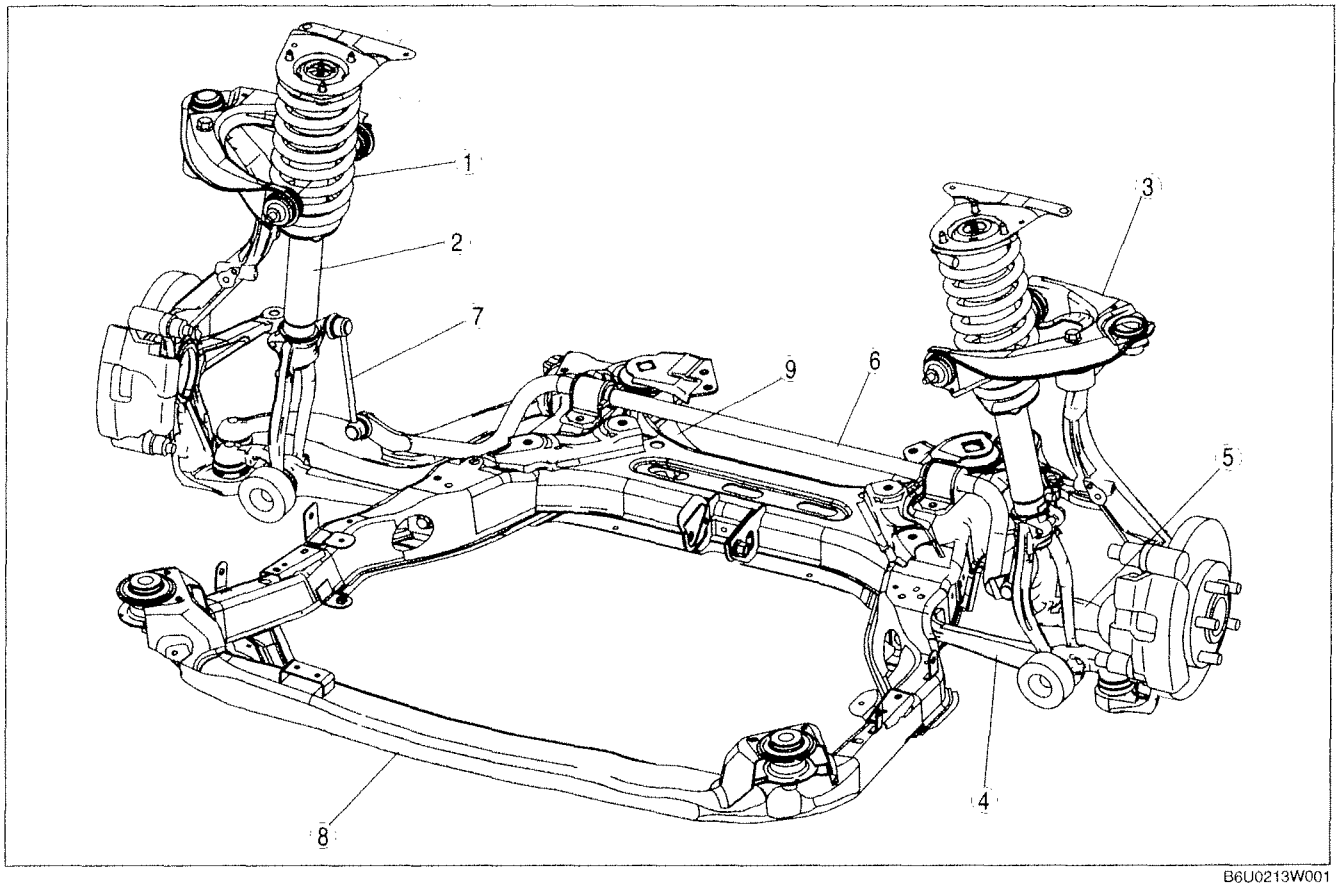
(g {oz})

	Dynamic unbalance (at rim)		Static unbalance (at rim)
	Outer	Inner	
16 inch wheel	10 {0.35} max.	8 {0.28} max.	13 {0.46} max.
17 inch wheel	9 {0.32} max.	7 {0.25} max.	11 {0.39} max.

02–13 FRONT SUSPENSION

FRONT SUSPENSION LOCATION INDEX

C6U021301015W01



B6U0213W001

1	Front shock absorber and coil spring (See 02–13–3 FRONT SHOCK ABSORBER AND SPRING REMOVAL/INSTALLATION)
2	Front shock absorber (See 02–13–6 FRONT SHOCK ABSORBER INSPECTION) (See02–13–6 FRONT SHOCK ABSORBER DISPOSAL)
3	Front upper arm (See 02–13–6 FRONT UPPER ARM REMOVAL/ INSTALLATION) (See 02–13–8 FRONT UPPER ARM INSPECTION)
4	Front lower arm (front) (See 02–13–9 FRONT LOWER ARM (FRONT) REMOVAL/INSTALLATION) (See 02–13–12 FRONT LOWER ARM (FRONT) INSPECTION)

5	Front lower arm (rear) (See 02–13–13 FRONT LOWER ARM (REAR) REMOVAL/INSTALLATION) (See 02–13–16 FRONT LOWER ARM (REAR) INSPECTION)
6	Front stabilizer (See 02–13–17 FRONT STABILIZER REMOVAL/ INSTALLATION)
7	Stabilizer control link (See 02–13–18 STABILIZER CONTROL LINK INSPECTION)
8	Front crossmember (See 02–13–18 FRONT CROSSMEMBER REMOVAL/INSTALLATION)
9	Transverse member (See 02–13–22 TRANSVERSE MEMBER REMOVAL/INSTALLATION)

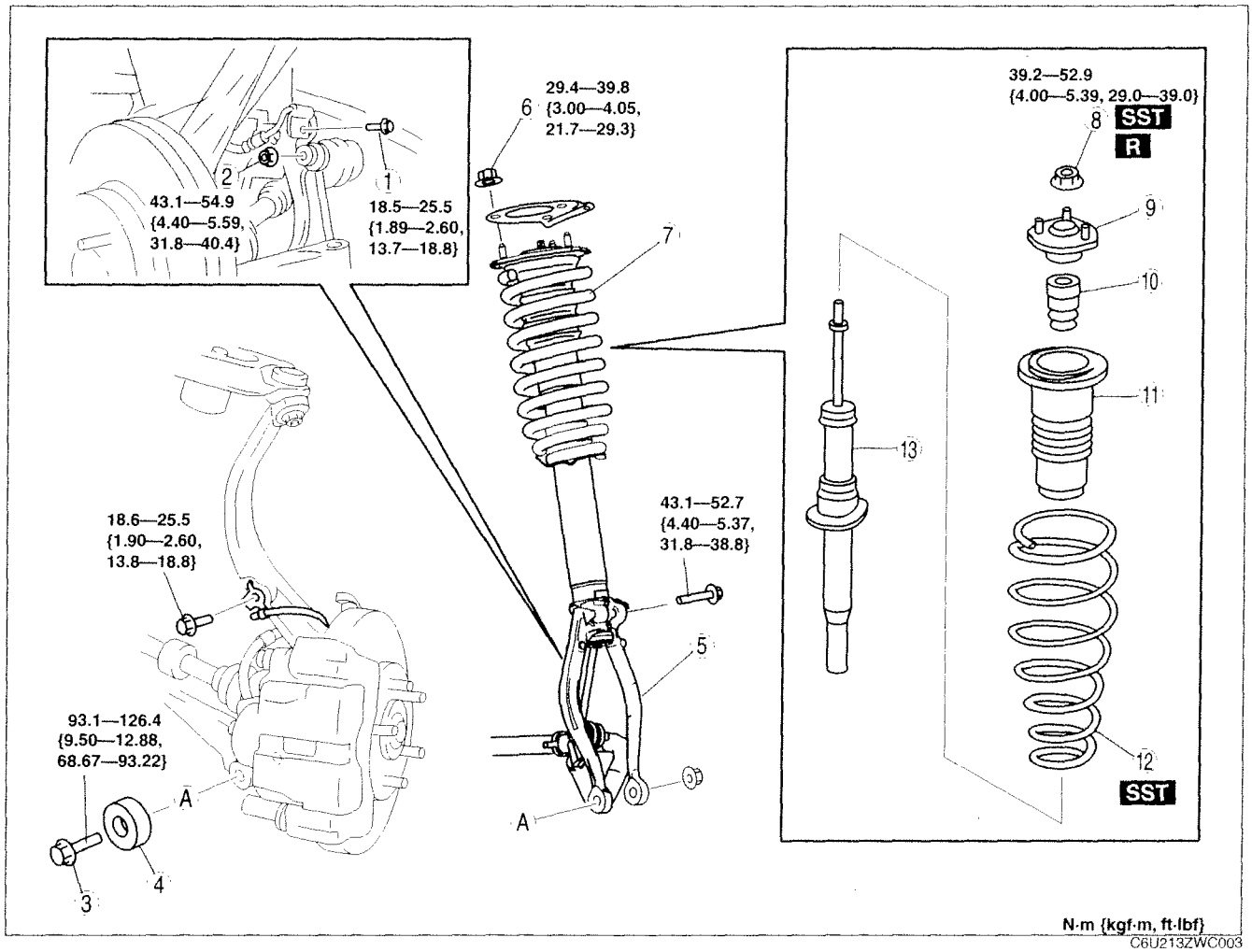
FRONT SHOCK ABSORBER AND SPRING REMOVAL/INSTALLATION

C6U021304910W01

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.**

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



1	Bolt (brake hose bracket)
2	Nut (front stabilizer control link)
3	Bolt (front shock absorber lower side) (See 02–13–4 Bolt (Front Shock Absorber Lower Side) Removal Note)
4	Dynamic damper
5	Damper fork (See 02–13–6 Damper Fork Installation Note)
6	Nut (front shock absorber upper side)

7	Front shock absorber and coil spring (See 02–13–5 Front Shock Absorber and Coil Spring Installation Note)
8	Piston rod nut (See 02–13–4 Piston Rod Nut Removal Note)
9	Mounting rubber
10	Bound stopper
11	Dust boot
12	Coil spring (See 02–13–4 Coil Spring Installation Note)
13	Front shock absorber

Bolt (Front Shock Absorber Lower Side) Removal Note

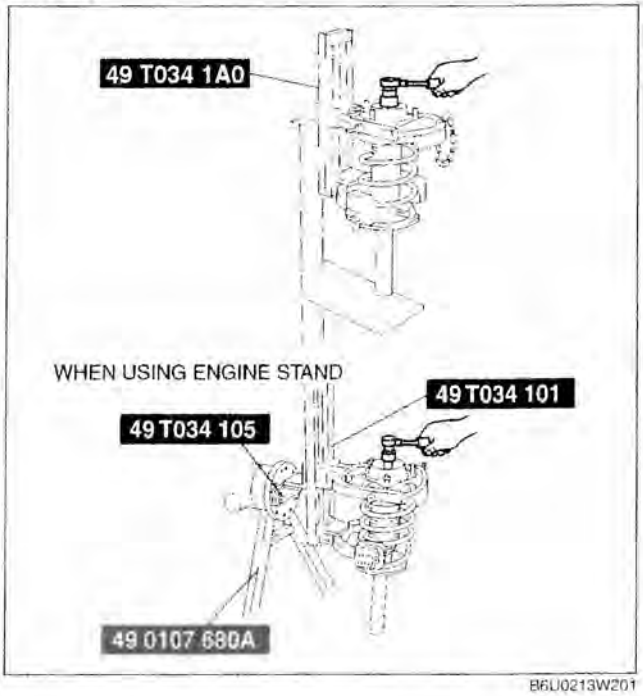
1. Support the knuckle with a jack to prevent it from falling.

Piston Rod Nut Removal Note

Warning

- **Removing the piston rod nut is dangerous. The shock absorber and spring could fly off under tremendous pressure and cause serious injury or death. Secure the shock absorber in the SSTs before removing the piston rod nut.**

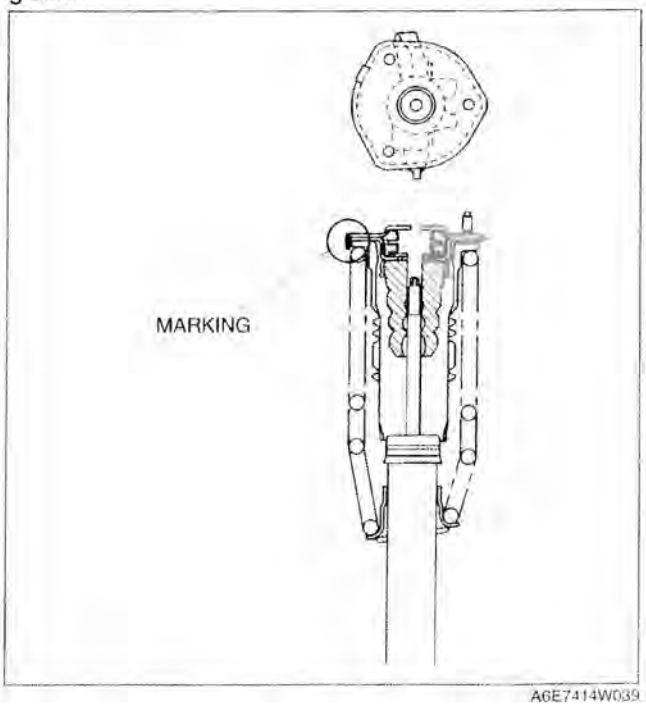
1. Protect the coil spring using a piece of cloth, then set the **SSTs**.
2. Compress the coil spring using the **SSTs**, and remove the piston rod nut.



B6U0213W201

Coil Spring Installation Note

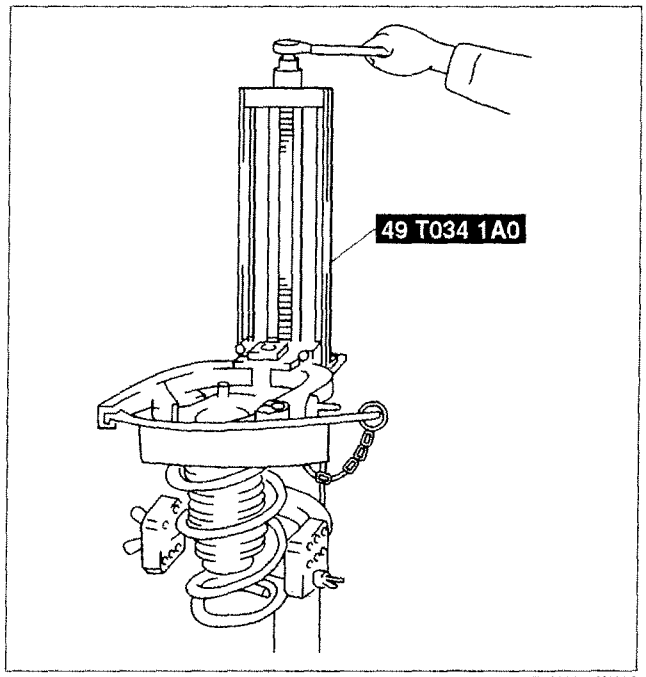
1. Temporarily install the coil spring, dust boot and mounting rubber on the shock absorber so that the lower end of the coil spring is seated on the step of the lower spring seat.
2. Mark the coil spring, dust boot and mounting rubber for proper installation as shown in the figure.
3. Align the marks of the coil spring and dust boot. Protect the coil spring and dust boot using a piece of cloth, then set the **SSTs**.



A6E7414W039

4. Compress the coil spring using the **SSTs**.
5. Install the shock absorber so that the lower end of the coil spring is seated on the step of the lower spring seat.
6. Make sure that the marks on the shock absorber and dust boot are aligned.
7. Install the mounting rubber and piston rod nut, then remove the **SSTs**.

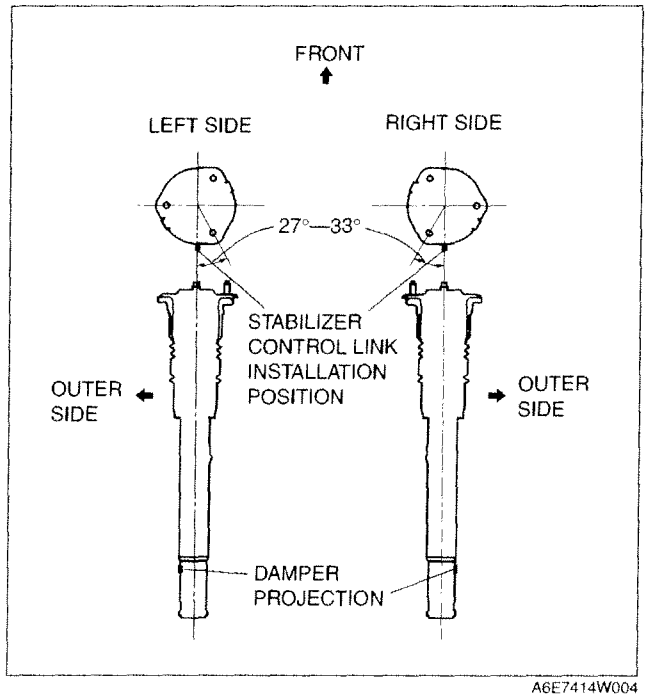
Piston rod nut tightening torque
39.2—52.9 N·m {4.00—5.39 kgf·m, 29.0—39.0 ft·lbf}



B6U0213W202

Front Shock Absorber and Coil Spring Installation Note

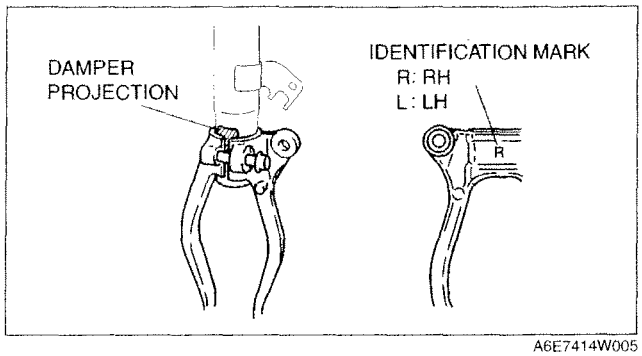
1. Install the stud bolts at a 27°—33° angle from where the stabilizer control link is installed (center line), towards the inner side of the vehicle.



A6E7414W004

Damper Fork Installation Note

1. Align the gap of the damper fork with the projections of the damper.
2. Tighten the bolt.



A6E7414W005

FRONT SHOCK ABSORBER INSPECTION

C6U021334700W01

1. Remove the front shock absorber from the vehicle.
2. Inspect for damage and oil leakage.
3. Inspect the rubber bushing for deterioration and wear.
4. Compress and extend the shock piston at least three times. Verify that the operational force does not change and that there is no unusual noise.
   - If not as specified, replace the shock absorber.
   (1) Compress the shock absorber piston and release it.
   (2) Verify that the piston extends fully at a normal speed.

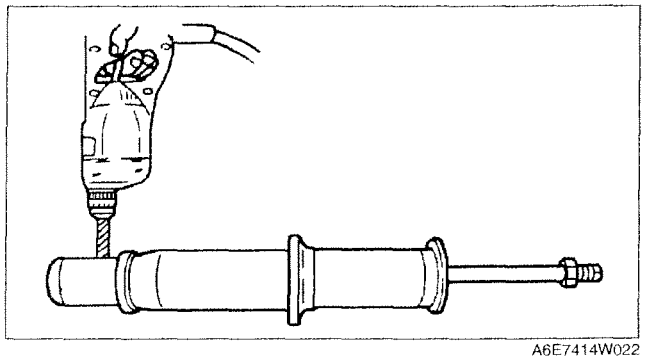
FRONT SHOCK ABSORBER DISPOSAL

C6U021334700W02

Warning

- **Whenever drilling into a shock absorber, wear protective eye wear. The gas in the shock absorber is pressurized, and could spray metal chips into the eyes and face when drilling.**

1. Clamp a shock absorber on a flat surface or with the piston pointing downwards.
2. Drill a **2—3 mm {0.08—0.12 in}** hole at a point **20—30 mm {0.8—1.2 in}** from the bottom of the tube, so that the gas can escape.
3. Turn the hole downwards.
4. The oil can be collected by moving the piston rod several times up and down and cutting the tube at the end.
5. Dispose of waste oil according to the waste disposal law.



A6E7414W022

Note

- Shock absorber gas is nitrogen gas.
- Shock absorber oil is mineral oil.

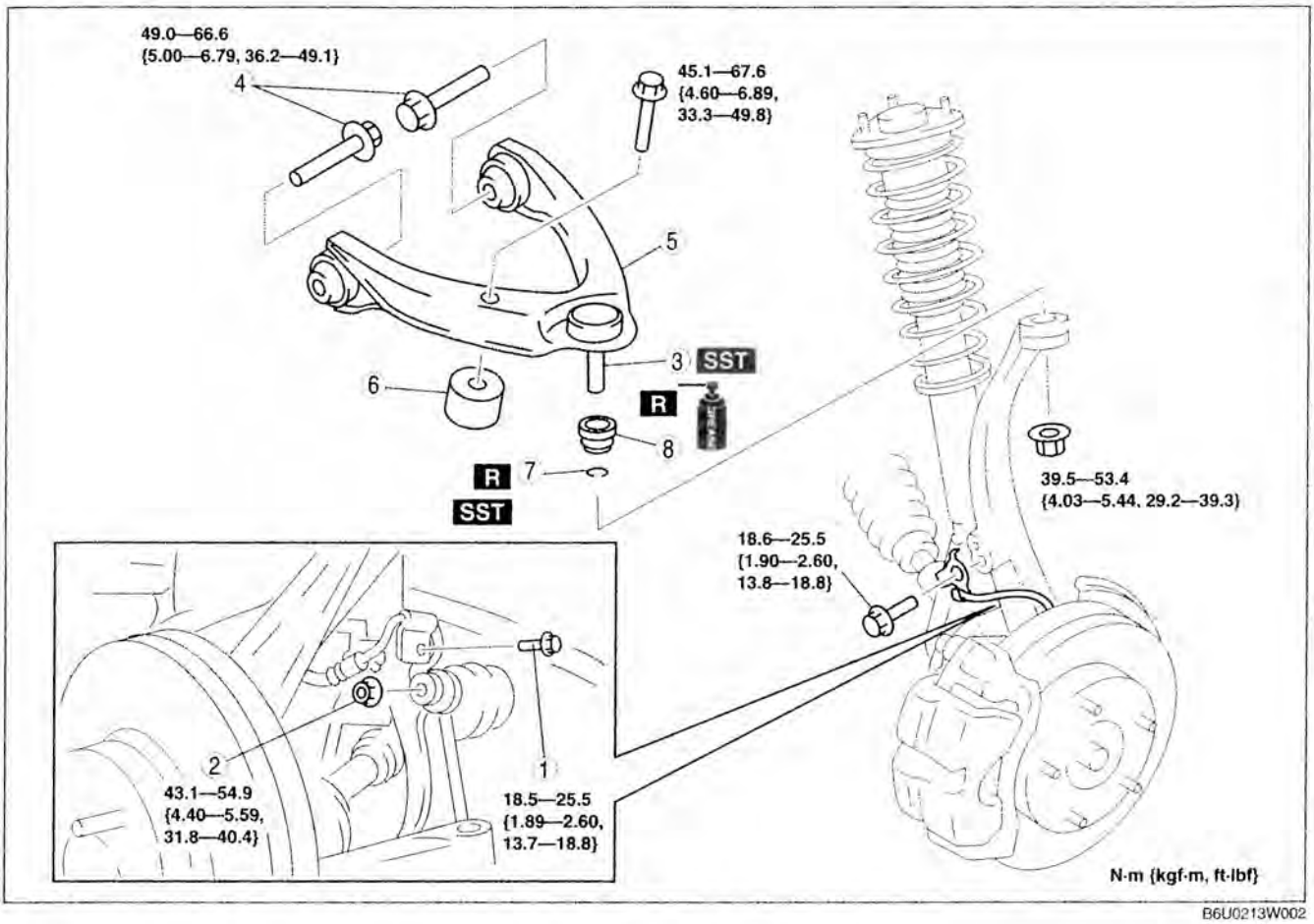
FRONT UPPER ARM REMOVAL/INSTALLATION

C6U021334200W01

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.**

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the front wheel alignment.
   (See 02-11-2 FRONT WHEEL ALIGNMENT.)



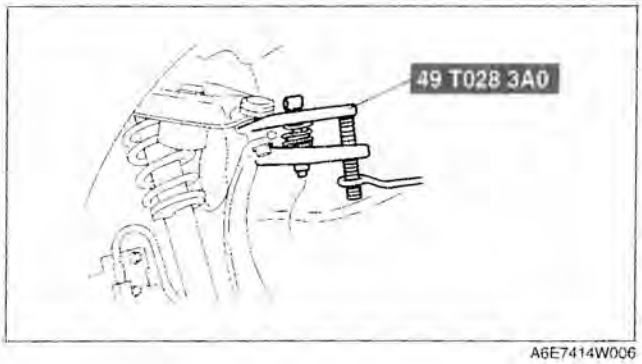
B6U0213W002

1	Bolt (brake hose bracket)
2	Nut (stabilizer control link)
3	Front upper arm ball joint (See 02–13–7 Front Upper Arm Ball Joint Removal Note)
4	Bolt (front upper arm) (See 02–13–8 Bolt (Front Upper Arm) Removal Note)

5	Front upper arm
6	Dynamic Damper
7	Clip (See 02–13–8 Clip Installation Note)
8	Dust boot

Front Upper Arm Ball Joint Removal Note

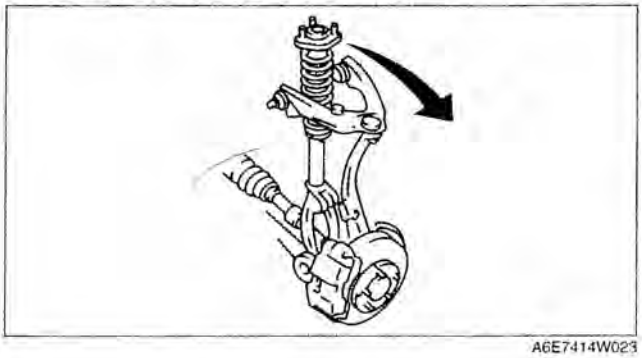
1. Support the knuckle using the jack.
2. Separate the ball joint from the knuckle using the **SST**.



A6E7414W006

Bolt (Front Upper Arm) Removal Note

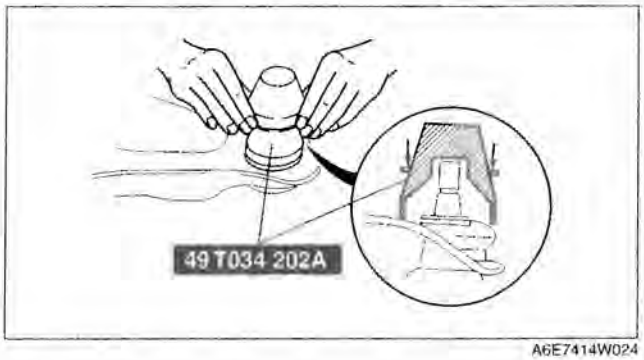
1. Remove the nuts (3 locations) from the upper part of the front shock absorber.
2. Pull the front shock absorber and coil spring out of the way, towards the outer side of the vehicle.
3. Remove the bolts.



A6E7414W023

Clip Installation Note

1. Wipe the grease off the ball stud.
2. Fill the inside of the new dust boot with grease.
3. Install the boot on the ball joint.
4. Install the new clip using the **SST**.
5. Verify that the clip is installed securely to the groove.
6. Wipe away the excess grease.



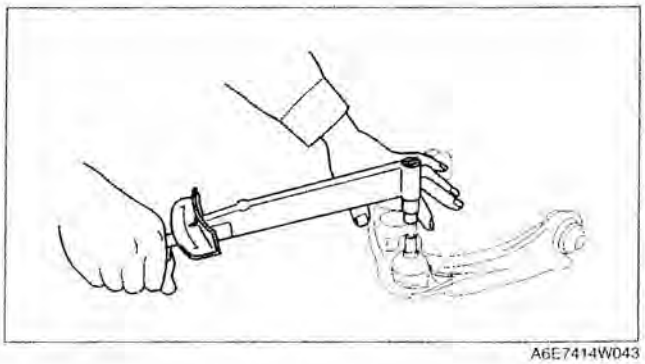
A6E7414W024

FRONT UPPER ARM INSPECTION

C6U021334200W02

1. Remove the upper arm from the vehicle.
2. Inspect for damage, cracks, and bending.
3. Inspect the ball joint rotational torque.
   (1) Rotate the ball joint five times.
   (2) Measure the rotational torque using a suitable allen socket and a torque wrench.
      - If not within the specification, replace the lower arm component.

Rotation torque
1.5 N·m {15.0 kgf·cm, 13.2 in·lbf} max.

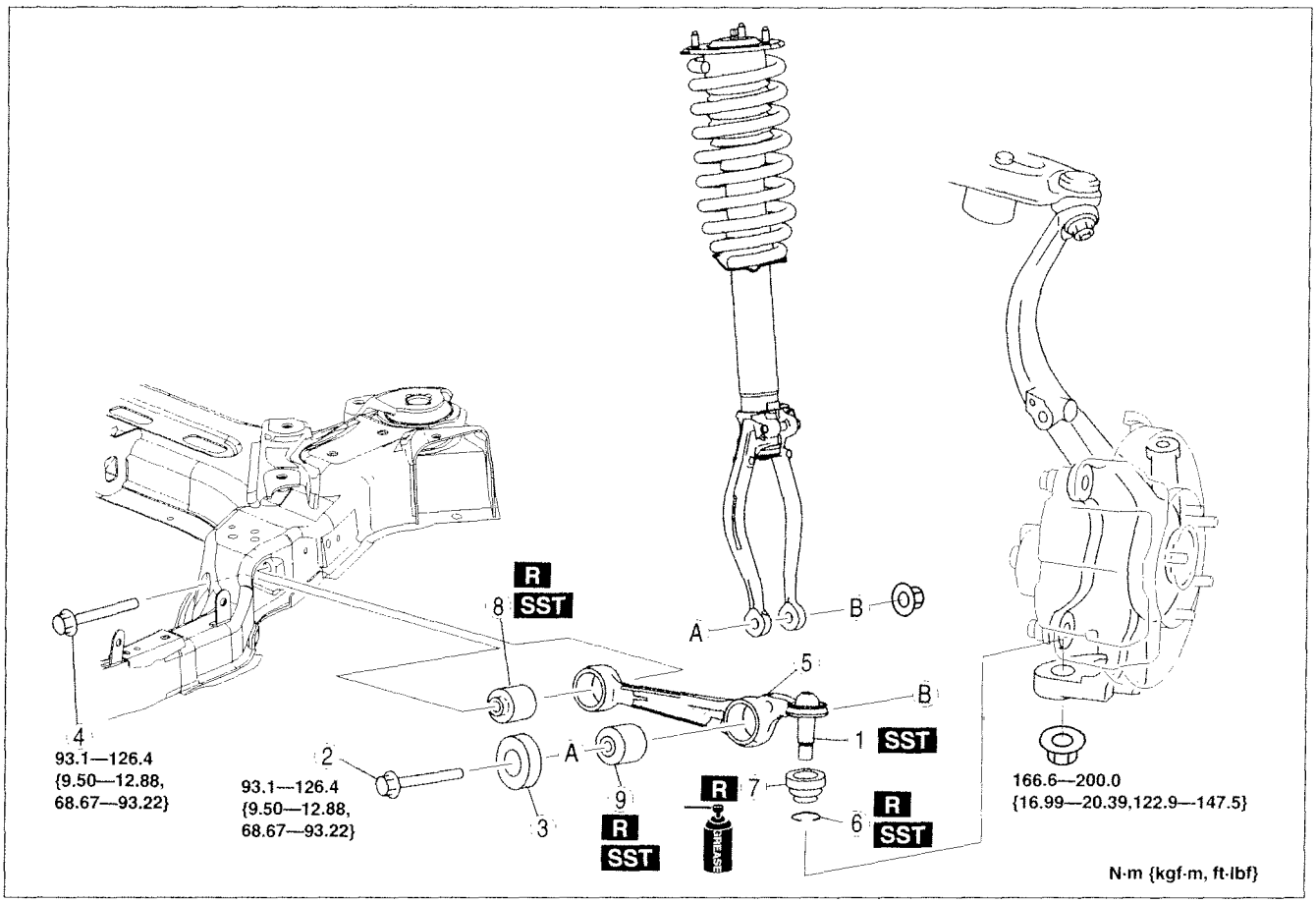


A6E7414W043

FRONT LOWER ARM (FRONT) REMOVAL/INSTALLATION

C6U021334300W01

1. Remove the TWC (AJ) (only when removing/installing the right side front lower arm (front)). (See 01–15B–2 EXHAUST SYSTEM REMOVAL/INSTALLATION [AJ].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



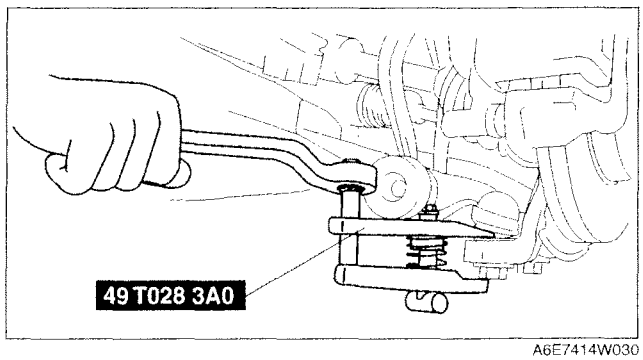
B6U0213W102

1	Front lower arm (front) ball joint (See 02–13–10 Front Lower Arm (Front) Ball Joint Removal Note)
2	Bolt (front shock absorber lower side)
3	Dynamic damper
4	Bolt (front lower arm inner side)
5	Front lower arm (front) component
6	Clip (See 02–13–12 Clip Installation Note)
7	Dust boot

8	Front lower arm (front) bushing (inner side) (See 02–13–10 Front Lower Arm (Front) Bushing (Inner Side) Removal Note) (See 02–13–11 Front Lower Arm (Front) Bushing (Inner Side) Installation Note)
9	Front lower arm (front) bushing (outer side) (See 02–13–10 Front Lower Arm (Front) Bushing (Outer Side) Removal Note) (See 02–13–10 Front Lower Arm (Front) Bushing (Outer Side) Installation Note)

Front Lower Arm (Front) Ball Joint Removal Note

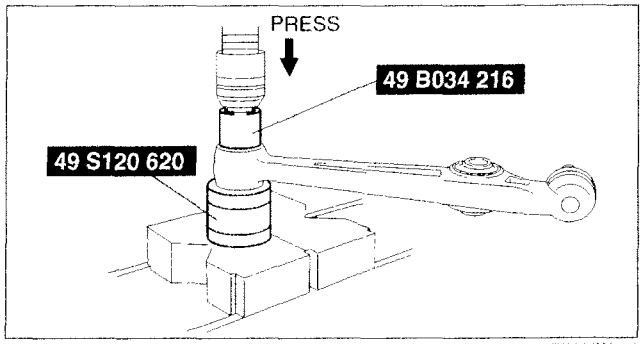
1. Separate the ball joint from the knuckle using the **SSTs**.



A6E7414W030

Front Lower Arm (Front) Bushing (Inner Side) Removal Note

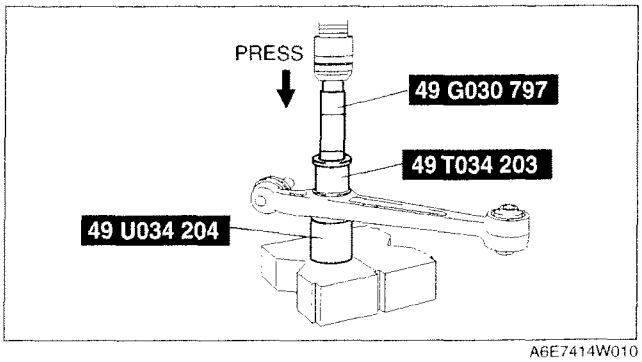
1. Press the bushing (inner side) out using the **SSTs**.



A6E7414W001

Front Lower Arm (Front) Bushing (Outer Side) Removal Note

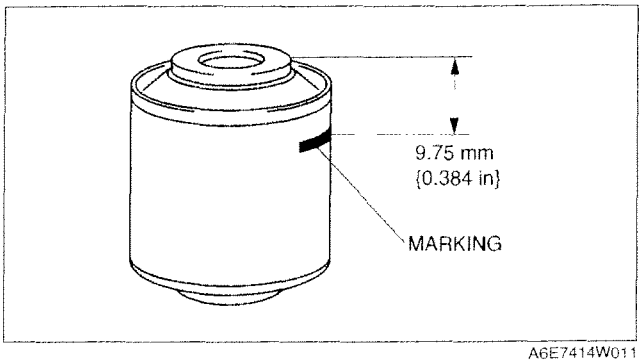
1. Press the bushing (outer side) out using the **SSTs**.



A6E7414W010

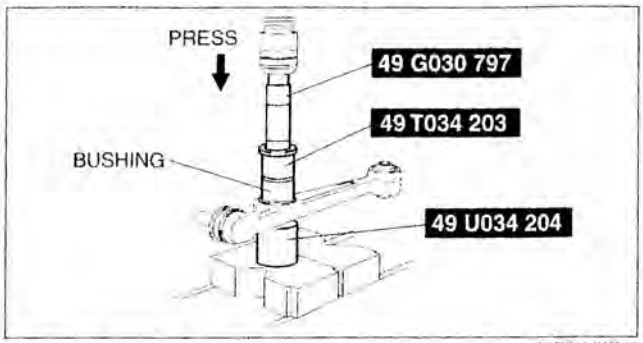
Front Lower Arm (Front) Bushing (Outer Side) Installation Note

1. Mark the new bushing as shown in the figure.



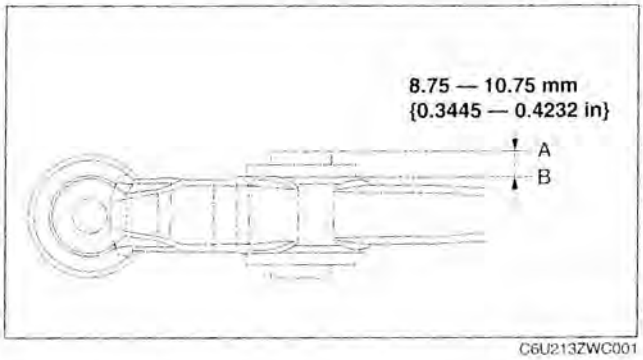
A6E7414W011

2. Press the bushing in to the marking using the **SSTs**.



A6E7414W012

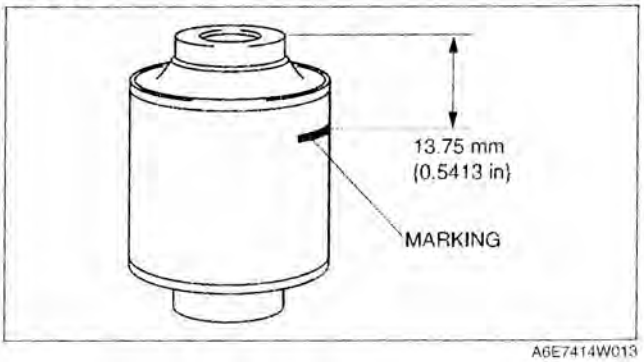
3. Verify that clearance distance A—B is **8.75—10.75 mm {0.3445—0.4232 in}**.



C6U213ZWC001

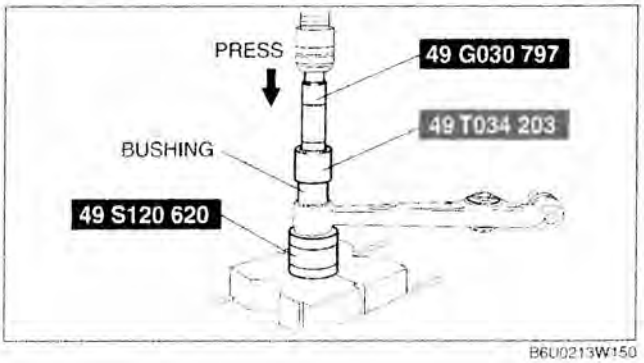
Front Lower Arm (Front) Bushing (Inner Side) Installation Note

1. Mark the new bushing as shown in the figure.



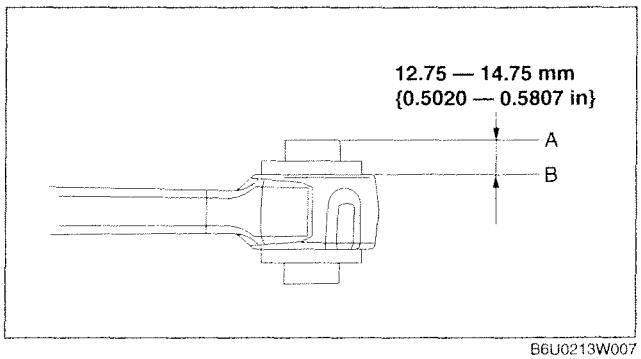
A6E7414W013

2. Press the bushing in to the marking using the **SSTs**.



B6U0213W150

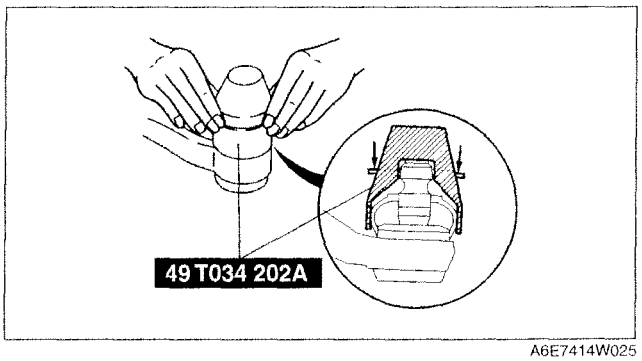
3. Verify that clearance distance A—B is **12.75—14.75 mm {0.5020—0.5807 in}**.



B6U0213W007

Clip Installation Note

1. Wipe the grease off the ball stud.
2. Fill the inside of the new dust boot with grease.
3. Install the boot on the ball joint.
4. Install the new clip using the **SST**.
5. Verify that the clip is installed securely to the groove.
6. Wipe away the excess grease.



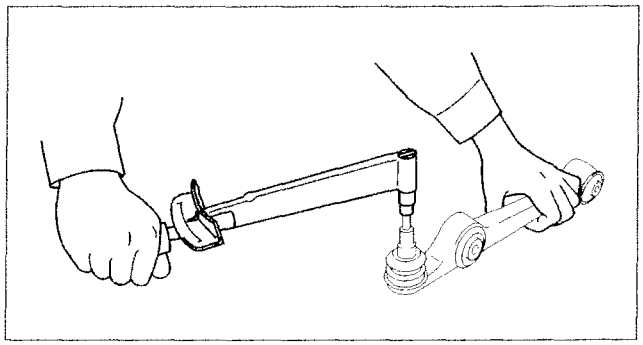
A6E7414W025

FRONT LOWER ARM (FRONT) INSPECTION

C6U021334300W02

1. Remove the lower arm (front) from the vehicle.
2. Inspect for damage, cracks, and bending.
3. Inspect the ball joint rotational torque.
   (1) Rotate the ball joint five times.
   (2) Measure the rotational torque using a suitable allen socket and a torque wrench.
      - If not within the specification, replace the lower arm component.

Rotation torque
1.18—2.23 N·m {12.1—22.7 kgf·cm, 10.5—19.7 in·lbf}



A6E7414W044

FRONT LOWER ARM (REAR) REMOVAL/INSTALLATION

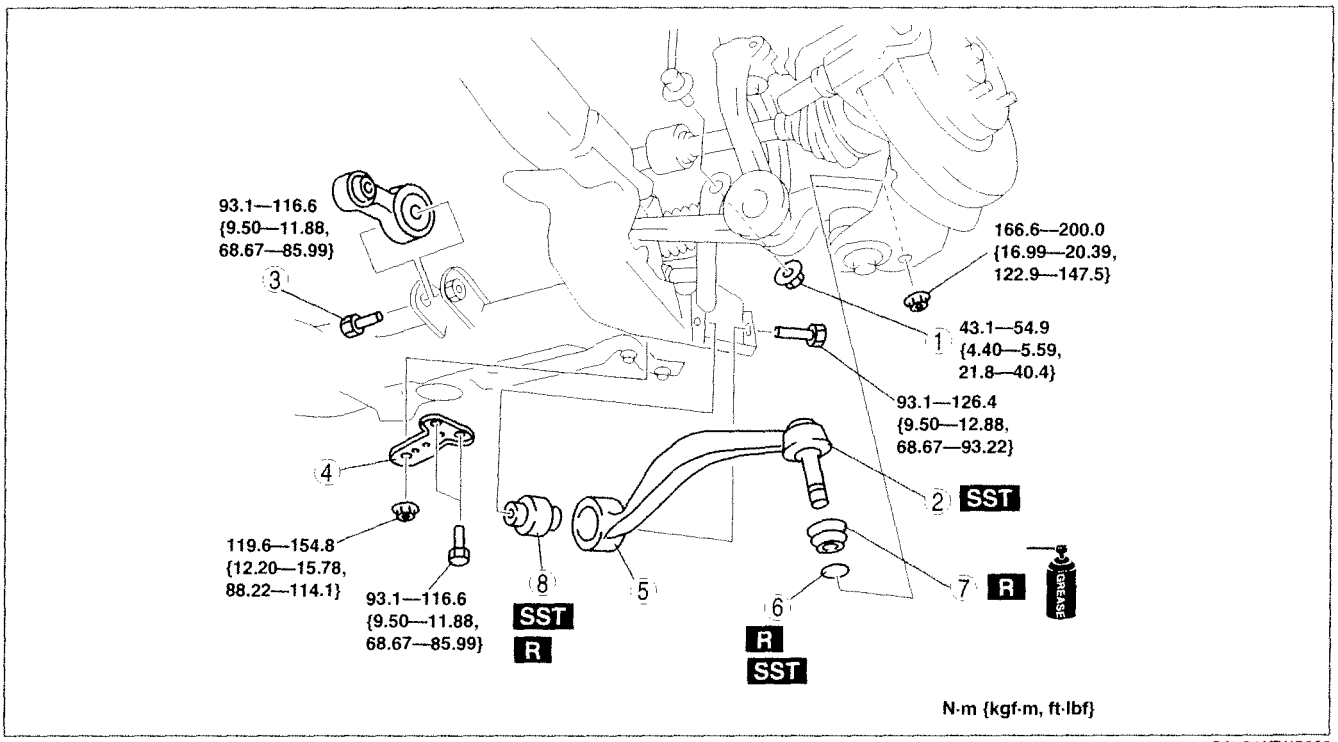
C6U021334300W03

1. Remove the under cover.
2. Remove the splash shield.
3. Remove the steering gear and linkage installation bolts, and pipe component installation bolts from the front crossmember, then suspend the steering gear and linkage with a cable.

Tightening torque

- **Steering gear and linkage: 74.4—104.8 N·m {7.857—10.68 kgf·m, 54.88—77.29 ft·lbf}**
- **Pipe component: 7.8—10.8 N·m {79.6—110.0 kgf·cm, 69.1—95.5 in·lbf}**

4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Inspect the front wheel alignment.
   (See 02–11–2 FRONT WHEEL ALIGNMENT.)



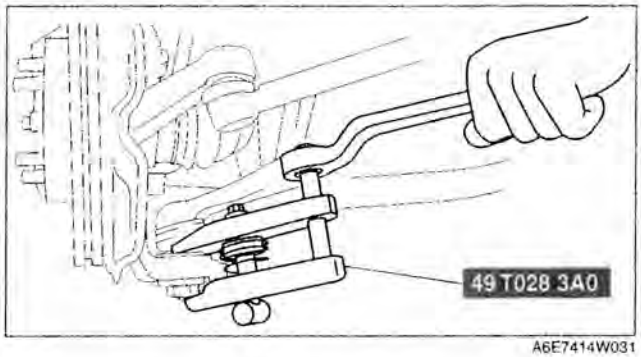
C6U213ZWC002

1	Nut (stabilizer control link lower side)
2	Front lower arm (rear) ball joint (See 02–13–14 Front Lower Arm (Rear) Ball Joint Removal Note)
3	No.1 engine mount center bolt
4	Crossmember bracket (See 02–13–14 Crossmember Bracket Removal Note)

5	Front lower arm (rear) (See 02–13–14 Front Lower Arm (Rear) Removal Note)
6	Clip (See 02–13–16 Clip Installation Note)
7	Dust boot
8	Front lower arm (rear) bushing (See 02–13–15 Front Lower Arm (Rear) Bushing Removal Note) (See 02–13–15 Front Lower Arm (Rear) Bushing Installation Note)

Front Lower Arm (Rear) Ball Joint Removal Note

1. Separate the ball joint from the knuckle using the **SSTs**.



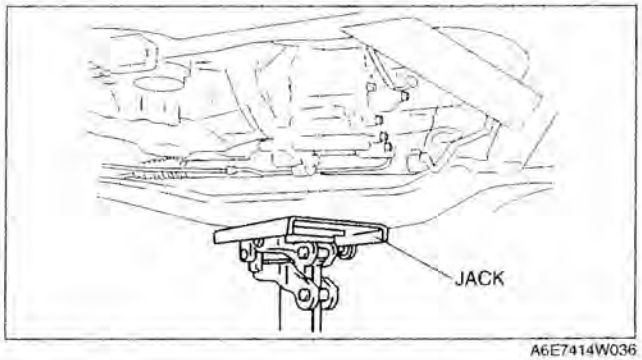
A6E7414W031

Crossmember Bracket Removal Note

Warning

- **Removing the crossmember is dangerous. The crossmember component could fall and cause serious injury or death. Verify that the jack securely supports the crossmember component before removing the crossmember bracket.**

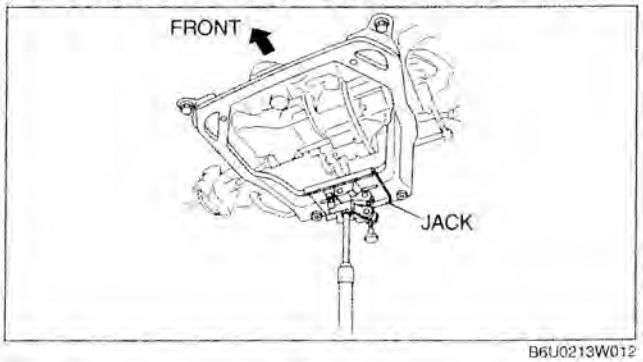
1. Support the crossmember component with a jack and remove the nuts.
2. Remove the crossmember bracket.



A6E7414W036

Front Lower Arm (Rear) Removal Note

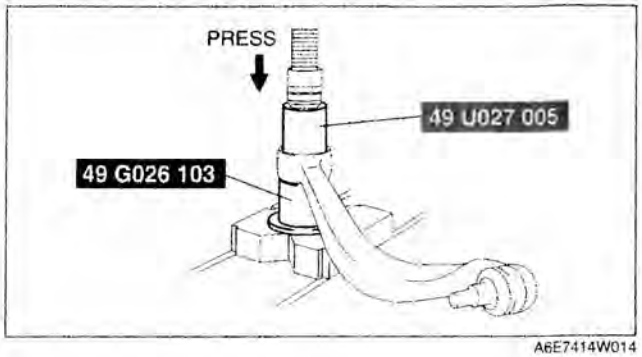
1. Support the crossmember component with a jack.
2. Loosen the crossmember component installation bolts (front side). (Do not remove the bolts completely.)
3. Remove the crossmember component installation bolts (rear side).
4. Remove the front lower arm (rear).



B6U0213W012

Front Lower Arm (Rear) Bushing Removal Note

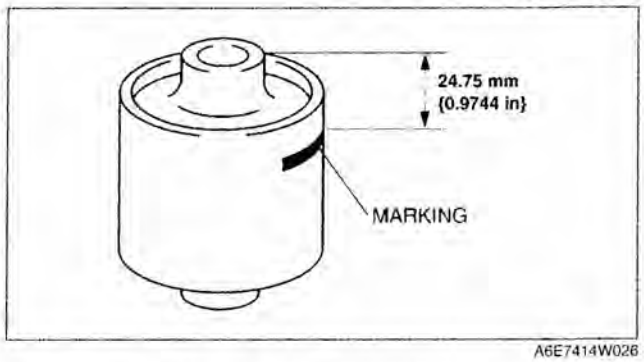
1. Press the bushing out using the **SSTs**.
2. Remove the front lower arm (rear) from the press and tap the bushing out with a hammer.



A6E7414W014

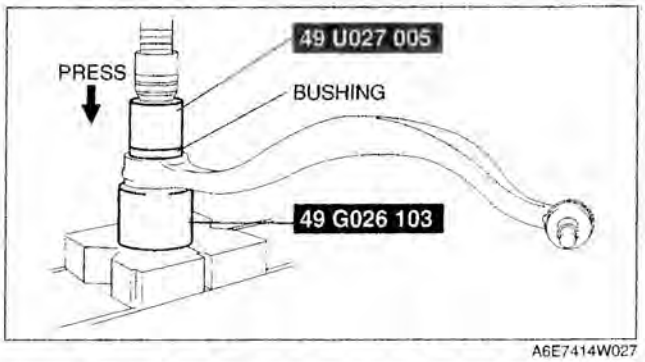
Front Lower Arm (Rear) Bushing Installation Note

1. Mark the new bushing as shown in the figure.



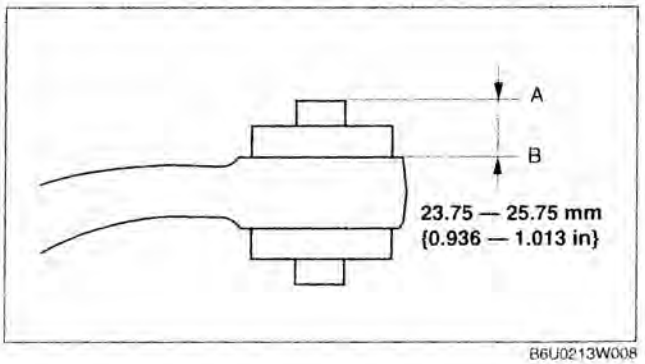
A6E7414W026

2. Press the bushing in to the marking using the **SSTs**.



A6E7414W027

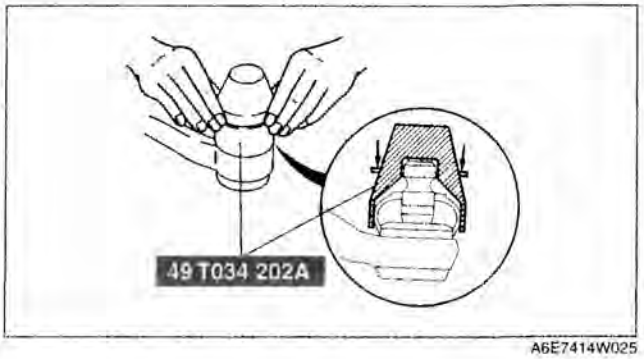
3. Verify that clearance distance A—B is **23.75—25.75 mm {0.936—1.013 in}**.



B6U0213W008

Clip Installation Note

1. Wipe the grease off the ball stud.
2. Fill the inside of the new dust boot with grease.
3. Install the boot on the ball joint.
4. Install the new clip using the **SST**.
5. Verify that the clip is installed securely to the groove.
6. Wipe away the excess grease.



A6E7414W025

Front Lower Arm (Rear) Installation Note

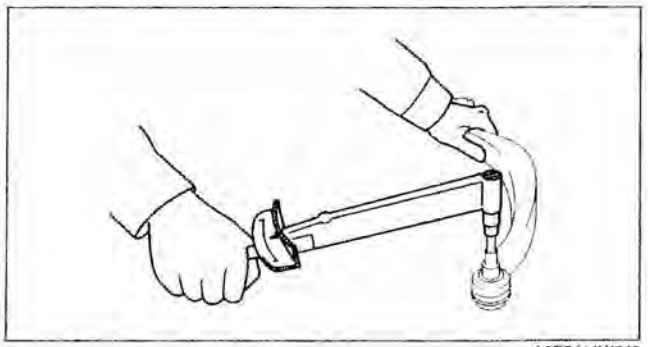
1. Install the lower arm (rear) so that identification mark (L or R) faces toward the front of the vehicle.

FRONT LOWER ARM (REAR) INSPECTION

C6U021334300W04

1. Remove the lower arm (rear) from the vehicle.
2. Inspect for damage, cracks, and bending.
3. Inspect the ball joint rotational torque.
   (1) Rotate the ball joint five times.
   (2) Measure the rotational torque using a suitable allen socket and a torque wrench.
      - If not within the specification, replace the lower arm component.

Rotation torque
1.00—2.22 N·m {10.2—22.6 kgf·cm, 8.86—19.6 in·lbf}



A6E7414W045

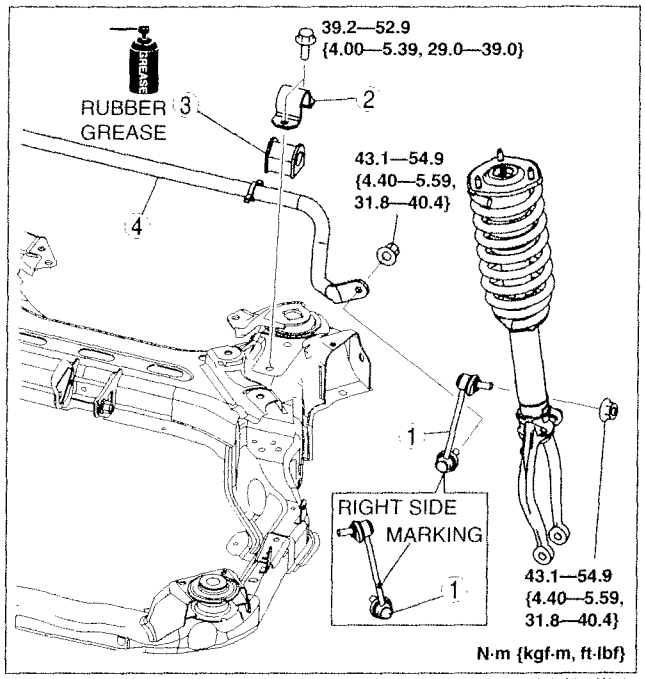
FRONT STABILIZER REMOVAL/INSTALLATION

C6U021334100W01

1. Remove the front crossmember component. (See 02–13–18 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.

1	Stabilizer control link
2	Stabilizer bracket (See 02–13–17 Stabilizer Bracket Installation Note)
3	Stabilizer bushing
4	Front stabilizer

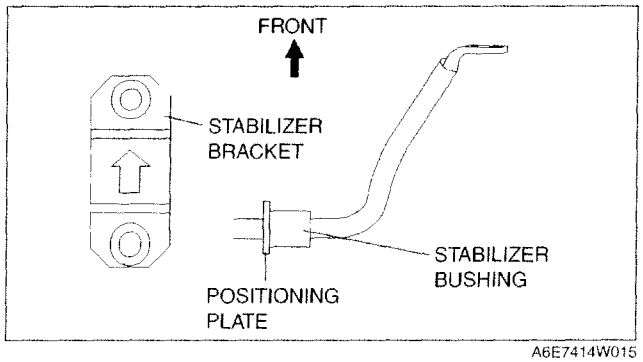
3. Install in the reverse order of removal.
4. Inspect the front wheel alignment.
   (See 02–11–2 FRONT WHEEL ALIGNMENT.)



B6U0213W003

Stabilizer Bracket Installation Note

1. Apply rubber grease to the inside surface of the stabilizer bushing.
2. Align the bushing with the inside of positioning plate on the stabilizer bar.
3. Install the stabilizer bracket.



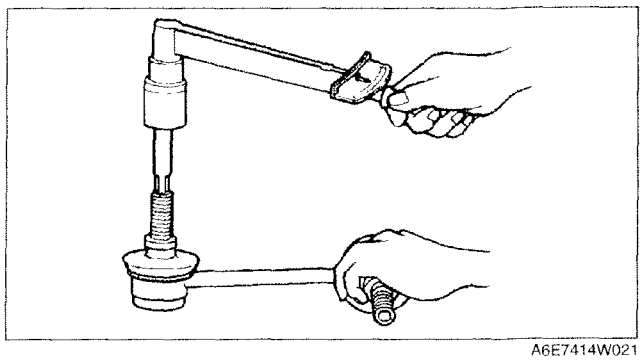
A6E7414W015

STABILIZER CONTROL LINK INSPECTION

C6U021334150W01

1. Remove the stabilizer control link from the vehicle.
2. Inspect for bending and damage.
3. Measure the ball joint starting torque.
   (1) Rock the ball joint stud side to side 10 times.
   (2) Rotate the ball joint stud 10 times.
   (3) Measure the starting torque using a suitable allen socket and a torque wrench.

Starting torque
0.23—0.47 N·m {2.4—4.7 kgf·cm, 2.1—4.1 in·lbf}



A6E7414W021

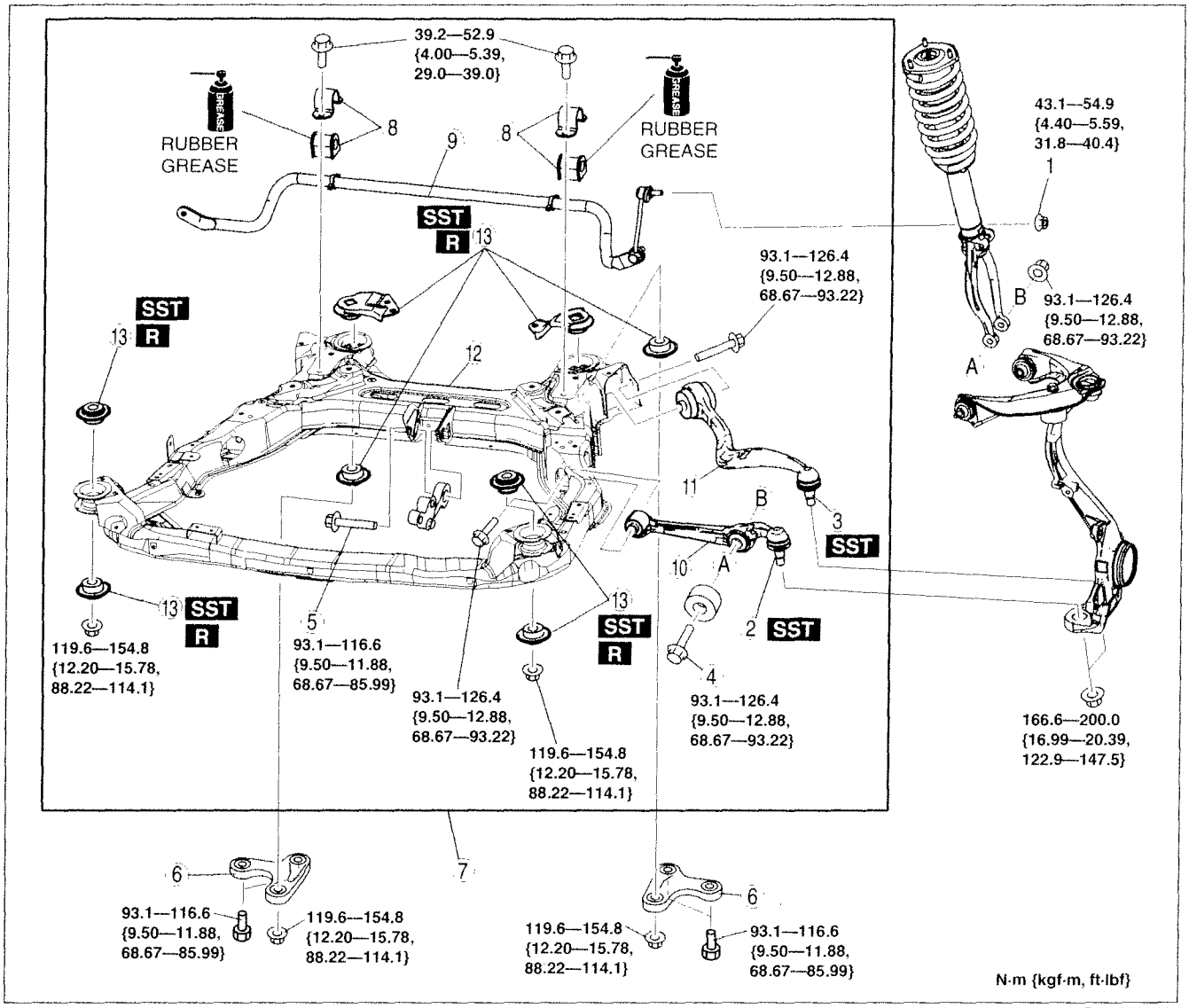
FRONT CROSSMEMBER REMOVAL/INSTALLATION

C6U021334800W01

1. Remove the under cover.
2. Remove the splash shield.
3. Remove the transverse member.
   (See 02–13–22 TRANSVERSE MEMBER REMOVAL/INSTALLATION.)
4. Remove the steering gear and linkage, and pipe component installation bolts from the front crossmember, then suspend the steering gear and linkage with a cable.

Tightening torque
- **Steering gear and linkage: 74.4—104.8 N·m {7.857—10.68 kgf·m, 54.88—77.29 ft·lbf}**
- **Pipe component: 7.8—10.8 N·m {79.6—110.0 kgf·cm, 69.1—95.5 in·lbf}**

5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Inspect the front wheel alignment.
   (See 02–11–2 FRONT WHEEL ALIGNMENT.)



B6U0213W004

1	Nut (stabilizer control link)
2	Front lower arm (front) ball joint (See 02–13–10 Front Lower Arm (Front) Ball Joint Removal Note)
3	Front lower arm (rear) ball joint (See 02–13–14 Front Lower Arm (Rear) Ball Joint Removal Note)
4	Bolt (front shock absorber lower side)
5	No.1 engine mount center bolt
6	Crossmember bracket (See 02–13–20 Crossmember Bracket Removal Note)
7	Crossmember component

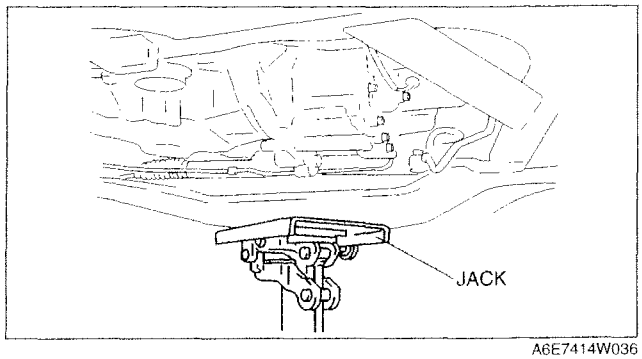
8	Stabilizer bracket and bushing
9	Front Stabilizer
10	Front lower arm (front)
11	Front lower arm (rear)
12	Front crossmember
13	Front crossmember bushing (See 02–13–20 Front Crossmember Bushing Removal Note) (See 02–13–21 Front Crossmember Bushing Installation Note)

Crossmember Bracket Removal Note

Warning

- **Removing the crossmember is dangerous. The crossmember component could fall and cause serious injury or death. Verify that the jack securely supports the crossmember component before removing the crossmember bracket.**

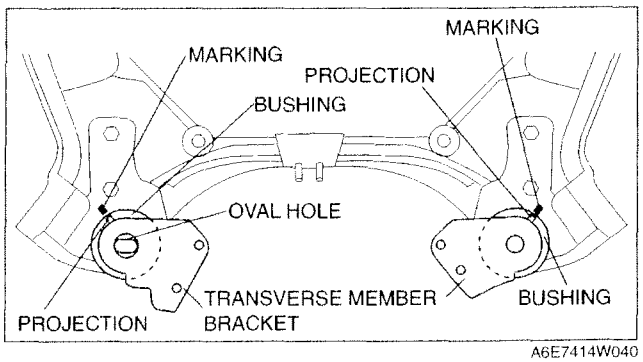
1. Support the crossmember component with a jack and remove the nuts.
2. Remove the crossmember bracket.



A6E7414W036

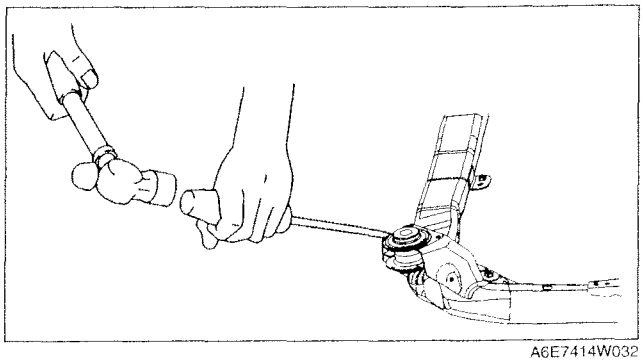
Front Crossmember Bushing Removal Note

1. Mark the crossmember as shown in the figure (rear upper side only).



A6E7414W040

2. Remove the bushings using flathead screwdriver, being careful not to damage the front crossmember.



A6E7414W032

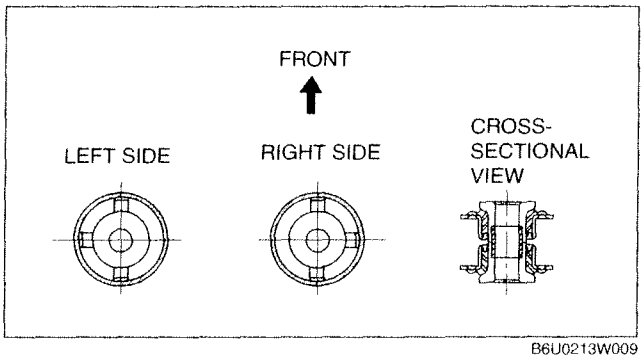
Front Crossmember Bushing Installation Note

1. Set the bushings as shown in the figure.

Note

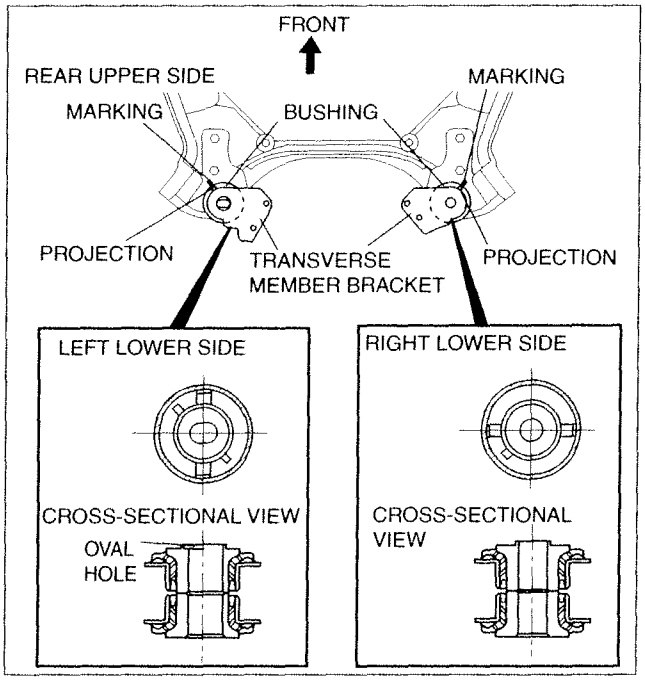
- The bushings must be installed with correct orientation as shown below, or increased noise and vibration may result.

Front Side



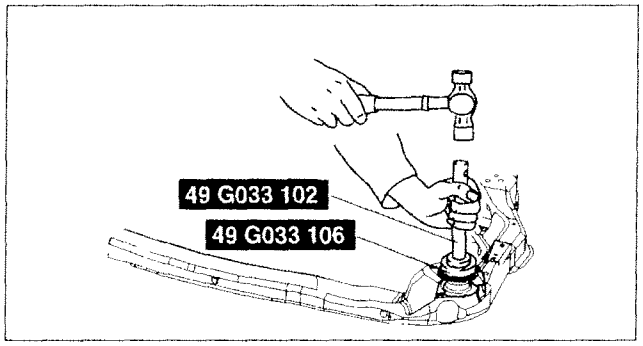
B6U0213W009

Rear Side



B6U0213W010

2. Install the bushing onto the crossmember using the **SSTs**.

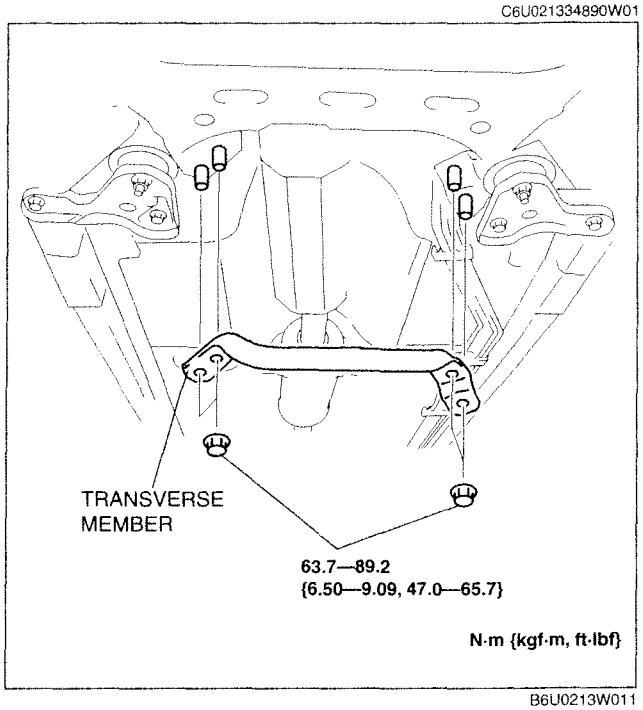


A6E7414W042

TRANSVERSE MEMBER REMOVAL/INSTALLATION

1. Remove the transverse member.
2. Install the transverse member.

C6U021334890W01

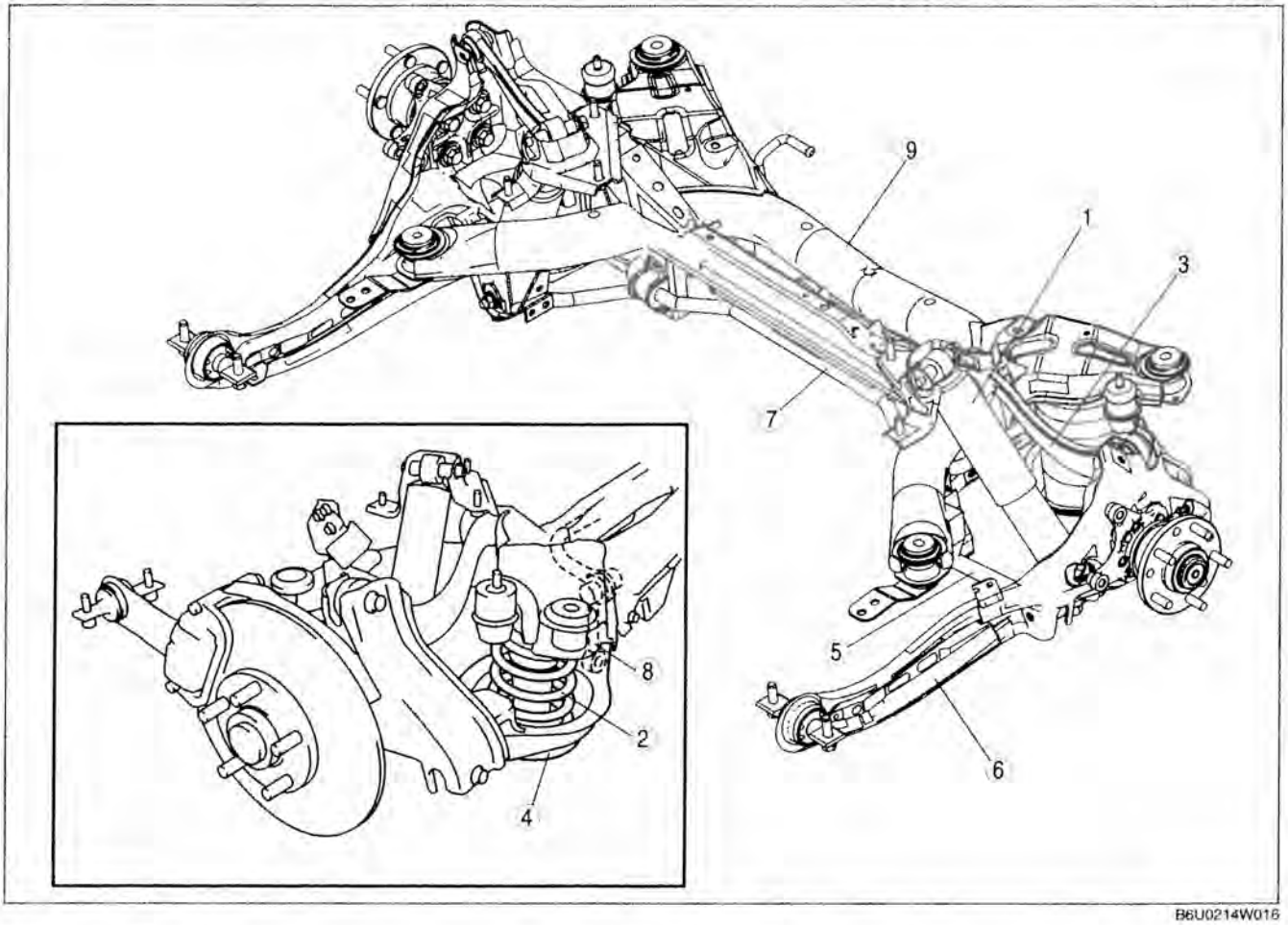


B6U0213W011

02–14 REAR SUSPENSION

REAR SUSPENSION LOCATION INDEX

C6U021401016W01



B6U0214W016

1	Rear shock absorber (See02–14–3 REAR SHOCK ABSORBER REMOVAL/INSTALLATION) (See 02–14–3 REAR SHOCK ABSORBER INSPECTION) (See 02–14–3 REAR SHOCK ABSORBER DISPOSAL)
2	Rear coil spring (See02–14–4 REAR COIL SPRING REMOVAL/ INSTALLATION)
3	Rear upper arm (See02–14–6 REAR UPPER ARM REMOVAL/ INSTALLATION)
4	Rear lower arm (See02–14–5 REAR LOWER ARM REMOVAL/ INSTALLATION)

5	Rear lateral link (See02–14–9 REAR LATERAL LINK REMOVAL/ INSTALLATION)
6	Trailing link (See02–14–11 TRAILING LINK REMOVAL/ INSTALLATION)
7	Rear stabilizer (See02–14–10 REAR STABILIZER REMOVAL/ INSTALLATION)
8	Stabilizer control link (See02–14–10 STABILIZER CONTROL LINK INSPECTION)
9	Rear crossmember (See02–14–12 REAR CROSSMEMBER REMOVAL/INSTALLATION)

REAR SHOCK ABSORBER REMOVAL/INSTALLATION

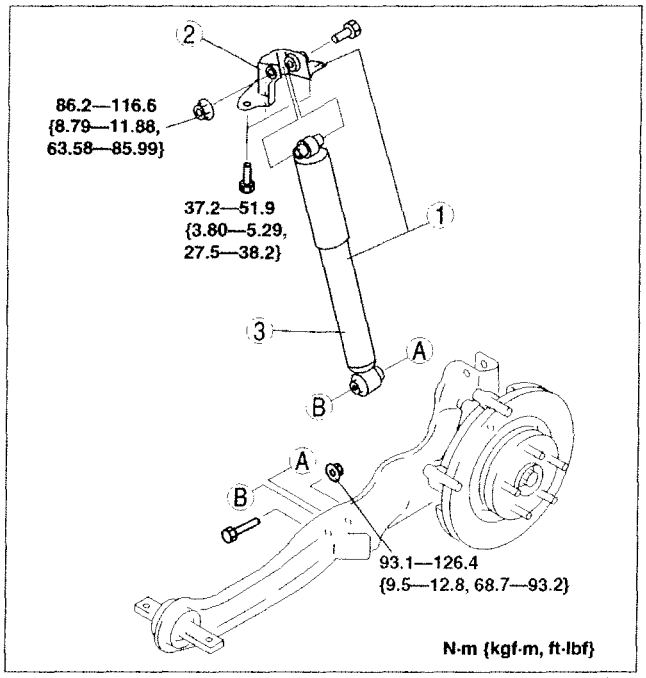
C6U021428700W01

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.**

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.

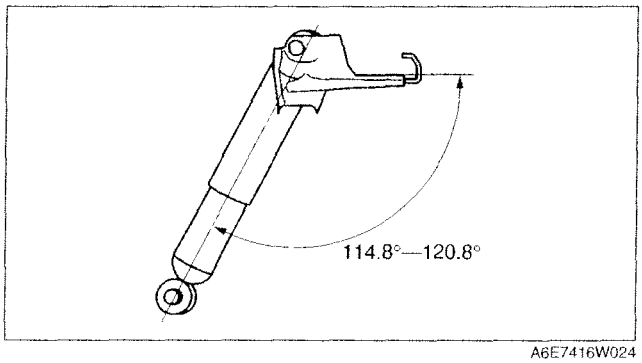
1	Rear shock absorber and bracket
2	Bracket (See 02–14–3 Bracket Installation Note)
3	Rear shock absorber



C6U214ZWC001

Bracket Installation Note

1. Install the bracket as shown in the figure.



A6E7416W024

REAR SHOCK ABSORBER INSPECTION

C6U021428700W02

1. Inspect the rear shock absorber in the same way as the front shock absorber. (See 02–13–6 FRONT SHOCK ABSORBER INSPECTION.)

REAR SHOCK ABSORBER DISPOSAL

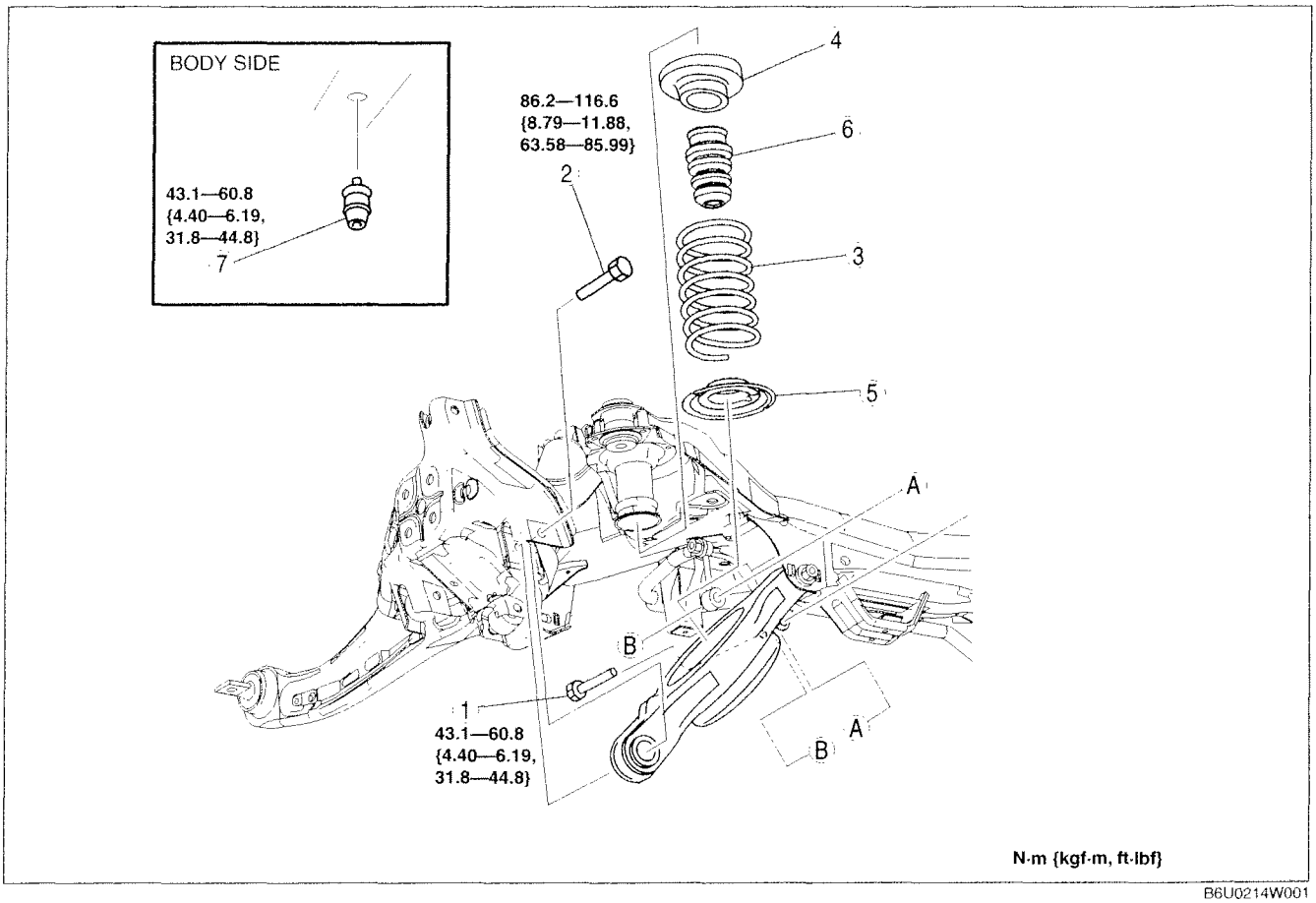
C6U021428700W03

1. Dispose the rear shock absorber in the same way as the front shock absorber. (See 02–13–6 FRONT SHOCK ABSORBER DISPOSAL.)

REAR COIL SPRING REMOVAL/INSTALLATION

C6U021428011W01

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the rear wheel alignment.
   (See 02–11–3 REAR WHEEL ALIGNMENT.)



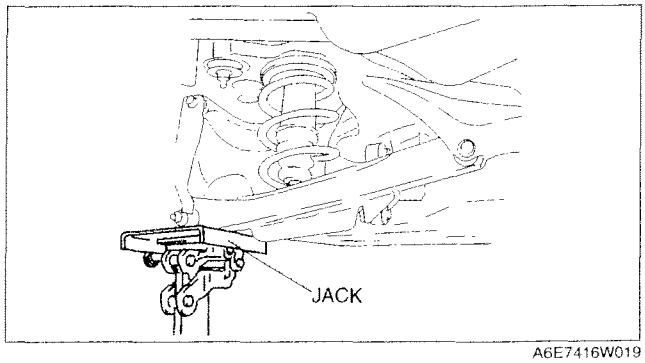
B6U0214W001

1	Bolt (stabilizer control link lower side)
2	Bolt (rear lower arm outer side) (See 02–14–4 Bolt (Rear Lower Arm Outer Side) Removal Note)
3	Rear coil spring (See 02–14–5 Rear Coil Spring Installation Note)

4	Upper spring seat rubber
5	Lower spring seat
6	Bound stopper (spring side)
7	Bound stopper (body side) (See 02–14–5 Bound Stopper (Body Side) Removal/Installation Note)

Bolt (Rear Lower Arm Outer Side) Removal Note

1. Support the lower arm with a jack.
2. Loosen the inner bolt of the lower arm.
3. Remove the outer bolt of the lower arm.



A6E7416W019

Bound Stopper (Body Side) Removal/Installation Note

1. Remove or/and install the bound stopper (body side) using the extension bar.

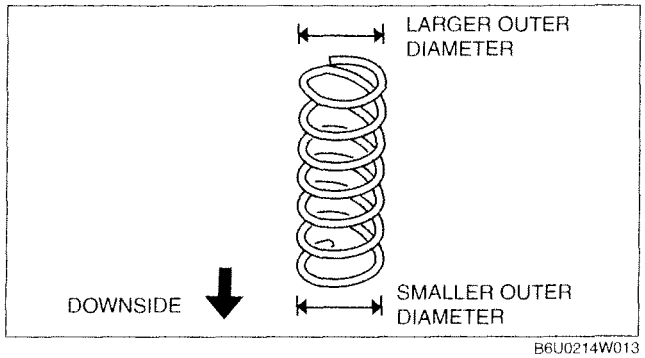
Rear Coil Spring Installation Note

1. Install the coil spring so that the small outer diameter faces downside.
2. Position the jack under the lower arm and jack up slowly.

Warning

- **Installing the coil spring is dangerous. The coil spring could fly off, and cause serious injure or death.**

3. Install the lower arm (outer side) bolt.

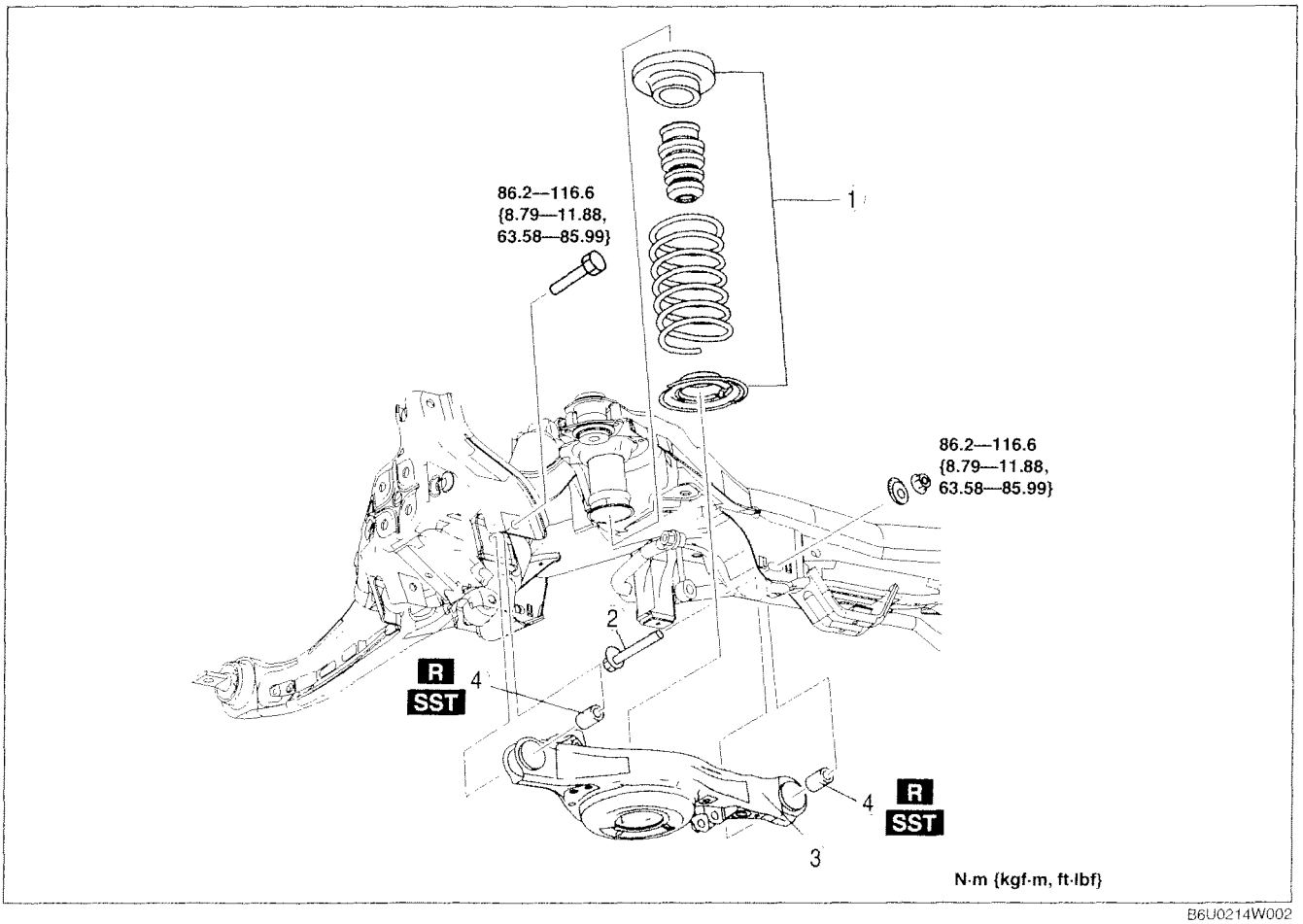


B6U0214W013

REAR LOWER ARM REMOVAL/INSTALLATION

C6U021428310W01

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the rear wheel alignment.
   (See 02–11–3 REAR WHEEL ALIGNMENT.)

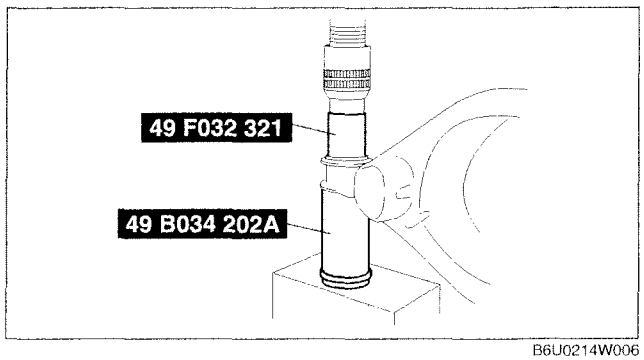


B6U0214W002

1	Rear coil spring component (See 02–14–4 REAR COIL SPRING REMOVAL/ INSTALLATION)
2	Bolt (rear lower arm inner side)
3	Rear lower arm
4	Rear lower arm bushing (See 02–14–6 Rear Lower Arm Bushing Removal Note) (See 02–14–6 Rear Lower Arm Bushing Installation Note)

Rear Lower Arm Bushing Removal Note

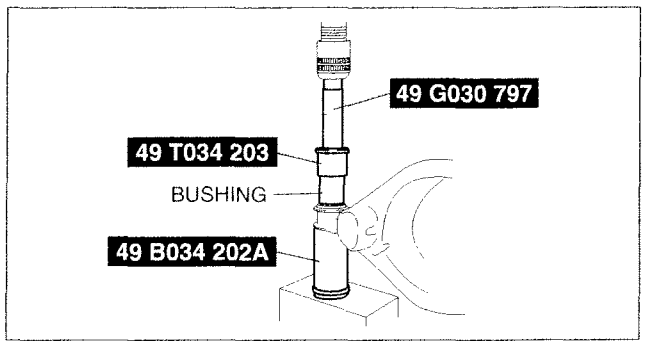
1. Press the rear lower arm bushing out using the **SSTs**.



B6U0214W006

Rear Lower Arm Bushing Installation Note

1. Press the rear lower arm bushing in using the **SSTs**.



B6U0214W008

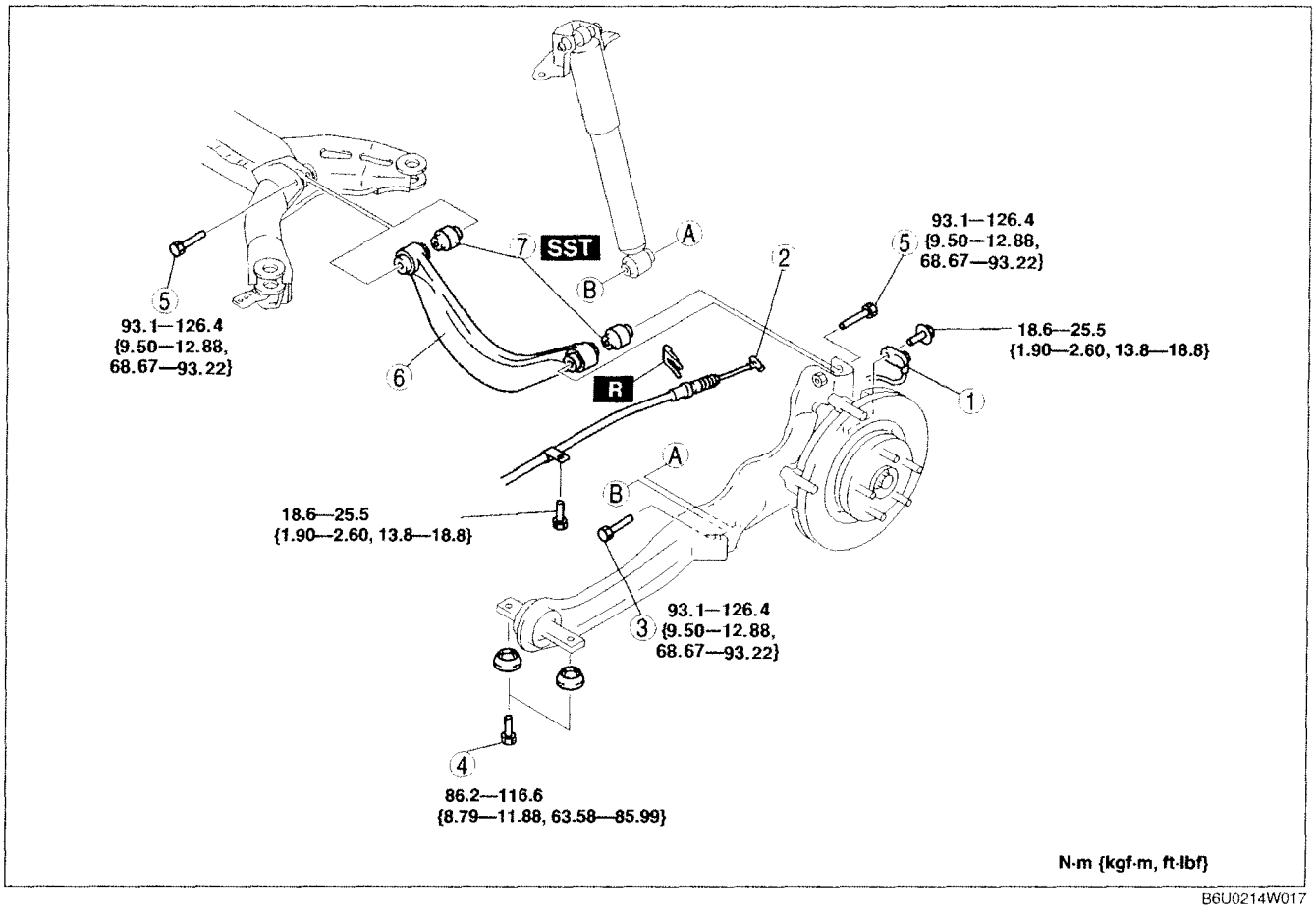
REAR UPPER ARM REMOVAL/INSTALLATION

C6U021428210W01

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.**

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the rear wheel alignment.
   (See 02–11–3 REAR WHEEL ALIGNMENT.)



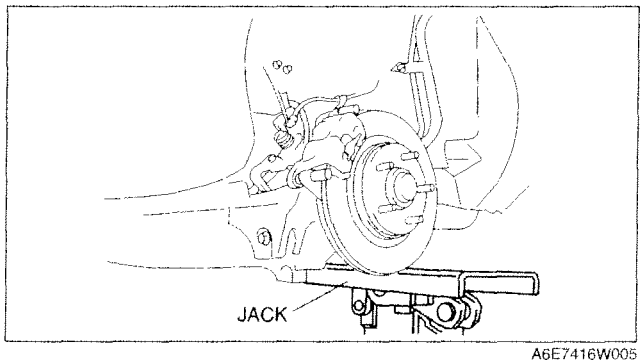
B6U0214W017

1	ABS wheel-speed sensor
2	Parking brake cable
3	Bolt (rear shock absorber lower side) (See 02–14–7 Bolt (Rear Shock Absorber Lower Side) Removal Note)
4	Bolt (trailing link front side)

5	Bolt (rear upper arm) (See 02–14–7 Bolt (Rear Upper Arm) Removal Note)
6	Rear upper arm
7	Rear upper arm bushing (See 02–14–8 Rear Upper Arm Bushing Removal Note) (See 02–14–8 Rear Upper Arm Bushing Installation Note)

Bolt (Rear Shock Absorber Lower Side) Removal Note

1. Support the trailing link with a jack.



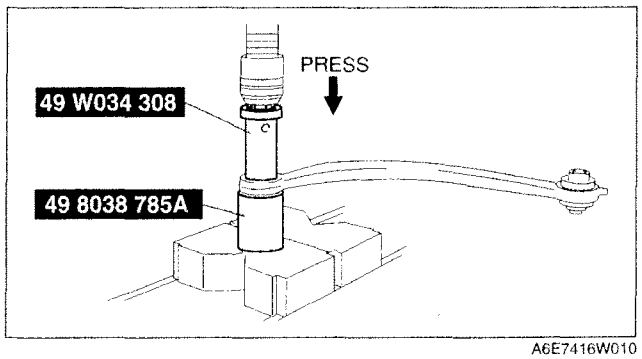
A6E7416W005

Bolt (Rear Upper Arm) Removal Note

1. Loosen the bolts on the inner and outer side of the lateral link.

Rear Upper Arm Bushing Removal Note

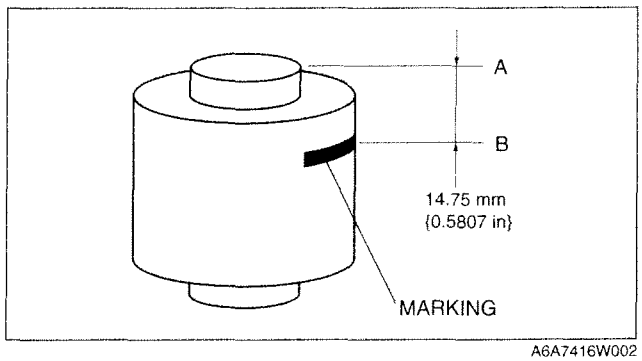
1. Press the upper arm bushing out using the **SSTs**.



A6E7416W010

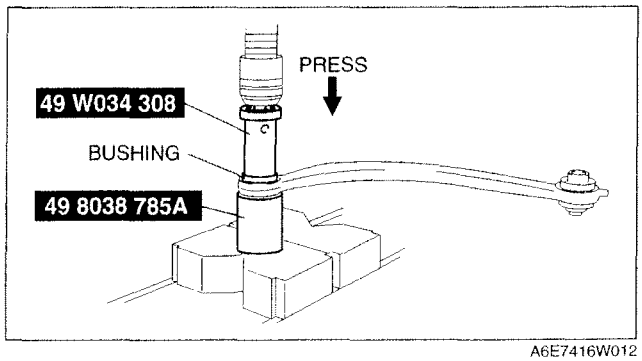
Rear Upper Arm Bushing Installation Note

1. Mark the new bushing as shown in the figure.



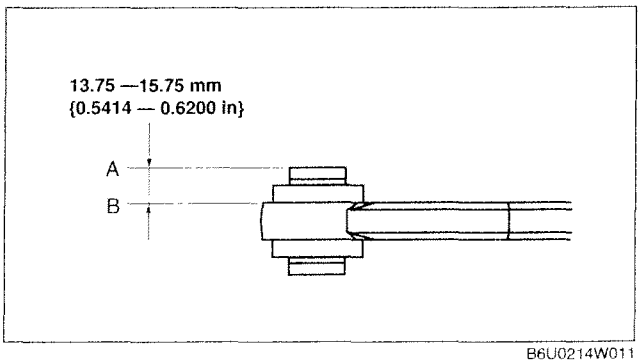
A6A7416W002

2. Press the bushing in to the marking using the **SSTs**.



A6E7416W012

3. Verify that clearance distance A—B is **13.75 mm—15.75 mm {0.5414 in—0.6200 in}**.

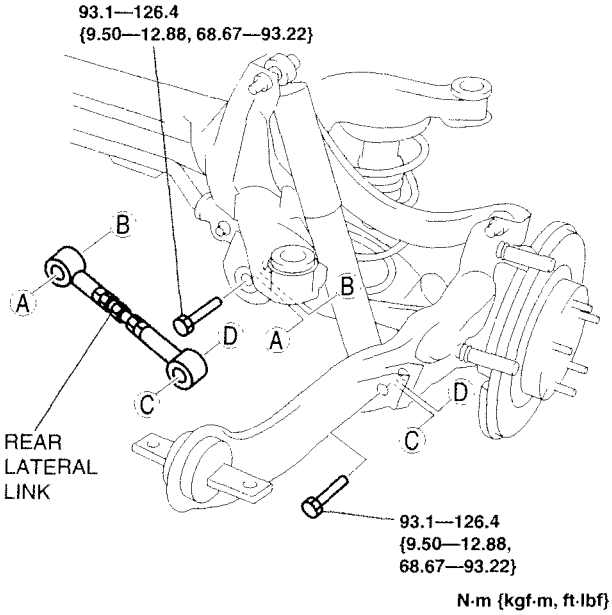


B6U0214W011

REAR LATERAL LINK REMOVAL/INSTALLATION

C6U021428600W01

1. Remove the rear lateral link.

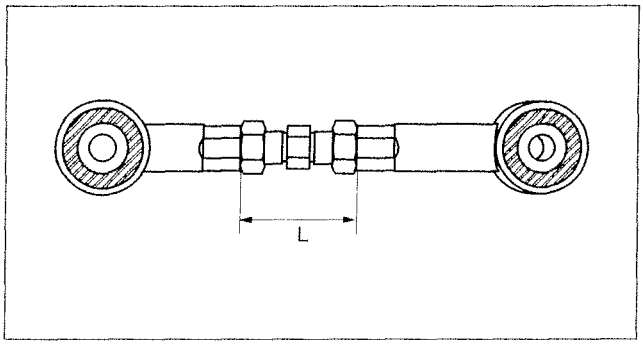


B6U0214W015

Caution

- **When working near left rear suspension, avoid any impact to the fuel tank.**

2. Measure the length L shown in the figure for proper installation.
3. Temporarily loosen a locknut of the rear lateral link.
4. Install the rear lateral link.
5. Inspect the rear wheel alignment. (See 02–11–3 REAR WHEEL ALIGNMENT.)

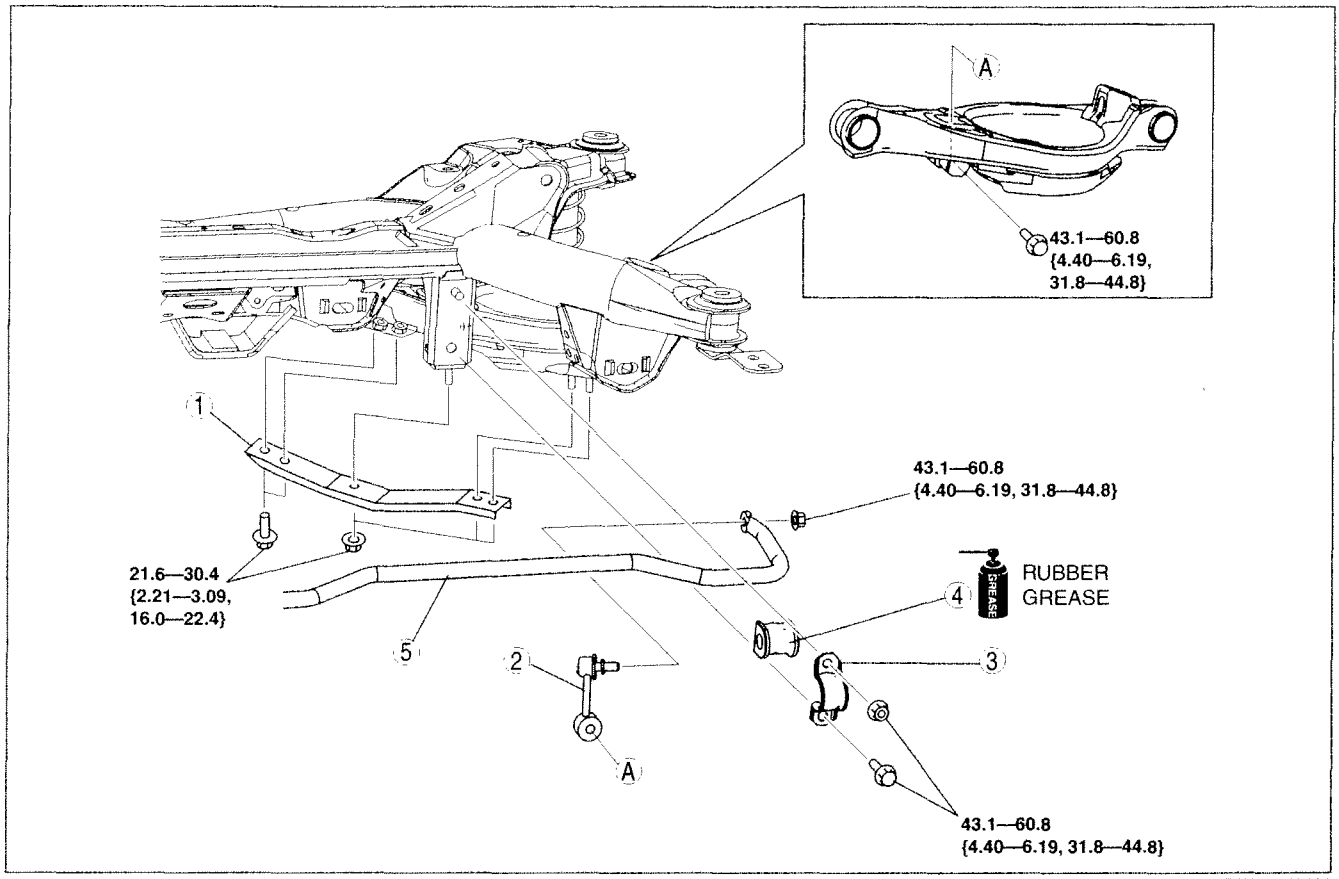


B6U0214W014

REAR STABILIZER REMOVAL/INSTALLATION

C6U021428100W01

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



B6U0214W003

1	Side bracket member
2	Stabilizer control link
3	Stabilizer bracket

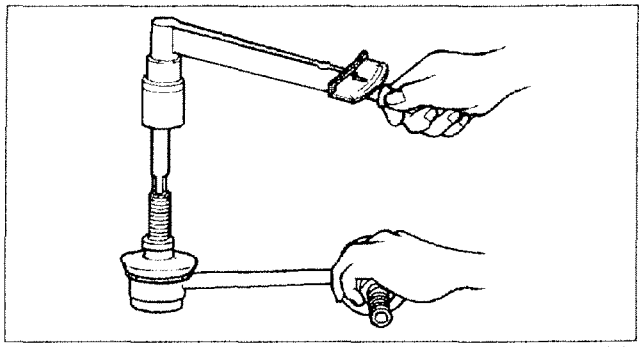
4	Bushing
5	Rear stabilizer

STABILIZER CONTROL LINK INSPECTION

C6U021434150W01

1. Remove the stabilizer control link from the vehicle.
2. Inspect for bending and damage.
3. Measure the ball joint starting torque.
   (1) Rock the ball joint stud side to side 10 times.
   (2) Rotate the ball joint stud 10 times.
   (3) Measure the starting torque using a suitable Allen socket and a torque wrench.

Starting torque
0.23—0.47 N·m {2.4—4.7 kgf·cm, 2.1—4.1 in·lbf}



A6E7414W021

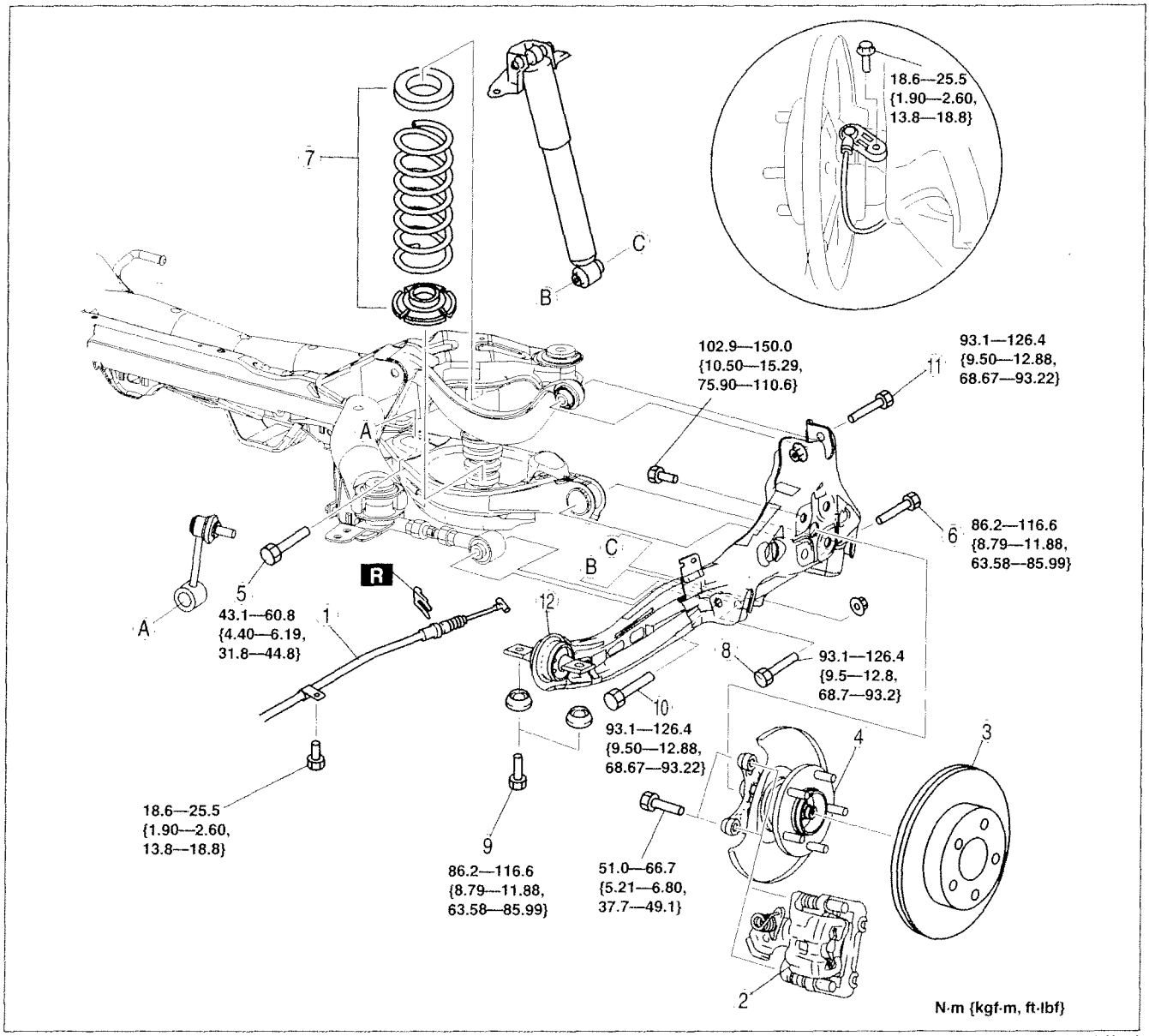
TRAILING LINK REMOVAL/INSTALLATION

C6U021428200W01

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.**

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the rear wheel alignment.
   (See 02–11–3 REAR WHEEL ALIGNMENT.)



C6U214ZWC002

1	Parking brake cable
2	Caliper component (See 02–14–12 Caliper Component Removal Note)
3	Disc plate (See 04–11–17 Disc Plate Removal Note)
4	Spindle and hub component (See 03–12–2 WHEEL HUB, HUB SPINDLE REMOVAL/INSTALLATION)
5	Bolt (stabilizer control link lower side)

6	Bolt (rear lower arm outer side) (See 02–14–4 Bolt (Rear Lower Arm Outer Side) Removal Note)
7	Spring component
8	Bolt (rear shock absorber lower side)

9	Bolt (trailing link front side) (See 02–14–12 Bolt (Trailing Link Front Side) Removal Note) (See 02–14–12 Bolt (Trailing Link Front Side) Installation Note)
10	Bolt (rear lateral link outer side) (See 02–14–12 Bolt (Rear Lateral Link Outer Side) Removal Note)
11	Bolt (rear upper arm outer side)
12	Trailing link

Caliper Component Removal Note

1. Suspend the caliper aside with cable.

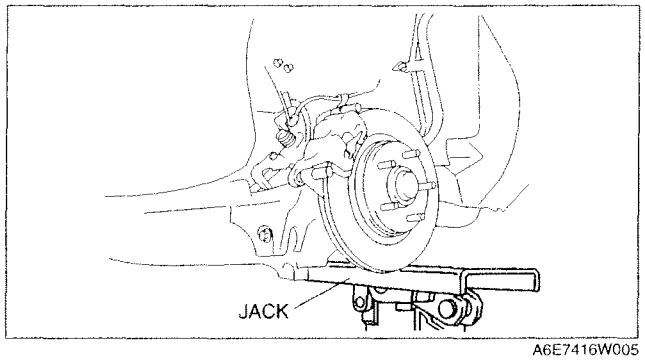
Bolt (Trailing Link Front Side) Removal Note

1. Support the trailing link with a jack.

Caution

- **Removing the trailing link is dangerous. The trailing link could fall and cause serious injury or death. Verify that the jack securely supports the trailing link.**

2. Remove the bolts (trailing link front side).



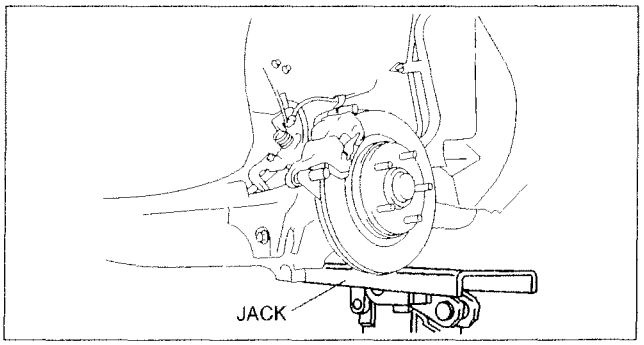
A6E7416W005

Bolt (Rear Lateral Link Outer Side) Removal Note

1. Loosen the bolt (lateral link inner side).
2. Remove the bolt (lateral link outer side).

Bolt (Trailing Link Front Side) Installation Note

1. Support the trailing link with a jack.
2. Tighten the bolts (trailing link front side).



A6E7416W005

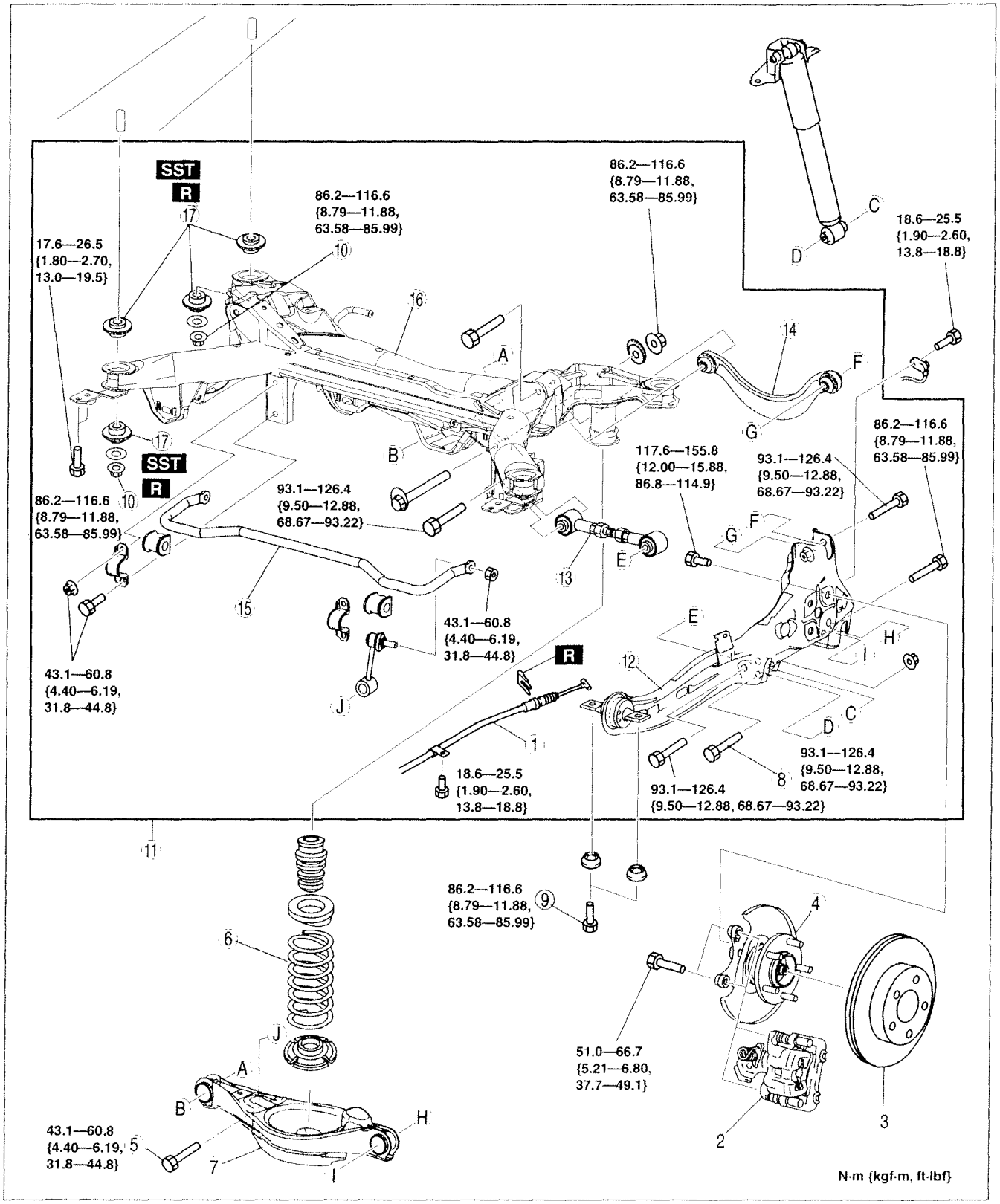
REAR CROSSMEMBER REMOVAL/INSTALLATION

C6U021428400W01

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.**

1. Remove the pre-silencer.
   (See 01–15A–1 EXHAUST SYSTEM REMOVAL/INSTALLATION [L3].)
   (See 01–15B–2 EXHAUST SYSTEM REMOVAL/INSTALLATION [AJ].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Inspect the rear wheel alignment.
   (See 02–11–3 REAR WHEEL ALIGNMENT.)



C6U214ZWC003

1	Parking brake cable
2	Caliper component (See 02-14-14 Caliper Component Removal Note)
3	Disc plate (See 04-11-17 Disc Plate Removal Note)

4	Spindle and hub component (See 03-12-2 WHEEL HUB, HUB SPINDLE REMOVAL/INSTALLATION)
5	Bolt (stabilizer control link)
6	Rear coil spring (See 02-14-4 REAR COIL SPRING REMOVAL/INSTALLATION)

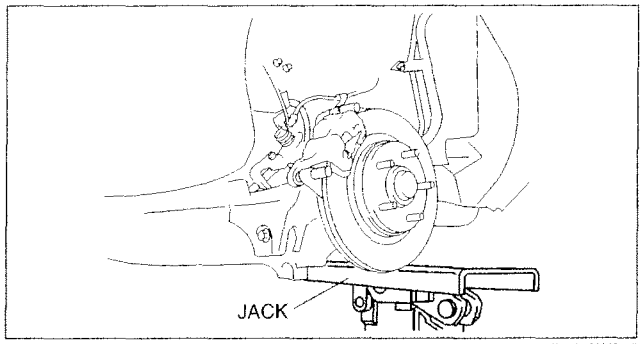
7	Rear lower arm (See 02–14–5 REAR LOWER ARM REMOVAL/ INSTALLATION)
8	Bolt (rear shock absorber lower side)
9	Bolt (trailing link front side) (See 02–14–14 Bolt (Trailing Link Front Side) Removal Note) (See 02–14–16 Bolt (Trailing Link Front Side) Installation Note)
10	Nut (crossmember)
11	Crossmember component (See 02–14–14 Crossmember Component Removal Note)
12	Trailing link
13	Rear lateral link
14	Rear upper arm
15	Rear stabilizer
16	Rear crossmember
17	Rear crossmember bushing (See 02–14–15 Rear Crossmember Bushing Removal Note) (See 02–14–15 Rear Crossmember Bushing Installation Note)

Caliper Component Removal Note

1. Remove the caliper, and suspend it aside with cable.

Bolt (Trailing Link Front Side) Removal Note

1. Support the trailing link with a jack.
2. Loosen the bolt (lateral link inner side).



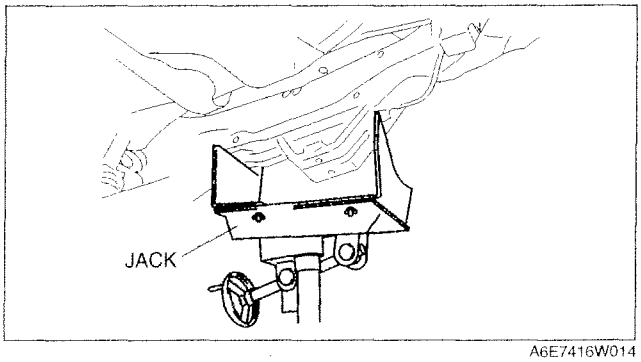
A6E7416W005

Crossmember Component Removal Note

Warning

- **Removing the crossmember is dangerous. The crossmember component could fall and cause serious injury or death. Verify that the jack securely supports the crossmember component.**

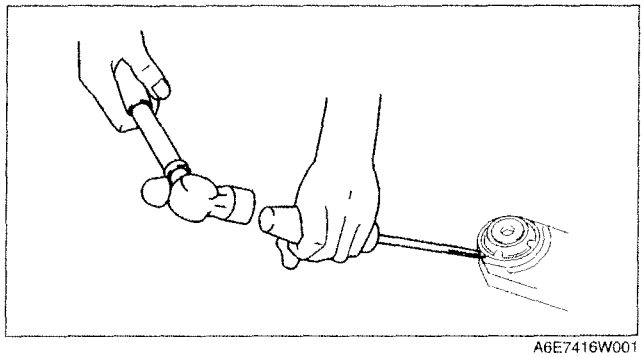
1. Support the crossmember component using a jack and remove the nuts.
2. Remove the crossmember component.



A6E7416W014

Rear Crossmember Bushing Removal Note

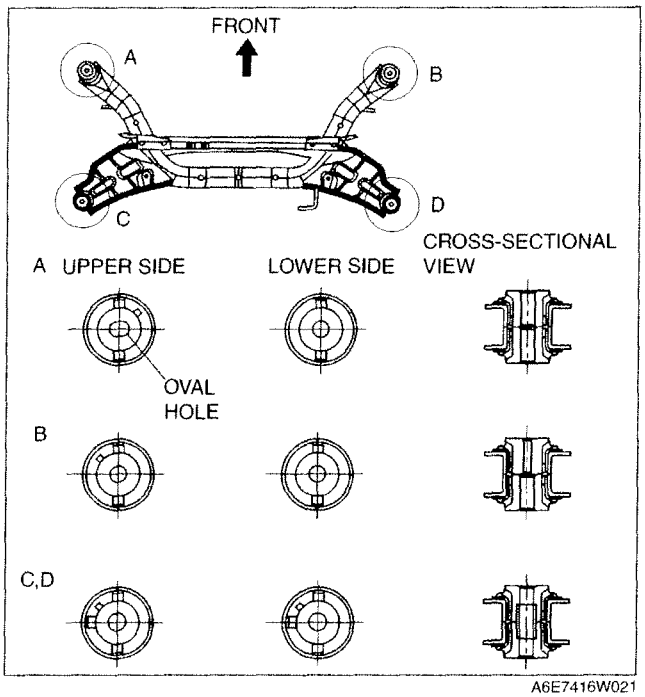
1. Remove the bushing using a flathead screwdriver, being careful not to damage the rear crossmember.



A6E7416W001

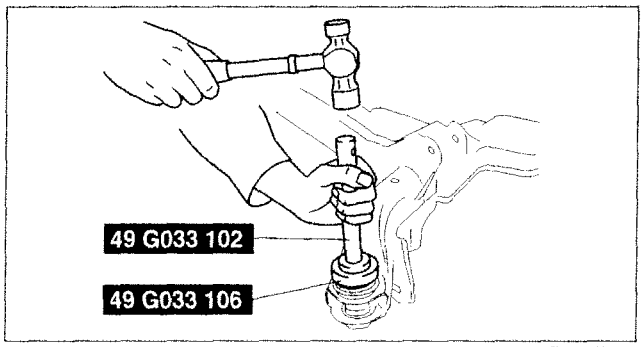
Rear Crossmember Bushing Installation Note

1. Set the bushings as shown in the figure.



A6E7416W021

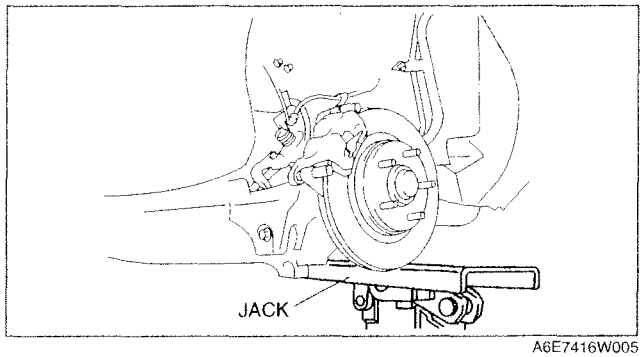
2. Tap the bushing onto the rear crossmember using the **SSTs**.



A6E7416W002

Bolt (Trailing Link Front Side) Installation Note

1. Support the trailing link with a jack.
2. Tighten the bolts (trailing link front side).



A6E7416W005

02–50 TECHNICAL DATA

SUSPENSION

C6U025001013W01

Suspension

4SD, 5HB

Item			Specification				
Fuel gauge indication			**Empty**	**1/4**	**1/2**	**3/4**	**Full**
Front wheel alignment (Unloaded)*1	Maximum steering angle	Inner	34°±3°				
		Outer	29°±3°				
	Total toe-in	(mm {in})	Tire: 2±4 {0.08±0.16}, Rim inner: 1.4±2.8 {0.06±0.12}				
		(degree)	0°11′±0°22′				
	Caster angle*2 (Reference value)		3°37′±1°	3°39′±1°	3°41′±1°	3°44′±1°	3°47′±1°
	Camber angle*2 (Reference value)	L3	−0°16′±1°			−0°17′±1°	
		AJ	−0°17′±1°			−0°18′±1°	
	Steering axis inclination (Reference value)	L3	5°26′			5°28′	
		AJ	5°30′			5°29′	
Rear wheel alignment (Unloaded)*1	Total toe-in	(mm {in})	Tire: 2±4 {0.08±0.16}, Rim inner: 1.4±2.8 {0.06±0.12}				
		(degree)	0°11′±0°22′				
	Camber angle*2		−1°05′±1°	−1°07′±1°	−1°09′±1°	−1°11′±1°	−1°13′±1°
	Thrust angle		0°±0°48′				

WGN

Item			Specification				
Fuel gauge indication			**Empty**	**1/4**	**1/2**	**3/4**	**Full**
Front wheel alignment (Unloaded)*1	Maximum steering angle	Inner	34°±3°				
		Outer	29°±3°				
	Total toe-in	(mm {in})	Tire: 2±4 {0.08±0.16}, Rim inner: 1.4±2.8 {0.06±0.12}				
		(degree)	0°11′±0°22′				
	Caster angle*2 (Reference value)		3°29′±1°	3°32′±1°	3°34′±1°	3°37′±1°	3°39′±1°
	Camber angle*2 (Reference value)		−0°16′±1°			−0°17′±1°	
	Steering axis inclination (Reference value)		5°28′			5°27′	
Rear wheel alignment (Unloaded)*1	Total toe-in	(mm {in})	Tire: 2±4 {0.08±0.16}, Rim inner: 1.4±2.8 {0.06±0.12}				
		(degree)	0°11′±0°22′				
	Camber angle*2		−0°59′±1°	−1°00′±1°	−1°02′±1°	−1°04′±1°	−1°06′±1°
	Thrust angle		0°±0°48′				

*1 : Engine coolant and engine oil are at specified level. Spare tire, jack, and tools are in designated position. Adjust to the median when carrying out wheel alignment.
*2 : Difference between left and right must not exceed **1° 30′**.

Rotation torque

Item			Specification
Ball joint	Front upper arm	(N·m {kgf·cm, in·lbf})	1.5 {15.0, 13.2} max.
	Front lower arm (front)		1.18—2.23 {12.1—22.7, 10.5—19.7}
	Front lower arm (rear)		1.00—2.22 {10.2—22.6, 8.86—19.6}
Front and rear stabilizer control link		(N·m {kgf·cm, in·lbf})	0.23—0.47 {2.4—4.7, 2.1—4.1}

Wheel and Tires

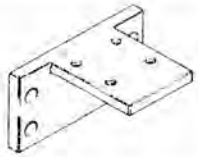
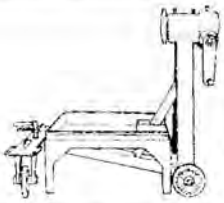
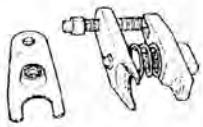
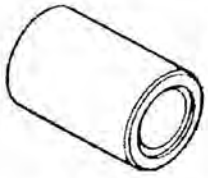
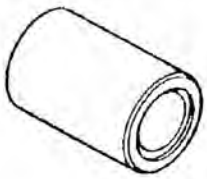
Item			Specification		
Standard tire and wheel					
Wheel	Size		16 × 6 1/2JJ	16 × 7JJ	17 × 7JJ
	Offset (mm {in})		55 {2.2}		60 {2.4}
	Pitch circle diameter (mm {in})		114.3 {4.50}		
	Material		Steel	Aluminum alloy	
Tire	Size		P205/60R16 91H		P215/50R17 93V
	Air pressure (kPa {kgf/cm^2, psi})	Front	220 {2.2, 32}		
		Rear	220 {2.2, 32}		
	Remaining tread (mm {in})		1.6 {0.06}		
Wheel and tire	Wheel and tire runout (mm {in})	Radial direction	1.5 {0.06} max.		
		Lateral direction	2.5 {0.10} max.	2.0 {0.08} max.	
	Wheel unbalance (g {oz})		Knock-type*2: 8 {0.28} max.	Adhesive-type*1: 10 {0.35} max. Knock-type*2: 8 {0.28} max.	Adhesive-type*1: 9 {0.32} max. Knock-type*2: 7 {0.25} max.
	Tightening torque (N·m {kgf·m, ft·lbf})		88—118 {9.0—12.0, 65.0—87.0}		
Temporary spare tire					
Wheel	Size		15 × 4T		
	Offset (mm {in})		40 {1.57}		
	Pitch circle diameter (mm {in})		114.3 {4.50}		
	Material		Steel		
Tire	Size		T115/70 R15 T115/70 D15		
	Air pressure (kPa {kgf/cm^2, psi})		420 {4.2, 60}		
Wheel and tire	Wheel and tire runout (mm {in})	Radial direction	2.0 {0.08} max.		
		Lateral direction	2.5 {0.10} max.		
	Tightening torque (N·m {kgf·m, ft·lbf})		88—118 {9.0—12.0, 65.0—87.0}		

*1 : Total weight exceeds, **160 g {5.65 oz}**.
*2 : One balance weight: **60 g {2.12 oz}** max. If the total weight exceeds **100 g {3.53 oz}** on one side, rebalance after moving the tire around on the rim. Do not use 3 or more balance weights.

02–60 SERVICE TOOLS

SUSPENSION

C6U026001013W01

49 T034 1A0 Coil spring compressor set 	49 T034 101 Coil spring compressor 	49 T034 105 Attachment 
49 0107 680A Engine stand 	49 T028 3A0 Ball joint puller set 	49 T034 202A Guide 
49 B034 216 Installer 	49 S120 620 Bearing installer 	49 T034 203 Attachment 
49 G030 797 Handle 	49 U034 204 Dust boot installer 	49 U027 005 Bearing installer 
49 G026 103 Support block 	49 G033 102 Handle 	49 G033 106 Attachment 
49 W034 308 Puller and installer 	49 8038 785A Dust boot installer 	49 F032 321 Installer B 
49 B034 202A Support block 	—	—

DRIVELINE/AXLE

03 SECTION

03–10 GENERAL PROCEDURES

PRECAUTION (FRONT AND REAR AXLE)

C6U031001018W01

Wheel and Tire Removal/Installation

1. The removal and installation procedures for the wheels and tires are not mentioned in this section. When a wheel is removed, tighten it to **88—118 N·m {9.0—12.0 kgf·m, 65.0—87.0 ft·lbf}**

Brake Line Disconnection/Connection

Caution
- **Brake fluid will damage painted surfaces. If brake fluid gets on a painted surface, wipe it off immediately.**

1. Tighten the brake pipe flare nut using the **SST** (49 0259 770B). Be sure to modify the brake pipe flare nut tightening torque to allow for use of a torque wrench-**SST** combination. (See 00–00–17 Torque Formulas.)
2. If any brake line has been disconnected any time during the procedure, add brake fluid, bleed the brakes, and inspect for leakage after the procedure has been completed.

Suspension Arm Removal/Installation

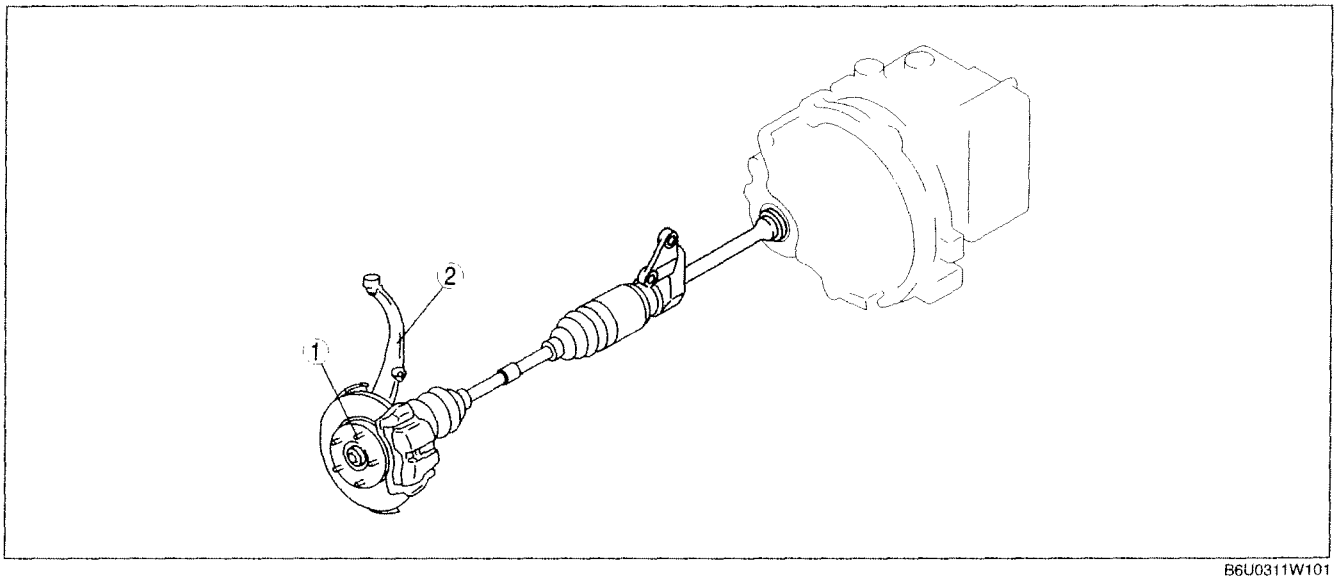
1. Tighten any part of the suspension that uses rubber bushings only after vehicle has been lowered to the ground and unloaded.

Note
- Unloaded: Fuel tank is full. Engine coolant and engine oil are at specified level. Spare tire, jack, and tools are in designated position.

03–11 FRONT AXLE

FRONT AXLE LOCATION INDEX

C6U031104000W01



B6U0311W101

1	Hub bolt (See 03–11–2 WHEEL HUB BOLT REPLACEMENT)
2	Wheel hub, steering knuckle (See 03–11–1 WHEEL HUB, STEERING KNUCKLE PRE-INSPECTION) (See 03–11–3 WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION)

WHEEL HUB, STEERING KNUCKLE PRE-INSPECTION

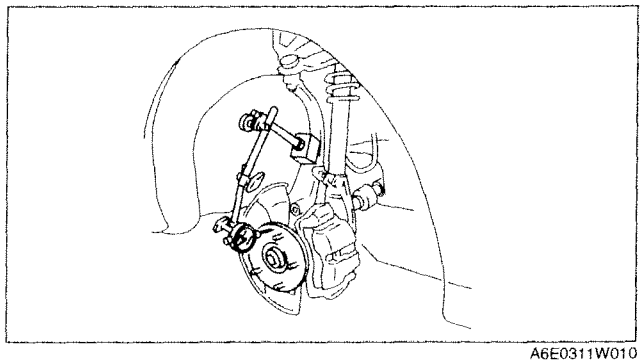
C6U031104000W02

Wheel Bearing Play Inspection

1. Position a dial indicator against the wheel hub.
2. Push and pull the wheel hub by hand in the axial direction and measure the wheel bearing play.

   Maximum wheel bearing play
   0.05 mm {0.002 in}

3. If the bearing play exceeds the specification, replace and tighten the locknut to the specified torque and retest.
   - Replace the wheel bearing as necessary.



A6E0311W010

WHEEL HUB BOLT REPLACEMENT

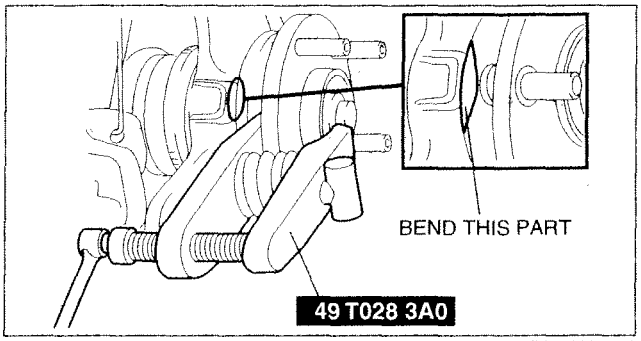
1. Remove the hub bolt using the **SSTs**.

   Note
   - If the dust cover interferes with the wheel hub bolt and the wheel hub bolt cannot be removed, tap the part shown in the figure with a chisel lightly and bend the processing point back to the steering knuckle side.

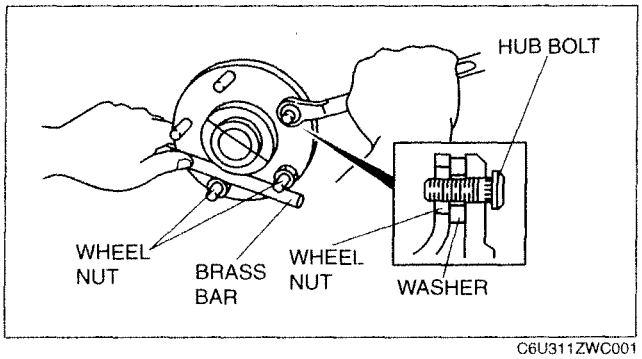
2. Install the hub bolt into the wheel hub and install a washer and hub nut on the hub bolt.

3. Tighten the hub nut while holding the wheel hub using a brass bar.

C6U031133060W01



B6U0311W002



C6U311ZWC001

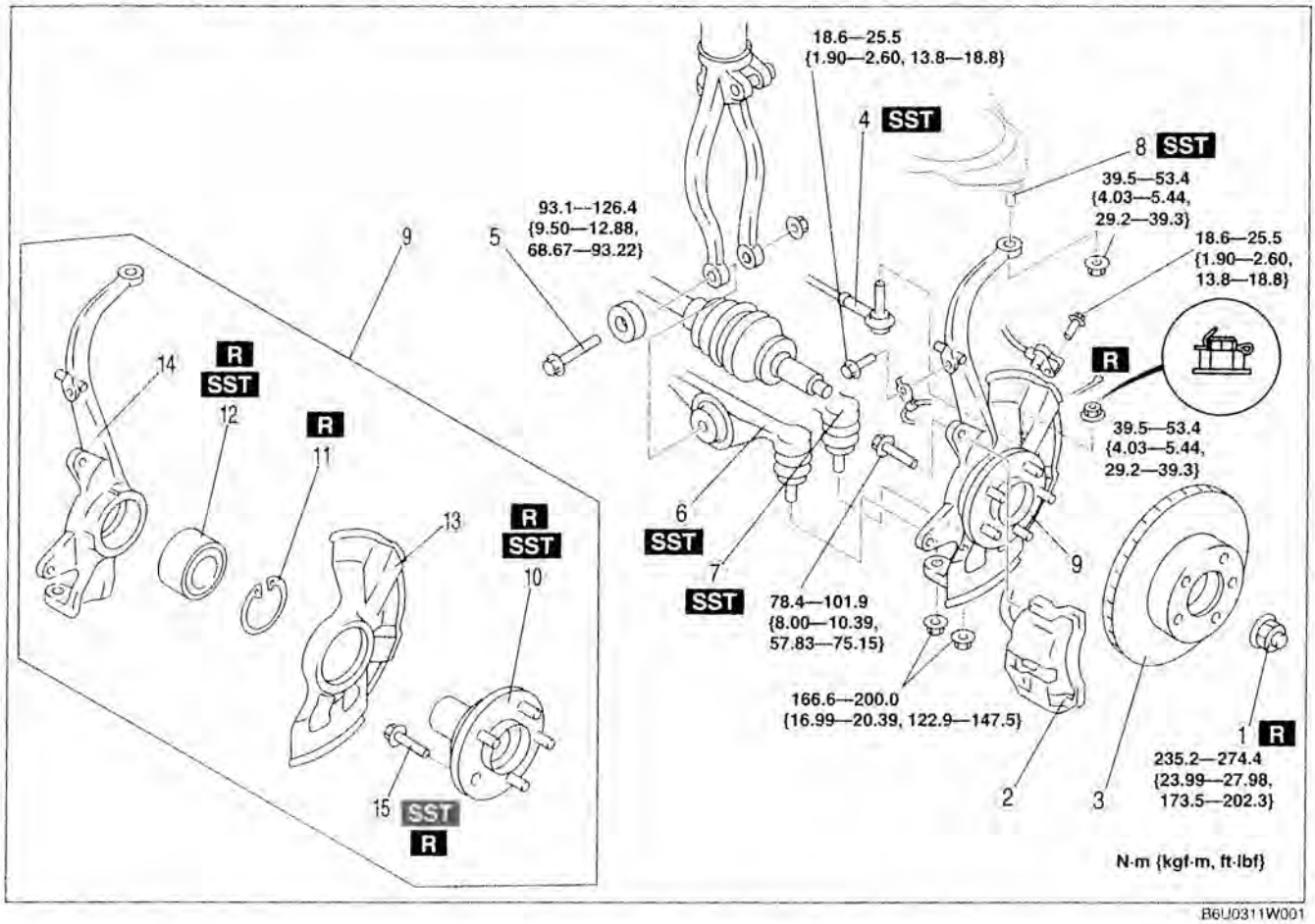
WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION

C6U031104000W03

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while the vehicle is being serviced.**

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, inspect the front wheel alignment. (See 02–11–2 FRONT WHEEL ALIGNMENT.)



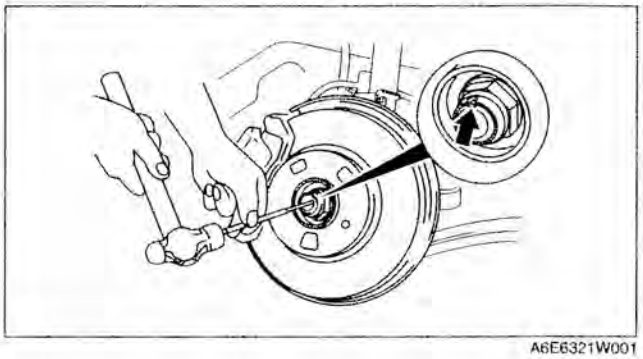
B6U0311W001

1	Locknut (See 03–11–4 Locknut Removal Note) (See 03–11–7 Locknut Installation Note)
2	Brake caliper component
3	Disc plate (See 04–11–17 Disc Plate Removal Note)
4	Tie-rod end ball joint (See 06–12–10 Tie-rod End Ball Joint Removal Note)
5	Bolt
6	Front lower arm (front) ball joint (See 02–13–10 Front Lower Arm (Front) Ball Joint Removal Note)
7	Front lower arm (rear) ball joint (See 02–13–14 Front Lower Arm (Rear) Ball Joint Removal Note)
8	Front upper arm ball joint (See 02–13–7 Front Upper Arm Ball Joint Removal Note)

9	Wheel hub, steering knuckle, dust cover
10	Wheel hub component (See 03–11–4 Wheel Hub Component Removal Note) (See 03–11–7 Wheel Hub Component Installation Note)
11	Retaining ring
12	Wheel bearing (See 03–11–4 Wheel Bearing Removal Note) (See 03–11–6 Wheel Bearing Installation Note)
13	Dust cover (See 03–11–5 Dust Cover Removal Note) (See 03–11–6 Dust Cover Installation Note)
14	Steering knuckle
15	Hub bolt (See 03–11–5 Hub Bolt Removal Note) (See 03–11–6 Hub Bolt Installation Note)

Locknut Removal Note

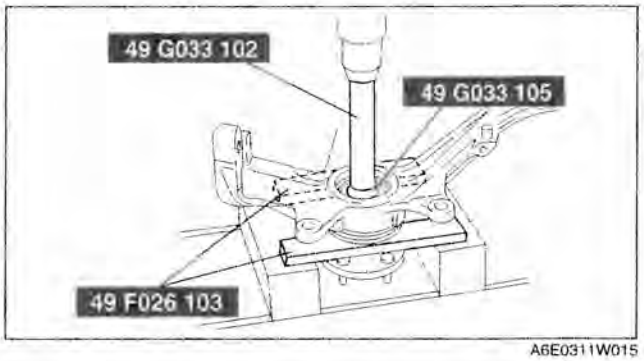
1. Knock the crimped portion of the locknut outward using a small chisel and a hammer.
2. Lock the hub by applying the brakes.
3. Remove the locknut.



A6E6321W001

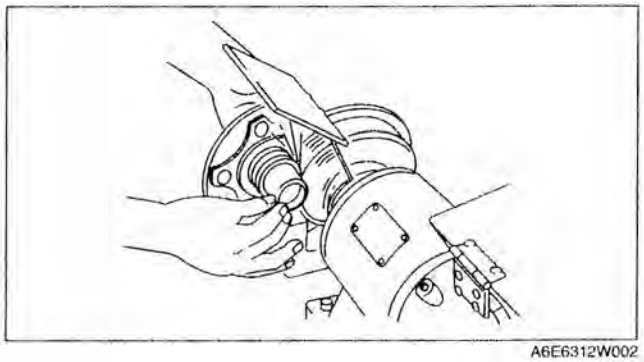
Wheel Hub Component Removal Note

1. Remove the wheel hub component using the **SSTs**.



A6E0311W015

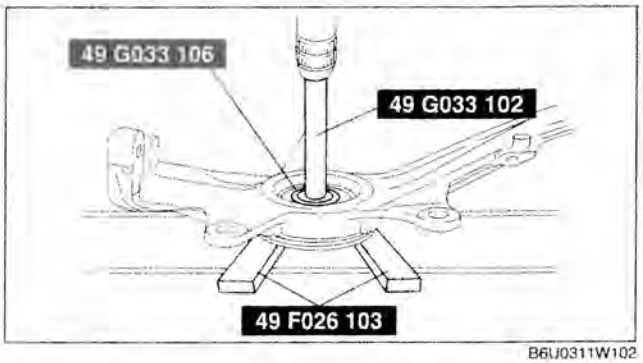
2. If the bearing inner race remains on the front wheel hub component, grind a section of the bearing inner race until **approx. 0.5 mm {0.02 in}** remains. Then remove it using a chisel.



A6E6312W002

Wheel Bearing Removal Note

1. Remove the wheel bearing using the **SSTs**.

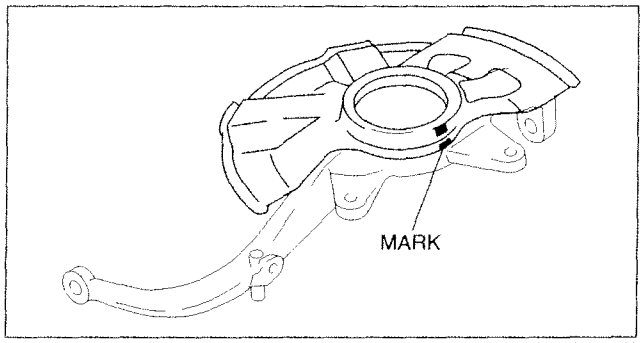


B6U0311W102

Dust Cover Removal Note

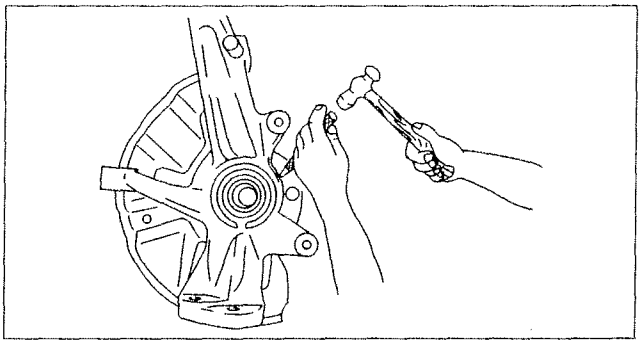
Note
- The dust cover does not need to be removed unless it is being replaced.

1. Mark the dust cover and steering knuckle for proper installation.



A6E0311W018

2. Remove the dust cover using a chisel.

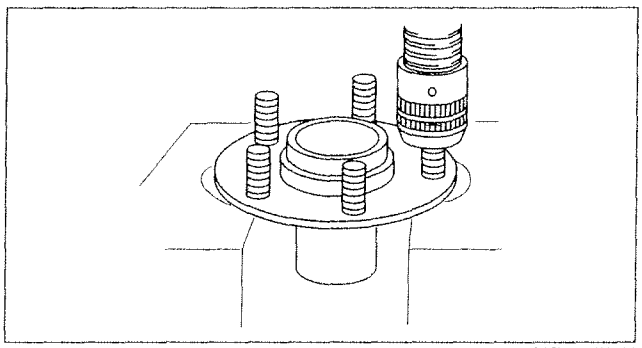


A6E0311W019

Hub Bolt Removal Note

Note
- The hub bolts do not need to be removed unless they are being replaced.

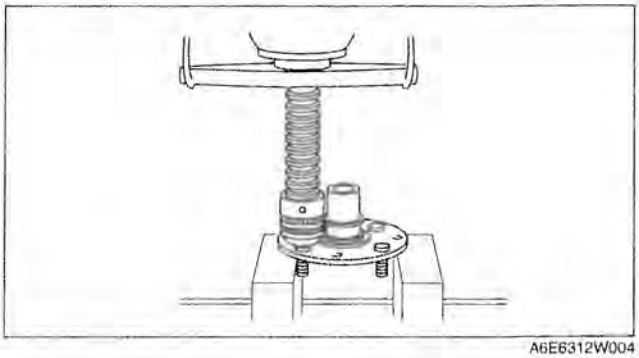
1. Remove the hub bolts using a press.



A6E6312W003

Hub Bolt Installation Note

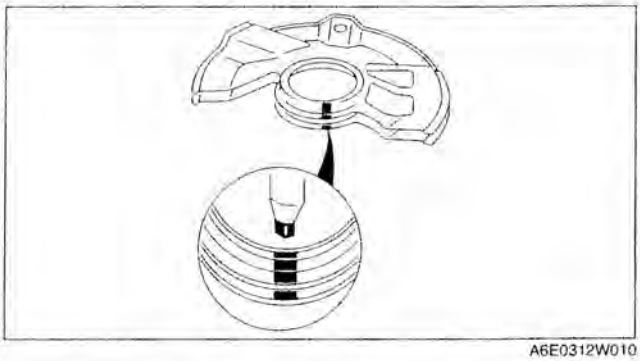
1. Install the new hub bolts using a press.



A6E6312W004

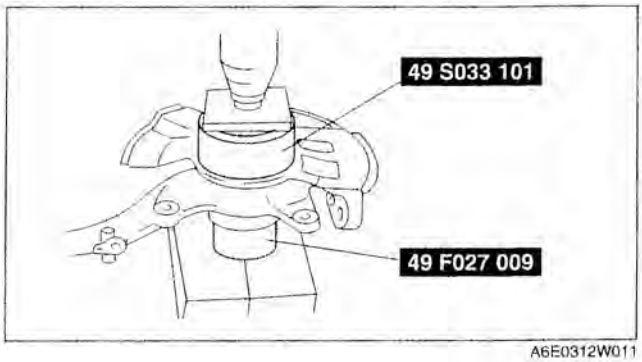
Dust Cover Installation Note

1. Mark the new dust cover in the same way as the removed one.
2. Align the marks of the new dust cover and the knuckle.



A6E0312W010

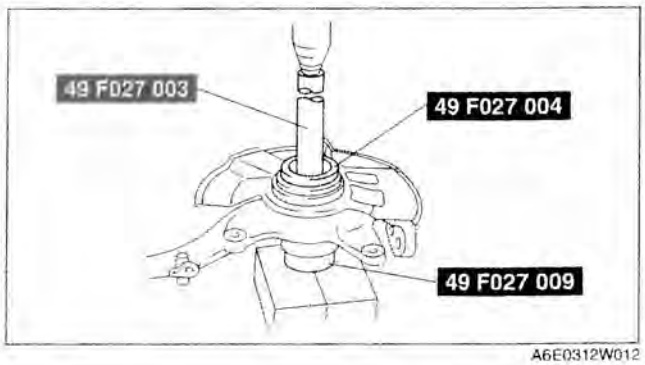
3. Install the new dust cover using the **SSTs**.



A6E0312W011

Wheel Bearing Installation Note

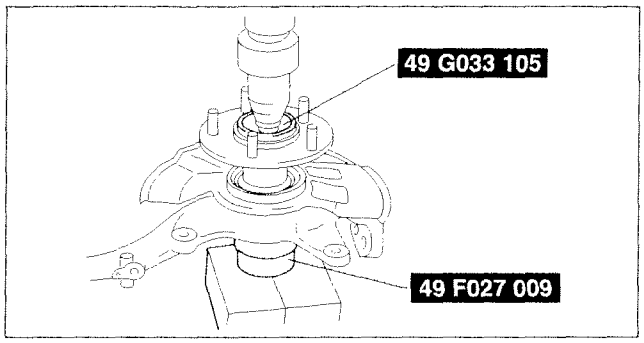
1. Install the new wheel bearing using the **SSTs**.



A6E0312W012

Wheel Hub Component Installation Note

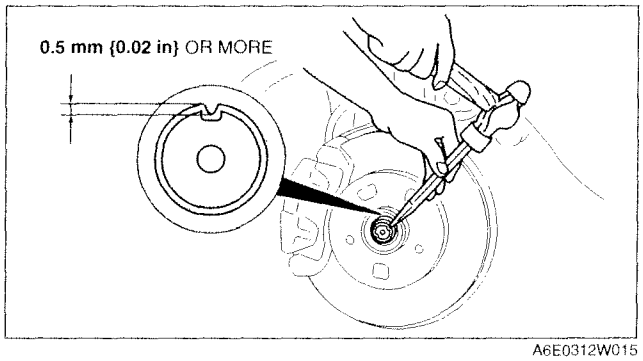
1. Install the wheel hub component using the **SSTs**.



A6E0312W013

Locknut Installation Note

1. Install a new locknut and stake it as shown.

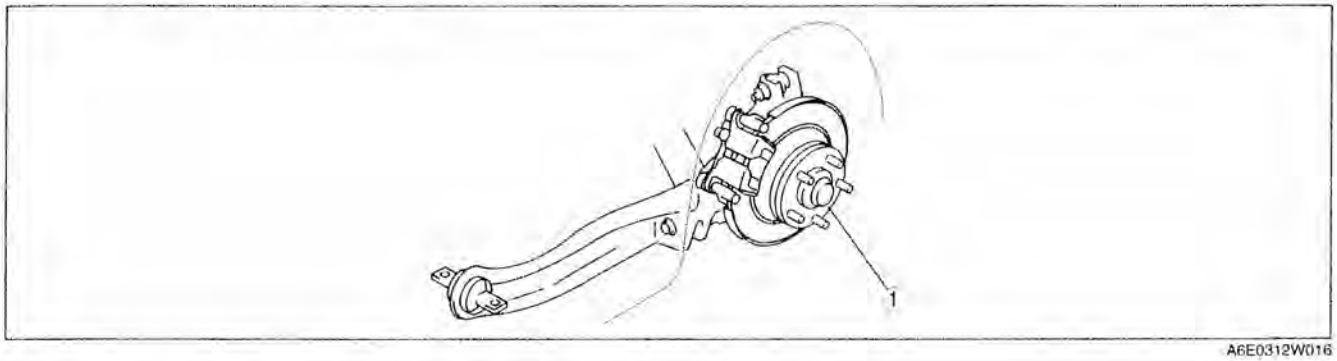


A6E0312W015

03–12 REAR AXLE

REAR AXLE LOCATION INDEX

C6U031205000W01



A6E0312W016

1	Wheel hub, hub spindle (See 03–12–1 WHEEL HUB, HUB SPINDLE PRE-INSPECTION) (See 03–12–2 WHEEL HUB, HUB SPINDLE REMOVAL/INSTALLATION)

WHEEL HUB, HUB SPINDLE PRE-INSPECTION

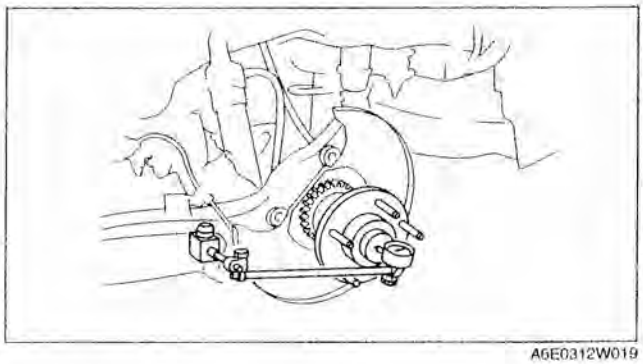
Wheel Bearing Play Inspection

C6U031205000W02

1. Position a dial indicator against the wheel hub.
2. Push and pull the wheel hub by hand in the axial direction and measure the wheel bearing play.

   Maximum wheel bearing play
   0.05 mm {0.002 in}

3. If the bearing play exceeds the specification, replace and tighten the locknut to the specified torque and retest.
   - Replace the wheel hub component as necessary.



A6E0312W019

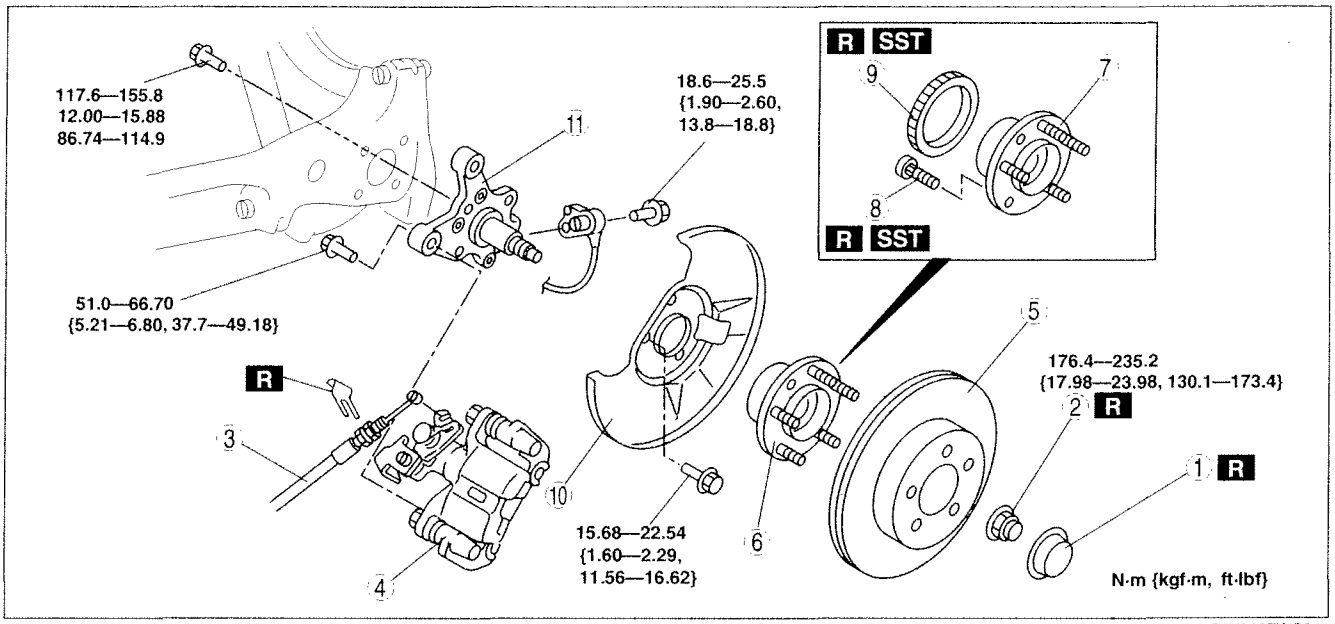
WHEEL HUB, HUB SPINDLE REMOVAL/INSTALLATION

C6U031205000W03

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while the vehicle is being serviced.**

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



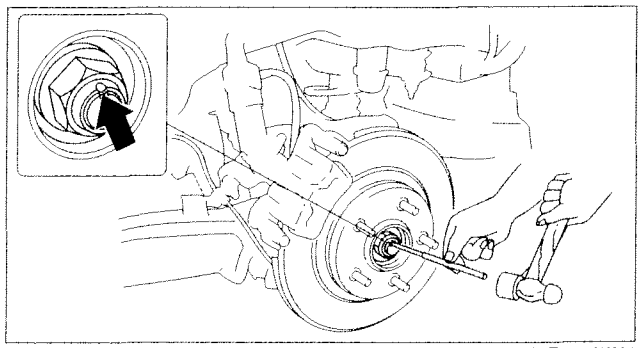
C6U312ZWC001

1	Hub cap
2	Locknut (See 03–12–2 Locknut Removal Note) (See 03–12–4 Locknut Installation Note)
3	Parking brake cable
4	Brake caliper component
5	Disc plate (See 04–11–17 Disc Plate Removal Note)
6	Wheel hub component

7	Wheel hub
8	Hub bolt (See 03–11–5 Hub Bolt Removal Note) (See 03–11–6 Hub Bolt Installation Note)
9	ABS sensor rotor (with ABS) (See 03–12–3 ABS Sensor Rotor Removal Note) (See 03–12–3 ABS Sensor Rotor Installation Note)
10	Dust cover
11	Hub spindle

Locknut Removal Note

1. Knock the crimped portion of the locknut outward using a small cape chisel and a hammer.
2. Lock the hub by applying the brakes.
3. Remove the locknut.

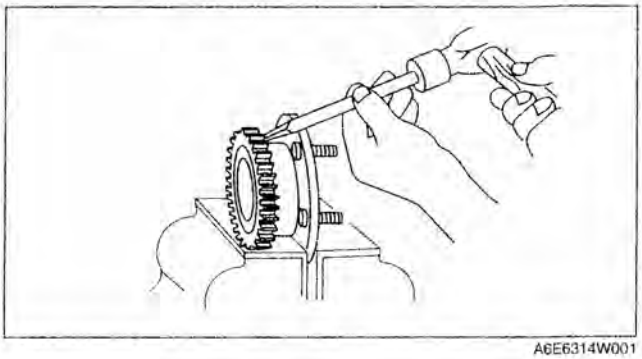


A6E0312W021

ABS Sensor Rotor Removal Note

Note
- The sensor rotor does not need to be removed unless it is being replaced.

1. Remove the sensor rotor using a chisel.

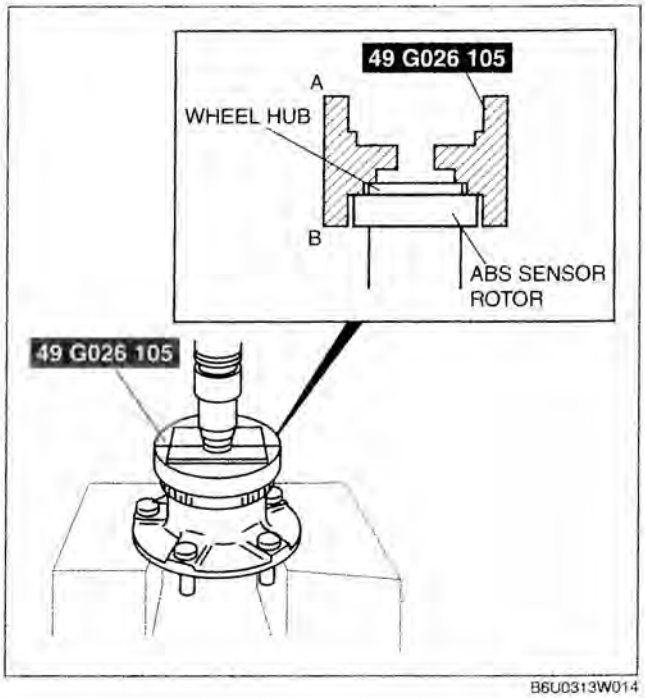


A6E6314W001

ABS Sensor Rotor Installation Note

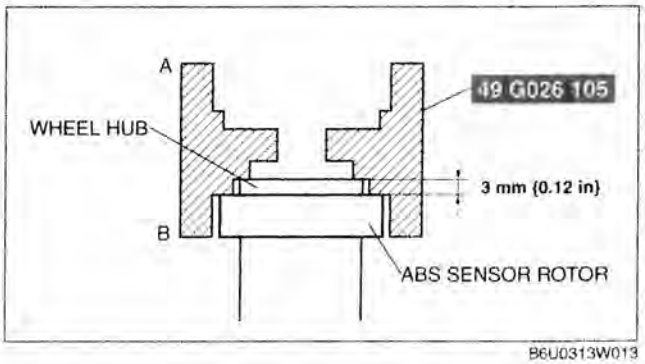
1. Set the **SST** as shown in the figure.

Caution
- **Position the SST so that marking B faces the bottom.**



B6U0313W014

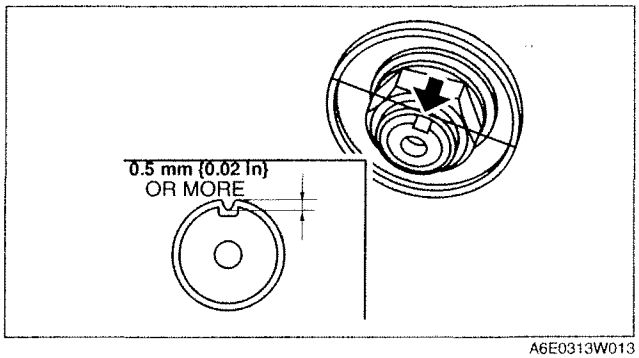
2. Press on the new sensor rotor using the **SST** and a press.



B6U0313W013

Locknut Installation Note

1. Install a new locknut and stake it as shown.

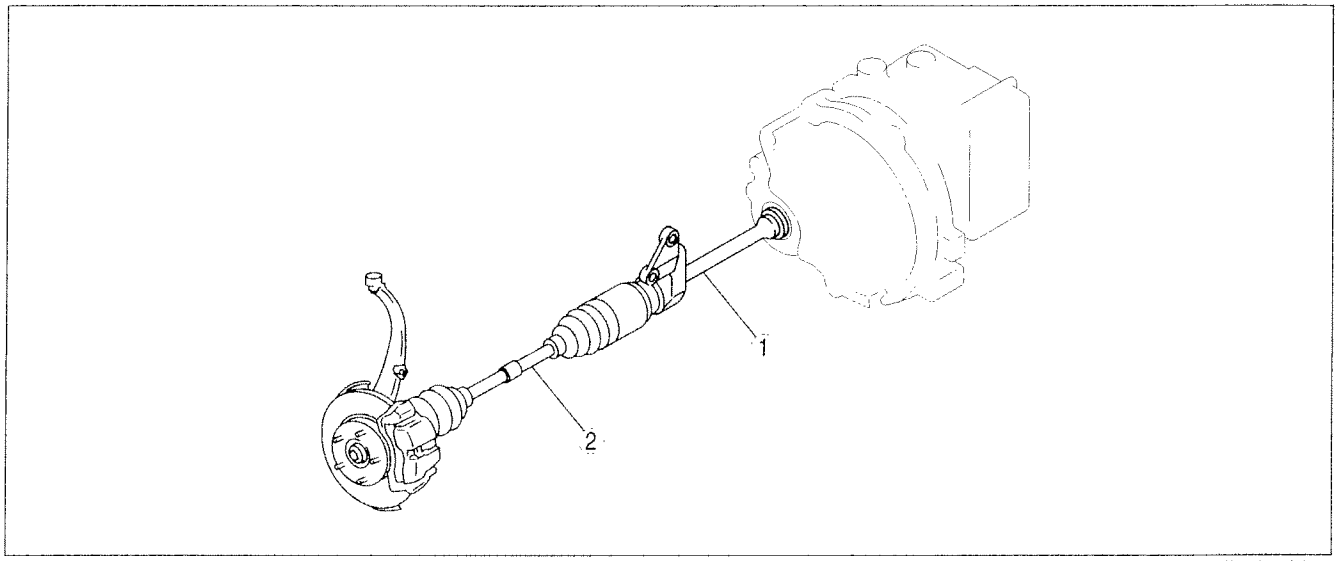


A6E0313W013

03–13 DRIVE SHAFT

DRIVE SHAFT LOCATION INDEX

C6U031304000W01



B6U0313W102

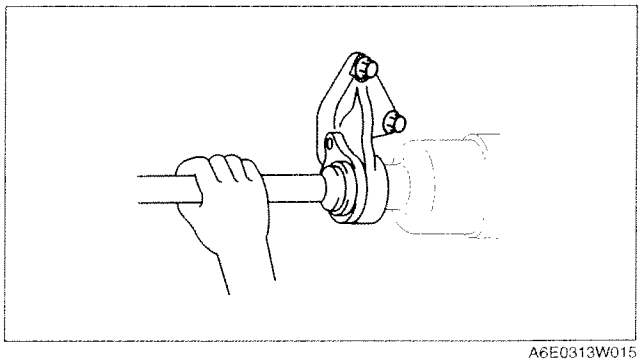
1	Joint shaft (See 03–13–2 JOINT SHAFT PRE-INSPECTION) (See 03–13–3 JOINT SHAFT REMOVAL/ INSTALLATION [L3]) (See 03–13–5 JOINT SHAFT REMOVAL/ INSTALLATION [AJ]) (See 03–13–7 JOINT SHAFT DISASSEMBLY/ ASSEMBLY [L3]) (See 03–13–9 JOINT SHAFT DISASSEMBLY [AJ]) (See 03–13–10 JOINT SHAFT ASSEMBLY [AJ])

2	Drive shaft (See 03–13–12 DRIVE SHAFT PRE-INSPECTION) (See 03–13–12 DRIVE SHAFT REMOVAL/ INSTALLATION [L3]) (See 03–13–14 DRIVE SHAFT REMOVAL/ INSTALLATION [AJ]) (See 03–13–24 DRIVE SHAFT DISASSEMBLY/ ASSEMBLY [MTX]) (See 03–13–18 DRIVE SHAFT DISASSEMBLY/ ASSEMBLY [ATX])

JOINT SHAFT PRE-INSPECTION

C6U031325700W01

1. Verify that the joint shaft is not twisted or cracked.
   - Replace it as necessary.
2. Turn the joint shaft by hand and verify that the bearing rotates smoothly and freely.
   - Replace it as necessary.



A6E0313W015

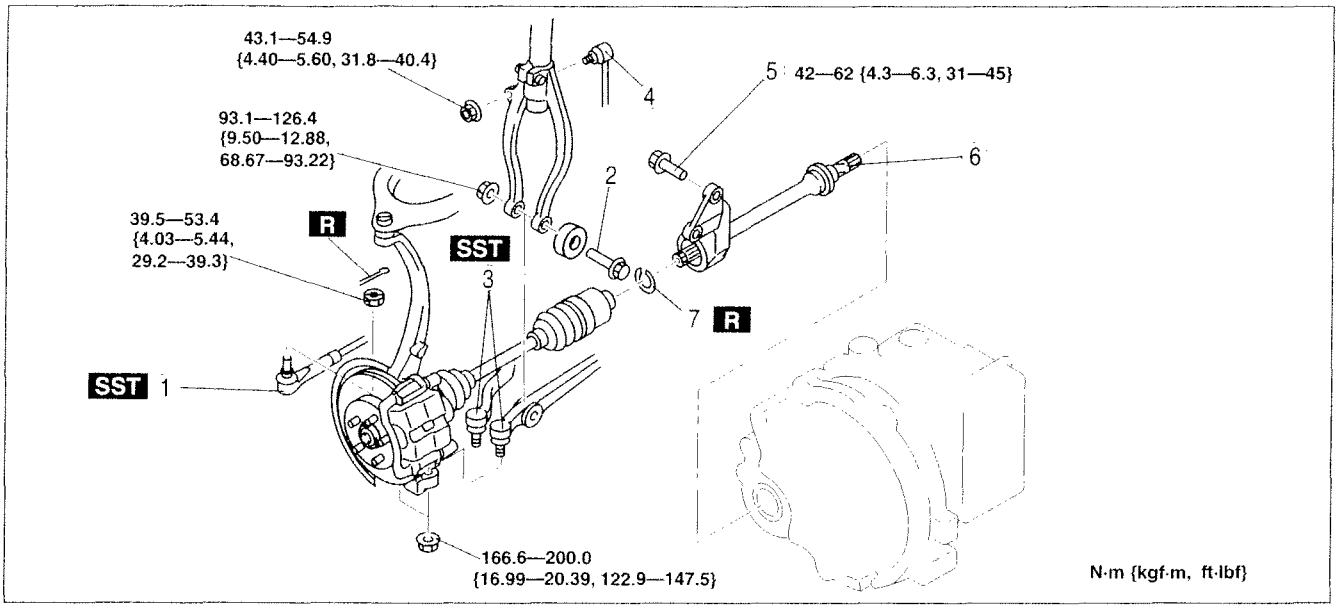
JOINT SHAFT REMOVAL/INSTALLATION [L3]

C6U031325700W02

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while the vehicle is being serviced.**

1. Drain the transaxle oil. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].) (See 05–15A–2 TRANSAXLE OIL REPLACEMENT [G35M-R].)
2. Remove the ABS sensor. (See 04–13–8 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



B6U0313W002

1	Tie-rod end ball joint (See 06–12–10 Tie-rod End Ball Joint Removal Note)
2	Bolt
3	Lower arm (front, rear) ball joint (See 02–13–10 Front Lower Arm (Front) Ball Joint Removal Note) (See 02–13–14 Front Lower Arm (Rear) Ball Joint Removal Note)
4	Stabilizer control link

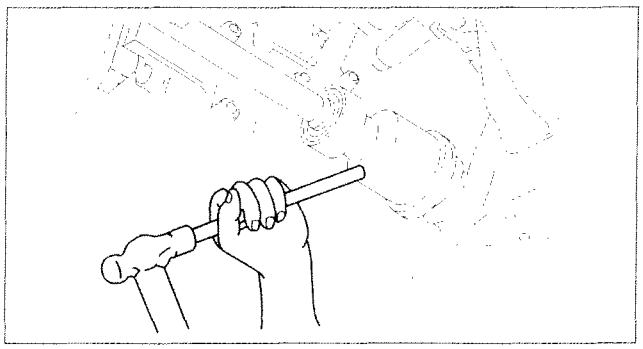
5	Joint shaft bracket bolt
6	Joint shaft (See 03–13–3 Joint Shaft Removal Note)
7	Clip (See 03–13–4 Clip Installation Note)

Joint Shaft Removal Note

1. Separate the right side drive shaft from the joint shaft by tapping on a brass bar inserted between them.
2. Separate the joint shaft bracket from cylinder block.
3. Pull the joint shaft straight out.

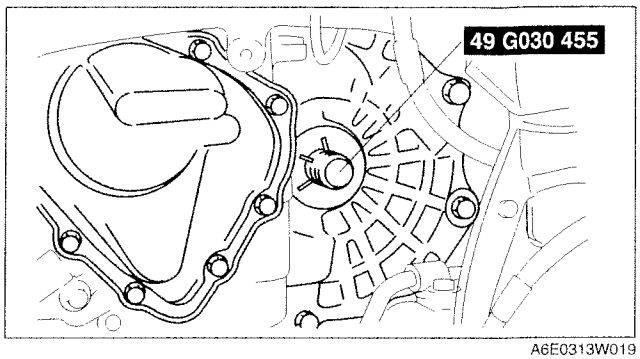
Caution

- **The sharp edges of the joint shaft can slice or puncture the oil seal. Be careful when removing the joint shaft from the transaxle.**



B6U0313W003

4. Install the **SST** into the transaxle to hold the side gears after the joint shaft is removed.

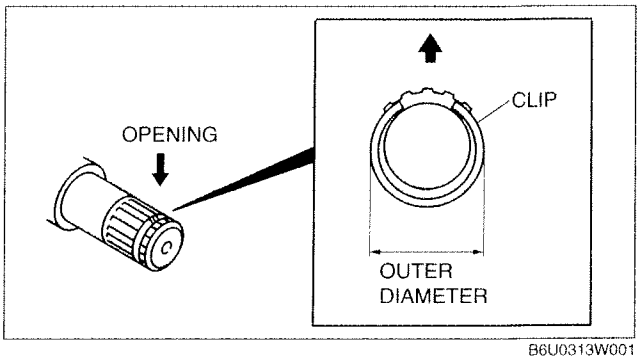


A6E0313W019

Clip Installation Note

1. Install a new clip onto the joint shaft with the opening facing upward. Ensure that the diameter of the clip does not exceed the specification on installation.
2. After installation, measure the outer diameter. If it exceeds the specification, repeat Step 1 using a new clip.

Outer diameter specification
30.0—31.2 mm {1.19—1.23 in}



B6U0313W001

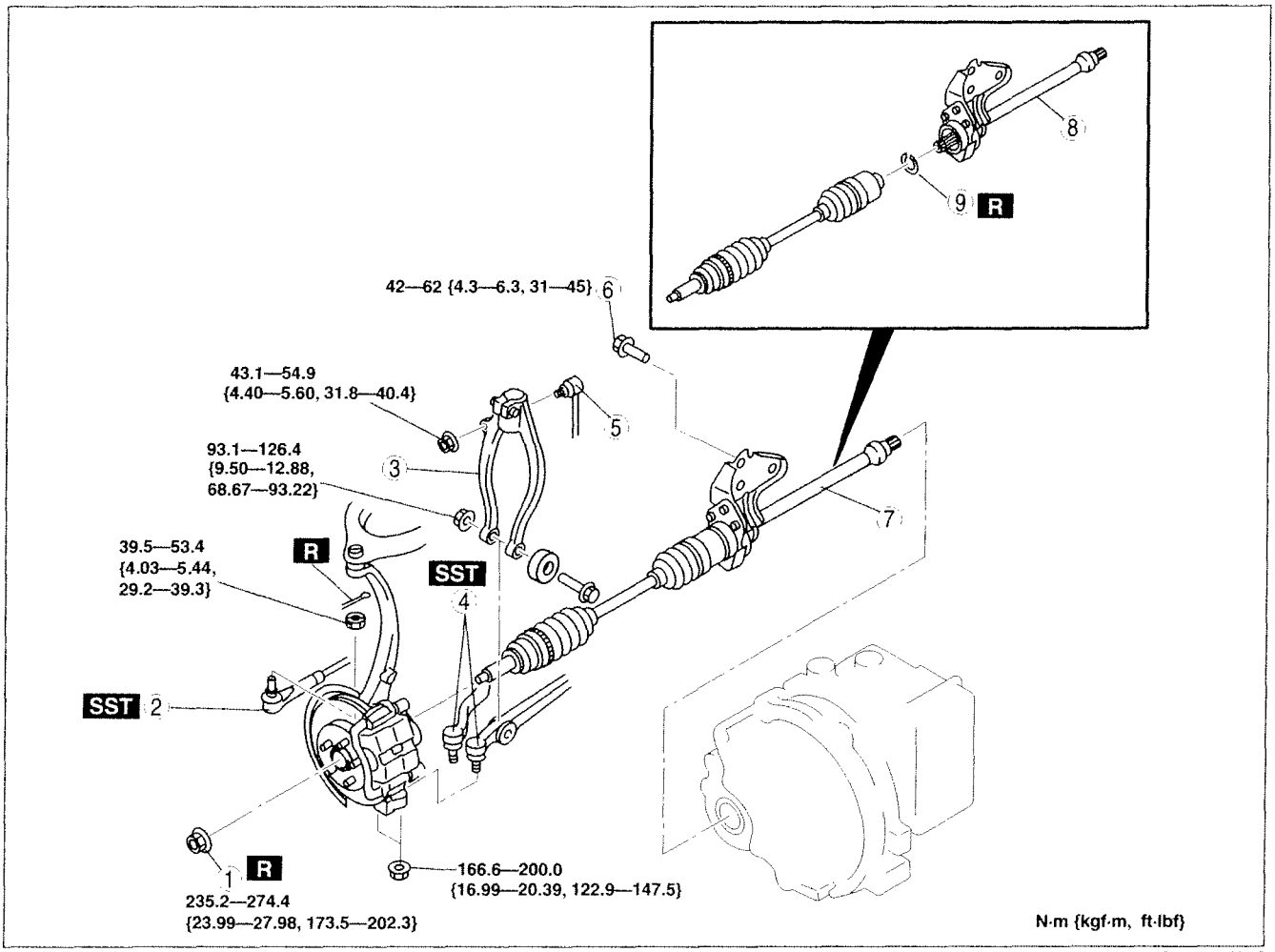
JOINT SHAFT REMOVAL/INSTALLATION [AJ]

C6U031325700W03

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while the vehicle is being serviced.**
- **Removing the drive shaft with the joint shaft bracket installed may cause the deformation of the joint shaft bracket. Therefore remove/install the drive shaft and joint shaft as a component.**

1. Drain the transaxle oil. (See 05–17B–11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [JA5A-EL].)
   (See 05–15B–2 TRANSAXLE OIL REPLACEMENT [A65M-R].)
2. Remove the ABS sensor. (See 04–13–8 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



B6U0312W002

1	Locknut (See 03–11–4 Locknut Removal Note) (See 03–11–7 Locknut Installation Note)
2	Tie-rod end ball joint (See 06–12–10 Tie-rod End Ball Joint Removal Note)
3	Damper fork
4	Lower arm (front, rear) ball joint (See 02–13–10 Front Lower Arm (Front) Ball Joint Removal Note) (See 02–13–14 Front Lower Arm (Rear) Ball Joint Removal Note)

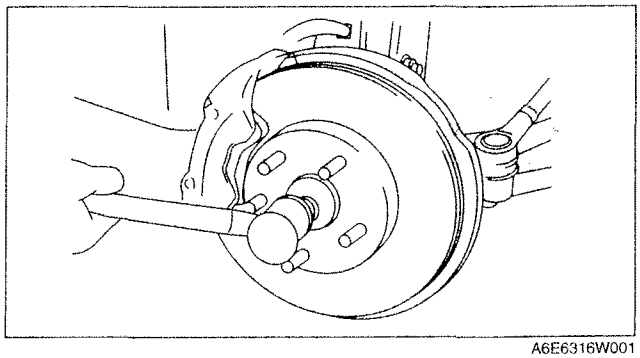
5	Stabilizer control link
6	Joint shaft bracket bolt
7	Drive shaft and joint shaft (See 03–13–6 Drive Shaft And Joint Shaft Removal Note) (See 03–13–7 Drive Shaft And Joint Shaft Installation Note)
8	Joint shaft (See 03–13–6 Joint Shaft Removal Note)
9	Clip (See 03–13–6 Clip Installation Note)

Drive Shaft And Joint Shaft Removal Note

1. Install a spare nut onto the drive shaft so that the nut is flush with the end of the drive shaft.
2. Tap the nut with a copper hammer to loosen the drive shaft from the front wheel hub.
3. Separate the drive shaft from the wheel hub.

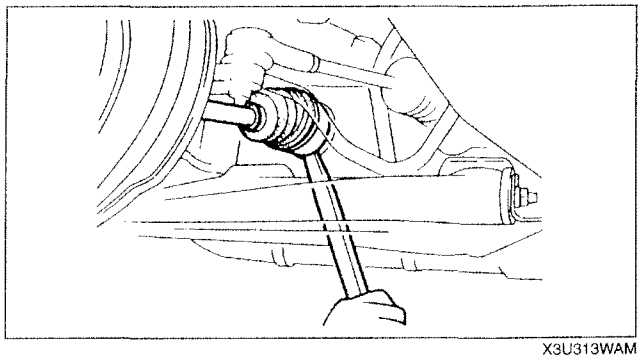
Caution

- **The sharp edges of the drive shaft can slice or puncture the oil seal. Be careful when removing the drive shaft from the transaxle.**



A6E6316W001

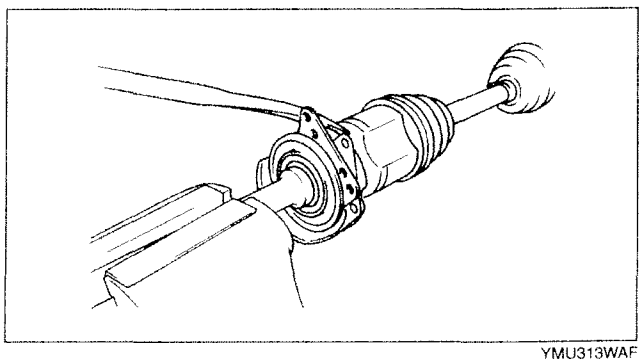
4. Separate the left side drive shaft from the transaxle by prying with a bar inserted between the outer ring and the transaxle, as shown in the figure.



X3U313WAM

Joint Shaft Removal Note

1. Secure the shaft portion of the joint shaft in a vise.
2. As shown in the figure, insert a pry bar between the drive shaft and joint shaft, and tap on the bar to uncouple them.

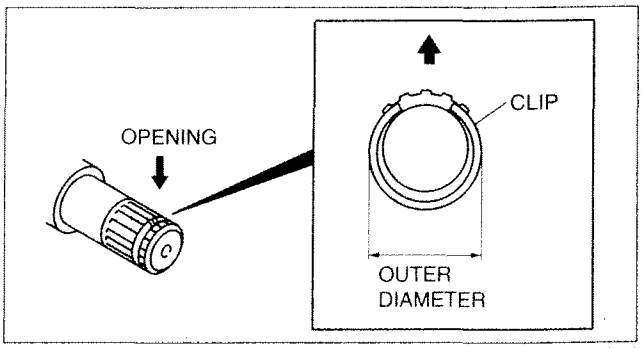


YMU313WAF

Clip Installation Note

1. Install a new clip onto the joint shaft with the opening facing upward. Ensure that the diameter of the clip does not exceed the specification on installation.
2. After installation, measure the outer diameter. If it exceeds the specification, repeat Step 1 using a new clip.

Outer diameter specification
32.0—33.2 mm {1.26—1.31 in}



B6U0313W001

Drive Shaft And Joint Shaft Installation Note

1. Apply ATF to the oil seal lip.
2. Push the drive shaft and joint shaft into the transaxle.

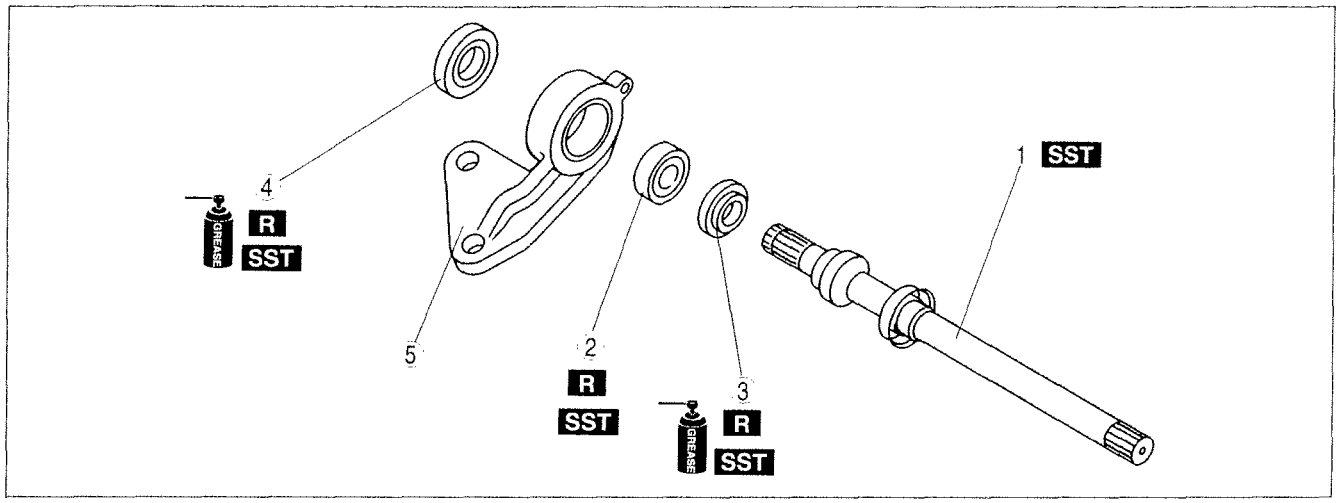
Caution

- **The sharp edges of the joint shaft can slice or puncture the oil seal. Be careful when installing the joint shaft to the transaxle.**

JOINT SHAFT DISASSEMBLY/ASSEMBLY [L3]

C6U031325700W04

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

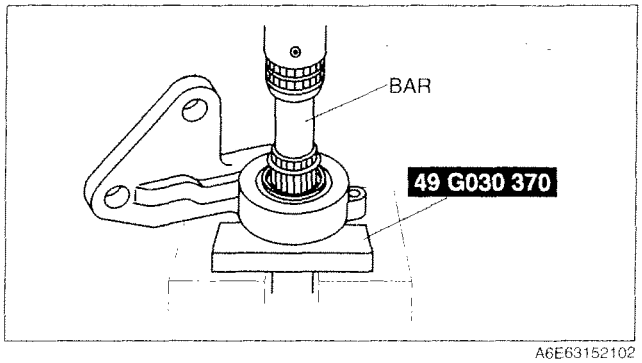


A6J63152001

1	Joint shaft (See 03–13–7 Joint Shaft Disassembly Note) (See 03–13–9 Joint Shaft Assembly Note)
2	Bearing (See 03–13–8 Bearing Disassembly Note) (See 03–13–8 Bearing Assembly Note)
3	Dust seal (Differential side) (See 03–13–8 Dust Seal (Differential Side) Assembly Note)
4	Dust seal (Wheel side) (See 03–13–8 Dust Seal (Wheel Side) Assembly Note)
5	Bracket

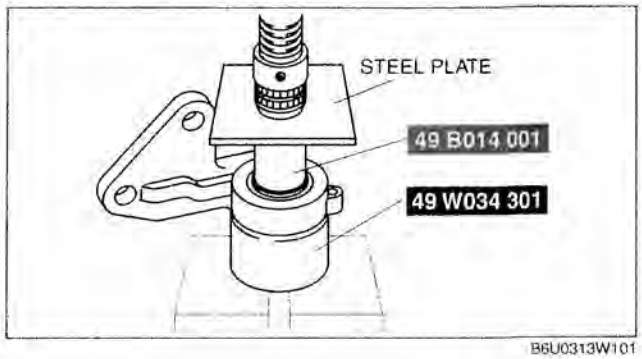
Joint Shaft Disassembly Note

1. Disassemble the joint shaft using the **SST**.



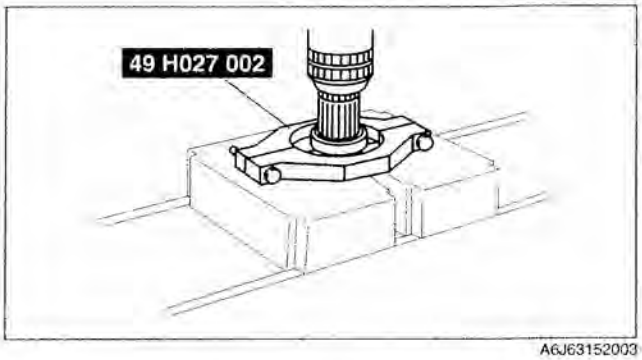
A6E63152102

Bearing Disassembly Note
When the bearing remains on the bracket
1. Remove the bearing and the dust seals (both differential side and wheel side) using the **SSTs**.



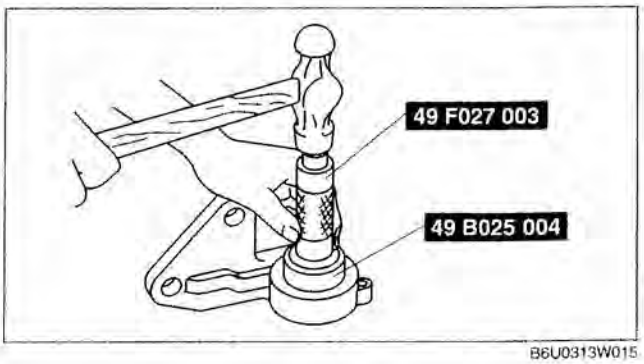
B6U0313W101

When the bearing remains on the shaft
1. Remove the bearing from the joint shaft using the **SST**.



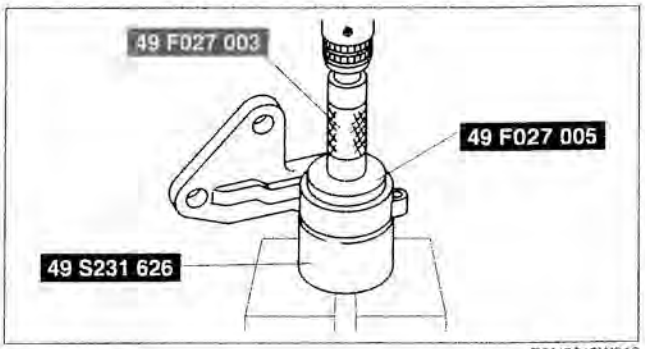
A6J63152003

Dust Seal (Wheel Side) Assembly Note
1. Apply grease to the new dust seal lip.
2. Install the new dust seal (wheel side) using the **SSTs**.



B6U0313W015

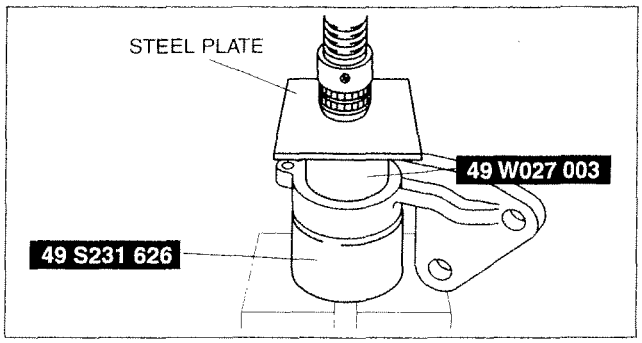
Bearing Assembly Note
1. Install the new bearing using the **SSTs**.



B6U0313W016

Dust Seal (Differential Side) Assembly Note
1. Apply grease to the new dust seal lip.

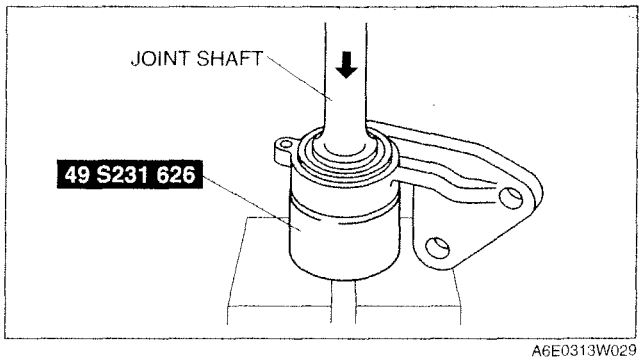
2. Install the new dust seal (differential side) using a steel plate and the **SSTs**.



A6E63152103

Joint Shaft Assembly Note

1. Assemble the joint shaft using a press and the **SST**.

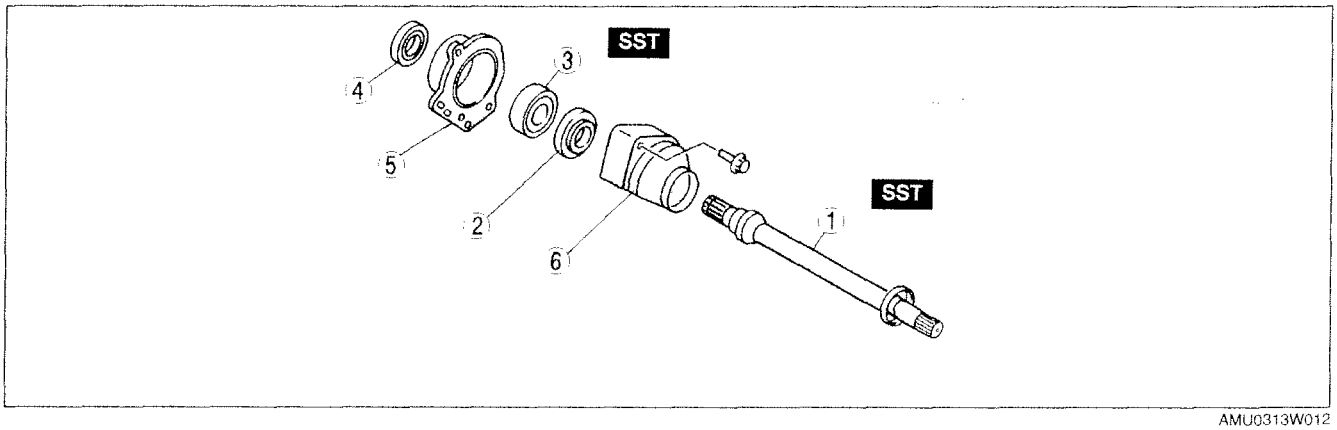


A6E0313W029

JOINT SHAFT DISASSEMBLY [AJ]

C6U031325700W05

1. Disassemble in the order indicated in the table.



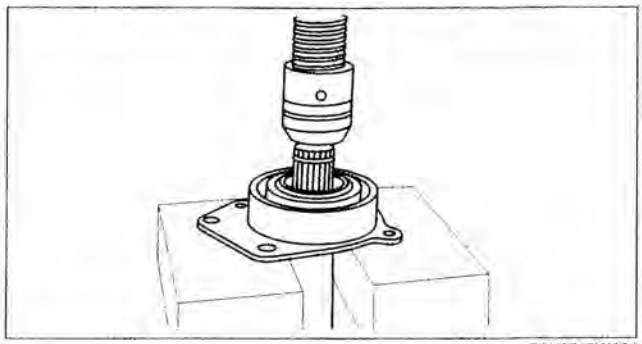
AMU0313W012

1	Joint shaft (See 03–13–10 Joint Shaft Disassembly Note)
2	Dust seal (differential side) (See 03–13–10 Dust Seal (Differential Side) Disassembly Note)
3	Bearing (See 03–13–10 Bearing And Dust Seal (Drive Shaft Side) Disassembly Note)

4	Dust seal (drive shaft side) (See 03–13–10 Bearing And Dust Seal (Drive Shaft Side) Disassembly Note)
5	Bracket
6	Dust cover

Joint Shaft Disassembly Note

1. Remove the joint shaft as shown in the figure.



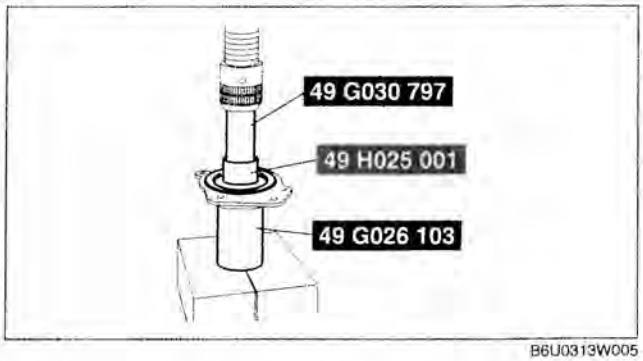
B6U0313W004

Dust Seal (Differential Side) Disassembly Note

1. Remove the dust seal (differential side) using a flathead screwdriver.

Bearing And Dust Seal (Drive Shaft Side) Disassembly Note

1. Remove the bearing using the **SSTs** and a press.

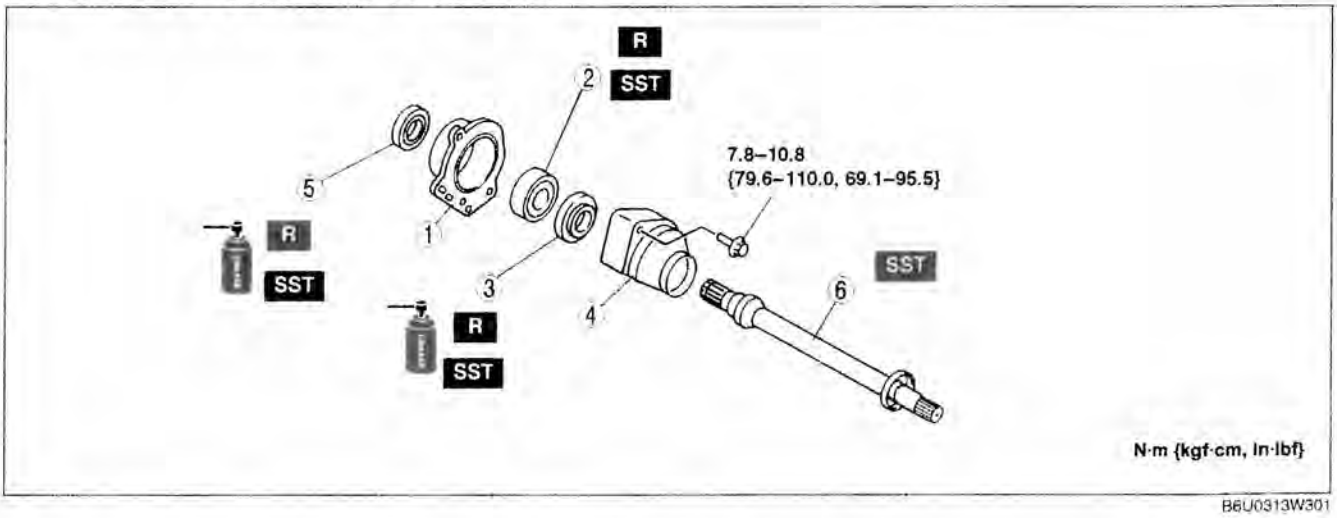


B6U0313W005

JOINT SHAFT ASSEMBLY [AJ]

C6U031325700W06

1. Assemble in the order indicated in the table.



B6U0313W301

1	Bracket
2	Bearing (See 03–13–11 Bearing Assembly Note)
3	Dust seal (differential side) (See 03–13–11 Dust Seal (Differential Side) Assembly Note)

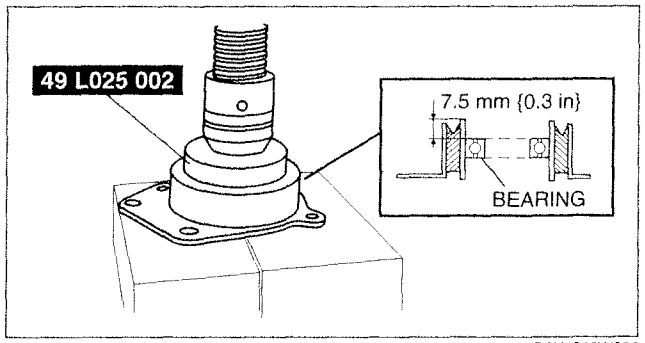
4	Dust cover
5	Dust seal (drive shaft side) (See 03–13–11 Dust Seal (Drive Shaft Side) Assembly Note)
6	Joint shaft (See 03–13–11 Joint Shaft Assembly Note)

Bearing Assembly Note

1. Install the new bearing using the **SST** and a press.

Note

- Press the outer race of the bearing.



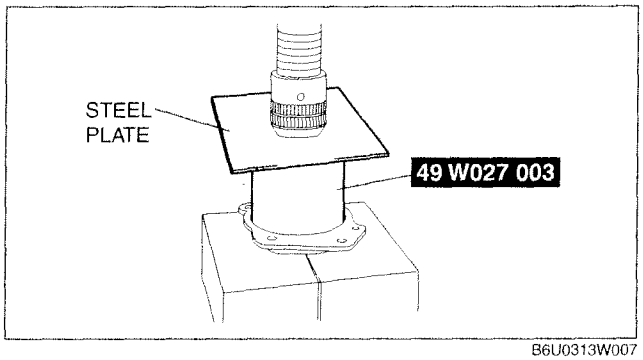
B6U0313W006

Dust Seal (Differential Side) Assembly Note

1. Apply grease to the new dust seal lip.
2. Install the new differential side dust seal using a press, steel plate and the **SST**.

Caution

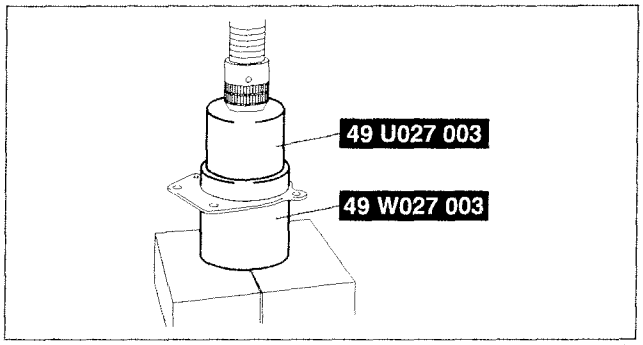
- **Do not damage the rubber part of the dust cover.**



B6U0313W007

Dust Seal (Drive Shaft Side) Assembly Note

1. Apply grease to the new dust seal lip.
2. Install the new drive shaft side dust seal using the **SSTs** and a press.



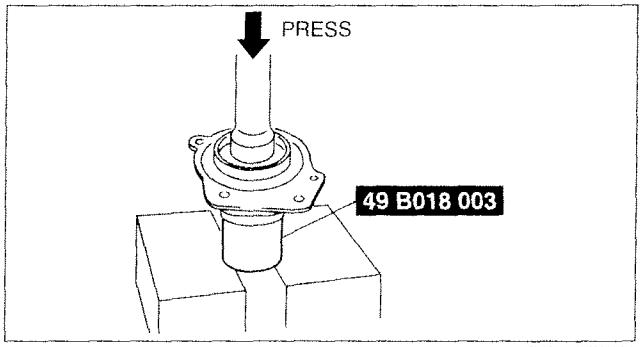
B6U0313W008

Joint Shaft Assembly Note

1. Install the joint shaft using a press and the **SST**.

Note

- Support the inner race of the bearing.

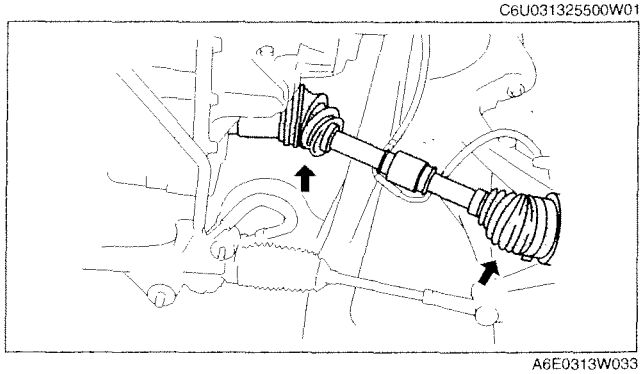


B6U0313W009

DRIVE SHAFT PRE-INSPECTION

1. Inspect the dust boot on the drive shaft for cracks, damage, leaking grease, and looseness in the boot band.
2. Inspect the drive shaft for bends, cracks, and wear in the joint or splines.
   - Repair or replace the drive shaft or boot/band as necessary.

C6U031325500W01



A6E0313W033

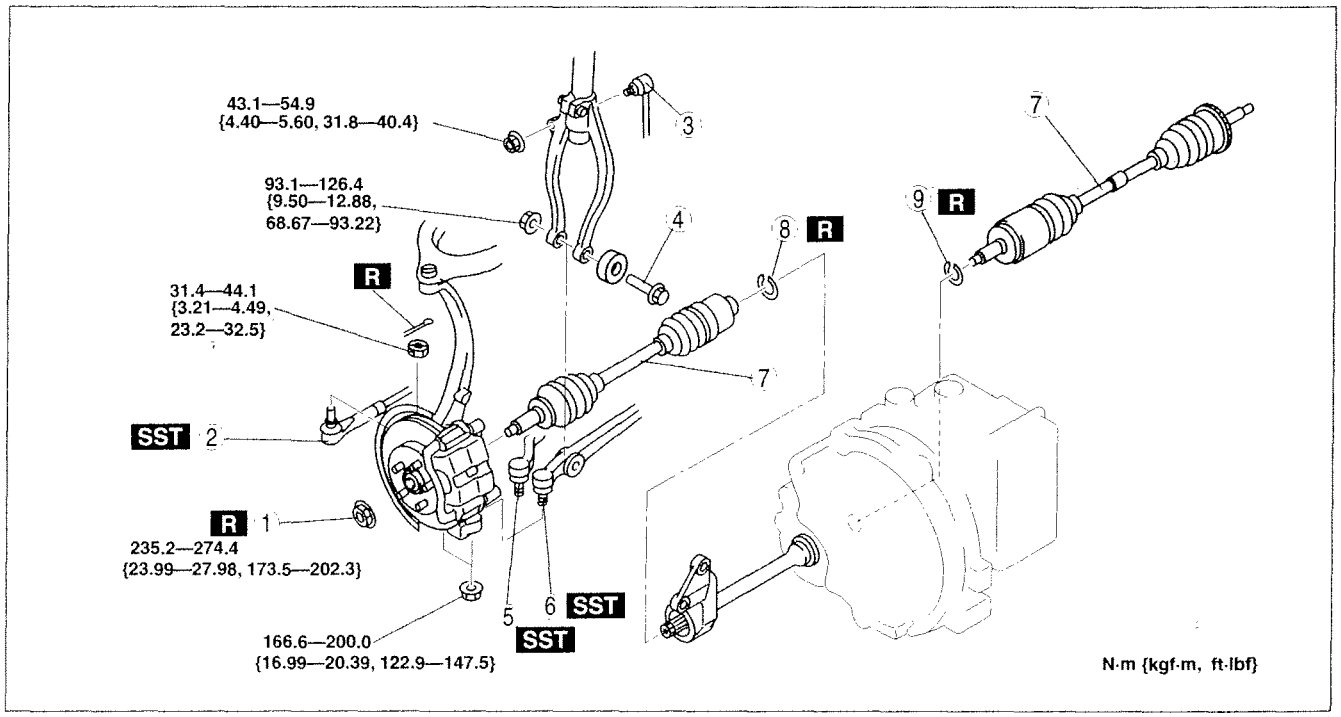
DRIVE SHAFT REMOVAL/INSTALLATION [L3]

C6U031325500W02

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while the vehicle is being serviced.**

1. Drain the transaxle oil (left side). (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].) (See05–15A–2 TRANSAXLE OIL REPLACEMENT [G35M-R].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



B6U0313W010

1	Locknut (See 03–11–4 Locknut Removal Note) (See 03–11–7 Locknut Installation Note)
2	Tie-rod end ball joint (See 06–12–10 Tie-rod End Ball Joint Removal Note)
3	Front stabilizer control link (See 02–13–17 FRONT STABILIZER REMOVAL/INSTALLATION)
4	Bolt
5	Front lower arm (rear) ball joint (See 02–13–14 Front Lower Arm (Rear) Ball Joint Removal Note)

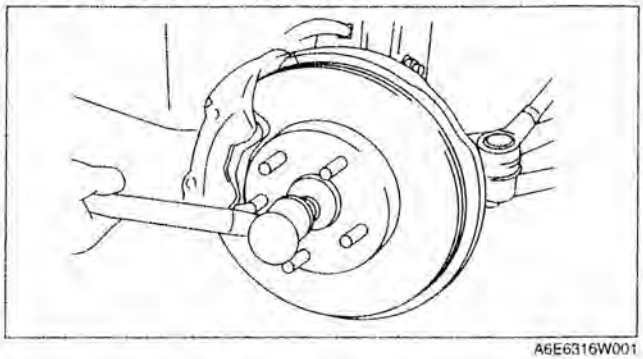
6	Front lower arm (front) ball joint (See 02–13–10 Front Lower Arm (Front) Ball Joint Removal Note)
7	Drive shaft (See 03–13–13 Drive Shaft Removal Note) (See 03–13–14 Drive Shaft Installation Note)
8	Clip (right side) (See 03–13–4 Clip Installation Note)
9	Clip (left side) (See 03–13–13 Clip Installation Note)

Drive Shaft Removal Note

1. Install a spare nut onto the drive shaft so that the nut is flush with the end of the drive shaft.
2. Tap the nut with a copper hammer to loosen the drive shaft from the front wheel hub.
3. Separate the drive shaft from the wheel hub.

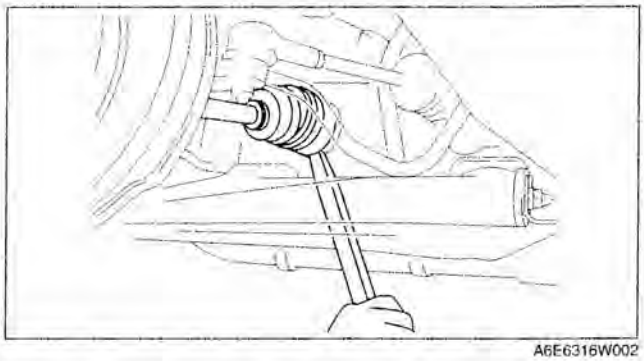
Caution

- **The sharp edges of the drive shaft can slice or puncture the oil seal. Be careful when removing the drive shaft from the transaxle.**



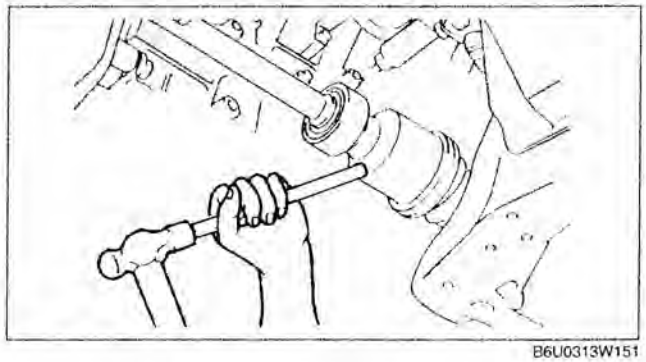
A6E6316W001

4. Separate the left side drive shaft from the transaxle by prying with a bar inserted between the outer ring and the transaxle, as shown in the figure.



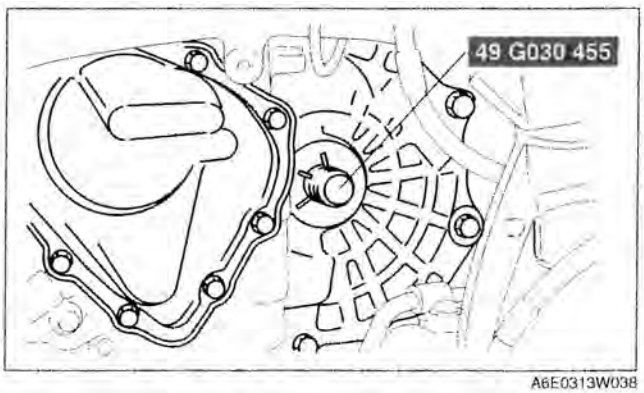
A6E6316W002

5. Separate the right side drive shaft from the joint shaft by tapping on a bar inserted between them.



B6U0313W151

6. Install the **SST** into the transaxle to hold the side gears after the drive shaft is removed.



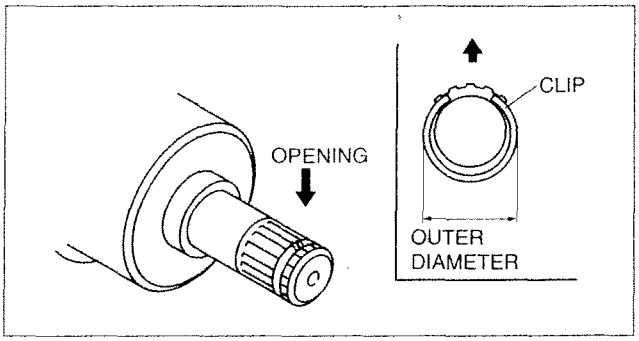
A6E0313W038

Clip Installation Note

1. Install a new clip onto the drive shaft with the opening facing upward. Ensure that the diameter of the clip does not exceed the specification on installation.

2. After installation, measure the outer diameter. If it exceeds the specification, repeat Steps 1—2 using a new clip.

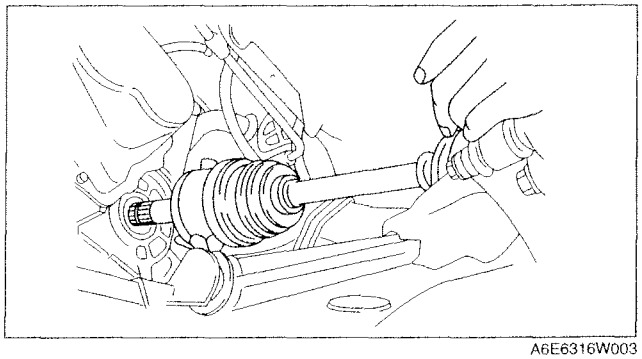
Outer diameter specification
30.0—31.2 mm {1.19—1.23 in}



A6E0313W021

Drive Shaft Installation Note

Caution
- **The sharp edges of the drive shaft can slice or puncture the oil seal. Be careful when installing the drive shaft to the transaxle.**
- **The oil seals are damaged easily if this procedure is not done correctly.**



A6E6316W003

Left side
1. Insert the drive shaft into the wheel hub.
2. Apply transaxle oil to the oil seal lip.
3. Push the drive shaft into the transaxle.
4. After installation, pull the transaxle side outer ring forward to confirm that the drive shaft is securely held by the clip.

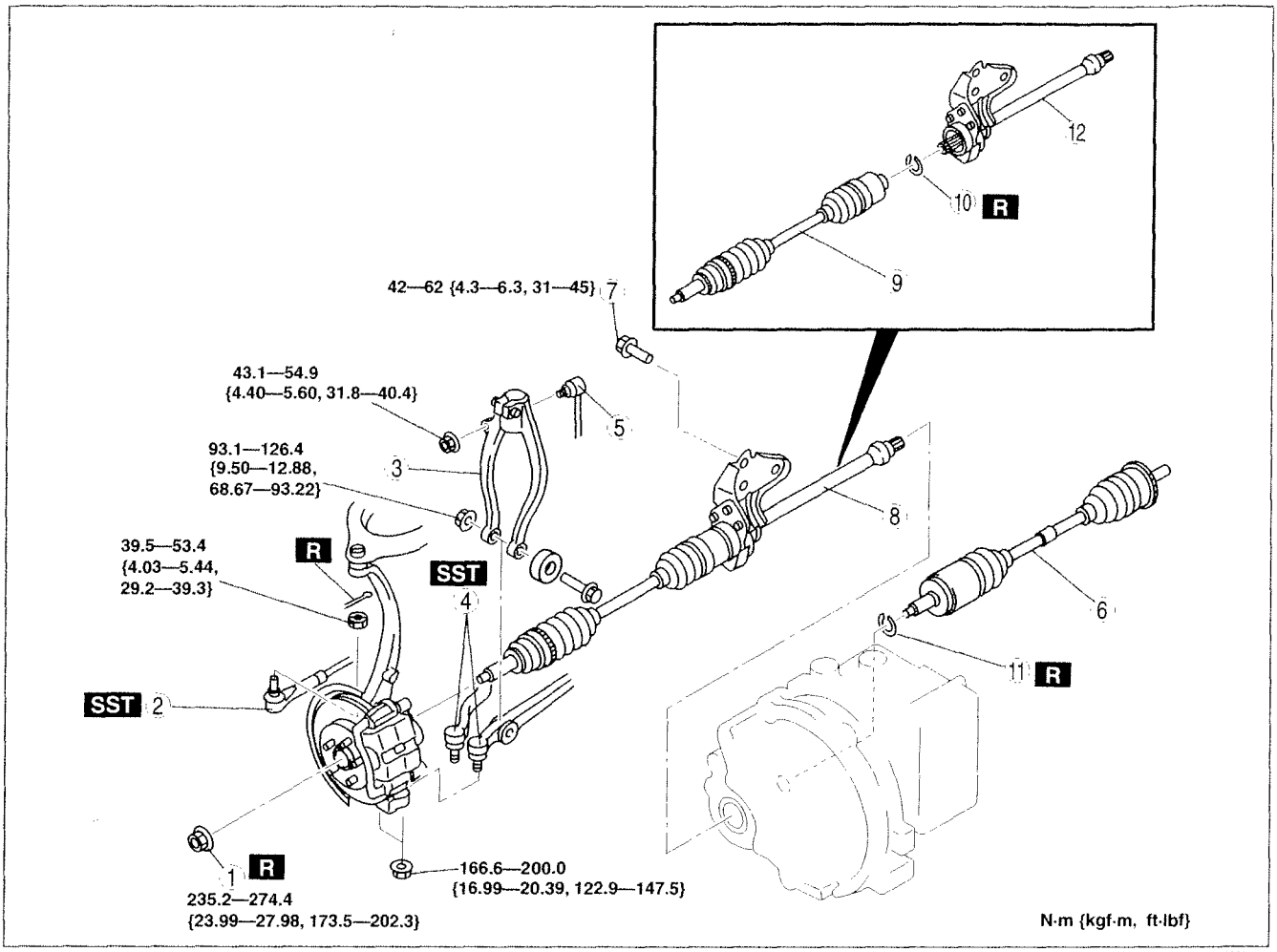
Right side
1. Insert the drive shaft into the wheel hub.
2. Insert the drive shaft into the joint shaft.
3. After installation, pull the transaxle side outer ring forward to confirm that the drive shaft is securely held by the clip.

DRIVE SHAFT REMOVAL/INSTALLATION [AJ]

C6U031325500W03

Caution
- **Performing the following procedures without first removing the ABS wheel-speed sensor could cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.**
- **Removing the right side drive shaft with the shaft bracket installed may cause the deformation of the joint shaft bracket. Therefore, remove/install the right side drive shaft and joint shaft as a component.**

1. Drain the transaxle oil. (See 05–17B–11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [JA5A-EL].) (See 05–15B–2 TRANSAXLE OIL REPLACEMENT [A65M-R].)
2. Remove the steering knuckle, wheel hub and dust cover component. (Right side) (See 03–11–3 WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



B6U0313W152

1	Locknut (See 03–11–4 Locknut Removal Note) (See 03–11–7 Locknut Installation Note)
2	Tie-rod end (See 06–12–10 Tie-rod End Ball Joint Removal Note)
3	Damper fork
4	Lower arm (front, rear) ball joint (See 02–13–10 Front Lower Arm (Front) Ball Joint Removal Note) (See 02–13–14 Front Lower Arm (Rear) Ball Joint Removal Note)
5	Stabilizer control link
6	Drive shaft (left side) (See 03–13–16 Drive Shaft (Left Side) Removal Note) (See 03–13–17 Drive Shaft (Left Side) Installation Note)

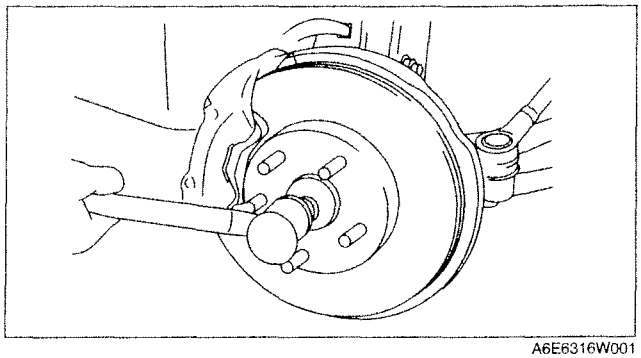
7	Joint shaft bracket bolt
8	Drive shaft (right side) and joint shaft (See 03–13–6 Drive Shaft And Joint Shaft Removal Note) (See 03–13–7 Drive Shaft And Joint Shaft Installation Note)
9	Drive shaft (right side) (See 03–13–16 Drive Shaft (Right Side) Removal Note)
10	Clip (right side) (See 03–13–6 Clip Installation Note)
11	Clip (left side) (See 03–13–17 Clip Installation Note)
12	Joint shaft (See 03–13–17 Joint Shaft Installation Note)

Drive Shaft (Left Side) Removal Note

1. Install a spare nut onto the drive shaft so that the nut is flush with the end of the drive shaft.
2. Tap the nut with a copper hammer to loosen the drive shaft from the front wheel hub.
3. Separate the drive shaft from the wheel hub.

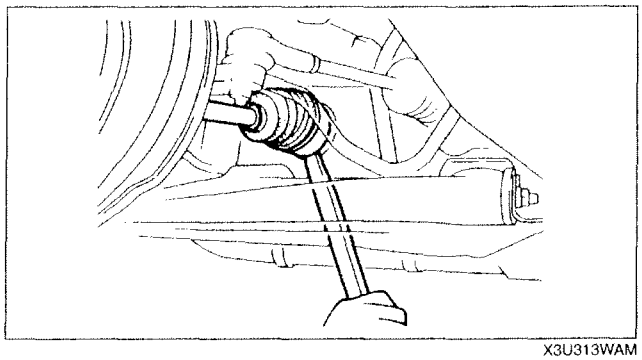
Caution

- **The sharp edges of the drive shaft can slice or puncture the oil seal. Be careful when removing the drive shaft from the transaxle.**



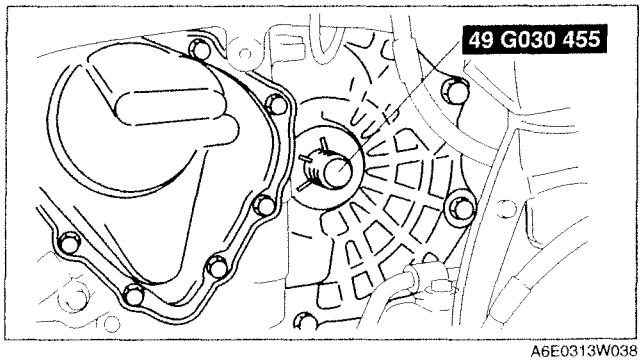
A6E6316W001

4. Separate the left side drive shaft from the transaxle by prying with a bar inserted between the outer ring and the transaxle, as shown in the figure.



X3U313WAM

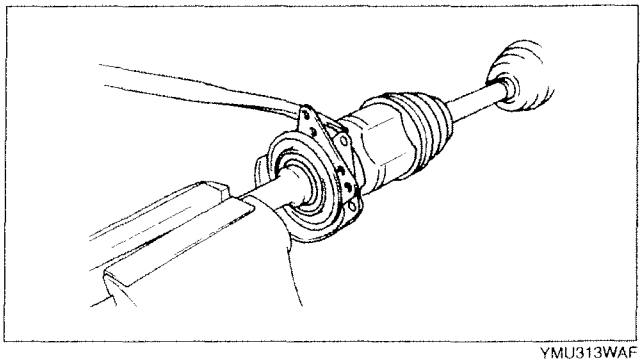
5. Install the **SST** into the transaxle to hold the side gears after the drive shaft is removed.



A6E0313W038

Drive Shaft (Right Side) Removal Note

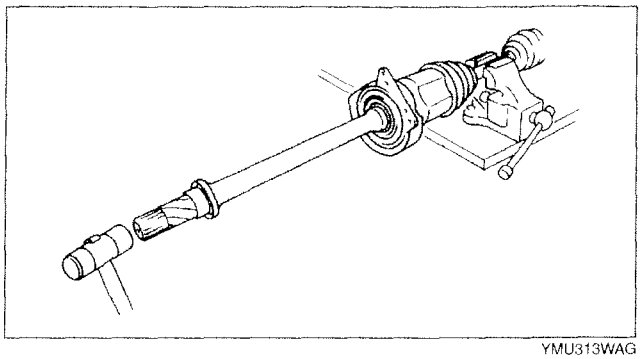
1. Secure the shaft portion of the joint shaft in a vise.
2. As shown in the figure, insert a pry bar between the drive shaft and the joint shaft and tap on the bar to uncouple them.



YMU313WAF

Joint Shaft Installation Note

1. Secure the shaft portion of the drive shaft in a vise.
2. Install the joint shaft using a plastic hammer as shown.

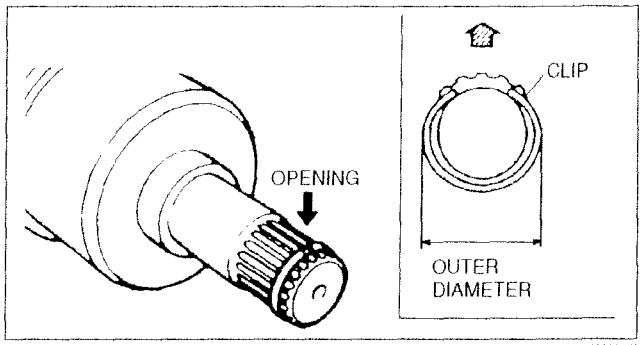


YMU313WAG

Clip Installation Note

1. Install a new clip onto the drive shaft with the opening facing upward. Ensure that the diameter of the clip does not exceed the specification on installation.
2. After installation, measure the outer diameter. If it exceeds the specification, repeat steps 1—2 using a new clip.

   Outer diameter specification
   32.0—33.2 mm {1.26—1.30 in}



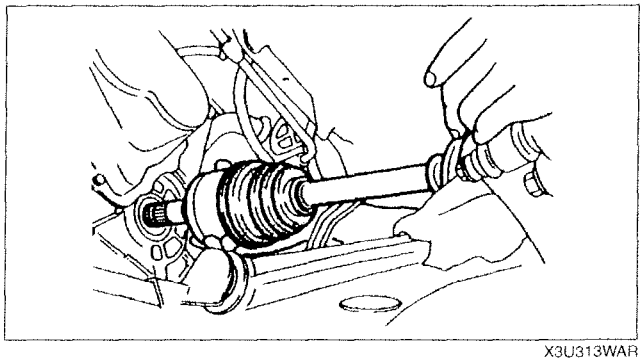
AMU0313W005

Drive Shaft (Left Side) Installation Note

1. Insert the drive shaft into the wheel hub.
2. Apply ATF to the oil seal lip.
3. Push the drive shaft into the transaxle.

   Caution
   - **The sharp edges of the drive shaft can slice or puncture the oil seal. Be careful when installing the drive shaft to the transaxle.**
   - **The oil seals are damaged easily if this procedure is not done correctly.**

4. After installation, pull the transaxle side outer ring forward to confirm that the drive shaft is securely held by the clip.

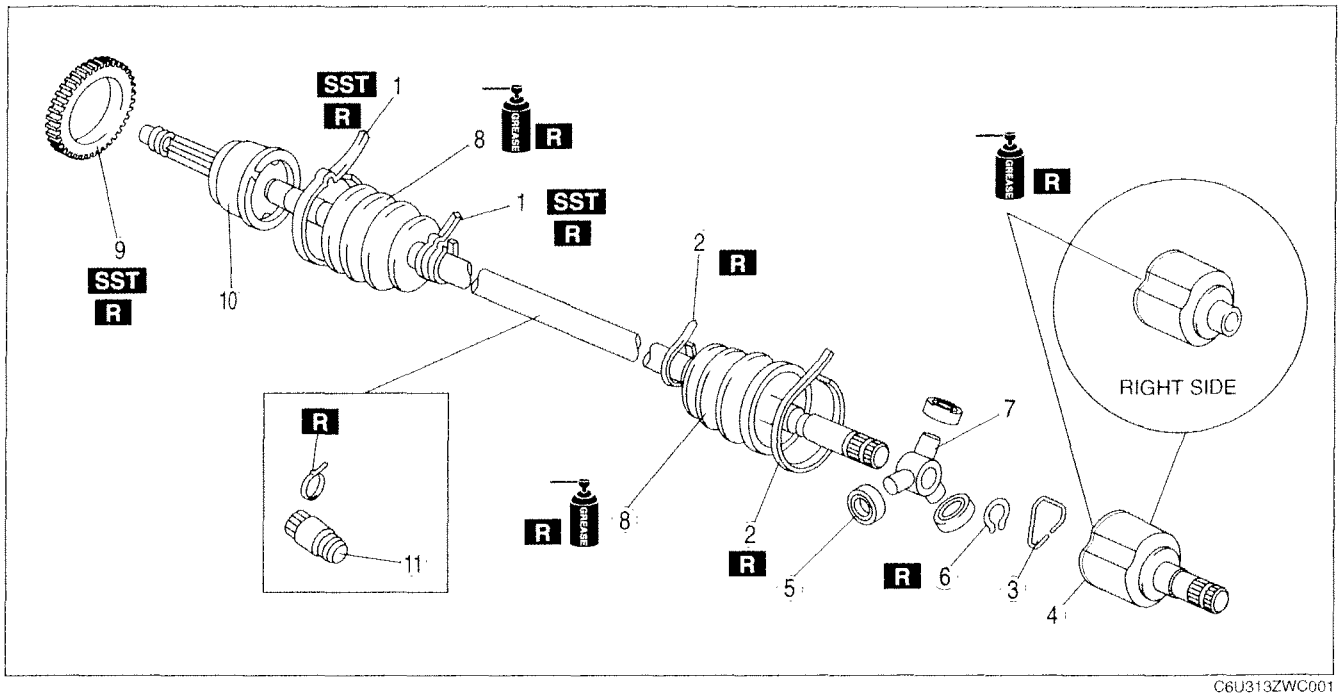


X3U313WAR

DRIVE SHAFT DISASSEMBLY/ASSEMBLY [ATX]

C6U031325500W04

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



C6U313ZWC001

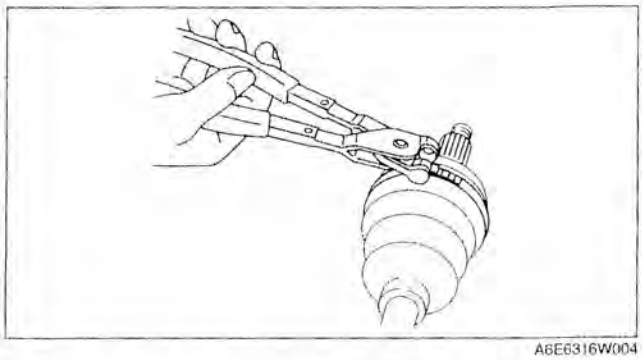
1	Boot band (wheel side) (See 03–13–19 Boot Band (Wheel Side) Disassembly Note) (See 03–13–23 Boot Band (Wheel Side) Assembly Note)
2	Boot band (transaxle side) (See 03–13–19 Boot Band (Transaxle Side) Disassembly Note) (See 03–13–22 Boot Band (Transaxle Side) Assembly Note)
3	Clip
4	Outer ring (See 03–13–19 Outer Ring Disassembly Note) (See 03–13–22 Outer Ring Assembly Note)
5	Roller cassette
6	Snap ring (See 03–13–20 Snap Ring, Tripod Joint Disassembly Note) (See 03–13–21 Tripod Joint, Snap Ring Assembly Note)

7	Tripod joint (See 03–13–20 Snap Ring, Tripod Joint Disassembly Note) (See 03–13–21 Tripod Joint, Snap Ring Assembly Note)
8	Boot (See 03–13–20 Boot Disassembly Note) (See 03–13–21 Boot Assembly Note)
9	ABS sensor rotor (with ABS) (See 03–13–20 ABS Sensor Rotor (With ABS) Disassembly Note) (See 03–13–21 ABS Sensor Rotor (With ABS) Assembly Note)
10	Shaft and ball joint component
11	Dynamic damper (See 03–13–21 Dynamic Damper Assembly Note)

Boot Band (Wheel Side) Disassembly Note

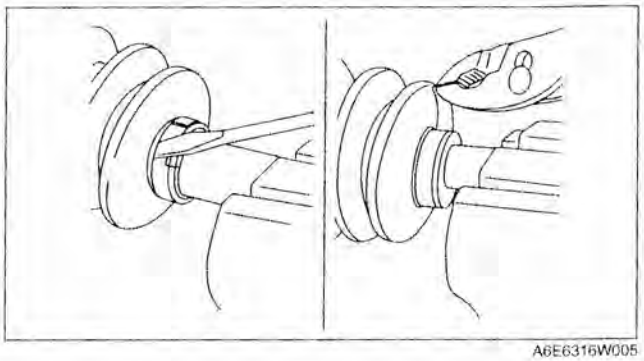
Note
- The boot band does not need to be removed unless it is being replaced.

1. Remove the boot clamp with end clamp pliers as shown and discard the clamp.



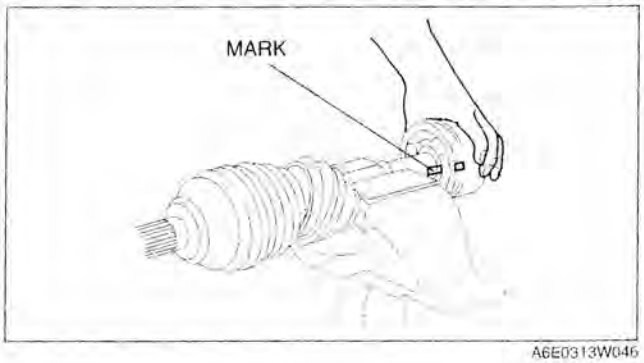
A6E6316W004

Boot Band (Transaxle Side) Disassembly Note
1. Pry up the locking clips using a screwdriver.
2. Pull back the end of the band.



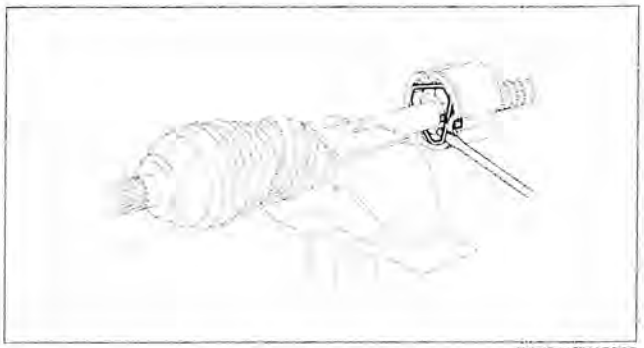
A6E6316W005

Outer Ring Disassembly Note
1. Mark the outer ring and the shaft for proper assembly.



A6E0313W046

2. Remove the clip.
3. Remove the outer ring.



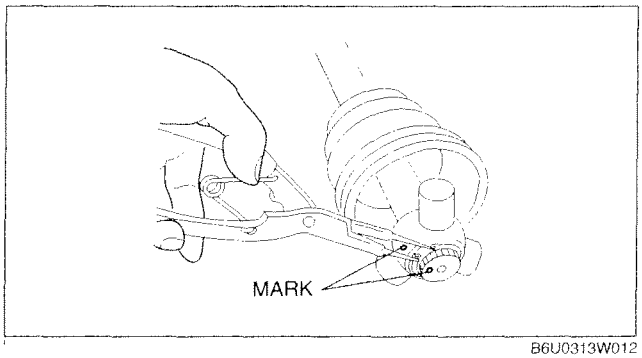
C6U313ZWC002

Snap Ring, Tripod Joint Disassembly Note

1. Mark the shaft and tripod joint for proper assembly.
2. Remove the snap ring using snap-ring pliers.
3. Remove the tripod joint from the shaft.

Caution

- **Do not tap the tripod joint with a hammer.**



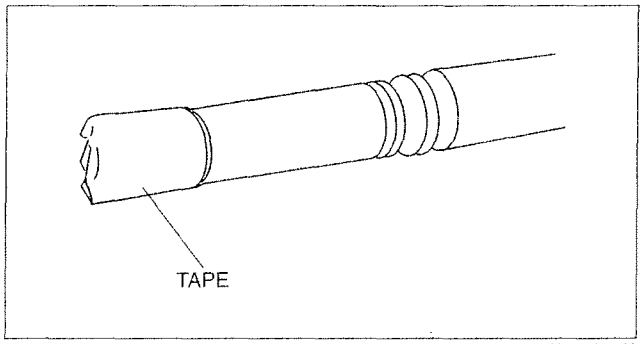
B6U0313W012

Boot Disassembly Note

Note

- The wheel side boot does not need to be removed unless replacing it or the ball joint and shaft component.
- Do not strip the tape until the boot is assembled.

1. Wrap the shaft splines with tape.
2. Remove the boot.



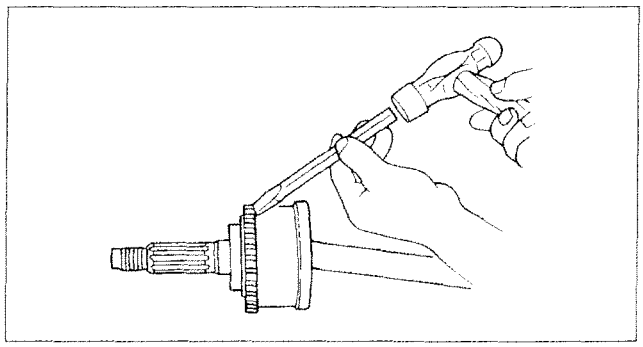
A6E0313W048

ABS Sensor Rotor (With ABS) Disassembly Note

Caution

- **Do not remove the sensor rotor unless it is necessary.**
- **Do not reuse the sensor rotor if removed.**

1. Tap the ABS sensor rotor off the drive shaft using a chisel.



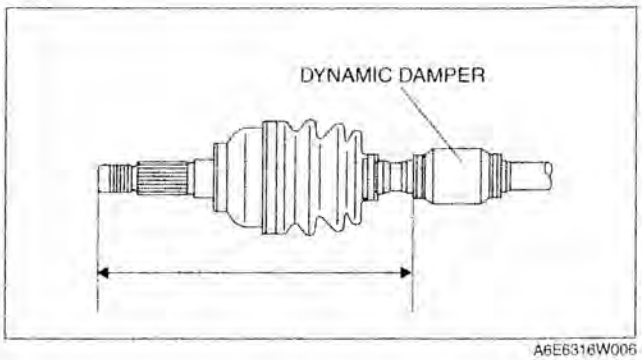
ZLU0313W105

Dynamic Damper Assembly Note

1. Install the dynamic damper as shown in the figure.

   Standard length
   287.7—293.7 mm {11.33—11.56 in}

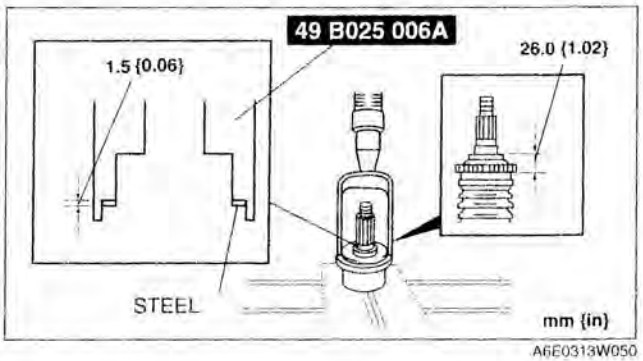
2. Install the new boot band onto the dynamic damper.



A6E6316W006

ABS Sensor Rotor (With ABS) Assembly Note

1. Set a new ABS sensor rotor on the drive shaft and press it on using the **SSTs**.



A6E0313W050

Boot Assembly Note

Note
- The wheel side and transaxle side boots are different.

1. Fill the boot (wheel side) with the specified grease.

   Caution
   - **Do not touch grease with your hand. Apply it from the tube to prevent foreign matter from entering the boot.**

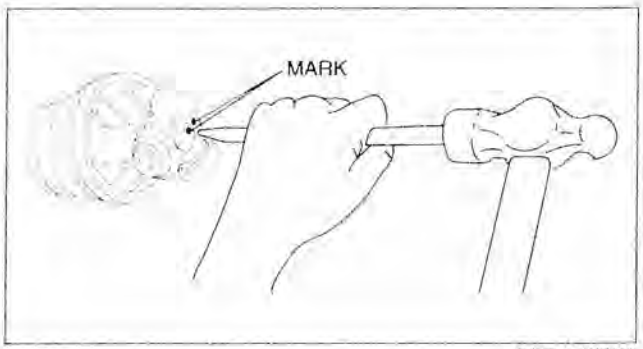
   Grease amount
   L3: 90—110 g {3.18—3.88 oz}
   AJ: 105—125 g {3.71—4.41 oz}

2. With the splines of the shaft still wrapped in tape from disassembly, install the boot.
3. Remove the tape.

Tripod Joint, Snap Ring Assembly Note

1. Align the marks and install the tripod joint using a bar and a hammer.
2. Install the new snap ring using snap-ring pliers.

   Caution
   - **Be sure the snap ring engages correcting in the groove of the shaft.**



C6U313ZWC003

Outer Ring Assembly Note

1. Fill the outer ring and boot (transaxle side) with the specified grease.

Caution

- **Do not touch grease with your hand. Apply it from the tube to prevent foreign matter from entering the boot.**

Grease amount

200—220 g {7.06—7.76 oz}

2. Install the roller cassettes.
3. Align the marks, and install the outer ring on to the shaft.
4. Install a new clip.
5. Install the boot.
6. Set the drive shaft to the standard length.

Standard length

mm {in}

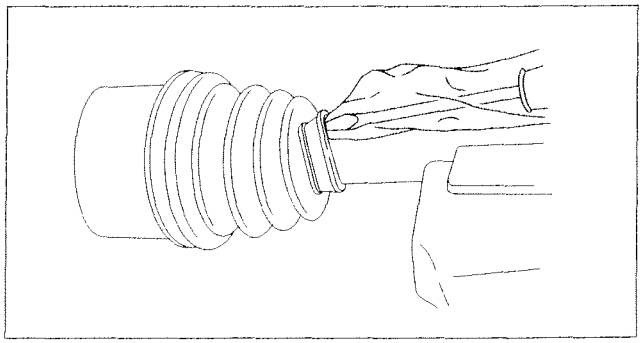
	Left side	Right side
L3	674.1—684.1 {26.54—26.93}	630.4—640.4 {24.82—25.21}
AJ	642.1—652.1 {25.28—25.67}	597.4—607.4 {23.52—23.91}

7. Release any trapped air from the boots by carefully lifting up the small end of each boot with a cloth- wrapped flathead screwdriver.

Caution

- **Do not let grease leak.**
- **Do not damage the boot.**

8. Verify that the drive shaft length is within the standard.



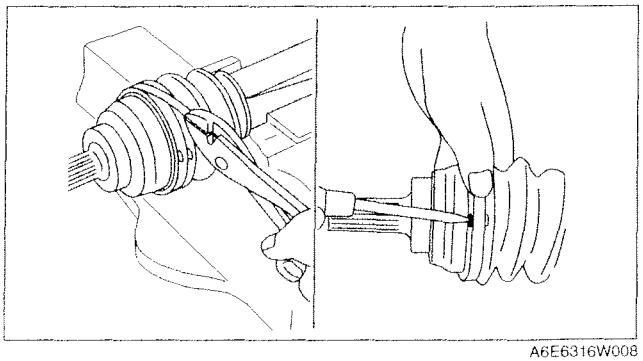
A6E6316W007

Boot Band (Transaxle Side) Assembly Note

1. Fold the band in the direction opposite to the forward revolving direction of the drive shaft and use pliers to pull it tight.
2. Lock the end of the band by bending the locking clips.

Caution

- **Install the band into the groove securely.**

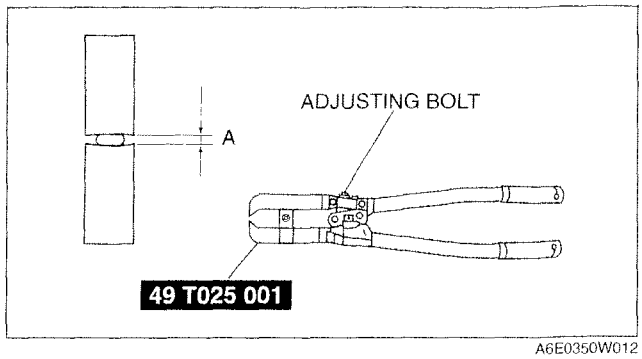


A6E6316W008

Boot Band (Wheel Side) Assembly Note

1. Adjust clearance A by turning the adjusting bolt of the **SST**.

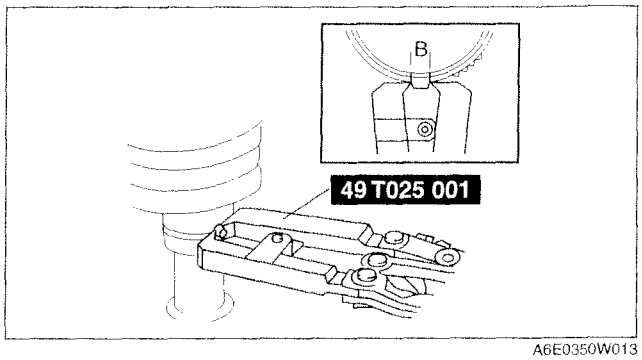
   Clearance A
   2.9 mm {0.11 in}



A6E0350W012

2. Crimp the wheel side small boot band using the **SST**. Verify that clearance B is within the specification.
   - If clearance B is more than the specification, reduce clearance A of the **SST** and crimp the boot again.
   - If clearance B is less than the specification, replace the boot band, increase clearance A of the **SST**, and crimp the new boot.

   Clearance B
   2.4—2.8 mm {0.095—0.110 in}



A6E0350W013

3. Verify that the boot band does not protrude from the boot band installation area.
   - If it does, replace the boot band and repeat Steps 2 and 3.
4. Fill the boot with the repair kit grease.
5. Adjust clearance A by turning the adjusting bolt of the **SST**.

   Clearance A
   3.2 mm {0.13 in}

6. Crimp the wheel side big boot band using the **SST**.
7. Verify that clearance B is within the specification.
   - If clearance B is more than the specification, reduce clearance A of the **SST** and crimp the boot again.
   - If clearance B is less than the specification, replace the boot band, increase clearance A of the **SST** and crimp the new boot.

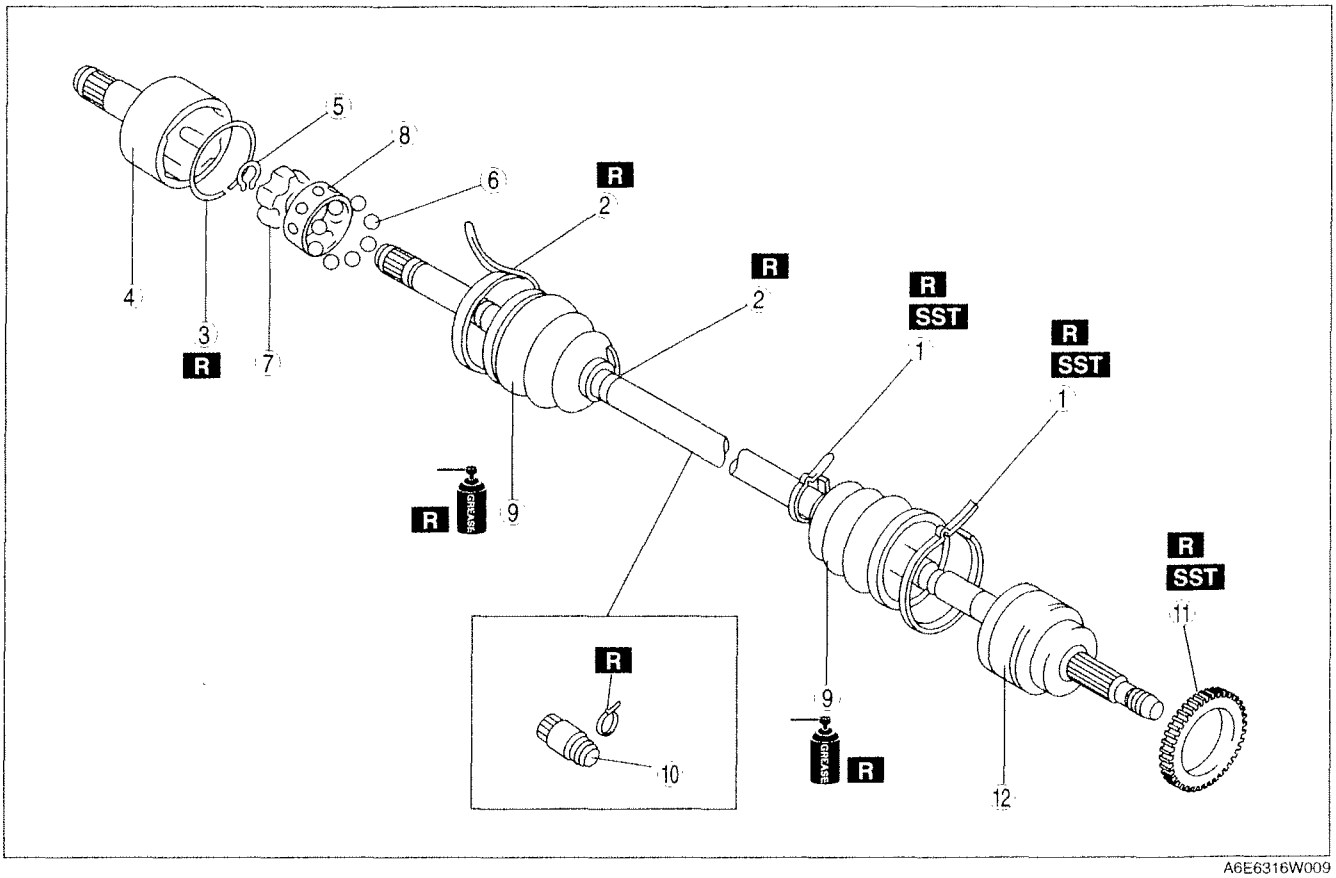
   Clearance B
   2.4—2.8 mm {0.095—0.110 in}

8. Verify that the boot band does not protrude from the boot band installation area.
   - If it does, replace the boot band and repeat Steps 7 and 8.

DRIVE SHAFT DISASSEMBLY/ASSEMBLY [MTX]

C6U031325500W05

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



A6E6316W009

1	Boot band (wheel side) (See 03–13–19 Boot Band (Wheel Side) Disassembly Note) (See 03–13–23 Boot Band (Wheel Side) Assembly Note)
2	Boot band (transaxle side) (See 03–13–19 Boot Band (Transaxle Side) Disassembly Note) (See 03–13–22 Boot Band (Transaxle Side) Assembly Note)
3	Clip (See 03–13–25 Clip Disassembly Note) (See 03–13–26 Outer Ring, Clip Assembly Note)
4	Outer ring (See 03–13–26 Outer Ring, Clip Assembly Note)
5	Snap ring (See 03–13–26 Cage, Inner Ring, Balls, Snap Ring Assembly Note)
6	Balls (See 03–13–25 Balls, Inner Ring, Cage Disassembly Note) (See 03–13–26 Cage, Inner Ring, Balls, Snap Ring Assembly Note)

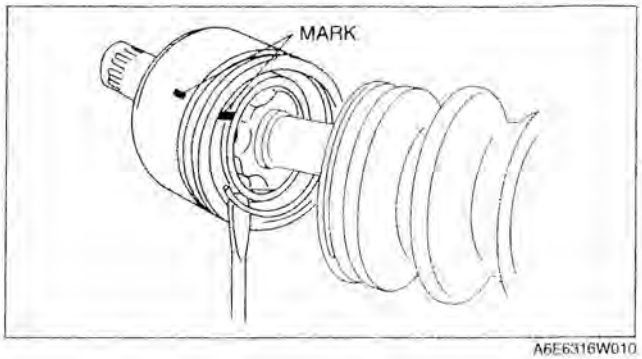
7	Inner Ring (See 03–13–25 Balls, Inner Ring, Cage Disassembly Note) (See 03–13–26 Cage, Inner Ring, Balls, Snap Ring Assembly Note)
8	Cage (See 03–13–25 Balls, Inner Ring, Cage Disassembly Note) (See 03–13–26 Cage, Inner Ring, Balls, Snap Ring Assembly Note)
9	Boot (See 03–13–25 Boot Assembly Note)
10	Dynamic damper (See 03–13–25 Dynamic Damper Assembly Note)
11	ABS sensor rotor (See 03–13–20 ABS Sensor Rotor (With ABS) Disassembly Note) (See 03–13–21 ABS Sensor Rotor (With ABS) Assembly Note)
12	Shaft and ball joint component

Clip Disassembly Note

1. Mark the drive shaft and outer ring for proper assembly.

Caution
- **Mark with paint; do not use a punch.**

2. Remove the clip.



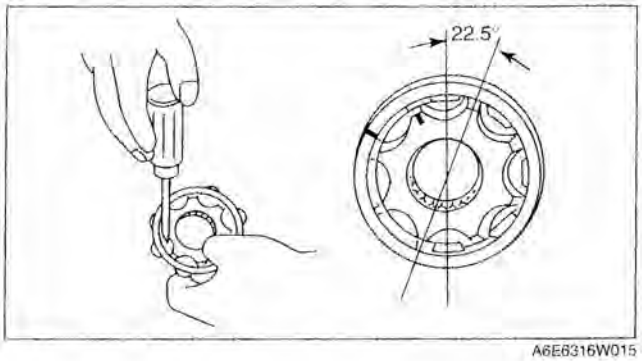
A6E6316W010

Balls, Inner Ring, Cage Disassembly Note

1. Mark the inner ring and cage.

Caution
- **Mark with paint; do not use a punch.**

2. Remove the snap ring using snap-ring pliers.
3. Turn the cage **approximately 22.5 degree** and pull the cage and balls away from the inner ring.



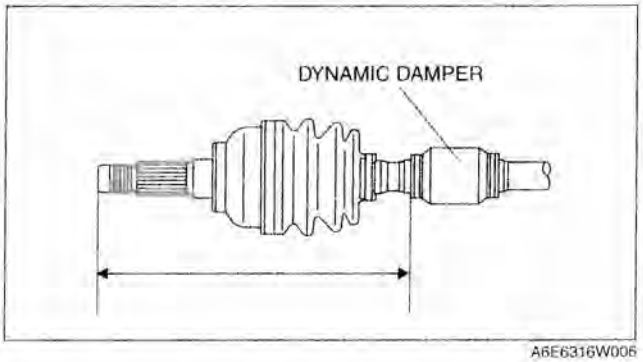
A6E6316W015

Dynamic Damper Assembly Note

1. Install the dynamic damper as shown in the figure.

Standard length
287.7—293.7 mm {11.33—11.56 in}

2. Install the new boot band onto the dynamic damper.



A6E6316W006

Boot Assembly Note

Note
- The wheel side and transaxle side boots are different.

1. Fill the boot (wheel side) with the specified grease.

Caution
- **Do not touch grease with your hand. Apply it from the tube to prevent foreign matter from entering the boot.**

Grease amount
105—125 g {3.71—4.41 oz}

2. With the splines of the shaft still wrapped in tape from disassembly, install the boot.
3. Remove the tape.

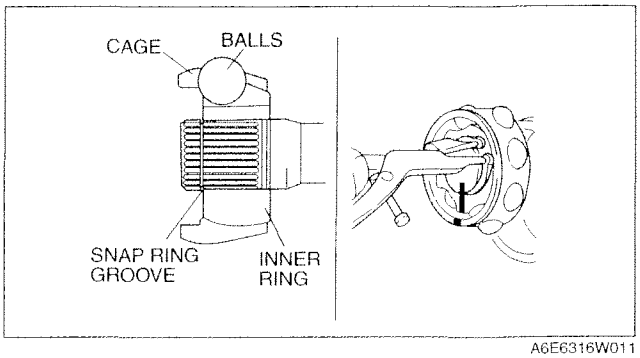
Cage, Inner Ring, Balls, Snap Ring Assembly Note

1. Align the marks and install the balls and cage to the inner ring in the direction shown in the figure.

Caution

- **Install the cage with the offset facing the snap ring groove. If incorrectly installed, the drive shaft may become disengaged.**

2. Install a new snap ring.



A6E6316W011

Outer Ring, Clip Assembly Note

1. Fill the outer ring and boot (transaxle side) with the specified grease.

Caution

- **Do not touch grease with your hand. Apply it from the tube to prevent foreign matter from entering the boot.**

Grease amount
120—140 g {4.24—4.94 oz}

2. Align the marks, and install the outer ring on to the shaft.
3. Install a new clip.
4. Install the boot.
5. Set the drive shaft to the standard length.

Standard length

mm {in}

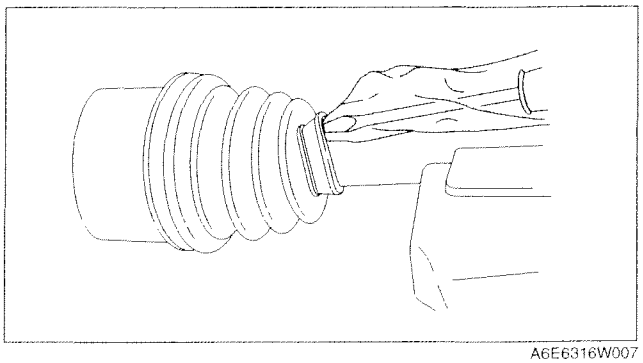
	Left side	Right side
L3	678.6—688.6 {26.72—27.11}	630.6—640.6 {24.83—25.22}
AJ	666.6—676.6 {26.25—26.63}	597.9—607.9 {23.54—23.93}

6. Release any trapped air from the boots by carefully lifting up the small end of each boot with a cloth wrapped screwdriver.

Caution

- **Be careful not to allow the grease to leak.**
- **Do not damage the boot.**

7. Verify that the drive shaft length is within the specification.



A6E6316W007

03–50 TECHNICAL DATA

FRONT AND REAR AXLE

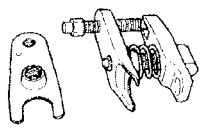
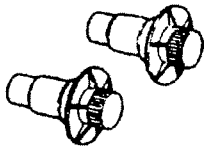
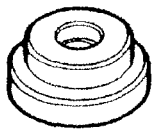
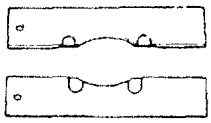
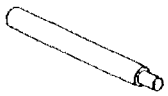
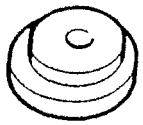
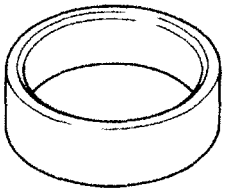
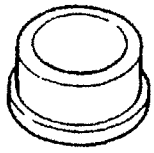
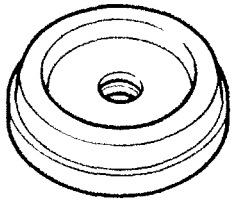
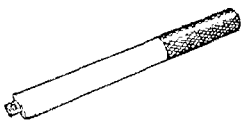
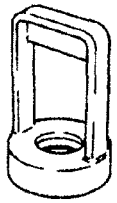
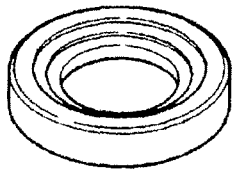
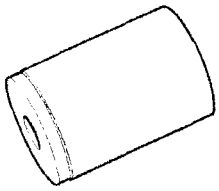
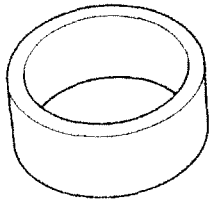
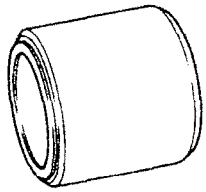
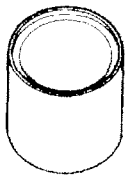
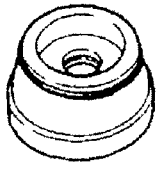
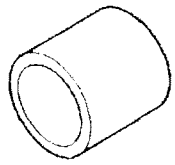
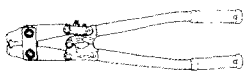
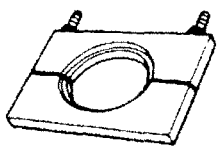
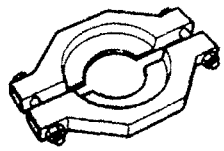
C6U035001018W01

Item		Specification			
		ATX		MTX	
		L3	AJ	L3	AJ
FRONT AXLE					
Maximum wheel bearing play (mm {in})		0.05 {0.002}			
REAR AXLE					
Maximum wheel bearing play (mm {in})		0.05 {0.002}			
DRIVE SHAFT					
Shaft length (Air in boot at atmospheric pressure) (mm {in})	Left side	674.1—684.1 {26.54—26.93}	642.1—652.1 {25.28—25.67}	678.6—688.6 {26.72—27.11}	666.6—676.6 {26.25—26.63}
	Right side	630.4—640.4 {24.82—25.21}	597.4—607.4 {23.52—23.91}	630.6—640.6 {24.83—25.22}	597.9—607.9 {23.54—23.93}

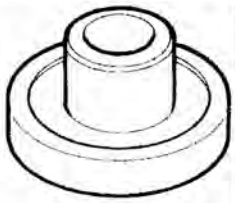
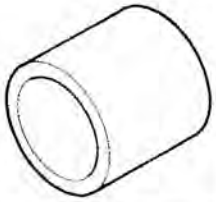
03–60 SERVICE TOOLS

FRONT AND REAR AXLE

C6U036001018W01

49 T028 3A0 Ball joint puller set 	49 G030 455 Diff. side gear holder 	49 G033 105 Attachment 
49 F026 103 Wheel hub puller 	49 G033 102 Handle 	49 G033 106 Attachment 
49 S033 101 Dust cover installer 	49 F027 009 Attachment ø68 & 77 	49 F027 004 Attachment ø80 
49 F027 003 Handle 	49 B025 006A Sensor rotor installer 	49 G026 105 Sensor rotor installer 
49 W034 301 Support block 	49 S231 626 Support block 	49 B014 001 Oil seal installer 
49 B025 004 Dust seal installer 	49 F027 005 Attachment ø62 	49 W027 003 Bearing installer 
49 T025 001 Boot clamp crimpers 	49 G030 370 Removing plate 	49 H027 002 Bearing remover 

SERVICE TOOLS

49 G030 797 Handle 	49 H025 001 Bearing installer 	49 G026 103 Support block 
49 L025 002 Bearing installer 	49 U027 003 Oil seal installer 	49 B018 003 Body B 

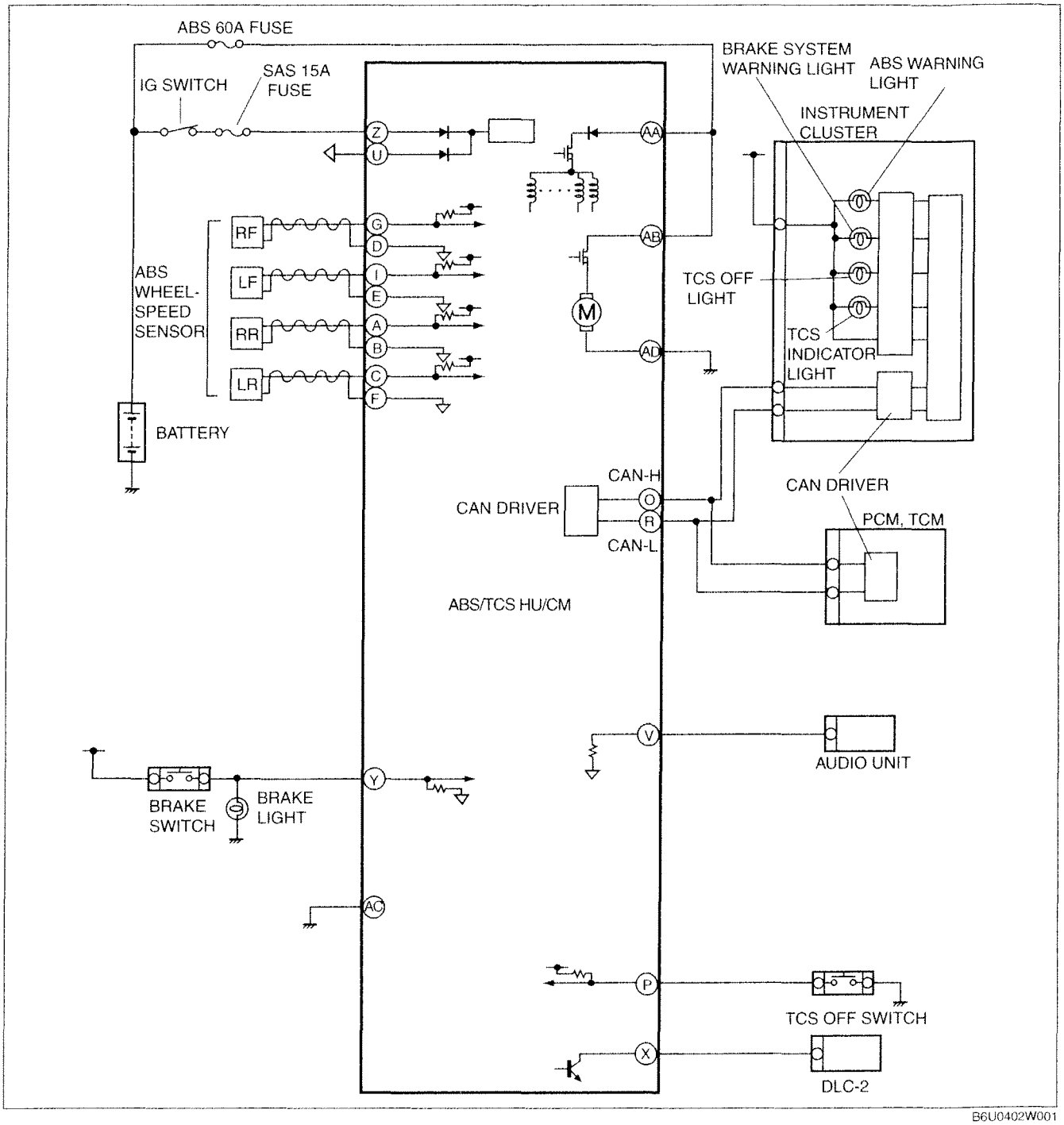
BRAKES

04 SECTION

04–02 ON-BOARD DIAGNOSTIC

ABS/TCS SYSTEM WIRING DIAGRAM

C6U040267650W01



B6U0402W001

ABS/TCS ON-BOARD DIAGNOSIS

C6U040267650W02

On-Board Diagnostic (OBD) Test Description

- The OBD test inspects the integrity and function of the ABS/TCS and outputs the results when requested by the specific tests.
- On-board diagnostic test also:
  - — Provides a quick inspection of the ABS/TCS usually performed at the start of each diagnostic procedure.
  - — Provides verification after repairs to ensure that no other faults occurred during service.
- The OBD test is divided into 3 tests:
  - — Read/clear diagnostic results, PID monitor and record and active command modes.

Read/clear diagnostic results

- This function allows you to read or clear DTCs in the ABS/TCS HU/CM memory.

PID/Data monitor and record

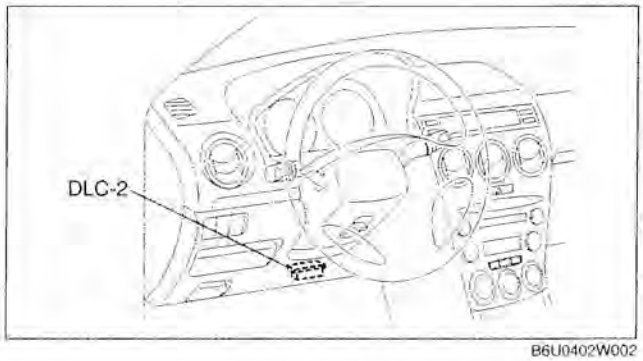
- This function allows you to access certain data values, input signals, calculated values, and system status information.

Active command modes

- This function allows you to control devices through the WDS or equivalent.

Reading DTCs Procedure

1. Connect WDS or equivalent to the vehicle DLC-2 connector.
2. Retrieve DTC using the WDS or equivalent.



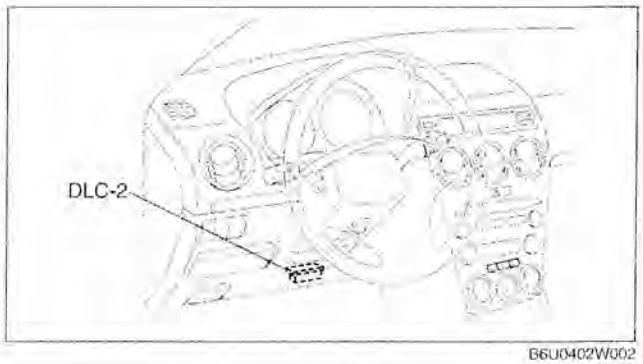
B6U0402W002

Clearing DTCs Procedures

1. After repairs have been made, perform the **DTCs reading procedure**.
2. Erase DTC using the WDS or equivalent.
3. Ensure that the customer's concern has been resolved.

PID/Data Monitor and Record Procedure

1. Connect WDS or equivalent to the vehicle DLC-2 connector.
2. Access and monitor PIDs using the WDS or equivalent.

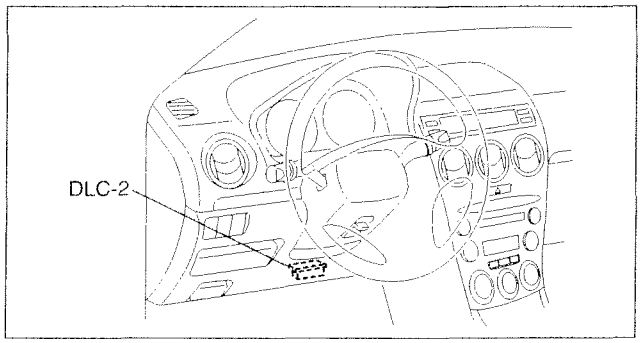


B6U0402W002

Active Command Modes Procedure

Note
- When driving, the ABS motor and each valve automatically turn ABS_POWER on, and then each command on. ABS_POWER regulates the power supply for the ABS motor and 8 valves.

1. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector.
2. Turn the ignition key to ON (engine off) or start engine.
3. Activate active command modes using the WDS or equivalent.



B6U0402W002

DTC Table

DTC WDS or equiva-lent	Diagnosis system component	Page
B1318	ABS/TCS power supply	(See 04–02–8 DTC B1318)
B1342	ABS/TCS HU/CM	(See 04–02–9 DTC B1342)
C1095	Motor relay, pump motor	(See 04–02–10 DTC C1095, C1096)
C1096	Motor relay, pump motor	(See 04–02–10 DTC C1095, C1096)
C1119	Engine control system, torque reduction inhibit signal line	(See 04–02–12 DTC C1119)
C1140	ABS/TCS HU/CM (pump)	(See 04–02–13 DTC C1140)
C1145	Right front ABS wheel-speed sensor	(See 04–02–14 DTC C1145, C1155, C1165, C1175)
C1148	Right front ABS wheel-speed sensor/sensor rotor	(See 04–02–17 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1155	Left front ABS wheel-speed sensor	(See 04–02–14 DTC C1145, C1155, C1165, C1175)
C1158	Left front ABS wheel-speed sensor/sensor rotor	(See 04–02–17 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1165	Right rear ABS wheel-speed sensor	(See 04–02–14 DTC C1145, C1155, C1165, C1175)
C1168	Right rear ABS wheel-speed sensor/sensor rotor	(See 04–02–17 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1175	Left rear ABS wheel-speed sensor	(See 04–02–14 DTC C1145, C1155, C1165, C1175)
C1178	Left rear ABS wheel-speed sensor/sensor rotor	(See 04–02–17 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1186	Fail-safe relay	(See 04–02–20 DTC C1186, C1266)
C1194	Left front pressure reduction solenoid valve	(See 04–02–22 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1198	Left front pressure retention solenoid valve	(See 04–02–22 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1210	Right front pressure reduction solenoid valve	(See 04–02–22 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1214	Right front pressure retention solenoid valve	(See 04–02–22 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1233	Left front ABS wheel-speed sensor/sensor rotor	(See 04–02–17 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1234	Right front ABS wheel-speed sensor/sensor rotor	(See 04–02–17 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)

DTC WDS or equivalent	Diagnosis system component	Page
C1235	Right rear ABS wheel-speed sensor/sensor rotor	(See 04–02–17 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1236	Left rear ABS wheel-speed sensor/sensor rotor	(See 04–02–17 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1242	Left rear pressure reduction solenoid valve	(See 04–02–22 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1246	Right rear pressure reduction solenoid valve	(See 04–02–22 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1250	Left rear pressure retention solenoid valve	(See 04–02–22 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1254	Right rear pressure retention solenoid valve	(See 04–02–22 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1266	Fail-safe relay	(See 04–02–20 DTC C1186, C1266)
C1508	TCS control	(See 04–02–22 DTC C1508)
C1510	Right front solenoid valve, motor or ABS wheel-speed sensor/sensor rotor	(See 04–02–23 DTC C1510, C1511, C1512, C1513)
C1511	Left front solenoid valve, motor or ABS wheel-speed sensor/sensor rotor	(See 04–02–23 DTC C1510, C1511, C1512, C1513)
C1512	Right rear solenoid valve, motor or ABS wheel-speed sensor/sensor rotor	(See 04–02–23 DTC C1510, C1511, C1512, C1513)
C1513	Left rear solenoid valve, motor or ABS wheel-speed sensor/sensor rotor	(See 04–02–23 DTC C1510, C1511, C1512, C1513)
U1900	Can communication	(See 09–02C–7 DTC U0073, U1900, U2516)
U2021	Engine coolant temperature	(See 04–02–23 DTC U2021)
U2516	Can communication	(See 09–02C–7 DTC U0073, U1900, U2516)

PID/DATA Monitor Table

PID Name (Definition)	Unit/Condition	Condition/Specification	Action	ABS/TCS HU/CM terminal
RPM (Engine speed signal input)	RPM	• Engine is stopped: **0 RPM** • Engine is running: Indicates engine speed	Inspect PCM. (See 01–40A–7 PCM INSPECTION [L3]) (See 01–40B–6 PCM INSPECTION [AJ])	—
CCNTABS (Number of continuous codes)	—	• DTC is detected: **1—255** • DTC is not detected: **0**	Perform inspection using appropriate DTC.	—
PMPSTAT (Pump motor output state)	On/Off	• Pump motor is activated: On • Pump motor is deactivated: Off	Inspect ABS/TCS HU/CM. (See 04–13–3 ABS/TCS HU/CM SYSTEM INSPECTION)	—
BOO_ABS (Brake pedal switch input)	On/Off	• Brake pedal is depressed: On • Brake pedal is released: Off	Inspect brake switch.	Y
ABS_LAMP (ABS warning light driver output state)	On/Off	• ABS warning light is illuminated: On • ABS warning light is not illuminated: Off	Inspect ABS warning light.	—
BRAKE_LMP (BRAKE system warning light output state)	On/Off	• BRAKE system warning light is illuminated: On • BRAKE system warning light is not illuminated: Off	Inspect BRAKE system warning light.	—
ABSRR_O (Right rear ABS pressure reduction solenoid valve output state)	On/Off	• During ABS control: On/Off (solenoid valve is activated/deactivated) • No ABS control: Off (solenoid valve is deactivated)	Internal fault of ABS/TCS HU/CM. Replace ABS/TCS HU/CM. (See 04–13–4 ABS/TCS HU/CM REMOVAL/ INSTALLATION)	—

PID Name (Definition)	Unit/Condition	Condition/Specification	Action	ABS/TCS HU/CM terminal
ABSLR_O (Left rear ABS pressure reduction solenoid valve output state)	On/Off	• During ABS or EBD control: On/Off (solenoid valve is activated/deactivated) • No ABS and EBD control: Off (solenoid valve is deactivated)	Internal fault of ABS/TCS HU/CM. Replace ABS/TCS HU/CM. (See 04–13–4 ABS/TCS HU/CM REMOVAL/ INSTALLATION)	—
ABSRF_O (Right front ABS pressure reduction solenoid valve output state)	On/Off	• During ABS control: On/Off (solenoid valve is activated/deactivated) • No ABS control: Off (solenoid valve is deactivated)	Internal fault of ABS/TCS HU/CM. Replace ABS/TCS HU/CM. (See 04–13–4 ABS/TCS HU/CM REMOVAL/ INSTALLATION)	—
ABSLF_O (Left front ABS pressure reduction solenoid valve output state)	On/Off	• During ABS control: On/Off (solenoid valve is activated/deactivated) • No ABS control: Off (solenoid valve is deactivated)	Internal fault of ABS/TCS HU/CM. Replace ABS/TCS HU/CM. (See 04–13–4 ABS/TCS HU/CM REMOVAL/ INSTALLATION)	—
ABSRR_I (Right rear ABS pressure retention solenoid valve output state)	On/Off	• During ABS control: On/Off (solenoid valve is activated/deactivated) • No ABS control: Off (solenoid valve is deactivated)	Internal fault of ABS/TCS HU/CM. Replace ABS/TCS HU/CM. (See 04–13–4 ABS/TCS HU/CM REMOVAL/ INSTALLATION)	—
ABSLR_I (Left rear ABS pressure retention solenoid valve output state)	On/Off	• During ABS or EBD control: On/Off (solenoid valve is activated/deactivated) • No ABS and EBD control: Off (solenoid valve is deactivated)	Internal fault of ABS/TCS HU/CM. Replace ABS/TCS HU/CM. (See 04–13–4 ABS/TCS HU/CM REMOVAL/ INSTALLATION)	—
ABSRF_I (Right front ABS pressure retention solenoid valve output state)	On/Off	• During ABS control: On/Off (solenoid valve is activated/deactivated) • No ABS control: Off (solenoid valve is deactivated)	Internal fault of ABS/TCS HU/CM. Replace ABS/TCS HU/CM. (See 04–13–4 ABS/TCS HU/CM REMOVAL/ INSTALLATION)	—
ABSLF_I (Left front ABS pressure retention solenoid valve output state)	On/Off	• During ABS control: On/Off (solenoid valve is activated/deactivated) • No ABS control: Off (solenoid valve is deactivated)	Internal fault of ABS/TCS HU/CM. Replace ABS/TCS HU/CM. (See 04–13–4 ABS/TCS HU/CM REMOVAL/ INSTALLATION)	—
ABSVLVRLY (Fail-safe relay output state)	On/Off	• Fail-safe relay is activated: On • Fail-safe relay is deactivated: Off	Inspect ABS/TCS HU/CM. (See 04–13–6 ABS/TCS HU/CM INSPECTION)	—
ABSPMPRLY (Motor relay output state)	On/Off	• Motor relay is activated: On • Motor relay is deactivated: Off	Inspect ABS/TCS HU/CM. (See 04–13–6 ABS/TCS HU/CM INSPECTION)	—
LF_WSPD (Left front ABS wheel-speed sensor input)	KPH, MPH	• Vehicle is stopped: **0 KPH {0 MPH}** • Vehicle is driving: Indicates vehicle speed	Inspect ABS wheel-speed sensor/sensor rotor.	I, E
RF_WSPD (Right front ABS wheel-speed sensor input)	KPH, MPH	• Vehicle is stopped: **0 KPH {0 MPH}** • Vehicle is driving: Indicates vehicle speed	Inspect ABS wheel-speed sensor/sensor rotor.	G, D

PID Name (Definition)	Unit/Condition	Condition/Specification	Action	ABS/TCS HU/CM terminal
LR_WSPD (Left rear ABS wheel-speed sensor input)	KPH, MPH	• Vehicle is stopped: **0 KPH {0 MPH}** • Vehicle is driving: Indicates vehicle speed	Inspect ABS wheel-speed sensor/sensor rotor.	C, F
RR_WSPD (Right rear ABS wheel-speed sensor input)	KPH, MPH	• Vehicle is stopped: **0 KPH {0 MPH}** • Vehicle is driving: Indicates vehicle speed	Inspect ABS wheel-speed sensor/sensor rotor.	A, B
ABS_VOLT (System battery voltage value)	V	• Ignition key at ON: **B+** • Idle: **Approx. 14—16 V**	Inspect power supply circuit. (See 04–13–6 ABS/TCS HU/CM INSPECTION)	Z
PCM_MSG (Missing message from the PCM)	Present/ Not Present	• Present: Circuit in the PCM is normal. • Not Present: Circuit in the PCM is abnormal.	Inspect PCM. (See 01–40A–7 PCM INSPECTION [L3]) (See 01–40B–6 PCM INSPECTION [AJ]) Inspect ABS/TCS HU/CM. (See 04–13–6 ABS/TCS HU/CM INSPECTION)	—
TCM_MSG (Missing message from the TCM)	Present/ Not Present	• Present: Circuit in the TCM is normal. • Not Present: Circuit in the TCM is abnormal.	Inspect TCM. (See 05–17A–24 TCM INSPECTION [FN4A-EL]) (See 05–17B–23 TCM INSPECTION [JA5A-EL]) Inspect ABS/TCS HU/CM. (See 04–13–6 ABS/TCS HU/CM INSPECTION)	—

Active Command Modes Table

Command Name	Definition	Operation	Note
ABS_POWER	Fail-safe relay	On/Off	Ignition key at ON (Engine running, vehicle is not moving)
LR_OUTLET	Left rear ABS pressure reduction solenoid valve	On/Off	
LR_INLET	Left rear ABS pressure retention solenoid valve	On/Off	
RR_INLET	Right rear ABS pressure retention solenoid valve	On/Off	
RR_OUTLET	Right rear ABS pressure reduction solenoid valve	On/Off	
LF_INLET	Left front ABS pressure retention solenoid valve	On/Off	
LF_OUTLET	Left front ABS pressure reduction solenoid valve	On/Off	
RF_INLET	Right front ABS pressure retention solenoid valve	On/Off	
RF_OUTLET	Right front ABS pressure reduction solenoid valve	On/Off	
PMP_MOTOR	ABS motor	On/Off	

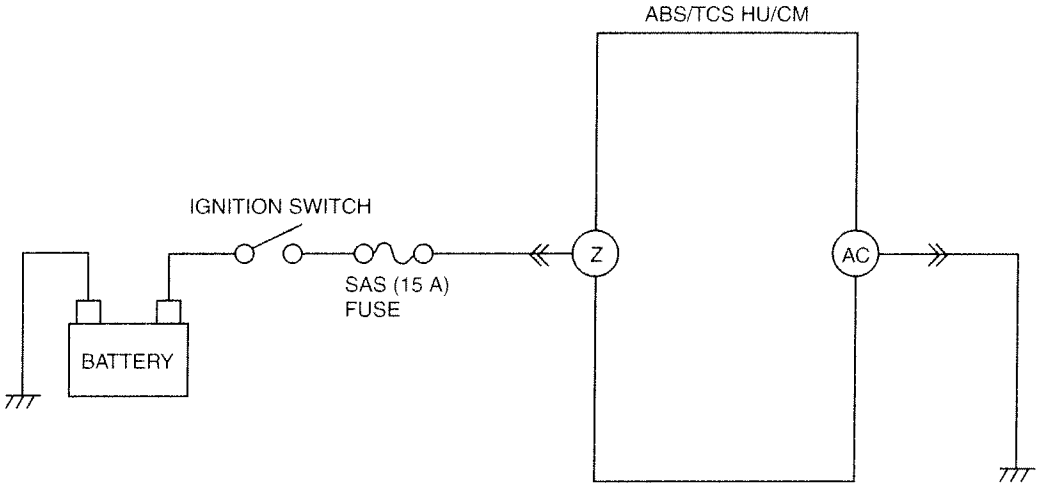
DTC B1318

C6U040267650W03

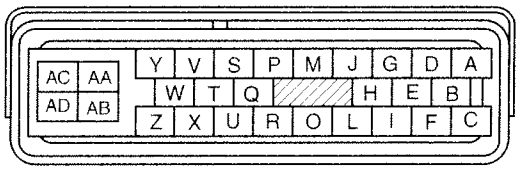
Caution

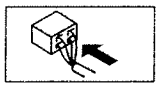
- **When attaching the tester lead to the ABS/TCS HU/CM harness connector, the SST (49 G066 001 [Adapter harness]) must be used. (See 04–13–6 ABS/TCS HU/CM INSPECTION.)**

DTC B1318	ABS/TCS power supply
DETECTION CONDITION	• Low voltage is detected at the voltage monitor of solenoid valve monitor, or the motor monitor
POSSIBLE CAUSE	• Malfunction of fuse (SAS 15 A) • Open circuit or short to power supply in harness between ABS/TCS HU/CM terminal Z and battery positive terminal • Open circuit in harness between body ground and ABS/TCS HU/CM terminal AC • Battery and/or generator malfunction

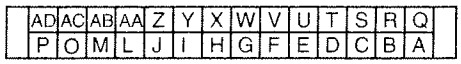


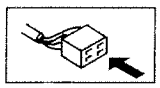
ABS/TCS HU/CM HARNESS SIDE CONNECTOR





SST (49 G066 001) CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT BATTERY VOLTAGE** • Is battery terminal voltage okay?	Yes	Make sure that battery terminal connection is okay. Go to the next step.
		No	Charge or replace battery, then go to Step 6.
2	**INSPECT BATTERY GRAVITY** • Is battery specific gravity as specified?	Yes	Go to the next step.
		No	Replace battery, then go to Step 6.
3	**INSPECT CHARGING SYSTEM** • Are generator and drive belt tensions okay?	Yes	Go to the next step.
		No	Adjust drive belt tension as necessary. Replace generator and/or drive belt as necessary.
4	**INSPECT ABS/TCS HU/CM POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Start engine. • Measure voltage between ABS/TCS HU/CM terminal Z and ground. • Is voltage **above 10 V**?	Yes	Go to the next step.
		No	Go to Step 6.
5	**INSPECT ABS/TCS HU/CM GROUND CIRCUIT FOR POOR GROUND OR OPEN CIRCUIT** • Turn the ignition switch off. • Measure resistance between ground and ABS/TCS HU/CM terminal AC. • Is resistance **within 0—1 ohm**?	Yes	Go to the next step.
		No	If there is no continuity: • Repair or replace harness for open circuit between ABS/TCS HU/CM and ground, then go to the next step. If resistance is not **within 0—1 ohm**: • Repair or replace harness for poor ground then go to the next step.
6	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the memory. (See 04–02–3 Clearing DTCs Procedures) • Is same DTC present?	Yes	Replace ABS/TCS HU/CM, then go to the next step.
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Is there any other DTC present?	Yes	Go to the applicable DTC inspection.
		No	Troubleshooting completed.

04–02

DTC B1342

C6U040267650W04

DTC B1342	ABS/TCS HU/CM
DETECTION CONDITION	The on-board diagnostic function detects control module malfunction.
POSSIBLE CAUSE	• Malfunction of ABS/TCS HU/CM

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY CURRENT STATUS OF MALFUNCTION** • Clear the DTC from the memory. (See 04–02–3 Clearing DTCs Procedures) • Start engine and drive vehicle at **10 km/h {6.2 mph}** or above. • Is same DTC present?	Yes	Replace ABS/TCS HU/CM, then go to the next step.
		No	Inspect intermittent concern using the same procedure as engine control system.
2	**VERIFY AFTER REPAIR PROCEDURE** • Is there any other DTC present?	Yes	Go to the applicable DTC inspection.
		No	Troubleshooting completed.

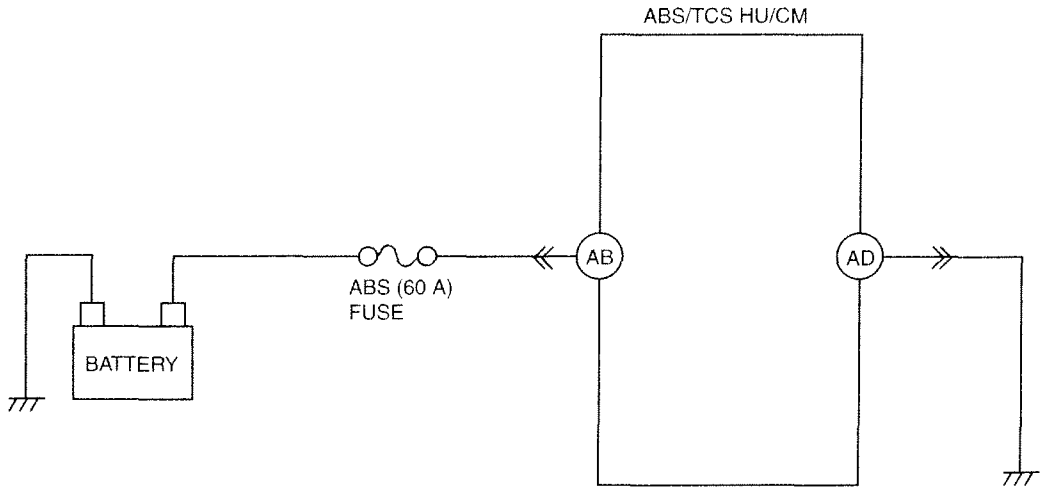
DTC C1095, C1096

C6U040267650W05

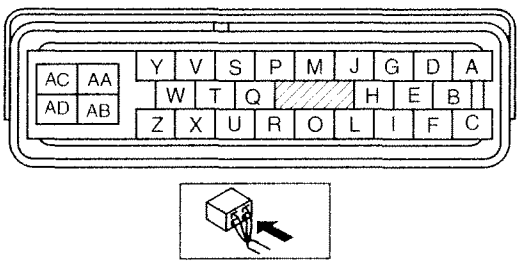
Caution

- **When attaching the tester lead to the ABS/TCS HU/CM harnesses connector the SST (49 G066 001 [Adapter harness]) must be used. (See 04–13–6 ABS/TCS HU/CM INSPECTION.)**

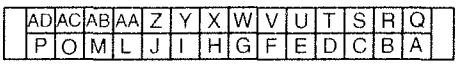
DTC C1095, C1096	Motor relay, pump motor
DETECTION CONDITION	• C1095: — ABS motor stuck OFF when vehicle is started or during ABS operation, ABS motor ON is commanded. • C1096: — ABS motor stuck OFF when vehicle is started or during ABS operation, ABS motor ON is commanded. — Motor monitor ON signal is not input after specified time when the motor signal is switched from ON to OFF by ABS/TCS HU/CM.
POSSIBLE CAUSE	• Open circuit, or short to power supply or short to ground of motor relay and/or ABS motor in ABS/TCS HU/CM • Stuck motor relay and/or ABS motor • Open circuit of ABS motor power supply • Open circuit of ABS motor ground

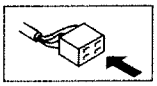


ABS/TCS HU/CM HARNESS SIDE CONNECTOR



SST (49 G066 001) CONNECTOR





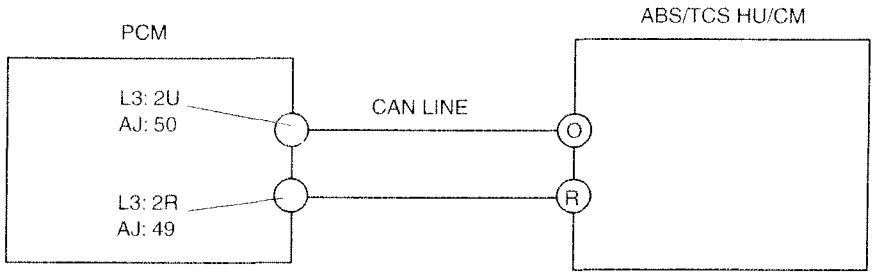
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY OTHER DTC HAS BEEN RECORDED** • Has DTC C1186 and/or C1266 also been stored?	Yes	Go to the applicable DTC inspection.
		No	Go to the next step.
2	**INSPECT ABS FUSE CONDITION** • Is ABS fuse (60 A) okay?	Yes	Go to the next step.
		No	Replace fuse, then go to Step 6.
3	**INSPECT MOTOR RELAY POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Disconnect ABS/TCS HU/CM connector. • Connect **SST** (adapter harness) to ABS/TCS HU/CM connector (harness side only). • Turn ignition key to ON (engine off). • Measure voltage between ABS/TCS HU/CM terminal AB (harness side) of **SST** and ground. • Is voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace harness for open circuit between battery positive terminal and ABS/TCS HU/CM terminal AC, then go to Step 6.
4	**INSPECT PUMP MOTOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect continuity between ABS/TCS HU/CM terminal AD (harness side) of **SST** and ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace harness for open circuit between ABS/TCS HU/CM terminal AB and ground, then go to Step 6.
5	**VERIFY PUMP MOTOR OPERATION** • Turn the ignition switch off. • Remove **SST** (adapter harness) and connect all disconnected connectors. • Connect WDS or equivalent to DLC-2. • Turn ignition key to ON (engine off). • Access ABS_POWER and PMP_MOTOR active command modes using the WDS or equivalent. • Does pump motor operate?	Yes	Go to the next step.
		No	Repair ABS/TCS HU/CM, then go to the next step.
6	**VERIFY TROUBLESHOOTING COMPLETED** • Clear the DTC from the memory. (See 04–02–3 Clearing DTCs Procedures) • Start engine and drive vehicle at **10 km/h {6.2 mph}** or above. • Gradually slow down and stop vehicle. • Is same DTC present?	Yes	Replace ABS/TCS HU/CM, then go to the next step.
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Is there any other DTC present?	Yes	Go to the applicable DTC inspection.
		No	Troubleshooting completed.

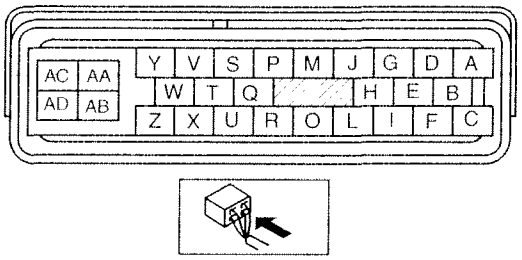
DTC C1119

C6U040267650W06

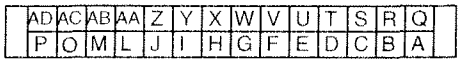
DTC C1119	Engine control system, torque reduction inhibit signal line
DETECTION CONDITION	• Engine RPM information through CAN is out of specification or invalid value. • Throttle information through CAN is out of specification or invalid value. • Received control prohibition signal from PCM through CAN.
POSSIBLE CAUSE	• Malfunction of PCM

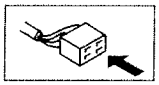


ABS/TCS HU/CM HARNESS SIDE CONNECTOR

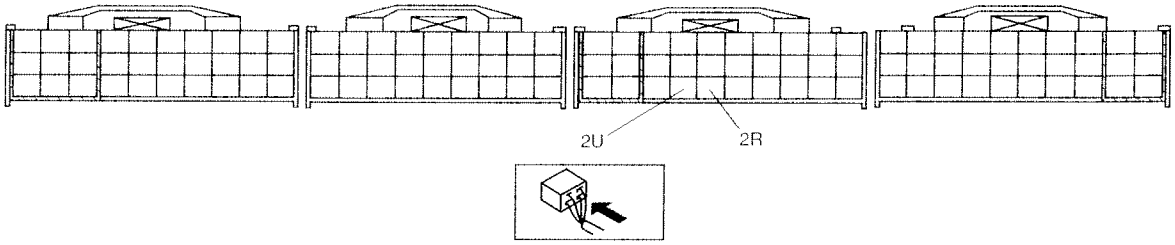


SST (49 G066 001) CONNECTOR

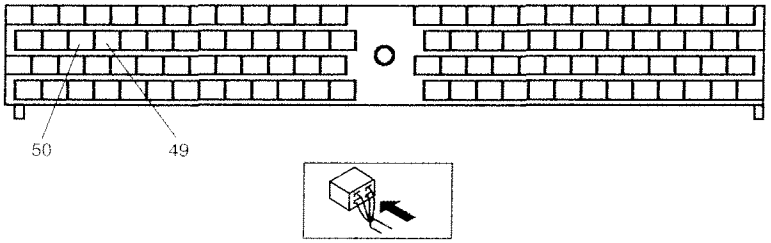




PCM HARNESS SIDE CONNECTOR (L3)



PCM HARNESS SIDE CONNECTOR (AJ)



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**CHECK FOR PCM FOR DTCs** • Turn the ignition switch off. • Connect WDS or equivalent to DLC-2 • Turn ignition key to ON (engine off). • Is DTC for engine control system obtained?	Yes	Follow inspection procedures for engine control system.
		No	Go to the next step.
2	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the memory. (See 04–02–3 Clearing DTCs Procedures • Start engine.) • Is same DTC present?	Yes	Replace ABS/TCS HU/CM, then go to the next step.
		No	Go to the next step.
3	**VERIFY AFTER REPAIR PROCEDURE** • Is there any other DTC present?	Yes	Go to the applicable DTC inspection.
		No	Troubleshooting completed.

DTC C1140

C6U040267650W07

Caution

- **When attaching the tester lead to the ABS/TCS HU/CM harness connector, the SST (49 G066 001 [Adapter harness]) must be used. (See 04–13–6 ABS/TCS HU/CM INSPECTION.)**

DTC C1140	ABS/TCS HU/CM (pump)
DETECTION CONDITION	Right front and left rear wheels, or left front and right rear wheel-lock is detected during ABS/TCS operation.
POSSIBLE CAUSE	Stuck pump motor in ABS/TCS HU/CM

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT ABS/TCS HU/CM OPERATION** • Perform ABS/TCS HU/CM system inspection. (See 04–13–3 ABS/TCS HU/CM SYSTEM INSPECTION) • Is it normal?	Yes	Go to the next step.
		No	Replace ABS/TCS HU/CM, then go to Step 4.
2	**INSPECT CONVENTIONAL BRAKE OPERATION** • Inspect brake fluid level. • Start engine. • Perform a road test to verify conventional vehicle braking performance. • Is there any concern.	Yes	Inspect conventional brake line, then go to Step 4.
		No	Go to the next step.
3	**INSPECT REAR BRAKE DRAGGING** • Turn the ignition switch off. • Jack-up vehicle and support it with safety stand. • Release parking brake. • Turn rear wheel by hand and inspect for rear brake drag. • Is rear brake dragging?	Yes	Repair parking brake system, then go to the next step.
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING COMPLETED** • Clear the DTC from the memory. (See 04–02–3 Clearing DTCs Procedures) • Start engine and drive vehicle at **10 km/h {6.2 mph}** or above at least one minute. • Gradually slow down vehicle and stop. • Is same DTC present?	Yes	Replace ABS/TCS HU/CM, then go to the next step.
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Is there any other DTC present?	Yes	Go to the applicable DTC inspection.
		No	Troubleshooting completed.

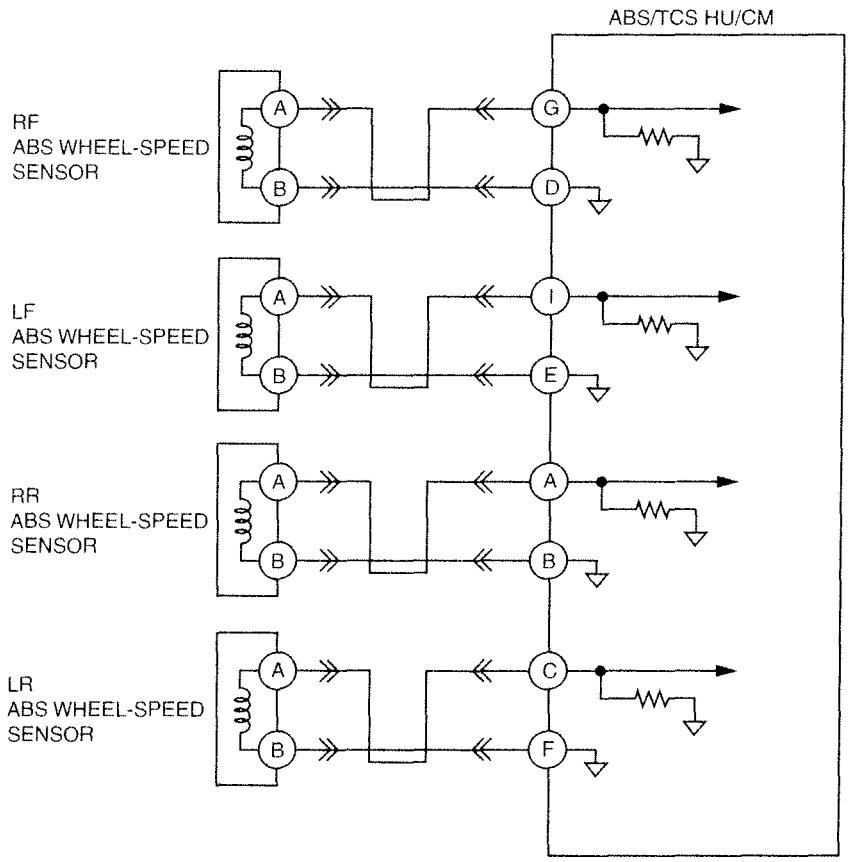
DTC C1145, C1155, C1165, C1175

C6U040267650W08

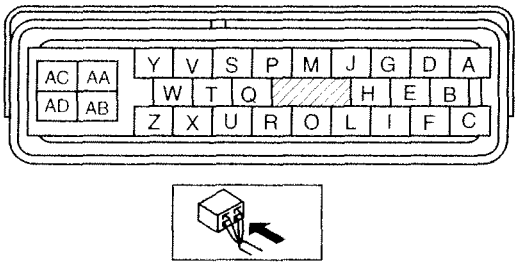
Caution

- **When attaching the tester lead to the ABS/TCS HU/CM harness connector, the SST (49 G066 001 [Adapter harness]) must be used. (See 04–13–6 ABS/TCS HU/CM INSPECTION.)**

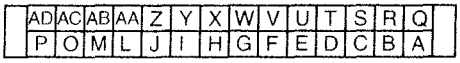
DTC	**C1145** **C1155** **C1165** **C1175**	**RF ABS wheel-speed sensor** **LF ABS wheel-speed sensor** **RR ABS wheel-speed sensor** **LR ABS wheel-speed sensor**
DETECTION CONDITION	• Abnormal input is detected.	
POSSIBLE CAUSE	• Open circuit or short to ground in harness between ABS/TCS HU/CM terminal and ABS wheel-speed sensor (s) terminals indicated below: — ABS/TCS HU/CM terminal G—RF ABS wheel-speed sensor terminal A — ABS/TCS HU/CM terminal D—RF ABS wheel-speed sensor terminal B — ABS/TCS HU/CM terminal I—LF ABS wheel-speed sensor terminal A — ABS/TCS HU/CM terminal E—LF ABS wheel-speed sensor terminal B — ABS/TCS HU/CM terminal A—RR ABS wheel-speed sensor terminal A — ABS/TCS HU/CM terminal B—RR ABS wheel-speed sensor terminal B — ABS/TCS HU/CM terminal C—LR ABS wheel-speed sensor terminal A — ABS/TCS HU/CM terminal F—LR ABS wheel-speed sensor terminal B • ABS wheel-speed sensor (s) malfunction	

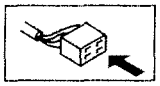


ABS/TCS HU/CM HARNESS SIDE CONNECTOR



SST (49 G066 001) CONNECTOR

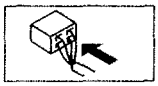




ABS WHEEL-SPEED SENSOR HARNESS SIDE CONNECTOR

FRONT

REAR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT ABS WHEEL-SPEED SENSOR CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Disconnect ABS/TCS HU/CM connector. • Measure resistance between suspected sensor terminals of ABS/TCS HU/CM connector (harness side). — RF ABS wheel-speed sensor: G—D — LF ABS wheel-speed sensor: I—E — RR ABS wheel-speed sensor: A—B — LR ABS wheel-speed sensor: C—F • Is resistance **within 1.3—1.7 kilohm**?	Yes	Go to the next step.
		No	Go to Step 3.
2	**INSPECT ABS WHEEL-SPEED SENSOR CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect continuity between suspected sensor terminal (s) of ABS/TCS HU/CM connector (harness side) and ground (s). — RF ABS wheel-speed sensor (+): G — RF ABS wheel-speed sensor (–): D — LF ABS wheel-speed sensor (+): I — LF ABS wheel-speed sensor (–): E — RR ABS wheel-speed sensor (+): A — RR ABS wheel-speed sensor (–): B — LR ABS wheel-speed sensor (+): C — LR ABS wheel-speed sensor (–): F • Is there continuity?	Yes	Repair or replace harness for short to ground circuit between ABS/TCS HU/CM and ABS wheel-speed sensor (s), then go to Step 5.
		No	Go to Step 5.
3	**INSPECT ABS WHEEL-SPEED SENSOR** • Turn the ignition switch off. • Disconnect suspected sensor connector (s) and inspect resistance between sensor terminals (part side). • Is resistance **within 1.3—1.7 kilohm**?	Yes	Go to the next step.
		No	Replace ABS wheel-speed sensor, then go to Step 5.
4	**INSPECT ABS/TCS HU/CM TO ABS WHEEL-SPEED SENSOR CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between suspected sensor terminal (s) of ABS/TCS HU/CM connector (harness side) and ABS wheel-speed sensor connector. (vehicle harness side) — RF ABS wheel-speed sensor (+): G—A — RF ABS wheel-speed sensor (–): D—B — LF ABS wheel-speed sensor (+): I—A — LF ABS wheel-speed sensor (–): E—B — RR ABS wheel-speed sensor (+): A—A — RR ABS wheel-speed sensor (–): B—B — LR ABS wheel-speed sensor (+): C—A — LR ABS wheel-speed sensor (–): F—B • Is there continuity?	Yes	Repair or replace poor connections of ABS/TCS HU/CM connector and/or ABS wheel-speed sensor connector (s), then go to the next step.
		No	Repair or replace harness for open circuits between ABS/TCS HU/CM and ABS wheel-speed sensor (s), then go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the memory (See 04–02–3 Clearing DTCs Procedures) • Is same DTC present?	Yes	Replace ABS/TCS HU/CM, then go to the next step.
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Is there any other DTC present?	Yes	Go to the applicable DTC inspection.
		No	Troubleshooting completed.

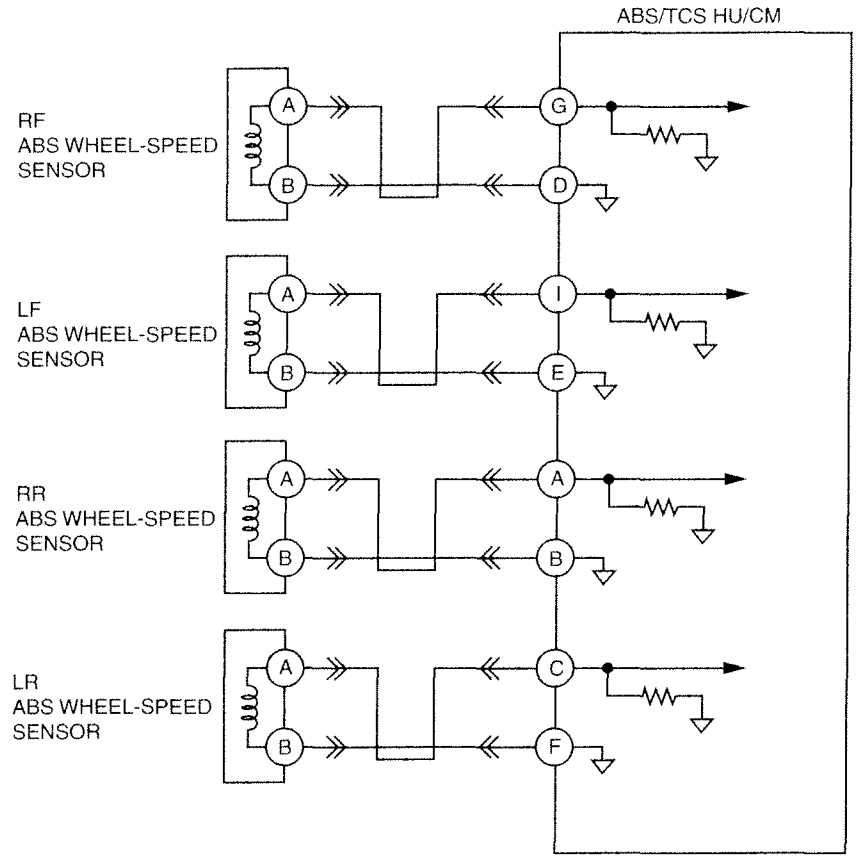
DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236

C6U040267650W09

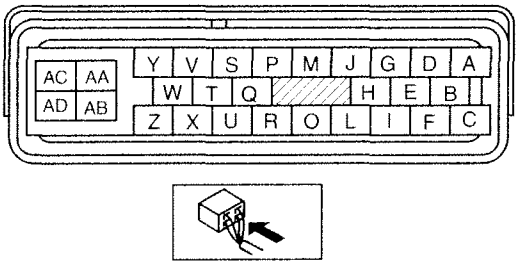
Caution

- **When attaching the tester lead to the ABS/TCS HU/CM harness connector, the SST (49 G066 001 [Adapter harness]) must be used. (See 04–13–6 ABS/TCS HU/CM INSPECTION.)**

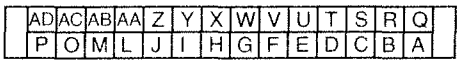
DTC	**C1148, C1234** **C1158, C1233** **C1168, C1235** **C1178, C1236**	**RF ABS wheel-speed sensor/sensor rotor** **LF ABS wheel-speed sensor/sensor rotor** **RR ABS wheel-speed sensor/sensor rotor** **LR ABS wheel-speed sensor/sensor rotor**
DETECTION CONDITION	• C1148, C1158, C1168, C1178: — Abnormal sensor output is detected on any of four vehicle wheels when the vehicle goes from start to a speed of **10 km/h {6.2 mph}** — Greater than specified amount of ABS demand occurs from front ABS wheel sensors when vehicle is started • C1234, C1233, C1235, C1236: — Abnormal sensor output due to chipping of sensor rotor teeth, etc. is detected — ABS control operates for **60 seconds or more**	
POSSIBLE CAUSE	• Short to ground circuit of ABS wheel-speed sensor (s) circuit • Malfunction of ABS wheel-speed sensor (s) • Damaged sensor rotor (s) • Incorrect clearance between ABS wheel-speed sensor and sensor rotor • Poor installation of ABS wheel speed sensor and/or sensor rotor (If the sensor rotor is installed twisted, it may cause output of abnormal wave form at high speeds) • ABS/TCS HU/CM internal damage (Solenoid valve malfunction, pump motor malfunction, or pipe clogging)	

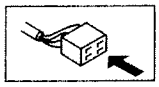


ABS/TCS HU/CM HARNESS SIDE CONNECTOR



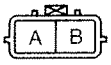
SST (49 G066 001) CONNECTOR



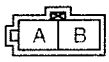


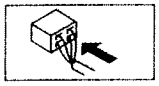
ABS WHEEL-SPEED SENSOR HARNESS SIDE CONNECTOR

FRONT

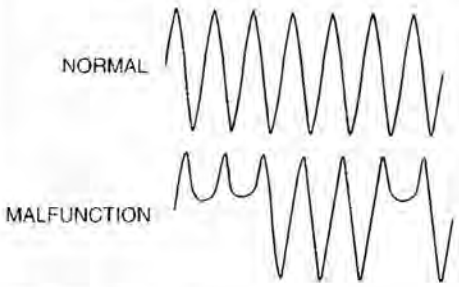


REAR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY OTHER DTC HAS BEEN RECORDED** • Have DTCs related to solenoid valve, pump motor, or pump motor relay been stored?	Yes	Go to the applicable DTC inspection.
		No	Go to the next step.
2	**VERIFY IF CURRENT CONCERNED INPUT SIGNAL STATUS IS INTERMITTENT OR CONSTANT** • Turn the ignition switch off. • Connect WDS or equivalent to DLC-2. • Start engine and drive vehicle. • Access LF_WSPD, LR_WSPD, RF_WSPD and RR_WSPD using the WDS or equivalent • Do vehicle speeds correspond approximately to the four PIDs above?	Yes	Go to Step 8.
		No	If there is a difference in speed of four wheels: Go to the next step. If any wheel speed is **0 km/h {0 mph}**: Go to Step 4.
3	**INSPECT ABS WHEEL-SPEED SENSOR OUTPUT PULSE** • Start engine and drive vehicle. • Inspect output voltage pattern using an oscilloscope.  • Is output voltage pattern okay?	Yes	Go to Step 9.
		No	Go to Step 6.
4	**INSPECT ABS WHEEL-SPEED SENSOR CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Disconnect ABS/TCS HU/CM and ABS wheel-speed sensor connectors. • Inspect continuity between suspected sensor terminal (s) of ABS/TCS HU/CM connector (harness side) and ground (s). — RF ABS wheel-speed sensor: G—ground — LF ABS wheel-speed sensor: I—ground — RR ABS wheel-speed sensor: A—ground — LR ABS wheel-speed sensor: C—ground • Is there continuity?	Yes	Repair or replace harness for short to ground circuit between ABS/TCS HU/CM and ABS wheel-speed sensor, then go to Step 9.
		No	Go to the next step.
5	**INSPECT ABS WHEEL-SPEED SENSOR** • Turn the ignition switch off. • Disconnect suspected ABS wheel-speed sensor connector (s) and inspect resistance between ABS wheel-speed sensor terminal (s) (part side). • Is resistance **within 1.3—1.7 kilohm**?	Yes	Go to the next step.
		No	Replace ABS wheel-speed sensor (s), then go to Step 9.
6	**INSPECT SENSOR ROTOR CLEARANCE** • Jack-up vehicle and support it with safety stands. • Remove suspected wheel (s). • Inspect clearance between ABS wheel-speed sensor and sensor rotor. • Is clearance **within 0.3—1.1 mm {0.012—0.043 in}**?	Yes	Go to the next step.
		No	Replace ABS wheel-speed sensor (s), then go to Step 9.

STEP	INSPECTION		ACTION
7	**INSPECT SENSOR ROTOR FOR DAMAGE** • Jack-up vehicle and support it with safety stands. • Remove suspected wheel (s). • Visually inspect sensor rotor for missing, deformed and obstructed teeth. **Number of teeth: 44** • Is sensor rotor okay?	Yes	Go to the next step.
		No	Replace sensor rotor, then go to Step 9.
8	**INSPECT ABS/TCS HU/CM OPERATION** • Perform ABS/TCS HU/CM system inspection. (See 04–13–3 ABS/TCS HU/CM SYSTEM INSPECTION) • Is it normal?	Yes	Go to the next step.
		No	Replace ABS/TCS HU/CM, then go to the next step.
9	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the memory (See 04–02–3 Clearing DTCs Procedures) • Start engine and drive vehicle at **10 km/h {6.2 mph}** or above. • Gradually slow down vehicle and stop. • Is same DTC present?	Yes	Replace ABS/TCS HU/CM, then go to the next step.
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Is there any other DTC present?	Yes	Go to the applicable DTC inspection.
		No	Troubleshooting completed.

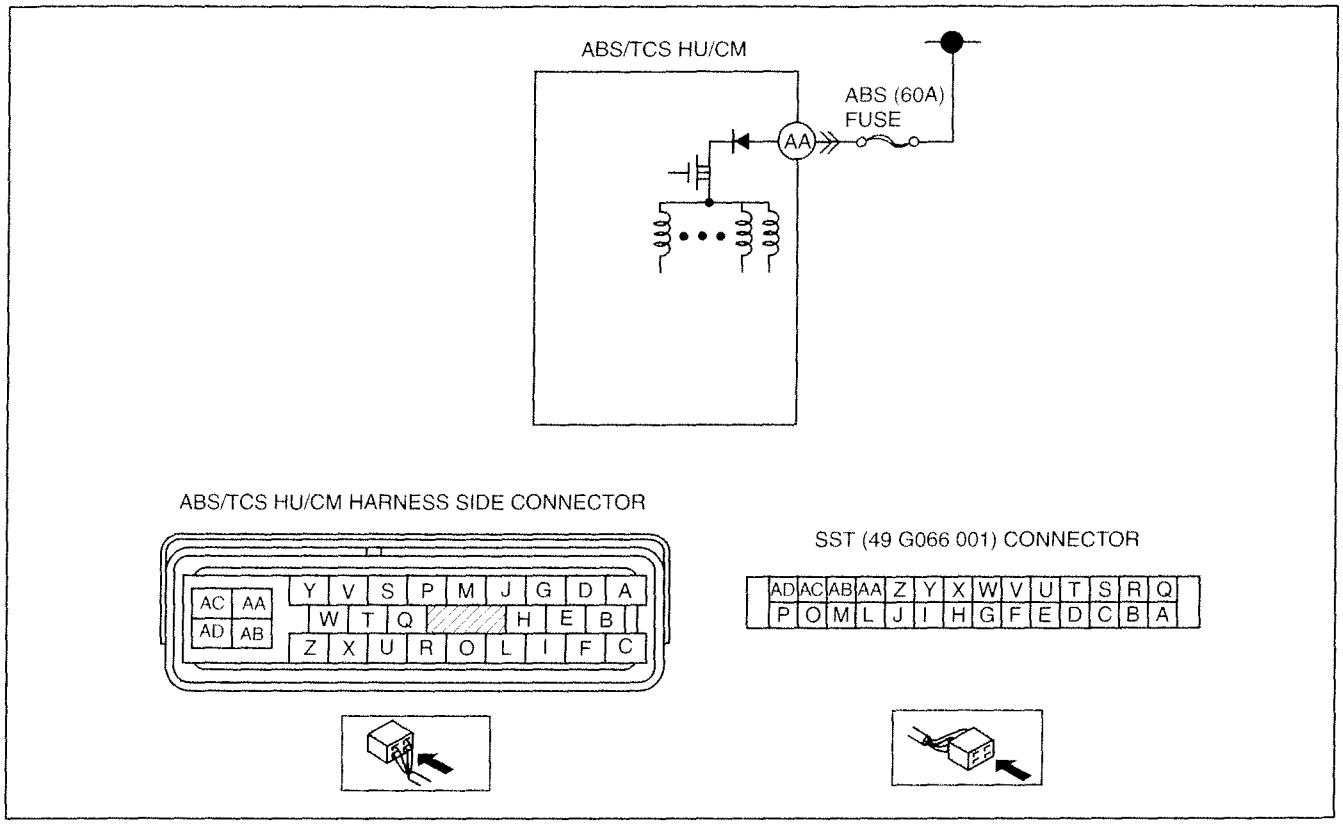
DTC C1186, C1266

C6U040267650W10

Caution

- **When attaching the tester lead to the ABS/TCS HU/CM harnesses connector the SST (49 G066 001 [Adapter harness]) must be used. (See 04–13–6 ABS/TCS HU/CM INSPECTION.)**

DTC C1186, C1266	Fail-safe relay
DETECTION CONDITION	• C1186: — Fail-safe relay in ABS/TCS HU/CM stuck OFF when ignition key is turned ON, fail-safe relay ON is commanded. • C1266: — Fail-safe relay in ABS/TCS HU/CM stuck ON when ignition key is turned ON, fail-safe relay OFF is commanded.
POSSIBLE CAUSE	• Malfunction of fuse (ABS 60 A) • Open circuit in harness between ABS/TCS HU/CM terminal AA and battery positive terminal • Open circuit or short of fail-safe relay in ABS/TCS HU/CM • Stuck fail-safe relay in ABS/TCS HU/CM



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT ABS FUSE CONDITION** • Is ABS fuse (60 A) okay?	Yes	Go to the next step.
		No	Replace fuse, then go to Step 4.
2	**INSPECT FAIL-SAFE RELAY POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Disconnect ABS/TCS HU/CM connector. • Connect **SST** (adapter harness) to ABS/TCS HU/CM connector (harness side only). • Turn ignition key to ON (engine off). • Measure voltage between ABS/TCS HU/CM terminal AA (harness side) of **SST** and ground. • Is voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace harness for open circuit between battery positive terminal and ABS/TCS HU/CM terminal AA, then go to Step 4.
3	**VERIFY FAIL-SAFE OPERATION** • Turn the ignition switch off. • Remove **SST** (adapter harness) and connect all disconnected connectors. • Connect WDS or equivalent to DLC-2. • Turn ignition key to ON (engine off). • Access ABS_VOLT using the WDS or equivalent. • Does fail-safe relay operate?	Yes	Go to the next step.
		No	Replace ABS/TCS HU/CM, then go to the next step.
4	**VERIFY TROUBLESHOOTING COMPLETED** • Clear the DTC from the memory. (See 04–02–3 Clearing DTCs Procedures) • Is same DTC present?	Yes	Replace ABS/TCS HU/CM, then go to the next step.
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Is there any other DTC present?	Yes	Go to the applicable DTC inspection.
		No	Troubleshooting completed.

DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254

C6U040267650W11

DTC	C1210	RF pressure reduction solenoid valve
	C1214	RF pressure retention solenoid valve
	C1194	LF pressure reduction solenoid valve
	C1198	LF pressure retention solenoid valve
	C1246	RR pressure reduction solenoid valve
	C1254	RR pressure retention solenoid valve
	C1242	LR pressure reduction solenoid valve
	C1250	LR pressure retention solenoid valve
DETECTION CONDITION	• Solenoid monitor signal does not track in response to solenoid ON/OFF command.	
POSSIBLE CAUSE	• Open circuit, short to power supply, or short to ground circuit in ABS/TCS HU/CM • Stuck solenoid valve in ABS/TCS HU/CM	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY SOLENOID VALVE OPERATION** • Turn the ignition switch off. • Remove **SST** (adapter harness) and connect all disconnected connectors. • Connect WDS or equivalent to DLC-2. • Turn ignition key to ON (engine off). • Access solenoid valve (s) PIDs using the WDS or equivalent. • Does solenoid valve operate?	Yes	Go to the next step.
		No	Repair ABS/TCS HU/CM, then go to the next step.
2	**VERIFY TROUBLESHOOTING COMPLETED** • Clear the DTC from the memory. (See 04–02–3 Clearing DTCs Procedures) • Start engine and drive vehicle at **10 km/h {6.2 mph}** or above. • Gradually slow down and stop vehicle. • Is same DTC present?	Yes	Replace ABS/TCS HU/CM, then go to the next step.
		No	Go to the next step.
3	**VERIFY AFTER REPAIR PROCEDURE** • Is there any other DTC present?	Yes	Go to the applicable DTC inspection.
		No	Troubleshooting completed.

DTC C1508

C6U040267650W12

DTC C1508	TCS control
DETECTION CONDITION	• TCS control continues operation for **60 seconds or more**.
POSSIBLE CAUSE	• System is normal. For protection of solenoid valves in the ABS/TCS HU/CM, or protection of the engine, sustained and continual control of TCS is inhibited.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY CURRENT STATUS OF MALFUNCTION** • Clear the DTC from the memory. (See 04–02–3 Clearing DTCs Procedures) • Start engine and drive vehicle at **10 km/h {6.2 mph}** or above. • Is same DTC present?	Yes	Replace ABS/TCS HU/CM, then go to the next step.
		No	Inspect intermittent concern using the same procedure as engine control system.
2	**VERIFY AFTER REPAIR PROCEDURE** • Is there any other DTC present?	Yes	Go to the applicable DTC inspection.
		No	Troubleshooting completed.

DTC C1510, C1511, C1512, C1513

C6U040267650W13

DTC	C1510 C1511 C1512 C1513	**RF solenoid valve, motor or RF ABS wheel-speed sensor/ABS sensor rotor.** **LF solenoid valve, motor or LF ABS wheel-speed sensor/ABS sensor rotor.** **RR solenoid valve, motor or RR ABS wheel-speed sensor/ABS sensor rotor.** **LR solenoid valve, motor or LR ABS wheel-speed sensor/ABS sensor rotor.**
DETECTION CONDITION	• Wheel lock is detected during ABS operation (pressure reduction inoperative). • Pressure reduction on a single wheel continues for **more than 20 seconds**.	
POSSIBLE CAUSE	• Malfunction of solenoid valve in ABS/TCS HU/CM • Malfunction of ABS wheel-speed sensor • Damaged sensor rotor • Stuck pump motor in ABS/TCS HU/CM	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY OTHER DTC HAS BEEN RECORDED** • Has any ABS wheel-speed sensor, sensor rotor, solenoid valve, pump motor, or motor relay related DTC been output?	Yes	Go to the applicable DTC inspection.
		No	Go to the next step.
2	**INSPECT ABS/TCS HU/CM OPERATION** • Perform ABS/TCS HU/CM system inspection. (See 04–13–3 ABS/TCS HU/CM SYSTEM INSPECTION) • Is it normal?	Yes	Go to the next step.
		No	Replace ABS/TCS HU/CM, then go to the next step.
3	**VERIFY CURRENT STATUS OF MALFUNCTION** • Clear the DTC from the memory. (See 04–02–3 Clearing DTCs Procedures) • Start engine and drive vehicle at **10 km/h {6.2 mph}** or above at least one minute. • Gradually slow down and stop vehicle. • Is same DTC present?	Yes	Replace ABS/TCS HU/CM, then go to the next step.
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Is there any other DTC present?	Yes	Go to the applicable DTC inspection.
		No	Troubleshooting completed.

DTC U2021

C6U040267650W14

Note

- To warm up the engine completely, idle the engine and wait for **more than 5 minutes**.

DTC U2021	**Engine coolant temperature**
DETECTION CONDITION	• After engine is warmed up, engine coolant temperature is **0 °C {32 °F}** or less, and TCS operation is inhibited by PCM.
POSSIBLE CAUSE	• System is normal. When engine coolant temperature rises, TCS operation is executed by PCM.

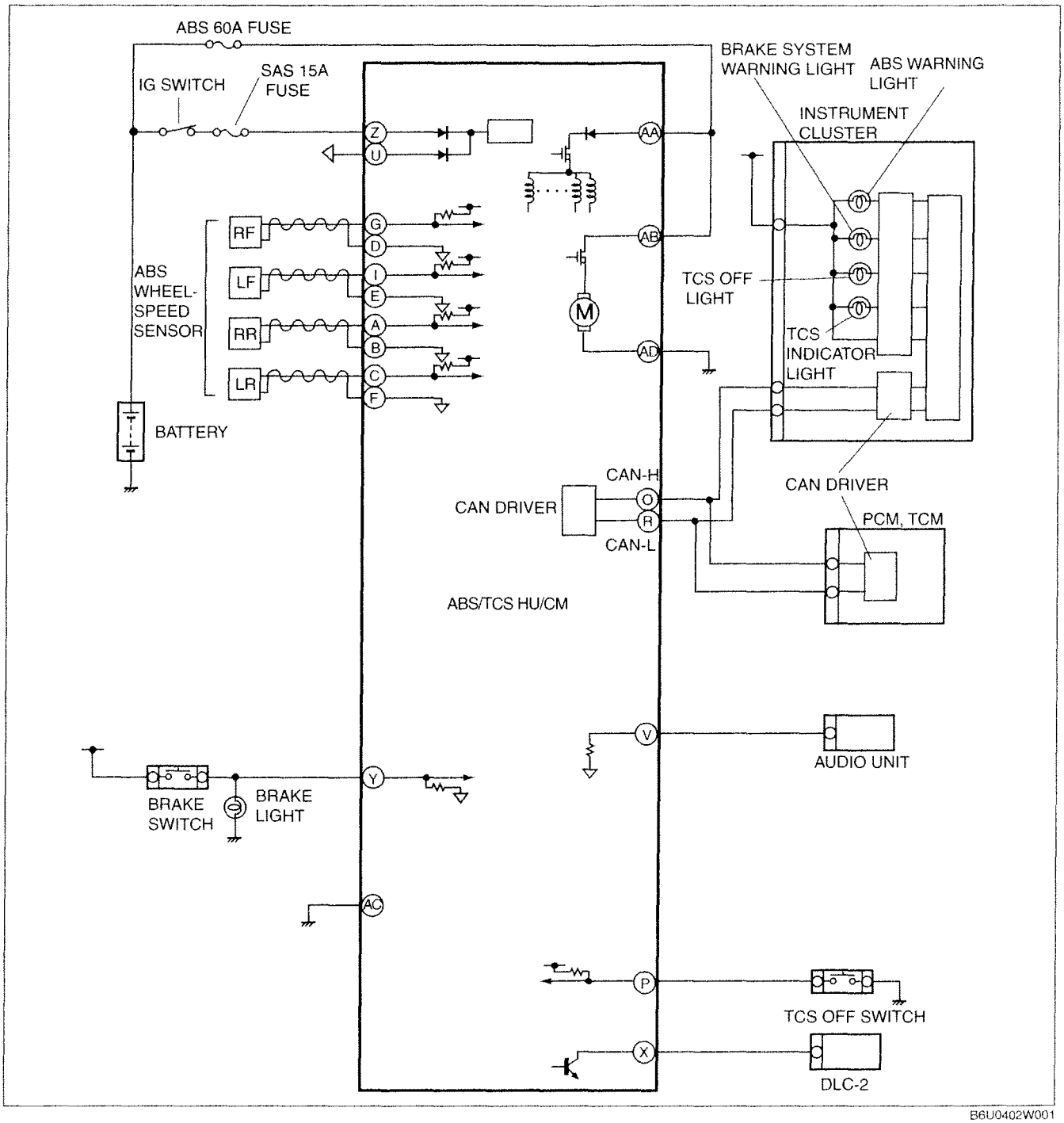
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**CHECK WHETHER ENGINE HAS WARMED UP** • Has engine warmed up?	Yes	Go to the next step.
		No	Warm up the engine. If TCS OFF light goes out, system is normal.
2	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER ENGINE IS WARMED UP** • Warm up the engine. • Is TCS indicator light also illuminated and DTC C1119 obtained?	Yes	Go to DTC C1119 chart.
		No	If TCS OFF light goes out, system is normal. If TCS OFF light does not goes out, go to the next step.
3	**VERIFY TROUBLESHOOTING COMPLETED** • Clear the DTC from the memory. (See 04–02–3 Clearing DTCs Procedures) • Is same DTC present?	Yes	Replace ABS/TCS HU/CM, then go to the next step.
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Is there any other DTC present?	Yes	Go to the applicable DTC inspection.
		No	Troubleshooting completed.

04–03 SYMPTOM TROUBLESHOOTING

SYSTEM WIRING DIAGRAM

C6U040367650W01



B6U0402W001

FOREWORD

C6U040367650W02

- Before performing the steps in Symptom Troubleshooting, perform the On-board Diagnostic Inspection. To check the DTC, follow the DTC Inspection steps.

PRECAUTION

C6U040367650W03

1. Any one or a combination of the ABS warning light, BRAKE system warning light, TCS indicator light, and TCS OFF light illuminate even when the system is normal.

Warning lights that may illuminate and/or flash	Cases in which the light may illuminate	Conditions in which the light will go out	ABS, EBD, TCS control
Any or all the following light (s) illuminate: • ABS warning light • BRAKE system warning light (*1)	Under any of the following conditions: • When the front wheels are jacked up, stuck, or placed on a chassis roller, and only the front wheel ABS wheel speed sensors are spun for **more than 60 seconds**.	After turning ignition key to OFF, vehicle is driven at speed **greater than 10 km/h {6.2 mph}** and normal operation is confirmed.	• ABS: Cuts control. • EBD: 1. Cuts control, in cases where the light may illuminate, only when ABS/TCS HU/CM detects that a wheel speed sensor determines that more than the two rear wheels are malfunctioning. 2. Operates control, if wheel speed sensor determines that more than 3 wheels are functioning correctly.
	Parking brake is not fully released while driving.		
	Brake drag.		
	Sudden acceleration/ deceleration.		
	Left/right or front/rear tires are different. (Size, radius, tire pressure, or wear is other than that listed on tire label.)		
All the following lights illuminate: • ABS warning light • BRAKE system warning light	Battery voltage at ABS/TCS HU/CM ignition terminal Z drops **below about 9 to 10 V.** (*2)	Battery voltage rises **above about 10 V.** (Only BRAKE system warning light goes out.)	ABS: Operates control. EBD: Operates control.

*1 : The light will illuminate only when ABS/TCS HU/CM detects that a rear wheel's speed sensor is malfunctioning.

*2 : If battery voltage drops **below 9 V** while vehicle speed is **greater than 6 km/h {3.7mph}**, ABS/TCS HU/CM records DTC B1318.

Warning lights that may illuminate and/or flash	Cases in which the light may illuminate	Conditions in which the light will go out	ABS, EBD, TCS control
The following light illuminates: • TCS OFF light	When the engine coolant temperature is below **0 °C {32 °F}**. (*1)	When engine is started and engine coolant temperature rises **above 0 °C {32 °F}**.	ABS: Cuts control. EBD: Cuts control. TCS: 1. If TCS is operating, cuts control after gradually released TCS control value. 2. If TCS is not operating, cuts control.
All the following lights flash: • ABS warning light • BRAKE system warning light • TCS OFF light	When confirming DTC, PID/ DATA and ACTIVE COMMAND MODES item using the WDS or equivalent.	When ABS ON-BOARD DIAGNOSTIC SYSTEM is released.	ABS: Cuts control. EBD: Cuts control. TCS: Cuts control.
The following light illuminates: • TCS OFF light	For **1 second** after starting the engine.	**More than 1 second** after starting the engine.	ABS: Cuts control. EBD: Cuts control. TCS: Cuts control.
Warning lights that may illuminate and/or flash.	Cases in which the light may illuminate.	Conditions in which the light will go out.	ABS, EBD, TCS control.

*1 : DTC U2021 for past malfunction is not recorded in the ABS/TCS HU/CM. DTC U2021 for present malfunction displayed, but goes out when engine coolant temperature rises **above 0° C {32° F}.**

2. Precautions during servicing of ABS/TCS.
   The ABS/TCS is composed of electrical and mechanical parts. It is necessary to categorize malfunctions as being either electrical or hydraulic when performing troubleshooting.
   (1) Malfunctions in electrical system
   - The ABS/TCS HU/CM has an on-board diagnostic function. With this function, any one or a combination of the ABS warning light, BRAKE system warning light, TCS indicator light, and TCS OFF light will come on when there is a problem in the electrical system. Also, past and present malfunctions are recorded in the ABS/TCS HU/CM. This function can find malfunctions that do not occur during periodic inspections. Connect the WDS or equivalent to the DLC-2. Stored malfunctions will be displayed in the order of occurrence. To find out the causes of ABS/TCS malfunctions, use these on-board diagnostic results.
   - If a malfunction occurred in the past but is now normal, the cause is likely a temporary poor connection of the harness. The ABS/TCS HU/CM usually operates normally. Be careful when searching for the cause of malfunction.
   - After repair, it is necessary to clear the DTC from the ABS/TCS HU/CM memory. Also, if the ABS/TCS related parts have been replaced, verify that the no DTC has been displayed after repairs.
   - After repairing the ABS wheel-speed sensor or ABS sensor rotor, or after replacing the ABS/TCS HU/CM, the ABS warning light may not go off (*) even when the ignition key is turned ON. In this case, drive the vehicle at a speed of **more than 10km/h {6.2mph}**, make sure that ABS warning light goes off, and then clear the DTC.
     * The BRAKE system warning light also illuminates when there is any rear wheel deformations.
   - When repairing, if the ABS/TCS related connectors are disconnected and the ignition key is turned ON, the ABS/TCS HU/CM will mistakenly detect a fault and record it as a malfunction.
   - To protect the ABS/TCS HU/CM, make sure the ignition is off before connecting or disconnecting the ABS/TCS HU/CM connector.
   - To protect the terminal, use the **SST** (49 G066 001) when connecting the tester lead to the ABS/TCS HU/CM connector.

