

Kawasaki

ELIMINATOR 125



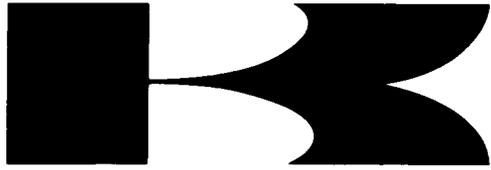
Motorcycle Service Manual

Quick Reference Guide

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This quick reference guide will assist you in locating a desired topic or procedure.

- Bend the pages back to match the black tab of the desired chapter number with the black tab on the edge at each table of contents page.
- Refer to the sectional table of contents for the exact pages to locate the specific topic required.



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ELIMINATOR 125

Motorcycle Service Manual

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No liability can be accepted for any inaccuracies or omissions in this publication, although every possible care has been taken to make it as complete and accurate as possible.

The right is reserved to make changes at any time without prior notice and without incurring an obligation to make such changes to products manufactured previously. See your Motorcycle dealer for the latest information on product improvements incorporated after this publication.

All information contained in this publication is based on the latest product information available at the time of publication. Illustrations and photographs in this publication are intended for reference use only and may not depict actual model component parts.

LIST OF ABBREVIATIONS

A	ampere(s)	lb	pound(s)
ABDC	after bottom dead center	m	meter(s)
AC	alternating current	min	minute(s)
ATDC	after top dead center	N	newton(s)
BBDC	before bottom dead center	Pa	pascal(s)
BDC	bottom dead center	PS	horsepower
BTDC	before top dead center	psi	pound(s) per square inch
°C	degree(s) Celsius	r	revolution
DC	direct current	rpm	revolution(s) per minute
F	farad(s)	TDC	top dead center
°F	degree(s) Fahrenheit	TIR	total indicator reading
ft	foot, feet	V	volt(s)
g	gram(s)	W	watt(s)
h	hour(s)	Ω	ohm(s)
L	liter(s)		

Read OWNER'S MANUAL before operating.

EMISSION CONTROL INFORMATION

To protect the environment in which we all live, Kawasaki has incorporated crankcase emission (1) and exhaust emission (2) control systems in compliance with applicable regulations of the United States Environmental Protection Agency and California Air Resources Board. Additionally, Kawasaki has incorporated an evaporative emission control system (3) in compliance with applicable regulations of the California Air Resources Board on vehicles sold in California only.

1. Crankcase Emission Control System

This system eliminates the release of crankcase vapors into the atmosphere. Instead, the vapors are routed through an oil separator to the inlet side of the engine. While the engine is operating, the vapors are drawn into combustion chamber, where they are burned along with the fuel and air supplied by the carburetion system.

2. Exhaust Emission Control System

This system reduces the amount of pollutants discharged into the atmosphere by the exhaust of this motorcycle. The fuel, ignition, and exhaust systems of this motorcycle have been carefully designed and constructed to ensure an efficient engine with low exhaust pollutant levels.

The exhaust system of this model motorcycle manufactured primarily for sale in California includes a catalytic converter system.

3. Evaporative Emission Control System

Vapors caused by fuel evaporation in the fuel system are not vented into the atmosphere. Instead, fuel vapors are routed into the running engine to be burned, or stored in a canister when the engine is stopped. Liquid fuel is caught by a vapor separator and returned to the fuel tank.

The Clean Air Act, which is the Federal law covering motor vehicle pollution, contains what is commonly referred to as the Act's "tampering provisions."

"Sec. 203(a) The following acts and the causing thereof are prohibited...

(3)(A) for any person to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title prior to its sale and delivery to the ultimate purchaser, or for any manufacturer or dealer knowingly to remove or render inoperative any such device or element of design after such sale and delivery to the ultimate purchaser.

(3)(B) for any person engaged in the business of repairing, servicing, selling, leasing, or trading motor vehicles or motor vehicle engines, or who operates a fleet of motor vehicles knowingly to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title following its sale and delivery to the ultimate purchaser..."

NOTE

○The phrase "remove or render inoperative any device or element of design" has been generally interpreted as follows:

1. Tampering does not include the temporary removal or rendering inoperative of devices or elements of design in order to perform maintenance.
2. Tampering could include:
 - a. Maladjustment of vehicle components such that the emission standards are exceeded.
 - b. Use of replacement parts or accessories which adversely affect the performance or durability of the motorcycle.
 - c. Addition of components or accessories that result in the vehicle exceeding the standards.
 - d. Permanently removing, disconnecting, or rendering inoperative any component or element of design of the emission control systems.

WE RECOMMEND THAT ALL DEALERS OBSERVE THESE PROVISIONS OF FEDERAL LAW, THE VIOLATION OF WHICH IS PUNISHABLE BY CIVIL PENALTIES NOT EXCEEDING \$10,000 PER VIOLATION.

TAMPERING WITH NOISE CONTROL SYSTEM PROHIBITED

Federal law prohibits the following acts or the causing thereof: (1) The removal or rendering inoperative by any person other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use, or (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

Among those acts presumed to constitute tampering are the acts listed below:

- Replacement of the original exhaust system or muffler with a component not in compliance with Federal regulations.
- Removal of the muffler(s) or any internal portion of the muffler(s).
- Removal of the air box or air box cover.
- Modifications to the muffler(s) or air inlet system by cutting, drilling, or other means if such modifications result in increased noise levels.

Foreword

This manual is designed primarily for use by trained mechanics in a properly equipped shop. However, it contains enough detail and basic information to make it useful to the owner who desires to perform his own basic maintenance and repair work. A basic knowledge of mechanics, the proper use of tools, and workshop procedures must be understood in order to carry out maintenance and repair satisfactorily. Whenever the owner has insufficient experience or doubts his ability to do the work, all adjustments, maintenance, and repair should be carried out only by qualified mechanics.

In order to perform the work efficiently and to avoid costly mistakes, read the text, thoroughly familiarize yourself with the procedures before starting work, and then do the work carefully in a clean area. Whenever special tools or equipment are specified, do not use makeshift tools or equipment. Precision measurements can only be made if the proper instruments are used, and the use of substitute tools may adversely affect safe operation.

For the duration of the warranty period, we recommend that all repairs and scheduled maintenance be performed in accordance with this service manual. Any owner maintenance or repair procedure not performed in accordance with this manual may void the warranty.

To get the longest life out of your vehicle:

- Follow the Periodic Maintenance Chart in the Service Manual.
- Be alert for problems and non-scheduled maintenance.
- Use proper tools and genuine Kawasaki Motorcycle parts. Special tools, gauges, and testers that are necessary when servicing Kawasaki motorcycles are introduced by the Service Manual. Genuine parts provided as spare parts are listed in the Parts Catalog.
- Follow the procedures in this manual carefully. Don't take shortcuts.
- Remember to keep complete records of maintenance and repair with dates and any new parts installed.

How to Use This Manual

In this manual, the product is divided into its major systems and these systems make up the manual's chapters. The Quick Reference

Guide shows you all of the product's system and assists in locating their chapters. Each chapter in turn has its own comprehensive Table of Contents.

For example, if you want ignition coil information, use the Quick Reference Guide to locate the Electrical System chapter. Then, use the Table of Contents on the first page of the chapter to find the Ignition Coil section.

Whenever you see these WARNING and CAUTION symbols, heed their instructions! Always follow safe operating and maintenance practices.

▲ WARNING

This warning symbol identifies special instructions or procedures which, if not correctly followed, could result in personal injury or loss of life.

CAUTION

This caution symbol identifies special instructions or procedures which, if not strictly observed, could result in damage to or destruction of equipment.

This manual contains four more symbols (in addition to WARNING and CAUTION) which will help you distinguish different types of information.

NOTE

○ *This note symbol indicates points of particular interest for more efficient and convenient operation.*

- Indicates a procedural step or work to be done.
- Indicates a procedural sub-step or how to do the work of the procedural step it follows. It also precedes the text of a NOTE.
- ★ Indicates a conditional step or what action to take based on the results of the test or inspection in the procedural step or sub-step it follows.

In most chapters an exploded view illustration of the system components follows the Table of Contents. In these illustrations you will find the instructions indicating which parts require specified tightening torque, oil, grease or a locking agent during assembly.

General Information

1

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1-2 GENERAL INFORMATION

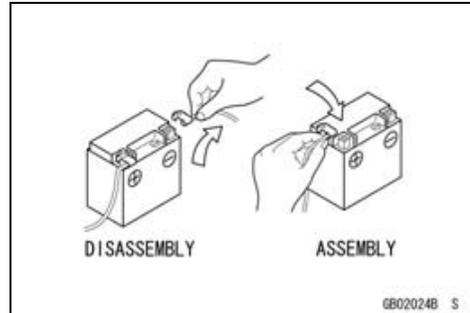
Before Servicing

Before starting to perform an inspection service or carry out a disassembly and reassembly operation on a motorcycle, read the precautions given below. To facilitate actual operations, notes, illustrations, photographs, cautions, and detailed descriptions have been included in each chapter wherever necessary. This section explains the items that require particular attention during the removal and reinstallation or disassembly and reassembly of general parts.

Especially note the following:

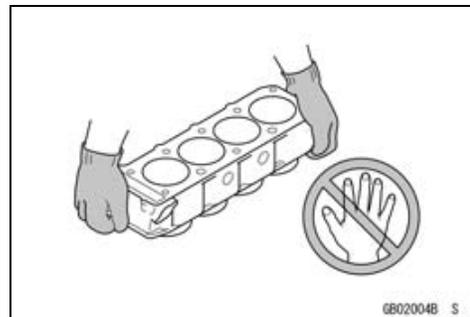
Battery Ground

Before completing any service on the motorcycle, disconnect the battery cables from the battery to prevent the engine from accidentally turning over. Disconnect the ground cable (-) first and then the positive (+). When completed with the service, first connect the positive (+) cable to the positive (+) terminal of the battery then the negative (-) cable to the negative terminal.



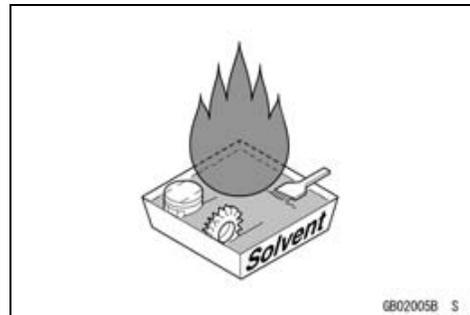
Edges of Parts

Lift large or heavy parts wearing gloves to prevent injury from possible sharp edges on the parts.



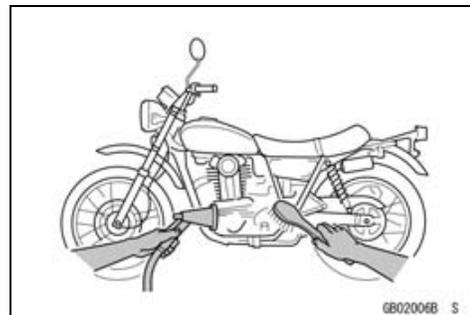
Solvent

Use a high flash point solvent when cleaning parts. High flash point solvent should be used according to directions of the solvent manufacturer.



Cleaning vehicle before disassembly

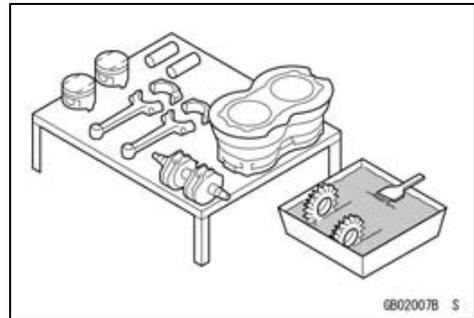
Clean the vehicle thoroughly before disassembly. Dirt or other foreign materials entering into sealed areas during vehicle disassembly can cause excessive wear and decrease performance of the vehicle.



Before Servicing

Arrangement and Cleaning of Removed Parts

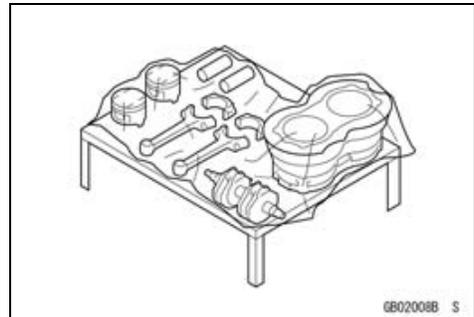
Disassembled parts are easy to confuse. Arrange the parts according to the order the parts were disassembled and clean the parts in order prior to assembly.



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Storage of Removed Parts

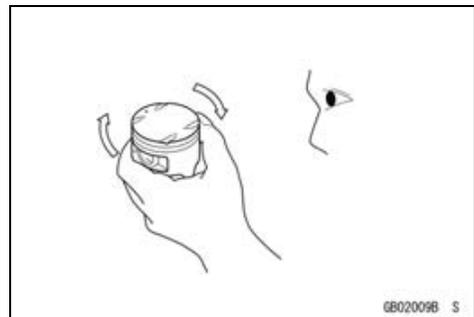
After all the parts including subassembly parts have been cleaned, store the parts in a clean area. Put a clean cloth or plastic sheet over the parts to protect from any foreign materials that may collect before re-assembly.



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Inspection

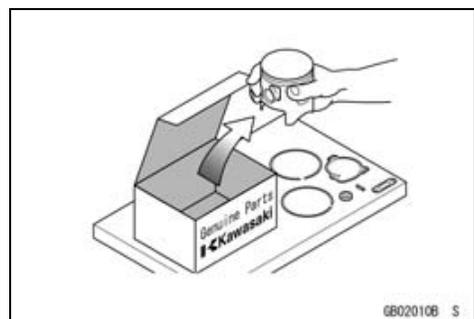
Reuse of worn or damaged parts may lead to serious accident. Visually inspect removed parts for corrosion, discoloration, or other damage. Refer to the appropriate sections of this manual for service limits on individual parts. Replace the parts if any damage has been found or if the part is beyond its service limit.



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Replacement Parts

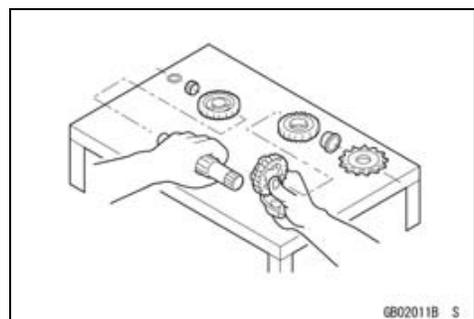
Replacement parts must be KAWASAKI genuine or recommended by KAWASAKI. Gaskets, O-rings, oil seals, grease seals, circlips or cotter pins must be replaced with new ones whenever disassembled.



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Assembly Order

In most cases assembly order is the reverse of disassembly, however, if assembly order is provided in this Service Manual, follow the procedures given.



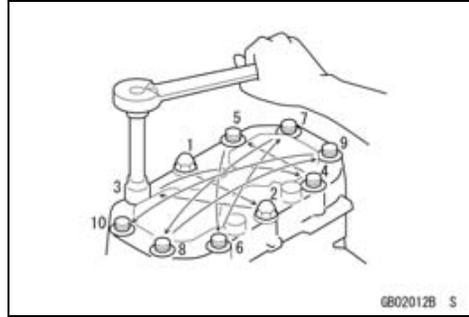
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1-4 GENERAL INFORMATION

Before Servicing

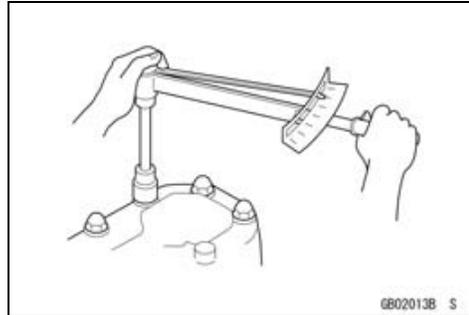
Tightening Sequence

Generally, when installing a part with several bolts, nuts, or screws, start them all in their holes and tighten them to a snug fit. Then tighten them according to the specified sequence to prevent case warpage or deformation which can lead to malfunction. Conversely when loosening the bolts, nuts, or screws, first loosen all of them by about a quarter turn and then remove them. If the specified tightening sequence is not indicated, tighten the fasteners alternating diagonally.



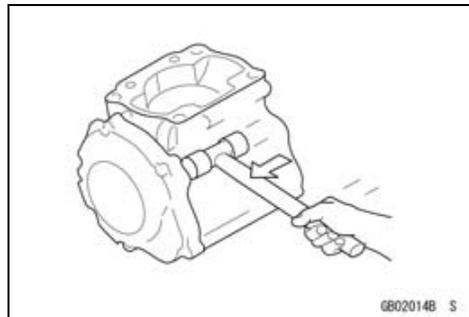
Tightening Torque

Incorrect torque applied to a bolt, nut, or screw may lead to serious damage. Tighten fasteners to the specified torque using a good quality torque wrench. Often, the tightening sequence is followed twice-initial tightening and final tightening with torque wrench.



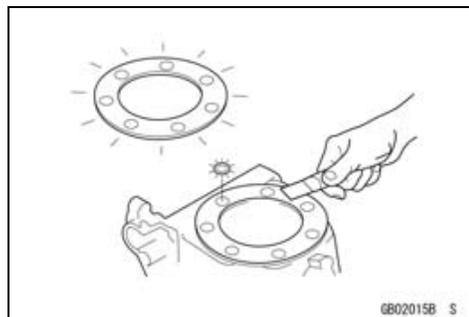
Force

Use common sense during disassembly and assembly, excessive force can cause expensive or hard to repair damage. When necessary, remove screws that have a non-permanent locking agent applied using an impact driver. Use a plastic-faced mallet whenever tapping is necessary.



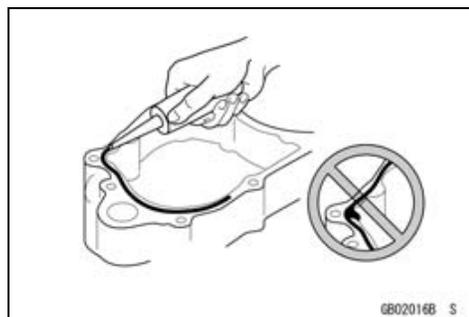
Gasket, O-ring

Hardening, shrinkage, or damage of both gaskets and O-rings after disassembly can reduce sealing performance. Remove old gaskets and clean the sealing surfaces thoroughly so that no gasket material or other material remains. Install new gaskets and replace used O-rings when re-assembling.



Liquid Gasket, Locking Agent

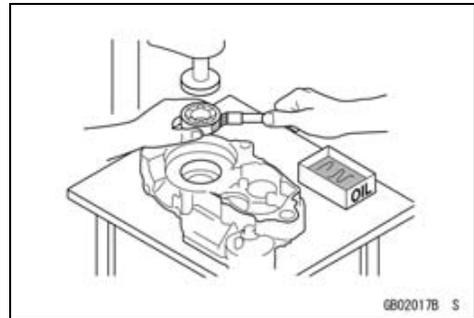
For applications that require Liquid Gasket or a Locking agent, clean the surfaces so that no oil residue remains before applying liquid gasket or locking agent. Do not apply them excessively. Excessive application can clog oil passages and cause serious damage.



Before Servicing

Press

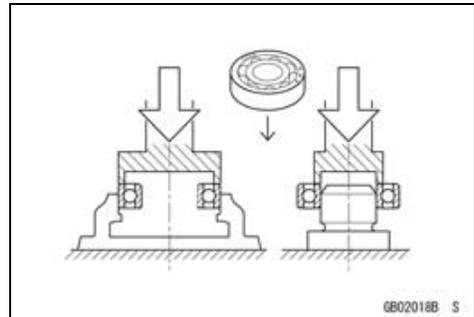
For items such as bearings or oil seals that must be pressed into place, apply small amount of oil to the contact area. Be sure to maintain proper alignment and use smooth movements when installing.



Ball Bearing and Needle Bearing

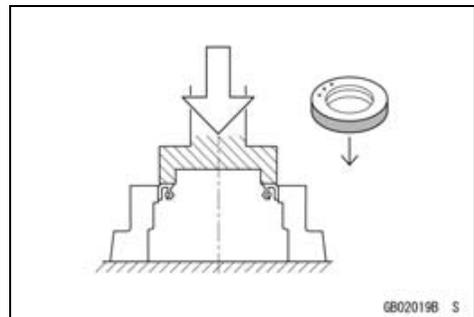
Do not remove pressed ball or needle unless removal is absolutely necessary. Replace with new ones whenever removed. Press bearings with the manufacturer and size marks facing out. Press the bearing into place by putting pressure on the correct bearing race as shown.

Pressing the incorrect race can cause pressure between the inner and outer race and result in bearing damage.

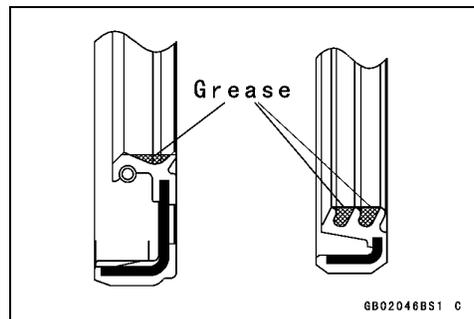


Oil Seal, Grease Seal

Do not remove pressed oil or grease seals unless removal is necessary. Replace with new ones whenever removed. Press new oil seals with manufacture and size marks facing out. Make sure the seal is aligned properly when installing.

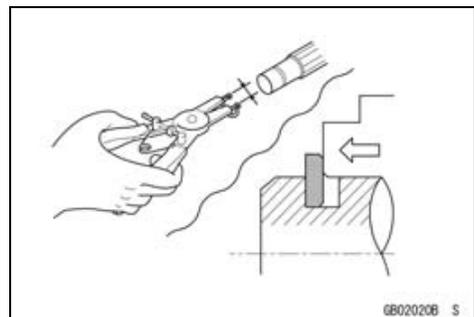


Apply specified grease to the lip of seal before installing the seal.



Circlips, Cotter Pins

Replace circlips or cotter pins that were removed with new ones. Take care not to open the clip excessively when installing to prevent deformation.

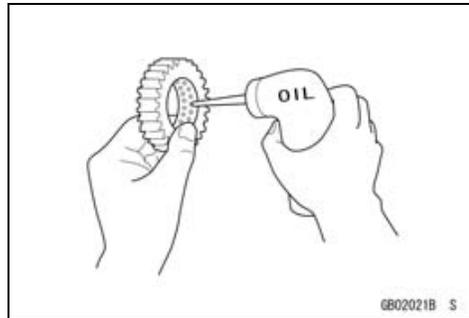


1-6 GENERAL INFORMATION

Before Servicing

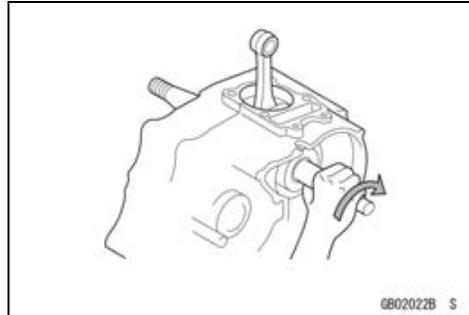
Lubrication

It is important to lubricate rotating or sliding parts during assembly to minimize wear during initial operation. Lubrication points are called out throughout this manual, apply the specific oil or grease as specified.



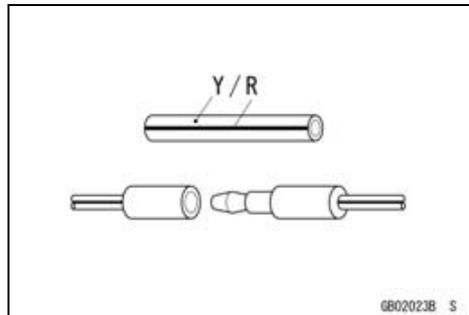
Direction of Engine Rotation

When rotating the crankshaft by hand, the free play amount of rotating direction will affect the adjustment. Rotate the crankshaft to positive direction (clockwise viewed from output side).



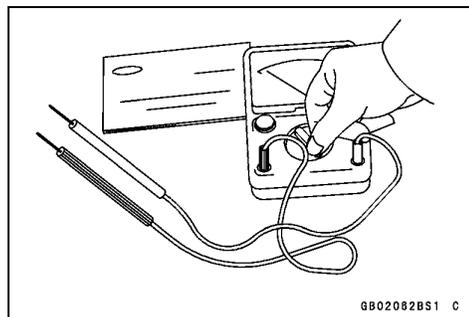
Electrical Leads

A two-color lead is identified first by the primary color and then the stripe color. Unless instructed otherwise, electrical leads must be connected to those of the same color.



Instrument

Use a meter that has enough accuracy for an accurate measurement. Read the manufacture's instructions thoroughly before using the meter. Incorrect values may lead to improper adjustments.



Model Identification

BN125-A1 (Europe) Left Side View



BN125-A1 (Europe) Right Side View



1-8 GENERAL INFORMATION

Model Identification

BN125-A1 (Singapore) Left Side View



BN125-A1 (Singapore) Right Side View



General Specifications

Items	BN125-A1 ~ A2	BN125-A3 ~ A4	BN125-A5 ~
Dimensions			
Overall length	2 150 mm (84.6 in.)		
Overall width	780 mm (30.7 in.)		
Overall height	1 020 mm (40.2 in.)	1 035 mm (40.8 in.)	← 1 050 mm (41.3 in.) (US, CA) 1 045 mm (41.1 in.) BN125-A7 ~ (N, NU)
Wheelbase	1 470 mm (57.9 in.)		
Road clearance	145 mm (5.7 in.)	160 mm (6.3 in.)	← 155 mm (6.1 in.) (US, CA)
Seat height	680 mm (26.8 in.)		
Dry mass	128 kg (1 255 N, 282 lb)	135 kg (1 323 N, 298 lb) 132 kg (1 294 N, 291 lb) (US): (BN125-A4 ~)	
Curb mass:			
Front	64 kg (628 N, 141 lb)		← 66 kg (647 N, 146 lb) (CAL) 65 kg (637 N, 143 lb) (BN125-A7 ~, N, NU)
Rear:	80 kg (785 N, 176 lb)	84 kg (824 N, 185 lb) 81 kg (794 N, 179 lb): (BN125-A4, US, CA)	← ← 82 kg (804 N, 181 lb) (CAL) 83 kg (814 N, 183 lb) (BN125-A7 ~, N, NU)
Fuel tank capacity	13 L (3.43 US gal)		
Performance			
Minimum turning radius	2.5 m (8.2 ft.)		
Engine			
Type	4-stroke, SOHC, 1-cylinder		
Cooling system	Air-cooled		
Bore and stroke	55 × 52.4 mm (2.2 × 2.1 in.)		
Displacement	124 cm ³ (7.6 cu in.)		
Compression ratio	9.6 : 1		
Maximum horsepower	8.8 kW (12 PS) @9 500 r/min (rpm), (US) –		← 8.5 kW (11.6 PS) @9 500 r/min (rpm) (BN125-A7 ~, N, NU)

1-10 GENERAL INFORMATION

General Specifications

Items	BN125-A1 ~ A2	BN125-A3 ~ A4	BN125-A5 ~
Maximum torque	9.7 N·m (0.99 kgf·m, 7.2 ft·lb) @8 000 r/min (rpm) (US)–		← 9.8 N·m (1.00 kgf·m, 7.2 ft·lb) @8 000 r/min (rpm) (BN125-A7 ~, N, NU)
Carburetion system	Carburetor, MIKUNI BS28		
Starting system	Electric starter		
Ignition system	DC-CDI		
Timing advance	Electronically advanced (analog)		
Ignition timing	From 10° BTDC @1 300 r/min (rpm) to 30° BTDC @4 500 r/min (rpm)		← From 10° BTDC @1 300 r/min (rpm) to 35° BTDC @4 500 r/min (rpm) (US, CA, CAL)
Spark plug	NGK CR7E	← NGK CR7E or U22ESR-N: (BN125-A4 ~, US, CA)	
Valve timing:			
Inlet:			
Open	23° BTDC		
Close	57° ABDC		
Duration	260°		
Exhaust:			
Open	64° BBDC		
Close	16° ATDC		
Duration	260°		
Lubrication system	Forced lubrication (wet sump)		
Engine oil:			
Grade	SE, SF or SG	←(BN125-A3) API SE, SF or SG API SH, SJ or SL with JASO MA	
Viscosity	SAE10W-40		
Capacity	1.4 L (1.48 US qt) (when engine is completely dry)		
Drive Train			
Primary reduction system:			
Type	Gear		
Reduction ratio	3.666 (77/21)		
Clutch type	Wet multi disc		
Transmission:			
Type	5-speed, constant mesh, return shift		

General Specifications

Items	BN125-A1 ~ A2	BN125-A3 ~ A4	BN125-A5 ~
Gear ratios:			
1st	2.700 (27/10)		
2nd	1.705 (29/17)		
3rd	1.300 (26/20)		
4th	1.090 (24/22)		
5th	0.952 (20/21)		
Final drive system:			
Type	Chain drive		
Reduction ratio	3.066 (46/15)		← 2.800 (42/15) (BN125-A7 ~, N, NU)
Overall drive ratio	10.708 @Top gear		← 9.778 @Top gear (BN125-A7 ~, N, NU)
Frame			
Type	Double cradle		
Caster (rake angle)	34°		
Trail	121 mm (4.8 in.)	←	119 mm (4.7 in.): BN125-A4 ~ (US, CA)
Rim Size:			
Front	17 × 1.85		
Rear	15 × 2.75		
Front tire:			
Type	Tube type		
Size	90/90-17 M/C 49P		
Rear tire:			
Type	Tube type		
Size	130/90-15 M/C 66P		
Front suspension:			
Type	Telescopic fork		
Wheel travel	130 mm (5.1 in.)		140 mm (5.5 in.)
Rear suspension:			
Type	Swingarm		
Wheel travel	60 mm (2.4 in.) 75 mm (3.0 in.) (BN125-A2 ~)		80 mm (3.1 in.)
Brake type:			
Front	Single disc		
Rear	Drum		
Electrical Equipment			
Battery	12 V 9 Ah		
Headlight:			
Type	Semi-sealed beam		
Bulb	12 V 60/55 W		

1-12 GENERAL INFORMATION

General Specifications

Items	BN125-A1 ~ A2	BN125-A3 ~ A4	BN125-A5 ~
Trail/brake light	12 V 5/21 W		
Alternator:			
Type	Single-phase AC		
Rated output	8.75 A/12 V @4 000 r/min (rpm): BN125-A1 15 A/14 V @8 000 r/min (rpm): BN125-A2 ~		

Specifications subject to change without notice, and may not apply to every country.

(CA): Canada Model

(US): United States Model

(N): No Catalytic Converter

(NU): No Catalytic Converter (United Kingdom Model)

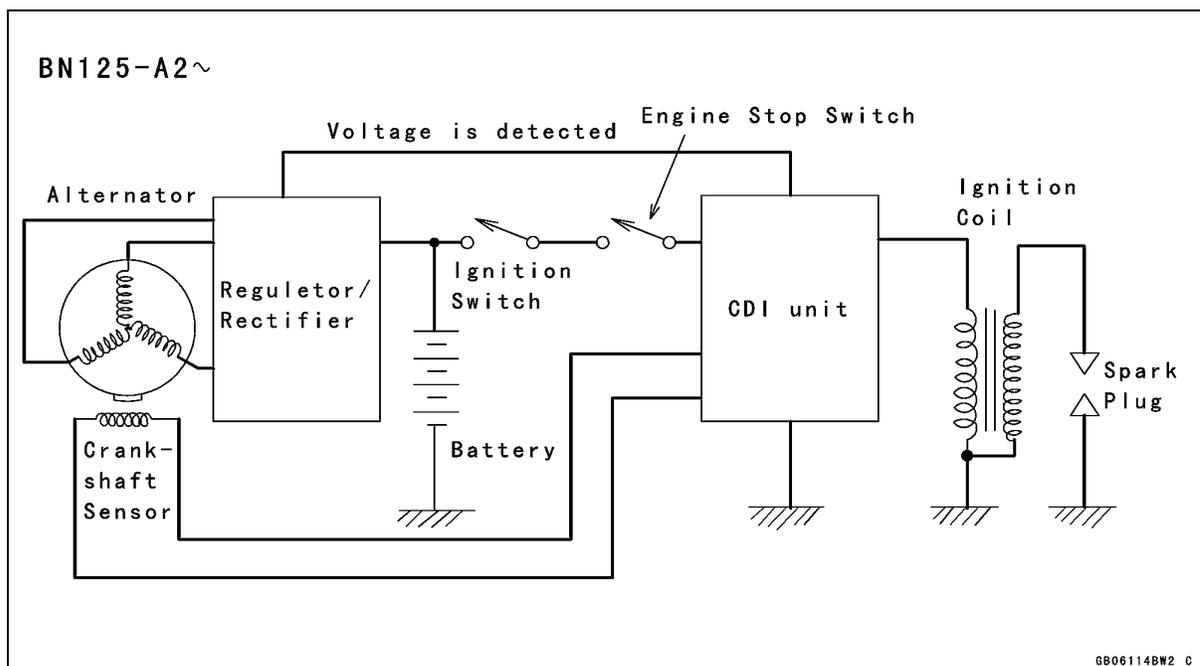
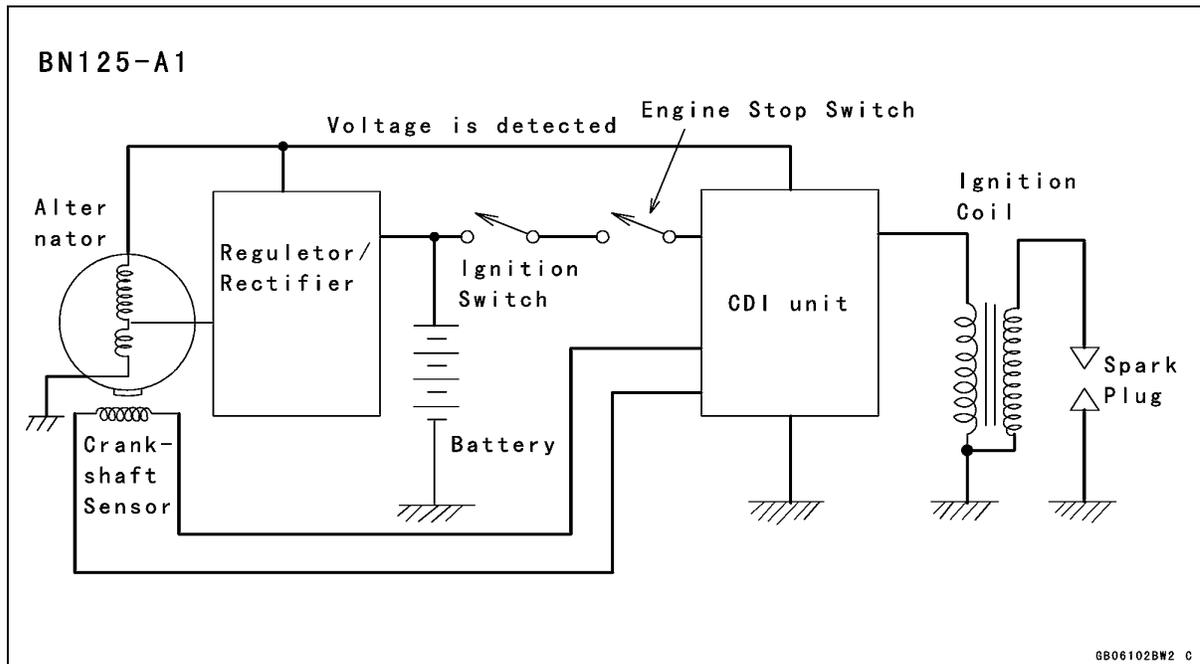
Technical Information-DC-CDI (Direct Current-Capacitor Discharge Ignition System)

Description

- Unlike the conventional CDI, the DC-CDI uses a battery instead of a magneto as a power source.
- The DC-CDI powered by a battery generates strong ignition spark even at low engine speeds. The conventional CDI, which uses AC voltage supplied by an exciter coil, generates less ignition spark at low engine speeds.
- The DC-CDI has a built-in DC-DC converter which changes battery voltage or battery-charging voltage into high voltage AC. Even if the battery loses its charge, the DC-CDI can use battery-charging voltage.
- The DC-CDI doesn't have an exciter coil, a power consumer, therefore the battery is charged better.

Ignition System

The DC-CDI is connected as shown.



1-14 GENERAL INFORMATION

Technical Information-DC-CDI (Direct Current-Capacitor Discharge Ignition System)

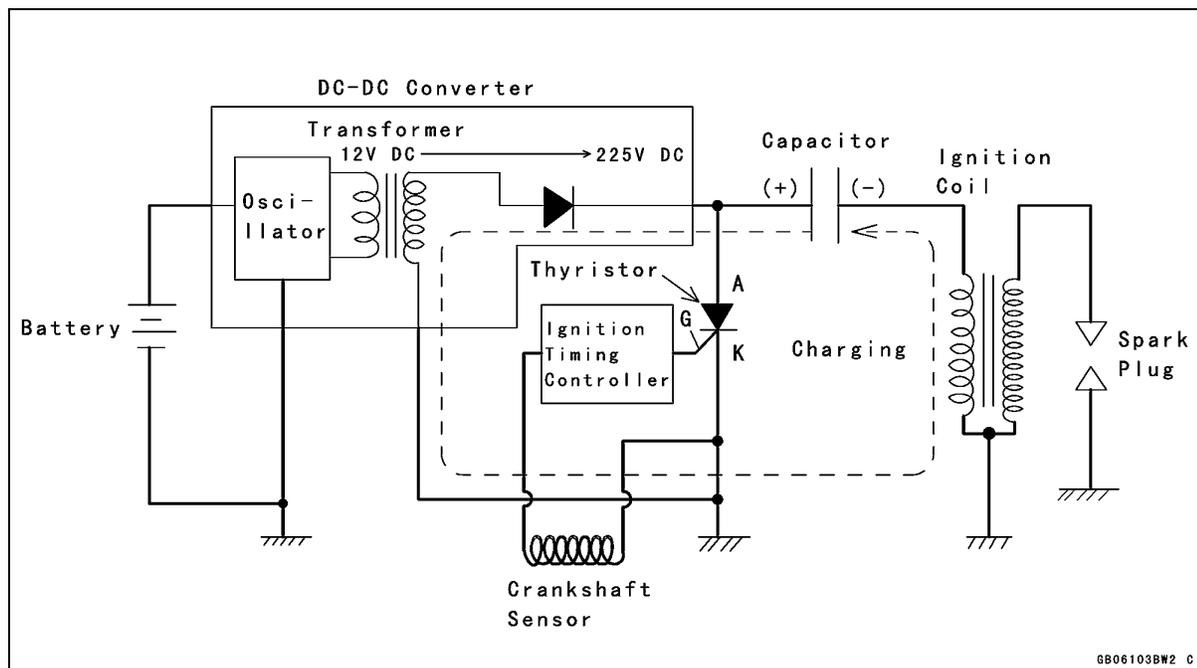
Operation

The DC-CDI circuit consists of a battery, a DC-DC converter, a diode, a capacitor, an ignition timing controller, a crankshaft sensor, a thyristor, an ignition coil, a spark plug, an ignition switch, and an engine stop switch. If the ignition switch or the engine stop switch is turned to the OFF position, the battery power supply is cut off, and no spark is generated.

The DC-DC converter in the CDI unit has a built-in transformer, which changes 12 V battery voltage or battery-charging voltage into AC voltage. The diode converts the AC voltage into about 225 V DC to charge the capacitor.

First step-Charging the Capacitor

The converter generates the current to charge the capacitor through the diode with 225 V DC. During this process, the current changes slowly through the primary coil winding so that the secondary coil winding goes not produce enough voltage to fire the spark plug.



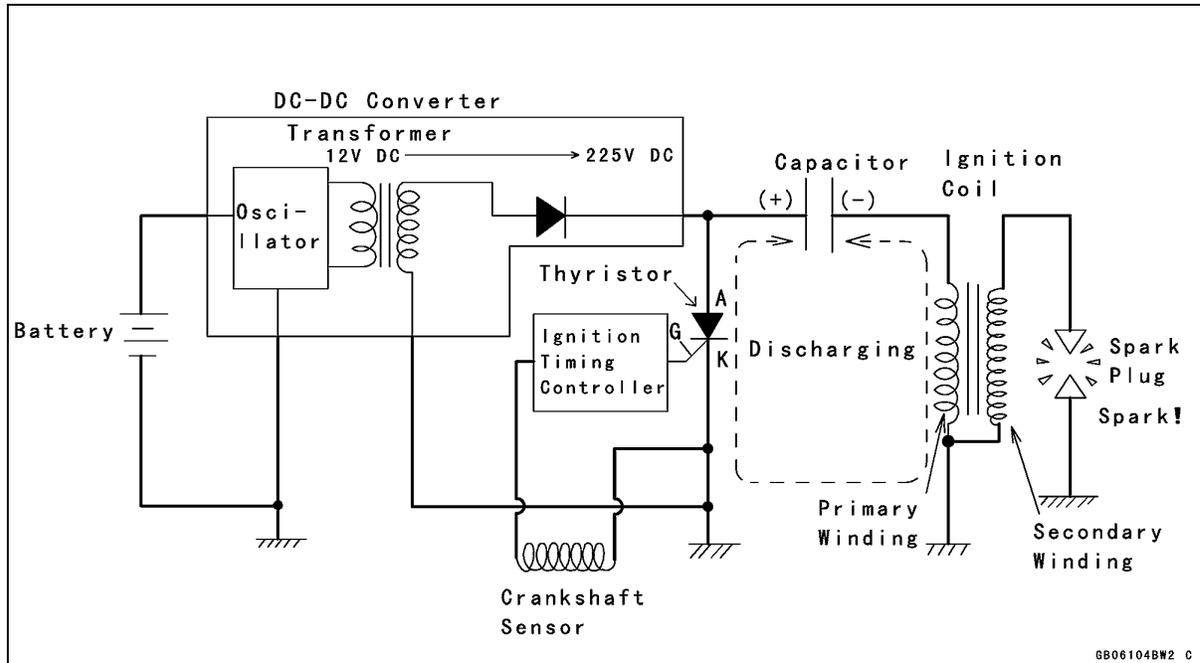
Second step-thyristor conducts

After charging, the crankshaft sensor and ignition timing controller send a trigger signal to the gate through the cathode (K → G in the figure) in the thyristor. When this happens, the current flows from the cathode to the anode (K → A) in the thyristor.

Third step-Surging current into the Primary Winding

When the thyristor conducts, the charge stored in the capacitor is released suddenly, flowing through the primary winding, back through the thyristor to the capacitor.

Technical Information-DC-CDI (Direct Current-Capacitor Discharge Ignition System)



This sudden change in the primary current induces a primary voltage (counterelectromotive force) which is equal to the capacitor voltage (about 225 V) but against the discharging current. The primary voltage induces a high secondary voltage in the secondary coil, generating spark plug gap. The secondary voltage multiplied by winding ratio (about 90 : 1) reaches about 20 000 V.

Final step-Thyristor resets

After the charge stored in the capacitor is completely released, the cathode to anode voltage is removed in the thyristor and the thyristor stops conducting and automatically resets. Then, the DC-DC converter charges the capacitor again and operation returns to first step.

The control of Ignition Timing

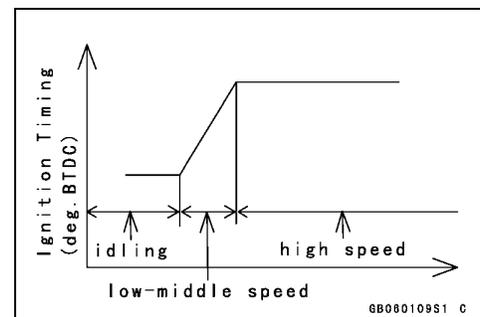
Since the ignition timing is electronically advanced or retarded, this system has no mechanical parts such as a cam or contact breakers and there are no parts to wear out and no periodic maintenance is required. So, there is never any need to adjust the timing once it has been installed correctly.

Generally, the spark plug must be fired at a proper crank angle before top dead center (BTDC).

At low and mid-range engine speeds, the faster the engine runs, the further the ignition timing advances. This prevents knocking and preignition, and provides better engine performance.

If the engine speed increases further, no timing advance is required because the engine can breathe in and burn the fuel/air mixture in a shorter time. The ignition timing does not increase further and the timing advance stops. This also provides better engine performance and prevents the engine from overrunning and overheating.

The operation of a diode and thyristor is explained here in order to describe how the ignition timing is controlled.



1-16 GENERAL INFORMATION

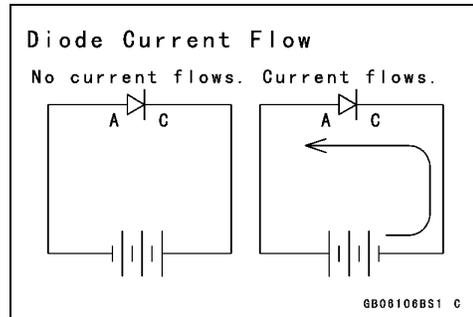
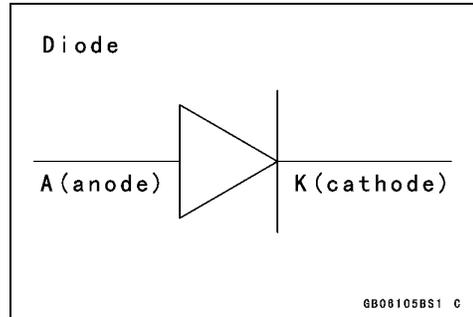
Technical Information-DC-CDI (Direct Current-Capacitor Discharge Ignition System)

Diode

A diode functions as an electrical check valve. It conducts current easily from its cathode to its anode, but it will not permit current flow in the opposite direction. Since electricity attempts to flow from negative (-) to positive (+), a circuit with a diode will conduct current only when the polarity is correct, i.e., when the negative charge is applied to the diode's cathode.

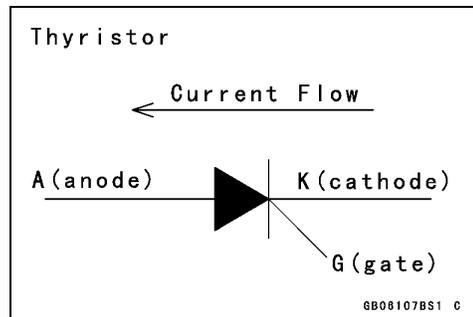
NOTE

○ *This manual doesn't use the conventional current flow concept, but the electron theory current flow concept; current is supposed to flow negative (-) to positive (+) in this text.*



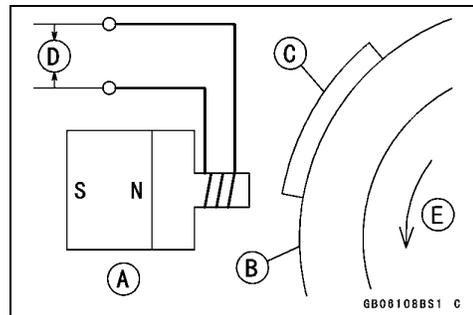
Thyristor (SCR)

Current will flow from the cathode to anode but will not flow in the reverse direction. The thyristor differs from a diode in two respects: (a) even though a voltage of the correct polarity-negative to cathode-may be applied, the thyristor will not conduct until a signal is applied to the gate input lead; (b) once started, it will not stop conducting (even if the gate lead signal voltage stops) until the cathode to anode voltage is removed or reversed.



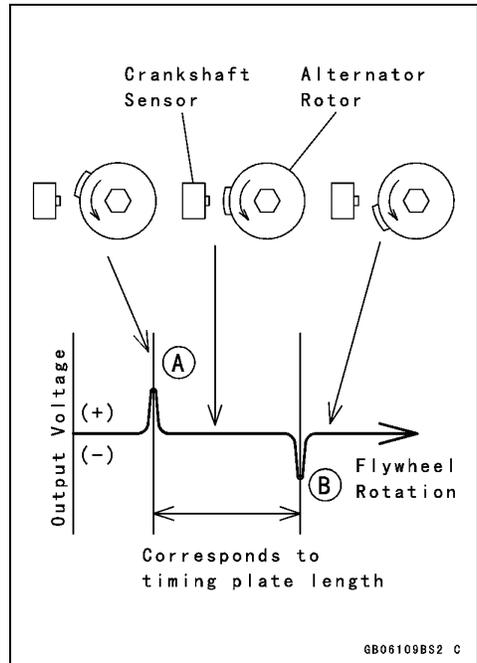
The crankshaft sensor is installed on the alternator cover so that it will be close to the alternator rotor. One side of the crankshaft sensor core has a permanent magnet and the other side has a coil to signal the CDI unit.

- Crankshaft Sensor [A]
- Alternator Rotor [B]
- Timing Plate [C]
- Output Voltage [D]

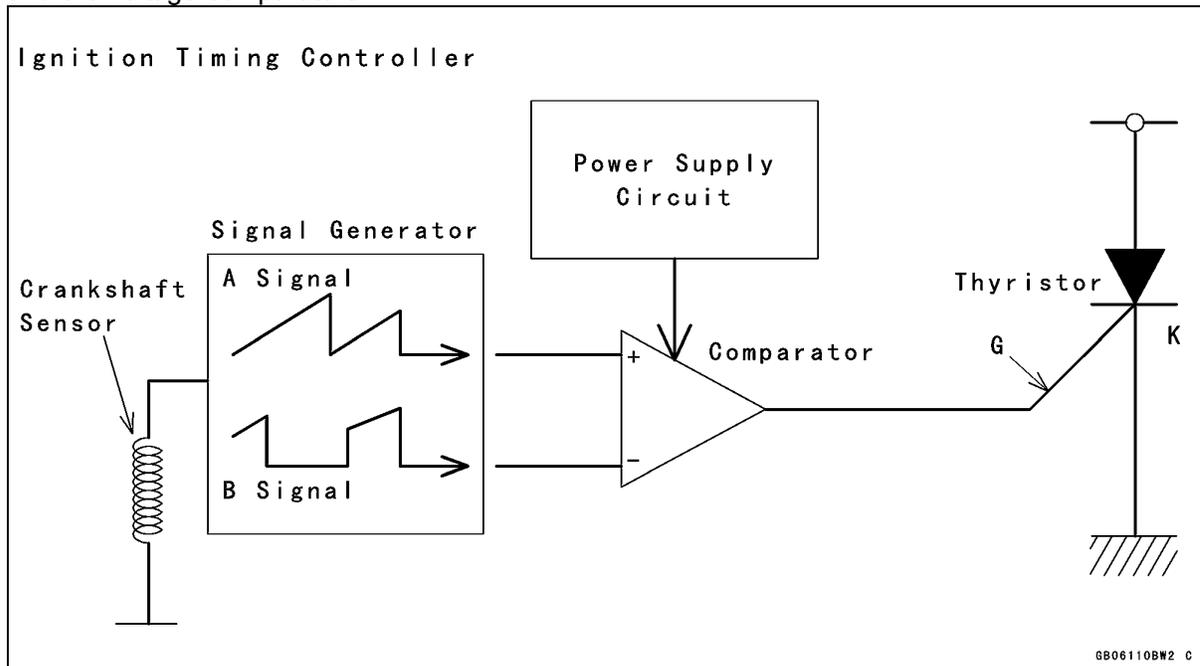


Technical Information-DC-CDI (Direct Current-Capacitor Discharge Ignition System)

Every time either end of the timing plate on the rotor passes by the crankshaft sensor, a pulse is generated and sent to the CDI unit, that is, two pulses are generated per one revolution of the rotor. One is a positive pulse [A] and the other is a negative pulse [B].



The crankshaft sensor, a signal generator, and voltage comparators determine the ignition timing in the ignition timing controller. The power supply circuit is the power source for the signal generator and the voltage comparators.

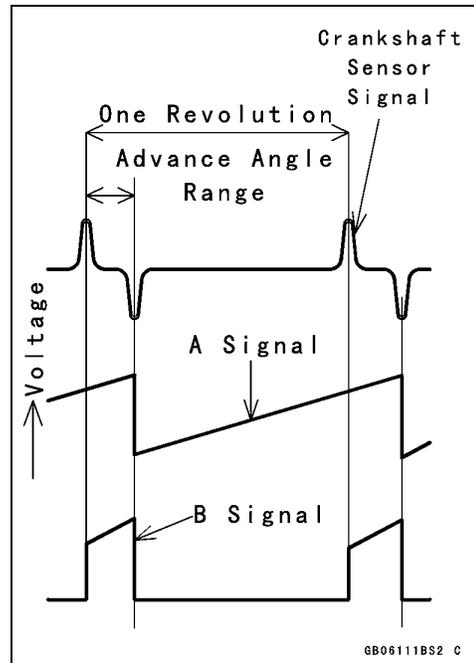


1-18 GENERAL INFORMATION

Technical Information-DC-CDI (Direct Current-Capacitor Discharge Ignition System)

The crankshaft sensor generates a crankshaft sensor signal and sends it to the signal generator. The signal generator generates A and B signals synchronized with the crankshaft sensor signal. These signals are shown in the figure.

That is to say, the signal generator changes the crankshaft sensor signal into A and B signals.



Technical Information-DC-CDI (Direct Current-Capacitor Discharge Ignition System)

(Ignition Timing Advancing)

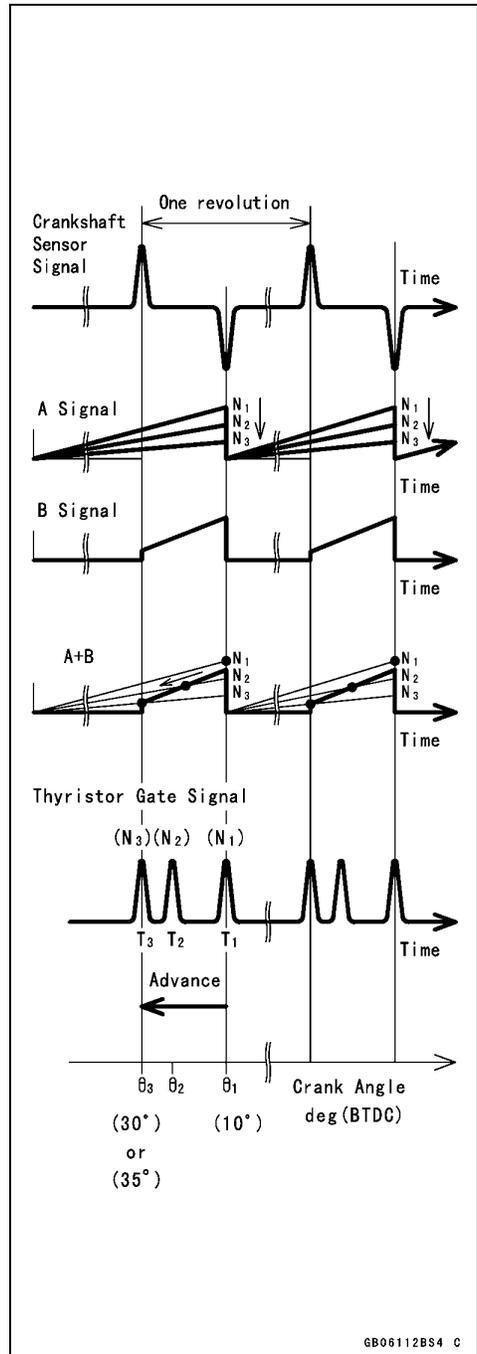
A signal and B signal in the comparator advance the ignition timing.

The signal generator decreases A signal as the engine rpm increases from N1, to N3 as shown, but keeps B signal unchanged.

A and B signals are shown with the signals overlapped.

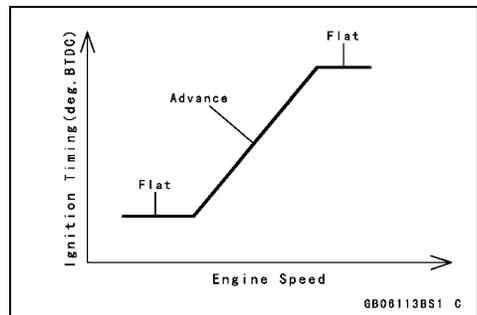
The comparator compares A signal with B signal. When A signal voltage becomes equal to or less than B signal voltage, the comparator sends a trigger signal to the gate in the thyristor, firing the spark plug.

The intersection point between A and B signals indicates the timing when the spark plug fires. This point moves left (the timing advances) as the engine rpm increases from N1 to N3 as shown.



Before or after advancing period, the ignition timing is determined by the crankshaft sensor signal and the ignition timing remains constant.

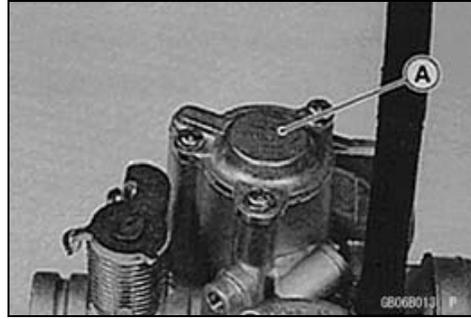
The figure shows the advancing chart.



1-20 GENERAL INFORMATION

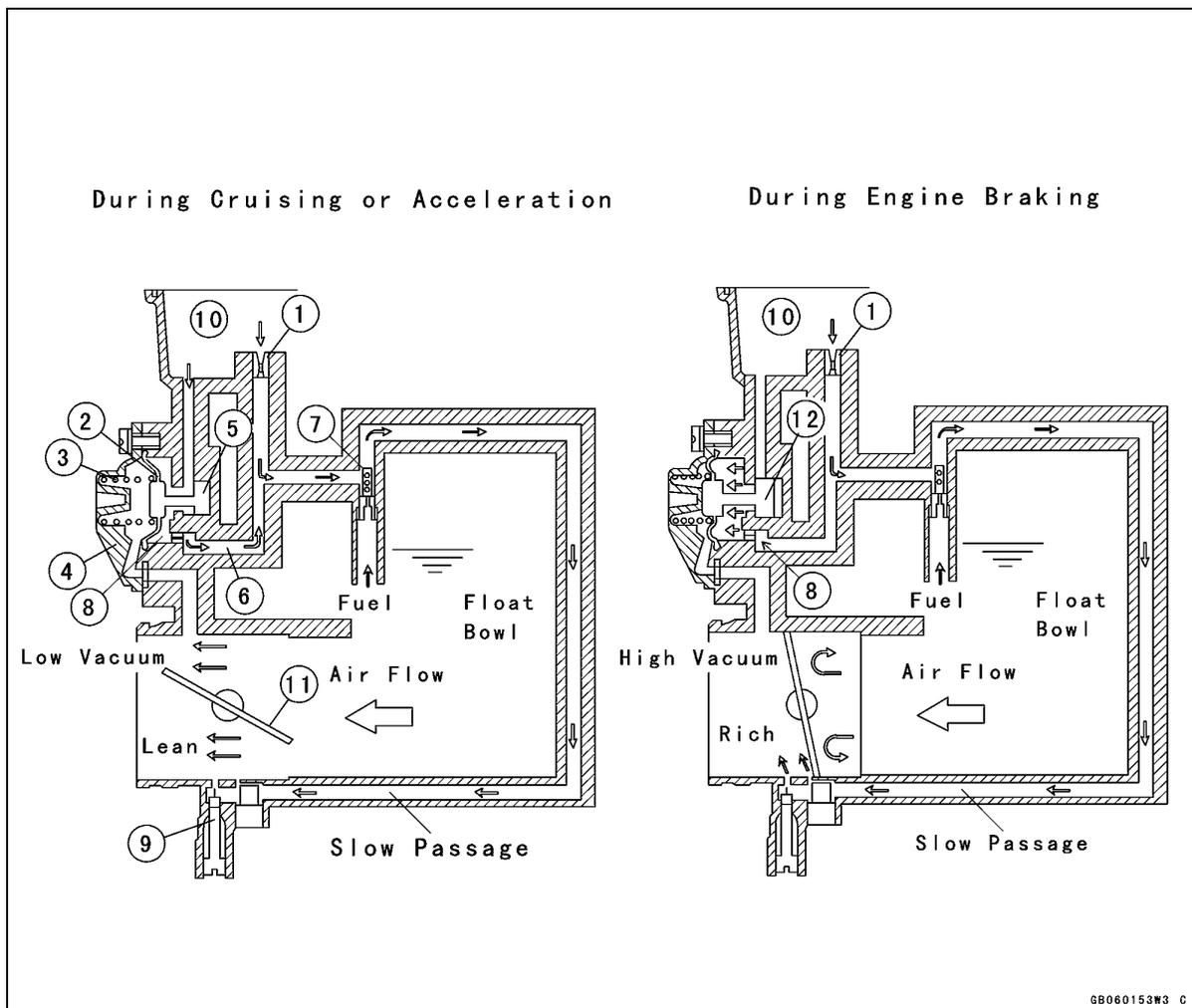
Technical Information-Coasting Enricher

The coasting enricher [A] prevents backfiring during engine braking by supplying a rich fuel mixture to the engine.



When the motorcycle is cruising or accelerating, the engine vacuum is low, and the return spring [3] pushes the valve in its opened position [5]. The passage [6] is open and the air runs through the pilot jet [7] for better atomization.

During engine braking, a high vacuum is generated behind the butterfly valve [11]. This draws the diaphragm [2] against the return spring [3] to close the valve [12], and then the passage [6]. The mixture becomes rich to prevent backfiring because the amount of air is reduced.



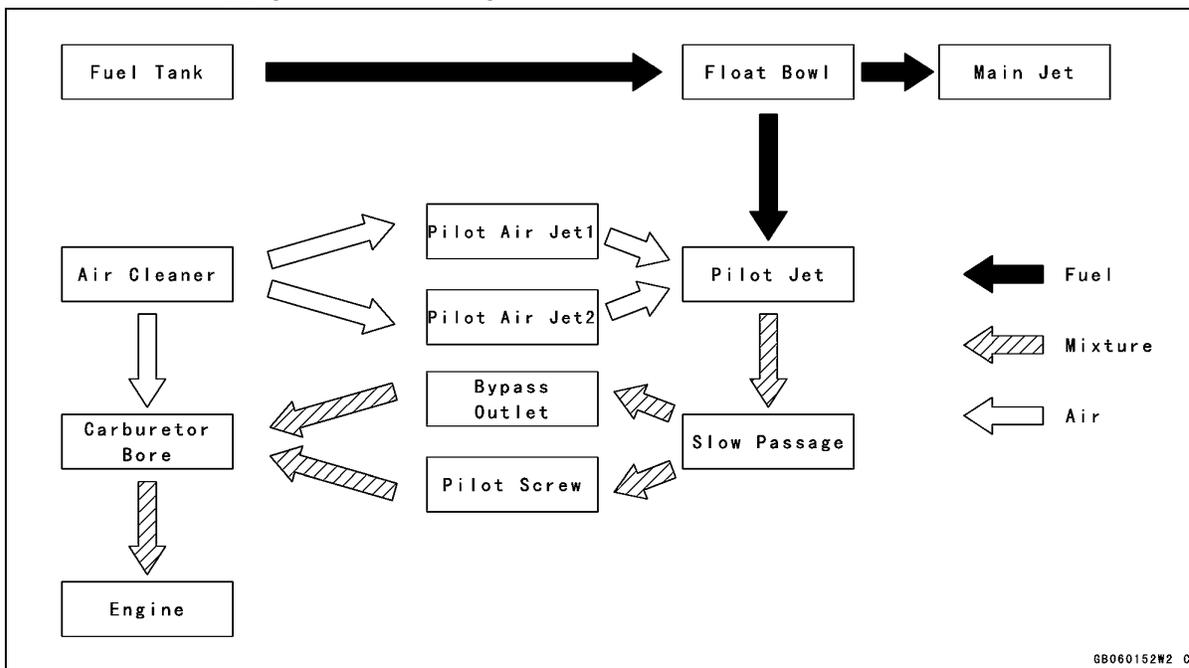
- 1. Pilot Air Jet 1
- 2. Diaphragm
- 3. Return Spring
- 4. Cover
- 5. Valve Opened
- 6. Passage

- 7. Pilot Jet
- 8. Pilot Air Jet 2
- 9. Pilot Screw
- 10. Air Cleaner Housing
- 11. Butterfly Valve (Throttle Valve)
- 12. Valve Closed

GB060153W3 C

Technical Information-Coasting Enricher

Fuel and Air Supply of Enricher System



1-22 GENERAL INFORMATION

Unit Conversion Table

Prefixes for Units

Prefix	Symbol	Power
mega	M	× 1 000 000
kilo	k	× 1 000
centi	c	× 0.01
milli	m	× 0.001
micro	μ	× 0.000001

Units of Mass

kg	×	2.205	=	lb
g	×	0.03527	=	oz

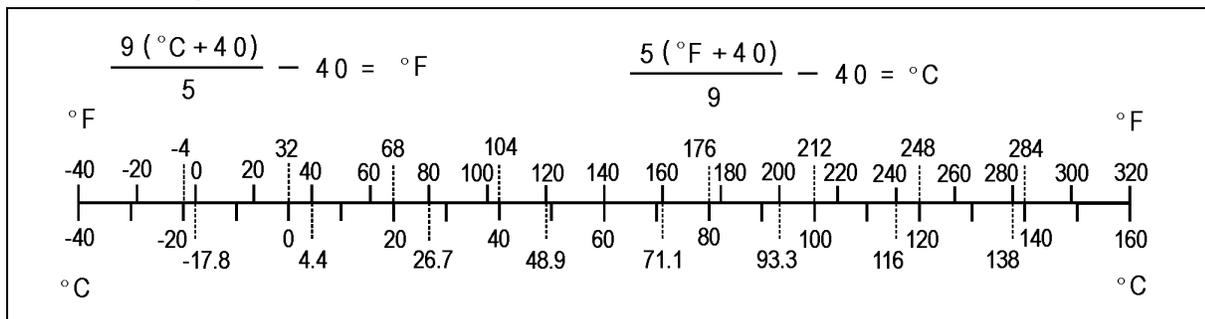
Units of Volume

L	×	0.2642	=	gal (US)
L	×	0.2200	=	gal (imp)
L	×	1.057	=	qt (US)
L	×	0.8799	=	qt (imp)
L	×	2.113	=	pint (US)
L	×	1.816	=	pint (imp)
mL	×	0.03381	=	oz (US)
mL	×	0.02816	=	oz (imp)
mL	×	0.06102	=	cu in

Units of Force

N	×	0.1020	=	kg
N	×	0.2248	=	lb
kg	×	9.807	=	N
kg	×	2.205	=	lb

Units of Temperature



Units of Length

km	×	0.6214	=	mile
m	×	3.281	=	ft
mm	×	0.03937	=	in

Units of Torque

N·m	×	0.1020	=	kgf·m
N·m	×	0.7376	=	ft·lb
N·m	×	8.851	=	in·lb
kgf·m	×	9.807	=	N·m
kgf·m	×	7.233	=	ft·lb
kgf·m	×	86.80	=	in·lb

Units of Pressure

kPa	×	0.01020	=	kgf/cm ²
kPa	×	0.1450	=	psi
kPa	×	0.7501	=	cm Hg
kgf/cm ²	×	98.07	=	kPa
kgf/cm ²	×	14.22	=	psi
cm Hg	×	1.333	=	kPa

Units of Speed

km/h	×	0.6214	=	mph
------	---	--------	---	-----

Units of Power

kW	×	1.360	=	PS
kW	×	1.341	=	HP
PS	×	0.7355	=	kW
PS	×	0.9863	=	HP

Periodic Maintenance

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2-2 PERIODIC MAINTENANCE

Periodic Maintenance Chart

The scheduled maintenance must be done in accordance with this chart to keep the motorcycle in good running condition. **The initial maintenance is vitally important and must not be neglected.**

OPERATION	FREQUENCY	* ODOMETER READING × 1 000 km (× 1 000 mile)						
	Whichever comes first ↓ Every	1 (0.6)	6 (4)	12 (7.5)	18 (12)	24 (15)	30 (20)	36 (24)
Fuel hose, connections- inspect †			•	•	•	•	•	•
Throttle grip play-inspect †		•		•		•		•
Idle speed-inspect		•		•		•		•
Air cleaner element-clean †#				•		•		•
Evaporative emission control system (CAL)-inspect †		•	•	•	•	•	•	•
Air suction valve-inspect (AT CH, DE, SI, US)			•	•	•	•	•	•
Cylinder head bolt tightness-inspect †		•		•		•		•
Valve clearance-inspect †				•		•		•
Clutch-adjust		•	•	•	•	•	•	•
Engine oil-change #	6 month	•	•	•	•	•	•	•
Oil filter-replace		•		•		•		•
Oil screen-clean		•		•		•		•
Spoke tightness and rim runout-inspect †		•	•	•	•	•	•	•
Tire wear-inspect †			•	•	•	•	•	•
Drive chain slack-inspect †#	1 000 km							
Drive chain wear-inspect †#			•	•	•	•	•	•
Drive chain-lubricate #	600 km							
Brake pedal free play-inspect †		•	•	•	•	•	•	•
Brake lining or pad wear-inspect †#			•	•	•	•	•	•
Brake hose, connections-inspect †			•	•	•	•	•	•
Brake fluid level-inspect †	month	•	•	•	•	•	•	•
Brake fluid-change	2 years					•		
Brake master cylinder cup and dust cover-replace	4 years							
Caliper fluid seal and dust seal-replace	4 years							
Brake light switch-inspect †		•	•	•	•	•	•	•
Brake cable-replace	2 years					•		
Front fork oil-change	2 years					•		
Front fork oil leak-inspect †				•		•		•
Rear shock absorber oil leak-inspect †				•		•		•
Swingarm pivot-lubricate				•		•		•
Steering-inspect †		•	•	•	•	•	•	•
Steering stem bearing-lubricate	2 years					•		
Battery electrolyte level-inspect †	6 months		•	•	•	•	•	•

Periodic Maintenance Chart

FREQUENCY	* ODOMETER READING × 1 000 km (× 1 000 mile)							
	Whichever comes first ↓ Every	1 (0.6)	6 (4)	12 (7.5)	18 (12)	24 (15)	30 (20)	36 (24)
OPERATION								
Spark plug-clean and gap †			•	•	•	•	•	•
General lubrication-perform				•		•		•
Nuts, bolts, and fasteners tightness-inspect		•		•		•		•

#: Service more frequently when operating in severe conditions; dusty, wet, muddy, high speed, or frequent starting/stopping.

*: For higher odometer readings, repeat at the frequency interval established here.

†: Replace, add, adjust, clean, or torque if necessary.

AT: Austria

CAL: California

CH: Switzerland

DE: Germany

SG: Singapore

US: United States

2-4 PERIODIC MAINTENANCE

Torque and Locking Agent

The following tables list the tightening torque for the major fasteners requiring use of a non-permanent locking agent or liquid gasket.

Letters used in the "Remarks" column mean:

L: Apply a non-permanent locking agent to the threads.

M: Apply molybdenum disulfide grease.

O: Apply an oil to the threads and seating surface.

S: Tighten the fasteners following the specified sequence.

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Fuel System				
Upper Chamber Cover Screws	3.5	0.36	31 in·lb	L
Spring Seat Screws	0.8	0.080	7 in·lb	
Choke Lever Set Screw	0.8	0.080	7 in·lb	
Choke Lever Pivot Screw	2.0	0.20	17 in·lb	
Pilot Air Jet	1.8	0.18	15 in·lb	
Coasting Enricher Cover Screws	2.0	0.20	17 in·lb	
Pilot Jet	0.8	0.080	7 in·lb	
Main Jet	1.8	0.18	15 in·lb	
Float Valve Holder Screw	2.0	0.20	17 in·lb	
Choke Plunger Cap	3.9	0.40	35 in·lb	
Float Bowl Screws	2.0	0.20	17 in·lb	
Carburetor Drain Plug	2.0	0.20	17 in·lb	
Fuel Tap Plate Screws	0.8	0.080	7 in·lb	
Fuel Tap Diaphragm Cover Screws	1.0	0.10	9 in·lb	
Fuel Tap Mounting Bolts (White Washer)	2.5	0.25	22 in·lb	
Fuel Tap Mounting Bolts (Black Washer)	4.9	0.50	43 in·lb	
Engine Top End				
Valve Adjusting Cap Bolts (Bn125-A1 ~ A3)	9.8	1.0	87 in·lb	O, M, S (washer) S
Valve Adjusting Cap Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
Camshaft Chain Cover Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
Camshaft Chain Cover Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
Cylinder Head Bolts M9	26	2.7	19	
Cylinder Head Bolts M6	12	1.2	104 in·lb	
Camshaft Chain Cover Damper Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
Camshaft Chain Cover Damper Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
Spark plug	13	1.3	9.5	
Cylinder Head Blank Cap Bolt (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
Cylinder Head Blank Cap Bolt (BN125-A4 ~)	8.8	0.90	78 in·lb	
Carburetor Holder Bolts	9.8	1.0	87 in·lb	
Air Suction Valve Cover Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
Air Suction Valve Cover Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
Cylinder Head Plug	4.9	0.50	43 in·lb	
Vacuum Hose Fitting	5.9	0.60	52 in·lb	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Oil Pipe Banjo Bolts M8	9.8	1.0	87 in·lb	
Oil Pipe Banjo Bolts M10	25	2.5	18	
Oil Pipe Mounting Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
Oil Pipe Mounting Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
Camshaft Bearing Holder Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
Camshaft Bearing Holder Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
Camshaft Sprocket Bolts	12	1.2	104 in·lb	
Camshaft Chain Holder Screw	4.9	0.50	43 in·lb	
Camshaft Chain Guide Bolts	8.8	0.90	78 in·lb	
Chain Tensioner Mounting Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
Chain Tensioner Mounting Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
Chain Tensioner Cap	4.9	0.50	43 in·lb	
Valve Adjusting Screw Locknuts	15	1.5	11	
Rocker Shaft Bolts	8.8	0.90	78 in·lb	
Muffler Mounting Nut	15	1.5	11	
Clutch				
Clutch Hub Bolt	98	10.0	72	
Clutch Spring Bolts	8.8	0.90	78 in·lb	
Clutch Cover Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
Clutch Cover Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
Oil Seal Retaining Plate Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
Oil Seal Retaining Plate Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
Clutch Cover Damper Bolts	8.8	0.90	78 in·lb	L
Starter Locknut Switch Screws	1.0	0.10	9 in·lb	
Primary Gear Nut	69	7.0	51	
Engine Lubrication System				
Engine Oil Drain Plug	18	1.8	13	
Oil Screen Cover Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
Oil Screen Cover Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
Oil Pressure Relief Valve	15	1.5	11	
Oil Filter Cover Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
Oil Filter Cover Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
Oil Pump Mounting Screws	4.9	0.50	43 in·lb	
Oil Pump Assy Screw	9.8	1.0	87 in·lb	
Oil Pipe Banjo Bolt	25	2.5	18	Clutch Cover, S
Oil Pipe Banjo Bolts	9.8	1.0	87 in·lb	Cylinder Head, S
Oil Pipe Mounting Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
Oil Pipe Mounting Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
Oil Filler Plug	2.5	0.25	22 in·lb	

2-6 PERIODIC MAINTENANCE

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Engine Removal/installation				
Engine Mounting Bolts, Nuts (M10)	44	4.5	33	
Engine Mounting Bolts, Nuts (M8)	25	2.5	18	
Engine Mounting Bracket Bolts, Nuts	25	2.5	18	
Engine Ground Terminal Bolt	9.8	1.0	87 in·lb	
Crankshaft/transmission				
Primary Gear Nut	69	7.0	51	
Balancer Shaft Gear Nut	78	8.0	58	O
Crankcase Bolts	8.8	0.90	78 in·lb	
Crankcase Bearing Retainer Screws	4.9	0.50	43 in·lb	
Neutral Switch	15	1.5	11	
Shift Drum Cam Screw	4.9	0.50	43 in·lb	L
Gear Set Lever Nut	11	1.1	95 in·lb	
Engine Sprocket Holder Bolts	12	1.2	104 in·lb	
Shift Return Spring Pin (Bolt)	29	3.0	21	L
Shift Lever Clamp Bolt	12	1.2	104 in·lb	
Shift Pedal Nut	30	3.1	22	
Wheels/tires				
Front Axle Nut	78	8.0	58	
Rear Axle Nut	98	10.0	72	
Tire Air Valve Nuts	1.5	0.15	13 in·lb	
Spoke Nipples	2.0 ~ 3.9	0.20 ~ 0.40	17 ~ 35 in·lb	
Final Drive				
Engine Sprocket Cover Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
Engine Sprocket Cover Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
Engine Sprocket Cover Damper Bolts	8.8	0.90	78 in·lb	L
Torque Link Bolt and Nut	34	3.5	25	
Rear Sprocket Nut	26	2.7	19	
Rear Axle Nut	98	10.0	72	
Engine Sprocket Holder Bolts	12	1.2	104 in·lb	
Brakes				
Brake Disc Bolt	27	2.8	20	
Caliper Mounting Bolts	25	2.5	18	
Caliper Holder Shaft Bolt	18	1.8	13	
Caliper Pad Bolts	18	1.8	13	
Caliper Bleed Valves	7.8	0.80	69 in·lb	
Brake Hose Banjo Bolts	25	2.5	18	
Brake Lever Pivot Bolt	5.9	0.60	52 in·lb	
Brake Lever Pivot Bolt Locknut	5.9	0.60	52 in·lb	
Front Brake Reservoir Cap Screws	1.5	0.15	13 in·lb	
Front Brake Light Switch Screws	1.0	0.10	9 in·lb	
Front Master Cylinder Clamp Bolts	8.8	0.90	78 in·lb	S
Torque Link Bolt and Nut	34	3.5	25	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Brake Pedal Bolt	9.8	1.0	87 in·lb	
Suspension				
Front Fork Top Plugs	23	2.3	17	
Front Fork Bottom Allen Bolts	20	2.0	15	L
Front Fork Clamp Bolts (Upper)	20	2.0	15	
Front Fork Clamp Bolts (Lower)	34	3.5	25	
Rear Shock Absorber Nuts (Upper)	34	3.5	25	
Rear Shock Absorber Bolts (Lower)	34	3.5	25	
Swingarm Pivot Nut	98	10.0	72	
Steering				
Steering Stem Head Bolt	44	4.5	33	
Steering Stem Nut	Hand-tight or 4.9	Hand-tight or 0.50	Hand-tight or 43 in·lb	
Handlebar Nuts	34	3.5	25	
Handlebar Holder Clamp Bolts (BN125-A3 ~)	20	2.0	15	S
Handlebar Weight Screws	–	–	–	L
Handlebar Switch Housing Screws	3.4	0.35	30 in·lb	
Front Fork Clamp Bolts (Upper)	20	2.0	15	
Front Fork Clamp Bolts (Lower)	34	3.5	25	
Frame				
Front Footpeg Bolts	23	2.3	16.5	
Electrical System				
Spark Plug	13	1.3	113 in·lb	
Crankshaft Sensor Screws	3.9	0.40	35 in·lb	
Ignition Coil Bolt	6.9	0.70	61 in·lb	
Igniter Mounting Screws	4.9	0.50	43 in·lb	
Alternator Cover Bolts	8.8	0.90	78 in·lb	
Alternator Cover Damper Bolts	8.8	0.90	78 in·lb	L
Alternator Rotor Nut (BN125-A1 ~ A2)	69	7.0	51	
Alternator Rotor Nut (BN125-A3)	98	10.0	72	
Alternator Rotor Nut (BN125-A4 ~)	104	10.6	76	
Starter Coil Bolts	13	1.3	113 in·lb	
Alternator Lead Holder Bolts (BN125-A1 ~ A2)	13	1.3	113 in·lb	
Alternator Lead Holder Bolts (BN125-A3 ~)	8.8	0.90	78 in·lb	
Starter Motor Terminal Locknut	6.9	0.70	61 in·lb	
Starter Motor Terminal Nut	4.9	0.50	43 in·lb	
Starter Relay Terminal Bolt	4.9	0.50	43 in·lb	
Starter Motor Assembly Bolts	3.4	0.35	30 in·lb	
Starter Motor Mounting Bolts	8.8	0.90	78 in·lb	
Starter Motor Clutch Bolts (BN125-A1)	34	3.5	25	L
Starter Motor Clutch Bolts (BN125-A2 ~)	12	1.2	104 in·lb	L
Headlight Body Screws	2.9	0.30	26 in·lb	
Handlebar Switch Housing Screws	3.4	0.35	30 in·lb	

2-8 PERIODIC MAINTENANCE

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Turn Signal Light Holder Nuts	5.9	0.60	52 in·lb	L
Neutral Switch	15	1.5	11	
Sidestand Switch Screws	3.9	0.40	35 in·lb	

The table below, relating tightening torque to thread diameter, lists the basic torque for the bolts and nuts. Use this table for only the bolts and nuts which do not require a specific torque value. All of the values are for use with dry solvent-cleaned threads.

Basic Torque for General Fasteners

Threads dia. (mm)	Torque		
	N·m	kgf·m	ft·lb
5	3.4 ~ 4.9	0.35 ~ 0.50	30 ~ 43 in·lb
6	5.9 ~ 7.8	0.60 ~ 0.80	52 ~ 69 in·lb
8	14 ~ 19	1.4 ~ 1.9	10.0 ~ 13.5
10	25 ~ 34	2.6 ~ 3.5	19.0 ~ 25
12	44 ~ 61	4.5 ~ 6.2	33 ~ 45
14	73 ~ 98	7.4 ~ 10.0	54 ~ 72
16	115 ~ 155	11.5 ~ 16.0	83 ~ 115
18	165 ~ 225	17.0 ~ 23.0	125 ~ 165
20	225 ~ 325	23 ~ 33	165 ~ 240

Specifications

Item	Standard	Service Limit
Fuel System		
Throttle Grip Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	---
Idle Speed	1 300 ±50 r/min (rpm)	---
Air Cleaner Element Oil:		
Grade	SE, SF or SG class	---
Viscosity	SAE 30	---
Engine Top End		
Valve Clearance:		
Inlet	0.08 ~ 0.12 (0.0031 ~ 0.0047 in.)	---
Exhaust	0.15 ~ 0.19 (0.0059 ~ 0.0075 in.)	---
Clutch		
Clutch Lever Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	---
Engine Lubrication System		
Engine Oil:		
Grade:		
(BN125-A1 ~ A3)	API SE, SF or SG	---
(BN125-A4 ~)	API SE, SF or SG	
	API SH, SJ or SL with JASO MA	
Viscosity	SAE 10W-40	---
Capacity		
	1.1 L (1.16 US qt) (when filter is not removed)	---
	1.2 L (1.27 US qt) (when filter is removed)	---
	1.4 L (1.48 US qt) (when engine is completely dry)	---
Level	Between upper and lower level lines (Wait 2 ~ 3 minutes after idling or running)	---
Tires		
Rim Runout (With Tire Installed):		
Axial	TIR 0.8 mm (0.03 in.) or less	TIR 2.0 mm (0.08 in.)
Radial	TIR 1.0 mm (0.04 in.) or less	TIR 2.0 mm (0.08 in.)
Air Pressure (When Cold):		
Front:		
(BN125-A1 ~ A2)	Up to 185 kg (408 lb) load: 150 kPa (1.5 kgf/cm ² , 21 psi)	---
(BN125-A3 ~)	Up to 155 kg (342 lb) load: 150 kPa (1.5 kgf/cm ² , 21 psi)	---
Rear:		
(BN125-A1 ~ A2)	Up to 185 kg (408 lb) load: 175 kPa (1.75 kgf/cm ² , 25 psi)	---
(BN125-A3 ~)	Up to 155 kg (342 lb) load: 175 kPa (1.75 kgf/cm ² , 25 psi)	---
Tread Depth:		
Front:		
(BN125-A1 ~ A2)	4.5 mm (0.18 in.)	1 mm (0.04 in.)
(BN125-A3 ~ A5)	4.0 mm (0.157 in.)	1 mm (0.04 in.)

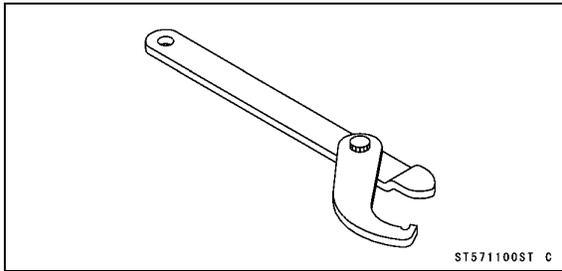
2-10 PERIODIC MAINTENANCE

Specifications

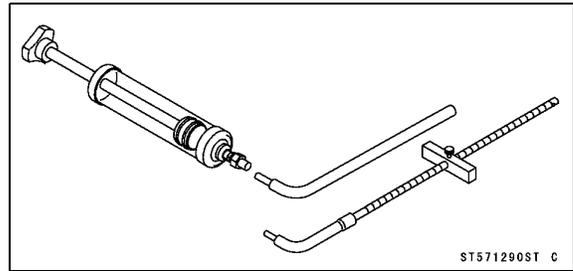
Item	Standard	Service Limit
(BN125-A6 ~) Rear	4.1 mm (0.161 in.) 7.3 mm (0.29 in.)	1 mm (0.04 in.) 2 mm (0.08 in.)
Final Drive		
Drive Chain Slack	25 ~ 40 mm (0.98 ~ 1.57 in.)	---
20 Link Length	254.0 ~ 254.6 mm (10.00 ~ 10.02 in.)	259 mm (10.2 in.)
Brakes		
Brake Lever Free Play	Non-adjustable	---
Brake Pedal Free Play	20 ~ 30 mm (0.79 ~ 1.18 in.)	---
Shoe Lining Thickness	3.85 ~ 4.15 mm (0.152 ~ 0.163 in.)	2 mm (0.08 in.)
Brake Fluid:		
Grade	DOT4	---
Brake Pad Lining Thickness:		
(BN125-A1 ~ A2)	4.5 mm (0.177 in.)	1 mm (0.04 in.)
(BN125-A3 ~)	6.0 mm (0.236 in.)	1 mm (0.04 in.)
Brake Light Timing:		
Front	Pulled on	---
Rear	On after about 10 mm (0.39 in.) of pedal travel	---
Suspension		
Oil Viscosity	SHOWA SS-8 or equivalent	---
Oil Capacity (Par Unit):		
Completely Dry	191 ±2.5 mL (6.46 ±0.085 US oz.)	---
When Changing Oil	Approx 165 mL (5.58 US oz.)	---
Oil Level (Fully Compressed, Without Main Spring)	218 ±2 mm (8.58 ±0.08 in.)	---
Electrical system		
Spark Plug Gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)	---
Battery Electrolyte Level	Between level lines	---

Special Tools

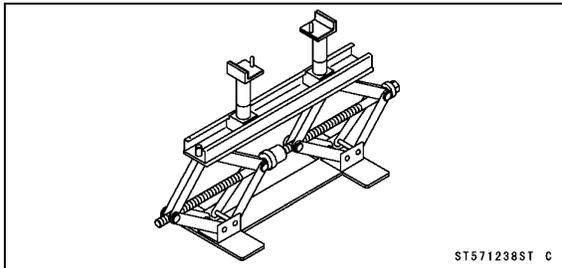
Steering Stem Nut Wrench:
57001-1100



Fork Oil Level Gauge:
57001-1290



Jack:
57001-1238



2-12 PERIODIC MAINTENANCE

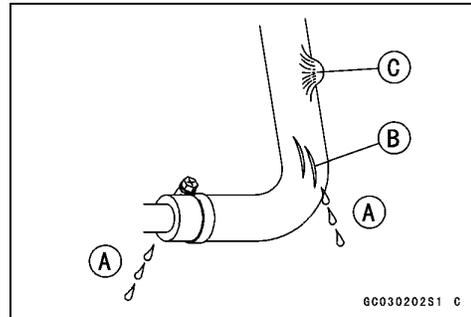
Periodic Maintenance Procedures

Fuel System

Fuel Hose and Connection Inspection

○ The fuel hose is designed to be used throughout the motorcycle's life without any maintenance, however, if the motorcycle is not properly handled, the inside the fuel line can cause fuel to leaks [A] or the hose to burst. Remove the fuel tank (see Fuel System chapter) and check the fuel hose.

- ★ Replace the fuel hose if any fraying, cracks [B] or bulges [C] are noticed.
- Check that the hose is securely connected and clamps are tightened correctly.
- When installing, route the hose according to Cable, Wire, and Hose Routing section in the Appendix chapter.
- When installing the fuel hose avoids sharp bending, kinking, flattening or twisting, and route the fuel hose with a minimum of bending so that the fuel flow will not be obstructed.
- ★ Replace the hose if it has been sharply bent or kinked.



Throttle Grip Free Play Inspection

If the throttle grip has excessive free play due to cable stretch or misadjustment, there will be a delay in throttle response. Also, the throttle valve may not open fully at full throttle. On the other hand, if the throttle grip has no play, the throttle will be hard to control, and the idle speed will be erratic. Check the throttle grip play periodically in accordance with the Periodic Maintenance Chart, and adjust the play if necessary.

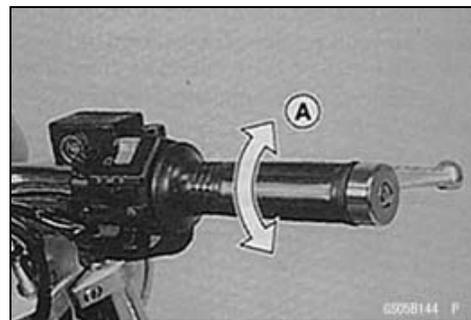
The throttle cable routing is shown in Cable, Harness, Hose Routing section in the Appendix chapter.

- Check the throttle grip free play [A].
- ★ If the free play is incorrect, adjust the throttle cable.

Throttle Grip Free Play

Standard: 2 ~ 3 mm (0.08 ~ 0.12 in.)

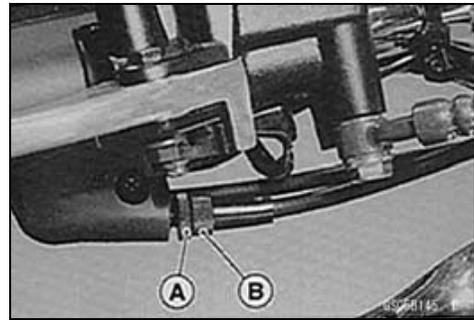
- Check that the throttle grip moves smoothly from full open to close, and the throttle closes quickly and completely in all steering positions by the return spring.
- ★ If the throttle grip does not return properly, check the throttle cable routing, grip free play, and cable damage. Then lubricate the throttle cable.
- Run the engine at the idle speed, and turn the handlebar all the way to the right and left to ensure that the idle speed does not change.
- ★ If the idle speed increase, check the throttle grip free play and the cable routing.



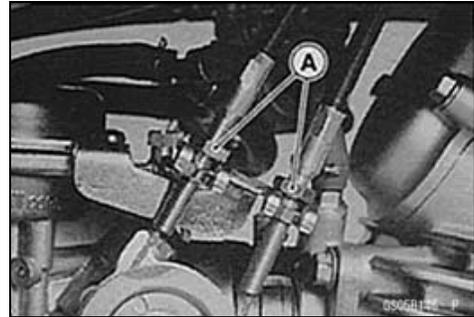
Periodic Maintenance Procedures

Throttle Grip Free Play Adjustment

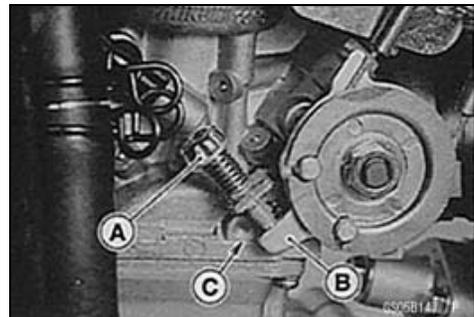
- Loosen the locknut [A].
- Turn the adjuster [B] until the proper amount of free play can be obtained.
- Tighten the locknut against the adjuster.
- ★ If the throttle grip free play cannot be adjusted with the adjuster, use the cable adjusters at the lower ends of the throttle cables.



- Loosen the locknut, and screw the adjuster at the upper end of the accelerator cable all the way in.
- Tighten the locknut securely against the adjuster.
- Adjuster either lower nuts [A] of the accelerator cable or the decelerator cable until the correct throttle grip free play is obtained.



- ★ If the free play cannot be adjusted with the lower adjusting nuts, use the adjuster at the upper end of the cable again.
- Check that the throttle pulley [B] stops [C] against the idle adjusting screw [A] with the throttle grip closed.



Idle Speed Inspection

- Start the engine and warm it up thoroughly.
- With the engine idling, turn the handlebar to both sides.
- ★ If handlebar movement changes the idle speed, the throttle cable may be improperly adjusted or incorrectly routed, or damaged. Be sure to correct any of these conditions before riding (see Cable, Wire, and Hose Routing section in Appendix chapter).

⚠ WARNING

Operation with an improperly adjusted, incorrectly routed, or damaged cable could result in an unsafe riding condition.

- Check idle speed.
- ★ If the idle speed is out of the specified range, adjust it.

Idle Speed

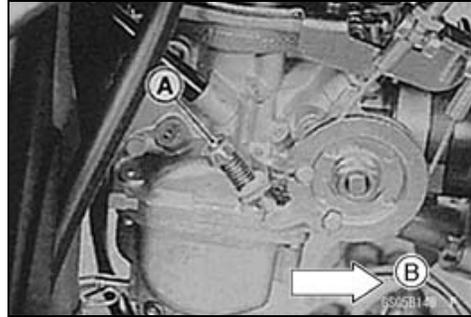
Standard: 1 300 ±50 r/min (rpm)

2-14 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

Idle Speed Adjustment

- Start the engine and warm it up thoroughly.
- Turn the idle adjusting screw [A] until the idle speed is correct.
- Open and close the throttle a few times to make sure that the idle speed is within the specified range. Readjust if necessary.
Front [B]



Air Cleaner Element Cleaning

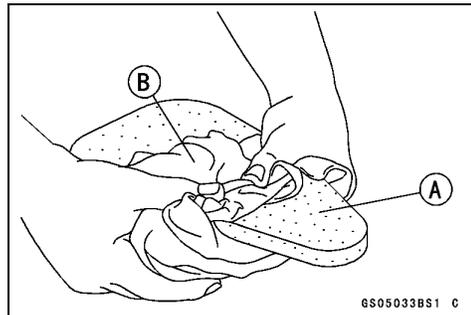
NOTE

- In dusty areas, the element should be cleaned more frequently than the recommended interval.
- After riding through rain or on muddy roads, the element should be cleaned immediately.
- Since repeated cleaning opens the pores of the foam element, replace it with a new one in accordance with the Periodic Maintenance Chart. Also, if there is a break in the element material or any other damage to the element, replace the element with a new one.

▲ WARNING

Clean the element in a well-ventilated area, and make sure that there is no spark or flame anywhere near the working area. Because of the danger of highly flammable liquids, do not use gasoline or a low-flash point solvent to clean the element.

- Remove the air cleaner element (see Fuel System chapter).
- Clean the element in a bath of high-flash-point solvent, and then dry it with compressed air or by shaking it.
- Visually check the element for tears or breaks and replace the damaged element with a new one.
- After cleaning, saturate the element with SE, SF, or SG class SAE 30 oil, squeeze out excess oil.
- Wrap the element [A] in a clean rag [B] and squeeze it as dry as possible.



Evaporative Emission Control System Inspection (CAL)

Canister Inspection

- Remove the canister cover [A].

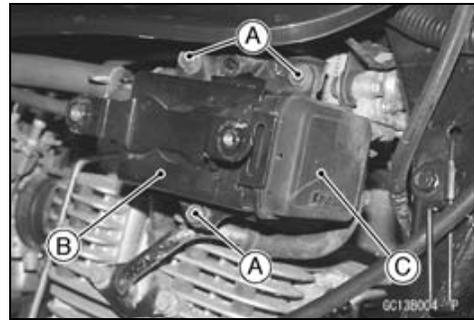


Periodic Maintenance Procedures

- Remove the canister mounting bracket bolts [A] and remove the brackets [B] and canister [C] together.
- Disconnect the hoses from the canister.
- Visually inspect the canister for cracks and other damage.
- ★ If the canister has any cracks or bad damage, replace it with a new one.

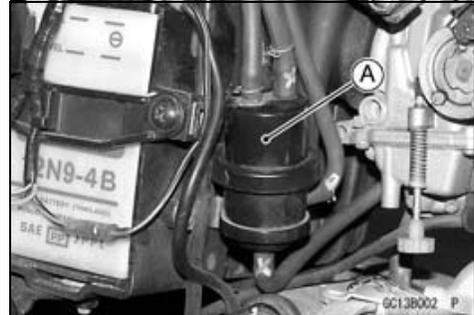
NOTE

○ The canister is designed to work well through the motor cycle's life without any maintenance if it is used under normal conditions.



Separator Inspection

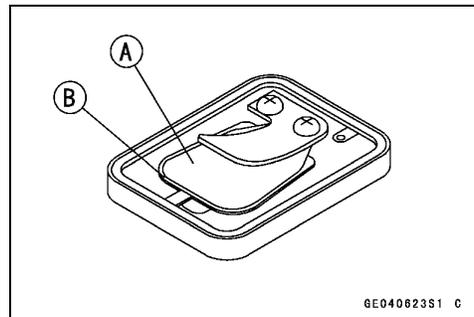
- Remove the right side cover (see Frame chapter).
- Disconnect the hoses from the liquid/vapor separator [A], and remove the separator up from the bracket.
- Visually inspect the separator for cracks and other damage.
- ★ If the separator has any cracks or is badly damaged, replace it with a new one.



Engine Top

Air Suction Valve Inspection

- Remove the air suction valve (see Engine Top End chapter).
- Visually inspect the reeds [A] for cracks, folds, warps, heat damage, or other damage.
- ★ If there is any doubt as to the condition of the reed, replace the air suction valve as an assembly.
- Check the reed contact areas [B] of the valve holder for grooves, scratches, any signs of separation from the holder, or heat damage.
- ★ If there is any doubt as to the condition of the reed contact areas, replace the air suction valve as an assembly.
- ★ If any carbon or other foreign particles have accumulated between the reed and the reed contact area, wash the valve assembly with a high-flash-point solvent.



CAUTION

Do not scrape off the deposits with a scraper as this could damage the rubber, requiring replacement of the suction valve assembly.

2-16 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

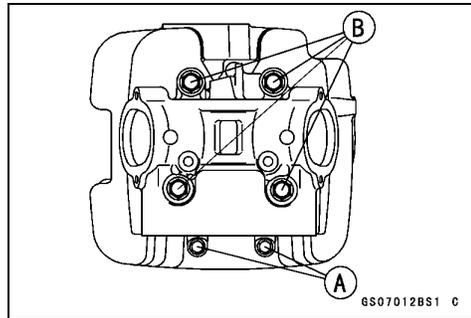
Cylinder Head Bolt Tightness Inspection

- Check that 6 mm [A] and 9 mm [B] cylinder head bolts are tightened evenly.
- ★ Standard head bolts tightening torque are shown below.

Tightening Torque

6 mm Cylinder Head Bolts: 12 N·m (1.2 kgf·m, 104 in·lb)

9 mm Cylinder Head Bolts: 26 N·m (2.7 kgf·m, 19 ft·lb)



Valve Clearance Inspection

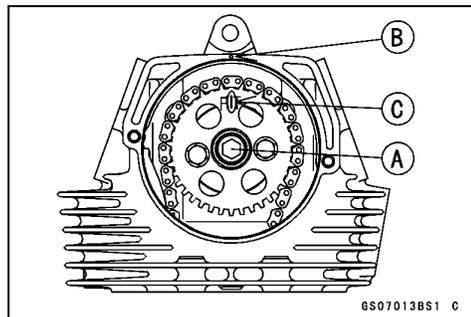
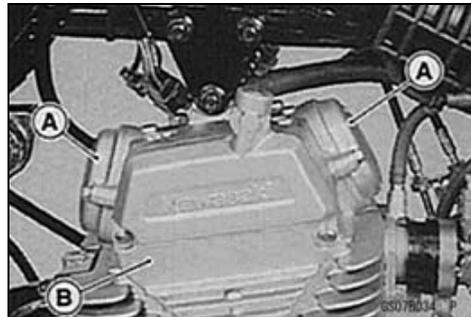
CAUTION

If valve clearance is left unadjusted, wear will eventually cause the valves to remain partly open, which lowers performance, burns the valves and the valve seats, and may cause serious engine damage.

NOTE

○ Valve clearance must be checked and adjusted when the engine is cold (at room temperature).

- Remove:
 - Valve Adjusting Caps [A]
 - Camshaft Chain Cover [B]
- Turn the camshaft center bolt [A] counterclockwise with a wrench.
- Making sure that the inlet valve opens and then closes, start to turn the bolt in the same direction until the "T" mark [C] on the camshaft sprocket aligns with the timing mark [B] on the cylinder head. This shows that the piston TDC is at the end of the compression stroke.



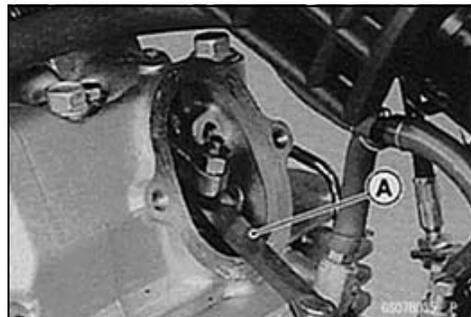
- Using a thickness gauge [A], measure the valve clearance between the adjusting screw and valve stem. Measure the clearance for both valves at a time.

Valve Clearance (when cold)

Standard:

Inlet 0.08 ~ 0.12 mm (0.0031 ~ 0.0047 in.)

Exhaust 0.15 ~ 0.19 mm (0.0059 ~ 0.0075 in.)



Periodic Maintenance Procedures

Valve Clearance Adjustment

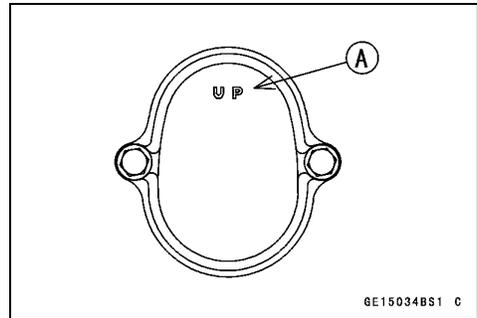
★ If the valve clearance is not within the specified range, adjust the clearance by loosening the locknut and turning the adjusting screw.

- Tighten the nuts to the specified torque and check the valve clearance again.

Torque - Valve Adjusting Screw Locknut: 15 N·m (1.5 kgf·m, 11 ft·lb)

- Install the valve adjusting caps with their “up” marks [A] up.

Torque - Valve Adjusting Cap Bolts
 (BN125-A1 ~ A3): 9.8 N·m (1.0 kgf·m, 87 in·lb)
 (BN125-A4 ~): 8.8 N·m (0.90 kgf·m, 78 in·lb)



Clutch

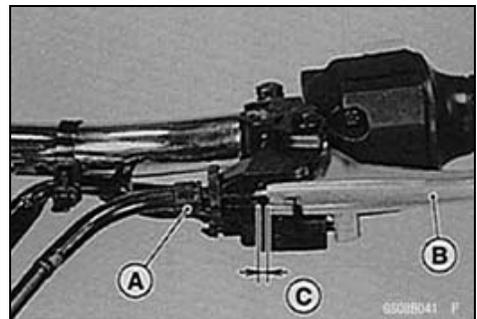
Clutch Lever Free Play Inspection

- Check that the clutch cable upper end is fully seated in the adjuster [A].
- Pull the clutch lever [B] just enough to take up the free play [C].

○ Measure the gap (free play) between the lever and the lever holder.

★ If the gap (free play) is too wide, the clutch may not release fully. If the gap is too narrow, the clutch may not engage fully. In either case, adjust it.

Clutch Lever Free Play
Standard: 2 ~ 3 mm (0.08 ~ 0.12 in.)

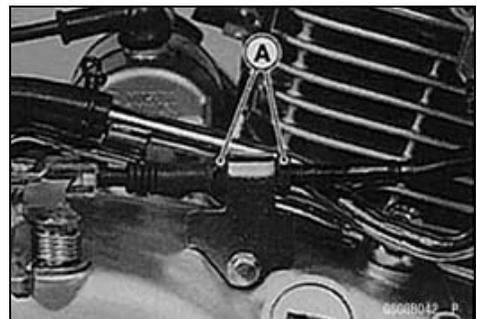


Clutch Lever Free Play Adjustment

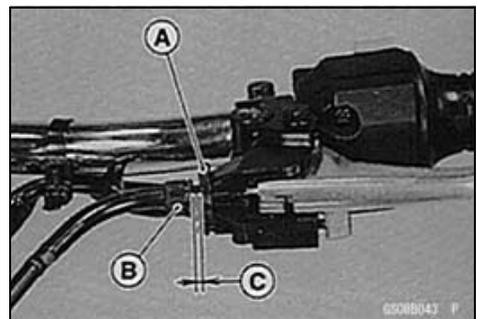
⚠ WARNING

To avoid a serious burn, never touch the engine or exhaust pipe during clutch adjustment.

- Slide back the dust cover.
- Loosen both adjuster nuts [A] at the clutch cable bracket as far as they will go.



- Loosen the knurled locknut [A] at the clutch lever.
- Turn the adjuster [B] so that 5 ~ 6 mm (0.20 ~ 0.24 in.) [C] of threads are visible.



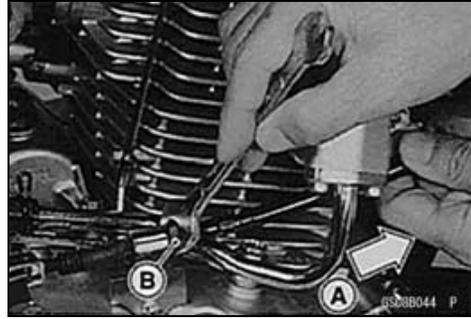
2-18 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

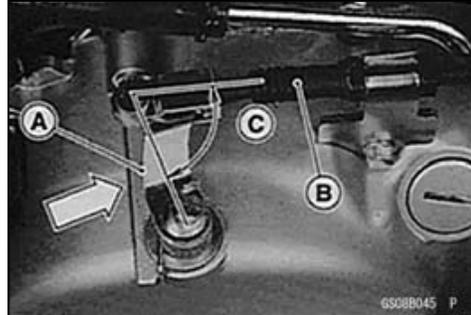
- Pull the clutch cable [A] tight and tighten the adjusting nuts [B] against the clutch cable bracket.
- Turn the adjuster at the clutch lever until the free play is correct.
- Tighten the knurled locknut at the clutch lever.