   (2) Malfunctions in hydraulic system
   - Symptoms in a hydraulic system malfunction are similar to those in a conventional brake malfunction. However, it is necessary to determine if the malfunction is in an ABS component or the conventional brake system.
   - The ABS hydraulic unit contains delicate mechanical parts. If foreign materials get into the component, the ABS may fail to operate. Also, it will likely become extremely difficult to find the location of the malfunction in the event that the brakes operate but the ABS does not. Make sure foreign materials do not get inside when servicing the ABS (e.g. brake fluid replacement, pipe removal).

Intermittent Concern Troubleshooting
Vibration method

- If malfunction occurs or becomes worse while driving on a rough road or when the engine is vibrating, perform the steps below.

Note

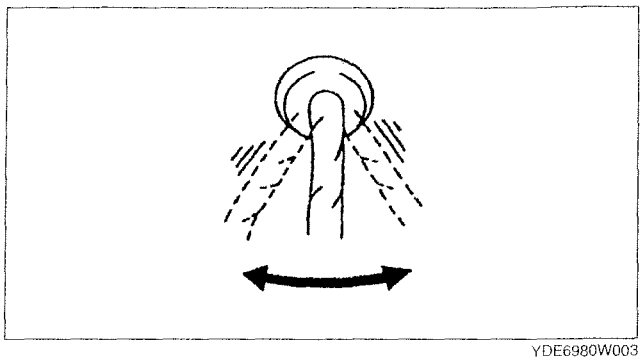
- There are several reasons why vehicle or engine vibration could cause an electrical malfunction. Some of the things to check for are:
  — Connectors not fully seated.
  — Wire harnesses not having full play.
  — Wires laying across brackets or moving parts.
  — Wires routed too close to hot parts.
- An improperly routed, improperly clamped, or loose harness can cause wiring to become pinched between parts.
- The connector joints, points of vibration, and places where wire harnesses pass through the firewall, body panels, etc. are the major areas to be checked.

Inspection method for switch connectors or wires

1. Connect WDS or equivalent to DLC-2.
2. Turn ignition key to ON (engine off).

Note
- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Turn switch on manually.
5. Shake each connector or wire harness a bit vertically and horizontally while monitoring the PID.
   - If PID value is unstable, check for poor connection.



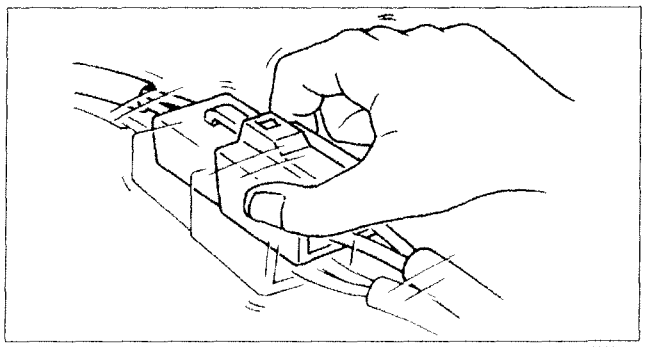
YDE6980W003

Inspection method for sensor connectors or wires

1. Connect WDS or equivalent to DLC-2.
2. Turn ignition key to ON (engine off).

Note
- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Shake each connector or wire harness a bit vertically and horizontally while monitoring the PID.
   - If PID value is unstable, check for poor connection.



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Inspection method for sensors

1. Connect WDS or equivalent to DLC-2.
2. Turn ignition key to ON (engine off).

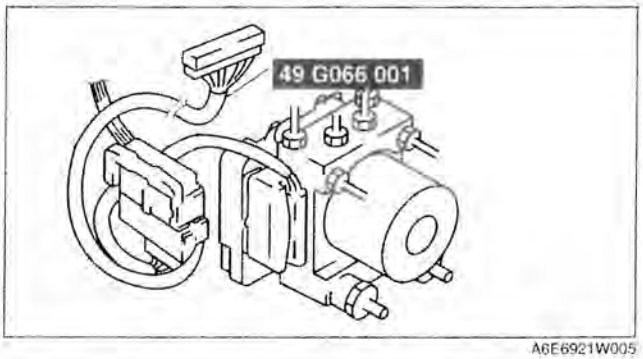
Note
- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Vibrate the sensor slightly with your finger.
   - If PID value is unstable or malfunction occurs, check for poor connection and/or poorly mounted sensor.

Malfunction data monitor method

1. Perform malfunction reappearance test according to malfunction reappearance mode and malfunction data monitor. The malfunction cause is found in the malfunction data.

Malfunction data monitor using SST



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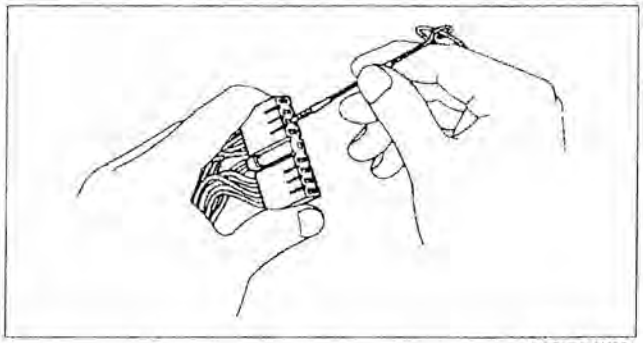
Connector terminal check method

1. Check the connection condition of each female terminal.
2. Insert male terminal; fit the female terminal side to female terminal and check to see whether the malfunction is in the female terminal or not.



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SYMPTOM TROUBLESHOOTING

C6U040367650W04

- Verify the symptoms, and perform troubleshooting according to the appropriate number.

No.	Symptom
1	ABS warning light, BRAKE system warning light, TCS indicator light, TCS OFF light do not illuminate with ignition key to ON.
2	Neither ABS warning light nor BRAKE system warning light illuminate with ignition key to ON.
3	ABS warning light does not illuminate with ignition key to ON.
4	BRAKE system warning light and TCS indicator light do not illuminate with ignition key to ON.
5	TCS OFF light does not illuminate with ignition key to ON.
6	Both ABS warning light and BRAKE system warning light stay on **more than 4 seconds** with ignition key to ON.
7	ABS warning light stays on **more than 4 seconds** with ignition key to ON.
8	BRAKE system warning light stays on **more than 4 seconds** with ignition key to ON. (Parking brake is released.)
9	TCS OFF light stays on **more than 4 seconds** with ignition key to ON.
10	TCS does not work correctly.
11	There is a malfunction in the system even though ABS warning light, BRAKE system warning light, TCS OFF light, TCS indicator light do not illuminate.

x: Applicable

	Possible factor / Troubleshooting item	ABS/TCS HU/CM	Instrument cluster	ABS warning light circuit	BRAKE system warning light circuit	TCS OFF light circuit	TCS OFF switch circuit	Battery	Brake fluid	Brake fluid level sensor	Parking brake switch	Charging system	ABS/TCS HU/CM power supply (terminal Z)	ABS/TCS HU/CM GND 1 (terminal AA)	Instrument cluster power supply (terminal 2V)	Instrument cluster GND (terminal 2E)	Tire size, tire air pressure	Conventional brakes	Brake pipe routing
1	ABS warning light, BRAKE system warning light, TCS indicator light, TCS OFF light do not illuminate with ignition key ON.		X												X				
2	Neither ABS warning light nor BRAKE system warning light illuminates with ignition key ON.		X													X			
3	ABS warning light does not illuminate with ignition key ON.	X	X	X															
4	BRAKE system warning light does not illuminate with ignition key ON.	X	X		X														
5	TCS OFF light and TCS indicator light do not illuminate with ignition key ON.	X	X			X													
6	Both ABS warning light and BRAKE system warning light stay on more than 4 seconds with ignition key ON.	X	X	X	X			X				X	X	X					
7	ABS warning light stays on more than 4 seconds with ignition key ON.	X	X	X															
8	BRAKE system warning light stays on more than 4 seconds with ignition key ON.	X	X		X				X	X	X								
9	TCS OFF light stays on more than 4 seconds with ignition key ON.	X	X			X	X												
10	TCS does not work correctly.	X															X		
11	There is a malfunction in the system even though ABS warning light, BRAKE system warning light, TCS OFF light, TCS indicator light do not illuminate.	X																X	X

B6U0403W002

NO.1 ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, TCS OFF LIGHT, TCS INDICATOR LIGHT DO NOT ILLUMINATE WITH IGNITION KEY TO ON

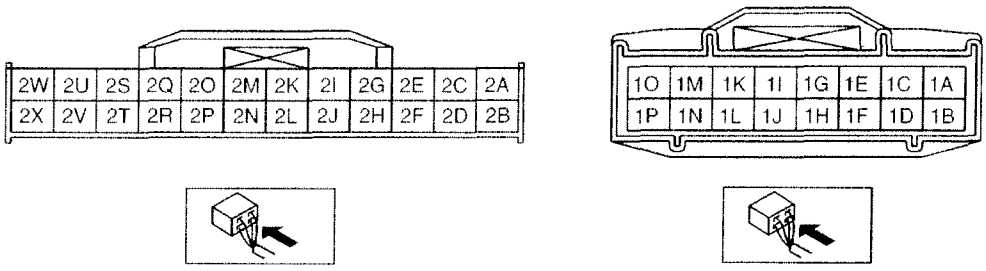
C6U040367650W05

1	**ABS warning light, BRAKE system warning light, TCS OFF light, TCS indicator light do not illuminate with ignition key to ON.**

[TROUBLESHOOTING HINTS]
- **Malfunction of instrument cluster or ABS/TCS HU/CM**
- **Improper configuration (instrument cluster)**

STEP	INSPECTION		ACTION
1	**VERIFY WHETHER MALFUNCTION IS IN WARNING LIGHTS AND INDICATOR LIGHTS' COMMON POWER SUPPLY, OR IN OTHER WARNING LIGHTS AND INDICATOR LIGHTS** • Do other warning and indicator lights illuminate when ignition key is turned to ON?	Yes	Go to step 4.
		No	Go to the next step.
2	**INSPECT INSTRUMENT CLUSTER POWER SUPPLY FUSE** • Is instrument cluster ignition power supply fuse okay?	Yes	Go to the next step.
		No	Check for a short to ground on circuit of blown fuse. Repair or replace if necessary. Install appropriate amperage fuse.
*3	**VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN INSTRUMENT CLUSTER POWER SUPPLY AND INSTRUMENT CLUSTER FOR CONTINUITY) OR INSTRUMENT CLUSTER** • Turn ignition key to ON. • Measure voltage at instrument cluster connector (24 pin) terminal 2V. • Is voltage **approximately 12V?**	Yes	Replace instrument cluster (open circuit in instrument cluster).
		No	Check for open circuit between instrument cluster and ground. Repair or replace if necessary.
4	**CONFIRM DTC U1900 USING WDS OR EQUIVALENT** • Retrieve DTC from PCM, ABS/TCS and instrument cluster. • Is DTC U1900 retrieved?	Yes	Go to the next step.
		No	Inspect instrument cluster. If okay, then go to step 6.
5	**CONFIRM THE FOLLOWING PIDs USING WDS OR EQUIVALENT:** • ABS_MSG • PCM_MSG • Is "not present" message displayed on WDS or equivalent?	Yes	Replace instrument cluster (open circuit in instrument cluster).
		No	Network communication, for related system is malfunction. Repair or replace if necessary.
6	**CONFIRM DTC B2477 FOR INSTRUMENT CLUSTER USING WDS OR EQUIVALENT** • Is DTC B2477 retrieved?	Yes	Re-configure the instrument cluster.
		No	Replace ABS/TCS HU/CM.

INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR



- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

NO.2 NEITHER ABS WARNING LIGHT NOR BRAKE SYSTEM WARNING LIGHT ILLUMINATE WITH IGNITION KEY TO ON

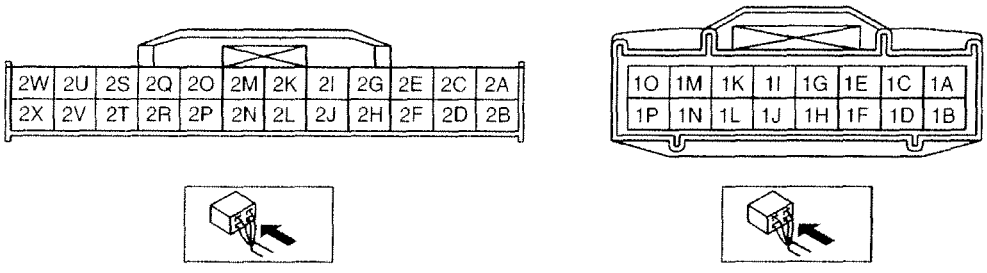
C6U040367650W06

2	Neither ABS warning light nor BRAKE system warning light illuminate with ignition key to ON.

[TROUBLESHOOTING HINTS]
- Malfunction of instrument cluster or ABS/TCS HU/CM
- Improper configuration (instrument cluster)

STEP	INSPECTION		ACTION
1	**VERIFY WHETHER MALFUNCTION IS IN WARNING LIGHTS AND INDICATOR LIGHTS' COMMON POWER SUPPLY, OR IN OTHER WARNING LIGHTS AND INDICATOR LIGHTS** • Do other warning and indicator lights illuminate when ignition key is turned to ON?	Yes	Go to step 4.
		No	Go to the next step.
2	**INSPECT INSTRUMENT CLUSTER POWER SUPPLY FUSE** • Is instrument cluster ignition power supply fuse okay?	Yes	Go to the next step.
		No	Check for a short to ground on circuit of blown fuse. Repair or replace if necessary. Install appropriate amperage fuse.
*3	**VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN INSTRUMENT CLUSTER POWER SUPPLY AND INSTRUMENT CLUSTER FOR CONTINUITY) OR INSTRUMENT CLUSTER** • Turn ignition key to ON. • Measure voltage at instrument cluster connector (24 pin) terminal 2V. • Is voltage **approximately 12V?**	Yes	Replace instrument cluster (open circuit in instrument cluster).
		No	Check for open circuit between instrument cluster and ground. Repair or replace if necessary.
4	**CONFIRM DTC U1900 USING WDS OR EQUIVALENT** • Retrieve DTC from PCM, ABS/TCS and instrument cluster. • Is DTC U1900 retrieved?	Yes	Go to the next step.
		No	Inspect instrument cluster. If okay, then go to step 6.
5	**CONFIRM THE FOLLOWING PIDs USING WDS OR EQUIVALENT:** • ABS_MSG • PCM_MSG • Is "not present" message displayed on WDS or equivalent?	Yes	Replace instrument cluster (open circuit in instrument cluster).
		No	Network communication, for related system is malfunction. Repair or replace if necessary.
6	**CONFIRM DTC B2477 FOR INSTRUMENT CLUSTER USING WDS OR EQUIVALENT** • Is DTC B2477 retrieved?	Yes	Re-configure the instrument cluster.
		No	Replace ABS/TCS HU/CM.

INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR



NO.3 ABS WARNING LIGHT DOES NOT ILLUMINATE WITH IGNITION KEY TO ON

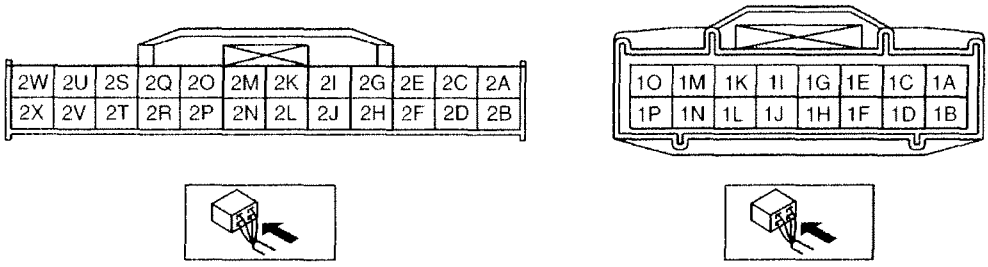
C6U040367650W07

3	ABS warning light does not illuminate with ignition key to ON.
[TROUBLESHOOTING HINTS] • Malfunction of instrument cluster or ABS/TCS HU/CM	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	CONFIRM DTC U1900 USING WDS OR EQUIVALENT • Retrieve DTC from PCM, ABS/TCS and instrument cluster. • Is DTC U1900 retrieved?	Yes	Go to the next step.
		No	Inspect instrument cluster. If okay, then go to the next step.
2	CONFIRM THE FOLLOWING PIDs USING WDS OR EQUIVALENT: • ABS_MSG • PCM_MSG • Is "not present" message displayed on WDS or equivalent?	Yes	Replace instrument cluster (open circuit in instrument cluster).
		No	Network communication, for related system is malfunction. Repair or replace if necessary.

INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR



NO.4 BRAKE SYSTEM WARNING LIGHT DOES NOT ILLUMINATE WITH IGNITION KEY TO ON

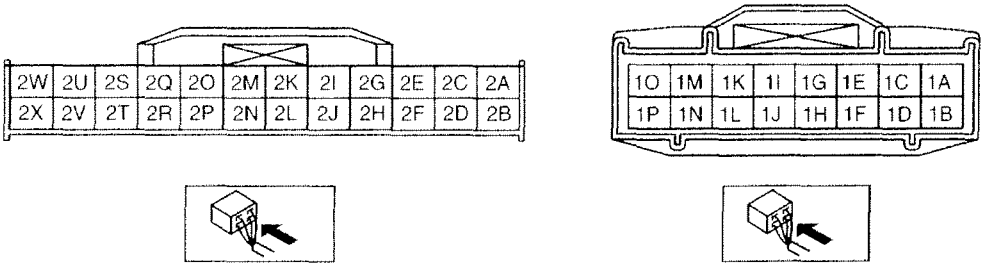
C6U040367650W08

4	BRAKE system warning light does not illuminate with ignition key to ON.
[TROUBLESHOOTING HINTS] • Malfunction of instrument cluster or ABS/TCS HU/CM	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	CONFIRM DTC U1900 USING WDS OR EQUIVALENT • Retrieve DTC from PCM, ABS/TCS and instrument cluster. • Is DTC U1900 retrieved?	Yes	Go to the next step.
		No	Inspect instrument cluster. If okay, then go to the next step.
2	CONFIRM THE FOLLOWING PIDs USING WDS OR EQUIVALENT: • ABS_MSG • PCM_MSG • Is "not present" message displayed on WDS or equivalent?	Yes	Replace instrument cluster (open circuit in instrument cluster).
		No	Network communication, for related system is malfunction. Repair or replace if necessary.

INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR



NO.5 TCS OFF LIGHT AND TCS INDICATOR LIGHT DO NOT ILLUMINATE WITH IGNITION KEY TO ON

C6U040367650W09

5	TCS OFF light and TCS indicator light do not illuminate with ignition key to ON.

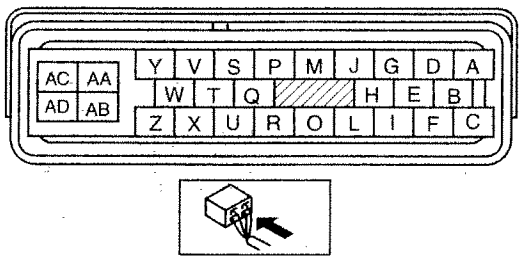
[TROUBLESHOOTING HINTS]
- Malfunction of instrument cluster or ABS/TCS HU/CM
- Improper configuration (ABS/TCS HU/CM)

Diagnostic procedure

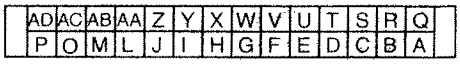
STEP	INSPECTION		ACTION
1	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR CONTINUITY AND SHORT CIRCUIT** • Activate TRAC_OFF (TCS OFF light) using the WDS or equivalent. • Is error message displayed regarding communication between ABS/TCS CM and WDS or equivalent?	Yes	If a communication error message is displayed even after inspecting according to procedures displayed on the WDS or equivalent, go to Step 6.
		No	Go to the next step.
2	**CHECK TCS OFF LIGHT BULB FOR MALFUNCTIONS BY USING INSPECTION FUNCTION IN ABS/TCS HU/CM** • Activate TRAC_OFF (TCS OFF light) using the WDS or equivalent • Does TCS OFF light illuminate?	Yes	Go to the next step.
		No	Go to next step 3.
3	**CONFIRM DTC U1900 USING WDS OR EQUIVALENT** • Retrieve DTC from PCM, ABS/TCS and instrument cluster. • Is DTC U1900 retrieved?	Yes	Go to the next step.
		No	Inspect instrument cluster. If okay, then go to step 6.
4	**CONFIRM THE FOLLOWING PIDs USING WDS OR EQUIVALENT:** • ABS_MSG • PCM_MSG • Is "not present" message displayed on WDS or equivalent?	Yes	Replace instrument cluster (open circuit in instrument cluster).
		No	Network communication, for related system is malfunction. Repair or replace if necessary.
5	**CONFIRM DTC B2477 FOR INSTRUMENT CLUSTER USING WDS OR EQUIVALENT** • Is DTC B2477 retrieved?	Yes	Re-configure the instrument cluster.
		No	Replace ABS/TCS HU/CM.
*6	**INSPECT WIRING HARNESS BETWEEN ABS/TCS CM AND DLC-2 FOR CONTINUITY** • Is there continuity between **SST** terminal X and DLC-2?	Yes	Go to the next step.
		No	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
*7	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR SHORT CIRCUIT TO B+** • Is voltage **approximately 12 V** at **SST** terminal X?	Yes	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
		No	Go to the next step.
8	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR SHORT CIRCUIT TO GROUND** • If there continuity between **SST** terminal X and ground?	Yes	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
		No	Replace ABS/TCS HU/CM (communication circuit malfunction in ABS/TCS HU/CM).

STEP	INSPECTION	ACTION

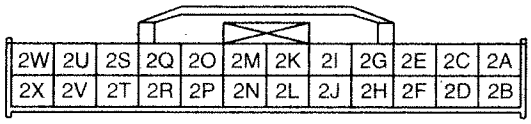
ABS/TCS HU/CM HARNESS SIDE CONNECTOR

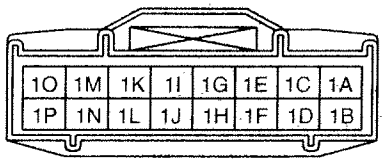


SST (49 G066 001) CONNECTOR



INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR





- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

NO.6 BOTH ABS WARNING LIGHT AND BRAKE SYSTEM WARNING LIGHT STAY ON MORE THAN 4 SECONDS WITH IGNITION KEY TO ON

C6U040367650W10

6	**Both ABS warning light and BRAKE system warning light stay on more than 4 seconds with ignition key to ON.**

[TROUBLESHOOTING HINTS]
- **ABS/TCS HU/CM detects ABS proportioning system malfunction.**
- **ABS/TCS HU/CM detects low voltage in power supply (ABS/TCS CM ingestion terminal Z voltage is below about 9 to 10 V).**
- **ABS/TCS HU/CM does not operate.**
- **Malfunction of communication network.**

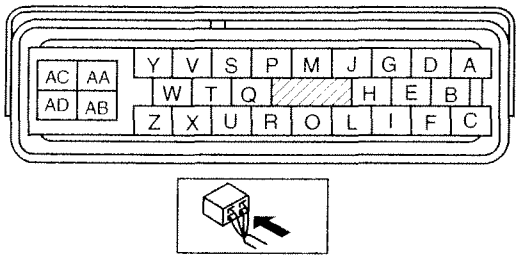
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT ABS/TCS HU/CM POWER SUPPLY FUSE** • Is ABS/TCS HU/CM ignition power supply fuse okay?	Yes	Go to the next step.
		No	Check for a short to ground on circuit of blown fuse. Repair or replace if necessary. Install appropriate amperage fuse.
2	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR CONTINUITY AND SHORT CIRCUIT** • Perform DTC inspection. • Is error message displayed regarding communication between ABS/TCS HU/CM and WDS or equivalent?	Yes	If a communication error message is displayed even after inspecting according to procedure displayed on WDS or equivalent, go to step 10.
		No	Go to the next step.
3	**CHECK FOR DTCS IN ABS/TCS HU/CM** • Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to the next step.

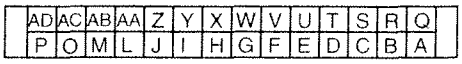
STEP	INSPECTION		ACTION
4	**INSPECT PID/DATA IN ABS/TCS HU/CM** • Inspect the following items using the WDS or equivalent PID/DATA monitor function. — ABS_LAMP (ABS warning light) — BRAKE_ LMP (BRAKE system warning light) — ABS_VOLT (power supply voltage) • Is ABS_LAMP and BRAKE_LMP ON after **more than 4 seconds** with ignition key to ON?	Yes	Go to the next step.
		No	Inspect instrument cluster.
5	**INSPECT ABS/TCS HU/CM IGNITION POWER SUPPLY SYSTEM (TERMINAL Z)** • Check the voltage for PID/DATA monitor ABS_VOLT item. **Specification: about 10 V** • Is voltage within specification?	Yes	Replace ABS/TCS HU/CM (open circuit or short in ground circuit in ABS/TCS HU/CM)
		No	Go to the next step.
6	**INSPECT BATTERY** • Is battery voltage normal?	Yes	Go to the next step.
		No	Inspect battery and charging system.
7	**INSPECT CHARGING SYSTEM** • Is battery voltage normal with electrical load (A/C, headlight, etc.) on and engine idling?	Yes	Go to the next step.
		No	Inspect charging system (drive belt tension, generator, etc.).
*8	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM POWER SUPPLY AND ABS/TCS HU/CM FOR CONTINUITY** • Disconnect ABS/TCS HU/CM connector. • Connect the **SST** (49 G066 001) (vehicle harness side only). • Is voltage **approximately 12 V** at **SST** terminal Z?	Yes	Go to the next step.
		No	Check for connection of ABS/TCS HU/CM connector securely.
*9	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM GROUND FOR CONTINUITY** • Turn ignition key to LOCK. • Is there continuity between **SST** terminal AC and ground?	Yes	If a malfunction error message is displayed on WDS or equivalent in Step 1 inspection, go to the next step. If a malfunction error message is not displayed on WDS or equivalent in Step 1 inspection, troubleshooting is completed.
		No	Repair wiring harness between ABS/TCS HU/CM and ground.
*10	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR CONTINUITY** • Is there continuity between **SST** terminal X and DLC-2?	Yes	Go to the next step.
		No	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
11	***INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR SHORT CIRCUIT TO BATTERY** • Is voltage **approximately 12 V** at SST terminal X?	Yes	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
		No	Go to the next step.
12	***INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR SHORT CIRCUIT TO GROUND** • Is there continuity between **SST** Terminal X and DLC-2?	Yes	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
		No	Replace ABS/TCS HU/CM (communication circuit malfunction in ABS/TCS HU/CM)

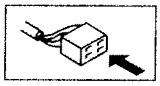
STEP	INSPECTION	ACTION

ABS/TCS HU/CM HARNESS SIDE CONNECTOR

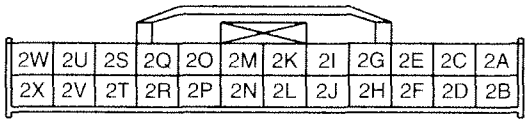


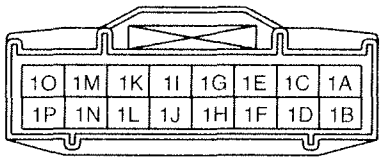
SST (49 G066 001) CONNECTOR

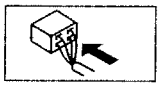


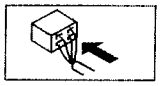


INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR









NO.7 ABS WARNING LIGHT STAYS ON MORE THAN 4 SECONDS WITH IGNITION KEY TO ON

C6U040367650W11

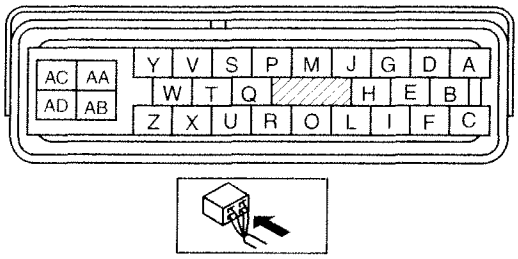
7	**ABS warning light stays on more than 4 seconds with ignition key to ON.**
[TROUBLESHOOTING HINTS] • **ABS/TCS HU/CM detects ABS system malfunction.**	

Diagnostic procedure

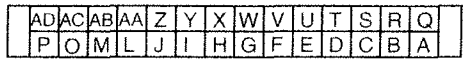
STEP	INSPECTION		ACTION
1	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR CONTINUITY AND SHORT CIRCUIT** • Perform DTC inspection. • Is error message displayed regarding communication between ABS/TCS HU/CM and WDS or equivalent?	Yes	If the communication error message is displayed even after inspecting according to procedures displayed in the WDS or equivalent, go to Step 4.
		No	Go to the next step.
2	**CHECK FOR DTCs IN ABS/TCS HU/CM** • Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to the next step.
3	**INSPECT PID/DATA IN ABS/TCS HU/CM** • Inspect the following items using the WDS or equivalent PID/DATA monitor function. — ABS_LAMP (ABS warning light) • Is ABS_LAMP ON after **more than 4 seconds** with ignition key to ON?	Yes	Replace ABS/TCS HU/CM (open circuit or short to ground in ABS/TCS HU/CM).
		No	Inspect instrument cluster.
*4	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR CONTINUITY** Disconnect ABS/TCS HU/CM connector. • Connect the **SST** (49 G066 001) (vehicle harness side only). • Is there continuity between **SST** terminal X and DLC-2?	Yes	Go to the next step.
		No	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
*5	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR SHORT CIRCUIT TO B+** • Is voltage **approximately 12V** at **SST** terminal X?	Yes	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
		No	Go to the next step.

STEP	INSPECTION		ACTION
*6	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR SHORT CIRCUIT TO GROUND** • Is there continuity between **SST** terminal X and ground?	Yes	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
		No	Replace ABS/TCS HU/CM (communication circuit malfunction is ABS/TCS HU/CM).

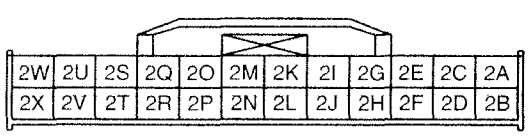
ABS/TCS HU/CM HARNESS SIDE CONNECTOR

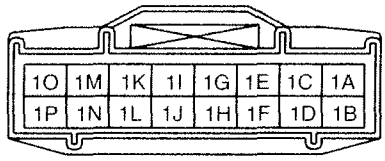


SST (49 G066 001) CONNECTOR



INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR





04–03

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

NO.8 BRAKE SYSTEM WARNING LIGHT STAYS ON MORE THAN 4 SECONDS WITH IGNITION KEY TO ON

C6U040367650W12

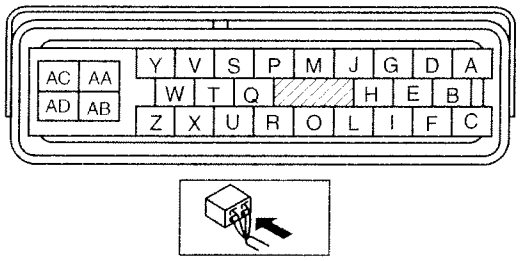
8	**BRAKE system warning light stays on more than 4 seconds with ignition key to ON. (Parking brake is released.)**
[TROUBLESHOOTING HINTS] • **Malfunction of instrument cluster or ABS/TCS HU/CM** • **Short to ground in circuit in parking brake switch and/or brake fluid level sensor**	

Diagnostic procedure

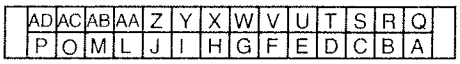
STEP	INSPECTION		ACTION
1	**INSPECT BRAKE FLUID LEVEL** • Is brake fluid level okay?	Yes	Go to the next step.
		No	Add brake fluid.
*2	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR CONTINUITY AND SHORT CIRCUIT** • Inspect the following items using the WDS or equivalent PID/DATA monitor function. — BRAKE_LMP (BRAKE system warning light) • Is error message displayed regarding communication between ABS/TCS HU/CM and WDS or equivalent?	Yes	If a communication error message is displayed even after inspecting according to procedures displayed on WDS or equivalent. Go to next step 6.
		No	Go to the next step.
3	**CHECK FOR DTCs IN ABS/TCS HU/CM** • Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to the next step.

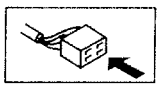
STEP	INSPECTION		ACTION
4	**INSPECT PID/DATA IN ABS/TCS HU/CM** • Inspect (BRAKE system warning light) using the WDS or equivalent PID/DATA monitor function. • Is BRAKE_LMP on after **more than 4 seconds** with ignition key to ON?	Yes	Replace ABS/TCS HU/CM.
		No	Go to the next step.
5	**VERIFY WHETHER MALFUNCTION IS IN PARKING BRAKE SWITCH OR BRAKE FLUID LEVEL SENSOR, OR IN SOME OTHER PART** • Disconnect the following in order: 1. Parking brake switch connector 2. Brake fluid level sensor connector • Does BRAKE system warning light go out with ignition key to ON?	Yes	Replace parking brake switch and/or brake fluid level sensor (shorted on some internal part).
		No	Perform the following inspections. Repair if necessary. • Short to ground in wiring harness between instrument cluster (BRAKE system warning light) and parking brake switch. • Short to ground in wiring harness between instrument cluster (BRAKE system warning light) and brake fluid level sensor. Inspect instrument cluster.
*6	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR CONTINUITY** • Disconnect ABS/TCS HU/CM connector. • Connect the **SST** (49 G066 001) (vehicle harness side only). • Is there continuity between **SST** terminal X and DLC-2?	Yes	Go to the next step.
		No	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
*7	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR SHORT CIRCUIT TO B+** • Is voltage **approximately 12 V** at **SST** terminal X?	Yes	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
		No	Go to the next step.
*8	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR SHORT CIRCUIT TO GROUND** • Is there continuity between **SST** terminal X and ground?	Yes	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
		No	Replace ABS/TCS HU/CM (communication circuit malfunction in ABS/TCS HU/CM).

ABS/TCS HU/CM HARNESS SIDE CONNECTOR

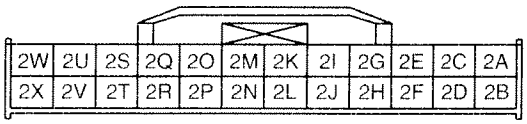


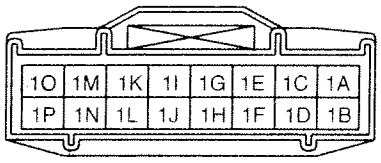
SST (49 G066 001) CONNECTOR

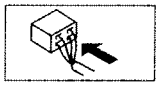


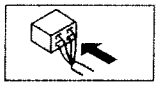


INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR









- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

NO.9 TCS OFF LIGHT STAYS ON MORE THAN 4 SECONDS WITH IGNITION KEY TO ON

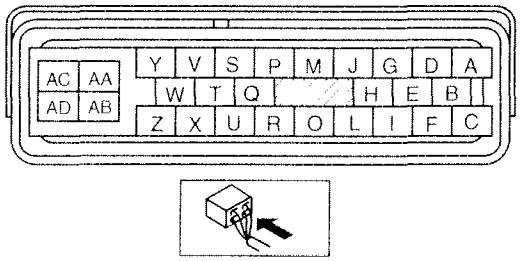
C6U040367650W13

9	TCS OFF light stays on more than 4 seconds with ignition key to ON
[TROUBLESHOOTING HINTS] • Warning light circuit open or shorted to ground in ABS/TCS HU/CM	

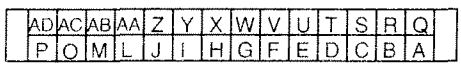
Diagnostic procedure

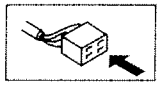
STEP	INSPECTION		ACTION
1	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR CONTINUITY AND SHORT CIRCUIT** • Perform DTC inspection. • Is error message displayed regarding communication between ABS/TCS HU/CM and WDS or equivalent?	Yes	If a communication error message is displayed even after inspecting according to procedures displayed on WDS or equivalent, go to Step 7.
		No	Go to the next step.
2	**CHECK FOR DTCS IN ABS/TCS HU/CM** • Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to the next step.
3	**INSPECT PID/DATA IN ABS/TCS HU/CM** • Inspect the following items using the WDS or equivalent PID/DATA monitor function. — **TRAC_SW** (TCS OFF switch) • Is **TRAC_SW** ON displayed on WDS or equivalent?	Yes	Go to Step 5 (TCS OFF switch system malfunction).
		No	Go to the next step.
*4	**CHECK FOR SHORT CIRCUIT TO GROUND IN ABS/TCS HU/CM** • Disconnect ABS/TCS HU/CM connector. • Does TCS OFF light go out with ignition key to ON?	Yes	Replace ABS/TCS HU/CM (short to ground in ABS/TCS HU/CM).
		No	Inspect instrument cluster.
*5	**INSPECT TCS OFF SWITCH** • Disconnect TCS OFF switch connector. • Is TRAC_SW ON displayed on WDS or equivalent?	Yes	Go to the next step.
		No	Replace TCS OFF switch (TCS will not turn off, even though switch is OFF).
*6	**VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN ABS/TCS HU/CM AND TCS OFF SWITCH, CHECK FOR SHORT CIRCUIT TO GROUND) OR ABS/TCS HU/CM** • Is there continuity between **SST** terminal P and ground?	Yes	Repair wiring harness between ABS/TCS HU/CM (terminal P) and TCS OFF switch.
*7	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR SHORT CIRCUIT TO B+** • Is voltage **approximately 12 V** at **SST** terminal X?	Yes	Repair wiring harness between ABS/TCS HU/CM (terminal P) and DLC-2.
		No	Go to the next step.
*8	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 FOR SHORT CIRCUIT TO GROUND** • Is there continuity between **SST** terminal X and ground?	Yes	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
		No	Replace ABS/TCS HU/CM (communication circuit malfunction in ABS/TCS HU/CM).

ABS/TCS HU/CM HARNESS SIDE CONNECTOR



SST (49 G066 001) CONNECTOR





- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged

NO.10 TCS DOES NOT WORK CORRECTLY

C6U040367650W14

10	TCS does not work correctly.

[TROUBLESHOOTING HINTS]
- **There is a difference in size or air pressure between the front and rear tires**
- **There is a malfunction in the engine control system.**
- **ABS/TCS HU/CM detects TCS system malfunction**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**CHECK TIRE SIZE AND AIR PRESSURE** • Inspect tire size and air pressure. • Are size and air pressure as specified?	Yes	Go to the next step.
		No	Replace with specified tires or adjust tire air pressure.
2	**CHECK FOR DTCS IN ABS/TCS HU/CM** • Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to the next step.
3	**CHECK FOR DTCS IN PCM** • Check the DTC for the PCM ON-BOARD DIAGNOSTIC SYSTEM. • Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to the next step.
4	**CHECK FOR TCS OPERATION** • Jack up the front of the vehicle on level ground and support it on safety support. • Start the engine, and depress the accelerator pedal. • Does engine speed decrease?	Yes	System is normal. Recheck customer's complaint.
		No	Replace ABS/TCS HU/CM.

NO.11 THERE IS A MALFUNCTION IN THE SYSTEM EVEN THOUGH ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, TCS OFF LIGHT, TCS INDICATOR LIGHT DO NOT ILLUMINATE

C6U040367650W15

11	There is a malfunction in the system even though ABS warning light, BRAKE system warning light, TCS OFF light, TCS indicator light do not illuminate.

[TROUBLESHOOTING HINTS]
- **There is a difference in size or air pressure between the front and rear tires**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**CHECK FOR DTCs IN ABS/TCS HU/CM** • Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to the next step.
2	**INSPECT ABS HYDRAULIC UNIT** • Perform "ABS hydraulic unit system inspection". • Is system okay?	Yes	Inspect conventional brake system.
		No	**If wheels do not rotate:** Replace ABS/TCS HU/CM. **If wheels rotate but order in which wheels rotate is incorrect:** Inspect brake pipe passage to ABS/TCS HU/CM.

04–10 GENERAL PROCEDURES

PRECAUTION (BRAKES)

C6U041001020W01

Wheels and Tires Removal/Installation

1. The removal and installation procedures for the wheels and tires are not mentioned in this section. When a wheel is removed, tighten it to **88—118 N·m {9.0—12.0 kgf·m, 65.0—87.0 ft·lbf}**.

Brake Lines Disconnection/Connection

Caution
- **Brake fluid will damage painted surfaces. If brake fluid does get on a painted surface, wipe it off immediately.**

1. Tighten the brake pipe flare nut using the **SST** (49 0259 770B). Be sure to modify the brake pipe flare nut tightening torque to allow for use of a torque wrench-**SST** combination.
   - If any brake line has been disconnected anytime during the procedure, add brake fluid, bleed the brakes, and inspect for leakage after the procedure has been completed.

Connectors Disconnection

1. Disconnect the negative battery cable before doing any work that requires handling of connectors. Reconnect the negative battery cable only after the work is completed.

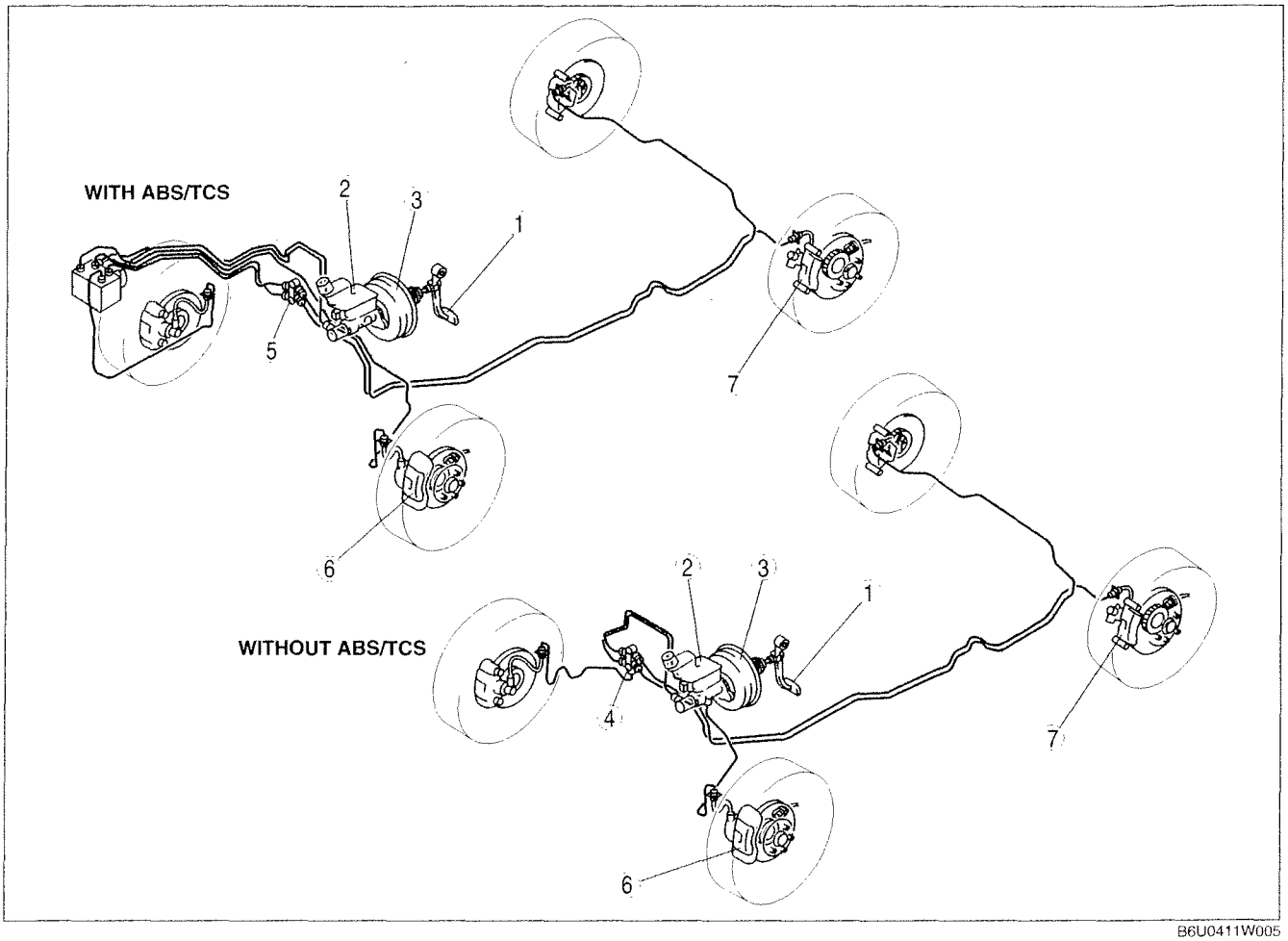
ABS/TCS Components Operations

1. Make sure that there are no DTCs in the ABS/TCS memory after working on ABS/TCS components.
   - If there are any DTCs in the memory, clear them.

04–11 CONVENTIONAL BRAKE SYSTEM

CONVENTIONAL BRAKE LOCATION INDEX

C6U041101015W01



B6U0411W005

1	Brake pedal (See04–11–4 BRAKE PEDAL INSPECTION) (See04–11–6 BRAKE PEDAL REMOVAL/INSTALLATION) (See04–11–7 BRAKE SWITCH INSPECTION)
2	Master cylinder (See04–11–7 MASTER CYLINDER REMOVAL/INSTALLATION) (See04–11–10 FLUID LEVEL SENSOR INSPECTION) (See04–11–9 MASTER CYLINDER DISASSEMBLY/ASSEMBLY)
3	Power brake unit (See04–11–11 POWER BRAKE UNIT INSPECTION) (See04–11–12 POWER BRAKE UNIT REMOVAL/INSTALLATION)
4	Dual proportioning valve (without ABS/TCS) (See04–11–13 DUAL PROPORTIONING VALVE INSPECTION (WITHOUT ABS/TCS)) (See04–11–13 DUAL PROPORTIONING VALVE (WITHOUT ABS/TCS) AND BRAKE PIPE JOINT (WITH ABS/TCS) REPLACEMENT)
5	Brake pipe joint (with ABS/TCS) (See04–11–13 DUAL PROPORTIONING VALVE (WITHOUT ABS/TCS) AND BRAKE PIPE JOINT (WITH ABS/TCS) REPLACEMENT)
6	Front brake (disc) (See04–11–14 FRONT BRAKE (DISC) INSPECTION) (See04–11–17 FRONT BRAKE (DISC) REMOVAL/INSTALLATION) (See04–11–19 CALIPER (FRONT) DISASSEMBLY/ASSEMBLY)
7	Rear brake (disc) (See04–11–20 REAR BRAKE (DISC) INSPECTION) (See04–11–21 REAR BRAKE (DISC) REMOVAL/INSTALLATION) (See04–11–23 CALIPER (REAR) DISASSEMBLY/ASSEMBLY)

AIR BLEEDING

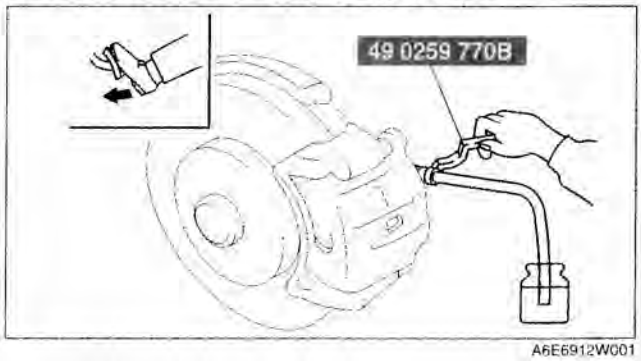
C6U04114300 1W01

Caution
- **Maintain the fluid level in the reservoir tank proper while bleeding the air.**

Specified fluid
SAE J1703, FMVSS 116 DOT3

Note
- The brakes should be bled whenever a brake line is disconnected. If a hydraulic line is disconnected at the master cylinder, start at the slave cylinder farthest from the brake master cylinder, and move to the next farthest slave cylinder until all four cylinders have been bled. If the disconnection point is anywhere except the master cylinder, start at the point closest to the disconnection, and move to the next closest slave cylinder until all four cylinders have been bled.

1. Remove the bleeder cap and attach a vinyl tube to the bleeder screw.
2. Place the other end of the vinyl tube in a clear, fluid-filled container.
3. One person should depress the brake pedal a few times, and then hold it in the depressed position.
4. A second person should loosen the bleeder screw, drain out the fluid and close the screw using the **SST**.



A6E6912W001

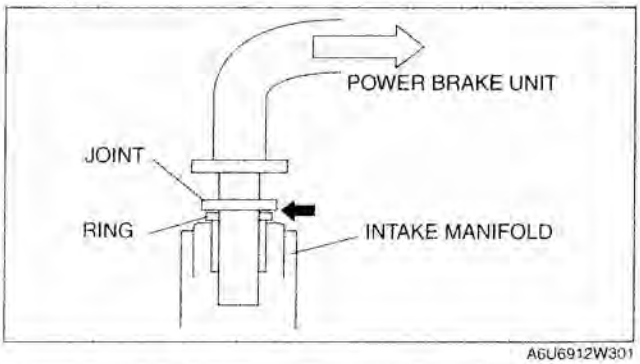
Tightening torque
Front: 6.9—9.8 N·m
{71—99 kgf·cm, 62—86 in·lbf}
Rear: 5.9—8.8 N·m
{61—89 kgf·cm, 53—77 in·lbf}

5. Repeat steps 3 and 4 until no air bubbles are seen.
6. Bleed air from each component by following the procedure above.
7. After air bleeding, check the following:
   - Brake operation
   - Fluid leakage
   - Fluid level

VACUUM HOSE CHECK VALVE INSPECTION (POWER BRAKE UNIT)

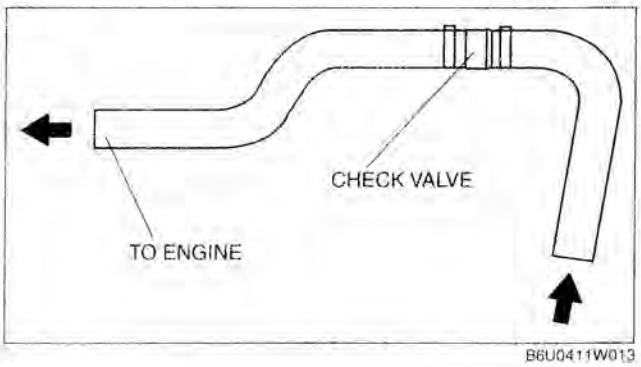
C6U04114398 0W01

1. Remove the clamps and vacuum hose (power brake unit side).
2. For engine side, insert a small flathead screwdriver in the direction of the arrow shown in the figure, push the ring down and remove the vacuum hose. (L3)
3. Remove the clamps and vacuum hose (engine-side). (AJ)



A6U6912W301

4. Apply both suction and pressure to the engine-side hose, and verify that air blows only toward that side.
   - If air flows in both directions or not at all, replace the vacuum hose.



B6U0411W013

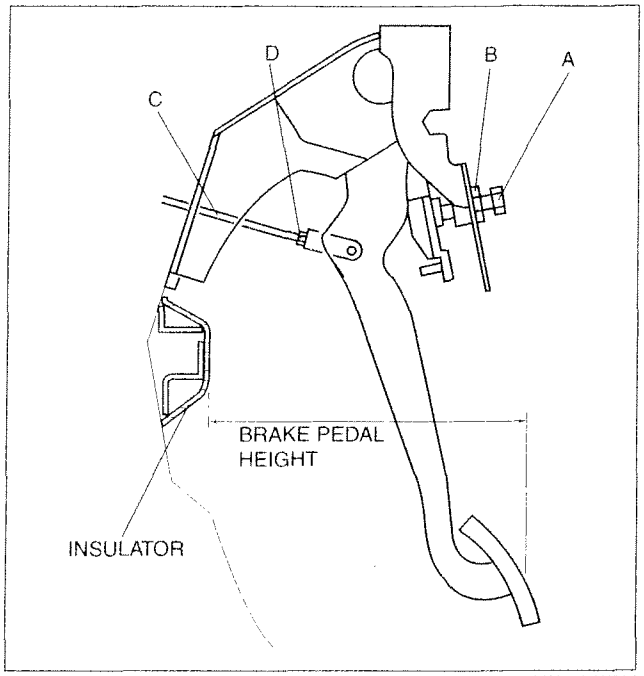
BRAKE PEDAL INSPECTION

C6U041143300W01

Brake Pedal Height Inspection

1. Verify that the distance from the insulator to the center of the upper surface of the pedal pad is as specified.

Pedal height (reference value)
187 mm {7.36 in}



B6U0411W014

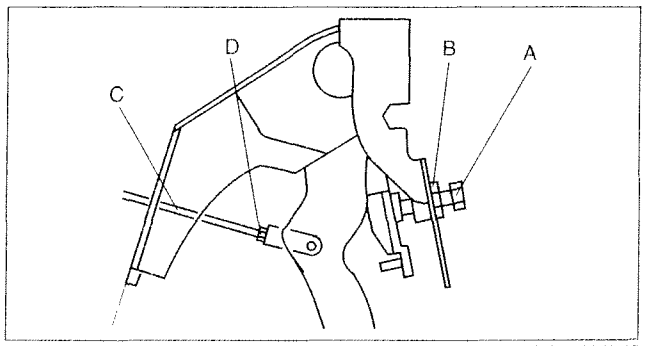
Brake Pedal Height Adjustment

Caution
- **The brake switch may not operate normally after adjusting the pedal height. Whenever adjusting the pedal height, replace the brake switch with a new one.**

1. Loosen locknut B and turn the bolt A until it does not contact the pedal.
2. Loosen locknut D and turn rod C to adjust the height.
3. Tighten the bolt with locknut B.

Tightening torque
9.8—14.7 N·m
{100—149 kgf·cm, 116—130 in·lbf}

4. After adjustment, inspect the pedal play and the brake light operation.



B6U0411W015

Brake Pedal Play Inspection

1. Depress the pedal a few times to eliminate the vacuum in the system.
2. Remove the spring pin, verify that the holes in the fork and in the pedal are aligned, and reinstall the pin. (See 04–11–6 BRAKE PEDAL REMOVAL/INSTALLATION.)
3. Gently depress the pedal by hand until resistance is felt, and check the pedal play.

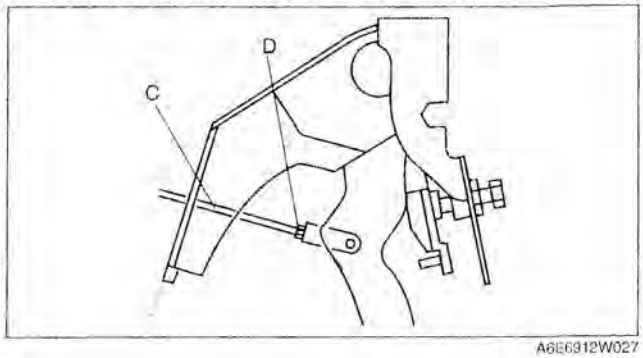
Pedal play
0—3 mm {0—0.1 in}

Brake Pedal Play Adjustment

1. Remove the spring pin and clevis pin. (See 04-11-6 BRAKE PEDAL REMOVAL/INSTALLATION.)
2. Loosen locknut D and turn rod C to align the holes in the fork and in the pedal.
3. Install the clevis pin and the spring pin.
4. Tighten locknut D.

   Tightening torque
   15.7—21.6 N·m
   {1.60—2.20 kgf·m, 11.6—15.9 ft·lbf}

5. Check the pedal height and the brake light operation.

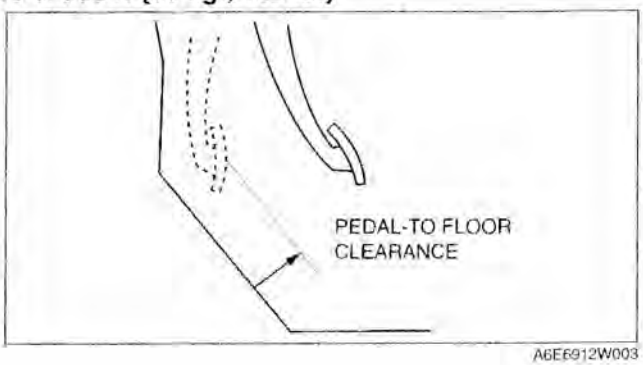


A6E6912W027

Pedal-to-floor Clearance Inspection

1. Start the engine and depress the brake pedal with a force of **588 N {60 kgf, 132 lbf}**
2. Verify that the distance from the floor panel to the pedal pad center is as specified when the pedal is depressed.
   - If the distance is less than specified, check for air in brake system.

   Specification
   68 mm {2.7 in} min.



A6E6912W003

BRAKE PEDAL REMOVAL/INSTALLATION

C6U041143300W02

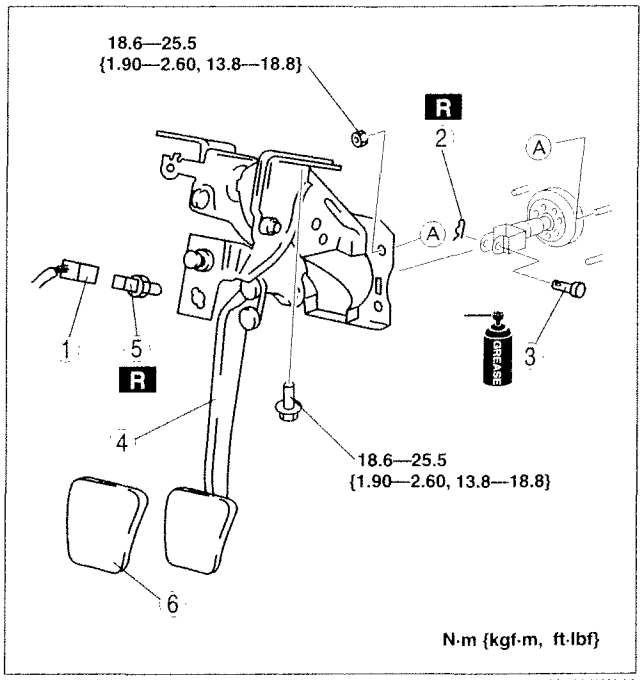
Caution

- **The clearance between the brake switch and the brake pedal is automatically adjusted to the correct amount when the brake switch connector is connected after the brake switch has been properly installed. If the brake switch is not properly installed or the connector is connected before installation, the clearance may be incorrect, causing a brake light malfunction. Therefore, always verify that the brake switch is properly installed before connecting the connector.**
- **Once the brake switch clearance has automatically been adjusted, it cannot be adjusted again. Therefore, replace the switch with a new one when replacing the power brake unit or the pedal, or performing any procedure that changes the pedal stroke.**

1. For models with an interlock cable unit, remove the lock unit with the brake switch.
2. Remove in the order indicated in the table.

1	Brake switch connector (See 04–11–6 Brake Switch Connector Installation Note)
2	Spring pin
3	Clevis pin
4	Brake pedal
5	Brake switch (See 04–11–6 Brake switch Installation Note)
6	Pedal pad

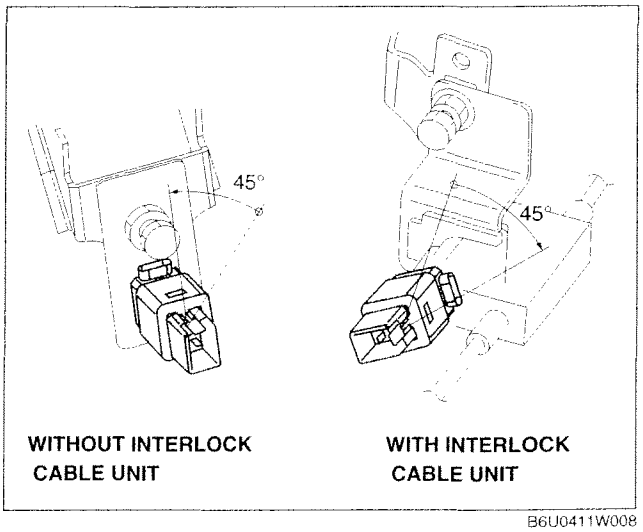
3. Install in the reverse order of removal.



B6U0411W018

Brake switch Installation Note

1. Fix the new brake switch on the brake pedal bracket or interlock cable unit by pressing down at **50 N {5.1 kgf, 11 lbf}**.
2. Rotate the brake switch **45°** counterclockwise (without interlock cable unit) or clockwise (with interlock cable unit).
3. Verify that the brake switch is locked securely.



B6U0411W008

Brake Switch Connector Installation Note

1. Inspect the brake pedal. (See 04–11–4 BRAKE PEDAL INSPECTION.)
2. With the brake pedal in its original position, install the brake switch to the brake switch connector.

BRAKE SWITCH INSPECTION

C6U041166490W01

Caution

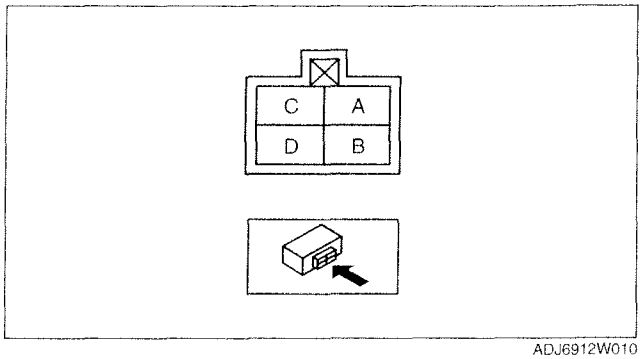
- **If the brake switch is removed from the brake pedal, its proper functioning cannot be guaranteed when reinstalled. Therefore, inspect the brake switch by either not removing the brake switch, or by replacing it if removed.**

1. Disconnect the negative battery cable.
2. Disconnect the brake switch connector.
3. Inspect for continuity between the brake switch connector terminals.
   - If not as specified, replace the brake switch.

O—O : Continuity

Condition	Terminal			
	A	B	C	D
When the brake pedal is depressed		O		O
When the brake pedal is not depressed (Vehicle with auto cruise)	O		O	

A6E6912W033



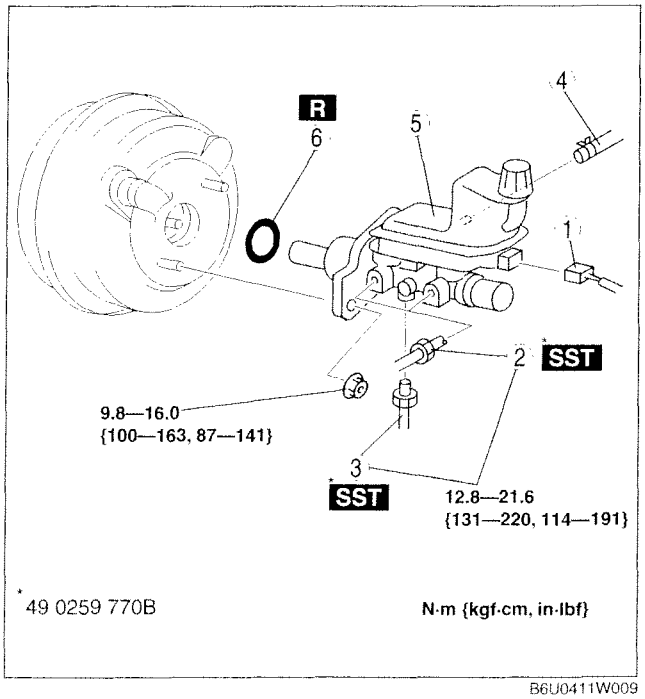
ADJ6912W010

MASTER CYLINDER REMOVAL/INSTALLATION

C6U041143400W01

1. Remove the battery and battery tray.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.

1	Brake fluid level sensor connector
2	Brake pipe
3	Brake pipe (without ABS/TCS)
4	Hose (MTX)
5	Master cylinder (See 04–11–8 Master Cylinder Installation Note
6	O-ring



B6U0411W009

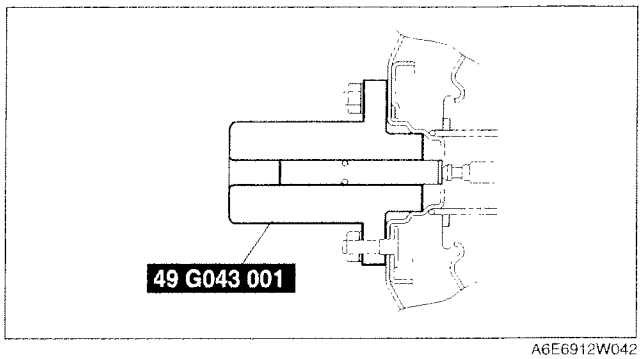
Master Cylinder Installation Note

Caution

- **If the master cylinder is installed at a slanted angle to the power brake unit, the master cylinder piston may jam against the push rod retainer of the power brake unit, causing improper air bleeding, brake drag or other malfunctions. Be sure to install the master cylinder at a level, perpendicular angle to the power brake unit.**
- **Always install the gasket of the power brake unit push rod before performing measurement inspections or adjustments.**

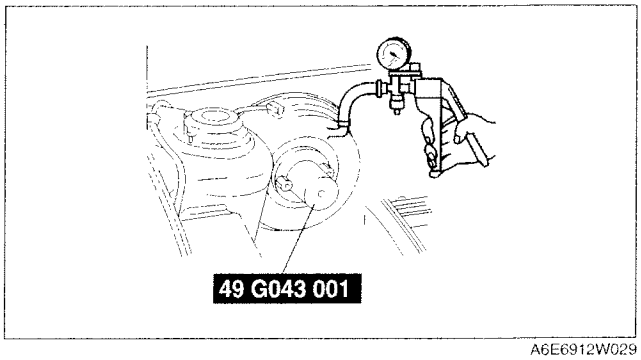
1. Install the **SST** to the power brake unit as shown, and tighten within the specified torque.

   Tightening torque
   9.8—16.0 N·m
   {100—163 kgf·cm, 87—141 in·lbf}



A6E6912W042

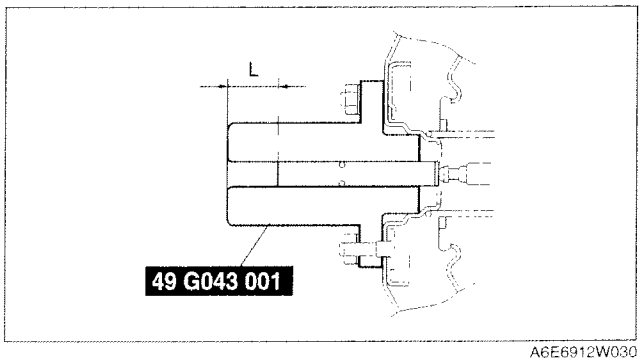
2. Using a vacuum gauge, create a vacuum pressure of **66.7 kPa {500 mmHg, 19.7 inHg}** in the power brake unit.



A6E6912W029

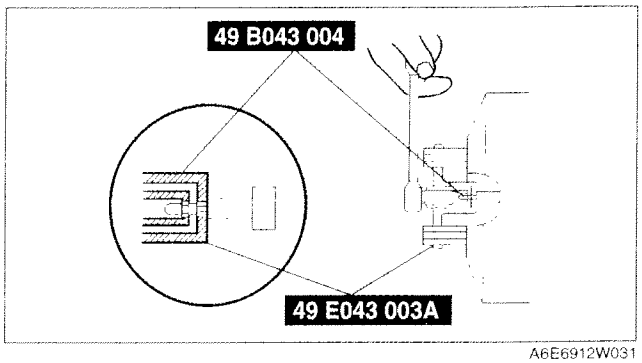
3. Using calipers, measure dimension L as shown.

   Specification
   25.9—26.1 mm {1.020—1.027 in}



A6E6912W030

4. If dimension L is not within the specification as shown, remove **SST** (49 G043 001) and use **SST** (49 B043 004) to adjust the length of the push rod while using **SST** (49 E043 003A) to keep the push rod from rotating.
5. Remove the **SSTs**, replace **SST** (49 G043 001) and measure dimension L again.

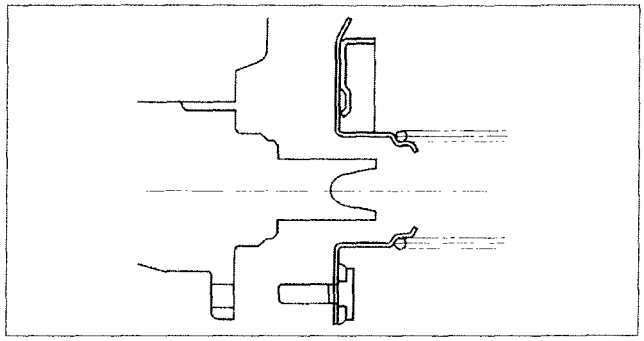


A6E6912W031

6. Install the master cylinder to the power brake unit.

Caution

- **If, after installing the master cylinder, air does not bleed properly from the brake lines even after performing air bleeding, brake drag occurs or other characteristics are present, it is possible that the master cylinder piston is jammed against the power brake unit. If air cannot be bled properly, brake drag exists or other malfunctions occur, remove the master cylinder and reinstall properly.**



A6E6912W032

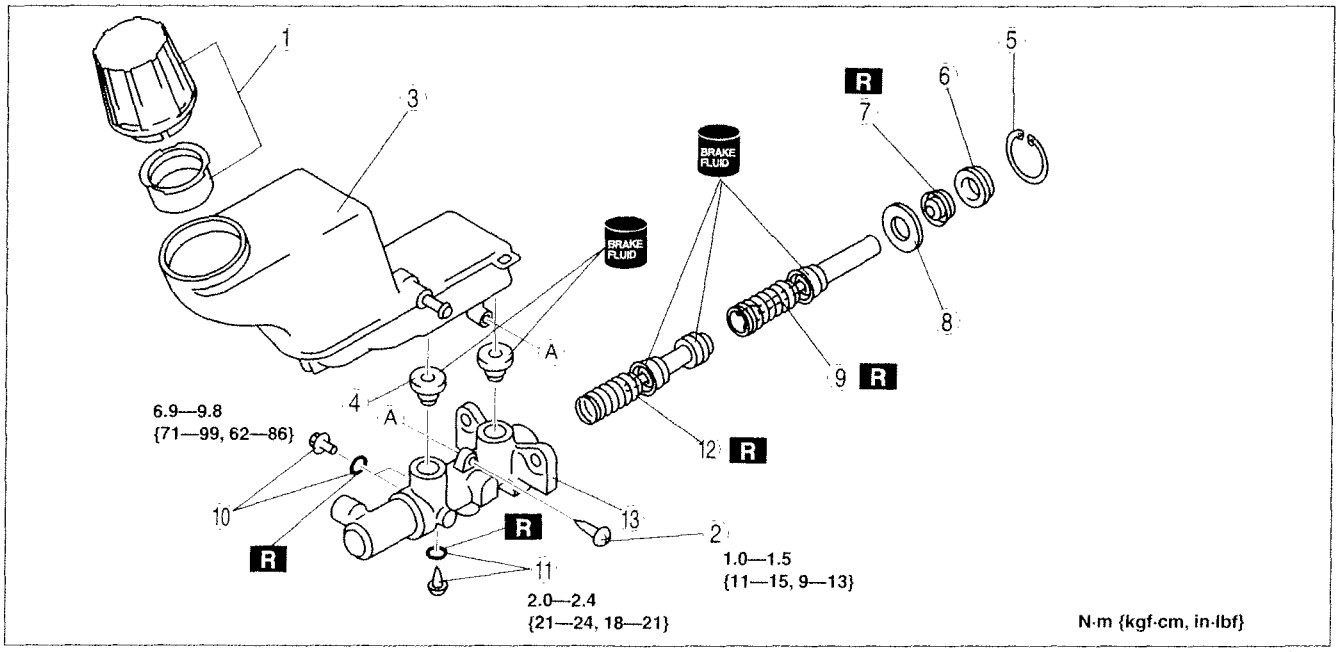
MASTER CYLINDER DISASSEMBLY/ASSEMBLY

C6U041143400W02

Caution

- **If the master cylinder body is damaged, replace the unit as a component. When securing the master cylinder in a vise, tighten only the flange of the master cylinder.**

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



B6U0411W004

1	Cap set
2	Screw
3	Reservoir
4	Joint bushing
5	Snap ring
6	Piston guide
7	Cup
8	Stopper

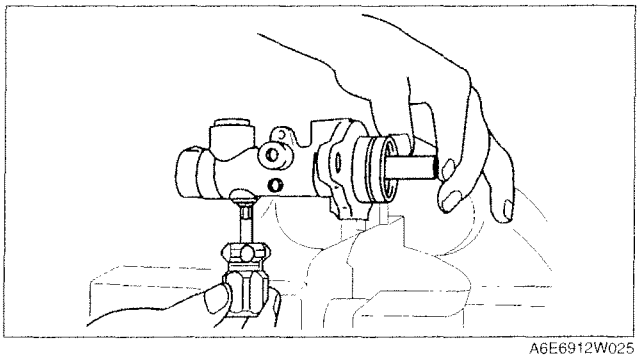
9	Primary piston
10	Stop pin and O-ring (with ABS/TCS) (See 04–11–10 Stop Pin and O-ring (with ABS/TCS) Assembly Note)
11	Stop screw and O-ring (without ABS/TCS) (See04–11–10 Stop Screw and O-ring (without ABS/TCS) Assembly Note)
12	Secondary piston
13	Master cylinder body

Stop Screw and O-ring (without ABS/TCS) Assembly Note

1. Install the secondary piston and primary piston.
2. Install the new O-ring onto the stop screw.
3. Push the primary piston assembly in full.
4. Install and tighten the stop screw.

   Tightening torque
   2.0—2.4 N·m {21—24 kgf·cm, 18—21 in·lbf}

5. Push and release the secondary piston component to verify that it is held properly by the stop screw.



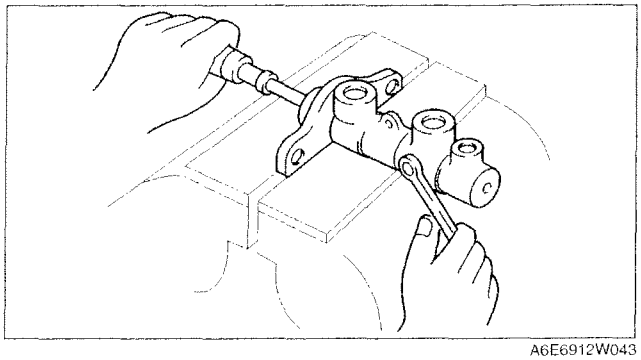
A6E6912W025

Stop Pin and O-ring (with ABS/TCS) Assembly Note

1. Install the secondary piston with the piston hole facing the stop pin and primary piston.
2. Install the new O-ring onto the stop pin.
3. Push the primary piston assembly in fully.
4. Install and tighten the stop pin.

   Tightening torque
   6.9—9.8 N·m {71—99 kgf·cm, 62—86 in·lbf}

5. Push and release the secondary piston component to verify that it is held properly by the stop pin.



A6E6912W043

FLUID LEVEL SENSOR INSPECTION

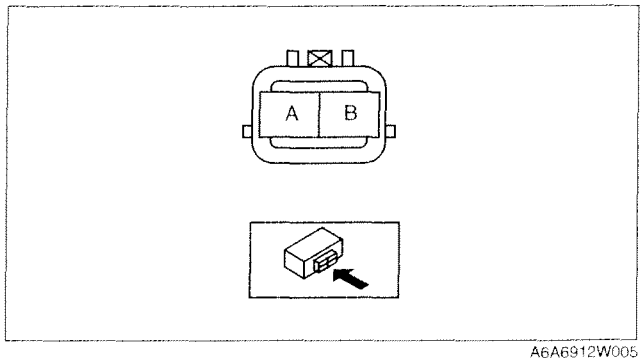
C6U041143540W01

1. Disconnect the negative battery cable.
2. Disconnect the sensor connector.
3. Inspect for continuity between terminals of fluid level sensor.
   - If not as specified, replace the fluid level sensor.

O—O : Continuity

Fluid level	A	B
Above approx. 3 mm {0.1 in} above MIN line		
Below approx. 3 mm {0.1 in} above MIN line	O	O

B6U0411W019



A6A6912W005

POWER BRAKE UNIT INSPECTION

C6U041143800W01

Warning
- **The following inspection methods are simple inspection methods to judge the function of the power brake unit.**
- **If there is a malfunction in the power brake unit, replace the power brake unit as a component.**

Power Brake Unit Function Check (Simple Method)

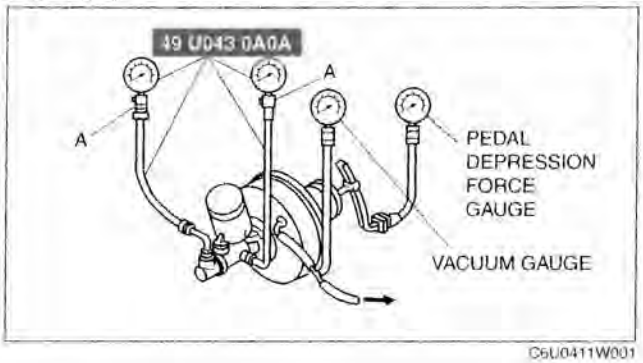
Step 1
1. With the engine stopped, depress the pedal a few times.
2. With the pedal depressed, start the engine.
3. If the pedal moves down slightly immediately after the engine starts, the unit is operating.

Step 2
1. Start the engine.
2. Stop the engine after it has run for **1 or 2 minutes**.
3. Depress the pedal with the usual force.
4. If the first pedal stroke is long and becomes shorter with subsequent strokes, the unit is operating.
   - If a problem is found, inspect for damage of the vacuum hose, and vacuum tank. Repair if necessary, and inspect it again.

Step 3
1. Start the engine.
2. Depress the pedal with usual force.
3. If the pedal height does not change, the unit is operating.
4. Hold the pedal down for **about 30 seconds**.
5. If the pedal height does not change, the unit is operating.

Power Brake Unit Function Check (Inspection Using The Testers)

1. Connect the **SSTs**, vacuum gauge, and pedal depression force gauge as shown in the figure to bleed the air from the **SSTs** and brake line. (Bleed the air from the **SSTs** using a air bleed valve A.)



C6U0411W001

Checking for vacuum loss (unloaded condition)
1. Stop the engine when the vacuum gauge reading reaches **66.7 kPa {500 mmHg, 19.7 inHg}**.
2. Observe the vacuum gauge for **15 seconds**.
   - If the gauge shows **63.3—66.7 kPa {475—500 mmHg, 18.7—19.6 inHg}**, the unit is operating.
   - If not, inspect for damage on the check valve or vacuum hose, and examine the installation. Repair as necessary, and inspect it again.

Checking for vacuum loss (loaded condition)
1. Start the engine.
2. Depress the brake pedal with a force of **196 N {20 kgf, 44 lbf}**.
3. Stop the engine when the vacuum gauge reading reaches **66.7 kPa {500 mmHg, 19.7 inHg}**.
4. Observe the vacuum gauge for **15 seconds**.
5. If the gauge shows **63.3—66.7 kPa {475—500 mmHg, 18.7—19.6 inHg}**, the unit is operating.

Checking for hydraulic pressure

1. When the engine is stopped (vacuum **0 kPa {0 mmHg, 0 inHg}**) and the fluid pressure is within the specification, the unit is operating.

Pedal force	Fluid pressure
200 N {20 kgf, 44 lbf}	590 kPa {6.02 kgf/cm^2, 85.6 psi} min.

2. Start the engine. Depress the brake pedal when the vacuum reaches **66.7 kPa {500 mmHg, 19.7 inHg}**.
   - If the fluid pressure is within the specification, the unit is operating.
   - If the fluid pressure is not as specified, inspect for damage to the check valve or vacuum hose, and fluid leakage of the hydraulic line. Repair as necessary, and inspect again.

Pedal force	Fluid pressure
200 N {20 kgf, 44 lbf}	8,780 kPa {89.53 kgf/cm^2, 1,273 psi} min.

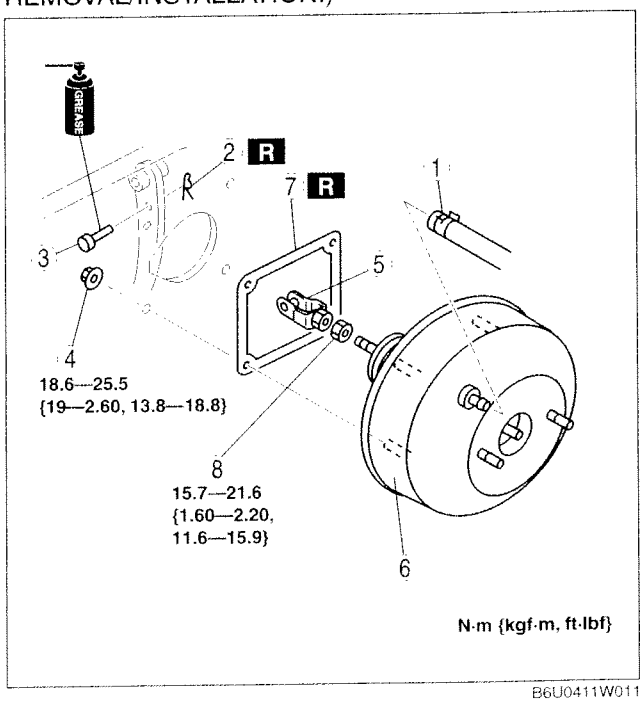
POWER BRAKE UNIT REMOVAL/INSTALLATION

C6U041143800W02

1. Remove the master cylinder. (See 04–11–7 MASTER CYLINDER REMOVAL/INSTALLATION.)
2. Remove the windshield wiper arm and blade. (See 09–19–3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
3. Remove the cowl grille. (See 09–16–3 COWL GRILLE REMOVAL/INSTALLATION.)
4. Remove the windshield wiper motor. (See 09–19–4 WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION.)
5. Remove the cowl panel. (See 09–10–12 COWL PANEL REMOVAL/INSTALLATION.)
6. Remove in the order indicated in the table.

1	Vacuum hose
2	Snap pin
3	Clevis pin
4	Nut
5	Fork
6	Power brake unit
7	Gasket
8	Nut

7. Install in the reverse order of removal.

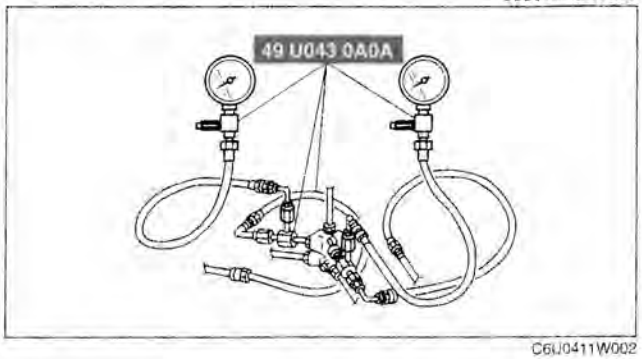


B6U0411W011

DUAL PROPORTIONING VALVE INSPECTION (WITHOUT ABS/TCS)

1. Connect the **SSTs** to the brake pipes as shown in the figure.
2. Bleed the air from the brake system.

C6U041143900W01



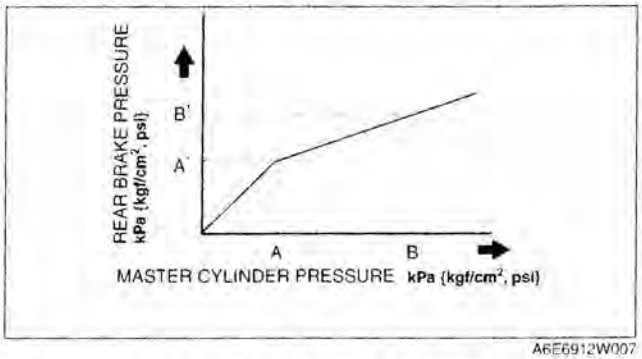
C6U0411W002

3. Measure the fluid pressure of the master cylinder and the rear brake.
   - If not within the specification, replace the dual proportioning valve.

Fluid pressure

kPa {kgf/cm^2, psi}

MASTER CYLINDER PRESSURE	REAR BRAKE PRESSURE
A: 2,450 {25, 355}	A': 2,450 {25, 355} ± 200 {2, 29}
B: 5,880 {60, 853}	B': 3,480 {35.5, 505} ± 300 {3, 44}



A6E6912W007

04–11

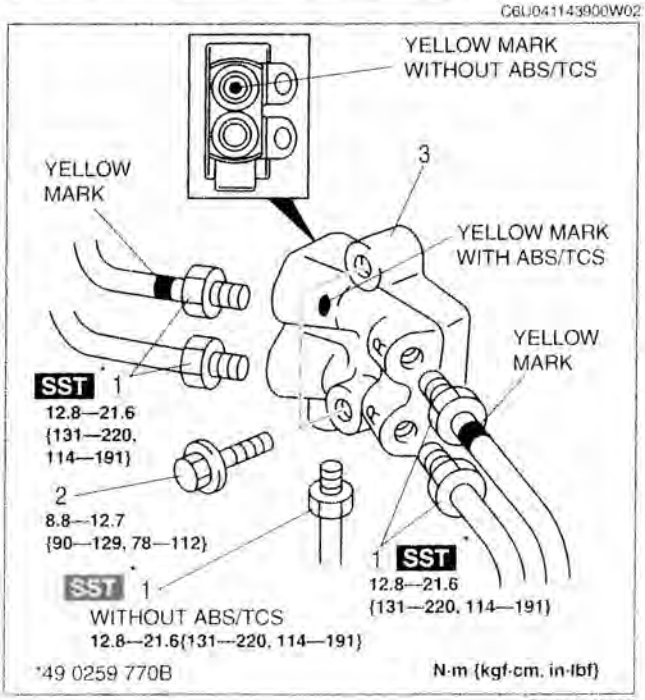
DUAL PROPORTIONING VALVE (WITHOUT ABS/TCS) AND BRAKE PIPE JOINT (WITH ABS/TCS) REPLACEMENT

1. Remove in the order indicated in the table.

1	Brake pipe
2	Bolt
3	Dual proportioning valve (without ABS/TCS) or brake pipe joint (with ABS/TCS) (See 04–11–14 Dual Proportioning Valve (Without ABS/TCS) or Brake Pipe Joint (With ABS/TCS) Installation Note)

2. Install in the reverse order of removal.

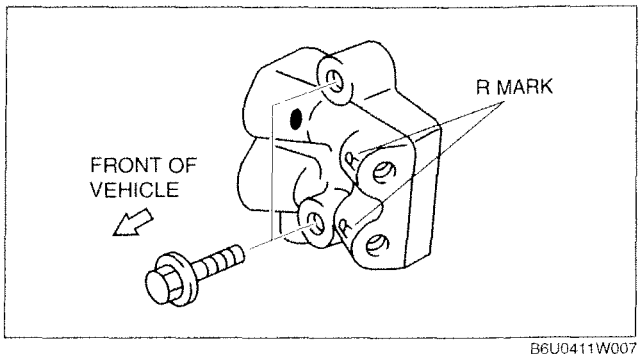
C6U041143900W02



B6U0411W006

Dual Proportioning Valve (Without ABS/TCS) or Brake Pipe Joint (With ABS/TCS) Installation Note

1. Install the dual proportioning valve (without ABS/TCS) or brake pipe joint (with ABS/TCS) so that the R mark faces the left side of the vehicle.



B6U0411W007

FRONT BRAKE (DISC) INSPECTION

C6U041133980W01

Brake Judder Repair Hints

Description

1. Brake judder concern has the following 3 characteristics:

Steering wheel vibration

1. Steering wheel vibrates in the rotation direction. This characteristic is most noticeable when applying brakes at a vehicle speed of **100—140 km/h {62.1—86.8 mph}**.

Floor vibration

1. When applying the brakes, the vehicle body shakes back and forth. The seriousness of the shaking is not influenced by vehicle speed.

Brake pedal vibration

1. When applying brakes, a pulsating force tries to push the brake pad back. The pulsation is transmitted to the brake pedal.
2. The following are the main possible causes of brake judder:

Due to an excessive runout (side-to-side wobble) of the disc plate, the thickness of the disc plate is uneven.

1. If the runout is **more than 0.02 mm {0.0008 in}** at the position **10 mm {0.39 in}** from the disc plate edge, uneven wear occurs on the disc plate because the pad contacts the plate unevenly.
2. If the runout is **less than 0.02 mm {0.0008 in}**, uneven wear does not occur.

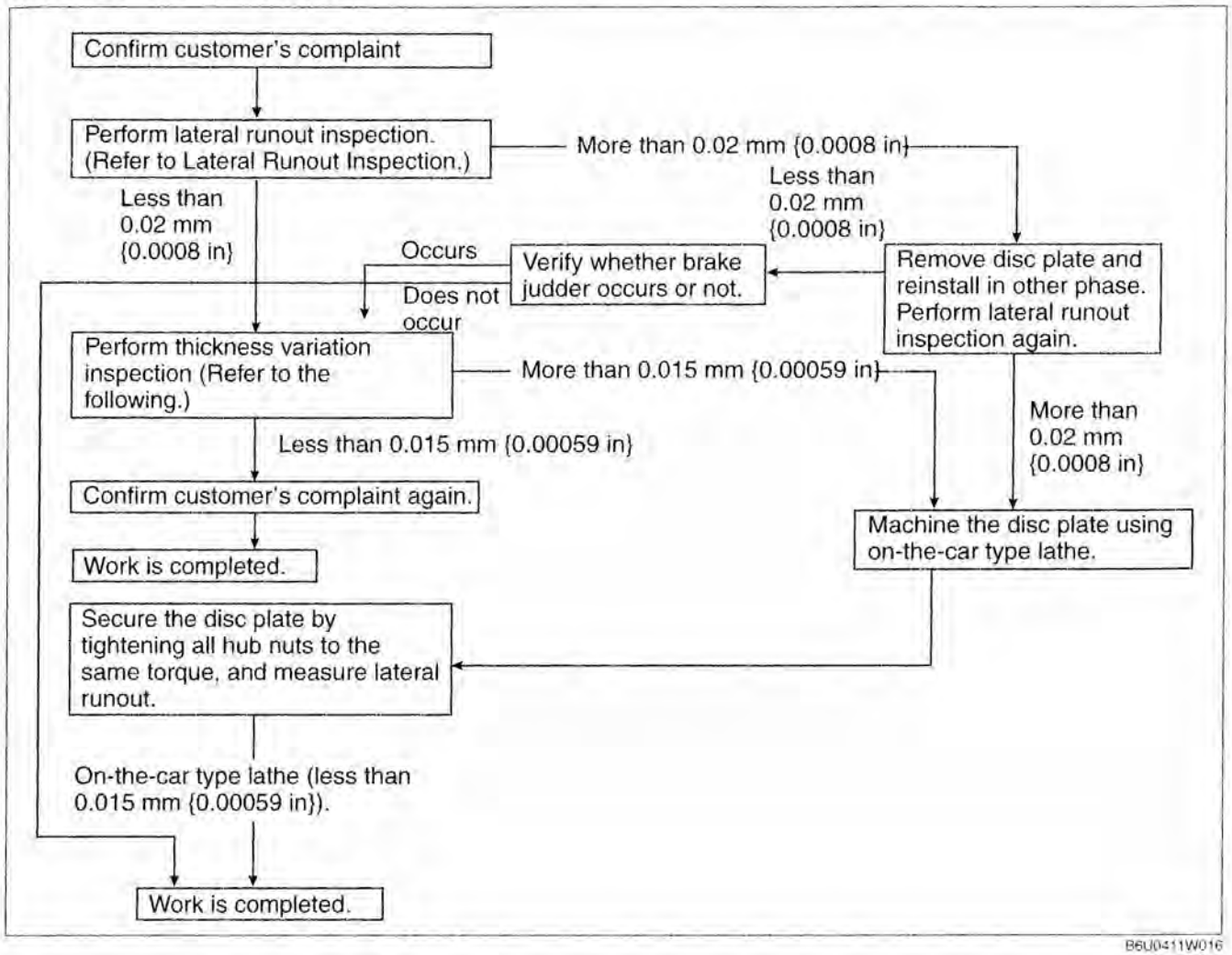
The disc plate is deformed by heat.

1. Repeated panic braking may raise the temperature in some portions of disc plate by **approximately 1,000 °C {1,832 °F}**. This results in a deformed disc plate.

Due to corrosion, the thickness and friction coefficient of disc plate change.

1. If a vehicle is parked in damp conditions for a long time, corrosion occurs on the friction surface of disc plate.
2. The thickness of corrosion is uneven and sometimes appears like a wave pattern, which changes the friction coefficient and causes a reaction force.

Inspection and repair procedure



B6U0411W016

Lateral runout inspection

1. To secure the disc plate and the hub, tighten the hub nuts upside down or insert a washer (thickness **10 mm {0.39 in}**, inner diameter **more than 12 mm {0.47 in}**) between the hub bolt and the hub nut.

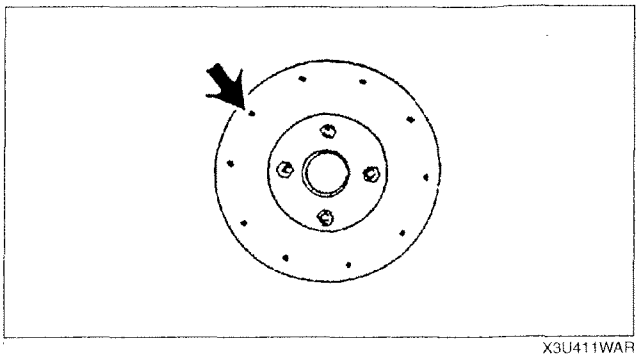
   Note
   - The component parts of the **SST** (49 B017 001 or 49 G019 003) can be used as a suitable washer.

2. After tightening all the hub nuts to the same torque, put the dial gauge on the friction surface of disc plate **10 mm {0.39 in}** from the disc plate edge.
3. Rotate the disc plate one time and measure the runout.

   Runout limit
   0.02 mm {0.0008 in}

Thickness variation inspection

1. Clean the disc plate-to-pad friction surface using a brake cleaner.
2. Measure the points indicated in the illustration using a caliper (micrometer).
3. Subtract the minimum value from the maximum, and if the result is not within specification, machine the disc plate using a lathe.


X3U411WAR

Thickness variation limit
0.015 mm {0.0005 in}

Warning
- **Do not exceed minimum disc plate thickness.**

Disc Plate Thickness Inspection

Caution
- **Excessive runout may result if the disc plate is removed from the vehicle then machined. Machine the disc plate while installed on the vehicle.**

1. Measure the thickness of the disc plate.
   - If the thickness is not within the specification, replace the disc plate.

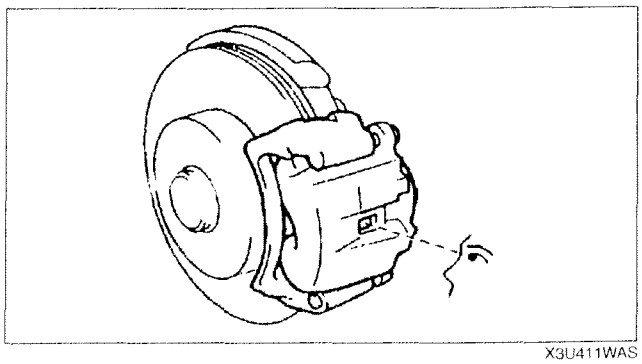
Minimum
23 mm {0.91 in}
Minimum thickness after machining using a brake lathe on-vehicle
23.8 mm {0.94 in}

Disc Pad Thickness Inspection

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheel and tires.
3. Verify the remaining thickness of the pads.

Minimum thickness
2.0 mm {0.079 in} min.

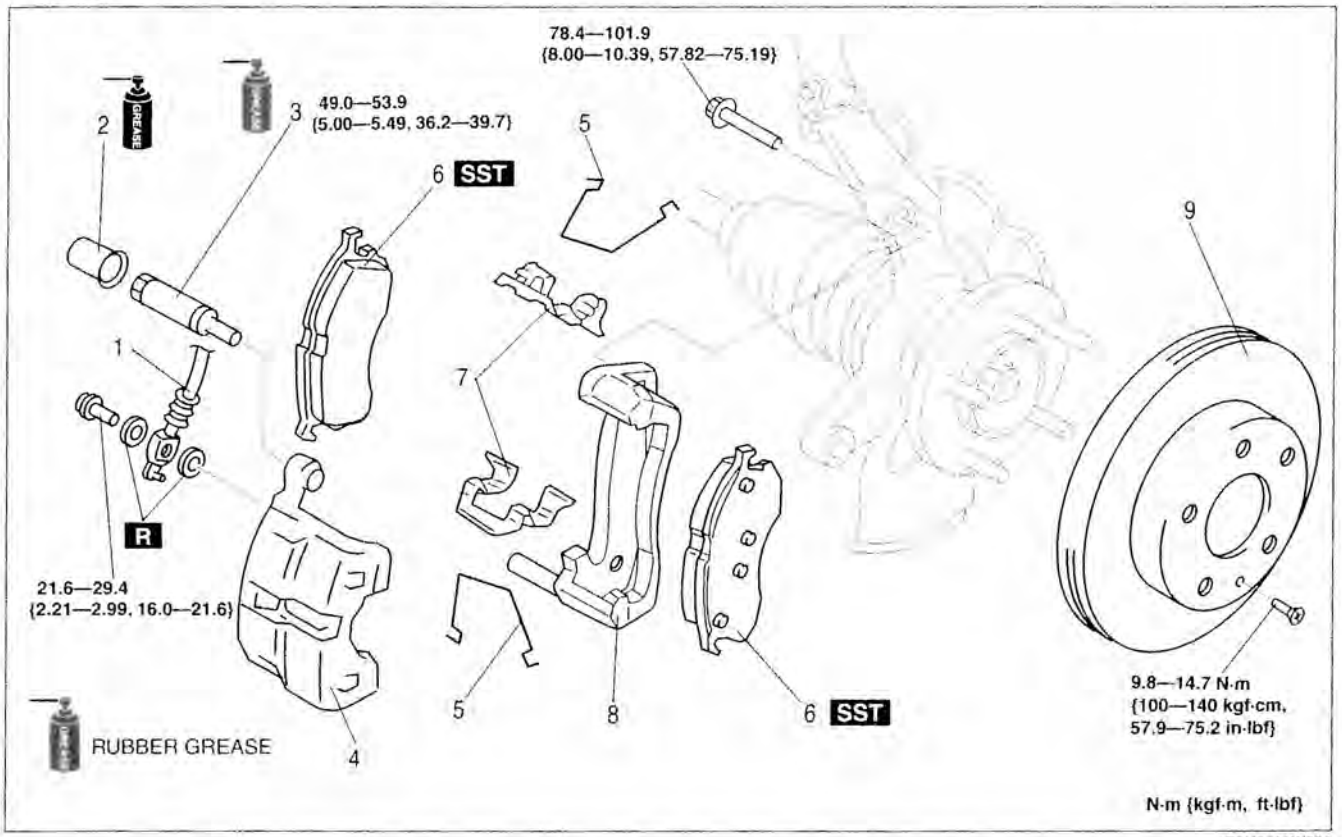
4. Replace the pads as a set: right and left wheels, if either one is at or less than the minimum thickness.


X3U411WAS

FRONT BRAKE (DISC) REMOVAL/INSTALLATION

C6U04113980W02

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, depress the pedal a few times, rotate the wheel by hand, and verify that the brake does not drag.



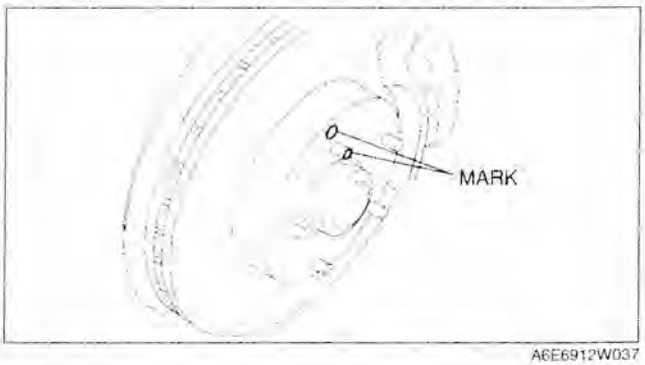
B6U0411W001

1	Flexible hose
2	Cap
3	Guide pin
4	Caliper
5	M-spring

6	Disc pad (See 04–11–18 Disc Pad Installation Note)
7	Guide plate
8	Mounting support
9	Disc plate (See 04–11–17 Disc Plate Removal Note) (See 04–11–17 Disc Plate Installation Note)

Disc Plate Removal Note

1. Mark the wheel hub bolt and disc plate before removal for reference during installation.



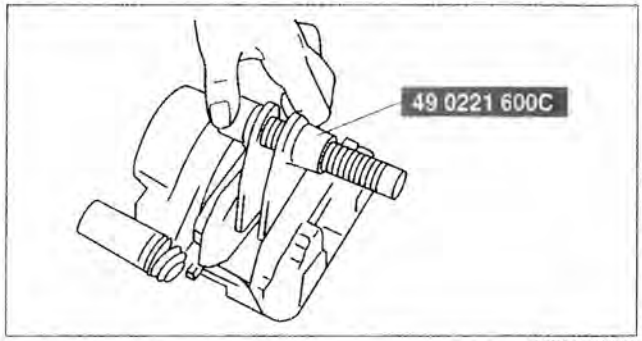
A6E6912W037

Disc Plate Installation Note

1. Remove any rust or grime on the contact face of the disc plate and wheel hub.
2. Install the disc plate and align the marks made before removal.

Disc Pad Installation Note

1. Push the piston fully inward using the **SST**.
2. Install the disc pad.

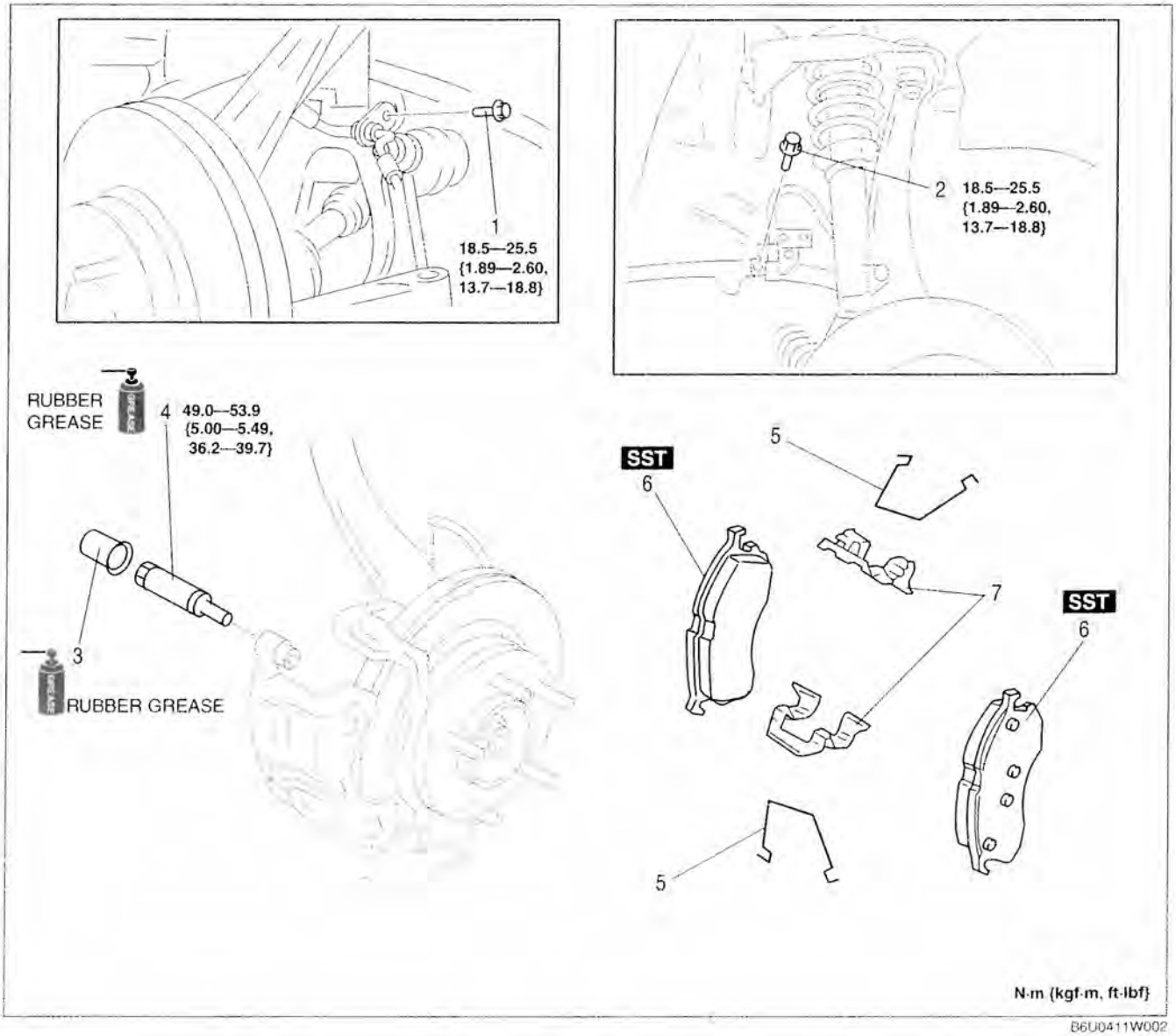


A6E6912W038

DISC PAD (FRONT) REPLACEMENT

C6U041133630W01

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



B6U0411W002

1	Bolt
2	Bolt
3	Cap
4	Guide pin

5	M-spring
6	Disc pad (See 04–11–18 Disc Pad Installation Note)
7	Guide plate

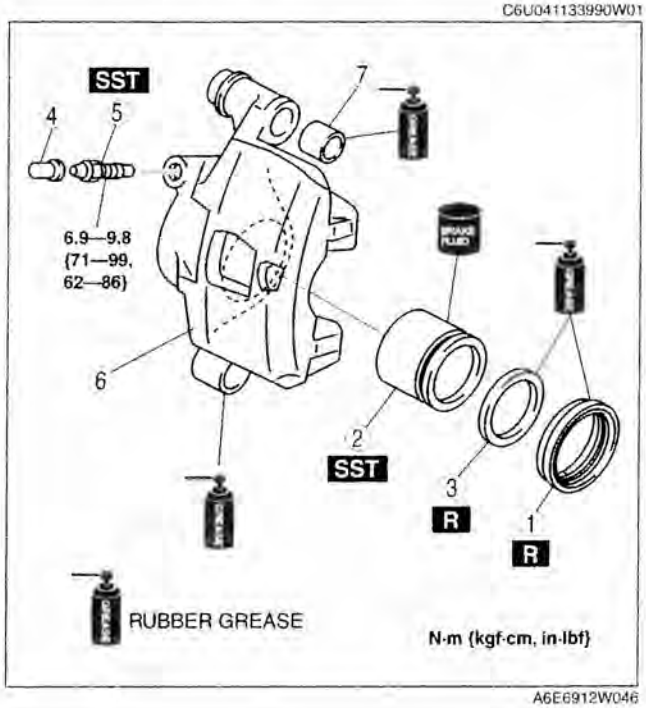
CALIPER (FRONT) DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

1	Dust seal
2	Piston (See 04–11–19 Piston Disassembly Note)
3	Piston seal (See 04–11–19 Piston Seal Disassembly Note)
4	Bleeder cap
5	Bleeder screw (See 04–11–20 Bleeder Screw Assembly Note)
6	Caliper body
7	Boot

2. Assemble in the reverse order of removal.

C6U041133990W01



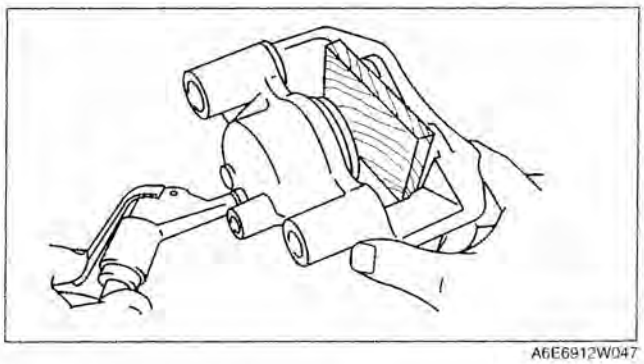
A6E6912W046

Piston Disassembly Note

Caution

- **Blow the compressed air slowly to prevent the piston from suddenly popping out.**

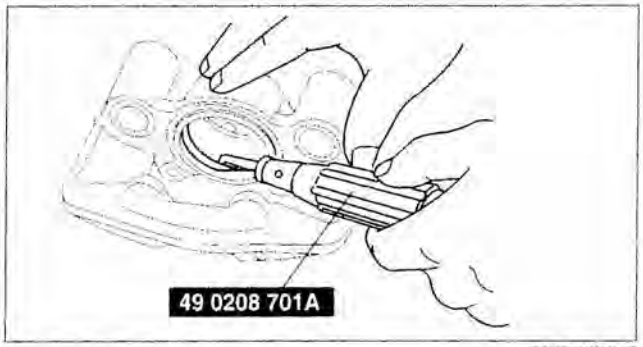
1. Place a piece of wood in the caliper, then blow compressed air through the hole to force the piston out of the caliper.



A6E6912W047

Piston Seal Disassembly Note

1. Remove the piston seal from the brake caliper using the **SST**.

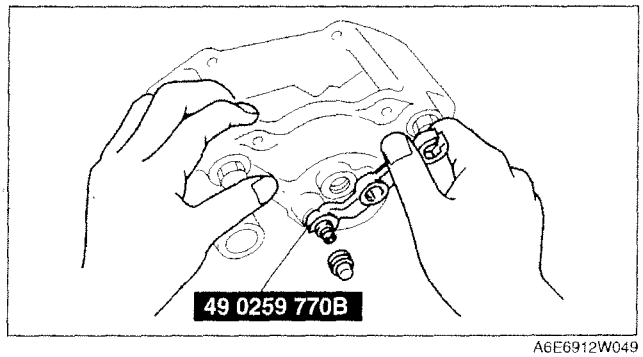


A6E6912W048

Bleeder Screw Assembly Note

1. Assemble the bleeder screw to the caliper using the **SST**.

Tightening torque
6.9—9.8 N·m {71—99 kgf·cm, 62—86 in·lbf}



A6E6912W049

REAR BRAKE (DISC) INSPECTION

C6U041126980W01

Brake Judder Repair Hint

1. (See 04–11–14 FRONT BRAKE (DISC) INSPECTION.)

Disc Plate Thickness Inspection

Caution
- **Excessive runout may result if the disc plate is removed from the vehicle and then machined. Machine the disc plate while installed on the vehicle.**

1. Measure the thickness of the disc plate.
   - If the thickness is not within the specification, replace the disc plate.

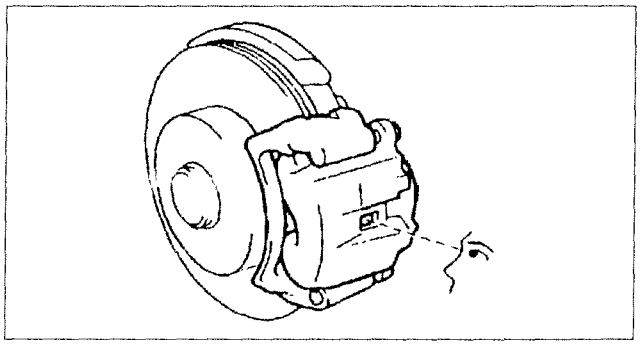
Minimum
8 mm {0.31 in}
Minimum thickness after machining using a brake lathe on-vehicle
8.8 mm {0.35 in}

Disc Pad Thickness Inspection

1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheel and tires.
3. Verify the remaining thickness of the pads.

Minimum thickness
2.0 mm {0.079 in} min.

4. Replace the pads as a set: right and left wheels, if either one is at or less than the minimum thickness.

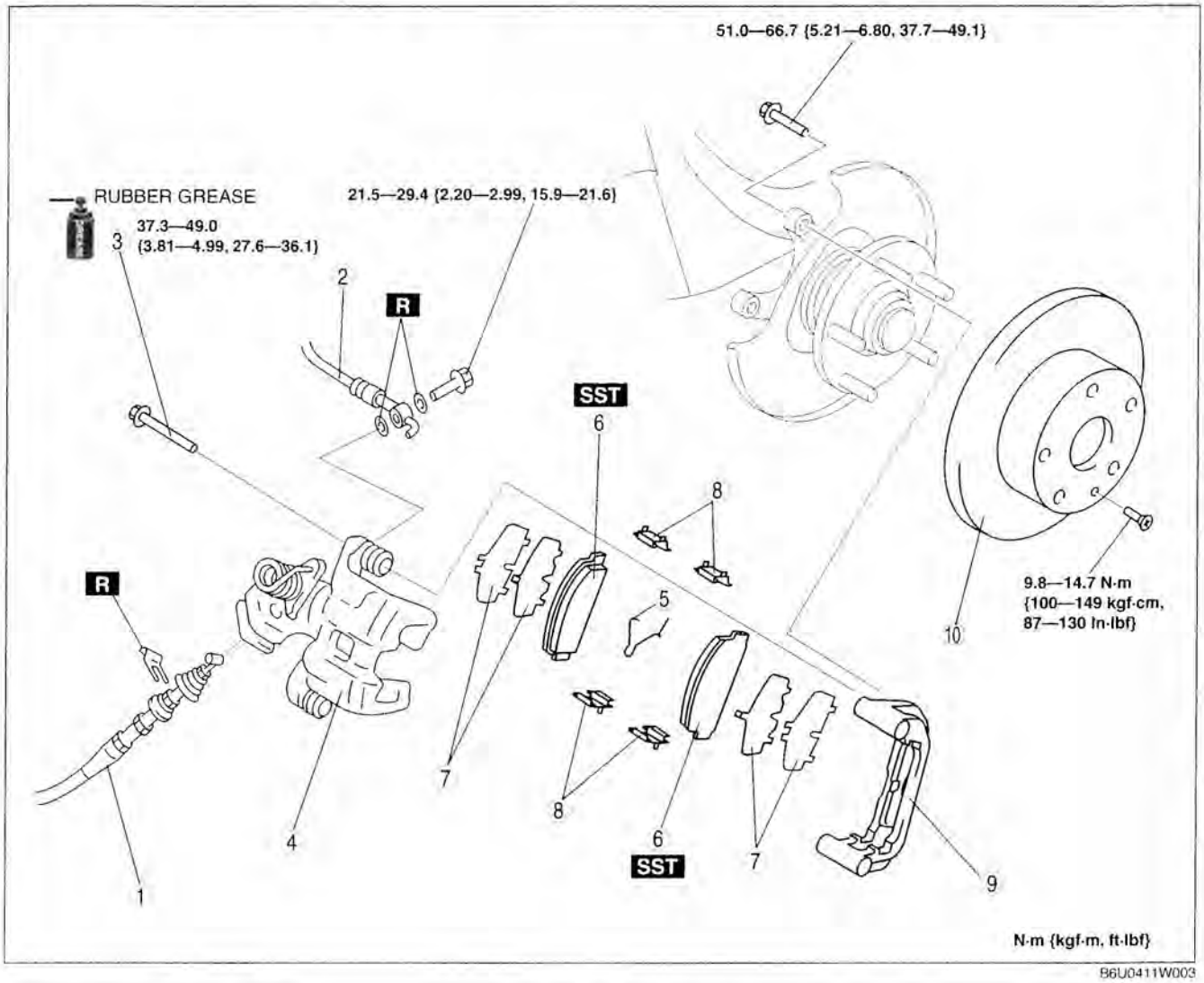


X3U411WAS

REAR BRAKE (DISC) REMOVAL/INSTALLATION

C6U041126980W02

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, depress the pedal several times, rotate the wheel by hand, and verify that the brake does not drag.



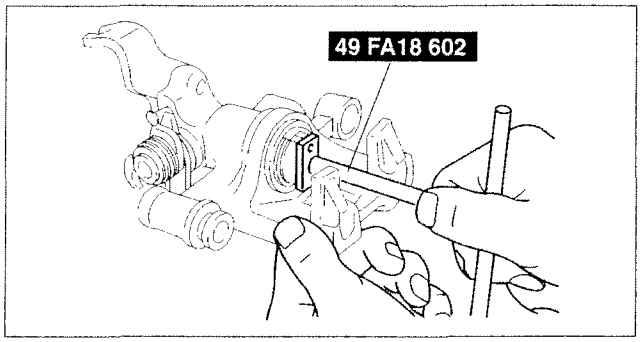
B6U0411W003

1	Parking brake cable, clip
2	Flexible hose
3	Bolt
4	Caliper
5	Spring
6	Disc pad (See 04–11–22 Disc Pad Installation Note)

7	Shim
8	Guide plate
9	Mounting support
10	Disc plate (See 04–11–17 Disc Plate Removal Note) (See 04–11–17 Disc Plate Installation Note)

Disc Pad Installation Note

1. Push the piston fully inward using the **SST**.
2. Install the disc pads.

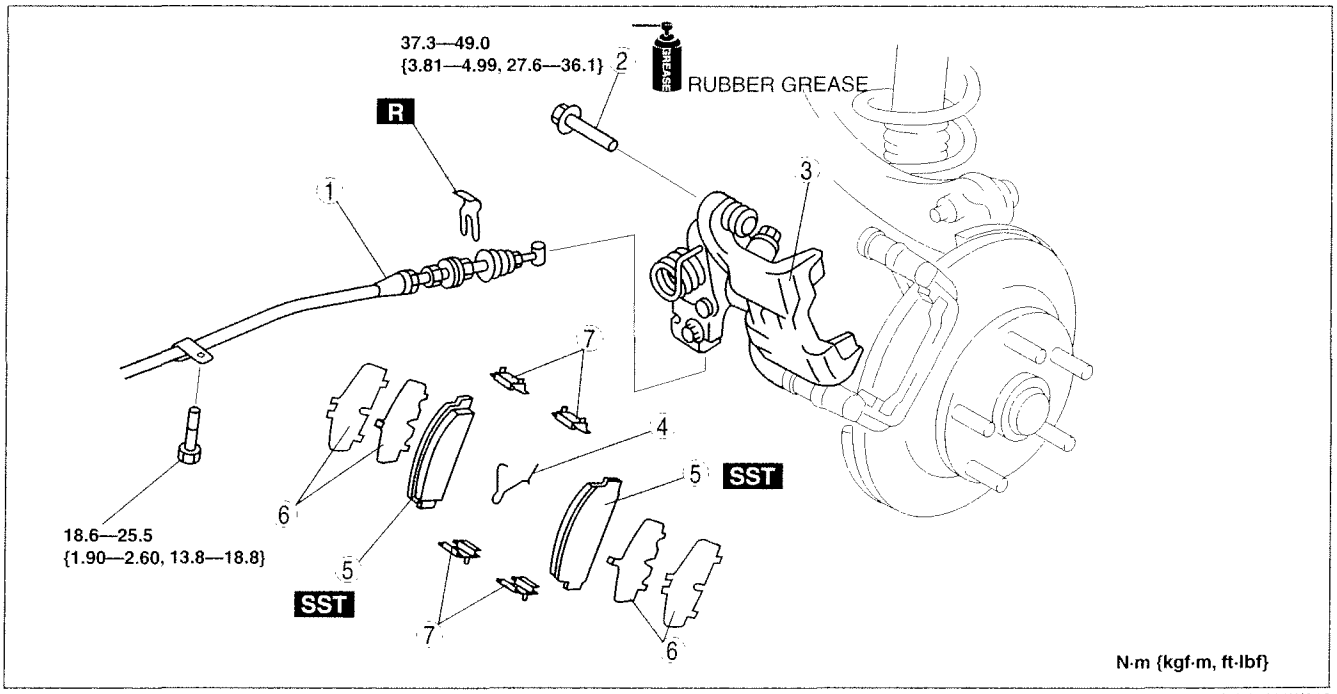


A6E6912W039

DISC PAD (REAR) REPLACEMENT

C6U041126630W01

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



B6U0411W012

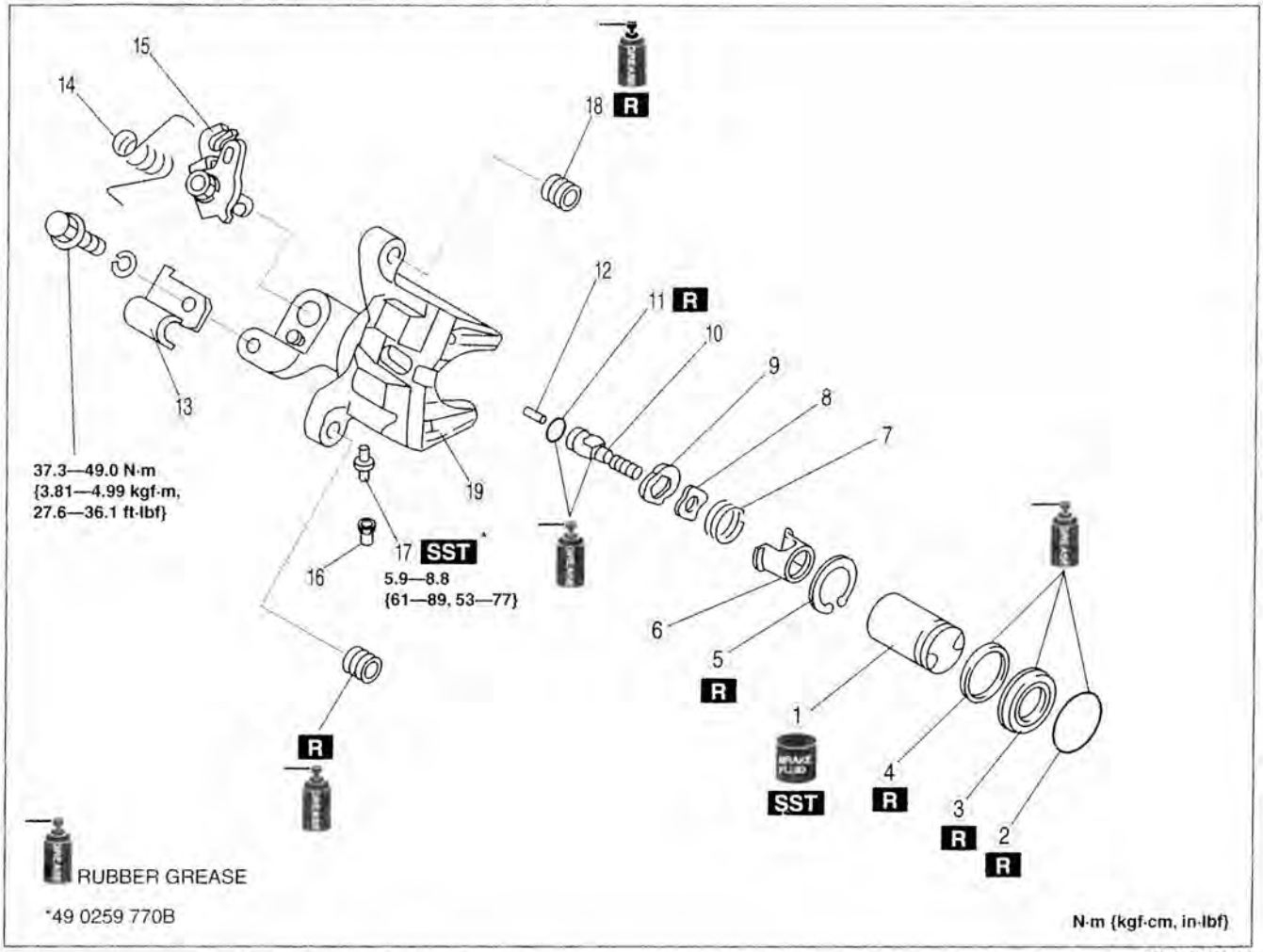
1	Parking brake cable, clip
2	Bolt
3	Caliper
4	Spring

5	Disc pad (See 04–11–22 Disc Pad Installation Note)
6	Shim
7	Guide plate

CALIPER (REAR) DISASSEMBLY/ASSEMBLY

C6U041126990W01

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



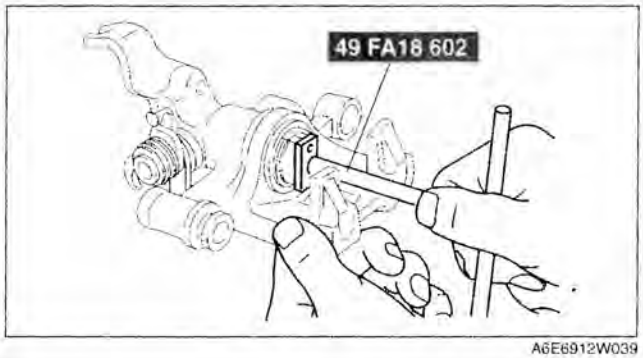
C6U411ZWC001

1	Piston (See 04–11–24 Piston Disassembly/Assembly Note)
2	O-ring
3	Piston boot
4	Piston seal
5	Snap ring
6	Cover
7	Spring
8	Washer
9	Stopper

10	Adjuster
11	O-ring
12	Connecting link
13	Bracket
14	Spring
15	Operating lever
16	Bleeder cap
17	Bleeder screw
18	Boot
19	Caliper body

Piston Disassembly/Assembly Note

- Remove/install the piston using the **SST**.

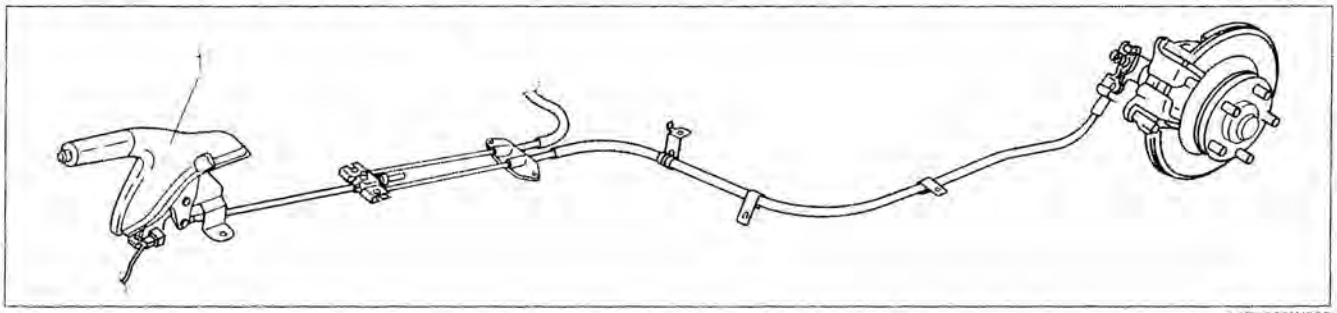


A6E6912W039

04–12 PARKING BRAKE SYSTEM

PARKING BRAKE LOCATION INDEX

C6U041244000W01



A6E6900W005

1	Parking brake lever (See04–12–1 PARKING BRAKE (LEVER TYPE) INSPECTION) (See04–12–1 PARKING BRAKE (LEVER TYPE) ADJUSTMENT) (See04–12–2 PARKING BRAKE (LEVER TYPE) REMOVAL/INSTALLATION)

PARKING BRAKE (LEVER TYPE) INSPECTION

C6U041244000W02

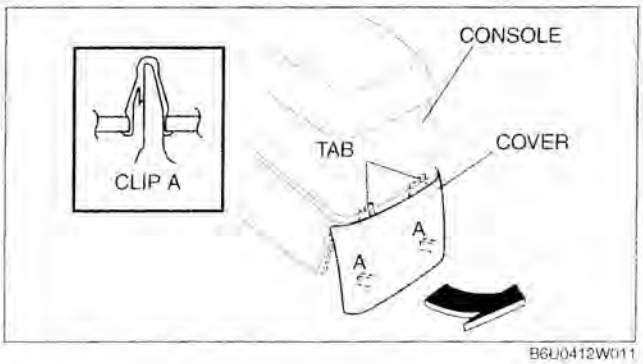
1. Pull the parking brake lever a few times.
2. Depress the brake pedal a few times.
3. Inspect the parking brake stroke by pulling the parking brake lever with a force of **98 N {10 kgf, 22 lbf}**.

Stroke
2—5 notches

PARKING BRAKE (LEVER TYPE) ADJUSTMENT

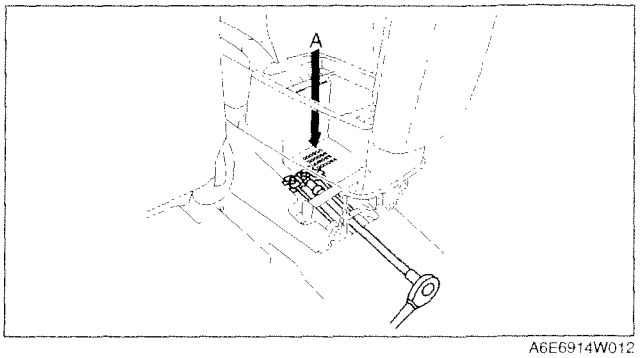
C6U041244000W03

1. Start the engine and depress the brake pedal several times.
2. Stop the engine.
3. Pull the underside of the cover in the direction shown by the arrow and remove clips A from the console.
4. Disengage the hooks from the console and remove the cover.



B6U0412W011

5. Verify the position of the adjusting nut while looking in from above the console (A) as shown, and set the socket on the nut.
6. Turn the adjusting nut to adjust the parking brake lever.
7. After adjustment, inspect the following points:
   (1) Turn the ignition switch to ON, pull the parking brake lever one notch, and verify that the parking brake warning light illuminates.
   (2) Verify that the rear brakes do not drag.

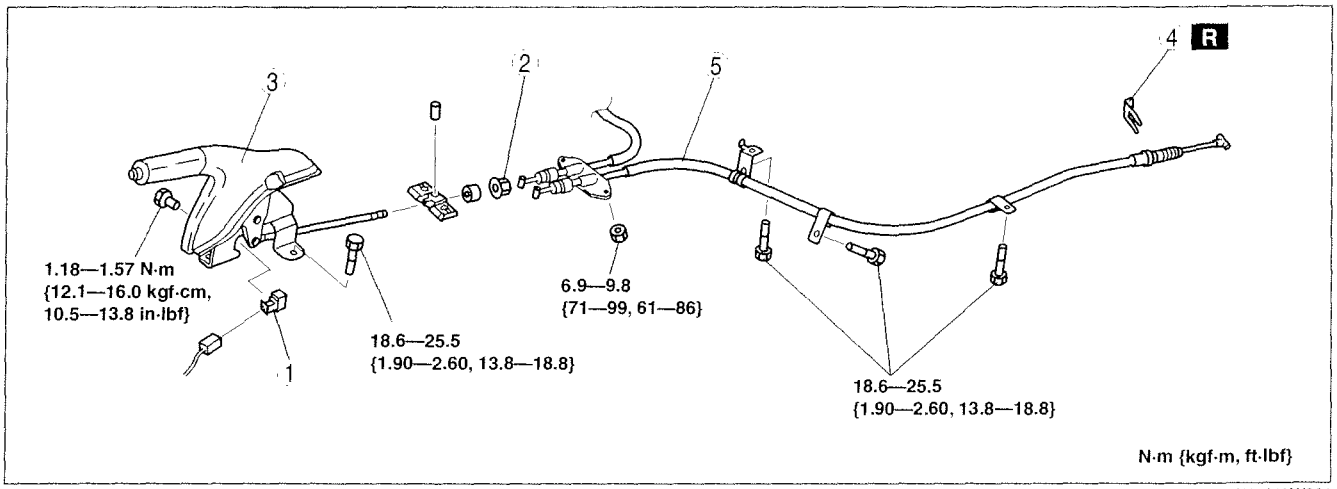


A6E6914W012

PARKING BRAKE (LEVER TYPE) REMOVAL/INSTALLATION

C6U041244000W04

1. Remove the console. (See 09–17–7 CONSOLE REMOVAL/INSTALLATION.)
2. Remove the rear seat cushion (4SD) or rear seat (5HB, WGN). (See 09–13–6 REAR SEAT REMOVAL/INSTALLATION [4SD].) (See 09–13–8 REAR SEAT REMOVAL/INSTALLATION [5HB, WGN].)
3. Remove the exhaust pipe. (See 01–15A–1 EXHAUST SYSTEM REMOVAL/INSTALLATION [L3].) (See 01–15B–2 EXHAUST SYSTEM REMOVAL/INSTALLATION [AJ].)
4. Remove the exhaust pipe insulator.
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Adjust the parking brake stroke. (See 04–12–1 PARKING BRAKE (LEVER TYPE) ADJUSTMENT.)



B6U0412W001

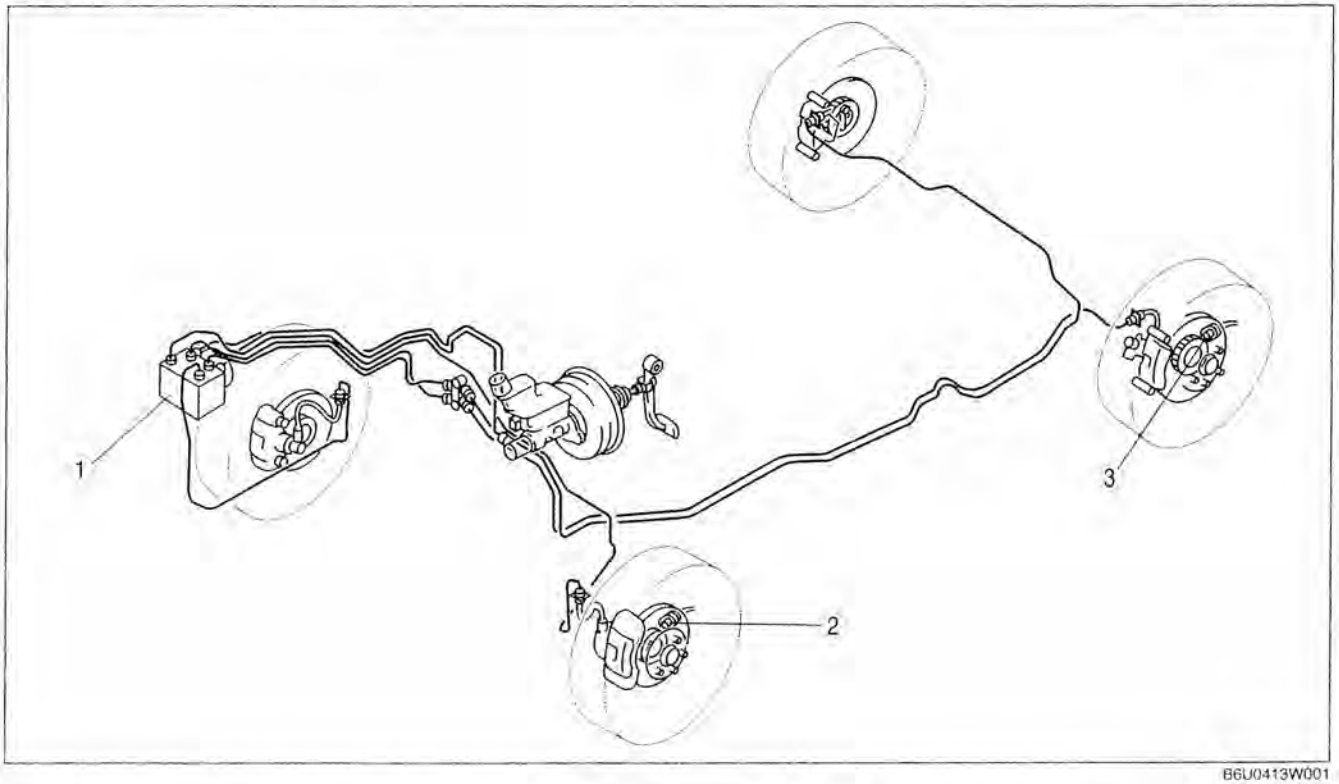
1	Parking brake switch
2	Adjusting nut
3	Parking brake lever

4	Clip
5	Parking brake cable

04–13 ANTILOCK BRAKE SYSTEM

ABS/TCS LOCATION INDEX

C6U041343000W01



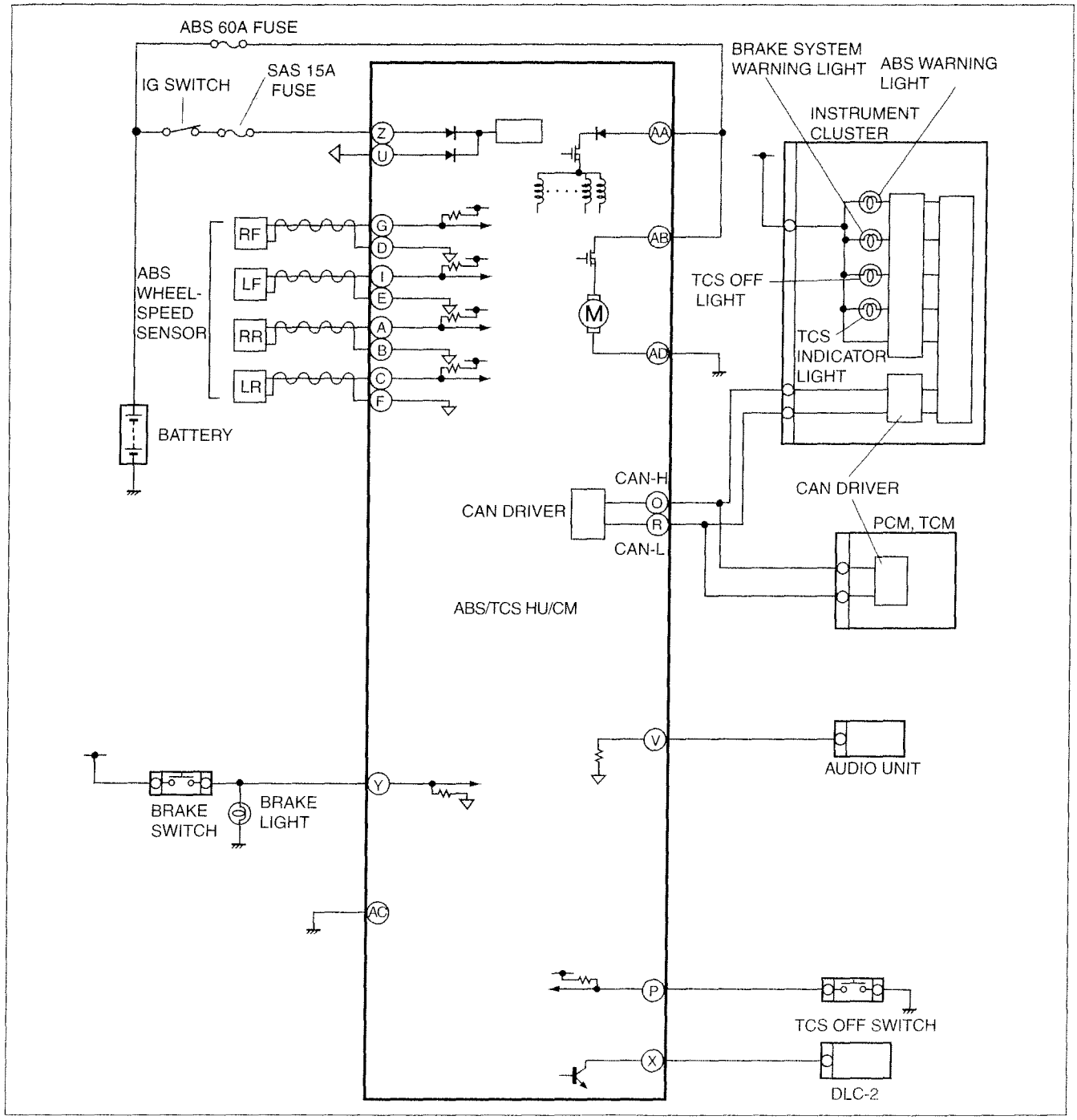
B6U0413W001

1	ABS/TCS HU/CM (See 04–13–3 ABS/TCS HU/CM SYSTEM INSPECTION) (See 04–13–4 ABS/TCS HU/CM REMOVAL/INSTALLATION) (See 04–13–6 ABS/TCS HU/CM INSPECTION) (See04–13–6 ABS/TCS HU/CM CONFIGURATION)

2	Front ABS wheel-speed sensor (See 04–13–8 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION) (See 04–13–9 FRONT/REAR ABS WHEEL-SPEED SENSOR INSPECTION)
3	Rear ABS wheel-speed sensor (See 04–13–9 FRONT/REAR ABS WHEEL-SPEED SENSOR INSPECTION) (See 04–13–10 REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION)

ABS/TCS SYSTEM DIAGRAM

C6U041343000W02



B6U0402W001

ABS/TCS HU/CM SYSTEM INSPECTION

C6U041343780W01

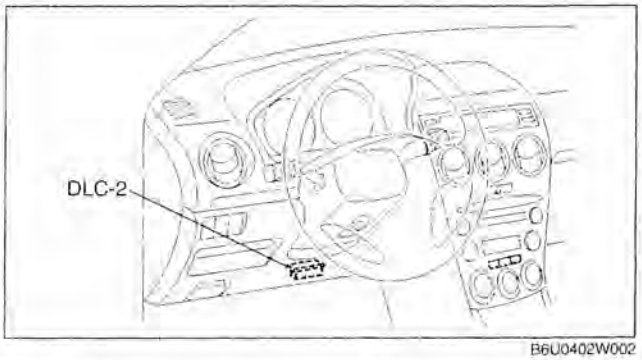
System Inspection

Preparation

1. Verify that the battery is fully charged. With the ignition switch at ON, verify that the ABS and BRAKE system warning lights go out after **3 seconds**.
2. If the lights stay on after **3 seconds**, the ABS/TCS HU/CM detects a failure. Follow the troubleshooting procedures.
3. Turn the ignition switch off.
4. On level ground, jack up the vehicle and support it evenly on safety stands. Shift the transaxle to N position.
5. Release the parking brake.
6. Rotate the wheels by hand, and inspect for brake drag.

Operation of ABS inspection

1. Perform the "Preparation."
2. Connect WDS or equivalent to the DLC-2.
3. Set up an active command mode inspection according to the combination of commands below.



B6U0402W002

OPERATION	COMMAND NAME				COMMAND TYPE
	PMP_MOTOR	RF_OUTLET	RF_INLET	ABS_POWER	
Pressure retention	Off	Off	On	On	Manual
Pressure reduction	On	On	On	On	

The chart above shows an example of a right wheel inspection.

Note

- When working with two people, one should press on the brake pedal, the other should attempt to rotate the wheel being inspected.

4. Send the command while pressing on the brake pedal and attempting to rotate the wheel being inspected.
5. When pressure is being maintained, and a click sound indicating the solenoid is operating comes from the ABS/TCS HU/CM, confirm that the wheel does not rotate. When pressure is being reduced, and a click sound indicating the solenoid is operating comes from the ABS/TCS HU/CM, confirm that the wheel rotates, even though the brake pedal is being depressed.

Note

- To protect the ABS/TCS HU/CM, the solenoid valve used for simulations and the ABS motor stay on for **10 seconds** each time they are switched on.
- Performing the inspections above determines the following.
  - — The ABS/TCS HU/CM brake lines are normal.
  - — The ABS/TCS HU/CM hydraulic system is not significantly abnormal.
  - — The ABS/TCS HU/CM wiring is normal.
- However, the following items cannot be checked.
  - — ABS/TCS HU/CM input system harness and parts.
  - — Extremely small leaks in the ABS/TCS HU/CM internal hydraulic system
  - — Unusual intermittent occurrences in the above items.

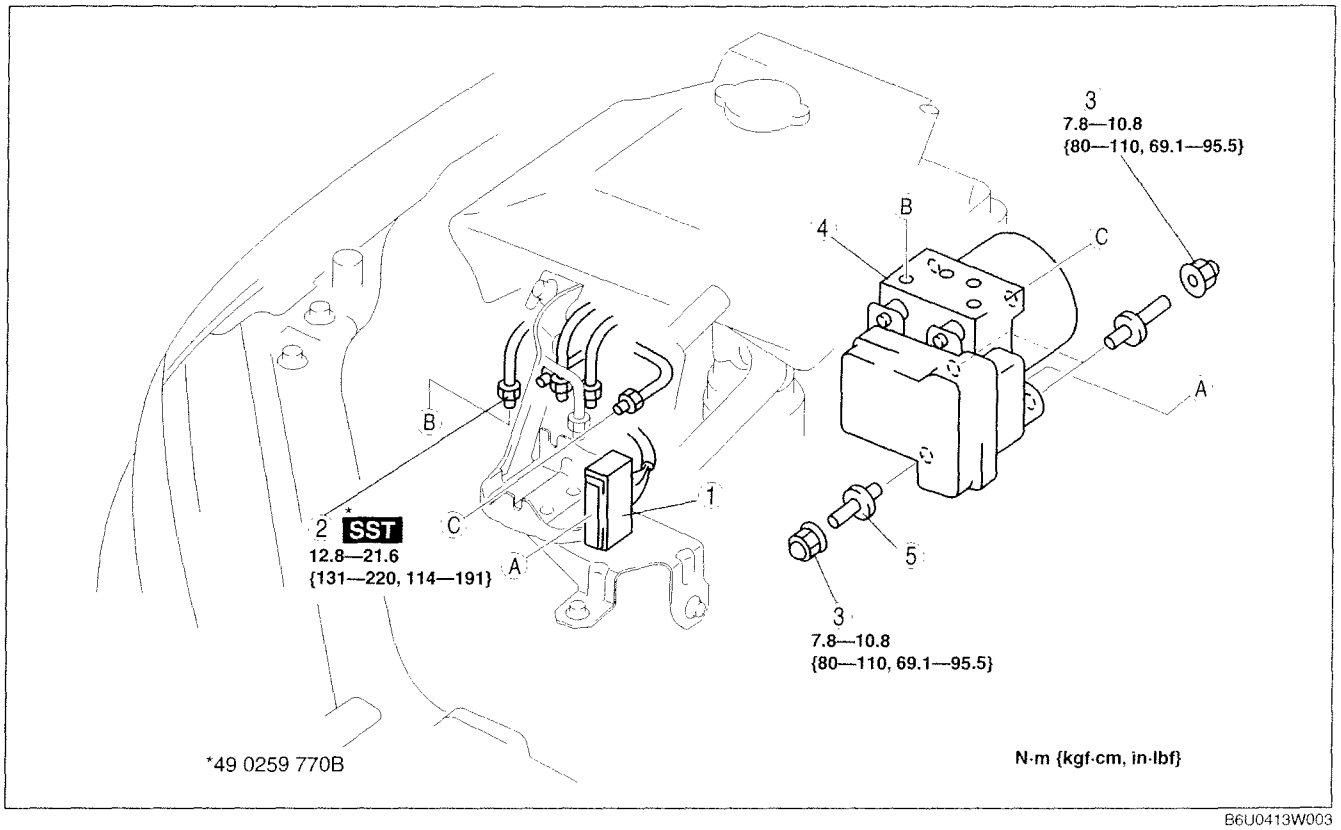
ABS/TCS HU/CM REMOVAL/INSTALLATION

C6U041343700W01

Caution

- **When replacing the ABS/TCS HU/CM, the configuration procedure must be done before removing the ABS/TCS HU/CM. If the configuration is not completed before removing the ABS/TCS HU/CM, TCS will not work properly after installation of the ABS/TCS HU/CM.**
- **Do not drop the ABS/TCS HU/CM. Replace it if it is subjected to an impact.**

1. Configurate the ABS/TCS HU/CM (only when replacing it). (See 04–13–6 ABS/TCS HU/CM CONFIGURATION.)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



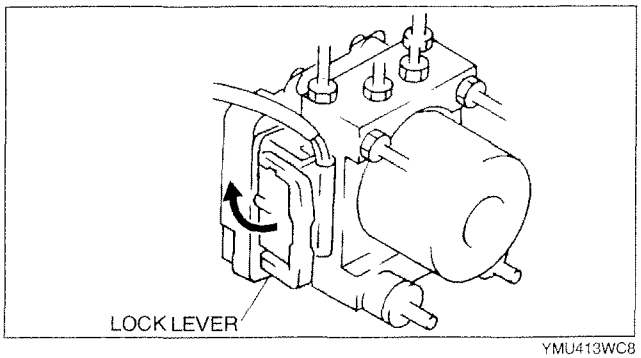
B6U0413W003

1	Connector (See 04–13–5 Connector Removal Note) (See 04–13–5 Connector Installation Note
2	Brake pipe (See 04–13–5 Brake Pipe Removal Note) (See 04–13–5 Brake Pipe Installation Note)
3	Nut

4	ABS/TCS HU/CM (See 04–13–5 ABS/TCS HU/CM Removal/ Installation Note)
5	Stud

Connector Removal Note

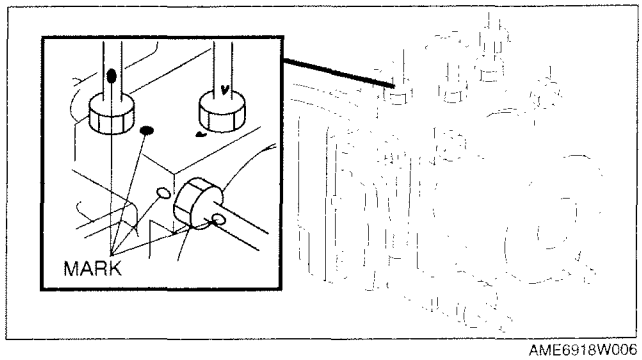
1. Release the lock lever to unlock it.
2. Remove the connector.



YMU413WC8

Brake Pipe Removal Note

1. Mark the brake pipe connecting positions before removal for reference during installation.



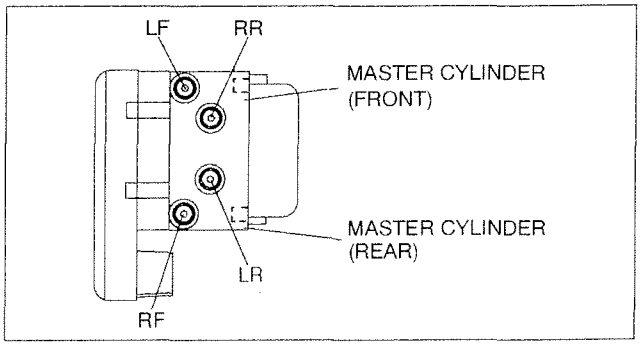
AME6918W006

ABS/TCS HU/CM Removal/Installation Note

1. When removing/installing the ABS/TCS HU/CM from/to the vehicle, attach a strip of protective tape on the ABS/TCS HU/CM connector to prevent brake fluid from entering.

Brake Pipe Installation Note

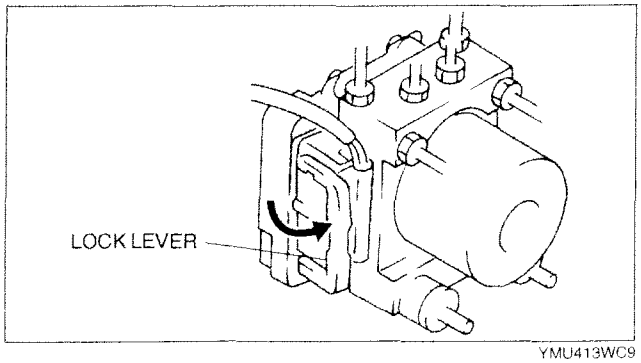
1. When installing the brake pipe, align the marks made before removal with the ABS/TCS HU/CM as shown in the figure.



B6U0413W004

Connector Installation Note

1. Verify that the lock lever of the harness connector is securely locked.

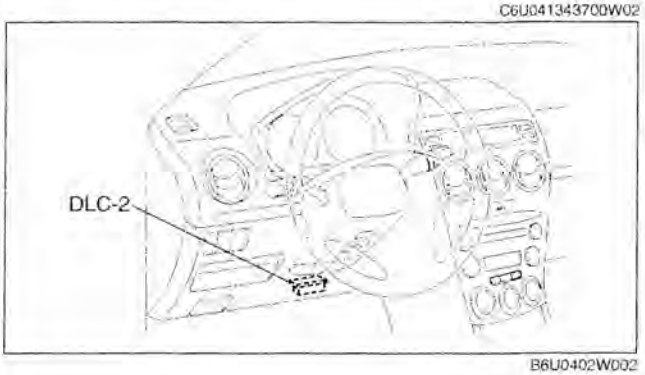


YMU413WC9

ABS/TCS HU/CM CONFIGURATION

1. Connect the WDS or equivalent to the DLC-2.
2. Input vehicle information following the directions on the WDS or equivalent screen.
3. Select "MODULE PROGRAMMING".
4. Select "PROGRAMMABLE MODULE INSTALLATION".
5. Select "ABS/TCS".
6. Retrieve DTCs using the WDS or equivalent, then verify that there is no DTC present.
   - If any DTC is present, perform applicable DTC inspection.

C6U041343700W02

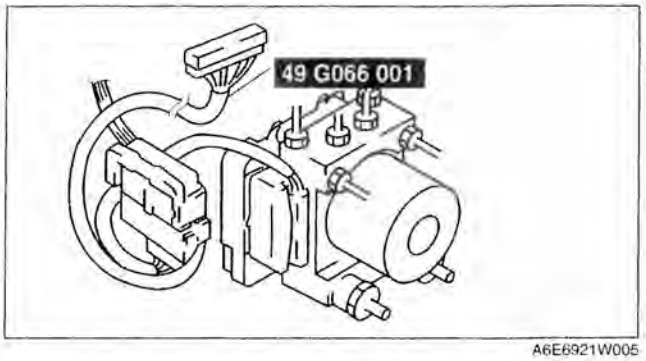


B6U0402W002

ABS/TCS HU/CM INSPECTION

1. Disconnect the negative battery cable.
2. Connect the **SST** between the ABS/TCS HU/CM and harness connector with the ignition switch off.
3. Attach the tester leads to the **SST** and inspect voltage referring to the table below.

C6U041367650W01

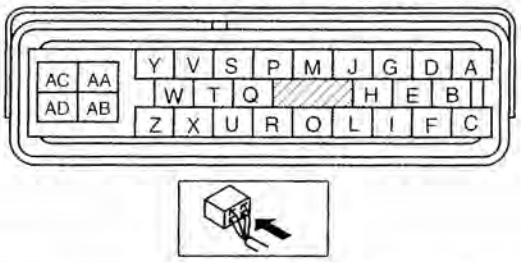


A6E6921W005

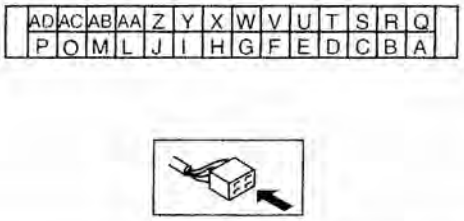
Terminal Voltage Table (Reference)

(Engine is idling, and connector is connected unless otherwise indicated)

ABS/TCS HU/CM HARNESS SIDE CONNECTOR



SST (49 G066 001) CONNECTOR



B6U0403W004

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
A B	RR wheel-speed	RR wheel-speed sensor	Vehicle is stopped	0 (AC)	• Inspect related harnesses • Inspect ABS wheel-speed sensor
			• Inspect by using the wave profile. (See 04–13–7 Inspection Using An Oscilloscope (Reference))		
C F	LR wheel-speed	LR wheel-speed sensor	Vehicle is stopped	0 (AC)	
			• Inspect by using the wave profile. (See 04–13–7 Inspection Using An Oscilloscope (Reference))		
G D	RF wheel-speed	RF wheel-speed sensor	Vehicle is stopped	0 (AC)	
			• Inspect by using the wave profile. (See 04–13–7 Inspection Using An Oscilloscope (Reference))		
I E	LF wheel-speed	LF wheel-speed sensor	Vehicle is stopped	0 (AC)	
			• Inspect by using the wave profile. (See 04–13–7 Inspection Using An Oscilloscope (Reference))		
H	—	—	—	—	—

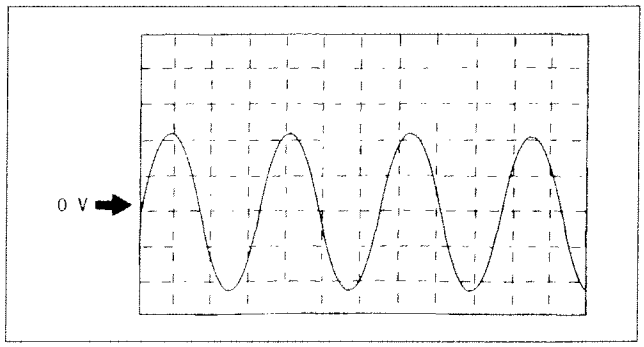
Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
K	—	—	—	—	—
L	—	—	—	—	—
M	—	—	—	—	—
N	—	—	—	—	—
O	CAN-H	—	—	No need to check	—
P	TCS OFF switch	TCS OFF switch	When switch is pressed	Below 1.0	• Inspect related harnesses • Inspect TCS OFF switch
			When switch is not pressed	B+	
Q	—	—	—	—	—
R	CAN-L	—	—	No need to check	—
S	—	—	—	—	—
T	—	—	—	—	—
U*	—	Check connector	—	No need to check	—
V	Vehicle speed output	• Audio unit	Vehicle is stopped	0	• Inspect related harnesses • Inspect ABS wheel-speed sensor
			• Inspect by using the wave profile. (See 04–13–7 Inspection Using An Oscilloscope (Reference))		
W	—	—	—	—	—
X	OBD	KLN terminal of DLC-2	It cannot be determined with terminal voltage whether the condition is good or bad because advanced function diagnostic output is performed with serial communication. Inspect with service codes.		• Inspect related harnesses • Inspect ABS/TCS HU/CM
Y	Brake switch	Brake switch	Brake pedal is depressed	10—14	• Inspect related harnesses
			Brake pedal is released	Below 0.5	
Z	Power supply	Ignition switch	—	B+	• Inspect related harnesses
AA	Power supply (Solenoid valve)	Battery	—	B+	• Inspect related harnesses
AB	Power supply (ABS motor)	Battery	—	B+	
AC	Ground	Ground	—	0	• Inspect related harnesses
AD	Ground	Ground	—	0	• Inspect related harnesses

* : This terminal is used at the factory only, not used for inspection and repair in the field.

Inspection Using An Oscilloscope (Reference)

Wheel speed

- ABS/TCS HU/CM terminal:
  RR: A (+)— B (–)
  LR: C (+)—F (–)
  RF: G (+)—D (–)
  LF: I (+)—E (–)
- Oscilloscope setting:
  1 V/DIV (Y), 2 ms/DIV (X), AC range
- Vehicle condition: Driving 30 km/h (18.6 mph)



Z3U0413W201

Note

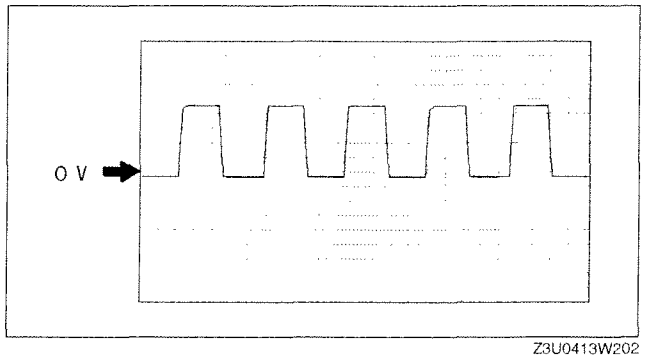
- As vehicle speed increases, the wave period shortens.
- If there is malfunctioning in the sensor rotor, the wave profile warps.

Vehicle speed output

- ABS/TCS HU/CM terminal: V (+)—AC (–)
- Oscilloscope setting:
  1 V/DIV (Y), 5 ms/DIV (X), DC range
- Vehicle condition: Driving 30 km/h (18.6 mph)

Note

- As vehicle speed increases, the wave period shortens.

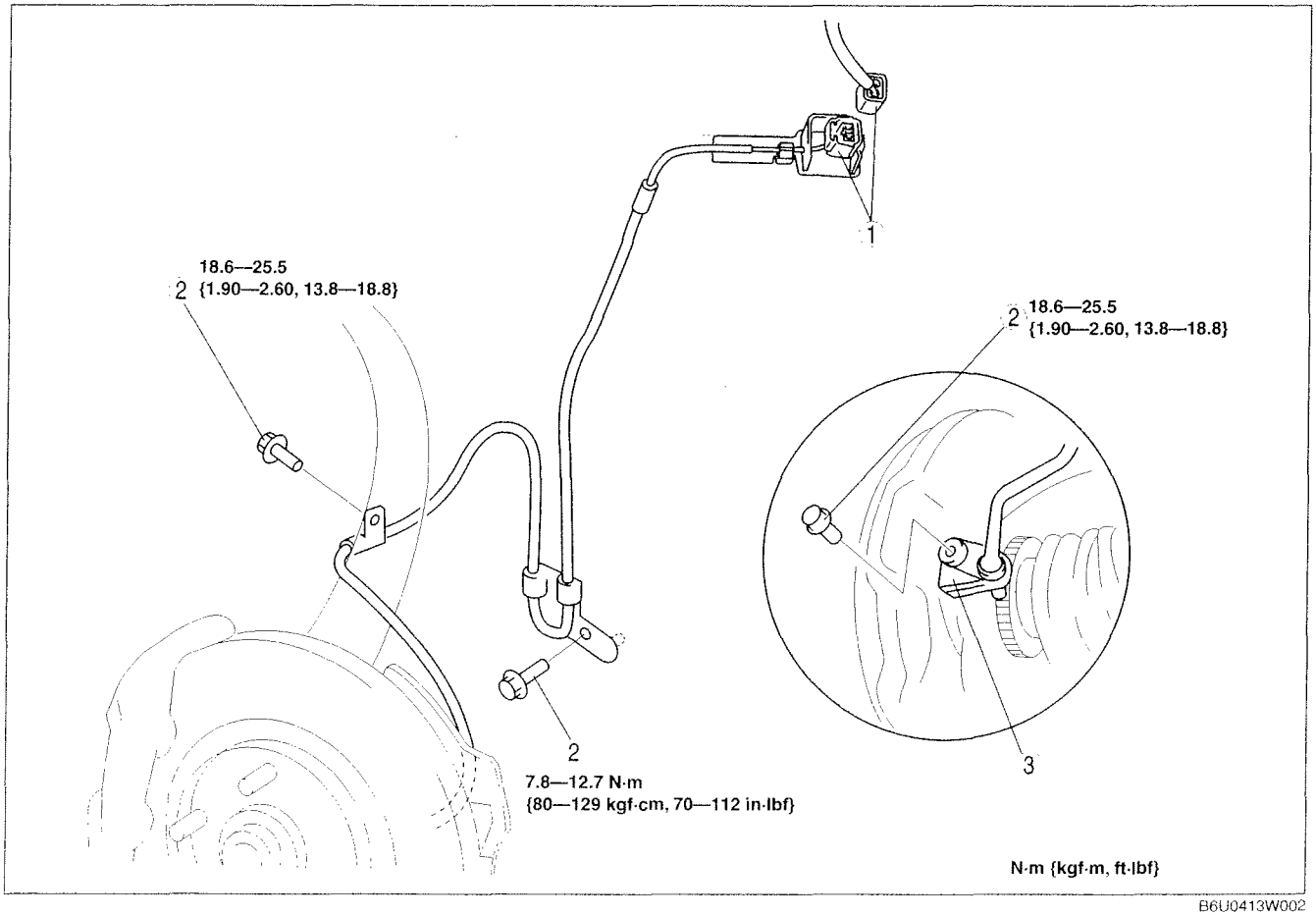


Z3U0413W202

FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

C6U041343720W01

1. Remove the mud guard.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



B6U0413W002

1	Connector
2	Bolts
3	Front ABS wheel-speed sensor

FRONT/REAR ABS WHEEL-SPEED SENSOR INSPECTION

C6U041343720W02

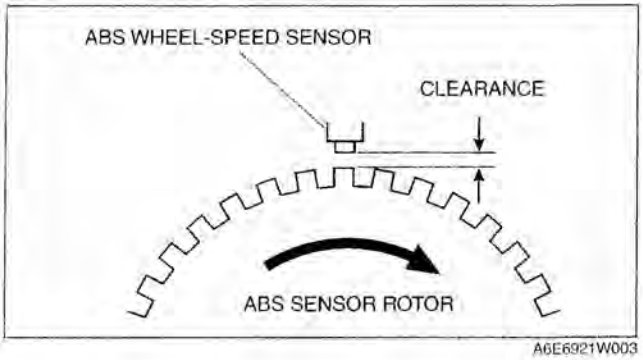
Visual Inspection

1. Remove the wheel and tire, and inspect the sensor for looseness and damage. Replace the sensor if necessary.

Clearance Inspection

1. Inspect the clearance between the wheel-speed sensor and the sensor rotor.

Clearance
0.3—1.1 mm {0.012—0.043 in}



A6E6921W003

Resistance Inspection

1. Disconnect the ABS wheel-speed sensor connector.
2. Inspect the resistance at the ABS wheel-speed sensor.
   - If not as specified, replace the ABS wheel-speed sensor.

Resistance
1.3—1.7 kilohm

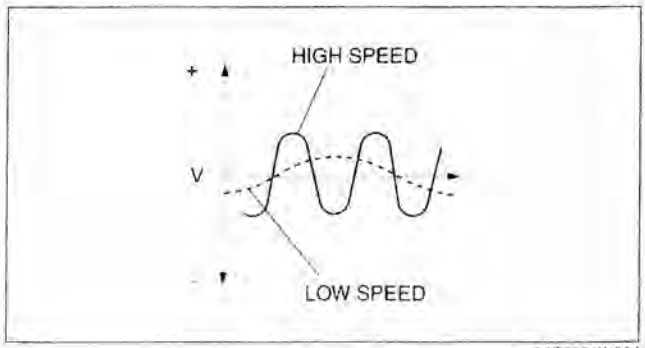
Voltage Inspection

1. On level ground, jack up the vehicle and support it evenly on safety stands.
2. Disconnect the ABS wheel-speed sensor connector.
3. Inspect each sensor by rotating each wheel one revolution per second.
   - If not as specified, replace the ABS wheel-speed sensor.

Voltage
0.25—1.2 V (AC)

Voltage Pattern Inspection

1. On level ground, jack up the vehicle and support it evenly on safety stands.
2. Disconnect the ABS wheel-speed sensor connector.
3. Using an oscilloscope, inspect the voltage pattern for distortion and noise by rotating each wheel.
   - If there is distortion or noise, inspect the ABS sensor rotor.

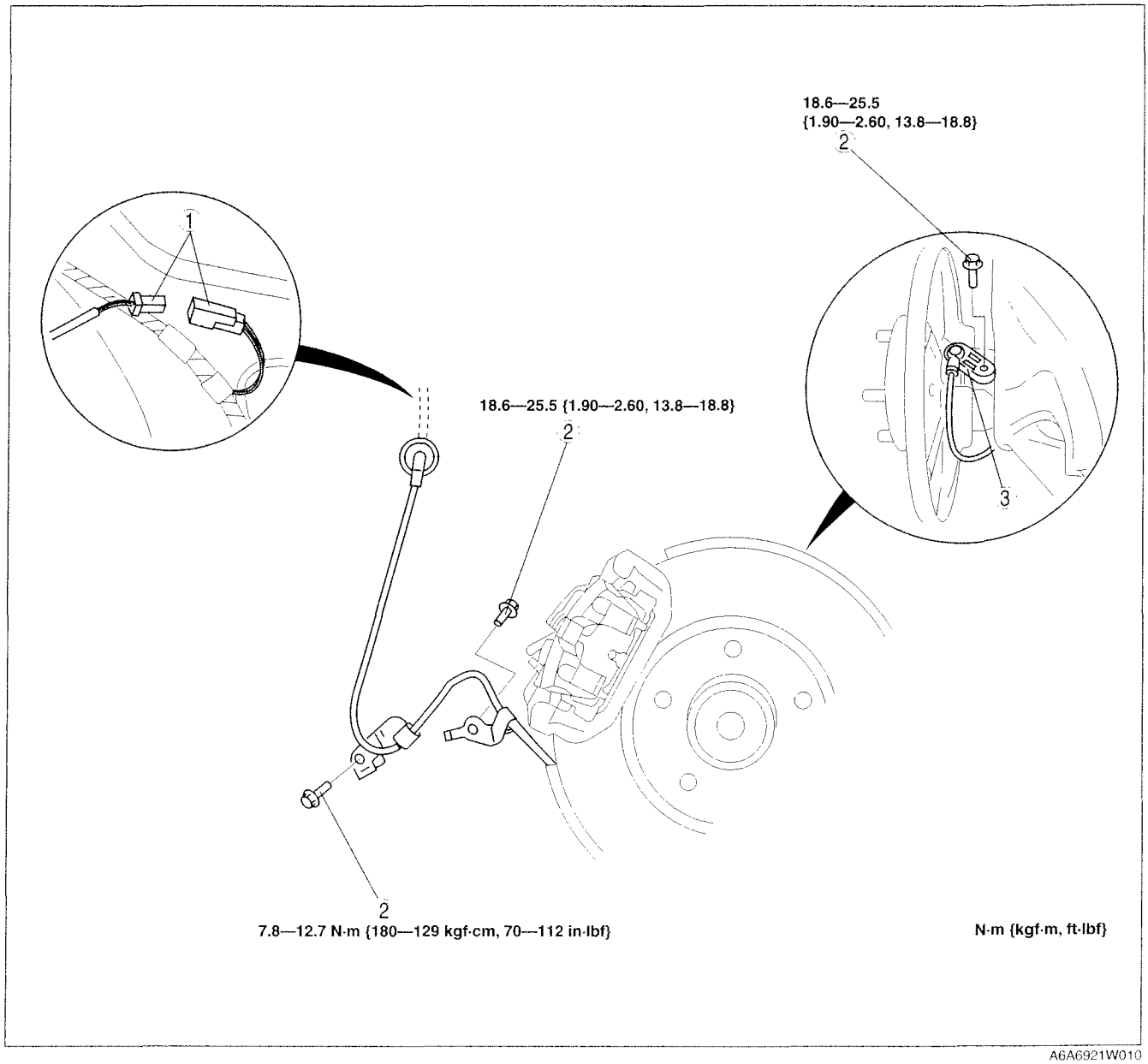


A6E6921W004

REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

C6U041343710W01

1. Remove the tire house trim. (See 09–17–13 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



A6A6921W010

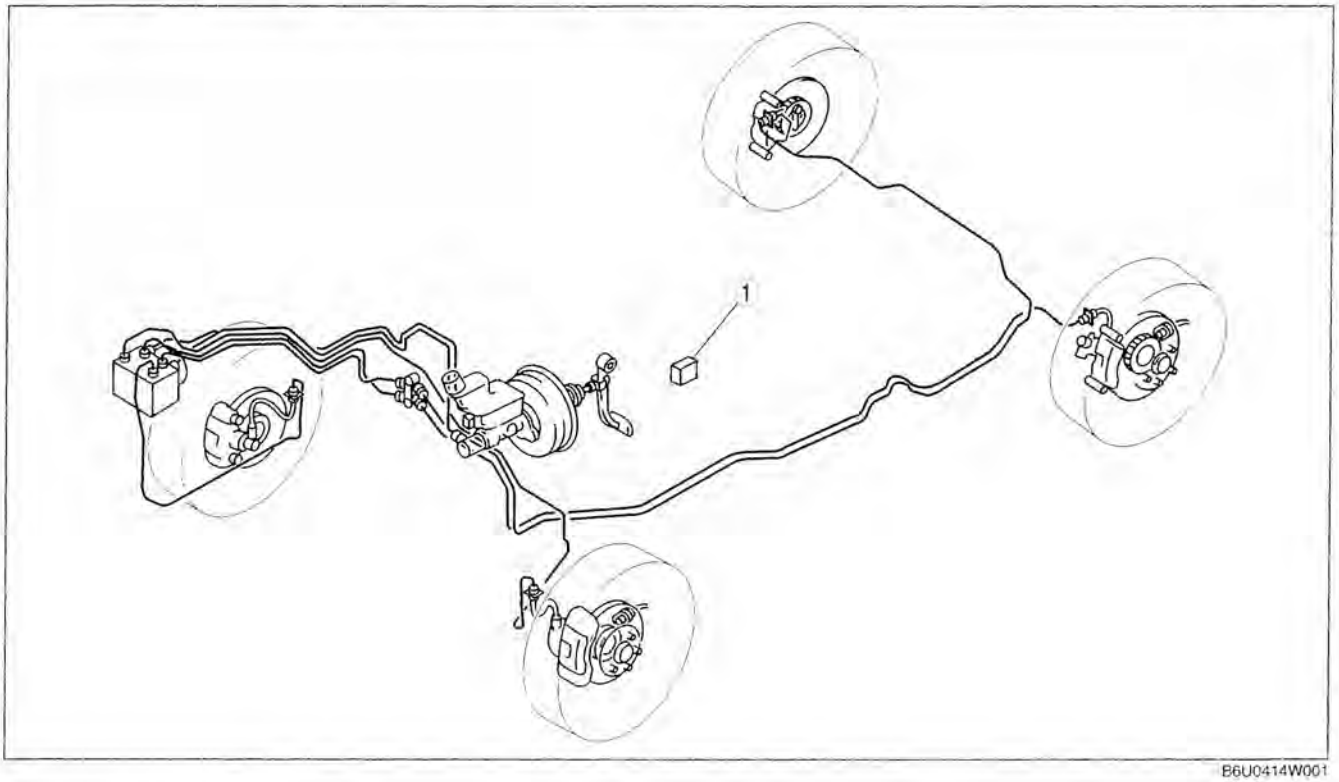
1	Connector
2	Bolt

3	Rear ABS wheel-speed sensor

04–14 TRACTION CONTROL SYSTEM

TRACTION CONTROL SYSTEM LOCATION INDEX

C6U041443000W01



B6U0414W001

1	TCS off switch (See 04–14–1 TCS OFF SWITCH REMOVAL/INSTALLATION) (See 04–14–2 TCS OFF SWITCH INSPECTION)

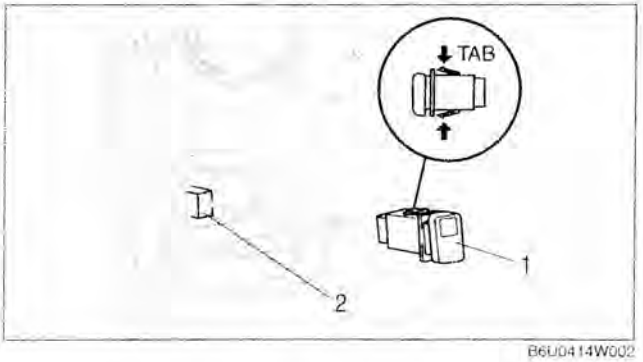
TCS OFF SWITCH REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	TCS off switch (See04–14–1 TCS Off Switch Removal Note)
2	Connector

3. Install in the reverse order of removal.

C6U041446444W01



B6U0414W002

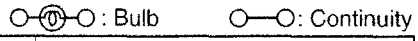
TCS Off Switch Removal Note

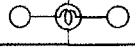
1. Insert your hand from the lower side of the dashboard and squeeze the tabs of the TCS off switch.
2. Pull the TCS off switch forward to remove it.

TCS OFF SWITCH INSPECTION

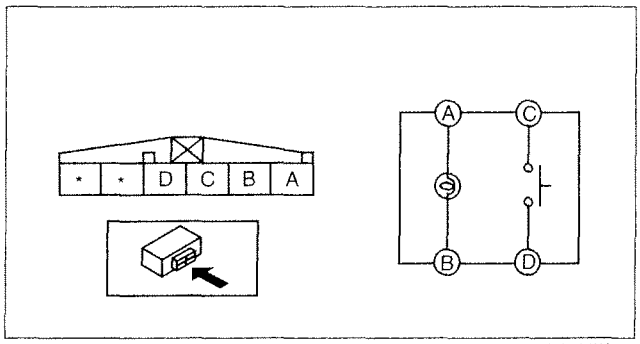
C6U041446444W02

1. Remove the TCS OFF switch.
2. Inspect for continuity between the TCS OFF switch terminals using an ohmmeter.
   - If not as specified, replace the TCS OFF switch.



Condition	Terminal			
	A	B	C	D
When the switch is pressed				
When the switch is released				

A6E6921W010



B6U0414W003

04–50 TECHNICAL DATA

BRAKING SYSTEM

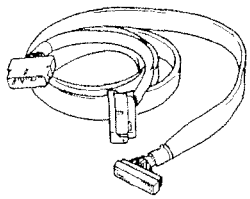
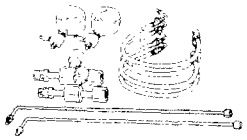
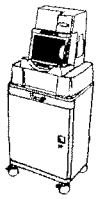
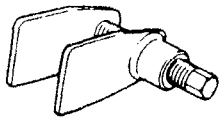
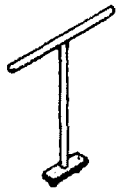
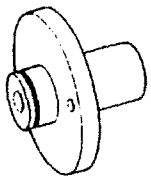
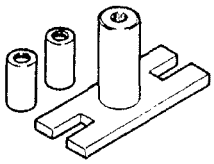
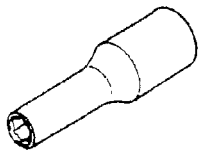
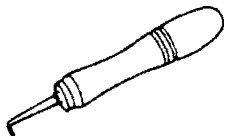
C6U045001020W01

Item			Specification
CONVENTIONAL BRAKE SYSTEM			
Brake pedal	Pedal height (reference value) (mm {in})		187 {7.36}
	Pedal play (mm {in})		0—3 {0—0.1}
	Pedal-to-floor clearance (Brake pedal when depressed at 588 N {60 kgf, 132 lbf}) (mm {in})		68 {2.7} min.
Power brake unit	Fluid pressure when pedal depressed at 200 N {20 kgf, 44 lbf} (kPa {kgf/cm^2, psi})	At 0 kPa {0 mmHg, 0 inHg}	590 {6.02, 85.6} min.
		At 66.7 kPa {500 mmHg, 19.7 inHg}	8,780 {89.53, 1,273} min.
Dual proportioning valve (without ABS/TCS)	Rear brake pressure when master cylinder pressure is 2,450 kPa {25 kgf/cm^2, 355 psi} (Switching point) (kPa {kgf/cm^2, psi})		2,450 {25, 355} ± 200 {2, 29}
	Rear brake pressure when master cylinder pressure is 5,880 kPa {60 kgf/cm^2, 853 psi} (kPa {kgf/cm^2, psi})		3,480 {35.5, 505} ± 300 {3, 44}
Front disc brake	Minimum disc pad thickness (mm {in})		2.0 {0.079}
	Minimum disc plate thickness (mm {in})		23 {0.91}
	Disc plate runout limit (mm {in})		0.02 {0.0008}
Rear disc brake	Minimum disc pad thickness (mm {in})		2.0 {0.079}
	Minimum disc plate thickness (mm {in})		8 {0.31}
	Disc plate runout limit (mm {in})		0.02 {0.0008}
Brake fluid	Type		SAE J1703, FMVSS 116 DOT3
PARKING BRAKE SYSTEM			
Parking brake lever	Lever stroke when pulled at 98 N {10 kgf, 22 lbf} (notches)		2—5

04–60 SERVICE TOOLS

BRAKES SST

C6U046001020W01

49 0259 770B Flare nut wrench 	49 G066 001 Adapter harness 	49 U043 0A0A Oil pressure gauge set 
418-FS475 WDS 	49 0221 600C Disc brake expand tool 	49 FA18 602 Disc brake piston wrench 
49 G043 001 Gauge 	49 E043 003A Turning lock tool 	49 B043 004 Socket wrench 
49 0208 701A Boot air out tool 	—	—

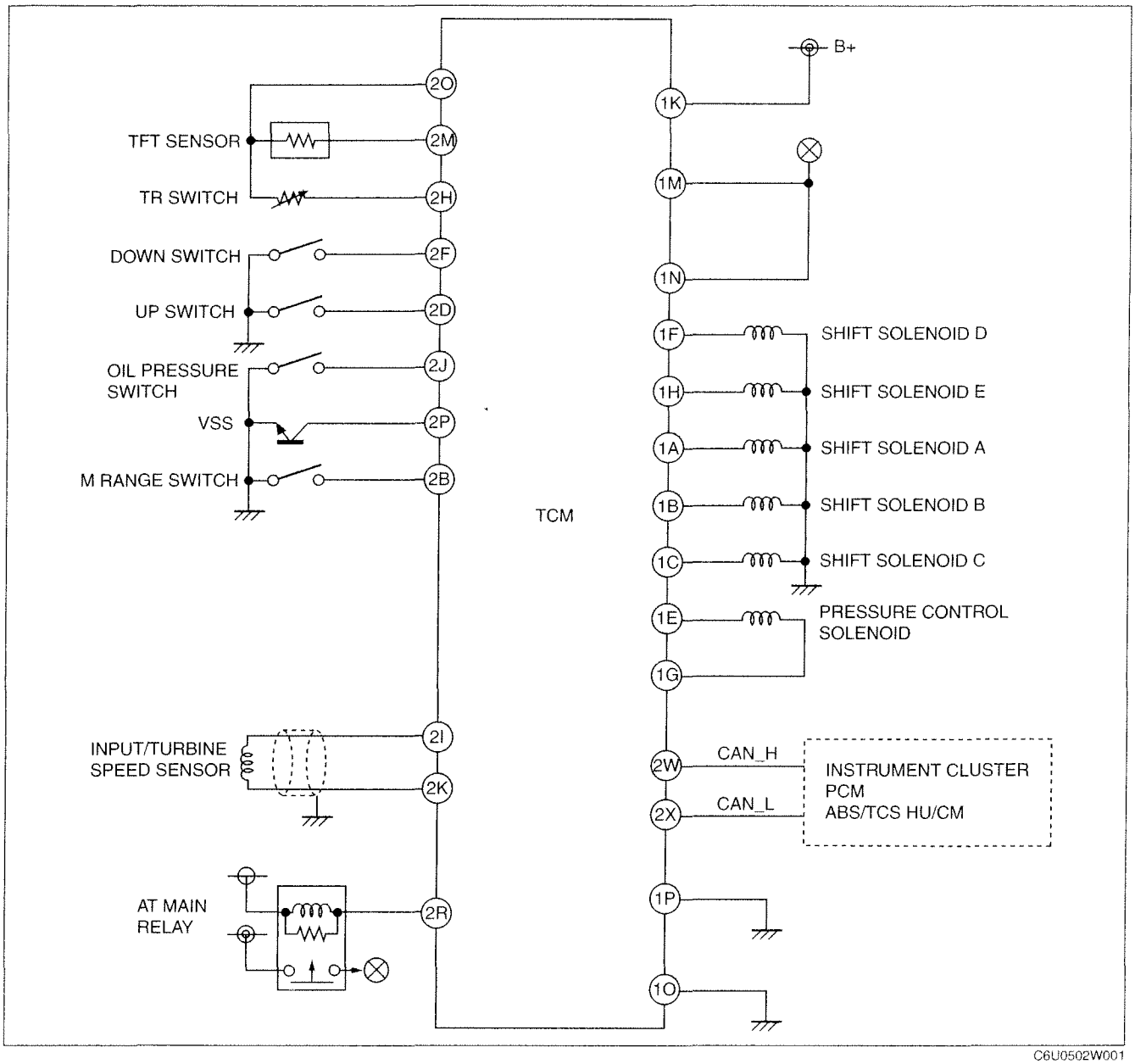
TRANSMISSION/TRANSAXLE

05 SECTION

05–02A ON-BOARD DIAGNOSTIC [FN4A-EL]

AUTOMATIC TRANSAXLE CONTROL SYSTEM WIRING DIAGRAM [FN4A-EL]

C6U050201030W01

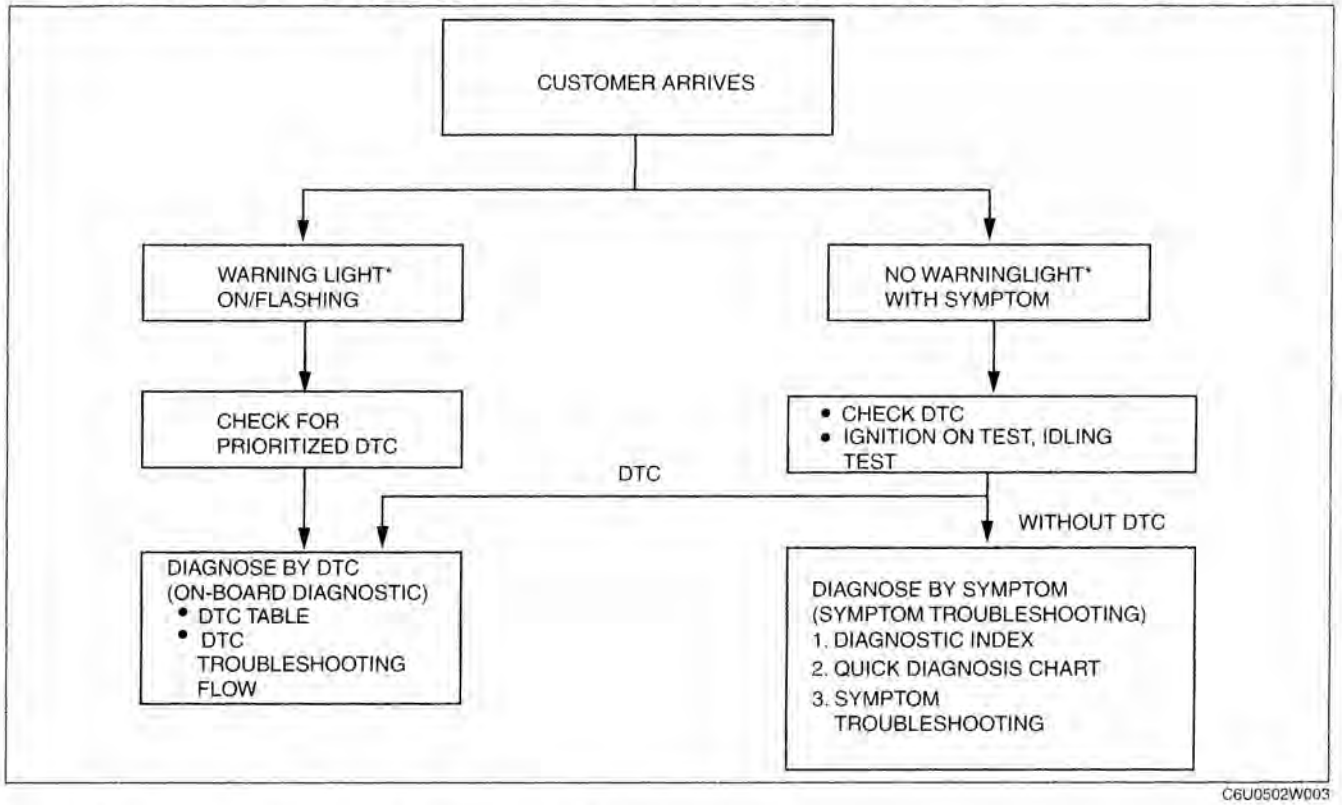


C6U0502W001

FOREWORD [FN4A-EL]

C6U050201030W02

- When the customer reports a vehicle malfunction, check the malfunction indicator lamp (MIL), AT warning light illumination, and TCM memory for diagnostic trouble code (DTC), then diagnose the malfunction according to following flowchart.
  - — If a DTC exists, diagnose the applicable DTC. (See 05–02A–4 DTC TABLE [FN4A-EL].)
  - — If a DTC does not exist, and the MIL and AT warning lights do not illuminate, diagnose the applicable symptom troubleshooting. (See 05–03A–4 SYMPTOM TROUBLESHOOTING ITEM TABLE [FN4A-EL].)



C6U0502W003

* : Malfunction Indicator Lamp (MIL), AT warning light

AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION [FN4A-EL]

C6U050201030W03

DTC Reading Procedure

(See 01–02A–7 ON-BOARD DIAGNOSTIC TEST [L3].)

AFTER REPAIR PROCEDURE [FN4A-EL]

C6U050201030W04

Caution

- **After repairing a malfunction, perform this procedure to verify that the malfunction has been corrected.**
- **When this procedure is carried out, be sure to drive the vehicle at lawful speed and pay attention to the other vehicles.**

1. Connect the WDS or equivalent to the DLC-2.
2. Turn the ignition switch to ON (engine off).
3. Verify that DTCs are cleared from memory.
4. Decrease ATF temperature to **20 °C {68 °F} or below**.
5. Start the engine then wait **180 seconds or more**.
6. Warm up the engine and ATX.
   - Engine coolant temperature: **60 °C {140 °F} or above**.
   - Transaxle fluid temperature: **20 °C {68 °F} or above**.
7. Shift the selector lever between P position to D range while depressing brake pedal.
8. Drive the vehicle for **150 seconds or more** at a vehicle speed **between 25 and 59 km/h {15 and 36 mph}**, then **60 km/h {37 mph} or more** for **100 seconds or more**.
9. Drive the vehicle in D range and shift gears between 1st and 4th (TCC operation) gear.
10. Gradually slow down and stop the vehicle.
11. Make sure that no DTC's occur.

DTC TABLE [FN4A-EL]

C6U050201030W05

×: Available

DTC No.	Condition	MIL	AT warning light indicates	DC	Monitor item	Memory function	Page
P0706	Transaxle range (TR) switch circuit range/ performance	ON	YES	2	CCM	X	(See 05–02A–7 DTC P0706 [FN4A-EL])
P0707	Transaxle range (TR) switch circuit low input	ON	YES	1	CCM	X	(See 05–02A–8 DTC P0707 [FN4A-EL])
P0708	Transaxle range (TR) switch circuit high input	ON	YES	2	CCM	X	(See 05–02A–10 DTC P0708 [FN4A-EL])
P0711	Transaxle fluid temperature (TFT) sensor circuit range/performance (stuck)	ON	NO	2	CCM	X	(See 05–02A–12 DTC P0711 [FN4A-EL])
P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)	ON	YES	1	CCM	X	(See 05–02A–13 DTC P0712 [FN4A-EL])
P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)	ON	YES	1	CCM	X	(See 05–02A–15 DTC P0713 [FN4A-EL])
P0715	Input/turbine speed sensor circuit malfunction	ON	YES	1	CCM	X	(See 05–02A–18 DTC P0715 [FN4A-EL])
P0720	VSS circuit malfunction	ON	YES	2	CCM	X	(See 05–02A–20 DTC P0720 [FN4A-EL])
P0731	Gear 1 incorrect (Incorrect Gear Ratio Detected)	OFF	YES	1	CCM	X	(See 05–02A–22 DTC P0731 [FN4A-EL])
P0732	Gear 2 incorrect (Incorrect Gear Ratio Detected)	OFF	YES	1	CCM	X	(See 05–02A–24 DTC P0732 [FN4A-EL])
P0733	Gear 3 incorrect (Incorrect Gear Ratio Detected)	OFF	YES	1	CCM	X	(See 05–02A–26 DTC P0733 [FN4A-EL])

DTC No.	Condition	MIL	AT warning light indicates	DC	Monitor item	Memory function	Page
P0734	Gear 4 incorrect (Incorrect Gear Ratio Detected)	OFF	YES	1	CCM	X	(See 05–02A–28 DTC P0734 [FN4A-EL])
P0741	Torque converter clutch (TCC) (stuck OFF)	OFF	YES	1	CCM	X	(See 05–02A–30 DTC P0741 [FN4A-EL])
P0742	Torque converter clutch (TCC) (stuck ON)	OFF	YES	1	CCM	X	(See 05–02A–32 DTC P0742 [FN4A-EL])
P0745	Pressure control solenoid malfunction	OFF	YES	1	CCM	X	(See 05–02A–34 DTC P0745 [FN4A-EL])
P0751	Shift solenoid A stuck OFF	ON	YES	2	CCM	X	(See 05–02A–36 DTC P0751 [FN4A-EL])
P0752	Shift solenoid A stuck ON	ON	YES	2	CCM	X	(See 05–02A–38 DTC P0752 [FN4A-EL])
P0753	Shift solenoid A malfunction (electrical)	ON	YES	1	CCM	X	(See 05–02A–40 DTC P0753 [FN4A-EL])
P0756	Shift solenoid B stuck OFF	ON	YES	2	CCM	X	(See 05–02A–42 DTC P0756 [FN4A-EL])
P0757	Shift solenoid B stuck ON	ON	YES	2	CCM	X	(See 05–02A–44 DTC P0757 [FN4A-EL])
P0758	Shift solenoid B malfunction (electrical)	ON	YES	1	CCM	X	(See 05–02A–46 DTC P0758 [FN4A-EL])
P0761	Shift solenoid C stuck OFF	ON	YES	2	CCM	X	(See 05–02A–48 DTC P0761 [FN4A-EL])
P0762	Shift solenoid C stuck ON	ON	YES	2	CCM	X	(See 05–02A–50 DTC P0762 [FN4A-EL])
P0763	Shift solenoid C malfunction (electrical)	ON	YES	1	CCM	X	(See 05–02A–53 DTC P0763 [FN4A-EL])
P0766	Shift solenoid D stuck OFF	ON	YES	2	CCM	X	(See 05–02A–55 DTC P0766 [FN4A-EL])
P0767	Shift solenoid D stuck ON	ON	YES	2	CCM	X	(See 05–02A–57 DTC P0767 [FN4A-EL])
P0768	Shift solenoid D malfunction (electrical)	ON	YES	1	CCM	X	(See 05–02A–59 DTC P0768 [FN4A-EL])
P0771	Shift solenoid E stuck OFF	ON	YES	2	CCM	X	(See 05–02A–61 DTC P0771 [FN4A-EL])
P0772	Shift solenoid E stuck ON	ON	YES	2	CCM	X	(See 05–02A–63 DTC P0772 [FN4A-EL])
P0773	Shift solenoid E malfunction (electrical)	ON	YES	1	CCM	X	(See 05–02A–65 DTC P0773 [FN4A-EL])
P0841	Oil pressure switch circuit malfunction	OFF	NO	2	CCM	X	(See 05–02A–67 DTC P0841 [FN4A-EL])

DTC No.	Condition	MIL	AT warning light indicates	DC	Monitor item	Memory function	Page
P0882	TCM B+ voltage low	ON	YES	1	CCM	X	(See 05–02A–69 DTC P0882 [FN4A-EL])
P0894	Forward clutch torque transmission	OFF	YES	1	CCM	X	(See 05–02A–70 DTC P0894 [FN4A-EL].)
U0073	CAN bus off	(See 09–02C–4 DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM])					
U0100	TCM cannot receive any signals from PCM	(See 09–02C–4 DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM])					

MIL: Malfunction Indicator Lamp
DC: Drive Cycle
CCM: Comprehensive Component Monitor

DTC P0706 [FN4A-EL]

C6U050201030W06

DTC P0706	Transaxle range (TR) switch range/performance
DETECTION CONDITION	• When all conditions below are satisfied and **100 seconds or more** have passed. — Engine speed **530 rpm or above** — Vehicle speed **20 km/h {12 mph} or above** — Voltage at TCM terminal 2H is **0.5 V or above**. — P, R, N or D range/position not detected. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • PENDING CODE is available if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TR switch malfunction • TR switch misadjustment • TCM malfunction

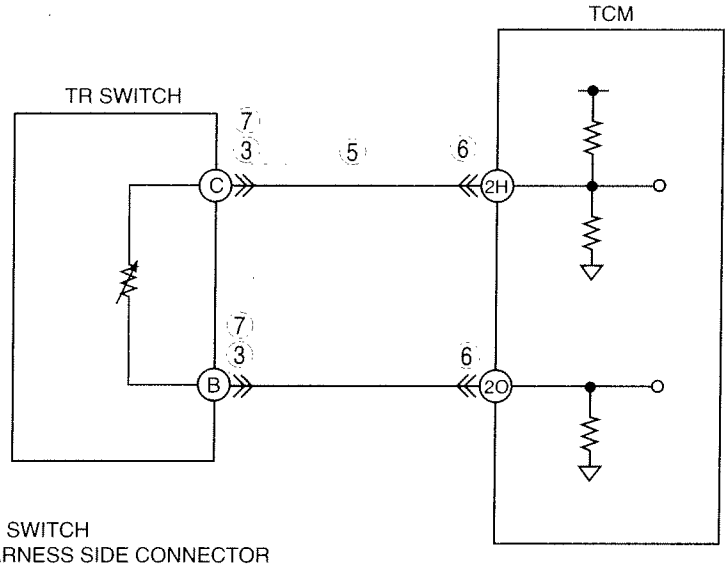
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TR SWITCH** • Turn ignition switch to OFF. • Disconnect the TR switch connector. • Inspect for resistance between TR switch terminals B and C (part-side). • Is resistance okay? (See 05–17A–9 TRANSAXLE RANGE (TR) SWITCH INSPECTION [FN4A-EL].)	Yes	Go to the next step.
		No	Adjust TR switch, then go to the next step. (See 05–17A–13 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [FN4A-EL].)
4	**VERIFY TROUBLESHOOTING OF DTC P0706 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in each range (D and R) for **100 seconds or more** under following conditions. — Engine speed (RPM PID) **530 rpm or above** — Vehicle speed (VSS PID) **20 km/h {12 mph} or above** • Is pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	No concern is detected. Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

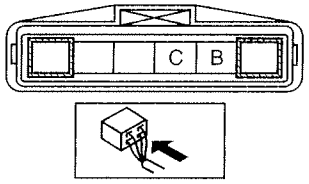
DTC P0707 [FN4A-EL]

C6U050201030W07

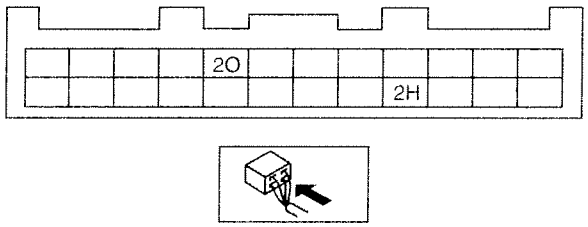
DTC P0707	Transaxle range (TR) switch circuit low input
DETECTION CONDITION	• When all conditions below are satisfied and **100 seconds or more** have passed. — Vehicle speed **20 km/h {12 mph} or above** — Engine speed **530 rpm or above** — Voltage at TCM terminal 2H is **below 0.5 V**. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TR switch malfunction • Short to ground between TR switch terminal C and TCM terminal 2H • TR switch signal and TR switch ground circuits are shorted each other • TCM malfunction



TR SWITCH
HARNESS SIDE CONNECTOR



TCM HARNESS SIDE CONNECTOR



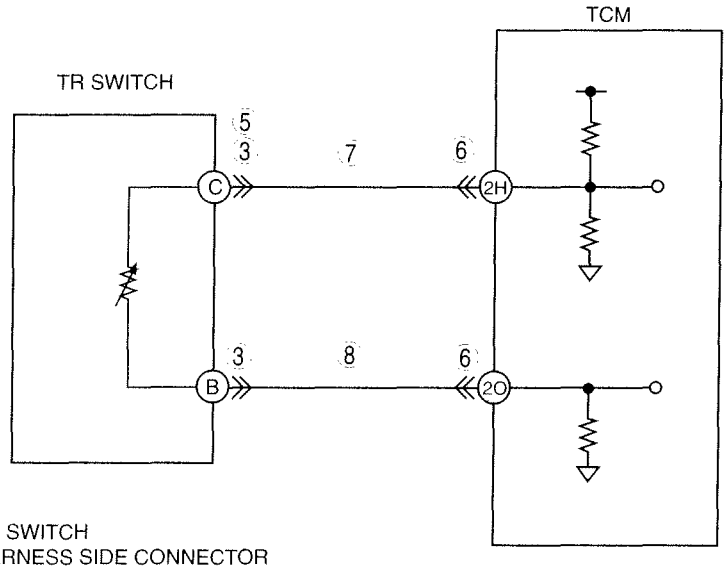
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TR SWITCH CONNECTOR** • Turn ignition switch OFF. • Disconnect the TR switch connector. • Inspect for bent terminals of TR switch terminals B and C (part-side). • Are TR switch terminals okay?	Yes	Go to the next step.
		No	Repair terminals or replace the TR switch, then go to Step 7. (See 05–17A–10 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION [FN4A-EL].)
4	**INSPECT TR SWITCH** • Turn ignition switch to OFF. • Disconnect the TR switch connector. • Inspect resistance between TR switch terminals B and C (part-side). — Resistance: **750 ohms** • Is resistance okay?	Yes	Go to the next step.
		No	Adjust TR switch, then go to Step 7. (See 05–17A–13 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [FN4A-EL].)
5	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Disconnect the TCM connector. • Check for continuity between TR switch terminal C (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness for short to ground, then go to Step 7.
		No	Go to the next step.
6	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection at terminals 2H and 2O (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
7	**INSPECT TR SWITCH CIRCUIT FOR SHORT** • Check for continuity between TR switch terminals B and C (harness-side). • Is there continuity?	Yes	Repair or replace the harness for short, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0707 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle for **100 seconds or more** under following conditions. — Engine speed (RPM PID) **530 rpm or above** — Vehicle speed (VSS PID) **20 km/h {12 mph} or above** • Is pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	No concern is detected. Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

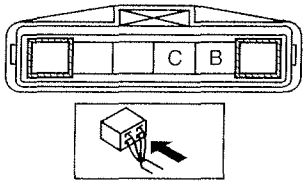
DTC P0708 [FN4A-EL]

C6U050201030W08

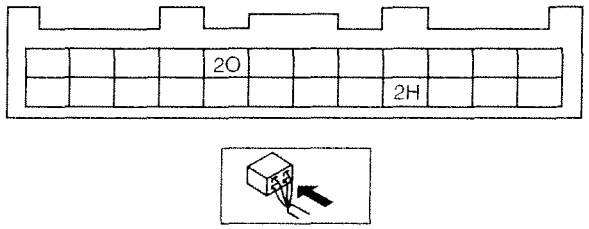
DTC P0708	Transaxle range (TR) switch circuit high input
DETECTION CONDITION	• When all conditions below are satisfied and **100 seconds or more** have passed. — Vehicle speed **20 km/h {12 mph} or above** — Engine speed **530 rpm or above** — Voltage at TCM terminal 2H is **4.79 V or above**. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TR switch malfunction • Open circuit between TR switch terminal C and TCM terminal 2H • Short to power circuit between TR switch terminal C and TCM terminal 2H • Open circuit between TR switch terminal B and TCM terminal 2O • Poor connection of TR switch or TCM connectors • TCM malfunction



TR SWITCH
HARNESS SIDE CONNECTOR



TCM HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TR SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition switch OFF. • Disconnect the TR switch connector. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Are TR switch terminals okay?	Yes	Go to the next step.
		No	Repair terminals or replace the TR switch, then go to Step 9. (See 05–17A–10 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION [FN4A-EL].)
4	**INSPECT TR SWITCH** • Turn ignition switch to OFF. • Disconnect the TR switch connector. • Inspect for resistance between TR switch terminals B and C (part-side). • Is resistance okay? (See 05–17A–9 TRANSAXLE RANGE (TR) SWITCH INSPECTION [FN4A-EL].)	Yes	Go to the next step.
		No	Adjust TR switch, then go to Step 9. (See 05–17A–13 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [FN4A-EL].)
5	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Measure the voltage between TR switch terminal C (harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the harness for short to power supply, then go to Step 9.
		No	Go to the next step.
6	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection at terminals 2H and 2O (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
7	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Check for continuity between TR switch terminal C (harness-side) and TCM terminal 2H. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness for open circuit, then go to Step 9.
8	**INSPECT TR SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT** • Check for continuity between TR switch terminal B (harness-side) and TCM terminal 2O. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness for open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0708 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle for **100 seconds or more** under following conditions. — Engine speed (RPM PID) **530 rpm or above** — Vehicle speed (VSS PID) **20 km/h {12 mph} or above** • Is pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	No concern is detected. Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0711 [FN4A-EL]

C6U050201030W09

DTC P0711	Transaxle fluid temperature (TFT) sensor circuit range/performance (stuck)
DETECTION CONDITION	• When all conditions below are satisfied. — When **180 seconds** have passed after engine is started, vehicle is driven for **150 seconds or more** at vehicle speed **between 25 – 59 km/h {15 – 36 mph}**, then **60 km/h {37 mph} or more** for **100 seconds or more**. — P0712, P0713 not output — Variation in ATF voltage **below 0.06 V** **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • PENDING CODE is available if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Connector corrosion • TCM malfunction

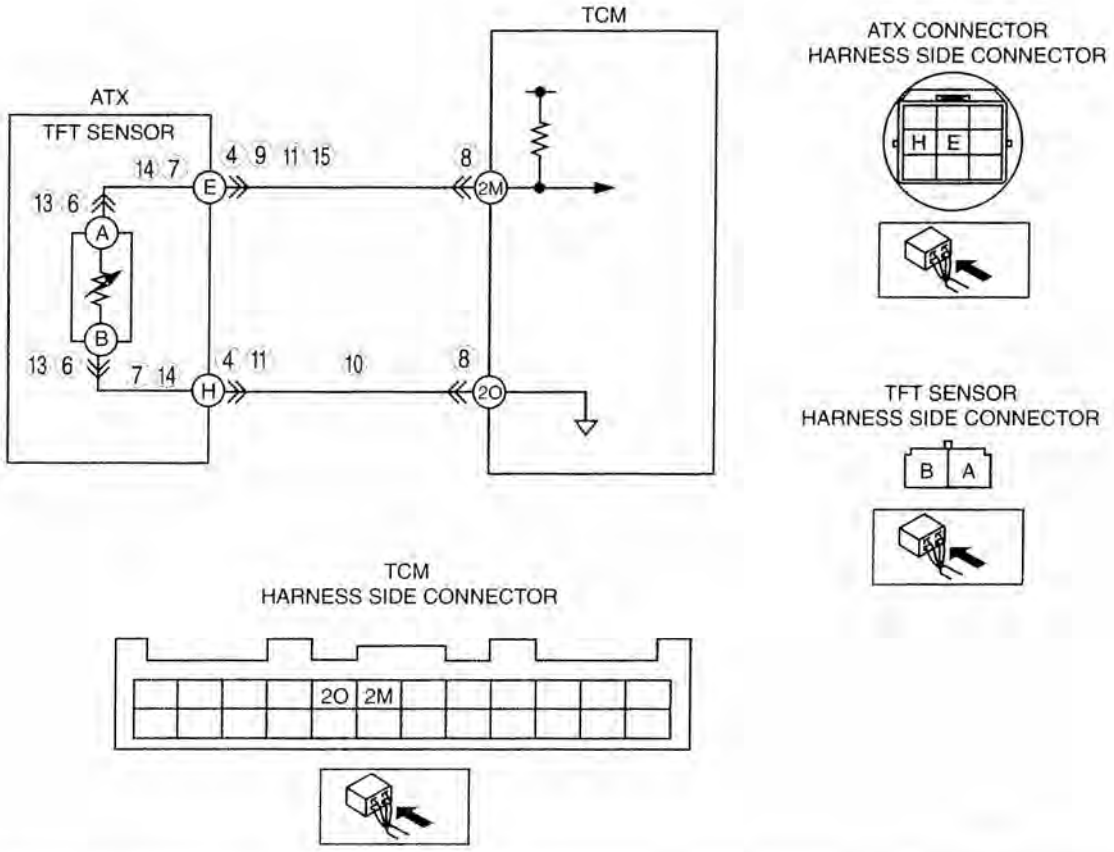
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TFT SENSOR VOLTAGE** • Turn ignition switch to OFF. • Connect breakout box to TCM. • Turn ignition switch to ON (engine off). • Measure the voltage at TCM terminal 2M. • Record terminal 2M voltage. • Start engine. • Drive vehicle at **60 km/h {37 mph} or above** for **430 seconds or more**. • Record terminal 2M voltage again. • Is variation in voltage **0.06V or above**?	Yes	Go to Step 5.
		No	Go to the next step.
4	**INSPECT TERMINAL CONDITION** • Turn ignition switch to OFF. • Disconnect the ATX connector. • Inspect terminals for corrosion. • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0711 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Decrease ATF temperature to **20 °C {68 °F} or below**. • Start engine and wait for **180 seconds or more**. • Drive vehicle at a vehicle speed **between 25 – 59 km/h {15 – 36 mph}** for **150 seconds or more**. • Drive vehicle at vehicle speed **60 km/h {37 mph} or above** for **100 seconds or more**. • Is pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0712 [FN4A-EL]

C6U050201030W10

DTC P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)
DETECTION CONDITION	• If TCM detects either of the following conditions for **150 seconds or more**, TCM determines that TFT sensor circuit has a malfunction. — TFT sensor voltage is **0.06 V or below** and vehicle speed **20 km/h {12 mph} or above**. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Short to ground between TFT sensor terminal A and ATX connector terminal E • Short to ground between TFT sensor terminal B and ATX connector terminal H • Short to ground between ATX connector terminal E and TCM terminal 2M • Damaged connectors between TFT sensor and TCM • TCM malfunction



Diagnostic procedure

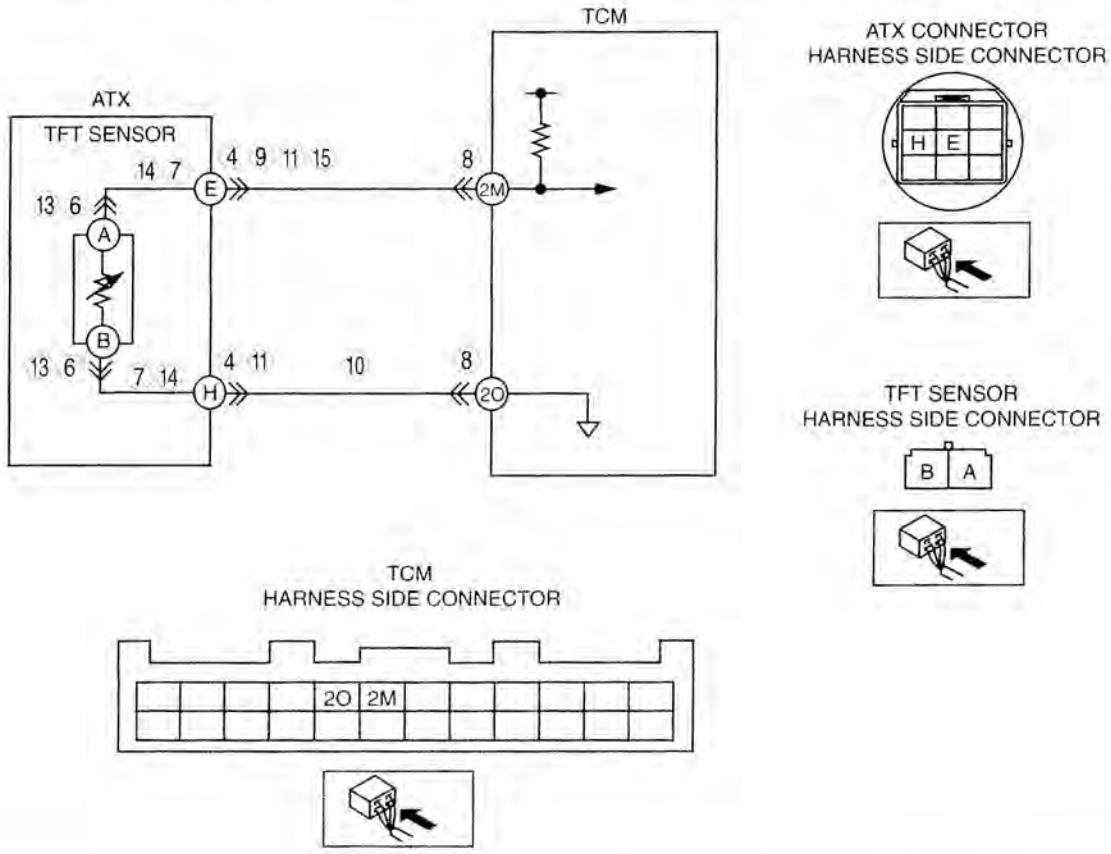
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**VERIFY CURRENT INPUT SIGNAL STATUS** • Turn ignition switch to OFF. • Connect breakout box to TCM. • Turn ignition switch to ON (engine off). • Measure the voltage at TCM terminal 2M. • Are voltage readings **above 0.06 V**?	Yes	Go to intermittent concern troubleshooting procedure. (See 01–03A–2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].)
		No	Go to the next step.
4	**INSPECT TERMINAL CONDITION** • Turn ignition switch to OFF. • Disconnect the ATX connector. • Inspect for bent terminals. • Are the terminals bent?	Yes	Repair or replace the terminals, then go to Step 9. • If terminals cannot be repaired, replace the harness, then go to Step 9.
		No	Go to the next step.
5	**INSPECT TFT SENSOR CIRCUIT** • Turn ignition switch to ON (engine off). • Verify if voltage changes to **4.67 V or above** at TCM terminal 2M when ATX connector disconnected. • Does voltage change?	Yes	Go to the next step.
		No	Go to Step 8.
6	**INSPECT TFT SENSOR TERMINALS CONDITION** • Turn ignition switch to OFF. • Disconnect the TFT sensor connector. • Inspect for bent TFT sensor terminals. • Are the terminals bent?	Yes	Repair terminals or replace the TFT sensor, then go to Step 9. (See 05–17A–16 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
7	**INSPECT TFT SENSOR CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between TFT sensor terminals (harness-side) and body ground. — A and body ground — B and body ground • Is there continuity?	Yes	Repair or replace the harness, then go to Step 9.
		No	Replace the TFT sensor, then go to Step 9. (See 05–17A–16 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [FN4A-EL].)
8	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Inspect for continuity between ATX connector terminal E (vehicle harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to the next step.
		No	Go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0712 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle under following condition for **150 seconds or more**. — Vehicle speed (VSS PID) **20 km/h {12 mph} or above**. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0713 [FN4A-EL]

C6U050201030W11

DTC P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)
DETECTION CONDITION	• If TCM detects either of the following conditions for **150 seconds or more**, TCM determines that TFT sensor circuit has a malfunction. — TFT sensor voltage is **4.67 V or above** and vehicle speed **20 km/h {12 mph} or above**. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Open circuit between TFT sensor terminal A and ATX connector terminal E • Open circuit between TFT sensor terminal B and ATX connector terminal H • Open circuit between ATX connector terminal E and TCM terminal 2M • Open circuit between ATX connector terminal H and TCM terminal 2O • Damaged connectors between TFT sensor and TCM • TCM malfunction



05–02A

Diagnostic procedure

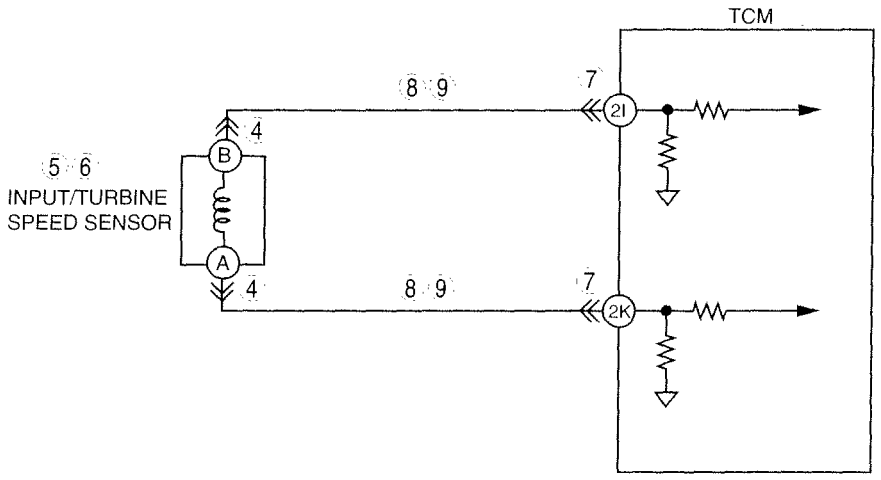
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS** • Turn ignition switch to OFF. • Connect breakout box to TCM. • Turn ignition switch to ON (engine off). • Measure the voltage at TCM terminal 2M. • Are voltage readings **below 4.67 V**?	Yes	Go to intermittent concern troubleshooting procedure. (See 01–03A–2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].)
		No	Go to the next step.
4	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Inspect ATX connector connection. • Disconnect the ATX connector. • Check for poor connection (damaged/pulled-out terminals, corrosion etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
5	**INSPECT TFT SENSOR CIRCUIT** • Turn ignition switch to ON (engine off). • Measure the voltage at TCM terminal 2M when connect between ATX connector terminals E and H (vehicle harness-side) using jumper wire. • Verify that voltage changes to **0.06 V or below**. • Does voltage change?	Yes	Go to the next step.
		No	Go to Step 8.
6	**INSPECT TFT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Remove valve body cover. • Disconnect the TFT sensor connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal or replace the TFT sensor, then go to Step 11. (See 05–17A–16 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [FN4A-EL].)
7	**INSPECT TFT SENSOR CIRCUIT FOR OPEN CIRCUIT** • Check for continuity between TFT sensor terminals (harness-side) and ATX connector terminals (transaxle case side). — ATX connector terminal E and TFT sensor terminal A — ATX connector terminal H and TFT sensor terminal B • Is there continuity?	Yes	Replace the TFT sensor, then go to Step 11. (See 05–17A–16 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [FN4A-EL].)
		No	Repair or replace the harness, then go to Step 11.
8	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the TCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
9	**INSPECT HARNESS FOR OPEN CIRCUIT** • Disconnect the ATX connector. • Connect the TCM connector. • Turn ignition switch to ON (engine off). • Inspect voltage at ATX connector terminal E (vehicle harness-side). • Is voltage **5 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.

STEP	INSPECTION		ACTION
10	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Turn ignition switch to OFF. • Inspect continuity between ATX connector terminal H (vehicle harness-side) and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0713 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle under following condition for **150 seconds or more**. — Vehicle speed (VSS PID) **20 km/h {12 mph} or above**. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

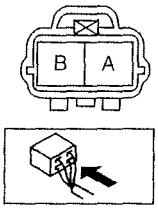
DTC P0715 [FN4A-EL]

C6U050201030W12

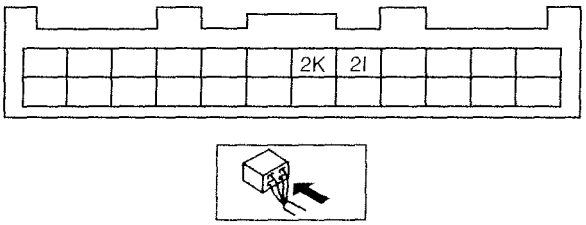
DTC P0715	Input/turbine speed sensor circuit malfunction
DETECTION CONDITION	• When all conditions below are satisfied and **0.7 second or more** have passed. — D range of TR switch input — Driving vehicle with vehicle speed **40 km/h {25 mph} or above** — Input/turbine speed sensor signal not input **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Input/turbine speed sensor malfunction • Short to ground between input/turbine speed sensor terminal A and TCM terminal 2K • Short to ground between input/turbine speed sensor terminal B and TCM terminal 2I • Open circuit between input/turbine speed sensor terminal A and TCM terminal 2K • Open circuit between input/turbine speed sensor terminal B and TCM terminal 2I • Damaged connectors between input/turbine speed sensor and TCM • TCM malfunction



INPUT/TURBINE SPEED SENSOR
HARNESS SIDE CONNECTOR



TCM
HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.

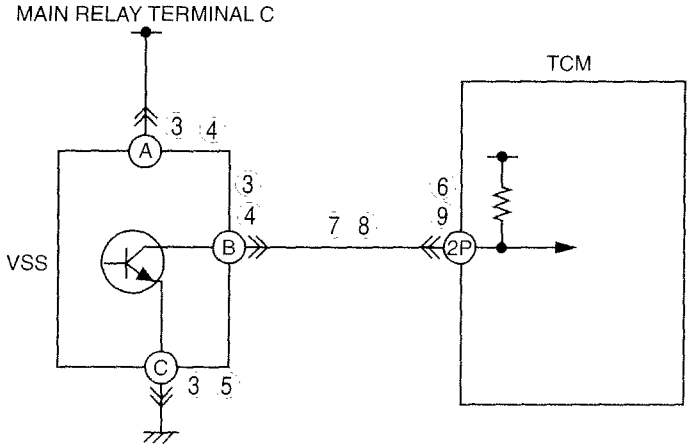
STEP	INSPECTION		ACTION
3	**VERIFY CURRENT INPUT SIGNAL STATUS** • Turn ignition switch to OFF. • Start engine. • Measure frequency of input/turbine speed sensor using a oscilloscope. — IG ON: **0 Hz** — Idle: **Within 320—374 Hz** (P, N position) • Are frequency of input/turbine speed sensor readings within specifications?	Yes	Go to intermittent concern troubleshooting procedure. (See 01–03A–2 INTERMITTENT CONCERN TROUBLESHOOTING [L3].)
		No	Go to the next step.
4	**INSPECT INPUT/TURBINE SPEED SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the input/turbine speed sensor connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
5	**INSPECT INPUT/TURBINE SPEED SENSOR RESISTANCE** • Measure resistance between input/turbine speed sensor terminals (part-side). • Is resistance **within 250—600 ohms** between input/turbine speed sensor terminals (part-side)? (See 05–17A–18 INPUT/TURBINE SPEED SENSOR INSPECTION [FN4A-EL].)	Yes	Go to the next step.
		No	Replace the input/turbine speed sensor, then go to Step 10. (See 05–17A–19 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION [FN4A-EL].)
6	**INSPECT INPUT/TURBINE SPEED SENSOR** • Remove input/turbine speed sensor. • Is there iron powder stuck on input/turbine speed sensor? (See 05–17A–19 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION [FN4A-EL].)	Yes	Clean input/turbine speed sensor, then go to Step 10.
		No	Go to the next step.
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
8	**INSPECT INPUT/TURBINE SPEED SENSOR CIRCUIT FOR OPEN CIRCUIT** • Inspect input/turbine speed sensor terminals A (harness-side) and TCM terminals 2K (harness-side). • Inspect input/turbine speed sensor terminals B (harness-side) and TCM terminals 2I (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 10.
9	**INSPECT INPUT/TURBINE SPEED SENSOR CIRCUIT FOR SHORT TO GROUND** • Inspect input/turbine speed sensor terminal A (harness-side) and body ground. • Inspect input/turbine speed sensor terminal B (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to the next step.
		No	Go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0715 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle with vehicle speed **40 km/h {25 mph} or above** for **0.7 second or more**. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

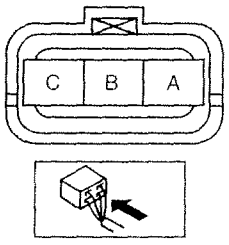
DTC P0720 [FN4A-EL]

C6U050201030W13

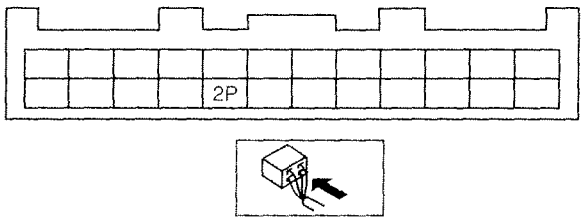
DTC P0720	Vehicle speed sensor (VSS) circuit malfunction
DETECTION CONDITION	• Vehicle speed signal is not input after the following conditions are met and **4.5 seconds or more** have passed: — D range switch ON — P and N position of TR switch OFF — Engine coolant temperature **60 °C {140 °F} or above** — Turbine speed **1,500 rpm or above** **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • PENDING CODE is available if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• VSS malfunction • Open circuit between VSS terminal B and TCM terminal 2P • Short to ground between VSS terminal B and TCM terminal 2P • Open circuit between VSS terminal A and fuse block connector terminal • Open circuit between VSS terminal C and body ground • Damaged connectors between VSS and TCM • TCM malfunction



VSS HARNESS SIDE CONNECTOR



TCM
HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair Information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT VSS CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the VSS connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the pin or connector, then go to Step 11.
4	**INSPECT VSS POWER CIRCUIT FOR OPEN CIRCUIT** • Verify that VSS connector is disconnected. • Turn ignition switch to ON (engine off). • Check voltage between VSS terminal A (harness-side) and ground • Is voltage reading **B+**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
5	**INSPECT VSS GROUND CIRCUIT FOR OPEN CIRCUIT** • Turn ignition switch to OFF. • Verify that VSS connector is disconnected. • Check for continuity between VSS terminal C (harness-side) and ground • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
6	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the pin or connector, then go to Step 11.
7	**INSPECT VEHICLE SPEED SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Disconnect the TCM connector and VSS connector. • Inspect for continuity between VSS terminal B and TCM terminal 2P. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
8	**INSPECT VEHICLE SPEED SIGNAL CIRCUIT FOR SHORT TO GROUND** • Verify that VSS connector and TCM connector are disconnected. • Inspect for continuity between TCM harness side connector and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to Step 11.
		No	Go to the next step.
9	**INSPECT VEHICLE SPEEDOMETER SENSOR** • Inspect VSS. (See 05–17A–19 VEHICLE SPEEDOMETER SENSOR (VSS) INSPECTION (WITHOUT ABS) [FN4A-EL].) • Is VSS okay?	Yes	Go to the next step.
		No	Repair or replace the VSS, then go to Step 11.
10	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the pin or connector, then go to Step 11.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0720 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Warm up engine. • Drive vehicle under following conditions for **4.5 seconds** or more while monitoring PIDs. — Engine coolant temp: **60 °C {140 °F} or above** — Drive in M range — Frequency of input/turbine speed sensor: **800 Hz or above** • Is pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	No concern is detected. Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0731 [FN4A-EL]

C6U050201030W14

DTC P0731	Gear 1 incorrect (Incorrect Gear Ratio Detected)
DETECTION CONDITION	• TCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If revolution ratio is **below 2.157**, TCM determines that there is malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or above** — Driving in 1GR in D range — Engine runs. — Turbine speed **within 225—4,988 rpm** — Throttle opening angle **5.67% or above** — Differential gear case (output) revolution speed **35 rpm or above**. — Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL does not illuminate. • AT warning light illuminates if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is not available. • Pending code is not available. • DTC stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoid A stuck • Pressure control solenoid stuck • Low line pressure • One-way clutch slipping • Forward clutch slipping • Control valve stuck • Oil pump malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**CHECK ATF CONDITION** • Check ATF condition. (See 05–17A–8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [FN4A-EL].) • Is it okay?	Yes	Go to the next step.
		No	Replace the ATX, then go to Step 8. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].)

STEP	INSPECTION		ACTION
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [FN4A-EL].)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 8.
4	**INSPECT SHIFT SOLENOID VALVE A** • Perform inspection of operation. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) • Verify the click sound of shift solenoid A when applying **B+** to transaxle connector terminal A. • Was click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where click sound could not be heard, then go to Step 8. (See 05–17A–23 SOLENOID VALVE REMOVAL/ INSTALLATION [FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm^2, 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm^2, 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm^2, 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the control valve body, then go to Step 8. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].)
6	**INSPECT STALL SPEED** • Measure stall speed in D range. (See 05–17A–4 Stall Test.) **Specification** **2,000—2,600 rpm** • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the ATX, then go to Step 8. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION [FN4A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn ignition switch to OFF. • Connect WDS or equivalent. • Start engine. • Measure frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **20 km/h {12 mph}** — Drive in D range, 1st gear — Throttle opening angle (TP PID): **about 25%** • Was frequency of input/turbine speed sensor at **approx. 1,100 Hz**?	Yes	Go to the next step.
		No	Replace the control valve body, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].)
8	**VERIFY REPAIR OF DTC P0731** • Make sure to reconnect all disconnected connectors. • Clear DTC using WDS or equivalent. • Start engine. • Warm up transaxle. • Drive vehicle under the following conditions at least 4 times for **more than 1 second**. — ATF temperature: **20 °C {68 °F} or above** — Drive in D range, 1st gear — Throttle opening angle (TP PID): **5.67% or above** — Vehicle speed (VSS PID): **4 km/h {3 mph} or above** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0732 [FN4A-EL]

C6U050201030W15

DTC P0732	Gear 2 incorrect (Incorrect Gear Ratio Detected)
DETECTION CONDITION	• TCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If revolution ratio is **below 1.249 or above 2.157**, TCM determines that there is malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or above** — Driving in 2GR in D range — Engine runs. — Turbine speed **within 225—4,988 rpm** — Differential gear case (output) revolution speed **35 rpm or above**. — Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL does not illuminate. • AT warning light illuminates if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is not available. • Pending code is not available. • DTC stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoids A, B or C stuck • Pressure control solenoid stuck • Low line pressure • 2-4 brake band slipping • Forward clutch slipping • Control valve stuck • Oil pump malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**CHECK ATF CONDITION** • Check ATF condition. (See 05–17A–8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [FN4A-EL].) • Is it okay?	Yes	Go to the next step.
		No	Replace the ATX, then go to Step 8. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [FN4A-EL].)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 8.
4	**INSPECTION SHIFT SOLENOID VALVE A, B AND C FOR CLICK SOUND** • Perform inspection of operation. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) • Verify the click sound of shift solenoid A, B, and C when applying **B+** to each transaxle connector terminal. • Was click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where click sound could not be heard, then go to Step 8. (See 05–17A–23 SOLENOID VALVE REMOVAL/INSTALLATION [FN4A-EL].)

STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm^2, 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm^2, 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm^2, 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the control valve body, then go to Step 8. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL], 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].)
6	**INSPECT STALL SPEED** • Measure stall speed in D range. (See 05–17A–4 Stall Test.) **Specification** **2,000—2,600 rpm** • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the ATX, then go to Step 8. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn ignition switch to OFF. • Connect WDS or equivalent. • Start engine. • Measure frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed: **40 km/h {24 mph}** (VSS PID) — Drive in D range, 2nd gear — Throttle opening angle: **about 25%** (TP PID) • Was frequency of input/turbine speed sensor at **approx. 1,156 Hz**?	Yes	Go to the next step.
		No	Replace the control valve body, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].)
8	**VERIFY REPAIR OF DTC P0732** • Make sure to reconnect all disconnected connectors. • Clear DTC using WDS or equivalent. • Start engine. • Warm up transaxle. • Drive vehicle under the following conditions at least 4 times for **more than 1 second**. — ATF temperature: **20 °C {68 °F} or above** — Drive in D range, 2nd gear — Vehicle speed (VSS PID): **3.8 km/h {2.4 mph} or above** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step.
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0733 [FN4A-EL]

C6U050201030W16

DTC P0733	Gear 3 incorrect (Incorrect Gear Ratio Detected)
DETECTION CONDITION	• TCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If revolution ratio is **below 0.863 or above 1.249**, TCM determines that there is malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or above** — Driving in 3 GR in D range — Engine runs. — Turbine speed **within 225—4,988 rpm** — Differential gear case (output) revolution speed **35 rpm or above**. — Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL does not illuminate. • AT warning light illuminates if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is not available. • Pending code is not available. • DTC stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoids A or C stuck • Pressure control solenoid stuck • Low line pressure • 3-4 clutch slipping • Forward clutch slipping • Control valve stuck (Bypass, TCC or 3-4 shift valve) • Oil pump malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**CHECK ATF CONDITION** • Check ATF condition. (See 05–17A–8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [FN4A-EL].) • Is it okay?	Yes	Go to the next step.
		No	Replace the ATX, then go to Step 8. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION [FN4A-EL].)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [FN4A-EL].)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 8.
4	**INSPECTION SHIFT SOLENOID VALVE A AND C FOR CLICK SOUND** • Perform inspection of operation. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) • Verify the click sound of shift solenoid A and C when applying **B+** to each transaxle connector terminal. • Was click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where click sound could not be heard, then go to Step 8. (See 05–17A–23 SOLENOID VALVE REMOVAL/ INSTALLATION [FN4A-EL].)

STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm², 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm², 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm², 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm², 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the control valve body, then go to Step 8. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].)
6	**INSPECT STALL SPEED** • Measure stall speed in D range. (See 05–17A–4 Stall Test.) **Specification** **2,000—2,600 rpm** • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the ATX, then go to Step 8. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION [FN4A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn ignition switch to OFF. • Connect WDS or equivalent. • Start engine. • Measure frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **60 km/h {37 mph}** — Drive in D range, 3rd gear — Throttle opening angle (TP PID): **about 25%** • Was frequency of input/turbine speed sensor at **approx. 1,200 Hz**?	Yes	Go to the next step.
		No	Replace the control valve body, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].)
8	**VERIFY REPAIR OF DTC P0732** • Make sure to reconnect all disconnected connectors. • Clear DTC using WDS or equivalent. • Start engine. • Warm up transaxle. • Drive vehicle under the following conditions for **more than 2 seconds.** — ATF temperature: **20 °C {68 °F} or above** — Drive in D range, 3rd gear — Vehicle speed (VSS PID): **4 km/h {3 mph} or above** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step.
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0734 [FN4A-EL]

C6U050201030W17

DTC P0734	Gear 4 incorrect (Incorrect Gear Ratio Detected)
DETECTION CONDITION	• TCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If revolution ratio is **below 0.6 or above 1.249**, TCM determines that there is malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or above** — Driving in 4 GR in D range — Engine runs. — Turbine speed **within 225—4,988 rpm** — Vehicle speed **50 km/h {31 mph} or above** — Closed throttle position — Differential gear case (output) revolution speed **35 rpm or above**. — Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL does not illuminate. • AT warning light illuminates if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is not available. • Pending code is not available. • DTC stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoids A, B or C stuck • Pressure control solenoid stuck • Low line pressure • 2-4 brake band slipping • 3-4 clutch slipping • Forward clutch slipping • Control valve stuck (Bypass or 3-4 shift valve) • Oil pump malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**CHECK ATF CONDITION** • Check ATF condition. (See 05–17A–8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [FN4A-EL].) • Is it okay?	Yes	Go to the next step.
		No	Replace the ATX, then go to Step 8. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION [FN4A-EL].)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [FN4A-EL].)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 8.
4	**INSPECT SHIFT SOLENOID VALVE A AND D FOR CLICK SOUND** • Perform inspection of operation. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) • Verify the click sound of shift solenoids A and D when applying **B+** to each transaxle connector terminal. **Note** • Click from solenoid D is barely audible. Remove solenoids to correctly inspect if necessary. • Was click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where click sound could not be heard, then go to Step 8. (See 05–17A–23 SOLENOID VALVE REMOVAL/ INSTALLATION [FN4A-EL].)

STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm^2, 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm^2, 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm^2, 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the control valve body, then go to Step 8. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].)
6	**INSPECT STALL SPEED** • Measure stall speed in D range. (See 05–17A–4 Stall Test.) **Specification** **2,000—2,600 rpm** • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the ATX, then go to Step 8. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION [FN4A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn ignition switch to OFF. • Connect WDS or equivalent. • Start engine. • Measure frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **80 km/h {49 mph}** — Drive in D range, 4th gear — Throttle opening angle (TP PID): **about 25%** • Was frequency of input/turbine speed sensor at **approx. 1,200 Hz**?	Yes	Go to the next step.
		No	Replace the control valve body, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].)
8	**VERIFY REPAIR OF DTC P0732** • Make sure to reconnect all disconnected connectors. • Clear DTC using WDS or equivalent. • Start engine. • Warm up transaxle. • Drive vehicle under the following conditions for **more than 5 seconds**. — ATF temperature: **20 °C {68 °F} or above** — Drive in D range, 4th gear — Throttle opening angle (TP PID): **0%** — Vehicle speed (VSS PID): **50 km/h {31 mph} or above** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step.
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Are any DTCs present? • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].)	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0741 [FN4A-EL]

C6U050201030W18

DTC P0741	Torque converter clutch (TCC) stuck OFF
DETECTION CONDITION	• When all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or above** — Driving in 4GR at D range — Engine runs. — Turbine speed **within 225—4,988 rpm** — Vehicle speed **within 60—100 km/h {37—62 mph}** — TCC operation — Shift solenoid A duty value exceeds **99%**. — Power or normal mode — Difference between engine speed and turbine speed **more than 100 rpm** — Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL does not illuminate if TCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is not available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoids A, B, C, D, E, and pressure control solenoid stuck • Low line pressure • 2-4 brake band slipping • 3-4 clutch slipping • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to the next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 6. (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)

STEP	INSPECTION		ACTION
4	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm^2, 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm^2, 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm^2, 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 6. • Any ranges: Replace the ATX, then go to Step 6. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
5	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition switch to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL], 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace the ATX, then go to the next step. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	**VERIFY TROUBLESHOOTING OF DTC P0741 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up engine and ATX. • Drive vehicle under following conditions for **5 seconds or more**. — ATF temperature: **20 °C {68 °F} or above** — Drive in D range, 4th gear (TCC operation) — Vehicle speed (VSS PID): **within 60—100 km/h {37—62 mph}** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0742 [FN4A-EL]

C6U050201030W19

DTC P0742	Torque converter clutch (TCC) stuck ON
DETECTION CONDITION	• All of following conditions are satisfied under each of following throttle conditions. — ATF temperature **20 °C {68 °F} or above** — Driving in 4GR at D range — Engine runs. — Turbine speed **within 225—4,988 rpm** — Vehicle speed **below 70 km/h {43 mph}** — Torque converter clutch (TCC) no operation — Difference between engine speed and turbine speed **below 50 rpm** — DTC P0734 not output • Throttle conditions. — Throttle opening angle (TP PID) **above 10.1%** and **5 seconds or more** have passed. — Throttle opening angle (TP PID) **within 3.1—10.1%** and **3 seconds or more** have passed. — Throttle opening angle at closed throttle position and **5 seconds or more** have passed. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL does not illuminate if TCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is not available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoids A, B, C, D, E, and pressure control solenoid stuck • Low line pressure • 2-4 brake band slipping • 3-4 clutch slipping • Control valve stuck • TCM malfunction

Diagnostic procedure

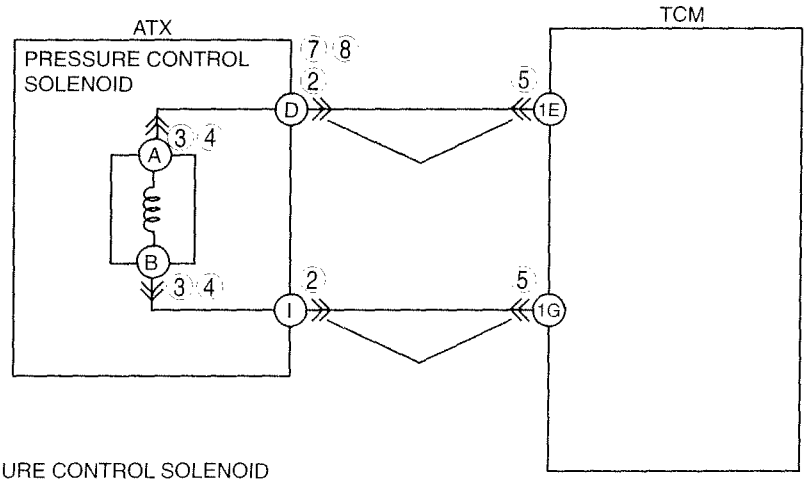
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to the next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 6. (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)

STEP	INSPECTION		ACTION
4	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm^2, 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm^2, 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm^2, 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 6. • Any ranges: Replace the ATX, then go to Step 6. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
5	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition switch to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL], 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace the ATX, then go to the next step. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	**VERIFY TROUBLESHOOTING OF DTC P0742 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up engine and ATX. • Drive vehicle under following. — ATF temperature: **20 °C {68 °F} or above** — Drive in D range, 4th gear (TCC not in operation). — Vehicle speed: **below 70 km/h {43 mph}**. • Throttle conditions — Throttle opening angle (TP PID) **above 10.1%** and **5 seconds or more** have passed. — Throttle opening angle (TP PID) **within 3.1—10.1%** and **3 seconds or more** have passed. — Throttle opening angle at closed throttle position and **5 seconds or more** have passed. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

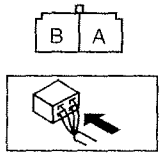
DTC P0745 [FN4A-EL]

C6U050201030W20

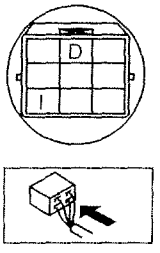
DTC P0745	Pressure control solenoid malfunction
DETECTION CONDITION	• If TCM detects either of the following conditions, TCM determines that pressure control solenoid circuit has a malfunction. — Pressure control solenoid voltage stuck **0 V** after engine start. — Pressure control solenoid voltage stuck **B+** after engine start. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL does not illuminate if TCM detects above malfunction conditions during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is not available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Pressure control solenoid malfunction • Open circuit between pressure control solenoid terminal B and ATX connector terminal I • Open circuit between ATX connector terminal I and TCM terminal 1G • Short to ground between ATX connector terminal D and TCM terminal 1E • Short to power between ATX connector terminal D and TCM terminal 1E • Open circuit between pressure control solenoid terminal A and ATX connector terminal D • Open circuit between ATX connector terminal D and TCM terminal 1E • Damaged connector between pressure control solenoid and TCM • TCM malfunction



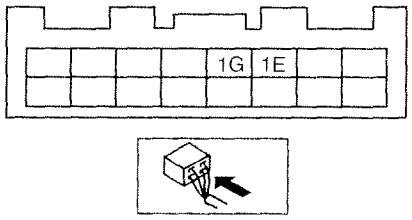
PRESSURE CONTROL SOLENOID HARNESS SIDE CONNECTOR



ATX CONNECTOR HARNESS SIDE CONNECTOR



TCM HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the ATX connector. • Check for poor connection (damaged/pulled-out terminal, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
3	**INSPECT RESISTANCE** • Inspect resistance between ATX connector (transaxle case side) terminals D and I. • Is resistance **within 2.4—7.3 ohms**? (See 05–17A–21 Resistance Inspection (On-Vehicle Inspection).)	Yes	Go to Step 6.
		No	Go to the next step.
4	**INSPECT PRESSURE CONTROL SOLENOID CONNECTOR FOR POOR CONNECTION** • Disconnect the pressure control solenoid connector. • Check for poor connection (damaged/pulled-out terminal, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
5	**INSPECT RESISTANCE** • Inspect resistance between pressure control solenoid terminals A and B. • Is resistance **within 2.4—7.3 ohms**? (See 05–17A–22 Resistance Inspection (Off-Vehicle Inspection).)	Yes	Replace the solenoid harness, then go to Step 10.
		No	Verify pressure control solenoid installation. • If solenoid installed correctly, replace the pressure control solenoid, then go to Step 10. (See 05–17A–23 SOLENOID VALVE REMOVAL/INSTALLATION [FN4A-EL].)
6	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
7	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM (harness-side) and ATX connector (vehicle harness-side). — TCM terminal 1E and ATX connector terminal D — TCM terminal 1G and ATX connector terminal I • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, the go to Step 10.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Inspect voltage at ATX connector terminal D (vehicle harness-side). • Is voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 10.
9	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Inspect for continuity between ATX connector terminal D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P0745 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Make sure to wait **more than 1 second** after turning ignition switch to ON. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	No concern is detected. Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0751 [FN4A-EL]

C6U050201030W21

DTC P0751	Shift solenoid A stuck OFF
DETECTION CONDITION	• When any of P0731, P0732, and P0733 are not generated, and all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or above** — Driving in 4GR at D range — Engine runs. — Turbine speed **within 225— 4,988 rpm** — Differential gear case (output) revolution speed **35 rpm or above** — Torque converter clutch (TCC) not operating — Revolution ratio of forward clutch drum revolution to differential gear case revolution **within 0.91—1.09** — Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • PENDING CODE is available if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoid A stuck • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to the next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)

STEP	INSPECTION		ACTION
4	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 7. (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm^2, 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm^2, 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm^2, 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition switch to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL], 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace the ATX, then go to the next step. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	**VERIFY TROUBLESHOOTING OF DTC P0751 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or above** — Drive in D range • Is pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0752 [FN4A-EL]

C6U050201030W22

DTC P0752	Shift solenoid A stuck ON
DETECTION CONDITION	• When P0734 is not generated, and all conditions below are satisfied in 1GR and 2GR. — ATF temperature **20 °C {68 °F} or above** — Engine runs. — Either of P0705 or P0706 is output, or D range is selected. — Brake pedal depressed — Throttle opening angle closed throttle position — Vehicle speed **0 km/h {0 mph}** — Input/turbine speed sensor signal **188 rpm or above** — Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • PENDING CODE is available if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoid A stuck • Control valve stuck • TCM malfunction

Diagnostic procedure

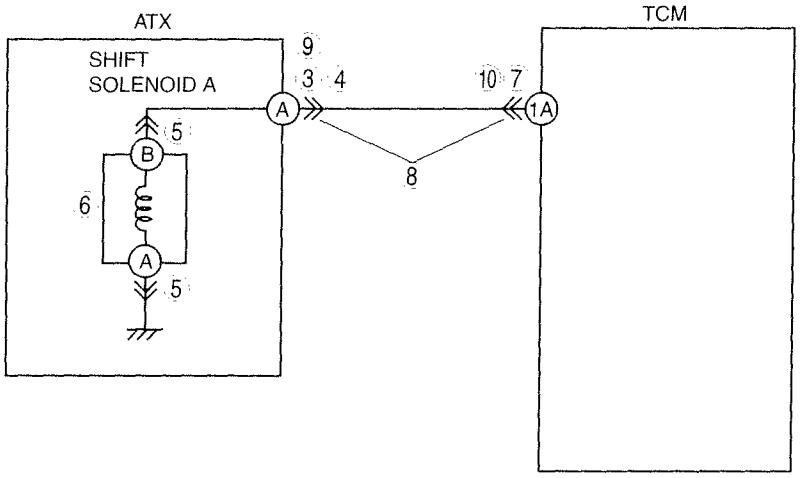
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to the next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)
4	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 7. (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)

STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm^2, 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm^2, 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm^2, 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition switch to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL], 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace the ATX, then go to the next step. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	**VERIFY TROUBLESHOOTING OF DTC P0752 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or above** — Drive in D range • Is pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

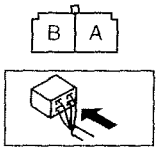
DTC P0753 [FN4A-EL]

C6U050201030W23

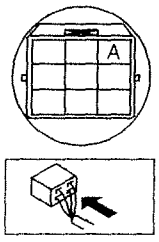
DTC P0753	Shift solenoid A malfunction (electrical)
DETECTION CONDITION	• If TCM detects either of the following conditions, TCM determines that shift solenoid A circuit has a malfunction. — Shift solenoid A voltage is stuck at **B+** after engine start. — Shift solenoid A voltage is stuck at **0 V** after engine start. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Shift solenoid A malfunction • Short to ground between ATX connector terminal A and TCM terminal 1A • Short to power between ATX connector terminal A and TCM terminal 1A • Open circuit between shift solenoid A terminal B and ATX connector terminal A • Open circuit between ATX connector terminal A and TCM terminal 1A • Open circuit between shift solenoid A terminal A and body ground point • Damaged connector between shift solenoid A and TCM • TCM malfunction



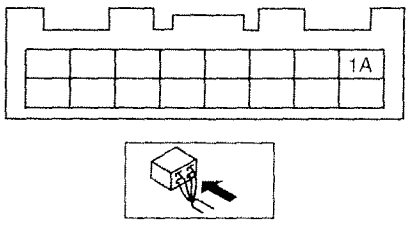
SHIFT SOLENOID A HARNESS SIDE CONNECTOR



ATX CONNECTOR HARNESS SIDE CONNECTOR



TCM HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the ATX connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Check resistance between ATX connector terminal A (transaxle case side) and body ground. • Is resistance **within 1.0—4.2 ohms**? (See 05–17A–21 Resistance Inspection (On-Vehicle Inspection).)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID A CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid A connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect resistance between shift solenoid A terminals A and B (part-side). • Is resistance **within 1.0—4.2 ohms**? (See 05–17A–22 Resistance Inspection (Off-Vehicle Inspection).)	Yes	Replace the solenoid harness, then go to Step 11.
		No	Verify shift solenoid A installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05–17A–23 SOLENOID VALVE REMOVAL/INSTALLATION [FN4A-EL].)
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM terminal 1A (harness-side) and ATX connector terminal A (vehicle harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Inspect voltage at ATX connector terminal A (vehicle harness-side). • Is voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
10	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Inspect for continuity between TCM terminal 1A (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to Step 11.
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0753 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	No concern is detected. Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0756 [FN4A-EL]

C6U050201030W24

DTC P0756	Shift solenoid B stuck OFF
DETECTION CONDITION	• When any of DTC P0732, P0733, and P0734 are not generated, and all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or above** — Driving in 1GR at D range — Engine runs. — Turbine speed **within 225—4,988 rpm** — Differential gear case (output) revolution speed **35 rpm or above** — Throttle opening angle (TP PID) **5.67% or above** — Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 2.157**. — Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • PENDING CODE is available if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoid B stuck • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to the next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)

STEP	INSPECTION		ACTION
4	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 7. (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm^2, 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm^2, 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm^2, 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition switch to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL], 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace the ATX, then go to the next step. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	**VERIFY TROUBLESHOOTING OF DTC P0756 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or above** — Drive in D range — Engine speed: **450 rpm or above** (RPM PID) — Throttle opening angle (TP PID): **5.67% or above** • Is pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0757 [FN4A-EL]

C6U050201030W25

DTC P0757	Shift solenoid B stuck ON
DETECTION CONDITION	• When either of DTC P0731 and P0733 are not generated, and both the following conditions are satisfied. — When all conditions below are satisfied while driving in 2GR. • ATF temperature **20 °C {68 °F} or above** • Driving in D range • Engine runs. • Turbine speed **within 225—4,988 rpm** • Differential gear case (output) revolution speed **35 rpm or above** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 1.249 or more than 2.157** • Any of the following are not generated: DTC P0705, P0706, P0710, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 — When all conditions below are satisfied with driving in 4GR. • ATF temperature **20 °C {68 °F} or above** • Driving in D range • Engine runs. • Turbine speed **within 225—4,988 rpm** • Differential gear case (output) revolution speed **35 rpm or above** • Vehicle speed **50 km/h {31 mph}** • Throttle opening angle closed throttle position • Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 0.6 or 1.249 or above** • Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • PENDING CODE is available if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoid B stuck • Control valve stuck • TCM malfunction

Diagnostic procedure

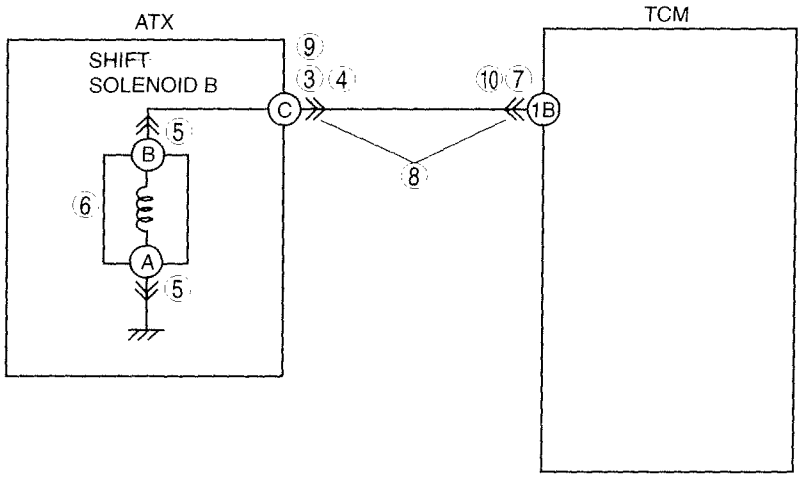
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to the next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)
4	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 7. (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)

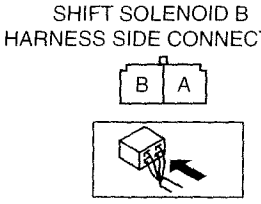
STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm^2, 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm^2, 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm^2, 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition switch to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL], 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace the ATX, then go to the next step. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	**VERIFY TROUBLESHOOTING OF DTC P0757 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive the vehicle under the following conditions make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or above** — Drive in D range — Engine speed: **450 rpm or above** (RPM PID) — Throttle opening angle (TP PID): **0%** (4th gear only) — Vehicle speed (VSS PID): **50 km/h {31 mph}** (4th gear only) • Is pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

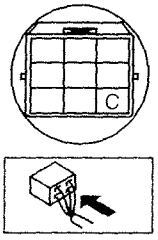
DTC P0758 [FN4A-EL]

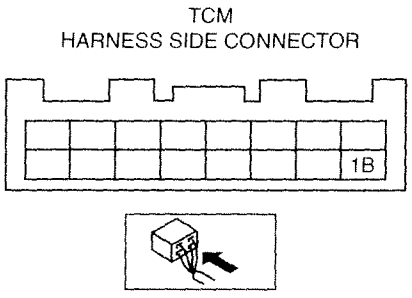
C6U050201030W26

DTC P0758	Shift solenoid B malfunction (electrical)
DETECTION CONDITION	• If TCM detects either of the following conditions, TCM determines that shift solenoid B circuit has a malfunction. — Shift solenoid B voltage is stuck at **B+** after engine start. — Shift solenoid B voltage is stuck at **0 V** after engine start. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Shift solenoid B malfunction • Short to ground between ATX connector terminal C and TCM terminal 1B • Short to power between ATX connector terminal C and TCM terminal 1B • Open circuit between shift solenoid B terminal B and ATX connector terminal C • Open circuit between ATX connector terminal C and TCM terminal 1B • Open circuit between shift solenoid B terminal A and body ground point • Damaged connector between shift solenoid B and TCM • TCM malfunction









Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the ATX connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect resistance between ATX connector terminal C (transaxle case side) and body ground. • Is resistance **within 1.0—4.2 ohms**? (See 05–17A–21 Resistance Inspection (On-Vehicle Inspection).)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID B CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid B connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect resistance between shift solenoid B terminals A and B (part-side). • Is resistance **within 1.0—4.2 ohms**? (See 05–17A–22 Resistance Inspection (Off-Vehicle Inspection).)	Yes	Replace the solenoid harness, then go to Step 11.
		No	Verify shift solenoid B installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05–17A–23 SOLENOID VALVE REMOVAL/INSTALLATION [FN4A-EL].)
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM terminal 1B (harness-side) and ATX connector terminal C (vehicle harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Check for voltage at ATX connector terminal C (vehicle harness-side). • Is voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
10	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Check for continuity between TCM terminal 1B (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to Step 11.
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0758 SHIFT SOLENOID B COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0761 [FN4A-EL]

C6U050201030W27

DTC P0761	Shift solenoid C stuck OFF
DETECTION CONDITION	• When either of DTC P0733 and P0734 are not generated, and both the following conditions are satisfied. — When all conditions below are satisfied while driving in 1GR. • ATF temperature **20 °C {68 °F} or above** • Driving in D range • Engine runs. • Turbine speed **within 225—4,988 rpm** • Throttle opening angle (TP PID) **5.67% or above** • Differential gear case (output) revolution speed **35 rpm or above** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 2.157**. • Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 — When all conditions below are satisfied while driving in 2GR. • ATF temperature **20 °C {68 °F} or above** • Driving in D range • Engine runs. • Turbine speed **within 225—4,988 rpm** • Differential gear case (output) revolution speed **35 rpm or above** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 1.249 or 2.157 or above** • Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • PENDING CODE is available if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoid C stuck • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to the next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)
4	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 7. (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm^2, 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm^2, 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm^2, 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition switch to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL], 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace the ATX, then go to the next step. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)

STEP	INSPECTION		ACTION
7	**VERIFY TROUBLESHOOTING OF DTC P0761 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or above** — Drive in D range — Throttle opening angle (TP PID): **5.67% or above** • Is pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0762 [FN4A-EL]

C6U050201030W28

DTC P0762	Shift solenoid C stuck ON
DETECTION CONDITION	• When either of DTC P0731 and P0732 are not generated, and both the following conditions are satisfied. — When all conditions below are satisfied while driving in 3GR. • ATF temperature **20 °C {68 °F} or above** • Driving in D range • Engine runs. • Turbine speed **within 225—4,988 rpm** • Differential gear case (output) revolution speed **35 rpm or above** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 0.863 or 1.249 or above** • Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 — When all conditions below are satisfied while driving in 4GR. • ATF temperature **20 °C {68 °F} or above** • Driving in D range • Engine runs. • Turbine speed **within 225—4,988 rpm** • Vehicle speed **50 km/h {31mph} or above** • Differential gear case (output) revolution speed **35 rpm or above** • Throttle opening angle at closed throttle position • Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 0.6 or 1.249 or above** • Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • PENDING CODE is available if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoid C and pressure control solenoid stuck • Control valve stuck • TCM malfunction

Diagnostic procedure

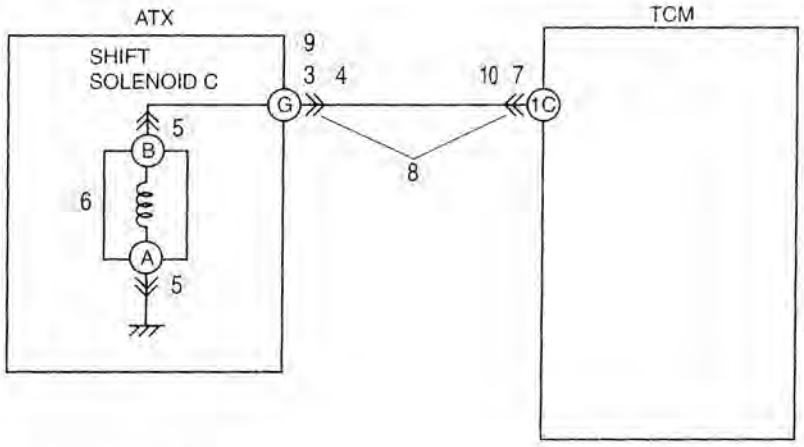
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to the next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)
4	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 7. (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm^2, 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm^2, 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm^2, 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition switch to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL], 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace the ATX, then go to the next step. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)

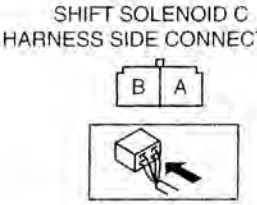
STEP	INSPECTION		ACTION
7	**VERIFY TROUBLESHOOTING OF DTC P0762 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or above** — Drive in D range — Throttle opening angle (TP PID): **0%** (4GR only) — Vehicle speed (VSS PID): **50 km/h {31 mph} or above** (4GR only) • Is pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

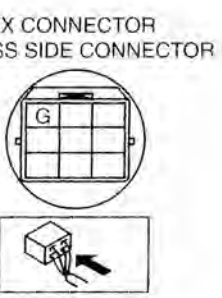
DTC P0763 [FN4A-EL]

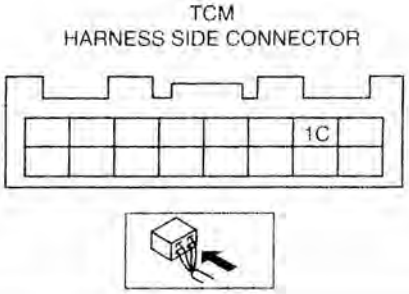
C6U050201030W29

DTC P0763	Shift solenoid C malfunction (electrical)
DETECTION CONDITION	• If TCM detects either of the following conditions, TCM determines that shift solenoid C circuit has a malfunction. — Shift solenoid C voltage is stuck at **B+** after engine start. — Shift solenoid C voltage is stuck at **0 V** after engine start. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Shift solenoid C malfunction • Short to ground between ATX connector terminal G and TCM terminal 1C • Short to power between ATX connector terminal G and TCM terminal 1C • Open circuit between shift solenoid C terminal B and ATX connector terminal G • Open circuit between ATX connector terminal G and TCM terminal 1C • Open circuit between shift solenoid C terminal A and body ground point • Damaged connector between shift solenoid C and TCM • TCM malfunction









Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the ATX connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect resistance between ATX connector terminal G (transaxle case side) and body ground. • Is resistance **within 1.0—4.2 ohms**? (See 05–17A–21 Resistance Inspection (On-Vehicle Inspection).)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID C CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid C connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect resistance between shift solenoid C terminals A and B (part-side). • Is resistance **within 1.0—4.2 ohms**? (See 05–17A–22 Resistance Inspection (Off-Vehicle Inspection).)	Yes	Replace the solenoid harness, then go to Step 11.
		No	Verify shift solenoid C installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05–17A–23 SOLENOID VALVE REMOVAL/INSTALLATION [FN4A-EL].)
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM terminal 1C (harness-side) and ATX connector terminal G (vehicle harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Check voltage at ATX connector terminal G (vehicle harness-side). • Is voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
10	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Inspect for continuity between TCM terminal 1C (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to Step 11.
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0763 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	No concern is detected. Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0766 [FN4A-EL]

C6U050201030W30

05–02A

DTC P0766	Shift solenoid D stuck OFF
DETECTION CONDITION	• When any of DTC P0731, P0732, and P0733 not output (correct determination), and all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or above** — Driving in 4GR at D range — Engine runs. — Turbine speed **within 225—4,988 rpm** — Differential gear case (output) revolution speed **35 rpm or above** — Vehicle speed **50 km/h {31 mph} or above** — Throttle opening angle closed throttle position — Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 0.6 or 1.249 or above** — Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • PENDING CODE is available if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoid D stuck • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to the next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)

STEP	INSPECTION		ACTION
4	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 7. (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm^2, 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm^2, 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm^2, 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition switch to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL], 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace the ATX, then go to the next step. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	**VERIFY TROUBLESHOOTING OF DTC P0766 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or above** — Drive in D range — Throttle opening angle (TP PID): **0%** (4GR only) — Vehicle speed: **50 km/h {31 mph} or above**. (4GR only) (VSS PID) • Is pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0767 [FN4A-EL]

C6U050201030W31

DTC P0767	Shift solenoid D stuck ON
DETECTION CONDITION	• When any of DTC P0731, P0732, P0734, and P0741 are not generated, and all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or above** — Driving in D range — Engine runs. — Turbine speed **within 225—4,988 rpm** — Differential gear case (output) revolution speed **35 rpm or above** — Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 0.863 or 1.249 or above** — Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • PENDING CODE is available if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoid D stuck • Control valve stuck • TCM malfunction

Diagnostic procedure

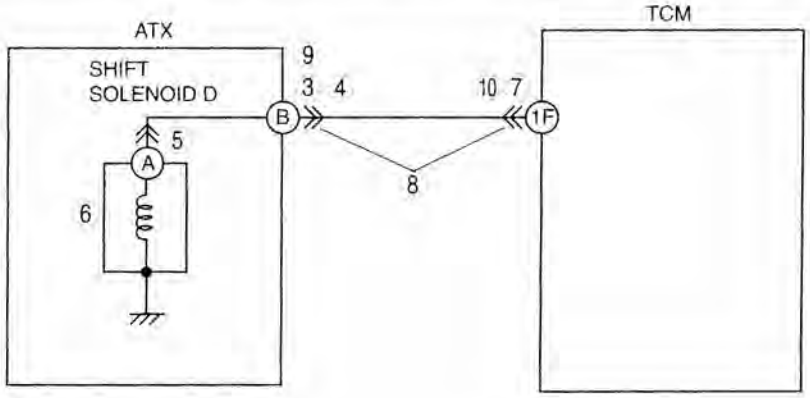
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to the next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)
4	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 7. (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)

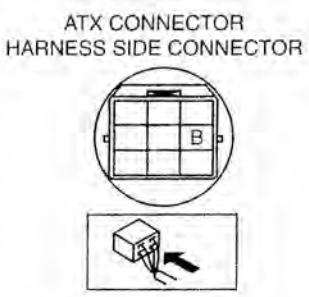
STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm^2, 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm^2, 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm^2, 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition switch to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL], 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace the ATX, then go to the next step. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	**VERIFY TROUBLESHOOTING OF DTC P0767 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or above** — Drive in D range • Is pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

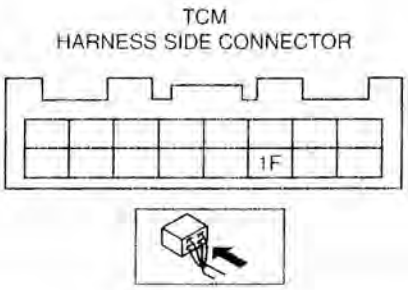
DTC P0768 [FN4A-EL]

C6U05020103OW32

DTC P0768	Shift solenoid D malfunction (electrical)
DETECTION CONDITION	• If TCM detects either of the following conditions while driving in 4GR at D range, TCM determines that shift solenoid D circuit has a malfunction. — Shift solenoid D voltage is stuck at **B+** after engine start. — Shift solenoid D voltage is stuck at **0 V** after engine start. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Shift solenoid D malfunction • Short to ground between ATX connector terminal B and TCM terminal 1F • Short to power between ATX connector terminal B and TCM terminal 1F • Open circuit between shift solenoid D terminal A and ATX connector terminal B • Open circuit between ATX connector terminal B and TCM terminal 1F • Damaged connector between shift solenoid D and TCM • TCM malfunction







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the ATX connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect resistance between ATX connector terminal B (transaxle case side) and body ground. • Is resistance **within 10.9—26.2 ohms**? (See 05–17A–21 Resistance Inspection (On-Vehicle Inspection).)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID D CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid D connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect resistance between shift solenoid D terminal A (part-side) and body ground. • Is resistance **within 10.9—26.2 ohms**? (See 05–17A–21 Resistance Inspection (On-Vehicle Inspection).)	Yes	Replace the solenoid harness, then go to Step 11.
		No	Verify shift solenoid D installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05–17A–23 SOLENOID VALVE REMOVAL/ INSTALLATION [FN4A-EL].)
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM terminal 1F (harness-side) and ATX connector terminal B (vehicle harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Inspect voltage at ATX connector terminal B (vehicle harness-side). • Is voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
10	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Inspect continuity between TCM terminal 1F (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to Step 11.
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0768 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	No concern is detected. Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0771 [FN4A-EL]

C6U05020103OW33

DTC P0771	Shift solenoid E stuck OFF
DETECTION CONDITION	• When any of P0731, P0732, and P0734 are not generated, and all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or above** — Driving in 4GR at D range — Engine runs. — Turbine speed **within 225—4,988 rpm** — Vehicle speed **within 60—100 km/h {37—62 mph}** — TCC operation — Shift solenoid A duty value exceeds **99%** — Power or normal mode — Difference between engine speed and turbine speed **more than 100 rpm**. — Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • PENDING CODE is available if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoid E stuck • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to the next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)

STEP	INSPECTION		ACTION
4	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 7. (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm^2, 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm^2, 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm^2, 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition switch to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL], 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace the ATX, then go to the next step. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	**VERIFY TROUBLESHOOTING OF DTC P0771 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or above** — Drive in D range — Vehicle speed: **within 60—100 km/h {37—62 mph}** (4th gear only). • Is pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0772 [FN4A-EL]

C6U050201030W34

DTC P0772	Shift solenoid E stuck ON
DETECTION CONDITION	• When any of DTC P0731, P0733, and P0734 are not generated, and all of the following conditions are satisfied under each of following throttle conditions. — ATF temperature **20 °C {68 °F} or above** — Driving in 4GR at D range — Engine runs. — Turbine speed **within 225—4,988 rpm** — Vehicle speed **below 70 km/h {43 mph}** — Torque converter clutch (TCC) not operated — Difference between engine speed and turbine speed **below 50 rpm** • Throttle conditions. — Throttle opening angle (TP PID) **above 10.1%** and **5 seconds or more** have passed. — Throttle opening angle (TP PID) **within 3.1—10.1%** and **3 seconds or more** have passed. — Throttle opening angle at closed throttle position and **5 seconds or more** have passed. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • PENDING CODE is available if TCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Shift solenoid E stuck • Control valve stuck • TCM malfunction

Diagnostic procedure

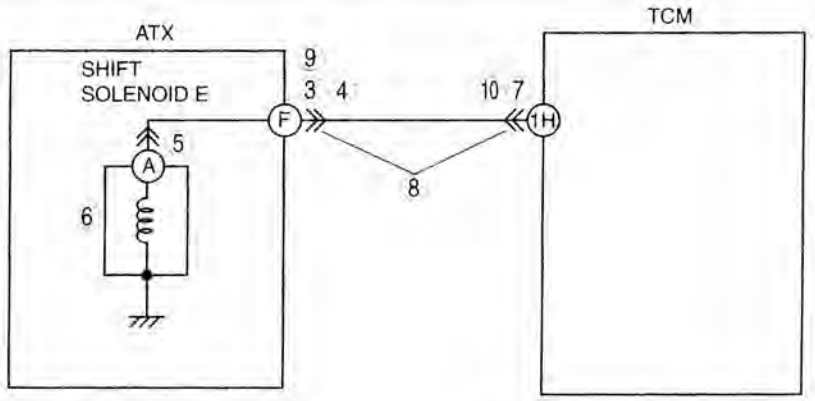
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to the next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)
4	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 7. (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)

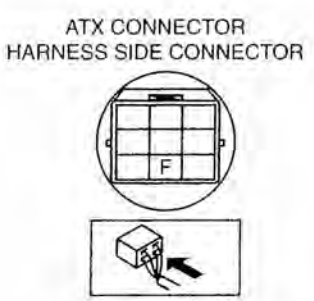
STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **D, M (1GR, 2GR) range** **Idle: 330—470 kPa {3.4—4.8 kgf/cm^2, 48—68 psi}** **Stall: 1,160—1,320 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** **R position** **Idle: 490—710 kPa {5.0—7.2 kgf/cm^2, 71—102 psi}** **Stall: 1,750—1,970 kPa {17.8—20.1 kgf/cm^2, 254—285 psi}** • Is line pressure within specification? (See 05–17A–3 Line Pressure Test.)	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition switch to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL], 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace the ATX, then go to the next step. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	**VERIFY TROUBLESHOOTING OF DTC P0772 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or above** — Drive in D range — Vehicle speed (VSS PID): **below 70 km/h {43 mph}** (4th gear only) • Is pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

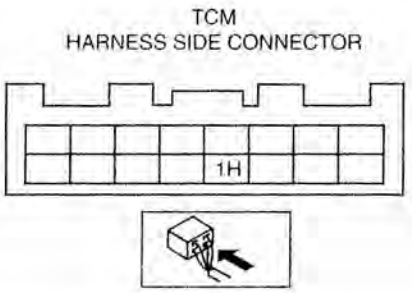
DTC P0773 [FN4A-EL]

C6U050201030W35

DTC P0773	Shift solenoid E malfunction (electrical)
DETECTION CONDITION	• If TCM detects either of following conditions while driving in 4GR at D range with TCC operation, TCM determines that shift solenoid E circuit has a malfunction. — Shift solenoid E voltage is stuck at **B+** after engine start. — Shift solenoid E voltage is stuck at **0 V** after engine start. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Shift solenoid E malfunction • Short to ground between ATX connector terminal F and TCM terminal 1H • Short to power between ATX connector terminal F and TCM terminal 1H • Open circuit between shift solenoid E terminal A and ATX connector terminal F • Open circuit between ATX connector terminal F and TCM terminal 1H • Damaged connector between shift solenoid E and TCM • TCM malfunction







Diagnostic procedure

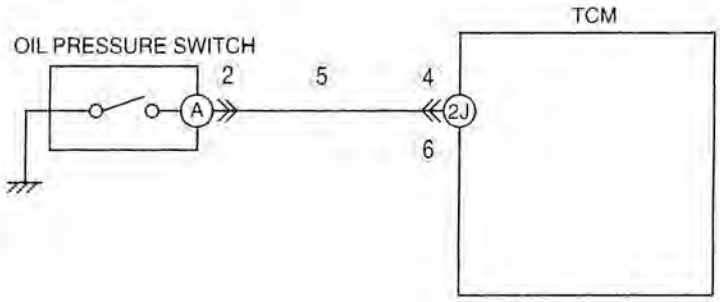
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.

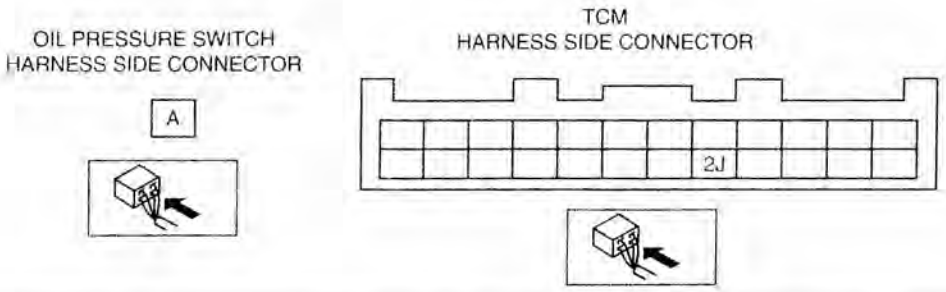
STEP	INSPECTION		ACTION
3	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the ATX connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect resistance between ATX connector terminal F (transaxle case side) and body ground. • Is resistance **within 10.9—26.2 ohms**? (See 05–17A–21 Resistance Inspection (On-Vehicle Inspection).)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID E CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid E connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect resistance between shift solenoid E terminal A (part-side) and body ground. • Is resistance **within 10.9—26.2 ohms**? (See 05–17A–22 Resistance Inspection (Off-Vehicle Inspection).)	Yes	Replace the solenoid harness, then go to Step 11.
		No	Verify shift solenoid E installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05–17A–23 SOLENOID VALVE REMOVAL/INSTALLATION [FN4A-EL].)
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM terminal 1H (harness-side) and ATX connector terminal F (vehicle harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Inspect voltage at ATX connector terminal F (vehicle harness-side). • Is voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
10	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Inspect for continuity between TCM terminal 1H (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to Step 11.
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0773 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	No concern is detected. Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0841 [FN4A-EL]

C6U050201030W36

DTC P0841	Oil pressure switch circuit malfunction
DETECTION CONDITION	• When each of DTC P0731, P0732, P0733 and P0734 are not generated and **10 seconds or more** passed. — When all conditions below are satisfied while driving in 1GR, 2GR or 3GR. • ATF temperature **20 °C {68 °F} or above** • Oil pressure switch OFF • Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 0.91 or more than 3.08** • Any of the following not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 — When all conditions below are satisfied with driving in 4GR. • ATF temperature **20 °C {68 °F} or above** • Oil pressure switch ON • Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 0.64 or more than 0.82** • Any of the following are not generated: DTC P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • PENDING CODE is not available. • FREEZE FRAME DATA is not available. • AT warning light illuminates. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Oil pressure switch malfunction • Open circuit between oil pressure switch terminal A and TCM terminal 2J • Short to ground between oil pressure switch terminal A and TCM terminal 2J • Damaged connector between oil pressure switch and TCM • TCM malfunction





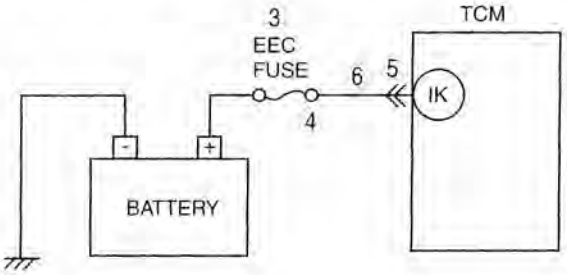
Diagnostic procedure

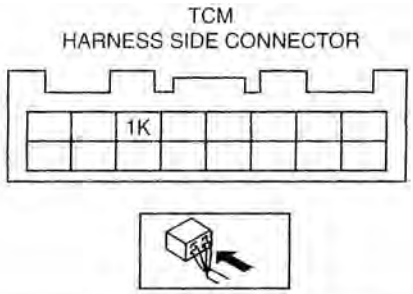
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**INSPECT OIL PRESSURE SWITCH CONNECTOR FOR POOR CONNECTION** • Disconnect the shift oil pressure switch connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 7.
3	**INSPECT CONTINUITY** • Inspect for continuity between oil pressure switch terminal A (part-side) and body ground. • Is there continuity?	Yes	Replace the oil pressure switch, then go to Step 7. (See 05–17A–18 OIL PRESSURE SWITCH REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
4	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 7.
5	**INSPECT OIL PRESSURE SWITCH CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM terminal 2J (harness-side) and ATX connector terminal A (harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 7.
6	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Inspect continuity between TCM terminal 2J (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to the next step.
		No	Replace the oil pressure switch, then go to the next step. (See 05–17A–18 OIL PRESSURE SWITCH REMOVAL/INSTALLATION [FN4A-EL].)
7	**VERIFY TROUBLESHOOTING OF DTC P0841 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle and make sure that gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	No concern is detected. Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0882 [FN4A-EL]

C6U050201030W37

DTC P0882	TCM B+ voltage low
DETECTION CONDITION	• The TCM monitors the voltage of back-up battery positive terminal at TCM terminal 1K. If the TCM detected battery positive terminal voltage **below 2.5 V** for **2 s**, the TCM determines that the backup voltage circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if TCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Melt down EEC fuse • Open circuit in wiring between EEC fuse and TCM terminal 1K • Short to ground between EEC fuse and TCM terminal 1K • Poor connection of TCM connector • TCM malfunction





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT EEC FUSE** • Turn ignition switch to OFF. • Inspect EEC fuse for failure and proper. • Is it okay?	Yes	Go to step 6.
		No	• If EEC fuse has been melt down, then go to the next step. • If EEC fuse is not installed correctly, install it correctly then go to Step 7.
4	**INSPECT MONITOR CIRCUIT FOR SHORT TO GROUND** • Disconnect the battery cables. • Inspect continuity between EEC fuse terminal and body ground. • Is there continuity?	Yes	Repair or replace the harness for short to ground and install new fuse, then go to Step 7.
		No	Go to step 7.

STEP	INSPECTION		ACTION
5	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminals, then go to Step 7.
		No	Go to the next step.
6	**INSPECT MONITOR CIRCUIT FOR OPEN CIRCUIT** • Disconnect the battery cables. • Inspect continuity between EEC fuse terminal and TCM terminal 1K (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness for open circuit, then go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0882 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to ON (Engine OFF). • Clear DTC from TCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0894 [FN4A-EL]

C6U050201030W39

DTC P0894	Forward clutch power transmission malfunction
DETECTION CONDITION	• With the engine running and the selector lever in the D or M range, all of the following conditions are met: — ATF temperature **20 °C {68 °F} or more** — Vehicle speed **0 km/h {0 mph}** (brake on) — Even when **3 s or more** has passed since the engine has started, the turbine speed will not decrease to **less than 200 rpm**. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL does not illuminate if the TCM detects above malfunction conditions during the first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is not available. • AT warning light illuminates. • DTCs are stored in the TCM memory.
POSSIBLE CAUSE	• Forward clutch not engaged or slipped • Short to power supply in wiring harness between shift solenoid A terminal B and TCM terminal 1A • Shift solenoid A stuck on • VSS malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY DTCS** • Turn ignition switch to OFF, then to ON. • Verify the DTCs in the TCM memory. • Are DTCs P0715, P0720, P0752, and/or P0753 output?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	Replace the forward clutch, then go to the next step.

STEP	INSPECTION		ACTION
3	**VERIFY TROUBLESHOOTING OF DTC P0894 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the WDS or equivalent. • Warm up the engine. • With the selector lever in the D range and the vehicle stopped (brake on), wait **3 s or more**. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
		No	No concern is detected. Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05–02A–4 AFTER REPAIR PROCEDURE [FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
		No	DTC troubleshooting completed.

PID/DATA MONITOR INSPECTION [FN4A-EL]

C6U050201030W38

1. Connect the WDS or equivalent to the DLC-2.
2. Measure the PID value.

Note
- Perform part inspection for the output device after TCM inspection.
- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the TCM. Therefore, if a monitored value of an output device is out of specification, it is necessary to inspect the monitored value of the input device related to the output device control. Since an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device, it is necessary to inspect the output device individually using the simulation function.

PID/DATA MONITOR AND RECORD function table

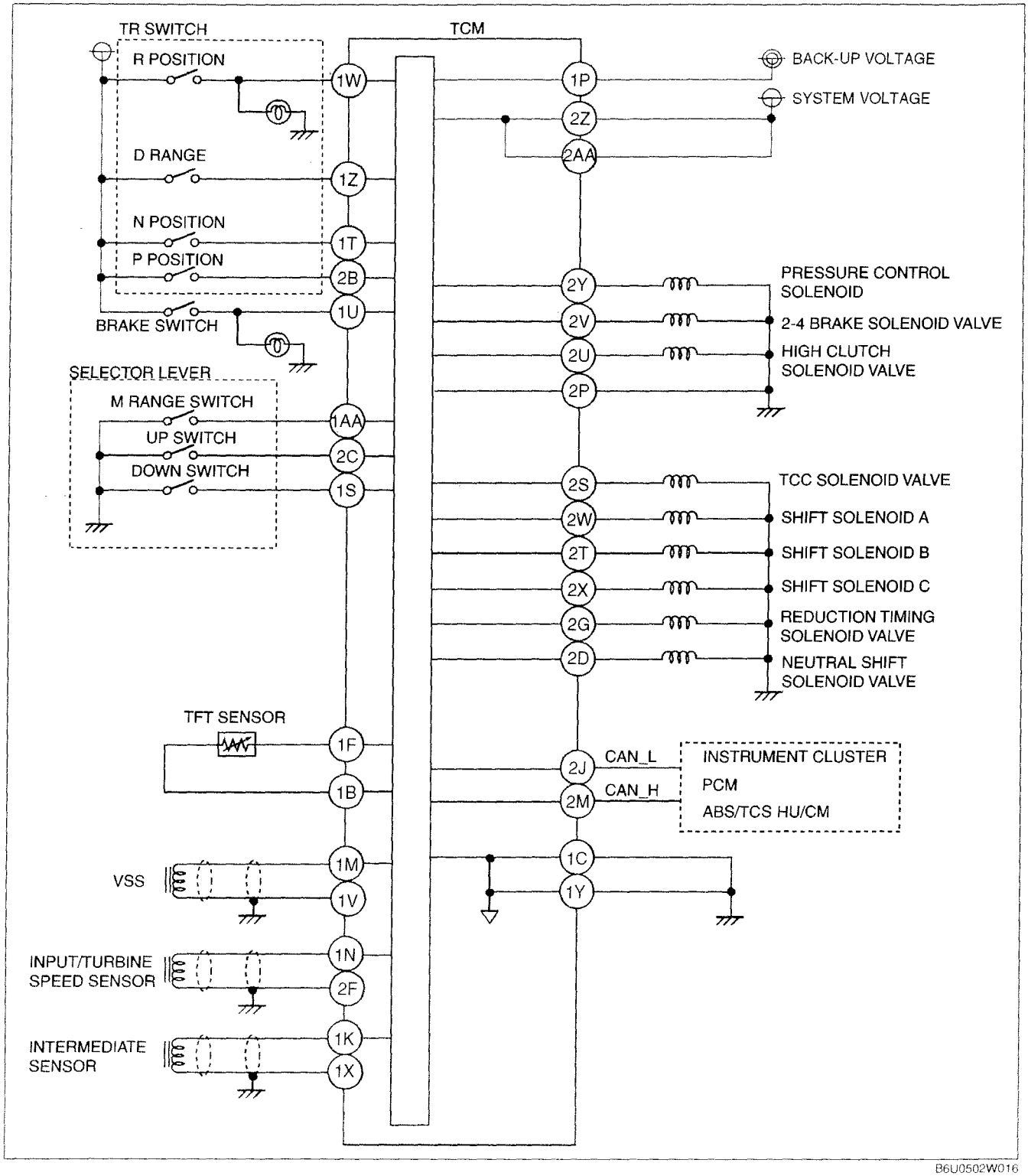
Monitor item (Definition)	Unit/ Condition	Condition/Specification	Action	TCM terminal
DTCCNT	—	Indicates number of DTC	Check DTC. (See 05–02A–4 DTC TABLE [FN4A-EL].)	—
DWN SW (Down switch)	On/Off	M range, down shift: On Other: Off	Inspect selector lever component. (See 05–18–5 SELECTOR LEVER COMPONENT INSPECTION.)	2F
GEAR	1st/2nd/3rd/ 4th	1GR: 1st 2GR: 2nd 3GR: 3rd 4GR: 4th	Inspect following PIDs: SSA/SS1, SSB/ SS2, SSC/SS3, SSD/SS4, SSE_SS5	—
LINEDES (Modifier pressure)	KPa / psi	Indicates target modifier pressure	Inspect following PIDs: TFT, TFTV, VPWR_TCM, TP, TSS, VSS, TR	—
LPS (Pressure control solenoid)	A	Change current value according to throttle opening angle and selector lever position	Inspect pressure control solenoid. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].)	1E, 1G
MNL SW (M range switch)	On/Off	M range: On Other: Off	Inspect selector lever component. (See 05–18–5 SELECTOR LEVER COMPONENT INSPECTION.)	2B
OP_SW_B (Oil pressure switch)	On/Off	1, 2 or 3GR: On Other: Off	Inspect oil pressure switch inspection. (See 05–17A–17 OIL PRESSURE SWITCH INSPECTION [FN4A-EL].)	2J
RPM (Engine speed)	RPM	Ignition switch ON: **0 rpm** Idle: **650—750 rpm**	Inspect TCM. (See 05–17A–24 TCM INSPECTION [FN4A-EL].)	—
SSA/SS1 (Shift solenoid A)	%	4GR: **99%** others: **0%**	Inspect shift solenoid A. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].)	1A
SSB/SS2 (Shift solenoid B)	%	1GR at D range: **99%** Others: **0%**	Inspect shift solenoid B. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].)	1B

Monitor item (Definition)	Unit/ Condition		Condition/Specification	Action	TCM terminal
SSC/SS3 (Shift solenoid C)	%		1GR/2GR: **99%** Others: **0%**	Inspect shift solenoid C. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].)	1C
SSD/SS4 (Shift solenoid D)	On/Off		1GR at D range: Off N position: On	Inspect shift solenoid D. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].)	1F
SSE_SS5 (Shift solenoid E)	On/Off		TCC operate OFF: Off TCC operate ON: On	Inspect shift solenoid E. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].)	1H
TFT (Transaxle fluid temperature)	°C	°F	Indicates ATF temperature	Inspect TFT sensor. (See 05–17A–15 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION [FN4A-EL].)	2M
TFTV (Transaxle fluid signal voltage)	V		ATF **20 °C {68 °F}: 3.4—3.6 V** ATF **130 °C {266 °F}: 0.4—0.5 V**	Inspect TFT sensor. (See 05–17A–15 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION [FN4A-EL].)	2M
TR (Transaxle range)	R/N/D		R position: R N position: N D range: D	Inspect TR switch. (See 05–17A–9 TRANSAXLE RANGE (TR) SWITCH INSPECTION [FN4A-EL].)	2H
TR_SENS (TR switch)	V		P position: **4.34—4.79 V** R position: **3.83—4.18 V** N position: **3.05—3.50 V** D range: **2.23—2.66 V**	Inspect TR switch. (See 05–17A–9 TRANSAXLE RANGE (TR) SWITCH INSPECTION [FN4A-EL].)	2H
TSS (Input/turbine speed)	RPM		Ignition switch On: **0 rpm** Idle: **650 rpm** (P, N position)	Inspect input/turbine speed sensor. (See 05–17A–18 INPUT/TURBINE SPEED SENSOR INSPECTION [FN4A-EL].)	2I, 2K
UP SW (Up switch)	On/Off		M range, up shift: On Other: Off	Inspect selector lever component. (See 05–18–5 SELECTOR LEVER COMPONENT INSPECTION.)	2D
VPWR_TCM (Battery positive voltage)	V		Ignition switch On: **B+** Engine running: **B+**	Inspect main relay. (See 09–21–6 RELAY INSPECTION.) Inspect battery. (See 01–17–1 BATTERY INSPECTION.)	1M, 1N
VSS (Vehicle speed)	KPH	MPH	Indicates vehicle speed	Inspect VSS. (See 05–17A–19 VEHICLE SPEEDOMETER SENSOR (VSS) INSPECTION (WITHOUT ABS) [FN4A-EL].)	2P

05–02B ON-BOARD DIAGNOSTIC [JA5A-EL]

AUTOMATIC TRANSAXLE CONTROL SYSTEM WIRING DIAGRAM [JA5A-EL]

C6U050218901W01

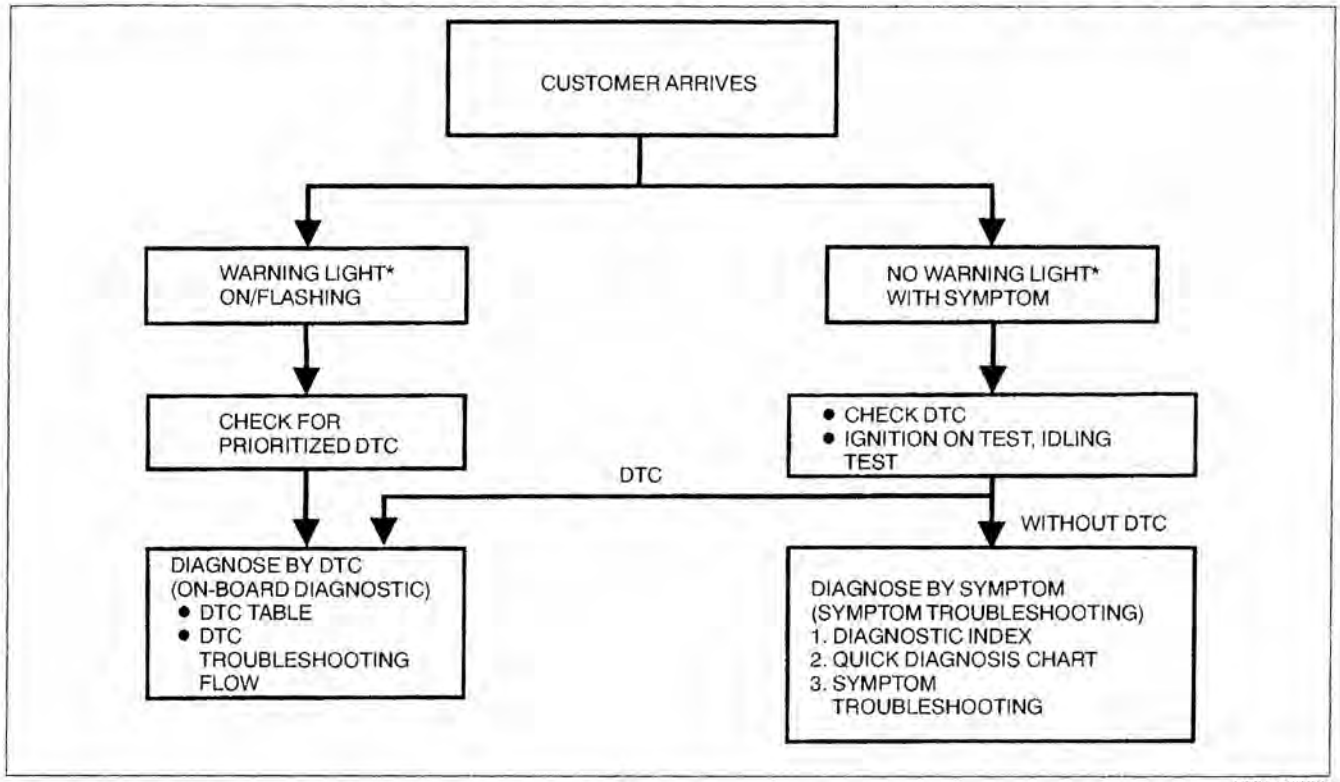


B6U0502W016

FOREWORD [JA5A-EL]

C6U050218901W02

- When the customer reports vehicle malfunction, check the malfunction indicator lamp (MIL) indication, AT warning indication, and diagnostic trouble code (DTC), then diagnose the malfunction according to following flowchart.
  - — If a DTC exists, diagnose the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
  - — If a DTC does not exist and the MIL and AT warning lights do not illuminate, diagnose the applicable symptom troubleshooting. (See 05–03B–4 SYMPTOM TROUBLESHOOTING ITEM TABLE [JA5A-EL].)



YMU102WBX

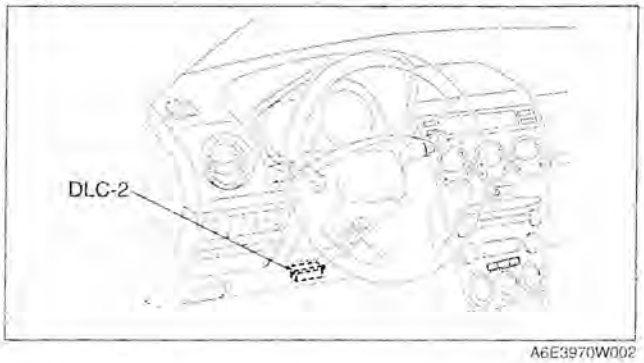
*: Malfunction Indicator Lamp (MIL), AT warning light

AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION [JA5A-EL]

C6U050218901W03

DTC Reading Procedure

1. Perform necessary vehicle preparation and visual inspection.
2. Connect the WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the center console.
3. Retrieve DTCs using the WDS or equivalent.



A6E3970W002

AFTER REPAIR PROCEDURE [JA5A-EL]

C6U050218901W04

Caution

- **After repairing a malfunction, perform this procedure to verify that the malfunction has been corrected.**
- **When this procedure is carried out, be sure to drive the vehicle at lawful speed and pay attention to the other vehicles.**

1. Connect the WDS or equivalent to the DLC-2.
2. Turn the ignition switch to ON (engine off).
3. Select the clear code function and clear the DTC.
4. Perform the following trouble code inspections to ensure that the DTC has been resolved:
   - For P0705
     i. Start the engine.
     ii. Warm up the engine to normal operating temperature.
     iii. Depress the brake pedal, and shift the selector lever from P to D for **5 seconds or more**.
     iv. Gradually slow down and stop the vehicle.
     v. Turn the IG switch to OFF.
     vi. Repeat from step i to step iii again.
     vii. Go to Step 5.
   - For P0706
     i. Start the engine.
     ii. Warm up the engine to normal operating temperature.
     iii. Depress the brake pedal, and shift the selector lever from P to D for **100 seconds or more**.
     iv. Gradually slow down and stop the vehicle.
     v. Turn the IG switch to OFF.
     vi. Repeat from step i to step iii again.
     vii. Go to Step 5.
   - For P0711
     i. Decrease ATF temperature to **20 °C {68 °F} or below**.
     ii. Start the engine.
     iii. Drive the vehicle in D range for **330 seconds or more**.
     iv. Gradually slow down and stop the vehicle.
     v. Turn the IG switch to OFF.
     vi. Repeat from step ii to step iii again.
     vii. Go to Step 5
   - For P0712
     i. Start the engine.
     ii. Warm up the engine to normal operating temperature.
     iii. Drive the vehicle in D range for **150 seconds or more**.
     iv. Gradually slow down and stop the vehicle.
     v. Turn the IG switch to OFF.
     vi. Repeat from step i to step iii again.
     vii. Go to Step 5.
   - For P0713
     i. Start the engine.
     ii. Warm up the engine to normal operating temperature.
     iii. Drive the vehicle, two separate times, in D range at **20 km/h {12 mph} or above** for **150 seconds or more**.
     iv. Gradually slow down and stop the vehicle.
     v. Turn the IG switch to OFF.
     vi. Repeat from step i to step iii again.
     vii. Go to Step 5.
   - For P0715, P0791
     i. Start the engine.
     ii. Drive the vehicle under the following conditions for **2 seconds or more**.
     — Vehicle speed (VSS PID): **40 km/h {25 mph} or above**
     — Engine speed (RPM PID): **1,500 rpm or above**.
     — Selector lever position: D range
     iii. Gradually slow down and stop the vehicle.
     iv. Turn the IG switch to OFF.
     v. Repeat from step ii again.
     vi. Go to Step 5.

- For P0720
  i. Start the engine.
  ii. Warm up the engine and ATX.
  iii. Drive the vehicle, two separate times, under the following conditions for **2 seconds or more**.
    — Selector lever position: D range
    — Vehicle speed (VSS PID): **40 km/h {25 mph}**
    — Engine speed (RPM PID): **1,400 rpm or above**.
  iv. Gradually slow down and stop the vehicle.
  v. Turn the IG switch to OFF.
  vi. Repeat from step i to step iii again.
  vii. Go to Step 5.
- For P0740
  i. Start the engine.
  ii. Warm up the engine and ATX.
  iii. Drive the vehicle under the following conditions for **10 seconds or more**.
    — Vehicle speed (VSS PID): **76 km/h {47 mph}**
    — Selector lever position: D range
    — TCC operating
  iv. Gradually slow down and stop the vehicle.
  v. Turn the IG switch to OFF.
  vi. Repeat from step i to step iii again.
  vii. Go to Step 5.
- For P0743
  i. Start the engine.
  ii. Warm up the engine and ATX.
  iii. Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 5GR and TCC is operated.
  iv. Go to Step 5.
- For P0748, P0751, P0752, P0756, P0757, P0761, P0762
  i. Start the engine.
  ii. Warm up the engine and ATX.
  iii. Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 5GR.
  iv. Gradually slow down and stop the vehicle.
  v. Turn the IG switch to OFF.
  vi. Repeat from step i to step iii again.
  vii. Go to Step 5.
- For P0753, P0758, P0763, P0768, P0773, P0778, P0798, P1710
  i. Start the engine.
  ii. Warm up the engine and ATX.
  iii. Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 5GR.
  iv. Go to Step 5.

5. Gradually slow down and stop the vehicle.
6. Make sure that no DTCs occur.

DTC TABLE [JA5A-EL]

C6U050218901W05

X: Available

DTC No.	Condition	MIL	AT warning light	DC	*Monitor item	Memory function	Page
P0705	Transaxle range (TR) switch circuit malfunction (power short circuit)	X	X	2	CCM	X	(See 05–02B–8 DTC P0705 [JA5A-EL])
P0706	Transaxle range (TR) switch circuit malfunction (open circuit/ground short circuit)	X	X	2	CCM	X	(See 05–02B–10 DTC P0706 [JA5A-EL])
P0711	Transaxle fluid temperature (TFT) sensor malfunction (stuck)	X	NO	2	CCM	X	(See 05–02B–13 DTC P0711 [JA5A-EL])
P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short circuit)	X	X	2	CCM	X	(See 05–02B–14 DTC P0712 [JA5A-EL])
P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)	X	X	2	CCM	X	(See 05–02B–16 DTC P0713 [JA5A-EL])
P0715	Input/turbine speed sensor circuit malfunction	X	X	2	CCM	X	(See 05–02B–19 DTC P0715 [JA5A-EL])
P0720	Vehicle speedometer sensor (VSS) circuit malfunction	X	X	2	CCM	X	(See 05–02B–22 DTC P0720 [JA5A-EL])
P0740	Torque converter clutch (TCC) system malfunction	X	–	2	CCM	X	(See 05–02B–24 DTC P0740 [JA5A-EL])
P0743	Torque converter clutch (TCC) solenoid valve circuit malfunction	X	X	1	CCM	X	(See 05–02B–27 DTC P0743 [JA5A-EL])
P0748	Pressure control solenoid circuit malfunction	–	X	–	CCM	X	(See 05–02B–30 DTC P0748 [JA5A-EL])
P0751	Shift solenoid A malfunction (stuck off)	X	–	2	CCM	X	(See 05–02B–33 DTC P0751 [JA5A-EL])
P0752	Shift solenoid A malfunction (stuck on)	X	–	2	CCM	X	(See 05–02B–34 DTC P0752 [JA5A-EL])
P0753	Shift solenoid A circuit malfunction (open circuit/ short circuit)	X	X	1	CCM	X	(See 05–02B–35 DTC P0753 [JA5A-EL])
P0756	Shift solenoid B malfunction (stuck off)	X	–	2	CCM	X	(See 05–02B–37 DTC P0756 [JA5A-EL])
P0757	Shift solenoid B malfunction (stuck on)	X	–	2	CCM	X	(See 05–02B–38 DTC P0757 [JA5A-EL])
P0758	Shift solenoid B circuit malfunction (open circuit/ short circuit)	X	X	1	CCM	X	(See 05–02B–40 DTC P0758 [JA5A-EL])
P0761	Shift solenoid C malfunction (stuck off)	X	–	2	CCM	X	(See 05–02B–42 DTC P0761 [JA5A-EL])
P0762	Shift solenoid C malfunction (stuck on)	X	–	2	CCM	X	(See 05–02B–43 DTC P0762 [JA5A-EL])
P0763	Shift solenoid C circuit malfunction (open circuit/ short circuit)	X	X	1	CCM	X	(See 05–02B–45 DTC P0763 [JA5A-EL])

DTC No.	Condition	MIL	AT warning light	DC	*Monitor item	Memory function	Page
P0768	Reduction timing solenoid valve circuit malfunction (open circuit/short circuit)	–	X	–	CCM	X	(See 05–02B–48 DTC P0768 [JA5A-EL])
P0773	Neutral shift solenoid valve circuit malfunction (open circuit/short circuit)	–	X	–	CCM	X	(See 05–02B–51 DTC P0773 [JA5A-EL])
P0778	2-4 brake solenoid valve circuit malfunction (open circuit/short circuit)	–	X	–	CCM	X	(See 05–02B–54 DTC P0778 [JA5A-EL])
P0791	Intermediate sensor circuit malfunction (open circuit/short circuit)	X	X	2	CCM	X	(See 05–02B–57 DTC P0791 [JA5A-EL])
P0798	High clutch solenoid valve circuit malfunction (open circuit/short circuit)	–	X	–	CCM	X	(See 05–02B–60 DTC P0798 [JA5A-EL])
P1710	GND return circuit malfunction	–	–	–	Other	X	(See 05–02B–63 DTC P1710 [JA5A-EL])
U0073	CAN BUS OFF	(See 09–02C–4 DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM])					
U0100	TCM cannot receive any signals from PCM	(See 09–02C–4 DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM])					

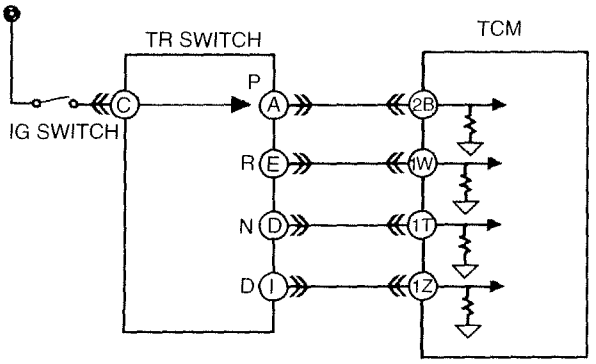
* : Indicates the applicable item in On-Board System Readiness Test defined by CARB.

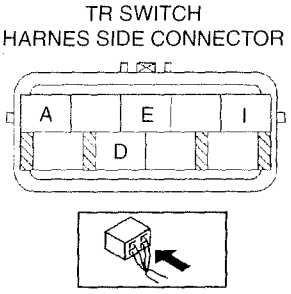
MIL: Malfunction Indicator Lamp
DC: Drive Cycle
CCM: Comprehensive Component Monitor
– : N/A

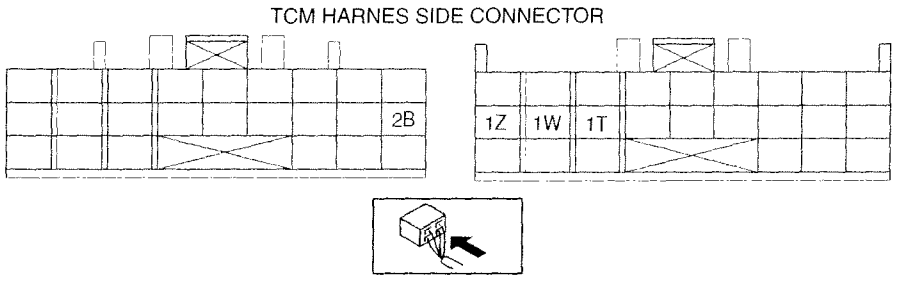
DTC P0705 [JA5A-EL]

C6U050218901W06

DTC P0705	Transaxle range (TR) switch circuit malfunction (short circuit)
DETECTION CONDITION	• Two or more range signals are input from TR switch for **5 seconds or more**. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions in two consecutive drive cycles. • PENDING CODE is available above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• TCM malfunction • Short to power between TR switch terminal A and TCM terminal 2B • Short to power between TR switch terminal E and TCM terminal 1W • Short to power between TR switch terminal D and TCM terminal 1T • Short to power between TR switch terminal I and TCM terminal 1Z • Damaged connector between TR switch and TCM • TR switch malfunction







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.

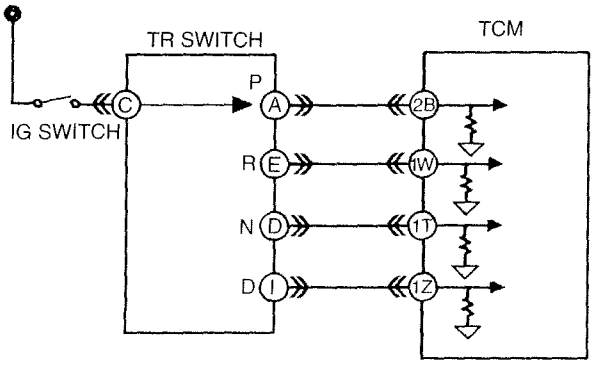
STEP	INSPECTION		ACTION
3	**VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT?** • Connect voltmeter to TCM. • Turn ignition switch to ON (engine off). • Inspect TCM terminal voltages. (See 05–17B–23 TCM INSPECTION [JA5A-EL].) — TCM terminal 2B • P position: **B+** • Other positions and all ranges: **0 V** — TCM terminal 1W • R position: **B+** • Other positions and all ranges: **0 V** — TCM terminal 1T — N position: **B+** — Other positions and all ranges: **0 V** — TCM terminal 1Z • D range: **B+** • Other ranges and all positions: **0 V** • Are two or more of the above terminal voltages indicated at the same time when shifting selector lever from P position to D range?	Yes	Go to the next step.
		No	Go to intermittent concern troubleshooting procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)
4	**INSPECT TR SWITCH CONNECTOR** • Turn ignition switch to OFF. • Disconnect the TR switch connector. • Inspect pin terminals for bending using mirror. • Are TR switch terminals okay?	Yes	Go to the next step.
		No	Repair terminals or replace the TR switch, then go to Step 8. (See 05–17B–12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION [JA5A-EL].)
5	**INSPECT TR SWITCH CIRCUIT MALFUNCTION** • Connect voltmeter to TCM. • Turn ignition switch to ON (engine off). • Does TCM terminal voltage change from **B+** to **0 V** when TR switch connector is disconnected? — P position • TCM terminal 2B — R position • TCM terminal 1W — N position — TCM terminal 1T — D range • TCM terminal 1Z	Yes	Go to the next step.
		No	Go to Step 7.
6	**INSPECT TR SWITCH CONTINUITY** • Turn ignition switch to OFF. • Disconnect the TR switch connector. • Inspect TR switch for continuity in positions/ranges failed in Step 3. • Is there continuity between TR switch terminals (part side)? (See 05–17B–11 TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL].)	Yes	Go to Step 8.
		No	Replace the TR switch, then go to Step 8. (See 05–17B–12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION [JA5A-EL].)
7	**INSPECT TR SWITCH CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Measure the voltage at TR switch terminal A, E, D, G, I, and F (harness-side). • Is there **0 V** at TR switch harness side connector?	Yes	Go to the next step.
		No	Repair or replace the wiring, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0705 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Turn ignition switch to ON (engine off). • Drive vehicle in each range (P, R, N, and D) for **5 seconds or more**. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.

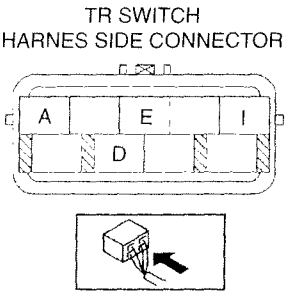
STEP	INSPECTION		ACTION
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

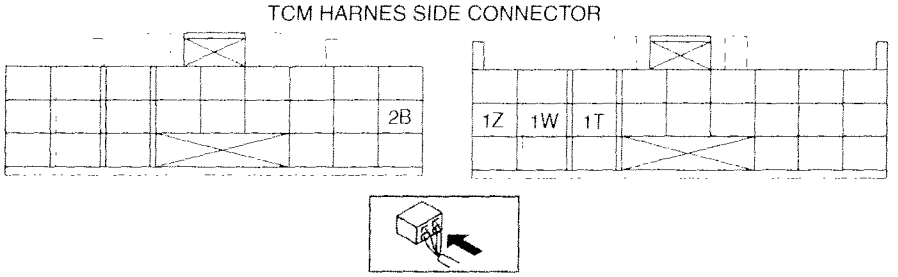
DTC P0706 [JA5A-EL]

C6U050218901W07

DTC P0706	Transaxle range (TR) switch circuit malfunction (open circuit/ground short circuit)
DETECTION CONDITION	• No range signal is input from TR switch for **100 seconds or more**. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions in two consecutive drive cycles. • PENDING CODE is available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• TR switch malfunction • TR switch misadjustment • Short to ground between TR switch terminal A and TCM terminal 2B • Short to ground between TR switch terminal E and TCM terminal 1W • Short to ground between TR switch terminal D and TCM terminal 1T • Short to ground between TR switch terminal I and TCM terminal 1Z • Open circuit between TR switch terminal A and TCM terminal 2B • Open circuit between TR switch terminal E and TCM terminal 1W • Open circuit between TR switch terminal D and TCM terminal 1T • Open circuit between TR switch terminal I and TCM terminal 1Z • Open circuit between TR switch terminal C and ignition switch (ACC) • Short to ground between TR switch terminal C and ignition switch (ACC) • Damaged connector between TR switch and TCM • TCM malfunction







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Check for poor connection (damaged pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
4	**INSPECT TR SWITCH CIRCUIT** • Connect voltmeter to TCM. • Inspect TCM terminal voltages. — TCM terminal 2B • P position: **B+** • Other positions and all ranges: **0 V** — TCM terminal 1W • R position: **B+** • Other position and all ranges: **0 V** — TCM terminal 1T • N position: **B+** • Other position and all range: **0 V** — TCM terminal 1Z • D range: **B+** • Other ranges and all positions: **0 V** • Are any of the above terminal voltages indicated for even a moment while shifting selector lever slowly from P position to D range?	Yes	Adjust TR switch, then go to Step 12. (See 05–17B–14 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [JA5A-EL].)
		No	Go to the next step.
5	**INSPECT TR SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Check for poor connection (damaged pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
6	**INSPECT TR SWITCH CIRCUIT** • Disconnect the TR switch connector. • Connect voltmeter to TCM. • Turn ignition switch to ON (engine off). • Connect harness side connector power line and signal line using jumper wire. — P position: C and A — R position: C and E — N position: C and D — D range: C and I • Inspect if terminal voltage changes. — **0 V** to **B+** • Does terminal voltage change?	Yes	Go to the next step.
		No	Go to Step 9.
7	**INSPECT TR SWITCH FOR OPEN CIRCUIT** • Turn ignition switch to OFF. • Inspect continuity between TR switch terminals (part side). — P position: C and A — R position: C and E — N position: C and D — D range: C and I • Is there continuity between TR switch terminals (part side)? (See 05–17B–11 TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL].)	Yes	Go to Step 12.
		No	Replace the TR switch, then go to Step 12. (See 05–17B–12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION [JA5A-EL].)

STEP	INSPECTION		ACTION
8	**INSPECT TR SWITCH POWER CIRCUIT FOR OPEN CIRCUIT** • Check voltage at TR switch terminal C (harness-side). • Is there **B+** at TR switch terminal C (harness-side)?	Yes	Go to the next step.
		No	Inspect main fuse. • If okay, repair or replace the wiring, then go to Step 12.
9	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Check for poor connection (damaged pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
10	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Check continuity between TR switch terminals (harness-side) and TCM terminals (harness-side). — P position: A and 2B — R position: E and 1W — N position: D and 1T — D range: I and 1Z • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 12.
11	**INSPECT TR SWITCH CIRCUIT FOR SHORT TO GROUND** • Check continuity between TCM terminals (harness-side) and body ground. — P position: 2B and body ground — R position: 1W and body ground — N position: 1T and body ground — D range: 1Z and body ground • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to the next step.
12	**VERIFY TROUBLESHOOTING OF DTC P0706 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in each range (P, R, N, and D) for **100 seconds or more**. • Is there pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

DTC P0711 [JA5A-EL]

C6U05021890IW08

DTC P0711	Transaxle fluid temperature (TFT) sensor malfunction (stuck)
DETECTION CONDITION	• TFT sensor signal stays outside normal temperature range for **330 seconds or more.** **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions in two consecutive drive cycles. • PENDING CODE is available. • FREEZE FRAME DATA is available. • AT warning light does not illuminate. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Connector corrosion • TCM malfunction

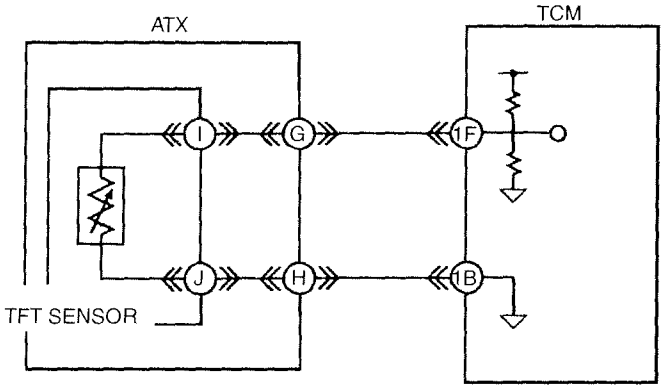
Diagnostic procedure

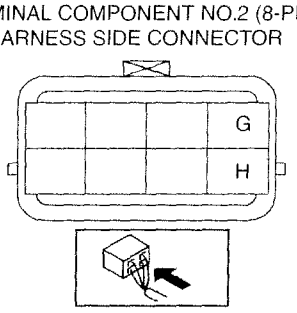
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TFT SENSOR VOLTAGE** • Connect voltmeter to TCM terminal 1F. • Turn ignition switch to ON (engine off). • Is TCM terminal voltage **1.55 V**?	Yes	Go to the next step.
		No	Go to Step 6.
4	**VERIFY CURRENT INPUT SIGNAL STATUS - IS CONCERN INTERMITTENT OR CONSTANT?** • Start engine. • Drive vehicle at **60 km/h {37 mph} or above** for **330 seconds or more.** • Measure the voltage between TCM terminals 1B and 1F. — ATF **20 °C {68 °F}: 1.55 V** — ATF **60 °C {140 °F}: 0.7 V** • Does TCM terminal voltage change?	Yes	Go to Step 6.
		No	Go to the next step.
5	**INSPECT TERMINAL CONDITION** • Turn ignition switch to OFF. • Disconnect the terminal component No.2 (8-pin). • Inspect terminals for corrosion. • Are terminals okay?	Yes	Replace the TFT sensor, then go to the next step. (See AUTOMATIC TRANSAXLE WORKSHOP MANUAL JA5A-EL.)
		No	Repair or replace the terminals, then go to the next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0711 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Decrease ATF temperature to **20 °C {68 °F} or below.** • Drive vehicle at **60 km/h {37 mph} or above** for **330 seconds or more.** • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

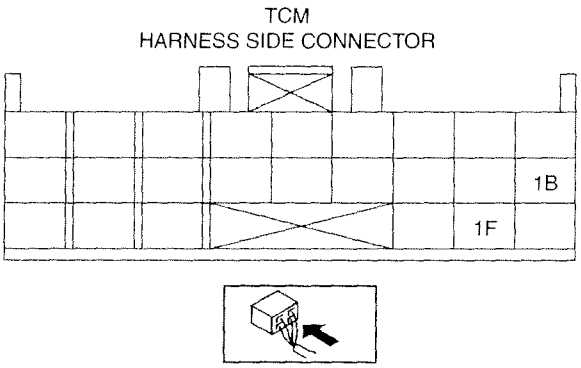
DTC P0712 [JA5A-EL]

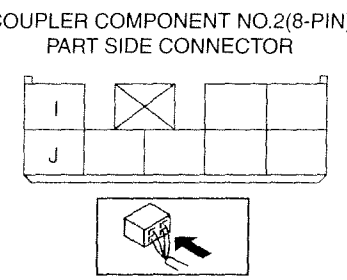
C6U050218901W09

DTC P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)
DETECTION CONDITION	• Signal from TFT sensor is **0.088 V or less** for **150 seconds or more**. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions in two consecutive drive cycles. • PENDING CODE is available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Open circuit between TFT sensor and TCM terminal 1F • Open circuit between TFT sensor and TCM terminal 1B • Damaged connectors between TFT sensor and TCM • TCM malfunction









Diagnostic procedure

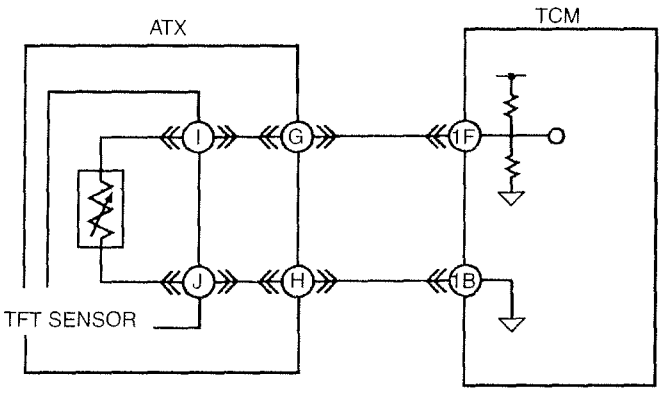
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS - IS CONCERN INTERMITTENT OR CONSTANT?** • Turn ignition switch to OFF. • Connect voltmeter to TCM terminal 1F. • Turn ignition switch to ON (engine off). • Are TCM terminal voltage **within 0.2—4.9 V**?	Yes	Go to intermittent concern troubleshooting procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)
		No	Go to the next step.

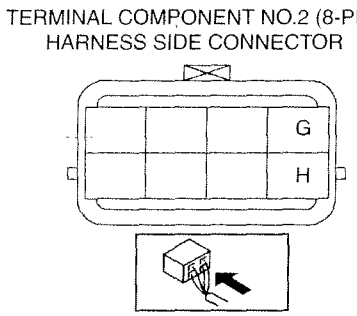
STEP	INSPECTION		ACTION
4	**INSPECT TERMINAL CONDITION** • Turn ignition switch to OFF. • Disconnect the terminal component No.2. • Inspect for bent terminals. • Is there any malfunction?	Yes	Repair or replace the terminals, then go to Step 9. • If terminals cannot be repaired, replace the harness, then go to Step 9.
		No	Go to the next step.
5	**INSPECT TFT SENSOR CIRCUIT** • Turn ignition switch to ON (engine off). • Verify if TCM terminal voltage changes to **4.9 V or above** when terminal component No.2 is disconnected. • Does TCM terminal voltage change?	Yes	Go to the next step.
		No	Go to Step 8.
6	**INSPECT COUPLER COMPONENT (8-PIN) TERMINALS CONDITION** • Turn ignition switch to OFF. • Disconnect the coupler component (8-pin) connector. • Inspect for bent coupler component (8-pin) terminals. • Is there any malfunction?	Yes	Repair or replace the connector and/or terminal, then go to the next step.
		No	Go to the next step.
7	**INSPECT COUPLER COMPONENT (8-PIN) CIRCUIT FOR SHORT TO GROUND** • Check continuity between coupler component (8-pin) terminals (part-side) and body ground. — I and body ground — J and body ground • Is there continuity?	Yes	Replace the TFT sensor, then go to Step 9.
		No	Repair or replace the coupler component, then go to Step 9.
8	**INSPECT TERMINAL COMPONENT NO.2 (8-PIN) CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Check continuity between terminal component No.2 terminal G (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to the next step.
		No	Go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0712 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle under following condition for **150 seconds or more**. — Vehicle speed (VSS PID): **20 km/h {12 mph}** • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

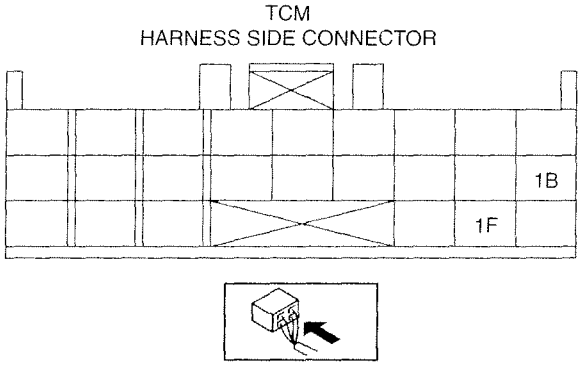
DTC P0713 [JA5A-EL]

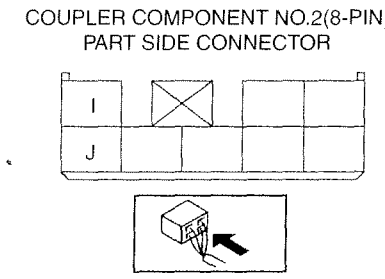
C6U050218901W10

DTC P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)
DETECTION CONDITION	• Vehicle speed is **20 km/h {12.4 mph} or greater**, and signal from TFT sensor is **2.4 V or above** for **150 seconds or more**. (two separate times) **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions in two consecutive drive cycles. • PENDING CODE is available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Open circuit between TFT sensor terminal G and TCM terminal 1F • Open circuit between TFT sensor terminal H and TCM terminal 1B • Damaged connectors between TFT sensor and TCM • TCM malfunction









Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.

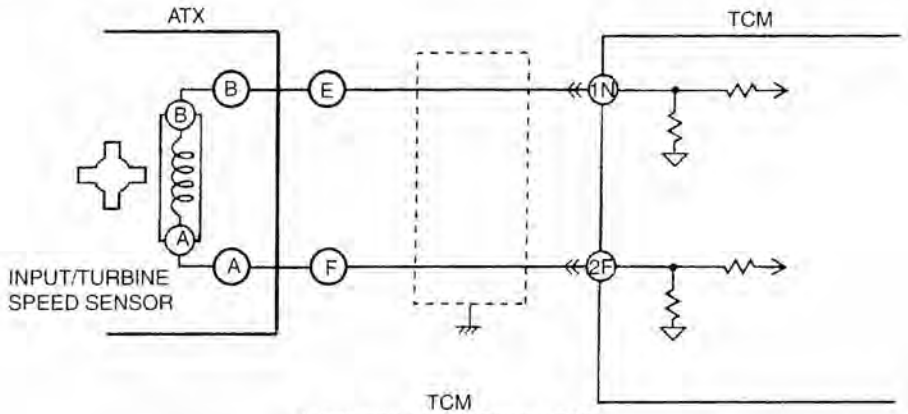
STEP	INSPECTION		ACTION
3	**VERIFY CURRENT INPUT SIGNAL STATUS - IS CONCERN INTERMITTENT OR CONSTANT?** • Turn ignition switch to OFF. • Connect voltmeter to TCM terminal 1F. • Turn ignition switch to ON (engine off). • Are TCM terminal voltage **within 0.2—4.9 V**?	Yes	Go to intermittent concern troubleshooting procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [AJ].)
		No	Go to the next step.
4	**INSPECT TERMINAL COMPONENT NO.2 (8-PIN) FOR POOR CONNECTION** • Turn ignition switch to OFF. • Inspect terminal component No.2 (8-pin) connection. • Disconnect the terminal component No.2 (8-pin). • Check for poor connection (damaged, pulled-out terminals, corrosion etc.). • Are connector and terminals okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
5	**INSPECT TFT SENSOR CIRCUIT** • Connect voltmeter to TCM terminal 1F. • Turn ignition switch to ON (engine off). • Connect between terminal component No.2 (8-pin) terminal H and G (harness-side) using jumper wire. • Verify if TCM terminal voltage changes to **0.2 V or below**. • Does TCM terminal voltage change?	Yes	Go to the next step.
		No	Go to Step 8.
6	**INSPECT COUPLER COMPONENT CONNECTOR CONNECTION FOR POOR CONNECTION** • Turn ignition switch to OFF. • Remove control valve body cover. • Disconnect the coupler component connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
7	**INSPECT COUPLER COMPONENT CIRCUIT FOR OPEN CIRCUIT** • Check continuity between coupler component (8-pin) terminals I and J (part-side). • Is there continuity?	Yes	Repair or replace the terminal component No.2 (8-pin).
		No	Replace the TFT sensor, then go to Step 11. (See 05–17B–15 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [JA5A-EL].)
8	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the TCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 11.
9	**INSPECT HARNESS FOR OPEN CIRCUIT** • Disconnect the terminal component No.2 (8-pin). • Connect the TCM connector. • Turn ignition switch to ON (engine off). • Inspect voltage at terminal component No.2 (8-pin) terminal G (harness-side). • Is voltage **5 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
10	**INSPECT TERMINAL COMPONENT NO.2 (8-PIN) CIRCUIT FOR OPEN CIRCUIT** • Turn ignition switch to OFF. • Check continuity between terminal component No.2 (8-pin) terminal H (harness-side) and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0713 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle for **150 seconds or more**. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

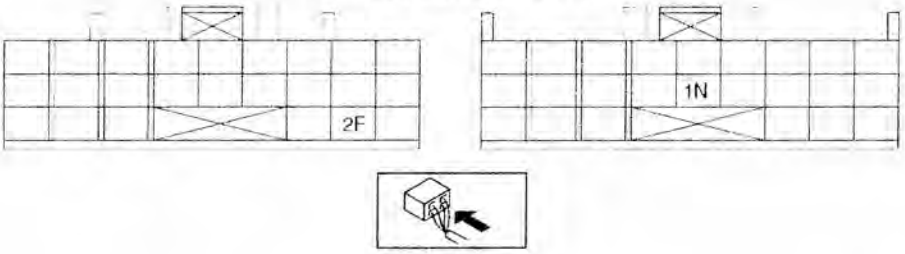
DTC P0715 [JA5A-EL]

C6U05021890 1W11

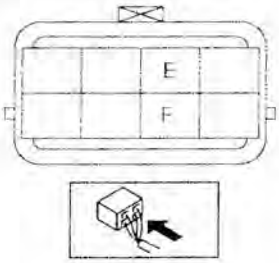
DTC P0715	Input/turbine speed sensor circuit malfunction
DETECTION CONDITION	• The following condition is detected twice: — Input/turbine speed sensor signal is **600 rpm or less** while engine speed is **1,500 rpm or greater** and vehicle speed is **40 km/h {24.8 mph} or greater** in D range. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions in two consecutive drive cycles. • PENDING CODE is available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Input/turbine speed sensor malfunction • Short to ground between input/turbine speed sensor terminal B and TCM terminal 1N • Short to ground between input/turbine speed sensor terminal A and TCM terminal 2F • Open circuit between input/turbine speed sensor terminal B and TCM terminal 1N • Open circuit between input/turbine speed sensor terminal A and TCM terminal 2F • Damaged connectors between input/turbine speed sensor and TCM • TCM malfunction



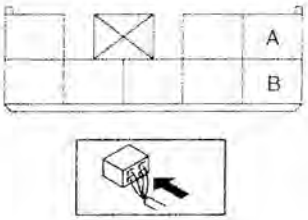
TCM
HARNESS SIDE CONNECTOR



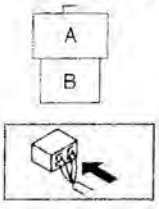
TERMINAL COMPONENT
NO.2 (8-PIN)
HARNESS SIDE CONNECTOR



COUPLER COMPONENT
(8-PIN)
PART SIDE CONNECTOR



INPUT/TURBINE
SPEED SENSOR
HARNESS SIDE CONNECTOR



Diagnostic procedure

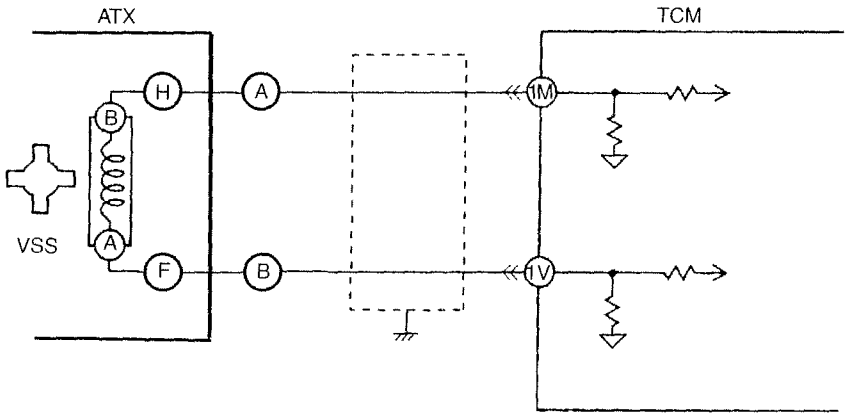
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TERMINAL COMPONENT NO.2 (8-PIN) CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the terminal component No.2 (8-pin) connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to Step 12.
4	**INSPECT INPUT/TURBINE SPEED SENSOR RESISTANCE** • Measure the resistance between terminal component No.2 (8-pin) (transaxle case side). • Is resistance **within 513—627 ohms** between terminal component No.2 (8-pin) terminal E and F (transaxle case side)?	Yes	Go to the next step.
		No	Go to Step 8.
5	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
6	**INSPECT TERMINAL COMPONENT NO.2 (8-PIN) CIRCUIT FOR OPEN CIRCUIT** • Check terminal component No.2 (8-pin) terminals F (harness-side) and TCM terminals 2F (harness-side). • Check terminal component No.2 (8-pin) terminals E (harness-side) and TCM terminals 1N (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 12.
7	**INSPECT TERMINAL COMPONENT NO.2 (8-PIN) CIRCUIT FOR SHORT TO GROUND** • Check terminal component No.2 (8-pin) terminal F (harness-side) and body ground. • Check terminal component No.2 (8-pin) terminal E (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to Step 12.
		No	Go to Step 12.
8	**INSPECT COUPLER COMPONENT (8-PIN) CONNECTOR FOR POOR CONNECTION** • Disassemble the control valve body cover. • Disconnect the coupler component (8-pin) connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
9	**INSPECT INPUT/TURBINE SPEED SENSOR RESISTANCE** • Measure the resistance between coupler component (8-pin) (transaxle case side). • Is resistance **within 513—527 ohms** between coupler component (8-pin) terminal B and A (part side)?	Yes	Repair or replace the terminal component, then go to Step 12.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**INSPECT INPUT/TURBINE SPEED SENSOR CONNECTOR FOR POOR CONNECTION** • Disassemble the transaxle. • Disconnect the input/turbine speed sensor connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
11	**INSPECT INPUT/TURBINE SPEED SENSOR RESISTANCE** • Measure the resistance between input/turbine speed sensor. • Is resistance **within 513—627 ohms** between input/turbine speed sensor connector terminal A and B (part side)?	Yes	Repair or replace coupler component, then go to the next step.
		No	Replace the input/turbine speed sensor, then go to the next step.
12	**VERIFY TROUBLESHOOTING OF DTC P0715 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle with vehicle speed **40 km/h {25 mph} or above** and engine speed **1,500 rpm or above** for **2 second or more** • Repeat Step ii two times. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

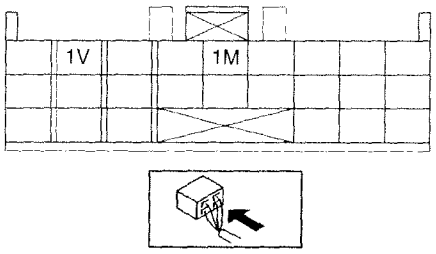
DTC P0720 [JA5A-EL]

C6U050218901W12

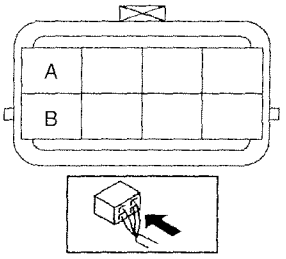
DTC P0720	Vehicle speedometer sensor (VSS) malfunction (open circuit/short circuit)
DETECTION CONDITION	• Parking gear rotation detected by VSS is **150 rpm (Vehicle speed: 5—6 km/h) or less** while intermediate sensor signal is **1,400 rpm or greater** in D range for **2 second or more**. (two separate times) **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions in two consecutive drive cycles. • PENDING CODE is available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Open circuit between vehicle speedometer sensor terminal B and TCM terminal 1M • Open circuit between vehicle speedometer sensor terminal A and TCM terminal 1V • Short to ground between vehicle speedometer sensor terminal B and TCM terminal 1M • Short to ground between vehicle speedometer sensor terminal A and TCM terminal 1V • Vehicle speedometer sensor malfunction • Damaged connectors between vehicle speedometer sensor to TCM • TCM malfunction



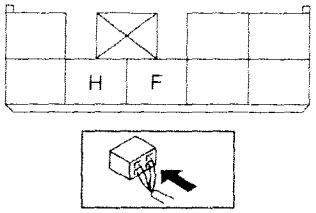
TCM
HARNESS SIDE CONNECTOR



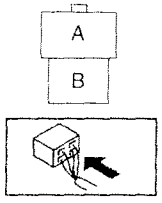
TERMINAL COMPONENT
NO.2 (8-PIN)
HARNESS SIDE CONNECTOR



COUPLER COMPONENT
(8-PIN)
PART SIDE CONNECTOR



VSS
HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TERMINAL COMPONENT NO.2 (8-PIN) CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the terminal component No.2 (8-pin) connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to Step 12.
4	**INSPECT VEHICLE SPEEDOMETER SENSOR RESISTANCE** • Measure the resistance between terminal component No.2 (8-pin) (transaxle case side). • Is resistance **within 513—627 ohms** between terminal component No.2 (8-pin) terminal A and B (transaxle case side)?	Yes	Go to the next step.
		No	Go to Step 8.
5	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
6	**INSPECT TERMINAL COMPONENT NO.2 (8-PIN) CIRCUIT FOR OPEN CIRCUIT** • Check terminal component No.2 (8-pin) terminals A (harness-side) and TCM terminals 1M (harness-side). • Check terminal component No.2 (8-pin) terminals B (harness-side) and TCM terminals 1V (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 12.
7	**INSPECT TERMINAL COMPONENT NO.2 (8-PIN) CIRCUIT FOR SHORT TO GROUND** • Check terminal component No.2 (8-pin) terminal A (harness-side) and body ground. • Check terminal component No.2 (8-pin) terminal B (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to Step 12.
		No	Go to Step 12.
8	**INSPECT COUPLER COMPONENT (8-PIN) CONNECTOR FOR POOR CONNECTION** • Disassemble the control valve body cover. • Disconnect the coupler component (8-pin) connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
9	**INSPECT VEHICLE SPEEDOMETER SENSOR RESISTANCE** • Measure the resistance between coupler component (8-pin) (transaxle case side). • Is resistance **within 513—627 ohms** between coupler component (8-pin) terminal H and F (part side)?	Yes	Repair or replace the terminal component, then go to Step 12.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**INSPECT VEHICLE SPEEDOMETER SENSOR CONNECTOR FOR POOR CONNECTION** • Disassemble the transaxle. • Disconnect the vehicle speedometer sensor connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
11	**INSPECT VEHICLE SPEEDOMETER SENSOR RESISTANCE** • Measure the resistance between vehicle speedometer sensor. • Is resistance **within 513—627 ohms** between vehicle speedometer sensor connector terminal A and B (part side)?	Yes	Repair or replace the coupler component, then go to the next step.
		No	Replace the vehicle speedometer sensor, then go to the next step.
12	**VERIFY TROUBLESHOOTING OF DTC P0720 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle with vehicle speed **40 km/h {25 mph} or above** for **2 second or more** • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

DTC P0740 [JA5A-EL]

C6U050218901W13

DTC P0740	TCC system malfunction
DETECTION CONDITION	• RPM difference between crankshaft (engine speed signal) and reverse clutch drum (input/turbine speed sensor signal) exceeds the pre-programmed value. **Diagnostic support note:** • This is continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions in two consecutive drive cycles. • PENDING CODE is available. • FREEZE FRAME DATA is available. • AT warning light does not illuminate. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Low ATF level • Deteriorated ATF • Stuck TCC solenoid valve and pressure control solenoid • Low line pressure • Oil pump malfunction • Stuck control valve • Torque convert clutch malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.

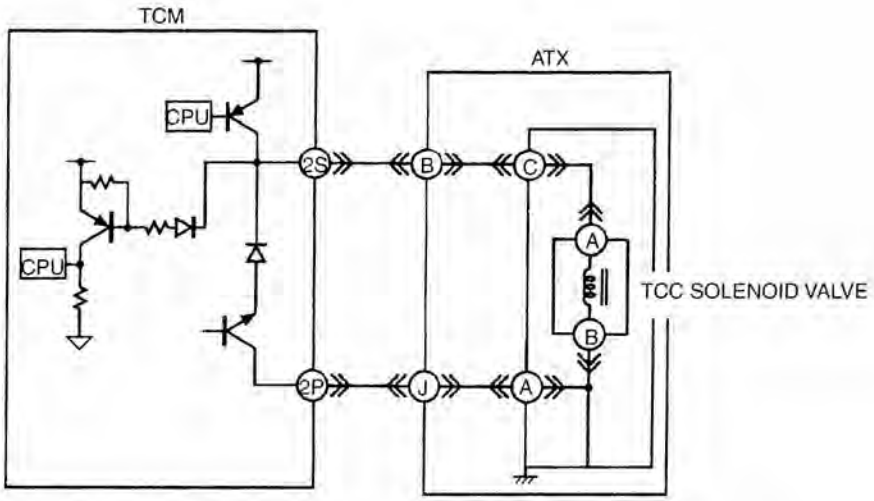
STEP	INSPECTION		ACTION
3	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17B–10 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to the next step.
		No	If ATF color milky or reddish brown, replace the ATF, then go to Step 5. (See 05–17B–11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [JA5A-EL].)
4	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See 05–17B–10 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to the next step.
		No	Adjust ATF level, then go to Step 9. (See 05–17B–10 Automatic Transaxle Fluid (ATF) Level Inspection.)
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** — D range, M (2GR) range Idle: **290—490 kPa {3.0—4.9 kgf/cm^2, 43—69 psi}** Stall: **1,550—1,750 kPa {15.8—17.8 kgf/cm^2, 225—254 psi}** — M (1GR) range, R position Idle: **550—750 kPa {5.6—7.6 kgf/cm^2, 80—109 psi}** Stall: **1,550—1,750 kPa {15.8—17.8 kgf/cm^2, 225—254 psi}** • Is line pressure within specification? (See 05–17B–3 Line Pressure Test.)	Yes	Go to the next step.
		No	All ranges: Replace or overhaul oil pump or control valve body, then go to Step 9. Any ranges: Replace or overhaul automatic transaxle, then go to Step 9.
6	**CLICK TEST OF SOLENOID VALVES** • Turn ignition switch to OFF. • Disconnect the terminal component No.1 (12-pin). • Apply battery voltage to terminal component No.1 (12-pin) terminals (transaxle case side). — TCC solenoid vale: B — Pressure control solenoid: D • Verify the click sounds from TCC solenoid valve and pressure control solenoid. • Are there click sounds?	Yes	Go to the next step.
		No	Replace the TCC solenoid valve or pressure control solenoid, then go to Step 9. (See 05–17B–35 CONTROL VALVE BODY REMOVAL/INSTALLATION [JA5A-EL].)
7	**INSPECT DIFFERENCE BETWEEN ENGINE SPEED AND TURBINE SPEED** • Inspect difference between engine speed and turbine speed during TCC operation in 5GR. • Drive vehicle under the following conditions: — TR switch position: D range — Gear position: 5GR — TCC solenoid valve: ON • Is difference between engine speed (RPM PID) and turbine speed okay? Difference **Below 99 rpm**	Yes	Go to the next step.
		No	Replace the torque converter, then go to Step 9. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].)
8	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay?	Yes	Replace the torque converter, then go to the next step.
		No	Replace the control valve body, then go to the next step. (See 05–17B–35 CONTROL VALVE BODY REMOVAL/INSTALLATION [JA5A-EL].)

STEP	INSPECTION		ACTION
9	**VERIFY TROUBLESHOOTING OF DTC P0740 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive vehicle under following condition for 10 seconds or more. — Vehicle speed (VSS PID): **Within 10—87 km/h {6—54 mph}** — Gear position: 5GR — TR switch position: D range — TCC solenoid valve: ON • Is there pending code present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

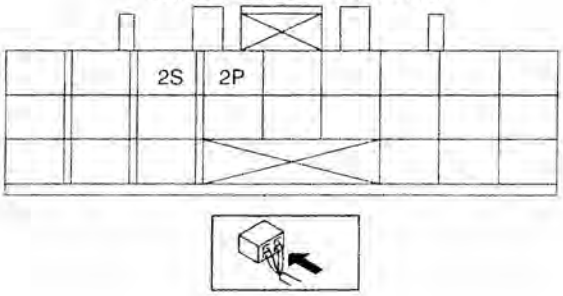
DTC P0743 [JA5A-EL]

C6U050218901W14

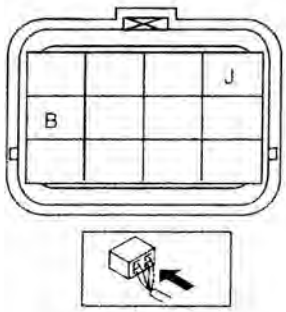
DTC P0743	Torque converter clutch (TCC) solenoid valve circuit malfunction (open circuit/short circuit)
DETECTION CONDITION	• Open or short circuit in TCC solenoid signal system (while TCM monitors solenoid output voltage, the voltage that differs from the ON/OFF signal output by CPU in TCM is detected). **Diagnostic support note:** • This is continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light does not illuminate. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Open circuit between TCC solenoid valve terminal A and TCM terminal 2S • Short to ground between TCC solenoid valve terminal A and TCM terminal 2S • Short to power between TCC solenoid valve terminal A and TCM terminal 2S • TCC solenoid valve malfunction • Damaged connector between TCC solenoid valve and TCM • TCM malfunction



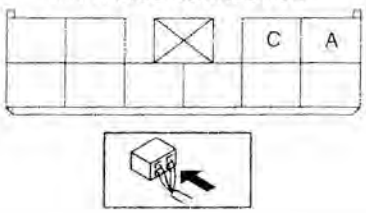
TCM
HARNESS SIDE CONNECTOR



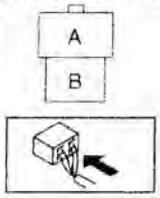
TERMINAL COMPONENT
NO.1 (12-PIN)
HARNESS SIDE CONNECTOR



COUPLER COMPONENT
(10-PIN)
PART SIDE CONNECTOR



TCC SOLENOID VALVE
HARNESS SIDE CONNECTOR



Diagnostic procedure

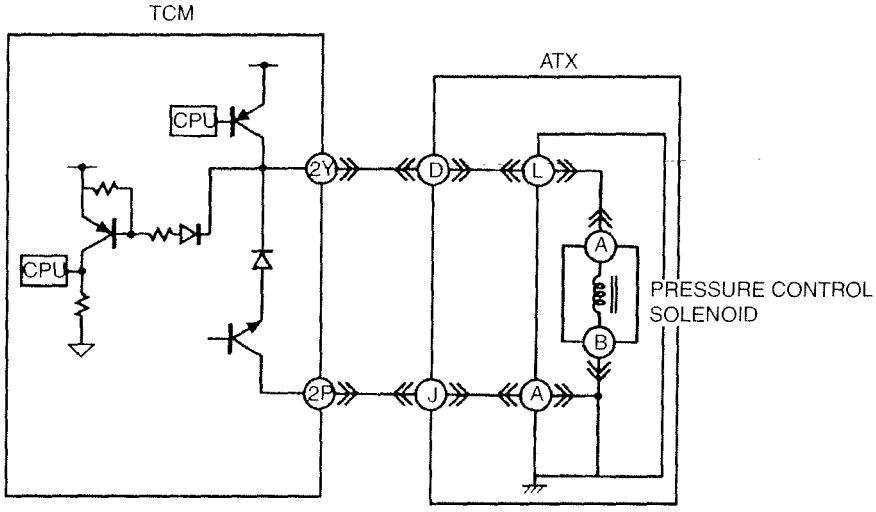
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the terminal component No.1 (12-pin). • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to Step 13.
4	**INSPECT RESISTANCE OF TCC SOLENOID VALVE** • Check resistance between terminal component No.1 (12-pin) terminal H (transaxle case side) and body ground. • Is resistance **within 12—13.2 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Go to Step 9.
		No	Go to the next step.
5	**INSPECT COUPLER COMPONENT (10-PIN) FOR POOR CONNECTION** • Disconnect the coupler component (10-pin) connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 13.
6	**INSPECT RESISTANCE OF TCC SOLENOID VALVE** • Check resistance between coupler component (10-pin) terminal C (part side) and body ground. • Is resistance **within 12—13.2 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the terminal component No.1 (12-pin), then go to Step 13.
		No	Go to the next step.
7	**INSPECT TCC SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Disconnect the TCC solenoid valve connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 13.
8	**INSPECT RESISTANCE OF TCC SOLENOID VALVE** • Check resistance between TCC solenoid valve connector (part side) terminal A and body ground. • Is resistance **within 12—13.2 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the coupler component (10-pin), then go to Step 13.
		No	Verify TCC solenoid valve installation. • If TCC solenoid valve is installed correctly, replace the TCC solenoid valve, then go to Step 13. (See 05–17B–22 SOLENOID VALVE REMOVAL/INSTALLATION [JA5A-EL].)
9	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 13.

STEP	INSPECTION		ACTION
10	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR OPEN CIRCUIT** • Check continuity between TCM terminal 2S (harness-side) and terminal component No.1 (12-pin) terminal H (harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 13.
11	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Check voltage at terminal component No.1 (12-pin) terminal H (harness-side). • Is voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 13.
12	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Check continuity between TCM terminal 2S (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to the next step.
		No	Go to the next step.
13	**VERIFY TROUBLESHOOTING OF DTC P0743 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

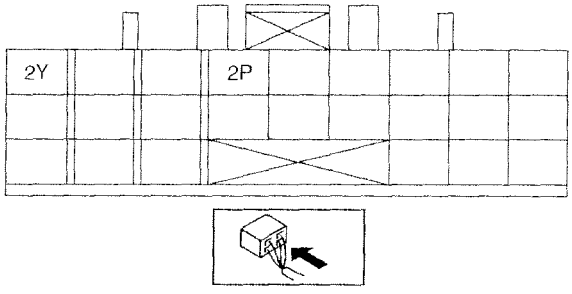
DTC P0748 [JA5A-EL]

C6U050218901W15

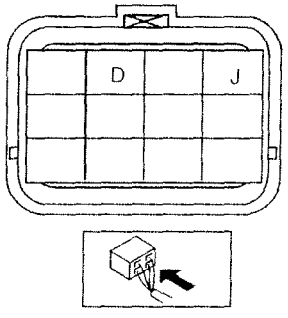
DTC P0748	Pressure control solenoid circuit malfunction (open circuit/short circuit)
DETECTION CONDITION	• Open or short circuit in pressure control solenoid signal system (while TCM monitors solenoid output voltage, the voltage that differs from the ON/OFF signal output by CPU in TCM is detected). **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL does not illuminate. • PENDING CODE is not available. • FREEZE FRAME DATA is not available. • AT warning light illuminates. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Open circuit between pressure control solenoid terminal A and TCM terminal 2Y • Short to ground between pressure control solenoid terminal A and TCM terminal 2Y • Short to power between pressure control solenoid terminal A and TCM terminal 2Y • Pressure control solenoid malfunction • Damaged connector between pressure control solenoid valve and TCM • TCM malfunction



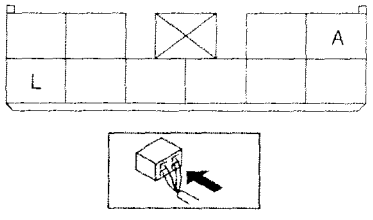
TCM
HARNESS SIDE CONNECTOR



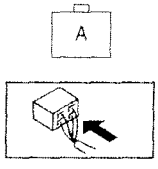
TERMINAL COMPONENT
NO.1 (12-PIN)
HARNESS SIDE CONNECTOR



COUPLER COMPONENT
(10-PIN)
PART SIDE CONNECTOR



PRESSURE CONTROL
SOLENOID
HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the terminal component No.1 (12-pin). • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to Step 12.
3	**INSPECT RESISTANCE OF PRESSURE CONTROL SOLENOID** • Check resistance between terminal component No.1 (12-pin) terminal D (transaxle case side) and body ground. • Is resistance **within 2.6—3.2 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Go to Step 8.
		No	Go to the next step.
4	**INSPECT COUPLER COMPONENT (10-PIN) FOR POOR CONNECTION** • Disconnect the coupler component (10-pin) connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 12.
5	**INSPECT RESISTANCE OF PRESSURE CONTROL SOLENOID** • Check resistance between coupler component (10-pin) terminal L (part side) and body ground. • Is resistance **within 2.6—3.2 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the terminal component No.1 (12-pin), then go to Step 12.
		No	Go to the next step.
6	**INSPECT PRESSURE CONTROL SOLENOID CONNECTOR FOR POOR CONNECTION** • Disconnect the pressure control solenoid connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 12.
7	**INSPECT RESISTANCE OF PRESSURE CONTROL SOLENOID** • Check resistance between pressure control solenoid connector (part side) terminal A and body ground. • Is resistance **within 2.6—3.2 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the coupler component (10-pin), then go to Step 12.
		No	Verify pressure control solenoid installation. • If pressure control solenoid is installed correctly, replace the pressure control solenoid, then go to Step 12. (See 05–17B–22 SOLENOID VALVE REMOVAL/INSTALLATION [JA5A-EL].)
8	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
9	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR OPEN CIRCUIT** • Check continuity between TCM terminal 2Y (harness-side) and terminal component No.1 (12-pin) terminal D (harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 12.

STEP	INSPECTION		ACTION
10	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Check voltage at terminal component No.1 (12-pin) terminal D (harness-side). • Is voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 12.
11	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Check continuity between TCM terminal 2Y (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to the next step.
		No	Go to the next step.
12	**VERIFY TROUBLESHOOTING OF DTC P0748 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

DTC P0751 [JA5A-EL]

C6U050218901W16

DTC P0751	Shift solenoid A malfunction (stuck off)
DETECTION CONDITION	• Difference between actual gear ratio and gear ratio set in TCM is large. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light does not illuminate. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Shift solenoid A malfunction • Stuck shift valve A • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK FOR DTC** • Turn ignition switch to ON (engine off). • Check DTC. • Is other DTC output?	Yes	Follow applicable DTC inspection procedure, then go to the next step. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Go to the next step.
4	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Transparent red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17B–10 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Replace the control valve body, then go to the next step.
		No	If ATF color milky or reddish brown, repair or replace the ATX, then go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0751 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

DTC P0752 [JA5A-EL]

C6U050218901W17

DTC P0752	Shift solenoid A malfunction (stuck on)
DETECTION CONDITION	• Difference between actual gear ratio and gear ratio set in TCM is large. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light does not illuminate. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Shift solenoid A malfunction • Stuck shift valve A • TCM malfunction

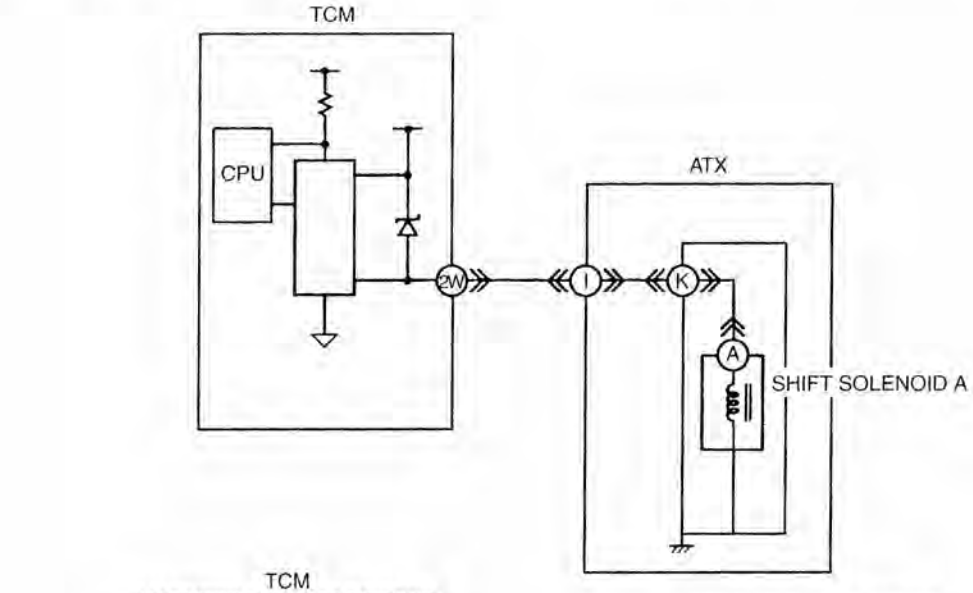
Diagnostic procedure

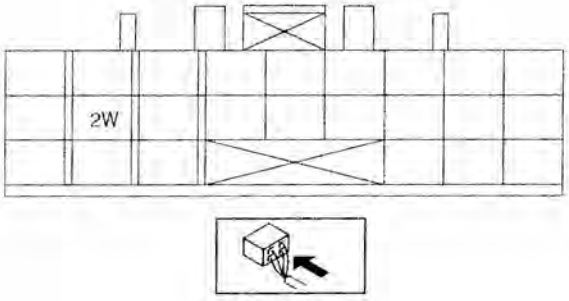
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK FOR DTC** • Turn ignition switch to ON (engine off). • Check DTC. • Is other DTC output?	Yes	Follow applicable DTC inspection procedure, then go to the next step. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Go to the next step.
4	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Transparent red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17B–10 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Replace the control valve body, then go to the next step.
		No	If ATF color milky or reddish brown, repair or replace the ATX, then go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0752 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

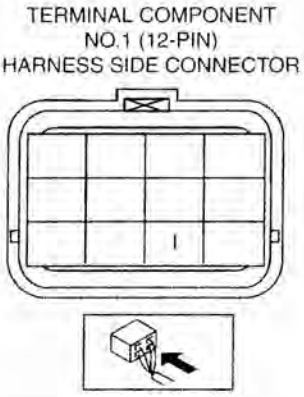
DTC P0753 [JA5A-EL]

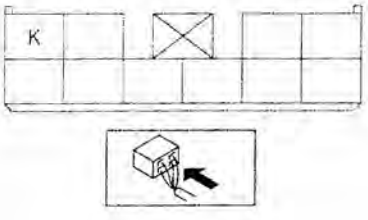
C6U050218901W18

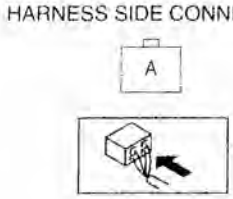
DTC P0753	Shift solenoid A circuit malfunction (open circuit/short circuit)
DETECTION CONDITION	• Open or short circuit in shift solenoid A signal system (while TCM monitors solenoid output voltage, the voltage that differs from the ON/OFF signal output by CPU in TCM is detected). **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Open circuit between shift solenoid A terminal A and TCM terminal 2W • Short to ground between shift solenoid A terminal A and TCM terminal 2W • Short to power between shift solenoid A terminal A and TCM terminal 2W • Shift solenoid A malfunction • Damaged connector between shift solenoid A and TCM • TCM malfunction











Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the terminal component No.1 (12-pin). • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to Step 13.
4	**INSPECT RESISTANCE OF SHIFT SOLENOID A** • Check resistance between terminal component No.1 (12-pin) terminal I (transaxle case side) and body ground. • Is resistance **within 14—18 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Go to Step 9.
		No	Go to the next step.
5	**INSPECT COUPLER COMPONENT (10-PIN) FOR POOR CONNECTION** • Disconnect the coupler component (10-pin) connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 13.
6	**INSPECT RESISTANCE OF SHIFT SOLENOID A** • Check resistance between coupler component (10-pin) terminal K (part side) and body ground. • Is resistance **within 14—18 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the terminal component No.1 (12-pin), then go to Step 13.
		No	Go to the next step.
7	**INSPECT SHIFT SOLENOID A CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid A connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 13.
8	**INSPECT RESISTANCE OF SHIFT SOLENOID A** • Check resistance between shift solenoid A connector terminal A (part side) and body ground. • Is resistance **within 14—18 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the coupler component (10-pin), then go to Step 13.
		No	Verify shift solenoid A installation. • If shift solenoid A is installed correctly, replace the shift solenoid A, then go to Step 13. (See 05–17B–22 SOLENOID VALVE REMOVAL/ INSTALLATION [JA5A-EL].)
9	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 13.
10	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR OPEN CIRCUIT** • Check continuity between TCM terminal 2W (harness-side) and terminal component No.1 (12-pin) terminal I (harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 13.

STEP	INSPECTION		ACTION
11	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Check voltage at terminal component No.1 (12-pin) terminal I (harness-side). • Is voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 13.
12	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Check continuity between TCM terminal 2W (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to the next step.
		No	Go to the next step.
13	**VERIFY TROUBLESHOOTING OF DTC P0753 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

DTC P0756 [JA5A-EL]

C6U050218901W19

DTC P0756	Shift solenoid B malfunction (stuck off)
DETECTION CONDITION	• Difference between actual gear ratio and gear ratio set in TCM is large. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light does not illuminate. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Shift solenoid B malfunction • Stuck shift valve B • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK FOR DTC** • Turn ignition switch to ON (engine off). • Check DTC. • Is other DTC output?	Yes	Follow applicable DTC inspection procedure, then go to the next step. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Transparent red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17B–10 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Replace the control valve body, then go to the next step.
		No	If ATF color milky or reddish brown, repair or replace the ATX, then go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0756 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

DTC P0757 [JA5A-EL]

C6U050218901W20

DTC P0757	Shift solenoid B malfunction (stuck on)
DETECTION CONDITION	• Difference between actual gear ratio and gear ratio set in TCM is large. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light does not illuminate. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Shift solenoid B malfunction • Stuck shift valve B • TCM malfunction

Diagnostic procedure

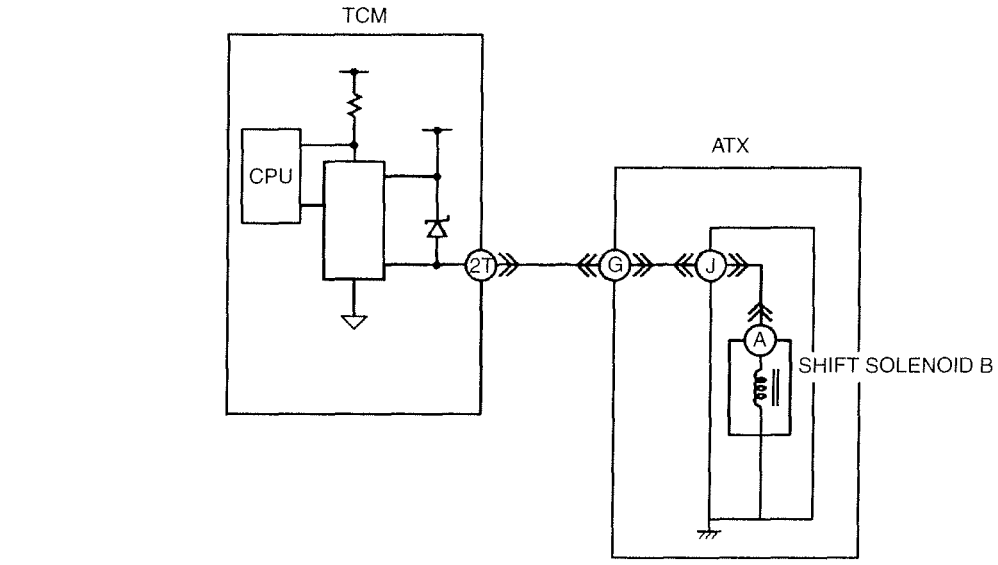
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK FOR DTC** • Turn ignition switch to ON (engine off). • Check DTC. • Is other DTC output?	Yes	Follow applicable DTC inspection procedure, then go to the next step. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Go to the next step.
4	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Transparent red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17B–10 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Replace the control valve body, then go to the next step.
		No	If ATF color milky or reddish brown, repair or replace the ATX, then go to the next step.

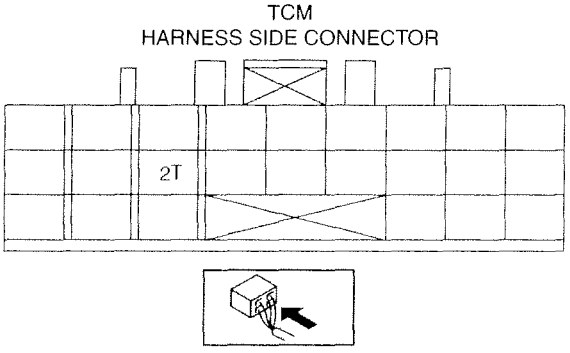
STEP	INSPECTION		ACTION
5	**VERIFY TROUBLESHOOTING OF DTC P0757 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

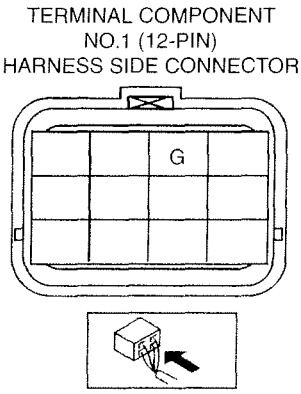
DTC P0758 [JA5A-EL]

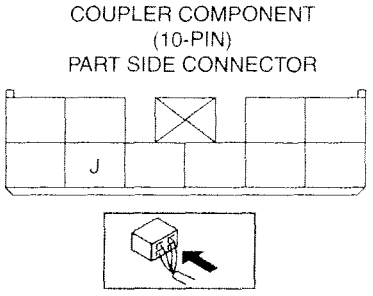
C6U050218901W21

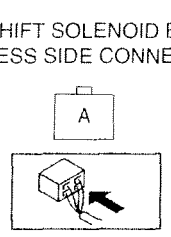
DTC P0758	Shift solenoid B circuit malfunction (open circuit/short circuit)
DETECTION CONDITION	• Open or short circuit in shift solenoid B signal system (while TCM monitors solenoid output voltage, the voltage that differs from the ON/OFF signal output by CPU in TCM is detected). **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Open circuit between shift solenoid B terminal A and TCM terminal 2T • Short to ground between shift solenoid B terminal A and TCM terminal 2T • Short to power between shift solenoid B terminal A and TCM terminal 2T • Shift solenoid B malfunction • Damaged connector between shift solenoid B and TCM • TCM malfunction











Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the terminal component No.1 (12-pin). • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to Step 13.
4	**INSPECT RESISTANCE OF SHIFT SOLENOID B** • Check resistance between terminal component No.1 (12-pin) terminal G (transaxle case side) and body ground. • Is resistance **within 14—18 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Go to Step 9.
		No	Go to the next step.
5	**INSPECT COUPLER COMPONENT (10-PIN) FOR POOR CONNECTION** • Disconnect the coupler component (10-pin) connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 13.
6	**INSPECT RESISTANCE OF SHIFT SOLENOID B** • Check resistance between coupler component (10-pin) terminal J (part side) and body ground. • Is resistance **within 14—18 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the terminal component No.1 (12-pin), then go to Step 13.
		No	Go to the next step.
7	**INSPECT SHIFT SOLENOID B CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid B connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 13.
8	**INSPECT RESISTANCE OF SHIFT SOLENOID B** • Check resistance between shift solenoid B connector terminal A (part side) and body ground. • Is resistance **within 14—18 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the coupler component (10-pin), then go to Step 13.
		No	Verify shift solenoid B installation. • If shift solenoid B is installed correctly, replace the shift solenoid B, then go to Step 13. (See 05–17B–22 SOLENOID VALVE REMOVAL/INSTALLATION [JA5A-EL].)
9	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 13.
10	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR OPEN CIRCUIT** • Check continuity between TCM terminal 2T (harness-side) and terminal component No.1 (12-pin) terminal G (harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 13.

STEP	INSPECTION		ACTION
11	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Check voltage at terminal component No.1 (12-pin) terminal G (harness-side). • Is voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 13.
12	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Check continuity between TCM terminal 2T (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to the next step.
		No	Go to the next step.
13	**VERIFY TROUBLESHOOTING OF DTC P0758 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

DTC P0761 [JA5A-EL]

C6U050218901W22

DTC P0761	Shift solenoid C malfunction (stuck off)
DETECTION CONDITION	• Difference between actual gear ratio and gear ratio set in TCM is large. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light does not illuminate. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Shift solenoid C malfunction • Stuck shift valve C • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK FOR DTC** • Turn ignition switch to ON (engine off). • Check DTC. • Is other DTC output?	Yes	Follow applicable DTC inspection procedure, then go to the next step. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Transparent red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17B–10 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Replace the control valve body, then go to the next step.
		No	If ATF color milky or reddish brown, repair or replace the ATX, then go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0761 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

DTC P0762 [JA5A-EL]

C6U050218901W23

DTC P0762	Shift solenoid C malfunction (stuck on)
DETECTION CONDITION	• Difference between actual gear ratio and gear ratio set in TCM is large. **Diagnostic support note:** • This is continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light does not illuminate. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Shift solenoid C malfunction • Stuck shift valve C • TCM malfunction

Diagnostic procedure

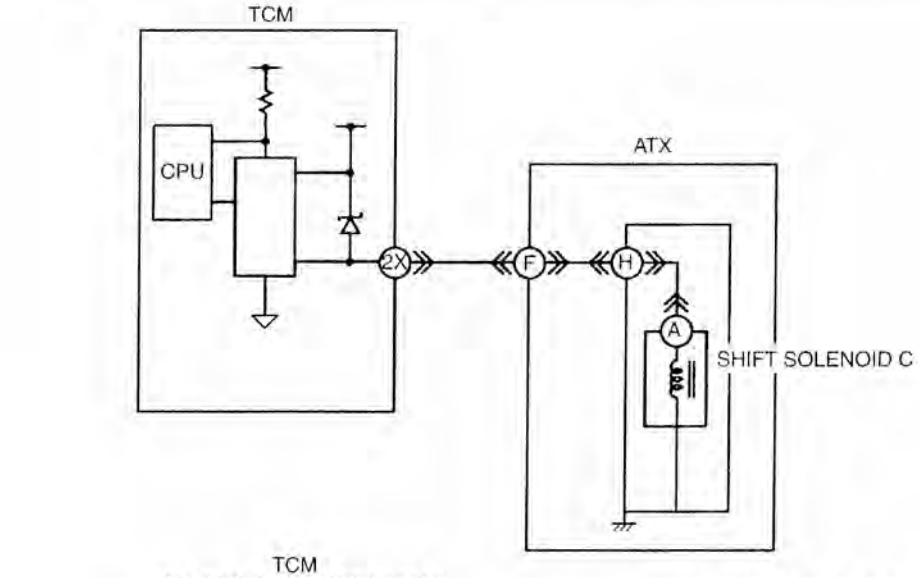
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK FOR DTC** • Turn ignition switch to ON (engine off). • Check DTC. • Is other DTC output?	Yes	Follow applicable DTC inspection procedure, then go to the next step. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Go to the next step.
4	**CHECK ATF CONDITION** • Turn ignition switch to OFF. • Check ATF condition. — Transparent red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See 05–17B–10 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Replace the control valve body, then go to the next step.
		No	If ATF color milky or reddish brown, repair or replace the ATX, then go to the next step.

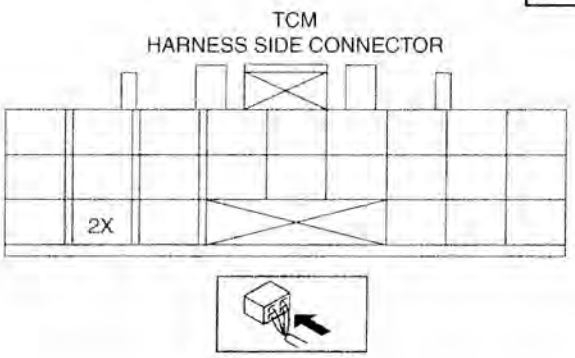
STEP	INSPECTION		ACTION
5	**VERIFY TROUBLESHOOTING OF DTC P0762 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Start engine. • Warm up ATX. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

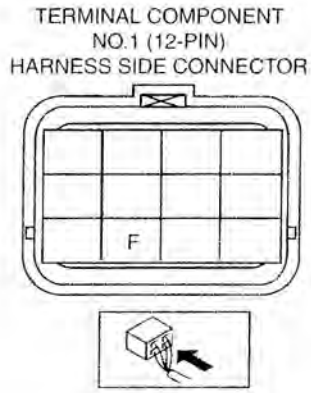
DTC P0763 [JA5A-EL]

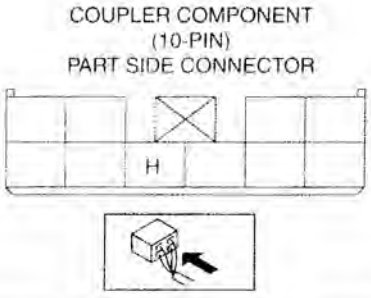
C6U050218901W24

DTC P0763	Shift solenoid C circuit malfunction (open circuit/short circuit)
DETECTION CONDITION	• Open or short circuit in shift solenoid C signal system (while TCM monitors solenoid output voltage, the voltage that differs from the ON/OFF signal output by CPU in TCM is detected). **Diagnostic support note:** • This is continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Open circuit between shift solenoid C terminal A and TCM terminal 2X • Short to ground between shift solenoid C terminal A and TCM terminal 2X • Short to power between shift solenoid C terminal A and TCM terminal 2X • Shift solenoid C malfunction • Damaged connector between shift solenoid C and TCM • TCM malfunction









Diagnostic procedure

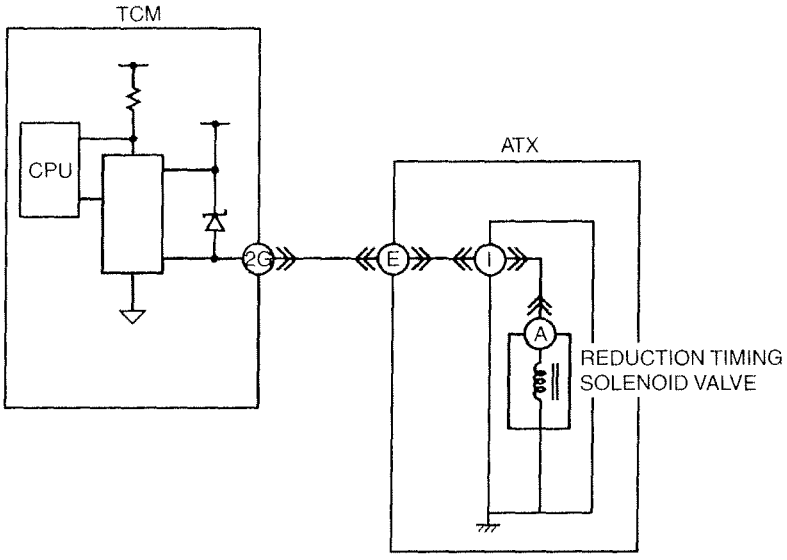
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the terminal component No.1 (12-pin). • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to Step 13.
4	**INSPECT RESISTANCE OF SHIFT SOLENOID C** • Check resistance between terminal component No.1 (12-pin) terminal F (transaxle case side) and body ground. • Is resistance **within 14—18 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Go to Step 9.
		No	Go to the next step.
5	**INSPECT COUPLER COMPONENT (10-PIN) FOR POOR CONNECTION** • Disconnect the coupler component (10-pin) connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 13.
6	**INSPECT RESISTANCE OF SHIFT SOLENOID C** • Check resistance between coupler component (10-pin) terminal H (part side) and body ground. • Is resistance **within 14—18 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the terminal component No.1 (12-pin), then go to Step 13.
		No	Go to the next step.
7	**INSPECT SHIFT SOLENOID C CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid C connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 13.
8	**INSPECT RESISTANCE OF SHIFT SOLENOID C** • Check resistance between shift solenoid C connector terminal A (part side) and body ground. • Is resistance **within 14—18 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the coupler component (10-pin), then go to Step 13.
		No	Verify shift solenoid C installation. • If shift solenoid C is installed correctly, replace the pressure control solenoid, then go to Step 13. (See 05–17B–22 SOLENOID VALVE REMOVAL/INSTALLATION [JA5A-EL].)
9	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 13.
10	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR OPEN CIRCUIT** • Check continuity between TCM terminal 2X (harness-side) and terminal component No.1 (12-pin) terminal F (harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 13.

STEP	INSPECTION		ACTION
11	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Check voltage at terminal component No.1 (12-pin) terminal F (harness-side). • Is voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 13.
12	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Check continuity between TCM terminal 2X (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to the next step.
		No	Go to the next step.
13	**VERIFY TROUBLESHOOTING OF DTC P0763 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

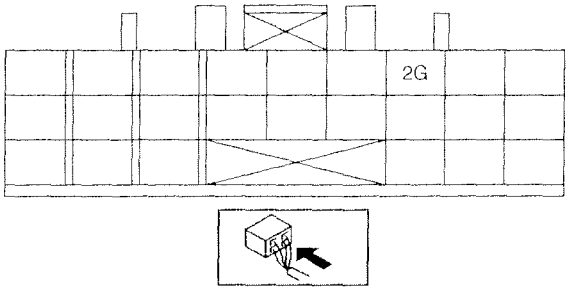
DTC P0768 [JA5A-EL]

C6U050218901W25

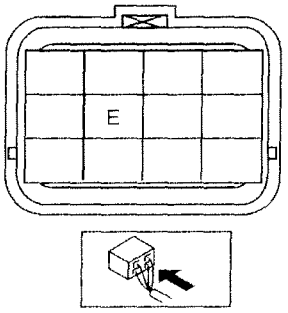
DTC P0768	Reduction timing solenoid valve circuit malfunction (open circuit/short circuit)
DETECTION CONDITION	• Open or short circuit in reduction timing solenoid signal system. (while TCM monitors solenoid output voltage, the voltage that differs from the ON/OFF signal output by CPU in TCM is detected.) **Diagnostic support note:** • This is continuous monitor (CCM). • MIL does not illuminate. • PENDING CODE is not available. • FREEZE FRAME DATA is not available. • AT warning light illuminates. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Open circuit between reduction timing solenoid valve terminal A and TCM terminal 2G • Short to ground between reduction timing solenoid valve terminal A and TCM terminal 2G • Short to power between reduction timing solenoid valve terminal A and TCM terminal 2G • Reduction timing solenoid valve malfunction • Damaged connector between reduction timing solenoid and TCM • TCM malfunction



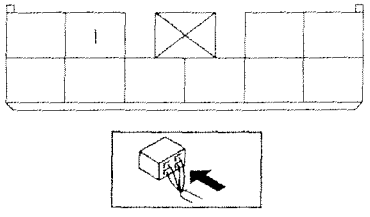
TCM
HARNESS SIDE CONNECTOR



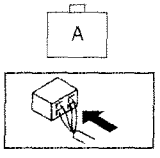
TERMINAL COMPONENT
NO.1 (12-PIN)
HARNESS SIDE CONNECTOR



COUPLER COMPONENT
(10-PIN)
PART SIDE CONNECTOR



REDUCTION TIMING
SOLENOID VALVE
HARNESS SIDE CONNECTOR



Diagnostic procedure

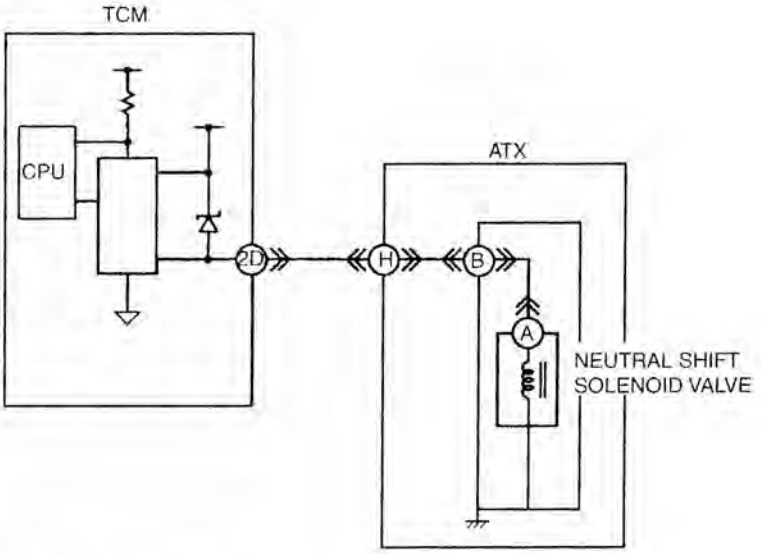
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the terminal component No.1 (12-pin). • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to Step 12.
3	**INSPECT RESISTANCE OF REDUCTION TIMING SOLENOID VALVE** • Check resistance between terminal component No.1 (12-pin) terminal E (transaxle case side) and body ground. • Is resistance **within 14—18 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Go to Step 8.
		No	Go to the next step.
4	**INSPECT COUPLER COMPONENT (10-PIN) FOR POOR CONNECTION** • Disconnect the coupler component (10-pin) connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 12.
5	**INSPECT RESISTANCE OF REDUCTION TIMING SOLENOID VALVE** • Check resistance between coupler component (10-pin) terminal I (part side) and body ground. • Is resistance **within 14—18 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the terminal component No.1 (12-pin), then go to Step 12.
		No	Go to the next step.
6	**INSPECT REDUCTION TIMING SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Disconnect the reduction timing solenoid valve connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 12.
7	**INSPECT RESISTANCE OF REDUCTION TIMING SOLENOID VALVE** • Check resistance between reduction timing solenoid valve connector terminal A (part side) and body ground. • Is resistance **within 14—18 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the coupler component (10-pin), then go to Step 12.
		No	Verify reduction timing solenoid valve installation. • If reduction timing solenoid valve is installed correctly, replace reduction timing solenoid valve, then go to Step 12. (See 05–17B–22 SOLENOID VALVE REMOVAL/INSTALLATION [JA5A-EL].)
8	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
9	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR OPEN CIRCUIT** • Check continuity between TCM terminal 2G (harness-side) and terminal component No.1 (12-pin) terminal E (harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 12.

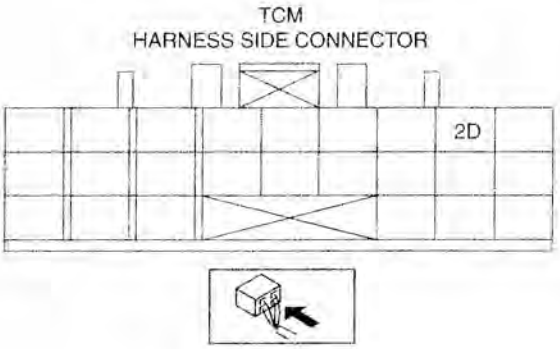
STEP	INSPECTION		ACTION
10	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Check voltage at terminal component No.1 (12-pin) terminal E (harness-side). • Is voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 12.
11	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Check continuity between TCM terminal 2G (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to the next step.
		No	Go to the next step.
12	**VERIFY TROUBLESHOOTING OF DTC P0763 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

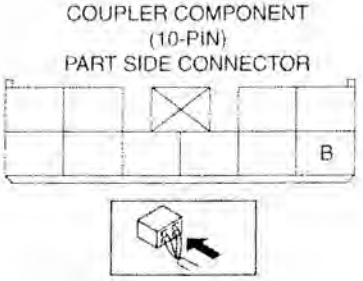
DTC P0773 [JA5A-EL]

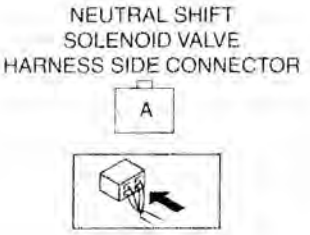
C6U050218901W26

DTC P0773	Neutral shift solenoid valve circuit malfunction (open circuit/short circuit)
DETECTION CONDITION	• Open or short circuit in neutral shift solenoid signal system (while TCM monitors solenoid output voltage, the voltage that differs from the ON/OFF signal output by CPU in TCM is detected). **Diagnostic support note:** • This is continuous monitor (CCM). • MIL does not illuminate. • PENDING CODE is not available. • FREEZE FRAME DATA is not available. • AT warning light illuminates. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Open circuit between neutral shift solenoid valve terminal A and TCM terminal 2D • Short to ground between neutral shift solenoid valve terminal A and TCM terminal 2D • Short to power between neutral shift solenoid vale terminal A and TCM terminal 2D • Neutral shift solenoid valve malfunction • Damaged connector between neutral shift solenoid valve and TCM • TCM malfunction









Diagnostic procedure

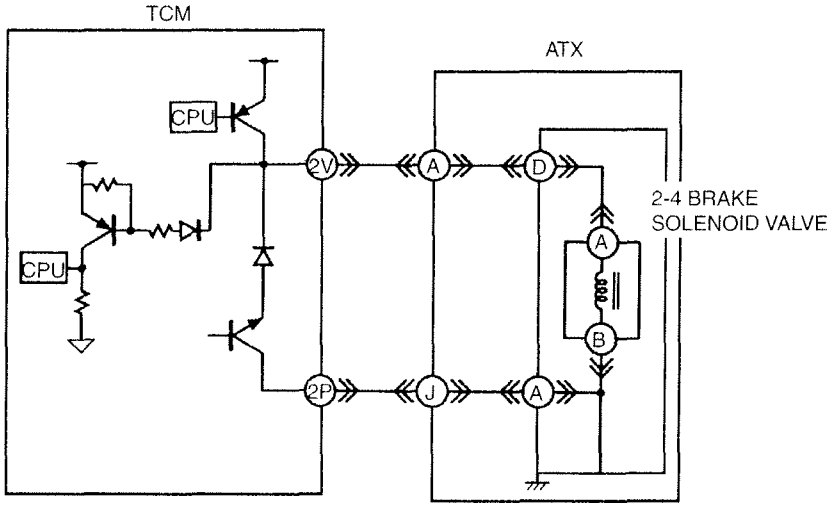
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the terminal component No.1 (12-pin). • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to Step 12.
3	**INSPECT RESISTANCE OF NEUTRAL SHIFT SOLENOID VALVE** • Check resistance between terminal component No.1 (12-pin) terminal H (transaxle case side) and body ground. • Is resistance **within 14—18 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Go to Step 8.
		No	Go to the next step.
4	**INSPECT COUPLER COMPONENT (10-PIN) FOR POOR CONNECTION** • Disconnect the coupler component (10-pin) connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 12.
5	**INSPECT RESISTANCE OF NEUTRAL SHIFT SOLENOID VALVE** • Check resistance between coupler component (10-pin) terminal B (part side) and body ground. • Is resistance **within 14—18 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the terminal component No.1 (12-pin), then go to Step 12.
		No	Go to the next step.
6	**INSPECT NEUTRAL SHIFT SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Disconnect the neutral shift solenoid valve connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 12.
7	**INSPECT RESISTANCE OF NEUTRAL SHIFT SOLENOID VALVE** • Check resistance between neutral shift solenoid valve connector terminal A (part side) and body ground. • Is resistance **within 14—18 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the coupler component (10-pin), then go to Step 12.
		No	Verify neutral shift solenoid valve installation. • If neutral shift solenoid valve is installed correctly, replace neutral shift solenoid valve, then go to Step 12. (See 05–17B–22 SOLENOID VALVE REMOVAL/INSTALLATION [JA5A-EL].)
8	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
9	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR OPEN CIRCUIT** • Check continuity between TCM terminal 2D (harness-side) and terminal component No.1 (12-pin) terminal H (harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 12.

STEP	INSPECTION		ACTION
10	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Check voltage at terminal component No.1 (12-pin) terminal H (harness-side). • Is voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 12.
11	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Check continuity between TCM terminal 2D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to the next step.
		No	Go to the next step.
12	**VERIFY TROUBLESHOOTING OF DTC P0773 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

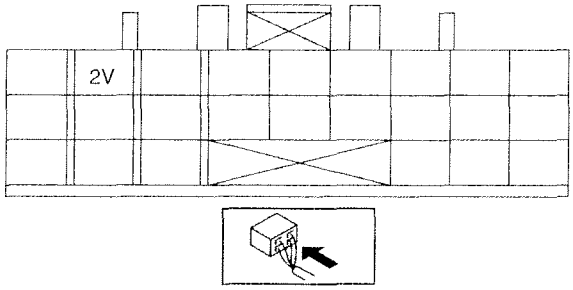
DTC P0778 [JA5A-EL]

C6U050218901W27

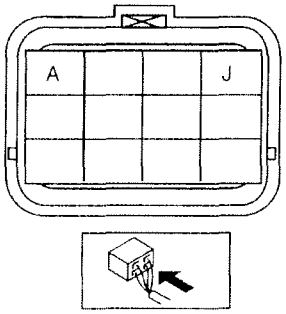
DTC P0778	2-4 brake solenoid valve circuit malfunction (open circuit/short circuit)
DETECTION CONDITION	• Open or short circuit in 2-4 brake solenoid signal system (while TCM monitors solenoid output voltage, the voltage that differs from the ON/OFF signal output by CPU in TCM is detected). **Diagnostic support note:** • This is continuous monitor (CCM). • MIL does not illuminates. • PENDING CODE is not available. • FREEZE FRAME DATA is not available. • AT warning light illuminates. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Open circuit between 2-4 brake solenoid valve terminal A and TCM terminal 2V • Short to ground between 2-4 brake solenoid valve terminal A and TCM terminal 2V • Short to power between 2-4 brake solenoid valve terminal A and TCM terminal 2V • 2-4 brake solenoid valve malfunction • Damaged connector between 2-4 brake solenoid valve and TCM • TCM malfunction



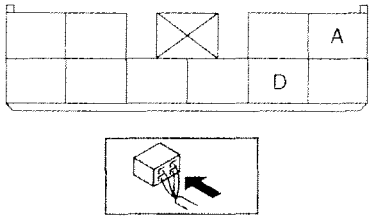
TCM
HARNESS SIDE CONNECTOR



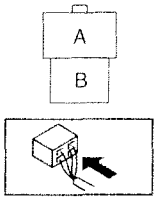
TERMINAL COMPONENT
NO.1 (12-PIN)
HARNESS SIDE CONNECTOR



COUPLER COMPONENT
(10-PIN)
PART SIDE CONNECTOR



2-4 BRAKE
SOLENOID VALVE
HARNESS SIDE CONNECTOR



Diagnostic procedure

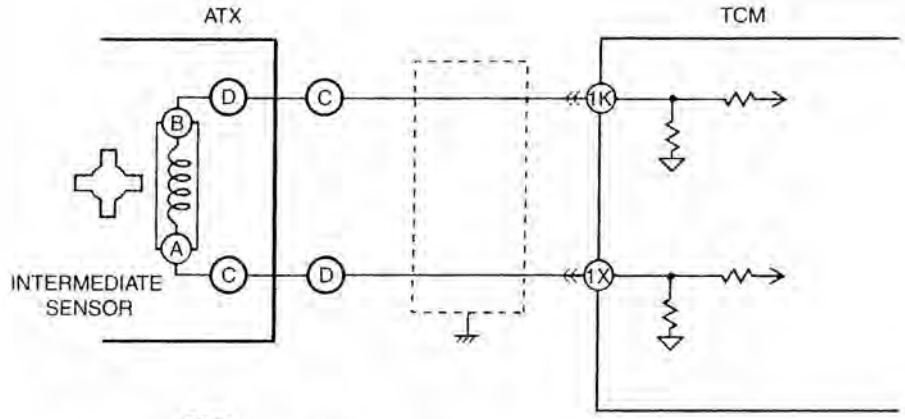
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the terminal component No.1 (12-pin). • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to Step 12.
3	**INSPECT RESISTANCE OF 2-4 BRAKE SOLENOID VALVE** • Check resistance between terminal component No.1 (12-pin) terminal A (transaxle case side) and body ground. • Is resistance **within 2.6—3.2 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Go to Step 8.
		No	Go to the next step.
4	**INSPECT COUPLER COMPONENT (10-PIN) FOR POOR CONNECTION** • Disconnect the coupler component (10-pin) connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 12.
5	**INSPECT RESISTANCE OF 2-4 BRAKE SOLENOID VALVE** • Check resistance between coupler component (10-pin) terminal D (part side) and body ground. • Is resistance **within 2.6—3.2 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the terminal component No.1 (12-pin), then go to Step 12.
		No	Go to the next step.
6	**INSPECT 2-4 BRAKE SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Disconnect the 2-4 brake solenoid vale connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 12.
7	**INSPECT RESISTANCE OF 2-4 BRAKE SOLENOID VALVE** • Check resistance between 2-4 brake solenoid valve connector terminal A (part side) and body ground. • Is resistance **within 2.6—3.2 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the coupler component (10-pin), then go to Step 12.
		No	Verify 2-4 brake solenoid valve installation. • If 2-4 brake solenoid valve is installed correctly, replace the 2-4 brake solenoid valve, then go to Step 12. (See 05–17B–22 SOLENOID VALVE REMOVAL/ INSTALLATION [JA5A-EL].)
8	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
9	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR OPEN CIRCUIT** • Check continuity between TCM terminal 2V (harness-side) and terminal component No.1 (12-pin) terminal A (harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 12.

STEP	INSPECTION		ACTION
10	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Check voltage at terminal component No.1 (12-pin) terminal A (harness-side). • Is voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 12.
11	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Check continuity between TCM terminal 2V (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to the next step.
		No	Go to the next step.
12	**VERIFY TROUBLESHOOTING OF DTC P0778 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

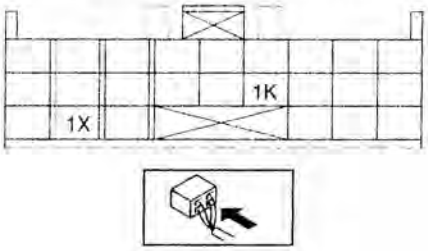
DTC P0791 [JA5A-EL]

C6U050218901W28

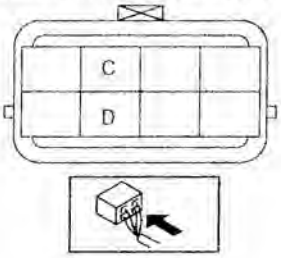
DTC P0791	Intermediate sensor circuit malfunction (open circuit/short circuit)
DETECTION CONDITION	• Rotation speed of output gear (intermediate sensor) is low when vehicle speed and engine speed exceed the preprogrammed value. **Diagnostic support note:** • This is continuous monitor (CCM). • MIL illuminates if TCM detects the above malfunction condition. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Intermediate sensor malfunction • Short to ground between intermediate sensor terminal B and TCM terminal 1K • Short to ground between intermediate sensor terminal A and TCM terminal 1X • Open circuit between intermediate sensor terminal B and TCM terminal 1K • Open circuit between intermediate sensor terminal A and TCM terminal 1X • Damaged connectors between intermediate sensor and TCM • TCM malfunction



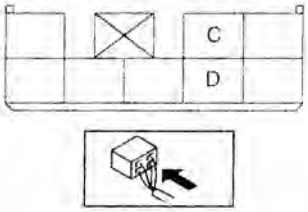
TCM
HARNESS SIDE CONNECTOR



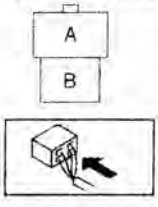
TERMINAL COMPONENT
NO.2 (8-PIN)
HARNESS SIDE CONNECTOR



COUPLER COMPONENT
(8-PIN)
PART SIDE CONNECTOR



INTERMEDIATE SENSOR
HARNESS SIDE CONNECTOR



Diagnostic procedure

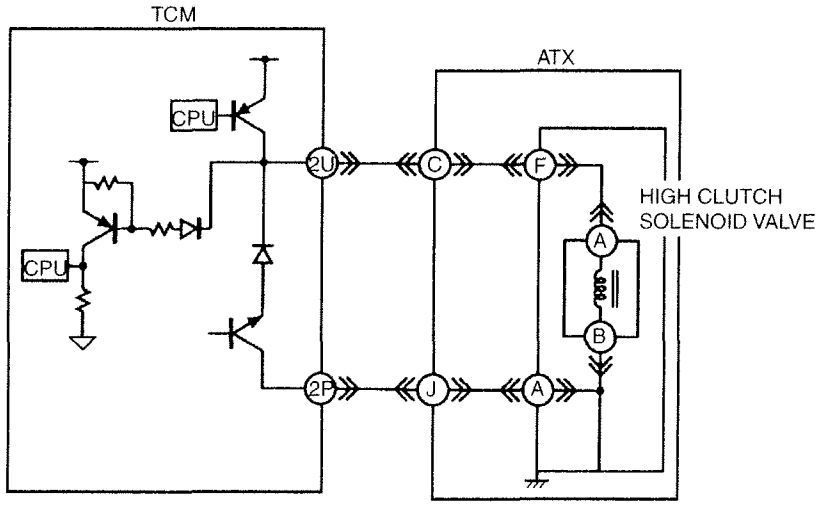
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TERMINAL COMPONENT NO.2 (8-PIN) CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the terminal component No.2 (8-pin) connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to Step 12.
4	**INSPECT INTERMEDIATE SENSOR RESISTANCE** • Measure the resistance between terminal component No.2 (8-pin) (transaxle case side). • Is resistance **within 513—627 ohms** between terminal component No.2 (8-pin) terminal C and D (transaxle case side)?	Yes	Go to the next step.
		No	Go to Step 8.
5	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
6	**INSPECT TERMINAL COMPONENT NO.2 (8-PIN) CIRCUIT FOR OPEN CIRCUIT** • Check terminal component No.2 (8-pin) terminals (harness-side) and TCM terminals (harness-side). — C and 1K — D and 1X • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 12.
7	**INSPECT TERMINAL COMPONENT NO.2 (8-PIN) CIRCUIT FOR SHORT TO GROUND** • Check terminal component No.2 (8-pin) terminal (harness-side) and body ground. — C and body ground — D and body ground • Is there continuity?	Yes	Repair or replace the harness, then go to Step 12.
		No	Go to Step 12.
8	**INSPECT COUPLER COMPONENT (8-PIN) CONNECTOR FOR POOR CONNECTION** • Disassemble the control valve body cover. • Disconnect the coupler component (8-pin) connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
9	**INSPECT INTERMEDIATE SENSOR RESISTANCE** • Measure the resistance between coupler component (8-pin). • Is resistance **within 513—627 ohms** between coupler component (8-pin) terminal D and C (part side)?	Yes	Repair or replace the coupler component, then go to Step 12.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**INSPECT INTERMEDIATE SENSOR CONNECTOR FOR POOR CONNECTION** • Disassemble the transaxle. • Disconnect the intermediate sensor connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
11	**INSPECT INTERMEDIATE SENSOR RESISTANCE** • Measure the resistance between intermediate sensor. • Is resistance **within 513—627 ohms** between intermediate sensor connector terminal A and B (part side)?	Yes	Repair or replace the coupler component, then go to the next step.
		No	Replace the intermediate sensor, then go to the next step.
12	**VERIFY TROUBLESHOOTING OF DTC P0791 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle with vehicle speed **40 km/h {25 mph} or above** and engine speed 1,500 rpm or above for **2 second or more.** • Repeat Step ii two times. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

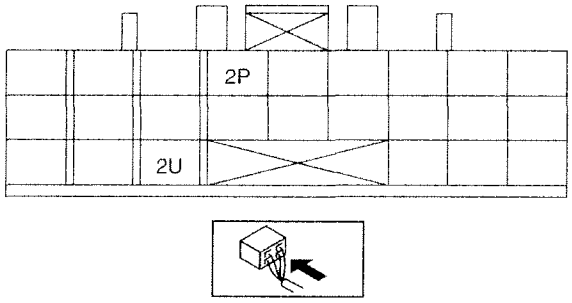
DTC P0798 [JA5A-EL]

C6U050218901W29

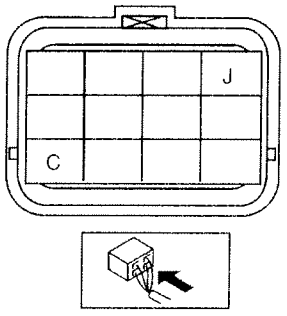
DTC P0798	High clutch solenoid valve circuit malfunction (open circuit/short circuit)
DETECTION CONDITION	• Open or short circuit is high clutch solenoid signal system (while TCM monitors solenoid output voltage, the voltage that differs from the ON/OFF signal output by CPU in TCM is detected). **Diagnostic support note:** • This is continuous monitor (CCM). • MIL does not illuminate. • PENDING CODE is not available. • FREEZE FRAME DATA is not available. • AT warning light illuminates. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Open circuit between high clutch solenoid valve terminal A and TCM terminal 2U • Short to ground between high clutch solenoid valve terminal A and TCM terminal 2U • Short to power between high clutch solenoid valve terminal A and TCM terminal 2U • High clutch solenoid valve malfunction • Damaged connector between high clutch solenoid valve and TCM • TCM malfunction



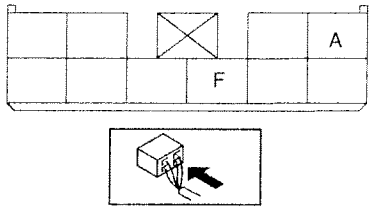
TCM
HARNESS SIDE CONNECTOR



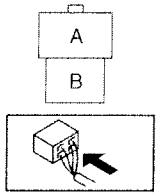
TERMINAL COMPONENT
NO.1 (12-PIN)
HARNESS SIDE CONNECTOR



COUPLER COMPONENT
(10-PIN)
PART SIDE CONNECTOR



HIGH CLUTCH SOLENOID VALVE
HARNESS SIDE CONNECTOR



Diagnostic procedure

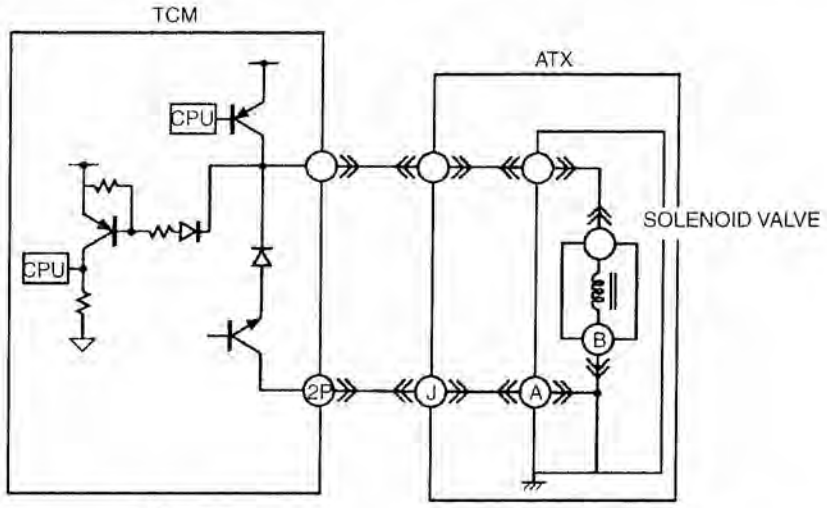
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the terminal component No.1 (12-pin). • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to Step 12.
3	**INSPECT RESISTANCE OF HIGH CLUTCH SOLENOID VALVE** • Check resistance between terminal component No.1 (12-pin) terminal C (transaxle case side) and body ground. • Is resistance **within 2.6—3.2 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Go to Step 8.
		No	Go to the next step.
4	**INSPECT COUPLER COMPONENT (10-PIN) FOR POOR CONNECTION** • Disconnect the coupler component (10-pin) connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 12.
5	**INSPECT RESISTANCE OF HIGH CLUTCH SOLENOID VALVE** • Check resistance between coupler component (10-pin) terminal F (part side) and body ground. • Is resistance **within 2.6—3.2 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the coupler component No.1 (12-pin), then go to Step 12.
		No	Go to the next step.
6	**INSPECT HIGH CLUTCH SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Disconnect the high clutch solenoid valve connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Is terminal okay?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 12.
7	**INSPECT RESISTANCE OF HIGH CLUTCH SOLENOID VALVE** • Check resistance between high clutch solenoid valve connector terminal A (part side) and body ground. • Is resistance **within 2.6—3.2 ohms**? (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	Yes	Repair or replace the coupler component (10-pin), then go to Step 12.
		No	Verify high clutch solenoid valve installation. • If high clutch solenoid valve is installed correctly, replace the high clutch solenoid, then go to Step 12. (See 05–17B–22 SOLENOID VALVE REMOVAL/INSTALLATION [JA5A-EL].)
8	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair terminals, then go to Step 12.
9	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR OPEN CIRCUIT** • Check continuity between TCM terminal 2U (harness-side) and terminal component No.1 (12-pin) terminal C (harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 12.

STEP	INSPECTION		ACTION
10	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR SHORT TO POWER** • Turn ignition switch to ON (engine off). • Check voltage at terminal component No.1 (12-pin) terminal C (harness-side). • Is voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 12.
11	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition switch to OFF. • Check continuity between TCM terminal 2U (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to the next step.
		No	Go to the next step.
12	**VERIFY TROUBLESHOOTING OF DTC P0798 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

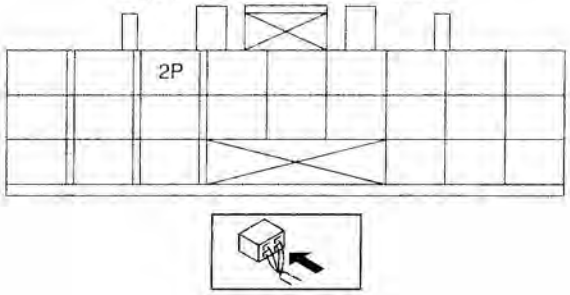
DTC P1710 [JA5A-EL]

C6U05021801W30

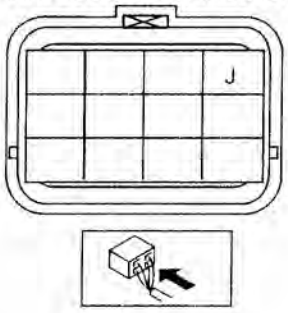
DTC P1710	GND return circuit malfunction
DETECTION CONDITION	• TCM detects open circuit in GND return signal line from solenoid valve. **Diagnostic support note:** • This is a diagnostic support DTC (monitored one per key cycle). • MIL does not illuminate. • PENDING CODE is not available. • FREEZE FRAME DATA is not available. • AT warning light does not illuminate. • DTC is stored in TCM memory.
POSSIBLE CAUSE	• Open circuit between duty type solenoid valves terminal and TCM terminal 2P • Damaged connector between solenoid valve and TCM • TCM malfunction



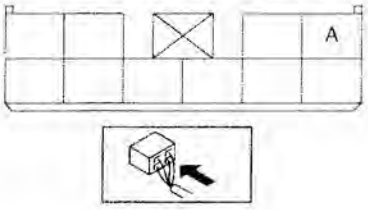
TCM
HARNESS SIDE CONNECTOR



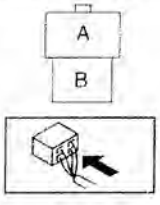
TERMINAL COMPONENT
NO.1 (12-PIN)
HARNESS SIDE CONNECTOR



COUPLER COMPONENT
(10-PIN)
PART SIDE CONNECTOR



SOLENOID VALVE
HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect the TCM connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to Step 9.
3	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Verify that TCM connector is disconnected. • Check continuity between TCM harness connector terminal 2P and ground. • Is there continuity?	Yes	Go to the next step.
		No	Go to Step 5.
4	**INSPECT TCM INTERNAL CIRCUIT FOR OPEN CIRCUIT** • Verify that TCM connector is disconnected. • Check continuity between TCM terminal 2P and TCM body. • Is there continuity?	Yes	Go to Step 9.
		No	Replace the TCM, then go to Step 9. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
5	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CONNECTOR FOR POOR CONNECTION** • Disconnect the terminal component No.1 (12-pin) connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to Step 9.
6	**INSPECT TERMINAL COMPONENT NO.1 (12-PIN) CIRCUIT FOR SHORT TO GROUND** • Verify that terminal component No.1 (12-pin) connector is disconnected. • Check continuity between terminal component No.1 (12-pin) connector terminal J (transaxle case side) and ground. • Is there continuity?	Yes	Repair or replace the TCM harness, then go to Step 9. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.
7	**INSPECT COUPLER COMPONENT (10-PIN) CONNECTOR FOR POOR CONNECTION** • Disconnect the coupler component (10-pin) connector. • Check for poor connection (damaged, pulled-out, terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to Step 9.
8	**INSPECT COUPLER COMPONENT (10-PIN) CIRCUIT FOR SHORT TO GROUND** • Verify that coupler component (10-pin) connector is disconnected. • Check continuity between coupler component (10-pin) connector terminal A (part side) and ground. • Is there continuity?	Yes	Repair or replace the terminal component, then go to the next step.
		No	Repair or replace coupler component, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P1710 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
		No	Troubleshooting completed.

PID/DATA MONITOR INSPECTION [JA5A-EL]

C6U050218901W31

1. Connect the WDS or equivalent to the DLC-2.
2. Turn the ignition switch to ON.
3. Measure the PID value.

Note

- Perform part inspection for the output device after TCM inspection.
- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the TCM. Therefore, if a monitored value of an output device is out of specification, it is necessary to inspect the monitored value of the input device related to the output device control. Since an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device, it is necessary to inspect the output device individually using the simulation function.

PID/DATA MONITOR AND RECORD function table

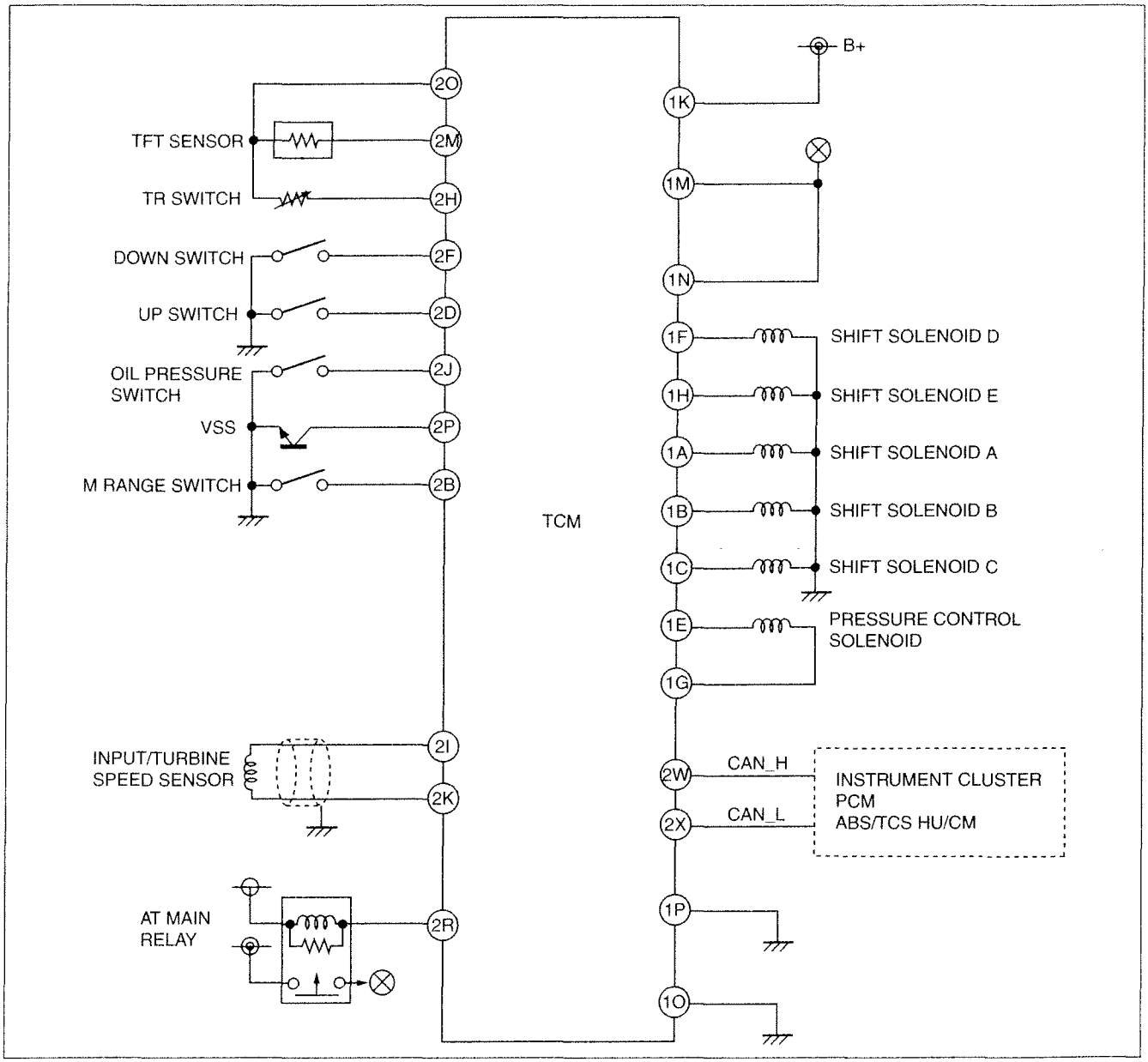
Monitor item (Definition)	Unit/ Condition	Condition/Specification	Action	TCM terminal
24B_Duty (2-4 brake solenoid vale)	%	N position: **0%** 2GR, 4GR, 5GR at D range: **99%**	Inspect 2-4 brake solenoid valve. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	3V
BOO_TCM (Brake switch)	On/Off	Brake pedal depressed: On Other: Off	Inspect brake switch. (See 04–11–7 BRAKE SWITCH INSPECTION.)	1U
DTCCNT	—	Indicates number of DTC	Check DTC. (See 05–02B–6 DTC TABLE [JA5A-EL].)	—
DWN SW (Down switch)	On/Off	Down shift at M range: On Other: Off	Inspect selector lever component. (See 05–18–5 SELECTOR LEVER COMPONENT INSPECTION.)	1S
ECT TCM (ECT)	°C, °F	Indicates ECT	Inspect TCM. (See 05–17B–23 TCM INSPECTION [JA5A-EL].)	—
FDPDTC (FREEZE FRAME DATA)	—	Indicates code of FREEZE FRAME DATA	Inspect TCM. (See 05–17B–23 TCM INSPECTION [JA5A-EL].)	—
GEAR (Calculated gear range in TCM)	1st/2nd/3rd/ 4th/5th	1GR: 1st 2GR: 2nd 3GR: 3rd 4GR: 4th 5GR: 5th	Inspect following PIDs: THOP, TSS	—
H/C_Duty (High clutch solenoid valve)	%	N position: **0%** 3GR, 5GR D range: **99%**	Inspect high clutch solenoid valve. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	2U
LPS (Pressure control solenoid)	%	Ignition switch ON: **0%** Idle: **0—100%**	Inspect pressure control solenoid. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	2Y
MNL SW (M range switch)	On/Off	M range: On Other: Off	Inspect selector lever component. (See 05–18–5 SELECTOR LEVER COMPONENT INSPECTION.)	1AA
NSFT TIM (Neutral shift solenoid valve)	On/Off	N position: Off R position inhibition control: On	Inspect main relay. (See 09–21–6 RELAY INSPECTION.) Inspect battery. (See 01–17–1 BATTERY INSPECTION.)	2D
OSS (Intermediate sensor	RPM	Ignition switch ON: **0 rpm** Idle: **700—800 rpm**	Inspect intermediate sensor. (See 05–17B–18 INTERMEDIATE SENSOR INSPECTION [JA5A-EL].)	1K, 1X

Monitor item (Definition)	Unit/ Condition	Condition/Specification	Action	TCM terminal
RDCN_TIM (Reduction timing solenoid valve)	On/Off	N position: Off D range: On	Inspect reduction timing solenoid valve. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	2G
RPM (Engine speed)	RPM	Ignition switch ON: **0 rpm** Idle: **700—800 rpm**	Inspect TCM. (See 05–17B–23 TCM INSPECTION [JA5A-EL].)	–
SSA/SS1 (Shift solenoid A)	On/Off	N position: On D range 3GR: Off	Inspect shift solenoid A. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	2W
SSB/SS2 (Shift solenoid B)	On/Off	N position: On D range 4GR: Off	Inspect shift solenoid B. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	2T
SSC/SS3 (Shift solenoid C)	On/Off	N position: On D range 2GR: Off	Inspect shift solenoid C. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	2X
TCCC (TCC solenoid valve)	%	TCC operate ON: On TCC operate OFF: Off	Inspect TCC solenoid valve. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)	2S
TFT (ATF temperature)	°C, °F	Indicates ATF temperature	Inspect TFT sensor. (See 05–17B–16 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION [JA5A-EL].)	1B, 1F
TR (TR switch)	R/N/D	R position: R N position: N D range: D	Inspect TR switch. (See 05–17B–11 TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL].)	1T, 1W, 1Z
TRD (TR switch [D range])	On/Off	D range: On Other ranges and all positions: Off	Inspect TR switch. (See 05–17B–11 TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL].)	1Z
TRR (TR switch [R position])	On/Off	R position: On Other positions and all ranges: Off	Inspect TR switch. (See 05–17B–11 TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL].)	1W
TSS (Input/turbine speed sensor)	RPM	Ignition switch ON: **0 rpm** Idle: **700—800 rpm**	Inspect input/turbine speed sensor. (See 05–17B–17 INPUT/TURBINE SPEED SENSOR INSPECTION [JA5A-EL].)	1N, 2F
UP SW (Up switch)	On/Off	Up shift at M range: On Other: Off	Inspect selector lever component. (See 05–18–5 SELECTOR LEVER COMPONENT INSPECTION.)	2C
VSS (Vehicle speed)	KPH, MPH	Indicates vehicle speed	Inspect vehicle speedometer sensor. (See 05–17B–19 VEHICLE SPEEDOMETER SENSOR (VSS) INSPECTION [JA5A-EL].)	1V, 1M

05–03A SYMPTOM TROUBLESHOOTING [FN4A-EL]

AUTOMATIC TRANSAXLE CONTROL SYSTEM WIRING DIAGRAM [FN4A-EL]

C6U050319090W01

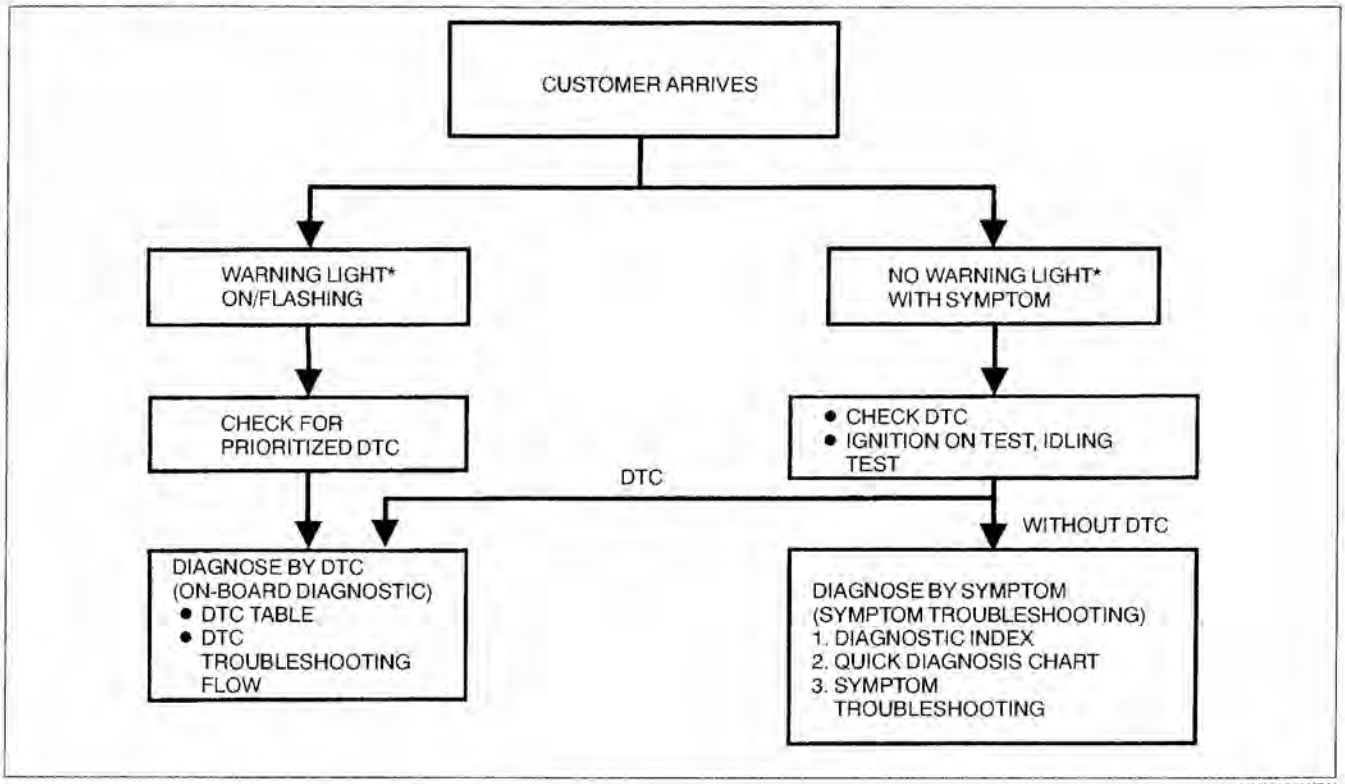


C6U0503W001

FOREWORD [FN4A-EL]

C6U050319090W02

- When the customer reports a vehicle malfunction, check the malfunction indicator lamp (MIL) indication, AT warning light flash, and diagnostic trouble code (DTC), then diagnose the malfunction according to following flowchart.
  - — If a DTC exists, diagnose the applicable DTC inspection. (See 05–02A–4 DTC TABLE [FN4A-EL].)
  - — If a DTC does not exist, the MIL does not illuminate and AT warning light illuminate, diagnose the applicable symptom troubleshooting. (See 05–03A–4 SYMPTOM TROUBLESHOOTING ITEM TABLE [FN4A-EL].)



YMU102WBX

*: Malfunction Indicator Lamp (MIL), AT warning light.

BASIC INSPECTION [FN4A-EL]

C6U050319090W03

STEP	INSPECTION		ACTION
1	Perform mechanical system test. (See 05–17A–3 MECHANICAL SYSTEM TEST [FN4A-EL].) Is mechanical system okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts according to inspection result.
2	Turn IG SW to ON. When selector lever is moved, does selector illumination indicate synchronized position to lever location? Also, when other ranges are selected from N or P during idling, does vehicle move **within 1—2 seconds**?	Yes	Go to the next step.
		No	Inspect selector lever and TR switch. Repair or replace defective areas. (See 05–18–5 SELECTOR LEVER INSPECTION.) (See 05–17A–9 TRANSAXLE RANGE (TR) SWITCH INSPECTION [FN4A-EL].) If selector lever and TR switch are okay, go to the next step.
3	Inspect ATF color and condition. (See 05–17A–8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [FN4A-EL].) Are ATF color and odor normal?	Yes	Go to the next step.
		No	Repair or replace any defective parts according to inspection result. Flush ATX and cooler line as necessary.
4	Perform line pressure test. (See 05–17A–3 Line Pressure Test.) Is line pressure okay?	Yes	Go to the next step.
		No	Adjust accelerator cable as necessary. Repair or replace any defective parts according to inspection result.
5	Perform stall test. (See 05–17A–4 Stall Test.) Is stall speed okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts according to inspection result.

STEP	INSPECTION		ACTION
6	Inspect voltage at the following TCM terminals. (See 05–17A–24 TCM INSPECTION [FN4A-EL].) • Terminal 2M (TFT sensor) • Terminal 2H (TR switch) • Terminal 2I, 2K (Input/turbine speed sensor) • Terminal 2F (Down switch) • Terminal 2D (Up switch) • Terminal 2B (M range switch) Is voltage okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts according to inspection result.
7	Inspect value at the following PCM PIDs using WDS or equivalent. (See 01–40A–7 PCM INSPECTION [L3].) • B+ • APP1 • APP2 • ECT • RPM • TP_REL • VSS Is PID value okay?	Yes	Perform symptom troubleshooting and follow procedures.
		No	Repair or replace any defective parts according to inspection result.

SYMPTOM TROUBLESHOOTING ITEM TABLE [FN4A-EL]

C6U050319090W04

- Use the chart below to verify the symptoms of the trouble in order to diagnose the appropriate area.

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
1	Vehicle does not move in D range, or in R position	Vehicle does not move when AP depressed.	(See 05–03A–9 NO.1 VEHICLE DOES NOT MOVE IN D RANGE, OR IN R POSITION [FN4A-EL].)
2	Vehicle moves in N position	Vehicle creeps in N position. Vehicle creeps if brake pedal is not depressed in N position.	(See 05–03A–10 NO.2 VEHICLE MOVES IN N POSITION [FN4A-EL].)
3	Vehicle moves in P position, or parking gear does not disengage when P position is disengaged	Vehicle rolls when on a downward slope and tires do not lock in P position. Tires locked when P position is disengaged, vehicle does not move in D range, and R position when AP depressed, and engine remains in stall condition.	(See 05–03A–10 NO.3 VEHICLE MOVES IN P POSITION, OR PARKING GEAR DOES NOT DISENGAGE WHEN P IS DISENGAGED [FN4A-EL].)
4	Excessive creep	Vehicle accelerates in D range, and R position without depressing accelerator pedal.	(See 05–03A–10 NO.4 EXCESSIVE CREEP [FN4A-EL].)
5	No creep at all	Vehicle does not move in D range, or R position when idling on flat, paved road.	(See 05–03A–11 NO.5 NO CREEP AT ALL [FN4A-EL].)
6	Low maximum speed and poor acceleration	Vehicle acceleration poor at start. Delayed acceleration when accelerator pedal depressed while driving.	(See 05–03A–12 NO.6 LOW MAXIMUM SPEED AND POOR ACCELERATION [FN4A-EL].)
7	No shifting	Single shift range only. Sometimes shifts correctly.	(See 05–03A–13 NO.7 NO SHIFTING [FN4A-EL].)
8	Does not shift to fourth gear (4GR)	Vehicle does not upshift from 3GR to 4GR even though vehicle speed is increased. Vehicle does not shift to 4GR even though accelerator pedal is released in D range at **60 km/h {37 mph}**.	(See 05–03A–14 NO.8 DOES NOT SHIFT TO FOURTH GEAR (4GR) [FN4A-EL].)
9	Abnormal shifting	Shifts incorrectly (incorrect shift pattern).	(See 05–03A–15 NO.9 ABNORMAL SHIFTING [FN4A-EL].)
10	Frequent shifting	Downshifting occurs immediately even when accelerator pedal depressed slightly in D range.	(See 05–03A–16 NO.10 FREQUENT SHIFTING [FN4A-EL].)

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
11	Shift point is high or low	Shift point considerably different from automatic shift diagram. Shift delays when accelerating. Shift occurs quickly when accelerating and engine speed does not increase.	(See 05–03A–16 NO.11 SHIFT POINT IS HIGH OR LOW [FN4A-EL].)
12	Torque converter clutch (TCC) non-operation	TCC does not operate when vehicle reaches TCC operation range.	(See 05–03A–16 NO.12 TORQUE CONVERTER CLUTCH (TCC) NON-OPERATION [FN4A-EL].)
13	No kickdown	Does not downshift when accelerator pedal fully depressed within kickdown range.	(See 05–03A–17 NO.13 NO KICKDOWN [FN4A-EL].)
14	Engine flares up or slips when upshifting or downshifting	When accelerator pedal is depressed, engine speed increases but vehicle speed increases slowly. When accelerator pedal is depressed while driving, engine speed increases but vehicle speed does not.	(See 05–03A–18 NO.14 ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING [FN4A-EL].)
15	Engine flares up or slips when accelerating vehicle	Engine flares up when accelerator pedal is depressed for upshifting. Engine flares up suddenly when accelerator pedal is depressed for downshifting.	(See 05–03A–19 NO.15 ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE [FN4A-EL].)
16	Judder upon torque converter clutch (TCC) operation	Vehicle jolts when TCC is engaged.	(See 05–03A–19 NO.16 JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION [FN4A-EL].)
17	Excessive shift shock from N to D or N to R position/range	Strong shock is felt when shifting from N to D or N to R position/range at idle.	(See 05–03A–20 NO.17 EXCESSIVE SHIFT SHOCK FROM N TO D OR N TO R POSITION/RANGE [FN4A-EL].)
18	Excessive shift shock is given when upshifting and downshifting	Excessive shift shock is felt when depressing accelerator pedal to accelerate at upshifting. During cruising, excessive shift shock is felt when depressing accelerator pedal at downshifting.	(See 05–03A–21 NO.18 EXCESSIVE SHIFT SHOCK IS FELT WHEN UPSHIFTING AND DOWNSHIFTING [FN4A-EL].)
19	Excessive shift shock on torque converter clutch (TCC)	Strong shock is felt when TCC engaged.	(See 05–03A–22 NO.19 EXCESSIVE SHIFT SHOCK ON TORQUE CONVERTER CLUTCH (TCC) [FN4A-EL].)
20	Noise occurs at idle when vehicle is stopped in all positions/ranges	Transaxle is noisy in all positions and ranges when vehicle idling.	(See 05–03A–23 NO.20 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES [FN4A-EL].)
21	Noise occurs at idle when vehicle is stopped in D range, or in R position	Transaxle is noisy in driving ranges when vehicle idling.	(See 05–03A–24 NO.21 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN D RANGE, OR IN R POSITION [FN4A-EL].)
22	No engine braking in 1GR position of M range	Engine speed drops to idle but vehicle coasts when accelerator pedal is released when in 1GR position of M range at low vehicle speed.	(See 05–03A–24 NO.22 NO ENGINE BRAKING IN 1GR POSITION OF M RANGE [FN4A-EL].)
23	Transaxle overheats	Burnt smell emitted from transaxle. Smoke is emitted from transaxle.	(See 05–03A–25 NO.23 TRANSAXLE OVERHEATS [FN4A-EL].)
24	Engine stalls when shifted to D range, or in R position	Engine stalls when shifting from N or P position to D range or R position at idle.	(See 05–03A–26 NO.24 ENGINE STALLS WHEN SHIFTED TO D RANGE, OR IN R POSITION [FN4A-EL].)

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
25	Engine stalls when driving at slow speeds or stopping	Engine stalls when brake pedal is depressed while driving at low speed or stopping.	(See 05–03A–26 NO.25 ENGINE STALLS WHEN DRIVING AT SLOW SPEEDS OR STOPPING [FN4A-EL].)
26	Starter does not work	Starter does not work even when P or N position is selected.	(See 05–03A–26 NO.26 STARTER DOES NOT WORK [FN4A-EL].)
27	Gear position indicator light does not illuminate in M range	Gear position indicator light in dashboard does not illuminate in M range and ignition switch at ON.	(See 05–03A–27 NO.27 GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE [FN4A-EL].)
28	Gear position indicator light illuminates in D range or P, N, R positions	Gear position indicator light in dashboard illuminates in D range or P, N, R positions and ignition switch at ON.	(See 05–03A–27 NO.28 GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS [FN4A-EL].)
29	Does not shift up in M range	Gear position indIcator light in dashboard illuminates but vehicle does not upshift when selector lever is pushed to "+"side.	(See 05–03A–27 NO.29 DOES NOT SHIFT UP IN M RANGE [FN4A-EL].)
30	Does not shift down in M range	Gear position indicator light in dashboard illuminates but vehicle does not downshift when selector lever is pushed to "–"side.	(See 05–03A–27 NO.30 DOES NOT SHIFT DOWN IN M RANGE [FN4A-EL].)

QUICK DIAGNOSIS CHART [FN4A-EL]

C6U050319090W05

X:Applied

	Symptom item / Cause of trouble	Selector lever is misadjusted	Parking mechanism malfunction	Not within line pressure specification	Not within idle speed specification	Excessive amount of ATF	TP sensor: Signal is not inputted	TP sensor: Malfunction signal is inputted	Input/turbine speed sensor: Signal is not inputted	Input/turbine speed sensor: Malfunction signal is inputted	Vehicle speed sensor: Signal is not inputted	Vehicle speed sensor: Malfunction signal is inputted	ECT sensor: Signal is not inputted	ECT sensor: Malfunction signal is inputted	TR switch: Misadjusted	TR switch: Not operating properly	M range switch: Signal is not inputted	M range switch: Malfunction signal is inputted	Up switch: Signal is not inputted	Up switch: Malfunction signal is inputted	Down switch: Signal is not inputted	Down switch: Malfunction signal is inputted	Brake switch: Always ON
		Electrical system components																					
		ATX outer parts																					
1	Vehicle does not move in D range, or in R position	X		X		X																	
2	Vehicle moves in N position	X																					
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged	X																					
4	Excessive creep		X		X	X																	
5	No creep at all			X		X	X	X	X	X	X	X											
6	Low maximum speed and poor acceleration		X	X			X	X	X	X	X	X			X	X							
7	No shifting			X			X	X	X	X	X	X											
8	Does not shift to fourth gear (4GR)	X		X			X	X	X	X	X	X	X	X	X	X							
9	Abnormal shifting	X		X		X	X	X	X	X	X	X			X	X							
10	Frequent shifting			X			X	X	X	X	X	X											
11	Shift point is high or low					X	X	X	X	X	X	X											
12	Torque converter clutch (TCC) non-operation					X	X	X	X	X	X	X	X	X	X	X							X
13	No kickdown						X	X															
14	Engine flares up or slips when upshifting or downshifting	X		X			X	X	X	X	X	X			X	X							
15	Engine flares up or slip when accelerating vehicle	X		X			X	X	X	X	X	X			X	X							
16	Judder upon torque converter clutch (TCC) operation			X			X	X	X	X	X	X											
17	Excessive shift shock from N to D or N to R position/range	X		X	X		X	X	X	X	X	X											
18	Excessive shift shock is felt when upshifting and downshifting			X			X	X	X	X	X	X											
19	Excessive shift shock on torque converter clutch (TCC)			X			X	X	X	X	X	X											
20	Noise occurs at idle when vehicle is stopped in all positions/ranges																						
21	Noise occurs at idle when vehicle is stopped in D range, or in R position																						
22	No engine braking in 1GR position of M range			X			X	X	X	X	X	X											
23	Transaxle overheats			X		X																	
24	Engine stalls when shifted to D range, or in R position				X					X	X												
25	Engine stalls when driving at slow speeds or stopping				X																		
26	Starter does not work															X	X						
27	Gear position indicator light does not illuminate in M range																	X					
28	Gear position indicator light illuminates in D range or P, N, R positions																		X				
29	Does not shift up in M range																	X		X	X		
30	Does not shift down in M range																	X				X	X

B6U0503W005

	Symptom item / Cause of trouble	Poor GND	Signal is not inputted	Malfunction signal is inputted	Shift solenoid D malfunction	Shift solenoid E malfunction	Shift solenoid A malfunction	Shift solenoid B malfunction	Shift solenoid C malfunction	Pressure control solenoid malfunction	Control valve is not operating properly	Forward accumulator is not operating properly	Servo apply accumulator is not operating properly	Pressure switch malfunction	Oil cooler is not operating properly	Slipping (Brake, clutch)	Burnt (Brake, clutch)	Torque converter is not operating properly	TCC burnt Inspection method
		Electrical system components									Hydraulic system components					Powertrain system			
		ATX outer parts		Transaxle fluid temperature sensor															
1	Vehicle does not move in D range, or in R position	X			X	X	X	X		X	X					X	X	X	
2	Vehicle moves in N position										X						X		
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged																		
4	Excessive creep																		
5	No creep at all	X		X	X		X	X	X	X	X					X	X	X	
6	Low maximum speed and poor acceleration	X	X	X	X	X	X	X	X	X	X					X	X	X	X
7	No shifting	X			X	X	X	X	X	X	X					X	X		
8	Does not shift to fourth gear (4GR)	X	X	X		X	X	X			X					X	X		
9	Abnormal shifting	X			X	X	X	X	X		X	X	X			X	X	X	
10	Frequent shifting	X														X	X		
11	Shift point is high or low	X														X			
12	Torque converter clutch (TCC) non-operation	X	X	X		X	X				X							X	X
13	No kickdown	X			X	X	X	X	X		X					X	X		
14	Engine flares up or slips when upshifting or downshifting	X			X	X	X	X	X	X	X					X	X		
15	Engine flares up or slip when accelerating vehicle	X		X	X	X	X		X	X	X					X	X		
16	Judder upon torque converter clutch (TCC) operation	X		X		X	X				X							X	X
17	Excessive shift shock from N to D or N to R position/range	X		X	X		X	X	X	X	X	X	X	X			X		
18	Excessive shift shock is felt when upshifting and downshifting	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		
19	Excessive shift shock on torque converter clutch (TCC)	X		X		X	X			X	X							X	X
20	Noise occurs at idle when vehicle is stopped in all positions/ranges																		
21	Noise occurs at idle when vehicle is stopped in D range, or in R position																		
22	No engine braking in 1GR position of M range	X			X	X			X		X					X	X		
23	Transaxle overheats		X	X							X				X				X
24	Engine stalls when shifted to D range, or in R position										X							X	X
25	Engine stalls when driving at slow speeds or stopping										X							X	X
26	Starter does not work																		
27	Gear position indicator light does not illuminate in M range																		
28	Gear position indicator light illuminates in D range or P, N, R positions																		
29	Does not shift up in M range																		
30	Does not shift down in M range																		

B6U0503W006

NO.1 VEHICLE DOES NOT MOVE IN D RANGE, OR IN R POSITION [FN4A-EL]

C6U050319090W06

1	Vehicle does not move in D range, or in R position
DESCRIPTION	• Vehicle does not move when AP is depressed.
POSSIBLE CAUSE	• If the vehicle does not move in D range or R position, basically, the malfunction is in the ATX. (Vehicle will move even with a malfunction in the TCM.) Since a malfunction is in the sensor circuit or output circuit is the cause of the malfunction in the ATX, inspect the sensors, output circuit, and the related harnesses. 1. Clutch slipped, worn (D range-Forward clutch, R position-Reverse clutch, Low and reverse brake) • Line pressure low • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Pressure control solenoid malfunction • Body GND malfunction • Control valve body malfunction 2. Selector lever malfunction 3. Parking mechanism not operating properly 4. Torque converter malfunction **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	When vehicle is stopped on a flat, level road and engine is off, does vehicle move when pushed? (in D range or N, R positions and brake released)	Yes	Go to the next step.
		No	Check for parking mechanism. (See ATX Workshop Manual (FN4A-EL).)
2	Disconnect TCM. Is resistance between TCM ground terminal 1P and body ground, and between TCM ground terminal 1O and body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair open ground circuit.
3	Inspect pressure control solenoid. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) Is it okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).)
		No	Repair or replace any defective parts.
4	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.2 VEHICLE MOVES IN N POSITION [FN4A-EL]

C6U050319090W07

2	Vehicle moves in N position
DESCRIPTION	• Vehicle creeps in N position. • Vehicle creeps if brake pedal is not depressed in N position.
POSSIBLE CAUSE	• If the vehicle moves in N position, basically, the malfunction is in the ATX. Since a malfunction in the sensor circuit or output circuit is the cause of the malfunction in the ATX, inspect the sensors, output circuit, and the related harnesses. 1. Clutch burned (Forward clutch) • Control valve body malfunction 2. Selector lever position disparity (Although the selector indicator shows N position, hydraulic circuit shows D range or R position) **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Does vehicle creep when selector lever is moved slightly in N position?	Yes	Go to the next step.
		No	Adjust selector lever. (See 05–18–6 SELECTOR CABLE ADJUSTMENT.)
2	Disconnect TCM. Is resistance between TCM ground terminal 1P and body ground, and between TCM ground terminal 1O and body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair open ground circuit. Reconnect TCM.
3	Inspect pressure control solenoid circuit. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) Is it okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).)
		No	Repair or replace any defective parts.
4	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.3 VEHICLE MOVES IN P POSITION, OR PARKING GEAR DOES NOT DISENGAGE WHEN P IS DISENGAGED [FN4A-EL]

C6U050319090W08

3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged
DESCRIPTION	• Vehicle rolls on a downward slope in P position. • Tires are locked when P is disengaged. Vehicle does not move in D range, and R position when AP is depressed, and engine remains in stall condition.
POSSIBLE CAUSE	1. Parking mechanism malfunction (May have effect on noise or shock from transaxle) 2. Improper adjustment of selector lever 3. If vehicle moves in N position, perform No.2 "VEHICLE MOVES IN N POSITION"

NO.4 EXCESSIVE CREEP [FN4A-EL]

C6U050319090W09

4	Excessive creep
DESCRIPTION	• Vehicle accelerates in D range, and R position without depressing accelerator pedal.
POSSIBLE CAUSE	1. Engine idle speed high (transaxle system is not cause of problem) 2. Go to No.9 "FAST IDLE/RUNS ON" (See 01–03A–28 NO.9 FAST IDLE/RUNS ON [L3].)

NO.5 NO CREEP AT ALL [FN4A-EL]

C6U05031909OW10

5	No creep at all
DESCRIPTION	• Vehicle does not move in D range and R position when idling on flat, paved road.
POSSIBLE CAUSE	• Either transaxle is stuck in 3GR or 4GR position, or clutch slippage due to a stuck 3–4 clutch is stuck. 1. Clutch burned • Line pressure low • Shift solenoid D malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Body GND malfunction • Control valve body malfunction 2. Transaxle fixed in 3GR (Operation of fail-safe function) • Short or open circuit in wiring harness • Poor connection of connector • Electronic parts of output and input system have malfunction 3. Engine torque is not start • Torque converter malfunction **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Does vehicle creep in any range/position?	Yes	Go to the next step.
		No	Inspect or adjust selector lever. (See 05–18–6 SELECTOR LEVER REMOVAL/ INSTALLATION.)
2	Check value at the following PCM PIDs using WDS or equivalent. (See 01–40A–7 PCM INSPECTION [L3].) • APP1 • APP2 • TP_REL Are PID values okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts.
3	Disconnect TCM. Is resistance between TCM ground terminal 1P and body ground, and between TCM ground terminal 1O and body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair open ground circuit.
4	Inspect pressure control solenoid. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) Is it okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).)
		No	Repair or replace any defective parts.
5	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.6 LOW MAXIMUM SPEED AND POOR ACCELERATION [FN4A-EL]

C6U050319090W11

6	Low maximum speed and poor acceleration
DESCRIPTION	• Vehicle acceleration is poor at start. • Delayed acceleration when accelerator pedal is depressed while driving.
POSSIBLE CAUSE	• If the clutch is stuck or does not stay in 3GR, the malfunction is in engine circuit. 1. Clutch slipped, burned • Line pressure low • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Body GND malfunction • Control valve body malfunction 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • Accelerator pedal position sensor malfunction • TP sensor malfunction • Input/turbine speed sensor malfunction 3. Transaxle fixed in 3GR (Operation of fail-safe function) • Short or open circuit in wiring • Poor connection of connector • Electronic parts of output and input system have malfunction 4. Insufficient starting torque (Suspected when in-gear condition, shift control and engine circuit are normal) • Torque converter have malfunction (Poor operation, stuck) 5. Engagement of TCC operation range (Operation of fail-safe function) • Transaxle fluid temperature sensor malfunction (Short or open circuit) 6. Transaxle fixed in M range • M range switch malfunction 7. TR switch adjustment incorrect **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With ignition switch at ON, does gear position indicator light indication correspond to selector lever position?	Yes	Go to the next step.
		No	Go to No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE", or No.30 "GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS."
2	Go to No.12 "LACK/LOSS OF POWER-ACCELERATION/CRUISE". (See 01–03A–34 NO.12 LACK/LOSS OF POWER-ACCELERATION/CRUISE [L3].) Is CIS system okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts.
3	Disconnect transaxle connector. Does vehicle operate as follows? **D range: 3GR (fixed)** **R position: Reverse**	Yes	Go to the next step.
		No	Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).) If problem remains, overhaul transaxle and repair or replace any defective parts.

STEP	INSPECTION		ACTION
4	Drive vehicle in D range. Does vehicle start from stop in first gear?	Yes	Go to the next step.
		No	Check value at the following. (See 01–40A–7 PCM INSPECTION [L3].) (See 05–17A–24 TCM INSPECTION [FN4A-EL].) PCM PIDs (using WDS or equivalent): • APP1 • APP2 • TP_REL • VSS TCM terminal voltage: • 2I, 2K (TSS sensor) • 2H (TR switch) Repair or replace any defective parts.
5	Stop engine. Inspect shift solenoids A, B and C. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) Are they okay?	Yes	Go to the next step.
		No	Inspect for shift solenoid stuck. — If shift solenoids are okay, inspect for open or short circuit in wiring harness between TCM terminals 1A, 1B, 1C and control valve body terminals A, C, G respectively.
6	Perform the stall test. (See 05–17A–4 Stall Test.) Is stall speed okay?	Yes	Reverify symptoms of malfunction.
		No	Overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL)].)
7	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.7 NO SHIFTING [FN4A-EL]

C6U050319090W12

7	No shifting
DESCRIPTION	• Single shift range only. • Sometimes it shifts correctly.
POSSIBLE CAUSE	• When the gear position is fixed in 3GR due to the fail-safe operation, the malfunction is in the ATX. • Perform malfunction diagnosis according to No.6 "LOW MAXIMUM SPEED AND POOR ACCELERATION". 1. Clutch slippage, burned • Line pressure low • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Body GND malfunction • Control valve body malfunction 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • Accelerator pedal position sensor malfunction • TP sensor malfunction • Input/turbine speed sensor malfunction 3. Transaxle fixed in 3GR (Operation in fail-safe function) • Short or open circuit in wiring harness • Poor connection of connector • Disconnected shift solenoid connector • Poor ground of shift solenoid 4. Transaxle fixed in M range • M range switch malfunction

NO.8 DOES NOT SHIFT TO FOURTH GEAR (4GR) [FN4A-EL]

C6U050319090W13

8	Does not shift to fourth gear (4GR)
DESCRIPTION	• Vehicle does not upshift from 3GR to 4GR even though vehicle speed is increased. • Vehicle does not shift to 4GR even though accelerator pedal is released in D range at **60 km/h {37 mph}**.
POSSIBLE CAUSE	• Basically, TCC does not operate when fail-safe is operating. Verify the DTCs first. If the TCC operates when driving at high speeds only, malfunction (improper adjustment) is in the M range switch circuit or TR switch circuit. **Caution** • **If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.** 1. TCC piston slipped, burned • Line pressure low • TP sensor malfunction • Engine coolant temperature sensor malfunction • Vehicle speed sensor malfunction • Input/turbine speed sensor malfunction • Sensor GND malfunction 2. Transaxle fluid temperature sensor malfunction • Short or open circuit in wiring harness • Poor connection of connector • Sensor malfunction 3. TR switch malfunction • Short or open circuit in wiring harness • Poor connection of connector • Sensor malfunction • Selector lever adjustment incorrect • TR switch adjustment incorrect 4. Shift solenoid A, shift solenoid B, shift solenoid D valve malfunction • Short or open circuit in wiring harness • Poor connection of connector • Solenoid valve stuck 5. M range switch malfunction 6. Control valve body malfunction **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With ignition switch at ON, does gear position indicator light indication correspond to selector lever position?	Yes	Go to the next step.
		No	Go to No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE", or No. 30 "GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS."
2	Inspect voltage at the following TCM terminal. (See 05–17A–24 TCM INSPECTION [FN4A-EL].) • Terminal 2M (TFT sensor) Is voltage okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts.
3	Inspect shift solenoids A, B and D. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) Are they okay?	Yes	Inspect for shift solenoid stuck. — If shift solenoids are okay, inspect for open or short in wiring harness circuit between TCM terminals 1A, 1B, 1F and control valve body terminals A, C, B respectively.
		No	Go to the next step.
4	Disconnect TCM. Is resistance between TCM ground terminal 1P and body ground, and between TCM ground terminal 1O and body ground **less than 5.0 ohms**?	Yes	Check value at the following. PCM PID (using WDS or equivalent): • VSS Repair or replace any defective parts.
		No	Repair open ground circuit. Reconnect TCM.

STEP	INSPECTION	ACTION
5	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.	

NO.9 ABNORMAL SHIFTING [FN4A-EL]

C6U050319090W14

9	Abnormal shifting
DESCRIPTION	• Shift incorrectly (incorrect shift pattern).
POSSIBLE CAUSE	• There is a malfunction in the signal circuit which controls shifting (accelerator pedal position sensor, TP sensor, input/turbine speed sensor, vehicle speed sensor), the control valve is stuck, the accumulator (forward or servo apply) is stuck, or the clutch circuit is stuck. 1. Clutch slipped, burned • Line pressure low • Control valve body malfunction • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Body GND malfunction 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • TP sensor malfunction or misadjustment • Accelerator pedal position sensor malfunction or misadjustment • Input/turbine speed sensor malfunction 3. TR switch malfunction • Selector lever adjustment incorrect • TR switch adjustment incorrect **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Disconnect TCM. Is resistance between TCM ground terminal 1P and body ground, and between TCM ground terminal 1O and body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair open ground circuit. Reconnect TCM.
2	Check value at the following. (See 01–40A–7 PCM INSPECTION [L3].) (See 05–17A–24 TCM INSPECTION [FN4A-EL].) PCM PIDs (using WDS or equivalent): • APP1 • APP2 • TP_REL TCM terminal voltage: • 2I, 2K (TSS sensor) Are they okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).)
		No	Repair or replace any defective parts.
3	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.10 FREQUENT SHIFTING [FN4A-EL]

C6U050319090W15

10	Frequent shifting
DESCRIPTION	• Downshifting occurs immediately even when accelerator pedal is depressed slightly in D range.
POSSIBLE CAUSE	• The circuit which is the cause is basically the same as No.9 "ABNORMAL SHIFTING". However, a malfunction of the input signal to the accelerator pedal position sensor, TP sensor, input/turbine speed sensor, vehicle speed sensor (including the sensor GND, sensor harness and connector), or clutch slippage (clutch stuck, low pressure in line) may also be the cause.

NO.11 SHIFT POINT IS HIGH OR LOW [FN4A-EL]

C6U050319090W16

11	Shift point is high or low
DESCRIPTION	• Shift point considerably different from automatic shift diagram. • Shift delays when accelerating. • Shift occurs quickly when accelerating and engine speed does not increase.
POSSIBLE CAUSE	• If the transaxle does not shift abnormally, there is a malfunction of the input signal to the accelerator pedal position sensor, TP sensor, input/turbine speed sensor, or vehicle speed sensor (including sensor GND). • If the engine speed is high or low, regardless normal shifting, inspect the tachometer. • Verify that the output signal of the accelerator pedal position sensor and TP sensor change linearly.

NO.12 TORQUE CONVERTER CLUTCH (TCC) NON-OPERATION [FN4A-EL]

C6U050319090W17

12	Torque converter clutch (TCC) non-operation
DESCRIPTION	• TCC does not operate when vehicle reaches TCC operation range.
POSSIBLE CAUSE	• Basically, the TCC does not operate when the fail-safe is operating. Verify the DTC first. **Caution** **• If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.** 1. TCC burned (1) Input sensor system malfunction • Transaxle fluid temperature sensor • Vehicle speed sensor • Input/turbine speed sensor • Sensor GND (2) Output solenoid valve system malfunction (Sticking) • Shift solenoid E malfunction • Shift solenoid A malfunction (3) Control valve body malfunction system (Poor operation, stuck) • TCC hydraulic pressure system 2. TP sensor malfunction (Not operating linear) 3. Accelerator pedal position sensor malfunction (Not operating linear) 4. Input/turbine speed sensor or vehicle speed sensor malfunction 5. Brake switch malfunction (Always ON) 6. ECT sensor malfunction **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With ignition switch at ON, does gear position indicator light indication correspond to selector lever position?	Yes	Go to the next step.
		No	Go to No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE", or No.30 "GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS."

STEP	INSPECTION		ACTION
2	Check value at the following. (See 01–40A–7 PCM INSPECTION [L3].) (See 05–17A–24 TCM INSPECTION [FN4A-EL].) PCM PIDs (using WDS or equivalent): • APP1 • APP2 • TP_REL • VSS TCM terminal voltage: • 2I, 2K (TSS sensor) Are they okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts.
3	Disconnect TCM. Is resistance between TCM ground terminal 1P and body ground, and between TCM ground terminal 1O and body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair harness.
4	Measure resistance between TCM terminal 1A and transaxle connector terminal A, and between TCM terminal 1H and transaxle connector terminal F. Are the resistances **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair shift solenoid A or E circuit. Reconnect TCM.
5	Inspect shift solenoids A and E. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) Are the shift solenoids operating properly?	Yes	Replace TCM.
		No	Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).)
6	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.13 NO KICKDOWN [FN4A-EL]

C6U050319090W18

13	No kickdown
DESCRIPTION	• Does not downshift when accelerator pedal is fully depressed within kickdown range.
POSSIBLE CAUSE	• If transaxle does not downshift though shifting is normal, malfunction is in accelerator pedal position sensor or TP sensor circuit (including sensor GND, sensor harness and connector).

NO.14 ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING [FN4A-EL]

C6U050319090W19

14	Engine flares up or slips when upshifting or downshifting
DESCRIPTION	• When accelerator pedal is depressed for driveway, engine speed increases but vehicle speed increases slowly. • When accelerator pedal is depressed while driving, engine speed increases but vehicle speed does not.
POSSIBLE CAUSE	• There is clutch slip because clutch is stuck or line pressure is low. 1. Clutch stuck, slippage (forward clutch, 3–4 clutch, 2–4 brake band, one-way clutch) • Line pressure low • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Body GND malfunction • Control valve body malfunction 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • TP sensor malfunction or misadjustment • Accelerator pedal position sensor malfunction or misadjustment • Input/turbine speed sensor malfunction 3. Poor operation of mechanical pressure • Selector lever position disparity • TR switch position disparity **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Is shift point okay?	Yes	Go to the next step.
		No	Go to No.9 "ABNORMAL SHIFTING".
2	Check value at the following PCM PIDs using WDS or equivalent. (See 01–40A–7 PCM INSPECTION [L3].) • APP1 • APP2 • TP_REL Are PID values okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts.
3	Disconnect TCM. Is resistance between TCM ground terminal 1P and body ground, and between TCM ground terminal 1O and body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair harness. Reconnect TCM.
4	Inspect pressure control solenoid (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) Is it okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).)
		No	Repair or replace any defective parts.
5	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.15 ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE [FN4A-EL]

C6U050319090W20

15	Engine flares up or slips when accelerating vehicle
DESCRIPTION	• Engine flares up when accelerator pedal is depressed for upshifting. • Engine flares up suddenly when accelerator pedal is depressed for downshifting.
POSSIBLE CAUSE	• The malfunction is basically the same as for No.14 "ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING". If conditions for No.14 worsen, the malfunction will develop to No.15.

NO.16 JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION [FN4A-EL]

C6U050319090W21

16	Judder upon torque converter clutch (TCC) operation
DESCRIPTION	• Vehicle jolts when TCC is engaged.
POSSIBLE CAUSE	• Poor TCC engagement due to either slippage because the TCC is stuck or the line pressure is low **Caution** **• If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.** 1. Torque converter clutch piston slipped, burned • Line pressure high • Shift solenoid A malfunction • Control valve body malfunction • Body GND malfunction • Pressure control solenoid malfunction 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • TFT sensor malfunction • TP sensor malfunction or misadjustment • Accelerator pedal position sensor malfunction or misadjustment • Input/turbine speed sensor malfunction 3. Torque converter malfunction **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

05–03A

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect voltage at the following TCM terminals. (See 05–17A–24 TCM INSPECTION [FN4A-EL].) • 2I, 2K (TSS sensor) Are they okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts.
2	Disconnect TCM. Is resistance between TCM ground terminal 1P and body ground, and between TCM ground terminal 1O and body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair harness.
3	Measure resistance between TCM terminal 1A and transaxle connector terminal A. Is the resistance **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair shift solenoid A circuit.
4	Inspect shift solenoid. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) Is the solenoid valve operating properly?	Yes	Go to the next step.
		No	Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).)
5	Inspect pressure control solenoid. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) Is it okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).)
		No	Replace TCM.

STEP	INSPECTION	ACTION
6	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.	

NO.17 EXCESSIVE SHIFT SHOCK FROM N TO D OR N TO R POSITION/RANGE [FN4A-EL]

C6U050319090W22

17	Excessive shift shock from N to D or N to R position/range
DESCRIPTION	• Strong shock felt when shifting from N to D or N to R position/range.
POSSIBLE CAUSE	• Shift shock may worsen when the fail-safe is operating. If no DTC is output, the shift shock may worsen due to poor operation of the control valve body or sticking of the clutch. 1. Clutch burned (N→D: Forward clutch, N→R: Reverse clutch or low and reverse brake) • Line pressure low, high • TP sensor malfunction • Accelerator pedal position sensor malfunction or misadjustment • Vehicle speed sensor malfunction • Input/turbine speed sensor malfunction • Shift solenoid B malfunction • Shift solenoid D malfunction • Shift solenoid A malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Control valve body malfunction • Sensor GND malfunction • Body GND malfunction 2. Poor hydraulic operation (Malfunction in range change) • Forward accumulator malfunction • Servo apply accumulator malfunction • Pressure switch malfunction 3. Idle speed high 4. Poor tightening torque of engine mount, exhaust mount 5. Poor operation of mechanical pressure • Selector lever position disparity **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Does shift shock occur only when engine cold?	Yes	Go to the next step.
		No	Go to Step 3.
2	Disconnect TCM. Is resistance between TCM ground terminal 1P and body ground, and between TCM ground terminal 1O and body ground **less than 5.0 ohms**?	Yes	Check value at the following. (See 01–40A–7 PCM INSPECTION [L3].) (See 05–17A–24 TCM INSPECTION [FN4A-EL].) PCM PIDs (using WDS or equivalent): • APP1 • APP2 • TP_REL TCM terminal voltage: • 2M (TFT sensor) Repair or replace any defective parts.
		No	Repair harness. Reconnect TCM.
3	Perform stall test. (See 05–17A–4 Stall Test.) Is stall speed okay?	Yes	Go to the next step.
		No	Go to Step 5.
4	Inspect voltage at the following TCM terminal. (See05–17A–24 TCM INSPECTION [FN4A-EL].) • 2H (TR switch) Is voltage okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).)
		No	Repair or replace any defective parts.

STEP	INSPECTION		ACTION
5	Check value at the following PCM PIDs using WDS or equivalent. (See 01–40A–7 PCM INSPECTION [L3].) • APP1 • APP2 • TP_REL Are PID values okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts.
6	Disconnect TCM. Is resistance between TCM ground terminal 1P and body ground, and between TCM ground terminal 1O and body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair harness. Reconnect TCM.
7	Inspect pressure control solenoid. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) Is it okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).)
		No	Repair or replace any defective parts.
8	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.18 EXCESSIVE SHIFT SHOCK IS FELT WHEN UPSHIFTING AND DOWNSHIFTING [FN4A-EL]

C6U050319090W23

18	Excessive shift shock is felt when upshifting and downshifting
DESCRIPTION	• Excessive shift shock felt when depressing accelerator pedal to accelerate at upshifting. During cruising, excessive shift shock is felt when depressing accelerator pedal at downshifting.
POSSIBLE CAUSE	• Shift shock may worsen when fail-safe is operating. The shift shock may worsen if the signal from the accelerator pedal position sensor, TP sensor, input/turbine speed sensor, or vehicle speed sensor has a malfunction. 1. Clutch slipped, burned (Forward clutch, 2–4 brake band, 3–4 clutch) • Line pressure low, high • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Accelerator pedal position sensor misadjustment • Control valve body malfunction • Body GND malfunction 2. Signal malfunction • Transaxle temperature sensor malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • TP sensor malfunction • Accelerator pedal position sensor misadjustment • Input/turbine speed sensor malfunction 3. Poor hydraulic operation (Malfunction in range change) • Pressure switch malfunction • Forward accumulator malfunction • Servo apply accumulator malfunction **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Perform stall test. (See 05–17A–4 Stall Test.) Is stall speed okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts.
2	Check value at the following PCM PIDs using WDS or equivalent. (See 01–40A–7 PCM INSPECTION [L3].) • APP1 • APP2 • TP_REL Are PID values okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts.
3	Disconnect TCM. Is resistance between TCM ground terminal 1P and body ground, and between TCM ground terminal 1O and body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair harness. Reconnect TCM.
4	Inspect pressure control solenoid. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) Is it okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).)
		No	Repair or replace any defective parts.
5	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.19 EXCESSIVE SHIFT SHOCK ON TORQUE CONVERTER CLUTCH (TCC) [FN4A-EL]

C6U050319090W24

19	**Excessive shift shock on torque converter clutch (TCC)**
DESCRIPTION	• Strong shock is felt when TCC engaged.
POSSIBLE CAUSE	• The troubleshooting flow is the same as No.16 "JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION".

NO.20 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES [FN4A-EL]

C6U05031909OW25

20	Noise occurs at idle when vehicle is stopped in all positions/ranges
DESCRIPTION	• Transaxle noisy in all positions and ranges when vehicle is idling.
POSSIBLE CAUSE	• The oil pump may cause a high-pitched noise to be emitted from the transaxle at idle. **Note** • If a noise is emitted during shifting only, the malfunction is in shift solenoid D, E or shift solenoid A, B, C. If a noise is emitted during shifting at certain gears only or during deceleration only, it is gear noise. • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect engine condition. Is there any engine concern (i.e. rough idle)?	Yes	Go to appropriate symptom troubleshooting. (See 01–03A–5 ENGINE SYMPTOM TROUBLESHOOTING [L3].)
		No	Go to the next step.
2	Does noise stop when transaxle connector is disconnected?	Yes	Go to the next step.
		No	Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).)
3	Check value at the following. (See 01–40A–7 PCM INSPECTION [L3].) (See 05–17A–24 TCM INSPECTION [FN4A-EL].) PCM PIDs (using WDS or equivalent): • APP1 • APP2 • TP_REL • VSS TCM terminal voltage: • 2I, 2K (TSS sensor) Are they okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts.
4	Disconnect TCM. Is resistance between TCM ground terminal 1P and body ground, and between TCM ground terminal 1O and body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair harness. Reconnect TCM.
5	Inspect pressure control solenoid. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) Is it okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).)
		No	Repair or replace any defective parts.
6	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.21 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN D RANGE, OR IN R POSITION [FN4A-EL]

C6U050319090W26

21	Noise occurs at idle when vehicle is stopped in D range, or in R position
DESCRIPTION	• Transaxle noisy in driving ranges when vehicle idling.
POSSIBLE CAUSE	• Although the malfunction is basically the same as No.20 "NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES", other causes may be selector lever position disparity or TR switch position disparity. **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

NO.22 NO ENGINE BRAKING IN 1GR POSITION OF M RANGE [FN4A-EL]

C6U050319090W27

22	No engine braking in 1GR position of M range
DESCRIPTION	• Engine speed drops to idle but vehicle coasts when accelerator pedal is released when in 1GR of M range at low vehicle speed.
POSSIBLE CAUSE	1. Clutch slippage, burned (low and reverse brake) • Line pressure low • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid C malfunction • Control valve body malfunction • Body GND malfunction 2. Signal malfunction • TP sensor malfunction • Accelerator pedal position sensor malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • Input/turbine speed sensor malfunction 3. M range switch ON not judged by TCM (short, or open circuit, poor operation) • M range switch signal malfunction **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Do the following symptoms concurrently occur? — Engine flares up or slips during acceleration. — Engine flares up or slips when shifting.	Yes	Go to symptom troubleshooting NO.14 "ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING" or No.15 "ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE".
		No	Repeat basic inspection and repair or replace any defective parts according to inspection result. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)
2	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.23 TRANSAXLE OVERHEATS [FN4A-EL]

C6U050319090W28

23	Transaxle overheats
DESCRIPTION	• Burnt smell emitted from transaxle. • Smoke emitted from transaxle.
POSSIBLE CAUSE	• The malfunction is restricted to hindrance of coolant at the oil cooler. In addition, overheating of the transaxle may be caused by a malfunction of the transaxle fluid temperature sensor. 1. Burned (TCC) • Line pressure low • Control valve body malfunction 2. Oil cooler malfunction (Foreign material mixed ATF) 3. Transaxle fluid temperature sensor malfunction 4. Excessive amount of ATF 5. Torque converter malfunction **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect oil cooler pipes for bends, damage, corrosion or kinks. Are oil cooler pipes okay?	Yes	Go to the next step.
		No	Replace any defective parts.
2	Perform stall test. (See 05–17A–4 Stall Test.) Is stall speed okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts.
3	Check value at the following PCM PIDs using WDS or equivalent. (See 01–40A–7 PCM INSPECTION [L3].) • APP1 • APP2 • TP_REL Are PID values okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts.
4	Disconnect TCM. Is resistance between TCM ground terminal 1P and body ground, and between TCM ground terminal 1O and body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair harness. Reconnect TCM.
5	Inspect pressure control solenoid. (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) Is it okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual (FN4A-EL).)
		No	Repair or replace any defective parts.
6	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.24 ENGINE STALLS WHEN SHIFTED TO D RANGE, OR IN R POSITION [FN4A-EL]

C6U050319090W29

24	Engine stalls when shifted to D range, or in R position
DESCRIPTION	• Engine stalls when shifting from N or P position to D range or R position at idle.
POSSIBLE CAUSE	• The malfunction is on the engine control side (i.e. Electronic throttle control system). Otherwise, the malfunction is in the input/turbine speed sensor (engine sometimes starts) or TCC circuit (engine always stalls).

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Go to symptom troubleshooting No.10 "LOW IDLE/STALLS DURING DECELERATION". (See 01–03A–29 NO.10 LOW IDLE/STALLS DURING DECELERATION [L3].) Is engine control system okay?	Yes	Repeat basic inspection and repair or replace any defective parts according to inspection result. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)
		No	Repair or replace any defective parts according to inspection results.
2	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.25 ENGINE STALLS WHEN DRIVING AT SLOW SPEEDS OR STOPPING [FN4A-EL]

C6U050319090W30

25	Engine stalls when driving at slow speeds or stopping
DESCRIPTION	• Engine stalls when brake pedal is depressed while driving at low speed or stopping.
POSSIBLE CAUSE	• The malfunction on engine control side (e.g. Fuel injection control, Electronic throttle control system) Otherwise, the malfunction is in the control valve body, shift solenoid E or TCC.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Go to symptom troubleshooting No.10 "LOW IDLE/STALLS DURING DECELERATION". (See 01–03A–29 NO.10 LOW IDLE/STALLS DURING DECELERATION [L3].) Does engine control system okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts according to inspection results.
2	Go to symptom troubleshooting No.5 "ENGINE STALLS-AFTER START/AT IDLE". (See 01–03A–16 NO.5 ENGINE STALLS-AFTER START/AT IDLE [L3].) Is engine control system okay?	Yes	Repeat basic inspection and repair or replace any defective parts according to inspection result. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)
		No	Repair or replace any defective parts according to inspection results.
3	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.26 STARTER DOES NOT WORK [FN4A-EL]

C6U050319090W31

26	Starter does not work
DESCRIPTION	• Starter does not work even when in P or N position.
POSSIBLE CAUSE	• Selector lever misadjustment • TR switch misadjustment • Open or short circuit in TR switch

NO.27 GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE [FN4A-EL]

C6U050319090W32

27	Gear position indicator light does not illuminate in M range
DESCRIPTION	• Gear position indicator light in instrument cluster illuminates in M range and ignition switch at ON.
POSSIBLE CAUSE	• M range switch, gear position indicator light or related wiring harness malfunction **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Are other indicator lights illuminated with ignition switch at ON?	Yes	Go to the next step.
		No	Inspect meter fuse.
2	Inspect voltage at TCM terminal 2B. (See 05–17A–24 TCM INSPECTION [FN4A-EL].) Is voltage okay?	Yes	Inspect instrument cluster.
		No	Repair or replace any defective part.
3	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.28 GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS [FN4A-EL]

C6U050319090W33

28	Gear position indicator light illuminates when in D range or P, N, R positions
DESCRIPTION	• Gear position indicator light in instrument cluster illuminates in D range or P, N, R position and ignition switch at ON.
POSSIBLE CAUSE	• M range switch or related wiring harness malfunction **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03A–3 BASIC INSPECTION [FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect voltage at TCM terminal 2B. (See 05–17A–24 TCM INSPECTION [FN4A-EL].) Is voltage okay?	Yes	Inspect instrument cluster.
		No	Repair or replace any defective part.
2	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.29 DOES NOT SHIFT UP IN M RANGE [FN4A-EL]

C6U050319090W34

29	No shift up in M range
DESCRIPTION	• Gear position indicator light in dashboard illuminates, but vehicle does not upshift when selector lever is pushed to "+" side.
POSSIBLE CAUSE	• Up switch or related harness malfunction

NO.30 DOES NOT SHIFT DOWN IN M RANGE [FN4A-EL]

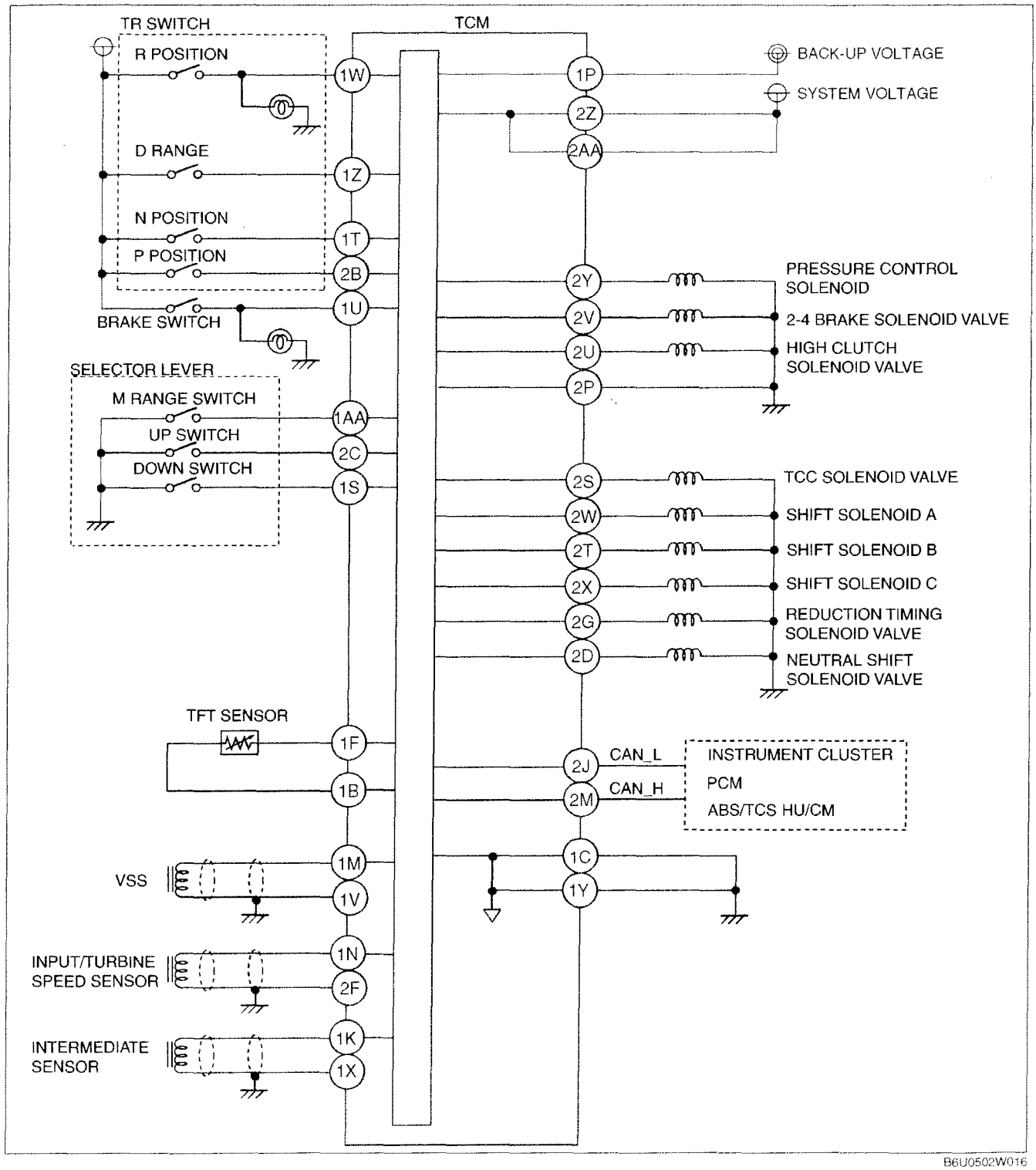
C6U050319090W35

30	No shift up in M range
DESCRIPTION	• Gear position indicator light in dashboard illuminates, but vehicle does not downshift when selector lever is pushed to "–" side.
POSSIBLE CAUSE	• Down switch or related harness malfunction

05–03B SYMPTOM TROUBLESHOOTING [JA5A-EL]

AUTOMATIC TRANSAXLE CONTROL SYSTEM WIRING DIAGRAM [JA5A-EL]

C6U050319090W36

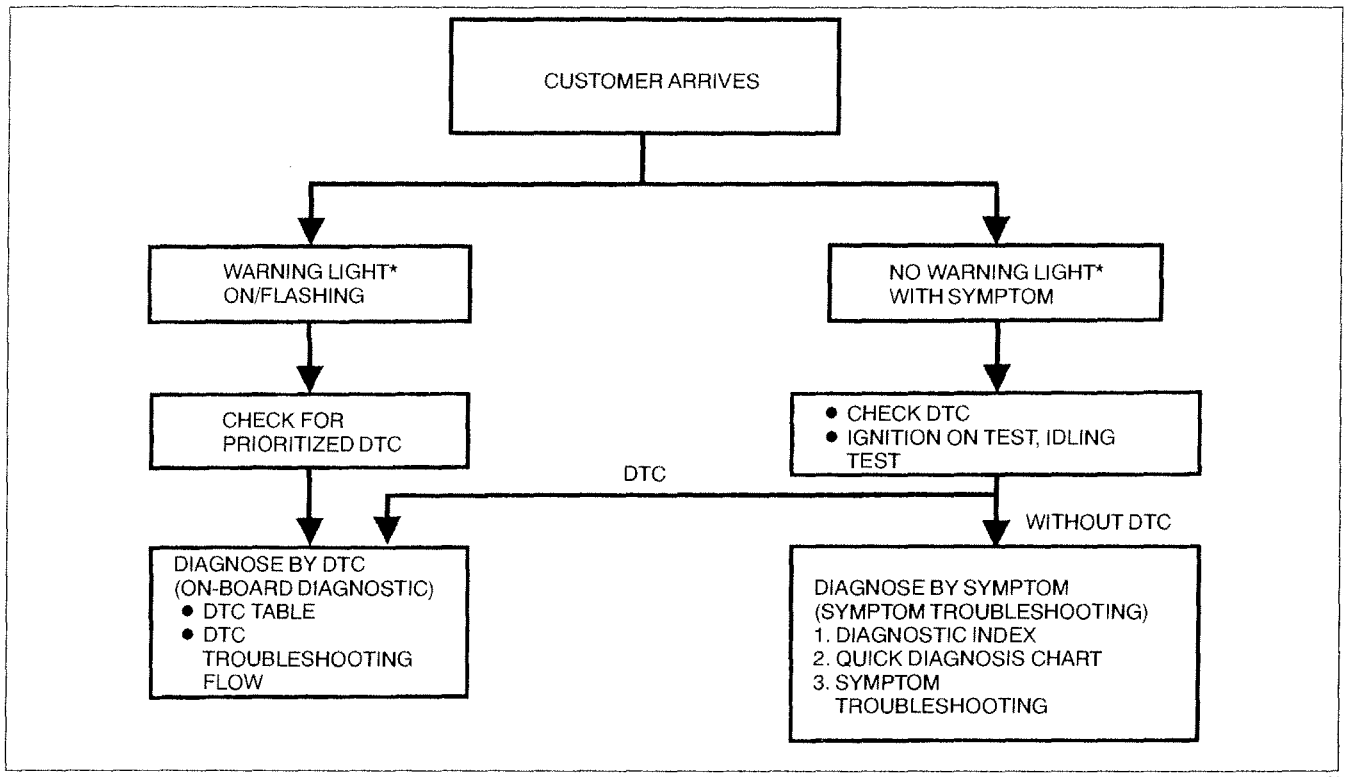


B6U0502W016

FOREWORD [JA5A-EL]

C6U050319090W37

- When the customer reports a vehicle malfunction, check the malfunction indicator lamp (MIL) indication, AT warning indicator light flash, and diagnostic trouble code (DTC), then diagnose the malfunction according to following flowchart.
  - — If a DTC exists, diagnose the applicable DTC inspection. (See 05–02B–6 DTC TABLE [JA5A-EL].)
  - — If a DTC does not exist, the MIL does not illuminate and the AT warning indicator light illuminate, diagnose the applicable symptom troubleshooting. (See 05–03B–4 SYMPTOM TROUBLESHOOTING ITEM TABLE [JA5A-EL].)



YMU102WBX

*: Malfunction Indicator Lamp (MIL), AT warning light.

BASIC INSPECTION [JA5A-EL]

C6U050319090W38

STEP	INSPECTION		ACTION
1	• Perform mechanical system test (See 05–17B–3 MECHANICAL SYSTEM TEST [JA5A-EL].) • Is mechanical system okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts according to inspection result.
2	• Turn ignition switch to ON. • When selector lever is moved, are selector lever position and indicator aligned? Also, when other ranges are selected from N or P during idling, does vehicle creep **within 1 — 2 seconds**?	Yes	Go to the next step.
		No	Inspect selector lever. (See 05–18–5 SELECTOR LEVER INSPECTION.) Repair or replace defected areas.
3	• Inspect ATF color and condition. (See 05–17B–10 Automatic Transaxle Fluid (ATF) Condition Inspection.) • Are ATF color and odor normal?	Yes	Go to the next step.
		No	Repair or replace any defective parts according to inspection result. Flush ATX and cooler line as necessary.
4	• Perform line pressure test. (See 05–17B–3 Line Pressure Test.) • Is line pressure okay?	Yes	Go to the next step.
		No	Adjust accelerator cable as necessary. Repair or replace any defective parts according to inspection result.
5	• Perform stall test. (See05–17B–5 Stall Speed Test.) • Is stall speed okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts according to inspection result.

STEP	INSPECTION		ACTION
6	Inspect voltage at the following TCM terminals. (See 05–17B–23 TCM INSPECTION [JA5A-EL].) • Terminal 1B, 1F (TFT sensor) • Terminal 1Z (D range switch) • Terminal 1W (R position switch) • Terminal 1M, 1V (VSS) • Terminal 1K, 1X (Intermediate sensor) • Terminal 1AA (M range switch) • Terminal 1S (Down switch) • Terminal 2C (Up switch) Is voltage okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts according to inspection result.
7	Inspect value at the following PCM PIDs using WDS or equivalent. (See 01–40B–6 PCM INSPECTION [AJ].) • B+ • ECT • RPM • APP1 • APP2 • TP_REL • VSS Are PID values okay?	Yes	Perform symptom troubleshooting and follow procedures.
		No	Repair or replace any defective parts according to inspection result.

SYMPTOM TROUBLESHOOTING ITEM TABLE [JA5A-EL]

C6U050319090W39

- Use the chart below to verify the symptoms of the trouble in order to diagnose the appropriate area.

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
1	• Vehicle does not move in D range, or in R position	• Vehicle does not move when accelerator pedal depressed.	(See 05–03B–10 NO.1 VEHICLE DOES NOT MOVE IN D RANGE, OR IN R POSITION [JA5A-EL].)
2	• Vehicle moves in N position	• Vehicle creeps in N position. • Vehicle creeps if brake pedal not depressed in N position.	(See 05–03B–11 NO.2 VEHICLE MOVES IN N POSITION [JA5A-EL].)
3	• Vehicle moves in P position, or parking gear does not disengage when P is disengaged	• Vehicle rolls when on a downward slope and tires do not lock in P position. • Tires locked when P disengaged, vehicle does not move in D range, and R position when accelerator pedal depressed, and engine remains in stall condition.	(See 05–03B–11 NO.3 VEHICLE MOVES IN P POSITION, OR PARKING GEAR DOES NOT DISENGAGE WHEN P IS DISENGAGED [JA5A-EL].)
4	• Excessive creep	• Vehicle accelerates in D range, and R position without depressing accelerator pedal.	(See 05–03B–11 NO.4 EXCESSIVE CREEP [JA5A-EL].)
5	• No creep at all	• Vehicle does not move in D range, or R position when idling on flat, paved road.	(See 05–03B–12 NO.5 NO CREEP AT ALL [JA5A-EL].)
6	• Low maximum speed and poor acceleration	• Vehicle acceleration poor at start. • Delayed acceleration when accelerator pedal depressed while driving.	(See 05–03B–13 NO.6 LOW MAXIMUM SPEED AND POOR ACCELERATION [JA5A-EL].)
7	• No shifting	• Single shift range only. • Sometimes shifts correctly.	(See 05–03B–14 NO.7 NO SHIFTING [JA5A-EL].)
8	• Does not shift to fifth gear (5GR)	• Vehicle does not upshift from 4GR to 5GR even though vehicle speed increased. • Vehicle does not shift to 5GR even though accelerator pedal released in D range at **60 km/h {37 mph}**.	(See 05–03B–14 NO.8 DOES NOT SHIFT TO FIFTH GEAR (5GR) [JA5A-EL].)
9	• Abnormal shifting	• Shifts incorrectly (incorrect shift pattern).	(See 05–03B–15 NO.9 ABNORMAL SHIFTING [JA5A-EL].)
10	• Frequent shifting	• Downshifting occurs immediately even when accelerator pedal depressed slightly in D range.	(See 05–03B–16 NO.10 FREQUENT SHIFTING [JA5A-EL].)

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
11	• Shift point is high or low	• Shift point considerably different from automatic shift diagram. • Shift delays when accelerating. • Shift occurs quickly when accelerating and engine speed does not increase.	(See 05–03B–16 NO.11 SHIFT POINT IS HIGH OR LOW [JA5A-EL].)
12	• Torque converter clutch (TCC) non-operation	• TCC does not operate when vehicle reaches TCC operation range.	(See 05–03B–17 NO.12 TORQUE CONVERTER CLUTCH (TCC) NON-OPERATION [JA5A-EL].)
13	• No kickdown	• Does not downshift when accelerator pedal fully depressed within kickdown range.	(See 05–03B–18 NO.13 NO KICKDOWN [JA5A-EL].)
14	• Engine flares up or slips when upshifting or downshifting	• When accelerator pedal depressed, engine speed increases but vehicle speed increases slowly. • When accelerator pedal depressed while driving, engine speed increases but vehicle speed does not increase.	(See 05–03B–18 NO.14 ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING [JA5A-EL].)
15	• Engine flares up or slips when accelerating vehicle	• Engine flares up when accelerator pedal depressed for upshifting. • Engine flares up suddenly when accelerator pedal depressed for downshifting.	(See 05–03B–19 NO.15 ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE [JA5A-EL].)
16	• Judder upon torque converter clutch (TCC) operation	• Vehicle jolts when TCC engaged.	(See 05–03B–19 NO.16 JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION [JA5A-EL].)
17	• Excessive shift shock from N to D or N to R position/range	• Strong shock felt when shifting from N to D or N to R position/range at idle.	(See 05–03B–19 NO.17 EXCESSIVE SHIFT SHOCK FROM N TO D OR N TO R POSITION/RANGE [JA5A-EL].)
18	• Excessive shift shock is given when upshifting and downshifting	• Excessive shift shock felt when depressing accelerator pedal to accelerate at upshifting. • During cruising, excessive shift shock felt when depressing accelerator pedal at downshifting.	(See 05–03B–20 NO.18 EXCESSIVE SHIFT SHOCK IS GIVEN WHEN UPSHIFTING AND DOWNSHIFTING [JA5A-EL].)
19	• Excessive shift shock on torque converter clutch (TCC)	• Strong shock felt when TCC engaged.	(See 05–03B–20 NO.19 EXCESSIVE SHIFT SHOCK ON TORQUE CONVERTER CLUTCH (TCC) [JA5A-EL].)
20	• Noise occurs at idle when vehicle is stopped in all positions/ranges	• Transaxle noisy in all positions and ranges when vehicle idling.	(See 05–03B–21 NO.20 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES [JA5A-EL].)
21	• Noise occurs at idle when vehicle is stopped in D range, or in R position	• Transaxle noisy in driving ranges when vehicle idling.	(See 05–03B–21 NO.21 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN D RANGE, OR IN R POSITION [JA5A-EL].)
22	• No engine braking in 1GR position of M range	• Engine speed drops to idle but vehicle coasts when accelerator pedal released during cruising at medium to high speeds. • Engine speed drops to idle but vehicle coasts when accelerator pedal released when in M range (1GR) at low vehicle speed.	(See 05–03B–21 NO.22 NO ENGINE BRAKING IN 1GR POSITION OF M RANGE [JA5A-EL].)
23	• Transaxle overheats	• Burnt smell emitted from transaxle. • Smoke emitted from transaxle.	(See 05–03B–22 NO.23 TRANSAXLE OVERHEATS [JA5A-EL].)

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
24	• Engine stalls when shifted to D range, or in R position	• Engine stalls when shifting from N or P position to D range or R position at idle.	(See 05–03B–23 NO.24 ENGINE STALLS WHEN SHIFTED TO D RANGE, OR IN R POSITION [JA5A-EL].)
25	• Engine stalls when driving at slow speeds or stopping	• Engine stalls when brake pedal depressed while driving at low speed or stopping.	(See 05–03B–24 NO.25 ENGINE STALLS WHEN DRIVING AT SLOW SPEED OR STOPPING [JA5A-EL].)
26	• Starter does not work	• Starter does not work even when P or N position selected.	(See 05–03B–24 NO.26 STARTER DOES NOT WORK [JA5A-EL].)
27	• Gear position indicator light does not illuminate in M range	• Gear position indicator light in dashboard does not illuminate in M range and ignition switch at ON.	(See 05–03B–24 NO.27 GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE [JA5A-EL].)
28	• Gear position indicator light illuminates in D range or P, N, R positions	• Gear position indicator light in dashboard illuminates in D range or P, N R positions and ignition switch at ON.	(See 05–03B–25 NO.28 GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS [JA5A-EL].)
29	• Does not shift up in M range	• Gear position indicator light in dashboard illuminates but vehicle does not upshift when selector lever is pushed to "+" side.	(See 05–03B–25 NO.29 DOES NOT SHIFT UP IN M RANGE [JA5A-EL].)
30	• Does not shift down in M range	• Gear position indicator light in dashboard illuminates but vehicle does not downshift when selector lever is pushed to "–" side.	(See 05–03B–25 NO.30 DOES NOT SHIFT DOWN IN M RANGE [JA5A-EL].)

QUICK DIAGNOSIS CHART [JA5A-EL]

C6U050319090W40

	Symptom item / Cause of trouble	Selector lever is misadjusted	Not within line pressure specification	Not within idle speed specification	IG timing is misadjusted	TR switch is misadjusted	Engine speed signal: Open/short	Engine speed signal: CAN signal	Vehicle speedometer sensor: Signal is not inputted	Vehicle speedometer sensor: Abnormal signal is inputted	Input/turbine speed sensor: Signal is not inputted	Input/turbine speed sensor: Abnormal signal is inputted	Intermediate sensor: Signal is not inputted	Intermediate sensor: Abnormal signal is inputted	M range switch: Signal is not inputted	M range switch: Malfunction signal is inputted	Up switch: Signal is not inputted	Up switch: Malfunction signal is inputted	Down switch: Signal is not inputted	Down switch: Malfunction signal is inputted	Throttle opening: Abnormal signal is inputted	Throttle opening: CAN signal
							Electrical system components															
							ATX outer parts															
1	Vehicle does not move in D range, or in R position	X	X																			
2	Vehicle moves in N position	X																				
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged	X																				
4	Excessive creep			X	X																	
5	No creep at all		X																			
6	Low maximum speed and poor acceleration		X		X	X			X													X
7	No shifting																					X
8	Does not shift to fifth gear (5GR)	X																		X		
9	Abnormal shifting	X							X													X
10	Frequent shifting								X													X
11	Shift point is high or low							X	X													X
12	Torque converter clutch (TCC) non-operation						X															
13	No kickdown								X													X
14	Engine flares up or slips when upshifting or downshifting		X						X	X	X	X	X									X
15	Engine flares up or slip when accelerating vehicle		X						X													X
16	Judder upon torque converter clutch (TCC) operation		X				X		X	X	X	X	X									X
17	Excessive shift shock from N to D or N to R position/range	X	X	X		X	X			X	X	X	X									X
18	Excessive shift shock is given when upshifting and downshifting		X		X				X	X	X	X	X									X
19	Excessive shift shock on torque converter clutch (TCC)		X		X		X		X	X	X	X	X									X
20	Noise occurs at idle when vehicle is stopped in all positions/ranges		X	X		X																X
21	Noise occurs at idle when vehicle is stopped in D range, or in R position		X																			
22	No engine braking in 1GR position of M range																					
23	Transaxle overheats		X																			
24	Engine stalls when shifted to D range, or in R position		X	X	X																	
25	Engine stalls when driving at slow speeds or stopping			X		X																
26	Starter does not work																					
27	Gear position indicator light does not illuminate in M range														X							
28	Gear position indicator light illuminates in D range or P, N, R positions															X						
29	Does not shift up in M range														X		X	X				
30	Does not shift down in M range														X				X	X		

B6U0503W015

	Symptom item / Cause of trouble	CAN signal	N-D select	Transaxle range switch	Power supply, GND	TFT sensor	Pressure control solenoid	TCC solenoid valve	High clutch solenoid valve	2-4 brake solenoid valve	Shift solenoid A	Shift solenoid B	Shift solenoid C	Neutral shift solenoid valve	Reducation timing solenoid	GND return line	ATF amount	Control valve spool is not operating properly	Low clutch solenoid accumulator is not operating properly	2-4 brake accumulator is not operating properly	High clutch accumulator is not operating properly	Direct clutch accumulator is not operating properly
		Signal is inputted	Open/short	Open/short	Open/short	Malfunction signal is inputted	Open/short	Open/short	Open/short	Open/short	Open/short	Open/short	Open/short	Open/short	Open/short	Open/short						
		Electrical system components															Hydraulic system components					
		ATX outer parts				ATX inner parts											Control valve body					
1	Vehicle does not move in D range, or in R position																X					
2	Vehicle moves in N position																					
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged																					
4	Excessive creep																					
5	No creep at all											X	X			X	X	X				
6	Low maximum speed and poor acceleration			X			X	X			X	X	X			X		X				
7	No shifting			X												X		X				
8	Does not shift to fifth gear (5GR)				X	X																
9	Abnormal shifting		X	X				X			X	X	X			X		X				
10	Frequent shifting			X																		
11	Shift point is high or low		X															X				
12	Torque converter clutch (TCC) non-operation				X	X		X										X				
13	No kickdown			X							X	X	X			X		X				
14	Engine flares up or slips when upshifting or downshifting		X	X		X	X				X	X	X			X	X	X				
15	Engine flares up or slip when accelerating vehicle			X			X	X			X	X	X			X	X	X				
16	Judder upon torque converter clutch (TCC) operation			X			X	X										X				
17	Excessive shift shock from N to D or N to R position/range	X	X	X	X	X	X									X		X	X		X	
18	Excessive shift shock is given when upshifting and downshifting		X	X	X	X	X	X	X	X	X	X	X			X		X	X	X	X	X
19	Excessive shift shock on torque converter clutch (TCC)		X	X		X	X	X										X				
20	Noise occurs at idle when vehicle is stopped in all positions/ranges						X	X	X	X												
21	Noise occurs at idle when vehicle is stopped in D range, or in R position																X					
22	No engine braking in 1GR position of M range		X	X											X			X				
23	Transaxle overheats																X	X				
24	Engine stalls when shifted to D range, or in R position							X										X				
25	Engine stalls when driving at slow speeds or stopping							X									X	X				
26	Starter does not work																					
27	Gear position indicator light does not illuminate in M range																					
28	Gear position indicator light illuminates in D range or P, N, R positions																					
29	Does not shift up in M range																					
30	Does not shift down in M range																					

B6U0503W016

	Symptom item / Cause of trouble	Reduction accumulator is not operating properly	Clogging	Pressure control solenoid hydraulic circuit	Clogging	TCC solenoid valve hydraulic circuit	Clogging	High clutch solenoid valve hydraulic circuit	Clogging	2-4 brake solenoid valve hydraulic circuit	Clogging	Shift solenoid A hydraulic circuit	Clogging	Shift solenoid B hydraulic circuit	Clogging	Shift solenoid C hydraulic circuit	Clogging	Neutral shift solenoid valve	Clogging	Reduction timing solenoid valve	Oil cooler is not operating properly	Slipping (clutch, brake)	Burned (clutch, brake)	Torque converter is not operating properly	TCC piston is cracking or peeling	TCC piston is not operating properly
		Hydraulic system components																				Powertrain				
		Control valve body																								
1	Vehicle does not move in D range, or in R position																					X	X	X	X	
2	Vehicle moves in N position																						X			
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged																									
4	Excessive creep																									
5	No creep at all												X	X	X	X						X	X	X	X	
6	Low maximum speed and poor acceleration										X	X	X	X								X	X	X		
7	No shifting																		X			X	X			
8	Does not shift to fifth gear (5GR)																		X							
9	Abnormal shifting										X	X	X									X	X			
10	Frequent shifting																									
11	Shift point is high or low																									
12	Torque converter clutch (TCC) non-operation																							X	X	X
13	No kickdown										X	X	X													
14	Engine flares up or slips when upshifting or downshifting										X	X	X									X	X			
15	Engine flares up or slip when accelerating vehicle																					X			X	
16	Judder upon torque converter clutch (TCC) operation																							X	X	X
17	Excessive shift shock from N to D or N to R position/range			X	X																		X			
18	Excessive shift shock is given when upshifting and downshifting	X	X	X	X	X	X	X	X										X			X	X			
19	Excessive shift shock on torque converter clutch (TCC)																								X	X
20	Noise occurs at idle when vehicle is stopped in all positions/ranges																									
21	Noise occurs at idle when vehicle is stopped in D range, or in R position																									
22	No engine braking in 1GR position of M range																			X		X				
23	Transaxle overheats																				X	X	X	X	X	X
24	Engine stalls when shifted to D range, or in R position				X																X			X		X
25	Engine stalls when driving at slow speeds or stopping				X																X			X		X
26	Starter does not work																									
27	Gear position indicator light does not illuminate in M range																									
28	Gear position indicator light illuminates in D range or P, N, R positions																									
29	Does not shift up in M range																									
30	Does not shift down in M range																									

B6U0503W017

NO.1 VEHICLE DOES NOT MOVE IN D RANGE, OR IN R POSITION [JA5A-EL]

C6U050319090W41

1	Vehicle does not move in D range, or in R position
DESCRIPTION	• Vehicle does not move when accelerator pedal is depressed.
POSSIBLE CAUSE	• If the vehicle does not move in D range or R position, basically, the malfunction is in the ATX. (Vehicle will move even with a malfunction in TCM.) Since a malfunction in the sensor circuit or output circuit is the cause of the malfunction in the ATX, inspect the sensors, output circuit, and the related harnesses. — Clutch slipped, worn (D range-Low clutch, Low one-way clutch, Reduction one-way clutch, R position-Reverse clutch, Low and reverse brake, Reduction brake) • Line pressure low • Malfunction of shift solenoid A, B, or C • Malfunction of sensor ground • Malfunction of body ground • Malfunction of control valve body — Malfunction of selector lever — Parking mechanism not operating properly — Malfunction of torque converter **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• With vehicle stopped on a flat, paved road and engine off, does vehicle move when pushed? (in D range or N, R positions and brake released)	Yes	Go to the next step.
		No	Inspect for parking mechanism. (See ATX Workshop Manual.)
2	• Start engine. • Does vehicle move when selector lever in between N position and D range?	Yes	Inspect or adjust selector lever. (See 05–18–5 SELECTOR LEVER INSPECTION.) (See 05–18–6 SELECTOR CABLE ADJUSTMENT.)
		No	Go to the next step.
3	• Stop engine. • Inspect pressure control solenoid. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].) • Is it okay?	Yes	• Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual.) — If problem remains, replace or overhaul transaxle and repair or replace any defective parts. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].) (See ATX Workshop Manual.)
		No	• Inspect for pressure control solenoid stuck. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].) — If pressure control solenoid is okay, inspect for open or short circuit in wiring harness between TCM terminal 2Y and pressure control solenoid terminal D.
4	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.2 VEHICLE MOVES IN N POSITION [JA5A-EL]

C6U050319090W42

2	Vehicle moves in N position
DESCRIPTION	• Vehicle creeps in N position. • Vehicle creeps if brake pedal is not depressed in N position.
POSSIBLE CAUSE	• If the vehicle moves in N position, basically, the malfunction is in the ATX. Since a malfunction in the sensor circuit or output circuit is the cause of the malfunction in the ATX, inspect the sensors, output circuit, and the related harnesses. — Clutch burned (Low clutch, Low one-way clutch, Low and reverse brake) • Line pressure low • Malfunction of control valve body — Selector lever position disparity (Although the selector indicator shows N position, hydraulic circuit shows D range or R position) **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

05–03B

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Does vehicle creep when selector lever is moved slightly in N position?	Yes	• Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual.) — If problem remains, replace or overhaul transaxle and repair or replace any defective parts. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].) (See ATX Workshop Manual.)
		No	Inspect and adjust selector lever. (See 05–18–5 SELECTOR LEVER INSPECTION.) (See 05–18–6 SELECTOR CABLE ADJUSTMENT.)
2	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.3 VEHICLE MOVES IN P POSITION, OR PARKING GEAR DOES NOT DISENGAGE WHEN P IS DISENGAGED [JA5A-EL]

C6U050319090W43

3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged
DESCRIPTION	• Vehicle rolls when on a downward slope and tires do not lock in P position. • Tires locked when P is disengaged, vehicle does not move in D range, and R position when accelerator pedal is depressed, and engine remains in stall condition.
POSSIBLE CAUSE	• Malfunction of parking mechanism (May have effect on noise or shock from transaxle) • Improper adjustment of selector lever • If the vehicle moves in N position, perform symptom troubleshooting No.2 "VEHICLE MOVES IN N POSITION"

NO.4 EXCESSIVE CREEP [JA5A-EL]

C6U050319090W44

4	Excessive creep
DESCRIPTION	• Vehicle accelerates in D range, and R position without depressing accelerator pedal.
POSSIBLE CAUSE	• Engine idle speed high (transaxle system is not cause of problem) • Go to symptom troubleshooting No.9 "FAST IDLE/RUNS ON" (See 01–03B–30 NO.9 FAST IDLE/RUNS ON [AJ].)

NO.5 NO CREEP AT ALL [JA5A-EL]

C6U050319090W45

5	No creep at all
DESCRIPTION	• Vehicle does not move in D range, or R position when idling on flat, paved road.
POSSIBLE CAUSE	• Either engine output low or there is clutch slippage. — Clutch burned • Line pressure low • Malfunction of shift solenoid A, B, or C • Malfunction of body ground • Malfunction of control valve body — Transaxle fixed in 4GR (Operation of fail-safe function) • Short or open circuit in wiring harness • Poor connection of connector • Electronic parts of output and input system have malfunction — Engine torque is not start • Torque converter malfunction **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Does vehicle creep in P and/or N position?	Yes	Inspect or adjust the selector lever. (See 05–18–5 SELECTOR LEVER INSPECTION.) (See 05–18–6 SELECTOR CABLE ADJUSTMENT.)
		No	Go to the next step.
2	• Stop engine. • Inspect pressure control solenoid. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].) • Is it okay?	Yes	Go to the next step.
		No	• Inspect for pressure control solenoid for stuck. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].) — If pressure control solenoid is okay, inspect for open or short circuit in wiring harness between TCM terminal 2Y and pressure control solenoid terminal D.
3	• Remove torque converter. • Inspect torque converter. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].) (See ATX Workshop Manual.) • Is torque converter okay?	Yes	• Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual.) — If problem remains, replace or overhaul transaxle and repair or replace any defective parts. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].) (See ATX Workshop Manual.)
		No	Replace torque converter.
4	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.6 LOW MAXIMUM SPEED AND POOR ACCELERATION [JA5A-EL]

C6U050319090W46

6	Low maximum speed and poor acceleration
DESCRIPTION	• Vehicle acceleration poor at start. • Delayed acceleration when accelerator pedal is depressed while driving.
POSSIBLE CAUSE	• If clutch is stuck or does not stay in 4GR, malfunction is in engine circuit. — Clutch slipped, burned • Line pressure low • Incorrect throttle position signal • Malfunction of VSS • Malfunction of input/turbine speed sensor • Malfunction of sensor ground • Malfunction of shift solenoid A, B, or C • Malfunction of body ground • Malfunction of control valve body — Transaxle fixed in 4GR (Operation of fail-safe function) • Short or open circuit in wiring harness • Poor connection of connector • Electronic parts of output and input system have malfunction — Insufficient starting torque (Suspected when in-gear, shift control and engine circuit are normal) • Malfunction of torque converter (Poor operation, sticking) — Engagement of TCC operation range (Operation of fail-safe function) • Malfunction of TFT sensor (Short or open circuit) **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• With ignition switch at ON, does gear position indicator light indication correspond to selector lever position?	Yes	Go to the next step.
		No	Go to symptom troubleshooting No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE", or No.28 "GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS".
2	• Go to symptom troubleshooting No.12 "LACK/LOSS OF POWER-ACCELERATION/CRUISE". (See 01–03B–36 NO.12 LACK/LOSS OF POWER-ACCELERATION/CRUISE [AJ].) • Does engine control system okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts according to inspection results.
3	• Stop engine. • Inspect shift solenoids A, B, and C. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].) • Are they okay?	Yes	Go to the next step.
		No	• Inspect for shift solenoid stuck. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].) — If shift solenoids are okay, inspect for open or short circuit in wiring harness between TCM terminals 2W, 2T, 2X and pressure control solenoid terminals I, G, F.
4	• Remove torque converter. • Inspect torque converter. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].) (See ATX Workshop Manual.) • Is torque converter okay?	Yes	• Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual.) — If problem remains, replace or overhaul transaxle and repair or replace any defective parts. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].) (See ATX Workshop Manual.)
		No	Replace torque converter.
5	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.7 NO SHIFTING [JA5A-EL]

C6U050319090W47

7	No shifting
DESCRIPTION	• Single shift range only. • Sometimes it shifts correctly.
POSSIBLE CAUSE	• When gear position is fixed in 4GR due to the fail-safe operation, malfunction is in the ATX. • Perform malfunction diagnosis according to No.6 "LOW MAXIMUM SPEED AND POOR ACCELERATION". — Clutch burned • Line pressure low • Incorrect throttle position signal • Malfunction of VSS • Malfunction of input/turbine speed sensor • Malfunction of sensor ground • Malfunction of shift solenoid A, B or C • Malfunction of control valve body — 4GR is fixed (Operation in fail-safe function) • Short or open circuit in wiring harness • Poor connection of connector • Poor ground of shift solenoid • Electronic parts of output and input system have malfunction

NO.8 DOES NOT SHIFT TO FIFTH GEAR (5GR) [JA5A-EL]

C6U050319090W48

8	Does not shift to fifth gear (5GR)
DESCRIPTION	• Vehicle does not upshift from 4GR to 5GR even though vehicle speed is increased. • Vehicle does not shift to 5GR even though accelerator pedal is released in D range at **60 km/h {37 mph}**.
POSSIBLE CAUSE	• Basically, TCC does not operate when fail-safe is operating. Verify DTC at first. If TCC operates when driving at high speeds only, the malfunction (improper adjustment) is in the M range switch circuit or TR switch circuit. **Note** • If the TCC or piston is stuck, inspect them. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF. — TCC piston slipped, burned • Line pressure low • Incorrect throttle position signal • Malfunction of ECT sensor • Malfunction of VSS • Malfunction of input/turbine speed sensor • Malfunction of sensor ground — Malfunction of TFT sensor • Short or open circuit in wiring harness • Poor connection of connector • Malfunction of sensor — Malfunction of TR switch • Selector lever adjustment incorrect • TR switch adjustment incorrect — Malfunction of TCC solenoid valve • Short or open circuit in wiring harness • Poor connection of connector • Solenoid valve stuck — Malfunction of M range switch • Selector lever adjustment incorrect • Short or open circuit in wiring harness — Malfunction of torque converter — Malfunction of control valve body **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Turn ignition switch to ON. • Does gear position indicator light indication correspond to selector lever position?	Yes	Go to the next step.
		No	Go to symptom troubleshooting No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE", or No.28 "GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS".
2	• Drive vehicle in D range and inspect following: — 1–2 shift up and down — 2–3 shift up and down — 3–4 shift up and down • Are all shift-up and shift-down possible?	Yes	Go to the next step.
		No	**No shift at all:** • Go to symptom troubleshooting No.7 "NO SHIFTING". **Abnormal shift:** • Go to symptom troubleshooting No.9 "ABNORMAL SHIFTING".
3	• Stop engine. • Inspect shift solenoids A, B, and C. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].) • Are they okay?	Yes	Go to the next step.
		No	• Inspect for shift solenoid stuck. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)
4	• Remove torque converter. • Inspect torque converter. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].) (See ATX Workshop.) • Is torque converter okay?	Yes	• Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual.) — If problem remains, replace or overhaul transaxle and repair or replace any defective parts. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].) (See ATX Workshop Manual.)
		No	Replace torque converter.
5	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.9 ABNORMAL SHIFTING [JA5A-EL]

C6U050319090W49

9	Abnormal shifting
DESCRIPTION	• Shift incorrectly (incorrect shift pattern).
POSSIBLE CAUSE	• There is a malfunction in signal circuit which controls shifting (Throttle position signal, accelerator position signal input/turbine speed sensor, VSS), control valve is stuck, or clutch circuit is stuck. — Clutch slipped, burned • Line pressure low • Incorrect throttle position signal • Incorrect accelerator position signal • Malfunction of VSS • Malfunction of input/turbine speed sensor • Malfunction of sensor ground • Malfunction of shift solenoid A, B, or C • Malfunction of TCC solenoid valve • Malfunction of body ground • Misadjustment of accelerator pedal position sensor • Malfunction of control valve body • Malfunction or misadjustment of TR switch **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Inspect for continuity between TCM terminal 1C and transaxle case, and between TCM terminal 1Y and transaxle case. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace ground circuit.
2	• Stop engine. • Inspect shift solenoid A, B, and C. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].) • Are they okay?	Yes	Inspect TCM terminal for bend, damage, corrosion or poor contact.
		No	• Inspect connection of shift solenoid terminals A, B, and C on ATX for bend, damage, corrosion or looseness. • Inspect for shift solenoid stuck. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].) — If shift solenoids are okay, inspect for open or short circuit in wiring harness between TCM terminals 2W, 2T, 2X and coupler component terminals I, G, F respectively.
3	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.10 FREQUENT SHIFTING [JA5A-EL]

C6U050319090W50

10	Frequent shifting
DESCRIPTION	• Downshifting occurs immediately even when accelerator pedal is depressed slightly in D range.
POSSIBLE CAUSE	• The circuit which is the cause is basically the same as for No.9 "ABNORMAL SHIFTING". However, a malfunction of input signal to accelerator pedal position sensor, TP sensor, input/turbine speed sensor, VSS (including the sensor ground, sensor harness and connector), or clutch slippage (clutch stuck, low pressure in line) may also be the cause.

NO.11 SHIFT POINT IS HIGH OR LOW [JA5A-EL]

C6U050319090W51

11	Shift point is high or low
DESCRIPTION	• Shift point considerably different from automatic shift diagram. • Shift delays when accelerating. • Shift occurs quickly when accelerating and engine speed does not increase.
POSSIBLE CAUSE	• If the transaxle does not shift abnormally, there is a malfunction of input signal to TP sensor, input/turbine speed sensor, or VSS. • If engine speed is high or low regardless that shifting is normal, inspect tachometer. • Verify that output signals of accelerator pedal position sensor and TP sensor change linearly.

NO.12 TORQUE CONVERTER CLUTCH (TCC) NON-OPERATION [JA5A-EL]

C6U050319090W52

12	Torque converter clutch (TCC) non-operation
DESCRIPTION	• TCC does not operate when vehicle reaches TCC operation range.
POSSIBLE CAUSE	• Basically, TCC does not operate when fail-safe is operating. Verify DTC at first. If TCC operates when driving at high speeds only, the malfunction (improper adjustment) is in M range switch circuit or TR switch circuit. **Note** • If the TCC or piston is stuck, inspect them. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF. • TCC piston slipped, burned — Line pressure low • Incorrect throttle position signal • Incorrect accelerator position signal • Input/turbine speed sensor malfunction • TFT sensor malfunction • Sensor ground malfunction • VSS malfunction • Malfunction of output solenoid valve system (Sticking) • TCC solenoid valve malfunction • Malfunction of control valve body system (Poor operation, sticking) • TCC piston hydraulic pressure system malfunction • Malfunction of accelerator pedal position sensor (Not operating linearly) • Malfunction of input/turbine speed sensor or VSS **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

05–03B

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Turn ignition switch to ON. • Does gear position indicator light indication correspond to selector lever position?	Yes	Go to the next step.
		No	Go to symptom troubleshooting No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE", or No.28 "GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS".
2	• Disconnect TCM. • Is resistance between TCM ground terminal 1C and body ground, and between TCM ground terminal 1Y and body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair open ground circuit.
3	• Remove torque converter. • Inspect torque converter. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].) (See ATX Workshop Manual.) • Is torque converter okay?	Yes	• Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual.) • If problem remains, replace or overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual.)
		No	• Replace torque converter.
4	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.13 NO KICKDOWN [JA5A-EL]

C6U050319090W53

13	No kickdown
DESCRIPTION	• Does not downshift when accelerator pedal is fully depressed within kickdown range.
POSSIBLE CAUSE	• If transaxle does not downshift though shifting is normal, malfunction is in accelerator pedal position sensor and accelerator pedal position sensor circuits (including sensor ground, sensor harness and connector).

NO.14 ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING [JA5A-EL]

C6U050319090W54

14	Engine flares up or slips when upshifting or downshifting
DESCRIPTION	• When accelerator pedal is depressed for driveway, engine speed increases but vehicle speed increases slowly. • When accelerator pedal is depressed while driving, engine speed increases but vehicle speed does not.
POSSIBLE CAUSE	• There is clutch slip because clutch is stuck or line pressure is low. — Clutch stuck, slippage • Line pressure low • Incorrect throttle position signal • Incorrect accelerator position signal • Malfunction of VSS • Malfunction of input/turbine speed sensor • Malfunction of sensor ground • Malfunction of shift solenoid A, B, or C • Malfunction of TCC solenoid valve • Malfunction of body ground • Malfunction of control valve body — Poor operation of mechanical pressure • Selector lever position disparity • TR switch position disparity **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is line pressure okay? (See 05–17B–3 Line Pressure Test.)	Yes	Go to the next step.
		No	Repair or replace any defective parts according to inspection results.
2	• Is shift point okay? (See 05–17B–7 ROAD TEST [JA5A-EL].)	Yes	Go to the next step.
		No	Go to symptom troubleshooting No.9 "ABNORMAL SHIFTING".
3	• Stop engine. • Inspect shift solenoid A, B, and C. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].) • Are they okay?	Yes	• Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual.) • If problem remains, replace or overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual.)
		No	• Inspect for shift solenoid stuck. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)
4	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.15 ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE [JA5A-EL]

C6U050319090W55

15	Engine flares up or slips when accelerating vehicle
DESCRIPTION	• Engine flares up when accelerator pedal is depressed for upshifting. • Engine flares up suddenly when accelerator pedal is depressed for downshifting.
POSSIBLE CAUSE	• The malfunction is basically the same as for No.14 "ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING". — If conditions for No.14 worsen, malfunction will develop into No.15.

NO.16 JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION [JA5A-EL]

C6U050319090W56

16	Judder upon torque converter clutch (TCC) operation
DESCRIPTION	• Vehicle jolts when TCC is engaged.
POSSIBLE CAUSE	• Poor TCC engagement due to either slippage because TCC piston is stuck or line pressure is low. **Caution** **• If the TCC or piston are stuck, inspect them. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.** — Torque converter clutch piston slipped, burned • Line pressure low • Incorrect throttle position signal • Incorrect accelerator position signal • Malfunction of VSS • Malfunction of input/turbine speed sensor • Malfunction of sensor ground • Malfunction of TCC solenoid valve • Malfunction of control valve body — Malfunction of torque converter

NO.17 EXCESSIVE SHIFT SHOCK FROM N TO D OR N TO R POSITION/RANGE [JA5A-EL]

C6U050319090W57

17	Excessive shift shock from N to D or N to R position/range
DESCRIPTION	• Strong shock felt when shifting from N to D or N to R position/range at idle.
POSSIBLE CAUSE	• Shift shock may worsen when fail-safe is operating. If no DTC is output, shift shock may worsen due to poor operation of control valve body or sticking of clutch. — Clutch burned (N→D: Low clutch, N→R: Reverse clutch or low and reverse brake) • Line pressure low • Incorrect throttle position signal • Incorrect accelerator position signal • Malfunction of TFT sensor • Malfunction of sensor ground • Misadjustment of accelerator pedal position sensor • Malfunction of control valve body — Poor hydraulic operation (Malfunction in range change) — Idle speed high — Poor tightening torque of engine mount, exhaust mount — Line pressure high **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Does shift shock occur only when engine cold?	Yes	Go to the next step.
		No	Go to Step 3.
2	• Inspect TFT sensor and related harness: vibration, intermittent open/short circuit. (See 05–17B–16 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION [JA5A-EL].) • Is it okay?	Yes	Go to the next step.
		No	Repair or replace part if necessary.
3	• Is line pressure okay? (See 05–17B–3 Line Pressure Test.)	Yes	Go to the next step.
		No	Repair or replace any defective parts according to inspection results.
4	• Is stall speed okay? (See 05–17B–5 Stall Speed Test.)	Yes	Go to the next step.
		No	Go to Step 6.
5	• Inspect TR switch and related harness: vibration, intermittent open/short circuit. (See 05–17B–11 TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL].) • Is it okay?	Yes	• Go to the next step.
		No	Repair or replace part if necessary.
6	• Stop engine and turn ignition switch on. • Inspect pressure control solenoid. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].) • Is it okay?	Yes	• Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual.) • If problem remains, replace or overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual.)
		No	• Inspect for pressure control solenoid stuck. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].)
7	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.18 EXCESSIVE SHIFT SHOCK IS GIVEN WHEN UPSHIFTING AND DOWNSHIFTING [JA5A-EL]

C6U050319090W58

18	Excessive shift shock is given when upshifting and downshifting
DESCRIPTION	• Excessive shift shock felt when depressing accelerator pedal to accelerate at upshifting. • During cruising, excessive shift shock felt when depressing accelerator pedal at downshifting.
POSSIBLE CAUSE	• Shift shock may worsen when fail-safe is operating. The shift shock may worsen if accelerator pedal position sensor, TP sensor, input/turbine speed sensor, or VSS signal malfunctions. — Clutch slipped, burned • Line pressure low, high • Incorrect throttle position signal • Malfunction of VSS • Malfunction of input/turbine speed sensor • Malfunction of TFT sensor • Malfunction of shift solenoid A, B, or C • Malfunction of TCC solenoid valve • Malfunction of body ground and sensor ground • Malfunction of control valve body — Poor hydraulic operation (Malfunction in range change)

NO.19 EXCESSIVE SHIFT SHOCK ON TORQUE CONVERTER CLUTCH (TCC) [JA5A-EL]

C6U050319090W59

19	Excessive shift shock on torque converter clutch (TCC)
DESCRIPTION	• Strong shock felt when TCC is engaged.
POSSIBLE CAUSE	• The troubleshooting flow is the same as No.16 "JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION".

NO.20 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES [JA5A-EL]

C6U050319090W60

20	Noise occurs at idle when vehicle is stopped in all positions/ranges
DESCRIPTION	• Transaxle noisy in all positions and ranges when vehicle idling.
POSSIBLE CAUSE	• The malfunction is in pressure solenoid or oil pump which causes a high-pitched noise to be emitted from transaxle at idle. **Note** • If a noise is emitted during shifting only, the malfunction is in shift solenoid A, B, or C. • If a noise is emitted during shifting at certain gears only or during deceleration only, it is gear noise. • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Inspect engine condition. • Is there any engine concern (e.g. Rough idle)?	Yes	Go to appropriate symptom troubleshooting. (See 01–03B–6 SYMPTOM DIAGNOSTIC INDEX [AJ].)
		No	Replace basic inspection and repair or replace any defective parts according to inspection result
2	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.21 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN D RANGE, OR IN R POSITION [JA5A-EL]

C6U050319090W61

21	Noise occurs at idle when vehicle is stopped in D range, or in R position
DESCRIPTION	• Transaxle noisy in driving ranges when vehicle idling.
POSSIBLE CAUSE	• Although the malfunction is basically the same as No.20 "NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES", other causes may be selector lever position disparity or TR switch position disparity.

NO.22 NO ENGINE BRAKING IN 1GR POSITION OF M RANGE [JA5A-EL]

C6U050319090W62

22	No engine braking in 1GR position of M range
DESCRIPTION	• Engine speed drops to idle but vehicle coasts when accelerator pedal is released during cruising at medium to high speeds. • Engine speed drops to idle but vehicle coasts when accelerator pedal is released when in M range (1GR) at low vehicle speed.
POSSIBLE CAUSE	• Clutch slipped, burned (Reduction brake) — Line pressure low • Malfunction of VSS • Malfunction of input/turbine speed sensor • Malfunction of sensor ground • Malfunction of control valve body — M range switch on not judged by TCM (short, or open circuit, poor operation) • Malfunction of M range switch signal — Down switch on not judged by TCM (short, or open circuit, poor operation) • Malfunction of down switch **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Inspect TR switch adjustment. (See 05–17B–14 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [JA5A-EL].) • Does TR switch adjusted properly? • Select PNP PID. • Is PNP PID reading okay when selecting range?	Yes	Go to the next step.
		No	Adjust TR switch as necessary. (See 05–17B–14 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [JA5A-EL].) Inspect TR switch. Repair or replace any defective parts.
2	• Do following symptoms concurrently occur? — Engine flares up or slips during acceleration — Engine flares up or slips when shifting	Yes	Go to symptom troubleshooting No.14 "ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING", or No.15 "ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE".
		No	Go to the next step.
3	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.23 TRANSAXLE OVERHEATS [JA5A-EL]

C6U050319090W63

23	TRANSAXLE OVERHEATS
DESCRIPTION	• Burnt smell emitted from transaxle. • Smoke emitted from transaxle.
POSSIBLE CAUSE	• The malfunction is restricted to hindrance of coolant at oil cooler. In addition, overheating of transaxle may be caused by a malfunction of TFT sensor. — Line pressure low • ATF level low • Incorrect throttle position signal • Incorrect accelerator position signal • Misadjustment of accelerator pedal position sensor — Oil cooler malfunction (Foreign material mixed in with ATF) — TFT sensor malfunction — Excessive amount of ATF **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is line pressure okay? (See 05–17B–3 Line Pressure Test.)	Yes	Go to the next step.
		No	Repair or replace any defective parts according to inspection results.
2	• Is stall speed okay? (See 05–17B–5 Stall Speed Test.)	Yes	Go to the next step.
		No	Repair or replace any defective parts according to inspection results.
3	• Inspect TFT sensor and related harness: vibration, intermittent open/short circuit (See 05–17B–16 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION [JA5A-EL].) • Is it okay?	Yes	Go to the next step.
		No	Repair or replace part if necessary.
4	• Inspect pressure control solenoid. (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL].) • Is it okay?	Yes	Go to the next step.
		No	• Repair or replace pressure control solenoid. (See 05–17B–22 SOLENOID VALVE REMOVAL/ INSTALLATION [JA5A-EL].)

STEP	INSPECTION		ACTION
5	• Inspect oil cooler pipes for bends, damage, corrosion or kinks. • Are oil cooler pipes okay?	Yes	• Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual.) • If problem remains, replace or overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual.)
		No	Replace any defective parts.
6	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.24 ENGINE STALLS WHEN SHIFTED TO D RANGE, OR IN R POSITION [JA5A-EL]

C6U050319090W64

24	Engine stalls when shifted to D range, or in R position
DESCRIPTION	• Engine stalls when shifting from N or P position to D range or R position at idle.
POSSIBLE CAUSE	• The malfunction is on the engine control side (e.g. electronic controlled throttle system). Otherwise, the malfunction is in the input/turbine speed sensor (engine sometimes starts) or TCC piston circuit (engine always stalls). **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Go to symptom troubleshooting No.5 "ENGINE STALLS-AFTER START/AT IDLE". (See 01–03B–18 NO.5 ENGINE STALLS-AFTER START/AT IDLE [AJ].) • Is engine control system okay?	Yes	Go to the next step.
		No	Repair or replace any defective parts according to inspection results.
2	• Remove torque converter. • Inspect torque converter. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].) (See ATX Workshop Manual.) • Is torque converter okay?	Yes	• Inspect oil cooler pipes for bends, damage or kinks. If okay, overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual.) • If problem remains, replace or overhaul transaxle and repair or replace any defective parts. (See ATX Workshop Manual.)
		No	Replace torque converter.
3	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.25 ENGINE STALLS WHEN DRIVING AT SLOW SPEED OR STOPPING [JA5A-EL]

C6U050319090W65

25	Engine stalls when driving at slow speeds or stopping
DESCRIPTION	• Engine stalls when brake pedal is depressed while driving at low speed or stopping.
POSSIBLE CAUSE	• The malfunction is on engine control side (e.g. Fuel injection control, electronic controlled throttle system) **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Go to symptom troubleshooting No.10 "OW IDLE/STALLS DURING DECELERATION". (See 01–03B–31 NO.10 LOW IDLE/STALLS DURING DECELERATION [AJ].) • Is engine control system okay?	Yes	Go to symptom troubleshooting No.24 "ENGINE STALLS WHEN SHIFTED TO D RANGE, OR IN R POSITION".
		No	Repair or replace any defective parts according to inspection results.
2	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.26 STARTER DOES NOT WORK [JA5A-EL]

C6U050319090W66

26	Starter does not work
DESCRIPTION	• Starter does not work even when in P or N position.
POSSIBLE CAUSE	• Selector lever misadjustment • TR switch misadjustment • Open or short circuit in TR switch

NO.27 GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE [JA5A-EL]

C6U050319090W67

27	Gear position indicator light does not illuminate in M range
DESCRIPTION	• Gear position indicator light in instrument cluster does not illuminate in M range and ignition switch at ON.
POSSIBLE CAUSE	• M range switch, gear position indicator light or related wiring harness malfunction **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Are other indicator lights illuminated with ignition switch at ON?	Yes	Go to the next step.
		No	Inspect meter fuse.
2	• Inspect voltage at TCM terminal 1AA. (See 05–17B–23 TCM INSPECTION [JA5A-EL].) • Is voltage okay?	Yes	Inspect instrument cluster.
		No	Inspect M range switch. If M range switch is okay, inspect for continuity between M range switch and TCM terminal 1AA.
3	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.28 GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS [JA5A-EL]

C6U050319090W68

28	Gear position indicator light illuminates when in D range or P, N, R positions
DESCRIPTION	• Gear position indicator light in instrument cluster illuminates in D range or P, N, R position and ignition switch at ON.
POSSIBLE CAUSE	• M range switch or related wiring harness malfunction **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05–03B–3 BASIC INSPECTION [JA5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Inspect voltage at TCM terminal 1AA. (See 05–17B–23 TCM INSPECTION [JA5A-EL].) • Is voltage okay?	Yes	Inspect instrument cluster.
		No	Inspect M range switch. If M range switch is okay, inspect for continuity between M range switch and TCM terminal 1AA.
2	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle repaired, troubleshooting completed. • If vehicle not repaired or additional diagnostic information not available, replace TCM.		

NO.29 DOES NOT SHIFT UP IN M RANGE [JA5A-EL]

C6U050319090W69

29	No shift up in M range
DESCRIPTION	• Gear position indicator light in dashboard illuminates, but vehicle does not upshift when selector lever is pushed to "+" side.
POSSIBLE CAUSE	• Up switch or related harness malfunction

NO.30 DOES NOT SHIFT DOWN IN M RANGE [JA5A-EL]

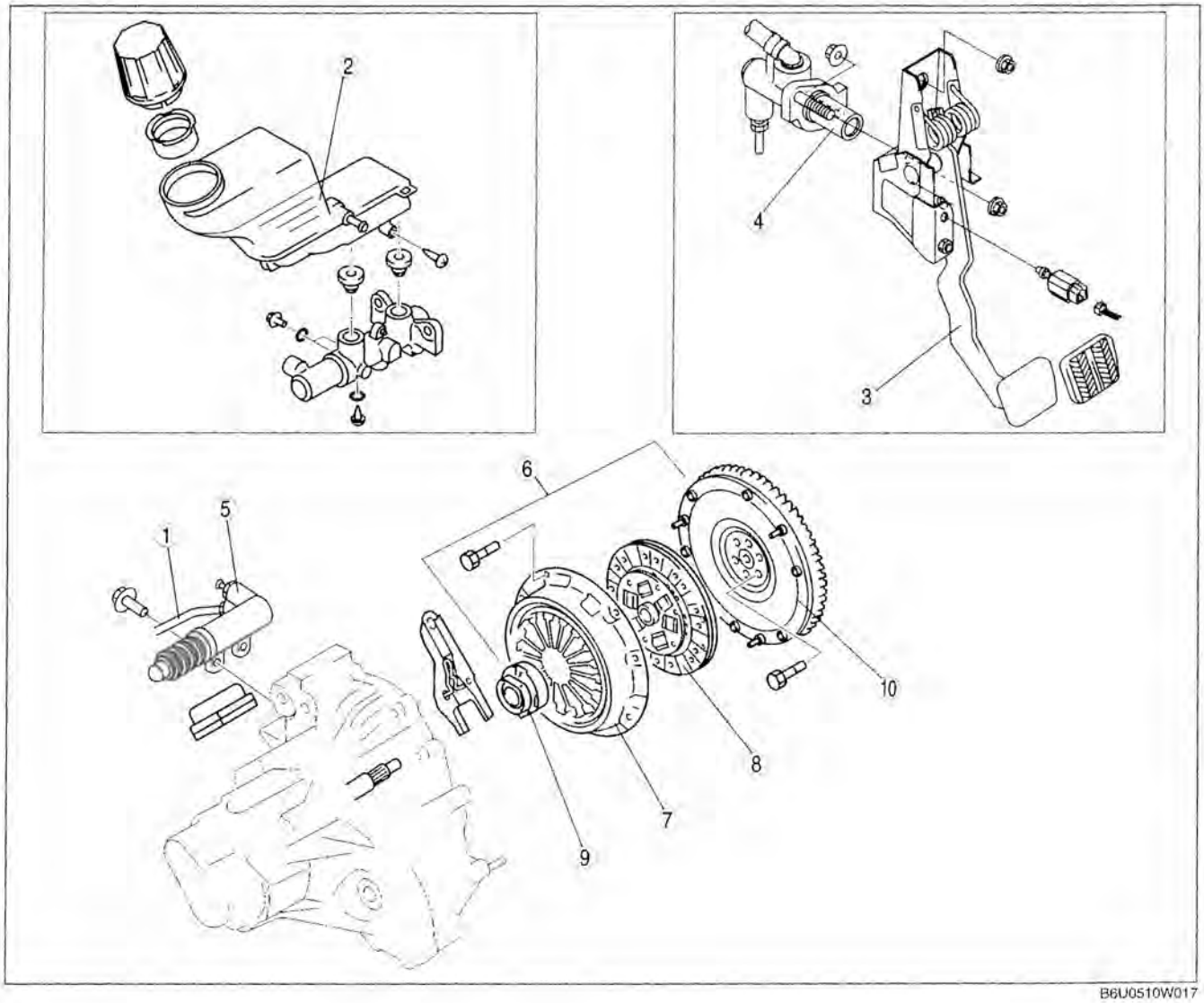
C6U050319090W70

30	No shift up in M range
DESCRIPTION	• Gear position indicator light in dashboard illuminates, but vehicle does not downshift when selector lever is pushed lever to "–" side.
POSSIBLE CAUSE	• Down switch or related harness malfunction

05–10 CLUTCH

CLUTCH LOCATION INDEX

C6U051016003W01



B6U0510W017

1	Clutch pipe (See 05–10–3 Clutch Pipe Removal/Installation)
2	Clutch fluid (See 05–10–3 CLUTCH FLUID INSPECTION) (See 05–10–3 CLUTCH FLUID REPLACEMENT)
3	Clutch pedal (See 05–10–4 CLUTCH PEDAL INSPECTION) (See 05–10–5 CLUTCH PEDAL ADJUSTMENT) (See 05–10–6 CLUTCH PEDAL REMOVAL/INSTALLATION)
4	Clutch master cylinder (See 05–10–7 CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION) (See 05–10–8 CLUTCH MASTER CYLINDER DISASSEMBLY/ASSEMBLY)

5	Clutch release cylinder (See 05–10–8 CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION) (See 05–10–11 CLUTCH RELEASE CYLINDER DISASSEMBLY/ASSEMBLY)
6	Clutch unit (See 05–10–12 CLUTCH UNIT REMOVAL/INSTALLATION)
7	Clutch cover (See 05–10–17 CLUTCH COVER INSPECTION)
8	Clutch disc (See 05–10–17 CLUTCH DISC INSPECTION)
9	Clutch release collar (See 05–10–18 CLUTCH RELEASE COLLAR INSPECTION)
10	Flywheel (See 05–10–18 FLYWHEEL INSPECTION)

GENERAL PROCEDURE

C6U051016003W02

Clutch Pipe Removal/Installation

Note
- A common reservoir is used for the clutch and brake system fluid.

1. If clutch pipes have been disconnected any time during the procedure, add clutch fluid (brake fluid), bleed the air, and inspect for leakage after the procedure has been completed.
2. Remove the clutch pipe using the **SST** (49 0259 770B). Install the clutch pipe using torque wrench **SST** combination. (See 00–00–17 Torque Formulas.)

CLUTCH FLUID INSPECTION

C6U051016010W01

Note
- A common reservoir is used for the clutch and brake system fluid.

1. Verify that the fluid is between the MIN mark and the MAX mark.
   - If necessary, add the fluid.

CLUTCH FLUID REPLACEMENT

C6U051016010W02

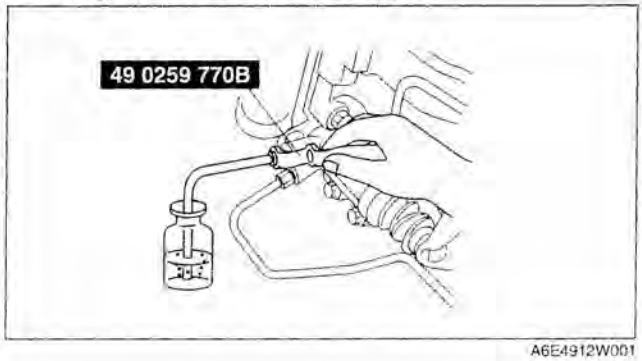
Caution
- **Be careful not to spill clutch fluid on a painted surface. If this should happen, wash it off immediately.**

Note
- Do not mix different brands of clutch fluid.
- Do not reuse the clutch fluid that was drained out.

1. Remove the under cover.
2. Draw the fluid from the reservoir with a suction pump.
3. Remove the bleeder cap from the clutch release cylinder and attach a vinyl hose to the bleeder plug.
4. Place the other end of the vinyl hose into a container.
5. Slowly pump the clutch pedal several times.
6. With the clutch pedal depressed, loosen the bleeder screw using the **SST** to let fluid escape.
7. Tighten the bleeder screw using the **SST** to stop the fluid.
8. Repeat Steps 4 and 5 until only clean fluid is seen.
9. Tighten the bleeder plug.

Tightening torque
5.9—8.8 N·m {61—89 kgf·cm, 53—77 in·lbf}

10. Add fluid to the MAX mark.
11. Install the under cover.
12. Verify the correct clutch operation.



A6E4912W001

CLUTCH PEDAL INSPECTION

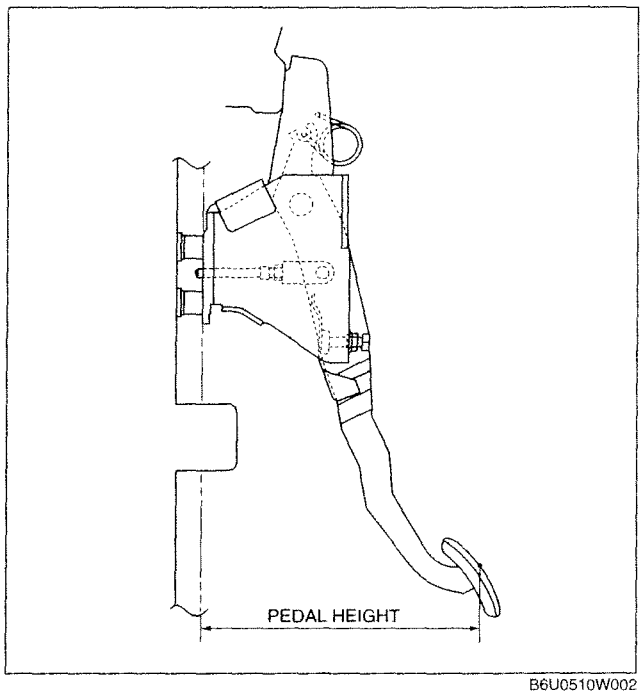
C6U051041030W01

Clutch Pedal Height Inspection

1. Measure the distance from the upper surface of the pedal pad.

   Pedal height (Reference Value)
   210—216 mm {8.27—8.50 in}

2. Adjust the height if necessary. (See 05–10–5 Clutch Pedal Height.)



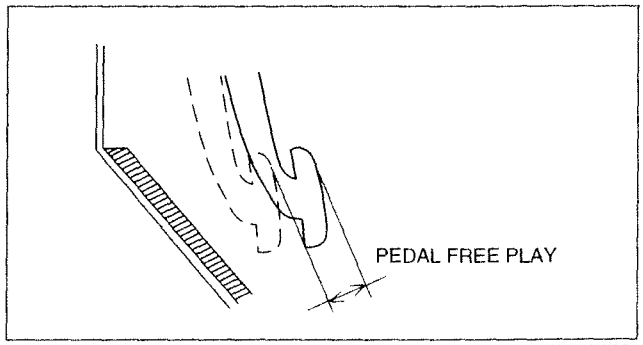
B6U0510W002

Clutch Pedal Free Play Inspection

1. Depress the clutch pedal by hand until clutch resistance is felt.

   Pedal free play
   1.0—3.0 mm {0.04—0.11 in}

2. Adjust the free play if necessary. (See 05–10–5 Clutch Pedal Free Play.)



B6U0510W003

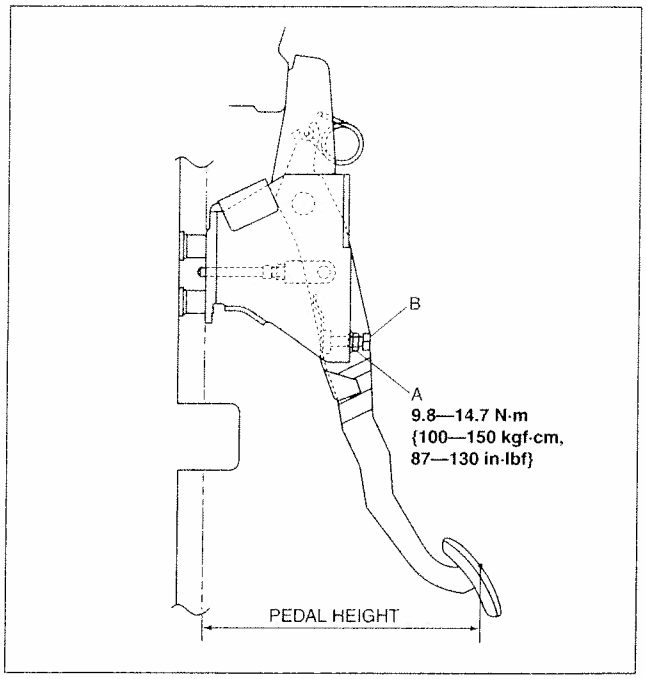
CLUTCH PEDAL ADJUSTMENT

C6U051041030W02

Clutch Pedal Height

1. Measure the distance from the upper surface of the pedal pad.
   - If not as specified, adjust the pedal height by turning adjustment bolt B and locknut A.

Pedal height (Reference value)
210—216 mm {8.27—8.50 in}



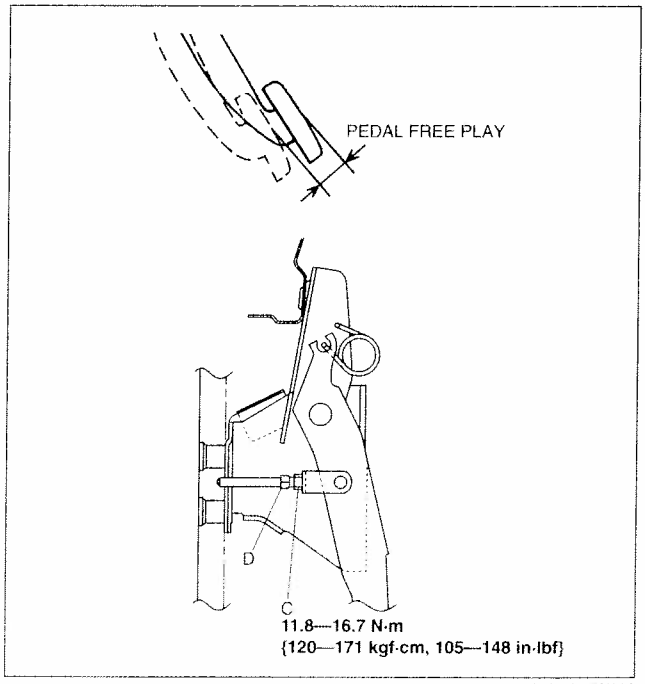
A6E4914W001

Clutch Pedal Free Play

1. Depress the clutch pedal by hand until clutch resistance is felt, and measure the pedal free play.
   - If not as specified, adjust the pedal free play by loosening locknut C and turning push rod D as necessary.

Pedal free play
1.0—3.0 mm {0.04—0.11 in}

Push rod free play at clutch pedal
0.1—0.5 mm {0.004—0.020 in} (Reference value)



A6E4914W002

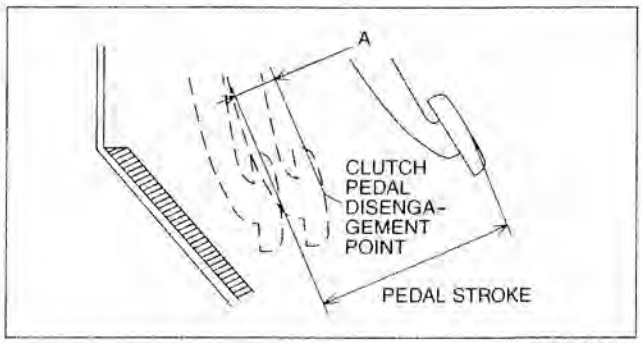
Clutch Pedal Disengagement Point

1. Apply the parking brake and fix the front and rear of the wheels with the wheel chocks.
2. Start the engine at idle.
3. Without depressing the clutch pedal, move the shift lever slowly to the reverse position.
4. Hold the lever when the gear noise is heard.
5. Depress the clutch pedal slowly.
6. Hold the pedal when the gear noise stops (clutch pedal disengagement point).
7. Measure distance A (the distance from the clutch pedal disengagement point to the fully depressed position) and the pedal stroke.

8. Verify that they are within specification.
   - If distance A or the pedal stroke is out of specification, adjust the pedal height or the clutch pedal free play to specification.

Clutch pedal disengagement stroke
Minimum: 20 mm {0.79 in} (Reference value)

Pedal stroke
140 mm {5.51 in} (Reference value)

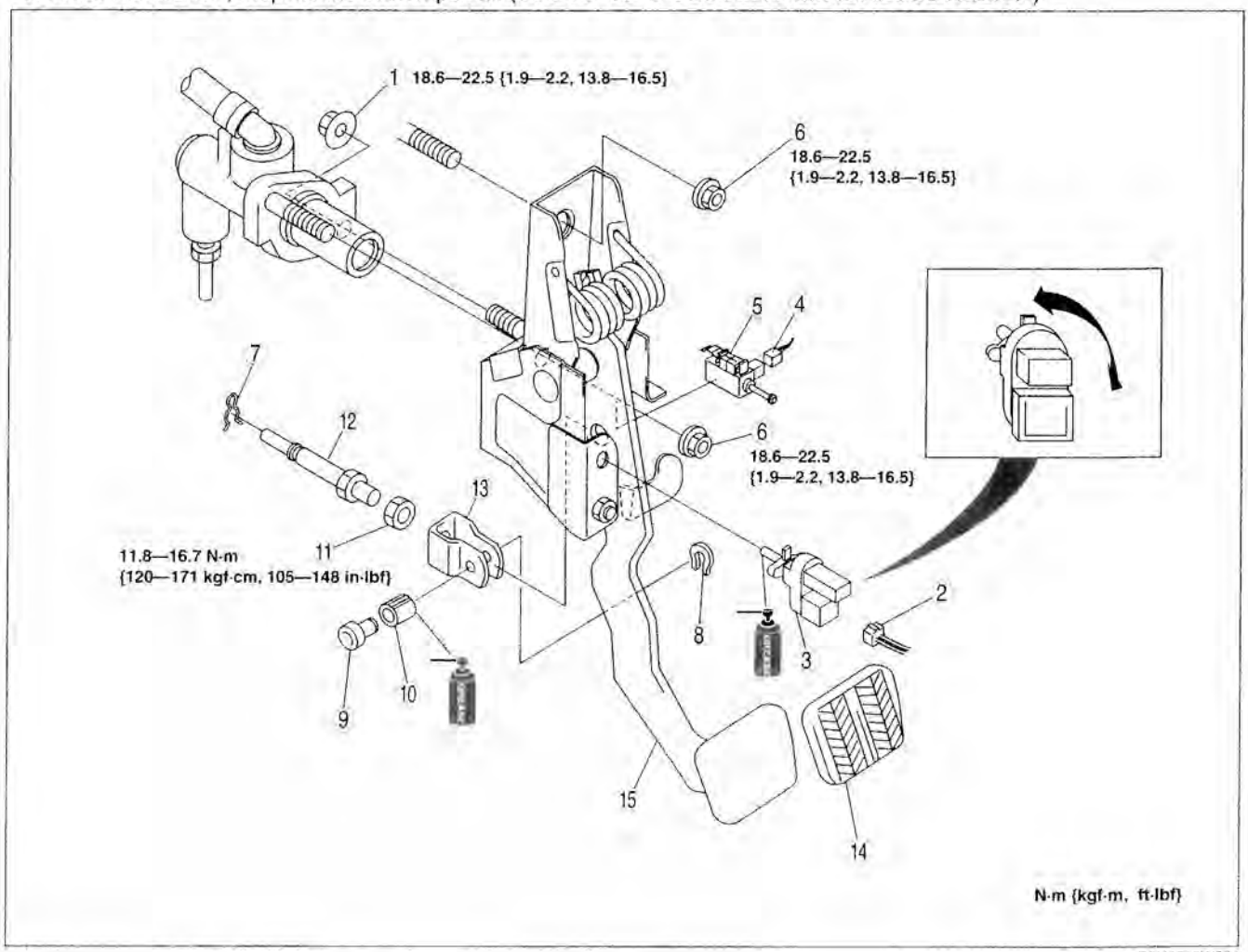


B6U0510W012

CLUTCH PEDAL REMOVAL/INSTALLATION

C6U051041030W03

1. Remove the battery and battery tray.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. After installation, inspect the clutch pedal. (See 05–10–5 CLUTCH PEDAL ADJUSTMENT.)



B6U0510W004

1	Nut
2	Clutch switch connector
3	Clutch switch
4	Clutch cut switch connector
5	Starter interlock switch (See 05–10–7 Starter interlock switch Installation Note)
6	Nut
7	Spring

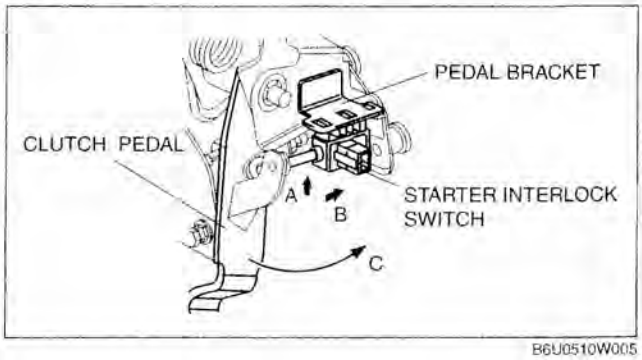
8	E-clip
9	Pin
10	Bushing
11	Nut
12	Push rod
13	Clevis
14	Pedal pad
15	Clutch pedal (See 05–10–7 Clutch Pedal Installation Note)

Clutch Pedal Installation Note

1. After installation, adjust the pedal height and free play. (See 05–10–5 CLUTCH PEDAL ADJUSTMENT.)

Starter interlock switch Installation Note

1. Insert starter interlock switch into hole in pedal bracket in arrow direction A.
2. Slide starter interlock switch pressing it in arrow direction B until locked.
3. Press clutch pedal fully in arrow direction C and adjust terminal of starter interlock switch.

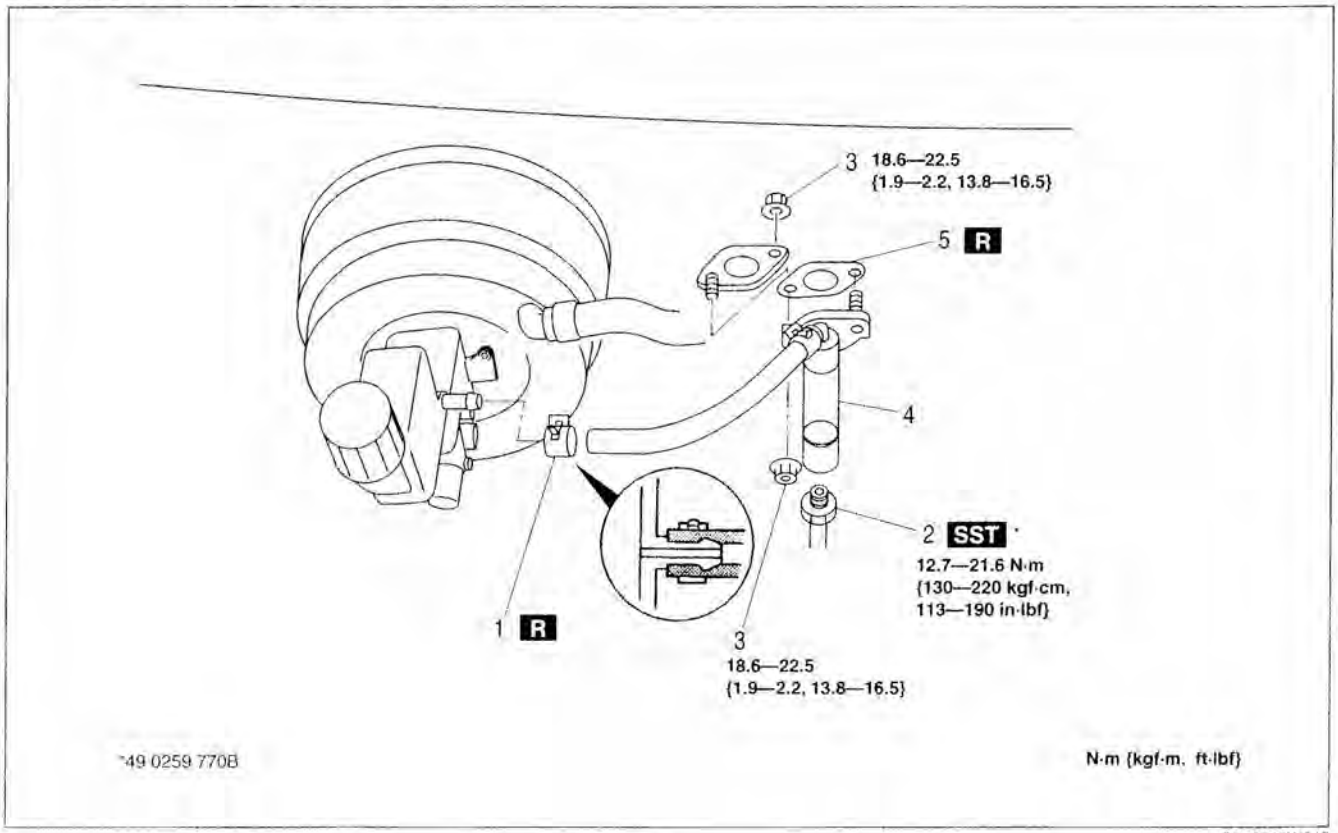


B6U0510W005

CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION

C6U051041990W01

1. Remove the battery and battery tray.
2. Remove in the order indicated in the table.
3. Plug the clutch pipe after removing it to avoid leakage.
4. Install in the reverse order of removal.



B6U0510W013

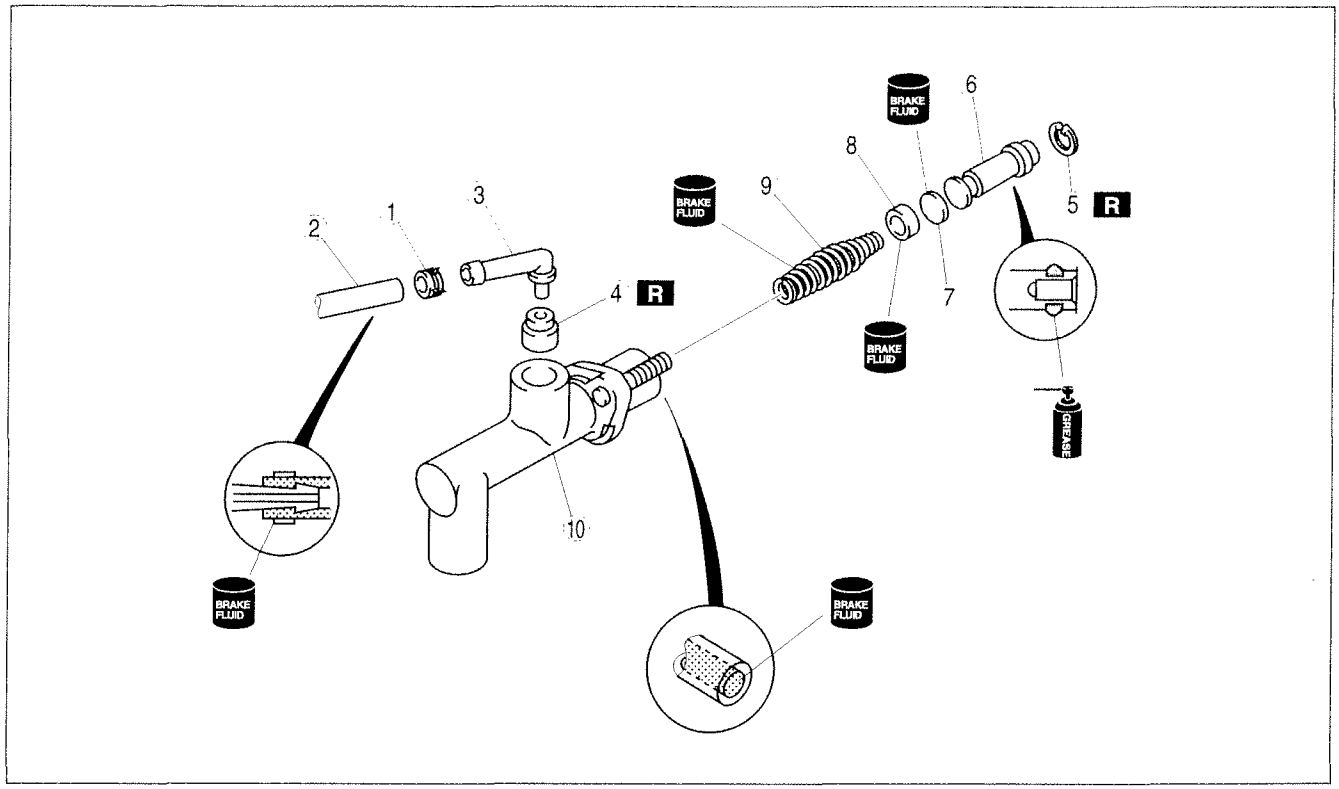
1	Clip
2	Clutch pipe
3	Nut

4	Clutch master cylinder
5	Gasket

CLUTCH MASTER CYLINDER DISASSEMBLY/ASSEMBLY

C6U051041990W02

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



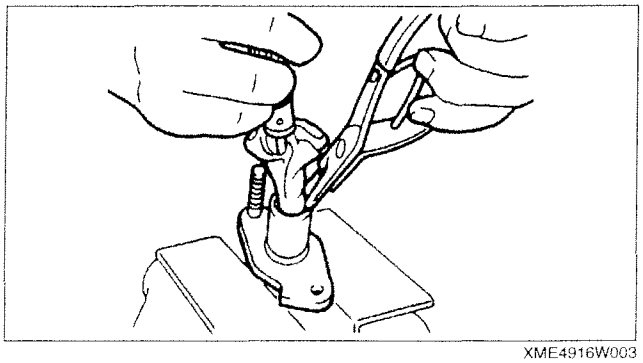
A6E4916W002

1	Clip
2	Hose
3	Joint
4	Bushing
5	Snap ring (See 05–10–8 Snap Ring Disassembly/Assembly Note)

6	Piston and secondary cap component
7	Spacer
8	Primary cap
9	Return spring
10	Clutch master cylinder body

Snap Ring Disassembly/Assembly Note

1. Hold the piston down using a cloth-wrapped pin punch.
   - If disassembling, remove the snap ring; if assembling, install it.



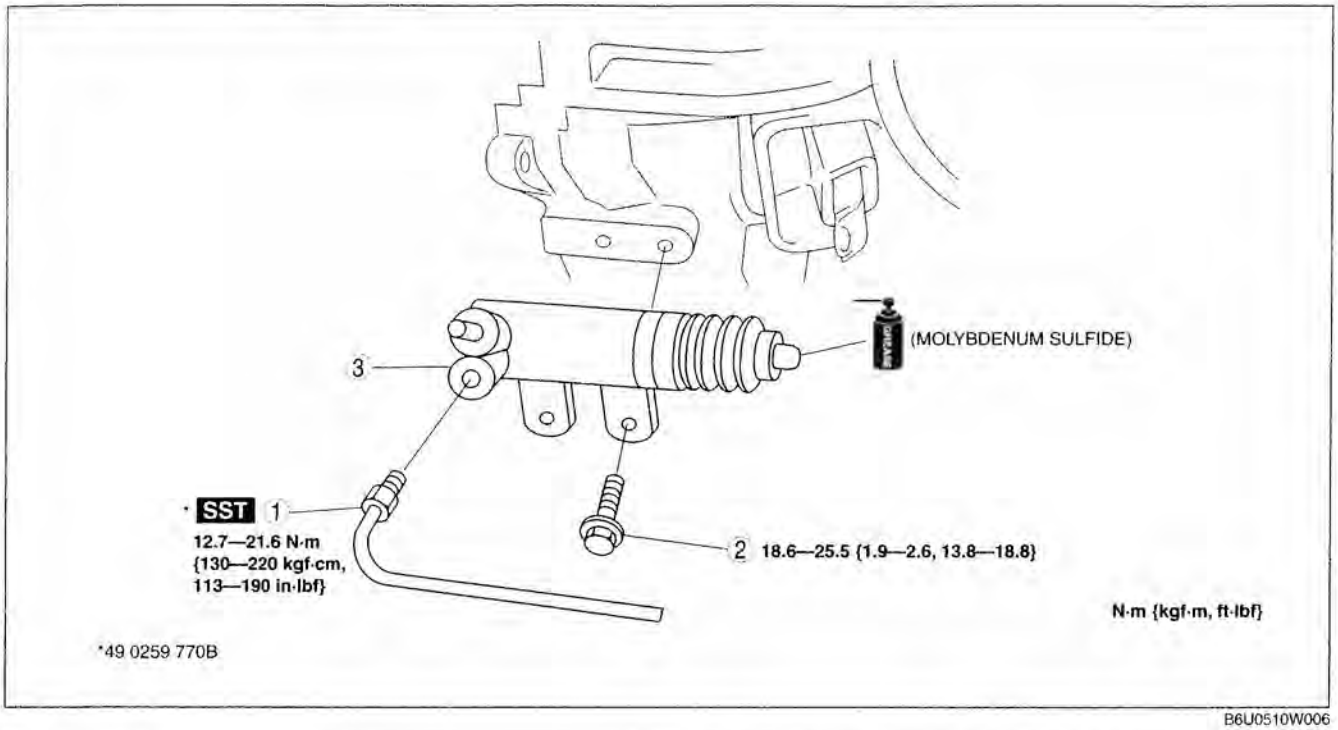
XME4916W003

CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION

C6U051041920W01

1. Remove the under cover.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.

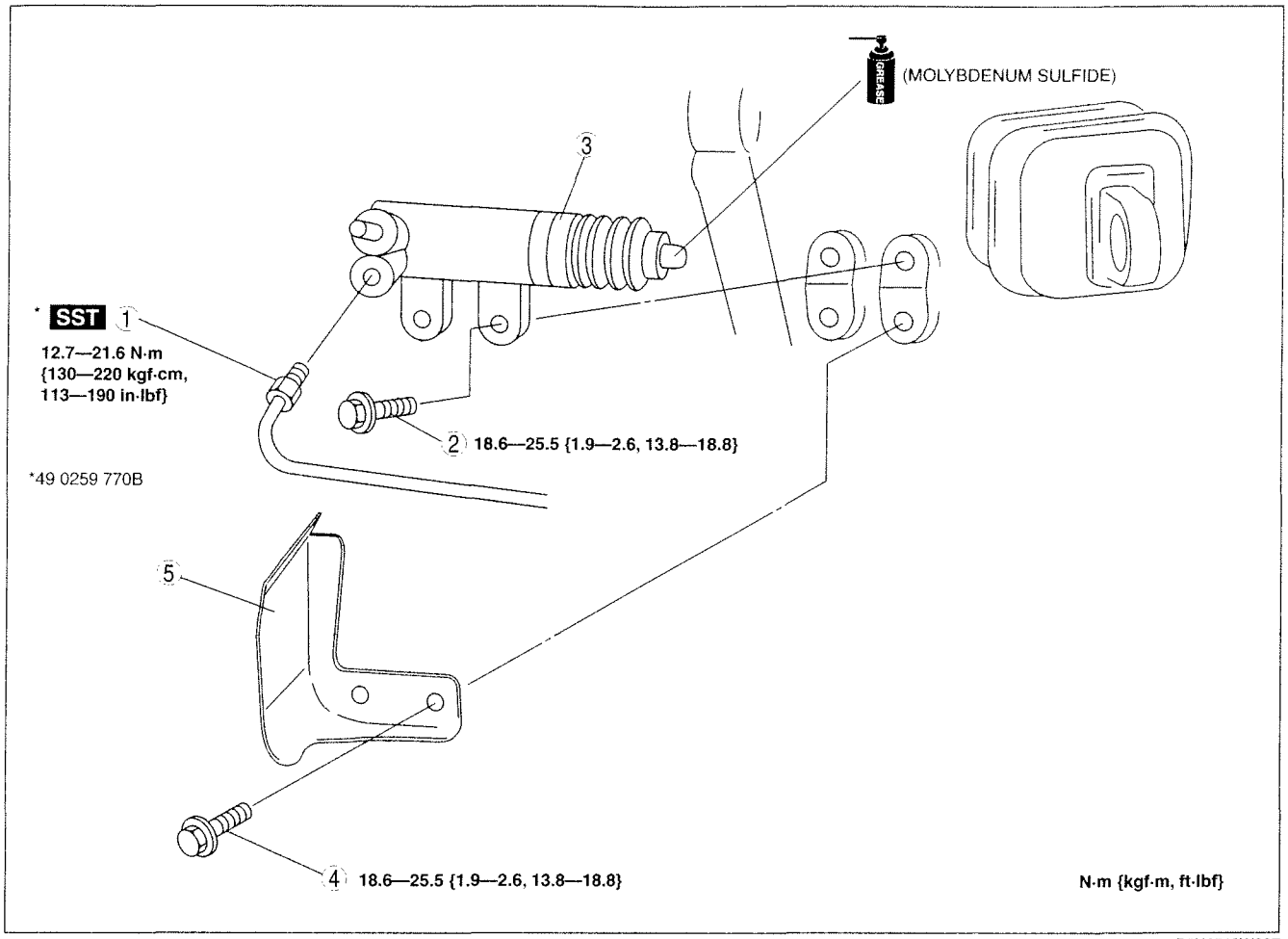
G35M-R manual transaxle models



B6U0510W006

1	Clutch pipe
2	Bolt
3	Clutch release cylinder

A65M-R manual transaxle models



B6U0510W007

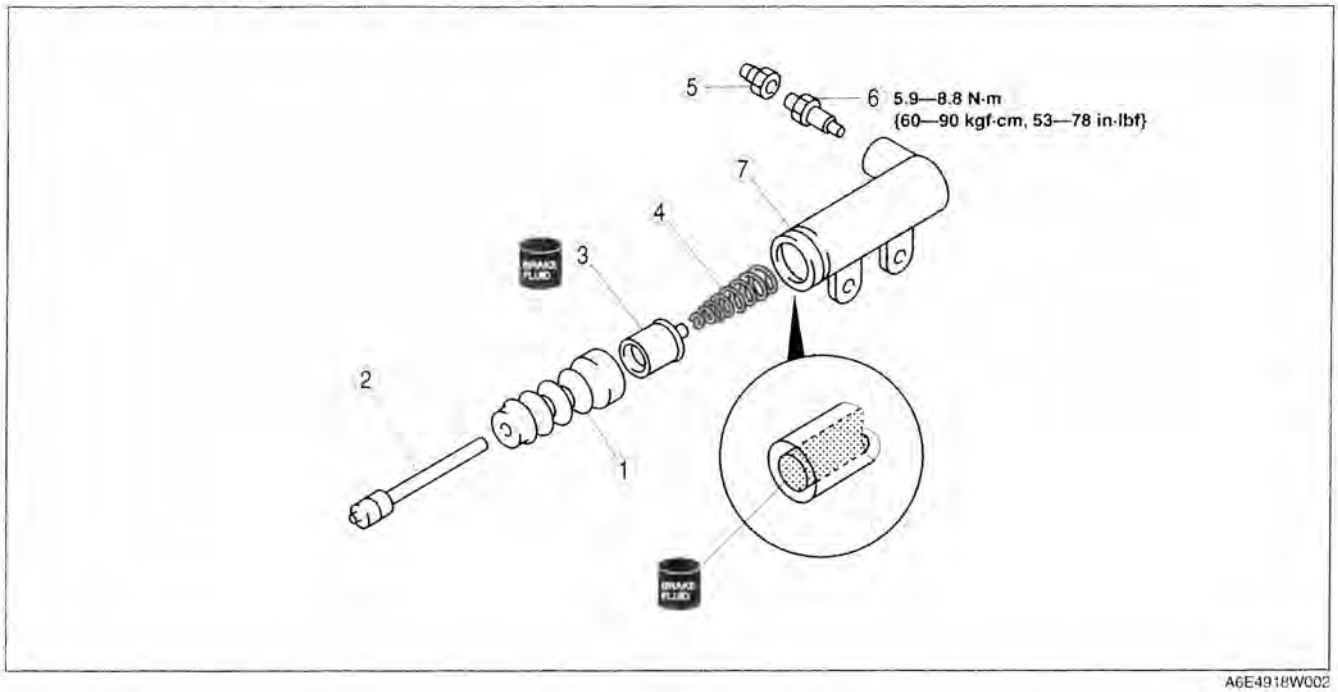
1	Clutch pipe
2	Bolt
3	Clutch release cylinder

4	Bolt
5	Insulator

CLUTCH RELEASE CYLINDER DISASSEMBLY/ASSEMBLY

C6U051041920W02

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



A6E4918W002

1	Boot
2	Push rod
3	Piston and cap
4	Return spring

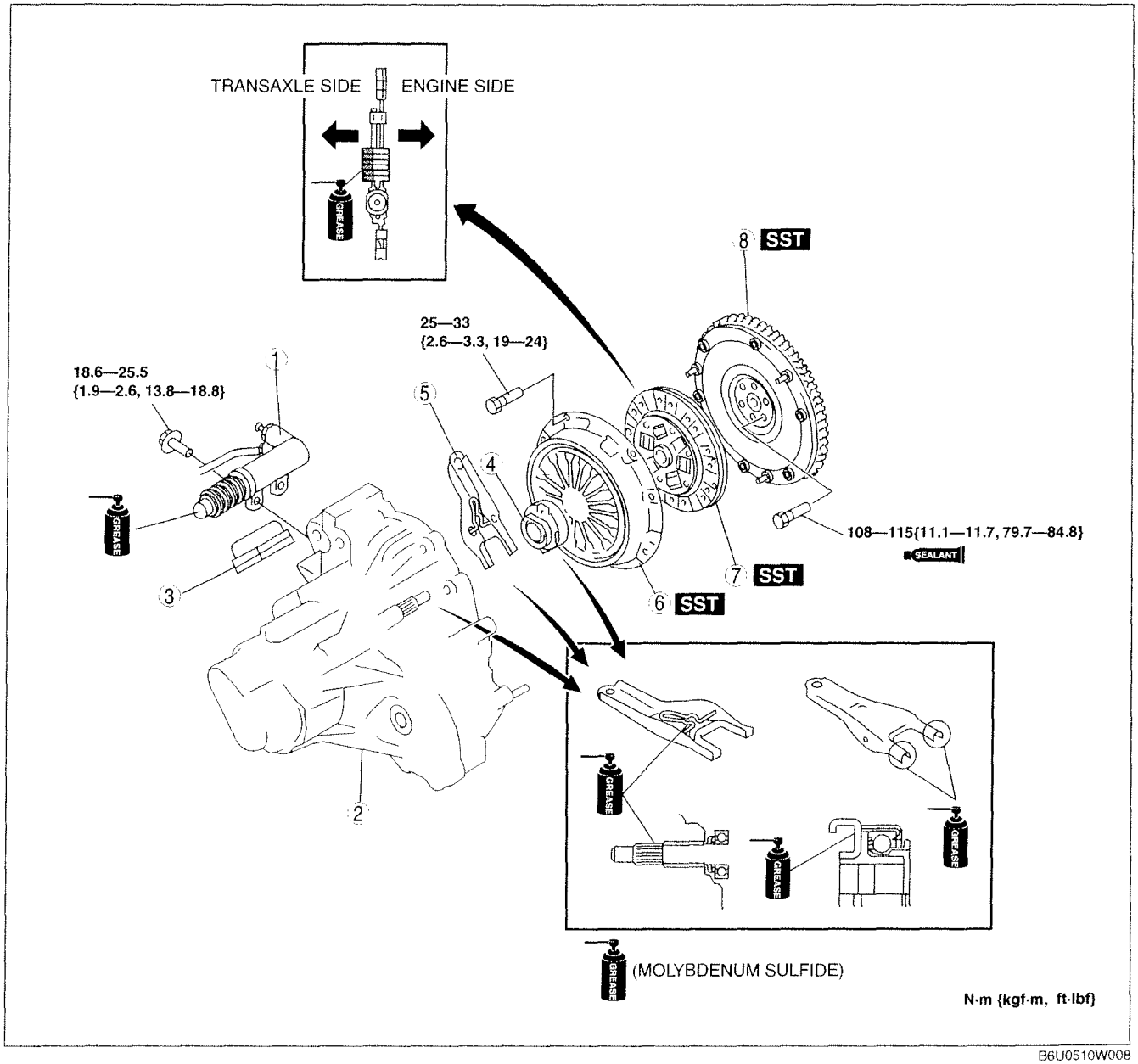
5	Bleeder cap
6	Bleeder screw
7	Release cylinder body

CLUTCH UNIT REMOVAL/INSTALLATION

C6U051016000W01

1. Remove in the order indicated in the table.
2. Install in the reverse order removal.

G35M-R manual transaxle models

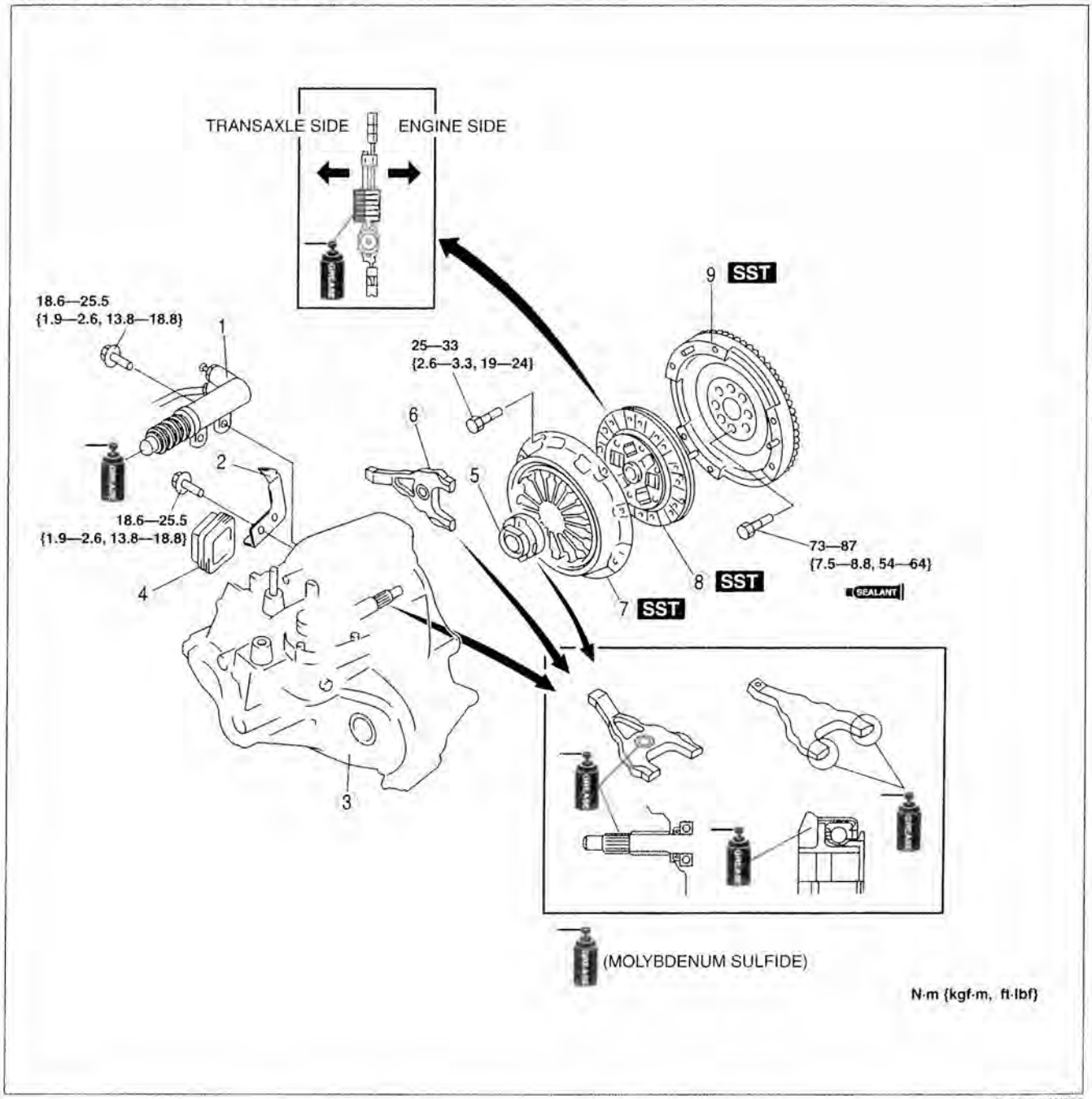


B6U0510W008

1	Clutch release cylinder
2	Manual transaxle (See 05–15A–4 MANUAL TRANSAXLE REMOVAL/INSTALLATION [G35M-R])
3	Boot
4	Clutch release collar
5	Clutch release fork

6	Clutch cover (See 05–10–14 Clutch Cover and Disc Removal Note) (See 05–10–16 Clutch Cover Installation Note)
7	Clutch disc (See 05–10–14 Clutch Cover and Disc Removal Note) (See 05–10–16 Clutch Disc Installation Note)
8	Flywheel (See 05–10–14 Flywheel Removal Note) (See 05–10–15 Flywheel Installation Note)

A65M-R manual transaxle models



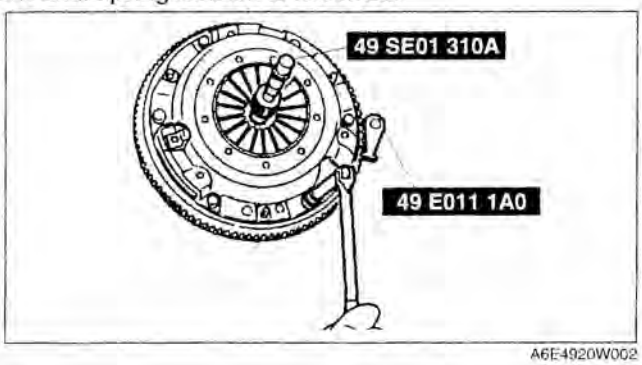
B6U0510W009

1	Clutch release cylinder
2	Insulator
3	Manual transaxle (See 05–15B–5 MANUAL TRANSAXLE REMOVAL/INSTALLATION [A65M-R])
4	Boot
5	Clutch release collar
6	Clutch release fork

7	Clutch cover (See 05–10–14 Clutch Cover and Disc Removal Note) (See 05–10–16 Clutch Cover Installation Note)
8	Clutch disc (See 05–10–14 Clutch Cover and Disc Removal Note) (See 05–10–16 Clutch Disc Installation Note)
9	Flywheel (See 05–10–14 Flywheel Removal Note) (See 05–10–15 Flywheel Installation Note)

Clutch Cover and Disc Removal Note
G35M-R manual transaxle models

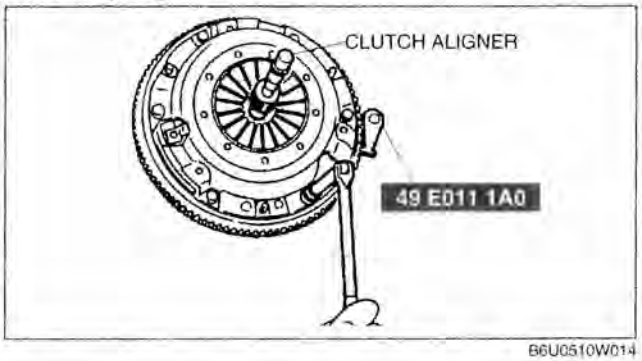
1. Install the **SSTs**.
2. Loosen each bolt one turn at a time in a crisscross pattern until spring tension is released.
3. Remove the clutch cover and disc.



A6E4920W002

A65M-R manual transaxle models

1. Install the clutch aligner and the **SST**.
2. Loosen each bolt one turn at a time in a crisscross pattern until spring tension is released.
3. Remove the clutch cover and disc.

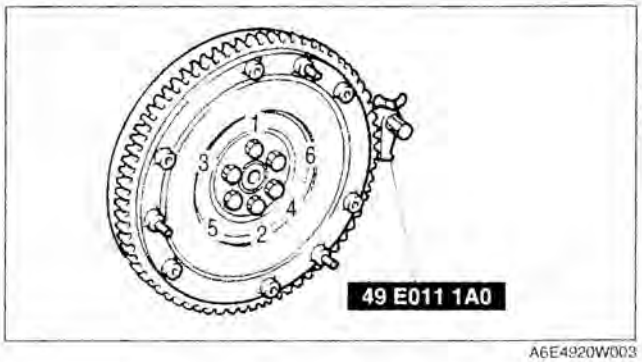


B6U0510W014

Flywheel Removal Note

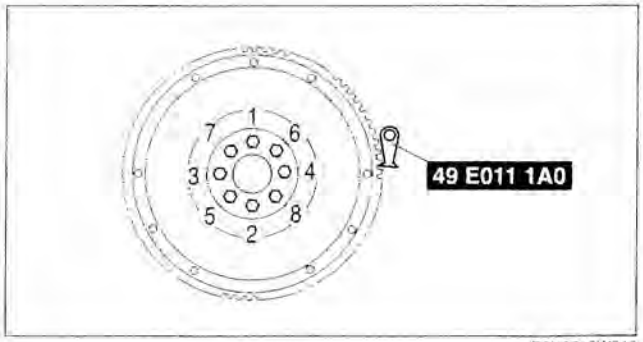
1. Hold the flywheel using the **SST**.
2. Remove the bolts evenly and gradually in a crisscross pattern.
3. Remove the flywheel.

G35M-R manual transaxle models



A6E4920W003

A65M-R manual transaxle models



B6U0510W010

Flywheel Installation Note

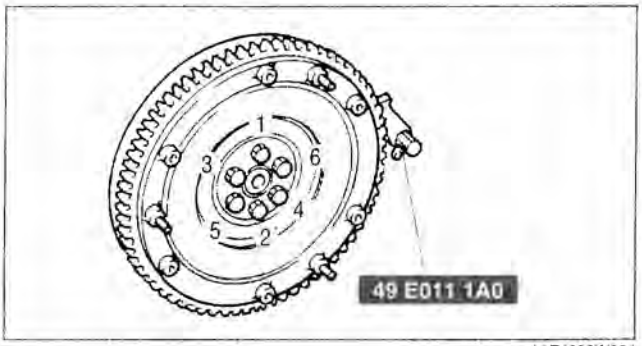
1. Install the flywheel to the crankshaft.
2. When reusing the bolts, clean threads and hole, then apply locking compound to the threads.

Note

- No locking compound is needed when using new bolts.

3. Hand-tighten the flywheel lock bolts.
4. Install the **SST** to the flywheel.

G35M-R manual transaxle models



A6E4920W004

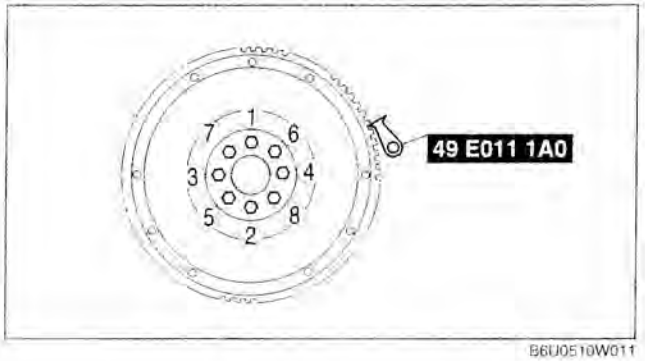
A65M-R manual transaxle models

5. Gradually tighten the flywheel lock bolts in a crisscross pattern.

Tightening torque

G35M-R manual transaxle models
108—115 N·m
{11.1—11.7 kgf·m, 79.7—84.8 ft·lbf}

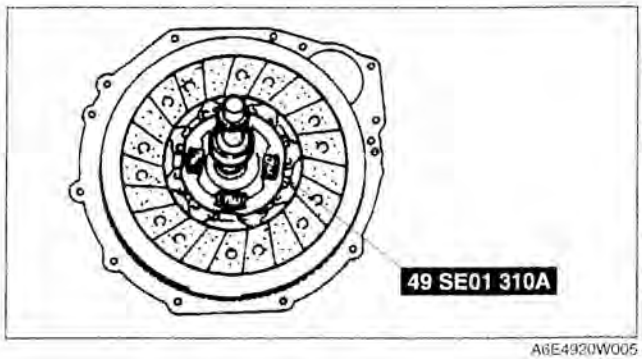
A65M-R manual transaxle models
73—87 N·m {7.5—8.8 kgf·m, 54—64 ft·lbf}



B6U0510W011

Clutch Disc Installation Note
G35M-R manual transaxle models

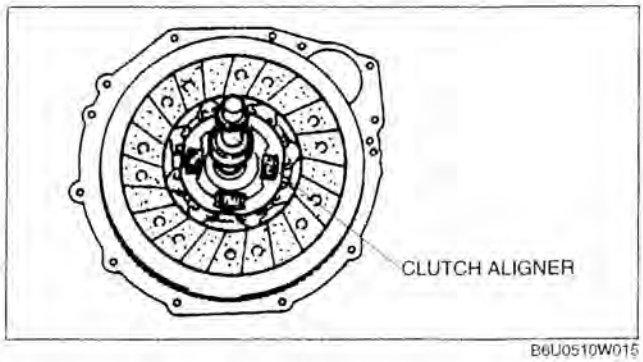
1. Hold the clutch disc position using the **SST**.



A6E4920W005

A65M-R manual transaxle models

1. Hold the clutch disc position using the clutch aligner.

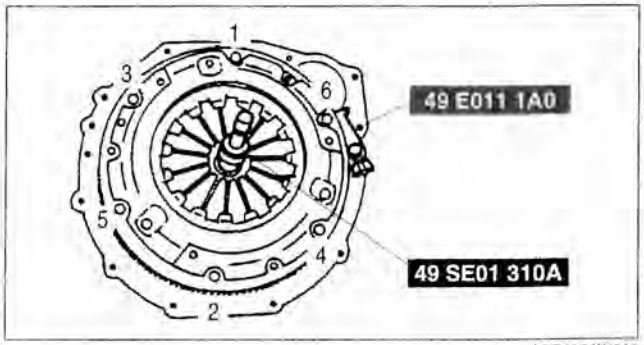


B6U0510W015

Clutch Cover Installation Note
G35M-R manual transaxle models

1. Install the **SSTs**.
2. Tighten the bolts evenly and gradually in a crisscross pattern.

   Tightening torque
   25—33 N·m {2.6—3.3 kgf·m, 19—24 ft·lbf}

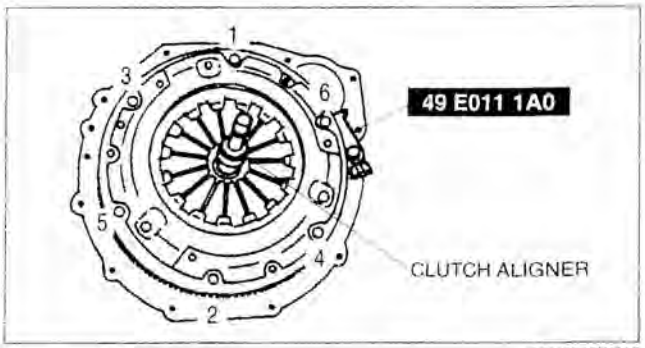


A6E4920W006

A65M-R manual transaxle models

1. Install the clutch aligner and the **SST**.
2. Tighten the bolts evenly and gradually in a crisscross pattern.

   Tightening torque
   25—33 N·m {2.6—3.3 kgf·m, 19—24 ft·lbf}



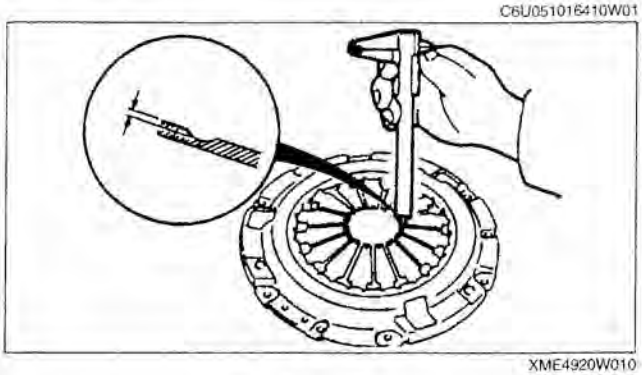
B6U0510W016

CLUTCH COVER INSPECTION

1. Measure the wear of the diaphragm spring fingers.
   - If not as specified, replace the clutch cover.

   Depth
   0.6 mm {0.024 in} max.

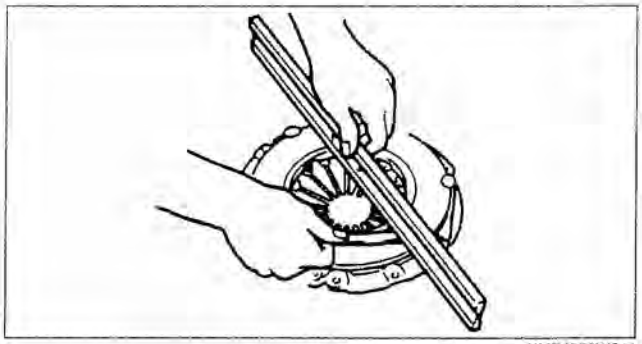
C6U051016410W01



XME4920W010

2. Measure the flatness of the pressure plate with a straight edge and a feeler gauge.
   - If not as specified, replace the clutch cover.

   Clearance
   0.3 mm {0.012 in} max.

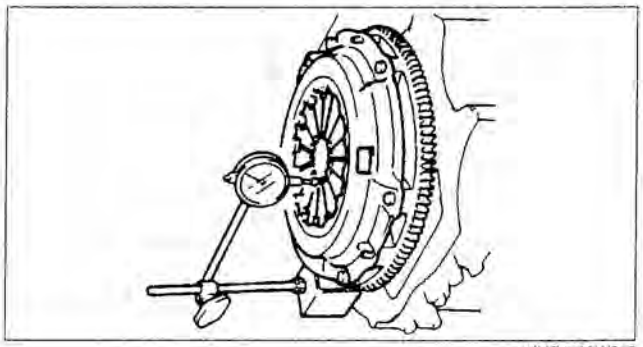


XME4920W011

3. When checking the diaphragm spring fingers, mount a dial indicator on the cylinder block.

4. Rotate the flywheel and check for misaligned diaphragm spring fingers.
   - If not as specified, replace the clutch cover.

   Misalignment
   0.6 mm {0.024 in} max.



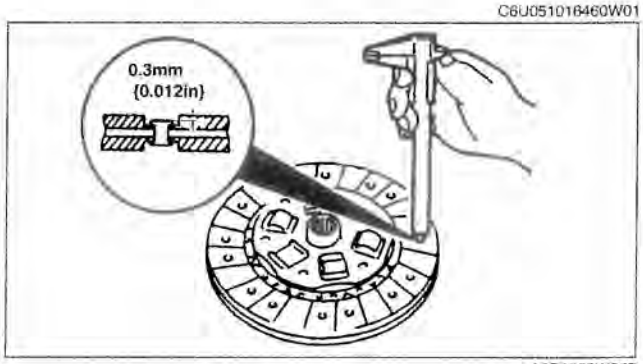
XME4920W012

CLUTCH DISC INSPECTION

1. Using vernier calipers, measure the thickness of the lining at a rivet head on both sides.
   - Replace the clutch disc if its thickness is less than the minimum.

   Thickness
   0.3 mm {0.012 in} min.

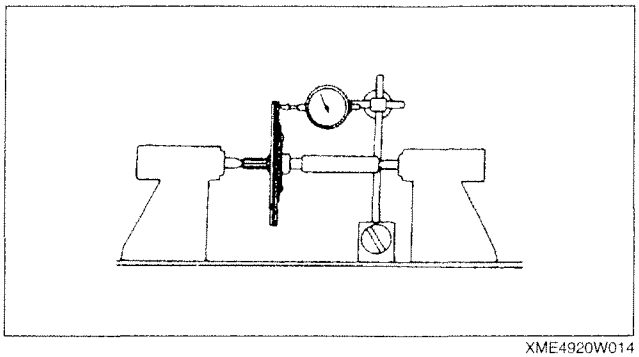
C6U051016460W01



A6E4920W007

2. Measure the clutch disc runout using a dial indicator.
   - If the runout is excessive, replace the clutch disc.

Runout
0.7 mm {0.028 in} max.



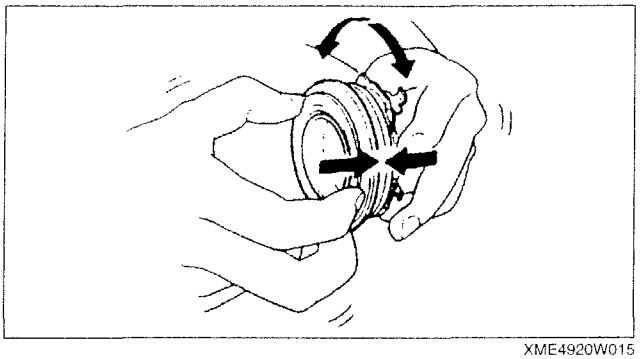
XME4920W014

CLUTCH RELEASE COLLAR INSPECTION

C6U051016510W01

Caution
- **Cleaning the clutch release collar with cleaning fluids or a steam cleaner can wash the grease out of the sealed bearing.**

1. Turn the collar while applying force in the axial direction.
   - If the collar sticks or has excessive resistance, replace the clutch release collar.



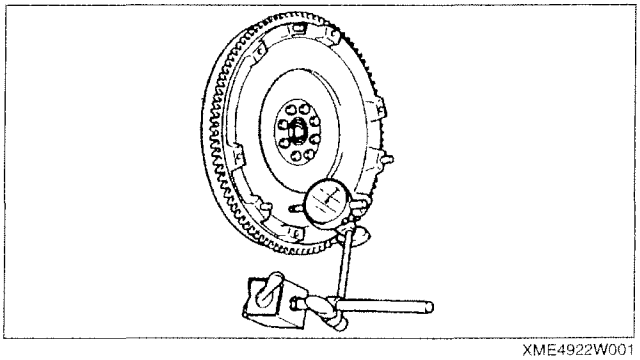
XME4920W015

FLYWHEEL INSPECTION

C6U051011500W01

1. Install a dial gauge on the cylinder block.
2. Measure the flywheel runout using a dial gauge.
   - If the runout is excessive, replace the flywheel.

Runout
G35M-R manual transaxle models
0.1 mm {0.004 in} max.
A65M-R manual transaxle models
0.05 mm {0.002 in} max.

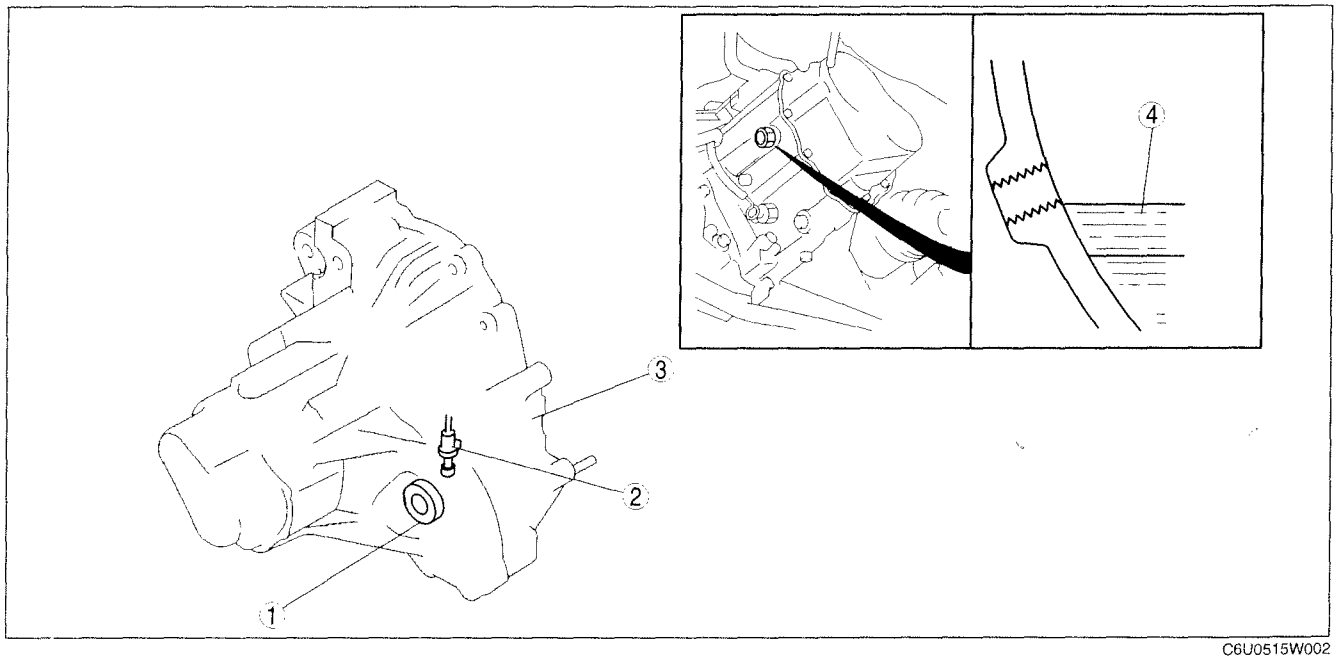


XME4922W001

05–15A MANUAL TRANSAXLE [G35M-R]

MANUAL TRANSAXLE LOCATION INDEX [G35M-R]

C6U051501029W03



C6U0515W002

1	Oil seal (differential) (See 05–15A–2 OIL SEAL (DIFFERENTIAL) REPLACEMENT [G35M-R])
2	Vehicle speedometer sensor (See 05–15A–3 VEHICLE SPEEDOMETER SENSOR REMOVAL/INSTALLATION (WITHOUT ABS) [G35M-R]) (See 05–15A–3 VEHICLE SPEEDOMETER SENSOR INSPECTION (WITHOUT ABS) [G35M-R])

3	Manual transaxle (See 05–15A–4 MANUAL TRANSAXLE REMOVAL/INSTALLATION [G35M-R])
4	Transaxle oil (See 05–15A–2 TRANSAXLE OIL INSPECTION [G35M-R]) (See 05–15A–2 TRANSAXLE OIL REPLACEMENT [G35M-R])

TRANSAXLE OIL INSPECTION [G35M-R]

C6U051527001W03

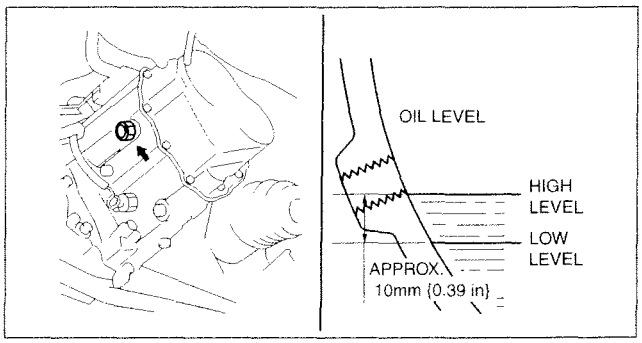
1. Park the vehicle on level ground.
2. Remove the oil level plug and washer.
3. Verify that the oil is near the brim of the plug port.
   - If the oil level is lower than the low level, add the specified amount and type of oil through the oil level plug hole.

   Specified oil grade
   API Service GL-4 or GL-5

   Specified oil viscosity
   All-season: SAE 75W-90
   Above 10 °C {50 °F}: SAE 80W-90

4. Install a new washer and the oil level plug.

   Tightening torque
   40—58 N·m {4.1—5.9 kgf·m, 30—42 ft·lbf}



B6U0515W102

TRANSAXLE OIL REPLACEMENT [G35M-R]

C6U051527001W04

1. Remove the drain plug with the washer.
2. Drain the oil into a suitable container.
3. Install a new washer and the drain plug.

   Tightening torque
   40—58 N·m {4.1—5.9 kgf·m, 30—42 ft·lbf}

4. Remove the oil level plug with washer and add the specified amount and type of oil through the oil level plug hole until the level reaches the bottom of the oil level plug hole.

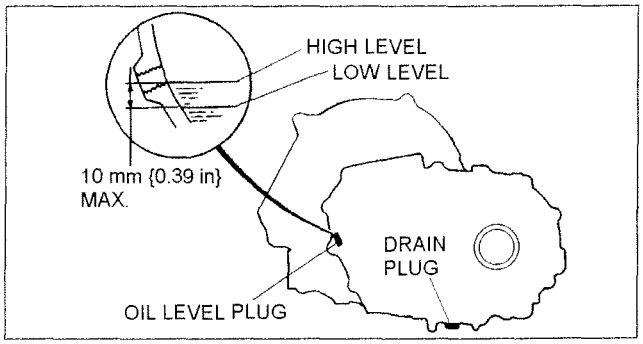
   Specified oil grade
   API Service GL-4 or GL-5

   Specified oil viscosity
   All-season: SAE 75W-90
   Above 10 °C {50 °F}: SAE 80W-90

   Capacity (approximate quantity)
   2.87 L {3.03 US qt, 2.53 Imp qt}

5. Install a new washer and the oil level plug.

   Tightening torque
   40—58 N·m {4.1—5.9 kgf·m, 30—42 ft·lbf}



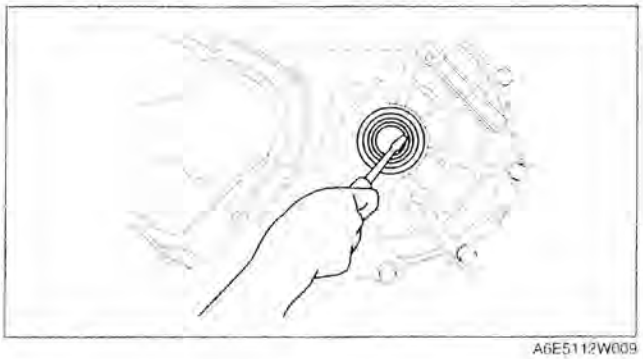
A6A5112W001

OIL SEAL (DIFFERENTIAL) REPLACEMENT [G35M-R]

C6U051527238W02

1. On level ground, jack up the vehicle and support it evenly on safety stands.
2. Drain the oil from the transaxle.
3. Remove the front wheels and splash shields.
4. Separate the drive shaft and joint shaft from the transaxle. (See 03–13–12 DRIVE SHAFT REMOVAL/INSTALLATION [L3].) (See 03–13–3 JOINT SHAFT REMOVAL/INSTALLATION [L3].)

5. Remove the oil seals using a screwdriver.



A6E5112W009

6. Using the **SST** and a hammer, tap each new oil seal in evenly until the **SST** contacts the transaxle case.
7. Coat the lip of each oil seal with transaxle oil.
8. Insert the drive shaft and joint shaft to the transaxle. (See 03–13–12 DRIVE SHAFT REMOVAL/INSTALLATION [L3].) (See 03–13–3 JOINT SHAFT REMOVAL/INSTALLATION [L3].)
9. Install the wheels and splash shields.
10. Add the specified amount and type of oil. (See 05–15A–2 TRANSAXLE OIL REPLACEMENT [G35M-R].)

A6E5112W001

VEHICLE SPEEDOMETER SENSOR REMOVAL/INSTALLATION (WITHOUT ABS) [G35M-R]

C6U051519200W06

1. Disconnect the negative battery cable.
2. Remove the battery and battery tray.
3. Remove the under cover.
4. Disconnect the vehicle speedometer sensor connector.
5. Remove the vehicle speedometer sensor.
6. Apply transmission oil to a new O-ring and install it on a vehicle speedometer sensor.
7. Install the vehicle speedometer sensor.

Tightening torque
7.8—11.3 N·m
{80—115 kgf·cm, 69.5—99.8 in·lbf}

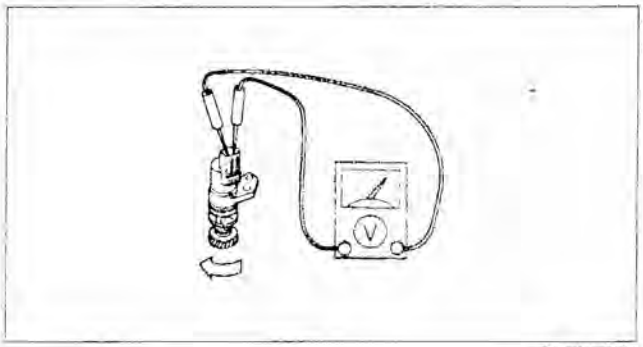
8. Connect the vehicle speedometer sensor connector.
9. Install the under cover.
10. Install the battery and battery tray.
11. Connect the negative battery cable.

VEHICLE SPEEDOMETER SENSOR INSPECTION (WITHOUT ABS) [G35M-R]

C6U051519200W07

1. Remove the vehicle speedometer sensor.
2. Measure voltage (AC range) between terminals of the vehicle speedometer sensor while the gear is turning.

Meter needle	Action
Moves slightly under **5 V** (AC range)	Repair wiring harness between instrument cluster and vehicle speedometer sensor.
Does not move	Replace vehicle speedometer sensor.



W6U515WA4

3. Install the vehicle speedometer sensor.

MANUAL TRANSAXLE REMOVAL/INSTALLATION [G35M-R]

C6U051501029W04

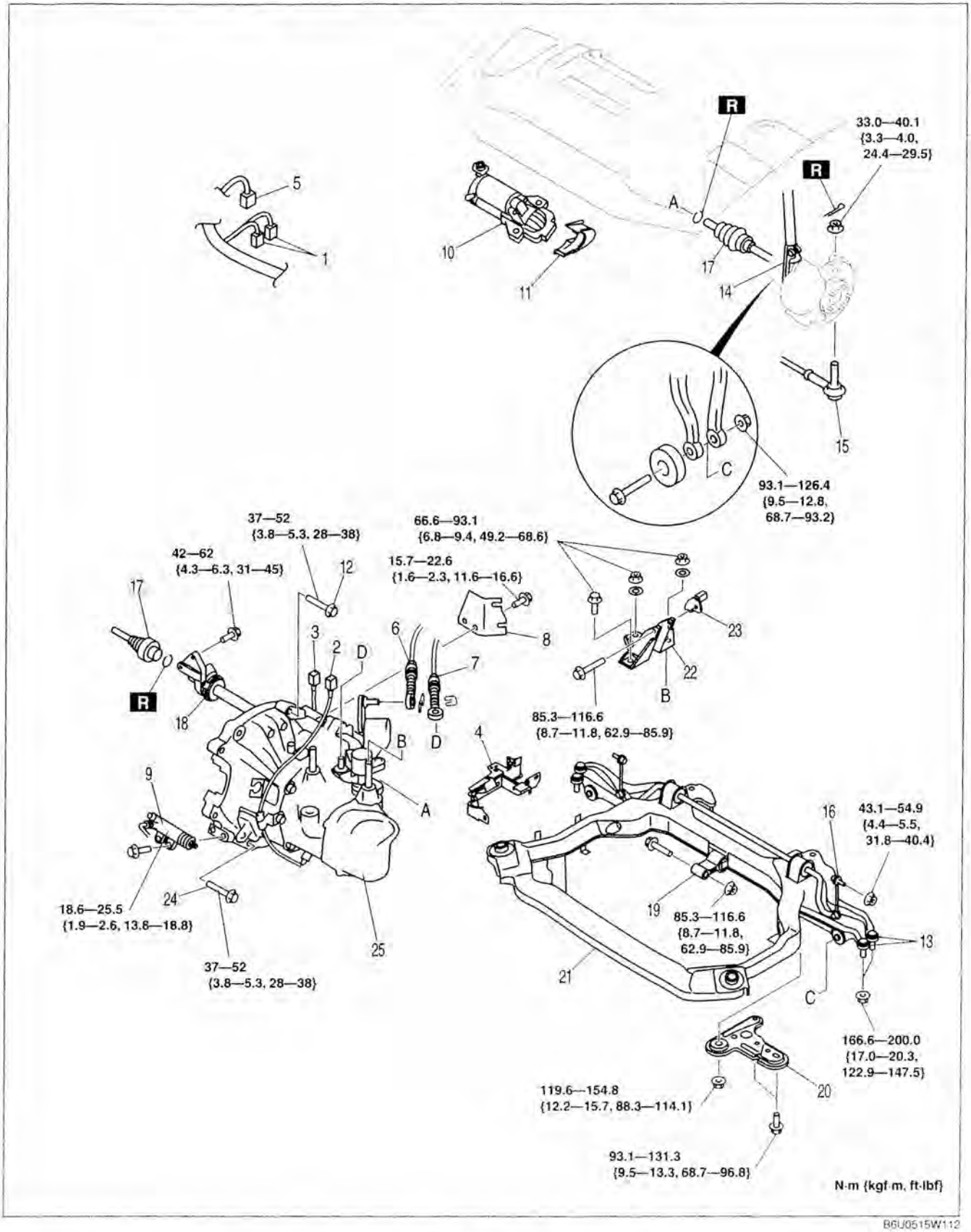
1. Disconnect the negative battery cable.
2. Remove the battery and battery tray.
3. Remove the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
4. Remove the wheels, tires and splash shields.
5. Remove the under cover.
6. Remove the steering gear and linkage, and pipe assembly installation bolts from the front crossmember, then suspend the steering gear and linkage with a cable. (See 06–12–9 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION [L3].)

   Pipe assembly tightening torque
   7.8—10.8 N·m {79.6—110.0 kgf·cm, 69.1—95.5 in·lbf}

7. Drain the transaxle oil into a suitable container.

   Warning
   - **Improperly jacking a transaxle is dangerous. It can slip off the jack and may cause serious injury.**

8. Remove in the order indicated in the table.
9. Install in the reverse order of removal.
10. Add the specified amount of specified transaxle oil.
11. Warm up the engine and transaxle, inspect for oil leakage, and inspect the transaxle operation.



B6U0515W112

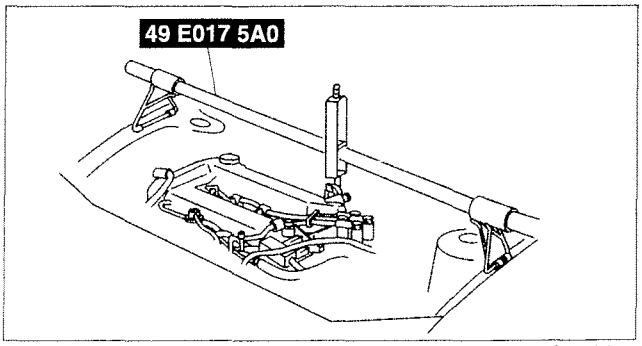
1	HO2S connector
2	Back-up light switch connector
3	Neutral switch connector
4	Harness bracket

5	Vehicle speedometer sensor connector (Without ABS)
6	Selector cable
7	Shift cable

8	Selector cable bracket
9	Clutch release cylinder
10	Starter
11	Endplate cover
12	Transaxle mounting bolt (upper side)
13	Lower arm (front, rear) ball joint (See 02–13–14 Front Lower Arm (Rear) Ball Joint Removal Note) (See 02–13–10 Front Lower Arm (Front) Ball Joint Removal Note)
14	Damper fork
15	Tie-rod end ball joint (See 06–12–10 Tie-rod End Ball Joint Removal Note)
16	Stabilizer control link
17	Drive shaft (See 03–13–12 DRIVE SHAFT REMOVAL/ INSTALLATION [L3])
18	Joint shaft (See 03–13–3 JOINT SHAFT REMOVAL/ INSTALLATION [L3])
19	No.1 engine mount (See 05–15A–6 No.1 Engine Mount Bracket Removal Note) (See 05–15A–7 No.1 Engine Mount and No.4 Engine Mount Bracket Installation Note)
20	Crossmember bracket
21	Crossmember component (See 02–13–18 FRONT CROSSMEMBER REMOVAL/INSTALLATION)
22	No.4 engine mount (See 05–15A–7 No.1 Engine Mount and No.4 Engine Mount Bracket Installation Note)
23	Dynamic damper
24	Transaxle mounting bolt (lower side)
25	Manual transaxle (See 05–15A–7 Manual Transaxle Removal Note) (See 05–15A–7 Manual Transaxle Installation Note)

No.1 Engine Mount Bracket Removal Note

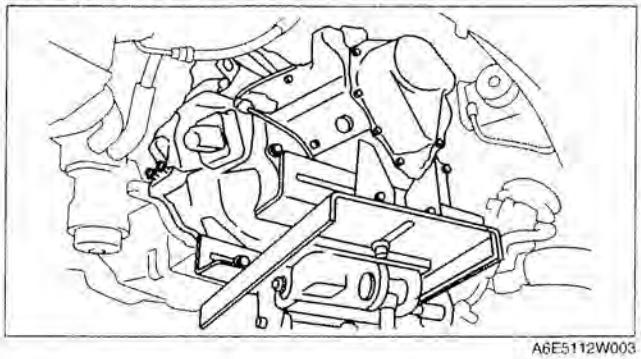
1. Support the engine using the **SST** before removing the No.1 engine mount.
2. Remove the No.1 engine mount.



A6E5614W049

Manual Transaxle Removal Note

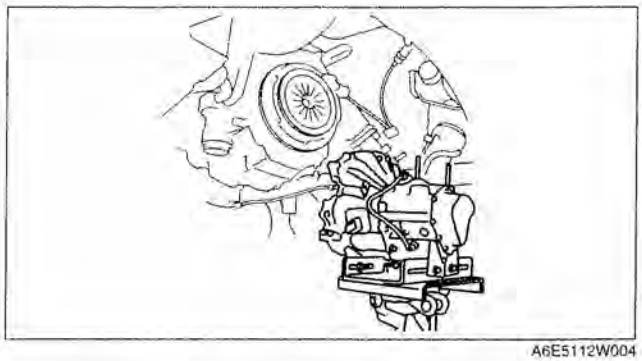
1. Loosen the **SST** (49 E017 5A0) and lean the engine toward the transaxle.
2. Support the transaxle on a jack.
3. Remove the transaxle mounting bolts.
4. Remove the transaxle.



A6E5112W003

Manual Transaxle Installation Note

1. Set the transaxle on a jack and lift into place.
2. Install the transaxle mounting bolts.
3. Tighten the **SST** (49 E017 5A0) so that the engine is located at the specified position.

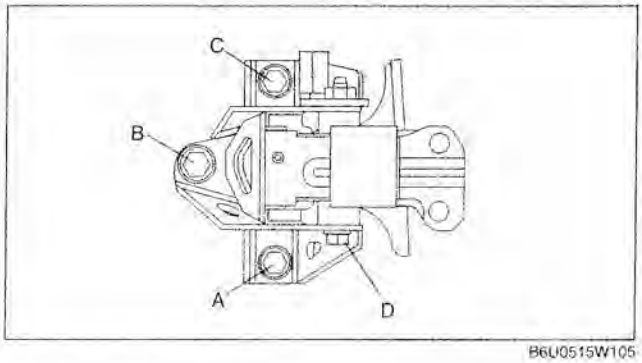


A6E5112W004

No.1 Engine Mount and No.4 Engine Mount Bracket Installation Note

1. Verify that the engine mount rubber is installed as shown.
2. By aligning the holes with the stud bolts, install the No.4 engine mount bracket to the transaxle.
3. By aligning the holes with the stud bolts, install the No.1 engine mount to the transaxle.
4. Align the hole of the No.4 engine mount bracket with the No.4 engine mount rubber on vehicle, and temporarily tighten bolt D.
5. Lightly tighten nuts B, C and bolt A.
6. Tighten nuts B, C in order of B→C, then bolt A.
7. Tighten bolt D.

Tightening torque
A, B, C: 66.6—93.1 N·m
{6.8—9.4 kgf·m, 49.2—68.6 ft·lbf}
D: 85.3—116.6 N·m
{8.7—11.8 kgf·m, 62.9—85.9 ft·lbf}

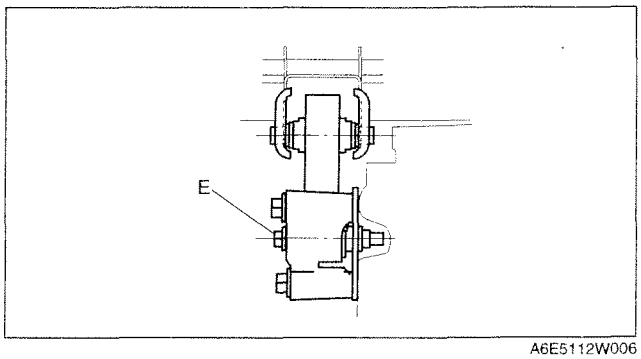


B6U0515W105

8. Tighten bolt E to the No.1 engine mount.

   Tightening torque
   E: 85.3—116.6 N·m
   {8.7—11.8 kgf·m, 62.9—85.9 ft·lbf}

9. Remove the **SST** (49 E017 5A0).

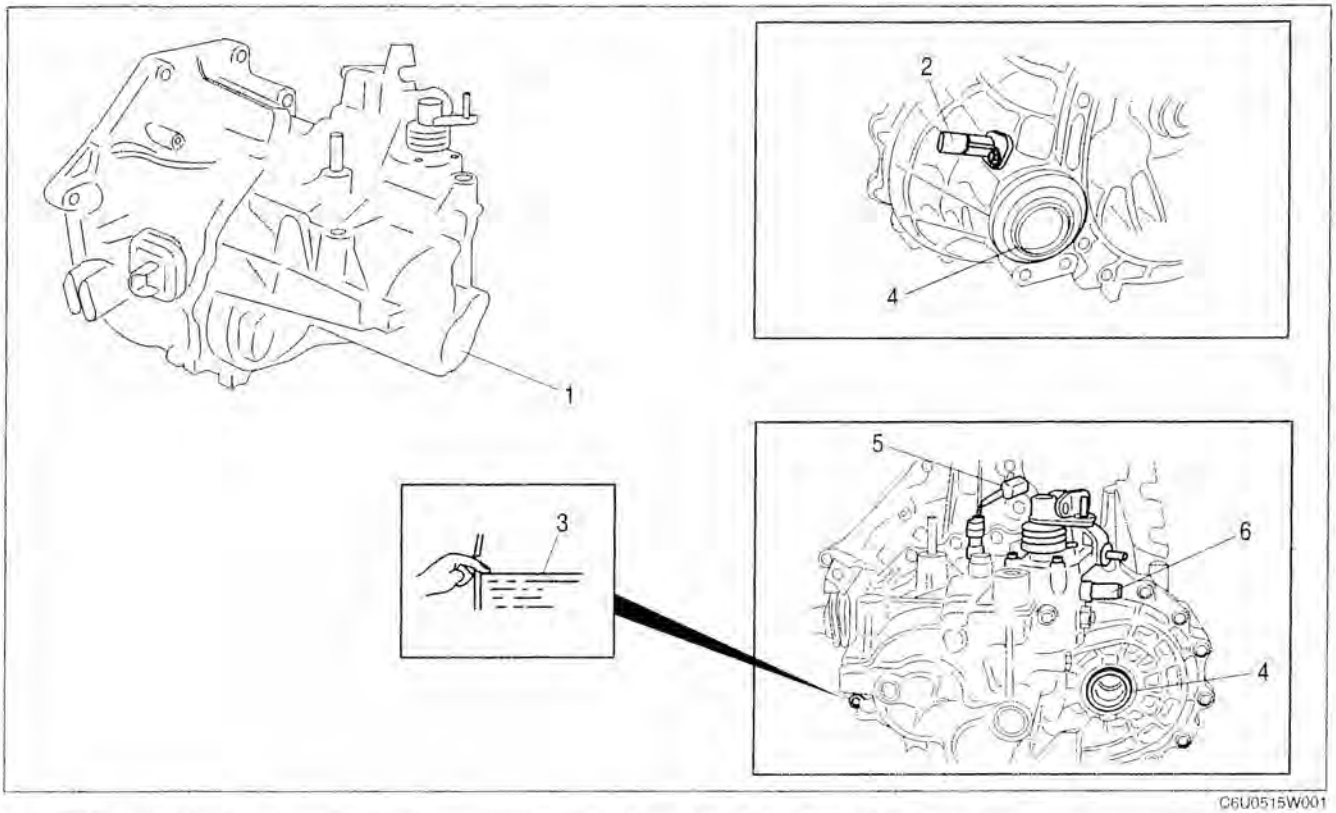


A6E5112W006

05–15B MANUAL TRANSAXLE [A65M-R]

MANUAL TRANSAXLE LOCATION INDEX [A65M-R]

C6U051501029W01



C6U0515W001

1	Manual transaxle (See 05–15B–5 MANUAL TRANSAXLE REMOVAL/INSTALLATION [A65M-R])
2	Vehicle speedometer sensor (Without ABS) (See 05–15B–4 VEHICLE SPEEDOMETER SENSOR REMOVAL/INSTALLATION (WITHOUT ABS) [A65M-R]) (See 05–15B–4 VEHICLE SPEEDOMETER SENSOR INSPECTION (WITHOUT ABS) [A65M-R])
3	Transaxle oil (See 05–15B–2 TRANSAXLE OIL INSPECTION [A65M-R]) (See 05–15B–2 TRANSAXLE OIL REPLACEMENT [A65M-R])

4	Oil seal (differential) (See 05–15B–2 OIL SEAL (DIFFERENTIAL) REPLACEMENT [A65M-R])
5	Reverse switch (See 05–15B–3 REVERSE SWITCH INSPECTION [A65M-R]) (See 05–15B–4 REVERSE SWITCH REMOVAL/INSTALLATION [A65M-R])
6	Neutral switch (See 05–15B–4 NEUTRAL SWITCH REMOVAL/INSTALLATION [A65M-R])

TRANSAXLE OIL INSPECTION [A65M-R]

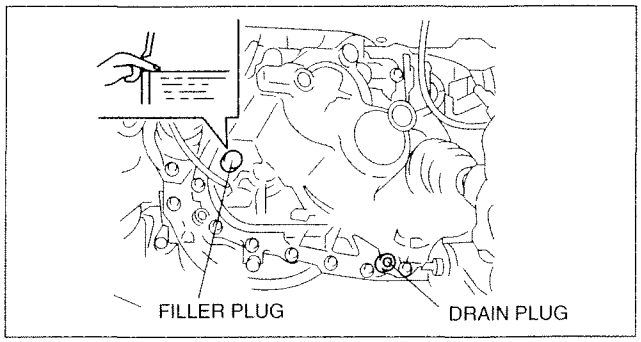
C6U051527001W01

1. Park the vehicle on level ground.
2. Remove the filler plug and gasket.
3. Verify that the oil is near the brim of the plug port.
   - If the oil level is low, add the specified amount and type of oil through the filler plug hole.

Specified oil grade
API Service GL-4 or GL-5
Specified oil viscosity
SAE 75W-90

4. Install a new gasket and the filler plug.

Tightening torque
30.0—39.0 N·m
{3.1—3.9 kgf·m, 22.1—28.8 in·lbf}



A6E5212W010

TRANSAXLE OIL REPLACEMENT [A65M-R]

C6U051527001W02

1. Remove the drain plug with the gasket.
2. Drain the oil into a suitable container.
3. Install a new gasket and the drain plug.

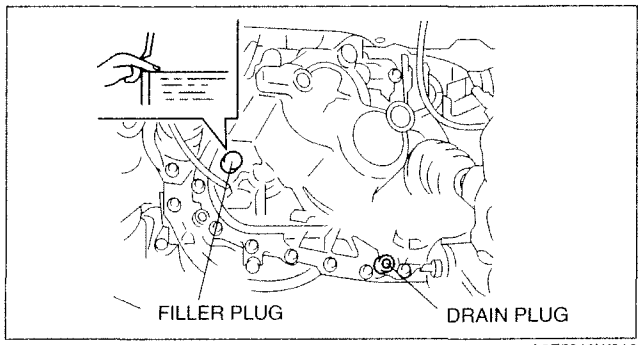
Tightening torque
30.0—39.0 N·m
{3.1—3.9 kgf·m, 22.1—28.8 in·lbf}

4. Remove the filler plug with gasket and add the specified amount and type of oil through the filler plug hole until the level reaches the bottom of the filler plug hole.

Specified oil grade
API Service GL-4 or GL-5
Specified oil viscosity
SAE 75W-90
Capacity (approximate quantity)
2.3 L {2.4 US qt, 2.0 Imp qt}

5. Install a new gasket and the filler plug.

Tightening torque
30.0—39.0 N·m
{3.1—3.9 kgf·m, 22.1—28.8 in·lbf}



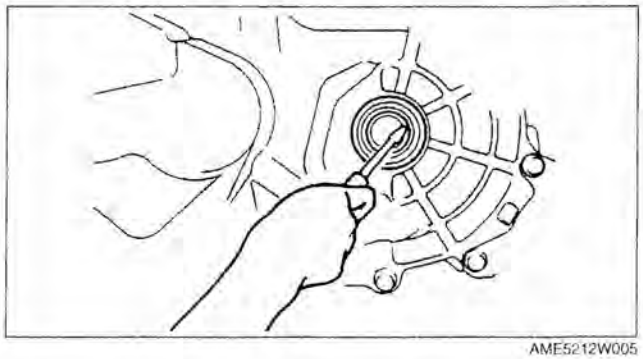
A6E5212W010

OIL SEAL (DIFFERENTIAL) REPLACEMENT [A65M-R]

C6U051527238W01

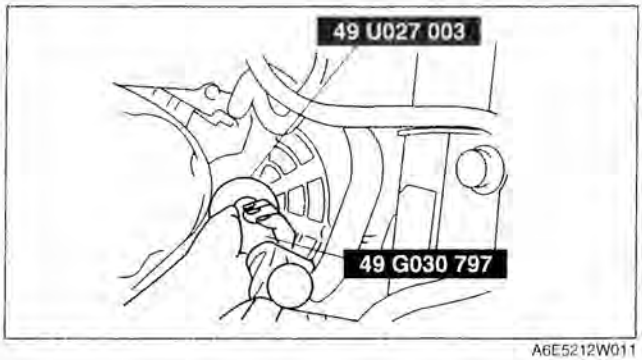
1. On level ground, jack up the vehicle and support it evenly on safety stands.
2. Drain the oil from the transaxle.
3. Remove the front wheels and splash shields.
4. Separate the drive shaft and joint shaft from the transaxle. (See 03–13–14 DRIVE SHAFT REMOVAL/INSTALLATION [AJ]) (See 03–13–5 JOINT SHAFT REMOVAL/INSTALLATION [AJ])

5. Remove the oil seals using a screwdriver.



AME5212W005

6. Using the **SSTs** and a hammer, tap each new oil seal in evenly until the **SSTs** contact the transaxle case.
7. Coat the lip of each oil seal with transaxle oil.
8. Insert the drive shaft and joint shaft into the transaxle. (See 03–13–14 DRIVE SHAFT REMOVAL/INSTALLATION [AJ]) (See 03–13–5 JOINT SHAFT REMOVAL/INSTALLATION [AJ])
9. Install the wheels and splash shields.
10. Add the specified amount and type of oil. (See 05–15B–2 TRANSAXLE OIL REPLACEMENT [A65M-R].)

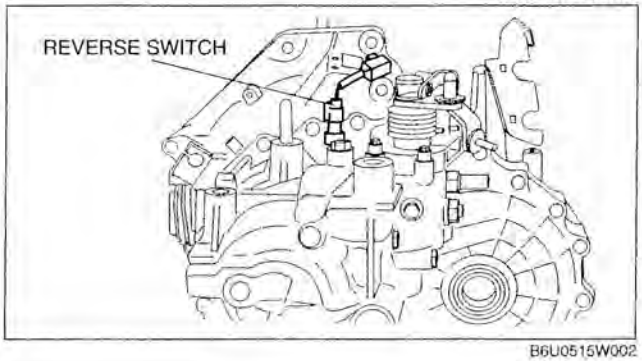


A6E5212W011

REVERSE SWITCH INSPECTION [A65M-R]

1. Disconnect the reverse switch connector.

C6U051519200W01



B6U0515W002

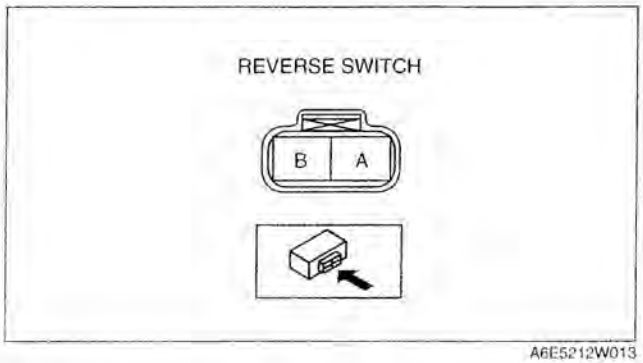
2. Shift the shift lever to each position, and inspect for continuity between terminals A and B.
   - If not as specified, replace the reverse switch. (See 05–15B–4 REVERSE SWITCH REMOVAL/INSTALLATION [A65M-R].)

Specification

○—○ : Continuity

Shift position	Connector terminal	
	A	B
Reverse	○	○
Others		

A6E5212W014



A6E5212W013

3. Connect the reverse switch connector.

REVERSE SWITCH REMOVAL/INSTALLATION [A65M-R]

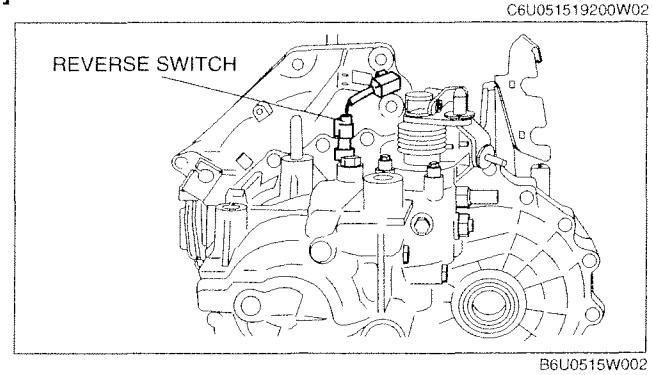
C6U051519200W02

1. Remove the reverse switch.
2. Apply a light coat of silicone sealant to the screw of the reverse switch.

Sealant
Three Bond product: TB1215

3. Install the reverse switch to the transaxle case.

Tightening torque
22.5—33.3 N·m
{2.3—3.4 kgf·m, 16.6—24.6 ft·lbf}



B6U0515W002

NEUTRAL SWITCH REMOVAL/INSTALLATION [A65M-R]

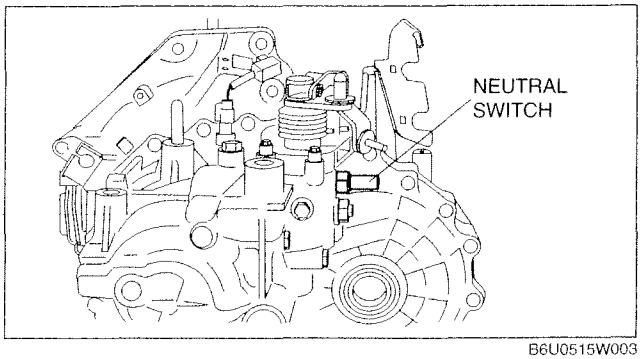
C6U051519200W03

1. Remove the neutral switch.
2. Apply a light coat of silicone sealant to the screw of the neutral switch.

Sealant
Three Bond product: TB1215

3. Install the neutral switch to the transaxle case.

Tightening torque
22.5—33.3 N·m
{2.3—3.4 kgf·m, 16.6—24.6 ft·lbf}



B6U0515W003

VEHICLE SPEEDOMETER SENSOR REMOVAL/INSTALLATION (WITHOUT ABS) [A65M-R]

C6U051519200W04

1. Disconnect the negative battery cable.
2. Remove the battery and battery tray.
3. Remove the under cover.
4. Disconnect the vehicle speedometer sensor connector.
5. Remove the vehicle speedometer sensor.
6. Apply transmission oil to a new O-ring and install it on a vehicle speedometer sensor.
7. Install the vehicle speedometer sensor.

Tightening torque
7.8—11.0 N·m
{80—112 kgf·cm, 57.6—81.1 in·lbf}

8. Connect the vehicle speedometer sensor connector.
9. Install the under cover.
10. Install the battery and battery tray.
11. Connect the negative battery cable.

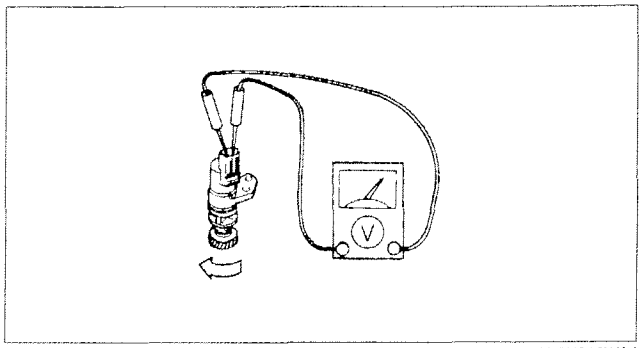
VEHICLE SPEEDOMETER SENSOR INSPECTION (WITHOUT ABS) [A65M-R]

C6U051519200W05

1. Remove the vehicle speedometer sensor.
2. Measure voltage (AC range) between terminals of the vehicle speedometer sensor while the gear is turning.

Meter needle	Action
Moves slightly under **5 V** (AC range)	Repair wiring harness between instrument cluster and vehicle speedometer sensor.
Does not move	Replace vehicle speedometer sensor.

3. Install the vehicle speedometer sensor.



W6U515WA4

MANUAL TRANSAXLE REMOVAL/INSTALLATION [A65M-R]

C6U051501029W02

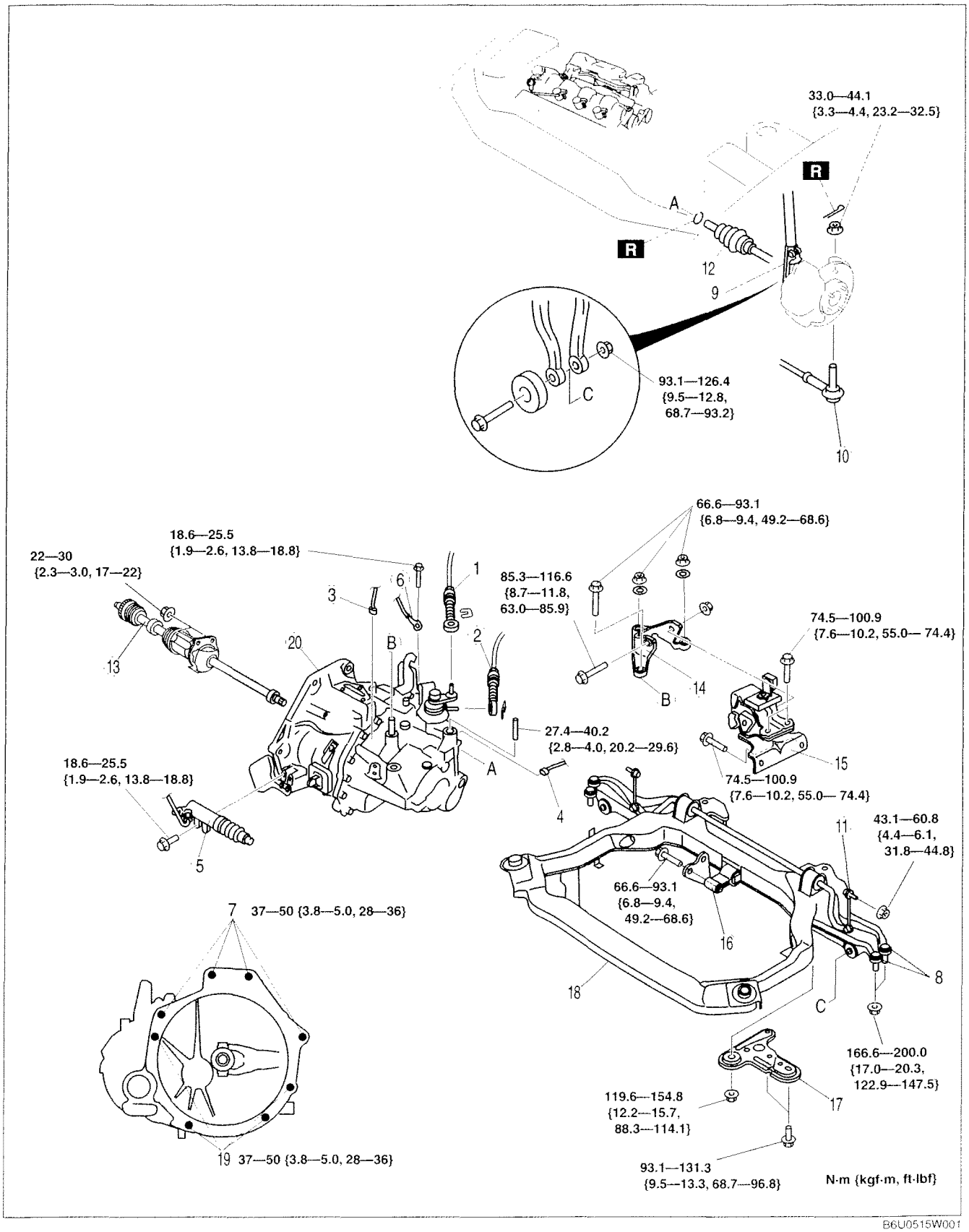
1. Disconnect the negative battery cable.
2. Remove the battery and battery tray.
3. Remove the air cleaner component and air cleaner bracket. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
4. Remove the starter. (See 01–19–1 STARTER REMOVAL/INSTALLATION.)
5. Remove the front tires and splash shields.
6. Remove the under cover.
7. Remove the steering gear and linkage, and pipe assembly installation bolts from the front crossmember, then suspend the steering gear and linkage with a cable. (See 06–12–11 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION [AJ].)

   Tightening torque
   - **Pipe assembly: 7.8—10.8 N·m {79.6—110.0 kgf·cm, 69.1—95.5 in·lbf}**

8. Drain the transaxle oil into a suitable container.

   Warning
   - **Improperly jacking a transaxle is dangerous. It can slip off the jack and may cause serious injury.**

9. Remove in the order indicated in the figure.
10. Install in the reverse order of removal.
11. Add the specified amount of specified transaxle oil. (See 05–15B–2 TRANSAXLE OIL REPLACEMENT [A65M-R].)
12. Warm up the engine and transaxle, inspect for oil leakage, and inspect the transaxle operation.



B6U0515W001

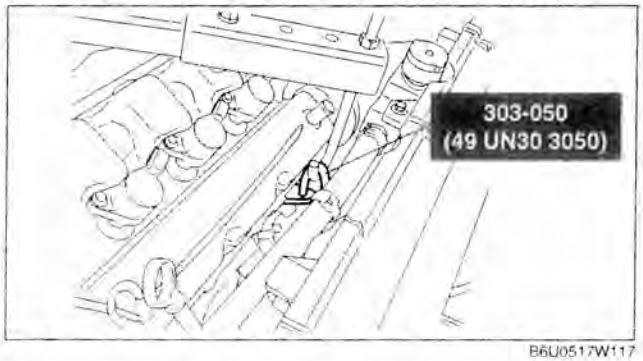
1	Shift cable
2	Select cable
3	Reverse switch connector
4	Neutral switch connector

5	Clutch release cylinder
6	GND harness
7	Transaxle mounting bolt (upper side)

8	Lower arm (front, rear) ball joint (See 02–13–10 Front Lower Arm (Front) Ball Joint Removal Note) (See 02–13–14 Front Lower Arm (Rear) Ball Joint Removal Note)
9	Damper fork
10	Tie-rod end ball joint (See 06–12–11 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION [AJ])
11	Stabilizer control link
12	Drive shaft (See 03–13–14 DRIVE SHAFT REMOVAL/INSTALLATION [AJ])
13	Drive shaft, joint shaft (See 03–13–14 DRIVE SHAFT REMOVAL/INSTALLATION [AJ]) (See 03–13–5 JOINT SHAFT REMOVAL/INSTALLATION [AJ])
14	No.4 engine mount bracket (See 05–15B–9 No.4 Engine Mount Installation Note)
15	No.4 engine mount rubber (See 05–15B–9 No.4 Engine Mount Installation Note)
16	No.1 engine mount (See 05–15B–7 No.1 Engine Mount Removal Note) (See 05–15B–10 No.1 Engine Mount Installation Note)
17	Crossmember bracket
18	Crossmember (See 02–13–18 FRONT CROSSMEMBER REMOVAL/INSTALLATION)
19	Transaxle mounting bolt (lower side)
20	Manual transaxle (See 05–15B–8 Manual Transaxle Removal Note) (See 05–15B–8 Manual Transaxle Installation Note)

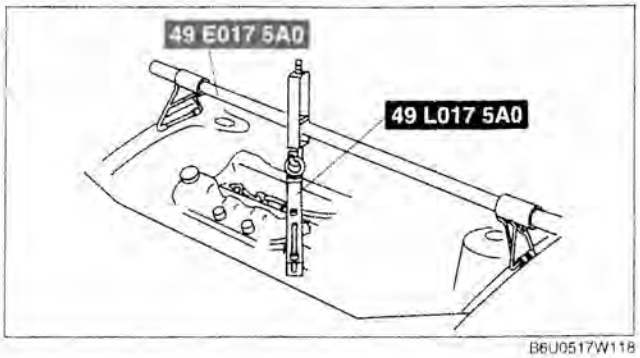
No.1 Engine Mount Removal Note

1. Remove the dynamic chamber. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
2. Install the **SST** to cylinder head.



B6U0517W117

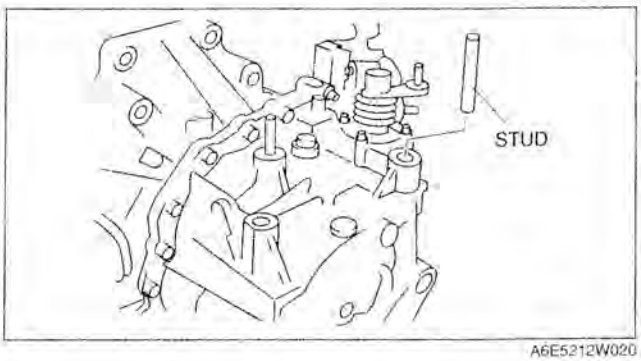
3. Support the engine the **SSTs** before removing the No.1 engine mount.
4. Remove the No.1 engine mount.



B6U0517W118

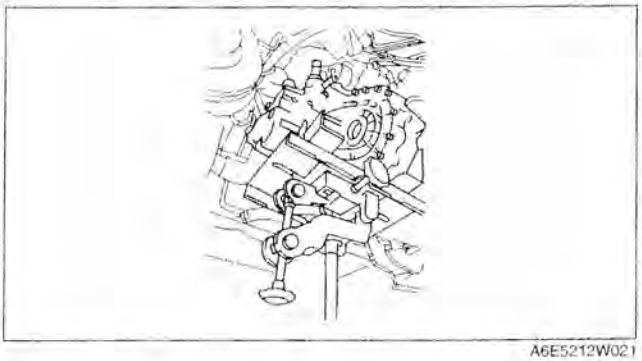
Manual Transaxle Removal Note

1. Remove the stud of the No.4 engine mount.
2. Loosen the **SST** (49 E017 5A0) and lean the engine toward the transaxle.



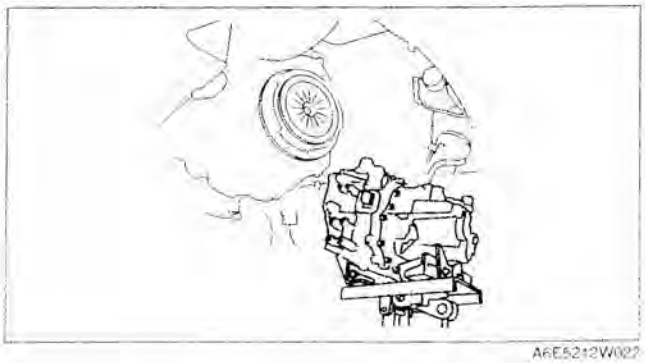
A6E5212W020

3. Support the transaxle on a jack.
4. Remove the transaxle mounting bolts.
5. Remove the transaxle.


A6E5212W021

Manual Transaxle Installation Note

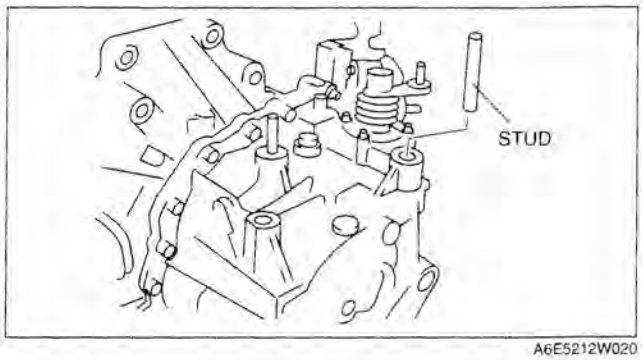
1. Set the transaxle on a jack and lift into place.
2. Install the transaxle mounting bolts.


A6E5212W022

3. Install the stud of the No.4 engine mount.

Tightening torque
27.4—40.2 N·m
{2.8—4.0 kgf·m, 20.2—29.6 ft·lbf}

4. Tighten the **SST** (49 E017 5A0)so that the engine is located at the specified position.



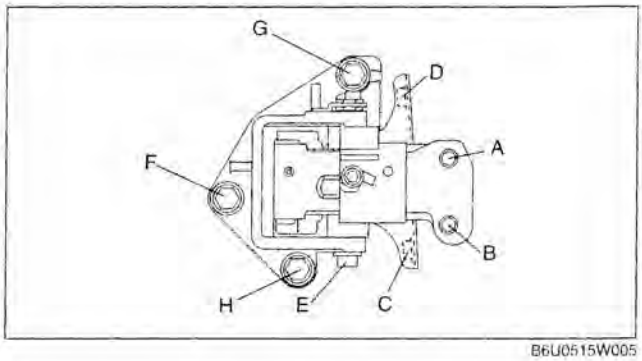
A6E5212W020

No.4 Engine Mount Installation Note

1. Verify that the No.4 engine mount rubber is installed as shown.
2. Lightly tighten bolts A and B.
3. Align the installation hole on the contacted area of the front frame with the bolt C installation hole.
4. Tighten bolt A, then bolt B.
5. Tighten bolt C, then bolt D.

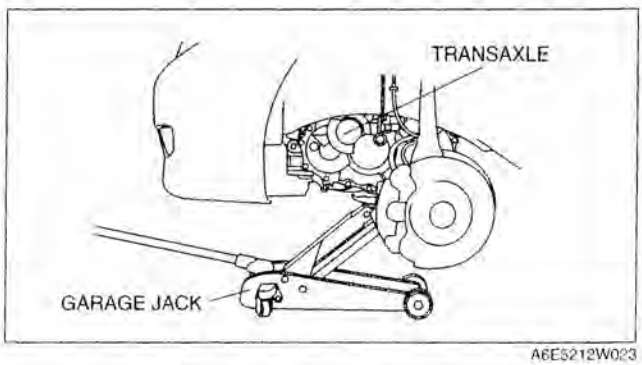
Tightening torque
A,B,C,D: 74.5—100.9 N·m
{7.6—10.2 kgf·m, 55.0—74.4 ft·lbf}

6. Verify that the No.4 engine mount bracket is installed as shown.
7. Lightly tighten bolt E.



B6U0515W005

8. Set the transaxle on a garage jack and lift it.
9. Align the hole of the No.4 engine mount bracket with the stud bolts of transaxle.
10. Lightly tighten nut F, G and bolt H.
11. Tighten nuts F, G in order of F→G, then bolt H.

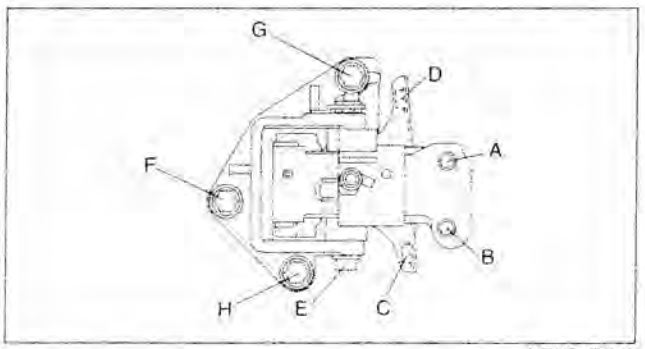


A6E5212W023

12. Tighten bolt E.

Tightening torque
E: 85.3—116.6 N·m
{8.7—11.8 kgf·m, 63.0—85.9 ft·lbf}
F,G,H: 66.6—93.1 N·m
{6.8—9.4 kgf·m, 49.2—68.6 ft·lbf}

13. Remove the **SST** (49 E017 5A0).

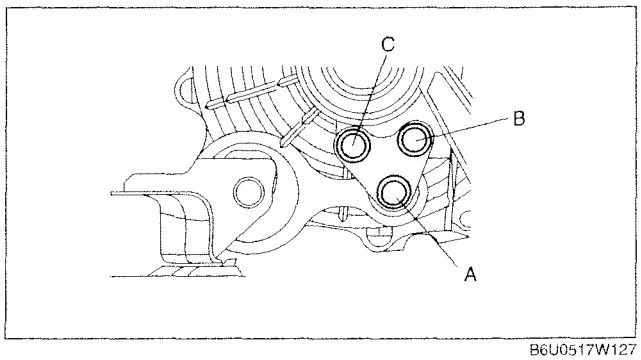


B6U0515W005

No.1 Engine Mount Installation Note

1. Align the hole of the No.1 engine mount rubber with the bolt hole of transaxle.
2. Lightly tighten bolt A, then tighten bolts B and C.
3. Tighten bolt A.

Tightening torque
66.6 —93.1 N·m
{6.8—9.4 kgf·m, 49.2—68.6 ft·lbf}

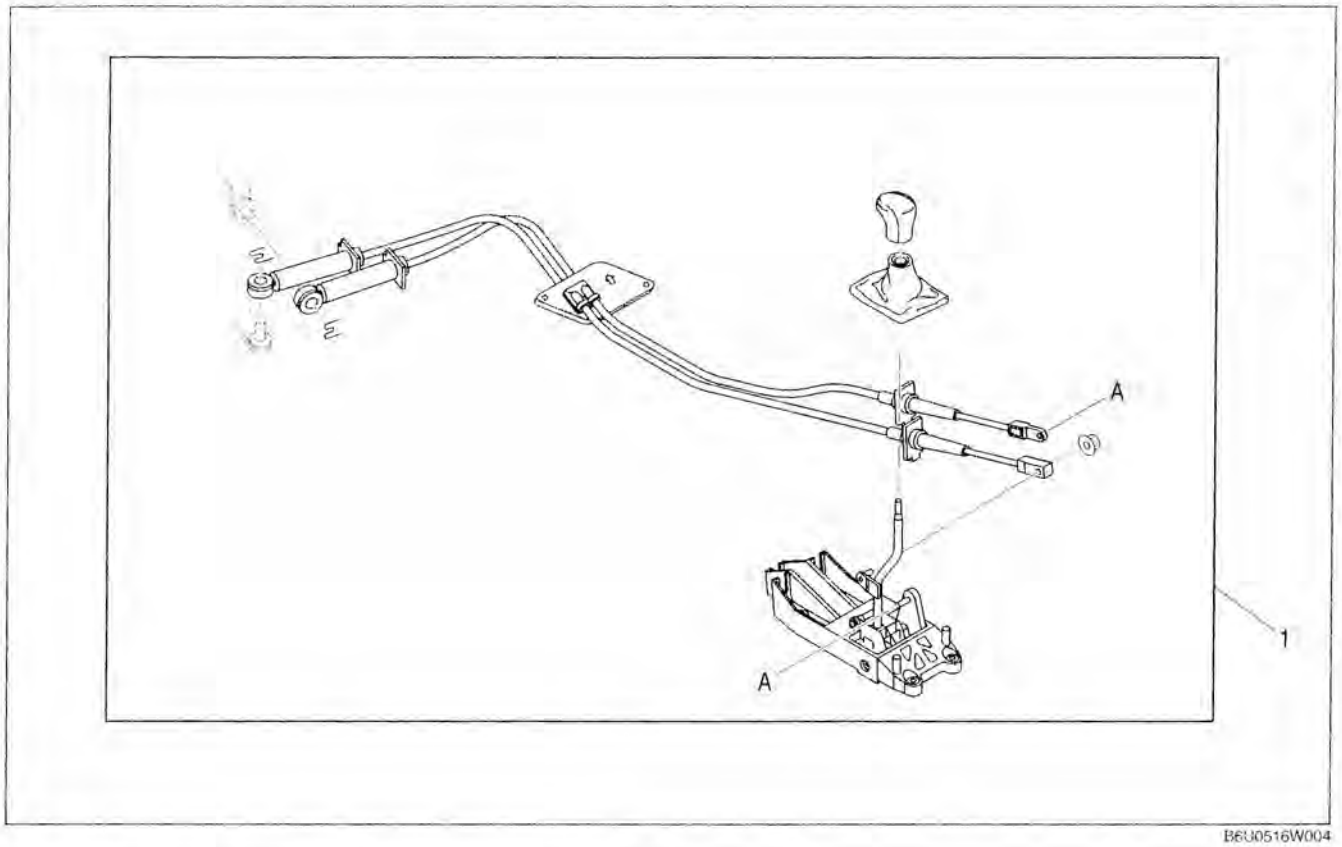


B6U0517W127

05–16 MANUAL TRANSAXLE SHIFT MECHANISM

MANUAL TRANSAXLE SHIFT MECHANISM LOCATION INDEX

C6U051601029W01



B6U0516W004

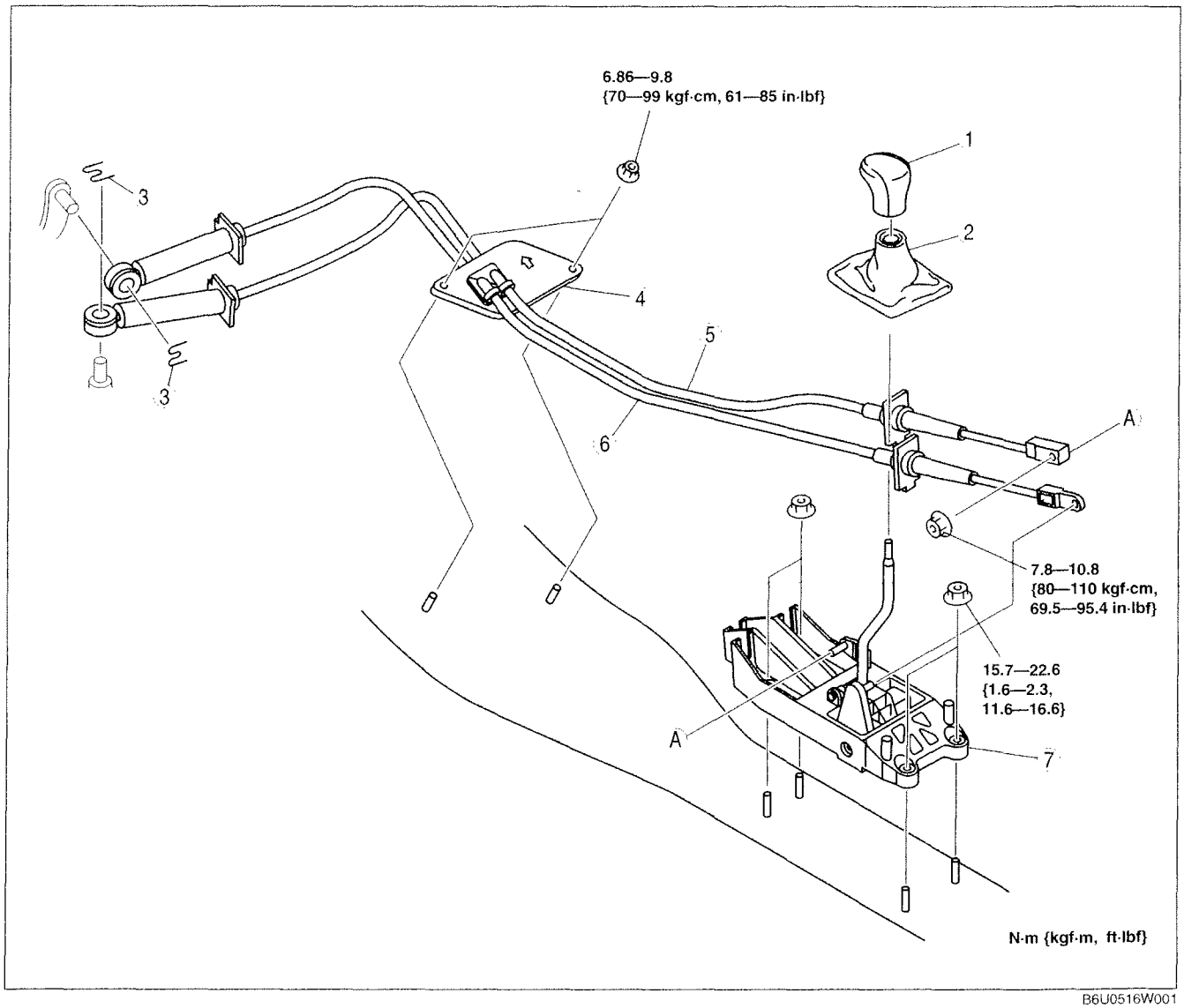
1	Shift mechanism (See 05–16–1 SHIFT MECHANISM REMOVAL/INSTALLATION)

SHIFT MECHANISM REMOVAL/INSTALLATION

C6U051646010W01

1. Remove the battery and battery tray.
2. Remove the air cleaner component.
   (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
   (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
3. Remove the dashboard completely.
   (See 09–17–4 DASHBOARD REMOVAL/INSTALLATION.)
4. Remove the SAS control module.
   (See 08–10–10 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
5. Remove the climate control unit. (See 07–40–16 CLIMATE CONTROL UNIT REMOVAL.) (See 07–40–16 CLIMATE CONTROL UNIT INSTALLATION.)
6. Remove the rear heat duct. (See 07–11–6 REAR HEAT DUCT REMOVAL/INSTALLATION.)
7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.
9. After installation, verify that the shift lever can be shifted smoothly into each position.

G35M-R manual transaxle models



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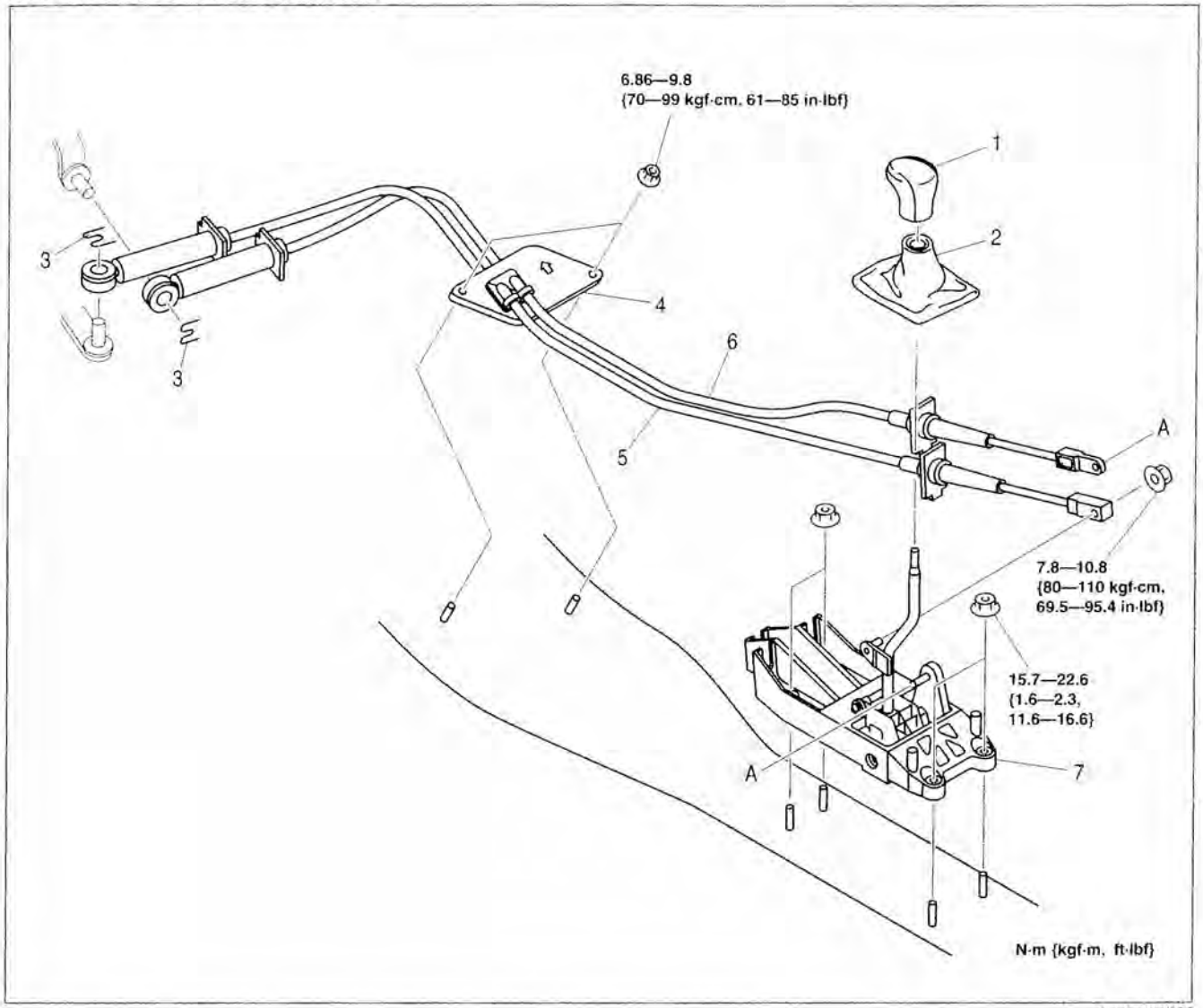
A65M-R manual transaxle models



B6U0516W005

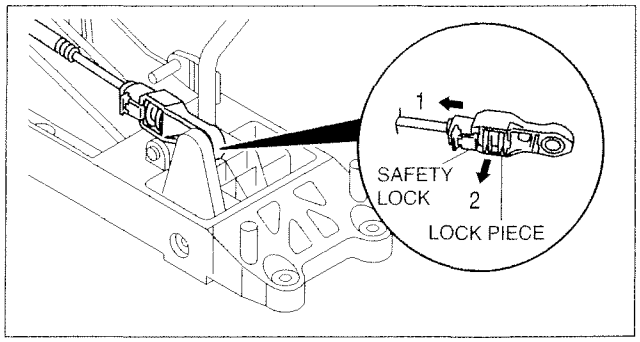
1	Shift lever knob
2	Boot panel
3	Clip
4	Seal plate

5	Shift cable
6	Select cable (See 05–16–4 Select Cable Installation Note)
7	Shift lever assembly

Select Cable Installation Note

1. Remove the center console.
2. Make sure that the shift lever (transaxle side) is in neutral.
3. Unlock the lock piece of the select cable (shift lever side) in the order shown in the figure.

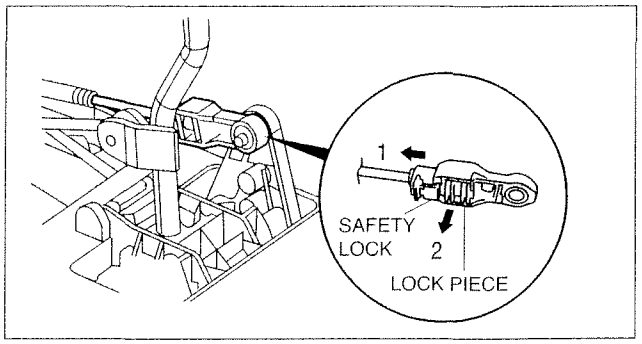
G35M-R manual transaxle models



B6U0516W002

A65M-R manual transaxle models

4. Shift the shift lever to neutral.
5. Lock the lock piece of the selector cable (shift cable side) in the order shown in the figure.



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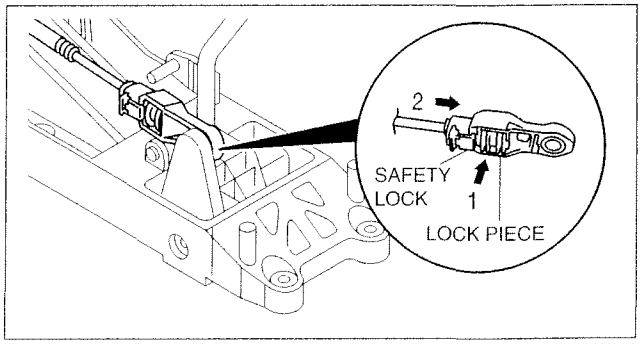
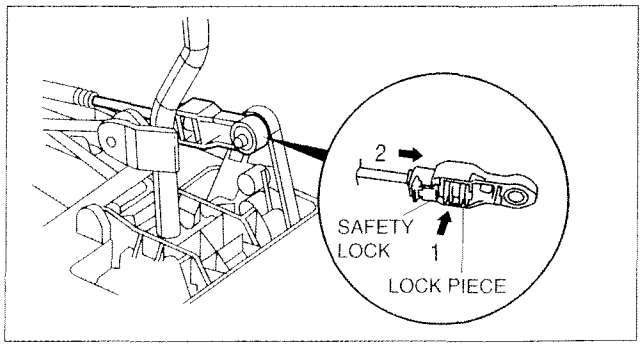
G35M-R manual transaxle models



B6U0516W003

A65M-R manual transaxle models

6. Install the center console.
7. Shift the shift lever from neutral to other position, and make sure that there are no other components in that area to interfere with the lever.

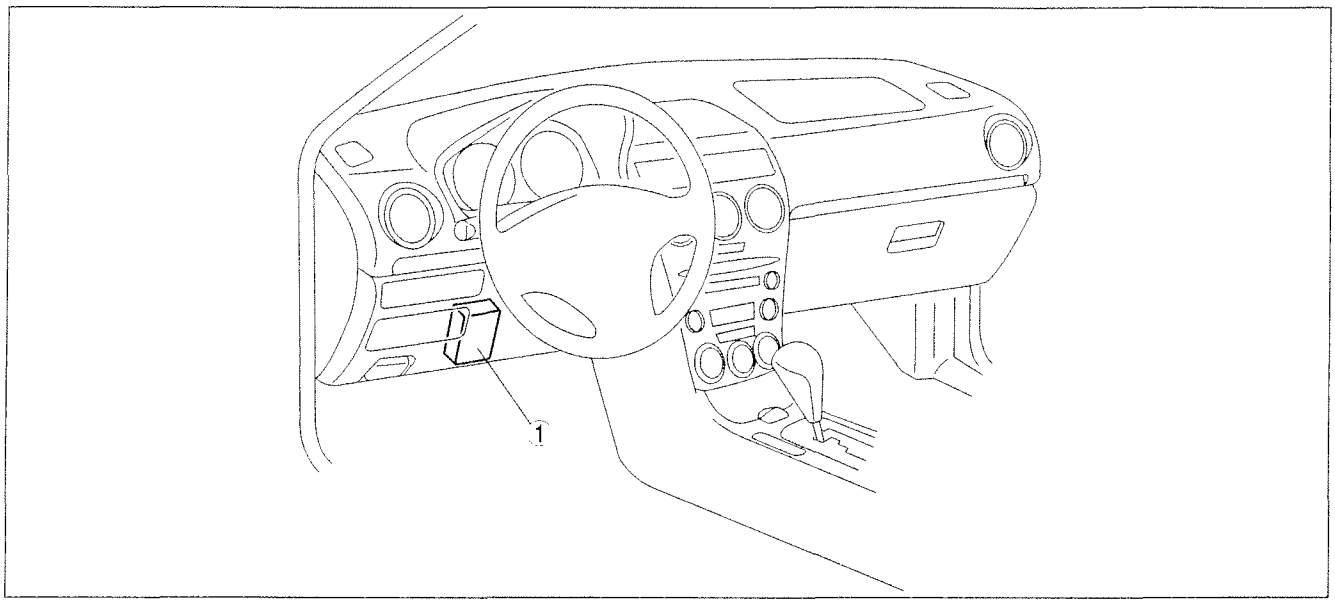


A6E5214W003

05–17A AUTOMATIC TRANSAXLE [FN4A-EL]

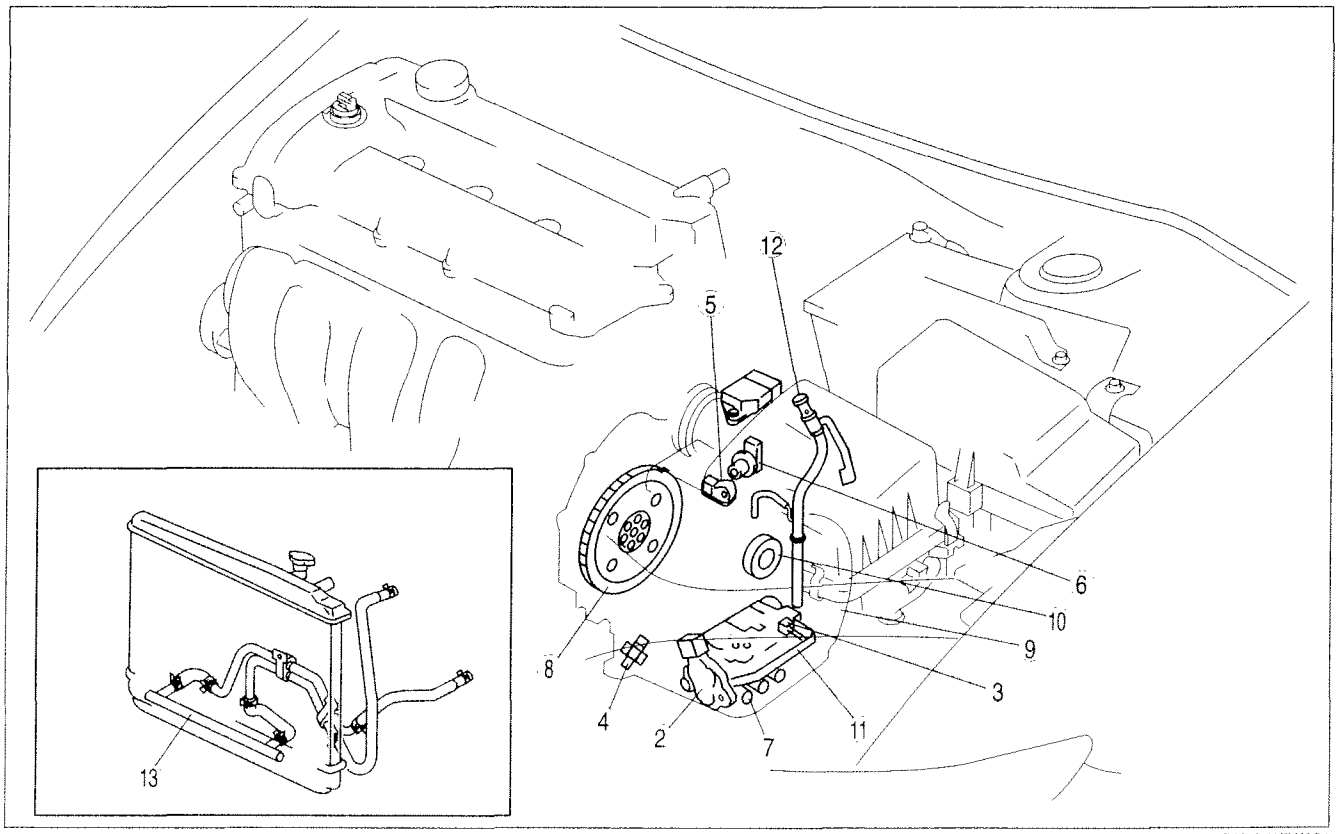
AUTOMATIC TRANSAXLE LOCATION INDEX [FN4A-EL]

C6U051719090W01



B6U0517W019

1	TCM (See 05–17A–24 TCM INSPECTION [FN4A-EL]) (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL])



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2	Transaxle range (TR) switch (See 05–17A–9 TRANSAXLE RANGE (TR) SWITCH INSPECTION [FN4A-EL]) (See 05–17A–10 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION [FN4A-EL]) (See 05–17A–13 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [FN4A-EL])
3	Transaxle fluid temperature (TFT) sensor (See 05–17A–15 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION [FN4A-EL]) (See 05–17A–16 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [FN4A-EL])
4	Oil pressure switch (See 05–17A–17 OIL PRESSURE SWITCH INSPECTION [FN4A-EL]) (See 05–17A–18 OIL PRESSURE SWITCH REMOVAL/INSTALLATION [FN4A-EL])
5	Input/turbine speed sensor (See 05–17A–18 INPUT/TURBINE SPEED SENSOR INSPECTION [FN4A-EL]) (See 05–17A–19 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION [FN4A-EL])
6	Vehicle speedometer sensor (See 05–17A–19 VEHICLE SPEEDOMETER SENSOR (VSS) INSPECTION (WITHOUT ABS) [FN4A-EL]) (See 05–17A–21 VEHICLE SPEEDOMETER SENSOR (VSS) REMOVAL/INSTALLATION (WITHOUT ABS) [FN4A-EL])
7	Solenoid valve (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL]) (See 05–17A–23 SOLENOID VALVE REMOVAL/INSTALLATION [FN4A-EL])
8	Drive plate (See 05–17A–44 DRIVE PLATE REMOVAL/INSTALLATION [FN4A-EL])
9	Automatic transaxle (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL])
10	Oil seal (See 05–17A–36 OIL SEAL REPLACEMENT [FN4A-EL])
11	Control valve body (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL]) (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL])
12	Automatic transaxle fluid (ATF) (See 05–17A–8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [FN4A-EL]) (See 05–17A–8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [FN4A-EL])
13	Oil cooler (See 05–17A–39 OIL COOLER FLUSHING [FN4A-EL]) (See 05–17A–40 OIL COOLER REMOVAL/INSTALLATION [FN4A-EL]) (See 05–17A–42 OIL COOLER DISASSEMBLY/ASSEMBLY [FN4A-EL])

MECHANICAL SYSTEM TEST [FN4A-EL]

C8U051719090W02

Mechanical System Test Preparation

1. Apply the parking brake and use wheel chocks at the front and rear of the wheels.
2. Inspect the engine coolant. (See 01–12–2 COOLING SYSTEM SERVICE WARNINGS.) (See 01–12–3 ENGINE COOLANT LEVEL INSPECTION.)
3. Inspect the engine oil. (See 01–11–3 ENGINE OIL LEVEL INSPECTION.)
4. Inspect the ATF levels. (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)
5. Inspect the ignition timing. (See 01–10A–31 Ignition Timing Inspection.)
6. Inspect the idle speed. (See 01–10A–31 Idle Speed Inspection.)

Line Pressure Test

1. Perform mechanical system test preparation. (See 05–17A–3 Mechanical System Test Preparation.)

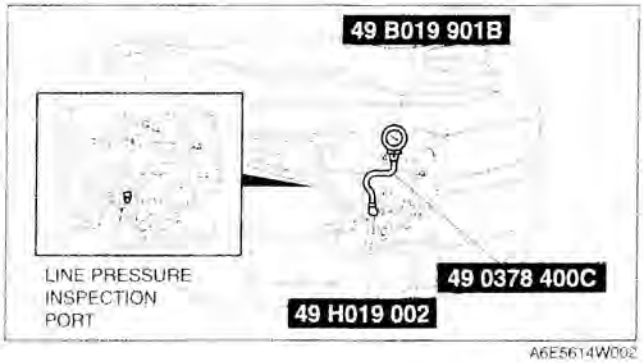
Warning

- **Removing the square-head plug when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the square-head plug, allow the ATF to cool.**

2. Connect the **SSTs** (49 0378 400C, 49 B019 901B and 49 H019 002) to the line pressure inspection port.
3. Start the engine and shift the selector lever to D range and read the line pressure at idle.

Warning

- **Removing the SST when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the SST, allow the ATF to cool.**



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4. Turn the engine off and remove the **SST** (49 B019 901B), and replace the gauge part of the **SST** (49 0378 400C).

Caution
- **Do not maintain WOT in any position/range for more than 5 seconds, or transaxle damage will occur.**

5. Start the engine and firmly depress the brake pedal with the left foot, and then depress the accelerator pedal to floor (WOT) with the right.
6. When the engine speed no longer increases, quickly read the line pressure and release the accelerator pedal.
7. Shift the selector lever to N position and let the engine idle for **1 minute** or more to cool the ATF.
8. Read the line pressure at idle and at the engine stall speed for the M (1GR, 2GR) range and R position in the same manner.

Line pressure specification

Position/range	Line pressure (kPa {kgf/cm^2, psi})	
	Idle	Stall
D, M (1GR, 2GR)	330—470 {3.4—4.8, 48—68}	1,160—1,320 {11.8—13.5, 168—191}
R	490—710 {5.0—7.2, 71—102}	1,750—1,970 {17.8—20.1, 254—285}

9. Shift the selector lever to P position and turn off the engine.

Warning
- **Removing the SST when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the SST, allow the ATF to cool.**

10. Remove the **SST**.
11. Install a new square head plug in the inspection port.

Tightening torque
4.8—9.8 N·m {49—99 kgf·cm, 43—85 in·lbf}

Evaluation of line pressure test

Condition	Possible cause
Low pressure in all positions/ranges	• Worn oil pump • Oil leaking from oil pump, control valve body, and/or transaxle case • Pressure regulator valve stuck • Pressure control solenoid malfunction • Solenoid reducing valve stuck
Low pressure in D, M (1GR, 2GR) only	• Oil leaking from forward clutch hydraulic circuit
Low pressure in M (2GR) only	• Oil leaking from 2-4 brake band hydraulic circuit
Low pressure in M (1GR), R only	• Oil leaking from low and reverse brake hydraulic circuit
Low pressure in R only	• Oil leaking from reverse clutch hydraulic circuit
Higher pressure in all positions/ranges	• Pressure control solenoid malfunction and/or open harness • Pressure regulator valve stuck • TCM malfunction

Stall Test
1. Perform mechanical system test preparation. (See 05–17A–3 Mechanical System Test Preparation.)
2. Start the engine and shift the selector lever to R position.

Caution
- **Do not maintain WOT in any position/range for more than 5 seconds, or transaxle damage will occur.**

3. Firmly depress the brake pedal with the left foot, and depress the accelerator pedal to floor (WOT) with the right.
4. When the engine speed no longer increases, quickly read the engine speed and release the accelerator pedal.
5. Shift the selector lever to N position and let the engine idle for **1 minute** or more to cool the ATF.
6. Perform stall tests of D, M (1GR, 2GR) ranges in the same manner.

7. Turn off the engine.

Engine stall speed

Position/range	Engine stall speed (rpm)
D, M (1GR, 2GR)	2,100—2,800
R	

Evaluation of stall test

Condition	Possible cause	
Above specification	Insufficient line pressure, torque converter pressure	• Worn oil pump
		• Oil leaking from oil pump, control valve, and/or transaxle case
		• Pressure regulator valve sticking
		• Converter relief valve sticking
		• Pressure control solenoid malfunction
	In D, M (1GR, 2GR) ranges	• Forward clutch slipping
	In M (2GR) range	• 2-4 brake band slipping
	In M (1GR) range and R position	• Low and reverse brake slipping
	In R position	• Low and reverse brake slipping • Reverse clutch slipping • Perform road test to determine whether problem is in low and reverse brake or reverse clutch • Engine braking felt in M (1GR) range: Reverse clutch is defective. • Engine braking not felt in M (1GR) range: Low and reverse brake is defective.
Below specification		• Engine lack of power

Time Lag Test

1. Perform mechanical system test preparation. (See 05–17A–3 Mechanical System Test Preparation.)
2. Start the engine and warm up the engine until the ATF temperature reaches **60—70 °C {141— 158 °F}**.
3. Shift the selector lever from N position to D range.
4. Use a stopwatch to measure the time it takes from shifting until engagement is felt. Take 3 measurements for each test and average the results using the following formula.

Formula

$$\textbf{Average time lag} = \frac{\textbf{Time 1 + Time 2 + Time 3}}{\textbf{3}}$$

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5. Perform the test for the following shifts in the same manner.
   - N position→R position

Average time lag
N position→D range: 0.4—0.7 sec.
N position→R position: 0.4—0.7 sec.

Evaluation of time lag test

Condition		Possible cause
N→D shift	More than specification	• Low line pressure • Forward clutch slipping • Oil leaking from forward clutch fluid circuit • Shift solenoid A not operating properly
	Less than specification	• Forward accumulator not operating properly • Shift solenoid A not operating properly • Excessive line pressure
N→R shift	More than specification	• Low line pressure • Low and reverse brake slipping • Reverse clutch slipping • Shift solenoid B not operating properly
	Less than specification	• Servo apply accumulator not operating properly • Shift solenoid B not operating properly • Excessive line pressure

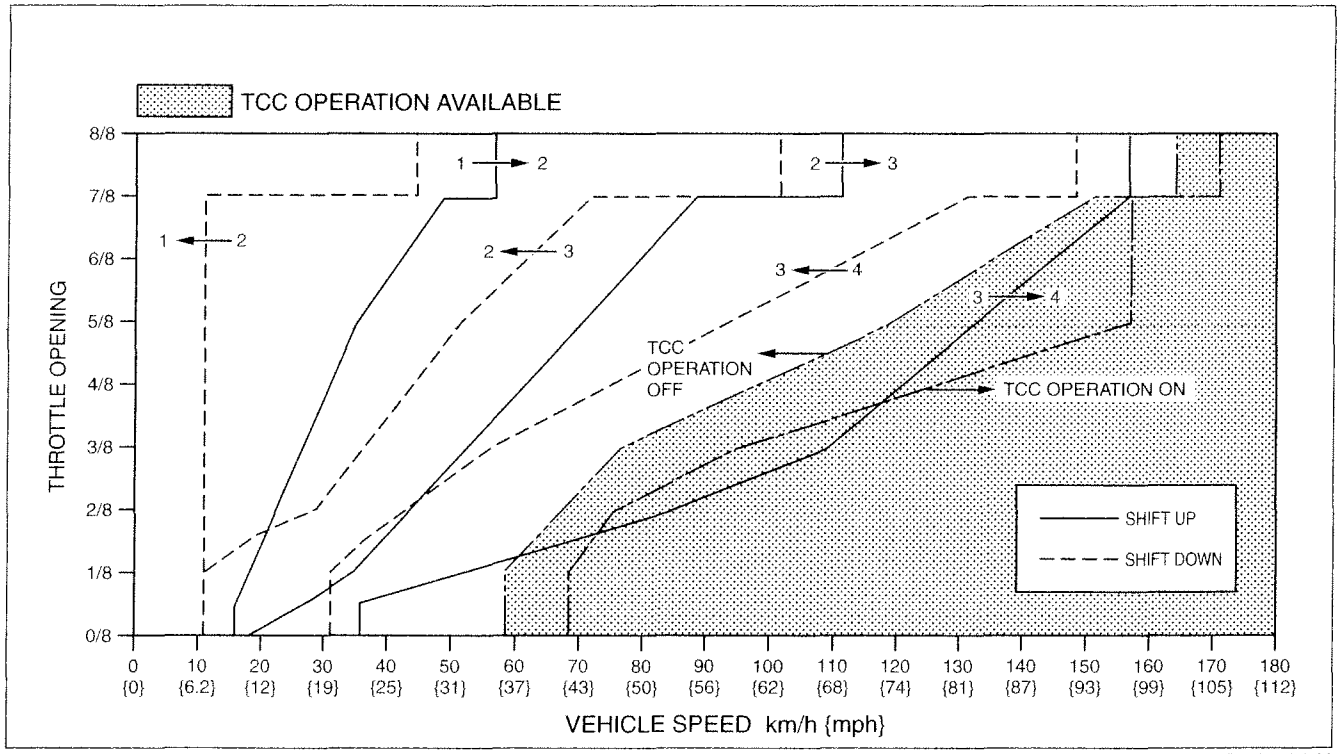
ROAD TEST [FN4A-EL]

C6U051719090W03

Road Test Preparation

1. Inspect the engine coolant. (See 01–12–2 COOLING SYSTEM SERVICE WARNINGS.) (See 01–12–3 ENGINE COOLANT LEVEL INSPECTION.)
2. Inspect the engine oil. (See 01–11–3 ENGINE OIL LEVEL INSPECTION.)
3. Inspect the ATF levels. (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)
4. Inspect the ignition timing. (See 01–10A–31 Ignition Timing Inspection.)
5. Inspect the idle speed. (See 01–10A–31 Idle Speed Inspection.)
6. Bring up the engine and transaxle to normal operating temperature.

Shift Diagram
D range (normal mode)



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D Range Test

1. Perform road test preparation. (See 05–17A–6 Road Test Preparation.)
2. Shift the selector lever to D range.
3. Accelerate the vehicle at half and WOT.
4. Verify that 1→2, 2→3, and 3→4 upshifts and downshifts are obtained. The shift points must be as shown in the table below.
   - If not as specified, inspect the TCM and ATX. (See 05–17A–24 TCM INSPECTION [FN4A-EL].) (See ATX Workshop Manual.)
5. Drive the vehicle in 4GR, 3GR, and 2GR and verify that kickdown occurs for 4→3, 3→2, 2→1 downshifts, and that the shift points are as shown in the table below.
   - If not as specified, inspect the TCM and ATX. (See 05–17A–24 TCM INSPECTION [FN4A-EL].) (See ATX Workshop Manual.)
6. Decelerate the vehicle and verify that engine braking effect is felt in 2GR, 3GR and 4GR.
   - If not as specified, inspect the TCM and ATX. (See 05–17A–24 TCM INSPECTION [FN4A-EL].) (See ATX Workshop Manual.)
7. Drive the vehicle and verify that TCC operation is obtained. The operation points must be as shown in the table below.
   - If not as specified, inspect the TCM and ATX. (See 05–17A–24 TCM INSPECTION [FN4A-EL].) (See ATX Workshop Manual.)

Vehicle speed at shift point table

Range	Mode	Throttle condition	Shift	Vehicle speed (km/h {mph})	Turbine speed (rpm)
D	NORMAL	Wide open throttle	$D_1 \rightarrow D_2$	56—62 {35—38}	5,500—6,050
			$D_2 \rightarrow D_3$	109—117 {68—72}	5,700—6,100
			$D_3 \rightarrow D_4$	154—164 {96—101}	5,400—5,700
			TCC ON (D_4)	168—178 {105—110}	4,250—4,450
		Half throttle	$D_1 \rightarrow D_2$	29—37 {18—22}	2,850—3,600
			$D_2 \rightarrow D_3$	55—70 {35—43}	2,850—3,650
			$D_3 \rightarrow D_4$	109—133 {68—82}	3,800—4,600
			TCC ON (D_4)	109—142 {68—88}	2,750—3,550
		Closed throttle position	$D_4 \rightarrow D_3$	28—34 {18—21}	750—850
			$D_3 \rightarrow D_1$	8—14 {5—8}	300—450
		Kickdown	$D_4 \rightarrow D_3$	144—154 {90—95}	3,650—3,850
			$D_3 \rightarrow D_2$	98—106 {61—65}	3,450—3,650
			$D_2 \rightarrow D_1$	42—48 {27—29}	2,200—2,500
	POWER	Wide open throttle	$D_1 \rightarrow D_2$	56—62 {35—38}	5,500—6,050
			$D_2 \rightarrow D_3$	109—117 {68—72}	5,700—6,100
			$D_3 \rightarrow D_4$	154—164 {96—101}	5,400—5,700
		Half throttle	$D_1 \rightarrow D_2$	34—42 {22—26}	3,300—4,150
			$D_2 \rightarrow D_3$	69—86 {43—53}	3,600—4,450
			$D_3 \rightarrow D_4$	116—139 {72—86}	4,050—4,850
		Closed throttle position	$D_4 \rightarrow D_3$	42—48 {27—29}	1,100—1,200
			$D_3 \rightarrow D_1$	8—14 {5—8}	300—450
		Kickdown	$D_4 \rightarrow D_3$	144—154 {90—95}	3,650—3,850
			$D_3 \rightarrow D_2$	98—106 {61—65}	3,450—3,650
			$D_2 \rightarrow D_1$	42—48 {27—29}	2,200—2,500

M Range Test

1. Perform road test preparation. (See 05–17A–6 Road Test Preparation.)
2. Shift the selector lever to M range.
3. Verify that 1→2, 2→3, and 3→4 upshifts and 4→3, 3→2, and 2→1 downshifts are obtained by manual shifting of the selector lever forward and back. The shift points must be as shown in the table below.
   - If not as specified, inspect the TCM and ATX. (See 05–17A–24 TCM INSPECTION [FN4A-EL].) (See ATX Workshop Manual.)
4. Decelerate the vehicle and verify that 4→3, 3→1, and 2→1 downshifts are obtained. The shift points must be as shown in the table below.
   - If not as specified, inspect the TCM and ATX. (See 05–17A–24 TCM INSPECTION [FN4A-EL].) (See ATX Workshop Manual.)
5. Decelerate the vehicle and verify that engine braking effect is felt in all gears.
   - If not as specified, inspect the TCM and ATX. (See 05–17A–24 TCM INSPECTION [FN4A-EL].) (See ATX Workshop Manual.)
6. Drive the vehicle and verify that TCC operation is obtained in 4GR. The operation points must be as shown in the table below.
   - If not as specified, inspect the TCM and ATX. (See 05–17A–24 TCM INSPECTION [FN4A-EL].) (See ATX Workshop Manual.)
7. Drive the vehicle in 4GR, 3GR, and 2GR and verify that kickdown occurs for 4→3, 4→2, 3→2 downshifts, and that the shift points are as shown in the table below.
   - If not as specified, inspect the TCM and ATX. (See 05–17A–24 TCM INSPECTION [FN4A-EL].) (See ATX Workshop Manual.)

Vehicle speed at shift point table

Range	Mode	Throttle condition	Shift	Vehicle speed km/h {mph}	Turbine speed (rpm)
M	Manual	Half throttle	TCC ON (M_4)	109—142 {68—88}	2,750—3,550
		All round	$M_4 \rightarrow M_3$	154—160 {96—99}	3,900—4,000
			$M_3 \rightarrow M_2$	108—114 {67—70}	3,800—3,950
			$M_2 \rightarrow M_1$	42—48 {27—29}	2,200—2,500
		Kickdown	$M_4 \rightarrow M_3$	144—154 {90—95}	3,650—3,850
			$M_4 \rightarrow M_2$	51—61 {32—37}	1,300—1,500
			$M_3 \rightarrow M_2$	52—60 {33—37}	1,850—2,050

P Position Test

1. Shift into P position on a gentle slope. Release the brake and verify that the vehicle does not roll.
   - If the vehicle rolls, inspect the ATX. (See ATX Workshop Manual.)

AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [FN4A-EL]

C6U051719090W04

Automatic Transaxle Fluid (ATF) Condition Inspection

1. One way of determining whether the transaxle should be disassembled is by noting:

- If the ATF is muddy or varnished.
- If the ATF smells strange or unusual.

ATF Condition

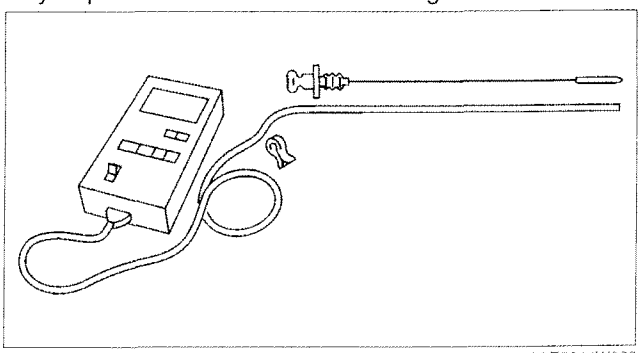
Condition			Possible cause
Clear red		Normal	—
Light red: pink		Contaminated with water	• Broken oil cooler inside of radiator • Poor filler tube installation: — Problem could be occurring to parts inside the transaxle by water contamination. It is necessary to overhaul transaxle and detect defective parts. If necessary, replace transaxle.
Reddish brown	Has burnt smell and metal specks are found	Deteriorated ATF	• Defective powertrain components inside of transaxle: Specks cause wide range of problems by plugging up in oil pipe, control valve body and oil cooler in radiator. • If a large amount of metal specks are found, overhaul transaxle and detect defective parts. If necessary, replace transaxle. • Implement flushing operation as there is a possibility specks are plugging up oil pipe and/or oil cooler inside of radiator.
	Has no burnt smell	Normal	• Discoloration by oxidation

Automatic Transaxle Fluid (ATF) Level Inspection

Caution

- **The ATF amount varies according to ATF temperature. Therefore, when checking the ATF level or replacing the ATF, use a thermometer to measure the temperature then adjust the ATF amount to the specified level according to the specified temperature.**

1. Park the vehicle on level ground.
2. Apply the parking brake and position wheel chocks securely to prevent the vehicle from rolling.
3. Adjust the length or thermometer probe so that the length is the same as the depth gauge, and hold the probe with a paper holder. Insert into the filler tube and measure the temperature.
   - If necessary, inspect the ATF before warming up the engine. In this case, use the cool range.**15—25 °C {59—77 °F}**
4. Warm up the engine until the ATF reaches **60—70 °C {140—158 °F}**.
5. Shift the selector lever and pause momentarily in each range (D—M) while depressing the brake pedal.
6. Shift the selector lever to P position.