⚠ WARNING

Be sure that the outer cable end at the clutch lever is fully seated in the adjuster at the clutch lever, or it could slip into place later, creating enough cable play to prevent clutch disengagement.



- Turn the release lever [A] clockwise until it becomes hard to turn, then inspect the angle of the release lever is set within 80° ~ 90° range [C].
- ★ If any angle is except 80° ~ 90° range, inspect the parts of the clutch.
- After the adjustment is made, start the engine and check that the clutch does not slip and that it releases properly.
Clutch Cable [B]



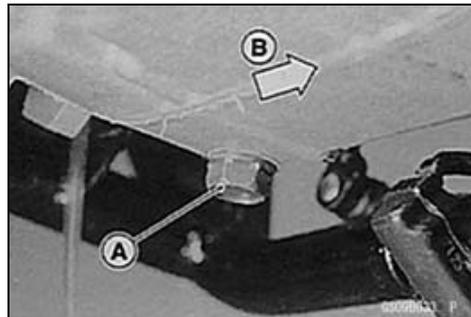
Engine Lubrication System

Engine Oil Change

- Warm up the engine thoroughly so that the oil will pick up any sediment and drain easily. Then stop the engine.
- Place an oil pan beneath the engine.
- Remove the oil filler plug.
- Remove the engine oil drain plug [A], and let the oil drain completely.
Front [B]
- If the oil filter is to be changed, replace it with a new one.
- Check the gasket at the drain plug for damage.
- ★ Replace the gasket with a new one.
- After draining, install the drain plug, and gasket.

Torque - Engine Oil Drain Plug: 18 N·m (1.8 kgf·m, 13 ft·lb)

- Pour in the specified type and amount of engine oil through the oil filler.



Periodic Maintenance Procedures

Recommended Engine Oil

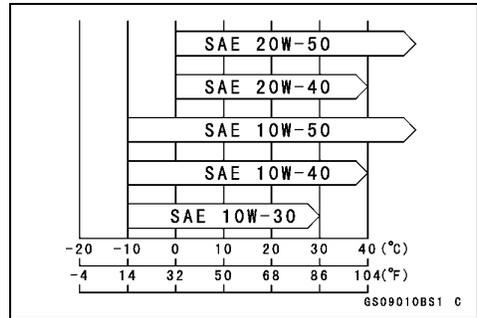
Grade:

(BN125-A1 ~ A3): API SE, SF or SG

(BN125-A4 ~): API SE, SF or SG
API SH, SJ or SL with JASO MA

Viscosity: SAE 10W-40

Capacity: 1.1 L (1.16 US qt)
(When filter is not removed)
1.2 L (1.27 US qt)
(when filter is removed)
1.4 L (1.48 US qt)
(when engine is completely dry)



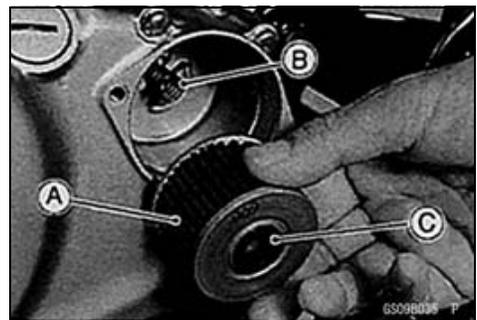
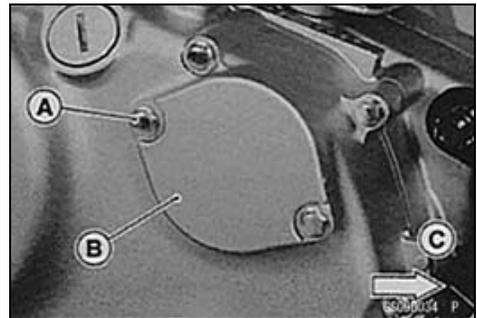
NOTE

○Although 10W-40 engine oil is the recommended oil for most conditions, the oil viscosity may need to be changed to accommodate atmospheric conditions in your riding area.

- Install the oil filler plug.
Torque - Oil Filler Plug: 2.5 N·m (0.25 kgf·m, 22 in·lb)
- Check the oil level (see Engine Lubrication chapter).

Oil Filter Change

- Drain the engine oil (see Engine Oil change).
 - Remove the oil filter cover bolts [A] and cover [B].
 - Take off the filter.
 - Remove the spring.
Front [C]
- Replace the filter [A] with a new one.
 - Install the spring [B].
 - Install the new filter so that the grommet [C] face to outside as shown.



CAUTION

If the filter is installed reversely, it can cause the engine seizure.

2-20 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

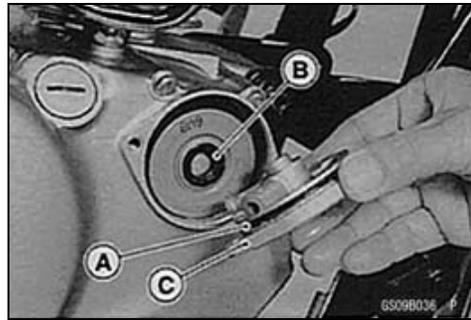
- Replace the O-ring [A] with new one.
- Apply grease to the O-ring and the grommet [B].
- Install the cover [C] and tighten the cover bolts.

Torque - Oil Filter Cover Bolts

(BN125-A1 ~ A3): 9.8 N·m (1.0 kgf·m, 87 in·lb)

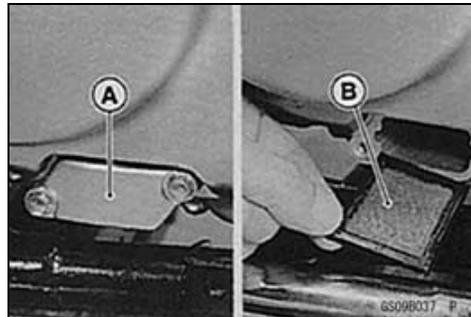
(BN125-A4 ~): 8.8 N·m (0.90 kgf·m, 78 in·lb)

- Pour in the specified type and amount of oil (see Engine Oil Change).



Oil Screen Cleaning

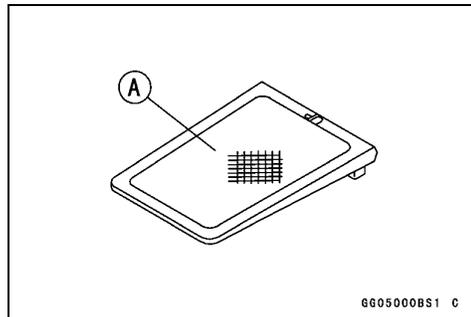
- Remove the oil screen cover [A].
- Remove the gasket.
- Remove the oil screen [B] from the clutch cover.



- Clean the oil screen [A] thoroughly whenever it is removed for any reason.
- Clean the oil screen with a high-flash point solvent and remove any particles stuck to it.

⚠ WARNING

Clean the screen in a well-ventilated area, and take care that there is no spark or flame anywhere near the working area. Because of the danger of highly flammable liquids, do not use gasoline or low-flash point solvents.



NOTE

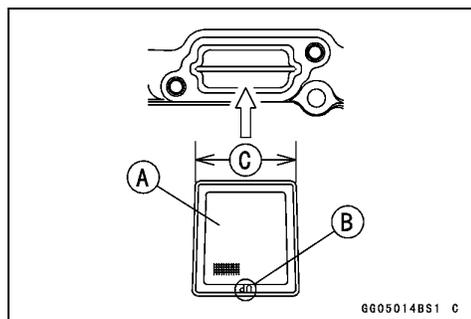
○ While cleaning the screen, check for any metal particles that might indicate internal engine damage.

- Check the screen carefully for any damage, holes, broken wires, gasket pulling off.
- ★ If the screen is damaged, replace it.
- Install the oil screen [A].
- Insert the oil screen with "UP" mark [B] facing up and the narrow side [C] of the screen going first.
- Install the new gasket and oil screen cover.
- Tighten the oil screen cover bolts.

Torque - Oil Screen Cover Bolts

(BN125-A1 ~ A3): 9.8 N·m (1.0 kgf·m, 87 in·lb)

(BN125-A4 ~): 8.8 N·m (0.90 kgf·m, 78 in·lb)



Periodic Maintenance Procedures

Wheels/Tires

Spoke Tightness Inspection

- Check that all the spokes are tightened evenly.
- ★ If spoke tightness is uneven or loose, tighten the spoke nipples evenly.

Torque - Spoke Nipples: 2.0 ~ 3.9 N·m (0.20 ~ 0.40 kgf·m, 17 ~ 35 in·lb)

- Check the rim runout.

⚠ WARNING

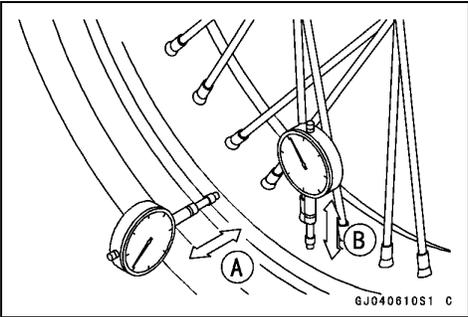
If any spoke breaks, it should be replaced immediately. A missing spoke places an additional load on the other spokes, which will eventually cause other spokes to break.

Rim Runout Inspection

- Place the jack under the frame so that the front/rear wheel off the ground.

Special Tool - Jack: 57001-1238

- Inspect the rim for small cracks, dents, bending, or warping.
- ★ If there is any damage to the rim, it must be replaced.
- Remove the wheels and set them on the suitable jig.
- Set a dial gauge to the side of the rim, and rotate the rim to measure axial runout [A]. The difference between the highest and lowest dial readings is the amount of runout.
- Set a dial gauge to the outer circumference of the rim, and rotate the rim to measure radial runout [B]. The difference between the highest and lowest dial readings is the amount of runout.



- ★ If rim runout exceeds the service limit, check the hub bearings first. Replace them if they are damaged. If the problem is not to the bearings, correct the rim warp (runout). A certain amount of rim warp can be corrected by recentering the rim. Loosen some spokes and tighten others within the standard torque to change the position of different parts of the rim. If the rim is badly bent, however, it must be replaced.

Rim Runout (with tire installed)

Standard:

Axial	TIR 0.8 mm (0.03 in.) or less
Radial	TIR 1.0 mm (0.04 in.) or less

Service Limit:

Axial	TIR 2.0 mm (0.08 in.)
Radial	TIR 2.0 mm (0.08 in.)

2-22 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

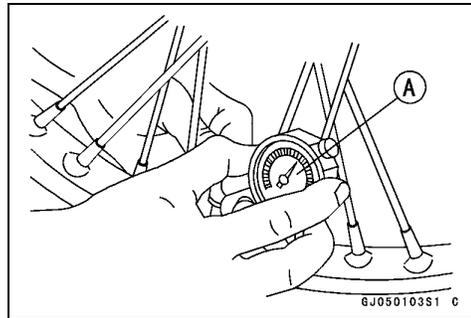
Air Pressure Inspection/Adjustment

- Remove the air valve cap.
- Measure the tire air pressure with an air pressure gauge [A] when the tires are cold (that is, when the motorcycle has not been ridden more than a mile during the past 3 hours).
- ★ Adjust the tire air pressure according to the specifications if necessary.

Air Pressure (when cold)

Front	BN125-A1 ~ A2	Up to 185 kg (408 lb)	150 kPa (1.5 kgf/cm ² , 21 psi)
	BN125-A3 ~	Up to 155 kg (342 lb)	
Rear	BN125-A1 ~ A2	Up to 185 kg (408 lb)	175 kPa (1.75 kgf/cm ² , 25 psi)
	BN125-A3 ~	Up to 155 kg (342 lb)	

- Install the air valve cap certainly after air pressure inspection.

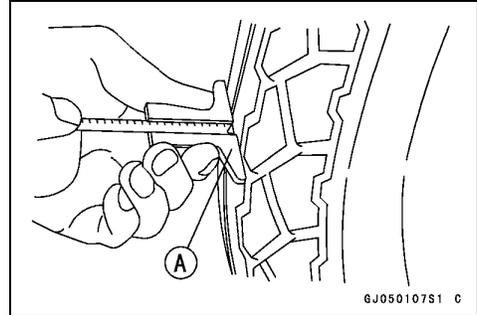


Periodic Maintenance Procedures

Tire Wear Inspection

As the tire tread wears down, the tire becomes more susceptible to puncture and failure. An accepted estimate is that 90% of all tire failures occur during the last 10% of tread life (90% worn). So it is false economy and unsafe to use the tires until they are bald.

- Remove any imbedded stones or other foreign particles from the tread.
- Visually inspect the tire for cracks and cuts, replacing the tire in case of damage. Swelling or high spots indicate internal damage, requiring tire replacement.
- Measure the tread depth at the center of the tread with a depth gauge [A]. Since the tire may wear unevenly, take measurement at several places.
- ★ If any measurement is less than the service limit, replace the tire.



Tread Depth

Standard:

Front	(BN125-A1 ~ A2) 4.5 mm (0.18 in.) (BN125-A3 ~ A5) 4.0 mm (0.16 in.) (BN125-A6 ~) 4.1 mm (0.16 in.)
Rear	7.3 mm (0.29 in.)

Service Limit:

Front	1 mm (0.04 in.)
Rear	2 mm (0.08 in.)

NOTE

- Most countries may have their own regulations requiring a minimum tire tread depth; be sure to follow them.
- Check and balance the wheel when a tire is replaced with a new one.

▲ WARNING

To ensure safe handling and stability, use only the recommended standard tires for replacement, inflated to the standard pressure.

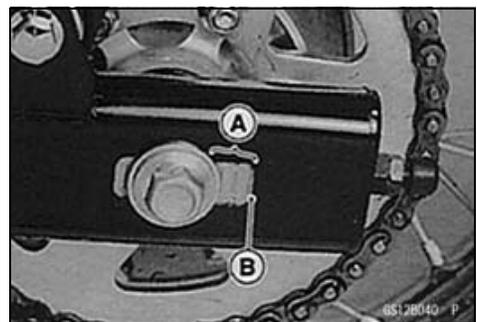
Final Drive

Drive Chain Slack Inspection

- Check to see that the notches [A] on the alignment indicators on both sides are in the same relative position at the rear end [B] of the hole in each swingarm.
- ★ If they are not, adjust the chain slack and align them.

▲ WARNING

Misalignment of the wheel will result in abnormal wear and may result in an unsafe riding condition.



NOTE

- Clean the chain if it is dirty, and lubricate it if it appears dry.

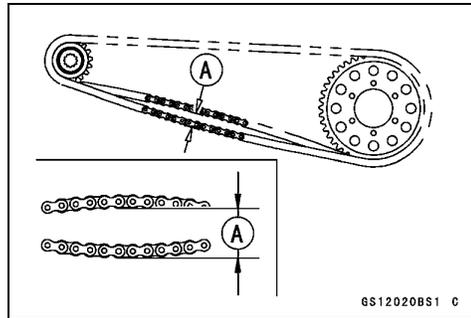
2-24 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

- Set the motorcycle up on its center stand.
- Rotate the rear wheel to find the position where the chain is tightest.
- Measure the vertical movement (chain slack) [A] midway between the sprockets.
- ★ If the chain slack exceeds the standard, adjust it.

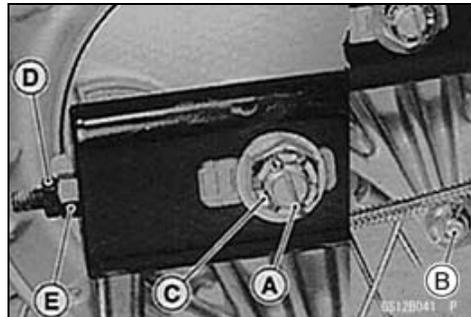
Chain Slack

Standard: 25 ~ 40 mm (0.98 ~ 1.57 in.)



Drive Chain Slack Adjustment

- Remove the cotter pin [A] from the rear axle nut.
- Loosen:
 - Torque Link Nut [B]
 - Rear Axle Nut [C]
 - Both Chain Adjuster Locknuts [D]
- Turn both chain adjusters [E] evenly until the drive chain has the correct amount of slack.
- Check to see that notches on the alignment indicators are in the same relative position on both sides.



⚠ WARNING

Misalignment of the wheel will result in abnormal wear and may result in an unsafe riding condition.

Torque - Rear Axle Nut: 98 N·m (10.0 kgf·m, 72 ft·lb)

Torque Link Nut: 34 N·m (3.5 kgf·m, 25 ft·lb)

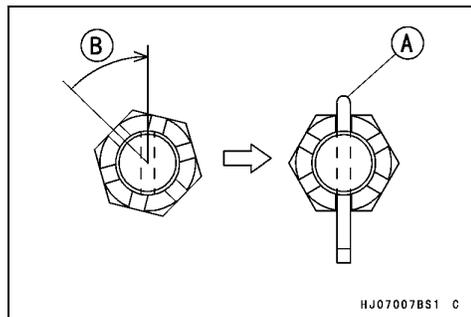
⚠ WARNING

If the axle nut and torque link nut are not securely tightened, an unsafe riding condition may result.

- Turn the wheel, measure the chain slack again at the tightest position, and readjust if necessary.
- Insert a new cotter pin [A].

NOTE

- When inserting the cotter pin, if the slots in the nut do not align with the cotter pin hole in the axle, tighten the nut clockwise [B] up to next alignment.
- It should be within 30 degree.
- Loosen once and tighten again when the slot goes past the nearest hole.



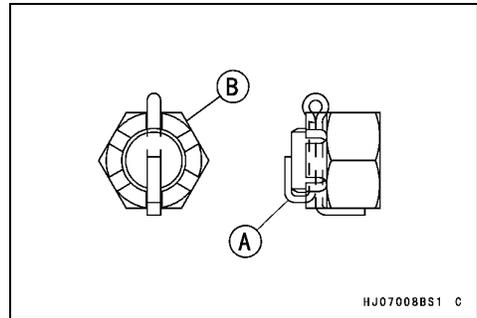
Periodic Maintenance Procedures

- Bend the cotter pin [A] over the nut [B].
- Check the rear brake effectiveness.

⚠ WARNING

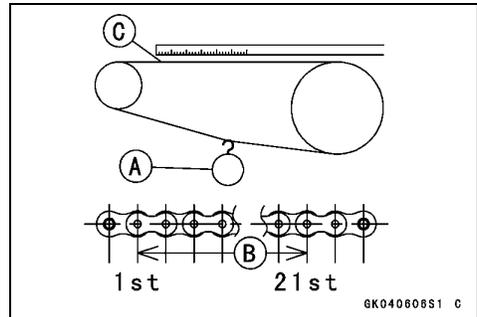
If the axle and torque link nuts are not securely tightened and the cotter pin and snap pin are not installed, an unsafe riding condition may result.

- Tighten the chain adjuster locknuts.



Drive Chain Wear Inspection

- Remove the chain cover (see Final Drive chapter).
- Rotate the rear wheel to inspect the drive chain for damaged rollers, and loose pins and links.
- ★ If there is any irregularity, replace the drive chain.
- ★ Lubricate the drive chain if it appears dry.
- Stretch the chain taut by hanging a 98 N (10 kg, 20 lb) weight [A] on the chain.
- Measure the length of 20 links [B] on the straight part [C] of the chain from the pin center of the 1st pin to the pin center of the 21st pin. Since the chain may wear unevenly, take measurements at several places.
- ★ If any measurements exceed the service limit, replace the chain. Also, replace the front and rear sprockets when the drive chain is replaced.



Chain 20-link Length

- Standard:** 254.0 ~ 254.6 mm (10.00 ~ 10.02 in.)
- Service Limit:** 259 mm (10.2 in.)

⚠ WARNING

If the drive chain wear exceeds the service limit, replace the chain or an unsafe riding condition may result. A chain that brakes or jumps off the sprockets could snag on the engine sprocket or lock the rear wheel, severely damaging the motorcycle and causing it to go out of control. For safety, use only the standard chain.

Standard Chain

BN125-A1 ~ A2

- Make:** ENUMA CHAIN
- Type:** Joint Endless EK428SH-R
- Link:** 132 Links

BN125-A3 ~ (except the N, NU of BN125-A7 ~)

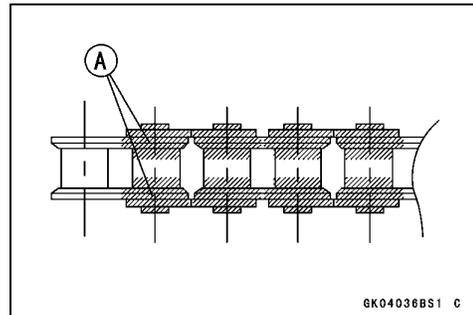
- Make:** DAIDO
- Type:** Joint Endless DID424HG
- Link:** 132 Links
130 Links (BN125-A7 ~) N, NU
- N:** Catalytic Converter Model
- NU:** Catalytic Converter (United Kingdom Model)

2-26 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

Drive Chain Lubrication

- The chain should be lubricated with a lubricant which will both prevent the exterior from rusting and also absorb shock and reduce friction in the interior of the chain.
- ★ If the chain is especially dirty, it should be washed in diesel oil or kerosene, and afterward soaked in a heavy oil. Shake the chain while it is in the oil so that oil will penetrate to the inside of each roller.
- An effective, good quality lubricant specially formulated for chains is best for regular chain lubrication.
- ★ If a special lubricant is not available, a heavy oil such as SAE 90 is preferred to a lighter oil because it will stay on the chain longer and provide better lubrication.
- Apply oil to the sides of the rollers so that oil will penetrate to the rollers and bushings.
- Wipe off any excess oil.
Oil Applied Areas [A]



Brakes

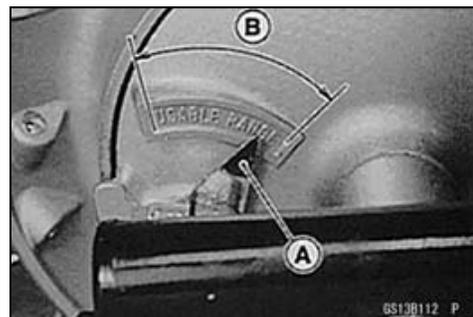
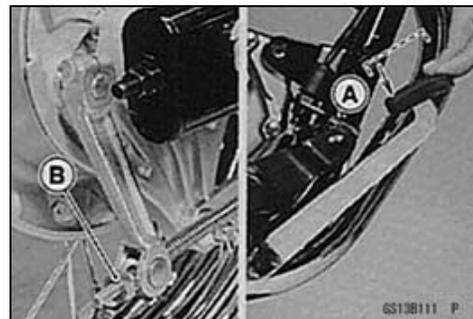
Brake Pedal Free Play Inspection

- Check the brake pedal free play [A] when the pedal is pushed down lightly by hand.

Brake Pedal Free Play

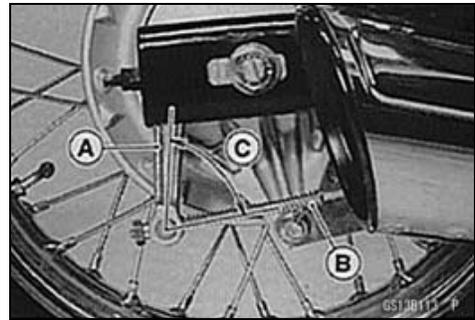
Standard: 20 ~ 30 mm (0.79 in ~ 1.18 in.)

- ★ If the pedal has improper play, adjust it.
- Turn the adjusting nut [B] at the brake cam lever so that the lever has proper play.
- Operate the pedal a few times to see that it returns to its rest position immediately upon release.
- Rotate the rear wheel to check for brake drag.
- Check braking effectiveness.
- ★ If there is any doubt as to the conditions of the brake, check the brake parts for wear or damage.
- Check that the brake lining wear indicator [A] points within the USABLE RANGE [B] when the brake lever is fully applied.
- ★ If it does not, the brake shoes must be replaced and other brake parts must be examined.



Periodic Maintenance Procedures

- Check that the front brake cam lever [A] comes to an 80° ~ 90° angle [C] with the rear brake rod [B] when the rear brake is fully applied.
- ★ If it does not, remove the adjusting nut [D] and lever, then adjust the rear brake cam lever angle.
- Check the brake pedal free play.



⚠ WARNING

Since a cam lever angle greater than 90° reduces braking effectiveness, cam lever angle adjustment should not be neglected. A change in cam lever angle is caused by wear of internal brake parts. Whenever the cam lever angle is adjusted, also check for drag and proper operation, taking particular note of the brake lining wear indicator position. In case of doubt as to braking effectiveness, disassemble and inspect all internal brake parts. Worn parts could cause the brake to lock or fall.

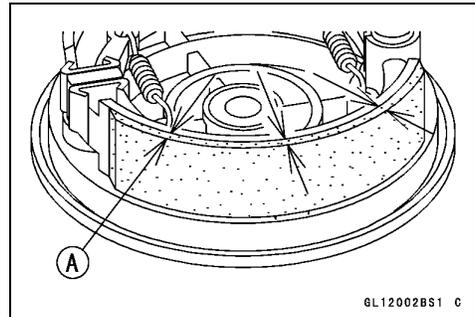
Brake Shoe Lining Wear Inspection

- Remove the brake shoes (see Brakes chapter).
- Measure the lining thickness [A], at a few points.
- Use a calipers or scale, and measure at several points.

Shoe Lining Thickness

Standard: 3.85 ~ 4.15 mm (0.152 ~ 0.163 in.)
Service Limit: 2 mm (0.08 in.)

- ★ If the lining thickness is greater than the service limit, replace both shoes as a set.
- Install the brake shoes (see Brakes chapter).



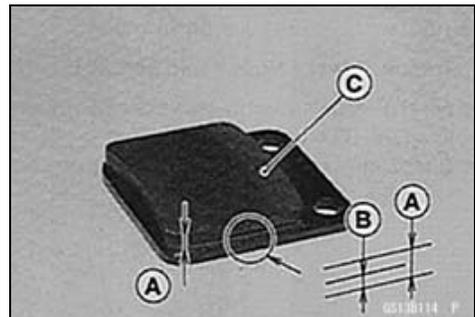
Brake Pad Wear Inspection

- Remove the pads. (see Brakes chapter).
 - Check the lining thickness [A] of the pads in the caliper.
 - ★ If the lining thickness of either pad is less than the service limit [B], replace both pads in the caliper as a set.
- Brake pad [C]

Brake Pad Thickness

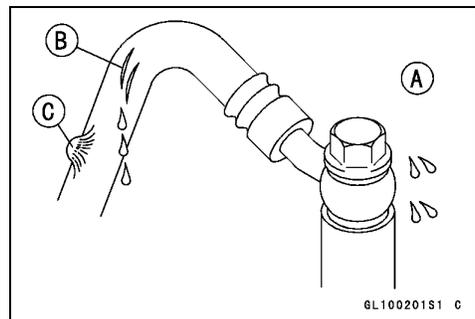
Standard: (BN125-A1 ~ A2) 4.5 mm (0.177 in.)
 (BN125-A3 ~) 6.0 mm (0.236 in.)
Service Limit: 1 mm (0.04 in.)

- Install the pads and pad bolts (see Brakes chapter).



Brake Hose and Connection Inspection

- Inspect the brake hose and fittings for deterioration, cracks and signs of leakage.
- The high pressure inside the brake line can cause fluid to leak [A] or the hose to burst if the line is not properly maintained. Bend and twist the rubber hose while examining it.
- ★ Replace the hose if any cracks [B] or bulges [C] are noticed.
- ★ Tighten any loose fittings.



2-28 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

Brake Fluid Level Inspection

- Check that the brake fluid level in the brake reservoir [A] is between the upper [B] and the lower [C] level line.

NOTE

○ Hold the reservoir horizontal by turning the handlebar when checking brake fluid level.

- ★ If the fluid level is lower than the lower level line, fill the reservoir to the upper level line in the reservoir.

⚠ WARNING

Do not mix two brands of fluid. Change the brake fluid in the brake line completely if the brake fluid must be refilled but the type and brand of the brake fluid that is already in the reservoir are unidentified. After changing the fluid, use only the same type and brand of fluid thereafter.

Recommended Disc Brake Fluid

Grade: DOT4

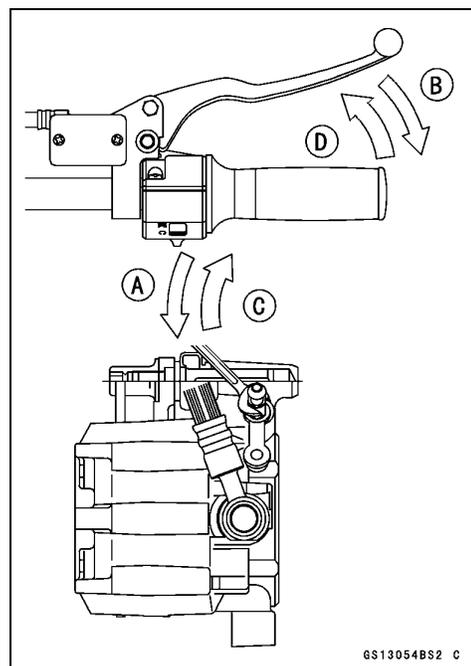
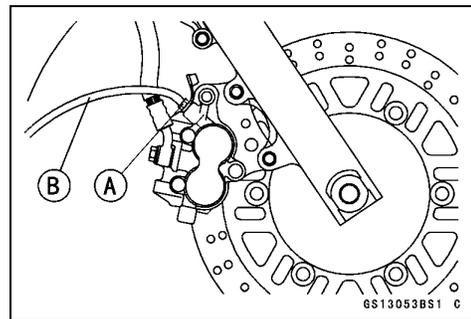
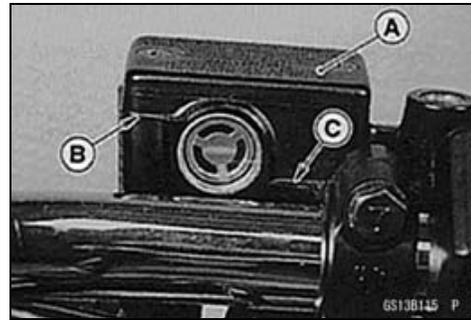
Brake Fluid Change

- Level the brake fluid reservoir.
- Remove the reservoir cap.
- Remove the rubber cap from the bleed valve [A] on the caliper.
- Attach a clear plastic hose [B] to the bleed valve, and run the other end of the hose into a container.
- Fill the reservoir with fresh specified brake fluid.
- Change the brake fluid as follows:

NOTE

○ The fluid level must be checked often during the changing operation and replenished with fresh brake fluid. If the fluid in the reservoir runs out any time during the changing operation, the brakes will need to be bled since air will have entered the brake line.

- Repeat this operation until fresh brake fluid comes out from the plastic hose or the color of the fluid changes.
 - Open the bleed valve [A].
 - Pump the brake lever and hold it [B].
 - Close the bleed valve [C].
 - Release the brake lever [D].



Periodic Maintenance Procedures

- Remove the clear plastic hose.
- Install the reservoir cap.
- Tighten the bleed valve, and install the rubber cap.

Torque - Caliper Bleed Valve: 7.8 N·m (0.80 kgf·m, 69 in·lb)
Front Brake Reservoir Cap Screws: 2.5 N·m (0.25 kgf·m, 22 in·lb)

- After changing the fluid, check the brake for good braking power, no brake drag, and no fluid leakage.
- ★ If necessary, bleed the air from the lines (see Brake Line Bleeding).

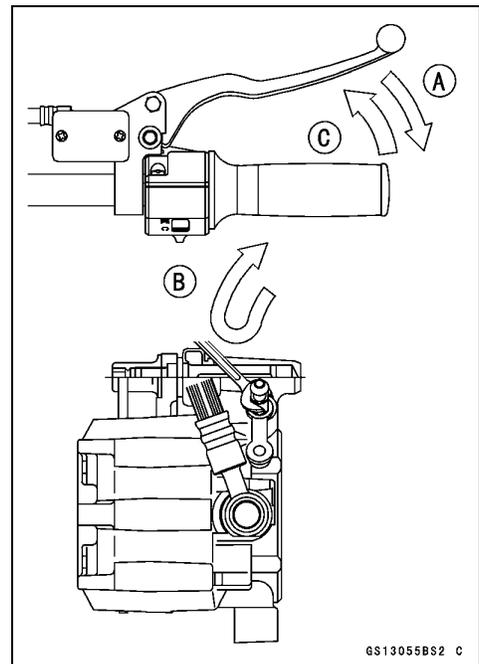
Brake Line Bleeding

The brake fluid has a very low compression coefficient so that almost all the movement of the brake lever is transmitted directly to the caliper for braking action. Air, however, is easily compressed. When air enters the brake lines, brake lever movement will be partially used in compressing the air. This will make the lever feel spongy, and it will be a loss in braking power.

⚠ WARNING

Be sure to bleed the air from the brake line whenever brake lever action feels soft or spongy after the brake fluid is changed, or whenever a brake line fitting has been loosened for any reason.

- Remove the reservoir cap, and fill the reservoir with fresh brake fluid to the upper level line in the reservoir.
- With the reservoir cap off, slowly pump the brake lever several times until no air bubbles can be seen rising up through the fluid from the holes at the bottom of the reservoir.
- Bleed the air completely from the master cylinder by this operation.
- Install the reservoir cap.
- Remove the rubber cap from the bleed valve on the caliper.
- Attach a clear plastic hose to the bleed valve, and run the other end of the hose into a container.
- Bleed the brake line and the caliper as follows.
- Repeat this operation until no more air can be seen coming out into the plastic hose.
 1. Pump the brake lever until it becomes hard, and apply the brake and hold it [A].
 2. Quickly open and close [B] the bleed valve while holding the brake applied.
 3. Release the brake [C].



GS13055BS2 C

2-30 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

NOTE

- *The fluid level must be checked often during the bleeding operation and replenished with fresh brake fluid as necessary. If the fluid in the reservoir runs completely out any time during bleeding, the bleeding operation must be done over again from the beginning since air will have entered the line.*
- *Tap the brake hose lightly from the caliper to the reservoir for more complete bleeding.*
- Remove the clear plastic hose.
- Tighten:
 - Torque - Caliper Bleed Valve: 7.8 N·m (0.80 kgf·m, 69 in·lb)**
 - Front Brake Reservoir Cap Screws: 2.5 N·m (0.25 kgf·m, 22 in·lb)**
- Check the fluid level.
- After bleeding is done, check the brake for good braking power, no brake drag, and no fluid leakage.

WARNING

When working with the disc brake, observe the precautions listed below.

1. Never reuse old brake fluid.
2. Do not use fluid from a container that has been left unsealed or that has been open for a long time.
3. Do not mix two types and brands of fluid for use in the brake. This lowers the brake fluid boiling point and could cause the brake to be ineffective. It may also cause the rubber brake parts to deteriorate.
4. Don't leave the reservoir cap off for any length of time to avoid moisture contamination of the fluid.
5. Don't change the fluid in the rain or when a strong wind is blowing.
6. Except for the disc pads and disc, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning brake parts. Do not use any other fluid for cleaning these parts. Gasoline, engine oil, or any other petroleum distillate will cause deterioration of the rubber parts. Oil spilled on any part will be difficult to wash off completely and will eventually deteriorate the rubber used in the disc brake.
7. When handling the disc pads or disc, be careful that no disc brake fluid or any oil gets on them. Clean off any fluid or oil that inadvertently gets on the pads or disc with a high-flash point solvent. Do not use one which will leave an oily residue. Replace the pads with new ones if they cannot be cleaned satisfactorily.
8. Brake fluid quickly ruins painted surfaces; any spilled fluid should be completely washed away immediately.
9. If any of the brake line fittings or the bleed valve is opened at any time, the **AIR MUST BE BLED FROM THE BRAKE LINE.**

Periodic Maintenance Procedures

Brake/Master Cylinder Cup and Dust Seal Replacement

- Refer to the Master Cylinder section in the Brakes chapter for Brake/Master Cylinder Cup and Dust Seal Replacement.

Caliper Piston/Dust Seals Replacement

- Refer to the Calipers section in the Brakes chapter for Caliper Piston/Dust Seals Replacement.

Brake Light Switch Inspection

Front Brake Light Timing Inspection

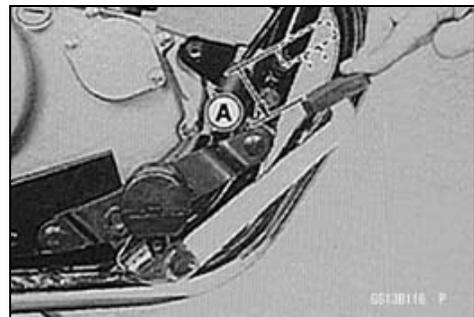
- Turn on the ignition switch.
- The brake light should go on when the front brake is applied.
- ★ If it does not, replace the switch.

Rear Brake Light Timing Inspection

- Turn on the ignition switch.
- Check the operation of the rear brake light switch by depressing the brake pedal.
- If it does not as specified, adjust the brake light timing.

Brake Light Timing

Standard: On After about 10 mm (0.39 in.) of pedal travel [A]

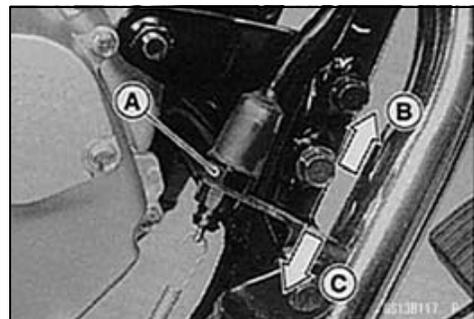


Rear Brake Light Timing Adjustment

- While holding the switch body, turn the adjusting nut [A] to adjust the switch.

CAUTION

To avoid damaging the electrical connections inside the switch, be sure that the switch body does not turn during adjustment.

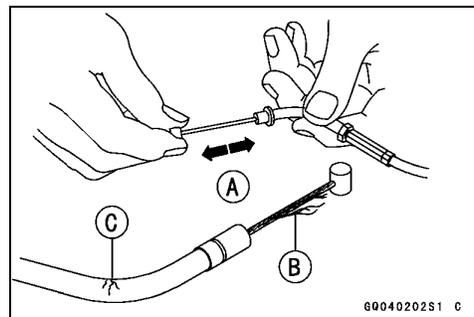


NOTE

○ Brake light turns on sooner as the switch body rises [B], and turns on later as the switch body lowers [C].

Brake Cable Replacement

- Whenever the brake cable is removed, lubricate it.
- With the cable disconnected at both ends, the cable should move freely [A] within the cable housing.
- ★ If cable movement is not free after lubricating, if the cable is frayed [B], or if the cable housing is kinked [C], replace the cable.



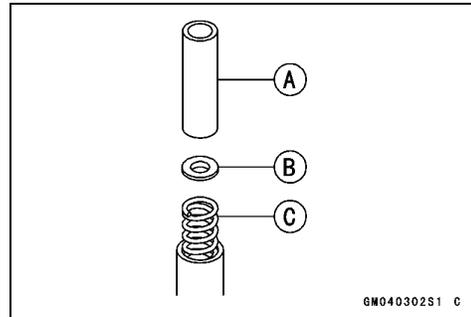
2-32 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

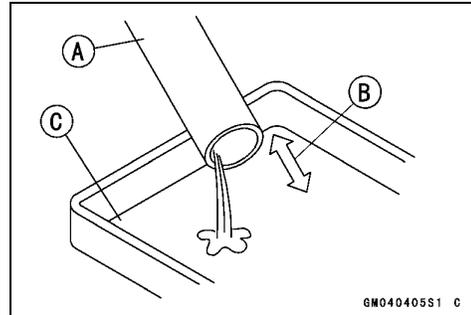
Suspension

Front Fork Oil Change

- Remove the front fork (see Suspension chapter).
- Hold the outer tube vertically in a vise.
- Unscrew the top plug out of the inner tube.
- Remove:
 - Spacer [A]
 - Fork Spring Seat [B]
 - Fork Spring [C]



- Pour out the fork oil to the container [C] with the fork upside down [B].
- Pump the outer tube [A] up and down to expel the oil from the fork.
- Holding the fork tube upright, press the inner tube all the way down.



NOTE

○ *The spring should not be installed.*

- Fill the front fork with the specified oil.

Fork Oil Viscosity: SHOWA SS-8 or equivalent

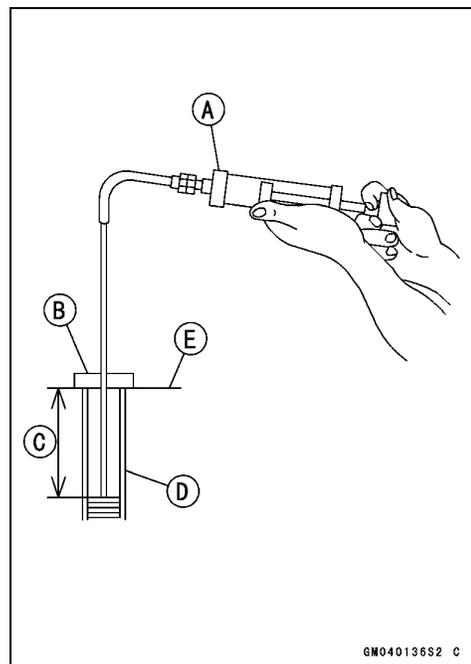
Fork Oil Capacity

(when changing oil): Approx. 165 mL (5.58 US oz.)

- Wait for about five minutes so that any suspended air bubbles can surface.
- Measure the oil level, using the fork oil level gauge [A].

Special Tool - Fork Oil Level Gauge: 57001-1290

- Set the gauge stopper [B] so that its lower side shows the oil level distance specified [C].
- Insert the gauge tube into the inner tube [D] and position the stopper across the top of the inner tube [E].
- Pull the handle slowly to draw out the excess oil until no more oil comes up the tube.
- ★ If no oil is drawn out, there is not enough oil in the fork. Pour in some more oil, then draw out the excess.

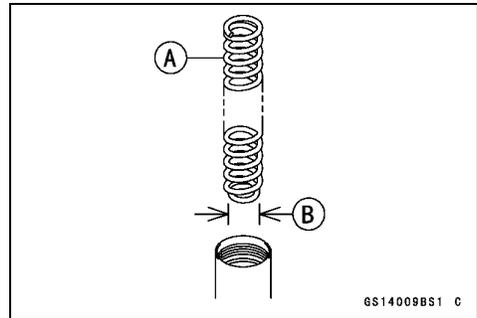


Front Fork Oil Level (Fully compressed without fork spring)

Standard: 218 ±2mm (8.58 ±0.08 in.)

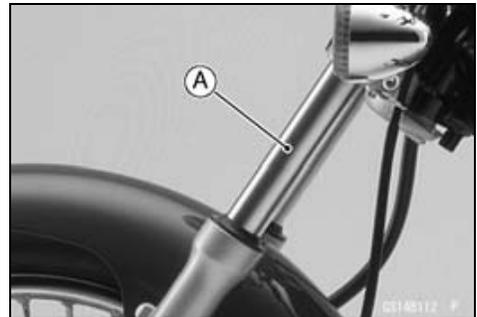
Periodic Maintenance Procedures

- Install the fork spring [A] with the smaller end facing [B] downward.
- Install:
Fork Spring Seat
Spacer
- Repeat the same procedure for another front fork.
- Install the front fork (see Suspension chapter).



Front Fork Oil Leak Inspection

- Visually inspect the front forks [A] for oil leakage, scoring or scratches on the outer surface of the inner tubes.
- ★ Replace or repair any defective parts, if necessary.



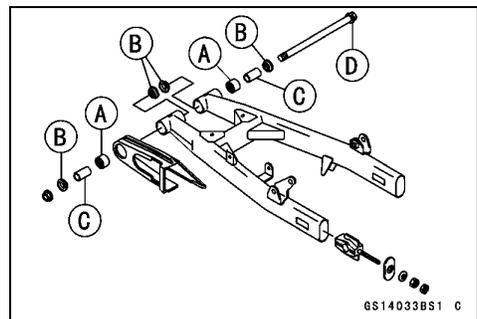
Rear Shock Absorber Oil Leak Inspection

- Visually inspect the rear shock absorbers [A] for oil leakage.
- ★ If they are oil leaked, one unit feels weaker than the other, replace both shock absorber as a set.



Swingarm Pivot Lubrication

- Remove the swingarm (see Suspension chapter).
- Using high-flash-point solvent, wash the following parts, and apply plenty of molybdenum disulfide grease them.
Needle Bearings [A]
Grease Seals [B]
Sleeve [C]
Swingarm Pivot Shaft (except for threads) [D]
- This prevents the shaft and the bolt from rusting or seizing.



2-34 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

Steering

Steering Inspection

- Check the steering.
- Lift the front wheel off the ground using the jack [A].

Special Tool - Jack: 57001-1238

- With the front wheel pointing straight ahead, alternately tap each end of the handlebar. The front wheel should swing fully left and right from the force of gravity until the fork hits the stop.

★ If the wheel binds or catches before the stop, the steering is too tight.

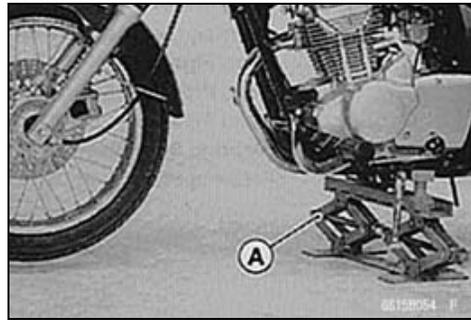
- Feel for steering looseness by pushing and pulling [A] the forks.

★ If you feel looseness, the steering is too loose.

NOTE

○ The cables and wiring will have some effect on the motion of the fork which must be taken into account. Be sure the wires and cables are properly routed.

○ The bearings must be in good condition and properly lubricated in order for any test to be valid.



Steering Adjustment

- Loosen:
 - Front Fork Lower Clamp Bolts (both sides) [A]
 - Steering Stem Head Bolt [B]
- Lift the front wheel off the ground using the jack.

Special Tool - Jack: 57001-1238

- Adjust the steering.

Special Tool - Steering Stem Nut Wrench: 57001-1100

★ If the steering is too tight, loosen the stem nut [C] a fraction of a turn.

★ If the steering is too loose, tighten the stem nut a fraction of a turn.

NOTE

○ Turn the stem nut 1/8 turn at a time maximum.

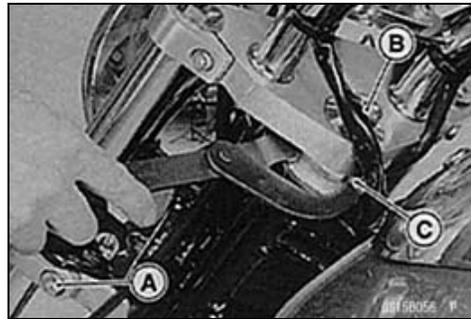
Torque - Steering Stem Nut: 4.9 N·m (0.50 kgf·m, 43 in·lb)

- Tighten:

Torque - Steering Stem Head Bolt: 44 N·m (4.5 kgf·m, 33 ft·lb)

Front Fork Clamp Bolts (Lower): 34 N·m (3.5 kgf·m, 25 ft·lb)

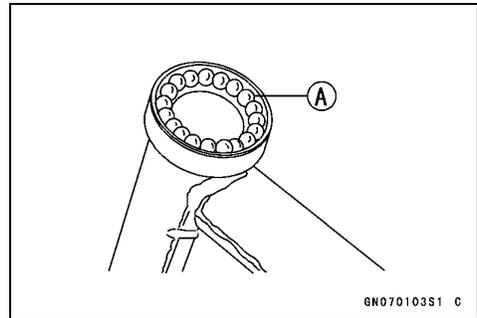
- Check the steering again.
- ★ If the steering is still too tight or too loose, inspect the steering parts.



Periodic Maintenance Procedures

Steering Stem Bearing Lubrication

- Remove the steering stem (see Steering chapter).
- Using a high-flash point solvent, wash the upper and lower steel balls.
- Wipe all the old grease off the upper and lower outer races.
- Visually check the races and balls.
- ★ Replace the bearing assemblies if they show wear or damage.
- Apply grease liberally to the upper and lower races, and stick the steel balls [A] in place with grease.
- Install the steering stem (see Steering chapter), and adjust the steering (see Steering Adjustment).

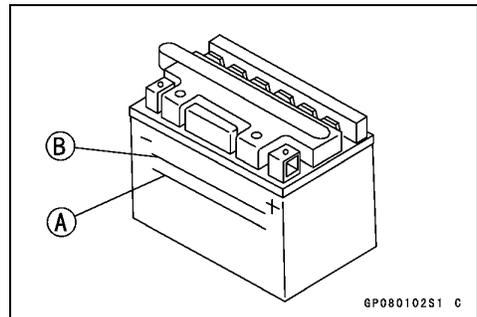


Electrical System

Battery Electrolyte Level Inspection

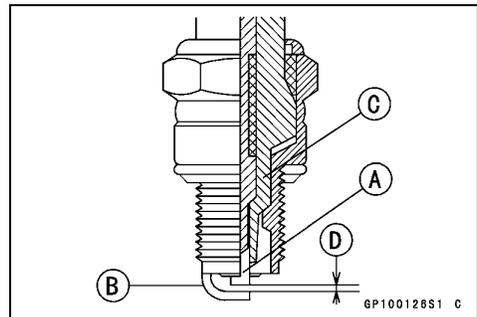
- Visually check the electrolyte level in the battery.
- ★ If the level line of electrolyte in any cell is below the lower level line [A] on the battery case, add distilled water only to that cell until the level is at the upper level line [B].

CAUTION
Ordinary tap water is not a substitute for distilled water and will shorten the life of the battery.



Spark Plug Cleaning/Inspection

- Clean the spark plug, preferably in a sandblasting device, and then clean off any abrasive particles. The plug may also be cleaned using a high-flash point solvent and a wire brush or other suitable tool.
- ★ If the spark plug center electrode [A] and/or side electrode [B] are corroded or damaged, or if the insulator [C] is cracked, replace the plug.
- Use the standard spark plug or its equivalent.



Spark Plug Gap Inspection

- Measure the gap [D] with a wire-type thickness gauge.
- ★ If the gap is incorrect, carefully bend the side electrode with a suitable tool to obtain the correct gap.

Spark Plug Gap: 0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)

2-36 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

General Lubrication

Lubrication

- Before lubricating each part, clean off any rusty spots with rust remover and wipe off any grease, oil, dirt, or grime.
- Lubricate the points listed below with indicated lubricant.

NOTE

○Whenever the vehicle has been operated under wet or rainy conditions, or especially after using a high-pressure water spray, perform the general lubrication.

Pivots: Lubricate with Motor Oil

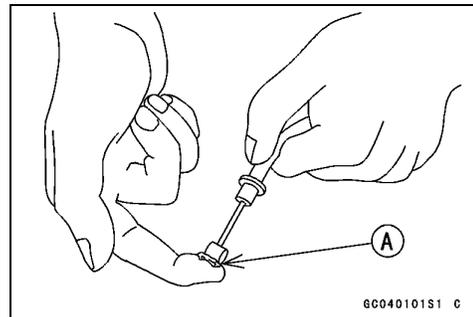
Sidestand
Brake Pedal
Clutch Lever

Points: Lubricate with Grease.

Throttle Inner Cable Upper Ends [A]
Speedometer Inner Cable*
Clutch Inner Cable Upper End
Brake Lever**

(*): Grease the lower part of the inner cable sparingly.

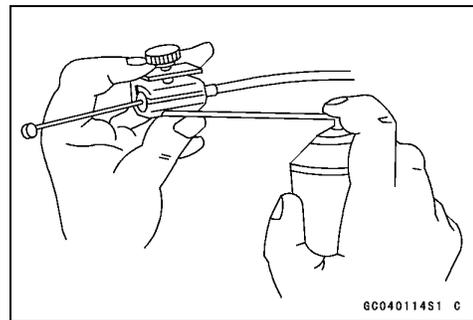
(**): Apply silicone grease.



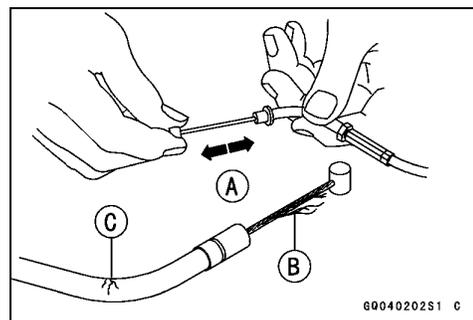
Cables: Lubricate with Cable Lubricant.

Throttle Inner Cable
Clutch Inner Cable

- Lubricate the cables by seeping the oil between the cable and housing.
- The cable may be lubricated by using a commercially available pressure cable lubricator with an aerosol cable lubricant.



- With the cable disconnected at the both ends, the cable should move freely [A] within the cable housing.
- ★If cable movement is not free after lubricating, if the cable is frayed [B], or if the cable housing is kinked [C], replace the cable.



Periodic Maintenance Procedures

Nut, Bolt, and Fastener Tightness Inspection

Tightness Inspection

- Check the tightness of the bolts and nuts listed here. Also, check to see that each cotter pin is in place and in good condition.

NOTE

○ *For the engine fasteners, check the tightness of them when the engine is cold (at room temperature).*

- ★ If there are loose fasteners, retighten them to the specified torque following the specified tightening sequence. Refer to the appropriate chapter for torque specifications. If torque specifications are not in the appropriate chapter, see the Standard Torque Table in this section. For each fastener, first loosen it by 1/2 turn, then tighten it.
- ★ If cotter pins are damaged, replace them with new ones.

Nut, Bolt and Fastener to be checked

Wheels:

Front Axle Nut
Rear Axle Nut Cotter Pin
Rear Axle Nut

Final Drive:

Chain Adjuster Locknuts
Rear Sprocket Nuts

Brakes:

Brake Lever Pivot Nut
Brake Pedal Cotter Pin
Brake Rod Joint Cotter Pin
Torque Link Nut
Brake Cam Lever Nut
Caliper Mounting Bolts
Front Master Cylinder Clamp Bolts

Suspension:

Front Fork Clamp Bolts
Front Fender Bolts
Rear Shock Absorber Bolts and Nuts
Swingarm Pivot Nut

Steering:

Stem Head Bolt
Handlebar Holder Clamp Nuts

Engine:

Throttle Cable Adjuster Locknut
Engine Mounting Bolts and Nuts
Shift Pedal Bolt
Muffler Mounting Bolts and Nuts
Clutch Cable Adjuster Locknut
Clutch Lever Pivot Nut

Others:

Sidestand Bolt and Nut
Front Footpeg Mounting Bolts
Rear Footpeg Mounting Bolts

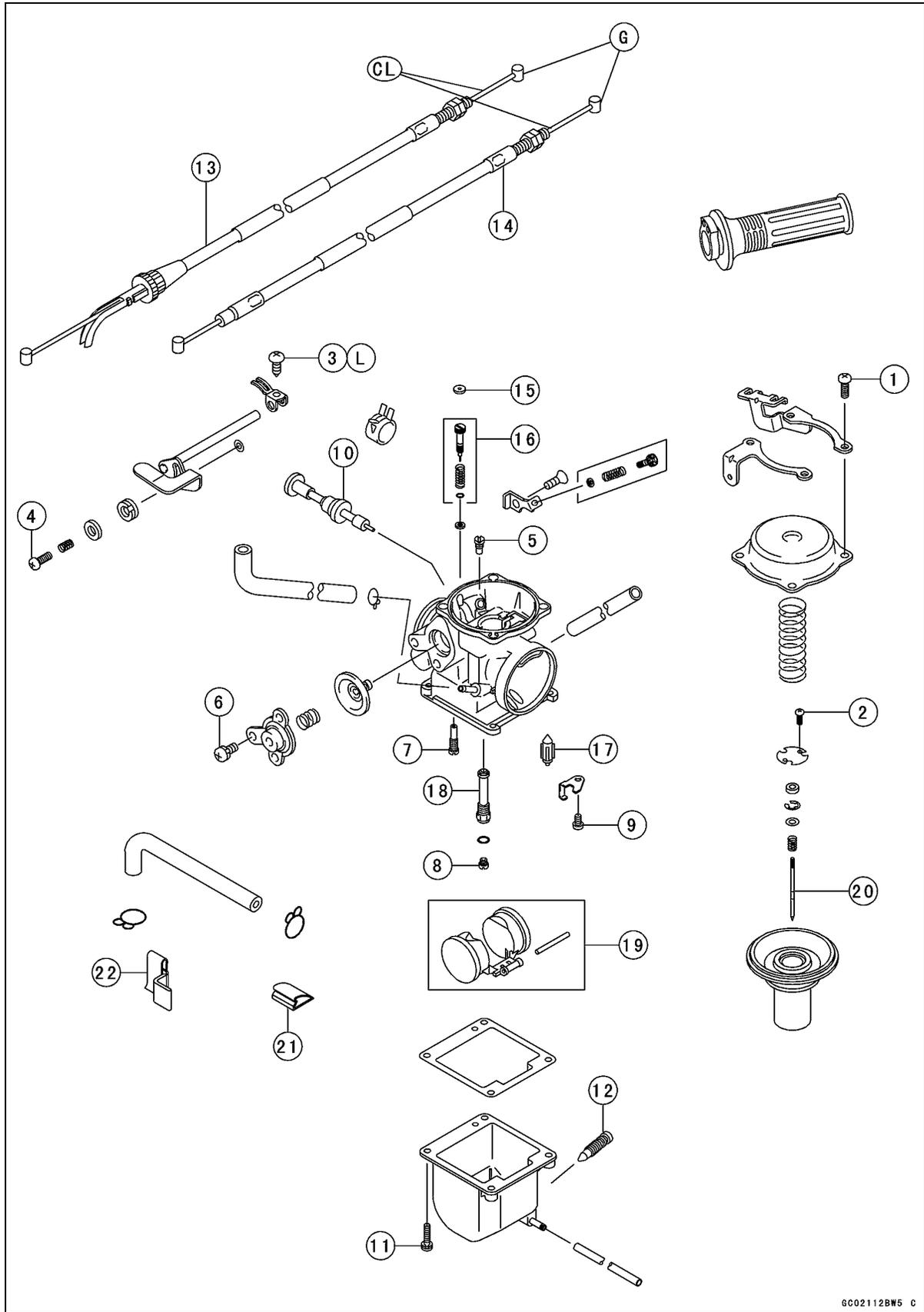
Fuel System

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3-2 FUEL SYSTEM

Exploded View



GC02112BW5 C

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Upper Chamber Cover Mounting Screws	3.5	0.36	31 in·lb	
2	Spring Seat Screws	0.8	0.080	7 in·lb	
3	Choke Lever Set Screw	0.8	0.080	7 in·lb	L
4	Choke Lever Pivot Screw	2.0	0.20	17 in·lb	
5	Pilot Air Jet	1.8	0.18	15 in·lb	
6	Coasting Enricher Cover Screws	2.0	0.20	17 in·lb	
7	Pilot Jet	0.8	0.080	7 in·lb	
8	Main Jet	1.8	0.18	15 in·lb	
9	Float Valve Holder Screw	2.0	0.20	17 in·lb	
10	Choke Plunger Cap	3.9	0.40	35 in·lb	
11	Float Bowl Screws	2.0	0.20	17 in·lb	
12	Carburetor Drain Plug	2.0	0.20	17 in·lb	

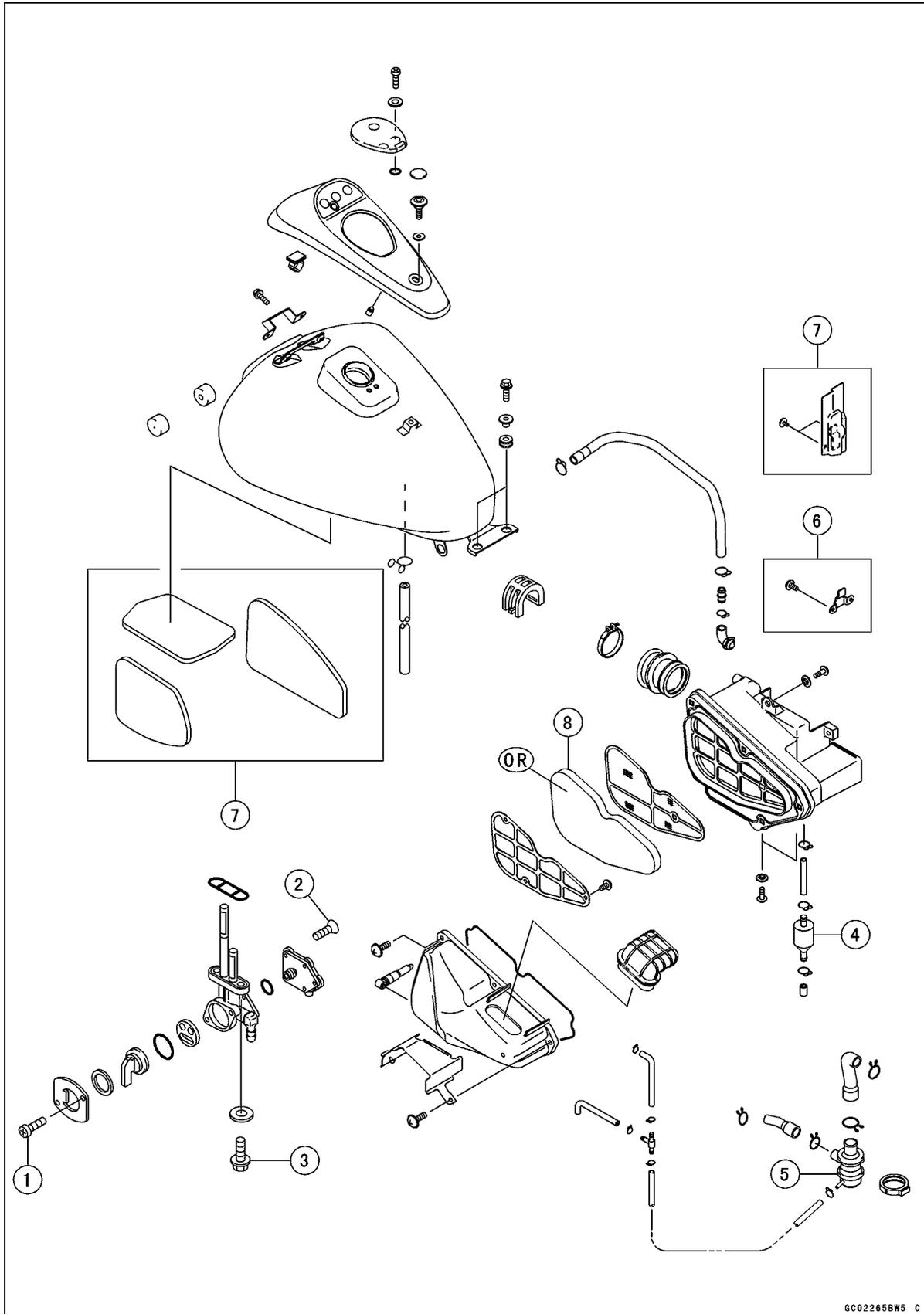
- 13. Throttle cable (accelerator)
- 14. Throttle cable (decelerator)
- 15. Plug (CA, CH, US)
- 16. Pilot screw
- 17. Valve needle
- 18. Needle jet
- 19. Float
- 20. Jet needle
- 21. BN125-A1 ~ A2
- 22. BN125-A3 ~
- CL: Apply cable lubricant.
- G: Apply grease.
- L: Apply a non-permanent locking agent.

CA: Canada
 CH: Switzerland
 US: United States

3-4 FUEL SYSTEM

Exploded View

Except the California Model



6C02265BW5 C

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Fuel Tap Plate Screws	0.8	0.080	7 in·lb	
2	Fuel Tap Diaphragm Cover Screws	1.0	0.10	9 in·lb	
3	Fuel Tap Mounting Bolts	2.5	0.25	22 in·lb	with White Washer
		4.9	0.50	43 in·lb	with Black Washer

4. Catch tank

5. Vacuum switch valve (For the AT, CH, DE of BN125-A1 ~ A2 and All Models of BN125-A3 ~)

6. For the AT, CH, DE of BN125-A1, and Except the EUR of BN125-A7 ~

7. On and after EUR of BN125-A7

8. Air cleaner element

OR: Apply high-quality-foam-air filter oil.

AT: Austria

CH: Switzerland

DE: Germany

EUR: Europe

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Fuel Tap Plate Screws	0.8	0.080	7 in·lb	
2	Fuel Tap Diaphragm Cover Screws	1.0	0.10	9 in·lb	
3	Fuel Tap Mounting Bolts	2.5	0.25	22 in·lb	with White Washer
		4.9	0.50	43 in·lb	with Black Washer

- 4. Catch tank
 - 5. Vacuum switch valve
 - 6. Canister
 - 7. Separator
 - 8. BN125-A5 only
 - 9. On and after BN125-A7
 - 10. Air cleaner element
- OR: Apply high-quality-foam-air filter oil.

3-8 FUEL SYSTEM

Specifications

Item	Standard
Throttle Grip Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)
Carburetor	
Make, Type	MIKUNI BS28
Idle Speed	1 300 ±50 r/min (rpm)
Pilot Screw (Turns Out)	1 5/8 3.0 (BN125-A7 ~, N, NU) (US, CA, CH) –
Service Fuel Level	1 ~ 3 mm (0.04 ~ 0.12 in.) below from the bottom edge of the of the carburetor body skirt.
Float Height	19.4 ±2 mm (0.76 ±0.08 in.)
Main Jet	#105 #125 (US, CA) #122.5 (BN125-A7 ~, N, NU)
Needle Jet (No.)	0-8 (807) 0-8M (891) (US, CA) 0-7M (891) (BN125-A7 ~, N, NU)
Jet Needle Mark	4DH24-3 4C17-1 (US, CA) 4C31-2 (BN125-A7 ~, N, NU)
Pilot Jet (Slow Jet)	#30 #32.5 (US, CA and BN125-A7 ~, N, NU)
Pilot Air Jet (Slow Air Jet)	#95 #90 (US, CA) #70 (BN125-A6 ~ US, CA and BN125-A7 ~, N, NU)
Throttle Valve	#110 #105 (US, CA and BN125-A7 ~, N, NU)
Air Cleaner Element Oil	High-quality-foam-air-filter oil
Grade	API SE, SF, or SG class
Viscosity	SAE30

CA: Canada

CH: Switzerland

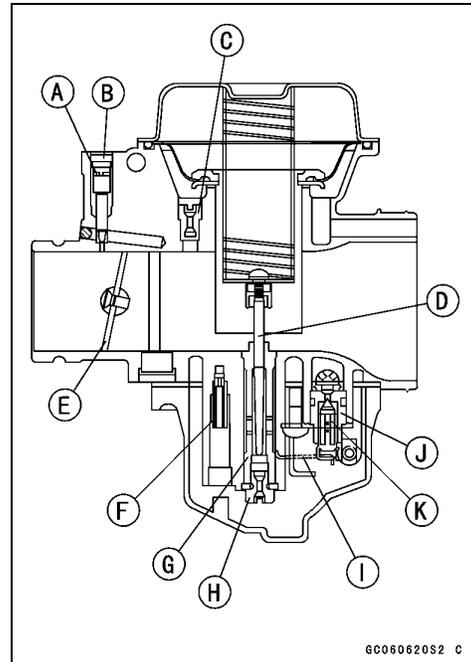
US: United States

N: No Catalytic Converter Model

NU: No Catalytic Converter (United Kingdom Model)

Specifications

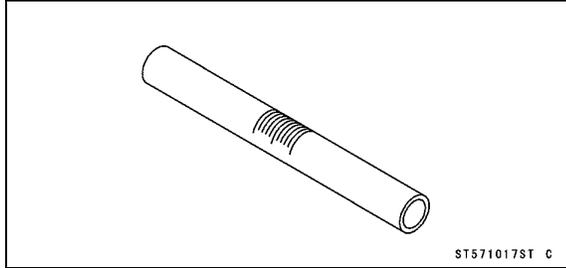
- Pilot screw [A]
- Plug [B] (US, CA, CH)
- Pilot air jet [C]
- Jet needle [D]
- Throttle valve [E]
- Pilot jet [F]
- Needle jet [G]
- Main jet [H]
- Float [I]
- Valve seat [J]
- Valve needle [K]



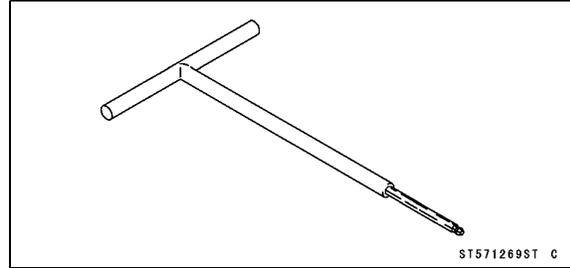
3-10 FUEL SYSTEM

Special Tools

**Fuel Level Gauge:
57001-1017**



**Carburetor Drain Plug Wrench, Hex 3:
57001-1269**



Throttle Grip and Cables

Free Play Inspection

- Refer to the Throttle Grip Free Play Inspection in the Periodic Maintenance chapter.

Free Play Adjustment

- Refer to the Throttle Grip Free Play Adjustment in the Periodic Maintenance chapter.

Throttle Cable Installation

- Install the throttle cable in accordance with the Cable, Wire, and Hose Routing section in the Appendix chapter.
- Install the upper ends of the throttle cables in the grip after installing the lower ends of the throttle cable on the carburetor.
- Tighten:
 - Torque - Handlebar Switch Housing Screws: 3.4 N·m (0.35 kgf·m, 30 in·lb)**
- After Installation, adjust the cable properly.

⚠ WARNING

Operation with incorrectly routed or improperly adjusted cables could result in an unsafe riding condition.

Throttle Cable Lubrication and Inspection

- Whenever the cable are removed, or in accordance with the Periodic Maintenance Chart, lubricate the throttle cable (see General Lubrication in Periodic Maintenance chapter).
- Apply a thin coating of grease to the cable upper end.
- Use the pressure cable lubber to lubricate the cable.
- With the cable disconnected at both ends, the cable should move freely in the cable housing.
- ★ If the cable movement is not free after lubricating, if the cable is frayed, or if the housing is kinked, replace the cable.

3-12 FUEL SYSTEM

Carburetor

Idle Speed Inspection

- Refer to the Idle Speed Inspection in the Periodic Maintenance chapter.

Idle Speed Adjustment

- Refer to the Idle Speed Adjustment in the Periodic Maintenance chapter.

Service Fuel Level Inspection

⚠ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

- Remove the carburetor, and hold it upright on a stand (see Carburetor Removal).
- Prepare an auxiliary fuel tank and connect the fuel tap to the carburetor using a suitable hose.
- Prepare a suitable fuel hose.
- Connect the fuel level gauge [A] to the carburetor float bowl with the fuel hose.

Special Tool - Fuel Level Gauge: 57001-1017

- Hold the gauge vertically against the side of the carburetor body so that the middle line [B] is several millimeters higher than the bottom edge [C] of the carburetor body.
- Turn the fuel tap to the ON position to feed fuel to the carburetor, then turn out the carburetor drain plug [D] a few turns.

Special Tool - Carburetor Drain Plug Wrench, Hex 3: 57001-1269

- Wait until the fuel level in the gauge settles.
- Keeping the gauge vertical, slowly lower the gauge until the "middle" line is even with the bottom edge [E] of the carburetor body.

NOTE

Do not lower the "middle" line below the bottom edge of the carburetor body. If the gauge is lowered and then raised again, the fuel level measured shows somewhat higher than the actual fuel level. If the gauge is lowered too far, dump the fuel out of it into suitable container and start the procedure over again.

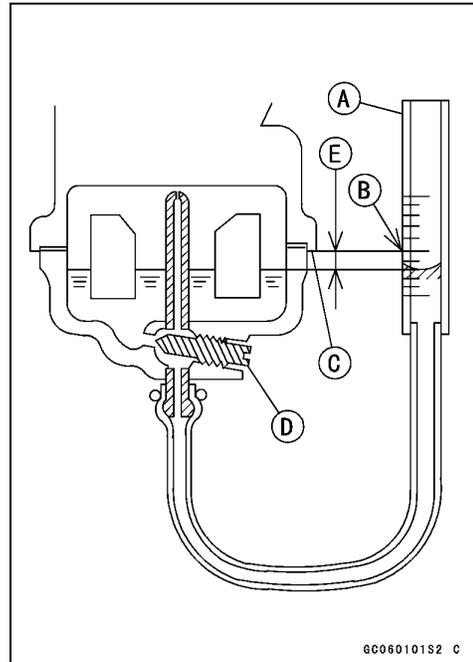
- Read the fuel level in the gauge and compare to the specification.

Service Fuel Level

Standard: 1 ~ 3 mm (0.04 ~ 0.12 in.)

below from the mating surface of the float bowl.

- Tighten the drain plug, turn the fuel tap to the OFF position and remove the fuel level gauge.
- ★ If the fuel level is incorrect, adjust it (see Service Fuel Level Adjustment).

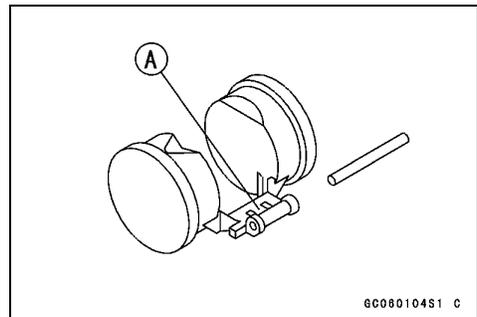
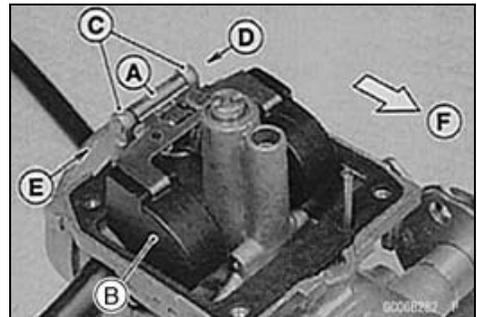
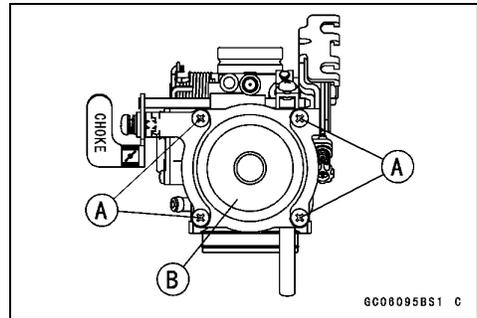


Carburetor

Service Fuel Level Adjustment

⚠ WARNING
Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

- Remove the carburetor, and drain the fuel into a suitable container.
- Remove the float bowl screws [A] and float bowl [B].
- Slide out the pivot pin [A] and remove the float [B].
- When removing and installing the pivot pin, note the followings.
 - Be careful not to snap the pin holder leg [C].
 - When removing it, tap [D] the left end of the pin.
 - When installing it, press [E] the right end of the pin. Front [F]
- Bend the tang [A] on the float arm very slightly to change the float height.



- Drive in the pivot pin to install the float [C].
 - Remove the float chamber gasket.
 - Measure the float height [D] tilting the carburetor so that the tang on the float just touches the needle rod in the float valve.
 - Increasing the float height lowers the fuel level and decreasing the float height raises the fuel level.
- Float Bowl Mating Surface [A]
 Float Valve Needle Rod (contacted but unloaded) [B]

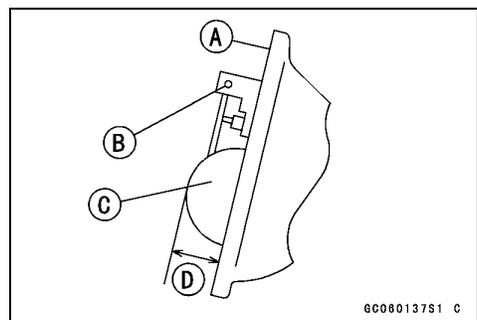
Float Height

Standard: 19.4 ±2 mm (0.76 ±0.08 in.)

NOTE

○ Do not push the needle rod in during float height measurement.

- Assemble the carburetor, and recheck the fuel level.
- ★ If the fuel level cannot be adjusted by this method, the float or the float valve is damaged.



3-14 FUEL SYSTEM

Carburetor

Fuel System Cleanliness Inspection

⚠ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

- Connect a suitable hose to the fitting at the bottom of the carburetor float bowl.
- Run the lower end of the hose into a suitable container.
- Turn the fuel tap to the PRI position.
- Turn out the drain plug [A] a few turns and drain the float bowl.

Front [B]

Special Tool - Carburetor Drain Plug Wrench, Hex 3: 57001-1269

- Check to see if water or dirt comes out.
- Tighten the drain plug and turn the fuel tap to the ON position.

Torque - Carburetor Drain Plug: 2.0 N·m (0.20 kgf·m, 17 in·lb)

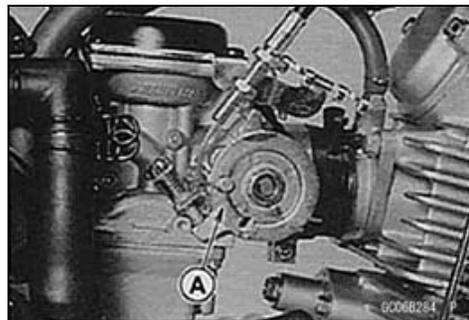
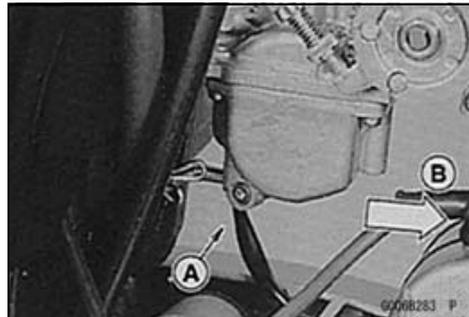
- ★ If any water or dirt appears during the above inspection, clean the fuel system (see Carburetor Cleaning and Fuel Tank Cleaning).

Carburetor Removal

⚠ WARNING

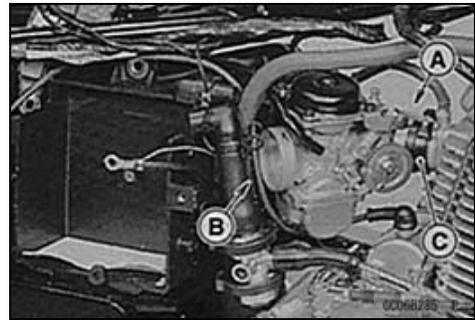
Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

- Remove:
 - Fuel Tank (see Fuel Tank Removal)
 - Throttle Cable Lower Ends [A]
- Move back the air cleaner housing (see Air Cleaner Housing Removal).



Carburetor

- Loosen the carburetor holder clamp [A] and air cleaner duct clamp.
- Pull the carburetor out of the air cleaner duct end [B], and then pull it out of the carburetor holder [C] from the vehicle's right side.
- Take out the carburetor.
- Stuff pieces of lint-free, clean cloth into the carburetor holder and the air cleaner duct to keep dirt out of the engine and air cleaner.



▲ WARNING

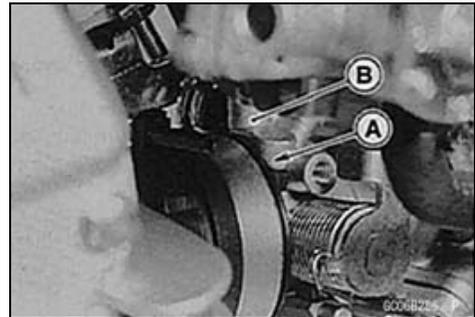
If dirt or dust is allowed to pass through into the carburetor, the throttle may become stuck, possibly causing an accident.

CAUTION

If dirt gets through into the engine, excessive engine wear and possibly engine damage will occur.

Carburetor Installation

- When installing the carburetor into the carburetor holder, fit the ridge [B] of the carburetor into the recess [A] of the carburetor holder.

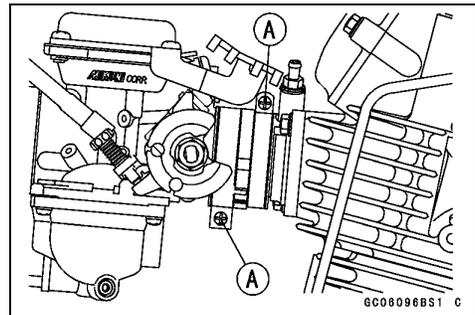


- Tighten the clamp screws [A] so that face the screw position and screw head direction.
- Check fuel leakage from the carburetor.

▲ WARNING

Fuel spilled from the carburetor is hazardous.

- Adjust the following items if necessary.
Throttle Cable
Idle Speed



Carburetor Disassembly

- Remove the carburetor (see Carburetor Removal).

▲ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

3-16 FUEL SYSTEM

Carburetor

- Remove:
 - Upper Chamber Cover [A]
 - Vacuum Piston and Diaphragm

CAUTION

During carburetor disassembly, be careful not to damage the diaphragm. Never use a sharp edge to remove the diaphragm.

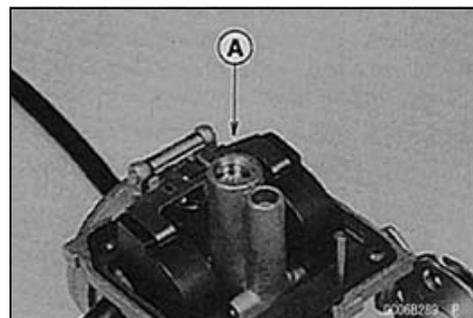
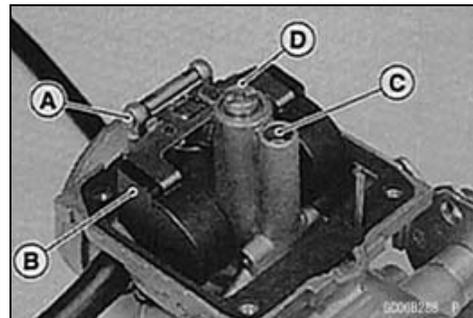
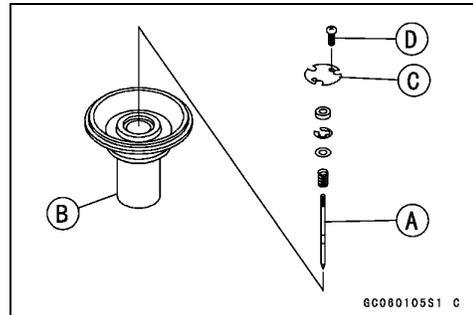
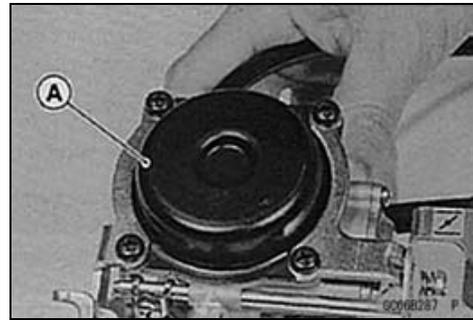
- Remove the spring seat screws [D].
- Remove the jet needle [A] from the vacuum piston [B] along with the spring seat [C].
- The pilot screw is set at the factory and should not be removed. But if necessary, remove the pilot screw as follows.
- Replace the O-ring with a new one.
- For the Swiss, United States, and Canada models, pry out the pilot screw plug with an awl or other suitable tool.
- Turn in the pilot screw and count the number of turns until it seats fully but not tightly, and then remove the screw. Use this number of turns to set the screw to its original position during assembly.

NOTE

○ A carburetor has different "turns out" of the pilot screw for each individual unit. When setting the pilot screw, use the "turns out" determined during disassembly. Use the specification in this manual only if the original number is unknown.

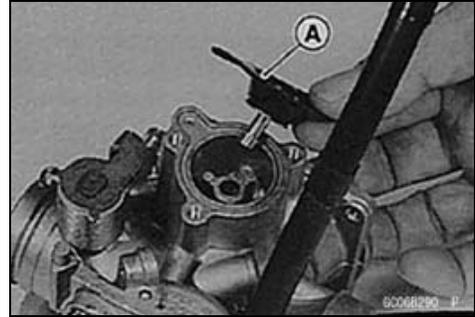
- Remove:
 - Float Bowl
 - Float Pivot Pin [A]
 - Float [B] with Float Valve Needle
 - Pilot Jet [C]
 - Main Jet [D]

- Push the needle jet [A] out from the inside of the carburetor bore with your finger.



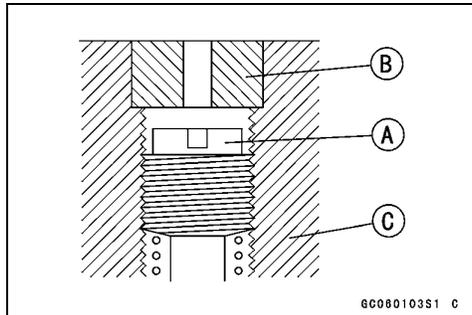
Carburetor

- Remove the coasting enricher cover.
- Remove the diaphragm [A].



Carburetor Assembly

- Turn in the pilot screw [A] fully but not tightly, and then back it out the same number of turn counted during disassembly.
- For the Swiss, United States, and Canada models, drive in a new plug [B] in the pilot screw hole of the carburetor body [C] as shown.

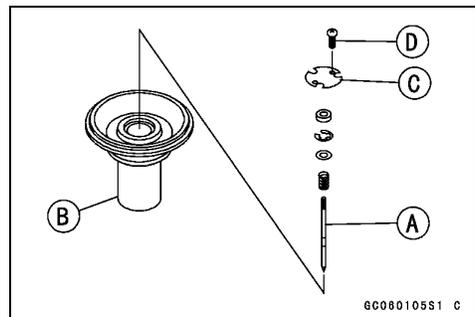
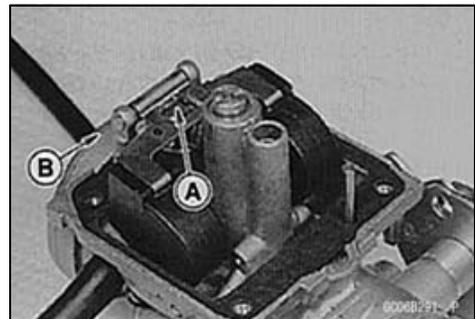


CAUTION

Do not force the needle jet and main jet or over-tighten them. They could be damaged requiring replacement.

- Tighten:
 - Torque - Main Jet: 1.8 N·m (0.18 kgf·m, 15 in·lb)**
 - Pilot Jet: 0.8 N·m (0.080 kgf·m, 7 in·lb)**
- Put the float valve needle into the valve seat.
- Before installing the float, insert the tang on the float plate through the clip [A] on the valve needle.
- Press the pivot pin [B] into the holder leg and float.
- Set the float height as specified (see Service Fuel Level Adjustment).
- Slip the jet needle [A] through the hole in the center of the vacuum piston [B], and put the spring seat [C] on the top of the needle.
- Tighten the spring seat screws [D].

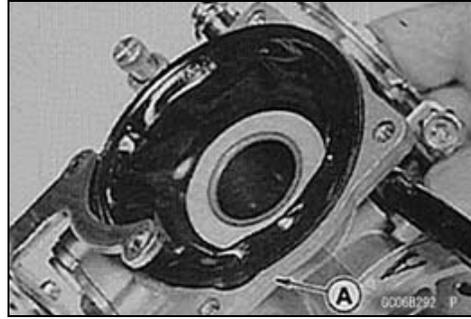
Torque - Spring Seat Screw: 0.8 N·m (0.080 kgf·m, 7 in·lb)



3-18 FUEL SYSTEM

Carburetor

- Align the diaphragm tang [A] with the notch in the upper chamber, and fit the diaphragm sealing lip into its groove.
- After installing the upper chamber cover, check that the vacuum piston slides up and down smoothly without binding in the carburetor bore.
- Tighten:
 - Torque - Upper Chamber Cover Screws : 3.5 N·m (0.36 kgf·m, 31 in·lb)
 - Float Bowl Screws: 2.0 N·m (0.20 kgf·m, 17 in·lb)
 - Coasting Enricher Screws: 2.0 N·m (0.20 kgf·m, 17 in·lb)



Carburetor Cleaning

⚠ WARNING

Clean the carburetor in a well-ventilated area, and take care that there is no spark or flame anywhere near the working area; this includes any appliance with a pilot light. Because of the danger of highly flammable liquids, do not use gasoline or low-flash point solvents to clean the carburetor.

CAUTION

Do not use compressed air on an assembled carburetor, or the floats may be crushed by the pressure. Remove as many rubber or plastic parts from the carburetor as possible before cleaning the carburetor with a cleaning solution. This will prevent damage to or deterioration of the parts.

The carburetor body has plastic parts that cannot be removed. Do not use a strong carburetor cleaning solution which could attack these parts; instead, use a mild high-flash point cleaning solution safe for plastic parts.

Do not use wire or any other hard instrument to clean carburetor parts, especially jets, as they may be damaged.

- Disassemble the carburetor.
- Immerse all the metal parts in a carburetor cleaning solution.
- Rinse the parts in water.
- When the parts are clean, dry them with compressed air.
- Blow through the air and fuel passages with compressed air.
- Assemble the carburetor.

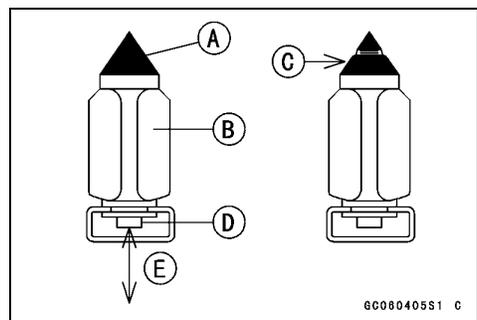
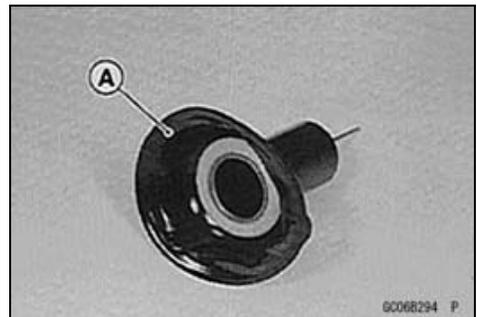
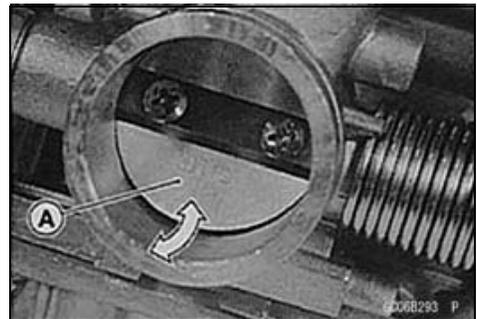
Carburetor

Carburetor Inspection

⚠ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

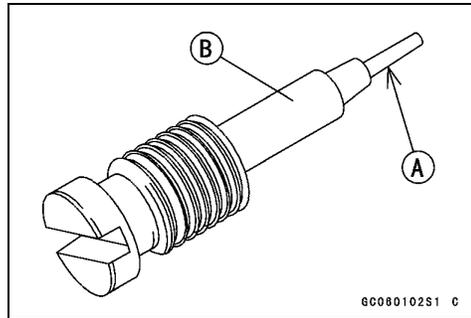
- Remove the carburetor.
 - Before disassembling the carburetor, check the fuel level (see Fuel Level Inspection).
 - Move the starter plunger lever up and down to check that the starter plunger moves smoothly.
 - ★ If the starter plunger does not work properly, replace the plunger, level and/or the carburetor.
 - Turn the throttle cable pulley to check that the throttle valve [A] moves smoothly and return by spring face.
 - ★ If the throttle valve does not move smoothly, replace the carburetor.
-
- Disassemble the carburetor (see Carburetor Disassembly).
 - Clean the carburetor (see Carburetor Cleaning).
 - Check that the diaphragm [A] on the vacuum piston is in good condition.
 - ★ If any of the diaphragm is not in good condition, replace them.
-
- Check the plastic tip [A] of the float valve needle [B]. It should be smooth, without any grooves, scratches, or tears.
 - ★ If the plastic tip is damaged [C], replace the needle.
 - Push the rod [D] in the other end of the float valve needle, and then release it [E].
 - ★ If the rod does not spring out, replace the float valve needle.



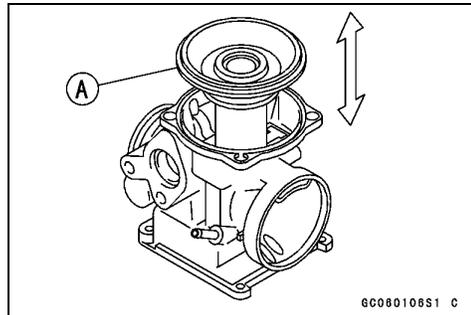
3-20 FUEL SYSTEM

Carburetor

- Check the tapered portion [A] of the pilot screw [B] for wear or damage.
- ★ If the pilot screw is worn or damaged on the tapered portion, it will prevent the engine from idling smoothly. Replace it.



- Check that the vacuum piston [A] moves smoothly in the carburetor body. The surface of the piston must not be excessively worn.
- ★ If the vacuum piston does not move smoothly, or if it is very loose in the carburetor body, replace the piston and/or the carburetor.



- Disassemble the carburetor, and clean the fuel, air passages with a high-flash-point solvent and compressed air.
- Stuff the lint-free, clean cloths into the air cleaner housing to keep dirt or other foreign material from entering.

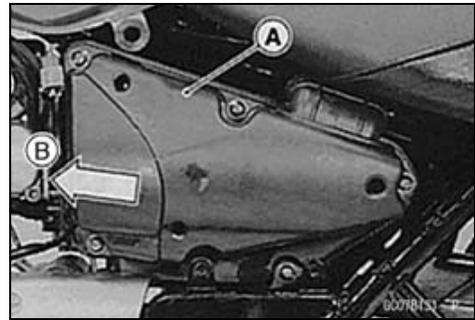
⚠ WARNING

If dirt or dust is allowed to pass through into the carburetor, the throttle valve may stick, possibly causing an accident.

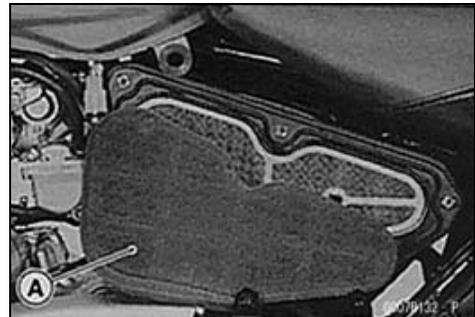
Air Cleaner

Air Cleaner Element Removal

- Remove the left side cover.
- Remove the element cover [A].
Front [B]



- Pull out the air cleaner element [A].
- Push a clean, lint-free towel into the air cleaner housing to keep dirt or other foreign material from entering.



⚠ WARNING

If dirt or dust is allowed to pass through into the carburetor, the throttle valve may become stuck, possibly causing an accident.

CAUTION

If dirt gets through into the engine, excessive engine wear and possibly engine damage will occur.

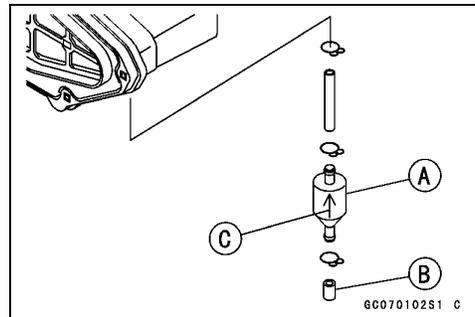
Element Cleaning and Inspection

- Refer to the Air Cleaner Element Cleaning and Inspection in the Periodic Maintenance chapter.

Air Cleaner Draining

A catch tank is provided beneath the air cleaner housing, and catches the water or oil from the bottom of the housing. Usually water or oil does not collect at the bottom of the housing. In the event that rain water is drawn in through the air cleaner, or if engine oil is blown back, drain the housing.

- Visually check the catch tank [A] if the water or oil accumulates in the tank.
- ★ If any water or oil accumulates in the tank, drain it by taking off the drain plug [B] at the lower end of the drain hose.
- Install the catch tank with the arrow [C] on it pointing upward.
- Be sure to install the plug firmly.



⚠ WARNING

Be sure to install the plug in the drain hose after draining. Oil could drain from the open hose and get on the tires which could cause an accident and injury.

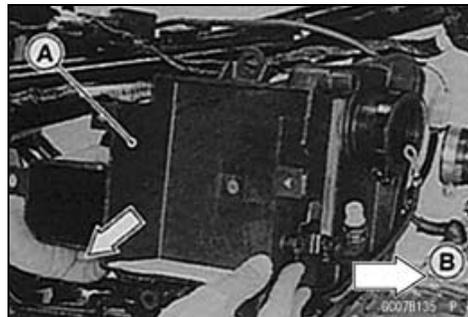
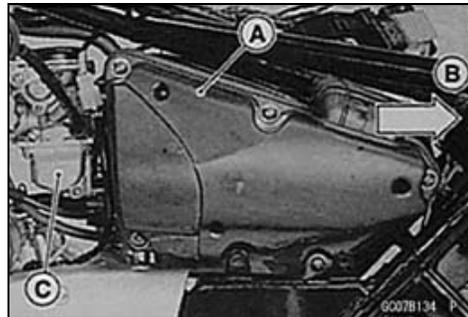
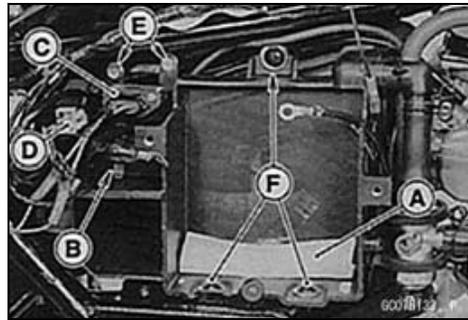
3-22 FUEL SYSTEM

Air Cleaner

Air Cleaner Housing Removal

- Remove:
 - Side Covers and Seat (see Frame chapter)
 - Fuel Tank (see Fuel Tank Removal)
 - Battery (see Electrical System) and Battery Seat [A]
 - Breather Hose of Air Cleaner
 - Starter Relay [B]
 - Fuse Case [C]
 - Starter Circuit Relay [D]
 - Housing Mounting Bolts [E] and Screws [F]
- Remove the element cover [A] and element.
- Move back [B] the air cleaner housing.
- Remove the carburetor [C] (see this chapter).

- Remove the air cleaner housing [A] from the vehicle's right side.
 - Front [B]



Air Cleaner Housing Installation

- Be sure to fit the engine breather hose and draining hoses into the air cleaner housing.

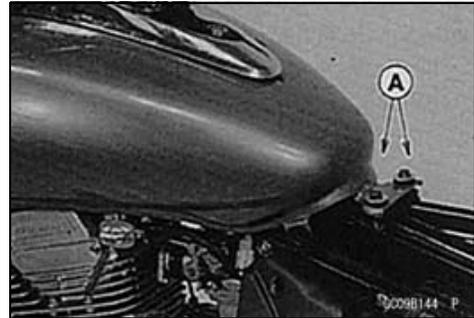
Fuel Tank

Fuel Tank Removal

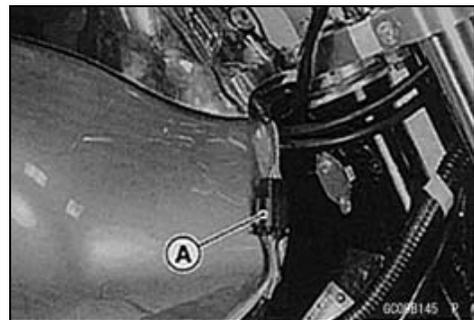
⚠ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

- Remove the seat and side covers (see Frame chapter).
- Remove the fuel tank mounting bolts [A].
- Turn the fuel tap to the OFF or RES position.
- Pull the hose off the tap.

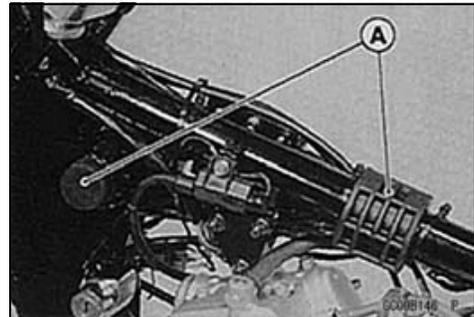


- Disconnect the indicator light lead connector [A].
- Remove the fuel tank.
- Drain the fuel tank.
- Place a suitable container under the fuel tank.
- Turn the fuel tap to the PRI position to drain the fuel into the container.



Fuel Tank Installation

- Read the above WARNING.
- Check the rubber dampers [A] on the frame.
- ★ If the dampers are damaged or deteriorated, replace them.
- Route the hose and leads correctly.
- Connect the indicator light connector.
- Be sure the hose are clamped securely.



Fuel Tank Inspection

- Remove the hoses from the fuel tank, and open the tank cap.
- Check to see if the breather pipe and water drain pipe in tank are not clogged.
- ★ If they are clogged, remove the tank and drain it, and then blow pipes free with compressed air.

CAUTION

Do not apply compressed air to the air vent holes in the tank cap. This could cause damage and clogging of the labyrinth in the cap.

3-24 FUEL SYSTEM

Fuel Tank

Fuel Tank Cleaning

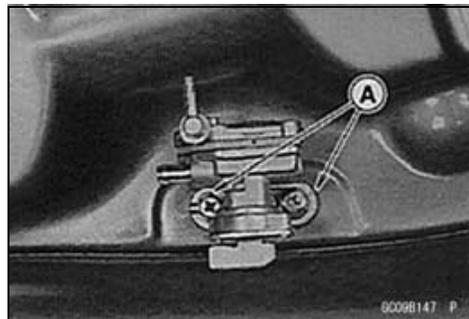
⚠ WARNING

Clean the tank in a well-ventilated area, and take care that there are no sparks or flame anywhere near the working area. Because of the danger of highly flammable liquids, do not use gasoline or low-flash point solvents to clean the tank.

- Remove the fuel tank and drain it.
- Pour some high-flash point solvent into the fuel tank and shake the tank to remove dirt and fuel deposits.
- Pour the solvent out of the tank.
- Remove the fuel tap from the tank (see Fuel Tap Removal).
- Clean the fuel tap filter screens in a high-flash point solvent.
- Pour high-flash point solvent through the tap in all lever positions.
- Dry the tank and the fuel tap with compressed air.
- Install the tap in the tank.
- Install the fuel tank.

Fuel Tap Removal

- Remove the fuel tank and drain it.
- Remove the tap bolts [A] with nylon flat washers and take out the fuel tap.



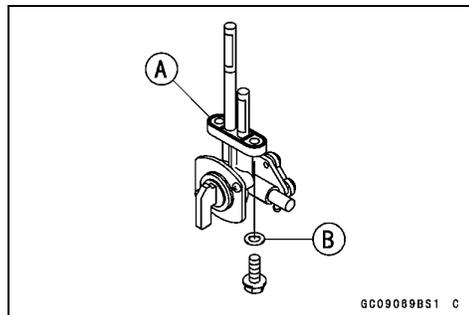
Fuel Tap Installation

- Replace the O-rings [A] with a new one.
- Be sure to clamp the fuel hose to the tap to prevent leaks.
- Be sure the flat washers [B] are in good condition to prevent leaks.
- Do not use steel washers in place of the flat washers, because they will not seal the bolts properly and fuel will leak.
- Tighten:

Torque - Fuel Tap Mounting Bolts:

2.5 N·m (0.25 kgf·m, 22 in·lb) (White Washer)

4.9 N·m (0.50 kgf·m, 43 in·lb) (Black Washer)



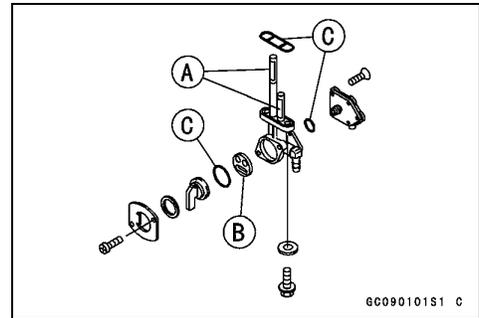
Fuel Tank

Fuel Tap Inspection

- Remove the fuel tap.
- Check the fuel tap filter screen [A] for any breaks or deterioration.
- ★ If the fuel tap screens have any breaks or are deteriorated, they may allow dirt to reach the carburetor, causing poor running. Replace the fuel tap.
- ★ If the fuel tap leaks, or allows fuel to flow when it is at On or RES position without engine running, replace the damaged gasket [B] or O-ring [C].

Torque - Fuel Tap Plate Screws: 0.8 N·m (0.080 kgf·m, 7 in·lb)

Fuel Tap Diaphragm Cover Screws: 1.0 N·m (0.10 kgf·m, 9 in·lb)



3-26 FUEL SYSTEM

Evaporative Emission Control System (California Model Only)

The Evaporative Emission Control System routes fuel vapors from the fuel system into the running engine or stores the vapors in a canister when the engine is stopped. Although no adjustments are required, a thorough visual inspection must be made at the intervals specified by the Periodic Maintenance Chart.

Parts Removal/Installation

⚠ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

CAUTION

If gasoline, solvent, water or any other liquid enters the canister, the canister's vapor absorbing capacity is greatly reduced. If the canister does become contaminated, replace it with a new one.

- To prevent the gasoline from flowing into or out of the canister, hold the separator perpendicular to the ground.
- Connect the hoses according to the diagram of the system. Make sure they do not get pinched or kinked.
- Route hoses with a minimum of bending so that the air or vapor will not be obstructed.
- Be sure to plug the return hose to prevent fuel spilling before fuel tank removal.

⚠ WARNING

When removing the fuel tank, be careful not to spill the gasoline through the return hose. Spilled fuel is hazardous.

- ★ If liquid gasoline flows into the breather hose, remove the hose and blow it clean with compressed air.

Hose Inspection

- Check that the hoses are securely connected.
- Replace any kinked, deteriorated or damaged hoses.

Separator Inspection

- Refer to the Evaporative Emission Control System Inspection in the Periodic Maintenance chapter.