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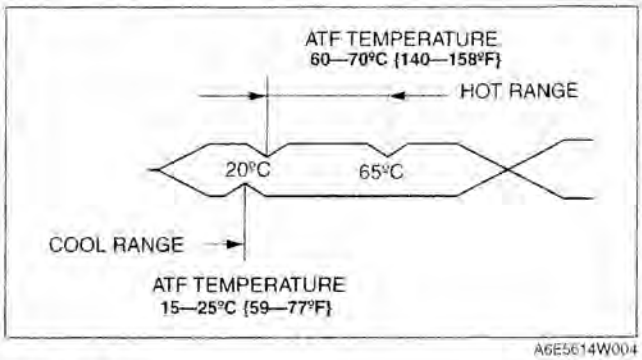
7. Verify that the ATF level is in the HOT range **(65 °C {149 °F})** while the engine is idling.
   - If necessary, add ATF to the specification.

ATF type
ATF M-V



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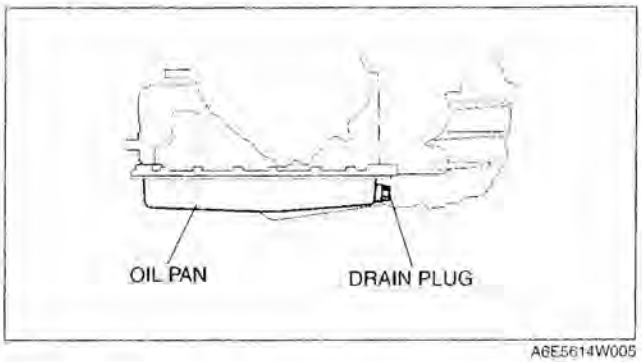
AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL]

C6U051719090W05

Warning
- **A hot transaxle and ATF can cause severe burns. Turn off the engine and wait until they are cool before changing the ATF.**

1. Remove the oil dipstick.
2. Remove the oil drain plug and washer.
3. Drain the ATF into a container.
4. Install a new washer and the drain plug.

Tightening torque
29.4—41.2 N·m
{3.0—4.2 kgf·m, 21.7—30.3 ft·lbf}



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5. Add the specified ATF until ATF level reaches lower notch of dipstick type of ATF through the oil filler tube.

ATF type
ATF M-V

Capacity (Approximate quantity)
7.2 L {7.6 US qt, 6.3 Imp qt}

6. Ensure that the ATF level is in the HOT range **(65 °C {149 °F}).**
   - Add ATF to the specified level as necessary.

TRANSAXLE RANGE (TR) SWITCH INSPECTION [FN4A-EL]

C6U051719200W01

Operating Inspection

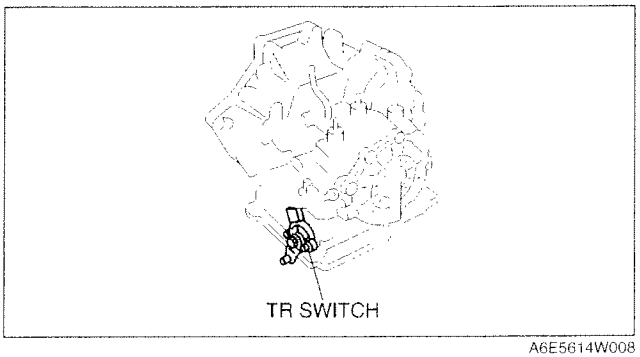
1. Verify that the starter operates only when the ignition switch is at the START position with the selector lever in P or N position.
   - If not as specified, adjust the TR switch.
2. Verify that the back-up lights illuminate when shifted to R position with the ignition switch at the ON position.
   - If not as specified, adjust the TR switch.

Continuity Inspection

Caution
- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)

3. Disconnect the TR switch connector.



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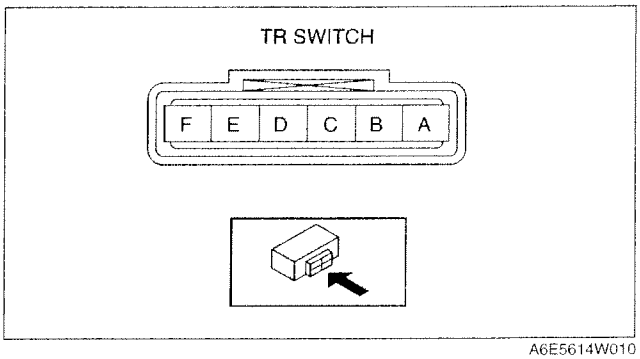
4. Inspect for continuity at the TR switch.
   - If not as specified, adjust the TR switch and go to Step 4.



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○—○ : Continuity

Position/ Range	Connector terminal				B — C
	A	F	D	E	Resistance (ohm)
P	○	○			4,085 — 4,515
R			○	○	1,425 — 1,575
N	○	○			713 — 788
D					132 — 390

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5. Reinspect for continuity at TR switch.
   - If not as specified, replace the TR switch. (See 05–17A–10 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION [FN4A-EL].)
6. Connect the TR switch connector.
7. Install the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
8. Connect the negative battery cable.

TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION [FN4A-EL]

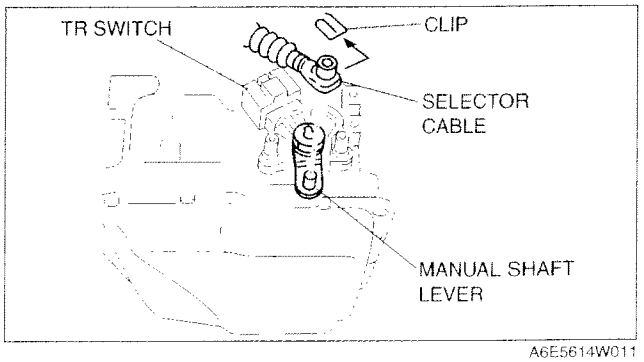
C6U051719200W02

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)

Caution
- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

3. Disconnect the TR switch connector.
4. Remove the clip and disconnect the selector cable.

Caution
- **Do not use an impact wrench. Hold the manual shaft lever when removing the manual shaft nut, or the transaxle may be damaged.**



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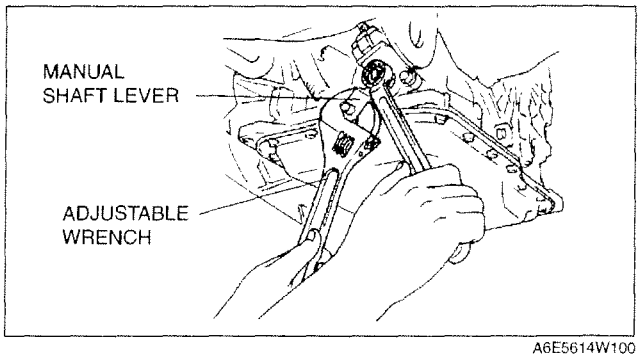
5. Set the adjustable wrench as shown to hold the manual shaft lever.
6. Remove the manual shaft nut and washer.



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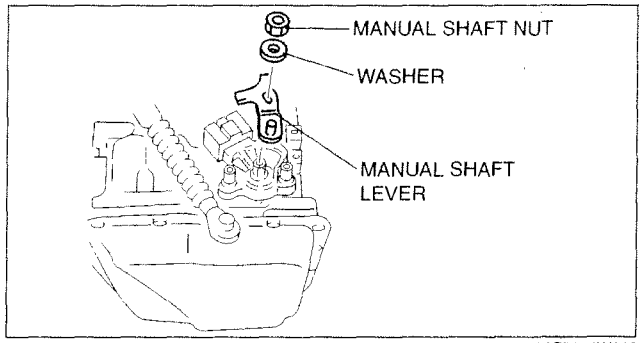
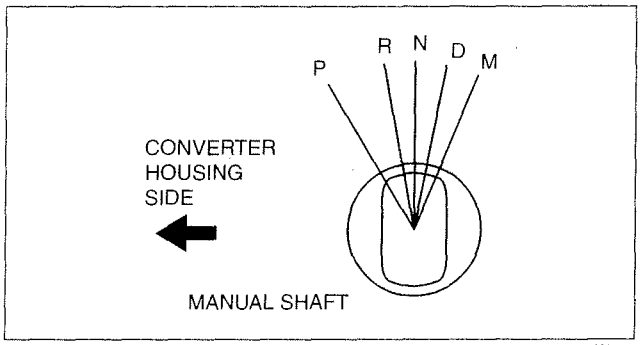
7. Remove the manual shaft lever.
8. Remove the TR switch.



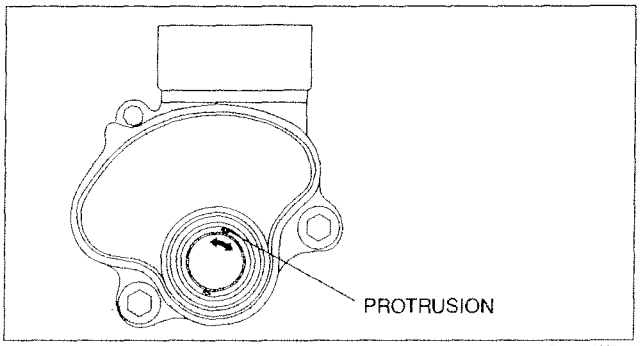
A6E5614W012

9. Rotate the manual shaft to the converter housing side fully, then return 2 notches to set the N position.

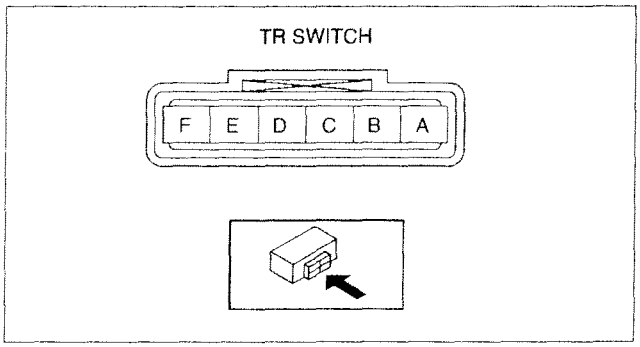


B6U0517W004

10. Turn the protrusion between terminals B and C until the resistance becomes **750 ohms**.

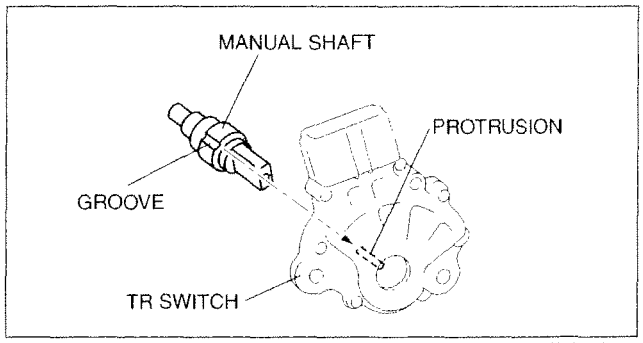


A6E5614W014



A6E5614W010

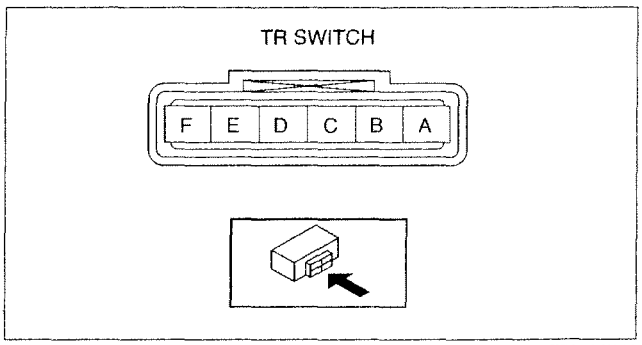
11. Install the TR switch while aligning the protrusion and groove as shown.
12. Hand-tighten the TR switch mounting bolts.



A6E5614W016

13. Inspect the resistance between the terminals B and C.
    - If not as specified, readjust the TR switch. (See 05–17A–13 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [FN4A-EL].)

    Resistance
    750 ohms



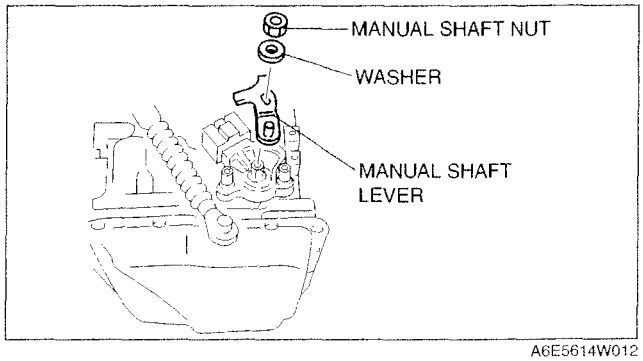
A6E5614W010

14. Tighten the TR switch mounting bolts.

    Tightening torque
    8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

Caution
- **Do not use an impact wrench. Hold the manual shaft lever when removing the manual shaft nut, or the transaxle may be damaged.**

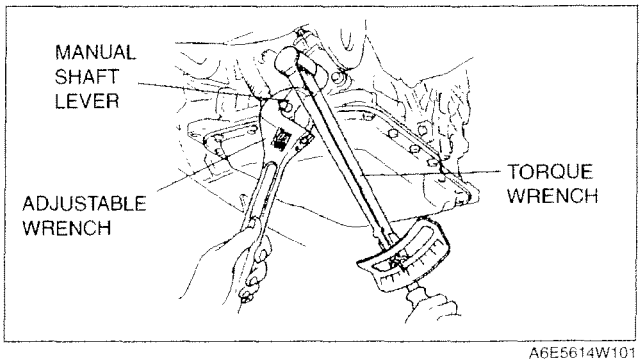
15. Install the manual shaft lever and the washer.



A6E5614W012

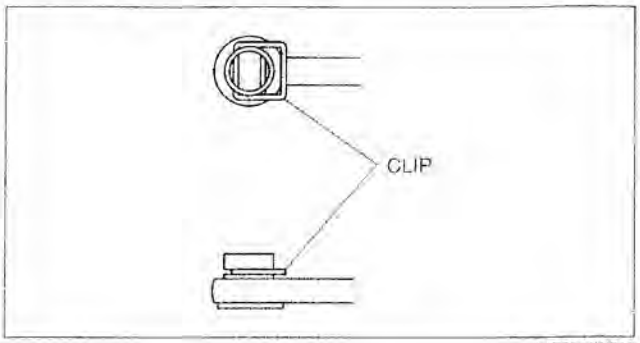
16. Set the adjustable wrench as shown to hold the manual shaft lever, and tighten the manual shaft nut.

    Tightening torque
    32—46 N·m {3.2—4.7 kgf·m, 24—33 ft·lbf}



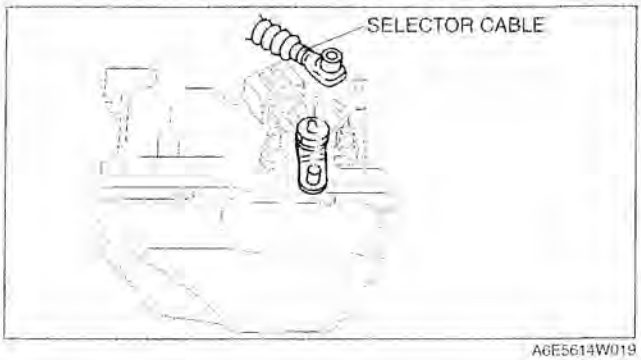
A6E5614W101

17. Install the clip to the SELECTOR CABLE as shown in the figure.
18. Shift the selector lever to P position.
19. Turn the manual shaft lever to P position.



A6E5614W018

20. Connect the selector cable.
21. Inspect for continuity at the TR switch. (See 05–17A–9 TRANSAXLE RANGE (TR) SWITCH INSPECTION [FN4A-EL].)
    - If not as specified, readjust the TR switch. (See 05–17A–13 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [FN4A-EL].)
22. Connect the TR switch connector.
23. Install the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [L3].)
24. Connect the negative battery cable.
25. Inspect operation of the TR switch. (See 05–17A–9 TRANSAXLE RANGE (TR) SWITCH INSPECTION [FN4A-EL].)
    - If not as specified, readjust the TR switch. (See 05–17A–13 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [FN4A-EL].)



A6E5614W019

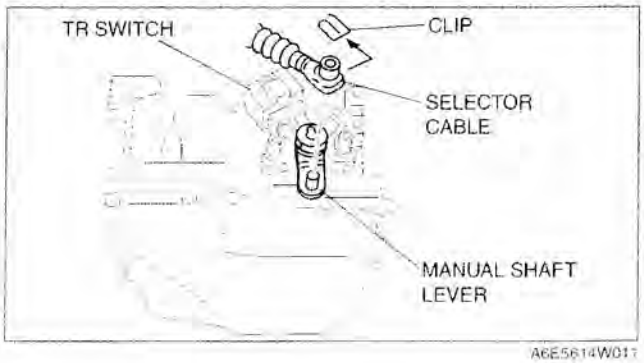
TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [FN4A-EL]

C6U051719200W03

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)

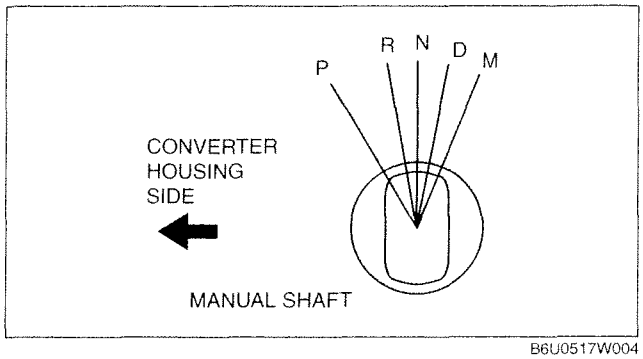
Caution
- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

3. Remove the clip and disconnect the selector cable.



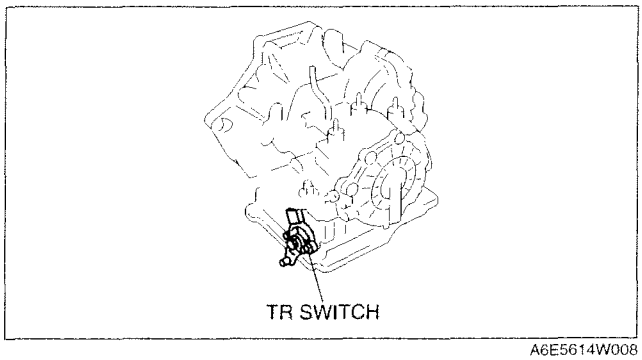
A6E5614W017

4. Rotate the manual shaft to the converter housing side fully, then return 2 notches to set the N position.



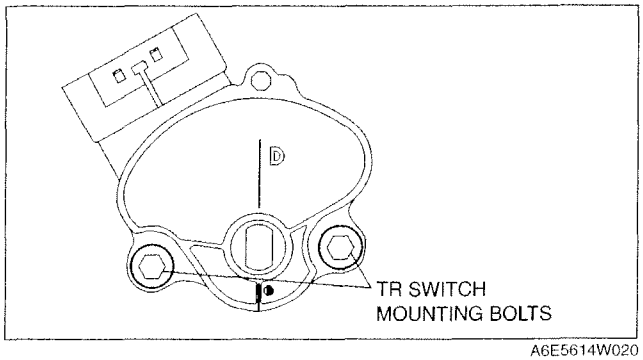
B6U0517W004

5. Disconnect the TR switch connector.



A6E5614W008

6. Loosen the TR switch mounting bolts.



A6E5614W020

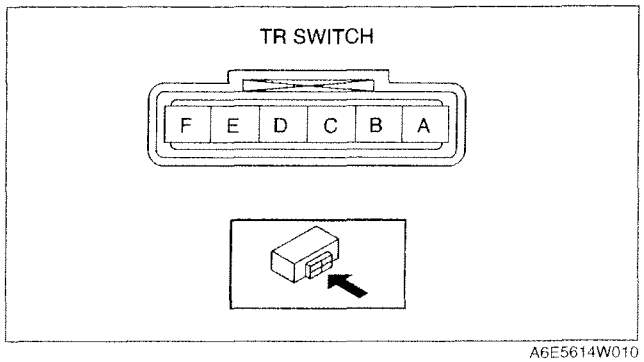
7. Measure the resistance between the terminals B and C.
8. Adjust the switch to the point as follows.

   Resistance standard value
   750 ohms

9. Tighten the TR switch mounting bolts.

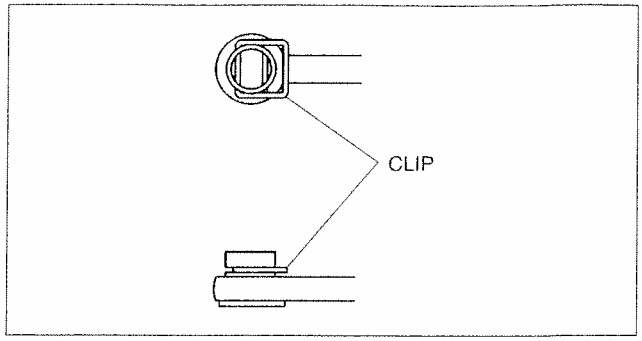
   Tightening torque
   8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

10. Move the selector lever to N position.
11. Verify that the TR switch is aligned with N position.
12. Connect the TR switch connector.



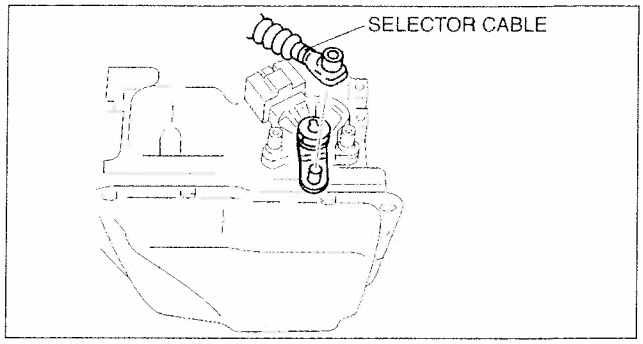
A6E5614W010

13. Install the clip to the selector cable as shown in the figure.



A6E5614W018

14. Connect the selector cable to the manual shaft lever as shown in the figure.
15. Inspect operation of the TR switch. (See 05–17A–9 TRANSAXLE RANGE (TR) SWITCH INSPECTION [FN4A-EL].)
    - If not as specified, readjust the TR switch.
16. Install the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [L3].)
17. Connect the negative battery cable.



A6E5614W019

TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION [FN4A-EL]

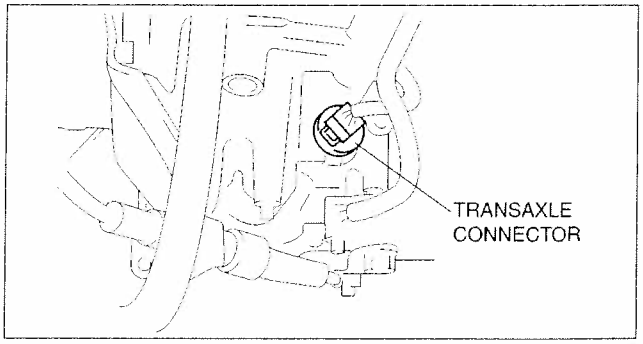
C6U051719200W04

On-Vehicle Inspection

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [L3].)

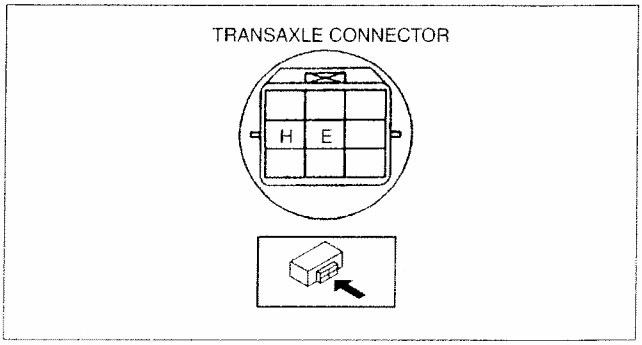
Caution

- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**



A6E5614W021

3. Disconnect the transaxle connector.
4. Measure the resistance between terminals E and H.
    - If it is out of specification, perform the off-vehicle inspection of TFT sensor. (See 05–17A–16 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/ INSTALLATION [FN4A-EL].)



A6E5614W022

ATF temperature (°C {°F})	Resistance (kilohm)
–20 {–4}	236—324
0 {32}	84.3—110
20 {68}	33.5—42.0
40 {104}	14.7—17.9
60 {140}	7.08—8.17
80 {176}	3.61—4.15
100 {212}	1.96—2.24
120 {248}	1.13—1.28
130 {266}	0.87—0.98

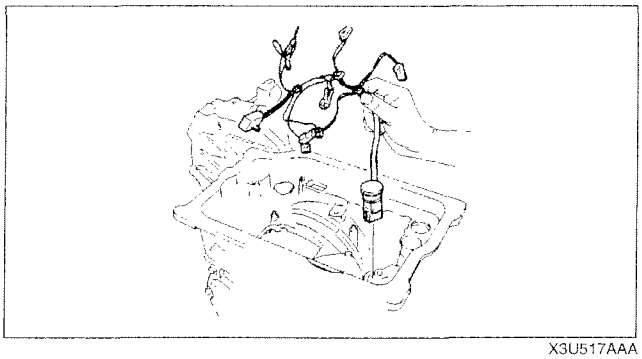
5. Install the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
6. Connect the negative battery cable.

Off-Vehicle Inspection

Warning

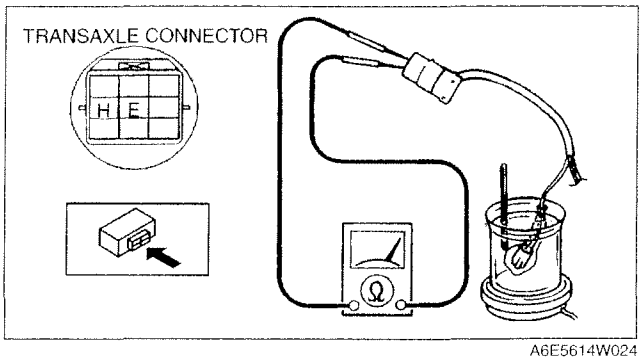
- **A hot transaxle and ATF can cause severe burns. Turn off the engine and wait until they are cool before changing the ATF.**

1. Remove the control valve body. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].)
2. Remove the coupler component.
3. Place the TFT sensor and a thermometer in ATF as shown, and heat the ATF gradually.



X3U517AAA

4. Measure resistance between the terminals of the TFT sensor.
   - If not as specified, replace the TFT sensor. (See 05–17A–16 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/ INSTALLATION [FN4A-EL].)



A6E5614W024

ATF temperature (°C {°F})	Resistance (kilohm)
-20 {-4}	236—324
0 {32}	84.3—110
20 {68}	33.5—42.0
40 {104}	14.7—17.9
60 {140}	7.08—8.17
80 {176}	3.61—4.15
100 {212}	1.96—2.24
120 {248}	1.13—1.28
130 {266}	0.87—0.98

5. Install the coupler component.
6. Install the control valve body. (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].)

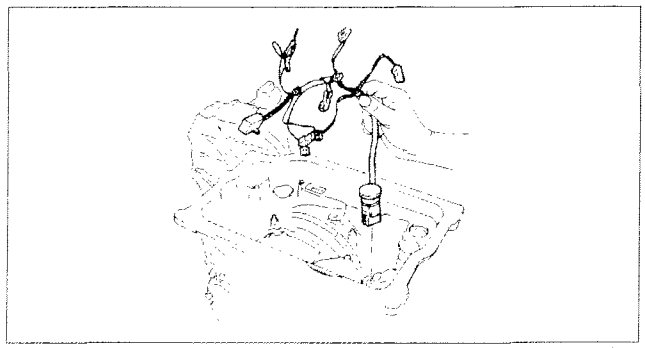
TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [FN4A-EL]

C6U051719200W05

Warning

- **A hot transaxle and ATF can cause severe burns. Turn off the engine and wait until they are cool before changing the ATF.**

1. Remove the oil pan. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].)
2. Remove the control valve body. (See 05–17A–36 On-Vehicle Removal.)
3. Remove the coupler component.
4. Install the coupler component.
5. Install the control valve body. (See 05–17A–37 On-Vehicle Installation.)
6. Install the oil pan. (See 05–17A–37 CONTROL VALVE BODY INSTALLATION [FN4A-EL].)
7. Carry out the mechanical system test. (See 05–17A–3 MECHANICAL SYSTEM TEST [FN4A-EL].)



X3U517AAA

OIL PRESSURE SWITCH INSPECTION [FN4A-EL]

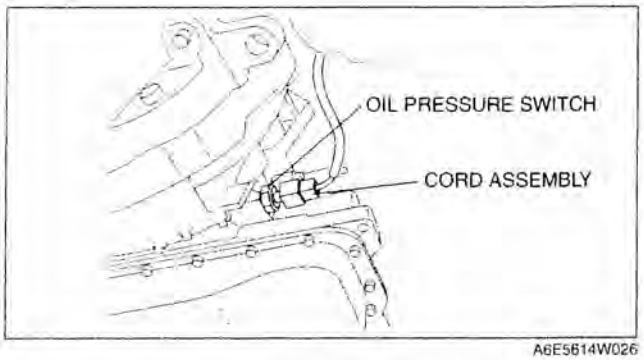
C6U051719200W06

Caution

- **Water or foreign objects entering the connector can cause poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

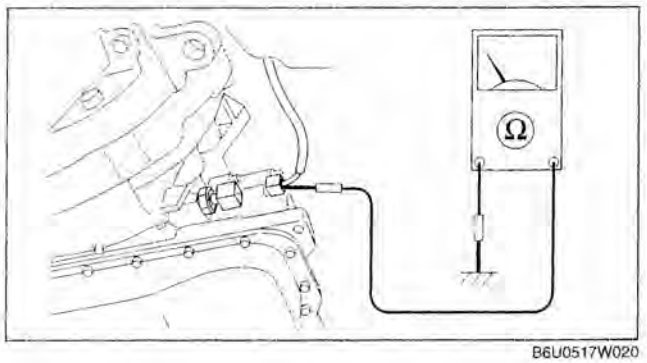
On-vehicle Inspection (harness inspection)

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Disconnect the cord assembly connector.



A6E5614W026

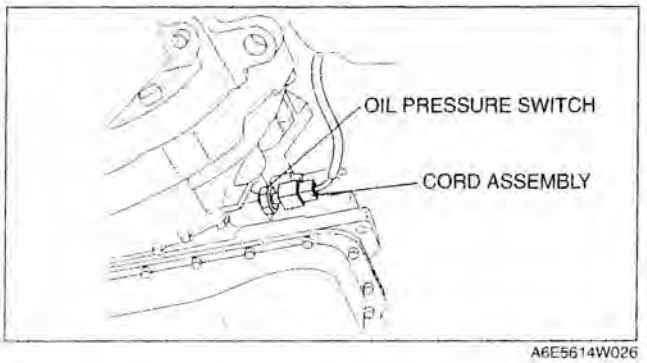
4. Verify that there is no continuity between cord assembly terminal and ground.
   - If there is no continuity, inspect the cord assembly.
   - If the cord assembly is okay, inspect the oil pressure switch. (See 05–17A–17 On-vehicle Inspection (oil pressure switch inspection).)
5. Connect the cord assembly connector.
6. Install the under cover.
7. Connect the negative battery cable.



B6U0517W020

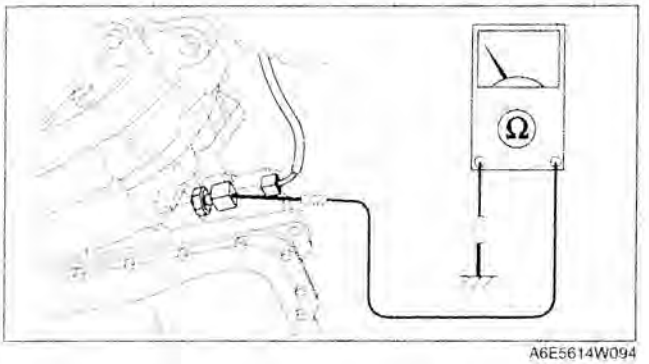
On-vehicle Inspection (oil pressure switch inspection)

1. Remove the under cover.
2. Disconnect the cord assembly connector.
3. Start the engine, with gear position in N or P.
4. Reaffirm that there is no continuity between cord assembly terminal and ground.
5. Firmly depress the brake pedal with the left foot.
6. Shift the selector lever to D range.



A6E5614W026

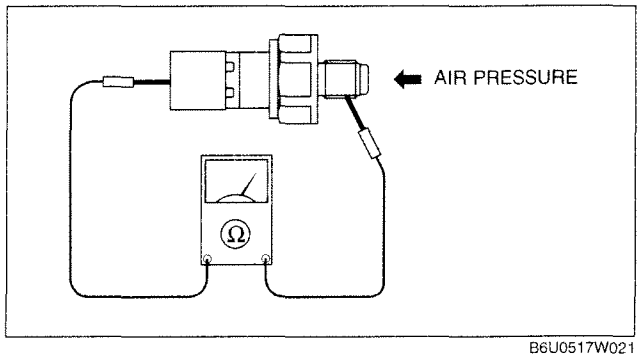
7. Verify that there is continuity between oil pressure switch terminal and ground.
   - If not as specified, replace the oil pressure switch. (See 05–17A–18 OIL PRESSURE SWITCH REMOVAL/INSTALLATION [FN4A-EL].)
8. Connect the oil pressure switch connector.
9. Install the under cover.
10. Connect the negative battery cable.



A6E5614W094

Off-vehicle inspection

1. Remove the oil pressure switch.
2. Apply air pressure at **400—440 kPa {4.1—4.4 kgf/cm^2, 58—63 psi}**
3. Inspect continuity the between oil pressure switch terminal and screw part.
   - If there is no continuity, replace the oil pressure switch. (See 05–17A–18 OIL PRESSURE SWITCH REMOVAL/INSTALLATION [FN4A-EL].)
4. Install the oil pressure switch.



B6U0517W021

OIL PRESSURE SWITCH REMOVAL/INSTALLATION [FN4A-EL]

C6U051719200W07

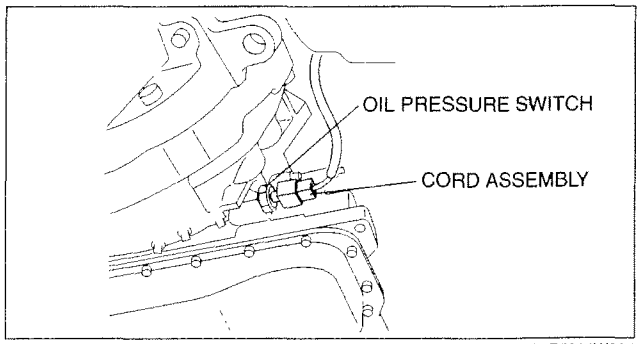
Warning

- **A hot transaxle and ATF can cause severe burns. Turn off the engine and wait until they are cool before changing the ATF.**

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Disconnect the cord assembly connector.
4. Remove the oil pressure switch.
5. Install the oil pressure switch.

Tightening torque
17.1—22.1 N·m
{1.8—2.2 kgf·m, 12.7—16.2 ft·lbf}

6. Connect the oil pressure switch connector.
7. Install the under cover.
8. Connect the negative battery cable.



A6E5614W026

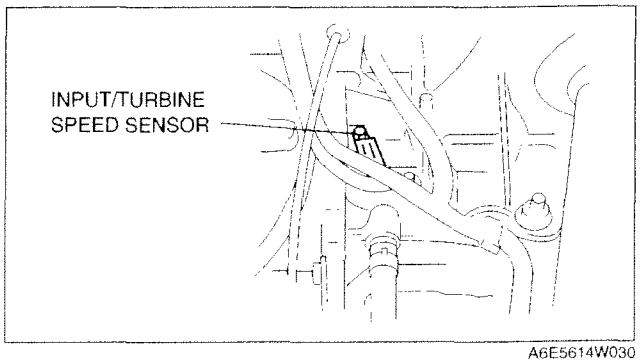
INPUT/TURBINE SPEED SENSOR INSPECTION [FN4A-EL]

C6U051719200W08

Caution

- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

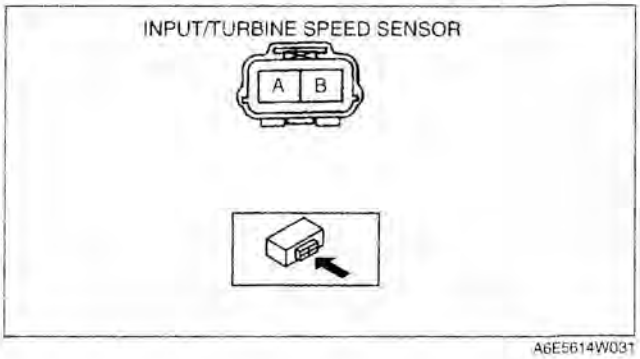
1. Disconnect the negative battery cable.
2. Remove the battery and battery tray.
3. Remove the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
4. Disconnect the input/turbine speed sensor connector.



A6E5614W030

5. Measure resistance between the terminals of the input/turbine speed sensor.
   - If not as specified, replace the input/turbine speed sensor.

   Resistance
   250—600 ohms (ATF temperature: –40—160 °C {–40—320 °F})



A6E5614W031

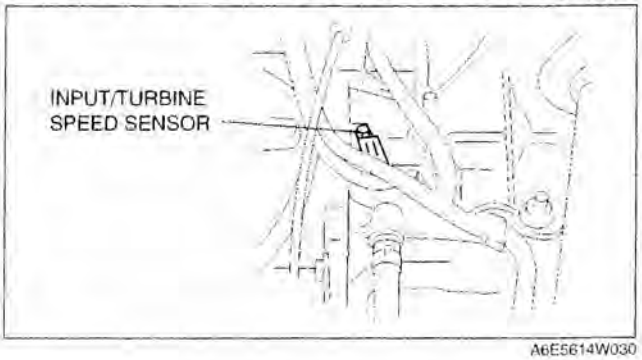
6. Connect the input/turbine speed sensor connector.
7. Install the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
8. Install the battery and battery tray.
9. Connect the negative battery cable.

INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION [FN4A-EL]

C6U051719200W09

1. Disconnect the negative battery cable.
2. Remove the battery and battery tray.
3. Remove the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
4. Disconnect the input/turbine speed sensor connector.
5. Remove the input/turbine speed sensor.
6. Apply ATF to a new O-ring and install it on a new input/turbine speed sensor.
7. Install the input/turbine speed sensor.

   Tightening torque
   8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}



A6E5614W030

8. Connect the input/turbine speed sensor connector.
9. Install the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
10. Install the battery and battery tray.
11. Connect the negative battery cable.

VEHICLE SPEEDOMETER SENSOR (VSS) INSPECTION (WITHOUT ABS) [FN4A-EL]

C6U051719200W10

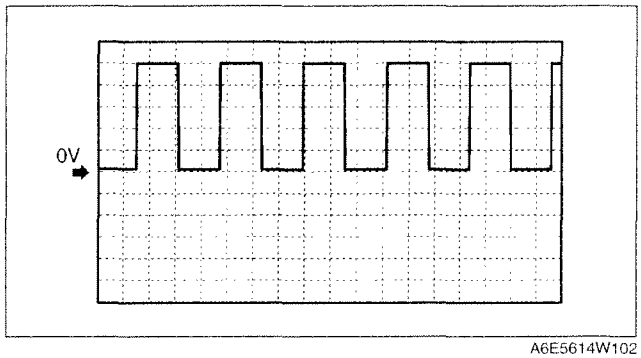
Visual Inspection

1. Remove the VSS. (See 05–17A–21 VEHICLE SPEEDOMETER SENSOR (VSS) REMOVAL/INSTALLATION (WITHOUT ABS) [FN4A-EL].)
2. Make sure that the sensor is free of any metallic shavings or particles.
   - If any are found on the sensor, clean them off.
3. Install the VSS. (See 05–17A–21 VEHICLE SPEEDOMETER SENSOR (VSS) REMOVAL/INSTALLATION (WITHOUT ABS) [FN4A-EL].)

Wave profile Inspection

1. Remove the TCM. (See 05–17A–30 TCM REMOVAL/INSTALLATION [FN4A-EL].)
2. Connect WDS or equivalent to DLC connector.
3. Connect oscilloscope test leads to the following TCM connector terminals.
   - (+) lead: TCM terminal 2P
   - (–) lead: TCM terminal 1O
4. Start the engine.
5. Monitor VSS PID.

6. Inspect wave profile.
   - TCM terminal: 2P (+)—1O (–)
   - Oscilloscope setting: 1 V/DIV (Y), 2.5 ms/DIV (X), DC range
   - Vehicle condition: drive the vehicle with 32 km/h {20 mph}
     — If wave profile or voltage are out of specifications, carry out the "Open Circuit Inspection" or "Short Circuit Inspection"



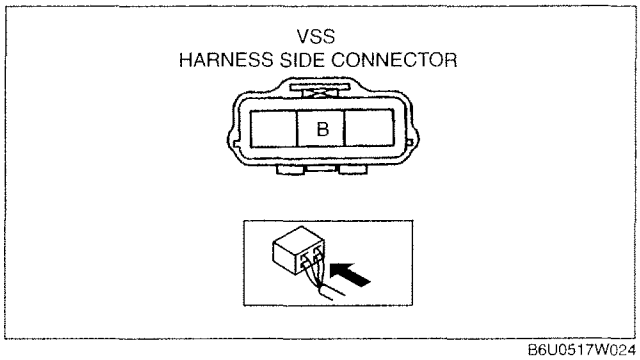
A6E5614W102

Power Supply Voltage Inspection

1. Disconnect the VSS connector.
2. Turn the ignition switch to ON.
3. Measure voltage at VSS connector terminal B (harness-side).

Specification
4.5—5.5 V

- If voltage is okay, go to Open Circuit Inspection and Short Circuit Inspection.
- If voltage is wrong, repair wiring harness between VSS and TCM.



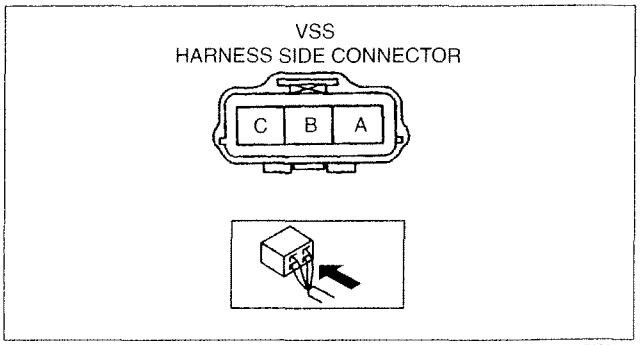
B6U0517W024

Open Circuit Inspection

1. Inspect the following circuit for open.
   - Power circuit (VSS connector terminal A (harness-side) to main relay terminal D)
   - Ground circuit (VSS connector terminal C (harness-side) to GND)
   - If an open circuit or short circuit is found, repair the malfunctioning wiring harness.
   - If there are no open or short circuits, perform the sensor rotor inspection.

Short Circuit Inspection

1. Inspect the following circuit for short.
   - Power circuit (VSS connector terminal A (harness-side) to main relay terminal D)
   - If an open circuit or short circuit is found, repair the malfunctioning wiring harness.
   - If there are no open or short circuits, perform the sensor rotor inspection.



B6U0517W025

Sensor Rotor Inspection

1. Remove the VSS. (See 05–17A–21 VEHICLE SPEEDOMETER SENSOR (VSS) REMOVAL/INSTALLATION (WITHOUT ABS) [FN4A-EL].)
2. Shift the selector lever to N position.
3. Inspect sensor rotor surface via VSS installation hole while rotating the front tire manually.
   (1) Is sensor rotor free of damage and cracks?
   (2) Is sensor rotor free of any metallic shavings or particles?
   - If sensor rotor is okay, replace the VSS.
   - If there is a problem, clean or replace the sensor rotor.

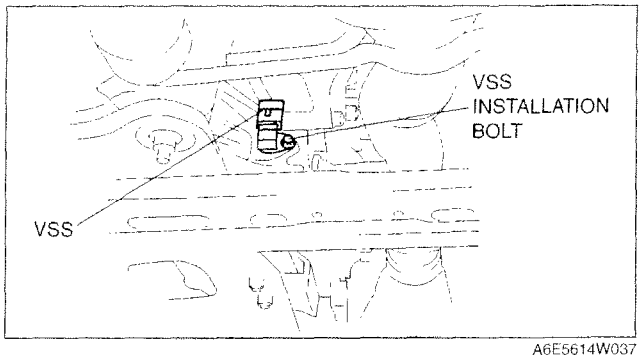
VEHICLE SPEEDOMETER SENSOR (VSS) REMOVAL/INSTALLATION (WITHOUT ABS) [FN4A-EL]

C6U051719200W11

Caution

- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**
- **If foreign materials are stuck to the VSS, disturbance by magnetic flux can cause sensor output to be abnormal and thereby negatively affect control. Make sure that foreign materials such as iron filings are not stuck to the VSS during installation.**

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Disconnect the VSS connector.
4. Remove the VSS.
5. Apply ATF to a new O-ring and install it on a new VSS.

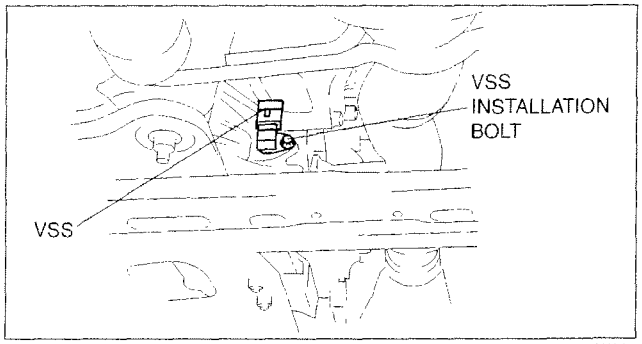


A6E5614W037

6. Install the VSS.

Tightening torque
8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

7. Connect the VSS connector.
8. Install the under cover.
9. Connect the negative battery cable.



A6E5614W037

SOLENOID VALVE INSPECTION [FN4A-EL]

C6U051721101W01

Resistance Inspection (On-Vehicle Inspection)

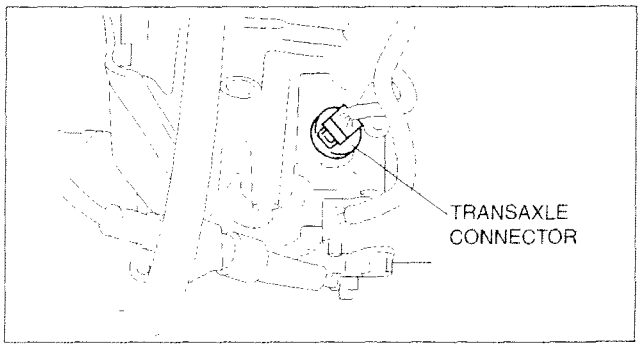
Caution

- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
3. Disconnect the transaxle connector.

Note

- When inspecting the pressure control solenoid, connect the ground connection to the ground terminal (terminal I) of the pressure control solenoid inside the solenoid valve connector.

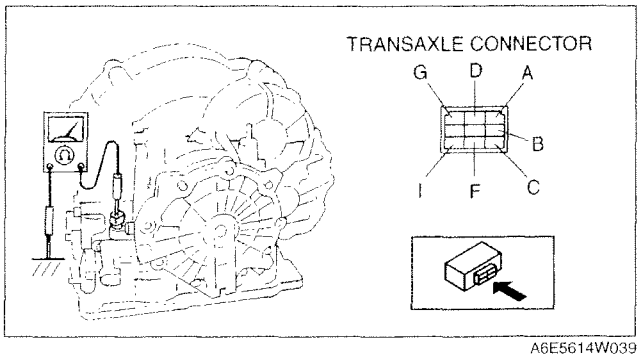


A6E5614W021

4. Measure the resistance between the following terminals.
   - If not as specified, inspect the ground, then perform the operating inspection.

ATF temperature: –40—150 °C {–40—302 °F}

Terminal	Solenoid valve	Resistance (ohm)
A—GND	Shift solenoid A	1.0—4.2
C—GND	Shift solenoid B	1.0—4.2
G—GND	Shift solenoid C	1.0—4.2
B—GND	Shift solenoid D	10.9—26.2
F—GND	Shift solenoid E	10.9—26.2
D—I	Pressure control	2.4—7.3



A6E5614W039

5. Connect the transaxle connector.
6. Install the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
7. Connect the negative battery cable.

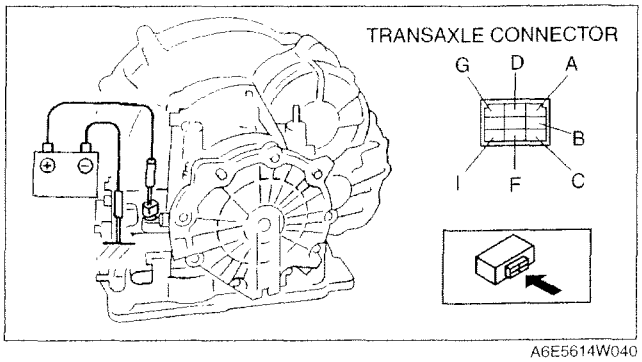
Operating Inspection

1. Disconnect the transaxle connector.

Caution
- **Do not apply battery position voltage to terminals A, B, C, D, F and G for more than three seconds.**

Note
- Because the operation sound of the valves is small, perform inspection in a quiet place.

2. Apply battery positive voltage to terminals A,B,C, F or G and battery negative voltage to GND, and verify that operating sound is heard from solenoid.
   - If the "click" is not heard, inspect the transaxle harness.
     — If the transaxle harness is okay, perform the resistance inspection (off-vehicle inspection).
     — If there is a problem, repair or replace the transaxle harness.
3. Apply battery positive voltage to terminal D and battery negative voltage to terminal I, and verify that operating sound is heard from solenoid.
   - If the "click" is not heard, inspect the transaxle harness.
     — If transaxle harness is okay, perform the resistance inspection (off-vehicle inspection)
     — If there is a problem, repair or replace the transaxle harness.



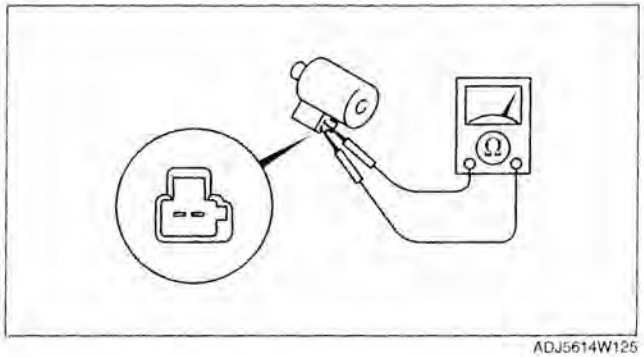
A6E5614W040

Resistance Inspection (Off-Vehicle Inspection)

1. Remove the control valve body. (See 05–17A–23 SOLENOID VALVE REMOVAL/INSTALLATION [FN4A-EL].)
2. Measure the resistance of each solenoid valve individually.
   - If not as specified, replace the solenoid valve.
3. Install the control valve body. (See 05–17A–23 SOLENOID VALVE REMOVAL/INSTALLATION [FN4A-EL].)

Pressure control solenoid

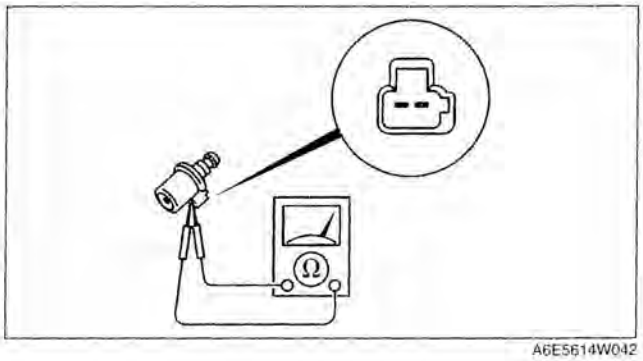
Resistance
2.4—7.3 ohms
(ATF temperature: –40—150 °C {–40—302 °F})



ADJ5614W125

Shift solenoid A, B, C

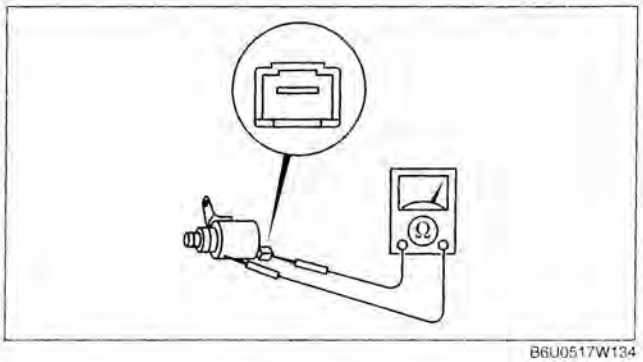
Resistance
1.0—4.2 ohms
(ATF temperature: –40—150 °C {–40—302 °F})



A6E5614W042

Shift solenoid D, E

Resistance
10.9—26.2 ohms
(ATF temperature: –40—150 °C {–40—302 °F})

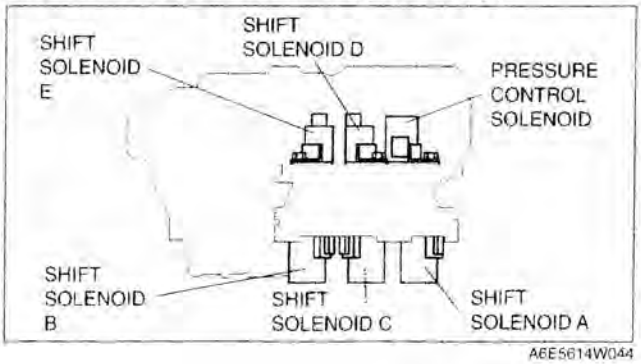


B6U0517W134

SOLENOID VALVE REMOVAL/INSTALLATION [FN4A-EL]

C6U051721101W02

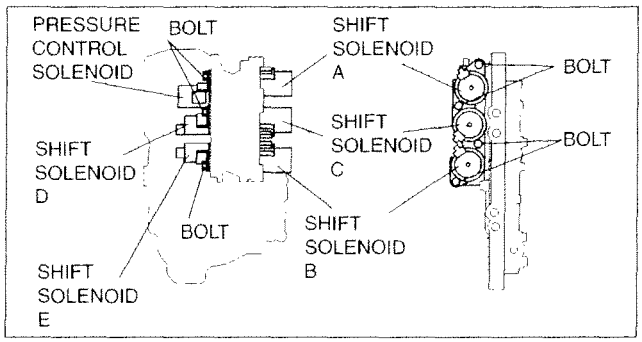
1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Remove the control valve body. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].)
4. Remove the solenoid valve (s).
5. Apply ATF to a new O-ring and install it on the solenoid valve.



A6E5614W044

6. Install the solenoid valve in the control valve body.

   Tightening torque
   7.8—10.8 N·m
   {80—110 kgf·cm, 69.5—95.4 in·lbf}



A6E5614W045

7. Install the control valve body. (See 05–17A–36 CONTROL VALVE BODY REMOVAL [FN4A-EL].)
8. Install the under cover.
9. Connect the negative battery cable.
10. Add ATF and, with the engine idling, inspect the ATF level and inspect for leakage. (See 05–17A–8 Automatic Transaxle Fluid (ATF) Level Inspection.)
11. Carry out the mechanical system test. (See 05–17A–3 MECHANICAL SYSTEM TEST [FN4A-EL].)
12. Carry out the road test. (See 05–17A–6 ROAD TEST [FN4A-EL].)

TCM INSPECTION [FN4A-EL]

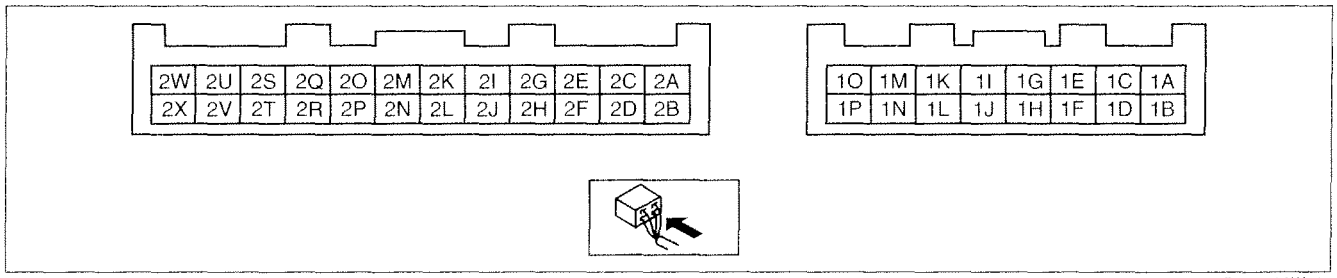
C6U051718901W01

Caution
- **The TCM terminal voltages vary with changes in measuring and vehicle conditions. Always carry out a total inspection of the input and output systems, and the TCM to determine the cause of trouble. Otherwise, a mis-diagnosis could occur.**

1. Measure the voltage at each terminal.
   - If any incorrect voltage is detected, inspect the related system (s), wiring harnesses and connector (s) referring to the Action column in the terminal voltage table.

Terminal Voltage Table (Reference)

Note
- Use the ground of terminal 1O and 1P of the TCM when measuring terminal voltage, as an error may occur when connecting the negative circuit tester to ground.



B6U0502W014

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
1A	Shift solenoid A control	Shift solenoid A	• Inspect using the wave profile. (See 05–17A–28 Inspection Using an Oscilloscope (Reference).)		• Inspect shift solenoid A (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) • Inspect related harness
1B	Shift solenoid B control	Shift solenoid B	• Inspect using the wave profile. (See 05–17A–28 Inspection Using an Oscilloscope (Reference).)		• Inspect shift solenoid B (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) • Inspect related harness

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
1C	Shift solenoid C control	Shift solenoid C	• Inspect using the wave profile. (See 05–17A–28 Inspection Using an Oscilloscope (Reference).)		• Inspect shift solenoid C (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) • Inspect related harness
1D	—	—	—	—	—
1E	Pressure control solenoid (+)	Pressure control solenoid valve	• Inspect using the wave profile. (See 05–17A–28 Inspection Using an Oscilloscope (Reference).)		• Inspect pressure control solenoid valve (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) • Inspect related harness
1F	Shift solenoid D control	Shift solenoid D	Selector lever is at P, N position	B+	• Inspect shift solenoid D (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) • Inspect related harness
			Other	Below 1.0	
1G	Pressure control solenoid (–)	Pressure control solenoid valve	• Inspect using the wave profile. (See 05–17A–28 Inspection Using an Oscilloscope (Reference).)		• Inspect pressure control solenoid valve (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) • Inspect related harness
1H	Shift solenoid E control	Shift solenoid E	Detects TCC operation	B+	• Inspect shift solenoid E (See 05–17A–21 SOLENOID VALVE INSPECTION [FN4A-EL].) • Inspect related harness
			Other	Below 1.0	
1I	—	—	—	—	—
1J	—	—	—	—	—
1K	Back-up power supply	Battery (positive terminal)	Under any condition	B+	• Inspect battery • Inspect related harness
1L	—	—	—	—	—
1M	B+	Main relay	Ignition switch OFF	Below 1.0	• Inspect battery • Inspect related harness
			Ignition switch ON	B+	
1N	B+	Main relay	Ignition switch OFF	Below 1.0	• Inspect battery • Inspect related harness
			Ignition switch ON	B+	
1O	GND	GND	Under any condition	Below 1.0	• Inspect related harness
1P	GND	GND	Under any condition	Below 1.0	• Inspect related harness
2A	—	—	—	—	—

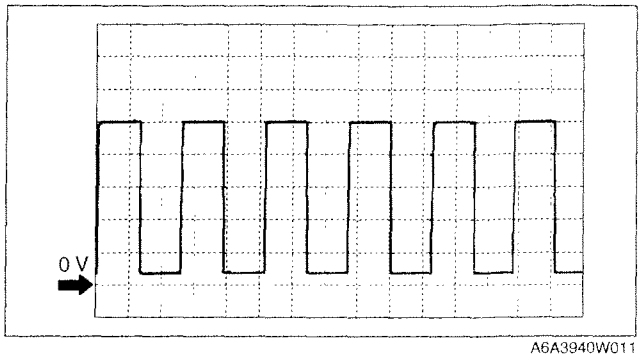
Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
2B	M range	M range switch	Ignition switch ON	Manual mode	Below 1.0	• Inspect M range switch (See 05–18–5 SELECTOR LEVER COMPONENT INSPECTION.) • Inspect related harness
				Other	B+	
2C	—	—	—		—	—
2D	Manual up	Up switch	Ignition switch ON	Detects up-shift operation of selector lever in M range	Below 1.0	• Inspect up switch (See 05–18–5 SELECTOR LEVER COMPONENT INSPECTION.) • Inspect related harness
				Other	B+	
2E	—	—	—		—	—
2F	Manual down	Down switch	Ignition switch ON	Detects down-shift operation of selector lever in M range	Below 1.0	• Inspect down switch (See 05–18–5 SELECTOR LEVER COMPONENT INSPECTION.) • Inspect related harness
				Other	B+	
2G	—	—	—		—	—
2H	Selector lever position	TR switch (terminal C)	Ignition switch ON	P position	Approx. 4.6	• Inspect TR switch (See 05–17A–9 TRANSAXLE RANGE (TR) SWITCH INSPECTION [FN4A-EL].) • Inspect related harness
				R position	Approx. 3.9	
				N position	Approx. 3.2	
				D range M range	Approx. 2.5	
2I	Input/turbine speed sensor (+)	Input/turbine speed sensor	• Inspect using the wave profile. (See 05–17A–28 Inspection Using an Oscilloscope (Reference).)			• Inspect input/turbine speed sensor (See 05–17A–18 INPUT/TURBINE SPEED SENSOR INSPECTION [FN4A-EL].) • Inspect related harness
2J	Oil pressure	Oil pressure switch	Ignition switch ON	Detects forward clutch pressure	Below 1.0	• Inspect oil pressure switch (See 05–17A–17 OIL PRESSURE SWITCH INSPECTION [FN4A-EL].) • Inspect related harness
				Other	B+	
2K	Input/turbine speed sensor (–)	Input/turbine speed sensor	• Inspect using the wave profile. (See 05–17A–28 Inspection Using an Oscilloscope (Reference).)			• Inspect input/turbine speed sensor (See 05–17A–18 INPUT/TURBINE SPEED SENSOR INSPECTION [FN4A-EL].) • Inspect related harness
2L	—	—	—		—	—

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
2M	ATF temperature	TFT sensor	Ignition switch ON	TFT 20 °C {68 °F}	Approx. 3.3	• Inspect TFT sensor (See 05–17A–15 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION [FN4A-EL].) • Inspect related harness
				TFT 40 °C {104 °F}	Approx. 2.4	
				TFT 60 °C {140 °F}	Approx. 1.5	
2N	—	—	—		—	—
2O	Sensor GND	MAF/IAT sensor, HO2S (front, rear), Variable resistor, ECT sensor, TP sensor, MAP sensor, TFT sensor, TR switch	Under any condition		Below 1.0	• Inspect related harness
2P	Vehicle speed	VSS	• Inspect using the wave profile. (See 05–17A–28 Inspection Using an Oscilloscope (Reference).)			• Inspect VSS (See 05–17A–19 VEHICLE SPEEDOMETER SENSOR (VSS) INSPECTION (WITHOUT ABS) [FN4A-EL].) • Inspect related harness
2Q	—	—	—		—	—
2R	Main relay control	Main relay	Ignition switch OFF		B+	• Inspect main relay (See 09–21–6 RELAY INSPECTION) • Inspect related harness
			Ignition switch ON		Below 1.0	
2S	Brake	Brake switch	Brake pedal depressed		B+	• Inspect brake switch (See 04–11–7 BRAKE SWITCH INSPECTION.) • Inspect related harness
			Brake pedal released		Below 1.0	
2T	—	—	—		—	—
2U	—	—	—		—	—
2V	—	—	—		—	—
2W	CAN_H	Instrument cluster, ABS HU/CM, ABS/TCS HU/CM, DSC HU/CM	Because this terminal is for CAN, adequate determination by terminal voltage is not possible.			—
2X	CAN_L	Instrument cluster, ABS HU/CM, ABS/TCS HU/CM, DSC HU/CM	Because this terminal is for CAN, adequate determination by terminal voltage is not possible.			—

Inspection Using an Oscilloscope (Reference)
VSS signal
TCM terminals
- 2P (+)—1O (–)

Oscilloscope setting
- 1 V/DIV (Y), 10 ms/DIV (X), DC range

Vehicle condition
- Drive the vehicle at approx. 10 km/h {6.2 mph}

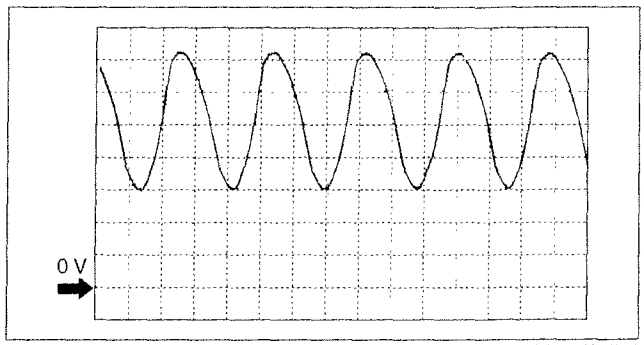


A6A3940W011

Input/turbine speed sensor signal
TCM terminals
- 2I (+)—1O (–)

Oscilloscope setting
- 500 mV/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

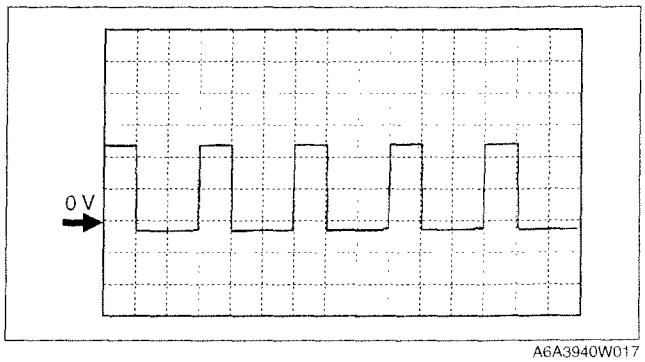


A6A3940W016

Pressure control solenoid signal
(–)
TCM terminals
- 1E (+)—1P (–)

Oscilloscope setting
- 5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

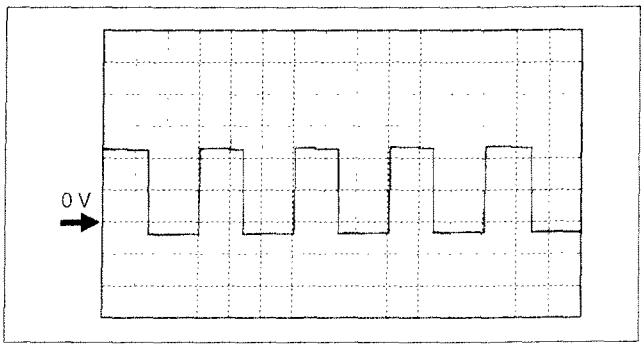


A6A3940W017

(+)
TCM terminals
- 1G (+)—1P (–)

Oscilloscope setting
- 5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

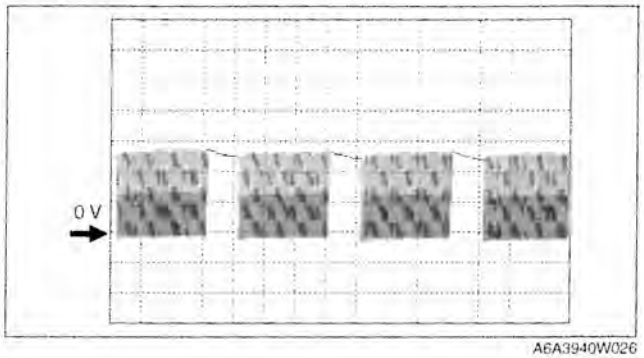


A6A3940W018

Shift solenoid A control
TCM terminals
- 1A (+)—1P (–)

Oscilloscope setting
- 5 V/DIV (Y), 5 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

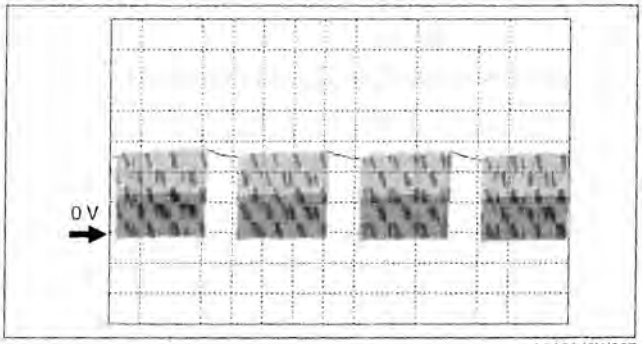


A6A3940W026

Shift solenoid B control
TCM terminals
- 1B (+)—1P (–)

Oscilloscope setting
- 5 V/DIV (Y), 5 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

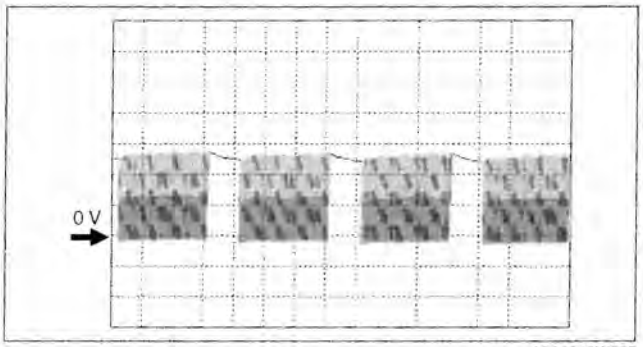


A6A3940W027

Shift solenoid C control
TCM terminals
- 1C (+)—1P (–)

Oscilloscope setting
- 5 V/DIV (Y), 5 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

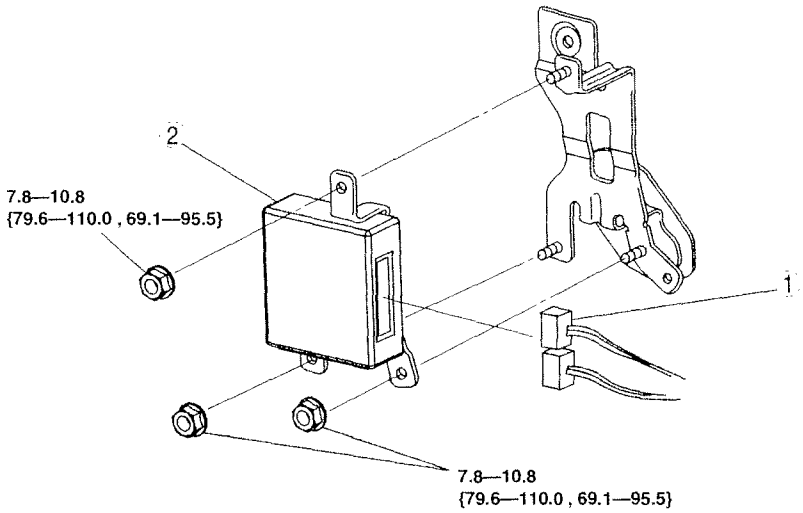


A6A3940W025

TCM REMOVAL/INSTALLATION [FN4A-EL]

C6U051718901W02

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Connect the negative battery cable.



N·m {kgf·cm, in·lbf}

B6U0517W114

1	TCM connector	2	TCM

AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL]

C6U051719090W06

1. Disconnect the negative battery cable.
2. Remove the battery and battery tray.
3. Remove the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].)
4. Remove the front tires and splash shield.
5. Remove the under cover.
6. Remove the steering gear and linkage, and pipe assembly installation bolts from the front crossmember, then suspend the steering gear and linkage with a cable. (See 06–12–9 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION [L3].)

   Pipe assembly tightening torque
   7.8—10.8 N·m {79.6—110.0 kgf·cm, 69.1—95.5 in·lbf}

7. Drain the ATF. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)

   Warning
   - **Improperly jacking a transaxle is dangerous. It can slip off the jack and may cause serious injury.**

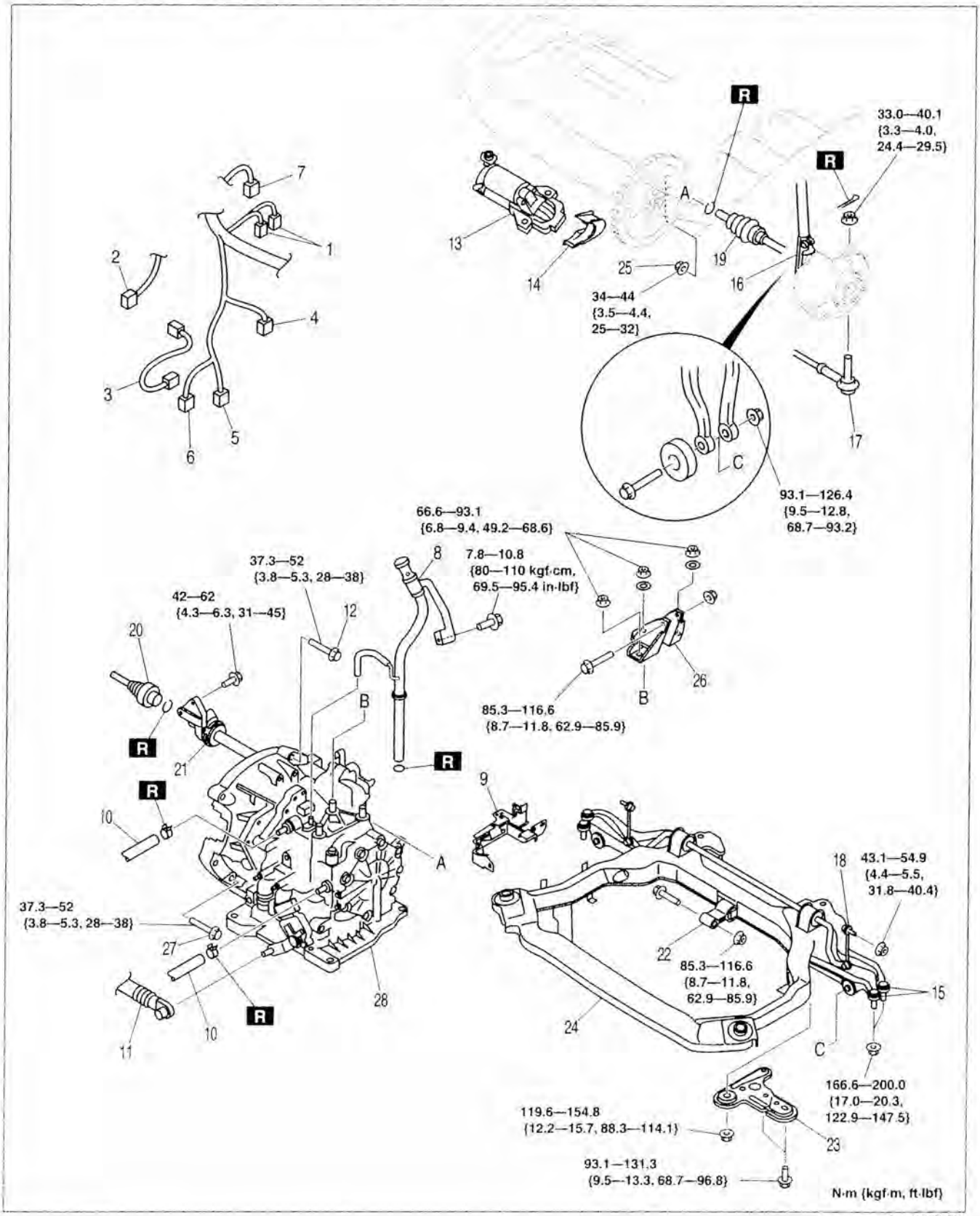
   Caution
   - **To prevent the torque converter and transaxle from separating, remove the transaxle without tilting it toward the torque converter.**

8. Remove in the order shown in the figure.
9. Install in the reverse order of removal.
10. Add ATF to the specified level. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)
11. Carry out the mechanical system test. (See 05–17A–3 MECHANICAL SYSTEM TEST [FN4A-EL].)

Service item	Test item		
	Line pressure test	Stall test	Time lag test
ATX replacement	X		
ATX overhaul	X	X	X
Torque converter replacement	X	X	
Oil pump replacement	X		
Clutch system replacement	X		X

X : Test to be performed after the service work

12. Perform the road test. (See 05–17A–6 ROAD TEST [FN4A-EL].)



C600517W001

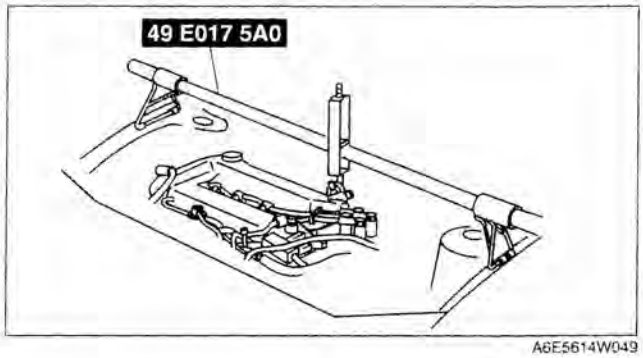
1	HO2S connector
2	Oil pressure switch connector (for oil filter)
3	Oil pressure switch connector (for ATX)

4	Input/turbine speed sensor connector
5	TR switch connector
6	Transaxle connector

7	VSS connector (Without ABS)
8	Oil dipstick and filler tube
9	Harness bracket
10	Oil hose
11	Selector cable
12	Transaxle mounting bolt (Upper side)
13	Starter (See 01–19–1 STARTER REMOVAL/ INSTALLATION)
14	Endplate cover
15	Lower arm (front, rear) ball joint (See 02–13–14 Front Lower Arm (Rear) Ball Joint Removal Note) (See 02–13–10 Front Lower Arm (Front) Ball Joint Removal Note)
16	Damper fork
17	Tie-rod end ball joint (See 06–12–9 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION [L3])
18	Stabilizer control link
19	Drive shaft (See 03–13–12 DRIVE SHAFT REMOVAL/ INSTALLATION [L3])
20	Drive shaft (See 03–13–12 DRIVE SHAFT REMOVAL/ INSTALLATION [L3])
21	Joint shaft (See 03–13–3 JOINT SHAFT REMOVAL/ INSTALLATION [L3])
22	No.1 engine mount (See 05–17A–34 No.1 Engine Mount Bracket Removal Note) (See 05–17A–35 No.1 Engine Mount and No.4 Engine Mount Bracket Installation Note)
23	Crossmember bracket
24	Crossmember (See 02–13–18 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
25	Torque converter installation nuts (See 05–17A–35 Torque Converter Nuts Removal Note) (See05–17A–35 Torque Converter Nuts Installation Note)
26	No.4 engine mount (See 05–17A–35 No.1 Engine Mount and No.4 Engine Mount Bracket Installation Note)
27	Transaxle mounting bolt (lower side)
28	Transaxle (See 05–17A–34 Transaxle Removal Note) (05–17A–34 Transaxle Installation Note)

No.1 Engine Mount Bracket Removal Note

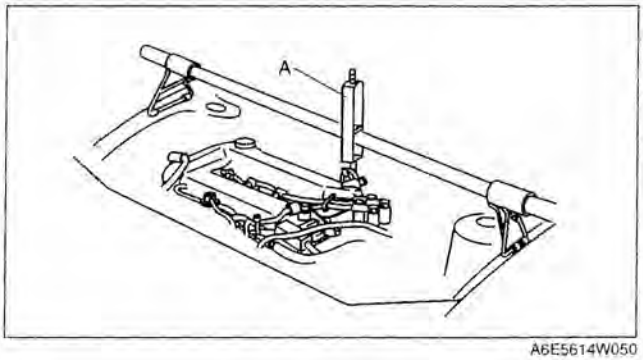
1. Support the engine using the **SST** before removing the No.1 engine mount.
2. Remove the No.1 engine mount.



A6E5614W049

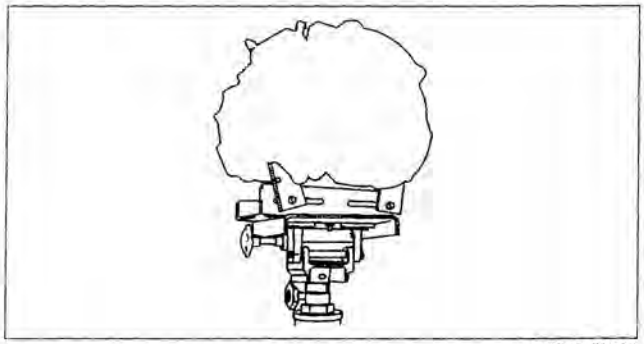
Transaxle Removal Note

1. Loosen the part marked A and lean the engine toward the transaxle.
2. Support the transaxle on a jack.
3. Remove the transaxle mounting bolts.



A6E5614W050

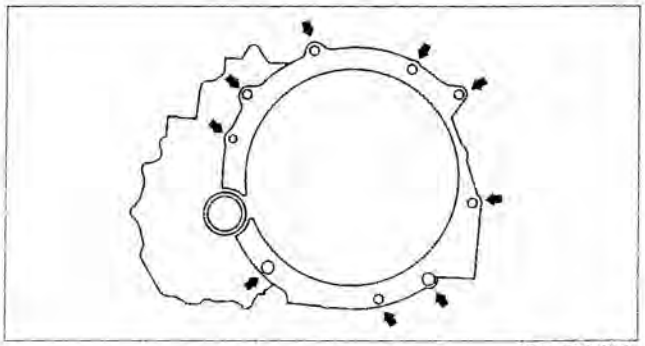
4. Remove the transaxle.


A6E5614W051

Transaxle Installation Note

1. Set the transaxle on a jack and lift it.
2. Install the transaxle mounting bolts.

Tightening torque
37.3—52 N·m {3.8—5.3 kgf·m, 28—38 ft·lbf}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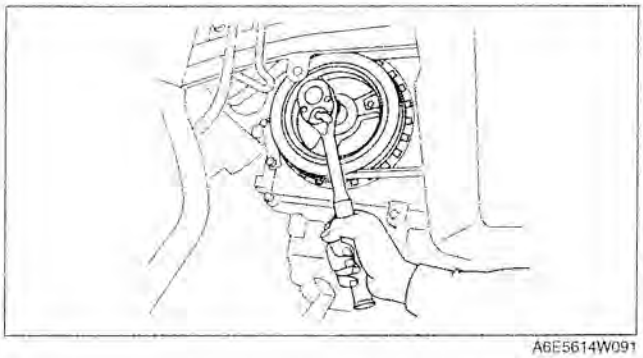
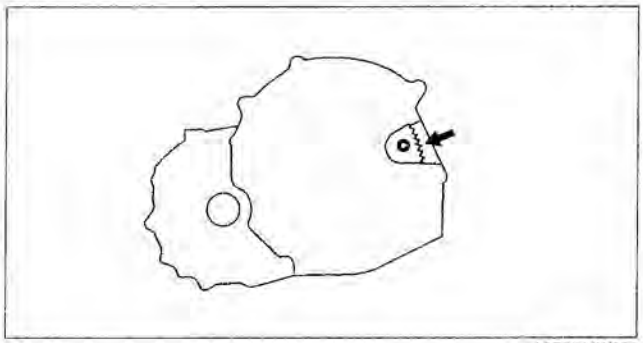
Torque Converter Nuts Removal Note

1. Hold the crankshaft pulley to prevent the drive plate from rotating.



A6E5614W091

2. Remove the torque converter nuts from the starter installation hole.



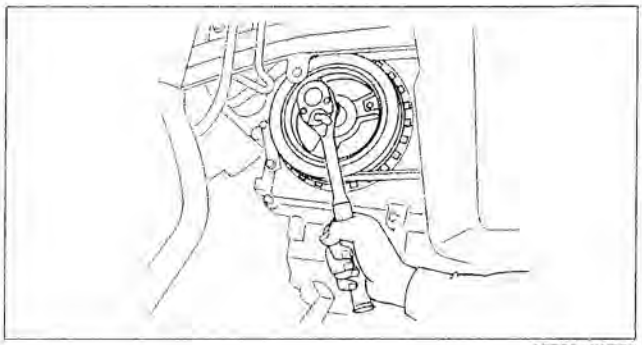
A6E5614W092

Torque Converter Nuts Installation Note

1. Hold the crankshaft pulley to prevent the drive plate from rotating.

Caution

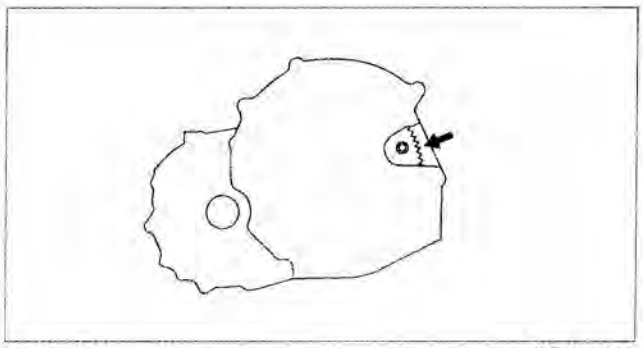
- **Loosely and equally tighten the torque converter nuts, then further tighten them to the specified tightening torque.**



A6E5614W091

2. Tighten the torque converter mounting nuts.

Tightening torque
34—44 N·m
{3.5—4.4 kgf·m, 25—32 ft·lbf}



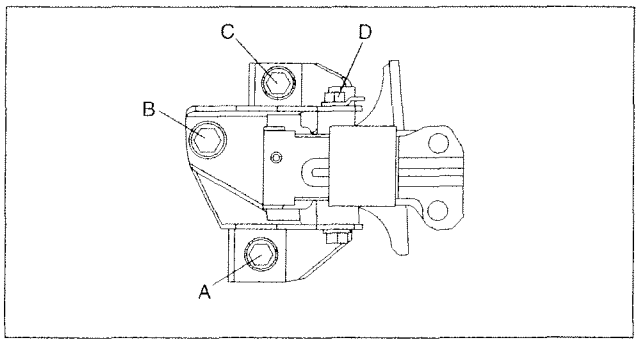
A6E5614W092

No.1 Engine Mount and No.4 Engine Mount Bracket Installation Note

1. Verify that the engine mount rubber is installed as shown.
2. By aligning the holes with the stud bolts, install the No.4 engine mount bracket to the transaxle.
3. By aligning the holes with the stud bolts, install the No.1 engine mount to the transaxle.
4. Align the hole of the No.4 engine mount bracket with the No.4 engine mount rubber on the vehicle, and lightly tighten bolt D.
5. Lightly tighten nuts A, B, C.
6. Tighten nuts A, B, C in the order of B→C→A.

7. Tighten bolt D.

Tightening torque
A, B, C: 66.6—93.1 N·m
{6.8—9.4 kgf·m, 49.2—68.6 ft·lbf}
D: 85.3—116.6 N·m
{8.7—11.8 kgf·m, 62.9—85.9 ft·lbf}



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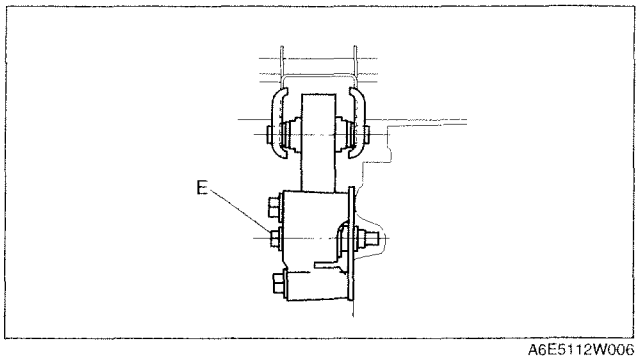
8. Tighten bolt E to the No.1 engine mount.

Tightening torque
E: 85.3—116.6 N·m
{8.7—11.8 kgf·m, 62.9—85.9 ft·lbf}

9. Remove the **SST** (49 E017 5A0).



A6E5112W006

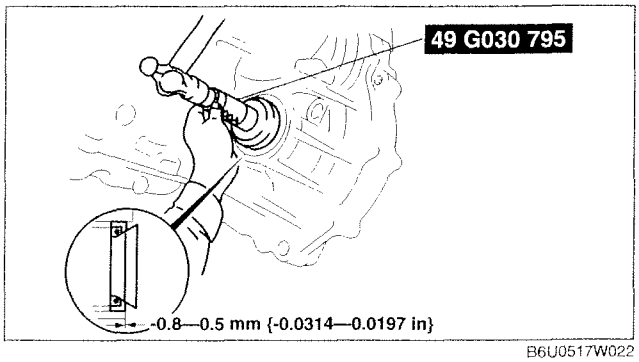
OIL SEAL REPLACEMENT [FN4A-EL]

C6U051727238W01

1. Drain the ATF. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)

Caution
- **The oil seal is easily damaged by the sharp edges of the drive shaft splines. Do not let the splines contact the oil seal.**

2. Remove the drive shaft. (See 03–13–12 DRIVE SHAFT REMOVAL/INSTALLATION [L3].)
3. Remove the oil seal.
4. Using the **SST** and a hammer, tap a new oil seal in evenly until the **SST** contacts the transaxle case.
5. Coat the lip of the oil seal with transaxle oil.
6. Install the drive shaft. (See 03–13–12 DRIVE SHAFT REMOVAL/INSTALLATION [L3].)
7. Add ATF to the specified level. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)
8. Carry out the mechanical system test. (See 05–17A–3 MECHANICAL SYSTEM TEST [FN4A-EL].)



B6U0517W022

CONTROL VALVE BODY REMOVAL [FN4A-EL]

C6U051721100W01

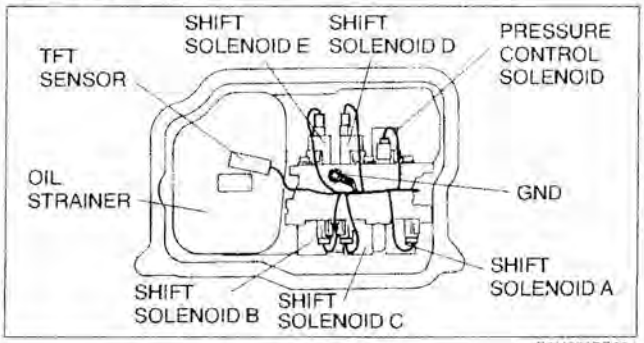
On-Vehicle Removal

Warning
- **Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eyeglasses whenever using compressed air.**

Caution
- **Clean the transaxle exterior throughout with a steam cleaner or cleaning solvents before removal.**
- **If any old sealant gets into the transaxle during installation of the oil pan, trouble may occur in the transaxle case and oil pan. Clean with cleaning fluids.**

1. Disconnect the negative battery cable.
2. Drain the ATF into a separate suitable container. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)
3. Remove the under cover.

4. Remove the front tires and splash shield.
5. Remove the crossmember. (See 02–13–18 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
6. Remove the oil pan.
7. Disconnect the solenoid connectors and GND, and remove the TFT sensor.
8. Remove the oil strainer.



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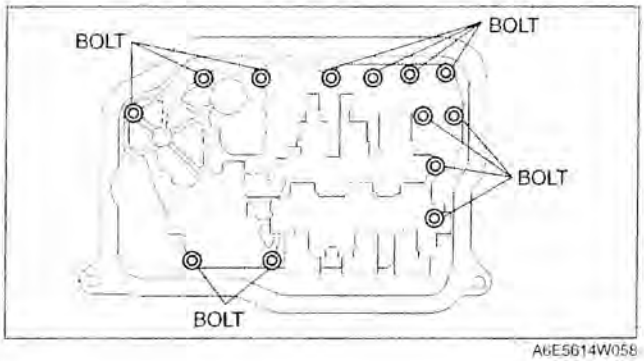
9. Remove the control valve body installation bolts A as shown, then remove the control valve body component as shown.



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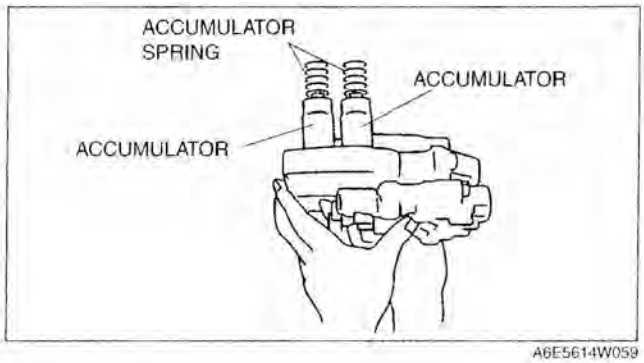
10. Remove the accumulators and accumulator springs.



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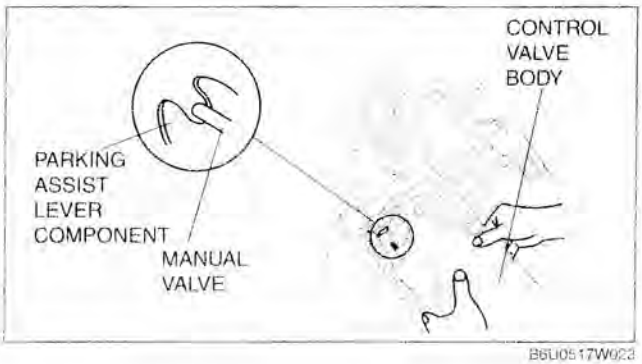
CONTROL VALVE BODY INSTALLATION [FN4A-EL]

C6U051721100W02

On-Vehicle Installation



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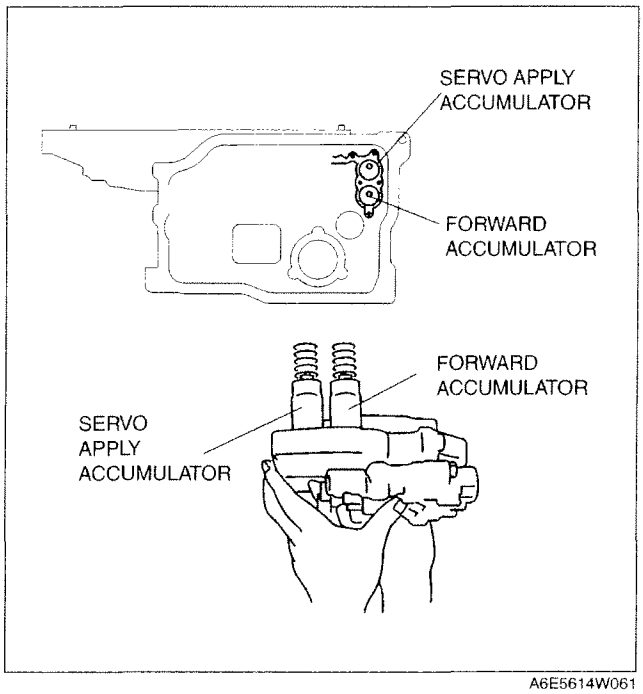
Caution
- **Be sure to align the parking rod and the manual valve.**

1. Install the accumulator springs and accumulators into the transaxle case.

Spring	Outer diameter (mm {in})	Free Length (mm {in})	No. of coils	Wire diameter (mm {in})
Servo apply accumulator large spring	21.0 {0.827}	67.8 {2.669}	10.3	3.5 {0.138}
Servo apply accumulator small spring	13.0 {0.512}	67.8 {2.669}	17.1	2.2 {0.087}
Forward accumulator small spring	21.0 {0.827}	75.0 {2.953}	10.7	2.3 {0.091}
Forward accumulator large spring	15.6 {0.614}	49.0 {1.929}	7.7	2.4 {0.094}

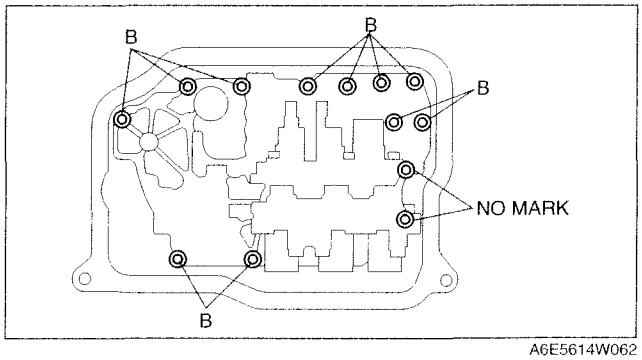


A6E5614W061

2. Install the control valve body component.

Tightening torque
7.8—10.8 N·m
{80—110 kgf·cm, 70—95 in·lbf}

Bolt length (measured from below the head)
Mark B: 40 mm {1.575 in}
No mark: 70 mm {2.756 in}



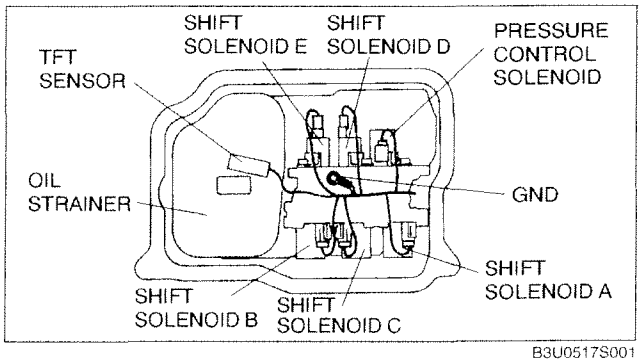
A6E5614W062

3. Install the oil strainer.
4. Match the harness colors, then connect the solenoid connectors and GND, and install the TFT sensor.

Spring	Color of connector (harness side)
Pressure control solenoid	Black
Shift solenoid A	White
Shift solenoid B	Blue
Shift solenoid C	Green
Shift solenoid D	White
Shift solenoid E	Black

5. Install the ground.

Tightening torque
8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}



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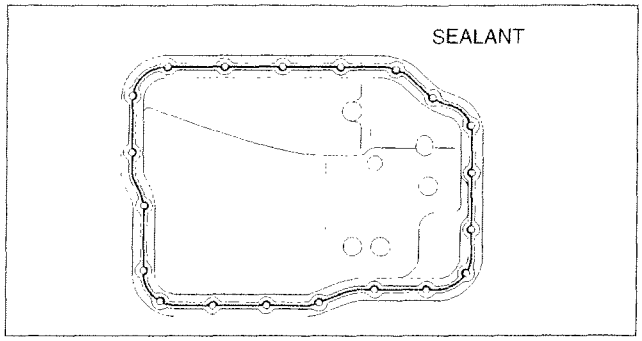
6. Apply a light coat of silicon sealant (TB1217E) to the contact surfaces of the oil pan and transaxle case.
7. Install the oil pan.

Tightening torque
6—8 N·m {62—81 kgf·cm, 53—70 in·lbf}



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8. Install the crossmember. (See 02–13–18 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
9. Install the front tires and splash shield.
10. Install the under cover.
11. Connect the negative battery cable.
12. Add ATF and with the engine idling, inspect the ATF level. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)
13. Perform the mechanical system test. (See 05–17A–3 MECHANICAL SYSTEM TEST [FN4A-EL].)
14. Perform the road test. (See 05–17A–6 ROAD TEST [FN4A-EL].)

OIL COOLER FLUSHING [FN4A-EL]

C6U051719900W01

Note
- The contaminated cooler line (oil pipes and hoses) and auxiliary cooler must be flushed completely when ATX is overhauled or replaced.

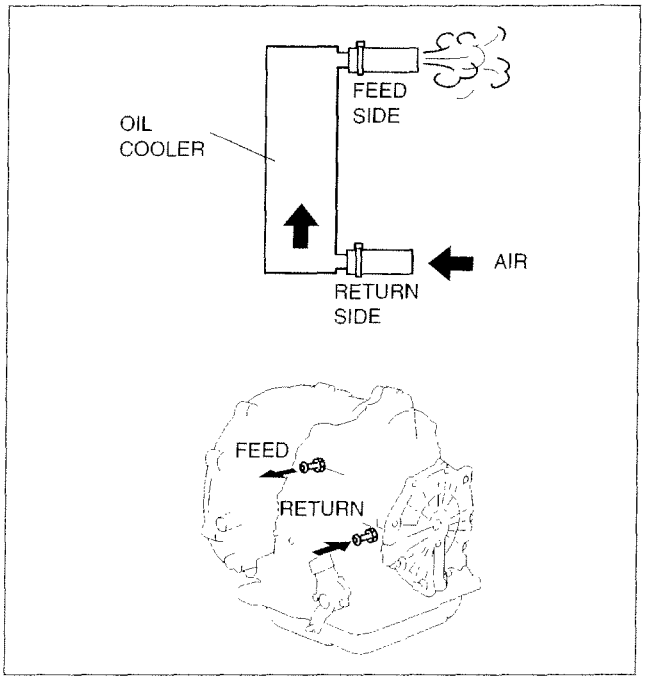
1. Remove the two oil cooler line hoses and apply air pressure of **196 kPa {2.0 kgf/cm^2, 28 psi}** from the return hose (pipe) side.

Caution
- **Power flushing should be performed very carefully when removing the accumulated debris from the fluid baffle, otherwise the debris cannot be removed or the problem becomes even worse.**

2. If there is no air blown out the feed side, flush the oil cooler lines using the power-flushing tool. (See 05–17A–40 Power Flushing)

Recommended power-flushing manufacturer

Manufacturer	Part number	Description
Kent Moore	J35944-AMAZ	Flushing kit or equivalent
OTC	60081	Portable torque converter, oil cooler cleaner or equivalent



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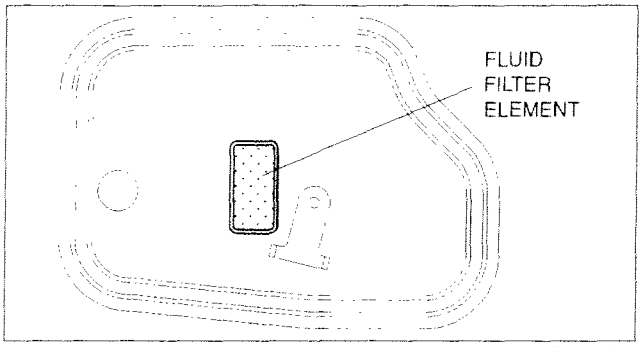
3. If there is ventilation, carry out the following steps.
   (1) Remove the oil pan and inspect the fluid filter element from the front filter.
   (2) If the element is covered with too much debris or particles and cannot be seen, replace the oil cooler. (See 05–17A–40 OIL COOLER REMOVAL/INSTALLATION [FN4A-EL].) (See 05–17A–42 OIL COOLER DISASSEMBLY/ ASSEMBLY [FN4A-EL].)
   (3) If the element can be seen, flush the oil cooler lines using the power-flushing tool.
   - Performing back and reverse power flushing two times each does not work because debris or particles flow out from the feed pipe side of ATX.



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Power Flushing
Repair procedure

1. Before power flushing, inspect the hoses/lines and clamps. Power flushing must begin with back flushing followed by forward flushing to quickly dislodge the restriction. If back flushing is not performed before forward flushing, the restriction could further reduce the ATF flow through the internal mesh type baffle of the cooler and flushing will not be effective or possible.

Inspecting oil lines and clamps

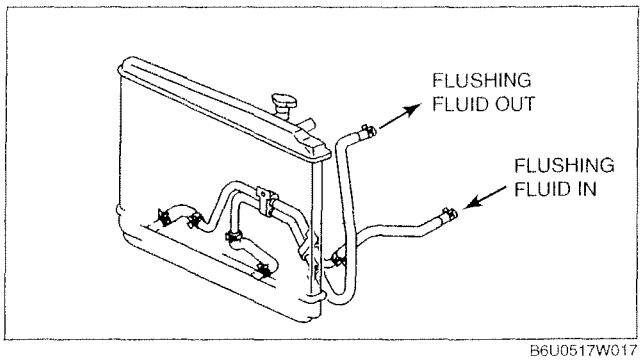
1. Be sure to inspect the lines (hoses/pipes) for cuts, crimps (pinched), cracks or any other damage before reusing them.
   - If any problems exist, replace lines and clamps.

Caution
- **Always use new clamps when replacing hoses.**

Back flushing

1. Using the power flushing equipment manufacturer's instructions, connect equipment so the flushing fluid flows in the opposite direction of normal fluid flow.
2. Flush oil cooler/lines until discharge fluid is clean.

Caution
- **If the cooler can not be properly flushed using recommended equipment, send the radiator out for sublet cleaning or replace.**



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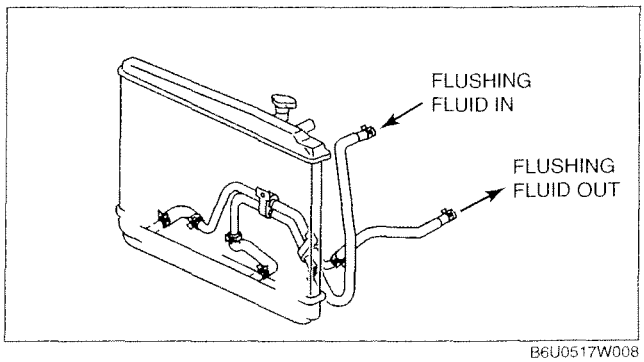
Forward flushing

1. Connect power flushing equipment so the flushing fluid flows in the direction of normal fluid flow.
2. Flush oil cooler/lines until discharge fluid is clean.



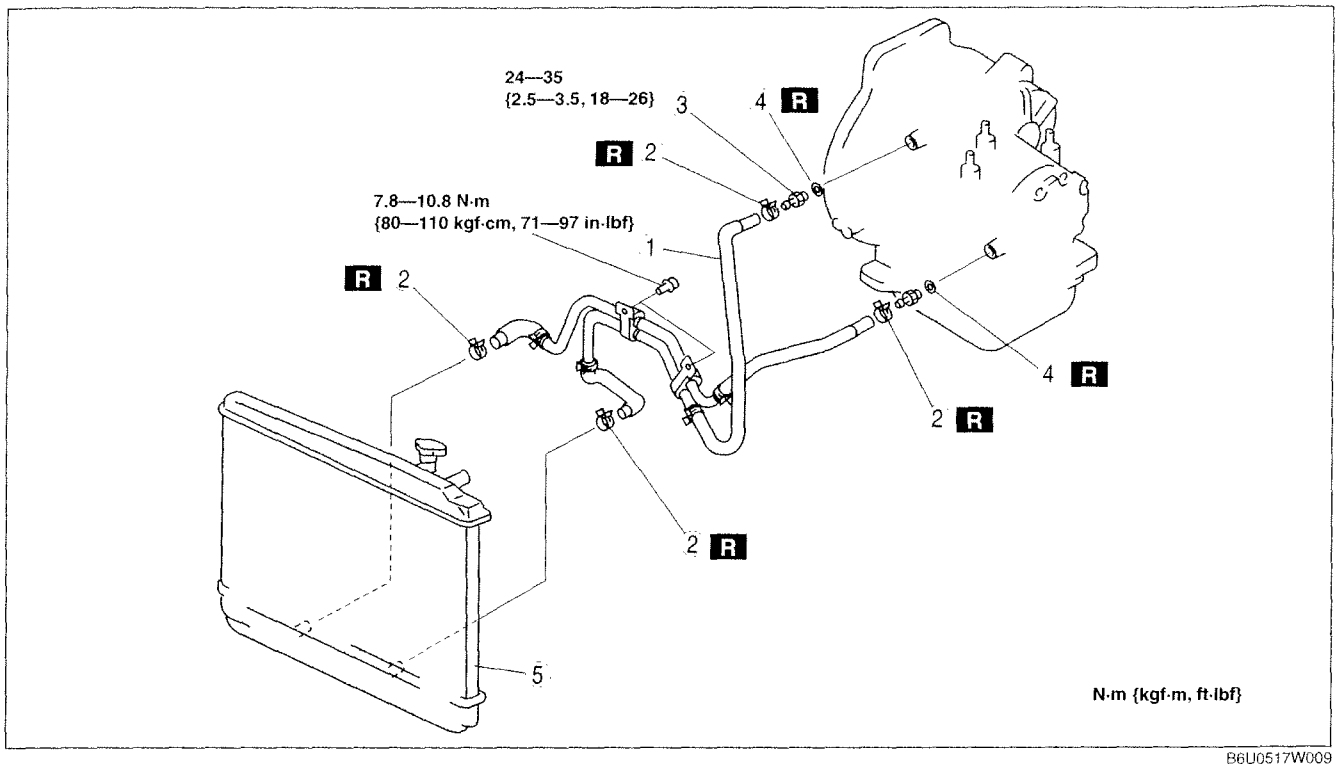
B6U0517W008

OIL COOLER REMOVAL/INSTALLATION [FN4A-EL]

C6U051719900W02

1. Disconnect the negative battery cable.
2. Drain the ATF into a container. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)
3. Remove the radiator. (See 01–12–8 RADIATOR REMOVAL/INSTALLATION.)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Add ATF to the specified level. (See 05–17A–9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [FN4A-EL].)
7. Connect the negative battery cable.
8. Inspect for oil leakage from the oil pipes and oil hoses.
9. Inspect for coolant from the hoses.
10. Inspect the ATF level and condition. (See 05–17A–8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [FN4A-EL].)
11. Carry out the line pressure test. (See 05–17A–3 MECHANICAL SYSTEM TEST [FN4A-EL].)

12. Carry out the road test. (See 05–17A–6 ROAD TEST [FN4A-EL].)



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1	Oil hose (See 05–17A–41 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
2	Hose clamp (See 05–17A–41 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
3	Connector bolt
4	O-ring
5	Radiator (in tank oil cooler) (See 05–17A–41 Radiator (In Tank Oil Cooler) Installation Note.)

Radiator (In Tank Oil Cooler) Installation Note

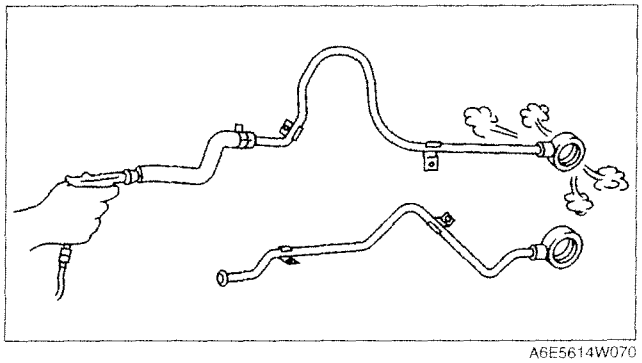
1. The automatic transaxle oil cooler flushing must be performed whenever a transaxle is removed for service because the existing fluid may be contaminated, and to prevent contamination of new fluid.

   Note
   - Flushing must be performed after installation of the overhauled or replaced transaxle.

2. Follow the instructions in the manufacturer's publication for flushing operation.

Oil Pipe, Hose Clamp, Oil Hose Installation Note

1. Apply compressed air to the cooler-side opening, and blow any remaining grime and foreign material from the cooler pipes. Compressed air should be applied for no **less than one minute**.

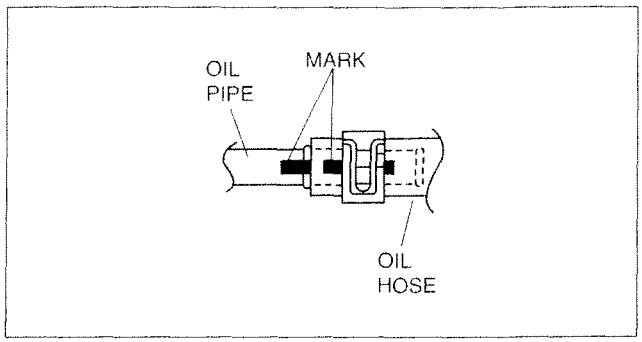


A6E5614W070

2. Align the marks, and slide the oil hose onto the oil pipe until it is fully seated as shown.

Note
- If reusing the hose, install the new hose clamp exactly on the mark left by the previous hose camp. Then apply force to the hose clamp in the direction of the arrow in order to fit the clamp in place.

3. Install the new hose clamp onto the hose.
4. Verify that the hose clamp does not interfere with any other components.

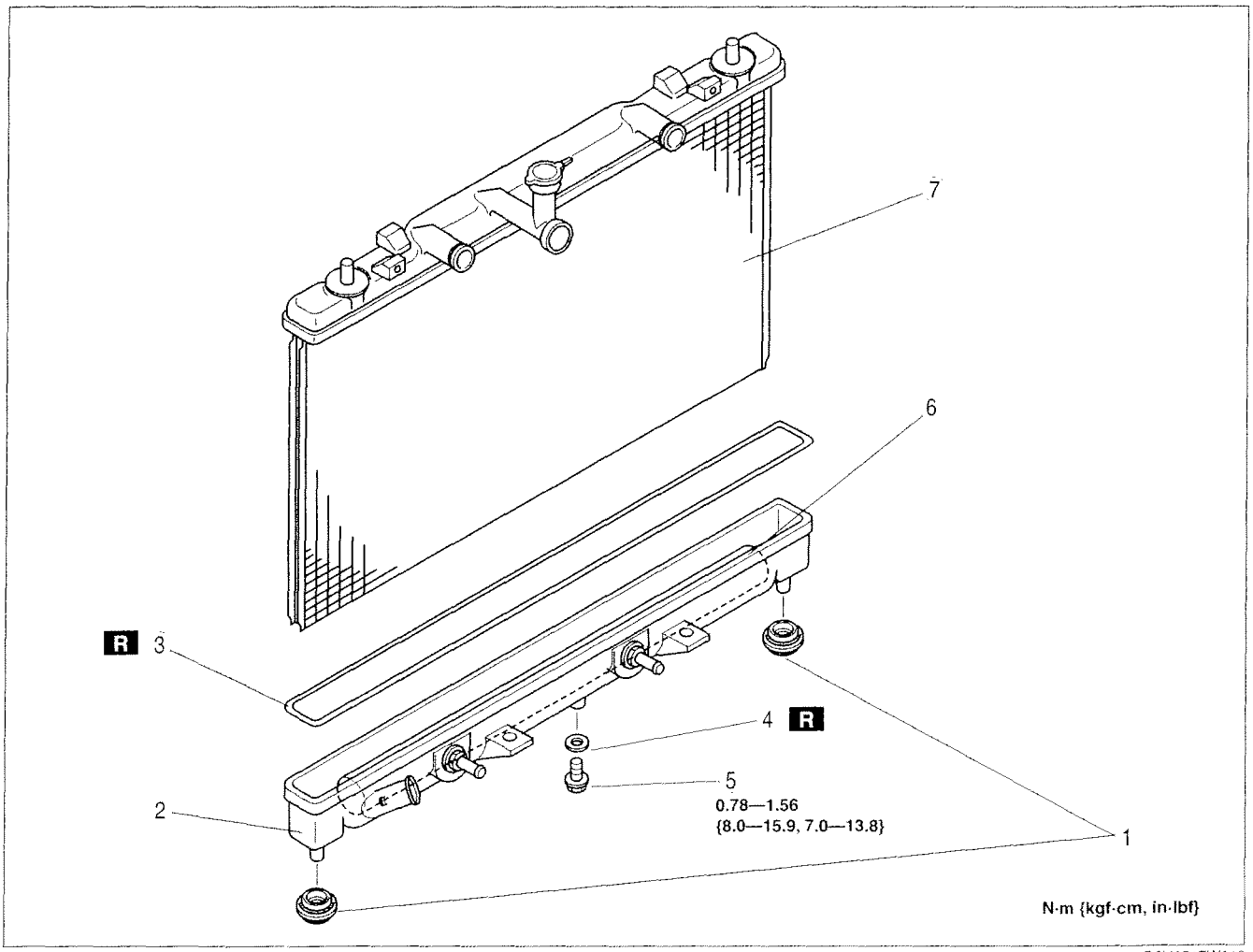


B6U0517W132

OIL COOLER DISASSEMBLY/ASSEMBLY [FN4A-EL]

C6U051719900W03

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



B6U0517W018

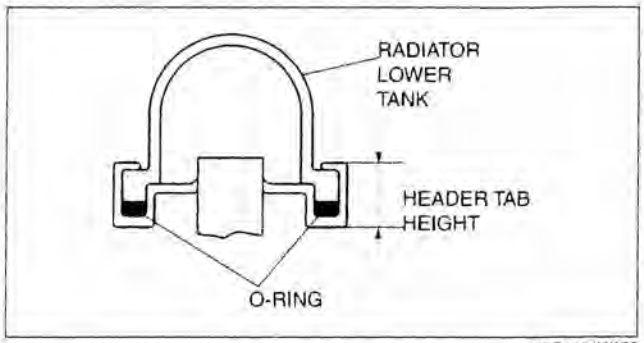
1	Mount rubber
2	Radiator outer tank (in tank oil cooler) (See 05–17A–43 Radiator Outer Tank (In Tank Oil Cooler) Removal Note.) (See 05–17A–43 Radiator Outer Tank (In Tank Oil Cooler) Installation Note.)
3	O-ring
4	Washer

5	Drain cock
6	ATF cooler
7	Radiator

Radiator Outer Tank (In Tank Oil Cooler) Removal Note

1. Inspect the height of the header tabs.
2. Insert the end of a medium tip screwdriver between the end of the header tab and the outer tank.

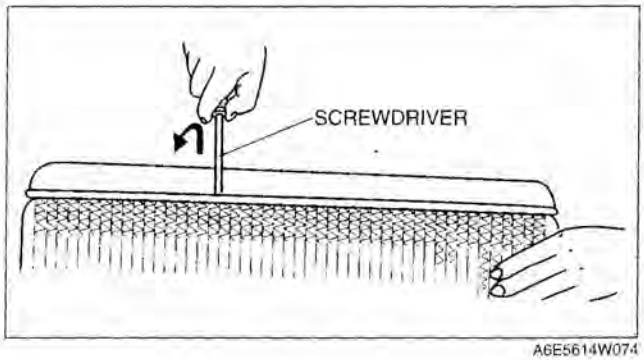
Note
- Do not open more tabs than necessary for tank removal.



A6E5614W073

3. Pivot the screwdriver to pry the tab away from the tank and repeat the procedure for each tab.
4. Remove the radiator outer tank and O-ring (gasket) from the core header when all of the tabs are opened.

Note
- If any header tabs are missing from the core, replace the radiator.



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5. Inspect the gasket surface of the radiator core header to ensure it is clean and free of foreign material or damage.
6. Inspect the radiator outer tank for warping. If it is warped, replace radiator tank.

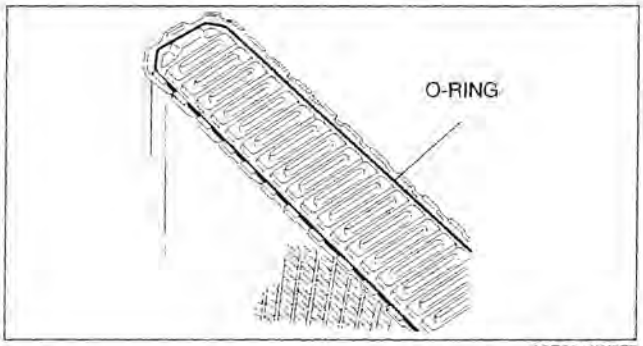
Radiator Outer Tank (In Tank Oil Cooler) Installation Note

1. Install a new O-ring and ensure it is not twisted.

Note
- The old O-ring must be replaced.

2. Position the radiator tank in the original direction to the core using care not to scratch the tank sealing surface with the header tabs.

Note
- Step 3 will set jaw opening to the correct specification.



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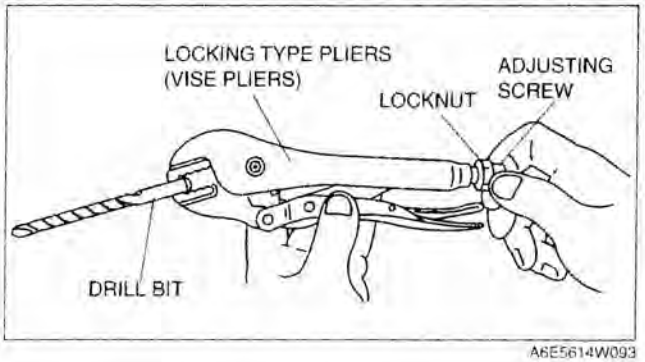
3. With the jaws of locking-type pliers (vise grips) closed and locked, turn the adjusting screw to position the jaws against the drill bit with the diameter measured (height) in the removal procedure 1. Tighten the lock nut on the adjusting screw against the handle to lock the adjustment in place.



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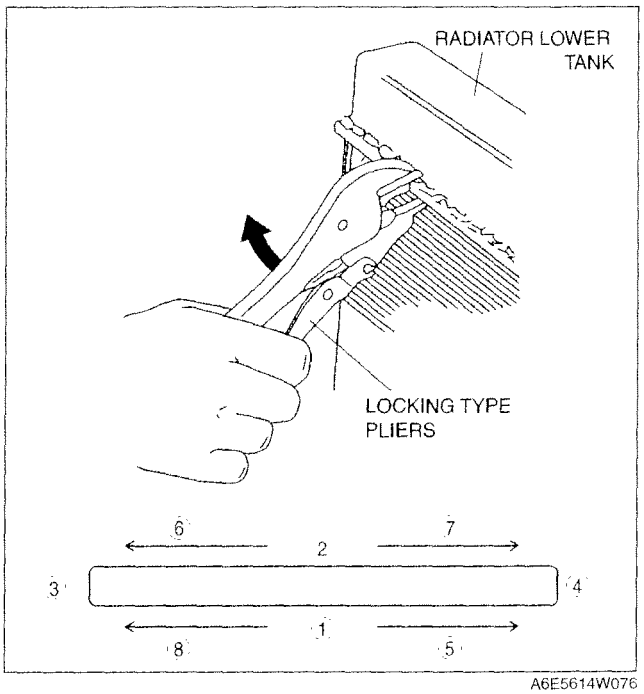
4. Squeeze the header tabs down in the order as shown against the lip of the radiator outer tank base with the locking-type pliers while rotating the pliers toward the tank.



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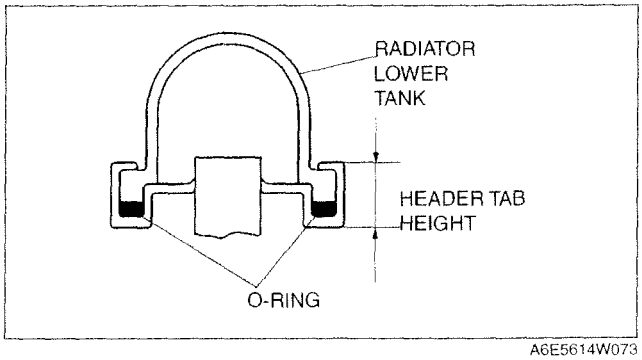
5. Verify that the height of the header tabs is same as the height before removal.
6. Inspect for leakage from radiator. (See 01–12–5 ENGINE COOLANT LEAKAGE INSPECTION.)



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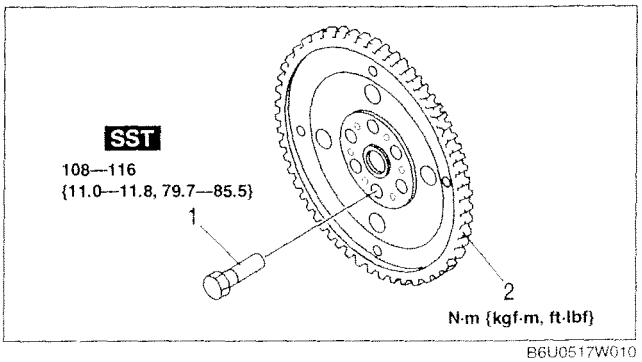
DRIVE PLATE REMOVAL/INSTALLATION [FN4A-EL]

C6U051719020W01

1. Remove the transaxle. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FN4A-EL].)
2. Remove in the order indicated in the figure.
3. Install in the reverse order of removal.

1	Drive plate mounting bolts (See 05–17A–45 Drive Plate Mounting Bolts Removal Note.)
2	Drive plate (See 05–17A–45 Drive Plate Installation Note.)



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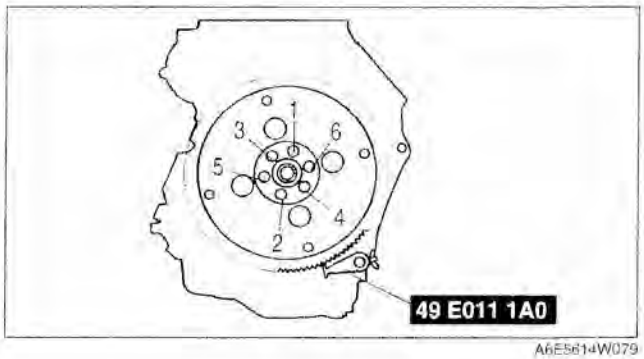
Drive Plate Mounting Bolts Removal Note

1. Set the **SST** or equivalent against the drive plate.
2. Remove the bolts and the drive plate.



A6E5614W079

Drive Plate Installation Note

Caution

- **If the bolts are reused, remove the oil sealant from the bolt threads. Tightening a bolt that has old sealant on it can cause thread damage.**

1. Remove the sealant from the bolts hole in the crankshaft and from the drive plate mounting bolts.

Note

- If all the previous sealant cannot be removed from a bolt, replace the bolts.
- Do not apply sealant if new bolts is used.

2. Install the drive plate.
3. Install the adapter.
4. Apply sealant to the drive plate mounting bolts and install them.
5. Set the **SST** or equivalent against the drive plate.

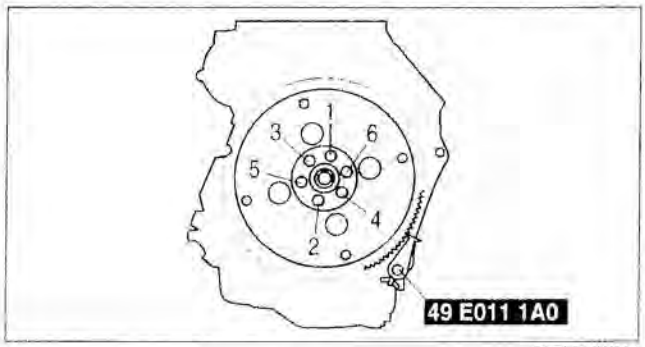
Caution

- **When installing sealant covered bolts, tighten them immediately. Leaving these bolts in a half installed condition could cause them to be stuck that way, due to the natural hardening of the sealant.**

6. Tighten the drive plate mounting bolts in two or three steps in the order shown.

Tightening torque
108—116 N·m
{11.0—11.8 kgf·m, 79.7—85.5 ft·lbf}

7. Install the transaxle. (See 05–17A–31 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION [FN4A-EL].)



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05–17B AUTOMATIC TRANSAXLE [JA5A-EL]

AUTOMATIC TRANSAXLE LOCATION INDEX [JA5A-EL]

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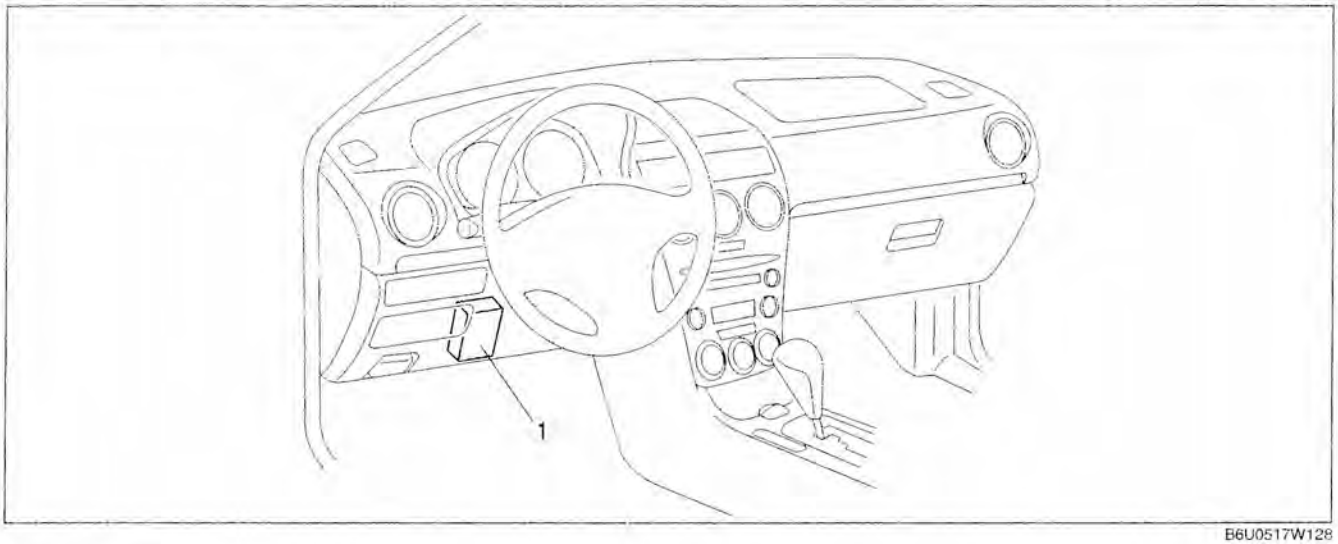

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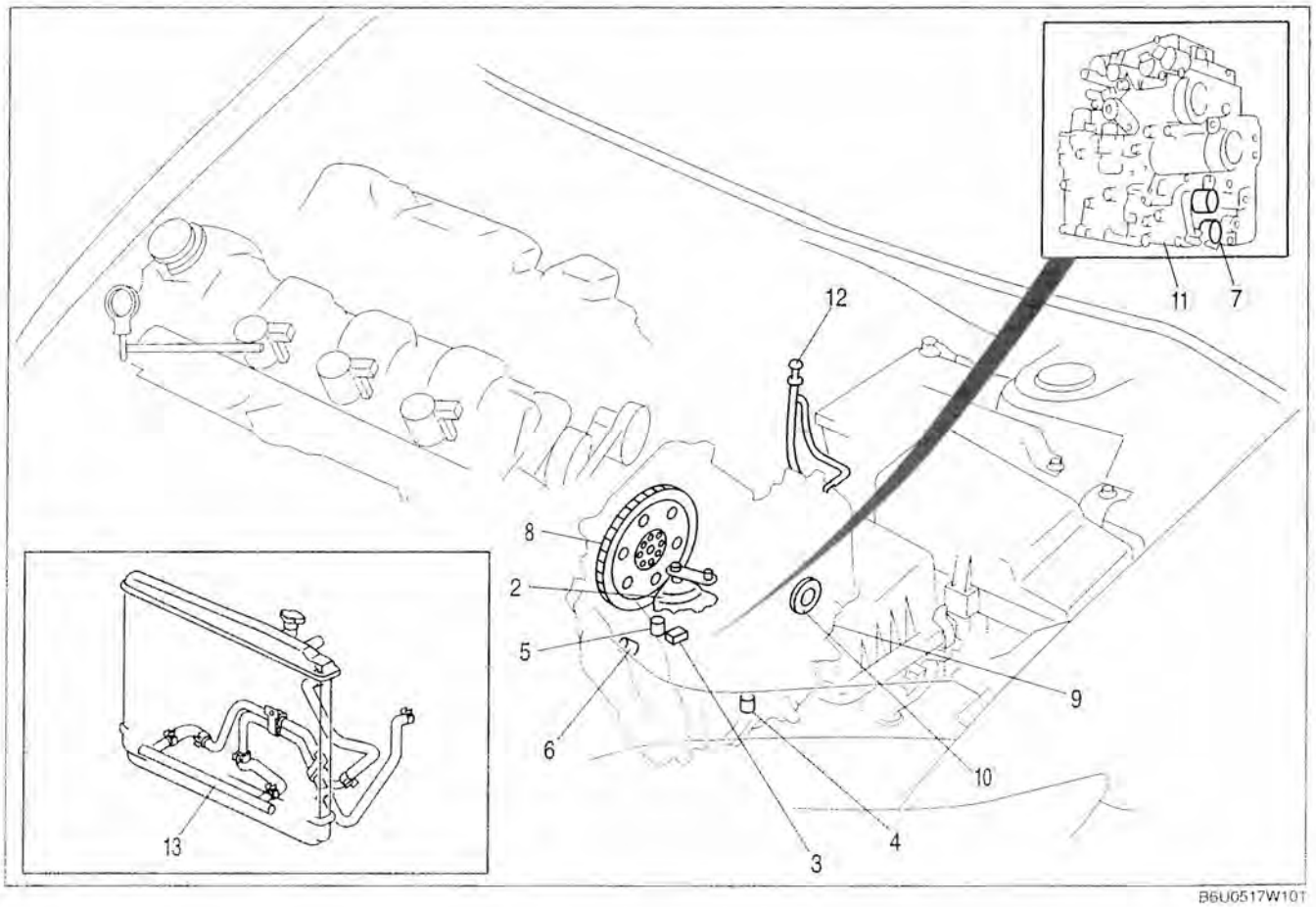
1	TCM (See 05–17B–23 TCM INSPECTION [JA5A-EL]) (See 05–17B–29 TCM REMOVAL/INSTALLATION [JA5A-EL])



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2	Transaxle range (TR) switch (See 05–17B–11 TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL]) (See 05–17B–12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION [JA5A-EL]) (See 05–17B–14 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [JA5A-EL])
3	Transaxle fluid temperature (TFT) sensor (See 05–17B–15 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [JA5A-EL]) (See 05–17B–16 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION [JA5A-EL])
4	Input/turbine speed sensor (See 05–17B–17 INPUT/TURBINE SPEED SENSOR INSPECTION [JA5A-EL]) (See 05–17B–17 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION [JA5A-EL])
5	Intermediate sensor (See 05–17B–18 INTERMEDIATE SENSOR REMOVAL/INSTALLATION [JA5A-EL]) (See 05–17B–18 INTERMEDIATE SENSOR INSPECTION [JA5A-EL])
6	Vehicle speedometer sensor (VSS) (See 05–17B–19 VEHICLE SPEEDOMETER SENSOR (VSS) REMOVAL/INSTALLATION [JA5A-EL]) (See 05–17B–19 VEHICLE SPEEDOMETER SENSOR (VSS) INSPECTION [JA5A-EL])
7	Solenoid valve (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL]) (See 05–17B–22 SOLENOID VALVE REMOVAL/INSTALLATION [JA5A-EL])
8	Drive plate (See 05–17B–41 DRIVE PLATE REMOVAL/INSTALLATION [JA5A-EL])
9	Automatic transaxle (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL])
10	Oil seal (See 05–17B–35 OIL SEAL REMOVAL/INSTALLATION [JA5A-EL])
11	Control valve body (See 05–17B–35 CONTROL VALVE BODY REMOVAL/INSTALLATION [JA5A-EL])
12	Automatic transaxle fluid (ATF) (See 05–17B–10 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [JA5A-EL]) (See 05–17B–11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [JA5A-EL])
13	Oil cooler (See 05–17B–36 OIL COOLER FLUSHING [JA5A-EL]) (See 05–17B–37 OIL COOLER REMOVAL/INSTALLATION [JA5A-EL]) (See 05–17B–39 OIL COOLER DISASSEMBLY/ASSEMBLY [JA5A-EL])

MECHANICAL SYSTEM TEST [JA5A-EL]

C6U051719090W08

Mechanical System Test Preparation

1. Apply the parking brake and use wheel chocks at the front and rear of the wheels.
2. Inspect the engine coolant. (See 01–12–3 ENGINE COOLANT LEVEL INSPECTION.)
3. Inspect the engine oil. (See 01–11–3 ENGINE OIL LEVEL INSPECTION.)
4. Inspect the ATF levels. (See 05–17B–10 Automatic Transaxle Fluid (ATF) Level Inspection.)
5. Inspect the idle speed and ignition timing in P position. (See 01–10B–44 ENGINE TUNE-UP [AJ].)

Line Pressure Test

Note

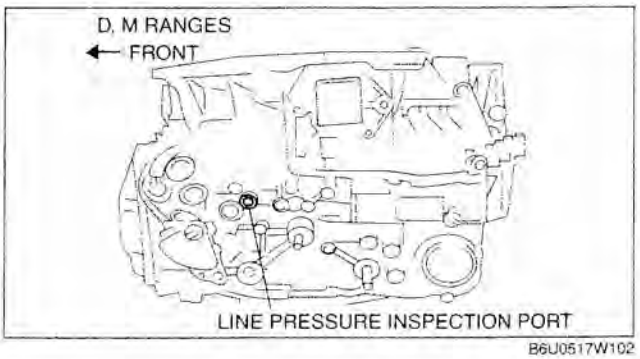
- Line pressure cannot be measured on the JA5A-EL automatic transaxle. Measure the low clutch pressure in place of D and M range line pressures. Measure the reverse clutch pressure in place of R position line pressure.

1. Engine idling.
   (1) Perform mechanical system test preparation. (See 05–17B–3 Mechanical System Test Preparation.)

Warning

- **Removing the plug when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the square-head plug, allow the ATF to cool.**

(2) Remove the plug and O-ring shown in the figure.



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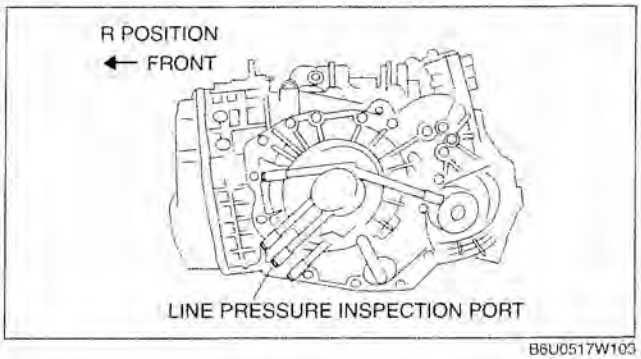

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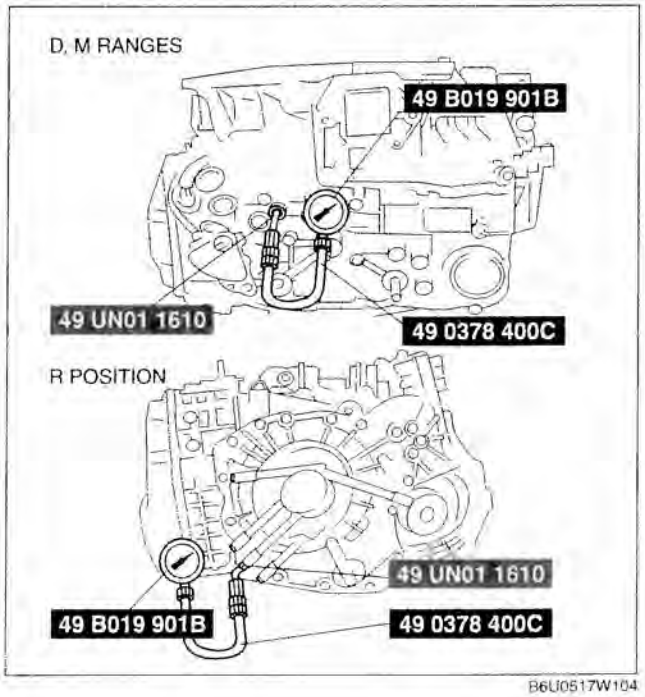
(3) Connect the **SSTs** (49 UN01 1610, 49 B019 901B, and 49 0378 400C) to the low clutch pressure inspection port (D and M range line pressures) or reverse clutch pressure inspection port (R position line pressure).
(4) Start the engine and warm it up until the ATF reaches **60—70 °C {140—158 °F}**.
(5) Shift the selector lever to D range.
(6) Read the line pressure at idle for the remaining ranges in the same manner.
- M range
- R position

ATF temperature
60—70 °C {140—158 °F}
Turn off all electrical loads



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Position/ Range	Line pressure (kPa {kgf/cm^2, psi})
	Idle
D, M (2GR)	290—490 {3.0—5.0, 42—71}
M (1GR), R	550—750 {5.6—7.6, 80—109}

(7) Turn the engine off.

2. Engine stall speed.

Caution
- **Perform the line pressure test at engine idling prior to performing the test at engine stall. If line pressure is low at idle, do not perform the test at engine stall or further transaxle damage will occur.**

(1) Replace the **SST** (49 B019 901B) with the gauge of the **SST** (49 0378 400C).
(2) Start the engine.

Caution
- **Do not maintain WOT in any gear range for more than 5 seconds or transaxle damage will occur.**

(3) Firmly depress the brake pedal with the left foot, and then gradually depress the accelerator pedal to the floor (WOT) with the right.
(4) When the engine speed no longer increases, quickly read the line pressure and release the accelerator pedal.
(5) Shift the selector lever to N position and let the engine idle for 1 minute or more to cool the ATF.
(6) Read the line pressure at the engine stall speed for the remaining ranges in the same manner.
- M range
- R position

ATF temperature
60—70 °C {140—158 °F}
Turn off all electrical loads

Position/ Range	Line pressure (kPa {kgf/cm^2, psi})
	Stall
D, M (2GR)	1,550—1,750 {15.8—17.8, 225—254}
M (1GR), R	

(7) Shift the selector lever to P position.
(8) Turn off the engine.
(9) Remove the **SSTs** and install a new square head plug and O-ring in the line pressure inspection port.

Tightening torque
4.91—9.80 N·m {50—100 kgf·cm, 43.4—86.7 in·lbf}

Evaluation of line pressure test

Condition			Possible cause
Idle	Below specification	Low pressure in all ranges	Worn oil pump Poor operation of each solenoid Fluid leaking from oil strainer, oil pump, pressure regulator valve, torque converter relief valve, and/or pressure relief valve Pressure regulator valve or pilot valve sticking Damaged pressure regulator valve spring or pilot valve spring
		Low pressure in D and M (1GR, 2GR) range only	Fluid leaking from hydraulic circuit of low clutch
		Low pressure in R position only	Fluid leaking from hydraulic circuit of reverse clutch Fluid leaking from hydraulic circuit of low and reverse brake clutch
	Above specification	High pressure in all ranges	Throttle position sensor malfunction TFT sensor malfunction Poor operation of shift solenoid Pilot valve sticking Pressure reducing valve or plug sticking
Stall	Below specification	Low pressure in all ranges	Throttle position sensor out of adjustment Pressure control solenoid malfunction Poor operation of shift solenoid Pilot valve sticking Pressure reducing valve or plug sticking

Stall Speed Test

Caution
- **Perform the line pressure test at engine idling prior to performing the test at engine stall. If line pressure is low at idle do not perform the test at engine stall or further transaxle damage will occur.**

1. Perform mechanical system test preparation. (See 05-17B-3 Mechanical System Test Preparation.)
2. Connect a tachometer.
3. Start the engine.
4. Shift the selector lever to D range.

Caution
- **Do not maintain WOT in any gear range for more than 5 seconds or transaxle damage will occur.**
- **If engine speed recorded by the tachometer exceeds maximum specified rpm, release the accelerator pedal immediately. Clutch or band slippage is indicator.**

5. Firmly depress the brake pedal with the left foot, and gently depress the accelerator pedal to the floor (WOT) with the right.
6. When the engine speed no longer increases, quickly read the engine speed and release the accelerator pedal.
7. Shift the selector lever to N position and let the engine idle for 1 minute or more to cool the ATF.
8. Perform stall tests for the remaining ranges and position in the same manner.
   - R position
   - M range

Engine stall speed
ATF temperature: 60—70 °C {140—158 °F}
Turn off all electrical loads
2,300—2,700 rpm

9. Turn off the engine.

Evaluation of stall test

Condition		Possible cause
Above specification	In all forward ranges and R position	Insufficient line pressure Worm oil pump Poor operation of low clutch Poor adjustment or malfunction of TR switch Oil leaking from oil pump, control valve, and/or transmission case Pressure regulator valve or pilot valve sticking
	In all forward ranges	Low clutch slippage Low one-way clutch slippage Reduction one-way clutch slippage
	In R position	Low and reverse brake slippage Reverse clutch slippage Reduction brake slippage
Below specification	In all forward ranges and R position	Engine out of tune One-way clutch slippage within torque converter

Time Lag Test

1. Perform mechanical system test preparation. (See 05–17B–3 Mechanical System Test Preparation.)
2. Start the engine.
3. Warm up the engine until the ATF temperature reaches **60—70°C {140—158°F}**. Shift the selector lever from N position to D range.
4. Use a stopwatch to measure the time it takes from shifting until engagement is felt. Take three measurements for each test and average the results using the following formula.

Formula
Average time lag = (Time 1 + Time 2 + Time 3) / 3

5. Perform the test for the following shifts in the same manner.
   - N position → P position

Time lag
N position→ D range... approx. 0.5—1.0 second
N position→ R position... approx. 0.6— 1.0 second

Evaluation of time lag test

Condition		Possible Cause
Above specification	N position→ D range	Insufficient line pressure in all forward ranges Low clutch slippage Low one-way clutch slippage Reduction one-way clutch slippage
	N position→ R position	Insufficient line pressure in R position Low and reverse brake slippage Reverse clutch slippage Reduction brake slippage

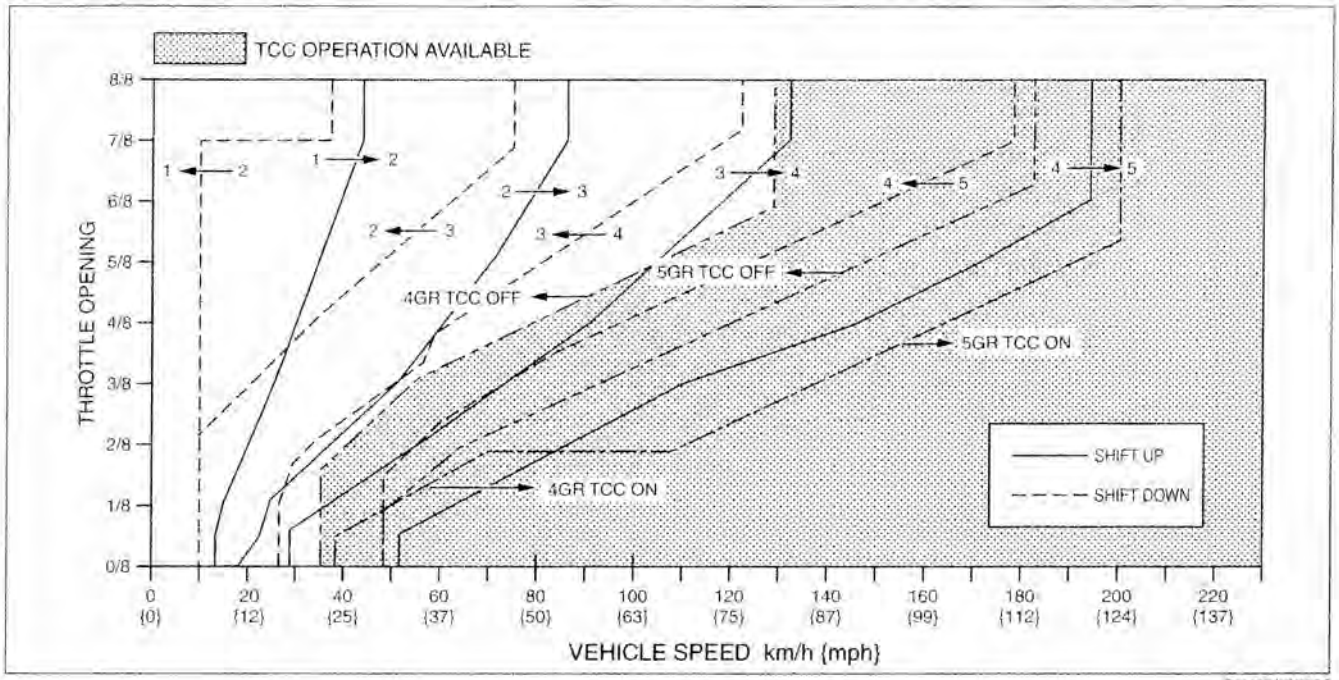
ROAD TEST [JA5A-EL]

C6U051719090W09

Road Test Preparation

1. Inspect the engine coolant. (See 01–12–3 ENGINE COOLANT LEVEL INSPECTION.)
2. Inspect the engine oil. (See 01–11–3 ENGINE OIL LEVEL INSPECTION.)
3. Inspect the ATF levels. (See 05–17B–10 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [JA5A-EL].)
4. Inspect the idle speed and ignition timing in P position. (See 01–10B–44 ENGINE TUNE-UP [AJ].)
5. Bring up the engine and transaxle to normal operating temperature.

Typical Shift Diagram



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D Range Test

Note

- The NORMAL mode and SLOPE mode are automatically selected by the TCM in D range. The TCM shifts to SLOPE mode when the upgrade is approx. 5% or more, and shifts to NORMAL mode when the upgrade is approx. 3% or less.

1. Perform road test preparation. (See 05–17B–7 Road Test Preparation.)
2. Shift the selector lever to D range.
3. Accelerate the vehicle with half and WOT, then verify that 1→2, 2→3, 3→4, and 4→5 upshifts and downshifts are obtained. The shift points must be as shown in the table below.
   - If not as specified, inspect the TCM and ATX. (See 05–03B–4 SYMPTOM TROUBLESHOOTING ITEM TABLE [JA5A-EL].)
4. Drive the vehicle in 5GR, 4GR, 3GR, and 2GR and verify that kickdown occurs for 5→4, 4→3, 3→2, and 2→1 downshifts, and that the shift points are as shown in the table below.
   - If not as specified, inspect the TCM and ATX. (See 05–03B–4 SYMPTOM TROUBLESHOOTING ITEM TABLE [JA5A-EL].)
5. Decelerate the vehicle and verify that engine braking effect is felt in 5GR.
   - If not as specified, inspect the TCM and ATX. (See 05–03B–4 SYMPTOM TROUBLESHOOTING ITEM TABLE [JA5A-EL].)
6. Drive the vehicle and verify that TCC operation is obtained. The operation points must be as shown in the table below.
   - If not as specified, inspect the TCM and ATX. (See 05–03B–4 SYMPTOM TROUBLESHOOTING ITEM TABLE [JA5A-EL].)

Note

- The shift solenoid electrical ON-OFF pattern in this chart describes the stabilized condition before and after shift control. The pattern may oscillate between ON and OFF momentarily while shifting-up or down. This is normal.

Vehicle speed at shift point table

Range	Mode	Throttle condition	Shift	Vehicle speed (km/h {mph})	Turbine speed (rpm)
D	NORMAL	Wide open throttle	$D_1 \rightarrow D_2$	43—49 {27—30}	5,200—5,850
			$D_2 \rightarrow D_3$	82—90 {51—55}	5,550—6,050
			$D_3 \rightarrow D_4$	130—140 {81—86}	5,650—6,000
			TCC ON (D_4)	197—207 {123—128}	5,850—6,100
			$D_4 \rightarrow D_5$	189—199 {118—123}	5,600—5,850
			TCC ON (D_5)	195—205 {121—127}	4,250—4,400
		Half throttle	$D_1 \rightarrow D_2$	31—39 {20—24}	3,750—4,650
			$D_2 \rightarrow D_3$	54—69 {34—42}	3,600—4,700
			$D_3 \rightarrow D_4$	77—103 {48—63}	3,350—4,400
			TCC ON (D_4)	147—176 {92—109}	4,350—5,200
			$D_4 \rightarrow D_5$	129—154 {80—95}	3,850—4,550
			TCC ON (D_5)	151—172 {94—106}	3,300—3,700
		Closed throttle position	$D_5 \rightarrow D_4$	45—51 {28—31}	1,000—1,100
			$D_4 \rightarrow D_3$	23—29 {15—17}	700—850
			$D_3 \rightarrow D_1$	7—13 {5—8}	350—550
		Kickdown	$D_5 \rightarrow D_4$	172—182 {107—112}	3,750—3,900
			$D_4 \rightarrow D_3$	119—129 {74—79}	3,550—3,800
			$D_3 \rightarrow D_2$	70—78 {44—48}	3,050—3,350
			$D_2 \rightarrow D_1$	34—40 {22—24}	2,300—2,650

M Range Test

1. Perform road test preparation. (See 05–17B–7 Road Test Preparation.)
2. Shift the selector lever to M range.
3. Verify that 1→2, 2→3, 3→4, and 4→5 upshifts and 5→4, 4→3, 3→2, and 2→1 downshifts are obtained by manual shifting of the selector lever forward and back. The shift points must be as shown in the table below.
   - If not as specified, inspect the TCM and ATX. (See 05–03B–4 SYMPTOM TROUBLESHOOTING ITEM TABLE [JA5A-EL].)
4. Decelerate the vehicle and verify that 5→4, 4→3, 3→1, and 2→1 downshifts are obtained. The shift points must be as shown in the table below.
   - If not as specified, inspect the TCM and ATX. (See 05–03B–4 SYMPTOM TROUBLESHOOTING ITEM TABLE [JA5A-EL].)
5. Decelerate the vehicle and verify that engine braking effect is felt in all gears.
   - If not as specified, inspect the TCM and ATX. (See 05–03B–4 SYMPTOM TROUBLESHOOTING ITEM TABLE [JA5A-EL].)
6. Drive the vehicle and verify that TCC operation is obtained in 5GR. The operation points must be as shown in the table below.
   - If not as specified, inspect the TCM and ATX. (See 05–03B–4 SYMPTOM TROUBLESHOOTING ITEM TABLE [JA5A-EL].)

Vehicle speed at shift point table

Range	Mode	Throttle condition	Shift	Vehicle speed (km/h {mph})	Turbine speed (rpm)
M	Manual	Half throttle	TCC ON (M_5)	156—167 {97—103}	3,400—3,600
		All round	$M_5 \rightarrow M_4$	191—197 {119—122}	4,150—4,250
			$M_4 \rightarrow M_3$	130—136 {81—84}	3,850—4,000
			$M_3 \rightarrow M_2$	84—90 {53—55}	3,650—3,850
			$M_2 \rightarrow M_1$	43—49 {27—30}	2,950—3,300

Noise and Vibration Test

1. Drive the vehicle and listen closely for any noise or vibration. The torque converter, drive shaft, and differential can be sources of noise and vibration if they are not functioning properly. Inspect these when searching for sources of noise and vibration.

P Position Test

1. Shift into P position on a gentle slope. Release the brake, and verify that the vehicle does not roll.
   - If the vehicle rolls, inspect the ATX. (See 05–03B–4 SYMPTOM TROUBLESHOOTING ITEM TABLE [JA5A-EL].)

Evaluation

Condition	Possible Cause
No 1-2 up- or downshift	Stuck shift solenoid C Stuck shift valve C Worn 2-4 brake Trouble intermediate sensor
No 2-3 up- or downshift	Stuck shift solenoid A Stuck shift valve A Worn high clutch
No 3-4 up- or downshift	Stuck shift solenoid B Stuck shift valve B Worn 2-4 brake
No 4-5 up- or downshift	Stuck shift solenoid A Stuck shift valve A Worn direct clutch Trouble TFT sensor
TCC non-operation shift	Stuck TCC solenoid valve Stuck TCC valve
Incorrect shift point	Trouble VSS output signal Trouble TR switch Trouble TP signal and engine torque signal
Excessive shift shock slippage	Stuck pressure control solenoid Stuck pressure regulator valve Stuck pressure modifier valve Stuck accumulator valve A, B, or C Stuck 2-4 brake solenoid valve Stuck high clutch solenoid valve Stuck low clutch accumulator Stuck 2-4 brake accumulator Stuck high clutch accumulator Stuck direct clutch accumulator Stuck reduction accumulator Trouble VSS
No engine braking effect	Worn reduction brake band Stuck reduction reducing valve Stuck reduction timing valve Stuck reduction timing solenoid valve

AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [JA5A-EL]

C6U051719001W01

Automatic Transaxle Fluid (ATF) Condition Inspection

1. One way of determining whether the transaxle should be replaced is by noting:
- If the ATF is muddy or varnished.
- If the ATF smells strange or unusual.

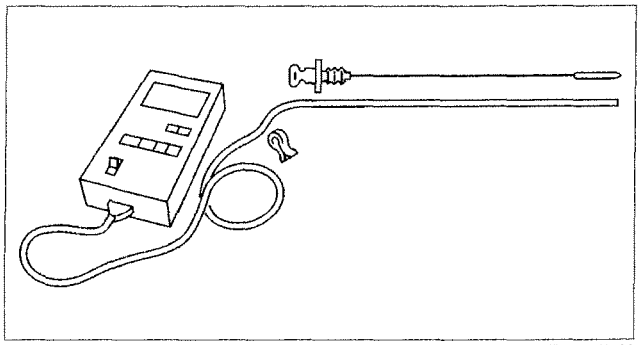
ATF Condition

Condition			Possible cause
Clear dark red		Normal	—
Light red (pink)		Contaminated with water	• Broken oil cooler inside of radiator • Poor filler tube installation: Problem could be occurring to parts inside the transaxle by water contamination. If necessary, replace transaxle.
Reddish brown	Has burnt smell and metal specs are found	Deteriorated ATF	Defective powertrain components inside of transaxle: Specks cause wide range of problems by plugging up in oil pipe, control valve body and oil cooler in radiator. • If a large amount of metal specks are found, replace transaxle if necessary. • Implement flushing operation as there is a possibility specks are plugging up oil pipe and/or oil cooler inside of radiator.
	Has no burnt smell	Normal	• Discoloration by oxidation

Automatic Transaxle Fluid (ATF) Level Inspection

Caution
- **The ATF amount varies according to ATF's temperature. Therefore, when checking the ATF level or replacing the ATF, use a thermometer to measure the temperature then adjust the ATF amount to the specified level according to the specified temperature.**

1. Park the vehicle on level ground.
2. Apply the parking brake and position wheel chocks securely to prevent the vehicle from rolling.
3. Adjust the length of the thermometer probe so that the length is the same as the depth gauge, and hold the probe with a suitable clip.
4. Insert the thermometer probe into the filler tube and measure the temperature.
5. Warm up the engine until the ATF reaches (**60—70 °C {140—158 °F}**).



A6E5614W003

Caution
- **Do not warm up the transaxle by performing stalls. This will damage the torque converter.**

Note
- In some cases it may be necessary to inspect the ATF in the cool range **15—25 °C {59—77 °F}** before warming up the engine.

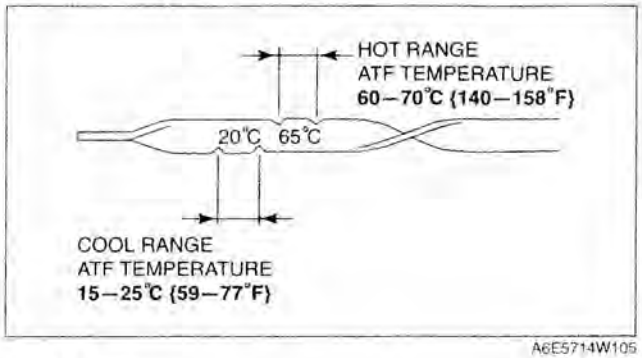
6. While depressing the brake pedal, shift the selector lever to each range (P—M), pausing momentarily in each range.
7. Shift back to P position.

Note
- If the ATF level is too high or too low under hot conditions, the following problems may be the cause.

ATF level	Condition	Possible cause
Too low	Line pressure is lower than the specification	Air in transaxle oil passage due to slipping or damaged clutch mechanism
Too high	ATF is hot	ATF deteriorated due to slipping clutch or stuck valve

8. While the engine is idling, verify that the ATF level is in the HOT (**65 °C {149 °F}**) range. Add the specified type of ATF, if necessary. (See 05–17B–11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [JA5A-EL].)

ATF type
ATF M-V



A6E5714W105

AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [JA5A-EL]

C6U051719001W02

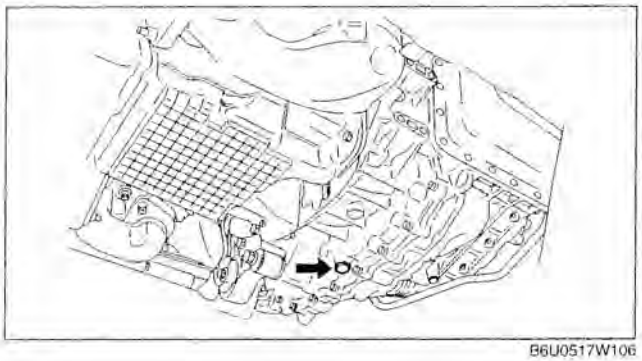
Warning
- **A hot transaxle and ATF can cause severe burns. Turn off the engine and wait until they are cool before changing the ATF.**

1. Remove the oil dipstick.
2. Remove the oil drain plug and washer.
3. Drain the ATF into a container.
4. Install a new washer and drain plug.

Tightening torque
39—54 N·m {3.9—5.6 kgf·m, 29—40 ft·lbf}

5. Add the specified type of ATF through the oil filler tube, until ATF level reaches lower notch of dipstick.

ATF type
ATF M-V
Capacity (Approximate quantity)
9.2 L {9.7 US qt, 8.1 Imp qt}



B6U0517W106

6. Verify that the ATF level is in the HOT (**65 °C {149 °F}**) range.
   - Add ATF to the specified level as necessary.

TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL]

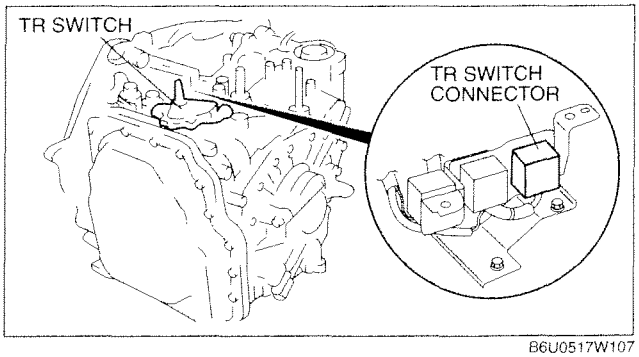
C6U051719200W12

Note
- Input signals of the TR switch can be inspected with a WDS or equivalent. (See 05–17B–23 TCM INSPECTION [JA5A-EL].)

Inspection of Operation
1. Verify that the starter operates only with the ignition switch at the START position and the selector lever in P and N positions.
   - If not as specified, inspect for continuity at the TR switch. (See 05–17B–12 Inspection of Continuity.)
2. Verify that the back-up lights illuminate when shifted to R position with the ignition switch at the ON position.
   - If not as specified, inspect for continuity at the TR switch.

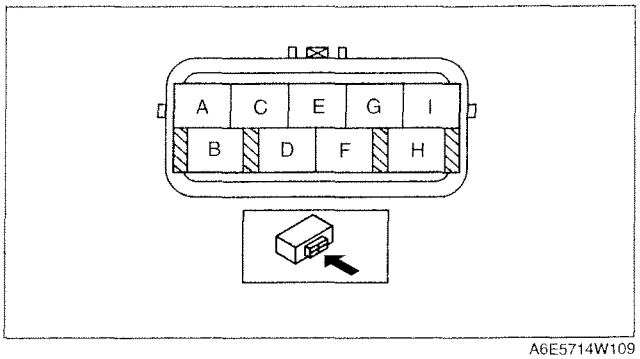
Inspection of Continuity

1. Disconnect the negative battery cable.
2. Disconnect the TR switch connector.



B6U0517W107

3. Inspect for continuity at the TR switch.
   - If not as specified, adjust the TR switch, then reinspect the TR switch. (See 05–17B–14 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [JA5A-EL].)



A6E5714W109

○——○: Continuity

Position/ Range	Connector terminal								
	H	B	C	A	E	D	G	I	F
P	○	○	○	○					
R			○		○				
N	○	○	○			○			
D			○					○	

B6U0517W130

4. Connect the TR switch connector.

TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION [JA5A-EL]

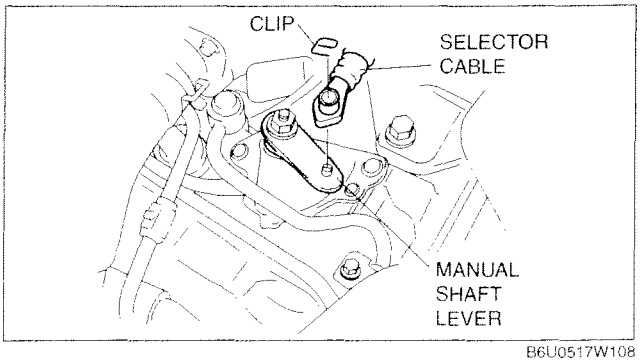
C6U051719200W13

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)

Caution

- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

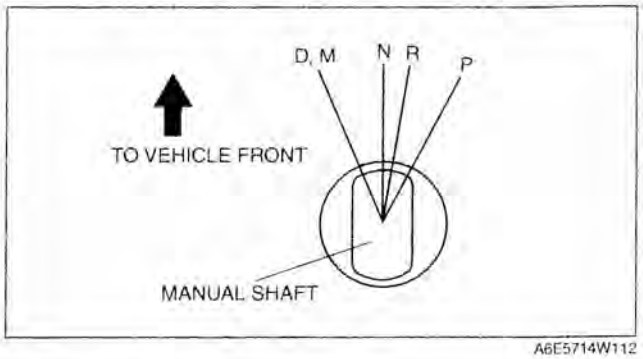
3. Disconnect the TR switch connector.
4. Remove the clip and disconnect the selector cable.



B6U0517W108

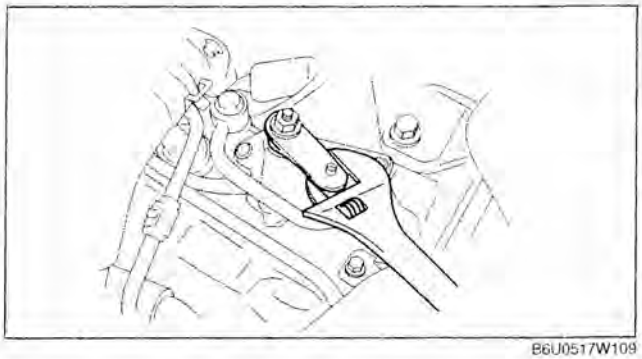
5. Rotate the manual shaft to the N position.

Caution
- **Do not use an impact wrench. Hold the manual shaft lever when removing the manual shaft nut, or the transaxle may be damaged.**



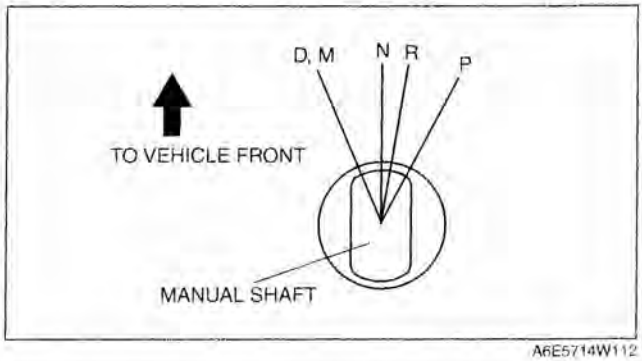
A6E5714W112

6. Set the adjustable wrench as shown to hold the manual shaft lever.
7. Remove the manual shaft nut and washer.
8. Remove the manual shaft lever.
9. Remove the TR switch.


B6U0517W109

10. Rotate the manual shaft to the right fully, then return 2 notches to set the N position.

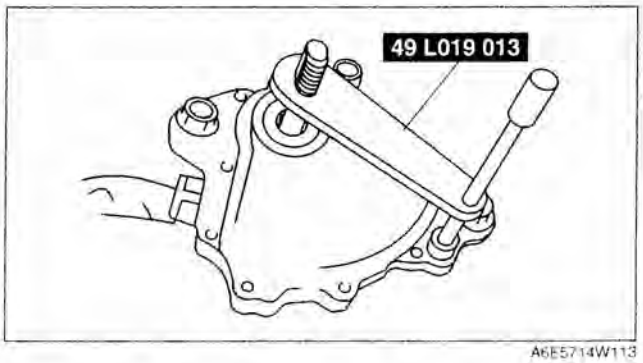
Caution
- **Improper adjustment of the TR switch will cause abnormal operation of the automatic transaxle. Be sure to use the SST to adjust the TR switch correctly.**



A6E5714W112

11. Using the **SST** and by turning the TR switch, adjust the positions of the manual shaft and the TR switch neutral hole.
12. Tighten the TR switch mounting bolts.

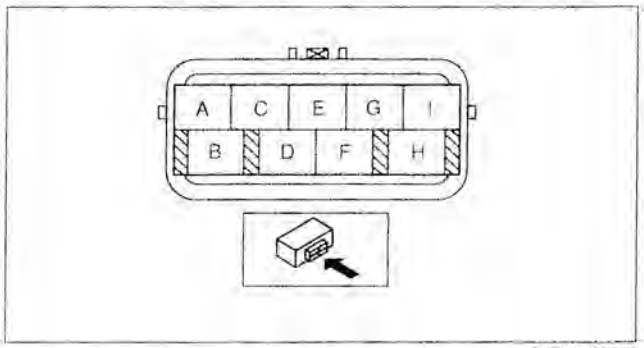
Tightening torque
4.9—6.9 N·m
{50—70 kgf·cm, 44—61 in·lbf}



A6E5714W113

13. Inspect for continuity at the TR switch between terminals C and D.
14. Remove the **SST**.
15. Install the manual shaft lever and washer.

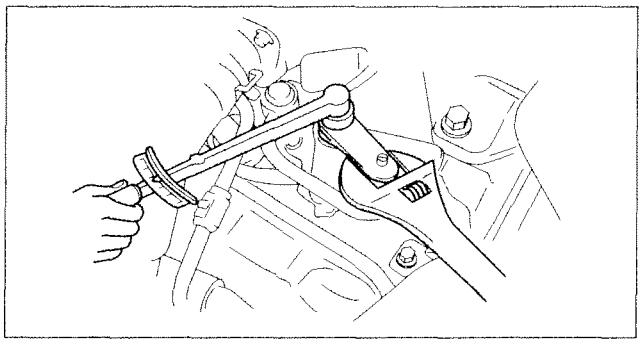
Caution
- **Do not use an impact wrench. Hold the manual shaft lever when tightening the manual shaft nut, or the transaxle may be damaged.**



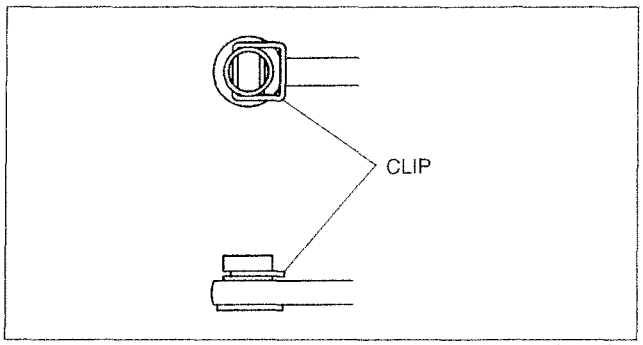
A6E5714W109

16. Set the adjustable wrench as shown to hold the manual shaft lever.
17. Tighten the manual shaft nut using a torque wrench.

Tightening torque
31.36—46.06 N·m {3.2—4.6 kgf·m, 23.2—33.9 ft·lbf}

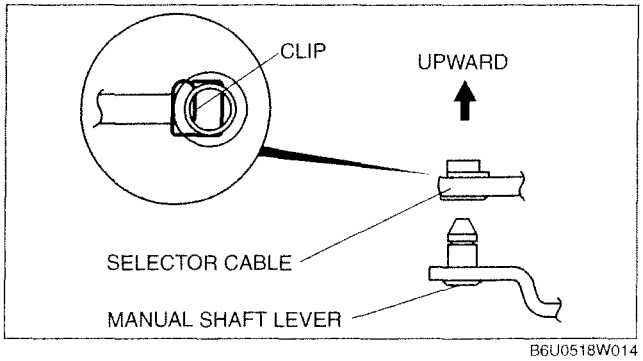

B6U0517W110

18. Install the clip as shown in the figure.
    - If it is bent, replace a new clip.



A6E5614W018

19. Verify that the selector lever range position and TR switch are aligned, then connect the selector cable.
20. Inspect for continuity at the TR switch. (See 05–17B–12 Inspection of Continuity.)
21. Connect the TR switch connector.
22. Install the air cleaner component. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [AJ].)
23. Connect the negative battery cable.
24. Inspect operation of the TR switch. (See 05–17B–11 Inspection of Operation.)



B6U0518W014

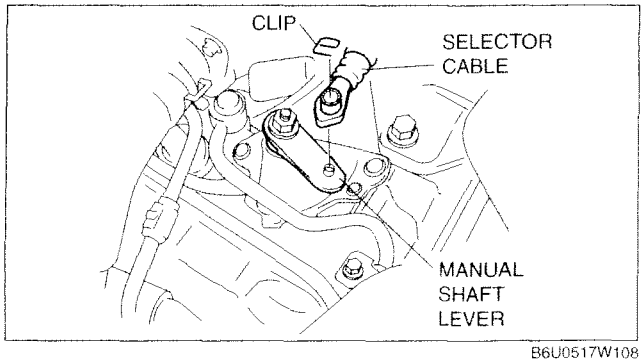
TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [JA5A-EL]

C6U051719200W14

Caution
- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

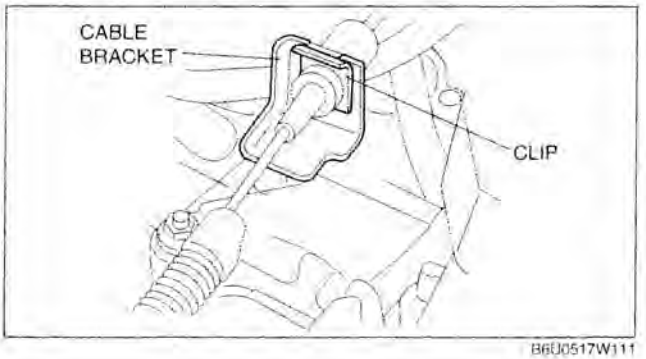
1. Disconnect the TR switch connector.
2. Remove the clip and disconnect the selector cable.

Note
- Do not reuse the clip when any of the hooks are deformed.



B6U0517W108

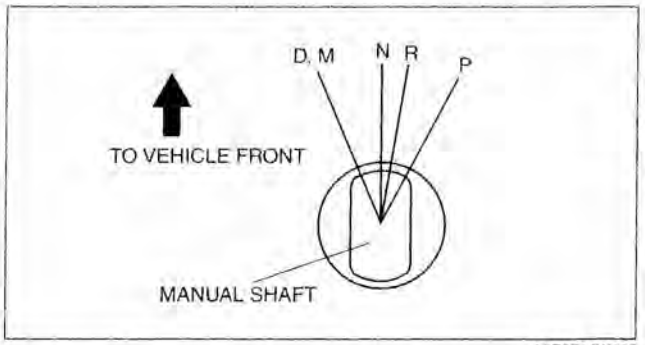
3. Remove the selector cable and clips together from the bracket as shown.



B6U0517W111

4. Rotate the manual shaft to the right fully, then return 2 notches to set the N position.
5. Loosen the TR switch mounting bolts.

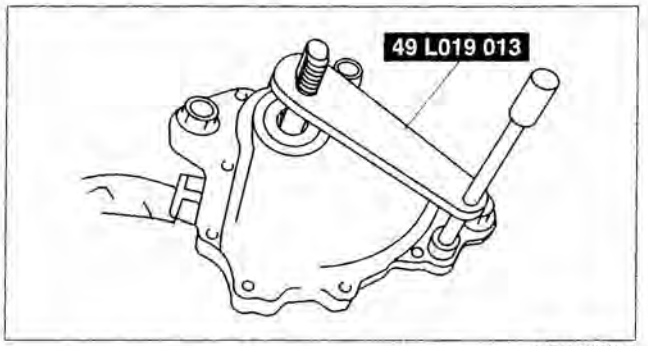
Caution
- **Improper adjustment of the TR switch will cause abnormal operation of the automatic transaxle. Be sure to use the SST to adjust the TR switch correctly.**



A6E5714W112

6. Using the **SST** and by turning the TR switch, adjust the positions of the manual shaft and the TR switch neutral hole.
7. Tighten the TR switch mounting bolts.

Tightening torque
4.9—6.9 N·m
{50—70 kgf·cm, 44—61 in·lbf}



A6E5714W113

8. Remove the **SST**.
9. Inspect for continuity at the TR switch. (See 05–17B–12 Inspection of Continuity.)
10. Connect the TR switch connector.
11. Connect the selector cable and install a clip and clip.
12. Inspect operation of the TR switch. (See 05–17B–11 Inspection of Operation.)

TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [JA5A-EL]

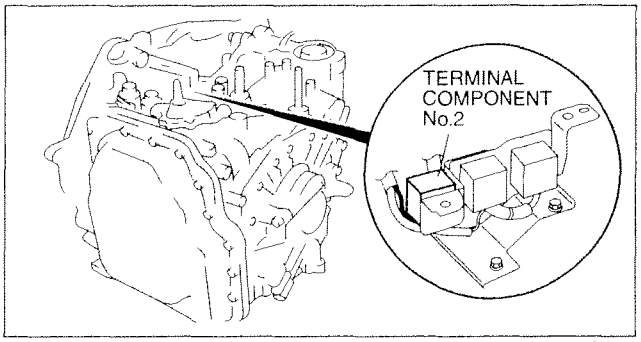
C6U051719200W15

1. Remove the automatic transaxle. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].)
2. Disassemble the automatic transaxle, and then remove the TFT sensor. (See Automatic Transaxle Workshop Manual JA5A-EL)
3. Install the TFT sensor, and then assemble the automatic transaxle. (See Automatic Transaxle Workshop Manual JA5A-EL)
4. Remove the automatic transaxle. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].)
5. Carry out the line pressure test. (See 05–17B–3 Line Pressure Test.)
6. Inspect the operation of the TR switch. (See 05–17B–11 TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL].)
7. Inspect the operation of the selector lever. (See 05–18–5 SELECTOR LEVER INSPECTION.)
8. Carry out the mechanical system test. (See 05–17B–3 MECHANICAL SYSTEM TEST [JA5A-EL].)
9. Carry out the road test. (See 05–17B–7 ROAD TEST [JA5A-EL].)

TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION [JA5A-EL]

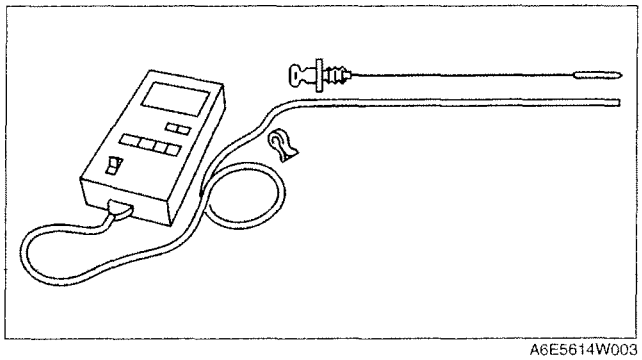
C6U051719200W16

1. Disconnect the terminal component No.2 connector.
2. Remove the oil dipstick.



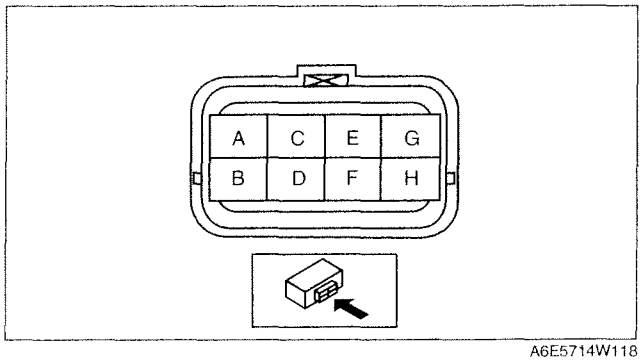
B6U0517W112

3. Insert the thermometer probe into the filler tube.
4. Start the engine.



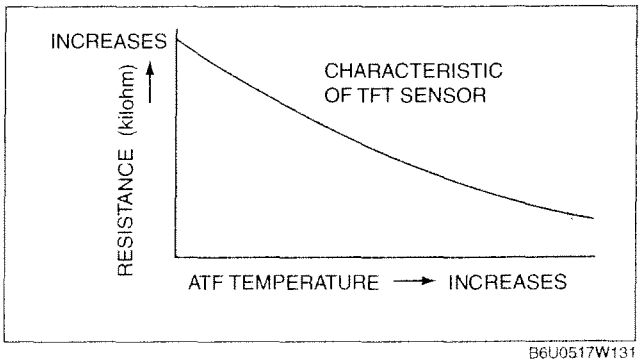
A6E5614W003

5. Measure resistance between terminals G and F.
   - If not as specified, replace the TFT sensor. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].) (See Automatic Transaxle Workshop Manual JA5A-EL.)



A6E5714W118

ATF temperature (°C {°F})	Resistance (kilohm)
-20 {-4}	15.87—17.54
0 {32}	5.73—6.33
20 {68}	2.38—2.63
40 {104}	1.10—1.22
60 {140}	0.56—0.62
80 {176}	0.31—0.34
100 {212}	0.18—0.20
120 {248}	0.11—0.12
130 {266}	0.09—0.10



B6U0517W131

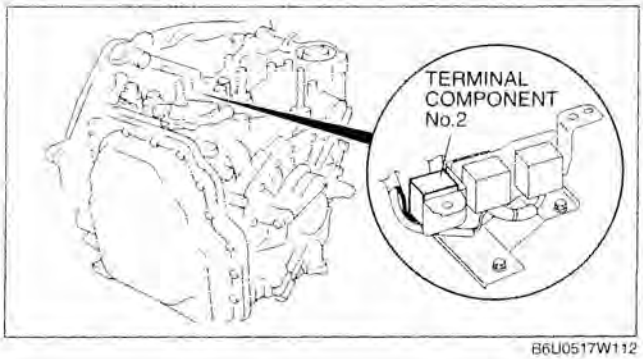
6. Connect the terminal component No.2 connector.
7. Clear the DTC.
   (See 05–02B–4 AFTER REPAIR PROCEDURE [JA5A-EL].)

INPUT/TURBINE SPEED SENSOR INSPECTION [JA5A-EL]

C6U051719200W17

On-Vehicle Inspection

1. Disconnect the negative battery cable.
2. Disconnect the terminal component No.2 connector.

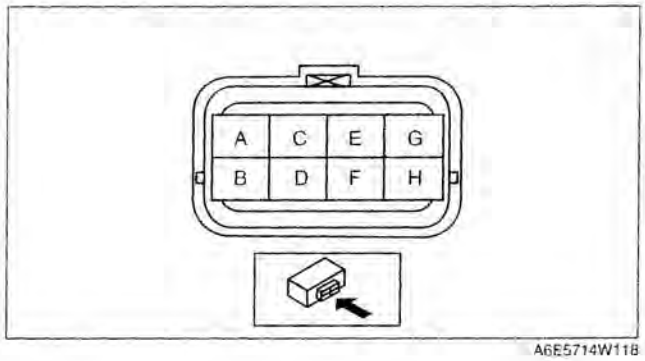


B6U0517W112

3. Measure resistance between terminals E and F.
   - If not as specified, inspect individual part. (See 05–17B–17 Inspection of Individual Part.)

   Resistance (ATF temperature: 20 °C {68 °F})
   513—627 ohms

4. Connect the terminal component No.2 connector.



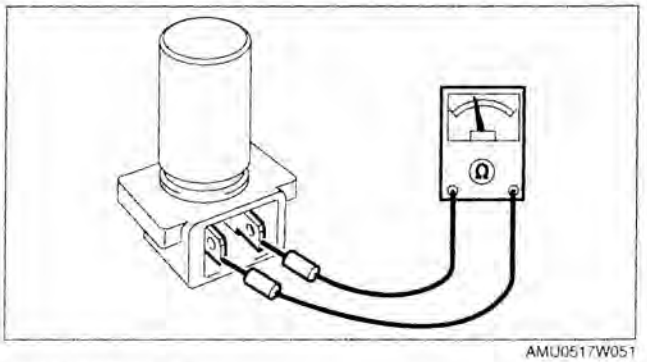
A6E5714W118

Inspection of Individual Part

1. Remove the input/turbine speed sensor. (See 05–17B–17 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION [JA5A-EL].)
2. Measure resistance between the terminals of the input/turbine speed sensor.
   - If not as specified, replace the input/turbine speed sensor.
   - If it is normal, replace the harness.

   Resistance (ATF temperature: 20 °C {68 °F})
   513—627 ohms

3. Install the input/turbine sensor. (See 05–17B–17 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION [JA5A-EL].)



AMU0517W051

INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION [JA5A-EL]

C6U051719200W18

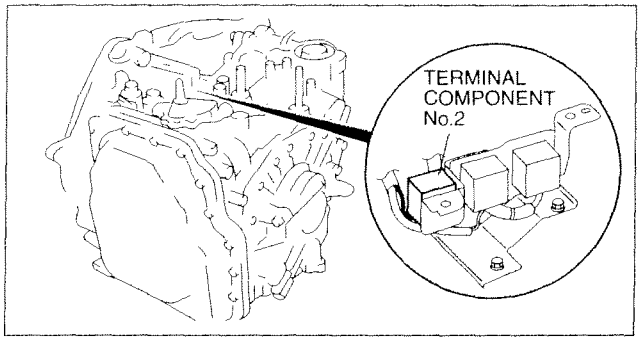
1. Remove the automatic transaxle. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].)
2. Remove the input/turbine speed sensor. (See Automatic Transaxle Workshop Manual JA5A-EL.)
3. Install the input/turbine speed sensor. (See Automatic Transaxle Workshop Manual JA5A-EL.)
4. Install the automatic transaxle. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].)

INTERMEDIATE SENSOR INSPECTION [JA5A-EL]

C6U051719200W19

On-Vehicle Inspection

1. Disconnect the negative battery cable.
2. Disconnect the terminal component No.2 connector.

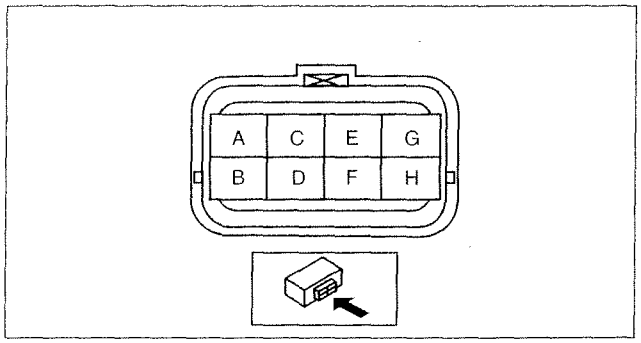


B6U0517W112

3. Measure resistance between terminals C and D.
   - If not as specified, inspect individual part. (See 05–17B–18 Inspection of Individual Part.)

   Resistance (ATF temperature: 20 °C {68 °F})
   513—627 ohms

4. Connect the terminal component No.2 connector.



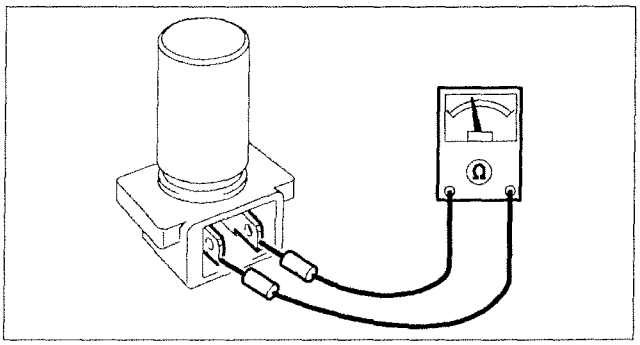
A6E5714W118

Inspection of Individual Part

1. Remove the intermediate sensor. (See 05–17B–18 INTERMEDIATE SENSOR REMOVAL/INSTALLATION [JA5A-EL].)
2. Measure resistance between the terminals of the intermediate speed sensor.
   - If not as specified, replace the intermediate sensor.
   - If it is normal, replace the harness.

   Resistance (ATF temperature: 20 °C {68 °F})
   513—627 ohms

3. Install the intermediate sensor. (See 05–17B–18 INTERMEDIATE SENSOR REMOVAL/INSTALLATION [JA5A-EL].)



AMU0517W051

INTERMEDIATE SENSOR REMOVAL/INSTALLATION [JA5A-EL]

C6U051719200W20

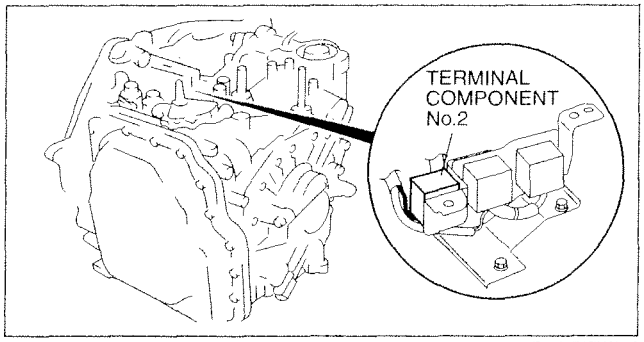
1. Remove the automatic transaxle. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].)
2. Remove the intermediate sensor. (See Automatic Transaxle Workshop Manual JA5A-EL.)
3. Install the intermediate sensor. (See Automatic Transaxle Workshop Manual JA5A-EL.)
4. Install the automatic transaxle. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].)

VEHICLE SPEEDOMETER SENSOR (VSS) INSPECTION [JA5A-EL]

C6U051719200W21

On-Vehicle Inspection

1. Disconnect the negative battery cable.
2. Disconnect the terminal component No.2 connector.

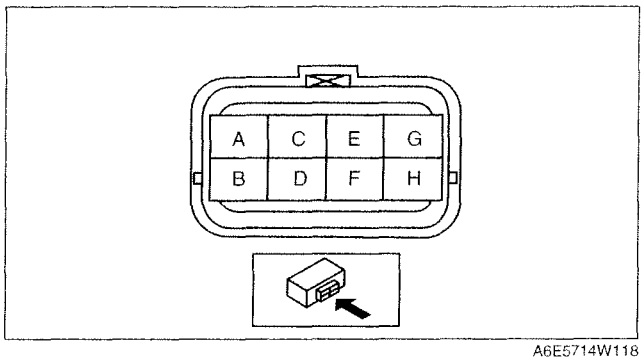


B6U0517W112

3. Measure resistance between terminals A and B.
   - If not as specified, inspect individual part. (See 05–17B–19 Inspection of Individual Part.)

   Resistance (ATF temperature: 20 °C {68 °F})
   513—627 ohms

4. Connect the terminal component No.2 connector.



A6E5714W118

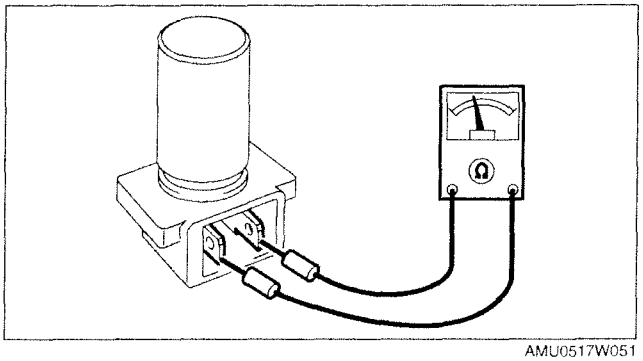
05–17B

Inspection of Individual Part

1. Remove the VSS sensor. (See 05–17B–19 VEHICLE SPEEDOMETER SENSOR (VSS) REMOVAL/INSTALLATION [JA5A-EL].)
2. Measure resistance between the terminals of the VSS speed sensor.
   - If not as specified, replace the VSS sensor.
   - If it is normal, replace the harness.

   Resistance (ATF temperature: 20 °C {68 °F})
   513—627 ohms

3. Install the VSS sensor. (See 05–17B–19 VEHICLE SPEEDOMETER SENSOR (VSS) REMOVAL/INSTALLATION [JA5A-EL].)



AMU0517W051

VEHICLE SPEEDOMETER SENSOR (VSS) REMOVAL/INSTALLATION [JA5A-EL]

C6U051719200W22

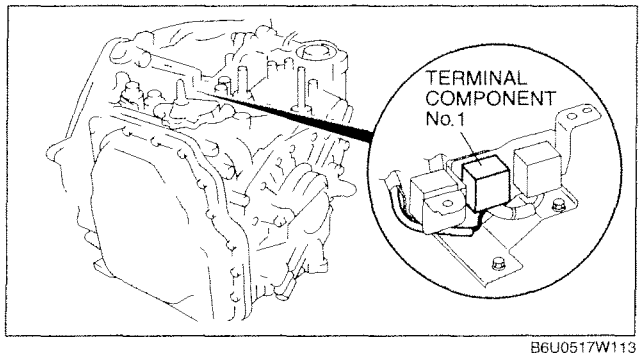
1. Remove the automatic transaxle. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].)
2. Remove the VSS sensor. (See Automatic Transaxle Workshop Manual JA5A-EL.)
3. Install the VSS sensor. (See Automatic Transaxle Workshop Manual JA5A-EL.)
4. Install the automatic transaxle. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].)

SOLENOID VALVE INSPECTION [JA5A-EL]

C6U051721101W03

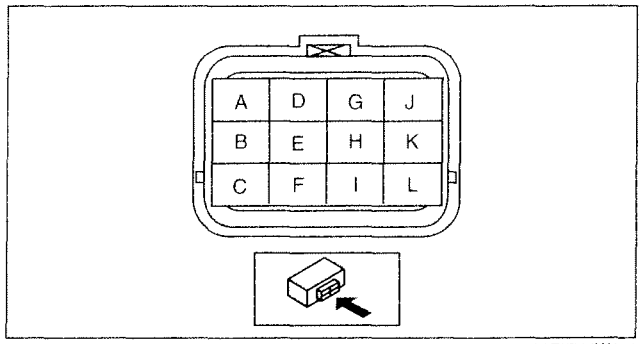
Resistance Inspection (On-Vehicle)

1. Disconnect the negative battery cable.
2. Disconnect the terminal component No.1 connector.



B6U0517W113

3. Measure the resistance between the following terminals.
   - If not as specified, inspect each solenoid valve. (See 05–17B–21 Resistance Inspection (Off-Vehicle).)



A6E5714W121

ATF temperature: 20 °C {68 °F}

Terminal	Solenoid valve	Resistance (ohm)
A—J	2-4 brake solenoid valve	2.6—3.2
B—J	TCC solenoid valve	12.0—13.2
C—J	High clutch solenoid valve	2.6—3.2
D—J	Pressure control solenoid	2.6—3.2
E—J	Reduction timing solenoid valve	14—18
F—J	Shift solenoid C	14—18
G—J	Shift solenoid B	14—18
H—J	Neutral shift solenoid valve	14—18
I—J	Shift solenoid A	14—18

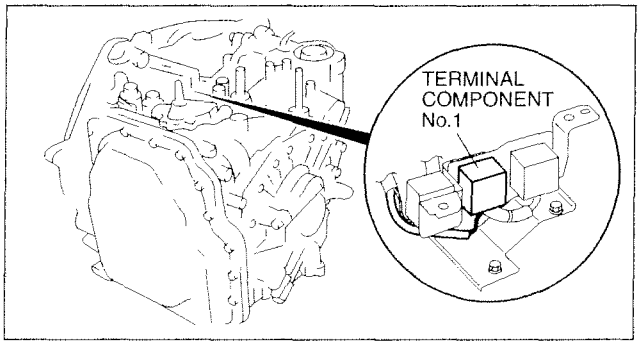
4. Connect the terminal component No.1 connector.
5. Connect the negative battery cable.

Operating Inspection (On-Vehicle)

1. Disconnect the terminal component No.1 connector.

Caution
- **Do not apply battery positive voltage to terminals for more than three seconds.**

Note
- Because the operation sound of the valves is small, inspect in a quiet place.



B6U0517W113

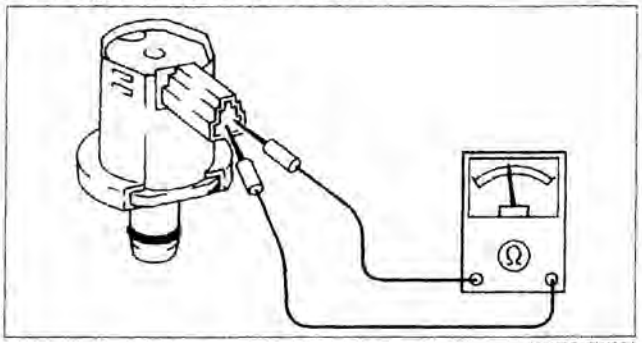
2. Apply battery positive voltage to terminals A, B, C, D, E, F, G, H, I and battery negative voltage to GND, and verify that operating sound is heard from solenoid.
   - If the "click" is not heard, inspect the transaxle harness.
     - — If the transaxle harness is okay, perform the resistance inspection (off-vehicle inspection).
     - — If there is a problem, repair or replace the transaxle harness.
3. Connect the terminal component No.1 connector.

Resistance Inspection (Off-Vehicle)

1. Remove each solenoid valve. (See 05–17B–22 SOLENOID VALVE REMOVAL/INSTALLATION [JA5A-EL].)
2. Measure the resistance of each solenoid valve individually.
   - If not specified, replace the solenoid valve.
   - If it is normal, replace the harness.

Pressure control solenoid, 2-4 brake solenoid valve, and high clutch solenoid valve

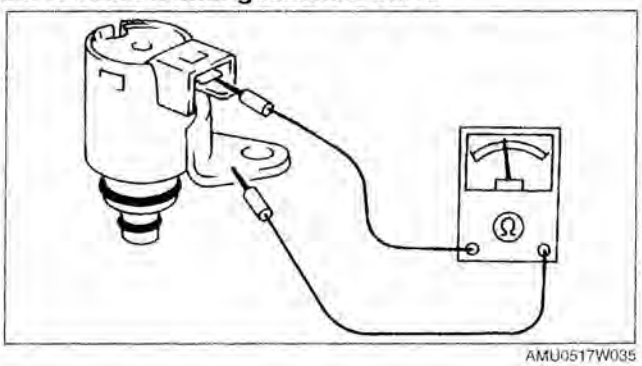
Resistance: 2.6—3.2 ohms (20 °C {68 °F})



AMU0517W034

Shift solenoid A, B, C, neutral shift solenoid valve, and reduction timing solenoid valve

Resistance: 14—18 ohms (20 °C {68 °F})

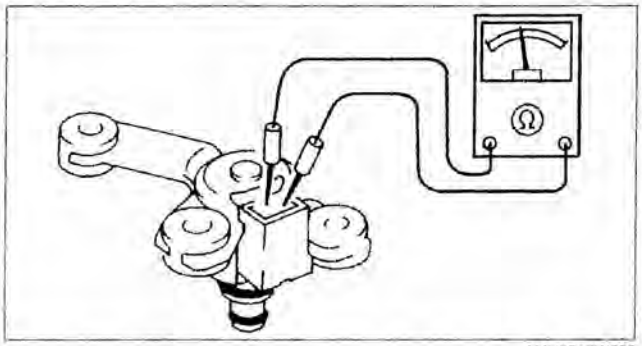


AMU0517W035

TCC solenoid valve

Resistance: 12.0—13.2 ohms (20 °C {68 °F})

3. Install each solenoid valve. (See 05–17B–22 SOLENOID VALVE REMOVAL/INSTALLATION [JA5A-EL].)



AMU0517W036

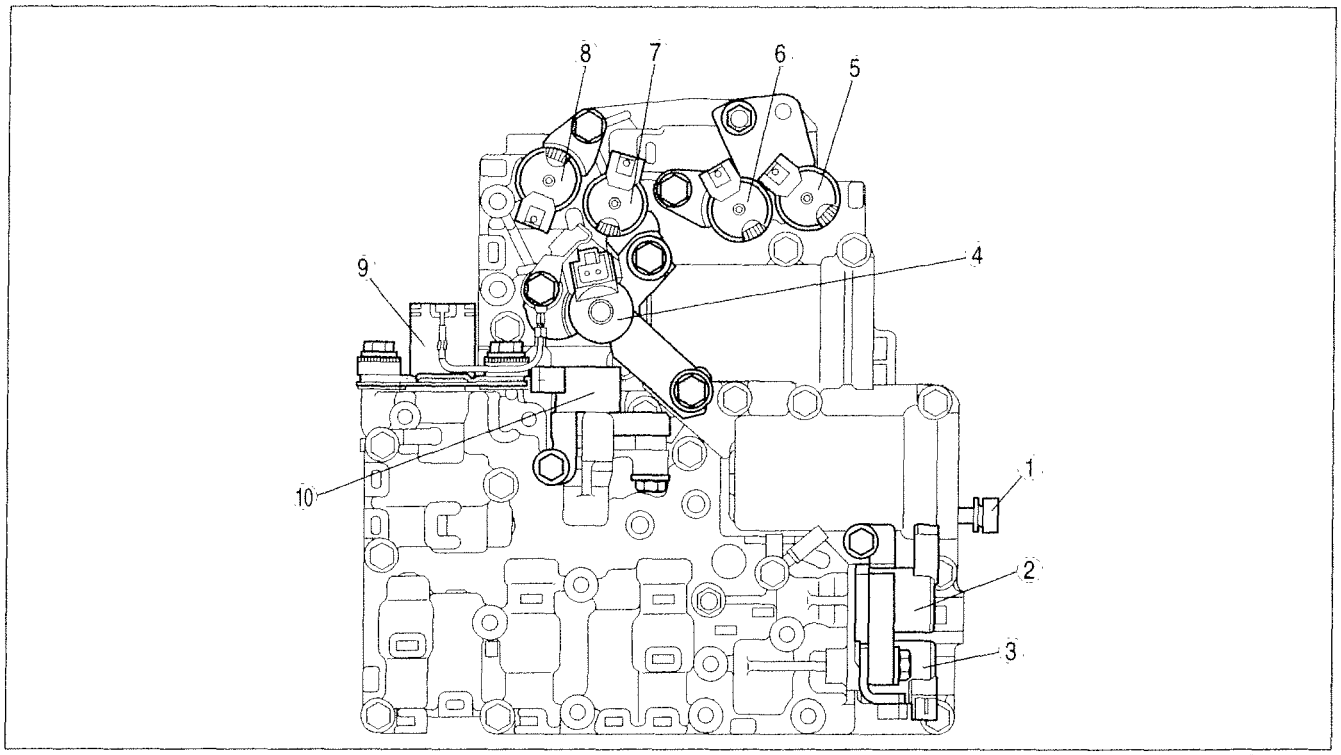
SOLENOID VALVE REMOVAL/INSTALLATION [JA5A-EL]

C6U051721101W04

Caution

- **Denting or scratching these components will reduce the ability of the transaxle to shift properly. When handling these components or the valve body that contains them, be careful not to drop or hit them.**

1. Remove the control valve body. (See 05–17B–35 CONTROL VALVE BODY REMOVAL/INSTALLATION [JA5A-EL].)
2. Remove the solenoid valves and manual valve.



A6E5714W122

1	Manual valve
2	2-4 brake solenoid valve
3	Neutral shift solenoid valve
4	TCC solenoid valve
5	Shift solenoid C

6	Shift solenoid B
7	Reduction timing solenoid valve
8	Shift solenoid A
9	Pressure control solenoid
10	High clutch solenoid valve

3. Apply ATF to a new O-ring and install it on the solenoid valve.
4. Install the solenoid valve and manual valve in the control valve body.

Tightening torque
8.34—10.30 N·m
{85.0—105.0 kgf·cm, 73.8—91.1 in·lbf}

5. Install the control valve body. (See 05–17B–35 CONTROL VALVE BODY REMOVAL/INSTALLATION [JA5A-EL].)
6. Add the ATF while the engine is idling, and inspect the ATF level and leakage. (See 05–17B–11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [JA5A-EL].) (See 05–17B–10 Automatic Transaxle Fluid (ATF) Level Inspection.)
7. Perform the time lag test and line pressure test. (See 05–17B–3 MECHANICAL SYSTEM TEST [JA5A-EL].)
8. Perform the road test. (See 05–17B–7 ROAD TEST [JA5A-EL].)

TCM INSPECTION [JA5A-EL]

C6U051718901W03

Caution

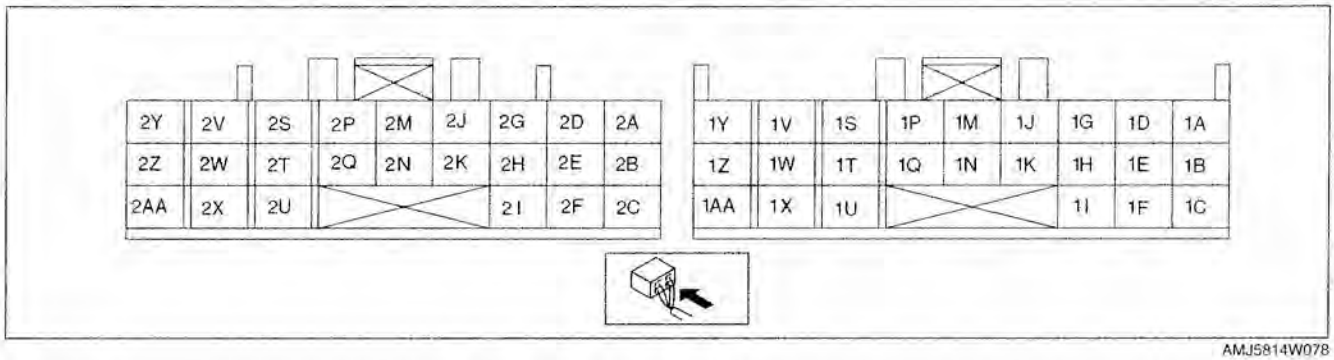
- **The TCM terminal voltages vary with changes in measuring and vehicle conditions. Always carry out a total inspection of the input and output systems, and the TCM to determine the cause of trouble. Otherwise, a mis-diagnosis could occur.**

1. Measure the voltage at each terminal.
   - If any incorrect voltage is detected, inspect the related system (s), wiring harnesses and connector (s) referring to the Action column in the terminal voltage table.

Terminal Voltage Table (Reference)

Note

- Use the ground of terminals 1C and 1Y of the TCM when measuring terminal voltage, as an error may occur when connecting the negative circuit tester to ground.



AMJ5814W078

Terminal	Signal	Connected to	Test Condition	Voltage (V)	Action
1A	—	—	—	—	—
1B	TFT sensor (GND)	TFT sensor	Under any condition	Continuity	• Inspect TFT sensor (See 05–17B–16 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION [JA5A-EL]) • Inspect related harness
1C	GND	GND	Under any condition	Below 1.0	• Inspect related harness
1D	—	—	—	—	—
1E	—	—	—	—	—
1F	TFT sensor	TFT sensor	ATF temperature 20 °C {68 °F}	Approx. 1.55	• Inspect TFT sensor (See 05–17B–16 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION [JA5A-EL]) • Inspect related harness
			ATF temperature 60 °C {140 °F}	Approx. 0.7	
1G	—	—	—	—	—
1H	—	—	—	—	—
1I	—	—	—	—	—
1J	—	—	—	—	—
1K	Intermediate sensor	Intermediate sensor	• Inspect using the wave profile. (See 05–17B–26 Inspection Using an Oscilloscope (Reference).)		• Inspect Intermediate sensor (See 05–17B–18 INTERMEDIATE SENSOR INSPECTION [JA5A-EL]) • Inspect related harness

Terminal	Signal	Connected to	Test Condition	Voltage (V)	Action
1M	VSS	VSS	• Inspect using the wave profile. (See 05–17B–26 Inspection Using an Oscilloscope (Reference).)		• Inspect VSS (See 05–17B–19 VEHICLE SPEEDOMETER SENSOR (VSS) INSPECTION [JA5A-EL]) • Inspect related harness
1N	Input/turbine speed sensor	Input/turbine speed sensor	• Inspect using the wave profile. (See 05–17B–26 Inspection Using an Oscilloscope (Reference).)		• Inspect Input/turbine speed sensor (See 05–17B–17 INPUT/TURBINE SPEED SENSOR INSPECTION [JA5A-EL]) • Inspect related harness
1P	Back-up power supply	Battery	Under any condition	B+	• Inspect battery (See 01–17–1 BATTERY INSPECTION) • Inspect related harness
1Q	—	—	—	—	—
1S	Manual down	Down switch	Down shift at M range	Below 1.0	• Inspect selector lever component (See 05–18–5 SELECTOR LEVER COMPONENT INSPECTION)
			Other	B+	
1T	TR switch (N position)	TR switch	N position	B+	• Inspect TR switch (See 05–17B–11 TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL]) • Inspect related harness
			Other	Below 1.0	
1U	Brake switch	Brake switch	Brake pedal depressed	B+	• Inspect Brake switch (See 04–11–7 BRAKE SWITCH INSPECTION.) • Inspect related harness
			Brake pedal released	Below 1.0	
1V	VSS (GND)	VSS	Under any condition	Below 1.0	• Inspect related harness
1W	TR switch (R position)	TR switch	R position	B+	• Inspect TR switch (See 05–17B–11 TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL]) • Inspect related harness
			Other	Below 1.0	
1X	Intermediate sensor (GND)	Intermediate sensor	Under any condition	Below 1.0	• Inspect Intermediate sensor (See 05–17B–18 INTERMEDIATE SENSOR INSPECTION [JA5A-EL]) • Inspect related harness
1Y	GND	GND	Under any condition	Below 1.0	• Inspect related harness
1Z	TR switch (D range)	TR switch	D, M range	B+	• Inspect TR switch (See 05–17B–11 TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL]) • Inspect related harness
			Other	Below 1.0	

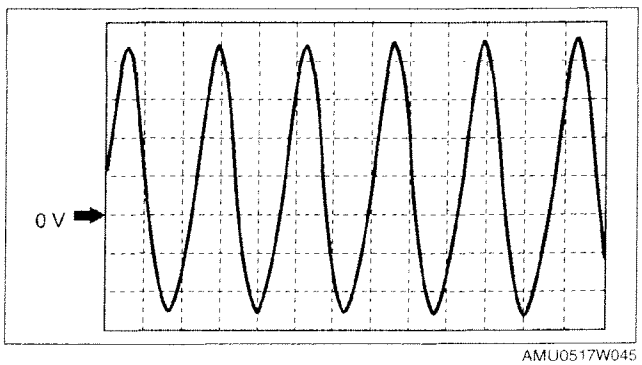
Terminal	Signal	Connected to	Test Condition	Voltage (V)	Action
1AA	M range switch	M range switch	M range	Below 1.0	• Inspect selector lever component (See 05–18–5 SELECTOR LEVER COMPONENT INSPECTION)
			Other	B+	
2A	—	—	—	—	—
2B	TR switch (P position)	TR switch	P position	B+	• Inspect TR switch (See 05–17B–11 TRANSAXLE RANGE (TR) SWITCH INSPECTION [JA5A-EL]) • Inspect related harness
			Other	Below 1.0	
2C	Manual up	Up switch	Up shift at M range	Below 1.0	• Inspect selector lever component (See 05–18–5 SELECTOR LEVER COMPONENT INSPECTION)
			Other	B+	
2D	Neutral shift solenoid valve	Neutral shift solenoid valve	N position	Below 1.0	• Inspect neutral shift solenoid valve (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL]) • Inspect related harness
			R position	B+	
2E	—	—	—	—	—
2F	Input/turbine speed sensor (GND)	Input/turbine speed sensor	Under any condition	Below 1.0	• Inspect Input/turbine speed sensor (See 05–17B–17 INPUT/TURBINE SPEED SENSOR INSPECTION [JA5A-EL]) • Inspect related harness
2G	Reduction timing solenoid valve	Reduction timing solenoid valve	N position	Below 1.0	• Inspect reduction timing solenoid valve (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL]) • Inspect related harness
			D range	B+	
2H	—	—	—	—	—
2I	—	—	—	—	—
2J	CAN_L	PCM	Because this terminal is for CAN, adequate determination by terminal voltage is not possible.		• Inspect related harness
2K	—	—	—	—	—
2M	CAN_H	PCM	Because this terminal is for CAN, adequate determination by terminal voltage is not possible.		• Inspect related harness
2N	—	—	—	—	—
2P	GND return (solenoid ground)	Solenoid valve	Under any condition	Continuity	• Inspect related harness
2Q	—	—	—	—	—
2S	TCC solenoid valve control	TCC solenoid valve	• Inspect using the wave profile. (See 05–17B–26 Inspection Using an Oscilloscope (Reference).)		• Inspect TCC solenoid valve (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL]) • Inspect related harness

Terminal	Signal	Connected to	Test Condition	Voltage (V)	Action
2T	Shift solenoid B control	Shift solenoid B	N position	B+	• Inspect shift solenoid B (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL]) • Inspect related harness
			D range, 4GR gear	Below 1.0	
2U	High clutch solenoid valve	High clutch solenoid valve	N position	Below 1.0	• Inspect high clutch duty solenoid valve (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL]) • Inspect related harness
			When shifting 1-2 in D range	B+	
2V	2-4 Brake solenoid valve	2-4 Brake duty solenoid valve	• Inspect using the wave profile. (See 05–17B–26 Inspection Using an Oscilloscope (Reference).)		• Inspect 2-4 Brake solenoid valve (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL]) • Inspect related harness
2W	Shift solenoid A	Shift solenoid A	N position	B+	• Inspect shift solenoid A (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL]) • Inspect related harness
			D range, 3GR gear	Below 1.0	
2X	Shift solenoid C control	Shift solenoid C	N position	B+	• Inspect shift solenoid C (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL]) • Inspect related harness
			D range	Below 1.0	
2Y	Pressure control solenoid control	Pressure control solenoid	• Inspect using the wave profile. (See 05–17B–26 Inspection Using an Oscilloscope (Reference).)		• Inspect pressure control solenoid (See 05–17B–20 SOLENOID VALVE INSPECTION [JA5A-EL]) • Inspect related harness
2Z	Power supply	Main relay	Ignition switch ON	B+	• Inspect main relay (See 09–21–6 Relay Type) • Inspect related harness
			Ignition switch OFF	Below 1.0	
2AA	Power supply	Main relay	Ignition switch ON	B+	• Inspect main relay (See 09–21–6 Relay Type) • Inspect related harness
			Ignition switch OFF	Below 1.0	

Inspection Using an Oscilloscope (Reference)
Input/turbine speed sensor signal
TCM terminals
- 1N (+)—2F (–)

Oscilloscope setting
- 1 V/DIV (Y) 1 ms/DIV (X)

Vehicle condition
- Turbine speed at 700 rpm, N position

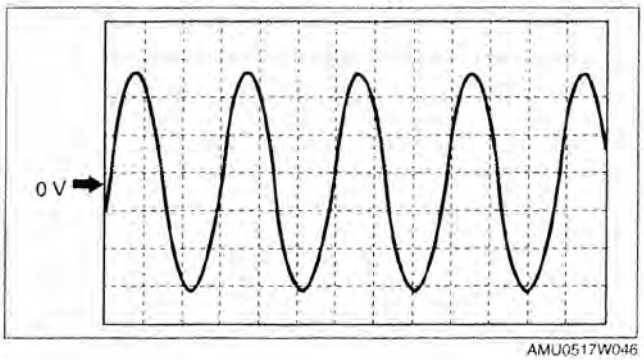


AMU0517W045

Intermediate sensor signal
TCM terminals
- 1K (+)—1X (–)

Oscilloscope setting
- 4 V/DIV (Y) 0.2 ms/DIV (X)

Vehicle condition
- Vehicle speed at 40 km/h {25 mph}, 4GR

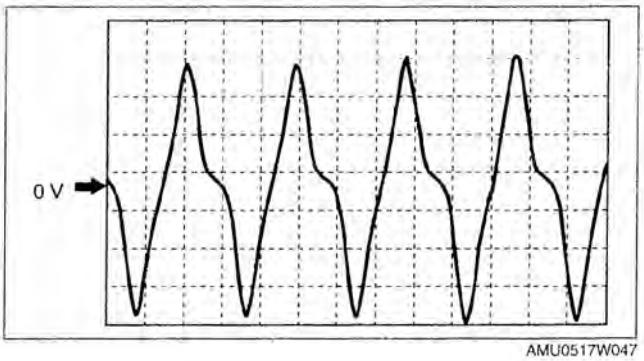


AMU0517W046

VSS signal
TCM terminals
- 1M (+)—1V (–)

Oscilloscope setting
- 4 V/DIV (Y) 1 ms/DIV (X)

Vehicle condition
- Vehicle speed at 40 km/h {25 mph}

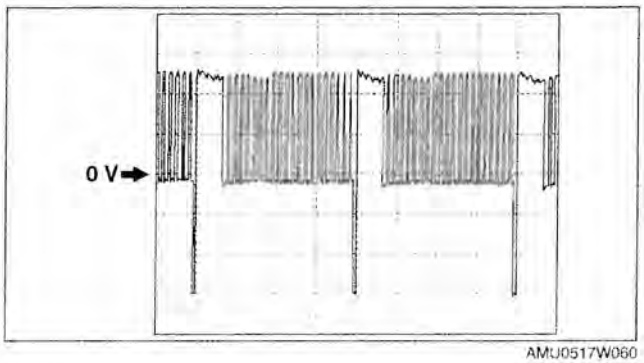


AMU0517W047

Pressure control solenoid signal
TCM terminals
- 2Y (+)—2P (–)

Oscilloscope setting
- 5 V/DIV (Y) 5 ms/DIV (X)

Vehicle condition
- Idle after warm-up

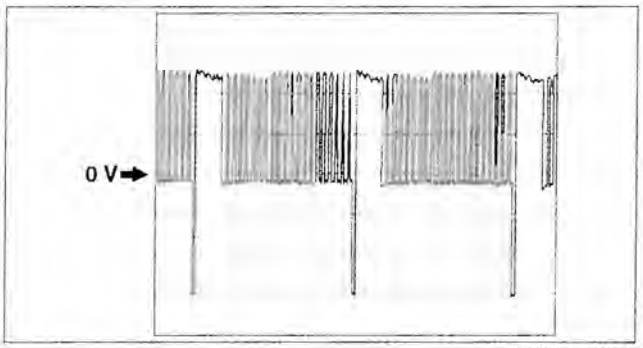


AMU0517W060

2-4 brake solenoid valve signal
TCM terminals
- 2V (+)—2P (–)

Oscilloscope setting
- 5 V/DIV (Y) 5 ms/DIV (X)

Vehicle condition
- Idle after warm-up

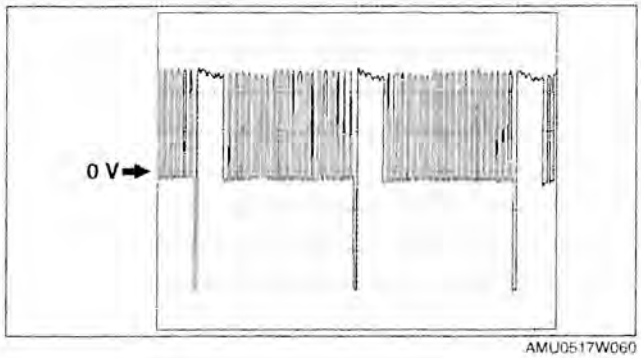


AMU0517W060

High clutch solenoid valve signal
TCM terminals
- 2U (+)—2P (–)

Oscilloscope setting
- 5 V/DIV (Y) 5 ms/DIV (X)

Vehicle condition
- Idle after warm-up

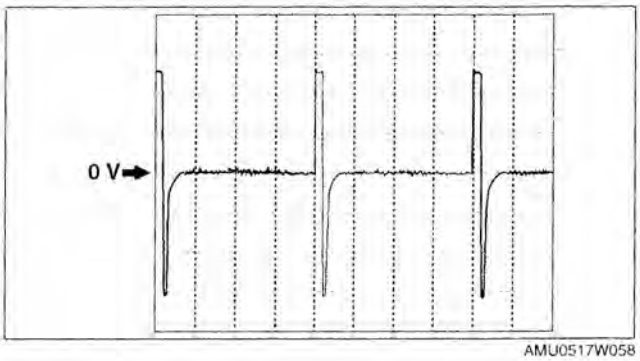


AMU0517W060

TCC solenoid valve signal (lock up off)
TCM terminals
- 2S (+)—2P (–)

Oscilloscope setting
- 5 V/DIV (Y) 5 ms/DIV (X)

Vehicle condition
- Idle after warm-up

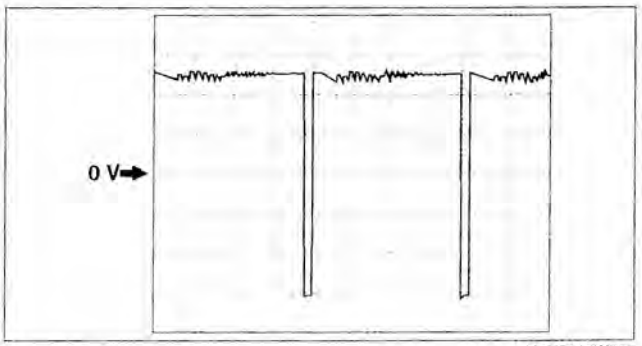


AMU0517W058

TCC solenoid valve signal (lock up on)
TCM terminals
- 2S (+)—2P (–)

Oscilloscope setting
- 5 V/DIV (Y) 5 ms/DIV (X)

Vehicle condition
- Drive the vehicle with lock up

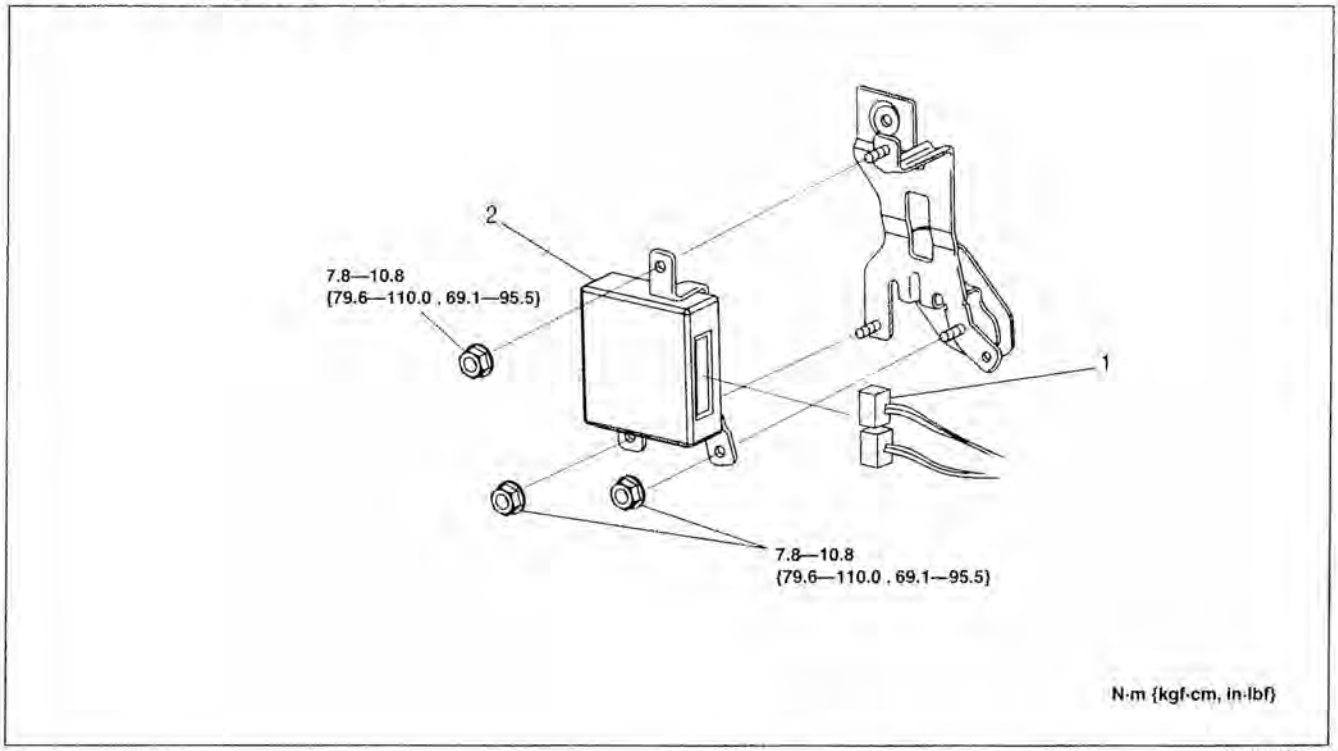


AMU0517W059

TCM REMOVAL/INSTALLATION [JA5A-EL]

C6U051718901W04

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Connect the negative battery cable.



B6U0517W114

1	TCM connector	2	TCM

AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL]

C6U051719090W10

1. Disconnect the negative battery cable.
2. Remove the battery and battery tray.
3. Remove the air cleaner component and air cleaner bracket. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
4. Remove the starter. (See 01–19–1 STARTER REMOVAL/INSTALLATION.)
5. Separate the heater pipe.
6. Remove the front tires and splash shield.
7. Remove the under cover.
8. Remove the steering gear and linkage, and pipe assembly installation bolts from the front crossmember, then suspend the steering gear and linkage with a cable. (See 06–12–11 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION [AJ].)

   Pipe assembly tightening torque
   7.8—10.8 N·m {79.6—110.0 kgf·cm, 69.1—95.5 in·lbf}

9. Drain the ATF. (See 05–17B–11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [JA5A-EL].)

   Warning
   - **Improperly jacking a transaxle is dangerous. It can slip off the jack and may cause serious injury.**

   Caution
   - **To prevent the torque converter and transaxle from separating, remove the transaxle without tilting it toward the torque converter.**

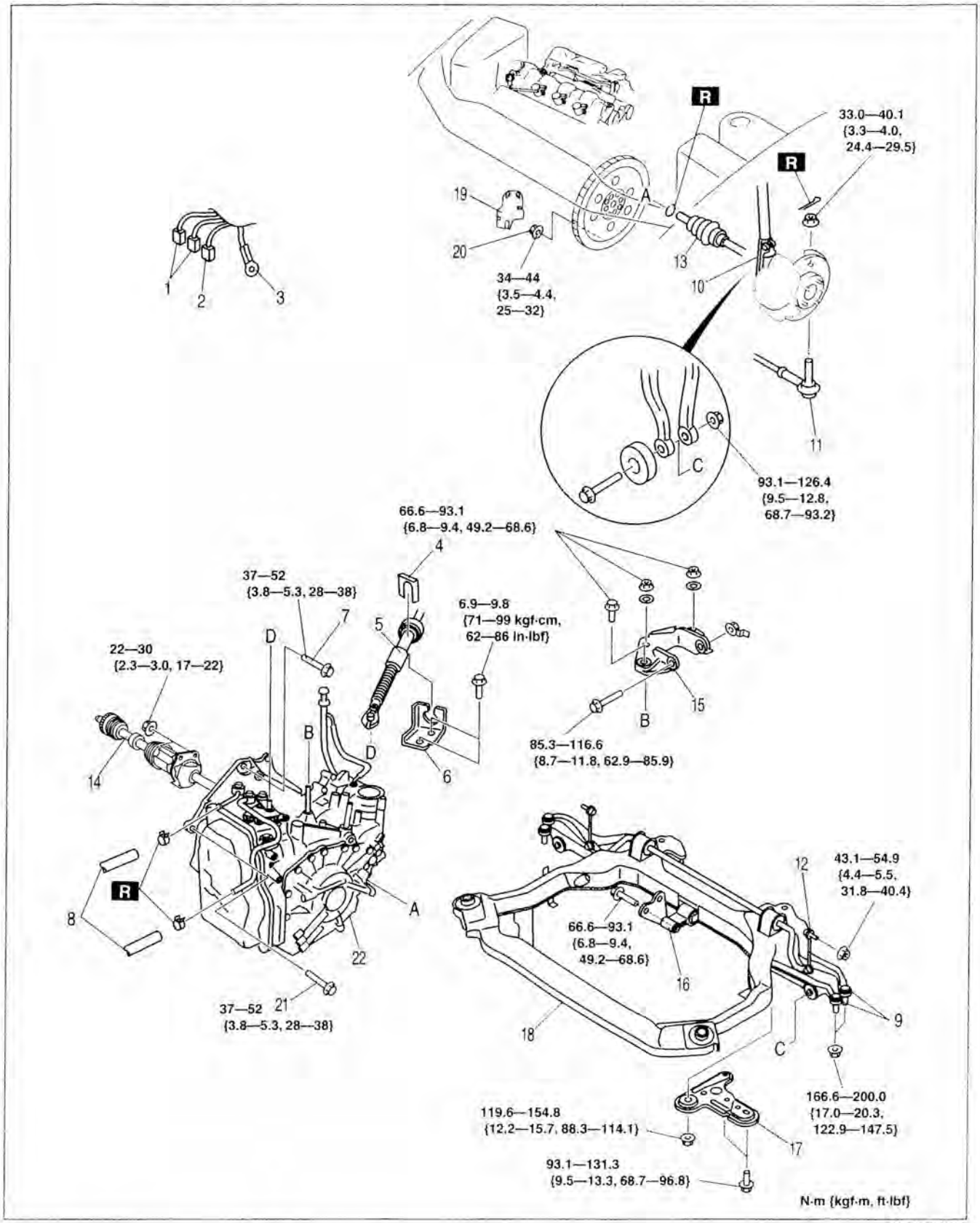
10. Remove in the order shown in the figure.
11. Install in the reverse order of removal.

12. Add ATF to the specified level. (See 05–17B–11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [JA5A-EL].)
13. Carry out the mechanical system test. (See 05–17B–3 MECHANICAL SYSTEM TEST [JA5A-EL].)

Service item	Test item		
	Line pressure test	Stall test	Time lag test
ATX replacement	X		
ATX overhaul	X	X	X
Torque converter replacement	X	X	
Oil pump replacement	X		
Clutch system replacement	X		X

X : Test to be performed after the service work

14. Perform the road test. (See 05–17B–7 ROAD TEST [JA5A-EL].)



C6U0517W01

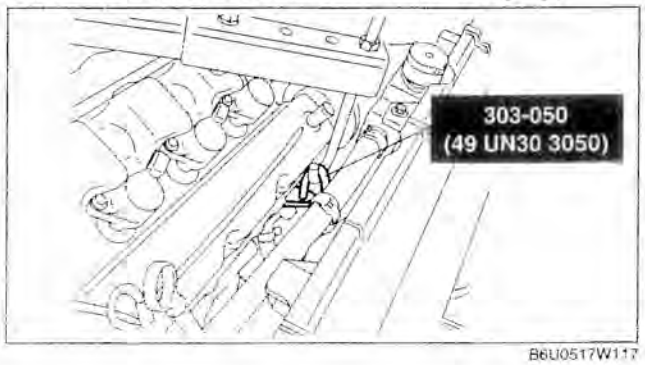
1	Terminal component No.1, No.2 connector
2	TR switch connector
3	GND harness

4	Clip
5	Selector cable (See 05–17B–35 Selector Cable Installation Note)

6	Cable bracket
7	Transaxle mounting bolt (Upper side)
8	Oil hose
9	Lower arm (front, rear) ball joint (See 02–13–14 Front Lower Arm (Rear) Ball Joint Removal Note) (See 02–13–10 Front Lower Arm (Front) Ball Joint Removal Note)
10	Damper fork
11	Tie-rod end ball joint (See 06–12–11 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION [AJ])
12	Stabilizer control link
13	Drive shaft (See 03–13–14 DRIVE SHAFT REMOVAL/INSTALLATION [AJ])
14	Drive shaft, joint shaft (See 03–13–14 DRIVE SHAFT REMOVAL/INSTALLATION [AJ])
15	No.4 engine mount (See 05–17B–34 No.4 Engine Mount Installation Note)
16	No.1 engine mount (See 05–17B–32 No.1 Engine Mount Removal Note) (See 05–17B–34 No.1 Engine Mount Installation Note)
17	Crossmember bracket
18	Crossmember (See 02–13–18 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
19	Endplate cover
20	Torque converter installation nuts (See 05–17B–33 Torque Converter Nuts Installation Note)
21	Transaxle mounting bolt (lower side)
22	Transaxle (See 05–17B–33 Transaxle Removal Note) (See 05–17B–33 Transaxle Installation Note)

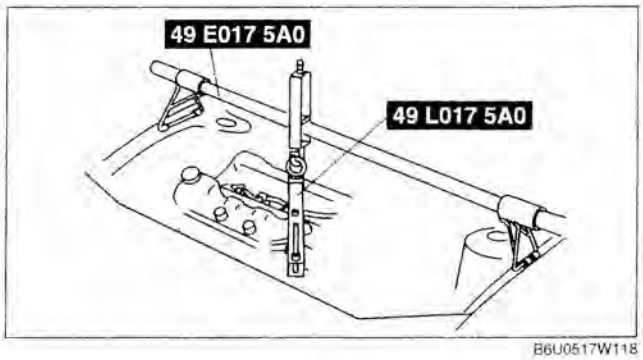
No.1 Engine Mount Removal Note

1. Remove the dynamic chamber. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
2. Install the **SST** to the cylinder head.



B6U0517W117

3. Support the engine using the **SSTs** before removing the No.1 engine mount.
4. Remove the No.1 engine mount.



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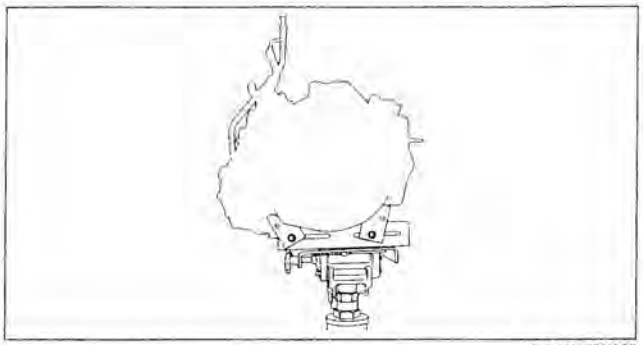
Transaxle Removal Note

1. Support the transaxle on a jack.
2. Remove the transaxle mounting bolts.
3. Remove the transaxle.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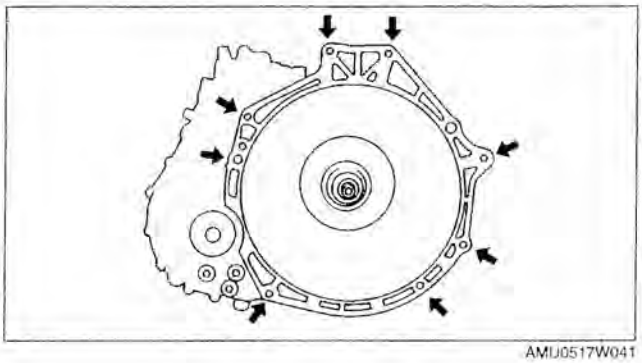
Transaxle Installation Note

1. Set the transaxle on a jack and lift it.
2. Install the transaxle mounting bolts.

Tightening torque
37—52 N·m {3.8—5.3 kgf·m, 28—38 ft·lbf}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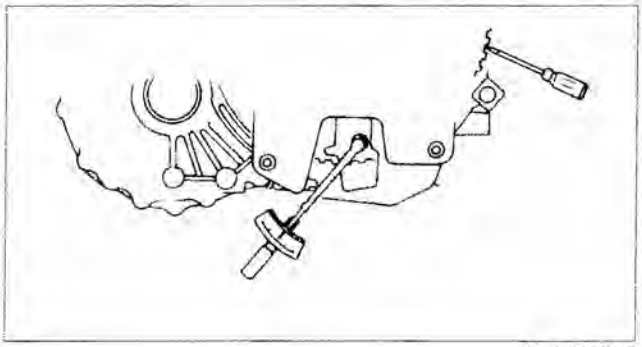
Torque Converter Nuts Installation Note

1. Align the holes by turning torque converter.
2. Insert a screwdriver from the starter installation hole, and lock the drive plate.

Caution
- **Loosely and equally tighten the torque converter nuts, then further tighten them to the specified tightening torque.**

3. Tighten the torque converter mounting nuts.

Tightening torque
34—44 N·m {3.5—4.4 kgf·m, 25—32 ft·lbf}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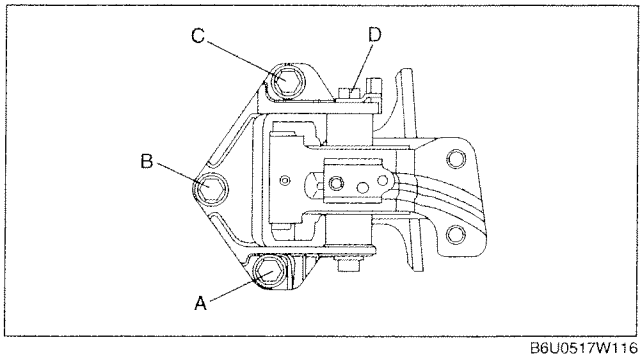
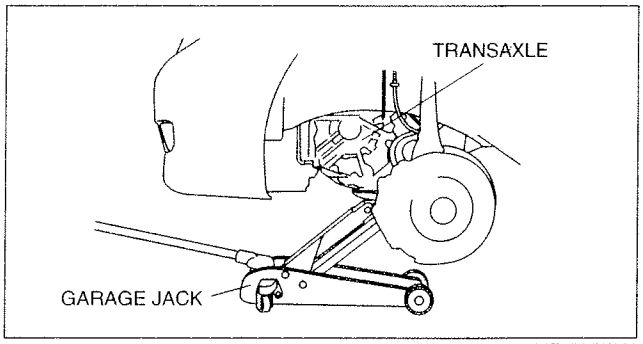
No.4 Engine Mount Installation Note

1. Verify that the No.4 engine mount bracket is installed as shown.
2. Lightly tighten bolt D.



B6U0517W116

3. Set the transaxle on a garage jack and lift it.
4. Align the hole of the No.4 engine mount bracket with the stud bolts of transaxle.
5. Lightly tighten bolt A and nuts B, C.
6. Tighten nuts B, C in the order of B→C, then bolt A.



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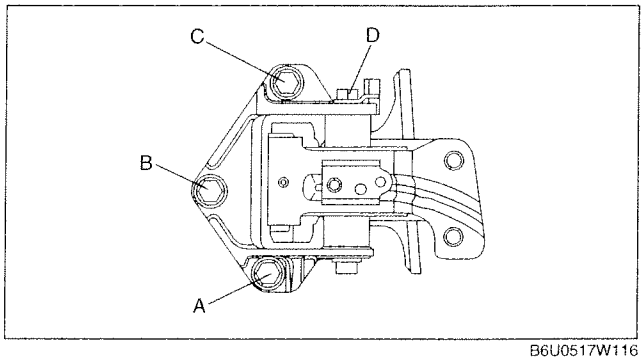
7. Tighten bolt D.

Tightening torque
A, B, C: 66.6—93.1 N·m
{6.8—9.4 kgf·m, 49.2—68.6 ft·lbf}
D: 85.3—116.6 N·m
{8.7—11.8 kgf·m, 62.9—85.9 ft·lbf}



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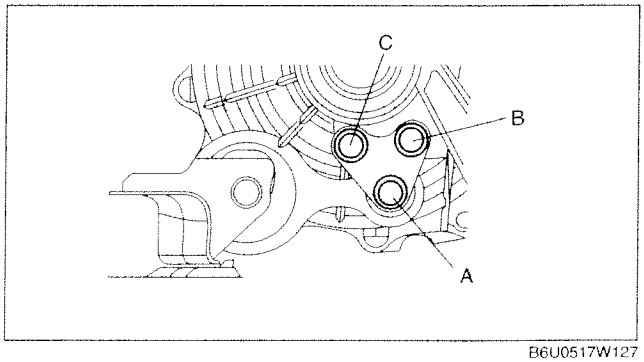
No.1 Engine Mount Installation Note

1. Align the hole of the No.1 engine mount rubber with the bolt hole of the transaxle.
2. Lightly tighten bolt A, then tighten bolts B, C.
3. Tighten bolt A.

Tightening torque
66.6—93.1 N·m
{6.8—9.4 kgf·m, 49.2—68.6 ft·lbf}



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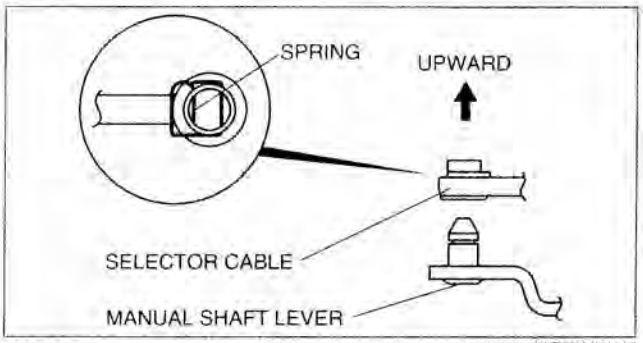
Selector Cable Installation Note

1. Install the selector lever to the manual shaft lever in such a way that the selector cable does not bear a load.

   Note
   - Install the selector lever to the manual shaft lever with the spring side of the selector cable end facing upward.

2. Confirm that the end of the manual shaft lever sticks out of the end of the selector cable.



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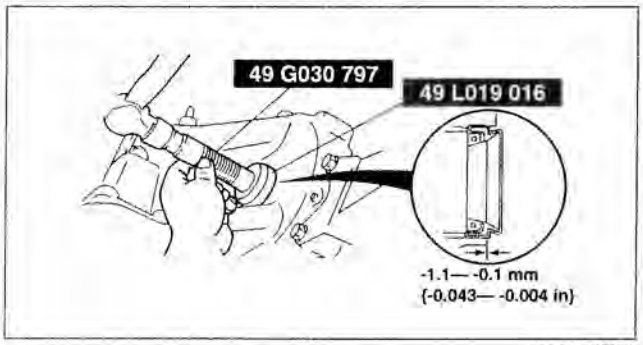
OIL SEAL REMOVAL/INSTALLATION [JA5A-EL]

C6U051727238W02

1. Drain the ATF. (See 05–17B–11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [JA5A-EL].)
2. Remove the drive shaft and joint shaft. (See 03–13–5 JOINT SHAFT REMOVAL/INSTALLATION [AJ].) (See 03–13–14 DRIVE SHAFT REMOVAL/INSTALLATION [AJ].)
3. Remove and discard the oil seal using a screwdriver.
4. Using the **SSTs** and a hammer, tap a new oil seal in evenly until the **SSTs** contacts the transaxle case.
5. Coat the lip of the oil seal with ATF.

   Caution
   - **The oil seal is easily damaged by the sharp edges of the drive shaft splines. Do not let the splines contact the oil seal.**

6. Install the drive shaft and joint shaft. (See 03–13–5 JOINT SHAFT REMOVAL/INSTALLATION [AJ].) (See 03–13–14 DRIVE SHAFT REMOVAL/INSTALLATION [AJ].)
7. Add ATF to the specified level. (See 05–17B–11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [JA5A-EL].)
8. Carry out the mechanical system test. (See 05–17B–3 MECHANICAL SYSTEM TEST [JA5A-EL].)



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CONTROL VALVE BODY REMOVAL/INSTALLATION [JA5A-EL]

C6U051721100W03

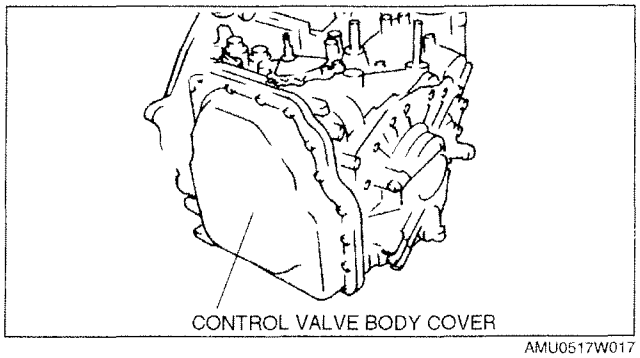
On-Vehicle Removal

Warning
- **A hot transaxle and ATF can cause severe burns. Turn off the engine and wait until they are cool before removing the control valve body.**
- **Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eyeglasses whenever using compressed air.**

Caution
- **Clean the transaxle exterior thoroughly with a stream cleaner or cleaning solvents before removal.**
- **If any old sealant gets into the transaxle during installation of the oil pan, trouble may occur in the transaxle case and oil pan. Clean with cleaning fluids.**

1. Clean the transaxle exterior thoroughly with a steam cleaner or cleaning solvents.
2. Disconnect the negative battery cable.
3. Remove the battery and battery tray.
4. Remove the air cleaner component and air cleaner bracket. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
5. Remove the thermostat case.
6. Drain the ATF into separate containers.
7. Remove the oil hose. (See 05–17B–37 OIL COOLER REMOVAL/INSTALLATION [JA5A-EL].)
8. Remove the oil pipe bracket.
9. Remove the heater pipe bracket.
10. Remove the heater hose of engine side.

11. Remove the control valve body cover.
12. Disconnect the solenoid valve connectors, then remove harness clips.
13. Remove the control valve body.



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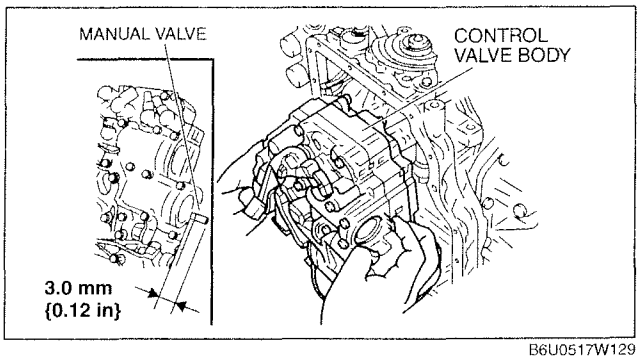
On-Vehicle Installation

1. Position the manual valve so that it protrudes from the control valve body end by **3.0 mm {0.12 in}**.
2. Install the control valve body while holding the manual valve in the position.

Tightening torque
6.9—8.8 N·m
{71—89 kgf·cm, 62—77 in·lbf}



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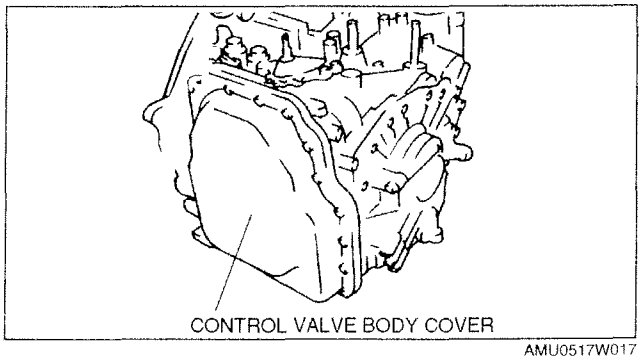
3. Connect the solenoid connectors, then install harness clips.
4. Apply a light coat of silicon sealant to the contact surfaces of the control valve body cover and transaxle case.
5. Install the control valve body cover.

Tightening torque
6.9—8.8 N·m
{71—89 kgf·cm, 62—77 in·lbf}



AMU0517W017

6. Install the heater hose of engine side.
7. Install the heater pipe bracket.
8. Install the oil pipe bracket.
9. Install the oil hose. (See 05–17B–37 OIL COOLER REMOVAL/INSTALLATION [JA5A-EL].)
10. Install the thermostat case.
11. Install the air cleaner component and air cleaner bracket. (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
12. Install the battery tray and battery.
13. Connect the negative battery cable.
14. Fill the transaxle with the specified ATF. (See 05–17B–11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [JA5A-EL].)
15. Inspect for leakage of ATF from the oil pan or the oil hose connecting points.
16. Carry out the mechanical system test. (See 05–17B–3 MECHANICAL SYSTEM TEST [JA5A-EL].)
17. Carry out the road test. (See 05–17B–7 ROAD TEST [JA5A-EL].)

OIL COOLER FLUSHING [JA5A-EL]

C6U051719900W04

Caution

- **Power flushing should be performed very carefully when removing the accumulated debris from the fluid baffle, otherwise the debris cannot be removed or the problem becomes even worse.**

Note

- The contaminated cooler line (oil pipes and hoses) and auxiliary cooler (if equipped) must be flushed completely when ATX is overhauled or replaced.
- Performing back and reverse power flushing two times each does not work because debris or particles flow out from the feed pipe side of ATX.

Recommended power-flushing manufacturer

Manufacturer	Part number	Description
Kent Moore	J35944-AMAZ	Flushing kit or equivalent
OTC	60081	Portable torque converter, oil cooler cleaner or equivalent

Power Flushing
Repair procedure

1. Before power flushing, inspect the hoses/lines and clamps. Power flushing must begin with back flushing followed by forward flushing to quickly dislodge the restriction. If back flushing is not performed before forward flushing, the restriction could further reduce the ATF flow through the internal mesh type baffle of the cooler and flushing will not be effective or possible.

Inspecting oil lines & clamps

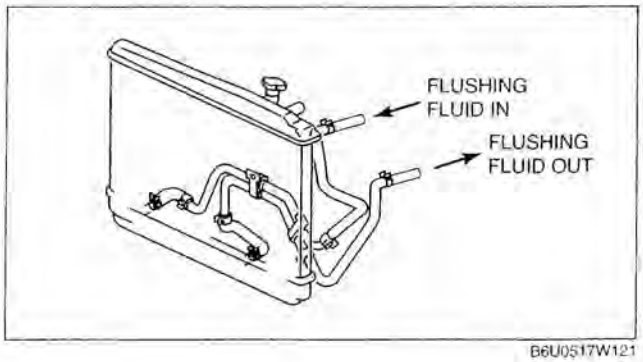
1. Be sure to inspect the lines (hoses/pipes) for cuts, crimps (pinched), cracks or any other damage before reusing them. If any problem exists replace it.

Caution
- **Always use new clamps when replacing hoses.**

Back flushing

1. Using the power flushing equipment manufacturer's instructions, connect equipment so the flushing fluid flows in the opposite direction of normal fluid flow.
2. Flush oil cooler/lines until discharge fluid is clean.

Caution
- **If the cooler can not be properly flushed using recommended equipment, send the radiator out for sublet cleaning or replace.**



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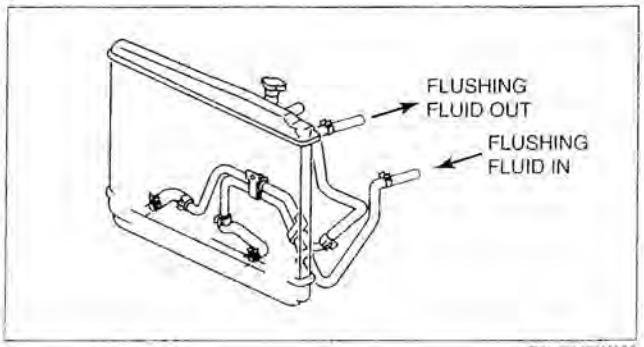
Forward flushing

1. Connect power flushing equipment so the flushing fluid flows in the direction of normal fluid flow.
2. Flush oil cooler/lines until discharge fluid is clean.



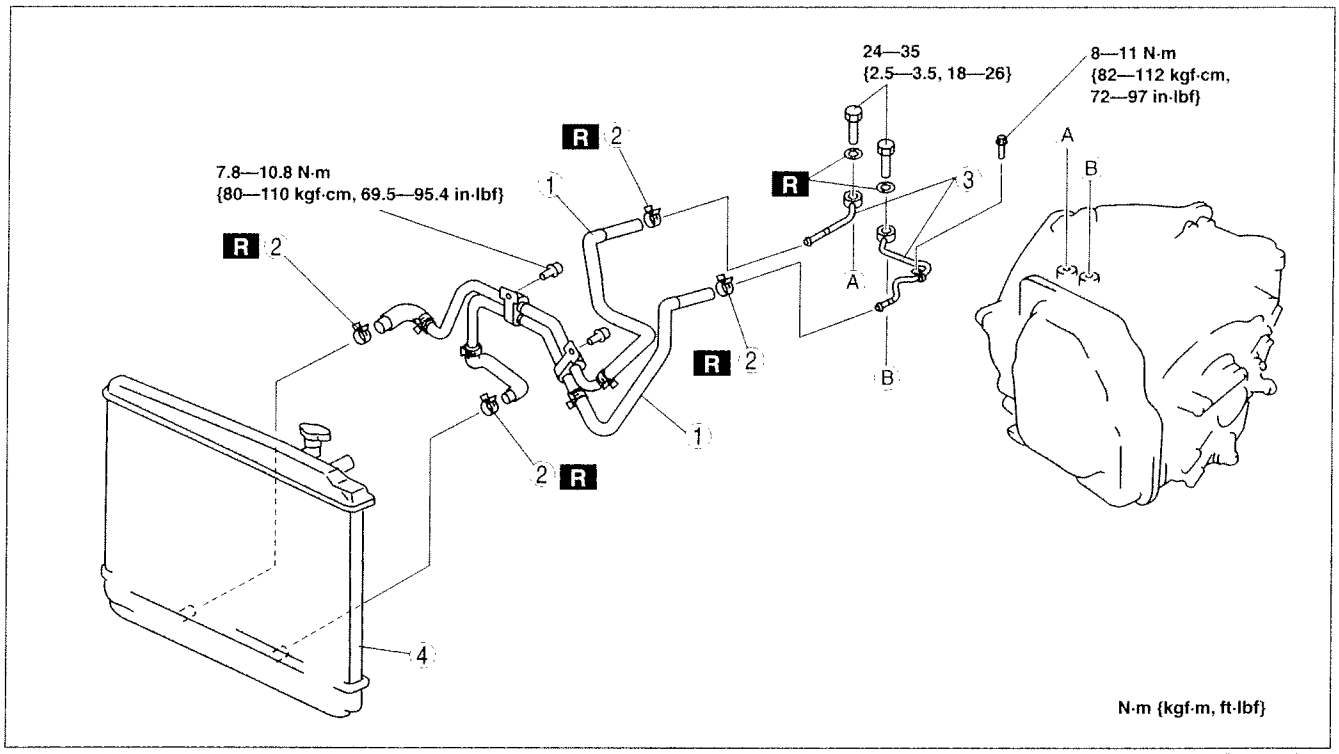
B6U0517W122

OIL COOLER REMOVAL/INSTALLATION [JA5A-EL]

C6U0517I9900W05

1. Disconnect the negative battery cable.
2. Drain the ATF into a container. (See 05–17B–11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [JA5A-EL].)
3. Remove the radiator. (See 01–12–8 RADIATOR REMOVAL/INSTALLATION.)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Add ATF to the specified level. (See 05–17B–11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [JA5A-EL].)
7. Connect the negative battery cable.
8. Inspect for oil leakage from the oil pipes and oil hoses.
9. Inspect for coolant from the hoses.

10. Inspect the ATF level and condition. (See 05–17B–10 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [JA5A-EL].)
11. Perform the line pressure test. (See 05–17B–3 MECHANICAL SYSTEM TEST [JA5A-EL].)
12. Perform the road test. (See 05–17B–7 ROAD TEST [JA5A-EL].)



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1	Oil hose (See 05–17B–38 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
2	Hose clamp (See 05–17B–38 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
3	Oil pipe
4	Radiator (in tank oil cooler) (See 05–17B–38 Radiator (In Tank Oil Cooler) Installation Note.)

Radiator (In Tank Oil Cooler) Installation Note

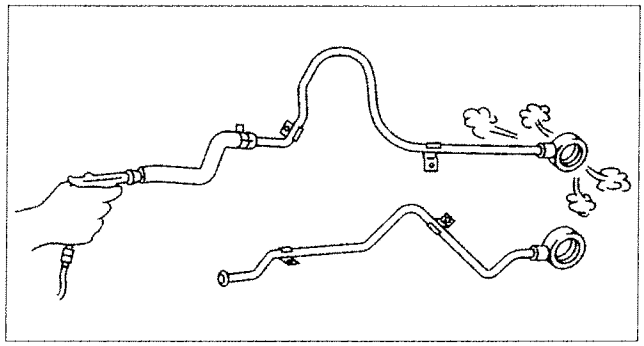
1. The automatic transaxle oil cooler flushing must be performed whenever a transaxle is removed for service because the existing fluid may be contaminated, and to prevent contamination of new fluid.

   Note
   - Flushing must be performed after installation of the overhauled or replaced transaxle.

2. Follow the instructions in the manufacturer's publication for flushing operation.

Oil Pipe, Hose Clamp, Oil Hose Installation Note

1. Apply compressed air to the cooler-side opening, and blow any remaining grime and foreign material from the cooler pipes. Compressed air should be applied for no **less than one minute**.



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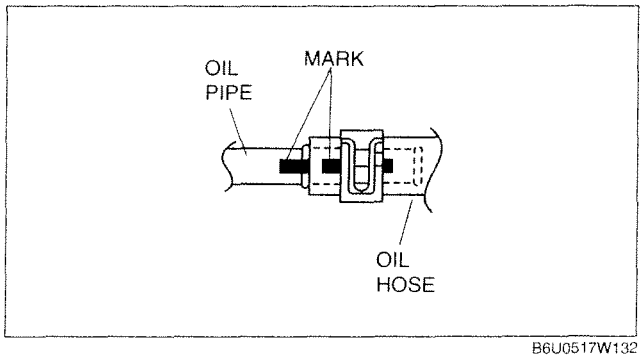
2. Align the marks, and slide the oil hose onto the oil pipe until it is fully seated as shown.

Note
- If reusing the hose, install the new hose clamp exactly on the mark left by the previous hose camp. Then apply force to the hose clamp in the direction of the arrow in order to fit the clamp in place.

3. Install the new hose clamp onto the hose.
4. Verify that the hose clamp does not interfere with any other components.

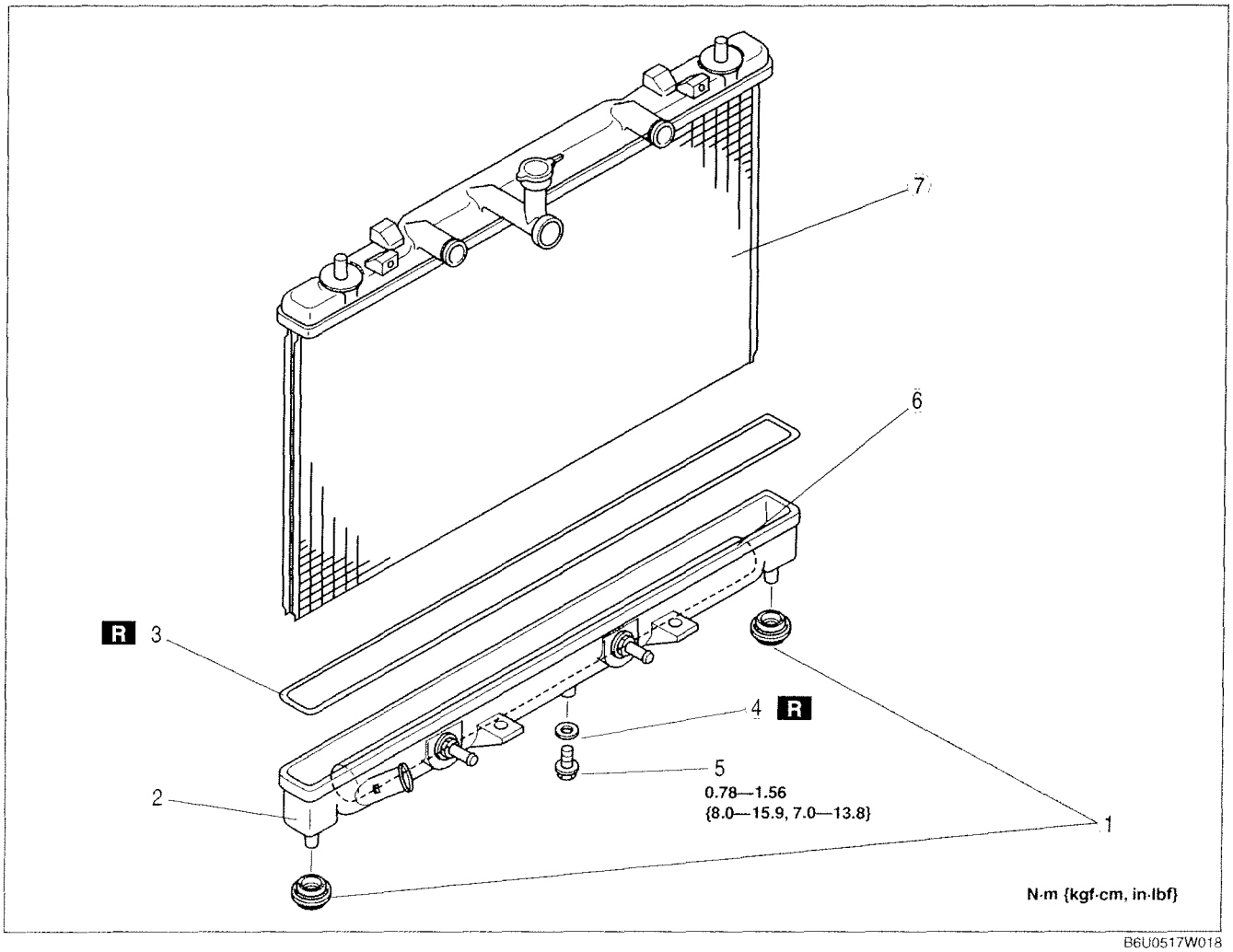


B6U0517W132

OIL COOLER DISASSEMBLY/ASSEMBLY [JA5A-EL]

C6U051719900W06

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



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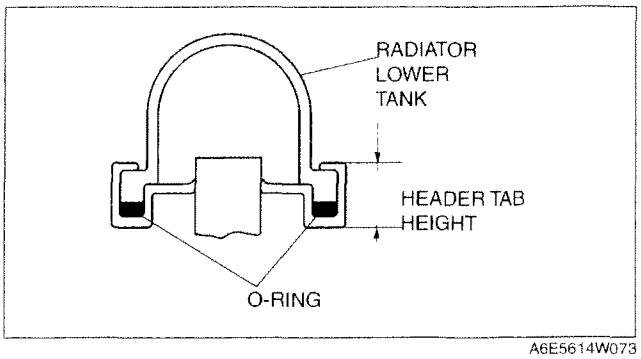
1	Mount rubber
2	Radiator outer tank (in tank oil cooler) (See 05–17B–40 Radiator Outer Tank (In Tank Oil Cooler) Removal Note.) (See 05–17B–40 Radiator Outer Tank (In Tank Oil Cooler) Installation Note.)
3	O-ring
4	Washer

5	Drain cock
6	ATF cooler
7	Radiator

Radiator Outer Tank (In Tank Oil Cooler) Removal Note

1. Inspect the height of the header tabs.
2. Insert the end of a medium tip screwdriver between the end of the header tab and the outer tank.

Note
- Do not open more tabs than necessary for tank removal.



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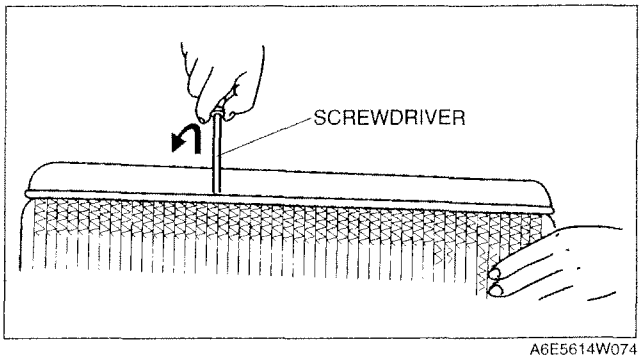
3. Pivot the screwdriver to pry the tab away from the tank and repeat the procedure for each tab.
4. Remove the radiator outer tank and O-ring (gasket) from the core header when all of the tabs are opened.

Note
- If any header tabs are missing from the core, replace the radiator.



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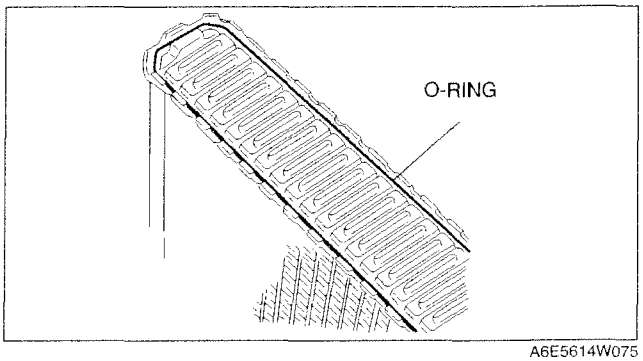
5. Inspect the gasket surface of the radiator core header to ensure it is clean and free of foreign material or damage.
6. Inspect the radiator outer tank for warping. If it is warped, replace radiator tank.

Radiator Outer Tank (In Tank Oil Cooler) Installation Note

1. Install a new O-ring and ensure it is not twisted.

Note
- The old O-ring must be replaced.



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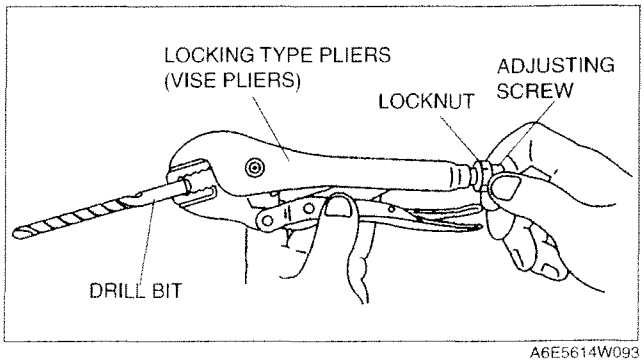
2. Position the radiator tank in the original direction to the core using care not to scratch the tank sealing surface with the header tabs.

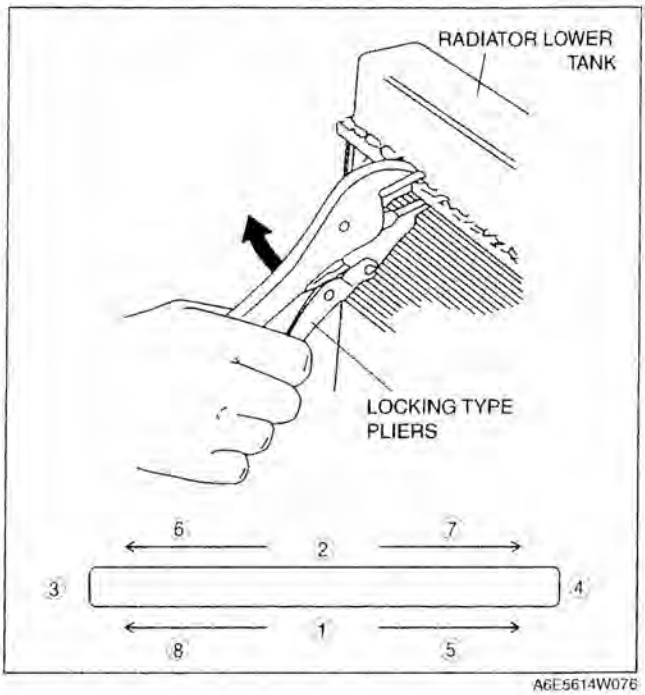
Note
- Step 3 will set jaw opening to the correct specification.

3. With the jaws of locking-type pliers (vise grips) closed and locked, turn the adjusting screw to position the jaws against the drill bit with the diameter measured (height) in the removal procedure 1. Tighten the lock nut on the adjusting screw against the handle to lock the adjustment in place.



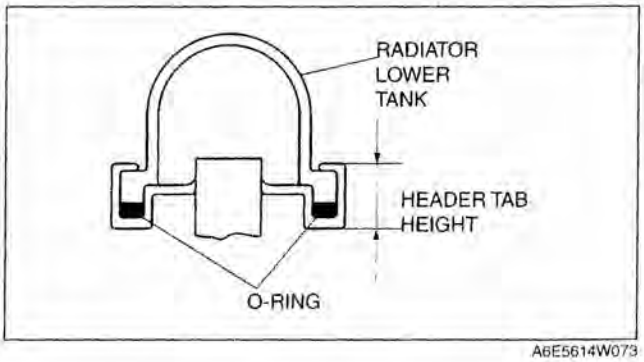
A6E5614W093

4. Squeeze the header tabs down in the order as shown against the lip of the radiator outer tank base with the locking-type pliers while rotating the pliers toward the tank.



A6E5614W076

5. Verify that the height of the header tabs is same as the height before removal.
6. Inspect for leakage from radiator. (See 01–12–5 ENGINE COOLANT LEAKAGE INSPECTION.)



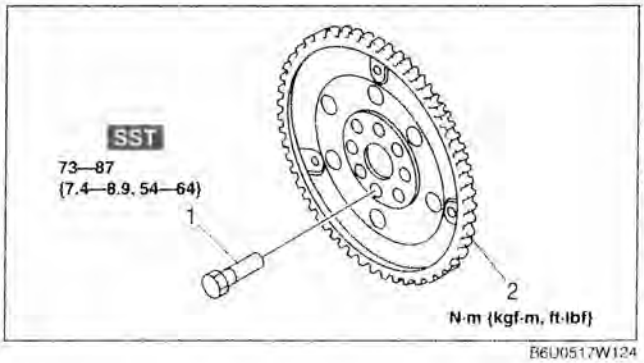
A6E5614W073

DRIVE PLATE REMOVAL/INSTALLATION [JA5A-EL]

C6U051719020W02

1. Remove the transaxle. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [JA5A-EL].)
2. Remove in the order indicated in the figure.
3. Install in the reverse order of removal.

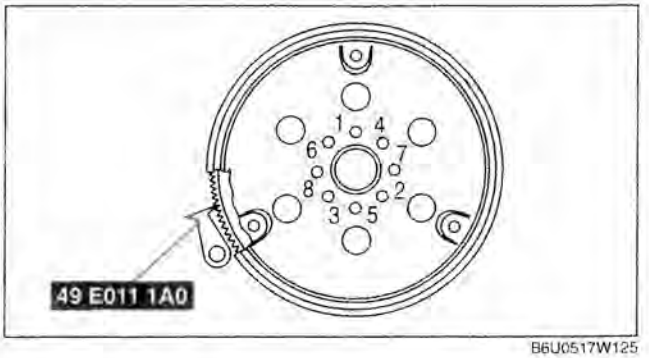
1	Drive plate mounting bolts (See 05–17B–42 Drive Plate Mounting Bolts Removal Note.)
2	Drive plate (See 05–17B–42 Drive Plate Installation Note.)



B6U0517W124

Drive Plate Mounting Bolts Removal Note

1. Set the **SST** or equivalent against the drive plate.
2. Remove the bolts and the drive plate.



B6U0517W125

Drive Plate Installation Note

Caution

- **If the bolts are reused, remove the oil sealant from the bolt threads. Tightening a bolt that has old sealant on it can cause thread damage.**

1. Remove the sealant from the bolts hole in the crankshaft and from the drive plate mounting bolts.

Note

- If all the previous sealant cannot be removed from a bolt, replace the bolts.
- Do not apply sealant if new bolts is used.

2. Install the drive plate.
3. Apply sealant to the drive plate mounting bolts and install them.
4. Set the **SST** or equivalent against the drive plate.

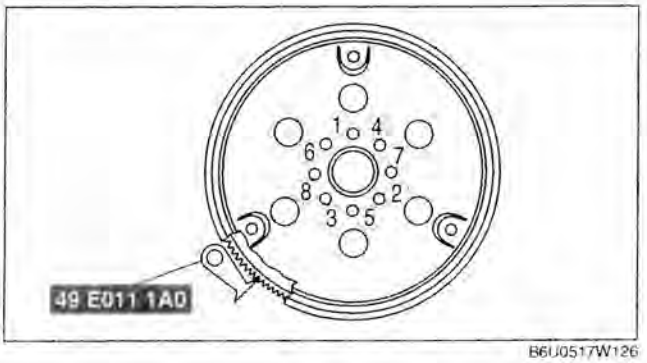
Caution

- **When installing sealant covered bolts, tighten them immediately. Leaving these bolts in a half installed condition could cause them to be stuck that way, due to the natural hardening of the sealant.**

5. Tighten the drive plate mounting bolts in two or three steps in the order shown.

Tightening torque
73—87 N·m {7.4—8.9 kgf·m, 54—64 ft·lbf}

6. Install the transaxle. (See 05–17B–29 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION [JA5A-EL].)

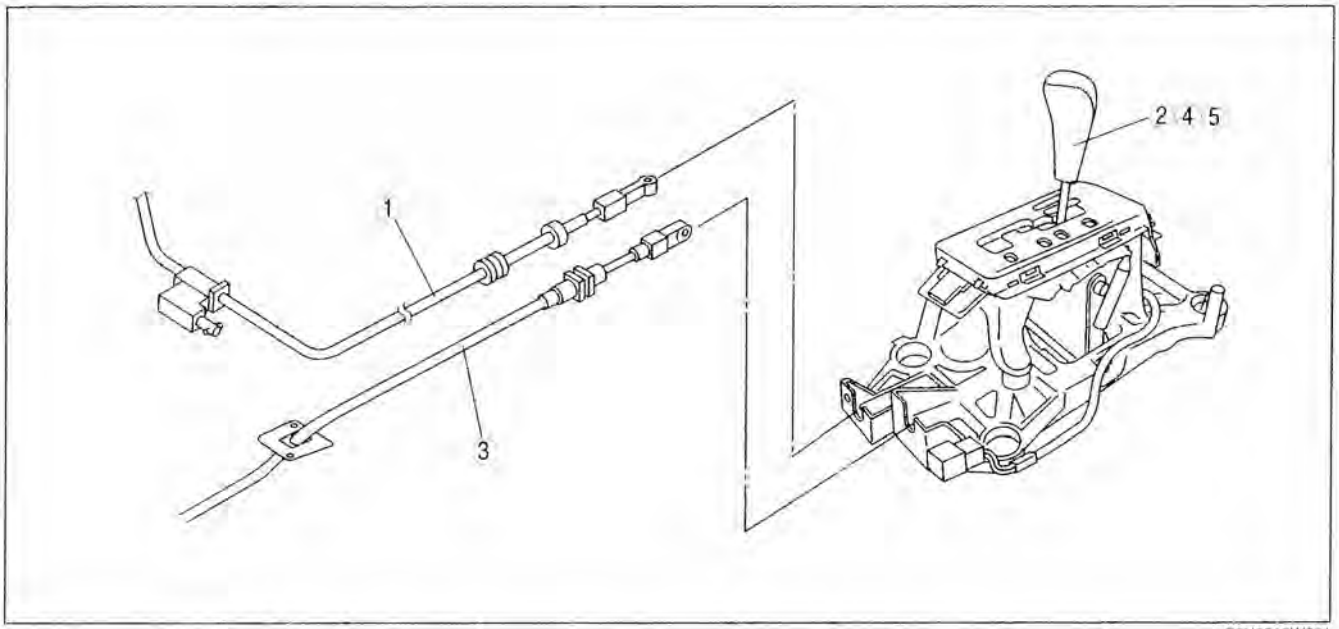


B6U0517W126

05–18 AUTOMATIC TRANSAXLE SHIFT MECHANISM

AUTOMATIC TRANSAXLE SHIFT MECHANISM LOCATION INDEX

C6U051819090W01



B6U0518W001

1	Interlock cable (See 05–18–2 INTERLOCK CABLE INSPECTION) (See 05–18–2 INTERLOCK CABLE ADJUSTMENT)
2	Selector lever (See 05–18–5 SELECTOR LEVER INSPECTION) (See 05–18–5 SELECTOR LEVER COMPONENT INSPECTION) (See 05–18–6 SELECTOR LEVER REMOVAL/ INSTALLATION) (See 05–18–14 SELECTOR LEVER DISASSEMBLY/ASSEMBLY)
3	Selector cable (See 05–18–6 SELECTOR CABLE ADJUSTMENT)
4	Shift-lock (See 05–18–1 SHIFT-LOCK INSPECTION)
5	Key interlock (See 05–18–2 KEY INTERLOCK INSPECTION)

SHIFT-LOCK INSPECTION

C6U051830000W01

1. Turn the ignition switch to the ON position.
2. Verify that the selector lever is in the P position.
3. Verify that the selector lever cannot be shifted from the P position without depressing the brake pedal.
4. Depress the brake pedal and verify that the selector lever cannot be shifted from the P position.
   - If a malfunction is found, inspect the interlock cable. (See 05–18–2 INTERLOCK CABLE INSPECTION.)

KEY INTERLOCK INSPECTION

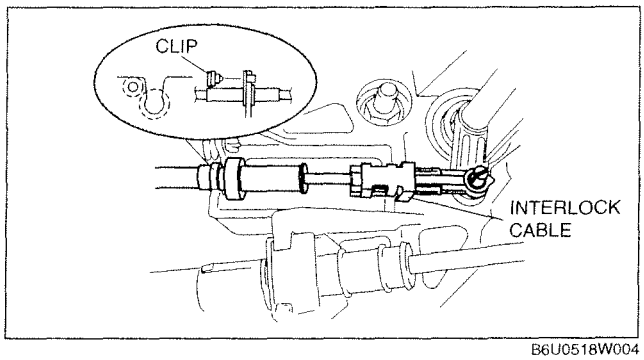
C6U051809000W01

1. Verify that the ignition key cannot be pulled out except in the P position.
   - If a malfunction is found, inspect the interlock cable. (See 05–18–2 INTERLOCK CABLE INSPECTION.)

INTERLOCK CABLE INSPECTION

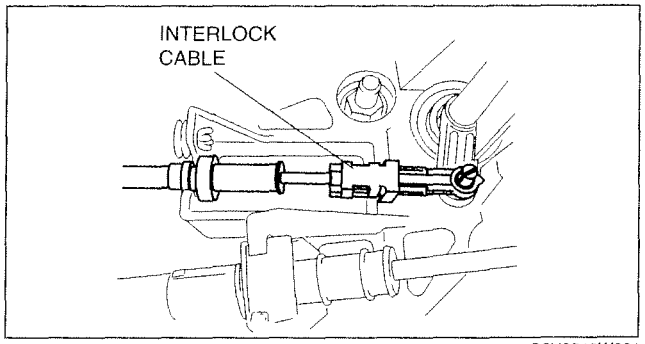
C6U051809000W02

1. Turn the ignition switch to ON position. (Engine off)
2. Remove the clip of the selector lever base plate, then remove the interlock cable from the U-groove.



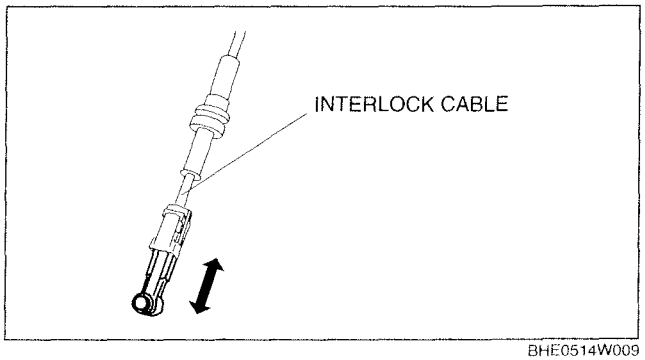
B6U0518W004

3. Remove the interlock cable from the selector lever.



C6U0518W001

4. Verify that the interlock cable moves freely with the brake pedal depressed.
   - If there is any malfunction, replace the interlock cable.

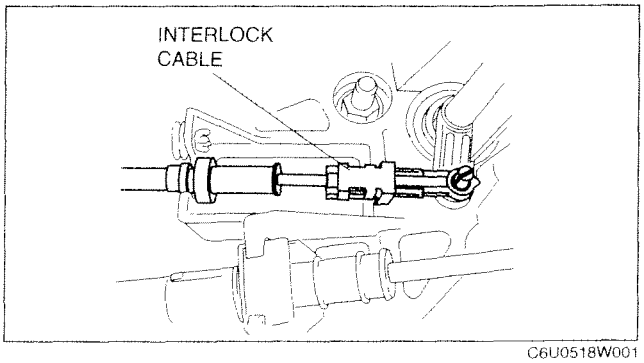


BHE0514W009

INTERLOCK CABLE ADJUSTMENT

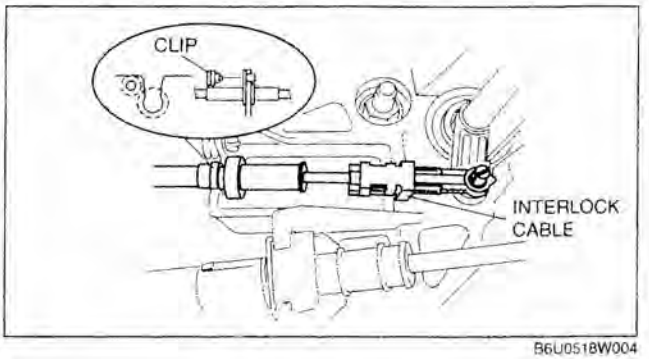
C6U051809000W03

1. Turn the ignition switch to ON position. (Engine off)
2. Pull up the lock piece of the interlock cable to release the lock.



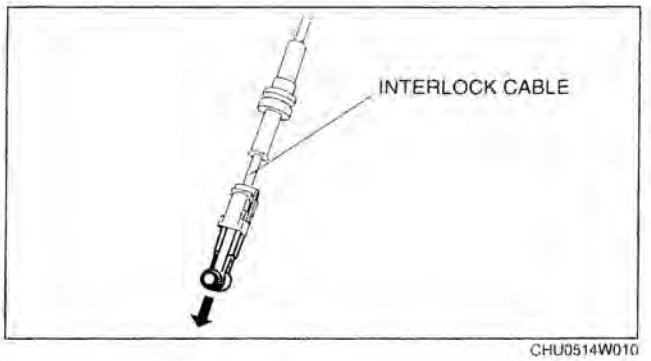
C6U0518W001

3. Remove the clip of the selector lever base plate, then remove the interlock cable from the U-groove.
4. Remove the interlock cable from the selector lever.



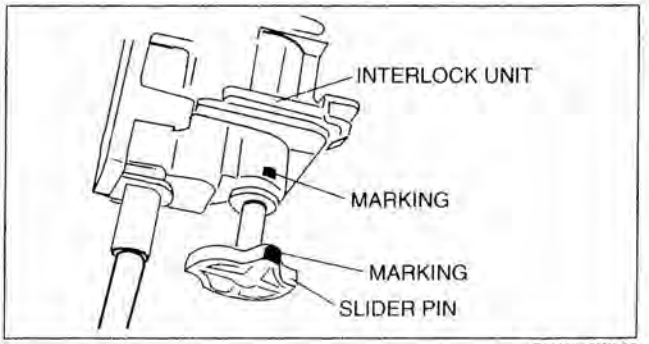
B6U0518W004

5. Fully pull the end of the interlock cable to the selector lever.
6. Remove the lock unit from the bracket.



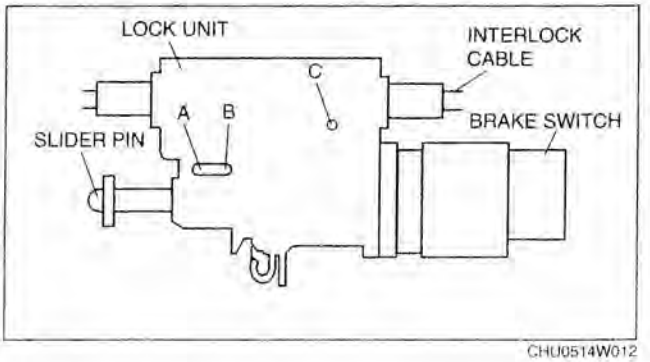
CHU0514W010

7. Verify that the markings on the slider pin and the lock unit are aligned.



C6U0518W002

8. Insert the snap pin (or a ϕ1.5 round bar or simular) into hole A with the slider pin fully pushed in.
9. Push the snap pin into hole B and hole C of the lock unit until it passes through.
10. Disconnect the brake switch connector.
11. Remove the brake switch. (See 04–11–6 BRAKE PEDAL REMOVAL/INSTALLATION.)
12. Install a new brake switch. (See 04–11–6 BRAKE PEDAL REMOVAL/INSTALLATION.)

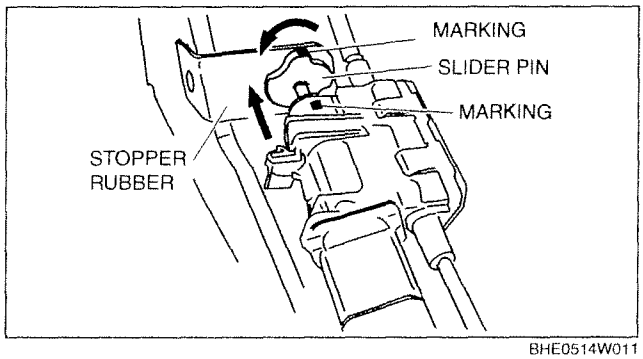


CHU0514W012

Caution
- **Do not connect the brake switch connector until the interlock cable adjustment is completed.**

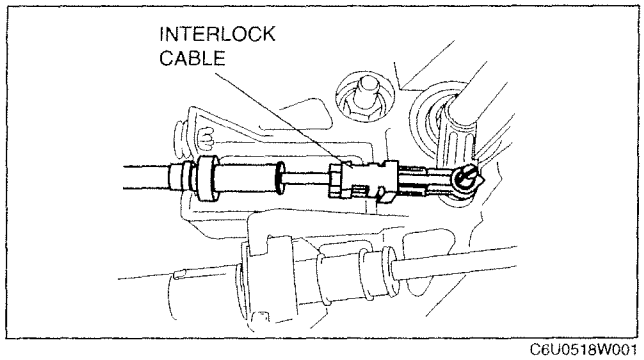
13. Install the lock unit to the bracket. (See 05–18–11 Interlock Cable Installation Note.)
14. Rotate the slider pin to release the lock and verify that it slides freely.

15. Verify that the slider pin contacts the brake pedal stopper rubber and rotate the slider pin to lock.



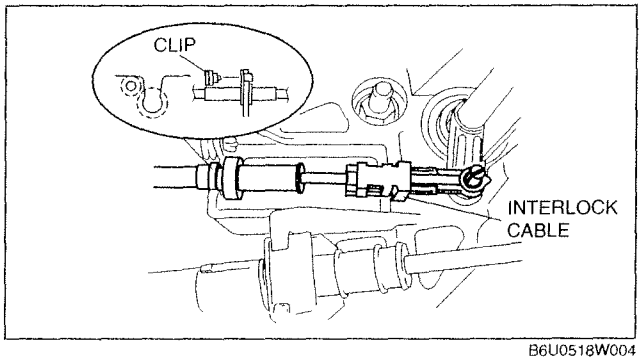
BHE0514W011

16. Install the interlock cable end to the interlock link on the selector lever.



C6U0518W001

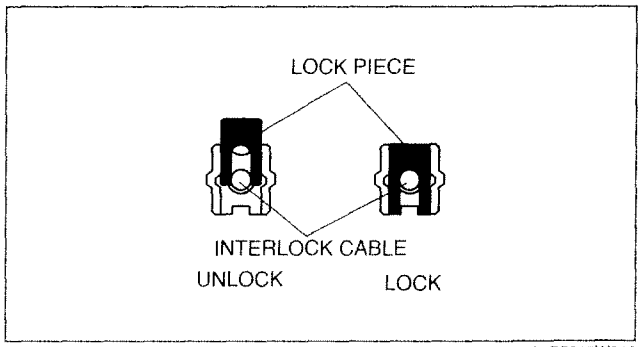
17. Fit the interlock cable in the U-groove in the selector lever base plate and install the clip.



B6U0518W004

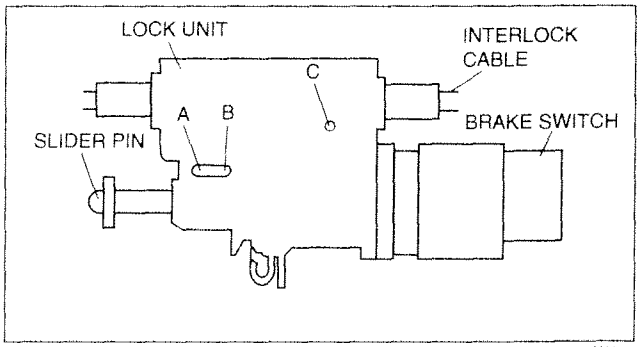
18. Press the interlock cable lock piece in until it is locked.

Caution
- **Applying a load to the interlock cable while pressing the lock piece in can affect the lock unit operation.**



A6E5616W012

19. Remove the snap pin from the lock unit holes A, B, and C.
20. Connect the brake switch connector with the brake pedal released.



CHU0514W012

Caution

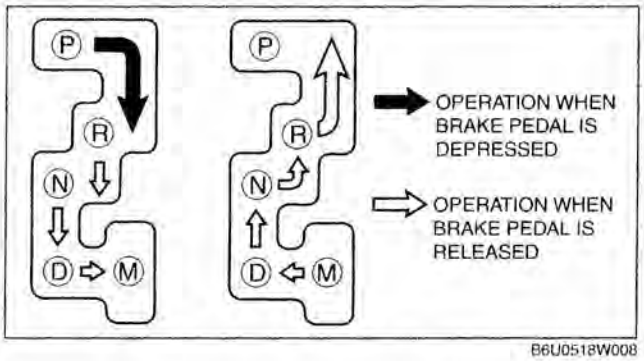
- **The clearance between the brake switch and the brake pedal is automatically adjusted to the correct amount when the brake switch connector is connected after the brake switch has been properly installed. If the brake switch is not properly installed or the connector is connected before installation, the clearance may be incorrect, causing a brake light malfunction. Therefore, always verify that the brake switch is properly installed before connecting the connector.**
- **Once the brake switch clearance has automatically been adjusted, it cannot be adjusted again. Therefore, replace the switch with a new one when replacing the power brake unit or the pedal, or performing any procedure that changes the pedal stroke.**

21. Inspect shift lock operation. (See 05–18–1 SHIFT-LOCK INSPECTION.)

SELECTOR LEVER INSPECTION

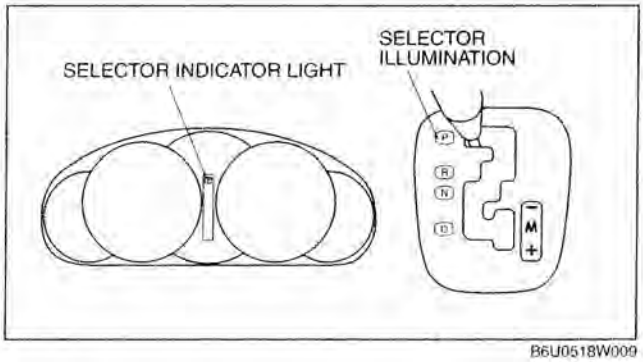
C6U051846102W01

1. Turn the ignition switch to ON (engine OFF).
2. With the brake pedal depressed, verify that there is a "click" at each range when shifted.
3. Verify that the selector lever can be shifted.
4. Verify that there is a "click" at each position when shifted from P position to M range.



B6U0518W008

5. Verify that the positions of the selector lever and the indicator are aligned.
   - If not as specified, adjust the TR switch. (See 05–17A–13 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [FN4A-EL].) (See 05–17B–14 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT [JA5A-EL].)
6. Verify that the vehicle operates in each selected range.



B6U0518W009

SELECTOR LEVER COMPONENT INSPECTION

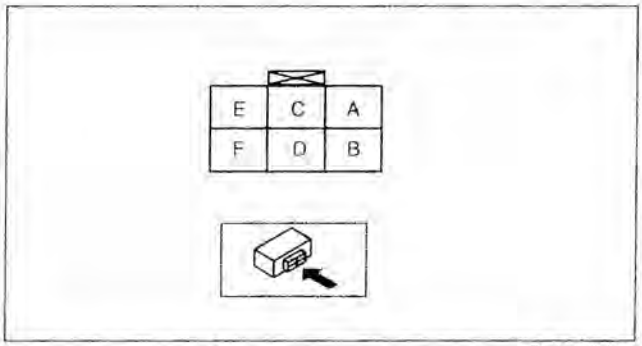
C6U051846102W02

1. Disconnect the negative battery cable.
2. Remove the center console.
3. Remove the dashboard completely. (See 09–17–4 DASHBOARD REMOVAL/INSTALLATION.)
4. Disconnect the selector lever component connector.
5. Inspect for continuity at the selector lever component.
   - If not as specified, adjust the selector cable. (See 05–18–6 SELECTOR CABLE ADJUSTMENT.)

○—○ : Continuity

Selector lever position/range		Connector terminal					
		A	B	C	D	E	F
M range	- M	○			○		
	center M		○	○	○		
	+ M			○	○		
Other							

B6U0518W012

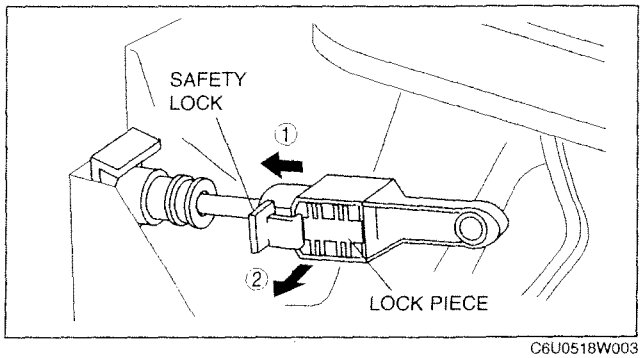


B6U0518W011

SELECTOR CABLE ADJUSTMENT

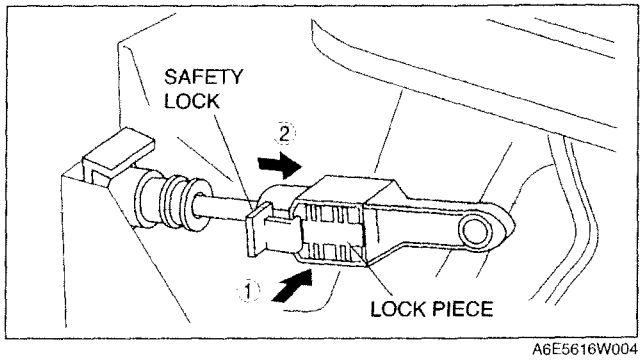
C6U051846102W03

1. Remove the center console.
2. Shift the selector lever to P position.
3. Unlock the lock piece of the selector cable (selector lever side) in the order shown in the figure.
4. Verify that the manual shaft is in P position.



C6U0518W003

5. Lock the lock piece of the selector cable (selector lever side) in the order shown in the figure.
6. Install the center console.
7. Shift the selector lever from P position to M range, and make sure that there are no other components in that area to interfere with the lever.



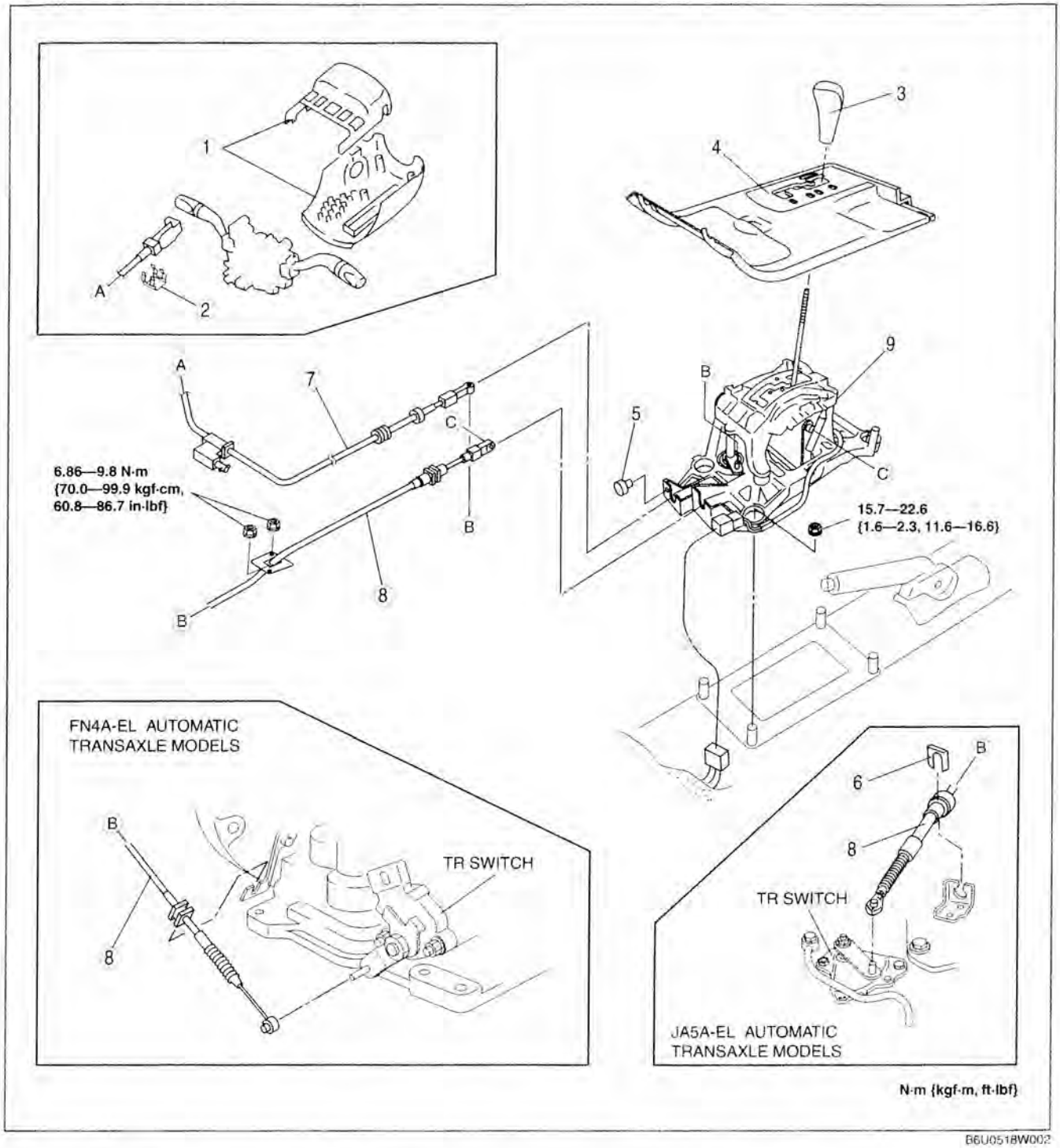
A6E5616W004

SELECTOR LEVER REMOVAL/INSTALLATION

C6U051846102W04

1. Disconnect the negative battery cable.
2. Remove the battery and battery tray.
3. Remove the air cleaner component. (See 01–13A–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [L3].) (See 01–13B–4 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [AJ].)
4. Remove the center console.
5. Remove the dashboard completely. (See 09–17–4 DASHBOARD REMOVAL/INSTALLATION.)
6. Remove the SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
7. Remove the climate control unit. (See 07–40–16 CLIMATE CONTROL UNIT REMOVAL.) (See 07–40–16 CLIMATE CONTROL UNIT INSTALLATION.)
8. Remove the rear heat duct. (See 07–11–6 REAR HEAT DUCT REMOVAL/INSTALLATION.)
9. Remove in the order shown in the figure.

10. Install in the reverse order of removal.



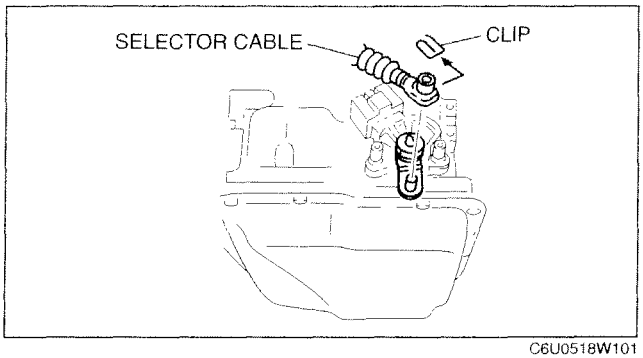
B6U0518W002

1	Column cover
2	Clip
3	Selector lever knob
4	Boot panel, indicator panel
5	Clip
6	Clip (JA5A-EL automatic transaxle models)
7	Interlock cable (See 05–18–11 Interlock Cable Installation Note)
8	Selector cable (See 05–18–8 Selector Cable Removal Note) (See 05–18–8 Selector Cable Installation Note (FN4A-EL automatic transaxle models)) (See 05–18–9 Selector Cable Installation Note (JA5A-EL automatic transaxle models))
9	Selector lever component

Selector Cable Removal Note

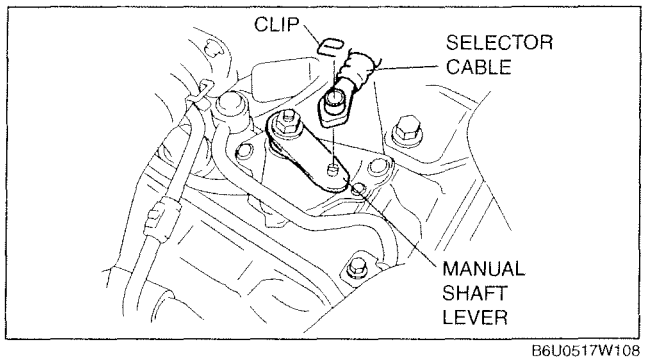
1. Remove the clip.
2. Remove the selector cable.

FN4A-EL automatic transaxle models



C6U0518W101

JA5A-EL automatic transaxle models



B6U0517W108

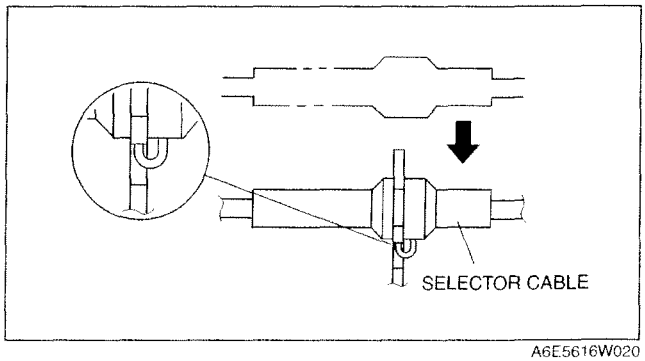
Selector Cable Installation Note (FN4A-EL automatic transaxle models)

1. Install the selector cable to the selector lever securely.
2. Install the selector cable to the bracket securely.

Note

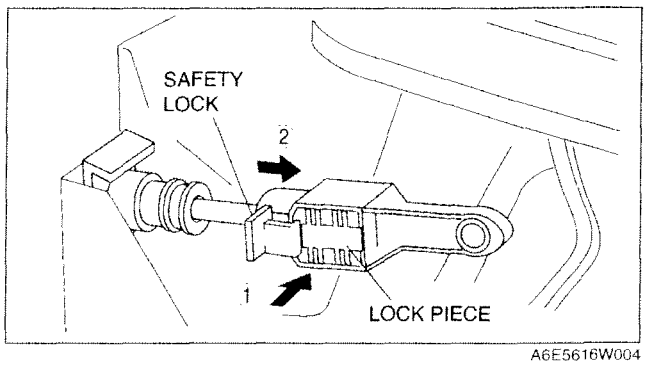
- Steps 3 and 4 are for the selector cable replacement only.

3. Verify that the selector lever is in the P position.



A6E5616W020

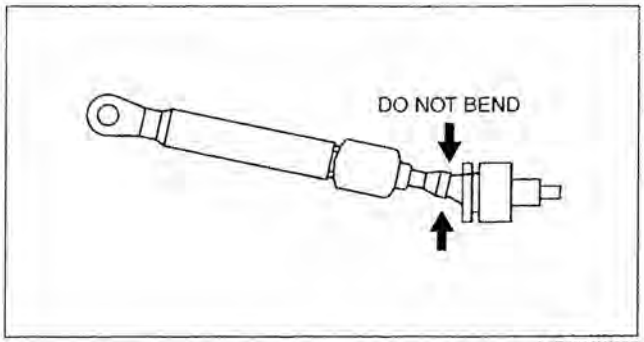
4. Lock the lock piece of the selector cable (selector lever side) in the order shown in the figure.
5. Verify that the manual shaft is in the P position.



A6E5616W004

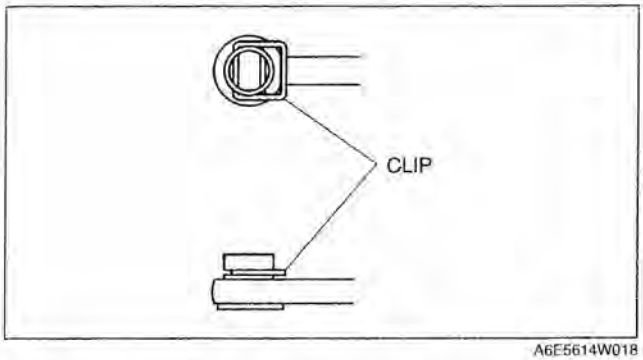
Caution

- **Bending the selector cable in the manner shown in the figure will damage the cable and it may become loose when shifted. When installing the selector cable, hold it straight.**



AGE5616W007

6. Install the clip as shown in the figure.

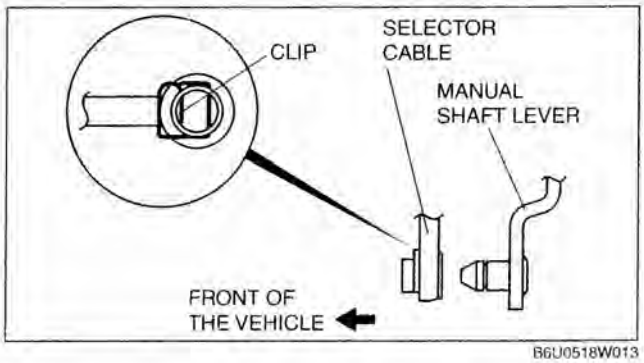


A6E5614W018

Note

- Install the selector lever to the manual shaft lever with the clip side of the selector cable end facing the front of the vehicle.

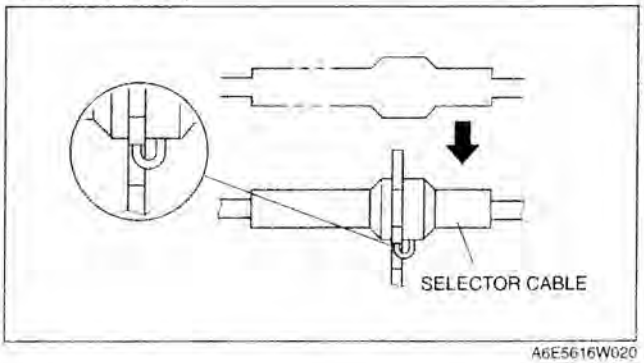
7. Install the selector lever to the manual shaft lever so that no load acts on the selector cable.
8. Confirm that the tip of the manual shaft lever projects out of the end of the selector cable.
9. Securely install the selector cable to the selector cable bracket.



B6U0518W013

Selector Cable Installation Note (JA5A-EL automatic transaxle models)

1. Install the selector cable to the selector lever securely.

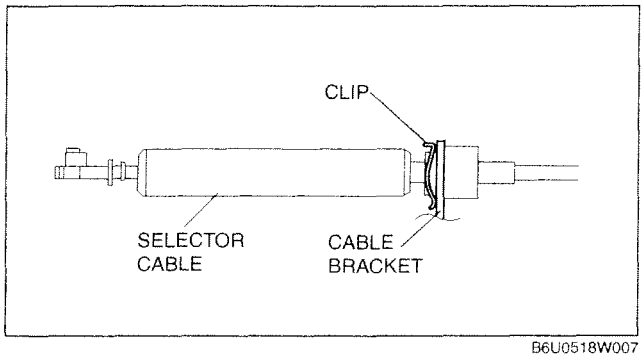


A6E5616W020

2. Install the selector cable and clip to the bracket as shown.

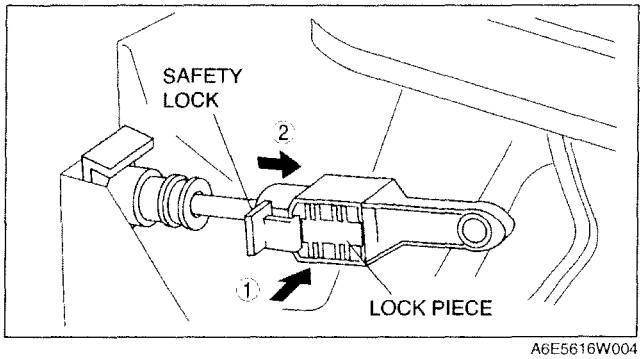
Note
- Steps 3 and 4 are for the selector cable replacement only.

3. Verify that the selector lever is in the P position.



B6U0518W007

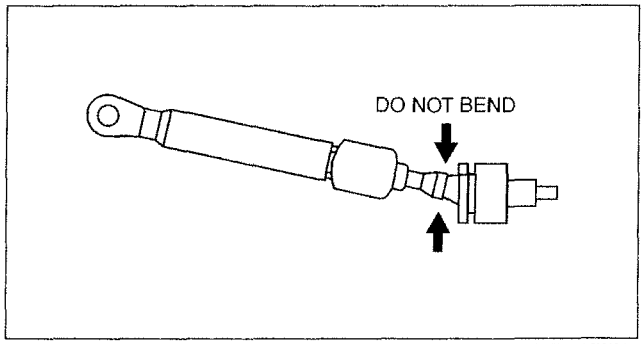
4. Lock the lock piece of the selector cable (selector lever side) in the order shown in the figure.



A6E5616W004

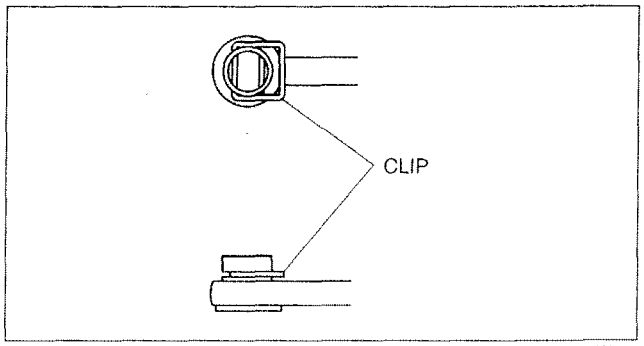
5. Verify that the manual shaft is in the P position.

Caution
- **Bending the selector cable in the manner shown in the figure will damage the cable and it may become loose when shifted. When installing the selector cable, hold it straight.**



A6E5616W007

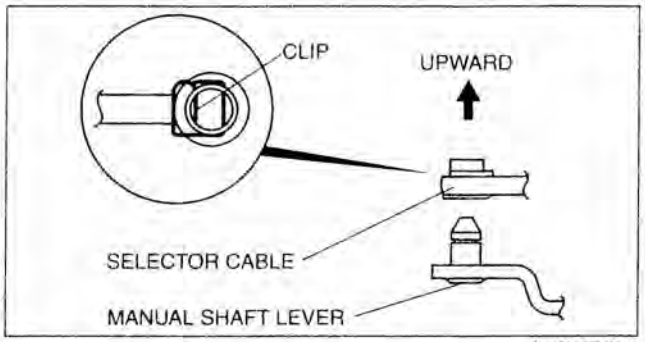
6. Install the clip as shown in the figure.



A6E5614W018

Note
- Install the selector lever to the manual shaft lever with the clip side of the selector cable end facing up.

7. Install the selector lever to the manual shaft lever so that no load acts on the selector cable.
8. Confirm that the tip of the manual shaft lever projects out of the end of the selector cable.
9. Securely install the selector cable to the selector cable bracket.

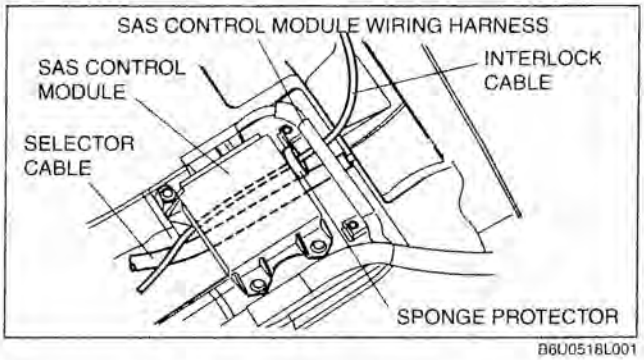


B6U0518W014

Interlock Cable Installation Note

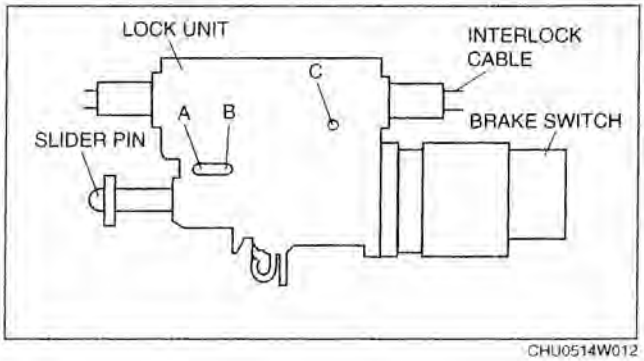
1. Install the interlock cable as shown in the figure.

Caution
- **Position the sponge protector so that it is not crushed or squeezed by the SAS control module.**
- **If the interlock and selector cables cross over each other, position the interlock cable to pass over the selector cable.**



B6U0518L001

2. Push the snap pin (or a f1.5 round bar or simular.) into hole A by fully pushing the slider pin in.
3. Push the snap pin into hole B and hole C of the lock unit until it passes through.
4. Disconnect the brake switch connector.
5. Remove the brake switch. (See 04–11–6 BRAKE PEDAL REMOVAL/INSTALLATION.)
6. Install a new brake switch. (See 04–11–6 BRAKE PEDAL REMOVAL/INSTALLATION.)



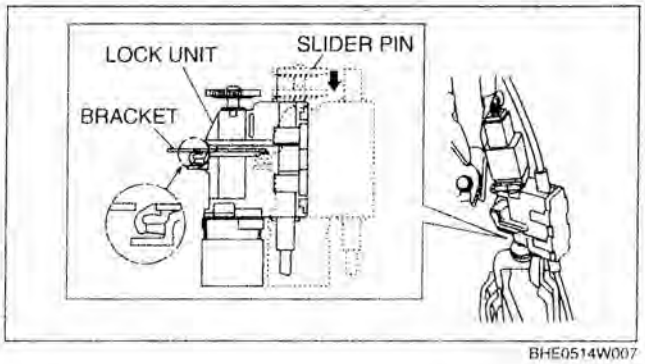
CHU0514W012

Caution
- **Do not connect the brake switch connector until the interlock cable is installed.**

7. With the slider pin pressed, slide the lock unit to fix the lock unit hook into the bracket hole securely as shown in the figure.

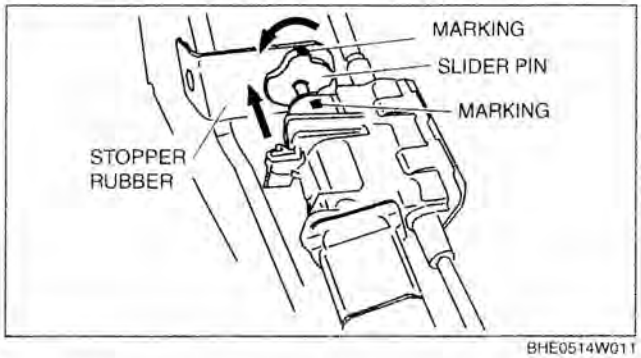
Caution
- **Allowing the interlock cable to be bent or twisted during installation can affect the lock unit operation.**

8. Rotate the slider pin to release the lock and verify that it slides freely.



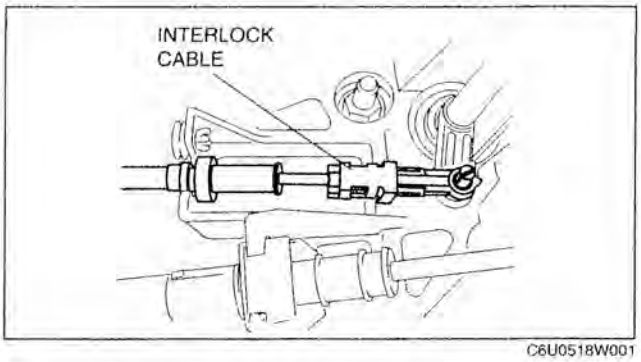
BHE0514W007

9. Pull the slider pin outward until it contacts the brake pedal stopper rubber and rotate the slider pin to lock.
10. Verify that the selector lever in the P position.



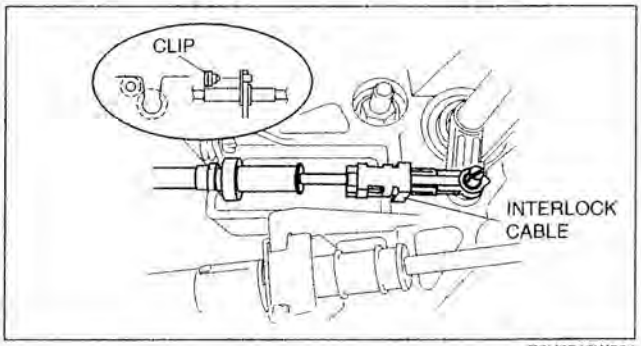
BHE0514W011

11. Install the interlock cable end to the cam pin on the selector lever.



C6U0518W001

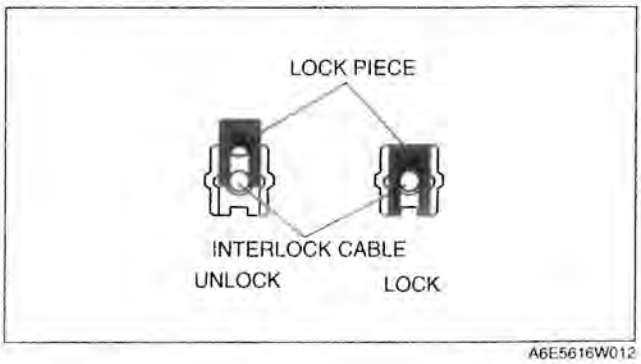
12. Fit the interlock cable in the U–groove in the selector lever base plate and install the clip.



B6U0518W004

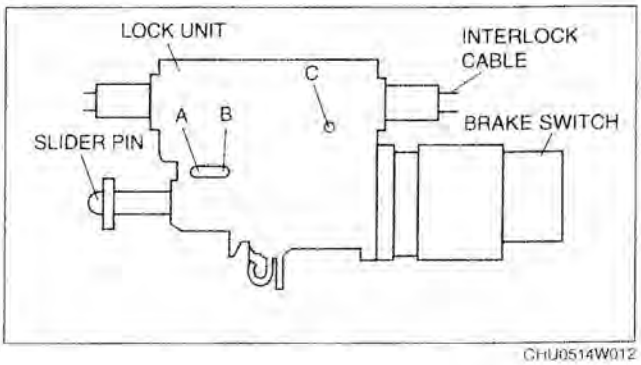
13. Press the interlock cable lock piece in until it is locked.

Caution
- **Applying a load to the interlock cable while pressing the lock piece in can affect the lock unit operation.**



A6E5616W012

14. Remove the snap pin from the lock unit holes A, B, and C.
15. Connect the brake switch connector with the brake pedal released.

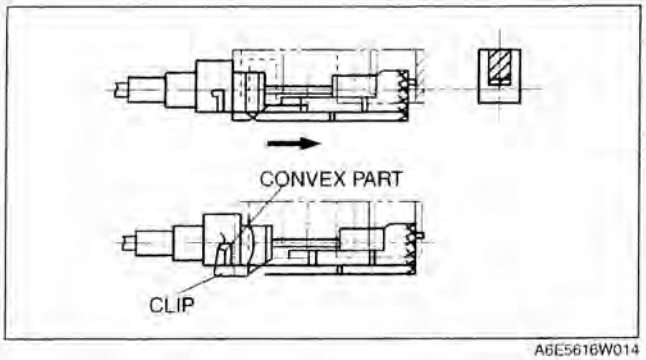


CHU0514W012

Caution

- **The clearance between the brake switch and the brake pedal is automatically adjusted to the correct amount when the brake switch connector is connected after the brake switch has been properly installed. If the brake switch is not properly installed or the connector is connected before installation, the clearance may be incorrect, causing a brake light malfunction. Therefore, always verify that the brake switch is properly installed before connecting the connector.**
- **Once the brake switch clearance has automatically been adjusted, it cannot be adjusted again. Therefore, replace the switch with a new one when replacing the power brake unit or the pedal, or performing any procedure that changes the pedal stroke.**

16. Turn the ignition switch to ON position.
17. Install the interlock cable to the steering lock.
18. Slide the outer casing to the steering lock and insert the clip over the convex part of the outer casing.

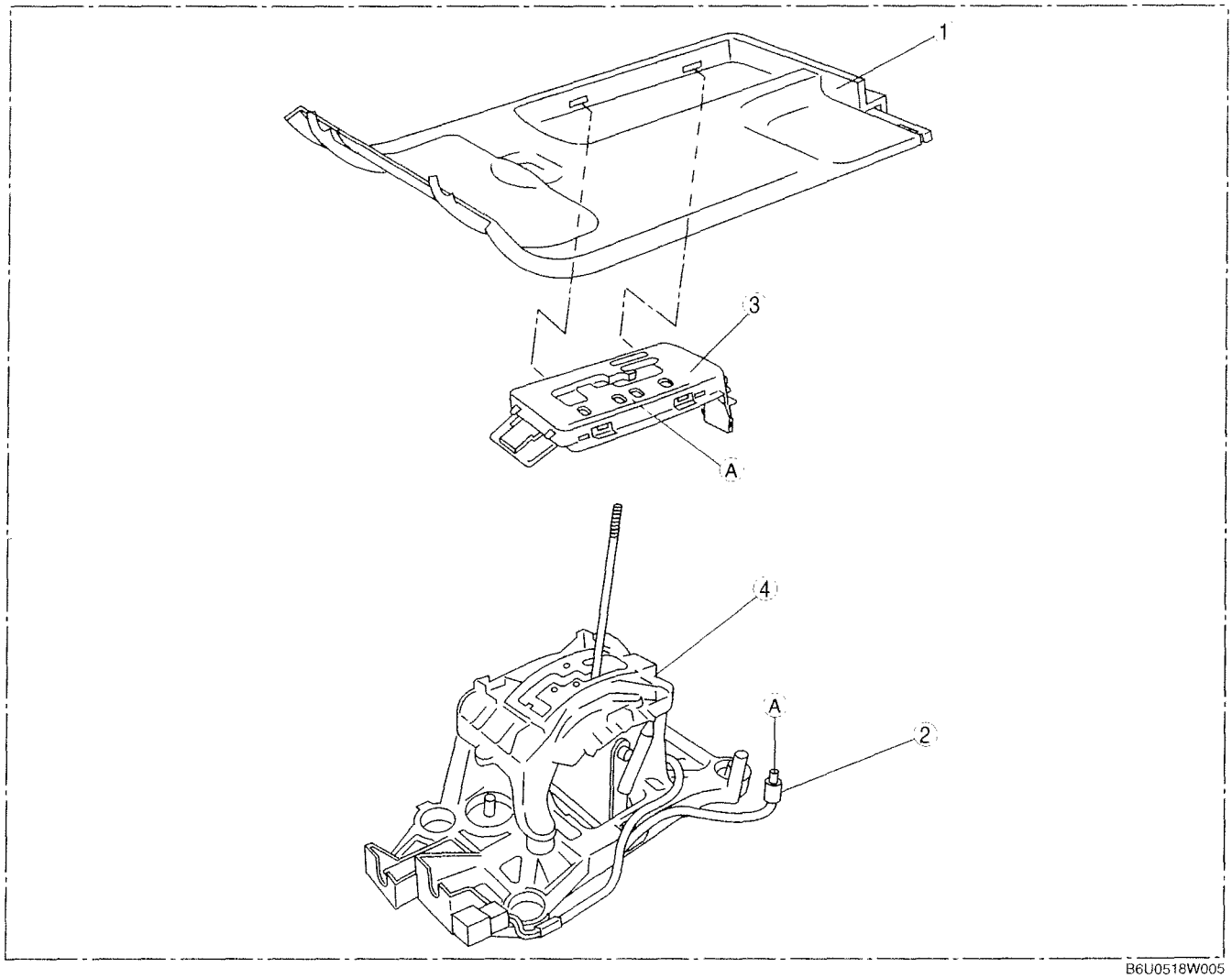


A6E5616W014

SELECTOR LEVER DISASSEMBLY/ASSEMBLY

C6U051846102W05

1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.



B6U0518W005

1	Boot panel	3	Indicator panel
2	Selector illumination light	4	Selector lever component

05–50 TECHNICAL DATA

TRANSMISSION/TRANSAXLE TECHNICAL DATA

C6U055001024W01

Item				Engine	
				L3	AJ
CLUTCH					
Clutch pedal	Height		(mm {in})	210—216 {8.27—8.50} (Reference value)	
	Free play	Pedal free play	(mm {in})	1.0—3.0 {0.04—0.11}	
		Push rod free play at clutch pedal	(mm {in})	0.1—0.5 {0.004—0.02} (Reference value)	
	Disengagement point	Disengagement stroke	(mm {in})	20 {0.79} (Reference value)	
		Pedal stroke	(mm {in})	140 {5.51} (Reference value)	
Clutch cover	Diaphragm spring fingers	Depth	(mm {in})	0.6 {0.024}	
		Misalignment	(mm {in})	0.6 {0.024}	
	Maximum clearance of flatness of the pressure plate		(mm {in})	0.3 {0.012}	
Clutch disc	Minimum thickness		(mm {in})	0.3 {0.012}	
	Runout limit		(mm {in})	0.7 {0.028}	
Flywheel	Runout limit		(mm {in})	0.1 {0.004}	0.05 {0.002}
MANUAL TRANSAXLE					
Manual transaxle type				G35M-R	A65M-R
Transaxle oil	Grade			API Service GL-4 or GL-5	
	Viscosity	All-season		SAE 75W-90	SAE 75W-90
		Above 10 °C {50 °F}		SAE 80W-90	
	Capacity (Approximate quantity)		(L {US qt, Imp qt})	2.87 {3.03, 2.53}	2.3 {2.4, 2.0}
AUTOMATIC TRANSAXLE					
Automatic transaxle type				FN4A-EL	JA5A-EL
ATF	Type			ATF M-V	
	Capacity (Approximate quantity)		(L {US qt, Imp qt})	7.2 {7.6, 6.4}	9.2 {9.7, 8.1}

Item			Engine	
			L3	AJ
Line pressure (kPa {kgf/cm^2, psi})	D, M (1GR, 2GR) range	Idle	330—470 {3.4—4.8, 48—68}	—
		Stall	1,160—1,320 {11.8—13.5, 168—191}	—
	R position	Idle	490—710 {5.0—7.2, 71—102}	—
		Stall	1,750—1,970 {17.8—20.1, 254—285}	—
	D, M (2GR) range	Idle	—	290—490 {3.0—5.0, 42—71}
		Stall	—	1,550—1,750 {15.8—17.8, 225—254}
	M (1GR) range, R position	Idle	—	550—750 {5.6—7.6, 80—109}
		Stall	—	1,550—1,750 {15.8—17.8, 225—254}
Engine stall speed (rpm)	D, M range		2,100—2,800	2,300—2,700
	R position			
Time lag (s)	N position→ D range		0.4—0.7	approx. 0.5—1.0
	N position→ R position		0.4—0.7	approx. 0.6—1.0
Transaxle range (TR) switch (ohm)	P position		4,085—4,515	—
	R position		1,425—1,575	—
	N position		713—788	—
	D range		132—390	—
Transaxle fluid temperature (TFT) sensor (kilohm)	ATF temperature: –20 °C {–4 °F}		236—324	15.87—17.54
	ATF temperature: 0 °C {32 °F}		84.3—110	5.73—6.33
	ATF temperature: 20 °C {68 °F}		33.5—42.0	2.38—2.63
	ATF temperature: 40 °C {104 °F}		14.7—17.9	1.10—1.22
	ATF temperature: 60 °C {140 °F}		7.08—8.17	0.56—0.62
	ATF temperature: 80 °C {176 °F}		3.61—4.15	0.31—0.34
	ATF temperature: 100 °C {212 °F}		1.96—2.24	0.18—0.20
	ATF temperature: 120 °C {248 °F}		1.13—1.28	0.11—0.12
	ATF temperature: 130 °C {266 °F}		0.87—0.98	0.09—0.10
Input/turbine speed sensor (ohm)	ATF temperature: –40—160 °C {–40—320 °F}		250—600	—
	ATF temperature: 20 °C {68 °F}		—	513—627
Intermediate sensor (ohm)	ATF temperature: 20 °C {68 °F}		—	513—627
Vehicle speedometer sensor (VSS) (V)			4.5—5.5	—
Vehicle speedometer sensor (VSS) (ohm)	ATF temperature: 20 °C {68 °F}		—	513—627

Item				Engine	
				L3	AJ
Solenoid valves	(ohm)	ATF temperature: –40—150 °C {–40—302 °F}	Shift solenoid A	1.0—4.2	—
			Shift solenoid B	1.0—4.2	—
			Shift solenoid C	1.0—4.2	—
			Shift solenoid D	10.9—26.2	—
			Shift solenoid E	10.9—26.2	—
			Pressure control	2.4—7.3	—
		Shift solenoid A		—	14—18
		Shift solenoid B		—	14—18
		Shift solenoid C		—	14—18
		Neutral shift solenoid valve		—	14—18
		Reduction timing solenoid valve		—	14—18
		TCC solenoid valve		—	12.0—13.2
		2-4 brake solenoid valve		—	2.6—3.2
		High clutch solenoid valve		—	2.6—3.2
		Pressure control solenoid		—	2.6—3.2

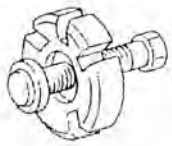
05–60 SERVICE TOOLS

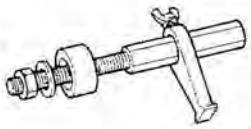
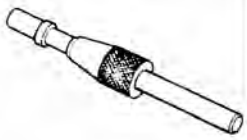
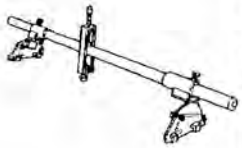
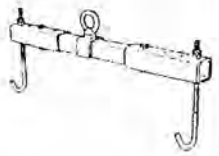
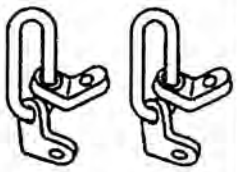
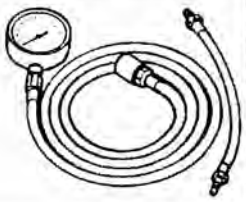
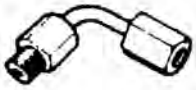
TRANSMISSION/TRANSAXLE SST

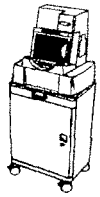
C6U056001024W01

1: Mazda SST number
2: Global SST number

Example

1: 49 UN30 3009 2: 303-009 Crankshaft damper remover	

1: 49 0259 770B 2: – Flare nut wrench	1: 49 E011 1A0 2: – Ring gear brake set	1: 49 SE01 310A 2: – Clutch disc centering tool
		
1: 49 E017 5A0 2: – Engine support set	1: 49 G030 795 2: – Oil seal installer	1: 49 L017 5A0 2: – Support hanger
		
1: 49 UN30 3050 2: 303-050 Engine lifting bracket	1: 49 U027 003 2: – Oil seal installer	1: 49 G030 797 2: – Handle
		
1: 49 0378 400C 2: – Oil pressure gauge set	1: 49 B019 901B 2: – Oil pressure gauge	1: 49 H019 002 2: – Adapter
		
1: 49 UN01 1610 2: – Adapter	1: 49 L019 016 2: – Installer	1: 49 L019 013 2: – Adapter
		

1: – 2: 418F-S475 WDS 	—	—

STEERING

06
SECTION

06–10 GENERAL PROCEDURES

PRECAUTION (STEERING)

C6U061001036W01

Wheels and Tires Removal/Installation

1. The removal and installation procedures for the wheels and tires are not mentioned in this section. When a wheel is removed, tighten it to **88—118 N·m {9.0—12.0 kgf·m, 65.0—87.0 ft·lbf}**.

Power Steering Components Removal/Installation

1. If any power steering fluid line has been disconnected anytime during the procedure, add ATF M-III, M-V or equivalent (e.g. Dexron®III), bleed the fluid lines, and inspect for leakage after the procedure has been completed.

Electric Connectors Disconnection/Connection

1. Disconnect the negative battery cable before doing any work that requires handling of electric connectors. Reconnect the negative battery cable only after the work is completed.

Suspension Arm Removal/Installation

1. Tighten any part of the suspension that uses rubber bushings only after vehicle has been lowered to the ground and unloaded.

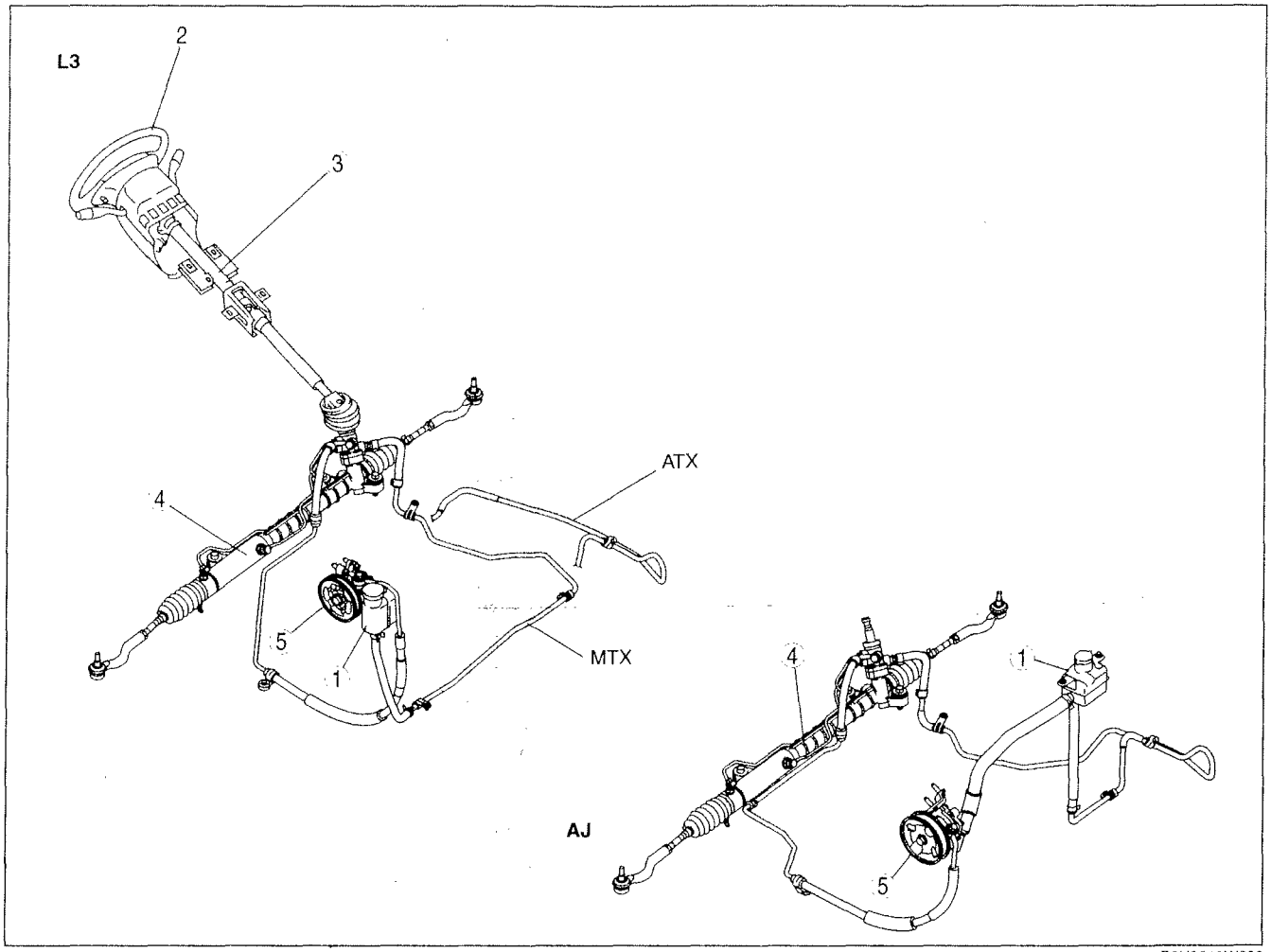
Note

- Unloaded: Fuel tank is full. Engine coolant and engine oil are at specified level. Spare tire, jack, and tools are in designated position.

06–12 ENGINE SPEED SENSING POWER STEERING

STEERING LOCATION INDEX

C6U061201036W01



B6U0612W002

1	Power steering fluid (See 06–12–3 POWER STEERING FLUID INSPECTION)
2	Steering wheel and column (See 06–12–5 STEERING WHEEL AND COLUMN INSPECTION) (See 06–12–6 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION)
3	Steering shaft (See 06–12–8 STEERING SHAFT INSPECTION)

4	Steering gear and linkage (See 06–12–9 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION [L3]) (See 06–12–11 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION [AJ]) (See 06–12–14 STEERING GEAR AND LINKAGE DISASSEMBLY) (See 06–12–18 STEERING GEAR AND LINKAGE INSPECTION) (See 06–12–18 STEERING GEAR AND LINKAGE ASSEMBLY)
5	Power steering oil pump (See 06–12–24 POWER STEERING OIL PUMP REMOVAL/INSTALLATION [L3]) (See 06–12–25 POWER STEERING OIL PUMP REMOVAL/INSTALLATION [AJ]) (See 06–12–26 POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY [L3]) (See 06–12–29 POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY [AJ])

AIR BLEEDING

C6U061201036W02

Caution
- **Do not turn the steering wheel during the fluid level inspection, otherwise the fluid level changes and cannot be inspected correctly.**

1. Inspect the fluid level. (See06–12–3 POWER STEERING FLUID INSPECTION.)
2. Jack up the front of the vehicle and support it on safety stands.
3. Turn the steering wheel fully to the left and right several times with the engine not running.
4. Reinspect the fluid level.
   - If it has dropped, add fluid.
5. Repeat Steps 3 and 4 until the fluid level stabilizes.
6. Lower the vehicle.
7. Start the engine and let it idle.
8. Turn the steering wheel fully to the left and right several times.
9. Verify that the fluid is not foamy and that the fluid level has not dropped.
   - If the fluid level has dropped, add fluid as necessary and repeat Steps 8 and 9.

POWER STEERING FLUID INSPECTION

C6U061232040W01

Fluid Level Inspection

1. Inspect the power steering fluid level.
   - Add fluid to the specified level as necessary.

Fluid specification
ATF M-III, M-V or equivalent (e.g. Dexron®III)

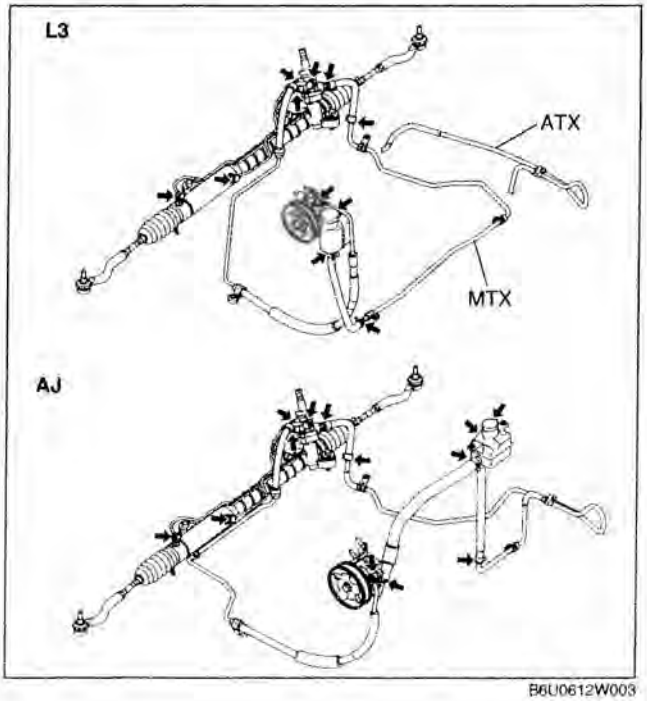
Fluid Leakage Inspection

1. Start the engine and let it idle.
2. Turn the steering wheel fully to the left and right to apply fluid pressure.

Caution
- **If the steering wheel is kept in the fully turned position for more than 5 seconds, the fluid temperature will rise excessively and adversely affect the oil pump.**

3. Inspect for fluid leakage.
   - If fluid leakage is found, replace related pipe or hose.

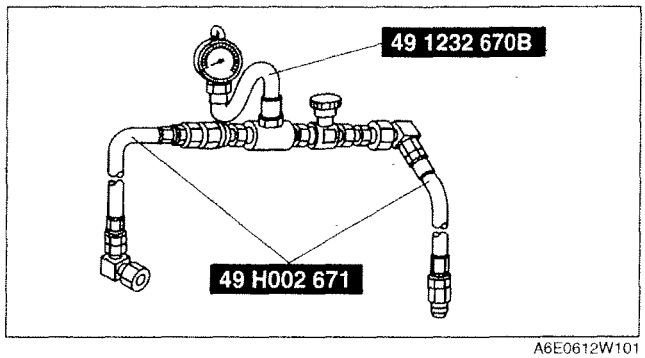
Note
- The points where fluid leakage may occur are indicated in the figure.



B6U0612W003

Fluid Pressure Inspection

1. Assemble the **SSTs** as shown in the figure.

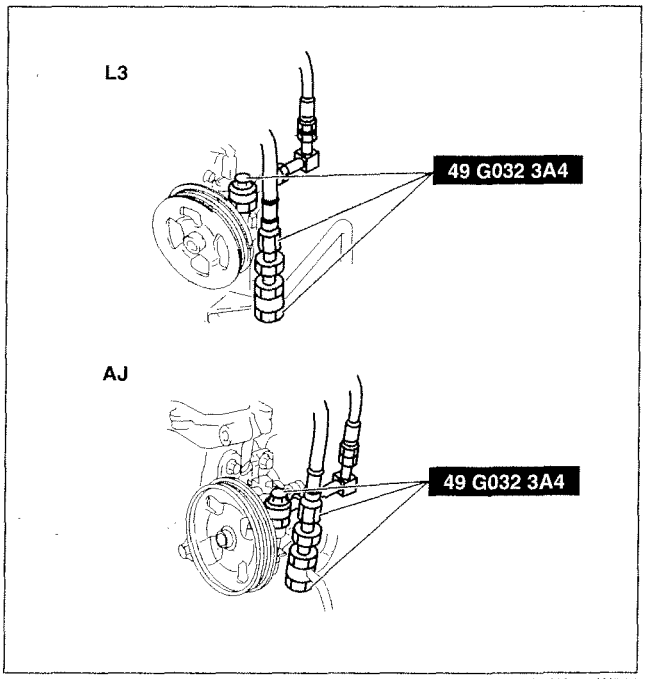


A6E0612W101

2. Disconnect the pressure pipe from the oil pump, and connect the **SSTs**.

   Tightening torque
   38—51 N·m {3.9—5.2 kgf·m, 29—37 ft·lbf}

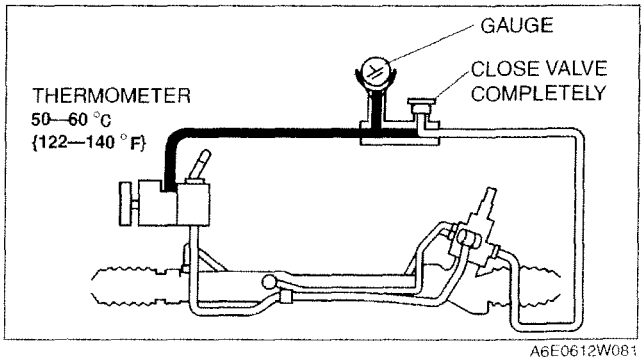
3. Bleed the air from the system. (See 06–12–3 AIR BLEEDING.)
4. Open the gauge valve fully.
5. Start the engine and turn the steering wheel fully left and right to raise the fluid temperature to **50—60 °C {122—140 °F}**.



C6U0612W001

6. Close the gauge valve completely.
7. Increase the engine speed to **1,000—1,500 rpm** and measure the fluid pressure generated by the oil pump.
   - If the pressure is not within the specification, repair or replace the oil pump component.

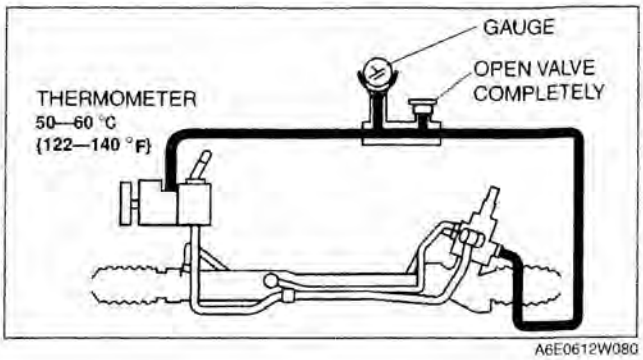
   Caution
   - **If the valve is left closed for more than 5 seconds, the fluid temperature will rise excessively and adversely affect the oil pump.**



A6E0612W081

Oil pump fluid pressure
L3: 10.80—11.29 MPa {110.2—115.2 kgf/cm^2, 1567—1637 psi}
AJ: 11.31—11.80 MPa {115.4—120.3 kgf/cm^2, 1640—1711 psi}

8. Open the gauge valve fully and increase the engine speed to **1,000—1,500 rpm**.
9. Turn the steering wheel fully to the left and right, then measure the fluid pressure generated at the gear housing.
   - If the pressure is not within the specification, repair or replace the steering gear component.



A6E0612W080

Caution
- **If the steering wheel is kept in the fully turned position for more than 5 seconds, the fluid temperature will rise excessively and adversely affect the oil pump.**

Gear housing fluid pressure
L3: 10.80—11.29 MPa {110.2—115.2 kgf/cm^2, 1567—1637 psi}
AJ: 11.31—11.80 MPa {115.4—120.3 kgf/cm^2, 1640—1711 psi}

10. Remove the **SSTs**. Install and tighten the pressure pipe to the specified torque.

Tightening torque
38—51 N·m {3.9—5.2 kgf·m, 29—37 ft·lbf}

11. Bleed the air from the system.

STEERING WHEEL AND COLUMN INSPECTION

C6U061232010W01

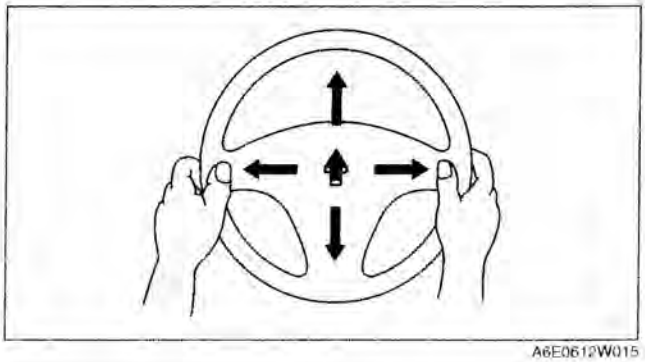
Steering Wheel Play Inspection

1. With the wheels in the straight-ahead position, gently turn the steering wheel to the left and right and verify that the play is within the specification.
   - If the play exceeds the specification, either the steering joints are worn or the backlash of the steering gear is excessive. Correct as necessary.

Play
0—30 mm {0—1.18 in}

Steering Wheel Looseness Inspection

1. Move the steering wheel as shown in the figure to inspect for column bearing wear, steering shaft joint play, steering wheel looseness, and column looseness.
   - Repair or replace as necessary.

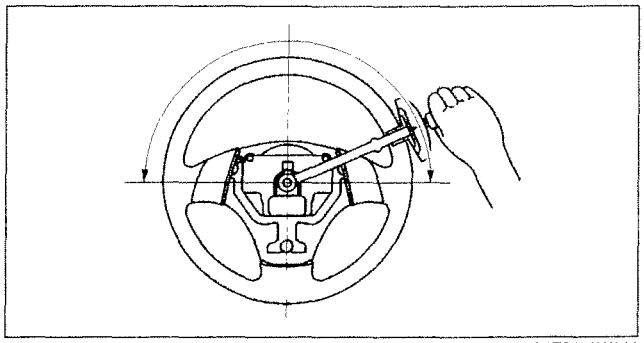

A6E0612W015

Steering Wheel Effort Inspection

1. Inspect the following points:
   - Tire size and tire pressure
   - Fluid level
   - Drive belt deflection
2. With the vehicle on a hard, level surface, put the wheels in the straight-ahead position.
3. Remove the air bag module.

Warning
- **Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read AIR BAG SYSTEM WARNINGS before handling the air bag module. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS.)**

4. Start the engine and warm the power steering fluid to **50—60 °C {122—140 °F}**.
5. Measure the steering wheel effort using a torque wrench.
   - If not within the specification, verify the following:
     — No air in steering system
     — No fluid leakage at hose or connectors
     — Function of oil pump and steering gear



A6E0612W016

Steering wheel effort
7.8 N·m {80 kgf·cm, 58 in·lbf} max.

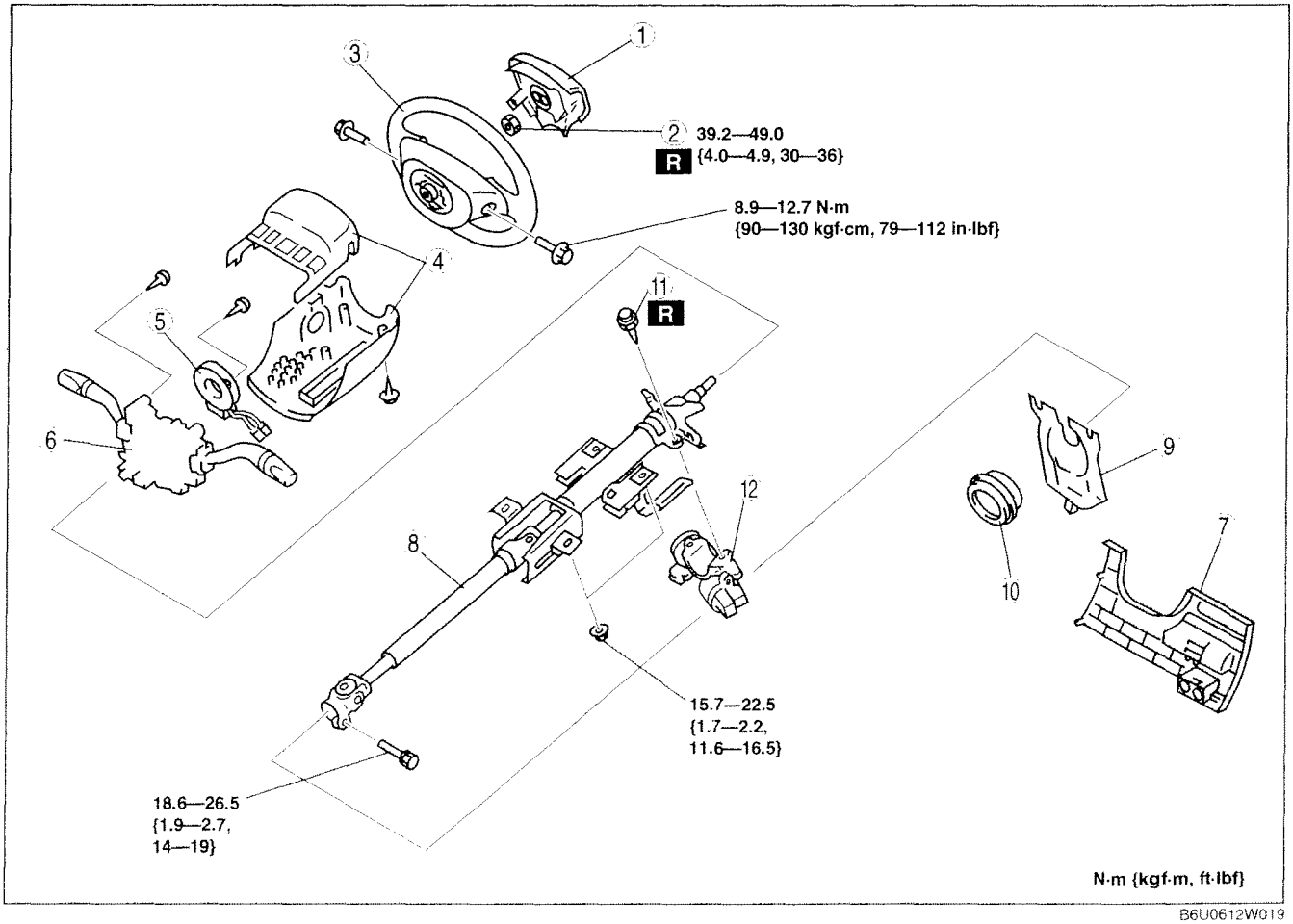
Note
- To determine whether the steering effort is satisfactory or not, perform the inspection on another vehicle of the same model and under the same conditions, and compare the results.
- The steering wheel effort varies with conditions as shown below.
  — Road conditions, such as dry or wet, and asphalt or concrete.
  — Tire conditions, such as brand, wear, and tire pressure.

STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION

C6U061232010W02

Warning
- **Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read AIR BAG SYSTEM WARNINGS before handling the air bag module. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS.)**

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



B6U0612W019

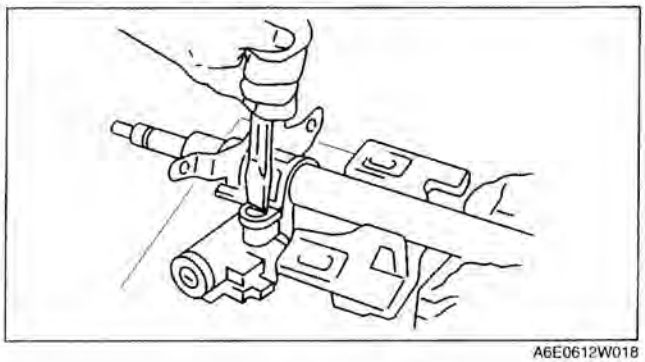
1	Air bag module (See 08–10–6 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION)
2	Locknut
3	Steering wheel (See 06–12–7 Steering Wheel Removal Note) (See 06–12–8 Steering Wheel Installation Note)
4	Column cover
5	Clock spring (See 08–10–10 CLOCK SPRING REMOVAL/INSTALLATION)
6	Combination switch
7	Lower panel
8	Steering shaft (See 06–12–8 Steering Shaft Installation Note)
9	Joint cover
10	Dust cover
11	Steering lock mounting bolts (See 06–12–7 Steering Lock Mounting Bolts Removal Note) (See 06–12–7 Steering Lock Mounting Bolts Installation Note)
12	Steering lock component

Steering Wheel Removal Note

Caution
- **Do not try to remove the steering wheel by hitting the shaft with a hammer. The column will collapse.**

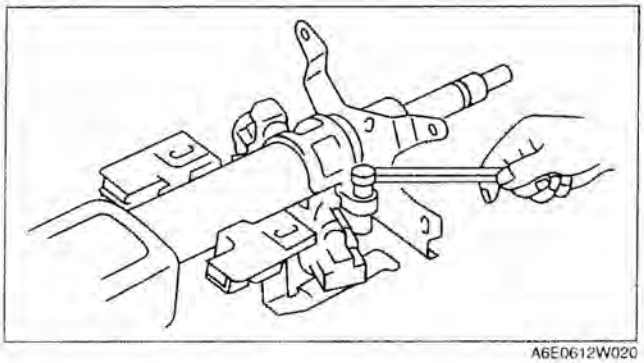
1. Set the vehicle in the straight-ahead position.
2. Remove the steering wheel using a suitable puller.

Steering Lock Mounting Bolts Removal Note
1. Make a groove in the heads of the steering lock mounting bolts using a chisel and a hammer.
2. Remove the bolts using a screwdriver.
3. Disassemble the steering lock component.



A6E0612W018

Steering Lock Mounting Bolts Installation Note
1. Assemble the steering lock component to the steering shaft.
2. Verify that the lock operates correctly.
3. Install new steering lock mounting bolts.
4. Tighten the bolts until the heads break off.

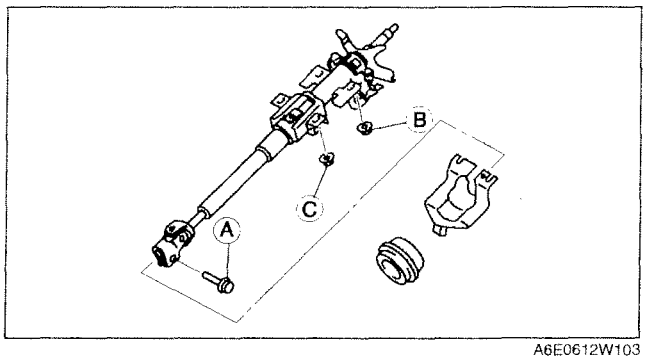


A6E0612W020

Steering Shaft Installation Note

Caution
- **Do not apply a shock in the axial direction of the shaft.**

1. Lock the tilt lever.
2. Tighten bolt A.
3. Tighten nut B.
4. Tighten nut C.



A6E0612W103

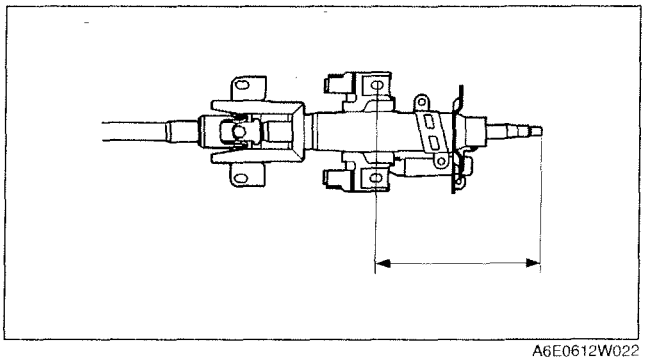
Steering Wheel Installation Note
1. Make sure the wheels in the straight-ahead position, and install the steering wheel.

STEERING SHAFT INSPECTION

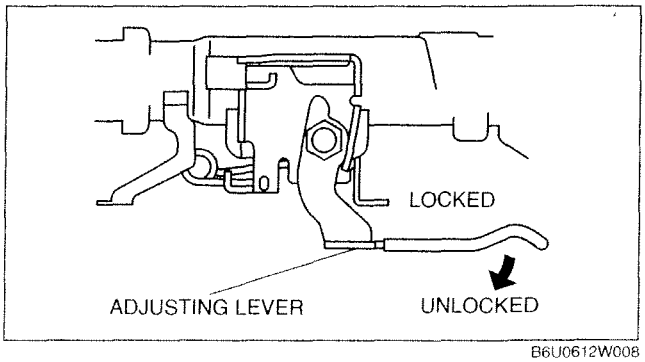
C6U061232100W01

1. Inspect the following.
   (1) Column bearing for damage
   (2) Steering shaft length
      - Replace the steering shaft component as necessary.

Length
211.6 mm {8.3 in}


A6E0612W022

2. Inspect the tilt and telescope operation.
   (1) Verify that the adjusting lever moves smoothly from unlock position to lock position.
   (2) Verify that the steering shaft is fixed firmly when the adjusting lever is locked.
      - Replace the steering shaft component as necessary.



B6U0612W008

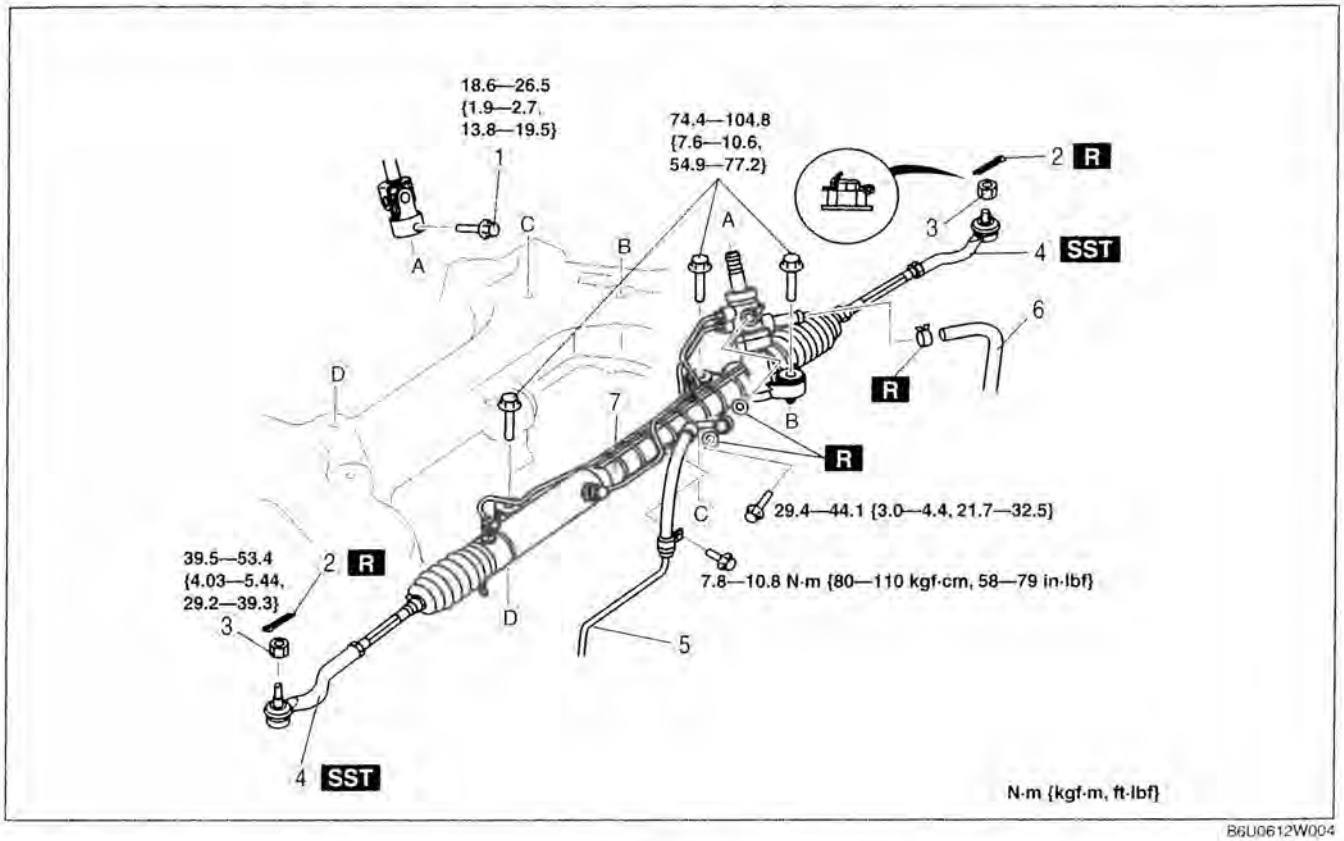
STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION [L3]

C6U061232960W01

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.**

1. Remove the ABS wheel-speed sensor. (See 04–13–8 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. After installation, inspect the front wheel alignment. (See 02–11–2 FRONT WHEEL ALIGNMENT.)



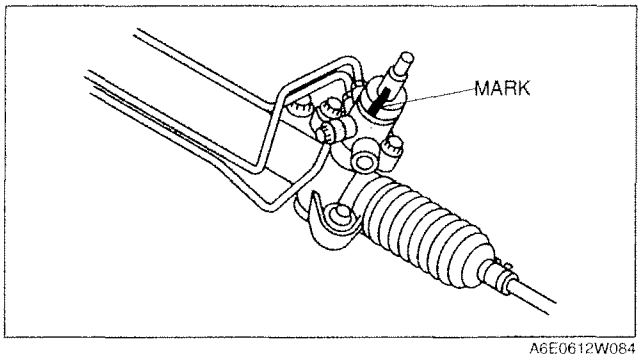
B6U0612W004

1	Bolt (intermediate shaft) (See 06–12–10 Bolt (Intermediate Shaft) Removal Note) (See 06–12–11 Bolt (Intermediate Shaft) Installation Note)
2	Cotter pin
3	Nuts (tie-rod end ball joint)
4	Tie-rod end ball joint (See 06–12–10 Tie-rod End Ball Joint Removal Note)

5	Pressure pipe
6	Return hose
7	Steering gear and linkage (See 06–12–10 Steering Gear and Linkage Removal Note) (See 06–12–11 Steering Gear and Linkage Installation Note)

Bolt (Intermediate Shaft) Removal Note

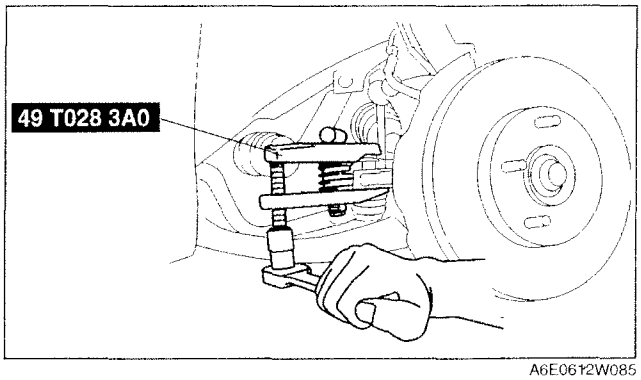
1. Mark the pinion shaft and gear housing for proper installation.



A6E0612W084

Tie-rod End Ball Joint Removal Note

1. Remove the tie-rod nut.
2. Separate the tie-rod end from the steering knuckle using the **SSTs**.



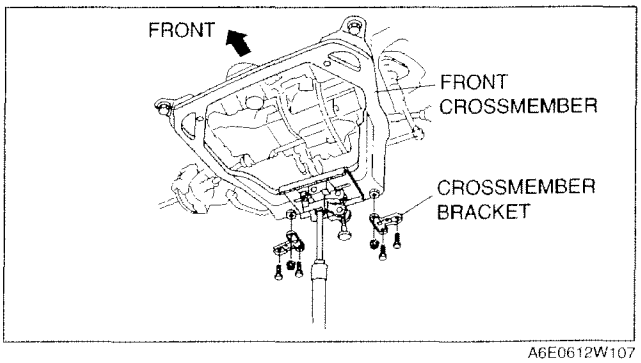
A6E0612W085

Steering Gear and Linkage Removal Note

Caution

- **Excessively loosening the crossmember nuts may possibly cause the crossmember to fall off. The crossmember nuts must remain threaded on the studs when loosening.**

1. Support the crossmember using a jack before removing the crossmember bracket.
2. Loosen the jack and lower the crossmember.
3. Remove the steering gear and linkage by pulling it from the left side.



A6E0612W107

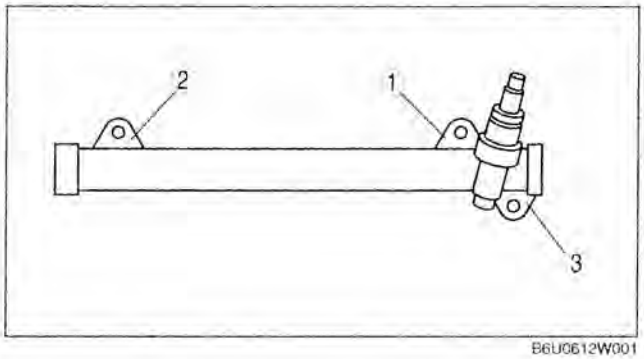
Steering Gear and Linkage Installation Note

1. Tighten bolts loosely.
2. Tighten the mounting bracket bolts to the specified torque in the order shown.

   Tightening torque
   74.4—104.8 N·m {7.6—10.6 kgf·m, 55—77 ft·lbf}

3. Tighten the crossmember bracket installation nuts and bolts.

   Tightening torque
   Nut: 119.6—154.8 N·m {12.2—15.7 kgf·m, 89—114 ft·lbf}
   Bolt: 93.1—116.6 N·m {9.50—11.88 kgf·m, 68.67—85.99 ft·lbf}



B6U0612W001

Bolt (Intermediate Shaft) Installation Note

1. Align the marks and install the intermediate shaft and bolt.

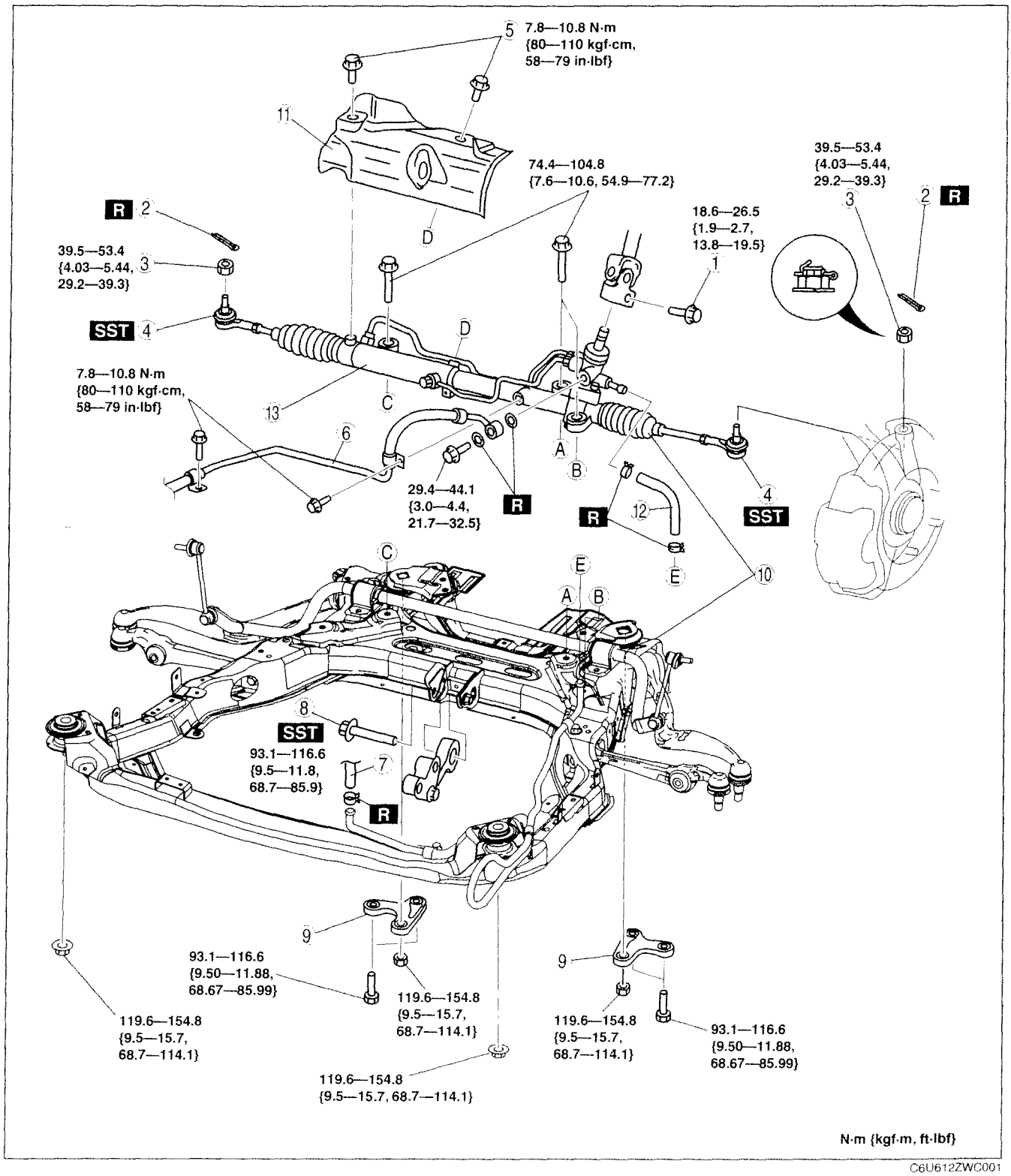
STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION [AJ]

C6U061232960W02

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.**

1. Remove the ABS wheel-speed sensor. (See 04–13–8 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.)
2. Remove the under cover and splash shield.
3. Separate the stabilizer control link (shock absorber side). (See02–13–17 FRONT STABILIZER REMOVAL/INSTALLATION.)
4. Separate the front lower arm (front and rear) ball joint.02–13–9 FRONT LOWER ARM (FRONT) REMOVAL/INSTALLATION.)
5. Remove the shock absorber bolt (lower side). (See02–13–3 FRONT SHOCK ABSORBER AND SPRING REMOVAL/INSTALLATION.)
6. Remove in the order indicated in the table.
7. Install in the reverse order of removal.
8. After installation, inspect the front wheel alignment. (See 02–11–2 FRONT WHEEL ALIGNMENT.)



N·m {kgf·m, ft·lbf}

C6U612ZWC001

1	Bolt (intermediate shaft) (See 06–12–10 Bolt (Intermediate Shaft) Removal Note) (See 06–12–11 Bolt (Intermediate Shaft) Installation Note)
2	Cotter pin
3	Nuts (tie-rod end ball joint)

4	Tie-rod end ball joint (See 06–12–10 Tie-rod End Ball Joint Removal Note)
5	Insulator bolts
6	Pressure pipe
7	Return hose
8	No.1 engine mount center bolt

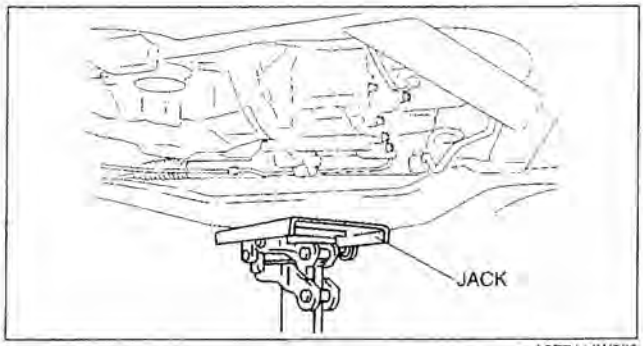
9	Crossmember bracket (See 06–12–13 Crossmember Bracket Removal Note)
10	Crossmember component, steering gear and linkage (See 06–12–13 Crossmember Component, Steering Gear and Linkage Removal Note) (See 06–12–13 Crossmember Component, Steering Gear and Linkage Installation Note)
11	Insulator (See 06–12–13 Insulator Installation Note)
12	Return hose
13	Steering gear and linkage (See 06–12–11 Steering Gear and Linkage Installation Note)

Crossmember Bracket Removal Note

Warning

- **Removing the crossmember is dangerous. The crossmember component could fall and cause serious injury or death. Verify that the jack securely supports the crossmember component before removing the crossmember bracket.**

1. Support the crossmember component with a jack and remove the nuts.
2. Remove the crossmember bracket.



A6E7414W036

Crossmember Component, Steering Gear and Linkage Removal Note

Warning

- **Removing the crossmember is dangerous. The crossmember component could fall and cause serious injury or death. Verify that the jack securely supports the crossmember component before removing the crossmember bracket.**

1. Remove the crossmember component, steering gear and linkage.

Insulator Installation Note

1. Install the insulator. (Do not install the bolts.)

Crossmember Component, Steering Gear and Linkage Installation Note

Warning

- **Installing the crossmember is dangerous. The crossmember component could fall and cause serious injury or death. Verify that the jack securely supports the crossmember component before installing the crossmember components, steering gear and linkage.**

1. Install the crossmember component, steering gear and linkage.

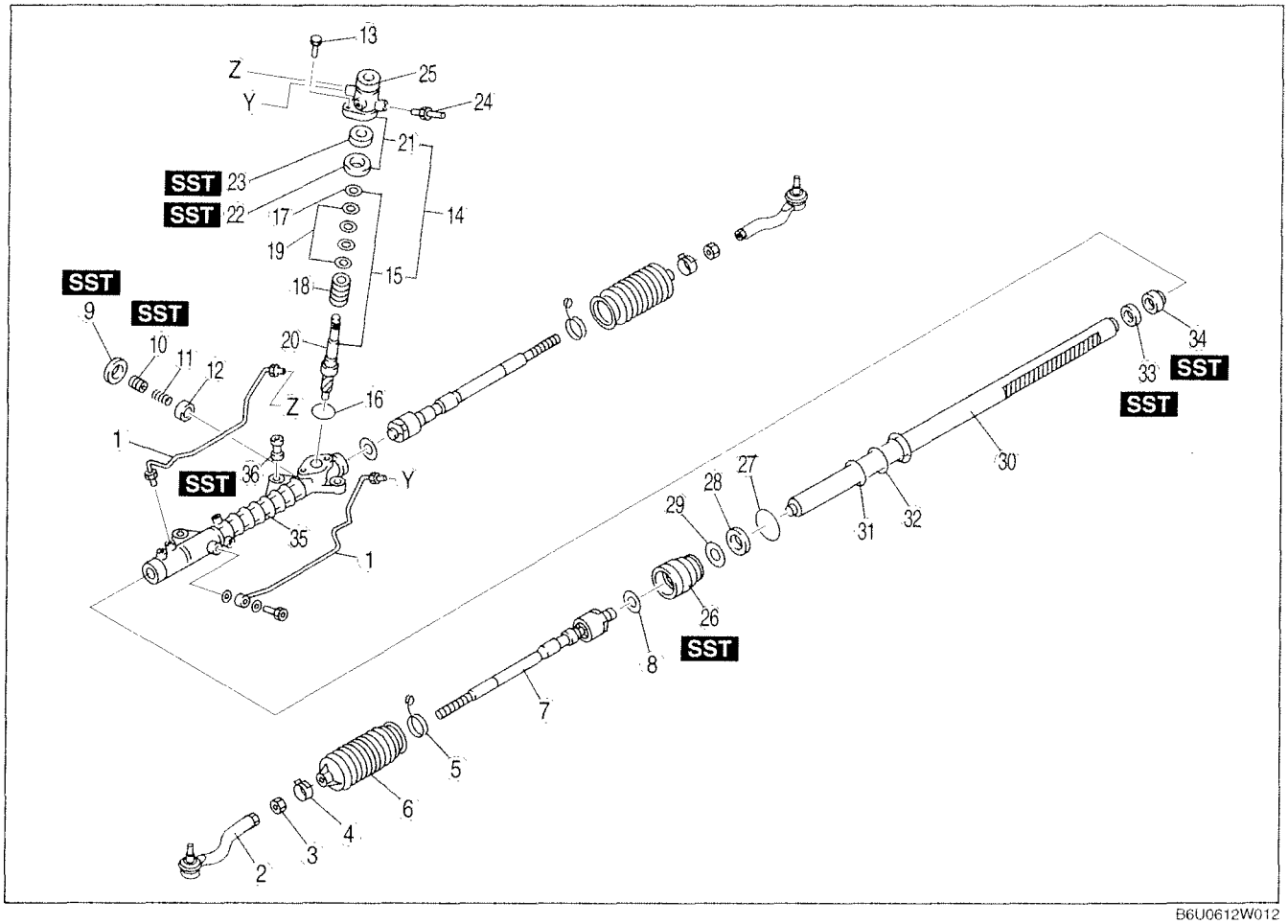
STEERING GEAR AND LINKAGE DISASSEMBLY

C6U061232960W03

Caution

- **Place copper plates, rag, or similar material in a vise, when securing the mounting bracket portion of the steering gear.**

1. Disassemble in the order indicated in the table.



B6U0612W012

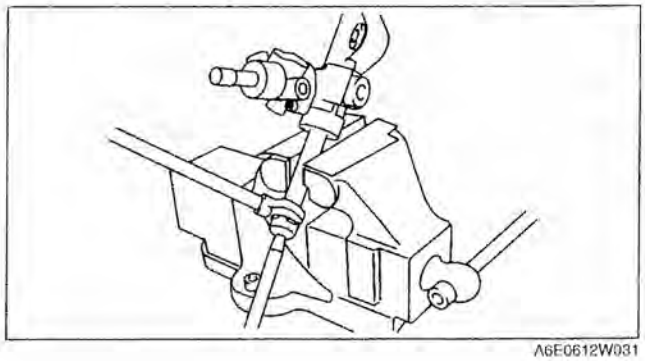
1	Oil pipe
2	Tie-rod end
3	Locknut
4	Boot clamp
5	Boot band
6	Boot
7	Tie rod (See 06–12–15 Tie Rod Disassembly Note)
8	Washer
9	Locknut (adjusting cover) (See 06–12–15 Locknut (Adjusting Cover) Disassembly Note)
10	Adjusting cover (See 06–12–15 Adjusting Cover Disassembly Note)
11	Yoke spring
12	Support yoke
13	Bolt
14	Pinion shaft and housing component (See 06–12–16 Pinion Shaft and Housing Component Disassembly Note)

15	Pinion shaft component (See 06–12–16 Pinion Shaft Component Disassembly Note)
16	O-ring
17	Snap ring (See 06–12–16 Snap Ring Disassembly Note)
18	Control valve component
19	Seal ring
20	Pinion shaft
21	Valve housing component
22	Upper bearing (See 06–12–17 Upper Bearing, Oil Seal Disassembly Note)
23	Oil seal (See 06–12–17 Upper Bearing, Oil Seal Disassembly Note)
24	Return pipe
25	Valve Housing
26	Holder (See 06–12–17 Holder Disassembly Note)
27	O-ring
28	U-gasket

29	Backup ring
30	Steering rack
31	Seal ring
32	O-ring
33	Oil seal (See 06–12–17 Oil Seal, Inner Guide Disassembly Note)
34	Inner guide (See 06–12–17 Oil Seal, Inner Guide Disassembly Note)
35	Gear housing
36	Mounting rubber (See 06–12–17 Mounting Rubber Disassembly Note)

Tie Rod Disassembly Note

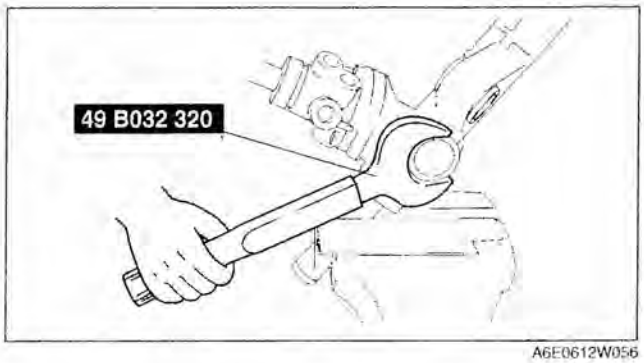
1. Unclamp the washer.
2. Remove the tie rod.



A6E0612W031

Locknut (Adjusting Cover) Disassembly Note

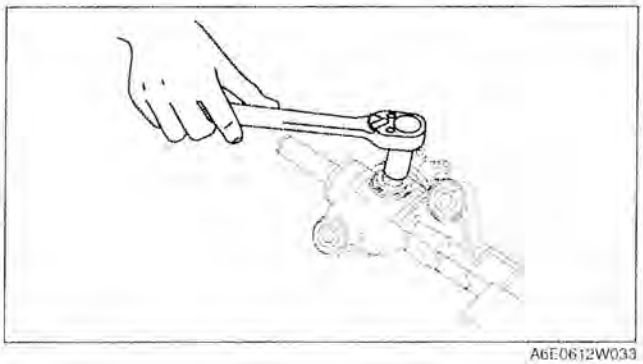
1. Remove the locknut using the **SST**.



A6E0612W056

Adjusting Cover Disassembly Note

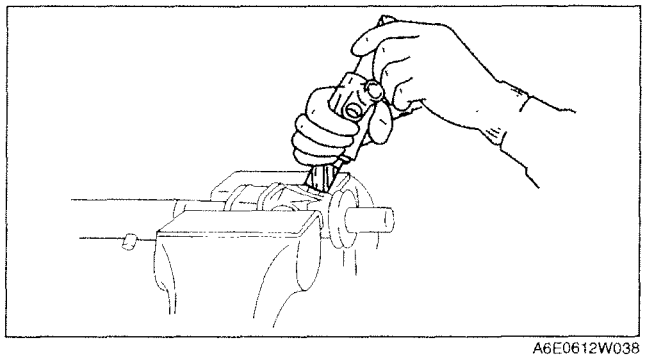
1. Remove the adjusting cover.



A6E0612W033

Pinion Shaft and Housing Component Disassembly Note

1. Hold the pinion shaft as shown, and pull out the pinion shaft and housing component.



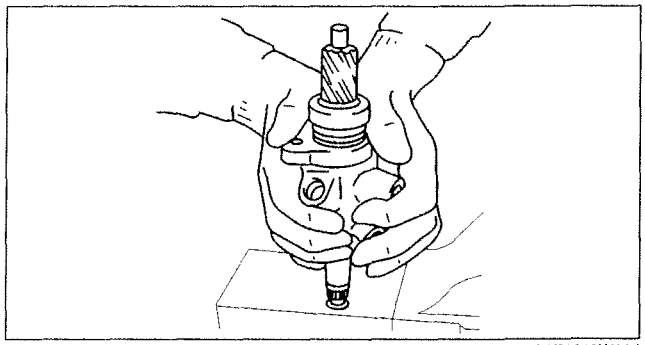
A6E0612W038

Pinion Shaft Component Disassembly Note

Note

- If the pinion shaft does not come out easily, remove it using a press.

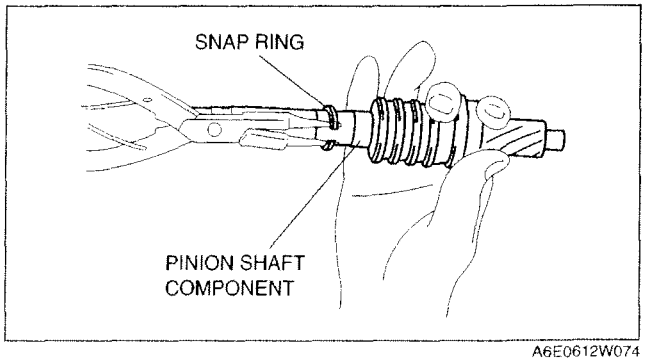
1. Push out the pinion shaft component from the valve housing as shown.



A6E0612W034

Snap Ring Disassembly Note

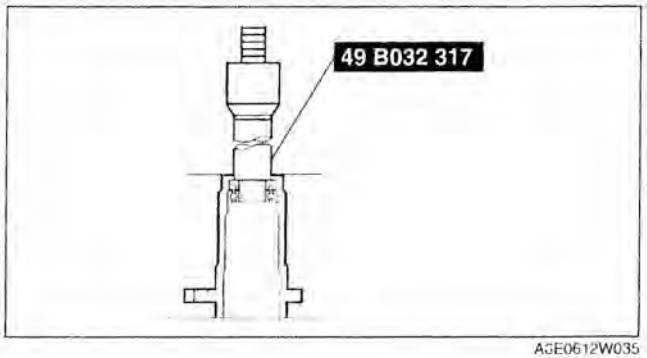
1. Carefully remove the snap ring without damaging the pinion shaft component.



A6E0612W074

Upper Bearing, Oil Seal Disassembly Note

1. Set the **SST** as shown.
2. Using a press, remove the oil seal and upper bearing without applying pressure to the edge of the valve housing.



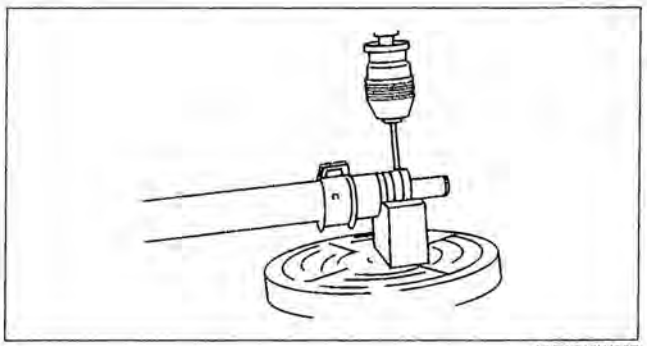
A3E0612W035

Holder Disassembly Note

1. Cut away the staked area by using a drill.

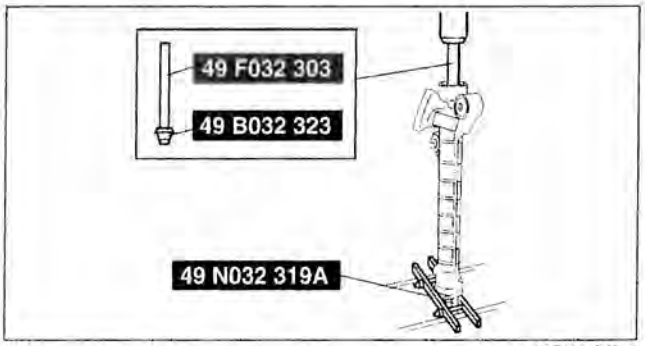
   Caution
   - **Carefully pull out the holder without damaging the U gasket.**

2. Disassemble the holder.


A6E0612W037

Oil Seal, Inner Guide Disassembly Note

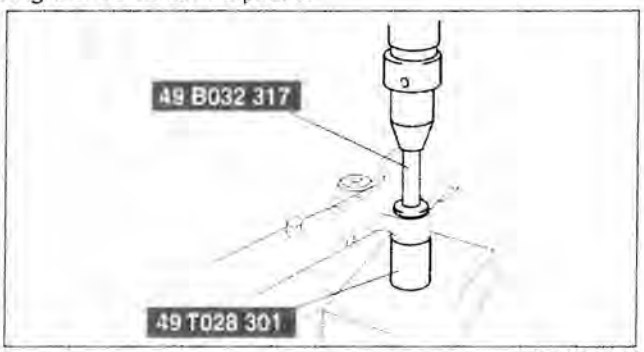
1. Set the **SSTs** into the valve side.
2. Install the **SST** to the gear housing.
3. Press out the oil seal and inner guide.



A6E0612W086

Mounting Rubber Disassembly Note

- Press the mounting rubber out from the gear housing using the **SSTs** and a press.



A6E0612W040

STEERING GEAR AND LINKAGE INSPECTION

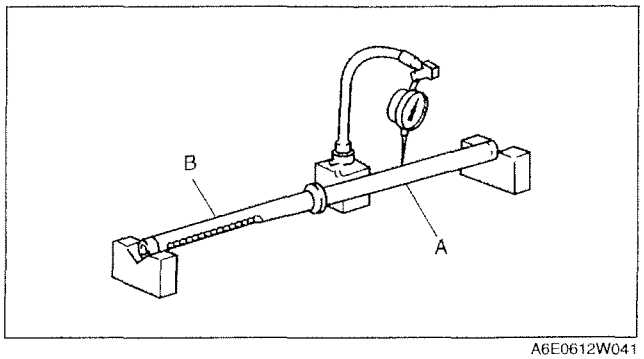
C6U061232960W04

Rack Inspection

1. Inspect the rack for cracking, damage, and tooth wear. Replace it if necessary.
2. Measure the runout of the rack.

Runout
Near point A: 0.15 mm {0.006 in} max.
Near point B: 0.20 mm {0.008 in} max.

3. If not within the specification, replace the rack.



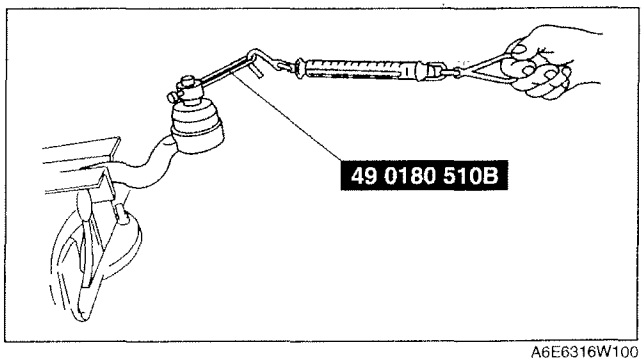
A6E0612W041

Tie-rod End Inspection

1. Inspect the tie-rod end for damage and boot cracks. Replace it if necessary.
2. Inspect the ball joint for looseness. Replace the tie-rod end if necessary.
3. Rotate the ball joint five times.
4. Measure the rotation torque of the ball joint using the **SST** and a pull scale.

Rotation torque
0.4—2.7 N·m {3.5—27.5 kgf·cm, 3.1—23.8 in·lbf}
Pull scale reading
3.4—25.5 N {0.35—2.60 kgf, 0.8—5.7 lbf}

5. If not within the specification, replace the tie-rod end.



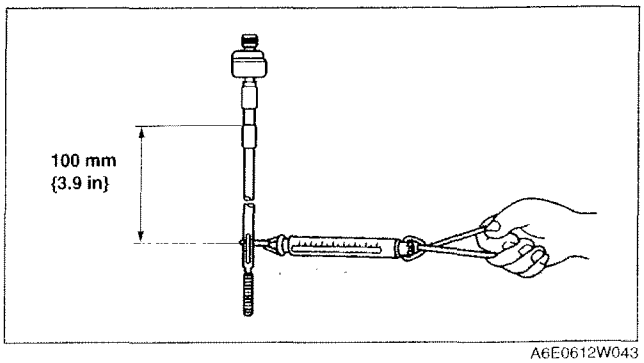
A6E6316W100

Tie rod Inspection

1. Inspect the tie rod for bending and damage. Replace it if necessary.
2. Inspect the ball joint for looseness. Replace the tie rod if necessary.
3. Swing the tie rod five times.
4. Measure the swinging torque using a pull scale.

Swinging torque
0.1—4.0 N·m {1.1—40.7 kgf·cm, 0.9—35.3 in·lbf}
Pull scale reading
0.6—24.5 N {0.06—2.49 kgf, 0.2—5.5 lbf}

5. If not within the specification, replace the tie rod.



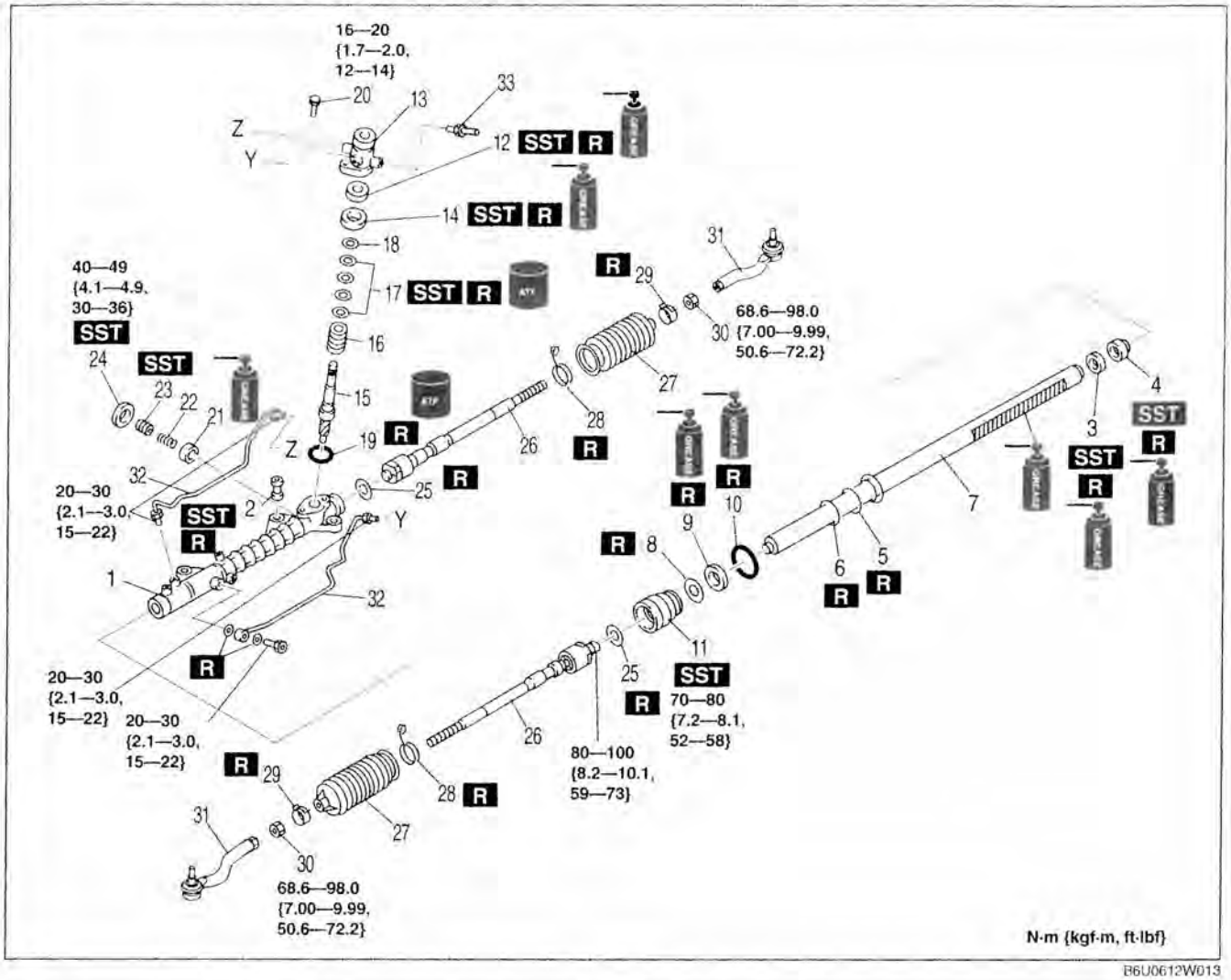
A6E0612W043

STEERING GEAR AND LINKAGE ASSEMBLY

C6U061232960W05

Caution
- **Place copper plates, rag, or similar material in a vise, when securing the mounting bracket portion of the steering gear.**

1. Assemble in the order indicated in the table.



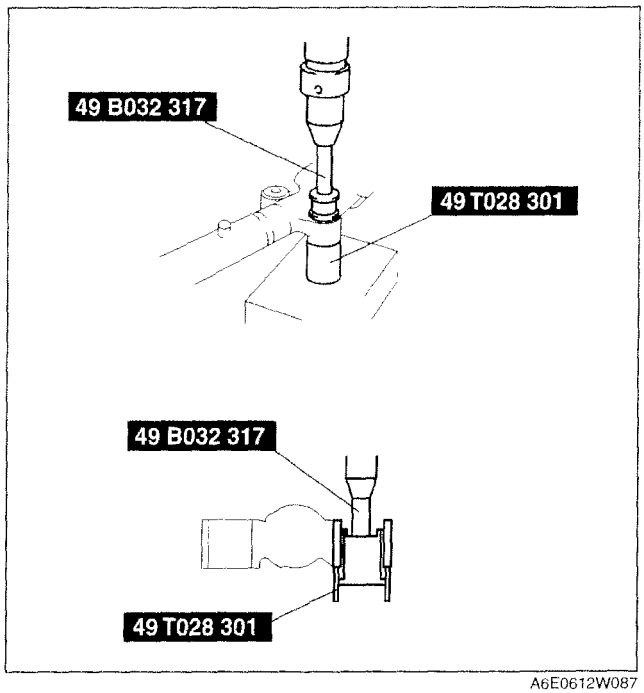
B6U0612W013

1	Gear housing
2	Mounting rubber (See 06–12–20 Mounting Rubber Assembly Note)
3	Oil seal (See 06–12–20 Oil Seal, Inner Guide Assembly Note)
4	Inner guide (See 06–12–20 Oil Seal, Inner Guide Assembly Note)
5	O-ring
6	Seal ring
7	Steering rack
8	Backup ring
9	U-gasket
10	O-ring
11	Holder (See 06–12–21 Holder Assembly Note)
12	Oil seal (See 06–12–22 Oil Seal Assembly Note)
13	Valve housing
14	Upper bearing (See 06–12–22 Upper Bearing Assembly Note)

15	Pinion shaft
16	Control valve
17	Seal ring (See 06–12–22 Seal Ring Assembly Note)
18	Snap ring
19	O-ring
20	Bolt
21	Support yoke
22	Yoke spring
23	Adjusting cover (See 06–12–22 Adjusting Cover Assembly Note)
24	Locknut (adjusting cover)
25	Washer
26	Tie rod
27	Boot
28	Boot band
29	Boot clamp
30	Locknut
31	Tie-rod end
32	Oil pipe
33	Return pipe

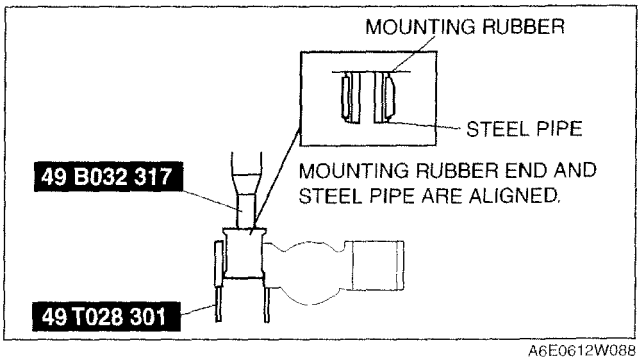
Mounting Rubber Assembly Note

1. Apply soapy water to the rubber part of the mounting rubber.
2. Press the mounting rubber until the mounting rubber end comes out completely from the gear housing using the **SSTs** and a press.



A6E0612W087

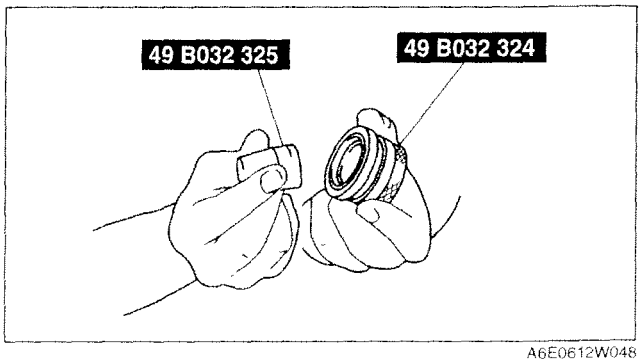
3. Reverse the gear housing, then press the mounting rubber until the mounting rubber end comes out completely from the other side. At this time, the mounting rubber end and steel pipe are aligned.



A6E0612W088

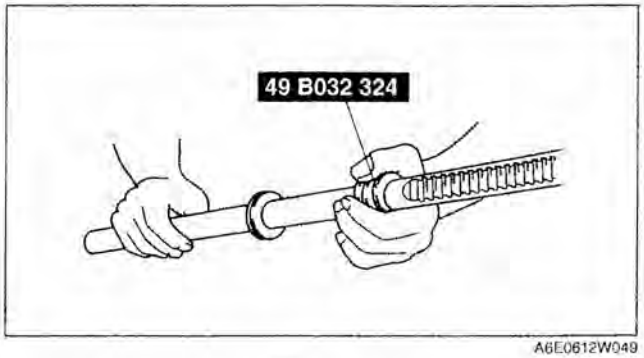
Oil Seal, Inner Guide Assembly Note

1. Install a new O-ring and a new seal ring to the rack's piston.
2. After installing the seal ring, seat it properly at the piston circumference.
3. Apply grease to a new oil seal and inner guide.
4. Install the oil seal to the **SST**.



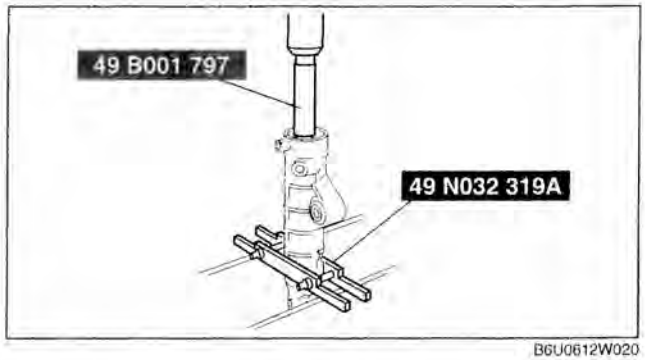
A6E0612W048

5. Using the **SST**, place the oil seal and inner guide at the edge of the steering rack's pinion, and remove the **SST**.



A6E0612W049

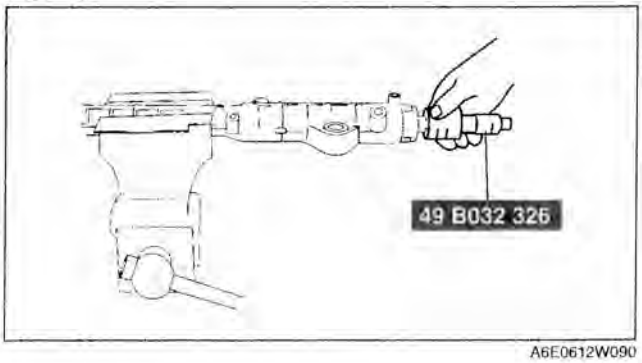
6. After installing the steering rack to the gear housing, press the oil seal and inner guide using the **SSTs** until the force required suddenly increases.



B6U0612W020

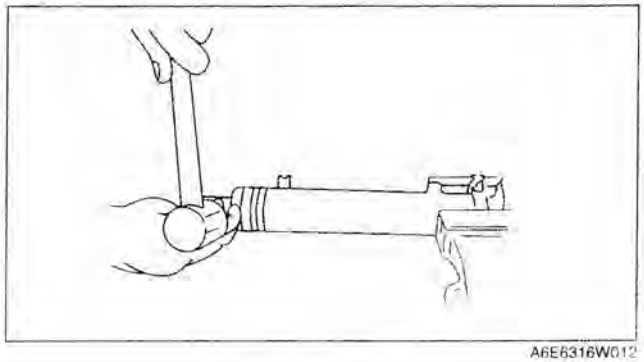
Holder Assembly Note

1. Apply grease to the U-gasket and O-ring.
2. Assemble the U-gasket, backup ring and O-ring into the holder.
3. Assemble the **SST** to the steering rack.



A6E0612W090

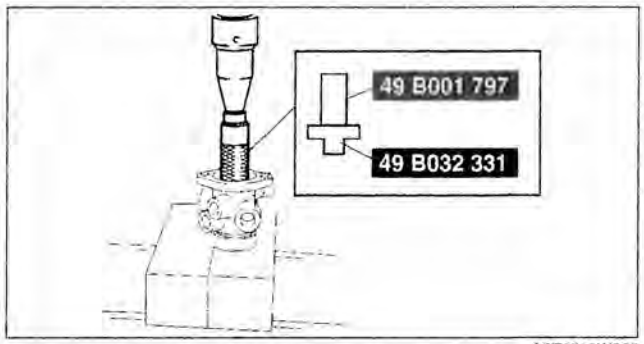
4. Stake the holder to the cylinder using a punch.



A6E6316W012

Oil Seal Assembly Note

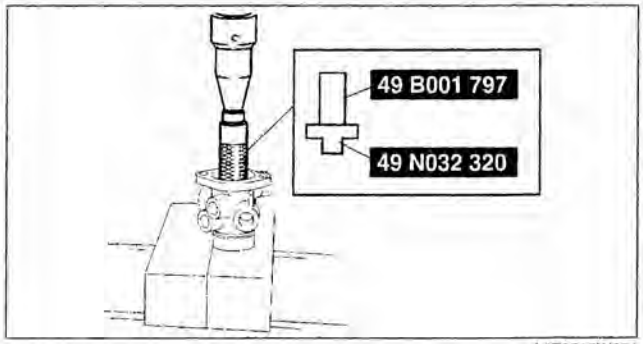
1. Apply grease to a new oil seal.
2. Press in the new oil seal using the **SSTs**.



A6E0612W036

Upper Bearing Assembly Note

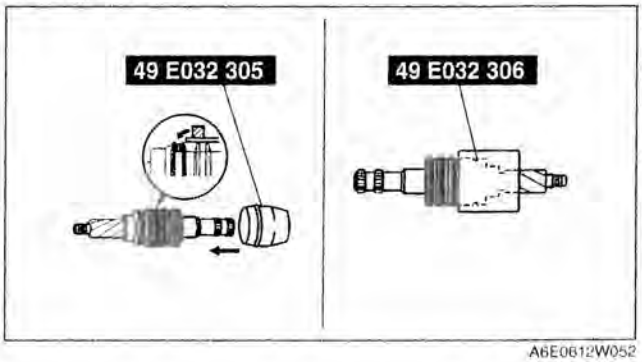
1. Apply grease to a new upper bearing.
2. Press in the upper bearing using the **SST**.



A6E0612W051

Seal Ring Assembly Note

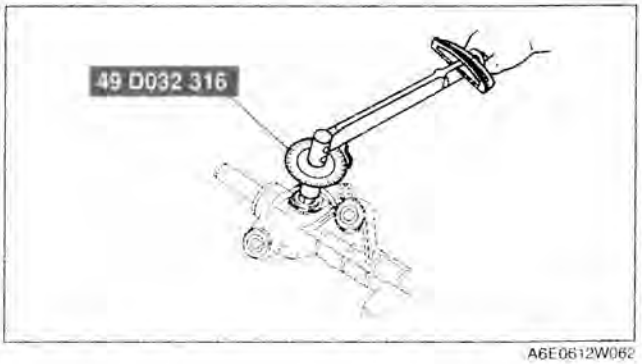
1. Install a new seal ring to the valve part of the pinion shaft using the **SST**.
2. After installing the new seal ring, seat it properly using the **SST**.
3. Install the snap ring.



A6E0612W052

Adjusting Cover Assembly Note

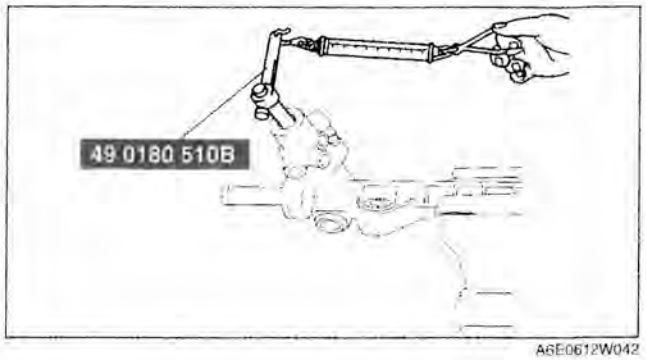
1. Set the rack to the center position.
2. Tighten the adjusting cover to **4.9 N·m {50 kgf·cm, 36 in·lbf}** three times, then return it **25°** using the **SST**.
3. Apply sealant to the threads of the locknut.
4. Attach the locknut.



A6E0612W062

5. Measure the pinion torque using the **SST** and a pull scale.

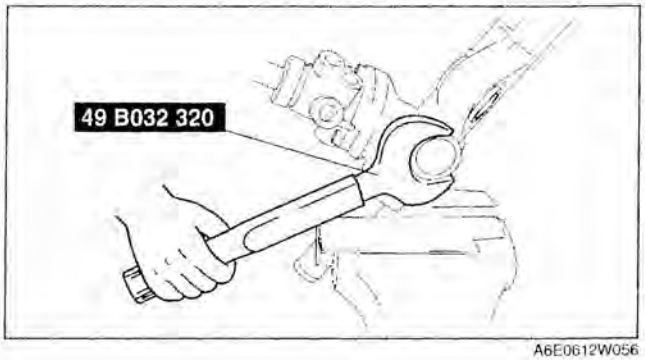
Standard
Center of rack ±90°
0.7—1.1 N·m
{7.2—11.2 kgf·cm, 6.2—9.7 in·lbf}
[Pull scale reading
7—11 N {0.8—1.1 kgf, 1.6—2.4 lbf}]
Except center of rack ±90°
Less than 1.6 N·m
{16.3 kgf·cm, 11.8 in·lbf}
[Pull scale reading
Less than 16.7 N {1.7 kgf, 3.8 lbf}]



A6E0612W042

6. If not as specified, repeat steps 2 through 5.
7. Install the locknut using the **SST** (49 B032 320).

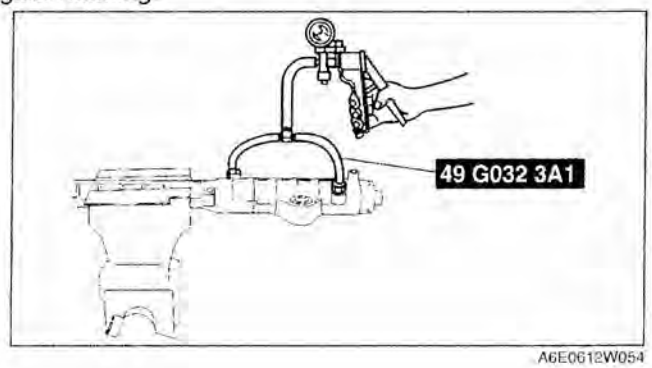
Tightening torque
40—49 N·m {4.1—4.9 kgf·m, 30—36 ft·lbf}



A6E0612W056

Hermetic sealing inspection

1. Connect the **SSTs** to the power cylinder section of the gear housing.
2. Apply **53.3 kPa {400 mmHg, 15.7 inHg}** vacuum with a vacuum pump and verify that it is held for at least **30 seconds**.
3. If the vacuum is not held, replace the oil seal.

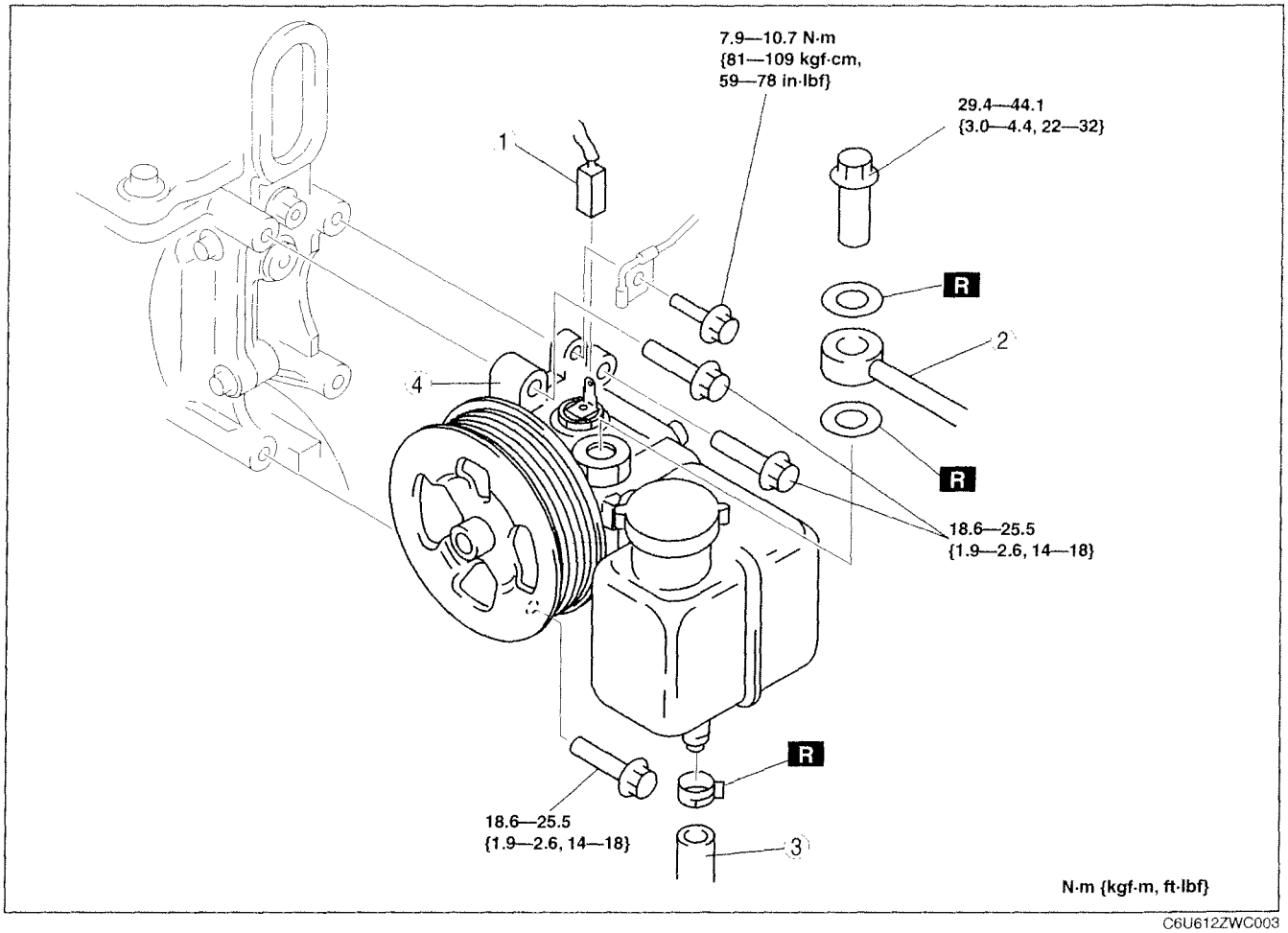


A6E0612W054

POWER STEERING OIL PUMP REMOVAL/INSTALLATION [L3]

C6U061232650W01

1. Remove the drive belt. (See 01–10A–3 DRIVE BELT REPLACEMENT [L3].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



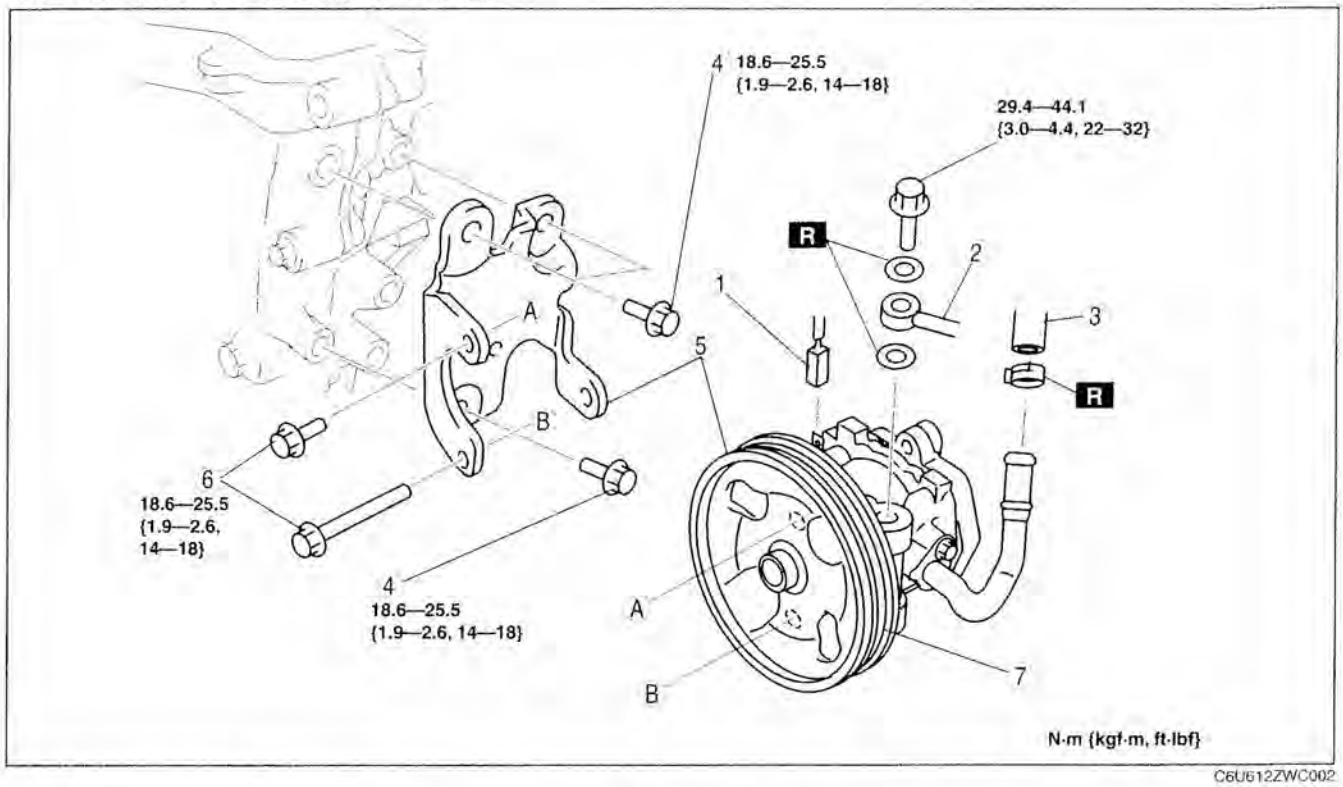
C6U612ZWC003

1	Pressure switch connector	3	Return hose
2	Pressure pipe	4	Power steering oil pump

POWER STEERING OIL PUMP REMOVAL/INSTALLATION [AJ]

C6U061232650W02

1. Remove the splash shield (right side).
2. Remove the under cover.
3. Remove the front drive belt. (See 01–10B–5 DRIVE BELT REPLACEMENT [AJ].)
4. Remove the oil level gauge pipe.
5. Remove the A/C compressor installation bolts.
6. Remove the exhaust manifold (LH). (See 01–15B–2 EXHAUST SYSTEM REMOVAL/INSTALLATION [AJ].)
7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.



C6U612ZWC002

1	Pressure switch connector
2	Pressure pipe
3	Return hose
4	Bolts

5	Power steering oil pump bracket, Power steering oil pump
6	Bolts
7	Power steering oil pump

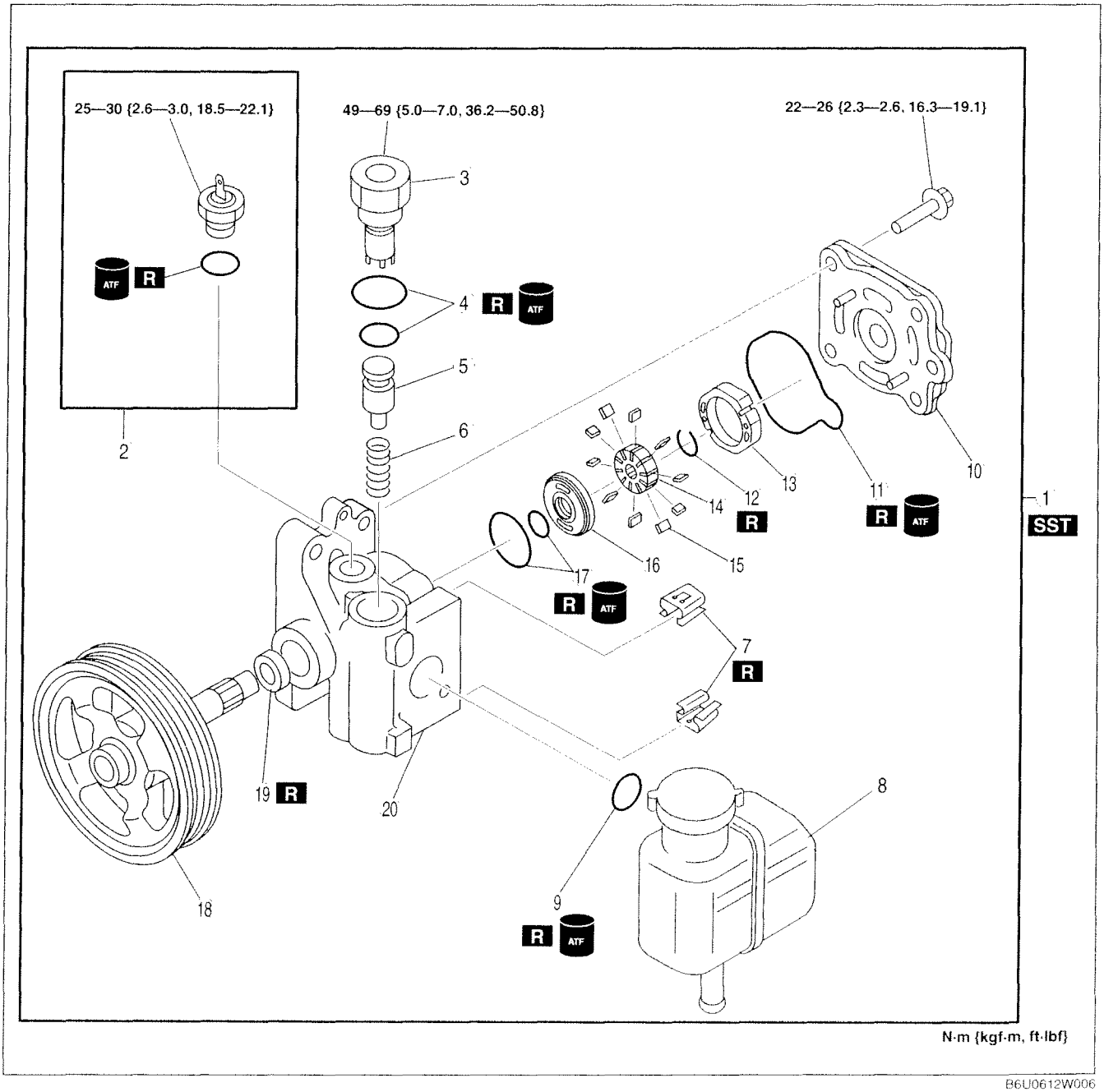
POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY [L3]

C6U061232650W03

Note

- The following procedure is for replacement of the O-ring and oil seal only. Replace the pump component if other repairs are necessary.

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



B6U0612W006

1	Power steering oil pump component (See 06–12–27 Power Steering Oil Pump Component Disassembly Note)
2	Pressure switch component
3	Connector
4	O-rings
5	Control valve
6	Spring

7	Clip (See 06–12–27 Clip Disassembly Note) (See 06–12–28 Clip Assembly Note)
8	Fluid reservoir
9	O-ring
10	Rear pump body (See 06–12–29 Rear Pump Body Assembly Note)
11	Gasket
12	Clip

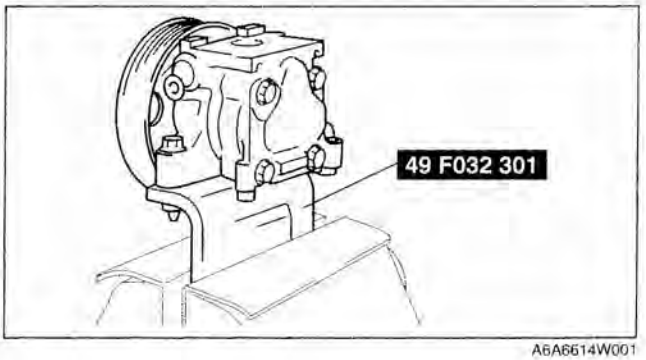
13	Cam ring (See 06–12–29 Cam Ring Assembly Note)
14	Rotor
15	Vane (See 06–12–28 Vane Assembly Note)
16	Side plate
17	O-ring
18	Shaft component
19	Oil seal (See 06–12–28 Oil Seal Assembly Note)
20	Front pump body

Power Steering Oil Pump Component Disassembly Note

1. Secure the power pressure oil pump using the **SST**.

Caution

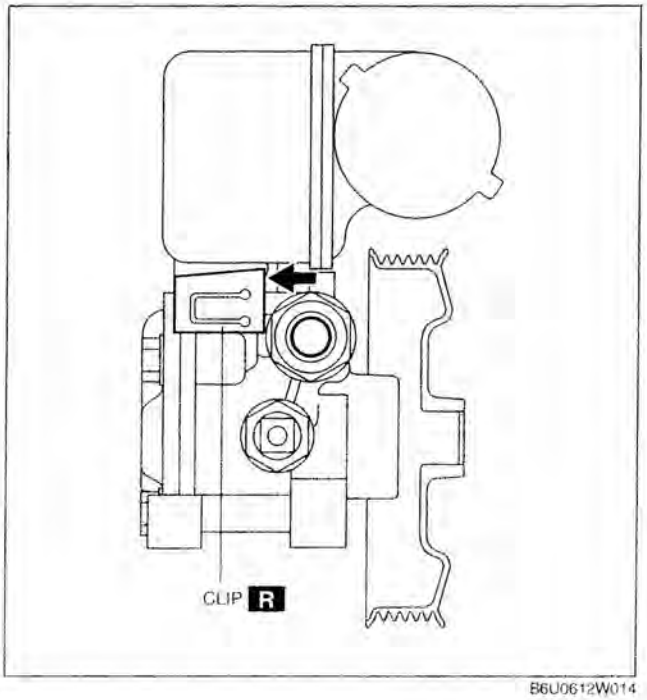
- **Use the SST to prevent damage to the pump when securing it in a vise.**



A6A6614W001

Clip Disassembly Note

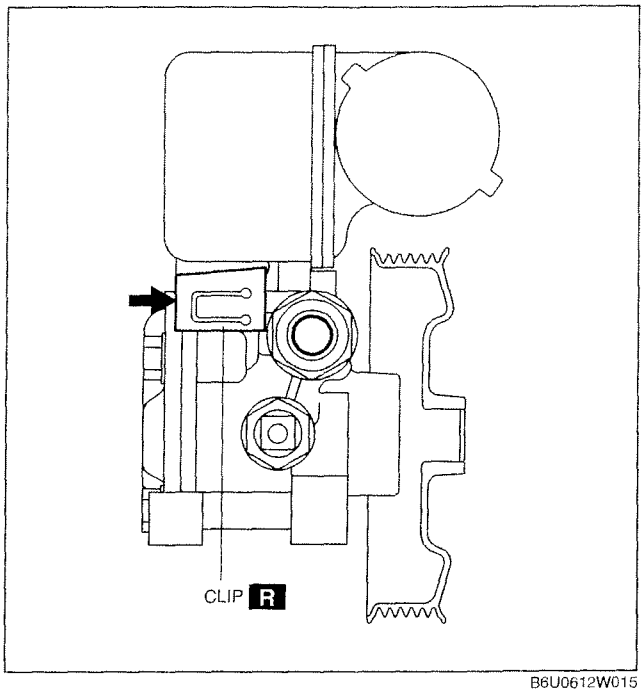
1. Lift up the clip tab using a screwdriver (–).
2. Remove the clip pushing with a screwdriver (–) and a hammer as shown in the figure.



B6U0612W014

Clip Assembly Note

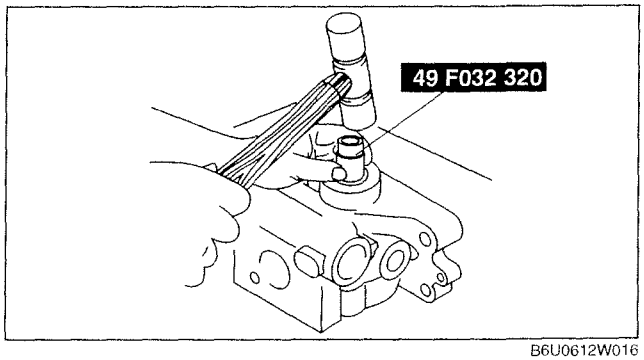
1. Push the clip slowly in the direction shown in the figure.
2. Confirm that the clip tab is caught correctly.



B6U0612W015

Oil Seal Assembly Note

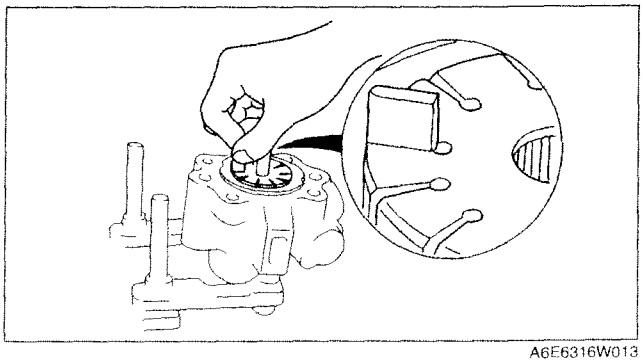
1. Install the oil seal in the front pump body using the **SST** and plastic hammer.



B6U0612W016

Vane Assembly Note

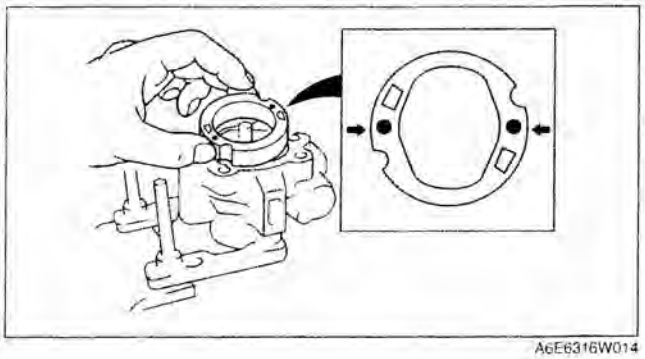
1. Place the vanes in the rotor with the rounded edges contacting the cam.



A6E6316W013

Cam Ring Assembly Note

1. Install the cam ring in the front pump body with the mark facing upward.



A6E6316W014

Rear Pump Body Assembly Note

1. After installing the rear body, manually turn the shaft to verify that it rotates smoothly.

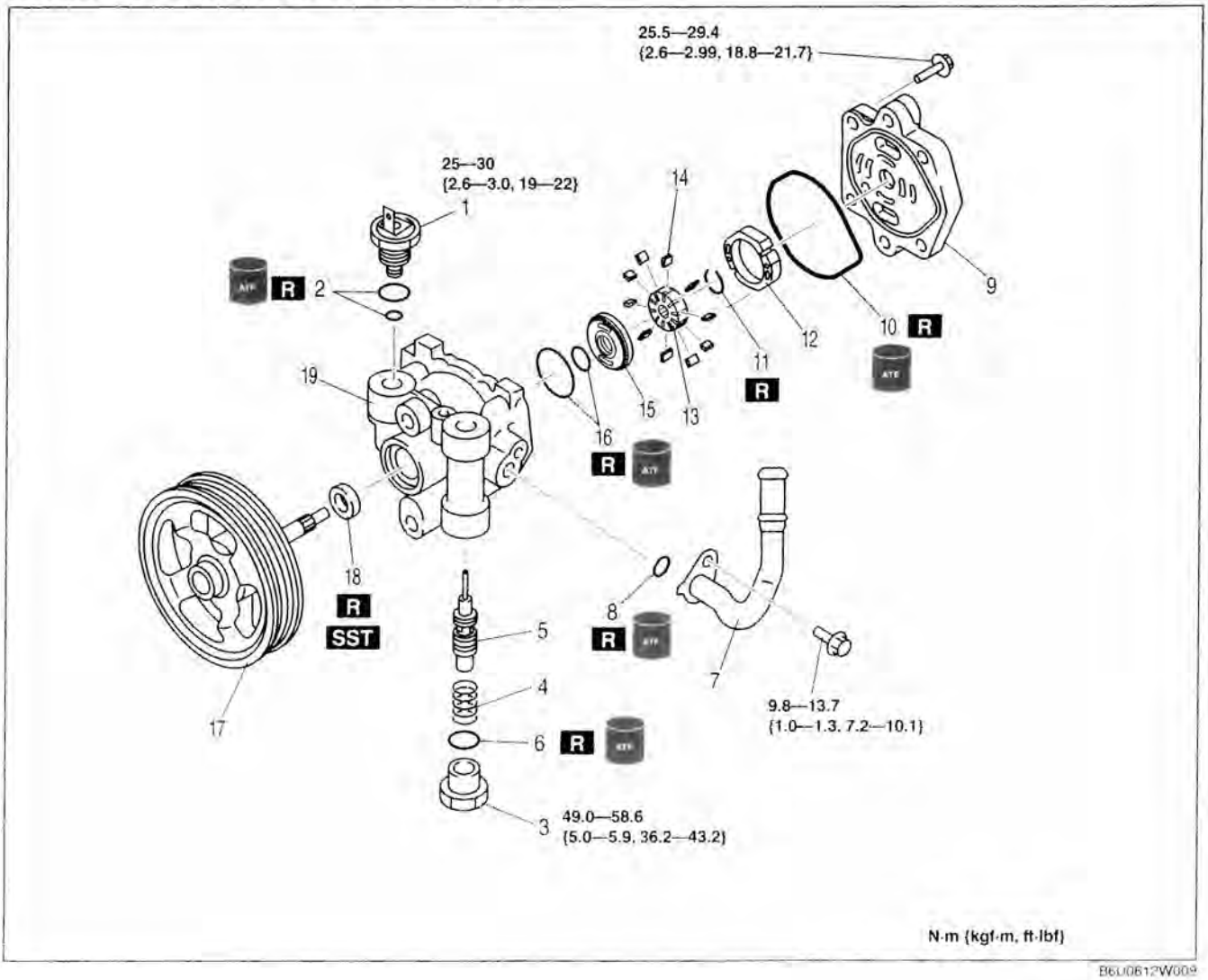
POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY [AJ]

C6U061232650W04

Note

- The following procedure is for replacement of the O-ring and oil seal only. Replace the pump component if other repairs are necessary.

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



B6U0612W009

1	Pressure switch component
2	O-rings
3	Connector
4	Spring
5	Control valve
6	O-ring
7	Suction pipe
8	O-ring
9	Rear pump body (See 06–12–29 Rear Pump Body Assembly Note)
10	Gasket

11	Clip
12	Cam ring (See 06–12–29 Cam Ring Assembly Note)
13	Rotor
14	Vane (See 06–12–28 Vane Assembly Note)
15	Side plate
16	O-rings
17	Shaft component
18	Oil seal (See 06–12–28 Oil Seal Assembly Note)
19	Front pump body

06–50 TECHNICAL DATA

STEERING SYSTEM

CGD0650010J4W01

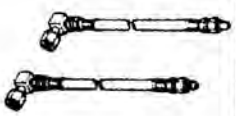
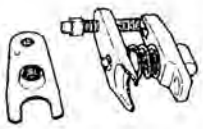
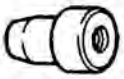
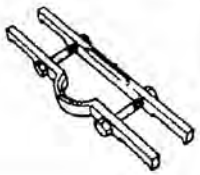
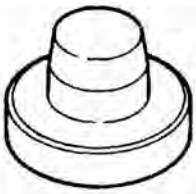
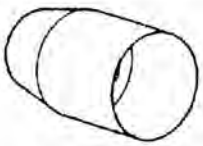
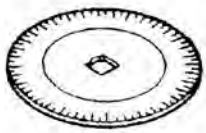
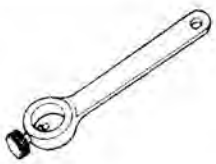
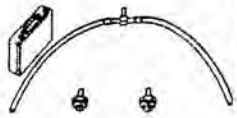
Item				Specification
ENGINE SPEED SENSING POWER STEERING				
Steering wheel	Play		(mm {in})	0—30 {0—1.18}
	Effort		(N·m {kgf·cm, in·lbf})	7.8 {80, 58} max.
Steering shaft	Length		(mm {in})	211.6 {8.3}
Steering gear	Tie-rod end	Rotation torque	(N·m {kgf·cm, in·lbf})	0.4—2.7 {3.5—27.5, 3.1—23.8}
		[Pull scale reading]	(N {kgf, lbf})	3.4—25.5 {0.35—2.60, 0.8—5.7}
	Tie rod	Swinging torque	(N·m {kgf·cm, in·lbf})	0.1—4.0 {1.1—40.7, 0.9—35.3}
		[Pull scale reading]	(N {kgf, lbf})	0.6—24.5 {0.06—2.49, 0.2—5.5}
	Steering rack	Runout (mm {in})	Large diameter portion	0.15 {0.006} max.
			Small diameter portion	0.20 {0.008} max.
Power steering oil pump	Oil pump fluid pressure		(MPa {kgf·cm^2, psi})	L3: 10.80—11.29 {110.2—115.2, 1567—1637} AJ: 11.31—11.80 {115.4—120.3, 1640—1711}
	Gear housing fluid pressure		(MPa {kgf·cm^2, psi})	L3: 10.80—11.29 {110.2—115.2, 1567—1637} AJ: 11.31—11.80 {115.4—120.3, 1640—1711}
Power steering system	Fluid	Type		ATF M-III, M-V or equivalent (e.g. Dexron®III)
		Capacity* (Approximate quantity)	(L {US qt, Imp qt})	L3 MTX: 0.77 {0.81, 0.68} L3 ATX: 0.84 {0.89, 0.74} AJ: 1.02 {1.08, 0.90}

* : When reservoir tank is at maximum volume.

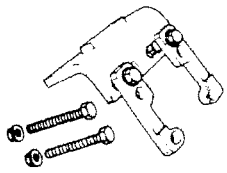
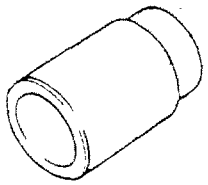
06–60 SERVICE TOOLS

STEERING SST

C6U066001034W01

49 1232 670B Power steering gauge set 	49 H002 671 Adapter 	49 G032 3A4 Power steering gauge adapter set 
49 T028 3A0 Ball joint puller set 	49 B032 320 Wrench 	49 B032 317 Bearing and oil seal remover 
49 F032 303 Handle 	49 B032 323 Rod seal remover body 	49 N032 319A Support plate 
49 B032 326 Outer box protector 	49 T028 301 Dust boot installer 	49 B032 324 Rod seal protector body 
49 B032 325 Rod seal guide 	49 B032 331 Oil seal installer 	49 B001 797 Handle 
49 N032 320 Bearing installer 	49 E032 305 Slipper seal protector 	49 E032 306 Slipper seal former 
49 D032 316 Protractor 	49 0180 510B Preload measuring attachment 	49 G032 3A1 Joint host set 

SERVICE TOOLS

49 F032 301 Power steering pump hanger 	49 F032 320 Installer A (Part of 49 F032 3A2) 	—

HEATER, VENTILATION & AIR CONDITIONING (HVAC)

07 SECTION

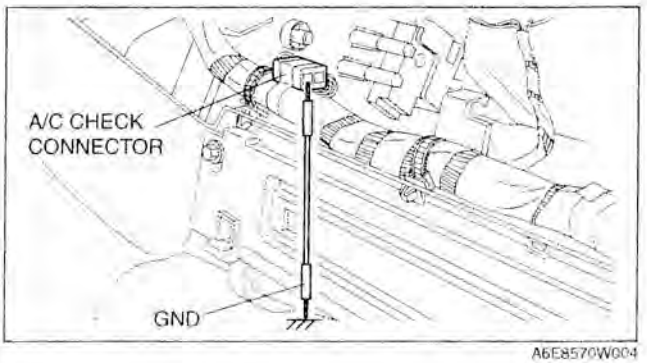
07–02 ON-BOARD DIAGNOSTIC

DIAGNOSTIC TROUBLE CODE NUMBER INSPECTION

C6U070201038W01

1. Remove the glove compartment.
2. Short the A/C check connector to the GND terminal using a jumper wire.
3. Shine a **60 W** incandescent light from a height of **approximately 100 mm {3.9 in}** onto the solar radiation sensor.

Note
- If incandescent light is not shone on the solar radiation sensor, the climate control unit determines a malfunction and indicates a diagnostic trouble code "02".



A6E8570W004

4. Turn the ignition switch to ON position.
5. Read DTCs from the flashing of the rear defroster indicator light on the climate control unit. Carry out DTC inspection. (Present and past failure indication modes)
   - When the system is normal, the rear defroster indicator light does not flash.
   - If any of the diagnostic trouble codes are indicated, carry out troubleshooting according to the code.
6. After completion of repairs, erase all diagnostic trouble code(s) from memory. (See 07–02–2 Erasing Past Failure Memory.)
7. Remove the jumper wire.

Present Failure Indication Mode

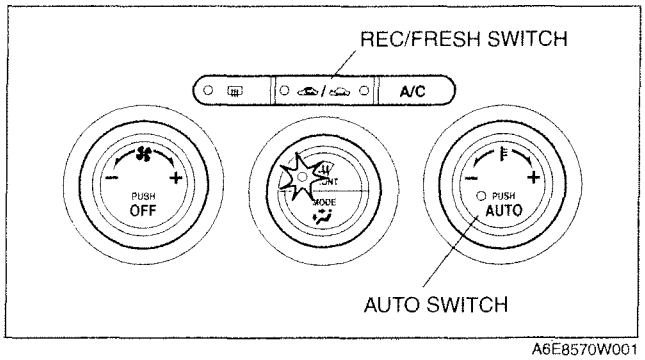
- The on-board diagnostic function displays the present failure indication mode directly after start up. In present failure indication mode, present failures in the control system circuits (open, short circuits) are detected, and the flashing of the rear defroster indicator light on the climate control unit indicates the DTCs.
  — If a diagnostic trouble code is indicated, refer to the diagnostic trouble code table below and inspect the appropriate system.

Past Failure Indication Mode

- While in present failure indication mode, press the A/C switch to change to the past failure indication mode. In past failure indication mode, past failures (intermittent problems) in the input sensor circuits (open, short circuits) are stored, and the flashing of the rear defroster indicator light on the climate control unit indicates the DTCs.
  - — If a diagnostic trouble code is indicated, refer to the following diagnostic trouble code table and inspect the appropriate system. (Disconnections and short circuits are stored in the same system even if either occurs only once.)
  - — If the A/C switch is pressed again while in past failure indication mode, the on-board diagnostic function will return to present failure indication mode.

Erasing Past Failure Memory

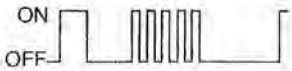
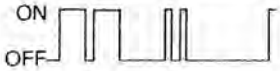
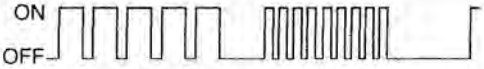
- When DTCs are displayed in the past failure indication mode, they remain in the memory after the failed systems are corrected. Consequently, the next time the past failure indication mode is used, the same past failure DTCs will be indicated by the flashing of the rear defroster indicator light on the climate control unit. Therefore, erase the past failure memory after correcting all failed systems. To erase the past failure memory, press the AUTO switch and REC/FRESH switch on the climate control unit at the same time while in past failure indication mode. If erased, the rear defroster indicator light flashes once.



A6E8570W001

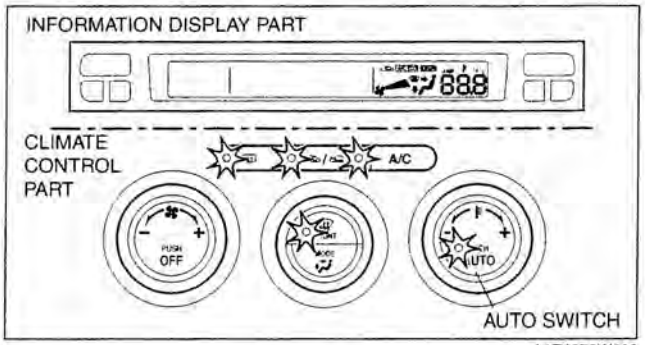
DTC Table

No.	Indicator pattern	Diagnosed circuit
02	ON / OFF	Solar radiation sensor (present)
03	ON / OFF	Solar radiation sensor (past)
06	ON / OFF	Passenger compartment temperature sensor (present)
07	ON / OFF	Passenger compartment temperature sensor (past)
10	ON / OFF	Evaporator temperature sensor (present)
11	ON / OFF	Evaporator temperature sensor (past)
12	ON / OFF	Ambient temperature sensor (present)
13	ON / OFF	Ambient temperature sensor (past)
14	ON / OFF	Water temperature sensor (present)

No.	Indicator pattern	Diagnosed circuit
15		Water temperature sensor (past)
21		Airflow mode actuator [potentiometer] (present)
22		Airflow mode actuator [potentiometer] (past)
59		Airflow mode actuator [motor lock] (past)

Output Device Operation Check Mode
Inspection

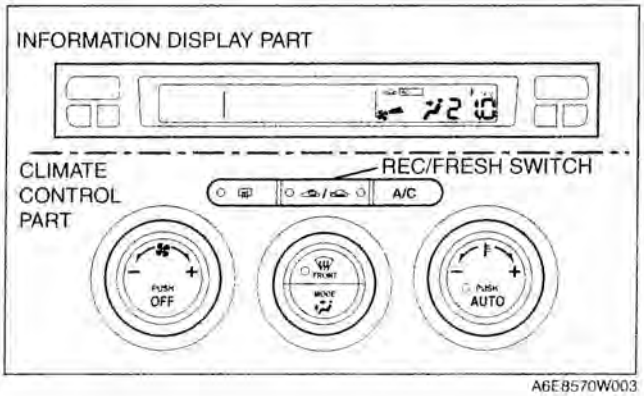
1. Warm up the engine.
2. Turn the ignition switch to LOCK position.
3. Start up the on-board diagnostic function (present failure indication mode).
4. Press the AUTO switch.
5. Verify that all the indicator lights of the climate control unit and center panel (climate control part) illuminate for **4 s**.



A6E8570W002

6. Verify the operation of each output device when changing steps by pressing the REC/FRESH switch, and referring to the output device operation check chart.
   - If not as specified, inspect the malfunctioning system.

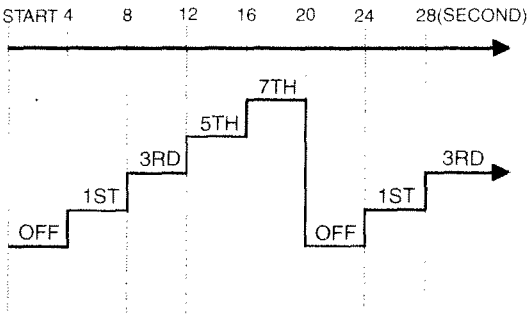
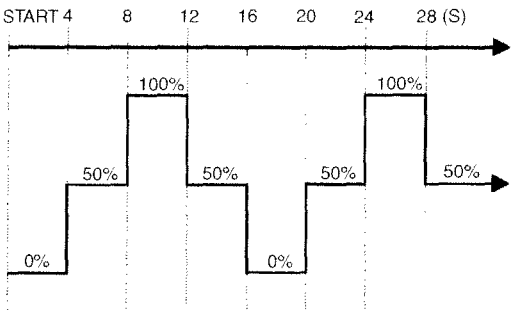
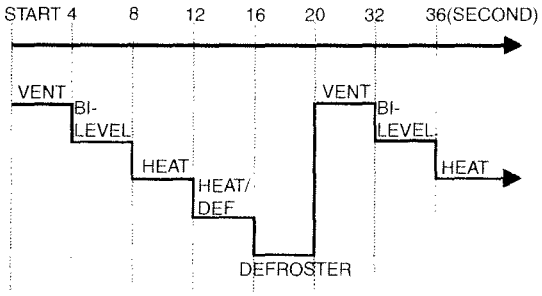
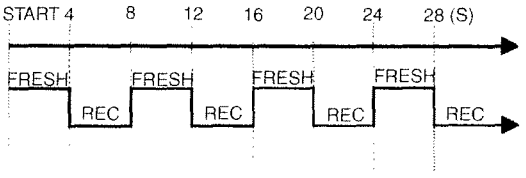
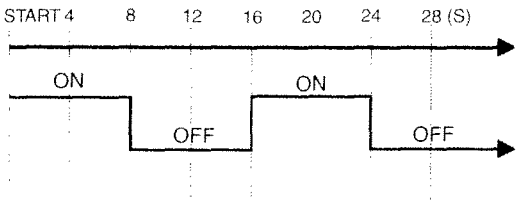
   Note
   - If the AUTO switch is pressed again, the on-board diagnostic function will return to present failure indication mode.



A6E8570W003

7. Turn the ignition switch to LOCK position to end the on-board diagnostic function.

Output device operation check table

Step	Operating device	Operating conditions	Monitor*	Other device conditions
1	Blower motor speed		1	• Air mix actuator operation — 50% • Airflow mode actuator operation — VENT • Air intake actuator operation — FRESH • A/C compressor operation — ON
2	Air mix actuator operation		20.0 20.5 21.0 20.5	• Blower motor speed — 2nd • Airflow mode actuator operation — VENT • Air intake actuator operation — FRESH • A/C compressor operation — ON
3	Airflow mode actuator operation		3	• Blower motor speed — 2nd • Air mix actuator operation — 50% • Air intake actuator operation — FRESH • A/C compressor operation — ON
4	Air intake actuator operation		4	• Blower motor speed — 2nd • Air mix actuator operation — 0% • Airflow mode actuator operation — VENT
	A/C compressor operation			

* : Shown on the information display according to step.

DTC 02

C6U070201038W02

DTC 02	Solar radiation sensor system inspection
POSSIBLE CAUSE	• Solar radiation sensor malfunction • Climate control unit malfunction • Open or short circuit between solar radiation sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Inspect solar radiation sensor. • Is it okay?	Yes	Go to next step.
		No	Replace solar radiation sensor.
2	• Disconnect climate control unit connector (24-pin) and solar radiation sensor connector. • Is there continuity between the following climate control unit terminals and solar radiation sensor terminal? — 1S—B — 1I—A	Yes	Go to next step.
		No	Repair wiring harness.
3	• Is there a short circuit to ground between climate control unit terminal 1S and solar radiation sensor terminal B?	Yes	Repair wiring harness.
		No	Replace climate control unit.

07-02

DTC 03

C6U070201038W03

DTC 03	Solar radiation sensor system inspection
POSSIBLE CAUSE	• Solar radiation sensor malfunction • Climate control unit malfunction • Short circuit between solar radiation sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Inspect solar radiation sensor. • Is it okay?	Yes	Go to next step.
		No	Replace solar radiation sensor.
2	• Is there a short circuit to ground between climate control unit terminal 1S and solar radiation sensor terminal B?	Yes	Repair wiring harness.
		No	This system is normal at present. (Erase the past failure from memory.)

DTC 06

C6U070201038W04

DTC 06	Passenger compartment temperature sensor system inspection
POSSIBLE CAUSE	• Passenger compartment temperature sensor malfunction • Climate control unit malfunction • Open or short circuit between passenger compartment temperature sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Is resistance between climate control unit terminals 1I and 1M as indicated below? — **76 ohms—124 kilohms**	Yes	Replace climate control unit.
		No	Go to next step.
2	• Inspect passenger compartment temperature sensor. • Is it okay?	Yes	Repair wiring harness.
		No	Replace passenger compartment temperature sensor.

DTC 07

C6U070201038W05

DTC 07	Passenger compartment temperature sensor system inspection
POSSIBLE CAUSE	• Passenger compartment temperature sensor malfunction • Climate control unit malfunction • Open or short circuit between passenger compartment temperature sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Inspect passenger compartment temperature sensor. • Is it okay?	Yes	Go to next step.
		No	Replace passenger compartment temperature sensor.
2	• Disconnect climate control unit connector (24-pin) and passenger compartment temperature sensor connector. • Is there an open circuit between the following climate control unit terminals and passenger compartment temperature sensor terminals? — 1I—A — 1M—B	Yes	Repair wiring harness.
		No	Go to next step.
3	• Is there a short circuit to ground between climate control unit terminal 1M and passenger compartment temperature sensor terminal B?	Yes	Repair wiring harness.
		No	Connect climate control unit connector, then go to next step.
4	• Turn the ignition switch to ON position. • Measure voltage at climate control unit terminal 1M. • Is voltage **approximately 5V**?	Yes	This system is normal at present. (Erase the past failure from memory.)
		No	Replace climate control unit.

DTC 10

C6U070201038W06

DTC 10	Evaporator temperature sensor system inspection
POSSIBLE CAUSE	• Evaporator temperature sensor malfunction • Climate control unit malfunction • Open or short circuit between evaporator temperature sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Is resistance between climate control unit terminals 1I and 1Q as indicated below? — **62 ohms—91 kilohms**	Yes	Replace climate control unit.
		No	Go to next step.
2	• Inspect evaporator temperature sensor. • Is it okay?	Yes	Repair wiring harness.
		No	Replace evaporator temperature sensor.

DTC 11

C6U070201038W07

DTC 11	Evaporator temperature sensor system inspection
POSSIBLE CAUSE	• Evaporator temperature sensor malfunction • Climate control unit malfunction • Open or short circuit between evaporator temperature sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Inspect evaporator temperature sensor. • Is it okay?	Yes	Go to next step.
		No	Replace evaporator temperature sensor.
2	• Disconnect climate control unit connector (24-pin) and evaporator temperature sensor connector. • Is there open circuit between following climate control unit terminals and evaporator temperature sensor terminals? — 1Q—C — 1I—A	Yes	Repair wiring harness.
		No	Go to next step.
3	• Is there short circuit to ground between climate control unit terminal 1Q and evaporator temperature sensor terminal C?	Yes	Repair wiring harness.
		No	Connect climate control unit connector, then go to next step.
4	• Turn ignition switch to ON position. • Measure voltage at climate control unit terminal 1Q. • Is voltage **approximately 5 V**?	Yes	This system is normal at present. (Erase the past failure from memory.)
		No	Replace climate control unit.

07–02

DTC 12

C6U070201038W08

DTC 12	Ambient temperature sensor system inspection
POSSIBLE CAUSE	• Ambient temperature sensor malfunction • Climate control unit malfunction • Open or short circuit between ambient temperature sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Is resistance between climate control unit terminals 1I and 1K as indicated below? — **75 ohms—89 kilohms**	Yes	Replace climate control unit.
		No	Go to next step.
2	• Inspect ambient temperature sensor. • Is it okay?	Yes	Repair wiring harness.
		No	Replace ambient temperature sensor.

DTC 13

C6U070201038W09

DTC 13	Ambient temperature sensor system inspection
POSSIBLE CAUSE	• Ambient temperature sensor malfunction • Climate control unit malfunction • Open or short circuit between ambient temperature sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Inspect ambient temperature sensor. • Is it okay?	Yes	Go to next step.
		No	Replace ambient temperature sensor.
2	• Disconnect climate control unit connector (24-pin) and ambient temperature sensor connector. • Is there an open circuit between the following climate control unit terminals and ambient temperature sensor terminals? — 1K—B — 1I—A	Yes	Repair wiring harness.
		No	Go to next step.
3	• Is there a short circuit to ground between climate control unit terminal 1K and ambient temperature sensor terminal B?	Yes	Repair wiring harness.
		No	Connect climate control unit connector, then go to next step.
4	• Turn ignition switch to ON position. • Measure voltage at climate control unit terminal 1K. • Is voltage **approximately 5 V**?	Yes	This system is normal at present. (Erase the past failure from memory.)
		No	Replace climate control unit.

DTC 14

C6U070201038W10

DTC 14	Water temperature sensor system inspection
POSSIBLE CAUSE	• Water temperature sensor malfunction • Climate control unit malfunction • Open or short circuit between water temperature sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Is resistance between climate control unit terminals 1I and 1O as indicated below? • **64 ohms—207 kilohms**	Yes	Replace climate control unit.
		No	Go to next step.
2	• Inspect water temperature sensor. • Is it okay?	Yes	Repair wiring harness.
		No	Replace water temperature sensor.

DTC 15

C6U070201038W11

DTC 15	Water temperature sensor system inspection
POSSIBLE CAUSE	• Water temperature sensor malfunction • Climate control unit malfunction • Open or short circuit between water temperature sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Is water temperature sensor normal?	Yes	Go to next step.
		No	Replace water temperature sensor.
2	• Disconnect climate control unit connector (24-pin) and water temperature sensor connector. • Is there an open circuit between the following climate control unit terminals and water temperature sensor terminals? — 1O—B — 1I—A	Yes	Repair wiring harness.
		No	Go to next step.
3	• Is there a short circuit to ground between climate control unit terminal 1O and water temperature sensor terminal B?	Yes	Repair wiring harness.
		No	Connect climate control unit connector, then go to next step.
4	• Turn the ignition switch to ON position. • Is voltage at climate control unit terminal 1O **5 V or above**?	Yes	This system is normal at present. (Erase the past failure from memory.)
		No	Replace climate control unit.

07–02

DTC 21

C6U070201038W12

DTC 21	Airflow mode actuator (potentiometer) system inspection
POSSIBLE CAUSE	• Airflow mode actuator malfunction • Climate control unit malfunction • Open circuit between airflow mode actuator and climate control unit • Short circuit between airflow mode actuator (terminal B) and climate control unit (terminal 1U: 24-pin)

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Inspect airflow mode actuator. • Is it okay?	Yes	Go to next step.
		No	Replace airflow mode actuator.
2	• Is resistance between climate control unit terminals 1U and 1I more than **4.6 kilohms**?	Yes	Go to next step.
		No	Repair wiring harness. (Short circuit)
3	• Disconnect climate control unit connectors (24-pin, 12-pin). • Is resistance between climate control unit terminals 2C and 1I less than **28.7 kilohms**?	Yes	Go to next step.
		No	Repair wiring harness. (Open circuit)
4	• Is resistance between climate control unit terminals 2C and 1U less than **25.1 kilohms**?	Yes	Replace climate control unit.
		No	Repair wiring harness. (Open circuit)

DTC 22

C6U070201038W13

DTC 22	Airflow mode actuator (potentiometer) system inspection
POSSIBLE CAUSE	• Airflow mode actuator malfunction • Climate control unit malfunction • Open circuit between airflow mode actuator and climate control unit • Short circuit between airflow mode actuator (terminal B) and climate control unit (terminal 1U: 24-pin)

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Inspect airflow mode actuator. • Is it okay?	Yes	Go to next step.
		No	Replace airflow mode actuator.
2	• Disconnect climate control unit connector (24-pin). • Is there an open circuit between the following climate control unit terminals and airflow mode actuator terminals? — 2C—A — 1U—B — 1I—C	Yes	Repair wiring harness.
		No	Go to next step.
3	• Is there a short circuit to ground between climate control unit terminal 1U and airflow mode actuator terminal B?	Yes	Repair wiring harness.
		No	This system is normal at present. (Erase the past failure from memory.)

DTC 59

C6U070201038W14

DTC 59	Airflow mode actuator (motor lock) system inspection
POSSIBLE CAUSE	• Airflow mode actuator malfunction • A/C unit (airflow mode links or airflow mode cranks or both) malfunction • Climate control unit malfunction • Open or short circuit between airflow mode actuator and climate control unit

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Disconnect airflow mode actuator connector. • Connect battery positive voltage to airflow mode actuator terminal E (or terminal F) and ground to terminal F (or terminal E). • Does airflow mode actuator operate?	Yes	Connect airflow mode actuator connector, then go to Step 3.
		No	Go to next step.
2	• Remove airflow mode actuator. • Operate airflow mode main link by hand. • Does airflow mode main link operate smoothly?	Yes	Replace airflow mode actuator.
		No	Replace airflow mode links or airflow mode cranks or both.
3	• Disconnect climate control unit connector (12-pin). • Connect battery positive voltage to climate control unit terminal 2G (or terminal 2E) and ground to terminal 2E (or terminal 2G). • Does airflow mode actuator operate?	Yes	Replace climate control unit.
		No	Repair wiring harness.

DTC 06, 10, 12, 14, 21 (WHEN TWO OR MORE DTCS ARE INDICATED AT THE SAME TIME)

C6U070201038W15

DTC 06, 10, 12, 14, 21	Climate control unit (+5V power supply or sensor ground system) or sensor ground system inspection
POSSIBLE CAUSE	• Climate control unit malfunction • Open circuit between climate control unit and each temperature sensor • Open circuit between climate control unit and airflow mode actuator

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Disconnect climate control unit connector (24-pin) and evaporator temperature sensor connector. • Is there continuity between climate control unit terminal 1I and evaporator temperature sensor terminal A?	Yes	Replace climate control unit.
		No	Repair wiring harness.

DTC 07, 11, 13, 15, 22 (WHEN TWO OR MORE DTCS ARE INDICATED AT THE SAME TIME)

C6U070201038W16

DTC 07, 11, 13, 15, 22	Climate control unit (+5V power supply or sensor ground system) or sensor ground system inspection
POSSIBLE CAUSE	• Climate control unit malfunction • Open circuit between climate control unit each temperature sensor • Open circuit between climate control unit and airflow mode actuator

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Disconnect climate control unit connector (24-pin) and evaporator temperature sensor connector. • Is there an open circuit between climate control unit terminal 1I and evaporator temperature sensor terminal A?	Yes	Repair wiring harness.
		No	This system is normal at present. (Erase the past failure from memory.)

07–03 SYMPTOM TROUBLESHOOTING

FOREWORD

C6U070301038W01

- The areas for inspection (steps) are given according to various circuit malfunctions. Use the following chart to verify the symptoms of the trouble in order to diagnose the appropriate area.

TROUBLESHOOTING INDEX

C6U070301038W02

No.	TROUBLESHOOTING ITEM	DESCRIPTION
1	Insufficient air (or no air) blown from vents.	• Problem with vents or ducts or both. • Airflow mode does not change.
2	Amount of air blown from vents does not change. (Full-auto air conditioner)	• Malfunction in blower system.
3	Amount of air blown from vents does not change. (Manual air conditioner)	• Malfunction in blower system.
4	Air intake mode does not change.	• Air intake mode does not change when switching REC/FRESH mode.
5	No temperature control with climate control unit.	• Malfunction in A/C unit or climate control unit air mix system or both.
6	Windshield fogged.	• A/C compressor does not operate when airflow mode is in DEFROSTER or HEAT/DEF modes. • Air intake mode does not change to FRESH when airflow mode is in DEFROSTER or HEAT/DEF modes.
7	Air from vents not cold enough.	• Magnetic clutch operates but A/C system malfunctions.
8	No cool air.	• Magnetic clutch does not operate.
9	Noise while operating A/C system.	• Noise from magnetic clutch, A/C compressor, hose or refrigerant line.

NO.1 INSUFFICIENT AIR (OR NO AIR) BLOWN FROM VENTS

C6U070301038W03

1	Insufficient air (or no air) blown from vents.
DESCRIPTION	• Problem with each vent or duct or both. • Airflow mode does not change.
POSSIBLE CAUSE	• Malfunction in airflow mode actuator (Steps 1) • Malfunction in VENT mode system (Steps 2—5) • Malfunction in HEAT mode system (Step 6) • Malfunction in DEFROSTER mode system (Steps 7—9)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT AIRFLOW MODE ACTUATOR** • Inspect airflow mode actuator. (See 07–40–6 AIRFLOW MODE ACTUATOR INSPECTION.) • Is it okay?	Yes	Go to next step
		No	Repair or replace malfunctioning part in accordance with further inspection result. (See 07–40–6 AIRFLOW MODE ACTUATOR INSPECTION.)
2	**INSPECT TO SEE WHETHER MALFUNCTION IS IN VENT MODE OR OTHER MODES** • Does air blow out when in VENT mode?	Yes	Go to Step 5.
		No	Go to next step.
3	**INSPECT VENT** • Is vent clogged?	Yes	Remove obstruction, then go to Step 9.
		No	Go to next step.
4	**VERIFY THAT DUCT IN DASHBOARD IS INSTALLED** • Is duct in dashboard properly installed?	Yes	Inspect duct for clogging, deformity and air leakage, then go to Step 8.
		No	Install duct securely in the proper position, then go to Step 9.
5	**INSPECT TO SEE WHETHER MALFUNCTION IS IN HEAT MODE OR DEFROSTER MODE** • Does air blow out when in HEAT mode?	Yes	Go to next step.
		No	Inspect vent for clogging, then go to Step 9.
6	**INSPECT DEFROSTER MODE** • Does air blow out when in DEFROSTER mode?	Yes	Operation is okay. Recheck malfunction symptoms.
		No	Go to next step.
7	**INSPECT VENT** • Is vent clogged?	Yes	Remove obstruction, then go to Step 9.
		No	Go to next step.
8	**VERIFY THAT DEFROSTER DUCT IS INSTALLED** • Is defroster duct properly installed?	Yes	Inspect duct for clogging, deformity, and air leakage, then go to next step.
		No	Install duct securely in proper position, then go to next step.
9	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does air blow out?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.2 AMOUNT OF AIR BLOWN FROM VENTS DOES NOT CHANGE

C6U070301038W04

Full-auto Air Conditioner

2	Amount of air blown from vents does not change.
DESCRIPTION	• Malfunction in blower system.
POSSIBLE CAUSE	• Malfunction in blower unit (Steps 3, 4, 12) • Malfunction in blower motor (Steps 5—9) • Malfunction in PWM unit system (Steps 10, 11, 13, 14) • Malfunction in climate control unit (Step 15)

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT BLOWER 40 A FUSE** • Inspect BLOWER 40 A fuse. • Is it okay?	Yes	Go to next step.
		No	Replace fuse, then go to Step 15. If fuse burns out immediately, go to next step.
2	**INSPECT TO SEE WHETHER MALFUNCTION IS IN BLOWER UNIT OR ELSEWHERE** • Turn ignition switch to ON position. • Turn the fan switch to ON position. • Recirculate air inside vehicle. • Does blower unit fan rotate smoothly?	Yes	Go to next step.
		No	Go to Step 4.
3	**INSPECT BLOWER UNIT INTAKE VENT** • Is intake vent of blower unit clogged?	Yes	Remove obstruction, then go to Step 15.
		No	Inspect if there are any obstructions in passage between blower unit to A/C unit, then go to Step 15.
4*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN BLOWER RELAY SYSTEM OR PWM UNIT SYSTEM** • Turn ignition switch to ON position. • Turn the fan switch to OFF position. • Test voltage at the following terminal of blower motor: — Terminal B (blower motor operation signal) • Is voltage **approximately 12 V**?	Yes	Go to Step 8.
		No	Go to next step.
5*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN FUSE BLOCK AND BLOWER RELAY) OR ELSEWHERE** • Test voltage at the following terminals of blower relay: — Terminal A (IG2 signal) — Terminal C (B+ signal) • Is voltage **approximately 12 V**?	Yes	Go to next step.
		No	Repair wiring harness between blower relay and BLOWER 40 A fuse, then go to Step 15.
6*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN BLOWER RELAY AND GROUND) OR ELSEWHERE** • Test voltage at the following terminal of blower relay: — Terminal E (GND signal) • Is voltage **approximately 0 V**?	Yes	Go to next step.
		No	Repair wiring harness between blower relay and ground, then go to Step 15.
7*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN BLOWER RELAY AND BLOWER MOTOR) OR BLOWER RELAY** • Test voltage at the following terminal of blower relay: — Terminal D (blower motor operation signal) • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between blower relay and blower motor, then go to Step 15.
		No	Replace blower relay, then go to Step 15.

STEP	INSPECTION		ACTION
8*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN BLOWER MOTOR OR ELSEWHERE** • Test voltage at the following terminal of blower motor: — Terminal A (blower motor operation signal) • Is voltage **approximately 12 V**?	Yes	Go to next step.
		No	Inspect blower motor, then go to Step 15.
9*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN BLOWER MOTOR AND PWM UNIT) OR ELSEWHERE** • Test voltage at the following terminal of PWM unit: — Terminal 2C and 1A (blower motor operation signal) • Is voltage **approximately 12 V**?	Yes	Go to next step.
		No	Repair wiring harness between blower motor and PWM unit, then go to Step 15.
10*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN PWM UNIT AND GROUND) OR ELSEWHERE** • Test voltage at the following terminal of PWM unit: — Terminal 1B (blower motor operation signal) • Is voltage **approximately 0 V**?	Yes	Go to next step.
		No	Repair wiring harness between PWM unit and ground, then go to Step 15.
11	**INSPECT BLOWER UNIT** • Inspect fan in blower unit. — Is fan free of interference with blower unit case? — Is fan free of foreign material and obstruction? • Is fan okay?	Yes	Go to next step.
		No	Remove obstruction, repair or replace fan and blower unit case, then go to Step 15.
12*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN PWM UNIT OR ELSEWHERE** • Turn the fan switch to 1st position from off. • Test voltage at the following terminal of PWM unit: — Terminal 2A (blower motor control signal) • Does voltage change from **12 V to 9 V**?	Yes	Replace PWM unit, then go to Step 15.
		No	Go to next step.
13*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN PWM UNIT AND CLIMATE CONTROL UNIT) OR ELSEWHERE** • Turn ignition switch to LOCK position. • Disconnect climate control unit connector. • Inspect for continuity at the following terminals between PWM unit and climate control unit: — Terminal 2A—1C (blower motor control signal) • Is there continuity?	Yes	Go to next step.
		No	Repair wiring harness between PWM unit and climate control unit, then go to Step 15.
14*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (SHORT TO GROUND BETWEEN PWM UNIT AND CLIMATE CONTROL UNIT)** • Inspect for continuity between the following PWM unit terminal and ground. — Terminal 2A (blower motor control signal) • Is there continuity?	Yes	Repair wiring harness between PWM unit and ground, then go to next step.
		No	Replace climate control unit, then go to next step.
15	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Is air discharged from vent?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.3 AMOUNT OF AIR BLOWN FROM VENTS DOES NOT CHANGE

C6U07030103BW05

Manual Air Conditioner

3	Amount of air blown from vents does not change.
DESCRIPTION	• Malfunction in blower system.
POSSIBLE CAUSE	• Blower relay, blower motor, resistor, fan switch malfunction (Step 1) • Blower unit malfunction (Steps 2—4)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT BLOWER SYSTEM** • Inspect the following systems and electrical parts: — Blower relay — Blower motor — Resistor — Fan switch — Related wiring harnesses • Are they okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning part, then go to Step 5.
2	**CHECK TO SEE WHETHER MALFUNCTION IS IN BLOWER UNIT OR ELSEWHERE** • Turn ignition switch to ON position. • Turn fan switch on. • Recirculate air inside vehicle. • Does fan in blower unit rotate smoothly?	Yes	Go to Step 4.
		No	Go to next step.
3	**INSPECT BLOWER UNIT** • Inspect fan in blower unit. — Is fan free of interference from blower unit case? — Is fan free of foreign material and obstructions? • Is fan okay?	Yes	Go to next step.
		No	Remove obstruction, repair or replace fan and blower unit case, then go to Step 5.
4	**INSPECT BLOWER UNIT INTAKE VENT** • Is blower unit intake vent clogged?	Yes	Remove obstruction, then go to next step.
		No	Inspect if there are any obstructions in passage between blower unit and A/C unit, then go to next step.
5	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does air blow out?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.4 AIR INTAKE MODE DOES NOT CHANGE

C6U070301038W06

4	**Air intake mode does not change.**
DESCRIPTION	• Air intake mode does not change when switching REC/FRESH mode.
POSSIBLE CAUSE	• Malfunction in air intake actuator (Steps 1—6) • Malfunction in air intake door (Step 7)

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.
- When checking intake motor drive signal, test it within **20 seconds** after switching REC/FRESH mode. For that signal turns off after **20 seconds**.

Diagnostic procedure

STEP	INSPECTION		ACTION
1*	**INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN AIR INTAKE ACTUATOR, WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR) OR ELSEWHERE** • Turn ignition switch to ON position. • Test voltages at the following terminals of climate control unit: — Terminal 2K (FRESH motor drive signal) — Terminal 2I (RECIRCULATE motor drive signal) (See 07–40–18 Full-auto Air Conditioner) • Are voltages okay?	Yes	Go to next step.
		No	Go to Step 3.
2*	**INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN AIR INTAKE ACTUATOR OR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR)** • Test voltages at the following terminals of air intake actuator: — Terminal H (FRESH motor drive signal) — Terminal G (RECIRCULATE motor drive signal) • Are voltages as shown below? — Terminal H: **approximately 0.5 V** during RECIRCULATE and **approximately 10 V** during FRESH — Terminal G: **approximately 10 V** during RECIRCULATE and **approximately 0.5 V** during FRESH	Yes	Replace air intake actuator, then go to Step 8.
		No	Repair wiring harness between climate control unit and air intake actuator, then go to Step 8.
3	**INSPECT TO SEE WHETHER MALFUNCTION IS IN AIR INTAKE ACTUATOR OR ELSEWHERE** • Disconnect air intake actuator connector. • Test voltages at the following terminals of climate control unit: — Terminal 2K (FRESH motor drive signal) — Terminal 2I (RECIRCULATE motor drive signal) (See 07–40–18 Full-auto Air Conditioner) • Are voltages okay?	Yes	Inspect air intake actuator, then go to Step 8.
		No	Go to next step.
4	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO B+ BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR) OR ELSEWHERE** • Disconnect climate control unit connector. • Test voltages at the following terminals of climate control unit: — Terminal 2K (FRESH motor drive signal) — Terminal 2I (RECIRCULATE motor drive signal) • Are voltages **approximately 0 V**?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and air intake actuator, then go to Step 8.

STEP	INSPECTION		ACTION
5	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO GROUND BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR) OR ELSEWHERE** • Turn ignition switch to LOCK position. • Inspect for continuity at the following terminals between climate control unit and ground: — Terminal 2K (FRESH motor drive signal) — Terminal 2I (RECIRCULATE motor drive signal) • Is there continuity?	Yes	Repair wiring harness between climate control unit and air intake actuator, then go to Step 8.
		No	Go to next step.
6	**INSPECT AIR INTAKE LINK** • Inspect air intake links. — Is there grease on link? — Are links securely and properly installed? — Are links free of obstructions and hindrances? • Are above items okay?	Yes	Go to next step.
		No	Apply grease to links. If any links are damaged, replace air intake actuator, then go to Step 8.
7	**INSPECT TO SEE WHETHER MALFUNCTION IS IN CLIMATE CONTROL UNIT OR AIR INTAKE DOOR** • Inspect blower unit air intake door. — Is door free of obstructions, cracks, and damage? — Are doors securely and properly installed? • Are above items okay?	Yes	Replace climate control unit, then go to next step.
		No	Remove obstruction, or install doors in proper positions. If any doors are cracked or damaged, replace them, then go to next step.
8	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does air intake mode change smoothly?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.5 NO TEMPERATURE CONTROL WITH CLIMATE CONTROL UNIT

C6U070301038W07

5	**No temperature control with climate control unit.**
DESCRIPTION	• Malfunction in A/C unit or climate control unit air mix system or both.
POSSIBLE CAUSE	• A/C unit air mix link, air mix crank, air mix rod, air mix wire, wire clamp malfunction (Steps 2, 3) • Climate control unit rack-and-pinion, air mix wire malfunction (Step 4) • A/C unit air mix door malfunction (Steps 5, 6) • Heater piping malfunction (Step 7)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT COOLANT TEMPERATURE** • Is coolant sufficiently warmed up?	Yes	Go to next step.
		No	Warm engine up, then go to Step 8.
2	**INSPECT A/C UNIT AIR MIX SYSTEM** • Inspect A/C unit air mix links, air mix cranks, air mix rods, air mix actuator or wire clamp. — Is there grease on links and cranks? — Are links, cranks, and rods securely installed in their proper positions? — Is wire clamp free of deformation? • Are above items okay?	Yes	Go to next step.
		No	Apply grease or install links, cranks, and rods securely in their proper positions, repair or replace air mix actuator or wire clamp, then go to Step 8.
3	**VERIFY THAT AIR MIX WIRE FROM A/C UNIT IS POSITIONED SECURELY AND CORRECTLY (IF AVAILABLE)** • Is air mix wire securely installed in the correct position in relation to A/C unit air mix links?	Yes	Go to next step.
		No	Adjust air mix wire or install securely in correct position, then go to Step 8.
4	**INSPECT CLIMATE CONTROL UNIT** • Inspect climate control unit. (See 07–40–18 CLIMATE CONTROL UNIT INSPECTION) • Is climate control unit okay?	Yes	Go to next step.
		No	Repair or replace climate control unit, then go to Step 8.
5	**INSPECT A/C UNIT** • Is there any foreign material or obstruction in A/C unit air mix doors?	Yes	Remove obstruction, then go to Step 8.
		No	Go to next step.
6	**INSPECT A/C UNIT AIR MIX DOORS** • Is A/C unit air mix door securely and properly installed?	Yes	Inspect air mix door for cracks or damage, then go to next step.
		No	Install air mix door securely in proper position, then go to next step.
7	**INSPECT HEATER LINES** • Inspect heater lines. — Is heater piping free of damage and cracks? — Are heater piping connections free of engine coolant leakage? — Are heater piping connections securely tightened? — Are heater piping installation points on A/C unit free of engine coolant leakage? • Are above items okay?	Yes	Operation is okay. Recheck malfunction symptoms.
		No	If heater piping connections are loose, tighten connections with specified torque. Repair or replace heater piping, then go to next step.
8	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does unit operate in every temperature setting?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.6 WINDSHIELD FOGGED

C6U07030103BW08

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.
- When checking intake motor drive signal, test it within **20 seconds** after switching REC/FRESH mode. For that signal turns off after **20 seconds**.

6	**Windshield fogged.**
DESCRIPTION	• A/C compressor does not operate when airflow mode is in DEFROSTER or HEAT/DEF modes. • Air intake mode does not change to FRESH when airflow mode is in DEFROSTER or HEAT/DEF modes.
POSSIBLE CAUSE	• Climate control unit (B+ signal) system malfunction (Steps 2, 4, 5) • Air intake actuator malfunction (Steps 3, 7) • Climate control unit (RECIRCULATE, FRESH signal) system malfunction (Steps 9—11) • Malfunction in blower unit air intake doors (Steps 12, 13)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**COOL AIR BLOW OUT INSPECTION** • When both A/C and fan switch in climate control unit are on, does cool air blow out from front vent?	Yes	Go to next step.
		No	Go to Step 1 of troubleshooting index No.8.
2	**INSPECT CLIMATE CONTROL UNIT POWER SUPPLY FUSE FOR B+ SIGNAL** • Is climate control unit power supply fuse for B+ signal okay?	Yes	Go to next step.
		No	Inspect for a short to ground on blown fuse circuit. • Repair or replace as necessary. Install appropriate amperage fuse.
3	**INSPECT AIR INTAKE ACTUATOR** • Inspect air intake actuator. — Is there grease on link? — Is link securely and properly positioned? — Is link free of obstructions? • Are above items okay?	Yes	Go to next step.
		No	Apply grease or install link properly and securely, remove obstruction, then go to Step 14.
*4	**INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND CLIMATE CONTROL UNIT FOR CONTINUITY** • Disconnect climate control unit connector (12-pin). • Turn ignition switch to ON position. • Test voltage at climate control unit terminal 2F (B+ signal). • Is voltage **approximately 12 V**?	Yes	Go to next step.
		No	Repair wiring harness between fuse block and climate control unit, then go to Step 14.
*5	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND GROUND FOR VOLTAGE** • Test voltage at climate control unit terminal 2L (Ground). • Is voltage **approximately 0V**?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and ground, then go to Step 14.
6	**VERIFY WHETHER MALFUNCTION IS IN BLOWER UNIT AIR INTAKE DOOR OR ELSEWHERE** • Turn ignition switch to LOCK position. • Connect climate control unit connector (12-pin). • Remove air intake actuator. • Turn ignition switch to ON position. • Set fan switch to 4th position. • Does air intake mode (RECIRCULATE, FRESH) change smoothly when air intake link is operated by hand?	Yes	Go to next step.
		No	Go to Step 12.
7	**INSPECT AIR INTAKE ACTUATOR** • Inspect air intake actuator. (See 07-40-4 AIR INTAKE ACTUATOR INSPECTION) • Is it okay?	Yes	Go to next step.
		No	Replace air intake actuator, then go to Step 14.

STEP	INSPECTION		ACTION
8	**INSPECT AIR INTAKE SELECTOR SWITCH AND DEFROSTER SWITCH IN CLIMATE CONTROL UNIT** • Test voltage at climate control unit terminals 2K and 2I. • Is it okay?	Yes	Go to next step.
		No	Replace climate control unit, then go to Step 14.
*9	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR CONTINUITY** • Turn ignition switch to LOCK position. • Is there continuity between the following climate control unit terminals and air intake actuator terminals? — Terminal 2K—Terminal H (FRESH signal) — Terminal 2I—Terminal G (RECIRCULATE signal)	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and air intake actuator, then go to Step 14.
*10	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR SHORT TO GROUND** • Is there continuity between the following climate control unit terminals and ground? — Terminal 2K (FRESH signal) — Terminal 2I (RECIRCULATE signal)	Yes	Repair wiring harness between climate control unit and air intake actuator, then go to Step 14.
		No	Go to next step.
*11	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR SHORT TO B+** • Turn ignition switch to ON position • Test voltage at the following climate control unit terminals: — Terminal 2K (FRESH signal) — Terminal 2I (RECIRCULATE signal) • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between climate control unit and air intake actuator, then go to Step 14.
		No	Replace climate control unit, then go to Step 14.
12	**INSPECT BLOWER UNIT AIR INTAKE DOOR** • Is there any foreign material or obstruction in blower unit air intake door?	Yes	Remove obstruction, then go to Step 14.
		No	Go to next step.
13	**VERIFY THAT BLOWER UNIT AIR INTAKE DOOR IS POSITIONED SECURELY AND PROPERLY** • Is blower unit air intake door securely and properly positioned?	Yes	Inspect air intake door for cracks or damage, then go to next step.
		No	Install air intake door securely in proper position, then go to next step.
14	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does malfunction disappear?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.7 AIR FROM VENTS COLD ENOUGH

C6U070301038W09

7	Air from vents not cold enough.
DESCRIPTION	• Magnetic clutch operates but A/C system malfunctions.
POSSIBLE CAUSE	• Drive belt malfunction (Step 2) • Malfunction in blower unit or condenser (Steps 4, 5) • Malfunction in receiver/drier or expansion valve (valve closes too much) (Steps 8, 9) • Malfunction in refrigerant lines (Steps 10, 11) • A/C compressor system malfunction, insufficient compressor oil (Steps 15, 16) • Over filling of compressor oil, malfunction in expansion valve or A/C unit air mix link system (Steps 17—19)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVE BELT** • Inspect drive belt. (See 01–10A–3 DRIVE BELT INSPECTION [L3]) (See 01–10B–3 DRIVE BELT INSPECTION [AJ]) • Is it okay?	Yes	Go to next step.
		No	Adjust or replace drive belt, then go to Step 20.
2	**INSPECT REFRIGERANT SYSTEM PERFORMANCE** • Perform refrigerant system performance test. (See 07–10–2 REFRIGERANT SYSTEM PERFORMANCE TEST) • Is operation normal?	Yes	Operation is normal. (Recheck malfunction symptoms.)
		No	Go to next step.
3	**CHECK TO SEE WHETHER MALFUNCTION IS IN BLOWER UNIT INTAKE AND CONDENSER OR ELSEWHERE** • Are refrigerant high-pressure and low-pressure values both high?	Yes	Go to next step.
		No	Go to Step 6.
4	**INSPECT BLOWER UNIT INTAKE** • Is blower unit intake clogged?	Yes	Remove obstruction, then go to Step 20. (If air does not reach evaporator within A/C unit, heat exchange does not occur and refrigerant pressure becomes high. Therefore, removal of obstruction is necessary.)
		No	Go to next step.
5	**INSPECT CONDENSER** • Inspect condenser. (See 07–11–8 CONDENSER INSPECTION) • Is it okay?	Yes	Adjust refrigerant to specified amount, then go to Step 20. (Excessive amount of refrigerant.)
		No	Replace condenser, or repair and clean condenser fins, then go to Step 20.
6	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE, RECEIVER/DRIER AND REFRIGERANT LINES OR ELSEWHERE** • Are refrigerant high-pressure and low-pressure values low?	Yes	Go to next step.
		No	Go to Step 14.
7	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE AND RECEIVER/DRIER OR ELSEWHERE** • Immediately after A/C compressor operates, does refrigerant high-pressure value momentarily rise to correct value, then fall and stay below it? (Is there negative pressure on low-pressure side?)	Yes	Go to next step.
		No	Go to Step 10.
8	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE OR RECEIVER/DRIER** • Turn A/C switch off and let air conditioner stop for **10 min**. • Start engine. • Turn both A/C switch and fan switch on. • Does malfunction occur after A/C compressor turns on?	Yes	Go to next step.
		No	Replace condenser and bleed refrigerant line for **30 min or more** using a vacuum pump, add refrigerant to specified level, then go to Step 20. (Since water has intermixed in receiver/drier and it is saturated, replacement is necessary.)

STEP	INSPECTION		ACTION
9	**VERIFY THAT EXPANSION VALVE HEAT-SENSING TUBE WITHIN A/C UNIT IS POSITIONED SECURELY AND CORRECTLY** • Is expansion valve heat-sensing tube within A/C unit securely installed in proper position?	Yes	Replace expansion valve, then go to Step 20. (Since valve closes too much, replacement is necessary.)
		No	Install heat-sensing tube securely in proper position, then go to Step 20.
10	**INSPECT REFRIGERANT LINES** • Inspect refrigerant lines. — Is piping free of damage and cracks? — Are piping connections free of oil grime? (Visual inspection) — Are piping connections free of gas leakage? — Are piping installation points on condenser free of gas leakage? — Are piping installation points on receiver/drier free of gas leakage? — Are piping installation points on A/C compressor free of gas leakage? — Are piping installation points on A/C unit free of gas leakage? — Perform gas leak inspection using gas leak tester. • Are above items okay?	Yes	Go to next step.
		No	If piping or A/C component(s) are damaged or cracked, replace them. Then go to Step 20. If there is no damage, go to Step 13.
11	**INSPECT EVAPORATOR PIPING CONNECTIONS IN A/C UNIT FOR GAS LEAKAGE** • Are piping connections for evaporator in A/C unit free of gas leakage?	Yes	If the vane makes a noise, add **10 ml {10 cc, 0.34 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Adjust refrigerant to specified amount, then go to Step 20.
		No	If piping is damaged or cracked, replace it. Then go to Step 20. If there is no damage, go to next step.
12	**INSPECT EVAPORATOR PIPING CONNECTIONS IN A/C UNIT FOR LOOSE** • Are piping connections for evaporator in A/C unit loose?	Yes	Tighten connections with specified torque, adjust both compressor oil and refrigerant to specified amount, then go to Step 20.
		No	If the vane makes a noise, add **10 ml {10 cc, 0.34 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Replace O-ring on piping, adjust refrigerant to specified amount, then go to Step 20.
13	**INSPECT PIPING CONNECTIONS FOR LOOSENESS** • Are piping connections loose?	Yes	Tighten connections with specified torque, adjust both compressor oil and refrigerant to specified amount, then go to Step 20.
		No	If the vane makes a noise, add **10 ml {10 cc, 0.34 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Replace O-ring on piping, adjust refrigerant to specified amount, then go to Step 20.
14	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE, AIR MIX ACTUATOR AND COMPRESSOR OIL OR ELSEWHERE** • Does refrigerant high-pressure value increase only a little?	Yes	Go to next step. (Pressure increases only a little.)
		No	Go to Step 17.
15	**CHECK TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL AMOUNT AND A/C COMPRESSOR OR ELSEWHERE** • When engine is racing, does high-pressure value increase?	Yes	Return to Step 3.
		No	Go to next step.
16	**CHECK TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL AMOUNT OR A/C COMPRESSOR** • After compressor oil is replenished each **10 ml {10 cc, 0.34 fl oz}**, does high-pressure value increase?	Yes	Troubleshooting completed. (Explain to customer that cause was insufficient compressor oil.)
		No	Replace A/C compressor, then go to Step 20. (Cause is defective A/C compressor.)
17	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE OR ELSEWHERE** • Is only refrigerant low-pressure value high?	Yes	Go to Step 19.
		No	Go to next step.

STEP	INSPECTION		ACTION
18	**VERIFY THAT AIR MIX IS INSTALLED SECURELY AND PROPERLY** • Are A/C unit air mix links, air mix cranks, and air mix rods securely and properly installed?	Yes	Set fan switch to 4th position. Turn A/C switch on. Set FRESH mode. Set temperature control to MAX COLD. Set VENT mode. (1)Start and run the engine at **1,500 rpm** for **10 min**. (2)Run the engine at idle for **1 min**. (3)Within **12 s**, idle → **4,000 rpm** → idle. Perform cycle **5 times**. (4) Run the engine at idle for **30 s**. (5)Drain the compressor oil completely from the A/C compressor and verify the amount. • If there is **approximately 90 ml {90 cc, 3.0 fl oz}** of compressor oil, go to Step 20. • If there is **90 ml {90 cc, 3.0 fl oz} or more** of compressor oil, remove surplus oil and fill A/C compressor with **90 ml {90 cc, 3.0 fl oz}** of compressor oil. Repeat Steps (1) to (5). (Cause is excessive amount of compressor oil.)
		No	Repair or install links, cranks and rods securely in proper position, then go to Step 20.
19	**VERIFY THAT EXPANSION VALVE HEAT-SENSING TUBE WITHIN A/C UNIT IS POSITIONED SECURELY AND CORRECTLY** • Is expansion valve heat-sensing tube within A/C unit securely installed in proper position?	Yes	Replace expansion valve, then go to next step. (Since valve opens too much, replacement is necessary.)
		No	Install heat-sensing tube securely in proper position, then go to next step.
20	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does cool air blow out? (Are results of refrigerant system performance test okay?)	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.8 NO COOL AIR

C6U070301038W10

8	No cool air
DESCRIPTION	• Magnetic clutch does not operate.
POSSIBLE CAUSE	• Malfunction in PCM A/C cut control system (Step 3) • Malfunction in climate control unit (Step 4) • Malfunction in refrigerant pressure switch (Steps 5, 7—9) • Malfunction in PCM (A/C signal) (Step 6) • Malfunction in PCM (IG1 signal) (Steps 10, 11) • Malfunction in A/C compressor (Step 12) • Malfunction in A/C relay (Steps 13—15) • Malfunction in evaporator temperature sensor (Step 16)

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT AIR BLOW OUT** • Does air blow out?	Yes	Go to next step.
		No	Go to Step 1 of troubleshooting indexes No.1 and 2.
2	**INSPECT A/C COMPRESSOR OPERATION** • Start engine. • Turn A/C switch and fan switch on. • Does A/C compressor operate?	Yes	Go to Step 1 of troubleshooting index No.7.
		No	Go to next step.
3	**INSPECT FOR PCM DTC** • Inspect for DTCs related to the PCM on-board diagnostic system. • Are any DTCs displayed?	Yes	Go to appropriate inspection procedure.
		No	Go to next step.
4	**INSPECT TO SEE WHETHER MALFUNCTION IS IN CLIMATE CONTROL UNIT OR ELSEWHERE** • Does cool air blow out when terminal 1P of climate control unit (A/C signal) is grounded?	Yes	Replace climate control unit, then go to Step 17.
		No	Release short, then go to next step.
5*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C SIGNAL CIRCUIT (BETWEEN REFRIGERANT PRESSURE SWITCH AND PCM) OR ELSEWHERE** • Test voltage at the following terminal of refrigerant pressure switch: — Terminal B (A/C signal) • Is voltage **approximately 12 V**?	Yes	Go to Step 7.
		No	Go to next step.
6*	**INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN REFRIGERANT PRESSURE SWITCH AND PCM) OR PCM** • Test voltage at PCM A/C signal terminal. • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between PCM and refrigerant pressure switch, then go to Step 17.
		No	Inspect PCM, then go to Step 17.
7	**INSPECT TO SEE WHETHER MALFUNCTION IS IN REFRIGERANT PRESSURE SWITCH, REFRIGERANT AMOUNT, OR ELSEWHERE** • Does cool air blow out when terminals A and B of refrigerant pressure switch connector are shorted?	Yes	Go to Step 9.
		No	Go to next step.
8*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN REFRIGERANT PRESSURE SWITCH AND CLIMATE CONTROL UNIT) OR ELSEWHERE** • Test voltage at the following terminal of climate control unit. — Terminal 1P (A/C signal) • Is voltage **approximately 12 V**?	Yes	Go to Step 10.
		No	Repair wiring harness between refrigerant pressure switch and climate control unit, then go to Step 17.
9	**INSPECT TO SEE WHETHER MALFUNCTION IS IN REFRIGERANT PRESSURE SWITCH OR REFRIGERANT AMOUNT** • Inspect refrigerant pressure switch. • Is it okay?	Yes	If there is no refrigerant, replace condenser, bleed the refrigerant line for **30 min or more** using a vacuum pump, and add refrigerant to specified level, then go to Step 17.
		No	Replace refrigerant pressure switch, then go to Step 17.

STEP	INSPECTION		ACTION
10	**INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN A/C CONTROL SIGNAL CIRCUIT (BETWEEN A/C RELAY AND PCM) OR ELSEWHERE** • Does cool air blow out when A/C relay terminal E (A/C control signal) is grounded?	Yes	Release short, then go to next step.
		No	Go to Step 12.
11*	**INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN PCM OR WIRING HARNESS (BETWEEN A/C RELAY AND PCM)** • Test voltage at the PCM A/C relay control signal terminal. • Is voltage **approximately 12 V**?	Yes	Inspect PCM, then go to Step 17.
		No	Repair wiring harness between A/C relay and PCM, then go to Step 17.
12*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN MAGNETIC CLUTCH OR ELSEWHERE** • Test voltage at the following terminal of magnetic clutch thermal protector: — Terminal A (magnetic clutch operation signal) • Is voltage **approximately 12 V**?	Yes	Inspect magnetic clutch, then go to Step 17.
		No	Go to next step.
13	**INSPECT FUSE** • Are A/C relay power supply fuses okay?	Yes	Go to next step.
		No	Replace fuse, then go to Step 17. If fuse burns out immediately, go to next step.
14	**INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND A/C RELAY FOR LACK OF CONTINUITY** • Test voltages at the following terminals of A/C relay. — Terminal A (A/C relay control signal) — Terminal C (A/C control signal) • Are voltages **approximately 12 V**?	Yes	Go to next step.
		No	Repair wiring harness between fuse block and A/C relay, then go to Step 17.
15	**INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C RELAY OR WIRING HARNESS (BETWEEN A/C RELAY AND MAGNETIC CLUTCH) AND EVAPORATOR TEMPERATURE SENSOR** • Test voltage at the following terminal of A/C relay: — Terminal D (magnetic clutch operation signal) • Is voltage **approximately 12 V**?	Yes	Inspect wiring harness between A/C relay and magnetic clutch. • If above wiring harness is OK, go to next step. • If above wiring harness malfunctions, repair wiring harness, then go to Step 17.
		No	Replace A/C relay, then go to Step 17.
16	**INSPECT EVAPORATOR TEMPERATURE SENSOR** • Inspect evaporator temperature sensor. • Is it okay?	Yes	Go to next step.
		No	Replace evaporator temperature sensor, then go to next step.
17	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does cool air blow out? (Are the results of refrigerant system performance test okay?)	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.9 NOISE WHILE OPERATING A/C SYSTEM

C6U070301038W11

9	**Noise while operating A/C system.**
DESCRIPTION	• Noise from magnetic clutch, A/C compressor, hose or refrigerant line.
POSSIBLE CAUSE	• Magnetic clutch operation noise (Step 3) • A/C compressor slippage noise (Steps 13—16) • Hose or refrigerant line interference noise (Step 17)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT A/C COMPRESSOR SLIPPAGE NOISE** • Is there a squeaking or whirling sound (A/C compressor slippage noise)?	Yes	Go to Step 13.
		No	Go to next step.
2	**INSPECT A/C COMPRESSOR INTERFERENCE NOISE** • Is there a rattling or vibrating sound (interference noise)?	Yes	Go to Step 17.
		No	Go to next step.
3	**INSPECT MAGNETIC CLUTCH OPERATION NOISE** • Is there a clicking sound (magnetic clutch operation noise)?	Yes	Adjust clearance between pressure plate of magnetic clutch and A/C compressor pulley, then go to Step 18. (See 07–40–10 MAGNETIC CLUTCH ADJUSTMENT)
		No	Condition is normal. (Recheck malfunction symptoms.)
4	**INSPECT A/C COMPRESSOR NOISE TIME** • Is noise heard continuously for **3 s or more** after A/C compressor comes on?	Yes	Go to next step.
		No	Condition is normal. (Noise occurs for **2—3 s** immediately after A/C compressor turns on.)
5	**INSPECT IDLE SPEED** • Inspect idle speed. (See 01–10A–31 Idle Speed Inspection) (See 01–10B–45 Idle Speed Inspection) • Is it okay?	Yes	Go to next step.
		No	Follow the repair instruction described in section F, then go to Step 18.
6	**INSPECT REFRIGERANT AMOUNT** • Inspect refrigerant amount. • Is it okay?	Yes	Go to Step 9.
		No	Go to next step.
7	**INSPECT REFRIGERANT LINES** • Inspect refrigerant lines. — Is piping free of damage and cracks? — Are piping connections free of oil grime? (Visual inspection) — Are piping connections free of gas leakage? — Are piping installation points on condenser free of gas leakage? — Are piping installation points on receiver/drier free of gas leakage? — Are piping installation points on A/C compressor free of gas leakage? — Are piping installation points on A/C unit free of gas leakage — Perform gas leak inspection using gas leak tester. • Are above items okay?	Yes	Go to next step.
		No	If piping or A/C component(s) is damaged or cracked, replace then go to Step 18. If there is gas leakage, repair or replace connection and replace condenser*, then go to Step 18.
8	**INSPECT EVAPORATOR PIPING CONNECTIONS IN A/C UNIT FOR GAS LEAKAGE** • Are piping connections for evaporator in A/C unit free of gas leakage?	Yes	Adjust refrigerant amount to specified level, then go to Step 18.
		No	If piping is damaged or cracked, replace then go to Step 18. If there is gas leakage, repair or replace connection and replace condenser*, then go to Step 18.
9	**CHECK TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL OR ELSEWHERE** • Add **20 ml {20 cc, 0.8 fl oz}** of compressor oil. • Is noise heard when racing engine?	Yes	Go to next step.
		No	Troubleshooting completed. Explain repair to customer.
10	**CHECK TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR ELSEWHERE** • Drain compressor oil. • Is it contaminated with metal particles?	Yes	Go to next step.
		No	Replace A/C compressor, then go to Step 18.

STEP	INSPECTION		ACTION
11	**CHECK TO SEE WHETHER MALFUNCTION IS SOMEWHERE IN A/C SYSTEM OR ELSEWHERE** • Is compressor oil whitish and mixed with water?	Yes	Replace entire A/C system (excluding heater), then go to Step 18.
		No	Go to next step.
12	**INSPECT A/C COMPRESSOR OIL** • Is compressor oil darker than normal and contaminated with aluminum chips?	Yes	Replace A/C compressor and condenser, then go to Step 18. (Since A/C compressor may be worn and receiver/drier may be clogged, replacement of receiver/drier is necessary.)
		No	Condition is normal. Recheck malfunction symptoms.
13	**CHECK TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR ELSEWHERE** • Is noise heard immediately after A/C compressor is stopped?	Yes	Replace A/C compressor, then go to Step 18. (A/C compressor discharge valve left open)
		No	Go to next step.
14	**INSPECT DRIVE BELT** • Inspect drive belt. (See 01–10A–3 DRIVE BELT INSPECTION [L3]) (See 01–10B–3 DRIVE BELT INSPECTION [AJ]) • Is it okay?	Yes	Go to next step.
		No	Adjust or replace drive belt, then go to Step 18.
15	**INSPECT DRIVE BELT CONDITION** • Is drive belt worn? • Does it have foreign material imbedded in it, or have oil on it?	Yes	Remove obstruction, remove oil, or replace drive belt, then go to Step 18.
		No	Go to next step.
16	**INSPECT MAGNETIC CLUTCH** • Inspect magnetic clutch. (See 07–40–11 MAGNETIC CLUTCH INSPECTION) • Is it okay?	Yes	Replace A/C compressor (excluding pressure plate, A/C compressor pulley, and stator), then go to Step 18.
		No	Replace magnetic clutch, then go to Step 18.
17	**CHECK TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR REFRIGERANT LINES** • Is noise emitted from A/C compressor?	Yes	Visually inspect A/C compressor, replace appropriate parts if necessary, then go to next step.
		No	If noise is due to refrigerant lines, repair detached or missing clips, tighten loose bolts, then go to next step.
18	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Has A/C compressor noise stopped?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

* : If there is gas leakage, air enters into the A/C system. The desiccant within the receiver/drier absorbs the moisture from the air and becomes saturated. If the A/C system is used in this condition, the inside of the A/C compressor will begin to rust due to this moisture, which may cause lock up or noise to occur. Therefore, replacement of the receiver/drier is necessary.

07–10 REFRIGERANT SYSTEM

REFRIGERANT SYSTEM SERVICE WARNINGS

C6U071001039W01

Using/Handling Unapproved Refrigerant

- **Using a flammable refrigerant, such as OZ-12, in this vehicle is dangerous. In an accident, the refrigerant may catch fire, resulting in serious injury or death. When servicing this vehicle, use only R-134a.**
- **Checking for system leakage on a vehicle that has been serviced with flammable refrigerant, such as OZ-12, is dangerous. Conventional leak detectors use an electronically generated arc which can ignite the refrigerant, causing serious injury or death. If a flammable refrigerant may have been used to service the system, or if you suspect a flammable refrigerant has been used, contact the local fire marshal or EPA office for information on handling the refrigerant.**

Handling Refrigerant

- **Avoid breathing air conditioning refrigerant or lubricant vapor. Exposure may irritate eyes, nose and throat. Also, due to environmental concerns, use service equipment certified to meet the requirements of SAE J2210 (R-134a recycling equipment) when draining R-134a from the air conditioning system. If accidental system discharge occurs, ventilate work area before resuming service.**
- **Do not pressure test or leak test R-134a service equipment and/or vehicle air conditioning system with compressed air. Some mixtures of air and R-134a have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.**
- **Do not allow the refrigerant to leak near fire or any kind of heat. A poisonous gas may be generated if the refrigerant gas contacts fire or heat such as from cigarettes and heaters. When carrying out any operation that can cause refrigerant leakage, extinguish or remove the above-mentioned heat sources and maintain adequate ventilation.**
- **Handling liquid refrigerant is dangerous. A drop of it on the skin can result in localized frostbite. When handling the refrigerant, wear gloves and safety goggles. If refrigerant splashes into the eyes, immediately wash them with clean water and consult a doctor.**

Storing Refrigerant

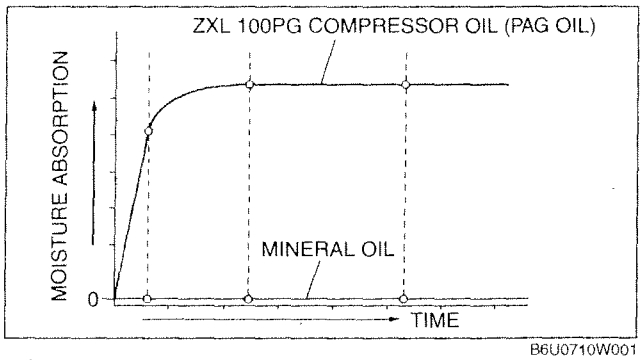
- **The refrigerant container is highly pressurized. If it is subjected to high heat, it could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Store the refrigerant at temperatures below 40°C {104°F}.**

REFRIGERANT SYSTEM SERVICE CAUTIONS

C6U071001039W02

Handling Compressor Oil

- **Use only ZXL 100PG compressor oil for this vehicle. Using PAG oil other than ZXL 100PG compressor oil can damage the A/C compressor.**
- **Do not spill ZXL 100PG compressor oil on the vehicle. A drop of compressor oil on the vehicle surface can eat away at the paint. If oil gets on the vehicle, wipe it off immediately.**
- **ZXL 100PG compressor oil (PAG oil) has a higher moisture absorption efficiency than the previously used mineral oil. If moisture mixes with the compressor oil, the refrigerant system could be damaged. Therefore, install caps immediately after using the compressor oil or removing refrigerant system parts to prevent moisture absorption.**



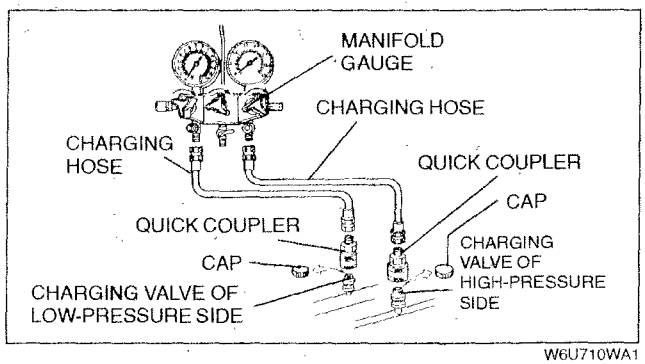
B6U0710W001

REFRIGERANT SYSTEM GENERAL PROCEDURES

C6U071001039W03

Manifold Gauge Set Installation

1. Fully close the valves of the manifold gauge.
2. Connect the charging hoses to the high and low-pressure side joints of the manifold gauge.
3. Connect the quick couplers to the ends of the charging hoses.
4. Connect the quick couplers to the charging valves.

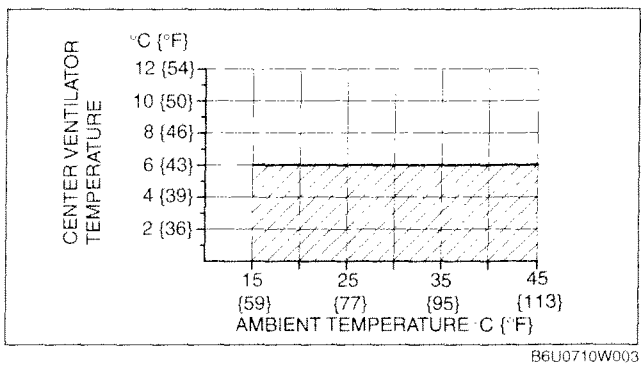


W6U710WA1

REFRIGERANT SYSTEM PERFORMANCE TEST

C6U071001039W04

1. Perform refrigerant pressure check. (See 07–10–3 REFRIGERANT PRESSURE CHECK.)
   - If not as specified, troubleshoot refrigerant system. (See 07–03–1 TROUBLESHOOTING INDEX.)
   - If they are correct, go to next step.
2. Place a dry-bulb thermometer in the driver-side center ventilator outlet.
3. Open the hood.
4. Warm up the engine and run it at a constant **1,500 rpm.**
5. Set the fan switch to 4th speed.
6. Turn the A/C switch on.
7. Set the RECIRCULATE mode.
8. Set the temperature control to MAX COLD.
9. Set the VENT mode.
10. Close all the doors and all the windows.
11. Wait until the center ventilator temperature stabilizes. The output temperature is stable when the A/C compressor is repeatedly turned on and off based on the A/C compressor control of evaporator temperature sensor.
12. Measure the center ventilator temperature.
13. Measure the ambient temperature.
14. Verify that the intersection of the center ventilator temperature and the ambient temperature is in the shaded zone.
    - If not as specified, troubleshoot the refrigerant system. (See 07–03–1 TROUBLESHOOTING INDEX.)

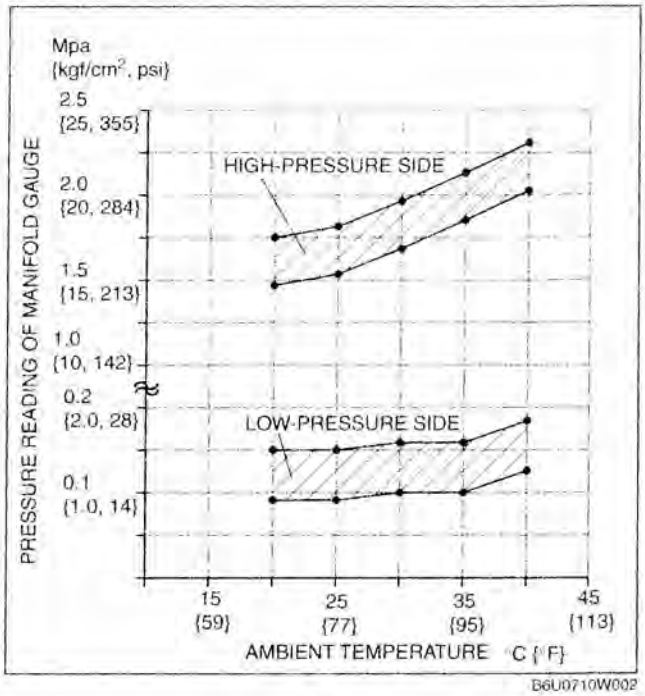


B6U0710W003

REFRIGERANT PRESSURE CHECK

C6U071078834W01

1. Install the manifold gauge set.
2. Warm up the engine and run it at a constant **1,500 rpm**.
3. Set the fan switch to 4th speed.
4. Turn the A/C switch on.
5. Set the RECIRCULATE mode.
6. Set the temperature control to MAX COLD.
7. Set the VENT mode.
8. Close all the doors and all the windows.
9. Measure the ambient temperature and the high and low-pressure side reading of the manifold gauge.
10. Verify that the intersection of the pressure reading of the manifold gauge and ambient temperature is in the shaded zone.
    - If not as specified, troubleshoot the refrigerant system. (See 07–03–1 TROUBLESHOOTING INDEX.)



B6U0710W002

07–10

REFRIGERANT RECOVERY

C6U071078834W02

Warning

- **Avoid breathing air conditioning refrigerant or lubricant vapor. Exposure may irritate eyes, nose and throat. Also, due to environmental concerns, use service equipment certified to meet the requirements of SAE J2210 (R-134a recycling equipment) when draining R-134a from the air conditioning system. If accidental system discharge occurs, ventilate work area before resuming service.**

1. Connect an R-134a recovery/recycling/recharging device to the vehicle and follow the device manufacturer's instructions.

REFRIGERANT CHARGING

C6U071078834W03

Warning

- **Avoid breathing air conditioning refrigerant or lubricant vapor. Exposure may irritate eyes, nose and throat. Also, due to environmental concerns, use service equipment certified to meet the requirements of SAE J2210 (R-134a recycling equipment) when draining R-134a from the air conditioning system. If accidental system discharge occurs, ventilate work area before resuming service.**

Caution

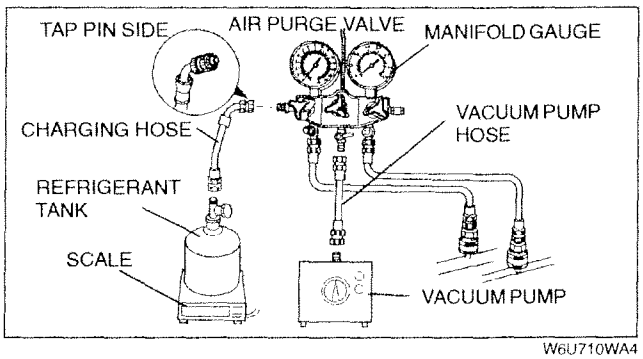
- **Do not exceed the specification when charging the system with refrigerant. Doing so will decrease the efficiency of the air conditioner or damage the refrigeration cycle parts.**

Charging Recycled R-134a Refrigerant

1. Connect an R-134a recovery/recycling/recharging device to the vehicle and follow the device manufacturer's instructions.

Charging New R-134a Refrigerant

1. Install the manifold gauge set.
2. Connect the tap pin side of the charging hose to the air purge valve of the manifold gauge.
3. Connect the vacuum pump hose to the center joint of the manifold gauge.
4. Connect the vacuum pump hose to the vacuum pump.
5. Connect the charging hose to the refrigerant tank.
6. Place the refrigerant tank on the scale.

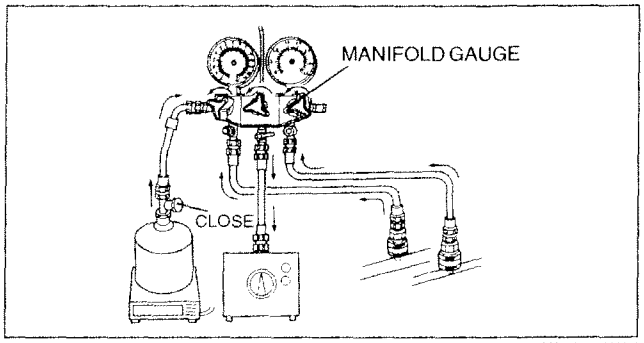


W6U710WA4

7. Open all the valves of the manifold gauge.

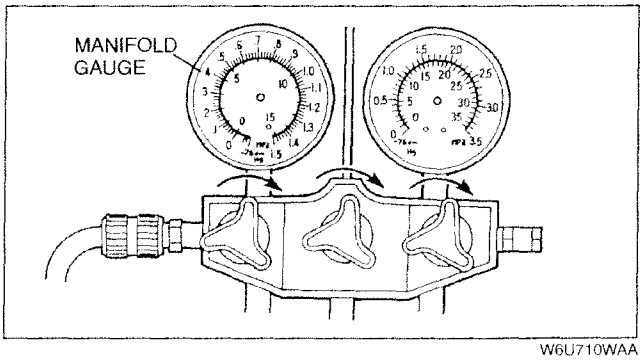
Caution

- **Close the manifold gauge valve immediately after stopping the vacuum pump. If the valve is left open, the vacuum pump oil will back flow into the refrigeration cycle and cause a decrease in the efficiency of the air conditioner.**



W6U710WA5

8. Start the vacuum pump and let it operate for **15 min**.
9. Verify that high and low-pressure side readings of the manifold gauge are at **–101 kPa {–760 mmHg, –29.9 inHg}**. Close each valve of the manifold gauge.
10. Stop the vacuum pump and wait for **5 min**.
11. Inspect the high and low-pressure side readings of the manifold gauge.
    - If the reading has changed, inspect for leakage and then repeat from Step 7.
    - If the reading has not changed, go to next step.
12. Open the valve of the refrigerant tank.
13. Weigh the refrigerant tank to charge the suitable amount of refrigerant.



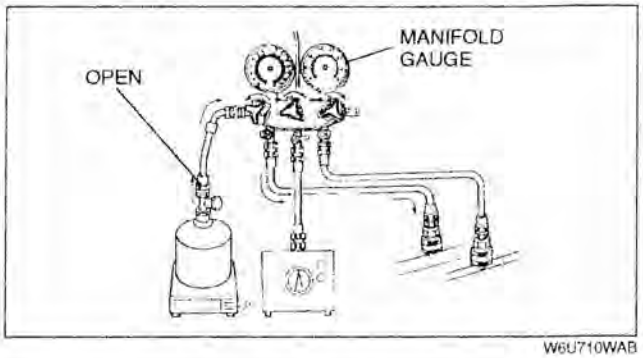
W6U710WAA

Regular amount of refrigerant (approximate quantity)
475 g {16.8 oz}

Warning

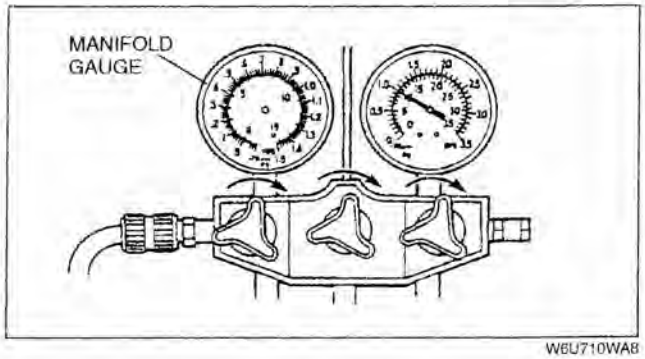
- **If the refrigerant system is charged with a large amount of refrigerant when checking for gas leakage, and if any leakage should occur, the refrigerant will be released into the atmosphere. In order to prevent the accidental release of refrigerant which can destroy the ozone layer in the stratosphere, follow the proper procedures and charge with only a small amount of refrigerant when checking for gas leakage.**
- **If charging the system with refrigerant by service cans or refrigerant tank, running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans or refrigerant tank will increase and they could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.**

14. Open the low-pressure side valve of the manifold gauge.



W6U710WAB

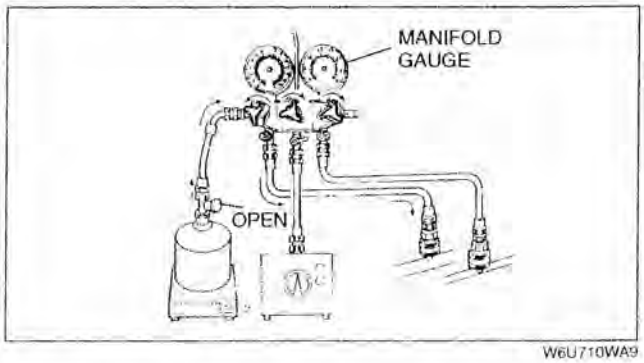
15. When the high-pressure side reading increases to **98 kPa {1.0 kgf/cm^2, 14 psi}**, close the low-pressure side valve of the manifold gauge.
16. Inspect for leakage from the cooler pipe/hose connections using a gas leak tester.
    - If there is no leakage, go to Step 18.
    - If leakage is found at a loose joint, tighten the joint, go to next step.
17. Inspect for leakage again.
    - If there is no leakage after tightening the joint, go to next step.
    - If there is still a leakage at the same joint, discharge the refrigerant and then repair the joint. Repeat the charging procedure from Step 7.



W6U710WA8

Warning
- **If charging the system with refrigerant by service cans or refrigerant tank, running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans or refrigerant tank will increase and they could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.**

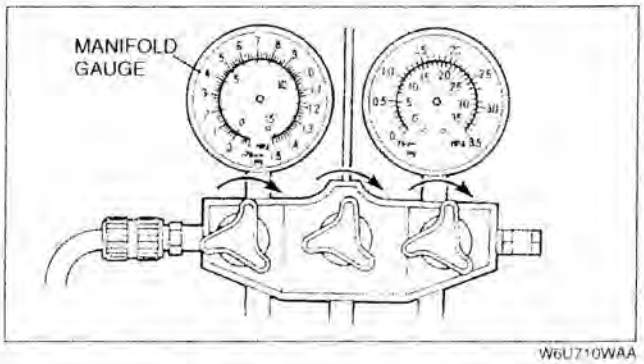
18. Open the low-pressure side valve of the manifold gauge and charge with refrigerant until the weight of refrigerant tank has decreased **250 g {8.83 oz}** from the amount in Step 13.



W6U710WA9

19. Close the low-pressure side valve of the manifold gauge.

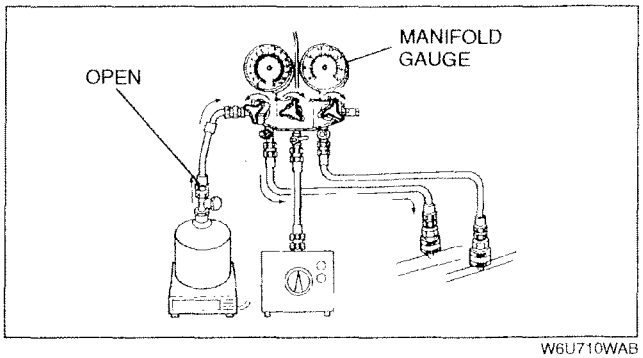
Warning
- **If charging the system with refrigerant by service cans or refrigerant tank, running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans or refrigerant tank will increase and they could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.**



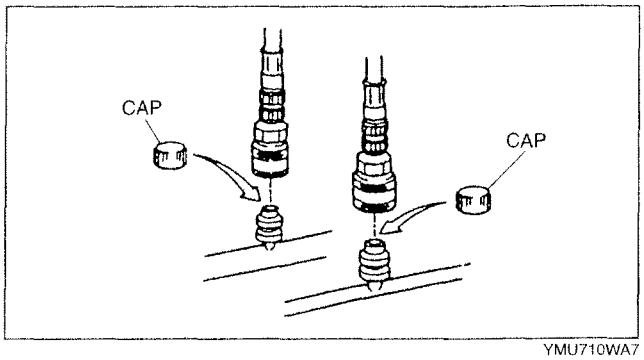
W6U710WAA

20. Start the engine and actuate the A/C compressor.

21. Open the low-pressure side valve of the manifold gauge and charge with refrigerant until the weight of the refrigerant tank has decreased **475 g {16.8 oz}** from the amount in Step 13.
22. Close the low-pressure side valve of the manifold gauge and the valve of the refrigerant tank.
23. Stop the engine and A/C compressor.
24. Inspect for leakage using a gas leak tester.
    - If there is no leakage, go to Step 26.
    - If leakage is found at a loose joint, tighten the joint, then go to next step.
25. Inspect for leakage again.
    - If there is still leakage after tightening the joint, go to next step.
    - If there is still leakage at the same joint, discharge the refrigerant and then repair the joint. Repeat the charging procedure from Step 7.
26. Remove the manifold gauge set.
27. Install the caps to the charging valves.



W6U710WAB

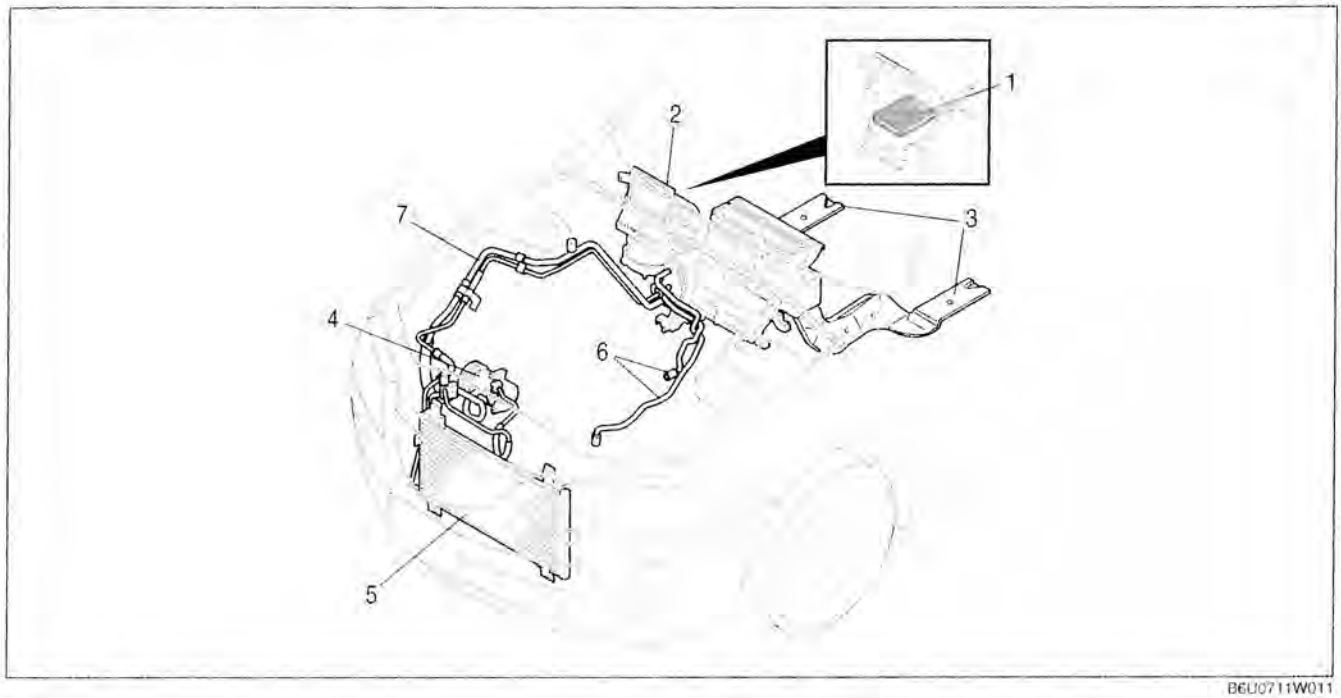


YMU710WA7

07–11 BASIC SYSTEM

BASIC SYSTEM LOCATION INDEX

C6U071101040W01



B6U0711W011

1	Air filter (See 07–11–5 AIR FILTER REMOVAL/INSTALLATION) (See 07–11–5 AIR FILTER INSPECTION)
2	A/C unit (See 07–11–2 A/C UNIT REMOVAL/INSTALLATION) (See 07–11–4 A/C UNIT DISASSEMBLY/ASSEMBLY)
3	Rear heat duct (See 07–11–6 REAR HEAT DUCT REMOVAL/INSTALLATION)

4	A/C compressor (See 07–11–6 A/C COMPRESSOR REMOVAL/INSTALLATION)
5	Condenser (See 07–11–7 CONDENSER REMOVAL/INSTALLATION) (See 07–11–8 CONDENSER INSPECTION)
6	Heater hose
7	Refrigerant lines (See 07–11–8 REFRIGERANT LINES REMOVAL/INSTALLATION)

A/C UNIT REMOVAL/INSTALLATION

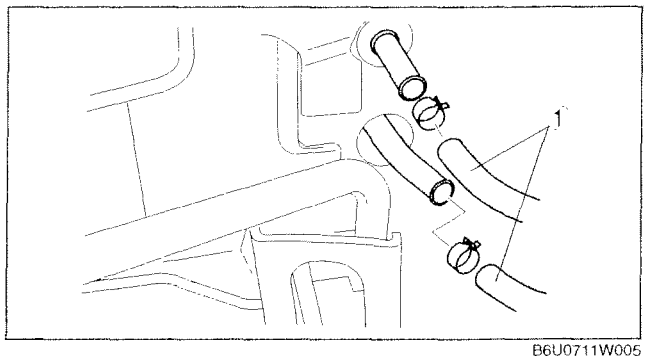
C6U071161130W01

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See 07–10–3 REFRIGERANT CHARGING.)
3. Drain the engine coolant. (See 01–12–4 ENGINE COOLANT REPLACEMENT.)
4. Remove the dynamic chamber.
5. Remove the dashboard. (See 09–17–4 DASHBOARD REMOVAL/INSTALLATION.)
6. Remove the theft-deterrent control module. (See 09–14–21 THEFT-DETERRENT CONTROL MODULE REMOVAL/INSTALLATION.)

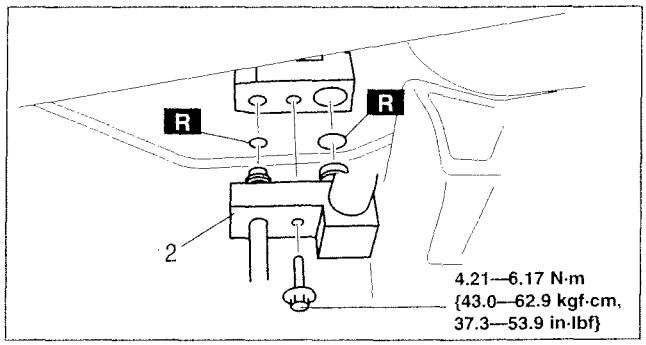
Caution

- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.**

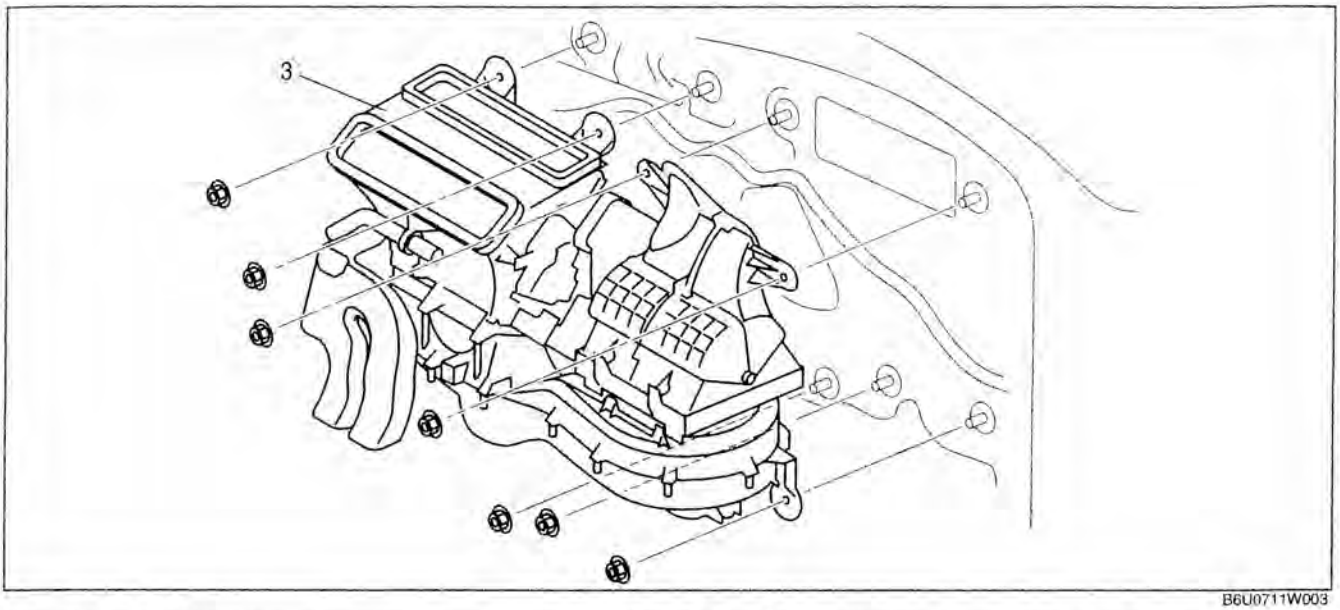
7. Remove in the order indicated in the table. Do not allow compressor oil to spill.



B6U0711W005



C6U0711W101



B6U0711W003

1	Heater hose
2	Cooler pipe No.2 (See 07–11–10 Refrigerant Lines Removal Note) (See 07–11–10 Refrigerant Lines Installation Note)
3	A/C unit (See 07–11–3 A/C Unit Installation Note)

8. Install in the reverse order of removal.
9. Perform the refrigerant system performance test. (See 07–10–2 REFRIGERANT SYSTEM PERFORMANCE TEST.)

A/C Unit Installation Note

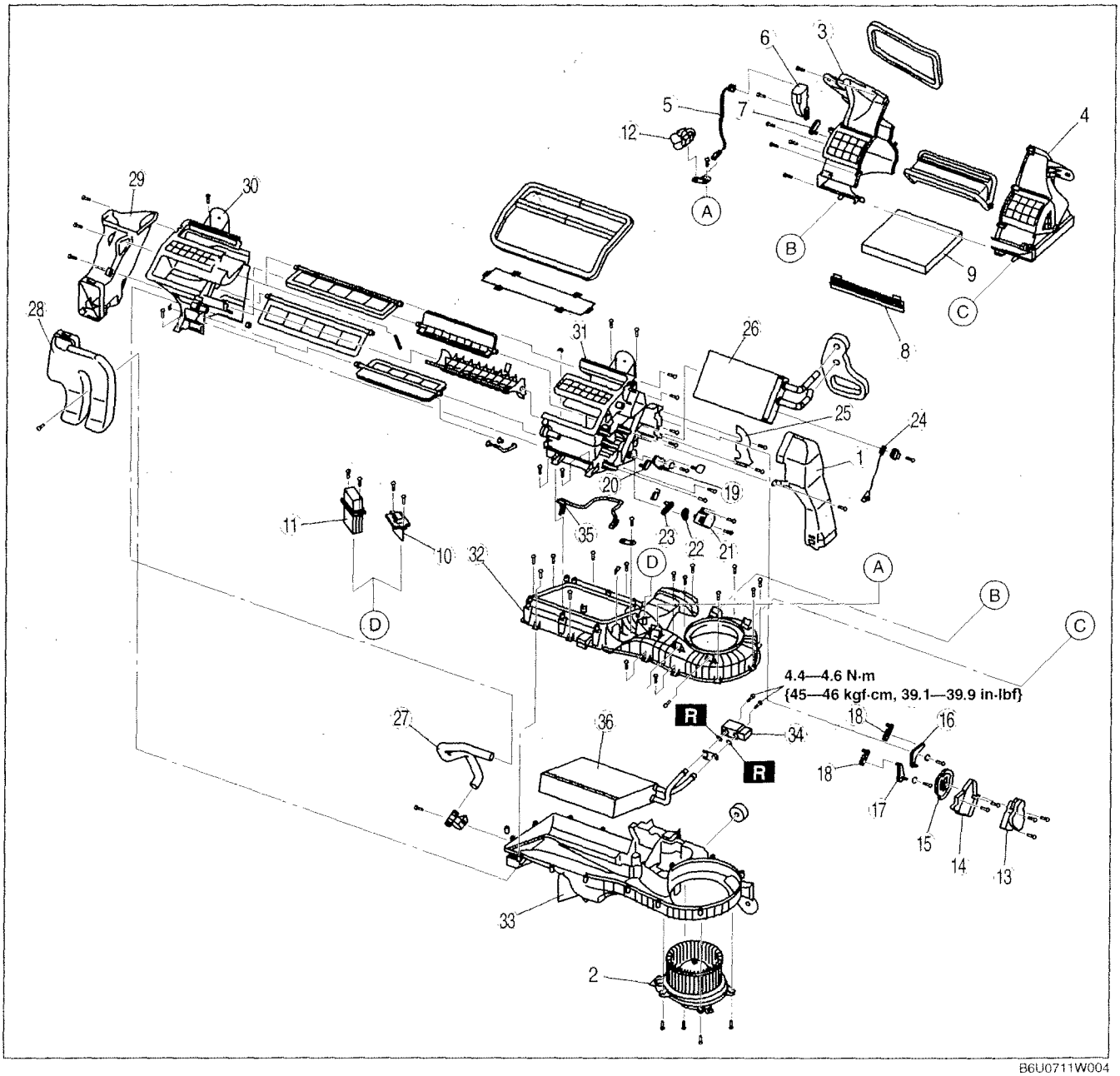
1. When installing a new A/C unit or evaporator, add a supplemental amount of ZXL100PG compressor oil into the refrigerant cycle.

Supplemental amount (approximate quantity)
50 ml {50 cc, 1.6 fl oz}

A/C UNIT DISASSEMBLY/ASSEMBLY

C6U071161130W02

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



B6U0711W004

1	Duct (1)
2	Blower motor
3	A/C case (3)
4	A/C case (4)
5	Harness (1)
6	Air intake actuator
7	Air intake crank
8	Air filter cover
9	Air filter
10	Resistor (manual air conditioner)
11	PWM unit (full-auto air conditioner)
12	Harness (2) (full-auto air conditioner)
13	Airflow mode actuator

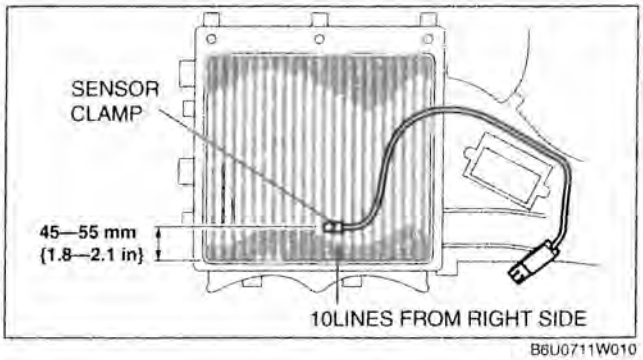
14	Airflow mode bracket
15	Airflow mode main link
16	Airflow mode sub link (1)
17	Airflow mode sub link (2)
18	Airflow mode crank
19	Air mix link (1) (manual air conditioner)
20	Air mix crank (1) (manual air conditioner)
21	Air mix actuator (full-auto air conditioner)
22	Air mix link (2) (full-auto air conditioner)
23	Air mix crank (2) (full-auto air conditioner)
24	Water temperature sensor (full-auto air conditioner)
25	Heater core cover
26	Heater core

27	Air hose (full-auto air conditioner)
28	Duct (2)
29	Duct (3)
30	A/C case (1)
31	A/C case (2)
32	A/C case (5)

33	A/C case (6)
34	Expansion valve
35	Evaporator temperature sensor (See 07–11–5 Evaporator Temperature Sensor Assembly Note)
36	Evaporator

Evaporator Temperature Sensor Assembly Note

1. Assemble the evaporator temperature sensor as shown in the figure.



B6U0711W010

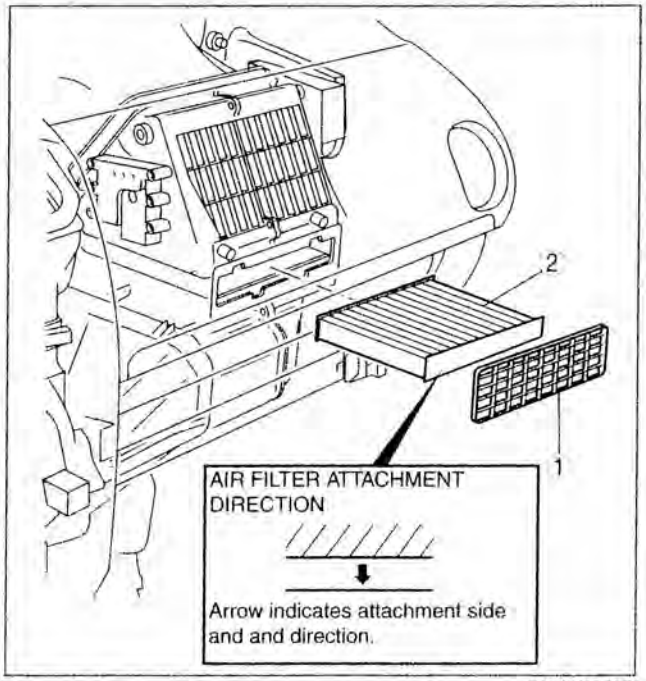
AIR FILTER REMOVAL/INSTALLATION

C6U071161140W01

1. Remove the glove compartment.
2. Remove in the order indicated in the table.

1	Air filter cover
2	Air filter

3. Install in the reverse order of removal.



B6U0711W128

AIR FILTER INSPECTION

C6U071161140W02

1. Remove the air filter.
2. Inspect for damage, excessive dirt, or foul smell.
   - If the air filter is damaged, excessively dirty, or foul smelling, replace it.

Note

- Replace the air filter every 24 months or after every **40,000 km {25,000 miles}**, depending on operating conditions.
- The air filter cannot be reused by cleaning it with water or compressed air.

EVAPORATOR INSPECTION

C6U071161810W01

1. Remove the A/C unit. (See 07–11–2 A/C UNIT REMOVAL/INSTALLATION.)
2. Remove the evaporator from the A/C unit.
3. Inspect for cracks, damage, and oil leakage.
   - If any problems are found, replace the evaporator.
4. Inspect for bent fins.
   - If any are bent, use a flathead screwdriver to straighten them.

HEATER CORE INSPECTION

C6U071161910W01

1. Remove the A/C unit. (See 07–11–2 A/C UNIT REMOVAL/INSTALLATION.)
2. Remove the heater core from the A/C unit.
3. Inspect for cracks, damage, and coolant leakage.
   - If any problems are found, replace the heater core.
4. Inspect for bent fins.
   - If any are bent, use a flathead screwdriver to straighten them.
5. Verify that the heater core inlet and outlet pipes are not distorted or damaged.
   - Repair with pliers if necessary.

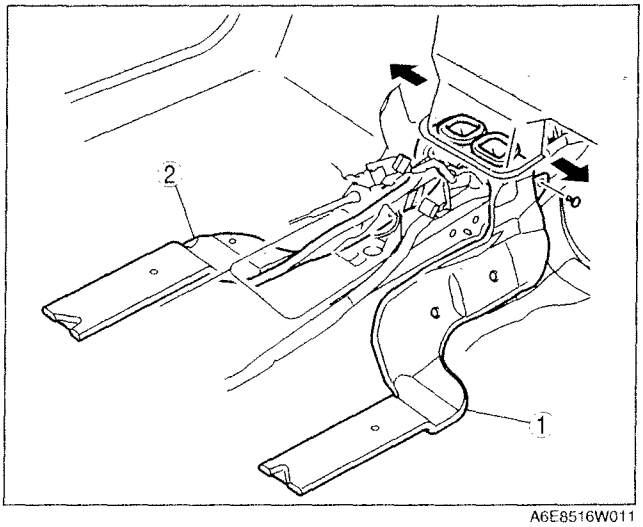
REAR HEAT DUCT REMOVAL/INSTALLATION

C6U071161273W01

1. Turn over the floor covering. (See 09–17–25 FLOOR COVERING REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.

1	Rear heat duct (Right)
2	Rear heat duct (Left)

3. Install in the reverse order of removal.



A6E8516W011

A/C COMPRESSOR REMOVAL/INSTALLATION

C6U071161450W01

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See 07–10–3 REFRIGERANT CHARGING.)
3. Remove the right side splash shield and mudguard.
4. Remove the WU-TWC.(AJ-VE only) (See 01–15B–2 EXHAUST SYSTEM REMOVAL/INSTALLATION [AJ].)
5. Loosen the drive belt and remove it.

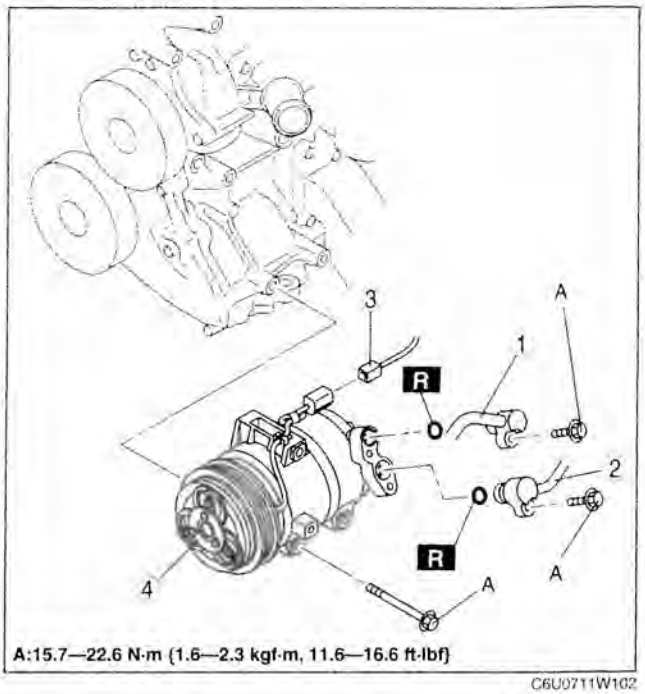
Caution

- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.**

6. Remove in the order indicated in the table. Do not allow compressor oil to spill.

1	Cooler hose (HI) (See 07–11–10 Refrigerant Lines Installation Note)
2	Cooler pipe No.1 (See 07–11–10 Refrigerant Lines Installation Note)
3	Magnetic clutch connector
4	A/C compressor (See 07–11–7 A/C Compressor Installation Note)

7. Install in the reverse order of removal.
8. Adjust the drive belt.
9. Perform the refrigerant system performance test. (See 07–10–2 REFRIGERANT SYSTEM PERFORMANCE TEST.)



A:15.7—22.6 N·m {1.6—2.3 kgf·m, 11.6—16.6 ft·lbf}

C6U0711W102

07–11

A/C Compressor Installation Note

1. Remove the following amount of compressor oil from the new A/C compressor when replacing the A/C compressor.

Compressor oil to be removed (approximate quantity)
150 ml {150 cc, 5.07 fl oz} – [compressor oil from old A/C compressor + 15 ml {15 cc, 0.5 fl oz}]

CONDENSER REMOVAL/INSTALLATION

C6U07116148OW01

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See 07–10–3 REFRIGERANT CHARGING.)
3. Remove the shroud panel. (See 09–10–11 SHROUD PANEL REMOVAL/INSTALLATION.)

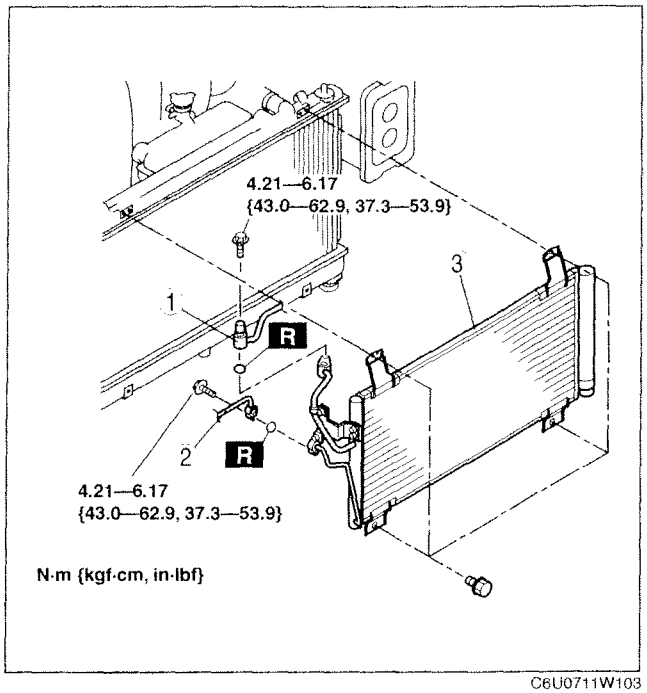
Caution

- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug all open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.**

4. Remove in the order indicated in the table. Do not allow compressor oil to spill.

1	Cooler hose (HI) (See 07–11–10 Refrigerant Lines Removal Note) (See 07–11–10 Refrigerant Lines Installation Note)
2	Cooler pipe No.1 (See 07–11–10 Refrigerant Lines Removal Note) (See 07–11–10 Refrigerant Lines Installation Note)
3	Condenser (See 07–11–8 Condenser Installation Note)

5. Install in the reverse order of removal.
6. Perform the refrigerant system performance test. (See 07–10–2 REFRIGERANT SYSTEM PERFORMANCE TEST.)



C6U0711W103

Condenser Installation Note

1. When installing a new condenser, add a supplemental amount of ZXL 100PG compressor oil inlet the refrigerant cycle.

   Supplemental amount (approximate quantity)
   50 ml {50 cc, 1.6 fl oz}

CONDENSER INSPECTION

C6U071161480W02

1. Inspect for cracks, damage, and oil leakage.
   - If any are found, replace the condenser.
2. Inspect for fins clogged by dust.
   - If any are clogged, remove the dust from the fins.
3. Inspect for bent fins.
   - If any are bent, use a flathead screwdriver to straighten them.

REFRIGERANT LINES REMOVAL/INSTALLATION

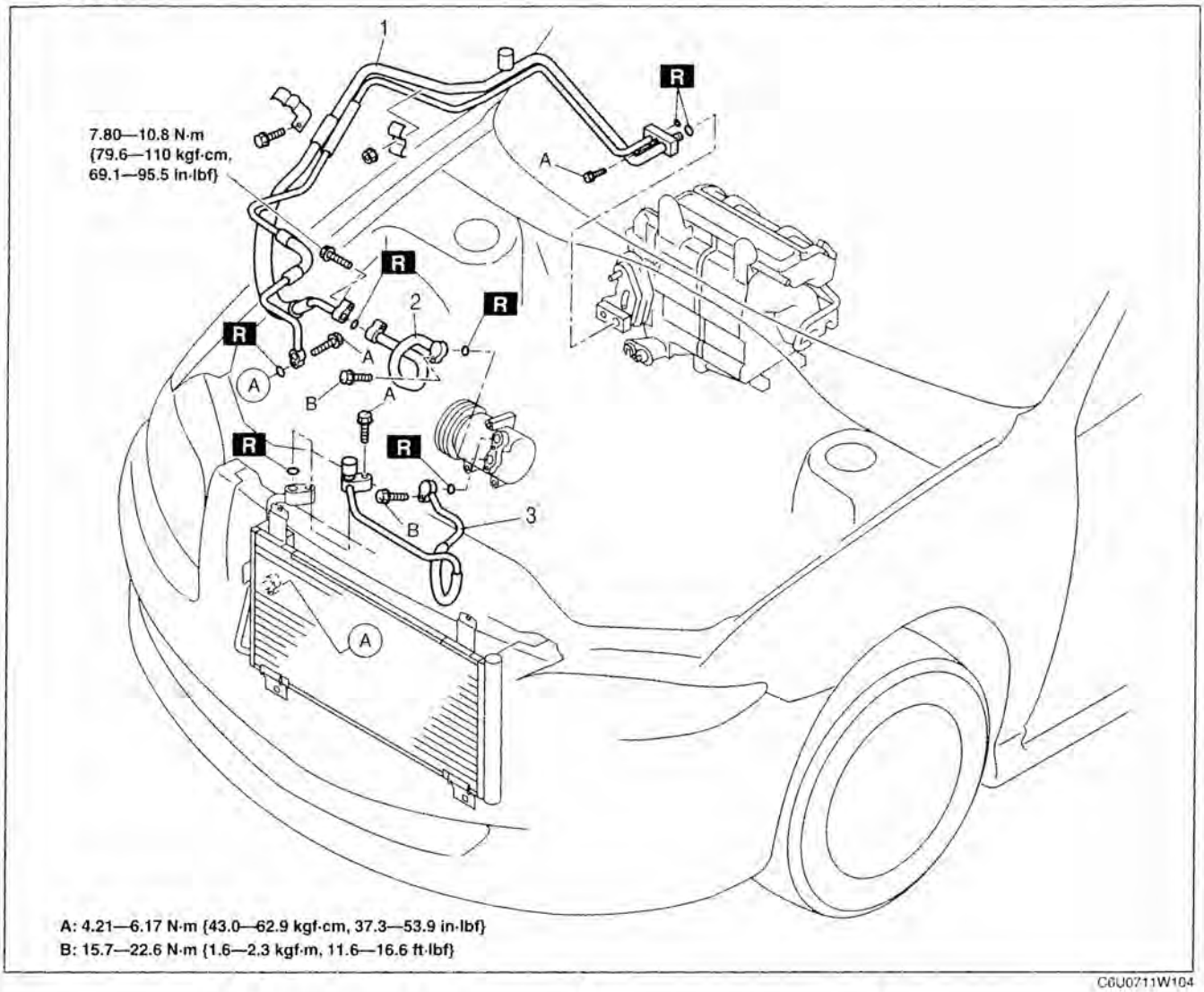
C6U071161460W01

1. Remove the battery.
2. Discharge the refrigerant from the system. (See 07–10–3 REFRIGERANT CHARGING.)
3. Remove the reservoir. (AJ-VE)
4. Remove the washer tank. (AJ-VE) (See 09–19–5 WASHER TANK REMOVAL/INSTALLATION [4SD].)(See 09–19–6 WASHER TANK REMOVAL/INSTALLATION [5HB, WGN].)
5. Remove the charcoal canister.
6. Remove the under cover.

   Caution
   - **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug all open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.**

7. Remove in the order indicated in the table. Do not allow compressor oil to spill.
8. Install in the reverse order of removal.

9. Perform the refrigerant system performance test. (See 07–10–2 REFRIGERANT SYSTEM PERFORMANCE TEST.)

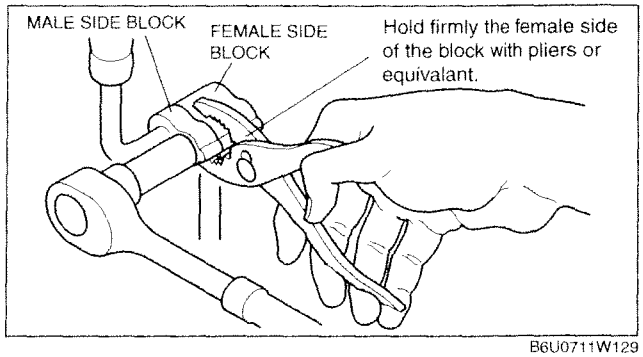


C6U0711W104

1	Cooler pipe No.2 (See 07–11–10 Refrigerant Lines Removal Note) (See 07–11–10 Refrigerant Lines Installation Note)
2	Cooler pipe No.1 (See 07–11–10 Refrigerant Lines Removal Note) (See 07–11–10 Refrigerant Lines Installation Note)
3	Cooler hose (HI) (See 07–11–10 Refrigerant Lines Removal Note) (See 07–11–10 Refrigerant Lines Installation Note)

Refrigerant Lines Removal Note

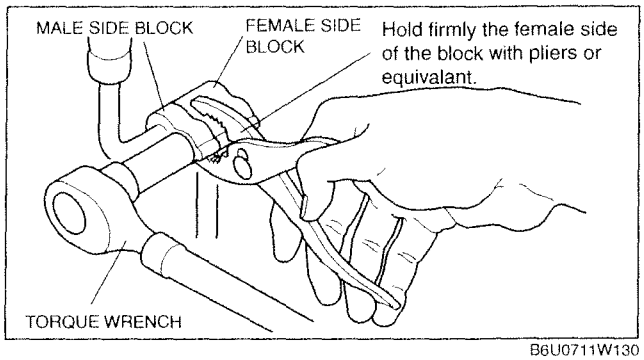
1. Disconnect the block joint type pipes by grasping female side of the block with pliers or similar tool and holding firmly, then remove the connection bolt or nut.



B6U0711W129

Refrigerant Lines Installation Note

1. Tighten the bolt of joint by hand.
2. Tighten the joint to the specified torque.
3. Connect the block joint type pipes by grasping the female side of the block with pliers or similar tool and holding firmly, then tighten the connection bolt with a torque wrench.



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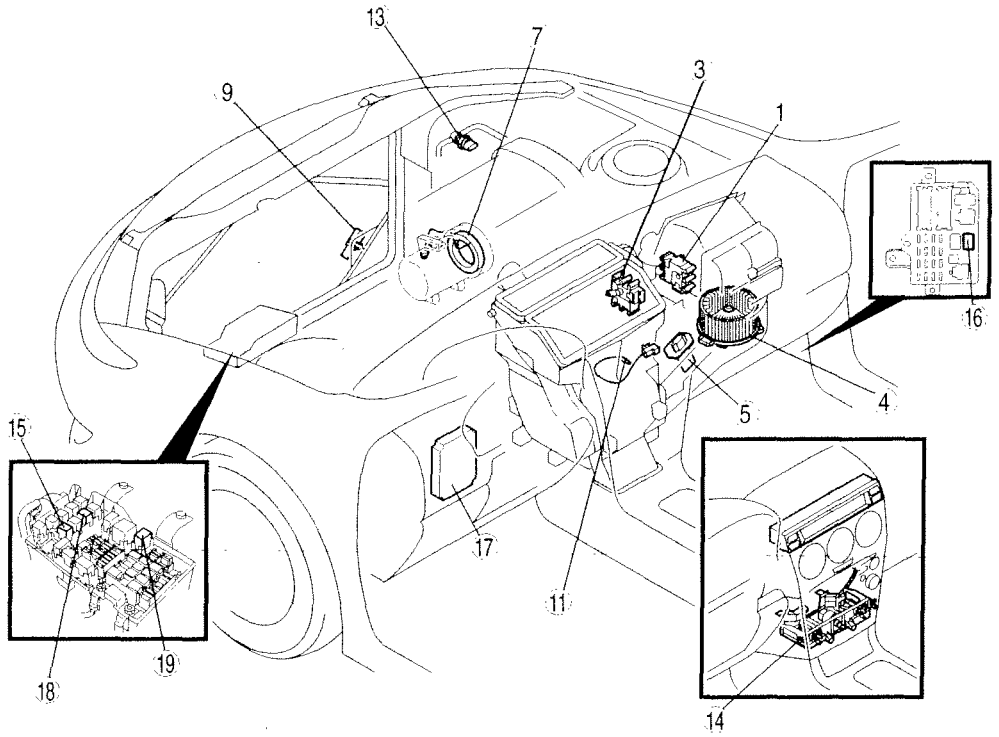
07–40 CONTROL SYSTEM

CONTROL SYSTEM LOCATION INDEX

C6U074001042W01

MANUAL AIR CONDITIONER



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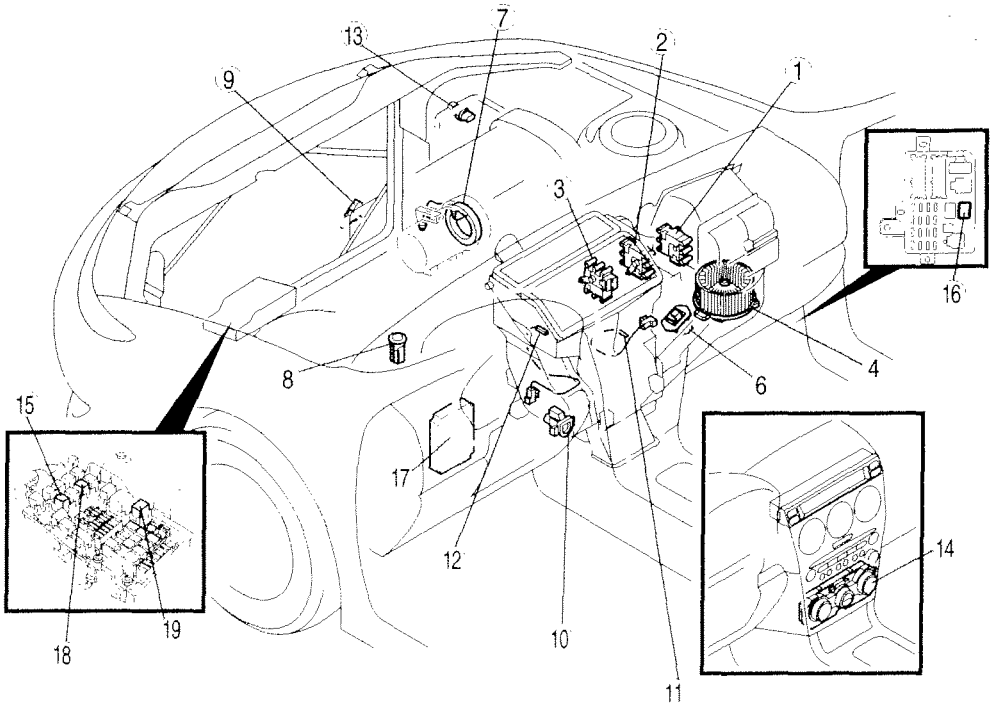
FULL-AUTO AIR CONDITIONER



B6U0740W047

1	Air intake actuator (See 07–40–3 AIR INTAKE ACTUATOR REMOVAL/ INSTALLATION) (See 07–40–4 AIR INTAKE ACTUATOR INSPECTION)

2	Air mix actuator (See 07–40–4 AIR MIX ACTUATOR REMOVAL/ INSTALLATION) (See 07–40–5 AIR MIX ACTUATOR INSPECTION)

3	Airflow mode actuator (See 07–40–5 AIRFLOW MODE ACTUATOR REMOVAL/INSTALLATION) (See 07–40–6 AIRFLOW MODE ACTUATOR INSPECTION)
4	Blower motor (See 07–40–7 BLOWER MOTOR REMOVAL/INSTALLATION) (See 07–40–8 BLOWER MOTOR INSPECTION)
5	Resistor (See 07–40–8 RESISTOR REMOVAL/INSTALLATION) (See 07–40–8 RESISTOR INSPECTION)
6	PWM unit (See 07–40–9 PWM UNIT INSPECTION)
7	Magnetic clutch (See 07–40–9 MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY) (See 07–40–10 MAGNETIC CLUTCH ADJUSTMENT) (See 07–40–11 MAGNETIC CLUTCH INSPECTION)
8	Solar radiation sensor (See 07–40–11 SOLAR RADIATION SENSOR REMOVAL/INSTALLATION) (See 07–40–11 SOLAR RADIATION SENSOR INSPECTION)
9	Ambient temperature sensor (See 07–40–12 AMBIENT TEMPERATURE SENSOR REMOVAL/INSTALLATION) (See 07–40–12 AMBIENT TEMPERATURE SENSOR INSPECTION)
10	Passenger compartment temperature sensor (See 07–40–12 PASSENGER COMPARTMENT TEMPERATURE SENSOR REMOVAL/INSTALLATION) (See 07–40–13 PASSENGER COMPARTMENT TEMPERATURE SENSOR INSPECTION)
11	Evaporator temperature sensor (See 07–40–13 EVAPORATOR TEMPERATURE SENSOR REMOVAL/INSTALLATION) (See 07–40–13 EVAPORATOR TEMPERATURE SENSOR INSPECTION)
12	Water temperature sensor (See 07–40–14 WATER TEMPERATURE SENSOR REMOVAL/INSTALLATION) (See 07–40–14 WATER TEMPERATURE SENSOR INSPECTION)
13	Refrigerant pressure switch (See 07–40–15 REFRIGERANT PRESSURE SWITCH REMOVAL/INSTALLATION) (See 07–40–15 REFRIGERANT PRESSURE SWITCH INSPECTION)
14	Climate control unit (See 07–40–16 CLIMATE CONTROL UNIT REMOVAL) (See 07–40–16 CLIMATE CONTROL UNIT INSTALLATION) (See 07–40–17 CLIMATE CONTROL UNIT DISASSEMBLY/ASSEMBLY) (See 07–40–18 CLIMATE CONTROL UNIT WIRE ADJUSTMENT) (See 07–40–18 CLIMATE CONTROL UNIT INSPECTION)
15	A/C relay (See 09–21–6 RELAY INSPECTION)
16	Blower relay (See 09–21–6 RELAY INSPECTION)
17	PCM (See 01–40A–7 PCM INSPECTION [L3]) (See 01–40B–6 PCM INSPECTION [AJ])
18	Rear window defroster relay (See 09–21–6 RELAY INSPECTION)
19	TNS relay (See 09–21–6 RELAY INSPECTION)

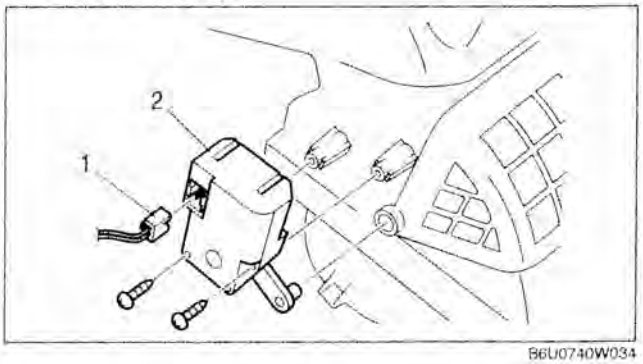
AIR INTAKE ACTUATOR REMOVAL/INSTALLATION

C6U074061060W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Remove the duct (1). (See 07–11–2 A/C UNIT REMOVAL/INSTALLATION.)
4. Remove in the order indicated in the table.

1	Air intake actuator connector
2	Air intake actuator

5. Install in the reverse order of removal.



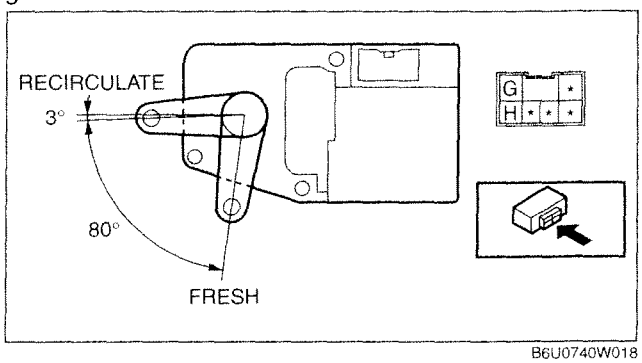
B6U0740W034

AIR INTAKE ACTUATOR INSPECTION

C6U074061060W02

1. Connect battery positive voltage to terminal G or H and ground to terminal H or G of the air intake actuator.
2. Verify that the air intake actuator operates as shown below.
   - If not as specified, replace the air intake actuator.

Connection		Movement
B+	GND	
G	H	RECIRCULATE←FRESH
H	G	FRESH←RECIRCULATE



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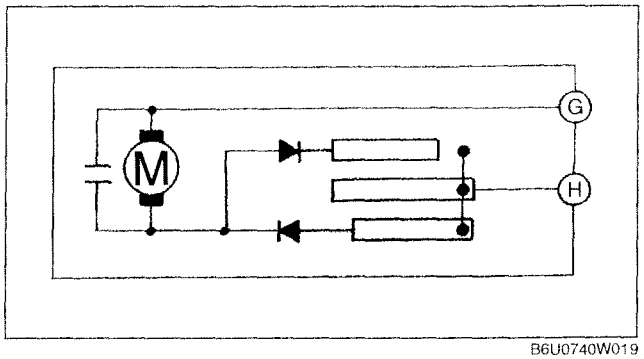


B6U0740W019

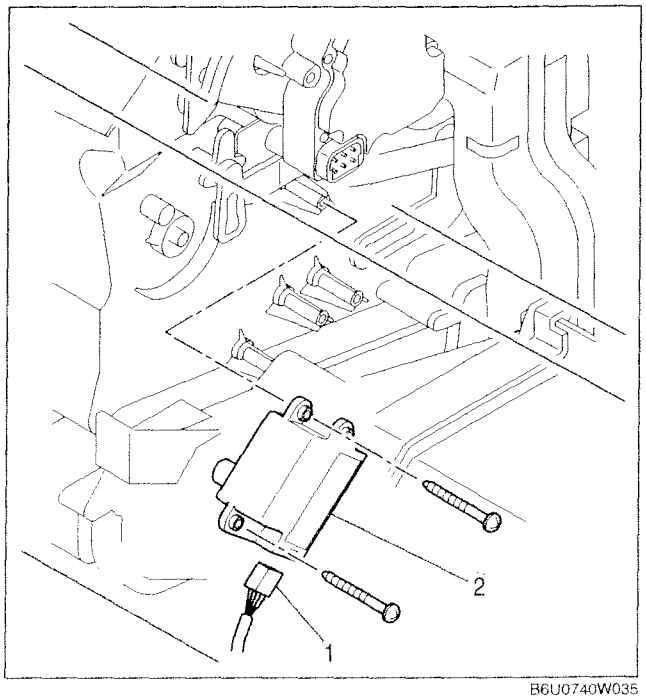
AIR MIX ACTUATOR REMOVAL/INSTALLATION

C6U074061415W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Remove in the order indicated in the table.

1	Air mix actuator connector
2	Air mix actuator

4. Install in the reverse order of removal.



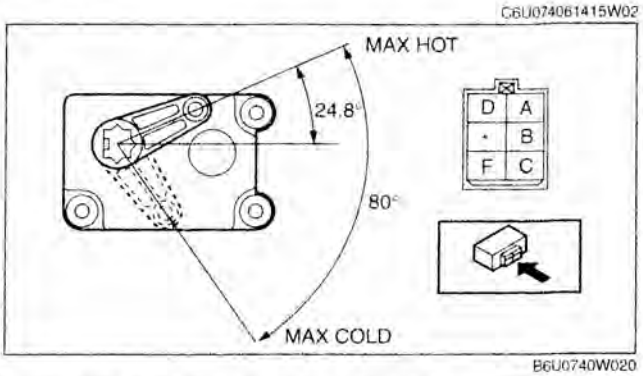
B6U0740W035

AIR MIX ACTUATOR INSPECTION

1. Verify that the resistance between the terminals of the air mix actuator is as shown in the table.
   - If not as specified, replace the air mix actuator.

Terminal	Resistance (ohm)
B—A	100
B—C	100
B—D	100
B—F	100

C6U074061415W02



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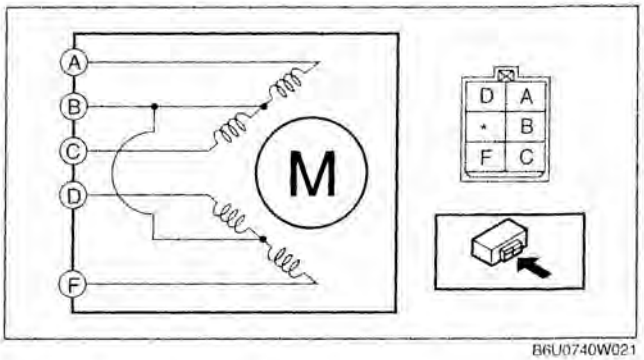


B6U0740W021

Reset Methods

- After replacing the air mix actuator, make sure to complete the following reset procedure.

Automatic reset

1. Disconnect the negative battery cable, and then reconnect it. (AUTO switch indicator light flashes.)

Controlled reset

1. Switch to on-board diagnostic mode. (See 07–02–1 DIAGNOSTIC TROUBLE CODE NUMBER INSPECTION.)
2. While in present failure indication mode, press the DEFROSTER switch for **3 seconds** or more. (AUTO switch indicator light flashes.)

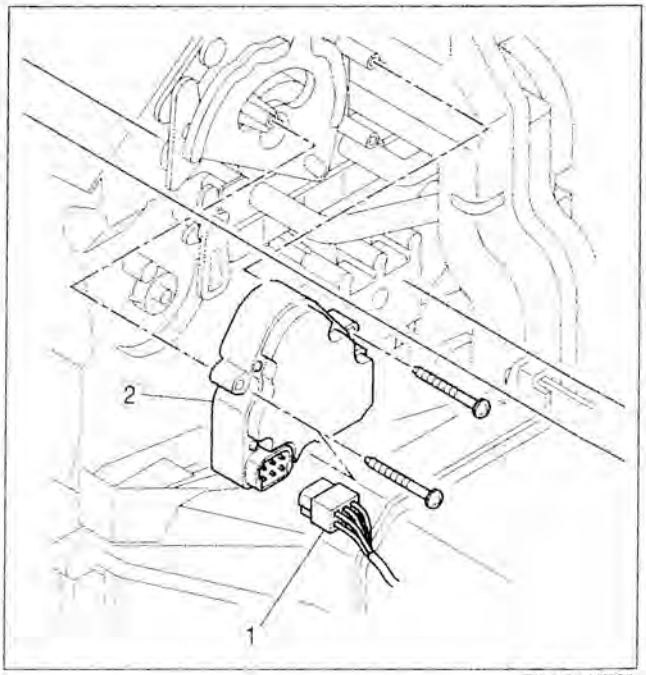
AIRFLOW MODE ACTUATOR REMOVAL/INSTALLATION

C6U074061070W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Remove in the order indicated in the table.

1	Airflow mode actuator connector
2	Airflow mode actuator

4. Install in the reverse order of removal.



B6U0740W036

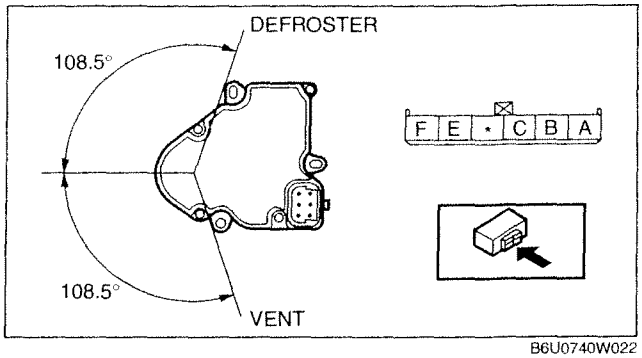
AIRFLOW MODE ACTUATOR INSPECTION

C6U074061070W02

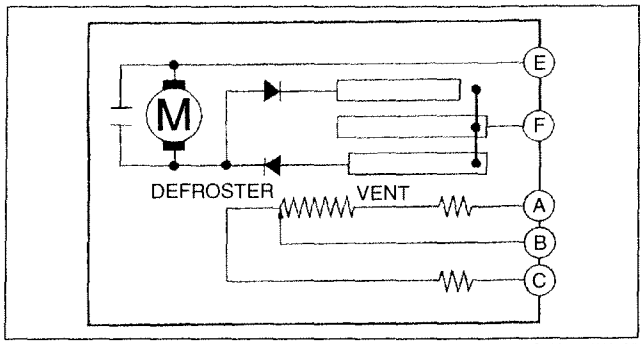
Full-auto Air Conditioner

1. Connect battery positive voltage to terminal E or F and ground to terminal F or E of the airflow mode actuator.
2. Verify that the airflow mode actuator operates as shown below.
   - If not as specified, replace the airflow mode actuator.

Connection		Movement
B+	GND	
E	F	VENT → DEFROSTER
F	E	DEFROSTER → VENT

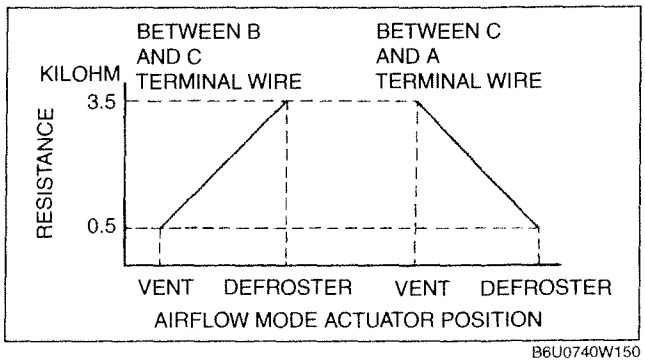


B6U0740W022



B6U0740W023

3. Verify that the resistance between the terminals of the airflow mode actuator is as shown in the graph.
   - If not as specified, replace the airflow mode actuator.

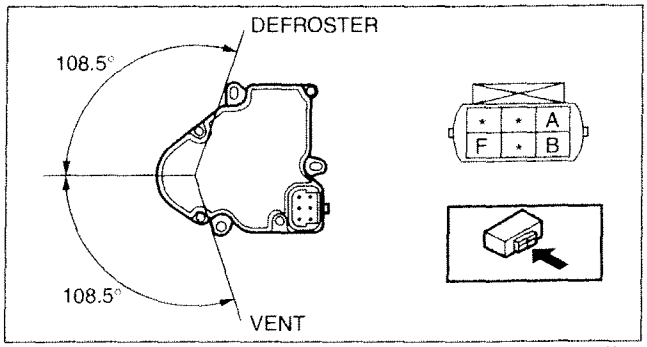


B6U0740W150

Manual Air Conditioner

Operating inspection

1. Turn the fan switch to OFF.
2. Turn the mode dial to VENT.
3. Turn the ignition switch to ON position. (engine ON)
4. Turn the fan switch 4th position.
5. Turn the mode dial from VENT to DEFROSTER.
6. Verify that the airflow mode actuator moves smoothly.
   - If not as specified, inspect the airflow mode main link and sub link for clogging and deformity.
   - If the actuator cannot move at all, go to voltage inspection.

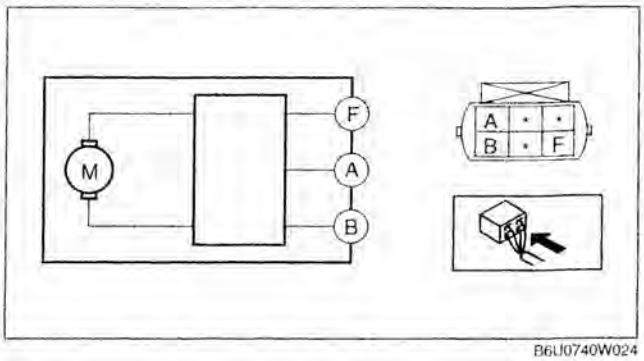


B6U0740W043

Voltage inspection

1. Disconnect the airflow mode actuator connector.
2. Turn the ignition switch to ON position. (engine OFF)
3. Verify that the voltage between the terminals of airflow mode actuator (harness-side) is as shown in the table.
   - If not as specified, perform the harness inspection and mode switch inspection. (See 07–40–24 Manual Air Conditioner.)
   - If as specified, replace the airflow mode actuator.

Mode dial position	Terminal	Voltage (V)
-	B—GND	0
-	B—F	B+
VENT	A—F	0
BI-LEVEL		3
HEAT		6
HEAT/DEF		9
DEFROSTER		12



B6U0740W024

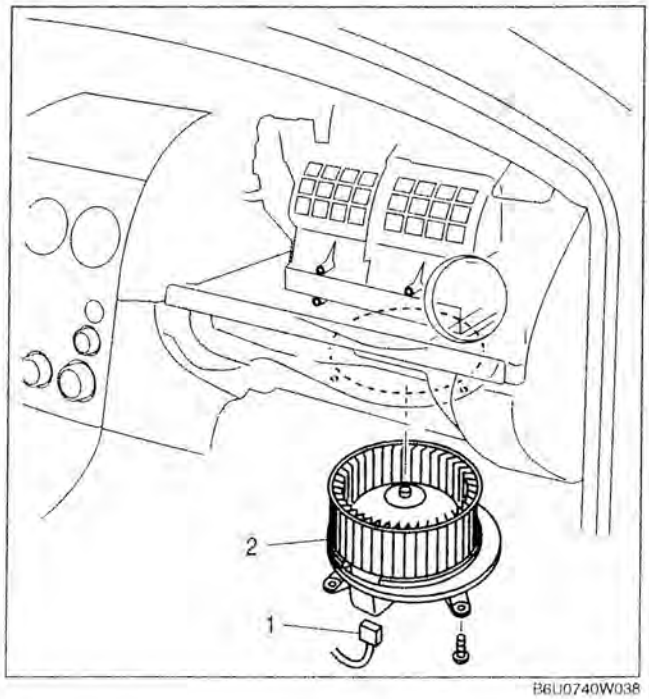
BLOWER MOTOR REMOVAL/INSTALLATION

C6U074061140W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Blower motor connector
2	Blower motor

3. Install in the reverse order of removal.

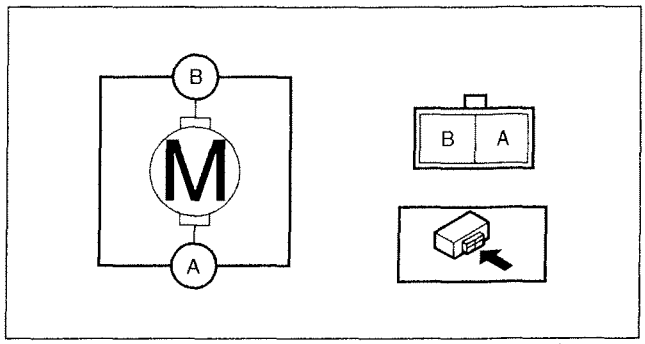


B6U0740W038

BLOWER MOTOR INSPECTION

C6U074061140W02

1. Connect battery positive voltage to terminal B and ground to terminal A of the blower motor and verify its operation.
   - If not as specified, replace the blower motor.



B6U0740W031

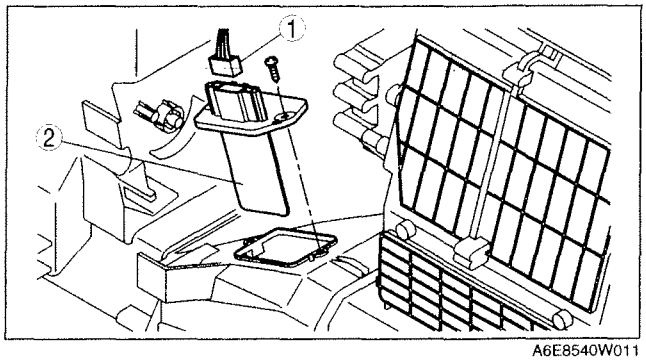
RESISTOR REMOVAL/INSTALLATION

C6U074061215W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Remove in the order indicated in the table.

1	Resistor connector
2	Resistor

4. Install in the reverse order of removal.



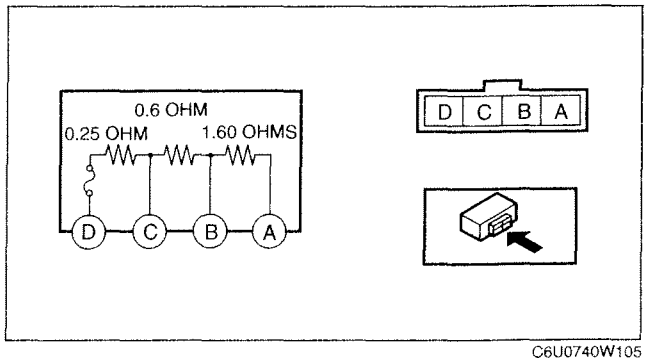
A6E8540W011

RESISTOR INSPECTION

C6U074061215W02

1. Verify that the resistance between the terminals of the resistor is as shown in the table.
   - If not as specified, replace the resistor.

Terminal	Resistance (ohm)
A—D	0.25
A—B	0.85
A—C	2.70



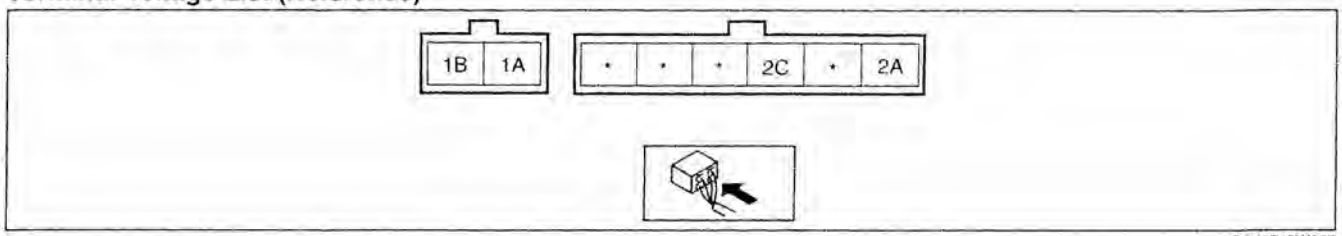
C6U0740W105

PWM UNIT INSPECTION

C6U074061B15W01

1. Connect the PWM unit connector.
2. Turn the ignition switch to ON position.
3. Measure the voltage at each PWM unit terminal and refer to the terminal voltage list.
   - If not as specified, inspect the parts listed under "Action" and the related wiring harness.

Terminal Voltage List (Reference)



B6U0740W027

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
1A	IG2	Blower relay	Ignition switch at ON position	B+	• Inspect for continuity or short circuit (PWM unit—blower relay: 1A—C) • Inspect blower relay
			Ignition switch at LOCK position	Below 1.0	
1B	GND	Ground	Under any condition	Below 1.0	• Inspect for continuity (PWM unit—ground: 1B—GND)
2A	Blower fan speed	Climate control unit	Fan speed: 1—7	Pulse*	• Inspect for continuity or short circuit (PWM unit—climate control unit: 2A—1C) • Inspect climate control unit
2B	—	—	—	—	—
2C	Motor operation	Blower motor	Fan off	B+	• Inspect for continuity or short circuit (PWM unit—blower motor: 2C—A) • Inspect blower motor
			Fan speed 1	8—10	
			Fan speed 2	6—8	
			Fan speed 3	5—6	
			Fan speed 4	3—5	
			Fan speed 5	1—3	
			Fan speed 6	0.7—1	
			Fan speed 7	0.7—1	
2D	—	—	—	—	—
2E	—	—	—	—	—
2F	—	—	—	—	—

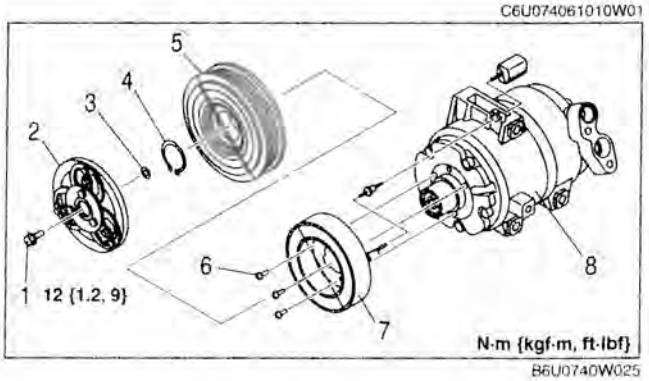
*: Refer to climate control unit terminal 1C (Figure 1). (See 07–40–18 CLIMATE CONTROL UNIT INSPECTION.)

MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

1	Bolt (See 07–40–10 Bolt Removal/Installation Note)
2	Pressure plate
3	Shim
4	Snap ring (See 07–40–10 Snap Ring Installation Note)
5	A/C compressor pulley
6	Screw
7	Stator
8	A/C compressor body

C6U074061010W01

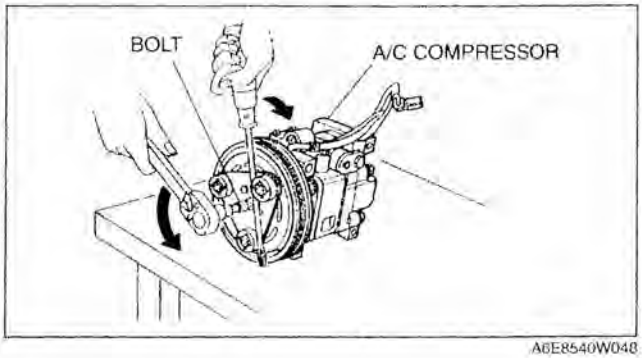


B6U0740W025

2. Assemble in the reverse order of disassembly.
3. Adjust the magnetic clutch clearance. (See 07–40–10 MAGNETIC CLUTCH ADJUSTMENT.)

Bolt Removal/Installation Note

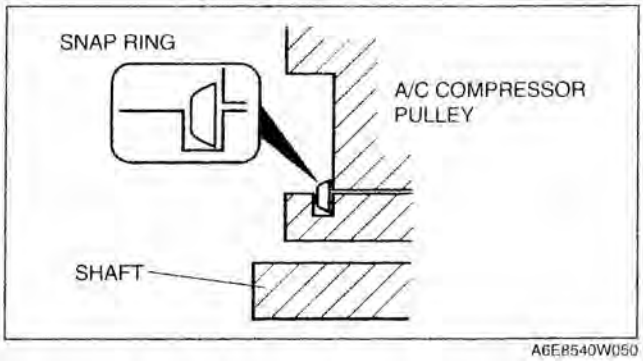
1. When removing or installing the bolt, hold the pressure plate in place as shown in the figure.
2. When installing a new A/C compressor body, replace the bolt.



A6E8540W048

Snap Ring Installation Note

1. When installing a new pressure plate, A/C compressor pulley, stator, or A/C compressor body, replace the snap ring.

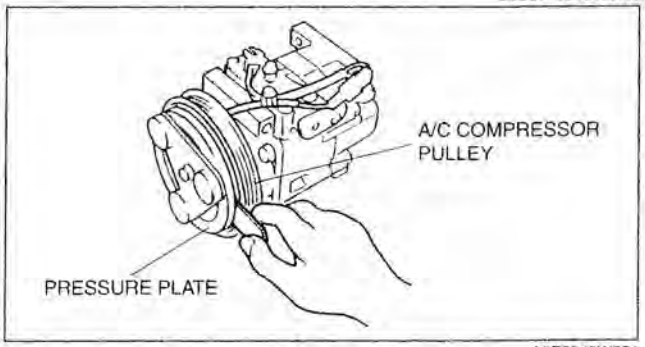


A6E8540W050

MAGNETIC CLUTCH ADJUSTMENT

C6U074061010W02

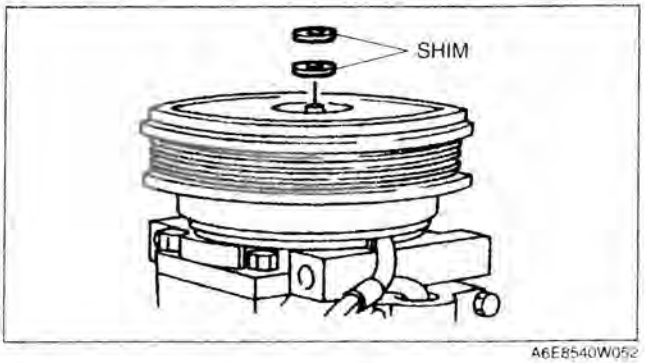
1. Measure the clearance around the entire circumference between the pressure plate and A/C compressor pulley using a thickness gauge.



A6E8540W051

2. Verify that the clearance is within the specification.
   - If not within the specification, remove the pressure plate and adjust the clearance by changing the shim (**0.2 mm {0.008 in}, 0.5 mm {0.02 in}**) or the number of shims.

   Clearance
   0.3—0.6 mm {0.012—0.023 in}

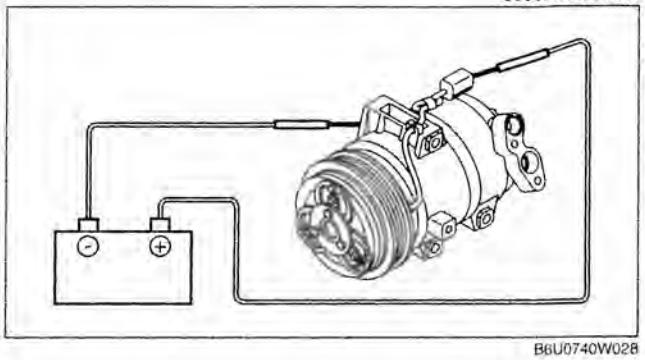


A6E8540W052

MAGNETIC CLUTCH INSPECTION

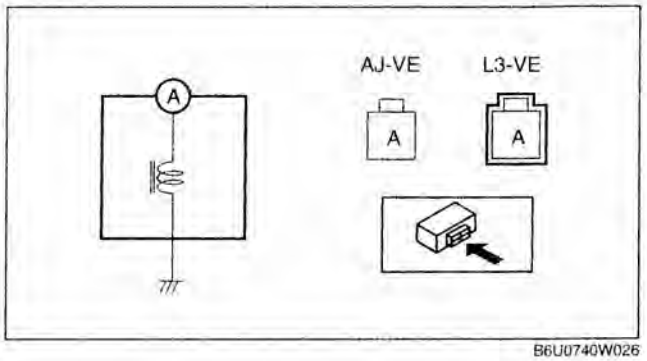
1. Connect battery positive voltage to terminal A of magnetic clutch and ground to A/C compressor body.

C6U074061010W03



B6U0740W028

2. Verify that the magnetic clutch operates.
   - If not as specified, replace the stator.

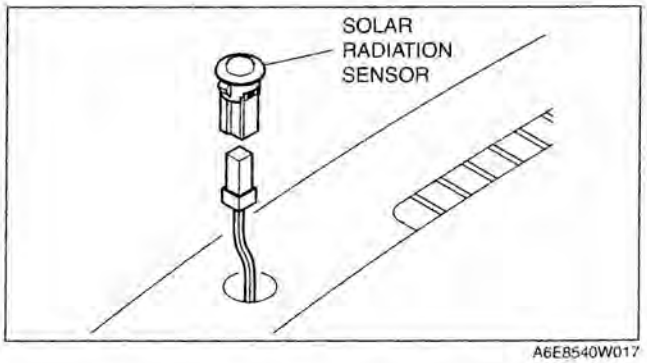


B6U0740W026

SOLAR RADIATION SENSOR REMOVAL/INSTALLATION

C6U074061751W01

1. Disconnect the negative battery cable.
2. Remove the solar radiation sensor from the dashboard using a tape-wrapped flathead screwdriver.
3. Install in the reverse order of removal.

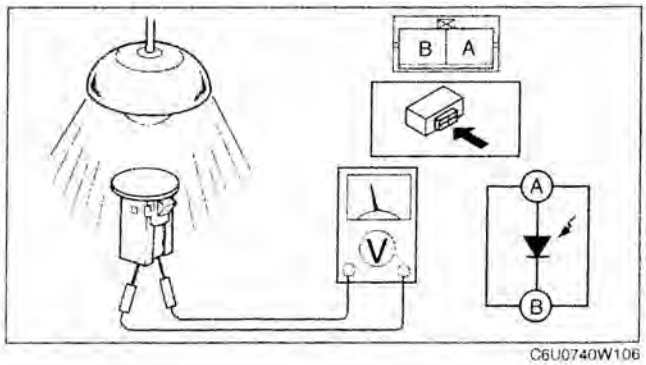


A6E8540W017

SOLAR RADIATION SENSOR INSPECTION

C6U074061751W02

1. Shine an incandescent light (**60 W**) on the solar radiation sensor from a distance of **approximately 100 mm {3.94 in}**.
2. Connect positive (+) lead to terminal A and negative (–) lead to terminal B of the solar radiation sensor.
   - If the output voltage is not **over 0.02V and not less 0.45 V**, replace the solar radiation sensor.



C6U0740W106

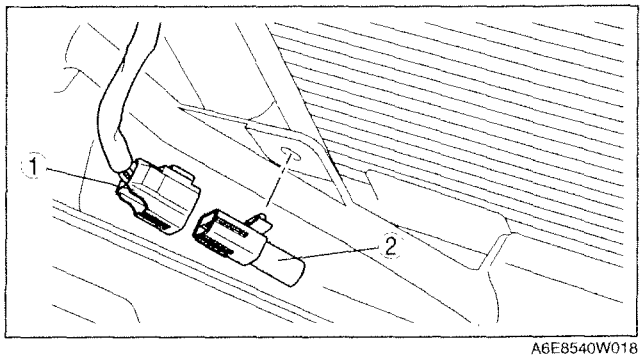
AMBIENT TEMPERATURE SENSOR REMOVAL/INSTALLATION

C6U074061764W01

1. Disconnect the negative battery cable.
2. Remove the radiator grille. (See 09–16–3 RADIATOR GRILLE REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Ambient temperature sensor connector
2	Ambient temperature sensor

4. Install in the reverse order of removal.

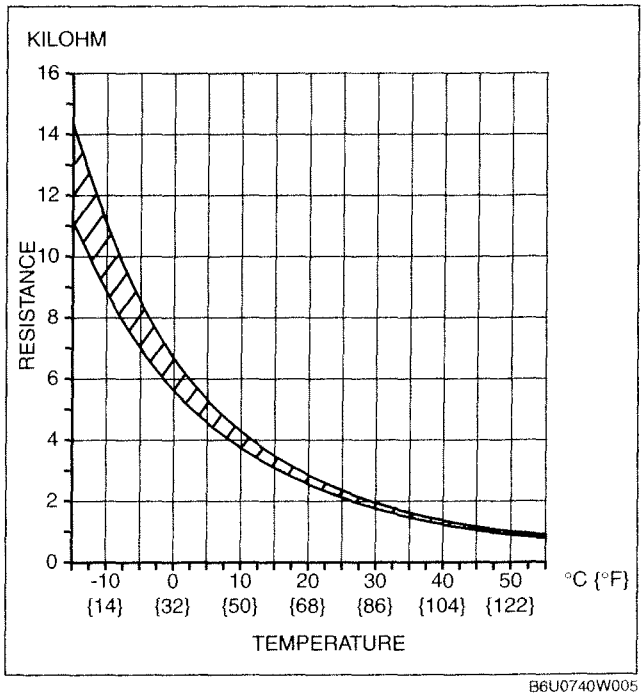


A6E8540W018

AMBIENT TEMPERATURE SENSOR INSPECTION

C6U074061764W02

1. Measure the temperature around the ambient temperature sensor.
2. Measure the resistance between terminals of the ambient temperature sensor.
   - If the resistance is not as shown in the graph, replace the ambient temperature sensor.



B6U0740W005

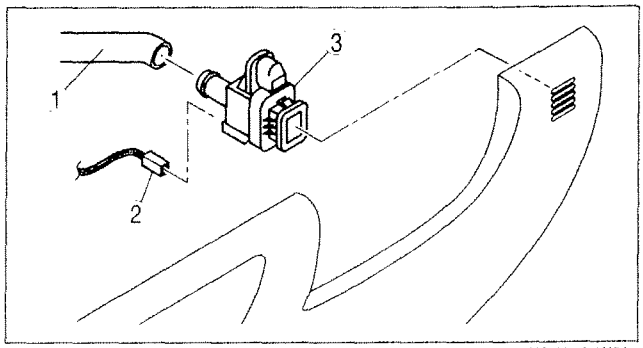
PASSENGER COMPARTMENT TEMPERATURE SENSOR REMOVAL/INSTALLATION

C6U074061764W03

1. Disconnect the negative battery cable.
2. Remove the lower panel. (See 09–17–6 LOWER PANEL REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Air hose
2	Passenger compartment temperature sensor connector
3	Passenger compartment temperature sensor

4. Install in the reverse order of removal.

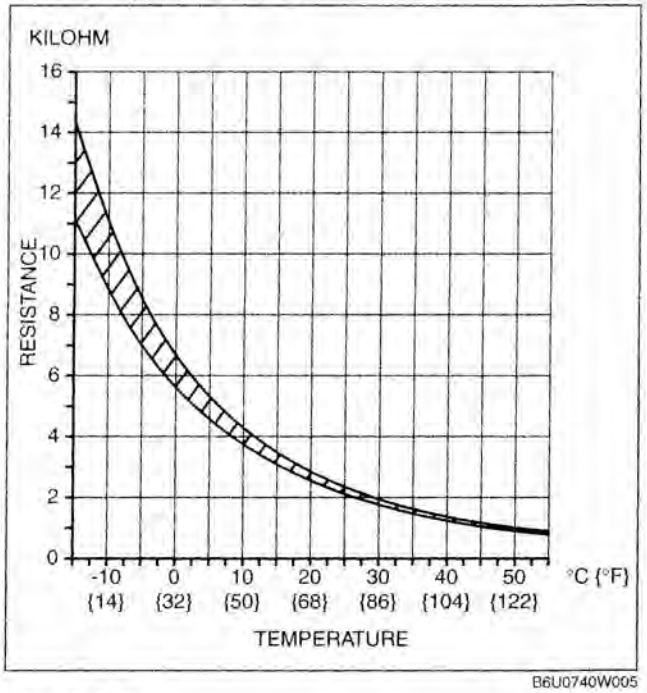


B6U0740W029

PASSENGER COMPARTMENT TEMPERATURE SENSOR INSPECTION

C6U074061764W04

1. Measure the temperature around the passenger compartment temperature sensor.
2. Measure the resistance between terminals of the passenger compartment temperature sensor.
   - If the resistance is not as shown in the graph, replace the passenger compartment temperature sensor.



B6U0740W005

EVAPORATOR TEMPERATURE SENSOR REMOVAL/INSTALLATION

C6U074061022W01

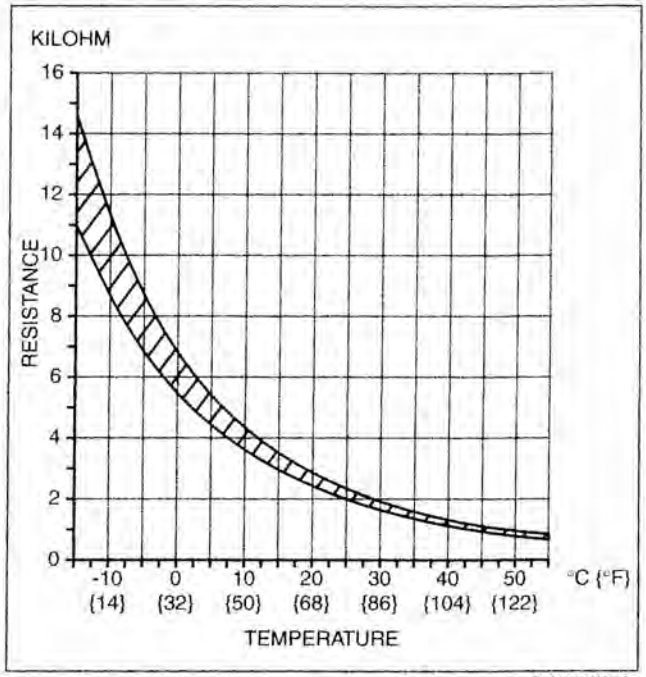
1. Remove the evaporator temperature sensor from the A/C unit. (See 07–11–4 A/C UNIT DISASSEMBLY/ ASSEMBLY.)

EVAPORATOR TEMPERATURE SENSOR INSPECTION

C6U074061022W02

1. Turn the AUTO switch on. (Full-auto air conditioner)
2. Set the temperature control to MAX COLD.
3. Push the A/C switch.
4. Set the RECIRCULATE mode.
5. Close all doors and windows.
6. Wait for **5 minutes**.
7. Remove the glove compartment.
8. Disconnect the evaporator temperature sensor.
9. Measure the temperature at the blower inlet.

10. Measure the resistance between terminals of the evaporator temperature sensor.
    - If the resistance is not as shown in the graph, replace the evaporator temperature sensor.



B6U0740W006

WATER TEMPERATURE SENSOR REMOVAL/INSTALLATION

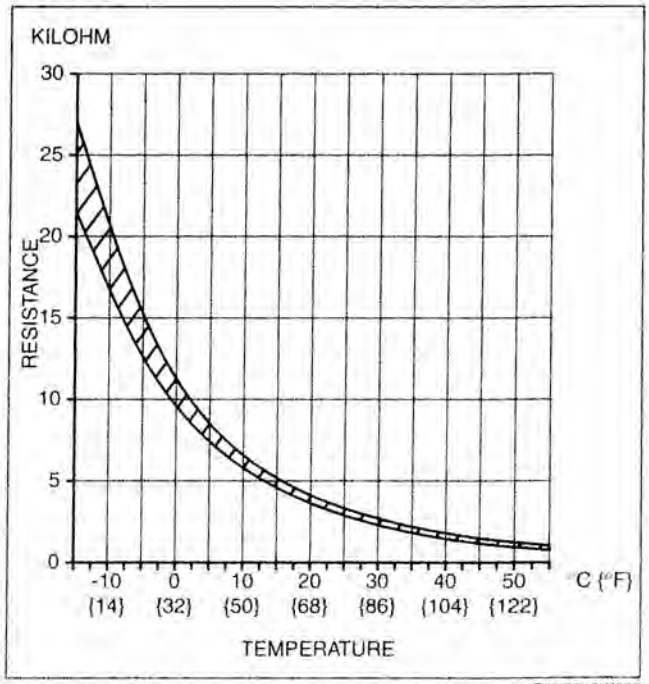
C6U074061752W01

1. Remove the water temperature sensor from the A/C unit. (See 07–11–4 A/C UNIT DISASSEMBLY/ ASSEMBLY.)

WATER TEMPERATURE SENSOR INSPECTION

C6U074061752W02

1. Measure the temperature around the water temperature sensor.
2. Measure the resistance between terminals of the water temperature sensor.
    - If the resistance is not as shown in the graph, replace the water temperature sensor.



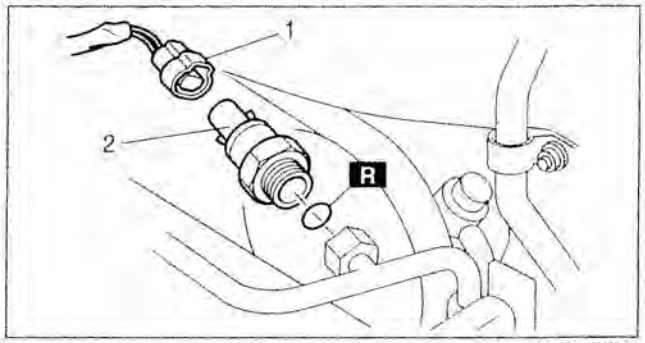
B6U0740W007

REFRIGERANT PRESSURE SWITCH REMOVAL/INSTALLATION

C6U074061503W01

1. Remove the battery.
2. Discharge the refrigerant from the system. (See 07–10–3 REFRIGERANT CHARGING.)
3. Remove the front combination light (RH). (See 09–18–6 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
4. Loosen the refrigerant pressure switch using two spanners.
5. Remove in the order indicated in the table.

1	Refrigerant pressure switch connector
2	Refrigerant pressure switch (See 07–40–15 Refrigerant Pressure Switch Installation Note)



B6U0740W037

6. Install in the reverse order of removal.

Refrigerant Pressure Switch Installation Note

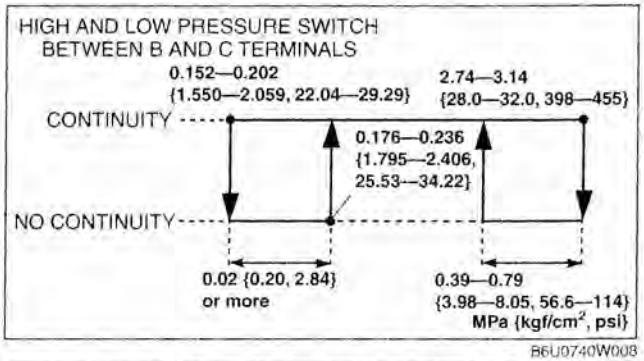
1. Apply compressor oil to O-ring and connect the joint.

REFRIGERANT PRESSURE SWITCH INSPECTION

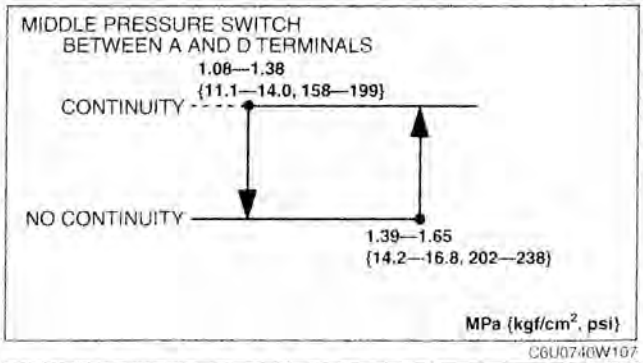
C6U074061503W02

07–40

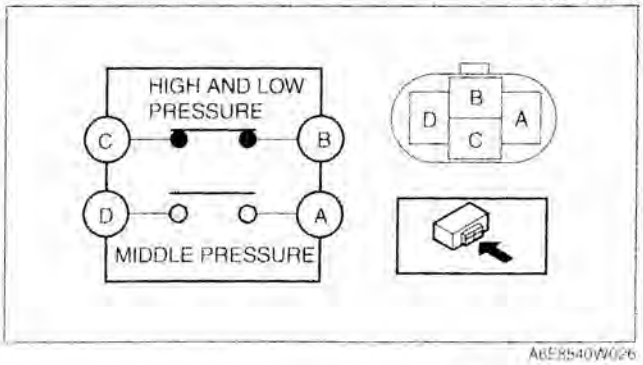
1. Install the manifold gauge set.
2. Disconnect the refrigerant pressure switch connector.
3. Verify the high-pressure side reading of the manifold gauge and continuity between the terminals of the refrigerant pressure switch.
   - If not as specified, replace the refrigerant pressure switch.



B6U0740W008



C6U0740W107

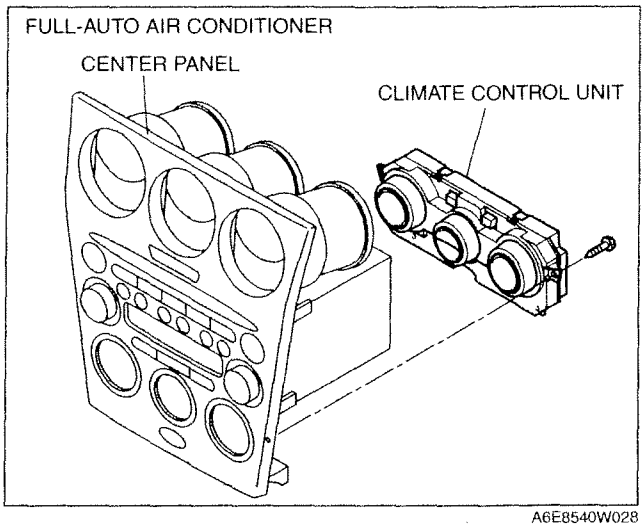


A6E3540W026

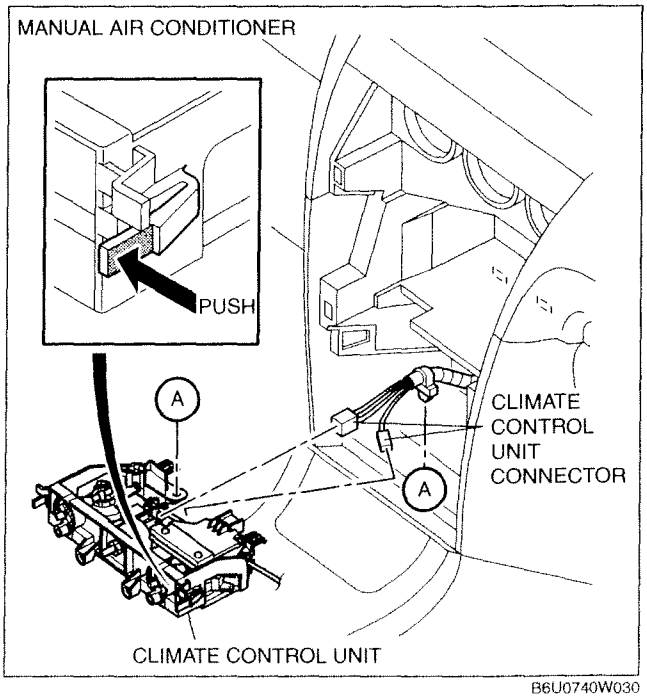
CLIMATE CONTROL UNIT REMOVAL

C6U074061190W01

1. Disconnect the negative battery cable.
2. Disconnect the air mix wire from wire clamp and link. (Manual air conditioner)
3. Remove the center panel. (See 09–20–11 CENTER PANEL MODULE REMOVAL/INSTALLATION.)
4. Remove the screws and climate control unit. (Full-auto air conditioner)
5. Release the hook and pull the climate control unit toward you. (Manual air conditioner)
6. Disconnect the climate control unit connectors and remove the climate control unit. (Manual air conditioner)



A6E8540W028

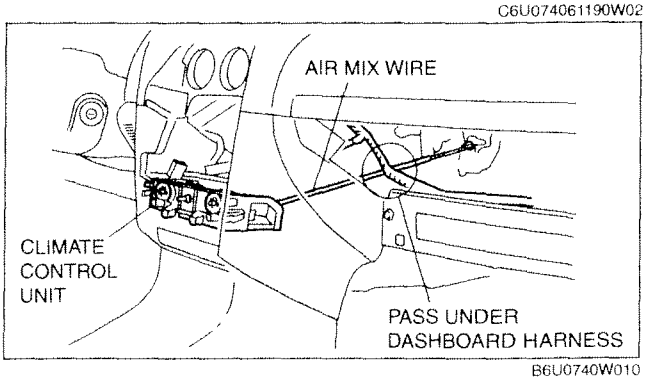


B6U0740W030

CLIMATE CONTROL UNIT INSTALLATION

1. Pass air mix wire through the following routes then connect to A/C unit. (Manual air conditioner)
2. Connect the climate control unit connectors. (Manual air conditioner)
3. Install the climate control unit to the center panel. (Full-auto air conditioner)
4. Install the center panel.
5. Adjust the climate control unit wire. (Manual air conditioner) (See 07–40–18 CLIMATE CONTROL UNIT WIRE ADJUSTMENT.)
6. Connect the negative battery cable.

C6U074061190W02



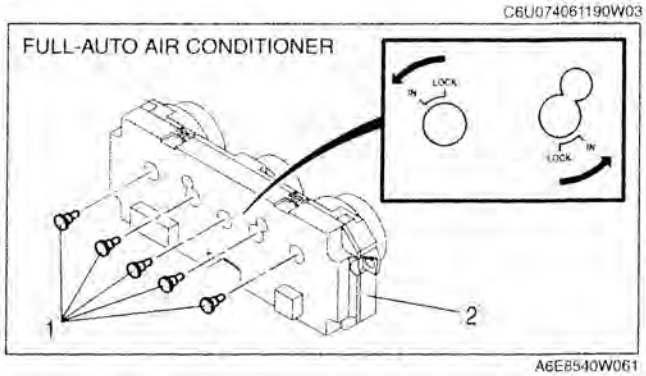
B6U0740W010

CLIMATE CONTROL UNIT DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

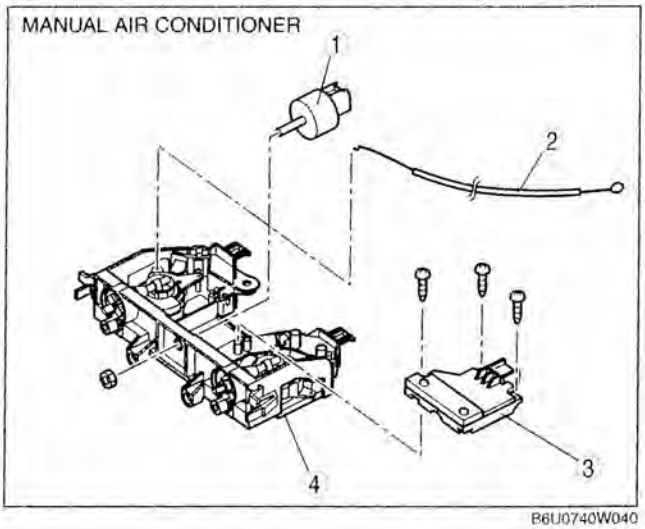
1	Illumination bulb
2	Body

C6U074061190W03



A6E8540W061

1	Fan switch
2	Air mix wire (See 07–40–17 Wire Disassembly Note) (See 07–40–17 Wire Assembly Note)
3	Mode switch
4	Body



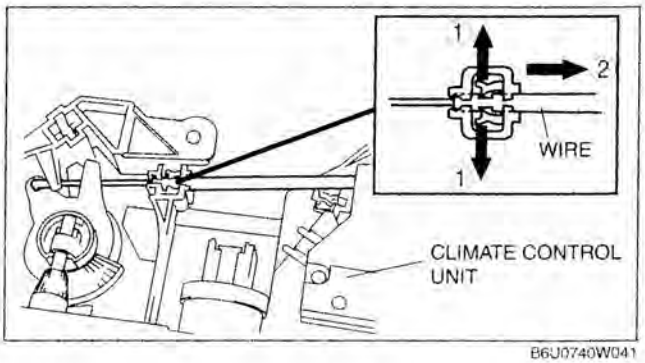
B6U0740W040

2. Assemble in the reverse order of disassembly.

07–40

Wire Disassembly Note

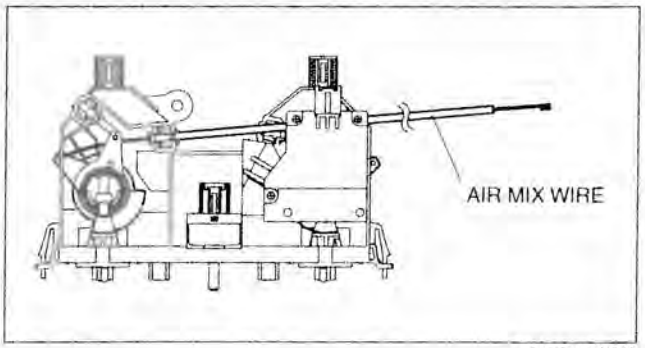
1. Disassemble the wire in the shown in the figure.



B6U0740W041

Wire Assembly Note

1. Assemble the wire to the position as shown in the figure.



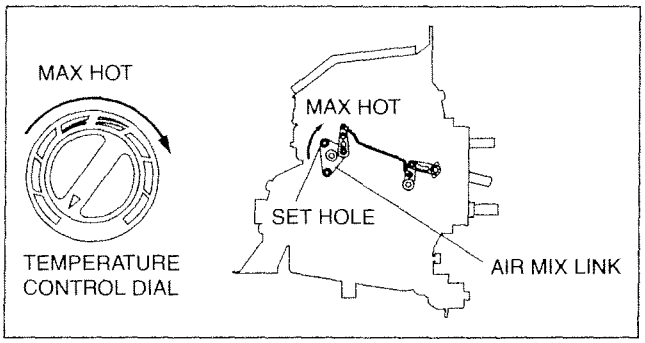
B6U0740W042

CLIMATE CONTROL UNIT WIRE ADJUSTMENT

C6U074061190W04

Air Mix Wire

1. Set the temperature control dial to max hot.
2. Set the air mix link to max hot in the direction shown by the arrow and insert a screwdriver at the set hole.
3. Connect the air mix wire to the air mix link.
4. Clamp the air mix wire to the wire clamp.
5. Verify that the temperature control dial rotates at full stroke.



C6U0740W108

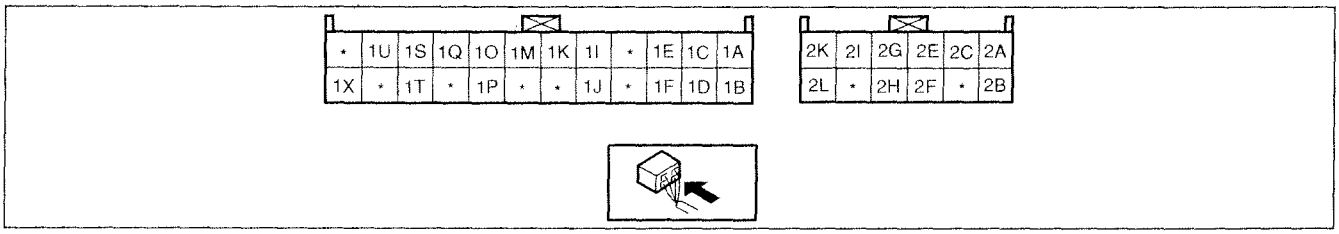
CLIMATE CONTROL UNIT INSPECTION

C6U074061190W05

Full-auto Air Conditioner

1. Connect all center panel connectors.
2. Turn the ignition switch to ON position.
3. Measure the voltage at each climate control unit terminal and refer to the terminal voltage list.
   - If not as specified, inspect the parts listed under "Action" and the related wiring harness.
     — If there is any malfunction, replace the climate control unit.

Terminal Voltage List (Reference)



B6U0740W001

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
1A	Air mix 1	Air mix actuator	Moving to HOT Moving to COLD	See Figure 2	• Inspect for continuity or short circuit (Climate control unit—air mix actuator: 1A—F) • Inspect air mix actuator
1B	Air mix 2	Air mix actuator	Moving to HOT Moving to COLD	See Figure 2	• Inspect for continuity or short circuit (Climate control unit—air mix actuator: 1B—A) • Inspect air mix actuator
1C	PWM output	PWM unit	Fan speed: 1—7	See Figure 1	• Inspect for continuity or short circuit (Climate control unit—PWM unit: 1C—2A) • Inspect PWM unit
1D	Air mix 3	Air mix actuator	Moving to HOT Moving to COLD	See Figure 2	• Inspect for continuity or short circuit (Climate control unit—air mix actuator: 1D—D) • Inspect air mix actuator
1E	Rear window defroster SW signal	Rear window defroster relay	Rear window defroster switch is off	12	• Inspect for continuity or short circuit (Climate control unit—rear window defroster relay: 1E—E) • Inspect rear window defroster relay
			Rear window defroster switch is on	Below 1.0	• Inspect terminal voltage of climate control unit (2H, 2L) • Inspect center panel

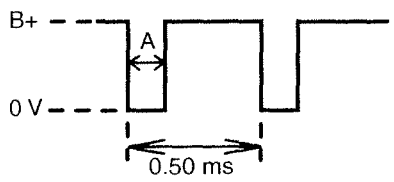
Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
1F	On-board diagnostic signal	A/C check connector	Terminal A of A/C check connector is shorted.	Below 1.0	• Inspect for continuity (Climate control unit—A/C check connector: 1F—A)
			Other	5	• Inspect short circuit (Climate control unit—A/C check connector: 1F—A) • Inspect terminal voltage of climate control unit (2H, 2L)
1G	—	—	—	—	—
1H	—	—	—	—	—
1I	GND	• Passenger compartment temperature sensor • Evaporator temperature sensor • Ambient temperature sensor • Water temperature sensor • Solar radiation sensor • Airflow mode actuator	Under any condition	Below 1.0	• Inspect terminal voltage of climate control unit (2L)
1J	Air mix 4	Air mix actuator	Moving to HOT Moving to COLD	See Figure 2	• Inspect for continuity or short circuit (Climate control unit—air mix actuator: 1J—C) • Inspect air mix actuator
1K	Ambient temperature sensor input	Ambient temperature sensor	Depends on temperature surrounding sensor	See Figure 4	• Inspect for continuity (Climate control unit—ambient temperature sensor: 1K—B, 1I—A) • Inspect for short circuit (Climate control unit—ambient temperature sensor: 1K—B) • Inspect ambient temperature sensor • Inspect terminal voltage of climate control unit (2H, 2L)
1L	—	—	—	—	—
1M	Passenger compartment temperature sensor input	Passenger compartment temperature sensor	Depends on temperature surrounding sensor	See Figure 5	• Inspect for continuity (Climate control unit—passenger compartment temperature sensor: 1M—B, 1I—A) • Inspect for short circuit (Climate control unit—passenger compartment temperature sensor: 1M—B) • Inspect passenger compartment temperature sensor • Inspect terminal voltage of climate control unit (2H, 2L)
1N	—	—	—	—	—
1O	Water temperature sensor input	Water temperature sensor	Depends on temperature surrounding sensor	See Figure 6	• Inspect for continuity (Climate control unit—water temperature sensor: 1O—A, 1I—B) • Inspect for short circuit (Climate control unit—water temperature sensor: 1O—A) • Inspect water temperature sensor • Inspect terminal voltage of climate control unit (2H, 2L)

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
1P	A/C	Refrigerant pressure switch	Fan switch at OFF	12	• Inspect for continuity or short circuit (Climate control unit—refrigerant pressure switch: 1P—C) (Refrigerant pressure switch—PCM: B—1AC (L3-V), 41 (AJ-V)) • Inspect refrigerant pressure switch • Inspect PCM terminal voltage (1AC (L3-V), 41 (AJ-V)) (See 01–40A–7 PCM INSPECTION [L3]) (See 01–40B–6 PCM INSPECTION [AJ])
			Fan switch at 1st position, A/C switch ON	Below 1.0	• Inspect terminal voltage of climate control unit (2H, 2L)
1Q	Evaporator temperature sensor input signal	Evaporator temperature sensor	Depends on temperature surrounding sensor	See Figure 3	• Inspect for continuity (Climate control unit—evaporator temperature sensor: 1Q—A, 1I—B) • Inspect for short circuit (Climate control unit—evaporator temperature sensor: 1Q—A) • Inspect evaporator temperature sensor • Inspect terminal voltage of climate control unit (2H, 2L)
1R	—	—	—	—	—
1S	Solar radiation sensor input	Solar radiation sensor	Incandescent light (**60W**) shining on solar radiation sensor from distance of **approx. 100mm {3.9 in}**	4.5	• Inspect for continuity or short circuit (Climate control unit—solar radiation sensor: 1S—B, 2C—A) • Inspect terminal voltage of climate control unit (2C) • Inspect solar radiation sensor
			Light to solar radiation sensor block	Below 1.0	
1T	GND	Ground	Under any condition	Below 1.0	• Inspect for continuity (Climate control unit—ground: 1T—GND) • Inspect center panel
1U	Potentiometer signal	Airflow mode actuator	VENT mode	4.1	• Inspect for continuity or short circuit (Climate control unit—airflow mode actuator: 1W—C) • Inspect airflow mode actuator • Inspect terminal voltage of climate control unit (2C)
			BI-LEVEL mode	3.3	
			HEAT mode	2.3	
			HEAT/DEF mode	1.5	
			DEFROSTER mode	0.9	
1V	—	—	—	—	—
1W	—	—	—	—	—
1X	Hazard warning SW signal	Hazard warning switch	Hazard warning switch is off	12	• Inspect for continuity or short circuit (Climate control unit—flasher unit: 1X—H) • Inspect flasher unit
			Hazard warning switch is on	Below 1.0	• Inspect terminal voltage of climate control unit (1T) • Inspect center panel

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
2A	Panel light control signal	Panel light control switch	Headlight switch ON and panel light control switch at max. illumination	0.2	• Inspect for continuity (Climate control unit— panel light control switch: 2A—C) (Panel light control switch—ground: C—GND) • Inspect panel light control switch
			Headlight switch ON and panel light control switch at min. illumination	10.2	• Inspect for short circuit (Climate control unit— panel light control switch: 2A—C)
2B	TNS signal	TNS relay	Headlight switch OFF	Below 1.0	• Inspect for short circuit (Climate control unit—TNS relay: 2B—D) • Inspect TNS relay • Inspect headlight switch
			Headlight switch ON	12	• Inspect for continuity or short circuit (Climate control unit—TNS relay: 2B—D) • Inspect TNS relay • Inspect headlight switch
2C	+5 V	• Airflow mode actuator	Ignition switch at ON position	5	• Inspect for short circuit (Climate control unit—airflow mode actuator: 2C—B, B, A) • Inspect air mix actuator • Inspect airflow mode actuator • Inspect solar radiation sensor • Inspect terminal voltage of climate control unit connector (2H, 2L)
			Ignition switch at LOCK position	Below 1.0	• Replace climate control unit
2D	—	—	—	—	—
2E	Motor drive signal	Airflow mode actuator	Moving to DEFROSTER	12	• Inspect for continuity or short circuit (Climate control unit—airflow mode actuator: 2E—F, 2G—D) • Inspect airflow mode actuator
			Moving to VENT	Below 1.0	
2F	Backup power supply	ROOM 15 A fuse	Under any condition	B+	• Inspect for continuity or short circuit (Climate control unit—fuse: 2F— ROOM 15 A fuse) • Inspect ROOM 15 A fuse
2G	Motor drive signal	Airflow mode actuator	Moving to VENT	12	• Inspect for continuity or short circuit (Climate control unit—airflow mode actuator: 2G—D, 2E—F) • Inspect airflow mode actuator
			Moving to DEFROSTER	Below 1.0	
2H	IG2	A/C 15 A fuse	Ignition switch at ON position	B+	• Inspect for continuity or short circuit (Climate control unit—fuse: 2H—A/C 15 A fuse) • Inspect A/C 15 A fuse
			Ignition switch at LOCK position	Below 1.0	• Inspect for short circuit (Climate control unit—fuse: 2H—A/C 15 A fuse)
2I	Motor drive signal	Air intake actuator	Moving to RECIRCULATE	12	• Inspect for continuity or short circuit (Climate control unit—air intake actuator: 2I—F, 2K—D) • Inspect air intake actuator
			Moving to FRESH	Below 1.0	
2J	—	—	—	—	—

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
2K	Motor drive signal	Air intake actuator	Moving to FRESH	12	• Inspect for continuity or short circuit (Climate control unit—air intake actuator: 2K—D, 2I—F) • Inspect air intake actuator
			Moving to RECIRCULATE	Below 1.0	
2L	GND	Ground	Under any condition	Below 1.0	• Inspect for continuity (Climate control unit—ground: 2L—GND)

Figure 1



FAN SPEED	A (ms)
1	0.13
2	0.19
3	0.24
4	0.29
5	0.34
6	0.38
7	0.50

Figure 2

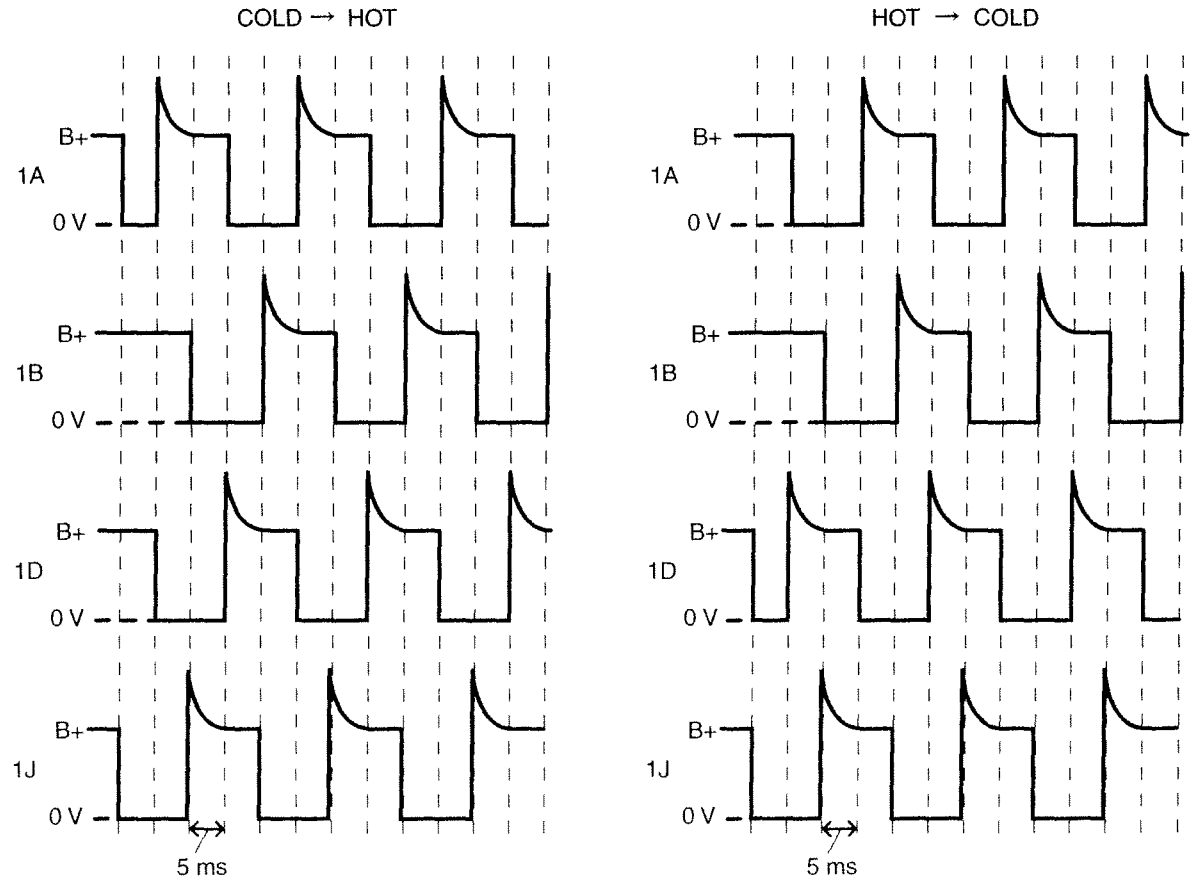


Figure 3 (Evaporator temperature sensor)

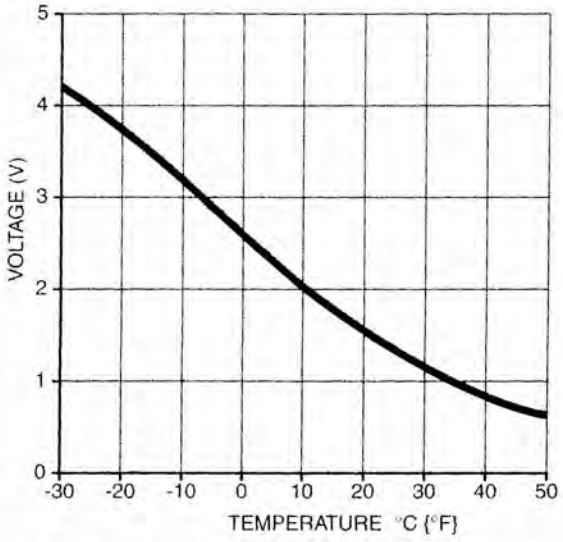


Figure 4 (Ambient temperature sensor)

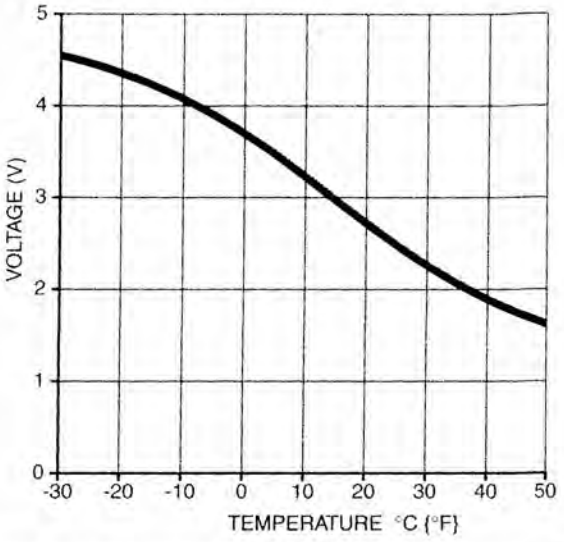


Figure 5 (Cabin temperature sensor)

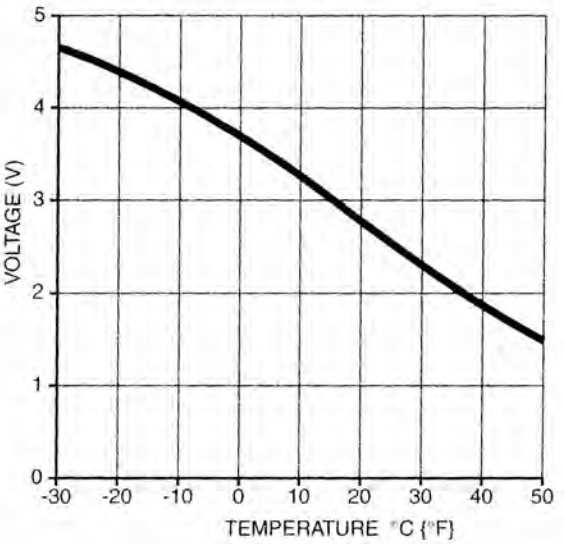
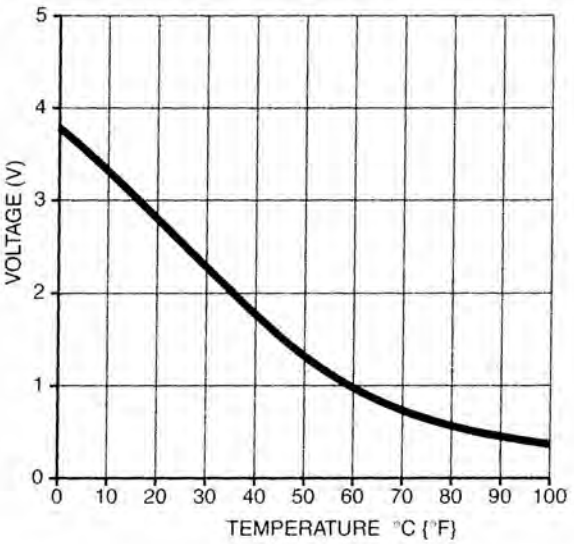


Figure 6 (Water temperature sensor)



Manual Air Conditioner

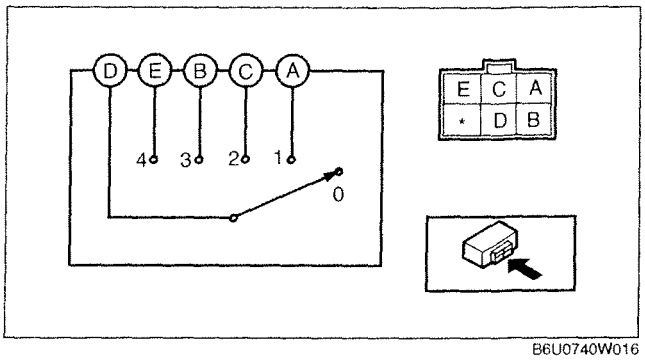
Fan switch

1. Remove the climate control unit.
2. Inspect for continuity between the fan switch terminals using an ohmmeter.
   - If not as specified, replace the fan switch.

○—○ : Continuity

Switch position	Terminal				
	D	A	B	C	E
0					
1	○	○			
2	○			○	
3	○				○
4	○		○		

B6U0740W015



B6U0740W016

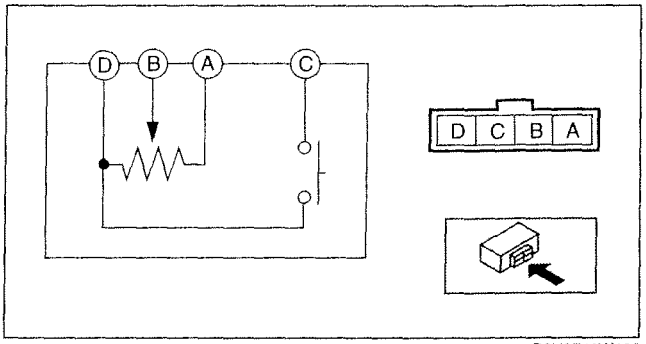
Mode switch

1. Remove the climate control unit.
2. Inspect for continuity between the mode switch terminals using an ohmmeter.
   - If not as specified, replace the climate control unit.

○—○: Continuity

Switch position	Terminal	
	C	D
VENT, BI-LEVEL, HEAT		
HEAT/DEF, DEFROSTER	○	○

B6U0740W017



B6U0740W033

3. Verify that the resistance between the terminals of the mode switch is as shown in the table.
   - If not as specified, replace the mode switch.

Terminals	Resistance (ohm)				
	VENT	BI-LEVEL	HEAT	HEAT/DEF	DEFROSTER
A—B	0	2.48	4.96	7.44	9.92
B—D	9.92	7.44	4.96	2.48	0

07–50 TECHNICAL DATA

HVAC TECHNICAL DATA

C6U075001038W01

Item				Specification
REFRIGERANT SYSTEM				
Refrigerant	Type			R-134a
	Regular amount (approximate quantity)		(g {oz})	475 {16.8}
BASIC SYSTEM				
A/C compressor	Lubrication oil (approximate quantity)	Type		ATMOS GU10
		Sealed volume	(ml {cc, fl oz})	150 {150, 5.07}
CONTROL SYSTEM				
A/C compressor	Magnetic clutch clearance		(mm {in})	0.3—0.6 {0.012—0.023}

RESTRAINTS

08 SECTION

08–02 ON-BOARD DIAGNOSTIC

FOREWORD

C6U080201046W01

Outline

- The OBD (on-board diagnostic) test inspects the integrity and function of the air bag system and outputs the results when requested by the specific tests.
- The OBD test also:
  - — Provides a quick inspection of the air bag system.
  - — Is usually performed at the start of each diagnostic procedure.
  - — Provides verification after repairs to ensure that no other faults occurred during service.
- The OBD test is divided into three tests:
  - — Read/clear diagnostic results
  - — PID/data monitor and record
- The diagnostic DTC can be read/cleared, using the **SST** (WDS or equivalent).

Note

- When the air bag system is malfunctioning, turn the ignition switch to the ON position to display the current DTC, using the air bag system warning light on the instrument cluster. However this light is strictly for reference. Make sure to inspect the system, using the **SST** (WDS or equivalent).

Read/clear diagnostic results

- This function allows you to read or clear DTCs in the SAS control module memory.

PID/data monitor and record

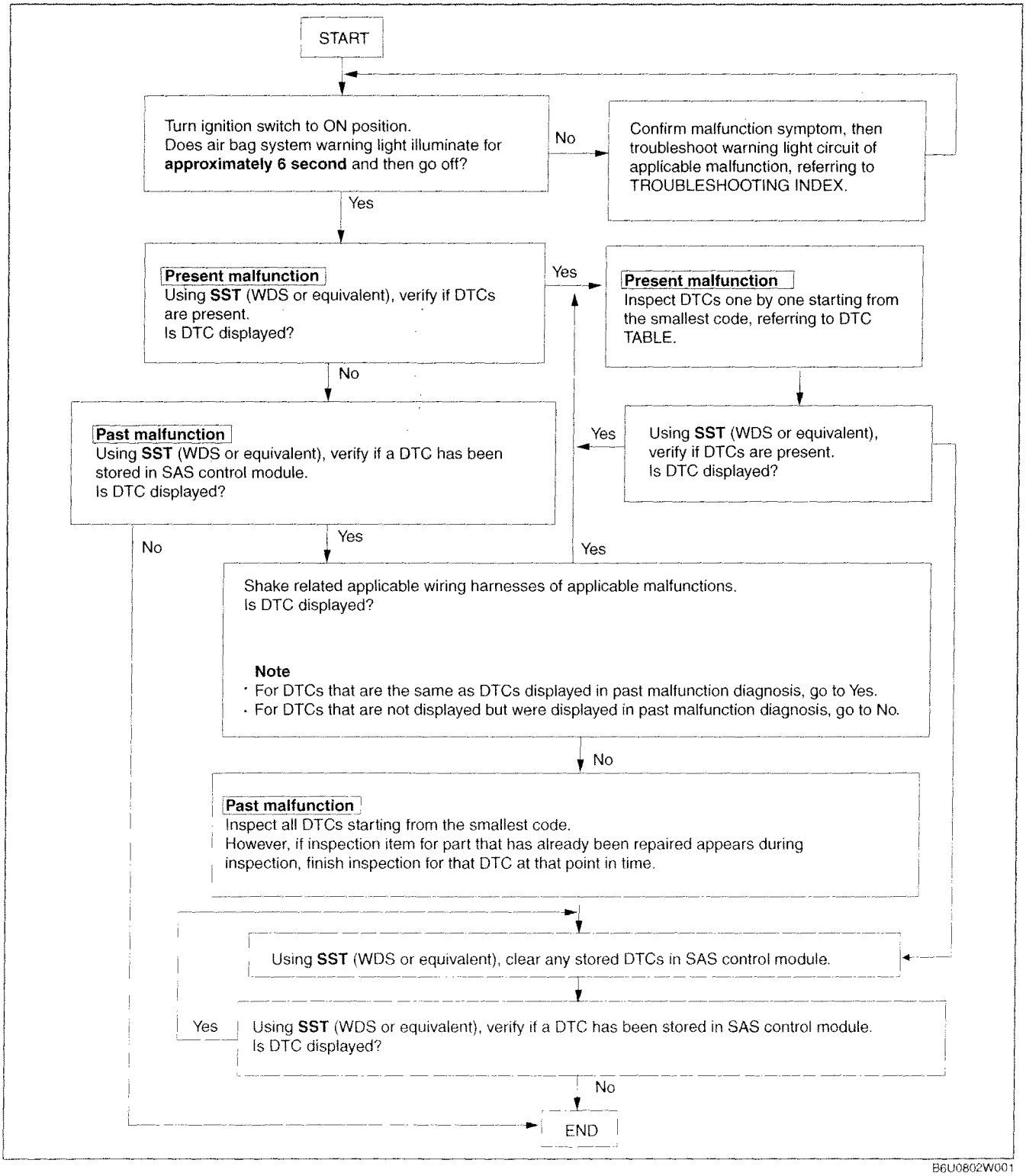
- This function allows you access certain data values, input signals, calculated values, and system status information.

Flowchart

- Use the following flowchart to verify the cause of the trouble.

Note

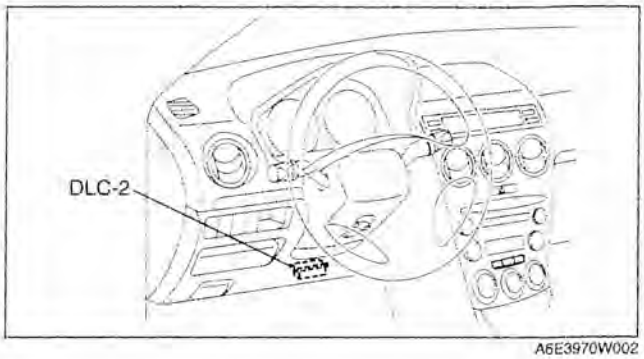
- When performing the inspection of the past malfunction code, the applicable DTCs may be added to memory by removing or disconnecting the related parts. Inspect only the DTCs that were indicated before inspecting.
- When DTCs for a present malfunction are no longer output after present or past malfunctions or both have been repaired, be sure to perform past malfunction display cancellation to prevent repair of malfunctions that have already been repaired.



B6U0802W001

DTCs Reading Procedure

1. Connect the **SST** (WDS or equivalent) to the vehicle DLC-2 16-pin connector.
2. Retrieve DTC using the **SST** (WDS or equivalent).



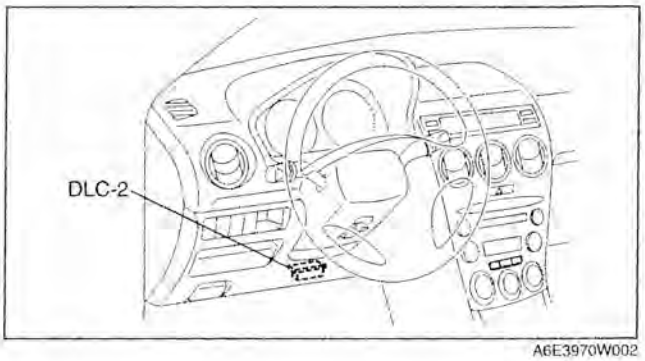
A6E3970W002

Clearing DTCs Procedure

1. After repairs have been made, perform the DTC reading procedure.
2. Erase DTCs using the **SST** (WDS or equivalent).
3. Ensure that the customer's concern has been resolved.

PID/Data Monitor and Record Procedure

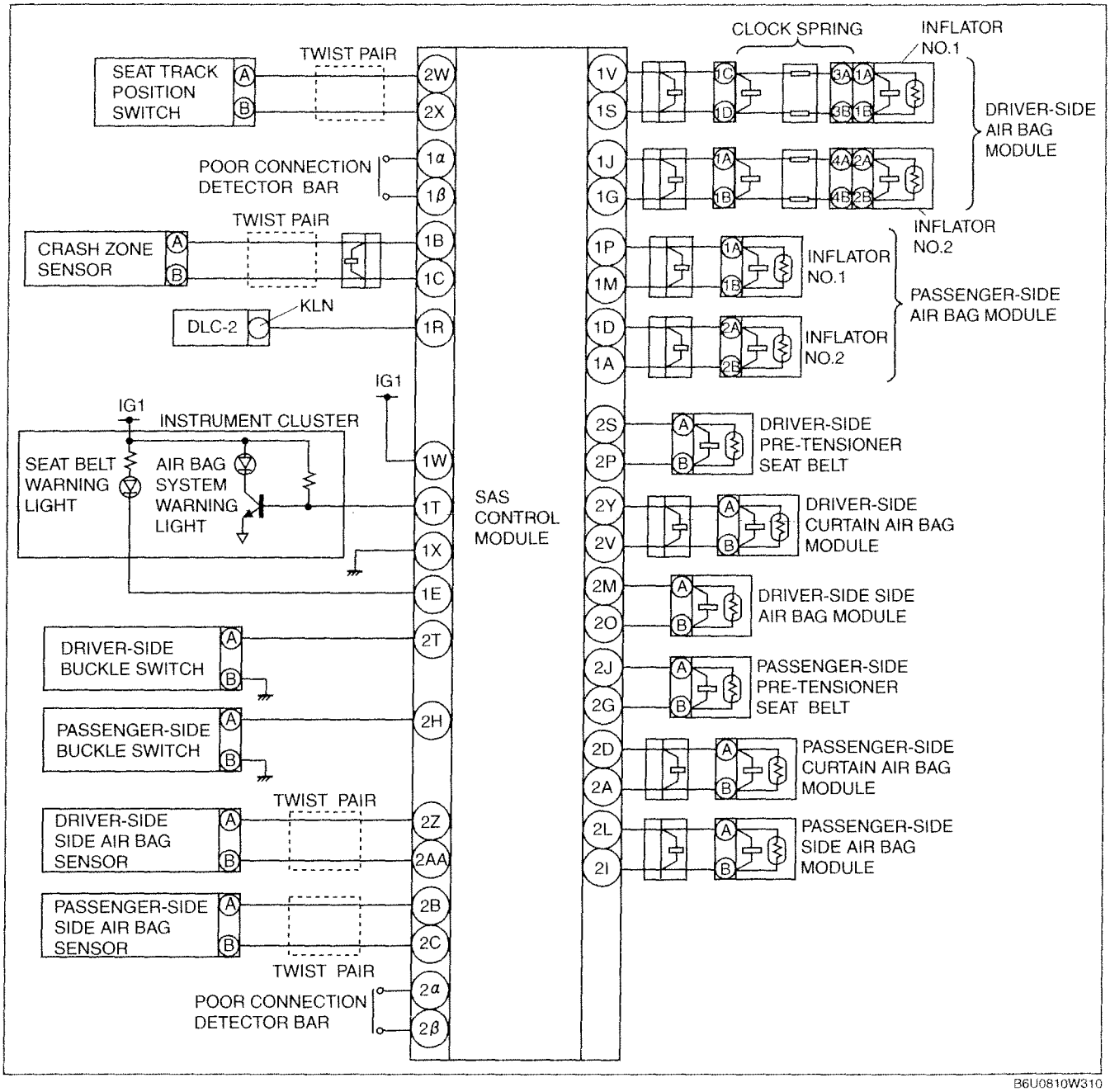
1. Connect the **SST** (WDS or equivalent) to the vehicle DLC-2 16-pin connector.
2. Access and monitor PIDs using the **SST** (WDS or equivalent).



A6E3970W002

AIR BAG SYSTEM WIRING DIAGRAM

C6U080201046W02



B6U0810W310

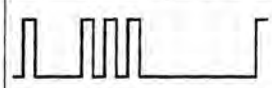
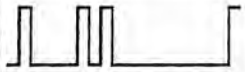
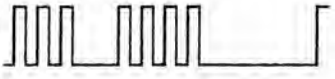
DTC TABLE

C6U080201046W03

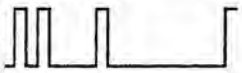
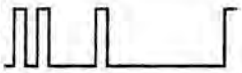
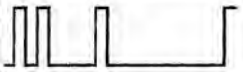
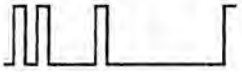
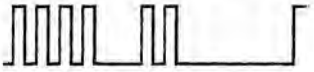
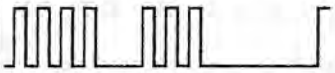
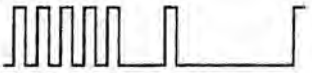
- DTCs are common for present and past malfunction diagnosis.

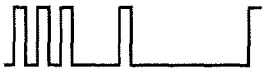
Note

- When DTCs not shown in the DTC table are displayed, replace the SAS control module.
- If the air bag system warning light does not illuminate or remains illuminated when the ignition switch is turned to the ON position, inspect and repair the air bag system warning light circuitry and then confirm that the air bag system warning light is operational.
- The air bag system warning light will flash the DTC pattern for five cycles, and then it will remain illuminated until the ignition switch is turned to the LOCK position.

DTC				Malfunction location	Page
WDS or equivalent	Air bag system warning light				
	Flashing pattern		Priority ranking		
B1231	13		3	SAS control module activation (deployment) control freeze	(See 08–02–12 DTC B1231)
B1342	12		2	SAS control module	(See 08–02–12 DTC B1342)
	—	Air bag system warning light is illuminated all the time.	1	SAS control module (DTC 12 detection circuit malfunction)	
B1426	57		25	Seat belt warning light circuit short to power supply	(See 08–02–12 DTC B1426, B1427)
B1427				Seat belt warning light circuit open	
B1869	—	Air bag system warning light is illuminated all the time.	1	Air bag system warning light system circuit open	(See 08–02–14 DTC B1869, B1870)
	—	Air bag system warning light does not illuminate.	—	Air bag system warning light system circuit short to ground	
B1870	—	Air bag system warning light is illuminated all the time.	1	Air bag system warning light system circuit short to power supply	
B1877	33		13	Driver-side pre-tensioner seat belt system resistance high	(See 08–02–16 DTC B1877, B1878, B1879, B1885)
B1878				Driver-side pre-tensioner seat belt system circuit short to power supply	
B1879				Driver-side pre-tensioner seat belt system circuit short to ground	
B1881	34		12	Passenger-side pre-tensioner seat belt system resistance high	(See 08–02–17 DTC B1881, B1882, B1883, B1886)
B1882				Passenger-side pre-tensioner seat belt system circuit short to power supply	
B1883				Passenger-side pre-tensioner seat belt system circuit short to ground	
B1885	33		13	Driver-side pre-tensioner seat belt system resistance low	(See 08–02–16 DTC B1877, B1878, B1879, B1885)

DTC				Malfunction location	Page
WDS or equivalent	Air bag system warning light				
	Flashing pattern		Priority ranking		
B1886	34		12	Passenger-side pre-tensioner seat belt system resistance low	(See 08–02–17 DTC B1881, B1882, B1883, B1886)
B1913	19		11	Driver-side air bag module (inflator No.1) system circuit short to ground	(See 08–02–19 DTC B1913, B1916, B1932, B1934)
	21		10	Passenger-side air bag module (inflator No.1) system circuit short to ground	(See 08–02–21 DTC B1913, B1925, B1933, B1935)
B1916	19		11	Driver-side air bag module (inflator No.1) system circuit short to power supply	(See 08–02–19 DTC B1913, B1916, B1932, B1934)
B1925	21		10	Passenger-side air bag module (inflator No.1) system circuit short to power supply	(See 08–02–21 DTC B1913, B1925, B1933, B1935)
B1932	19		11	Driver-side air bag module (inflator No.1) system resistance high	(See 08–02–19 DTC B1913, B1916, B1932, B1934)
B1933	21		10	Passenger-side air bag module (inflator No.1) system resistance high	(See 08–02–21 DTC B1913, B1925, B1933, B1935)
B1934	19		11	Driver-side air bag module (inflator No.1) system resistance low	(See 08–02–19 DTC B1913, B1916, B1932, B1934)
B1935	21		10	Passenger-side air bag module (inflator No.1) system resistance low	(See 08–02–21 DTC B1913, B1925, B1933, B1935)
B1992	22		15	Driver-side side air bag module system circuit short to power supply	(See 08–02–22 DTC B1992, B1993, B1994, B1995)
B1993				Driver-side side air bag module system circuit short to ground	
B1994				Driver-side side air bag module system resistance high	
B1995				Driver-side side air bag module system resistance low	
B1996	23		14	Passenger-side side air bag module system circuit short to power supply	(See 08–02–24 DTC B1996, B1997, B1998, B1999)
B1997				Passenger-side side air bag module system circuit short to ground	
B1998				Passenger-side side air bag module system resistance high	
B1999				Passenger-side side air bag module system resistance low	

DTC				Malfunction location	Page
WDS or equivalent	Air bag system warning light				
	Flashing pattern		Priority ranking		
B2228	19		11	Driver-side air bag module (inflator No.2) system circuit short to ground	(See 08–02–25 DTC B2228, B2230, B2232, B2234)
B2229	21		10	Passenger-side air bag module (inflator No.2) system circuit short to ground	(See 08–02–27 DTC B2229, B2231, B2233, B2235)
B2230	19		11	Driver-side air bag module (inflator No.2) system circuit short to power supply	(See 08–02–25 DTC B2228, B2230, B2232, B2234)
B2231	21		10	Passenger-side air bag module (inflator No.2) system circuit short to power supply	(See 08–02–27 DTC B2229, B2231, B2233, B2235)
B2232	19		11	Driver-side air bag module (inflator No.2) system resistance high	(See 08–02–25 DTC B2228, B2230, B2232, B2234)
B2233	21		10	Passenger-side air bag module (inflator No.2) system resistance high	(See 08–02–27 DTC B2229, B2231, B2233, B2235)
B2234	19		11	Driver-side air bag module (inflator No.2) system resistance low	(See 08–02–25 DTC B2228, B2230, B2232, B2234)
B2235	21		10	Passenger-side air bag module (inflator No.2) system resistance low	(See 08–02–27 DTC B2229, B2231, B2233, B2235)
B2296	42		9	Crash zone sensor system (communication error, sensor internal circuit abnormal)	(See 08–02–29 DTC B2296)
B2434	51		19	Driver-side buckle switch circuit short to ground	(See 08–02–31 DTC B2434, B2435, B2691)
B2435				Driver-side buckle switch circuit resistance out of range	
B2438	52		20	Passenger-side buckle switch circuit short to ground	(See 08–02–33 DTC B2438, B2439, B2692)
B2439				Passenger-side buckle switch circuit resistance out of range	
B2444	43		8	Driver-side side air bag sensor system (sensor internal circuit abnormal)	(See 08–02–35 DTC B2444, U2017)
B2445	44		7	Passenger-side side air bag sensor system (sensor internal circuit abnormal)	(See 08–02–37 DTC B2445, U2018)
B2691	51		19	Driver-side buckle switch circuit open or short to power supply	(See 08–02–31 DTC B2434, B2435, B2691)

DTC				Malfunction location	Page
WDS or equivalent	Air bag system warning light				
	Flashing pattern		Priority ranking		
B2692	52		5	Passenger-side buckle switch circuit open or short to power supply	(See 08–02–33 DTC B2438, B2439, B2692)
B2773	24		17	Driver-side curtain air bag module system resistance low	(See 08–02–39 DTC B2773, B2774, B2775, B2776)
B2774				Driver-side curtain air bag module system resistance high	
B2775				Driver-side curtain air bag module system circuit short to ground	
B2776				Driver-side curtain air bag module system circuit short to power supply	
B2777	25		16	Passenger-side curtain air bag module system resistance low	(See 08–02–40 DTC B2777, B2778, B2779, B2780)
B2778				Passenger-side curtain air bag module system resistance high	
B2779				Passenger-side curtain air bag module system circuit short to ground	
B2780				Passenger-side curtain air bag module system circuit short to power supply	
B2867	31		6	SAS control module connector poor connection	(See 08–02–42 DTC B2867)
C1947	49		22	Seat track position sensor circuit short to ground	(See 08–02–43 DTC C1947, C1948, C1981)
C1948				Seat track position sensor circuit resistance out of range	
C1981				Seat track position sensor circuit open or short to power supply	
U2017	43		8	Driver-side side air bag sensor system (communication error)	(See 08–02–35 DTC B2444, U2017)
U2018	44		7	Passenger-side side air bag sensor system (communication error)	(See 08–02–37 DTC B2445, U2018)

PID/DATA MONITOR TABLE

C6U080201046W04

PID name (definition)	Unit/condition	Condition/specification	SAS control module terminal
CCNT_RCM (Number of continuous DTC)	—	• DTC is detected: 1—255 • DTC is not detected: 0	—
D_ABAGR2 (Driver-side air bag module (inflator No.2) resistance)	ohm	Under any condition: 1.5—3.7 ohms	1G, 1J
D_CRSH_S (Driver-side side air bag sensor state)	OK/ COMM FAIL/ INT FAIL	• Sensor normal: OK • Sensor communication error: COMM FAIL • Sensor internal circuit abnormal: INT FAIL	2Z, 2AA
DABAGR (Driver-side air bag module (inflator No.1) resistance)	ohm	Under any condition: 1.5—3.7 ohms	1S, 1V
D_PTENSFLT (Driver-side pre-tensioner seat belt circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Pre-tensioner seat belt circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	2P, 2S
DR_BUKL (Driver-side buckle switch state)	Buckled/ Unbuckled	• Buckle switch on: Buckled • Buckle switch off: Unbuckled	2T
DR_CURTN (Driver-side curtain air bag module resistance)	ohm	Under any condition: 1.4—3.2 ohms	2V, 2Y
DR_PTENS (Driver-side pre-tensioner seat belt resistance)	ohm	Under any condition: 1.5—3.1 ohms	2P, 2S
DS_AB (Driver-side side air bag module resistance)	ohm	Under any condition: 1.4—3.2 ohms	2M, 2O
DS_AB_ST (Driver-side side air bag module circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	2M, 2O
DS_CURT_ST (Driver-side curtain air bag module circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	2V, 2Y
DS1_STAT (Driver-side air bag module (inflator No.1) circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	1S, 1V
DS2_STAT (Driver-side air bag module (inflator No.2) circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	1G, 1J
DSB_P_ST (Driver-side pre-tensioner seat belt circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Pre-tensioner seat belt circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	2P, 2S
FNT_CRSH_S (Crash zone sensor state)	OK/ COMM FAIL/ INT FAIL	• Sensor normal: OK • Sensor communication error: COMM FAIL • Sensor internal circuit abnormal: INT FAIL	1B, 1C

PID name (definition)	Unit/condition	Condition/specification	SAS control module terminal
OD_D_CRSH (On demand driver-side side air bag sensor state)	OK/ COMM FAIL/ INT FAIL	• Sensor normal: OK • Sensor communication error: COMM FAIL • Sensor internal circuit abnormal: INT FAIL	2Z, 2AA
OD_D_CURT (On demand driver-side curtain air bag module circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	2V, 2Y
OD_DAB1_ST (On demand driver-side air bag module (inflator No.1) circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	1S, 1V
OD_DAB2_ST (On demand driver-side air bag module (inflator No.2) circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	1G, 1J
OD_DSAB_ST (On demand driver-side side air bag module circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	2M, 2O
OD_F_CRSH (On demand crash zone sensor state)	OK/ COMM FAIL/ INT FAIL	• Sensor normal: OK • Sensor communication error: COMM FAIL • Sensor internal circuit abnormal: INT FAIL	1B, 1C
OD_P_CRSH (On demand passenger-side side air bag sensor state)	OK/ COMM FAIL/ INT FAIL	• Sensor normal: OK • Sensor communication error: COMM FAIL • Sensor internal circuit abnormal: INT FAIL	2B, 2C
OD_P_CURT (On demand passenger-side curtain air bag module circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	2A, 2D
OD_PAB1_ST (On demand passenger-side air bag module (inflator No.1) circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	1M, 1P
OD_PAB2_ST (On demand passenger-side air bag module (inflator No.2) circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	1A,1D
OD_PSAB_ST (On demand passenger-side side air bag module circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	2I, 2L
P_ABAGR2 (Passenger-side air bag module (inflator No.2) resistance)	ohm	Under any condition: 1.4—2.9 ohms	1A, 1D
P_PTENSFLT (Passenger-side pre-tensioner seat belt circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Pre-tensioner seat belt circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	2G, 2J
PABAGR (Passenger-side air bag module (inflator No.1) resistance)	ohm	Under any condition: 1.4—2.9 ohms	1M, 1P

PID name (definition)	Unit/condition	Condition/specification	SAS control module terminal
P_CRSH_S (Passenger-side side air bag sensor state)	OK/ COMM FAIL/ INT FAIL	• Sensor normal: OK • Sensor communication error: COMM FAIL • Sensor internal circuit abnormal: INT FAIL	2B, 2C
PS_AB (Passenger-side side air bag module resistance)	ohm	Under any condition: 1.4—3.2 ohms	2I, 2L
PS_AB_ST (Passenger-side side air bag module circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	2I, 2L
PS_BUKL (Passenger-side buckle switch state)	Buckled/ Unbuckled	• Buckle switch on: Buckled • Buckle switch off: Unbuckled	2H
PS_CURTN (Passenger-side curtain air bag module resistance)	ohm	Under any condition: 1.4—3.2 ohms	2A, 2B
PS_CURT_ST (Passenger-side curtain air bag module circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	2A, 2D
PS_PTENS (Passenger-side pre-tensioner seat belt resistance)	ohm	Under any condition: 1.5—3.1 ohms	2G, 2J
PS1_STAT (Passenger-side air bag module (inflator No.1) circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	1M, 1P
PS2_STAT (Passenger-side air bag module (inflator No.2) circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Air bag module circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	1A, 1D
PSB_P_ST (Passenger-side pre-tensioner seat belt circuit state)	SHRT GND/ SHRT B+/ OPEN/ SQ_LOWRES/ NORMAL	• Related wiring harness short to ground: SHRT GND • Related wiring harness short to power supply: SHRT B+ • Related wiring harness circuit open: OPEN • Pre-tensioner seat belt circuit resistance low: SQ_LOWRES • Related wiring harness normal: NORMAL	2G, 2J
RCM_VOLT (IG1 voltage)	V	• Ignition switch to ON position: B+ • Other: 0 V	1W
TRAK_SW (Seat track position sensor state)	Forward/ Rearward	• Front seat front position: Forward • Front seat rear position: Rearward	2W, 2X

DTC B1231

C6U080201046W05

DTC B1231	SAS control module activation (deployment) control freeze
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • SAS control module determined collision

Diagnostic procedure

ACTION
Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/INSTALLATION)

DTC B1342

C6U080201046W06

DTC B1342	SAS control module
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Malfunction in SAS control module inner circuit
POSSIBLE CAUSE	• SAS control module malfunction

Diagnostic procedure

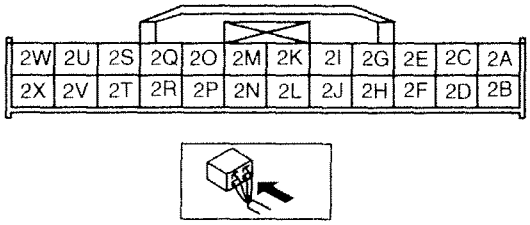
ACTION
• Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/INSTALLATION)

DTC B1426, B1427

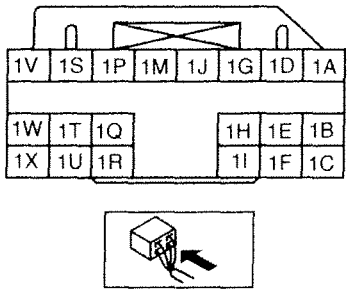
C6U080201046W07

DTC	B1426	Seat belt warning light circuit short to power supply
	B1427	Seat belt warning light circuit open
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Malfunction in seat belt warning light circuit
POSSIBLE CAUSE		• METER IG 15 A fuse malfunction • Instrument cluster malfunction • Malfunction of connectors between instrument cluster and SAS control module • Open or short circuit in wiring harness between METER IG 15 A fuse and instrument cluster • Open or short circuit in wiring harness between instrument cluster and SAS control module • SAS control module malfunction

INSTRUMENT CLUSTER CONNECTOR



SAS CONTROL MODULE CONNECTOR



Diagnostic procedure

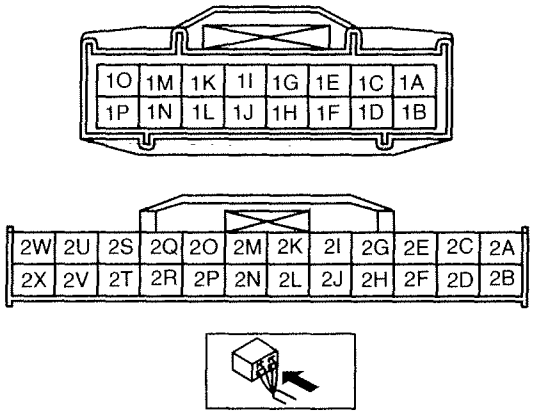
STEP	INSPECTION		ACTION
1	**INSPECT METER IG 15 A FUSE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable. • Remove METER IG 15 A fuse. • Is fuse okay?	Yes	Reinstall METER IG 15 A fuse, then go to next step.
		No	Replace METER IG 15 A fuse.
2	**INSPECT FOR CONTINUITY BETWEEN METER IG 15 A FUSE AND INSTRUMENT CLUSTER** • Connect negative battery cable. • Turn ignition switch to ON position. • Measure voltage at instrument cluster connector terminal 2V. • Is voltage **more than 9 V**?	Yes	Go to next step.
		No	Repair wiring harness.
3	**INSPECT WIRING HARNESS BETWEEN INSTRUMENT CLUSTER AND SAS CONTROL MODULE** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Remove B-pillar lower trims. (Vehicles with pre-tensioner seat belt) • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS control module connectors. • Disconnect instrument cluster. • Inspect the following wiring harness between SAS control module and instrument cluster terminals for short to ground, short to power supply, and open circuit: — 1E—2G • Is wiring harness okay?	Yes	Go to next step.
		No	Replace wiring harness.
4	**INSPECT SEAT BELT WARNING LIGHT** • Connect instrument cluster. • Using a jumper wire, cause a short circuit between instrument cluster terminal 2G and ground. • Turn ignition switch to ON position. • Is seat belt warning light illuminated?	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Replace instrument cluster. (See 09–22–3 INSTRUMENT CLUSTER REMOVAL/ INSTALLATION)

DTC B1869, B1870

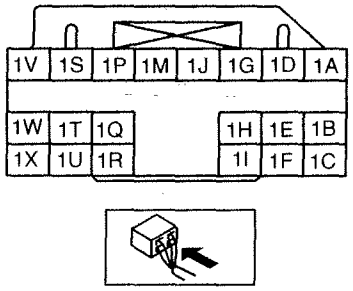
C6U080201046W08

DTC	B1869	**Air bag system warning light system circuit open or short to ground**
	B1870	**Air bag system warning light system circuit short to power supply**
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Malfunction in air bag system warning light circuit
POSSIBLE CAUSE		• METER IG 15 A fuse malfunction • Instrument cluster malfunction • Malfunction of connectors between instrument cluster and SAS control module • Open or short circuit in wiring harness between METER IG 15 A fuse and instrument cluster • Open or short circuit in wiring harness between instrument cluster and SAS control module • SAS control module malfunction

INSTRUMENT CLUSTER CONNECTOR



SAS CONTROL MODULE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT METER IG 15 A FUSE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable. • Remove METER IG 15 A fuse. • Is fuse okay?	Yes	Reinstall METER IG 15 A fuse, then go to next step.
		No	Replace METER IG 15 A fuse.
2	**INSPECT FOR CONTINUITY BETWEEN METER IG 15 A FUSE AND INSTRUMENT CLUSTER** • Connect negative battery cable. • Turn ignition switch to ON position. • Measure voltage at instrument cluster connector terminal 2V. • Is voltage **more than 9 V**?	Yes	Go to next step.
		No	Repair wiring harness.

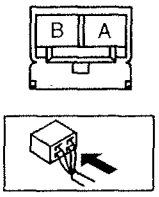
STEP	INSPECTION		ACTION
3	**INSPECT WIRING HARNESS BETWEEN INSTRUMENT CLUSTER AND SAS CONTROL MODULE** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Remove B-pillar lower trims. (Vehicles with pre-tensioner seat belt) • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS control module connectors. • Disconnect instrument cluster. • Inspect the following wiring harness between SAS control module and instrument cluster terminals for short to ground, short to power supply, and open circuit: — 1T—1O • Is wiring harness okay?	Yes	Go to next step.
		No	Replace wiring harness.
4	**INSPECT AIR BAG SYSTEM WARNING LIGHT** • Connect instrument cluster. • Turn ignition switch to ON position. • Is air bag system warning light illuminated?	Yes	Go to next step.
		No	Replace instrument cluster. (See 09–22–3 INSTRUMENT CLUSTER REMOVAL/ INSTALLATION)
5	**INSPECT AIR BAG SYSTEM WARNING LIGHT** • Using jumper wire, ground instrument cluster terminal 1O to body. • Does air bag system warning light go out?	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Replace instrument cluster. (See 09–22–3 INSTRUMENT CLUSTER REMOVAL/ INSTALLATION)

DTC B1877, B1878, B1879, B1885

C6U080201046W09

DTC	B1877	Driver-side pre-tensioner seat belt system resistance high
	B1878	Driver-side pre-tensioner seat belt system circuit short to power supply
	B1879	Driver-side pre-tensioner seat belt system circuit short to ground
	B1885	Driver-side pre-tensioner seat belt system resistance low
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Abnormal resistance (other than **1.5—3.1 ohms**) detected in driver-side pre-tensioner seat belt circuit • Malfunction in wiring harness between driver-side pre-tensioner seat belt and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between driver-side pre-tensioner seat belt and SAS control module • Driver-side pre-tensioner seat belt malfunction • SAS control module malfunction

DRIVER-SIDE PRE-TENSIONER SEAT BELT CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVER-SIDE PRE-TENSIONER SEAT BELT** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — DR_PTENS • Is resistance of driver-side pre-tensioner seat belt normal? — Resistance: **1.5—3.1 ohms**	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.
2	**INSPECT DRIVER-SIDE PRE-TENSIONER SEAT BELT CONNECTOR** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove driver-side B-pillar lower trim. • Disconnect driver-side pre-tensioner seat belt connector. • Is there cracking or chipping in driver-side pre-tensioner seat belt connector?	Yes	Replace wiring harness.
		No	Go to next step.

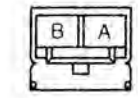
STEP	INSPECTION		ACTION
3	**VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE PRE-TENSIONER SEAT BELT OR RELATED WIRING HARNESS** • Connect leads of **SST** (Fuel and thermometer checker) or apply 2-ohm resistor to driver-side pre-tensioner seat belt terminal A and B. • Set resistance of **SST** (Fuel and thermometer checker) to 2 ohms. • Connect negative battery cable. • Turn ignition switch to ON position. • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — DSB_P_ST • Is related wiring harness normal?	Yes	Replace driver-side pre-tensioner seat belt. (See 08–11–2 FRONT SEAT BELT REMOVAL/ INSTALLATION)
		No	Replace wiring harness, then go to next step.
4	**INSPECT SAS CONTROL MODULE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Connect driver-side pre-tensioner seat belt connector. • Are any one or all of the following DTCs displayed? — B1877 — B1878 — B1879 — B1885	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Troubleshooting completed.

DTC B1881, B1882, B1883, B1886

C6U080201046W10

DTC	B1881	**Passenger-side pre-tensioner seat belt system resistance high**
	B1882	**Passenger-side pre-tensioner seat belt system circuit short to power supply**
	B1883	**Passenger-side pre-tensioner seat belt system circuit short to ground**
	B1886	**Passenger-side pre-tensioner seat belt system resistance low**
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Abnormal resistance (other than **1.5—3.1 ohms**) detected in passenger-side pre-tensioner seat belt circuit • Malfunction in wiring harness between passenger-side pre-tensioner seat belt and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between passenger-side pre-tensioner seat belt and SAS control module • Passenger-side pre-tensioner seat belt malfunction • SAS control module malfunction

PASSENGER-SIDE PRE-TENSIONER SEAT BELT CONNECTOR



Diagnostic procedure

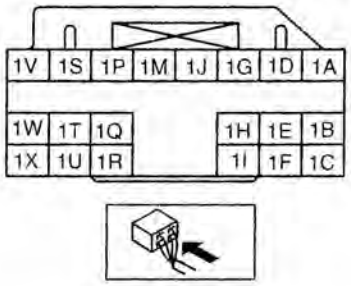
STEP	INSPECTION		ACTION
1	**INSPECT PASSENGER-SIDE PRE-TENSIONER SEAT BELT** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — PS_PTENS • Is resistance of passenger-side pre-tensioner seat belt normal? — Resistance: **1.5—3.1 ohms**	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.
2	**INSPECT PASSENGER-SIDE PRE-TENSIONER SEAT BELT CONNECTOR** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove passenger-side B-pillar lower trim. • Disconnect passenger-side pre-tensioner seat belt connector. • Is there cracking or chipping in passenger-side pre-tensioner seat belt connector?	Yes	Replace wiring harness.
		No	Go to next step.
3	**VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE PRE-TENSIONER SEAT BELT OR RELATED WIRING HARNESS** • Connect leads of **SST** (Fuel and thermometer checker) or apply 2-ohm resistor to passenger-side pre-tensioner seat belt terminal A and B. • Set resistance of **SST** (Fuel and thermometer checker) to 2 ohms. • Connect negative battery cable. • Turn ignition switch to ON position. • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — PSB_P_ST • Is related wiring harness normal?	Yes	Replace passenger-side pre-tensioner seat belt. (See 08–11–2 FRONT SEAT BELT REMOVAL/ INSTALLATION)
		No	Replace wiring harness, then go to next step.
4	**INSPECT SAS CONTROL MODULE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Connect passenger-side pre-tensioner seat belt connector. • Are any one or all of the following DTCs displayed? — B1881 — B1882 — B1883 — B1886	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Troubleshooting completed.

DTC B1913, B1916, B1932, B1934

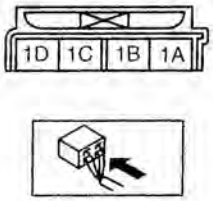
C6U080201046W11

DTC	B1913	**Driver-side air bag module (inflator No.1) system circuit short to ground**
	B1916	**Driver-side air bag module (inflator No.1) system circuit short to power supply**
	B1932	**Driver-side air bag module (inflator No.1) system resistance high**
	B1934	**Driver-side air bag module (inflator No.1) system resistance low**
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Abnormal resistance (other than **1.5—3.7 ohms**) detected in driver-side air bag module (inflator No.1) circuit • Malfunction in wiring harness between driver-side air bag module (inflator No.1) and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between clock spring and SAS control module • Clock spring malfunction • Driver-side air bag module (inflator No.1) malfunction • SAS control module malfunction

SAS CONTROL MODULE CONNECTOR



CLOCK SPRING CONNECTOR



08–02

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVER-SIDE AIR BAG MODULE (INFLATOR NO.1)** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — DABAGR • Is resistance value of driver-side air bag module normal? — Resistance: **1.5—3.7 ohms**	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.
2	**INSPECT DRIVER-SIDE AIR BAG MODULE CONNECTOR (CLOCK SPRING)** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove driver-side air bag module. • Is there cracking or chipping in driver-side air bag module connector?	Yes	Replace wiring harness.
		No	Go to next step.

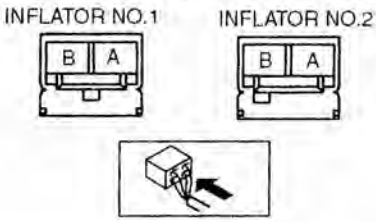
STEP	INSPECTION		ACTION
3	**VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE AIR BAG MODULE (INFLATOR NO.1) OR RELATED WIRING HARNESS** • Connect leads of **SST** (Fuel and thermometer checker) or apply 2-ohm resistor to driver-side air bag module (inflator No.1) terminal 3A and 3B, and driver-side air bag module (inflator No.2) terminal 4A and 4B. • Set resistance of **SST** (Fuel and thermometer checker) to 2 ohms. • Connect negative battery cable. • Turn ignition switch to ON position. • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — OD_DAB1_ST • Is related wiring harness normal?	Yes	Replace driver-side air bag module. (See 08–10–6 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION)
		No	Go to next step.
4	**INSPECT CLOCK SPRING** • Inspect clock spring. (See 08–10–12 CLOCK SPRING INSPECTION) • Is clock spring normal?	Yes	Go to next step.
		No	Replace clock spring. (See 08–10–10 CLOCK SPRING REMOVAL/INSTALLATION)
5	**INSPECT WIRING HARNESS BETWEEN CLOCK SPRING AND SAS CONTROL MODULE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Remove B-pillar lower trims. (Vehicles with pre-tensioner seat belt) • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS control module connectors. • Inspect the following wiring harnesses between SAS control module and clock spring terminals for short to ground, short to power supply, and open circuit: — 1S—1D — 1V—1C • Is wiring harness okay?	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Replace wiring harnesses.

DTC B1913, B1925, B1933, B1935

C6U08020104GW12

DTC	B1913	Passenger-side air bag module (inflator No.1) system circuit short to ground
	B1925	Passenger-side air bag module (inflator No.1) system circuit short to power supply
	B1933	Passenger-side air bag module (inflator No.1) system resistance high
	B1935	Passenger-side air bag module (inflator No.1) system resistance low
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Abnormal resistance (other than **1.4—2.9 ohms**) detected in passenger-side air bag module (inflator No.1) circuit • Malfunction in wiring harness between passenger-side air bag module (inflator No.1) and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between passenger-side air bag module (inflator No.1) and SAS control module • Passenger-side air bag module (inflator No.1) malfunction • SAS control module malfunction

PASSENGER-SIDE AIR BAG MODULE CONNECTOR



08–02

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.1)** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — PABAGR • Is resistance of passenger-side air bag module normal? — Resistance: **1.4—2.9 ohms**	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.
2	**INSPECT PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.1) CONNECTOR** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Is there cracking or chipping in passenger-side air bag module connector?	Yes	Replace wiring harness.
		No	Go to next step.

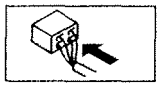
STEP	INSPECTION		ACTION
3	**VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.1) OR RELATED WIRING HARNESS** • Connect leads of **SST** (Fuel and thermometer checker) or apply 2-ohm resistor to passenger-side air bag module (inflator No.1) terminal A and B, and passenger-side air bag module (inflator No.2) terminal A and B. • Set resistance of **SST** (Fuel and thermometer checker) to 2 ohms. • Connect negative battery cable. • Turn ignition switch to ON position. • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — DO_PAB1_ST • Is related wiring harness normal?	Yes	Replace passenger-side air bag module. (See 08–10–6 PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION)
		No	Replace wiring harness, then go to next step.
4	**INSPECT SAS CONTROL MODULE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Connect passenger-side air bag module connector. • Are any one or all of the following DTCs displayed? — B1913 — B1925 — B1933 — B1935	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Troubleshooting completed.

DTC B1992, B1993, B1994, B1995

C6U080201046W13

DTC	B1992	**Driver-side side air bag module system circuit short to power supply**
	B1993	**Driver-side side air bag module system circuit short to ground**
	B1994	**Driver-side side air bag module system resistance high**
	B1995	**Driver-side side air bag module system resistance low**
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Abnormal resistance (other than **1.4—3.2 ohms**) detected in driver-side side air bag module circuit • Malfunction in wiring harness between driver-side side air bag module and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between driver-side side air bag module and SAS control module • Driver-side side air bag module malfunction • SAS control module malfunction

DRIVER-SIDE SIDE AIR BAG MODULE CONNECTOR



Diagnostic procedure

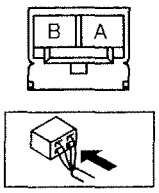
STEP	INSPECTION		ACTION
1	**INSPECT DRIVER-SIDE SIDE AIR BAG MODULE** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — DS_AB • Is resistance of driver-side side air bag module normal? — Resistance: **1.4—3.2 ohms**	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.
2	**INSPECT DRIVER-SIDE SIDE AIR BAG MODULE CONNECTOR** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove driver-side side air bag module. • Is there cracking or chipping in driver-side side air bag module connector?	Yes	Replace wiring harness.
		No	Go to next step.
3	**VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE SIDE AIR BAG MODULE OR RELATED WIRING HARNESS** • Connect leads of **SST** (Fuel and thermometer checker) or apply 2-ohm resistor to driver-side side air bag module terminal A and B. • Set resistance of **SST** (Fuel and thermometer checker) to 2 ohms. • Connect negative battery cable. • Turn ignition switch to ON position. • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — OD_DSAB_ST • Is related wiring harness normal?	Yes	Replace driver-side side air bag module. (See 08–10–7 SIDE AIR BAG MODULE REMOVAL/ INSTALLATION)
		No	Replace wiring harness, then go to next step.
4	**INSPECT SAS CONTROL MODULE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Connect driver-side side air bag module connector. • Are any one or all of the following DTCs displayed? — B1992 — B1993 — B1994 — B1995	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Troubleshooting completed.

DTC B1996, B1997, B1998, B1999

C6U080201046W14

DTC	B1996	**Passenger-side side air bag module system circuit short to power supply**
	B1997	**Passenger-side side air bag module system circuit short to ground**
	B1998	**Passenger-side side air bag module system resistance high**
	B1999	**Passenger-side side air bag module system resistance low**
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Abnormal resistance (other than **1.4—3.2 ohms**) detected in passenger-side side air bag module circuit • Malfunction in wiring harness between passenger-side side air bag module and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between passenger-side side air bag module and SAS control module • Passenger-side side air bag module malfunction • SAS control module malfunction

PASSENGER-SIDE SIDE AIR BAG MODULE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT PASSENGER-SIDE SIDE AIR BAG MODULE** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — PS_AB • Is resistance of passenger-side side air bag module normal? — Resistance: **1.4—3.2 ohms**	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.
2	**INSPECT PASSENGER-SIDE SIDE AIR BAG MODULE CONNECTOR** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove passenger-side side air bag module. • Is there cracking or chipping in passenger-side side air bag module connector?	Yes	Replace wiring harness.
		No	Go to next step.