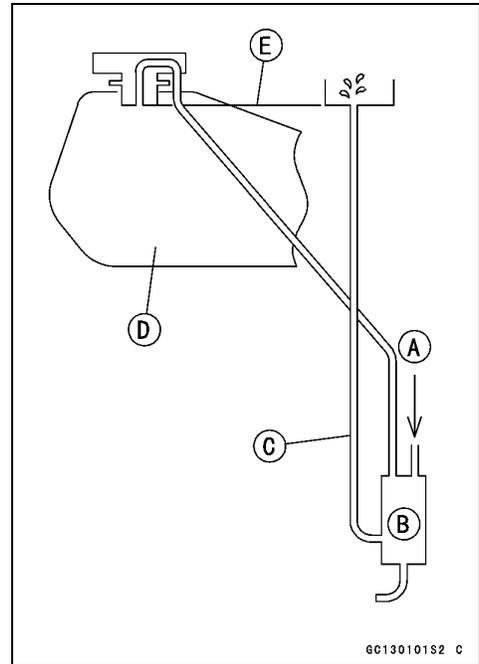
Evaporative Emission Control System (California Model Only)

Separator Operation Test

⚠ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

- Connect the hoses to the separator, and install the separator on the motorcycle.



- Disconnect the breather hose from the separator, and inject about 20 mL (0.68 US oz) of gasoline [A] into the separator [B] through the hose fitting.
- Disconnect the fuel return hose [C] from the fuel tank [D].
- Place the open end of the return hose into the container and hold it with the same level of the tank top [E].
- Start the engine, and let it idle.
- ★ If the gasoline in the separator comes out of the hose, the separator works well. If it does not, replace the separator with a new one.

Canister Inspection

- Refer to the Evaporative Emission Control System Inspection in the Periodic Maintenance chapter.

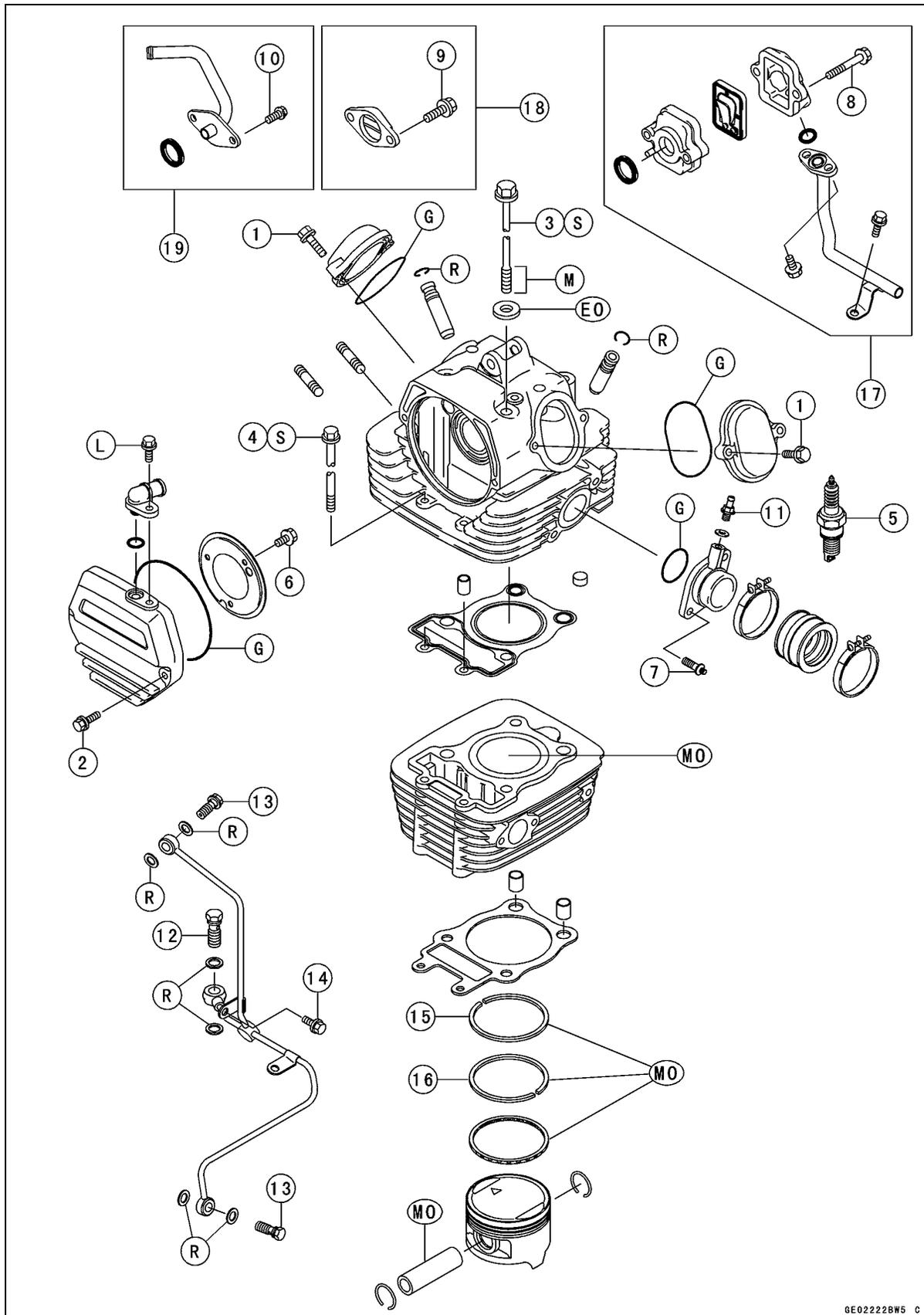
Engine Top End

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Installation	4-14	Cylinder, Piston Installation.....	4-33
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4-2 ENGINE TOP END

Exploded View



GE0222BWS C

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Valve Adjusting Cap Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
	Valve Adjusting Cap Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
2	Camshaft Chain Cover Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
	Camshaft Chain Cover Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
3	Cylinder Head Bolts (M9)	26	2.7	19	S, M
4	Cylinder Head Bolts (M6)	12	1.2	104 in·lb	S
5	Spark Plug	13	1.3	9.5	
6	Camshaft Chain Cover Damper Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
	Camshaft Chain Cover Damper Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
7	Carburetor Holder Bolts	9.8	1.0	87 in·lb	
8	Air Suction Valve Cover Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
	Air Suction Valve Cover Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
9	Cylinder Head Blank Cap Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
	Cylinder Head Blank Cap Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
10	Vacuum Switch Valve Pipe Mounting Bolts	8.8	0.90	78 in·lb	
11	Vacuum Hose Fitting	5.9	0.60	52 in·lb	
12	Oil Pipe Banjo Bolt (M10)	25	2.5	18	
13	Oil Pipe Banjo Bolts (M8)	9.8	1.0	87 in·lb	
14	Oil Pipe Mounting Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
	Oil Pipe Mounting Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	

15. "R" marked side faces up.

16. "RN" marked side faces up.

17. Air suction valve (For AT, CH, DE of BN125-A1 ~ A2 and other than the CAL of BN125A3 ~)

18. Other than AT, CH, DE of among the BN125-A1 ~ A2)

19. California Model

EO: Apply engine oil.

G: Apply grease.

L: Apply a non-permanent locking agent.

M: Apply molybdenum disulfide grease.

MO: Apply molybdenum disulfide oil. The molybdenum disulfide oil is a mixture of engine oil and molybdenum disulfide grease with a weight ratio (10 : 1).

R: Replacement Parts

S: Follow the specific tightening sequence.

AT: Austria

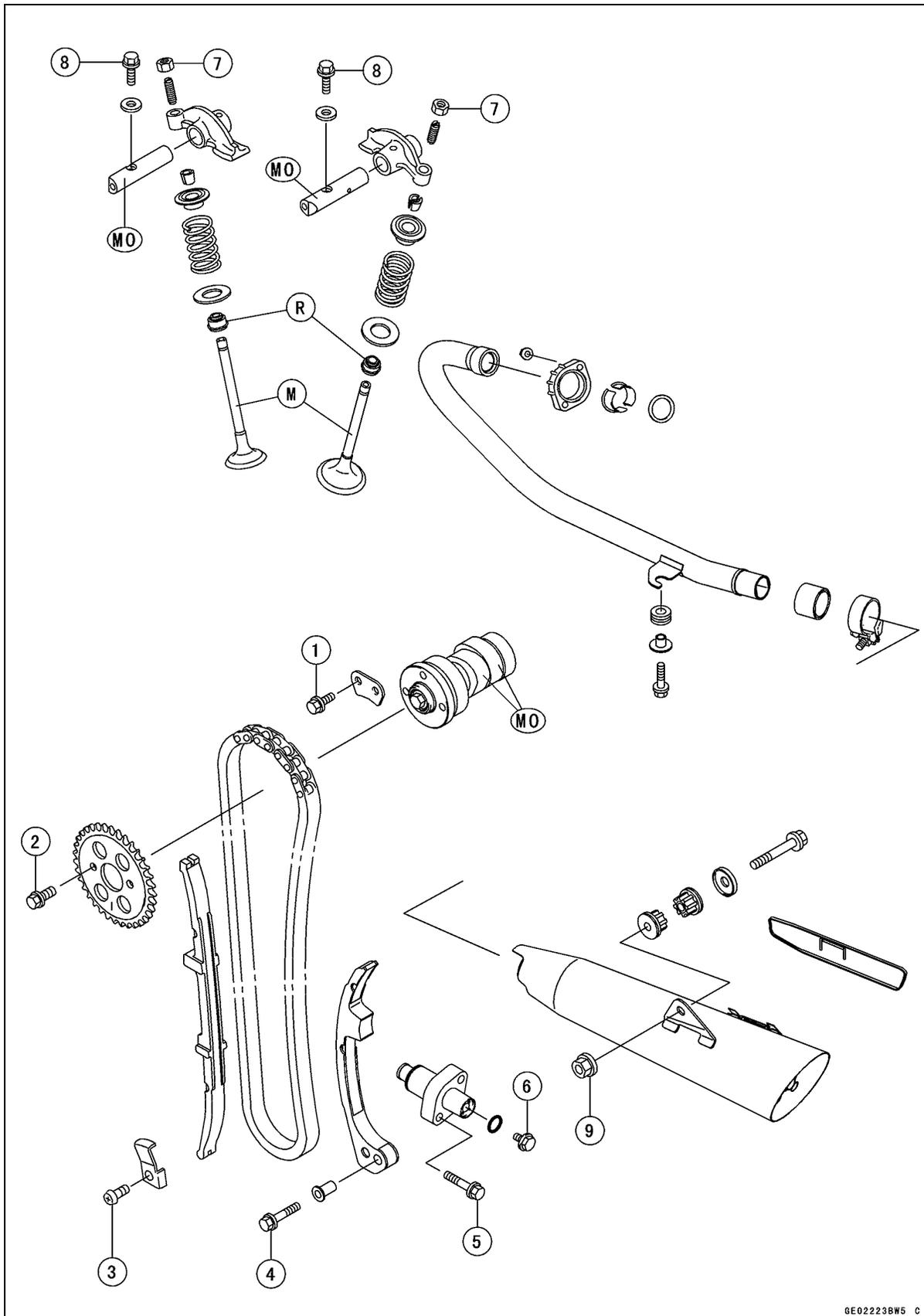
CAL: California

CH: Switzerland

DE: Germany

4-4 ENGINE TOP END

Exploded View



GE0223BWS C

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Camshaft Bearing Holder Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
	Camshaft Bearing Holder Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
2	Camshaft Sprocket Bolts	12	1.2	104 in·lb	
3	Camshaft Chain Holder Screw	4.9	0.50	43 in·lb	
4	Camshaft Chain Guide Bolt	8.8	0.90	78 in·lb	
5	Chain Tensioner Mounting Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
	Chain Tensioner Mounting Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
6	Chain Tensioner Cap	4.9	0.50	43 in·lb	
7	Valve Adjusting Screw Locknut	15	1.5	11	
8	Rocker Shaft Bolts	8.8	0.90	78 in·lb	
9	Muffler Body Mounting Nut	15	1.5	11	

M: Apply molybdenum disulfide grease.

MO: Apply molybdenum disulfide oil. The molybdenum disulfide oil is a mixture of engine oil and molybdenum disulfide grease with a weight ratio (10 : 1).

R: Replacement parts

4-6 ENGINE TOP END

Specifications

Item	Standard	Service Limit
Clean Air Sytem		
Vacuum Switch Valve Closing Pressure:	Open → Close	— — —
(AT, CH, DE, of the BN125-A1 ~ A2 and other than the CAL)	45 ~ 53 kPa (340 ~ 400 mmHg, 6.5 ~ 7.7 psi)	— — —
(CAL)	41 ~ 52 kPa (310 ~ 390 mmHg, 6.0 ~ 7.5 psi)	— — —
Camshaft		
Cam Height:		
Exhaust	39.348 ~ 39.464 mm (1.5491 ~ 1.5537 in.)	39.25 mm (1.545 in.)
Inlet	39.707 ~ 39.823 mm (1.5633 ~ 1.5678 in.)	39.61 mm (1.559 in.)
Camshaft Runout	TIR 0.02 mm (0.0008 in.) or less	TIR 0.1 mm (0.004 in.)
Rocker Arm Inside diameter	13.000 ~ 13.018 mm (0.5118 ~ 0.5125 in.)	13.05 mm (0.514 in.)
Rocker Shaft Diameter	12.983 ~ 12.994 mm (0.5111 ~ 0.5116 in.)	12.96 mm (0.510 in.)
Cylinder Head		
Cylinder Compression	(Usable range) 960 ~ 1 470 kPa (9.8 ~ 15.0 kgf/cm ² , 139 ~ 213 psi) @500 r/min (rpm)	— — —
Cylinder Head Warp	— — —	0.05 mm (0.002 in.)
Valves		
Valve Clearance:		
Exhaust	0.15 ~ 0.19 mm (0.006 ~ 0.007 in.)	— — —
Inlet	0.08 ~ 0.12 mm (0.003 ~ 0.005 in.)	— — —
Valve Head Thickness:		
Exhaust	0.9 ~ 1.1 mm (0.035 ~ 0.043 in.)	0.5 mm (0.02 in.)
Inlet	0.6 ~ 0.8 mm (0.024 ~ 0.031 in.)	0.4 mm (0.01 in.)
Valve Stem Bend	TIR 0.01 mm (0.0004 in.) or less	TIR 0.05 mm (0.002 in.)
Valve Stem Diameter:		
Exhaust	4.455 ~ 4.470 mm (0.1754 ~ 0.1760 in.)	4.44 mm (0.175 in.)
Inlet	4.475 ~ 4.490 mm (0.1762 ~ 0.1768 in.)	4.46 mm (0.176 in.)
Valve Guide Inside Diameter:		
Exhaust	4.500 ~ 4.512 mm (0.1772 ~ 0.1776 in.)	4.57 mm (0.180 in.)
Inlet	4.500 ~ 4.512 mm (0.1772 ~ 0.1776 in.)	4.57 mm (0.180 in.)
Valve/valve Guide Clearance (Wobble Method):		
Exhaust	0.14 ~ 0.19 mm (0.006 ~ 0.007 in.)	0.38 mm (0.015 in.)
Inlet	0.03 ~ 0.13 mm (0.001 ~ 0.005 in.)	0.33 mm (0.013 in.)
Valve Seat Cutting Angle	45°, 32°, 60°	— — —
Valve Seat Surface		
Outside Diameter:		
Exhaust	25.5 ~ 25.7 mm (1.00 ~ 1.01 in.)	— — —
Inlet	29.5 ~ 29.7 mm (1.16 ~ 1.17 in.)	— — —

Specifications

Item	Standard	Service Limit
Width:		
Exhaust	0.8 ~ 1.2 mm (0.03 ~ 0.05 in.)	---
Inlet	0.8 ~ 1.2 mm (0.03 ~ 0.05 in.)	---
Valve Spring Free Length:		
Exhaust	43.51 mm (1.713 in.)	42.1 mm (1.66 in.)
Inlet	43.51 mm (1.713 in.)	42.1 mm (1.66 in.)
Cylinder, Piston		
Cylinder Inside Diameter	55.000 ~ 55.012 mm (2.1654 ~ 2.1658 in.)	55.10 mm (2.169 in.)
Piston Diameter	54.960 ~ 54.975 mm (2.1638 ~ 2.1644 in.)	54.81 mm (2.158 in.)
	54.968 ~ 54.982 mm (2.1641 ~ 2.1646 in.) (BN125-A7 ~, N, NU)	54.82 mm (2.158 in.)
Piston/cylinder Clearance	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in.) 0.0241 ~ 0.0385 mm (0.0009 ~ 0.0015 in.) (BN125-A7 ~, N, NU)	---
Oversize Piston and Rings	+ 0.5 mm (0.02 in.), + 1.0 mm (0.04 in.)	---
Piston Ring/groove Clearance:		
Top	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in.)	0.17 mm (0.0067 in.)
Second	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in.)	0.16 mm (0.0063 in.)
Piston Ring Groove Width:		
Top	0.82 ~ 0.84 mm (0.0323 ~ 0.0331 in.)	0.92 mm (0.0362 in.)
Second	0.81 ~ 0.83 mm (0.0319 ~ 0.0327 in.)	0.91 mm (0.0358 in.)
Piston Ring Thickness:		
Top	0.77 ~ 0.79 mm (0.0303 ~ 0.0311 in.)	0.70 mm (0.028 in.)
Second	0.77 ~ 0.79 mm (0.0303 ~ 0.0311 in.)	0.70 mm (0.028 in.)
Piston Ring End Gap:		
Top	0.15 ~ 0.30 mm (0.006 ~ 0.012 in.)	0.60 mm (0.024 in.)
Second	0.30 ~ 0.45 mm (0.012 ~ 0.018 in.)	0.70 mm (0.028 in.)
Oil	0.20 ~ 0.70 mm (0.008 ~ 0.028 in.)	1.0 mm (0.04 in.)

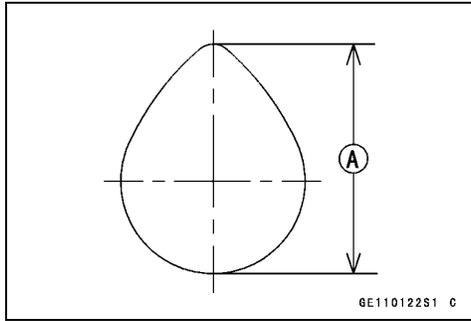
AT: Austria
 CAL: California
 CH: Switzerland
 DE: Germany

N: No Catalytic Converter Model
 NU: No Catalytic Converter (United Kingdom Model)

4-8 ENGINE TOP END

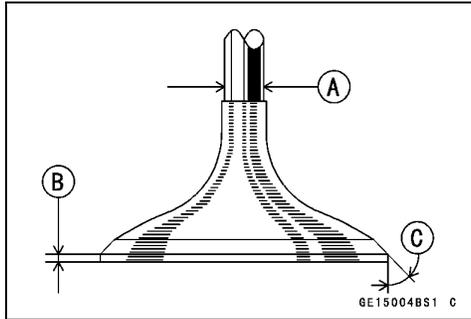
Specifications

Cam Height



Cam Height [A]

Valve Head Thickness

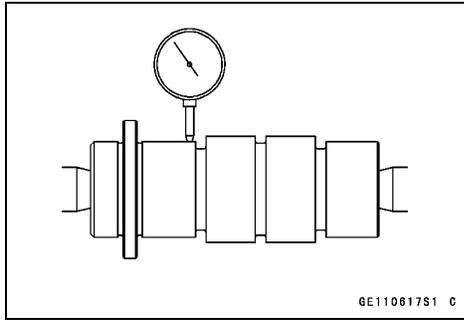


Valve Stem Diameter [A]

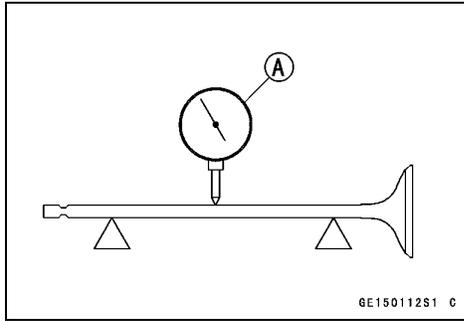
Valve Head Thickness [B]

45° [C]

Camshaft Runout



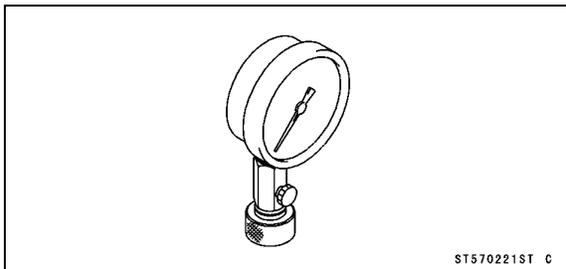
Valve Stem Bend



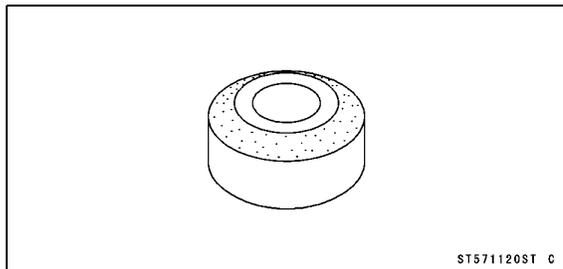
Dial Gauge [A]

Special Tools

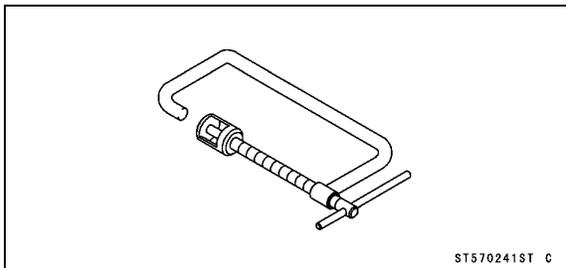
Compression Gauge, 20 kg/cm²:
57001-221



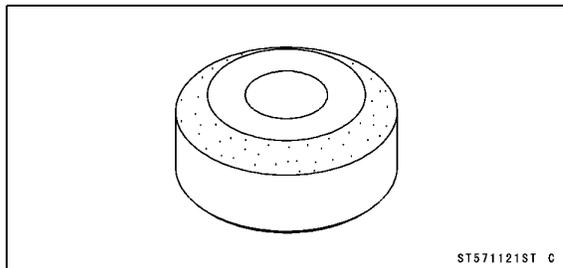
Valve Seat Cutter, 32°-φ30:
57001-1120



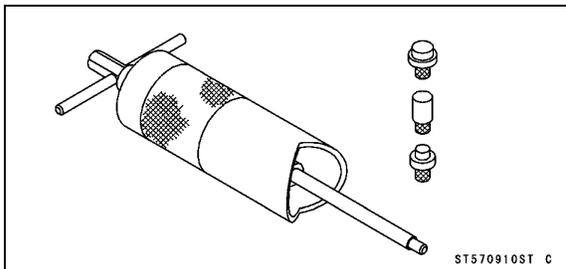
Valve Spring Compressor Assembly:
57001-241



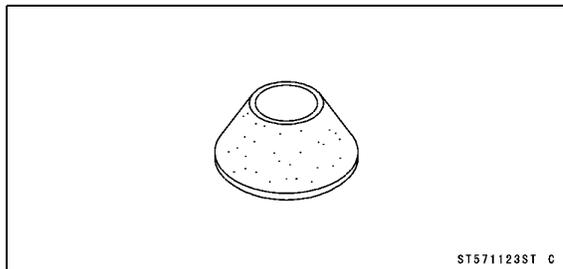
Valve Seat Cutter, 32° - φ35:
57001-1121



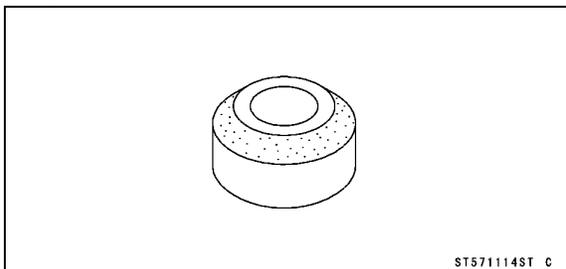
Piston Pin Puller Assembly:
57001-910



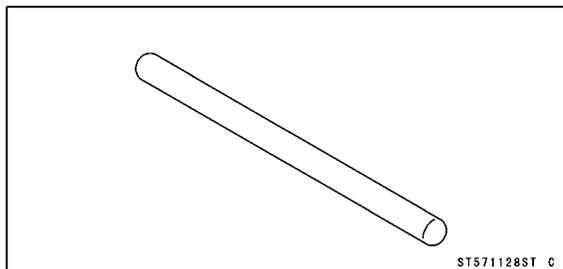
Valve Seat Cutter, 60°-φ30:
57001-1123



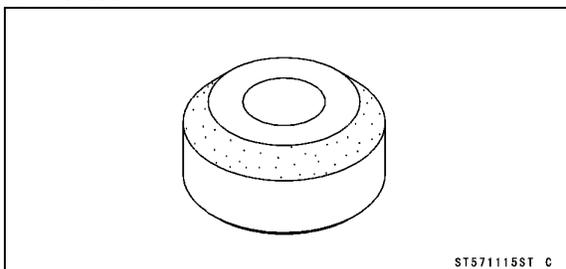
Valve Seat Cutter, 45°-φ27.5:
57001-1114



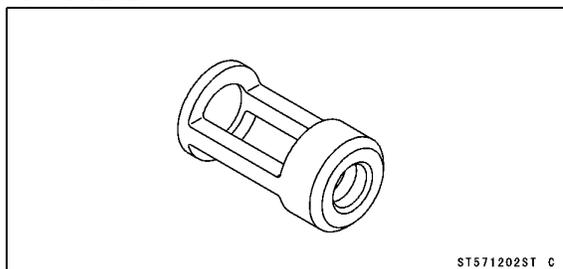
Valve Seat Cutter Holder Bar:
57001-1128



Valve Seat Cutter, 45° - φ32:
57001-1115



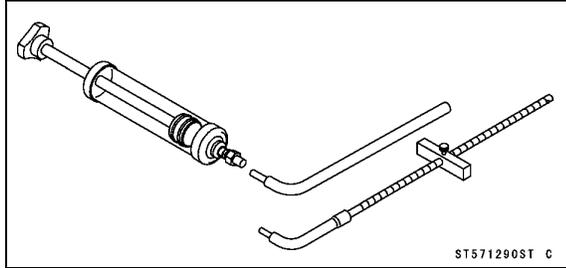
Valve Spring Compressor Adapter, φ22:
57001-1202



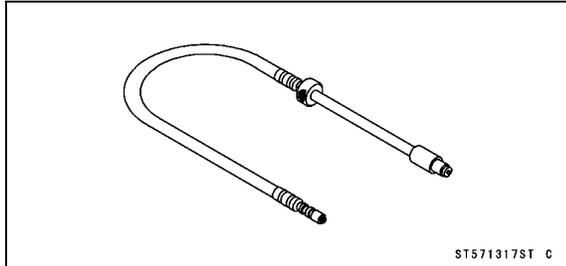
4-10 ENGINE TOP END

Special Tools

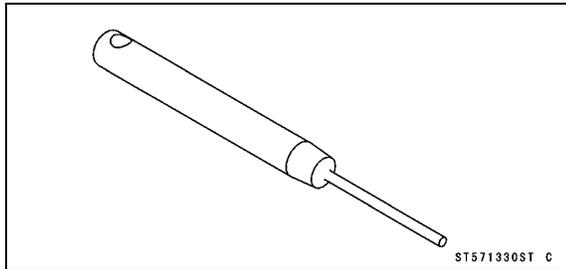
Fork Oil Level Gauge:
57001-1290



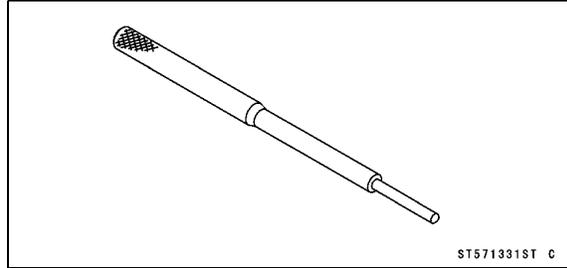
Compression Gauge Adapter, M10 × 1.0:
57001-1317



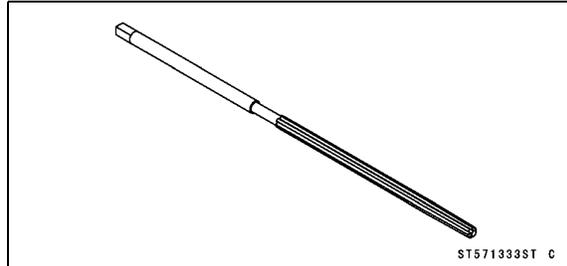
Valve Seat Cutter Holder, $\phi 4.5$:
57001-1330



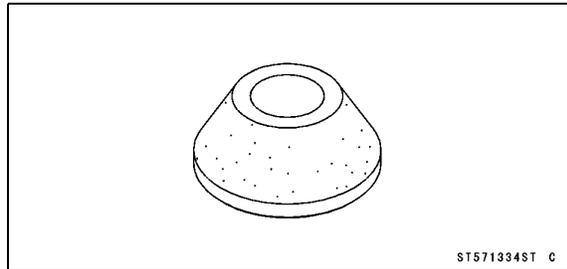
Valve Guide Arbor, $\phi 4.5$:
57001-1331



Valve Guide Reamer, $\phi 4.5$:
57001-1333



Valve Seat Cutter, $60^\circ - \phi 33$:
57001-1334



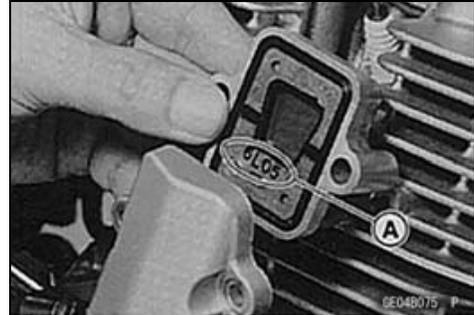
- Valve Seat Cutter, $32^\circ - \phi 33$: 57001-1199 can also be used instead of Valve Seat Cutter, $32^\circ - \phi 35$: 57001-1121
- Valve Seat Cutter, $45^\circ - \phi 30$: 57001-1187 can also be used instead of Valve Seat Cutter, $45^\circ - \phi 27.5$: 57001-1114

Clean Air System (For AT, CH, DE of BN125-A1 ~ A2 and other than the CAL)

AT: Austria
 CAL: California
 CH: Switzerland
 DE: Germany

Air Suction Valve Installation

- Install the air suction valve so that its number [A] of the read faces outside and downward.
- Tighten:
 - Torque - Air Suction Valve Cover Bolts:**
 - (BN125-A1 ~ A3): 9.8 N·m (1.0 kgf·m, 87 in·lb)
 - (BN125-A4 ~): 8.8 N·m (0.90 kgf·m, 78 in·lb)

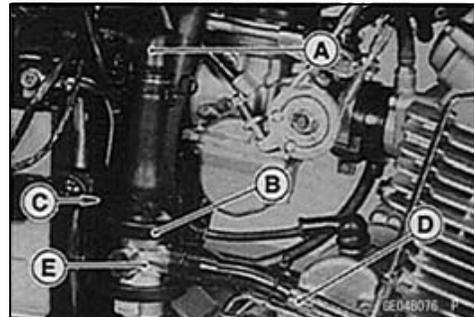


Air Suction Valve Inspection

- Refer to the Air Suction Valve Inspection in the Periodic Maintenance chapter.

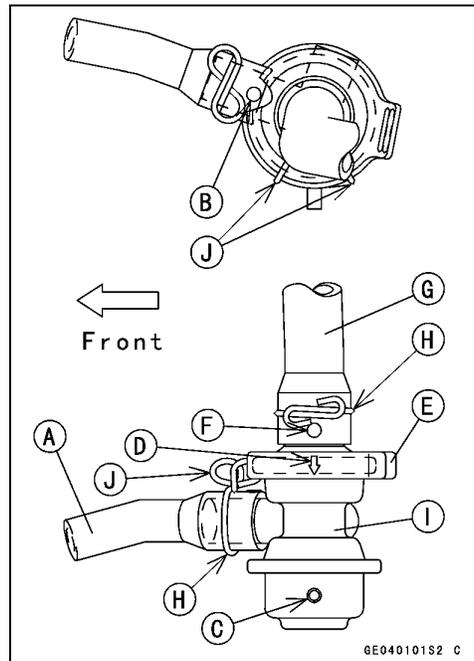
Vacuum Switch Valve Removal

- Remove the right side cover (see Frame chapter).
- Remove the hose [A] from the air cleaner housing.
- Pull the damper [B] upward to cleaner the stopper [C].
- Remove:
 - Pipe [D]
 - Vacuum Hose
 - Vacuum Switch Valve [E]



Vacuum Switch Valve Installation

- Install the hose [A] (to air suction valve) so that the mark [B] on it faces upward.
- Align the vacuum pipe [C], the arrow mark [D] on the damper [E], and the mark [F] on the air hose [G] (to air cleaner).
- Clamps [H]
- Vacuum Switch Valve [I]
- Face the tabs [J] as shown.
- Route the hoses correctly (see Appendix chapter).



4-12 ENGINE TOP END

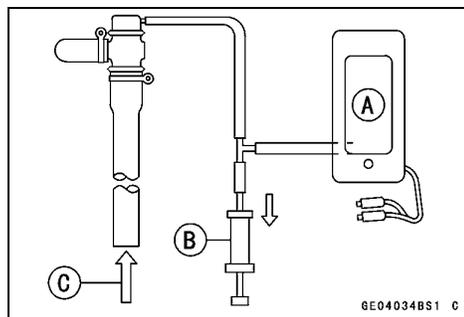
Clean Air System (For AT, CH, DE of BN125-A1 ~ A2 and other than the CAL)

Vacuum Switch Valve Unit Test

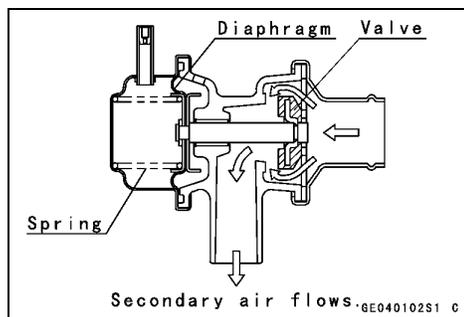
- Remove the vacuum switch valve (see Vacuum Switch Valve Removal).
- Connect a commercially available vacuum gauge [A] and syringe [B] (or fork oil level gauge) to the vacuum hoses as shown.

Special Tool - Fork Oil Level Gauge: 57001-1290

Air Flow [C]



- Gradually raise the vacuum (lower the pressure) applied to the vacuum switch valve, and check the valve operation. When the vacuum is low, the vacuum switch valve should permit air to flow. When the vacuum raises to valve closing pressure, it should stop air flow.



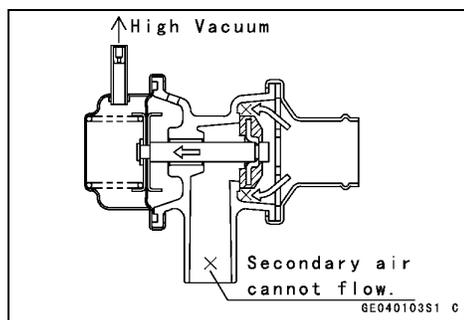
- ★ If the vacuum switch valve does not operate as described, replace it with a new one.

NOTE

- To check air flow through the vacuum switch valve, just blow through the air cleaner hose.

Vacuum Switch Valve Closing Pressure (Open → Close)

Standard: 45 ~ 53 kPa (340 ~ 400mmHg, 6.5 ~ 7.7 psi)



Clean Air System Hose Inspection

- Be certain that all the hoses are routed without being flattened or kinked, and are connected correctly to the right air cleaner housing, vacuum switch valve, carburetor holder, and air suction valve covers.
- ★ If they are not, correct them. Replace them if they are damaged.

Clean Air System (California Model)

Vacuum Switch Valve Test

- Remove the vacuum switch valve.
- Connect the vacuum gauge [A] and syringe [B] or fork oil level gauge to the vacuum hoses as shown.

Special Tool - Fork Oil Level Gauge : 57001-1290

Air Flow [C]

- Gradually raise the vacuum (lower the pressure) applied to the vacuum switch valve, and check the valve operation. When the vacuum is low, the vacuum switch valve should permit air to flow. When the vacuum raises to valve closing pressure, it should stop air flow.

Spring [A]

Diaphragm [B]

Valve [C]

Low Vacuum [D]

Secondary Air Flow [E]

High Vacuum [F]

Secondary Air Flow Cannot Flow [G]

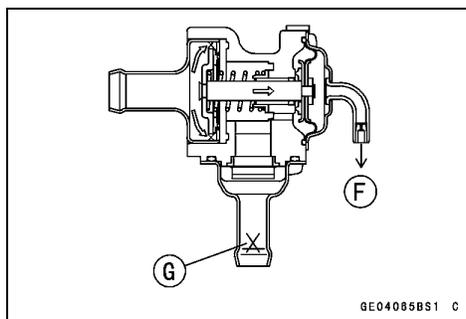
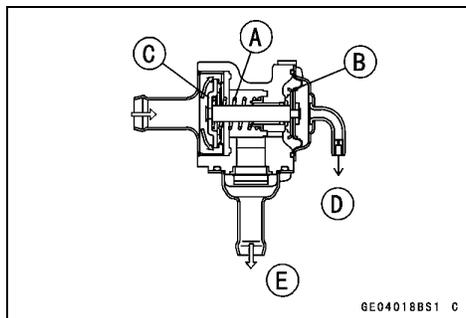
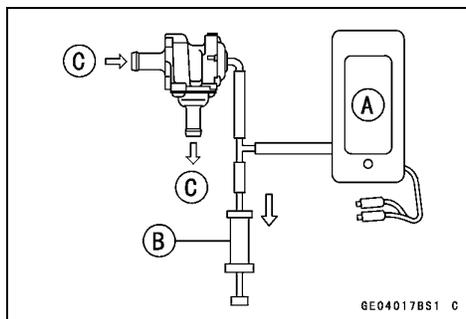
- ★ If the vacuum switch valve does not operate as described, replace it with a new one.

NOTE

- To check air flow through the vacuum switch valve, just blow through the air cleaner hose.

Vacuum Switch Valve Closing Pressure (Open → Close)

Standard: 41 ~ 52 kPa (310 ~ 390 mmHg)



4-14 ENGINE TOP END

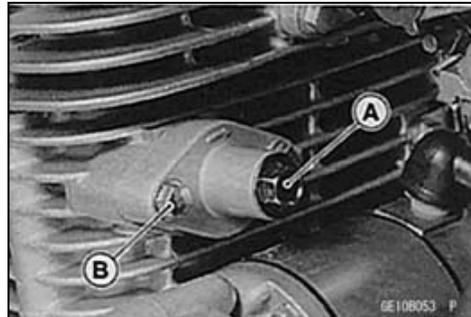
Camshaft Chain Tensioner

Camshaft Chain Tensioner Removal

CAUTION

This is a non-return type cam chain tensioner. The push rod does not return to its original position once it moves out to take up camshaft chain slack. Observe all the rules listed below: When removing the tensioner, do not take out the mounting bolts only halfway. Retightening the mounting bolts from this position could damage the tensioner and the camshaft chain. Once the bolts are loosened, the tensioner must be removed and reset as described in "Camshaft Chain Tensioner Installation." Do not turn over the crankshaft while the tensioner is removed. This could upset the cam chain timing, and damage the valves.

- Remove the chain tensioner cap [A] together with O-ring.
- Remove the mounting bolts [B] and take off the camshaft chain tensioner.

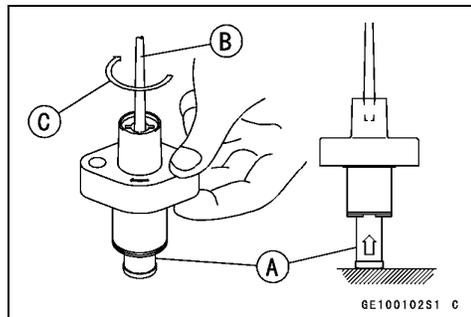


Camshaft Chain Tensioner Installation

- While compressing the push rod [A], turn [C] it clockwise with a suitable screwdriver [B] until the rod stops.

CAUTION

Do not turn the rod counterclockwise at installation. This could detach the rod and the tensioner cannot be reinstalled.

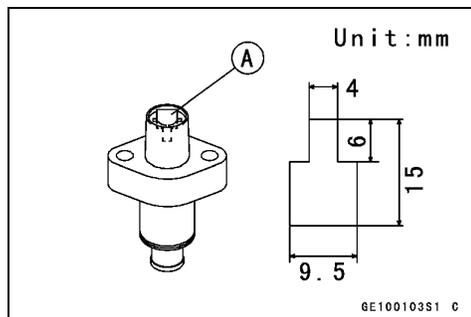


- While holding the rod in position with the screwdriver or a holder plate [A], install the tensioner on the cylinder block.

NOTE

○ To make the procedure easy, use a holder plate to keep the rod from pushing out. A replacement chain tensioner (spare parts) has a holder plate.

- The holder plate can be made of 1 mm (0.04 in.) thick aluminum plate as shown.



Camshaft Chain Tensioner

- Install the O-ring in the tensioner body.
- Install the tensioner so that the arrow mark [B] faces upward, and tighten the mounting bolts.

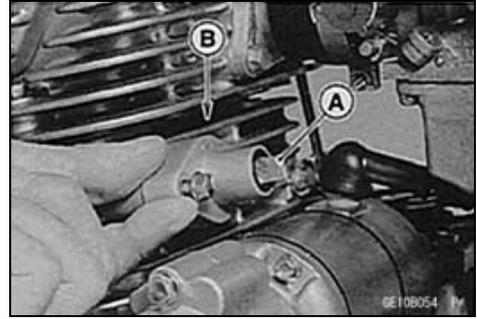
Torque - Chain Tensioner Mounting Bolts

(BN125-A1 ~ A3): 9.8 N·m (1.0 kgf·m 87in·lb)

(BN125-A4 ~): 8.8 N·m (0.90 kgf·m 87in·lb)

- Remove the screwdriver (or the holder plate [A]) and tighten the cap.

Torque - Chain Tensioner Cap: 4.9 N·m (0.50 kgf·m, 43 in·lb)

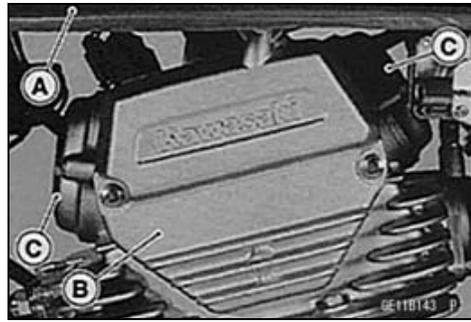


4-16 ENGINE TOP END

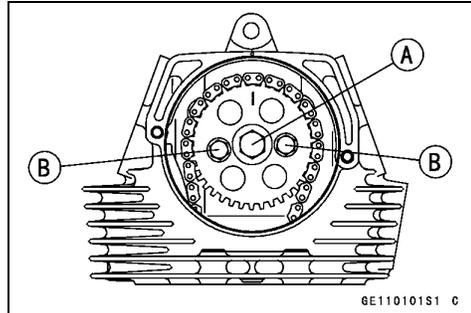
Camshaft

Camshaft Removal

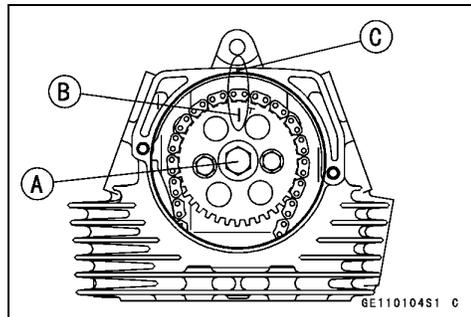
- Remove:
 - Fuel Tank [A] (see Fuel System chapter)
 - Camshaft Chain Cover [B]
 - Valve Adjusting Caps [C]



- Holding the camshaft center bolt [A] with a wrench, loosen the camshaft sprocket bolts [B].



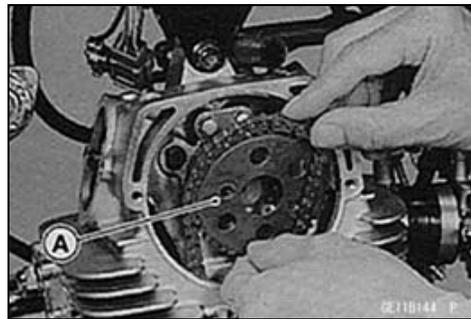
- Turn the camshaft center bolt [A] clockwise so that the mark [B] on the sprocket aligns with the timing mark [C] on the cylinder head. Be sure to position the piston TDC at the end of the compression stroke by turning the camshaft. (Align the mark when the inlet valve again comes up after it went down once.)



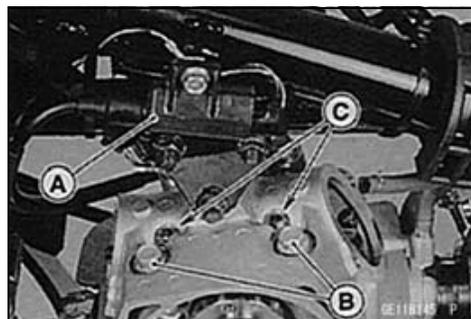
- Remove:
 - Camshaft Chain Tensioner (see this chapter)
 - Camshaft Sprocket [A]

NOTE

- Hold the camshaft chain with some tool so that the chain does not fall into the engine.

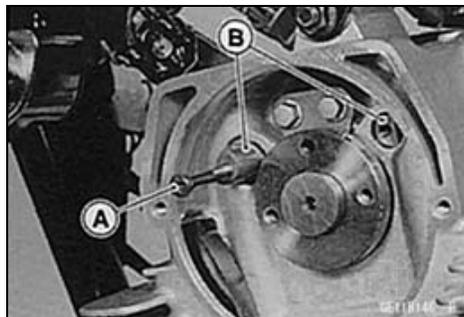


- Remove:
 - Ignition Coil [A]
 - Left Cylinder Head Bolts [B]
 - Rocker Shaft Bolts [C]
- Discard the rocker shaft bolt washers.

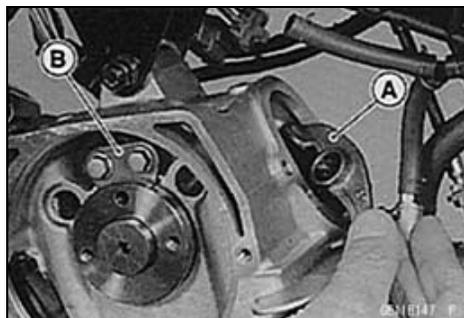


Camshaft

- Using a screw [A] (M5 × P0.8 mm), remove the rocker shafts [B].
- Mark the rocker shafts so that they can be installed later in the same position.



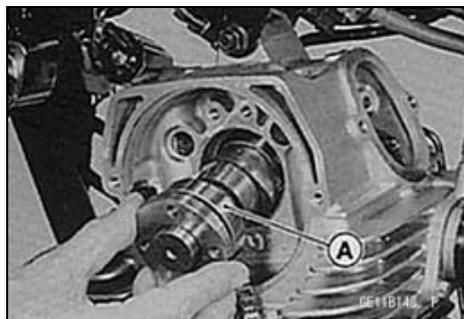
- Remove:
 - Rocker Arms [A]
 - Camshaft Bearing Holder [B]
- Mark the rocker arms so that they can be installed later in the same position.



- Pull out the camshaft [A].

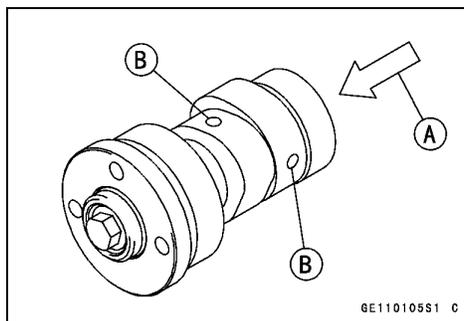
CAUTION

The crankshaft may be turned while the camshaft is removed. Always pull the chain taut while turning the crankshaft. This avoids kinking the chain on the lower (crankshaft) sprocket. A kinked chain could damage both the chain and the sprocket.

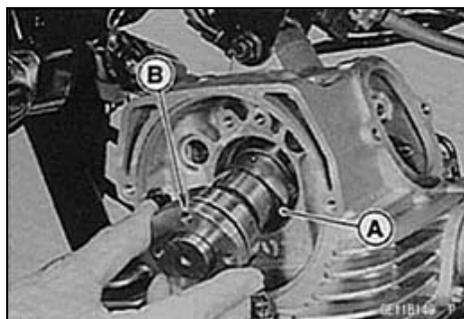


Camshaft Installation

- Blow through the oil passage [B] with compressed air [A].
- Apply engine oil to all cam parts, journal and bearing.
- If the camshaft is replaced with a new one, apply a thin coat of molybdenum disulfide grease to the new cam part surfaces and journal.



- Install the camshaft with the cam portion [A] down and the hole [B] up.



4-18 ENGINE TOP END

Camshaft

- Install the camshaft bearing holder [A].
- Apply engine oil to the rocker shaft surface and cam portion of the rocker arm, and then install them at the original position.
- Install the rocker shafts [B] so that the screw threads face outward.
- Replace the rocker shaft bolt washers with new ones.
- Install:
 - Cylinder Head Bolts (see Cylinder Head Installation)
 - Rocker Shaft Bolts
- Tighten:

Torque - Camshaft Bearing Holder Bolts

(BN125-A1 ~ A3): 9.8 N·m (1.0 kgf·m, 87 in·lb)

(BN125-A4 ~): 8.8 N·m (0.90 kgf·m, 78 in·lb)

Rocker Shaft Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)

- Engage the camshaft sprocket [A] with the chain [B]. Then, align the "T" mark [C] on the sprocket with the timing mark [D] on the cylinder head.

NOTE

- Pull the tension side (exhaust side) of the chain up to remove slack.

Torque - Camshaft Sprocket Bolts: 12 N·m (1.2 kgf·m, 104 in·lb)

- Install the camshaft chain tensioner (see Camshaft Chain Tensioner Installation).
- Check the valve clearance (see Periodic Maintenance chapter).
- Tighten:

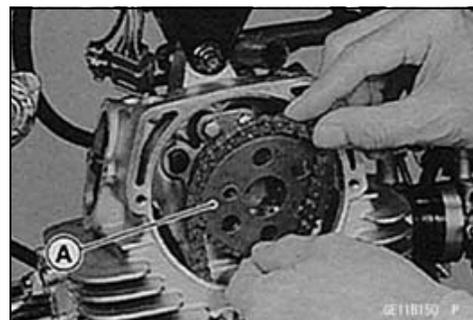
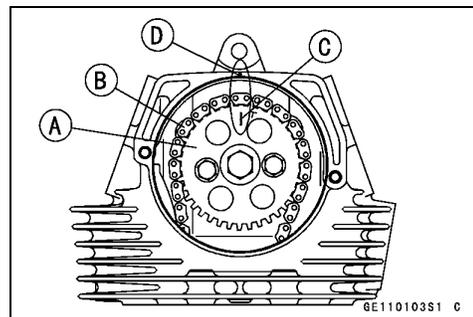
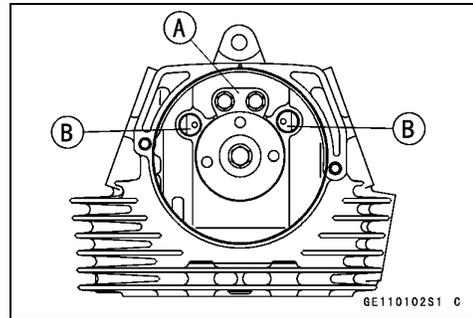
Torque - Camshaft Chain Cover Bolts

(BN125-A1 ~ A3): 9.8 N·m (1.0 kgf·m, 87 in·lb)

(BN125-A4 ~): 8.8 N·m (0.90 kgf·m, 78 in·lb)

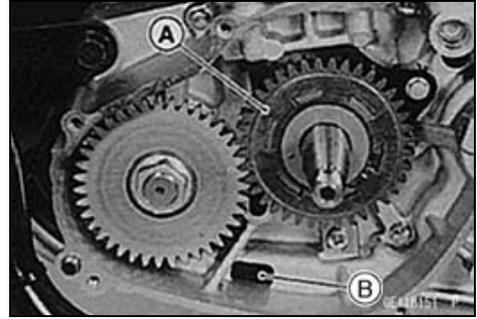
Camshaft Chain Removal

- Remove:
 - Camshaft Sprocket [A] (see Camshaft Removal, but do not remove the valve adjusting caps)
 - Alternator (see Electrical System chapter)

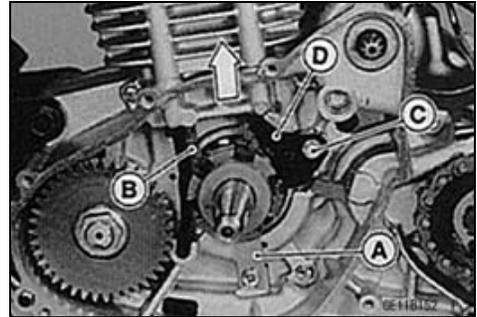


Camshaft

- Remove the crank balancer gear [A].
Special Tool - Outside Circlip Pliers: 57001-144
- Stuff a clean cloth into the hole [B] so that the balancer damper springs will not fall into it.

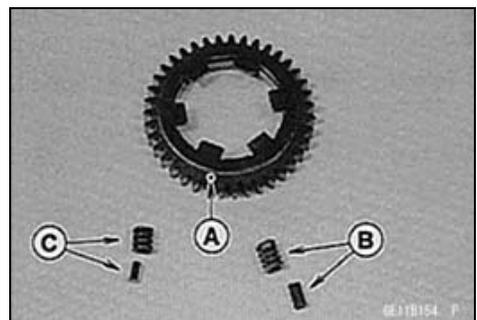
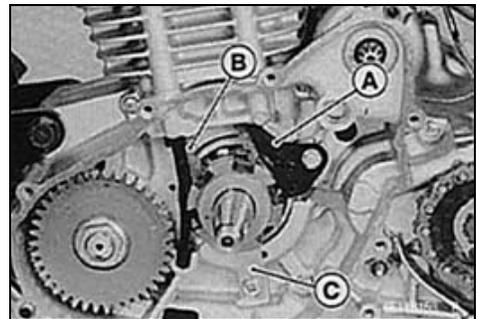


- Remove the camshaft chain holder [A], and pull the camshaft chain [B] upward.
- Remove the cylinder head (see Cylinder Head Removal).
- Remove the rear camshaft chain guide bolt [C], and pull the rear camshaft chain guide [D].



Camshaft Chain Installation

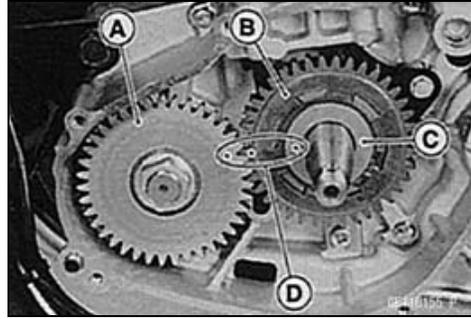
- Install:
Rear Camshaft Chain Guide [A]
Cylinder Head (see Cylinder Head Installation)
- Tighten:
Torque - Camshaft Chain Guide Bolt: 8.8 N·m (0.90 kgf·m, 78 in·lb)
- Engage the camshaft chain [B] with the crank sprocket, and install the camshaft chain holder [C].
- Tighten:
Torque - Camshaft Chain Holder screws: 4.9 N·m (0.50 kgf·m, 43 in·lb)
- Pull the camshaft chain and tie the upper end of the chain with a cord so that the chain is not kinking.
- Install the inner and outer springs [B] into the groove near the punch mark [A] on the crank balancer gear, and install the five springs and pins [C] into the other grooves.
- The inner and outer springs are a little longer than the five identical springs.



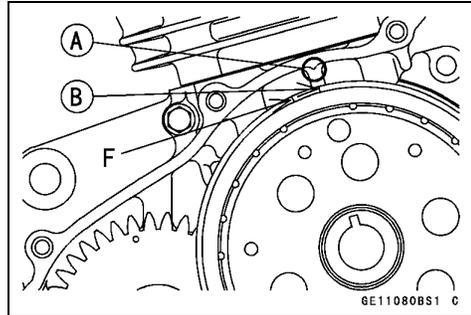
4-20 ENGINE TOP END

Camshaft

○Align the three punch marks [D] on the balancer shaft gear [A], crank balancer gear [B], and coupling [C].



- Install the alternator (see Electrical System chapter).
- Align the punch mark [A] on the crankcase with the "T" mark [B] on the rotor.



- Engage the camshaft sprocket [A] with the chain [B]. Then align the "T" mark [C] on the sprocket with the timing mark [D] on the cylinder head.

NOTE

○Pull the tension side (exhaust side) of the chain up to remove slack.

- Tighten:

Torque - Camshaft Sprocket Bolts: 12 N·m (1.2 kgf·m, 104 in·lb)

- Install:

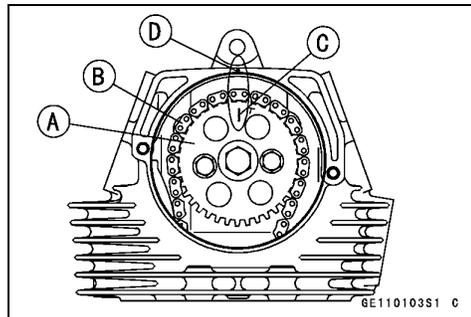
Camshaft Chain tensioner (see Camshaft Chain Tensioner Installation)
Alternator Rotor (see Electrical System chapter)
Alternator Cover (see Electrical System chapter)
Camshaft Chain Cover

- Tighten:

Torque - Camshaft Chain Cover Bolts

(BN125-A1 ~ A3): 9.8 N·m (1.0 kgf·m, 87 in·lb)

(BN125-A4 ~): 8.8 N·m (0.90 kgf·m, 78 in·lb)



Cylinder Head

Cylinder Compression Measurement

NOTE

○ Use the battery which is fully charged

- Warm up the engine thoroughly.
- Stop the engine.
- Remove:
 - Fuel Tank (see Fuel System chapter)
 - Spark Plug

Owner's Tool - Spark Plug Wrench, Hex 16: 92110-1172 [A]

- Attach the compression gauge [A] and adapter [B] firmly into the spark plug hole.

**Special Tools - Compression Gauge, 20 kgf/cm²: 57001-221
Compression Gauge Adapter, M10 × 1.0: 57001-1317**

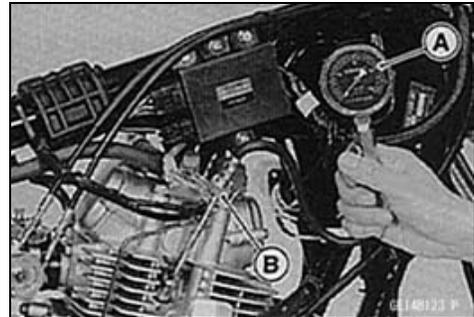
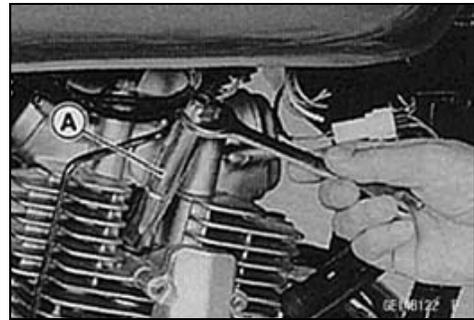
- Using the starter motor, turn the engine over with the throttle fully open until the compression gauge stops rising; the compression is the highest reading obtainable.

Cylinder Compression

Usable Range: 960 ~ 1 470 kPa (9.8 ~ 15.0 kgf/cm², 139 ~ 213 psi) @500 r/min (rpm)

- Install the spark plug and tighten it.

Torque - Spark Plug: 13 N·m (1.3 kgf·m, 113 in·lb)



The following table should be consulted if the obtainable compression reading is not within the usable range.

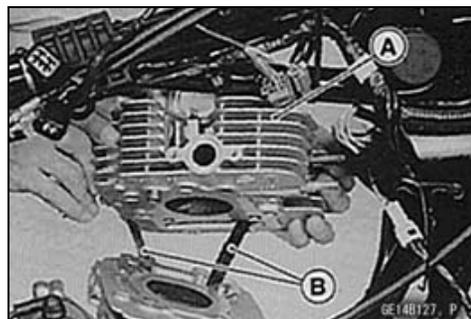
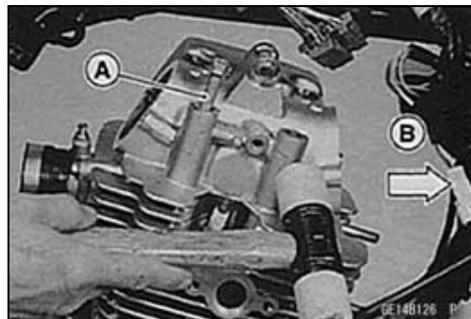
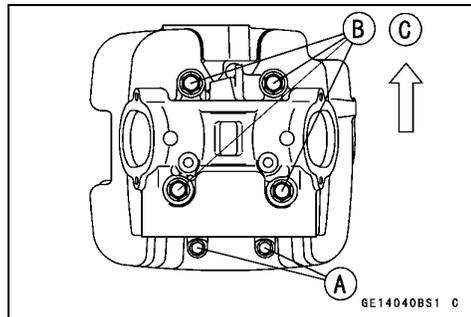
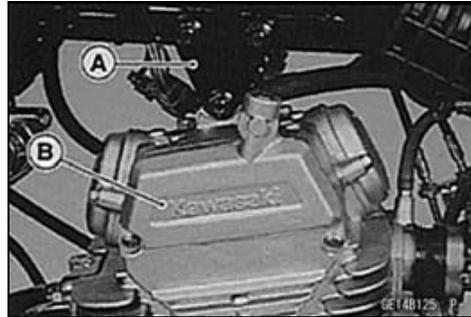
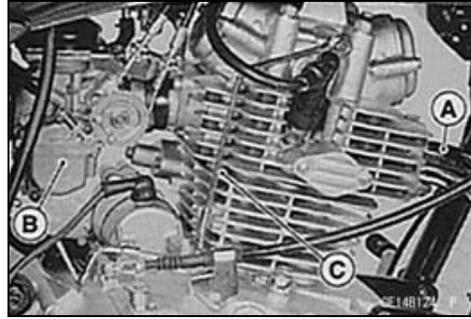
Problem	Diagnosis	Remedy (Action)
Cylinder compression is higher than usable range	Carbon accumulation on piston and in combustion chamber possibly due to damaged valve stem oil seal and/or damaged piston oil rings (This may be indicated by white exhaust smoke).	Remove the carbon deposits and replace damaged parts if necessary.
	Incorrect cylinder head gasket thickness.	Replace the gasket with a standard part.
Cylinder compression is lower than usable range	Gas leakage around cylinder head	Replace damaged gasket and check cylinder head warp.
	Bad condition of valve seating	Repair if necessary.
	Incorrect valve clearance.	Adjust the valve clearance.
	Incorrect piston/cylinder clearance	Replace the piston and/or cylinder
	Piston seizure.	Inspect the cylinder (and liner) and replace/repair the cylinder and/or piston as necessary.
	Bad condition of piston ring and/or piston ring grooves	Replace the piston and/or the piston rings.

4-22 ENGINE TOP END

Cylinder Head

Cylinder Head Removal

- Remove:
 - Fuel Tank (see Fuel System chapter)
 - Exhaust Pipe [A] (see Muffler Removal)
 - Carburetor [B] (see Fuel System chapter)
 - Oil Pipe [C] (see Engine Lubrication chapter)
 - Spark Plug Cap
 - Ignition Coil
 - CDI Unit (see Electrical System chapter)
 - Remove:
 - Engine Upper Bracket [A]
 - Camshaft Chain Cover [B]
 - Remove the camshaft sprocket from the camshaft chain (see Camshaft Removal).
 - Remove:
 - 6 mm Cylinder Head Bolts [A]
 - 9 mm Cylinder Head Bolts [B]
 - Front [C]
 - Remove the 9 mm cylinder head bolt [A] at the rear right along with the cylinder head.
 - Front [B]
- NOTE**
- If necessary tap lightly with a plastic hammer as shown. Never tap on the fins.
- Clear the chain guides [B], and remove the cylinder head [A].



Cylinder Head

Cylinder Head Installation

- Install:
 - Dowel Pins [A]
 - New Cylinder Head Gasket [B]

- Apply molybdenum disulfide grease to the threads of the 9 mm cylinder head bolts [1 ~ 4], and engine oil to both sides of the washers.
- Tighten the 9 mm bolts following the tightening sequence as shown. Tighten them first to the torque of 12 N·m (1.2 kgf·m, 104 in·lb), and then tighten them to the specified torque.

Torque - 9 mm Cylinder Head Bolts: 26 N·m (2.7 kgf·m, 19 ft·lb)
- Tighten the 6 mm bolts [5 ~ 6].

Torque - 6 mm Cylinder Head Bolts: 12 N·m (1.2 kgf·m, 104 in·lb)
- Install:
 - Camshaft Sprocket (see Camshaft Installation)
 - Camshaft Chain Tensioner (see Camshaft Chain Tensioner Installation)
 - Valve Adjusting Caps
- Apply grease to the O-ring, and install the camshaft chain cover.
- Tighten:

Torque - Camshaft Chain Cover Bolts

(BN125-A1 ~ A3): 9.8 N·m (1.0 kgf·m, 87 in·lb)

(BN125-A4 ~): 8.8 N·m (0.90 kgf·m, 78 in·lb)

Oil Pipe Banjo Bolts [A]

(M10): 25 N·m (2.5 kgf·m, 18 ft·lb)

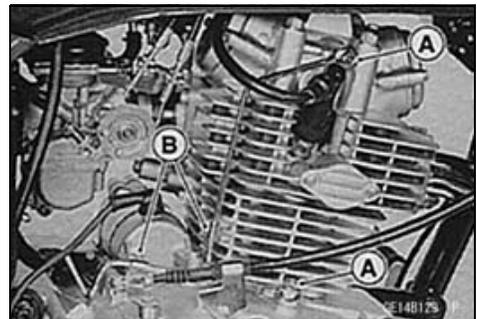
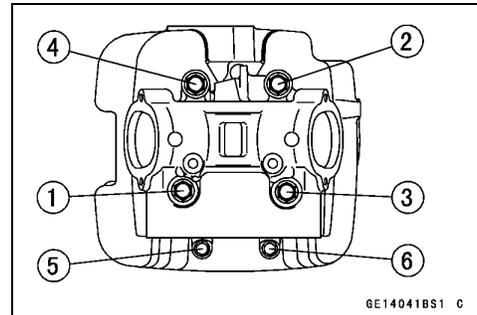
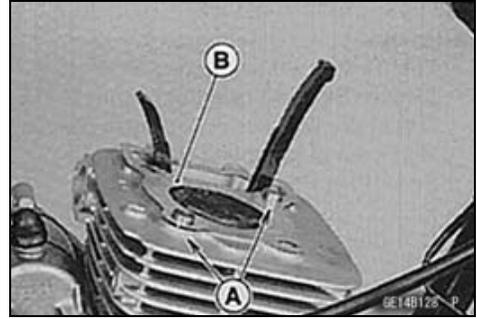
(M8): 9.8 N·m (1.0 kgf·m, 87 in·lb)

Oil Pipe Mounting Bolts [B]

(BN125-A1 ~ A3): 9.8 N·m (1.0 kgf·m, 87 in·lb)

(BN125-A4 ~): 8.8 N·m (0.90 kgf·m, 78 in·lb)

Cylinder Head Mounting Bolts: 25 N·m (2.5 kgf·m, 18 in·lb)
- Install:
 - Carburetor (see Fuel System chapter)
 - Exhaust pipe (see Muffler Removal)
 - Fuel Tank (see Fuel System chapter)

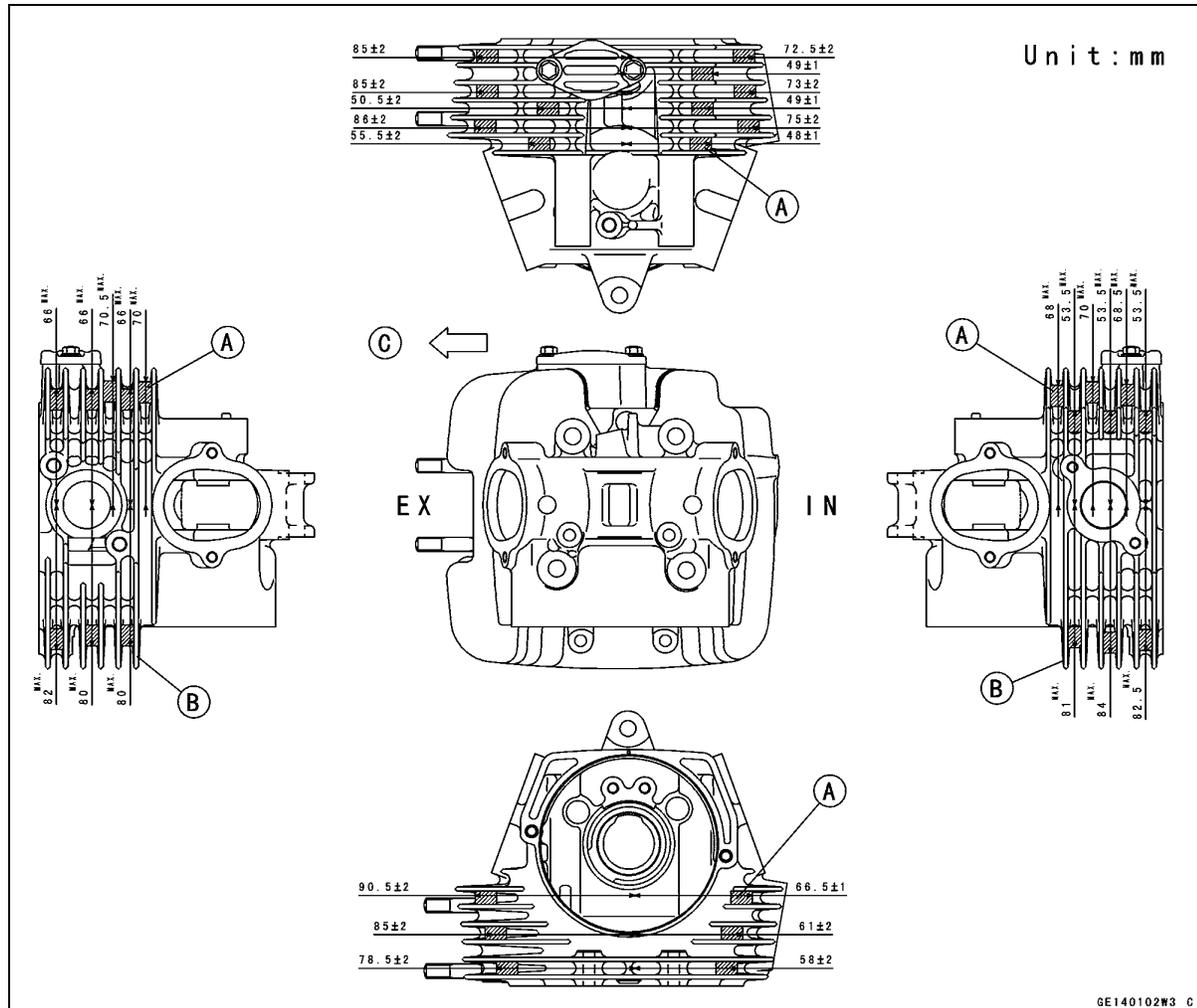


4-24 ENGINE TOP END

Cylinder Head

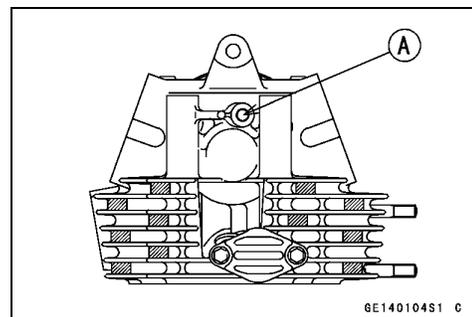
Cylinder Head Assembly

- Install the rubber dampers as shown.
 - Dampers [A]
 - Fins [B]
 - Front [C]



Cylinder Head Cleaning

- Remove the cylinder head (see Cylinder Head Removal).
- Remove the valves (see Valve Removal).
- Wash the head with a high-flash point solvent.
- Scrape the carbon out of the combustion chamber and exhaust port with a suitable tool.
- Clean the cylinder head in a bath of high-flash point solvent.
- Using compressed air, blow out [A] any particles which may obstruct the oil passage in the cylinder head.
- Install the valves (see Valve Installation).



Cylinder Head

Cylinder Head Warp

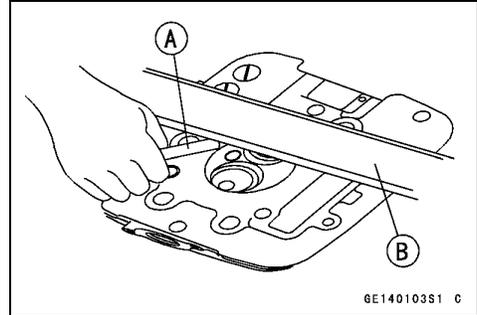
- Clean the cylinder head (see Cylinder Head Cleaning).
- Lay a straightedge across the lower surface of the cylinder head at the positions as shown.
- Use a thickness gauge [A] to measure the space between the straightedge [B] and the cylinder head.

Cylinder Head Warp

Standard: ---

Service Limit: 0.05 mm (0.002 in.)

- ★ If the cylinder head is warped more than the service limit, replace it.
- ★ If the cylinder head is warped less than the service limit, repair the head by rubbing the lower surface on emery paper secured to a surface plate (first No. 200, then No. 400).



4-26 ENGINE TOP END

Valves

Valve Clearance Inspection

- Refer to the Valve Clearance Inspection in the Periodic Maintenance chapter.

Valve Clearance Adjustment

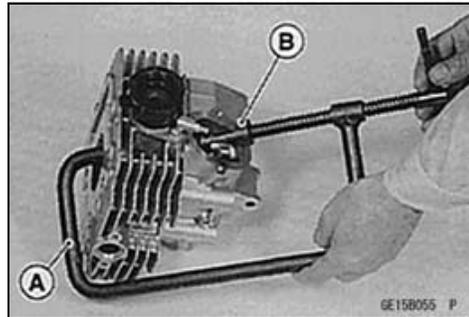
- Refer to the Valve Clearance Adjustment in the Periodic Maintenance chapter.

Valve Removal

- Remove the cylinder head (see Cylinder Head Removal).
- Remove the rocker shafts and rocker arms (see Camshaft Removal).
- Mark and record the rocker shafts, rocker arms, and valves locations so that they can be installed in their original positions to keep the valve clearance unchanged.
- Using the valve spring compressor assembly, remove the valves.

Special Tools - Valve Spring Compressor Assembly: 57001-241 [A]

Valve Spring Compressor Adapter, $\phi 22$: 57001-1202 [B]

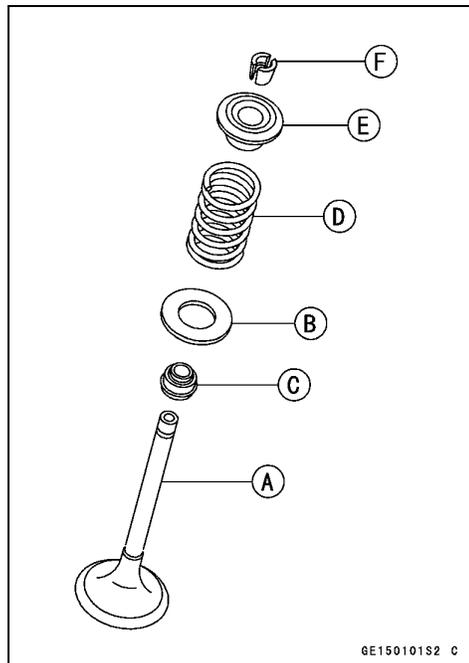


Valve Installation

- Replace the oil seal [C] with a new one.
- Apply a thin coat of molybdenum disulfide grease to the valve stem [A] before valve installation.
- Check the following:
 - Valve moves smoothly up and down in the guide.
 - Valve seats properly in the valve seat.
- Install the spring [D] so that the closed coil end faces the spring seat [B] (downwards).
- Put the spring retainer [E] on the springs, and fit the split keepers [F] between the retainer and the stem while compressing the valve spring.

Special Tools - Valve Spring Compressor Assembly: 57001-241

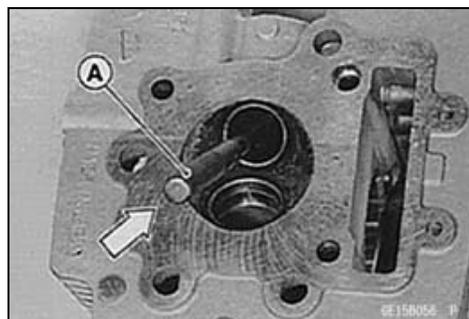
Valve Spring Compressor Adapter, $\phi 22$: 57001-1202



Valve Guide Removal

- Remove:
 - Valve (see Valve Removal)
 - Oil Seal
 - Spring Seat
- Heat the area around the valve guide to 120 ~ 150°C (248 ~ 302°F), and hammer lightly on the valve guide arbor [A] to remove the guide from the top of the head.

Special Tool - Valve Guide Arbor, $\phi 4.5$: 57001-1331



CAUTION

Do not heat the cylinder head with a torch. This will warp the cylinder head. Soak the cylinder head and heat the oil.

Valves

Valve Guide Installation

- Apply oil to the valve guide outer surface before installation.
- Heat the area around the valve guide hole to about 120 ~ 150°C (248 ~ 302°F).

CAUTION

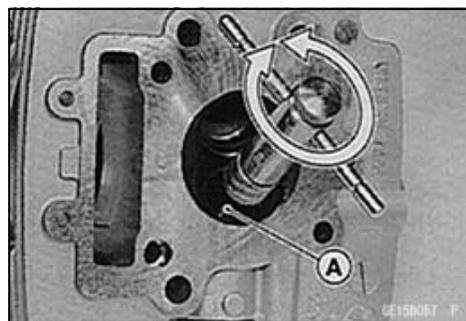
Do not heat the cylinder head with a torch. This will warp the cylinder head. Soak the cylinder head and heat the oil.

- Drive the valve guide in from the top of the head using the valve guide arbor until the circlip stops the guide from going in too far.

Special Tool - Valve Guide Arbor, ϕ 4.5: 57001-1331

- Ream the valve guide with valve guide reamer [A] even if the old guide is reused.

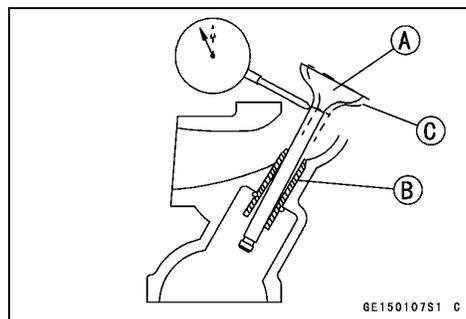
Special Tool - Valve Guide Reamer, ϕ 4.5: 57001-1333



Valve-to-Guide Clearance Measurement (Wobble Method)

If a small bore gauge is not available, inspect the valve guide wear by measuring the valve to valve guide clearance with the wobble method as indicated below.

- Insert a new valve [A] into the guide [B] and set a dial gauge against the stem perpendicular to it as close as possible to the cylinder head mating surface.
 - Move the stem back and forth [C] to measure valve/valve guide clearance.
 - Repeat the measurement in a direction at a right angle to the first.
- ★ If the reading exceeds the service limit, replace the guide.



NOTE

- The reading is not actual valve/valve guide clearance because the measuring point is above the guide.

Valve/Valve Guide Clearance (Wobble Method)

Standard:

Exhaust	0.14 ~ 0.19 mm (0.006 ~ 0.007 in.)
Inlet	0.03 ~ 0.13 mm (0.001 ~ 0.005 in.)

Service Limit:

Exhaust	0.38 mm (0.015 in.)
Inlet	0.33 mm (0.013 in.)

4-28 ENGINE TOP END

Valves

Valve Seat Inspection

- Remove the valve (see Valve Removal).
- Check the valve seating surface [A] between the valve [B] and valve seat [C].
- Measure the outside diameter [D] of the seating pattern on the valve seat.
- ★ If the outside diameter is too large or too small, repair the seat (see Valve Seat Repair).

Valve Seating Surface Outside Diameter

Standard:

Exhaust	25.5 ~ 25.7 mm (1.00 ~ 1.01 in.)
Inlet	29.5 ~ 29.7 mm (1.16 ~ 1.17 in.)

- Measure the seat width [E] of the portion where there is no build-up carbon (white portion) of the valve seat with a vernier caliper.

Good [F]
Too Wide [G]
Too Narrow [H]
Uneven [J]

- ★ If the width is too wide, too narrow or uneven, repair the seat (see Valve Seat Repair).

Valve Seating Surface Width

Standard:

Exhaust, Inlet: 0.8 ~ 1.2 mm (0.03 ~ 0.05 in.)

Valve Seat Repair

- Repair the valve seat with the valve seat cutters [A].
Special Tools - Valve Seat Cutter Holder, ϕ 4.5: 57001-1330 [B]
Valve Seat Cutter Holder Bar: 57001-1128 [C]

[For Exhaust Valve Seat]

Valve Seat Cutter, 45°- ϕ 27.5: 57001-1114 or ϕ 30: 57001-1187

Valve Seat Cutter, 32°- ϕ 30: 57001-1120

Valve Seat Cutter, 60°- ϕ 30: 57001-1123

- Valve Seat Cutter, 45°- ϕ 30: 57001-1187 can also be used instead of Valve Seat Cutter, 45°- ϕ 27.5: 57001-1114

[For Inlet Valve Seat]

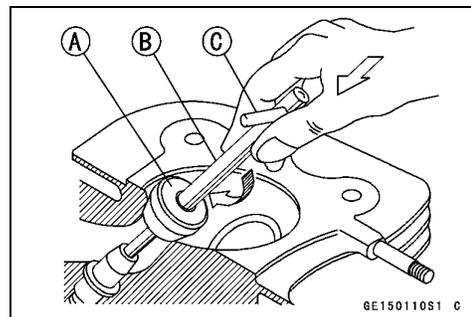
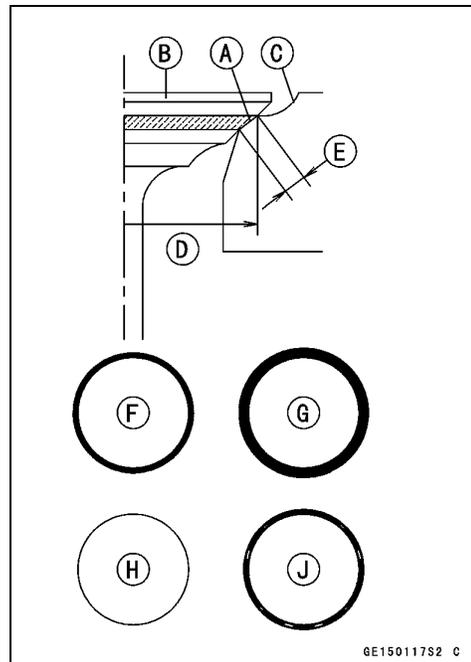
Valve Seat Cutter, 45°- ϕ 32: 57001-1115

Valve Seat Cutter, 32°- ϕ 35: 57001-1121 or ϕ 33: 57001-1199

Valve Seat Cutter, 60°- ϕ 33: 57001-1334

- Valve Seat Cutter, 32°- ϕ 33: 57001-1199 can also be used instead of Valve Seat Cutter, 32°- ϕ 35: 57001-1121

- ★ If the manufacturer's instructions are not available, use the following procedure.



Valves

Seat Cutter Operation Care

1. This valve seat cutter is developed to grind the valve for repair. Therefore the cutter must not be used for other purposes than seat repair.
2. Do not drop or shock the valve seat cutter, or the diamond particles may fall off.
3. Do not fail to apply engine oil to the valve seat cutter before grinding the seat surface. Also wash off ground particles sticking to the cutter with washing oil.

NOTE

○Do not use a wire brush to remove the metal particles from the cutter. It will take off the diamond particles.

4. Setting the valve seat cutter holder in position, operate the cutter in one hand. Do not apply too much force to the diamond portion.

NOTE

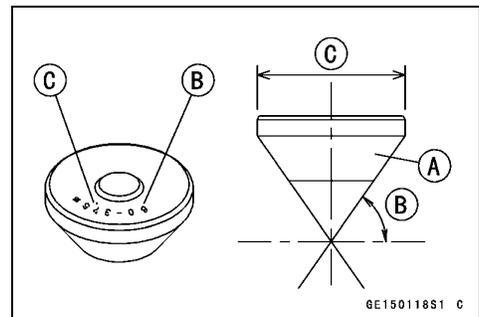
○Prior to grinding, apply engine oil to the cutter and during the operation, wash off any ground particles sticking to the cutter with washing oil.

5. After use, wash it with washing oil and apply thin layer of engine oil before storing.

Marks Stamped on the Cutter

The marks stamped on the back of the cutter [A] represent the following.

- 60° Cutter angle [B]
 $\phi 37.5$ Outer diameter of cutter [C]



Operating Procedures

- Clean the seat area carefully.
- Coat the seat with machinist's dye.
- Fit a 45° cutter into the holder and slide it into the valve guide.
- Press down lightly on the handle and turn it right or left. Grind the seating surface only until it is smooth.

CAUTION

Do not grind the seat too much. Overgrinding will reduce valve clearance by sinking the valve into the head. If the valve sinks too far into the head, it will be impossible to adjust the clearance, and the cylinder head must be replaced.

4-30 ENGINE TOP END

Valves

- Measure the outside diameter of the seating surface with a vernier caliper.

★ If the outside diameter of the seating surface is too small, repeat the 45° grind until the diameter is within the specified range.

Widened Width [A] of engagement by machining with 45° cutter

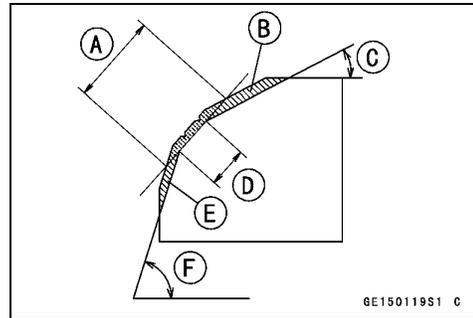
Ground Volume [B] by 32° cutter

32° [C]

Correct Width [D]

Ground Volume [E] by 60° cutter

60° [F]



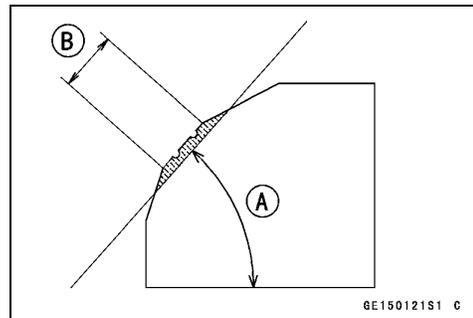
- Measure the outside diameter of the seating surface with a vernier caliper.

★ If the outside diameter of the seating surface is too small, repeat the 45° grind [A] until the diameter is within the specified range.

Original Seating Surface [B]

NOTE

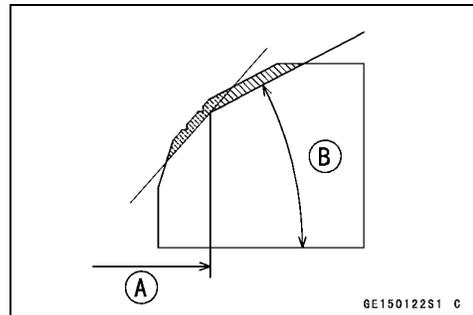
- Remove all pitting or flaws from 45° ground surface.
- After grinding with 45° cutter, apply thin coat of machinist's dye to seating surface. This makes seating surface distinct and 32° and 60° grinding operation easier.
- When the valve guide is replaced, be sure to grind with 45° cutter for centering and good contact.



★ If the outside diameter [A] of the seating surface is too large, make the 32° grind described below.

★ If the outside diameter of the seating surface is within the specified range, measure the seat width as described below.

- Grind the seat at a 32° angle [B] until the seat outside diameter is within the specified range.



○ To make the 32° grind, fit a 32° cutter into the holder, and slide it into the valve guide.

○ Turn the holder one turn at a time while pressing down very lightly. Check the seat after each turn.

CAUTION

The 32° cutter removes material very quickly. Check the seat outside diameter frequently to prevent overgrinding.

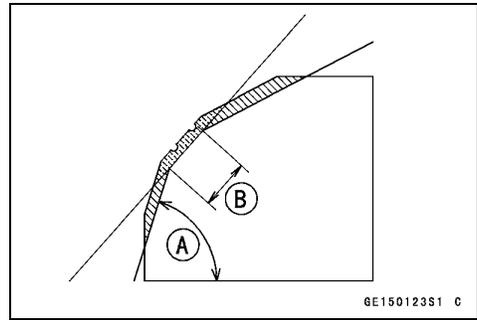
○ After making the 32° grind, return to the seat outside diameter measurement step above.

● To measure the seat width, use a vernier caliper to measure the width of the 45° angle portion of the seat at several places around the seat.

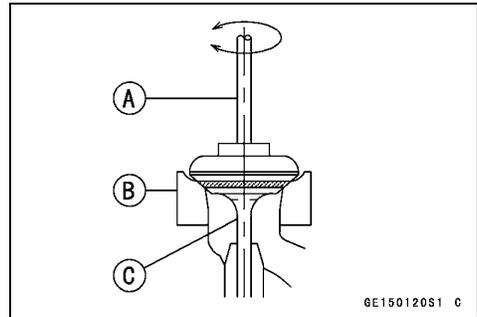
★ If the seat width is too narrow, repeat the 45° grind until the seat is slightly too wide, and then return to the seat outside diameter measurement step above.

Valves

- ★ If the seat width is too wide, make the 60° grind [A] described below.
 - ★ If the seat width is within the specified range, lap the valve to the seat as described below.
 - Grind the seat at a 60° angle until the seat width is within the specified range.
 - To make the 60° grind, fit 60° cutter into the holder, and slide it into the valve guide.
 - Turn the holder, while pressing down lightly.
 - After making the 60° grind, return to the seat width measurement step above.
- Correct Width [B]



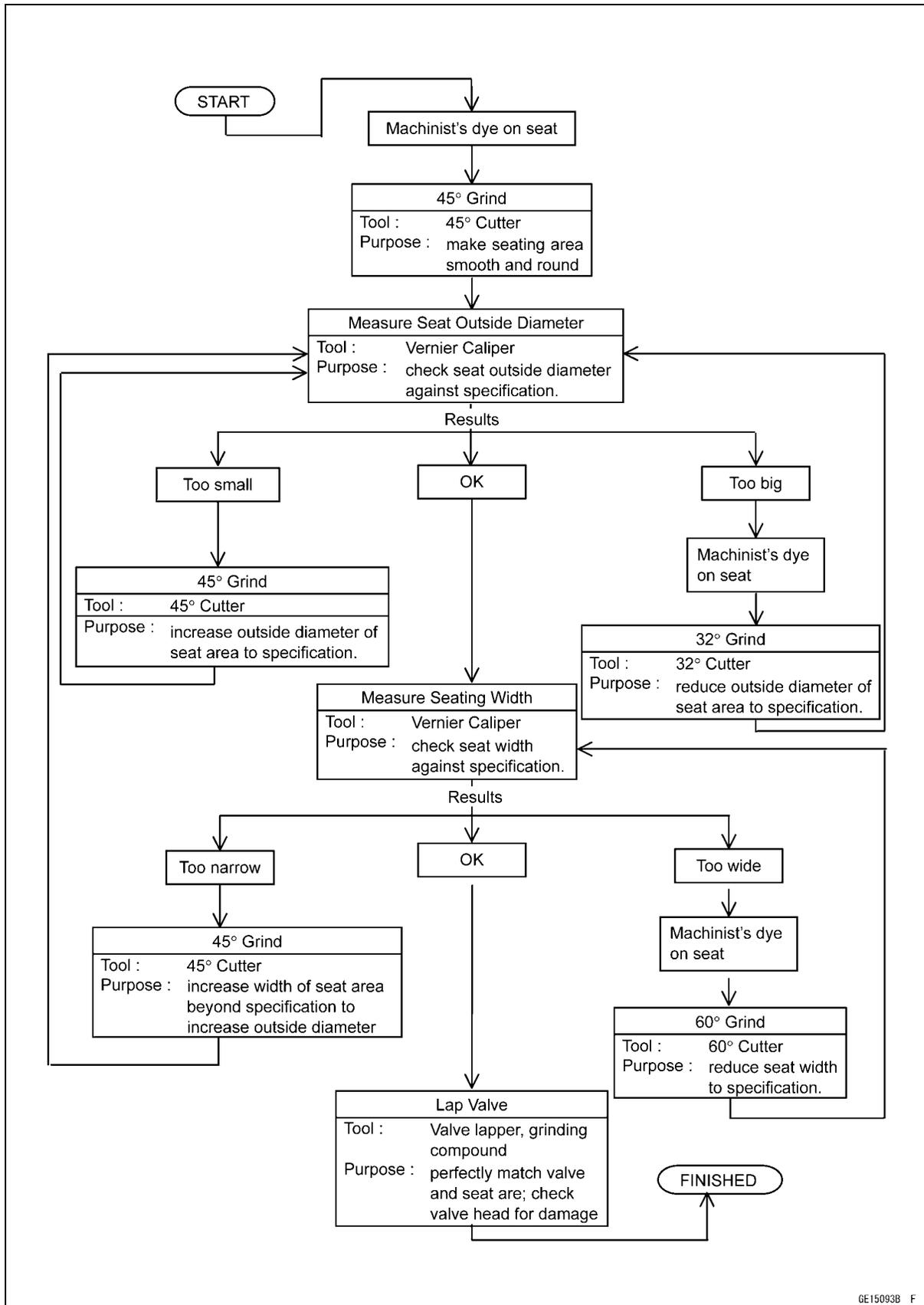
- Lap the valve to the seat, once the seat width and O.D. are within the ranges specified above.
 - Put a little coarse grinding compound on the face of the valve in a number of places around the valve head.
 - Spin the valve against the seat until the grinding compound produces a smooth, matched surface on both the seat and the valve.
 - Repeat the process with a fine grinding compound.
- Lapper [A]
Valve Seat [B]
Valve [C]



- The seating area should be marked about in the middle of the valve face.
- ★ If the seat area is not in the right place on the valve, check to be sure the valve is the correct part. If it is, it may have been refused too much; replace it.
- Be sure to remove all grinding compound before assembly.
- When the engine is assembled, be sure to adjust the valve clearance (see Valve Clearance Adjustment).

4-32 ENGINE TOP END

Valves

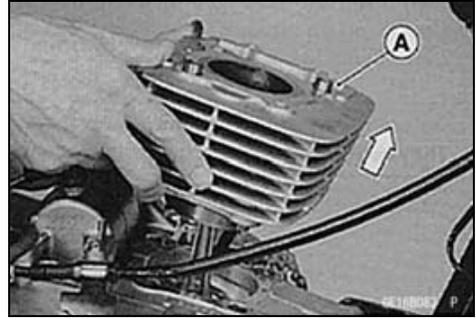


GE15093B F

Cylinder, Piston

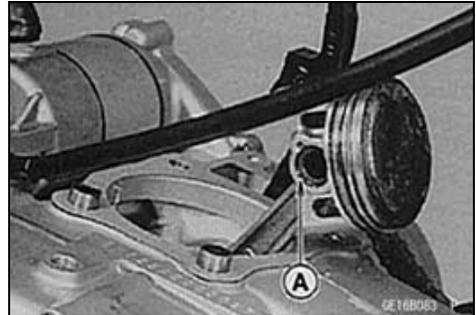
Cylinder Removal

- Remove:
 - Cylinder Head (see Cylinder Head Removal)
- Tap lightly up the cylinder [A] with a plastic mallet to separate from the crankcase.
- Remove the cylinder base gasket.



Piston Removal

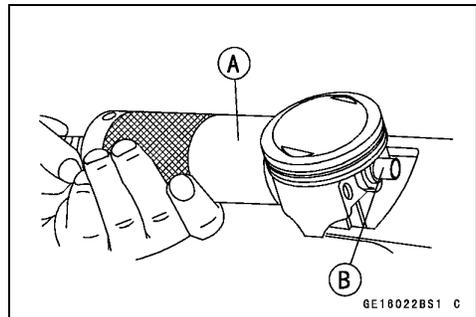
- Remove the cylinder (see Cylinder Removal).
- Place a clean cloth under the piston and remove the piston pin snap ring [A] from the outside of the piston.



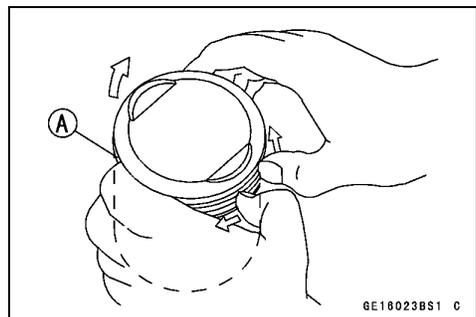
CAUTION

Do not reuse snap rings, as removal weakens and deforms them. They could fall out and score the cylinder wall.

- Remove the piston pin.
 - **Special Tools - Piston Pin Puller Assembly: 57001-910 [A] Adapter [B]**
- Remove the piston.



- Carefully spread the ring opening with your thumbs and then push up on the opposite side [A] of the ring to remove it.
- Remove the 3-piece oil ring with your thumbs in the same manner.

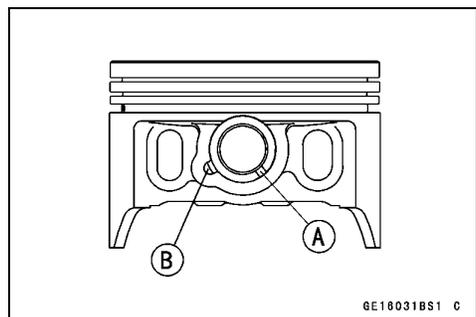


Cylinder, Piston Installation

NOTE

○ If a new piston or cylinder is used, check piston to cylinder clearance (see Piston/Cylinder Clearance), and use new piston ring.

- Apply engine oil to the inner surface of the connecting rod small end.
- The triangular mark on the piston head must point toward the front of the engine.
- Fit a new piston pin snap ring into the side of the piston so that the ring opening [A] does not coincide with the slit [B] of the piston pin hole.



4-34 ENGINE TOP END

Cylinder, Piston

○When installing the piston pin snap ring, compress it only enough to install it and no more.

CAUTION

Do not reuse snap rings, as removal weakens and deforms them. They could fall out and score the cylinder wall.

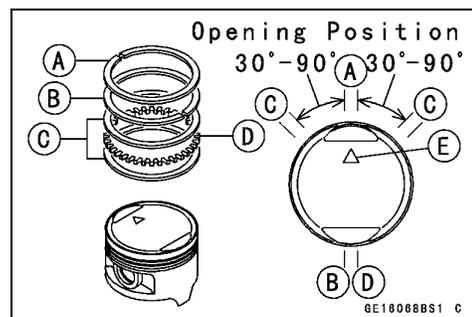
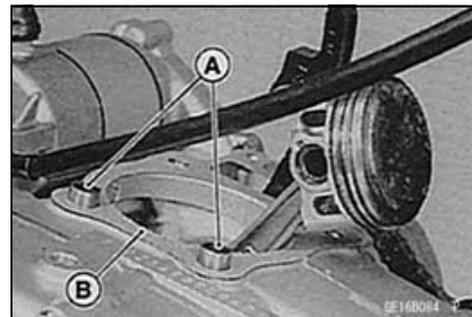
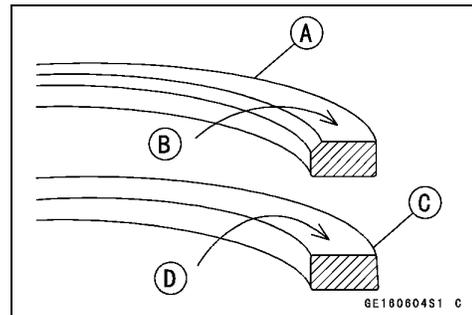
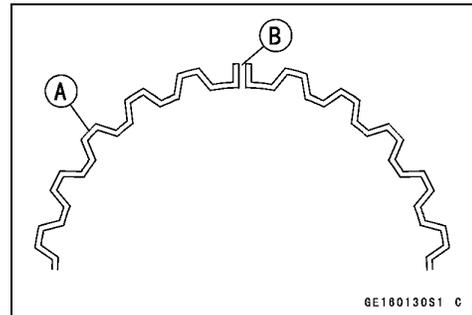
NOTE

○The oil ring rails have no "top" or "bottom".

- Install the oil ring expander [A] in the bottom piston ring groove so the ends [B] butt together.
- Install the oil ring steel rails, one above the expander and one below it.
- Spread the rail with your thumbs, but only enough to fit the rail over the piston.
- Release the rail into the bottom piston ring groove.
- Do not mix up the top ring and second ring.
- Install the second ring [C] so that the "RN" mark [D] faces up.
- Install the top ring [A] so that the "R" mark [B] faces up.

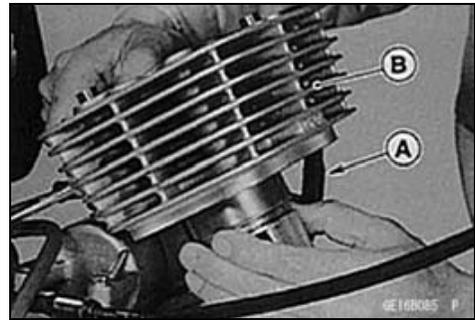
- Install:
 - Dowel Pins [A]
 - New Cylinder Base Gasket [B]

- The piston ring openings must be positioned as shown in the figure. The openings of the oil ring steel rails must be about 30 ~ 40° of angle from the opening of the top ring.
 - Top Ring [A]
 - Second Ring [B]
 - Oil Ring Steel Rails [C]
 - Oil Ring Expander [D]
 - Triangular Mark [E]



Cylinder, Piston

- Apply engine oil to the cylinder bore.
- Position the piston ring openings.
- Install the cylinder [B] while compressing [A] the piston rings with your thumbs.
- Install the removed parts.



Cylinder Wear

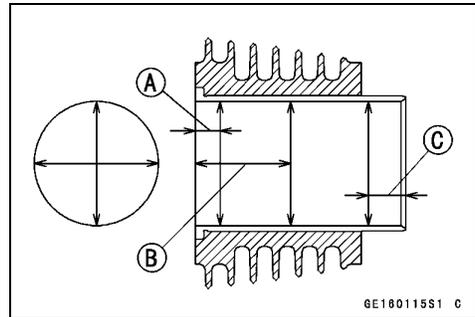
- Since there is a difference in cylinder wear in different directions, take a side-to-side and a front-to-back measurement at each of the three locations (total of six measurements) shown in the figure.

10 mm (0.39 in.) [A]

40 mm (1.57 in.) [B]

20 mm (0.79 in.) [C]

- ★ If any of the cylinder inside diameter measurements exceeds the service limit, replace the cylinder.



Cylinder Inside Diameter

Standard: 55.000 ~ 55.012 mm (2.1654 ~ 2.1658 in.), and less than 0.01 mm (0.0004 in.) difference between any two measurements.

Service Limit: 55.10 mm (2.169 in.), or 0.05 mm (0.002 in.) difference between any two measurements.

Piston Wear

- Measure the outside diameter [A] of each piston 5 mm (0.20 in.) [B] up from the bottom of the piston at a right angle to the direction of the piston pin.

- ★ If the measurement is under service limit, replace the piston.

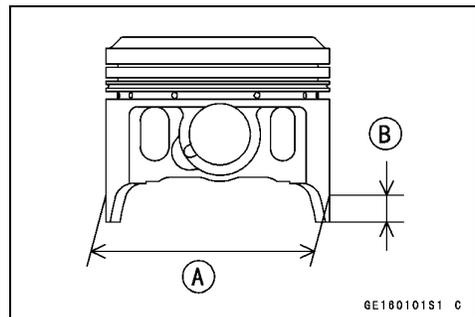
Piston Diameter

Standard: 54.960 ~ 54.975 mm (2.1638 ~ 2.1644 in.)
54.968 ~ 54.982 mm (2.1641 ~ 2.1646 in.)
(BN125-A7 ~, N, NU)

N: No Catalytic Converter Model

NU: No Catalytic Converter (United Kingdom Model)

Service Limit: 54.81 mm (2.158 in.)



4-36 ENGINE TOP END

Cylinder, Piston

Piston/Cylinder Clearance

- Subtract the piston diameter from the cylinder inside diameter to get the piston/cylinder clearance.

Piston/Cylinder Clearance

Standard: 0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in.)

- ★ If the piston/cylinder clearance is less than the specified range, use a smaller piston or increase the cylinder inside diameter by honing.
- ★ If the piston/cylinder clearance is greater than specified range, use a larger piston.
- ★ If only a piston is replaced, the clearance may exceed the standard slightly. But it must not be less than the minimum in order to avoid piston seizure.

Piston Ring, Piston Ring Groove Wear

- Check for uneven groove wear by inspecting the ring seating.
- ★ The rings should fit perfectly parallel to groove surfaces. If not, replace the piston and all the piston rings.
- With the piston rings in their grooves, make several measurements with a thickness gauge [A] to determine piston ring/groove clearance.

Piston Ring/Groove Clearance

Standard:

Top 0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in.)

Second 0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in.)

Service Limit:

Top 0.17 mm (0.0067 in.)

Second 0.16 mm (0.0063 in.)

- ★ If the piston ring groove clearance is greater than the service limit, measure the ring thickness and groove width as follows to decide whether to replace the rings, the piston or both.

Piston Ring Groove Width

- Measure the piston ring groove width.
- Use a vernier caliper at several points around the piston.

Piston Ring Groove Width

Standard:

Top 0.82 ~ 0.84 mm (0.0323 ~ 0.0331 in.)

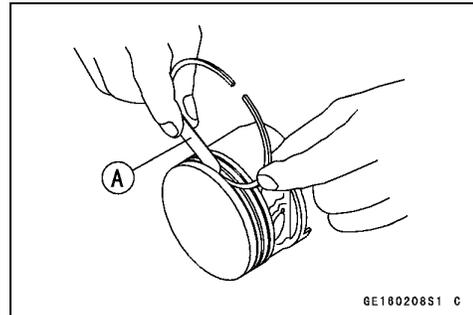
Second 0.81 ~ 0.83 mm (0.0319 ~ 0.0327 in.)