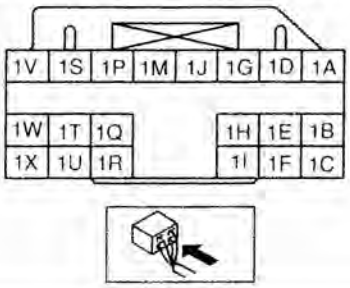
STEP	INSPECTION		ACTION
3	**VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE SIDE AIR BAG MODULE OR RELATED WIRING HARNESS** • Connect leads of **SST** (Fuel and thermometer checker) or apply 2-ohm resistor to passenger-side side air bag module terminal A and B. • Set resistance of **SST** (Fuel and thermometer checker) to 2 ohms. • Connect negative battery cable. • Turn ignition switch to ON position. • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — OD_PSAB_ST • Is related wiring harness normal?	Yes	Replace passenger-side side air bag module. (See 08–10–7 SIDE AIR BAG MODULE REMOVAL/ INSTALLATION)
		No	Replace wiring harness, then go to next step.
4	**INSPECT SAS CONTROL MODULE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Connect passenger-side side air bag module connector. • Are any one or all of the following DTCs displayed? — B1996 — B1997 — B1998 — B1999	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Troubleshooting completed.

DTC B2228, B2230, B2232, B2234

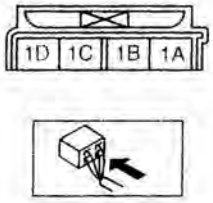
C6U080201046W15

DTC	**B2228**	**Driver-side air bag module (inflator No.2) system circuit short to ground**
	B2230	**Driver-side air bag module (inflator No.2) system circuit short to power supply**
	B2232	**Driver-side air bag module (inflator No.2) system resistance high**
	B2234	**Driver-side air bag module (inflator No.2) system resistance low**
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Abnormal resistance (other than **1.5—3.7 ohms**) detected in driver-side air bag module (inflator No.2) circuit • Malfunction in wiring harness between driver-side air bag module (inflator No.2) and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between clock spring and SAS control module • Clock spring malfunction • Driver-side air bag module (inflator No.2) malfunction • SAS control module malfunction

SAS CONTROL MODULE CONNECTOR



CLOCK SPRING CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVER-SIDE AIR BAG MODULE (INFLATOR NO.2)** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — D_ABAGR2 • Is resistance of driver-side air bag module normal? — Resistance: **1.5—3.7 ohms**	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.
2	**INSPECT DRIVER-SIDE AIR BAG MODULE CONNECTOR (CLOCK SPRING)** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove driver-side air bag module. • Is there cracking or chipping in driver-side air bag module connector?	Yes	Replace wiring harness.
		No	Go to next step.
3	**VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE AIR BAG MODULE (INFLATOR NO.2) OR RELATED WIRING HARNESS** • Connect leads of **SST** (Fuel and thermometer checker) or apply 2-ohm resistor to driver-side air bag module (inflator No.1) terminal 3A and 3B, and driver-side air bag module (inflator No.2) terminal 4A and 4B. • Set resistance of **SST** (Fuel and thermometer checker) to 2 ohms. • Connect negative battery cable. • Turn ignition switch to ON position. • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — OD_DAB2_ST • Is related wiring harness normal?	Yes	Replace driver-side air bag module. (See 08–10–6 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION)
		No	Go to next step.
4	**INSPECT CLOCK SPRING** • Inspect clock spring. (See 08–10–12 CLOCK SPRING INSPECTION) • Is clock spring normal?	Yes	Go to next step.
		No	Replace clock spring. (See 08–10–10 CLOCK SPRING REMOVAL/INSTALLATION)

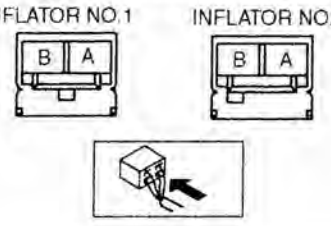
STEP	INSPECTION		ACTION
5	**INSPECT WIRING HARNESS BETWEEN CLOCK SPRING AND SAS CONTROL MODULE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Remove B-pillar lower trims. (Vehicles with pre-tensioner seat belt) • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS control module connectors. • Inspect the following wiring harnesses between SAS control module and clock spring terminals for short to ground, short to power supply, and open circuit: — 1G—1B — 1J—1A • Is wiring harness okay?	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Replace wiring harnesses.

DTC B2229, B2231, B2233, B2235

C6U080201046W16

DTC	B2229	**Passenger-side air bag module (inflator No.2) system circuit short to ground**
	B2231	**Passenger-side air bag module (inflator No.2) system circuit short to power supply**
	B2233	**Passenger-side air bag module (inflator No.2) system resistance high**
	B2235	**Passenger-side air bag module (inflator No.2) system resistance low**
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Abnormal resistance (other than **1.4—2.9 ohms**) detected in passenger-side air bag module circuit • Malfunction in wiring harness between passenger-side air bag module (inflator No.2) and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between passenger-side air bag module (inflator No.2) and SAS control module • Passenger-side air bag module (inflator No.2) malfunction • SAS control module malfunction

PASSENGER-SIDE AIR BAG MODULE CONNECTOR



Diagnostic procedure

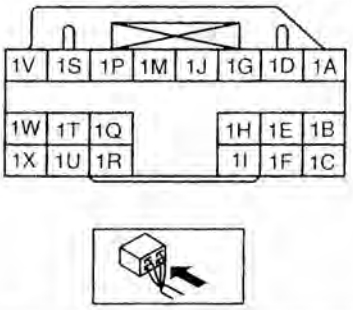
STEP	INSPECTION		ACTION
1	**INSPECT PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.2)** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — P_ABAGR2 • Is resistance of passenger-side air bag module normal? — Resistance: **1.4—2.9 ohms**	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.
2	**INSPECT PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.2) CONNECTOR** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Is there cracking or chipping in passenger-side air bag module connector?	Yes	Replace wiring harness.
		No	Go to next step.
3	**VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.2) OR RELATED WIRING HARNESS** • Connect leads of **SST** (Fuel and thermometer checker) or apply 2-ohm resistor to passenger-side air bag module (inflator No.1) terminal A and B, and passenger-side air bag module (inflator No.2) terminal A and B. • Set resistance of **SST** (Fuel and thermometer checker) to 2 ohms. • Connect negative battery cable. • Turn ignition switch to ON position. • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — OD_PAB2_ST • Is related wiring harness normal?	Yes	Replace passenger-side air bag module. (See 08–10–6 PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION)
		No	Replace wiring harness, then go to next step.
4	**INSPECT SAS CONTROL MODULE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Connect passenger-side air bag module connector. • Are any one or all of the following DTCs displayed? — B2229 — B2231 — B2233 — B2235	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Troubleshooting completed.

DTC B2296

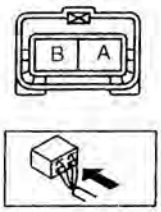
C6U080201046W17

DTC B2296	Crash zone sensor system (communication error, sensor internal circuit abnormal)
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Malfunction in wiring harness between crash zone sensor and SAS control module • Malfunction in crash zone sensor circuit
POSSIBLE CAUSE	• Open or short circuit in wiring harness between crash zone sensor and SAS control module • SAS control module malfunction • Crash zone sensor malfunction

SAS CONTROL MODULE CONNECTOR



CRASH ZONE SENSOR CONNECTOR



08–02

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT CRASH ZONE SENSOR** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — OD_F_CRSH • Is crash zone sensor normal?	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.

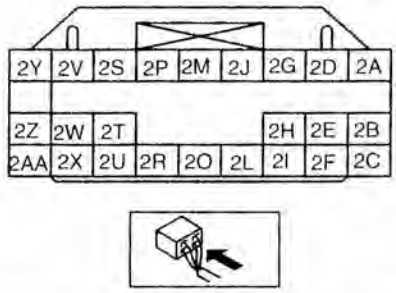
STEP	INSPECTION		ACTION
2	**INSPECT WIRING HARNESS BETWEEN CRASH ZONE SENSOR AND SAS CONTROL MODULE** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Remove B-pillar lower trims. (Vehicles with pre-tensioner seat belt) • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS control module connectors. • Disconnect crash zone sensor connector. • Connect negative battery cable. • Inspect the following wiring harnesses between SAS control module and crash zone sensor terminals for short to ground, short to power supply, and open circuit: — 1B—A — 1C—B • Is wiring harness okay?	Yes	Replace crash zone sensor, then go to next step. (See 08–10–9 CRASH ZONE SENSOR REMOVAL/ INSTALLATION)
		No	Replace wiring harnesses.
3	**INSPECT SAS CONTROL MODULE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Connect all SAS control module connectors. • Connect crash zone sensor connector. • Is DTC B2296 indicated?	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Troubleshooting completed.

DTC B2434, B2435, B2691

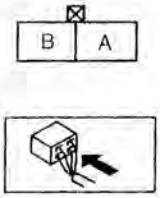
C6U080201046W18

DTC	B2434	**Driver-side buckle switch circuit short to ground**
	B2435	**Driver-side buckle switch circuit resistance out of range**
	B2691	**Driver-side buckle switch circuit open or short to power supply**
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Malfunction in driver-side buckle switch circuit.
POSSIBLE CAUSE		• Malfunction of connector between driver-side buckle switch and SAS control module • Open or short circuit in wiring harness between driver-side buckle switch and SAS control module • Driver-side buckle switch malfunction • SAS control module malfunction

SAS CONTROL MODULE CONNECTOR



DRIVER-SIDE FRONT BUCKLE SWITCH CONNECTOR



08–02

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVER-SIDE BUCKLE SWITCH CIRCUIT** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — DR_BUKL • Is driver-side buckle switch circuit normal?	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.
2	**INSPECT DRIVER-SIDE BUCKLE MODULE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Disconnect driver-side buckle switch. • Inspect wiring harness between driver-side buckle switch terminal B and ground for short to power supply, and open circuit. • Is driver-side buckle switch normal?	Yes	Go to next step.
		No	Replace wiring harness.

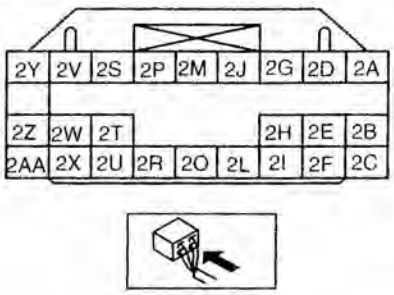
STEP	INSPECTION		ACTION
3	**INSPECT WIRING HARNESS BETWEEN DRIVER-SIDE BUCKLE SWITCH AND SAS CONTROL MODULE** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Remove B-pillar lower trims. (Vehicles with pre-tensioner seat belt) • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS control module connectors. • Inspect the following wiring harness between SAS control module and driver-side buckle switch terminals for short to ground, short to power supply, and open circuit: — 2T—A • Is wiring harness okay?	Yes	Replace the driver-side front buckle. (See 08–11–5 FRONT BUCKLE REMOVAL/ INSTALLATION) If the DTC is displayed even after the buckle switch is replaced, replace the SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION)
		No	Replace wiring harness.

DTC B2438, B2439, B2692

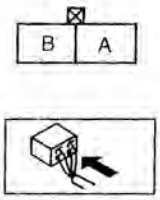
C6U080201046W19

DTC	B2438	Passenger-side buckle switch circuit short to ground
	B2439	Passenger-side buckle switch circuit resistance out of range
	B2692	Passenger-side buckle switch circuit open or short to power supply
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Malfunction in passenger-side buckle switch circuit.
POSSIBLE CAUSE		• Malfunction of connector between passenger-side buckle switch and SAS control module • Open or short circuit in wiring harness between passenger-side buckle switch and SAS control module • Passenger-side buckle switch malfunction • SAS control module malfunction

SAS CONTROL MODULE CONNECTOR



PASSENGER-SIDE FRONT BUCKLE SWITCH CONNECTOR



08-02

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT PASSENGER-SIDE BUCKLE SWITCH CIRCUIT** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08-02-9 PID/DATA MONITOR TABLE) — PS_BUKL • Is passenger-side buckle switch circuit normal?	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08-10-10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.
2	**INSPECT PASSENGER-SIDE BUCKLE MODULE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Disconnect passenger-side buckle switch. • Inspect wiring harness between passenger-side buckle switch terminal B and ground for short to power supply, and open circuit. • Is wiring harness okay?	Yes	Go to next step.
		No	Replace passenger-side buckle switch. (See 08-11-5 FRONT BUCKLE REMOVAL/ INSTALLATION)

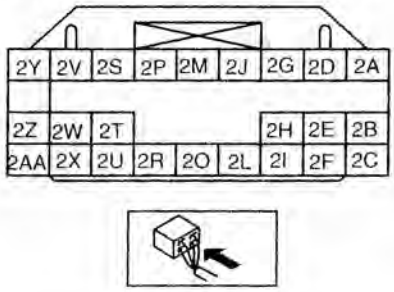
STEP	INSPECTION		ACTION
3	**INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE BUCKLE SWITCH AND SAS CONTROL MODULE** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Remove B-pillar lower trims. (Vehicles with pre-tensioner seat belt) • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS control module connectors. • Inspect the following wiring harness between SAS control module and passenger-side buckle switch terminals for short to ground, short to power supply, and open circuit: — 2H—A • Is wiring harness okay?	Yes	Replace the passenger-side front buckle. (See 08–11–5 FRONT BUCKLE REMOVAL/ INSTALLATION) (See 08–11–4 FRONT BUCKLE REMOVAL/ INSTALLATION.) If the DTC is displayed even after the buckle switch is replaced, replace the SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION)
		No	Replace wiring harness.

DTC B2444, U2017

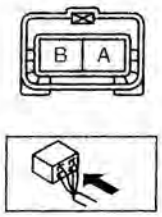
C6U080201046W20

DTC	B2444	**Driver-side side air bag sensor system (sensor internal circuit abnormal)**
	U2017	**Driver-side side air bag sensor system (communication error)**
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Malfunction in wiring harness between driver-side side air bag sensor and SAS control module • Malfunction in driver-side side air bag sensor circuit
POSSIBLE CAUSE		• Open or short circuit in wiring harness between driver-side side air bag sensor and SAS control module • Driver-side side air bag sensor malfunction • SAS control module malfunction

SAS CONTROL MODULE CONNECTOR



DRIVER-SIDE SIDE AIR BAG SENSOR CONNECTOR



08–02

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVER-SIDE SIDE AIR BAG SENSOR** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — OD_D_CRSH • Is driver-side side air bag sensor normal?	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.

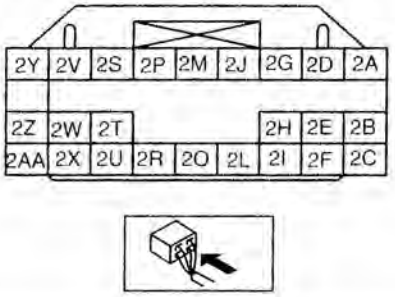
STEP	INSPECTION		ACTION
2	**INSPECT WIRING HARNESS BETWEEN DRIVER-SIDE SIDE AIR BAG SENSOR AND SAS CONTROL MODULE** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Remove B-pillar lower trims. (Vehicles with pre-tensioner seat belt) • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS control module connectors. • Disconnect driver-side side air bag sensor connector. • Connect negative battery cable. • Inspect the following wiring harnesses between SAS control module and driver-side side air bag sensor terminals for short to ground, short to power supply, and open circuit: — 2Z—A — 2AA—B • Is wiring harness okay?	Yes	Replace driver-side side air bag sensor, then go to next step. (See 08–10–10 SIDE AIR BAG SENSOR REMOVAL/ INSTALLATION)
		No	Replace wiring harnesses.
3	**INSPECT SAS CONTROL MODULE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Connect all SAS control module connectors. • Connect driver-side side air bag sensor connector. • Are DTCs B2444 or U2017 or both indicated?	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Troubleshooting completed.

DTC B2445, U2018

C6U080201046W21

DTC	B2445	Passenger-side side air bag sensor system (sensor internal circuit abnormal)
	U2018	Passenger-side side air bag sensor system (communication error)
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Malfunction in wiring harness between passenger-side side air bag sensor and SAS control module • Malfunction in passenger-side side air bag sensor circuit
POSSIBLE CAUSE		• Open or short circuit in wiring harness between passenger-side side air bag sensor and SAS control module • Passenger-side side air bag sensor malfunction • SAS control module malfunction

SAS CONTROL MODULE CONNECTOR



PASSENGER-SIDE SIDE AIR BAG SENSOR CONNECTOR

08–02

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT PASSENGER-SIDE SIDE AIR BAG SENSOR** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — OD_P_CRSH • Is passenger-side side air bag sensor normal?	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.

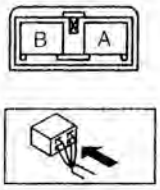
STEP	INSPECTION		ACTION
2	**INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE AIR BAG SENSOR AND SAS CONTROL MODULE** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Remove B-pillar lower trims. (Vehicles with pre-tensioner seat belt) • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS control module connectors. • Disconnect passenger-side side air bag sensor connector. • Connect negative battery cable. • Inspect the following wiring harnesses between SAS control module and passenger-side side air bag sensor terminals for short to ground, short to power supply, and open circuit: — 2B—A — 2C—B • Is wiring harness okay?	Yes	Replace passenger-side side air bag sensor, then go to next step. (See 08–10–10 SIDE AIR BAG SENSOR REMOVAL/ INSTALLATION)
		No	Replace wiring harnesses.
3	**INSPECT SAS CONTROL MODULE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Connect all SAS control module connectors. • Connect passenger-side side air bag sensor connector. • Are DTCs B2445 or U2018 or both indicated?	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Troubleshooting completed.

DTC B2773, B2774, B2775, B2776

C6U080201046W22

DTC	B2773	**Driver-side curtain air bag module system resistance low**
	B2774	**Driver-side curtain air bag module system resistance high**
	B2775	**Driver-side curtain air bag module system circuit short to ground**
	B2776	**Driver-side curtain air bag module system circuit short to power supply**
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Abnormal resistance (other than **1.4—3.2 ohms**) detected in driver-side curtain air bag module circuit • Malfunction in wiring harness between driver-side curtain air bag module and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between driver-side curtain air bag module and SAS control module • Driver-side curtain air bag module malfunction • SAS control module malfunction

DRIVER-SIDE CURTAIN AIR BAG MODULE CONNECTOR



08–02

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVER-SIDE CURTAIN AIR BAG MODULE** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — DR_CURTN • Is resistance of driver-side curtain air bag module normal? — Resistance: **1.4—3.2 ohms**	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.
2	**INSPECT DRIVER-SIDE CURTAIN AIR BAG MODULE CONNECTOR** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Disconnect driver-side curtain air bag module connector. • Is there cracking or chipping in driver-side curtain air bag module connector?	Yes	Replace wiring harness.
		No	Go to next step.

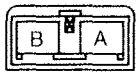
STEP	INSPECTION		ACTION
3	**VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE CURTAIN AIR BAG MODULE OR RELATED WIRING HARNESS** • Connect leads of **SST** (Fuel and thermometer checker) or apply 2-ohm resistor to driver-side curtain air bag module terminal A and B. • Set resistance of **SST** (Fuel and thermometer checker) to 2 ohms. • Connect negative battery cable. • Turn ignition switch to ON position. • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — OD_D_CURT • Is related wiring harness normal?	Yes	Replace driver-side curtain air bag module. (See 08–10–8 CURTAIN AIR BAG MODULE REMOVAL/ INSTALLATION [4SD]) (See 08–10–8 CURTAIN AIR BAG MODULE REMOVAL/ INSTALLATION [5HB, WGN])
		No	Replace wiring harness, then go to next step.
4	**INSPECT SAS CONTROL MODULE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Connect driver-side curtain air bag module connector. • Are any one or all of the following DTCs displayed? — B2773 — B2774 — B2775 — B2776	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Troubleshooting completed.

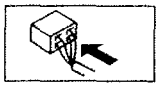
DTC B2777, B2778, B2779, B2780

C6U080201046W23

DTC	B2777	**Passenger-side curtain air bag module system resistance low**
	B2778	**Passenger-side curtain air bag module system resistance high**
	B2779	**Passenger-side curtain air bag module system circuit short to ground**
	B2780	**Passenger-side curtain air bag module system circuit short to power supply**
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Abnormal resistance (other than **1.4—3.2 ohms**) detected in passenger-side curtain air bag module circuit • Malfunction in wiring harness between passenger-side curtain air bag module and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between passenger-side curtain air bag module and SAS control module • Passenger-side curtain air bag module malfunction • SAS control module malfunction

PASSENGER-SIDE CURTAIN AIR BAG MODULE CONNECTOR





Diagnostic procedure

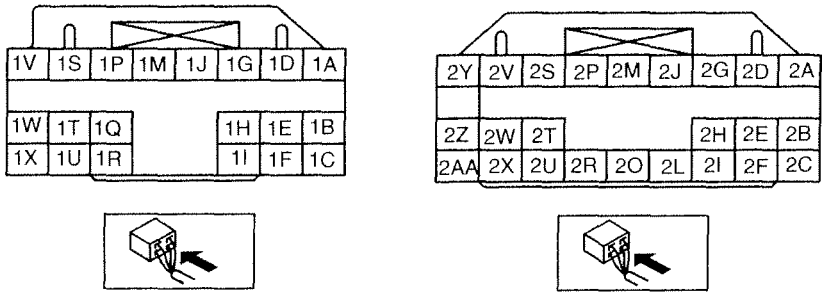
STEP	INSPECTION		ACTION
1	**INSPECT PASSENGER-SIDE CURTAIN AIR BAG MODULE** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — PC_CURTN • Is resistance of passenger-side curtain air bag module normal? — Resistance: **1.4—3.2 ohms**	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.
2	**INSPECT PASSENGER-SIDE CURTAIN AIR BAG MODULE CONNECTOR** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Disconnect passenger-side curtain air bag module connector. • Is there cracking or chipping in passenger-side curtain air bag module connector?	Yes	Replace wiring harness.
		No	Go to next step.
3	**VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE CURTAIN AIR BAG MODULE OR RELATED WIRING HARNESS** • Connect leads of **SST** (Fuel and thermometer checker) or apply 2-ohm resistor to passenger-side curtain air bag module terminal A and B. • Set resistance of **SST** (Fuel and thermometer checker) to 2 ohms. • Connect negative battery cable. • Turn ignition switch to ON position. • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — OD_P_CURT • Is related wiring harness normal?	Yes	Replace passenger-side curtain air bag module. (See 08–10–8 CURTAIN AIR BAG MODULE REMOVAL/ INSTALLATION [4SD]) (See 08–10–8 CURTAIN AIR BAG MODULE REMOVAL/ INSTALLATION [5HB, WGN])
		No	Replace wiring harness, then go to next step.
4	**INSPECT SAS CONTROL MODULE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Connect passenger-side curtain air bag module connector. • Are any one or all of the following DTCs displayed? — B2777 — B2778 — B2779 — B2780	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Troubleshooting completed.

DTC B2867

C6U080201046W24

DTC B2867	SAS control module connector poor connection
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • There is no continuity between poor connection detector bar terminals of SAS control module.
POSSIBLE CAUSE	• Poor connection of any SAS control module connectors • Malfunction of any SAS control module connectors • SAS control module malfunction

SAS CONTROL MODULE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY THAT ALL SAS CONTROL MODULE CONNECTORS ARE CONNECTED WITH SAS CONTROL MODULE** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Turn up floor covering. • Are all SAS control module connectors securely connected?	Yes	Go to next step.
		No	Reconnect connector properly.

STEP	INSPECTION		ACTION
2	**INSPECT ALL SAS CONTROL MODULE CONNECTORS** • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Remove B-pillar lower trims. (Vehicles with pre-tensioner seat belt) • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Disconnect all SAS control module connectors. • Are poor connection detector bars of all SAS control module connectors okay?	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Replace wiring harnesses.

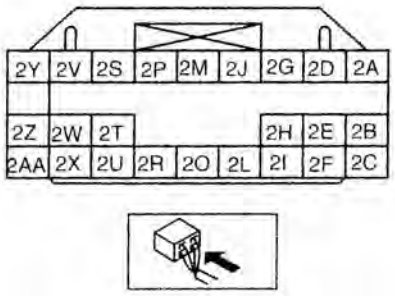
DTC C1947, C1948, C1981

C6U080201046W25

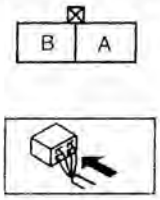
08–02

DTC	C1947	**Seat track position sensor circuit short to ground**
	C1948	**Seat track position sensor circuit resistance out of rang**
	C1981	**Seat track position sensor circuit open or short to power supply**
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Malfunction in seat track position sensor circuit.
POSSIBLE CAUSE		• Malfunction of connector between seat track position sensor and SAS control module. • Open or short circuit in wiring harness between seat track position sensor and SAS control module. • seat track position sensor malfunction • SAS control module malfunction

SAS CONTROL MODULE CONNECTOR



SEAT TRACK POSITION SENSOR CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT SEAT TRACK POSITION SENSOR CIRCUIT** • Check the following PID/DATA monitor, using **SST** (WDS or equivalent). (See 08–02–9 PID/DATA MONITOR TABLE) — TRAK_SW • Is seat track position sensor circuit normal?	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.

STEP	INSPECTION		ACTION
2	**INSPECT WIRING HARNESS BETWEEN SEAT TRACK POSITION SENSOR AND SAS CONTROL MODULE** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Remove B-pillar lower trims. (Vehicles with pre-tensioner seat belt) • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Turn up floor covering. • Disconnect seat track position sensor connector • Inspect the following wiring harness between SAS control module and seat track position sensor terminals for short to ground, short to power supply, and open circuit: — 2W—A — 2X—B • Is wiring harness okay?	Yes	Replace seat track position sensor, then go to next step.
		No	Replace wiring harness, then go to next step.
3	**INSPECT SAS CONTROL MODULE** • Connect SAS control module connector. • Connect clock spring connector. • Connect passenger-side air bag module connector. • Connect driver-and passenger-side curtain air bag module connectors. • Connect driver-and passenger-side side air bag module connectors. • Connect driver-and passenger-side pre tensioner seat belt connectors. • Connect seat track position sensor connector. • Are any one or all of the following DTCs displayed? — C1947 — C1948 — C1981	Yes	**Present malfunction diagnosis:** • Replace SAS control module. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Troubleshooting completed.

08–03 SYMPTOM TROUBLESHOOTING

AIR BAG SYSTEM

C6U080301046W01

Troubleshooting Index

- Use the chart below verify the symptoms of the trouble in order to diagnose the appropriate area.

No.	Troubleshooting item	Description	Page
1	Air bag system warning light does not illuminate.	Malfunction in air bag system warning circuit (short to ground).	(See 08–03–1 NO.1 AIR BAG SYSTEM WARNING LIGHT DOES NOT ILLUMINATE)
2	Air bag system warning light is illuminated all the time.	Malfunction in air bag system warning circuit (open circuit or short to power supply).	(See 08–03–3 NO.2 AIR BAG SYSTEM WARNING LIGHT IS ILLUMINATED ALL THE TIME)

NO.1 AIR BAG SYSTEM WARNING LIGHT DOES NOT ILLUMINATE

C6U080301046W02

1	**Air bag system warning light does not illuminate.**
DETECTION CONDITION	Malfunction in air bag system warning light circuit (short to ground)
POSSIBLE CAUSE	• SAS control module malfunction • Instrument cluster (print plate) malfunction • Short to ground circuit in wiring harness between instrument cluster and SAS control module

08–03

Diagnostic Procedure

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	**INSPECT OTHER WARNING AND INDICATOR LIGHTS CIRCUIT IN INSTRUMENT CLUSTER** • Turn ignition switch to ON position. • Do other warning and indicator lights illuminate?	Yes	Turn ignition switch to LOCK position, then go to next step.
		No	Inspect instrument cluster power supply system and ground system, then go to Step 5.

STEP	INSPECTION		ACTION
2	**INSPECT SAS CONTROL MODULE** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Remove B-pillar lower trims. (Vehicles with pre-tensioner seat belt) • Disconnect driver- and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS control module connectors. • Connect negative battery cable. • Turn ignition switch to ON position. • Does air bag system warning light illuminate?	Yes	Replace SAS control module, then go to Step 5. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION)
		No	Go to next step.
*3	**INSPECT WIRING HARNESS BETWEEN SAS CONTROL MODULE AND INSTRUMENT CLUSTER FOR SHORT TO GROUND** • Turn ignition switch to LOCK position. • Disconnect negative battery cable. • Disconnect instrument cluster connector. • Is there continuity between instrument cluster terminal 10 and ground?	Yes	Replace wiring harness, then go to Step 5.
		No	Go to next step.
4	**INSPECT INSTRUMENT CLUSTER** • Connect instrument cluster connector. • Connect negative battery cable. • Does air bag system warning light illuminate with ignition switch ON?	Yes	Go to next step.
		No	Replace instrument cluster, then go to next step. (See 09–22–3 INSTRUMENT CLUSTER REMOVAL/ INSTALLATION)

STEP	INSPECTION		ACTION
5	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Connect all SAS control module connectors. • Connect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Connect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Connect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Connect passenger-side air bag module connector. • Connect clock spring connector. • Connect negative battery cable. • Turn ignition switch to ON position. • Does air bag system warning light operate properly?	Yes	Complete troubleshooting, then explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.2 AIR BAG SYSTEM WARNING LIGHT IS ILLUMINATED ALL THE TIME

C6U080301046W03

08-03

2	**Air bag system warning light is illuminated all the time.**
DETECTION CONDITION	Malfunction in air bag system warning light circuit (open circuit or short to power supply).
POSSIBLE CAUSE	• Weak battery • SAS control module malfunction • Instrument cluster (print plate) malfunction • No connection in SAS control module connector • Poor contact in instrument cluster connector (16-pin) • Open or short to power supply circuit in wiring harness between instrument cluster and SAS control module • Poor contact at terminals 1T, 1X and/or 1W of SAS control module connector • Poor contact in wiring harness between terminal 1X of SAS control module connector and ground • Poor contact in wiring harness between AIR BAG 15 A fuse and terminal 1W of SAS control module

Diagnostic Procedure

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	**INSPECT BATTERY** • Measure voltage of battery. • Is voltage **more than 9 V**?	Yes	Go to next step.
		No	Battery is weak. Inspect charge/discharge system, then go to Step 10. (See 01-17-1 BATTERY INSPECTION)

STEP	INSPECTION		ACTION
2	**VERIFY THAT SAS CONTROL MODULE CONNECTOR IS CONNECTED** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Turn up floor covering. • Are all SAS control module connectors securely connected?	Yes	Go to next step.
		No	Reconnect connector properly, then go to Step 10.
* 3	**INSPECT WIRING HARNESS BETWEEN SAS CONTROL MODULE AND INSTRUMENT CLUSTER FOR CONTINUITY** • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Remove B-pillar lower trims. (Vehicles with pre-tensioner seat belt) • Disconnect driver- and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS control module connectors. • Disconnect instrument cluster connector. • Is there continuity between SAS control module terminal 1T and instrument cluster terminal 1O?	Yes	Go to next step.
		No	Replace wiring harness, then go to Step 10.
* 4	**INSPECT WIRING HARNESS BETWEEN SAS CONTROL MODULE AND INSTRUMENT CLUSTER FOR SHORT TO POWER SUPPLY** • Connect negative battery cable. • Turn ignition switch to ON position. • Measure voltage at instrument cluster terminal 1O. • Is voltage **more than 9 V**?	Yes	Replace wiring harness, then go to Step 10.
		No	Go to next step.
5	**CHECK TO SEE WHETHER MALFUNCTION IS IN AIR BAG SYSTEM WARNING LIGHT IN INSTRUMENT CLUSTER** • Connect instrument cluster terminal 1O to ground, then reconnect connector. • Does air bag system warning light illuminate with ignition switch ON?	Yes	Replace instrument cluster, then go to Step 10. (See 09–22–3 INSTRUMENT CLUSTER REMOVAL/ INSTALLATION)
		No	Go to next step.

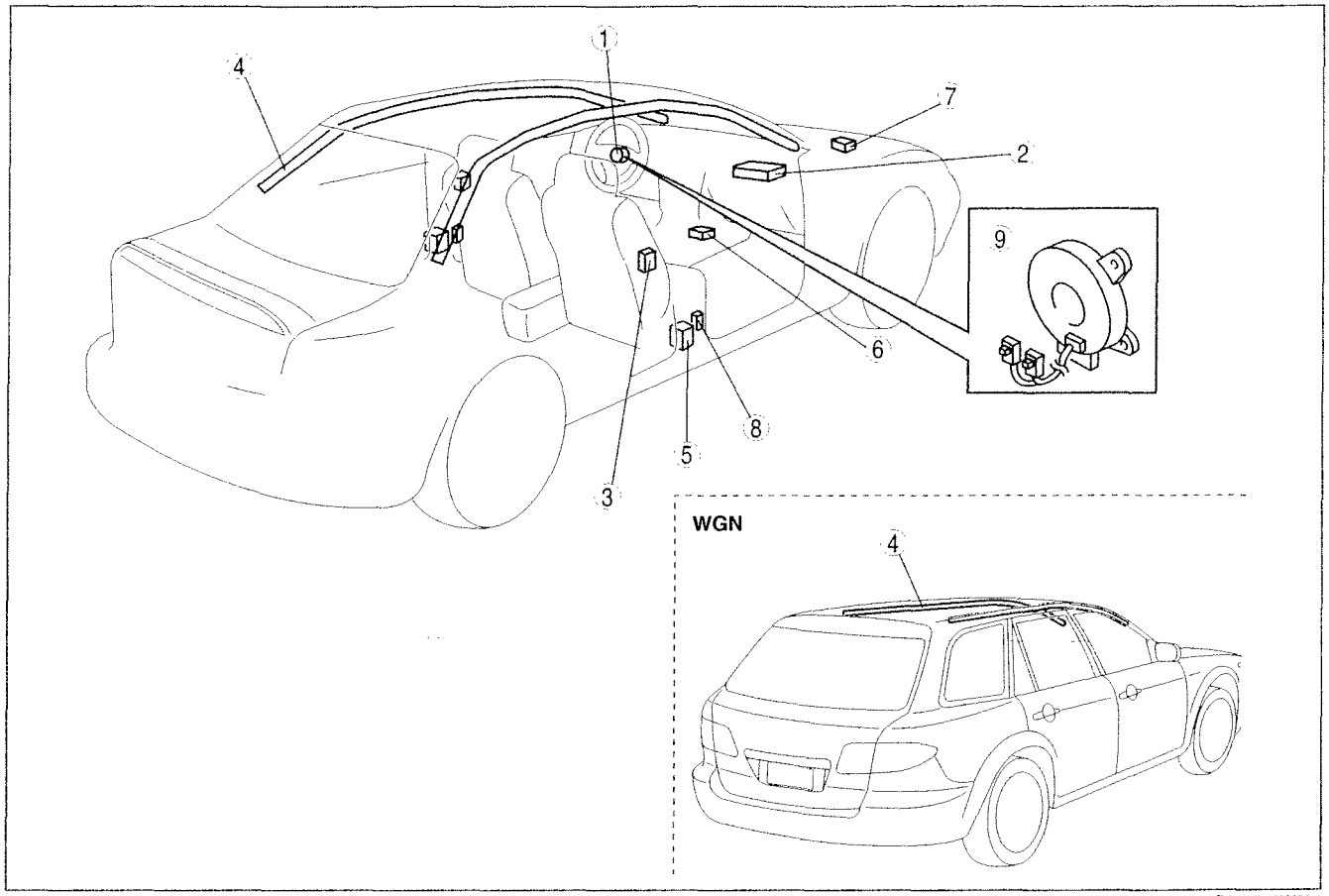
STEP	INSPECTION		ACTION
6	**INSPECT POWER SUPPLY CIRCUIT OF SAS CONTROL MODULE (TERMINAL 1W)** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Connect all SAS control module connectors. • Connect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Connect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Connect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Connect passenger-side air bag module connector. • Connect clock spring connector. • Inspect voltage for PID/DATA monitor RCM_VOLT item using **SST** (WDS or equivalent). • Is voltage of at least one terminal **more than 9 V**?	Yes	Go to Step 9.
		No	Go to next step.
7	**INSPECT WIRING HARNESS BETWEEN BATTERY AND FUSE BLOCK** • Remove driver-side front side trim. • Remove fuse block without disconnecting connectors. • Turn ignition switch to ON position. • Measure voltage at terminals D (JB–01) of fuse block connector. • Is voltage of at least one terminal **more than 9 V**?	Yes	Go to next step.
		No	Repair wiring harnesses, then go to Step 9.
8	**INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND SAS CONTROL MODULE** • Measure voltage at terminals I (JB–03) of fuse block connector. • Is voltage of at least one terminal **more than 9 V**?	Yes	Repair wiring harnesses, then go to Step 10.
		No	Inspect fuse block, then go to Step 10.

STEP	INSPECTION		ACTION
9	**VERIFY THAT SAS CONTROL MODULE CONNECTOR TERMINAL 1X IS GROUND** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Remove B-pillar lower trims. (Vehicles with pre-tensioner seat belt) • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS control module control model connectors. • Inspect wiring harness between SAS control module connector terminal 1X and ground for the following: — Short to power supply — Open circuit • Is wiring harness okay?	Yes	Replace SAS control module, then go to next step. (See 08–10–10 SAS CONTROL MODULE REMOVAL/ INSTALLATION)
		No	Replace wiring harnesses, then go to next step.
10	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Connect all SAS control module connectors. • Connect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Connect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Connect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Connect passenger-side air bag module connector. • Connect clock spring connector. • Connect instrument cluster connector. • Connect negative battery cable. • Turn ignition switch to ON position. • Does air bag system warning light operate properly?	Yes	Complete troubleshooting, then explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

08–10 AIR BAG SYSTEM

AIR BAG SYSTEM LOCATION INDEX

C6U081001046W01



C6U0810W001

1	Driver-side air bag module (See 08–10–6 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION) (See 08–10–13 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES)
2	Passenger-side air bag module (See 08–10–6 PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION) (See 08–10–13 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES)
3	Side air bag module (See 08–10–7 SIDE AIR BAG MODULE REMOVAL/INSTALLATION) (See 08–10–13 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES)
4	Curtain air bag module (See 08–10–8 CURTAIN AIR BAG MODULE REMOVAL/INSTALLATION [4SD]) (See 08–10–8 CURTAIN AIR BAG MODULE REMOVAL/INSTALLATION [5HB, WGN]) (See 08–10–13 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES)

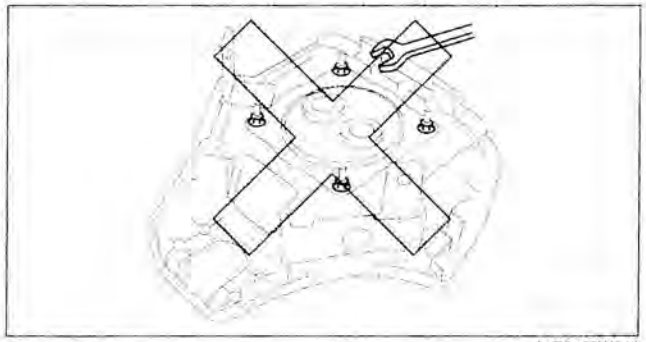
5	Pre-tensioner seat belt (See 08–10–13 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES)
6	SAS control module (See 08–10–10 SAS CONTROL MODULE REMOVAL/INSTALLATION)
7	Crash zone sensor (See 08–10–9 CRASH ZONE SENSOR REMOVAL/INSTALLATION)
8	Side air bag sensor (See 08–10–10 SIDE AIR BAG SENSOR REMOVAL/INSTALLATION)
9	Clock spring (See 08–10–10 CLOCK SPRING REMOVAL/INSTALLATION) (See 08–10–12 CLOCK SPRING INSPECTION) (See 08–10–11 CLOCK SPRING ADJUSTMENT)

AIR BAG SYSTEM SERVICE WARNINGS

C6U081001046W02

Component Disassembly

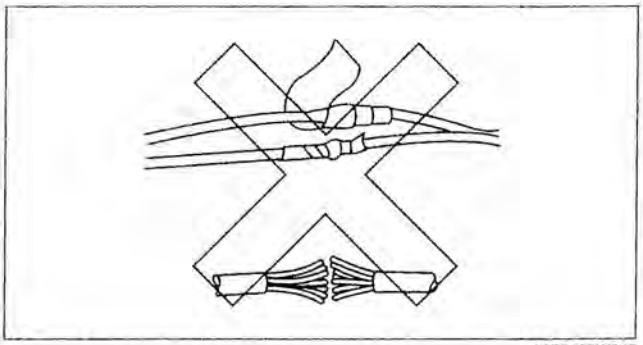
- **Disassembling and reassembling the components of the air bag system can render the system inoperative, which may result in serious injury or death in the event of an accident. Do not disassemble any air bag system components.**



A6E8130W044

Wiring Harness Repair

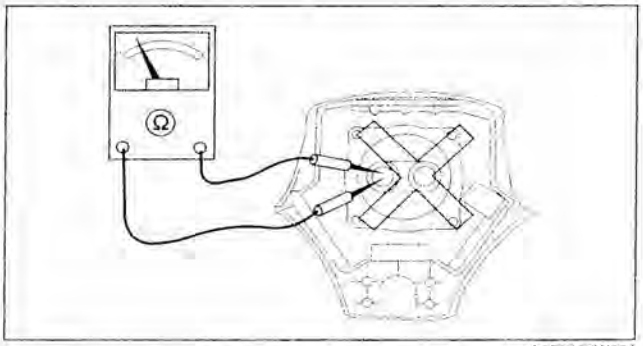
- **Incorrectly repairing an air bag system wiring harness can accidentally deploy the air bag module or pre-tensioner seat belt, which can cause serious injury. If a problem is found in the system wiring, replace the wiring harness. Do not try to repair it.**



A6E8130W045

Air Bag Module Inspection

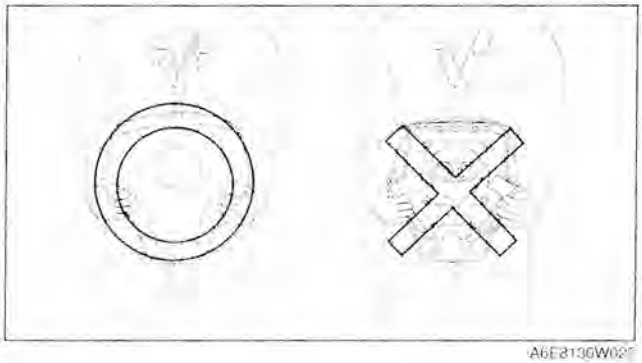
- **Inspecting an air bag module using an ohmmeter can deploy the air bag module, which may cause serious injury. Do not use an ohmmeter to inspect an air bag module. Always use the on-board diagnostic to diagnose the air bag module for malfunctions.**



A6E8130W024

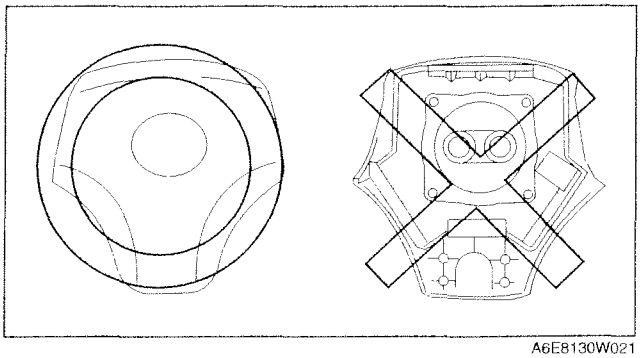
Air Bag Module Handling

- **A live (undeployed) air bag module may accidentally deploy when it is handled and cause serious injury. When carrying a live (undeployed) air bag module, point the front surface away from your body to lessen the chance of injury in case it deploys.**



A6E8130W027

- A live (undeployed) air bag module placed face down on a surface is dangerous. If the air bag module deploys, the motion of the module can cause serious injury. Always face the front surface up to reduce the motion of the module in case it accidentally deploys.



A6E8130W021

Side Air Bag Module Handling

- When the side air bag module deploys due to a collision, the interior of the seat back (pad, frame, etc.) may become damaged. If the seat back is reused and the side air bag module does not deploy properly, a serious accident may result. When the side air bag module deploys, always replace both the side air bag module and the seat back (pad, frame, trim) with new parts. After service, confirm that the seat operates normally and that the harness is positioned properly.

SAS Control Module Handling

- Disconnecting the SAS control module connector or removing the SAS control module with the ignition switch at the ON position can cause the air bag modules to deploy, which may seriously injure you. Before disconnecting the SAS control module connector or removing the SAS control module, turn the ignition switch to the LOCK position, then disconnect the negative battery cable and wait for more than 1 minute to allow the backup power supply of the SAS control module to deplete its stored power.
- Connecting the SAS control module connector without firmly installing the SAS control module to the vehicle is dangerous. The crash sensor inside the control module may send an electrical signal to the air bag modules. This will deploy the air bag modules, which may result in serious injury. Therefore, before connecting the connector, firmly mount the control module to the vehicle.
- For vehicles with a single point sensor, once an air bag module is deployed due to an accident or other causes, the SAS control module must be replaced with a new one even if the used one does not have any external signs of damage. The used SAS control module may have been damaged internally which may cause improper operation, resulting in major injuries or even death. The used single point SAS control module cannot be bench-checked or self-checked.

Crash Zone Sensor Handling

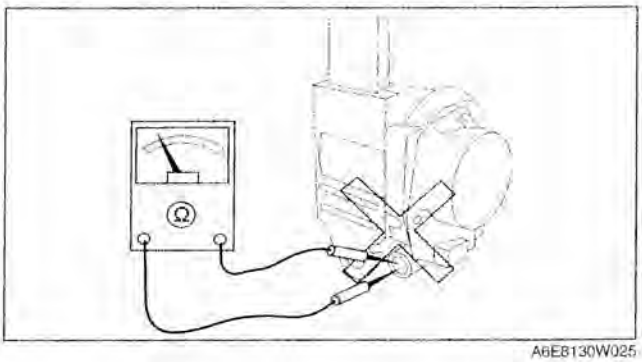
- Disconnecting the crash zone sensor connector or removing the crash zone sensor with the ignition switch at the ON position can cause the crash zone sensor to operate and the air bag modules and pre-tensioner seat belts to deploy, which may seriously injure you. Before disconnecting the crash zone sensor connector or removing the crash zone sensor, always turn the ignition switch to the LOCK position, then disconnect the negative battery cable and wait for more than 1 minute to allow the backup power supply of the SAS control module to deplete its stored power.
- If the crash zone sensor is subjected to shock or the sensor is disassembled, the air bag modules and pre-tensioner seat belts may operate (deploy) suddenly and cause injury, or it may fail to operate normally and cause a serious accident. Do not subject the crash zone sensor to shock or disassemble the sensor.
- Because a sensor is built into the crash zone sensor, when the air bag modules and pre-tensioner seat belts operates (deploys), there may be a problem, such as an internal malfunction, even if there is not any external damage or deformation. If the crash zone sensor is reused, the air bag modules and pre-tensioner seat belts may fail to operate normally and cause a serious injury. Always replace the crash zone sensor with a new part. The crash zone sensor cannot be bench-checked or self-checked.

Side Air Bag Sensor Handling

- Disconnecting the side air bag sensor connector or removing the side air bag sensor with the ignition switch at the ON position can cause the side air bag sensor to operate and the side air bag module to deploy, which may seriously injure you. Before disconnecting the side air bag sensor connector or removing the side air bag sensor, always turn the ignition switch to the LOCK position, then disconnect the negative battery cable and wait for more than 1 minute to allow the backup power supply of the SAS control module to deplete its stored power.
- If the side air bag sensor is subjected to shock or the sensor is disassembled, the side air bag module may operate (deploy) suddenly and cause injury, or it may fail to operate normally and cause a serious accident. Do not subject the side air bag sensor to shock or disassemble the sensor.
- Because a sensor is built into the side air bag sensor, when the side air bag module operates (deploys), there may be a problem, such as an internal malfunction, even if there is not any external damage or deformation. If the side air bag sensor is reused, the side air bag module may fail to operate normally and cause a serious injury. Always replace the side air bag sensor with a new part. The side air bag sensor cannot be bench-checked or self-checked.

Pre-tensioner Seat Belt Inspection

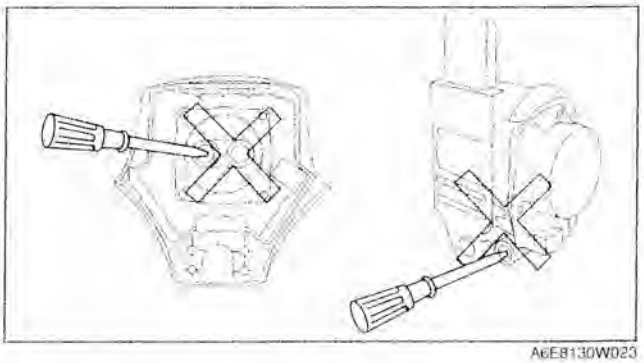
- Inspecting a pre-tensioner seat belt using an ohmmeter can deploy the pre-tensioner seat belt, which can cause serious injury. Do not use an ohmmeter to inspect the pre-tensioner seat belt. Always use the on-board diagnostic to diagnose the pre-tensioner seat belt for malfunctions.



A6E8130W025

Component Handling

- Oil, grease, water, etc on components may cause the air bag modules and pre-tensioner seat belts to fail to deploy in an accident, which may cause serious injury. Do not allow oil, grease, water, etc., on components.
- Inserting a screwdriver, etc., into the connector of an air bag module or a pre-tensioner seat belt may damage the connector and cause the air bag module or the pre-tensioner seat belt to deploy improperly, which may cause serious injury. Do not insert any foreign objects into the connector.


A6E8130W023

Component Reuse

- Even if an air bag module or a pre-tensioner seat belt does not deploy in a collision and does not have any external signs of damage, it may have been damaged internally, which may cause improper operation. Improper operation may cause serious injury. Always self-check the undamaged air bag module or pre-tensioner seat belt to determine whether it can be reused.

DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION

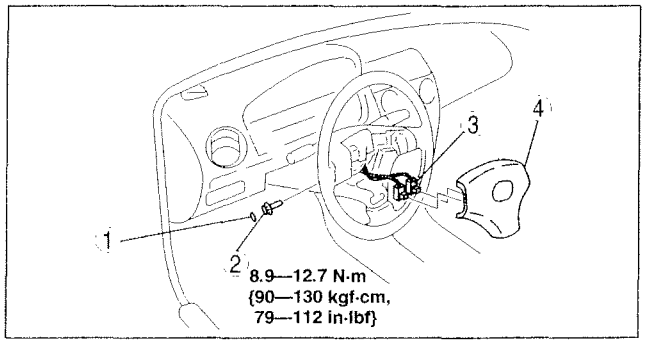
C6U081057010W01

Warning

- **Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the air bag module. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS.)**
- **Due to the adoption of 2-step deployment control in the driver-side air bag module, depending on the impact force, it is possible that inflator No. 2 might not deploy. In such cases, before disposing of the air bag module, make sure to follow the inflator deployment procedures and verify complete deployment of inflators No. 1 and 2.**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute**.
3. Remove in the order indicated in the table.

1	Cover
2	Bolt
3	Connector (See 08–10–6 Connector Removal Note)
4	Driver-side air bag module

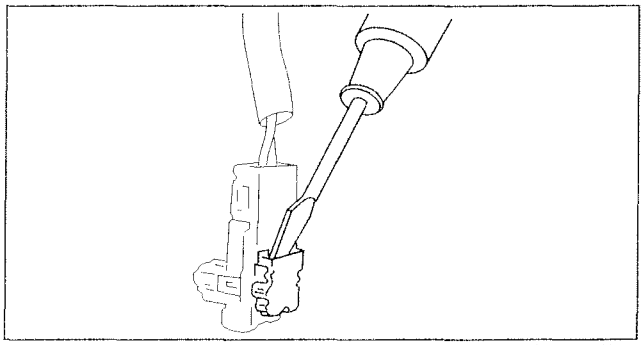


A6E8130W001

4. Install in the reverse order of removal.
5. Turn the ignition switch to the ON position.
6. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
   - If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic.

Connector Removal Note

1. Using a flathead screwdriver, pry out the connector's stopper plate.
2. Disconnect the connector.



A6E8130W002

PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION

C6U081057050W01

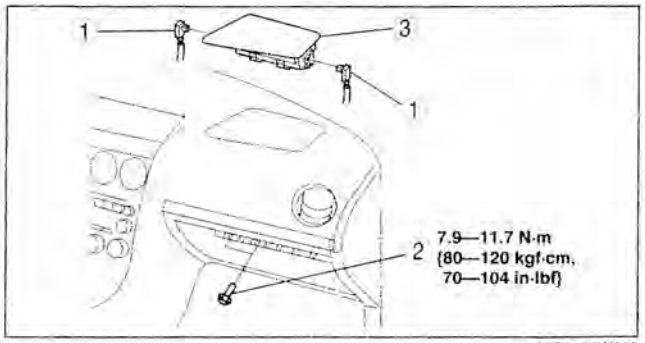
Warning

- **Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the air bag module. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS.)**
- **Due to the adoption of 2-step deployment control in the passenger-side air bag module, depending on the impact force, it is possible that inflator No. 2 might not deploy. In such cases, before disposing of the air bag module, make sure to follow the inflator deployment procedures and verify complete deployment of inflators No. 1 and 2.**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute**.
3. Remove the glove compartment.

4. Remove in the order indicated in the table.

1	Connector (See 08–10–7 Connector Removal Note)
2	Bolt
3	Passenger-side air bag module

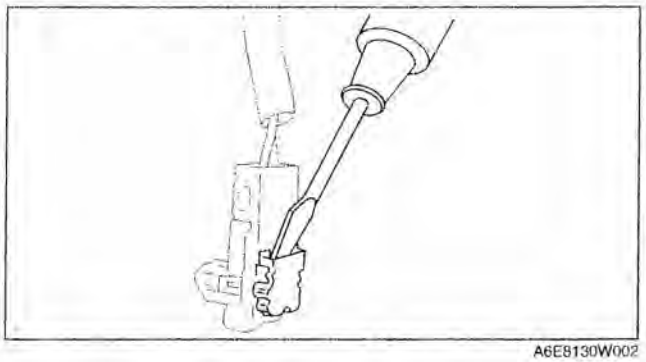


A6E8130W003

5. Install in the reverse order of removal.
6. Turn the ignition switch to the ON position.
7. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
   - If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic.

Connector Removal Note

1. Using a flathead screwdriver, pry out the connector stopper plate.
2. Disconnect the connector.


A6E8130W002

SIDE AIR BAG MODULE REMOVAL/INSTALLATION

C6U081000147W01

Warning

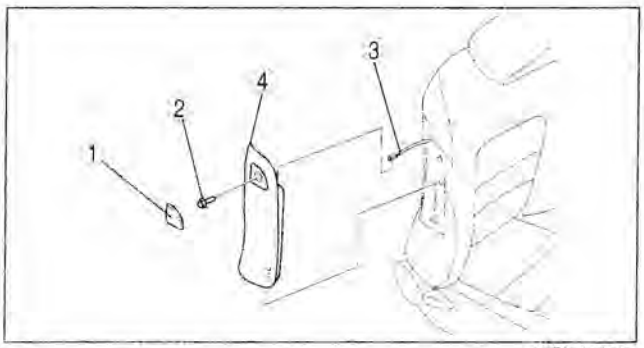
- **Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the air bag module. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS.)**

Warning

- **If the side air bag module is installed with debris in the seat back, the foreign material may be scattered when the side air bag module operates (deploys), causing injury. Verify that there is no foreign material in the seat back before installing the side air bag module.**

1. Remove in the order indicated in the table.

1	Cover
2	Bolt
3	Connector (See 08–10–8 Connector Removal Note)
4	Side air bag module

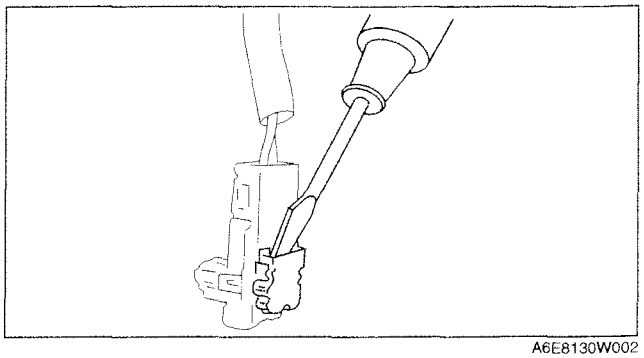


A6E8130W004

2. Install in the reverse order of removal.
3. Turn the ignition switch to the ON position.
4. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
   - If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic.

Connector Removal Note

1. Using a flathead screwdriver, pry out the connector's stopper plate.
2. Disconnect the connector.



A6E8130W002

CURTAIN AIR BAG MODULE REMOVAL/INSTALLATION [4SD]

C6U081000171W01

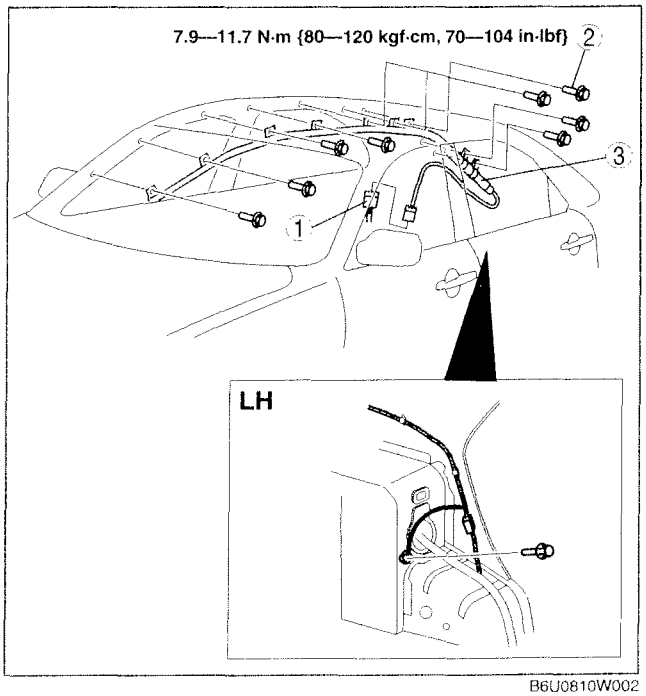
Warning

- **Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the air bag module. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS.)**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute**.
3. Remove the headliner.
4. Remove in the order indicated in the table.

1	Connector
2	Bolt
3	Curtain air bag module

5. Install in the reverse order of removal.
6. Turn the ignition switch to the ON position.
7. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
   - If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic.



B6U0810W002

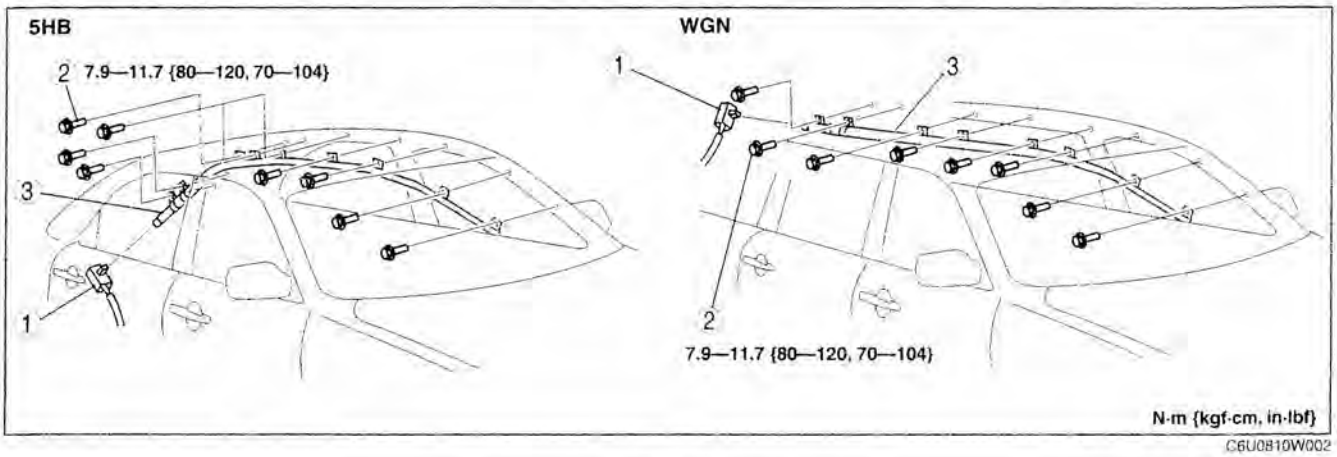
CURTAIN AIR BAG MODULE REMOVAL/INSTALLATION [5HB, WGN]

C6U081000171W02

Warning

- **Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the air bag module. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS.)**

1. Turn the ignition switch to LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute**.
3. Remove the headliner.
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Turn the ignition switch to ON position.
7. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
   - If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic.



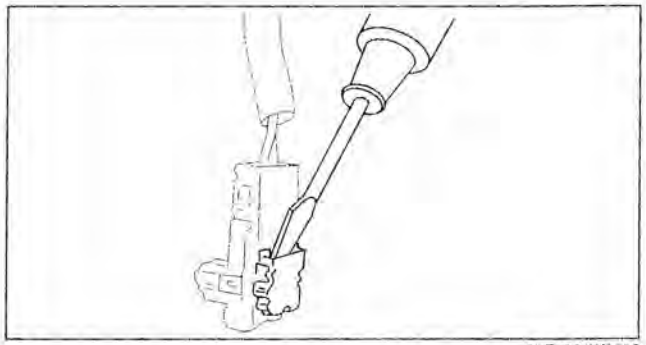
C6U0810W002

1	Connector (See 08–10–9 Connector Removal Note)

2	Bolt
3	Curtain air bag module

Connector Removal Note

1. Using a flathead screwdriver, pry out the connector's stopper plate.
2. Disconnect the connector.



A6E8130W0022

08–10

CRASH ZONE SENSOR REMOVAL/INSTALLATION

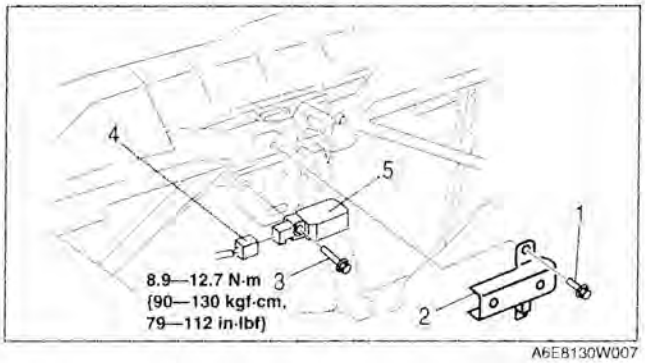
C6U0810000145W01

Warning

- **Handling the crash zone sensor improperly can accidentally deploy the air bag module and pre-tensioner seat belt, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the crash zone sensor. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS.)**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute**.
3. Remove the radiator grille.
4. Remove in the order indicated in the table.

1	Bolt
2	Cover
3	Bolt
4	Connector
5	Crash zone sensor



A6E8130W007

5. Install in the reverse order of removal.
6. Turn the ignition switch to the ON position.
7. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
   - If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic function.

SIDE AIR BAG SENSOR REMOVAL/INSTALLATION

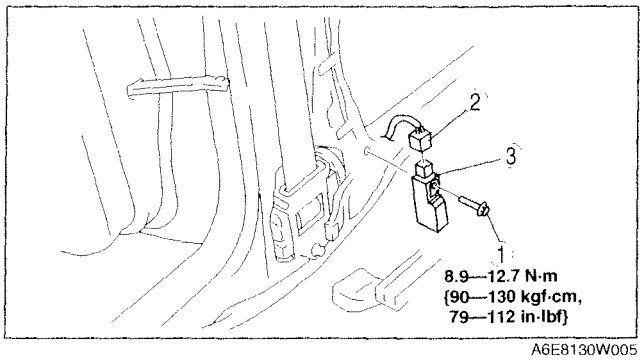
C6U081000146W01

Warning

- **Handling the side air bag sensor improperly can accidentally deploy the side air bag module, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the side air bag sensor. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS.)**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute**.
3. Remove the B-pillar lower trim.
4. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Side air bag sensor



A6E8130W005

5. Install in the reverse order of removal.
6. Turn the ignition switch to the ON position.
7. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
   - If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic function.

SAS CONTROL MODULE REMOVAL/INSTALLATION

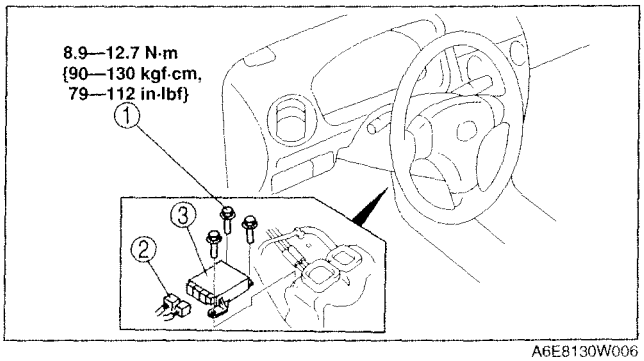
C6U081057030W01

Warning

- **Handling the SAS control module improperly can accidentally deploy the air bag modules and pre-tensioner seat belt, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the SAS control module. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS.)**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute**.
3. Partially peel off the floor covering.
4. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	SAS control module



A6E8130W006

5. Install in the reverse order of removal.
6. Turn the ignition switch to the ON position.
7. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
   - If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic.

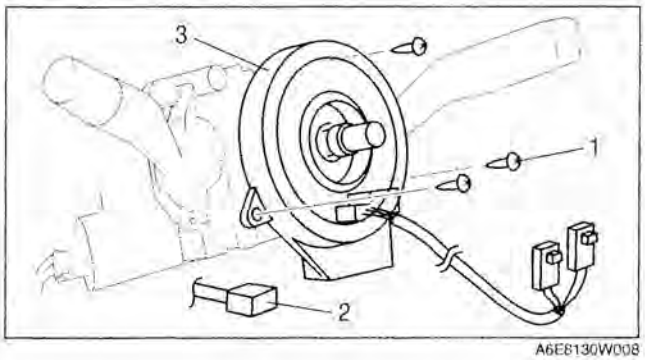
CLOCK SPRING REMOVAL/INSTALLATION

C6U081066123W01

1. Disconnect the negative battery cable.
2. Remove the driver-side air bag module. (See 08–10–6 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
3. Remove the steering wheel. (See 06–12–6 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
4. Remove the column cover.

5. Remove in the order indicated in the table.

1	Screw
2	Connector
3	Clock spring (See 08–10–11 Clock Spring Installation Note)



A6E8130W008

6. Install in the reverse order of removal.
7. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
   - If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic.

Clock Spring Installation Note

Caution
- **If the clock spring is not adjusted, the spring wire in the clock spring will break due to overtension when the steering wheel is turned. Always adjust the clock spring after installing it.**

- Adjust the clock spring after installing it. (See 08–10–11 CLOCK SPRING ADJUSTMENT.)

CLOCK SPRING ADJUSTMENT

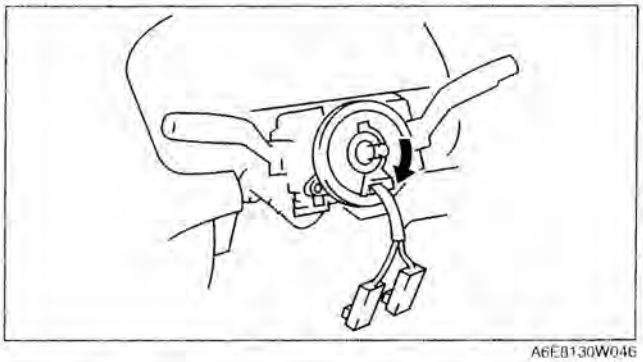
C6U081066123W02

Note
- The adjustment procedure is also specified on the caution label of the clock spring.

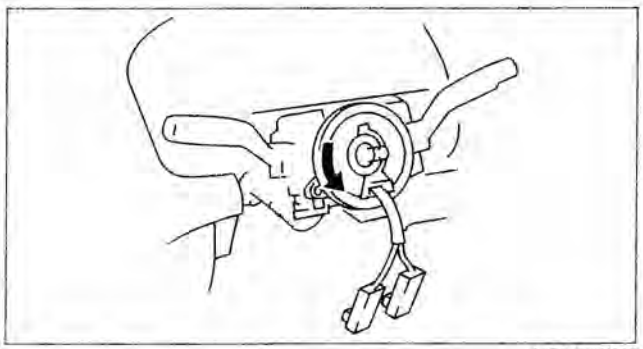
1. Set the front wheels straight ahead.

Caution
- **The clock spring will break if over-wound. Do not forcibly turn the clock spring.**

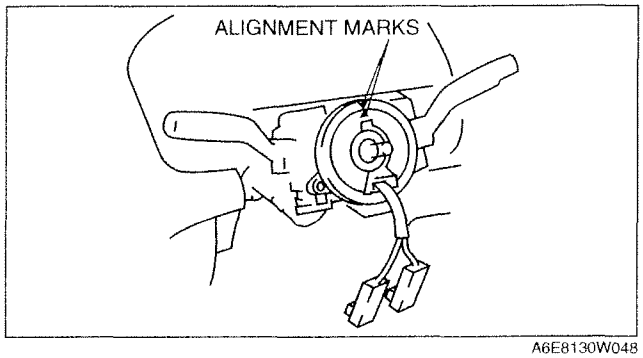
2. Turn the clock spring clockwise until it stops.


A6E8130W046

3. Turn the clock spring counterclockwise **2 3/4 turns**.


A6E8130W047

4. Align the mark on the clock spring with the mark on the outer housing.



A6E8130W048

CLOCK SPRING INSPECTION

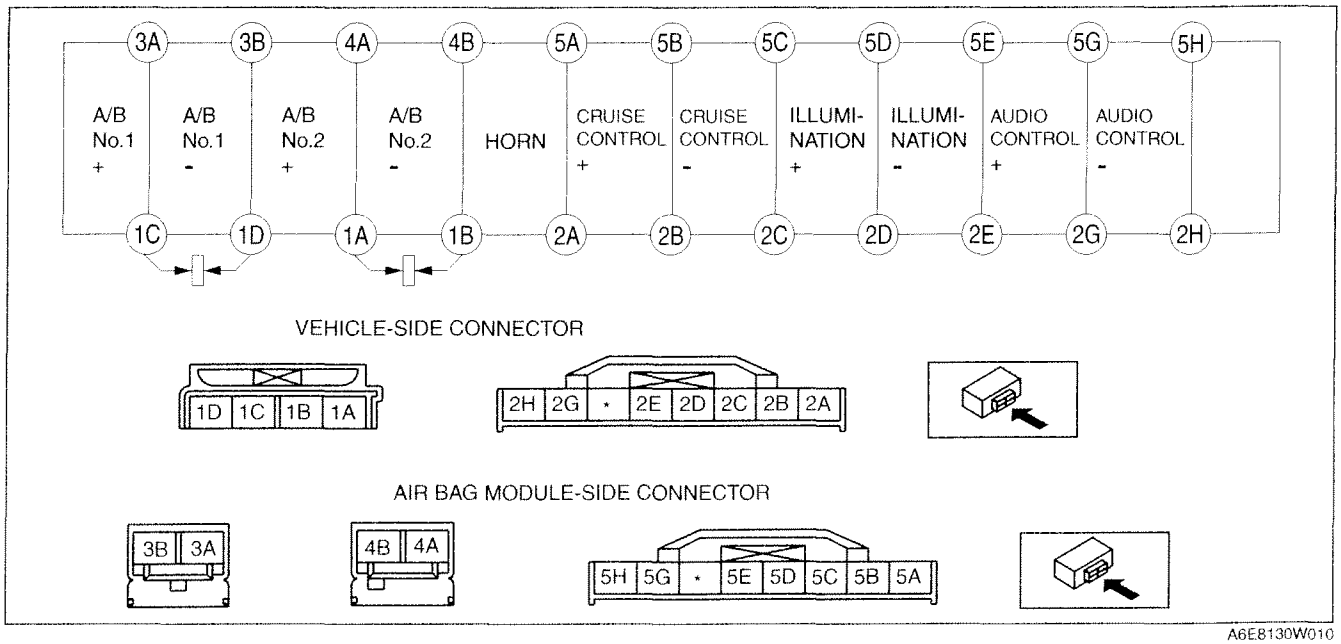
C6U081066123W03

1. Remove the clock spring.
2. Inspect for continuity between the clock spring terminals using an ohmmeter.
   - If not as specified, replace the clock spring.

○—○: Continuity

Test condition	Terminal																				
	1A	1B	1C	1D	2A	2B	2C	2D	2E	2G	2H	3A	3B	4A	4B	5A	5B	5C	5D	5E	5G	5H
Under any condition	○	○												○	○							
			○	○																		
					○							○	○			○						
						○											○					
							○											○				
								○											○			
									○											○		
										○											○	
											○											○

A6E8130W009



A6E8130W010

Note

- When the vehicle-side connector of the clock spring is disconnected, terminals 1A,1B, 1C and 1D are shorted to prevent unexpected deployment of the air bag module. When it is connected, the terminals are open.

AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES

C6U081057000W01

Warning

- **A live (undeployed) air bag module and pre-tensioner seat belt may accidentally deploy when it is disposed of and cause serious injury. Do not dispose of a live (undeployed) air bag module and pre-tensioner seat belt. If the SSTs (Deployment tool and Adapter harness) are not available, consult the nearest Mazda representative for assistance.**

Caution

- **Deploying the air bag modules and pre-tensioner seat belts inside the vehicle may cause damage to the vehicle interior. When the vehicle is not to be scrapped, always deploy the air bag modules and pre-tensioner seat belts outside the vehicle.**

- When the vehicle is to be scrapped, deploy the air bag modules and pre-tensioner seat belts inside the vehicle. (See 08–10–13 Deployment Procedure for Inside of Vehicle (Only When Vehicle Is To Be Scrapped).)
- When the vehicle is not to be scrapped, deploy the air bag modules and pre-tensioner seat belts outside the vehicle. (See 08–10–19 Deployment Procedure for Outside of Vehicle.)

Note

- When disposing of a deployed air bag module and pre-tensioner seat belt, refer to the disposal procedure, (See 08–10–29 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DISPOSAL PROCEDURES.)

Deployment Procedure for Inside of Vehicle (Only When Vehicle Is To Be Scrapped)

1. Inspect the **SST** (Deployment tool). (See 08–10–30 INSPECTION OF SST (DEPLOYMENT TOOL).)
2. Move the vehicle to an open space, away from strong winds, and close all of the vehicle's doors and windows.
3. Turn the ignition switch to the LOCK position.
4. Disconnect the negative battery cable and wait for **more than 1 minute**.
5. Follow the appropriate procedure for deploying the driver-side air bag module, passenger-side air bag module, side air bag module, curtain air bag module, or pre-tensioner seat belt.

Driver-side air bag module

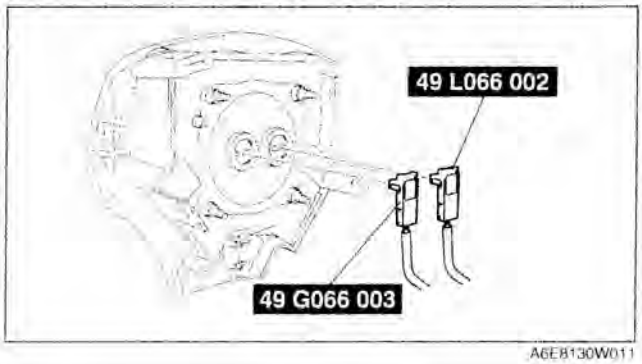
Warning

- **The driver-side air bag module is a dual inflator type. If one inflator is forced to operate (deploy), the other may operate (deploy) accidentally. To prevent injury while disposing of the air bag module, make sure to operate (deploy) both driver-side air bag module inflators simultaneously, following the procedure below.**

Note

- The **SSTs**, two types of adapter harnesses (for inflators No.1 and No.2) and two deployment tools are to be used to operate (deploy) the driver-side air bag module.

1. Remove the driver-side air bag module. (See 08–10–6 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
2. Connect the SST (Adapter harness) to the driver-side air bag module as shown in the figure.
3. Install the driver-side air bag module. (See 08–10–6 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)



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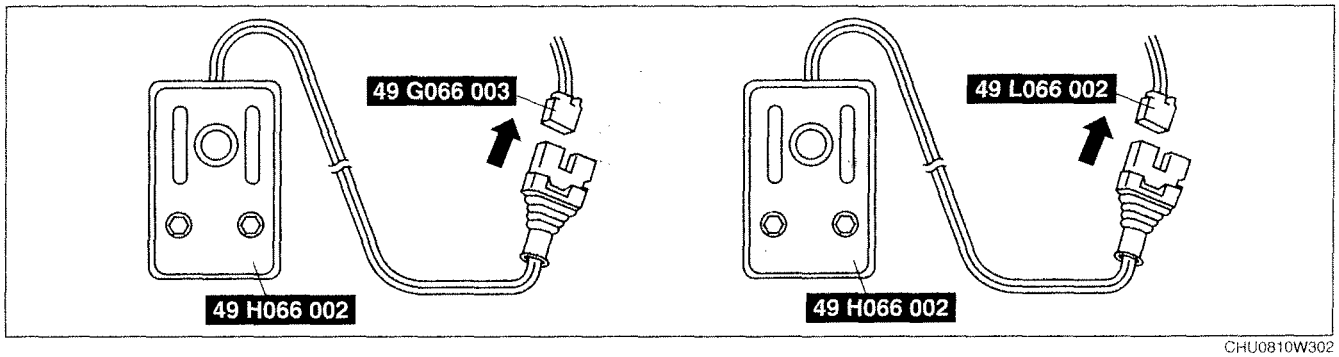
4. Connect the **SST** (Deployment tool) to the SST (Adapter harness).



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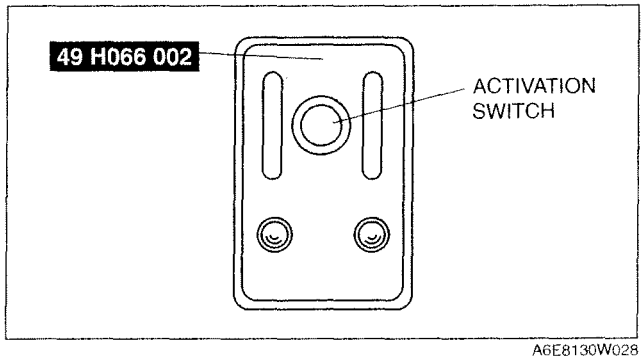
5. Connect both **SSTs** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.
6. Verify that the red lamp on both **SSTs** (Deployment tool) is illuminated.
7. Make sure all persons are standing **at least 6 m {20 ft}** away from the vehicle.
8. Press the activation switch on the **SST** (Deployment tool) connected with 49 L066 002 (a yellow connector) of the **SST** (Adapter harness), and **after 3 s**, press the activation switch on the other **SST** (Deployment tool) to operate (deploy) the air bag module (both inflators).

Warning

- **Verify that air bag module operation (explosive) sound occurs twice. if no operation (explosive) sound was heard or a single operation (explosive) sound was heard, both inflators would not have operated (deployed) properly. This may cause serious injury because the air bag module may operate (deploy) accidentally. if the two operation (explosive) sounds are not heard, perform Step 8 again. In case that the two operation (explosive) sounds in total are not verified even throgh Step 8 is performed again, leave the air bag module alone for 30 min or more before getting near it again.**
- **The air bag module is very hot immediately after it is operated (deployed). You can get burned. Do not touch the air bag module for at least 15 min after deployment.**

9. Disconnect the **SST** (Deployment tool) from the **SST** (Adapter harness).



A6E8130W028

Passenger-side air bag module

Warning

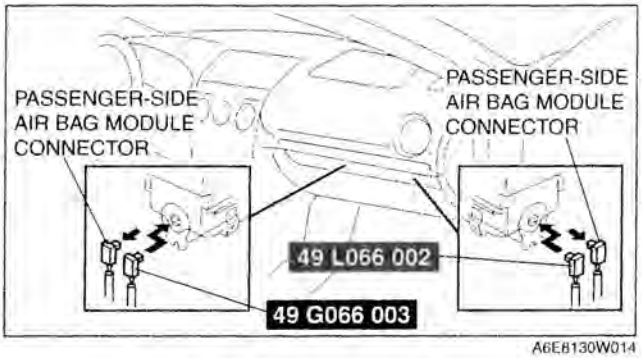
- **The passenger-side air bag module is a dual inflator type. If one inflator is forced to operate (deploy), the other may operate (deploy) accidentally. To prevent injury while disposing of the air bag module, make sure to operate (deploy) both passenger-side air bag module inflators simultaneously, following the procedure below.**

Note

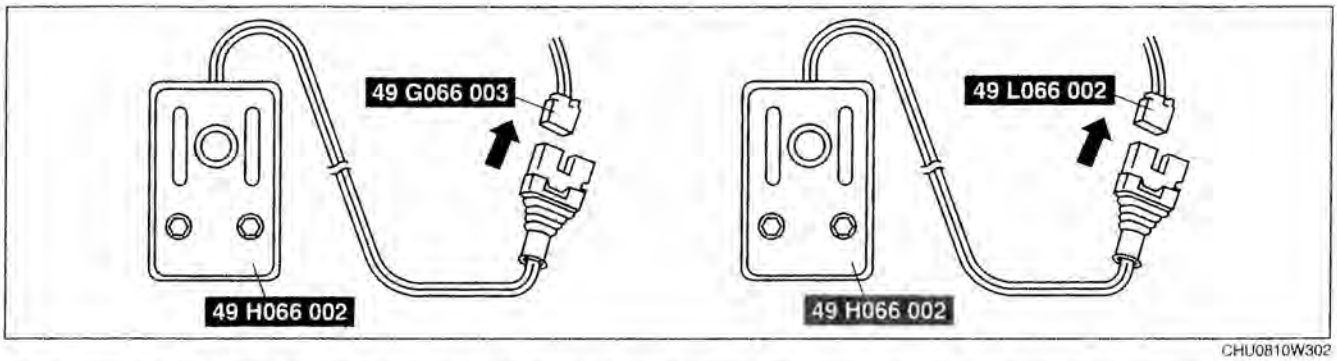
- The **SSTs**, two types of adapter harnesses (for inflators No.1 and No.2) and two deployment tools are to be used to operate (deploy) the passenger-side air bag module.

1. Remove the glove compartment.
2. Disconnect the passenger-side air bag module connector.

3. Connect the **SST** (Adapter harness) to the passenger-side air bag module as shown in the figure.
4. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).



A6E8130W014



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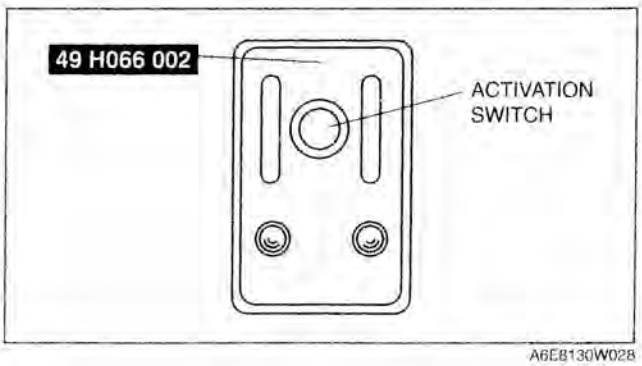
5. Connect both **SSTs** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.
6. Verify that the red lamp on both **SSTs** (Deployment tool) is illuminated.
7. Make sure all persons are standing **at least 6 m {20 ft}** away from the vehicle.
8. Press the activation switch on the **SST** (Deployment tool) connected with 49 L066 002 (a yellow connector) of the **SST** (Adapter harness), and **after 3 s**, press the activaton switch on the other **SST** (Deployment tool) to operate (deploy) the air bag module (both inflators).

Warning

- **Verify that air bag module operation (explosive) sound occurs twice. If no operation (explosive) sound was heard or a single operation (explosive) sound was heard, both inflators would not have operated (deployed) properly. This may cause serious injury because the air bag module may operate (deploy) accidentally. If the two operation (explosive) sounds are not heard, perform Step 8 again. In case that the two operation (explosive) sounds in total are not verified even though Step 8 is performed again, leave the air bag module alone for 30 min or more before getting near it again.**
- **The air bag module is very hot immediately after it is operated (deployed). You can be burned. Do not touch the air bag module tor at least 15 min after deployment.**

9. Disconnect the **SST** (Deployment tool) from the **SST** (Adapter harness).
10. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
11. Perform Steps 5 through 8, in order to deploy the passenger-side air bag module.



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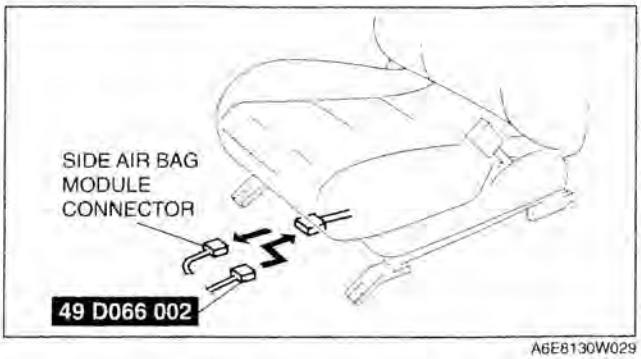
Side air bag module

1. Disconnect the side air bag module connector.

2. Connect the **SST** (Adapter harness) to the side air bag module.



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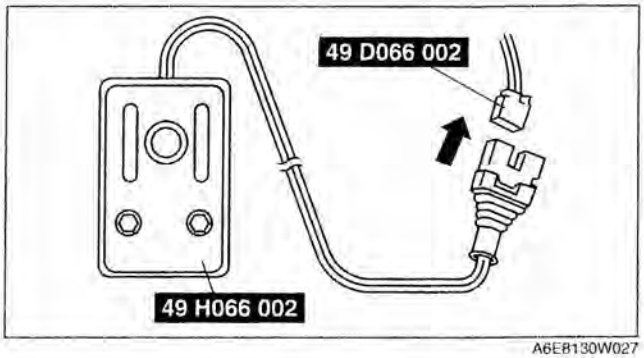
3. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
4. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
5. Verify that the red light on the **SST** (Deployment tool) is illuminated.
6. Make sure all persons are standing **at least 6 m {20 ft}** from the vehicle.



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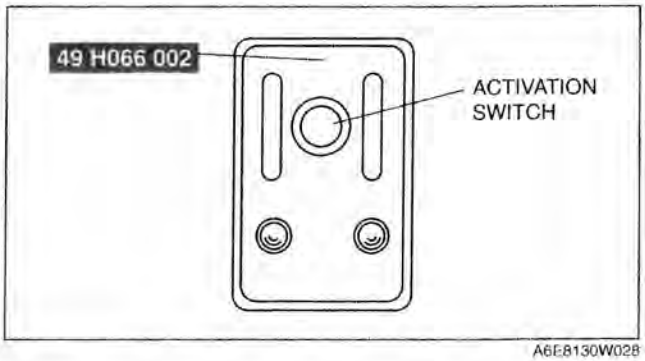
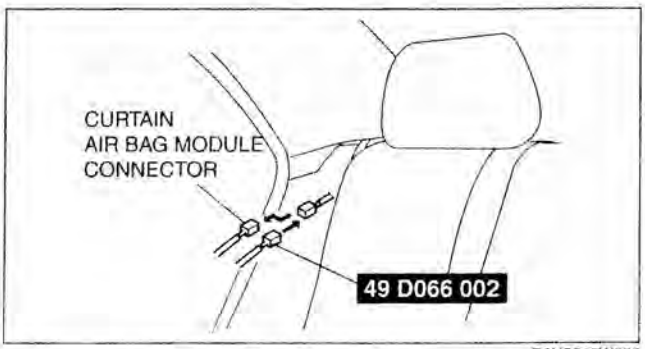
7. Press the activation switch on the **SST** (Deployment tool) to deploy the side air bag module.



A6E8130W028

Curtain air bag module (4SD)

1. Remove the side tire house trim.
2. Disconnect the curtain air bag module connector.
3. Connect the **SST** (Adapter harness) to the curtain air bag module.



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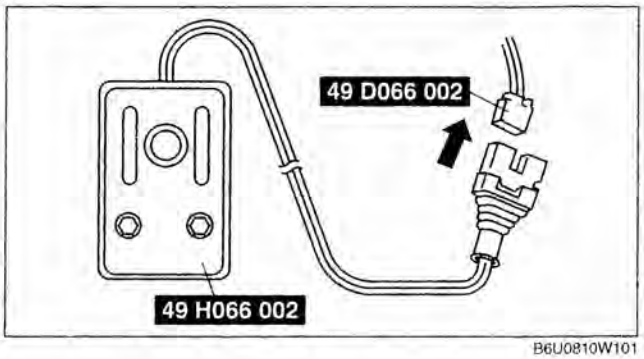
4. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
5. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
6. Verify that the red light on the **SST** (Deployment tool) is illuminated.
7. Make sure all persons are standing **at least 6 m {20 ft}** from the vehicle.



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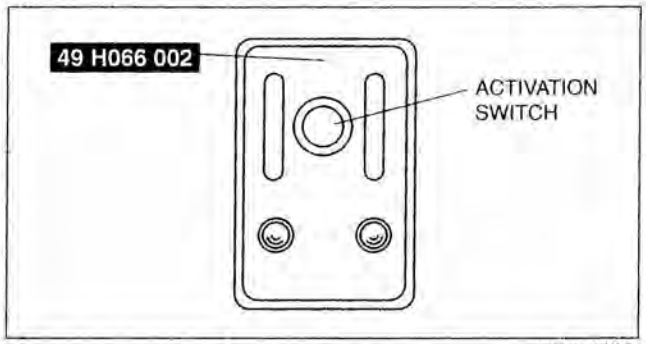
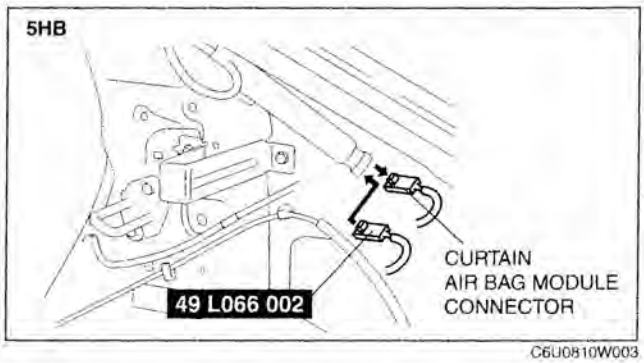
8. Press the activation switch on the **SST** (Deployment tool) to deploy the curtain air bag module.



A6E8130W028

Curtain air bag module (5HB, WGN)

1. Remove the side trunk side trim. (5HB)
2. Remove the headliner. (WGN)
3. Disconnect the curtain air bag module connector.



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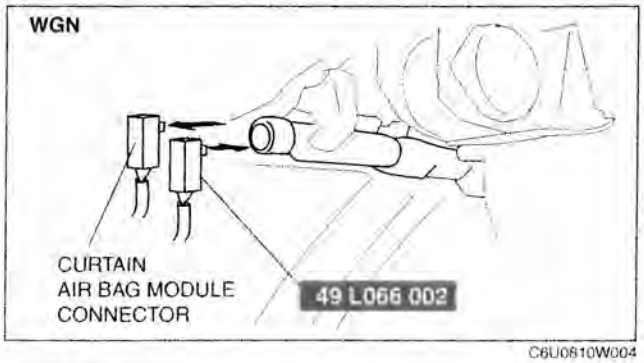
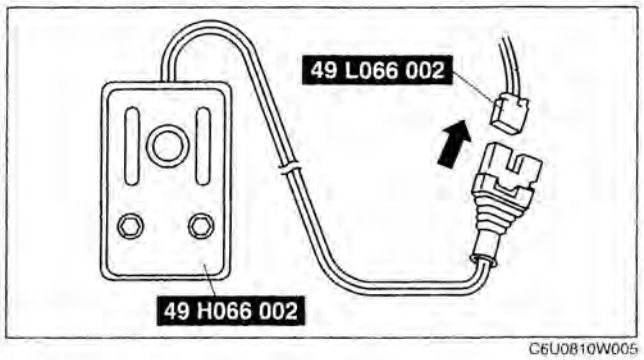


C6U0810W004

4. Connect the **SST** (Adapter harness) to the curtain air bag module.

5. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
6. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
7. Verify that the red light on the **SST** (Deployment tool) is illuminated.
8. Make sure all persons are standing **at least 6 m {20 ft}** from the vehicle.



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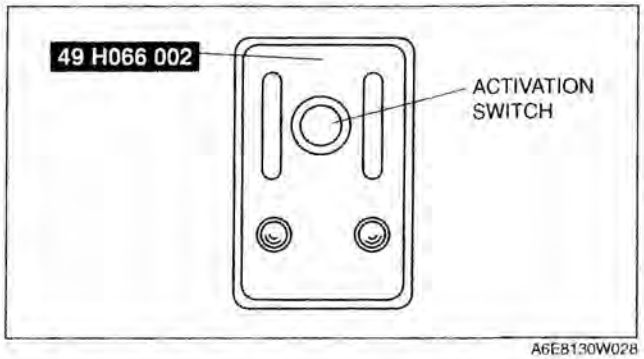
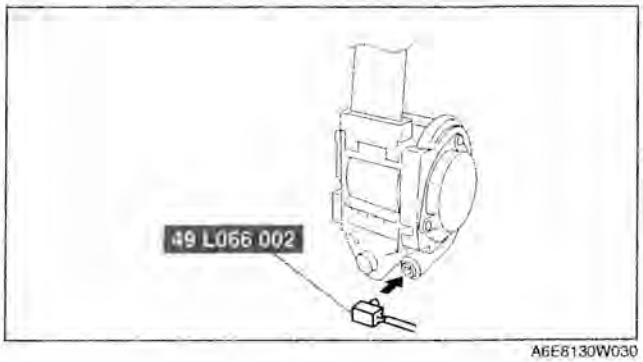
9. Press the activation switch on the **SST** (Deployment tool) to deploy the curtain air bag module.



A6E8130W028

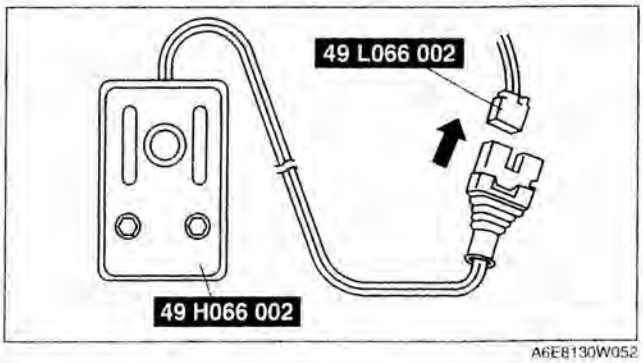
Pre-tensioner seat belt

1. Remove the B-pillar lower trim.
2. Remove the pre-tensioner seat belt and connect the **SST** (Adapter harness) to it as shown in the figure. (See 08–11–2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
3. Install the pre-tensioner seat belt.



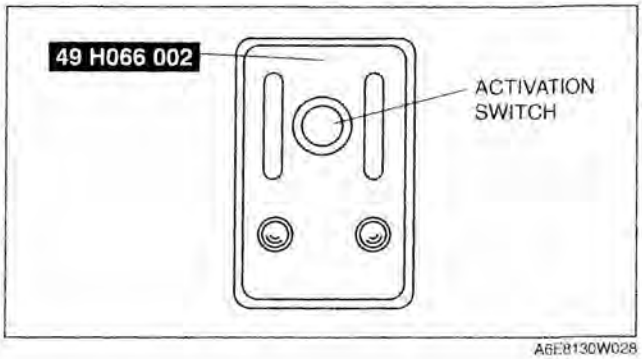
A6E8130W030

4. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
5. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
6. Verify that the red light on the **SST** (Deployment tool) is illuminated.
7. Make sure all persons are standing **at least 6 m {20 ft}** from the vehicle.



A6E8130W052

8. Press the activation switch on the **SST** (Deployment tool) to deploy the pre-tensioner seat belt.



A6E8130W028

Deployment Procedure for Outside of Vehicle

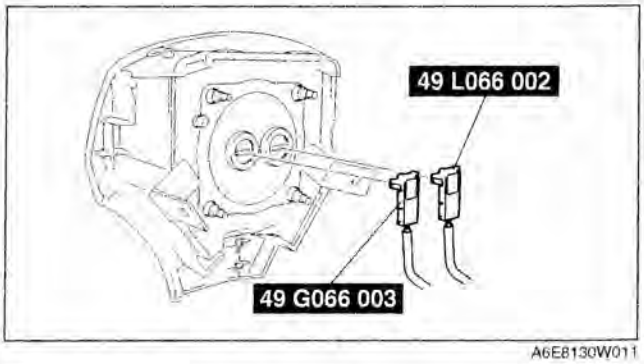
1. Inspect the **SST** (Deployment tool). (See 08–10–30 INSPECTION OF SST (DEPLOYMENT TOOL).)
2. Turn the ignition switch to the LOCK position.
3. Disconnect the negative battery cable and wait for **more than 1 minute**.
4. Follow the appropriate procedure for deploying the driver-side air bag module, passenger-side air bag module, side air bag module, curtain air bag module, or pre-tensioner seat belt.

Driver-side air bag module

Warning

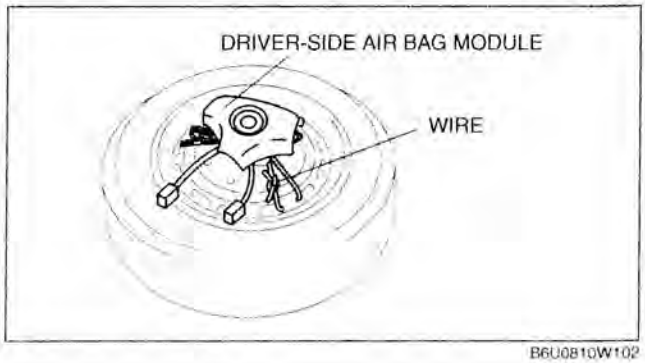
- **The driver-side air bag module is a dual inflator type. If one inflator is forced to operate (deploy), the other may operate (deploy) accidentally. To prevent injury while disposing of the air bag module, make sure to operate (deploy) both driver-side air bag module inflators simultaneously, following the procedure below.**

1. Remove the driver-side air bag module. (See 08–10–6 DRIVER-SIDE AIR BAG MODULE REMOVAL/ INSTALLATION.)
2. Connect the **SST** (Adapter harness) to the driver-side air bag module as shown in the figure,



A6E8130W011

3. Place the driver-side air bag module on the center of the tire wheel with the module facing up. To secure the air bag module to the tire wheel, wrap the wire through the wheel and around the bolt installation hole **at least four times**.

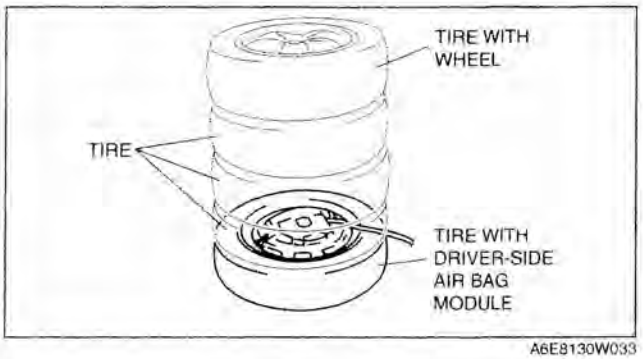


B6U0810W102

Warning

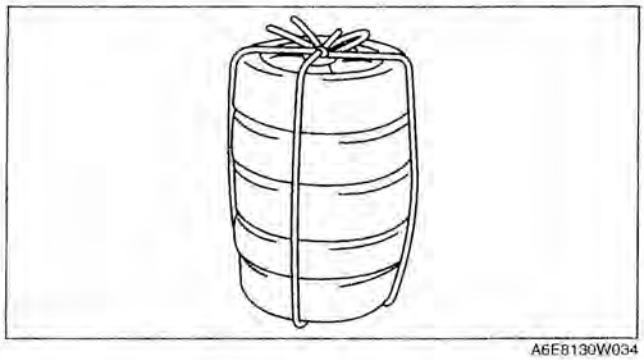
- **If the air bag module is not properly installed to the tire wheel, serious injury may occur when the module is deployed. When installing the air bag module to the tire wheel, make sure the module is facing up.**

4. Stack three tires on top of the tire with the air bag module. Stack another tire that has a wheel on top of the four tires.

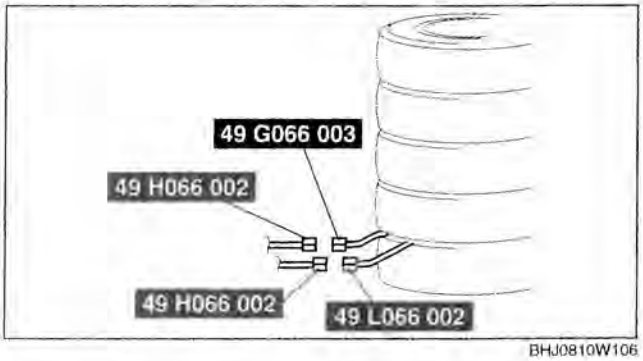


A6E8130W033

5. Tie all tires together with wire.


A6E8130W034

6. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
7. Connect both **SSTs** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.
8. Verify that the red lamp on both **SSTs** (Deployment tool) is illuminated.
9. Make sure all persons are standing **at least 6 m {20 ft}** away from the vehicle.



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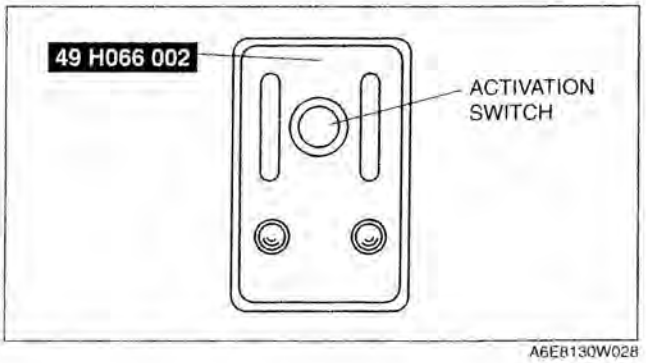
10. Press the activation switch on the **SST** (Deployment tool) connected with 49 L066 002 (a yellow connector) of the **SST** (Adapter harness), and **after 3 s**, press the activation switch on the other **SST** (Deployment tool) to operate (deploy) the air bag module (both inflators).



A6E8130W028

Warning

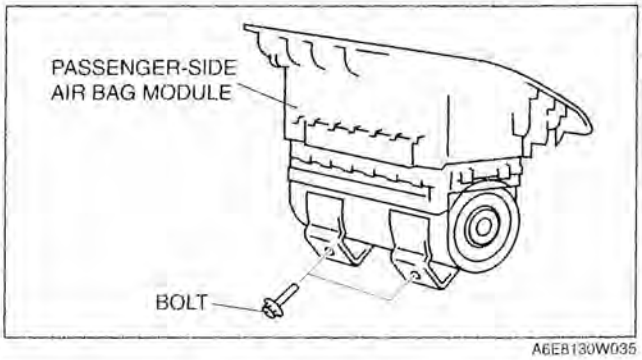
- **Verify that air bag module operation (explosive) sound occurs twice. If no operation (explosive) sound was heard or a single operation (explosive) sound was heard, both inflators would not have operated (deployed) properly. This may cause serious injury because the air bag module may operate (deploy) accidentally. If the two operation (explosive) sounds are not heard, perform Step 10 again. In case that the two operation (explosive) sounds in total are not verified even through Step 10 is performed again, leave the air bag module alone for 30 min or more before getting near it again.**
- **The air bag module is very hot immediately after it is operated (deployed). You can be burned. Do not touch the air bag module for at least 15 min after deployment.**

11. Disconnect the **SST** (Deployment tool) from the **SST** (Adapter harness).

Passenger-side air bag module

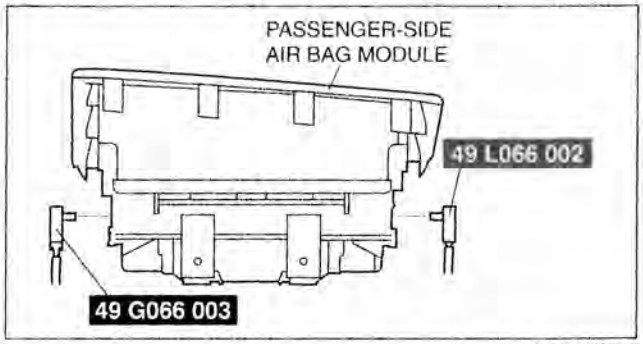
Warning
- **The passenger-side air bag module is a dual inflator type. If one inflator is forced to operate (deploy), the other may operate (deploy) accidentally. To prevent injury while disposing of the air bag module, make sure to operate (deploy) both passenger-side air bag module inflators simultaneously, following the procedure below.**

1. Remove the passenger-side air bag module. (See 08–10–6 PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
2. Install the bolts to the passenger-side air bag module.



A6E8130W035

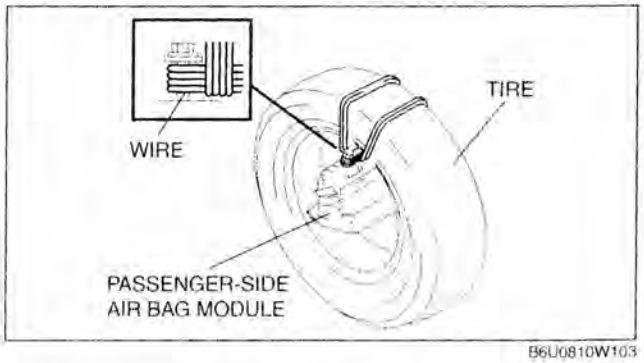
3. Connect the **SST** (Adapter harness) to the passenger-side air bag module as shown in the figure.



A6E8130W015

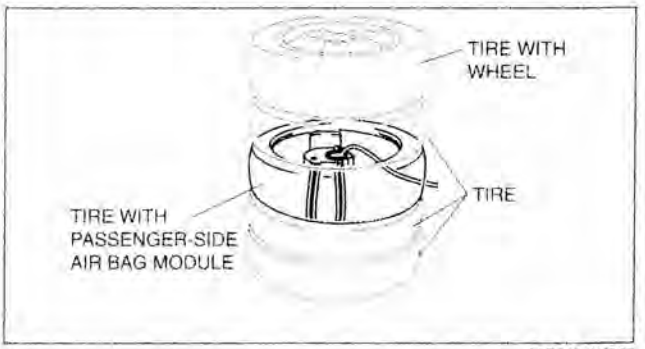
4. Tie the passenger-side air bag module to the tire with the module facing the center of the tire. Wrap the wire through the tire and around the bolts **at least four times**.

Warning
- **If the air bag module is not properly installed to the tire, serious injury may occur when the module is deployed, When installing the air bag module to the tire, make sure the module is facing the center of the tire.**



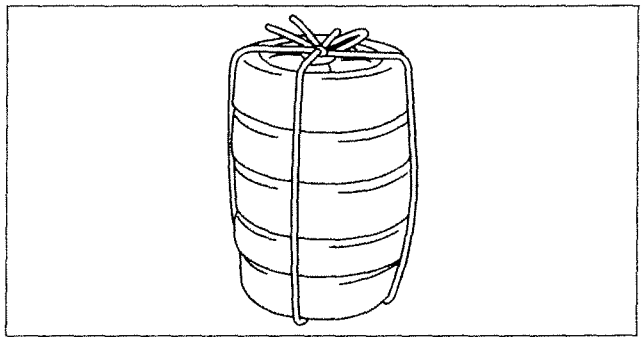
B6U0810W103

5. Stack the tire with the passenger-side air bag module on top of two tires. Stack another tire that has a wheel on top of the four tires.



A6E8130W037

6. Tie all tires together with wire.



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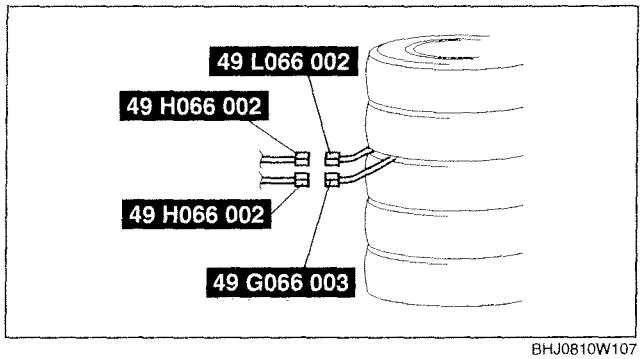
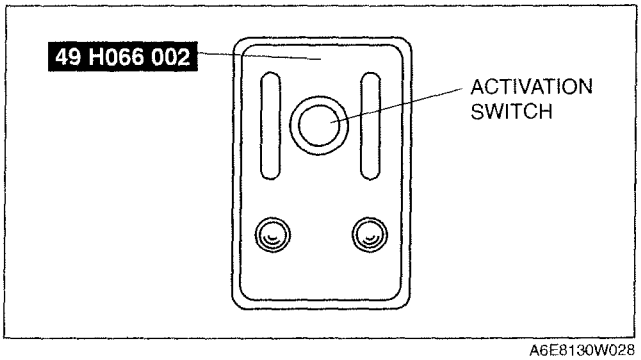
7. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
8. Connect both **SSTs** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.
9. Verify that the red lamp on the **SSTs** (Deployment tool) is illuminated.
10. Make sure all persons are standing **at least 6 m {20 ft}** away from the vehicle.



BHJ0810W107

11. Press the activation switch on the **SST** (Deployment tool) connected with 49 L066 002 (a yellow connector) of the **SST** (Adapter harness), and **after 3s**, press the activation switch on the other **SST** (Deployment tool) to operate (deploy) the air bag module (both inflators).



A6E8130W028

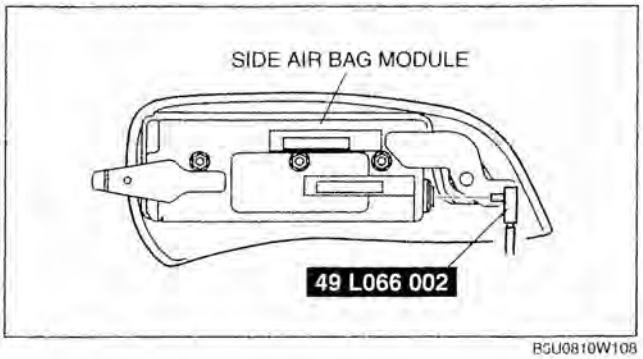
Warning

- **Verify that air bag module operation (explosive) sound occurs twice. If no operation (explosive) sound was heard or a single operation (explosive) sound was heard, both inflators would not have operated (deployed) properly. This may cause serious injury because the air bag module may operate (deploy) accidentally. If the two operation (explosive) sounds are not heard, perform Step 11 again. In case that the two operation (explosive) sounds in total are not verified even though Step 11 is performed again, leave the air bag module alone for 30 min or more before getting near it again.**
- **The air bag module is very hot immediately after it is operated (deployed). You can be burned. Do not touch the air bag module for at least 15 min after deployment.**

12. Disconnect the **SST** (Deployment tool) from the **SST** (Adapter harness).
13. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
14. Perform Steps 8 through 11, in order to deploy the passenger-side air bag module.

Side air bag module

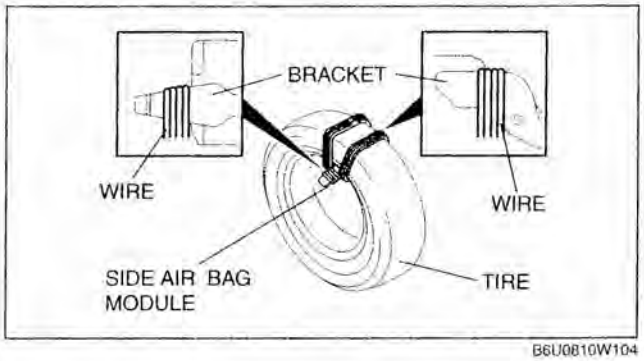
1. Remove the side air bag module. (See 08–10–7 SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
2. Connect the **SST** (Adapter harness) to the side air bag module as shown in the figure.



B5U0810W108

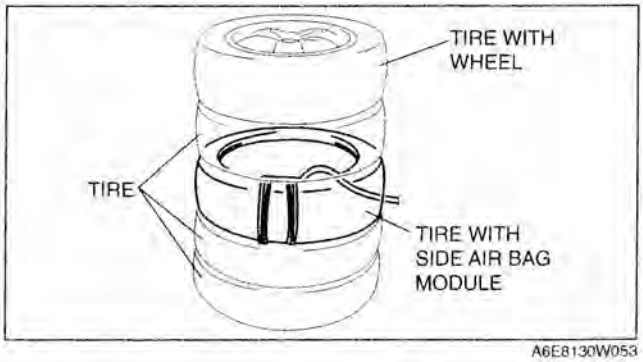
3. Tie the side air bag module to the tire with the module facing the center of the tire. Wrap the wire through the tire and around the bracket **at least four times**.

   Warning
   - **If the air bag module is not properly installed to the tire, serious injury may occur when the module is deployed. When installing the air bag module to the tire, make sure the module is facing the center of the tire.**



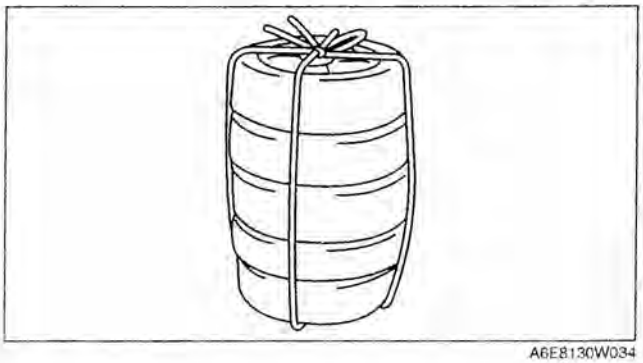
B6U0810W104

4. Stack the tire with the side air bag module on top of two tires. Stack a tire on top of three tires. Stack another tire that has a wheel on top of the four tires.



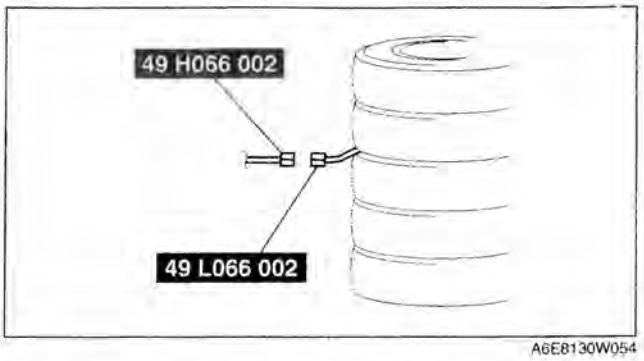
A6E8130W053

5. Tie all tires together with wire.



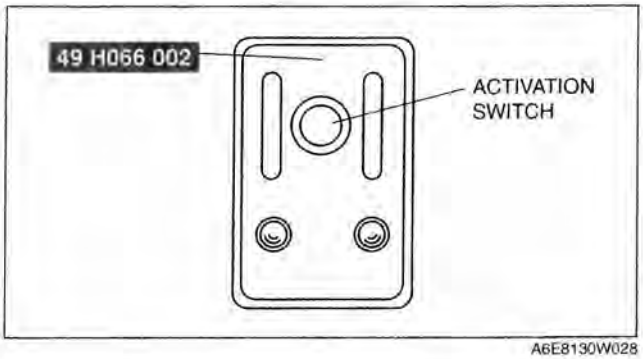
A6E8130W034

6. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
7. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
8. Verify that the red light on the **SST** (Deployment tool) is illuminated.
9. Make sure all persons are standing **at least 6 m {20 ft}** from the vehicle.



A6E8130W054

10. Press the activation switch on the **SST** (Deployment tool) to deploy the side air bag module.

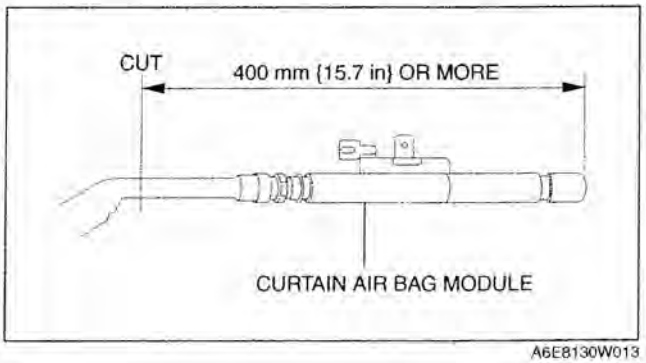


A6E8130W028

Curtain air bag module (4SD)

1. Remove the curtain air bag module. (See 08–10–8 CURTAIN AIR BAG MODULE REMOVAL/INSTALLATION [4SD].)
2. Secure the curtain air bag module in a vise, and cut off the deployment section, as shown in the figure.

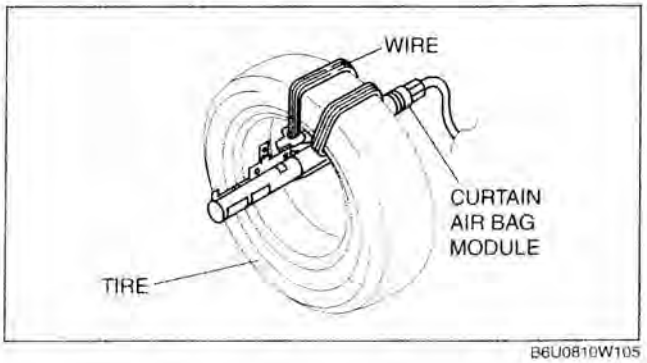
   Warning
   - **Be sure not to collapse the pipe on the side where it is cut. If it is collapsed, the interior pressure of the pipe will build up and can cause it to explode during air bag module deployment.**



A6E8130W013

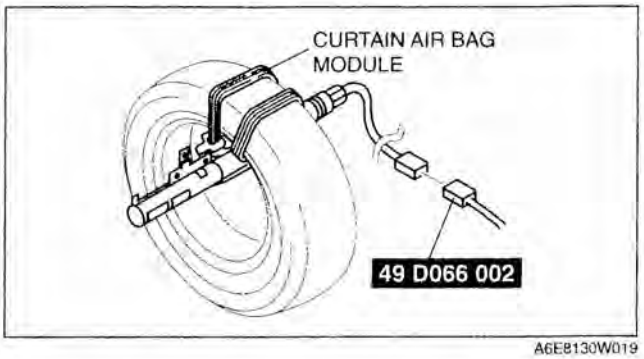
3. Tie the side air bag module to the tire with the module facing the center of the tire. Wrap the wire through the tire and around the bracket **at least four times**.

   Warning
   - **If the air bag module is not properly installed to the tire, serious injury may occur when the module is deployed. When installing the air bag module to the tire, make sure the module is facing the downward.**



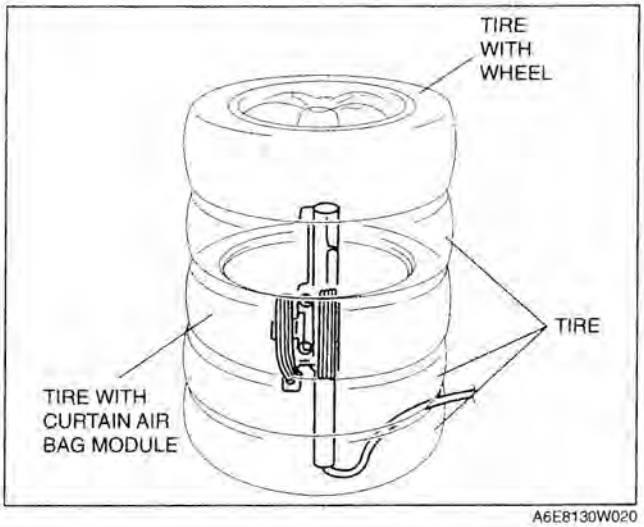
B6U0810W105

4. Connect the **SST** (Adapter harness) to the curtain air bag module as shown in the figure.



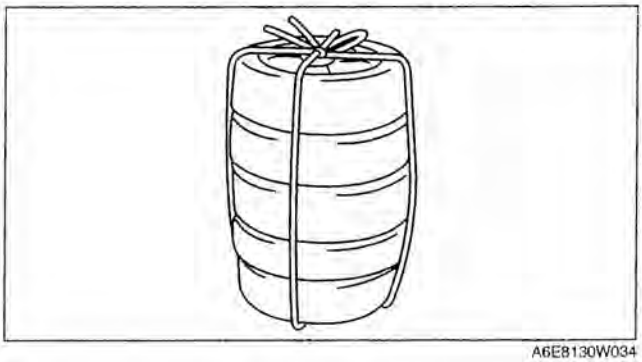
A6E8130W019

5. Stack the tire with the curtain air bag module on top of two tires. Stack a tire on top of three tires. Stack another tire that has a wheel on top of the four tires.



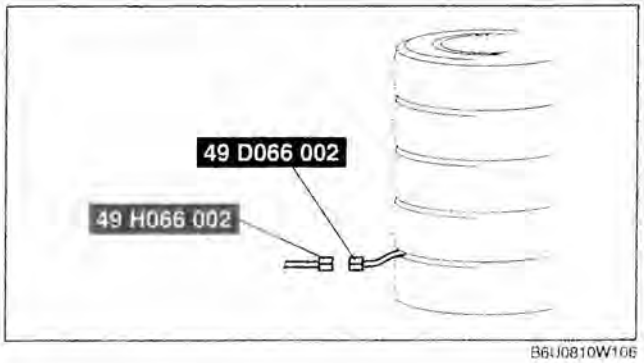
A6E8130W020

6. Tie all tires together with wire.



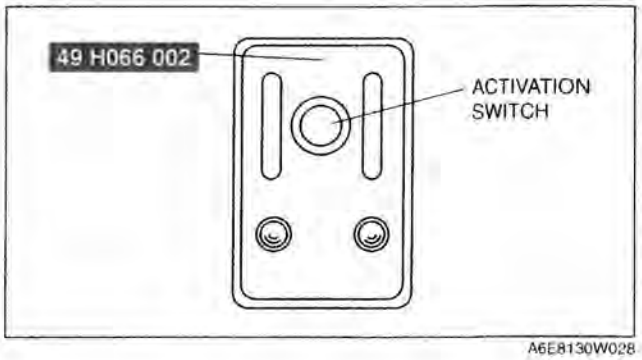
A6E8130W034

7. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
8. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
9. Verify that the red light on the **SST** (Deployment tool) is illuminated.
10. Make sure all persons are standing **at least 6 m {20 ft}** from the vehicle.



B6U0810W106

11. Press the activation switch on the **SST** (Deployment tool) to deploy the curtain air bag module.

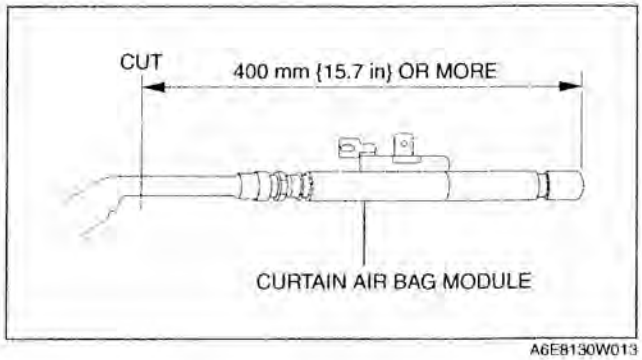


A6E8130W028

Curtain air bag module (5HB, WGN)

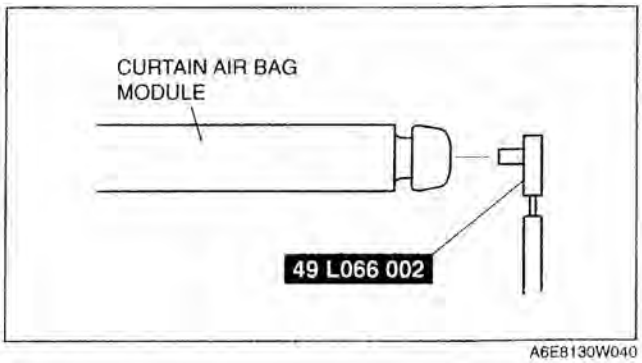
1. Remove the curtain air bag module. (See 08–10–8 CURTAIN AIR BAG MODULE REMOVAL/INSTALLATION [5HB, WGN].)
2. Secure the curtain air bag module in a vise, and cut off the deployment section, as shown in the figure.

   Warning
   - **Be sure not to collapse the pipe on the side where it is cut. If it is collapsed, the interior pressure of the pipe will build up and can cause it to explode during air bag module deployment.**



A6E8130W013

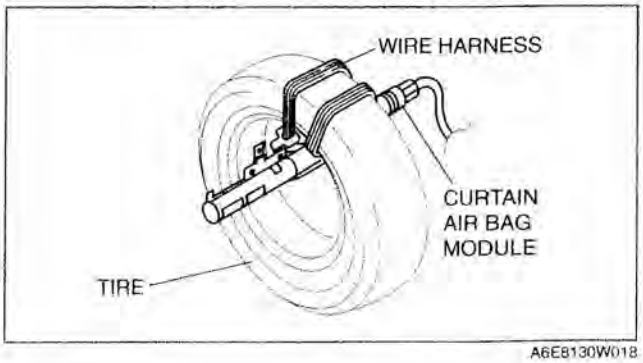
3. Connect the **SST** (Adapter harness) to the curtain air bag module as shown in the figure.



A6E8130W040

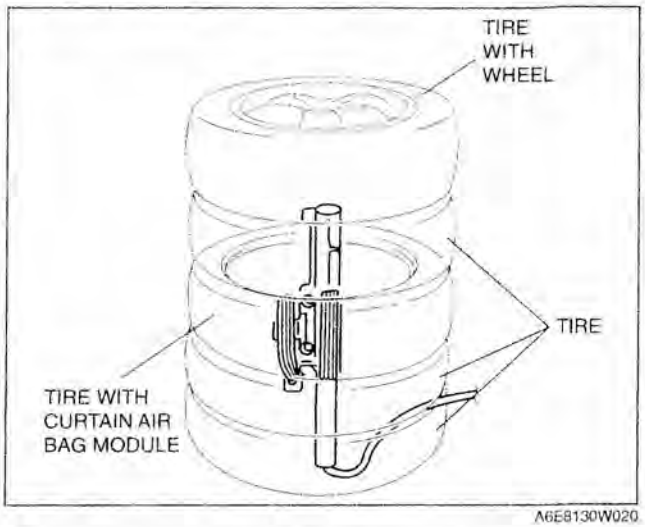
4. Tie the side air bag module to the tire with the module facing the center of the tire. Wrap the wire harness through the tire and around the bracket **at least four times**.

   Warning
   - **If the air bag module is not properly installed to the tire, serious injury may occur when the module is deployed. When installing the air bag module to the tire, make sure the module is facing the downward.**



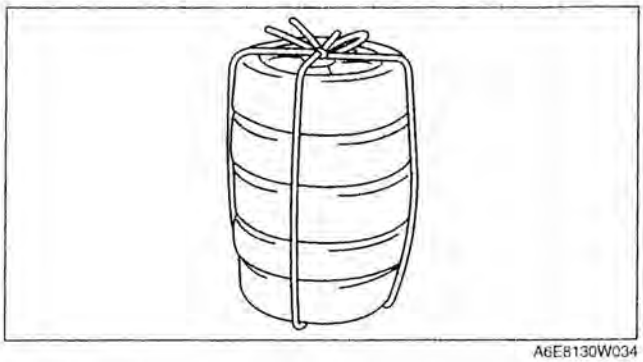
A6E8130W018

5. Stack the tire with the curtain air bag module on top of two tires. Stack a tire on top of three tires. Stack another tire that has a wheel on top of the four tires.

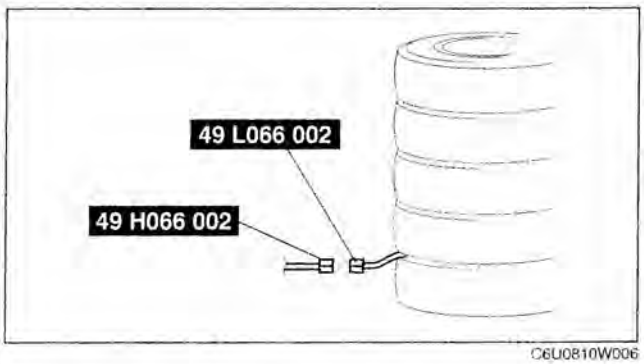


A6E8130W020

6. Tie all tires together with wire.

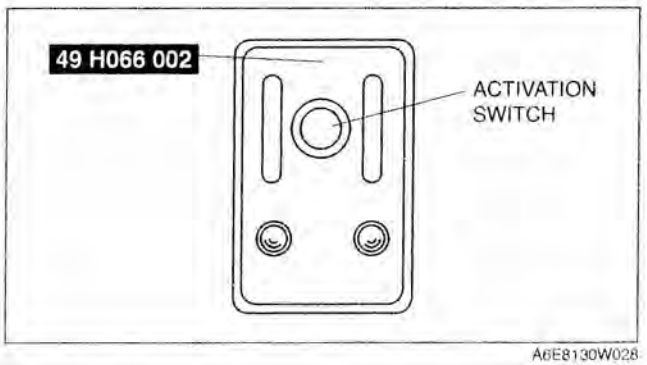

A6E8130W034

7. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
8. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
9. Verify that the red light on the **SST** (Deployment tool) is illuminated.
10. Make sure all persons are standing **at least 6 m {20 ft}** from the vehicle.



C6U0810W006

11. Press the activation switch on the **SST** (Deployment tool) to deploy the curtain air bag module.



A6E8130W028

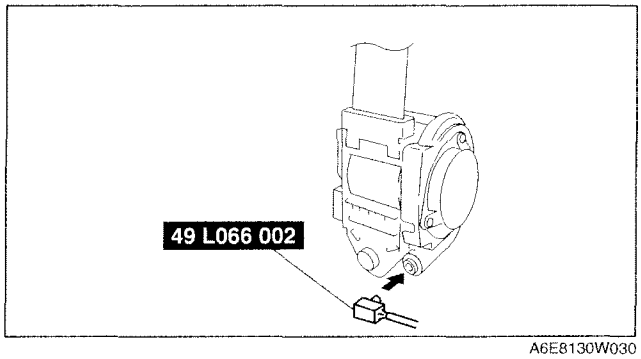
Pre-tensioner seat belt

1. Remove the pre-tensioner seat belt. (See 08–11–2 FRONT SEAT BELT REMOVAL/INSTALLATION.)

Warning

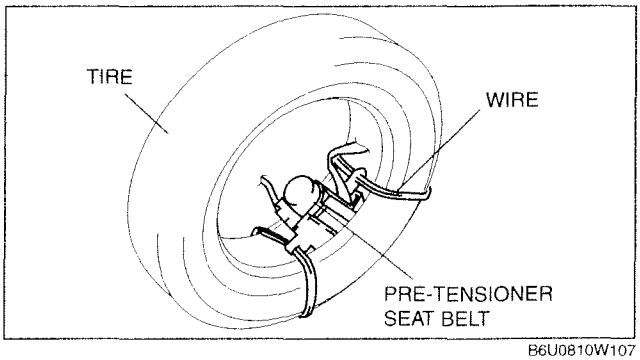
- **If the pre-tensioner seat belt is not properly installed to the tire, serious injury may occur when the pre-tensioner part is deployed. When installing the pre-tensioner seat belt to the tire, make sure the pre-tensioner part is inside the tire.**

2. Connect the **SST** (Adapter harness) to the pre-tensioner seat belt as shown in the figure.



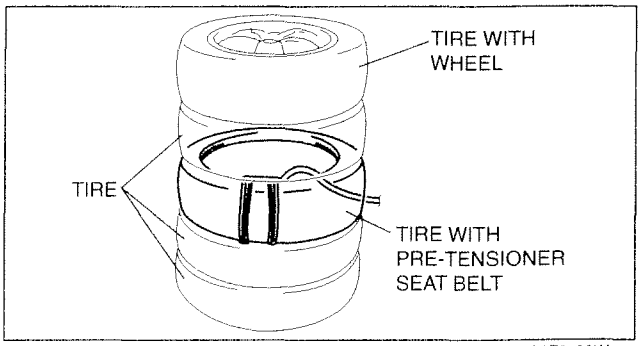
A6E8130W030

3. With the pre-tensioner part inside the tire, tie the pre-tensioner seat belt to the tire. Wrap the wire through the tire and around the pre-tensioner seat belt **at least four times**.



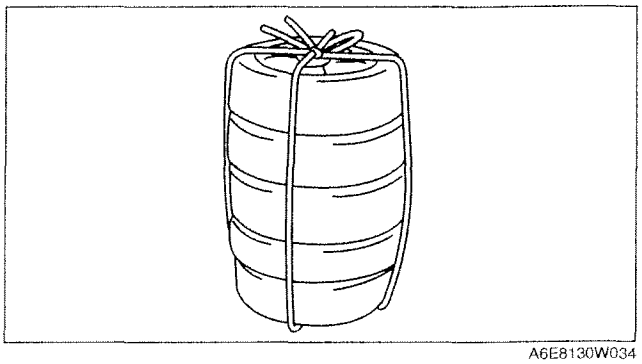
B6U0810W107

4. Stack the tire with the pre-tensioner seat belt on top of two tires. Stack a tire on top of the three tires. Stack another tire that has a wheel on top of the four tires.



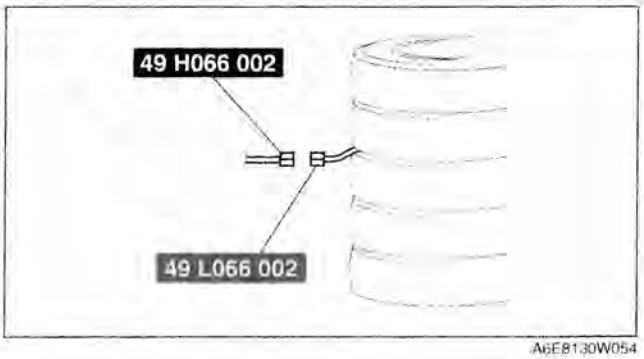
A6E8130W039

5. Tie all tires together with wire.



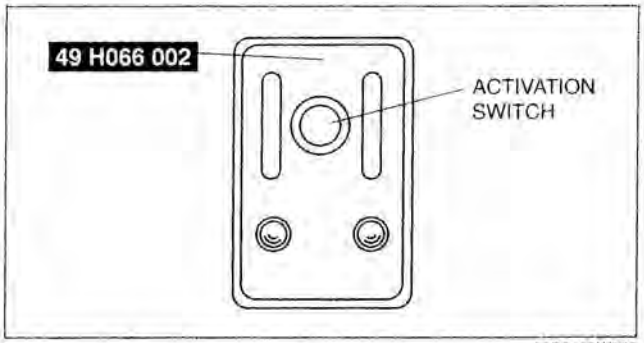
A6E8130W034

6. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
7. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
8. Verify that the red light on the **SST** (Deployment tool) is illuminated.
9. Make sure all persons are standing **at least 6 m {20 ft}** from the vehicle.



A6E8130W054

10. Press the activation switch on the **SST** (Deployment tool) to deploy the pre-tensioner seat belt.



A6E8130W028

AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DISPOSAL PROCEDURES

C6U081057600W02

Warning

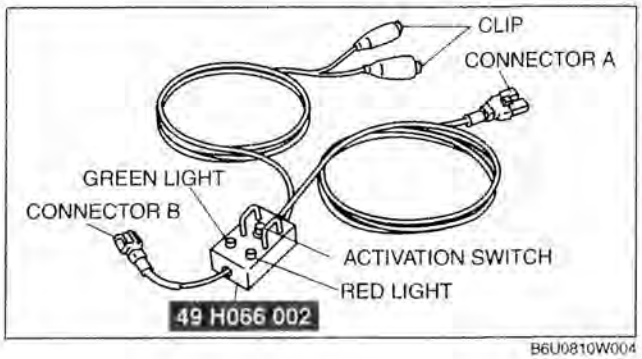
- **Before scrapping a vehicle with a live (undeployed) air bag module and pre-tensioner seat belt, deploy the air bag module and pre-tensioner seat belt. Never dispose of a live (undeployed) air bag module and pre-tensioner seat belt.**
- **The air bag module and the pre-tensioner seat belt are very hot immediately after they are deployed. You can get burned. Do not touch the air bag module and pre-tensioner seat belt for at least 15 minutes after deployment.**
- **Pouring water on the deployed air bag module and pre-tensioner seat belt is dangerous. The water will mix with the residual gases to form a gas that can make breathing difficult. Do not pour water on the deployed air bag module and pre-tensioner seat belt.**
- **The deployed air bag module and pre-tensioner seat belt may contain deposits of sodium hydroxide, a caustic byproduct of the gas-generated combustion. If this substance gets into your eyes or on your hands, it can cause irritation and itching. When handling the deployed air bag module and pre-tensioner seat belt, wear gloves and safety glasses.**
- **Due to the adoption of 2-step deployment control in both the driver and passenger-side air bag modules, depending on the impact force, it is possible that inflator No. 2 might not deploy. In such cases, before disposing of the air bag module, make sure to follow the inflator deployment procedures and verify complete deployment of inflators No. 1 and 2.**

1. Put on gloves and safety glasses.
2. Put the deployed air bag module or pre-tensioner seat belt in a plastic bag, seal it, and then dispose of it.
3. Wash your hands after removing your gloves.

INSPECTION OF SST (DEPLOYMENT TOOL)

C6U081001046W03

- Use the **SST** (Deployment tool) to deploy a live (undeployed) air bag module or pre-tensioner seat belt before disposing of it.
- Before using the **SST** (Deployment tool), inspect its operation.

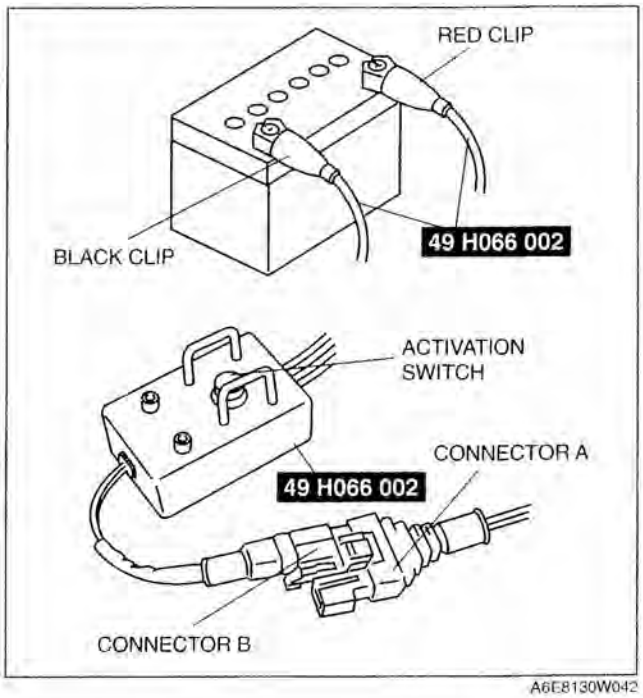


B6U0810W004

Inspection Procedure

1. Follow the steps below to verify that the **SST** (Deployment tool) is operating correctly.
   - If not as specified, do not use the **SST** (Deployment tool) because it may cause the air bag module or pre-tensioner seat belt to unexpectedly deploy upon connection to the air bag module or pre-tensioner seat belt.

Step	Inspection procedure	Light condition	
		Green	Red
1	Connect red clip to positive battery terminal and black clip to negative battery terminal.	On	Off
2	Connect connectors A and B of **SST** (Deployment tool).	Off	On
3	Press activation switch.	On	Off

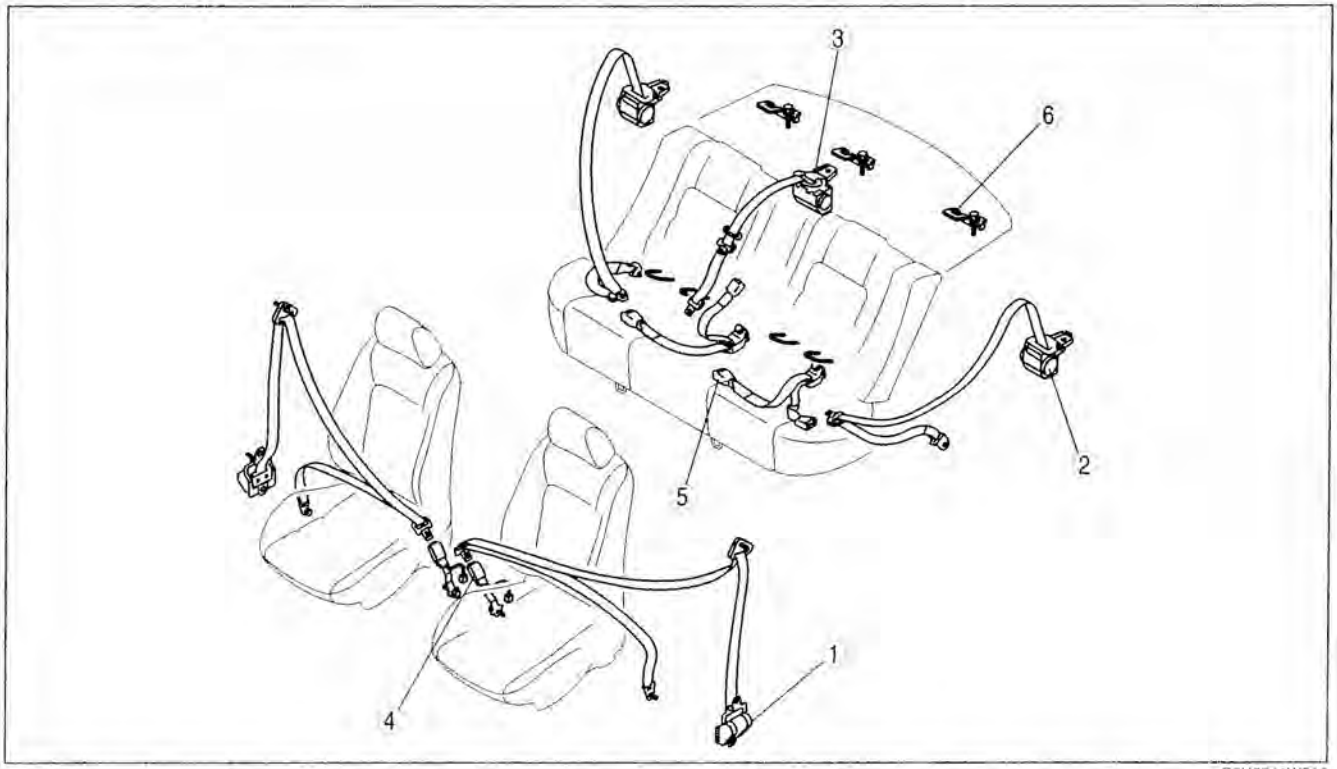


A6E8130W042

08–11 SEAT BELT

SEAT BELT LOCATION INDEX

C6U081157100W01

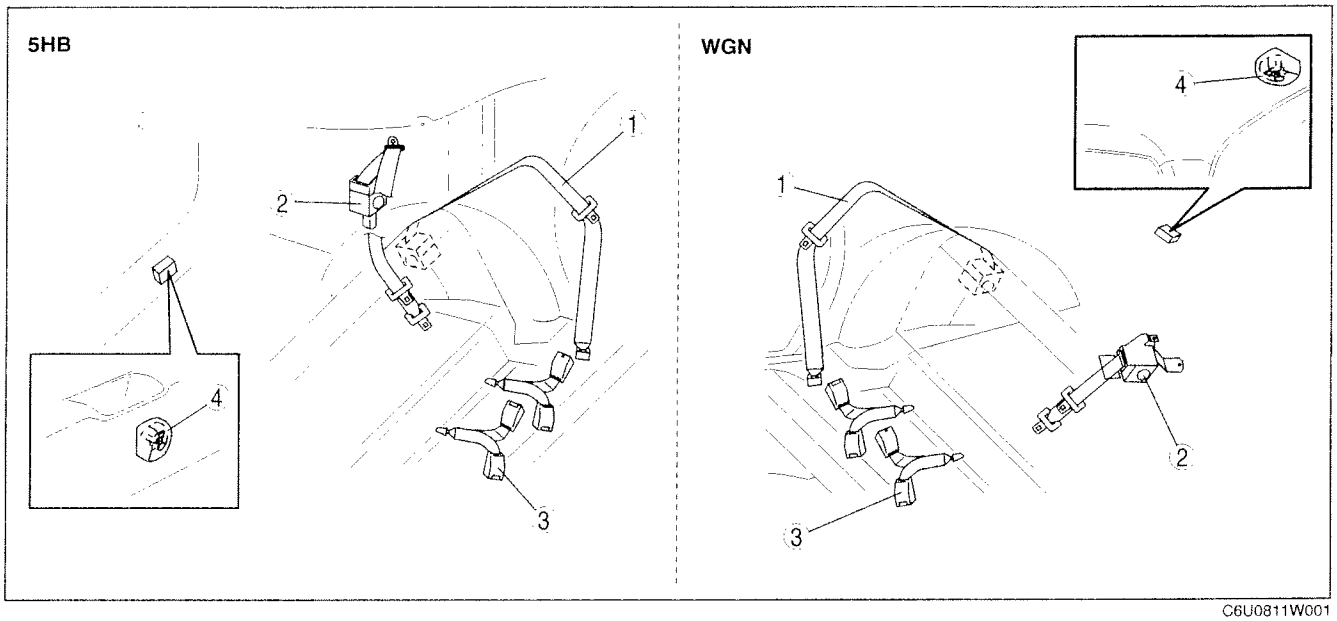


B6U0811W010

1	Front seat belt (See 08–11–2 FRONT SEAT BELT REMOVAL/INSTALLATION) (See 08–11–6 SEAT BELT INSPECTION)
2	Rear side seat belt (See 08–11–3 REAR SIDE SEAT BELT REMOVAL/INSTALLATION [4SD]) (See 08–11–6 SEAT BELT INSPECTION)
3	Rear center seat belt (See 08–11–4 REAR CENTER SEAT BELT REMOVAL/INSTALLATION [4SD]) (See 08–11–6 SEAT BELT INSPECTION)
4	Front buckle (See 08–11–5 FRONT BUCKLE REMOVAL/INSTALLATION)
5	Rear buckle (See 08–11–6 REAR BUCKLE REMOVAL/INSTALLATION)
6	Child restraint seat anchor (See 08–11–7 CHILD RESTRAINT SEAT ANCHOR REMOVAL/INSTALLATION [4SD])

SEAT BELT LOCATION INDEX [5HB, WGN]

C6U081157000W02



C6U0811W001

1	Rear side seat belt (See 08–11–3 REAR SIDE SEAT BELT REMOVAL/INSTALLATION [4SD].) (See 08–11–4 REAR SIDE SEAT BELT REMOVAL/INSTALLATION [5HB, WGN].) (See 08–11–6 SEAT BELT INSPECTION.)
2	Rear center seat belt (See 08–11–4 REAR CENTER SEAT BELT REMOVAL/INSTALLATION [4SD].) (See 08–11–4 REAR CENTER SEAT BELT REMOVAL/INSTALLATION [5HB].) (See 08–11–4 REAR CENTER SEAT BELT REMOVAL/INSTALLATION [WGN].) (See 08–11–6 SEAT BELT INSPECTION.)
3	Rear buckle (See 08–11–6 REAR BUCKLE REMOVAL/INSTALLATION.)
4	Child restraint seat anchor (See 08–11–7 CHILD RESTRAINT SEAT ANCHOR REMOVAL/INSTALLATION [5HB].) (See 08–11–7 CHILD RESTRAINT SEAT ANCHOR REMOVAL/INSTALLATION [WGN].)

FRONT SEAT BELT REMOVAL/INSTALLATION

C6U081157630W01

Warning

- **Handling the front seat belt (pre-tensioner seat belt) improperly can accidentally deploy the pre-tensioner, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the front seat belt. (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS.)**

Warning

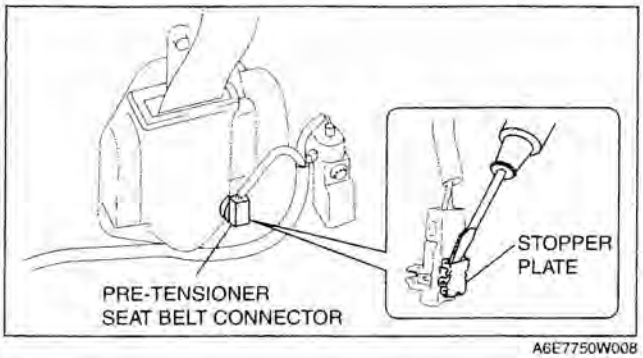
- **The side air bag sensor is attached to the lower part of the B-pillar. When working around the B-pillar, disconnect the negative battery cable or work carefully, avoiding excessive impact to the lower part of the B-pillar.**

Caution

- **The ELR has a spring that will unwind if the retractor cover is removed. The spring cannot be rewound by hand. If this occurs, the ELR will not work properly. Therefore, do not disassemble the retractor.**

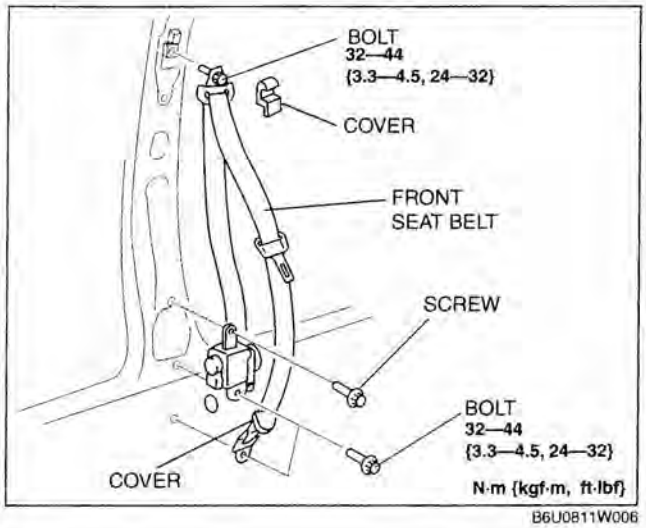
1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute**.
3. Remove the B-pillar lower trim.

4. Using a screwdriver, pry out the pre-tensioner seat belt connector stopper plate.
5. Disconnect the pre-tensioner seat belt connector.



A6E7750W008

6. Remove the covers.
7. Remove the bolts and screw, then remove the front seat belt.
8. Install in the reverse order of removal.
9. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
   - If the air bag system warning light does not operate in the manner described above, there is a malfunction in the system. Inspect the system using the on-board diagnostic function.



B6U0811W006

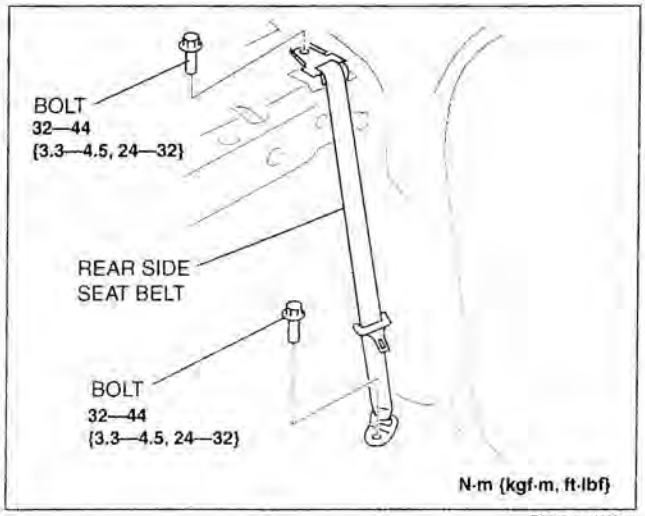
REAR SIDE SEAT BELT REMOVAL/INSTALLATION [4SD]

C6U081157730W01

Caution

- **The ELR has a spring that will unwind if the retractor's cover is removed. The spring cannot be rewound by hand. If this occurs, the ELR will not work properly. Therefore, do not disassemble the retractor.**

1. Fold the rear seat back.
2. Remove the rear side seats.
3. Remove the rear package trim.
4. Remove the bolts.
5. Remove the rear side seat belt.
6. Install in the reverse order of removal.



B6U0811W011

REAR SIDE SEAT BELT REMOVAL/INSTALLATION [5HB, WGN]

C6U081157830W01

Caution

- **The ELR has a spring that will unwind if the retractor's cover is removed. The spring cannot be rewound by hand. If this occurs, the ELR will not work properly. Therefore, do not disassemble the retractor.**

Note

- Rear side seat belts are built into the rear seat back. See rear seat disassembly/assembly to remove/install the rear side seat belt.

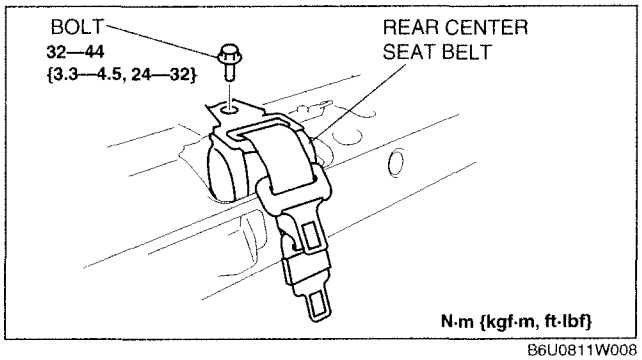
REAR CENTER SEAT BELT REMOVAL/INSTALLATION [4SD]

C6U081157730W02

Caution

- **The ELR has a spring that will unwind if the retractor cover is removed. The spring cannot be rewound by hand. If this occurs, the ELR will not work properly. Therefore, do not disassemble the retractor.**

1. Fold down the rear seat back.
2. Remove the rear package trim.
3. Remove the bolt.
4. Remove the rear center seat belt.
5. Install in the reverse order of removal.



B6U0811W008

REAR CENTER SEAT BELT REMOVAL/INSTALLATION [5HB]

C6U081157830W02

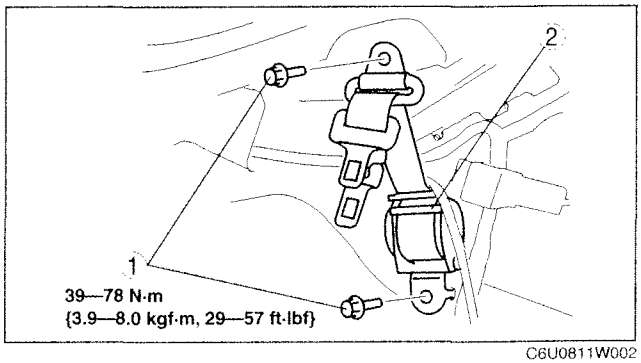
Caution

- **The ELR has a spring that will unwind if the retractor's cover is removed. The spring cannot be rewound by hand. If this occurs, the ELR will not work properly. Therefore, do not disassemble the retractor.**

1. Remove the rear scuff plate. (See 09–17–11 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
2. Remove the tire house trim. (See 09–17–13 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
3. Remove the trunk side trim. (See 09–17–14 TRUNK SIDE TRIM REMOVAL/INSTALLATION.)
4. Remove the C-pillar trims. (See 09–17–12 C-PILLAR TRIM REMOVAL/INSTALLATION.)
5. Remove the bolts.

1	Bolt
2	Rear center seat belt

6. Remove the rear center seat belt.
7. Install in the reverse order of removal.



C6U0811W002

REAR CENTER SEAT BELT REMOVAL/INSTALLATION [WGN]

C6U081157830W03

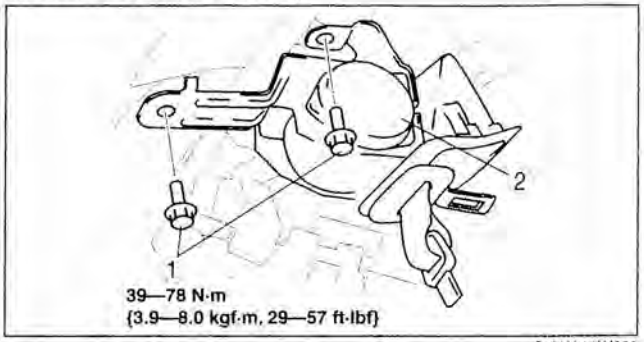
Caution

- **The ELR has a spring that will unwind if the retractor's cover is removed. The spring cannot be rewound by hand. If this occurs, the ELR will not work properly. Therefore, do not disassemble the retractor.**

1. Remove the headliner. (See 09–17–21 HEADLINER REMOVAL/INSTALLATION.)
2. Remove the bolts.

1	Bolt
2	Rear center seat belt

3. Remove the rear center seat belt.
4. Install in the reverse order of removal.

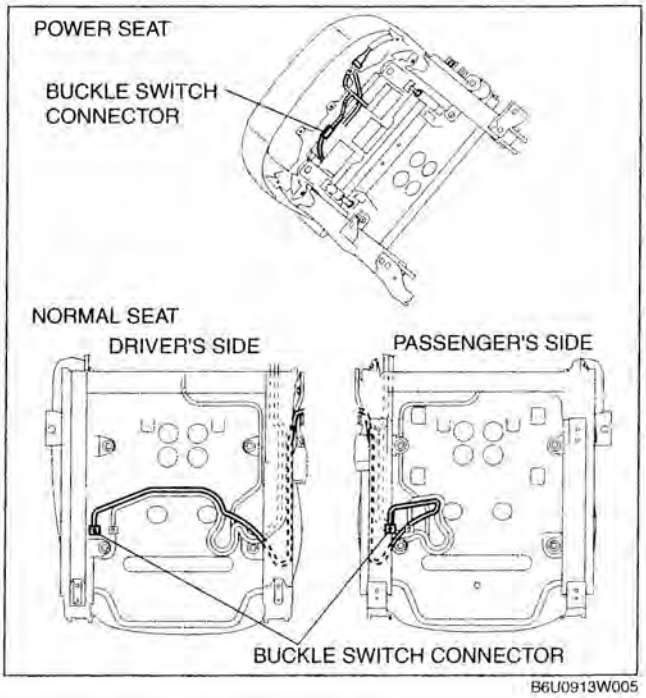


C6U0811W003

FRONT BUCKLE REMOVAL/INSTALLATION

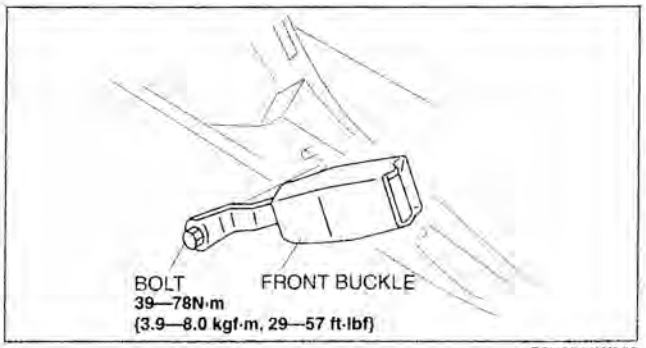
C6U081157620W01

1. Disconnect the negative battery cable.
2. Remove the front seat.
3. Disconnect the buckle switch connector.



B6U0913W005

4. Remove bolt.
5. Install in the reverse order of removal.

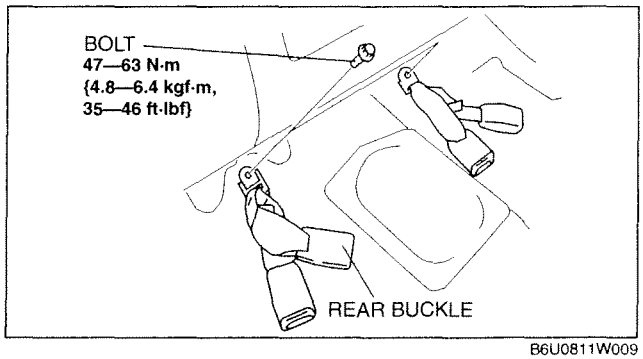


B6U0811W002

REAR BUCKLE REMOVAL/INSTALLATION

C6U081157720W01

1. Remove the rear seat cushion.
2. Remove the bolts.
3. Remove the rear buckles.
4. Install in the reverse order of removal.



B6U0811W009

SEAT BELT INSPECTION

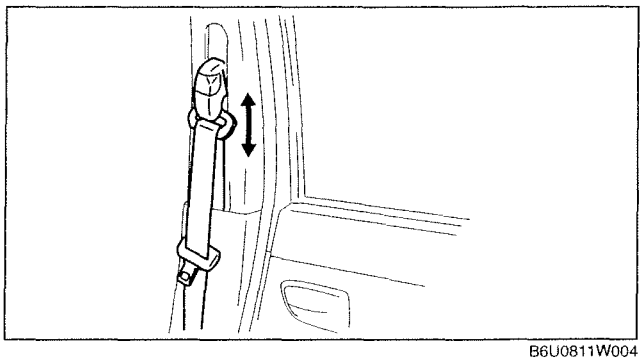
C6U081157000W01

Belt

1. Confirm that the seat belt is installed correctly.
2. Inspect the seat belt for damage and deformation of metal parts.
   - If any damage is found, replace the seat belt.

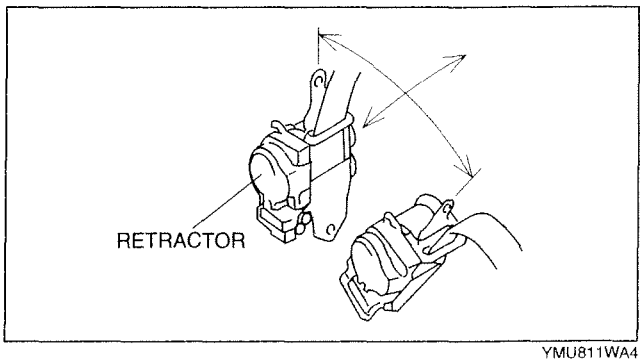
ELR

1. Verify that the belt can be pulled out smoothly, and that it moves smoothly when wound.
   - If not as specified, replace the seat belt.
2. Verify that the retractor locks when the belt is quickly pulled.
   - If not as specified, replace the seat belt.
3. Remove the retractor.



B6U0811W004

4. Make sure that the seat belt does not lock when the retractor is tilted slowly up to **15°** from the mounted position and locks when the retractor is tilted **40° or more**.
   - If not as specified, replace the seat belt.



YMU811WA4

ALR

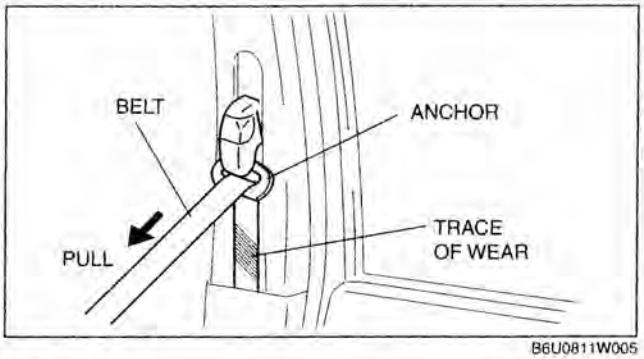
1. Pull the belt out fully and the lock mode changes from ELR to ALR.
2. Verify that retractor makes a clicking sound as the belt slowly retracts. If no sound is heard, the lock mode has not changed to ALR. If necessary, repeat the above Step 1.
   - If not as specified, replace the seat belt.
3. Verify that the belt locks when pulled.
   - If not as specified, replace the seat belt.
4. Verify that the lock mode changes to ELR when the belt fully retracts.
   - If not as specified, replace the seat belt.

Load Limiter Retractor

Warning

- **When the load limiter operates, the belt and anchor rub against each other strongly leaving a trace of wear. If the seat belt is used in this state, the seat belt will not function to its designed effect and there is the possibility of serious injury to passengers. Be sure to replace the seat belt once the load limiter operates.**

1. If the vehicle has been subjected to a shock in an accident, pull the belt from the retractor and confirm that there is no trace of wear (the load limiter has not operated) by visually inspecting and feeling the belt.
   - If not as specified, replace the seat belt.

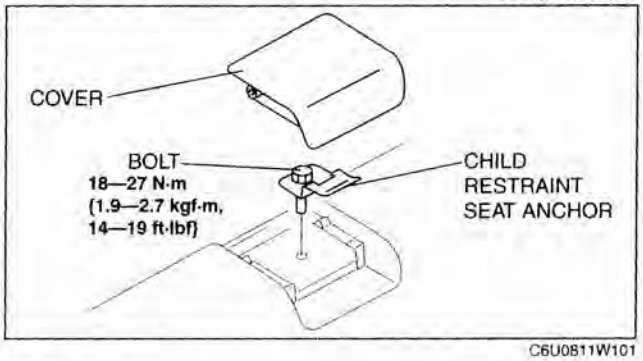


B6U0811W005

CHILD RESTRAINT SEAT ANCHOR REMOVAL/INSTALLATION [4SD]

1. Remove the cover.
2. Remove the bolt and child restraint seat anchor.
3. Install in the reverse order of removal.

C6U08115777ZW01

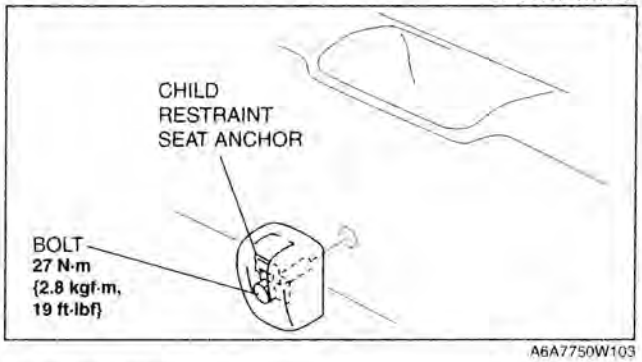


C6U0811W101

CHILD RESTRAINT SEAT ANCHOR REMOVAL/INSTALLATION [5HB]

1. Remove the bolt and child restraint seat anchor.
2. Install in the reverse order of removal.

C6U081100117W01

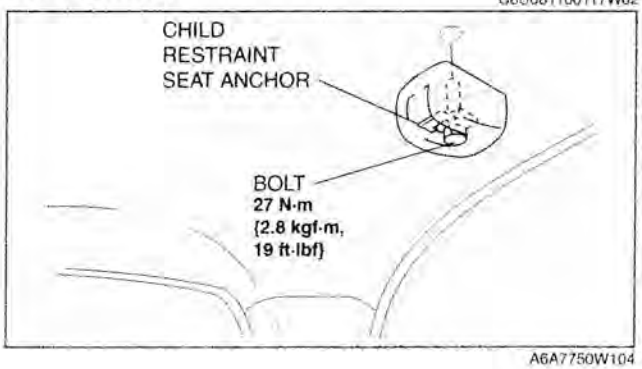


A6A7750W103

CHILD RESTRAINT SEAT ANCHOR REMOVAL/INSTALLATION [WGN]

1. Remove the bolt and child restraint seat anchor.
2. Install in the reverse order of removal.

C6U081100117W02

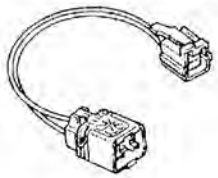


A6A7750W104

08–60 SERVICE TOOLS

RESTRAINTS SST

C6U086001045W01

49 H066 002 Deployment Tool 	49 D066 002 Adapter Harness 	49 L066 002 Adapter Harness 
49 G066 003 Adapter Harness 	49 N088 0A0 Fuel & Thermometer Checker 	418-FS475 WDS 

BODY & ACCESSORIES

09 SECTION

09–02A ON-BOARD DIAGNOSTIC [IMMOBILIZER SYSTEM]

FOREWORD

C6U090267000W01

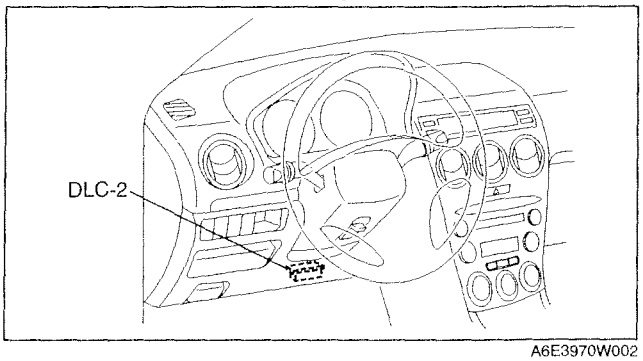
Caution

- **When the engine does not start or stalls and the following DTCs are not indicated, refer to engine symptom troubleshooting. (See 01–03A–12 NO.3 WILL NOT CRANK [L3]) (See 01–03B–14 NO.3 WILL NOT CRANK [AJ])**
- **If DTCs cannot be retrieved due to a security light circuit malfunction, refer to immobilizer system symptom troubleshooting. (See 09–03B–1 NO.1 SECURITY LIGHT REMAINS ON OR DOES NOT ILLUMINATE)**

Note

- When the immobilizer system is defective, the engine cannot be started.
- If engine condition is normal but security light stays on, inspect for short circuit between security light. Repair or replace the wiring harness if necessary.
- The vehicle may fail to start or a DTC may be stored in the PCM if the following occurs:
  - — If a large, metal object is close to a valid key
  - — If an electrical device is close to a valid key
  - — If two or more valid keys are on the same key ring
- If any malfunction cannot be identified, verify that no metal object or electrical device is on the key ring.
- The security light repeatedly displays a DTC 10 times when the ignition switch is in the ON position.

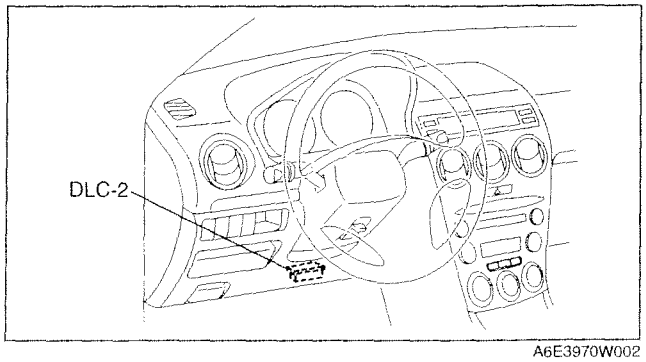
1. Turn the ignition switch to the ON position.
   - If there is any malfunction, the security light flashes rapidly for **approx. 1 minute** and starts displaying a DTC.
   - If there is no malfunction, the security light illuminates for **approx. 3 seconds** and goes off.
2. Verify the security light condition and read the DTC according to security light flashing pattern.
3. Connect the **SST** (WDS or equivalent) to the vehicle DLC-2 16-pin connector.
4. Verify the DTC with the **SST** (WDS or equivalent).
5. If a DTC is indicated, perform on-board diagnostic referring to the DTC table.



A6E3970W002

PID/Data Monitor and Record Procedure

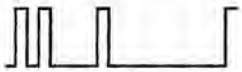
1. Connect the **SST** (WDS or equivalent) to the vehicle DLC-2 16-pin connector.
2. Access and monitor PIDs using the **SST** (WDS or equivalent).



A6E3970W002

DTC TABLE [IMMOBILIZER SYSTEM]

D6U090267000W02

DTC			Description	Page
Security light	Security light flashing pattern	WDS OR EQUIVALENT		
11		B1681	Coil signal is not received.	(See 09–02A–4 SECURITY LIGHT: DTC 11 (WDS OR EQUIVALENT: DTC B1681))
12		B2103	Coil failure.	(See 09–02A–5 SECURITY LIGHT: DTC 12 (WDS OR EQUIVALENT: DTC B2103))
13		B1600	ID number signal is not received.	(See 09–02A–6 SECURITY LIGHT: DTC 13 (WDS OR EQUIVALENT: DTC B1600))
		B2431	Transponder programming failure.	(See 09–02A–6 SECURITY LIGHT: DTC 13 (WDS OR EQUIVALENT: DTC B2431))
14		B1602	PCM received invalid format of ID number from transponder.	(See 09–02A–7 SECURITY LIGHT: DTC 14 (WDS OR EQUIVALENT: DTC B1602))
15		B1601	PCM received incorrect ID number from key (transponder).	(See 09–02A–7 SECURITY LIGHT: DTC 15 (WDS OR EQUIVALENT: DTC B1601))
21		B1213	Number of valid keys is below minimum.	(See 09–02A–8 SECURITY LIGHT: DTC 21 (WDS OR EQUIVALENT: DTC B1213))
Not illuminated	—	B1342	PCM is defective.	(See 09–02A–8 SECURITY LIGHT: NOT ILLUMINATED (WDS OR EQUIVALENT: DTC B1342))

Note

- Perform the following if the security light stays on:
  - — If engine stalls, go to symptom troubleshooting NO.11 "ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES" in.
    (See 01–03A–30 NO.11 ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES [L3].)
    (See 01–03B–32 NO.11 ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES [AJ].)
  - — If engine won't start, go to symptom troubleshooting NO.6 "CRANKS NORMALLY BUT WILL NOT START" in. (See 01–03A–20 NO.6 CRANKS NORMALLY BUT WILL NOT START [L3].)
    (See01–03B–22 NO.6 CRANKS NORMALLY BUT WILL NOT START [AJ].)
  - — If engine condition is normal but light stays on, inspect for continuity between the following wiring harness and body ground: security light and PCM terminal 2W (L3) or 2 (AJ). Repair or replace the wiring harness.

PID/DATA MONITOR TABLE [IMMOBILIZER SYSTEM]

C6U090267000W03

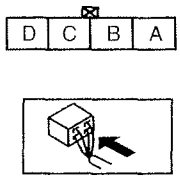
PID name (Description)	Unit	Specification	PCM terminal
NUMKEYS (Number of key stored in module)	–	Number of registered keys: 0—8	–

SECURITY LIGHT: DTC 11 (WDS OR EQUIVALENT: DTC B1681)

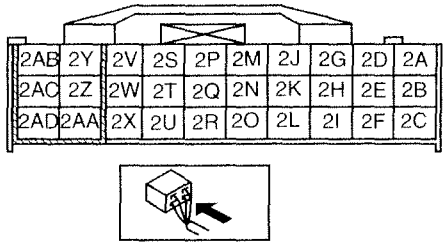
C6U090267000W04

DTC 11 (B1681)	Coil signal is not received.
POSSIBLE CAUSE	• Defective wiring harness • Defective coil • Defective PCM

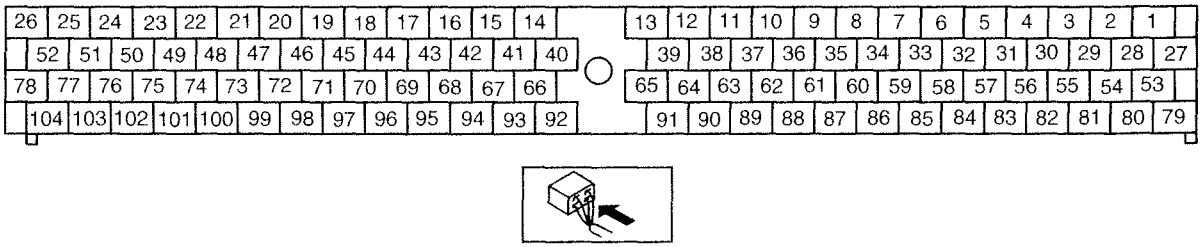
COIL
HARNESS SIDE CONNECTOR



PCM (L3)
HARNESS SIDE CONNECTOR



PCM (AJ) HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT POWER SUPPLY CIRCUIT OF COIL** • Disconnect coil connector. • Turn ignition switch to ON position. • Measure voltage at terminal D of coil connector. • Is voltage **more than 8 V**?	Yes	Go to next step.
		No	Repair wiring harness.
2	**INSPECT WIRING HARNESS BETWEEN COIL AND GROUND** • Turn ignition switch to LOCK position. • Inspect wiring harness between coil terminal C and ground for following. — Short to power supply — Open circuit • Is wiring harness okay?	Yes	Go to next step.
		No	Repair wiring harness.
3	**INSPECT COIL INPUT SIGNAL CIRCUIT** • Connect coil connector. • Turn ignition switch to ON position. • Measure voltage at terminal B of coil connector. • Is voltage **more than 8 V**?	Yes	Go to Step 5.
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**INSPECT COIL INPUT SIGNAL CIRCUIT** • Turn ignition switch to LOCK position. • Disconnect PCM connector. • Turn ignition switch to ON position. • Measure voltage at terminal 2T (L3) or 65 (AJ) of PCM connector. • Is voltage **more than 8 V**?	Yes	Replace PCM and reprogram immobilizer system. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No	Go to next step.
5	**INSPECT COMMUNICATION CIRCUIT (INPUT) FOR CONTINUITY** • Turn ignition switch to LOCK position. • Disconnect coil and PCM connectors. • Is there continuity between coil connector terminal B and PCM connector terminal 2T (L3) or 65 (AJ)?	Yes	Go to next step.
		No	Repair wiring harness.
6	**INSPECT COIL INPUT SIGNAL CIRCUIT** • Measure resistance between coil connector terminal B and ground. • Is resistance **more than 10 kilohms**?	Yes	Replace coil. (See 09–14–23 COIL REMOVAL/INSTALLATION)
		No	Repair wiring harness.
7	**INSPECT COIL OUTPUT SIGNAL CIRCUIT** • Connect coil and PCM connectors. • Turn ignition switch to ON position. • Measure voltage at terminal A of coil connector. • Is voltage **more than 8 V**?	Yes	Replace coil. (See 09–14–23 COIL REMOVAL/INSTALLATION)
		No	Go to next step.
8	**INSPECT COIL OUTPUT SIGNAL CIRCUIT** • Turn ignition switch to LOCK position. • Disconnect coil connector. • Turn ignition switch to ON position. • Measure voltage at terminal A of coil connector. • Is voltage **more than 8 V**?	Yes	Replace coil. (See 09–14–23 COIL REMOVAL/INSTALLATION)
		No	Go to next step.
9	**INSPECT COMMUNICATION CIRCUIT (OUTPUT) FOR CONTINUITY** • Turn ignition switch to LOCK position. • Disconnect PCM connector. • Is there continuity between coil terminal A and PCM terminal 2Q (L3) or 66 (AJ)?	Yes	Go to next step.
		No	Repair wiring harness.
10	**INSPECT COIL OUTPUT SIGNAL CIRCUIT** • Measure resistance between PCM terminal 2Q (L3) or 66 (AJ) and ground. • Is resistance **more than 10 kilohms**?	Yes	Replace PCM and reprogram immobilizer system. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No	Repair wiring harness.

SECURITY LIGHT: DTC 12 (WDS OR EQUIVALENT: DTC B2103)

C6U090267000W05

DTC 12 (B2103)	Coil failure.
POSSIBLE CAUSE	• Defective coil • Poor connection of coil connector

Diagnostic procedure

STEP	INSPECTION		ACTION
–	**INSPECT CONNECTOR CONNECTION** • Is connector of coil and PCM connected securely?	Yes	Replace coil. (See 09–14–23 COIL REMOVAL/INSTALLATION)
		No	Connect connector securely.

SECURITY LIGHT: DTC 13 (WDS OR EQUIVALENT: DTC B1600)

C6U090267000W06

DTC 13 (B1600)	ID number is not received.
POSSIBLE CAUSE	• No transponder in the key • Defective transponder in the key (ID number is not output.) • Defective coil • Defective PCM

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY DTC USING SST** • Does **SST** (WDS or equivalent) indicate DTC B1600?	Yes	Go to Step 3.
		No	Go to next step.
2	**VERIFY DTC USING SST** • Does **SST** (WDS or equivalent) indicate DTC B2431?	Yes	Go to SECURITY LIGHT: DTC 13 (WDS OR EQUIVALENT: B2431).
		No	Go to next step.
3	**VERIFY VALID KEY** • Is there any key, other than the one that caused displayed DTC, which can start the engine?	Yes	Go to Step 5.
		No	Go to next step.
4	**VERIFY WHETHER MALFUNCTION IS IN COIL OR KEY** • Using **SST** (WDS or equivalent) register an additional key. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE) • Using registered key, turn ignition switch to ON position. • Does **SST** (WDS or equivalent) indicate DTC B1600 again?	Yes	Replace coil, then go to step 6. (See 09–14–23 COIL REMOVAL/INSTALLATION)
		No	• Dispose of defective key. • Duplicate key if necessary. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
5	**VERIFY WHETHER MALFUNCTION IS IN COIL OR KEY** • Using any other valid key, turn ignition switch to ON position. • Does **SST** (WDS or equivalent) indicate DTC B1600 again?	Yes	Replace coil, then go to next step. (See 09–14–23 COIL REMOVAL/INSTALLATION)
		No	• Dispose of defective key. • Duplicate key if necessary. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
6	**INSPECT PCM** • Using registered key, turn ignition switch to ON position. • Does **SST** (WDS or equivalent) indicate DTC B1600 again?	Yes	Replace PCM and reprogram immobilizer system. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No	Troubleshooting is completed.

SECURITY LIGHT: DTC 13 (WDS OR EQUIVALENT: DTC B2431)

C6U090267000W07

DTC 13 (B2431)	ID number programing failure.
POSSIBLE CAUSE	• The procedure fails to program the transponder into PCM

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY DTC USING SST** • Does **SST** (WDS or equivalent) indicate DTC B2431?	Yes	Go to Step 3.
		No	Go to next step.
2	**VERIFY DTC USING SST** • Does **SST** (WDS or equivalent) indicate DTC B1600?	Yes	Go to SECURITY LIGHT: DTC 13 (WDS OR EQUIVALENT: B1600).
		No	Go to next step.

STEP	INSPECTION		ACTION
3	**INSPECT PCM** • Erase key ID number using **SST** (WDS or equivalent) and register key ID number. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE) • Using registered key, turn ignition switch to ON position. • Does **SST** (WDS or equivalent) indicate DTC B2431 again?	Yes	Replace PCM and reprogram immobilizer system. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No	Troubleshooting is completed.

SECURITY LIGHT: DTC 14 (WDS OR EQUIVALENT: DTC B1602)

C6U090267000W08

DTC 14 (B1602)	PCM received invalid format of ID number from key (transponder)
POSSIBLE CAUSE	• Defective transponder in the key • Defective coil • Defective PCM

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FOR OTHER PROPER KEYS** • Using any other valid key, turn ignition switch to ON position. • If there are no other valid keys, then register an additional key using **SST** (WDS or equivalent) and turn ignition switch to ON position. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE) • Does security light or **SST** (WDS or equivalent) indicate DTC 14 (B1602) again?	Yes	Replace coil, then go to next step. (See 09–14–23 COIL REMOVAL/INSTALLATION)
		No	• Dispose of defective key. • Duplicate key if necessary. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
2	**INSPECT PCM** • Turn ignition switch to ON position with the registered key. • Does security light or **SST** (WDS or equivalent) indicate DTC 14 (B1602) again?	Yes	Replace PCM and reprogram immobilizer system. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No	Troubleshooting is completed.

09–02A

SECURITY LIGHT: DTC 15 (WDS OR EQUIVALENT: DTC B1601)

C6U090267000W09

DTC 15 (B1601)	PCM received incorrect ID number from key (transponder).
POSSIBLE CAUSE	• No keys have been registered after installation of new PCM • Unregistered key detected • Attempt made to register a ninth key **Note** • A maximum of only eight keys can be registered for a single vehicle. • Defective PCM

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY REGISTERED KEY IN PCM** • Check following PID/DATA monitor using **SST** (WDS or equivalent). — NUMKEYS • Is NUMKEYS displayed more than 0?	Yes	Go to next step.
		No	Go to Step 3.
2	**VERIFY REGISTERED KEY IN PCM** • Check following PID/DATA monitor using **SST** (WDS or equivalent). — NUMKEYS • Is NUMKEYS displayed more than 8?	Yes	• Erase key ID number using **SST** (WDS or equivalent) and register key ID number. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE) • Go to next step.
		No	Go to next step.

STEP	INSPECTION		ACTION
3	**INSPECT PCM** • Erase key ID number using **SST** (WDS or equivalent) and register key ID number. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE) • Using registered key, turn ignition switch to ON position. • Does security light or **SST** (WDS or equivalent) indicate DTC 15 (B1601) again?	Yes	Replace PCM and reprogram immobilizer system. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No	Troubleshooting is completed.

SECURITY LIGHT: DTC 21 (WDS OR EQUIVALENT: DTC B1213)

C6U090267000W10

DTC 21 (B1213)	Number of valid keys is below minimum.
POSSIBLE CAUSE	• Less than two valid keys

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY NUMBER OF VALID KEYS** • Check following PID/DATA monitor with **SST** (WDS or equivalent). — NUMKEYS • Is NUMKEYS displayed more than 2? **Note** • To start the engine, two or more keys need to be registered.	Yes	Replace PCM and reprogram immobilizer system. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No	• Erase key ID numbers and register necessary key ID numbers. • Go to next step.
2	**VERIFY DTC** • Does security light or **SST** (WDS or equivalent) indicate DTC 21 (B1213) again?	Yes	Replace PCM and reprogram immobilizer system. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No	Troubleshooting is completed.

SECURITY LIGHT: NOT ILLUMINATED (WDS OR EQUIVALENT: DTC B1342)

C6U090267000W11

Not illuminated (B1342)	PCM is defective
POSSIBLE CAUSE	• Defective PCM

Diagnostic procedure

STEP	INSPECTION		ACTION
–	**INSPECT PCM** • Turn ignition switch to ON position from LOCK again. • Does **SST** (WDS or equivalent) indicate DTC B1342 again?	Yes	Replace PCM and reprogram immobilizer system. (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No	Connect connectors properly.

09–02B ON-BOARD DIAGNOSTIC [AUDIO]

STARTING PROCEDURE FOR ON-BOARD DIAGNOSTIC TEST MODE

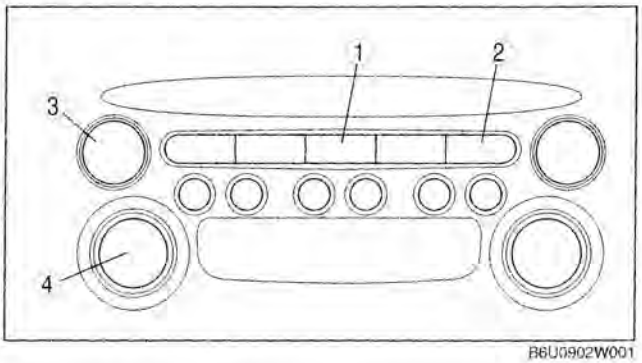
C6U09C266900W01

Note
- All DTCs displayed in the on-board diagnostic test mode should be entered in the Audio Repair Order Form.

09–02B

1. Turn the ignition switch to the ACC or ON position.
2. With the audio unit turned off, first press the POWER button, then simultaneously press the AM button and TAPE/MD button for **2 seconds or more**.

1	AM button
2	TAPE/MD button
3	SEEK button
4	POWER button



B6U0902W001

Note
- If several DTCs are in the memory, they can be displayed by the SEEK button.

3. To stop the on-board diagnostic test mode, turn the ignition switch to the LOCK position.

SUPPLIER IDENTIFICATION PROCEDURE

C6U090266900W02

Note
- When asking the supplier (service center) for repair or replacement, verify which supplier the module belongs to and enter in the Audio Repair Order Form.

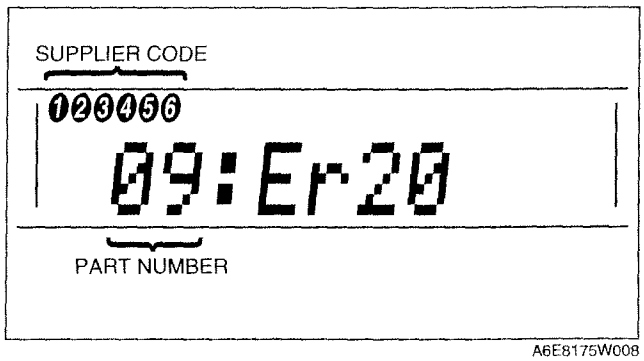
Identification With Printed Numbers/Label

1. Remove the audio unit.
2. Verify the supplier name written on the label attached on each module.

Identification With On-board Diagnostic Test Mode

1. Start the on-board diagnostic test mode.
2. Verify the part number and supplier code displayed in the LCD.

Note
- When no DTCs are in the memory, part numbers and supplier codes will not be displayed.



A6E8175W008

Part number	Part name
00	Cassette deck (lower module)
03	CD player (upper module)
06	CD changer (upper module)
07	MD player (lower module)
09	Base unit

Supplier code	Supplier name
1	FMS Audio
2	Panasonic
3	Clarion

DTC CLEARING PROCEDURE

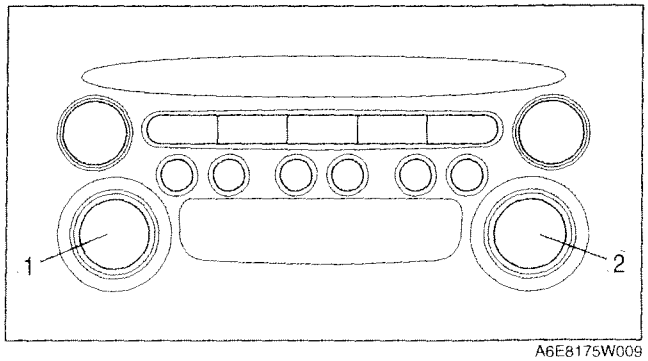
C6U090266900W03

Caution
- **Before clearing the DTCs, be sure to enter all of them displayed in the on-board diagnostic test mode in the Audio Repair Order Form.**

1. Start the on-board diagnostic test mode.
2. First press the POWER button, then simultaneously press AUDIO CONT button for **2 seconds or more**.

1	POWER button
2	AUDIO CONT button

3. To stop the on-board diagnostic test mode, turn the ignition switch to the LOCK position.



A6E8175W009

DTC TABLE [AUDIO SYSTEM]

C6U090266900W04

Screen display		Malfunction location	Page
DTC	Output signal		
09:Er22	—	Base unit (peripheral circuit)	(See 09–02B–3 DTC 09:ER22)
09:Er20	—	Power supply circuit of base unit	(See 09–02B–4 DTC 09:ER20)
00:Er10	—	Cassette deck—base unit communication line	(See 09–02B–5 DTC 00:ER10)
03:Er10	—	CD player—base unit communication line	(See 09–02B–5 DTC 03:ER10)
06:Er10	—	CD changer (upper module)—base unit communication line	(See 09–02B–6 DTC 06:ER10)
07:Er10	—	MD player—base unit communication line	(See 09–02B–6 DTC 07:ER10)
03:Er01	—	CD player	(See 09–02B–7 DTC 03:ER01)
03:Er02	CHECK CD	CD player	(See 09–02B–7 DTC 03:ER02)
03:Er07	CHECK CD	CD player	(See 09–02B–8 DTC 03:ER07)
00:Er01	—	Cassette deck	(See 09–02B–8 DTC 00:ER01)
00:Er03	—	Cassette deck	(See 09–02B–9 DTC 00:ER03)
00:Er04	CHECK TAPE	Cassette tape	(See 09–02B–9 DTC 00:ER04)
06:Er01	—	CD changer (upper module)	(See 09–02B–10 DTC 06:ER01)
06:Er02	CHECK CD	CD changer (upper module)	(See 09–02B–10 DTC 06:ER02)
06:Er07	CHECK CD	CD changer (upper module)	(See 09–02B–11 DTC 06:ER07)
07:Er01	—	MD player	(See 09–02B–11 DTC 07:ER01)
07:Er02	CHECK MD	MD player	(See 09–02B–12 DTC 07:ER02)
07:Er07	CHECK MD	MD player	(See 09–02B–12 DTC 07:ER07)
07:Er08	—	MD	(See 09–02B–12 DTC 07:ER08)
no Err	—	No stored DTCs	—

DTC 09:ER22

C6U090266900W05

DTC 09:Er22	Base unit (peripheral circuit)
DETECTION CONDITION	• Base unit detects malfunction in inner circuit (related to tuner).
POSSIBLE CAUSE	• Base unit malfunction

Diagnostic procedure

INSPECTION		ACTION
INSPECT BASE UNIT • Clear DTC. • Turn on radio and operate it for **3 seconds or more**. • Start on-board diagnostic test mode. • Is DTC 09:Er22 displayed?	Yes	Replace base unit.
	No	Troubleshooting completed.

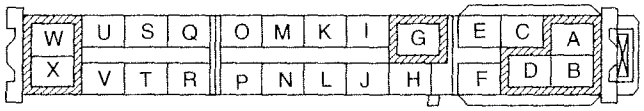
DTC 09:ER20

C6U090266900W06

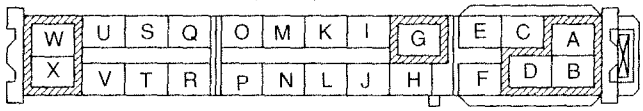
DTC 09:Er20	Power supply circuit of base unit
DETECTION CONDITION	• Voltage detected at base unit terminals 1B and 1R is **less than 8.5 V, or more than 16 V (must not be 16V).**
POSSIBLE CAUSE	• Weak battery • Malfunction in wiring harness between battery and base unit

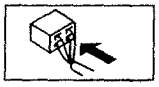
FUSE BLOCK CONNECTOR

(JB-01)

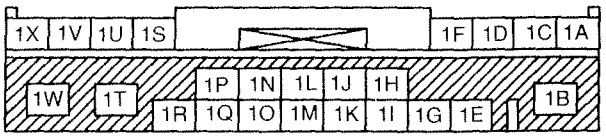


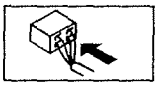
(JB-02)





BASE UNIT CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FUSE** • Remove MIRROR 5 A fuse and ROOM 15 A fuse. • Inspect MIRROR 5 A fuse and ROOM 15 A fuse. • Are fuses okay?	Yes	Go to next step.
		No	Replace fuse.
2	**INSPECT BATTERY** • Measure battery voltage. • Is voltage **8.5 V —16 V**?	Yes	Go to next step.
		No	Battery is weak. • Inspect charge/discharge system.
3	**INSPECT WIRING HARNESS BETWEEN BATTERY AND FUSE BLOCK** • Turn ignition switch to ACC position. • Measure voltage at fuse block (JB-01) terminals B and fuse block (JB-02) terminals D. • voltage **8.5 V —16 V**?	Yes	Go to next step.
		No	Repair wiring harness between battery and fuse block.
4	**INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND BASE UNIT** • Install MIRROR 5 A fuse and ROOM 15 A fuse. • Measure voltage at base unit terminals 1B and 1R. • Is voltage **8.5 V —16 V**?	Yes	Go to next step.
		No	Repair wiring harness between fuse block and base unit.
5	**INSPECT BASE UNIT** • Clear DTC. • Turn ignition switch to ACC or ON position and hold for **30 seconds or more**. • Start on-board diagnostic test mode. • Is DTC 09:Er20 displayed?	Yes	Replace base unit.
		No	Troubleshooting completed.

DTC 00:ER10

C6U090266900W07

DTC 00:Er10	Cassette deck—base unit communication line
DETECTION CONDITION	• Base unit detects communication error with cassette deck.
POSSIBLE CAUSE	• Malfunction of connectors between base unit and cassette deck • Cassette deck malfunction • Base unit malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT CONNECTOR** • Remove cassette deck and inspect connector for the following. — Deformation of pin — Poor connection of female terminal — Pinching of foreign material • Is connector okay?	Yes	Go to next step.
		No	Repair connector, then go to next step.
2	**VERIFY THAT CASSETTE DECK IS INSTALLED WITH BASE UNIT** • Install cassette deck and verify its installation condition. • Is cassette deck securely installed?	Yes	Go to next step.
		No	Securely install cassette deck, then go to next step.
3	**INSPECT CASSETTE DECK** • Clear DTC. • Turn ignition switch to ACC or ON position and hold for **3 seconds or more**. • Start on-board diagnostic test mode. • Is DTC 00:Er10 displayed?	Yes	Replace base unit and cassette deck.
		No	Troubleshooting completed.

09-02B

DTC 03:ER10

C6U090266900W08

DTC 03:Er10	CD player—base unit communication line
DETECTION CONDITION	• Base unit detects communication error with CD player.
POSSIBLE CAUSE	• Malfunction of connectors between base unit and CD player • CD player malfunction • Base unit malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT CONNECTOR** • Remove CD player and inspect connector for the following. — Deformation of pin — Poor connection of female terminal — Pinching of foreign material • Is connector okay?	Yes	Go to next step.
		No	Repair connector, then go to next step.
2	**VERIFY THAT CD PLAYER IS INSTALLED WITH BASE UNIT** • Install CD player and verify its installation condition. • Is CD player securely installed?	Yes	Go to next step.
		No	Securely install CD player, then go to next step.
3	**INSPECT CD PLAYER** • Clear DTC. • Turn ignition switch to ACC or ON position and hold for **3 seconds or more**. • Start on-board diagnostic test mode. • Is DTC 03:Er10 displayed?	Yes	Replace base unit and CD player.
		No	Troubleshooting completed.

DTC 06:ER10

C6U090266900W09

DTC 06:Er10	CD changer (upper module)—base unit communication line
DETECTION CONDITION	• Base unit detects communication error with CD changer (upper module).
POSSIBLE CAUSE	• Malfunction of connectors between base unit and CD changer (upper module) • CD changer (upper module) malfunction • Base unit malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT CONNECTOR** • Remove CD changer (upper module) and inspect connector for the following. — Deformation of pin — Poor connection of female terminal — Pinching of foreign material • Is connector okay?	Yes	Go to next step.
		No	Repair connector, then go to next step.
2	**VERIFY THAT CD CHANGER (UPPER MODULE) IS INSTALLED WITH BASE UNIT** • Install CD changer (upper module) and verify its installation condition. • Is CD changer (upper module) securely installed?	Yes	Go to next step.
		No	Securely install CD changer (upper module), then go to next step.
3	**INSPECT CD CHANGER (UPPER MODULE)** • Clear DTC. • Turn ignition switch to ACC or ON position and hold for **3 seconds or more**. • Start on-board diagnostic test mode. • Is DTC 06:Er10 displayed?	Yes	Replace base unit and CD changer (upper module).
		No	Troubleshooting completed.

DTC 07:ER10

C6U090266900W10

DTC 07:Er10	MD player—base unit communication line
DETECTION CONDITION	• Base unit detects communication error with MD player.
POSSIBLE CAUSE	• Malfunction of connectors between base unit and MD player • MD player malfunction • Base unit malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT CONNECTOR** • Remove MD player and inspect connector for the following. — Deformation of pin — Poor connection of female terminal — Pinching of foreign material • Is connector okay?	Yes	Go to next step.
		No	Repair connector, then go to next step.
2	**VERIFY THAT MD PLAYER IS INSTALLED WITH BASE UNIT** • Install MD player and verify its installation condition. • Is MD player securely installed?	Yes	Go to next step.
		No	Securely install MD player, then go to next step.
3	**INSPECT MD PLAYER** • Clear DTC. • Turn ignition switch to ACC or ON position and hold for **3 seconds or more**. • Start on-board diagnostic test mode. • Is DTC 07:Er10 displayed?	Yes	Replace base unit and MD player.
		No	Troubleshooting completed.

DTC 03:ER01

C6U090266900W11

DTC 03:Er01	CD player
DETECTION CONDITION	• CD player cannot implement insert and eject commands.
POSSIBLE CAUSE	• Defective CD (broken or foreign material stuck/attached) • CD player malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is CD able to be ejected?	Yes	Go to next step.
		No	Replace CD player.
2	**INSPECT CD** • Inspect condition of CD where error has occurred. • Is CD okay?	Yes	Go to next step.
		No	Repair (remove foreign material) or replace CD, then go to next step.
3	**INSPECT CD PLAYER** • Clear DTC. • Insert and eject CD with no defect. • Start on-board diagnostic test mode. • Is DTC 03:Er01 displayed?	Yes	Replace CD player.
		No	Troubleshooting completed.

DTC 03:ER02

C6U090266900W12

DTC 03:Er02	CD player
DETECTION CONDITION	**Note** • When error occurs, error message "CHECK CD" is displayed in the LCD. • Cannot play CD normally or change tracks.
POSSIBLE CAUSE	• Defective CD (scratches or dirt) • CD player malfunction

09–02B

Diagnostic procedure

STEP	INSPECTION		ACTION	
1	**VERIFY WHETHER MALFUNCTION IS IN CD PLAYER OR CD** • Play CD and select other song (change tracks). • Does CD player change tracks?	Yes	Go to Step 3.	
		No	Not able to change particular tracks.	Go to next step.
			Not able to change any tracks.	Change CD and perform track-change again. • If CD player changes tracks, then go to Step 3. • If not, replace CD player.
2	**INSPECT CD** • Inspect condition of CD where error has occurred. • Is CD okay?	Yes	Go to next step.	
		No	Repair (remove foreign material) or replace CD, then go to next step.	
3	**INSPECT CD PLAYER** • Clear DTC. • Play CD and select other song (change tracks). • Start on-board diagnostic test mode. • Is DTC 03:Er02 displayed?	Yes	Replace CD player.	
		No	Troubleshooting completed.	

DTC 03:ER07

C6U090266900W13

DTC 03:Er07	CD player
DETECTION CONDITION	**Note** • When error occurs, error message "CHECK CD" is displayed in the LCD. • Base unit detects CD reading error.
POSSIBLE CAUSE	• Defective CD (scratches or dirt) • CD player malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT CD** • Inspect condition of CD where error has occurred. • Is CD okay?	Yes	Go to next step.
		No	Repair (remove foreign material) or replace CD, then go to next step.
2	**INSPECT CD PLAYER** • Clear DTC. • Insert and play CD with no defect. • Start on-board diagnostic test mode. • Is DTC 03:Er07 displayed?	Yes	Replace CD player.
		No	Troubleshooting completed.

DTC 00:ER01

C6U090266900W14

DTC 00:Er01	Cassette deck
DETECTION CONDITION	• Cassette deck cannot implement insert and eject commands.
POSSIBLE CAUSE	• Defective cassette tape (deformation, broken, or foreign material stuck/attached) • Cassette deck malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is cassette tape able to be ejected?	Yes	Go to next step.
		No	Replace cassette deck.
2	**INSPECT CASSETTE TAPE** • Inspect condition of cassette tape where error has occurred. • Is cassette tape okay?	Yes	Go to next step.
		No	Repair (remove foreign material) or replace cassette tape, then go to next step.
3	**INSPECT CASSETTE DECK** • Clear DTC. • Insert and eject cassette tape with no defect. • Start on-board diagnostic test mode. • Is DTC 00:Er01 displayed?	Yes	Replace cassette deck.
		No	Troubleshooting completed.

DTC 00:ER03

C6U090266900W15

DTC 00:Er03	Cassette deck
DETECTION CONDITION	• Base unit detects that reel built into cassette deck does not operate.
POSSIBLE CAUSE	• Defective cassette tape (tape slack, pinched tape in internal cassette deck) • Cassette deck malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT CASSETTE TAPE** • Inspect condition of cassette tape where error has occurred. • Is cassette tape okay?	Yes	Go to next step.
		No	Repair (remove tape slack or repair pinched tape) or replace cassette tape, then go to next step.
2	**INSPECT CASSETTE DECK** • Clear DTC. • Insert cassette tape with no defect. • Play cassette tape for **20 seconds or more**. • Start on-board diagnostic test mode. • Is DTC 00:Er03 displayed?	Yes	Replace cassette deck.
		No	Troubleshooting completed.

DTC 00:ER04

C6U090266900W16

DTC 00:Er04	Cassette tape
DETECTION CONDITION	**Note** • When error occurs, error message "CHECK TAPE" is displayed in the LCD. • Cassette tape is worn out.
POSSIBLE CAUSE	• Tape wear • Cassette deck malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT CASSETTE TAPE** • Inspect condition of cassette tape where error has occurred. • Is cassette tape okay?	Yes	Go to next step.
		No	Replace cassette tape, then go to next step.
2	**INSPECT CASSETTE DECK** • Clear DTC. • Insert cassette tape with no defect. • Play cassette tape for **20 seconds or more**. • Start on-board diagnostic test mode. • Is DTC 00:Er04 displayed?	Yes	Replace cassette deck.
		No	Troubleshooting completed.

DTC 06:ER01

C6U090266900W17

DTC 06:Er01	CD changer (upper module)
DETECTION CONDITION	• CD changer (upper module) cannot implement insert, eject, and disc change commands.
POSSIBLE CAUSE	• Defective CD (broken or foreign material stuck/attached) • CD changer (upper module) malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is CD able to be ejected?	Yes	Go to next step.
		No	Replace CD changer (upper module).
2	**INSPECT CD** • Inspect condition of CD where error has occurred. • Is CD okay?	Yes	Go to next step.
		No	Repair (remove foreign material) or replace CD, then go to next step.
3	**INSPECT CD CHANGER (UPPER MODULE)** • Clear DTC. • Insert and eject CD with no defect. • Start on-board diagnostic test mode. • Is DTC 06:Er01 displayed?	Yes	Replace CD changer (upper module).
		No	Troubleshooting completed.

DTC 06:ER02

C6U090266900W18

DTC 06:Er02	CD changer (upper module)
DETECTION CONDITION	**Note** • When error occurs, error message "CHECK CD" is displayed in the LCD. • Cannot play CD normally or change tracks.
POSSIBLE CAUSE	• Defective CD (scratches or dirt) • CD changer (upper module) malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION	
1	**VERIFY WHETHER MALFUNCTION IS IN CD CHANGER (UPPER MODULE) OR CD** • Play all CDs in changer and select other song (change tracks). • Is CD changer able to change tracks?	Yes	Go to Step 3.	
		No	Not able to change particular tracks.	Go to next step.
			Not able to change any tracks.	Change CD and perform track-change again. • If CD changer changes tracks, go to Step 3. • If not, replace CD changer (upper module).
2	**INSPECT CD** • Inspect condition of CD where error has occurred. • Is CD okay?	Yes	Go to next step.	
		No	Repair (remove foreign material) or replace CD, then go to next step.	
3	**INSPECT CD CHANGER (UPPER MODULE)** • Clear DTC. • Play CD and select other song (change tracks). • Start on-board diagnostic test mode. • Is DTC 06:Er02 displayed?	Yes	Replace CD changer (upper module).	
		No	Troubleshooting completed.	

DTC 06:ER07

C6U090266900W19

DTC 06:Er07	CD changer (upper module)
DETECTION CONDITION	**Note** • When error occurs, error message "CHECK CD" is displayed in the LCD. • Base unit detects CD reading error.
POSSIBLE CAUSE	• Defective CD (scratches or dirt) • CD changer (upper module) malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION	
1	**VERIFY WHETHER MALFUNCTION IS IN CD CHANGER (UPPER MODULE) OR CD** • Play all CDs in changer. • Is CD changer able to read them properly?	Yes	Go to Step 3.	
		No	Not able to read particular CD.	Go to next step.
			Not able to read any CD.	Go to Step 3.
2	**INSPECT CD** • Inspect condition of CD where error has occurred. • Is CD okay?	Yes	Go to next step.	
		No	Repair (remove foreign material) or replace CD, then go to next step.	
3	**INSPECT CD CHANGER (UPPER MODULE)** • Clear DTC. • Insert and play CD for **12 seconds or more**. • Start on-board diagnostic test mode. • Is DTC 06:Er07 displayed?	Yes	Replace CD changer (upper module).	
		No	Troubleshooting completed.	

DTC 07:ER01

C6U090266900W20

09-02B

DTC 07:Er01	MD player
DETECTION CONDITION	• MD player cannot implement insert and eject commands.
POSSIBLE CAUSE	• Defective MD (broken or foreign material stuck/attached) • MD player malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is MD able to be ejected?	Yes	Go to next step.
		No	Replace MD player.
2	**INSPECT MD** • Inspect condition of MD where error has occurred. • Is MD okay?	Yes	Go to next step.
		No	Repair (remove foreign material) or replace MD, then go to next step.
3	**INSPECT MD PLAYER** • Clear DTC. • Insert and eject MD with no defect. • Start on-board diagnostic test mode. • Is DTC 07:Er01 displayed?	Yes	Replace MD player.
		No	Troubleshooting completed.

DTC 07:ER02

C6U090266900W21

DTC 07:Er02	MD player
DETECTION CONDITION	**Note** • When error occurs, error message "CHECK MD" is displayed in the LCD. • Cannot play MD normally or change tracks.
POSSIBLE CAUSE	• Defective MD (scratches or dirt) • MD player malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION	
1	**VERIFY WHETHER MALFUNCTION IS IN MD PLAYER OR MD** • Play MD and select other song (change tracks). • Is MD player able to change tracks?	Yes	Go to Step 3.	
		No	Not able to change particular tracks.	Go to next step.
			Not able to change any tracks.	Change MD and perform track-change again. • If MD player changes tracks, then go to Step 3. • If not, replace MD player.
2	**INSPECT MD** • Inspect condition of MD where error has occurred. • Is MD okay?	Yes	Go to next step.	
		No	Repair (remove foreign material) or replace MD, then go to next step.	
3	**INSPECT MD PLAYER** • Clear DTC. • Play MD and select other song (change tracks). • Start on-board diagnostic test mode. • Is DTC 07:Er02 displayed?	Yes	Replace MD player.	
		No	Troubleshooting completed.	

DTC 07:ER07

C6U090266900W22

DTC 07:Er07	MD player
DETECTION CONDITION	**Note** • When error occurs, error message "CHECK MD" is displayed in the LCD. • Base unit detects MD reading error.
POSSIBLE CAUSE	• Defective MD (scratches or dirt) • MD player malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT MD** • Inspect condition of MD where error has occurred. • Is MD okay?	Yes	Go to next step.
		No	Repair (remove foreign material) or replace MD, then go to next step.
2	**INSPECT MD PLAYER** • Clear DTC. • Insert and play MD for **12 seconds or more**. • Start on-board diagnostic test mode. • Is DTC 07:Er07 displayed?	Yes	Replace MD player.
		No	Troubleshooting completed.

DTC 07:ER08

C6U090266900W23

DTC 07:Er08	MD
DETECTION CONDITION	• Blank unrecorded MD is inserted.
POSSIBLE CAUSE	• Blank unrecorded MD

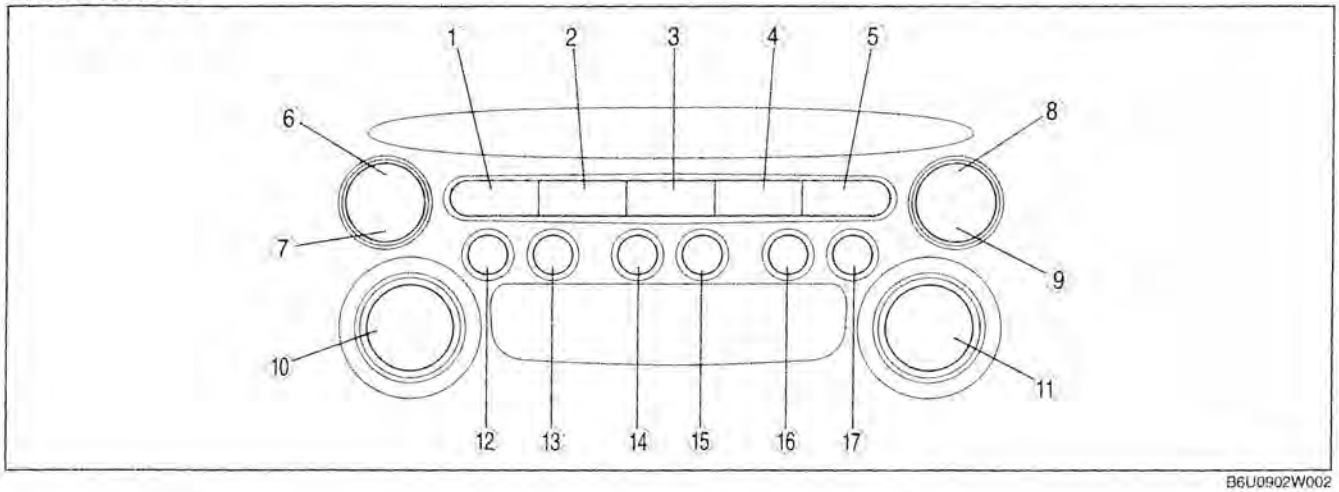
Diagnostic procedure

ACTION
• Inform customer that blank unrecorded MD was inserted into MD player. • Insert recorded MD into MD player.

DIAGNOSTIC ASSIST FUNCTION

C6U090266900W24

Structural View
Switch location



B6U0902W002

1	FM1 button
2	FM2 button
3	AM button
4	CD button
5	TAPE/MD button
6	SEEK button (upper)
7	SEEK button (lower)
8	SCAN button
9	AUTO-M button

10	POWER button
11	AUDIO CONT button
12	Preset button "1"
13	Preset button "2"
14	Preset button "3"
15	Preset button "4"
16	Preset button "5"
17	Preset button "6"

09-02B

LCD Inspection

1. With audio on, first press the POWER button, then simultaneously press the SEEK button (upper) for **approximately 1 second**.
2. Inspect the LCD according to the following table:

Inspection	Display	Action	
Start LCD inspection mode.		Characters displayed in LCD are not truncated or faint.	LCD is okay.
		Other than above.	Replace information display.

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

Button Inspection

1. With audio on, first press the POWER button, then simultaneously press the TAPE/MD button for **approximately 1 second**.
2. Inspect the button according to the following table:

Inspection	Display	Action	
• Start button inspection mode. • Press the all buttons.	—	Buzzer sounds.	Button is okay.
		Buzzer does not sound.	Replace base unit.

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

Speaker Inspection

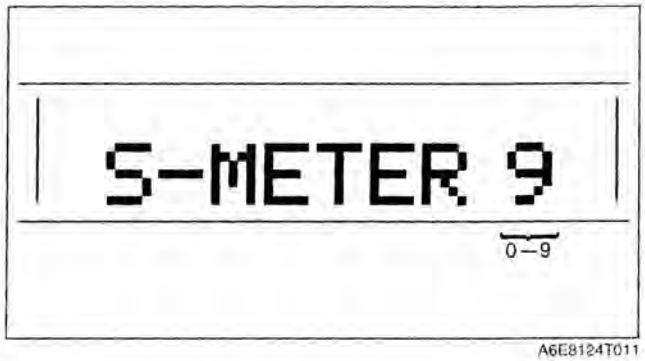
1. With audio on, first press the POWER button, then simultaneously press the AUTO-M button for **approximately 1 second**.
2. Inspect the speaker according to the following table:

Inspection	Display	Action	
• Start speaker inspection mode. • Does each speaker output sound in the following order? 1. Left front door speaker and tweeter 2. Right front door speaker and tweeter 3. Right rear door speaker and woofer 4. Left rear door speaker and woofer	—	Yes	Speakers and wiring harness between base unit and speakers are okay.
		No	Inspect the following parts. • Malfunctioning speaker • Wiring harness between base unit and malfunctioning speaker

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

Radio Reception Condition

1. With audio on and at radio mode, first press the POWER button, then simultaneously press the preset button "2" for **approximately 1 second**.
2. The diagnostic assist function displays the radio reception condition in 10 levels (0-9) to assist in determining the condition of the antenna, antenna feeders, and base unit (tuner).
3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.



A6E8124T011

Audio Amplifier (External) Inspection

1. With audio on, first press the POWER button, then simultaneously press the SCAN button for **approximately 1 second**.
2. Inspect the audio amplifier (external) according to the following table:

Inspection	Display	Action	
Start audio amplifier (external) inspection mode.	NORMAL AMP-ON AUDIO AMPLIFIER OPERATING SIGNAL IS OUTPUT	Speakers output sound.	System is okay.
		Speakers do not output sound.	Inspect following parts. • Audio amplifier (external) • Speakers • Woofer relay • Wiring harness (base unit—audio amplifier (external)—Woofer relay)
	MALFUNCTIONING AMP-OFF AUDIO AMPLIFIER OPERATING SIGNAL IS NOT OUTPUT	Replace base unit.	

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

09–02C ON-BOARD DIAGNOSTIC [MULTIPLEX COMMUNICATION SYSTEM]

MULTIPLEX COMMUNICATION SYSTEM

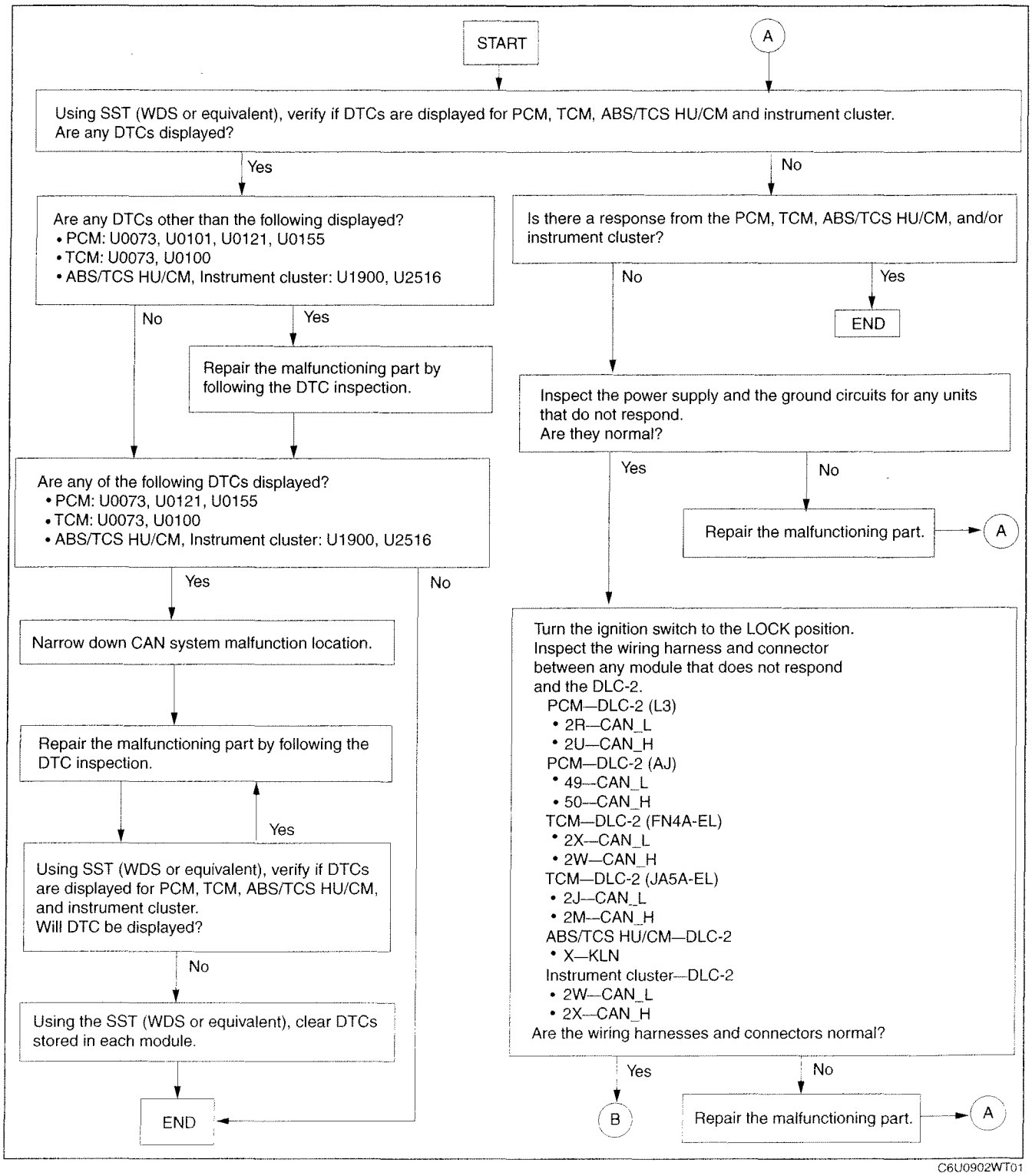
C6U090255430W01

Outline

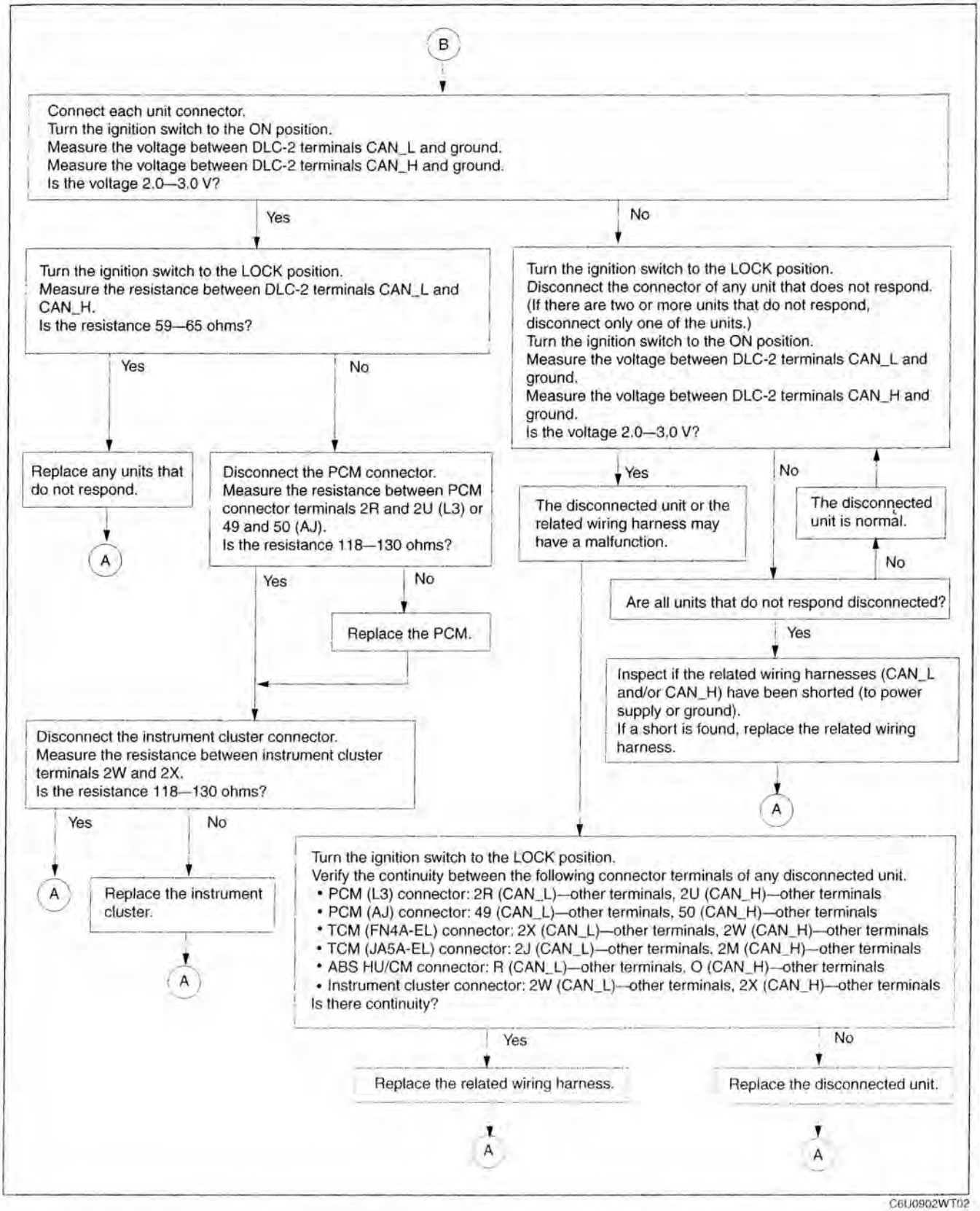
- If the controller area network (CAN) system is malfunctioning, read the DTCs of the following modules, using the **SST** (WDS or equivalent) to determine the malfunctioning system.
  - — PCM
  - — TCM
  - — ABS/TCS HU/CM
  - — Instrument cluster

Flowchart

- Use the following flowchart to verify the cause of the trouble.



C6U0902WT01



C6U0902WT02

DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]

C6U090255430W02

DTC	Malfunction location	DTC output module	Page
U0073	CAN system communication error	• PCM • TCM	(See 09–02C–7 DTC U0073, U1900, U2516)
U0100	Communication error to PCM	TCM	(See 09–02C–4 PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION)
U0101	Communication error to TCM	PCM	
U0121	Communication error to ABS/TCS HU/CM		
U0155	Communication error to instrument cluster		
U1900	CAN system communication error	• ABS/TCS HU/CM • Instrument cluster	(See 09–02C–7 DTC U0073, U1900, U2516)
U2516	CAN system wiring harness open or short circuit		

PID/DATA MONITOR TABLE [MULTIPLEX COMMUNICATION SYSTEM]

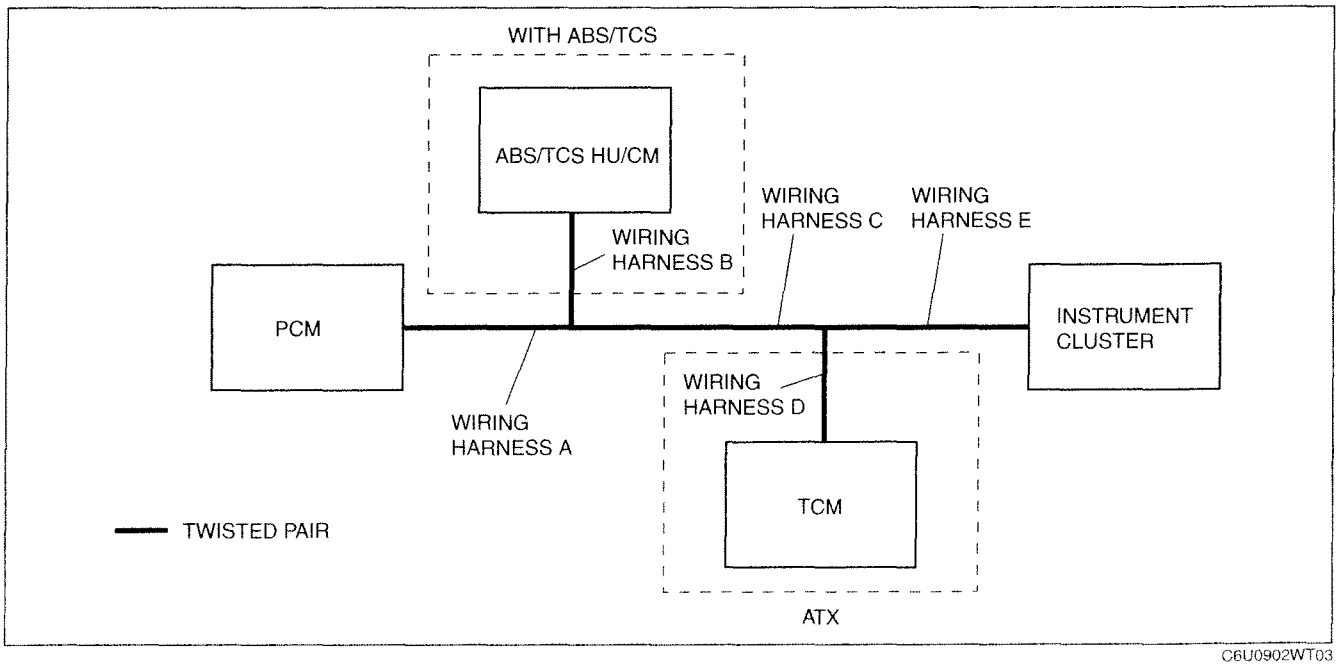
C6U090255430W03

PID name (definition)	Condition	Specification	PID monitor module	Terminal
ABS_MSG (Missing message from the ABS/TCS HU/CM)	Present	Circuit in the ABS/TCS HU/CM is normal.	Instrument cluster	• ABS/TCS HU/CM: O, R • Instrument cluster: 2W, 2X
	Not Present	Circuit in the ABS/TCS HU/CM is abnormal.		
TCM_MSG (Missing message from the TCM)	Present	Circuit in the TCM is normal.	• ABS/TCS HU/CM • Instrument cluster	
	Not Present	Circuit in the TCM is abnormal.		
PCM_MSG (Missing message from the PCM)	Present	Circuit in the PCM is normal.	• ABS/TCS HU/CM • Instrument cluster	
	Not Present	Circuit in the PCM is abnormal.		

PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION

C6U090255430W04

System Wiring Diagram



C6U0902WT03

PCM

1. Check the display of DTC U0121 and/or U0155, using the **SST** (WDS or equivalent). (See 09–02C–4 DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM].)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

X: Normal
—: Communication error

Module	Communication status			Malfunction location
	ABS/TCS HU/CM	TCM	Instrument cluster	
PCM	—	—	—	• Wiring harness A • Wiring harness C (without ABS/TCS) • Wiring harness E (MTX, without ABS/TCS) • Instrument cluster (TCM) • PCM • ABS • ABS/TCS HU/CM
	—	X	X	• Wiring harness B • TCM
	X	—	—	• Wiring harness C
	X	—	X	• Wiring harness D • TCM
	X	X	—	• Wiring harness E • Instrument cluster

TCM

Note

- The TCM is not able to read DTCs nor PIDs for confirming normal communication between ABS/TCS HU/CM and the instrument cluster. Therefore use the **SST** (WDS or equivalent) to read the PIDs from the ABS/TCS HU/CM and the instrument cluster in order to confirm normal communication between the two modules.

1. Check the display of DTC U0100, using the **SST** (WDS or equivalent). (See 09–02C–4 DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM].)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

X: Normal
—: Communication error

Module	Communication status			Malfunction location
	PCM	ABS/TCS HU/CM	Instrument cluster	
TCM	—	—	—	• Wiring harness D • TCM
	—	X	X	• Wiring harness A • PCM
	—	—	X	• Wiring harness C • Wiring harness A (without ABS/TCS) • PCM (without ABS/TCS)
	X	—	X	• Wiring harness B • ABS/TCS HU/CM
	X	X	—	• Wiring harness E • Instrument cluster

ABS/TCS HU/CM

Note
- The ABS/TCS HU/CM is not able to read DTCs nor PIDs for confirming normal communication between instrument cluster. Therefore use the **SST** (WDS or equivalent) to read the PIDs from the instrument cluster in order to confirm normal communication between the two modules.

1. Access and monitor the "PCM_MSG" and "TCM_MSG" of PID using the **SST** (WDS or equivalent).
2. Referring to the PID/DATA MONITOR, confirm the display status of the PID. (See 09–02C–4 PID/DATA MONITOR TABLE [MULTIPLEX COMMUNICATION SYSTEM].)
3. Referring to the following table, determine the malfunctioning part of the CAN system.

X: Normal
—: Communication error

Module	Communication status			Malfunction location
	PCM	TCM	Instrument cluster	
ABS/TCS HU/CM	—	—	—	• Wiring harness B • ABS/TCS HU/CM
	—	X	X	• Wiring harness A • PCM
	X	—	X	• Wiring harness D • TCM
	X	—	—	• Wiring harness E (MTX) • Wiring harness C • Instrument cluster (MTX)
	X	X	—	• Wiring harness E • Instrument cluster

Instrument Cluster

1. Access and monitor the "PCM_MSG", "TCM_MSG" and "ABS_MSG" of PID using the **SST** (WDS or equivalent).
2. Referring to the PID/DATA MONITOR, confirm the display status of the PID. (See 09–02C–4 PID/DATA MONITOR TABLE [MULTIPLEX COMMUNICATION SYSTEM].)
3. Referring to the following table, determine the malfunctioning part of the CAN system.

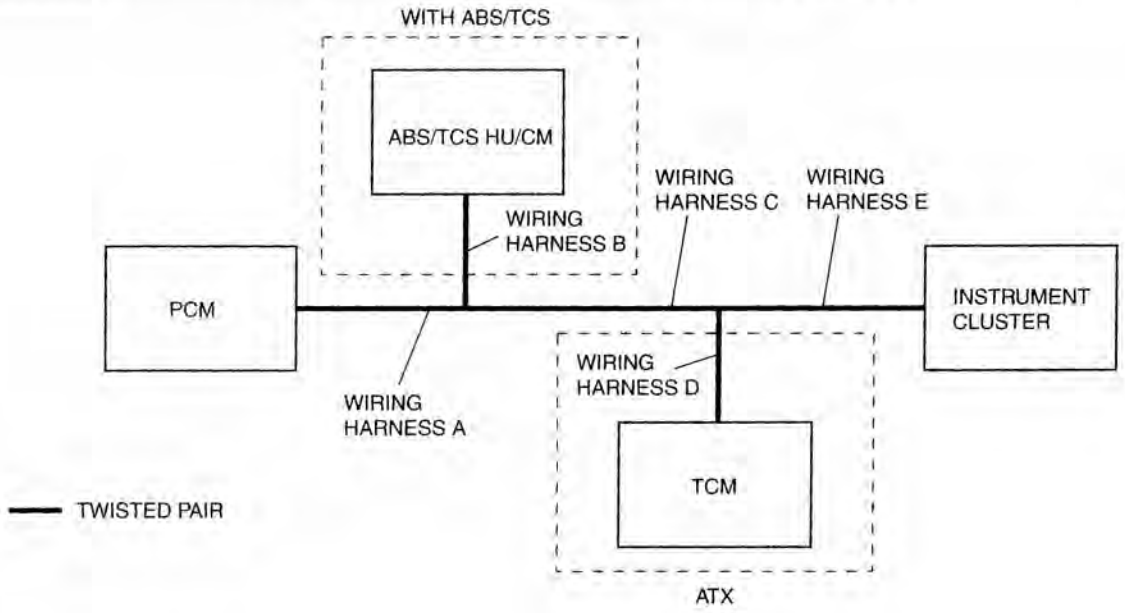
X: Normal
—: Communication error

Module	Communication status			Malfunction location
	PCM	TCM	ABS/TCS HU/CM	
Instrument cluster	—	—	—	• Wiring harness A (MTX, without ABS/TCS) • Wiring harness C (without ABS/TCS) • Wiring harness E • PCM (MTX, without ABS/TCS) • Instrument cluster
	—	X	X	• Wiring harness A • PCM
	X	—	X	• Wiring harness D • TCM
	X	X	—	• Wiring harness B • ABS/TCS HU/CM

DTC U0073, U1900, U2516

C6U090255430W05

DTC	U0073	CAN system communication error
	U1900	
	U2516	CAN system wiring harness open or short circuit
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • CAN system related harness malfunction • Related module communication error
POSSIBLE CAUSE		• Open or short circuit in wiring harness • Malfunction of connectors between PCM, TCM, ABS/TCS HU/CM and instrument cluster • PCM malfunction • TCM malfunction • ABS/TCS HU/CM malfunction • Instrument cluster malfunction



09–02C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**DETERMINING LOCATION OF A MALFUNCTION** • Determine malfunctioning part of CAN system. (See 09–02C–4 PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION) • Is malfunctioning part wiring harness E or instrument cluster?	Yes	Go to Step 6.
		No	Go to next step.
2	**DETERMINING LOCATION OF A MALFUNCTION** • Is malfunctioning part wiring harness B or ABS/TCS HU/CM?	Yes	Go to Step 12.
		No	Go to next step.
3	**DETERMINING LOCATION OF A MALFUNCTION** • Is malfunctioning part wiring harness C?	Yes	Go to Step 14.
		No	Go to next step.
4	**DETERMINING LOCATION OF A MALFUNCTION** • Is malfunctioning part wiring harness B or the TCM?	Yes	Go to Step 17.
		No	Go to next step.

STEP	INSPECTION		ACTION
5	**DETERMINING LOCATION OF A MALFUNCTION** • Is malfunctioning part wiring harness A or PCM?	Yes	Go to Step 19.
		No	Troubleshooting completed.
6	**INSPECT INSTRUMENT CLUSTER CONNECTOR** • Disconnect negative battery cable. • Disconnect instrument cluster connector. • Is instrument cluster connector okay?	Yes	Go to next step.
		No	Replace wiring harness.
7	• Is vehicle equipped with ABS/TCS?	Yes	Go to next step.
		No	Go to Step 9.
8	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND INSTRUMENT CLUSTER** • Disconnect ABS/TCS HU/CM connector. • Inspect following wiring harness between ABS/TCS HU/CM and instrument cluster terminals for short to ground, short power supply, and open circuit: — R—2W (CAN_L) — O—2X (CAN_H) • Is wiring harness okay?	Yes	Replace instrument cluster, then go to Step 21.
		No	Replace wiring harness.
9	• Is inspected vehicle ATX?	Yes	Go to next step.
		No	Go to Step 11.
10	**INSPECT WIRING HARNESS BETWEEN TCM AND INSTRUMENT CLUSTER** • Disconnect TCM connector. • Inspect following wiring harness between TCM and instrument cluster terminals for short to ground, short power supply, and open circuit: **FN4A-EL** — 2X—2W (CAN_L) — 2W—2X (CAN_H) **JA5A-EL** — 2J—2W (CAN_L) — 2M—2X (CAN_H) • Is wiring harness okay?	Yes	Replace instrument cluster, then go to Step 21.
		No	Replace wiring harness.
11	**INSPECT WIRING HARNESS BETWEEN PCM AND INSTRUMENT CLUSTER** • Disconnect PCM connector. • Inspect following wiring harness between PCM and instrument cluster terminals for short to ground, short power supply, and open circuit: **L3** — 2R—2W (CAN_L) — 2U—2X (CAN_H) **AJ** — 49—2W (CAN_L) — 50—2X (CAN_H) • Is wiring harness okay?	Yes	Replace instrument cluster, then go to Step 21.
		No	Replace wiring harness.
12	**INSPECT ABS/TCS HU/CM OR DSC HU/CM CONNECTOR** • Disconnect negative battery cable. • Disconnect ABS/TCS HU/CM connector. • Is ABS/TCS HU/CM connector okay?	Yes	Go to next step.
		No	Replace wiring harness.

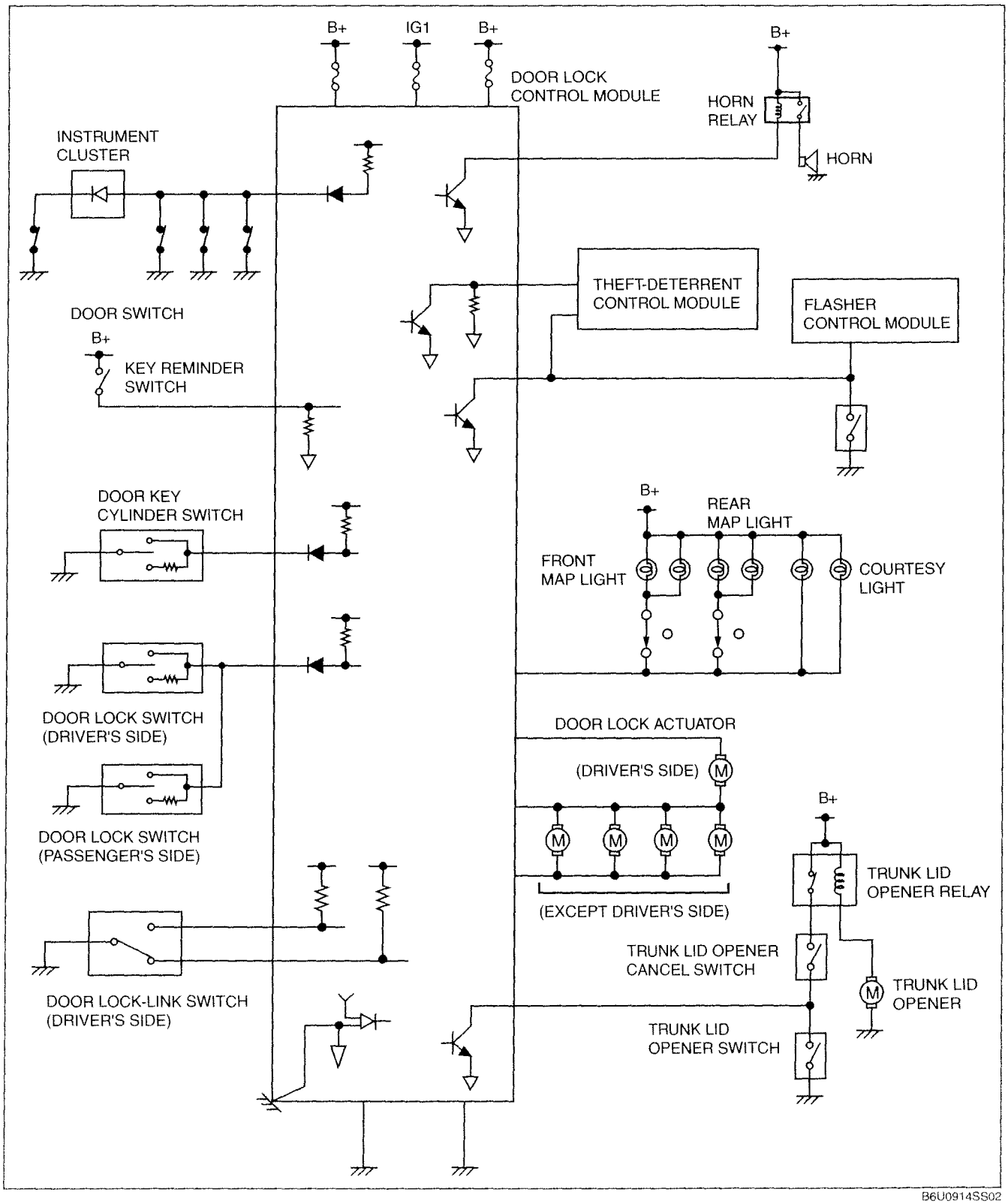
STEP	INSPECTION		ACTION
13	**INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND INSTRUMENT CLUSTER** • Disconnect instrument cluster connector. • Inspect following wiring harness between ABS/TCS HU/CM and instrument cluster terminals for short to ground, short power supply, and open circuit: — R—2W (CAN_L) — O—2X (CAN_H) • Is wiring harness okay?	Yes	Replace ABS/TCS HU/CM, then go to Step 21.
		No	Replace wiring harness.
14	• Is inspected vehicle ATX?	Yes	Go to next step.
		No	Go to Step 16.
15	**INSPECT WIRING HARNESS BETWEEN TCM AND ABS/TCS HU/CM** • Disconnect negative battery cable. • Disconnect TCM connector. • Disconnect ABS/TCS HU/CM connector. • Inspect following wiring harness between TCM and ABS/TCS HU/CM terminals for short to ground, short power supply, and open circuit: **FN4A-EL** — 2X—K (CAN_L) — 2W—O (CAN_H) **JA5A-EL** — 2J—K (CAN_L) — 2M—O (CAN_H) • Is wiring harness okay?	Yes	Go to Step 21.
		No	Replace wiring harness.
16	**INSPECT WIRING HARNESS BETWEEN PCM AND TCM** • Disconnect negative battery cable. • Disconnect PCM connector. • Disconnect TCM connector. • Inspect following wiring harness between PCM and TCM terminals for short to ground, short power supply, and open circuit: **L3** — 2R—2X (CAN_L) — 2U—2W (CAN_H) **AJ** — 49—2X (CAN_L) — 50—2W (CAN_H) • Is wiring harness okay?	Yes	Go to Step 21.
		No	Replace wiring harness.
17	**INSPECT TCM CONNECTOR** • Disconnect negative battery cable. • Disconnect TCM connector. • Is TCM connector okay?	Yes	Go to next step.
		No	Replace wiring harness.
18	**INSPECT WIRING HARNESS BETWEEN TCM AND INSTRUMENT CLUSTER** • Disconnect instrument cluster connector. • Inspect following wiring harness between TCM and instrument cluster terminals for short to ground, short power supply, and open circuit: **FN4A-EL** — 2X—2W (CAN_L) — 2W—2X (CAN_H) **JA5A-EL** — 2J—2W (CAN_L) — 2M—2X (CAN_H) • Is wiring harness okay?	Yes	Replace TCM, then go to Step 21.
		No	Replace wiring harness.
19	**INSPECT PCM CONNECTOR** • Disconnect negative battery cable. • Disconnect PCM connector. • Is PCM connector okay?	Yes	Go to next step.
		No	Replace wiring harness.

STEP	INSPECTION		ACTION
20	**INSPECT WIRING HARNESS BETWEEN PCM AND INSTRUMENT CLUSTER** • Disconnect DSC HU/CM connector. • Inspect following wiring harness between PCM and DSC HU/CM terminals for short to ground, short power supply, and open circuit: **L3** — 2R—2W (CAN_L) — 2U—2X (CAN_H) **AJ** — 49—2W (CAN_L) — 50—2X (CAN_H) • Is wiring harness okay?	Yes	Replace PCM, then go to next step.
		No	Replace wiring harness.
21	**CHECK DTC INDICATE** • Connect PCM connector. • Connect TCM connector. • Connect ABS/TCS HU/CM connector. • Connect instrument cluster connector. • Clear DTC from module memory using **SST** (WDS or equivalent). • Perform KOEO/KOER self-test. • Are DTCs U0073, U1900 and/or U2516 indicated?	Yes	Repeat from Step 1.
		No	Troubleshooting completed.

09–03A SYMPTOM TROUBLESHOOTING [KEYLESS ENTRY SYSTEM]

KEYLESS ENTRY SYSTEM WIRING DIAGRAM

C6U090369000W01



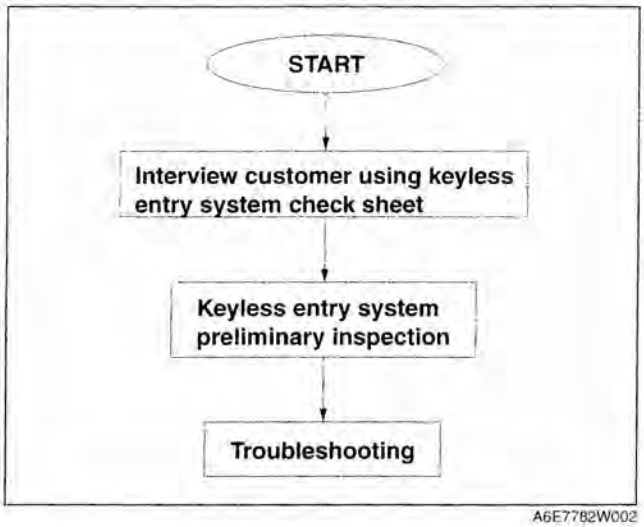
B6U0914SS02

FOREWORD

C6U090369000W02

- Go to troubleshooting after identifying the specific malfunction by doing a keyless entry system preliminary inspection.

Flowchart



A6E7782W002

KEYLESS ENTRY SYSTEM CHECK SHEET

C6U090369000W03

- Use the sheet below as a customer interview sheet when accepting a vehicle for service.
- If the symptom is "Power door lock system does not operate with transmitter at all," find out how the customer uses the keyless entry system by following the check sheet below.

Perform the following inspection with customer.

Q1. What's the customer's complaint?

☐ Power door lock system does not operate with transmitter (door does not lock/unlock).

☐ Other _____

Q2. Is system factory-installed or after-market?

☐ Factory-installed system

►GO to Q3.

☐ After-market system

►Perform troubleshooting according to after-market keyless entry system manual.

Q3. Operate transmitter with customer from 2.5 m {8.2 ft} away from center of vehicle. (Make sure the ignition key is either in the LOCK position or removed.)
Does keyless entry system work?

☐ Yes

►Explain the following to the customer.

- Keyless entry system does not work when ignition switch is in ON position.
- Keyless entry system does not work form excessive distances (more than 2.5 m {8.2 ft} away from center of vehicle).

☐ No

►Go to Q4.

Q4. Check location where customer uses keyless entry system.
Does a particular area, such as being near TV towers, power plants, power lines, or factories, have an effect on malfunction?

☐ Yes Place _____

►Area of operation is bad. Explain effect of outside interference on transmitter to customer.

☐ No

►Go to Q5.

Q5. Make sure there are no after-market electrical parts installed on vehicle.
Are there any of the following present?

- Cellular phone
- Radio-wave equipment
- Remote engine starter
- TV, ect.

☐ Yes Parts _____

☐ No

Perform the keyless entry system preliminary inspection.

A6E7782W001

KEYLESS ENTRY SYSTEM PRELIMINARY INSPECTION

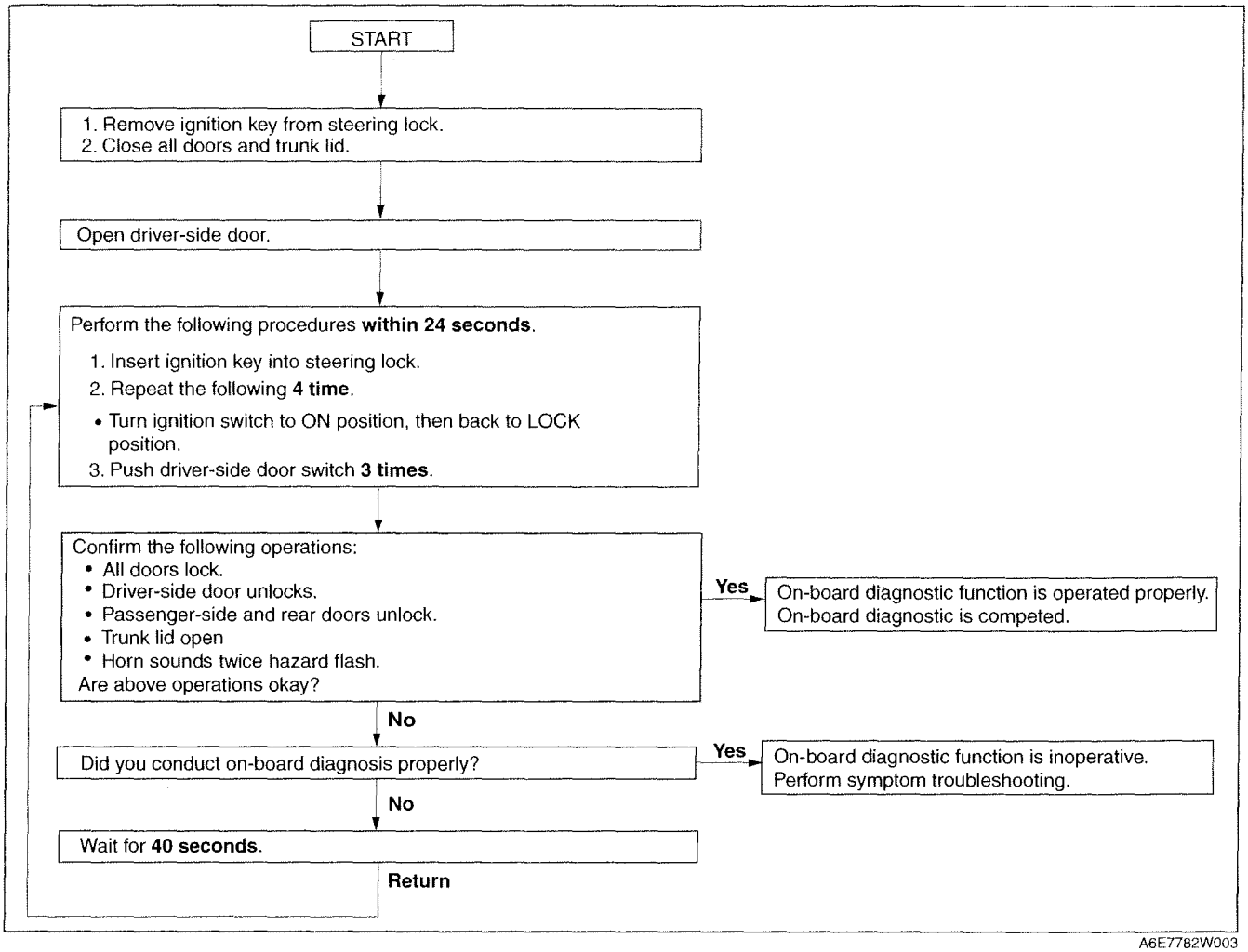
C6U090369000W04

- Perform the following preliminary inspection before troubleshooting.

STEP	INSPECTION		ACTION
1	• Is system an after-market one?	Yes	Perform troubleshooting according to after-market keyless entry system manual.
		No	Go to next step.
2	• Did customer activate keyless entry system when ignition switch was in LOCK position?	Yes	Go to next step.
		No	• Explain to customer that system does not work when ignition is in ON position. • Turn ignition switch to LOCK position, then go to next step.
3	• Did customer use keyless entry system in particular area, such as being near TV towers, power plants, power lines, or factories?	Yes	Attempt to lock/unlock doors with transmitter in non-interference area. **If system operates:** • Area of operation is bad. Explain effect of outside interference on transmitter to customer. **If system does not operate:** • Go to next step.
		No	Go to next step.
4	• Are any of the following after-market electrical parts on the vehicle? — Cellular phone — Radio-wave equipment — Remote engine starter — TV, etc.	Yes	Disconnect after-market electrical part connectors and attempt to lock/unlock doors with transmitter. **If system operates:** • After-market electrical parts are interfering with keyless entry system. **If system does not operate:** • Go to next step.
		No	Go to next step.
5	• Perform on-board diagnostic function. (See 09–03A–6 KEYLESS ENTRY SYSTEM ON-BOARD DIAGNOSIS.) • Does on-board diagnostic function work?	Yes	Go to next step.
		No	• Go to Step 1 of NO. 1 ONE OR MORE ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE. • Go to Step 1 of NO. 2 ALL ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE.
6	• Attempt to reprogram transmitter ID code. • Can transmitter ID code be reprogrammed?	Yes	System is normal now.
		No	Go to Step 1 of troubleshooting NO. 3 TRANSMITTER ID CODE CANNOT BE REPROGRAMMED.

KEYLESS ENTRY SYSTEM ON-BOARD DIAGNOSIS

C6U090369000W05



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TROUBLESHOOTING INDEX

C6U090369000W06

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
1	One or more on-board diagnostic functions inoperative.	• Malfunction in trunk lid opener system, horn system, hazard warning light system, or door lock linkage system.	(See 09–03A–7 NO.1 ONE OR MORE ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE)
2	All on-board diagnostic functions inoperative.	• Malfunction in door lock control module power supply circuit, door switch circuit, trunk lid compartment light switch circuit or door lock control module ground circuit.	(See 09–03A–9 NO.2 ALL ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE)
3	Transmitter ID code cannot be reprogrammed.	• Malfunction in transmitter battery, transmitter, door lock control module bracket, door lock control module bracket ground screw or door lock control module circuit.	(See 09–03A–10 NO.3 TRANSMITTER ID CODE CANNOT BE REPROGRAMMED)

NO.1 ONE OR MORE ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE

C6U090369000W07

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

1	One or more on-board diagnostic functions inoperative
DESCRIPTION	• Malfunction in trunk lid opener system, horn system, hazard warning light system, or door lock linkage system.
POSSIBLE CAUSE	• Malfunction in trunk lid opener system — Trunk lid opener relay circuit malfunction — Door lock control module malfunction • Malfunction in horn system — Horn circuit malfunction — Door lock control module malfunction — Malfunction in wiring harness between door lock control module and horn relay • Malfunction in hazard warning light system — Hazard warning light circuit — Door lock control module malfunction — Malfunction in wiring harness between door lock control module and hazard warning lights — Malfunction in wiring harness between door lock control module and flasher control module • Malfunction in door lock linkage • Malfunction in door lock control module door lock/unlock signal circuit — Door lock control module malfunction

Diagnostic procedure

Note

- For with theft-deterrent system, follow the procedure from Step 5.

STEP	INSPECTION		ACTION
1	**CHECK HORN, AND HAZARD WARNING LIGHT OPERATION DURING ON-BOARD DIAGNOSIS** • Did all of the following items work during on-board diagnostic function operation? — Hazard warning lights flashed — Horns sounded intermittently — Trunk lid open	Yes	Go to Step 11.
		No	Go to next step.
2	**INSPECT HAZARD WARNING LIGHT OPERATION DURING ON-BOARD DIAGNOSIS** • Did hazard warning lights flash during on-board diagnostic function operation?	Yes	Go to Step 5.
		No	Go to next step.
3	**INSPECT HAZARD WARNING LIGHT CIRCUIT** • Do hazard warning lights flash when hazard warning switch is on?	Yes	Go to next step.
		No	Inspect hazard warning light circuit.
*4	**CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN DOOR LOCK CONTROL MODULE AND FLASHER UNIT) OR DOOR LOCK CONTROL MODULE** • Measure voltage at door lock control module terminal I during on-board diagnostic function operation. — When hazard warning light flashed: **B+⇔below 1.0 V** • Is voltage as above?	Yes	Recheck malfunction symptoms, then repeat from Step 1 if malfunction reoccurs.
		No	• Inspect wiring harness between door lock control module and flasher unit. — If wiring harness is OK, replace door lock control module and reprogram transmitter ID code, then go to Step 14. — If wiring harness malfunction, repair wiring harness, then go to Step 14.
5	**CHECK HORN OPERATION DURING ON-BOARD DIAGNOSIS** • Did horns sound intermittently during on-board diagnostic function operation?	Yes	Go to Step 8.
		No	Go to next step.
6	**INSPECT HORN CIRCUIT** • Do horns sound when depressing horn switch on vehicle?	Yes	Go to next step.
		No	Inspect horn circuit.

STEP	INSPECTION		ACTION
*7	**CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN DOOR LOCK CONTROL MODULE AND HORN RELAY) OR DOOR LOCK CONTROL MODULE** • Turn ignition switch to LOCK position. • Disconnect door lock control module connector and horn relay connector. • Is there continuity between door lock control module terminal C and horn relay connector?	Yes	Replace door lock control module and reprogram door lock control module ID code, then go to Step 14.
		No	Repair wiring harness between door lock control module and horn relay, then go to Step 14.
8	**CHECK TRUNK LID OPERATION DURING ON-BOARD DIAGNOSIS** • Does trunk lid open during on-board diagnostic function operation?	Yes	Go to Step 11.
		No	Go to next step.
9	**INSPECT TRUNK LID OPENER SYSTEM** • Does trunk lid open by the trunk lid opener switch?	Yes	Go to next step.
		No	Inspect trunk lid opener system.
*10	**CHECK TO SEE WHETHER MALFUNCTION IS IN TRUNK LID OPENER RELAY CIRCUIT OR DOOR LOCK CONTROL MODULE** • Disconnect door lock control module connector. • Measure voltage at door lock control module terminal E. • Is voltage **approximately 12 V**?	Yes	Replace door lock control module and reprogram transmitter ID code, then go to Step 14.
		No	Inspect trunk lid opener relay circuit.
11	**MAKE SURE THAT ALL DOORS LOCK AND UNLOCK DURING ON-BOARD DIAGNOSIS** • Did all doors unlock and lock during on-board diagnostic function operation?	Yes	Recheck malfunction symptoms, then repeat from Step 1 if malfunction reoccurs.
		No	Go to next step.
12	**INSPECT DOOR LOCK LINKAGE** • Operate door lock knob and make sure door locks and unlocks manually. • Does every door lock system work?	Yes	Go to next step.
		No	Inspect door lock linkage.
*13	**CHECK TO SEE WHETHER MALFUNCTION IS IN DOOR LOCK ACTUATOR, DOOR LOCK CONTROL MODULE GROUND CIRCUIT OR ELSEWHERE** • Measure voltage at door lock control module terminal C, D during on-board diagnostic function operation. — All door locked: **below 1.0 V→B+→below 1.0 V** (terminal D) — All door unlocked: **B+→below 1.0 V→B+** (terminal C) • Is voltage as above?	Yes	Recheck malfunction symptoms, then repeat from Step 1 if malfunction reoccurs.
		No	• Inspect door lock control module connector. • Inspect wiring harness between door lock control module and door lock actuator. — If above parts are OK, go to next step. — If above parts malfunction, repair malfunction part.
14	**RECHECK MALFUNCTION SYMPTOM AFTER REPAIR** • Does keyless entry system operate properly?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction reoccurs.

NO.2 ALL ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE

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- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

2	All on-board diagnostic functions inoperative
DESCRIPTION	• Malfunction in door lock control module power supply circuit, door switch circuit, trunk lid compartment light circuit or door lock control module ground circuit.
POSSIBLE CAUSE	• Malfunction in IG1, B+ signal circuit of door lock control module — Door lock control module power supply fuse malfunction — Malfunction in wiring harness between door lock control module power supply fuse(s) and door lock control module itself • Malfunction in door lock control module's door open/closed signal circuit — Door switch system malfunction — Door lock control module malfunction — Malfunction in wiring harness between door lock control module and door switch • Malfunction in door lock control module's trunk lid open signal circuit — Trunk lid compartment light switch system malfunction — Door lock control module malfunction — Malfunction in wiring harness between door lock control module and trunk lid compartment light switch • Malfunction in door lock control module GND signal circuit — Malfunction in wiring harness between door lock control module and ground

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DOOR LOCK CONTROL MODULE POWER SUPPLY FUSES** • Are door lock control module power supply fuses okay?	Yes	Go to next step.
		No	Check for a short to ground on blown fuse's circuit. Repair or replace as necessary. Install appropriate amperage fuse.
2	**INSPECT DOOR SWITCH INSTALLATION** • Are door switches installed securely?	Yes	Go to next step.
		No	Install door switch(es) securely, then go back to Step 5 of keyless entry system preliminary inspection.
*3	**CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN FUSE BLOCK AND DOOR LOCK CONTROL MODULE) OR ELSEWHERE** • Turn ignition switch to ON position. • Measure voltage at following door lock control module terminals: — IG1 signal (Terminal B) — B+ signal (Terminal A) • Is voltage **B+**?	Yes	Go to next step.
		No	Repair wiring harness between fuse block and door lock control module, then go to Step 8.
*4	**CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO B+ BETWEEN FUSE BLOCK AND DOOR LOCK CONTROL MODULE, OR BETWEEN DOOR LOCK CONTROL MODULE AND GROUND) OR ELSEWHERE** • Turn ignition switch to LOCK position. • Disconnect door lock control module connector. • Measure voltage at following door lock control module terminals: — IG1 signal (Terminal B) • Is voltage **B+**?	Yes	Repair malfunctioning wiring harness, then go to Step 8.
		No	Go to next step.
*5	**CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN DOOR LOCK CONTROL MODULE AND GROUND) OR ELSEWHERE** • Is there continuity between door lock control module terminal W and ground?	Yes	Go to next step.
		No	Repair wiring harness between door lock control module and ground, then go to Step 8.

STEP	INSPECTION		ACTION
6	**INSPECT FOR CHECK CODE 04 IN INSTRUMENT CLUSTER** • Inspect door switch using instrument cluster input/output check mode. (See 09–22–6 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Does DTC 04 function properly?	Yes	Go to next step.
		No	Repair door switch system using DTC 04 inspection procedure, then go to Step 8.
7	**INSPECT DOOR LOCK CONTROL MODULE OR WIRING HARNESS (BETWEEN DOOR LOCK CONTROL MODULE AND DOOR SWITCHES, TRUNK LID COMPARTMENT LIGHT SWITCH FOR CONTINUITY)** • Open the driver-side door. • Is there continuity between door lock control module terminal K, G and ground?	Yes	Replace door lock control module and reprogram door lock control module ID code, then go to next step.
		No	Repair wiring harness between door lock control module and door switch(es), trunk lid compartment light switch then go to next step.
8	**RECHECK MALFUNCTION SYMPTOM AFTER REPAIR** • Does keyless entry system operate properly?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction reoccurs.

NO.3 TRANSMITTER ID CODE CANNOT BE REPROGRAMMED

C6U090369000W09

3	**Transmitter ID code cannot be reprogrammed**
DESCRIPTION	• Malfunction in transmitter battery, transmitter, door lock control module bracket, door lock control module bracket ground screw or door lock control module circuit.
POSSIBLE CAUSE	• Malfunction in transmitter battery, transmitter, door lock control module bracket, door lock control module bracket ground screw or door lock control module circuit — Transmitter battery, transmitter, door lock control module bracket, door lock control module bracket ground screw or door lock control module malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT TRANSMITTER BATTERY INSTALLATION AND TYPE** • Visually inspect transmitter battery. • Are below items okay? — Transmitter battery installation (correct polarity) — Battery type (CR2025)	Yes	Go to next step.
		No	Set transmitter battery properly or replace with specified transmitter battery (CR2025), then go to Step 8.
2	**INSPECT TRANSMITTER BATTERY TERMINALS FOR RUST AND POOR CONNECTION** • Visually inspect transmitter. — Is there rust on transmitter battery terminals (positive or negative pole)? — Is there poor connection between terminals and battery?	Yes	Replace transmitter battery or repair transmitter battery terminal, then go to Step 8.
		No	Go to next step.
3	**INSPECT TRANSMITTER BATTERY** • Inspect transmitter battery. • Is battery voltage normal?	Yes	Go to next step.
		No	Replace transmitter battery, then go to Step 8.
4	**INSPECT DOOR LOCK CONTROL MODULE BRACKET INSTALLATION** • Is door control module unit bracket installed securely?	Yes	Go to next step.
		No	Install bracket securely, then go back to Step 6 of keyless entry system preliminary inspection.
5	**INSPECT GROUND SCREW INSTALLATION BETWEEN DOOR LOCK CONTROL MODULE AND DOOR LOCK CONTROL MODULE BRACKET** • Are door lock control module and door lock control module bracket connected securely to ground screw?	Yes	Go to next step.
		No	Install screw securely, then go back to Step 6 of keyless entry system preliminary inspection.

STEP	INSPECTION		ACTION
6	**CHECK TO SEE WHETHER MALFUNCTION IS IN TRANSMITTER BATTERY OR ELSEWHERE** • Replace with a known good transmitter battery. • Does keyless entry system operate properly?	Yes	Replace transmitter battery, then go to Step 8.
		No	Go to next step.
7	**CHECK TO SEE WHETHER MALFUNCTION IS IN TRANSMITTER OR DOOR LOCK CONTROL MODULE** • Reprogram door lock control module ID code by using another known good transmitter. • Does keyless entry system operate okay?	Yes	Replace transmitter and reprogram transmitter ID code, then go to next step.
		No	Replace door lock control module and reprogram door lock control module ID code, then go to next step.
8	**RECHECK MALFUNCTION SYMPTOM AFTER REPAIR** • Does keyless entry system operate properly?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction reoccurs.

09–03B SYMPTOM TROUBLESHOOTING [IMMOBILIZER SYSTEM]

FOREWORD

C6U090367000W01

Troubleshooting Index

- Use the chart below verify the symptoms of the trouble in order to diagnose the appropriate area.

No.	Troubleshooting item	Description	Page
1	Security light remains on or does not illuminate.	Malfunction in security light circuit.	(See 09–03B–1 NO.1 SECURITY LIGHT REMAINS ON OR DOES NOT ILLUMINATE)
2	Engine does not start. (When ignition switch is turned to ON position, security light illuminates for **approx. 3 seconds** and goes off.)	Malfunction in starter system circuit.	(See 01–03A–12 NO.3 WILL NOT CRANK [L3]) (See 01–03B–14 NO.3 WILL NOT CRANK [AJ])

NO.1 SECURITY LIGHT REMAINS ON OR DOES NOT ILLUMINATE

C6U090367000W02

1	**Security light remains on or does not illuminate.**
DETECTION CONDITION	Malfunction in security light circuit
POSSIBLE CAUSE	• PCM malfunction • Instrument cluster (print plate) malfunction • Open or short to power supply circuit in wiring harness between instrument cluster and PCM

09–03B

Diagnostic Procedure

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

Step	Inspection		Action
1	**INSPECT OTHER WARNING AND INDICATOR LIGHTS CIRCUIT IN INSTRUMENT CLUSTER** • Turn ignition switch to ON position. • Do other warning and indicator lights illuminate?	Yes	Turn ignition switch to LOCK position, then go to next step.
		No	Inspect instrument cluster power supply system and ground system, then go to Step 4.
2	**INSPECT INSTRUMENT CLUSTER** • Turn ignition switch to LOCK position. • Disconnect negative battery cable. • Disconnect PCM connector. • Connect instrument cluster terminal 1G to ground using jumper wire. • Connect negative battery cable. • Turn ignition switch to ON position. • Does security light illuminate?	Yes	Go to next step.
		No	Replace instrument cluster, then go to Step 4. (See 09–22–3 INSTRUMENT CLUSTER REMOVAL/INSTALLATION)
* 3	**INSPECT WIRING HARNESS BETWEEN INSTRUMENT CLUSTER AND PCM** • Turn ignition switch to LOCK position. • Disconnect negative battery cable. • Disconnect instrument cluster connector. • Inspect wiring harness between instrument cluster terminal 1G and PCM terminal 2W (L3) or 2 (AJ) for following: — Short to ground — Short to power supply — Open circuit • Is wiring harness normal?	Yes	Replace PCM and reprogram immobilizer system, then go to next step. (See 01–40A–6 PCM REMOVAL/INSTALLATION [L3]) (See 01–40B–6 PCM REMOVAL/INSTALLATION [AJ]) (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No	Replace wiring harness, then go to next step.

Step	Inspection		Action
4	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Turn ignition switch to LOCK position. • Disconnect negative battery cable. • Connect instrument cluster connector. • Connect PCM connector. • Connect negative battery cable. • Turn ignition switch to ON position. • Does security light operate properly?	Yes	Complete troubleshooting, then explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

09–10 BODY PANELS

LOCATION INDEX

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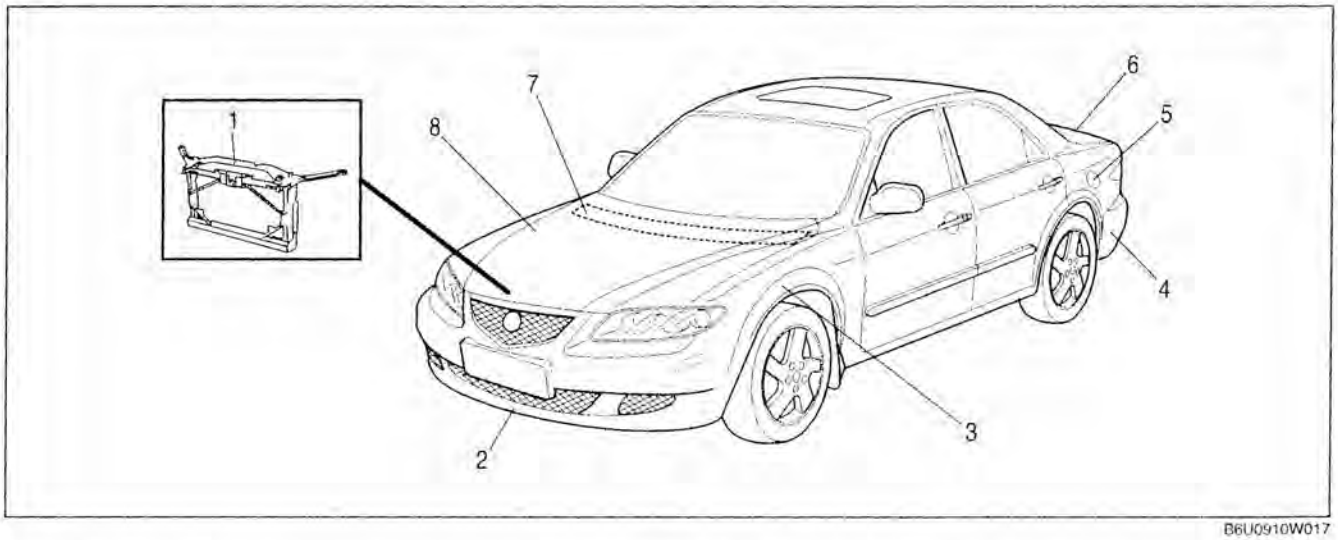

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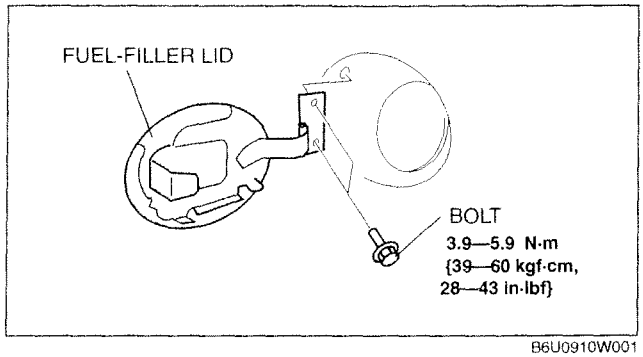
1	Shroud panel (See 09–10–11 SHROUD PANEL REMOVAL/INSTALLATION)
2	Front bumper (See 09–10–7 FRONT BUMPER REMOVAL/INSTALLATION) (See 09–10–8 FRONT BUMPER DISASSEMBLY/ASSEMBLY) Front bumper reinforcement (See 09–10–8 FRONT BUMPER REINFORCEMENT REMOVAL/INSTALLATION)
3	Front fender panel (See 09–10–11 FRONT FENDER PANEL REMOVAL/INSTALLATION)
4	Rear bumper (See 09–10–9 REAR BUMPER REMOVAL/INSTALLATION) Rear bumper reinforcement (See 09–10–10 REAR BUMPER REINFORCEMENT REMOVAL/INSTALLATION)

5	Fuel-filler lid (See 09–10–2 FUEL-FILLER LID REMOVAL/INSTALLATION) (See 09–10–2 FUEL-FILLER LID ADJUSTMENT)
6	Trunk lid (See 09–10–5 TRUNK LID REMOVAL/INSTALLATION) (See 09–10–6 TRUNK LID ADJUSTMENT)
7	Cowl panel (See 09–10–12 COWL PANEL REMOVAL/INSTALLATION)
8	Hood (See 09–10–2 HOOD REMOVAL/INSTALLATION) (See 09–10–3 HOOD ADJUSTMENT)

FUEL-FILLER LID REMOVAL/INSTALLATION

C6U091042410W01

1. Remove the bolts, then remove the fuel-filler lid.
2. Install in the reverse order of removal.
3. Adjust the fuel-filler lid. (See 09–10–2 FUEL-FILLER LID ADJUSTMENT.)



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FUEL-FILLER LID ADJUSTMENT

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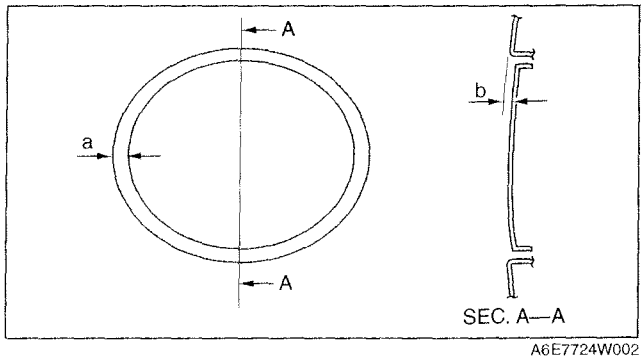
1. If not as specified, loosen the fuel-filler lid installation bolts, and reposition the fuel-filler lid.
2. Measure the gap and height difference between the fuel-filler lid and the body.

Clearance
a: 2.0—4.0 mm {0.079—0.15 in}
b: -1.5—0.5 mm {-0.06—0.019 in}

3. Tighten the bolts.



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HOOD REMOVAL/INSTALLATION

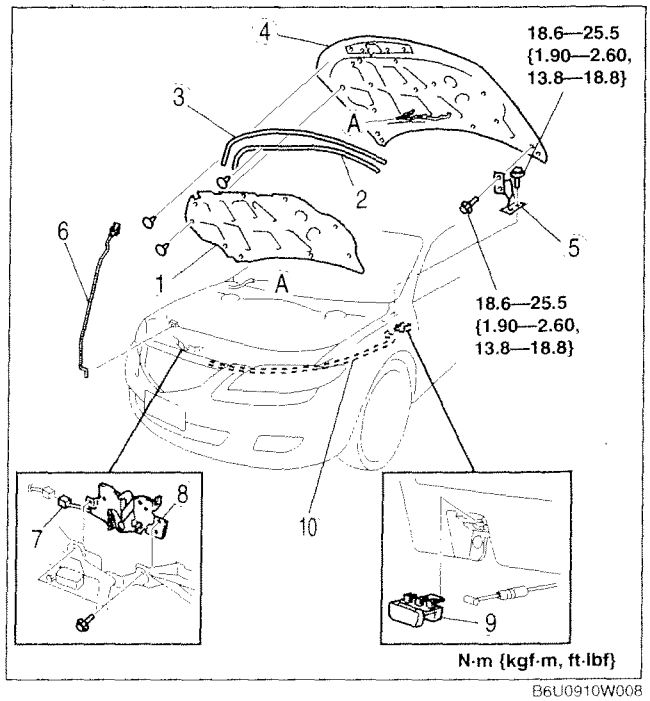
C6U091052310W01

Warning
- **Removing the hood without supporting can be dangerous. The hood may fall and injure you. Always perform the following procedure with at least another person.**

1. Disconnect the windshield washer hose.
2. To remove the hood hinge, remove the front fender panel.
3. To remove the hood lock, remove the radiator grille.
4. To remove the hood release cable, remove the driver-side mud guard.
5. Remove in the order indicated in the table.

1	Hood insulator
2	Shroud seal weatherstrip
3	Parting seal weatherstrip
4	Hood
5	Hood hinge
6	Hood stay
7	Hood switch connector (With theft-deterrent system)
8	Hood lock
9	Hood release lever (See 09–10–3 Hood Release Lever Removal Note)
10	Hood release cable

6. Install in the reverse order of removal.
7. Adjust the hood. (See 09–10–3 HOOD ADJUSTMENT.)



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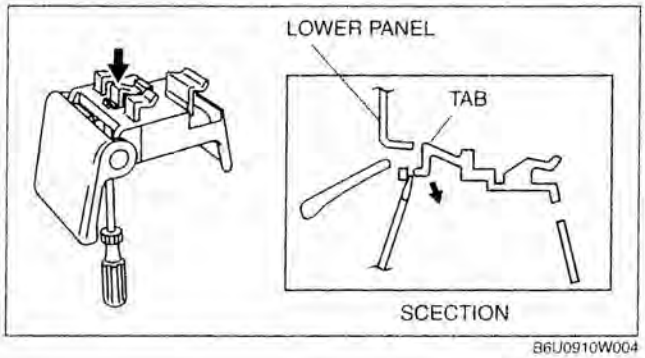
Hood Release Lever Removal Note

1. Pull the hood release lever.
2. While pushing the tab in the direction of the arrow using a tape-wrapped, small flathead screwdriver, pull the hood release lever outward to remove it from the lower panel.

Caution

- **Remove the hood release cable, taking care not damage it by flathead screwdriver**



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HOOD ADJUSTMENT

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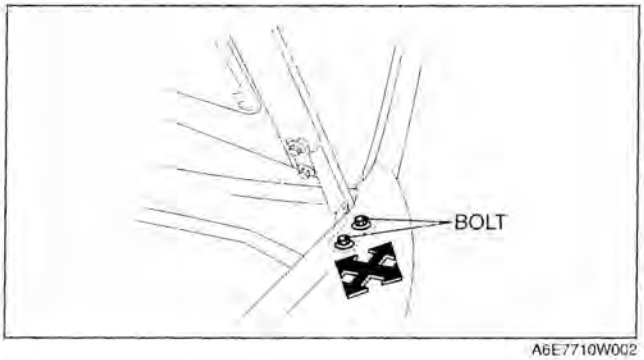
Gap Adjustment

1. Remove the front fender.
2. Loosen the hood hinge installation bolts and reposition the hood.
3. Tighten the bolts.



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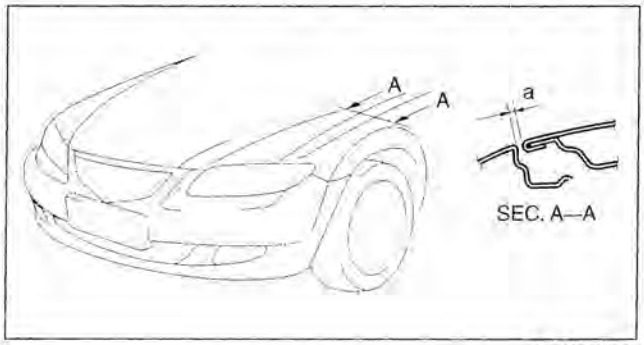
4. Verify that the gap between the hood and the body is within the specification.

Clearance

a: 2.5—4.5 mm {0.10—0.17 in}



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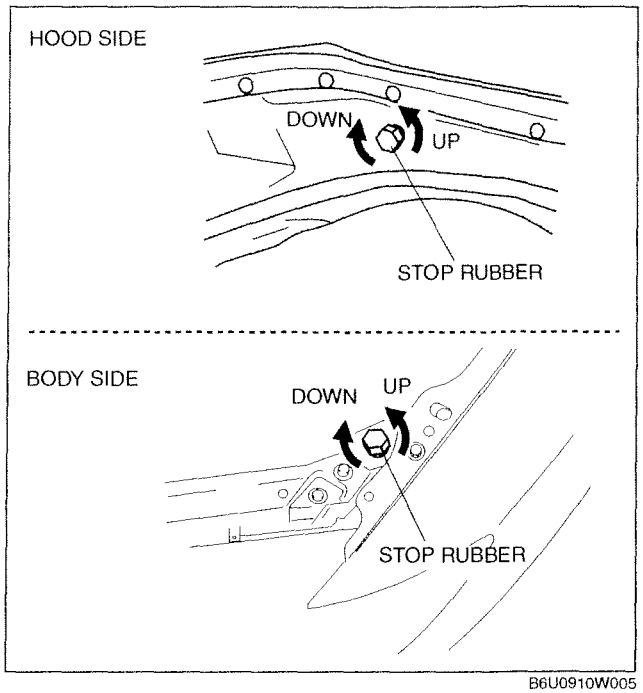
Height Adjustment

1. Turn the stop rubber to adjust the height of the hood.



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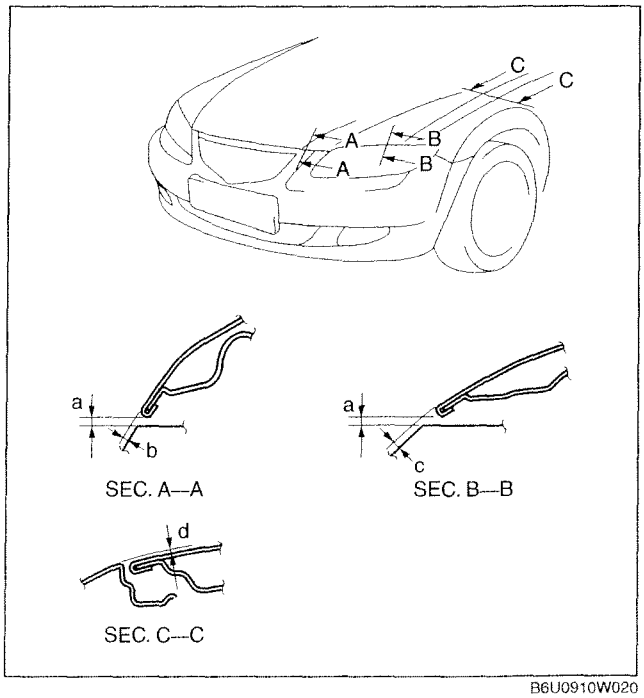
2. Verify that the height difference between the hood and the body is within the specification.

Clearance

a: 3.0—6.0 mm {0.12—0.23 in}
b: 2.5—5.5 mm {0.10—0.22 in}
c: 2.4—5.4 mm {0.09—0.21 in}
d: -1.0—1.0 mm {-0.04—0.04 in}



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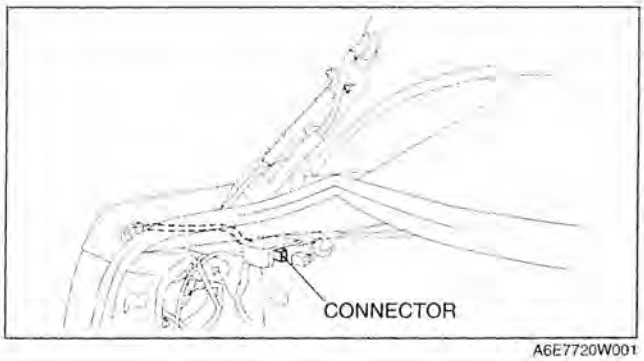
TRUNK LID REMOVAL/INSTALLATION

C6U091052610W01

Warning

- **Removing the stay damper without supporting the trunk lid can be dangerous. The trunk lid may fall and injure you. Open the trunk lid fully and support it before removing the stay damper.**

1. Disconnect the negative battery cable.
2. Disconnect the trunk lid harness connector, and pull the trunk lid harness out from the cabin.



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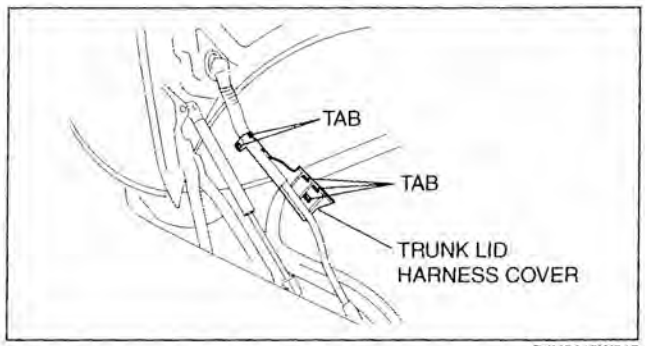
3. Disconnect the tabs, which secure the trunk lid harness to the trunk lid hinge.



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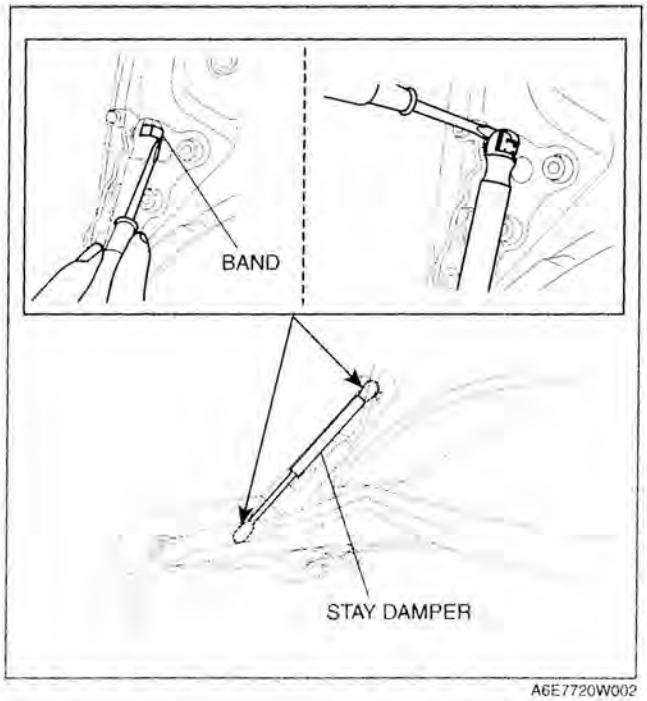
4. Pry away the stay damper band with a screwdriver.
5. Pry out the connecting part of the stay damper and the hinge with a screwdriver to disconnect them. Then remove the stay damper.



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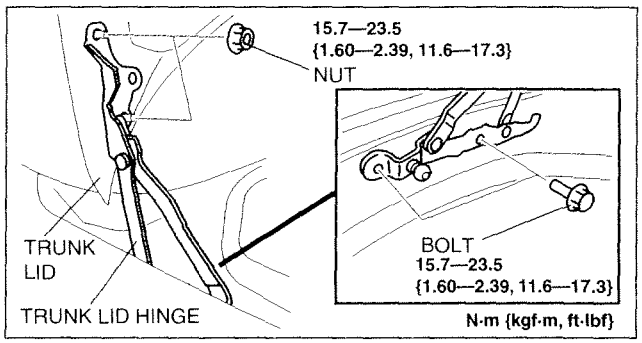
6. Remove the nuts, then remove the trunk lid.
7. Remove the bolts, then remove the trunk lid hinge.
8. Install in the reverse order of removal.
9. Adjust the trunk lid. (See 09–10–6 TRUNK LID ADJUSTMENT.)



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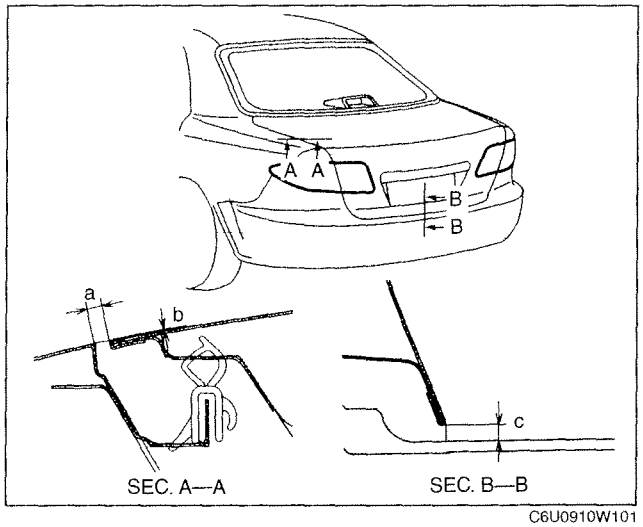
TRUNK LID ADJUSTMENT

C6U091052610W02

1. Measure the gap and height difference between the trunk lid and the body.
2. If not as specified, loosen the trunk lid hinge installation bolts or the trunk lid lock striker installation screws, and reposition the trunk lid.

   Clearance
   a: 2.5—4.5 mm {0.10—0.18 in}
   b: -1.0—1.0 mm {-0.04—0.04 in}
   c: 4.0—8.0 mm {0.16—0.31 in}

3. Tighten the bolts or screws.



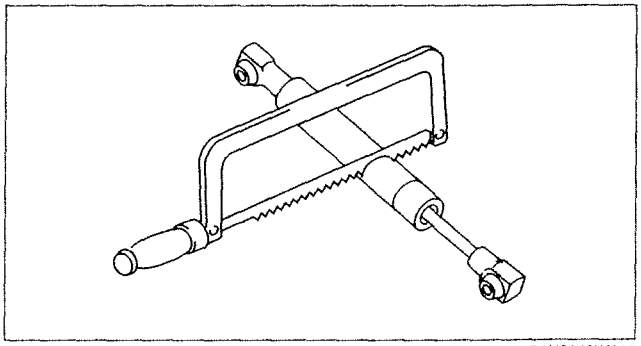
C6U0910W101

STAY DAMPER DISPOSAL

C6U091052610W03

Note
- The gas in the stay damper is colorless, odorless, and non-toxic.

1. Wear protective eye wear.
2. Lay the stay damper flat.
3. Saw through the stay damper body using a hacksaw.
4. Allow the gas to escape from the stay damper.
5. Discard the stay damper.



B6U0910W018

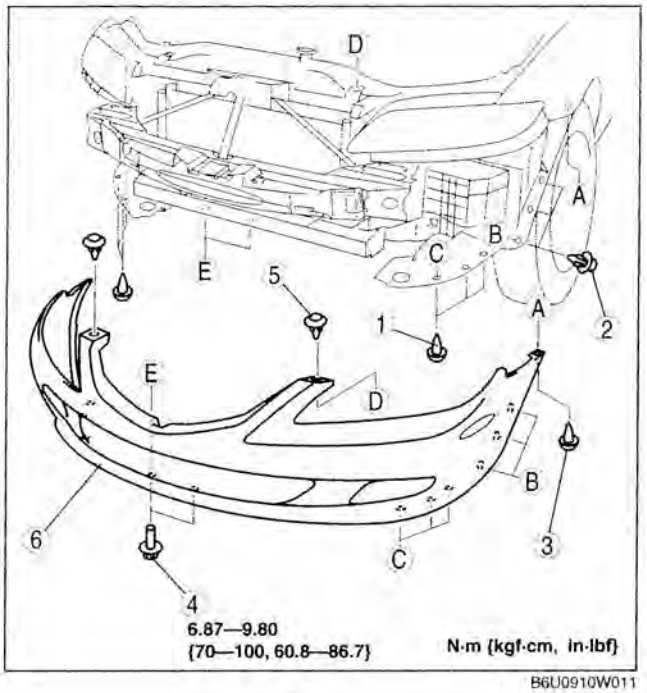
FRONT BUMPER REMOVAL/INSTALLATION

C6U091050031W01

1. Disconnect the negative battery cable.
2. Disconnect the front side maker light connector.
3. Remove in the order indicated in the table.

1	Screw A
2	Fastener A
3	Screw B
4	Bolt
5	Fastener B
6	Front bumper (See 09–10–7 Front Bumper Removal Note) (See 09–10–7 Front Bumper Installation Note)

4. Install in the reverse order of removal.



B6U0910W011

09–10

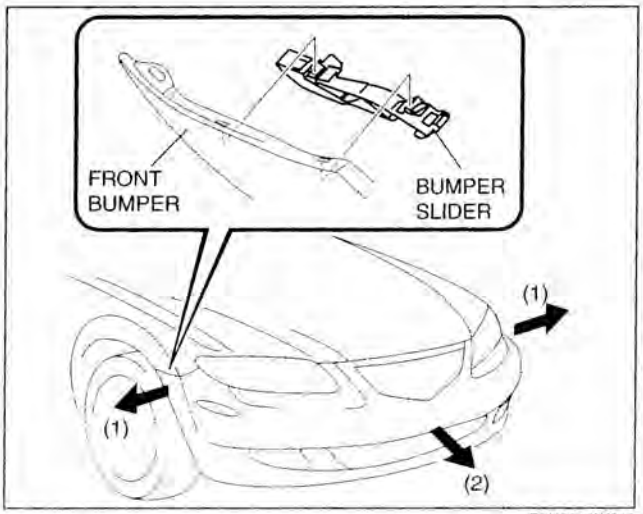
Front Bumper Removal Note

1. Pull the front bumper ends (wheel arch) outward to disengage from the bumper slider.

Caution

- **If only one side of the front bumper is disengaged from the bumper slider and the bumper falls, it could be damaged. When disengaging the front bumper from the slider, secure the bumper so that it does not fall.**

2. Remove the front bumper from the body.



B6U0910W012

Front Bumper Installation Note

1. Spread the front bumper ends (wheel arches) apart.
2. Attach the front bumper to the body.
3. Press the front bumper connecting area into the body to engage with the bumper slider.

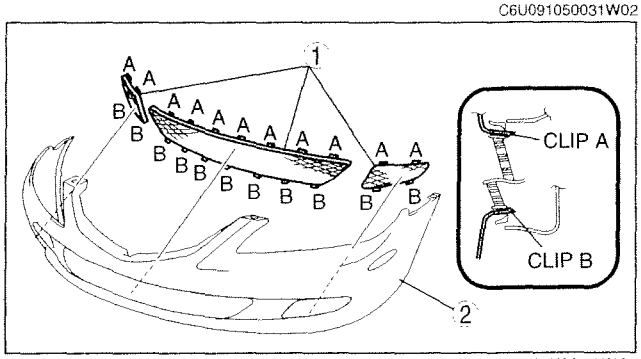
FRONT BUMPER DISASSEMBLY/ASSEMBLY

C6U091050031W02

1. Disassemble in the order indicated in the table.

1	Front bumper mesh
2	Front bumper fascia

2. Assemble in the reverse order of disassembly.



B6U0910W002

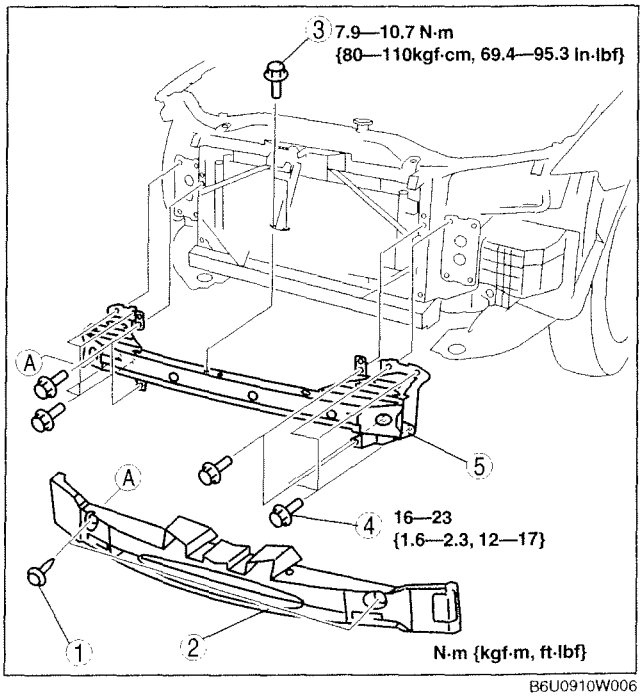
FRONT BUMPER REINFORCEMENT REMOVAL/INSTALLATION

C6U091050031W03

1. Disconnect the negative battery cable.
2. Remove the front bumper. (See 09–10–7 FRONT BUMPER REMOVAL/INSTALLATION.)
3. Remove the headlight. (See 09–18–6 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
4. Support the radiator and the condenser using the wire.
5. Remove in the order indicated in the table.

1	Fastener
2	Front energy-absorbing foam
3	Bolt
4	Bolt
5	Front bumper reinforcement

6. Install in the reverse order of removal.



B6U0910W006

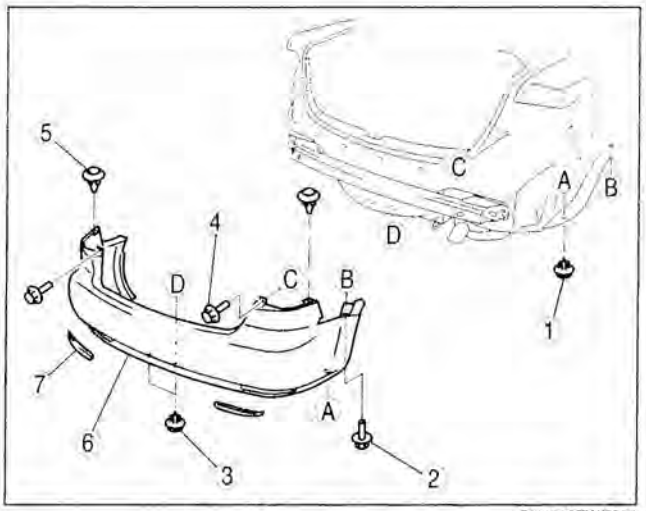
REAR BUMPER REMOVAL/INSTALLATION

C6U091050221W01

1. Disconnect the negative battery cable.
2. Remove the rear combination light.
3. Remove in the order indicated in the table.

1	Fastener A
2	Screw A
3	Fastener B
4	Screw B
5	Fastener C
6	Rear bumper (See 09–10–9 Rear bumper Removal Note) (See 09–10–9 Rear bumper Installation Note)
7	Reflector (See 09–10–10 Reflector Removal Note)

4. Install in the reverse order of removal.



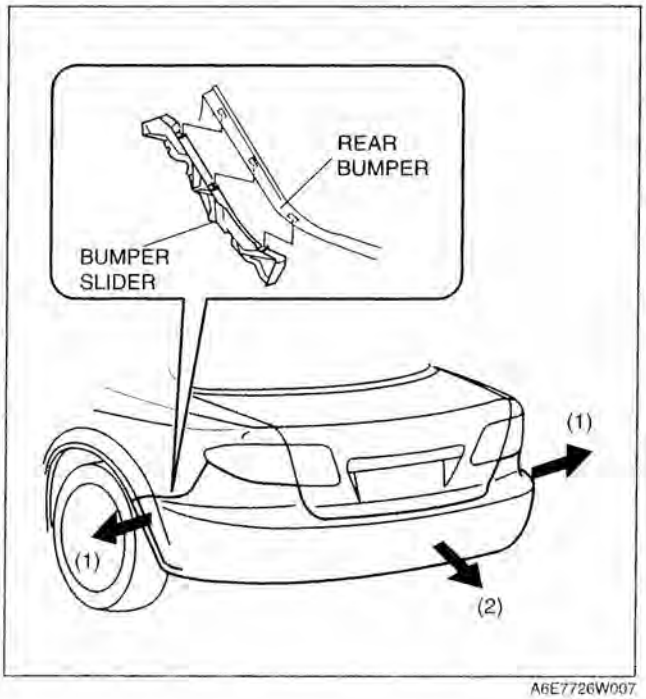
C6U910ZWC001

Rear bumper Removal Note

1. Pull the rear bumper ends (wheel arch) outward to disengage from the bumper slider.

Caution

- **If only one side of the rear bumper is disengaged from the bumper slider and the bumper falls, it could be damaged. When disengaging the rear bumper from the slider, secure the bumper so that it does not fall.**



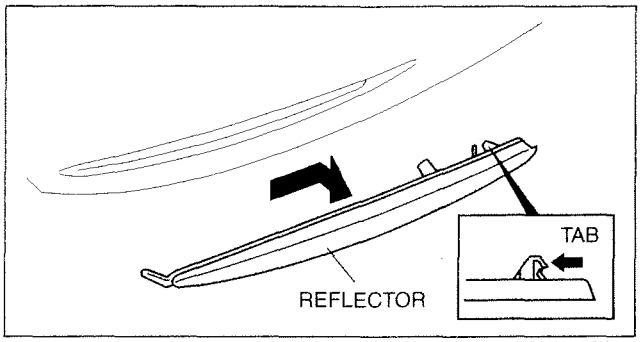
A6E7726W007

Rear bumper Installation Note

1. Spread the rear bumper ends (wheel arches) apart.
2. Attach the rear bumper to the body.
3. Press the rear bumper connecting area into the body to engage with the bumper slider.

Reflector Removal Note

1. Lift the reflector up in the direction of the arrow, then unhook it from the rear bumper.

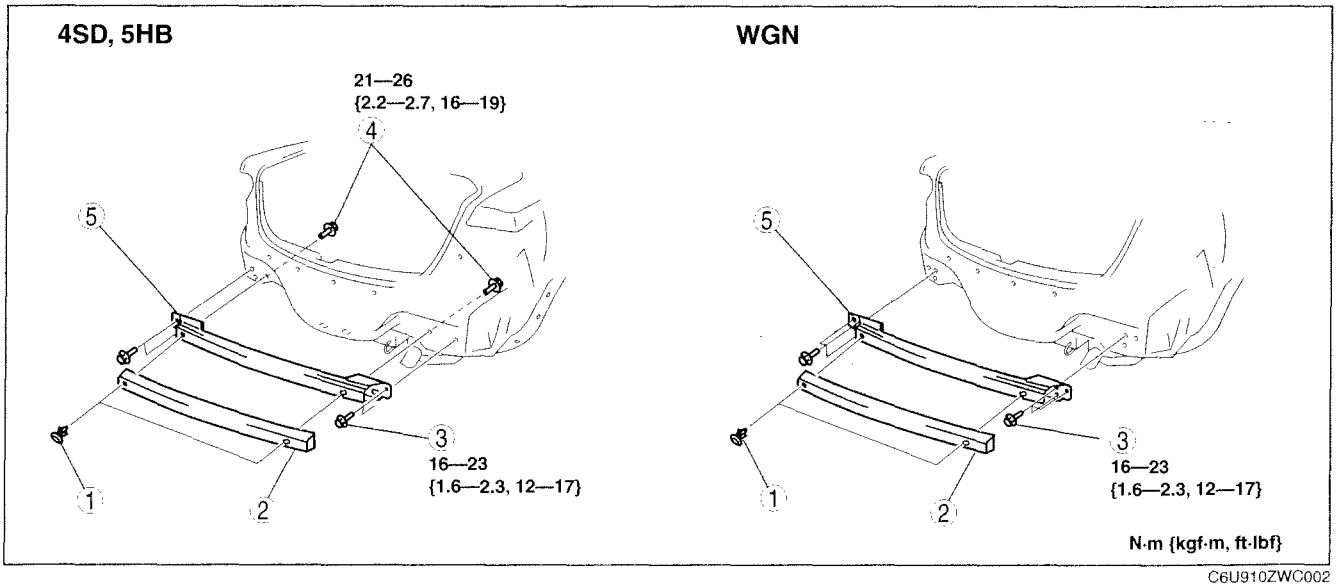


B6U0910W016

REAR BUMPER REINFORCEMENT REMOVAL/INSTALLATION

C6U091050221W02

1. Disconnect the negative battery cable.
2. Remove the trunk side trim. (See09–17–14 TRUNK SIDE TRIM REMOVAL/INSTALLATION.)
3. Remove the rear bumper. (See 09–10–9 REAR BUMPER REMOVAL/INSTALLATION.)
4. Remove in the order indicated in the table.



C6U910ZWC002

1	Fastener
2	Rear energy-absorbing foam
3	Bolt A

4	Bolt B
5	Rear bumper reinforcement

5. Install in the reverse order of removal.

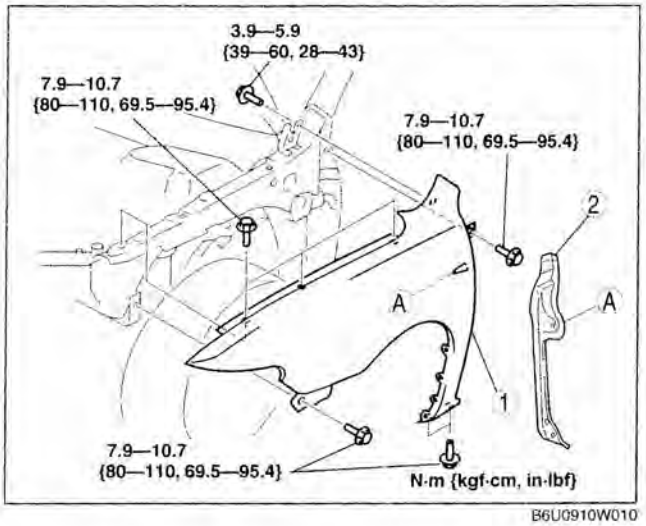
FRONT FENDER PANEL REMOVAL/INSTALLATION

C6U091052110W01

1. Disconnect the negative battery cable.
2. Remove the fender molding. (See 09–16–3 COWL GRILLE REMOVAL/INSTALLATION.)
3. Remove the front bumper. (See 09–10–7 FRONT BUMPER REMOVAL/INSTALLATION.)
4. Remove the front combination light. (See 09–18–6 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
5. Remove in the order indicated in the table.

1	Front fender panel
2	Seal plate

6. Install in the reverse order of removal.



B6U0910W010

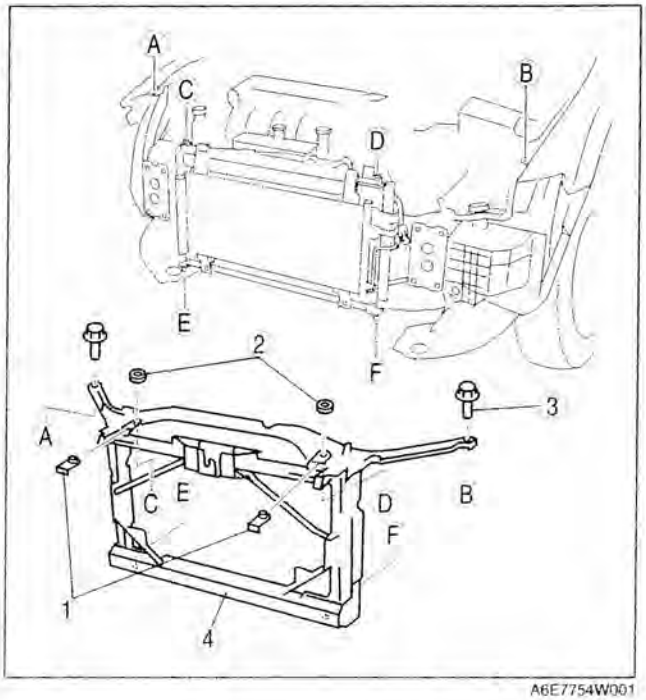
SHROUD PANEL REMOVAL/INSTALLATION

C6U091053140W01

1. Remove the hood. (See 09–10–2 HOOD REMOVAL/INSTALLATION.)
2. Remove the front bumper. (See 09–10–7 FRONT BUMPER REMOVAL/INSTALLATION.)
3. Remove the front combination light. (See 09–18–6 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
4. Remove the front bumper reinforcement. (See 09–10–8 FRONT BUMPER REINFORCEMENT REMOVAL/INSTALLATION.)
5. Remove in the order indicated in the table.

1	Radiator mount cover
2	Radiator mount rubber
3	Bolt
4	Shroud panel

6. Install in the reverse order of removal.



A6E7754W001

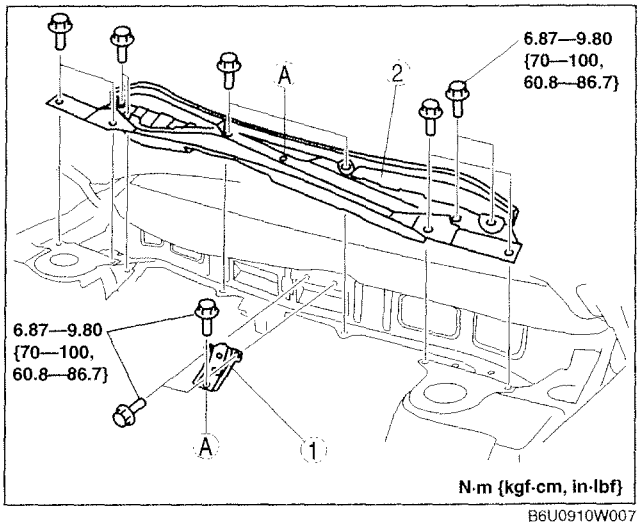
COWL PANEL REMOVAL/INSTALLATION

C6U091053580W01

1. Remove the windshield wiper arm and blade. (See 09–19–3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
2. Remove the cowl grille.
3. Remove the windshield wiper motor. (See 09–19–4 WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION.)
4. Remove in the order indicated in the table.

1	Gusset
2	Cowl panel

5. Install in the reverse order of removal.

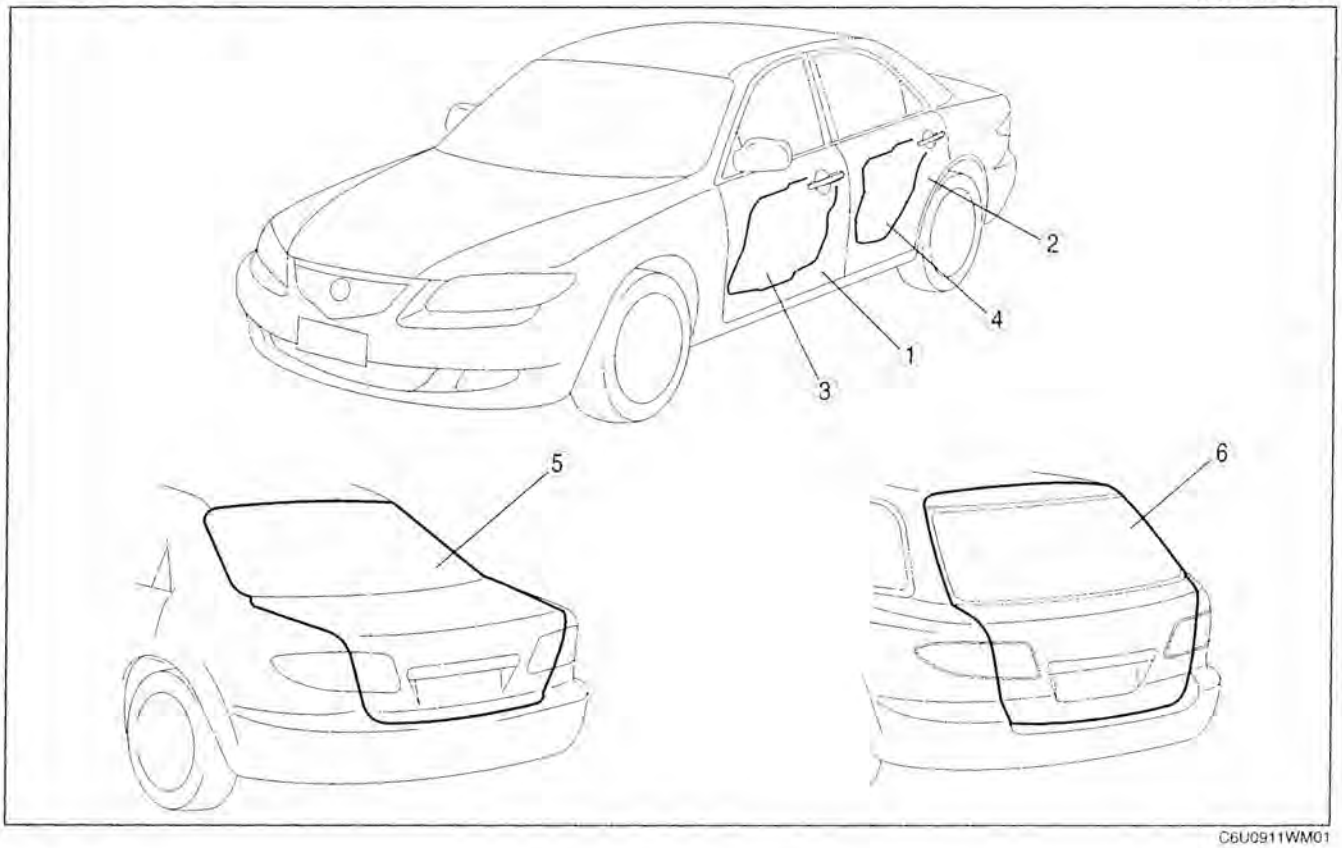


B6U0910W007

09–11 DOORS AND LIFTGATE

LOCATION INDEX

C6U091158010W01



C6U0911WM01

1	Front door (See 09–11–2 FRONT DOOR REMOVAL/ INSTALLATION) (See 09–11–3 DOOR ADJUSTMENT)
2	Rear door (See 09–11–2 REAR DOOR REMOVAL/ INSTALLATION) (See 09–11–3 DOOR ADJUSTMENT)
3	Front door unit (See 09–11–4 FRONT DOOR UNIT REMOVAL/ INSTALLATION)

4	Rear door unit (See 09–11–4 REAR DOOR UNIT REMOVAL/ INSTALLATION)
5	Liftgate [5HB] (See 09–11–5 LIFTGATE REMOVAL/ INSTALLATION [5HB]) (See 09–11–8 LIFTGATE ADJUSTMENT [5HB])
6	Liftgate [5HB] (See 09–11–7 LIFTGATE REMOVAL/ INSTALLATION [WGN]) (See 09–11–9 LIFTGATE ADJUSTMENT [WGN])

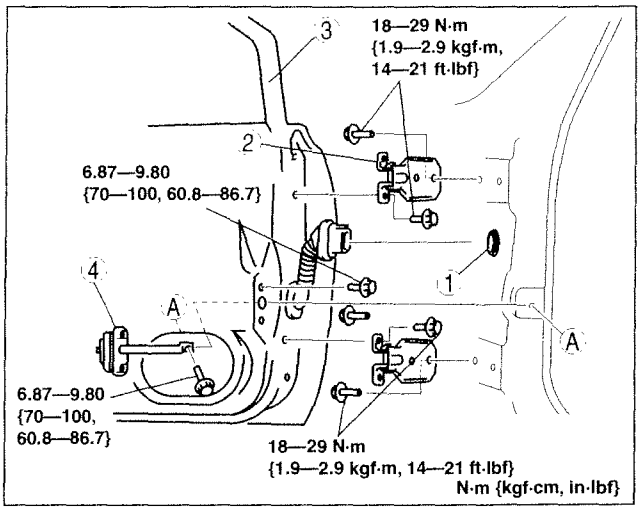
FRONT DOOR REMOVAL/INSTALLATION

C6U091158010W02

1. Disconnect the negative battery cable.
2. To remove the front door hinge, remove the front fender panel.
3. To remove the checker, remove the front door speaker.
4. Remove in the order indicated in the table.

1	Connector (See 09–11–2 Connector Removal Note)
2	Front door hinge
3	Front door
4	Checker

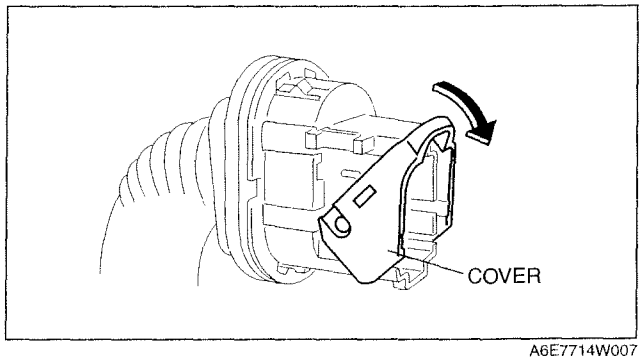
5. Install in the reverse order of removal.
6. Adjust the front door. (See 09–11–3 DOOR ADJUSTMENT.)



B6U0911W003

Connector Removal Note

1. Pull down the cover in the direction of the arrow and disconnect the connector.



A6E7714W007

REAR DOOR REMOVAL/INSTALLATION

C6U091172010W01

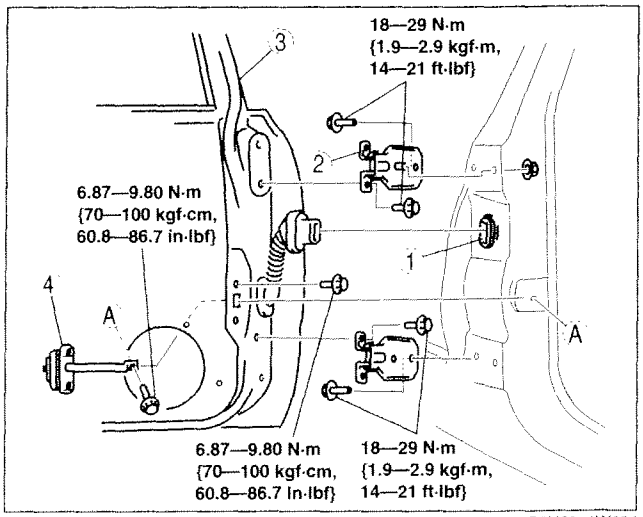
Warning

- **The side air bag sensor is attached to the lower part of the B-pillar. When working around the B-pillar, disconnect the negative battery cable or work carefully, avoiding excessive impact to the lower part of the B-pillar.**

1. Disconnect the negative battery cable.
2. To remove the checker, remove the rear door speaker.
3. Remove in the order indicated in the table.

1	Connector
2	Rear door hinge
3	Rear door
4	Checker

4. Install in the reverse order of removal.
5. Adjust the rear door. (See 09–11–3 DOOR ADJUSTMENT.)



B6U0911W004

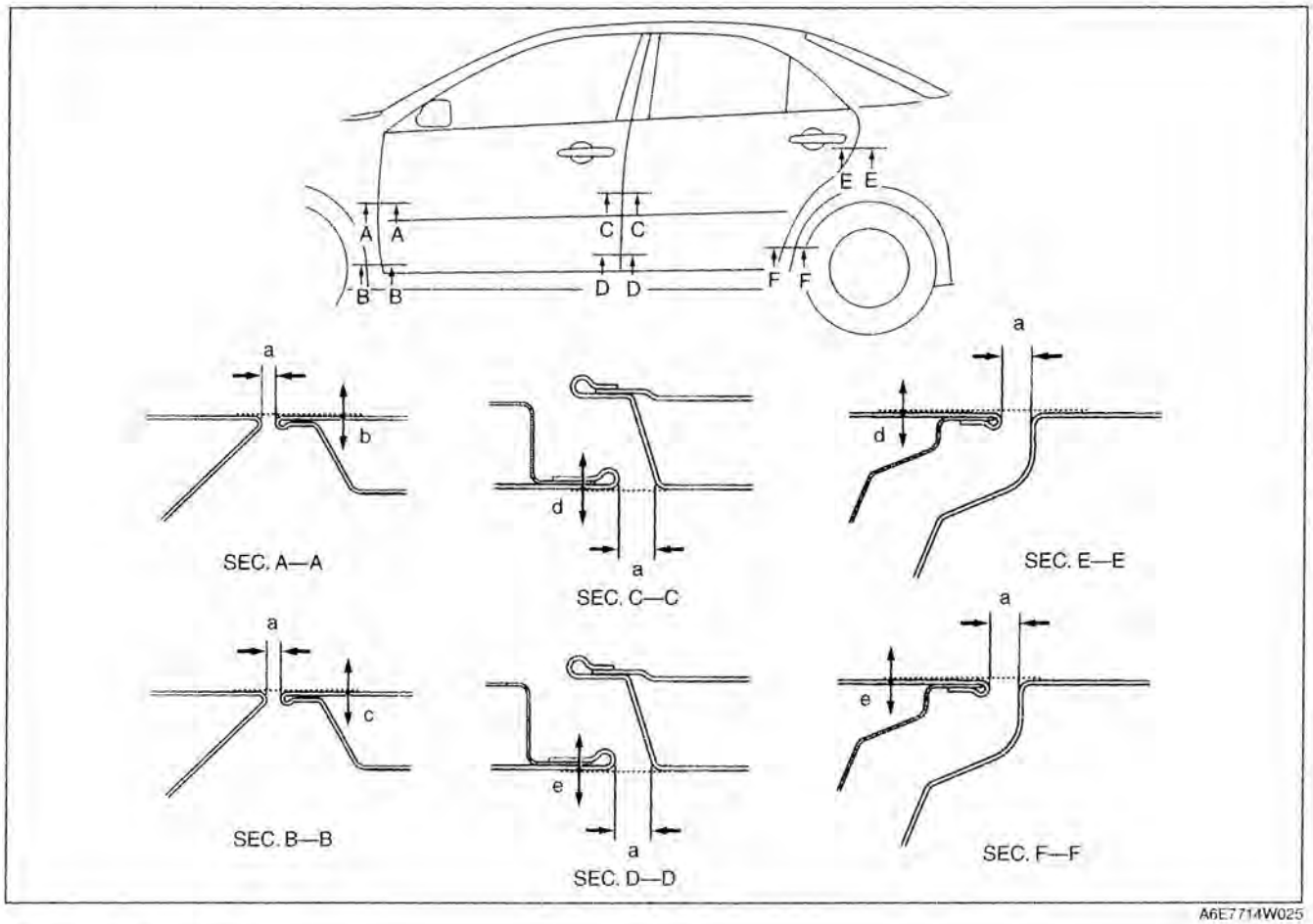
DOOR ADJUSTMENT

C6U09115B010W03

1. Measure the gap and height difference between the front or rear door and the body.
2. If not as specified, loosen the front or rear door hinge installation bolts or the door lock striker installation screws, and reposition the door.

Clearance

a: 2.5—4.5 mm {0.10—0.18 in}
b: -0.8—1.2 mm {-0.03—0.05 in}
c: -0.3—1.7 mm {-0.01—0.07 in}
d: -1.0—1.0 mm {-0.04—0.04 in}
e: -0.5—1.5 mm {-0.02—0.06 in}



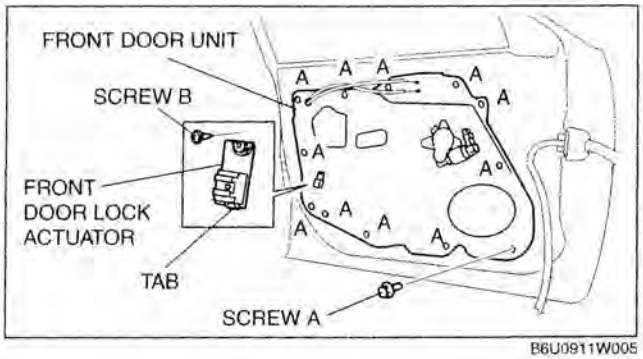
A6E7714W025

3. Tighten the bolts or screws.

FRONT DOOR UNIT REMOVAL/INSTALLATION

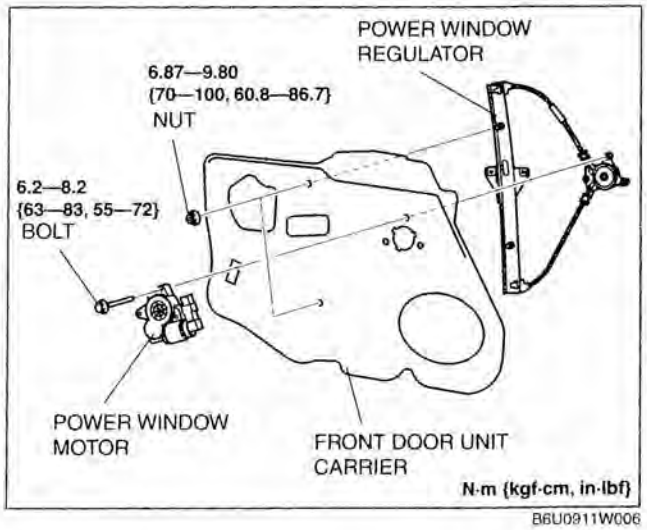
C6U091158971W01

1. Remove the front door glass.
2. Remove the inner handle.
3. Remove the front door speaker.
4. Disconnect the power window motor connector, front door lock actuator connector, and the power outside mirror connector.
5. Remove the front door harness from the front door unit.
6. Remove screws A.
7. Remove the screw B.
8. Remove the front door actuator tab from the front door unit.
9. Pull the front door unit slightly outward, and while keeping the power window regulator from catching on the front door, remove the front door unit from the front door.
10. Pull out the inner handle cable and door lock knob cable from the hole.



B6U0911W005

11. Remove the power window motor and power window regulator from the front door unit carrier.
12. Install in the reverse order of removal.

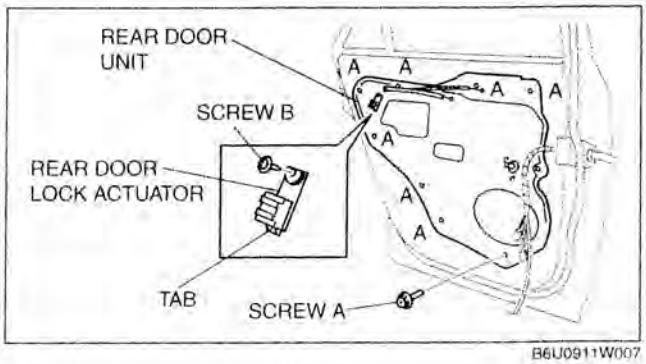


B6U0911W006

REAR DOOR UNIT REMOVAL/INSTALLATION

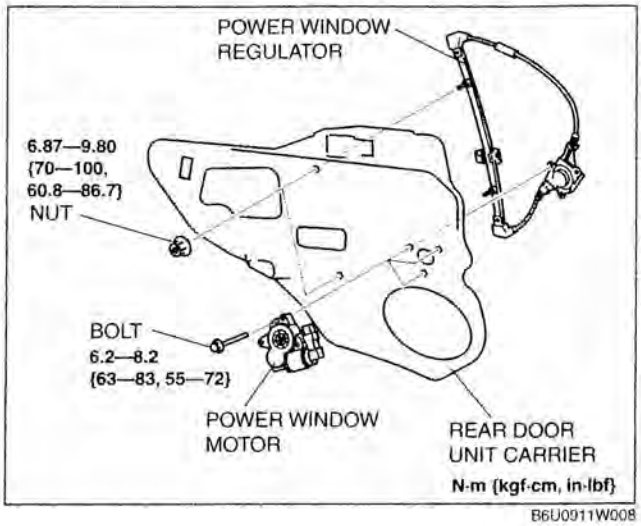
C6U091158971W02

1. Remove the rear door glass.
2. Remove the inner handle.
3. Remove the rear door speaker.
4. Disconnect the power window motor connector and rear door lock actuator connector.
5. Remove the rear door harness from the rear door unit.
6. Remove screws A.
7. Remove the screw B.
8. Remove the rear door lock actuator tab from the rear door unit.
9. Pull the rear door unit slightly outward, and while keeping the power window regulator from catching on the rear door, remove the rear door unit from the rear door.
10. Pull out the inner handle cable and door lock knob cable from the hole.



B6U0911W007

11. Remove the power window motor and power window regulator from the rear door unit carrier.
12. Install in the reverse order of removal.



B6U0911W008

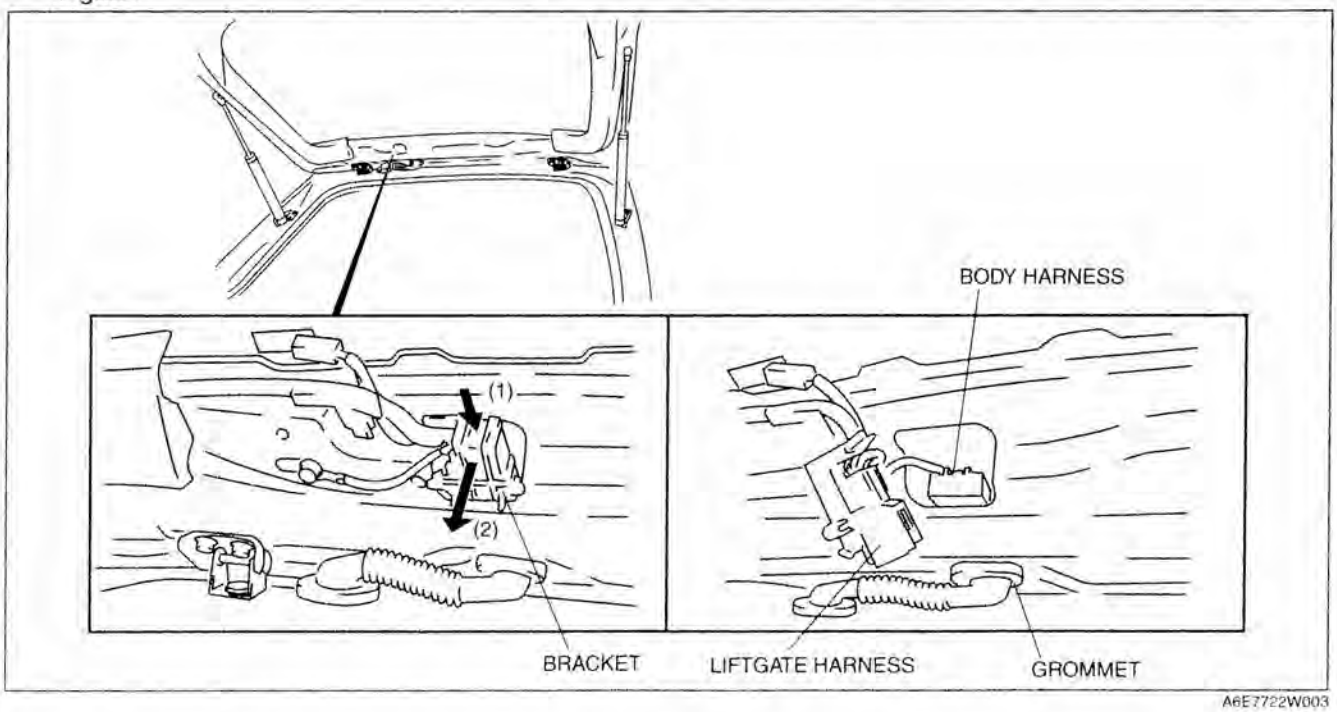
LIFTGATE REMOVAL/INSTALLATION [5HB]

C6U091162010W02

Warning

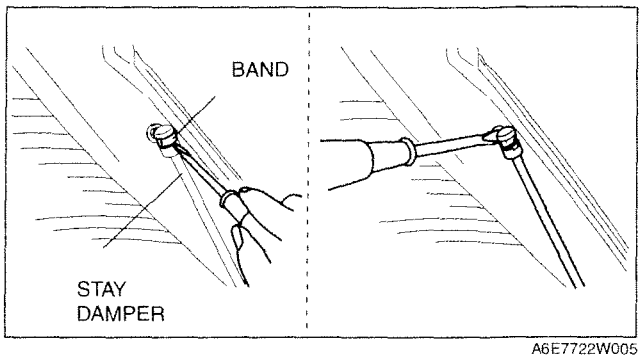
- **Removing the stay damper without supporting the liftgate can be dangerous. The liftgate may fall and injure you. Open the liftgate fully and support it before removing the stay damper.**

1. Disconnect the negative battery cable.
2. Remove the liftgate upper trim. (See 09–17–18 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION [5HB, WGN])
3. Remove the liftgate side trim. (See 09–17–19 LIFTGATE SIDE TRIM REMOVAL/INSTALLATION [5HB, WGN])
4. Remove the liftgate lower trim. (See 09–17–20 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION [5HB, WGN])
5. Press the liftgate harness connector's bracket, which is attached to the liftgate, to the (1) direction shown in the figure, and then detach the fit. Then remove the connector toward the (2) direction shown in the figure.
6. Disconnect the vehicle harness connector and the liftgate connector. Then remove the grommet from the liftgate.

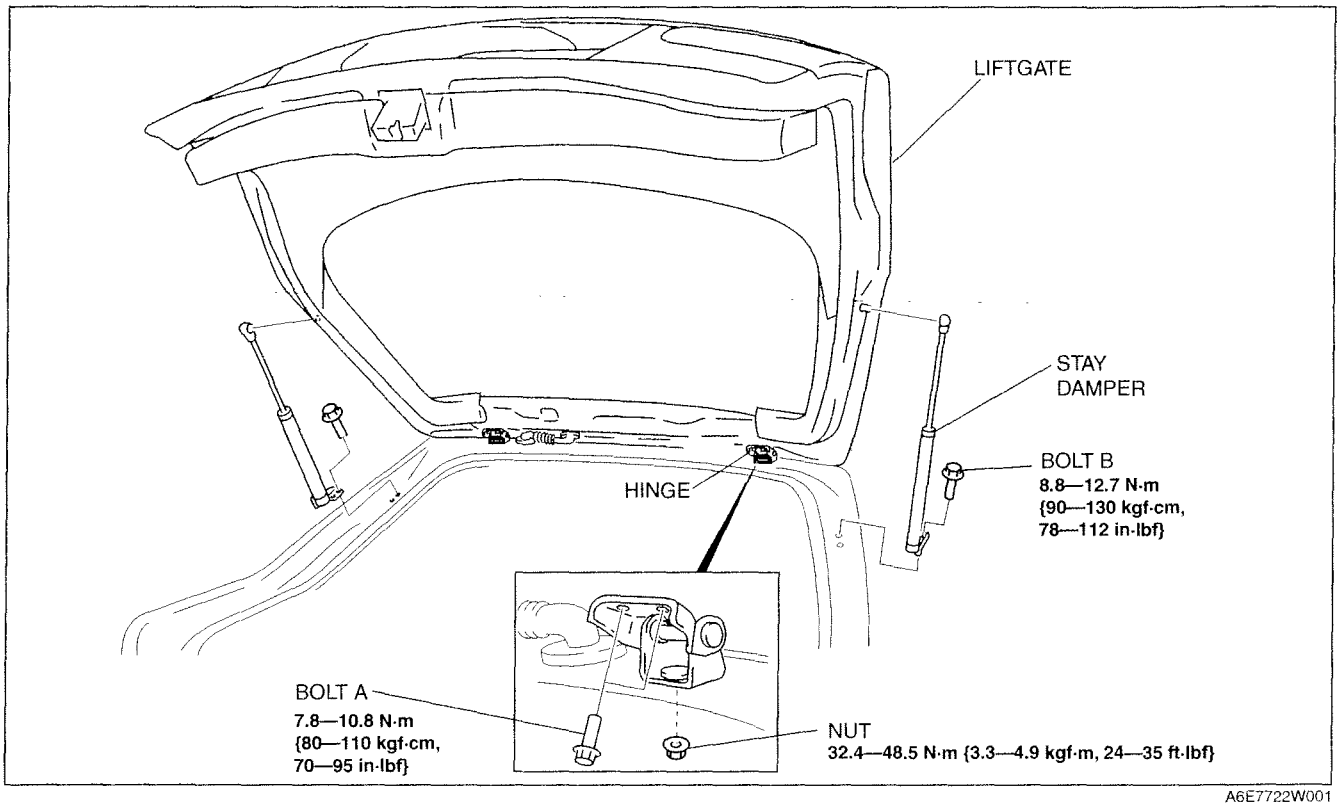


A6E7722W003

7. Pry away the stay damper's band with a screwdriver.
8. Pry out the connecting part of the stay damper and the hinge with a screwdriver to disconnect them. Then remove the stay damper.
9. Remove the bolts A, then remove the liftgate.
10. To remove the hinge, remove the headliner and the nut.
11. To remove the stay damper, remove the bolt B.



A6E7722W005



A6E7722W001

12. Install in the reverse order of removal.

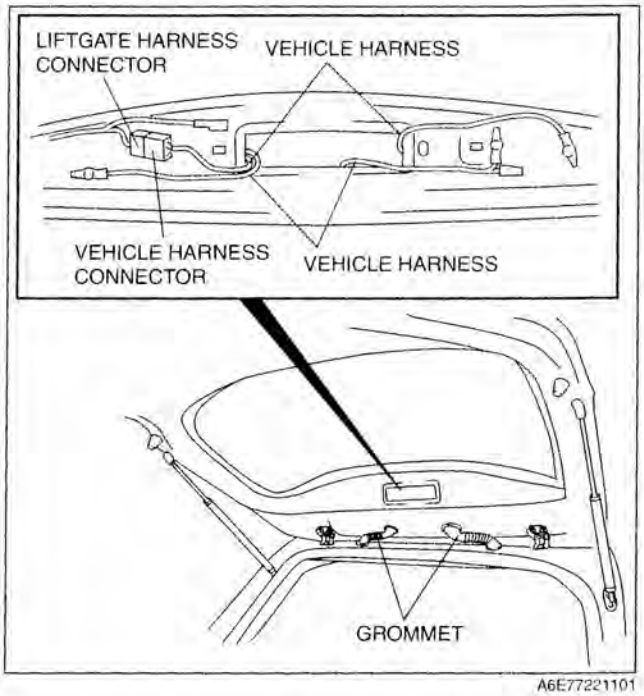
LIFTGATE REMOVAL/INSTALLATION [WGN]

C6U091162010W03

Warning

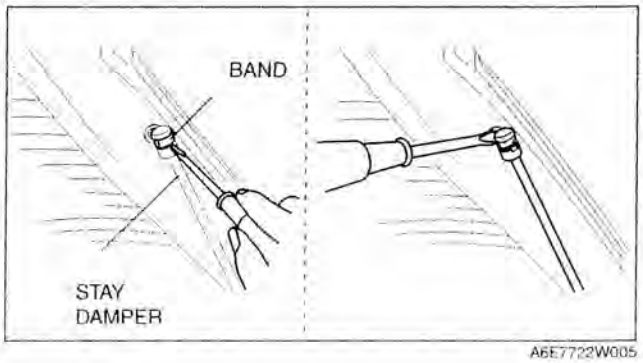
- **Removing the stay damper without supporting the liftgate can be dangerous. The liftgate may fall and injure you. Open the liftgate fully and support it before removing the stay damper.**

1. Disconnect the negative battery cable.
2. Remove the liftgate upper trim. (See 09–17–18 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION [5HB, WGN])
3. Remove the liftgate side trim. (See 09–17–19 LIFTGATE SIDE TRIM REMOVAL/INSTALLATION [5HB, WGN])
4. Remove the liftgate lower trim. (See 09–17–20 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION [5HB, WGN])
5. Disconnect the rear washer hose.
6. Disconnect the vehicle harness and the vehicle harness connector, attached to the liftgate, from the liftgate harness connector.



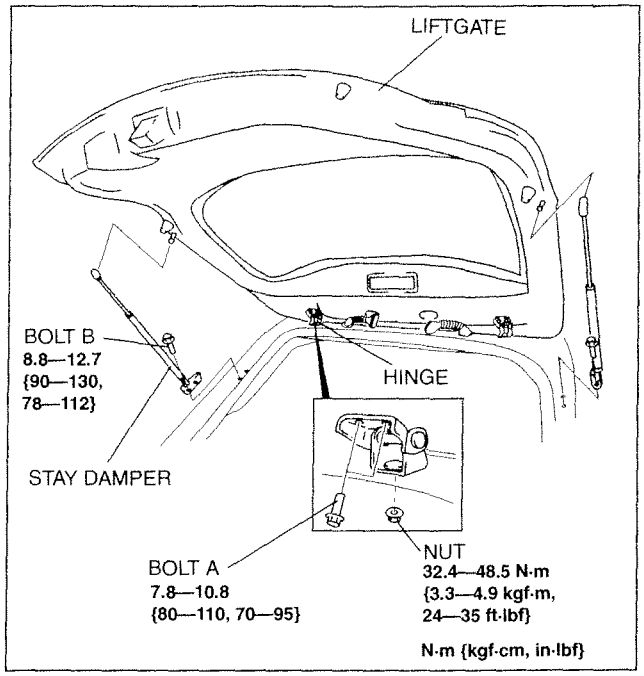
A6E77221101

7. Pry away the stay damper's band with a screwdriver.
8. Pry out the connecting part of the stay damper and the hinge with a screwdriver to disconnect them. Then remove the stay damper.
9. Remove the bolts A, then remove the liftgate.
10. To remove the hinge, remove the headliner and the nut.



A6E7722W005

11. To remove the stay damper, remove the bolt B.
12. Install in the reverse order of removal.



A6E77221102

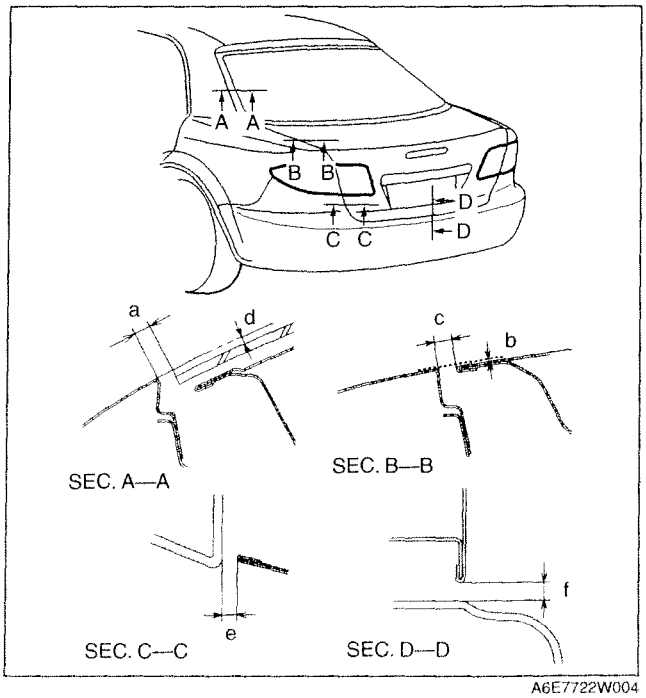
LIFTGATE ADJUSTMENT [5HB]

C6U091162010W04

1. Measure the gap and height between the liftgate and the body.
2. If not as specified, loosen the liftgate hinge installation bolts or the liftgate striker installation screws, and reposition the liftgate.