Service Limit:

Top 0.92 mm (0.0362 in.)

Second 0.91 mm (0.0358 in.)

- ★ If the width of any of the two grooves is wider than the service limit at any point, replace the piston.



Cylinder, Piston

Piston Ring Thickness

- Measure the piston ring thickness.
- Use a micrometer to measure at several points around the ring.

Piston Ring Thickness (Top, Second)

Standard: 0.77 ~ 0.79 mm (0.0303 ~ 0.0311 in.)

Service Limit: 0.70 mm (0.028 in.)

- ★ If any of the measurements is less than the service limit on either of the rings, replace all the rings.

NOTE

- When using new rings in a used piston, check for uneven groove wear. The rings should fit perfectly parallel to the groove sides. If not, replace the piston.

Piston Ring End Gap

- Place the piston ring [A] inside the cylinder, using the piston to locate the ring squarely in place. Set it close to the bottom of the cylinder, where cylinder wear is low.
- Measure the gap [B] between the ends of the ring with a thickness gauge.

Piston Ring End Gap

Standard:

Top 0.15 ~ 0.30 mm (0.006 ~ 0.012 in.)

Second 0.30 ~ 0.45 mm (0.012 ~ 0.018 in.)

Oil 0.20 ~ 0.70 mm (0.008 ~ 0.028 in.)

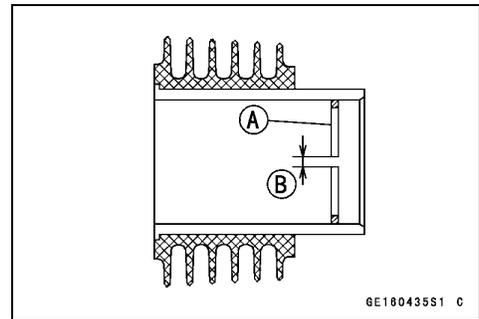
Service Limit:

Top 0.6 mm (0.024 in.)

Second 0.7 mm (0.028 in.)

Oil 1.0 mm (0.04 in.)

- ★ If the end gap of either ring is greater than the service limit, replace all the rings.

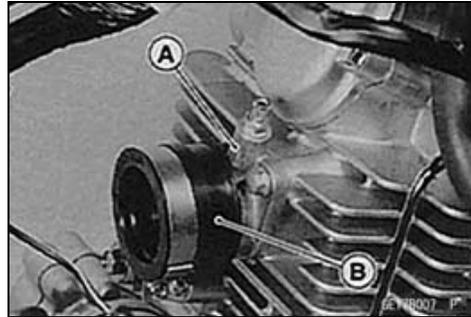
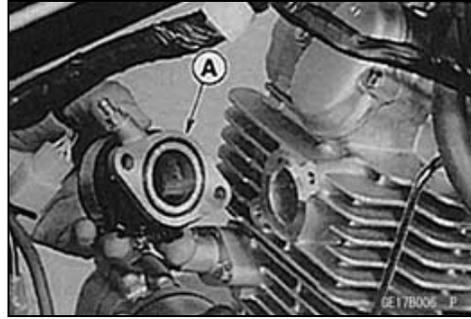


4-38 ENGINE TOP END

Carburetor Holder

Carburetor Holder Installation

- Apply grease to the O-ring [A], and install the carburetor holder.
 - Take care not to pinch the O-ring.
 - Tighten:
Torque - Carburetor Holder Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)
-
- Install the insulator [B] so that its recess aligns with the boss [A] on the carburetor holder.



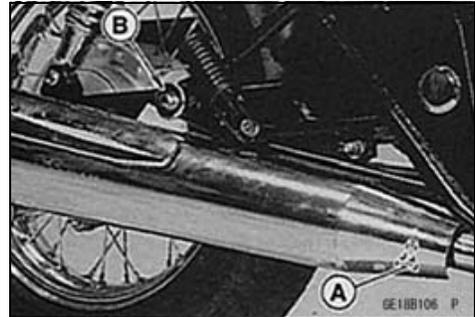
Muffler

⚠ WARNING

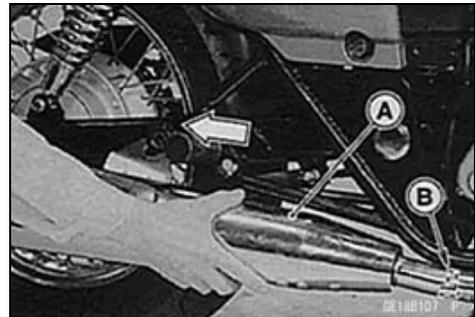
To avoid a serious burn, do not remove the muffler when the engine is still hot. Wait until the muffler cools down.

Muffler Removal

- loosen the muffler body clamp bolt [A].
- Remove the muffler body mounting bolt and nut [B].



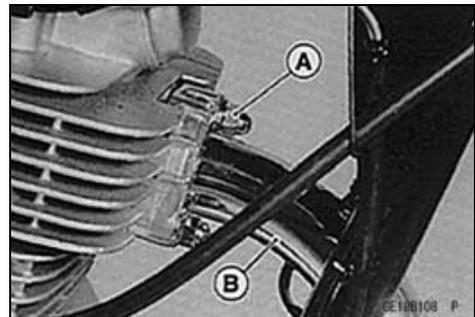
- Remove the muffler body [A] backward.
- Remove the exhaust pipe mounting bolt [B].



- Remove:
 - Exhaust Pipe Holder Nuts [A]
 - Exhaust Pipe [B]

NOTE

○When removing the muffler body and exhaust pipe assembly, do not loosen the muffler body clamp bolt.

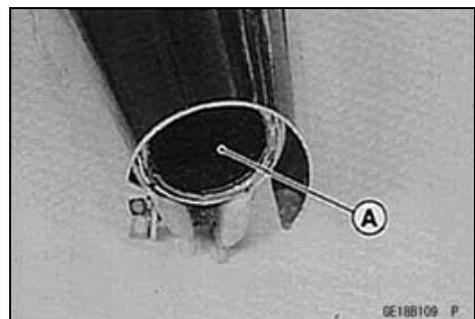


Muffler Installation

- Check the exhaust pipe holder gasket for signs of damage.
- ★ If necessary, replace the gasket with a new one.
- Check the gasket [A] of the clamp for signs of damage and that it fits in place securely.
- ★ If necessary, replace the gasket with a new one.
- Tighten:

Torque - Muffler Body Mounting Nut: 15 N·m (1.5 kgf·m, 11 ft·lb)

- First tighten all the bolts and nuts to a snug fit.
- Next tighten the exhaust pipe holder nuts evenly to avoid exhaust leaks.
- Lastly, tighten the rest of the bolts and clamp bolt securely.
- Thoroughly warm up the engine, wait until the engine cools down, and then retighten the exhaust pipe holder nuts, and the clamp bolt securely.



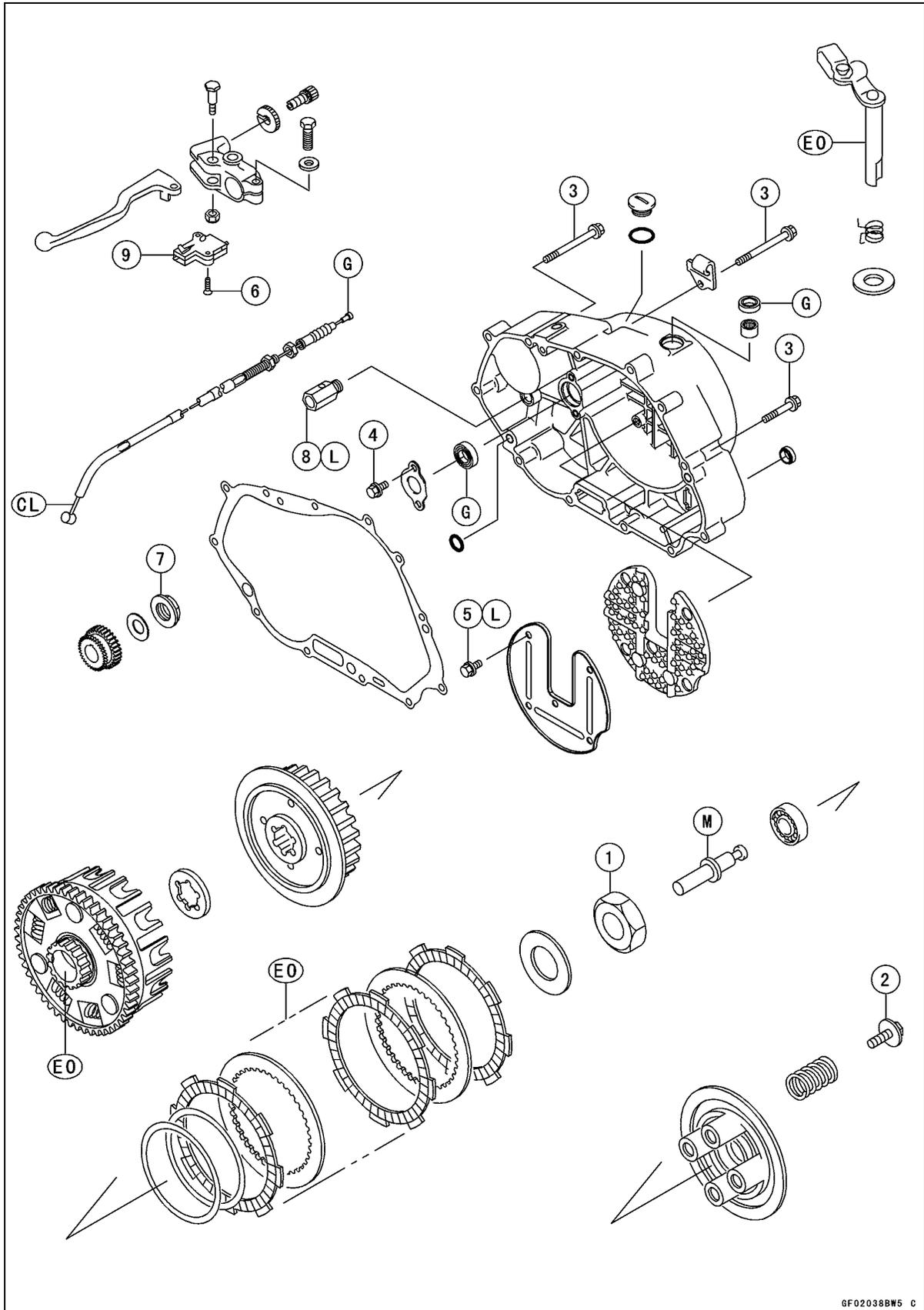
Clutch

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5-2 CLUTCH

Exploded View



GF02038BW5 C

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Clutch Hub Nut	98	10.0	72	
2	Clutch Spring Bolt	8.8	0.90	78 in·lb	
3	Clutch Cover Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
	Clutch Cover Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
4	Oil Seal Retaining Plate Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
	Oil Seal Retaining Plate Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
5	Clutch Cover Damper Bolt	8.8	0.90	78 in·lb	L
6	Starter Lockout Switch Screws	1.0	0.10	9 in·lb	
7	Primary Gear Nut	69	7.0	11	
8	Oil Pressure Relief Valve	15	1.5	11	L

9. Starter lockout switch

CL: Apply cable lubricant.

EO: Apply engine oil.

G: Apply grease.

L: Apply a non-permanent locking agent.

M: Apply molybdenum disulfide grease.

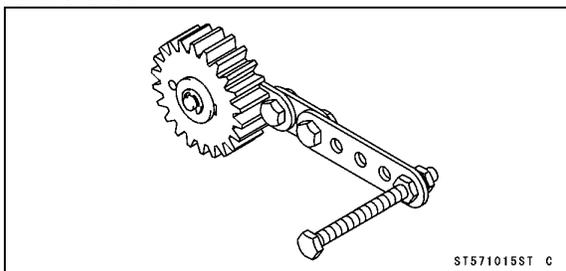
5-4 CLUTCH

Specifications

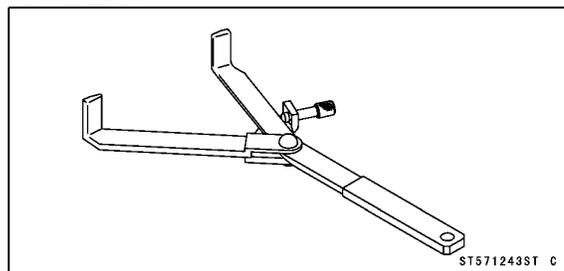
Item	Standard	Service Limit
Clutch Lever Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	— — —
Clutch		
Friction Plate Thickness	2.92 ~ 3.08 mm (0.115 ~ 0.121 in.)	2.8 mm (0.11 in.)
Friction and Steel Plate Warp	0.2 mm (0.008 in.) or less	0.3 mm (0.012 in.)
Clutch Spring Free Length	35.0 mm (1.38 in.)	34.0 mm (1.34 in.)

Special Tools

**Gear Holder, m1.75:
57001-1015**



**Clutch Holder:
57001-1243**



5-6 CLUTCH

Clutch Lever and Cable

Due to friction plate wear and clutch cable stretch over a long period of use, the clutch must be adjusted in accordance with the Periodic Maintenance Chart.

Clutch Lever Free Play Inspection

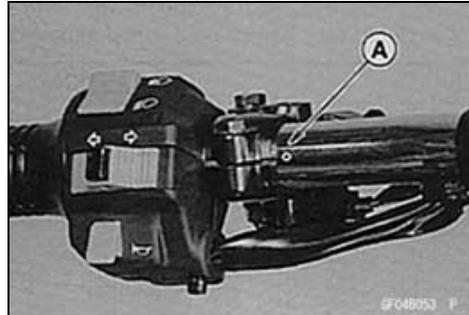
- Refer to the Clutch Lever Free Play Inspection in the Periodic Maintenance chapter.

Clutch Lever Free Play Adjustment

- Refer to the Clutch Lever Free Play Adjustment in the Periodic Maintenance chapter.

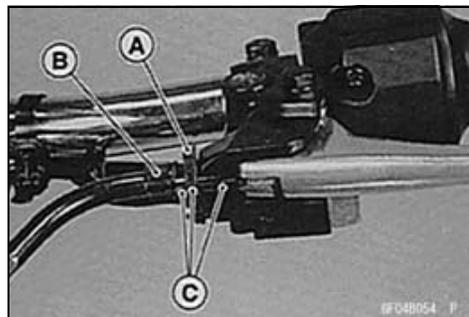
Clutch Lever Installation

- Install the clutch lever so that the mating surface of the lever holder is aligned with the punch mark [A] on the handlebar.



Clutch Cable Removal

- Loosen the locknut [A] at the clutch lever, and screw in the adjuster [B].
- Line up the slots [C] in the clutch lever, locknut, and adjuster and then free the cable from the lever.
- Free the clutch inner cable tip from the clutch release lever.
- Push the release lever toward the front of the motorcycle and tape the release lever to the clutch cover to prevent the release shaft from falling out.
- Pull the clutch cable out of the frame.



Clutch Cable Installation

- Run the clutch cable correctly (see Appendix chapter).
- Adjust the clutch lever free play (see Periodic Maintenance chapter).

Clutch Cable Lubrication

- Refer to the General Lubrication in the Periodic Maintenance chapter.

Clutch Cover

Clutch Cover Removal

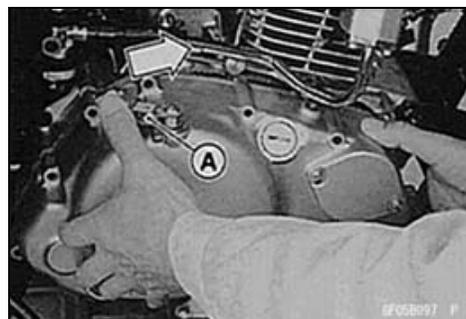
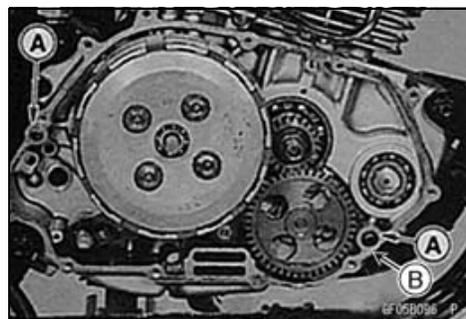
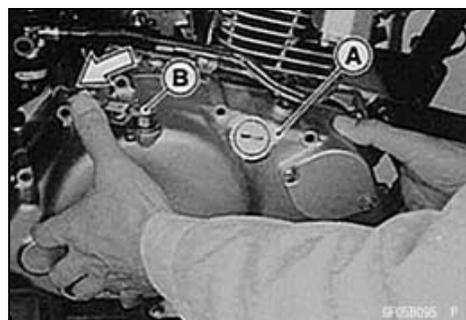
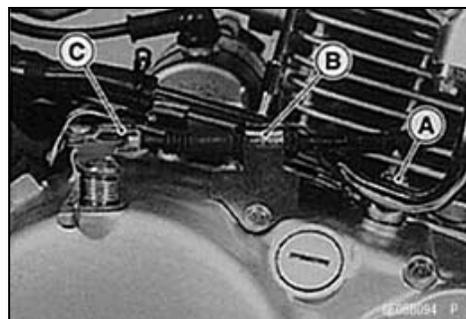
- Drain the engine oil (see Periodic Maintenance chapter).
- Remove:
 - Front Footpeg
 - Oil Pipe Banjo Bolt [A]
- Screw the clutch lever adjuster in completely so as to give the clutch cable plenty of play.
- Remove the clutch cable holder [B] of clutch release lever.
- Free the clutch inner cable tip from the clutch release lever [C].
- Remove the clutch cover bolts, and remove the clutch cover [A].
- Turn the release lever toward the rear to free the release shaft [B] from the clutch spring plate pusher and remove the clutch cover.

CAUTION

Do not remove the clutch release lever and shaft assembly unless it is absolutely necessary. If removed, the oil seal replacement may be required. Apply high temperature grease to the oil seal lips.

Clutch Cover Installation

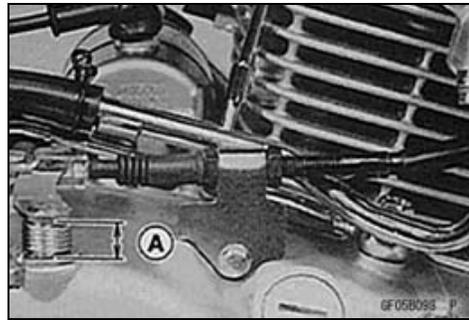
- Install the dowel pins [A] and replace the cover gasket with a new one.
- Install the O-ring [B].
- Install the clutch cover with the clutch release lever toward the rear.
- Engage the clutch release shaft with the clutch spring plate pusher by turning the clutch release lever [A] toward the front.



5-8 CLUTCH

Clutch Cover

- With the shaft pulled a little out of the cover, turn the lever until it becomes hard to turn.
- The release lever should have about 11 mm (0.43 in.) [A] clearance between the lever and the washer.



- Tighten the cover bolts and clutch cable holder bolts.
- While pushing [B] the clutch cable holder [A] rearward until the holder touches the clutch cover, tighten the clutch cable holder bolt.

Torque - Clutch Cover Bolts

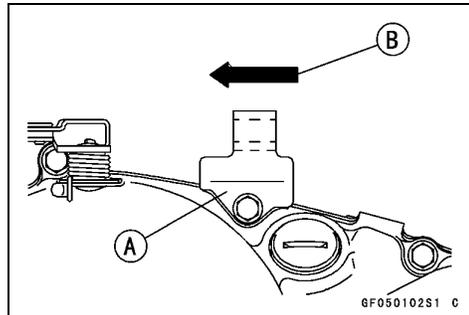
(BN125-A1 ~ A3): 9.8 N·m (1.0 kgf·m, 87 in·lb)

(BN125-A4 ~): 8.8 N·m (0.90 kgf·m, 78 in·lb)

- Replace the banjo bolt washers with new ones.
- Tighten the oil pipe banjo bolt.

Torque - Oil Pipe Banjo Bolt: 25 N·m (2.5 kgf·m, 18 in·lb)

- Pour in the specified type and amount of oil (see Periodic Maintenance chapter).
- Install the front footpeg.
- Adjust and inspect the following.
 - Clutch Lever Free Play
 - Rear Brake
 - Rear Brake Light Switch



▲ WARNING

**If a full brake pedal is not obtained, disassemble and inspect the rear brake parts.
Worn parts cause lock of the brake or loss of braking.**

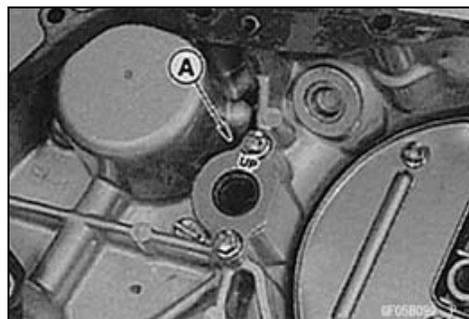
Clutch Cover Assembly

- Install the oil seal retainer with the “UP” mark facing [A] upward.
- ★ If the oil seal is damaged, replace it with a new one.
- Tighten:

Torque - Oil Seal Retaining Plate Bolts

(BN125-A1 ~ A3): 9.8 N·m (1.0 kgf·m, 87 in·lb)

(BN125-A4 ~): 8.8 N·m (0.90 kgf·m, 78 in·lb)



Clutch

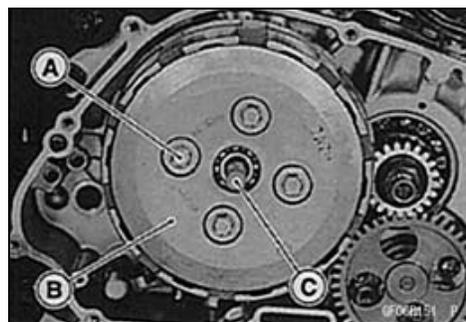
Clutch Removal

- Remove the clutch cover (see Clutch Cover Removal).

NOTE

If the primary gear is to be removed, remove the primary gear nut before clutch removal (see Primary Gear Removal).

- Remove:
 - Clutch Spring Bolts [A] with Springs
 - Clutch Spring Plate [B]
 - Ball Bearing and Pusher [C]
 - Friction Plates and Steel Plates



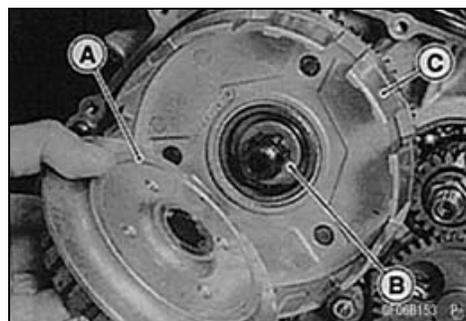
- Using the clutch holder [A], hold the hub to remove the clutch hub nut [B].

Special Tool - Clutch Holder: 57001-1243

- Remove the spring washer.

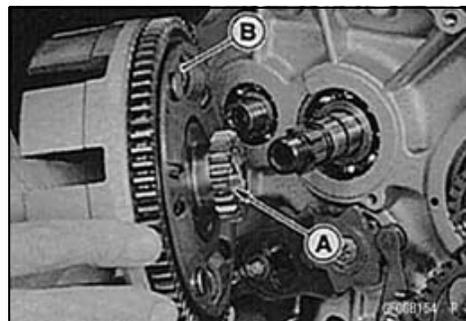


- Remove:
 - Clutch Hub [A]
 - Spacer [B]
 - Clutch Housing [C]



Clutch Installation

- Apply molybdenum disulfide grease to the clutch housing bearing hole [A].
- Install:
 - Clutch Housing [B]
 - Spacer
 - Clutch Hub



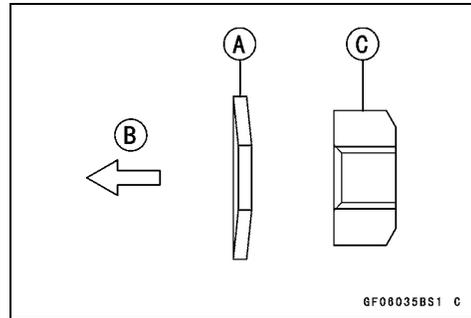
5-10 CLUTCH

Clutch

- Install the washer [A] as shown.
Crankcase Side [B]
- Tighten the clutch hub nut [C], while holding the clutch hub with the clutch holder.

Special Tool - Clutch Holder: 57001-1243

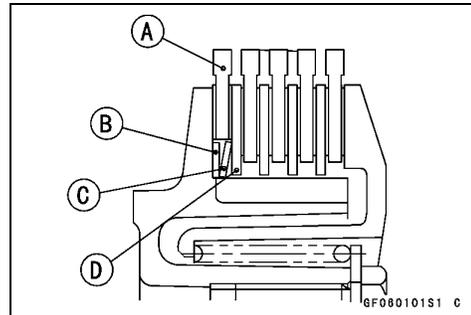
Torque - Clutch Hub Nut: 98 N·m (10.0 kgf·m, 72 ft·lb)



- Install the spring seat [B], and then the spring [C] with the concave side facing to the clutch cover.
- When installing the friction plates and steel plates, first install the friction plate [A] whose inside diameter is larger than the others and then install a steel plate [D] and alternating them.

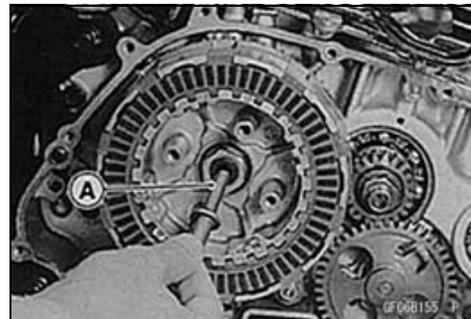
CAUTION

If new dry friction plates and steel plates are installed, apply engine oil to the surfaces of each plate to avoid clutch plate seizure.



- Apply molybdenum disulfide grease to the pusher ends [A] and install the thrust bearing.
- Tighten the clutch spring bolts.

Torque - Clutch Spring Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)



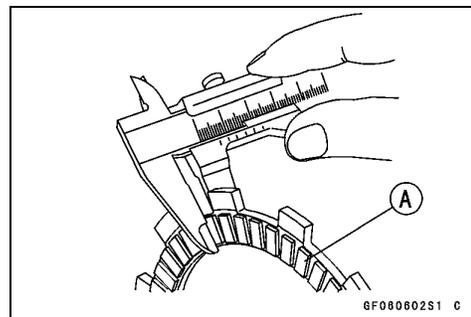
Friction and Steel Plate Damage, Wear

- Visually inspect the friction and steel plates for signs of seizure, overheating (discoloration), or uneven wear.
- Measure the thickness of the friction plates [A] at several points.
- ★ If any plates show signs of damage, or if they have worn past the service limit, replace them with new ones.

Friction Plate Thickness

Standard: 2.92 ~ 3.08 mm (0.115 ~ 0.121 in.)

Service Limit: 2.8 mm (0.11 in.)



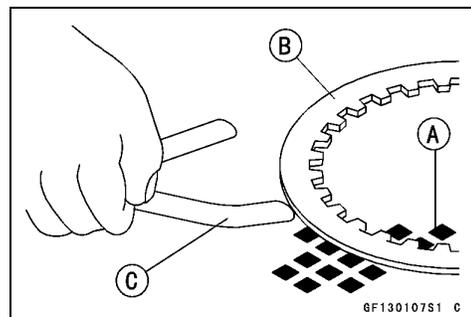
Friction and Steel Plate Warp

- Place friction plate or steel plate [B] on a surface plate [A], and measure the gap between the surface plate [A] with a thickness gauge [C]. The gap is the amount of friction or steel plate warp.
- ★ If any plate is warped over the service limit, replace it with a new one.

Friction and Steel Plate Warp

Standard: 0.2 mm (0.008 in.) or less

Service Limit: 0.3 mm (0.012 in.)



Clutch

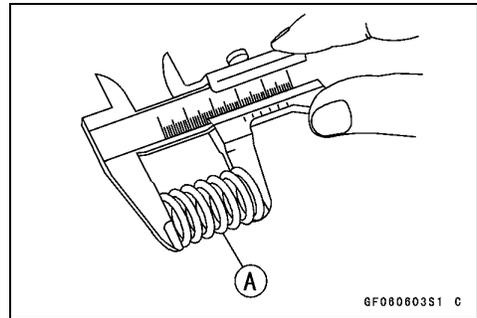
Clutch Spring Free Length Measurement

- Measure the free length of the clutch springs [A].
- ★ If any spring is shorter than the service limit, it must be replaced.

Clutch Spring Free Length

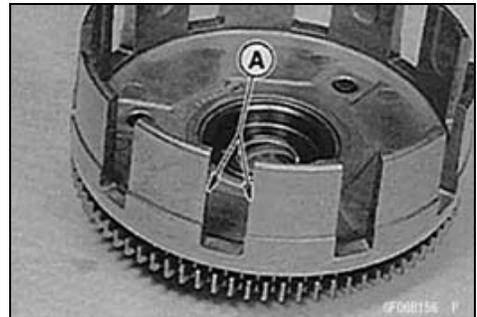
Standard: 35.0 mm (1.38 in.)

Service Limit: 34.0 mm (1.34 in.)



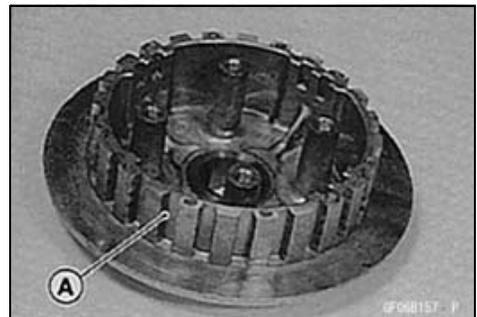
Clutch Housing Finger Damage

- Visually inspect the clutch housing fingers [A] where the friction plate tangs hit them.
- ★ If they are badly worn or if there are groove cuts where the tangs hit, replace the housing. Also, replace the friction plates if their tangs are damaged.



Clutch Hub Spline Damage

- Visually inspect where the teeth on the steel plates wear against the clutch hub splines.
- ★ If there are notches worn into the clutch hub splines [A], replace the clutch hub. Also, replace the steel plates if their teeth are damaged.



5-12 CLUTCH

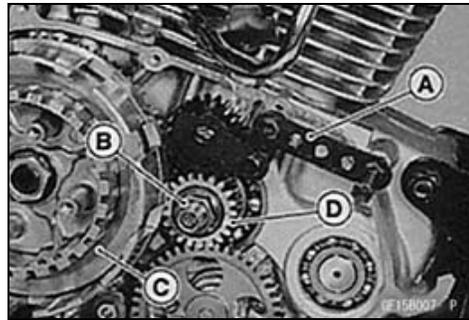
Primary Gear

Primary Gear Removal

- Remove the clutch cover (see Clutch Cover Removal).
- Using the gear holder [A], hold the primary gear and loosen the primary gear nut [B].

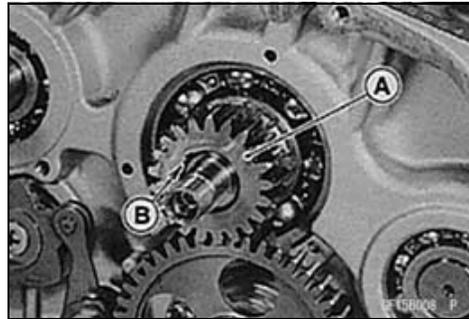
Special Tool - Gear Holder, m1.75: 57001-1015

- Remove:
 - Clutch (see Clutch Removal) [C]
 - Primary Gear Nut [B]
 - Spring Washer
 - Primary Gear [D]
 - Woodruff Key

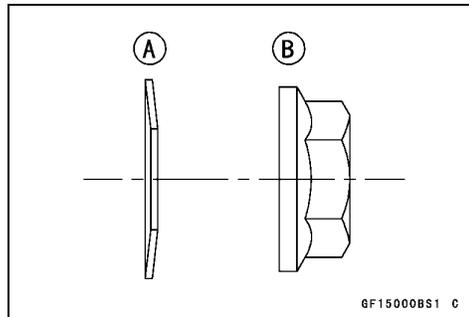


Primary Gear Installation

- Fit the woodruff key [B] securely in the slot before installing the primary gear [A].



- Install the spring washer [A] with the concave side facing to the crankcase.
- Install the clutch.
- Temporarily tighten the primary gear nut [B].

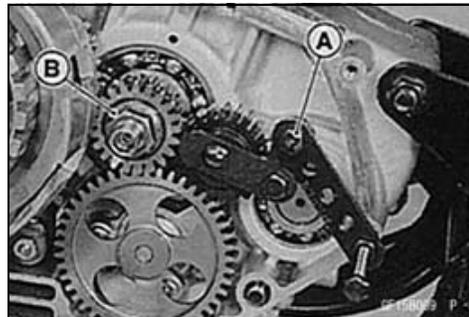


- Using the gear holder [A], hold the primary gear as shown.
- Tighten the primary gear nut [B].

Torque - Primary Gear Nut: 69 N·m (7.0 kgf·m, 51 ft·lb)

Special Tool - Gear Holder, m1.75: 57001-1015

- Install the clutch cover (see Clutch Cover Installation).



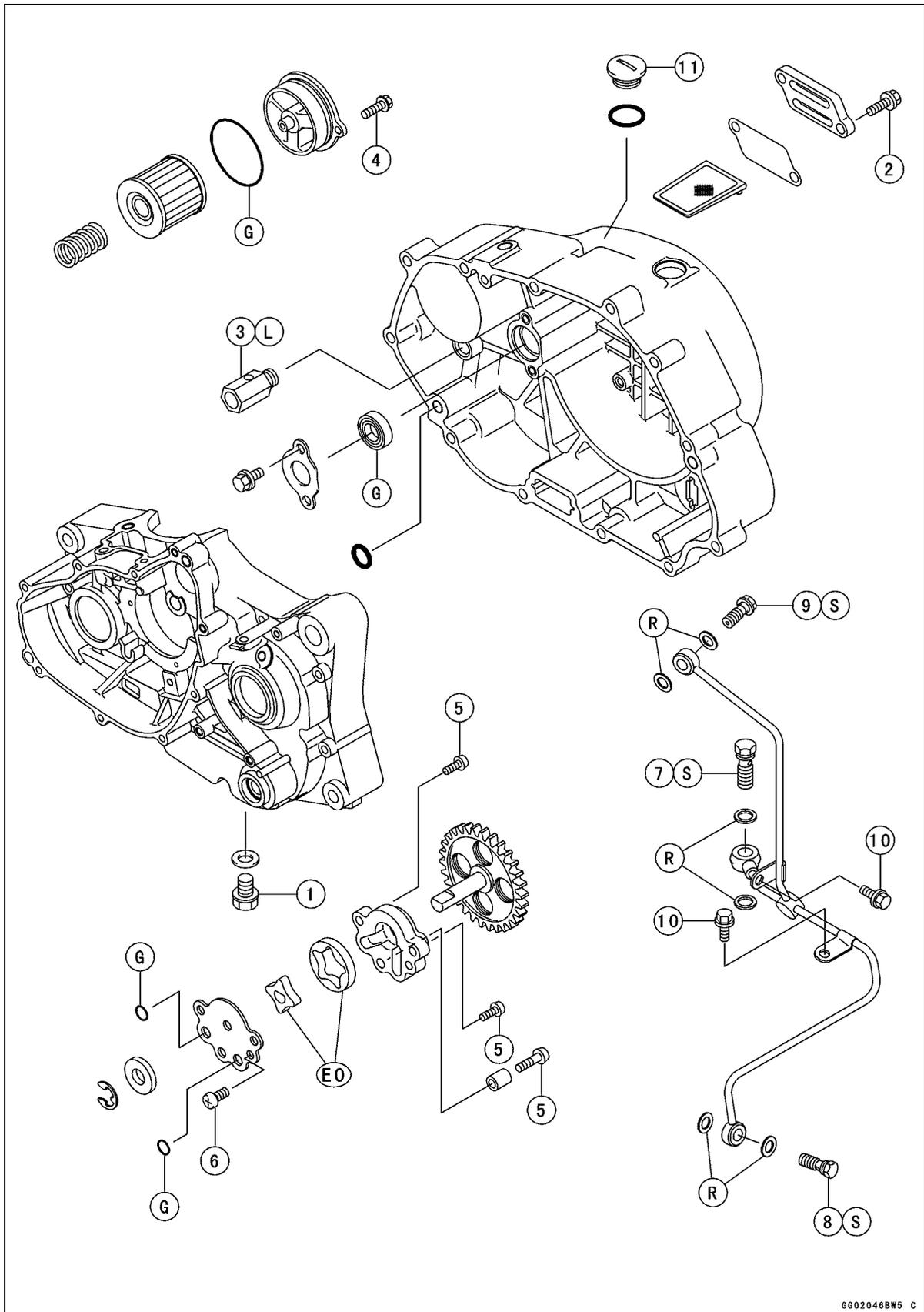
Engine Lubrication System

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6-2 ENGINE LUBRICATION SYSTEM

Exploded View



GG02046BWS C

ENGINE LUBRICATION SYSTEM 6-3

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Engine Oil Drain Plug	18	1.8	13	
2	Oil Screen Cover Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
	Oil Screen Cover Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
3	Oil Pressure Relief Valve	15	1.5	11	L
4	Oil Filter Cover Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
	Oil Filter Cover Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
5	Oil Pump Mounting Screws	4.9	0.50	43 in·lb	
6	Oil Pump Assembly Screw	9.8	1.0	87 in·lb	
7	Oil Pipe Banjo Bolt (Clutch Cover)	25	2.6	19	S
8	Oil Pipe Banjo Bolt (Left Crankcase)	9.8	1.0	87 in·lb	S
9	Oil Pipe Banjo Bolt (Cylinder Head)	9.8	1.0	87 in·lb	S
10	Oil Pipe Mounting Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
	Oil Pipe Mounting Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
11	Oil Filler Plug	2.5	0.25	22 in·lb	

EO: Apply engine oil.

G: Apply grease.

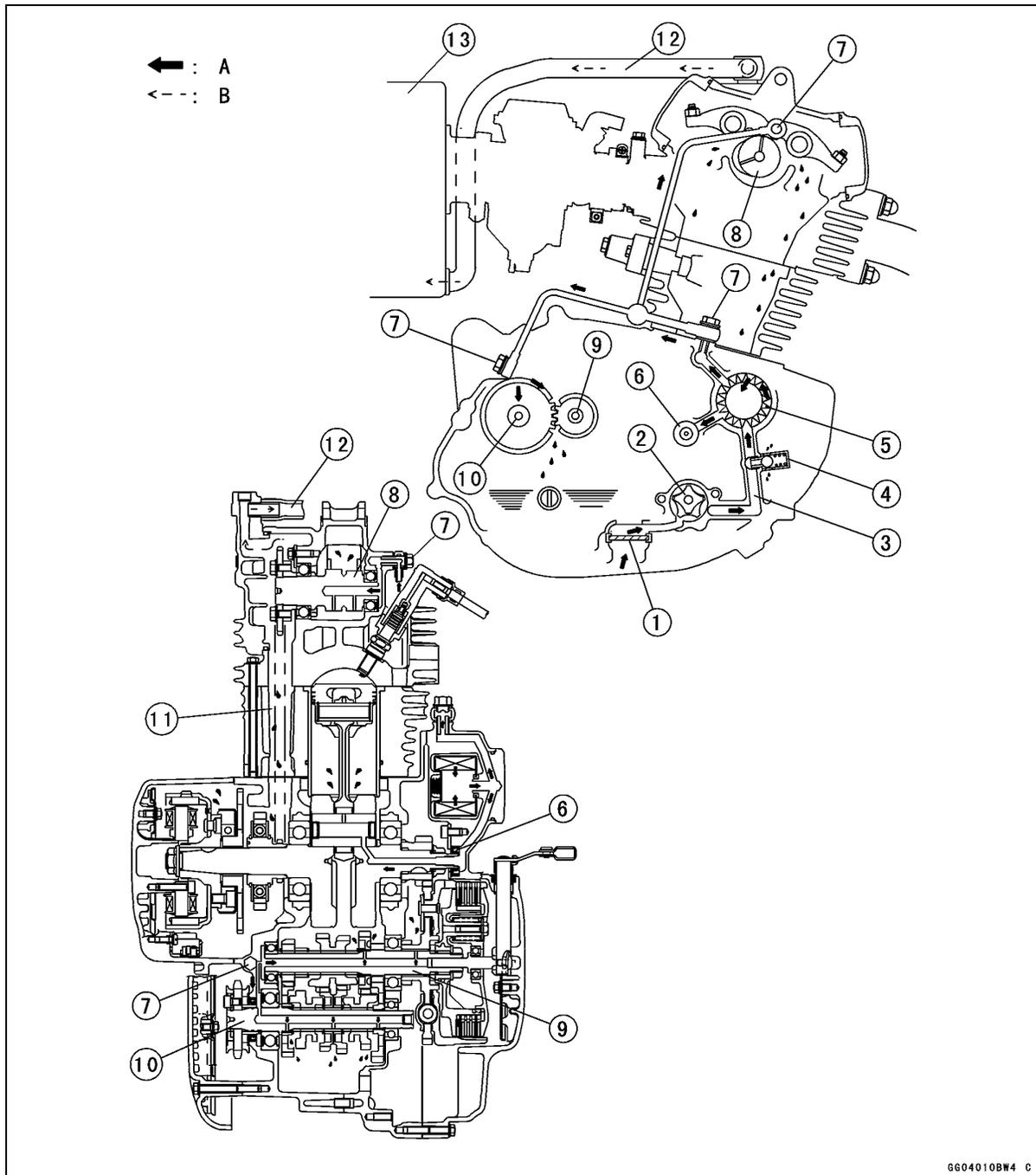
L: Apply a non-permanent locking agent.

R: Replacement parts

S: Follow the specific tightening sequence.

6-4 ENGINE LUBRICATION SYSTEM

Engine Oil Flow Chart



- | | |
|------------------------------|---------------------------|
| 1. Oil screen | 9. Drive Shaft |
| 2. Oil pump | 10. Output Shaft |
| 3. Clutch Cover Oil Passage | 11. Camshaft Chain Tunnel |
| 4. Oil Pressure Relief Valve | 12. Engine Breather Hose |
| 5. Oil Filter | 13. Air Cleaner Housing |
| 6. Crankshaft Oil seal | A. Oil Flow |
| 7. Oil Pipe Banjo Bolts | B. Blowby Gas |
| 8. Camshaft | |

ENGINE LUBRICATION SYSTEM 6-5

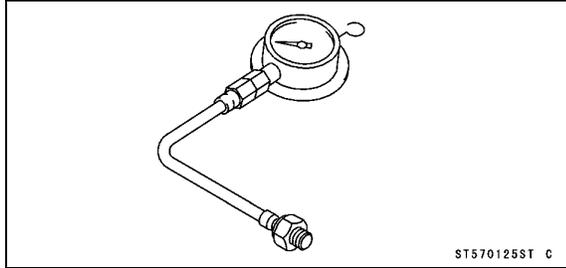
Specifications

Item	Standard
Engine Oil Grade: (BN125-A1 ~ A3) (BN125-A4 ~) Viscosity Capacity Level	API SE, SF or SG API SE, SF or SG API SH, SJ or SL with JASO MA SAE 10W-40 1.1 L (1.16 US qt) (when filter is not removed) 1.2 L (1.27 US qt) (when filter is removed) 1.4 L (1.48 US qt) (when engine is completely dry) Between upper and lower level lines
Oil Pressure Measurement Oil Pressure @4 000 r/min (rpm), Oil Temperature 90°C (194°F)	13 ~ 32 kPa (0.13 ~ 0.33 kgf/cm ² , 1.8 ~ 4.7 psi)

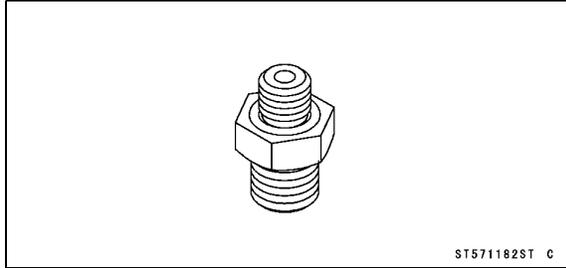
6-6 ENGINE LUBRICATION SYSTEM

Special Tools

Oil Pressure Gauge, 5 kgf/cm²:
57001-125



Oil Pressure Gauge Adapter, M10 × 1.25:
57001-1182



Engine Oil and Oil Filter

⚠ WARNING

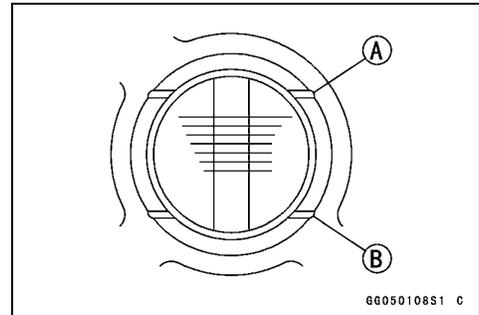
Motorcycle operation with insufficient, deteriorated, or contaminated engine oil will cause accelerated wear and may result in engine or transmission seizure, accident, and injury.

Oil Level Inspection

- Situate the motorcycle so that it is vertical.
- Check that the engine oil level is between the upper [A] and lower [B] levels in the gauge.

NOTE

- Situate the motorcycle so that it is perpendicular to the ground.
- If the motorcycle has just been used, wait several minutes for all the oil to drain down.
- If the oil has just been changed, start the engine and run it for several minutes at idle speed. This fills the oil filter with oil. Stop the engine, then wait several minutes until the oil settles.



CAUTION

Racing the engine before the oil reaches every part can cause engine seizure.

- ★ If the oil level is too high, remove the excess oil through the filler opening, using a syringe or some other suitable device.
- ★ If the oil level is too low, add the correct amount of oil through the oil filler opening. Use the same type and make of oil that is already in the engine.

NOTE

- If the engine oil type and make are unknown, use any brand of the specified oil to top off the level rather than running the engine with the oil level low. Then at your earliest convenience, change the oil completely.

Engine Oil Change

- Refer to the Engine Oil Change in the Periodic Maintenance chapter.

Oil Filter Change

- Refer to the Oil Filter Change in the Periodic Maintenance chapter.

6-8 ENGINE LUBRICATION SYSTEM

Oil Screen

Oil Screen Removal

- Refer to the Oil Screen Cleaning in the Periodic Maintenance chapter.

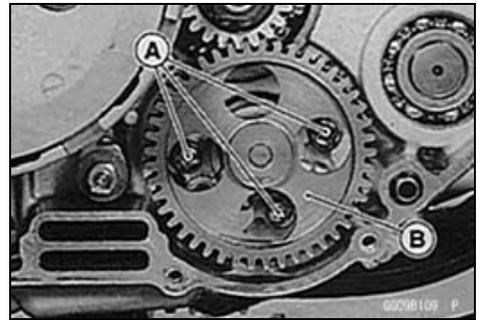
Oil Screen Installation

- Refer to the Oil Screen Cleaning in the Periodic Maintenance chapter.

Oil Pump

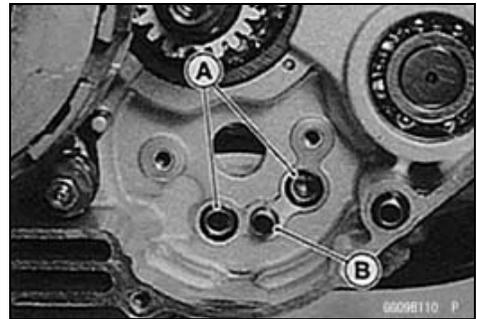
Oil Pump Removal

- Remove the clutch cover (see Clutch chapter).
- Remove the mounting screws [A] and remove the oil pump assembly [B].
- Turn the pump gear so that the pump mounting screws can be removed through the pump gear holes.

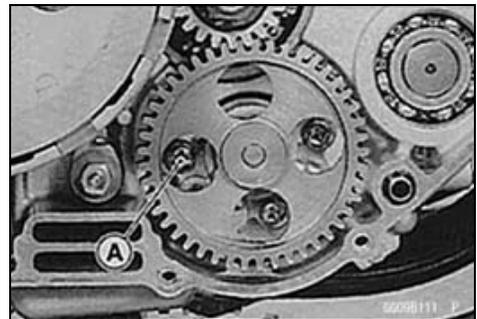


Oil Pump Installation

- Replace the O-rings with new ones.
- Install the O-rings [A].
- Install the dowel pin [B].

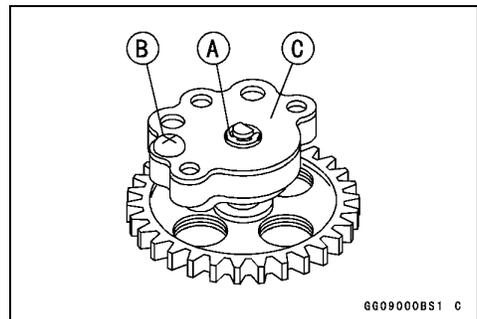


- Install the oil pump assembly.
- Tighten:
 - Torque - Oil Pump Mounting Screws [A]: 4.9 N·m (0.50 kgf·m, 43 in·lb)**
- Install the clutch cover (see Clutch chapter).

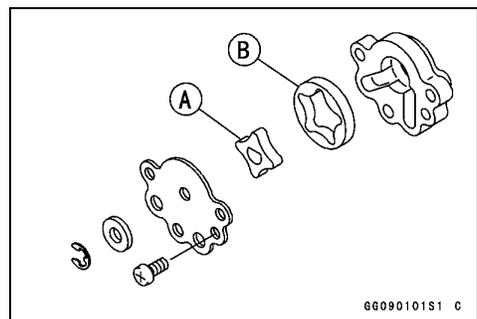


Oil Pump Disassembly

- Remove:
 - Oil Pump (see this chapter)
 - Circlip and Washer [A]
 - Oil Pump Assembly Screw [B]
- Remove the oil pump cover [C].



- Remove:
 - Inner Rotor [A]
 - Outer Rotor [B]



6-10 ENGINE LUBRICATION SYSTEM

Oil Pump

Oil Pump Assembly

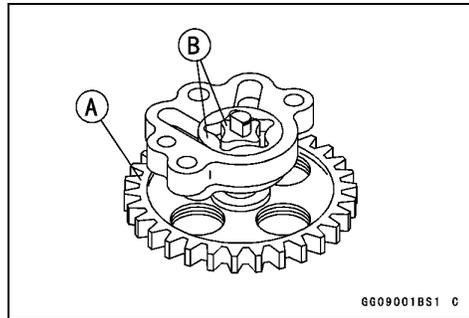
- Install the oil pump gear [A].
- Fill the rotors [B] with engine oil.
- Install the cover and tighten the oil pump assembly screw.

Torque - Oil Pump Assembly Screw: 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Install the washer and circlip.
- Replace the O-rings with new ones.
- Check that the pump gear turns freely after assembly.

Oil Pump Inspection

- Disassemble the oil pump (see Oil Pump Disassembly).
- Visually inspect the oil pump body, outer and inner rotors, and cover.
- ★ If there is any damage or uneven wear, replace the rotors, cover, body, or the oil pump assembly.



Oil Pressure

Oil Pressure Measurement

- Remove the air suction valve [A] (see Engine Top End chapter).
- Replace the oil pipe banjo bolt of the clutch cover [B] with the oil pressure gauge adapter (special tool) [C].
- ★ If the oil pressure gauge adapter bottoms out, add washer(s) (P/N: 11009-1105) [D] under the adapter.
- Attach the oil Pressure gauge [E].

Special Tools - Oil Pressure Gauge, 5 kgf/cm²: 57001-125
Oil Pressure Gauge Adapter, M10 × 1.25: 57001-1376

- Install the air suction valve (see Engine Top End chapter).
- Start the engine and warm up the engine thoroughly.
- Run the engine at the specified speed, and read the oil pressure gauge.
- ★ If the oil pressure is much lower than the standard, check the oil pump, crankshaft oil seal of the clutch cover and oil pump relief valve.
- ★ If the reading is much higher than the standard, check the oil pump screen and the oil filter first, and oil passages for dirt or clogging.

Oil Pressure

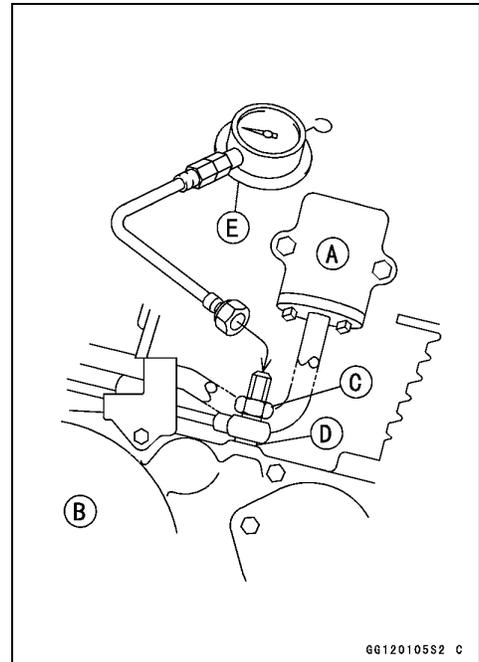
Standard: 13 ~ 32 kPa (0.13 ~ 0.33 kgf/cm², 1.8 ~ 4.7 psi) @4 000 r/min (rpm), oil temperature 90°C (194°F)

- Stop the engine, and remove the oil pressure gauge and adapter.

⚠ WARNING

Take care against burns from hot engine oil that will drain through the oil passage when the oil pressure gauge adapter is removed.

- Install the new copper washers.
- Tighten:
Torque - Oil Pipe Banjo Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)



6-12 ENGINE LUBRICATION SYSTEM

Relief Valve

Relief Valve Inspection

- Remove the relief valve from the clutch cover.
- Check to see if the valve [A] slides smoothly when pushing in with a wooden or other soft rod, and see if it comes back to its seat by spring [B] pressure.

NOTE

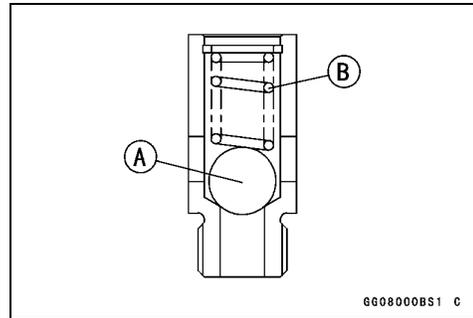
○ *Inspect the valve in its assembled state. Disassembly and assembly may change the valve performance.*

- ★ If any rough spots are found during above inspection, wash the valve clean with a high-flash point solvent and blow out any foreign particles that may be in the valve with compressed air.

⚠ WARNING

Clean the relief valve in a well-ventilated area, and take care that there is no spark or flame anywhere near the working area. Because of the danger of highly flammable liquids, do not use gasoline or low-flash point solvent.

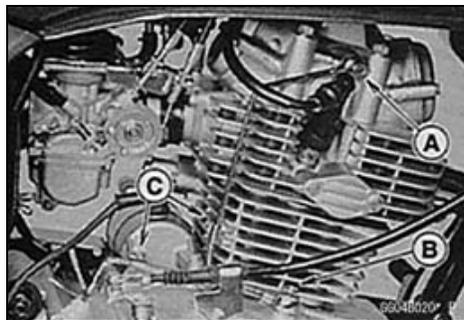
- ★ If cleaning does not solve the problem, replace the relief valve as an assembly. The relief valve is precision made with no allowance for replacement of individual parts.



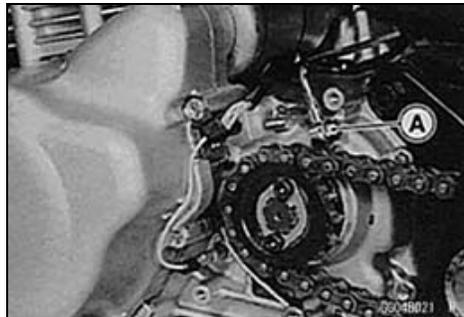
Oil Pipe

Oil Pipe Removal

- Remove:
 - Oil Pipe Banjo Bolts (Cylinder Head) [A]
 - Oil Pipe Banjo Bolt (Clutch Cover) [B]
 - Oil Pipe Mounting Bolt [C]



- Remove:
 - Engine Sprocket Cover (see Final Drive chapter)
 - Oil Pipe Banjo Bolt (Left Crankcase) [A]
- Remove the oil pipe from the right side of the engine.



Oil Pipe Installation

- Replace the washers on both sides of the oil pipe banjo bolt with new ones.
- Tighten the following banjo bolts in the order listed to prevent pipe warp.

Torque - Oil Pipe Banjo Bolts

- (Clutch Cover): 25 N·m (2.5 kgf·m, 18 ft·lb)
- (Left Crankcase): 9.8 N·m (1.0 kgf·m, 87 in·lb)
- (Cylinder Head): 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Tighten:

Torque - Oil Pipe Mounting Bolt

- (BN125-A1~A3): 9.8 N·m (1.0 kgf·m, 87 in·lb)
- (BN125-A4~): 8.8 N·m (0.90 kgf·m, 78 in·lb)

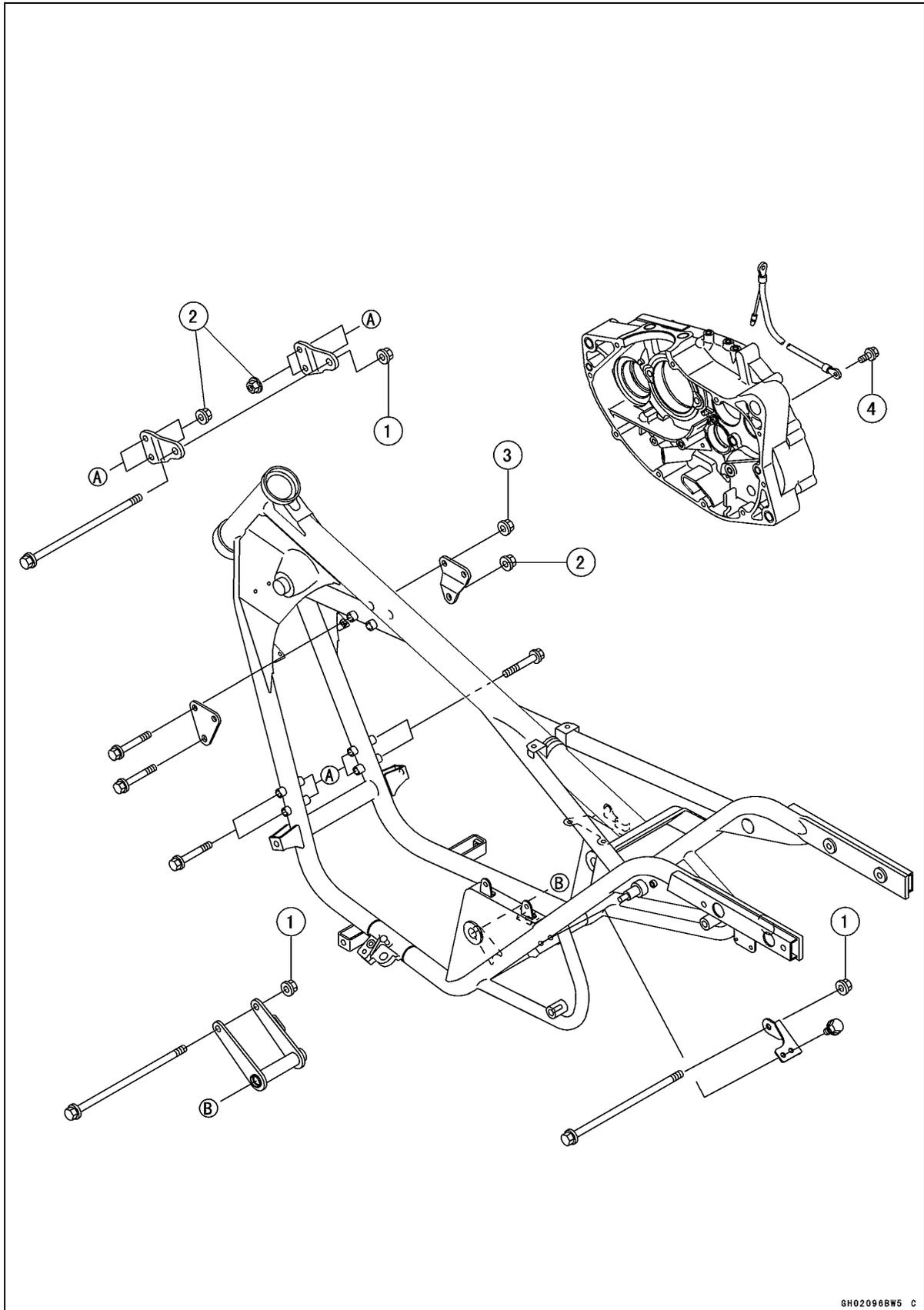
Engine Removal/Installation

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7-2 ENGINE REMOVAL/INSTALLATION

Exploded View



ENGINE REMOVAL/INSTALLATION 7-3

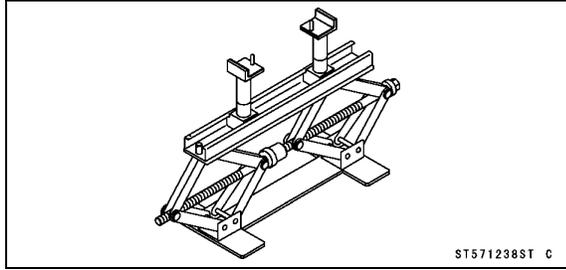
Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Engine Mounting Bolts, Nuts (M10)	44	4.5	33	
2	Engine Mounting Bolts, Nuts (M8)	25	2.5	18	
3	Engine Mounting Bracket Bolts, Nuts	25	2.5	18	
4	Engine Ground Terminal Bolt	9.8	1.0	87 in·lb	

7-4 ENGINE REMOVAL/INSTALLATION

Special Tool

Jack:
57001-1238

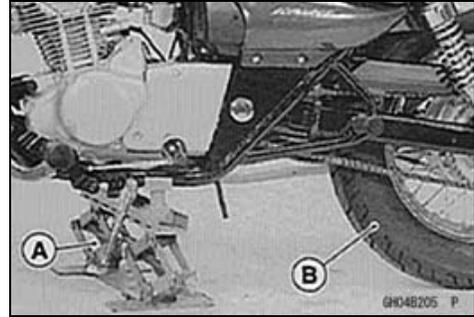


Engine Removal/Installation

Engine Removal

- Place the jack [A] under the frame to lift the rear wheel [B] off the ground.

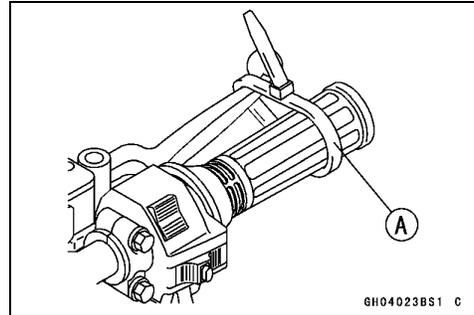
Special Tool - Jack: 57001-1238



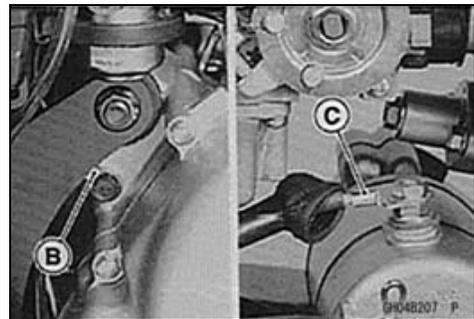
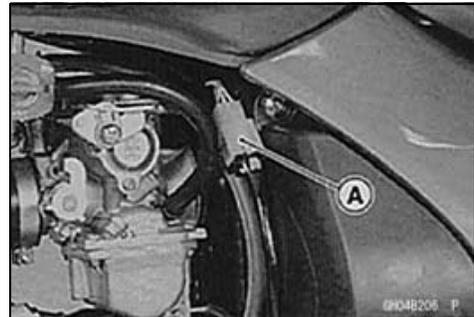
- Squeeze the brake lever slowly and hold it with a band [A].

⚠ WARNING

Be sure to hold the front brake when removing the engine, or the motorcycle may fall over. It could cause an accident and injury.



- Drain the engine oil (see Periodic Maintenance chapter).
- Remove:
 - Side Covers and Seat (see Frame chapter)
 - Fuel Tank (see Fuel System chapter)
- Disconnect the cables and wiring leads from the engine.
 - Alternator Lead Connector [A]
 - Engine Ground Lead [B]
 - Electric Starter Motor Cable Terminal [C]
 - Spark Plug Cap
 - Breather Tube



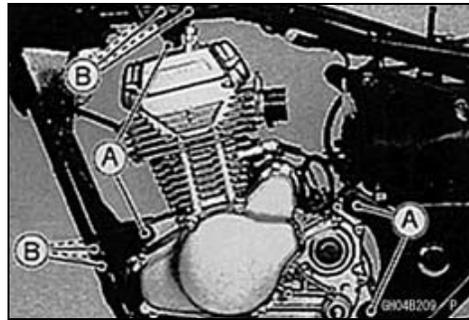
- Remove:
 - Muffler (see Engine Top End chapter)
 - Cylinder Head Bracket [A]
 - Carburetor [B] (see Fuel System chapter)
 - Shift Pedal (see Crankshaft/Transmission chapter)
 - Chain Cover and Engine Sprocket (see Final Drive chapter)
 - Clutch Cable Lower End (see Clutch chapter)



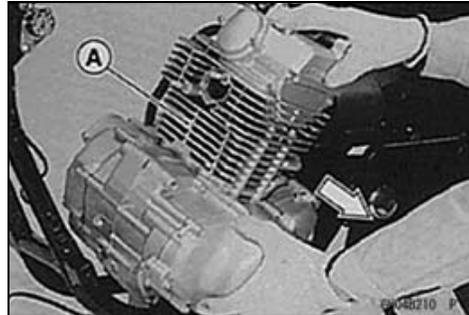
7-6 ENGINE REMOVAL/INSTALLATION

Engine Removal/Installation

- Remove:
 - Engine Mounting Bolts [A]
 - Engine Mounting Bracket Bolts [B]
- Pull out the mounting bolts while lifting the engine.



- Lift up the engine and move it to the right side of the frame.
- Remove the engine [A] from the vehicle right side.



Engine Installation

- Insert the mounting bolts from the left side of the engine and install the nuts on the right side.
- Tighten the engine mounting bolts with the specified torque.

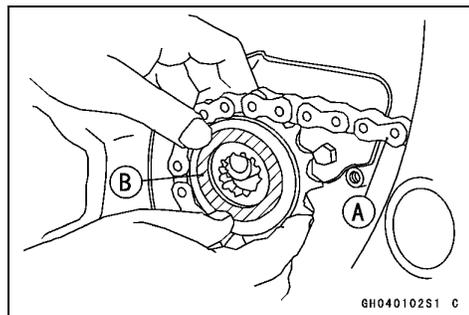
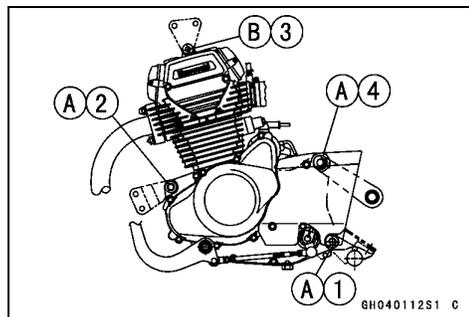
Torque - Engine Mounting Bolts, Nuts (M10) [A]: 44 N·m (4.5 kgf·m, 33 ft·lb)

Engine Mounting Bolts, Nuts (M8) [B]: 25 N·m (2.5 kgf·m, 18 ft·lb)

Engine Mounting Bracket Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)

Cylinder Head Bracket Bolts, Nuts: 25 N·m (2.5 kgf·m, 18 ft·lb)

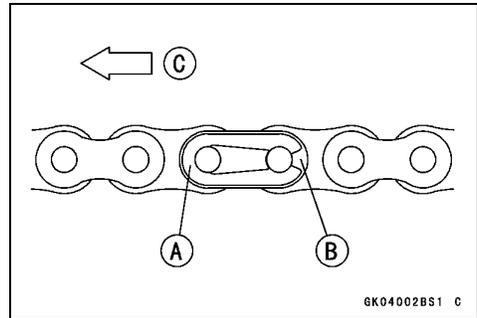
- Install the drive chain [A] and engine sprocket [B].



Engine Removal/Installation

★ If the engine sprocket is hard to install, remove the master link and the clip from the drive chain, and then install the engine sprocket.

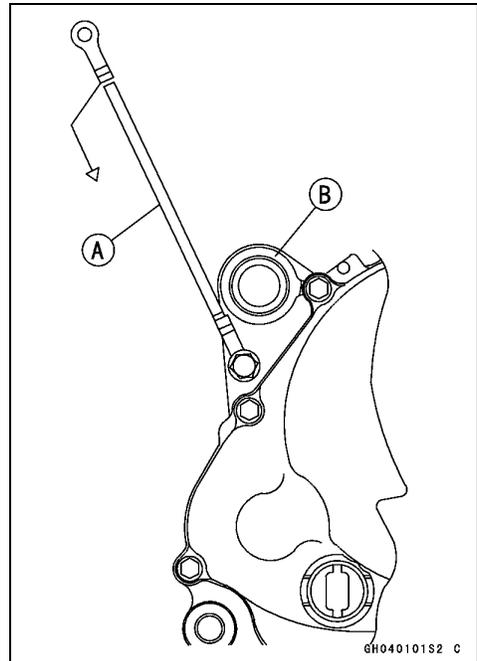
○ Install the clip [A] so that the open end [B] of the "U" points in the opposite direction of chain rotation [C].



● Install the engine ground cable [A] as shown. Run the cable near the mounting boss [B].

● Tighten:

Torque - Engine Ground Terminal Bolt: 9.8 N·m (1.0 kgf·m, 87 in·lb)



- Run the cables, hoses, and leads according to the Cable, Wire, and Hose Routing section of the Appendix chapter.
- Install the removed parts (see appropriate chapters).
- Adjust:
 - Throttle Cable (see Fuel System chapter)
 - Clutch Cable (see Clutch chapter)
 - Drive Chain (see Final Drive chapter)
- Fill the engine with engine oil (see Engine Lubrication System chapter).
- Adjust the idle speed (see Fuel System chapter).
- Check the clutch operation.
- Check the brake effectiveness.

⚠ WARNING

Do not attempt to drive the motorcycle until a full brake lever is obtained by pumping the brake lever until the pads are against the disc. The brake will not function on the first application of the lever if this is not done.

⚠ WARNING

If a full brake pedal is not obtained, disassemble and inspect the brake parts. Worn parts can cause lock of the brake or loss of braking.

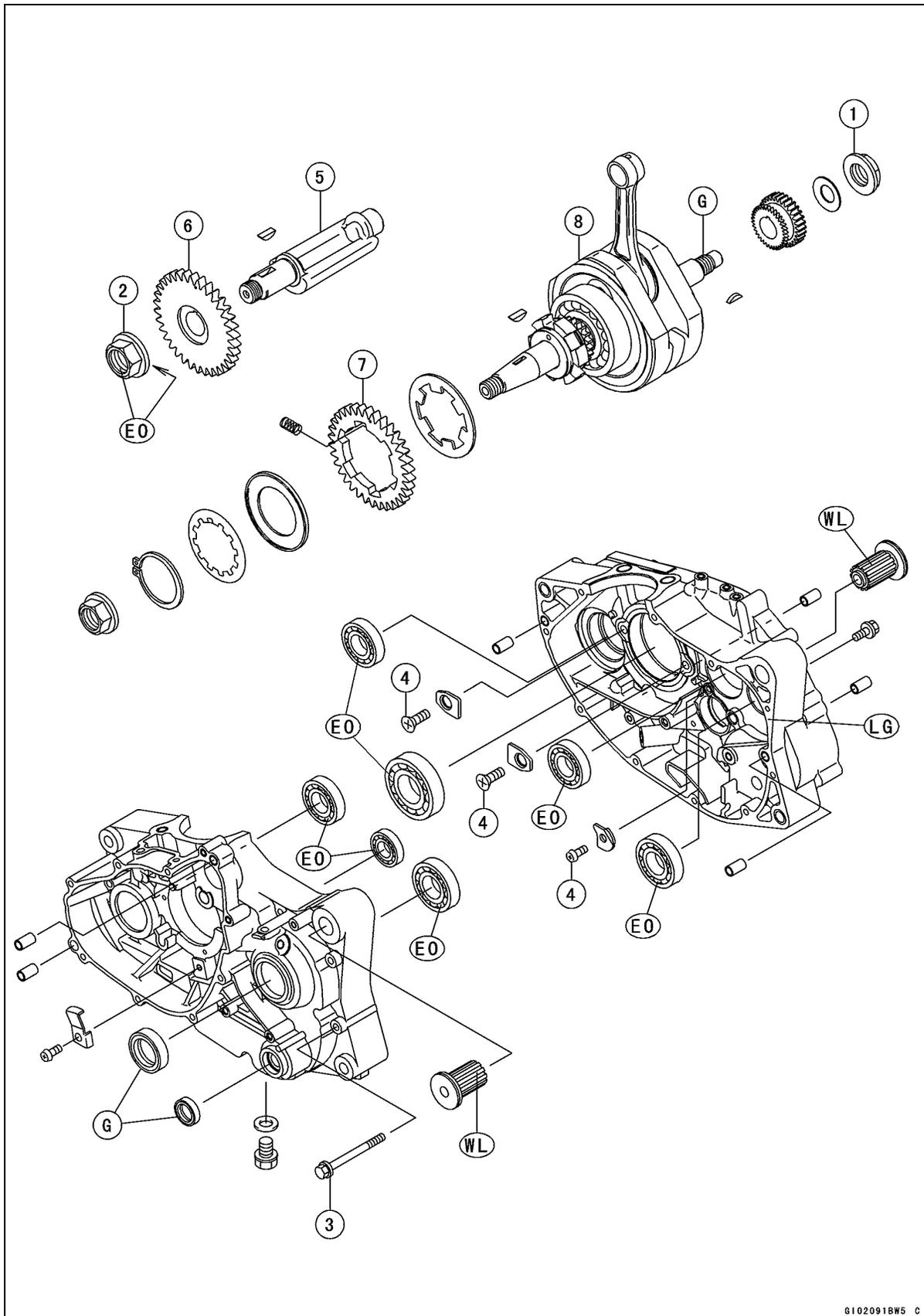
Crankshaft/Transmission

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8-2 CRANKSHAFT/TRANSMISSION

Exploded View



G102091BWS C

CRANKSHAFT/TRANSMISSION 8-3

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Primary Gear Nut	69	7.0	51	
2	Balancer Shaft Gear Nut	78	8.0	58	EO
3	Crankcase Bolts	8.8	0.90	78 in·lb	
4	Crankcase Bearing Retainer Screws	4.9	0.50	43 in·lb	

5. Balancer Shaft

6. Balancer shaft gear

7. Crank balancer gear

8. Crankshaft

EO: Apply engine oil.

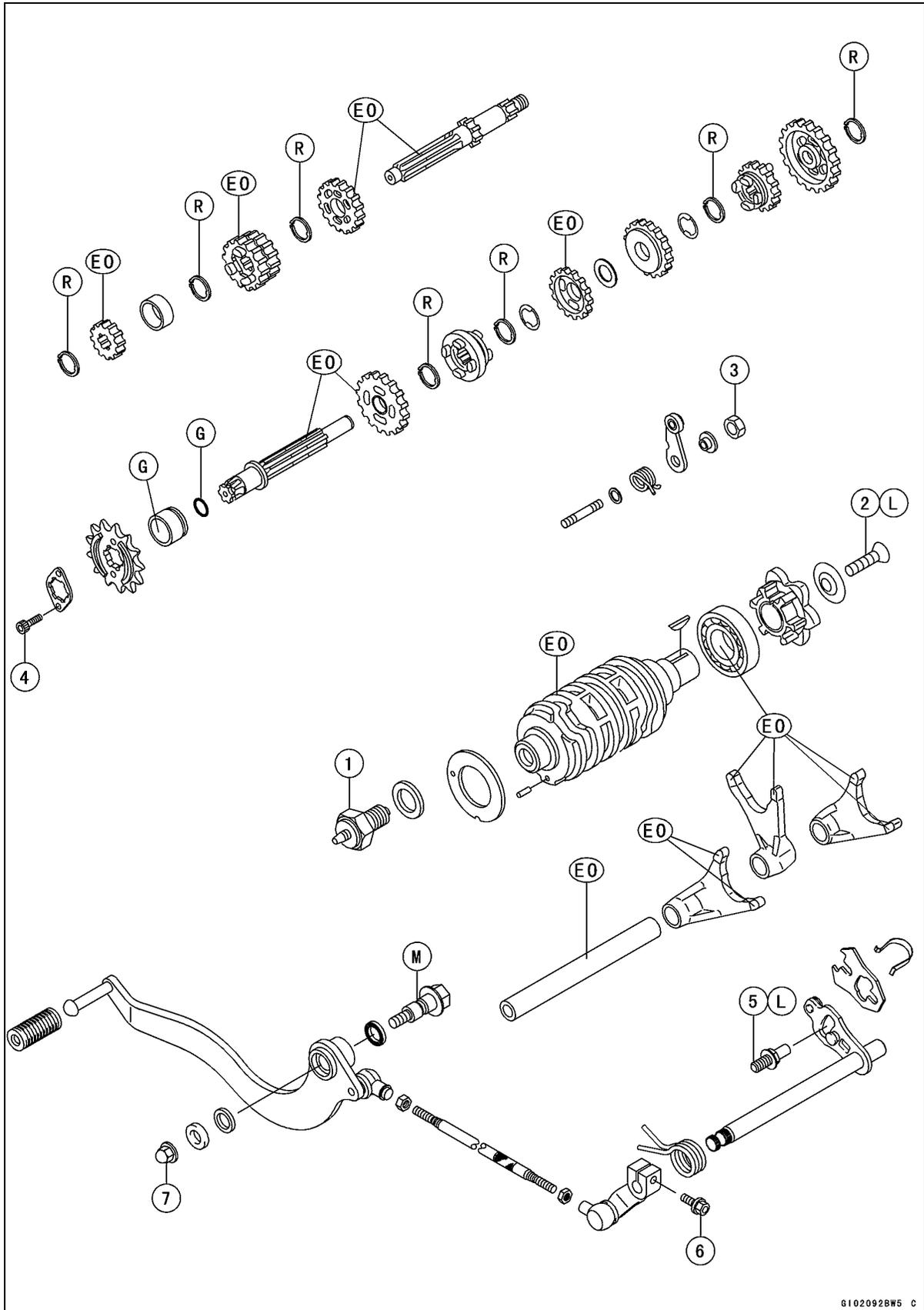
G: Apply grease.

LG: Apply liquid gasket.

WL: Apply soap and water solution.

8-4 CRANKSHAFT/TRANSMISSION

Exploded View



CRANKSHAFT/TRANSMISSION 8-5

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Neutral Switch	15	1.5	11	
2	Shift Drum Cam Screw	4.9	0.50	43 in·lb	L
3	Gear Set Lever Nut	11	1.1	95 in·lb	
4	Engine Sprocket Holder Bolts	12	1.2	104 in·lb	
5	Shift Shaft Return Spring Pin	29	3.0	21	L
6	Shift Lever Clamp Bolt	12	1.2	104 in·lb	
7	Shift Pedal Nut	30	3.1	22	

EO: Apply engine oil.

G: Apply grease.

L: Apply a non-permanent locking agent.

M: Apply molybdenum disulfide grease.

R: Replacement Parts

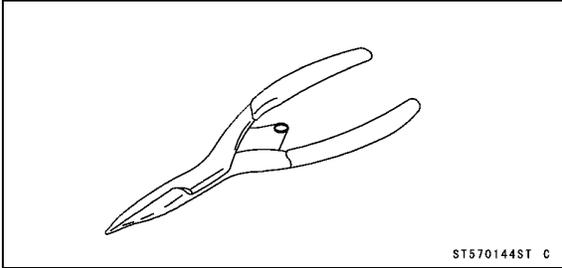
8-6 CRANKSHAFT/TRANSMISSION

Specifications

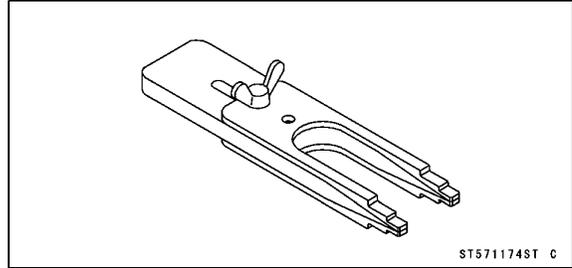
Item	Standard	Service Limit
Crankshaft, Connecting Rod		
Connecting Rod Big End Side Clearance	0.20 ~ 0.35 mm (0.008 ~ 0.014 in.)	0.5 mm (0.020 in.)
Connecting Rod Big End Radial Clearance	0.005 ~ 0.017 mm (0.0002 ~ 0.0007 in.)	0.07 mm (0.003 in.)
Crankshaft Runout	TIR 0.03 mm (0.0012 in.) or less	TIR 0.07 mm (0.003 in.)
Transmission		
Shift Fork Ear Thickness	4.9 ~ 5.0 mm (0.193 ~ 0.197 in.)	4.8 mm (0.189 in.)
Gear Shift Fork Groove Width	5.05 ~ 5.15 mm (0.199 ~ 0.203 in.)	5.25 mm (0.207 in.)
Shift Fork Guide Pin Diameter	5.9 ~ 6.0 mm (0.232 ~ 0.236 in.)	5.8 mm (0.228 in.)
Shift Drum Groove Width	6.05 ~ 6.20 mm (0.238 ~ 0.244 in.)	6.3 mm (0.248 in.)

Special Tools and Sealant

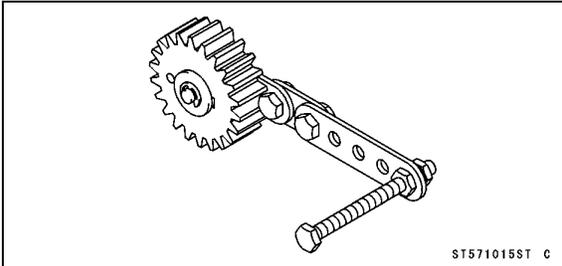
Outside Circlip Pliers:
57001-144



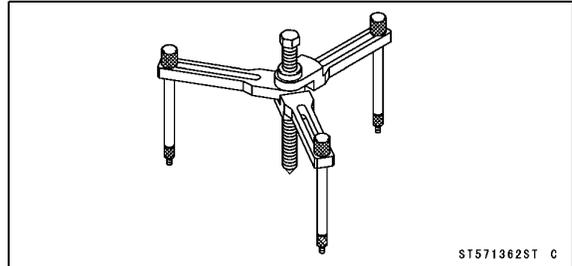
Crankshaft Jig:
57001-1174



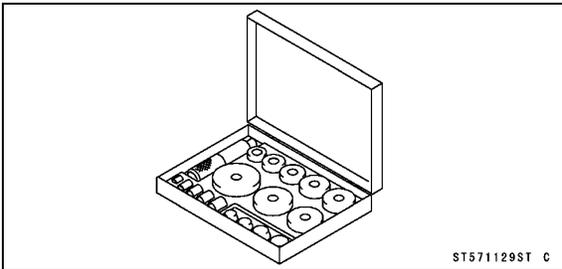
Gear Holder, m1.75:
57001-1015



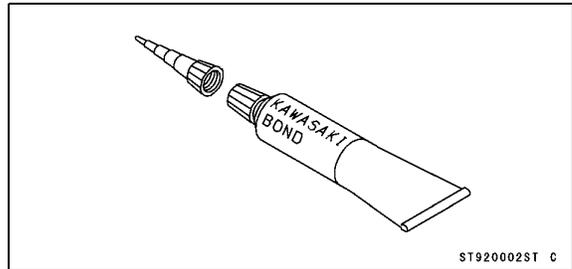
Crankcase Splitting Tool Assembly:
57001-1362



Bearing Driver Set:
57001-1129



Kawasaki Bond (Liquid Gasket-Silver):
92104-002

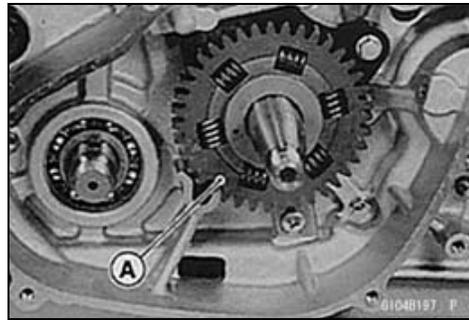


8-8 CRANKSHAFT/TRANSMISSION

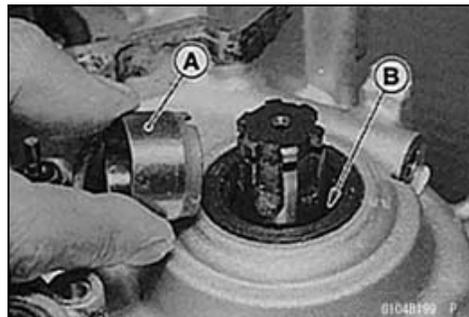
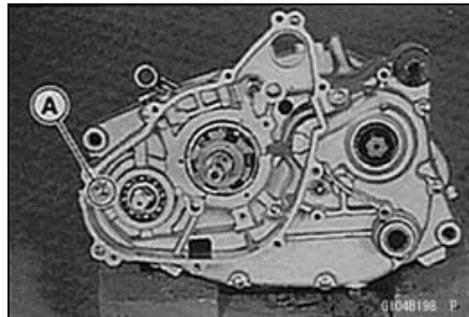
Crankcase

Crankcase Disassembly

- Remove:
 - Clutch (see Clutch chapter)
 - Primary Gear (see Clutch chapter)
 - Starter Motor (see Electrical System chapter)
 - Alternator (see Electrical System chapter)
 - Balancer Shaft Gear (see Balancer Shaft Gear Removal)
 - Crank Balancer Gear (see Engine Top End chapter) [A]
- Remove the engine (see Engine Removal/Installation chapter).
- Set the engine on a clean surface and hold the engine steady while parts are being removed.
- ★ If the crankshaft is to be removed, remove the following.
 - Camshaft Chain (see Engine Top End chapter)
 - Cylinder Head (see Engine Top End chapter)
 - Cylinder and Piston (see Engine Top End chapter)
- Remove the external shift mechanism (see External Shift Mechanism Removal).
- Remove the all crankcase bolts [A] from the left side of the crankcase.



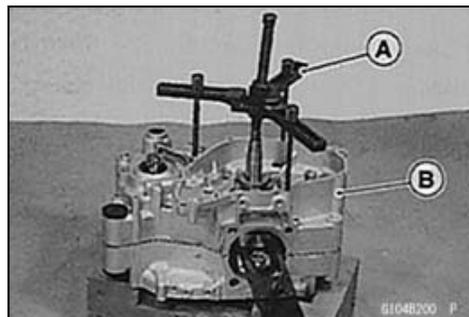
- Remove the output shaft sleeve [A] and O-ring [B].
 - Do not reuse the removed O-ring.



- Screw the crankcase splitting tool [A] into the left side of the crankcase [B]. Be certain to screw the adapters in all the way.

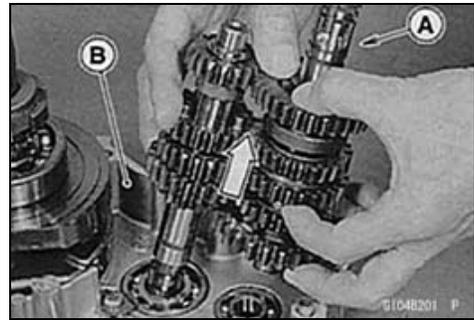
Special Tool - Crankcase Splitting Tool Assembly: 57001-1362

- Tighten the center bolt of the crankcase splitting tool to split the crankcase.
- Remove the left crankcase half.

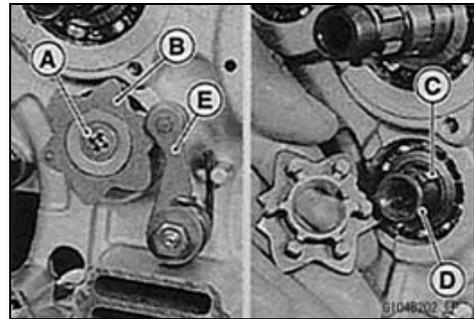


Crankcase

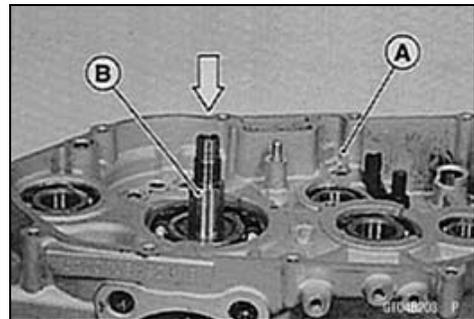
- Remove the transmission shaft [A], gears and balancer shaft from the right crankcase half [B].



- Remove:
 - Shift Drum Cam Screw [A]
 - Shift Drum Cam [B]
 - Woodruff Key [C]
 - Shift Drum [D]
 - Gear Set Lever [E]



- Support the right crankcase half [A] with a suitable retainer.
- Remove the crankshaft [B] from the right crankcase half using a press.

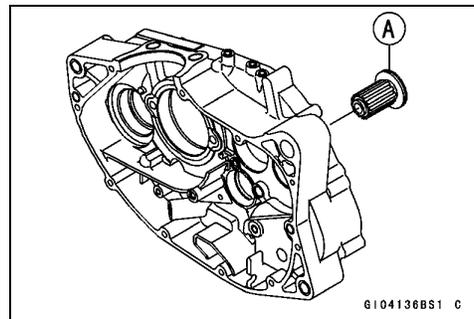


CAUTION
Do not remove the ball bearings and the oil seals unless it is necessary. If they are removed, replace them with new ones.

Crankcase Assembly

CAUTION
Right and left crankcase halves are machined at the factory in the assembled state, so if replaced, they must be replaced as a set.

- Apply soap and water solution around the engine damper [A] before pressing it into the crankcase.



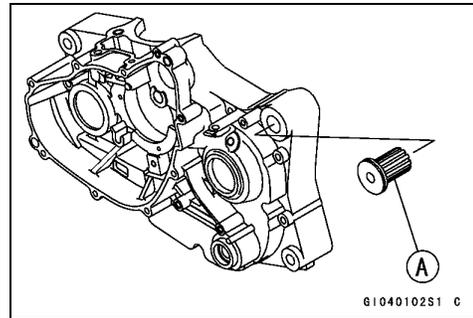
CAUTION
Do not apply engine oil to prevent rubber damper deterioration.

8-10 CRANKSHAFT/TRANSMISSION

Crankcase

- Press the damper [A] into the crankcase with the bearing drier set.

Special Tool - Bearing Driver Set: 57001-1129



- Chip off the old gasket from the mating surfaces of the crankcase halves and clean them off with a high-flash point solvent.
- Using compressed air, blow out the oil passages in the crankcase halves.

⚠ WARNING

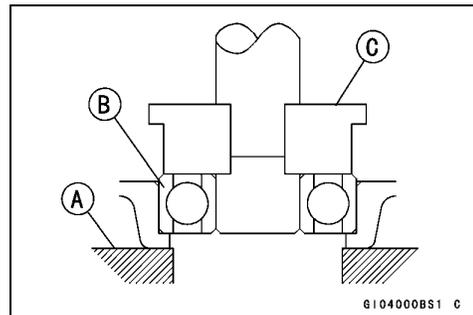
Clean the engine parts in a well-ventilated area, and take care that there are no sparks or flame anywhere near the working area; this includes any appliance with a pilot light. Do not use gasoline or a low-flash point solvent to clean parts. A fire or explosions could result.

- Support the crankcase bearing boss with a suitable retainer [A].
- Using a press and the bearing driver set [C], install new bearings [B] until they bottoms out.

Special Tool - Bearing Driver Set: 57001-1129

CAUTION

Support the crankcase bearing boss when the bearings are pressed, or the crankcase could be damaged.



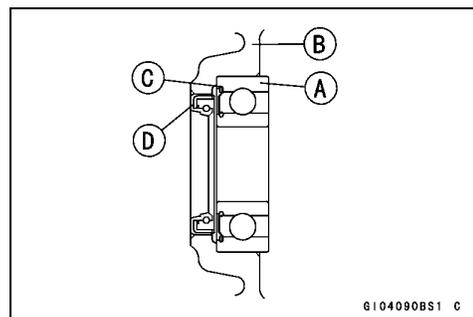
- Press the output shaft bearing [A] in the left crankcase half [B] so that the sealed side [C] faces to the oil seal.

Special Tool - Bearing Driver Set: 57001-1129

- Tighten the bearing retaining screws securely in the right crankcase half.

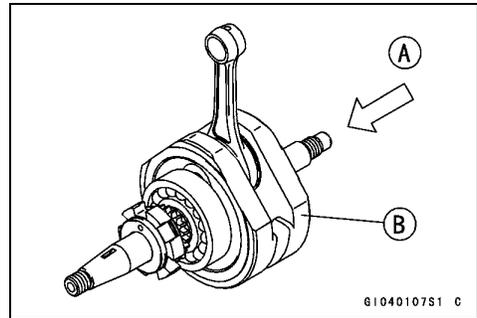
Torque - Bearing Retaining Screws: 4.9 N·m (0.50 kgf·m, 43 in·lb)

- Put the output shaft oil seal [D] in, being careful of the proper direction as shown.



Crankcase

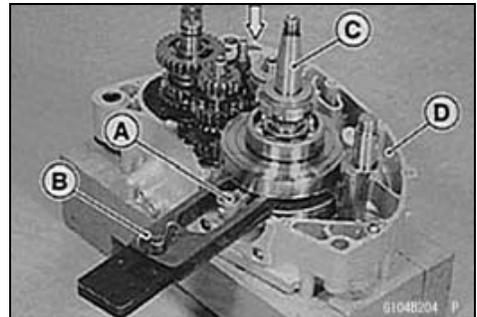
- Using compressed air [A], blow out the oil passage in the right crankshaft [B].



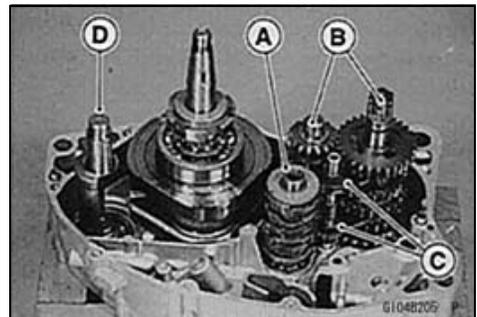
- Positioning the connecting rod [A] big end at BDC, put in the crankshaft jig [B] between the crankshaft flywheels.
- Press the crankshaft [C] in the right crankcase half [D].

Special Tool - Crankshaft Jig: 57001-1174

- Apply engine oil to the transmission gears, bearings, shift forks, shift drum and crankshaft bearing.



- Install:
 - Shift Drum [A]
 - Transmission Shafts [B]
 - Shift Forks [C]
 - Balancer Shaft [D] (Be careful of its direction)
- Check that the shift drum is in neutral position.

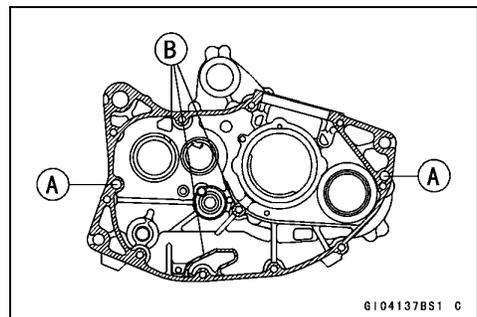


- Check that two dowel pins [A] are in place of the right crankcase half.
- Apply liquid gasket to the mating surface [B] of the left crankcase half.

Sealant - Kawasaki Bond (Liquid Gasket-Silver): 92104-002

- Using a suitable tool on the left crankcase to press around the hole for the crankshaft, fit the crankcase halves together with a press on the tool.
- Remove the crankshaft jig.
- Install the crankcase bolts [A] in the left crankcase half [B] and tighten them, starting with the nearest ones to the crankshaft, then farther ones.

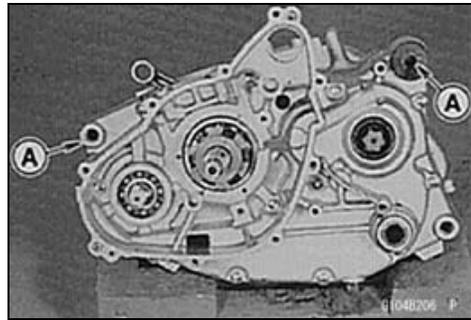
Torque - Crankcase Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)



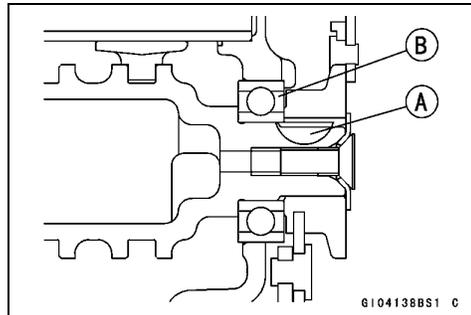
8-12 CRANKSHAFT/TRANSMISSION

Crankcase

- Check to see that the crankshaft, drive shaft, and output shaft all turn freely (in the neutral position).
- ★ If the crankshaft will not turn, probably the crankshaft is not centered; Tap the mount portion [A] of the crankcase with a plastic hammer to reposition it.



- Put the end of the woodruff key [A] into the inside of the ball bearing [B] so that the key can seat securely.



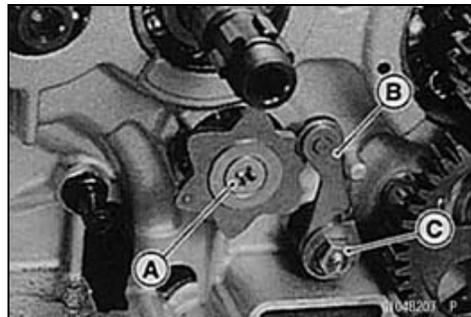
- Apply a non-permanent locking agent to the shift drum cam screw [A] and tighten it.

Torque - Shift Drum Cam Screw: 4.9 N·m (0.50 kgf·m, 43 in·lb)

- Install the gear set lever [B] and tighten the nut [C].

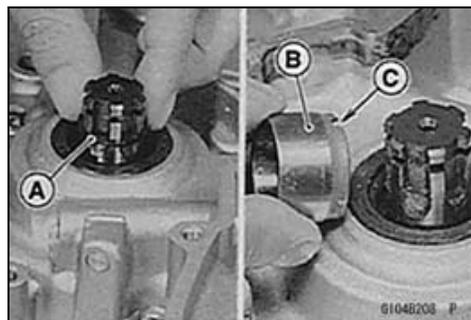
Torque - Gear Set Lever Nut: 11 N·m (1.1 kgf·m, 95 in·lb)

- Install the external shift mechanism [D] (see this chapter).



- Check to see that gears shift smoothly from 1st to 5th gear, and 5th to 1st while spinning the output shaft.
- Set the shift drum in the neutral position.

- Replace the O-ring [A] on the output shaft with a new one.
- Apply grease to the inside of the output shaft collar [B].
- Insert the collar with the oil groove end [C] facing in.
- Install the removed parts (see appropriate chapters).



Crankshaft

Crank Balancer Gear Removal/Installation

- Refer to Camshaft Chain Removal/Installation in the Engine Top End chapter.

Crankshaft Removal

- Refer to the Crankcase Disassembly in this chapter.

Crankshaft Installation

- Refer to the Crankcase Assembly in this chapter.

Crankshaft Disassembly

If the crankshaft is damaged, replace it as a set. Not for sale to each part of the crankshaft.

Connecting Rod Big End Seizures

- In case of seizure, replace the crankshaft assembly.

Connecting Rod Big End Radial Clearance

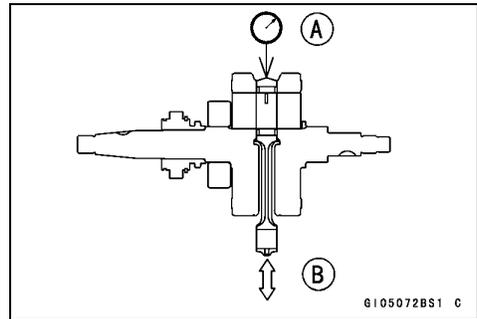
- Support the crankshaft with both side, and place a dial gauge [A] against the connecting rod big end.
- Push [B] the connecting rod first towards the gauge and then in the opposite direction. The difference between two gauge readings is the radial clearance.

Connecting Rod Big End Radial Clearance

Standard: 0.005 ~ 0.017 mm (0.0002 ~ 0.0007 in.)

Service Limit: 0.07 mm (0.003 in.)

- ★ If the radial clearance exceeds the service limit, replace the crankshaft assembly.



Connecting Rod Big End Side Clearance

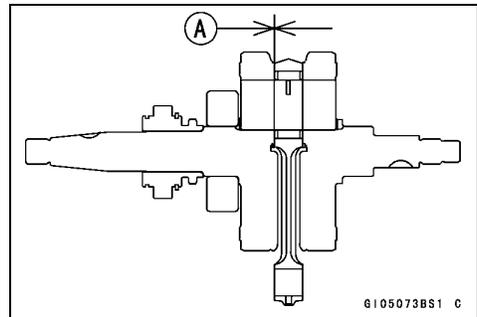
- Measure connecting rod big end side clearance [A].

Connecting Rod Big End Side Clearance

Standard: 0.20 ~ 0.35 mm (0.008 ~ 0.014 in.)

Service Limit: 0.50 mm (0.020 in.)

- ★ If the clearance exceeds the service limit, replace the crankshaft assembly.



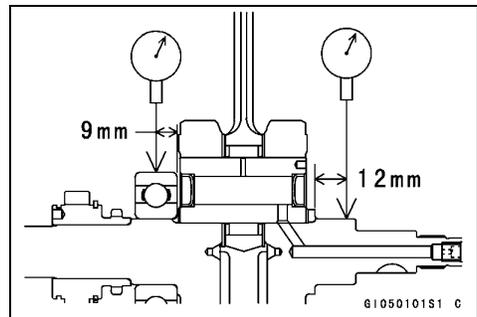
Crankshaft Runout

- Supporting the crankshaft from both side, place a dial gauge as shown and turn the crankshaft slowly. The maximum difference in gauge reading is the crankshaft runout.

Standard: TIR 0.03 mm (0.0012 in.) or less

Service Limit: TIR 0.07 mm (0.003 in.)

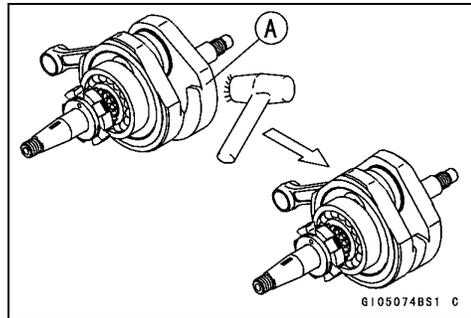
- ★ If the runout at either point exceeds the service limit, replace the crankshaft assembly with a new one or align the crankshaft so that the runout falls within the service limit.



8-14 CRANKSHAFT/TRANSMISSION

Crankshaft

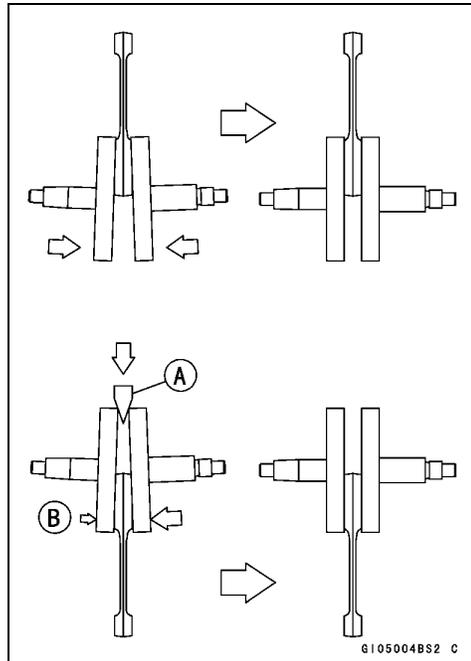
- First correct the horizontal misalignment by striking the projecting crank half [A] with a plastic, soft lead, or brass hammer as shown.
- Recheck the runout with a dial gauge and repeat the process until the runout falls within the service limit.



- Next, correct the vertical misalignment by either driving a wedge [A] in between the crank halves or by squeezing them in a vice, depending on the nature of the misalignment.

CAUTION

Do not hammer the crank half at the point [B].

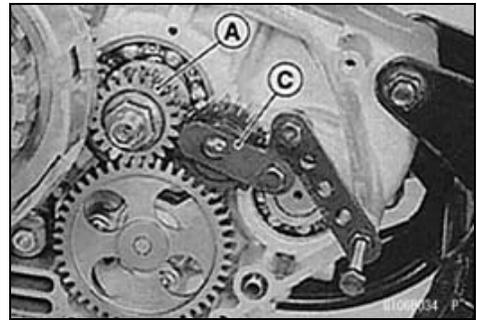


Balancer Shaft Gear

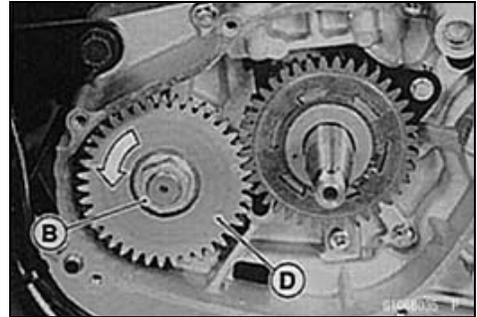
Balancer Shaft Gear Removal

- Remove:
 - Alternator Rotor (see Electrical System chapter)
 - Clutch Cover (see Clutch chapter)
- Using the gear holder, hold the primary gear [A] and loosen the balancer shaft gear nut [B].