Clearance
a: 3.0—7.0 mm {0.12—0.28 in}
b: -1.0—3.4 mm {-0.04—013 in}
c: 2.8—5.2 mm {0.11—0.24 in}
d: -1.2—1.2 mm {0.05—0.05 in}
e: 2.8—5.8 mm {0.11—0.22 in}
f:4.0—8.0 mm {0.16—0.31 in}

3. Tighten the bolts or screws.



A6E7722W004

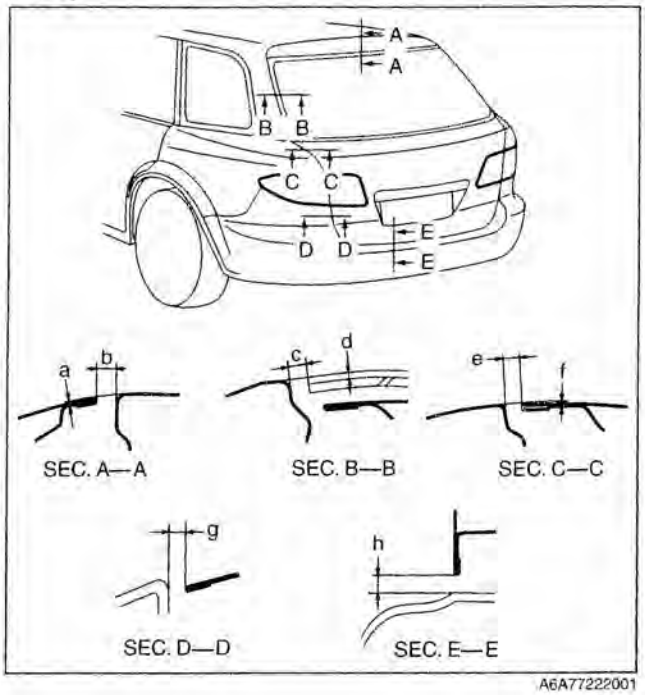
LIFTGATE ADJUSTMENT [WGN]

C6U091162010W05

1. Measure the gap and height between the liftgate and the body.
2. If not as specified, loosen the liftgate hinge installation bolts or the liftgate striker installation screws, and reposition the liftgate.

Clearance
a: 0—2.0 mm {0—0.07 in}
b: 4.8—6.8 mm {0.19—0.26 in}
c: 3.5—7.5 mm {0.14—0.29 in}
d: 1.2—3.2 mm {0.05—0.12 in}
e: 2.8—5.2 mm {0.11—0.20 in}
f: -0.7—1.7 mm {-0.02—0.06 in}
g: 2.3—5.7 mm {0.10—0.22 in}
h: 4.0—8.0 mm {0.16—0.31 in}

3. Tighten the bolts or screws.



A6A77222001

STAY DAMPER DISPOSAL

C6U091162010W06

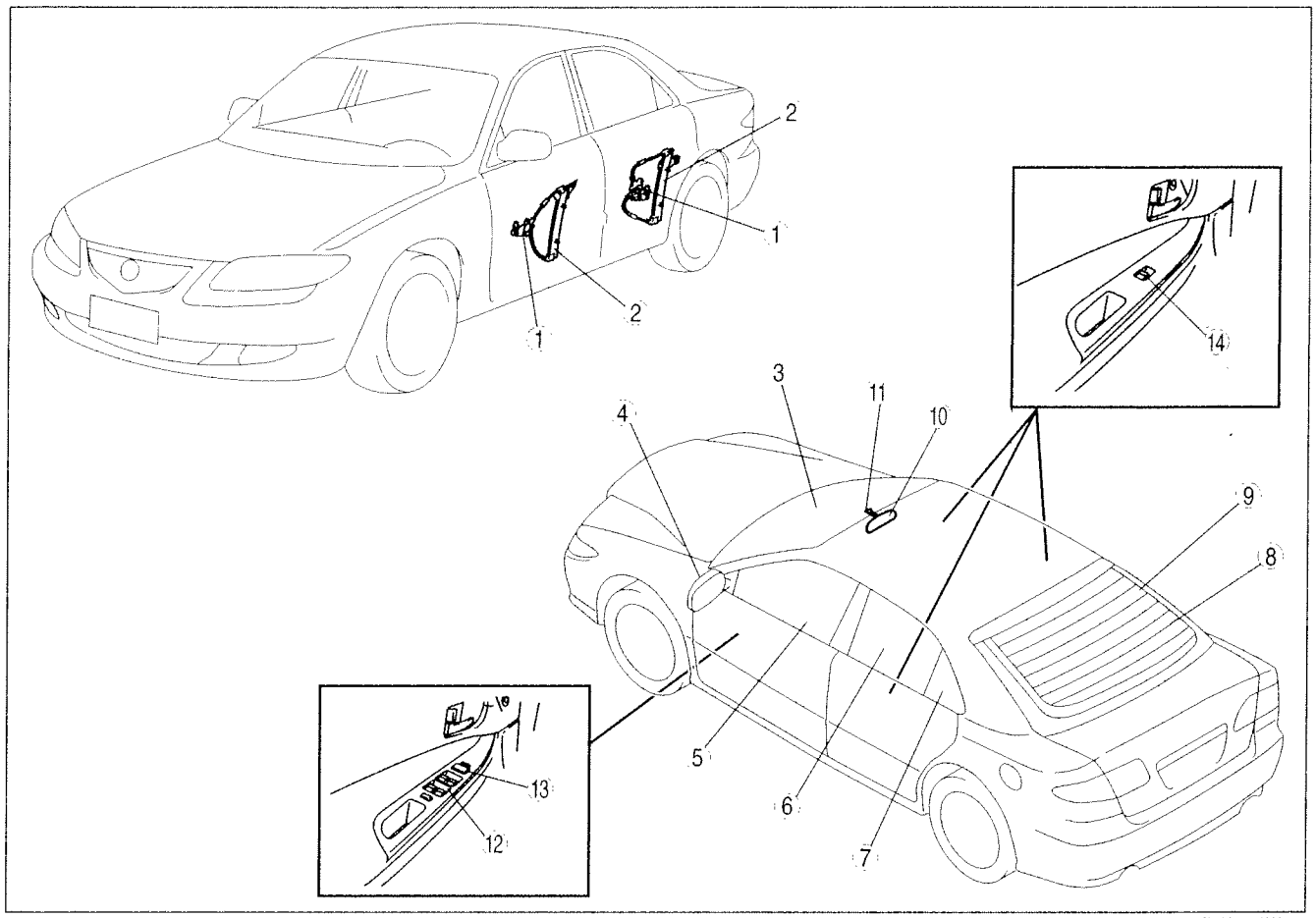
1. Referring to procedures for trunk lid stay damper disposal, dispose of the liftgate stay damper.

09–12 GLASS/WINDOWS/MIRRORS

09–12

LOCATION INDEX

C6U091201048W01



B6U0912W032

1	Power window motor (See 09–12–5 POWER WINDOW MOTOR REMOVAL/INSTALLATION) (See 09–12–5 POWER WINDOW MOTOR INSPECTION)
2	Power window regulator (See 09–12–4 POWER WINDOW REGULATOR REMOVAL/INSTALLATION)
3	Windshield (See 09–12–7 WINDSHIELD REMOVAL) (See 09–12–9 WINDSHIELD INSTALLATION)
4	Outside mirror (See 09–12–16 POWER OUTSIDE MIRROR REMOVAL/INSTALLATION) (See 09–12–16 POWER OUTSIDE MIRROR DISASSEMBLY/ASSEMBLY) (See 09–12–17 POWER OUTSIDE MIRROR INSPECTION)
5	Front door glass (See 09–12–3 FRONT DOOR GLASS REMOVAL/INSTALLATION)
6	Rear door glass (See 09–12–3 REAR DOOR GLASS REMOVAL/INSTALLATION)
7	Rear door quarter glass (See 09–12–4 REAR DOOR QUAUTER GLASS REMOVAL/INSTALLATION)
8	Filament (See 09–12–15 FILAMENT INSPECTION) (See 09–12–15 FILAMENT REPAIR)

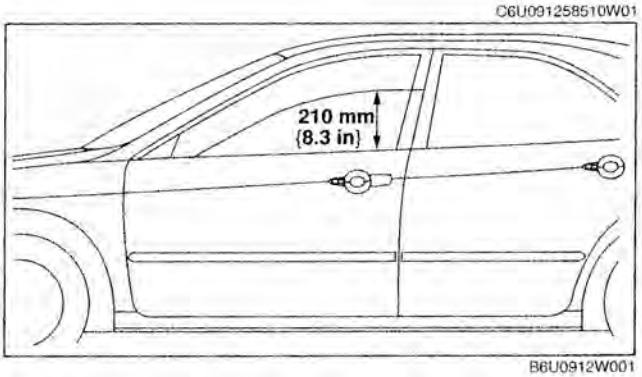
9	Rear window glass (See 09–12–11 REAR WINDOW GLASS REMOVAL) (See 09–12–13 REAR WINDOW GLASS INSTALLATION)
10	Rearview mirror (See 09–12–19 REARVIEW MIRROR REMOVAL/INSTALLATION) (See 09–12–20 AUTO-DIMMING MIRROR INSPECTION)
11	Base (See 09–12–21 BASE REMOVAL) (See 09–12–21 BASE INSTALLATION)
12	Power window main switch (See 09–12–5 POWER WINDOW SWITCH REMOVAL/INSTALLATION) (See 09–12–6 POWER WINDOW MAIN SWITCH INSPECTION)
13	Outside mirror switch (See 09–12–18 POWER OUTSIDE MIRROR SWITCH REMOVAL/INSTALLATION) (See 09–12–18 POWER OUTSIDE MIRROR SWITCH INSPECTION)
14	Power window subswitch (See 09–12–5 POWER WINDOW SWITCH REMOVAL/INSTALLATION) (See 09–12–6 POWER WINDOW MAIN SWITCH INSPECTION)

12	Power window main switch (See 09–12–6 POWER WINDOW SWITCH REMOVAL/INSTALLATION) (See 09–12–7 POWER WINDOW MAIN SWITCH INSPECTION)
13	Outside mirror switch (See 09–12–24 POWER OUTSIDE MIRROR SWITCH REMOVAL/INSTALLATION) (See 09–12–24 POWER OUTSIDE MIRROR SWITCH INSPECTION)
14	Power window subswitch (See 09–12–6 POWER WINDOW SWITCH REMOVAL/INSTALLATION) (See 09–12–8 POWER WINDOW SUBSWITCH INSPECTION)
15	Quarter window glass (See 09–12–19 QUARTER WINDOW GLASS REMOVAL [WGN]) (See 09–12–19 QUARTER WINDOW GLASS INSTALLATION [WGN])

FRONT DOOR GLASS REMOVAL/INSTALLATION

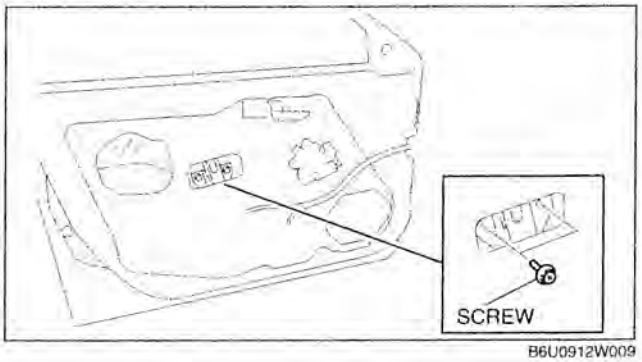
1. Operate the front door glass so that the distance from the top of the front door glass to the upper part of the front beltline molding is **210 mm {8.3 in}**.
2. Remove the front door trim.
3. Remove the hole cover.

C6U091258510W01



B6U0912W001

4. Remove the screws.
5. Lift out the front door glass.
6. Install in the reverse order of removal.

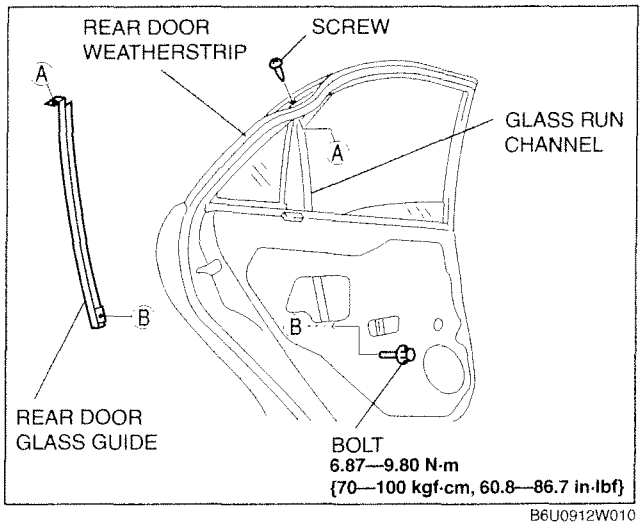


B6U0912W009

REAR DOOR GLASS REMOVAL/INSTALLATION

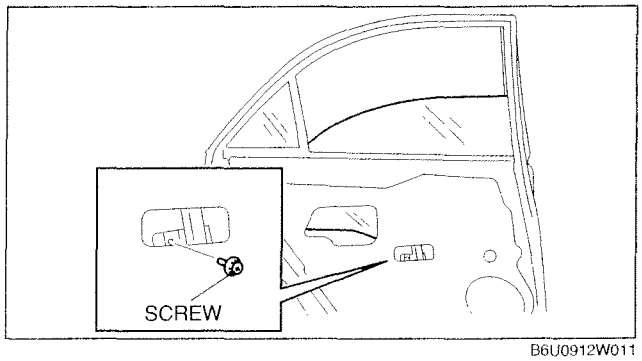
C6U091272510W01

1. Fully roll down the rear door glass.
2. Remove the rear door trim.
3. Remove the hole cover.
4. Pull up the rear door weatherstrip and remove the screw.
5. Remove the bolt.
6. Remove the glass run channel from the rear door glass guide.



B6U0912W010

7. Lift the rear door glass to the position where the rear door glass installation screw is visible.
8. Remove the screw.
9. Lift out the rear door glass.
10. Install in the reverse order of removal.

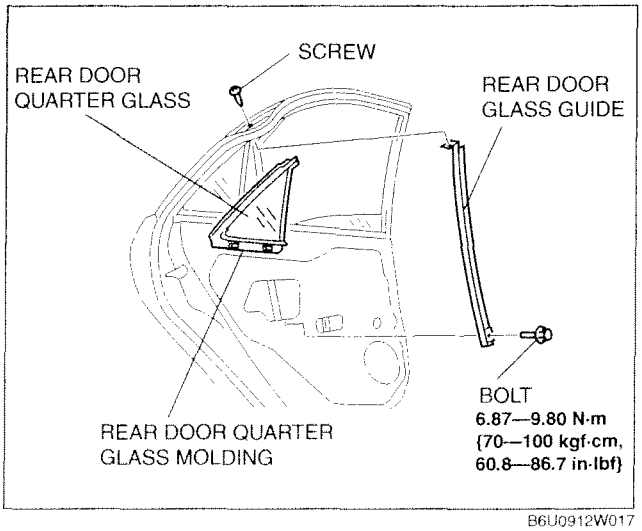


B6U0912W011

REAR DOOR QUARTER GLASS REMOVAL/INSTALLATION

C6U091272510W02

1. Remove the rear door trim.
2. Remove the screw and bolt, then remove the rear door glass guide.
3. Remove the rear door quarter glass and the molding as a signal unit.
4. Remove the rear door quarter glass molding from the glass.
5. Install in the reverse order of removal.

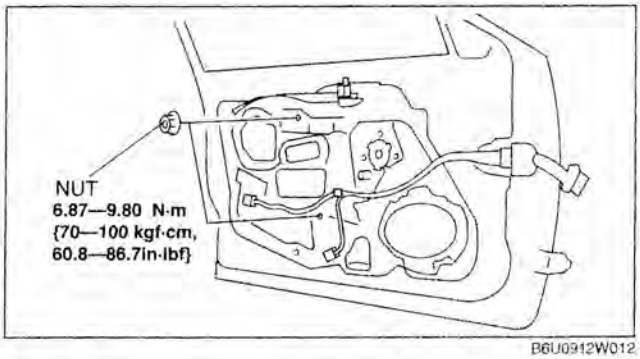


B6U0912W017

POWER WINDOW REGULATOR REMOVAL/INSTALLATION

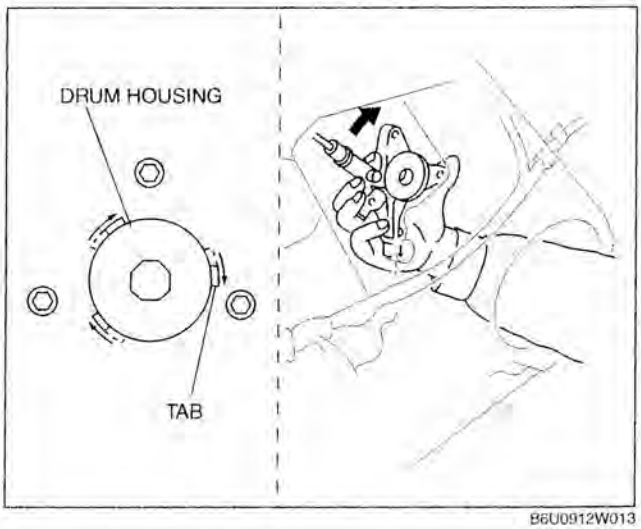
C6U091258560W01

1. Disconnect the negative battery cable.
2. Remove the front door glass or rear door glass.
3. Remove the front door speaker or rear door speaker.
4. Remove the power window motor.
5. Remove the nuts.



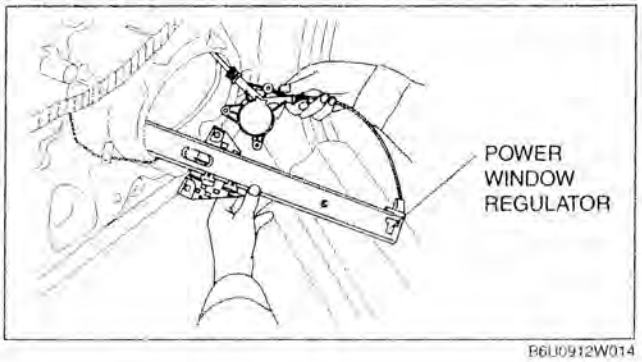
B6U0912W012

6. Insert hand through the speaker installation hole, rotate the regulator drum housing in the direction shown in the figure, and disengage the regulator drum housing from the door unit connection tabs.



B6U0912W013

7. Remove the power window regulator from the speaker installation hole.
8. Install in the reverse order of removal.



B6U0912W014

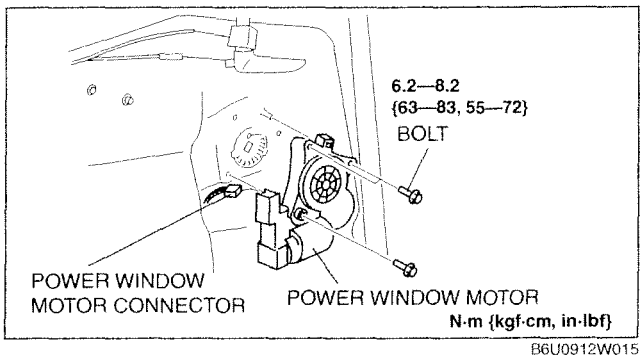
POWER WINDOW MOTOR REMOVAL/INSTALLATION

C6U091259560W01

1. Disconnect the negative battery cable.
2. Remove the front door trim or rear door trim.
3. Disconnect the power window motor connector.
4. Remove the bolts.
5. Remove the power window motor from the power window regulator drum.
6. Install in the reverse order of removal.

Note

- When installing the power window motor to the power window regulator drum, the drum housing hook may come off the door unit. If this happens, remove the door speaker, insert your hand in the speaker installation hole, connect the drum housing hooks, and while supporting the drum housing, install the power window motor to the drum.



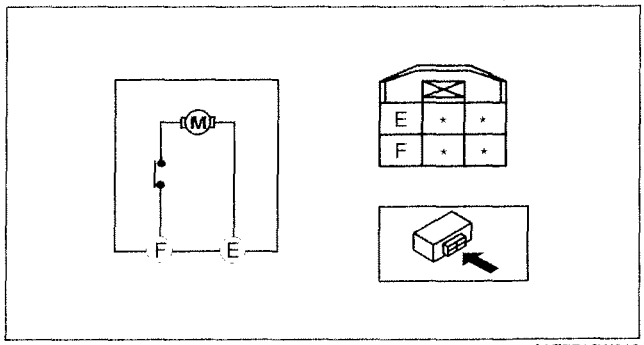
B6U0912W015

POWER WINDOW MOTOR INSPECTION

C6U091259560W02

1. Apply battery positive voltage to the power window motor terminals and inspect the power window motor operation.
   - If not as specified, replace the power window motor.

Motor operation	Terminal	
	F	E
UP	GND	B+
DOWN	B+	GND

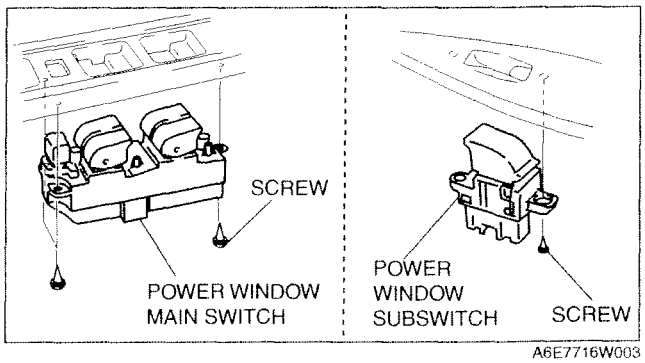


A6E7716W010

POWER WINDOW SWITCH REMOVAL/INSTALLATION

C6U091266350W01

1. Disconnect the negative battery cable.
2. Remove the front door trim or rear door trim.
3. Remove the screws, then the power window switch.
4. Install in the reverse order of removal.



A6E7716W003

POWER WINDOW MAIN SWITCH INSPECTION

C6U091266350W02

1. Remove the power window main switch. (See 09–12–6 POWER WINDOW SWITCH REMOVAL/INSTALLATION.)
2. When inspecting the passenger's side and the rear, turn the power-cut switch UNLOCK.
3. Inspect for continuity between the power window main switch terminals using an ohmmeter.
   - If not as specified, replace the power window main switch.

Driver's side

O—O : Continuity

Switch position	Terminal			
	H	M	L	N
CLOSED	O	O	O	O
OFF		O	O	O
MANUAL OPEN AUTO OPEN	O	O	O	O

Passenger's side

O—O : Continuity

Switch position	Terminal			
	H	M	D	B
CLOSED	O	O	O	O
OFF		O	O	O
OPEN	O	O	O	O

Rear left

O—O : Continuity

Switch position	Terminal			
	H	M	K	I
CLOSED	O	O	O	O
OFF		O	O	O
OPEN	O	O	O	O

Rear right

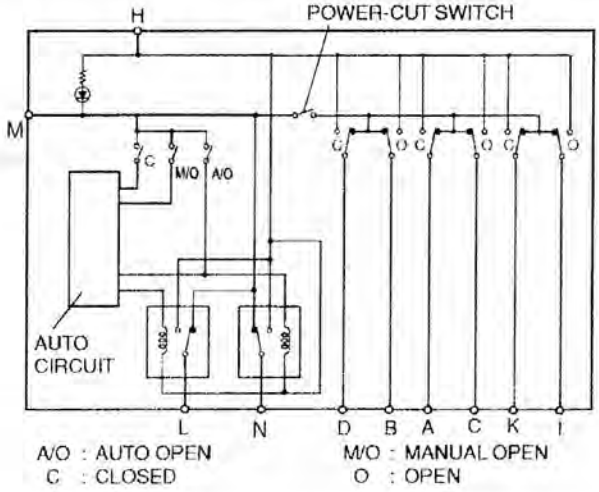
O—O : Continuity

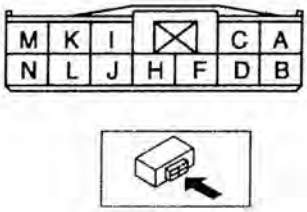
Switch position	Terminal			
	H	M	A	C
CLOSED	O	O	O	O
OFF		O	O	O
OPEN	O	O	O	O

Power-cut switch

O—O : Continuity

Switch position	Terminal								
	M	L	N	D	B	A	C	K	I
UNLOCK	O	O	O	O	O	O	O	O	O
LOCK	O	O	O	O	O	O	O	O	O



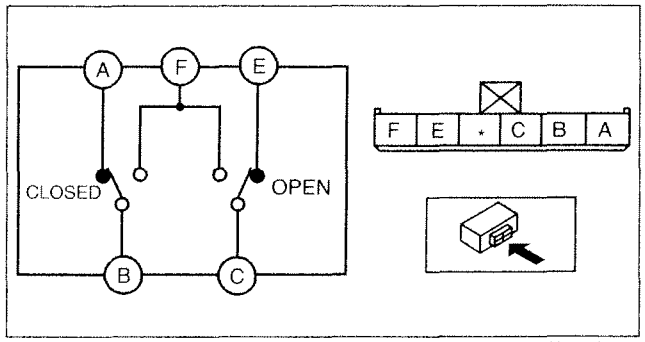


B6U0912W102

POWER WINDOW SUBSWITCH INSPECTION

C6U091266370W01

1. Inspect for continuity between the power window subswitch terminals.
   - If not as specified, replace the power window subswitch.



B6U0912W026

○—○ : Continuity

Switch position	Terminal				
	A	B	C	E	F
CLOSED		○	○	○	○
OFF	○	○	○	○	
OPEN	○			○	○

B6U0912W027

WINDSHIELD REMOVAL

C6U091263900W01

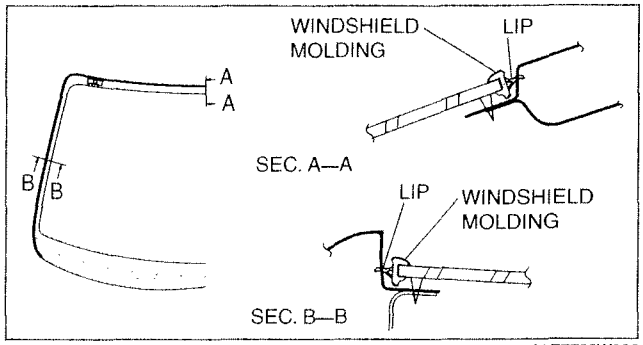
1. Remove the rearview mirror.
2. Remove the cowl grille.
3. Remove the headliner.
4. Apply protective tape along the edge of the body to protect it from damage.
5. Apply protective tape to the dashboard to protect it from damage.
6. Cut the lip of the windshield molding using a razor.

Warning

- **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**

Note

- The windshield molding is a replacement part.



A6E7738W006

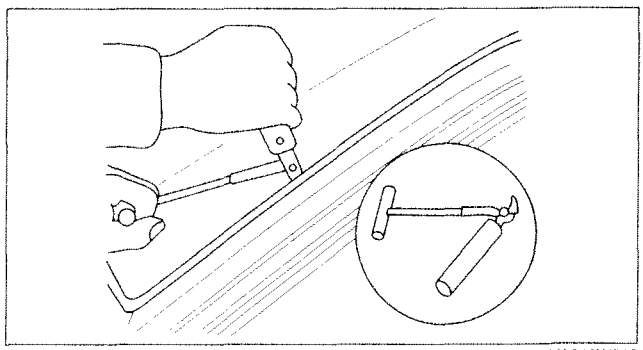
Not Reusing Windshield

1. Remove the base.

Note

- For the areas of the sealant that are difficult to cut, use the **SST** (piano wire) and follow the procedure under "Reusing Windshield."

2. Use the tool like that shown in the figure, and insert the blade into the sealant.
3. Pull through the sealant around the edge of the glass.
4. Remove the windshield.

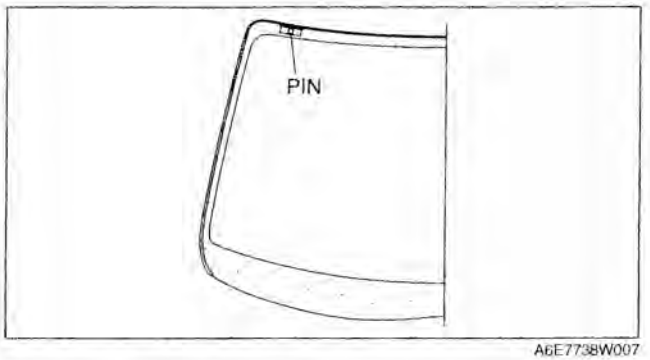


B6U0912W028

Reusing Windshield

Note
- Before removing the windshield from the body, mark the position of the windshield by affixing tape to the windshield and body panel.

1. Make a hole through the sealant, avoiding pins, from the inside of the vehicle using an awl.



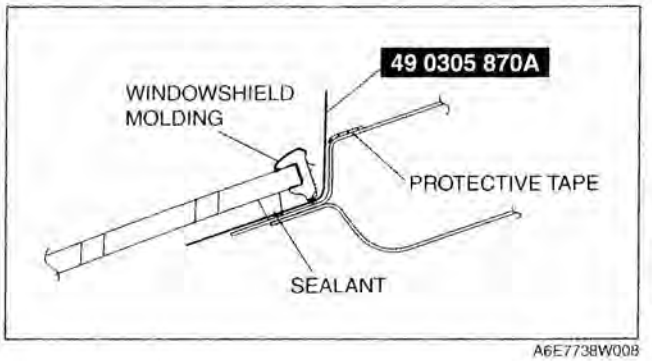
A6E7738W007

2. Pass the **SST** (piano wire) through the hole.

Warning
- **Using the SST (piano wire) with bare hands can cause injury. Always wear gloves when using the SST (piano wire).**

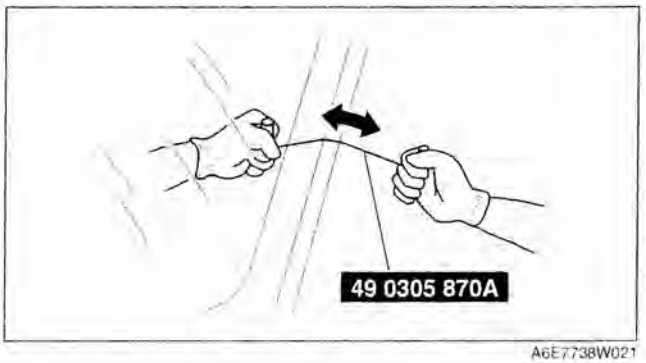
3. Wind each end of the **SST** (piano wire) around a bar.

Note
- Use a long sawing action to spread the work over the whole length of the **SST** (piano wire) to prevent it from breaking due to localized heating.



A6E7738W008

4. Fix one end of the **SST** (piano wire), and while pulling the other end, cut the sealant around the windshield.
5. Remove the windshield.
6. Remove the pins from the windshield.
7. Remove the windshield molding from the windshield glass.



A6E7738W021

WINDSHIELD INSTALLATION

C6U091263900W02

Caution

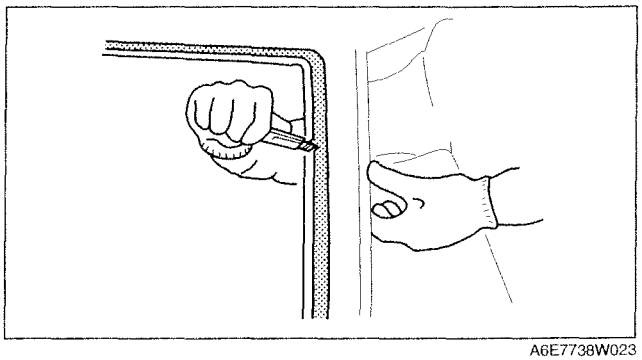
- **To prevent the sealant from cracking or the glass from being pushed out by air pressure if a door is closed, open all of the windows and leave them open until the sealant has hardened.**

1. Cut away the old sealant using a razor so that **1—2 mm {0.04—0.07 in}** thickness of sealant remains along the perimeter of the frame.

Warning

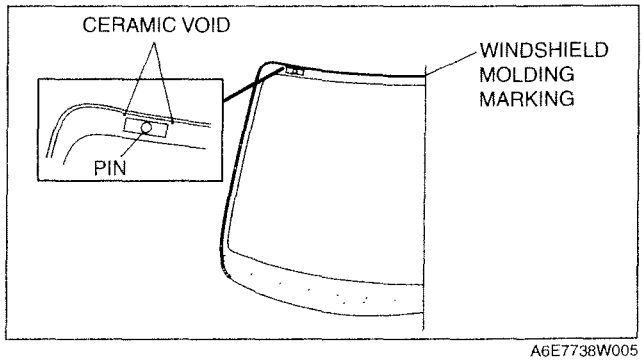
- **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**

2. If the sealant has come off completely in any one place, apply some primer after degreasing, and allow it **approximately 30 minutes** to dry. Then put on new sealant to create a **2 mm {0.08 in}** layer.
3. Clean and degrease an **approximately 50.0 mm {1.97 in}** wide strip along the perimeter of the glass and the bonding area on the body.



A6E7738W023

4. If installing reused glass, install pins at the ceramic void on the upper part of the windshield.
5. If installing reused glass, align the windshield molding marking and the center of the upper section of the windshield, then install the molding to the windshield.

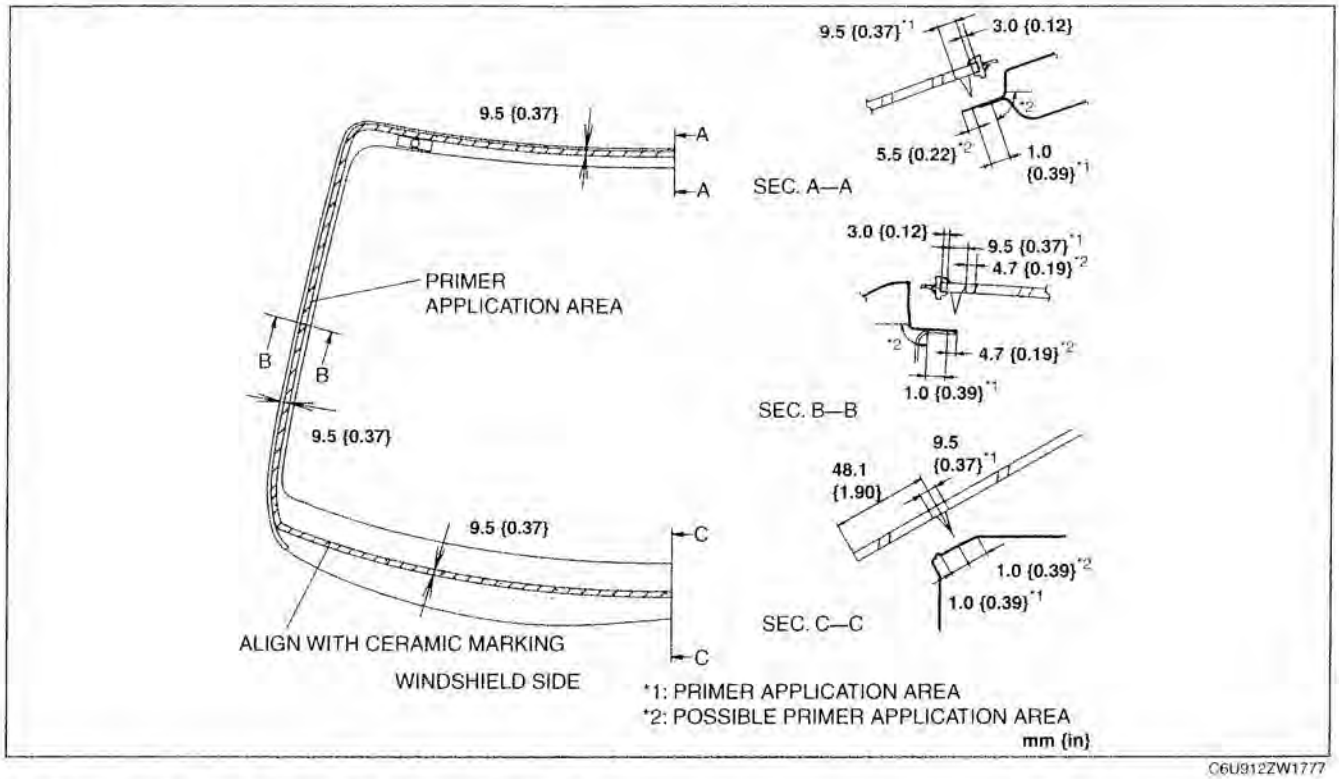


A6E7738W005

6. Use only glass primer on the glass. Allow it to dry for **approximately 30 minutes**.

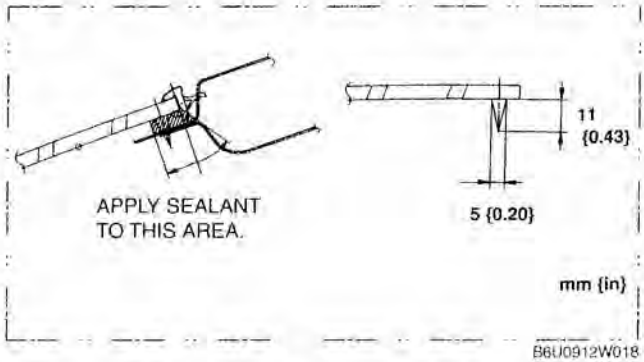
Caution

- **Keep the area free of dirt and grease, and do not touch the surface. Otherwise, the primer may not properly bond to the surface of the glass and body, which may cause leaks to occur.**



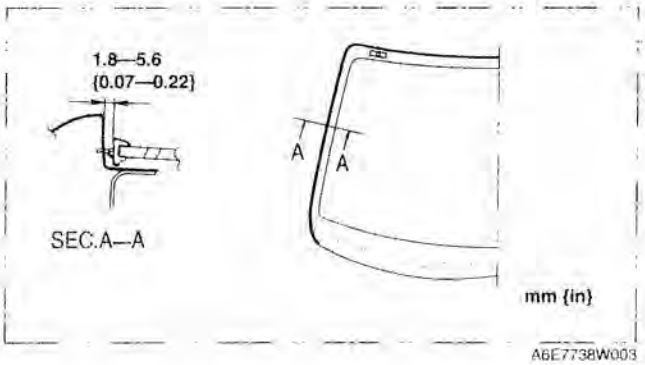
C6U912ZW1777

7. Apply sealant to the area of the glass surface as shown in the figure.
8. Set the windshield in place and insert the pins into the body. Install the windshield.



B6U0912W018

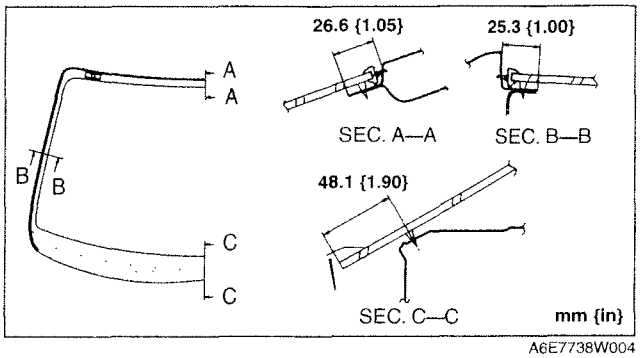
9. Verify that the gap of the A-pillar part as shown in the figure.



A6E7738W003

10. Keeping the measurement of the molding lip gap within specification, press completely along the perimeter of the glass.
11. Install the cowl grille.
12. Install the headliner
13. Install the rearview mirror.
14. Allow the sealant to harden completely.

Sealant hardening time: 24 hours



A6E7738W004

REAR WINDOW GLASS REMOVAL

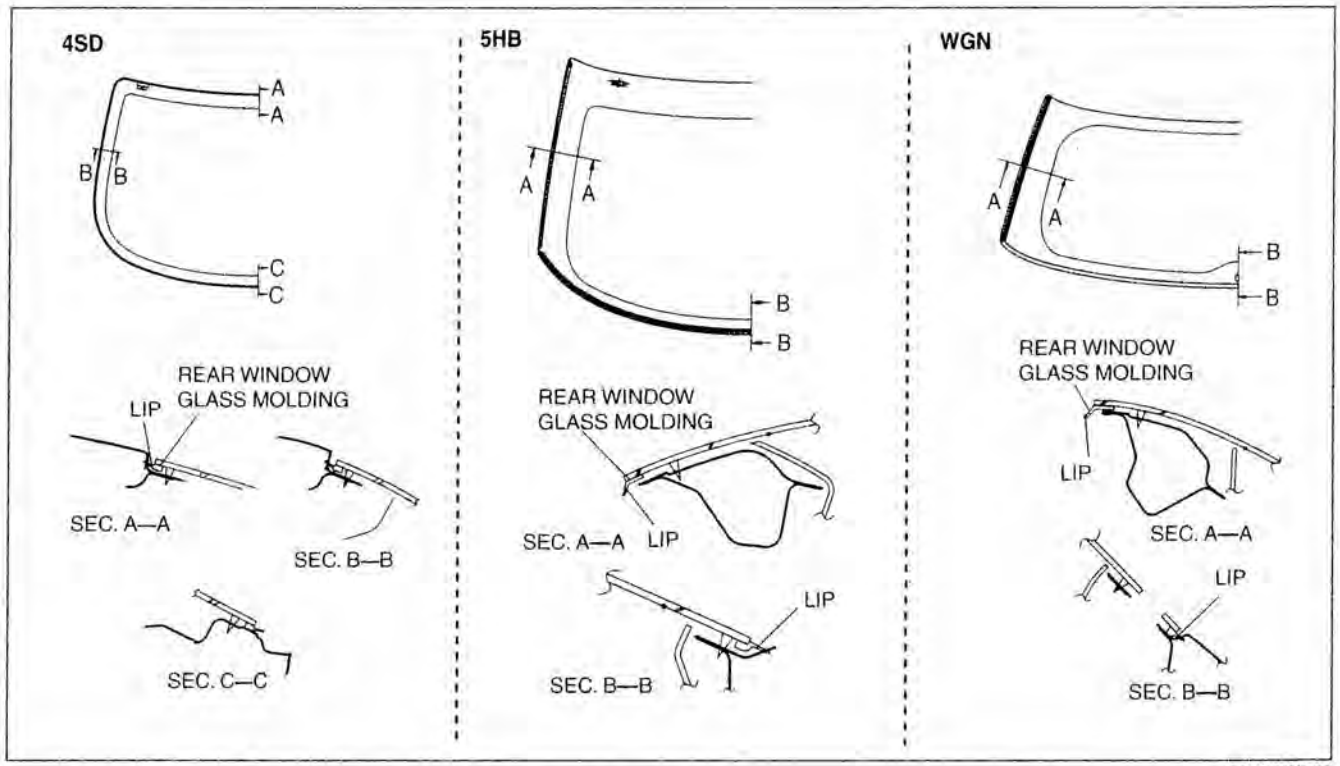
C6U091263900W06

1. For the 4SD, remove the following parts:
   (1) Remove the headliner.
   (2) Remove the rear package trim.
2. For the 5HB, remove the following parts:
   (1) Remove the rear wiper arm and blade.
   (2) Remove the liftgate lower trim.
   (3) Remove the liftgate side trim.
   (4) Remove the liftgate upper trim.
3. For the WGN, remove the following parts:
   (1) Remove the rear wiper arm and blade.
   (2) Remove the liftgate lower trim.
   (3) Remove the liftgate side trim.
   (4) Remove the liftgate upper trim.
   (5) Remove the rear wiper motor.
4. Apply protective tape along the edge of the body to protect it from damage.

5. Cut the lip of the rear window molding using a razor.

Warning
- **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**

Note
- The rear window molding is a replacement part.

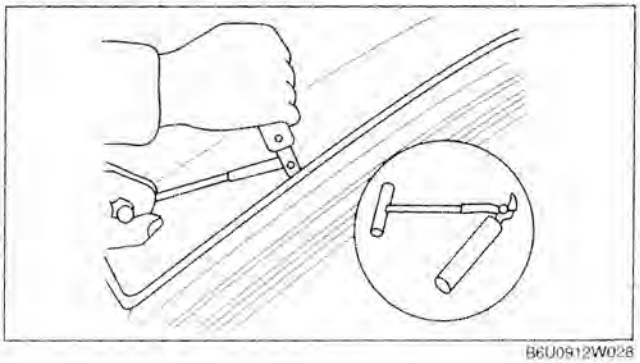


A6A7738W107

Not Reusing Rear Window Glass

Note
- For the areas of the sealant that are difficult to cut, use a **SST** (piano wire) and follow the procedure under "Reusing Rear Window Glass."

1. Use the tool like that shown in the figure, and insert the blade into the sealant.
2. Pull through the sealant around the edge of the glass.
3. Remove the rear window glass.

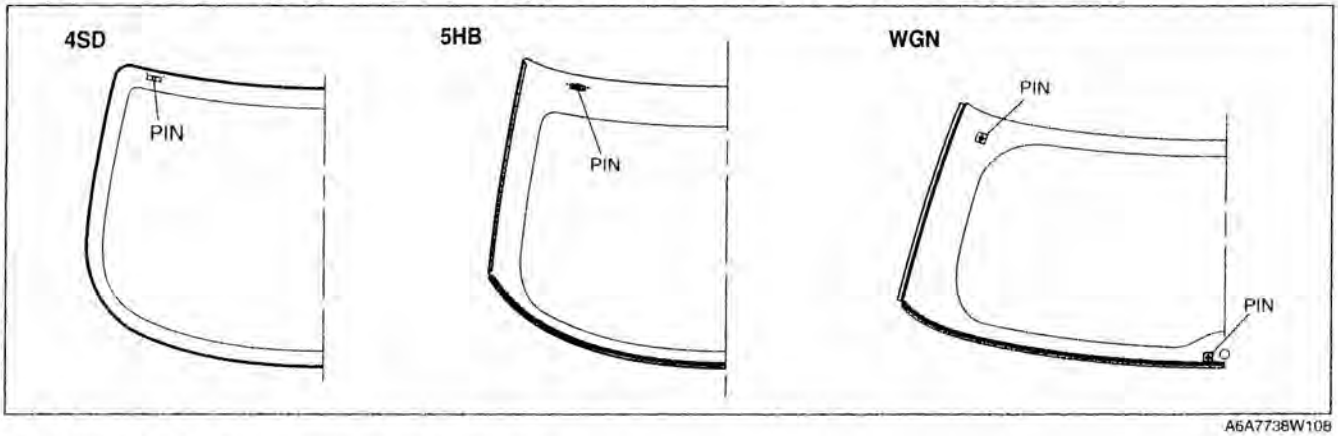


B6U0912W028

Reusing Rear Window Glass

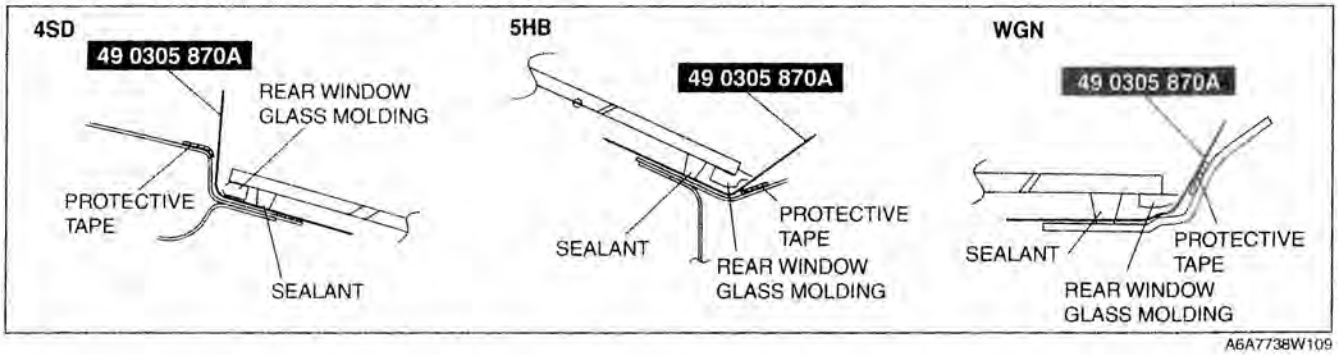
Note
- Before removing the rear window glass from the body, mark the position of the glass by affixing tape to the glass and body panel.

1. Make a hole through the sealant, avoiding pins, from the inside of the vehicle using an awl.



A6A7738W108

2. Pass the **SST** (piano wire) through the hole.



A6A7738W109

Warning
- **Using the SST (piano wire) with bare hands can cause injury. Always wear gloves when using the SST (piano wire).**

3. Wind each end of the **SST** (piano wire) around a bar.

Note
- Use a long sawing action to spread the work over the whole length of the **SST** (piano wire) to prevent it from breaking due to localized heating.

4. Fix one end of the **SST** (piano wire), and while pulling the other end, cut the sealant around the rear window glass.
5. Remove the rear window glass.
6. Remove the pins from the glass.
7. Remove the rear window molding from the glass.

A6E7738W021

REAR WINDOW GLASS INSTALLATION

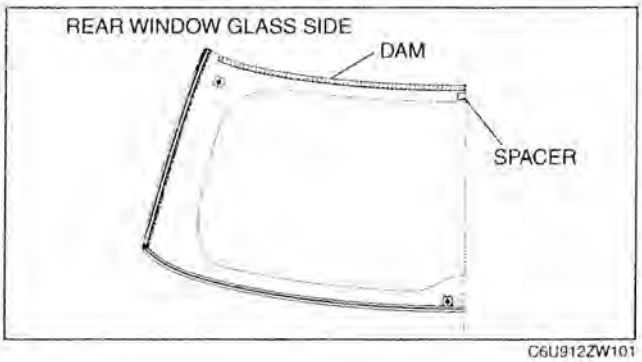
C6U091263900W07

Caution
- **To prevent the sealant from cracking or the glass from being pushed out by air pressure if a door is closed, open all of the windows and leave them open until the sealant has hardened.**

1. Cut away the old sealant using a razor so that **1—2 mm {0.04—0.07 in}** thickness of sealant remains around the circumference of the frame.

Warning
- **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**

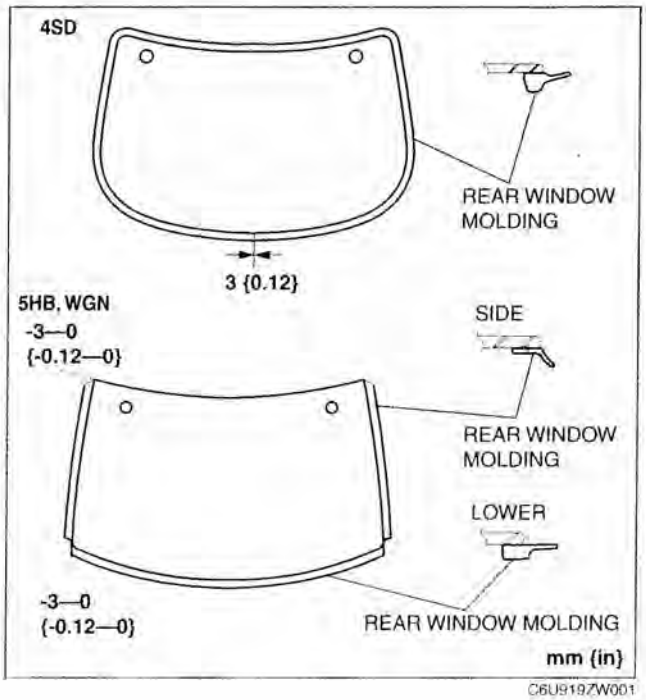
2. If the sealant has come off completely in any one place, apply some primer after degreasing, and allow it **approximately 30 minutes** to dry. Then put on new sealant to create a **2 mm {0.08 in}** layer.
3. Clean and degrease an **approximately 50.0 mm {1.97 in}** wide strip along the perimeter of the glass and the bonding area on the body.
4. Install the dams and spacer as shown in the figure. (WGN only)



C6U912ZW101

5. Install the molding as shown in the figure.
6. Use only glass primer on the glass. Allow it to dry for **approximately 30 minutes**.

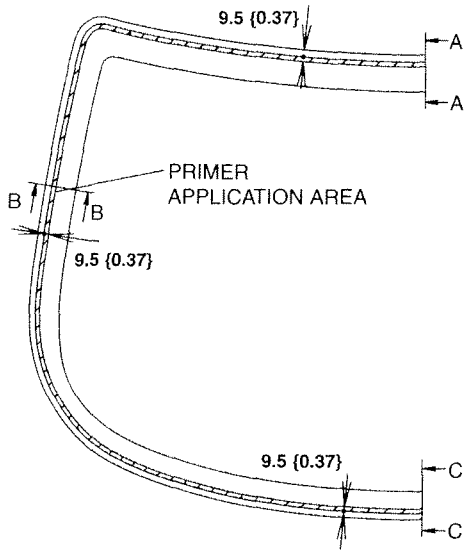
Caution
- **Keep the area free of dirt and grease, and do not touch the surface or the primer may not properly bond to the surface of the glass and body, which may cause leaks to occur.**

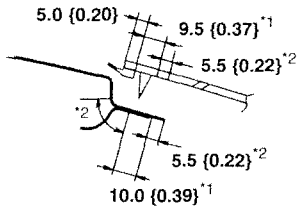


C6U919ZW001

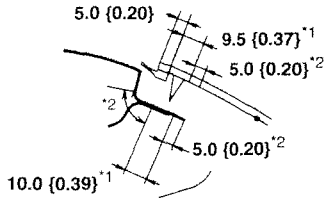
4SD

REAR WINDOW GLASS SIDE

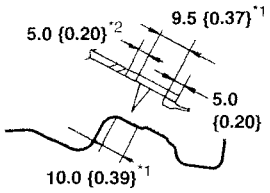




SEC. A—A



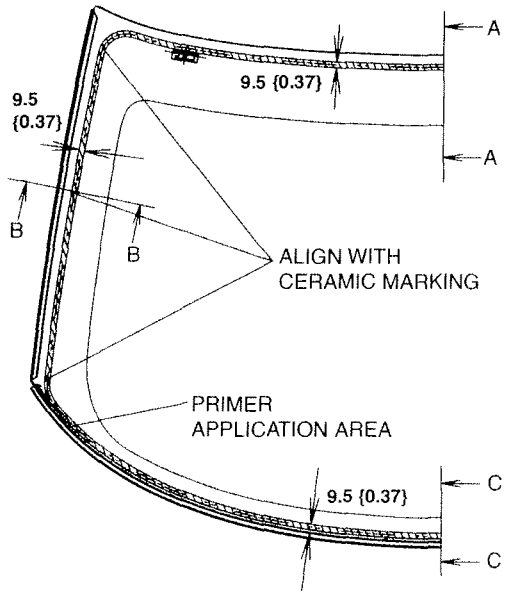
SEC. B—B

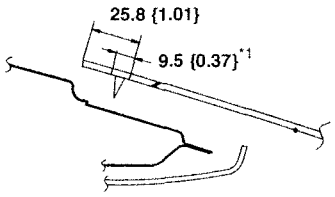


SEC. C—C

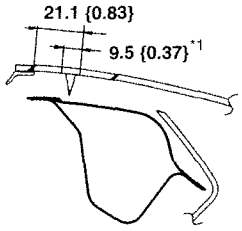
5HB

REAR WINDOW GLASS SIDE

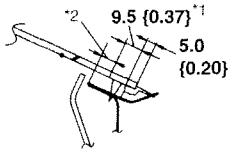




SEC. A—A



SEC. B—B

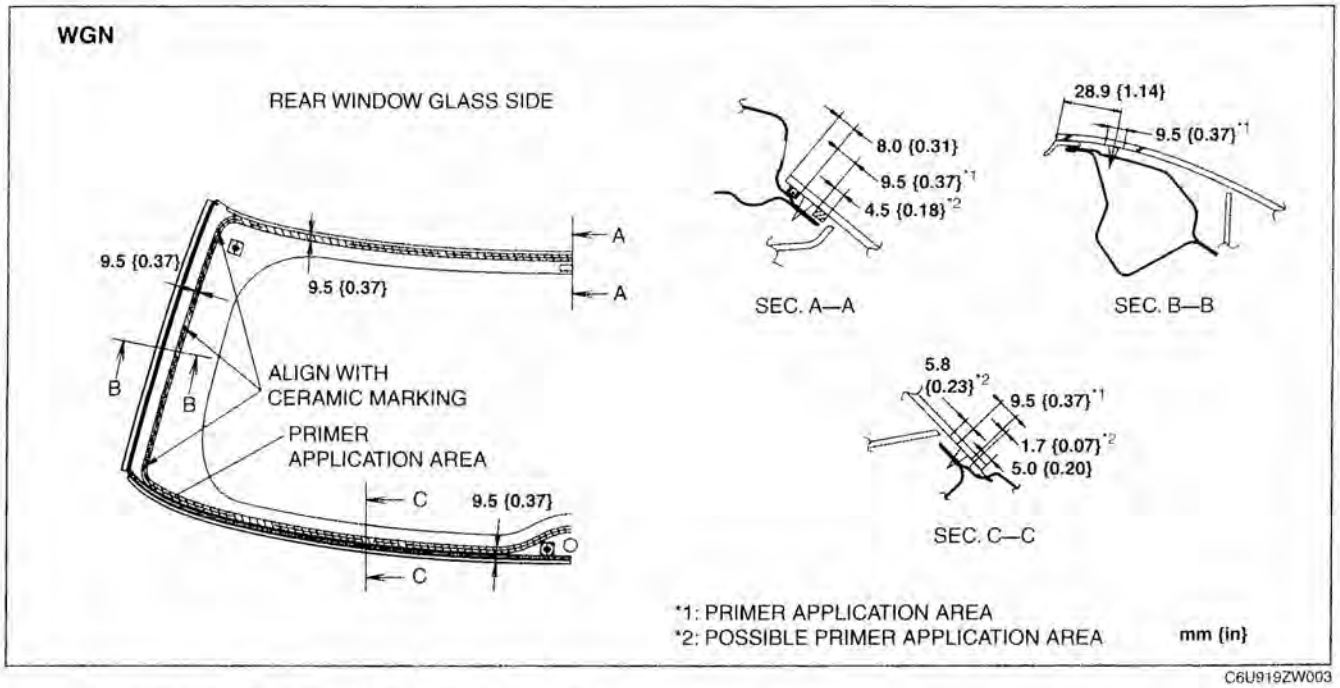


SEC. C—C

*1: PRIMER APPLICATION AREA
*2: POSSIBLE PRIMER APPLICATION AREA

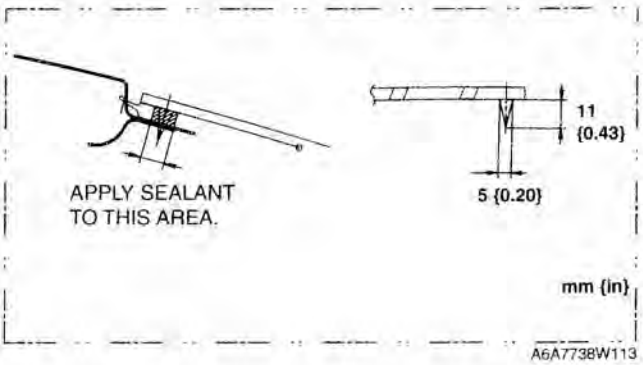
mm {in}

C6U919ZW002

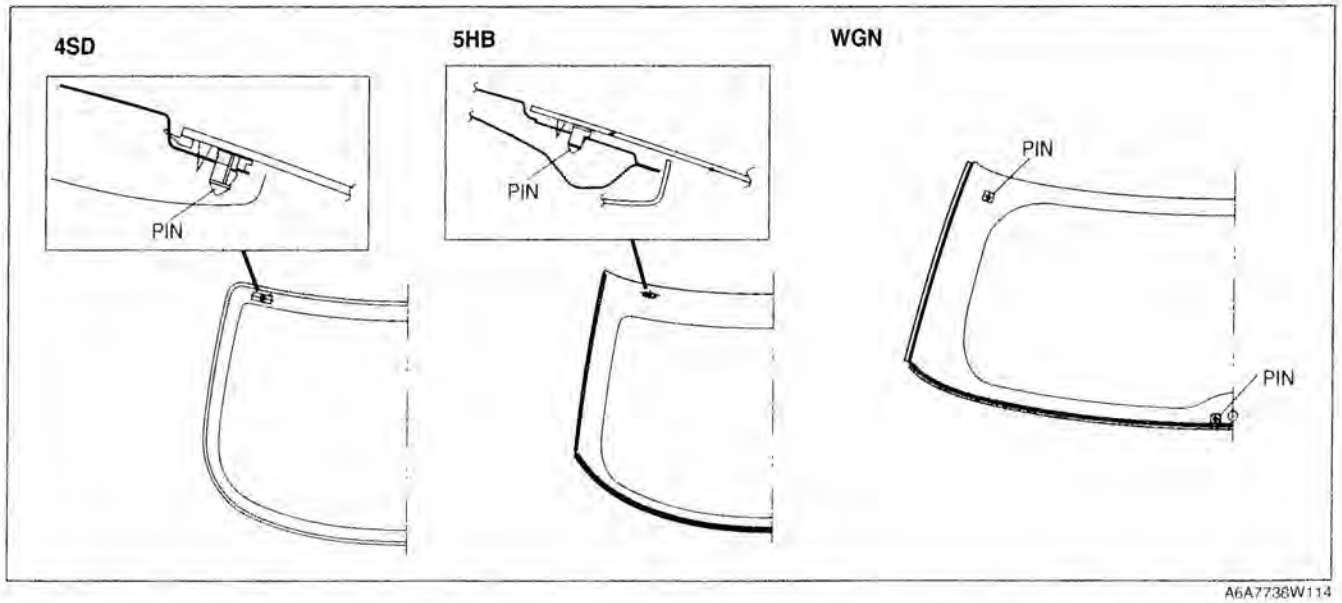


C6U919ZW003

7. Apply sealant to the area of the glass surface as shown in the figure.
8. Set the position of the front windshield glass and insert a pin into the body. Install the glass.

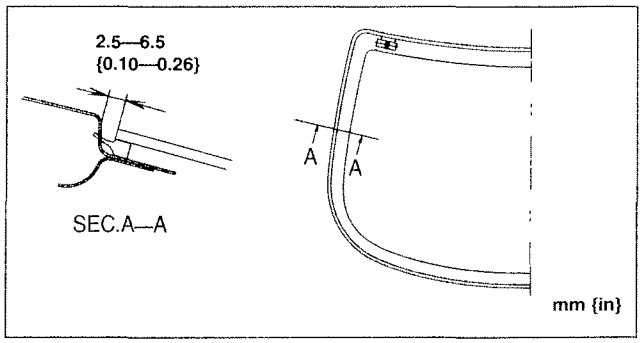


A6A7738W113

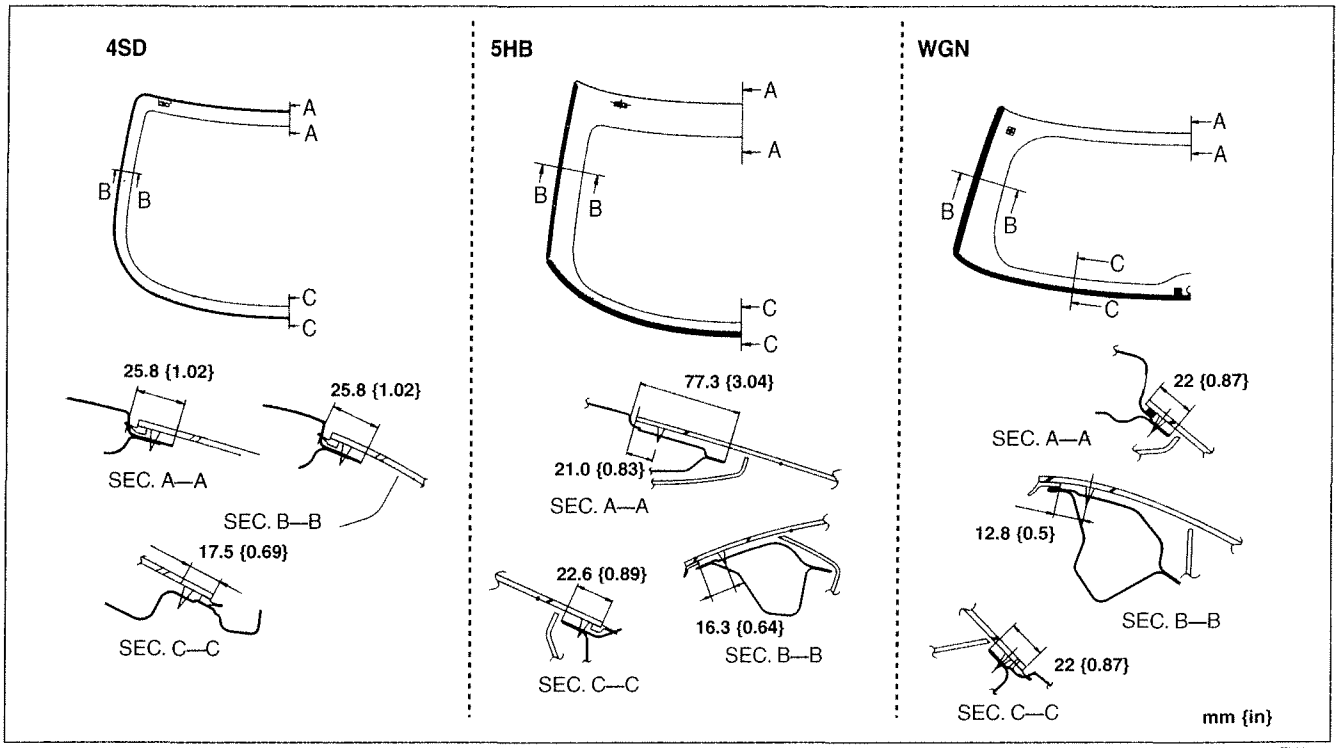


A6A7738W114

9. Verify that the gap of the upper part is **7.3 mm {0.29 in}** and the A pillar part is **6.8 mm {0.27 in}**. (Only for 4SD)
10. Keeping the measurement of the molding lip gap within specification, press completely along the perimeter of the glass.



A6E7738W016



C6U919ZW004

11. For the 4SD, install the following parts:
    (1) Install the headliner.
    (2) Install the rear package trim.
12. For the 5HB, install the following points.
    (1) Install the rear wiper motor.
    (2) Install the liftgate lower trim.
13. For the WGN, install the following points.
    (1) Install the rear wiper motor.
    (2) Install the liftgate lower trim.
    (3) Install the liftgate side trim.
    (4) Install the liftgate upper trim.
14. Allow the sealant to harden completely.

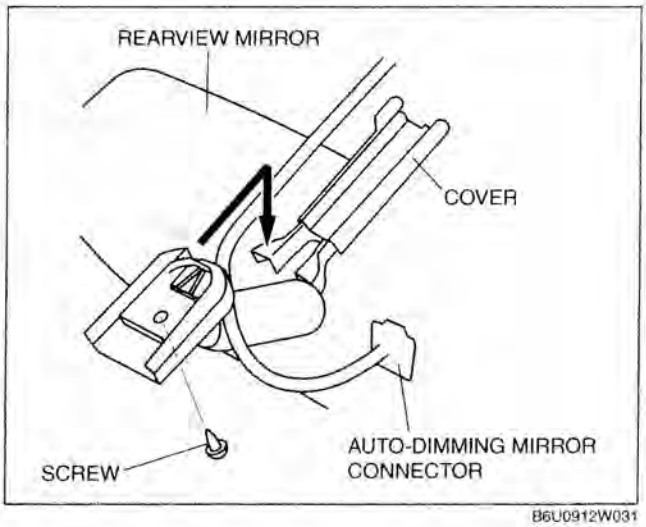
Sealant hardening time: 24 hours

REARVIEW MIRROR REMOVAL/INSTALLATION

C6U091269220W01

Auto-dimming Mirror

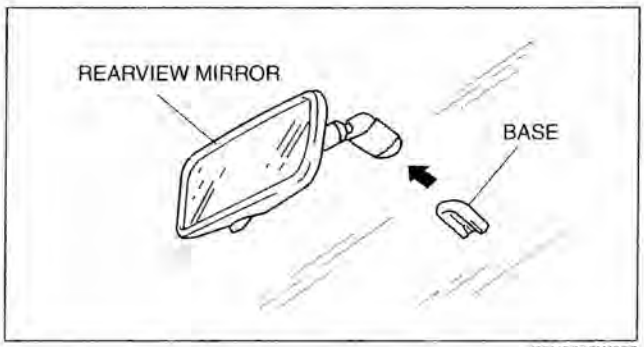
1. Disconnect the negative battery cable.
2. Remove the cover.
3. Disconnect the auto-dimming mirror connector.
4. Remove the screw.
5. Remove the rearview mirror.
6. Install in the reverse order of removal.



B6U0912W031

Normal Type

1. Pull the rearview mirror in the direction indicated by the arrow.
2. Install in the reverse order of removal.



B6U0912W033

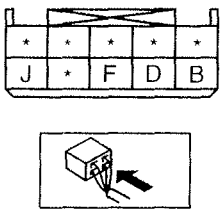
AUTO-DIMMING MIRROR INSPECTION

C6U091269220W03

1. Measure the voltage at each terminal (other than terminal F).
   - If the voltage is not as specified in the Terminal Voltage Table (Reference), inspect the parts under "Inspection item(s)" and related wiring harnesses.
2. Disconnect the negative battery cable.
3. Inspect the auto-dimming mirror connector for continuity at terminal F.
4. If the system does not work properly even though the inspection items or related wiring harnesses do not have any malfunction, replace the auto-dimming mirror.

Terminal Voltage Table (Reference)

AUTO-DIMMING MIRROR
HARNESS-SIDE CONNECTOR



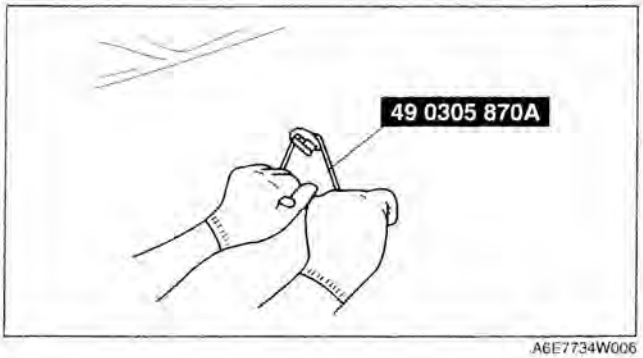
C6U912ZW001

Terminal	Signal name	Connected to	Measured condition	Voltage (V)/ Continuity	Inspection item(s)
B	Power supply	A/C 15 A fuse	Ignition switch at ON	B+	• A/C 15 A fuse • Related wiring harnesses
D	R range signal	Back-up light switch/TR switch	R range	B+	• Back-up light switch/TR switch • Related wiring harnesses
			Other than R range	1.0 or less	
F	GND	Body ground	Under any condition: Inspect for continuity to ground.	Continuity detected	• GND • Related wiring harnesses
J	Power supply	ROOM 15 A fuse	Under any condition	B+	• ROOM 15 A fuse • Related wiring harnesses

BASE REMOVAL

C6U091269240W01

1. Remove the rearview mirror.
2. Wind each end of a wire around a bar.



A6E7734W006

Warning
- **Using the SST (piano wire) with bare hands can cause injury. Always wear gloves when using the SST (piano wire).**

Note
- Use a long sawing action to spread the work over the whole length of the **SST** (piano wire) to prevent it from breaking.

3. Saw through the sealant to remove the base.

BASE INSTALLATION

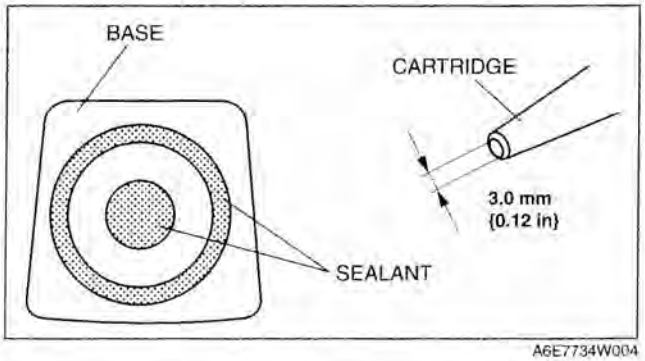
C6U091269240W02

1. Cut away all of the original sealant using a razor.
2. Clean and degrease the ceramic coating on the glass and the base.
3. Apply primer to the bonding area of the glass and the base.

Caution
- **Keep the area free of dirt and grease, and do not touch the surface. Otherwise, the primer may not properly bond to the surface of the glass.**

4. Apply a **3.0 mm {0.12 in}** layer of sealant to the base.

Note
- Use only glass primer on the glass, and body primer on the base. Allow the primer to dry for **approximately 30 minutes**.

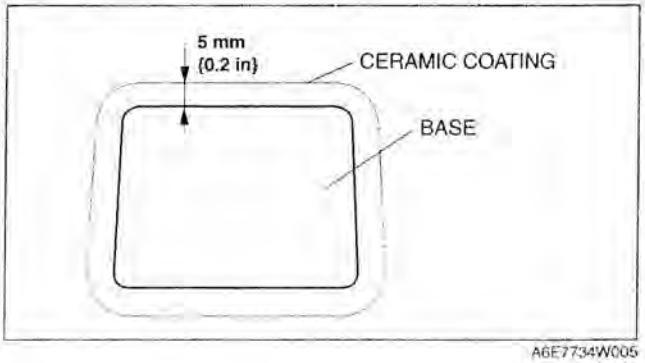


A6E7734W004

5. Center the base in the ceramic coating and press it onto the glass.
6. Use isopropyl alcohol to remove any excess repair sealant.

Hardening time of sealant

Temperature	Surface hardening time	Time required until vehicle can be put into service
5 °C {41 °F}	Approx. 1.5 h	Approx. 12 h
20 °C {68 °F}	Approx. 1 h	Approx. 4 h
35 °C {95 °F}	Approx. 10 min.	Approx. 2 h



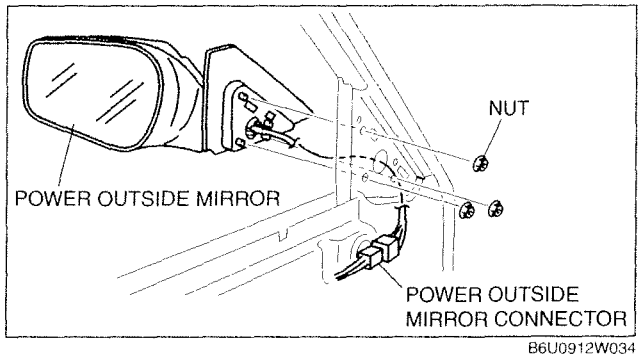
A6E7734W005

7. Install the rearview mirror.

POWER OUTSIDE MIRROR REMOVAL/INSTALLATION

C6U091269110W01

1. Disconnect the negative battery cable.
2. Remove the inner garnish.
3. Remove the front door trim.
4. Disconnect the power outside mirror connector.
5. Remove the nuts.
6. Remove the power outside mirror.
7. Install in the reverse order of removal.



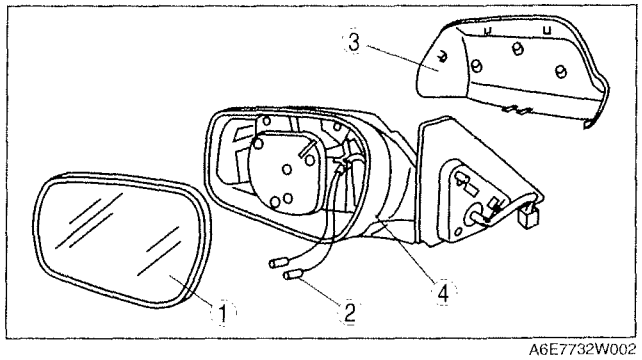
B6U0912W034

POWER OUTSIDE MIRROR DISASSEMBLY/ASSEMBLY

C6U091269110W02

1. Disassemble in the order indicated in the table.

1	Outside mirror glass (See 09–12–22 Outside Mirror Glass Disassembly Note) (See 09–12–23 Outside Mirror Glass Assembly Note)
2	Connector (with heated outside mirror)
3	Cover (See 09–12–23 Cover Disassembly Note)
4	Outside mirror

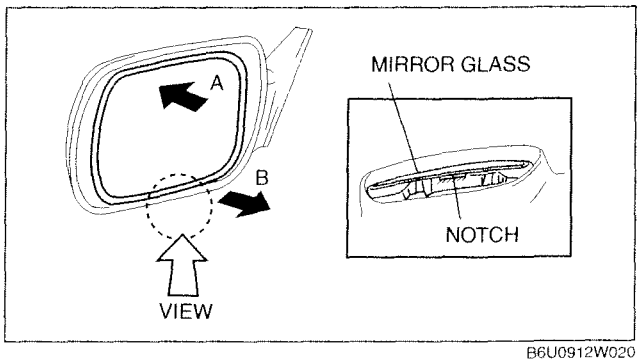


A6E7732W002

2. Assemble in the reverse order of disassembly.

Outside Mirror Glass Disassembly Note

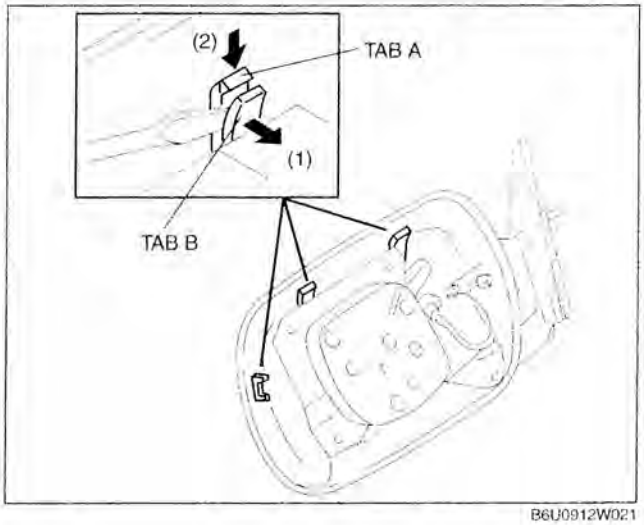
1. Press area A of the glass so that area B moves outward.
2. Insert a screwdriver into the notch and remove the glass from the mirror base.



B6U0912W020

Cover Disassembly Note

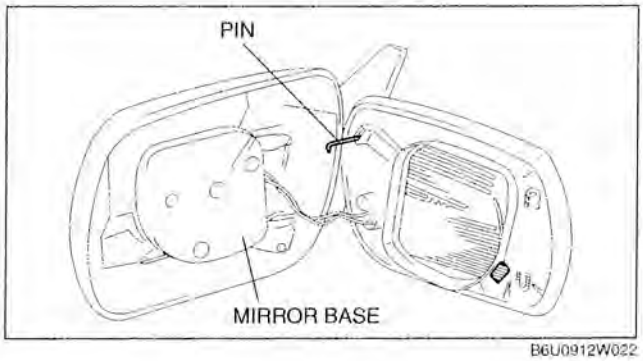
1. Pull off the tab A with a screwdriver and press the tab B downward.



B6U0912W021

Outside Mirror Glass Assembly Note

1. Press the outside mirror into the base so that the pin does not dislodge.



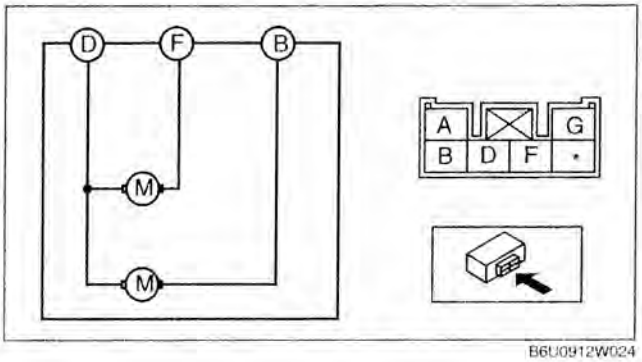
B6U0912W022

POWER OUTSIDE MIRROR INSPECTION

C6U091269110W03

1. Disconnect the power outside mirror connector.
2. Apply battery positive voltage to the power outside mirror terminals, and inspect the operation of the power outside mirror.
   - If not as specified, replace the power outside mirror.

Mirror operation	Terminal	
	B+	GND
Up	B	D
Down	D	B
Left	F	D
Right	D	F



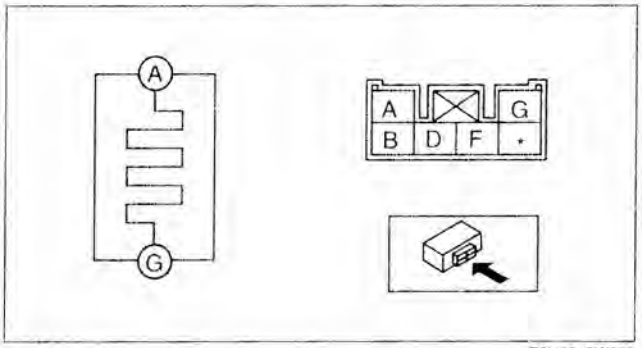
B6U0912W024

3. Inspect for continuity between the power outside mirror heater terminals.
   - If not as specified, replace the power outside mirror.

○—○ : Continuity

Mirror operation	Terminal	
	A	G
Heater	○	○

B6U0912W023

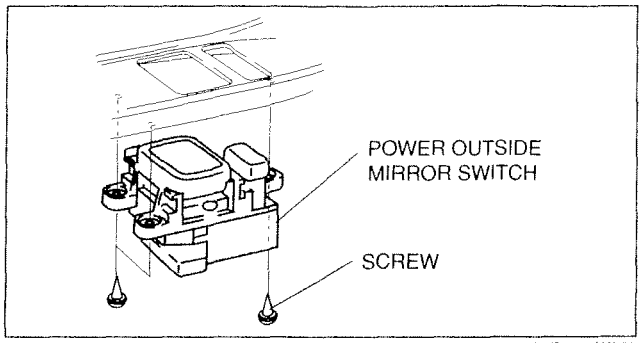


B6U0912W025

POWER OUTSIDE MIRROR SWITCH REMOVAL/INSTALLATION

C6U091266600W01

1. Disconnect the negative battery cable.
2. Remove the driver-side front door trim.
3. Remove the screws and the power outside mirror switch.
4. Install in the reverse order of removal.

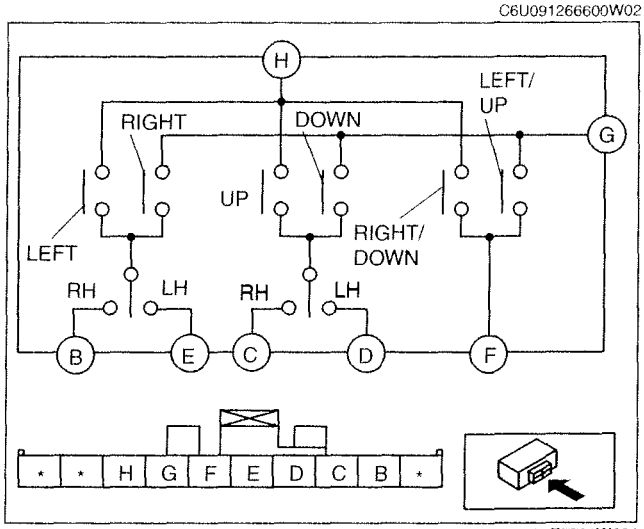


A6E7732W008

POWER OUTSIDE MIRROR SWITCH INSPECTION

C6U091266600W02

1. Inspect for continuity between the power outside mirror switch terminals using an ohmmeter.
   - If not as specified, replace the power outside mirror switch.



A6E7732W001

○—○ : Continuity

Operation		D	C	E	B	H	G	F
LH	Up	○				○	○	○
	Down	○				○	○	○
	Left			○		○	○	○
	Right			○		○	○	○
RH	Up		○			○	○	○
	Down		○			○	○	○
	Left				○	○	○	○
	Right				○	○	○	○

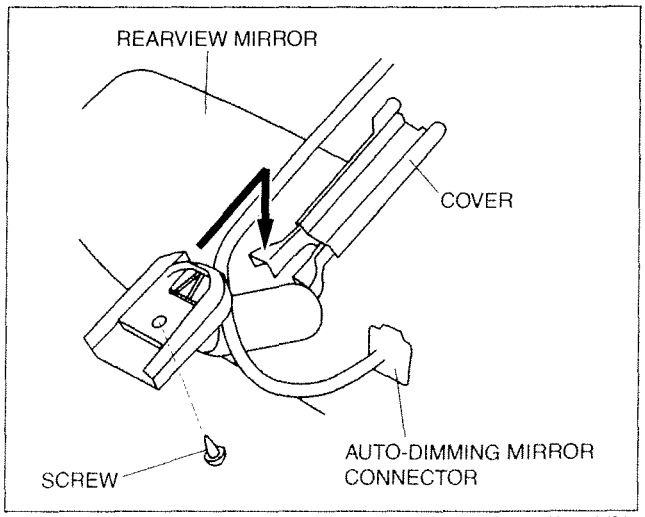
B6U0912W019

REARVIEW MIRROR REMOVAL/INSTALLATION

C6U091269220W01

Auto-dimming Mirror

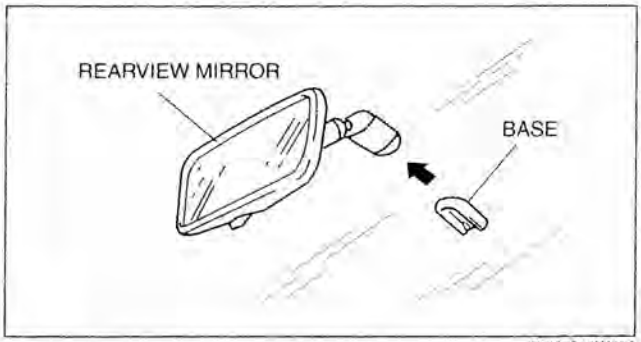
1. Disconnect the negative battery cable.
2. Remove the cover.
3. Disconnect the auto-dimming mirror connector.
4. Remove the screw.
5. Remove the rearview mirror.
6. Install in the reverse order of removal.



B6U0912W031

Normal Type

1. Pull the rearview mirror in the direction indicated by the arrow.
2. Install in the reverse order of removal.



B6U0912W033

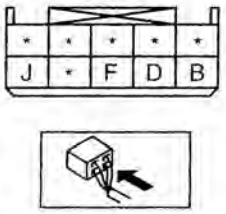
AUTO-DIMMING MIRROR INSPECTION

C6U091269220W03

1. Measure the voltage at each terminal (other than terminal F).
   - If the voltage is not as specified in the Terminal Voltage Table (Reference), inspect the parts under "Inspection item(s)" and related wiring harnesses.
2. Disconnect the negative battery cable.
3. Inspect the auto-dimming mirror connector for continuity at terminal F.
4. If the system does not work properly even though the inspection items or related wiring harnesses do not have any malfunction, replace the auto-dimming mirror.

Terminal Voltage Table (Reference)

AUTO-DIMMING MIRROR
HARNESS-SIDE CONNECTOR



C6U912ZW001

Terminal	Signal name	Connected to	Measured condition	Voltage (V)/ Continuity	Inspection item(s)
B	Power supply	METER IG 15 A fuse (5HB, WGN) A/C 15 A fuse (4SD)	Ignition switch at ON	B+	• METER IG 15 A fuse (5HB, WGN) • A/C 15 A fuse (4SD) • Related wiring harnesses
D	R range signal	Back-up light switch/TR switch	R range	B+	• Back-up light switch/TR switch • Related wiring harnesses
			Other than R range	1.0 or less	
F	GND	Body ground	Under any condition: Inspect for continuity to ground.	Continuity detected	• GND • Related wiring harnesses
J	Power supply	ROOM 15 A fuse	Under any condition	B+	• ROOM 15 A fuse • Related wiring harnesses

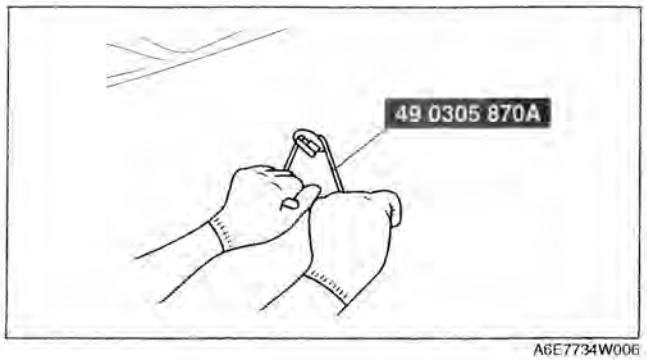
BASE REMOVAL

C6U091269240W01

1. Remove the rearview mirror.
2. Wind each end of a wire around a bar.

Warning
- **Using the SST (piano wire) with bare hands can cause injury. Always wear gloves when using the SST (piano wire).**

Note
- Use a long sawing action to spread the work over the whole length of the **SST** (piano wire) to prevent it from breaking.



A6E7734W006

3. Saw through the sealant to remove the base.

BASE INSTALLATION

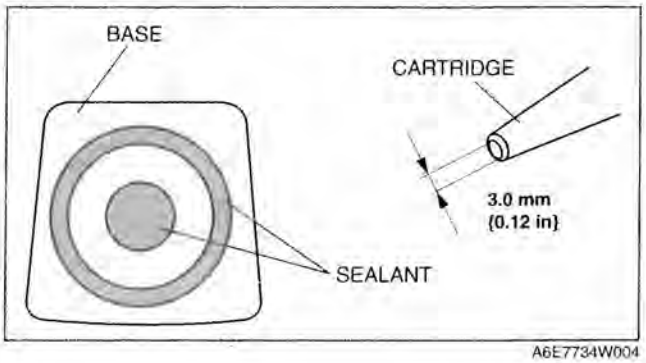
C6U091269240W02

1. Cut away all of the original sealant using a razor.
2. Clean and degrease the ceramic coating on the glass and the base.
3. Apply primer to the bonding area of the glass and the base.

Caution
- **Keep the area free of dirt and grease, and do not touch the surface. Otherwise, the primer may not properly bond to the surface of the glass.**

4. Apply a **3.0 mm {0.12 in}** layer of sealant to the base.

Note
- Use only glass primer on the glass, and body primer on the base. Allow the primer to dry for **approximately 30 minutes**.

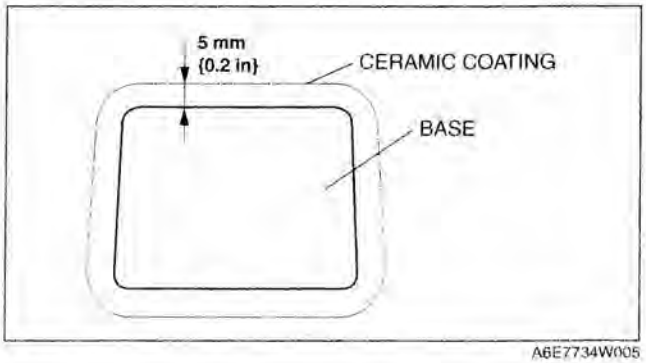


A6E7734W004

5. Center the base in the ceramic coating and press it onto the glass.
6. Use isopropyl alcohol to remove any excess repair sealant.

Hardening time of sealant

Temperature	Surface hardening time	Time required until vehicle can be put into service
5 °C {41 °F}	Approx. 1.5 h	Approx. 12 h
20 °C {68 °F}	Approx. 1 h	Approx. 4 h
35 °C {95 °F}	Approx. 10 min.	Approx. 2 h



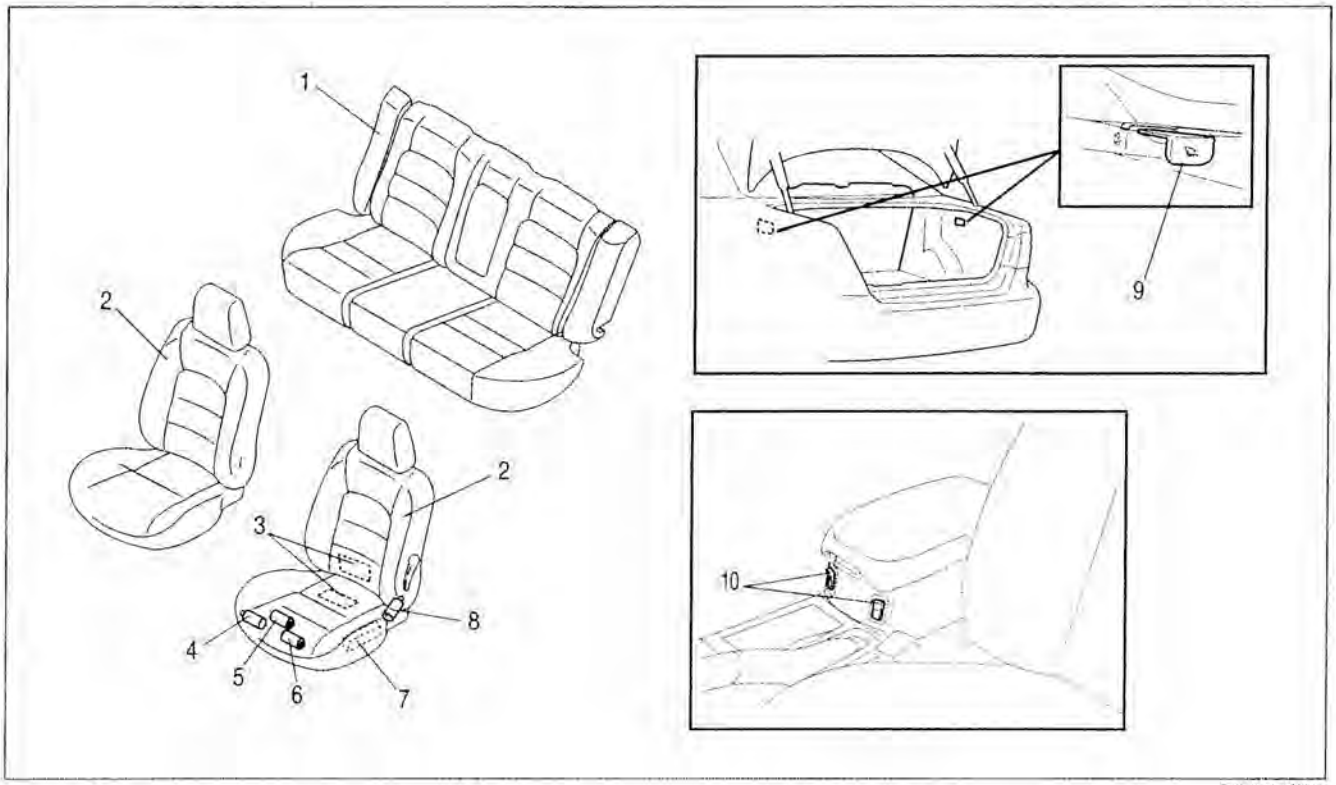
A6E7734W005

7. Install the rearview mirror.

09–13 SEATS

LOCATION INDEX

C6U09135710OW01



B6U0913W010

1	• Rear seat [4SD] (See 09–13–6 REAR SEAT REMOVAL/INSTALLATION [4SD]) (See 09–13–9 REAR SEAT DISASSEMBLY/ASSEMBLY [4SD]) • Rear seat [5HB, WGN] (See 09–13–8 REAR SEAT REMOVAL/INSTALLATION [5HB, WGN]) (See 09–13–10 REAR SEAT DISASSEMBLY/ASSEMBLY [5HB, WGN])

2	Front seat (See 09–13–2 FRONT SEAT REMOVAL/INSTALLATION) (See 09–13–3 FRONT SEAT DISASSEMBLY/ASSEMBLY)
3	Seat warmer unit (See 09–13–15 SEAT WARMER UNIT INSPECTION)
4	Rear tilt motor (See 09–13–12 REAR TILT MOTOR INSPECTION)

5	Slide motor (See 09–13–12 SLIDE MOTOR INSPECTION)
6	Front tilt motor (See 09–13–12 FRONT TILT MOTOR INSPECTION)
7	Power seat switch (See 09–13–13 POWER SEAT SWITCH INSPECTION)
8	Recliner motor (See 09–13–12 RECLINER MOTOR INSPECTION)
9	Remote handle lever (See 09–13–11 REMOTE HANDLE LEVER REMOVAL/INSTALLATION [4SD]) (See 09–13–11 REMOTE HANDLE LEVER REMOVAL/INSTALLATION [5HB, WGN])
10	Seat warmer switch (See 09–13–14 SEAT WARMER SWITCH REMOVAL/INSTALLATION) (See 09–13–14 SEAT WARMER SWITCH INSPECTION)

FRONT SEAT REMOVAL/INSTALLATION

C6U091357100W02

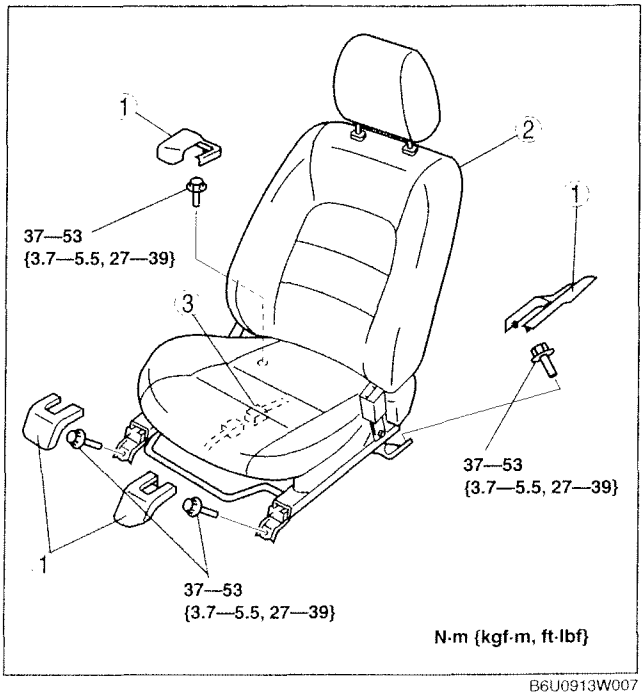
Warning

- **Handling the front seat (with a side air bag) improperly can accidentally deploy the side air bag, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the front seat (with a side air bag). (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS.)**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute**.
3. Remove in the order indicated in the table.

1	Cover
2	Front seat
3	Connector

4. Install in the reverse order of removal.



B6U0913W007

FRONT SEAT DISASSEMBLY/ASSEMBLY

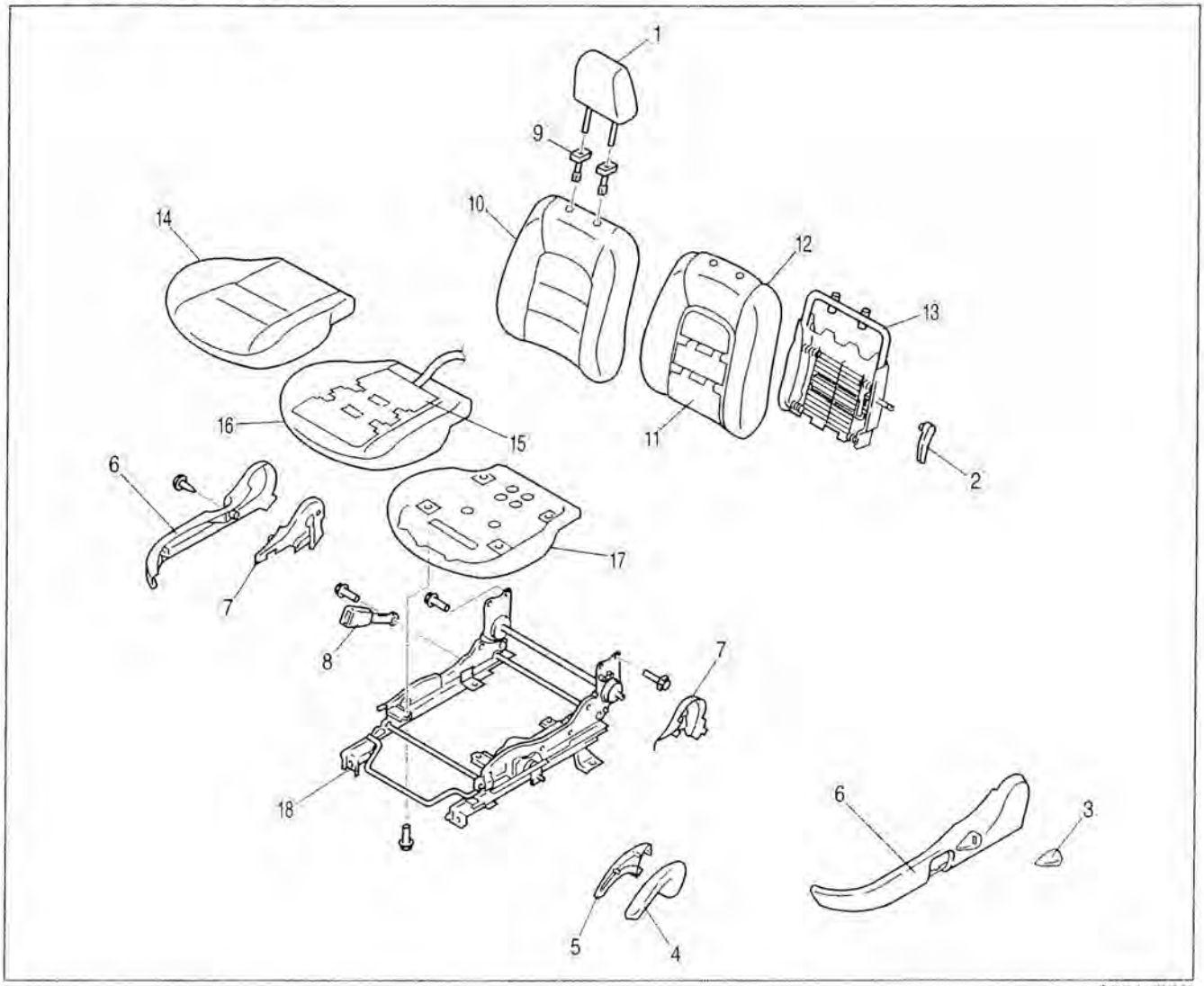
C6U091357100W03

Warning

- **Handling the front seat (with a side air bag) improperly can accidentally deploy the side air bag, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the front seat (with a side air bag). (See 08–10–3 AIR BAG SYSTEM SERVICE WARNINGS.)**

1. Disconnect the negative battery cable and wait for **more than 1 minute**.
2. Remove the side air bag module. (See 08–10–7 SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
3. Disassemble in the order indicated in the table.
4. Assemble in the reverse order of disassembly.

Driver's Seat (Normal Seat)

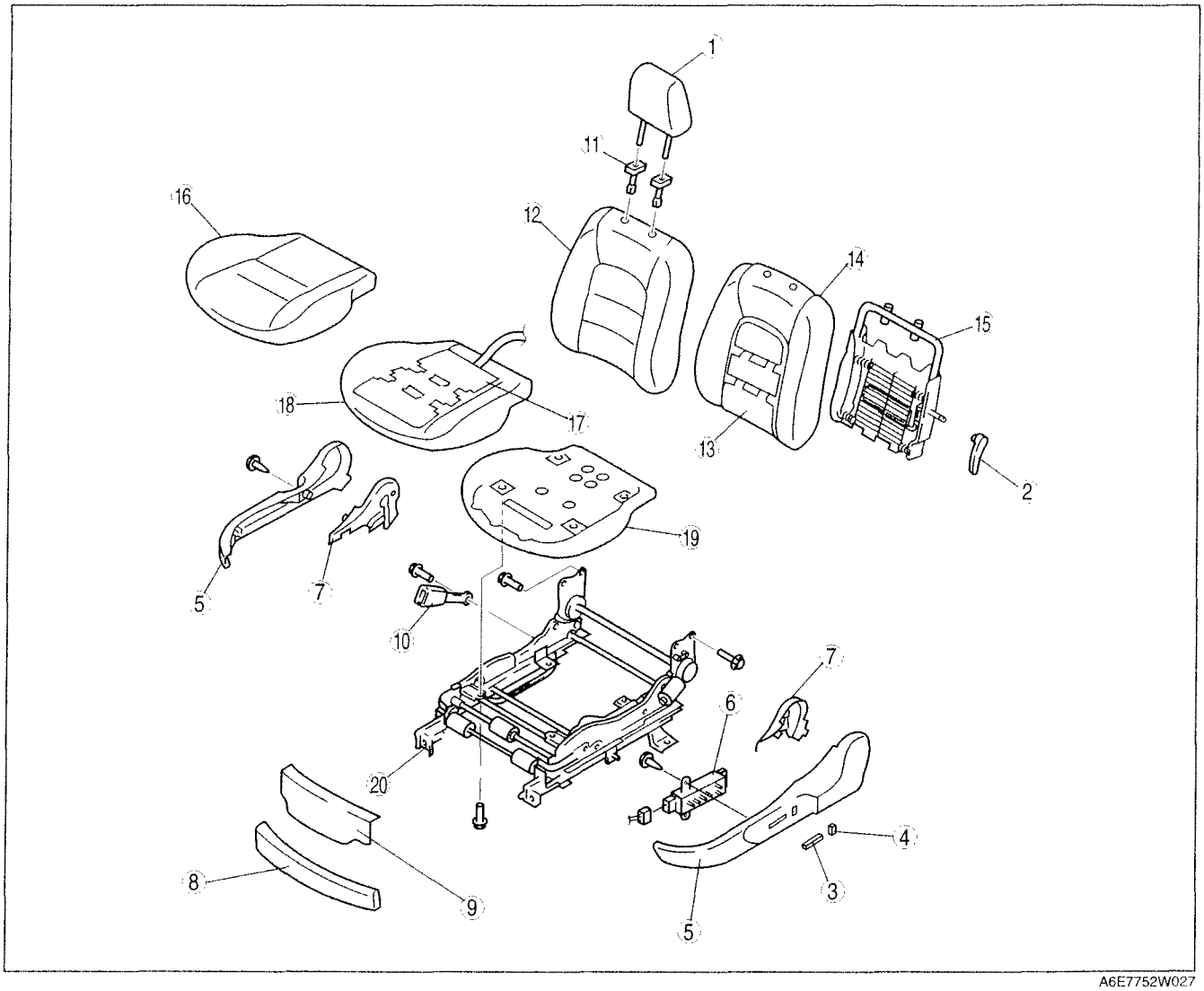


B6U0913W006

1	Headrest
2	Lumber support lever (See 09–13–5 Lumber support lever disassembly note.)
3	Recliner lever
4	Outer lift lever
5	Inner lift lever
6	Side cover (See 09–13–6 Side cover disassembly note.)
7	Reverse cover
8	Front buckle

9	Pole guide
10	Seat back trim
11	Seat warmer unit
12	Seat back pad
13	Seat back frame
14	Seat cushion trim
15	Seat warmer unit
16	Seat cushion pad
17	Seat cushion frame
18	Slide adjuster

Driver's Seat (Power Seat)

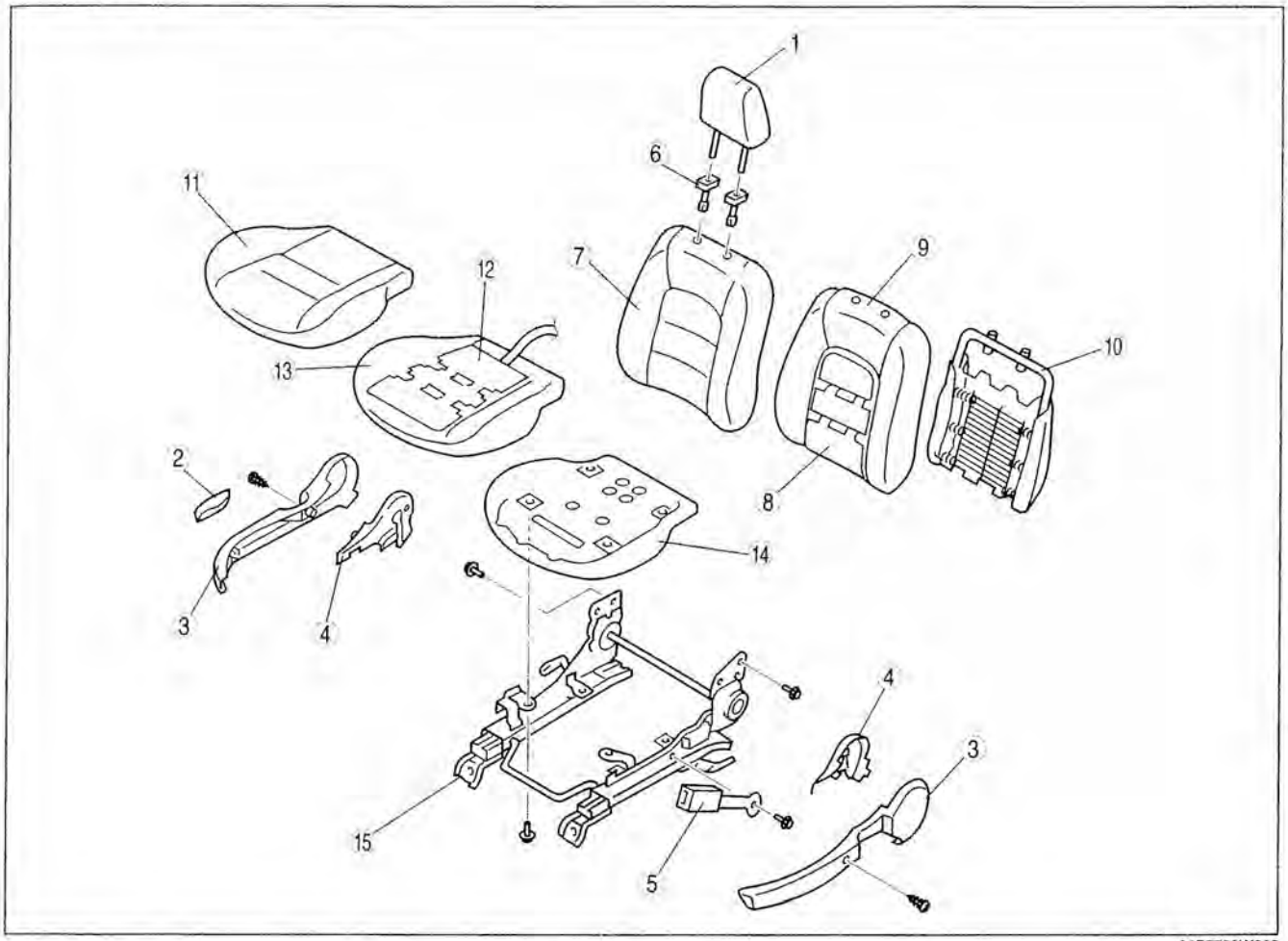


A6E7752W027

1	Headrest
2	Lumber support lever (See 09–13–5 Lumber support lever disassembly note.)
3	Slider and lifter switch knob
4	Recliner switch knob
5	Side cover (See 09–13–6 Side cover disassembly note.)
6	Power seat switch
7	Reverse cover
8	Front cover No. 1
9	Front cover No. 2

10	Front buckle
11	Pole guide
12	Seat back trim
13	Seat warmer unit
14	Seat back pad
15	Seat back frame
16	Seat cushion trim
17	Seat warmer unit
18	Seat cushion pad
19	Seat cushion frame
20	Slide adjuster

Passenger's Seat



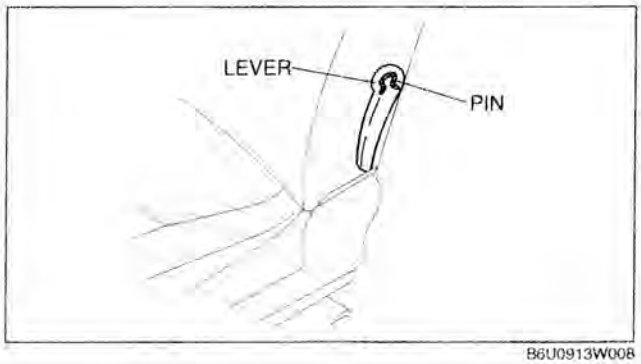
A6E7752W003

1	Headrest
2	Recliner lever
3	Side cover (See 09–13–6 Side cover disassembly note.)
4	Reverse cover
5	Front buckle
6	Pole guide
7	Seat back trim

8	Seat warmer unit
9	Seat back pad
10	Seat back frame
11	Seat cushion trim
12	Seat warmer unit
13	Seat cushion pad
14	Seat cushion frame
15	Slide adjuster

Lumber support lever disassembly note

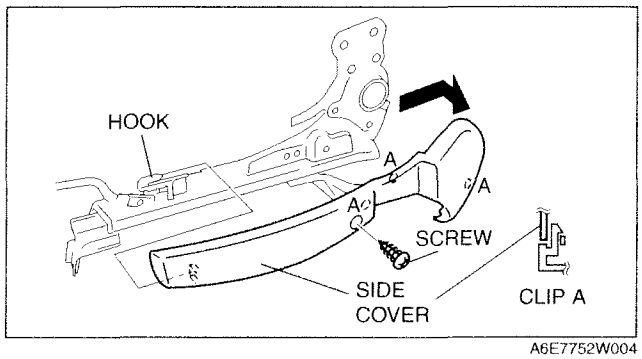
1. Remove the pin from the lumber support lever installation part with rag.



B6U0913W008

Side cover disassembly note

1. Remove the screws.
2. Disengage clips A.
3. Lift the side cover up in the direction of the arrow, then unhook it from slide adjuster.

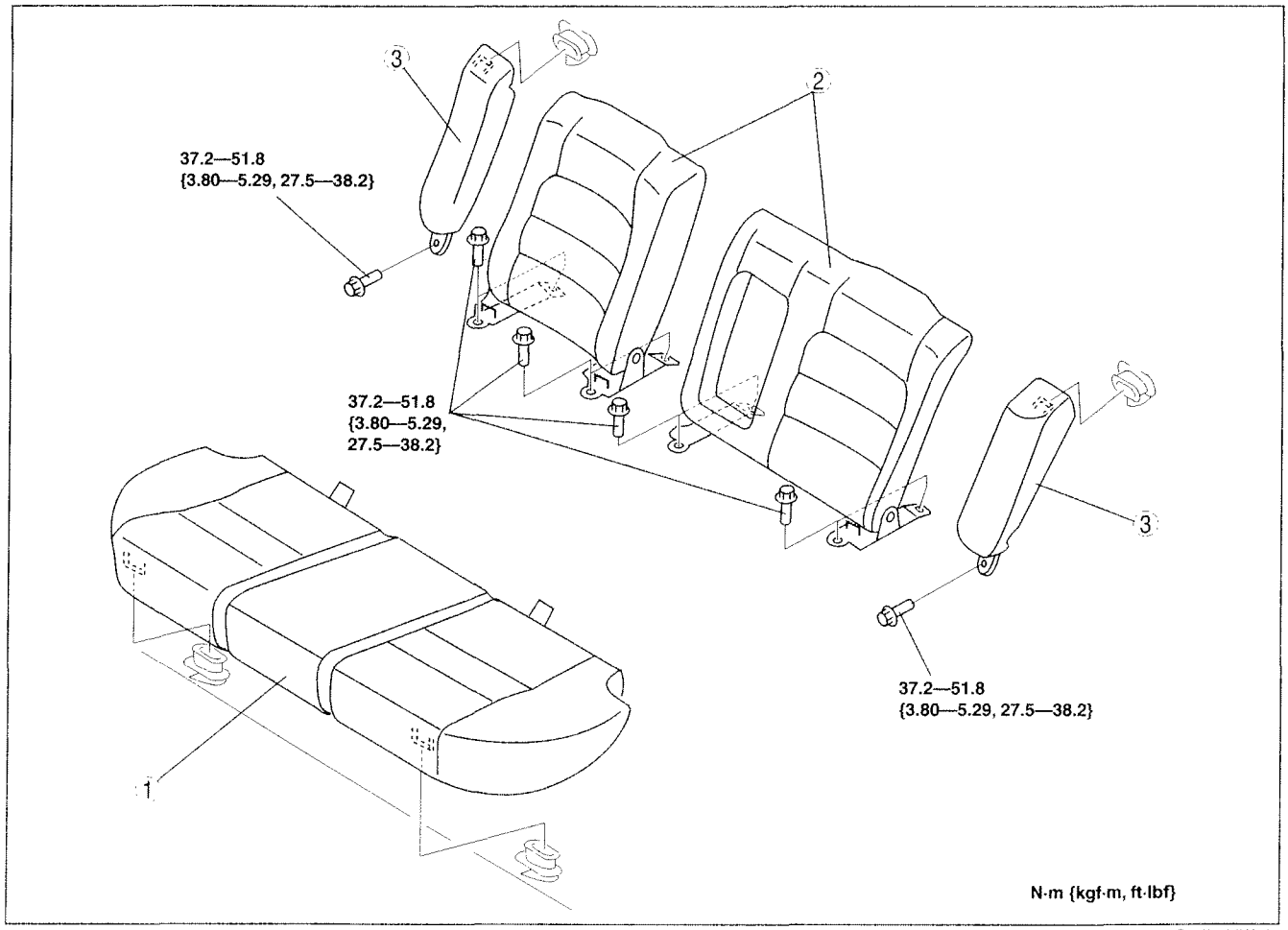


A6E7752W004

REAR SEAT REMOVAL/INSTALLATION [4SD]

C6U091357200W01

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



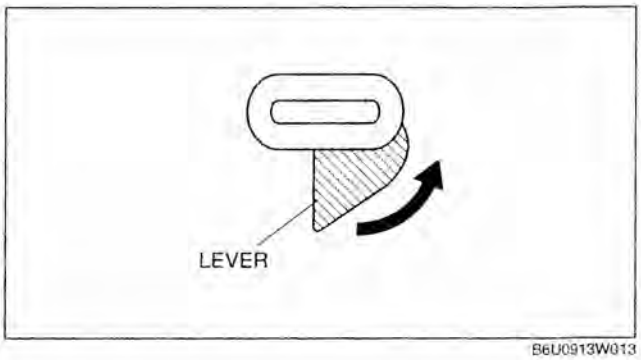
C6U0913W101

1	Rear seat cushion (See 09–13–7 Rear Seat Cushion Removal Note)
2	Rear seat back

3	Rear side seat (See 09–13–7 Rear Side Seat Removal Note)

Rear Seat Cushion Removal Note

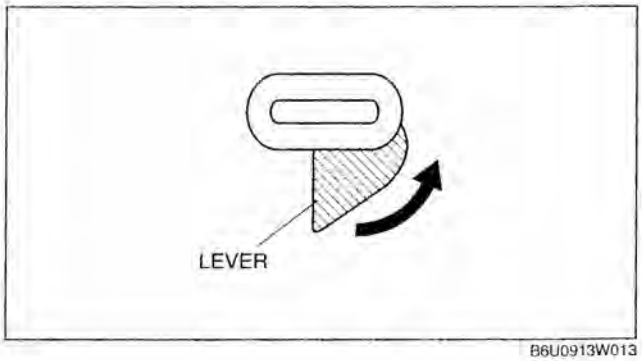
1. Remove the rear seat cushion while pushing the lever in the direction of the arrow.



B6U0913W013

Rear Side Seat Removal Note

1. Partially peel back the trunk side trim.
2. Remove the rear side seat while pushing the lever in the direction of the arrow.

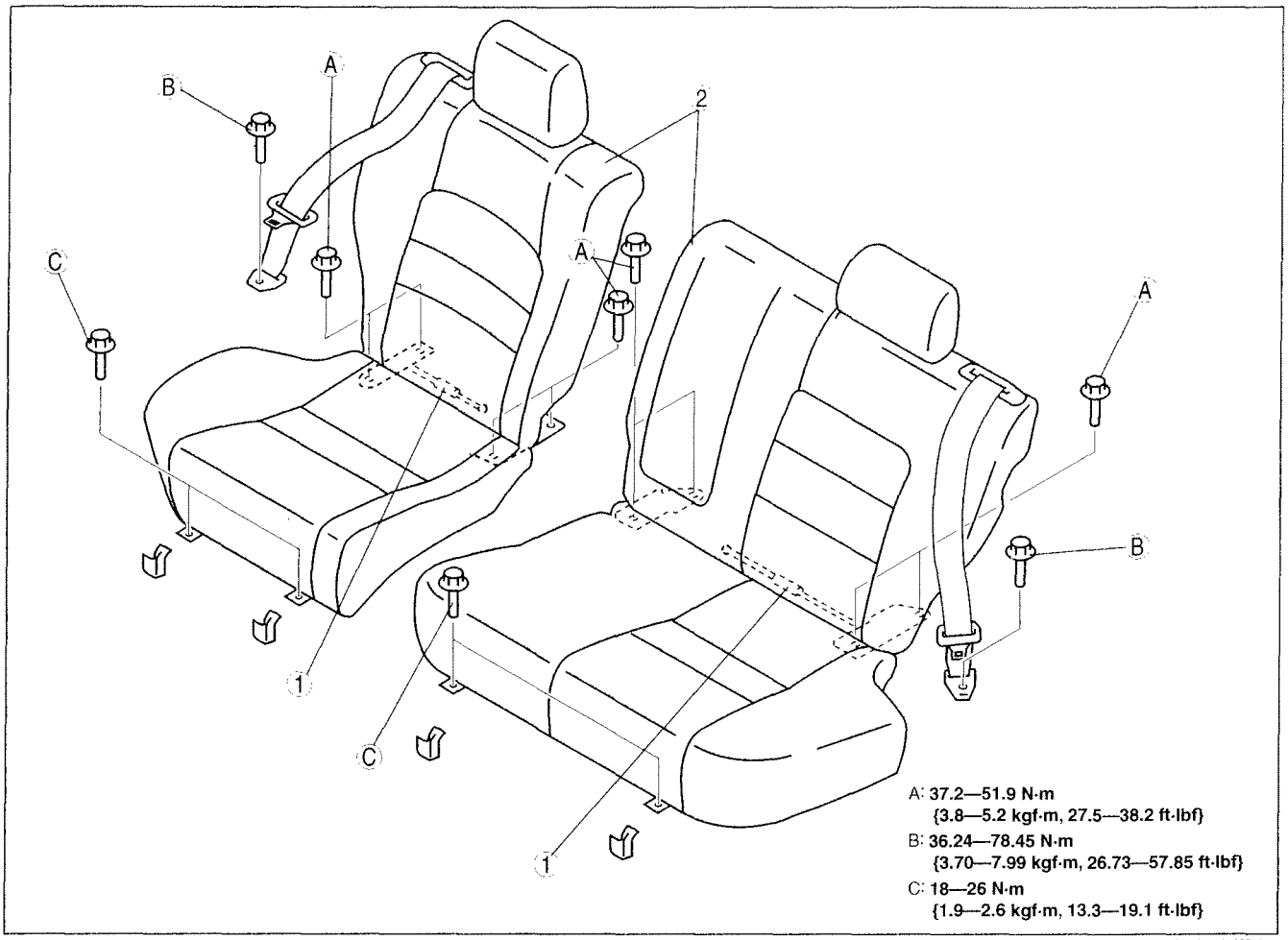


B6U0913W013

REAR SEAT REMOVAL/INSTALLATION [5HB, WGN]

C6U091357200W03

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



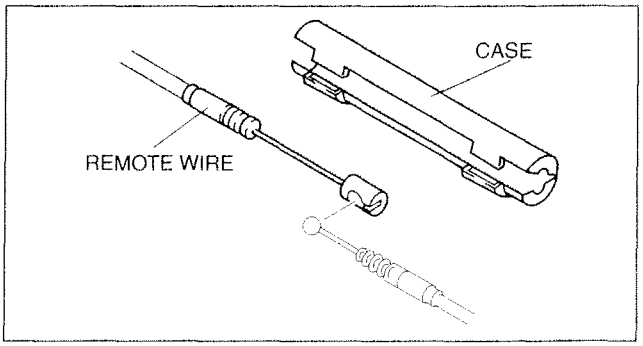
C6U0913WM01

1	Remote wire (See 09–13–8 Remote wire removal note.)

2	Rear seat (See 09–13–9 Rear seat removal note.)

Remote wire removal note

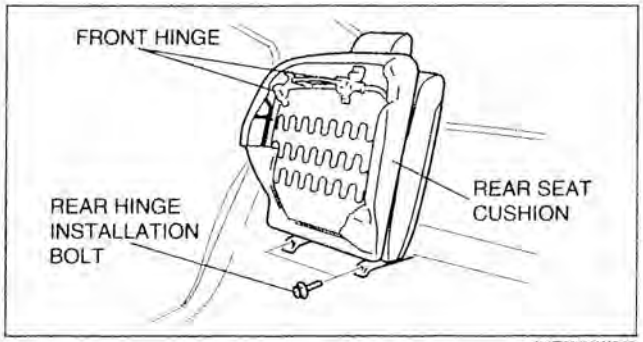
1. Turn over the trunk floor mat.
2. Remove the case.
3. Remove the remote wire.



A6E7752W014

Rear seat removal note

1. Remove the front hinge installation bolts.
2. Lift the rear seat cushion, then remove the rear hinge installation bolts.

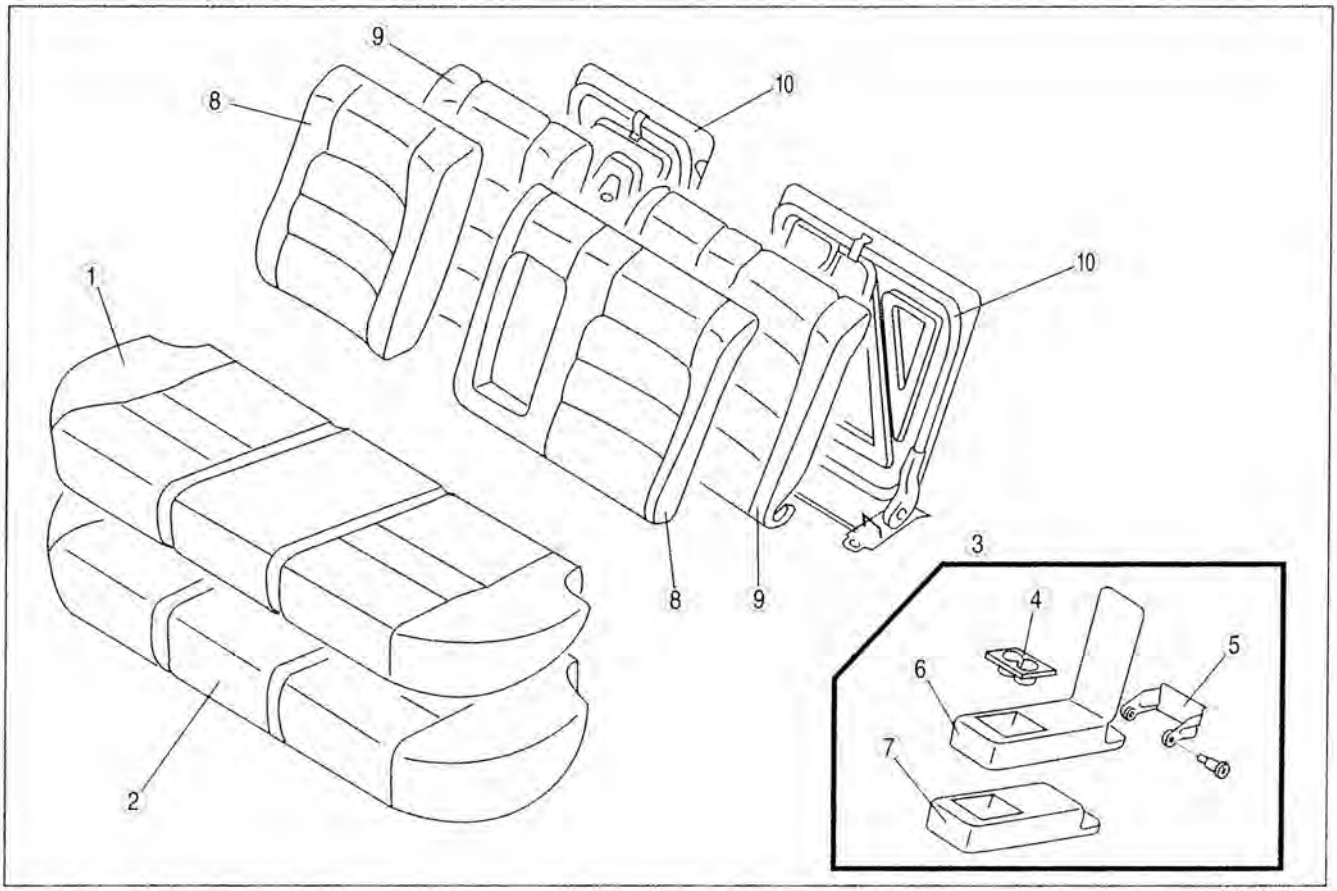


A6E7752W013

REAR SEAT DISASSEMBLY/ASSEMBLY [4SD]

C6U091357200W02

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



B6U0913W011

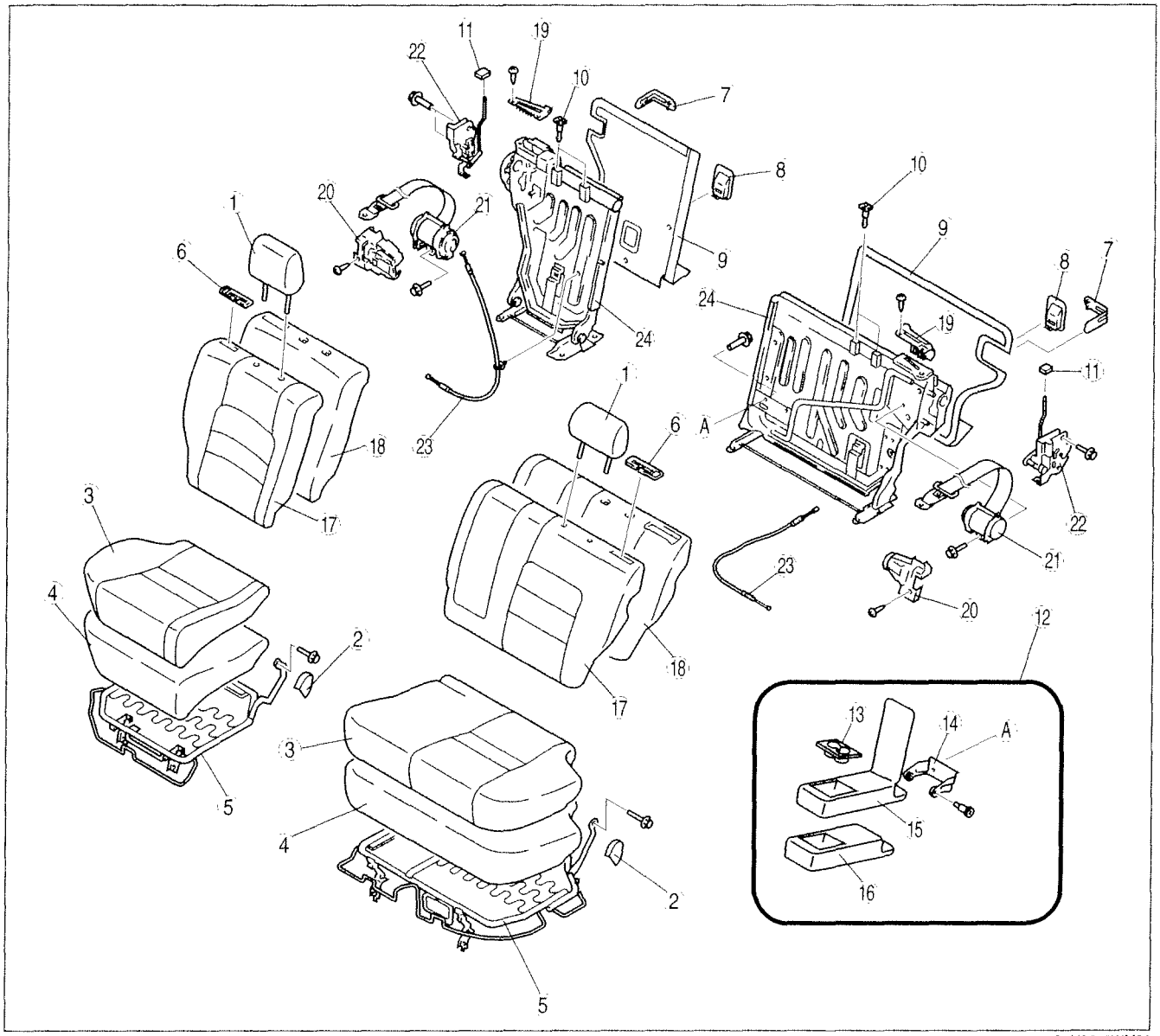
1	Seat cushion trim
2	Seat cushion pad
3	Armrest
4	Cup holder
5	Armrest hinge

6	Armrest trim
7	Armrest pad
8	Seat back trim
9	Seat back pad
10	Seat back frame

REAR SEAT DISASSEMBLY/ASSEMBLY [5HB, WGN]

C6U091357200W04

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



C6U0913WM02

1	Headrest
2	Hinge cover
3	Seat cushion trim
4	Seat cushion pad
5	Seat cushion frame
6	Remote button cover
7	Seat back catch cover
8	Child seat anchor cover
9	Seat back board
10	Pole guide
11	Remote button
12	Armrest assembly

13	Cup holder
14	Armrest hinge
15	Armrest trim
16	Armrest pad
17	Seat back trim
18	Seat back pad
19	Seat belt guide
20	Retractor cover
21	Rear seat belt
22	Seat back catch
23	Remote wire
24	Seat back frame

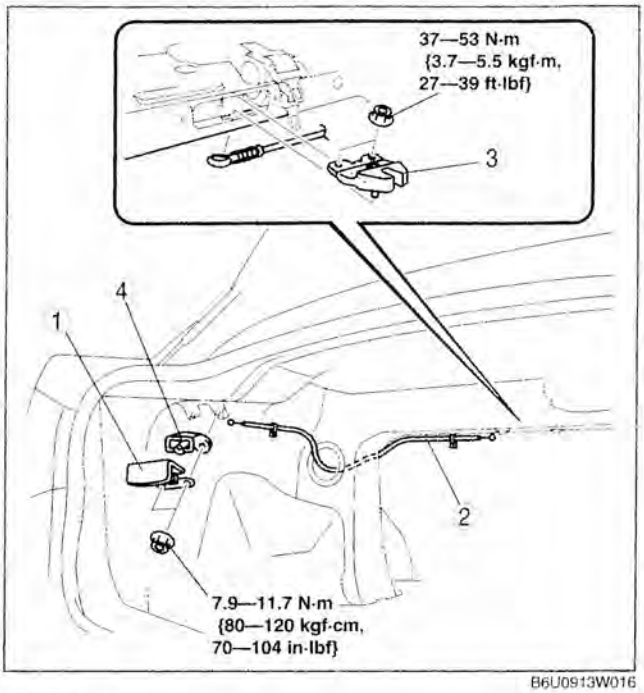
REMOTE HANDLE LEVER REMOVAL/INSTALLATION [4SD]

C6U091300166W01

1. To remove the remote wire, remove the trunk side trim.
2. Remove in the order indicated in the table.

1	Remote handle lever
2	Remote wire
3	Remote catch
4	Seat bracket

3. Install in the reverse order of removal.



B6U0913W016

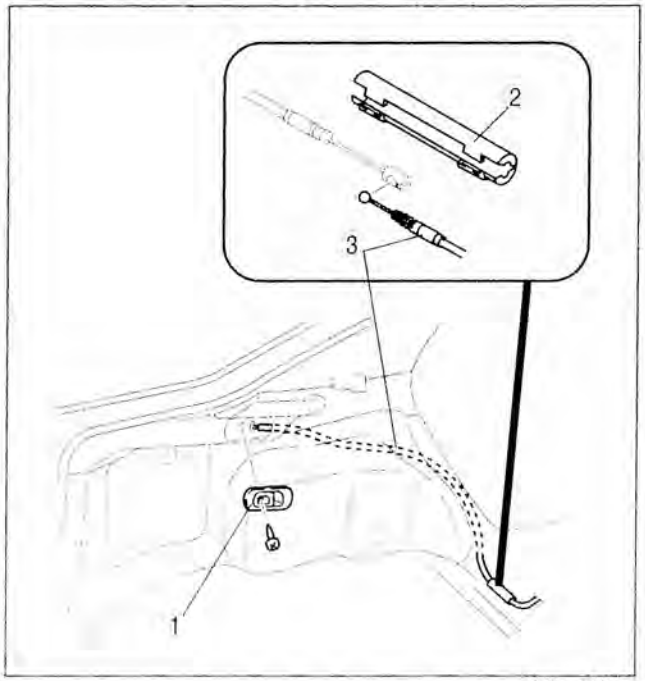
REMOTE HANDLE LEVER REMOVAL/INSTALLATION [5HB, WGN]

C6U091357200W05

1. To remove the remote wire, remove the trunk side upper trim and trunk side lower trim.
2. Remove in the order indicated in the table.

1	Remote handle lever
2	Cover
3	Remote wire

3. Install in the reverse order of removal.



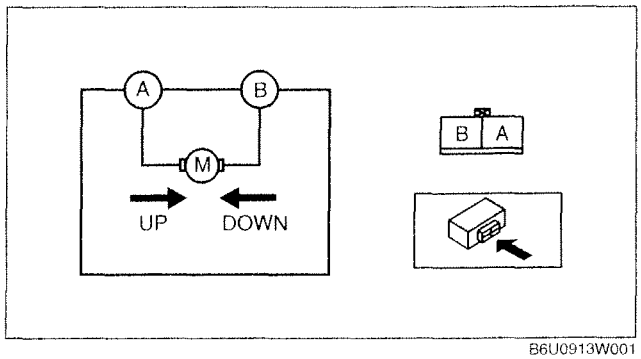
A6E7752W011

FRONT TILT MOTOR INSPECTION

C6U091388650W01

1. Disconnect the front tilt motor connector.
2. Apply battery positive voltage to the front tilt motor terminals and inspect the front tilt motor operation
   - If not as specified, replace the seat cushion frame.

Motor operation	Connection	
	B+	GND
Up	A	B
Down	B	A



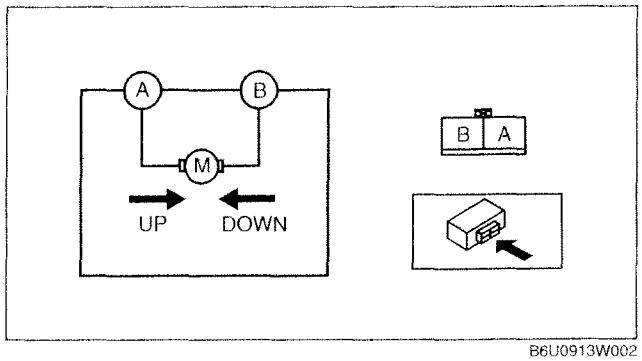
B6U0913W001

REAR TILT MOTOR INSPECTION

C6U091388651W01

1. Disconnect the rear tilt motor connector.
2. Apply battery positive voltage to the rear tilt motor terminals and inspect the rear tilt motor operation
   - If not as specified, replace the seat cushion frame.

Motor operation	Connection	
	B+	GND
Up	A	B
Down	B	A



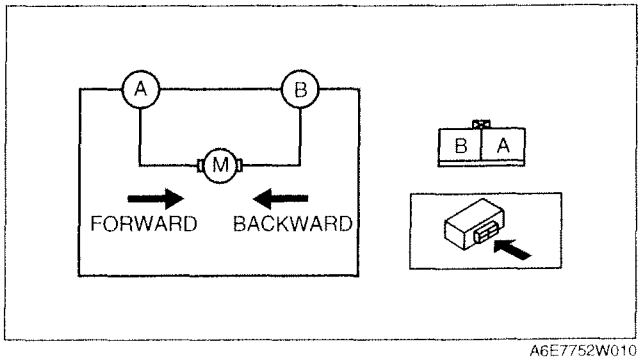
B6U0913W002

SLIDE MOTOR INSPECTION

C6U091388662W01

1. Disconnect the slide motor connector.
2. Apply battery positive voltage to the slide motor terminals and inspect the slide motor operation
   - If not as specified, replace the seat cushion frame.

Motor operation	Connection	
	B+	GND
Forward	A	B
Backward	B	A



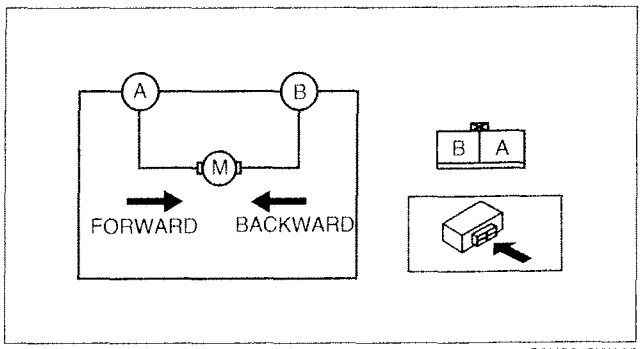
A6E7752W010

RECLINER MOTOR INSPECTION

C6U091388663W01

1. Disconnect the recliner motor connector.
2. Apply battery positive voltage to the recliner motor terminals and inspect the recliner motor operation.
   - If not as specified, replace the seat cushion frame.

Motor operation	Connection	
	B+	GND
Forward	A	B
Backward	B	A



B6U0913W009

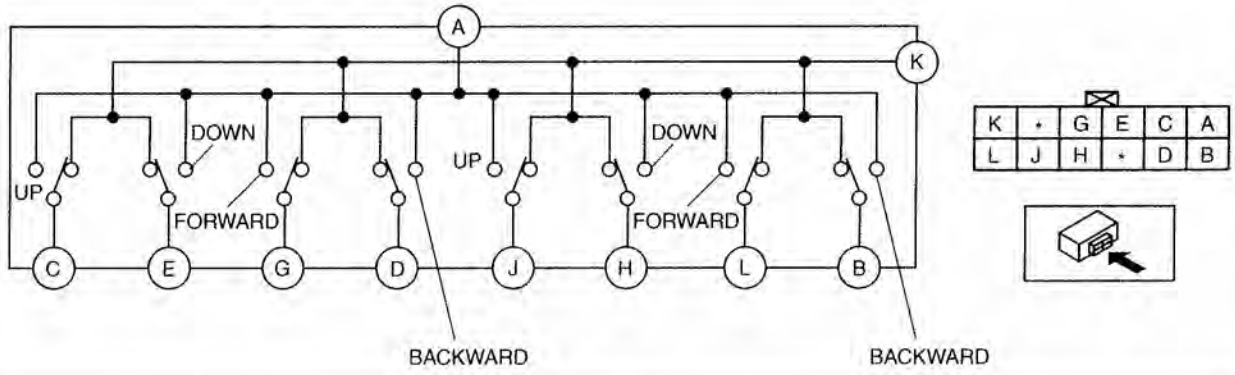
POWER SEAT SWITCH INSPECTION

C6U091357155W01

1. Disconnect the power seat switch connector.
2. Disconnect the rear tilt motor connector.
3. Inspect for continuity between the power seat switch connector terminals using an ohmmeter.
   - If not as specified, replace the power seat switch.

○—○ : Continuity

Switch position		Terminal									
		A	B	C	D	E	G	H	J	K	L
Recliner	Forward	○									○
	Off		○							○	○
	Backward	○	○							○	○
Slide	Forward	○			○		○			○	
	Off				○		○			○	
	Backward	○			○		○			○	
Front tilt	Up	○		○		○				○	
	Off			○		○				○	
	Down	○		○		○				○	
Rear tilt	Up	○						○	○	○	
	Off							○	○	○	
	Down	○						○	○	○	



B6U0913W003

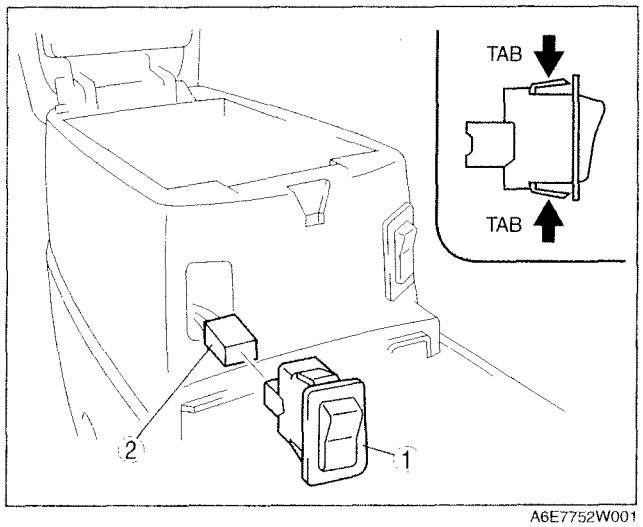
SEAT WARMER SWITCH REMOVAL/INSTALLATION

C6U091359000W01

1. Disconnect the negative battery cable.
2. Remove the panel No.1.
3. Remove in the order indicated in the table.

1	Seat warmer switch (See 09–13–14 Seat Warmer Switch Removal Note.)
2	Connector

4. Install in the reverse order of removal.



A6E7752W001

Seat Warmer Switch Removal Note

1. Squeeze the tabs of seat warmer switch and pull it outward to remove it.

SEAT WARMER SWITCH INSPECTION

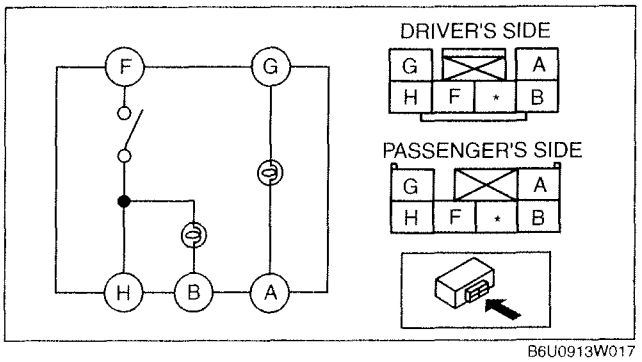
C6U091359000W02

1. Inspect for continuity between the seat warmer switch terminals using an ohmmeter.
   - If not as specified, replace the seat warmer switch.

○——○ : Continuity ○—⊖—○ : Bulb

Switch position	Terminal				
	B	H	F	A	G
ON	○—⊖—○		○——	○—⊖—○	
OFF	○—⊖—○			○—⊖—○	

A6E7752W024

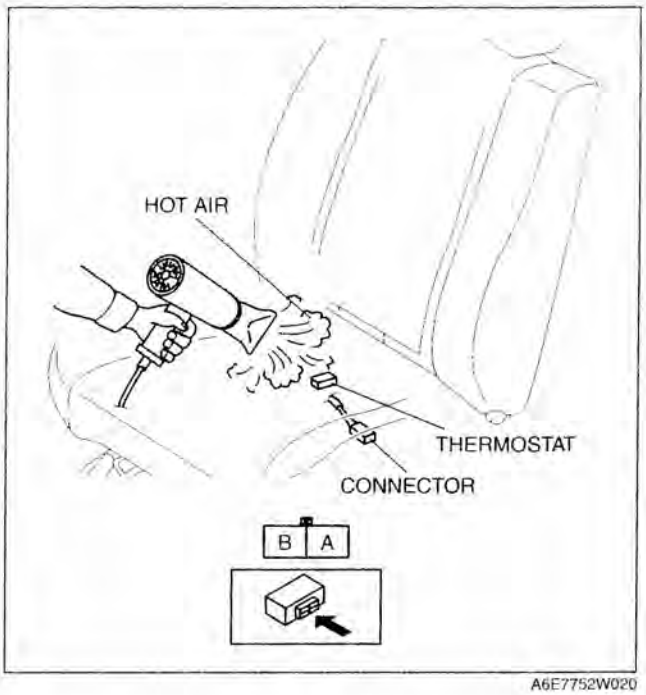


B6U0913W017

SEAT WARMER UNIT INSPECTION

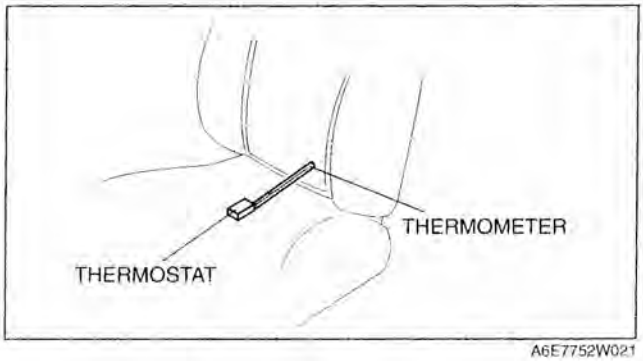
C6U091359000W03

1. Remove the front seat. (See 09–13–2 FRONT SEAT REMOVAL/INSTALLATION.)
2. Remove the seat cushion trim.
3. While inspecting for continuity between the connector terminals A and B, use a dryer to warm the thermostat of the seat warmer unit on seat cushion.



A6E7752W020

4. When the ohmmeter indicates that there is no continuity, turn off the dryer, then use a thermometer to measure the temperature of the thermostat.
5. Verify that the temperature is **approximately 37 °C {99 °F}**.



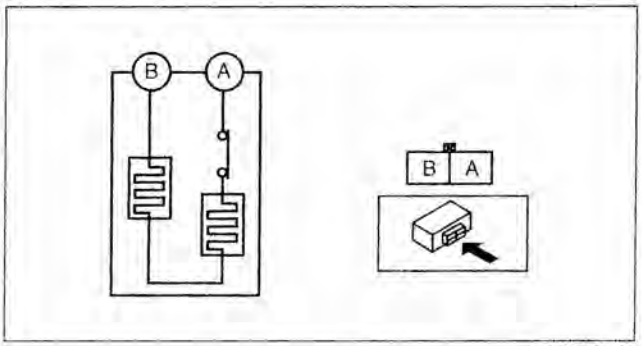
A6E7752W021

6. Using an ohmmeter, verify that there is continuity between the seat warmer unit connector terminals when temperature drops to **approximately 28 °C {82 °F}**.

O—O : Continuity

Thermostat temperature	Terminal A	Terminal B
More than approx. 37 °C {99 °F}		
Less than approx. 28 °C {82 °F}	O	O

C6U0913W102

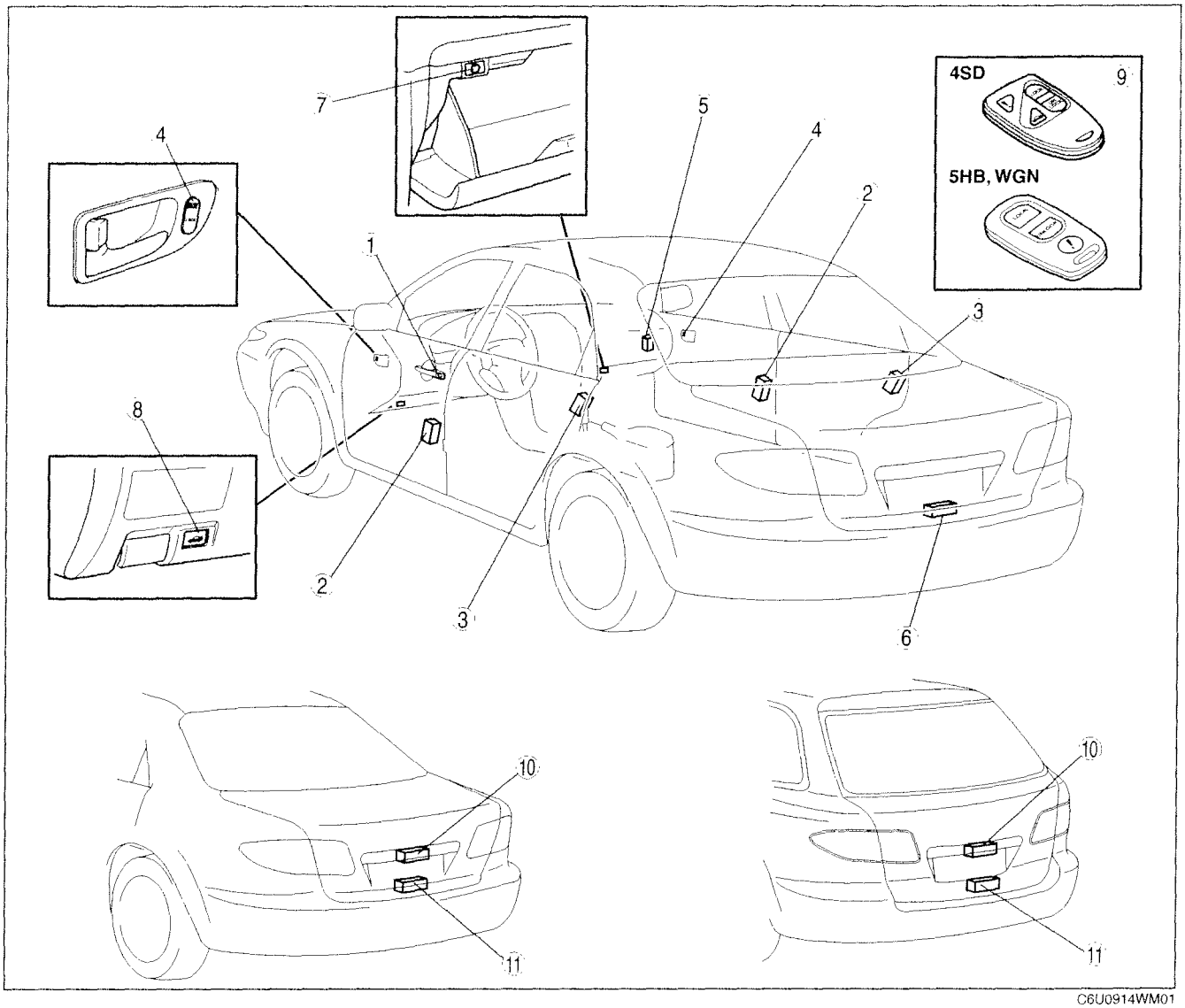


B6U0913W015

09–14 SECURITY AND LOCKS

POWER DOOR LOCK SYSTEM LOCATION INDEX

C6U091466000W01



C6U0914WM01

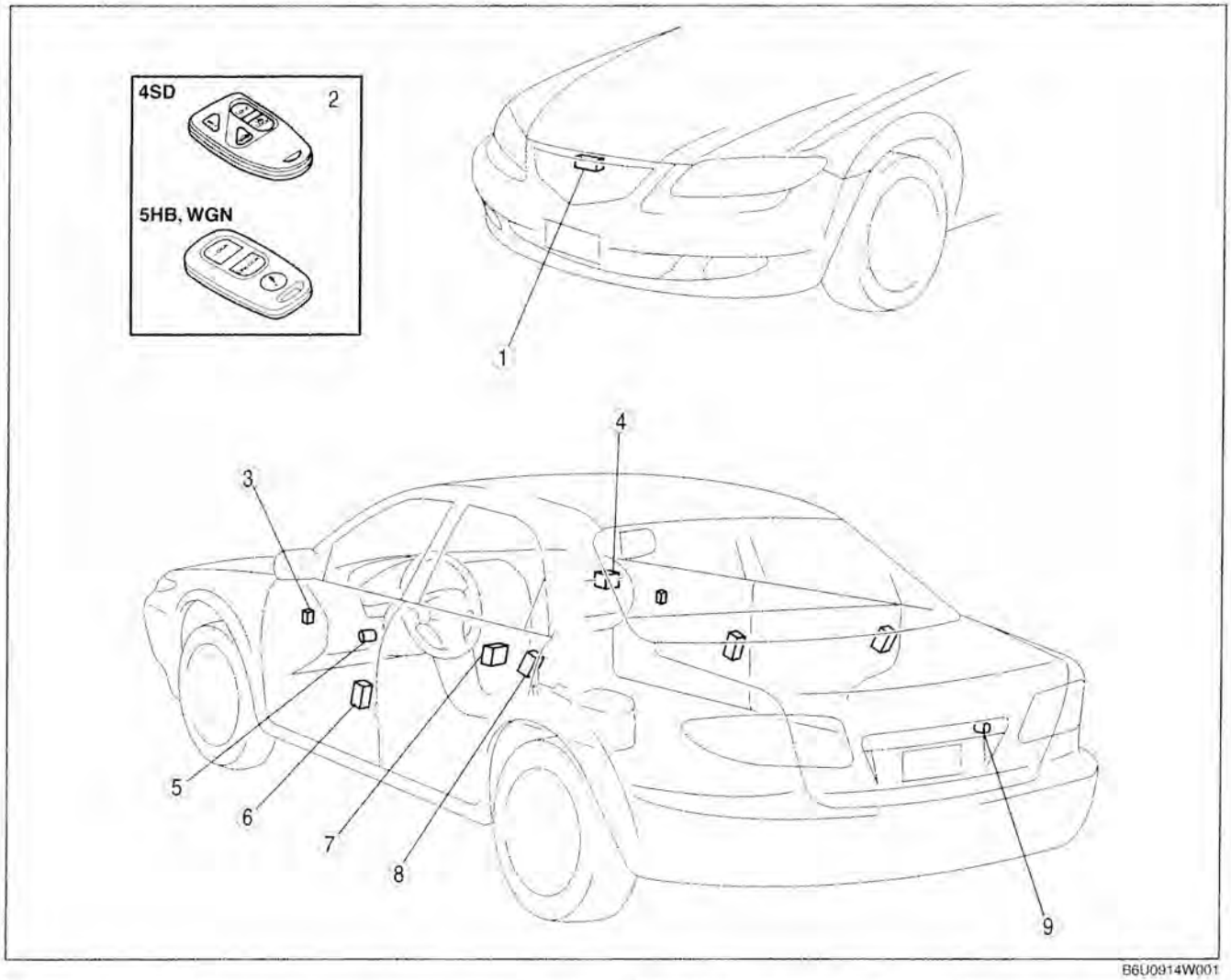
1	Door key cylinder (See 09–14–4 FRONT DOOR KEY CYLINDER REMOVAL/INSTALLATION)
2	Front door lock actuator (See 09–14–5 FRONT DOOR LOCK ACTUATOR INSPECTION)
3	Rear door lock actuator (See 09–14–6 REAR DOOR LOCK ACTUATOR INSPECTION)
4	Door lock switch (See 09–14–8 DOOR LOCK SWITCH REMOVAL/INSTALLATION) (See 09–14–8 DOOR LOCK SWITCH INSPECTION)
5	Door lock control module (See 09–14–11 DOOR LOCK CONTROL MODULE INSPECTION) (See 09–14–9 DOOR LOCK CONTROL MODULE REMOVAL/INSTALLATION) (See 09–14–14 DOOR LOCK CONTROL MODULE ID CODE CHANGE)

6	Trunk lid opener [4SD] (See 09–14–17 TRUNK LID OPENER REMOVAL/INSTALLATION [4SD]) (See 09–14–18 TRUNK LID OPENER INSPECTION [4SD])
7	Trunk lid open cancel switch [4SD] (See 09–14–19 TRUNK LID OPEN CANCEL SWITCH REMOVAL/INSTALLATION [4SD]) (See 09–14–19 TRUNK LID OPEN CANCEL SWITCH INSPECTION [4SD])
8	Trunk lid open switch [4SD] (See 09–14–19 TRUNK LID OPENER SWITCH REMOVAL/INSTALLATION [4SD])
9	Transmitter (See 09–14–15 TRANSMITTER BATTERY REPLACEMENT) (See 09–14–16 TRANSMITTER BATTERY INSPECTION)
10	Liftgate outer handle [5HB, WGN] (See 09–14–18 LIFTGATE OUTER HANDLE REMOVAL/INSTALLATION [5HB, WGN])

11	Liftgate latch and lock actuator [5HB, WGN] (See 09–14–18 LIFTGATE LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION [5HB, WGN]) (See 09–14–19 LIFTGATE LOCK ACTUATOR INSPECTION [5HB, WGN])

THEFT-DETERRENT SYSTEM LOCATION INDEX

C6U091450000W01



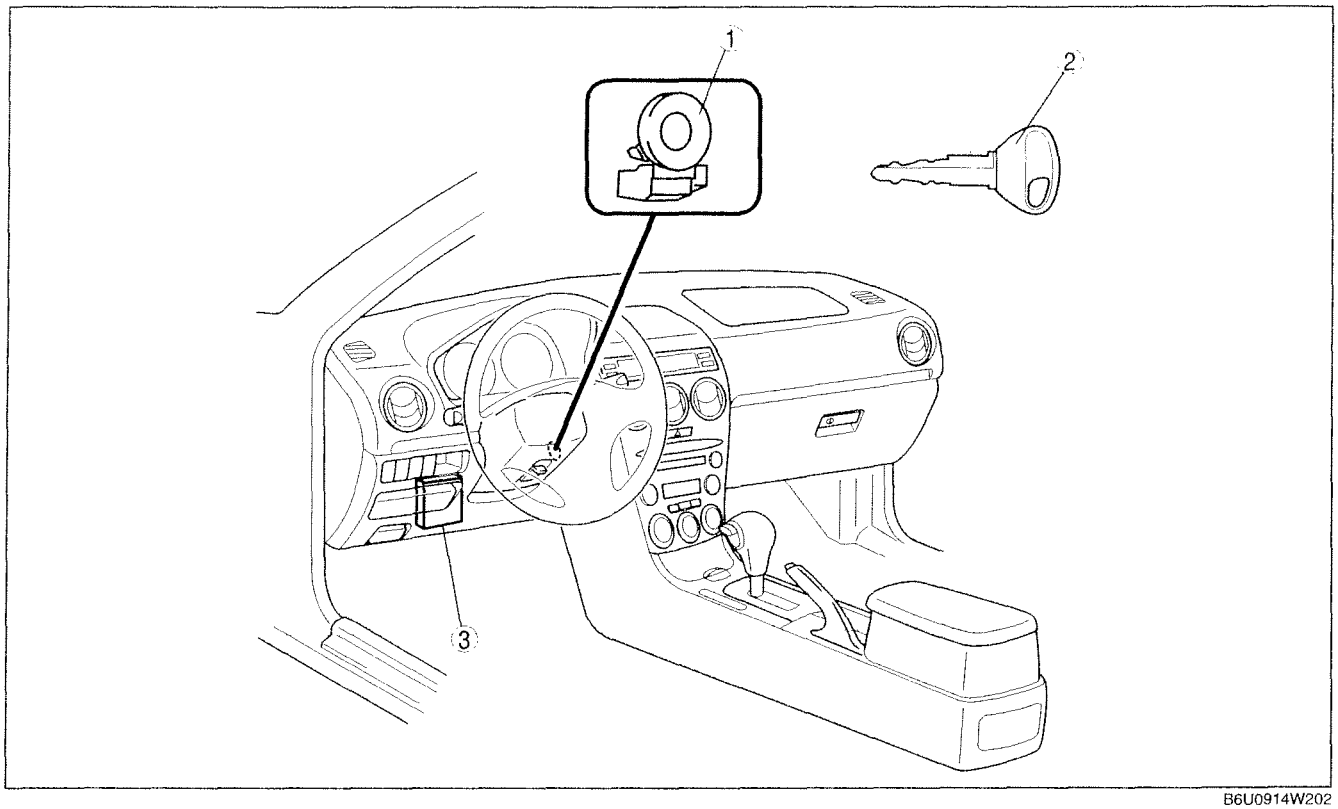
B6U0914W001

1	Hood switch (See 09–14–20 HOOD SWITCH INSPECTION)
2	Transmitter (See 09–14–15 TRANSMITTER BATTERY REPLACEMENT) (See 09–14–16 TRANSMITTER BATTERY INSPECTION)
3	Door lock switch (See 09–14–8 DOOR LOCK SWITCH REMOVAL/INSTALLATION) (See 09–14–8 DOOR LOCK SWITCH INSPECTION)
4	Door lock control module (See 09–14–9 DOOR LOCK CONTROL MODULE REMOVAL/INSTALLATION) (See 09–14–11 DOOR LOCK CONTROL MODULE INSPECTION)
5	Front door key cylinder (See 09–14–4 FRONT DOOR KEY CYLINDER REMOVAL/INSTALLATION)

6	Front door lock-link switch (See 09–14–5 FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION) (See 09–14–5 FRONT DOOR LOCK ACTUATOR INSPECTION)
7	Theft-deterrent control module (See 09–14–21 THEFT-DETERRENT CONTROL MODULE REMOVAL/INSTALLATION) (See 09–14–21 THEFT-DETERRENT CONTROL MODULE INSPECTION)
8	Rear door lock-link switch (See 09–14–6 REAR DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION) (See 09–14–6 REAR DOOR LOCK ACTUATOR INSPECTION)
9	Trunk key cylinder switch [4SD] (See 09–14–20 TRUNK KEY CYLINDER REMOVAL/INSTALLATION [4SD]) (See 09–14–20 TRUNK KEY CYLINDER SWITCH INSPECTION [4SD])

IMMOBILIZER SYSTEM LOCATION INDEX

C6U091467000W01



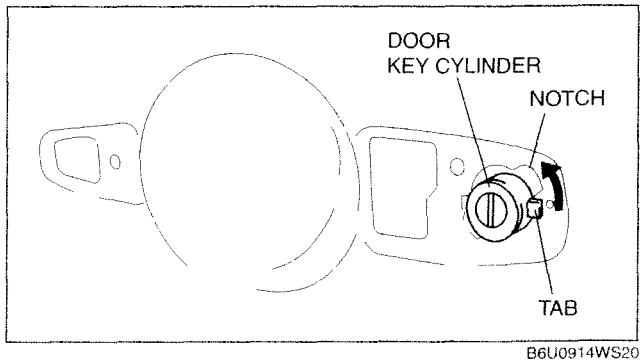
B6U0914W202

1	Coil (See 09–14–23 COIL REMOVAL/INSTALLATION)
2	Key (transponder) (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
3	PCM (See 09–14–24 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)

FRONT DOOR KEY CYLINDER REMOVAL/INSTALLATION

C6U091458310W01

1. Disconnect the rod.
2. Remove the front outer handle.
3. Turn the key cylinder in the direction indicated by the arrow and move the tab to the notch.
4. Pull the key cylinder outward to remove it.
5. Install in the reverse order of removal.

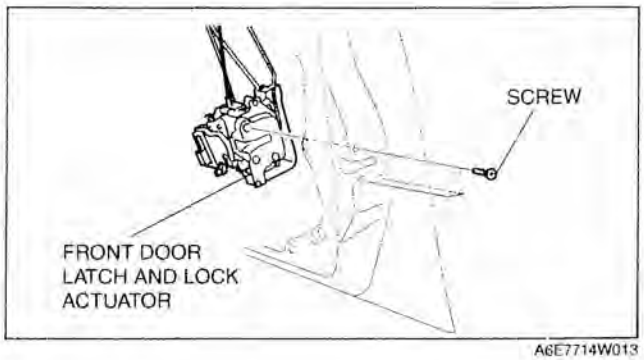


B6U0914WS20

FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION

C6U091458310W02

1. Remove the front door unit.
2. Remove the screws, then remove the front door latch and door lock actuator.
3. Install in the reverse order of removal.



A6E7714W013

FRONT DOOR LOCK ACTUATOR INSPECTION

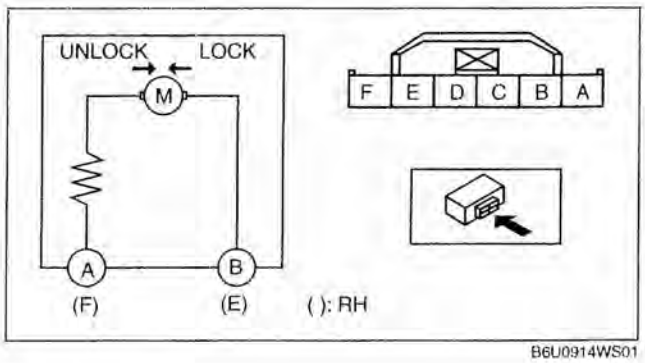
C6U091458310W03

Door Lock Actuator

1. Disconnect the front door lock actuator connector.
2. Apply battery positive voltage to the front door lock actuator terminals and inspect the front door lock actuator operation.
   - If not as specified, replace the front door lock actuator.

Actuator operation	Connection	
	GND	B+
Lock	A (F)	B (E)
Unlock	A (F)	B (E)

( ) : RH



B6U0914WS01

Door Lock-link Switch

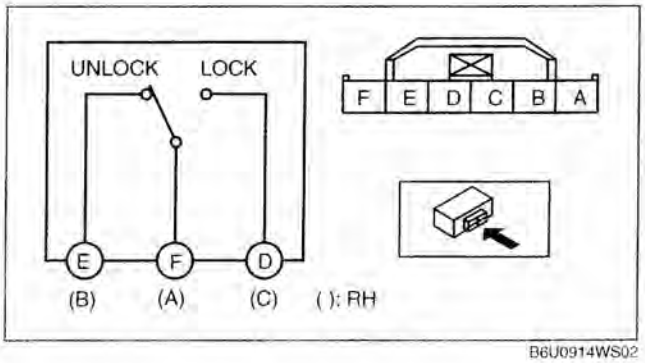
1. Disconnect the front door lock actuator connector.
2. Inspect for continuity between the door lock-link switch terminals using an ohmmeter.
   - If not as specified, replace the front door lock actuator.

○—○ : Continuity

Lock knob position	Terminal		
	E (B)	F (A)	D (C)
Lock		○—○	
Unlock	○—○		

( ): RH

B6U0914WS03



B6U0914WS02

09-14

Door Key Cylinder Switch

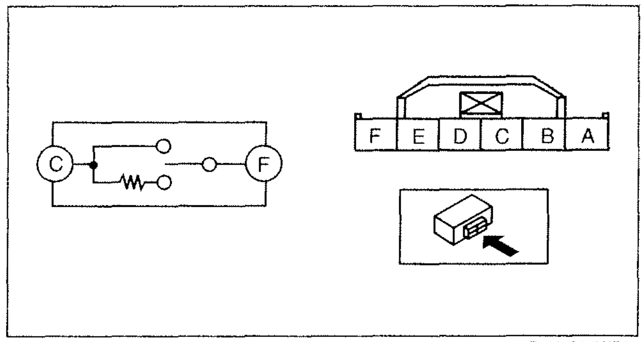
1. Disconnect the front door lock actuator connector.
2. Inspect for continuity between the door lock-link switch terminals using an ohmmeter.
   - If not as specified, replace the front door lock actuator.

O—O : Continuity O-ʌʌʌ-O : Resistance

Key cylinder position	Terminal C	Terminal F
Neutral		
Lock	O—ʌʌʌ—	—O R
Unlock	O—	—O

R: 950—1050 Ω

B6U0914WS05

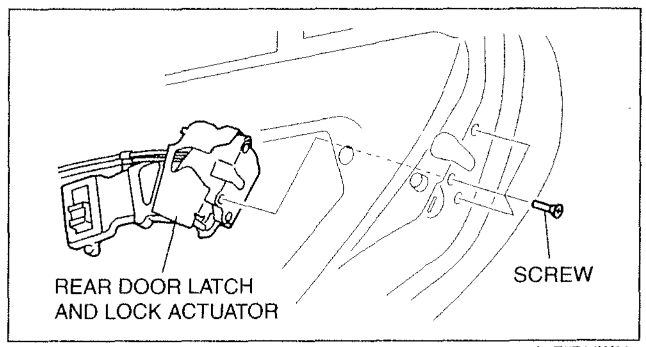


B6U0914WS04

REAR DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION

C6U091472310W01

1. Remove the rear door unit.
2. Remove the screws, then remove the rear door latch and lock actuator.
3. Install in the reverse order of removal.



A6E7714W020

REAR DOOR LOCK ACTUATOR INSPECTION

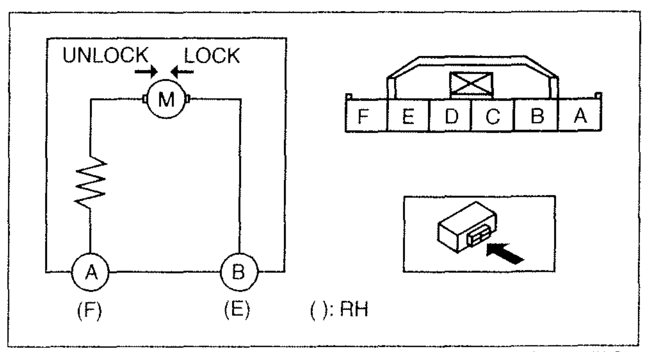
C6U091472310W02

Door Lock Actuator

1. Disconnect the rear door lock actuator connector.
2. Apply battery positive voltage to the rear door lock actuator terminals and inspect the rear door lock actuator operation.
   - If not as specified, replace the rear door lock actuator.

Actuator operation	Connection GND	Connection B+
Lock	A (F)	B (E)
Unlock	B (E)	A (F)

( ) : RH



B6U0914WS06

Door Lock-link Switch (With Theft-deterrent System)

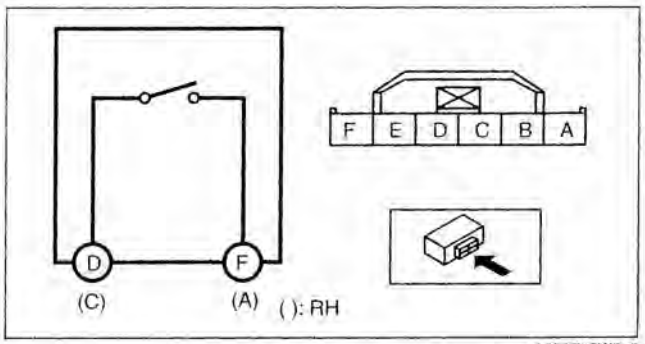
1. Disconnect the rear door lock actuator connector.
2. Inspect for continuity between the door lock-link switch terminals using an ohmmeter.
   - If not as specified, replace the rear door lock actuator.

O—O : Continuity

Lock knob position	Terminal	
	D (C)	F (A)
Lock		
Unlock	O	O

( ): RH

A6E7718W019

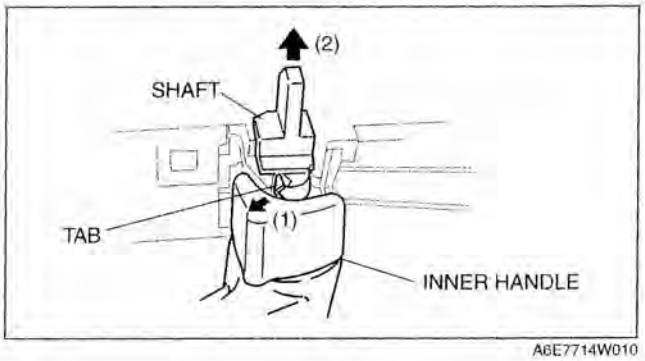


A6E7718W010

INNER HANDLE REMOVAL/INSTALLATION

C6U091458330W01

1. Remove the front door trim.
2. Using a flathead screwdriver, press and hold the tab in the direction indicated by arrow (1), and remove the shaft by pulling it in the direction indicated by arrow (2).
3. Pull off the inner handle, and remove the door lock knob cable and inner handle cable.
4. Install in the reverse order of removal.



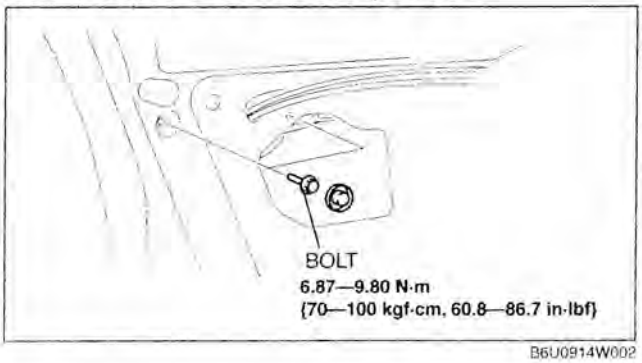
A6E7714W010

09-14

FRONT OUTER HANDLE REMOVAL/INSTALLATION

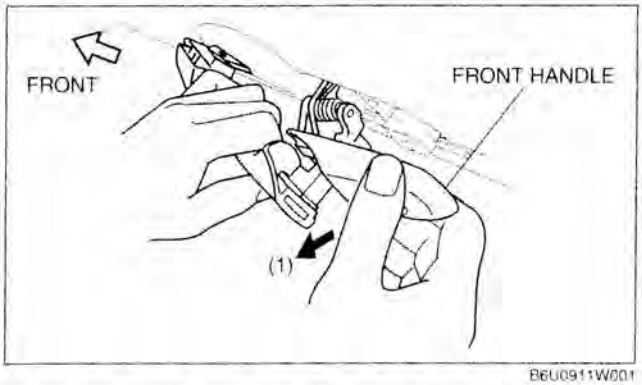
C6U091458410W01

1. Remove the front door glass.
2. Detach the outer handle and front door latch rod.
3. For protector-equipped vehicles, refer to key cylinder removal/installation to remove the protector.
4. Remove the bolts.



B6U0914W002

5. With the rear side of the outer handle fixed and the outer handle lever pulled out (1), remove the rear side of the outer handle from the front door.
6. Pull out the front side of the outer handle from the front door.
7. Install in the reverse order of removal.

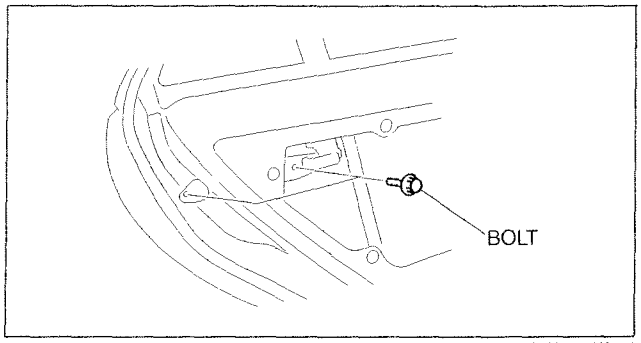


B6U0911W001

REAR OUTER HANDLE REMOVAL/INSTALLATION

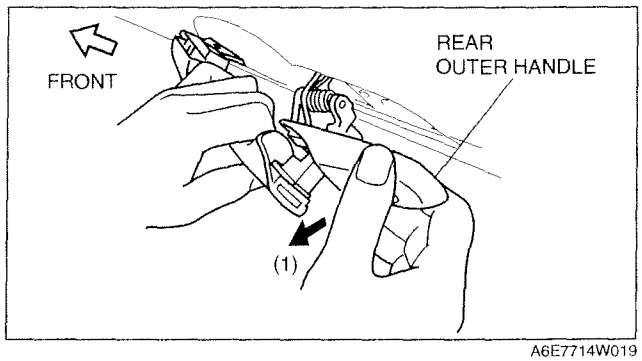
C6U091458410W02

1. Remove the rear door glass.
2. Remove the rear door unit.
3. Remove the rear door latch.
4. Remove the bolts.
5. Detach the rear outer handle and rear door latch rod.



B6U0914W003

6. With the rear side of the rear outer handle fixed and the outer handle lever pulled out (1), remove the rear side of the rear outer handle from the rear door.
7. Pull out the front side of the rear outer handle from the rear door.
8. Install in the reverse order of removal.

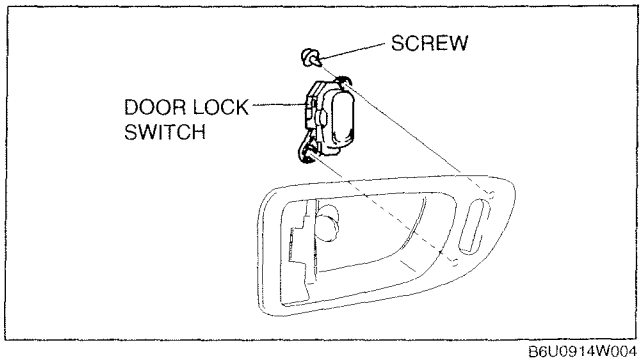


A6E7714W019

DOOR LOCK SWITCH REMOVAL/INSTALLATION

C6U091466210W01

1. Disconnect the negative battery cable.
2. Remove the inner handle cover. (See09–17–11 FRONT DOOR TRIM REMOVAL/INSTALLATION.)
3. Remove the screws, then remove the door lock switch.
4. Install in the reverse order of removal.



B6U0914W004

DOOR LOCK SWITCH INSPECTION

C6U091466210W02

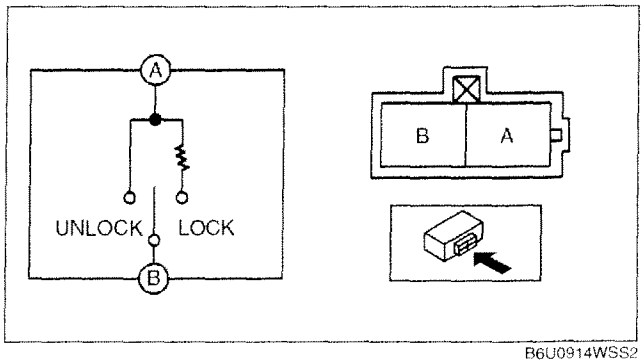
1. Remove the door lock switch.
2. Inspect for continuity between the door lock switch terminals using an ohmmeter.
   - If not as specified, replace the door lock switch.

O—O : Continuity O∿O : Resistance

Position	Terminal	
	A	B
Lock	O—∿—O	R
Unlock	O	O

R: 940—1060 Ω

B6U0914WSS1

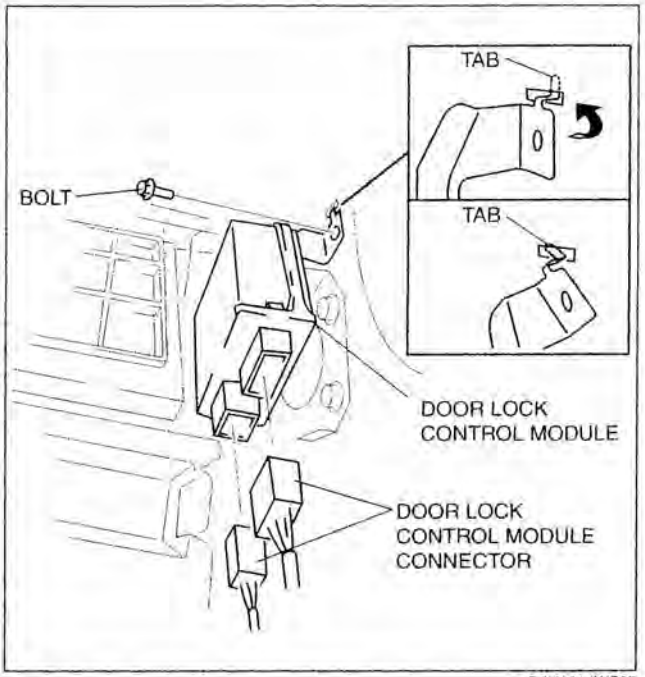


B6U0914WSS2

DOOR LOCK CONTROL MODULE REMOVAL/INSTALLATION

C6U091467830W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Remove the bolt.
4. While inclining the door lock control module along the body panel in the direction indicated by the arrow, disengage the bracket tab from the hole in the body panel.
5. Disconnect the door lock control module connector.
6. Remove the door lock control module.



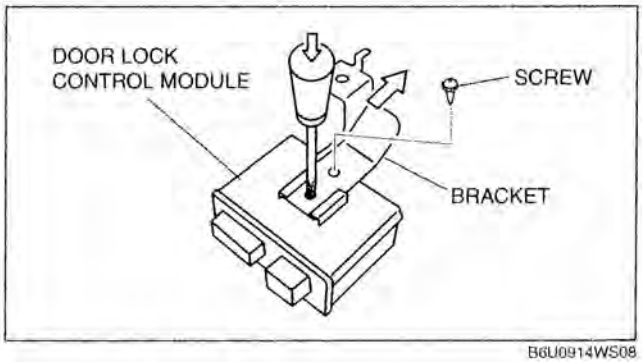
B6U0914WS07

7. Remove the screw, then remove the bracket.

Note

- The screw which fixes the door lock control module and bracket is for a body ground connection. Be sure to secure the screw when installing.

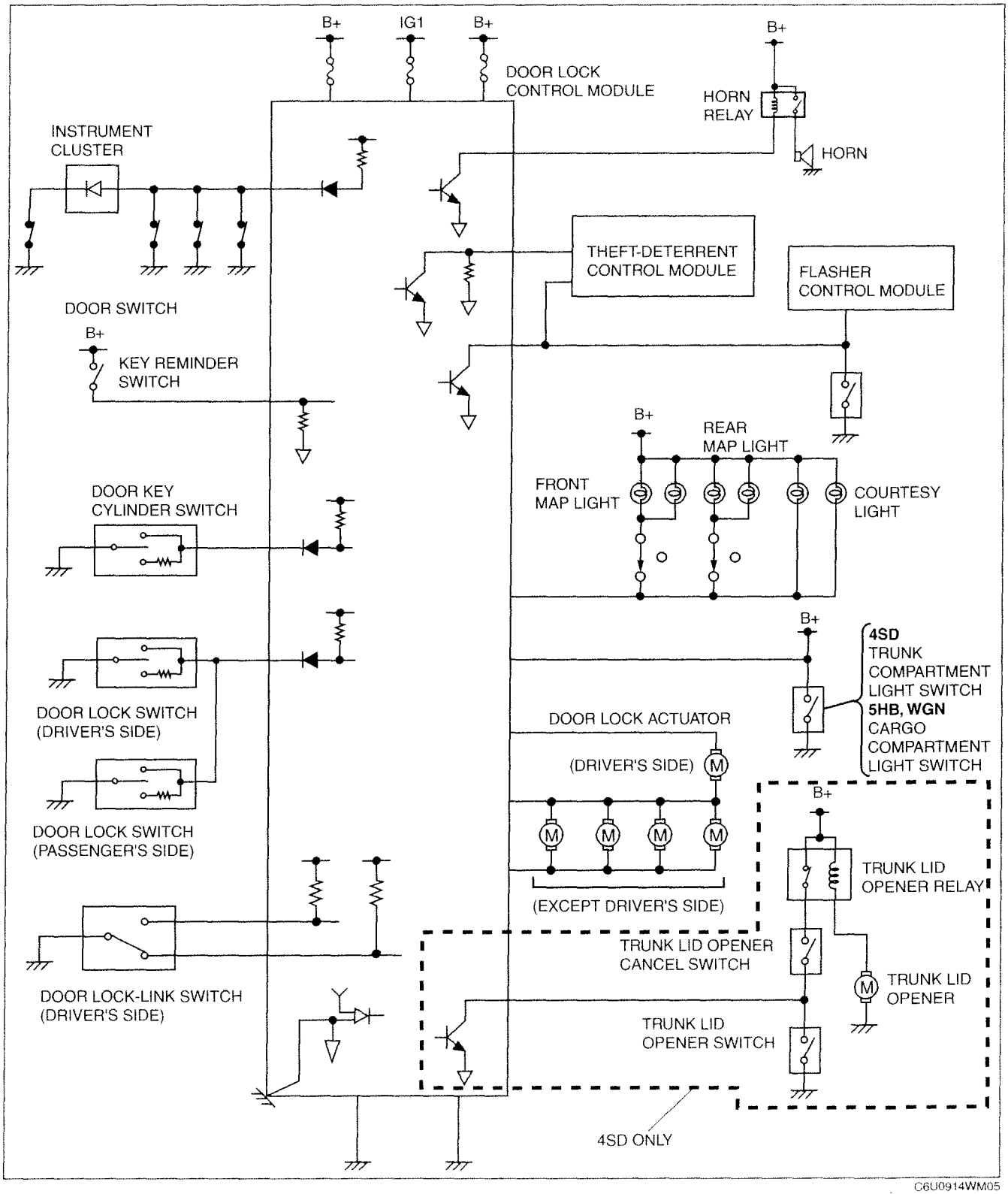
8. Install in the reverse order of removal.



B6U0914WS08

POWER DOOR LOCK SYSTEM WIRING DIAGRAM

C6U091467830W02



C6U0914WM05

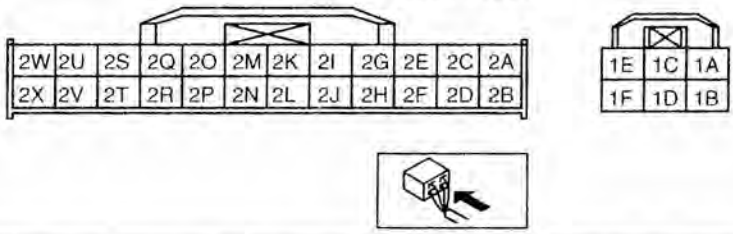
DOOR LOCK CONTROL MODULE INSPECTION

C6U091467830W03

1. Measure the voltage at the door lock control module terminals (other than terminals 1E, 2G, 2K and 2W) as indicated below.
   - If not as specified, inspect the parts listed under "Action."
2. Disconnect the negative battery cable.
3. Disconnect the door lock control module connector and inspect for continuity between terminal 1E or 2W and the bracket.
4. Inspect for continuity at terminals 1E, 2G, 2K and 2W as indicated below.
5. If the parts and wiring harnesses are okay but the system still does not work properly, perform the troubleshooting.

Terminal voltage list (Reference)

DOOR LOCK CONTROL MODULE
HARNESS SIDE CONNECTOR



B6U0914WS09

Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
1A	Power supply	D. LOCK 30 A fuse	Under any condition	B+	• Inspect D. LOCK 30 A fuse. • Inspect vehicle battery. • Inspect related harness.
1B	Room light control	• Front map light • Rear map light • Courtesy light	Any door is open.	Below 1.0	• Inspect ROOM 15 A fuse. • Inspect door switch. • Inspect front map light. • Inspect rear map light. • Inspect courtesy light. • Inspect related harness.
1C	Unlock output	Driver-side door lock actuator	While driver-side lock actuator is unlocking.	Below 1.0→B+→Below 1.0	• Inspect except driver-side door lock actuator. • Inspect D. LOCK 30 A fuse. • Inspect related harness.
			Other	Below 1.0	
1D	Lock output	Door lock actuator	While lock actuator is locking.	Below 1.0→B+→Below 1.0	• Inspect door lock actuator. • Inspect trunk lid lock actuator. (4SD) • Inspect liftgate lock actuator. (5HB, WGN) • Inspect D. LOCK 30 A fuse. • Inspect related harness.
			Other	Below 1.0	
1E	Power ground	GND	Under any condition: inspect for continuity to ground.	Continuity	• Inspect GND.

Terminal	Signal	Connected to	Test condition		Voltage (V)/ Continuity	Action
1F	Unlock output	Except driver-side door lock actuator	While all door lock actuators (except driver-side door lock actuator) are unlocking.		Below 1.0→B+→Below 1.0	• Inspect door lock actuator. (except driver-side door lock actuator) • Inspect liftgate lock actuator • Inspect D. LOCK 30 A fuse. • Inspect related harness.
			Other		Below 1.0	
2A	Power supply	METER IG 15 A fuse	Under any condition		B+	• Inspect METER IG 15 A fuse. • Inspect related harness.
2B	IG1	ROOM 15 A fuse	Ignition switch is at ON position.		B+	• Inspect ROOM 15 A fuse. • Inspect related harness.
			Ignition switch is at LOCK or ACC position.		Below 1.0	
2C	Horn output	Horn relay	Transmitter panic button is pressed		Alternates between B+ and Below 1.0	• Inspect horn relay (See 09-21-6 RELAY INSPECTION) • Inspect related harness
2D	-	-	-		-	-
2E*	Trunk lid open	Trunk lid opener relay	Transmitter trunk lid button is pressed.		B+→Below 1.0→B+	• Inspect trunk lid opener relay. • Inspect related harness.
			Other: inspect for continuity to ground.		Continuity	
2F	Key reminder switch	Key reminder switch	Key reminder switch is on.		B+	• Inspect key reminder switch. • Inspect related harness.
			Other		Below 1.0	
2G	**4SD** • Trunk lid open/ closed **5HB, WGN** • Liftgate open/ closed	**4SD** • Trunk compartment light switch **5HB, WGN** • Cargo compartment light switch	Trunk lid/liftgate is open (trunk/ cargo compartment light switch is on): inspect for continuity to ground.		Continuity	• Inspect trunk compartment light switch. (4SD) • Inspect cargo compartment light switch. (5HB, WGN) • Inspect related harness.
			Trunk lid/liftgate is closed (trunk/ cargo compartment light switch is off): inspect for continuity to ground.		No	
2H	-	-	-		-	-
2I	Hazard	Flasher control module	Except vehicles with theft-deterrent system	Transmitter LOCK button is pressed.	B+→Below 1.0→B+	• Inspect flasher control module. • Inspect related harness.
				Transmitter UNLOCK button is pressed.	B+→Below 1.0→B+→Below 1.0→B+	
				No transmitter buttons are pressed.	B+	
			Vehicles with theft-deterrent system	Under any condition	B+	• Inspect theft-deterrent control module. • Inspect related harness.
2J	-	-	-		-	-
2K	Door open/ closed	Door switch	Any door is open (any door switch is on): inspect for continuity to ground.		Continuity	• Inspect door switches. • Inspect related harness.
			All door are closed (door switches are off): inspect for continuity to ground.		No	
2L	-	-	-		-	-

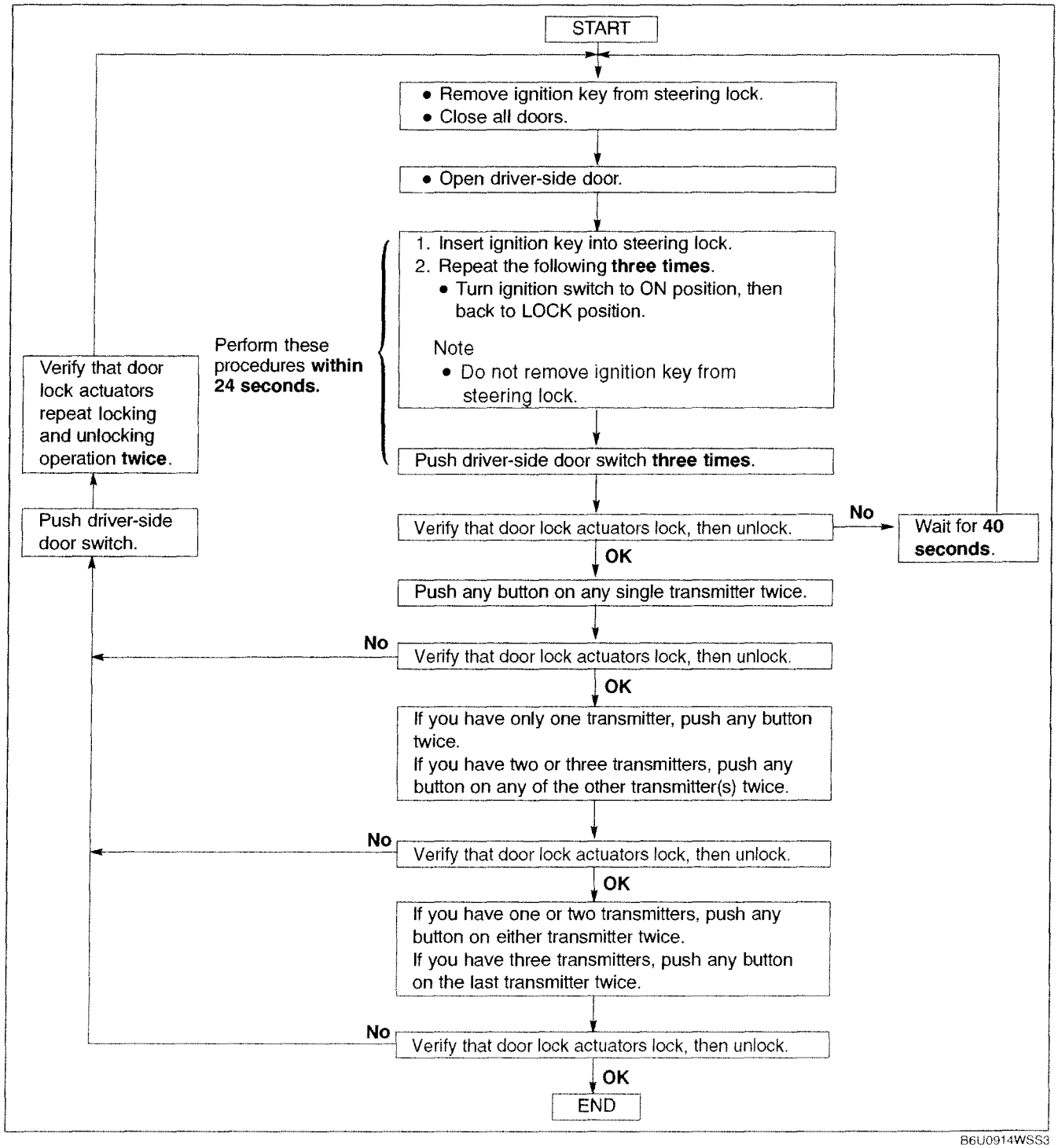
Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
2M	-	-	-	-	-
2N	-	-	-	-	-
2O	-	-	-	-	-
2P	Theft-deterrent alarm control	Theft-deterrent control module	Ignition switch is at ON position.	B+→Below 1.0→B+	• Inspect theft-deterrent control module. • Inspect related harness.
2Q	Lock input	Door lock-link switch	Driver-side door is locked: inspect for continuity to ground.	Continuity	• Inspect door lock-link switch. • Inspect related harness.
			Driver-side door is unlocked: inspect for continuity to ground.	No	
2R	Unlock input	Door lock-link switch	Driver-side door is locked: inspect for continuity to ground.	No	• Inspect door lock-link switch. • Inspect related harness.
			Driver-side door is unlocked: inspect for continuity to ground.	Continuity	
2S	Lock/Unlock input	• Door key cylinder switch (driver's side)	At the moment of key cylinder locking.	Approx. 2.5	• Inspect key cylinder switch. • Inspect related harness.
			At the moment of key cylinder unlocking.	Below 1.0	
			Key cylinder at neutral position.	Approx. 5	
2T	-	-	-	-	-
2U	-	-	-	-	-
2V	Lock/unlock input	Door lock switch	Door lock switch is locked.	5→2.5→5	• Inspect door lock switch. • Inspect related harness.
			Door lock switch is unlocked.	5→0→5	
2W	Signal ground	GND	Under any condition: inspect for continuity to ground.	Continuity	• Inspect GND.
2X	-	-	-	-	-

* : 4SD only

DOOR LOCK CONTROL MODULE ID CODE CHANGE

C6U091401097W01

- When programming the ID code into a transmitter, verify that other transmitters are not being operated in the vicinity.
- Program the ID code as indicated in the procedure below.

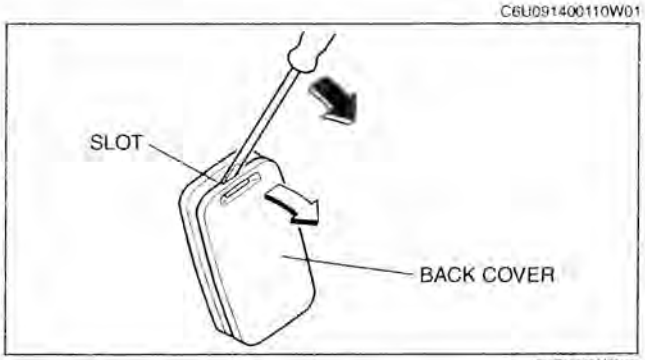


B6U0914WSS3

TRANSMITTER BATTERY REPLACEMENT

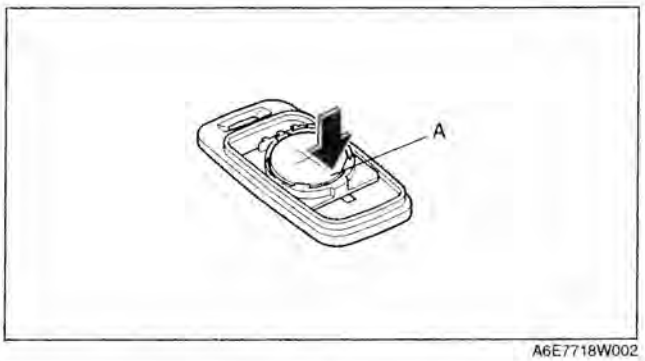
1. Insert a small screwdriver into the slot and gently pry open the transmitter.

C6U091400110W01



A6E7718W001

2. Press the portion of the battery indicated by A and remove the battery.
3. Install a new battery (CR2025) into the front portion of the holder with the positive pole (+) facing up. Press on the B portion of the battery to set the battery.

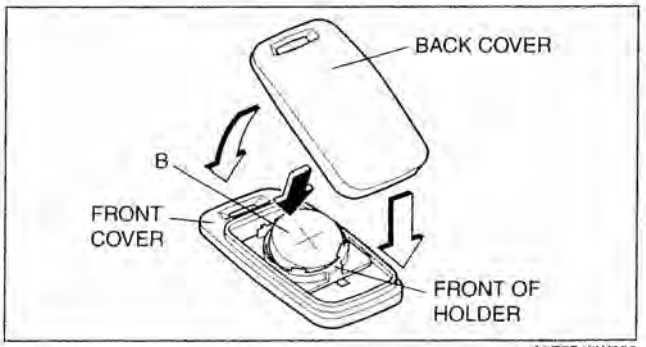


A6E7718W002

4. Align the front and back covers and snap the transmitter shut.

Battery specification
Lithium CR2025 × 1

Note
- The batteries will last about **2 years** when used **10 times** a day.



A6E7718W003

TRANSMITTER BATTERY INSPECTION

C6U091400110W02

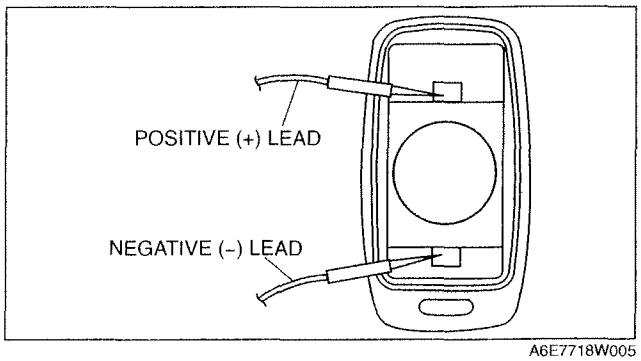
Caution

- **Since the battery voltage does not drop fully if the button is pushed for only 4 seconds or less, it can not be properly examined to see whether it is good or bad. Always push the button for 5 seconds.**

Note

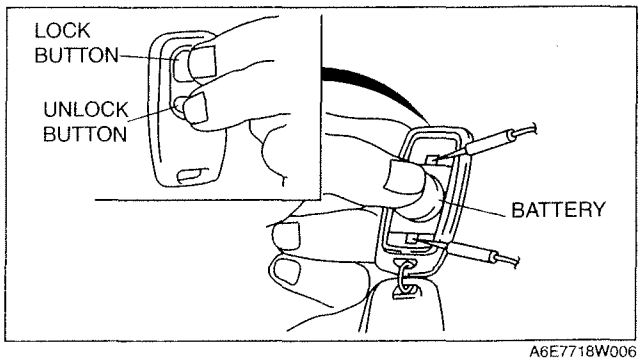
- A correct measurement cannot be obtained if the battery temperature is low. Make sure the battery is at **18 °C {64 °F} or more** for **at least 30 minutes** before reinspecting if a measurement value is under the standard voltage.

1. Remove the transmitter cover.
2. Apply the ohmmeter leads to the positions as indicated in the figure.



A6E7718W005

3. While pressing the battery as shown in the figure, press the LOCK and UNLOCK buttons on the transmitter at the same time to start measurement of the voltage.
4. Release the buttons after **5 seconds**.
5. Verify that the minimum voltage is the standard voltage or more for **10 seconds** after starting measurement.
   - If the voltage is under the standard voltage, replace the battery.



A6E7718W006

Standard voltage
2.7 V

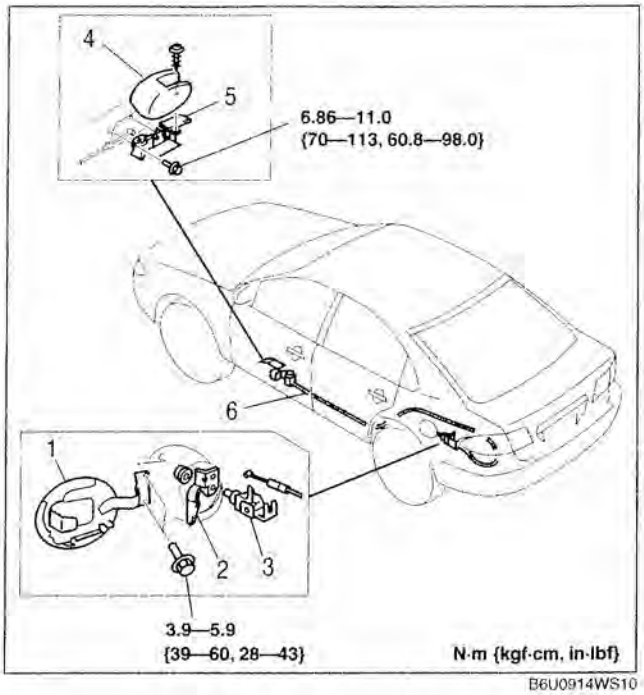
FUEL-FILLER LID AND OPENER REMOVAL/INSTALLATION

C6U091456890W01

1. To remove the fuel-filler lid opener, remove the left side trunk side trim.
2. To remove the fuel-filler lid opener cable, perform the following and partially peel back the floor covering.
   (1) Remove the driver-side front seat.
   (2) Remove the driver-side front scuff plate.
   (3) Remove the driver-side rear scuff plate.
   (4) Remove the driver-side B-pillar lower trim.
   (5) Remove the driver-side tire house trim.
3. Remove in the order indicated in the table.

1	Fuel-filler lid
2	Lift spring
3	Fuel-filler lid opener
4	Cover
5	Fuel-filler lid opener lever
6	Fuel-filler lid opener cable

4. Install in the reverse order of removal.
5. Adjust the fuel-filler lid. (See 09–10–2 FUEL-FILLER LID ADJUSTMENT.)

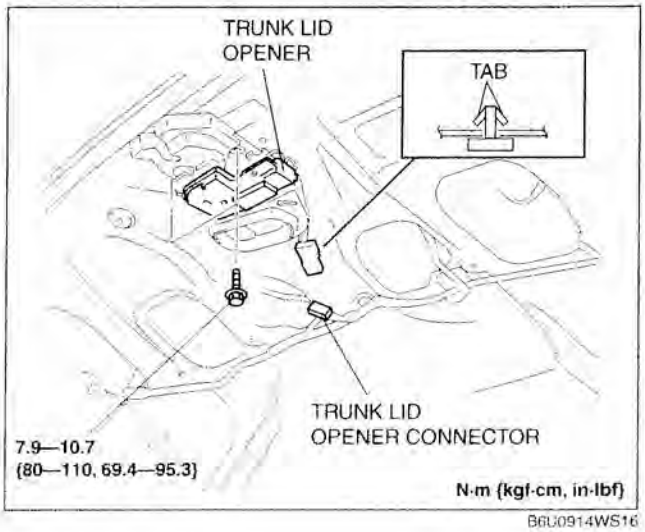


B6U0914WS10

TRUNK LID OPENER REMOVAL/INSTALLATION [4SD]

C6U091456840W01

1. Disconnect the negative battery cable.
2. Disconnect the trunk lid opener connector.
3. Squeeze the tabs of the connector and pull it downward to remove it.
4. Disconnect the rod
5. Remove the bolts
6. Install in the reverse order of removal.



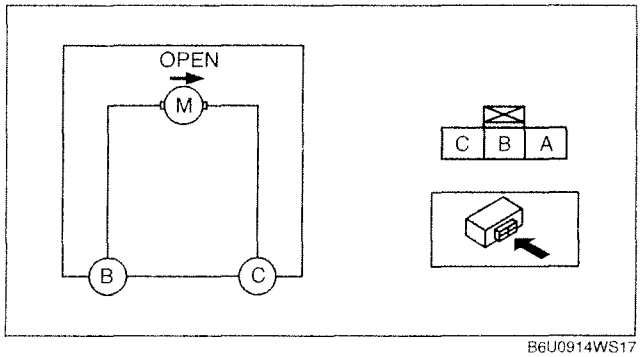
B6U0914WS16

TRUNK LID OPENER INSPECTION [4SD]

C6U091456840W02

1. Disconnect the trunk lid opener connector.
2. Apply battery positive voltage to the trunk lid opener terminals and inspect the trunk lid opener operation.
   - If not as specified, replace the trunk lid opener.

Actuator operation	Connection	
	B+	GND
Open	B	C



B6U0914WS17

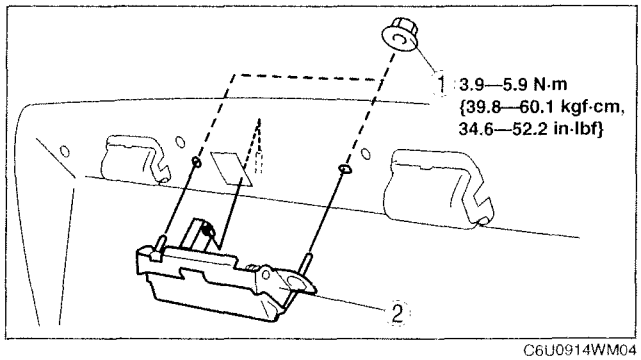
LIFTGATE OUTER HANDLE REMOVAL/INSTALLATION [5HB, WGN]

C6U091462490W02

1. Disconnect the negative battery cable.
2. Remove the liftgate upper trim. (See 09–17–18 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION [5HB, WGN].)
3. Remove the liftgate side trim. (See 09–17–19 LIFTGATE SIDE TRIM REMOVAL/INSTALLATION [5HB, WGN].)
4. Remove the liftgate lower trim. (See 09–17–20 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION [5HB, WGN].)
5. Remove the rear finisher. (See 09–16–5 REAR FINISHER REMOVAL/INSTALLATION.)
6. Remove in the order indicated in the table.

1	Nut
2	Liftgate outer handle

7. Install in the reverse order of removal.



C6U0914WM04

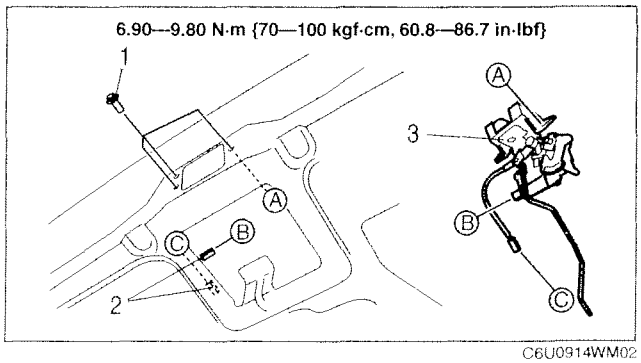
LIFTGATE LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION [5HB, WGN]

C6U091462490W03

1. Disconnect the negative battery cable.
2. Remove the liftgate upper trim. (See 09–17–18 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION [5HB, WGN].)
3. Remove the liftgate side trim. (See 09–17–19 LIFTGATE SIDE TRIM REMOVAL/INSTALLATION [5HB, WGN].)
4. Remove the liftgate lower trim. (See 09–17–20 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION [5HB, WGN].)
5. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Liftgate latch and lock actuator

6. Install in the reverse order of removal.



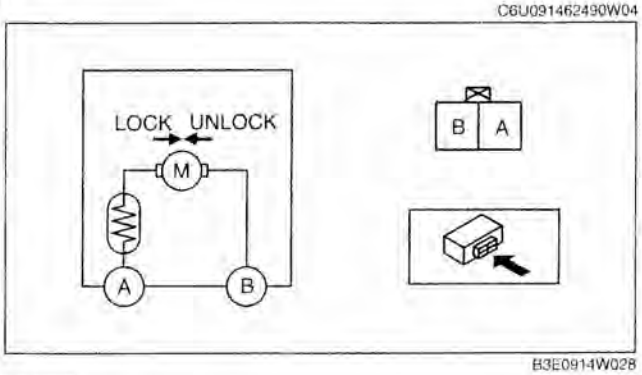
C6U0914WM02

LIFTGATE LOCK ACTUATOR INSPECTION [5HB, WGN]

1. Apply battery positive voltage and connect ground to the corresponding liftgate lock actuator terminals, and inspect the liftgate lock actuator operation.
   - If not as specified, replace the liftgate latch and lock actuator.

Lock actuator operation	Connection	
	B+	GND
Lock	A	B
Unlock	B	A

C6U091462490W04

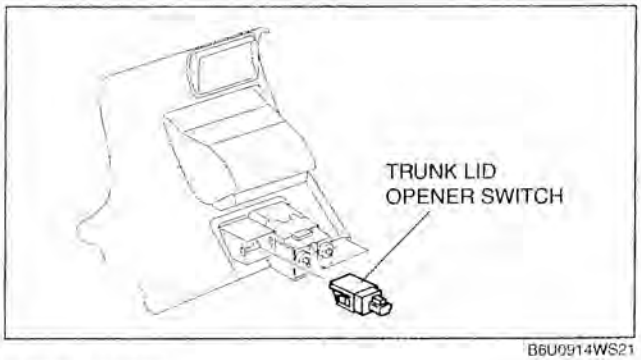


B3E0914W028

TRUNK LID OPENER SWITCH REMOVAL/INSTALLATION [4SD]

C6U091467002W03

1. Disconnect the negative battery cable.
2. Remove the lower panel.
3. Disconnect the trunk lid open switch connector.
4. Squeeze the tabs of the trunk lid open switch and pull it toward you to remove it.
5. Remove the trunk lid open switch.
6. Install in the reverse order of removal.



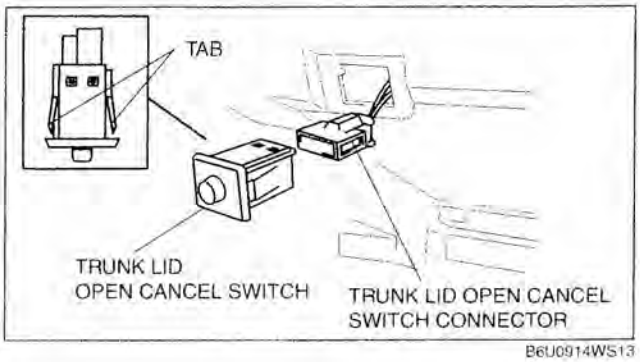
B6U0914WS21

09-14

TRUNK LID OPEN CANCEL SWITCH REMOVAL/INSTALLATION [4SD]

C6U091466400W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Squeeze the tabs of the trunk lid open cancel switch and pull it forward to remove it.
4. Disconnect the trunk lid open cancel switch connector.
5. Remove the trunk lid open cancel switch.
6. Install in the reverse order of removal.



B6U0914WS13

TRUNK LID OPEN CANCEL SWITCH INSPECTION [4SD]

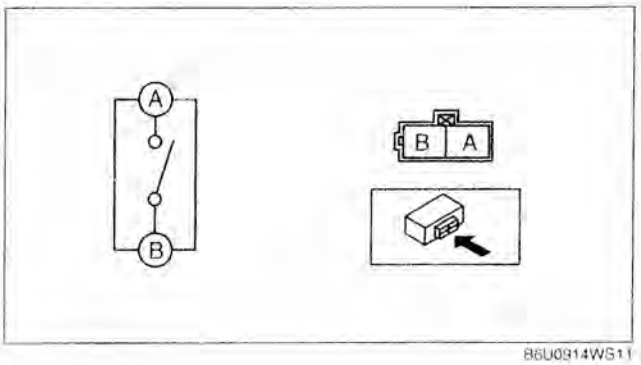
C6U091466400W02

1. Remove the trunk lid open cancel switch.
2. Inspect for continuity between the trunk lid open cancel switch terminals using an ohmmeter.
   - If not as specified, replace the trunk lid open cancel switch.

O—O : Continuity

Operation	Terminal	
	A	B
On	O	O
Off		

B6U0914WS12

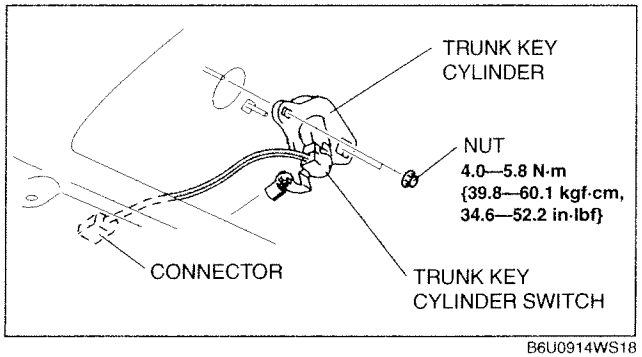


B6U0914WS11

TRUNK KEY CYLINDER REMOVAL/INSTALLATION [4SD]

C6U091467002W01

1. Disconnect the negative battery cable.
2. Remove the trunk key cylinder switch connector.
3. Remove the nuts
4. Remove the trunk key cylinder.
5. Install in the reverse order of removal.



B6U0914WS18

TRUNK KEY CYLINDER SWITCH INSPECTION [4SD]

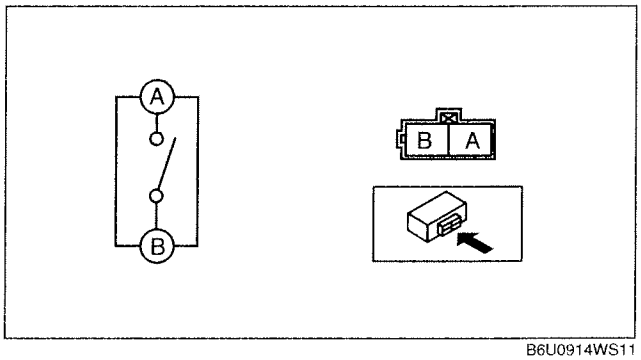
C6U091467002W02

1. Remove the trunk key cylinder switch.
2. Inspect for continuity between the trunk key cylinder switch terminals using an ohmmeter.
   - If not as specified, replace the trunk key cylinder switch.

○—○ : Continuity

Operation	Terminal	
	A	B
On	○	○
Off		

B6U0914WS12



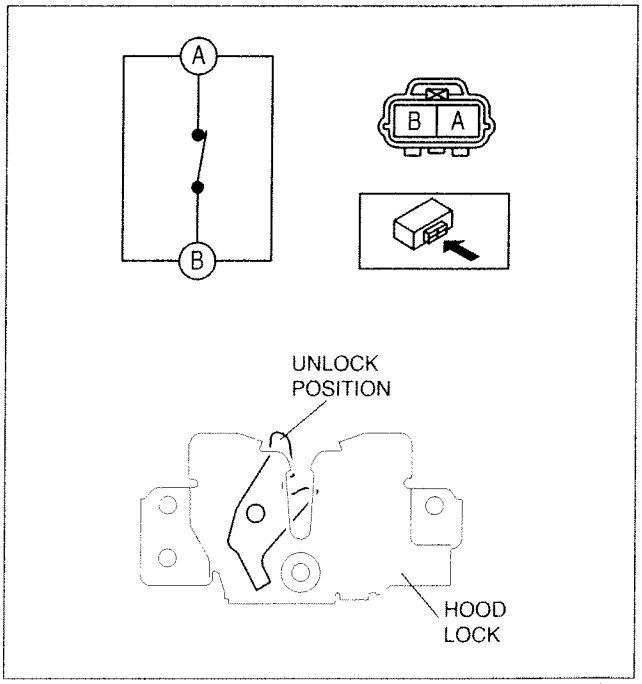
B6U0914WS11

HOOD SWITCH INSPECTION

C6U091401084W01

Note
- Hood switch has a built-in hood lock.

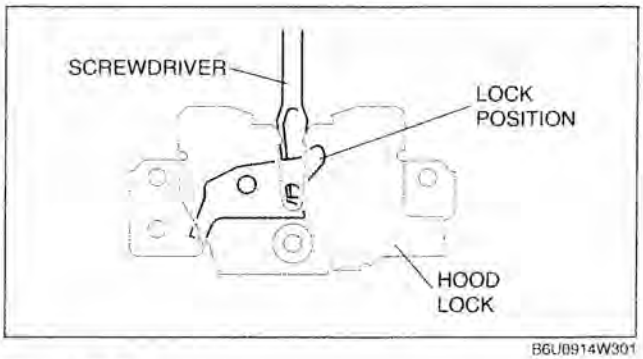
1. Open the hood.
2. Disconnect the negative battery cable.
3. Remove the radiator grille.
4. Disconnect the hood switch connector.
5. Inspect for continuity between the hood switch terminals A and B using an ohmmeter.
   - If there is no continuity, replace the hood switch.



B6U0914W300

6. Lock the hood lock using a flathead screwdriver or equivalent as shown.
7. Inspect for continuity between the hood switch terminals A and B using an ohmmeter.
   - If there is continuity, replace the hood switch.

Caution
- **After the inspection, unlock the hood lock. If closing the hood with the hood lock locked, the hood lock and/or hood striker may be broken.**



B6U0914W301

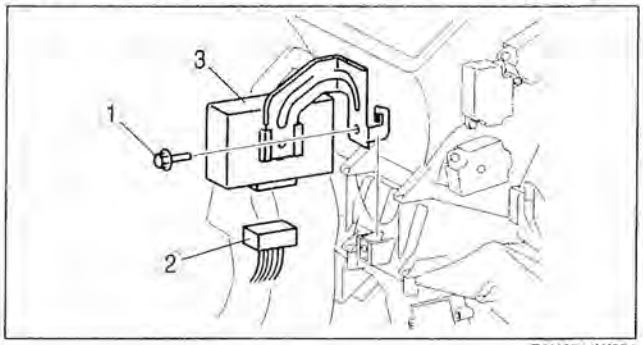
THEFT-DETERRENT CONTROL MODULE REMOVAL/INSTALLATION

C6U091467790W01

1. Disconnect the negative battery cable.
2. Remove the center panel module. (See 09–20–11 CENTER PANEL MODULE REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Theft-deterrent control module

4. Install in the reverse order of removal.



B6U0914W201

09–14

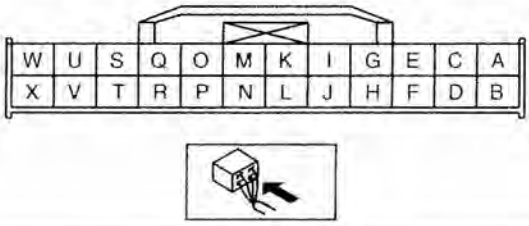
THEFT-DETERRENT CONTROL MODULE INSPECTION

C6U091467790W02

1. Remove the theft-deterrent control module without disconnecting the connector.
2. Measure the voltage at the theft-deterrent control module terminals as indicated below.
3. Disconnect the theft-deterrent control module connector before inspecting for continuity at terminals B, N, O, P, and T.
4. If not as specified, inspect the parts listed under "Action."
   - If the parts and wiring harnesses are okay but the system still does not work properly, replace the theft-deterrent control module.

Terminal Voltage Table (Reference)

THEFT-DETERRENT CONTROL MODULE CONNECTOR



A6E8120W004

Terminal	Signal	Connected to	Test condition	Voltage (V)/ continuity	Action
A	—	—	—	—	—
B	Theft-deterrent control module ground	GND	Under any condition; inspect for continuity to ground	Yes	• Inspect GND
C	—	—	—	—	—
D	Driver's door key cylinder locked	Driver's door key cylinder switch	Driver's door key cylinder locked	2.5	• Inspect driver's door key cylinder switch • Inspect related harness
			Driver's door key cylinder unlocked	Below 1.0	
			Other	5	

Terminal	Signal	Connected to	Test condition	Voltage (V)/ continuity	Action
E	Horn on/off	Horn relay	Theft-deterrent system alarm: Other	B+	• Inspect horn relay (See 09–21–6 RELAY INSPECTION) • Inspection related harness
			Theft-deterrent system alarm: Active	Alternates between below 1.0 and B+	
F	Key reminder switch on/off	Key reminder switch	Key reminder switch on (key inserted)	B+	• Inspect key reminder switch (See 09–21–4 KEY REMINDER SWITCH INSPECTION) • Inspect related harness
			Key reminder switch off (key removed)	Below 1.0	
G	—	—	—	—	—
H	—	—	—	—	—
I	—	—	—	—	—
J*	Trunk key cylinder unlock	Trunk key cylinder switch	Trunk key cylinder unlocked	Below 1.0	• Inspect trunk key cylinder switch • Inspect related harness
			Other	5	
K	—	—	—	—	—
L	—	—	—	—	—
M	—	—	—	—	—
N	Lock/unlock	Driver's door lock-link switch	Driver's door lock-link switch locked: inspect for continuity to ground	No	• Inspect driver's door lock-link switch (See 09–14–5 FRONT DOOR LOCK ACTUATOR INSPECTION) • Inspect related harness
			Driver's door lock-link switch unlocked: inspect for continuity to ground	Yes	
O	Lock/unlock	• Passenger's door lock-link switch • Rear door lock-link switch	Passenger's and rear door lock-link switch locked: inspect for continuity to ground	No	• Inspect passenger's or rear door lock-link switch (See 09–14–5 FRONT DOOR LOCK ACTUATOR INSPECTION) (See 09–14–6 REAR DOOR LOCK ACTUATOR INSPECTION) • Inspect related harness
			Passenger's or any rear door lock-link switch unlocked: inspect for continuity to ground	Yes	
P	Hood open/closed	Hood switch	Hood open: inspect for continuity to ground	Yes	• Inspect hood switch (See 09–14–20 HOOD SWITCH INSPECTION) • Inspect related harness
			Hood closed: inspect for continuity to ground	No	
Q	—	—	—	—	—
R	**4SD** • Trunk compartment light switch on/off **5HB, WGN** • Cargo compartment light switch on/off	**4SD** • Trunk compartment light switch **5HB, WGN** • Cargo compartment light switch	**4SD** • Trunk compartment light switch on **5HB, WGN** • Cargo compartment light switch on	Below 1.0	• Inspect trunk compartment light switch (See 09–18–28 TRUNK COMPARTMENT LIGHT SWITCH INSPECTION [4SD]) • Inspect cargo compartment light switch (See 09–18–25 CARGO COMPARTMENT LIGHT SWITCH INSPECTION [5HB, WGN]) • Inspect related harness
			4SD • Trunk compartment light switch off **5HB, WGN** • Cargo compartment light switch off	B+	

Terminal	Signal	Connected to	Test condition	Voltage (V)/ continuity	Action
S	Security light signal output	Instrument cluster	Ignition switch at ON position	B+	• Inspect security light • Inspect related harness
			Ignition switch at LOCK or ACC position	Alternates between below 1.0 and B+	
T	Door open/closed	Door switch	Any door open: inspect for continuity to ground	Yes	• Inspect door switch (See 09–18–31 DOOR SWITCH INSPECTION) • Inspect related harness
			All doors closed: inspect for continuity to ground	No	
U	Hazard warning signal output	Flasher control module	Theft-deterrent system alarm: Active	Alternates between below 1.0 and B+	• Inspect flasher control module (See 09–18–17 FLASHER CONTROL MODULE INSPECTION) • Inspect related harness
			Theft-deterrent system alarm: Other	B+	
V	• Theft-deterrent system recognition signal output • Keyless entry system operation signal input	Door lock control module	Transmitter LCOK or UNLCOK button is pressed	5→ below 1.0 →5	• Inspect door lock control module (See 09–14–11 DOOR LOCK CONTROL MODULE INSPECTION) • Inspect related harness
			Other	5	
W	IG1	METER IG 15 A fuse	Ignition switch at ON position	B+	• Inspect ignition switch (See 09–21–3 IGNITION SWITCH INSPECTION) • Inspect METER IG 15 A fuse • Inspect related harness
			Ignition switch at LOCK or ACC position	Below 1.0	
X	Power supply	ROOM 15 A fuse	Under any condition	B+	• Inspect ROOM 15 A fuse • Inspect related harness

* : 4SD only

09–14

COIL REMOVAL/INSTALLATION

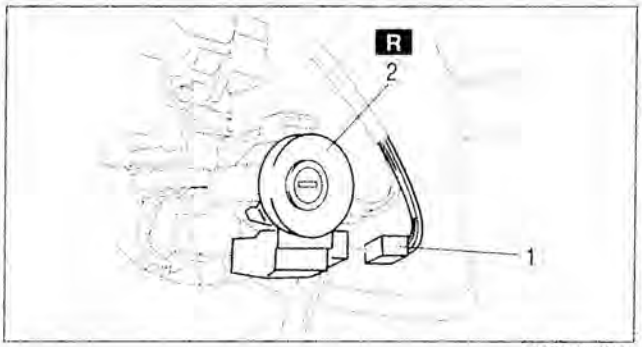
C6U091467004W01

Note
- Do not remove the coil unless you are replacing it.
- When only the coil is replaced, the immobilizer system reprogram procedure is not necessary.

1. Disconnect the negative battery cable.
2. Remove the column cover.
3. Remove in the order indicated in the table.

1	Connector
2	Coil (See 09–14–24 Coil Installation Note)

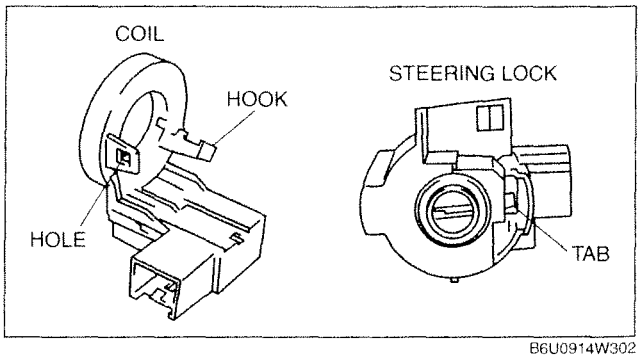
4. Install in the reverse order of removal.



A6F8122W001

Coil Installation Note

1. Install the hole of coil to the tab of steering lock.
2. Install the hook of coil to the steering lock.



B6U0914W302

IMMOBILIZER SYSTEM REPROGRAM PROCEDURE

C6U091467000W02

Caution

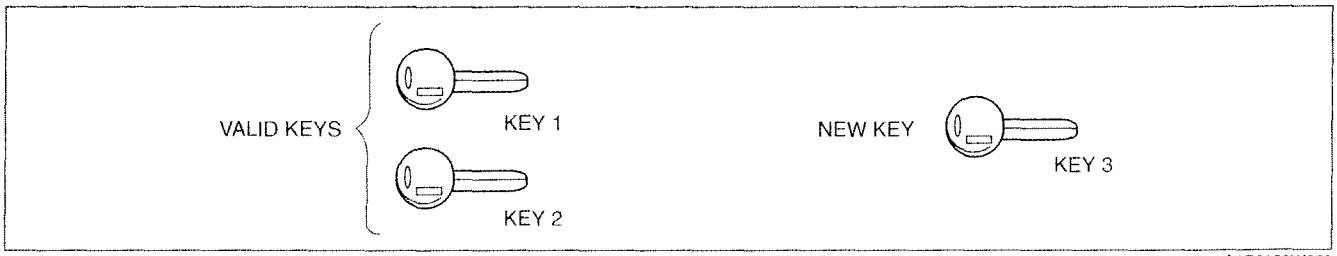
- **Do not perform key registration or start the engine under the following conditions. Doing so could result in a key registration error or the engine not starting even with a correctly programmed key.**
  - **— If a large, metal object is close to a valid key**
  - **— If an electrical device is close to a valid key**
  - **— If two or more valid keys are on the same key ring**

Note

- When an error occurs during the reprogram procedures, except when the PCM is replaced, repeat the procedure from Step 1. If you still cannot reprogram, confirm how many keys can start the engine. Then, perform the key replacement or addition reprogram procedure according to the valid key number.
- To make a copy of the key or replace the immobilizer system component parts (the key(s), and/or PCM), the customer should bring all keys to the dealer. This is because the previously programmed key IDs are erased when reprogramming the key IDs into the PCM.
- The immobilizer system cannot be deactivated.
- Confirm that all keys programmed can start the engine after the reprogram procedure. When confirming, wait for **more than 5 seconds** before inserting the next key.
- When the customer does not need to register more than two keys, the following procedures can be stopped after programming two keys.
- If the engine is started during the key registration procedure, the key registration mode will be erased. Therefore, do not start the engine until the key registration procedure for all the necessary keys is finished.
- A maximum of 8 keys can be programmed for one vehicle.
- To start the engine, two or more keys need to be programmed.

Key Addition

When the customer has two or more valid keys



A6E8122W003

1. Cut new transponder-equipped key(s).
2. Using key 1, turn ignition switch to ON position.
   (1) Observe illumination of security light in instrument cluster.
   (2) After the security light turns off (after approx. 3 seconds from when ignition switch is turned to the ON position), turn key 1 to the LOCK position **within approx. 4 seconds** and remove it from the steering lock.
3. Repeat Step 2 with key 2.
4. Repeat Step 2 with key 3.
5. If there are 4—8 keys (new keys), repeat Step 2.
6. Verify that the engine starts using the programmed key.

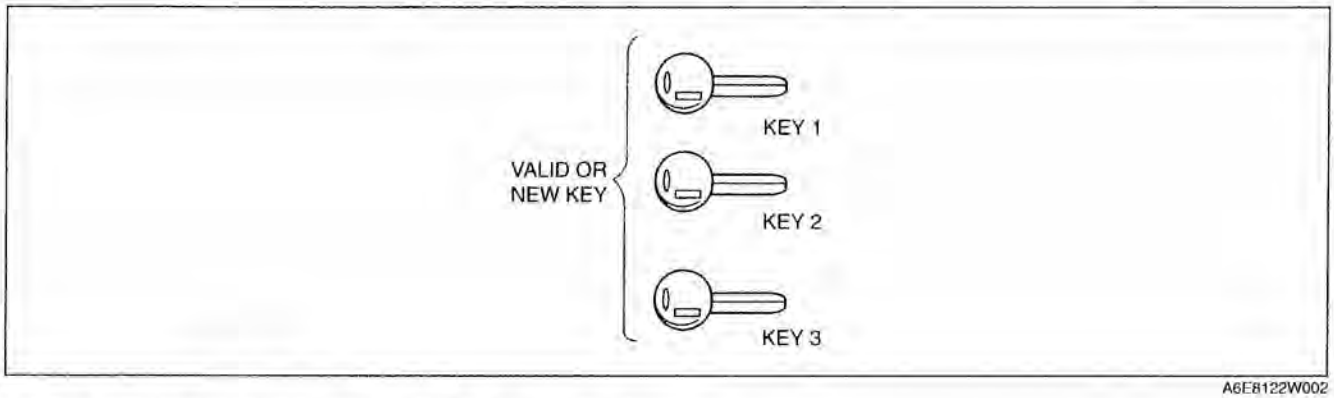
When the customer has only one or no valid key

- If only one or no valid key is available, use the **SST** (WDS or equivalent) to register additional keys. (See 09–14–25 Key registration using SST (WDS or equivalent))

Key registration using SST (WDS or equivalent)

Note

- Additional keys can be programmed without having to erase the key codes already programmed.
- If 8 keys have already been programmed, this procedure cannot be used to register a key. To register a key under this condition, it is necessary to first erase all the key codes. (See 09–14–26 Key Replacement)

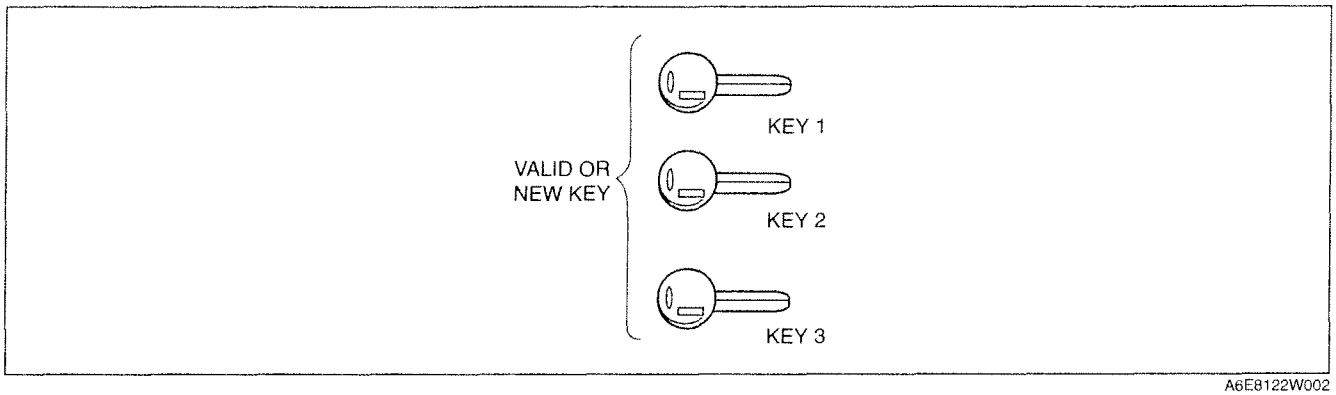


A6E8122W002

1. Cut new transponder equipped key(s) if necessary.
2. Connect the **SST** (WDS or equivalent).
3. Using key 1, turn ignition switch to the ON position.
   - Valid key: The security light illuminates, then turns off after **approx. 3 seconds**.
   - New key: The security light flashes rapidly for **approx. 1 minute** and start displaying the DTC 15 (WDS or equivalent: DTC B1601).
   (1) Perform security access approval. (See 09–14–27 Security Access Procedure.)
   (2) Select "Program additional ignition key".
   (3) Turn key 1 to the LOCK position and remove from the steering lock.
4. Using key 2, turn ignition switch to the ON position.
   (1) Select "Program additional ignition key".
   (2) Turn key 2 to the LOCK position and remove from the steering lock.
5. If there are 3—8 keys (new keys), repeat Step 4.
6. Verify that the engine starts using the programmed key.

Key Replacement

Note
- Perform this procedure to erase a previously programmed key code and register a new key.
- If a new key code is programmed by following this procedure, the engine will not start using the previously programmed keys. The keys need to be re-programmed.



A6E8122W002

1. Cut new transponder equipped key(s) if necessary.
2. Connect the **SST** (WDS or equivalent).
3. Using key 1, turn ignition switch to the ON position.
   - Valid key: The security light illuminates, then turns off after **approx. 3 seconds**.
   - New key: The security light flashes rapidly for **approx. 1 minute** and start displaying the DTC 15 (WDS or equivalent: DTC B1601).
   (1) Perform security access approval. (See 09–14–27 Security Access Procedure.)
   (2) Select "Ignition Key Code Erase".

   Note
   - Do not select any other command from this menu.

   (3) Turn key 1 to the LOCK position for **more than 1 second**.
   (4) Turn key 1 to the ON position for **more than 3 seconds**.

   Note
   - Security light will remain illuminated as long as key is in the ON position.

   (5) Remove key 1 from the steering lock.

   Note
   - After **approx. 1 minute** security light: DTC 21 (WDS or equivalent: DTC B1213) is output

4. Using key 2, turn ignition switch to the ON position for **more than 3 seconds**. Observe that security light illuminates (for **approx. 3 seconds**).
   (1) Verify that the security light is not illuminated, then turn key 2 to the LOCK position and remove from the steering lock.
5. If there are 3—8 keys (valid and/or new keys), repeat Step 4.
6. Verify that the engine starts using the programmed key.

PCM Replacement
- PCM must be replaced by performing "Programmable Module Installation Procedure." (See 01–40A–26 PCM REPLACEMENT [L3]) (See 01–40B–23 PCM REPLACEMENT [AJ])
- After PCM replacement, and programmable module installation has been performed, refer to the procedure for "Key Replacement", and perform key programming. (See 09–14–26 Key Replacement.)

Note
- To start the engine, two or more keys need to be programmed.

Customer Spare Key Programming Without Using SST (WDS or equivalent) Set-up

Note
- With this function, enabling and disabling of the "When the customer has two or more valid keys" function can be set using the **SST** (WDS or equivalent). This function is provided to prohibit drivers from performing the reprogram procedure on vehicles owned by rental car companies or other large vehicle fleet owners.

1. Connect the **SST** (WDS or equivalent).
2. Using valid or new key, turn ignition switch to the ON position.
3. Perform security access approval. (See 09–14–27 Security Access Procedure.)
4. Select "Customer Spare Key Programming Enable/Disable".
5. The following chart indicates setting of the customer spare key programming.

X: Applicable
–: Not applicable

Setting	Key registration method	
	Using 2 valid key	Using SST (WDS or equivalent)
Enable (Default)	X	X
Disable	–	X

Note
- At the time of new vehicle delivery, the function is set on "Enable".

Security Access Procedure

Note
- When using the **SST** (WDS or equivalent) to perform "Ignition Key Code Erase" or "Customer Spare Key Programming Enable/Disable", it is necessary to obtain security access approval.

1. Connect the **SST** (WDS or equivalent).
2. Select "Tool box", "Body", "Security", and then "PATS Functions" (in this order).
3. The **SST** (WDS or equivalent) will read out an outcode depending on the designated procedure.

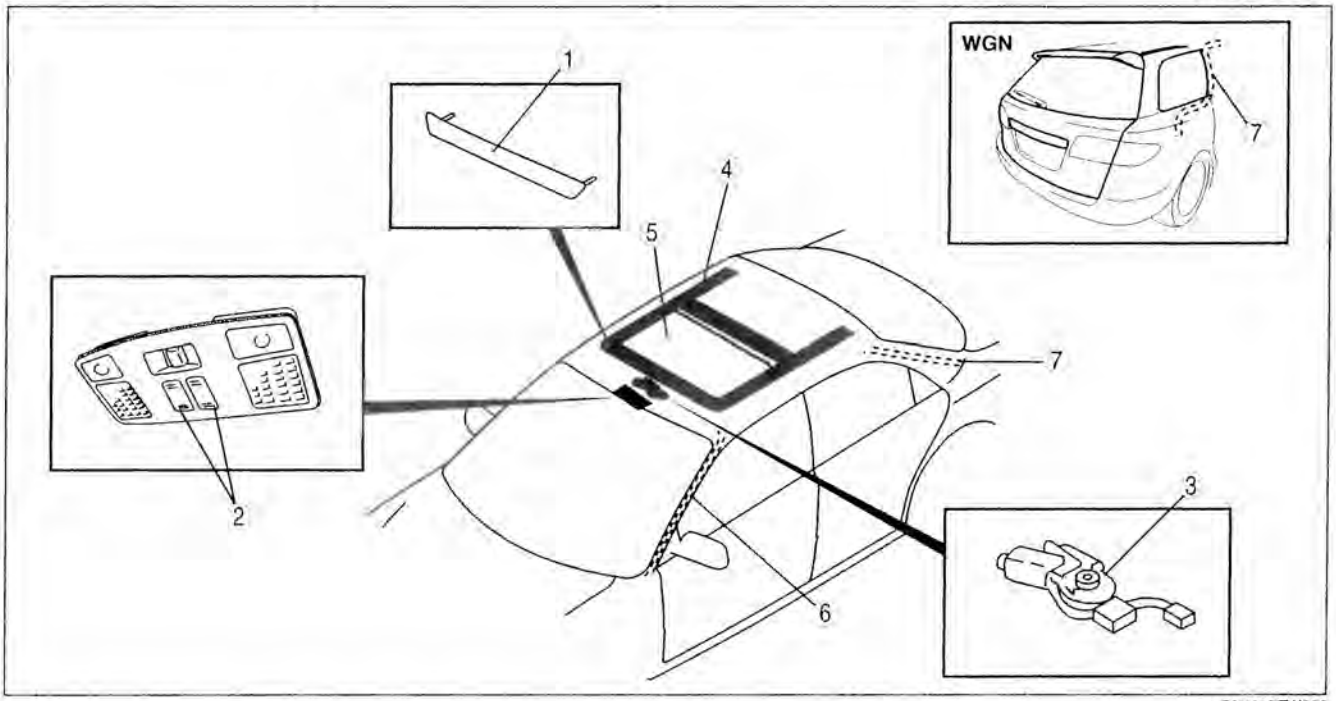
Caution
- **After reading out the outcode, do not turn ignition switch from LOCK to ON position 5 times, otherwise the outcode value will be changed.**

4. Access the Mazda official website to obtain the incode that corresponds to the outcode. Refer to Service Information Ref. No. A001/02 for details of this procedure.
5. Input the incode to the **SST** (WDS or equivalent).
6. Verify that the security access procedure finishes normally.

09–15 SUNROOF

LOCATION INDEX

C6U091501049W01



C6U915ZW002

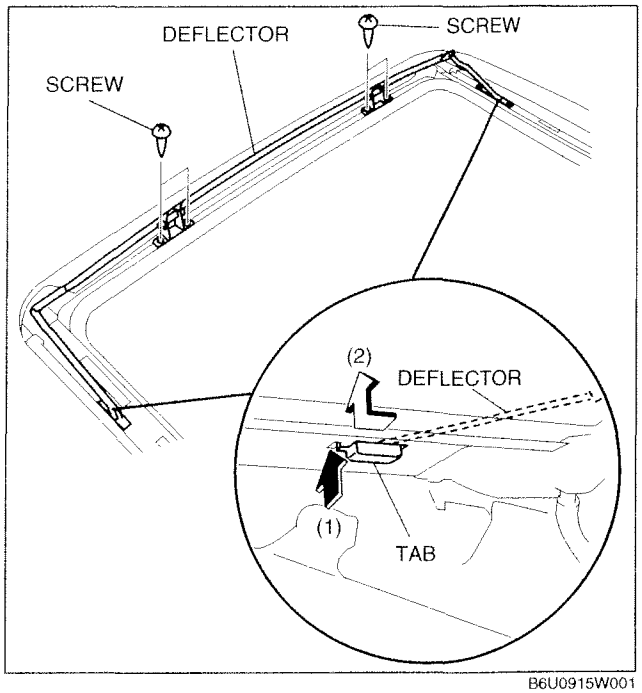
1	Deflector (See 09–15–2 DEFLECTOR REMOVAL/ INSTALLATION.)
2	Sunroof switch (See 09–15–10 SUNROOF SWITCH REMOVAL/ INSTALLATION.) (See 09–15–10 SUNROOF SWITCH INSPECTION.)
3	Sunroof motor and relay (See 09–15–8 SUNROOF MOTOR REMOVAL.) (See 09–15–8 SUNROOF MOTOR INSTALLATION.) (See 09–15–8 SUNROOF MOTOR INSPECTION.) (See 09–15–9 SUNROOF RELAY INSPECTION.)

4	Sunroof unit (See 09–15–5 SUNROOF UNIT REMOVAL/ INSTALLATION.) (See 09–15–6 SUNROOF UNIT DISASSEMBLY/ ASSEMBLY.)
5	Glass panel (See 09–15–2 GLASS PANEL REMOVAL/ INSTALLATION.) (See 09–15–3 GLASS PANEL ADJUSTMENT.)
6	Front drain hose (See 09–15–3 FRONT DRAIN HOSE REMOVAL.) (See 09–15–3 FRONT DRAIN HOSE INSTALLATION.)
7	Rear drain hose (See 09–15–4 REAR DRAIN HOSE REMOVAL.) (See 09–15–4 REAR DRAIN HOSE INSTALLATION.)

DEFLECTOR REMOVAL/INSTALLATION

C6U091569880W01

1. Fully open the glass panel.
2. Remove the headliner.
3. Remove the screws.
4. Disengage the tabs by performing the following procedure.
   (1) Press the rear end of the tabs.
   (2) After sliding the hooks rearward, press them upward.
5. Remove the deflector.
6. Install in the reverse order of removal.

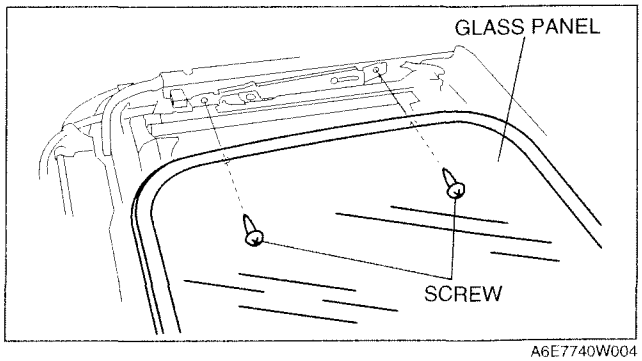


B6U0915W001

GLASS PANEL REMOVAL/INSTALLATION

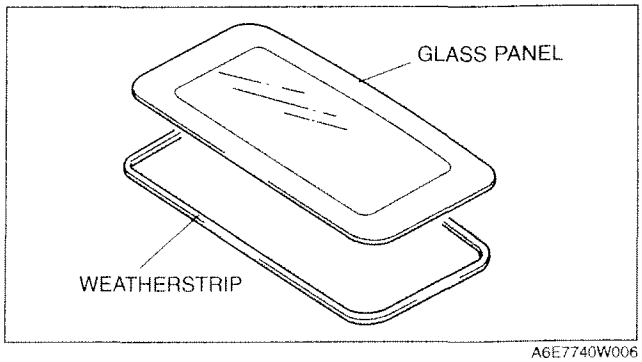
C6U091569810W01

1. Fully close the glass panel.
2. Fully open the sunshade.
3. Remove the screws, and then remove the glass panel.



A6E7740W004

4. Peel the weatherstrip off the glass panel.
5. Install in the reverse order of removal.
6. Adjust the glass panel. (See 09–15–3 GLASS PANEL ADJUSTMENT.)



A6E7740W006

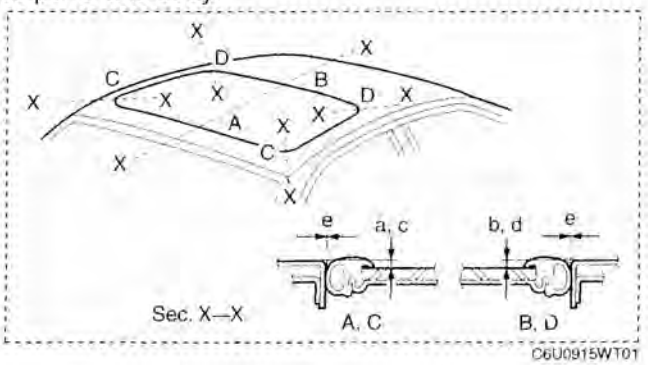
GLASS PANEL ADJUSTMENT

C6U091569810W02

1. Fully close the glass panel.
2. Measure the gap and height difference between the glass panel and body.
3. If not as specified, loosen the glass panel installation screws and reposition the glass panel.

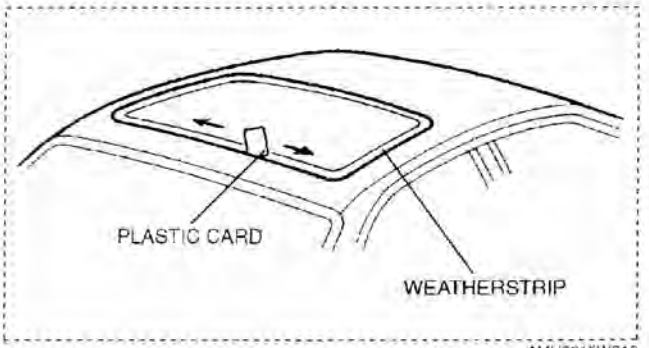
Clearance
a: -1.5—0.5 mm {0.059—0.019 in}
b: -1.5—-0.5 mm {-0.059—-0.019 in}
c: -2.9—-0.9 mm {-0.11—-0.035 in}
d: -20—0 mm {-0.078—0 in}
e: 0 mm {0 in}

4. Tighten the installation screws.



C6U0915WT01

5. Insert a plastic card between the weatherstrip and the body of the vehicle. Verify that the sunroof is shut tightly (there is resistance when the prepaid card is moved).
   - If the sunroof is not shut tightly, readjust by performing Steps 3 and 4.



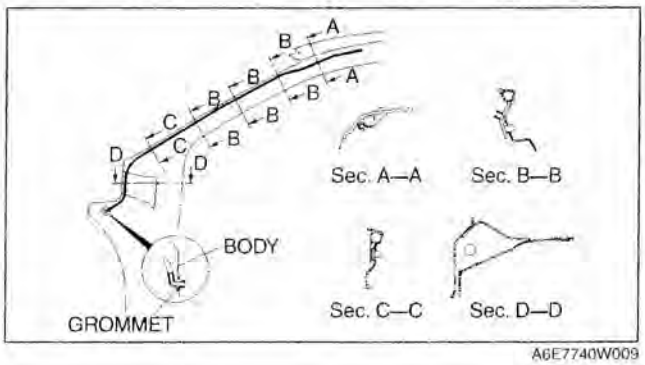
AMU0915W010

09-15

FRONT DRAIN HOSE REMOVAL

C6U091569920W01

1. Remove the headliner.
2. Disconnect the front drain hose from the sunroof frame.
3. Remove the front drain hose from the clips.
4. Pull the front drain hose into the room side.
5. Remove the front drain hose.



A6E7740W009

FRONT DRAIN HOSE INSTALLATION

C6U091569920W02

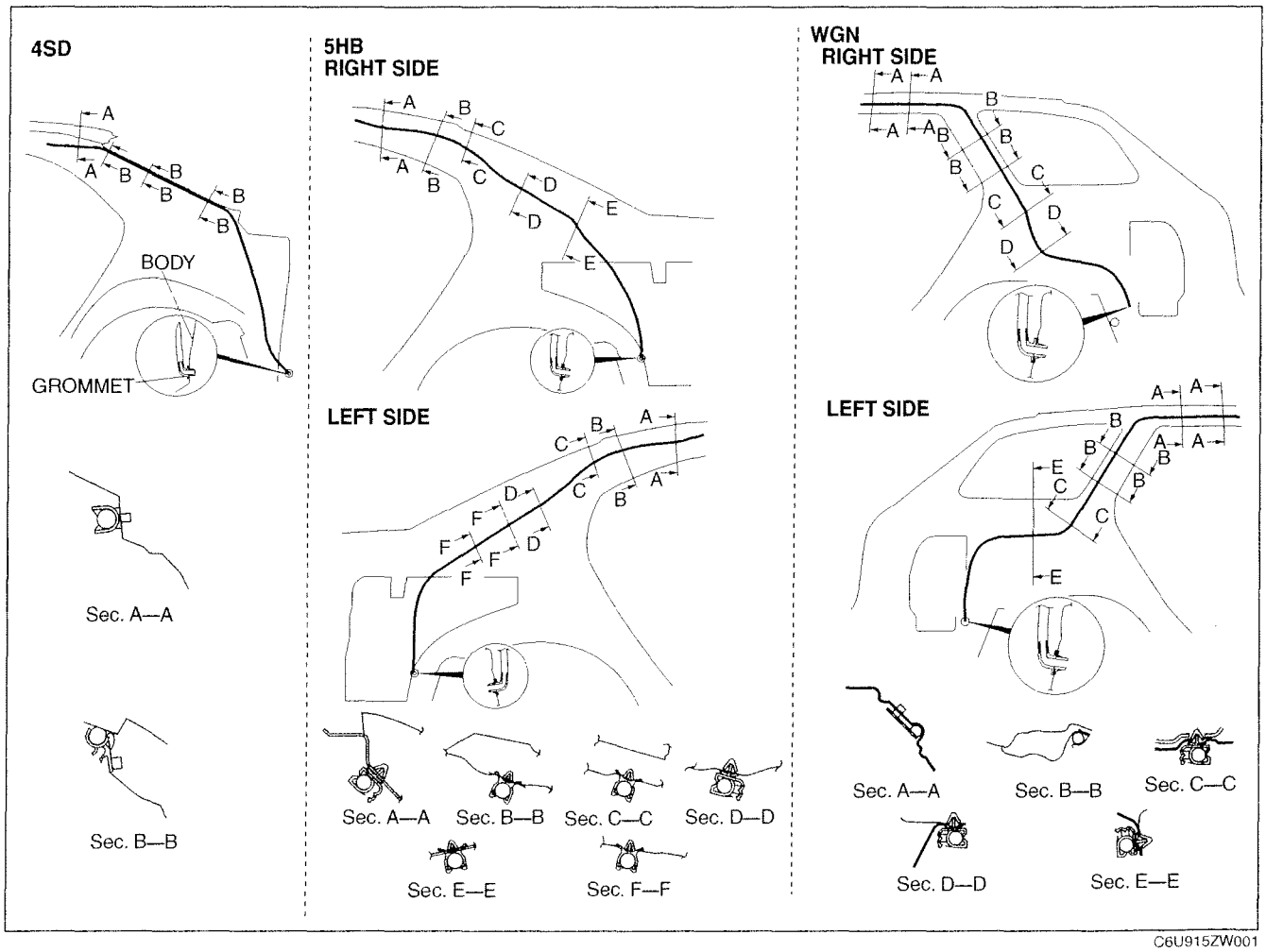
Caution
- **If the front drain hose is pinched or bent anywhere, the water in the hose may not discharge and enter the inside of the vehicle. During and after installation of the trims and the headliner, always make sure there is no interference with the front drain hose. Fix any problem if found.**

1. Apply soapy water to the front drain hose insertion area.
2. Insert one end (the wider end) of the front drain hose into the sunroof frame.
3. Install the front drain hose to the clips, parallel to the pillar and free of slack.
4. Insert the front drain hose grommet into the hinge pillar inner hole.
5. Install the headliner.

REAR DRAIN HOSE REMOVAL

C6U091569920W03

1. Remove the headliner.
2. Remove the trunk side trim. (4SD)
3. Remove the trunk side upper trim and trunk side trim. (5HB, WGN)
4. Disconnect the rear drain hose from the sunroof frame.
5. Remove the rear drain hose from the clips.
6. Pull the rear drain hose into the room side.
7. Remove the rear drain hose.



C6U915ZW001

REAR DRAIN HOSE INSTALLATION

C6U091569920W04

Caution

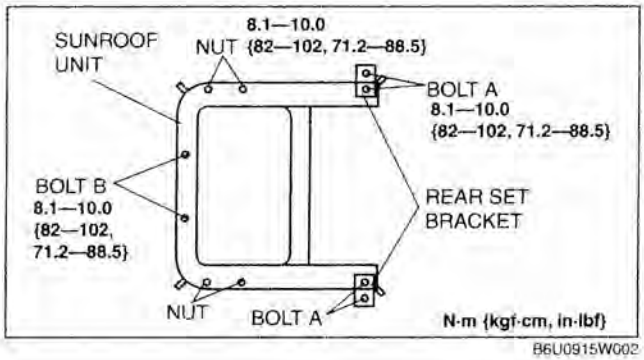
- **If the rear drain hose is pinched or bent anywhere, the water in the hose may not discharge and enter the inside of the vehicle. During and after installation of the trims and the headliner, always make sure there is no interference with the rear drain hose. Fix any problem if found.**

1. Apply soapy water to the rear drain hose inserting area.
2. Insert one end (the wider side) of the rear drain hose into the sunroof frame.
3. Install the rear drain hose to the clips parallel to the pillar and free of slack.
4. Insert the rear drain hose joint into the rear pillar inner hole.
5. Install the trunk side trim. (4SD)
6. Install the trunk side upper trim and trunk side trim. (5HB, WGN)
7. Install the headliner.

SUNROOF UNIT REMOVAL/INSTALLATION

C6U09156985OW01

1. Disconnect the negative battery cable.
2. Remove the headliner.
3. Remove the glass panel.
4. Remove the over head console bracket. (5HB, WGN)
5. Disconnect the front and rear drain hose from the sunroof frame.
6. Remove bolts A, and then remove the rear set bracket.
7. Remove bolts B and nuts, and then remove the sunroof unit.
8. Install in the reverse order of removal.
9. Adjust the glass panel. (See 09–15–3 GLASS PANEL ADJUSTMENT.)

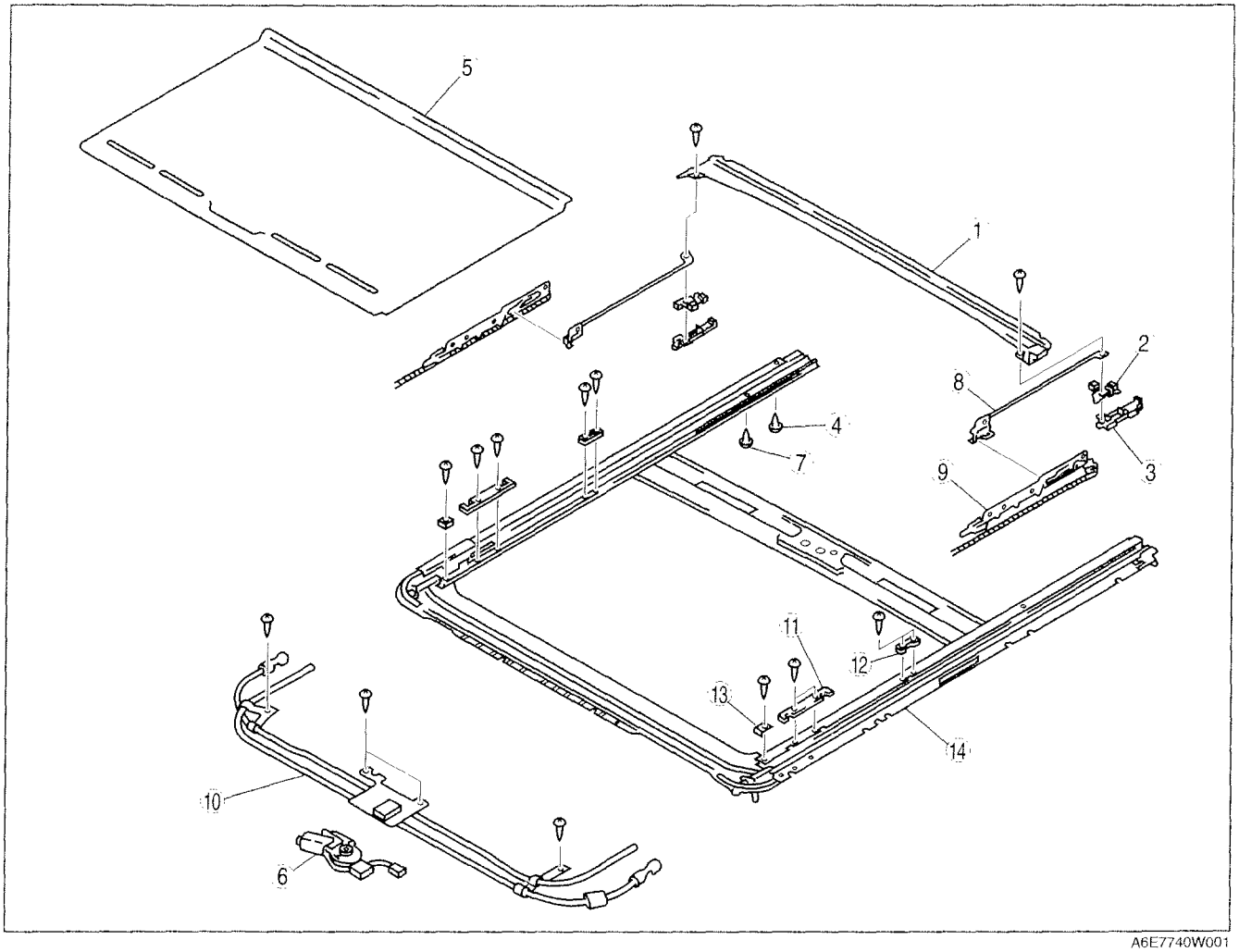


B6U0915W002

SUNROOF UNIT DISASSEMBLY/ASSEMBLY

C6U091569850W02

1. Disconnect the negative battery cable.
2. Remove the deflector.
3. Remove the glass panel.
4. Disassemble in the order indicated in the table.
5. Assemble in the reverse order of disassembly.



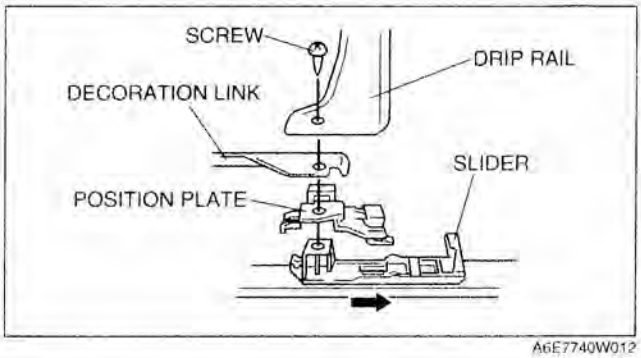
A6E7740W001

1	Drip rail
2	Position plate
3	Slider (See 09–15–7 Slider Disassembly Note)
4	Rear stopper A
5	Sunshade
6	Sunroof motor
7	Rear stopper B

8	Decoration link (See 09–15–7 Decoration Link Assembly Note)
9	Guide (See 09–15–7 Guide Disassembly Note)
10	Drive unit (See 09–15–7 Guide Assembly Note)
11	Set plate A
12	Set plate B
13	Front stopper
14	Frame

Slider Disassembly Note

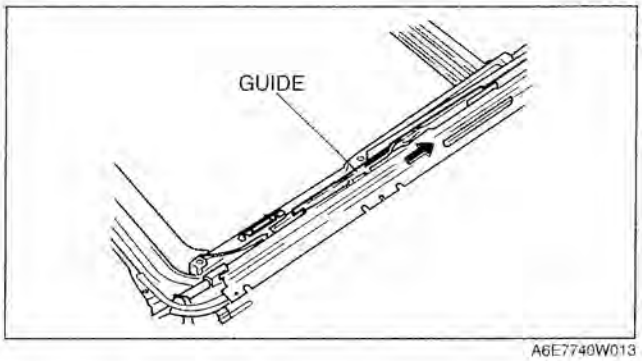
1. Remove the screw.
2. Slide the slider rearward, and remove it from the sunroof frame.



A6E7740W012

Guide Disassembly Note

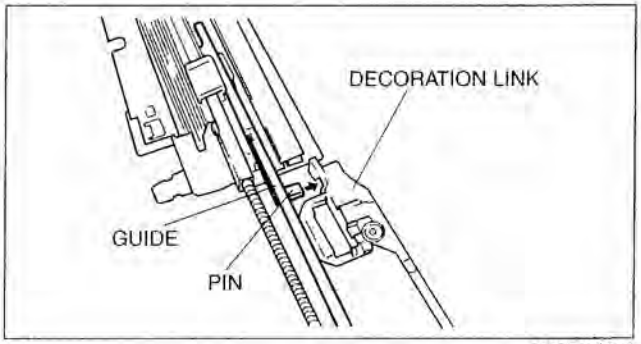
1. Slide the guide rearward, and remove it from the sunroof frame.



A6E7740W013

Decoration Link Assembly Note

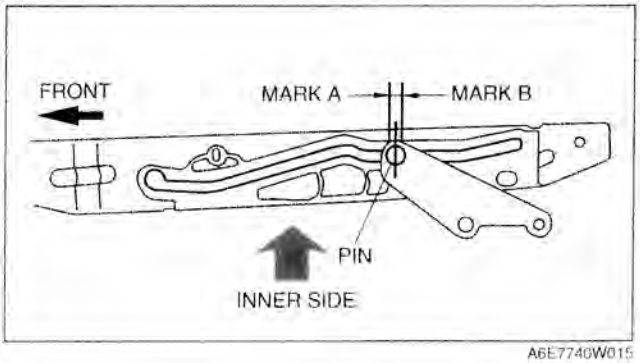
1. Set the pin in the decoration link.



A6E7740W014

Guide Assembly Note

1. Move the guide by hand until it comes to the front stopper.
2. Move the guide by hand until the center of the pin comes between marks A and B.

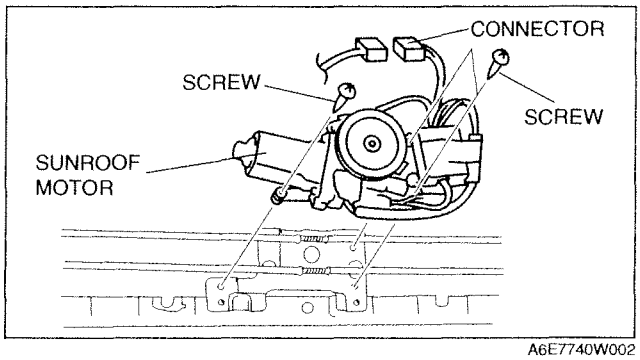


A6E7740W015

SUNROOF MOTOR REMOVAL

C6U091569870W01

1. Disconnect the negative battery cable.
2. Remove the headliner.
3. Remove the over head console bracket.
4. Disconnect the connector.
5. Remove the screws, and then remove the sunroof motor.



A6E7740W002

SUNROOF MOTOR INSTALLATION

C6U091569870W02

1. Connect the sunroof motor connector.
2. Connect the sunroof switch connector.
3. Connect the negative battery cable.
4. Turn the ignition switch to the LOCK position.
5. Press the CLOSE side of the slide switch until the sunroof motor stops.
6. Disconnect the sunroof switch connector.
7. Install the screws, and then install the sunroof motor.
8. Install the over head console bracket.
9. Install the headliner.

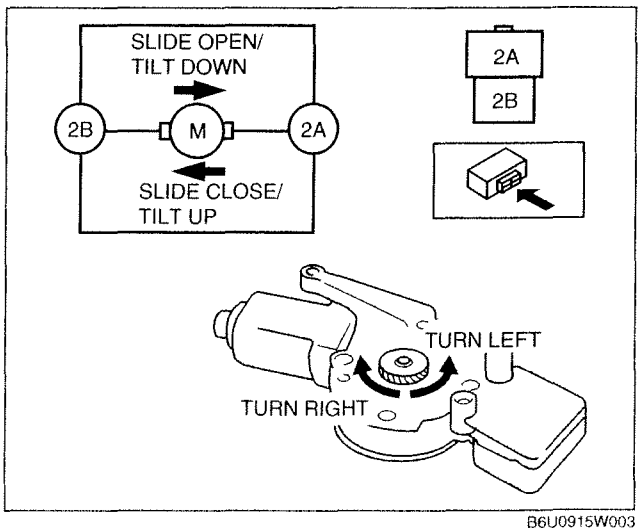
SUNROOF MOTOR INSPECTION

C6U091569870W03

Motor

1. Remove the sunroof motor.
2. Apply battery positive voltage to the sunroof motor terminals and inspect the sunroof motor operation.
   - If not as specified, replace the sunroof motor.

Motor operation	Terminal	
	2A	2B
Turn left (Slide close/Tilt up)	B+	GND
Turn right (Slide open/Tilt down)	GND	B+



B6U0915W003

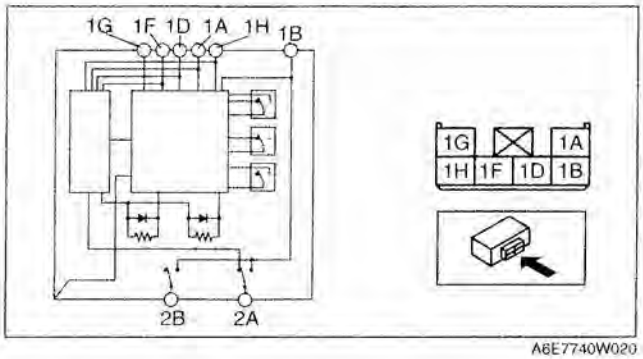
Limit Switch

1. Remove the headliner.
2. Verify the glass panel position.
3. Disconnect the connector.
4. Inspect for continuity between the sunroof motor terminals using an ohmmeter.
   - If not as specified, replace the sunroof motor.

O—O : Continuity

Glass panel position	Terminal						
	1A	1D	1F	1H	GND	2A	2B
Fully open			O		O	O	
Fully closed	O	O		O			O
Fully tilt up				O	O		O

A6E7740W021



A6E7740W020

SUNROOF RELAY INSPECTION

C6U091569873W01

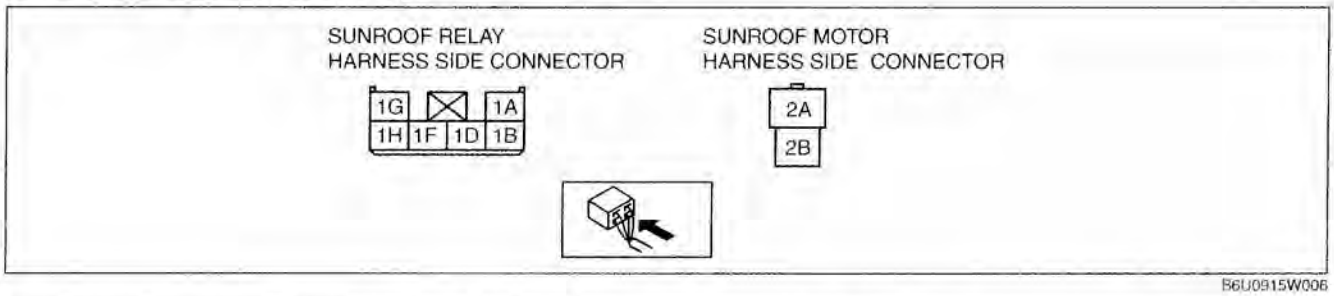
Note

- Sunroof relay is built in the sunroof motor.

1. Remove the headliner.
2. Connect the sunroof switch connector.
3. Measure the voltage at the sunroof relay terminals as indicated below.
4. Disconnect the sunroof relay connector before inspecting for continuity at terminal 1G.
   - If not as specified, inspect the parts listed under "Action" and the related wiring harnesses.
   - If the parts and wiring harnesses are okay but the system still does not work properly, replace the sunroof relay.
5. Connect the negative battery cable.

09-15

Terminal voltage list (Reference)



B6U0915W006

Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
1A	Tilt down	Sunroof switch	Sunroof is tilting down. (Not including position when fully closed)	0	• Inspect sunroof switch. • Inspect related harness.
			Other	B+	
1B	IG2	Sunroof motor	Ignition switch is at ON position.	B+	• Inspect A/C 15 A fuse. • Inspect sunroof switch. • Inspect related harness
			Other	0	
1C	-	-	-	-	-
1D	Slide close	Sunroof switch	Sunroof is closing. (Including position when fully closed and open)	0	• Inspect sunroof switch. • Inspect related harness.
			Other	B+	
1E	-	-	-	-	-
1F	Slide open	Sunroof switch	Sunroof is fully opening.	0	• Inspect sunroof switch. • Inspect related harness.
			Other	B+	
1G	Sunroof relay ground	GND	Under any condition: inspect for continuity to ground.	Continuity detected	• Inspect related harness.

Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
1H	Tilt up	Sunroof switch	Sunroof is tilting up. (Including position when fully closed)	0	• Inspect sunroof switch. • Inspect related harness.
			Other	B+	
2A	Slide close/ tilt up	Sunroof motor	Sunroof is opening/tilting down.	0	• Inspect sunroof switch. • Inspect sunroof motor. • Inspect related harness.
			Sunroof is closing/tilting up.	B+	
			Other	0	
2B	Slide open/tilt down	Sunroof motor	Sunroof is opening/tilting down.	B+	• Inspect sunroof switch. • Inspect sunroof motor. • Inspect related harness.
			Sunroof is closing/tilting up.	0	
			Other	0	

SUNROOF SWITCH REMOVAL/INSTALLATION

C6U091566560W01

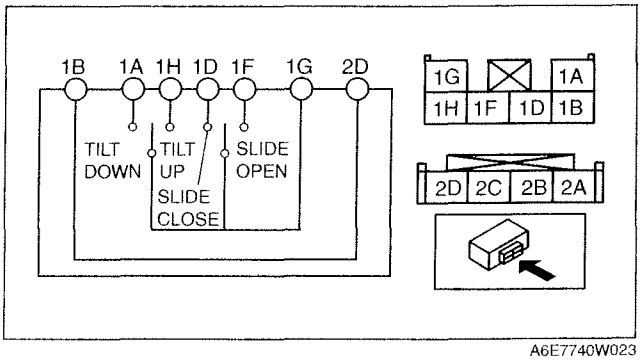
Note
- The sunroof switch is integrated with the map light.

1. Disconnect the negative battery cable.
2. Remove the map light from the headliner. (See 09–18–21 FRONT MAP LIGHT REMOVAL/INSTALLATION.)
3. Install in the reverse order of removal.

SUNROOF SWITCH INSPECTION

C6U091566560W02

1. Remove the sunroof switch.
2. Inspect for continuity between the sunroof switch terminals using an ohmmeter.
   - If not as specified, replace the sunroof switch.



A6E7740W023

○—○ : Continuity

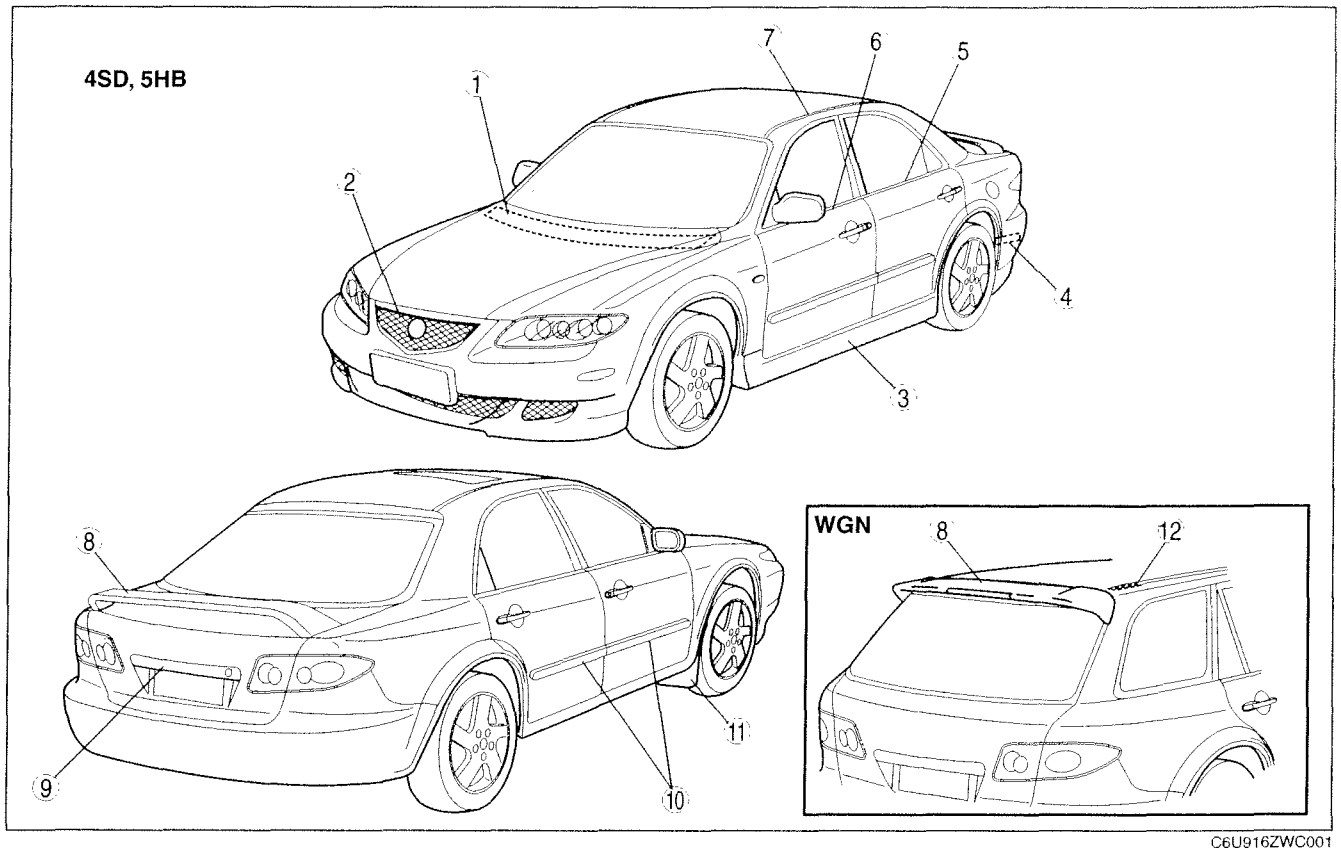
Switch position	Terminal						
	1A	1D	1F	1G	1H	1B	2D
Slide open			○—○			○—○	
Slide closed		○———○				○—○	
Tilt up				○—○		○—○	
Tilt down	○———○					○—○	
Off						○—○	

A6E7740W022

09–16 EXTERIOR TRIM

LOCATION INDEX

C6U091601050W01



C6U916ZWC001

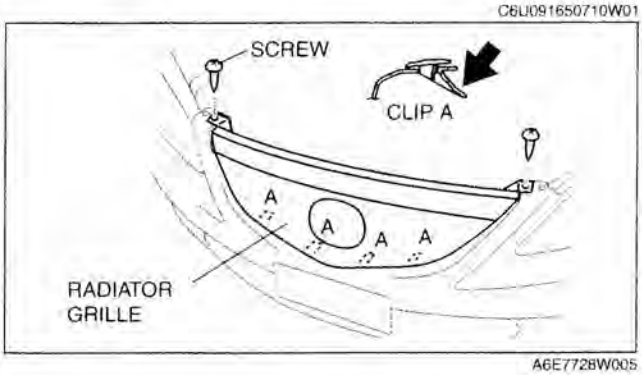
1	Cowl grille (See 09–16–3 COWL GRILLE REMOVAL/ INSTALLATION)
2	Radiator grille (See 09–16–3 RADIATOR GRILLE REMOVAL/ INSTALLATION)
3	Side step molding (See 09–16–3 SIDE STEP MOLDING REMOVAL/ INSTALLATION)
4	Extractor chamber (See 09–16–5 EXTRACTOR CHAMBER REMOVAL/INSTALLATION)
5	Rear beltline molding (See 09–16–7 REAR BELTLINE MOLDING REMOVAL) (See 09–16–7 REAR BELTLINE MOLDING INSTALLATION)
6	Front beltline molding (See 09–16–6 FRONT BELTLINE MOLDING REMOVAL) (See 09–16–7 FRONT BELTLINE MOLDING INSTALLATION)

7	Roof molding (See 09–16–8 ROOF MOLDING REMOVAL) (See 09–16–8 ROOF MOLDING INSTALLATION)
8	Rear spoiler (See 09–16–6 REAR SPOILER REMOVAL/ INSTALLATION)
9	Rear finisher (See 09–16–5 REAR FINISHER REMOVAL/ INSTALLATION)
10	Side protector (See 09–16–4 SIDE PROTECTOR REMOVAL) (See 09–16–4 SIDE PROTECTOR INSTALLATION)
11	Front flap (See 09–16–3 FRONT FLAP REMOVAL/ INSTALLATION)
12	Roof carrier bracket (See 09–16–6 ROOF CARRIER BRACKET REMOVAL/INSTALLATION [WGN])

RADIATOR GRILLE REMOVAL/INSTALLATION

C6U091650710W01

1. Remove the screws.
2. Press clips A in the direction of the arrow, pull the radiator grille outward, and remove it from the front bumper.
3. Install in the reverse order of removal.



A6E7728W005

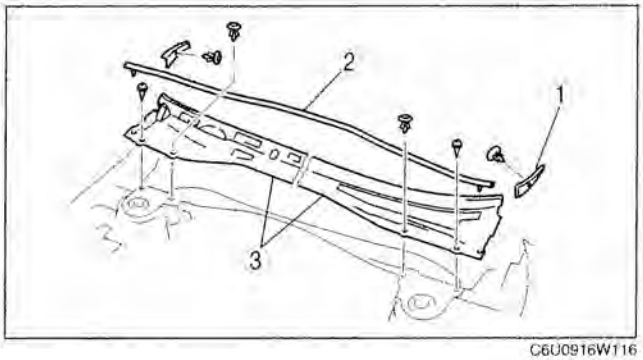
COWL GRILLE REMOVAL/INSTALLATION

C6U091650790W01

1. Remove the windshield wiper arm and blade. (See 09–19–3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.

1	Front fender molding
2	Weatherstrip
3	Cowl grille

3. Install in the reverse order of removal.



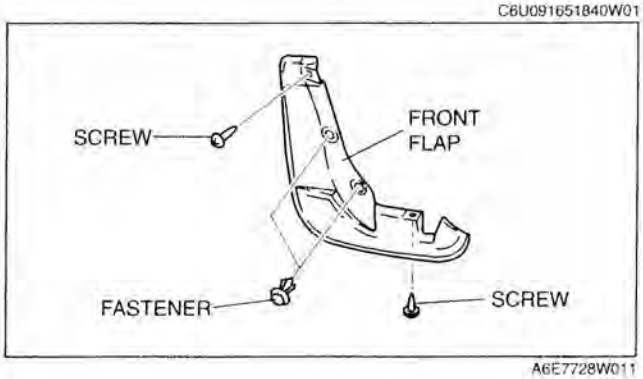
C6U0916W116

09–16

FRONT FLAP REMOVAL/INSTALLATION

C6U091651840W01

1. Remove the screws and fasteners.
2. Remove the front flap.
3. Install in the reverse order of removal.

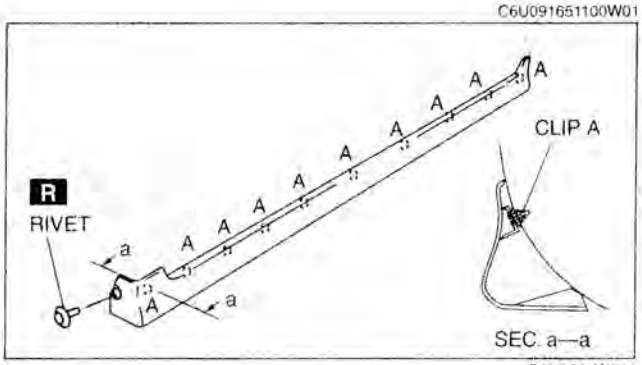


A6E7728W011

SIDE STEP MOLDING REMOVAL/INSTALLATION

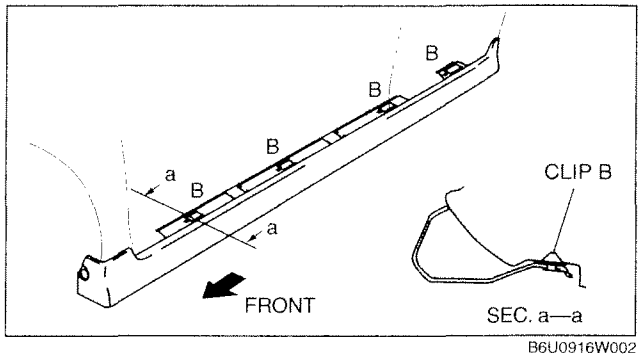
C6U091651100W01

1. Remove the rivet.
2. Pull the side step molding outward, then disengage clips A from the body.



B6U0916W001

3. Slide the side step molding towards the front of the vehicle and remove clips B from the molding.
4. Remove the side step molding.
5. Install in the reverse order of removal.



B6U0916W002

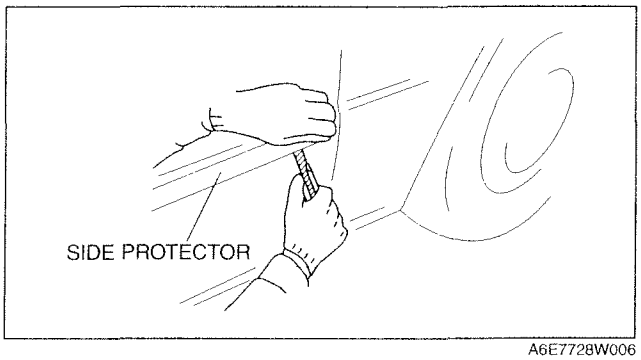
SIDE PROTECTOR REMOVAL

C6U091650680W01

1. Pry the side protector end **20—30 mm {0.8—1.1 in}** using a flathead screwdriver or a razor.

Warning
- **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**

Note
- The side protector is installed with double-sided adhesive tape. If the side protector is difficult to remove, soften the double-sided adhesive tape using a hot air blower.



A6E7728W006

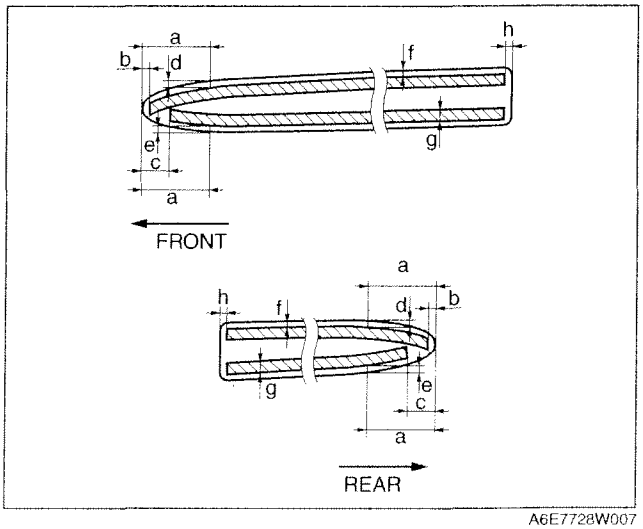
2. Pull the side protector outward, then remove it.

SIDE PROTECTOR INSTALLATION

C6U091650680W02

1. Remove the adhesive remaining on the side protector (if it will be reused) and the body using a razor.
2. Remove any grease or dirt from the adhesion surface of the side protector (if it will be reused) and the body.
3. Attach double-sided adhesive tape to the side protector as shown (if it will be reused).

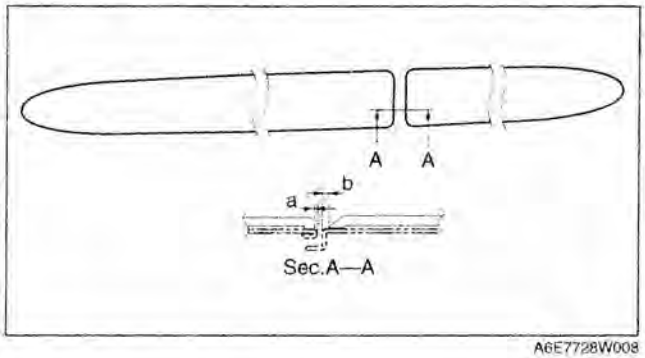
Clearance
- **a: 50.0 mm {1.97 in}**
- **b: 2.0 mm {0.79 in}**
- **c: 12.0 mm {0.47 in}**
- **d: 3.0 mm {0.11 in}**
- **e: 3.0 mm {0.11 in}**
- **f: 1.0—3.0 mm {0.04—0.11 in}**
- **g: 5.0 mm {0.19 in}**
- **h: 1.0 mm {0.04 in}**



A6E7728W007

4. Peel off the backing of the double-sided adhesive tape and attach the side protector onto the body as shown.

Clearance
a: 1.2—4.2 mm {0.05—0.16 in}
b: 3.2—6.2 mm {0.13—0.24 in}

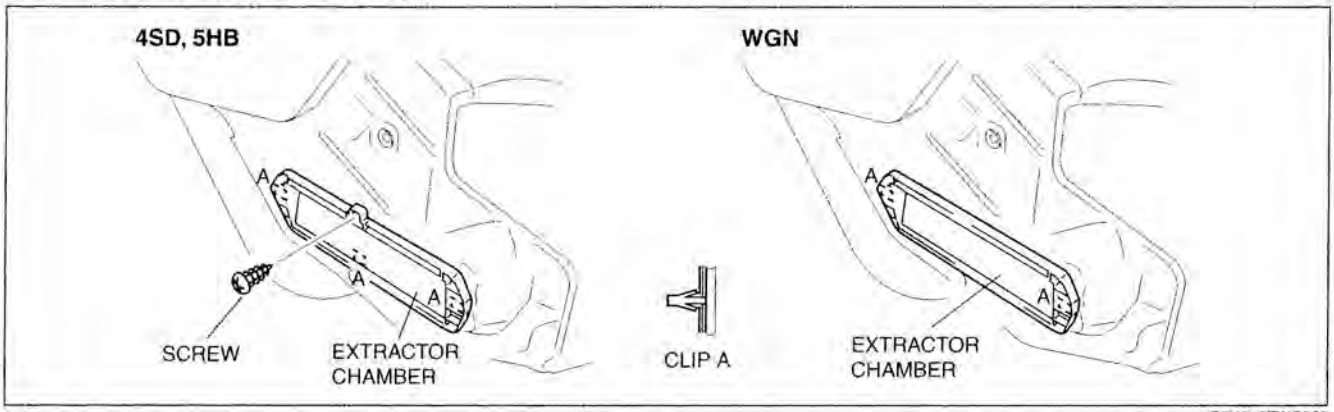


A6E7728W008

EXTRACTOR CHAMBER REMOVAL/INSTALLATION

C6U091651920W01

1. Remove the trunk side trim. (See09–17–14 TRUNK SIDE TRIM REMOVAL/INSTALLATION.)
2. Remove the rear bumper. (See 09–10–9 REAR BUMPER REMOVAL/INSTALLATION.)
3. Remove the screw. (4SD, 5HB)



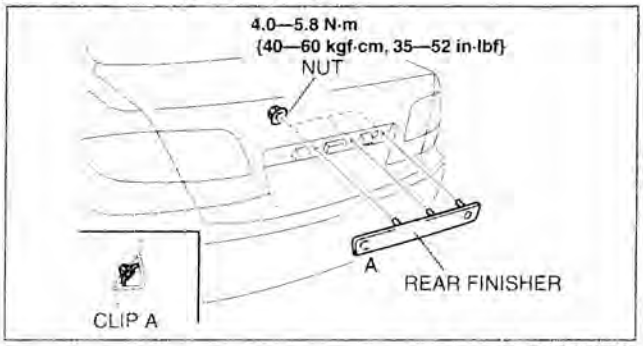
C6U916ZWC002

4. Squeeze the clips A and remove the extractor chamber from the vehicle side.
5. Install in the reverse order of removal.

REAR FINISHER REMOVAL/INSTALLATION

C6U091650850W01

1. Remove the trunk lid trim. (4SD)
2. Remove the liftgate upper trim, liftgate side trim and liftgate lower trim. (5HB, WGN)
3. Remove the nuts.
4. Pull the rear finisher outward, then disengage clip A from the body.
5. Install in the reverse order of removal.

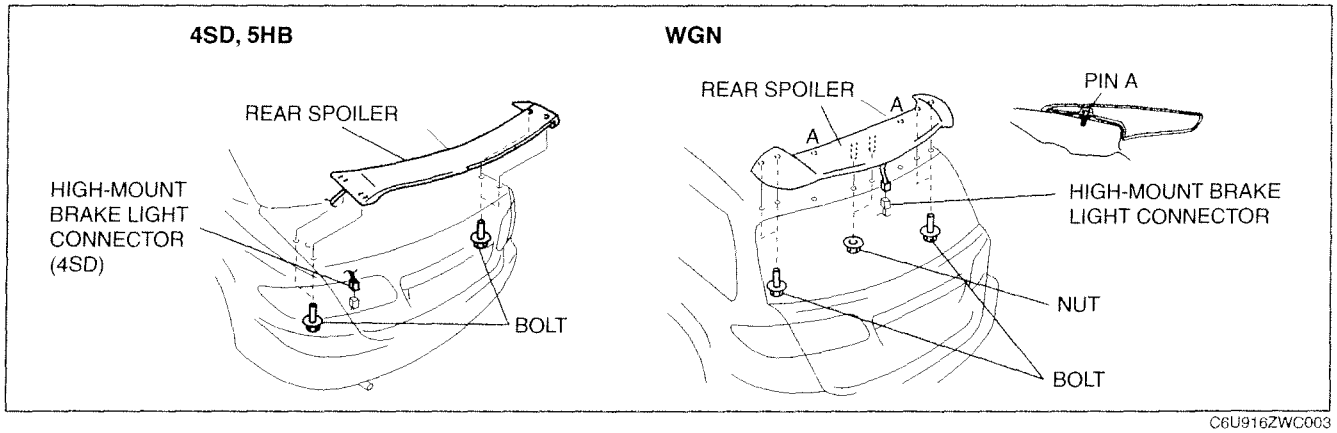


B6U0916W003

REAR SPOILER REMOVAL/INSTALLATION

C6U091651920W02

1. Remove the trunk lid trim. (4SD)
2. Remove the liftgate upper trim, liftgate side trim and liftgate lower trim. (5HB)
3. Remove the liftgate upper trim. (WGN)
4. Remove the bolts and nuts.



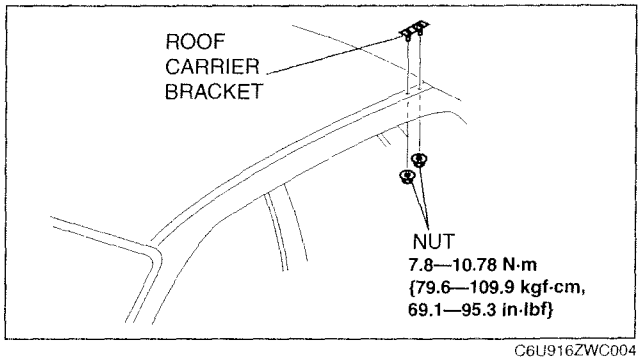
C6U916ZWC003

5. Disconnect the high-mount brake light connector. (4SD, WGN)
6. Remove the rear spoiler.
7. Install in the reverse order of removal.

ROOF CARRIER BRACKET REMOVAL/INSTALLATION [WGN]

C6U091650710W02

1. Remove the headliner.
2. Remove the nuts.
3. Remove the roof carrier bracket.
4. Install in the reverse order of removal.



C6U916ZWC004

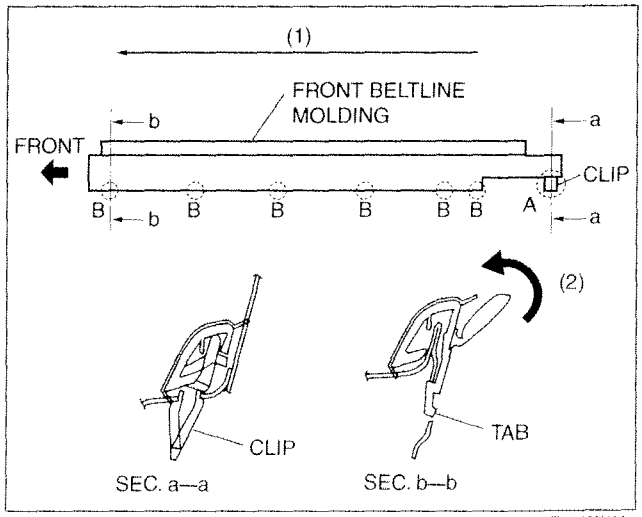
FRONT BELTLINE MOLDING REMOVAL

C6U091650640W01

Note

- When removing the front beltline molding, the clip may be damaged. If the clip is damaged, replace the front beltline molding with a new one.

1. Pull section A upward and remove the clip.
2. Rotate section B of the front beltline molding in direction (2), along the direction (1) shown in the figure, and remove it from the body.



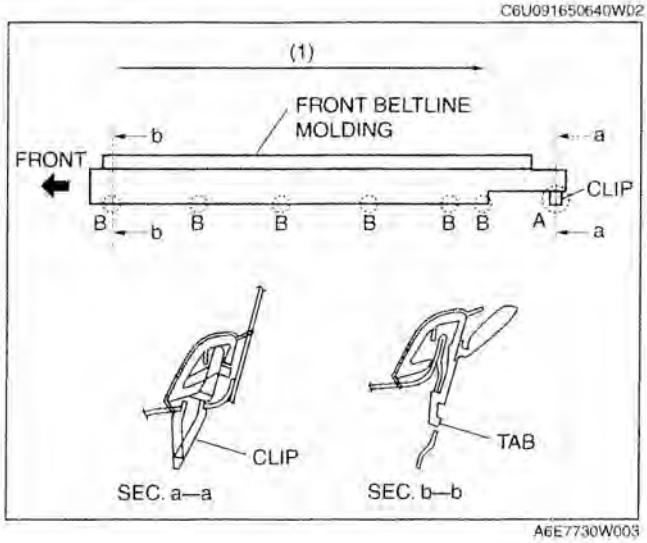
A6E7730W001

FRONT BELTLINE MOLDING INSTALLATION

1. Press the clip into the body.
2. Press in section B of the front beltline molding along the direction (1) shown in the figure to attach it to the body.

Note
- If the front beltline molding is difficult to attach, apply soapy water.

C6U091650640W02



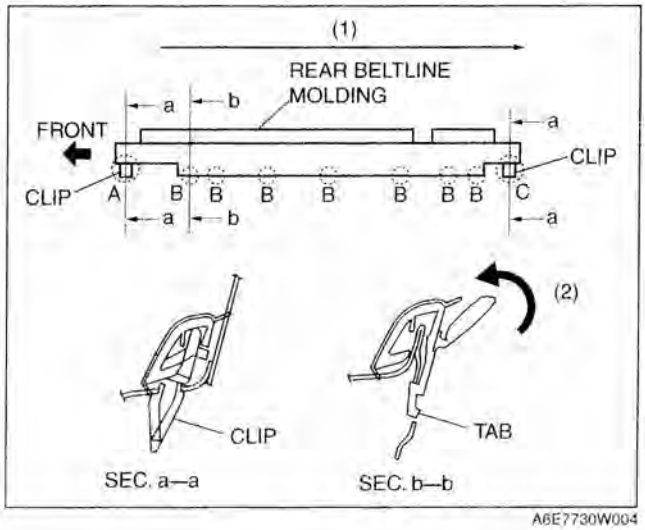
A6E7730W003

REAR BELTLINE MOLDING REMOVAL

C6U091650660W01

Note
- When removing the rear beltline molding, the clip may be damaged. If the clip is damaged, replace the rear beltline molding with a new one.

1. Pull section A upward and remove the clip.
2. Rotate section B of the rear beltline molding in direction (2), along the direction (1) shown in the figure and remove it from the body.
3. Pull section C upward and remove the clip. Then remove the rear beltline molding.



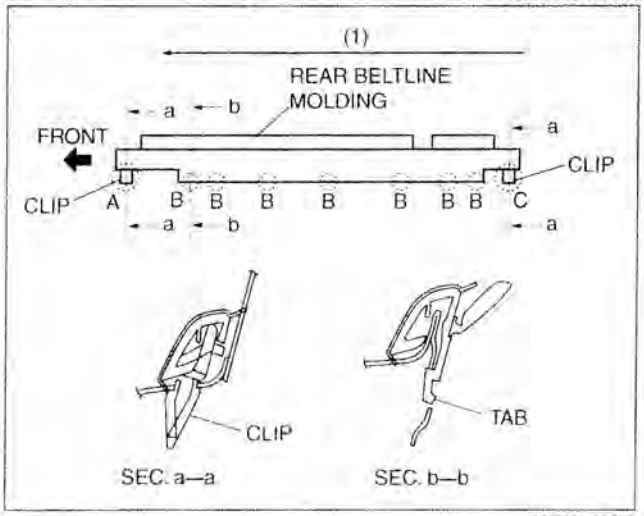
A6E7730W004

REAR BELTLINE MOLDING INSTALLATION

1. Press the clip at section C into the body.
2. Press in section B of the rear beltline molding along the direction (1) to attach it to the body.
3. Press the clip at section A in and attach the rear beltline molding.

Note
- If the rear beltline molding is difficult to attach, apply soapy water.

C6U091650660W02

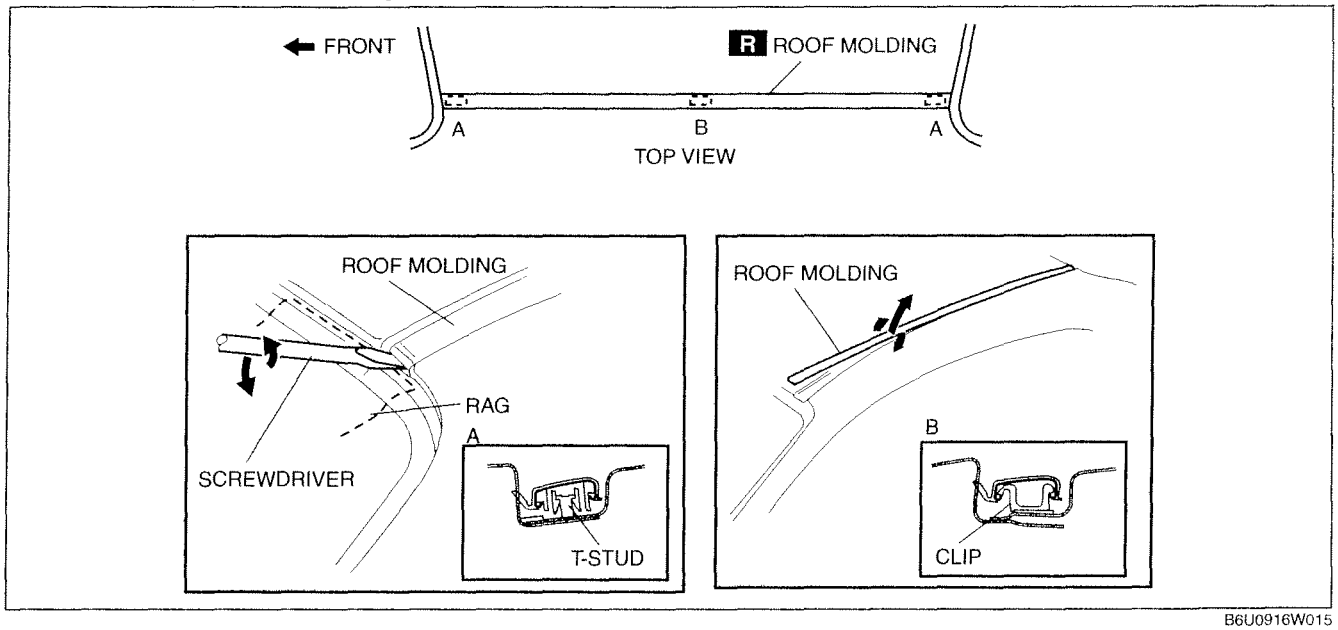


A6E7730W005

ROOF MOLDING REMOVAL

C6U091650620W01

1. Detach the T-stud which secure sections A of roof molding, using a screwdriver or equivalent tool.
2. While pulling the roof molding up, detach it from the clips at section B, and then remove the roof molding.

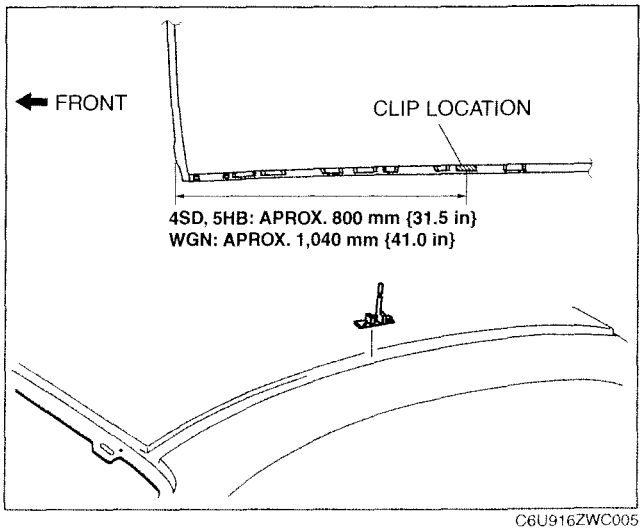


B6U0916W015

ROOF MOLDING INSTALLATION

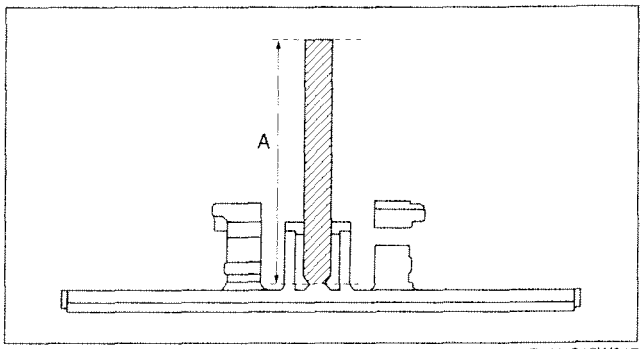
C6U091650620W02

1. Follow the following procedure when installing a new clip.
   (1) Remove the faulty clip.
   (2) Clean and degrease the area of the roof panel where the clip will be affixed.
   (3) If the temperature is **less than 20 °C {68 °F}**, warm the clip installation surface to **20 °C—40 °C {68—104 °F}** using a hot air blower.
   (4) Peel off the backing of the double-sided adhesive tape of the clip.
   (5) Install the clip by pressing it on the vehicle.



C6U916ZWC005

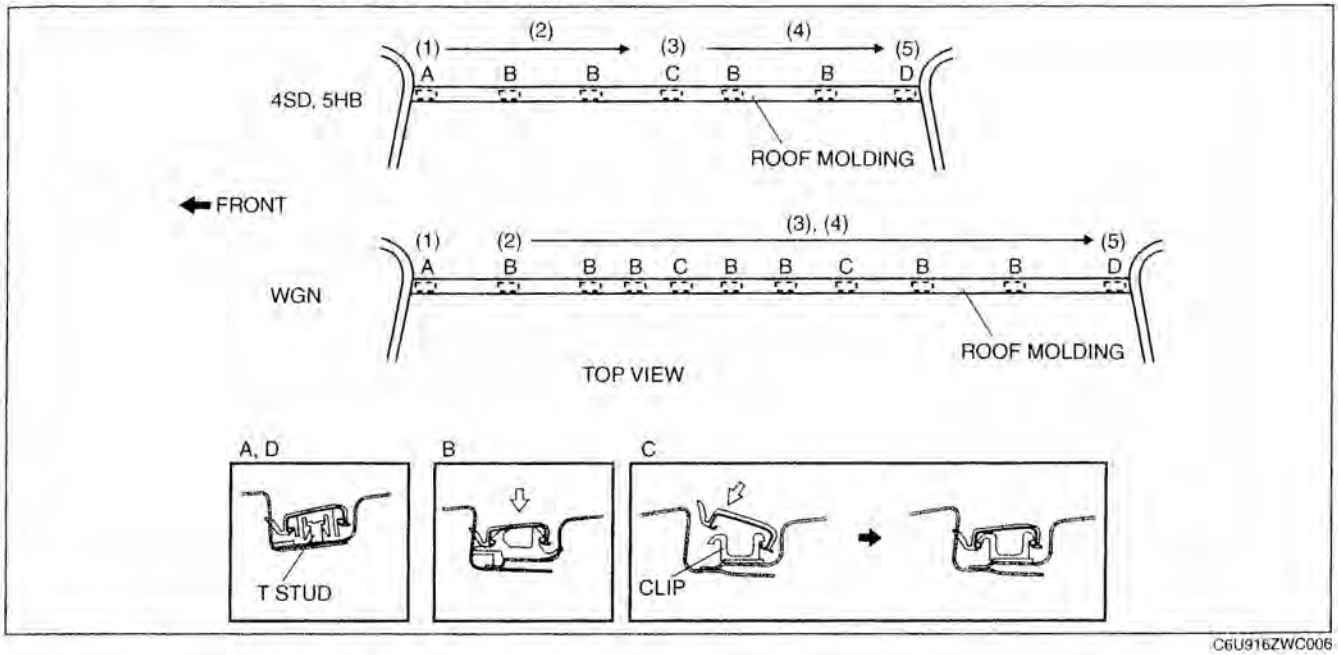
   (6) Remove section A of the clip.



B6U0916W017

Vehicle with T-stud

1. Attach the roof molding to the T-stud at section A.



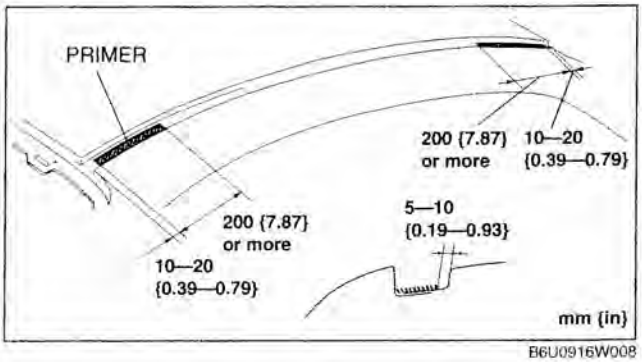
C6U916ZWC006

2. Press in the roof molding following the arrows.
3. Hook the roof molding to the clip, and then press it in to attach the roof molding to the clip.
4. Press in the roof molding following the arrows.
5. Attach the roof molding to the T-stud at section D.

09–16

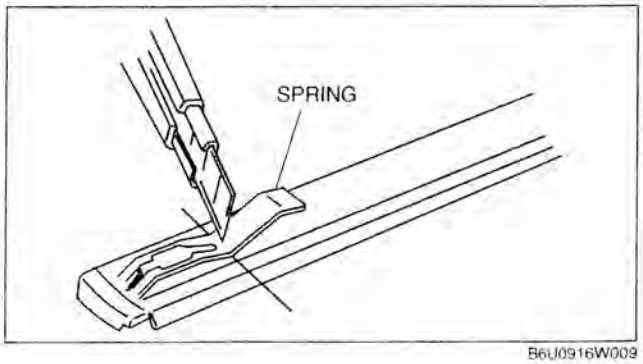
Vehicle without T-stud (When replacing roof panel)

1. Apply primer to the areas of the roof panel indicated in the figure.



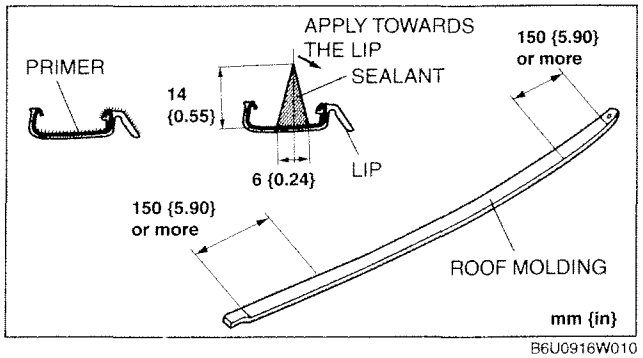
B6U0916W008

2. Cut the spring off of the front and rear ends of the roof molding.
3. Apply primer to the areas of the roof molding indicated in the figure.



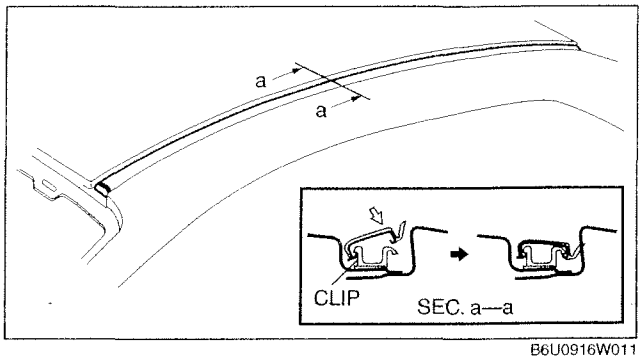
B6U0916W009

4. Apply sealant to the areas of the roof molding indicated in the figure.



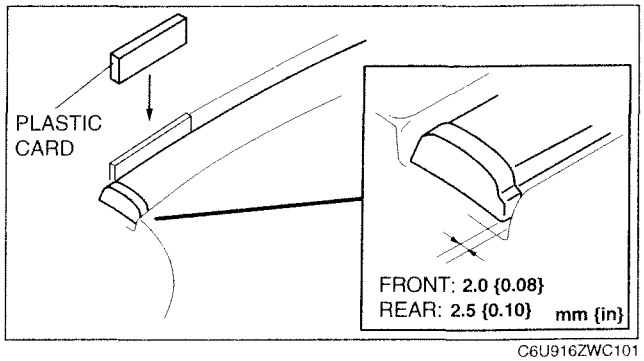
B6U0916W010

5. Install the roof molding to the clips as shown in the figure.



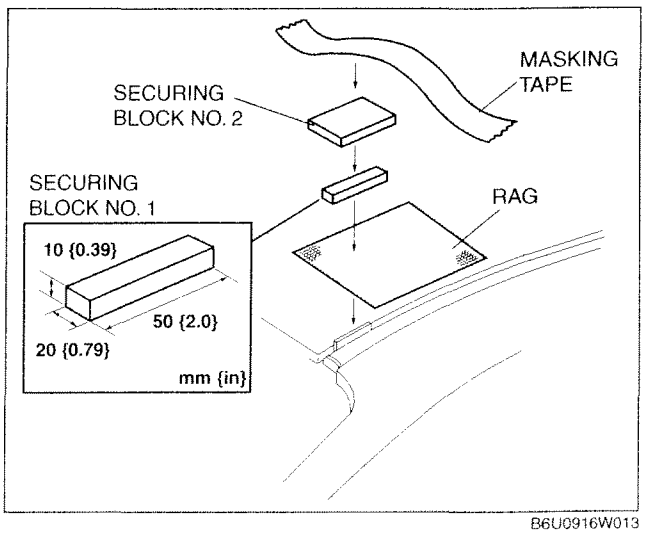
B6U0916W011

6. Use a plastic card (**10 mm {0.39 in}** width, **30 mm {1.18 in}** length) to adjust the front and rear gaps of the roof molding.



C6U916ZWC101

7. Secure the front and rear ends of the roof molding as shown in the figure.
8. After the adhesive material has hardened, remove the securing parts.

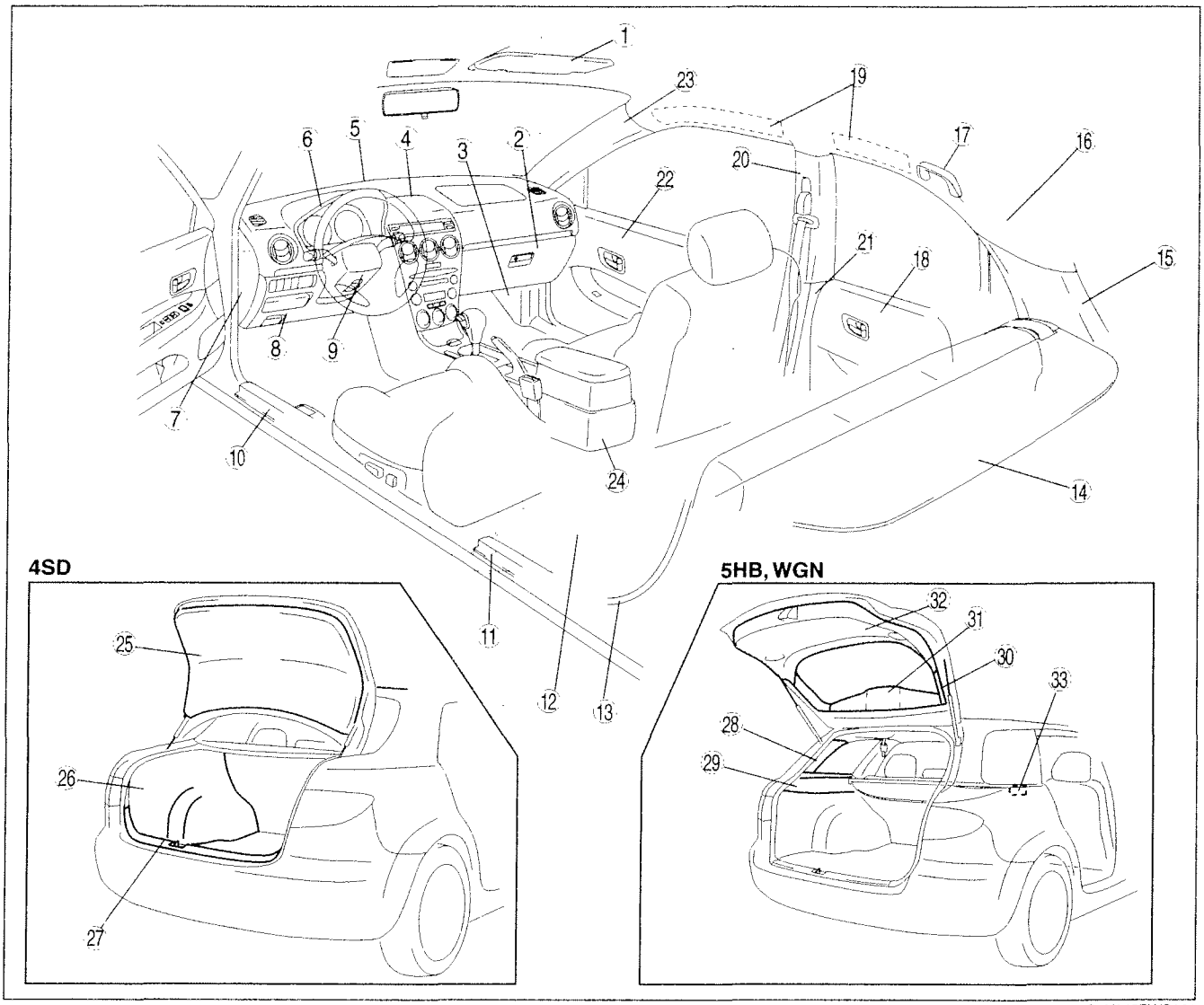


B6U0916W013

09–17 INTERIOR TRIM

LOCATION INDEX

C6U091755000W01



C6U917ZWC001

1	Sunvisor (See 09–17–23 SUNVISOR REMOVAL/ INSTALLATION)
2	Glove compartment (See 09–17–8 GLOVE COMPARTMENT REMOVAL/INSTALLATION)
3	Front side trim (See 09–17–10 FRONT SIDE TRIM REMOVAL/ INSTALLATION)
4	Center box (See 09–17–8 CENTER BOX REMOVAL/ INSTALLATION)
5	Dashboard (See 09–17–4 DASHBOARD REMOVAL/ INSTALLATION) (See 09–17–5 DASHBOARD DISASSEMBLY/ ASSEMBLY)
6	Meter hood (See 09–17–6 METER HOOD REMOVAL/ INSTALLATION)
7	Side panel (See 09–17–5 SIDE PANEL REMOVAL/ INSTALLATION)

8	Lower panel (See 09–17–6 LOWER PANEL REMOVAL/ INSTALLATION)
9	Column cover (See 09–17–6 COLUMN COVER REMOVAL/ INSTALLATION)
10	Front scuff plate (See 09–17–10 FRONT SCUFF PLATE REMOVAL/ INSTALLATION)
11	Rear scuff plate (See 09–17–11 REAR SCUFF PLATE REMOVAL/ INSTALLATION)
12	Floor covering (See 09–17–25 FLOOR COVERING REMOVAL/ INSTALLATION)
13	Tire house trim (See 09–17–13 TIRE HOUSE TRIM REMOVAL/ INSTALLATION)
14	Rear package trim (4SD) (See 09–17–14 REAR PACKAGE TRIM REMOVAL/ INSTALLATION [4SD])

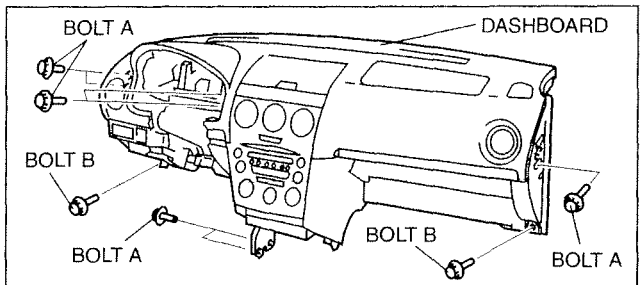
15	C-pillar trim (See 09–17–12 C-PILLAR TRIM REMOVAL/ INSTALLATION)
16	Headliner (See 09–17–21 HEADLINER REMOVAL/ INSTALLATION)
17	Assist handle (See 09–17–23 ASSIST HANDLE REMOVAL/ INSTALLATION)
18	Rear door trim (See 09–17–11 REAR DOOR TRIM REMOVAL/ INSTALLATION)
19	Shock absorbing pad (See 09–17–24 SHOCK ABSORBING PAD REMOVAL/INSTALLATION)
20	B-pillar upper trim (See 09–17–10 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION)
21	B-pillar lower trim (See 09–17–9 B-PILLAR LOWER TRIM REMOVAL/ INSTALLATION)
22	Front door trim (See 09–17–11 FRONT DOOR TRIM REMOVAL/ INSTALLATION)
23	A-pillar trim (See 09–17–9 A-PILLAR TRIM REMOVAL/ INSTALLATION)
24	Console (See 09–17–7 CONSOLE REMOVAL/ INSTALLATION) (See 09–17–7 CONSOLE DISASSEMBLY/ ASSEMBLY)

25	Trunk lid trim (See 09–17–18 TRUNK LID TRIM REMOVAL/ INSTALLATION [4SD])
26	Trunk side trim (See 09–17–14 TRUNK SIDE TRIM REMOVAL/ INSTALLATION)
27	Trunk end trim (See 09–17–17 TRUNK END TRIM REMOVAL/ INSTALLATION)
28	D-pillar trim (WGN) (See 09–17–13 D-PILLAR TRIM REMOVAL/ INSTALLATION [WGN])
29	Trunk side upper trim (5HB, WGN) (See 09–17–16 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION [5HB, WGN])
30	Liftgate side trim (5HB, WGN) (See 09–17–19 LIFTGATE SIDE TRIM REMOVAL/INSTALLATION [5HB, WGN])
31	Liftgate upper trim (5HB, WGN) (See 09–17–18 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION [5HB, WGN])
32	Liftgate lower trim (5HB, WGN) (See 09–17–20 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION [5HB, WGN])
33	Tonneau cover anchor (WGN) (See 09–17–24 TONNEAU COVER ANCHOR REMOVAL/INSTALLATION [WGN])

DASHBOARD REMOVAL/INSTALLATION

C6U091755100W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Remove the console.
4. Remove the meter hood.
5. Remove the instrument cluster.
6. Remove the column cover.
7. Remove the lower panel.
8. Remove the steering shaft.
9. Remove the A-pillar trims.
10. Remove the front scuff plates.
11. Remove the front side trims.
12. Remove the side panels.
13. For vehicles equipped with the wire-type climate control unit, disconnect the wires for the front A/C unit. (See 07–40–16 CLIMATE CONTROL UNIT REMOVAL.) (See 07–40–16 CLIMATE CONTROL UNIT INSTALLATION.)
14. Disconnect the dashboard harness connectors.
15. Remove the bolts.



BOLT A: **18.6—25.5 N·m {1.9—2.6 kgf·m, 13.2—18.8 ft·lbf}**
BOLT B: **2.1—2.9 N·m {21—30 kgf·cm, 19—26 in·lbf}**

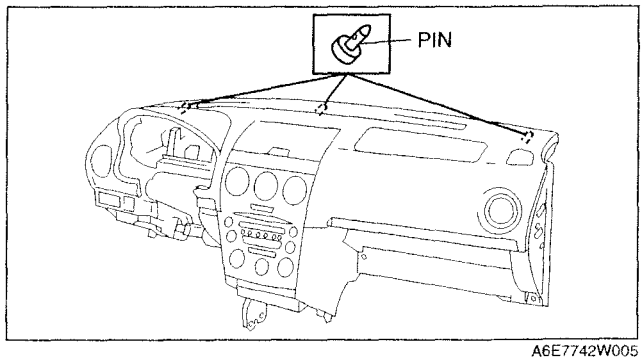
C6U0917W121

16. Pull out the support pins from the body to remove the dashboard.

Warning

- **Removing the dashboard without supporting it can be dangerous. The dashboard may fall and injure you. Always perform these procedures together with at least another person.**

17. Take the dashboard off from the driver-side door opening.
18. Install in the reverse order of removal.

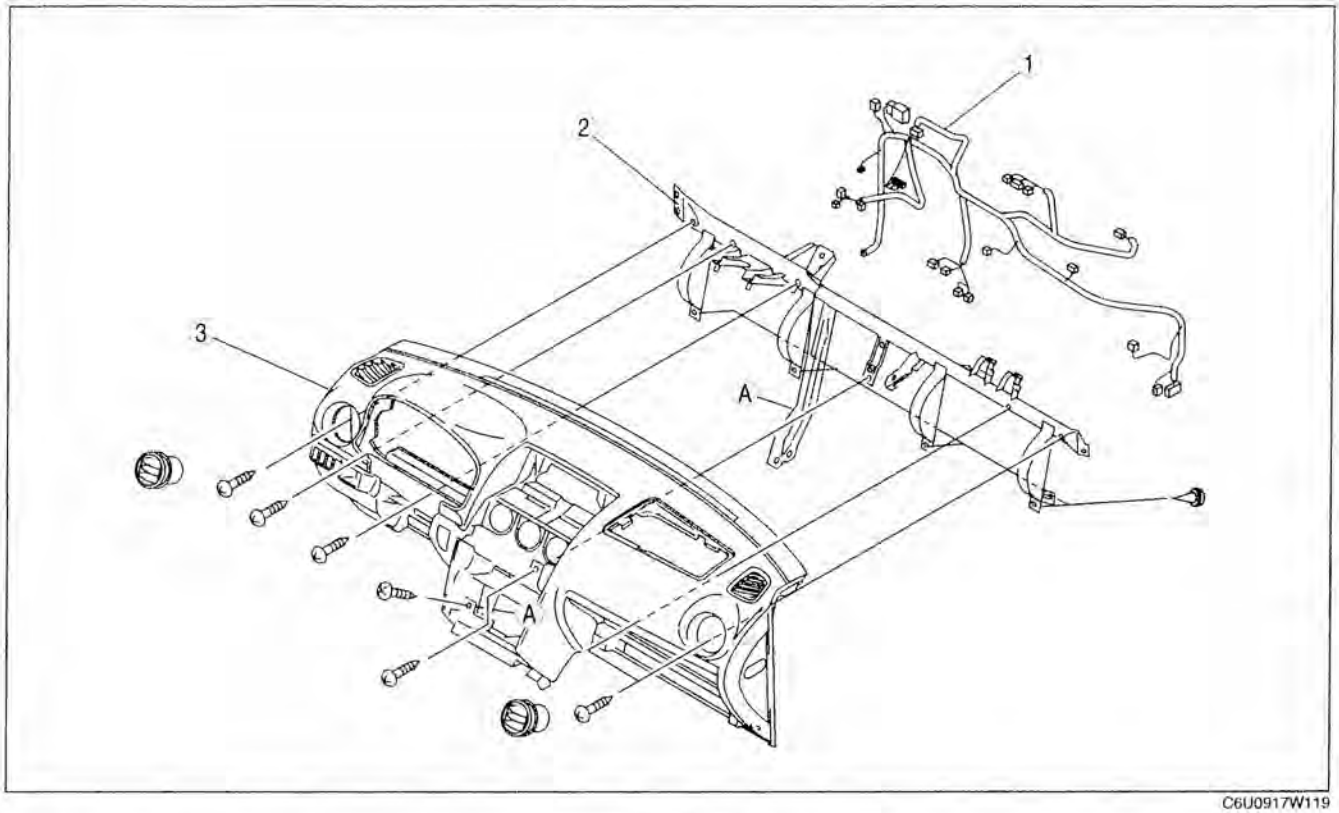


A6E7742W005

DASHBOARD DISASSEMBLY/ASSEMBLY

C6U091755100W02

1. Remove the passenger-side air bag module.
2. Remove the ventilator grilles.
3. Remove the audio unit.
4. Remove the climate control unit.
5. Disassemble in the order indicated in the table.
6. Assemble in the reverse order of disassembly.



C6U0917W119

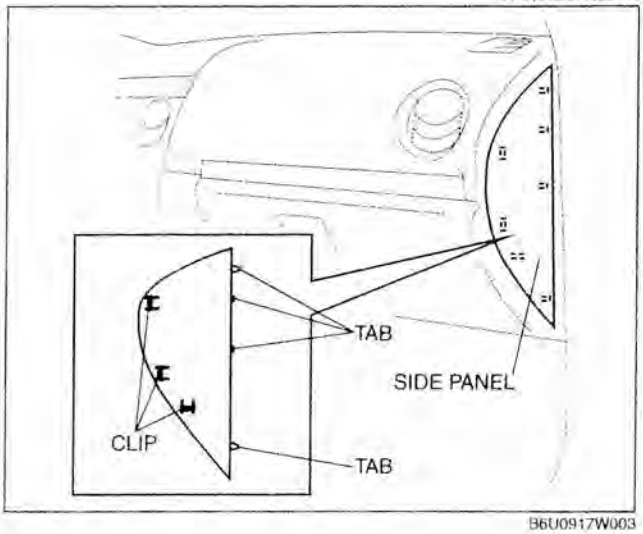
1	Dashboard harness
2	Dashboard member

3	Dashboard

SIDE PANEL REMOVAL/INSTALLATION

1. Disengage clips using a tape-wrapped flathead screwdriver.
2. Pull the side panel outward, then disengage tabs from dashboard, and remove the side panel.
3. Install in the reverse order of removal.

C6U091764960W01

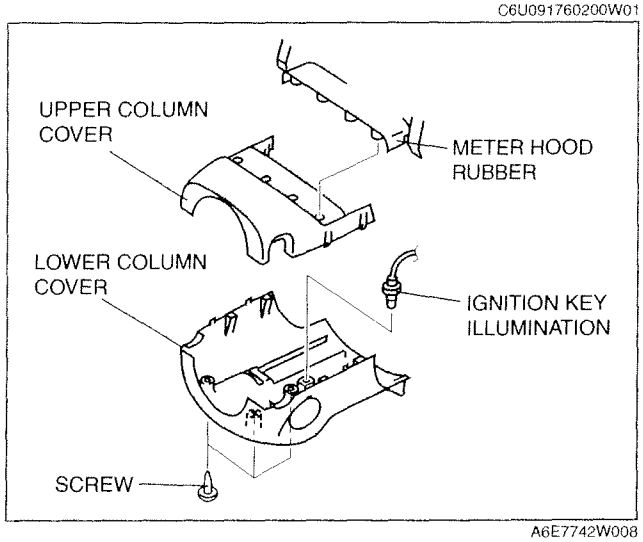


B6U0917W003

COLUMN COVER REMOVAL/INSTALLATION

1. Detach the fitting parts of the upper column cover from the meter hood rubber.
2. Remove the upper column cover.
3. Remove the ignition key illumination.
4. Remove the screws.
5. Remove the lower column cover.
6. Install in the reverse order of removal.

C6U091760200W01

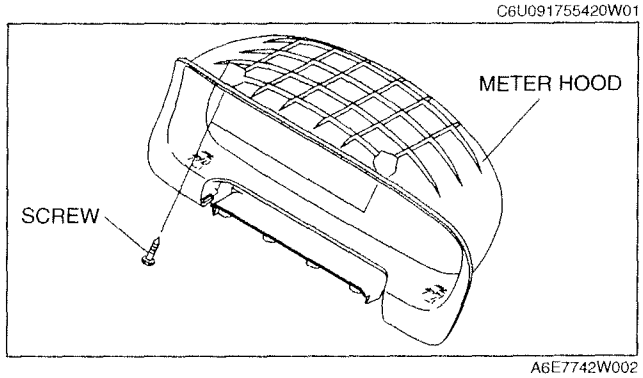


A6E7742W008

METER HOOD REMOVAL/INSTALLATION

1. Remove the screws.
2. Pull the meter hood outward, then detach the column cover.
3. Install in the reverse order of removal.

C6U091755420W01

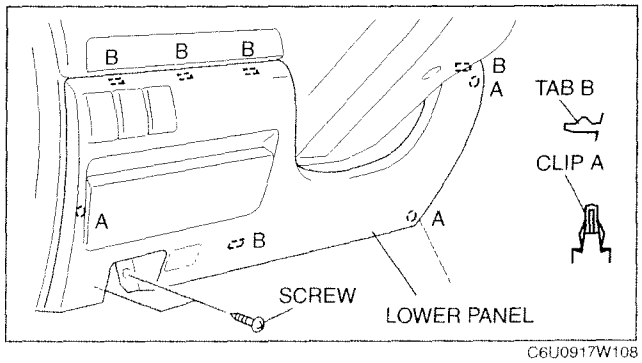


A6E7742W002

LOWER PANEL REMOVAL/INSTALLATION

C6U091764280W01

1. Remove the hood release lever. (See 09–10–3 Hood Release Lever Removal Note.)
2. Remove the screws.
3. Pull the lower panel outward, disengage clips A and tabs B from the dashboard, and remove the lower panel.
4. Install in the reverse order of removal.

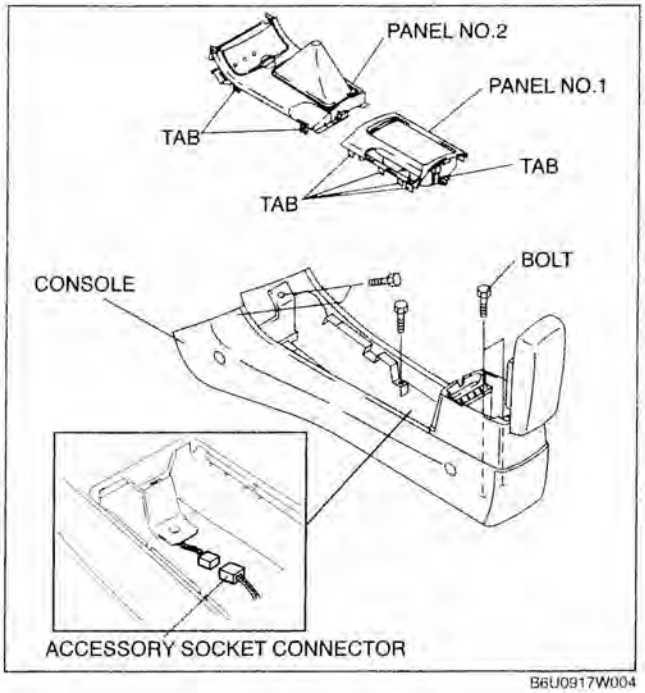


C6U0917W108

CONSOLE REMOVAL/INSTALLATION

C6U091764270W01

1. Disconnect the negative battery cable.
2. For MTX vehicle, remove the shift lever knob.
3. Remove the panel No.1 using a tape-wrapped screwdriver.
4. Remove the panel No.2 using a tape-wrapped screwdriver, disconnect the cigarette lighter connector, and remove the front ashtray illumination.
5. Remove the bolts.
6. Disconnect the accessory socket connector.
7. Install in the reverse order of removal.



B6U0917W004

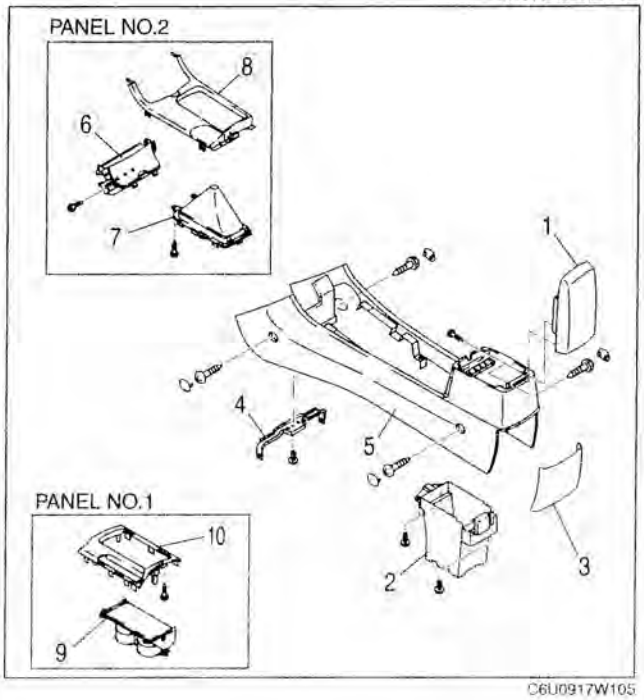
CONSOLE DISASSEMBLY/ASSEMBLY

C6U091764270W02

1. Disassemble in the order indicated in the table.

1	Console lid
2	Box
3	Cover
4	Bracket
5	Console
6	Front ashtray
7	Boot (only MTX vehicle)
8	Panel No.2
9	Cup holder
10	Panel No.1

2. Assemble in the reverse order of disassembly.

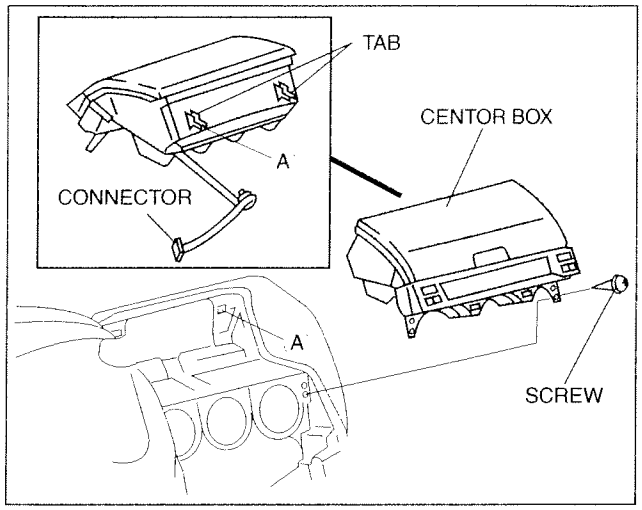


C6U0917W105

CENTER BOX REMOVAL/INSTALLATION

C6U091764030W01

1. Disconnect the negative battery cable.
2. Remove the center panel module.
3. Remove the screws.
4. Pull the center box outward, then disengage the tabs.
5. Disconnect the information display connector.
6. Install in the reverse order of removal.

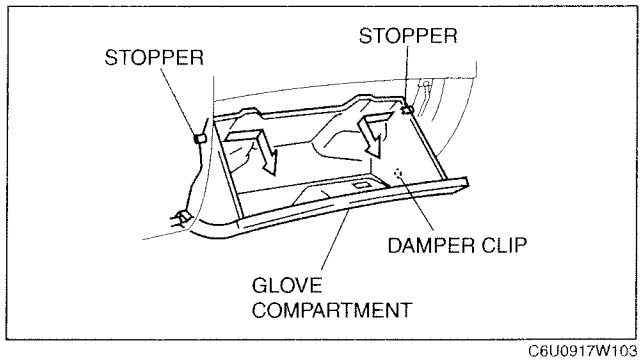


A6E7742W012

GLOVE COMPARTMENT REMOVAL/INSTALLATION

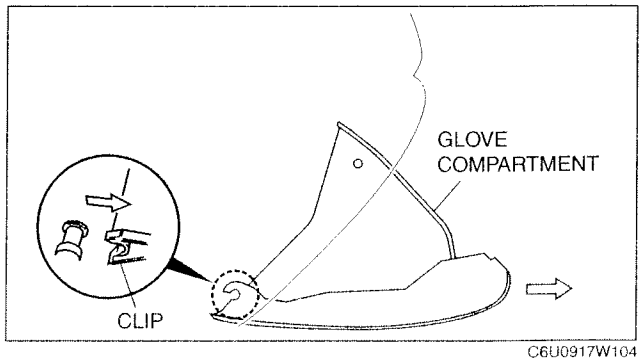
C6U091764030W02

1. Remove the damper clip.
2. Bend the stoppers inward to remove.



C6U0917W103

3. Open the glove compartment lid until it is completely horizontal and remove the clips by pulling them in the direction of the arrow.
4. Remove the glove compartment.
5. Install in the reverse order of removal.