Special Tool - Gear Holder, m1.75: 57001-1015 [C]

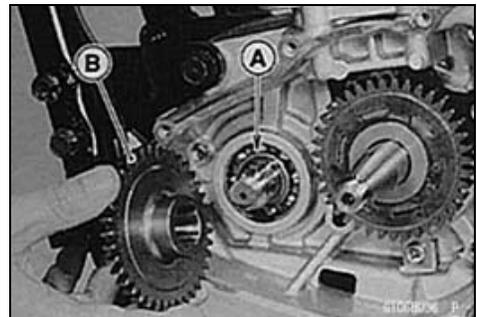


- Remove the balancer shaft gear [D] along with the woodruff key.

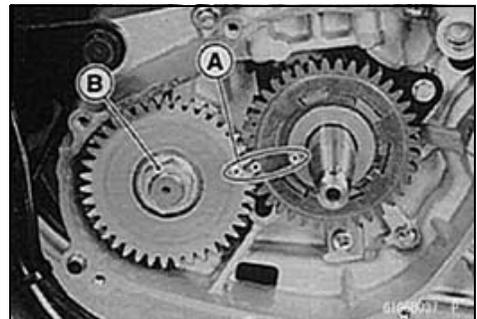


Balancer Shaft Gear Installation

- Fit the woodruff key [A] securely into the groove, then install the balancer shaft gear [B].



- Align the timing marks [A] on the balancer shaft gear and the crank balancer gear.
Balancer Shaft Gear Nut [B]

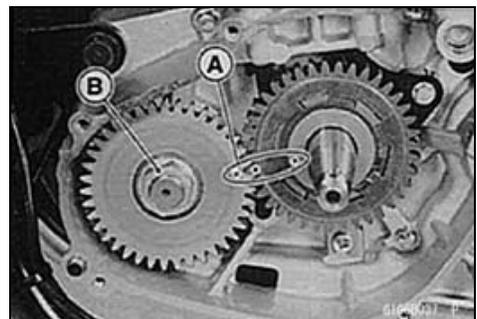


- Using the gear holder, hold the primary gear [A] as shown.
- Apply oil to the threads and seating surface of the balancer shaft gear nut.
- Tighten the balancer shaft gear nut [B].

Torque - Balancer Shaft Gear Nut: 78 N·m (8.0 kgf·m, 58 ft·lb)

Special Tool - Gear Holder, m1.75: 57001-1015

- Install:
 - Alternator Rotor (see Electrical System chapter)
 - Alternator Cover (see Electrical System chapter)
 - Clutch Cover (see Clutch chapter)



8-16 CRANKSHAFT/TRANSMISSION

Starter Motor Clutch

Starter Motor Clutch Removal/Installation

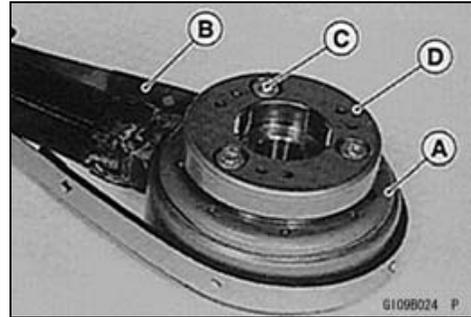
- Refer to the Alternator Rotor Removal and Installation in the Electrical System chapter.

Starter Motor Clutch Disassembly

- Remove the alternator rotor [A] (see Electrical System chapter).
- Hold the alternator rotor with the flywheel holder [B] and remove the starter motor clutch bolts [C].

Special Tool - Flywheel Holder: 57001-1313

- Remove the starter motor clutch [D].



Starter Motor Clutch Assembly

- Apply a non-permanent locking agent to the threads of the starter motor clutch bolts [A], and tighten them.

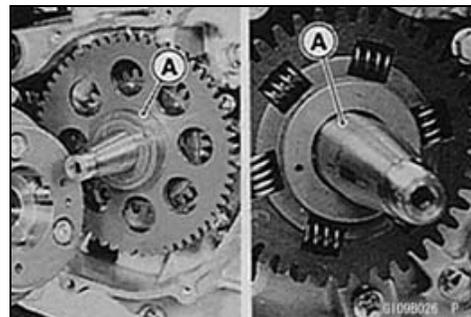
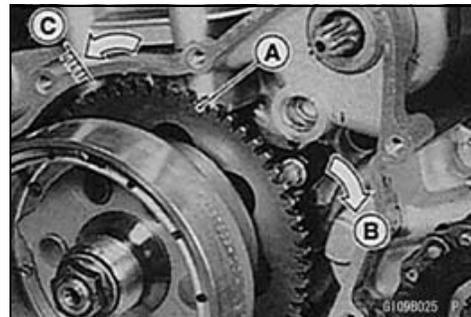
Torque - Starter Motor Clutch Bolts

(BN125-A1): 34 N·m (3.5 kgf·m, 25 ft·lb)

(BN125-A2 ~): 12 N·m (1.2 kgf·m, 104 in·lb)

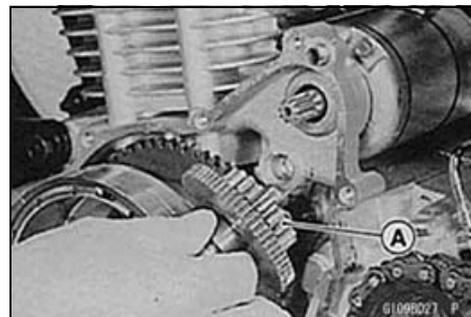
Starter Motor Clutch Inspection

- Remove the alternator cover (see Electrical System chapter).
- Turn the starter gear [A] by hand. The starter gear should turn clockwise [B] freely, but should not turn counterclockwise [C] by the starter clutch function.
- ★ If the starter motor clutch does not operate as it should or if it makes noise, disassemble the starter motor clutch, and visually inspect the clutch parts. If there is any worn or damaged part, replace it.
- Visually inspect the starter gear and crankshaft.
- ★ If the sliding surface [A] is worn or damaged, replace the starter gear and/or crankshaft.



Torque Limiter Inspection

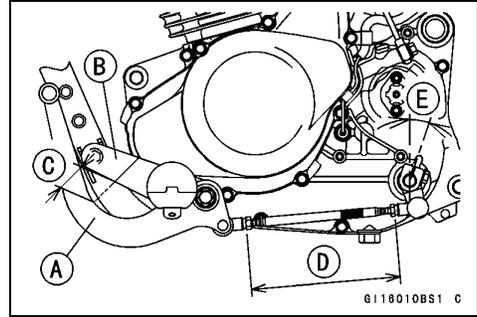
- Remove the torque limiter [A] and visually inspect it.
- ★ If the limiter has any wear, discoloration, or other damage, replace it as a unit.



External Shift Mechanism

Shift Pedal Height Adjustment

- Adjust the length of the shift linkage rod so that the distance between the shift pedal [A] and the front left footpeg [B] shall be 26.5 ~ 29.5 mm (1.04 ~ 1.16 in.) [C]. Then, the length [D] of the shift linkage rod will be approximately 141 mm (5.55 in.) as illustrated.
- [E]: 18.6°

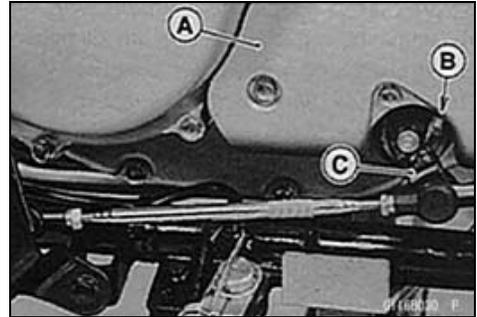


Shift Pedal Removal

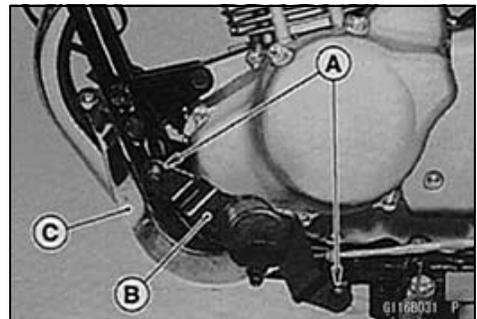
- Remove the engine sprocket cover [A] (see Final Drive chapter).
- Remove the clamp bolt [B].
- Remove the shift lever [C] from the shift shaft.

NOTE

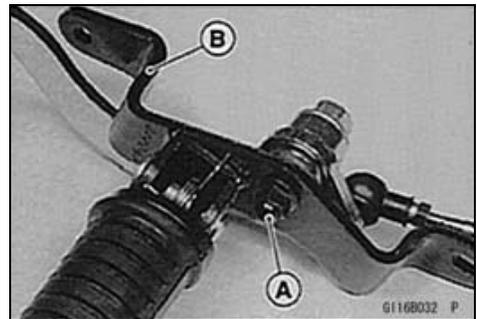
○When installing the shift lever onto the shift shaft, align the groove of the lever with the punch mark of the shift shaft.



- Remove:
Bolts [A]
Front Left Footpeg [B]
Shift Pedal [C]



- Remove:
Nut [A]
Shift Pedal [B]



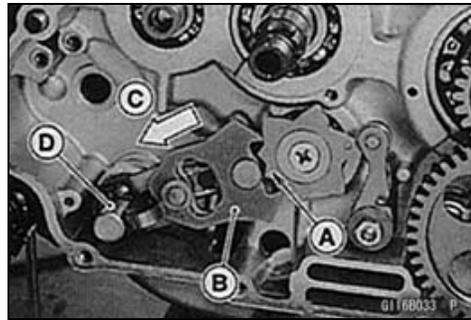
External Shift Mechanism Removal

- Drain the engine oil (see Engine Lubrication System chapter).
- Remove:
Clutch (see Clutch chapter)
Engine Sprocket Cover (see Final Drive chapter)
- Unscrew the shift lever clamp bolt and remove the shift lever from the shift shaft.

8-18 CRANKSHAFT/TRANSMISSION

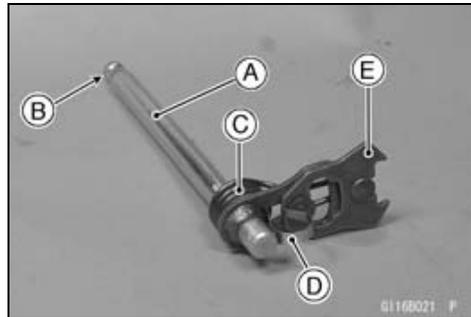
External Shift Mechanism

- Turn the shift drum and position the neutral groove [A] as shown.
- Remove the shift shaft [D] while pushing [C] the shift mechanism arm [B] toward the shaft.



External Shift Mechanism Inspection

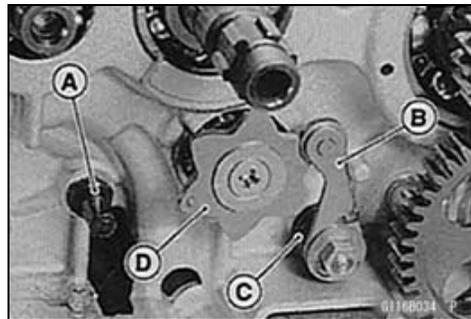
- Examine the shift shaft [A] for any damage.
 - ★ If the shaft is bent, straighten or replace it.
 - ★ If the splines [B] are damaged, replace the shaft.
 - ★ If the springs [C] [D] are damaged in any way, replace them.
 - ★ If the shift pawl [E] is damaged in any way, replace the shift shaft assembly.



- Check the return spring pin [A] is not loose.
 - ★ If it is loose, unscrew it to apply a non-permanent locking agent to the threads, and tighten it.

Torque - Shift Shaft Return Spring Pin: 29 N·m (3.0 kgf·m, 21 ft·lb)

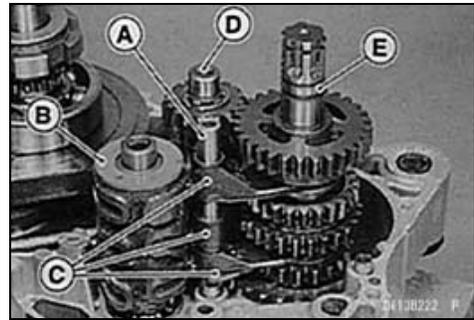
- Check the gear positioning lever [B], and their spring [C] for breaks or distortion.
 - ★ If the lever or springs are damaged in any way, replace them.
- Visually inspect the shift drum cam [D].
 - ★ If the cam is badly worn or if it shows any damage, replace it.



Transmission

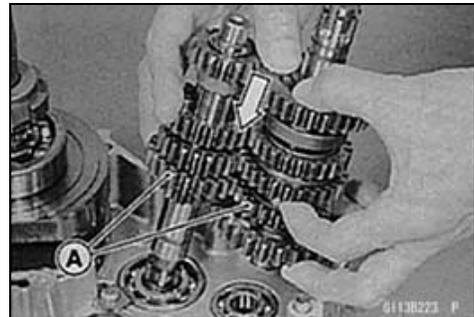
Transmission Shaft Removal

- Split the crankcase (see Crankcase Disassembly).
- Pull out the shift rod [A] allowing the shift fork guide pins to free from the shift drum [B].
- Remove the shift forks [C].
- Remove the shift drum.
- Pull out the drive shaft [D] and output shaft [E] together with their gears meshed.

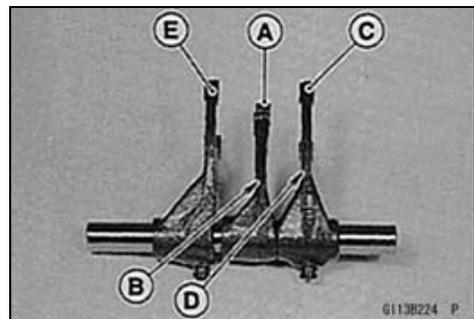


Transmission Shaft Installation

- Apply engine oil to the sliding portions of every gear and bearing.
- Install the drive shaft and output shaft [B] in the right crankcase with their gears [A] meshed.

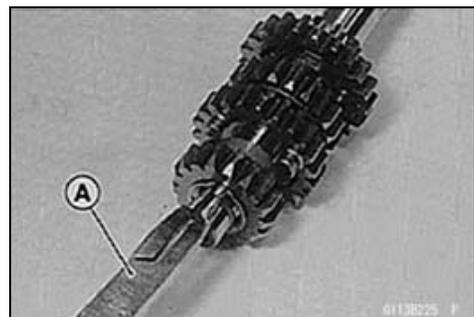


- Apply a small amount of engine oil to the shift fork fingers and fit each shift fork into the groove of the proper gear.
- The shift forks can be identified by their shape or number. Install them noting the direction shown.
- The drive shaft fork [A] is the shortest, and install it with its mark "65" [B] facing the engine left side.
- Install the output shaft fork [C] with its mark "64" [D] facing the engine left side.
- Install the left output shaft fork [E] as shown.
- Fit each shift fork guide pin into the corresponding groove in the shift drum.
- Apply a small amount of engine oil to the shift rod and slide them into the shift forks.
- Assemble the crankcase (see Crankcase Assembly).



Transmission Disassembly

- Remove the transmission shafts.
- Remove the circlips, washers, then gears.
- **Special Tool - Outside Circlip Pliers: 57001-144 [A]**
- Do not reuse the removed circlips.

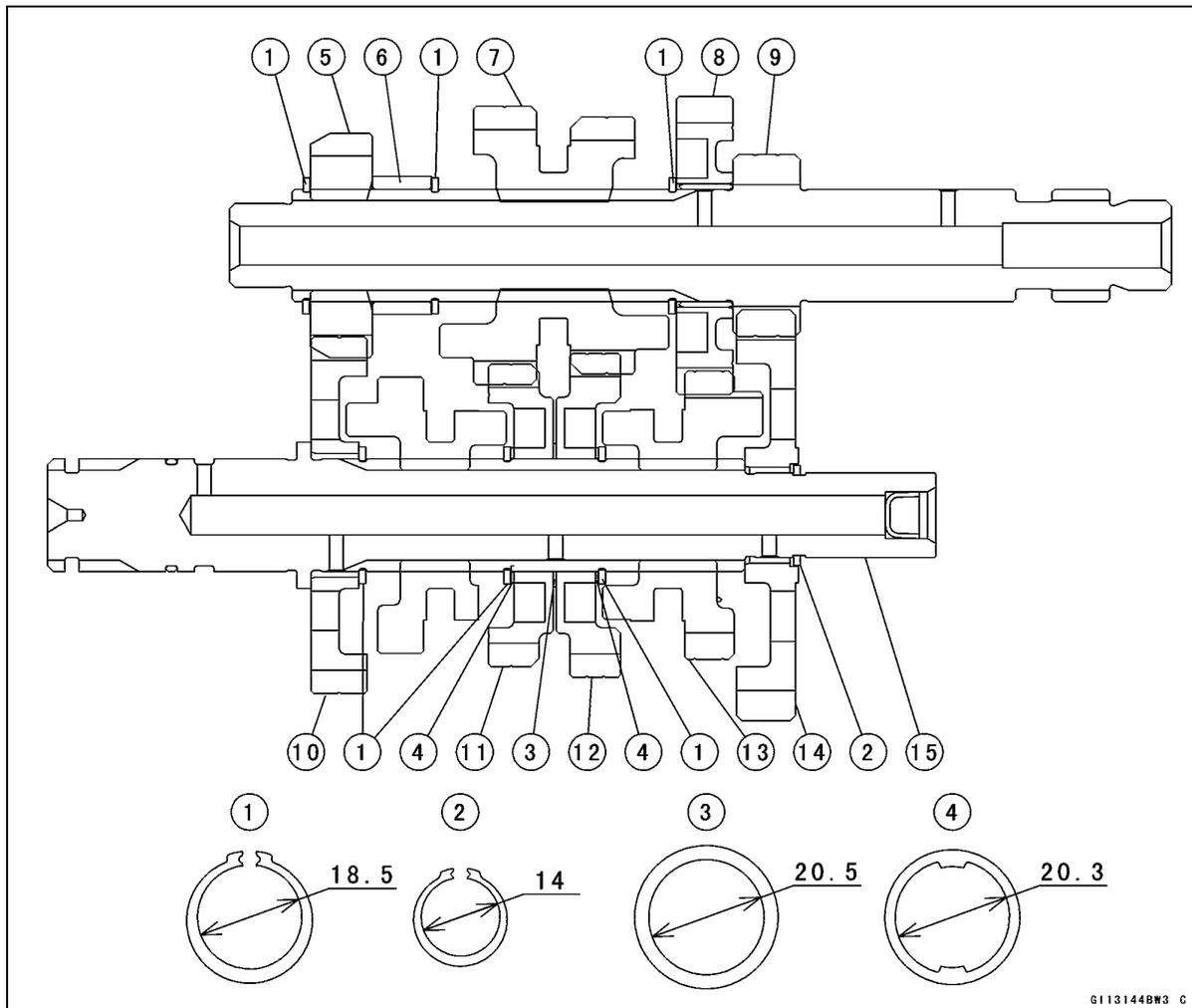
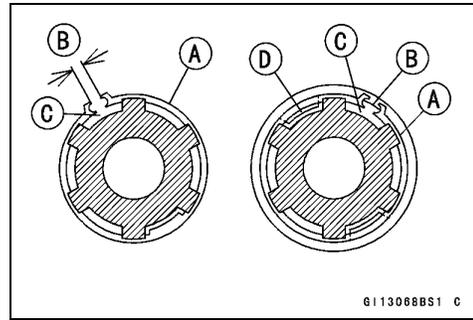


8-20 CRANKSHAFT/TRANSMISSION

Transmission

Transmission Assembly

- Replace any circlips removed with new ones.
- Install the circlips [A] so that the opening [B] is aligned with a spline groove [C].
- Install the toothed washer [D] so that the teeth [E] are not aligned with the opening of the circlip.
- The drive shaft gears can be recognized by size: the gear with the smallest diameter is 1st gear, and the largest one is 5th gear. Be sure that all parts are put back in the correct sequence and all circlips and washers are properly in place.
- The output shaft gears can be recognized by size: the gear with the largest diameter is 1st gear, and the smallest one is 5th gear. Be sure that all parts are put back in the correct sequence and all circlips and washers are properly in place.
- Check that each gear spins or slides freely on the transmission shafts without binding after assembly.



1. Circlip
2. Circlip
3. Washer
4. Toothed Washer
5. Drive Gear-2nd

6. Collar
7. Drive Gear-3rd and 4th
8. Drive Gear-5th
9. Drive Shaft
10. Output Gear-2nd

11. Output Gear-4th
12. Output Gear-3rd
13. Output Gear-5th
14. Output Gear-Low
15. Output Shaft

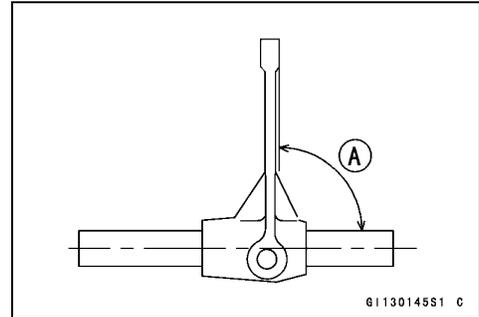
Transmission

Shift Drum Removal/Installation

- Refer to the Crankcase Disassembly/Installation in the Crankshaft/Transmission chapter.

Shift Fork Bending

- Visually inspect the shift forks, and replace any fork that is bent. A bent fork could cause difficulty in shifting, or allow the transmission to jump out of gear when under power. 90° [A]



Shift Fork/Gear Groove Wear

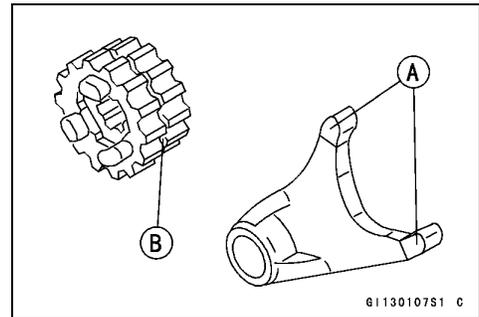
- Measure the thickness of the shift fork ears [A], and measure the width [B] of the gear grooves.

Shift Fork Ear Thickness

- Standard:** 4.9 ~ 5.0 mm (0.193 ~ 0.197 in.)
- Service Limit:** 4.8 mm (0.189 in.)

Gear Groove Width

- Standard:** 5.05 ~ 5.15 mm (0.199 ~ 0.203 in.)
- Service Limit:** 5.25 mm (0.207 in.)



- ★ If the thickness of a shift fork ear is less than the service limit, the shift fork must be replaced.
- ★ If the gear groove is worn over the service limit, the gear must be replaced.

Shift Fork Guide Pin/Drum Groove Wear

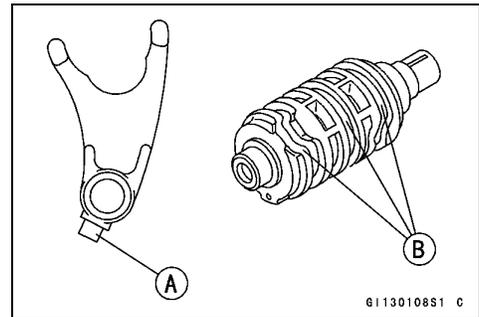
- Measure the diameter of each shift fork guide pin [A], and measure the width [B] of each shift drum groove.

Shift Fork Guide Pin Diameter

- Standard:** 5.9 ~ 6.0 mm (0.232 ~ 0.236 in.)
- Service Limit:** 5.8 mm (0.228 in.)

Shift Drum Groove Width

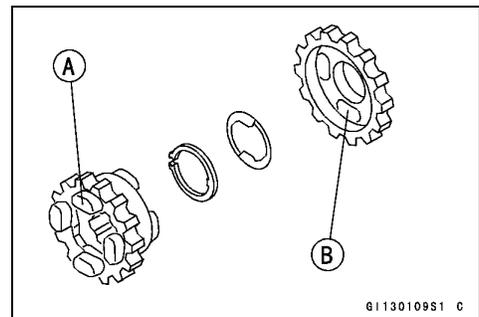
- Standard:** 6.05 ~ 6.20 mm (0.238 ~ 0.244 in.)
- Service Limit:** 6.3 mm (0.248 in.)



- ★ If the guide pin on any shift fork is less than the service limit, the fork must be replaced.
- ★ If any shift drum groove is worn over the service limit, the drum must be replaced.

Gear Dog and Gear Dog Hole Damage

- Visually inspect the gear dogs [A] and gear dog holes [B].
- ★ Replace any damaged gears or gears with excessively worn dogs or dog holes.



8-22 CRANKSHAFT/TRANSMISSION

Ball Bearing, and Oil Seal

Ball Bearing Replacement

CAUTION

Do not remove the ball bearings unless it is necessary. Removal may damaged them.

- Using a press or puller, remove the ball bearing.

NOTE

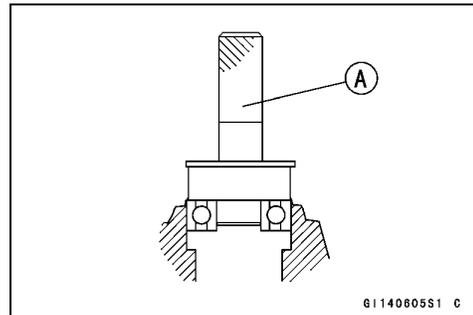
○ In the absence of the above mentioned tools, satisfactory results may be obtained by heating the case to approximately 93°C (200°F) max, and tapping the bearing in or out.

CAUTION

Do not heat the case with a torch. This will warp the case. Soak the case in oil and heat the oil.

- Using a press and the bearing driver set [A], install the new bearing until it stops at the bottom of its housing.

Special Tool - Bearing Driver Set: 57001-1129

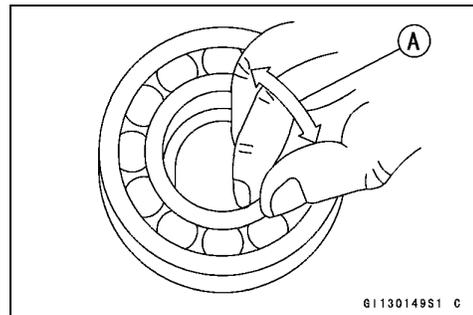


Ball Bearing Wear

CAUTION

Do not remove the bearings for inspection. Removal may damage them.

- Check the ball bearings.
- Since the ball bearings are made to extremely close tolerances, the wear must be judged by feel rather than measurement. Clean each bearing in a high-flash point solvent, dry it (do not spin the bearing while it is dry), and oil it with engine oil.
- Spin [A] the bearing by hand to check its condition.
- ★ If the bearing is noisy, does not spin smoothly, or has any rough spots, replace it.



Oil Seal Inspection

- Inspect the oil seals.
- ★ Replace it if the lips are misshapen, discolored (indicating that the rubber has deteriorated), hardened or otherwise damaged.

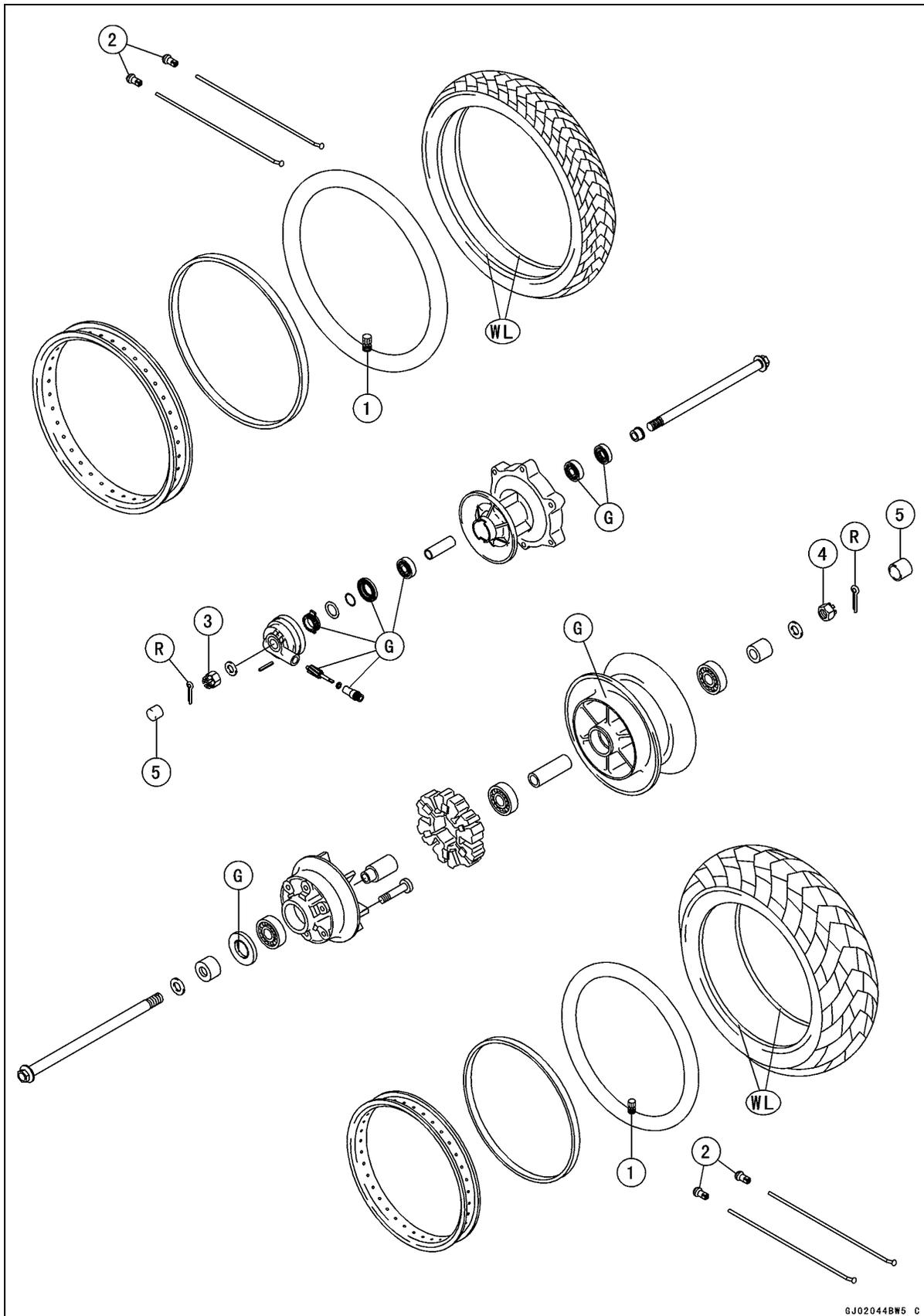
Wheels/Tires

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9-2 WHEELS/TIRES

Exploded View



GJ02044BW5 C

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Tire Air Valve Nuts	1.5	0.15	13 in·lb	
2	Spoke Nipples	2.0 ~ 3.9	0.20 ~ 0.40	17 ~ 35 in·lb	
3	Front Axle Nut	78	8.0	58	
4	Rear Axle Nut	98	10.0	72	

5. For DE of BN125-A1 ~ A2 and On and after BN125-A3 of EUR Models

G: Apply grease.

R: Replacement Parts

WL: Apply soap and water solution or rubber lubricant.

DE: Germany

EUR: Europe

9-4 WHEELS/TIRES

Specifications

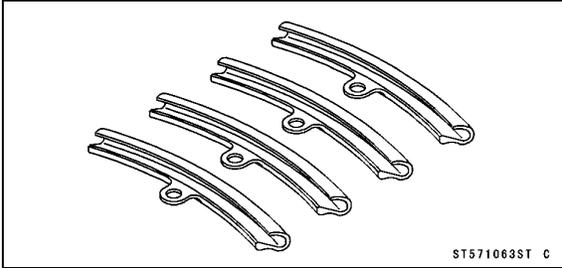
Item	Standard	Service Limit
Wheels (Rims)		
Rim Size:		
Front	17 × 1.85	---
Rear	15 × 2.75	---
Rim Runout (with tire installed):		
Axial	TIR 0.8 mm (0.03 in.) or less	2 mm (0.08 in.)
Radial	TIR 1.0 mm (0.04 in.) or less	2 mm (0.08 in.)
Axle Rumout/100 mm (3.9 in.)	TIR 0.1 mm (0.004 in.) or less	0.2 mm (0.008 in.)
Tires		
Air Pressure (When Cold):		
Front:		
(BN125-A1 ~ A2)	Up to 185 kg (408 lb) load: 150 kPa (1.5 kgf/cm ² , 21 psi)	---
(BN125-A3 ~)	Up to 155 kg (342 lb) load: 150 kPa (1.5 kgf/cm ² , 21 psi)	---
Rear:		
(BN125-A1 ~ A2)	Up to 185 kg (408 lb) load: 175 kPa (1.75 kgf/cm ² , 25 psi)	---
(BN125-A3 ~)	Up to 155 kg (342 lb) load: 175 kPa (1.75 kgf/cm ² , 25 psi)	---
Tread Depth:		
Front:		
(BN125-A1 ~ A2)	4.5 mm (0.18 in.)	
BN125-A3 ~ A5)	4.0 mm (0.157 in.)	1 mm (0.04 in.)
(BN125-A6 ~)	4.1 mm (0.161 in.)	
Rear:	7.3 mm (0.29 in.)	2 mm (0.08 in.)
Standard Tires:	Make, Type	Size
Front:		
(BN125-A1 ~ A2)	DUNLOP D404F, tube type	90/90 -17 49P
(BN125-A3 ~ A5)	IRC NF53 Tube type	90/90-17 49P
(BN125-A6 ~)	IRC NF53 Tube type	90/90 -17 M/C 49P
Rear:		
(BN125-A1 ~ A2)	DUNLOP D404, tube type	130/90-15 M/C 66P
(BN125-A3 ~)	IRC NR67 Tube type	130/90 -15 M/C 66P
Replacement Tires:	Make, Type	Size
Front	METZELER PERFECT ME77, tube type	3.00-17 50P
Rear	METZELER PERFECT ME77, tube type	130/90-15 M/C 66S

WARNING

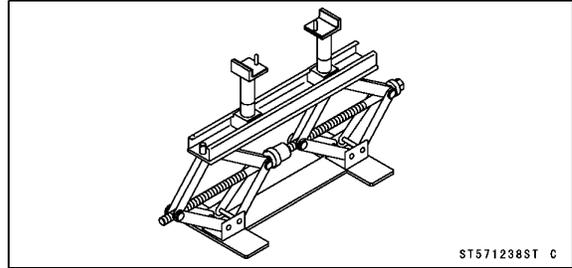
Use the same manufacturer's tires on both front and rear wheels.

Special Tools

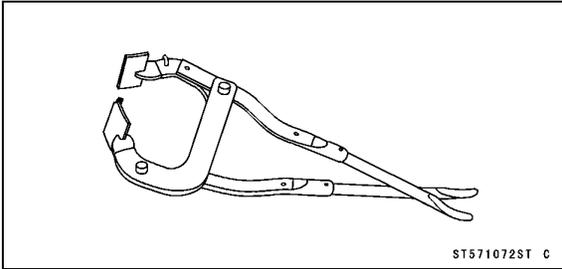
Rim Protector:
57001-1063



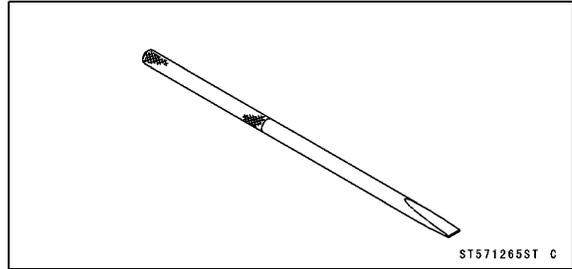
Jack:
57001-1238



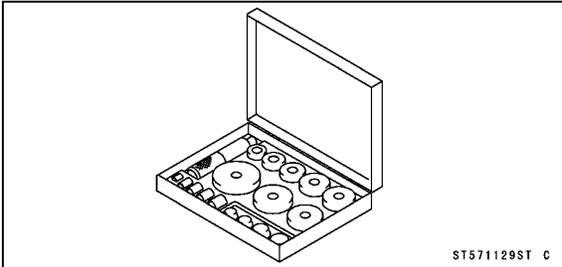
Bead Breaker Assembly:
57001-1072



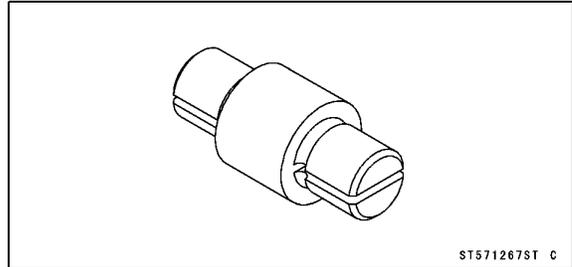
Bearing Remover Shaft, $\phi 9$:
57001-1265



Bearing Driver Set:
57001-1129



Bearing Remover Head, $\phi 15 \times \phi 17$:
57001-1267

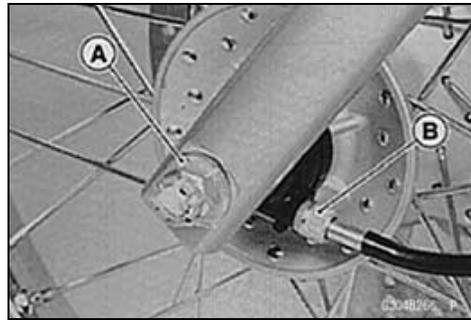


9-6 WHEELS/TIRES

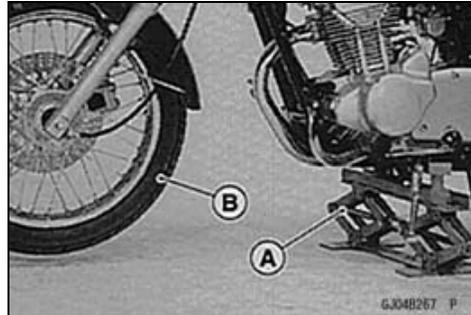
Wheels (Rims)

Front Wheel Removal

- Remove the cotter pin and axle nut [A].
- Remove the speedometer cable lower end [B].



- Raise the front wheel [B] off the ground using the jack [A].
Special Tool - Jack: 57001-1238



- Pull out the axle and drop the front wheel [A] out of the forks.
- Insert a wooden plate between the pads in the caliper to prevent the caliper piston from jumping out.

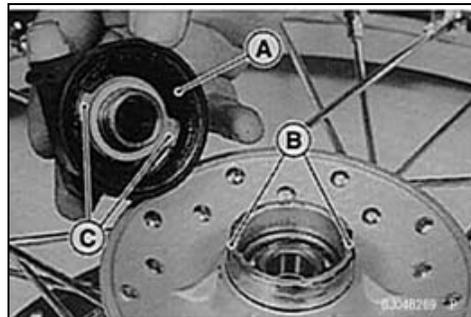


CAUTION

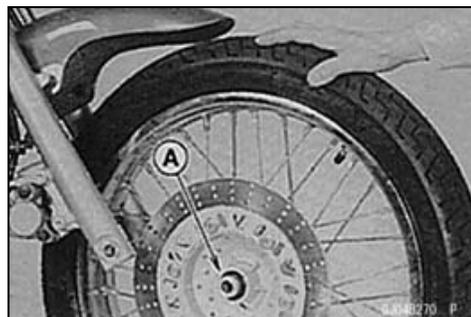
Do not lay the wheel down on the disc. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

Front Wheel Installation

- Apply grease to the seal lip [A] of the speedometer gear.
- Install the speedometer gear housing so that the projections [C] fit in the drive notches [B].

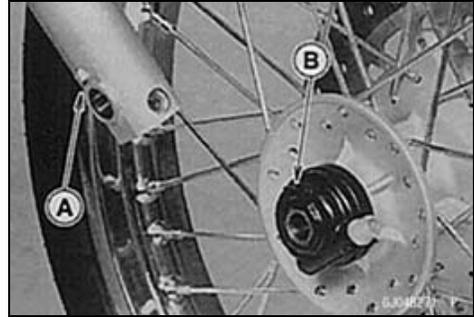


- Fit the collar [A] on the right side of the hub.



Wheels (Rims)

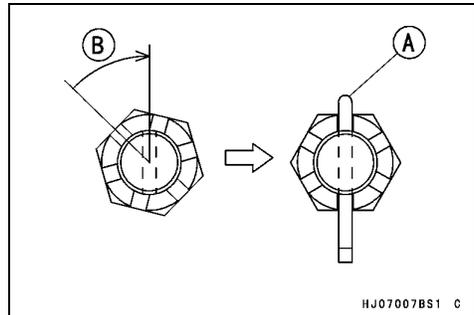
- Fit the fork leg stop [A] between the speedometer gear housing stop [B] and install the front wheel.
- Install the axle from the right side and tighten the axle nut.
Torque - Front Axle Nut: 78 N·m (8.0 kgf·m, 58 ft·lb)



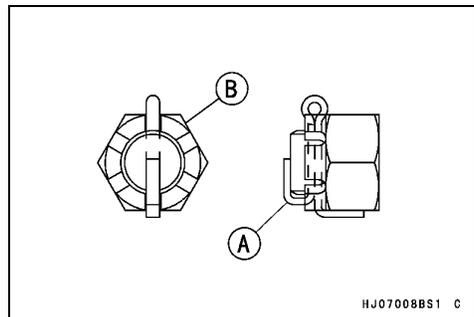
- Insert a new cotter pin [A].

NOTE

- When inserting the cotter pin, if the slots in the nut do not align with the cotter pin hole in the axle, tighten the nut clockwise [B] up to next alignment.
- It should be within 30 degree.
- Loosen once and tighten again when the slot goes past the nearest hole.



- Bend the cotter pin [A] over the nut [B].



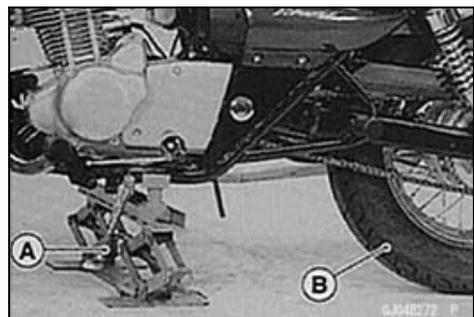
- Check the front brake effectiveness.

⚠ WARNING

Do not attempt to drive the motorcycle until a full brake lever is obtained by pumping the brake lever until the pads are against the disc. The brake will not function on the first application of the lever if this is not done.

Rear Wheel Removal

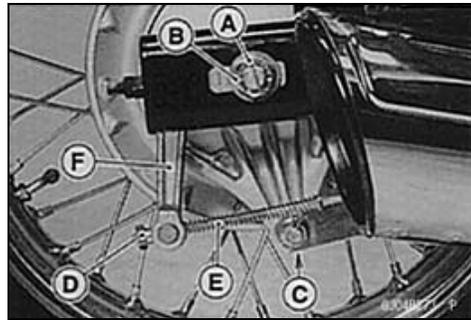
- Raise the rear wheel [B] off the ground using the jack [A].
Special Tool - Jack: 57001-1238



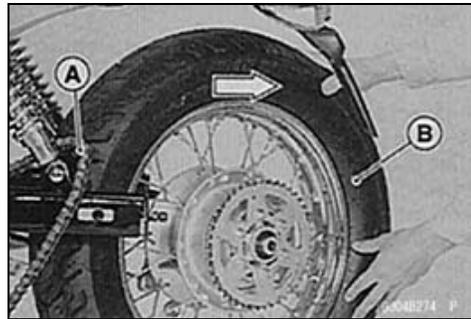
9-8 WHEELS/TIRES

Wheels (Rims)

- Remove:
 - Chain Cover
 - Cotter Pin [A] and Axle Nut [B]
 - Torque Link Bolt, Nut (rear) [C]
 - Brake Adjusting Nut [D]
- Remove the brake rod [E] from the brake cam lever [F].



- Remove the drive chain [A] from the rear sprocket, then remove the rear wheel [B] to the rear.



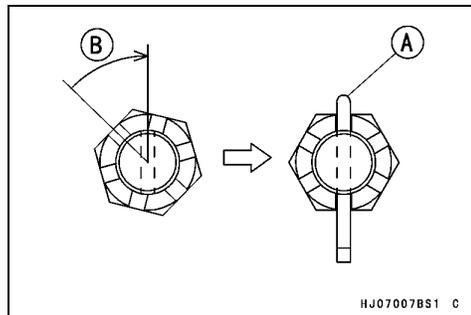
Rear Wheel Installation

- Apply high-temperature grease seal lips and the inner circumference of the sprocket coupling (see Final Drive chapter).
- Install the collar [A] on the both side of the hub.
- Engage the drive chain with the rear sprocket, and install the rear wheel.
- Check the drive chain slack (see Periodic Maintenance chapter).
- Tighten:
 - Torque - Rear Axle Nut: 98 N·m (10.0 kgf·m, 72 ft·lb)**

- Insert a new cotter pin [A].

NOTE

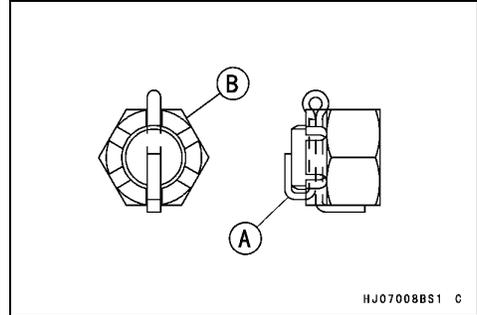
- When inserting the cotter pin, if the slots in the nut do not align with the cotter pin hole in the axle, tighten the nut clockwise [B] up to next alignment.
- It should be within 30 degree.
- Loosen once and tighten again when the slot goes past the nearest hole.



HJ07007BS1 C

Wheels (Rims)

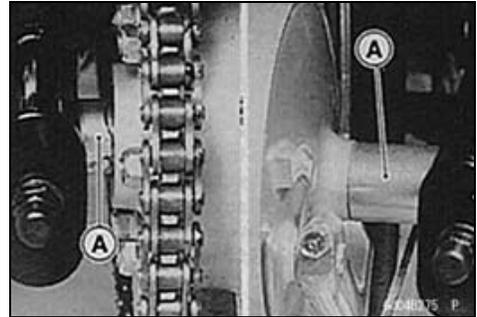
- Bend the cotter pin [A] over the nut [B].



- Adjust the brake pedal free play (see Brakes chapter).
- Check the rear brake effectiveness.

⚠ WARNING

If a full brake pedal is not obtained, disassemble and inspect the brake parts. Worn parts cause lock of the brake or loss of braking.



Wheel Inspection

- Raise the front/rear wheel off the ground.
 - Special Tool - Jack: 57001-1238**
- Spin the wheel lightly, and check for roughness or binding.
- ★ If roughness or binding is found, replace the hub bearings.

Spoke Inspection

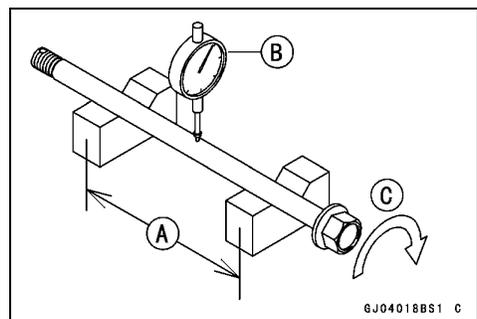
- Refer to the Spoke Tightness Inspection in the Periodic Maintenance chapter.

Rim Inspection

- Refer to the Rim Runout Inspection in the Periodic Maintenance chapter.

Axle Inspection

- Visually inspect the front or rear axle for damage.
- ★ If the axle is damaged or bent, replace it.
- Place the axle on the V blocks that are 100 mm (3.9 in.) [A] apart, and set a dial gauge [B] on the axle at a point halfway between the blocks. Turn [C] the axle to measure the runout. The difference between the highest and lowest dial readings is the amount of runout.
- ★ If axle runout exceeds the service limit, replace the axle.



Axle Runout/100 mm (3.9 in.)

Standard: TIR 0.1 mm (0.004 in.) or less

Service Limit: TIR 0.2 mm (0.008 in.)

9-10 WHEELS/TIRES

Tires

Air Pressure Inspection/Adjustment

- Refer to the Air Pressure Inspection/Adjustment in the Periodic Maintenance chapter.

Tire Inspection

- Refer to the Tire Wear Inspection in the Periodic Maintenance chapter.

Tire Removal

- Remove the following.
 - Wheel (see this chapter)
 - Brake Disc (front)
 - Brake Panel (rear)
 - Valve Core (let out the air)
- To maintain wheel balance, mark the air valve position on the tire with chalk so that the tire can be reinstalled in the same position.
 - Air Valve [A]
 - Chalk Mark [B]
- Lubricate the tire beads and rim flanges on both sides with a soap and water solution or rubber lubricant. This helps the tire beads slip off the rim flanges.

CAUTION

Never lubricate with engine oil or petroleum distillates because they will deteriorate the tire.

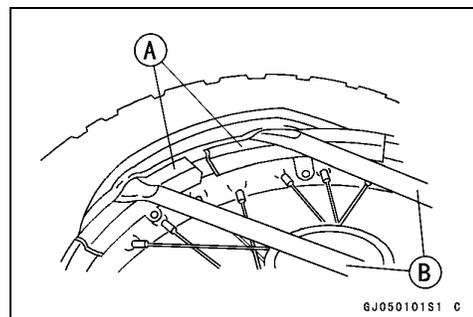
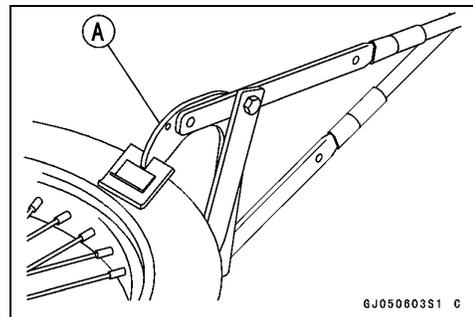
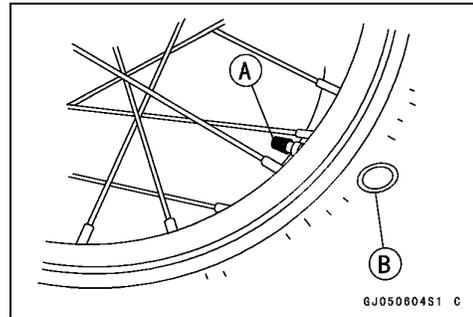
- Break the beads away from both sides of the rim with the bead breaker [A].

Special Tool - Bead Breaker Assembly: 57001-1072

- Install the rim protectors [A] around the valve stem. Lubricate the tire irons [B] and rim protectors with soap and water solution, or rubber lubricant.
- Step on the side of the tire opposite the valve stem, and start prying the tire off the rim near the valve stem with tire irons (special tools).

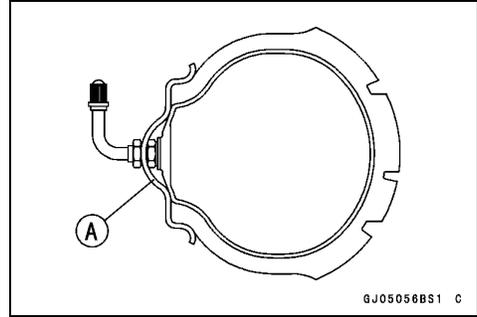
Special Tools - Rim Protector: 57001-1063

Bead Breaker Assembly: 57001-1072



Tires

- For easier removal, always drop the tire bead opposite the valve stem into the rim well [A], and pry the tire bead a little at a time.
- Do the same for the other side of the tire, then remove the rim from the tire.
- Remove the protectors.



Tire Installation

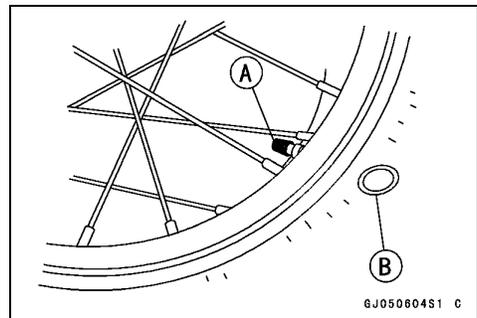
⚠ WARNING

To ensure safe handling and stability, use only the recommended standard tires for replacement, inflated to the standard pressure. Use the same manufacturer's tires on both front and rear wheels.

NOTE

○ Replace the rim band with a new one whenever the tire is replaced.

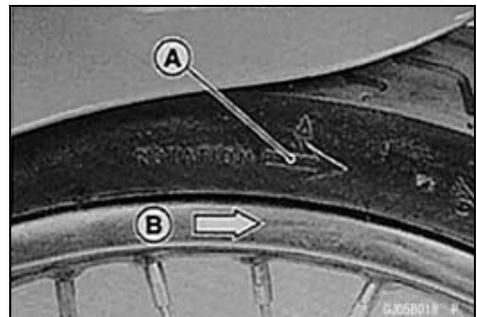
- Position the tire on the rim so that the air valve [A] is at the tire balance mark [B] (the chalk mark made during removal or the yellow paint mark on a new tire).
- Tighten:
 - Torque - Tire Air Valve Nut: 1.5 N·m (0.15 kgf·m, 13 in·lb)
 - Brake Disc Bolts: 27 N·m (2.8 kgf·m, 20 ft·lb)



- Check the tire rotation mark [A] on the front/rear tire and install it on the rim accordingly.

NOTE

○ The direction of the tire rotation [B] is shown by an arrow on the tire sidewall.

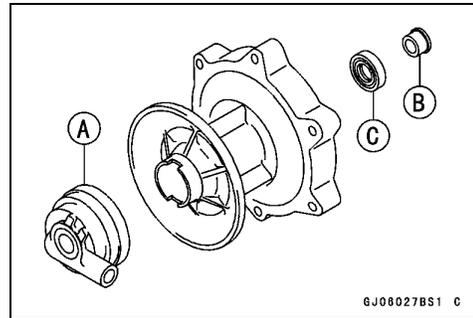


9-12 WHEELS/TIRES

Hub Bearings (Wheel Bearings)

Removal

- Remove the wheel, and take out the following.
 - Speedometer Gear (from front hub) [A]
 - Collars [B]
 - Grease Seals [C]
- Use a screwdriver for the grease seal removal.

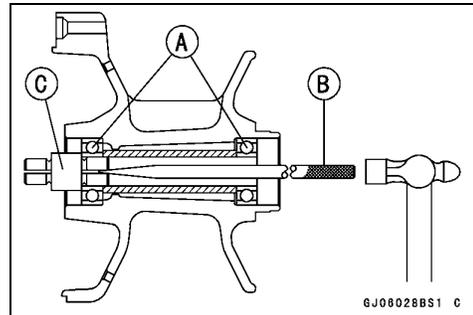


- Remove the hub bearings [A].

CAUTION

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

Special Tools - Bearing Remover Shaft, $\phi 9$: 57001-1265 [B]
Bearing Remover Head, $\phi 15 \times \phi 17$: 57001-1267 [C]



Installation

- Before installing the wheel bearings, blow any dirt or foreign particles out of the hub with compressed air to prevent contamination of the bearings.
- Replace the bearings with new ones.
- Install the bearings so that the marked side faces out.
- Press in each right bearing [A] first until it bottoms out.

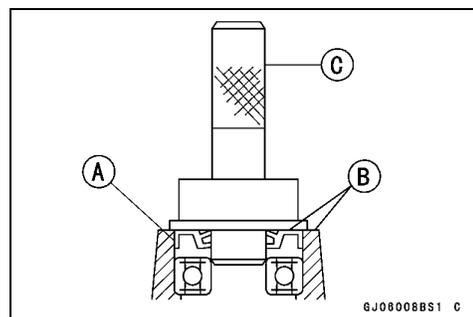
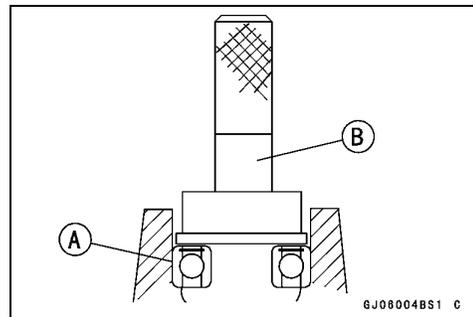
Special Tool - Bearing Driver Set: 57001-1129 [B]

⚠ WARNING

Be sure to bottom out the right bearings on both front and rear wheels, or misalignment of the wheel will result in abnormal drive chain wear, and may result in an unsafe riding condition.

- Replace the grease seal in the front hub with a new one.
- Press in the grease seal [A] so that the seal surface flush [B] with the end of the hole.
- Apply high temperature grease to the grease seal lips.

Special Tool - Bearing Driver Set: 57001-1129 [C]



Hub Bearings (Wheel Bearings)

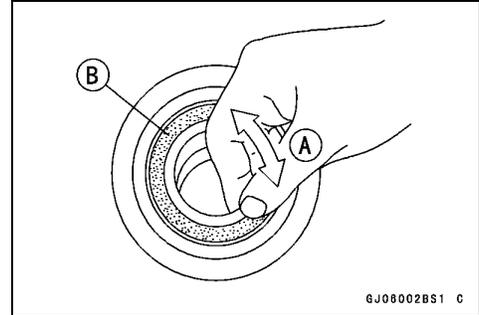
Inspection

○ Since the hub bearings are made to extremely close tolerances, the clearance cannot normally be measured.

NOTE

○ Do not remove any bearings for inspection. If any bearings are removed, they will need to be replaced with new ones.

- Spin [A] the bearing by hand to check its condition.
- ★ If it is noisy, does not spin smoothly, or has any rough spots, it must be replaced.
- Examine the rear hub bearing seal [B] for tears or leakage.
- ★ If the seal is torn or is leaking, replace the bearing.



Lubrication

CAUTION

Do not remove any bearings for lubrication. If any bearings are removed, they will need to be replaced with new ones.

- Pack the front hub bearings with good quality bearing grease. Turn the bearings around by hand a few times to make sure the grease is distributed evenly inside the bearings.

NOTE

○ Since the rear hub bearing are packed with grease and sealed, lubrication is not required.

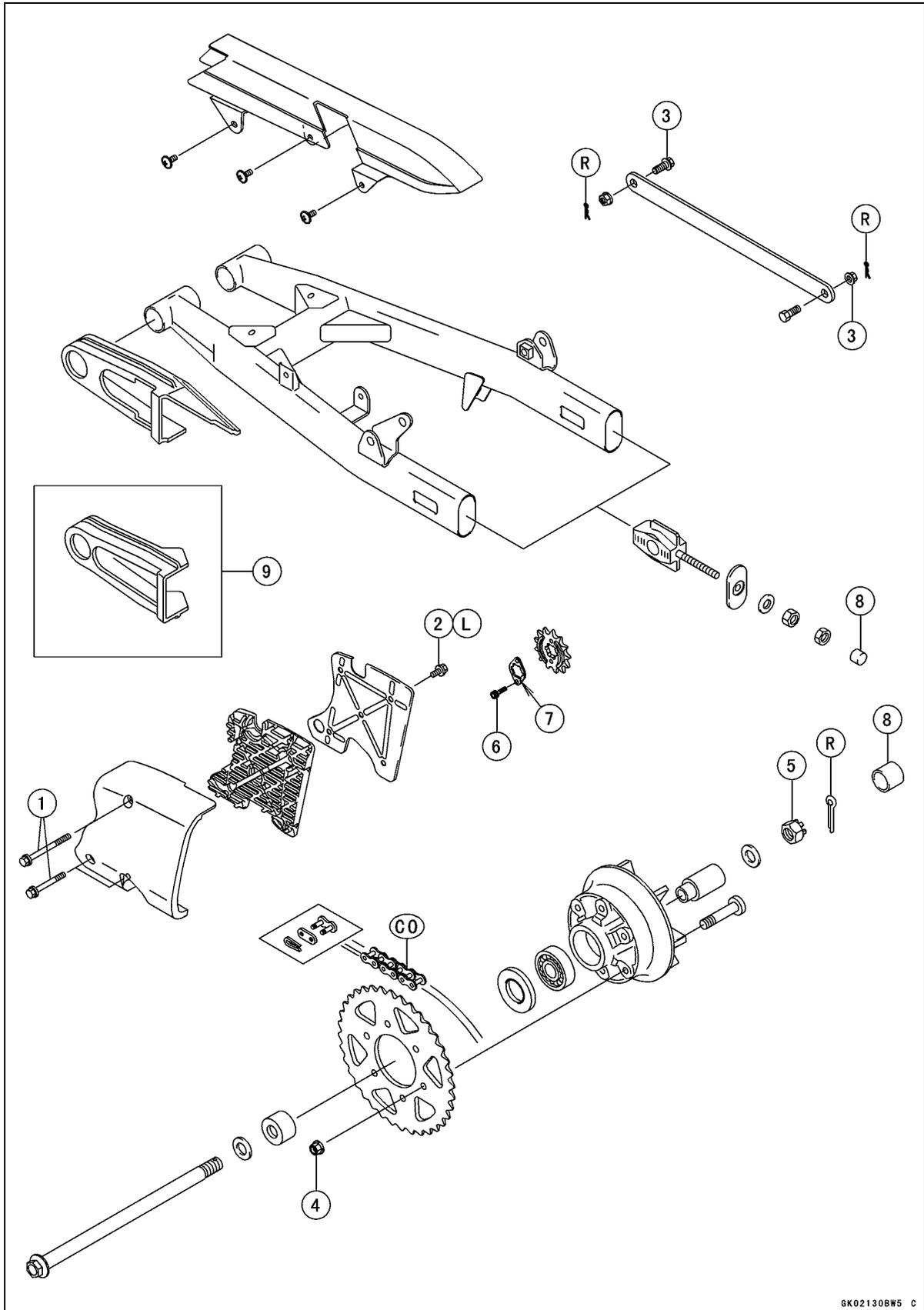
Final Drive

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10-2 FINAL DRIVE

Exploded View



GK02130BWS C

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Engine Sprocket Cover Bolts (BN125-A1 ~ A3)	9.8	1.0	87 in·lb	
	Engine Sprocket Cover Bolts (BN125-A4 ~)	8.8	0.90	78 in·lb	
2	Engine Sprocket Cover Damper Bolts	8.8	0.90	78 in·lb	L
3	Torque Link Bolt and Nut	34	3.5	25	
4	Rear Sprocket Nuts	26	2.7	19	
5	Rear Axle Nuts	98	10.0	72	
6	Engine Sprocket Bolts	12	1.2	102 in·lb	

7. Face the punch mark outward.

8. For DE of BN125-A1 ~ A2 and On and after BN125-A3 of EUR Models

9. BN125-A1 ~ A2 Models only

CO: Apply chain oil.

L: Apply a non-permanent locking agent.

R: Replacement Parts

DE: Germany

EUR: Europe

10-4 FINAL DRIVE

Specifications

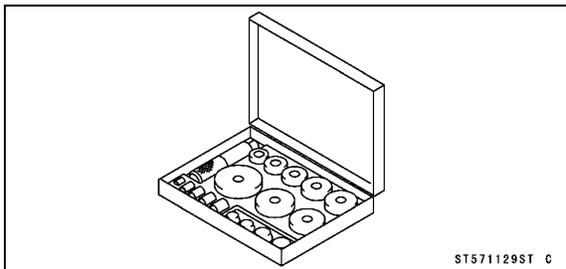
Item	Standard	Service Limit
Drive Chain Standard Chain: Make/type: Link: Chain Slack 20-link Length	ENUMA CHAIN (BN125-A1 ~ A2) Joint Endless EK428SH-R DAIDO (BN125-A3 ~) Joint Endless DID424HG 132 links 130 links (BN125-A7 ~, N, NU) 25 ~ 40 mm (0.98 ~ 1.57 in.) 254.0 ~ 254.6 mm (10.00 ~ 10.02 in.)	- - - - - - - - - - - - 259 mm (10.2 in.)
Sprockets Rear Sprocket Warp	TIR 0.4 mm (0.016 in.) or less	TIR 0.5 mm (0.020 in.)

N: No Catalytic Converter Model

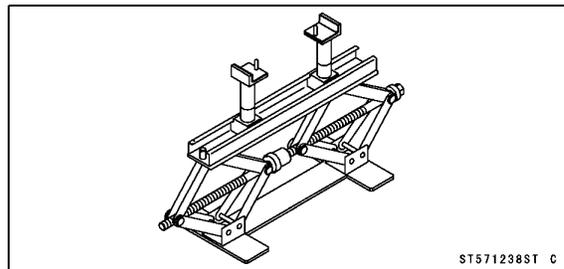
NU: No Catalytic Converter (United Kingdom Model)

Special Tools

**Bearing Driver Set:
57001-1129**



**Jack:
57001-1238**



10-6 FINAL DRIVE

Drive Chain

Chain Slack Inspection

- Refer to the Drive Chain Slack Inspection in the Periodic Maintenance chapter.

Chain Slack Adjustment

- Refer to the Drive Chain Slack Adjustment in the Periodic Maintenance chapter.

Wear Inspection

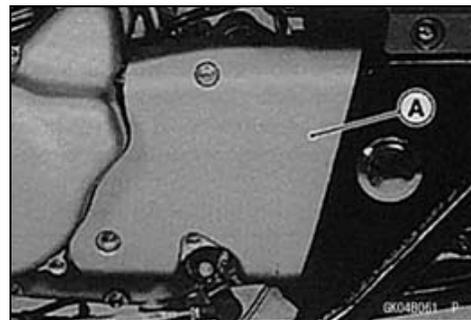
- Refer to the Drive Chain Wear Inspection in the Periodic Maintenance chapter.

Lubrication

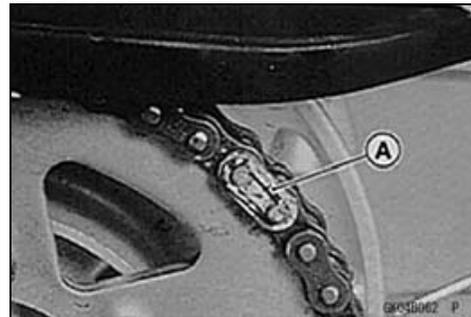
- Refer to the Drive Chain Lubrication in the Periodic Maintenance chapter.

Drive Chain Removal

- Remove the engine sprocket cover [A].



- Remove the clip [A] from the master link using pliers, and remove the chain from the rear sprocket.
- Take the chain off the motorcycle.

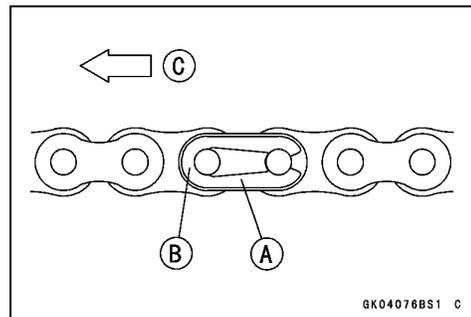


Drive Chain Installation

⚠ WARNING

For safety, use only the standard chain.

- Fit the drive chain back onto the sprockets with the ends at the rear sprocket.
- Install the master link from the frame side.
- Install the clip [A] so that the closed end of the "U" [B] pointed in the direction of chain rotation [C].
- Adjust the drive chain slack (see Periodic Maintenance chapter).
- Check the brake for good braking power, and no brake drag (see Brakes chapter).



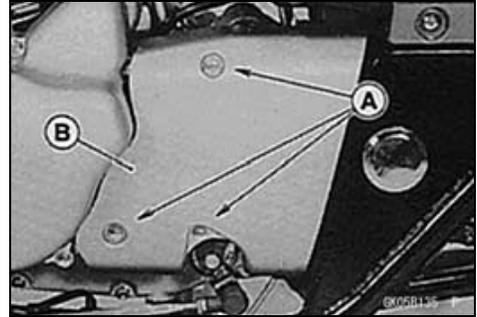
⚠ WARNING

If a full brake pedal is not obtained, disassemble and inspect the brake parts. Worn parts cause lock of the brake or loss of braking.

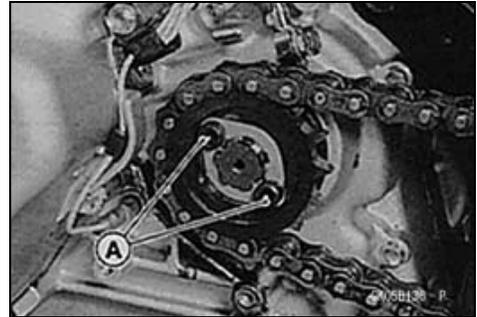
Sprocket, Coupling

Engine Sprocket Removal

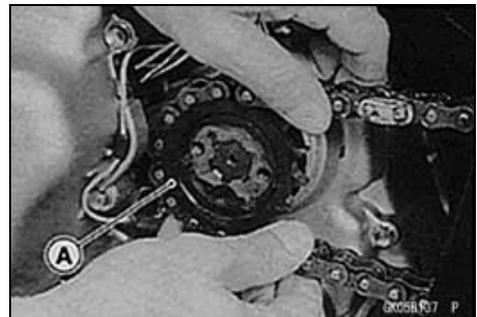
- Remove the engine sprocket cover bolts [A] and sprocket cover [B].



- Remove the engine sprocket bolts [A].



- Pull the engine sprocket [A] off the output shaft along with the chain.

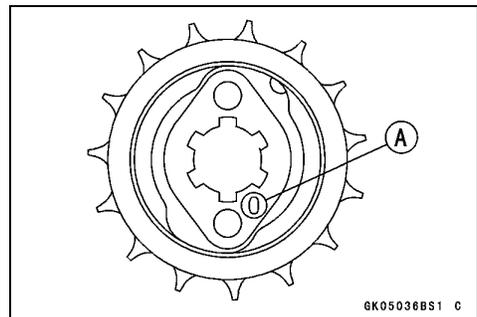


Engine Sprocket Installation

- Install the engine sprocket so that the punch mark [A] face the outward.
- Tighten the engine sprocket bolts
Torque - Engine Sprocket Bolts: 12 N·m (1.2 kgf·m, 104 in·lb)

NOTE

○When tightening the holder bolts, hold the rear brake on.



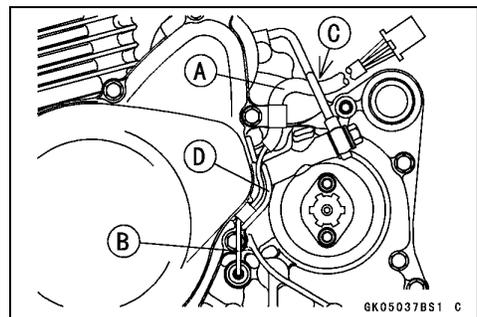
- Install the engine sprocket cover, and tighten the bolts with specified torque.

Torque - Engine Sprocket Cover Bolts

(BN125-A1~A3): 9.8 N·m (1.0 kgf·m, 87 in·lb)

(BN125-A4~): 8.8 N·m (0.90 kgf·m, 78 in·lb)

- Run the alternator leads, crankshaft sensor leads [A], and neutral switch leads [B] as shown.
 Run under the oil pipe [C].
 Guide Rib [D]
- Adjust the drive chain (see Periodic Maintenance chapter).



10-8 FINAL DRIVE

Sprocket, Coupling

Rear Sprocket Removal

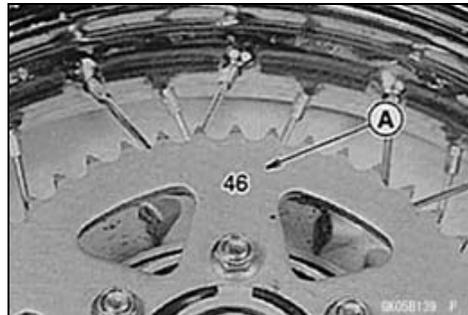
- Remove the rear wheel (see Wheels/Tires chapter).
- Remove the drive chain (see Drive Chain Removal).
- Remove the rear sprocket nuts [A] and separate the rear sprocket [B] from the coupling.



Rear Sprocket Installation

- Install the sprocket with the tooth number marking [A] outward.
- Tighten the rear sprocket nuts.

Torque - Rear Sprocket Nuts: 26 N·m (2.7 kgf·m, 19 ft·lb)



Sprocket Wear

- Visually inspect the engine and rear sprocket teeth.
- ★ If the teeth are worn as illustrated, replace the sprockets, and inspect the drive chain (see Periodic Maintenance chapter).

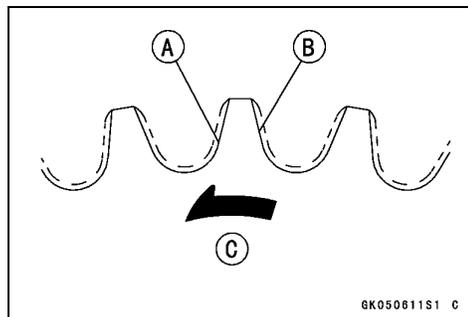
NOTE

○ Sprocket wear is exaggerated for illustration.

Worn Tooth (Engine Sprocket) [A]

Worn Tooth (Rear Sprocket) [B]

Direction of Rotation [C]

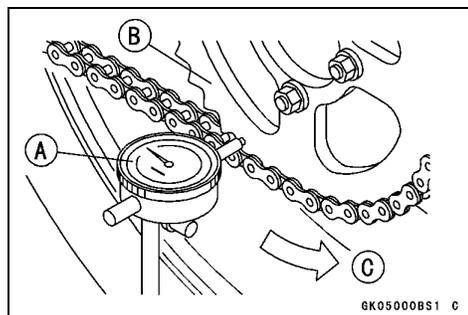


CAUTION

If a sprocket requires replacement, the drive chain is probably worn also. Upon replacing the rear sprocket, inspect the chain and engine sprocket.

Sprocket Warp Inspection

- Raise the rear wheel off the ground with a jack.
- Special Tool - Jack: 57001-1238**
- Set a dial gauge [A] against the rear sprocket [B] near the teeth as shown.
- Turn [C] the rear wheel. The difference between the highest and lowest dial gauge readings is the amount of runout (warp).
- ★ If the runout exceeds the service limit, replace the rear sprocket.



Rear Sprocket Warp

Standard: TIR 0.4 mm (0.016 in.) or less

Service Limit: TIR 0.5 mm (0.020 in.)

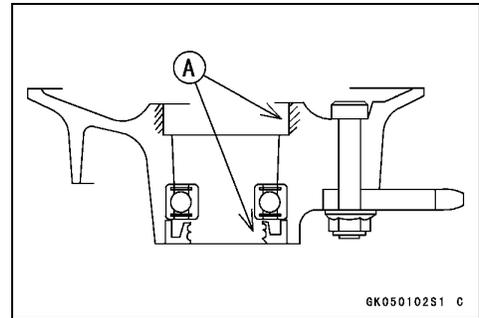
Coupling Removal

- Remove the rear wheel (see Wheels/Tires chapter).
- Remove the rear sprocket (see this chapter).

Sprocket, Coupling

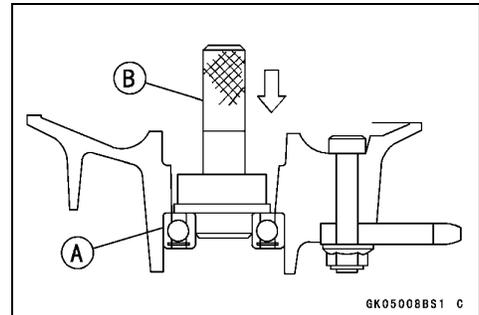
Coupling Installation

- Grease [A] the following and install the coupling.
 - Coupling Grease Seal Lips.
 - Coupling Internal Surface
- Install the rear sprocket and the coupling (see this chapter).
- Install the rear wheel (see Wheels/Tires chapter).



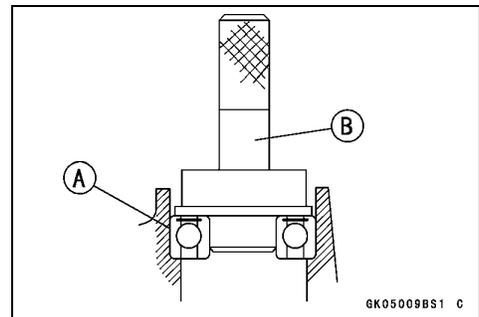
Coupling Bearing Removal

- Remove the coupling.
 - Pry the grease seal out.
 - Remove the bearing [A] by tapping from the wheel side.
- Special Tool - Bearing Driver Set: 57001-1129 [B]**



Coupling Bearing Installation

- Replace the bearing [A] with a new one.
 - Press in the bearing with the marked side out until it bottoms out.
- Special Tool - Bearing Driver Set: 57001-1129 [B]**

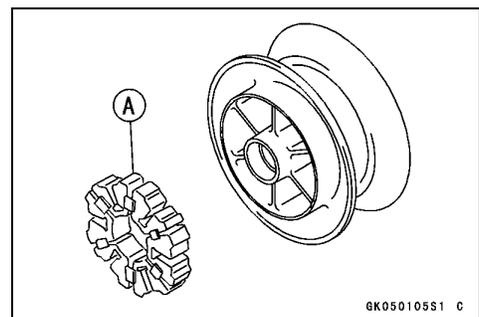


Coupling Bearing Wear/Lubrication

- See the Inspection and Lubrication sections of the rear hub bearings in Wheels/Tires chapter.

Damper Inspection

- Remove the rear wheel coupling, and inspect the rubber dampers [A].
- Replace the damper if it appears damaged or deteriorated.



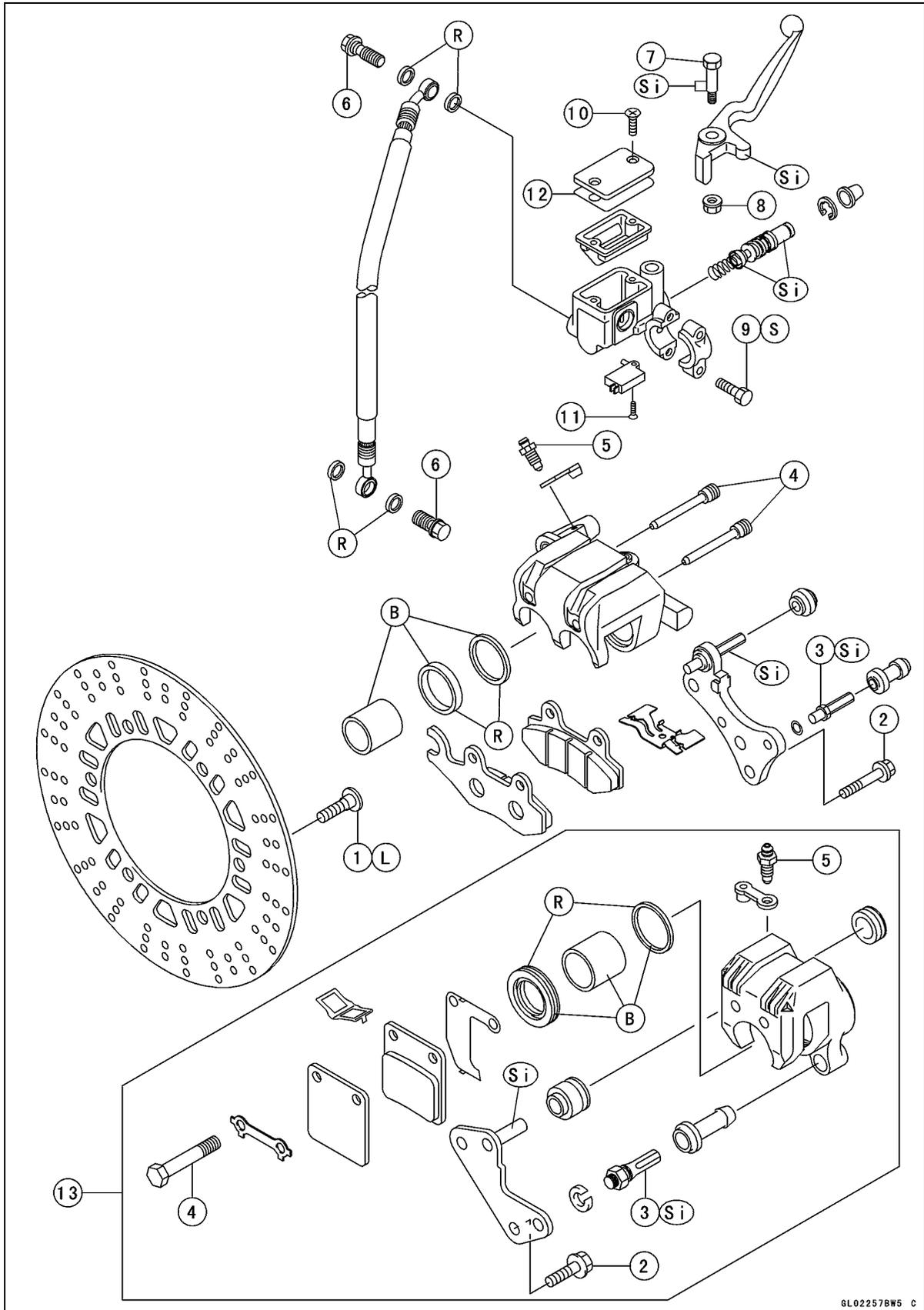
Brakes

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11-2 BRAKES

Exploded View



GL02257BWS C

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Brake Disc Bolts	27	2.8	20	L
2	Caliper Mounting Bolts	25	2.5	18	
3	Caliper Holder Shaft Bolts	18	1.8	13	
4	Caliper Pad Bolts	18	1.8	13	
5	Caliper Bleed Valve	7.8	0.80	69 in·lb	
6	Brake Hose Banjo Bolts	25	2.5	18	
7	Brake Lever Pivot Bolt	5.9	0.60	52 in·lb	
8	Brake Lever Pivot Bolt Locknut	5.9	0.60	52 in·lb	
9	Front Master Cylinder Clamp Bolts	8.8	0.90	78 in·lb	S
10	Front Brake Reservoir Cap Screws	1.5	0.15	13 in·lb	
11	Front Brake Light Switch Screws	1.0	0.10	9 in·lb	

12. Diaphragm plate (BN125-A1 ~ A2)

13. BN125-A1 ~ A2

B: Apply brake fluid.

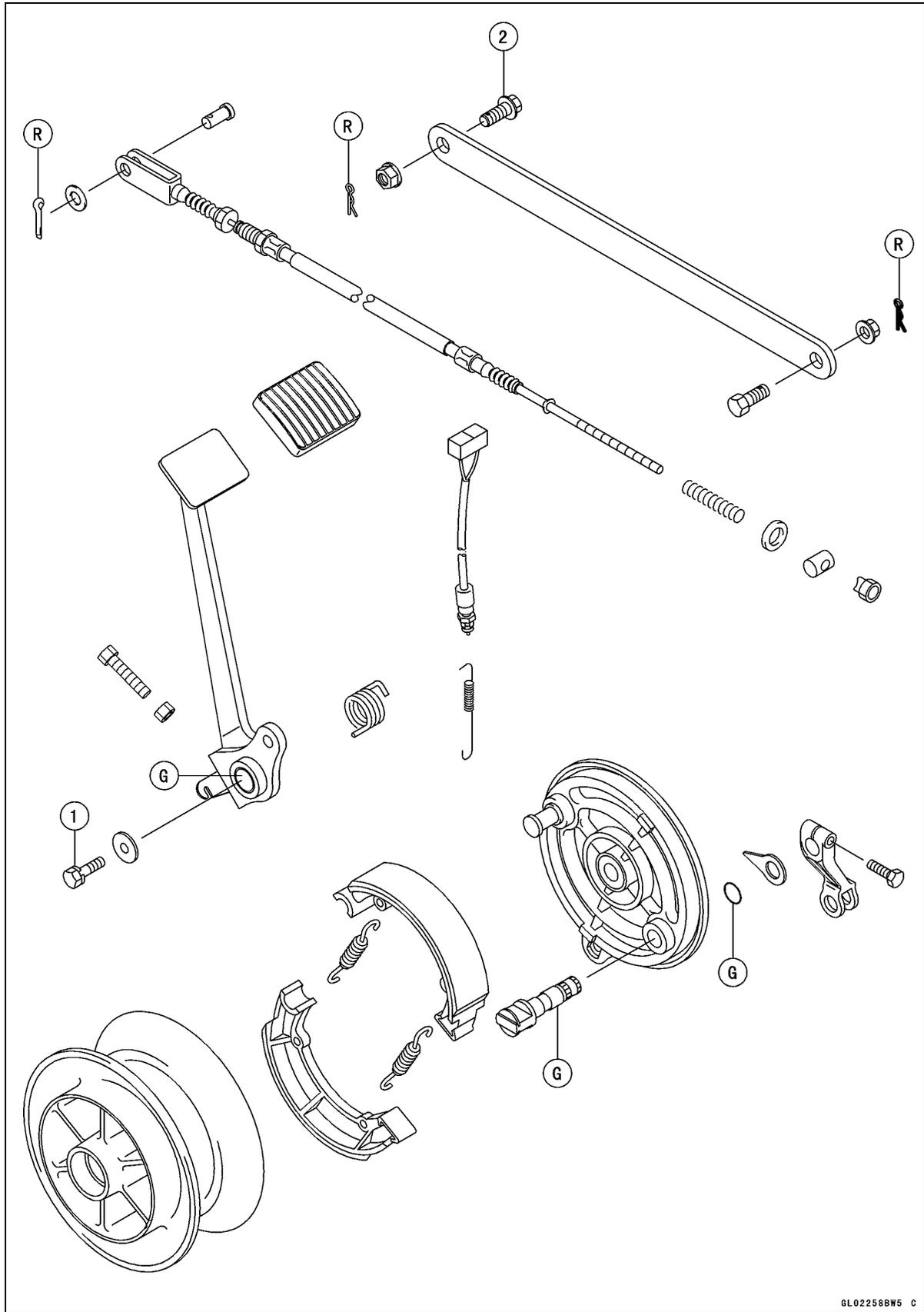
R: Replacement Parts

S: Follow the specific tightening sequence.

Si: Apply silicone grease or PBC grease.

11-4 BRAKES

Exploded View



GL02258BWS C

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Brake Pedal Bolt	9.8	1.0	87 in·lb	
2	Torque Link Bolt and Nut	34	3.5	25	

G: Apply grease.

R: Replacement Parts

11-6 BRAKES

Specifications

Item	Standard	Service Limit
Front Brake		
Pad Lining Thickness:	4.5 mm (0.177 in.) (BN125-A1 ~ A2)	1 mm (0.04 in.)
	6.0 mm (0.236 in.) (BN125-A3 ~)	1 mm (0.04 in.)
Disk Thickness	3.8 ~ 4.2 mm (0.150 ~ 0.165 in.)	3.5 mm (0.138 in.)
	4.3 ~ 4.7 mm (0.169 ~ 0.185 in.)	4.0 mm (0.157 in.)
	(BN125-A3, NO, ES)	
	(BN125-A4 ~)	
Disc Runout	Less than 0.2 mm (0.008 in.)	0.3 mm (0.012 in.)
Brake Fluid:		
Grade	DOT 4	---
Rear Brake		
Shoe Spring Free Length:		
Long	44.5 ~ 45.5 mm (1.752 ~ 1.791 in.)	47.2 mm (1.86 in.)
Short	32.5 mm (1.280 in.)	34.1 mm (1.34 in.)
Cam Lever Angle	80 ~ 90°	---
Brake Pedal Free Play	20 ~ 30 mm (0.79 ~ 1.18 in.)	---
Brake Maintenance		
Brake Drum Inside Diameter	130.00 ~ 130.16 mm (5.118 ~ 5.124 in.)	130.75 mm (5.148 in.)
Brake Shoe Lining Thickness	3.85 ~ 4.15 mm (0.152 ~ 0.163 in.)	2 mm (0.08 in.)
Brake Camshaft Diameter	11.957 ~ 11.984 mm (0.471 ~ 0.472 in.)	11.88 mm (0.47 in.)
	(BN125-A1 ~ A6)	
	14.95 ~ 14.99 mm (0.589 ~ 0.590 in.)	14.88 mm (0.59 in.)
	(BN125-A7 ~ and A8 ~, US)	
Brake Camshaft Hole Diameter	12.000 ~ 12.027 mm (0.472 ~ 0.474 in.)	12.15 mm (0.478 in.)
	(BN125-A1 ~ A6)	
	15.000 ~ 15.027 mm (0.591 ~ 0.592 in.)	15.15 mm (0.596 in.)
	(BN125-A7 ~ and A8 ~, US)	

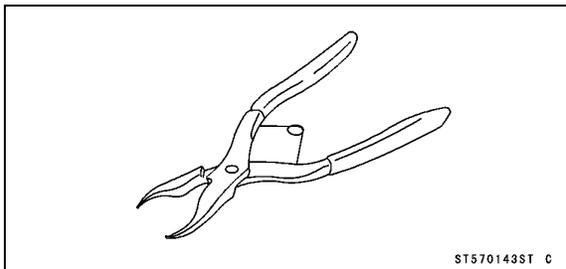
ES: Spain

NO: Norway

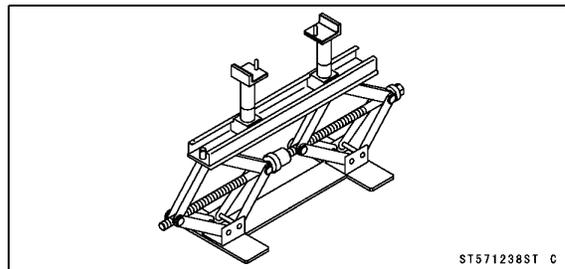
US: United States

Special Tools

Inside Circlip Pliers:
57001-143



Jack:
57001-1238



11-8 BRAKES

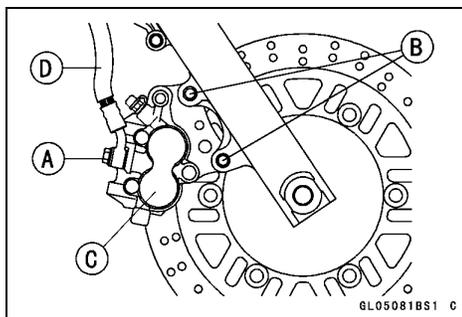
Caliper

Caliper Removal

- Loosen the banjo bolt [A] at the brake hose lower end, and tighten it loosely.
- Unscrew the caliper mounting bolts [B], and detach the caliper [C] from the disc.
- Unscrew the banjo bolt and remove the brake hose [D] from the caliper (see Brake Hose Removal/Installation).

CAUTION

Immediately wash away any brake fluid that spills.



NOTE

○If the caliper is to be disassembled after removal and if compressed air is not available, disassemble the caliper before the brake hose is removed (see Caliper Disassembly).

Caliper Installation

- Install the caliper and brake hose lower end.
- Replace the washers that are on each side of hose fitting with new ones.
- Tighten:
 - Torque - Caliper Mounting Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)**
 - Brake Hose Banjo Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)**
- Check the fluid level in the brake reservoir.
- Bleed the brake line (see Bleeding the Brake Line).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

⚠ WARNING

Do not attempt to drive the motorcycle until a full brake lever is obtained by pumping the brake lever until the pads are against the disc. The brake will not function on the first application of the lever if this is not done.

Caliper Disassembly

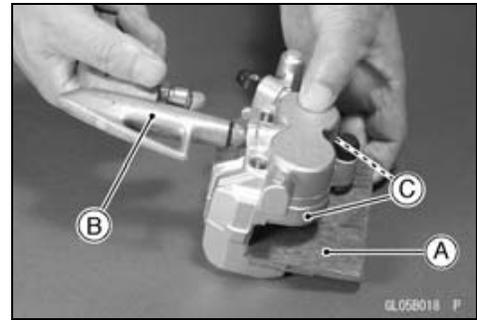
- Remove the caliper (see Caliper Removal).
- Remove the pads and spring (see Brake Pad Removal).
- Using compressed air, remove the pistons.
- Lightly apply compressed air to the hose joint opening.

⚠ WARNING

To avoid serious injury, never place your fingers or palm inside the caliper opening. If you apply compressed air into the caliper, the piston may crush your hand or fingers.

Caliper

- Insert a wooden board [A] 5 mm (0.2 in.) thick inside the caliper opening.
- Apply compressed air [B] to the banjo bolt hole to allow the pistons [C] to protrude and stop at the wooden board.
- Remove the wooden board and pull out the pistons by hand.
- ★ If compressed air is not available, with the brake hose still attached, apply the brake lever to remove the pistons. The remaining process is as described above.

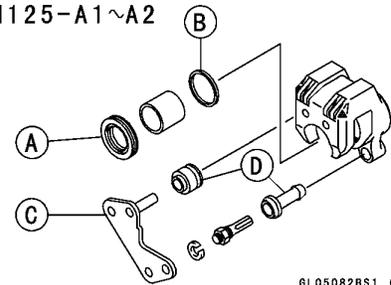


- Remove:
 - Dust Seals [A]
 - Fluid Seals (piston seals) [B]
 - Caliper Holder [C]
 - Friction Boot [D]
 - Bleed Valve
 - Rubber Cap

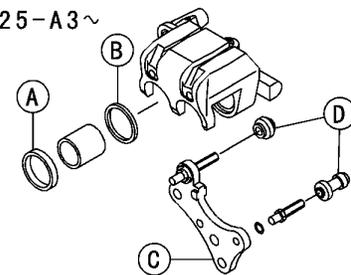
CAUTION

Immediately wash away brake fluid that spills.

BN125-A1~A2



BN125-A3~



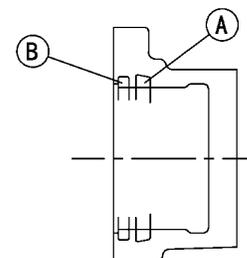
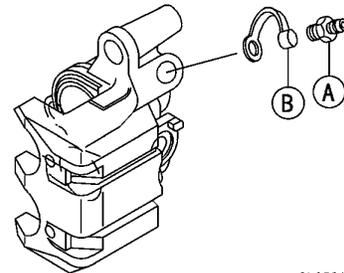
Caliper Assembly

- Clean all parts other than the outer and inner pads.

CAUTION

For cleaning the parts, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol

- Install the bleed valve [A] and the rubber cap [B].
- Tighten:
 - Torque - Caliper Bleed Valve: 7.8 N·m (0.80 kgf·m, 69 in·lb)**
- Replace the fluid seals [A] with new ones, apply brake fluid to them, and install them in the caliper body. Either side of the fluid seal may face outboard.
- Check the dust seals [B] and replace them with new ones if they are damaged.

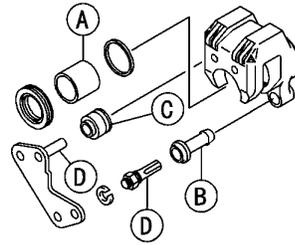


11-10 BRAKES

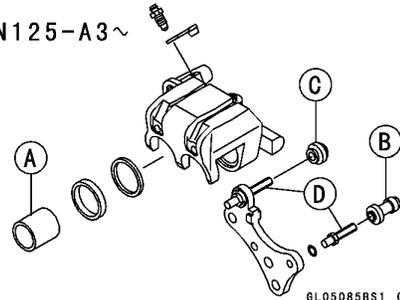
Caliper

- Apply brake fluid to the inside of the cylinders and to the outside of the pistons and push the pistons [A] into the cylinders.
- Check the friction boot [B] and dust boot [C] and replace them with new ones if they are damaged.
- Apply a thin coat of silicon grease to the holder shafts [D] and the holder holes.

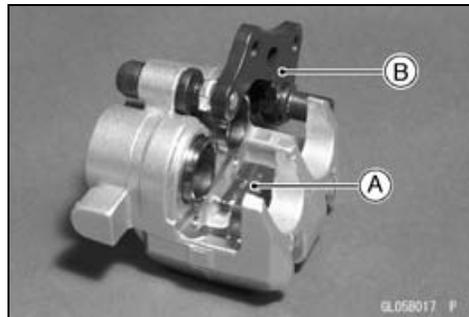
BN125-A1~A2



BN125-A3~



- Install:
 - Pad Spring [A]
 - Caliper Holder [B]
 - Pads and Caliper Pad Bolts
- Tighten:
 - Torque - Caliper Pad Bolts: 18 N·m (1.8 kgf·m, 13 ft·lb)**
- Install the caliper (see Caliper Installation).

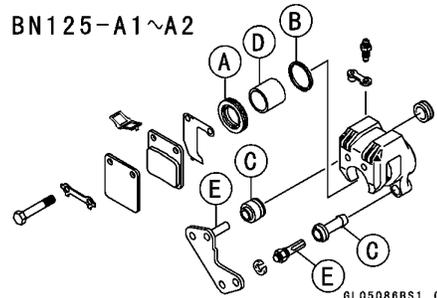


Caliper Fluid Seal Damage

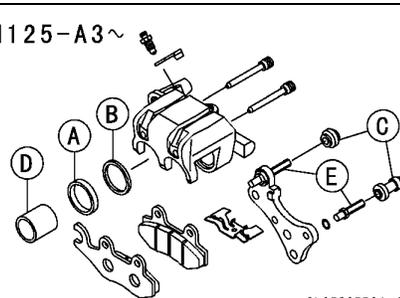
The fluid seal (piston seal) [A] is placed around the piston to maintain clearance between the pad and the disc. If the seal is in a poor condition, it could lead the pad to wear excessively or the brake to drag, which may cause the temperature of the disc or the brake fluid to increase.

- Replace the fluid seal if it exhibits any of the conditions listed below.
 - Brake fluid leakage around the pad.
 - Brakes overheat.
 - Considerable difference in inner and outer pad wear.
 - Seal and piston are stuck together.
- ★ If the fluid seal is replaced, replace the dust seal [B] as well. Also, replace all seals every other time the pads are changed.

BN125-A1~A2



BN125-A3~



Caliper

Caliper Dust Seal/Friction Boot Damage

- Check that the dust seal and friction boot [C] are not cracked, worn, swollen, or otherwise damaged.
- If they show any damage, replace it.

Caliper Piston and Cylinder Damage

- Visually inspect the piston [D] and cylinder surfaces for damage.
- ★ Replace the caliper if the cylinder and piston are badly scored or rusty.
Caliper Holder Shafts [E]

Caliper Holder Shaft Wear

The caliper body must slide smoothly on the caliper holder shafts. If the body does not slide smoothly, only one pad will wear more than the other, pad wear will increase, and constant drag on the disc will raise the brake and brake fluid temperature.

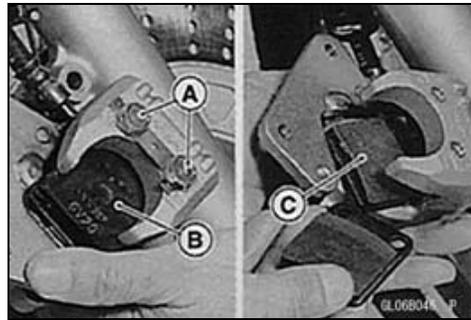
- Visually inspect the caliper holder shafts for excessive wear or warp, and rubber friction boots for damage.
- ★ If the rubber friction boot is damaged, replace the rubber friction boot.
- ★ If the caliper holder shaft is damaged, replace the caliper holder.

11-12 BRAKES

Front Brake Pads

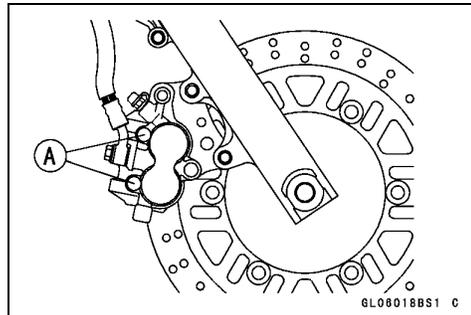
Brake Pad Removal (BN125-A1 ~ A2)

- Remove the caliper with the hose attached.
- Remove:
 - Caliper Pad Bolts [A]
 - Outer Pad [B]
- Remove the inner pad (piston side pad) [C].



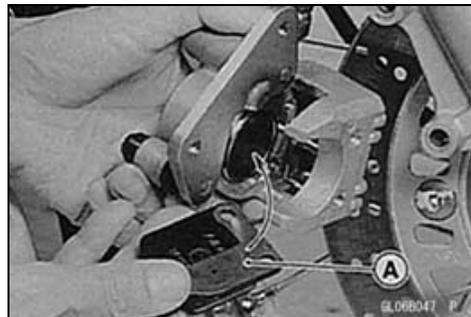
Brake Pad Removal (BN125-A3 ~)

- Loosen the caliper pad bolts [A].
- Remove the caliper with the hose attached.
- Remove:
 - Caliper Pad Bolts
 - Pads



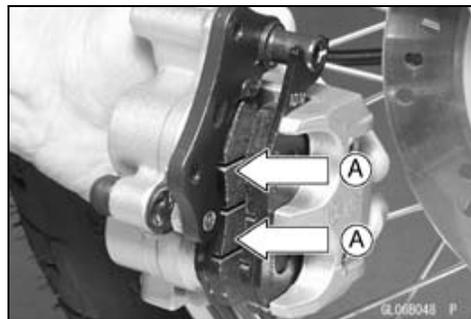
Brake Pad Installation (BN125-A1 ~ A2)

- Before installation, clean the pads with a high-flash point solvent.
- Push the caliper piston in by hand as far as they will go.
- The inner pad has a wear-protect plate [A]. Do not mix up the outer pad and the inner pad.
- Tighten:
 - Torque - Caliper Pad Bolts: 18 N·m (1.8 kgf·m, 13 ft·lb)



Brake Pad Installation (BN125-A3 ~)

- Before installation, clean the pads with a high-flash point solvent.
- Push the caliper pistons in by hand [A] as far as they will go.
- Install the pads and caliper pad bolts.
- Tighten:
 - Torque - Caliper Pad Bolts: 18 N·m (1.8 kgf·m, 13 ft·lb)
- Install the caliper (see Caliper Installation).



⚠ WARNING

Do not attempt to drive the motorcycle until a full brake lever is obtained by pumping the brake lever until the pads are against the disc. The brake will not function on the first application of the lever if this is not done.

Brake Pad Wear Inspection

- Refer to the Brake Pad Wear Inspection in the Periodic Maintenance chapter.

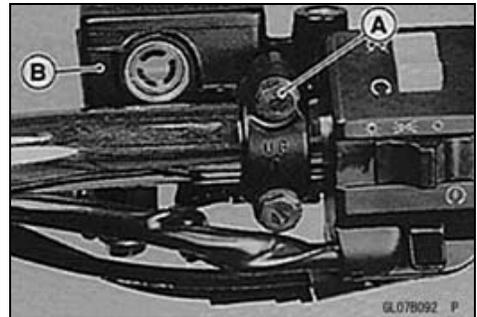
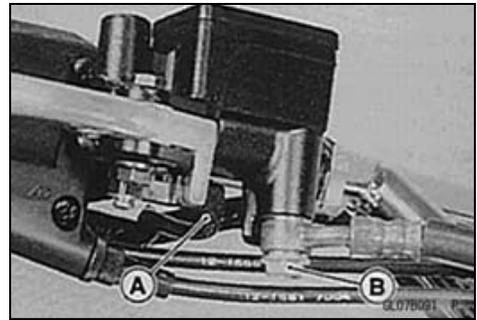
Master Cylinder

Master Cylinder Removal

- Remove the brake fluid from the reservoir with a syringe or other suitable device.
 - Disconnect the front brake light switch connectors [A].
 - Remove the banjo bolt [B] to disconnect the brake hose from the master cylinder (see Brake Hose Removal/Installation).
- When removing the brake hose, temporarily secure the end of the brake hose to same high place to keep fluid loss to a minimum.
- Unscrew the clamp bolts [A], and take off the master cylinder [B] as an assembly with the reservoir, brake lever, and brake switch installed.
- When removing the master cylinder take care not to spill the brake fluid on the painted or plastic parts.

CAUTION

Immediately wash away any brake fluid that spills.



Master Cylinder Installation

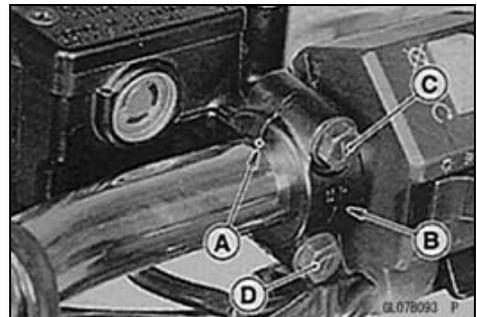
- Set the master cylinder to match its mating face to the punched mark [A] of the handlebar.
- The master cylinder clamp must be installed with the arrow mark [B] faced upward.
- Tighten the upper clamp bolt [C] first, and then the lower clamp bolt [D]. There will be a gap at the lower part of the clamp after tightening.

Torque - Master Cylinder Clamp Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)

- Replace the washers that are on each side of the hose fitting with new ones.
- Tighten:

Torque - Brake Hose Banjo Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)

- Bleed the brake line (see Bleeding the Brake Line).
- Check the brake for good braking power, no brake drag, and no fluid leakage.



Master Cylinder Disassembly

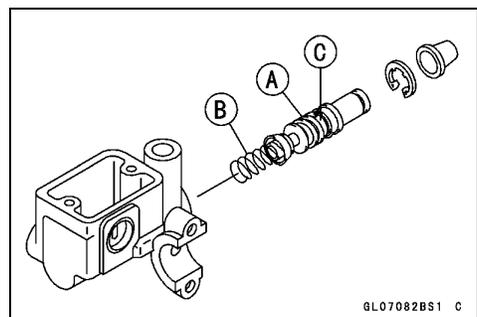
- Remove the master cylinder (see Master Cylinder Removal).
- Remove the reservoir cap and diaphragm, and pour the brake fluid into a container.
- Unscrew the pivot nut and pivot bolt, and remove the brake lever.
- Pull the dust cover out of place, and remove the circlip.

Special Tool - Inside Circlip Pliers : 57001-143

- Pull out the piston assembly [A], return spring [B].

CAUTION

Do not remove the secondary cup [C] from the piston since removal will damage it.



GL07082BS1 C

11-14 BRAKES

Master Cylinder

Master Cylinder Assembly

- Before assembly, clean all parts including the master cylinder with brake fluid or alcohol.

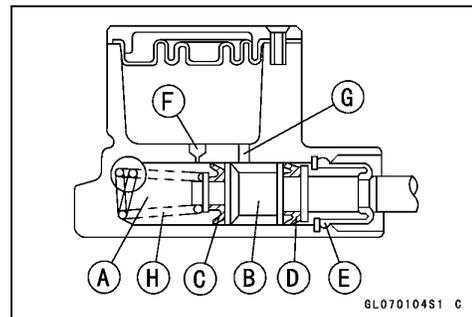
CAUTION

Except for the disc pads and disc, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning brake parts. Do not use any other fluid for cleaning these parts, Gasoline, engine oil, or any other petroleum distillate will cause deterioration of the rubber parts. Oil spilled on any part will be difficult to wash off completely, and will eventually deteriorate the rubber used in the disc brake.

- Apply brake fluid to the removed parts and to the inner wall of the cylinder.
- Take care not to scratch the piston or the inner wall of the cylinder.
- Apply silicone grease (ex. PBC grease) to the following points.
 - Brake Lever Pivot Bolt
 - Brake Lever Pivot Contact
 - Dust Cover
- Tighten:
 - Torque - Brake Reservoir Cap Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)**
 - Brake Lever Pivot Bolt: 5.9 N·m (0.60 kgf·m, 52 in·lb)**
 - Brake Lever Pivot Locknut: 5.9 N·m (0.60 kgf·m, 52 in·lb)**

Master Cylinder Inspection (Visual Inspection)

- Disassemble the master cylinder.
- Check that there are no scratches, rust or pitting on the inner wall [A] of the master cylinder and on the outside of the piston [B].
- ★ If a master cylinder or piston shows any damage, replace them.
- Inspect the primary cup [C] and secondary cup [D].
- ★ If a cup is worn, damaged softened (rotted), or swollen, the piston assembly should be replaced to renew the cups.
- ★ If fluid leakage is noted at the brake lever, the piston assembly should be replaced to renew the cups.
- Check the dust cover [E] for damage.
- ★ If the dust cover is damaged, replace it.
- Check the relief [F] and supply [G] ports are not plugged.
- ★ If the relief port becomes plugged, the brake pads will drag on the disc. Blow the ports clean with compressed air.
- Check the piston return springs [H] for any damage.
- ★ If the spring is damaged, replace it.



Front Brake Disc

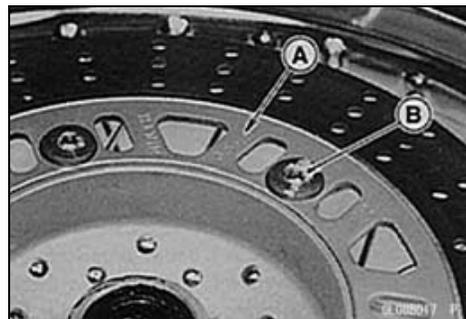
Brake Disc Removal

- Remove the wheel (see Wheels/Tires chapter).
- Unscrew the mounting bolts, and take off the disc.

Brake Disc Installation

- Install the brake disc on the wheel so that the marked side [A] faces out.
- Tighten:

Torque - Brake Disc Mounting Bolts [B]: 27 N·m (2.8 kgf·m, 20 ft·lb)



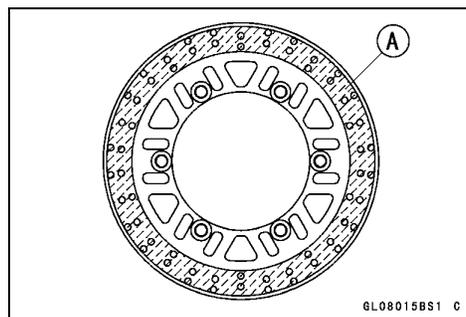
Brake Disc Wear

- Visually inspect the disk.
 - ★ Replace the disc if it shows any damage or crack.
 - Measure the thickness of the disc [A] at the point where it has worn the most.
 - ★ If the disc has worn past the service limit, replace it.
- [B] Measuring Area

Brake Disc Thickness

Standard: 3.8 ~ 4.2 mm (0.150 ~ 0.165 in.)
4.3 ~ 4.7 mm (0.169 ~ 0.185 in.)
(BN125-A3, Norway and Spain)
(BN125-A4 ~)

Service Limit: 3.5 mm (0.138 in.)
4.0 mm (0.157 in.)
(BN125-A3, Norway and Spain)
(BN125-A4 ~)



Brake Disc Warp

- Using a jack, raise the wheel off the ground (see Wheels/Tires chapter).

Special Tool - Jack: 57001-1238

○ For front disc inspection, turn the handlebar fully to one side.

- Set up a dial gauge against the disc [B] as shown and measure disc runout, while turning [A] the wheel by hand.
- ★ If runout exceeds the service limit, replace the disc.



Disc Runout

Standard: Less than 0.12 mm (0.008 in.) or less
Service Limit: 0.3 mm (0.012 in.)

11-16 BRAKES

Brake Fluid

Brake Fluid Level Inspection

- Refer to the Brake Fluid Level Inspection in Periodic Maintenance chapter.

Brake Fluid Change

- Refer to the Brake Fluid Change in Periodic Maintenance chapter.

Brake Line Bleeding

- Refer to the Brake Line Bleeding in Periodic Maintenance chapter.

Brake Hose

Brake Hose Removal/Installation

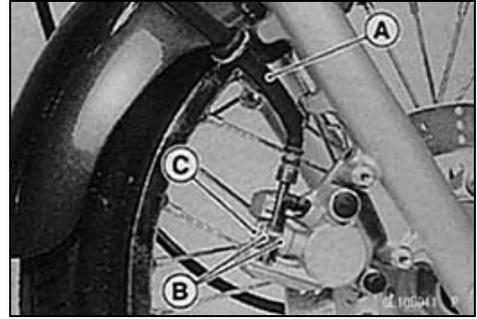
CAUTION

Brake fluid quickly ruins painted or plastic surfaces; any spilled fluid should be completely wiped up immediately with wet cloth.

- When removing the brake hose, take care not to spill the brake fluid on the painted or plastic parts.
- When removing the brake hose [A], temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
- There are washers [B] on each side of the brake hose fitting. Replace them with new ones when installing.
- When installing the hoses, avoid sharp bending, kinking, flattening or twisting, and route the hoses according to Cable, Wire and Hose Routing section in Appendix chapter.
- Tighten:
 - Torque - Brake Hose Banjo Bolts [C]: 25 N·m (2.5 kgf·m, 18 ft·lb)**
- Bleed the brake line after installing the brake hose (see Brake Line Bleeding).

Brake Hose Inspection

- Refer to the Brake Hose Check in the Periodic Maintenance chapter.



11-18 BRAKES

Rear Brake Pedal and Brake Cable

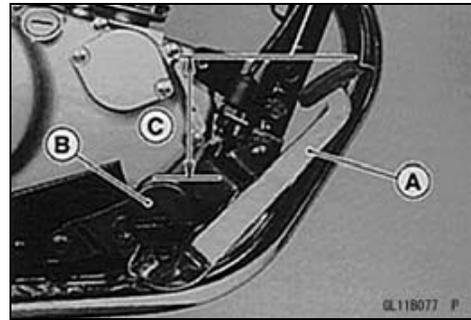
Brake Pedal Position Inspection/Adjustment

- Check that the brake pedal [A] is in the correct position.

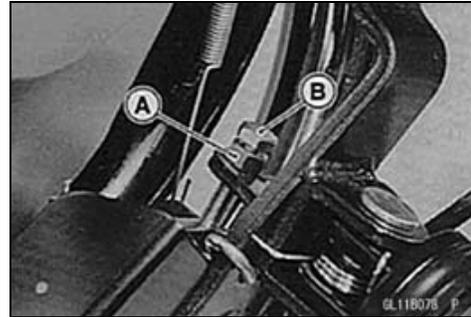
Pedal Position [C]

Standard: About 80 mm (3.15 in.) above footpeg top [B]

- ★ If it is incorrect, adjust the brake pedal position.



- Loosen the locknut [A], and turn the adjusting bolt [B] until the brake pedal is correctly positioned.
- Tighten the locknut.
- Check:
 - Rear Brake Light Switch Timing (see Electrical System chapter)
 - Brake Pedal Free Play (see Brake Pedal Free Play Inspection)



NOTE

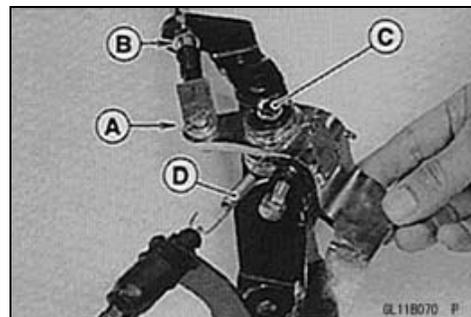
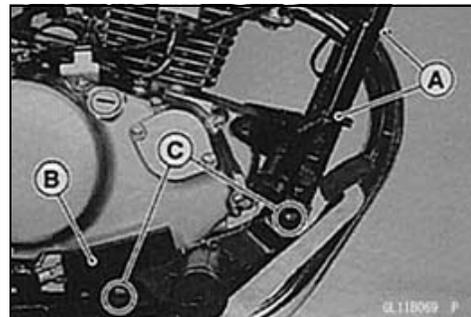
○ If the pedal position cannot be adjusted by turning the adjusting bolt, the brake pedal may be deformed or incorrectly installed.

Brake Pedal Free Play Inspection/Adjustment

- Refer to the Brake Pedal Free Play Check in the Periodic Maintenance chapter.

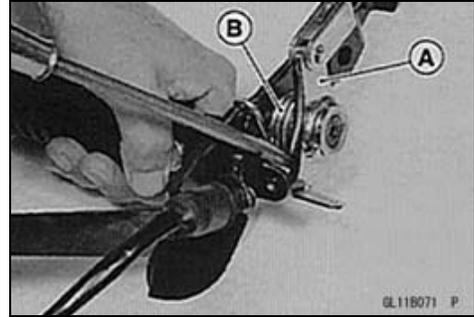
Brake Pedal Removal

- Remove the adjusting nut from the end of the brake rod, and take off the joint and brake rod from the brake cam lever.
- Remove:
 - Bands [A]
 - Cover [B]
 - Front Footpeg Mounting Bolts [C]
- Remove:
 - Cotter Pin and Joint Pin [A]
 - Brake Cable Nut [B]
 - Brake Pedal Bolts [C]
 - Rear Brake Light Switch Spring [D]



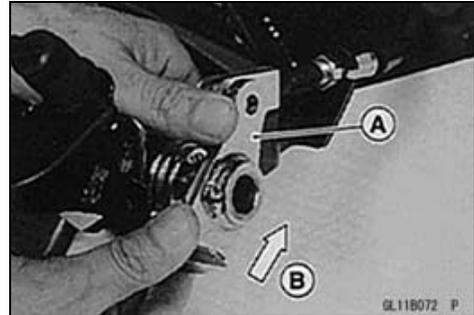
Rear Brake Pedal and Brake Cable

- Remove the brake pedal [A] and return spring [B].



Brake Pedal Installation

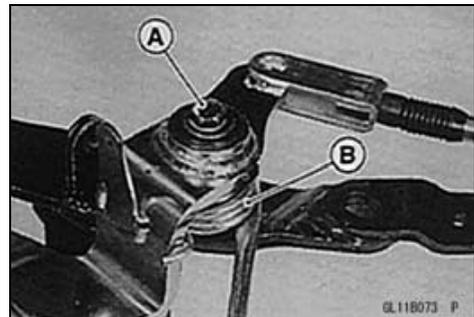
- Apply grease to the brake pedal pivot.
- Temporarily install the brake return spring onto the brake shaft and hook the spring onto the brake pedal.
- Push [B] the brake pedal [A] across the brake shaft and insert the pedal onto the shaft.



- Lightly tighten the brake pedal bolt [A].
- Pry the brake return spring [B] onto the brake shaft with a screwdriver.
- Tighten the brake pedal bolt.

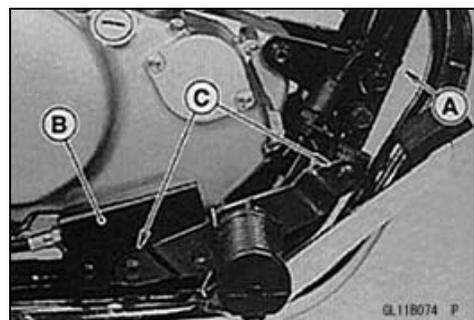
Torque - Brake Pedal Bolt: 9.8 N·m (1.0 kgf·m, 87 ft·lb)

- Hook the rear brake light switch spring and brake return spring lower end.
- Insert a new cotter pin through the joint pin, and spread its ends.
- Check:
 - Brake Pedal Position (see Brake Pedal Position Inspection/Adjustment)
 - Brake Pedal Free Play (see Periodic Maintenance chapter)
 - Rear Brake Light Switch Timing (see Periodic Maintenance chapter)
- Install the parts removed.



Brake Cable Removal

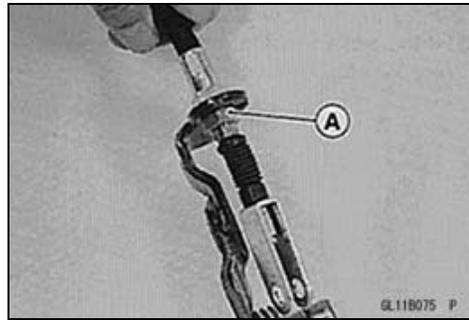
- Remove:
 - Bands [A]
 - Cover [B]
 - Front Footpeg Mounting Bolts [C]



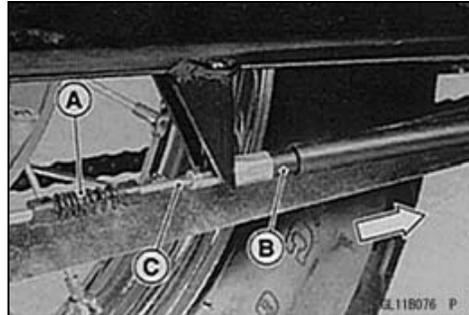
11-20 BRAKES

Rear Brake Pedal and Brake Cable

- Remove:
 - Cotter Pin and Joint Pin
 - Brake Cable Nut [A]



- Remove the silencer (see Engine Top End chapter).
- Remove the adjusting nut on the end of the brake rod, and take off the joint pin and brake rod from the brake cam lever.
- Remove the cable dust boot [A].
- Pull the outer cable housing [B] forward, and take out the inner cable [C] from the groove of the stay.
- Pull the brake cable out of the frame.



Brake Cable Installation

- Lubricate the cable before installation.
- Adjust the brake pedal position and free play.

Brake Cable Lubrication

- Whenever the cable is removed, or in accordance with the Periodic Maintenance Chart, lubricate the brake cable. Refer to General Lubrication in the Periodic Maintenance chapter.
- Apply a thin coating of grease to the cable upper end.
- Use a commercially available pressure cable lubricator to lubricate the cable.
- With the cable disconnected at both ends, the cable should move freely in the cable housing.

Rear Brake Panel and Drum

Brake Panel Removal

- Remove the rear wheel (see Wheels/Tires chapter).
- Separate the brake panel from the wheel hub.

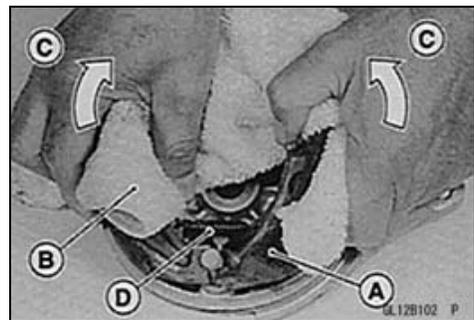
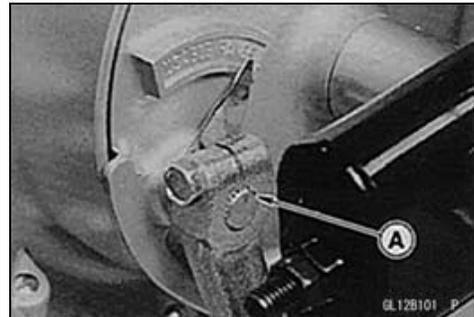
Brake Panel Installation

- Fit the brake panel into the rear wheel, and then install the rear wheel (see Wheels/Tires chapter).

Brake Panel Disassembly

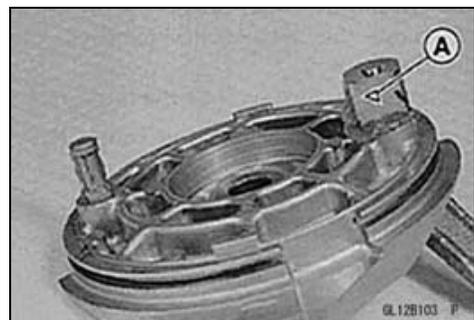
- Remove the brake panel (see Brake Panel Removal).
- Before removing the brake cam lever, mark [A] the position of the cam lever so that it can be installed later in the same position.
- Before removing the brake lining wear indicator, mark the position of the brake camshaft and lining wear indicator so that it can be installed later in the same position.

- Using a clean cloth [B] around the linings to prevent grease or oil from getting on them, remove the brake shoes [A] by pulling up [C] on the center of the linings.
- Remove the springs [D] to separate the two shoes.



Brake Panel Assembly

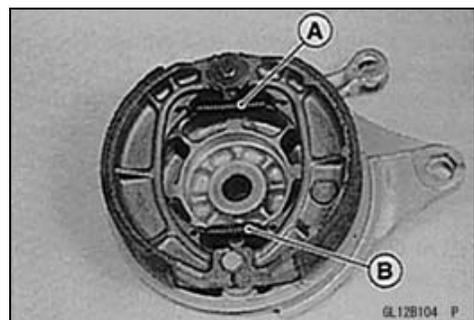
- Clean the old grease from the camshaft and brake shoe anchor pin, and regrease them.
- Apply grease to the center of shaft and very lightly on the cam surfaces. Do not over grease.
- Push the camshaft into the panel so that the triangular mark [A] on the cam surface points toward the center of the panel.



⚠ WARNING

Improper Installation will cause ineffective braking.

- Visually inspect the brake shoe springs for breaks or distortion.
- ★ If the springs are damaged in any way, replace them.
- Fit the large spring [A] and small spring [B] onto the brake shoes as shown.
- Wrap a clean cloth around the linings to prevent grease or oil from getting on them, and install the shoes on the brake panel.



Rear Brake Panel and Drum

Brake Shoe Springs Inspection

- Visually inspect the brake shoe springs for breaks or distortion.
- ★ If the springs are damaged in any way, replace them.
- Measure the free length of the brake shoe springs.
- ★ If either is stretched beyond the service limit, replace both springs.

Brake Shoe Springs Free Length

Standard:

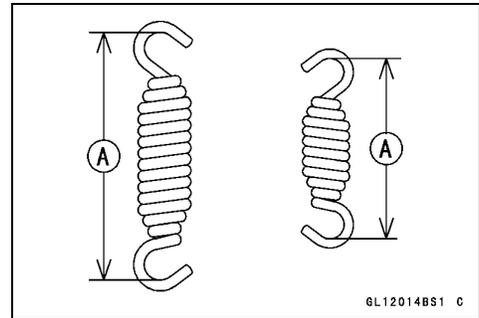
Long 44.5 ~ 45.5 mm (1.752 ~ 1.791 in.)

Short 32.5 mm (1.280 in.)

Service Limit:

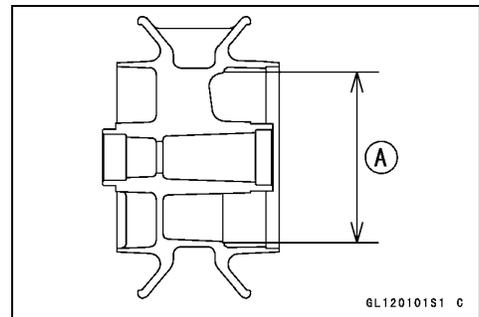
Long 47.2 mm (1.86 in.)

Short 34.1 mm (1.34 in.)



Brake Drum Wear Inspection

- Remove the rear wheel (see Wheels/Tires chapter).
- Remove the brake panel.
- Measure the inside diameter [A] of the drum.
- Use calipers and measure at several points.
- ★ If any measurement is greater than the service limit, replace the wheel hub.
- ★ If the drum is worn unevenly or scored, lightly turn the drum on a brake drum lathe or replace the wheel hub. Do not turn the drum beyond the service limit.



Drum Inside Diameter

Standard: 130.00 ~ 130.16 mm (5.118 ~ 5.124 in.)

Service Limit: 130.75 mm (5.148 in.)

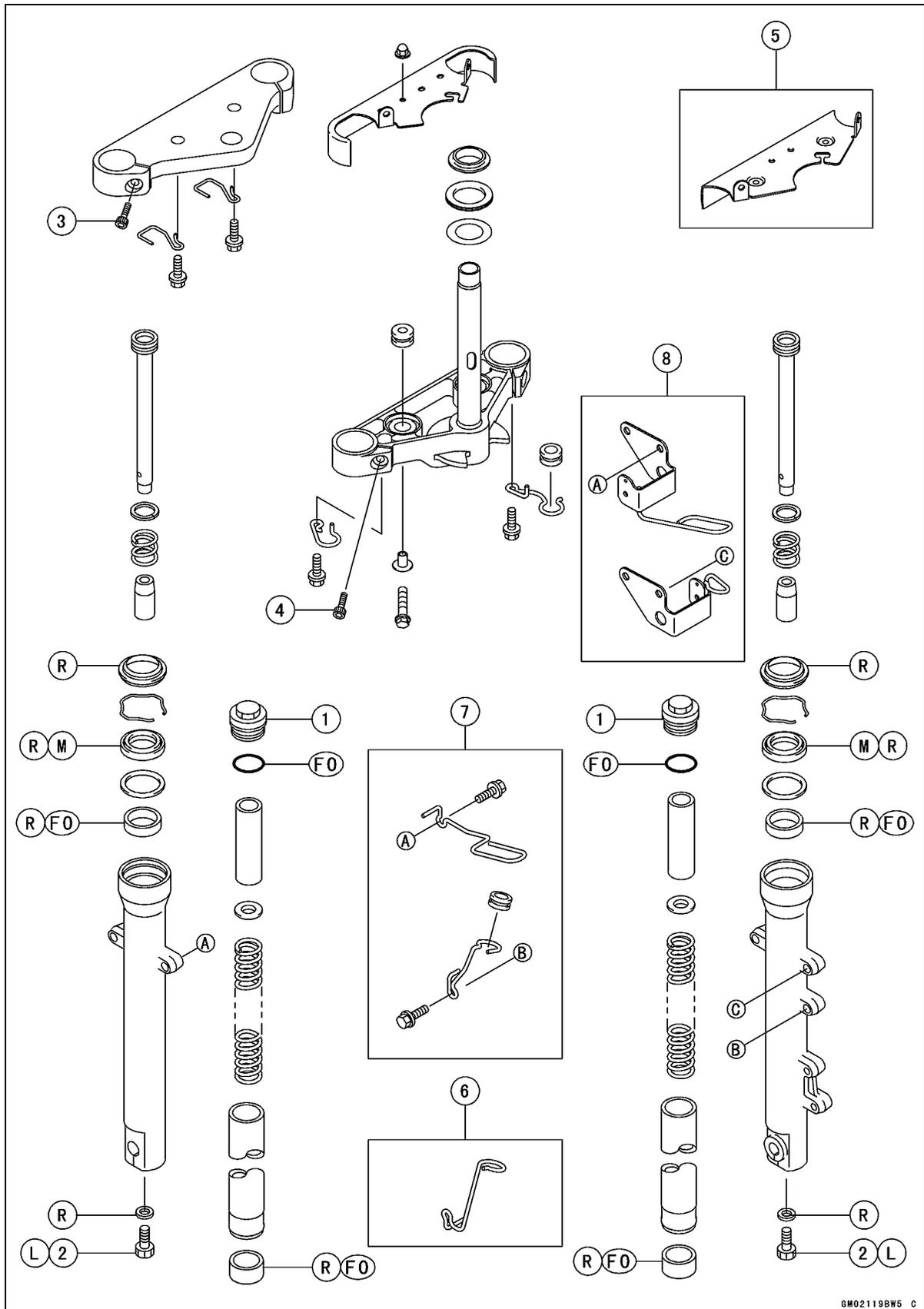
Suspension

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12-2 SUSPENSION

Exploded View



GM02119BWS C

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Front Fork Top Plugs	23	2.3	17	
2	Front Fork Bottom Allen Bolts	20	2.0	15	
3	Front Fork Clamp Bolt (Upper)	20	2.0	15	
4	Front Fork Clamp Bolt (Lower)	34	3.5	25	

5. Fork cover (BN125-A1 ~ A5)

6. Brake hose clamp (BN125-A1 only)

7. Other than the US and CA Models

8. Speedmeter cable guide and Brake hose guide (US and CA Models)

FO: Apply fork oil.

L: Apply a non-permanent locking agent.

M: Apply molybdenum disulfide grease.

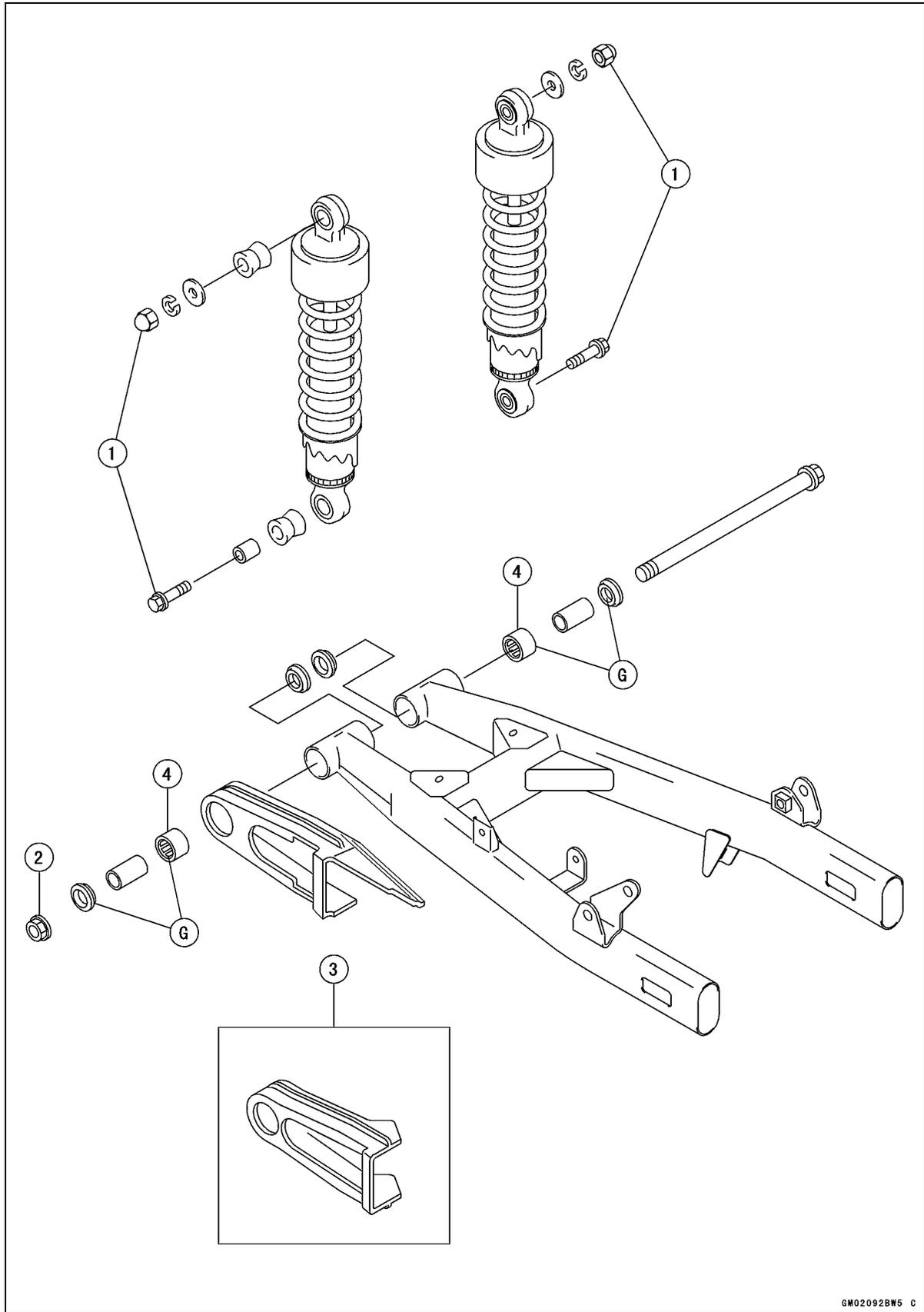
R: Replacement Parts

CA: Canada

US: United States

12-4 SUSPENSION

Exploded View



GM02092BWS C

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Rear Shock Absorber Nuts and Bolts	34	3.5	25	
2	Swingarm Pivot Nut	98	10.0	72	

3. Chain guard (BN125-A1 ~ A2 only)

4. Face the manufacture's marks out.

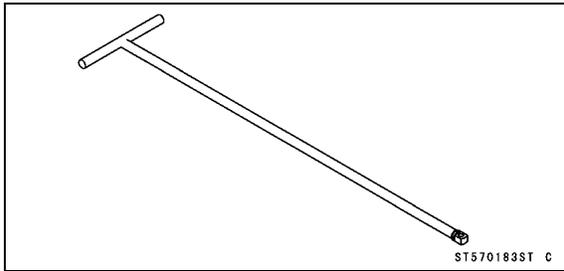
12-6 SUSPENSION

Specifications

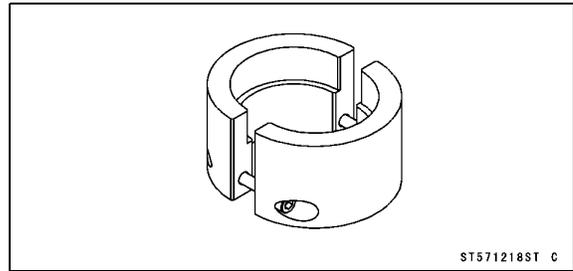
Item	Standard
Front Fork (Per One Unit)	
Fork Inner Tube Diameter	ϕ 33 mm (1.30 in.)
Fork Spring Setting	Non-adjustable
Air Pressure	Atmospheric pressure (non-adjustable)
Damper Setting	Non adjustable
Fork Oil Viscosity	SHOWA SS-8 or equivalent
Fork Oil Capacity	191 \pm 2.5 mL (6.46 \pm 0.085 US oz.) (completely dry)
	approx. 165 mL (5.58 US oz.) (when changing oil)
Fork Oil Level	218 \pm 2 mm (8.58 \pm 0.08 in.) below from inner tube top with fully compressed, without fork spring
Fork Spring Free Length	398.5 mm (15.7 in.) (Service limit: 391 mm (15.4 in.))
Rear Shock Absorbers	
Spring Preload	1st step (Adjustable range : 1st ~ 5th steps)
Gas Pressure	No gas

Special Tools

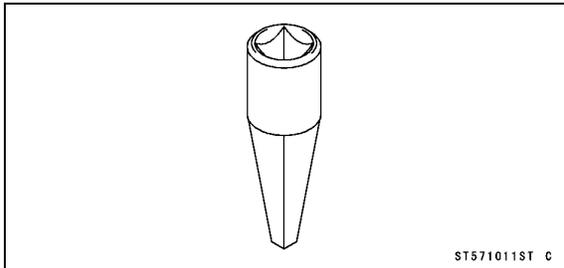
Fork Cylinder Holder Handle:
57001-183



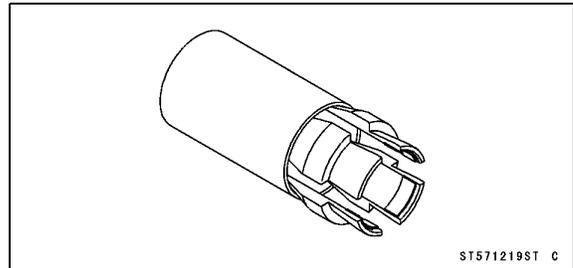
Fork Outer Tube Weight:
57001-1218



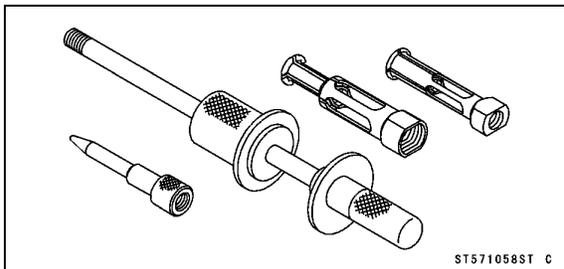
Fork Cylinder Holder Adapter:
57001-1011



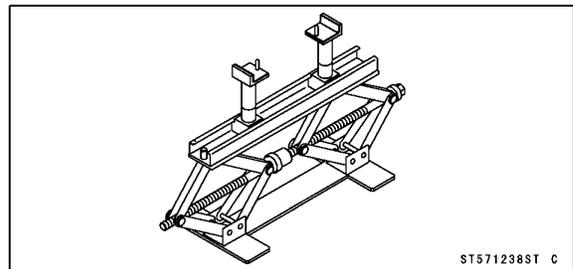
Front Fork Oil Seal Driver:
57001-1219



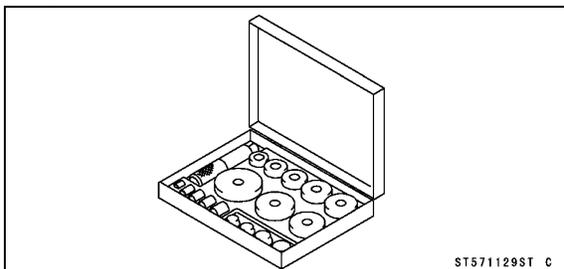
Oil Seal & Bearing Remover:
57001-1058



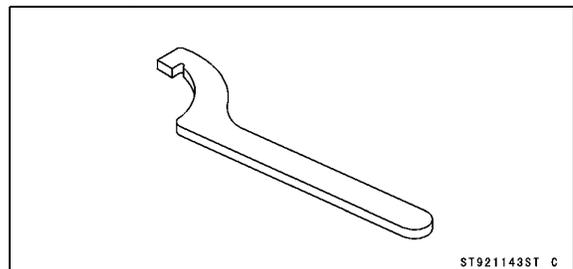
Jack:
57001-1238



Bearing Driver Set:
57001-1129



Hook Wrench (Owner's Tool):
92110-1143



12-8 SUSPENSION

Front Fork

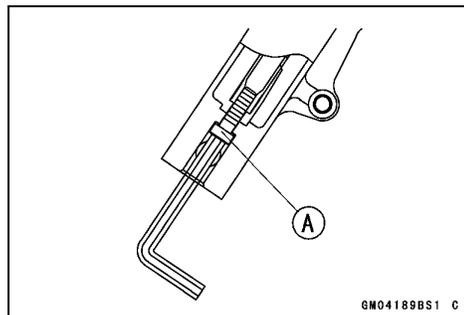
Fork Oil Change

- Refer to the Front Fork Oil Change in the Periodic Maintenance chapter.

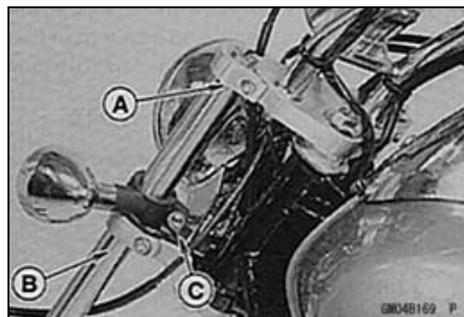
Fork Removal

★ If the fork leg is to be disassembled, loosen the top plug beforehand. To loosen the fork top plug, loosen the fork upper clamp bolts.

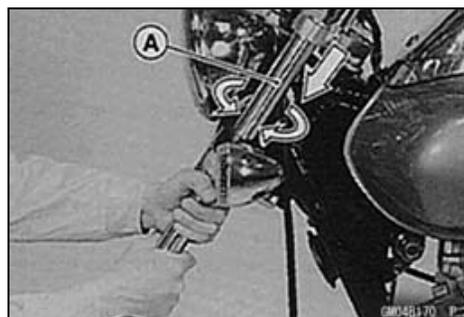
- Remove:
 - Brake Caliper (see Brakes chapter)
 - Front Wheel (see Wheels/Tire chapter)
- ★ If the fork leg is to be disassembled, loosen the fork bottom Allen bolt [A] beforehand.



- Loosen the upper [A] and lower fork clamp bolts [B].
- Loosen the turn signal light holder bolt and nut [C].



- With a twisting motion, work the fork leg [A] down and out.



Fork Installation

- Install the fork so that the top end [A] of the inner tube is flush with the upper surface of the steering stem head [B].
- Run the cables, wires, and hoses as shown in the Cable, Wire, and Hose Routing section of the Appendix chapter.
- Tighten:

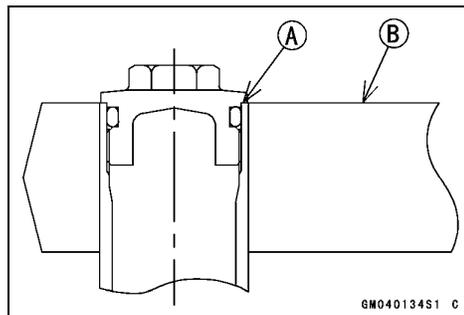
Torque - Front Fork Clamp Bolts (Upper): 20 N·m (2.0 kgf·m, 15 ft·lb)

Front Fork Clamp Bolts (Lower): 34 N·m (3.4 kgf·m, 25 ft·lb)

Fork Top Plugs: 23 N·m (2.3 kgf·m, 17 ft·lb)

Turn Signal Light Holder Nut: 5.9 N·m (0.60 kgf·m, 52 in·lb)

- Install the front wheel (see Wheels/Tires chapter).



Front Fork

- Check the front brake effectiveness after installation.

⚠ WARNING

Do not attempt to ride the motorcycle until a full brake lever is obtained by pumping the brake lever until the pads are against the disc. The brake will not function to the first application of the lever if this is not done.

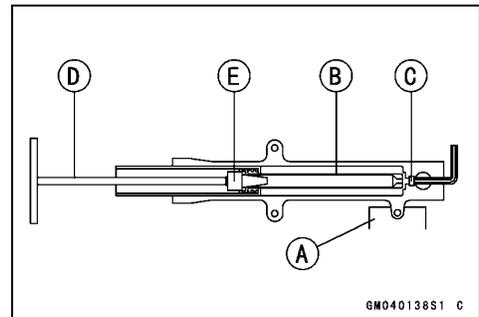
Fork Disassembly

- Remove the front fork (see Front Fork Removal).
- Drain the fork oil (see Periodic Maintenance chapter).
- The following parts are removed during draining the fork oil.
 - Top Plug
 - Spacer
 - Fork Spring Seat
 - Fork Spring

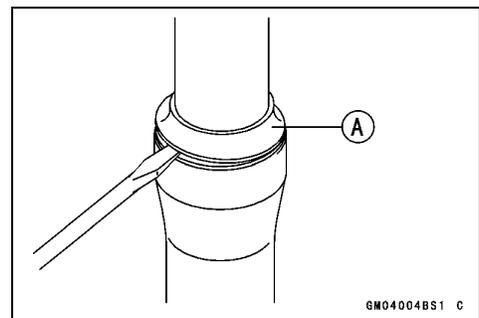
- Hold the front fork horizontally in a vise [A].
- Stop the cylinder unit [B] from turning by using the special tools and Allen wrench.
- Unscrew the Allen bolt [C], and take the gasket out of the bottom of the outer tube.

**Special Tools - Fork Cylinder Holder Handle: 57001-183 [D]
Fork Cylinder Holder Adapter: 57001-1011 [E]**

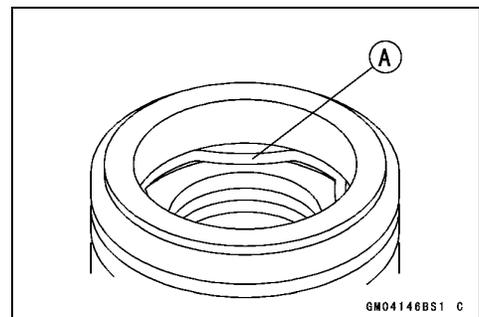
- Take the cylinder unit out of the inner tube.
- Remove the dust seal [A] from the outer tube with a screwdriver.
- Remove the retaining ring [A] from the outer tube with a screwdriver.



GM040138S1 C



GM04004BS1 C



GM04146BS1 C

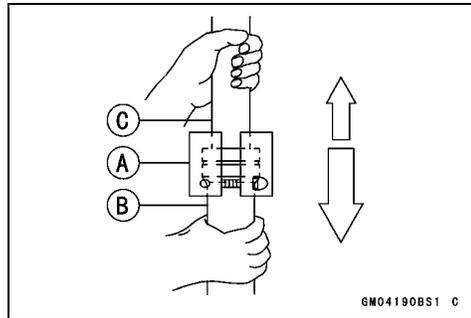
12-10 SUSPENSION

Front Fork

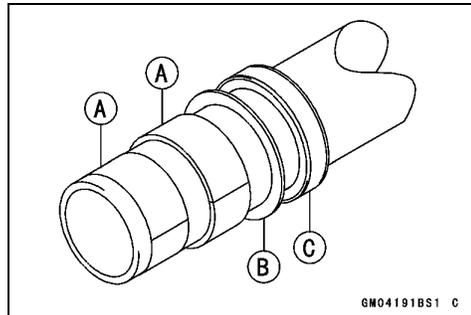
- Use the fork outer tube weight [A] to separate the outer tube [B] from the inner tube [C]. Holding the inner tube by hand, pull the outer tube several times to pull out the inner tube.

Special Tool - Fork Outer Tube Weight: 57001-1218

- Take out the cylinder base out of the outer tube.

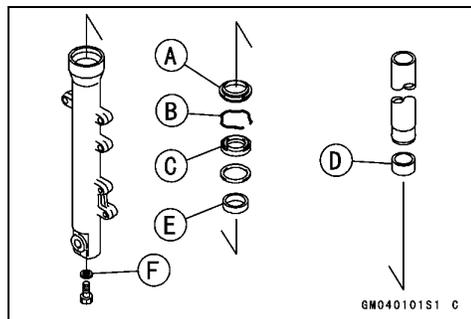


- Remove the guide bushings [A], washer [B], and oil seal [C] from the inner tube.

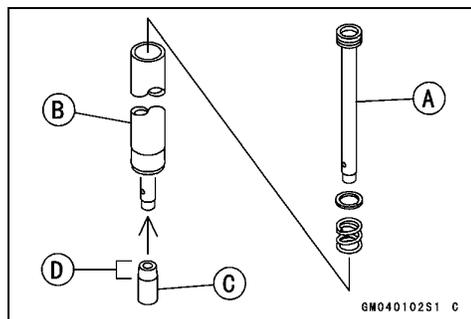


Fork Assembly

- Check the O-ring on the top plug and replace it with a new one.
- Replace the following parts with new ones after removal.
 - Dust Seal [A]
 - Retaining Ring [B]
 - Oil Seal [C]
 - Inner Guide Bushing [D]
 - Outer Guide Bushing [E]
 - Bottom Allen Bolt Gasket [F]



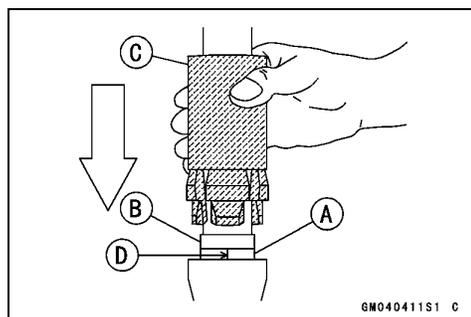
- Put the cylinder unit [A] with the spring into the inner tube [B] protruding from the inner tube, and install the cylinder base [C] onto the bottom end of the cylinder unit.
- Install the cylinder base with the tapered end [D] up.
- Install the inner tube, cylinder unit, and cylinder base as a set into the outer tube.



- Install the new guide bushing [A] with a used guide bushing [B] on it by tapping the used guide bushing with the fork oil seal driver [C] until it stops.
- The split [D] of the bushing should face toward the side of the vehicle.

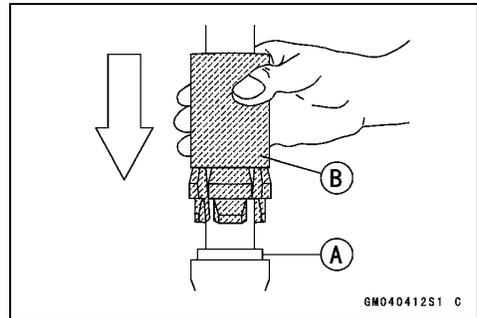
Special Tool - Front Fork Oil Seal Driver: 57001-1219

- Remove the used guide bushing.



Front Fork

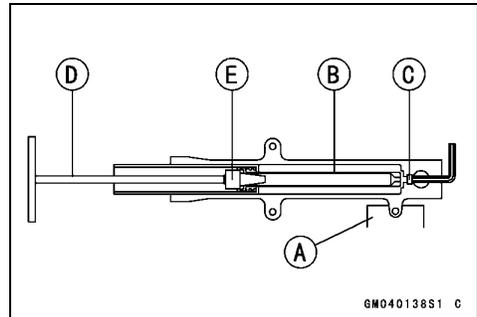
- Apply molybdenum disulfide grease to the oil seal lips and install the washer and oil seal [A] into the outer tube.
- **Special Tool - Front Fork Oil Seal Driver: 57001-1219 [B]**
- Install the retaining ring and dust seal by hand.



- Put the new gasket on the bottom of the outer tube.
- Apply a non-permanent locking agent to the threads of the Allen bolt and screw the Allen bolt into the bottom of the outer tube.
- Hold the outer tube horizontally in a vise [A].
- Hold the cylinder unit [B] with the special tools and Allen wrench, tighten the Allen bolt [C].

Torque - Bottom Allen Bolt: 20 N·m (2.0 kgf·m, 15 ft·lb)

**Special Tools - Fork Cylinder Holder Handle: 57001-183 [D]
Fork Cylinder Holder Adapter: 57001-1011 [E]**



- Pour in the specified type of oil and install the parts removed.

Fork Oil Viscosity:

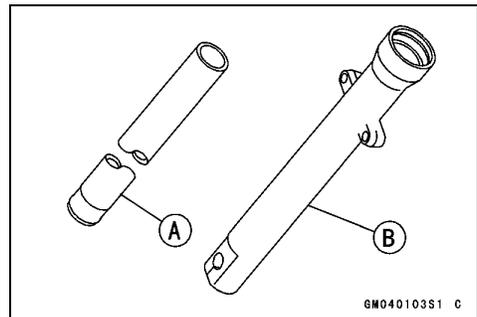
SHOWA SS-8 or equivalent

Fork Oil Capacity (completely dry):

191 ±2.5 mL (6.46 ±0.085 US oz.)

Inner Tube, Outer Tube Inspection

- Visually inspect the inner tube [A] and repair any damage.
- Nick or rust damage can sometimes be repaired by using a wet-stone to remove sharp edges or raised areas which cause seal damage.
- ★ If the damage is not repairable, replace the inner tube. Since damage to the inner tube damages the oil seal, replace the oil seal whenever the inner tube is repaired or replaced.



CAUTION

If the inner tube is badly bent or creased, replace it. Excessive bending, followed by subsequent straightening, can weaken the inner tube.

- Temporarily assemble the inner and outer tubes [B], and pump them back and forth manually to check for smooth operation.
- ★ If you feel binding or catching, the inner and outer tubes must be replaced.

WARNING

A straightened inner or outer fork tube may fail in use, possibly causing an accident. Replace a badly bent or damaged inner or outer tube, and inspect the other tube carefully before reusing it.

12-12 SUSPENSION

Front Fork

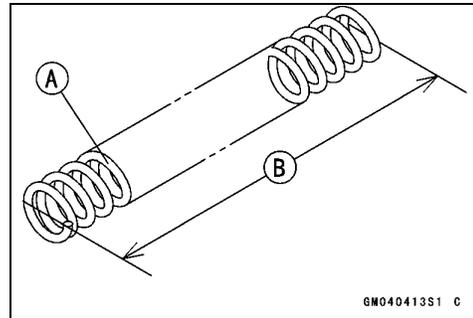
Spring Inspection

- Since the fork spring [A] becomes shorter as it weakens, check its free length [B] to determine its condition.
- ★ If the spring of either fork leg is shorter than the service limit, it must be replaced. If the length of the replacement spring and that of the remaining spring vary greatly, the remaining spring should also be replaced in order to keep the fork legs balanced for motorcycle stability.

Fork Spring Free Length

Standard: 398.5 mm (15.7 in.)

Service Limit: 391 mm (15.4 in.)



Rear Shock Absorbers

Spring Preload Adjustment

- To adjust the spring force, turn the adjuster on each shock absorber to the desired position.

Owner's Tool - Hook Wrench: 92110-1143 [A]

Spring Preload Adjustment

Adjuster Position	1	2	3	4	5
Spring Tension	→ Stronger				

⚠ WARNING

If a pair of adjusters are not adjusted equally, handling may be impaired and a hazardous condition may result.

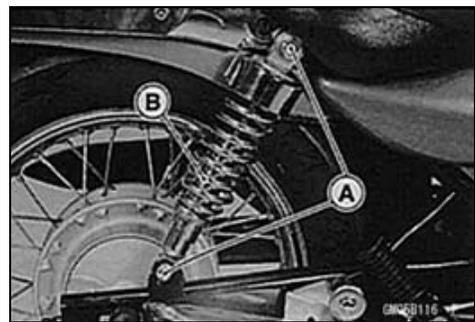
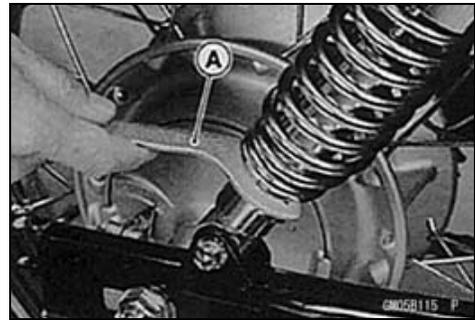
Removal

- Raise the rear wheel off the ground.
- **Special Tool - Jack: 57001-1238**
- Unscrew the upper mounting nut and lower mounting bolts [A], and remove the rear shock absorber [B].

Installation

- Install the rear shock absorbers.
- Tighten the rear shock absorber nuts and bolts.

Torque - Rear Shock Absorber Mounting Nut and Bolt: 34 N·m (3.5 kgf·m, 25 ft·lb)



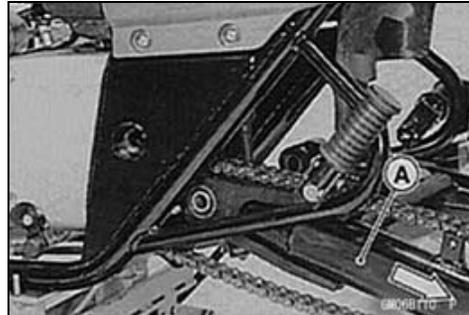
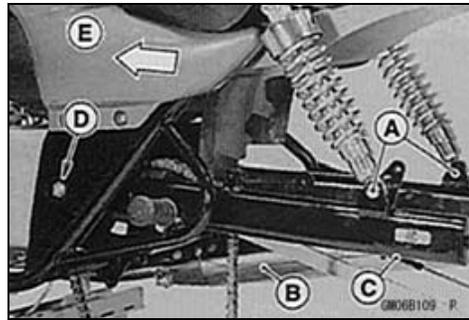
12-14 SUSPENSION

Swingarm

Swingarm Removal

- Remove:
 - Chain Cover
 - Rear Wheel (see Wheels/Tires chapter)
 - Rear Shock Absorber Lower Mounting Bolts [A] (see this chapter)
 - Silencer [B] (see Engine Top End chapter)
 - Brake Cable [C] (see Brakes chapter)
 - Pivot Nut [D]
 - Front [E]

- Pull out the swingarm pivot shaft, and remove the swingarm [A].
- Separate the drive chain.



Swingarm Installation

- Apply plenty of grease to the inside of the needle bearings and grease seals.
- Loop the drive chain [A] onto the swingarm.
- Install the swingarm.
- Install the removed parts (see appropriate chapters).
- Tighten the following:

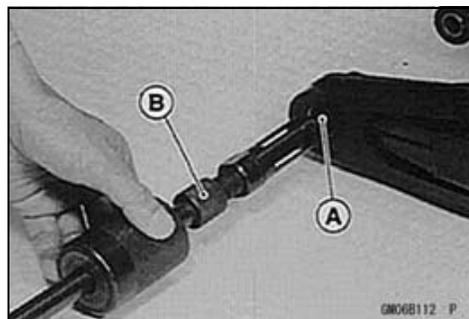
Torque - Swingarm Pivot Nut: 98 N·m (10.0 kgf·m, 72 ft·lb)
Rear Shock Absorber Bolts: 34 N·m (3.5 kgf·m, 25 ft·lb)



Swingarm Bearing Removal

- Remove:
 - Swingarm (see this chapter)
 - Sleeve
 - Grease Seals
- Remove the needle bearings [A], using the oil seal & bearing remover [B].

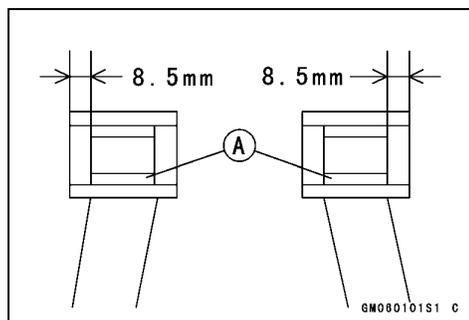
Special Tool - Oil Seal & Bearing Remover: 57001-1058



Swingarm Bearing Installation

- Apply plenty of grease to the new needle bearings, sleeve, and grease seal lip.
- Position the bushings [A] as shown, using a suitable bearing driver in the bearing driver set.
- Be sure to install the needle bearing so that the manufacturer's marks are faced out. This prevents bearing damage.

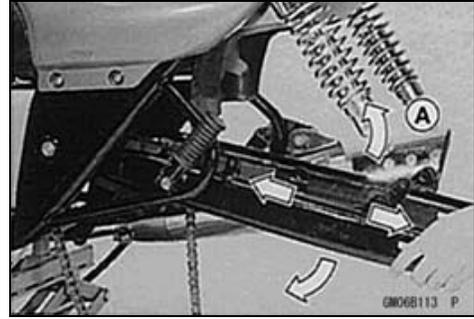
Special Tool - Bearing Driver Set: 57001-1129



Swingarm

Swingarm Pivot Check

- Remove:
 - Rear Wheel (see Wheels/Tires chapter)
 - Rear Shock Absorber Bolts
- Move the swingarm up and down to check for abnormal friction, and push and pull it to check for bushings play [A]. A small amount of play on the pivot is normal and no corrective action is needed. However, if excessive play is felt, check the swingarm bushings for wear and replace them if necessary.

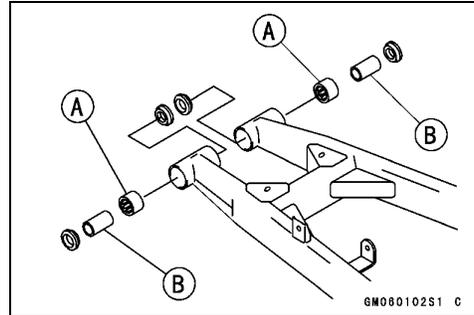


Swingarm Bearing, Sleeve Inspection

CAUTION

Do not remove the bearing for inspection. Removal may damage them.

- Visually inspect the swingarm needle bearing [A].
- The rollers in a needle bearing normally wear very little, and wear is difficult to measure. Instead of measuring, inspect the bearing in the swingarm for abrasion, color change, or other damage.
- ★ If there is any doubt as to the condition of any of the needle bearings or sleeves [B], replace all the sleeves, and needle bearings as a set.



Steering

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Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Steering Stem Head Bolts	44	4.5	33	
2	Steering Stem Nut	Hand-tight or 4.9	Hand-tight or 0.50	Hand-tight or 43 in·lb	
3	Handlebar Nuts	34	3.5	25	
4	Handlebar Weight Screws	–	–	–	L
5	Handlebar Switch Housing Screws	3.4	0.35	30 in·lb	
6	Front Fork Clamp Bolts (Lower)	34	3.5	25	S
7	Front Fork Clamp Bolts (Upper)	20	2.0	15	S
8	Handlebar holder clamp bolts	20	2.0	15	S

9. BN125-A3 ~

AD: Apply adhesive.

G: Apply grease.

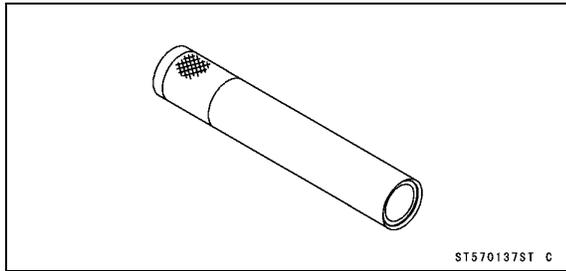
L: Apply a non-permanent locking agent.

S: Follow the specific tightening sequence.

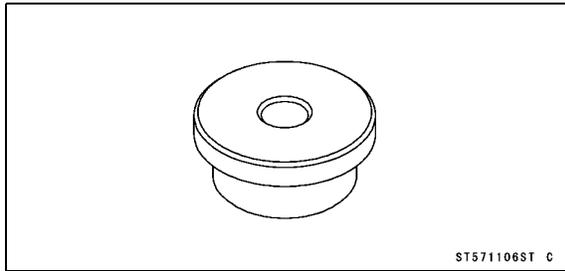
13-4 STEERING

Special Tools

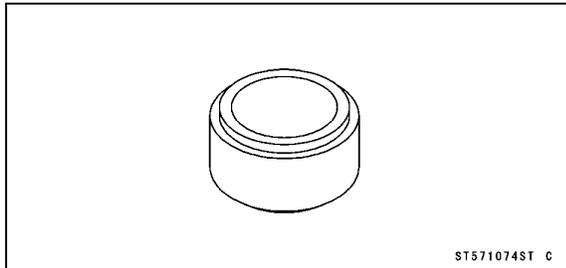
Steering Stem Bearing Driver:
57001-137



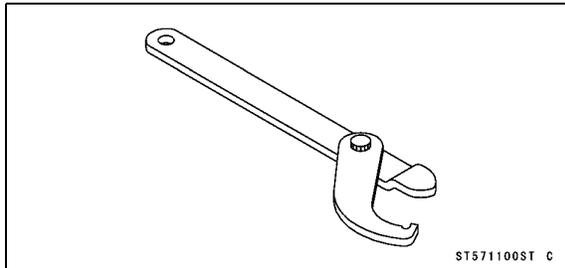
Head Pipe Outer Race Driver, $\phi 46.5$:
57001-1106



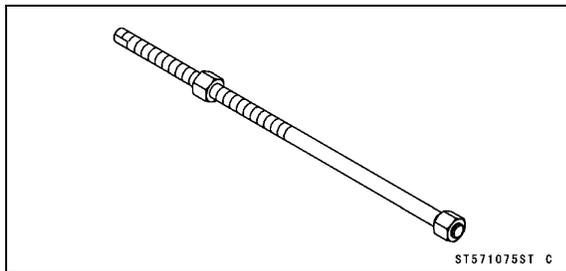
Steering Stem Bearing Driver Adapter, $\phi 34.5$:
57001-1074



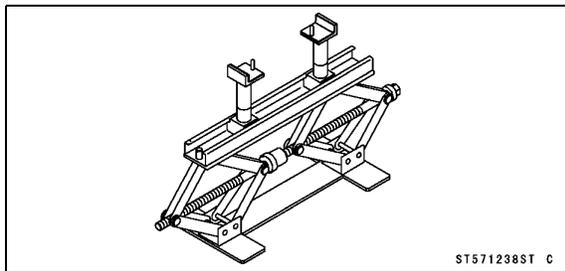
Steering Stem Nut Wrench:
57001-1100



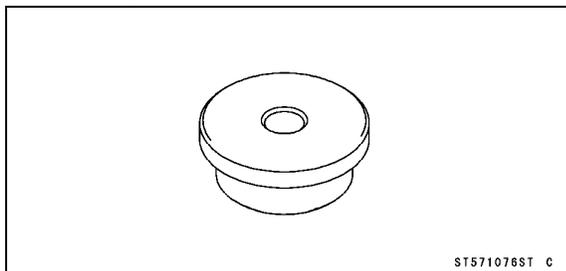
Head Pipe Outer Race Press Shaft:
57001-1075



Jack:
57001-1238



Head Pipe Outer Race Driver, $\phi 51.5$:
57001-1076



Steering

Steering Inspection

- Refer to the Steering Inspection in the Periodic Maintenance chapter.

Steering Adjustment

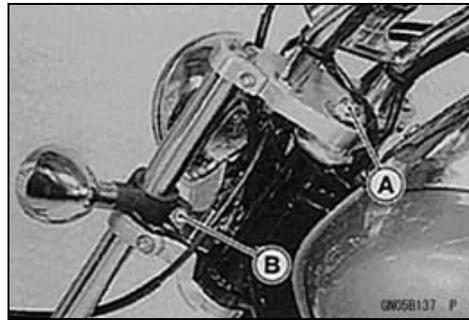
- Refer to the Steering Adjustment in the Periodic Maintenance chapter.

13-6 STEERING

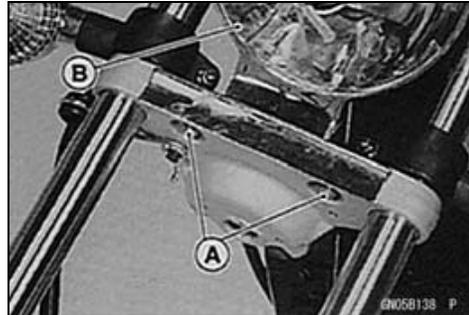
Steering Stem

Steering Stem Removal

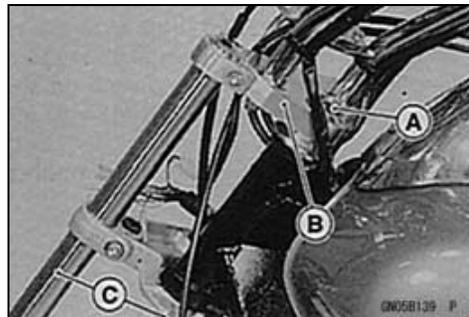
- Loosen the steering stem head bolt [A].
- Open the headlight body and pull off the connectors in the headlight body (see Electrical System chapter).
- Remove the clutch cable upper end and lead connector.
- Loosen the turn signal light holder bolts and nuts [B].



- Remove the nuts [A] and take off the headlight body [B].

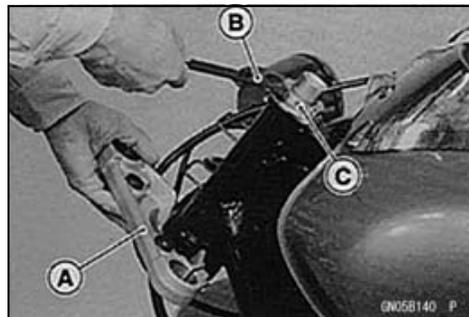


- Remove:
 - Steering Stem Head Bolt [A]
 - Steering Stem Head [B]
 - Front Fork [C] (see Suspension chapter)
- Remove the steering stem head with the meter unit and handlebar left installed.



- Push up on the stem base [A], and remove the stem nut [C] with the steering stem nut wrench [B], then remove the steering stem.

Special Tool - Steering Stem Nut Wrench: 57001-1100



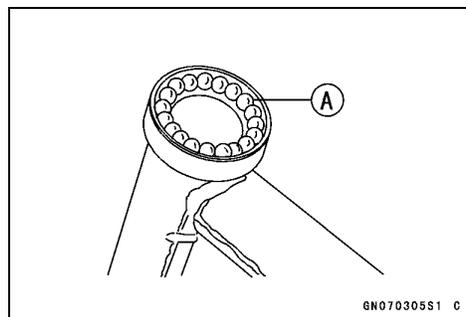
- Remove:
 - Lower Inner Race and Steel Balls (20)
 - Steering Stem Cap [A]
 - Upper Inner Race and Steel Balls (19)



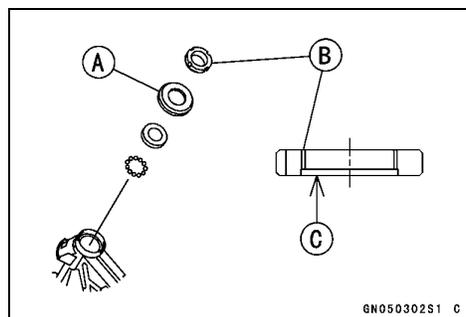
Steering Stem

Steering Stem Installation

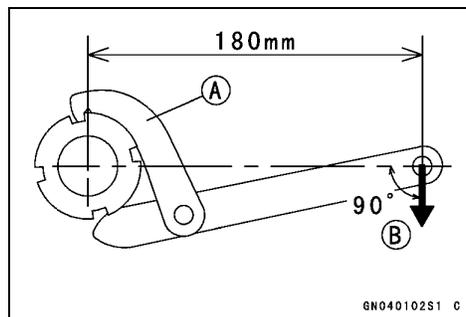
- Apply grease to the upper and lower outer races in the head pipe so that the steel balls will stick in place during stem insertion. Install the upper steel balls (23) [A] and lower steel balls (23). All the steel balls are the same size.



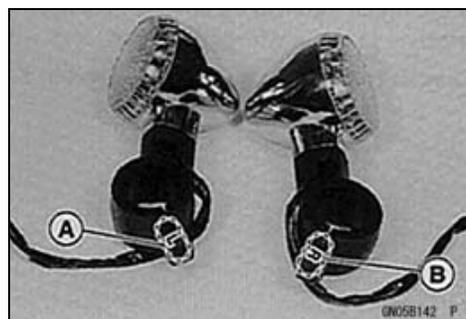
- Put on the upper inner race and steering stem cap [A] and insert the steering stem into the head pipe.
- Install the stem nut [B] so that the recessed side [C] faces down.



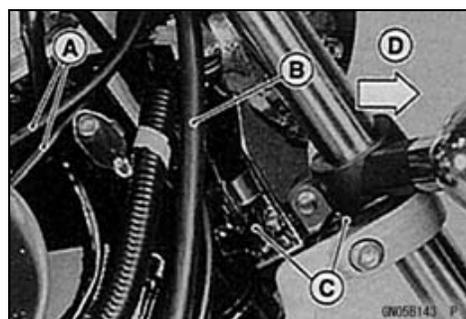
- When the races are replaced with new ones, tighten the stem nut to 20 N·m (2.0 kgf·m, 14.5 ft·lb) of torque with the stem nut wrench [A] to settle the races in place. To tighten the stem nut to the specified torque, hook the wrench on the stem nut, and pull the wrench at the hole with 108 N (11 kgf) of force [B] in the direction shown.
- Loosen the stem nut and adjust the steering (see this chapter).



- Install the turn signal light unit.
 - The left turn signal light unit has an L mark [A] on it, and the right turn signal light unit has an R mark [B].
 - Tighten:
 - Torque - Turn Signal Light Holder Nuts: 5.9 N·m (0.60 kgf·m, 52 in·lb)**



- Run the throttle cables [A], clutch cable [B], and turn signal light leads [C] as shown. Front [D]



13-8 STEERING

Steering Stem

- Install the front fork (see Suspension chapter).

NOTE

○ Install the front fork at the correct position. Tighten the fork upper clamp bolts [A] first, next the stem head bolt [B], last the fork lower clamp bolts.

Torque - Front Fork Clamp Bolts (Upper): 20 N·m (2.0 kgf·m, 15 ft·lb)

Steering Stem Head Bolt: 44 N·m (4.5 kgf·m, 33 ft·lb)

Front Fork Clamp Bolts (Lower): 34 N·m (3.5 kgf·m, 25 ft·lb)

- Install the removed parts.

⚠ WARNING

Do not impede the handlebar turning by routing the cables, harnesses and hoses improperly (see General Information chapter).

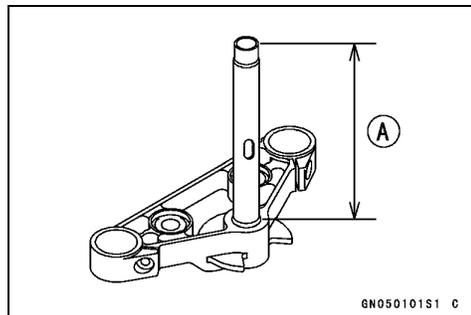
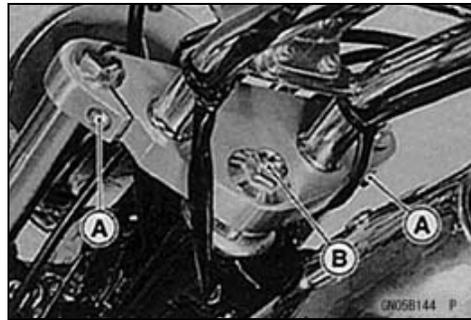
- Check and adjust the following items.
 - Throttle Cables (see Fuel System chapter)
 - Clutch Cable
 - Rear View Mirrors
- Check the front brake effectiveness.

⚠ WARNING

Do not attempt to ride the motorcycle until a full brake lever is obtained by pumping the brake lever until the pads are against the disc. The brakes will not function on the first application of the lever if this is not done.

Steering Stem Warp

- Whenever the steering stem [A] is removed, or if the steering cannot be adjusted for smooth action, check the steering stem for straightness.
- ★ If the steering stem is bent, replace the steering stem.

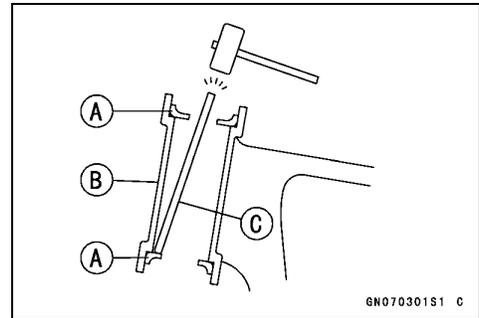


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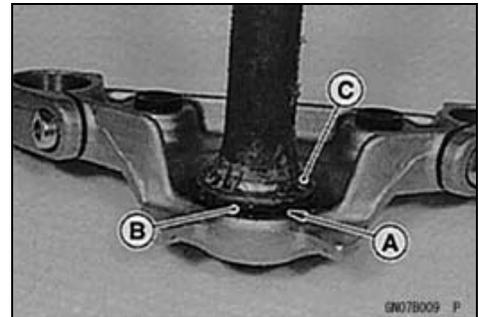
Steering Stem Bearing

Steering Stem Bearing Removal

- ★ If the bearing is damaged, remove it.
- To remove the outer races [A] pressed in the head pipe, insert a bar [C] into the head pipe [B], and hammer evenly around the circumference of the opposite race to drive it out.



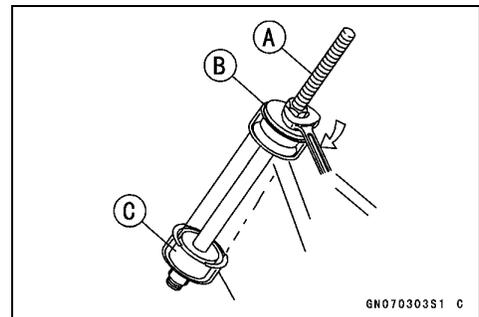
- Hammer the bottom [A] of the lower inner race with a chisel.
- Using a suitable bar, pry out the inner race from the stem.
 - Grease Seal [B]
 - Lower Inner Race [C]



Steering Stem Bearing Installation

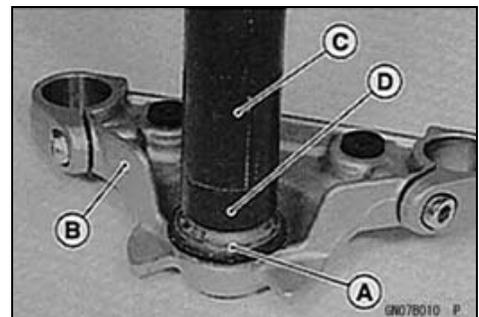
- Replace the bearing outer races with new ones.
- Apply grease to the outer races, and drive them into the head pipe at the same time.

- Special Tools - Head Pipe Outer Race Press Shaft: 57001-1075 [A]**
Head Pipe Outer Race Driver, ϕ 51.5: 57001-1076 [C]
Head Pipe Outer Race Driver, ϕ 46.5: 57001-1106 [B]



- Replace the stem bearing inner race with new ones.
- Apply grease to the lower inner race [A], and drive it onto the stem [B].

- Special Tools - Steering Stem Bearing Driver: 57001-137 [C]**
Steering Stem Bearing Driver Adapter, ϕ 34.5: 57001-1074 [D]



Steering Stem Bearing Wear, Damage

- Remove the steering stem (see this chapter).
- Using a high-flash point solvent, wash the bearings, clean of grease and dirt, and examine the races and balls.
- Visually check the balls or races.
- ★ If the balls or races are worn, or if either race is dented, replace both races and all the balls for that bearing as a set.

Steering Stem Bearing Lubrication

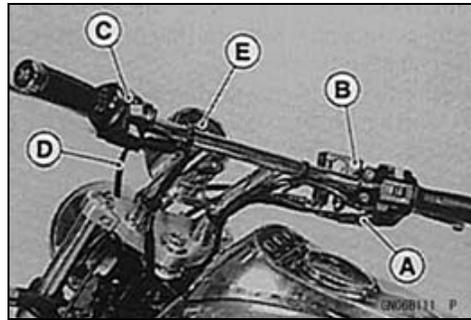
- Refer to the Steering Stem Bearing Lubrication in the Periodic Maintenance chapter.

13-10 STEERING

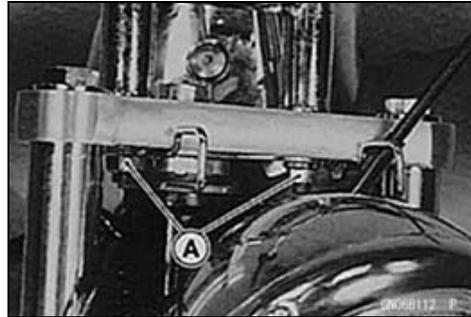
Handlebar

Handlebar Removal (BN125-A1/A2)

- Remove:
 - Throttle Cables [A] (see Fuel System chapter)
 - Brake Master Cylinder [B] (see Brakes chapter)
 - Left Handlebar Switch Housing [C]
 - Clutch Cable Upper End [D]
 - Speedometer Unit [E] (with Cable)

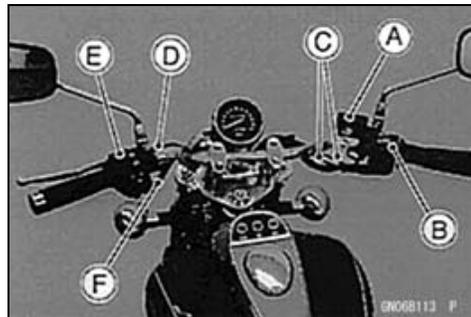


- Remove the handlebar nuts [A] and take off the handlebar.

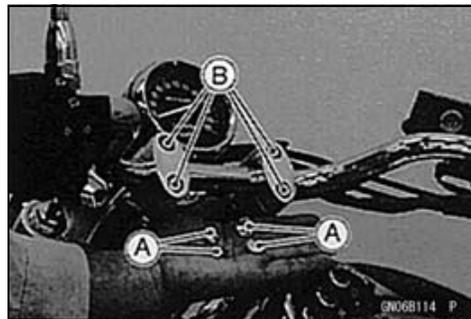


Handlebar Removal (BN125-A3 ~)

- Remove:
 - Brake Master Cylinder [A] (see Brakes chapter)
 - Right Handlebar Switch Housing [B] with Throttle Cables [C]
 - Clutch Cable Upper End [D]
 - Left Handlebar Switch [E]
 - Starter Lockout Switch Lead [F]



- Remove the caps [A] and handlebar holder clamp bolts [B].

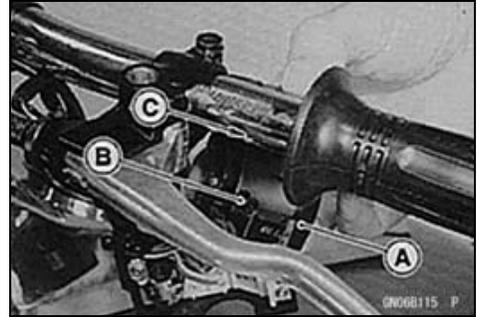


Handlebar Installation (BN125-A1/A2)

- Tighten the handlebar nuts.
 - Torque - Handlebar Nuts: 34 N·m (3.5 kgf·m, 25 ft·lb)**
- Install the removed parts.
 - Brake Master Cylinder (see Brakes chapter).

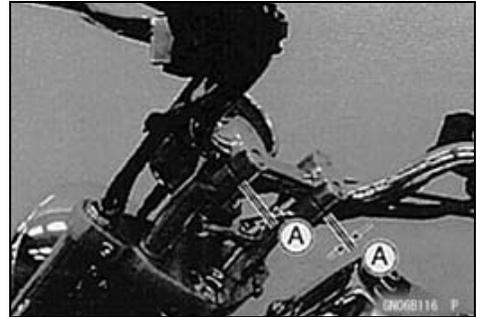
Handlebar

- The front half of the right and left switch housings [A] has a small projection [B]. Fit the projection into the small hole [C] in the handlebar.
- Install the handlebar switch housing.
- Tighten:
 - Torque - Handlebar Switch Housing Screws: 3.4 N·m (0.35 kgf·m, 30 in·lb)**



Handlebar Installation (BN125-A3 ~)

- There is a gap [A] between the upper handle holder and lower handle holder so that the handlebar should be installed securely. When the upper holder shall be installed, tighten the front handlebar clamp bolts first and then rear bolt with specified torque.
- Tighten:
 - Torque - Handlebar Holder Clamp Bolts: 20 N·m (2.0 kgf·m, 15 ft·lb)**
- Install the removed parts.

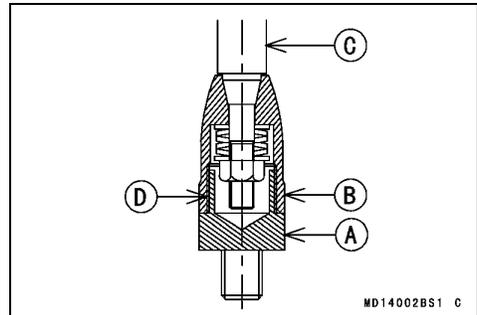


Rear View Mirror Removal (Europe)

- Loosen the lower hexagonal area [A] for tightening to remove the rear view mirror from the holder.

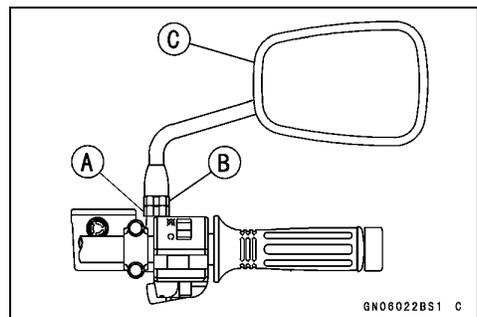
CAUTION

Do not force to tighten and/or loosen the upper hexagonal area (Adapter) [B] with a pair of spanners. Disassembly of this area is Not Available. Non-permanent locking agent [D] is already applied to the threads of this inner area. Forcible loosening may damage the adapter and/or the turning mechanism of the stay [C].



Rear View Mirrors Installation (Europe)

- Screw the mounting area of the right rear view mirror into the holder all the way, and tighten the lower hexagonal area for tightening securely.
 - [A] Lower Hexagonal Area for Tightening
 - [B] Upper Hexagonal Area (Adapter)
 - [C] Rear View Mirror (Right)



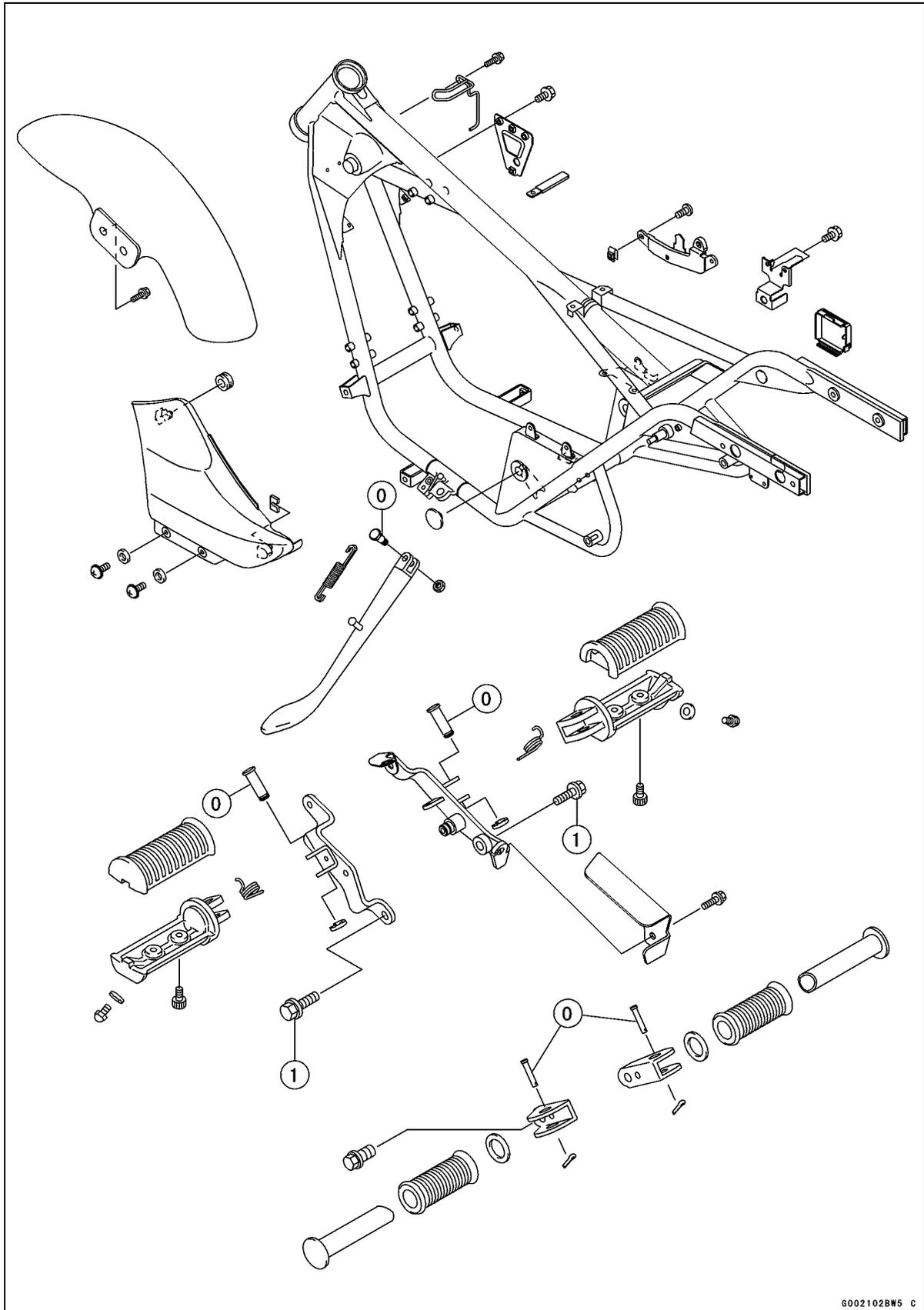
Frame

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14-2 FRAME

Exploded View



6002102BWS C

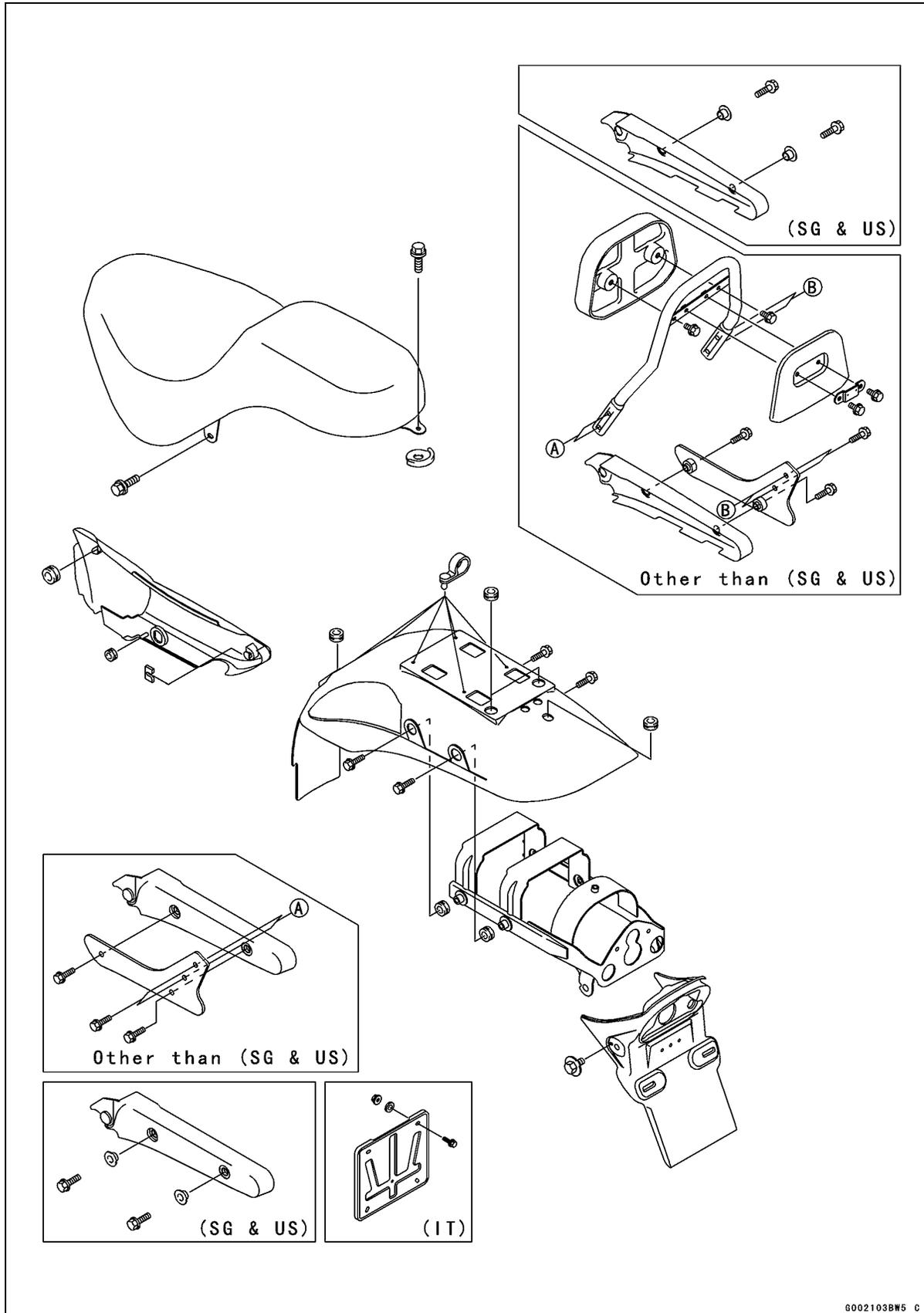
Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Front Footpeg Bolts	23	2.3	17	

O: Apply oil.

14-4 FRAME

Exploded View



6002103BWS C

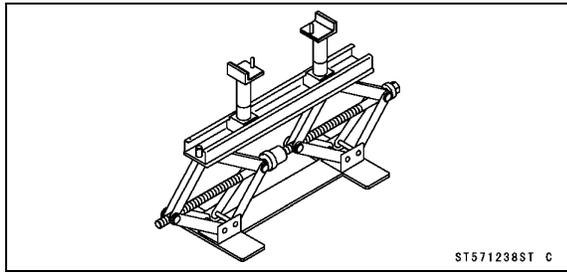
Exploded View

IT: Italy
SG: Singapore
US: United States (BN125-A4 ~)

14-6 FRAME

Special Tool

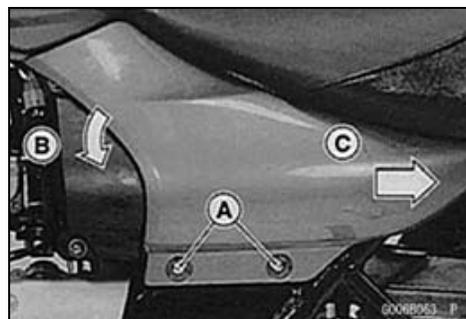
Jack:
57001-1238



Side Covers

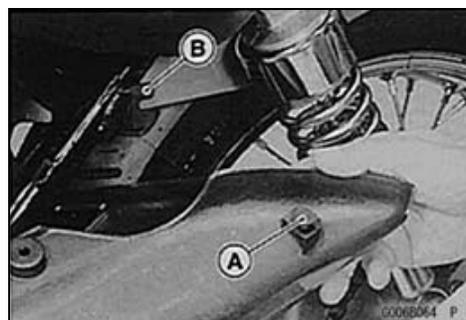
Left Side Cover Removal

- Remove the screws [A].
- Pull [B] the front part of the left side cover outward to clear the stopper.
- Pull [C] the cover rearward to clear the hook, and remove it.



Left Side Cover Installation

- Slip the stopper [A] of the left side cover onto the hook [B].
- Push the stopper of the cover into the grommet.
- Tighten the screws.



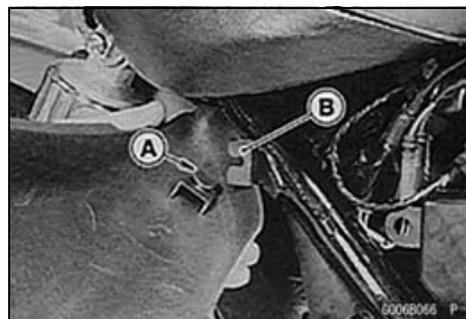
Right Side Cover Removal

- Insert the ignition switch key into the right side cover.
- Turn [A] the key clockwise, and pull [B] the front part of the cover outward to clear the stopper.
- Pull [C] the cover rearward to clear the hook, and remove it.



Right Side Cover Installation

- Slip the stopper [A] of the right side cover onto the hook [B].
- While turning the ignition switch key clockwise, push the stopper of the cover into the grommet.
- Turn the key counterclockwise, and pull out the key.

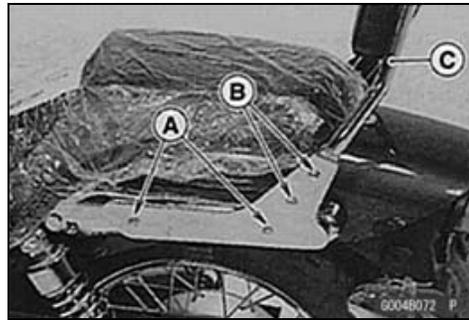


14-8 FRAME

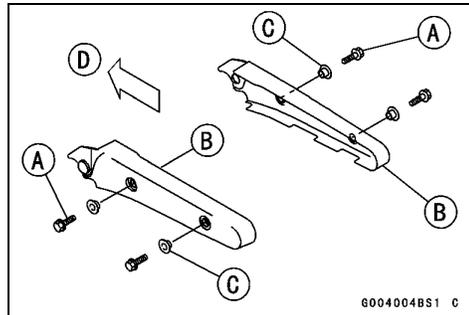
Seat

Seat Removal

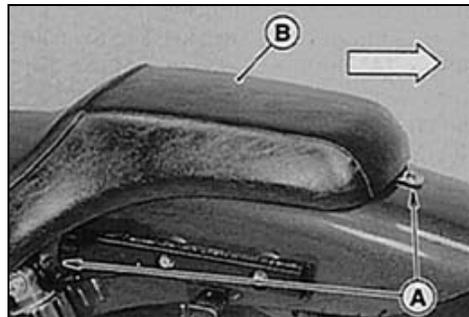
- For the models other than the Singapore and U.S.A. models, remove the bolts [A] and loosen the bolts [B] on both sides.
- Remove the pad assembly [C].



- For the Singapore and U.S.A. models remove the bolts [A], cover [B], and collar [C] on both sides.
Front [D]

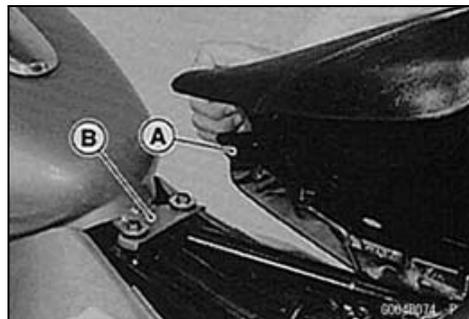


- Remove the seat bolts [A] and take off the seat [B].



Seat Installation

- Slip the hook [A] of the seat under the bracket [B] on the fuel tank.
- Install the removed parts.
- For the Singapore and U.S.A. models, install the collar, noting its direction (see above figure).



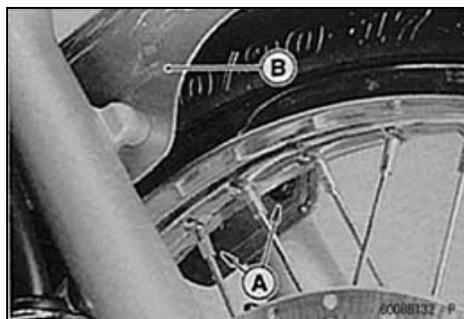
Fenders

Front Fender Removal

CAUTION

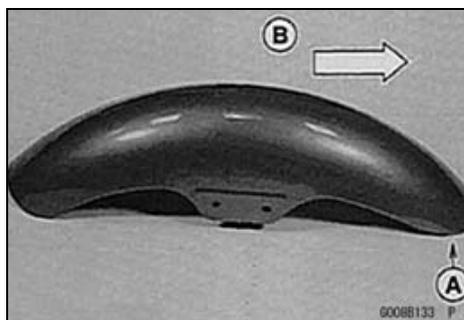
Be careful not to scratch the painted surface during removal or installation.

- Remove the mounting bolts [A] and take off the front fender [B].



Front Fender Installation

- Install the front fender so that the narrower side [A] faces forward [B].

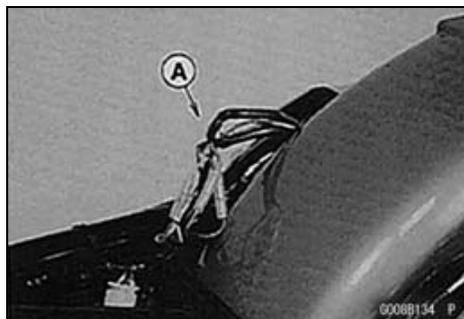


Rear Fender Rear Removal

- Remove the seat (see this chapter).
- Raise the rear wheel off the ground, using the jack (see Wheels/Tires chapter).

Special Tool - Jack: 57001-1238

- Pull the connectors [A] of the rear turn signal light and tail/brake light leads.



- Remove the rear fender rear bolts [A].



- Pull the rear fender rear [A] rearward.
- The rear turn signal light and tail/brake light leads come off.

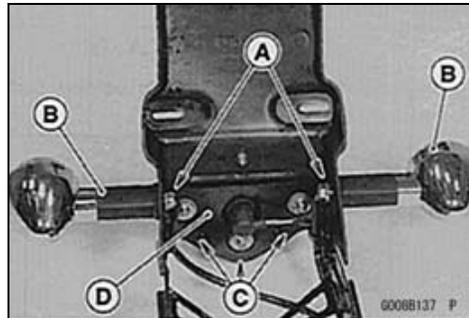


14-10 FRAME

Fenders

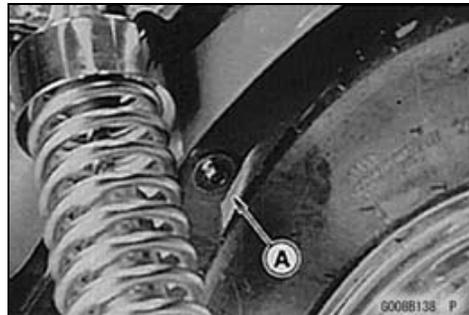
Rear Fender Rear Disassembly

- Remove the nuts [A] and take off the rear turn signal light assembly [B].
- Remove the nuts [C] and take off the tail/brake light assembly [D].

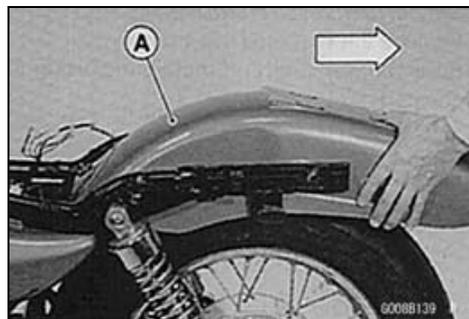


Rear Fender Front Removal

- Remove:
 - Rear Fender Rear (see this chapter)
 - Drive Chain Clip
 - Rear Brake Rod Rear End
- Remove the rear axle, and move the rear wheel rearward for the access to the bolts [A].



- Remove the rear fender front [A].



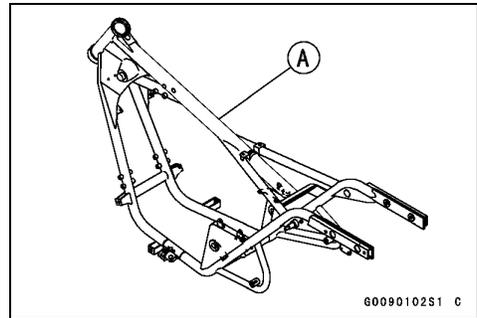
Frame

Frame Inspection

- Visually inspect the frame [A] for cracks, dents, bending, or warp.
- ★ If there is any damage to the frame, replace it.

⚠ WARNING

A repaired frame may fail in use, possibly causing an accident. If the frame is bent, dented, cracked, or warped, replace it.



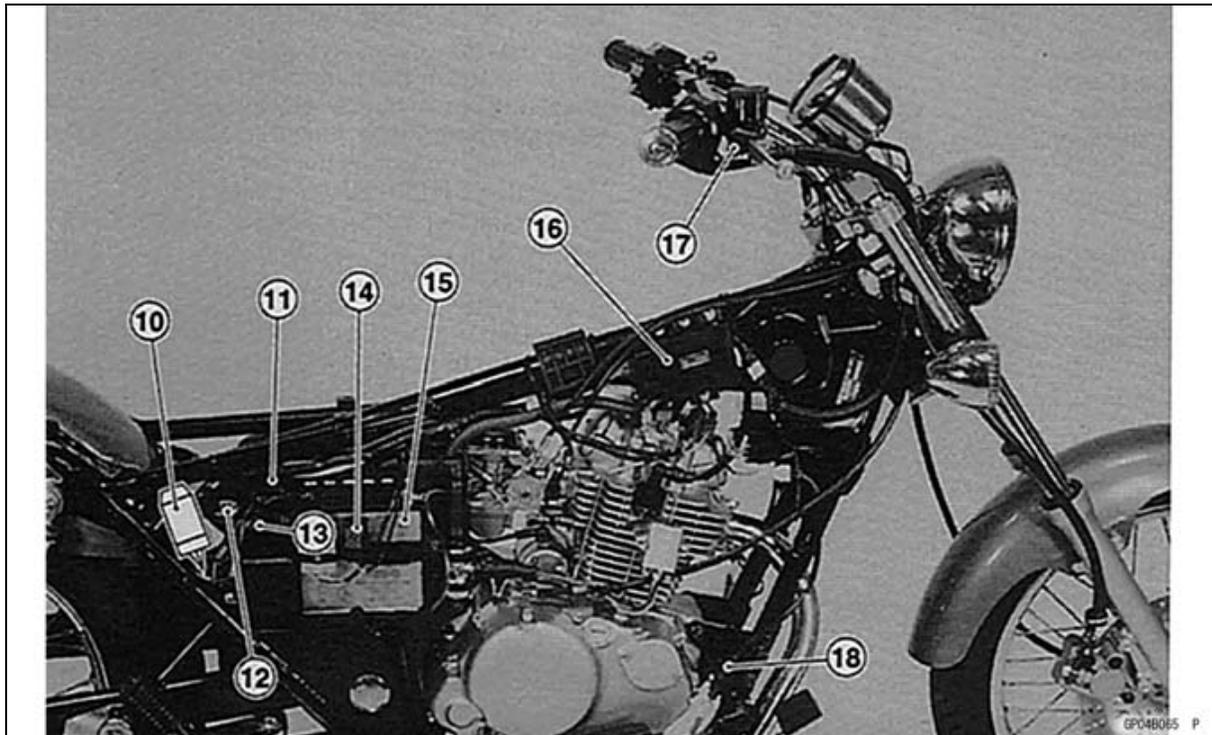
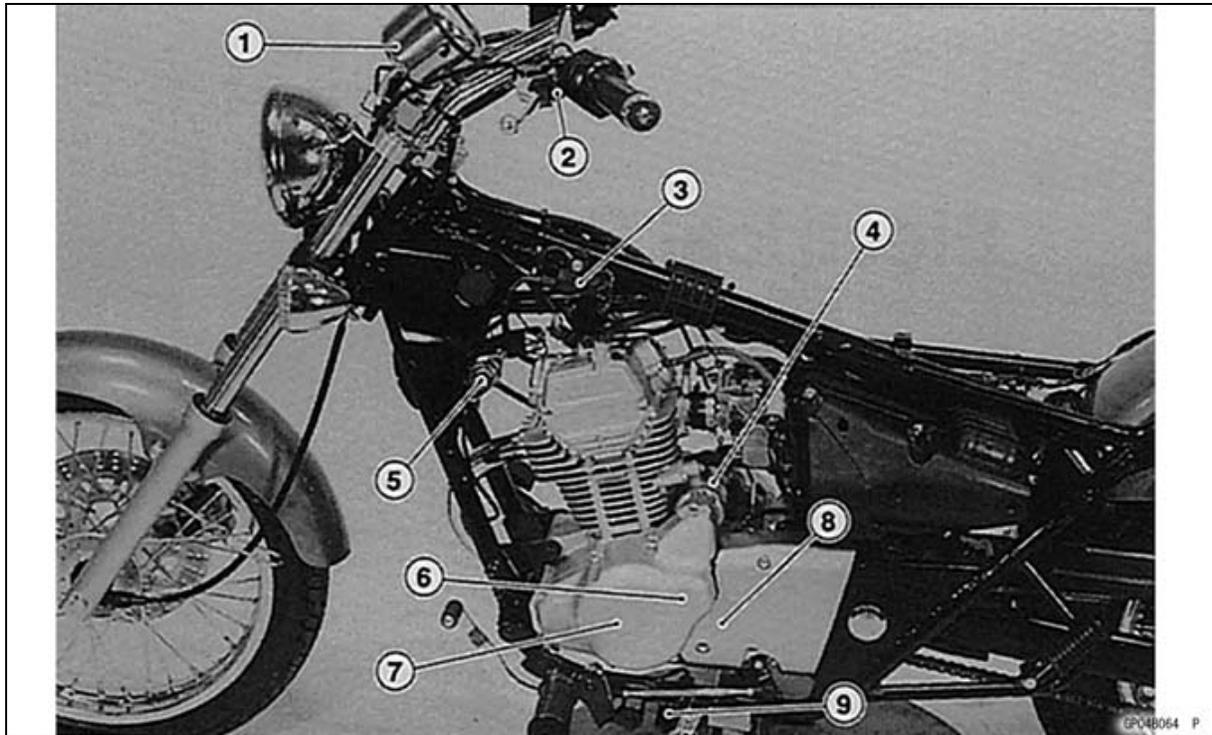
Electrical System

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15-2 ELECTRICAL SYSTEM

Parts Location

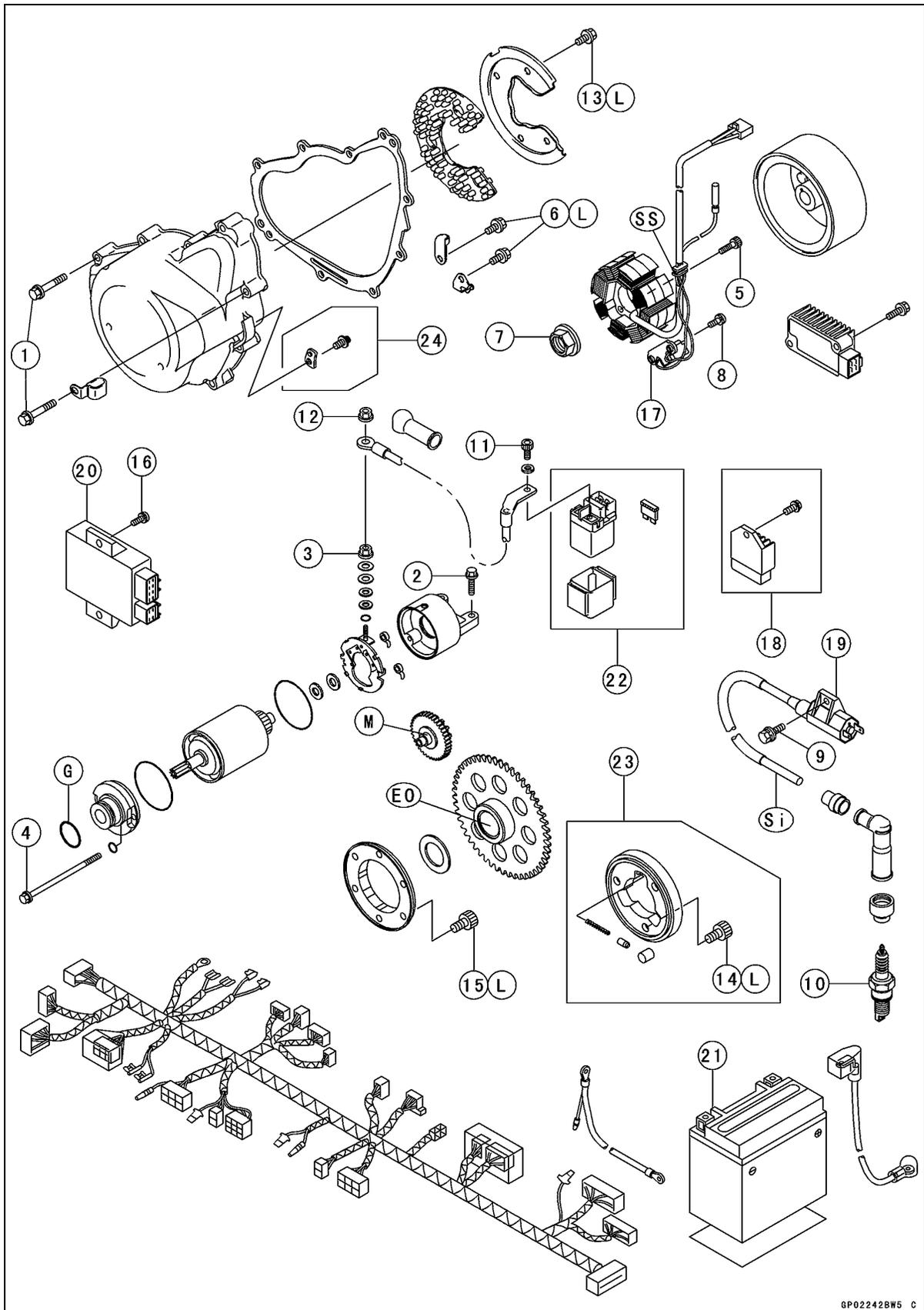


Parts Location

1. Speedometer
2. Starter lockout switch
3. Ignition coil
4. Starter motor
5. Ignition switch
6. Crankshaft sensor
7. Alternator
8. Neutral switch
9. Sidestand switch
10. Regulator/rectifier
11. Fuse unit
12. Starter circuit relay
13. Starter relay
14. Turn signal relay
15. Battery
16. CDI unit
17. Front brake light switch
18. Rear brake light switch

15-4 ELECTRICAL SYSTEM

Exploded View



GP02242BWS C

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Alternator Cover Bolts	8.8	0.90	78 in·lb	
2	Starter Motor Mounting Bolts	8.8	0.90	78 in·lb	
3	Starter Motor Terminal Locknut	6.9	0.70	61 in·lb	
4	Starter Motor Assembly Bolts	3.4	0.35	30 in·lb	
5	Stator Coil Bolts	13	1.3	113 in·lb	
6	Alternator Lead Holder Bolts (BN125-A1 ~ A2)	13	1.3	113 in·lb	
	Alternator Lead Holder Bolts (BN125-A3 ~)	8.8	0.90	78 in·lb	
7	Alternator Rotor Nut (BN125-A1/A2)	69	7.0	51	
	Alternator Rotor Nut (BN125-A3)	98	10.0	72	
	Alternator Rotor Nut (BN125-A4 ~)	104	10.6	76	
8	Crankshaft Sensor Screws	3.9	0.40	35 in·lb	
9	Ignition Coil Bolt	6.9	0.70	61 in·lb	
10	Spark Plug	13	1.3	113 in·lb	
11	Starter Relay Terminal Bolt	4.9	0.50	43 in·lb	
12	Starter Motor Terminal Nut	4.9	0.50	43 in·lb	
13	Alternator Cover Damper Bolts	8.8	0.90	78 in·lb	L
14	Starter Motor Clutch Bolts (BN125-A1)	34	3.5	25	L
15	Starter Motor Clutch Bolts (BN125-A2 ~)	12	1.2	104 in·lb	L
16	Igniter Mounting Screws	4.9	0.50	43 in·lb	

- 17. Crankshaft sensor
- 18. Regulator/rectifier
- 19. Ignition coil
- 20. CDI unit
- 21. Battery
- 22. Starter relay
- 23. Starter clutch (BN125-A1)
- 24. Other than United States and Canada Models

EO: Apply engine oil.