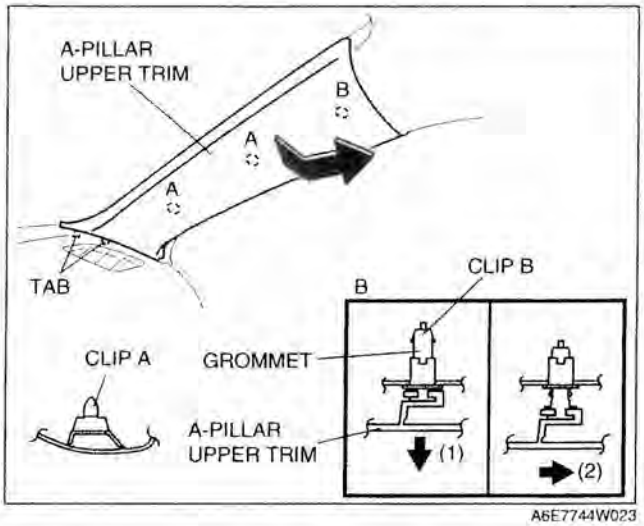


C6U0917W104

A-PILLAR TRIM REMOVAL/INSTALLATION

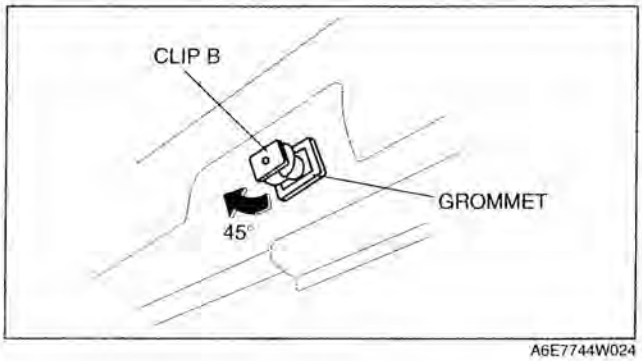
C6U091768160W01

1. Partially peel back the seaming welt.
2. Pull the A-pillar trim, then disengage clips A.
3. Pull the A-pillar trim, then disengage clip B (1).
4. Pull the A-pillar trim upward, then disengage clip B from the A-pillar trim (2).
5. Disengage the tabs from the dashboard, then remove the A-pillar trim.



A6E7744W023

6. Pull clip B out, then rotate 45°.
7. Remove clip B from the grommet by pulling it outward.
8. Install in the reverse order of removal.

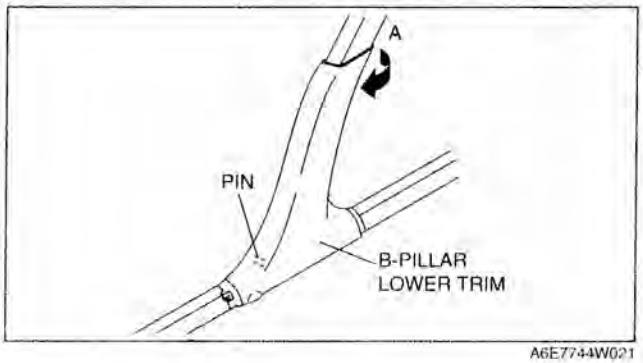


A6E7744W024

B-PILLAR LOWER TRIM REMOVAL/INSTALLATION

C6U091768220W01

1. Remove the front scuff plate.
2. Remove the rear scuff plate.
3. Pull the area marked A, then remove one side of the B-pillar lower trim.
4. Pull the B-pillar lower trim, then remove the pin from the body.
5. Remove the B-pillar lower trim.
6. Install in the reverse order of removal.

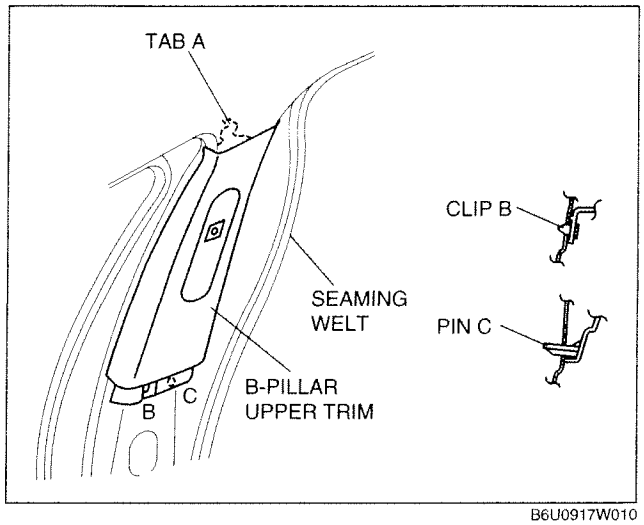


A6E7744W021

B-PILLAR UPPER TRIM REMOVAL/INSTALLATION

C6U091768210W01

1. Remove the upper anchor of the front seat belt.
2. Remove the B-pillar lower trim.
3. Partially peel back the seaming welt.
4. Pull the B-pillar upper trim outward, then disengage clip B and pin C from the body.
5. Disengage tab A from the body, then remove B-pillar upper trim.
6. Install in the reverse order of removal.

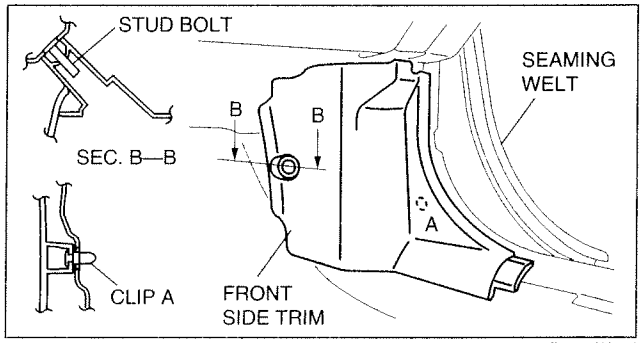


B6U0917W010

FRONT SIDE TRIM REMOVAL/INSTALLATION

C6U091768370W01

1. Remove the front scuff plate.
2. Partially peel back the seaming welt.
3. Pull the front side trim outward, disengage clip A and the stud bolt, then remove the front side trim.
4. Install in the reverse order of removal.

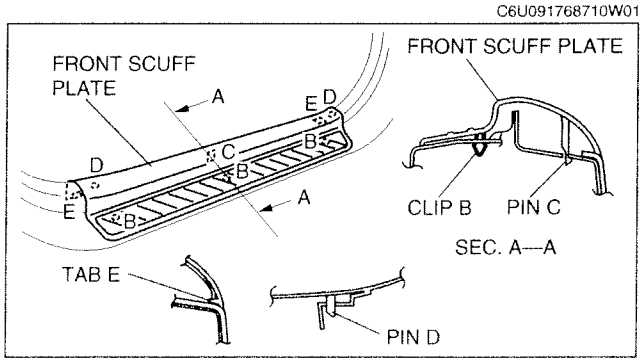


A6E7744W014

FRONT SCUFF PLATE REMOVAL/INSTALLATION

C6U091768710W01

1. Pull the front scuff plate upward, disengage clips B, pins C, D and tabs E from the body, and remove the front scuff plate.
2. Install in the reverse order of removal.

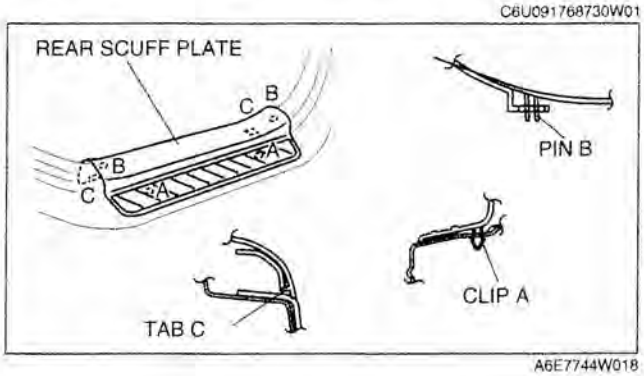


B6U0917W011

REAR SCUFF PLATE REMOVAL/INSTALLATION

1. Pull the rear scuff plate upward, then disengage clips A, pins B, and tabs C from the body, and remove the rear scuff plate.
2. Install in the reverse order of removal.

C6U091768730W01

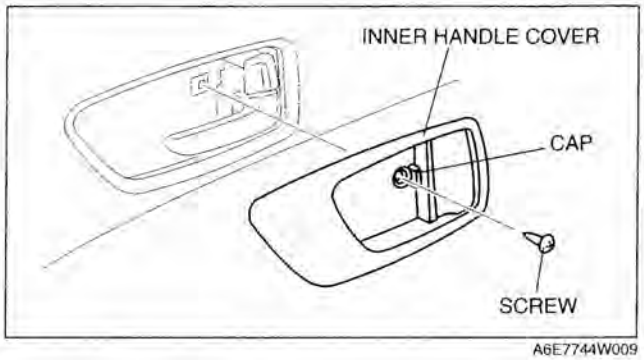


A6E7744W018

FRONT DOOR TRIM REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Open the cap using a small screwdriver, then remove the screw.
3. Remove the inner handle cover.
4. Remove the inner garnish.

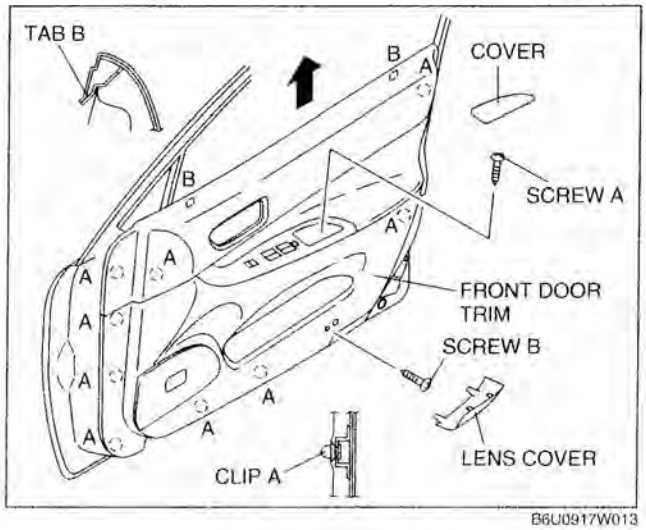
C6U091768420W01



A6E7744W009

09–17

5. Remove the cover, then remove screw A.
6. Remove the lens cover, then remove screw B.
7. Disengage clips A from the front door using a fastener remover.
8. Pull the front door trim upward, then disengage tabs B from the front door.
9. Disconnect the power door mirror switch connector and the power window main switch connector (driver's side) or power window subswitch connector (passenger's side).
10. Remove the courtesy light.
11. Remove the front door trim.
12. Remove the switch panel from the front door trim.
13. Install in the reverse order of removal.

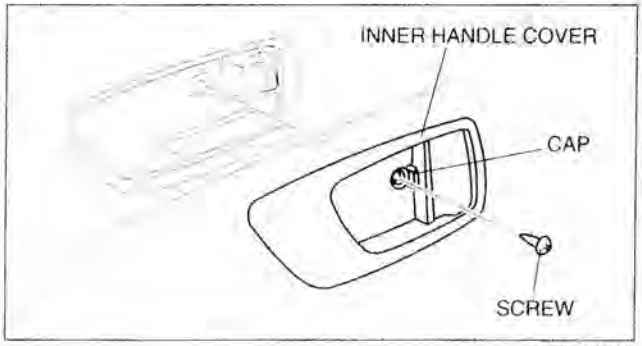


B6U0917W013

REAR DOOR TRIM REMOVAL/INSTALLATION

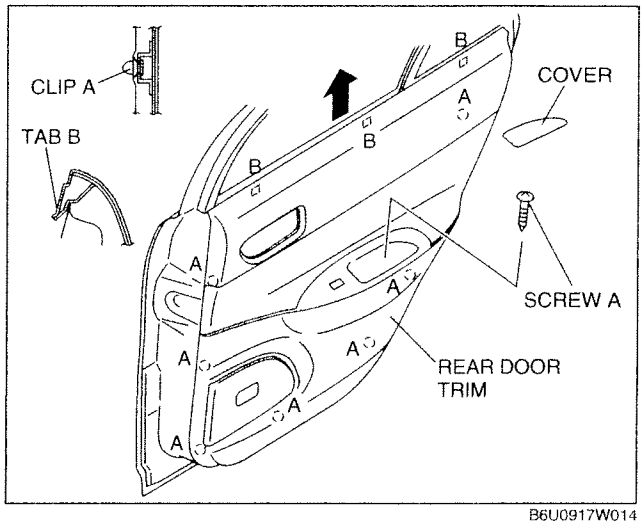
1. Disconnect the negative battery cable.
2. Open the cap using a small screwdriver, then remove the screw.
3. Remove the inner handle cover.
4. Remove the cover, then remove screw A.
5. Disengage clips A from the rear door using a fastener remover.

C6U091768520W01



A6E7744W009

6. Pull the rear door trim upward, then disengage tabs B from the rear door.
7. Disconnect the power window subswitch connector.
8. Remove the rear door trim.
9. Remove the switch panel from the rear door trim.
10. Install in the reverse order of removal.



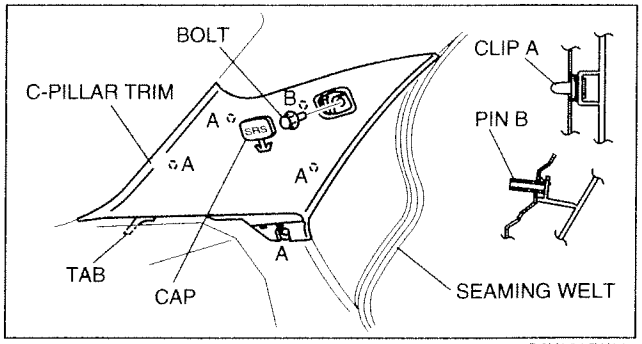
B6U0917W014

C-PILLAR TRIM REMOVAL/INSTALLATION

C6U091768240W01

4SD

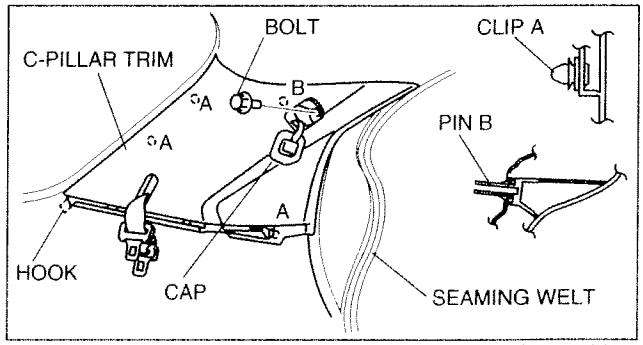
1. Remove the tire house trim.
2. Partially peel back the seaming welt.
3. Remove the cap using a fastener remover, and remove the bolt (with curtain air bag system).
4. Disengage clips A and pin B using a fastener remover.
5. Pull the C-pillar trim outward, then disengage the tab from the body.
6. Install in the reverse order of removal.



B6U0917W015

5HB

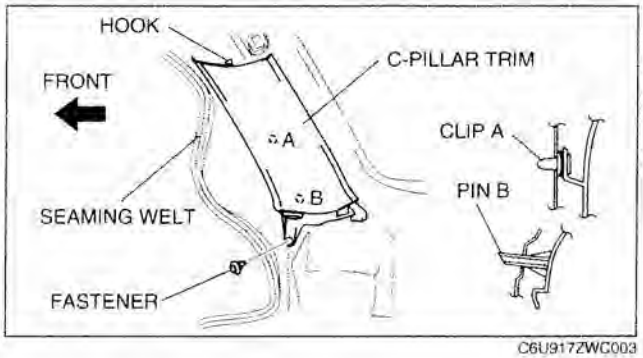
1. Remove the tire house trim.
2. Remove the trunk side upper trim
3. Turn the seaming welt over.
4. Remove the cap using a fastener remover the bolt. (with curtain air bag system)
5. Disengage clips A and pin B using a fastener remover.
6. Pull the C-pillar trim forward, then disengage the hook from the body.
7. Remove the rear center seat belt tongue from the C-pillar trim. (LH only)
8. Remove the C-pillar trim.
9. Install in the reverse order of removal.



C6U917ZWC002

WGN

1. Remove the trunk side upper trim.
2. Turn the seaming welt over.
3. Remove the fastener.
4. Pull the C-pillar trim forward, then disengage the clip A and pin B from the body.
5. Remove the hook from the body, then remove the C-pillar trim.
6. Install in the reverse order of removal.

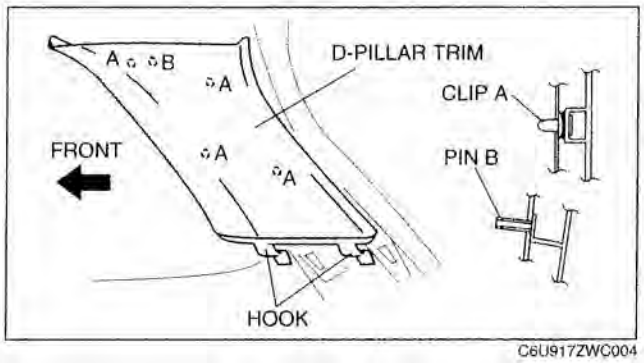


C6U917ZWC003

D-PILLAR TRIM REMOVAL/INSTALLATION [WGN]

C6U091768150W01

1. Remove the trunk side upper trim.
2. Pull the D-pillar trim forward, then disengage the clips A and pin B from the body.
3. Remove the hook from the body, then remove the D-pillar trim.
4. Install in the reverse order of removal.



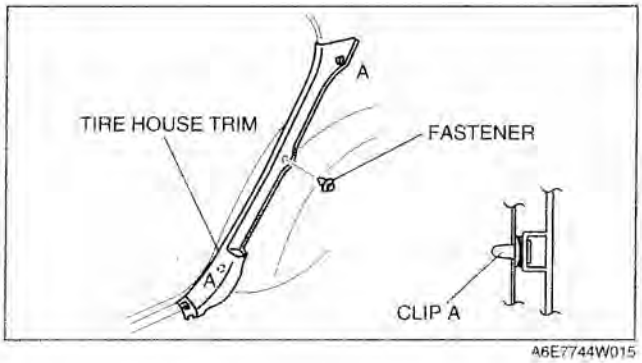
C6U917ZWC004

TIRE HOUSE TRIM REMOVAL/INSTALLATION

C6U091768760W01

4SD

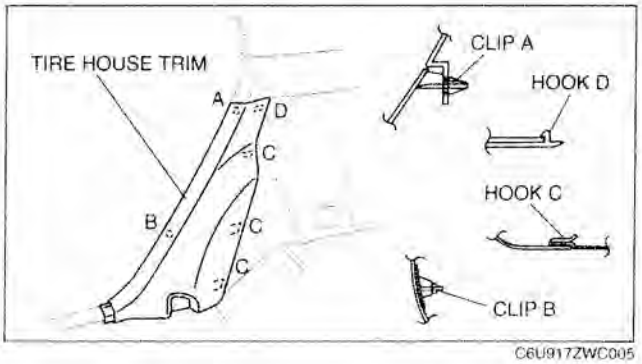
1. Remove the rear scuff plate.
2. Remove the rear side seat.
3. Remove the fastener.
4. Pull the tire house trim outward, disengage clips A from the body, and remove the tire house trim.
5. Install in the reverse order of removal.



A6E7744W015

5HB, WGN

1. Remove the rear scuff plate.
2. Pull the tire house trim toward you, then disengage clip B from the body and clip A, hooks C, D from the trunk side trim.
3. Remove the tire house trim.
4. Install in the reverse order of removal.

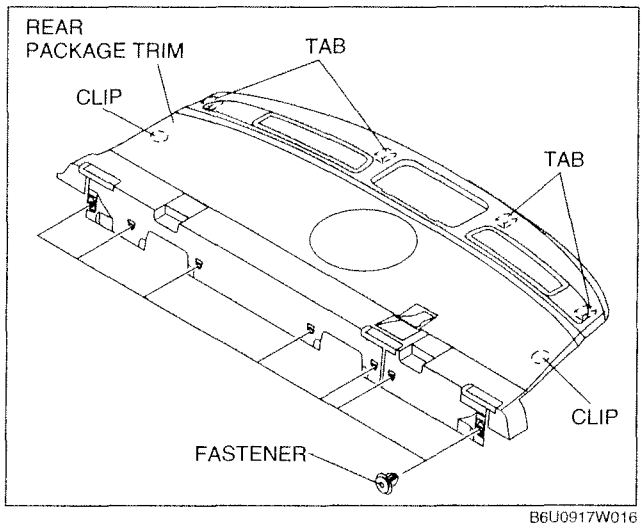


C6U917ZWC005

REAR PACKAGE TRIM REMOVAL/INSTALLATION [4SD]

C6U091768320W01

1. Remove the high-mount brake light.
2. Fold down the rear seat back.
3. Remove the fasteners.
4. Pull the rear package trim upward, then disengage the clips from the body.
5. Disengage the tabs, then remove the rear package trim.
6. Install in the reverse order of removal.



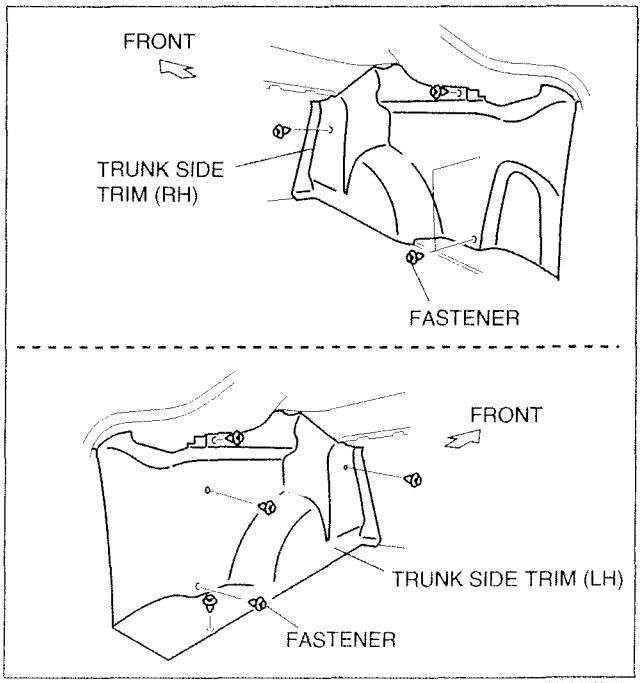
B6U0917W016

TRUNK SIDE TRIM REMOVAL/INSTALLATION

C6U091768860W01

4SD

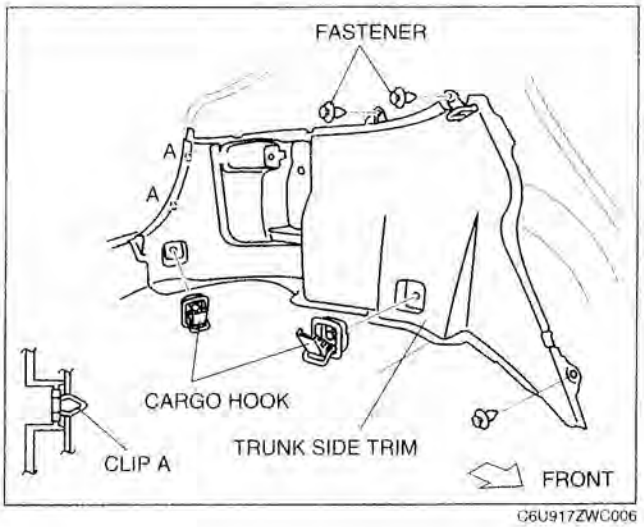
1. Remove the trunk end trim.
2. Remove the fasteners, then remove the trunk side trim.
3. Install in the reverse order of removal.



B6U0917W022

5HB

1. Remove the trunk end trim.
2. Remove the trunk side upper trim.
3. Remove the trunk side trim cover.
4. Remove the cargo hooks.
5. Remove the fasteners.
6. Pull the trunk side trim toward you, then disengage clips A from the body.
7. Install in the reverse order of removal.



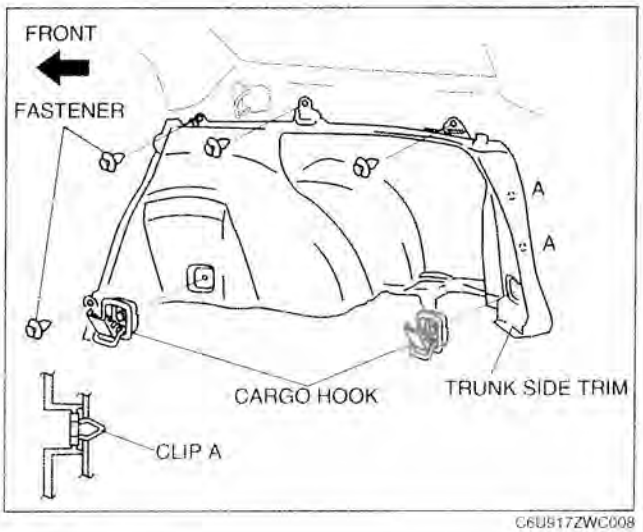
C6U917ZWC006

WGN

1. Remove the trunk end trim.
2. Remove the trunk side upper trim.
3. Remove the trunk side trim cover.

C6U917ZWC007

4. Remove the cargo hooks.
5. Remove the fasteners.
6. Pull the trunk side trim toward you, then disengage clips A from the body.
7. Install in the reverse order of removal.



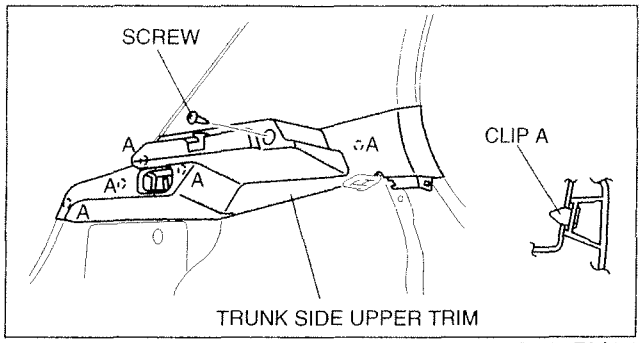
C6U917ZWC008

TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION [5HB, WGN]

C6U091768810W01

5HB

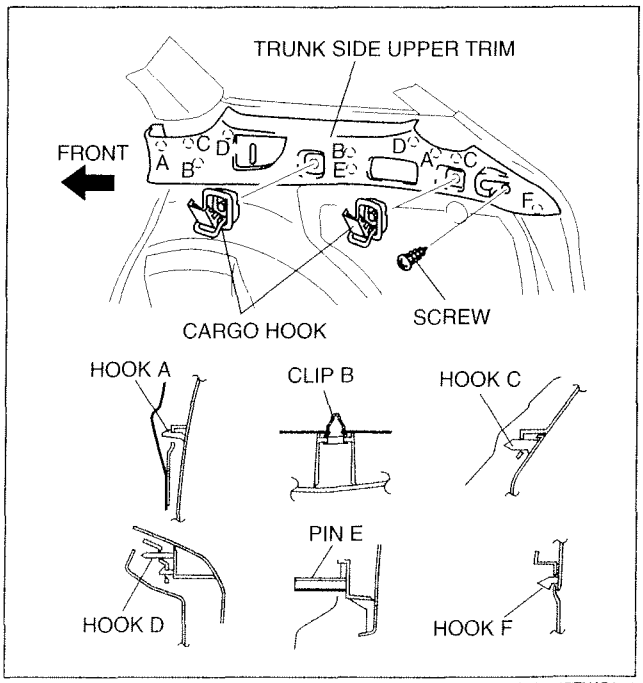
1. Disconnect the negative battery cable. (LH only)
2. Remove the tire house trim.
3. Remove the cargo compartment light. (LH only)
4. Remove the rear seat remote lever.
5. Remove the screw.
6. Pull the trunk side upper trim toward you, then disengage clips A from the body.
7. Install in the reverse order of removal.



C6U917ZWC009

WGN

1. Remove the tire house trim.
2. Remove the rear seat remote lever.
3. Remove the cargo hooks.
4. Remove the screw.
5. Pull the trunk side upper trim toward you, then remove the hooks A, C, D, F and clips B, pin E from the body.
6. Remove the trunk side upper trim.
7. Install in the reverse order of removal.



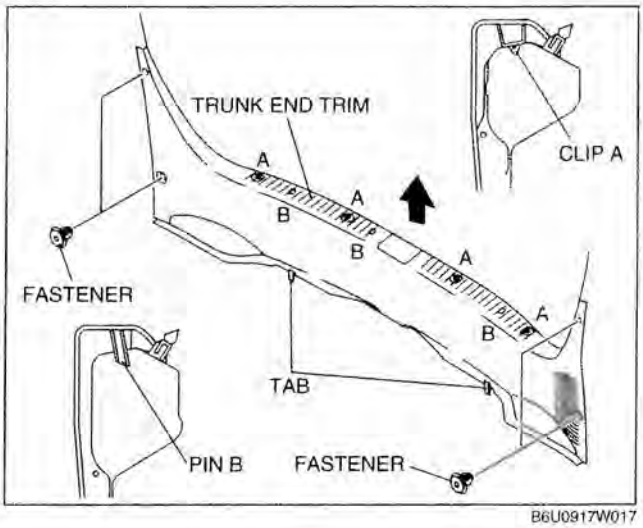
C6U917ZWC010

TRUNK END TRIM REMOVAL/INSTALLATION

C6U091768890W01

4SD

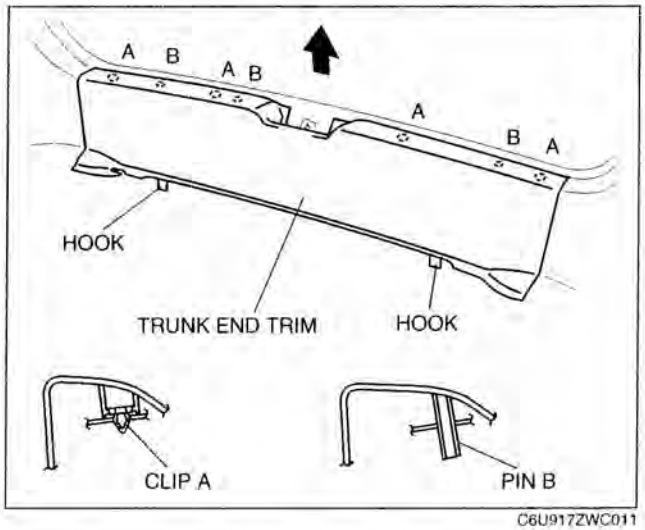
1. Remove the fasteners.
2. Pull the trunk end trim upward, then disengage clips A, pins B, and the tabs.
3. Remove the trunk end trim.
4. Install in the reverse order of removal.



B6U0917W017

5HB

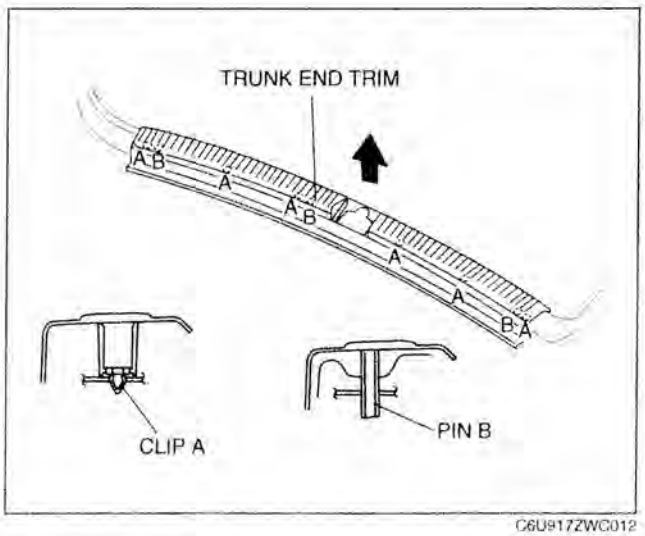
1. Pull the trunk end trim upward, then disengage clips A, pins B, and hooks.
2. Remove the trunk end trim.
3. Install in the reverse order of removal.



C6U917ZWC011

WGN

1. Pull the trunk end trim upward, then disengage clips A and pins B from the body.
2. Remove the trunk end trim.
3. Install in the reverse order of removal.

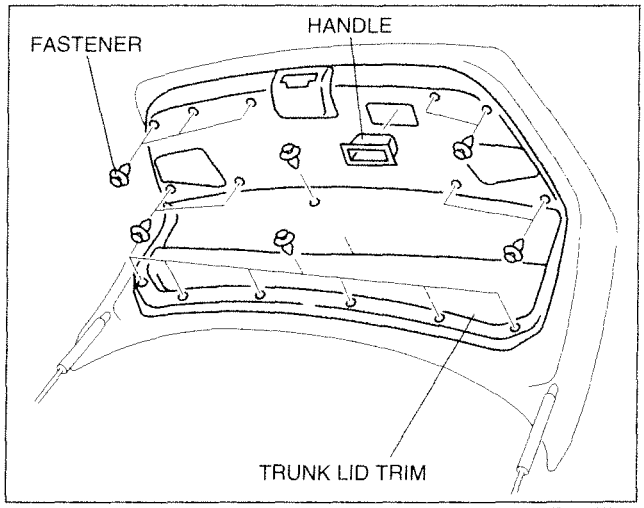


C6U917ZWC012

TRUNK LID TRIM REMOVAL/INSTALLATION [4SD]

1. Pull the handle outward, then remove the handle.
2. Remove the fasteners, then remove the trunk lid trim.
3. Install in the reverse order of removal.

C6U091758800W01



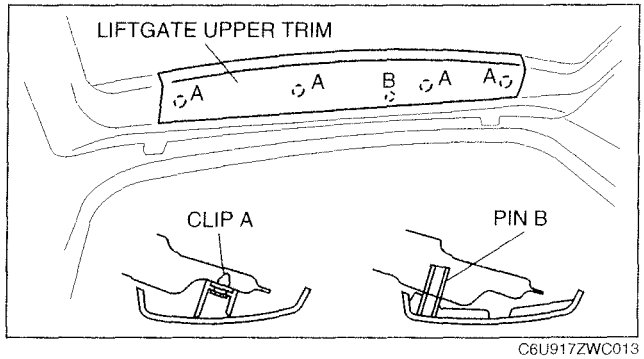
A6E7744W005

LIFTGATE UPPER TRIM REMOVAL/INSTALLATION [5HB, WGN]

C6U091768940W01

5HB

1. Pull the liftgate upper trim toward you, then disengage clips A, and pin B from the body.
2. Remove the liftgate upper trim.
3. Install in the reverse order of removal.



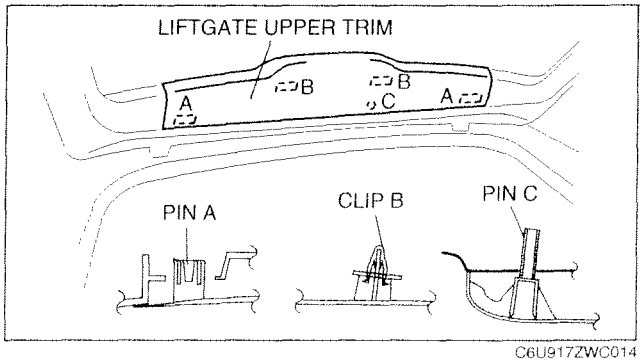
C6U917ZWC013

WGN
Without rear spoiler

Caution

- **Removing the liftgate upper trim by pulling on the middle section of the trim could damage the high-mount brake light. When removing the trim, be sure to pull on the side edges of the trim only.**

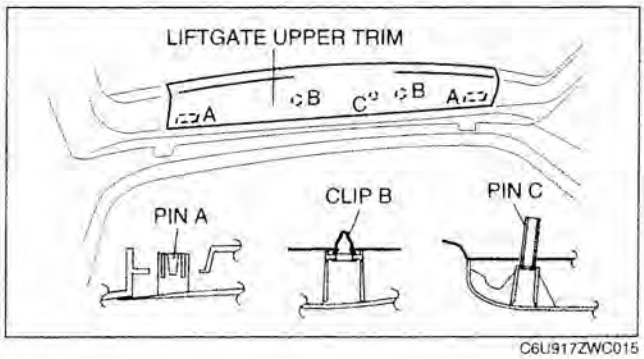
1. Pull the liftgate upper trim on the side edges towards you, then disengage pins A from the body.
2. Pull the middle section of the trim towards you and disengage clips B and pin C from the body.
3. Remove the liftgate upper trim.
4. Install in the reverse order of removal.



C6U917ZWC014

With rear spoiler

1. Pull the liftgate upper trim toward you, then disengage the pin A, C and clip B from the body.
2. Remove the liftgate upper trim.
3. Install in the reverse order of removal.



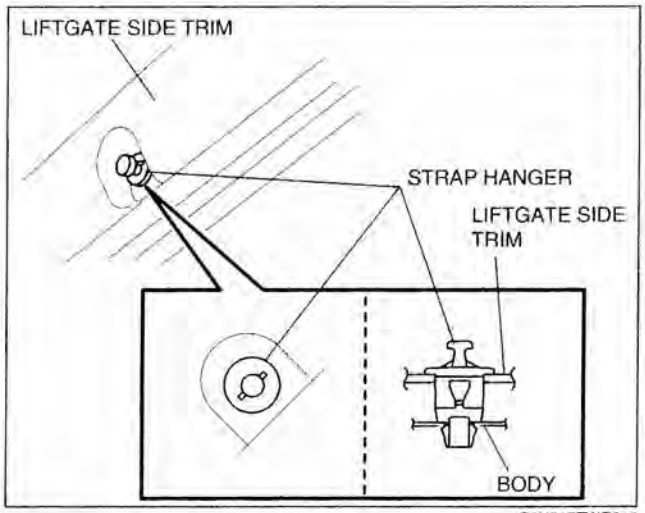
C6U917ZWC015

LIFTGATE SIDE TRIM REMOVAL/INSTALLATION [5HB, WGN]

C6U091768940W02

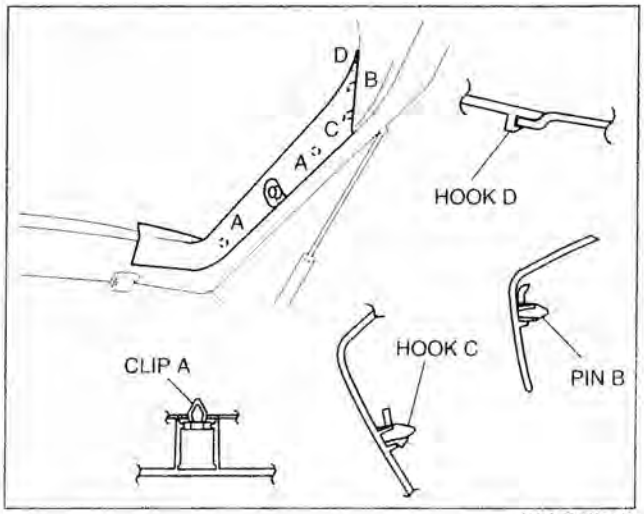
5HB

1. Remove the liftgate upper trim. (See09–17–18 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION [5HB, WGN])
2. Position the strap hanger as shown in the figure.



C6U917ZWC016

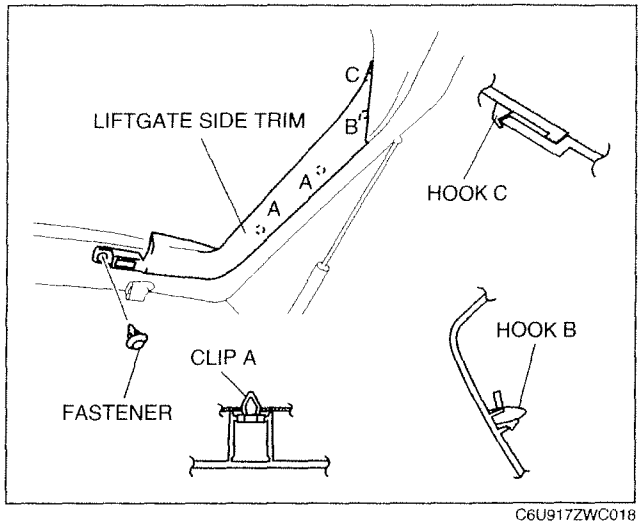
3. Pull the liftgate side trim toward you, then disengage clips A, pin B and the strap hanger from the body and pin B, hook C, D from the liftgate lower trim.
4. Remove the liftgate side trim.
5. Remove the hanger strap from the liftgate side trim.
6. Install in the reverse order of removal.



C6U917ZWC017

WGN

1. Remove the liftgate upper trim. (See09–17–18 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION [5HB, WGN])
2. Remove the fastener.
3. Pull the liftgate side trim toward you, then disengage the clips A and hook B, C from the body.
4. Remove the liftgate side trim.
5. Install in the reverse order of removal.



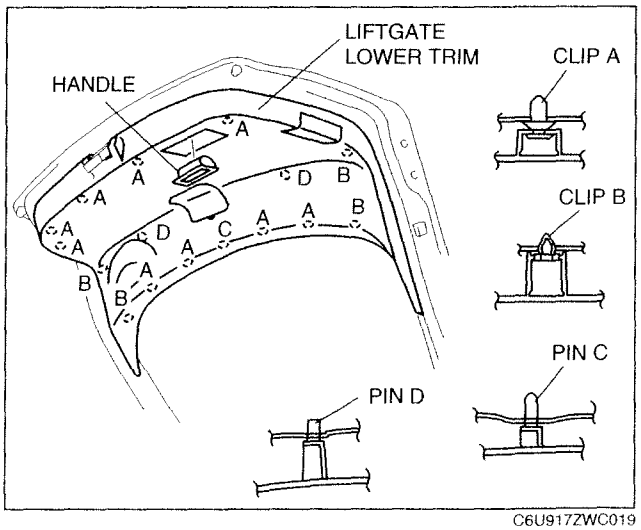
C6U917ZWC018

LIFTGATE LOWER TRIM REMOVAL/INSTALLATION [5HB, WGN]

C6U091768940W03

5HB

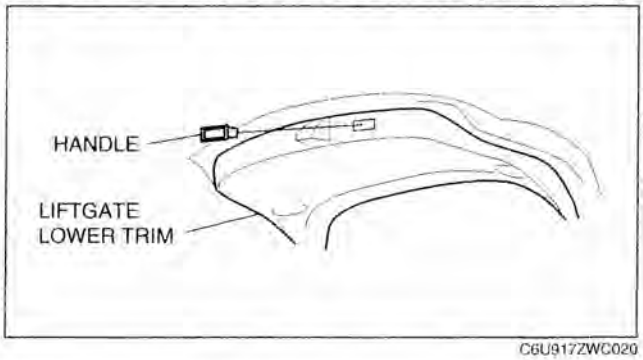
1. Remove the liftgate upper trim. (See09–17–18 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION [5HB, WGN])
2. Remove the liftgate side trim. (See09–17–19 LIFTGATE SIDE TRIM REMOVAL/INSTALLATION [5HB, WGN])
3. Pull the handle toward you, then remove the handle.
4. Pull the liftgate lower trim toward you, then disengage clips A, B and pins C, D from the body.
5. Remove the liftgate lower trim.
6. Install in the reverse order of removal.



C6U917ZWC019

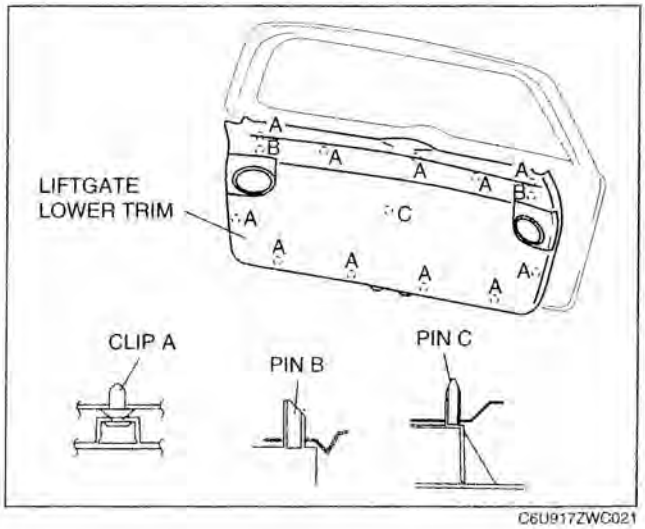
WGN

1. Remove the liftgate upper trim. (See09–17–18 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION [5HB, WGN])
2. Remove the liftgate side trim. (See09–17–19 LIFTGATE SIDE TRIM REMOVAL/INSTALLATION [5HB, WGN])
3. Pull the handle toward you, then remove it.



C6U917ZWC020

4. Pull the liftgate lower trim toward you, then disengage the clips A and pins B, C from the body.
5. Remove the liftgate lower trim.
6. Install in the reverse order of removal.



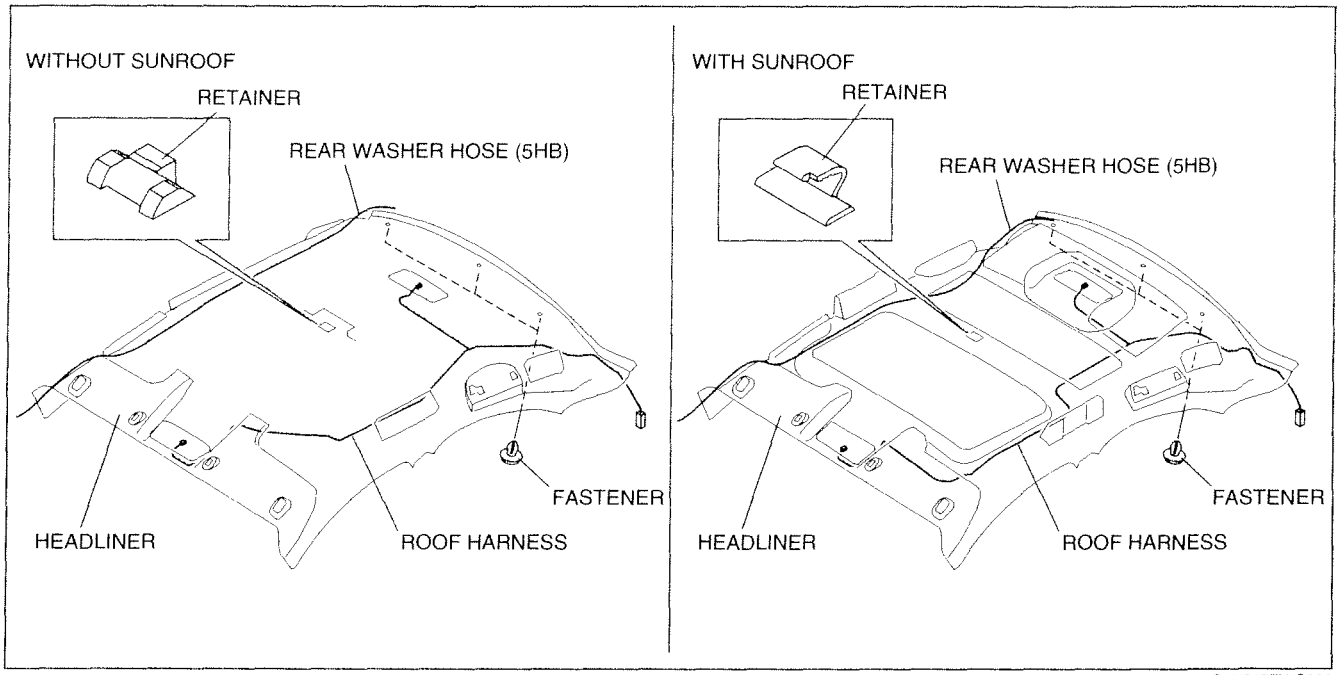
C6U917ZWC021

HEADLINER REMOVAL/INSTALLATION

C6U091768030W01

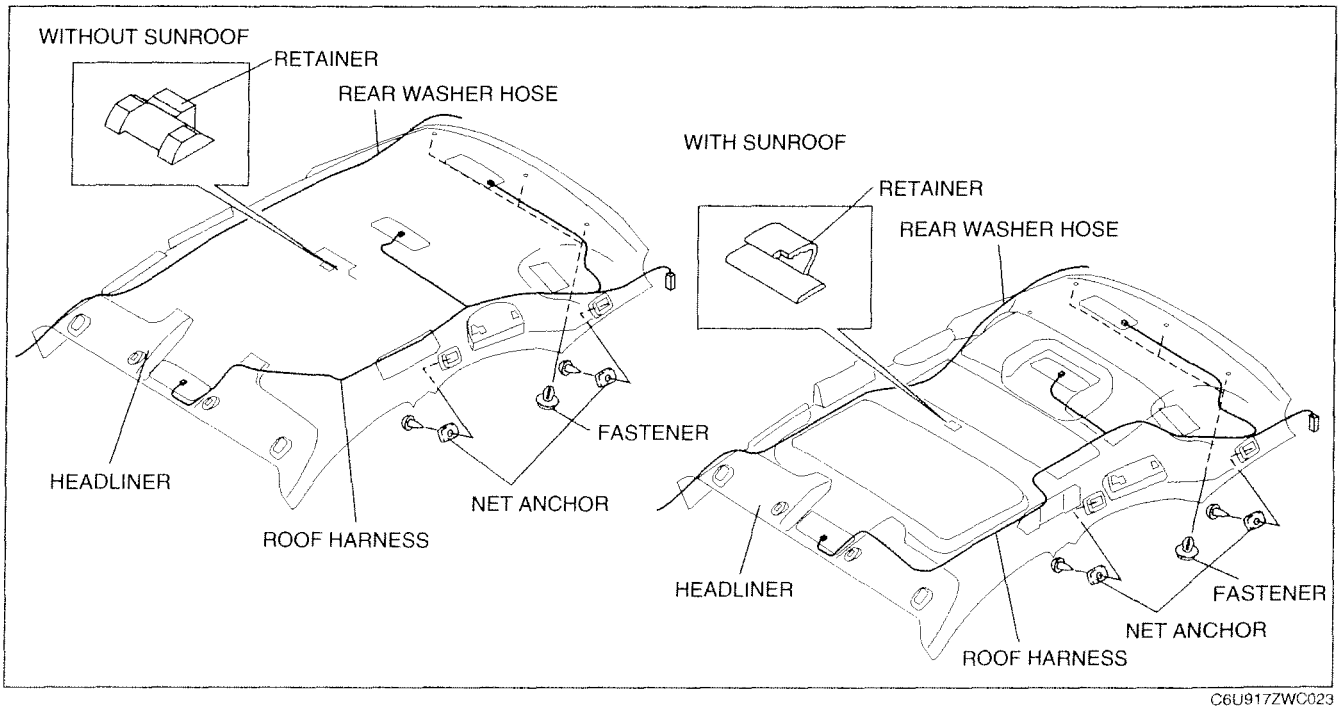
1. Disconnect the negative battery cable.
2. Partially peel back the seaming welt.
3. Remove the sunroof seaming welt. (vehicles with sunroof only)
4. Remove the A-pillar trims.
5. Remove the B-pillar upper trims.
6. Remove the C-pillar trims.
7. Remove the D-pillar trims. (WGN)
8. Remove the front and rear map lights. (See 09–18–21 FRONT MAP LIGHT REMOVAL/INSTALLATION.) (See 09–18–22 REAR MAP LIGHT REMOVAL/INSTALLATION.)
9. Remove the cargo compartment light. (See 09–18–23 CARGO COMPARTMENT LIGHT REMOVAL/INSTALLATION [5HB, WGN].)
10. Disconnect the auto-dimming mirror connector. (vehicles with auto-dimming mirror only)
11. Remove the sunvisors.
12. Remove the assist handle.
13. Remove the net anchor. (WGN)
14. Disconnect the roof harness connector, remove the clip, and remove the connector.
15. Disconnect the rear washer hose. (5HB, WGN)
16. Place the rear center seat belt bezel out of the way of the headliner. (WGN)
17. Remove the fasteners.
18. Remove the retainer holding the roof panel and remove the headliner.

4SD, 5HB



C6U917ZWC022

WGN



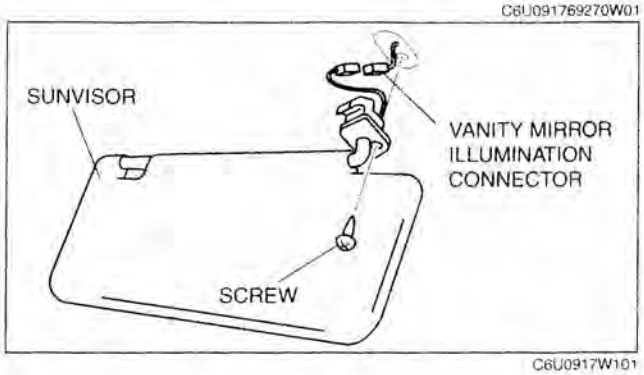
C6U917ZWC023

19. Take the headliner off from the passenger-side door opening. (4SD, 5HB)
20. Take the headliner off from the liftgate opening. (WGN)
21. Install in the reverse order of removal.

SUNVISOR REMOVAL/INSTALLATION

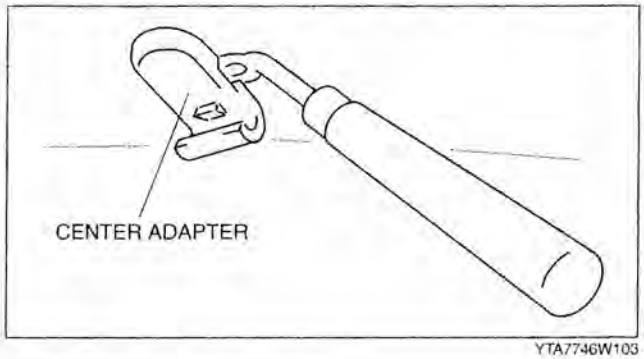
1. Remove the screw, then the sunvisor.
2. Disconnect the vanity mirror illumination connector.

C6U091769270W01



C6U0917W101

3. Disengage the center adapter (sunvisor stopper) from the body using a fastener remover.
4. Install in the reverse order of removal.

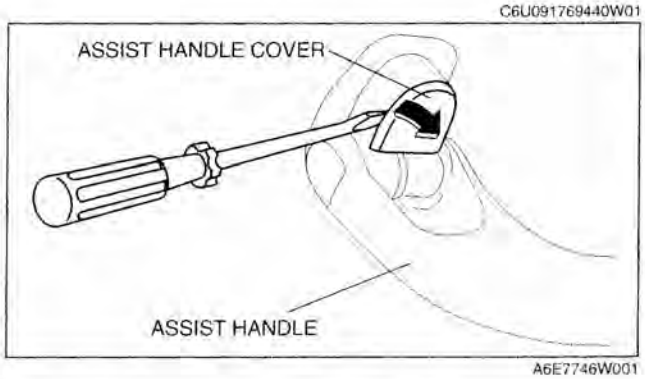


YTA7746W103

ASSIST HANDLE REMOVAL/INSTALLATION

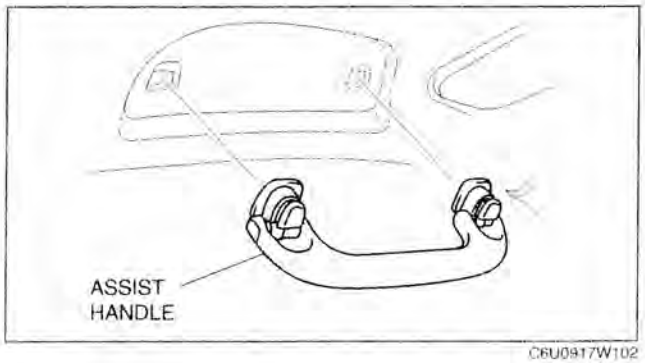
1. Insert a screwdriver into the assist handle notch and remove the assist handle cover.

C6U091769440W01



A6E7746W001

2. Pull the assist handle outward, then remove the assist handle.
3. Install in the reverse order of removal.



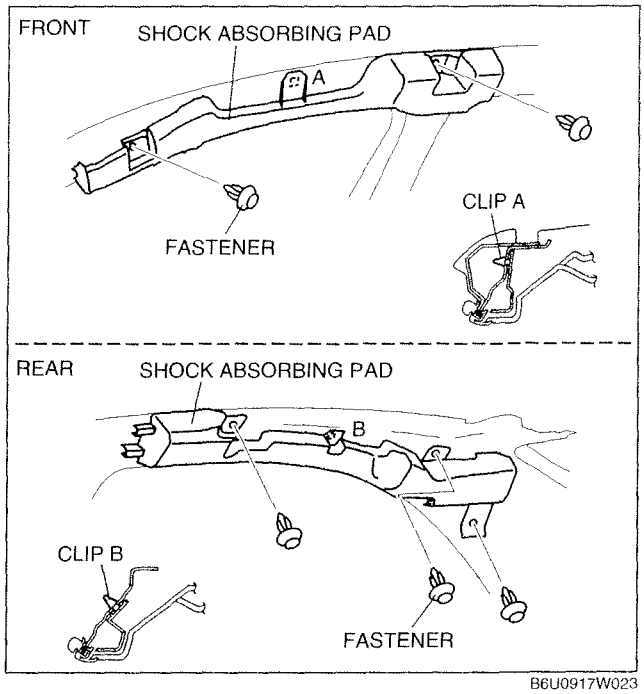
C6U0917W102

09-17

SHOCK ABSORBING PAD REMOVAL/INSTALLATION

C6U091768H10W01

1. Remove the headliner.
2. Remove the fasteners.
3. Pull the shock absorbing pad, then disengage the clip A or B from the body.
4. Install in the reverse order of removal.

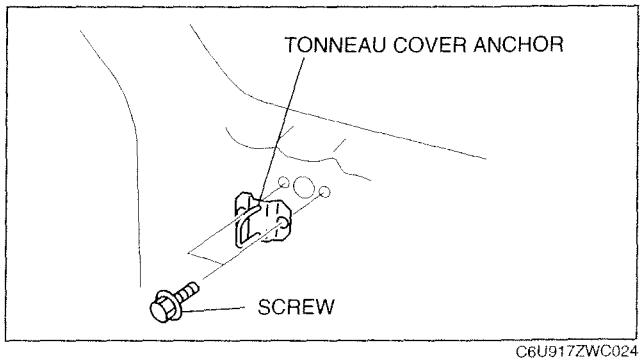


B6U0917W023

TONNEAU COVER ANCHOR REMOVAL/INSTALLATION [WGN]

C6U091768580W01

1. Remove the trunk side upper trim.
2. Remove the screws.
3. Remove the tonneau cover anchor.
4. Install in the reverse order of removal.

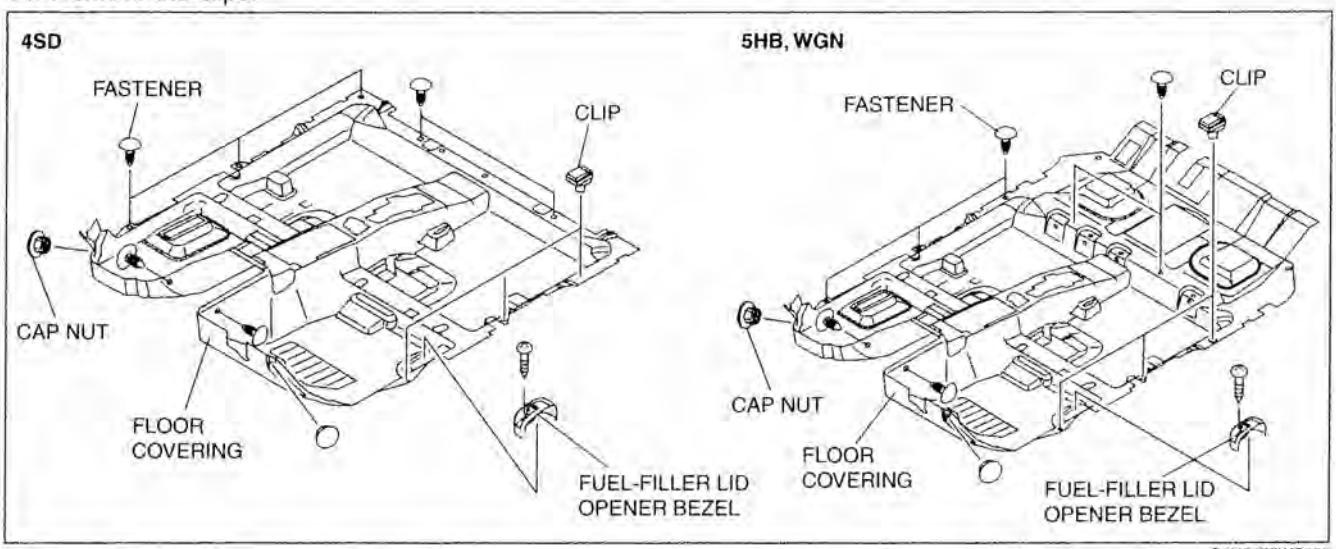


C6U917ZWC024

FLOOR COVERING REMOVAL/INSTALLATION

C6U091768670W01

1. Disconnect the negative battery cable.
2. Remove the front seats. (See 09–13–2 FRONT SEAT REMOVAL/INSTALLATION.)
3. Remove the rear seat.
4. Remove the front scuff plates.
5. Remove the rear scuff plates.
6. Remove the console.
7. Remove the front side trims.
8. Remove the B-pillar lower trims.
9. Remove the lower anchor of the front seat belt installation bolts.
10. Remove the tire house trim. (5HB, WGN)
11. Remove the fuel-filler lid opener bezel.
12. Remove the fasteners.
13. Remove the cap nuts.
14. Remove the clips.



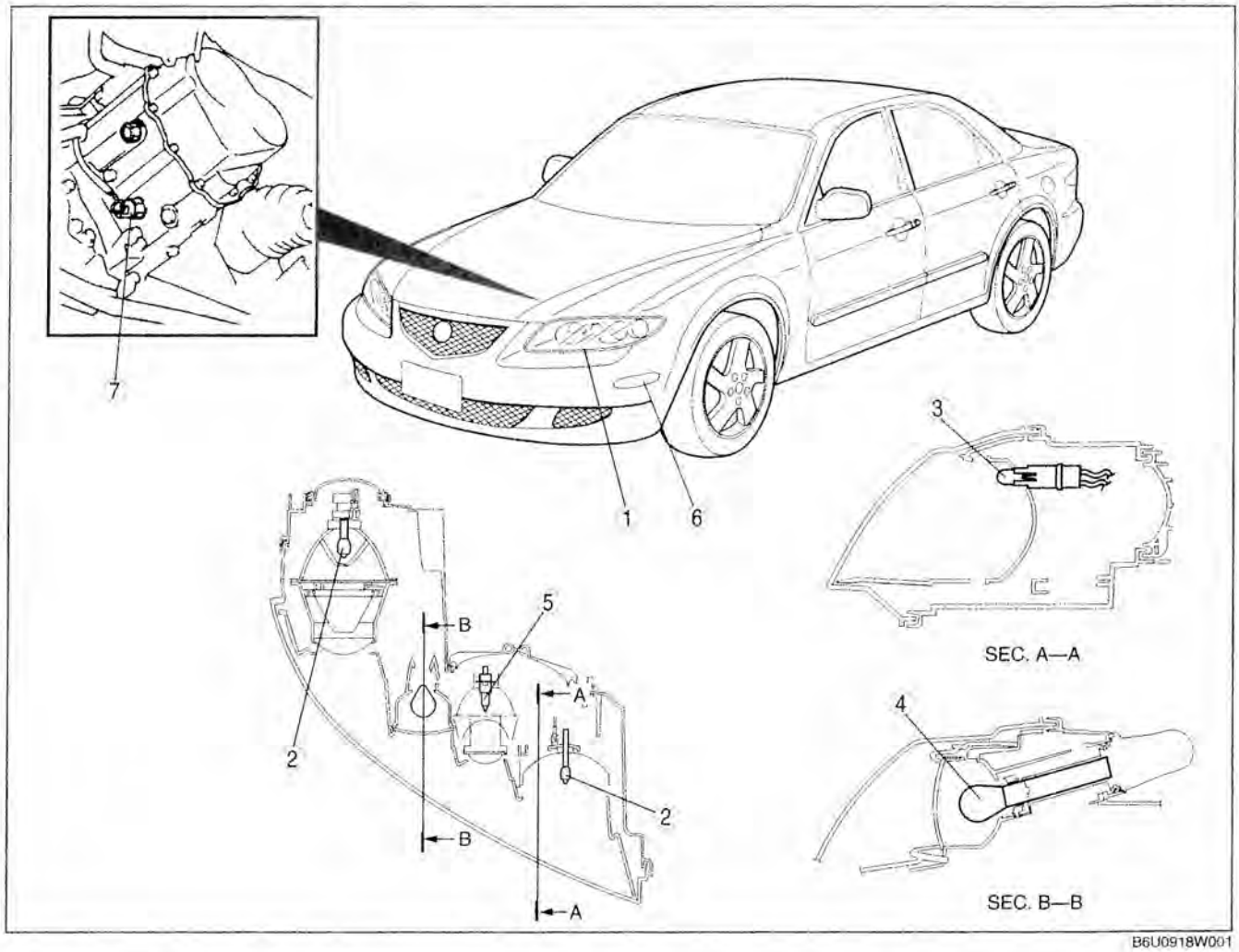
C6U917ZWC025

15. Take the floor covering off from the front passenger-side door opening.
16. Install in the reverse order of removal.

09–18 LIGHTING SYSTEMS

EXTERIOR LIGHTING SYSTEM LOCATION INDEX

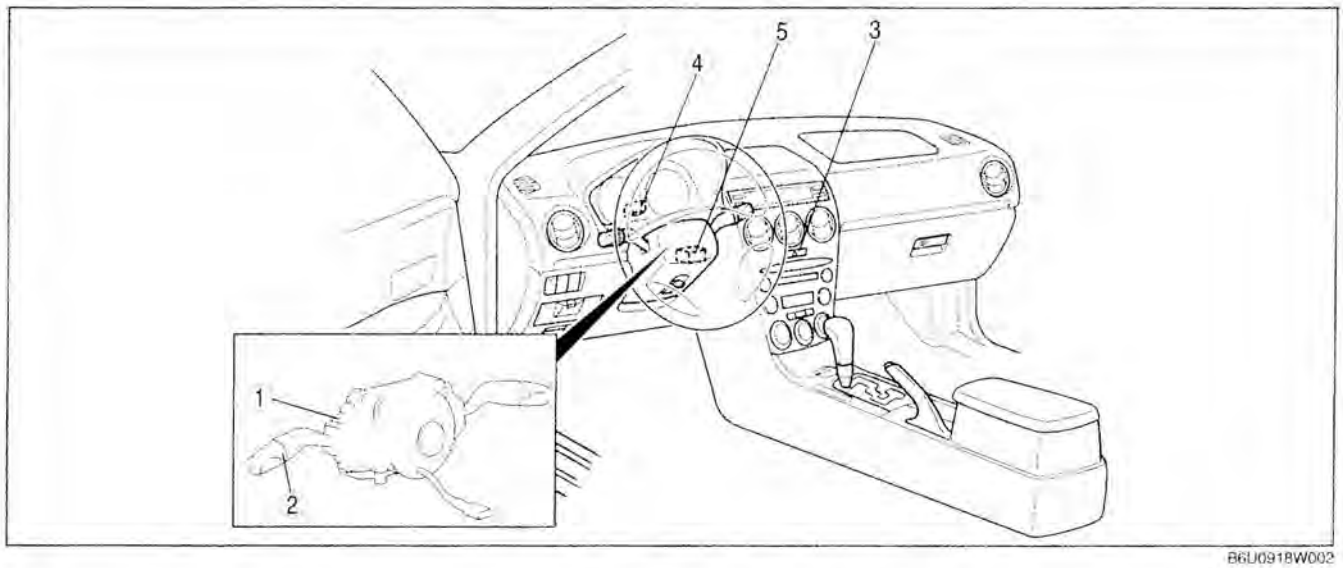
C6U091801052W01



B6U0918W001

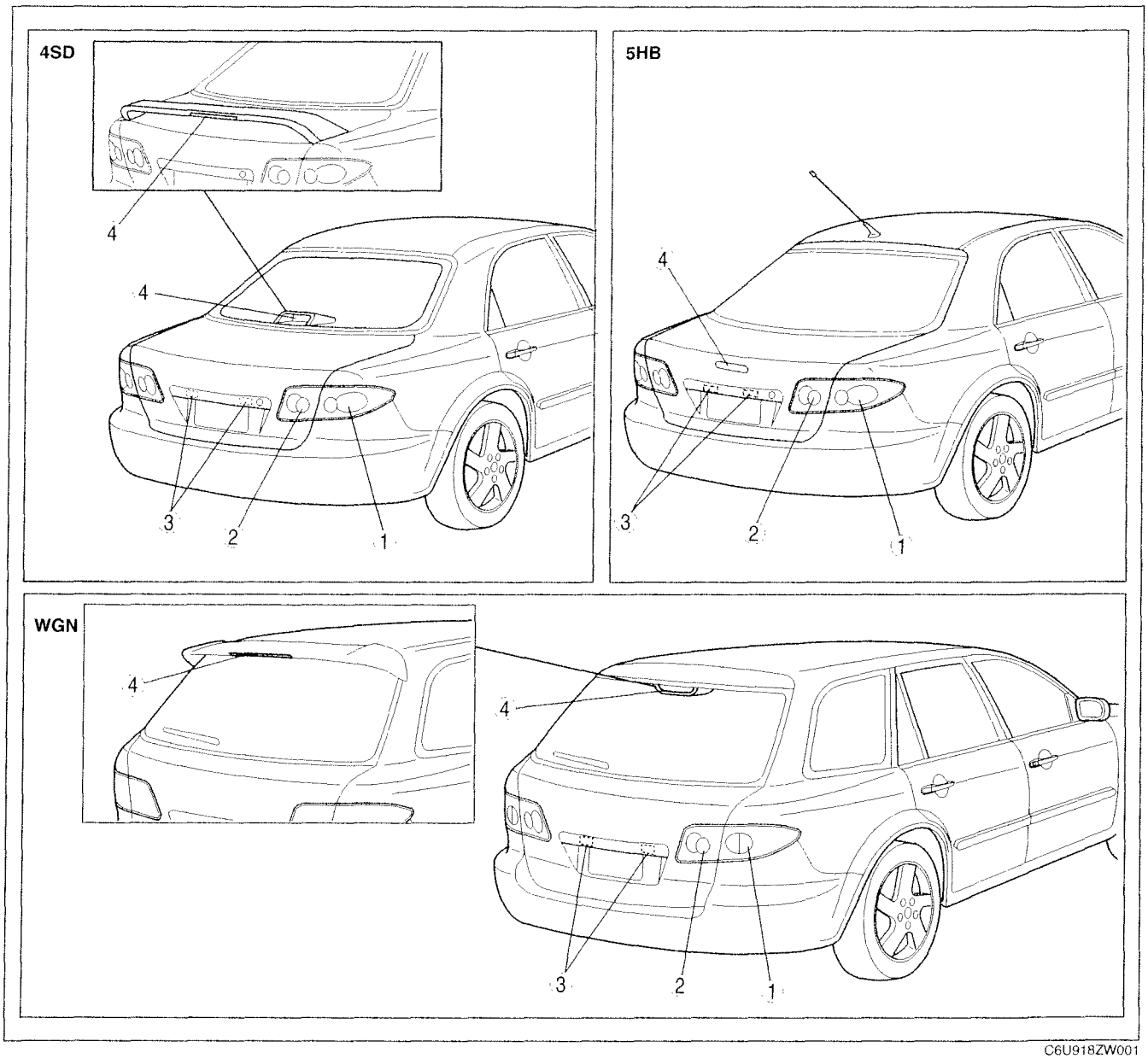
1	Front combination light (See 09–18–6 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.) (See 09–18–7 HEADLIGHT ADJUSTMENT.)
2	Headlight bulb (See 09–18–7 HEADLIGHT BULB REMOVAL/INSTALLATION.)
3	Parking light bulb (See 09–18–8 PARKING LIGHT BULB REMOVAL/INSTALLATION.)
4	Front turn light (See 09–18–8 FRONT TURN LIGHT REMOVAL/INSTALLATION.)

5	Front fog light bulb (See 09–18–10 FRONT FOG LIGHT BULB REMOVAL/INSTALLATION.) (See 09–18–9 FRONT FOG LIGHT ADJUSTMENT.)
6	Front side marker light (See 09–18–9 FRONT SIDE MARKER LIGHT REMOVAL/INSTALLATION.)
7	Back-up light switch (See 09–18–14 BACK-UP LIGHT SWITCH REMOVAL/INSTALLATION.) (See 09–18–14 BACK-UP LIGHT SWITCH INSPECTION.)



B6U0918W002

1	Combination switch (See 09–18–14 COMBINATION SWITCH REMOVAL/INSTALLATION.) (See 09–18–15 COMBINATION SWITCH DISASSEMBLY/ASSEMBLY.)
2	Light switch (See 09–18–15 LIGHT SWITCH REMOVAL/INSTALLATION.) (See 09–18–15 LIGHT SWITCH INSPECTION.) (See 09–18–16 FRONT FOG LIGHT SWITCH INSPECTION.)
3	Hazard warning switch (See 09–18–16 HAZARD WARNING SWITCH INSPECTION.)
4	Flasher control module (See 09–18–16 FLASHER CONTROL MODULE REMOVAL/INSTALLATION.) (See 09–18–17 FLASHER CONTROL MODULE INSPECTION.)
5	Auto light-off control module (See 09–18–18 AUTO LIGHT-OFF CONTROL MODULE REMOVAL/INSTALLATION.) (See 09–18–19 DRL AND AUTO LIGHT-OFF SYSTEM WIRING DIAGRAM.) (See 09–18–20 AUTO LIGHT-OFF CONTROL MODULE INSPECTION.)



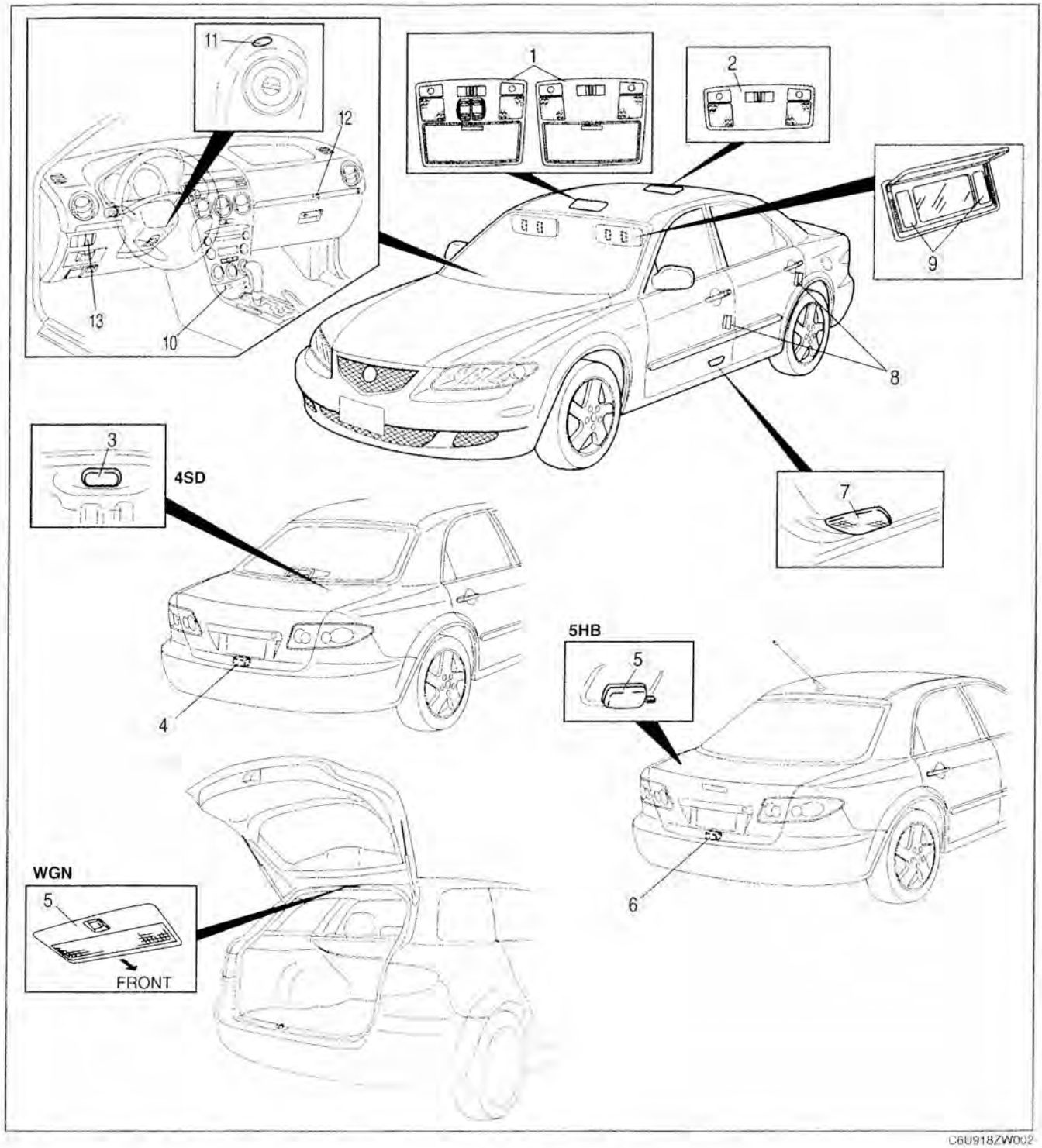
C6U918ZW001

1	Rear combination light (See 09–18–10 REAR COMBINATION LIGHT REMOVAL/INSTALLATION.)
2	Inboard combination light (See 09–18–10 INBOARD COMBINATION LIGHT REMOVAL/INSTALLATION.)

3	License plate light (See 09–18–13 LICENSE PLATE LIGHT REMOVAL/INSTALLATION.)
4	High-mount brake light (See 09–18–11 HIGH-MOUNT BRAKE LIGHT REMOVAL/INSTALLATION [4SD].) (See 09–18–12 HIGH-MOUNT BRAKE LIGHT REMOVAL/INSTALLATION [5HB, WGN].)

INTERIOR LIGHTING SYSTEM LOCATION INDEX

C6U091801052W02



C6U918ZW002

1	Front map light (See 09–18–21 FRONT MAP LIGHT REMOVAL/INSTALLATION.) (See 09–18–22 FRONT MAP LIGHT INSPECTION.)
2	Rear map light (See 09–18–22 REAR MAP LIGHT REMOVAL/INSTALLATION.) (See 09–18–23 REAR MAP LIGHT INSPECTION.)

3	Trunk compartment light (See 09–18–27 TRUNK COMPARTMENT LIGHT BULB REMOVAL/INSTALLATION [4SD].)
4	Trunk compartment light switch (See 09–18–28 TRUNK COMPARTMENT LIGHT SWITCH INSPECTION [4SD].)
5	Cargo compartment light (See 09–18–23 CARGO COMPARTMENT LIGHT REMOVAL/INSTALLATION [5HB, WGN].)

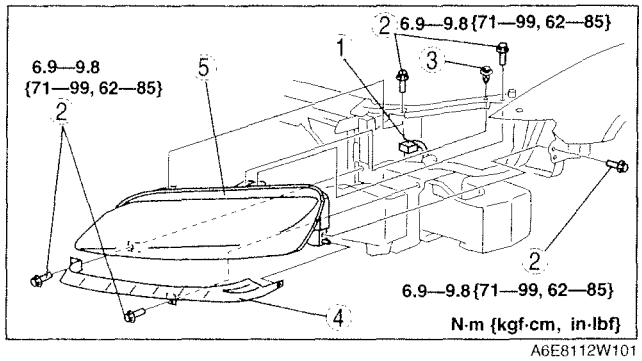
6	Cargo compartment light switch (See 09–18–25 CARGO COMPARTMENT LIGHT SWITCH INSPECTION [5HB, WGN].)
7	Courtesy light (See 09–18–27 COURTESY LIGHT BULB REMOVAL/INSTALLATION.)
8	Door switch (See 09–18–30 DOOR SWITCH REMOVAL/INSTALLATION.) (See 09–18–31 DOOR SWITCH INSPECTION.)
9	Vanity mirror illumination (See 09–18–26 VANITY MIRROR ILLUMINATION BULB REMOVAL/INSTALLATION.) (See 09–18–26 VANITY MIRROR ILLUMINATION INSPECTION.)
10	Ashtray illumination (See 09–18–25 ASHTRAY ILLUMINATION BULB REMOVAL/INSTALLATION.)
11	Ignition key illumination (See 09–18–25 IGNITION KEY ILLUMINATION BULB REMOVAL/INSTALLATION.)
12	Glove compartment light (See 09–18–27 GLOVE COMPARTMENT LIGHT BULB REMOVAL/INSTALLATION.)
13	Panel light control switch (See 09–18–28 PANEL LIGHT CONTROL SWITCH REMOVAL/INSTALLATION.) (See 09–18–29 PANEL LIGHT CONTROL SWITCH INSPECTION.)

FRONT COMBINATION LIGHT REMOVAL/INSTALLATION

C6U091851060W01

1. Disconnect the negative battery cable.
2. Remove the front bumper. (See 09–10–7 FRONT BUMPER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Connector
2	Bolt
3	Fastener
4	Cover
5	Front combination light



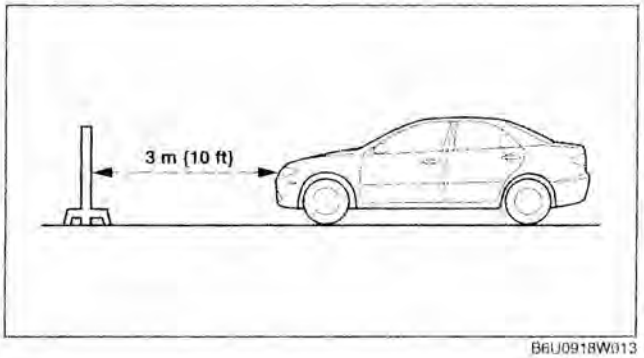
A6E8112W101

4. Install in the reverse order of removal.
5. Adjust the headlight aiming. (See 09–18–7 HEADLIGHT ADJUSTMENT.)
6. Adjust the front fog light aiming. (See 09–18–9 FRONT FOG LIGHT ADJUSTMENT.)

HEADLIGHT ADJUSTMENT

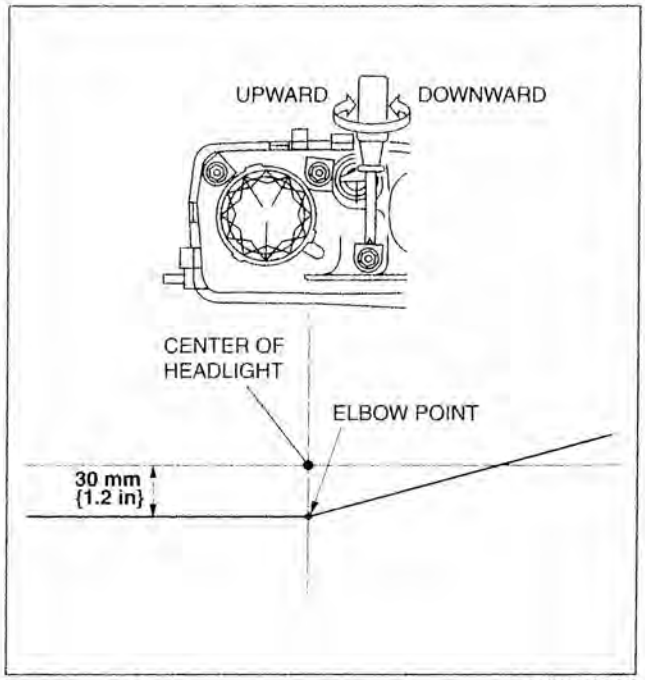
C6U091851030W01

1. Adjust the tire air pressure to the specification.
2. Position the unloaded vehicle on a flat, level surface.
3. Seat one person in the driver's seat.
4. Position the vehicle straight ahead and perpendicular to a wall.
5. Set the headlights **3 m {10 ft}** from the white screen.
6. While adjusting one headlight, mask the other.
7. Start the engine to charge the battery.
8. Turn on the lower-beam headlight.



B6U0918W013

9. Adjust the headlights as shown in the figure.



B6U0918W012

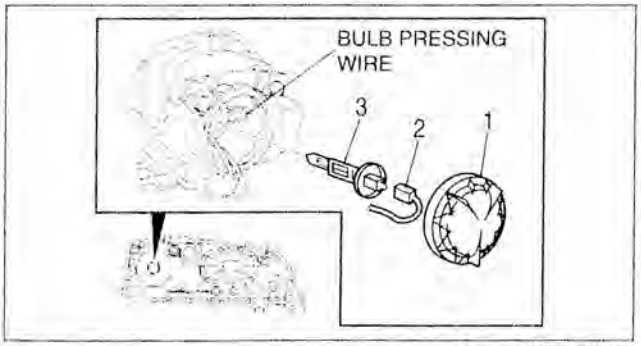
HEADLIGHT BULB REMOVAL/INSTALLATION

C6U091851030W02

Low-beam

1. Disconnect the negative battery cable.
2. Disconnect the front combination light. (See 09–18–6 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Cover
2	Connector
3	Headlight bulb (See 09–18–8 Headlight bulb removal note)



A6EB112W105

Caution

- **A halogen bulb generates extremely high heat when it is used. If the surface of the bulb is soiled, excessive heat will build up and the light's life will be shortened. When replacing the bulb, hold the metal flange, not the glass.**

4. Install in the reverse order of removal.

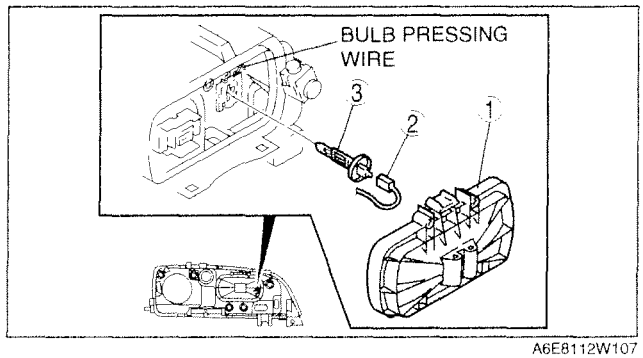
Headlight bulb removal note

1. Release the bulb pressing wire to remove the headlight bulb.

High-beam

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Cover
2	Connector
3	Headlight bulb (See 09–18–8 Headlight bulb removal note)



A6E8112W107

Caution

- **A halogen bulb generates extremely high heat when it is used. If the surface of the bulb is soiled, excessive heat will build up and the light's life will be shortened. When replacing the bulb, hold the metal flange, not the glass.**

3. Install in the reverse order of removal.

Headlight bulb removal note

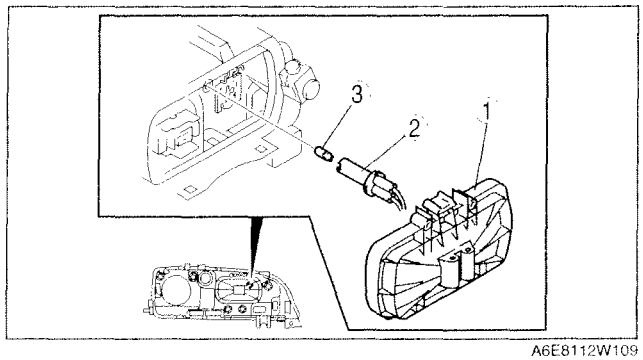
1. Release the bulb pressing wire to remove the headlight bulb.

PARKING LIGHT BULB REMOVAL/INSTALLATION

C6U091851040W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Cover
2	Socket
3	Parking light bulb



A6E8112W109

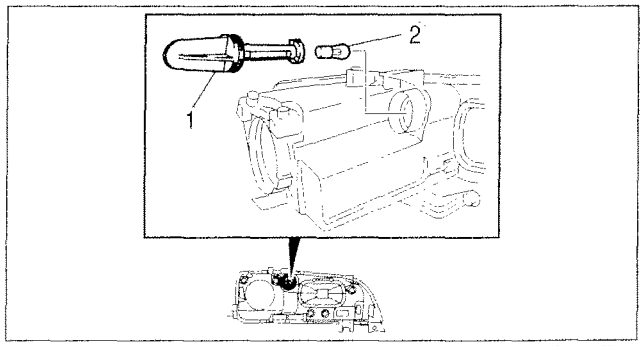
3. Install in the reverse order of removal.

FRONT TURN LIGHT REMOVAL/INSTALLATION

C6U091851050W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Socket
2	Front turn light bulb



A6E8112W110

3. Install in the reverse order of removal.

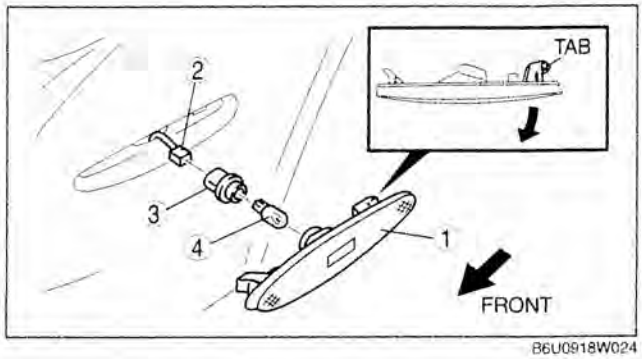
FRONT SIDE MARKER LIGHT REMOVAL/INSTALLATION

C6U091851120W01

1. Disconnect the negative battery cable.
2. Partially peel off the mud guard.
3. Remove in the order indicated in the table.

1	Front side marker light (See 09–18–9 Front Side Marker Light Removal Note)
2	Connector
3	Socket
4	Front side marker light bulb

4. Install in the reverse order of removal.



B6U0918W024

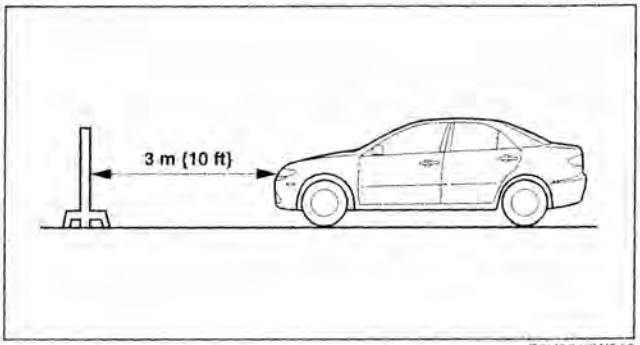
Front Side Marker Light Removal Note

1. Insert your hand into where the mud guard is bent back and push the tab to remove the front side marker light.
2. Pull the front side marker light toward you to remove it.

FRONT FOG LIGHT ADJUSTMENT

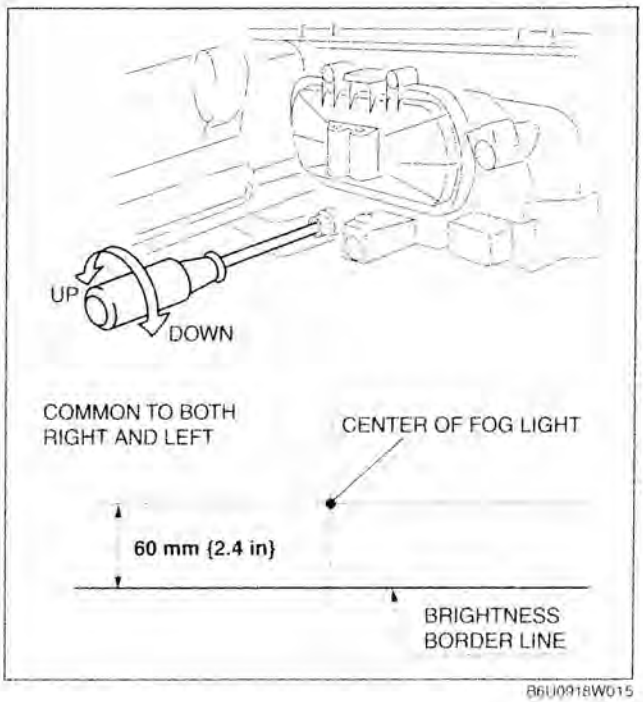
C6U091851680W01

1. Adjust the tire air pressure to the specification.
2. Position the unloaded vehicle on a flat, level surface.
3. Seat one person in the driver's seat.
4. Position the vehicle **3 m {10 ft}** in front of a white screen.
5. While adjusting one fog light, mask the other.
6. Start the engine to charge the battery.
7. Turn the front fog light on.



B6U0918W013

8. Adjust the front fog light as shown in the figure.



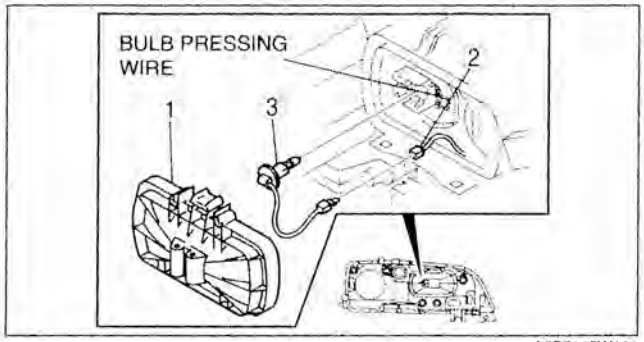
B6U0918W015

FRONT FOG LIGHT BULB REMOVAL/INSTALLATION

C6U091851680W02

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Cover
2	Connector
3	Front fog light bulb (See 09–18–10 Front Fog Light Bulb Removal Note)



A6E8112W111

Caution

- **A halogen bulb generates extremely high heat when it is used. If the surface of the bulb is soiled, excessive heat will build up and the light's life will be shortened. When replacing the bulb, hold the metal flange, not the glass.**

3. Install in the reverse order of removal.

Front Fog Light Bulb Removal Note

1. Release the bulb pressing wire to remove the front fog light bulb.

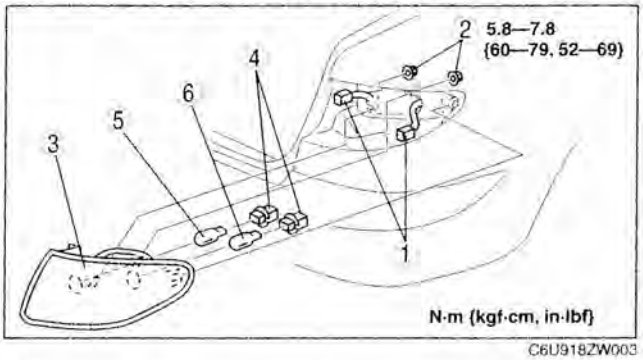
REAR COMBINATION LIGHT REMOVAL/INSTALLATION

C6U091851150W02

1. Disconnect the negative battery cable.
2. Remove the trunk side trim. (See 09–17–14 TRUNK SIDE TRIM REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Connector
2	Nut
3	Rear combination light
4	Socket
5	Rear turn light bulb
6	Brake light/taillight bulb

4. Install in the reverse order of removal.



C6U918ZW003

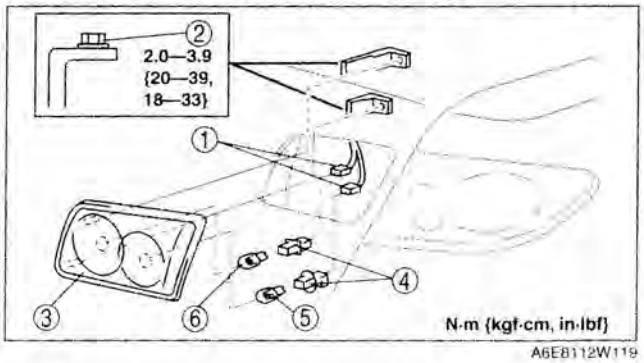
INBOARD COMBINATION LIGHT REMOVAL/INSTALLATION

C6U091851380W01

1. Disconnect the negative battery cable.
2. Remove the trunk lid trim. (See 09–17–18 TRUNK LID TRIM REMOVAL/INSTALLATION [4SD].)
3. Remove in the order indicated in the table.

1	Connector
2	Nut
3	Inboard combination light (See 09–18–11 Inboard Combination Light Installation Note)
4	Socket
5	Back-up light bulb
6	Taillight bulb

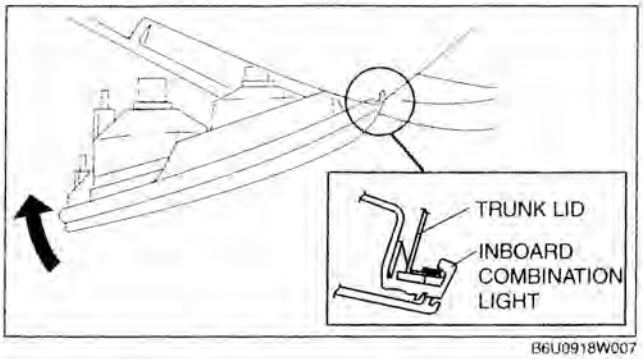
4. Install in the reverse order of removal.



A6E8112W119

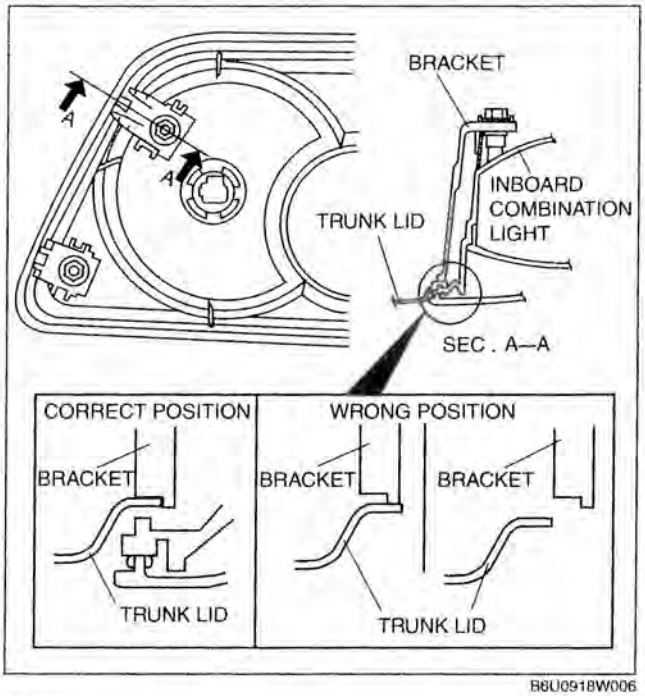
Inboard Combination Light Installation Note

1. Insert the inboard combination light into the trunk lid as shown in the figure, then pivot it inward and fix in place.



B6U0918W007

2. Place the bracket in the proper position as shown in the figure and press it to the trunk lid to attach.



B6U0918W006

HIGH-MOUNT BRAKE LIGHT REMOVAL/INSTALLATION [4SD]

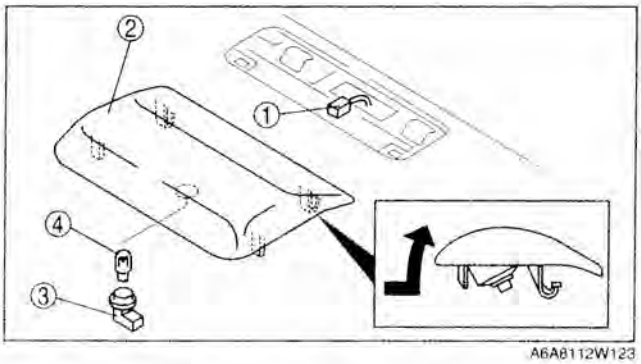
C6U091851580W01

In-Vehicle-Type

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Connector
2	High-mount brake light
3	Socket
4	High-mount brake light bulb

3. Install in the reverse order of removal.



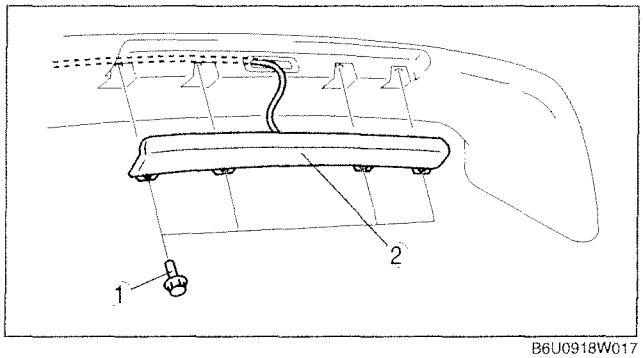
A6A8112W123

Rear Spoiler Type

1. Disconnect the negative battery cable.
2. Remove the rear spoiler. (See 09–16–6 REAR SPOILER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Bolt
2	High-mount brake light (See 09–18–12 High-mount brake light removal note)

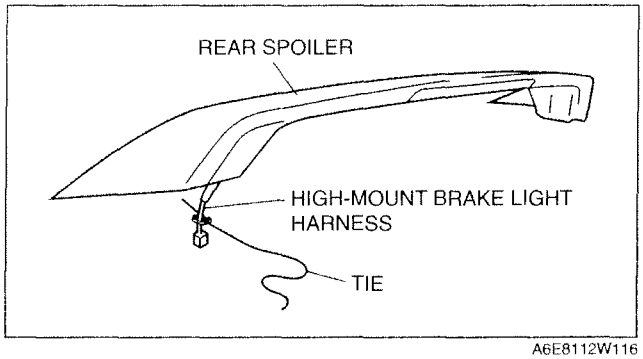
4. Install in the reverse order of removal.



B6U0918W017

High-mount brake light removal note

1. Tie a string to the end of the high-mount brake light connector beforehand so that the connector can be passed easily through the rear spoiler during installation.



A6E8112W116

HIGH-MOUNT BRAKE LIGHT REMOVAL/INSTALLATION [5HB, WGN]

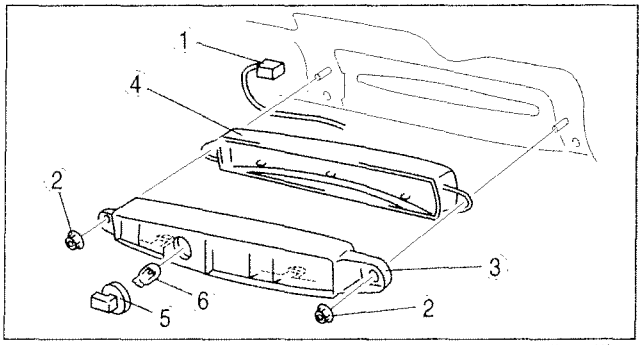
C6U091851580W02

5HB

1. Disconnect the negative battery cable.
2. Remove the liftgate lower trim. (See 09–17–20 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION [5HB, WGN])
3. Remove in the order indicated in the table.

1	Connector
2	Nut
3	High-mount brake light
4	Lens
5	Socket
6	High-mount brake light bulb

4. Install in the reverse order of removal.



A6E8112W142

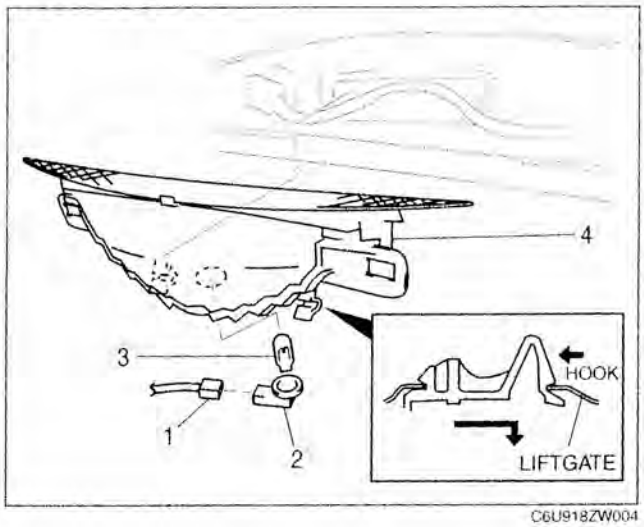
WGN

In-vehicle-type

1. Disconnect the negative battery cable.
2. Remove the liftgate upper trim.
3. Remove in the order indicated in the table.

1	Connector
2	Socket
3	High-mount brake light bulb
4	High-mount brake light

4. Install in the reverse order of removal.



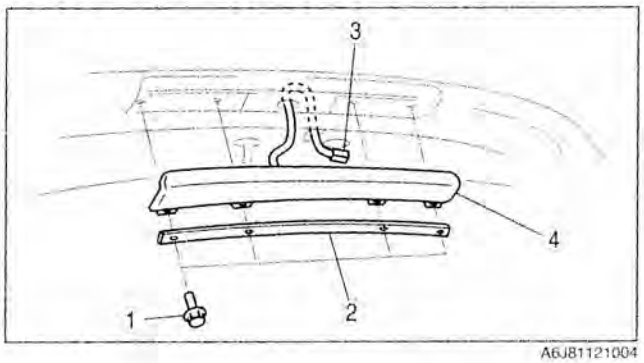
C6U918ZW004

Rear spoiler type

1. Disconnect the negative battery cable.
2. Remove the rear spoiler.
3. Remove in the order indicated in the table.

1	Bolt
2	Cover
3	Connector
4	High-mount brake light

4. Install in the reverse order of removal.



A6J81121004

09-18

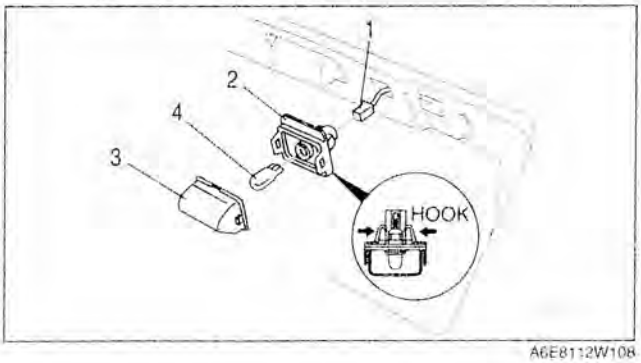
LICENSE PLATE LIGHT REMOVAL/INSTALLATION

C6U091851270W01

1. Disconnect the negative battery cable.
2. Remove the rear finisher. (See 09-16-5 REAR FINISHER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Connector
2	License plate light
3	Lens
4	License plate light bulb

4. Install in the reverse order of removal.



A6E8112W108

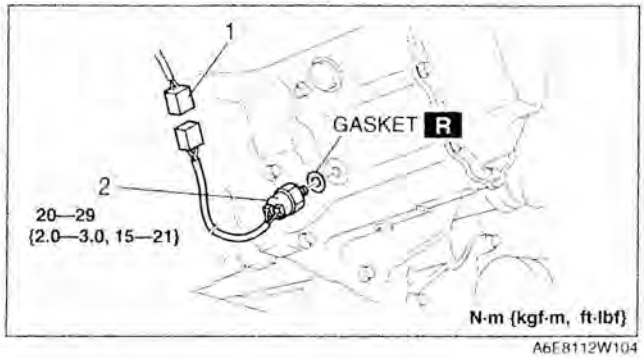
BACK-UP LIGHT SWITCH REMOVAL/INSTALLATION

C6U091817640W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Connector
2	Back-up light switch

3. Install in the reverse order of removal.



A6E8112W104

BACK-UP LIGHT SWITCH INSPECTION

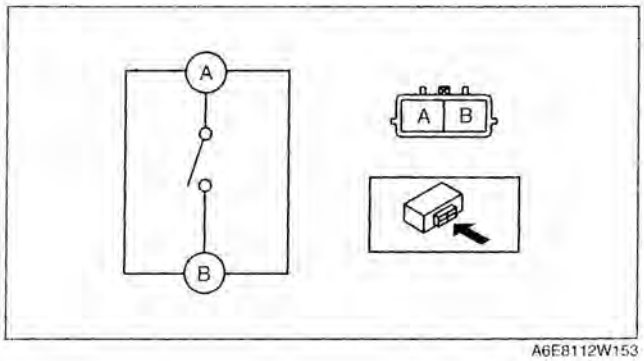
C6U091817640W02

1. Disconnect the back-up light switch connector.
2. Inspect for continuity between the back-up light switch terminals using an ohmmeter.
   - If not as specified, replace the back-up light switch.

○—○ : Continuity

Shift lever position	Terminal	
	A	B
Reverse	○	○
Other		

A6E8112W128



A6E8112W153

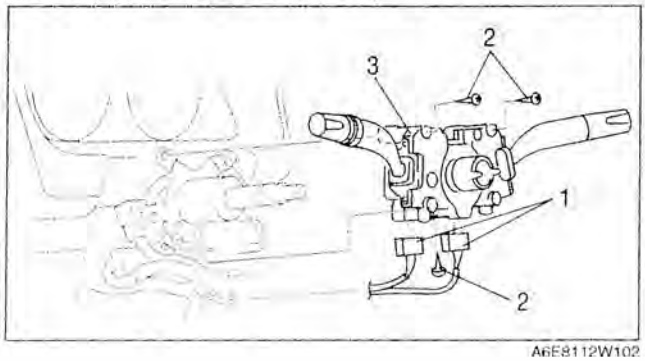
COMBINATION SWITCH REMOVAL/INSTALLATION

C6U091866120W01

1. Disconnect the negative battery cable.
2. Remove the driver-side air bag module. (See 08–10–6 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
3. Remove the steering wheel. (See 06–12–6 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
4. Remove the column cover.
5. Remove the clock spring. (See 08–10–10 CLOCK SPRING REMOVAL/INSTALLATION.)
6. Remove in the order indicated in the table.

1	Connector
2	Screw
3	Combination switch

7. Install in the reverse order of removal.



A6E8112W102

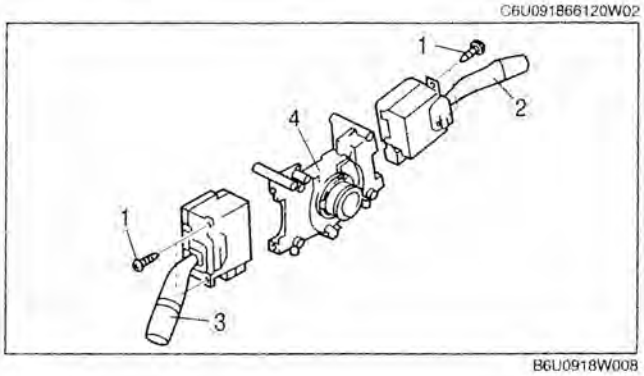
COMBINATION SWITCH DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

1	Screw
2	Wiper and washer switch
3	Light switch
4	Body

2. Assemble in the reverse order of disassembly.

C6U091866120W02



B6U0918W008

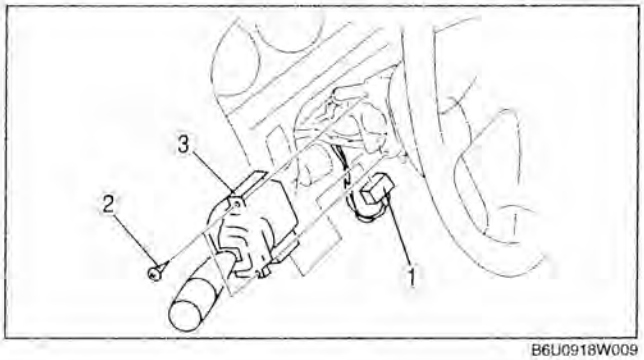
LIGHT SWITCH REMOVAL/INSTALLATION

C6U091866121W01

1. Disconnect the negative battery cable.
2. Remove the column cover.
3. Remove in the order indicated in the table.

1	Connector
2	Screw
3	Light switch

4. Install in the reverse order of removal.



B6U0918W009

09–18

LIGHT SWITCH INSPECTION

C6U091866121W02

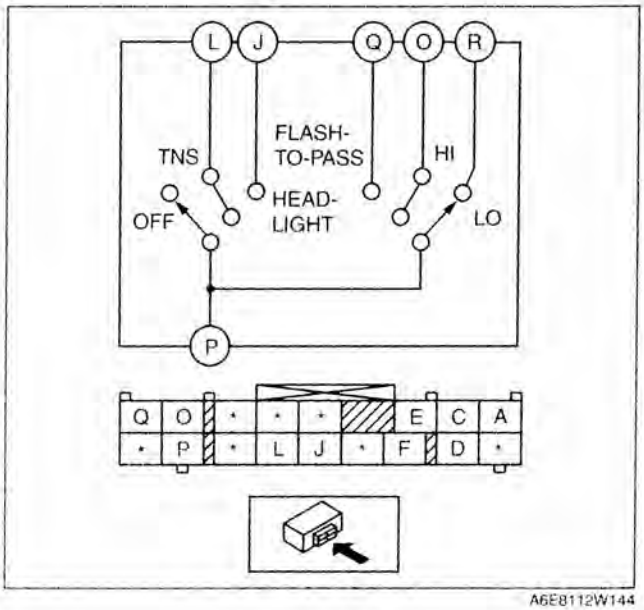
1. Remove the light switch. (See 09–18–15 LIGHT SWITCH REMOVAL/INSTALLATION.)
2. Inspect for continuity between the light switch terminals using an ohmmeter.
   - If not as specified, replace the light switch.

Headlight switch

O—O : Continuity

Switch position			Terminal					
Light	Dimmer	Flash-to-pass	J	L	P	Q	O	R
OFF	-	Off						
		On			O	O	O	
TNS	-	Off		O	O			
		On		O	O	O	O	
Head-light	LO	Off	O	O	O			O
		On	O	O	O	O	O	
	HI	-	O	O	O		O	

B6U0918W210



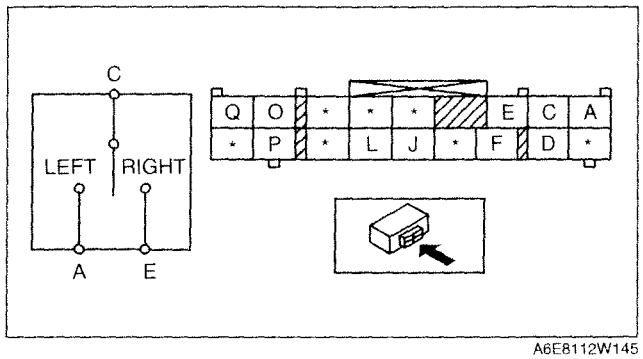
A6E8112W144

Turn switch

○—○ : Continuity

Switch position	Terminal		
	C	A	E
Left	○——	——○	
Off			
Right	○——		——○

A6E8112W130



A6E8112W145

HAZARD WARNING SWITCH INSPECTION

C6U091866401W01

1. Inspect the hazard warning switch. (See 07–40–18 CLIMATE CONTROL UNIT INSPECTION.)

FRONT FOG LIGHT SWITCH INSPECTION

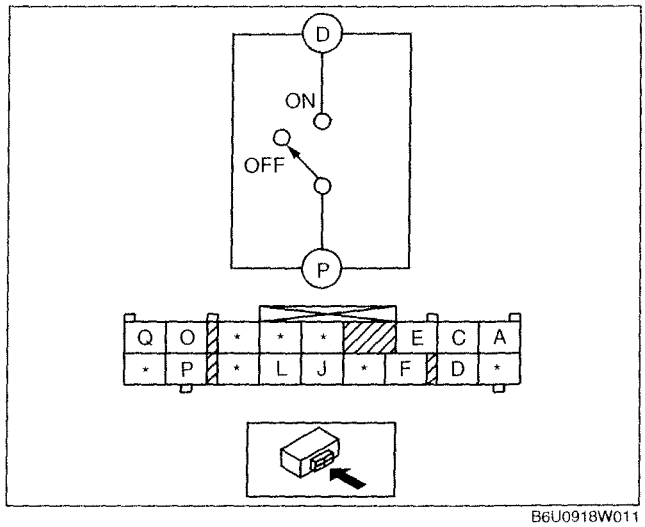
C6U091866402W01

1. Remove the light switch. (See 09–18–15 LIGHT SWITCH REMOVAL/INSTALLATION.)
2. Inspect for continuity between the light switch terminals using an ohmmeter.
   - If not as specified, replace the light switch.

○—○ : Continuity

Switch position	Terminal	
	D	P
Off		
On	○——	——○

B6U0918W600



B6U0918W011

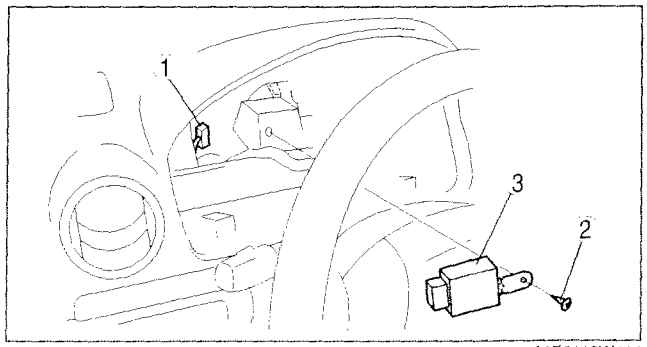
FLASHER CONTROL MODULE REMOVAL/INSTALLATION

C6U091866830W01

1. Disconnect the negative battery cable.
2. Remove the instrument cluster. (See 09–22–3 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Connector
2	Screw
3	Flasher control module

4. Install in the reverse order of removal.



A6E8112W114

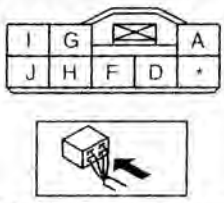
FLASHER CONTROL MODULE INSPECTION

C6U0918668301W02

1. Connect the connector to the flasher control module.
2. Connect the negative battery cable.
3. Measure the voltage at the flasher control module using a voltmeter.
   - When inspecting terminal F for continuity, disconnect the flasher control module connector.
4. If the value are not as specified in the Terminal Voltage List (Reference), inspect the parts under "Action" and related wiring harnesses.
5. If the system does not work properly even though the parts or related wiring harnesses do not have any malfunction, replace the flasher control module.

Terminal Voltage List (Reference)

FLASHER CONTROL MODULE
HARNESS SIDE CONNECTOR



B6U0918W014

Terminal	Signal	Connected to	Test condition		Voltage (V)/ Continuity	Action
A	Power supply	HAZARD 10 A fuse	Under any condition		B+	• Inspect HAZARD 10 A fuse • Inspect related harness
D	Turn signal flasher (LH)	Turn signal light (LH)	Turn switch (LH) ON	Turn signal light (LH) flashes	Alternates between below 1.0 and B+	• Inspect turn signal light (LH) • Inspect related harness
			Hazard warning switch at ON position			
			Other		Below 1.0	
F	Flasher control module ground	GND	Under any condition: inspect for continuity to ground		Yes	• Inspect GND
G	Turn signal flasher (RH)	Turn signal light (RH)	Turn switch (RH) ON	Turn signal light (RH) flashes	Alternates between below 1.0 and B+	• Inspect turn signal light (RH) • Inspect related harness
			Hazard warning switch at ON position			
			Other		Below 1.0	
H	Hazard warning ON	Hazard warning switch	Hazard warning switch at ON position		Below 1.0	• Inspect hazard warning switch • Inspect related harness
			Hazard warning switch at OFF position		B+	
I	Turn switch ON/ OFF (RH)	Combination switch	Ignition switch is at ON and turn switch (RH) ON		B+	• Inspect combination switch • Inspect related harness
			Other		Below 1.0	
J	Turn switch ON/ OFF (LH)	Combination switch	Ignition switch is at ON and turn switch (LH) ON		B+	• Inspect combination switch • Inspect related harness
			Other		Below 1.0	

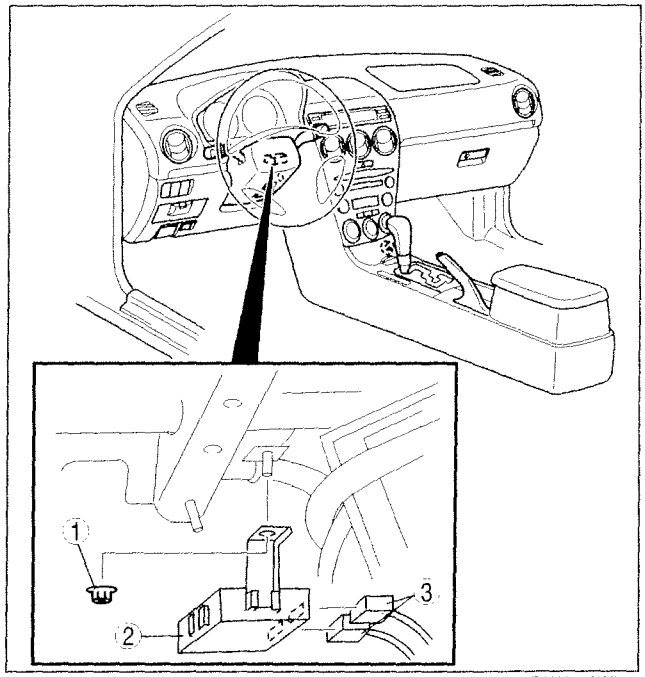
AUTO LIGHT-OFF CONTROL MODULE REMOVAL/INSTALLATION

C6U091867750W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Nut
2	Auto light-off control module
3	Connector

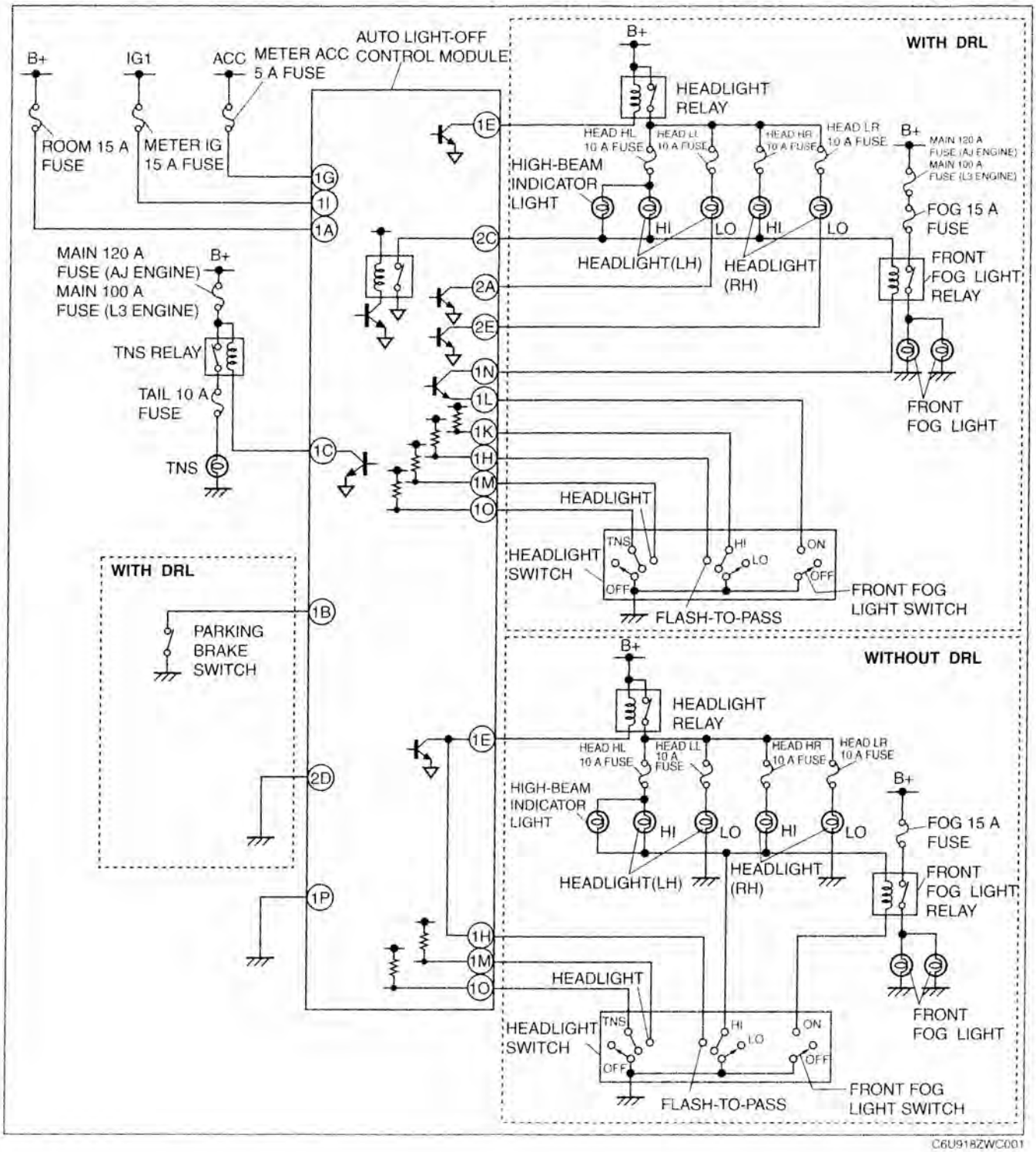
3. Install in the reverse order of removal.



B6U0918W025

DRL AND AUTO LIGHT-OFF SYSTEM WIRING DIAGRAM

C6U091867750W02



C6U918ZWC001

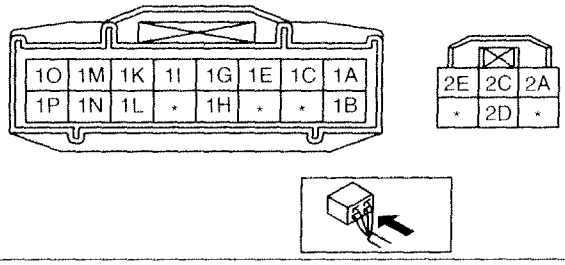
AUTO LIGHT-OFF CONTROL MODULE INSPECTION

C6U091867750W03

1. Measure the voltage at the auto light-off control module terminals as indicated below.
2. Disconnect the auto light-off control module connector before inspecting for continuity at terminals 1B, 1P and 2D.
   - If not as specified, inspect the parts listed under "Action."
   - If the parts and wiring harnesses are okay but the system still does not work properly, replace the auto light-off control module.

Terminal Voltage List (Reference)

AUTO LIGHT-OFF CONTROL MODULE
HARNESS SIDE CONNECTOR



B6U0918W023

Terminal	Signal	Connection	Test condition		Voltage (V)/ Continuity	Action
1A	Power supply	ROOM 15 A fuse	Constant		B+	• Inspect ROOM 15 A fuse • Inspect related harness
1B	Parking brake lever pulled/ released	Parking brake switch	Parking brake lever pulled: check for continuity to ground		Yes	• Inspect parking brake switch • Inspect related harness
			Parking brake lever released: check for continuity to ground		No	
1C	TNS relay operation	TNS relay	Headlight switch at 1st or 2nd position		Below 1.5	• Inspect TAIL 10 A fuse • Inspect TNS relay • Inspect related harness
			Headlight switch at OFF		B+	
1E	Headlight relay operation	Headlight relay	Headlight switch at 2nd position		Below 1.5	• Inspect headlight relay • Inspect related harness
			Headlight switch at OFF or 1st position		B+	
1G	ACC	METER ACC 5 A fuse	Ignition switch at ACC or ON		B+	• Inspect METER ACC 5 A fuse • Inspect related harness
			Ignition switch at LOCK		Below 1.0	
1H	Flash-to-pass	Headlight switch	Ignition switch at ON	Flash-to-pass activated	Below 1.0	• Inspect combination switch • Inspect related harness
				Flash-to-pass not activated	B+	
1I	IG1	METER IG 15 A fuse	Ignition switch at ON		B+	• Inspect METER IG 15 A fuse • Inspect related harness
			Ignition switch at LOCK or ACC		Below 1.0	
1K*	High-beam on/ off	Headlight switch	Ignition switch at ON	Dimmer switch at HI	Below 1.0	• Inspect combination switch • Inspect related harness
				Dimmer switch at LO	B+	
1L*	Front fog light switch on/off	Front fog light switch	Headlight switch at 2nd position	Front fog light switch at ON	Below 1.0	• Inspect combination switch • Inspect related harness
				Front fog light switch at OFF	B+	

Terminal	Signal	Connection	Test condition		Voltage (V)/ Continuity	Action
1M	Headlight switch on/off	Headlight switch	Ignition switch at ON	Headlight switch at 2nd position	Below 1.0	• Inspect combination switch • Inspect related harness
				Headlight switch at OFF or 1st position	B+	
1N*	Front fog light relay operation	Front fog light relay	Headlight switch at 2nd position and dimmer switch at LO	Front fog light switch at ON	Below 1.0	• Inspect FOG 15 A fuse • Inspect front fog light relay • Inspect related harness
				Front fog light switch at OFF	B+	
1O	TNS switch on/ off	Headlight switch	Ignition switch at ON	Headlight switch at 1st or 2nd position	Below 1.0	• Inspect combination switch • Inspect related harness
				Headlight switch at OFF	B+	
1P	Ground	GND	Constant: check for continuity to ground		Yes	Inspect GND
2A*	LH headlight operation (low-beam)	LH headlight (low-beam)	Headlight switch at 2nd position	Dimmer switch at LO	Below 1.0	• Inspect HEAD LL 10 A fuse • Inspect LH headlight • Inspect related harness
				Dimmer switch at HI	Below 1.0	
2C*	Headlight operation (high-beam)	Headlight (high-beam)	Headlight switch at 2nd position	Dimmer switch at the high-beam position	Below 1.0	• Inspect HEAD HL 10 A fuse • Inspect HEAD HR 10 A fuse • Inspect headlight • Inspect related harness
				Dimmer switch at the low-beam position	B+	
2D	Ground	GND	Constant: check for continuity to ground		Yes	Inspect GND
2E*	RH headlight operation (low-beam)	RH headlight (low-beam)	Headlight switch at 2nd position	Dimmer switch at LO	Below 1.0	• Inspect HEAD LR 10 A fuse • Inspect RH headlight • Inspect related harness
				Dimmer switch at HI	Below 1.0	

* : For vehicles with DRL only.

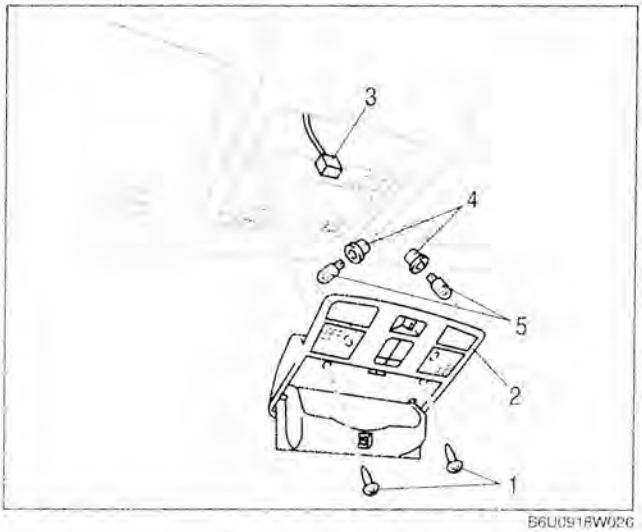
FRONT MAP LIGHT REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Screw
2	Front map light (See 09–18–22 Front Map Light Removal Note)
3	Connector
4	Socket
5	Front map light bulb

3. Install in the reverse order of removal.

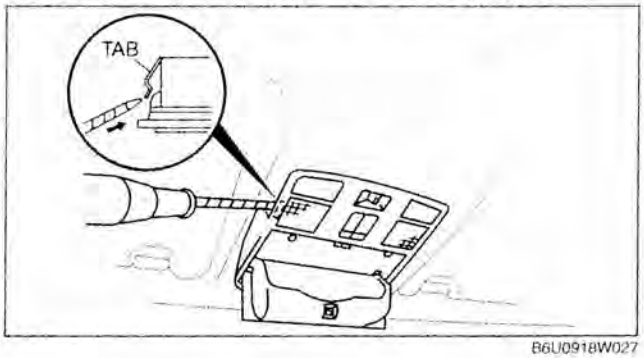
C6U091851310W01



B6U0918W026

Front Map Light Removal Note

1. Insert a tape-wrapped flathead screwdriver into the gap between the headliner and the front map light.
2. Push the tabs to remove the front map light.



B6U0918W027

FRONT MAP LIGHT INSPECTION

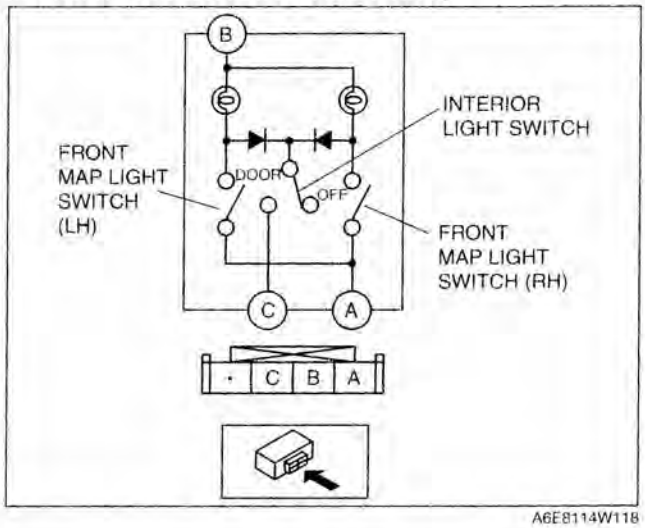
C6U091851310W02

1. Remove the front map light. (See 09–18–21 FRONT MAP LIGHT REMOVAL/INSTALLATION.)
2. Inspect for continuity between the front map light terminals using an ohmmeter.
   - If not as specified, replace the front map light.

: Bulb

Switch position		Terminal		
Front map light switch	Interior light switch	B	C	A
ON	-	○	⓪	○
OFF	DOOR	○	⓪	○
	OFF			

A6E8114W117



A6E8114W118

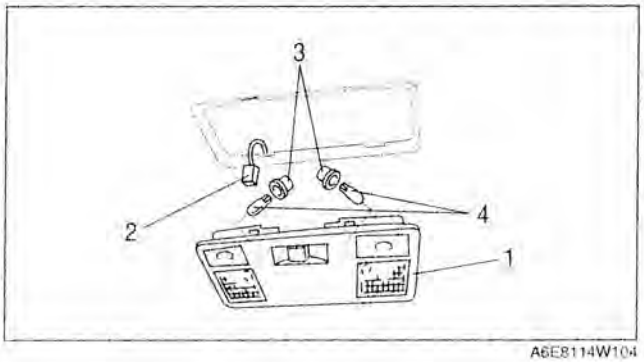
REAR MAP LIGHT REMOVAL/INSTALLATION

C6U091851311W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Rear map light (See 09–18–23 Rear Map Light Removal Note)
2	Connector
3	Socket
4	Rear map light bulb

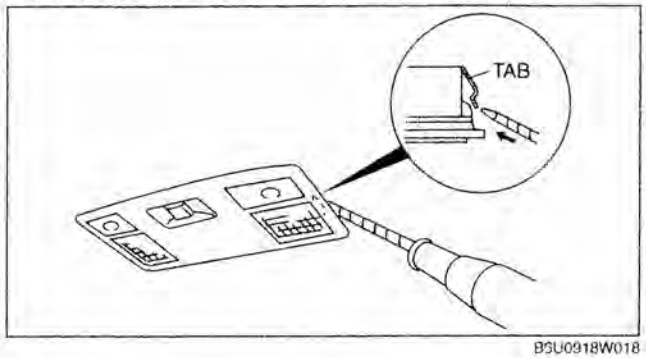
3. Install in the reverse order of removal.



A6E8114W104

Rear Map Light Removal Note

1. Insert a tape-wrapped flathead screwdriver into the gap between the headliner and the rear map light.
2. Push the tabs to remove the rear map light.



B3U0918W018

REAR MAP LIGHT INSPECTION

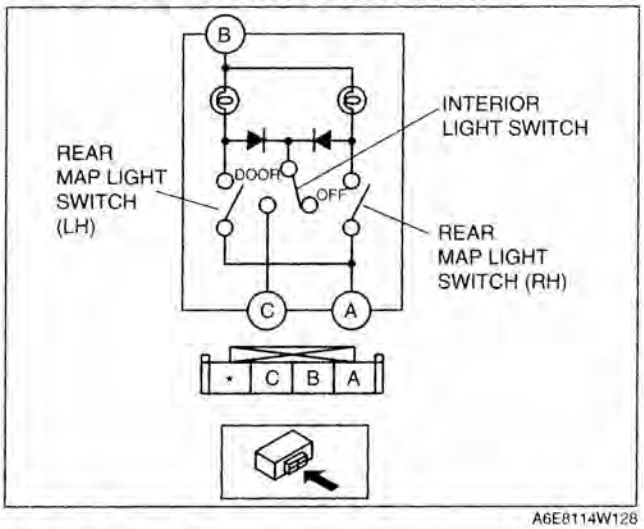
C6U091851311W02

1. Remove the rear map light. (See 09–18–22 REAR MAP LIGHT REMOVAL/INSTALLATION.)
2. Inspect for continuity between the rear map light terminals using an ohmmeter.
   - If not as specified, replace the rear map light.

○—⊘—○ : Bulb

Switch position		Terminal		
Rear map light switch	Interior light switch	B	C	A
ON	-	○	⊘	○
OFF	DOOR	○	⊘	○
	OFF			

A6E8114W127



A6E8114W128

09–18

CARGO COMPARTMENT LIGHT REMOVAL/INSTALLATION [5HB, WGN]

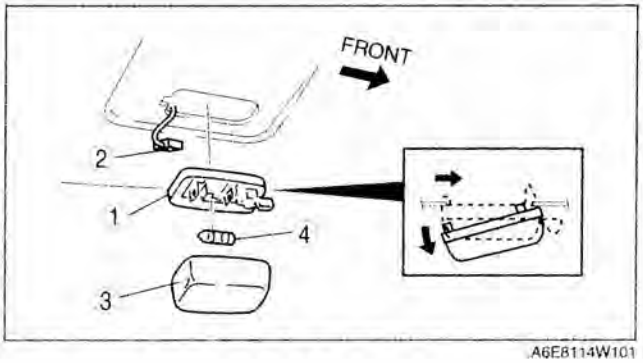
C6U091851441W01

5HB

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Cargo compartment light
2	Connector
3	Lens
4	Cargo compartment light bulb

3. Install in the reverse order of removal.



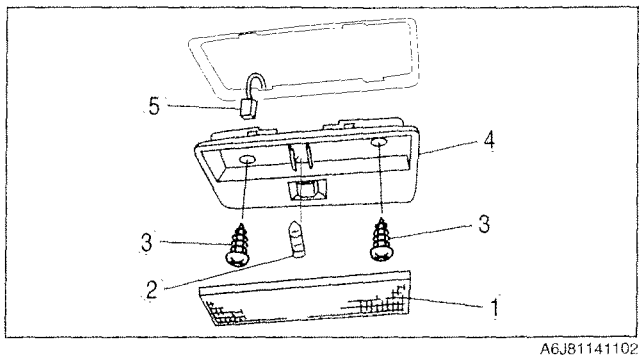
A6E8114W101

WGN

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Lens (See09–18–24 Lens removal note)
2	Cargo compartment light bulb
3	Screw
4	Cargo compartment light
5	Connector

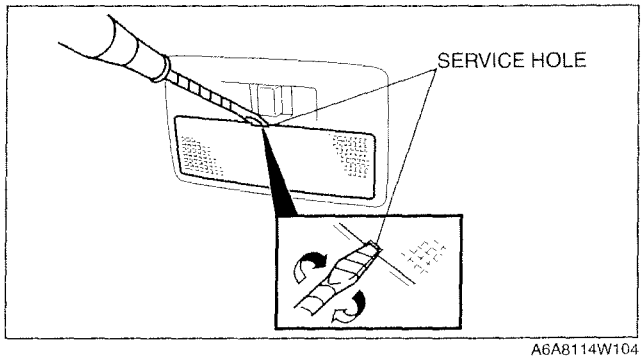
3. Install in the reverse order of removal.



A6J81141102

Lens removal note

1. Insert a tape-wrapped flathead screwdriver into the service hole.
2. Twist the flathead screwdriver as indicated by the arrow to remove the lens.



A6A8114W104

CARGO COMPARTMENT LIGHT INSPECTION [5HB, WGN]

C6U091851441W02

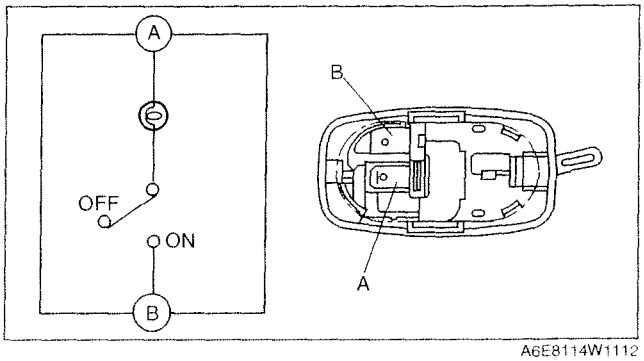
5HB

1. Remove the cargo compartment light. (See 09–18–23 CARGO COMPARTMENT LIGHT REMOVAL/ INSTALLATION [5HB, WGN].)
2. Inspect for continuity between the cargo compartment light terminals using an ohmmeter.
   - If not as specified, replace the cargo compartment light.

: Bulb

Switch position	Terminal	
	A	B
ON	○—⊗—○	
OFF		

A6E8114W1142



A6E8114W1112

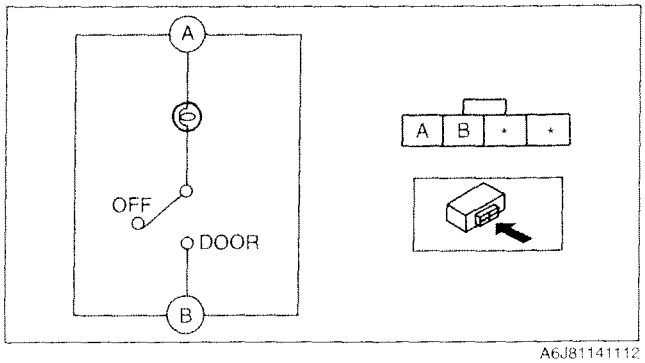
WGN

1. Remove the cargo compartment light. (See 09–18–23 CARGO COMPARTMENT LIGHT REMOVAL/ INSTALLATION [5HB, WGN].)
2. Inspect for continuity between the cargo compartment light terminals using an ohmmeter.
   - If not as specified, replace the cargo compartment light.

: Bulb

Switch position	Terminal	
	A	B
DOOR	○—⊗—○	
OFF		

A6A81141119



A6J81141112

CARGO COMPARTMENT LIGHT SWITCH INSPECTION [5HB, WGN]

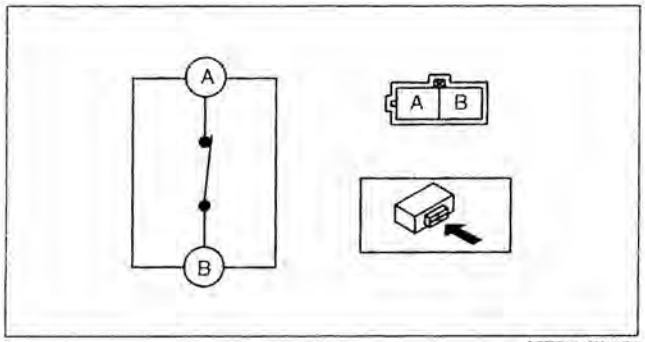
C6U091851441W03

1. Remove the liftgate lower trim. (See 09–17–20 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION [5HB, WGN].)
2. Disconnect the cargo compartment light switch connector.
3. Inspect for continuity between the cargo compartment light switch terminals using an ohmmeter.
   - If not as specified, replace the liftgate lock.

○—○ : Continuity

Switch position	Terminal	
	A	B
On (liftgate open)	○	○
Off (liftgate closed)		

A6E8114W120

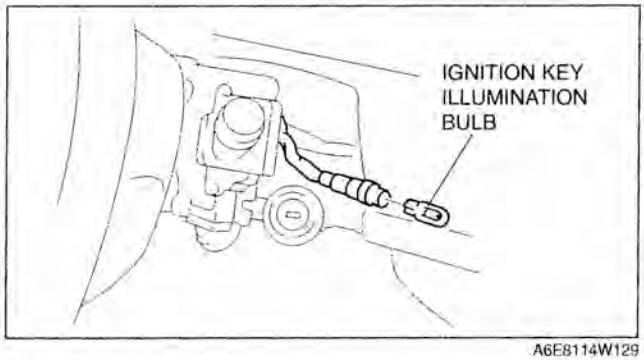


A6E8114W1194

IGNITION KEY ILLUMINATION BULB REMOVAL/INSTALLATION

C6U091860231W01

1. Disconnect the negative battery cable.
2. Remove the column cover.
3. Remove the ignition key illumination bulb.
4. Install in the reverse order of removal.



A6E8114W129

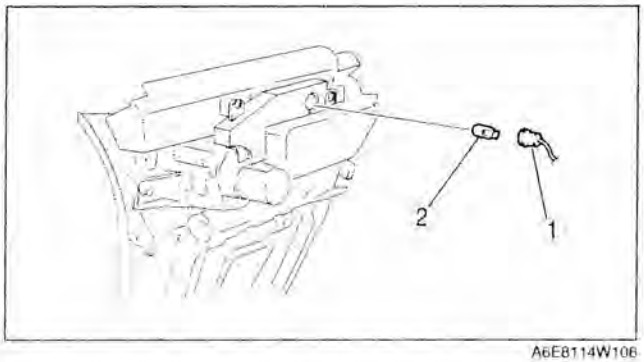
ASHTRAY ILLUMINATION BULB REMOVAL/INSTALLATION

C6U091855431W01

1. Disconnect the negative battery cable.
2. Remove the boot panel.
3. Remove in the order indicated in the table.

1	Socket
2	Ashtray illumination bulb

4. Install in the reverse order of removal.



A6E8114W106

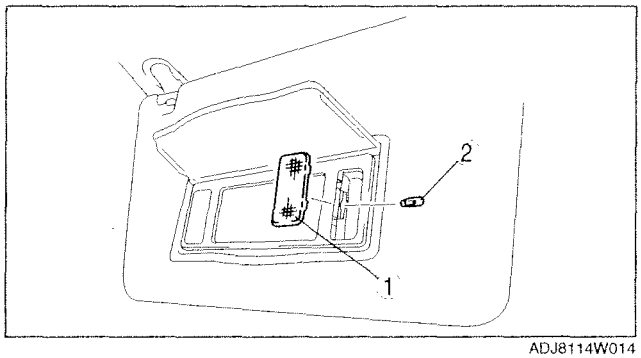
VANITY MIRROR ILLUMINATION BULB REMOVAL/INSTALLATION

C6U091869270W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Lens (See 09–18–26 Lens Removal Note)
2	Vanity mirror illumination bulb

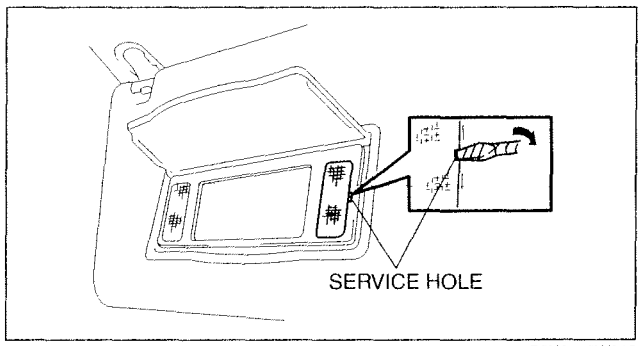
3. Install in the reverse order of removal.



ADJ8114W014

Lens Removal Note

1. Insert a tape-wrapped flathead screwdriver into the service hole, and pry the screwdriver in the direction indicated by the arrow to remove the lens.



B6U0918W019

VANITY MIRROR ILLUMINATION INSPECTION

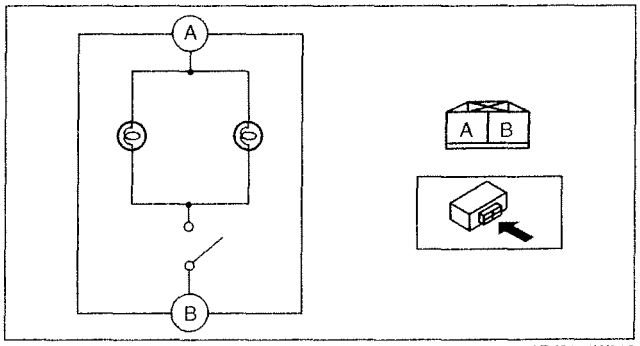
C6U091869270W02

1. Remove the sunvisor.
2. Inspect for continuity between the vanity mirror illumination terminals using an ohmmeter.
   - If not as specified, replace the sunvisor.

: Bulb

Vanity mirror cover codition	Terminal	
	A	B
OPEN		
CLOSED		

B6U0918W020



ADJ8114W013

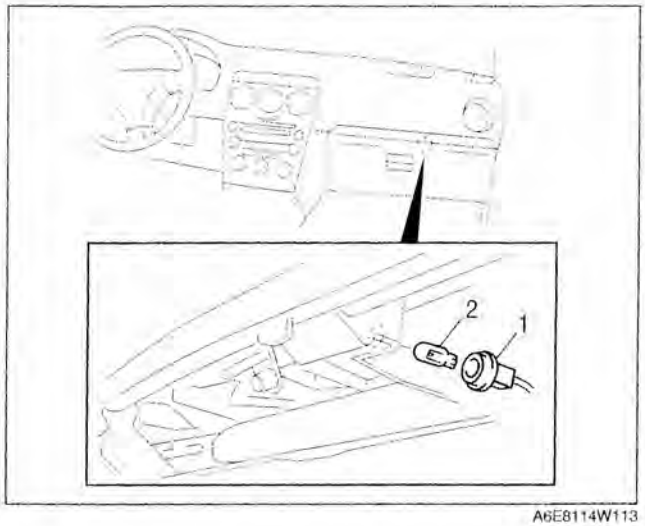
GLOVE COMPARTMENT LIGHT BULB REMOVAL/INSTALLATION

C6U091851445W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Socket
2	Glove compartment light bulb

3. Install in the reverse order of removal.



A6E8114W113

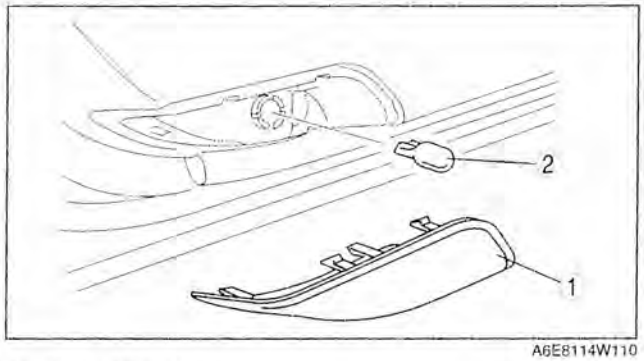
COURTESY LIGHT BULB REMOVAL/INSTALLATION

C6U091869971W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Lens
2	Courtesy light bulb

3. Install in the reverse order of removal.



A6E8114W110

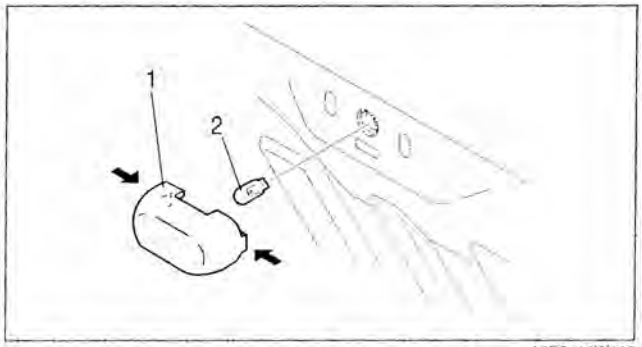
TRUNK COMPARTMENT LIGHT BULB REMOVAL/INSTALLATION [4SD]

C6U091851440W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Lens
2	Trunk compartment light bulb

3. Install in the reverse order of removal.



A6E8114W112

TRUNK COMPARTMENT LIGHT SWITCH INSPECTION [4SD]

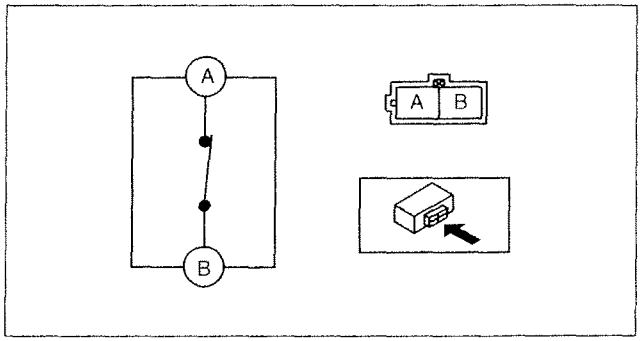
C6U091851440W02

1. Remove the trunk lid trim. (See 09–17–18 TRUNK LID TRIM REMOVAL/INSTALLATION [4SD].)
2. Disconnect the trunk compartment light switch connector.
3. Inspect for continuity between the trunk compartment light switch terminals using an ohmmeter.
   - If not as specified, replace the trunk lid lock.

O—O : Continuity

Switch position	Terminal	
	A	B
On (trunk open)	O	O
Off (trunk closed)		

A6E8114W121



A6E8114W119

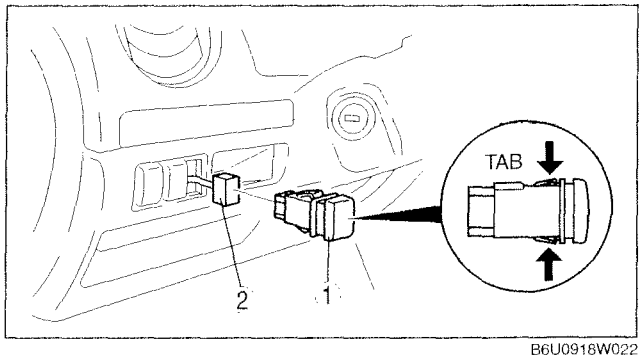
PANEL LIGHT CONTROL SWITCH REMOVAL/INSTALLATION

C6U091866600W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Panel light control switch (See 09–18–28 Panel Light Control Switch Removal Note)
2	Connector

3. Install in the reverse order of removal.



B6U0918W022

Panel Light Control Switch Removal Note

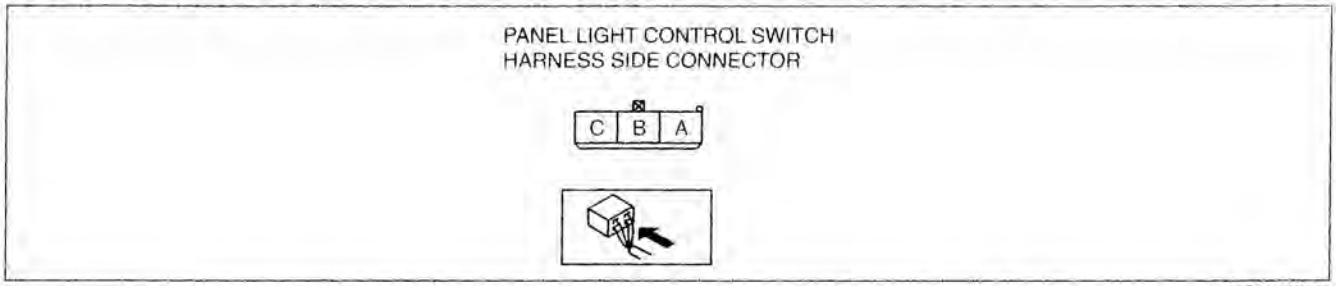
1. Insert your hand from the lower side of the dashboard and squeeze the tabs of the panel light control switch.
2. Pull the panel light control switch toward you to remove it.

PANEL LIGHT CONTROL SWITCH INSPECTION

C6U09186600W02

1. Connect the connector to the panel light control switch.
2. Connect the negative battery cable.
3. Measure the voltage at the panel light control switch using a voltmeter.
   - When inspecting terminal B for continuity, disconnect the panel light control switch connector.
   - If the values are not as specified in the Terminal Voltage List (Reference), inspect the parts under "Action" and related wiring harnesses.
   - If the system does not work properly even though the parts or related wiring harnesses do not have any malfunction, replace the panel light control switch.

Terminal Voltage Table (Reference)

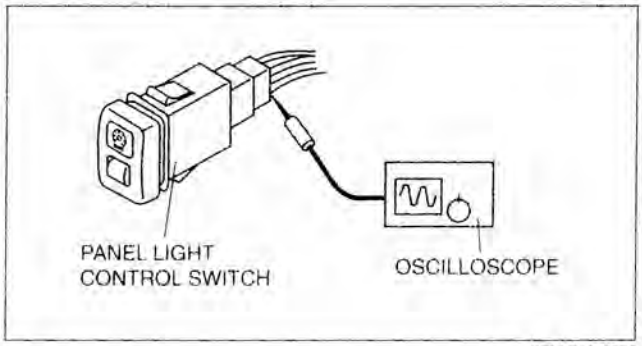


A6E8114W123

Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
A	TNS	TNS relay	Headlight switch at TNS or headlight position	B+	• Inspect TNS relay (See 09-21-6 RELAY INSPECTION) • Inspect ILLUMI 10A fuse • Inspect related harness
			Other	Below 1.0	
B	Ground	GND	Under any condition: inspect for continuity to ground	Yes	• Inspect GND • Inspect related harness
C	Illumination	Each illumination	Inspect using an oscilloscope (See 09-18-29 Terminal C inspection)	—	• Inspect each illumination • Inspect related harness

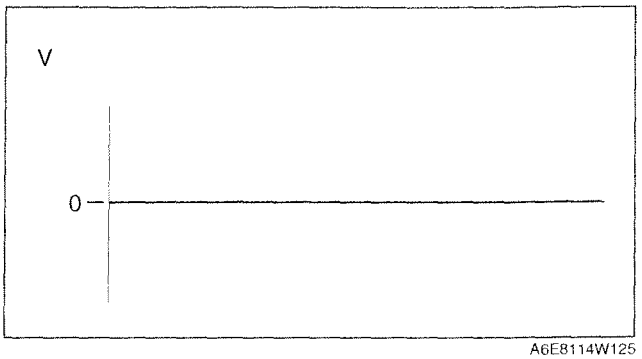
Terminal C inspection

1. Measure the wave pattern of the terminal C on the panel light control switch using an oscilloscope.
2. Set the headlight switch to either the TNS or headlight position.
3. Set the panel light control switch to the brightest position.



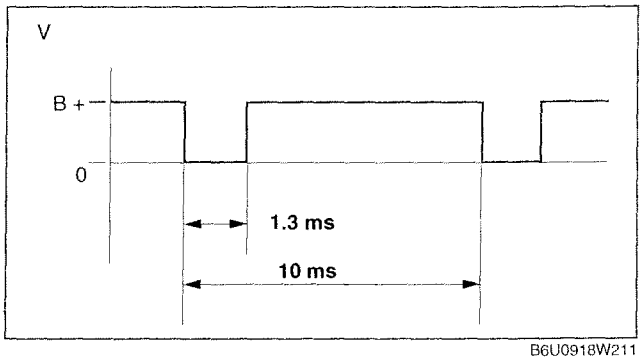
A6E8114W124

4. Verify that the pattern on the screen is as shown in the figure.



A6E8114W125

5. Verify that the pattern on the screen matches the pattern shown in the figure as the panel light control switch is gradually turned to the darkest position.



B6U0918W211

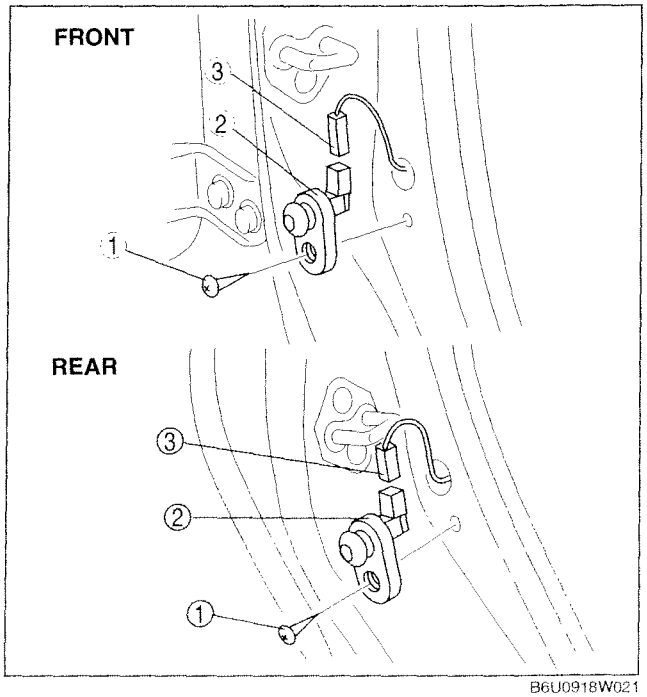
DOOR SWITCH REMOVAL/INSTALLATION

C6U091866540W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Screw
2	Door switch
3	Connector

3. Install in the reverse order of removal.



B6U0918W021

DOOR SWITCH INSPECTION

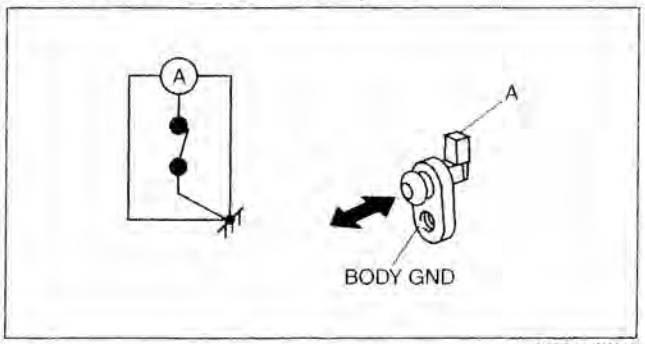
C6U091866540W02

1. Remove the door switch. (See 09–18–30 DOOR SWITCH REMOVAL/INSTALLATION.)
2. Inspect for continuity between the door switch terminal and a body ground using an ohmmeter.
   - If not as specified, replace the door switch.

O—O : Continuity

Switch position	Terminal	
	A	Body GND
Pressed		
Released	O	O

A6E8114W122

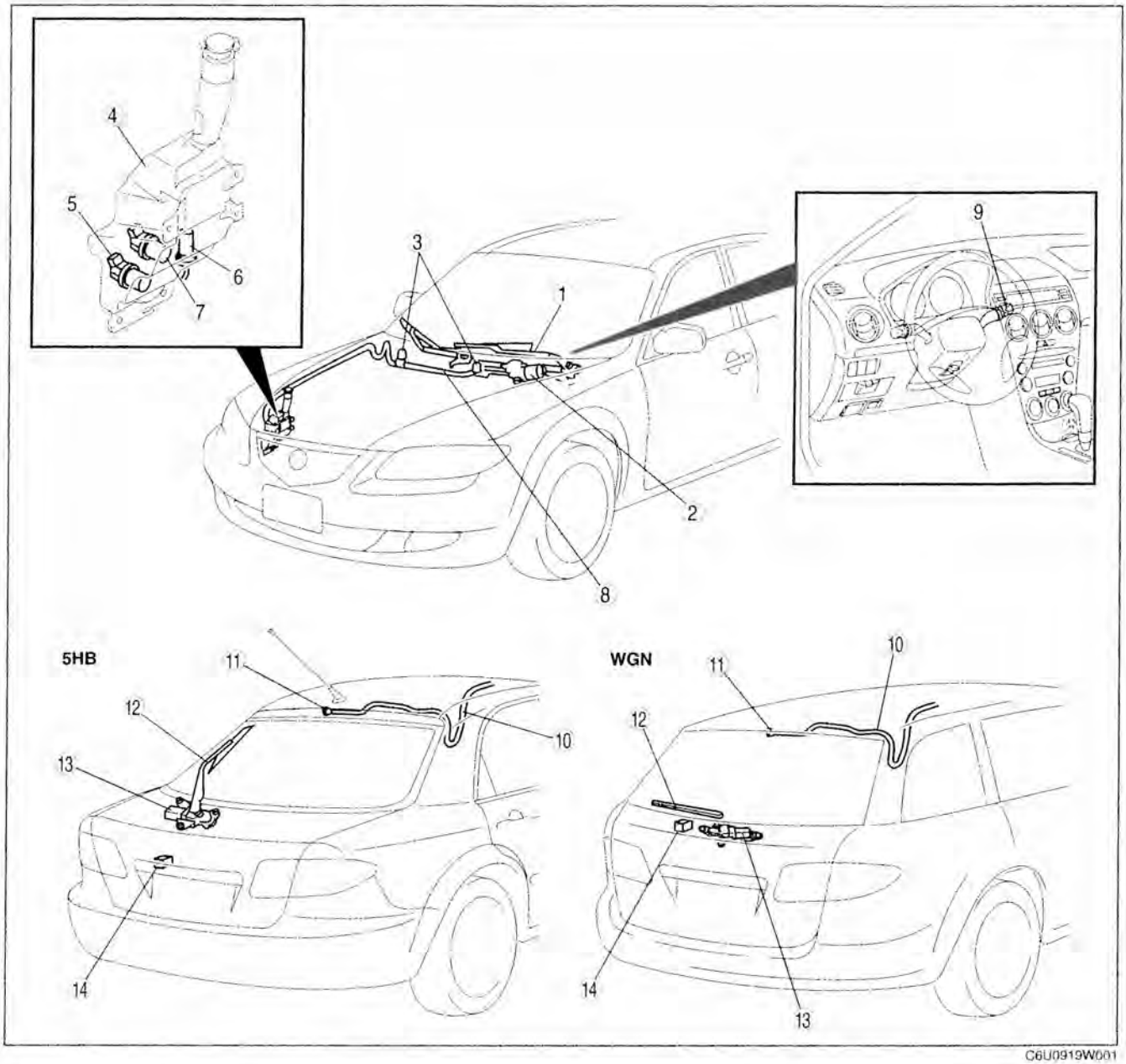


A6E8114W115

09–19 WIPER/WASHER SYSTEM

WIPER AND WASHER SYSTEM LOCATION INDEX

C6U091901052W01



C6U0919W001

1	Windshield wiper arm and blade (See 09–19–3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.) (See 09–19–3 WINDSHIELD WIPER ARM AND BLADE ADJUSTMENT)
2	Windshield wiper motor (See 09–19–4 WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION.) (See 09–19–4 WINDSHIELD WIPER MOTOR DISASSEMBLY/ASSEMBLY.) (See 09–19–5 WINDSHIELD WIPER MOTOR INSPECTION.)
3	Windshield washer nozzle (See 09–19–9 WINDSHIELD WASHER NOZZLE REMOVAL/INSTALLATION.) (See 09–19–9 WINDSHIELD WASHER NOZZLE CLEANING.)

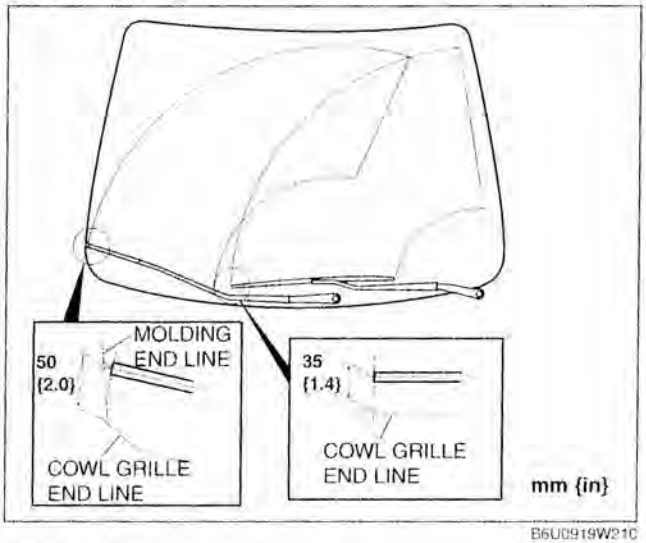
4	Washer tank (See 09–19–5 WASHER TANK REMOVAL/INSTALLATION [4SD].) (See 09–19–6 WASHER TANK REMOVAL/INSTALLATION [5HB, WGN].)
5	Windshield washer motor (See 09–19–6 WINDSHIELD WASHER MOTOR REMOVAL/INSTALLATION.) (See 09–19–7 WINDSHIELD WASHER MOTOR INSPECTION.)
6	Washer fluid-level sensor (See 09–19–7 WASHER FLUID-LEVEL SENSOR REMOVAL/INSTALLATION.) (See 09–19–7 WASHER FLUID-LEVEL SENSOR INSPECTION.)

7	Rear washer motor (5HB, WGN) (See 09–19–10 REAR WASHER MOTOR REMOVAL/INSTALLATION [5HB, WGN].) (See 09–19–11 REAR WASHER MOTOR INSPECTION [5HB, WGN].)
8	Windshield washer hose (See 09–19–10 WINDSHIELD WASHER HOSE REMOVAL/INSTALLATION.)
9	Wiper and washer switch (See 09–19–8 WIPER AND WASHER SWITCH REMOVAL/INSTALLATION.) (See 09–19–8 WIPER AND WASHER SWITCH INSPECTION.) (See 09–19–9 REAR WIPER AND WASHER SWITCH INSPECTION [5HB, WGN].)
10	Rear washer hose (5HB, WGN) (See 09–19–15 REAR WASHER HOSE REMOVAL/INSTALLATION [5HB, WGN])
11	Rear washer nozzle (5HB, WGN) (See 09–19–14 REAR WASHER NOZZLE REMOVAL/INSTALLATION [5HB, WGN].) (See 09–19–14 REAR WASHER NOZZLE CLEANING [5HB, WGN].)
12	Rear wiper arm and blade (5HB, WGN) (See 09–19–13 REAR WIPER ARM AND BLADE REMOVAL/INSTALLATION [5HB, WGN].) (See 09–19–13 REAR WIPER ARM AND BLADE ADJUSTMENT [5HB, WGN].)
13	Windshield wiper motor (5HB, WGN) (See 09–19–11 REAR WIPER MOTOR REMOVAL/INSTALLATION [5HB, WGN].) (See 09–19–12 REAR WIPER MOTOR INSPECTION [5HB, WGN].)
14	Intermittent rear wiper relay (5HB, WGN) (See 09–19–16 INTERMITTENT REAR WIPER RELAY REMOVAL/INSTALLATION [5HB, WGN]) (See 09–19–17 INTERMITTENT REAR WIPER RELAY INSPECTION [5HB, WGN])

WINDSHIELD WIPER ARM AND BLADE ADJUSTMENT

C6U091967320W01

1. Operate the windshield wiper motor to set the wipers in the park position.
2. Set the windshield wiper arm heights as shown.



B6U0919W210

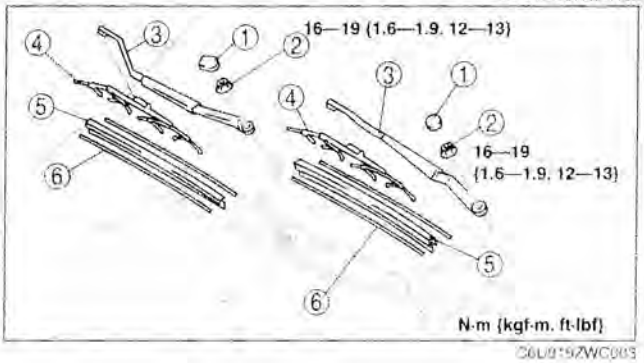
09–19

WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION

C6U091967320W02

1. Remove in the order indicated in the table.

1	Cap
2	Nut
3	Windshield wiper arm (See 09–19–4 Windshield Wiper Arm Installation Note)
4	Windshield wiper blade
5	Rubber brush
6	Backing plate

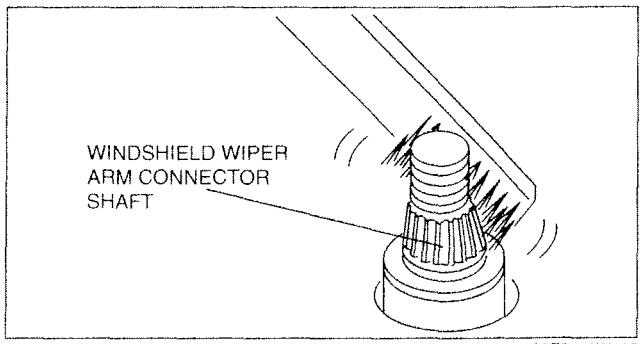


C6U0919ZWC003

2. Install in the reverse order of removal.
3. Adjust the windshield wiper arm and blade. (See 09–19–3 WINDSHIELD WIPER ARM AND BLADE ADJUSTMENT.)

Windshield Wiper Arm Installation Note

1. Clean the windshield wiper arm connector shafts using a wire brush before installing the windshield wiper arms.



A6E8116W103

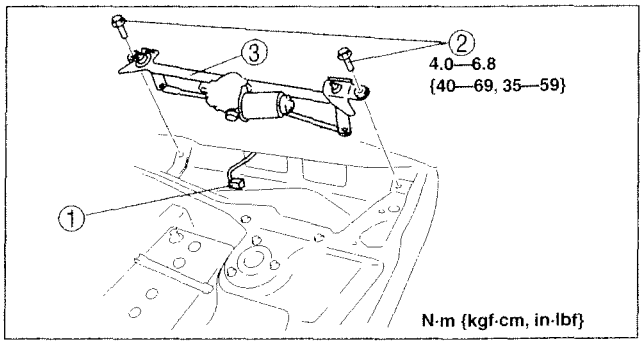
WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION

C6U091967340W01

1. Disconnect the negative battery cable.
2. Remove the windshield wiper arm and blade. (See 09–19–3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
3. Remove the cowl grille. (See 09–16–3 COWL GRILLE REMOVAL/INSTALLATION.)
4. Remove in the order indicated in the table.

1	Connector
2	Bolt
3	Windshield wiper motor

5. Install in the reverse order of removal.
6. Adjust the windshield wiper arm and blade. (See 09–19–3 WINDSHIELD WIPER ARM AND BLADE ADJUSTMENT.)



A6E8116W102

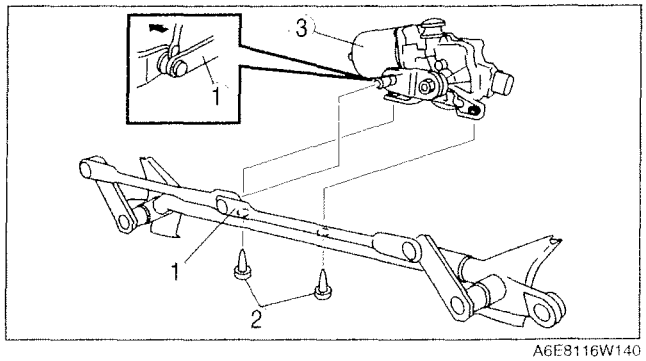
WINDSHIELD WIPER MOTOR DISASSEMBLY/ASSEMBLY

C6U091967340W02

1. Disassemble in the order indicated in the table.

1	Windshield wiper link (See 09–19–4 Windshield Wiper Link Removal Note)
2	Bolt
3	Windshield wiper motor

2. Assemble in the reverse order of disassembly.



A6E8116W140

Windshield Wiper Link Removal Note

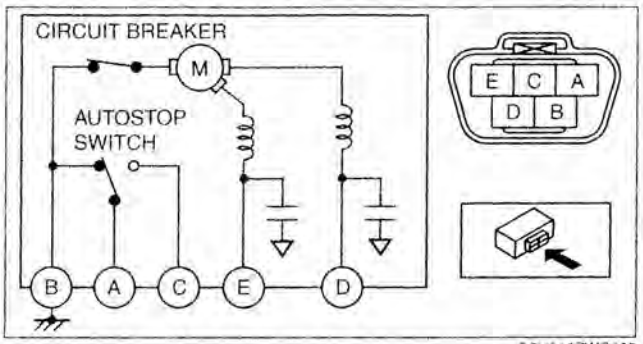
1. Pry off the connection between the windshield wiper motor and windshield wiper link.

WINDSHIELD WIPER MOTOR INSPECTION

C6U091967340W03

1. Disconnect the windshield wiper motor connector.
2. Connect battery positive voltage to terminal E or D and ground to terminal B, and inspect operation of the windshield wiper motor as indicated below.

Terminal	Operation
E	High
D	Low



C6U919ZWC005

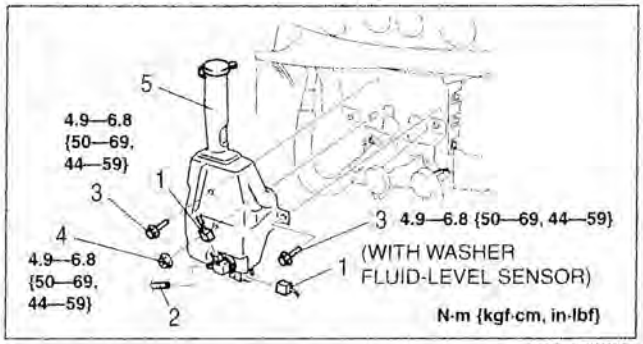
3. Disconnect battery positive voltage from terminal E of the motor while the wipers are operating.
4. Verify that the wipers do not stop in the park position.
5. Short between the motor terminals A and D and connect battery positive voltage to the motor terminal C.
6. Verify that the wipers operate at low speed again, then stop in the park position.
   - If not as specified, replace the windshield wiper motor.

WASHER TANK REMOVAL/INSTALLATION [4SD]

C6U091967481W01

1. Disconnect the negative battery cable.
2. Remove the front bumper. (See 09–10–7 FRONT BUMPER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Connector
2	Windshield washer hose (See 09–19–5 Windshield Washer Hose Installation Note)
3	Bolt
4	Nut
5	Washer tank

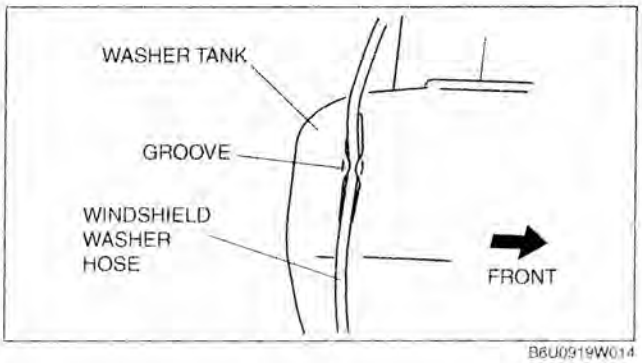


B6U0919W010

4. Install in the reverse order of removal.

Windshield Washer Hose Installation Note

1. Install the windshield washer hose by inserting it in the washer tank groove.



B6U0919W014

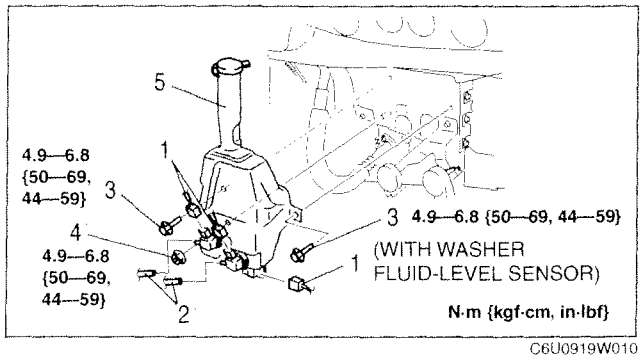
WASHER TANK REMOVAL/INSTALLATION [5HB, WGN]

C6U091967480W01

1. Disconnect the negative battery cable.
2. Remove the front bumper. (See 09–10–7 FRONT BUMPER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Connector
2	Washer hose (See 09–19–6 Washer Hose Installation Note)
3	Bolt
4	Nut
5	Washer tank

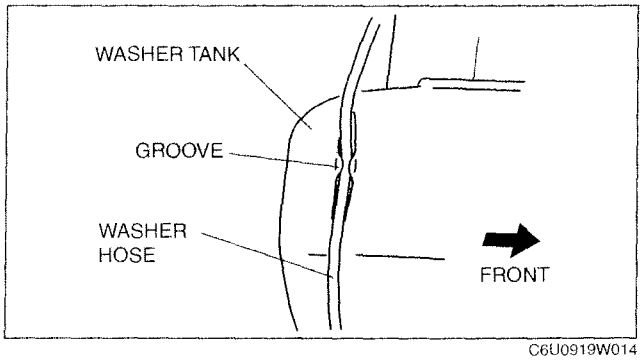
4. Install in the reverse order of removal.



C6U0919W010

Washer Hose Installation Note

1. Install the washer hose by inserting it in the washer tank groove.



C6U0919W014

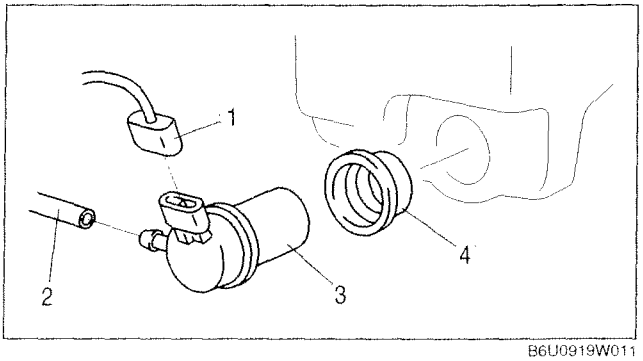
WINDSHIELD WASHER MOTOR REMOVAL/INSTALLATION

C6U091976670W01

1. Disconnect the negative battery cable.
2. Remove the front bumper. (See 09–10–7 FRONT BUMPER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Connector
2	Washer hose
3	Windshield washer motor
4	Grommet

4. Install in the reverse order of removal.

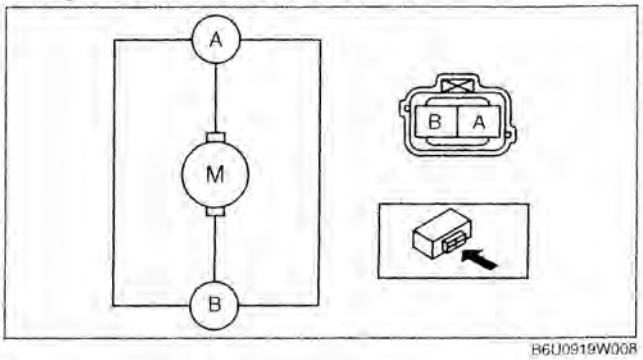


B6U0919W011

WINDSHIELD WASHER MOTOR INSPECTION

C6U091976670W02

1. Disconnect the negative battery cable.
2. Remove the front bumper. (See 09–10–7 FRONT BUMPER REMOVAL/INSTALLATION.)
3. Connect battery positive voltage to the motor terminal A and ground to the motor terminal B.
4. Verify that the windshield washer motor operates.
   - If the motor does not operate, replace the windshield washer motor.



B6U0919W008

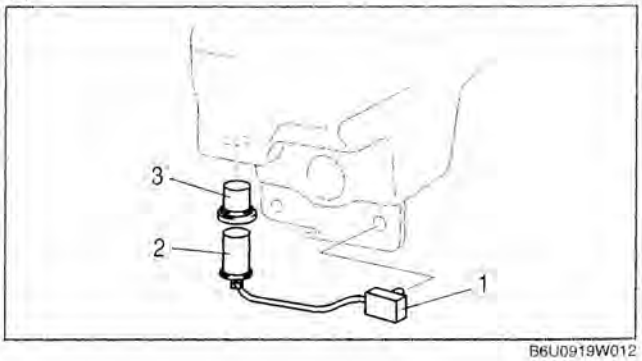
WASHER FLUID-LEVEL SENSOR REMOVAL/INSTALLATION

C6U091976670W03

1. Disconnect the negative battery cable.
2. Remove the washer tank. (See 09–19–5 WASHER TANK REMOVAL/INSTALLATION [4SD].) (See 09–19–6 WASHER TANK REMOVAL/INSTALLATION [5HB, WGN].)
3. Remove in the order indicated in the table.

1	Connector
2	Washer fluid-level sensor
3	Grommet

4. Install in the reverse order of removal.



B6U0919W012

WASHER FLUID-LEVEL SENSOR INSPECTION

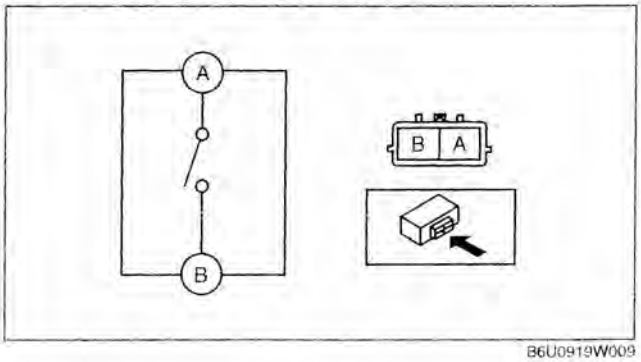
C6U091976670W04

1. Disconnect the negative battery cable.
2. Remove the front bumper. (See 09–10–7 FRONT BUMPER REMOVAL/INSTALLATION.)
3. Inspect for continuity between the washer fluid-level sensor terminals using an ohmmeter.
   - If not as specified, replace the washer fluid-level sensor.

○—○ : Continuity

Fluid level	Terminal	
	A	B
Above low		
Below low	○	○

B6U0919W016



B6U0919W009

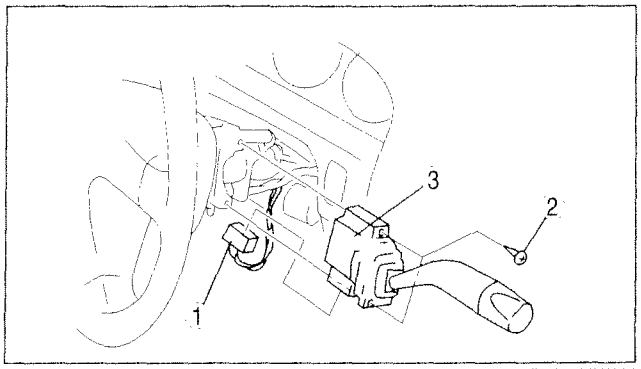
WIPER AND WASHER SWITCH REMOVAL/INSTALLATION

C6U091966122W01

1. Disconnect the negative battery cable.
2. Remove the column cover.
3. Remove in the order indicated in the table.

1	Connector
2	Screw
3	Wiper and washer switch

4. Install in the reverse order of removal.



B6U0919W004

WIPER AND WASHER SWITCH INSPECTION

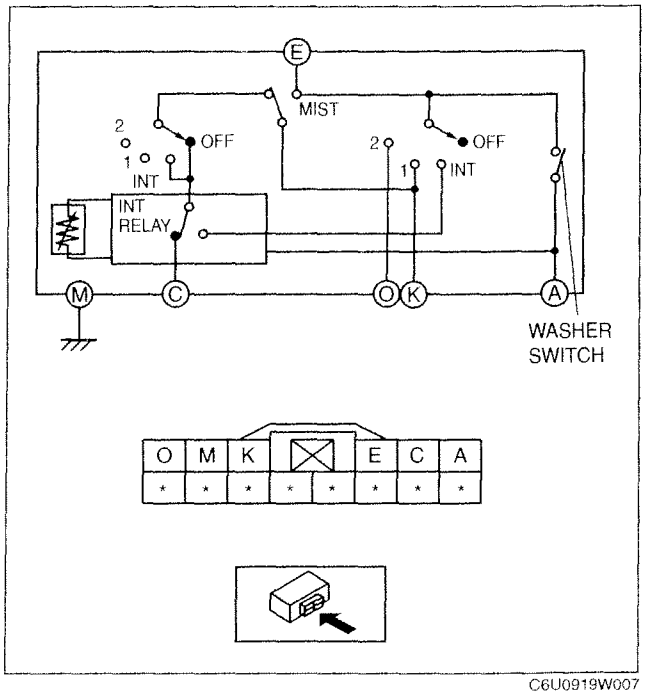
C6U091966122W02

1. Remove the wiper and washer switch. (See 09–19–8 WIPER AND WASHER SWITCH REMOVAL/INSTALLATION.)
2. Inspect for continuity between the wiper and washer switch terminals using an ohmmeter.
   - If not as specified, replace the wiper and washer switch.

O—O : Continuity

Switch position		One-touch	Terminal				
			A	C	E	K	O
Wiper switch	OFF	OFF		O		O	
		ON			O	O	
	INT			O		O	
	1				O	O	
	2				O		O
Washer switch	ON		O		O		

B6U0919W006



C6U0919W007

REAR WIPER AND WASHER SWITCH INSPECTION [5HB, WGN]

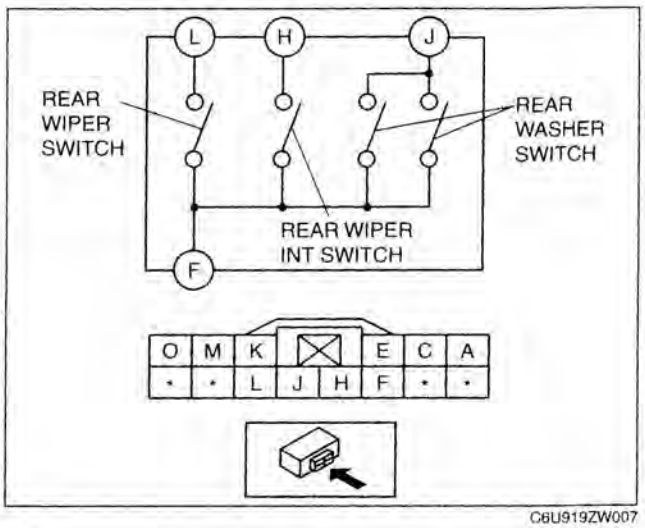
C6U091966122W03

1. Remove the wiper and washer switch. (See 09–19–8 WIPER AND WASHER SWITCH REMOVAL/INSTALLATION.)
2. Inspect for continuity between the wiper and washer switch terminals using an ohmmeter.
   - If not as specified, replace the wiper and washer switch.

O—O : Continuity

Switch position	Terminal			
	L	H	J	F
OFF				
Rear wiper	O			O
Rear wiper INT		O		O
Rear wiper and washer	O		O	O
Rear washer			O	O

C6U919ZW006

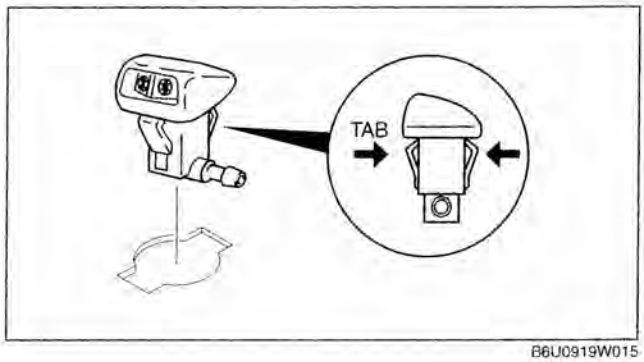


C6U919ZW007

WINDSHIELD WASHER NOZZLE REMOVAL/INSTALLATION

C6U091967510W01

1. Remove the hood insulator.
2. Remove the windshield washer hose from the windshield washer nozzle.
3. Squeeze the tabs of the windshield washer nozzle.
4. Pull the windshield washer nozzle out to remove it.
5. Install in the reverse order of removal.



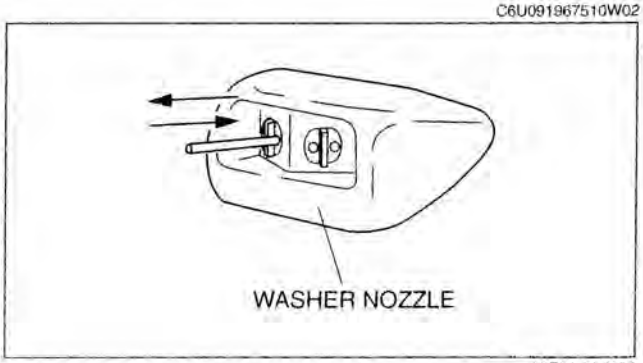
B6U0919W015

09–19

WINDSHIELD WASHER NOZZLE CLEANING

C6U091967510W02

1. Clean the washer nozzle by inserting and moving a needle or an equivalent tool back and forth.
   - If the nozzle becomes clogged again after cleaning, remove the hose from washer nozzle. Make sure there is enough washer fluid. Then turn the washer switch on and flush the inside of the hose.



A6E8116W124

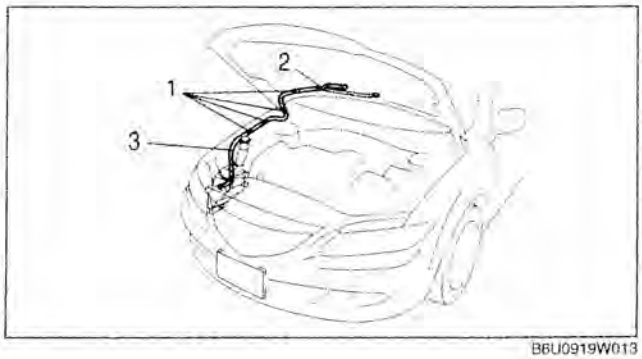
WINDSHIELD WASHER HOSE REMOVAL/INSTALLATION

C6U091950601W01

1. Remove the hood insulator.
2. Partially peel off the right side mud guard.
3. Remove in the order indicated in the table.

1	Clip
2	Joint pipe
3	Windshield washer hose (See 09–19–10 Windshield Washer Hose Installation Note)

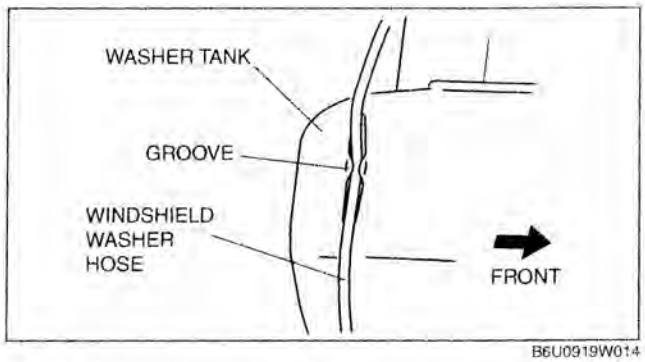
4. Install in the reverse order of removal.



B6U0919W013

Windshield Washer Hose Installation Note

1. Install the windshield washer hose by inserting it in the washer tank groove.



B6U0919W014

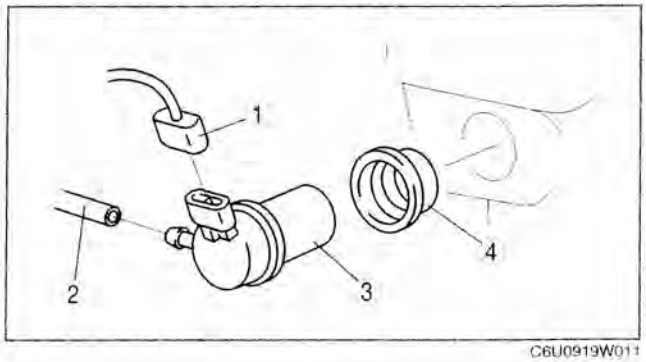
REAR WASHER MOTOR REMOVAL/INSTALLATION [5HB, WGN]

C6U091976672W01

1. Disconnect the negative battery cable.
2. Remove the front bumper. (See 09–10–7 FRONT BUMPER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Connector
2	Washer hose
3	Rear washer motor
4	Grommet

4. Install in the reverse order of removal.

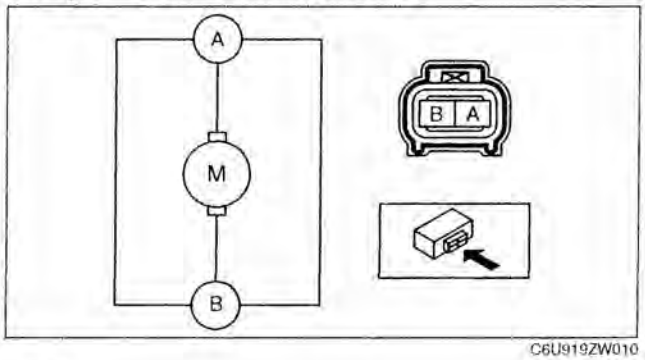


C6U0919W011

REAR WASHER MOTOR INSPECTION [5HB, WGN]

C6U091976672W02

1. Disconnect the negative battery cable.
2. Remove the front bumper. (See 09–10–7 FRONT BUMPER REMOVAL/INSTALLATION.)
3. Connect battery positive voltage to the motor terminal B and ground to the motor terminal A.
4. Verify that the rear washer motor operates.
   - If the motor does not operate, replace the rear washer motor.



C6U919ZW010

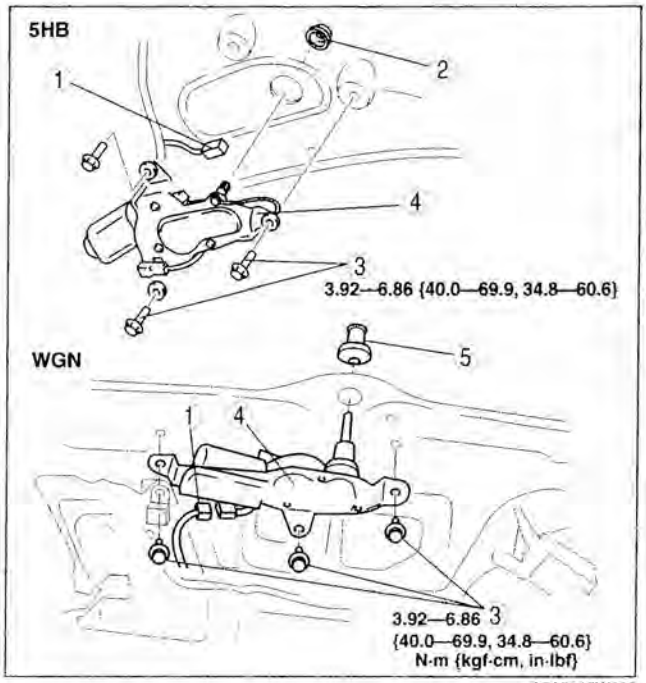
REAR WIPER MOTOR REMOVAL/INSTALLATION [5HB, WGN]

C6U091967450W01

1. Disconnect the negative battery cable.
2. Remove the rear wiper arm and blade. (See 09–19–13 REAR WIPER ARM AND BLADE REMOVAL/INSTALLATION [5HB, WGN].)
3. Remove the liftgate lower trim. (See 09–17–20 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION [5HB, WGN].)
4. Remove in the order indicated in the table.

1	Connector
2	Outer bushing (5HB)
3	Bolt
4	Rear wiper motor
5	Outer bushing (WGN)

5. Install in the reverse order of removal.
6. Adjust the rear wiper arm and blade. (See 09–19–13 REAR WIPER ARM AND BLADE ADJUSTMENT [5HB, WGN].)

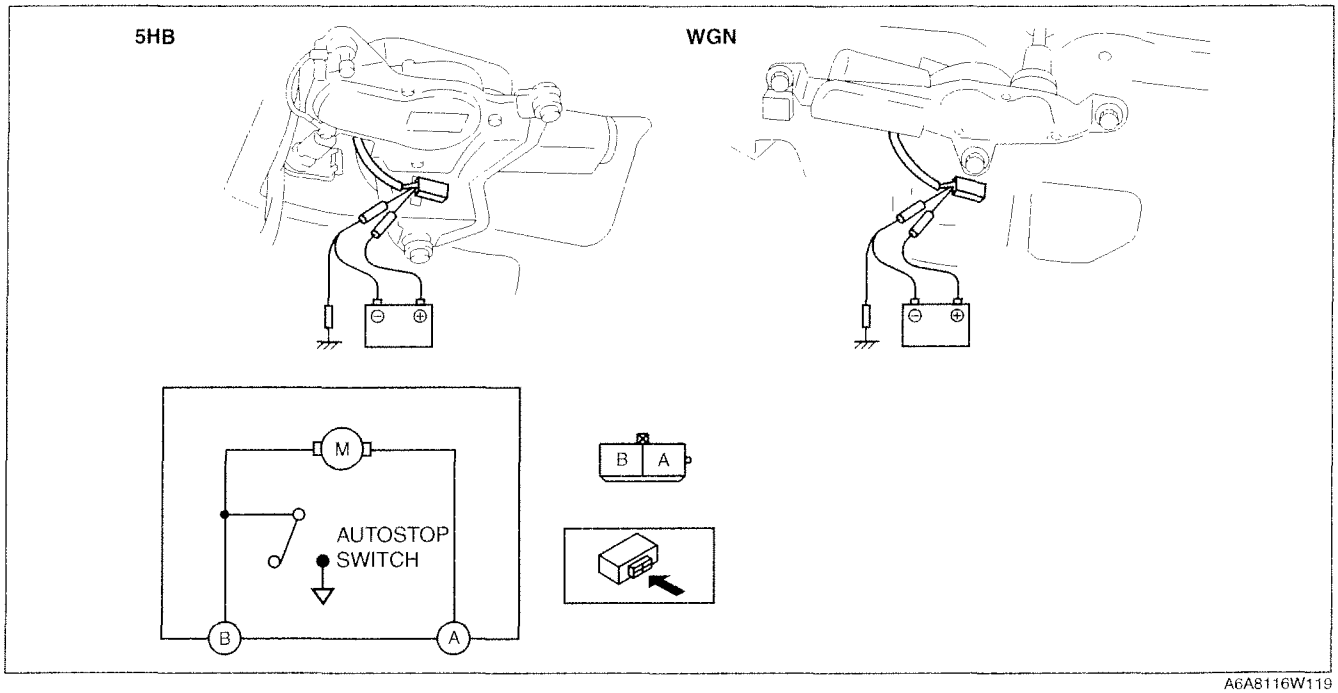


A6A8116W110

REAR WIPER MOTOR INSPECTION [5HB, WGN]

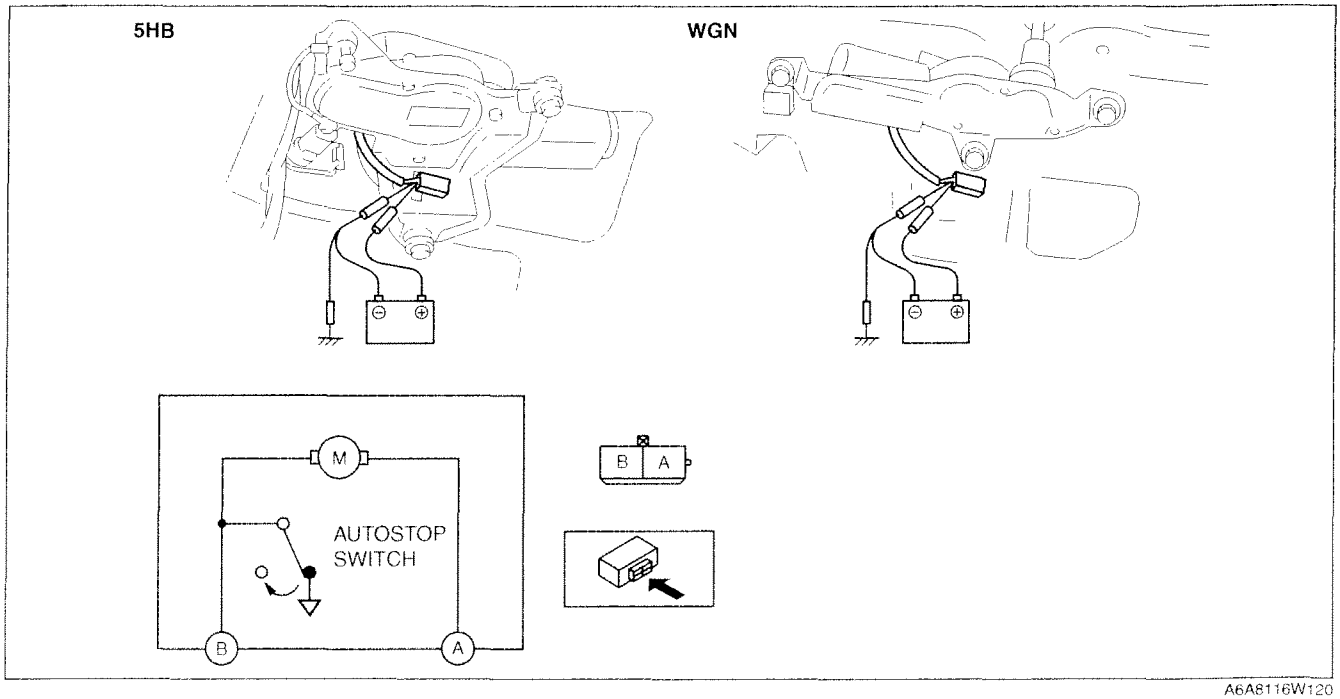
C6U091967450W02

1. Disconnect the negative battery cable.
2. Remove the liftgate lower trim. (See 09–17–20 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION [5HB, WGN].)
3. Disconnect the rear wiper motor connector.
4. Connect battery positive voltage to the rear wiper motor terminal A, and ground the rear wiper motor terminal B to a bare metal part of the vehicle.
5. Verify that the rear wiper motor operates.



A6A8116W119

6. Disconnect the ground to the terminal B while the rear wiper is operating.
7. Verify that the rear wiper stops in the park position.



A6A8116W120

- If not as specified, replace the rear wiper motor.

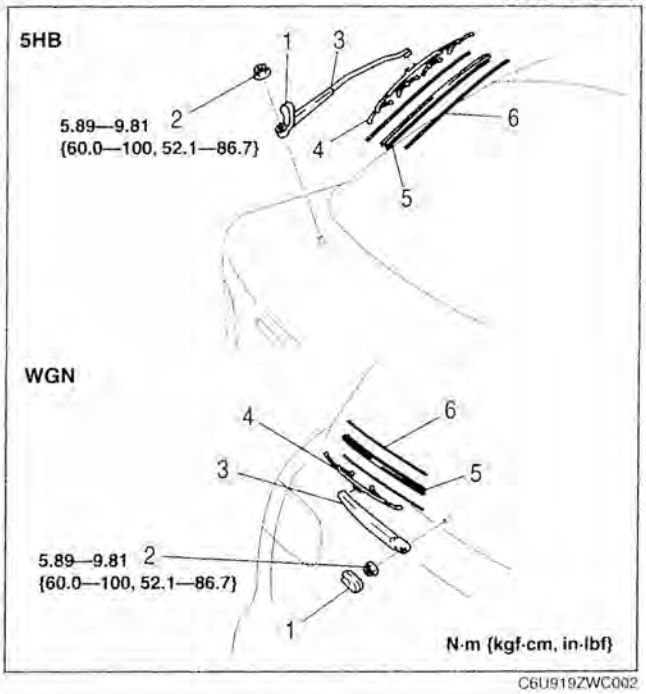
REAR WIPER ARM AND BLADE REMOVAL/INSTALLATION [5HB, WGN]

C6U091967420W01

1. Remove in the order indicated in the table.

1	Cap
2	Nut
3	Rear wiper arm (See 09–19–13 Rear Wiper Arm Installation Note)
4	Rear wiper blade
5	Rubber brush
6	Backing plate

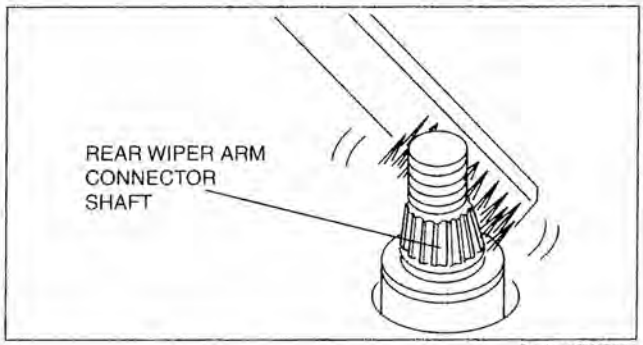
2. Install in the reverse order of removal.
3. Adjust the rear wiper arm and blade. (See 09–19–13 REAR WIPER ARM AND BLADE ADJUSTMENT [5HB, WGN].)



C6U919ZWC002

Rear Wiper Arm Installation Note

1. Clean the rear wiper arm connector shaft using a wire brush before installing the rear wiper arm.



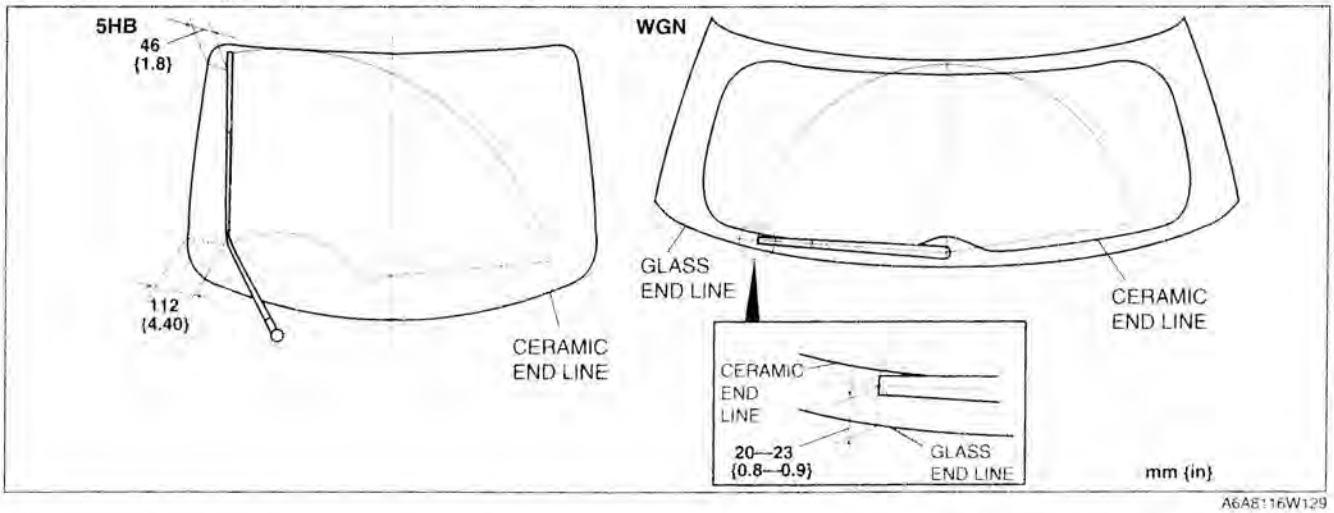
C6U919ZWC001

09–19

REAR WIPER ARM AND BLADE ADJUSTMENT [5HB, WGN]

C6U091967420W02

1. Operate the rear wiper motor to set the wiper in the park position.
2. Set the rear wiper arm onto the ceramic end line.

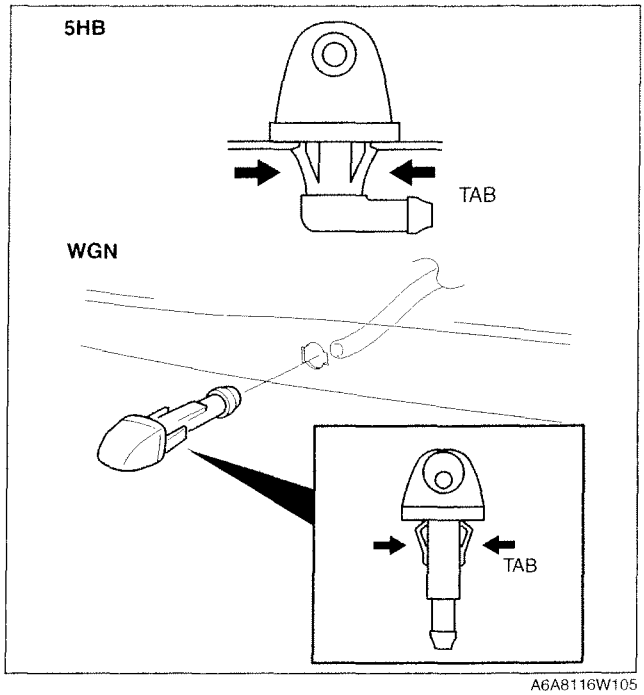


A6A8116W129

REAR WASHER NOZZLE REMOVAL/INSTALLATION [5HB, WGN]

C6U091967511W01

1. Disconnect the negative battery cable.
2. Remove the liftgate upper trim. (See 09–17–18 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION [5HB, WGN].)
3. Remove the high-mount brake light (In-vehicle-type). (WGN)
4. Remove the rear washer hose from the rear washer nozzle.
5. Squeeze the tabs of the rear washer nozzle.
6. Pull the rear washer nozzle out to remove it.
7. Install in the reverse order of removal.
8. Adjust the rear washer nozzle. (See 09–19–14 REAR WASHER NOZZLE ADJUSTMENT [5HB, WGN].)

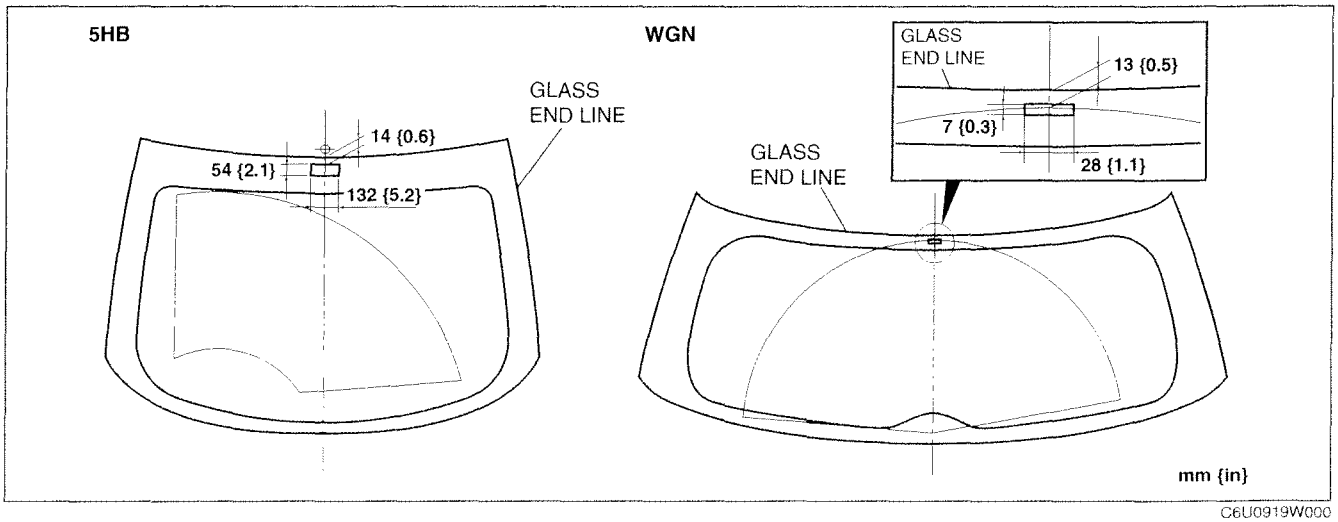


A6A8116W105

REAR WASHER NOZZLE ADJUSTMENT [5HB, WGN]

C6U091967511W02

1. Insert a needle or an equivalent tool into the spray hole of the rear washer nozzle and adjust the nozzle direction as shown.



C6U0919W000

REAR WASHER NOZZLE CLEANING [5HB, WGN]

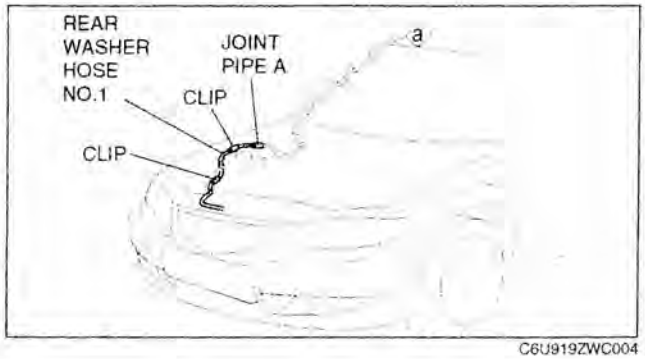
C6U091967511W03

1. Clean the rear washer nozzle. (See 09–19–9 WINDSHIELD WASHER NOZZLE CLEANING.)

REAR WASHER HOSE REMOVAL/INSTALLATION [5HB, WGN]

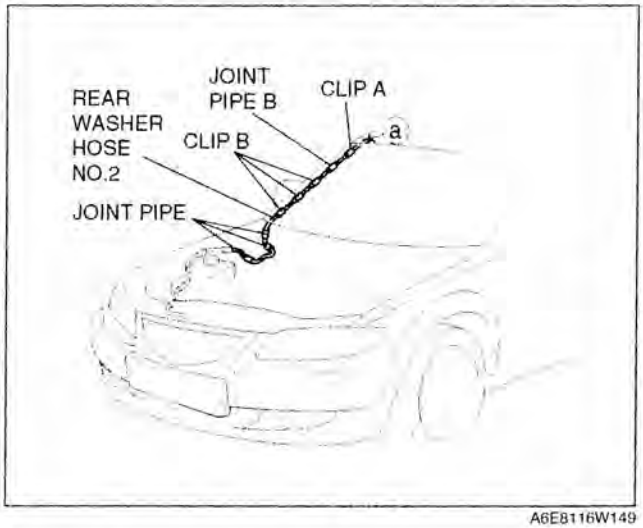
C6U091967471W01

1. Disconnect the negative battery cable.
2. Remove the washer tank. (See 09–19–6 WASHER TANK REMOVAL/INSTALLATION [5HB, WGN].)
3. Partially peel off the right side mud guard.
4. Remove rear washer hose No.1 from the clips.
5. Remove rear washer hose No.1 and joint pipe A.
6. Remove the A-pillar trim. (See 09–17–9 A-PILLAR TRIM REMOVAL/INSTALLATION.)



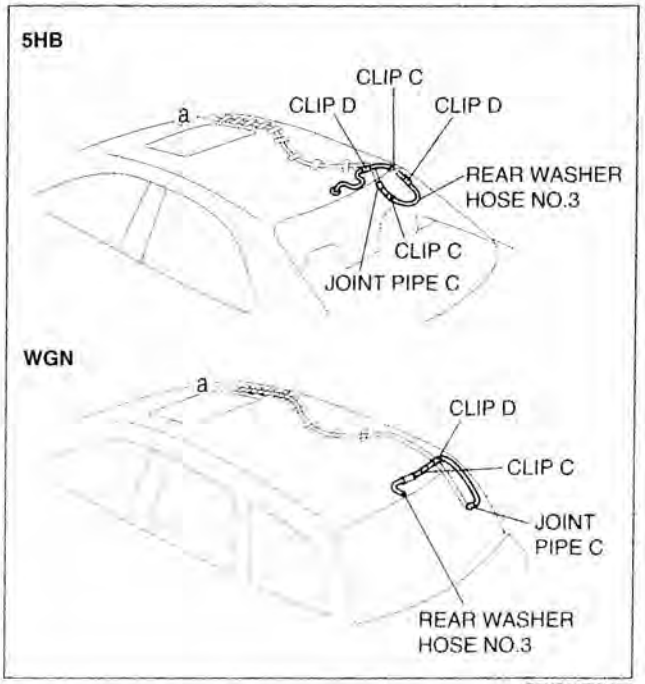
C6U919ZWC004

7. Remove rear washer hose No.2 from clip A.
8. Remove clips B from the body.
9. Remove rear washer hose No.2 and joint pipes B.
10. Remove the C-pillar trim. (See 09–17–12 C-PILLAR TRIM REMOVAL/INSTALLATION.) (5HB)
11. Remove the D-pillar trim. (WGN)
12. Remove the liftgate upper trim. (See 09–17–18 LIFTGATE UPPER TRIM REMOVAL/ INSTALLATION [5HB, WGN].)



A6E8116W149

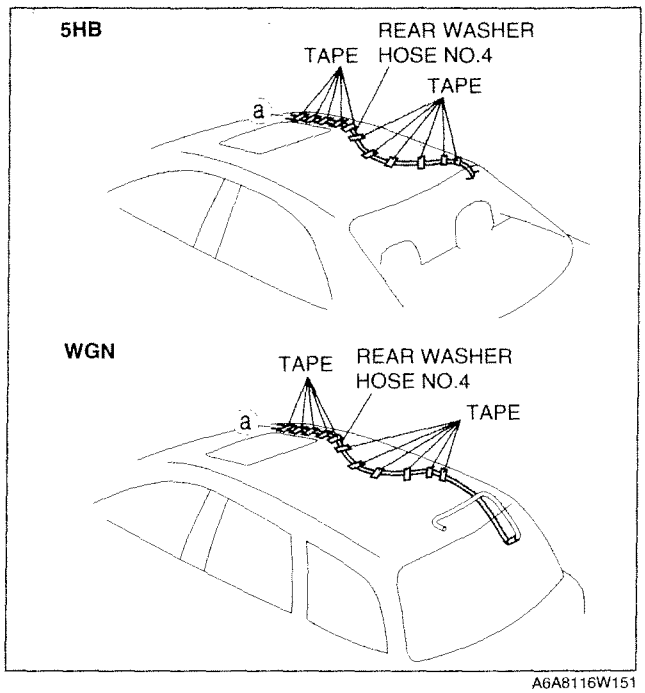
13. Remove rear washer hose No.3 from clip C.
14. Remove clips D from the body. (5HB)
15. Remove rear washer hose No.3 and joint pipe C.
16. Remove the headliner. (See 09–17–21 HEADLINER REMOVAL/INSTALLATION.)



C6U919ZW050

09–19

17. Remove the tape from rear washer hose No.4.
18. Install in the reverse order of removal.



A6A8116W151

INTERMITTENT REAR WIPER RELAY REMOVAL/INSTALLATION [5HB, WGN]

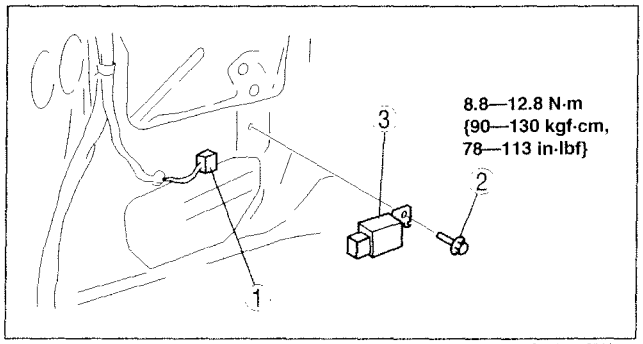
C6U091966810W01

5HB

1. Disconnect the negative battery cable.
2. Remove the trunk side trim. (See 09–17–14 TRUNK SIDE TRIM REMOVAL/INSTALLATION)
3. Remove in the order indicated in the table.

1	Connector
2	Bolt
3	Intermittent rear wiper relay

4. Install in the reverse order of removal.



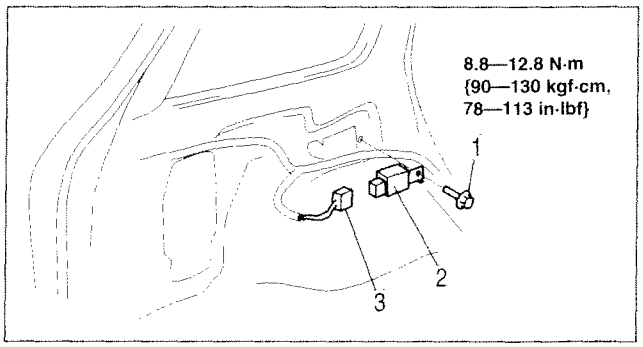
C6U919ZW008

WGN

1. Disconnect the negative battery cable.
2. Remove the trunk side trim. (See 09–17–14 TRUNK SIDE TRIM REMOVAL/INSTALLATION)
3. Remove in the order indicated in the table.

1	Bolt
2	Intermittent rear wiper relay
3	Connector

4. Install in the reverse order of removal.



C6U919ZW009

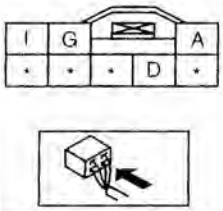
INTERMITTENT REAR WIPER RELAY INSPECTION [5HB, WGN]

C6U091966810W02

1. Connect the connector to the intermittent rear wiper relay.
2. Connect the negative battery cable.
3. Measure the voltage at the intermittent rear wiper relay using a voltmeter.
   - When inspecting terminal D for continuity, disconnect the intermittent rear wiper relay connector.
4. If the value are not as specified in the Terminal Voltage List (Reference), inspect the parts under "Action" and related wiring harnesses.
5. If the system does not work properly even though the parts or related wiring harnesses do not have any malfunction, replace the intermittent rear wiper relay.

Terminal Voltage Table (Reference)

INTERMITTENT REAR WIPER RELAY
HARNESS-SIDE CONNECTOR



C6U919ZW011

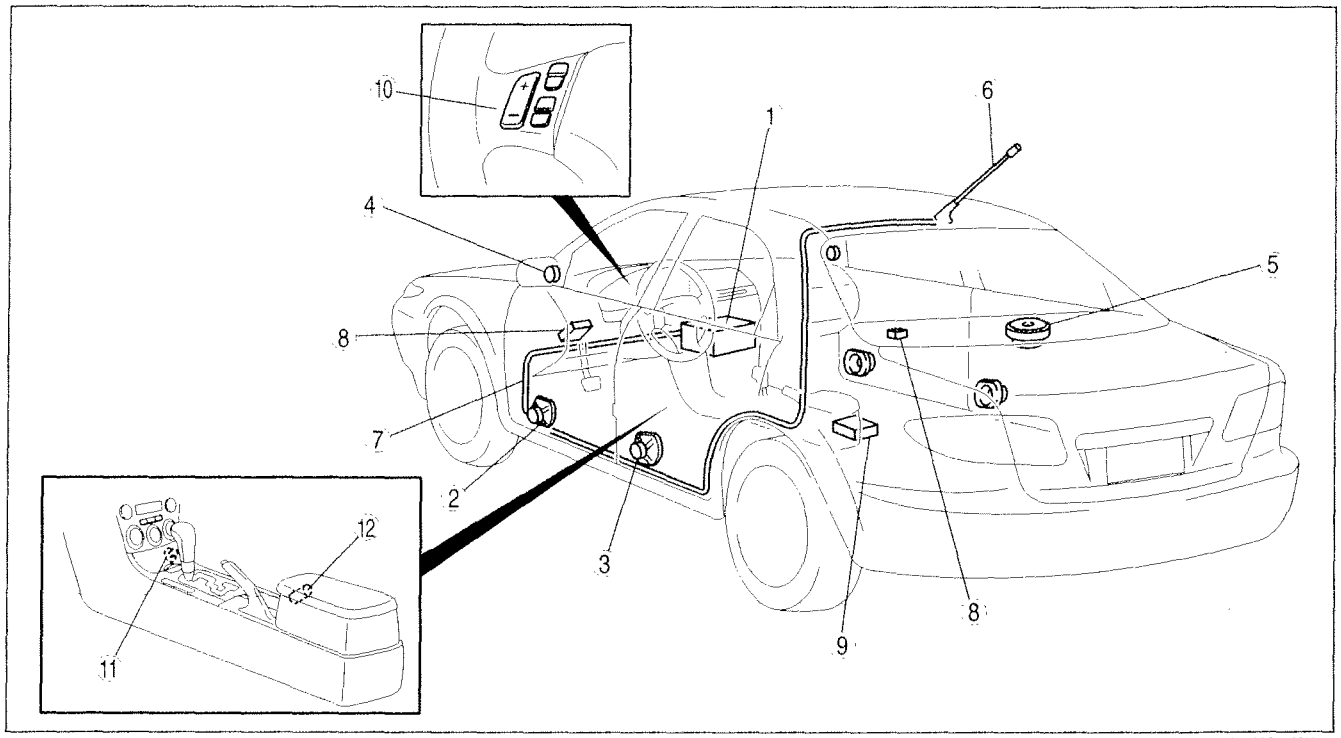
Terminal	Signal	Connected to	Test condition		Voltage (V)/ Continuity	Action
A	Autostop	Rear wiper motor	Rear wiper is operating (INT position or ON position)		Alternates between 0 and B+	• Inspect R. WIP 10 A fuse • Inspect wiper and washer switch (See 09–19–9 REAR WIPER AND WASHER SWITCH INSPECTION [5HB, WGN].) • Inspect rear wiper motor (See 09–19–12 REAR WIPER MOTOR INSPECTION [5HB, WGN].) • Inspect related harness
			Other		B+	
D	GND	GND	Under any condition: inspect for continuity to ground		Continuity detected	• Inspect GND • Inspect related harness
G	Rear wiper switch INT	Rear wiper switch	Ignition switch at ON position	Rear wiper switch at INT position	0	• Inspect R. WIP 10 A fuse • Inspect wiper and washer switch (See 09–19–9 REAR WIPER AND WASHER SWITCH INSPECTION [5HB, WGN].) • Inspect related harness
				• Rear wiper switch at OFF position • Rear wiper switch at ON position	B+	
I	IG 2	R. WIP 10 A fuse	Ignition switch at ON position		B+	• Inspect R. WIP 10 A fuse • Inspect related harness
			Other		0	

09–20 ENTERTAINMENT

ENTERTAINMENT LOCATION INDEX

C6U0920010660W01

Audio System



C6U0920W103

1	Audio unit (See 09–20–11 CENTER PANEL MODULE REMOVAL/INSTALLATION) (See 09–20–12 CENTER PANEL MODULE DISASSEMBLY/ASSEMBLY) (See 09–20–13 AUDIO UNIT DISASSEMBLY/ ASSEMBLY)
2	Front door speaker (See 09–20–3 FRONT DOOR SPEAKER REMOVAL/INSTALLATION) (See 09–20–3 FRONT DOOR SPEAKER INSPECTION)
3	Rear door speaker (See 09–20–4 REAR DOOR SPEAKER REMOVAL/ INSTALLATION) (See 09–20–4 REAR DOOR SPEAKER INSPECTION)
4	Tweeter (See 09–20–5 TWEETER REMOVAL/ INSTALLATION) (See 09–20–5 TWEETER INSPECTION)
5	Woofer (See 09–20–5 WOOFER REMOVAL/ INSTALLATION [4SD]) (See 09–20–6 WOOFER REMOVAL/ INSTALLATION [5HB, WGN]) (See 09–20–6 WOOFER INSPECTION [4SD]) (See 09–20–7 WOOFER INSPECTION [5HB, WGN])
6	Center roof antenna (See 09–20–7 CENTER ROOF ANTENNA REMOVAL/INSTALLATION) (See 09–20–7 CENTER ROOF ANTENNA INSPECTION)
7	Antenna feeder (See 09–20–8 ANTENNA FEEDER LOCATION [4SD]) (See 09–20–8 ANTENNA FEEDER LOCATION [5HB]) (See 09–20–9 ANTENNA FEEDER LOCATION [WGN]) (See 09–20–9 FRONT ANTENNA FEEDER INSPECTION) (See 09–20–10 REAR ANTENNA FEEDER INSPECTION [4SD]) (See 09–20–10 REAR ANTENNA FEEDER INSPECTION [5HB]) (See 09–20–11 REAR ANTENNA FEEDER INSPECTION [WGN])
8	Condenser (See 09–20–14 CONDENSER REMOVAL/ INSTALLATION [4SD]) (See 09–20–15 CONDENSER REMOVAL/ INSTALLATION [5HB]) (See 09–20–15 CONDENSER REMOVAL/ INSTALLATION [WGN])
9	Audio amplifier (See 09–20–13 AUDIO AMPLIFIER REMOVAL/ INSTALLATION)
10	Audio control switch (See 09–20–13 AUDIO CONTROL SWITCH REMOVAL/INSTALLATION) (See 09–20–14 AUDIO CONTROL SWITCH INSPECTION)
11	Cigarette lighter (See 09–20–15 CIGARETTE LIGHTER REMOVAL/ INSTALLATION) (See 09–20–16 CIGARETTE LIGHTER INSPECTION)

12	Accessory socket (See 09–20–17 ACCESSORY SOCKET REMOVAL/INSTALLATION) (See 09–20–17 ACCESSORY SOCKET INSPECTION)

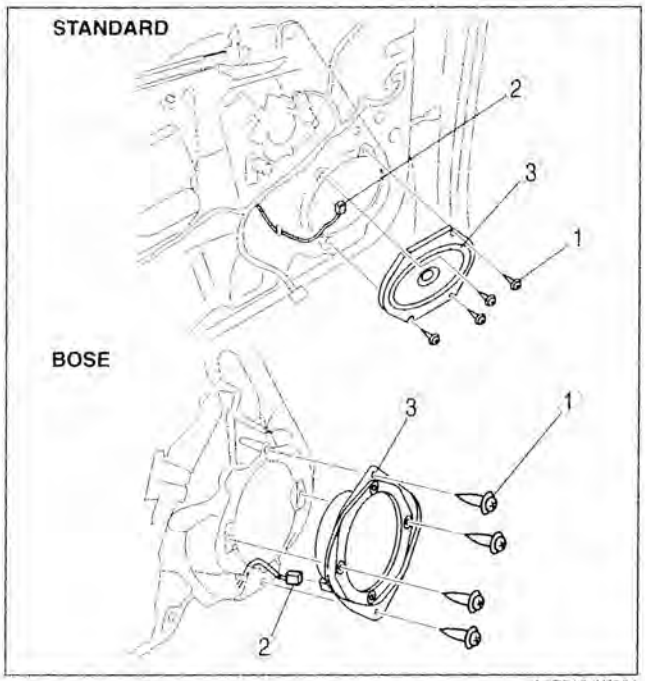
FRONT DOOR SPEAKER REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the front door trim.
3. Remove in the order indicated in the table.

1	Screw
2	Connector
3	Front door speaker (See 09–20–3 Front Door Speaker Installation Note)

4. Install in the reverse order of removal.

C6U092066960W01



A6E8124W001

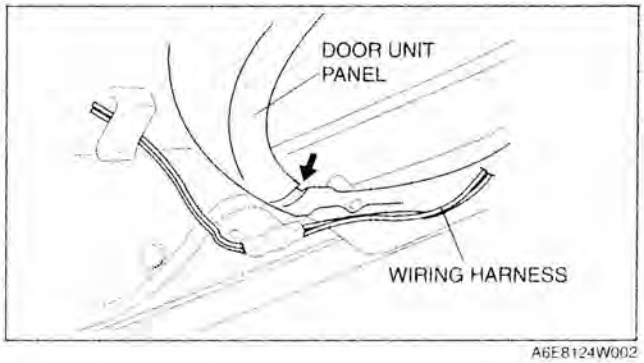
09–20

Front Door Speaker Installation Note

1. Attach the speaker with the wiring harness placed in the groove of the door unit panel.

Caution

- **If the speaker is attached with the harness placed outside of the groove, the wiring harness might be broken.**

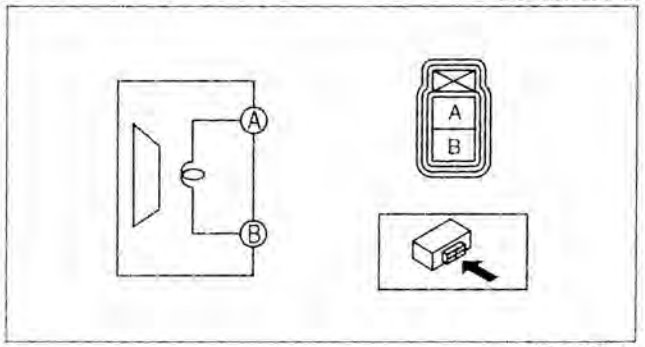


A6E8124W002

FRONT DOOR SPEAKER INSPECTION

1. Inspect for resistance between the front door speaker terminals using an ohmmeter.
   - If not as specified, replace the front door speaker.

C6U092066960W02



A6E8124W040

○WW○ : Resistance

Test condition	Terminal A	Terminal B	
Under any condition	○	○	R

R: 4 ohms (standard)
1.8 ohms (BOSE)

B6U0920W602

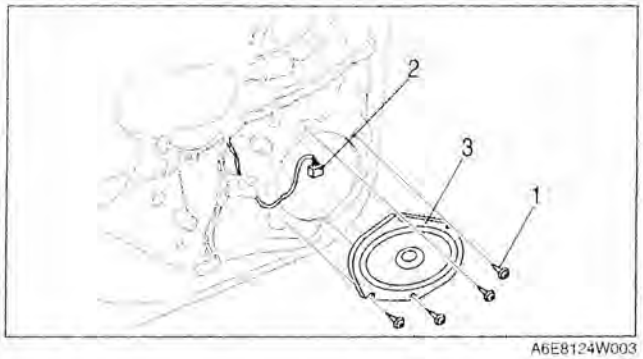
2. To verify that the front door speaker outputs sound, apply voltage to the front door speaker and release using a 1.5 V battery.
   - If it does not output sound, replace the front door speaker.

REAR DOOR SPEAKER REMOVAL/INSTALLATION

C6U092066964W01

1. Disconnect the negative battery cable.
2. Remove the rear door trim.
3. Remove in the order indicated in the table.

1	Screw
2	Connector
3	Rear door speaker (See 09–20–4 Rear Door Speaker Installation Note)



A6E8124W003

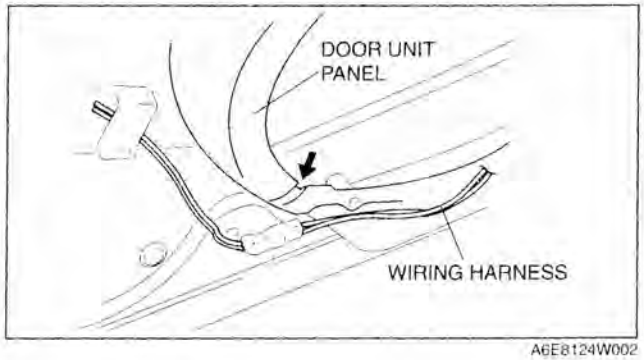
4. Install in the reverse order of removal.

Rear Door Speaker Installation Note

1. Attach the speaker with the wiring harness placed in the groove of the door unit panel.

Caution

- **If the speaker is attached with the harness placed outside of the groove, the wiring harness might be broken.**

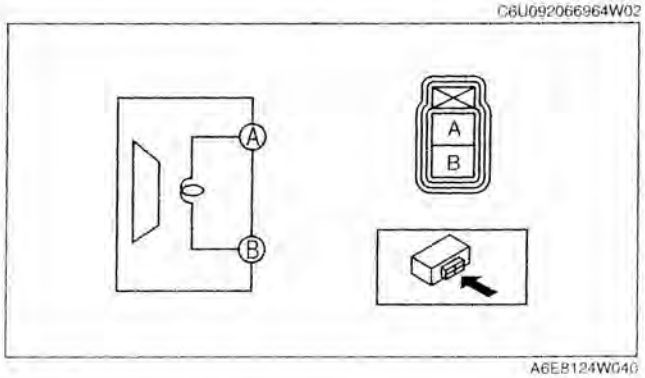


A6E8124W002

REAR DOOR SPEAKER INSPECTION

C6U092066964W02

1. Inspect for resistance between the rear door speaker terminals using an ohmmeter.
   - If not as specified, replace the rear door speaker.



A6E8124W040

○WW○ : Resistance

Test condition	Terminal	
	A	B
Under any condition	○——WW——○	R

R: 4 ohms (standard)
2 ohms (BOSE)

A6E8124W032

2. To verify that the rear door speaker outputs sound, apply voltage to the rear door speaker and release using a 1.5 V battery.
   - If it does not output sound, replace the rear door speaker.

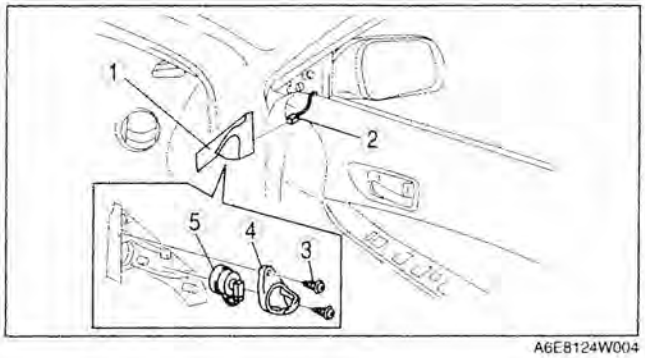
TWEETER REMOVAL/INSTALLATION

C6U092068966W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Inner garnish
2	Connector
3	Screw
4	Cover
5	Tweeter

3. Install in the reverse order of removal.



A6E8124W004

TWEETER INSPECTION

C6U092068966W02

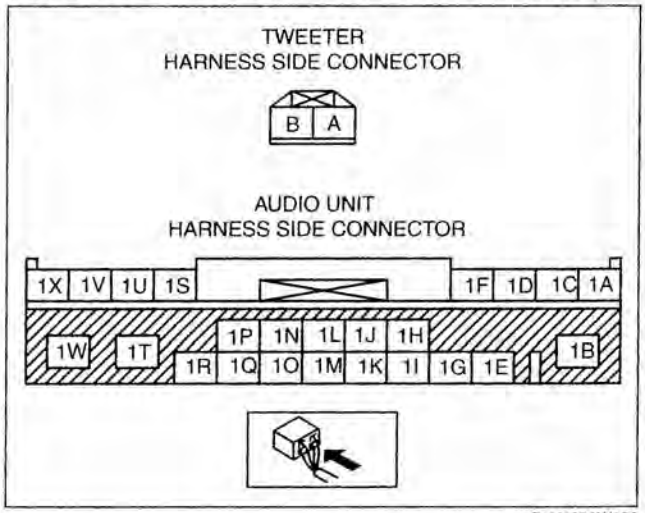
1. To verify the front door speaker outputs sound.
   - If it does output sound, then go to next step.
   - If it does not output sound, inspect the front door speaker and related wiring harnesses. (See 09–20–3 FRONT DOOR SPEAKER INSPECTION.)
2. Remove the center panel module. (See 09–20–11 CENTER PANEL MODULE REMOVAL/INSTALLATION.)
3. Inspect for continuity between the tweeter connector terminals and audio unit connector terminals using an ohmmeter.
   - If there is no continuity, replace the related wiring harnesses.
   - If there is continuity, replace the tweeter.

O—O: Continuity

Test condition	Terminal			
	Audio unit connector		Tweeter connector	
	[1D], (1A)	[1C], (1F)	A	B
Under any condition	O		O	
		O		O

[ ]: LH, ( ): RH

C6U0920W105



B6U0920W603

09–20

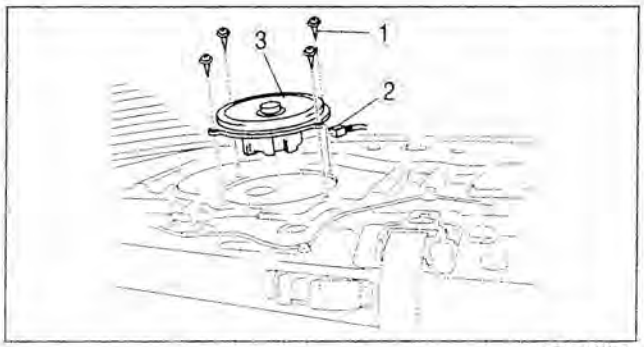
WOOFER REMOVAL/INSTALLATION [4SD]

C6U092066967W01

1. Disconnect the negative battery cable.
2. Remove the rear package trim.
3. Remove in the order indicated in the table.

1	Screw
2	Connector
3	Woofer

4. Install in the reverse order of removal.



A6E8124W005

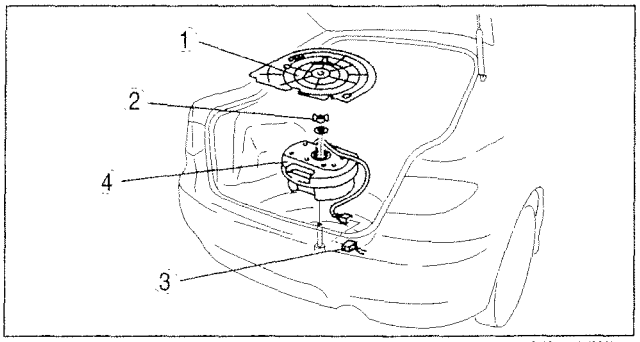
WOOFER REMOVAL/INSTALLATION [5HB, WGN]

C6U092066967W03

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Temporary spare tire cover
2	Wing bolt
3	Connector
4	Woofer

3. Install in the reverse order of removal.



A6E8124W006

WOOFER INSPECTION [4SD]

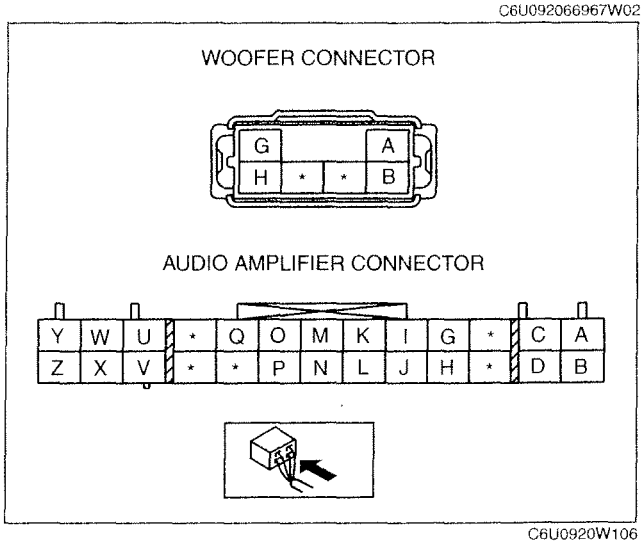
C6U092066967W02

1. Inspect for continuity between the audio amplifier connector terminals and woofer connector terminals using an ohmmeter.
   - If not as specified, replace the related wiring harnesses.

O—O: Continuity

Test condition	Terminal			
	Audio amplifier connector		Woofer connector	
	O	P	G	H
Under any condition	O		O	
		O		O

B6U0920W003



C6U0920W106

2. Verify that there is battery positive voltage at the woofer connector terminal A using a voltmeter.
   - If not as specified, replace the related wiring harness.
3. Inspect continuity between the woofer connector terminal B and body ground using an ohmmeter.
   - If not as specified, replace the related wiring harness.
   - If as specified, replace the woofer.

WOOFER INSPECTION [5HB, WGN]

1. Inspect for continuity between the audio amplifier connector terminals and woofer connector terminals using an ohmmeter.
   - If not as specified, replace the related wiring harnesses.

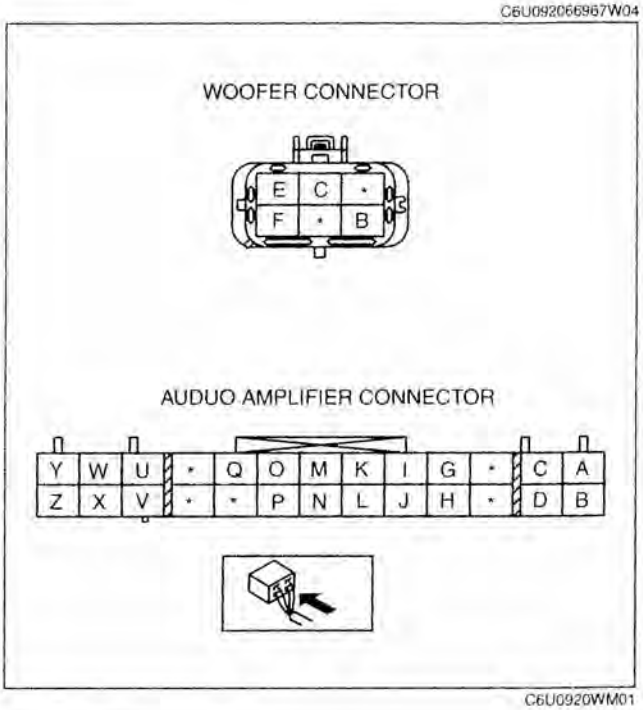
O—O: Continuity

Test condition	Terminal			
	Audio amplifier connector		Woofer connector	
	O	P	E	F
Under any condition	O		O	
		O		O

C6U0920WM02

2. Verify that there is battery positive voltage at the woofer connector terminal C using a voltmeter.
   - If not as specified, replace the related wiring harness.
3. Inspect continuity between the woofer connector terminal B and body ground using an ohmmeter.
   - If not as specified, replace the related wiring harness.
   - If as specified, replace the woofer.

C6U092066967W04



C6U0920WM01

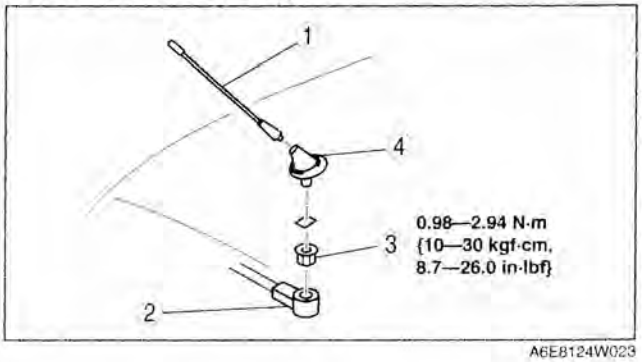
CENTER ROOF ANTENNA REMOVAL/INSTALLATION

C6U092066939W01

1. Disconnect the negative battery cable.
2. Remove the headliner. (See 09–17–21 HEADLINER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Antenna rod
2	Antenna feeder
3	Nut
4	Center roof antenna

4. Install in the reverse order of removal.
5. After installation, verify that the rubber of the center roof antenna is installed to the roof panel with no space between them.



A6E8124W023

CENTER ROOF ANTENNA INSPECTION

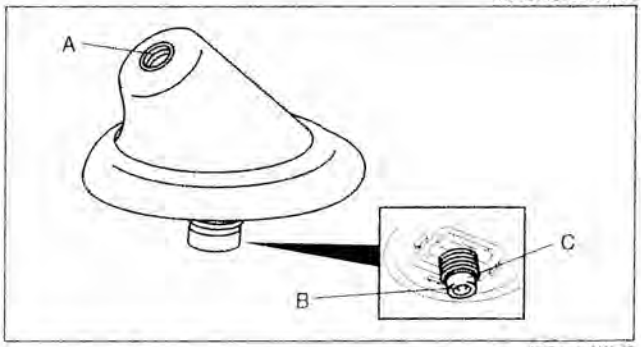
1. Verify that there is no continuity between the center roof antenna terminals A and C using an ohmmeter.
2. Inspect for continuity between the center roof antenna terminals using an ohmmeter.
   - If not as specified, replace the center roof antenna.

O—O: Continuity

Test condition	Terminal	
	A	B
Under any condition	O	O

A6E8124W031

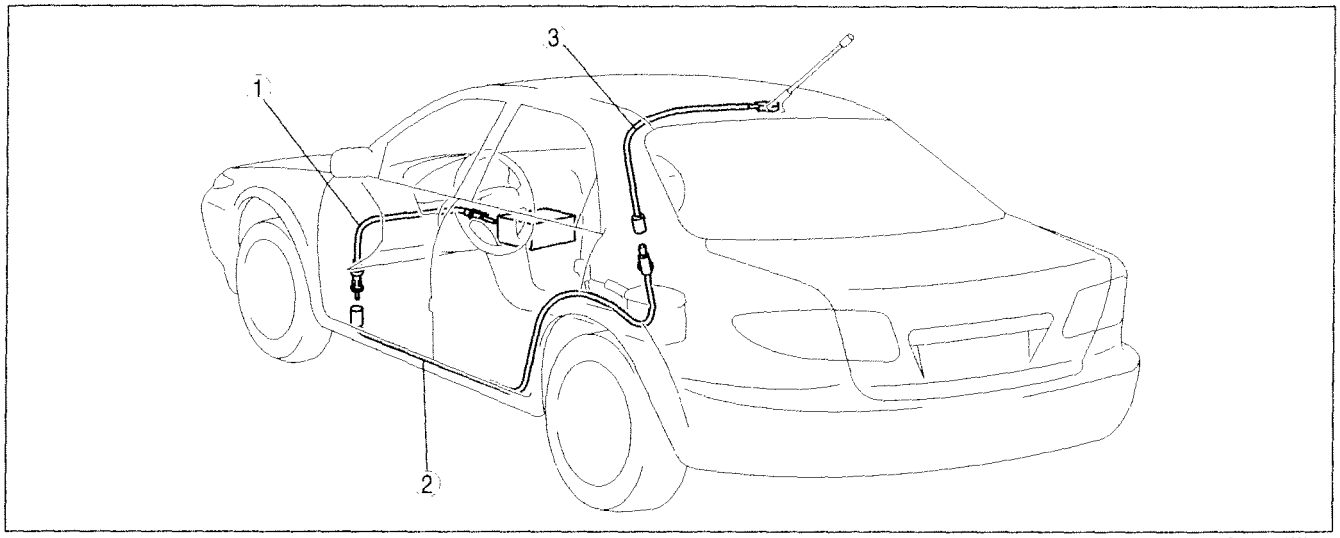
C6U092066939W02



A6E8124W048

ANTENNA FEEDER LOCATION [4SD]

C6U092066941W01



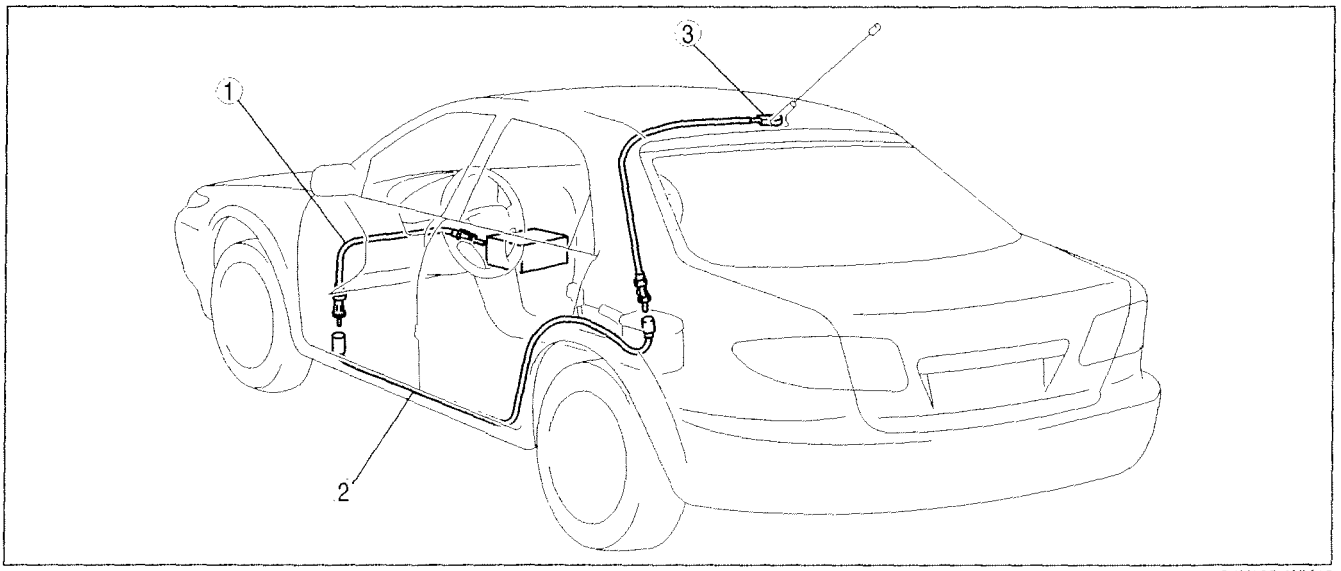
C6U0920W102

1	Front antenna feeder
2	Rear antenna feeder No.1

3	Rear antenna feeder No.2

ANTENNA FEEDER LOCATION [5HB]

C6U092066940W04



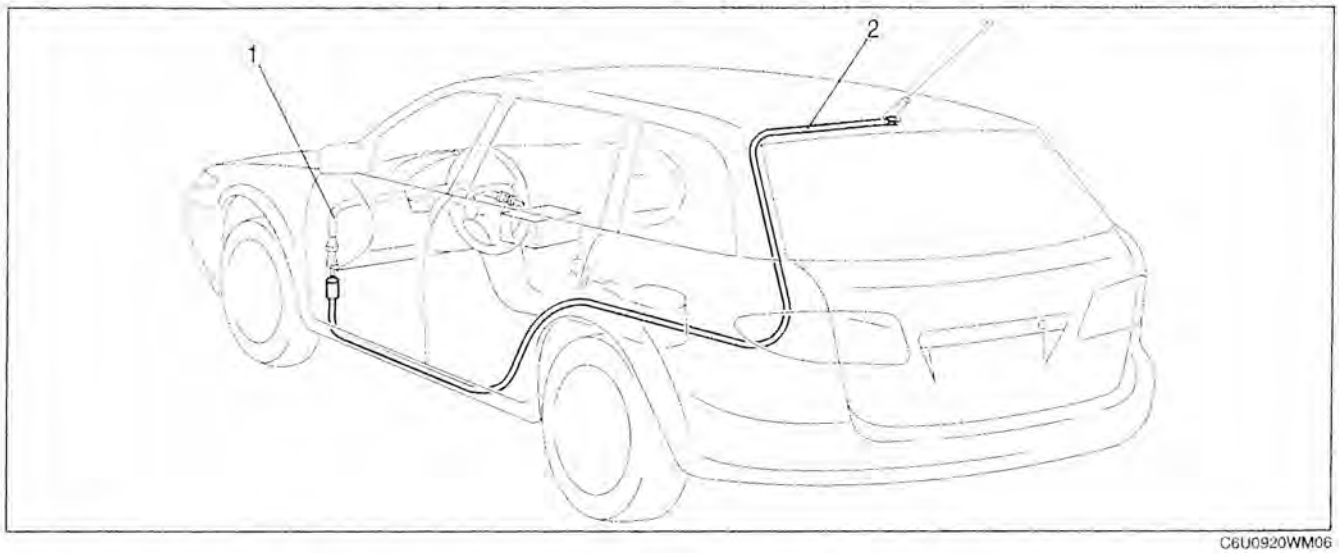
C6U0920WM05

1	Front antenna feeder
2	Rear antenna feeder No.1

3	Rear antenna feeder No.2

ANTENNA FEEDER LOCATION [WGN]

C6U092066940W03



C6U0920WM06

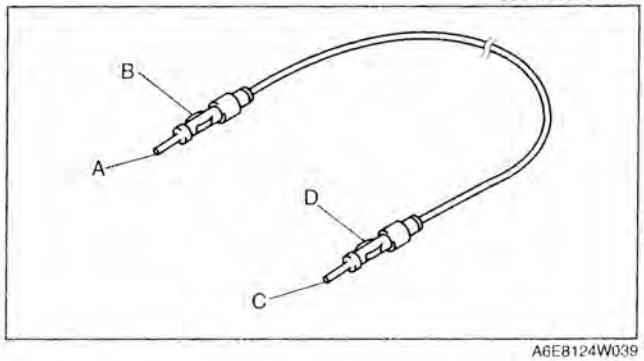
1	Front antenna feeder

2	Rear antenna feeder

FRONT ANTENNA FEEDER INSPECTION

1. Verify that there is no continuity between the front antenna feeder terminals A and B using an ohmmeter.
2. Inspect for continuity between the front antenna feeder terminals using an ohmmeter.
   - If not as specified, replace the instrument panel harness.

C6U092066941W02



A6E8124W039

○—○ : Continuity

Step	Terminal			
	A	B	C	D
1	○		○	
2		○		○

A6E8124W047

09–20

REAR ANTENNA FEEDER INSPECTION [4SD]

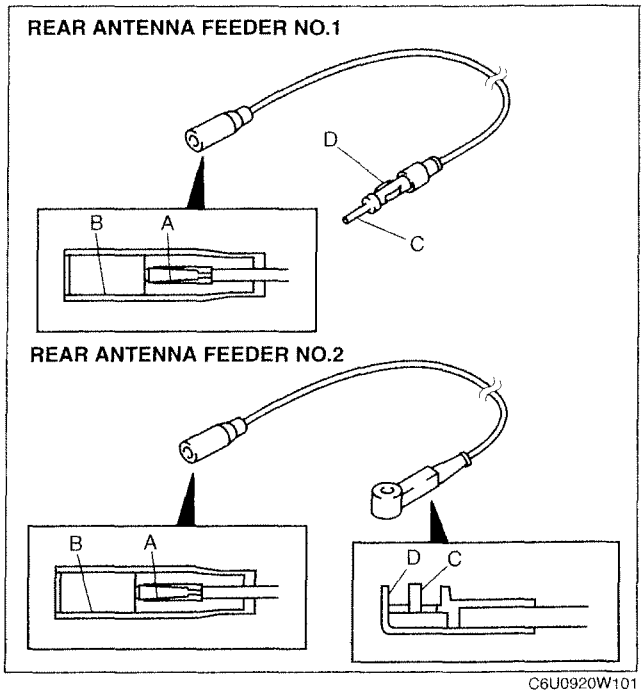
1. Verify that there is no continuity between antenna feeder terminals A and B using an ohmmeter.
2. Inspect for continuity between the antenna feeder terminals using an ohmmeter.
   - If not as specified, replace the rear harness.

○—○ : Continuity

Step	Terminal			
	A	B	C	D
1	○		○	
2		○		○

A6E8124W047

C6U092066942W01



C6U0920W101

REAR ANTENNA FEEDER INSPECTION [5HB]

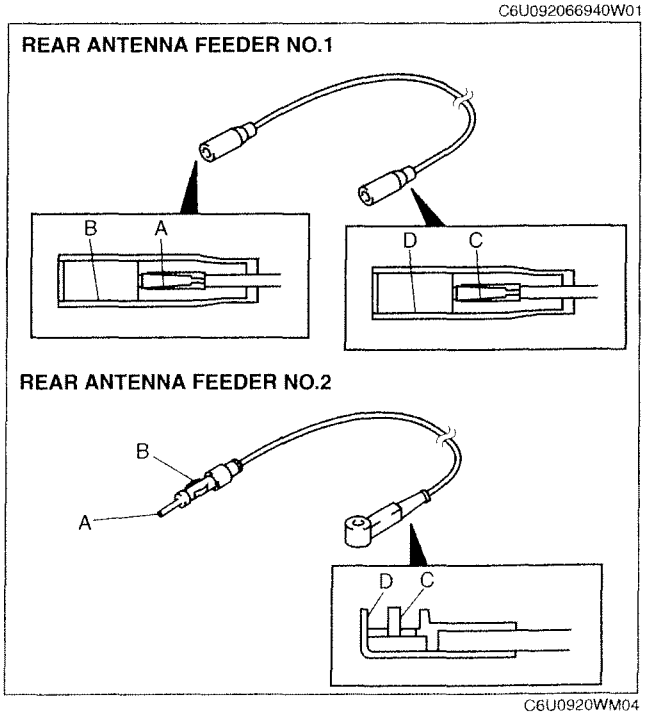
1. Verify that there is no continuity between antenna feeder terminals A and B using an ohmmeter.
2. Inspect for continuity between the antenna feeder terminals using an ohmmeter.
   - If not as specified, replace the rear harness.

○—○ : Continuity

Step	Terminal			
	A	B	C	D
1	○		○	
2		○		○

A6E8124W047

C6U092066940W01



C6U0920WM04

REAR ANTENNA FEEDER INSPECTION [WGN]

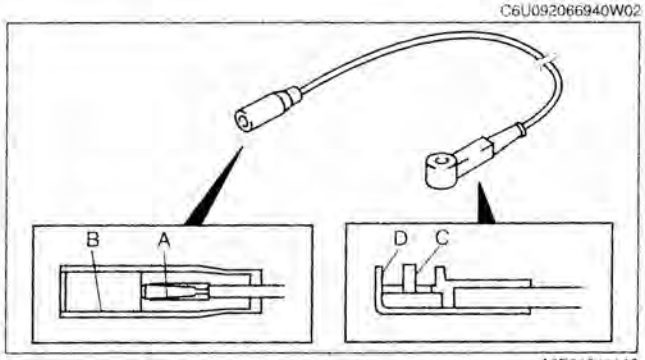
1. Verify that there is no continuity between antenna feeder terminals A and B using an ohmmeter.
2. Inspect for continuity between the antenna feeder terminals using an ohmmeter.
   - If not as specified, replace the rear harness.

O—O : Continuity

Step	Terminal			
	A	B	C	D
1	O		O	
2		O		O

A6E81241147

C6U092066940W02



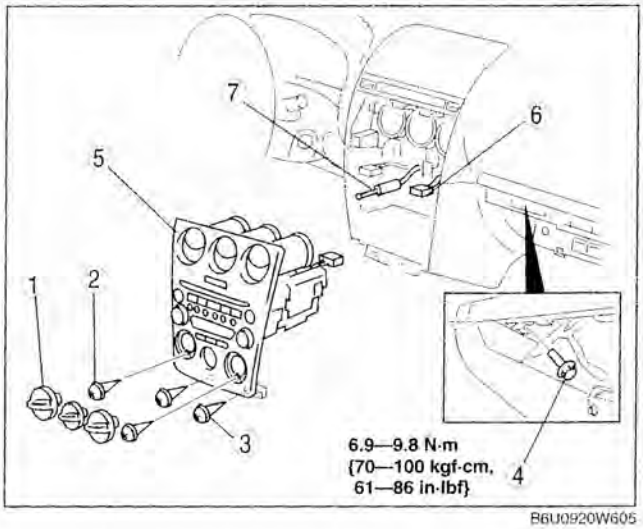
A6E81241142

CENTER PANEL MODULE REMOVAL/INSTALLATION

C6U092066900W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Remove the rear console.
4. Remove in the order indicated in the table.

1	Dial (manual A/C only)
2	Screw (manual A/C only)
3	Screw
4	Bolt (See 09–20–11 Bolt Removal Note)
5	Center panel module (See 09–20–12 Center Panel Module Removal Note)
6	Connector
7	Antenna feeder



B6U0920W605

5. Install in the reverse order of removal.

Caution

- **Make certain that the wiring harness and antenna feeder are not caught between the unit and dashboard. If the harness or the antenna feeder is caught between the unit and dashboard, it may cause trouble or malfunctions.**

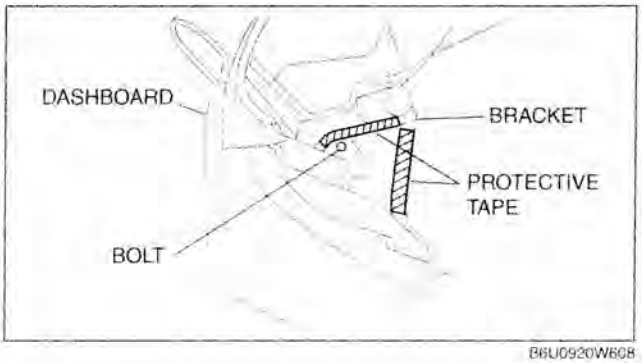
Bolt Removal Note

1. Attach protective tape to the bracket installed to the dashboard.

Caution

- **Removing the bolt without attaching protective tape to the bracket may cause injury to your hand. Always attach protective tape to the bracket when removing the bolt.**

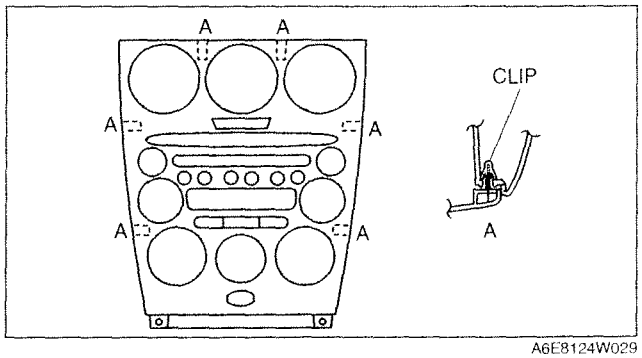
2. Remove the Bolt.



B6U0920W608

Center Panel Module Removal Note

1. Pull the center panel module toward you, then disengage clips A from the dashboard, and remove the center panel module.



A6E8124W029

CENTER PANEL MODULE DISASSEMBLY/ASSEMBLY

C6U092066900W02

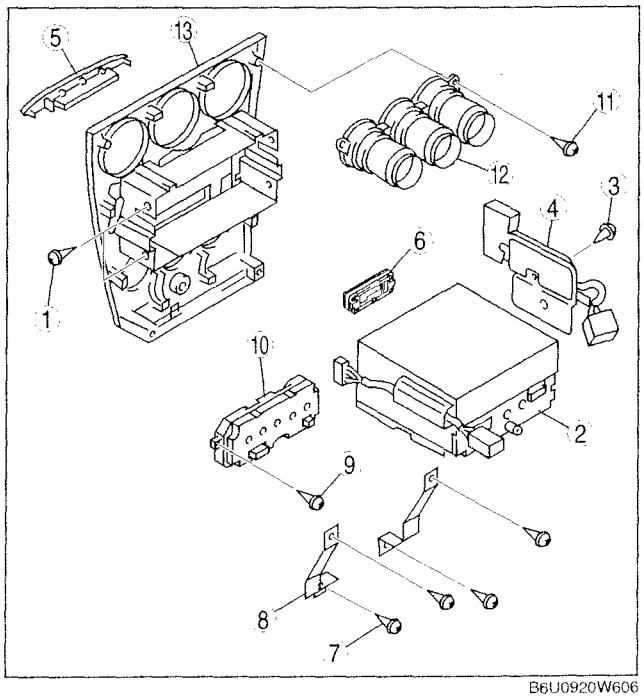
Caution

- **Before disassembling the center panel module, spread a cloth on the floor to put the disassembled parts on. This protects the surface of the panel from scratches or dirt.**

1. Remove the center panel module. (See 09–20–11 CENTER PANEL MODULE REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.

1	Screw
2	Audio unit
3	Screw
4	Circuit board (manual A/C only)
5	Cover (upper module)
6	Cover (lower module)
7	Screw
8	Bracket (full-auto A/C only)
9	Screw (full-auto A/C only)
10	Climate control unit (full-auto A/C only)
11	Screw
12	Ventilator grille
13	Center panel

3. Install in the reverse order of removal.



B6U0920W606

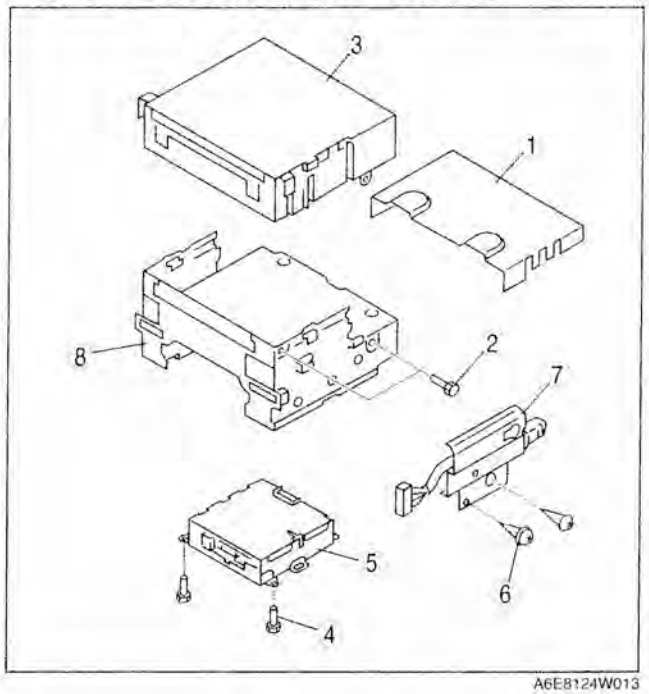
AUDIO UNIT DISASSEMBLY/ASSEMBLY

C6U092066900W03

1. Remove the audio unit. (See 09–20–12 CENTER PANEL MODULE DISASSEMBLY/ASSEMBLY.)
2. Disassemble in the order indicated in the table.

1	Cover (without upper module)
2	Screw
3	Upper module
4	Screw
5	Lower module
6	Screw
7	Wiring harness
8	Base unit

3. Assemble in the reverse order of disassembly.



A6E8124W013

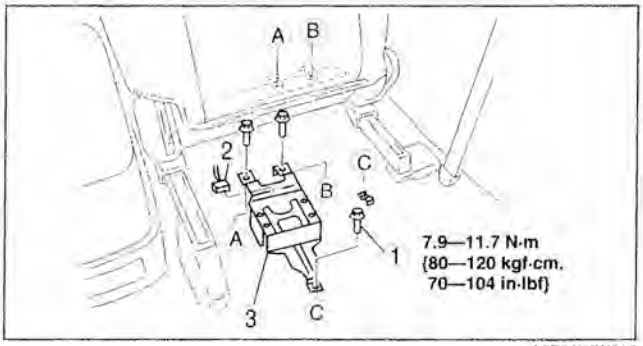
AUDIO AMPLIFIER REMOVAL/INSTALLATION

C6U092066910W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Audio amplifier

3. Install in the reverse order of removal.



A6E8124W010

AUDIO CONTROL SWITCH REMOVAL/INSTALLATION

C6U092000148W01

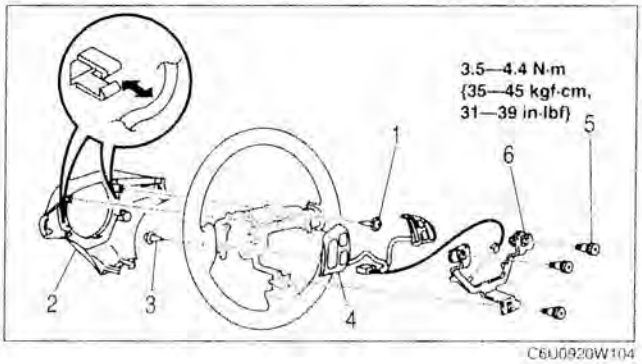
Note

- The audio control switch and the cruise control switch use a common connector.

1. Disconnect the negative battery cable.
2. Remove the driver-side air bag module. (See 08–10–6 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
3. Remove the steering wheel.
4. Remove in the order indicated in the table.

1	Screw
2	Cover
3	Screw
4	Audio control switch/cruise control switch
5	Bolt
6	Bracket

5. Install in the reverse order of removal.

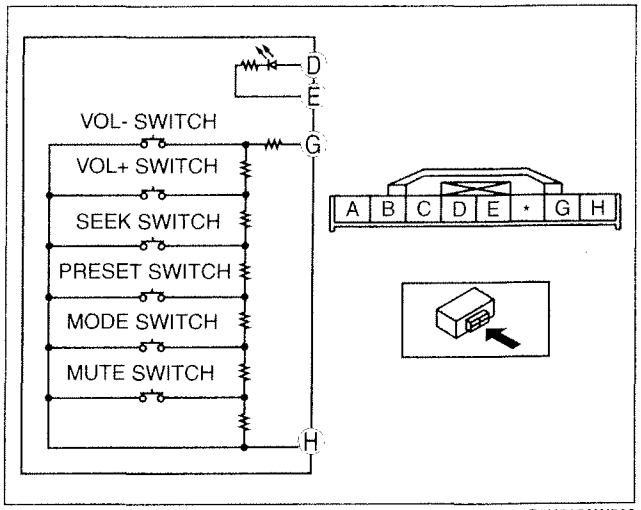


C6U0920W104

AUDIO CONTROL SWITCH INSPECTION

C6U092000148W02

1. Disconnect the negative battery cable.
2. Remove the driver-side air bag module. (See 08–10–6 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
3. Disconnect the audio control switch connector.
4. Measure the resistance and inspect for continuity between the cruise control switch terminals using an ohmmeter.
   - If not as specified, replace the cruise control switch.



B6U0920W503

O-W-O: Resistance O-▶|-O: Diode

Switch position	Terminal			
	D	E	G	H
VOL- switch held at on	O-▶|-O		O-W-O	R_1
VOL+ switch held at on	O-▶|-O		O-W-O	R_2
SEEK+ switch held at on	O-▶|-O		O-W-O	R_3
PRESET switch held at on	O-▶|-O		O-W-O	R_4
MODE switch held at on	O-▶|-O		O-W-O	R_5
MUTE switch held at on	O-▶|-O		O-W-O	R_6
Neutral	O-▶|-O		O-W-O	R_7

R_1: 51—56 ohms, R_2: 140—153 ohms
R_3: 287—314 ohms, R_4: 535—588 ohms
R_5: 987—1086 ohms, R_6: 1.94—2.13 kilohms
R_7: 4.08—5.29 kilohms

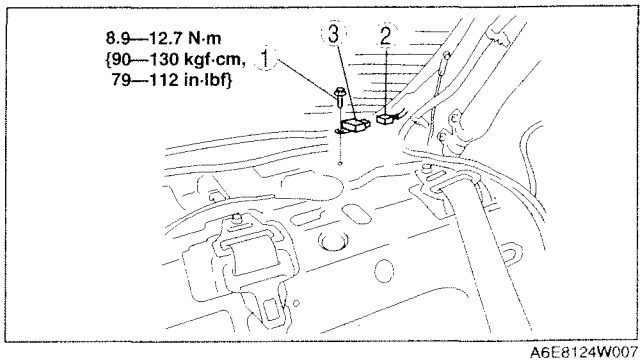
A6E8124W028

CONDENSER REMOVAL/INSTALLATION [4SD]

C6U092066869W01

1. Disconnect the negative battery cable.
2. Remove the rear package trim.
3. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Condenser



A6E8124W007

4. Install in the reverse order of removal.

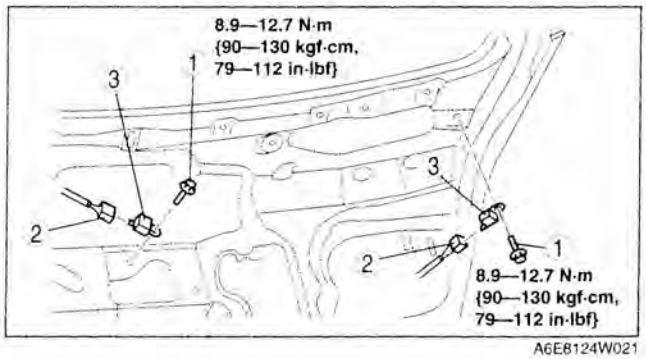
CONDENSER REMOVAL/INSTALLATION [5HB]

C6U092066869W04

1. Disconnect the negative battery cable.
2. Remove the liftgate lower trim.
3. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Condenser

4. Install in the reverse order of removal.



A6E8124W021

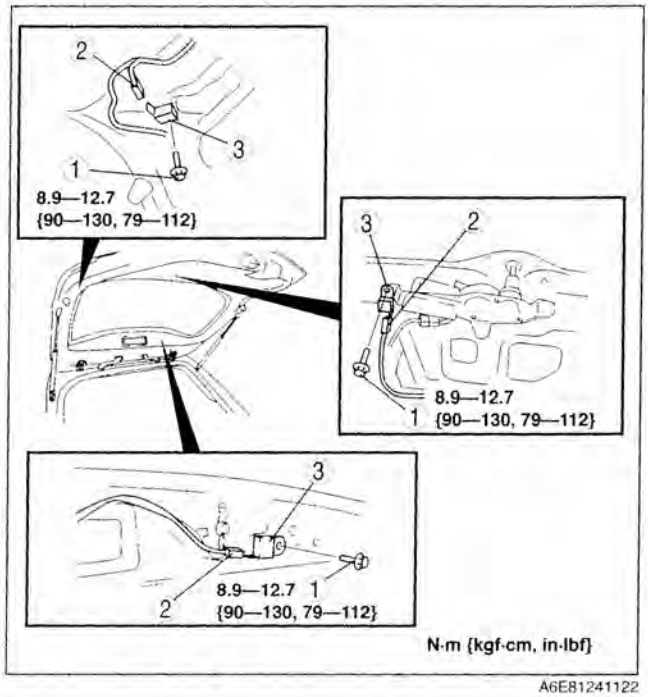
CONDENSER REMOVAL/INSTALLATION [WGN]

C6U092066869W05

1. Disconnect the negative battery cable.
2. Remove the liftgate lower trim.
3. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Condenser

4. Install in the reverse order of removal.



A6E81241122

09–20

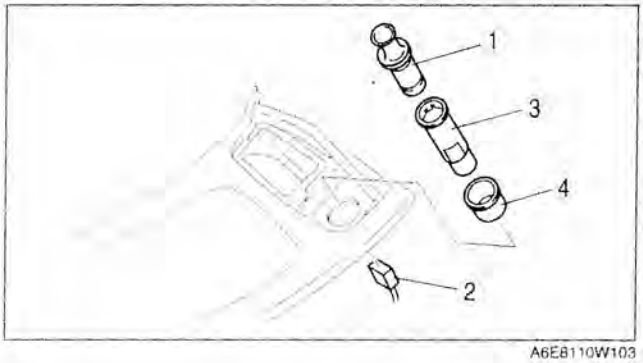
CIGARETTE LIGHTER REMOVAL/INSTALLATION

C6U092067000W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Cigarette lighter plug
2	Connector
3	Socket (See 09–20–16 Socket Removal Note)
4	Ring (See 09–20–16 Ring Removal Note)

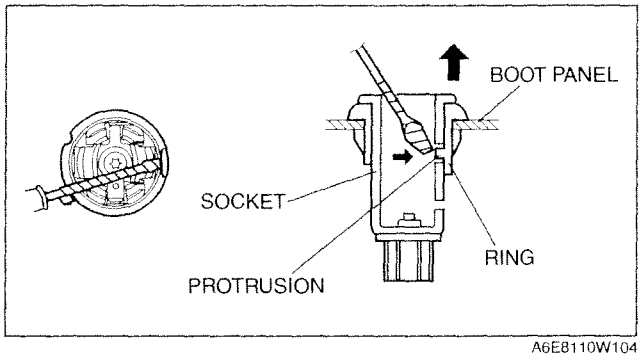
3. Install in the reverse order of removal.



A6E8110W103

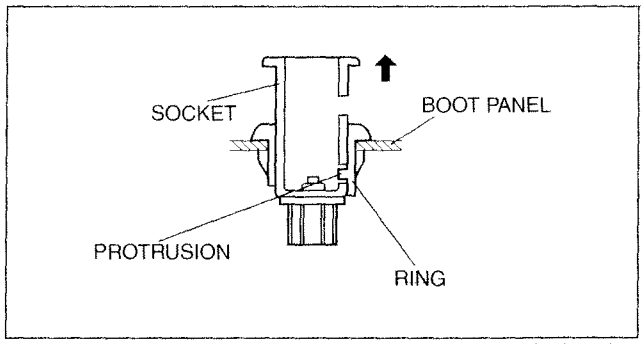
Socket Removal Note

1. Insert a tape-wrapped flathead screwdriver into the socket hole, then push on the ring protrusion to lift the socket toward you.



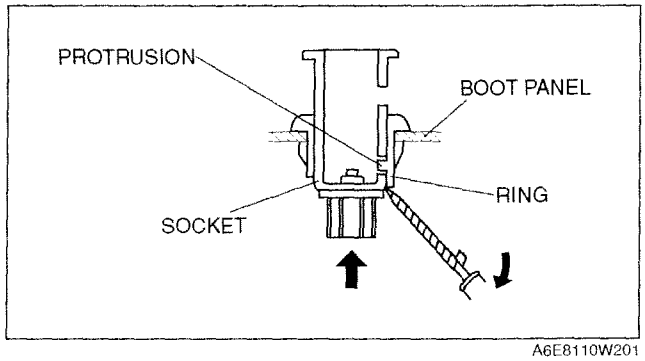
A6E8110W104

2. As shown in the figure, lift out the socket until the ring protrusion locks into the lower socket hole.
3. Remove the boot panel.



A6A8110W106

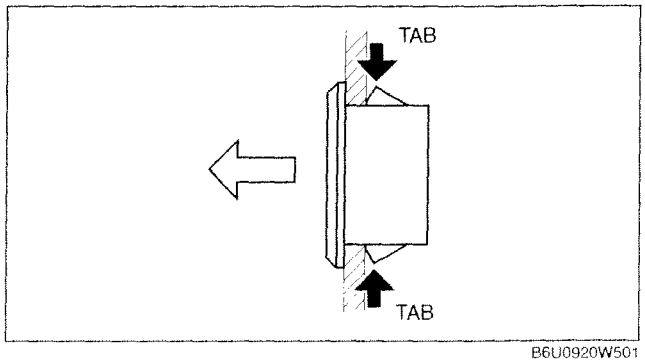
4. Front behind the boot panel, slide a tape-wrapped flathead screwdriver in between the socket and the ring protrusion.
5. While twisting the ring protrusion with the screwdriver, push out and remove the socket.



A6E8110W201

Ring Removal Note

1. Pull the ring forward while squeezing the tabs.



B6U0920W501

CIGARETTE LIGHTER INSPECTION

C6U092067000W02

1. Turn the ignition switch to the ACC position.
2. Verify that the cigarette lighter comes out within **10—20 seconds**, after pressing the plug into the socket.
   - If the cigarette lighter does not operate normally, replace the cigarette lighter plug and socket.

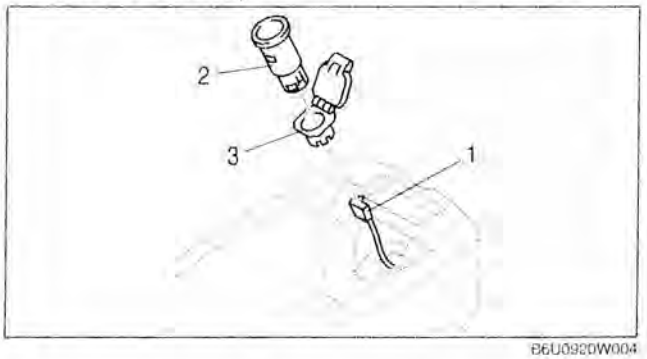
ACCESSORY SOCKET REMOVAL/INSTALLATION

C6U092066290W01

1. Disconnect the negative battery cable.
2. Remove the console. (See 09–17–7 CONSOLE REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Connector
2	Socket (See 09–20–17 Socket Removal Note)
3	Cap (See 09–20–17 Cap Removal Note)

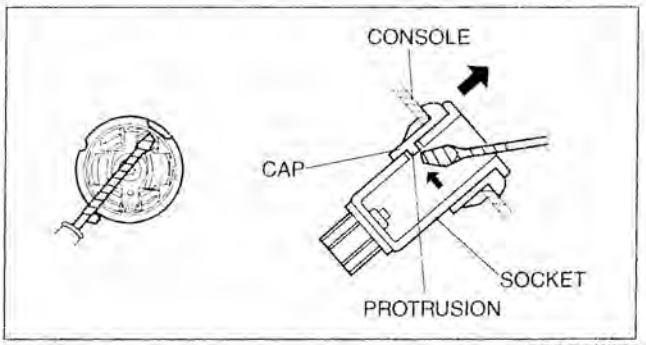
4. Install in the reverse order of removal.



B6U0920W004

Socket Removal Note

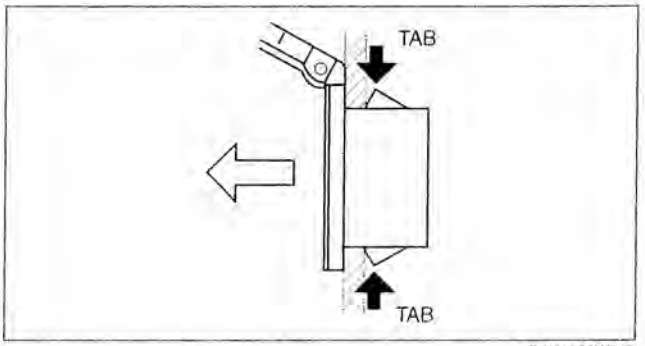
1. Remove the socket by pushing on the protrusion with a tape-wrapped flathead screwdriver inserted through the socket hole, and pulling the socket toward you.



B6U0920W006

Cap Removal Note

1. Pull the cap forward while squeezing the tabs.

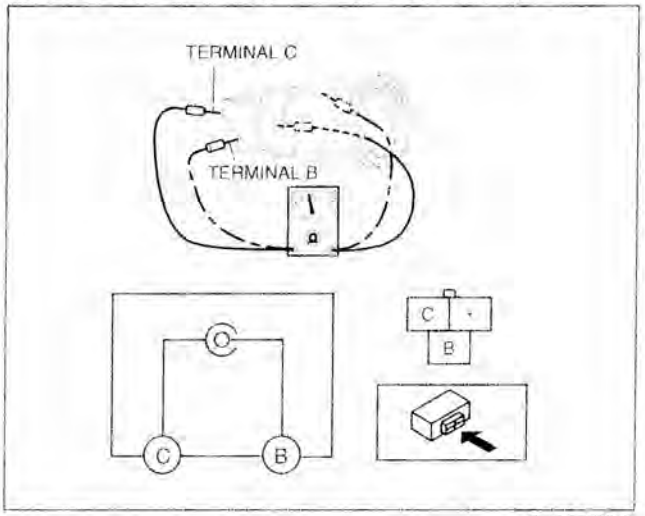


B6U0920W007

ACCESSORY SOCKET INSPECTION

C6U092066290W02

1. Remove the accessory socket. (See 09–20–17 ACCESSORY SOCKET REMOVAL/INSTALLATION.)
2. Inspect for continuity between the accessory socket terminals B and C using an ohmmeter as shown in the figure.
   - If not as specified, replace the accessory socket.

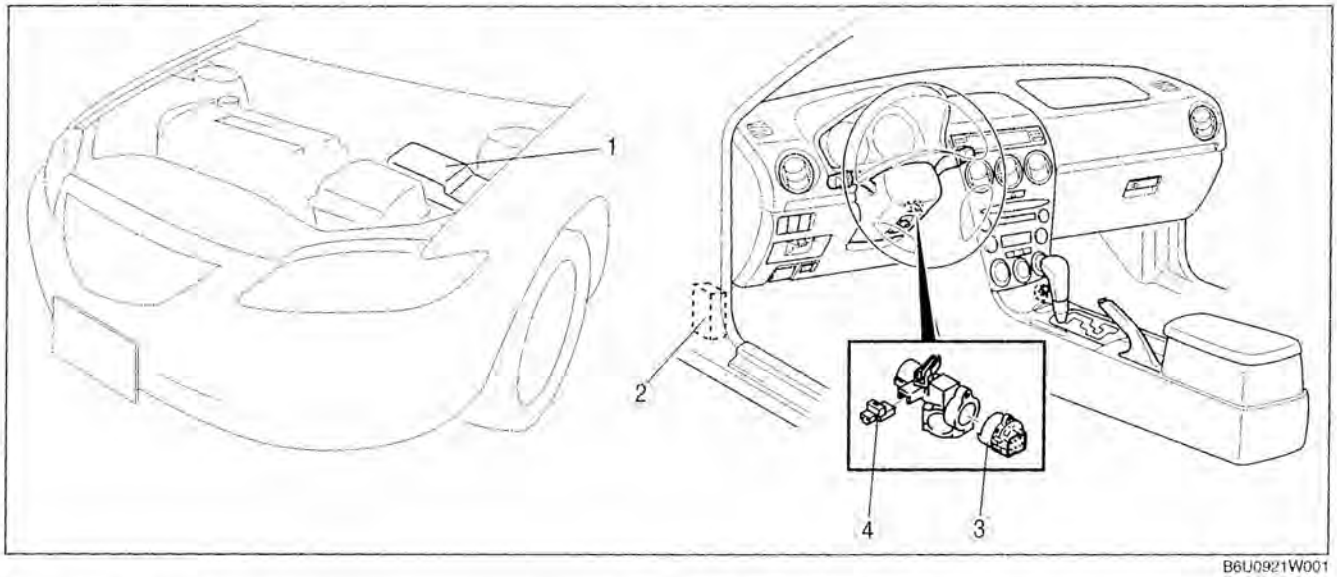


B6U0920W005

09–21 POWER SYSTEMS

POWER SYSTEM LOCATION INDEX

C6U092101072W01



B6U0921W001

1	Main fuse block (See 09–21–2 MAIN FUSE REMOVAL/ INSTALLATION) (See09–21–5 RELAY LOCATION) (See09–21–6 RELAY INSPECTION)
2	Fuse block (See 09–21–2 FUSE BLOCK REMOVAL/ INSTALLATION) (See09–21–5 RELAY LOCATION) (See09–21–6 RELAY INSPECTION)

3	Ignition switch (See 09–21–3 IGNITION SWITCH REMOVAL/ INSTALLATION) (See 09–21–3 IGNITION SWITCH INSPECTION)
4	Key reminder switch (See 09–21–3 KEY REMINDER SWITCH REMOVAL/INSTALLATION) (See 09–21–4 KEY REMINDER SWITCH INSPECTION)

FUSE SERVICE CAUTION

C6U092166000W01

Caution

- **Determine and correct the cause of the burnt fuse before replacing it with the specified type. If the fuse is replaced before doing this, it may burn again.**

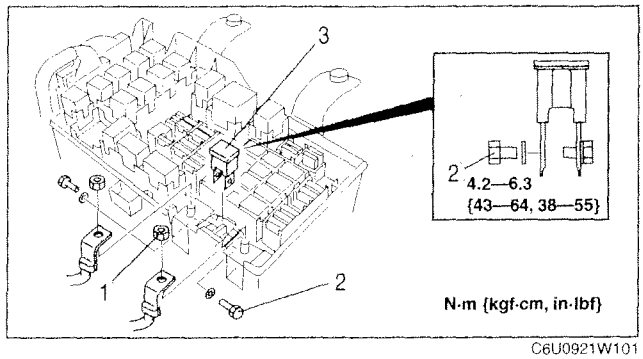
MAIN FUSE REMOVAL/INSTALLATION

C6U092166761W01

1. Disconnect the negative battery cable.
2. Remove the main fuse block cover.
3. Remove in the order indicated in the table.

1	Nut
2	Bolt (See 09–21–2 Bolt Removal Note)
3	Main fuse

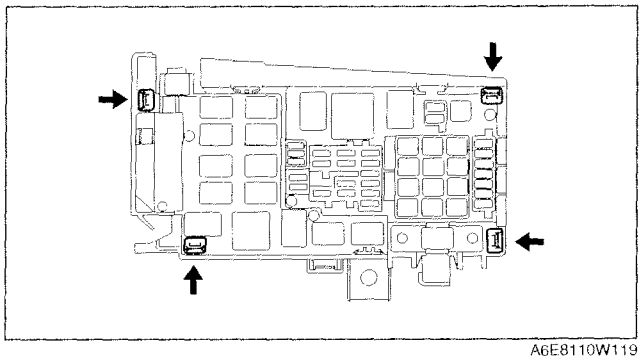
4. Install in the reverse order of removal.



C6U0921W101

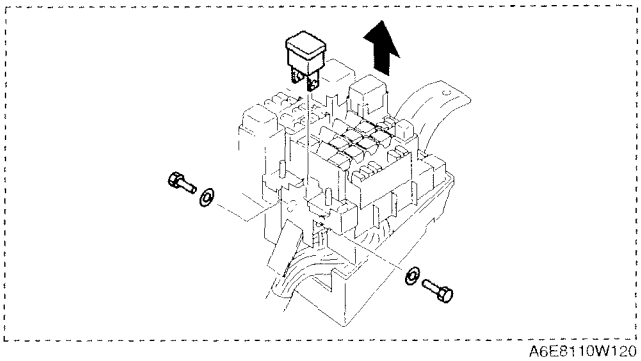
Bolt Removal Note

1. Press and remove the tabs on the main fuse block at the positions indicated by the arrows.



A6E8110W119

2. Lift up the main fuse block and remove the bolts.



A6E8110W120

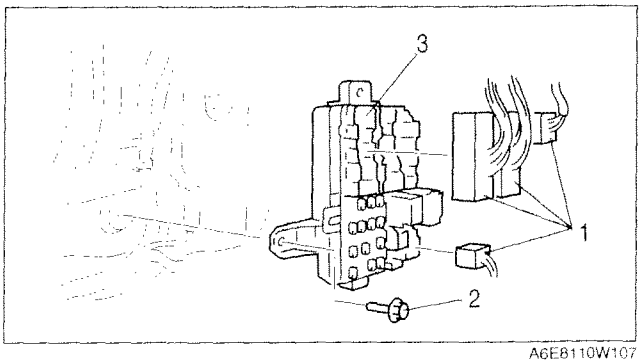
FUSE BLOCK REMOVAL/INSTALLATION

C6U092166730W01

1. Disconnect the negative battery cable.
2. Remove the left-side front side trim. (See 09–17–10 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Connector
2	Bolt
3	Fuse block

4. Install in the reverse order of removal.



A6E8110W107

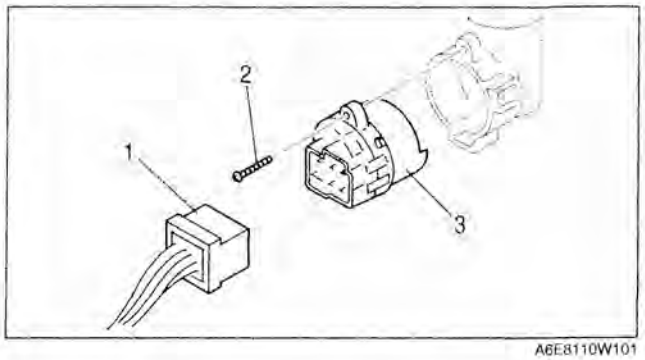
IGNITION SWITCH REMOVAL/INSTALLATION

C6U092166151W01

1. Disconnect the negative battery cable.
2. Remove the column cover.
3. Remove in the order indicated in the table.

1	Connector
2	Screw
3	Ignition switch

4. Install in the reverse order of removal.



A6E8110W101

IGNITION SWITCH INSPECTION

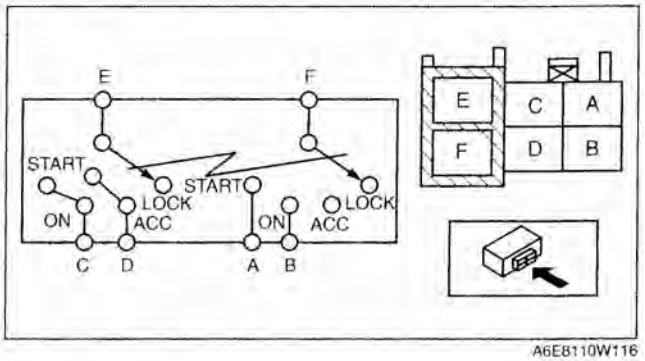
C6U092166151W02

1. Disconnect the negative battery cable.
2. Remove the column cover.
3. Disconnect the ignition switch connectors.
4. Inspect for continuity between the ignition switch terminals using an ohmmeter.
   - If not as specified, replace the ignition switch.

O—O: Continuity

Ignition key position	Terminal					
	E	F	D	C	B	A
LOCK						
ACC	O		O			
ON	O		O	O		
		O			O	
START	O			O		
		O				O

A6E8110W11

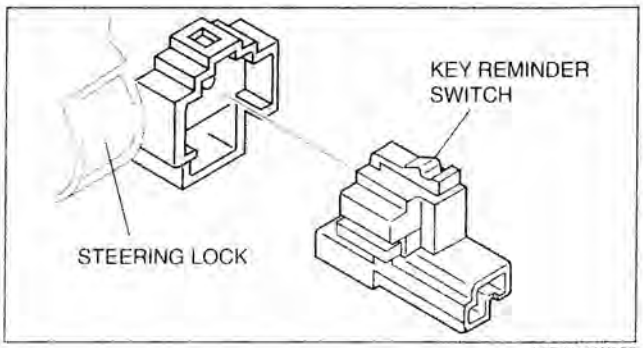


A6E8110W116

KEY REMINDER SWITCH REMOVAL/INSTALLATION

C6U092166152W01

1. Disconnect the negative battery cable.
2. Remove the column cover.
3. Disconnect the key reminder switch connector.
4. Remove the key reminder switch.
5. Install in the reverse order of removal.

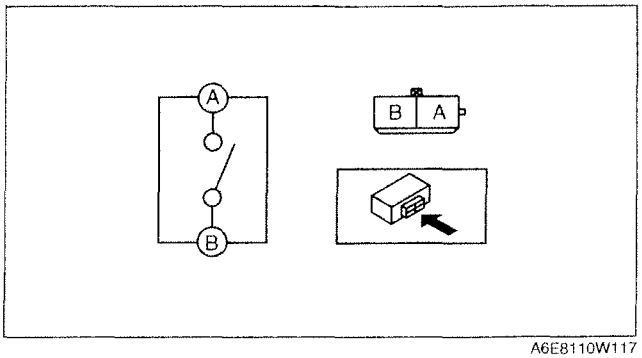


A6E8110W102

KEY REMINDER SWITCH INSPECTION

C6U092166152W02

1. Disconnect the negative battery cable.
2. Remove the column cover.
3. Disconnect the key reminder switch connector.
4. Inspect for continuity between the key reminder switch terminals using an ohmmeter.
   - If not as specified, replace the key reminder switch.



A6E8110W117

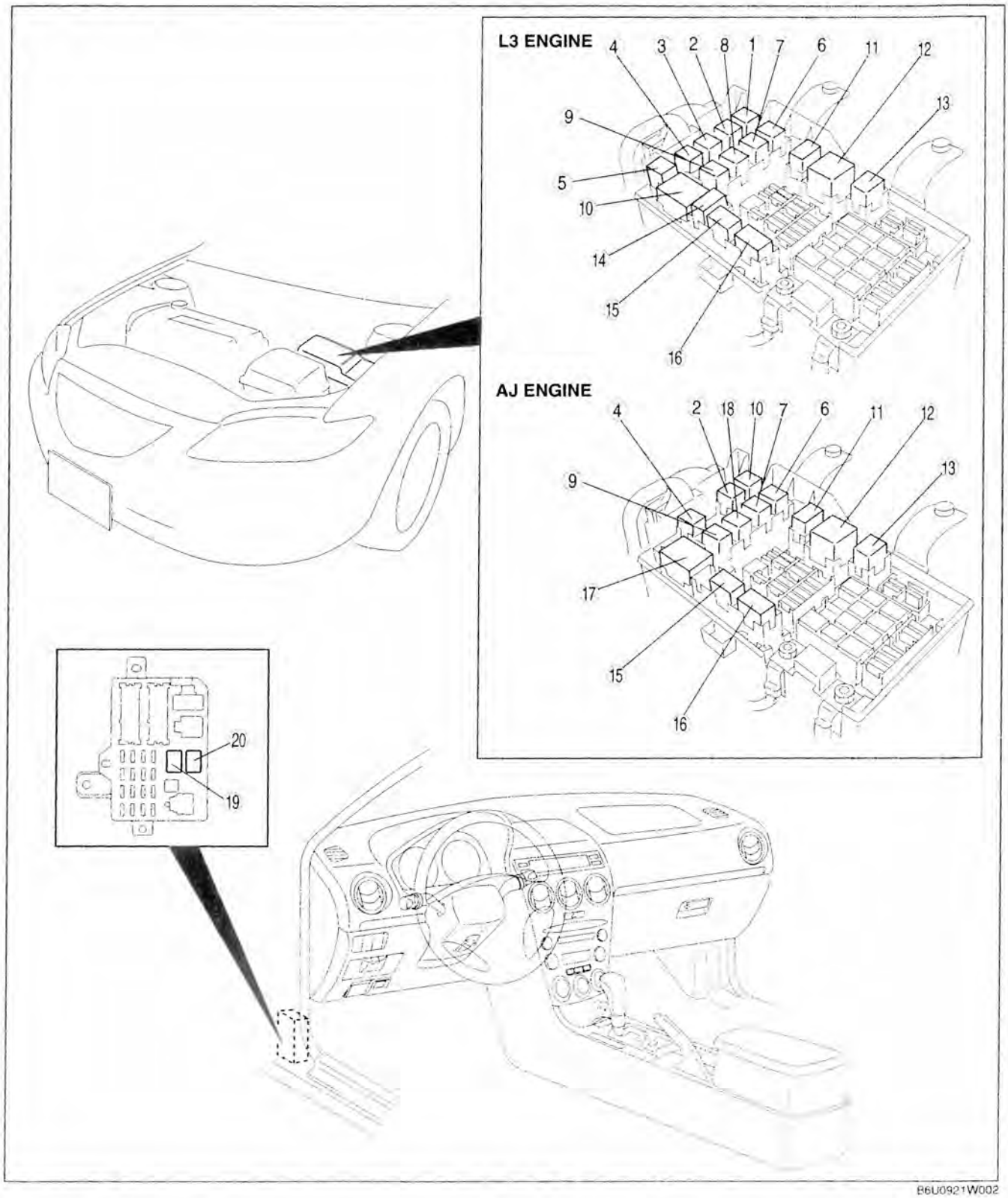
○—○ : Continuity

Key position	Terminal	
	A	B
Key inserted	○	○
Key removed		

A6E8110W11

RELAY LOCATION

C6U092167730W01



B6U0921W002

1	Cooling fan relay No.2
2	Horn relay
3	Cooling fan relay No.3
4	Starter relay
5	Cooling fan relay No.4
6	Woofer relay

7	Rear window defroster relay
8	AT main relay
9	A/C relay
10	Front fog light relay
11	Main relay
12	Headlight relay

13	TNS relay
14	Cooling fan relay No.1
15	ETC relay
16	Trunk lid opener relay

17	Cooling fan relay
18	IG1 relay
19	Fuel pump relay
20	Blower relay

RELAY INSPECTION

C6U092167730W02

Relay Type

Terminal type		Part name
Four-terminal	Type A	• Main relay • Fuel pump relay • Starter relay • TNS relay • IG1 relay • Front fog light relay (AJ engine) • Horn relay • Trunk lid opener relay • Rear window defroster relay • Woofer relay • AT main relay • ETC relay • A/C relay • Blower relay • Cooling fan relay No.1 • Cooling fan relay No.2 • Cooling fan relay No.3 • Cooling fan relay No.4
	Type B	• Headlight relay • Front fog light relay (L3 engine) • Cooling fan relay

Four-terminal

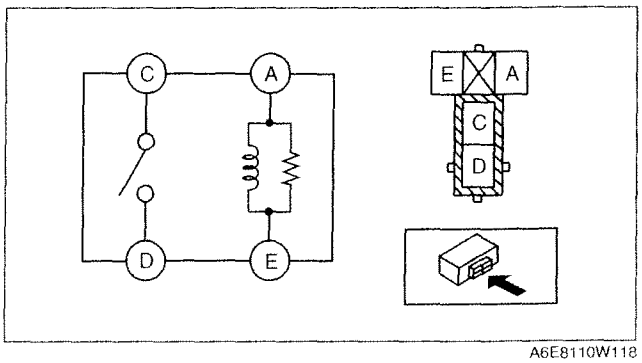
Type A

1. Remove the relay.
2. Inspect for continuity between the relay terminals using an ohmmeter.
   - If not as specified, replace the relay.

○—○ : Continuity

Step	Terminal			
	A	E	C	D
1	○—○			
2	B+	GND	○—○	

A6E8110W121



A6E8110W118

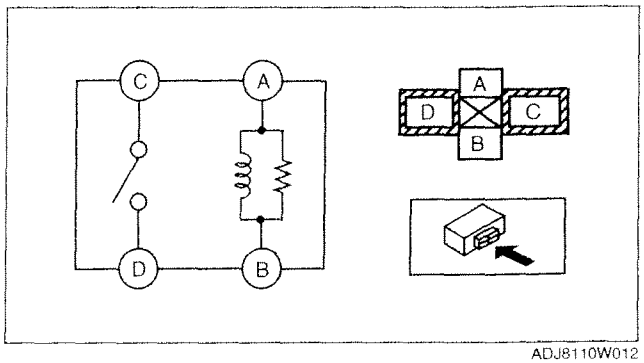
Type B

1. Remove the relay.
2. Inspect for continuity between the relay terminals using an ohmmeter.
   - If not as specified, replace the relay.

○—○ : Continuity

Step	Terminal			
	A	B	C	D
1	○—○			
2	B+	GND	○—○	

A6E8110W12

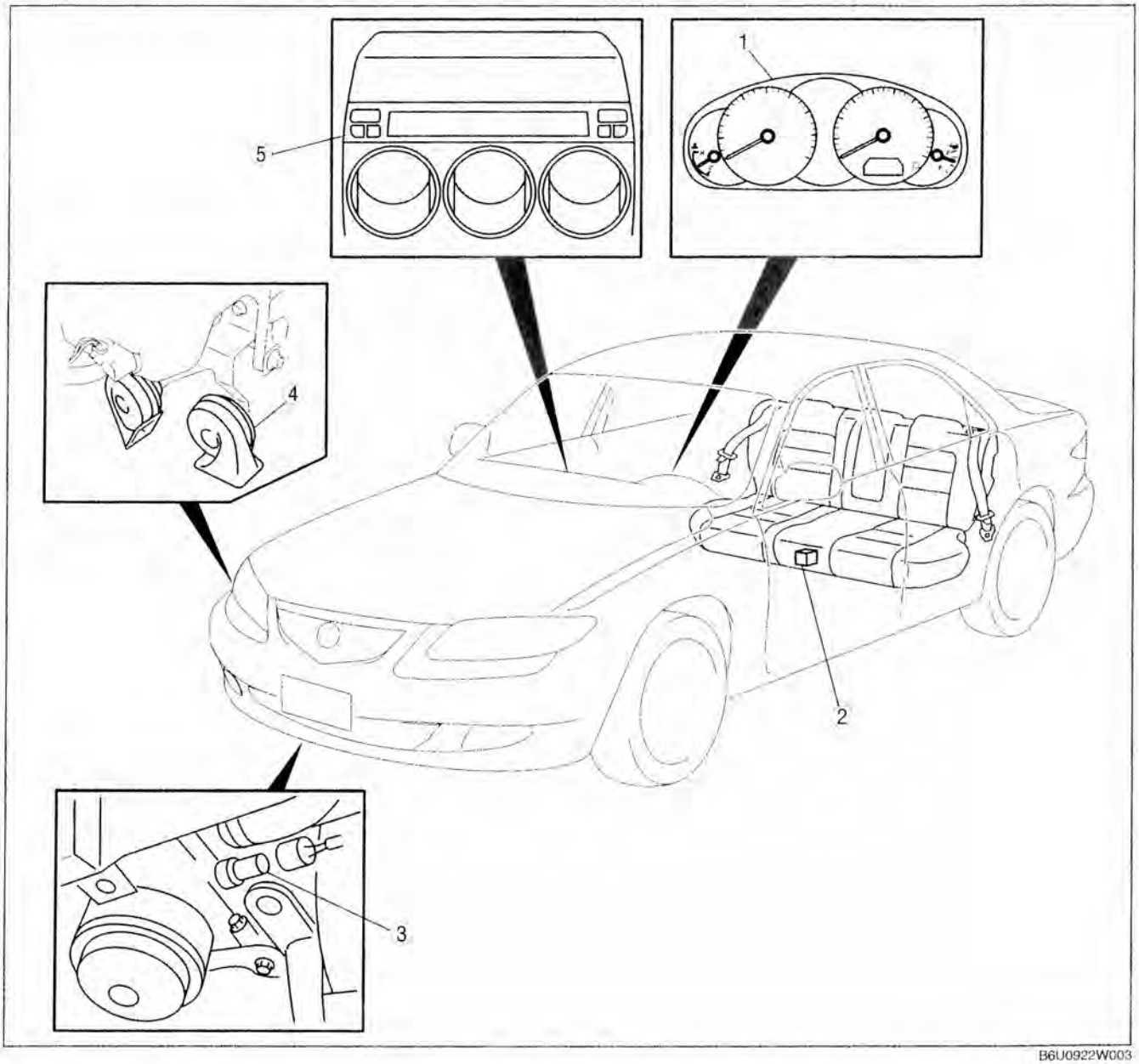


ADJ8110W012

09–22 INSTRUMENTATION/DRIVER INFO.

INSTRUMENTATION/DRIVER INFO. LOCATION INDEX

C6U092201067W01



B6U0922W003

1	Instrument cluster (See 09–22–3 INSTRUMENT CLUSTER REMOVAL/INSTALLATION) (See 09–22–4 INSTRUMENT CLUSTER DISASSEMBLY/ASSEMBLY) (See 09–22–4 INSTRUMENT CLUSTER INSPECTION) (See 09–22–5 INSTRUMENT CLUSTER REPAIR) (See 09–22–6 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE)

2	Fuel gauge sender unit (See 09–22–14 FUEL GAUGE SENDER UNIT INSPECTION)
3	Oil pressure switch (See 09–22–14 OIL PRESSURE SWITCH INSPECTION)
4	Horn (See 09–22–14 HORN REMOVAL/INSTALLATION)
5	Information display (See 09–22–15 INFORMATION DISPLAY REMOVAL/INSTALLATION)

INSTRUMENT CLUSTER REMOVAL/INSTALLATION

C6U092255430W01

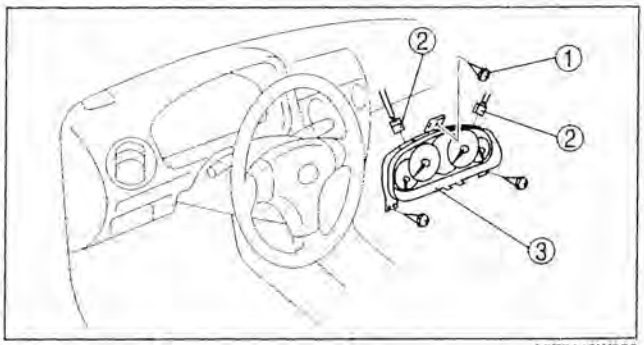
Caution

- **When replacing the instrument cluster, the configuration procedure must be performed before removing the instrument cluster. If the configuration procedure is not performed before removing the instrument cluster, it is possible that the instrument cluster will not operate normally.**

1. Configurate the instrument cluster (only when replacing it). (See 09–22–3 INSTRUMENT CLUSTER CONFIGURATION.)
2. Disconnect the negative battery cable.
3. Pull down the adjusting lever of the tilt steering wheel and push the steering wheel down.
4. Pull the steering wheel toward you.
5. Remove the meter hood.
6. Remove in the order indicated in the table.

1	Screw
2	Connector
3	Instrument cluster (See 09–22–3 Instrument Cluster Removal Note)

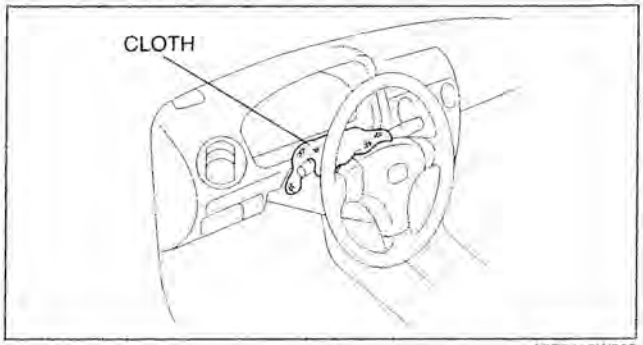
7. Install in the reverse order of removal.



A6EB118W003

Instrument Cluster Removal Note

1. When removing the instrument cluster, in order to prevent damage to the lens, cover the steering shaft with a cloth.



A6EB118W005

09–22

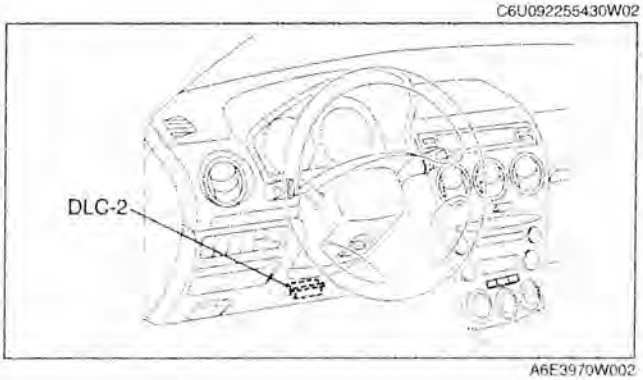
INSTRUMENT CLUSTER CONFIGURATION

C6U092255430W02

1. Connect the **SST** (WDS or equivalent) to the DLC-2.
2. Input vehicle information following the directions on the screen.
3. Select "MODULE PROGRAMMING".
4. Select "PROGRAMMABLE MODULE INSTALLATION".
5. Select the following items and perform procedures according to directions on the screen.

Items

- **"IC"**



A6E3970W002

6. Retrieve DTCs using the **SST** (WDS or equivalent), then verify that there is no DTC present.
   - If DTC is present, perform applicable DTC inspection.

INSTRUMENT CLUSTER DISASSEMBLY/ASSEMBLY

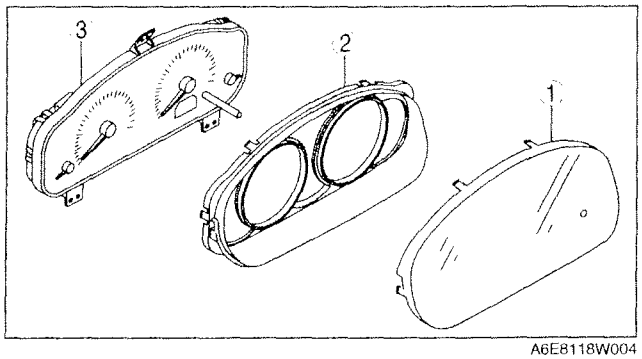
C6U092255430W03

Caution
- **If the instrument cluster is dropped or the print plate is damaged, the system will not work properly and it may be the cause of trouble or malfunctions.**

1. Disassemble in the order indicated in the table.

1	Lens
2	Case
3	Meter unit

2. Assemble in the reverse order of disassembly.



A6E8118W004

INSTRUMENT CLUSTER INSPECTION

C6U092255430W04

Speedometer

Using the input/output check mode

1. Inspect the speedometer by setting it in the input/output check mode DTC 12.

Using a speedometer tester

1. Adjust the tire air pressure to the specification.
2. Using a speedometer tester, verify that the speedometer indication is within the allowable ranges shown below.

Speedometer tester indication (km/h)	Allowable range (km/h)
20	18—22
40	38—42
60	58—62
80	78—82
100	98—102
120	117—123
140	137—143

Speedometer tester indication (mph)	Allowable range (mph)
10	9—11
20	19—21
30	29—31
40	39—41
50	49—51
60	59—61
70	69—71
80	78—82

3. Verify that fluctuation of the speedometer needle is within the allowable range.
   - If the speedometer needle does not move or the indication is outside of the allowable range, inspect the PCM, ABS HU/CM (vehicles with ABS), VSS (vehicles without ABS) and related wiring harnesses.
     — If the PCM, ABS HU/CM (vehicles with ABS), VSS (vehicles without ABS) and related wiring harnesses are normal, replace the instrument cluster.

Needle fluctuation allowable range
Within 3.0 km/h

Tachometer

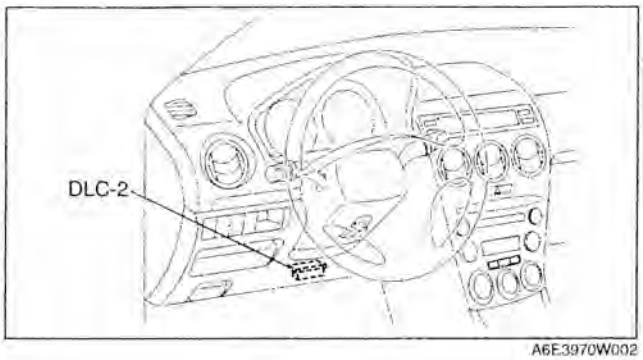
Using the input/output check mode

1. Inspect the tachometer by setting it in the input/output check mode DTC 13.

Using the SSTs (WDS or equivalent)

Caution
- **If the engine speed exceeds the allowable range, the engine could be damaged. Therefore, when inspecting the tachometer, do not allow the engine speed to exceed the allowable range indication on the tachometer.**

1. Connect the **SSTs** (WDS or equivalent) to the vehicle DLC-2 16-pin connector.
2. Access and monitor PIDs by **SSTs** (WDS or equivalent).



A6E3970W002

Fuel Gauge
1. Inspect the fuel gauge by setting it in the input/output check mode DTC 23.

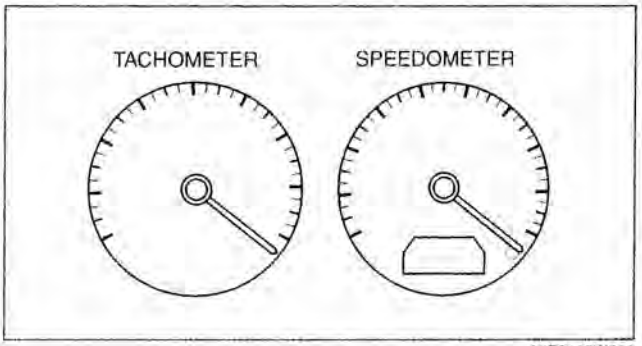
Water Temperature Gauge
1. Inspect the water temperature gauge by setting it in the input/output check mode DTC 25.

INSTRUMENT CLUSTER REPAIR

C6U092255430W05

Note
- The needle of speedometer or tachometer may continue to rotate clockwise until it indicates over maximum graduation. If a customer complains of this concern, repair the needle position according to the following steps.

1. Verify the concern.
2. Turn the ignition switch to LOCK position.
3. Disconnect the negative battery cable.
4. Connect the negative battery cable.
5. Turn the ignition switch to ON position.
6. Verify that the needle returns to zero.
   - If the needle does not return to zero, replace the instrument cluster



A6E8118W011

INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE

C6U092255430W06

Note

- In this mode, it is possible to check the items in the following chart.

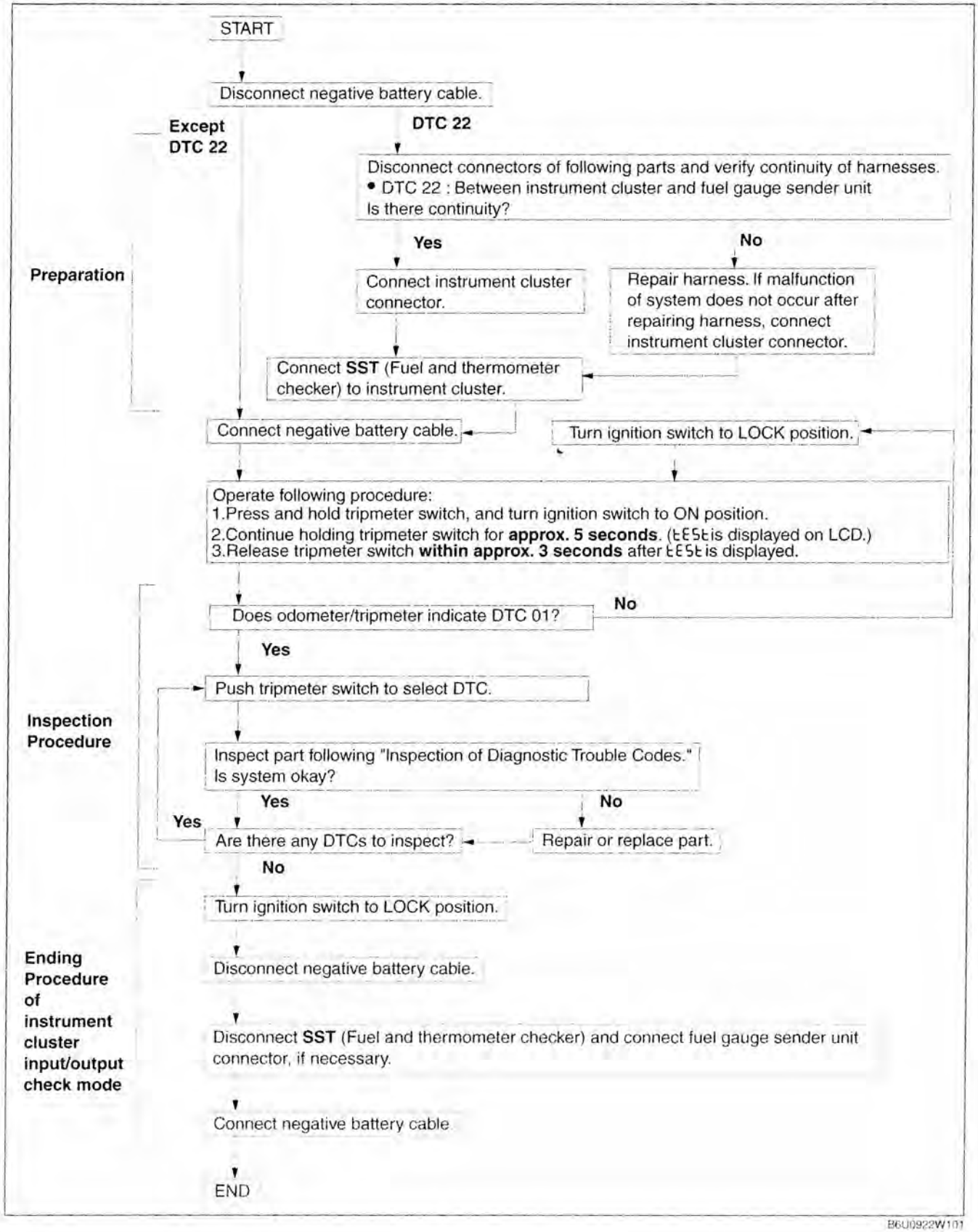
Diagnostic Trouble Code Chart

DTC	Checked item	Related item
01	Buckle switch	Buckle switch
04	Door switch	• Ignition key illumination • Key reminder warning buzzer • Lights-on reminder warning buzzer
08	TNS relay	• Lights-on reminder warning buzzer • Each illumination
12	Speedometer	Speedometer
13	Tachometer	Tachometer
14	Buzzer	Buzzer
16	Fuel-level warning light	Fuel-level warning light
18	Ignition key cylinder illumination	Ignition key cylinder illumination
22	Fuel gauge sender unit	Fuel gauge
23	Fuel gauge	Fuel gauge
25	Water temperature gauge	Water temperature gauge
26	LCD	LCD
31	Key reminder switch	Key reminder warning buzzer

Note

- Diagnostic trouble codes which are not listed may be indicated, but they cannot be inspected.
- The diagnostic trouble codes are displayed in numerical order. (While performing the inspection, if you want to inspect a diagnostic trouble code of which the number is smaller than the code number you are currently inspecting, terminate the check mode then repeat the inspection from the beginning.)
- If a speed signal is input to the instrument cluster (the front wheels are rotated) the input/output check mode will be cancelled.
- The diagnostic trouble codes can be fast-forwarded by pushing and holding the odometer/tripmeter switch for **1 second or more**.

Operating Order



B6U0922W101

Checking Order

Note

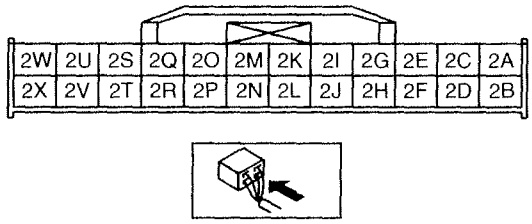
- When inspecting more than two DTCs, perform the inspection by following the priority order of inspection indicated in the chart below.

Priority order of inspection	IG switch position	Check code
1	ON	22
2		01, 04, 08, 12, 13, 14, 16, 18, 23, 25, 26
3	LOCK	31

Inspection of Diagnostic Trouble Codes

DTC 01	Buckle switch on/off signal

INSTRUMENT CLUSTER CONNECTOR

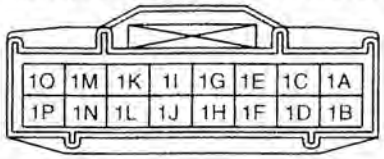


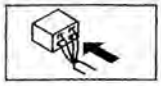
Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Unfasten driver-side seat belt. (Buckle switch on.)	ON	Go to next step.
		OFF	Measure voltage at instrument cluster terminal 2G. Is voltage **0 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Buckle switch — Wiring harness (Buckle switch—instrument cluster)
2	Fasten driver-side seat belt. (Buckle switch off.)	ON	Measure voltage at instrument cluster terminal 2G. Is voltage **B+**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Buckle switch — Wiring harness (Buckle switch—instrument cluster)
		OFF	Input signal to instrument cluster is okay.

DTC 04	Door switch on/off signal

INSTRUMENT CLUSTER CONNECTOR





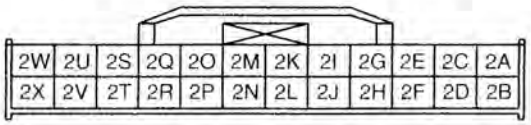
Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Open driver-side door. (Door switch on.)	on	Close driver-side door, then go to next step.
		oFF	Measure voltage at instrument cluster terminal 1J. Is voltage **0 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Door switch — Wiring harness (Instrument cluster—door switch)
2	Close driver-side door. (Door switch off.)	on	Measure voltage at instrument cluster terminals 1J. Is voltage **B+**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Door switch — Wiring harness (Instrument cluster—door switch)
		oFF	Input signal to instrument cluster is okay.

09–22

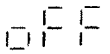
DTC 08	TNS relay on/off signal

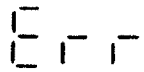
INSTRUMENT CLUSTER CONNECTOR

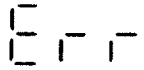


Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Turn headlight switch to TNS position. (TNS relay on.)	on	Go to next step.
		oFF	Measure voltage at instrument cluster terminal 2K. Is voltage **B+**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — TNS relay — Wiring harness (Battery—TNS relay—instrument cluster)

STEP	INSPECTION	INDICATION	ACTION
2	Turn headlight switch off. (TNS relay off.)		Measure voltage at instrument cluster terminal 2K. Is voltage **0 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — TNS relay — Wiring harness (TNS relay—instrument cluster)
			Input signal to instrument cluster is okay.

DTC 12	Operation signal to speedometer		
INSPECTION	INDICATION	SITUATION	ACTION
Wait for **2 seconds** after selecting DTC 12.		Speedometer needle moves full scale then returns to **60 km/h or 60 MPH**.	Speedometer is okay.
		Other than stated above.	Replace instrument cluster.
		—	

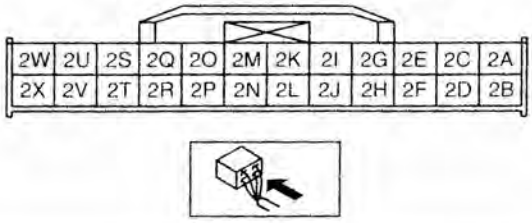
DTC 13	Operation signal to tachometer		
INSPECTION	INDICATION	SITUATION	ACTION
Wait for **2 seconds** after selecting DTC 13.		Tachometer needle moves full scale then returns to **3000 rpm**.	Tachometer is okay.
		Other than stated above.	Replace instrument cluster.
		—	

DTC 14	Operation signal to buzzer		
INSPECTION	INDICATION	SITUATION	ACTION
Wait for **2 seconds** after selecting DTC 14.	 (Fixed)	Buzzer sounds.	Buzzer is okay.
		Buzzer does not sound.	Replace instrument cluster.

DTC 16	Operation signal to fuel-level warning light		
INSPECTION	INDICATION	SITUATION	ACTION
Wait for **2 seconds** after selecting DTC 16.	 (Turns on and off)	Fuel-level warning light turns on and off **three times**.	Fuel-level warning light is okay.
		Other than stated above.	Replace instrument cluster.

DTC 18	Ignition key illumination on/off signal

INSTRUMENT CLUSTER CONNECTOR



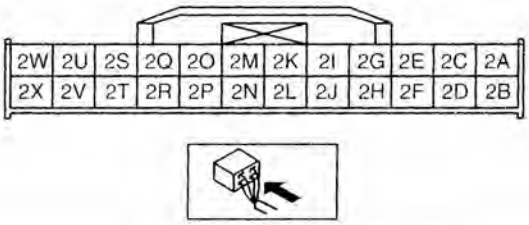
Diagnostic procedure

INSPECTION	INDICATION	SITUATION	ACTION
Wait for **2 seconds** after selecting DTC 18.	01 (Turns on and off)	Ignition key illumination turns on and off **three times.**	Ignition key illumination is okay.
		Other than stated above.	Measure voltage at instrument cluster terminal 2C. Is voltage **B+**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Ignition key illumination — Wiring harness (Battery—ignition key illumination—instrument cluster)

09-22

DTC 22	Fuel level signal

INSTRUMENT CLUSTER CONNECTOR



Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Select DTC 22 with fuel gauge sender unit connector disconnected.	104 ↓ 127	Go to next step.
		Other than stated above.	Replace instrument cluster.
2	Connect instrument cluster terminals 2D and 2M.	000 ↓ 003	Go to next step.
		Other than stated above.	Replace instrument cluster.

STEP	INSPECTION	INDICATION	ACTION
3	Using **SST** (Fuel and thermometer checker) or resistor, input **20 ohms** between instrument cluster terminals 2D and 2M.	017 | 023	Go to next step.
		Other than stated above.	Replace instrument cluster.
4	Using **SST** (Fuel and thermometer checker) or resistor, input **60 ohms** between instrument cluster terminals 2D and 2M.	057 | 063	Go to next step.
		Other than stated above.	Replace instrument cluster.
5	Using **SST** (Fuel and thermometer checker) or resistor, input **100 ohms** between instrument cluster terminals 2D and 2M.	097 | 103	Inspect fuel gauge sender unit.
		Other than stated above.	Replace instrument cluster.

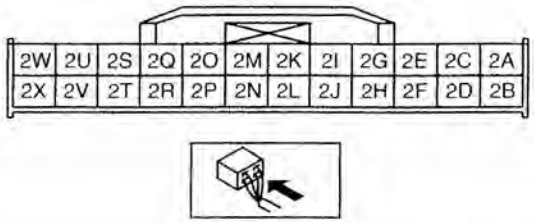
DTC 23	Operation signal to fuel gauge		
INSPECTION	**INDICATION**	**SITUATION**	**ACTION**
Wait for **2 seconds** after selecting DTC 23.	00	Fuel gauge indicates in following order every **2 seconds**. • F→1/2→E→F (fixed)	Fuel gauge is okay.
		Other than stated above.	Replace instrument cluster.
	Err	Replace instrument cluster.	

DTC 25	Operation signal to water temperature gauge		
INSPECTION	**INDICATION**	**SITUATION**	**ACTION**
Wait for **2 seconds** after selecting DTC 25.	00	Water temperature gauge indicates in following order for every **2 seconds**. • H→Center→C→H (fixed)	Water temperature gauge is okay.
		Other than stated above.	Replace instrument cluster.
	Err	Replace instrument cluster.	

DTC 26	LCD indication		
INSPECTION	**INDICATION**	**SITUATION**	**ACTION**
Select DTC 26.	888888 TRIP A/B 8888	Indication is normal.	LCD is okay.
		Other than stated above.	Replace instrument cluster.

DTC 31	Key reminder on/off signal

INSTRUMENT CLUSTER CONNECTOR



Diagnostic procedure

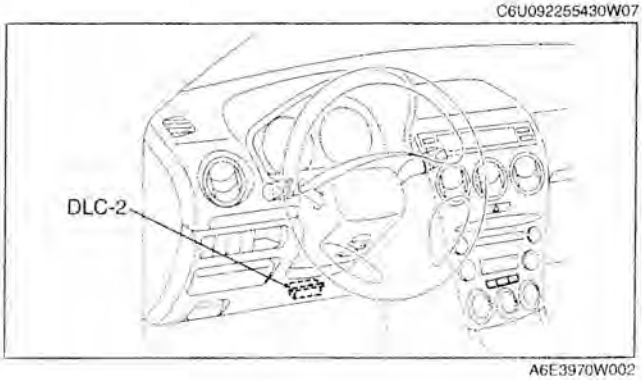
STEP	INSPECTION	INDICATION	ACTION
1	Remove key from steering lock and then insert key into steering lock after selecting DTC 31. (Key reminder switch on.)	ON	Go to next step.
		OFF	Measure voltage at instrument cluster terminal 2B. Is voltage **B+**? • If as specified, replace instrument cluster. • If not as specified, replace following parts. — Key reminder switch — Wiring harness (Battery—key reminder switch—instrument cluster)
2	Remove key from steering lock (Key reminder switch off.)	ON	Measure voltage at instrument cluster terminal 2B. Is voltage **0 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Key reminder switch — Wiring harness (Key reminder switch—instrument cluster)
		OFF	Input signal to instrument cluster is okay.

09–22

PID/DATA MONITOR AND RECORD PROCEDURE

1. Connect the **SST** (WDS or equivalent) to the vehicle DLC-2 16-pin connector.
2. Access and monitor PIDs using the **SST** (WDS or equivalent).

C6U092255430W07



A6E3970W002

Monitor Item Table

- The PID/DATA monitoring items for the instrument cluster is as shown in the table below.

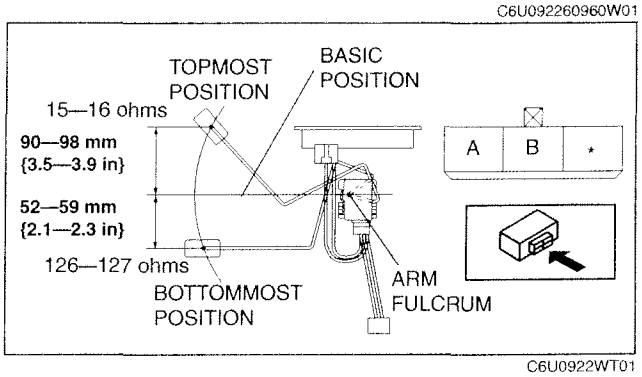
—: Not applicable

PID item	Definition	Unit/Condition		Terminal
CCNT_HE	Continuous codes	Number of continuous codes		—
ECT_GAUGE	Temperature gauge	°C	°F	2W, 2X
FUEL	Fuel flow	l/min		2D, 2M
ODOMETR	Total distance	km	mile	2W, 2X
SPEEDSG	Speedometer	km/h	mile/h	
RPM	Tachometer	rpm		

FUEL GAUGE SENDER UNIT INSPECTION

1. Move the float to the topmost and bottommost positions, and verify that the resistance between terminals A and B of the unit and the position of the float are as indicated in the figure.
   - If they are not as indicated, replace the fuel gauge sender unit.

C6U092260960W01



C6U0922WT01

OIL PRESSURE SWITCH INSPECTION

C6U092218500W01

1. Verify that the oil pressure warning light illuminates when the ignition switch is at the ON position.
2. Verify that the oil pressure warning light goes off when the engine is started.
   - If the oil pressure warning light does not illuminate or remains illuminated, inspect the related wiring harness.
     - — If the related wiring harness are normal, inspect the oil pressure. (See 01–11–4 OIL PRESSURE INSPECTION.)
       - If the oil pressure is normal, replace the oil pressure switch.

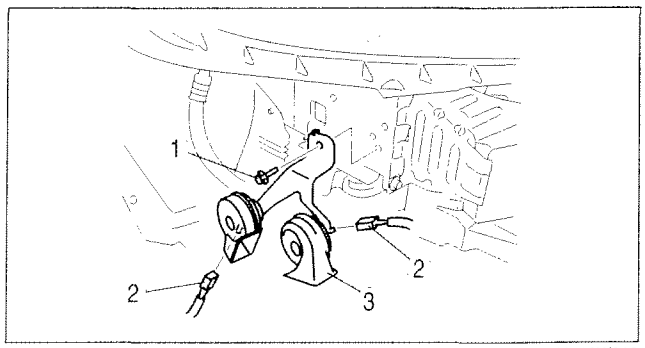
HORN REMOVAL/INSTALLATION

C6U092266790W01

1. Disconnect the negative battery cable.
2. Bend the mud guard.
3. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Horn

4. Install in the reverse order of removal.



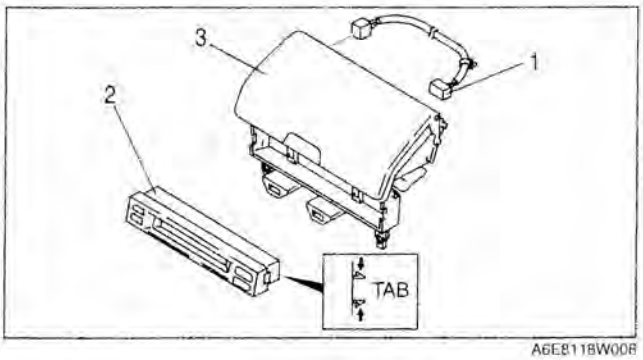
B6U0922W002

INFORMATION DISPLAY REMOVAL/INSTALLATION

C6U092255000W01

1. Disconnect the negative battery cable.
2. Remove the center panel module. (See 09–20–11 CENTER PANEL MODULE REMOVAL/INSTALLATION.)
3. Remove the center box.
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.

1	Short harness
2	Information display (See 09–22–15 Information Display Removal Note)
3	Center box



A6E8118W008

Information Display Removal Note

1. Squeeze the tabs of information display and pull forward to remove it.

09–50 TECHNICAL DATA

BODY ELECTRICAL SYSTEM

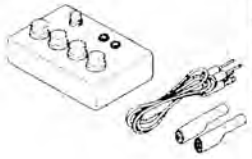
C6U095001047W01

Item				Specifications
Exterior light bulb capacity (W)	Headlight	Low-beam		55 × 2
		High-beam		55 × 2
	Parking light			5 × 2
	Front fog light			55 × 2
	Front turn light			28 × 2
	Front side marker light			5 × 2
	Brake light/taillight			21/5 × 2
	Rear turn light			21 × 2
	Back-up light			18.4 × 2
	Taillight			5 × 2
	License plate light			5 × 2
	High-mount brake light	4SD, WGN	In-vehicle-type	18.4 × 1
			Rear spoiler type	4 (LED)
		5HB		21 × 1
Interior light bulb capacity (W)	Front map light			5 × 2
	Rear map light			5 × 2
	Trunk compartment light			3 × 1
	Courtesy light			5 × 2
	Vanity mirror illumination			1.2 × 2
	Ignition key illumination			1.4 × 1
	Ashtray illumination			1.4 × 1
	Glove compartment light			1.7 × 1
	Cargo compartment light		5HB	5 × 1
			WGN	10 × 1

09–60 SERVICE TOOLS

BODY & ACCESSORIES SST

C6U096001047W01

49 0305 870A Window Tool Set 	49 N088 0A0 Fuel & Thermometer Checker 	418-FS475 WDS 

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