L: Apply a non-permanent locking agent.

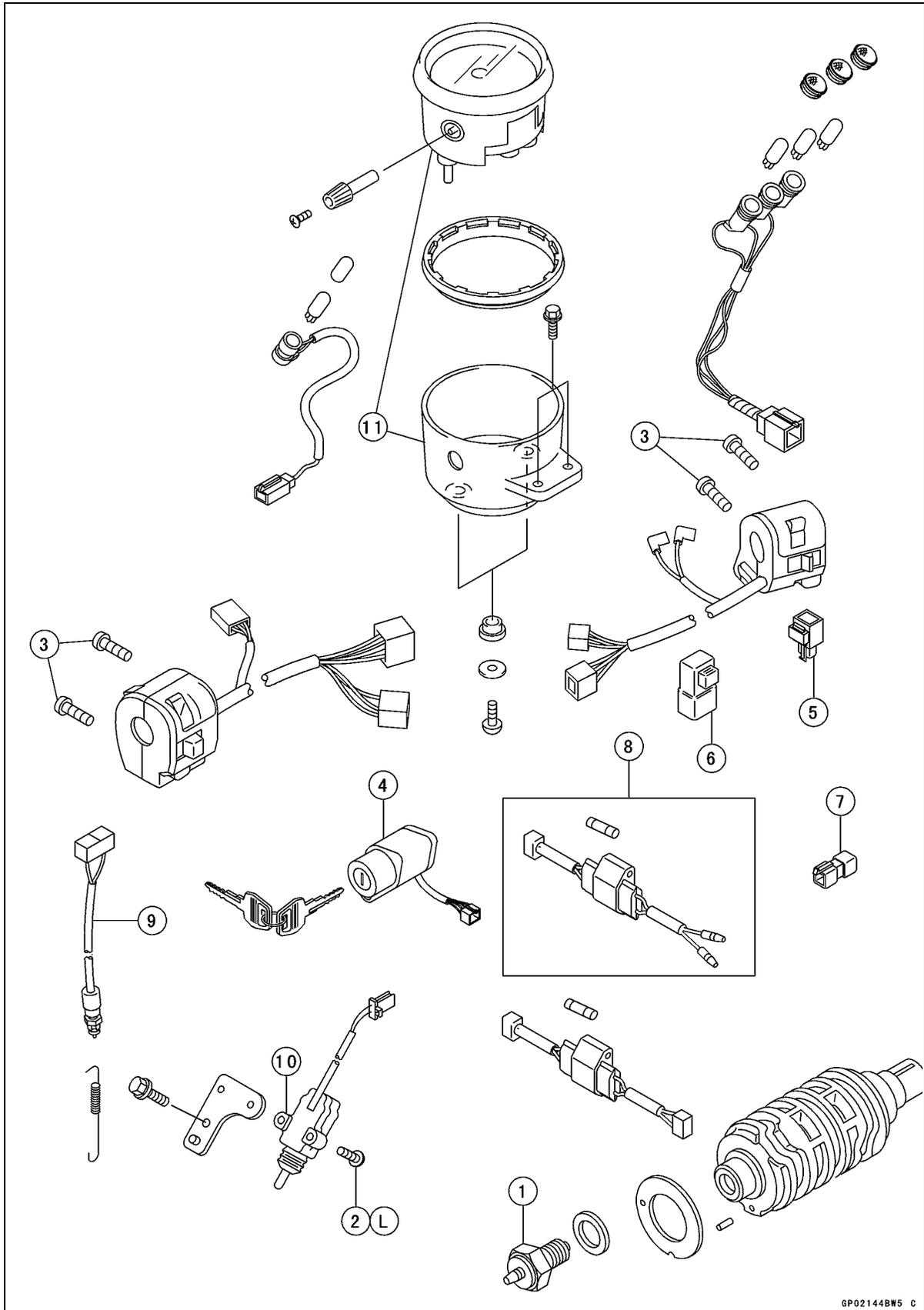
M: Apply molybdenum disulfide grease.

Si: Apply silicone grease.

SS: Apply silicone sealant (Kawasaki Bond: 56019-120).

15-6 ELECTRICAL SYSTEM

Exploded View



GP02144BWS C

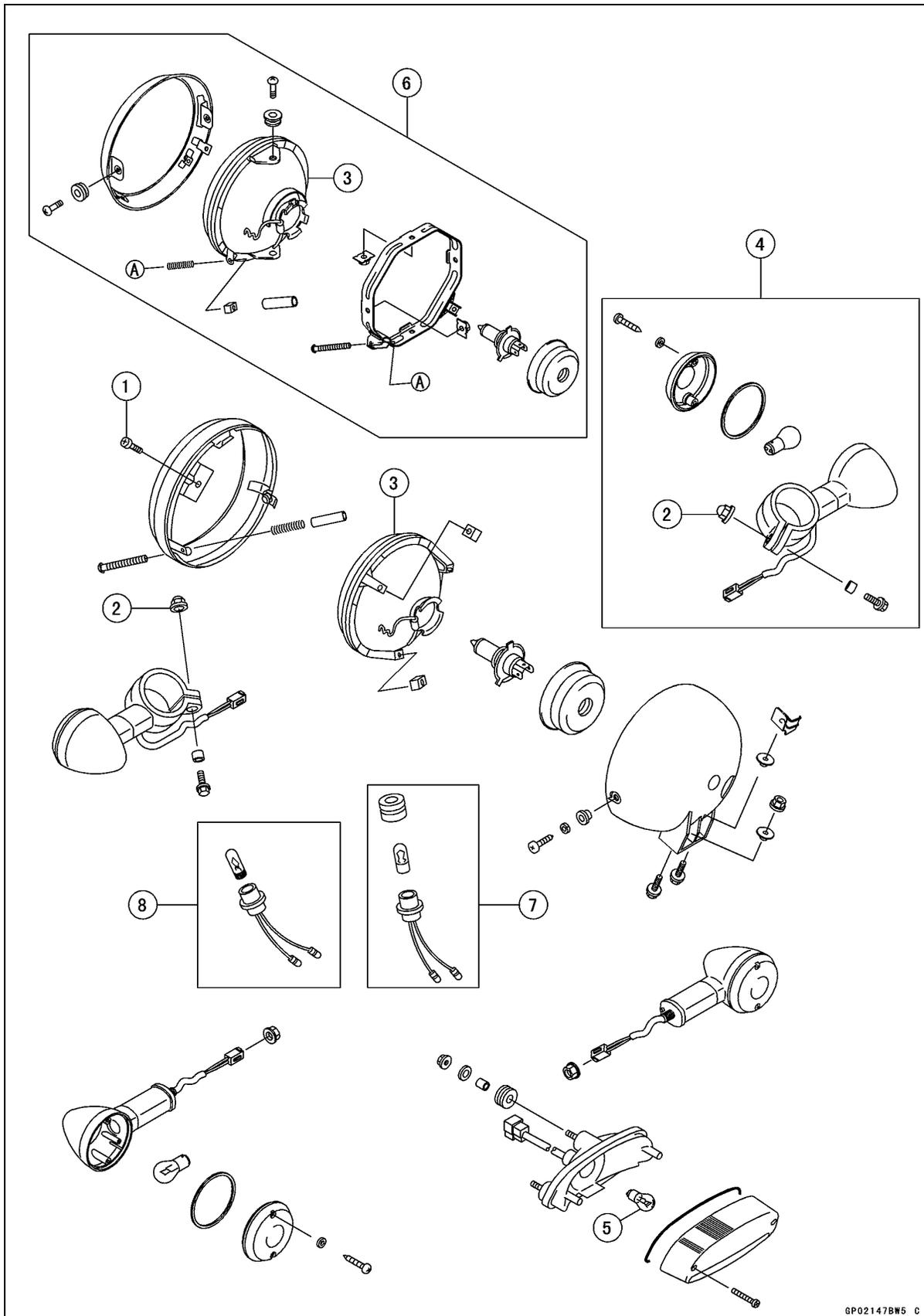
Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Neutral Switch	15	1.5	11	
2	Sidestand Switch Screws	3.9	0.40	35 in·lb	L
3	Handlebar Switch Housing Screws	3.4	0.35	30 in·lb	

- 4. Ignition switch
 - 5. Turn signal relay
 - 6. Starter circuit relay
 - 7. Interlock diode
 - 8. Fuse case (BN125-A1)
 - 9. Rear brake light switch
 - 10. Sidestand switch
 - 11. Meter unit
- L: Apply a non-permanent locking agent.

15-8 ELECTRICAL SYSTEM

Exploded View



GP02147BWS C

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Headlight Body Screws	2.9	0.30	26 in·lb	
2	Turn Signal Light Holder Nuts	5.9	0.60	52 in·lb	

3. Headlight unit
4. Turn signal lights
5. Tail/brake light
6. Canada and United Kingdom Models (BN125-A6 ~)
7. Other than Canada and United Kingdom Models
8. United Kingdom Model only (BN125-A6 ~)

15-10 ELECTRICAL SYSTEM

Specifications

Item	Standard	Service Limit
Battery		
Capacity	12 V 9 Ah	---
Electrolyte Level	between level lines	---
Specific Gravity of Electrolyte	1.280 ±0.01 @20°C (68°F)	---
Charging System		
Type:		
(BN125-A1/A2)	Single-phase AC	---
(BN125-A3 ~)	Three-phase AC	---
Charging Voltage	14 ~ 15 V @engine speed 4 000 r/min (rpm), night	---
Stator Coil Resistance	in the text	---
Regulator/rectifier:		
Type:		
(BN125-A1/A2)	Single-phase all wave rectifier	---
(BN125-A3 ~)	Three-phase all wave rectifier	---
Resistance	in the text	---
AC Lighting System		
Alternator Type:		
(BN125-A1/A2)	Single-phase AC	---
(BN125-A3 ~)	Three-phase AC	---
AC Lighting Voltage	11 ~ 16 V @engine speed 4 000 r/min (rpm)	---
Lighting Coil Resistance:		
(BN125-A1/A2)	0.1 ~ 0.8 Ω (Y-Ground)	---
(BN125-A3 ~)	0.3 ~ 0.9 Ω (Y-Y)	---
Ignition System		
Crankshaft Sensor Resistance:		
(BN125-A1/A2)	180 ~ 280 Ω (× 100 Ω)	---
(BN125-A3 ~)	190 ~ 290 Ω (× 100 Ω)	---
Crankshaft Sensor Peak Voltage	3.6 V or more	---
Ignition Coil:		
3 Needle Arcing Distance	6 mm or more	---
Primary Winding Resistance	0.09 ~ 0.13 Ω (× 1 Ω)	---
Secondary Winding Resistance	3.8 ~ 5.8 kΩ (× 1 kΩ)	---
Primary Peak Voltage	110 V or more	---
Spark Plug:		
Spark Plug Type:		
Standard	NGK CR7E	---
Option	NGK CR8E or ND U24ESR-N	---
Spark Plug Gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)	---
Spark Plug Cap Resistance	3.75 ~ 6.25 kΩ (× 1 kΩ)	---
Electric Starter System		
Starter Motor:		
Brush Length	9.5 ~ 10.5 mm (0.37 ~ 0.41 in.)	8 mm (0.31 in.)
Commutator Diameter	27.95 ~ 28.05 mm (1.10 ~ 1.11 in.)	27 mm (1.06 in.)

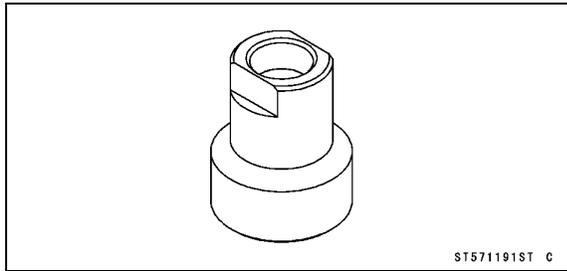
Specifications

Item	Standard	Service Limit
Switches Rear Brake Light Switch Timing	ON after about 10 mm (0.39 in.) pedal travel	- - -

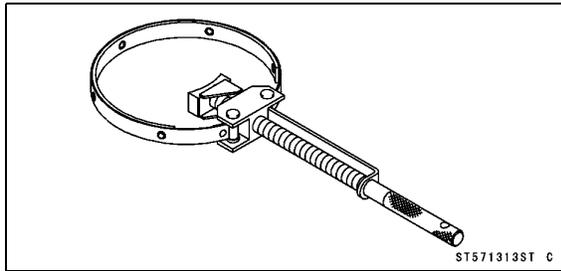
15-12 ELECTRICAL SYSTEM

Special Tools and Sealant

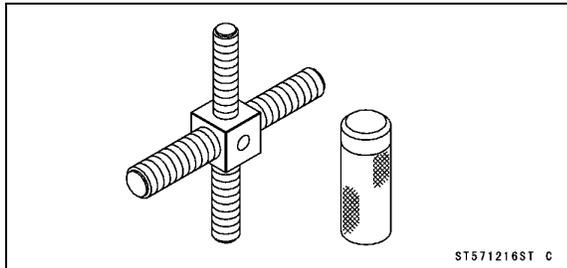
Flywheel Puller, M30 × 1.5:
57001-1191



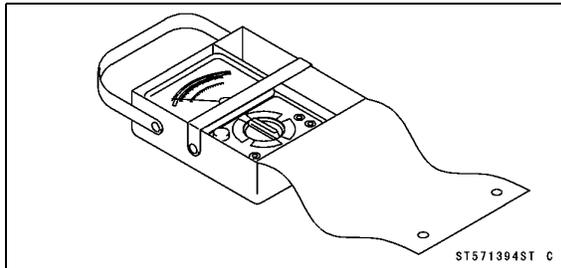
Flywheel Holder:
57001-1313



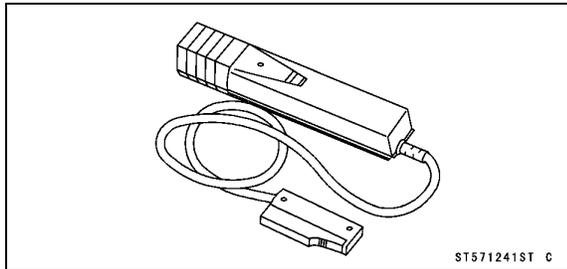
Rotor Puller, M16/M18/M20/M22 × 1.5:
57001-1216



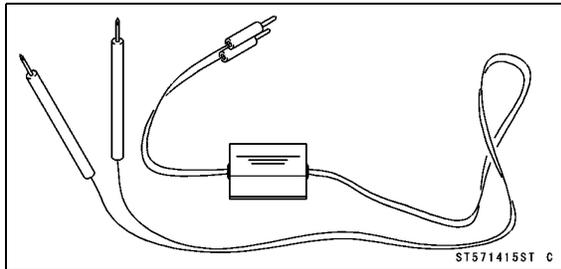
Hand Tester:
57001-1394



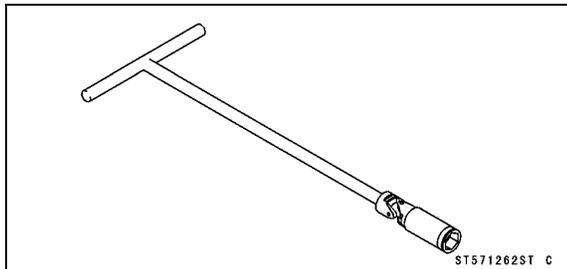
Timing Light:
57001-1241



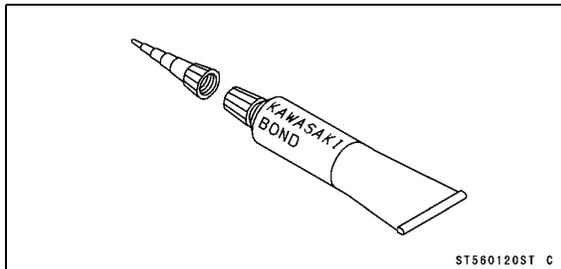
Peak Voltage Adapter:
57001-1415



Spark Plug Wrench, Hex 16:
57001-1262



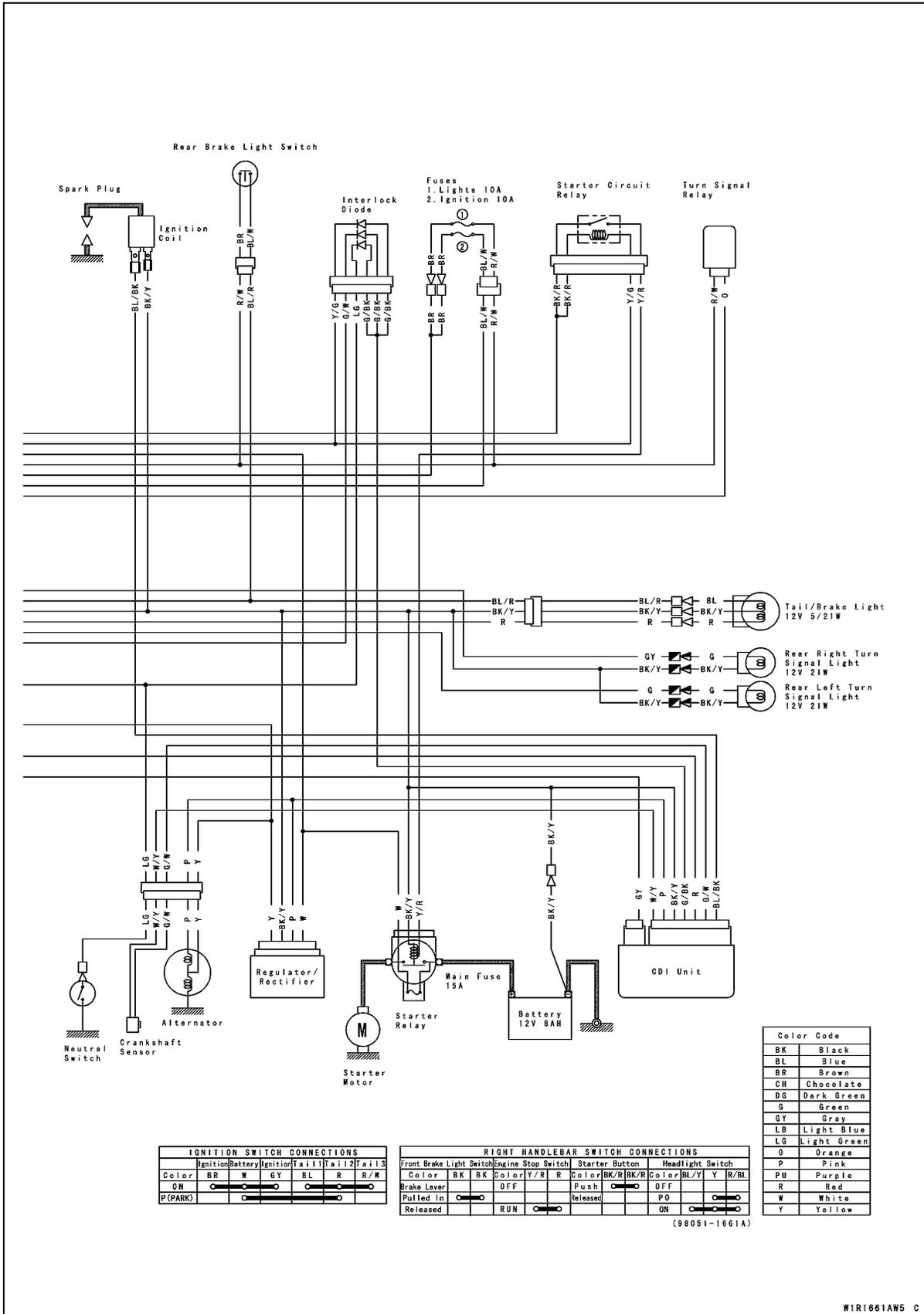
Kawasaki Bond (Silicone Sealant):
56019-120



Wiring Diagram

Dummy Page

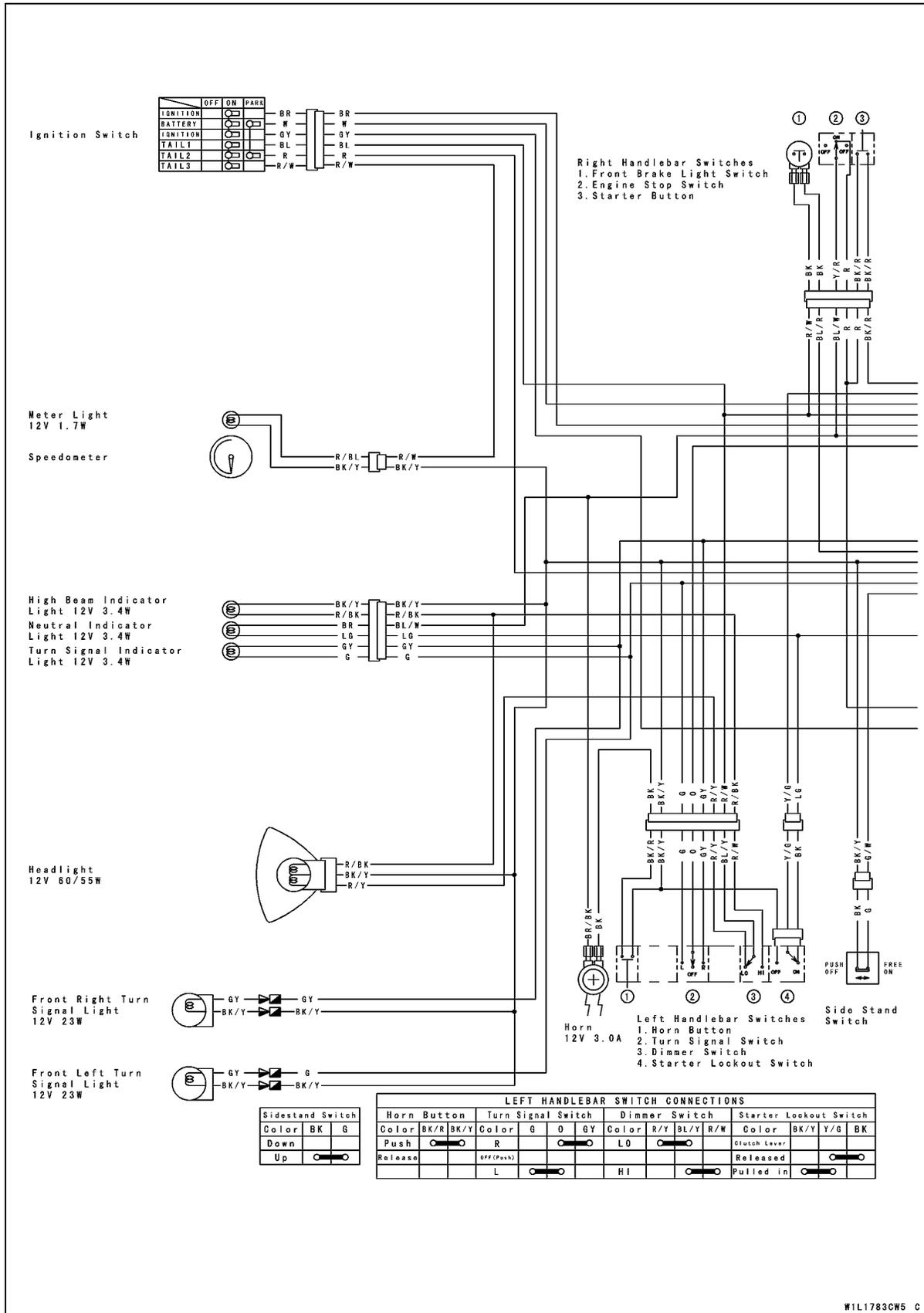
Wiring Diagram



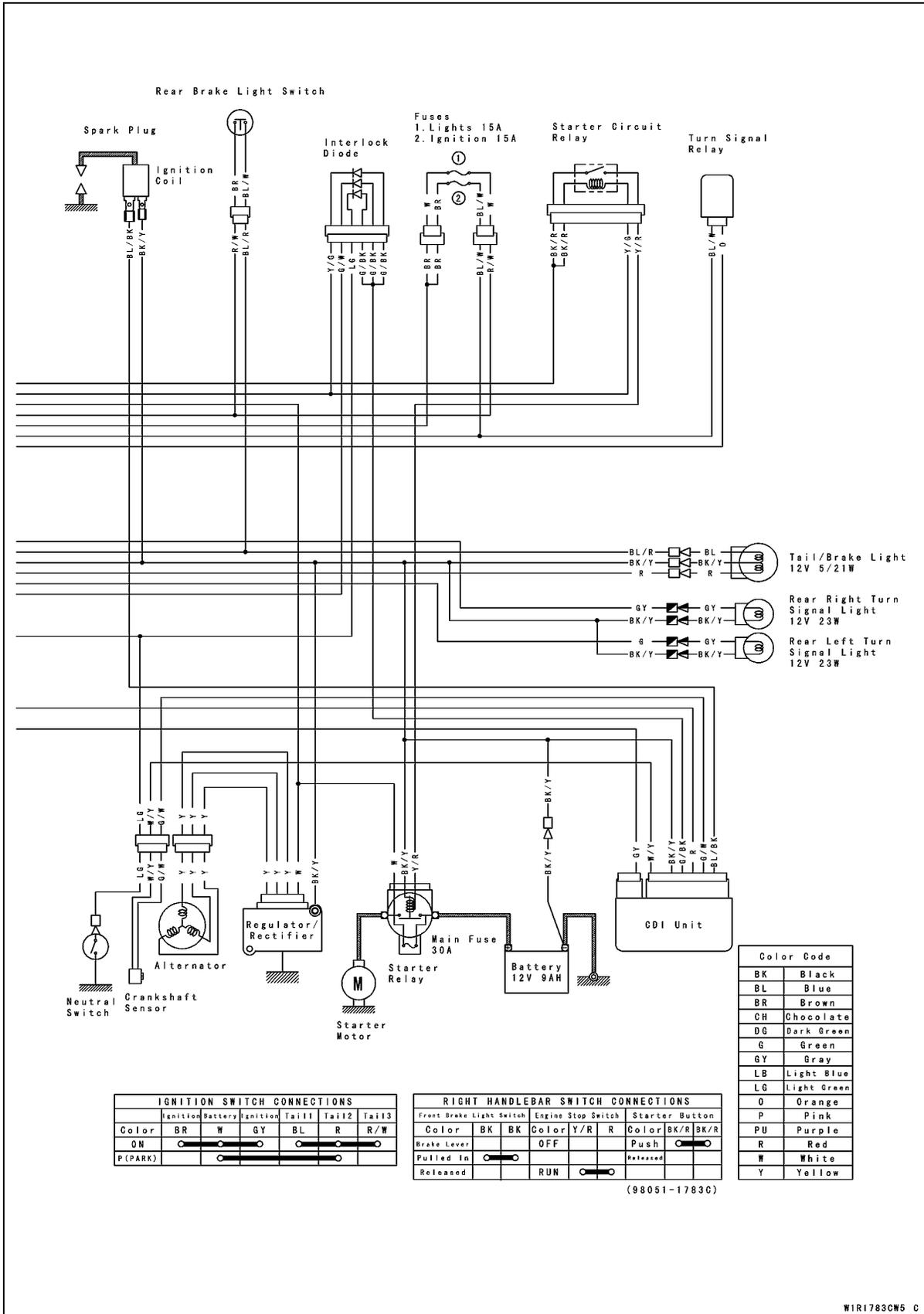
15-16 ELECTRICAL SYSTEM

Wiring Diagram

BN125-A2 ~ (Singapore) and BN125-A4 (United States)



Wiring Diagram



IGNITION SWITCH CONNECTIONS						
	Ignition	Battery	Ignition	Tail I	Tail II	Tail III
Color	BR	W	GY	BL	R	R/W
ON	●	○	○	○	○	○
P (PARK)	○	●	○	○	○	○

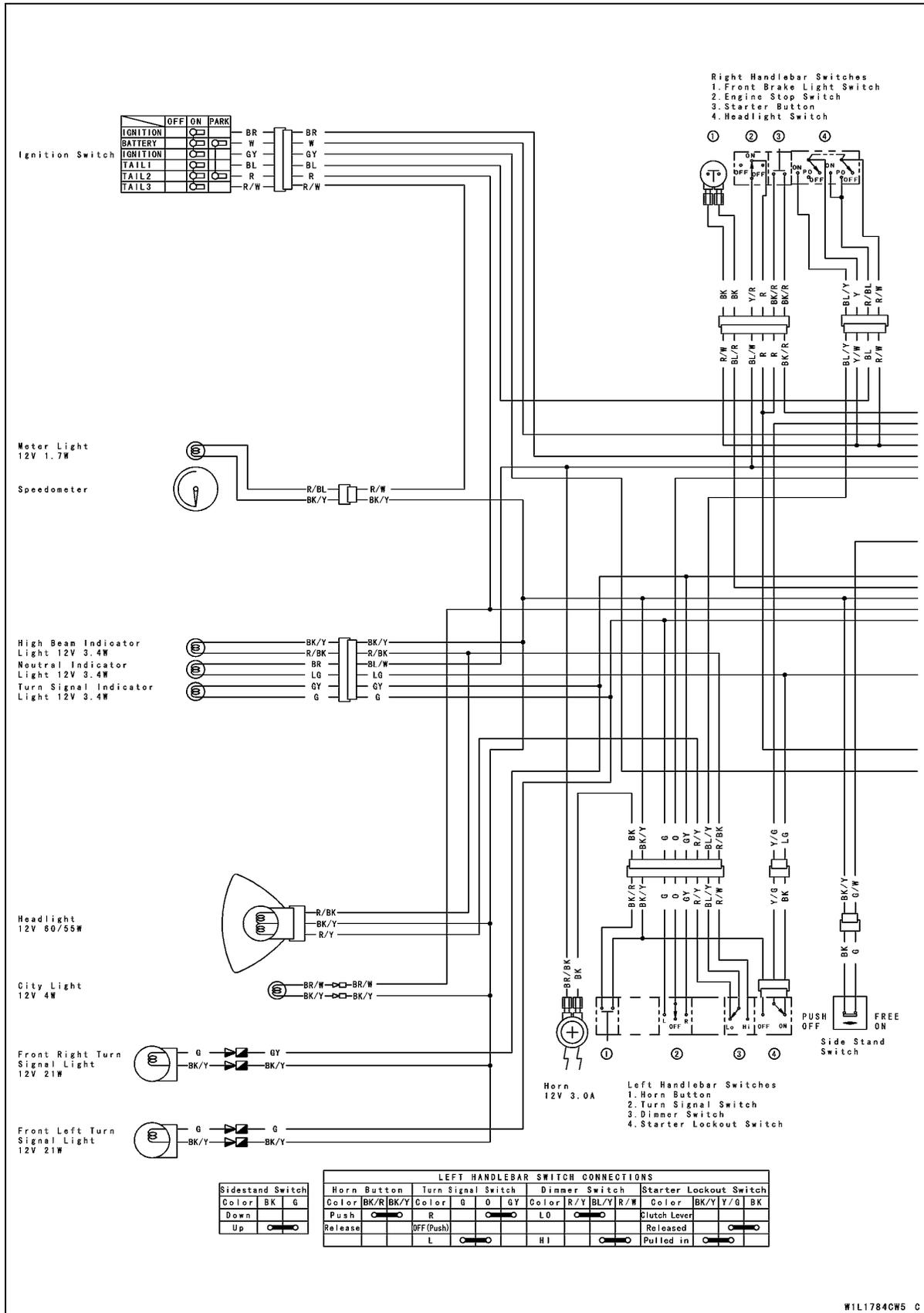
RIGHT HANDLEBAR SWITCH CONNECTIONS								
	Front Brake Light Switch	Engine Stop Switch	Starter Button					
Color	BK	BK	Color	Y/R	R	Color	BK/R	BK/R
Brake Lever	○	○	OFF	○	○	Push	○	○
Pulled In	○	○	○	○	○	Released	○	○
Released	○	○	RUN	○	○		○	○

(98051-17830)

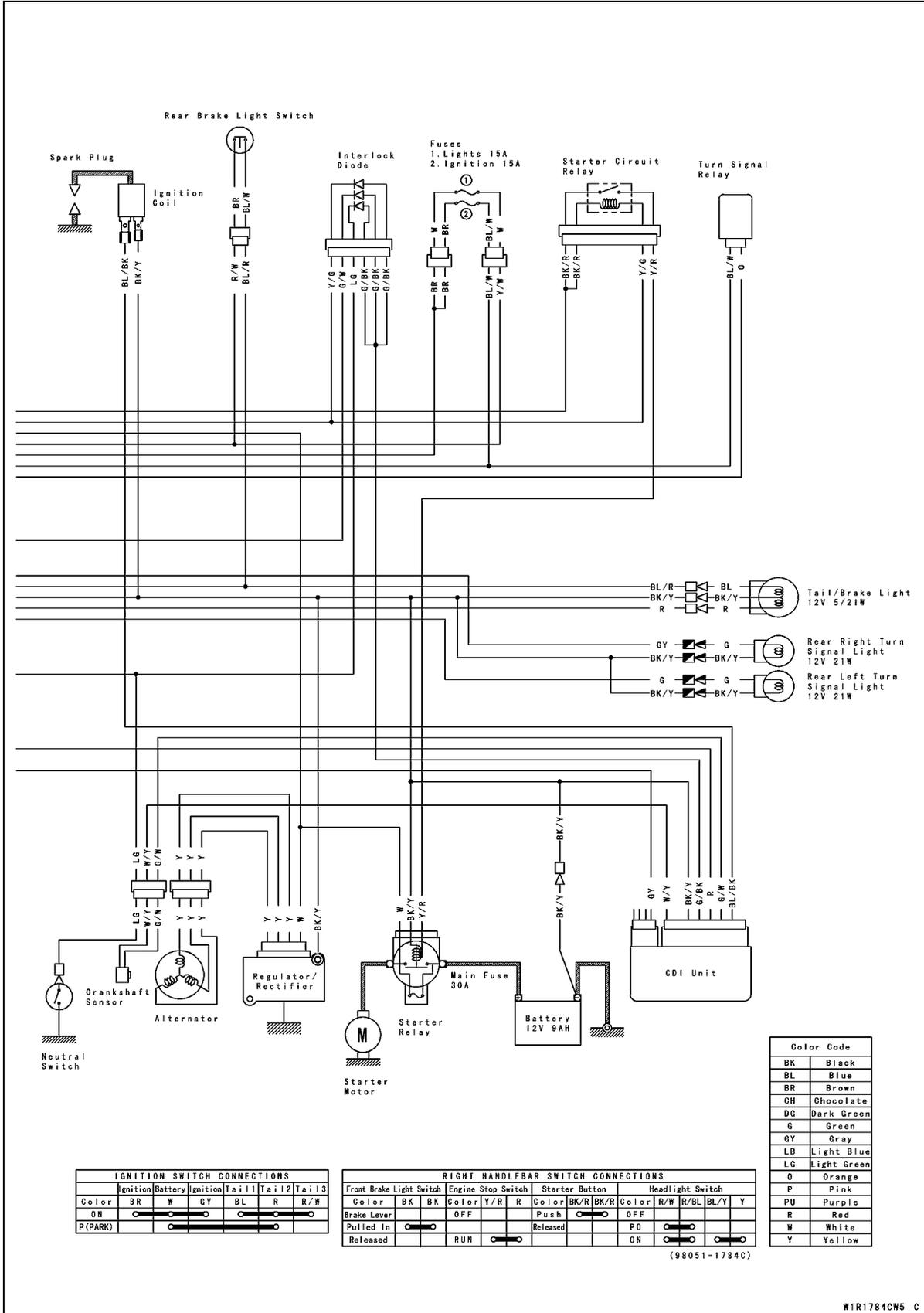
15-18 ELECTRICAL SYSTEM

Wiring Diagram

BN125-A2 ~ A5 (Europe)



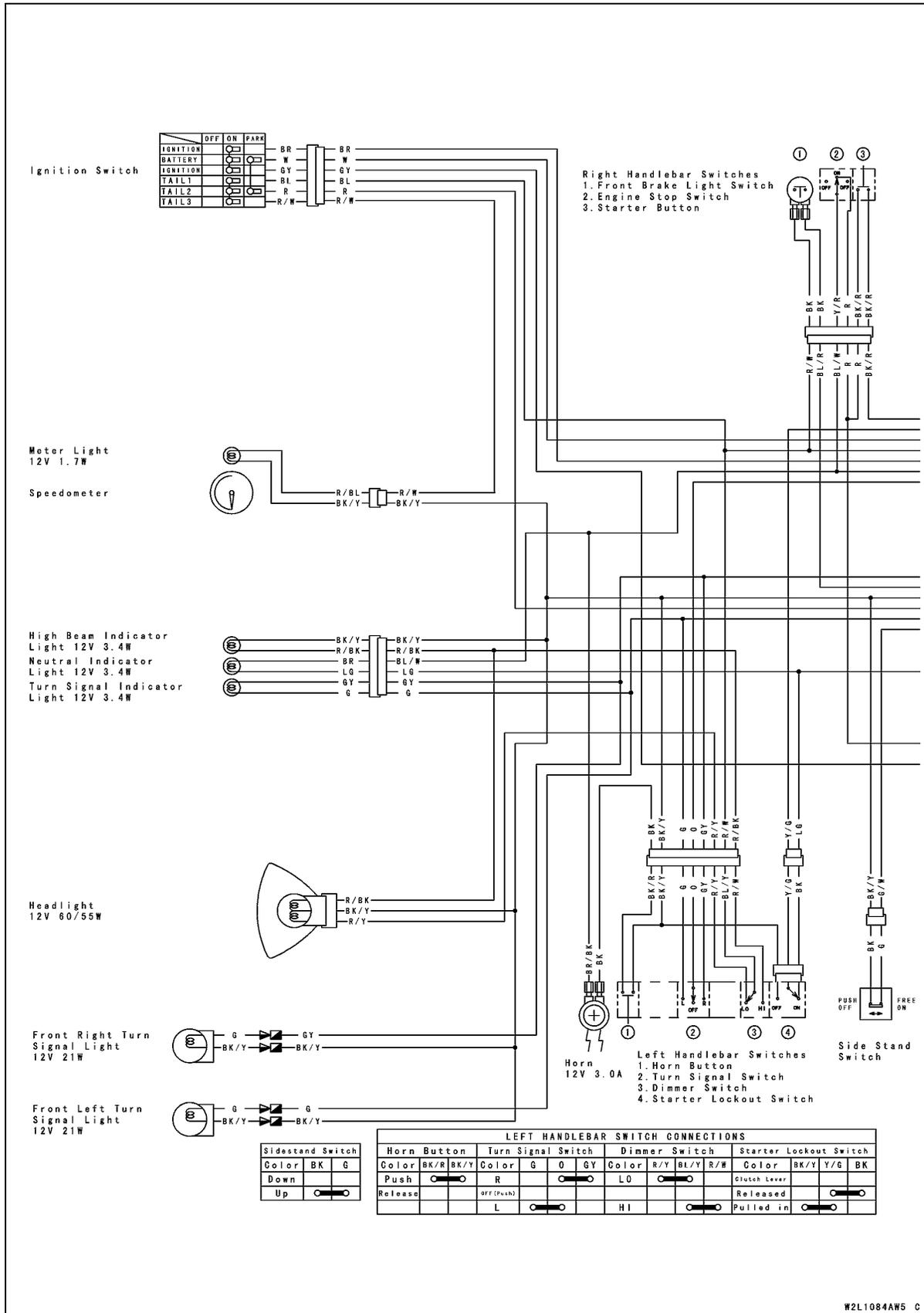
Wiring Diagram



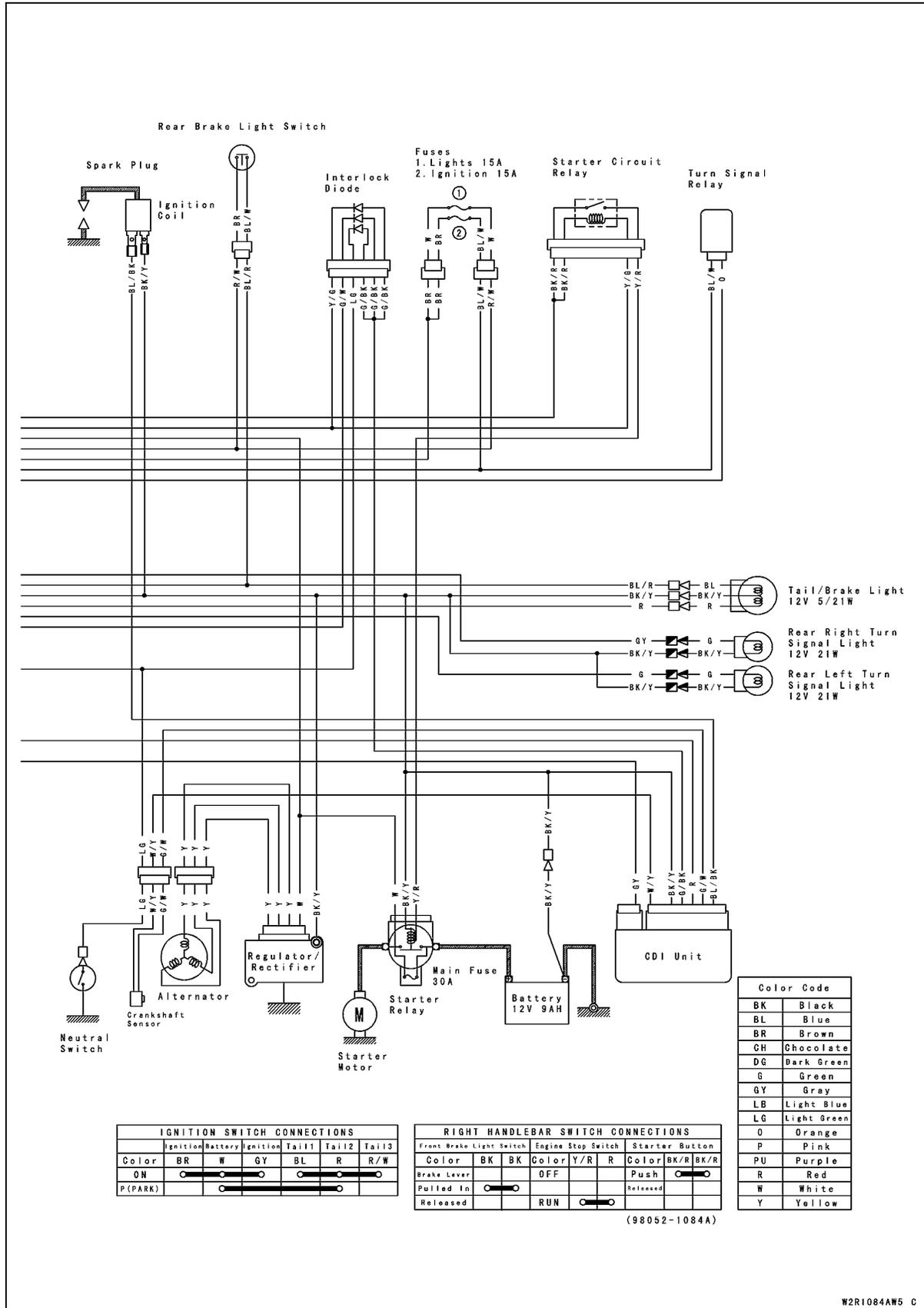
15-20 ELECTRICAL SYSTEM

Wiring Diagram

BN125-A5 (United States and Canada)



Wiring Diagram



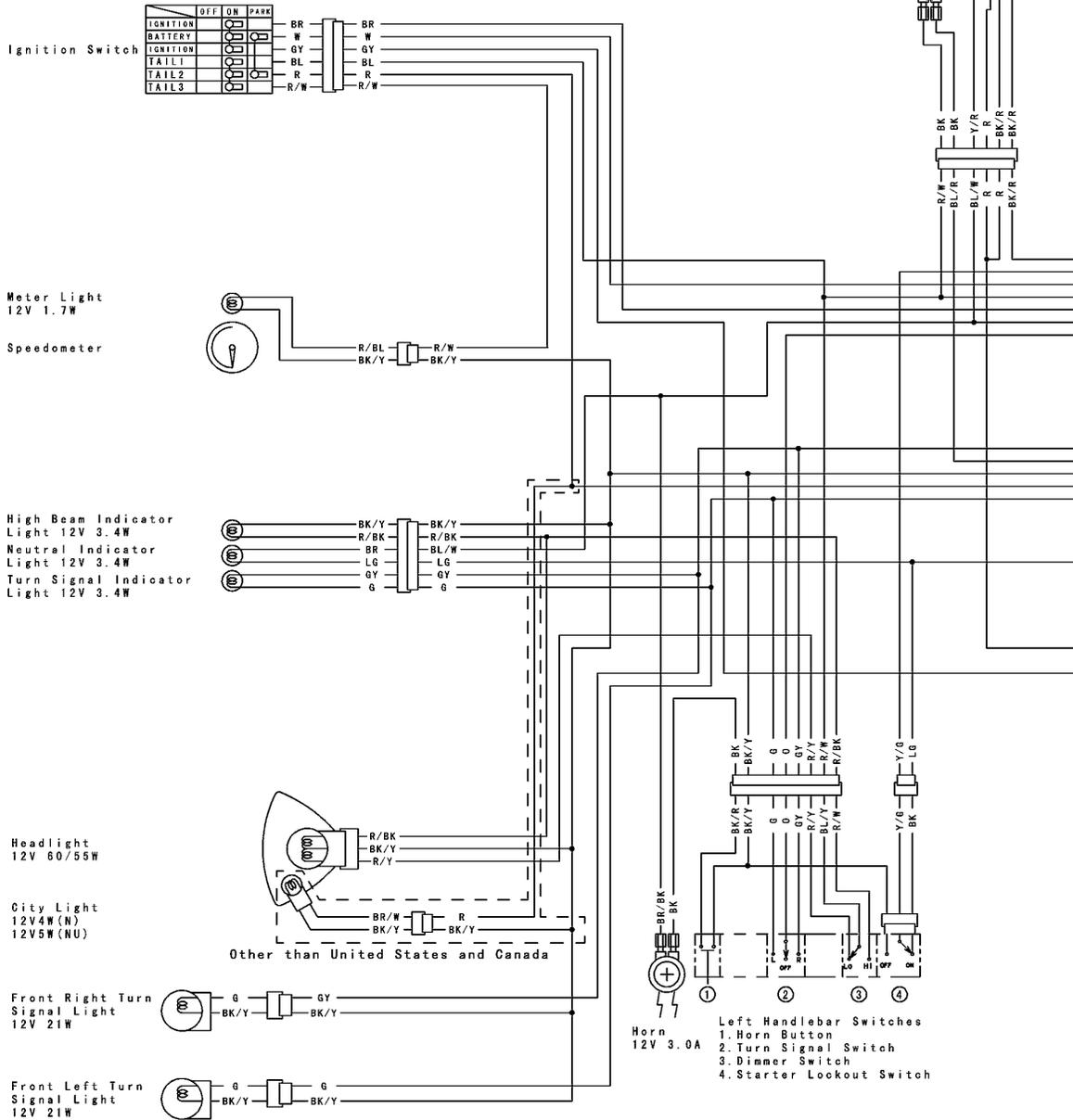
15-22 ELECTRICAL SYSTEM

Wiring Diagram

BN125-A6 ~ (US, CA, N, NU)

US: United States
 CA: Canada
 N: No Catalytic Converter
 NU: No Catalytic Converter
 (United Kingdom model)

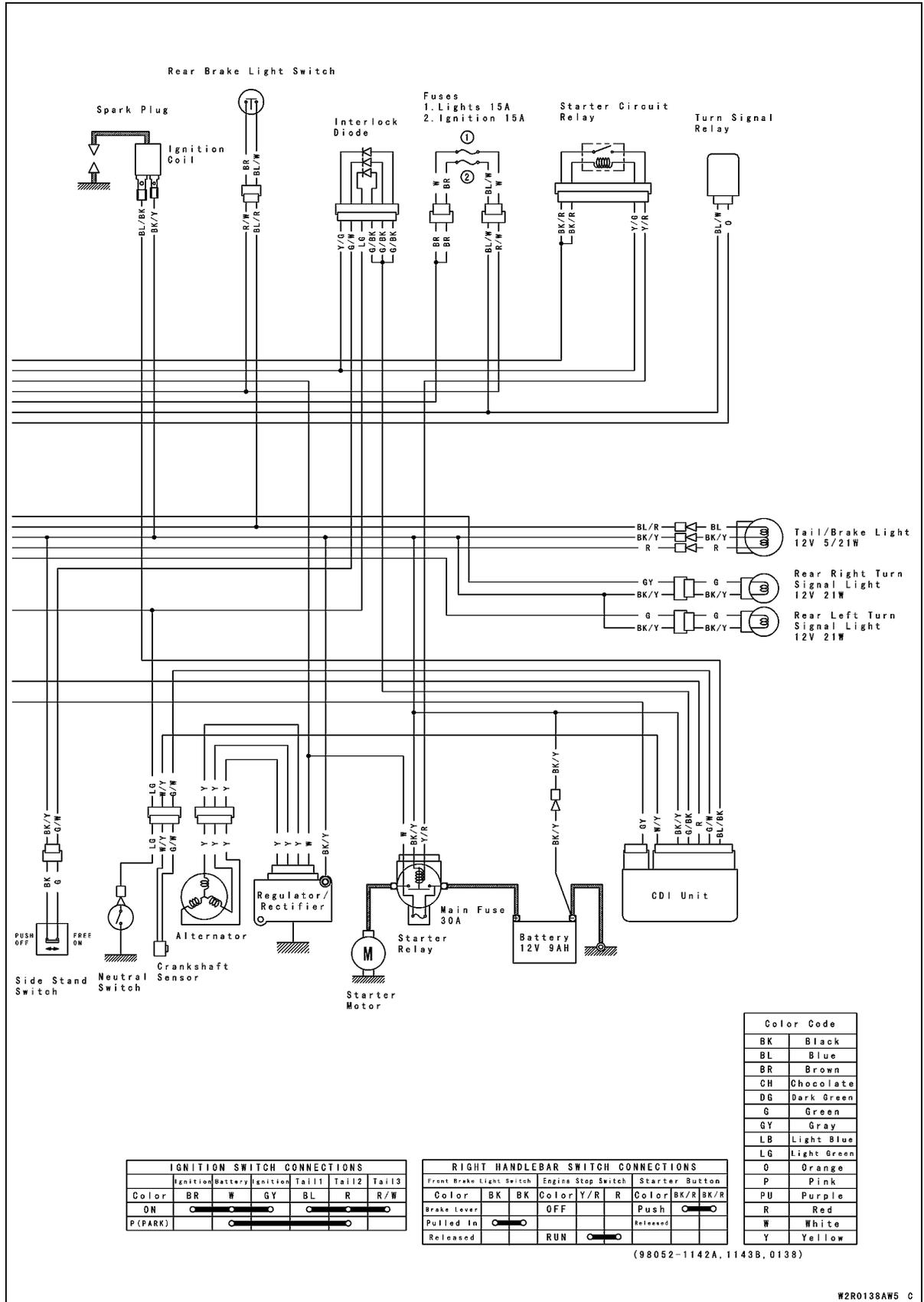
Right Handlebar Switches
 1. Front Brake Light Switch
 2. Engine Stop Switch
 3. Starter Button



Sidestand Switch		
Color	BK	G
Down	○	○
Up	○	○

LEFT HANDLEBAR SWITCH CONNECTIONS														
	Horn Button			Turn Signal Switch			Dimmer Switch			Starter Lockout Switch				
Color	BK/R	BK/Y	Color	G	D	GY	Color	R/Y	BL/Y	R/W	Color	BK/Y	Y/G	BK
Push	○	○	R	○	○	○	LO	○	○	○	Clutch Lever	○	○	○
Release			OFF (Push)	○			HI	○	○		Released	○	○	○
			L	○				○	○		Pulled in	○	○	○

Wiring Diagram



15-24 ELECTRICAL SYSTEM

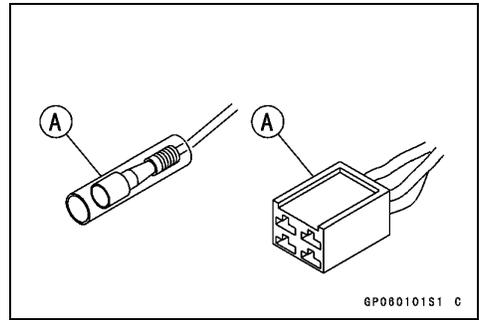
Precautions

There are a number of important precautions that are musts when servicing electrical systems. Learn and observe all the rules below.

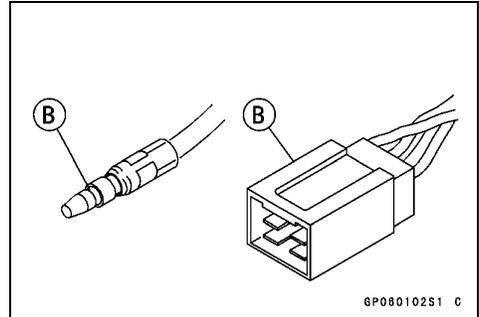
- Do not reverse the battery cable connections. This will burn out the diodes on the electrical parts.
- Always check battery condition before condemning other parts of an electrical system. A fully charged battery is a must for conducting accurate electrical system tests.
- The electrical parts should never be struck sharply, as with a hammer, or allowed to fall on a hard surface. Such a shock to the parts can damage them.
- To prevent damage to electrical parts, do not disconnect the battery cables or any other electrical connections when the ignition switch is on, or while the engine is running.
- Because of the large amount of current, never keep the starter button pushed when the starter motor will not turn over, or the current may burn out the starter motor windings.
- Do not use a meter or indicator illumination bulb rated for other than voltage or wattage specified in the wiring diagram, as the meter or indicator panel could be warped by excessive heat radiated from the bulb.
- Take care not to short the leads that are directly connected to the battery positive (+) terminal to the chassis ground.
- Troubles may involve one or in some cases all items. Never replace a defective part without determining what CAUSED the failure. If the failure was caused by some other item or items, they too must be repaired or replaced, or the new replacement will soon fail again.
- Make sure all connectors in the circuit are clean and tight, and examine wires for signs of burning, fraying, etc. Poor leads and bad connections will affect electrical system operation.
- Measure coil and winding resistance when the part is cold (at room temperature).
- Color Codes:
 - BK: Black
 - BL: Blue
 - BR: Brown
 - CH: Chocolate
 - DG: Dark green
 - G: Green
 - GY: Gray
 - LB: Light blue
 - LG: Light green
 - O: Orange
 - P: Pink
 - PU: Purple
 - R: Red
 - W: White
 - Y: Yellow

Precautions

○Electrical Connectors
Connectors [A]



Connectors [B]



15-26 ELECTRICAL SYSTEM

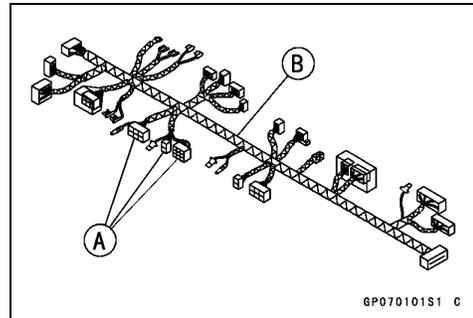
Electrical Wiring

Wiring Inspection

- Visually inspect the wiring for signs of burning, fraying, etc.
- ★ If any wiring is poor, replace the damaged wiring.
- Pull each connector [A] apart and inspect it for corrosion, dirt, looseness and damage.
- ★ If the connector is corroded or dirty, clean it carefully. If it is damaged, replace it.
- Check the wiring for continuity.
- Use the wiring diagram to find the ends of the lead which is suspected of being a problem.
- Connect the hand tester between the ends of the leads.

Special Tool - Hand Tester: 57001-1394

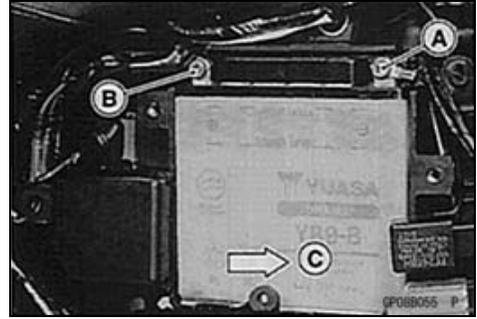
- Set the tester to the $\times 1 \Omega$ range, and read the tester.
- ★ If the tester does not read 0Ω , the lead is defective. Replace the lead or the wiring harness [B] if necessary.



Battery

Battery Removal/Installation

- Remove:
 - Right Side Cover (see Frame chapter)
 - Battery Holder
- Disconnect the battery negative (–) cable [A] first, and then the positive (+) cable [B].
 - Front [C]



- When installing the battery, connect the positive (+) cable [A] first and then the negative cable [B].



CAUTION

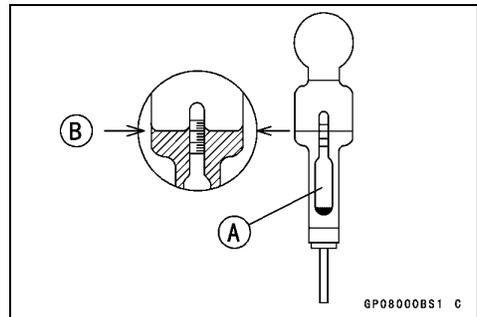
If the battery cable is not correctly disconnected or connected, sparks can arise at electrical connections, causing damage to electrical parts.

Electrolyte Specific Gravity Inspection

- Check battery condition by testing the specific gravity of the electrolyte in each cell with a hydrometer [A].
- Read the level of the electrolyte [B] on the floating scale.
- ★ If the specific gravity is below 1.200, the battery needs to be charged.

NOTE

- The specific gravity of the electrolyte varies with changes in temperature, so the specific gravity reading must be corrected for the temperature of the electrolyte.
- Celsius: Add 0.007 points to reading for each 10°C (50°F) above 20°C (68°F) or subtract 0.007 points for each 10°C below 20°C (68°F).
- Fahrenheit: Add 0.004 points to reading for each –12°C (10°F) above 10°C (68°F) or subtract 0.004 points for each –12°C (10°F) below 10°C (68°F).
- ★ If the specific gravity of any of the cells is more than 0.050 away from any other reading, the battery will probably not accept a charge. It is generally best to replace the battery in this condition.
- ★ If the specific gravity of all the cells is 1.280 or more, the battery is fully charged.
- When using the hydrometer, read the electrolyte level at the bottom of the meniscus (curved surface of the fluid).



GP0800BS1 C

15-28 ELECTRICAL SYSTEM

Battery

Initial Charging

⚠ WARNING

Keep the battery away from sparks and open flames during charging, since the battery gives off an explosive gas mixture of hydrogen and oxygen. When using a battery charger, connect the battery to the charger before turning on the charger. This procedure prevents sparks at the battery terminals which could ignite any battery gases.

- Remove the battery (see this chapter).
- Fill each cell to the upper level line on the battery case with fresh electrolyte (specific gravity: 1.280) at a temperature of 30°C (86°F) or less. Let the battery stand for about 30 minutes before charging.

NOTE

○ If the electrolyte level drops, add electrolyte to the upper level line before charging.

- Set the charging rate at 1/10 the battery capacity, and **charge it for 10 hours**. The battery is rated at 9 Ah, and the recommended charging rate is 0.9 A.

CAUTION

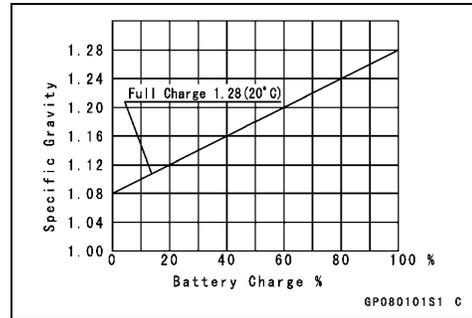
If the battery is not given a full initial charging, it will discharge in a few weeks. After that it can not be charged by supplemental charging.

Always remove the battery from the vehicle for charging. If the battery is charged while still installed, battery electrolyte may spill and corrode the frame or other parts of the vehicle.

Do not use a high rate battery charger, as is typically employed at automotive service stations, unless the charger rate can be reduced to the level required. Charging the battery at a rate higher than specified may ruin the battery. Charging at a high rate causes excess heat which can warp the plates and cause internal shorting. Higher-than-normal charging rates also cause the plates to shed active material. Deposits will accumulate, and can cause internal shorting.

If the temperature of the electrolyte rises above 45°C (113°F) during charging, reduce the charging rate to lower the temperature, and increase charging time proportionately.

- Turn the charger off, then disconnect it from the battery.
- Check battery voltage. Battery voltage should be 12 ~ 13 V.



Battery

Ordinary Charging

- Remove the battery (see Battery Removal).
- If any of the cells are low, fill them to the LOWER level line with distilled water only. The electrolyte will expand during charging, and the level will rise.

▲ WARNING

Keep the battery away from sparks and open flames during charging, since the battery gives off an explosive gas mixture of hydrogen and oxygen. When using a battery charger, connect the battery to the charger before turning on the charger. This procedure prevents sparks at the battery terminals which could ignite any battery gases.

- Connect a charger to the battery BEFORE plugging it in or turning it on.
- Set the charging rate and time according to the battery condition previously determined, using the Battery Charging Rate/Time Table.
- Check the electrolyte level after charging.

CAUTION

Always remove the battery from the vehicle for charging. If the battery is charged while still installed, battery electrolyte may spill and corrode the frame or other parts of the vehicle.

Do not use a high rate battery charger, as is typically employed at automotive service stations, unless the charger rate can be reduced to the level required. Charging the battery at a rate higher than specified may ruin the battery. Charging at a high rate causes excess heat which can warp the plates and cause internal shorting. Higher-than-normal charging rates also cause the plates to shed active material. Deposits will accumulate, and can cause internal shorting.

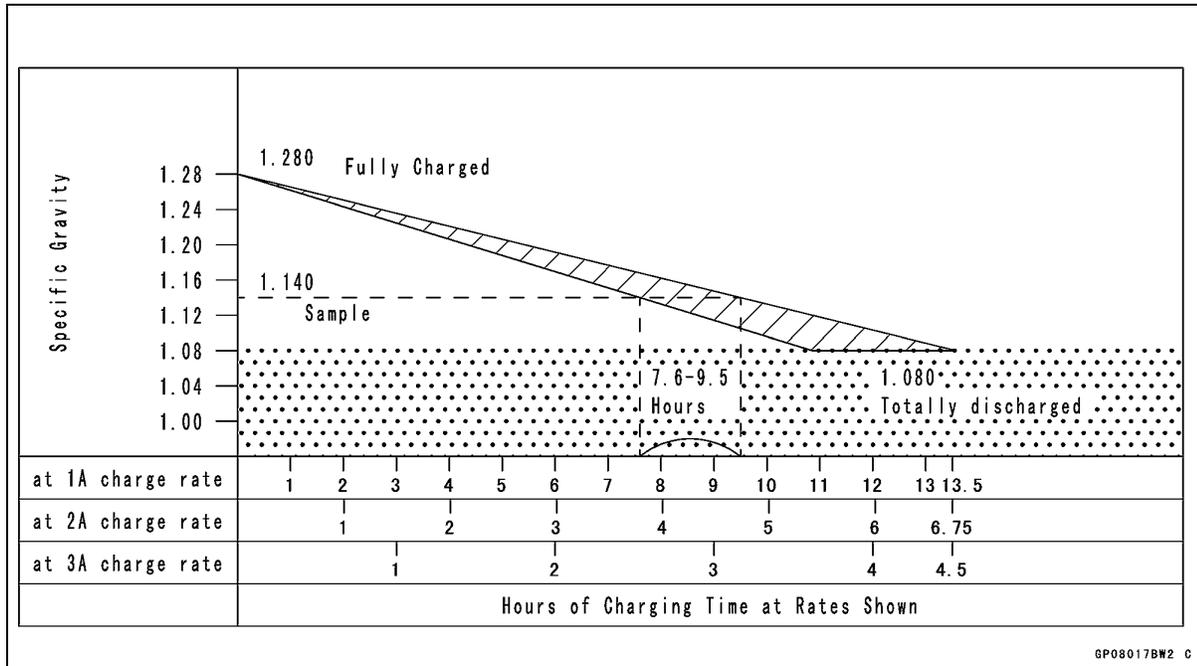
If the temperature of the electrolyte rises above 45°C (113°F) during charging, reduce the charging rate to lower the temperature, and increase charging time proportionately.

- Turn the charger off or unplug it, then disconnect it from the battery.
- Check battery condition.
- ★ If the battery condition indicates that it is not fully charged, additional charging time is necessary.

15-30 ELECTRICAL SYSTEM

Battery

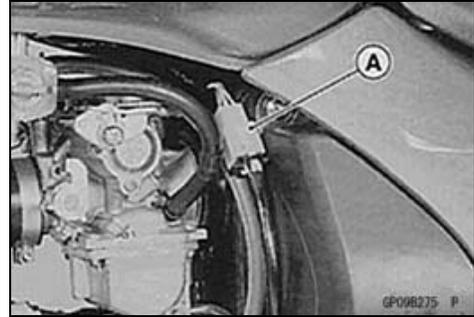
Battery Charging Rate/Time Table (12 V 9 Ah)



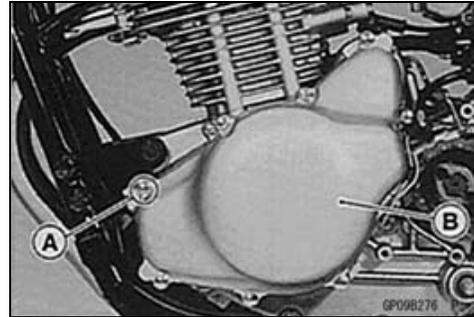
Charging System

Alternator Cover Removal

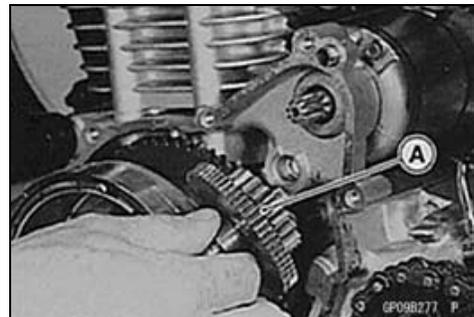
- Drain the engine oil (see Engine Lubrication System chapter).
- Remove:
 - Engine Sprocket Cover (see Final Drive chapter)
 - Alternator Lead Connector [A]



- Remove:
 - Alternator Cover Bolts [A]
 - Alternator Cover [B]

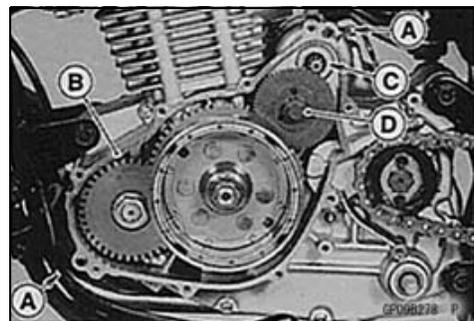


- Remove the torque limiter [A].



Alternator Cover Installation

- Install:
 - Dowel Pins [A]
 - New Gasket [B]
- Apply molybdenum disulfide grease to the starter pinion gear [C] and torque limiter shaft [D].
- Route the leads correctly (see Appendix chapter).
- Tighten:
 - Torque - Alternator Cover Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)**
- Pour the engine oil (see Engine Lubrication System chapter).



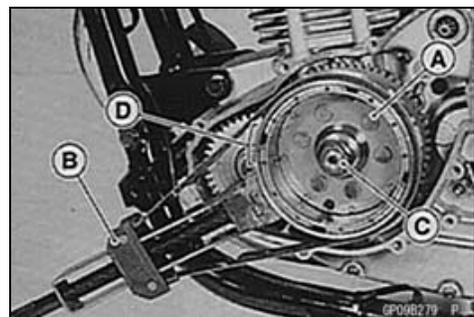
Alternator Rotor Removal

- Remove the alternator cover (see this chapter).
- Wipe oil off the outer circumference of the rotor.
- Hold the alternator rotor [A] steady with the flywheel holder [B], and remove the rotor nut [C].

Special Tool - Flywheel Holder: 57001-1313

CAUTION

Do not hold the timing plate [D] of the alternator rotor. This can damage the timing plate.



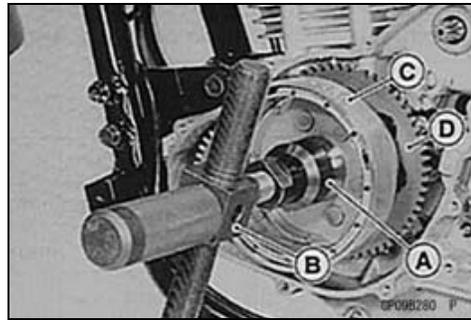
15-32 ELECTRICAL SYSTEM

Charging System

- Using the flywheel puller [A] and rotor puller [B], remove the alternator rotor [C] from the crankshaft.

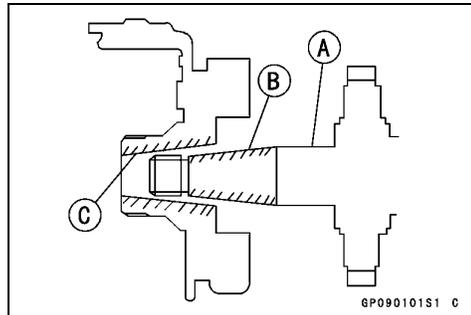
Special Tools - Flywheel Puller, M30 × 1.5: 57001-1191
Rotor Puller, M16/M18/M20/M22 × 1.5: 57001-1216

- Holding the flywheel puller, screw in the rotor puller while tapping the head of the rotor puller with a hammer and remove the alternator rotor.
- Remove the starter gear [D].



Alternator Rotor Installation

- Apply oil to the crankshaft journal [A].
- Using a cleaning fluid, clean off any oil or dirt on the following portions and dry them with a clean cloth.
 - Crankshaft Tapered Portion [B]
 - Alternator Rotor Tapered Portion [C]

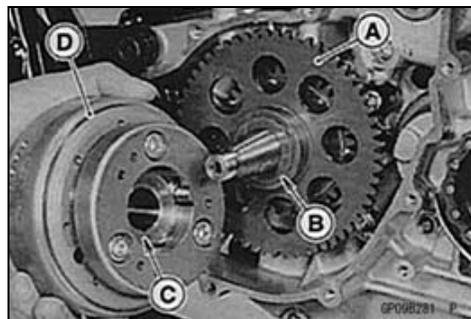


- Install the starter gear [A].
- Install the woodruff key [B] securely in the slot of the crankshaft.
- Install the alternator rotor [D] so that the woodruff key fits in the groove [C] of the rotor.
- Tighten:

Torque - Alternator Rotor Nut
(BN125-A1/A2): 69 N·m (7.0 kgf·m, 51 ft·lb)
(BN125-A3): 98 N·m (10.0 kgf·m, 72 ft·lb)
(BN125-A4~): 104 N·m (10.6 kgf·m, 76 ft·lb)

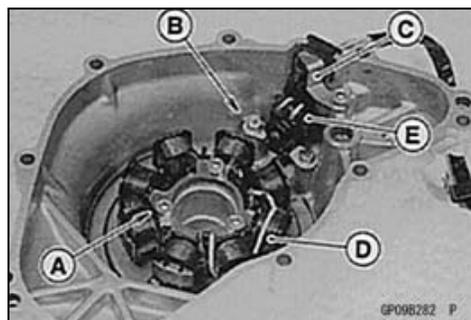
Special Tool - Flywheel Holder: 57001-1313

- Install the alternator cover (see this chapter).



Stator Coil Removal

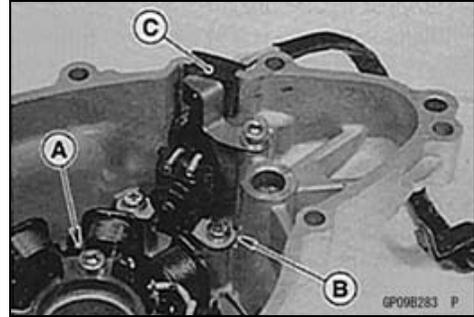
- Remove:
 - Alternator Cover (see this chapter)
 - Stator Coil Bolts [A]
 - Crankshaft Sensor Screws [B]
 - Holders [C]
- Remove the stator coil [D] and the crankshaft sensor [E] from the alternator cover.



Charging System

Stator Coil Installation

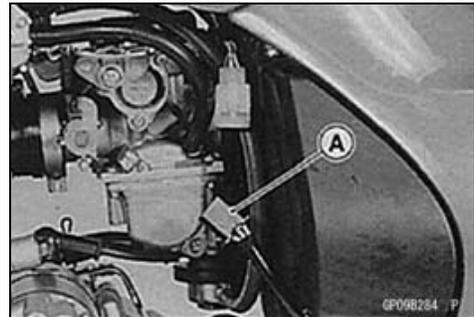
- Tighten:
 - Torque - Stator Coil Bolts [A]: 13 N·m (1.3 kgf·m, 113 in·lb)
 - Crankshaft Sensor Screws [B]: 3.9 N·m (0.40 kgf·m, 35 in·lb)
 - Alternator Lead Holder Bolts
 - (BN125-A3 ~): 8.8 N·m (0.90 kgf·m, 78 in·lb)
 - (BN125-A1 ~ A2): 13 N·m (1.3 kgf·m, 113 in·lb)
 - Apply silicone sealant to the circumference of the alternator lead grommet [C], and fit the grommet into the notch of the cover securely.
- Sealant - Kawasaki Bond (Silicone Sealant): 56019-120**



Alternator Inspection

There are three types of alternator failures: short, open (wire burned out), or loss in rotor magnetism. A short or open in one of the coil wires will result in either a low output, or no output at all. A loss in rotor magnetism, which may be caused by dropping or hitting the alternator, by leaving it near an electromagnetic field, or just by aging, will result in low output.

- To check the alternator output voltage, do the following procedures.
 - Disconnect the alternator connector [A]. Using an auxiliary wires, connect the following leads in the connectors for engine operation.
 - L/G ↔ L/G
 - W/Y ↔ W/Y
 - G/W ↔ G/W
 - Connect the hand tester as shown in the table.
 - Start the engine.
 - Run it at 4 000 r/min (rpm) of the engine speed.
 - Note the voltage readings.



Special Tool - Hand Tester: 57001-1394

Alternator Output Voltage (BN125-A1/A2)

Meter Range	Connections		Reading @4 000 rpm
	Meter (+) to	Meter (-) to	
50 V AC	Pink lead	Engine ground	37 V or more

Alternator Output Voltage (BN125-A3 ~)

Meter Range	Connections		Reading @4 000 rpm
	Meter (+) to	Meter (-) to	
250 V AC	Yellow lead	Yellow lead	38 V or more

- ★ If the output voltage shows the value in the table, the alternator operates properly. A much lower reading than the value in the table indicates that the alternator is defective.

15-34 ELECTRICAL SYSTEM

Charging System

- Check the stator coil resistance as follows.
- Stop the engine.
- Connect the hand tester as shown in the table.
- Note the resistance readings.

Stator Coil Resistance (BN125-A1/A2)

Tester Range	Connections		Reading
	Meter (+) to	Meter (-) to	
× 1 Ω	Pink lead	Engine ground	0.1 ~ 0.8 Ω

Stator Coil Resistance (BN125-A3 ~)

Tester Range	Connections		Reading
	Meter (+) to	Meter (-) to	
× 1 Ω	Yellow lead	Yellow lead	0.3 ~ 0.9 Ω

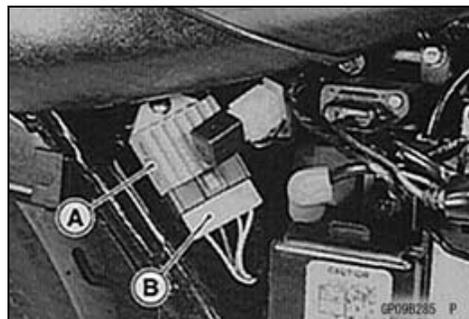
- ★ If there is more resistance than shown in the table, or no hand tester reading (infinity), the stator has an open lead and must be replaced. Much less than this resistance means the stator is shorted, and must be replaced.
- ★ If the stator coil has normal resistance, but the voltage check showed the alternator to be defective, then the rotor magnets have probably weakened, and the rotor must be replaced.

Regulator/Rectifier Inspection

- Remove:
 - Right Side Cover (see Frame chapter)
 - Regulator/Rectifier [A]
- Disconnect the connector [B] from the regulator/rectifier.
- Set the hand tester to the × 1 kΩ range and make the measurements shown in the table.

Special Tool - Hand Tester: 57001-1394

- ★ If the tester readings are not as specified, replace the regulator/rectifier.



CAUTION

Use only Hand Tester 57001-1394 for this test. A tester other than the Kawasaki Hand Tester may show different readings.
If a mugger or a meter with a large-capacity battery is used, the regulator/rectifier will be damaged.

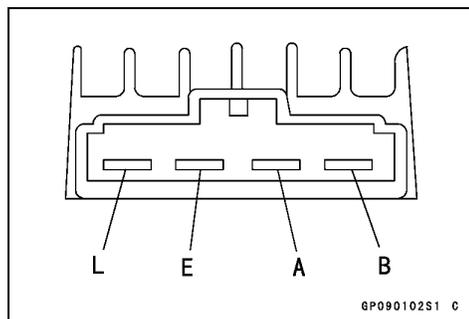
Regulator/Rectifier Internal Resistance (BN125-A1/A2)

Unit: kΩ

		Tester (+) Lead Connection			
Terminal		L	E	A	B
(-)*	L	—	10 ~ 100	∞	∞
	E	10 ~ 100	—	∞	∞
	A	∞	∞	—	5 ~ 30
	B	∞	∞	∞	—

(-)*: Tester (-) Lead Connection

- L: Y Lead
- E: BK/Y Lead
- A: P Lead
- B: W Lead



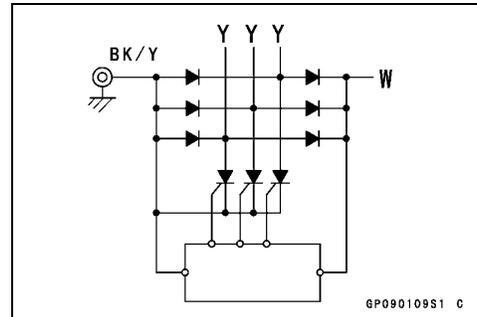
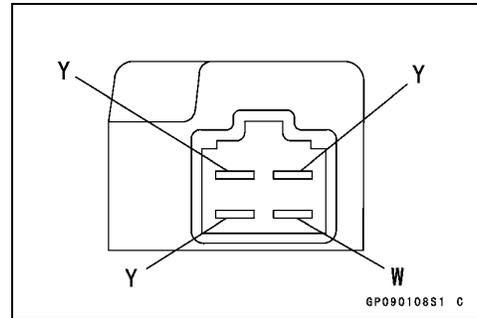
Charging System

Regulator/Rectifier Internal Resistance (BN125-A3 ~)

Unit: k Ω

		Tester (+) Lead Connection				
	Terminal	W	Y	Y	Y	BK/Y
(-)*	W	–	∞	∞	∞	∞
	Y	0.5 ~ 10	–	∞	∞	∞
	Y	0.5 ~ 10	∞	–	∞	∞
	Y	0.5 ~ 10	∞	∞	–	∞
	BK/Y	0.5 ~ 20	0.5 ~ 10	0.5 ~ 10	0.5 ~ 10	–

(-)*: Tester (-) Lead Connection



Charging Voltage Inspection

- Check the battery condition (see Battery section).
- Warm up the engine to obtain actual alternator operating conditions.
- Check that the ignition switch is turned off, and connect the hand tester as shown in the table.

Special Tool - Hand Tester: 57001-1394

Charging Voltage

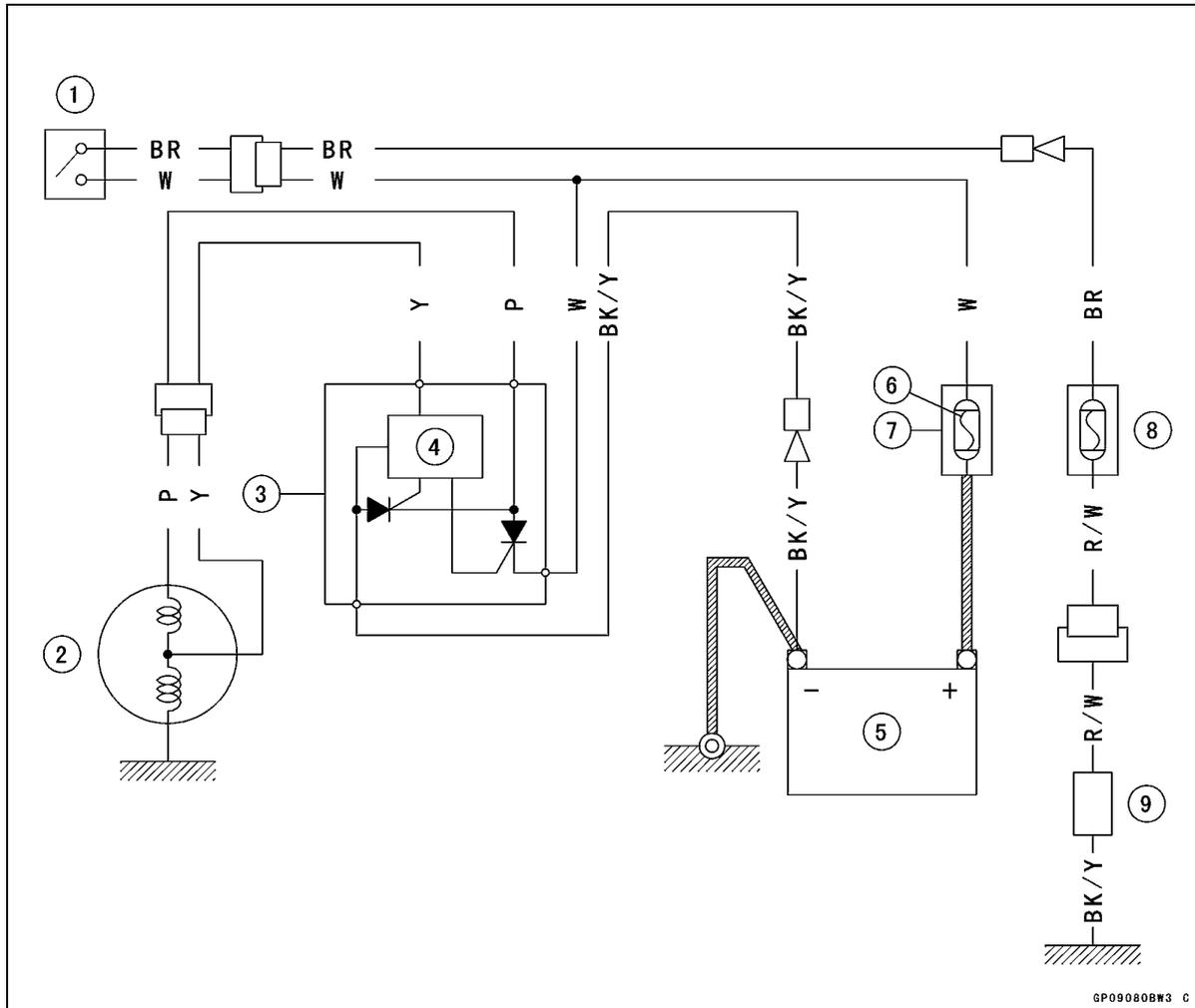
Tester Range	Connections		Reading
	Tester (+) to	Tester (-) to	
25 V DC	Battery (+)	Battery (-)	14 ~ 15 V

- Turn on the ignition switch and start the engine, and note the voltage readings at various engine speeds with the headlight turned on and then turned off. The readings should show nearly battery voltage when the engine speed is low, and as the engine speed rises, the readings should also rise. But they must be kept under the specified voltage.
- Turn off the ignition switch to stop the engine, and disconnect the hand tester.
- ★ If the charging voltage is kept between the values given in the table, the charging system is considered to be working normally.
- ★ If the output voltage is much higher than the values specified in the table, the regulator/rectifier is defective or the regulator/rectifier leads are loose or open.
- ★ If the charging voltage does not rise as the engine speed increases, then the regulator/rectifier is defective or the alternator output is insufficient for the loads. Check the alternator and regulator/rectifier to determine which part is defective.

15-36 ELECTRICAL SYSTEM

Charging System

Charging System Circuit (BN125-A1/A2)

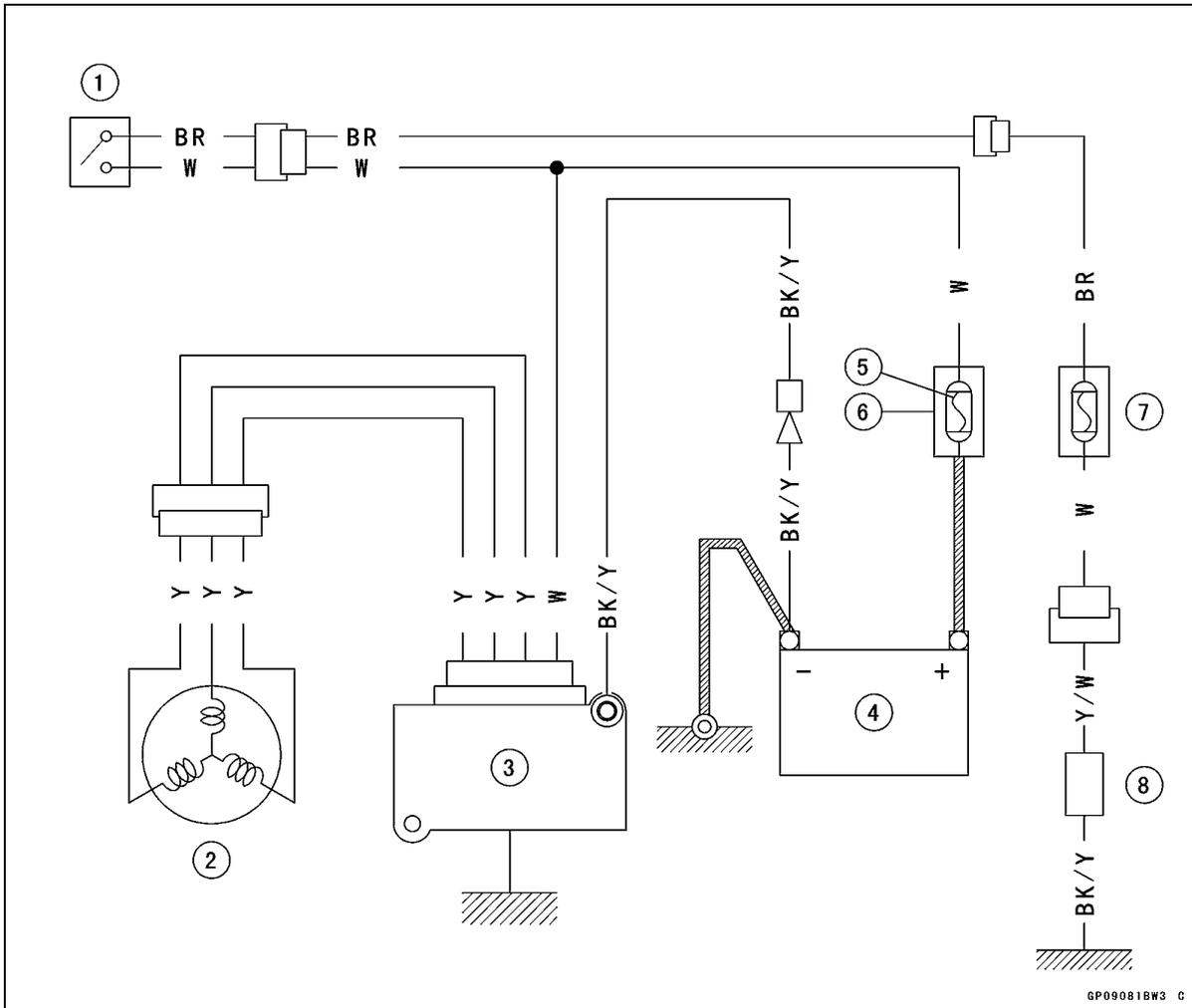


1. Ignition switch
2. Alternator
3. Regulator/rectifier
4. Controller
5. Battery
6. Main fuse 15 A
7. Starter relay
8. Light fuse 10 A
9. Load

GP090808W3 C

Charging System

Charging System Circuit (BN125-A3 ~)



1. Ignition switch
2. Alternator
3. Regulator/rectifier
4. Battery
5. Main fuse 30 A
6. Starter relay
7. Light fuse 15 A
8. Load

15-38 ELECTRICAL SYSTEM

Ignition System

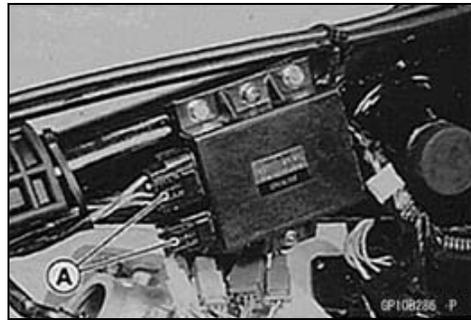
CDI Unit Connectors [A]

CAUTION

Do not disconnect the battery cables or any other electrical connections when the ignition switch is on, or while the engine is running. This is to prevent CDI unit damage. Do not install the battery backwards. The negative side is grounded. This is to prevent damage to the diodes and CDI unit.

⚠ WARNING

The ignition system produces extremely high voltage. Do not touch the spark plug, ignition coil while the engine is running, or you could receive a severe electrical shock.



Crankshaft Sensor Removal/Installation

- Refer to the Stator Coil Removal/Installation in the Electrical System chapter.

Crankshaft Sensor Inspection

- Remove the alternator lead connector [A].
- Set the hand tester to the $\times 100 \Omega$ range and measure the resistance between the G/W and W/Y lead terminals in the female connector.

Special Tool - Hand Tester: 57001-1394

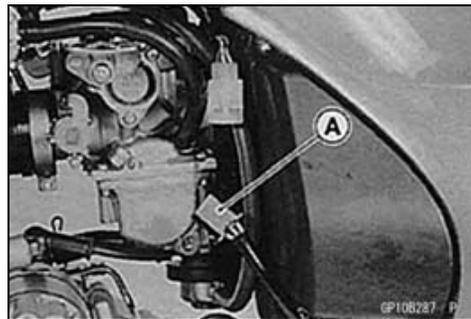
- ★ If there is more resistance than the specified value, the coil has an open lead and must be replaced. Much less than this resistance means the coil is shorted, and must be replaced.

Crankshaft Sensor Resistance

BN125-A1/A2: 180 ~ 280 Ω

BN125-A3 ~: 190 ~ 290 Ω

- Using the highest resistance range of the tester, measure the resistance between the G/W and W/Y lead in the female connector and chassis ground.
- ★ Any tester reading less than infinity (∞) indicates a short, necessitating replacement of the crankshaft sensor assembly.



Crankshaft Sensor Peak Voltage Inspection

NOTE

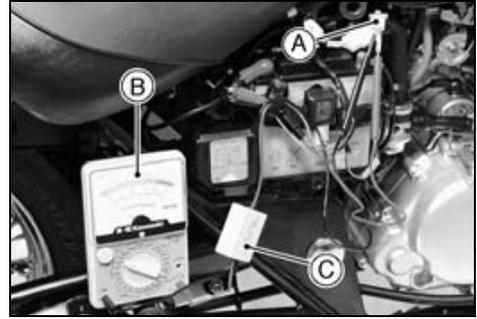
- Be sure the battery is fully charged.
- Using the peak voltage adapter is a more reliable way to determine the condition of the crankshaft sensor than crankshaft sensor internal resistance measurements.

- Remove:
 - Right Side Cover (see Frame chapter)
- Disconnect the crankshaft sensor connector [A].



Ignition System

- Set the hand tester [B] to the $\times 25$ V DC range, and connect it to the peak voltage adapter [C] as shown in the diagram.
- Connect the black lead of the adapter to W/Y lead and red lead to G/W lead in the crankshaft sensor connector [A].
- Turn the ignition switch.
- Pushing the starter button, turn the engine 4 ~ 5 seconds with the transmission gear in neutral to measure the crankshaft sensor peak voltage.
- Repeat the measurement 5 or more times.



Crankshaft Sensor Peak Voltage

Standard: 3.6 V or more

Special Tools - Hand Tester: 57001-1394

Peak Voltage Adapter: 57001-1415

Type: KEK-54-9-B

- ★ If the tester reading is not specified one, check the crankshaft sensor.

CAUTION

Do not disconnect the battery cables or any other electrical connections when the ignition switch is on, or while the engine is running. This is to prevent CDI unit damage. Do not install the battery backwards. The negative side is grounded. This is to prevent damage to the diodes and CDI unit.

⚠ WARNING

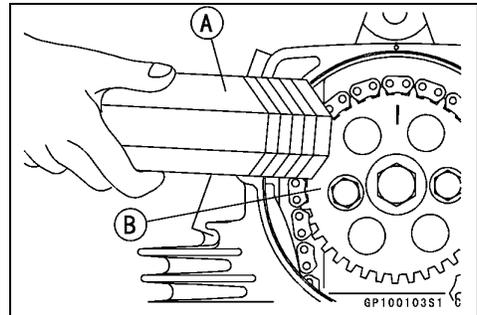
The ignition system produces extremely high voltage. Do not touch the spark plug, ignition coil, or spark plug lead while the engine is running, or you could receive a severe electrical shock.

Ignition Timing Inspection

- Remove the camshaft chain cover (see Engine Top End chapter).
- Attach the timing light [A] in the manner prescribed by the manufacturer.

Special Tool - Timing Light: 57001-1241

- Start the engine and aim the timing light at the ignition timing mark on the camshaft sprocket [B].
- Run the engine at the speed specified and note the alignment of the ignition timing marks.



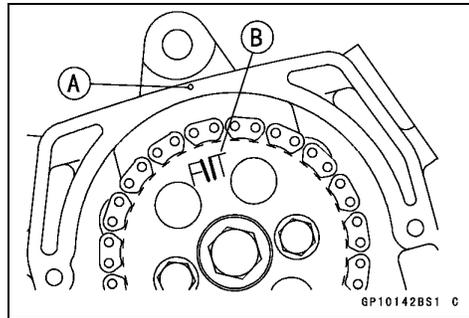
15-40 ELECTRICAL SYSTEM

Ignition System

Ignition Timing

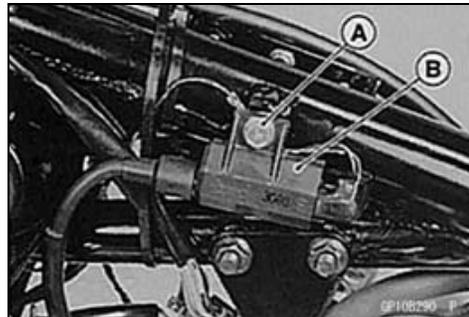
Engine speed	Head timing mark [A] aligns with:
1 300 ±100 r/min (rpm)	"T" mark [B] on camshaft sprocket

★ If the ignition timing is incorrect, inspect the CDI unit and the crankshaft sensor.



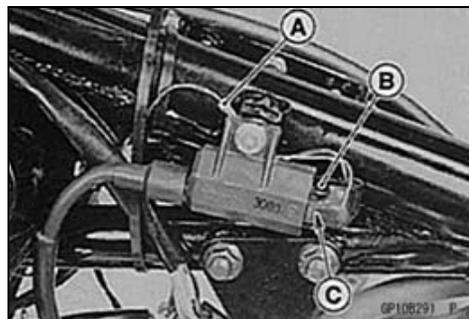
Ignition Coil Removal

- Remove the fuel tank (see Fuel System chapter).
- Disconnect the primary winding leads from the ignition coil.
- Remove the mounting bolt [A].
- Take off the ignition coil [B].



Ignition Coil Installation

- Tighten the ignition coil bolt.
- Torque - Ignition Coil Bolt: 6.9 N·m (0.70 kgf·m, 61 in·lb)**
- Install the ignition coil noting the position of the ground terminal [A], and primary winding leads.
 - (+) Terminal [B] → BL/BK Lead
 - (-) Terminal [C] → BK/Y Lead



Ignition Coil Inspection

- Remove the ignition coil (see this chapter).
- Measure the arcing distance with the suitable commercially available coil tester [A] to check the condition of the ignition coil [B].
- Connect the ignition coil (with the spark plug cap left attached at the end of the spark plug lead) to the tester in the manner prescribed by the manufacturer and measure the arcing distance.

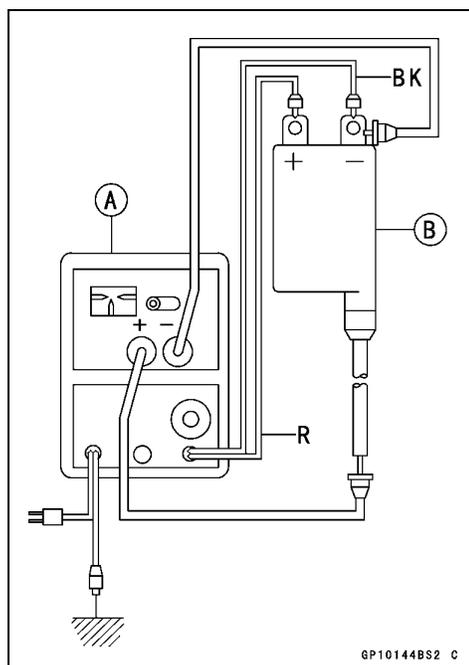
⚠ WARNING

To avoid extremely high voltage shocks, do not touch the coil body or leads.

★ If the distance reading is less than the specified value, the ignition coil or spark plug cap is defective.

Ignition Coil Arcing Distance: 6 mm or more

- To determine which part is defective, measure the arcing distance again with the spark plug cap removed from the ignition coil. Remove the cap by turning it counterclockwise.
- ★ If the arcing distance is subnormal as before, the trouble is with the ignition coil itself. If the arcing distance is now normal, the trouble is with the spark plug cap.



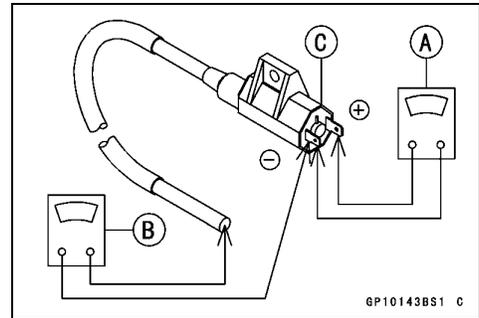
Ignition System

- ★ If the coil tester is not available, the coil can be checked for a broken or badly shorted winding with the hand tester.

NOTE

○ The hand tester cannot detect layer shorts and shorts resulting from insulation breakdown under high voltage.

- Measure the primary winding resistance as follows.
- Connect the hand tester between the coil terminals.
- Measure the secondary winding resistance as follows.
- Remove the plug cap.
- Connect the tester between the spark plug leads.
 - Measure primary winding resistance [A].
 - Measure secondary winding resistance [B].
 - Ignition Coil [C]



- ★ If the tester does not read as specified, replace the coil.

Ignition Coil Winding Resistance

Primary Windings:	0.09 ~ 0.13 Ω ($\times 1 \Omega$)
Secondary Windings:	3.8 ~ 5.8 k Ω ($\times 1 \text{ k}\Omega$)

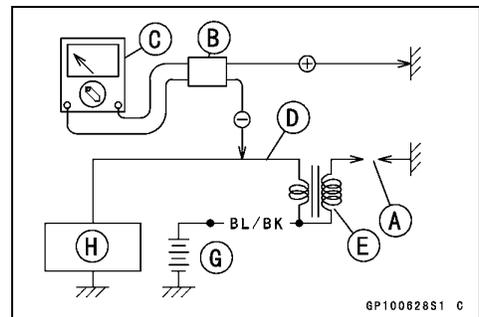
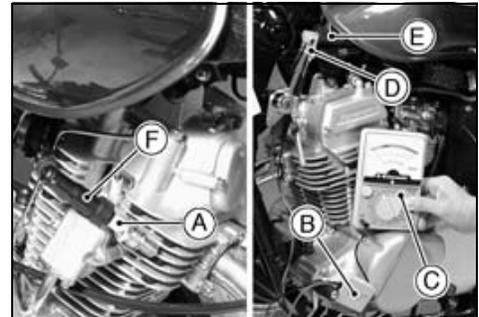
- Visually inspect the secondary winding lead.
- ★ If it shows any damage, replace the coil.

Ignition Coil Primary Peak Voltage

NOTE

○ Be sure the battery is fully charged.

- Remove the fuel tank (see Fuel System chapter).
- Remove the spark plug cap.
- Measure the ignition coil primary peak voltage as follows;
- Install the new spark plug [A] into the removed spark plug cap [F] and ground it onto the engine.
- Connect the peak voltage adapter [B] into the hand tester [C] and set it to the $\times 250 \text{ V DC}$ range.
 - Adapter black lead \rightarrow Ignition coil primary lead terminal [D]
 - Adapter red lead \rightarrow Ignition coil ground terminal Ignition Coil [E]
 - Battery [G]
 - CDI Unit (IC Igniter) [H]



⚠ WARNING

To avoid extremely high voltage shock, do not touch the spark plug or tester connection.

15-42 ELECTRICAL SYSTEM

Ignition System

- Turn the ignition switch and engine stop switch on.
- Pushing the starter button, turn the engine 4 ~ 5 seconds with the transmission gear in neutral to measure the ignition coil primary peak voltage.
- Repeat the measurement 5 or more times.

Ignition Coil Primary Peak Voltage

Standard: 110 V or more

Special Tools - Hand Tester: 57001-1394

Peak Voltage Adapter: 57001-1415

Type: KEK-54-9-B

- ★ If the reading is less than the specified value, check the following;

Ignition Coil (see Ignition Coil Inspection)

Crankshaft Sensor (see Crankshaft Sensor Inspection)

CDI Unit (see CDI Unit Inspection)

Spark Plug Removal

- Remove the spark plug cap.
- Remove the spark plug using the 16 mm plug wrench [A].

Special Tools - Spark Plug Wrench, Hex 16: 57001-1262 or
Owner's Tool: 92110-1172



Spark Plug Cleaning/Inspection

- Refer to the Spark Plug Cleaning/Inspection in the Periodic Maintenance chapter.

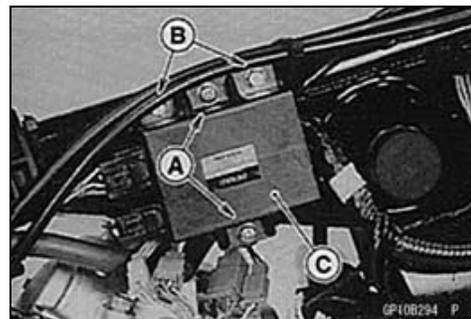
Spark Plug Gap Inspection

- Refer to the Spark Plug Gap Inspection in the Periodic Maintenance chapter.

CDI Unit Removal

○ The hand tester can check the CDI unit for a broken or badly shorted winding, but it is a shortcut method which cannot inspect the precise condition of the CDI unit.

- Remove:
 - Fuel Tank (see Fuel System chapter)
 - CDI Unit screws [A] and Bolts [B]
 - CDI Unit [C]
- Disconnect the connectors from the CDI unit.

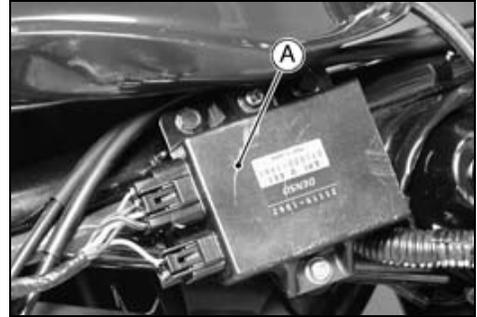


Ignition System

CDI Unit Inspection

CAUTION

When inspecting the CDI Unit [A], observe the following to avoid damage to the CDI Unit. Do not disconnect the CDI Unit with the ignition switch on. This may damage the CDI Unit. Do not disconnect the battery leads while the engine is running. This may damage the CDI Unit.



CDI Unit Operation Check

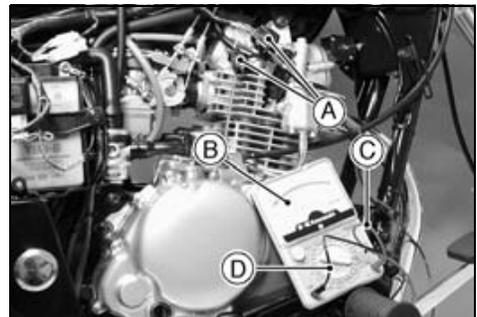
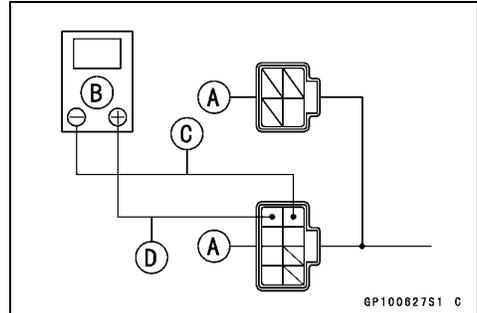
- Remove the fuel tank (see Fuel System chapter).
- Disconnect the connectors [A] from the CDI Unit.
- Set the hand tester [B] to the 25V DC range, and connect it to the connector come from harness side as follows.
 - Tester (+) terminal [D] → R lead
 - Tester (-) terminal [C] → BK/Y lead

Special Tool - Hand Tester: 57001-1394

- Turn the ignition switch on, and read the voltage.

CDI Unit Operation Voltage: Battery Voltage

- ★ If the tester reading is not specified one, check the battery voltage, ignition switch and ignition fuse.



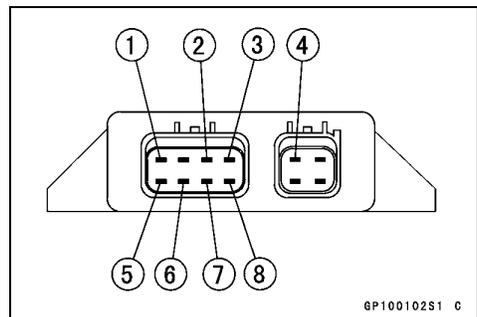
- Set the hand tester to the $\times 1 \text{ k}\Omega$ range and make the measurements shown in the table.

Special Tool - Hand Tester: 57001-1394

- ★ If the tester readings are not as specified, replace the CDI unit.

CAUTION

Use only Hand Tester 57001-1394 for this test. A tester other than the Kawasaki Hand Tester may show different readings. If a megger or meter with a large-capacity battery is used, the CDI unit will be damaged.



15-44 ELECTRICAL SYSTEM

Ignition System

CDI Unit Internal Resistance (BN125-A1/A2)

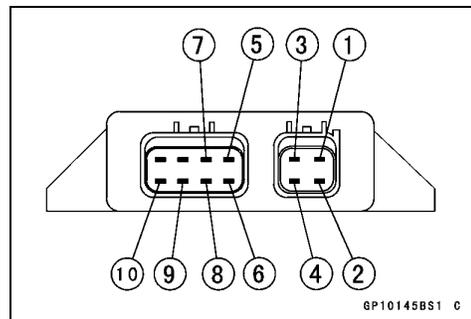
Unit: kΩ

		Tester (+) Lead Connection							
Terminal		1	2	3	4	5	6	7	8
(-)*	1	–	10 ~ 41	10 ~ 41	11 ~ 44	35 ~ 140	14 ~ 56	18.5 ~ 74	∞
	2	8.5 ~ 34	–	0	0.5 ~ 2.2	18.5 ~ 74	2.5 ~ 10	3 ~ 13	∞
	3	8.5 ~ 34	0	–	0.6 ~ 2.4	18.5 ~ 74	2.5 ~ 10	3 ~ 13	∞
	4	9.5 ~ 38	0.6 ~ 2.4	0.6 ~ 2.4	–	19.5 ~ 78	3.1 ~ 12.4	4.1 ~ 16.4	∞
	5	∞	∞	∞	∞	–	∞	∞	∞
	6	13 ~ 52	3.5 ~ 14	3.5 ~ 14	4.1 ~ 16.4	22.5 ~ 90	–	5 ~ 20	∞
	7	∞	∞	∞	∞	∞	∞	–	∞
	8	19 ~ 76	5 ~ 20	5 ~ 20	5.5 ~ 23	35 ~ 140	4 ~ 16	7.5 ~ 31	–

(-)*: Tester (-) Lead Connection

CAUTION

Use only Hand Tester 57001-1394 for this test. A tester other than the Kawasaki Hand Tester may show different readings. If a megger or meter with a large-capacity battery is used, the CDI unit will be damaged.



CDI Unit Internal Resistance (BN125-A3 ~)

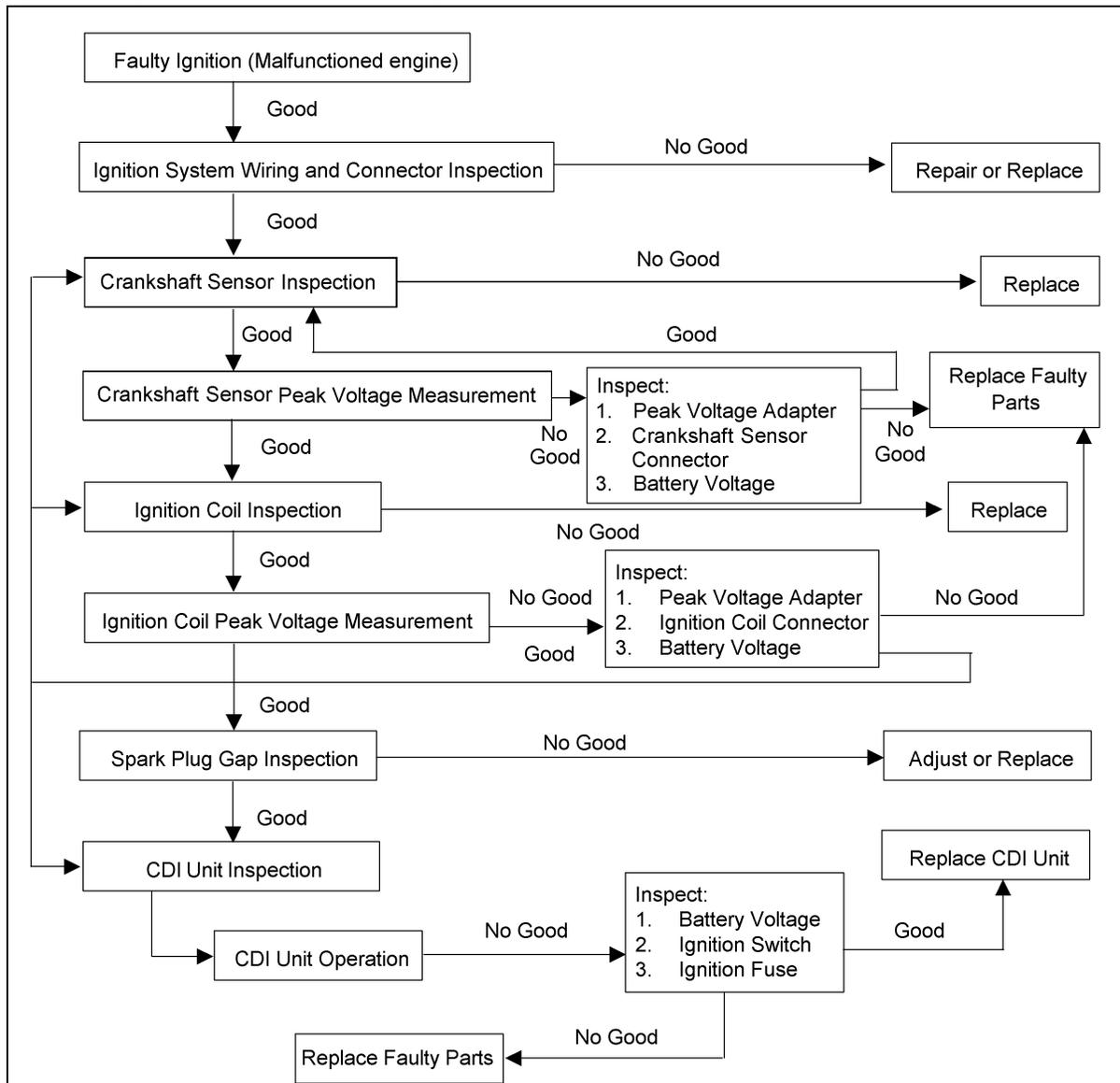
Unit: kΩ

		Tester (+) Lead Connection									
Terminal		1	2	3	4	5	6	7	8	9	10
(-)*	1	–	30 ~ 150	92.5 ~ 370	30 ~ 150	80 ~ 320	32.5 ~ 160	55 ~ 220	67.5 ~ 270	30 ~ 150	6.5 ~ 26
	2	∞	–	24 ~ 96	0	8 ~ 38	0.5 ~ 2	3.3 ~ 13	7 ~ 28	0	4.5 ~ 18
	3	∞	24.5 ~ 98	–	24.5 ~ 98	47.5 ~ 190	25 ~ 100	26.5 ~ 106	40 ~ 160	47.5 ~ 198	33 ~ 132
	4	∞	0	24 ~ 96	–	9.5 ~ 38	0.5 ~ 2	3 ~ 12	7 ~ 28	0	4.5 ~ 18
	5	∞	∞	∞	∞	–	∞	∞	∞	∞	∞
	6	∞	0.5 ~ 2	24.5 ~ 98	0.5 ~ 2	10 ~ 40	–	6.5 ~ 26	7.5 ~ 30	0.5 ~ 2	5.3 ~ 21
	7	∞	5 ~ 20	26.5 ~ 106	5 ~ 20	18.5 ~ 74	5.5 ~ 22	–	12 ~ 48	5 ~ 20	11 ~ 44
	8	∞	500 ~ 2 000	500 ~ 2 000	500 ~ 2 000	750 ~ 3 000	500 ~ 2 000	500 ~ 2 000	–	500 ~ 2 000	500 ~ 2 000
	9	∞	0	24 ~ 96	0	9.5 ~ 38	0.5 ~ 2	3.5 ~ 14	7 ~ 28	–	5 ~ 20
	10	∞	20 ~ 96	70 ~ 280	20 ~ 92	55 ~ 220	20 ~ 96	20 ~ 130	45 ~ 180	19.5 ~ 92	–

(-)*: Tester (-) Lead Connection

Ignition System

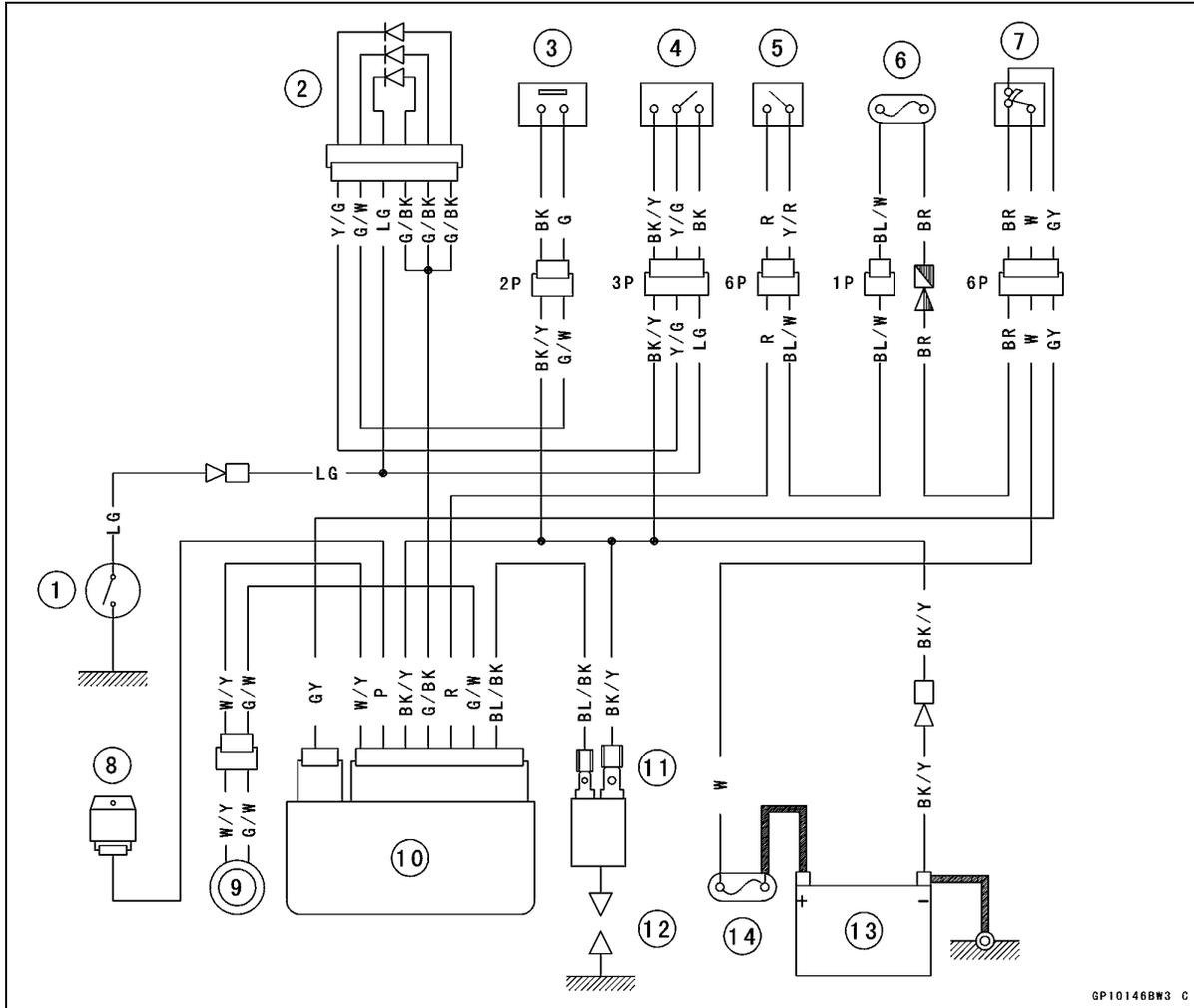
Ignition System Troubleshooting



15-46 ELECTRICAL SYSTEM

Ignition System

Ignition System Circuit (BN125-A1/A2)

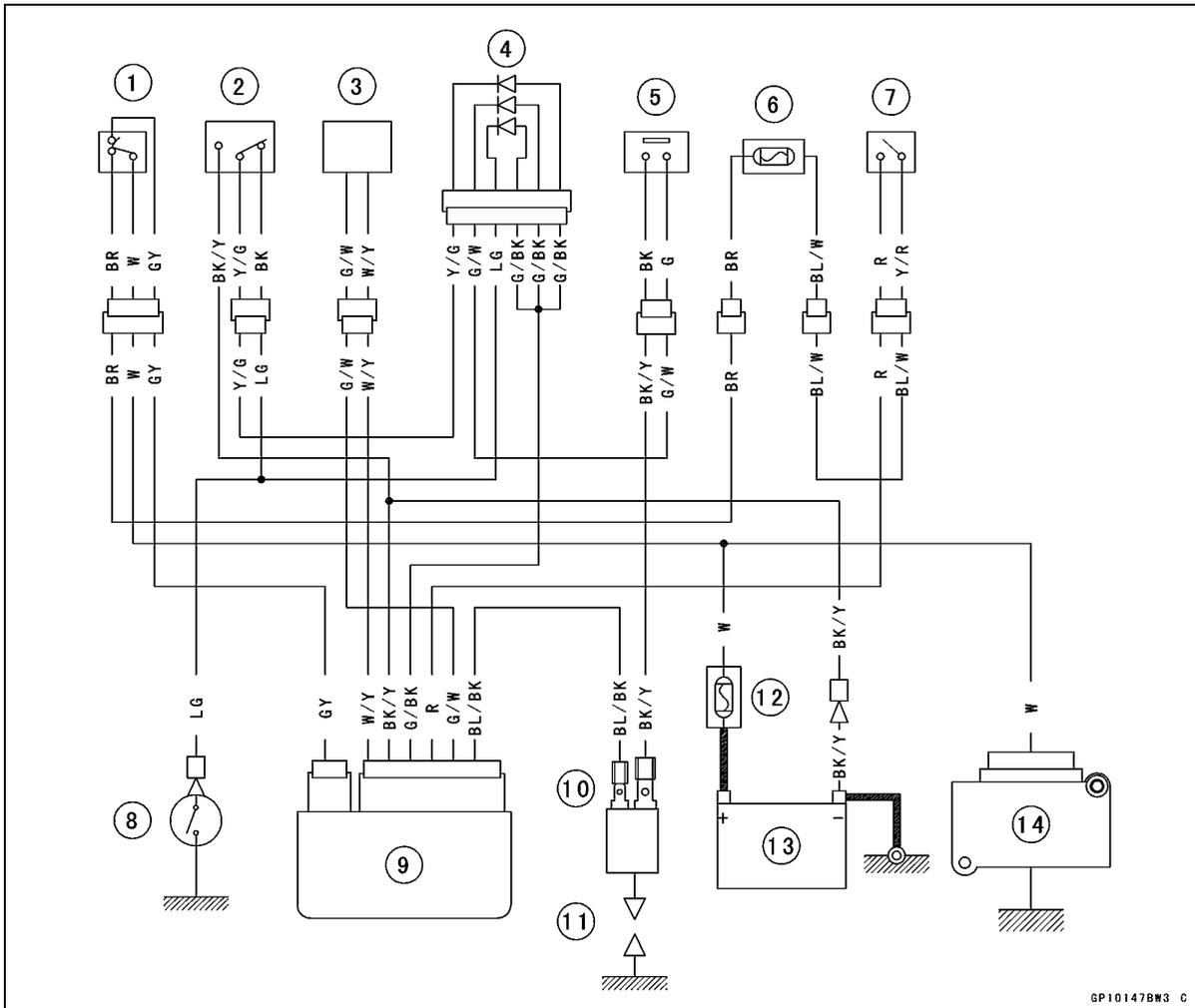


GP10146BW3 C

1. Neutral switch
2. Interlock diodes
3. Sidestand switch
4. Starter lockout switch
5. Engine stop switch
6. Ignition fuse 10 A
7. Ignition switch
8. Regulator/rectifier
9. Crankshaft sensor
10. CDI unit
11. Ignition coil
12. Spark plug
13. Battery
14. Main fuse 15 A

Ignition System

Ignition System Circuit (BN125-A3 ~)



GP10147BW3 C

1. Ignition switch
2. Starter lockout switch
3. Crankshaft sensor
4. Interlock diodes
5. Sidestand switch
6. Ignition fuse 15 A
7. Engine stop switch
8. Neutral switch
9. CDI unit
10. Ignition coil
11. Spark plug
12. Main fuse 30 A
13. Battery
14. Regulator/rectifier

15-48 ELECTRICAL SYSTEM

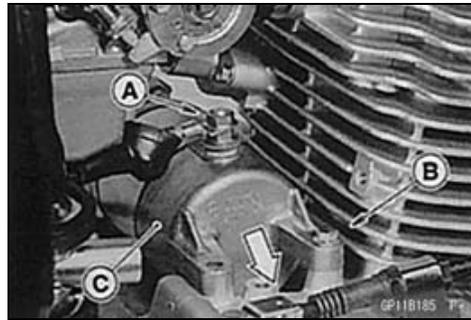
Electric Starter System

Starter Motor Removal

CAUTION

Do not tap the starter motor shaft or body. Tapping the shaft or body could damage the motor.

- Remove:
 - Oil Pipe (see Engine Lubrication System chapter)
- Slide back the rubber cap.
- Remove the starter motor terminal nut [A].
- Remove the starter motor mounting bolts [B].
- Pull out the starter motor [C].

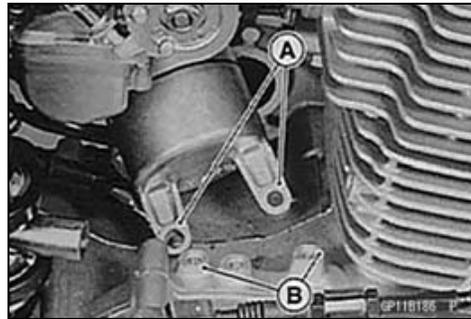


Starter Motor Installation

CAUTION

Do not tap the starter motor shaft or body. Tapping the shaft or body could damage the motor.

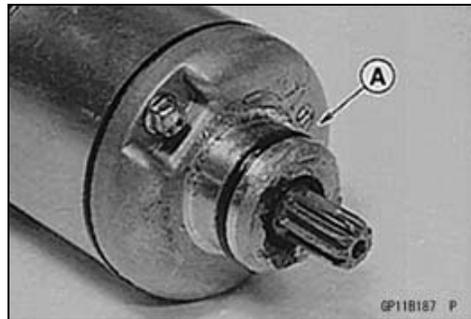
- When installing the starter motor, clean the starter motor legs [A] and crankcase [B] where the starter motor is grounded.



- Replace the O-ring [A] with a new one.
- Apply a small amount of engine oil to the O-ring.
- Install the starter motor.
- Tighten:

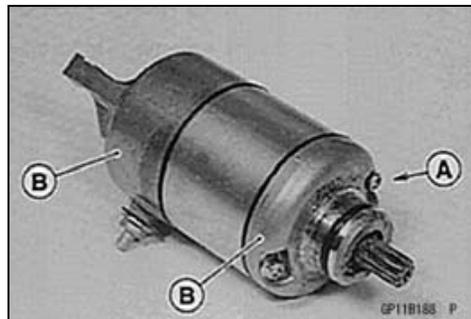
Torque - Starter Motor Mounting Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)

Starter Motor Terminal Nut: 4.9 N·m (0.50 kgf·m, 43 in·lb)



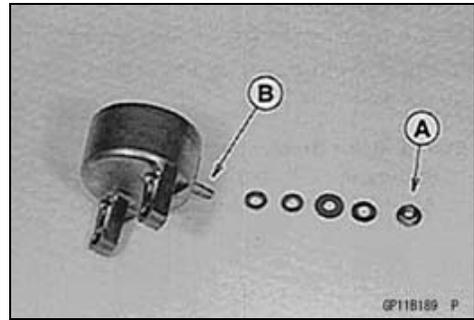
Starter Motor Disassembly

- Remove the starter motor (see this section).
- Take off the starter motor assembly bolts [A] and remove both end covers [B] and pull the armature out of the yoke.



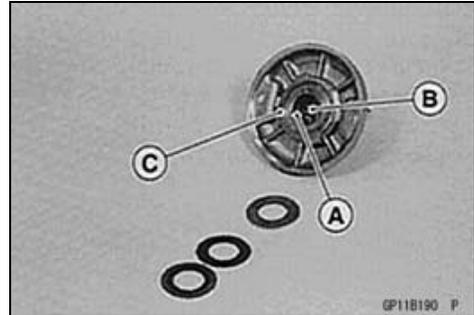
Electric Starter System

- Remove the terminal locknut [A] and terminal bolt [B], and then remove the brush with the brush plate from the yoke.

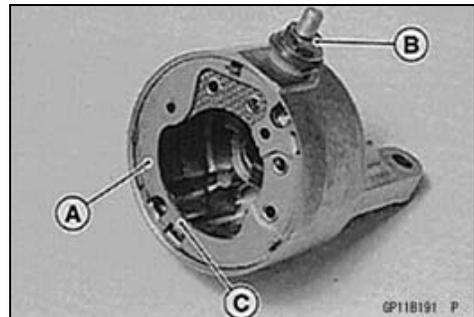


Starter Motor Assembly

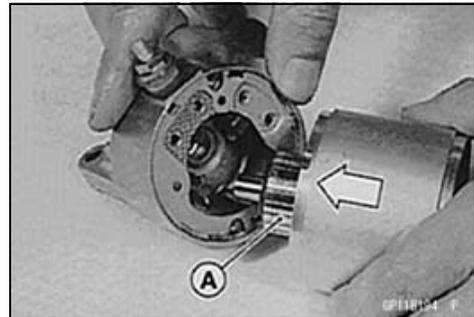
- Replace the O-rings with new ones.
- Apply a thin coat of grease to the oil seal [A] and needle bearing [B].
- Fit the toothed washer [C] into the end cover.



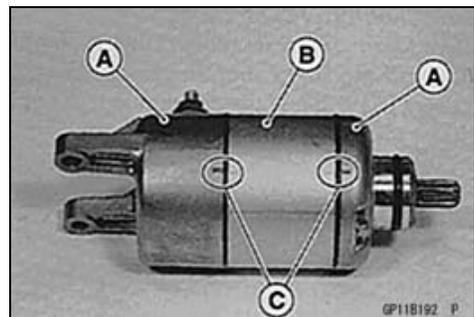
- Install the brush plate [A] and tighten the terminal locknut [B].
Torque - Starter Motor Terminal Locknut: 6.9 N·m (0.70 kgf·m, 61 in·lb)
- Fit the tongue [C] on the brush plate into the end cover groove.



- Insert the armature [A] between the brushes.



- Align the marks [C] on the yoke [B] and end covers [A].
- Tighten the starter motor assembly bolts.
Torque - Starter Motor Assembly Bolts: 3.4 N·m (0.35 kgf·m, 30 in·lb)



15-50 ELECTRICAL SYSTEM

Electric Starter System

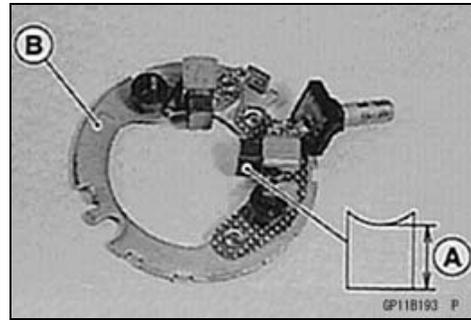
Brush Inspection

- Measure the length [A] of each brush.
- ★ If any is worn down to the service limit, replace the carbon brush holder assembly [B].

Starter Motor Brush Length

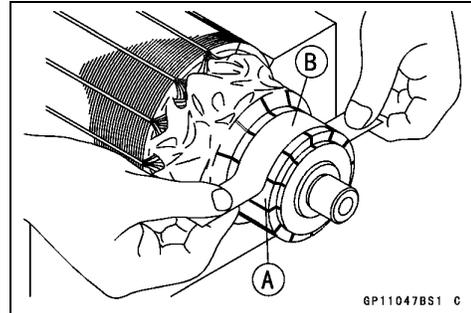
Standard: 9.5 ~ 10.5 mm (0.37 ~ 0.41 in.)

Service Limit: 8 mm (0.31 in.)



Commutator Cleaning and Inspection

- Smooth the commutator surface [A] if necessary with fine emery cloth [B], and clean out the grooves.

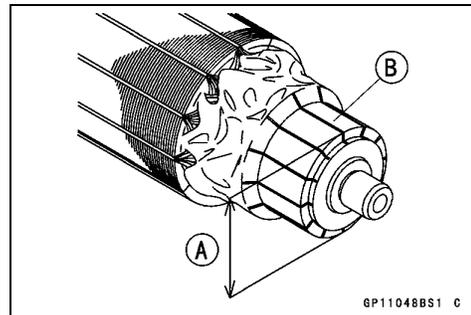


- Measure the diameter [A] of the commutator [B].
- ★ If the commutator diameter is less than the service limit, replace the starter motor with a new one .

Commutator Diameter

Standard: 27.95 ~ 28.05 mm (1.10 ~ 1.11 in.)

Service Limit: 27 mm (1.06 in.)

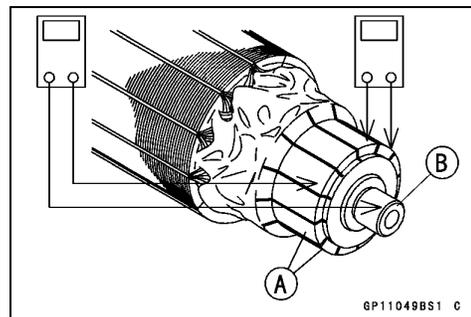


Armature Inspection

- Using the $\times 1 \Omega$ hand tester range, measure the resistance between any two commutator segments [A].

Special Tool - Hand Tester: 57001-1394

- ★ If there is a high resistance or no reading (∞) between any two segments, a winding is open and the starter motor must be replaced.
- Using the highest hand tester range, measure the resistance between the segments and the shaft [B].
- ★ If there is any reading at all, the armature has a short and the starter motor must be replaced.



NOTE

○ Even if the foregoing checks show the armature to be good, it may be defective in some manner not readily detectable with the hand tester. If all other starter motor and starter motor circuit components check good, but the starter motor still does not turn over or only turns over weakly, replace the starter motor with a new one.

Electric Starter System

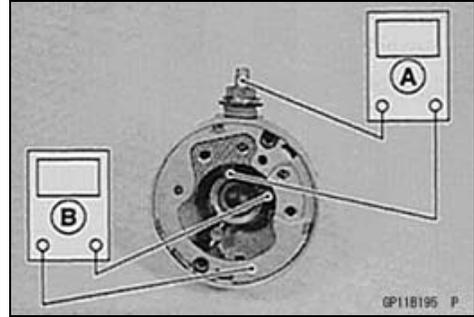
Brush Lead Inspection

- Using the $\times 1 \Omega$ hand tester range, measure the resistance as shown.

Terminal Bolt and Positive Brush [A]
 Brush Plate and Negative Brush [B]

Special Tool - Hand Tester: 57001-1394

- ★ If there is not close to 0Ω , the brush has an open. Replace the terminal bolt assembly and/or the brush holder assembly.



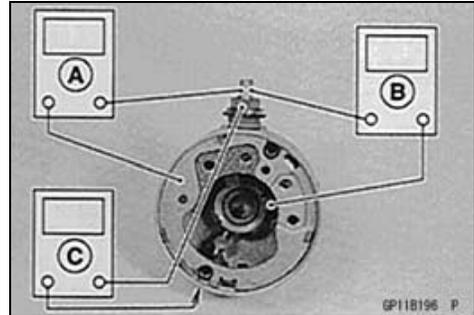
Brush Plate and Terminal Bolt Inspection

- Using the highest hand tester range, measure the resistance as shown.

Terminal Bolt and Brush Plate [A]
 Terminal Bolt and Negative Brush Holder [B]
 Terminal Bolt and End Cover [C]

Special Tool - Hand Tester: 57001-1394

- ★ If there is any reading, the brush holder assembly and/or terminal bolt assembly have a short. Replace the brush holder assembly and the terminal bolt assembly.

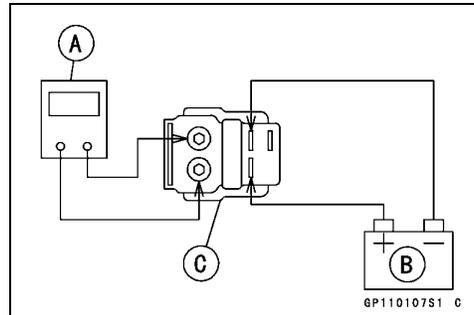


Starter Relay Inspection

- Remove:
 - Right Side Cover (see Frame chapter)
 - Starter Circuit Relay
- Connect the hand tester [A] and 12 V battery [B] to the starter relay [C] as shown.

Special Tool - Hand Tester: 57001-1394

- ★ If the relay does not work as specified, the relay is defective. Replace the relay.



Testing Relay

Tester Range: $\times 1 \Omega$ range

Criteria: When battery is connected $\rightarrow 0 \Omega$

When battery is disconnected $\rightarrow \infty \Omega$

15-52 ELECTRICAL SYSTEM

Electric Starter System

Starter Circuit Relay Inspection

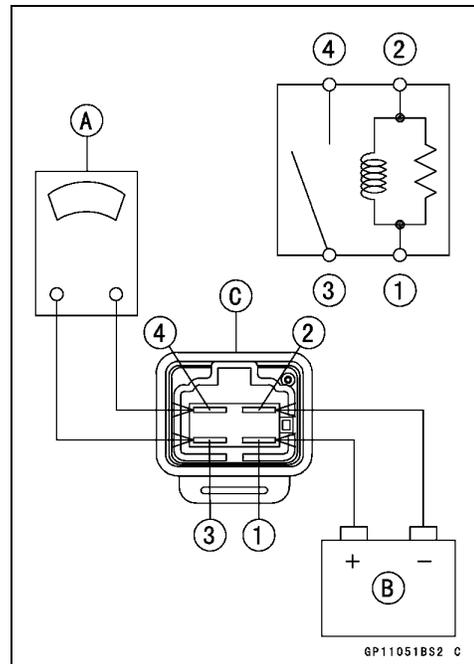
- Remove:
 - Right Side Cover (see Frame chapter)
 - Starter Circuit Relay
- Connect the hand tester [A] and 12 V battery [B] as shown.
 - Relay Coil Terminal [1] and [2]
 - Relay Switch Terminal [3] and [4]
- ★ If the relay [C] does not work as specified, the relay is defective. Replace the relay.

Special Tool - Hand Tester: 57001-1394

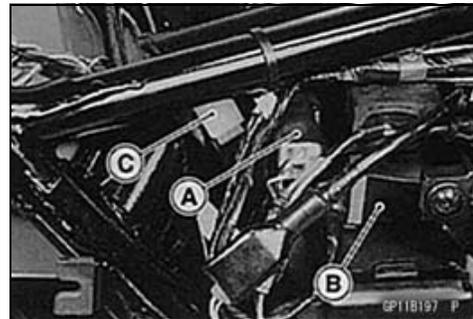
Testing Relay

Tester Range: $\times 1 \Omega$ range

Criteria: **When battery is connected $\rightarrow 0 \Omega$**
 When battery is disconnected $\rightarrow \infty \Omega$

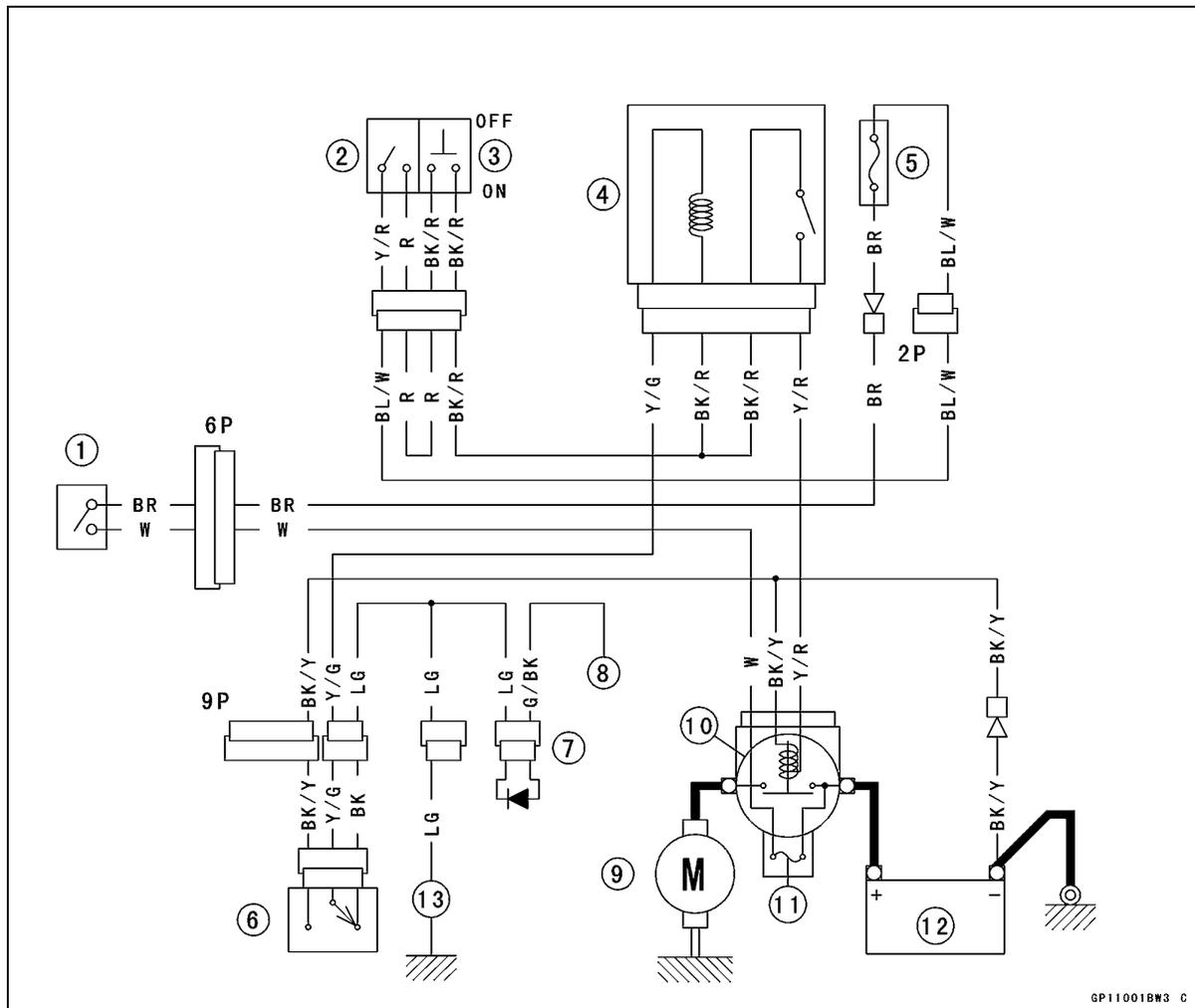


Starter Circuit Relay [A]
Starter Relay [B]
Interlock Diodes [C]



Electric Starter System

Electric Starter Circuit (BN125-A1/A2)

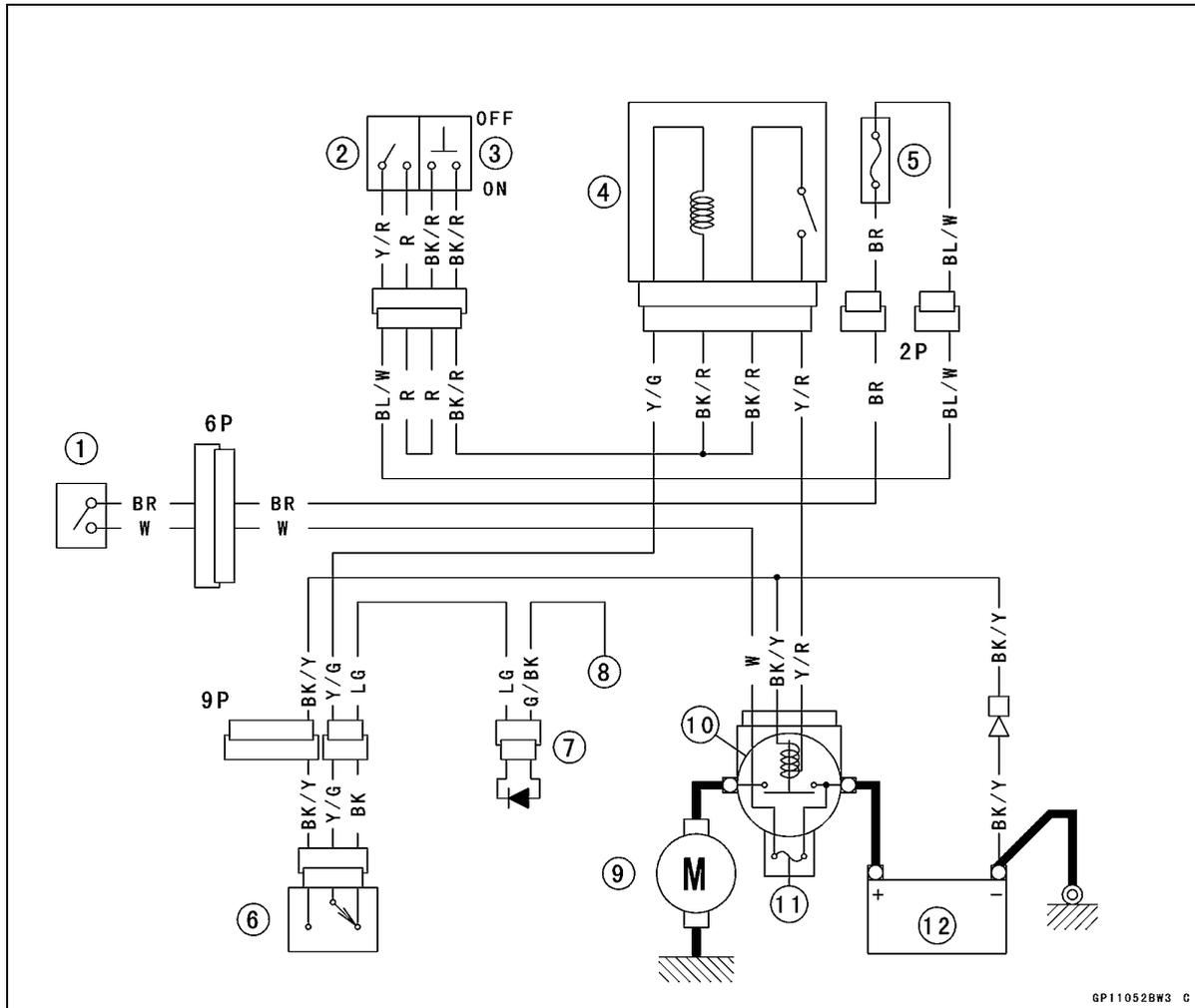


1. Ignition switch
2. Engine stop switch
3. Starter button
4. Starter circuit relay
5. Ignition fuse 10 A
6. Starter lockout switch
7. Interlock diodes
8. CDI unit
9. Starter motor
10. Starter relay
11. Main fuse 15 A
12. Battery
13. Neutral switch

15-54 ELECTRICAL SYSTEM

Electric Starter System

Electric Starter Circuit (BN125-A3 ~)



GP11052BW3 C

1. Ignition switch
2. Engine stop switch
3. Starter button
4. Starter circuit relay
5. Ignition fuse 15 A
6. Starter lockout switch
7. Interlock Diodes
8. CDI unit
9. Starter motor
10. Starter relay
11. Main fuse 30 A
12. Battery

Lighting System

Headlight Beam Horizontal/Vertical Adjustment

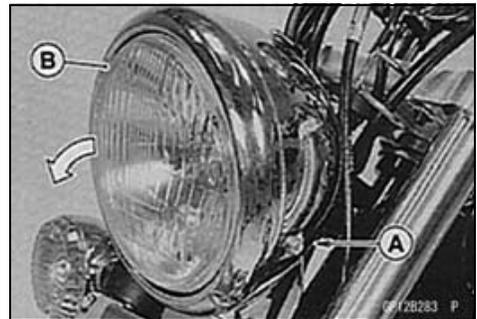
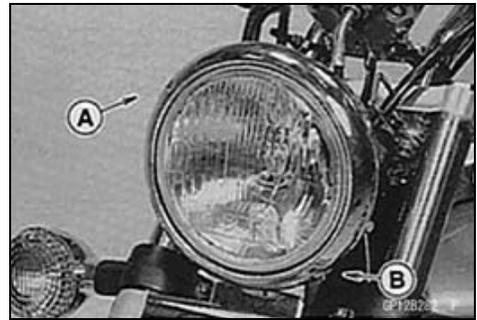
- Turn the horizontal adjuster [A] on the headlight with a screwdriver in or out until the beam points straight ahead.
- Turn the horizontal adjuster clockwise to face the headlight left.
- Turn the vertical adjuster [B] on the headlight in or out to adjust the headlight vertically.
- Turn the vertical adjuster clockwise to face the headlight up.

NOTE

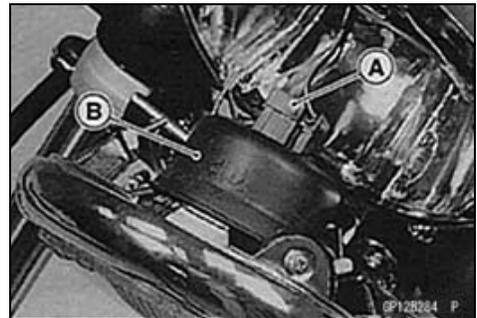
- On high beam, the brightest points should be slightly below horizontal with the motorcycle on its wheels and the rider seated. Adjust the headlight to the proper angle according to local regulations.

Headlight Bulb Replacement

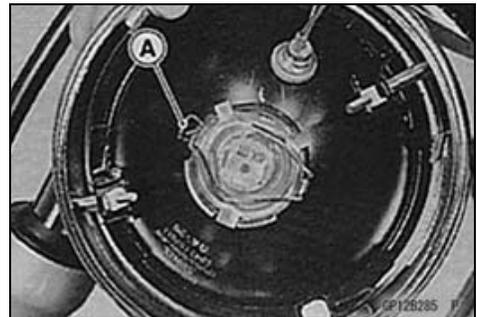
- Remove the headlight rim screws [A].
- Pull the headlight unit [B] and drop it out.



- Remove:
 - Bulb Socket [A]
 - Dust Cover [B]



- Remove the hook [A].



15-56 ELECTRICAL SYSTEM

Lighting System

- Replace the headlight bulb [A].

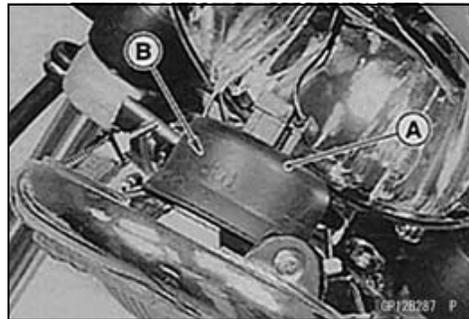
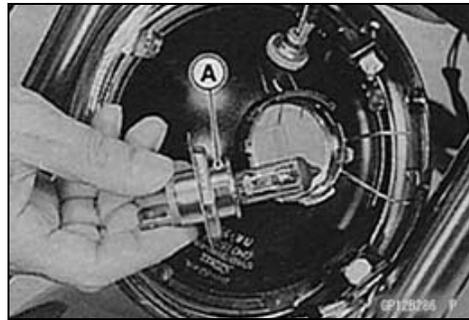
CAUTION

When handling the quartz-halogen bulb, never touch the glass portion with bare hands. Always use a clean cloth. Oil contamination from hands or dirty rags can reduce bulb life or cause the bulb to explode.

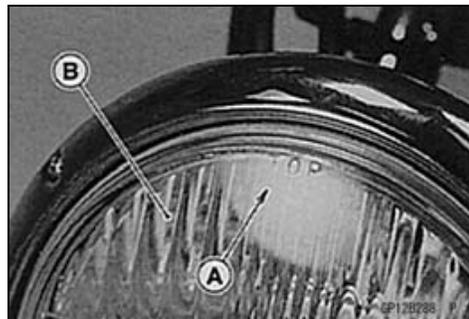
NOTE

○ Clean off any contamination that inadvertently gets on the bulb with alcohol or soap and water solution.

- Fit the dust cover [A] with the "TOP" mark [B] upward onto the bulb firmly as shown.

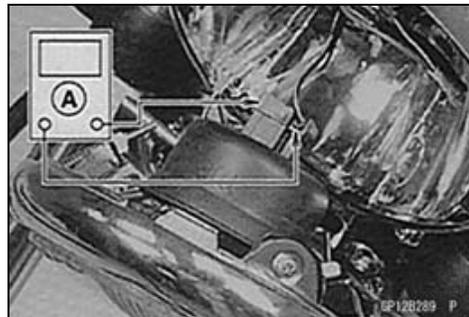


- Install the headlight unit [B] with the "TOP" mark [A] upward.
- After installation, adjust the headlight aim (see this chapter).



AC Lighting Voltage Inspection

- Remove the headlight unit (see this chapter).
- Do not remove the bulb socket.
- Connect the hand tester [A] to the R/BK and BK/Y leads in the socket as shown in the table.
- Push the headlight switch to ON and dimmer switch to HI.
- Run the engine at 4 000 r/min (rpm) and measure the voltage.



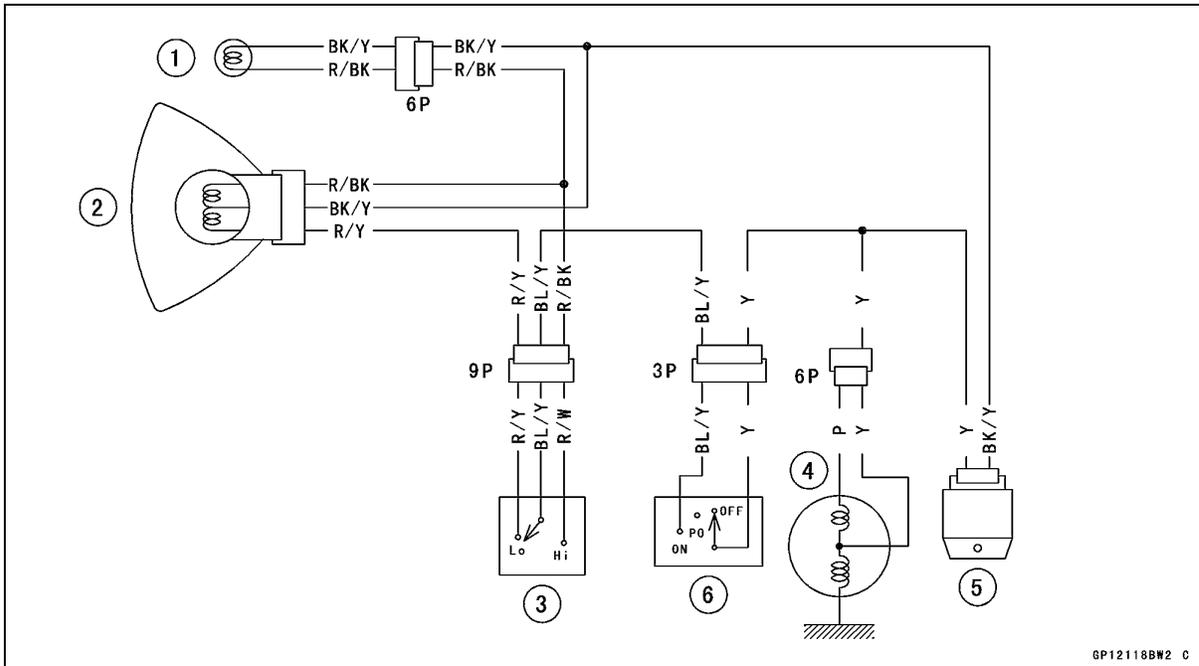
AC Lighting Voltage

Tester Range	Connections		Rearing @4 000 rpm
	Tester (+) to	Tester (-) to	
25 V AC	R/BK lead	BK/Y lead	11 ~ 16 V

- Stop the engine.
- ★ If the voltage is kept between the values given in the table, the lighting system is considered to be working normally.
- ★ If the voltage is much higher than the values specified in the table, the regulator/rectifier is defective or the regulator/rectifier leads are loose or open.
- ★ If the voltage is much lower than the values specified in the table, the regulator/rectifier is defective or alternator output is insufficient. Check the regulator/rectifier and alternator to determine which part is defective.

Lighting System

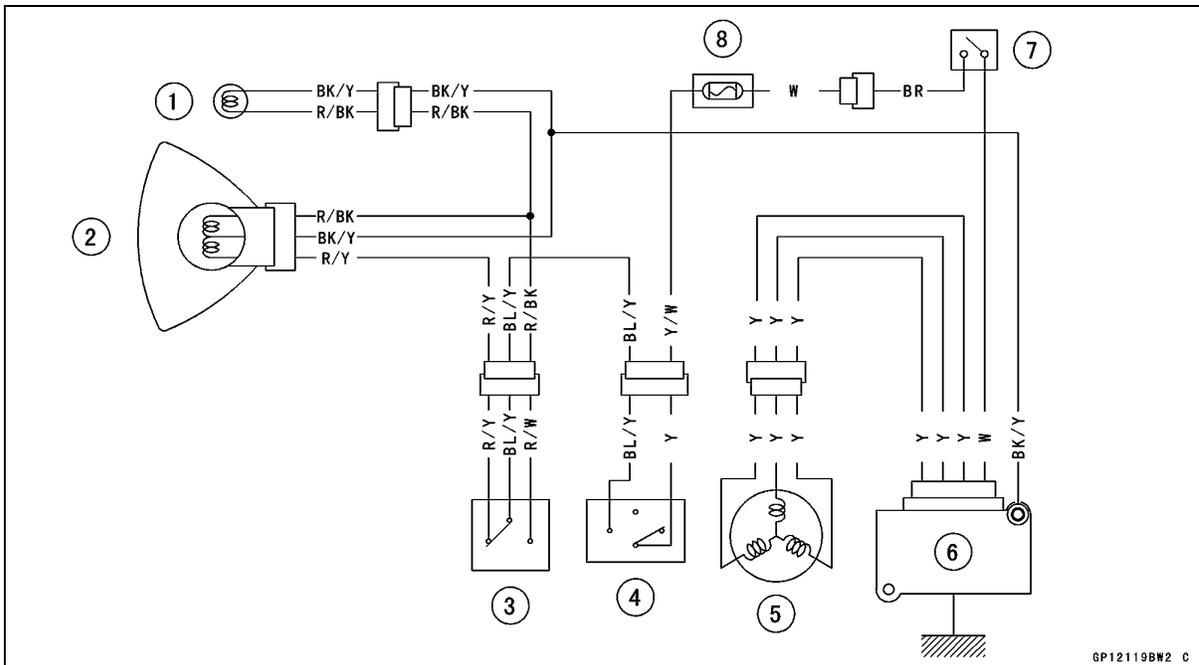
Headlight Circuit (BN125-A1/A2)



- 1. High beam indicator light
- 2. Headlight
- 3. Dimmer switch

- 4. Alternator
- 5. Regulator/rectifier
- 6. Headlight switch

Headlight Circuit (BN125-A3 ~ A5)



- 1. High beam indicator light
- 2. Headlight
- 3. Dimmer switch
- 4. Headlight switch

- 5. Alternator
- 6. Regulator/rectifier
- 7. Ignition switch
- 8. Headlight fuse 15 A

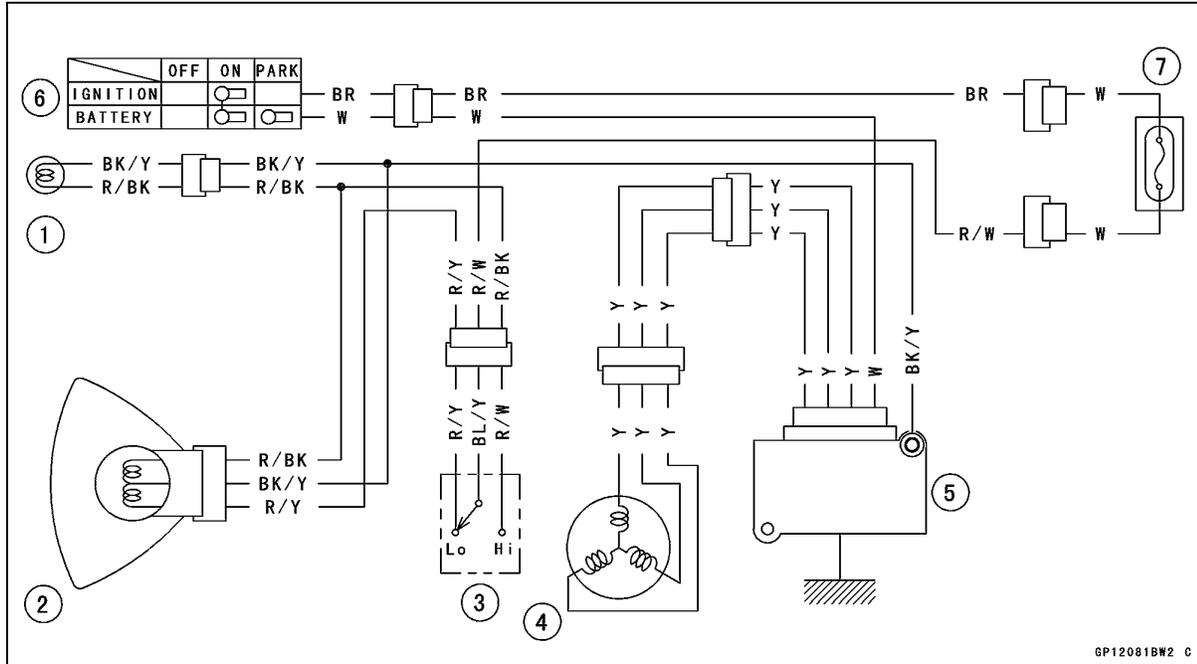
GP12118BW2 C

GP12119BW2 C

15-58 ELECTRICAL SYSTEM

Lighting System

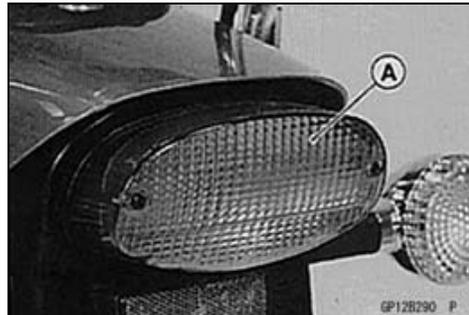
Headlight Circuit (BN125-A6~)



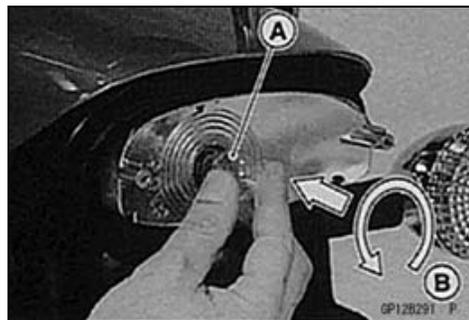
1. High beam indicator light
2. Headlight
3. Dimmer switch
4. Alternator
5. Regulator/rectifier
6. Ignition switch
7. Headlight fuse 15 A

Tail/Brake Light Bulb Replacement

- Remove the tail/brake light lens [A].

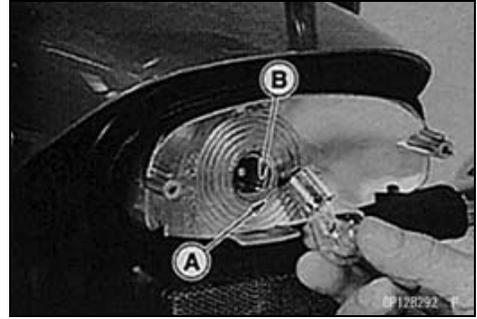


- Push the bulb [A] in the socket, turn it counterclockwise [B], and pull it out.



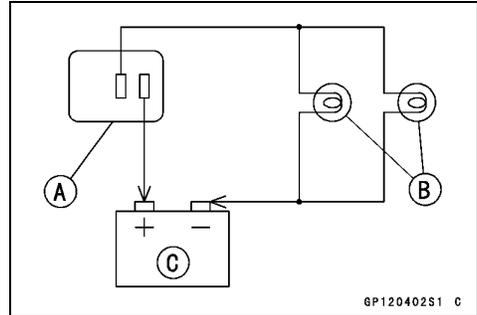
Lighting System

- With the front pin [A] down, insert the new bulb by aligning the front pin with the groove [B] in the walls of the socket.
- Push the bulb in, turn it clockwise, and replace it. It should lock in position.
- Tighten the lens screws. Be careful not to overtighten them.



Turn Signal Relay Inspection

- Remove the right side cover (see Frame chapter).
- Connect one 12 V battery and turn signal lights as indicated in the figure, and count how many times the lights flash for one minute.
Turn Signal Relay [A]
Turn Signal Lights [B]
12 V Battery [C]
- ★ If the lights do not flash as specified, replace the turn signal relay.

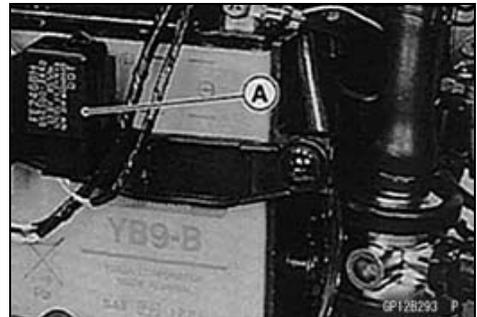


Testing Turn Signal Relay

Load		Flashing times (c/m*)
The Number of Turn Signal Lights	Wattage (W)	
1**	23 or 21	Light stays on or 140 ~ 250
2	42 or 46	75 ~ 95

*: Cycle(s) per minute

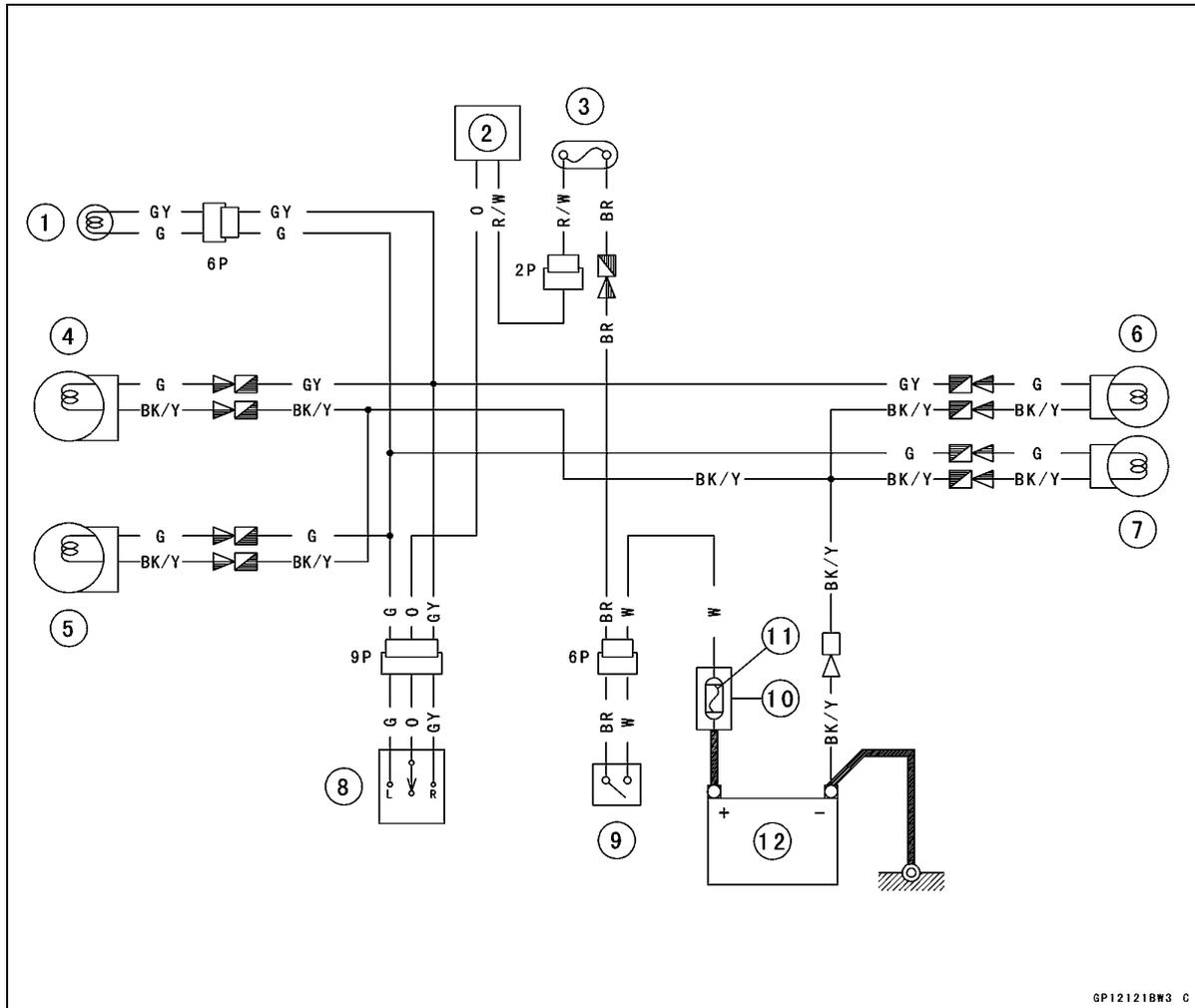
** : Correspond to "one light burned out"



15-60 ELECTRICAL SYSTEM

Lighting System

Turn Signal Light Circuit (BN125-A1/A2)

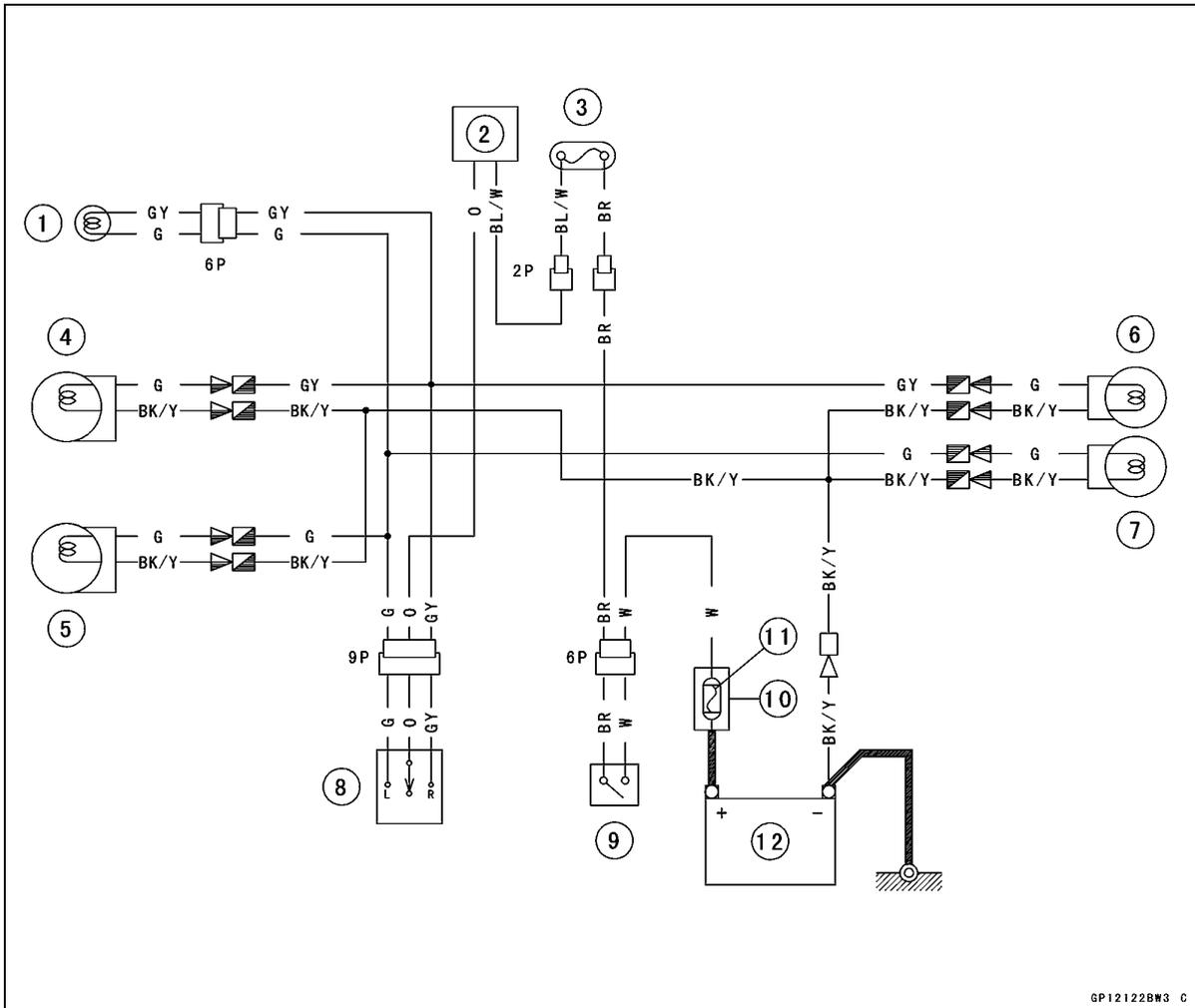


1. Turn signal indicator light
2. Turn signal relay
3. Ignition fuse 10 A
4. Front right turn signal light
5. Front left turn signal light
6. Rear right turn signal light
7. Rear left turn signal light
8. Turn signal switch
9. Ignition switch
10. Starter relay
11. Main fuse 15 A
12. Battery

GP12121BW3 C

Lighting System

Turn Signal Light Circuit (BN125-A3 ~ A5)

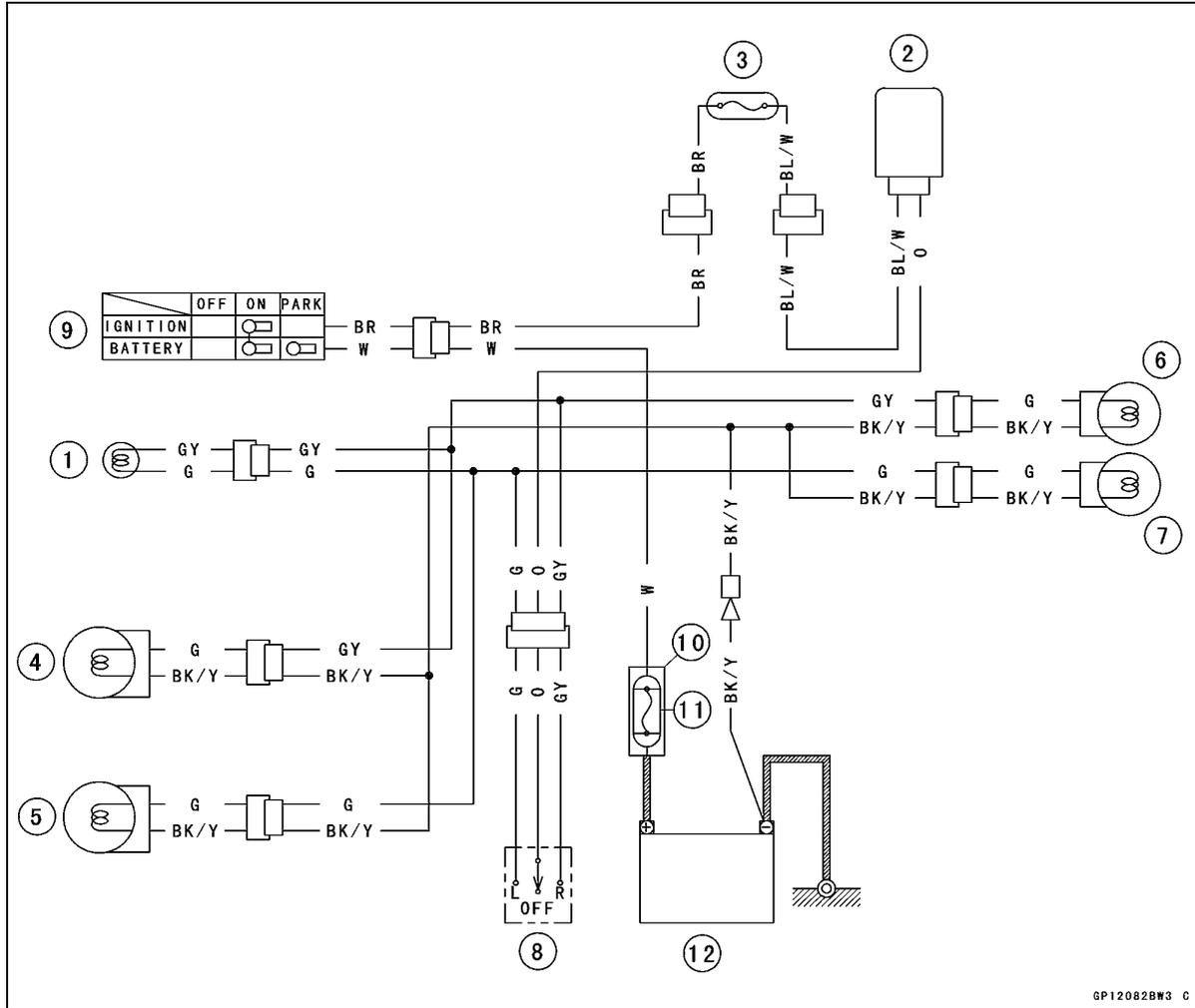


1. Turn signal indicator light
2. Turn signal relay
3. Ignition fuse 15 A
4. Front right turn signal light
5. Front left turn signal light
6. Rear right turn signal light
7. Rear left turn signal light
8. Turn signal switch
9. Ignition switch
10. Starter relay
11. Main fuse 30 A
12. Battery

15-62 ELECTRICAL SYSTEM

Lighting System

Turn Signal Light Circuit (BN125-A6~)



1. Turn signal indicator light
2. Turn signal relay
3. Ignition fuse 15 A
4. Front right turn signal light
5. Front left turn signal light
6. Rear right turn signal light
7. Rear left turn signal light
8. Turn signal switch
9. Ignition switch
10. Starter relay
11. Main fuse 30 A
12. Battery

GP12082BW3 C

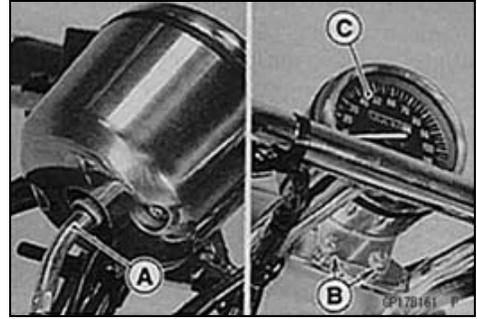
Meter, Gauge, Indicator Unit

Speedometer Removal

- Remove the speedometer cable upper end [A].
- Remove the meter unit [C] by taking off the mounting bolts [B].

CAUTION

Place the meter so that the face is up. If a meter is left upside down or sideways for any length of time, it will malfunction.

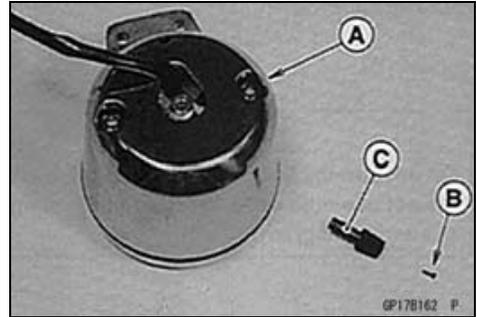


Speedometer Disassembly

- Remove:
 - Speedometer (see this chapter)
 - Screws [A]
 - Screw [B] and Knob [C]
- To remove the wedge-base type bulb [A], then pull the bulb out of the socket.

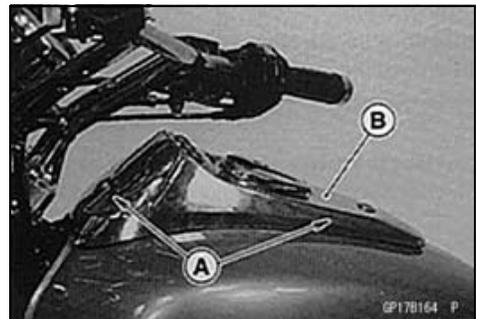
CAUTION

Do not turn the bulb. Pull the bulb out to prevent damage to the bulb. Do not use bulb rated for other than voltage or wattage specified in the wiring diagram.



Indicator Unit Removal/Installation

- Remove the bolts [A] and indicator unit [B] from the fuel tank.
- When installing the indicator unit, tighten the front bolt first.

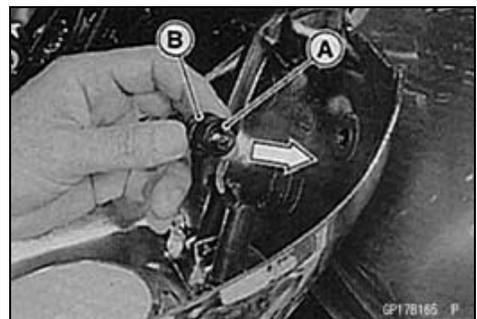


Bulb Replacement

- To remove the wedge-base type bulb [A], pull the bulb out of the socket [B].

CAUTION

Do not turn the bulb. Pull the bulb out to prevent damage to the bulb. Do not use bulb rated for other than voltage or wattage specified in the wiring diagram.



15-64 ELECTRICAL SYSTEM

Switches and Sensors

Front Brake Light Switch Inspection

- Refer to the Front Brake Light Switch Inspection in the Periodic Maintenance chapter.

Rear Brake Light Timing Inspection

- Refer to the Rear Brake Light Timing Inspection in the Periodic Maintenance chapter.

Rear Brake Light Timing Adjustment

- Refer to the Rear Brake Light Timing Adjustment in the Periodic Maintenance chapter.

Switch Inspection

- Using the hand tester, check to see that only the connections shown in the table have continuity (about 0 Ω).
- For the handlebar switches and the ignition switch, refer to the tables in the Wiring Diagram.
- ★ If the switch has an open or short, repair it or replace it with a new one.

Special Tool - Hand Tester: 57001-1394

Rear Brake Light Switch Connections		
Color	BR	BL/W
When brake pedal is pushed down	○ — ○	○ — ○
When brake pedal is released		

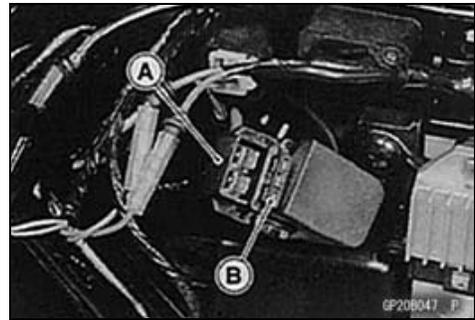
Sidestand Switch Connections		
Color	BK	G
When sidestand is down		
When sidestand is up	○ — ○	○ — ○

Neutral Switch Connections		
Color	SW. Terminal	Ground
When transmission is in neutral	○ — ○	○ — ○
When transmission is not in neutral		

Fuse

Main Fuse 15 A Removal

- Remove the right side cover (see Frame chapter).
- Disconnect the starter relay connector.
- Pull out the main fuse [B] from the starter relay [A] with needle nose pliers.



Main Fuse 15 A Inspection

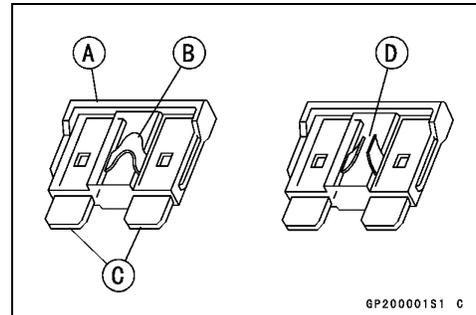
- Remove the fuse (see Fuse Removal).
- Inspect the fuse element.
- ★ If it is blown out, replace the fuse. Before replacing a blown fuse, always check the amperage in the affected circuit. If the amperage is equal to or greater than the fuse rating, check the wiring and related components for a short circuit.

Housing [A]

Fuse Element [B]

Terminals [C]

Blown Element [D]

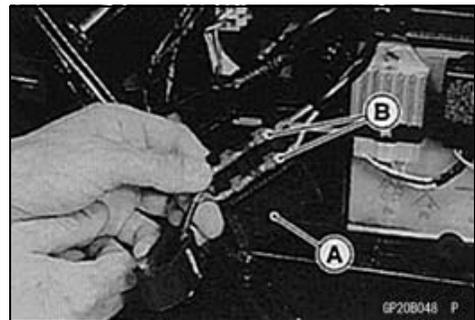


CAUTION

When replacing a fuse, be sure the new fuse matches the specified fuse rating for that circuit. Installation of a fuse with a higher rating may cause damage to wiring and components.

Fuse 10 A Removal

- Remove the right side cover (see Frame chapter).
- Open the fuse case [A] and remove the fuses [B].



Fuse 10 A Installation

- ★ If a fuse fails during operation, inspect the electrical system to determine the cause, and then replace it with a new fuse or proper amperage.

CAUTION

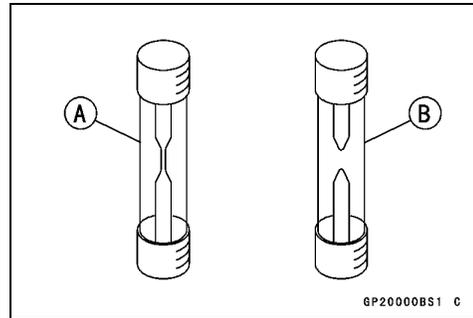
The fuse case has 10 A fuses only. Do not use the fuse other than 10 A fuse.

15-66 ELECTRICAL SYSTEM

Fuse

Fuse 10 A Inspection

- Inspect the fuse element.
- ★ If it is blown out, replace the fuse.
 - Fuse Element [A]
 - Blown Element [B]



Appendix

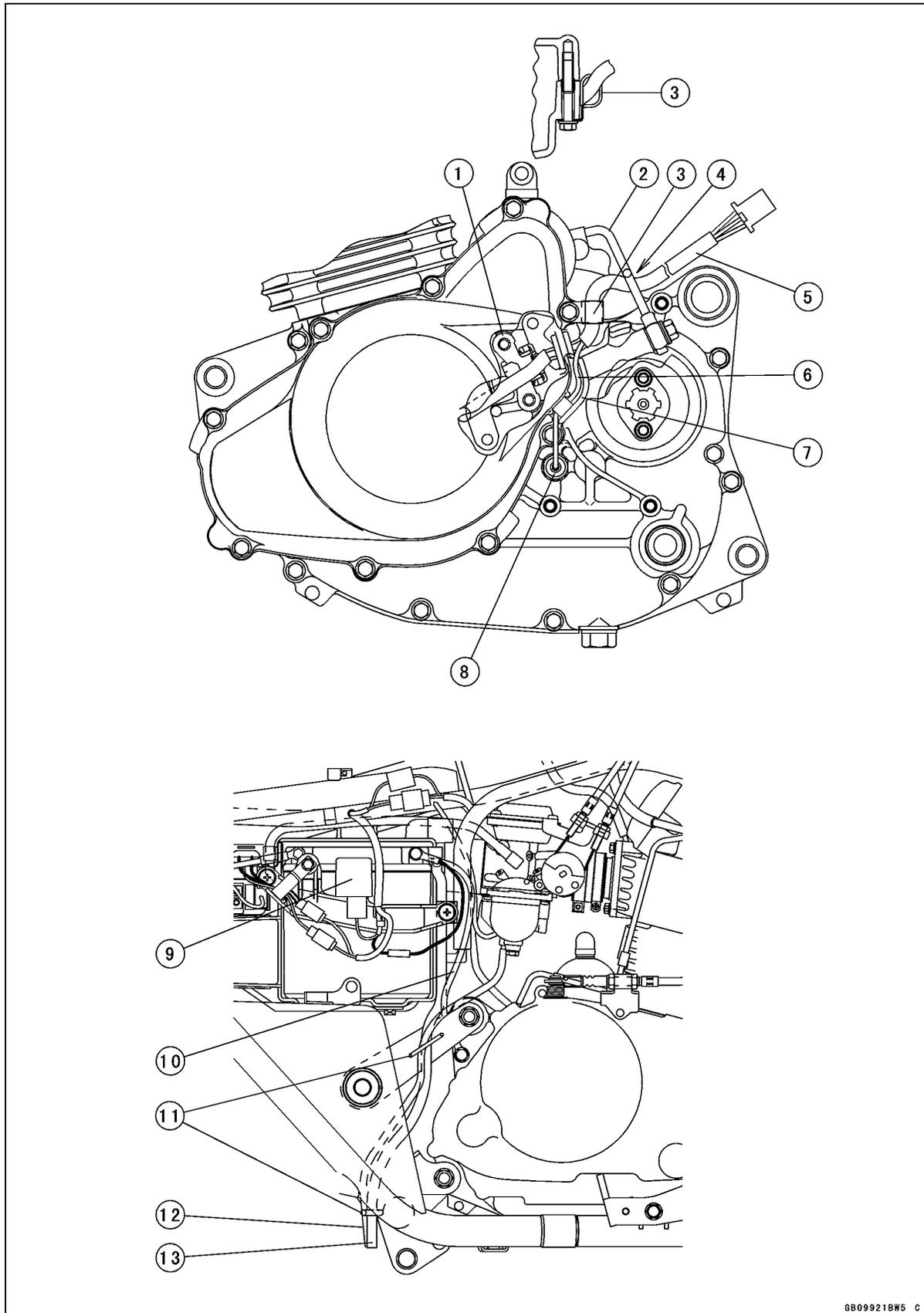
Table of Contents

Cable, Wire, and Hose Routing	16-2
Troubleshooting Guide	16-32

16-2 APPENDIX

Cable, Wire, and Hose Routing

BN125-A1 ~



GB09921BWS C

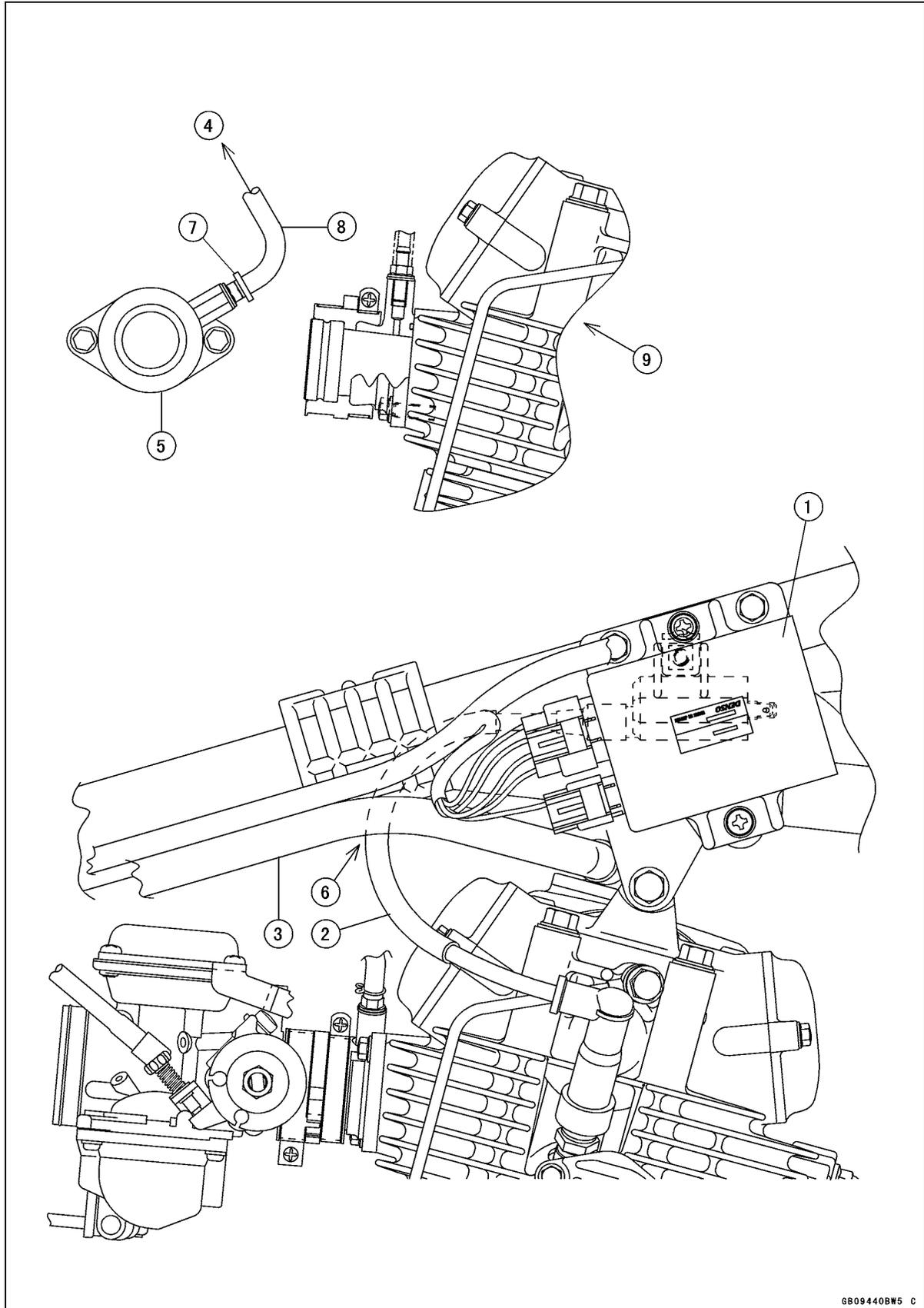
Cable, Wire, and Hose Routing

1. Crankshaft Sensor
2. Oil Pipe
3. Clamp
4. Run the alternator lead under the oil pipe.
5. Alternator Lead
6. Run the neutral switch lead so that it shall not out of guide rib.
7. Guide Rib
8. Neutral Switch
9. Turn Signal Relay
10. Engine Ground Lead
11. Holder
12. Carburetor Drain Hose
13. Battery Vent Hose

16-4 APPENDIX

Cable, Wire, and Hose Routing

BN125-A1 ~



GB09440BWS C

Cable, Wire, and Hose Routing

1. CDI Unit
2. Ignition Coil Lead
3. Engine Breather Hose
4. To Fuel Tap
5. Insulator
6. Run the ignition coil lead under the engine breather hose.
7. Clamp
8. Install the hose as shown.
9. Other than AT, DE, SG, CH Models

AT: Austria

CH: Switzerland

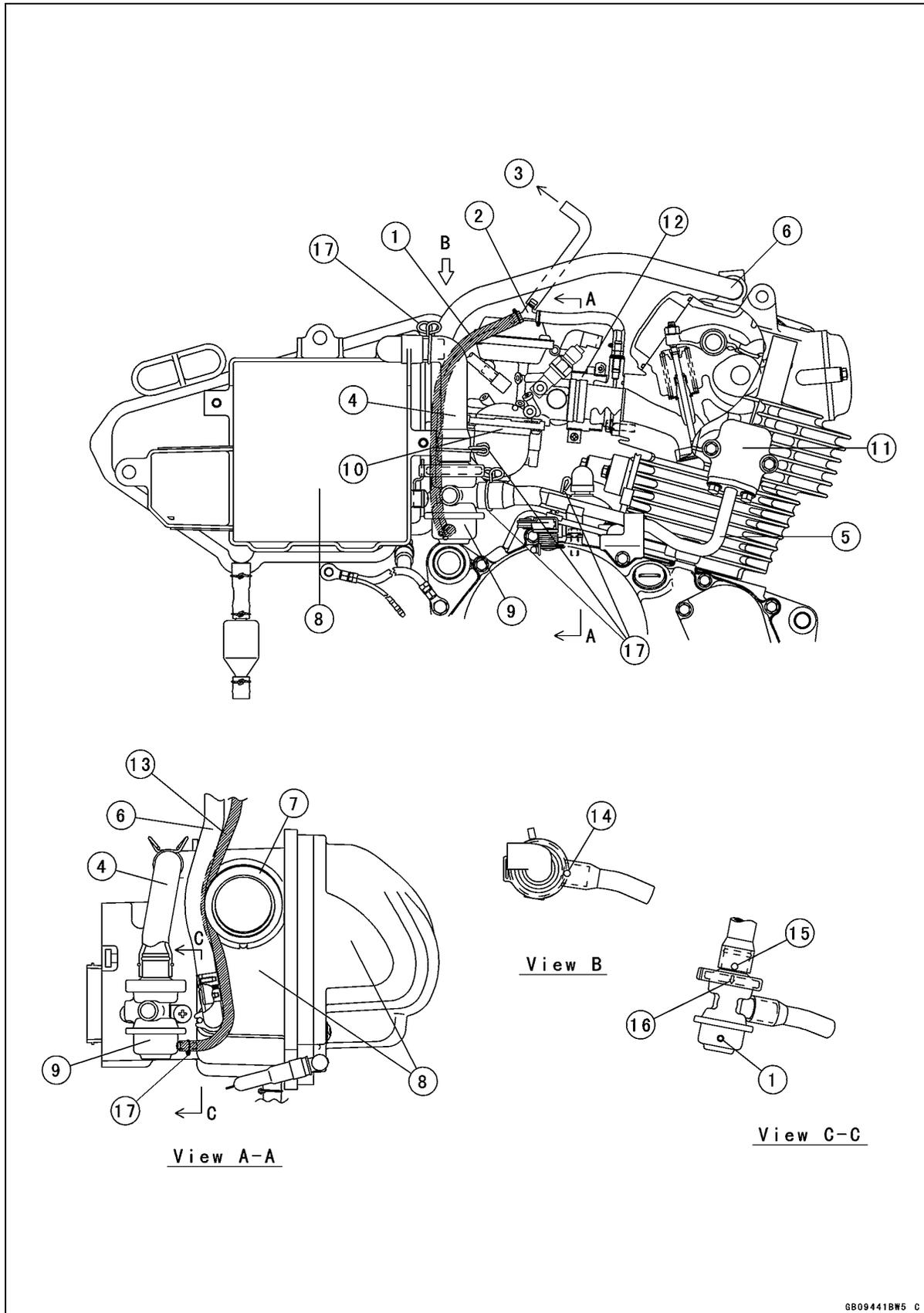
DE: Germany

SG: Singapore

16-6 APPENDIX

Cable, Wire, and Hose Routing

Clean Air System



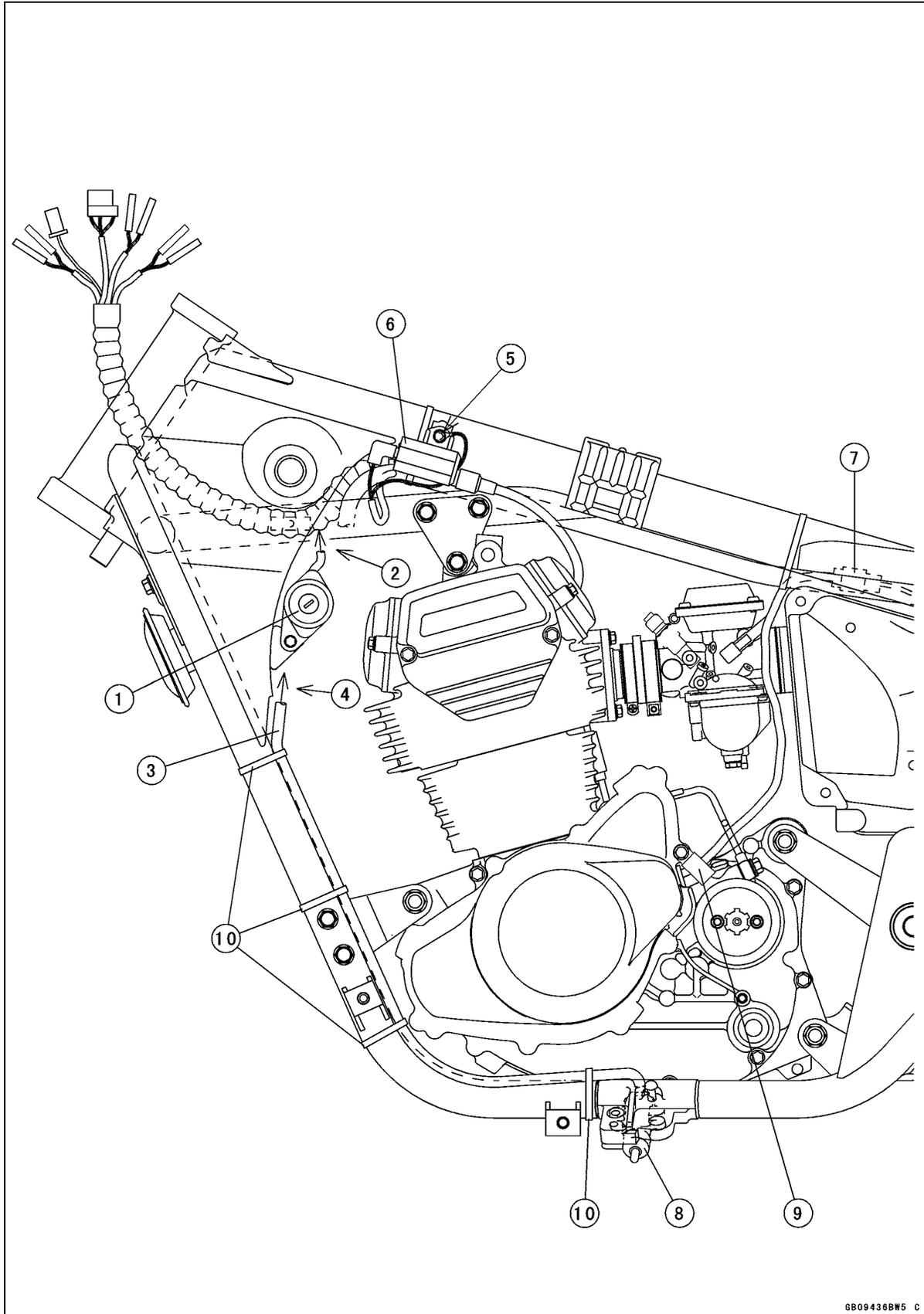
Cable, Wire, and Hose Routing

1. Vacuum Hose
 2. Three-way Joint
 3. To Fuel Tap
 4. Air Hose
 5. Air Pipe
 6. Engine Breather Hose
 7. Air Cleaner Duct
 8. Air Cleaner Housing
 9. Vacuum Switch
 10. Carburetor
 11. Air Suction Valve
 12. Insulator
 13. Run the vacuum hose onto the left side of the duct (7), and then behind the hose (6) and carburetor (10).
 14. The mark faces upward.
 15. Positioning Mark
 16. Arrow Mark (faces toward the vacuum hose)
 17. Clamp
- Note: The position mark (15), arrow mark (16) and vacuum hose (1) shall be in line as shown.

16-8 APPENDIX

Cable, Wire, and Hose Routing

BN125-A1 ~ A4



GB09436BW5 C

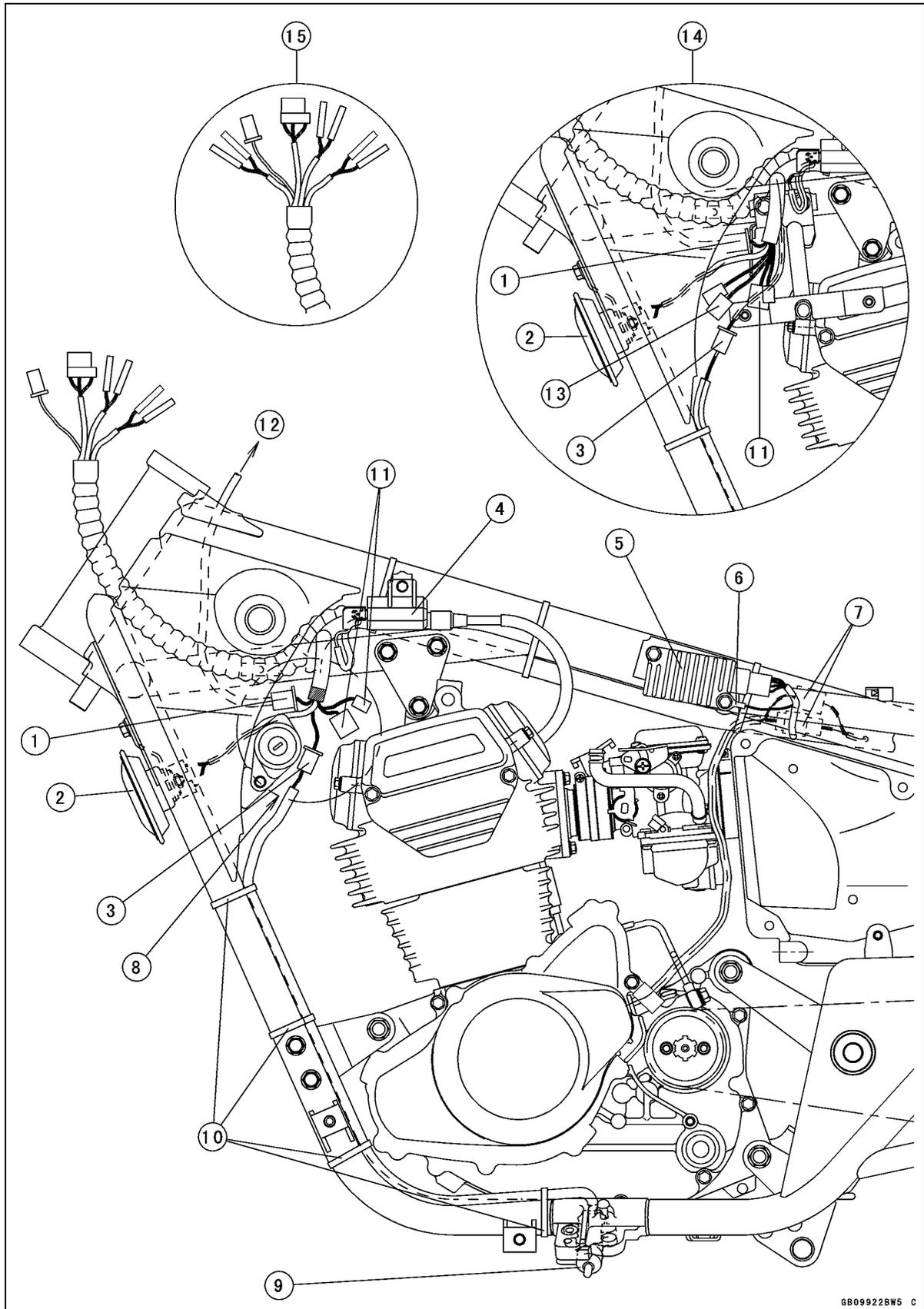
Cable, Wire, and Hose Routing

1. Ignition Switch
2. Run the ignition switch lead to the right.
3. Sidestand Switch Lead
4. Run the sidestand switch lead to the right.
5. Body Ground
6. Ignition Coil
7. Alternator Lead Connector
8. Sidestand Switch
9. Clamp
10. Band

16-10 APPENDIX

Cable, Wire, and Hose Routing

BN125-A5 ~



GB09922BWS C

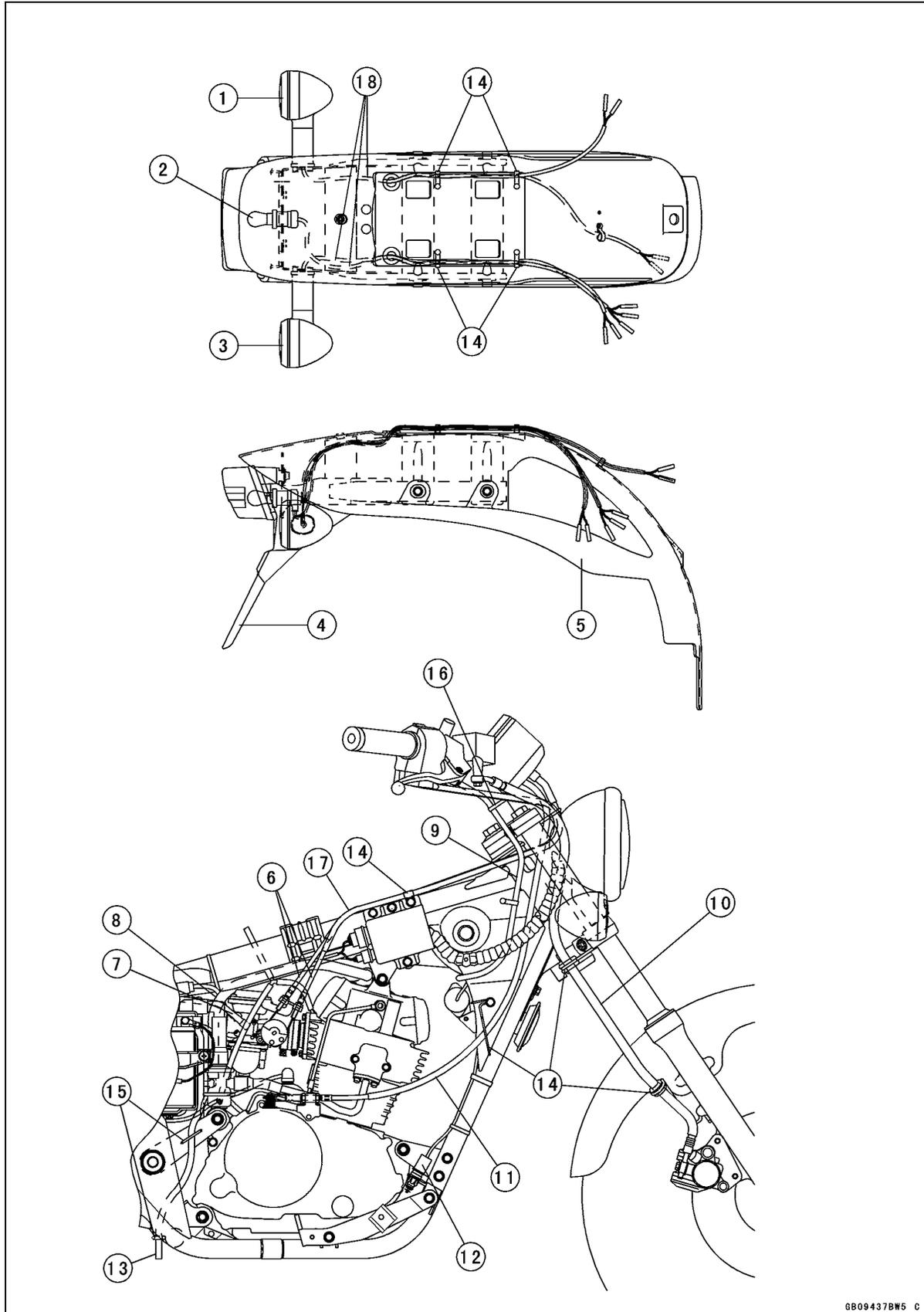
Cable, Wire, and Hose Routing

1. Indicator Light Connector (Move it to the right side after connected.)
2. Horn
3. Sidestand switch connector
4. Ignition coil
5. Regulator/Rectifier
6. Ground Lead
7. Alternator Lead
8. Put the connectors into the gusset after connecting them.
9. Sidestand Switch
10. Band
11. Left Handlebar Switch Connector
12. Connect it in the fuel tank cover.
13. Right Handlebar Switch Connector
14. California Model
15. Europe Model

16-12 APPENDIX

Cable, Wire, and Hose Routing

BN125-A1 ~



GB09437BWS C

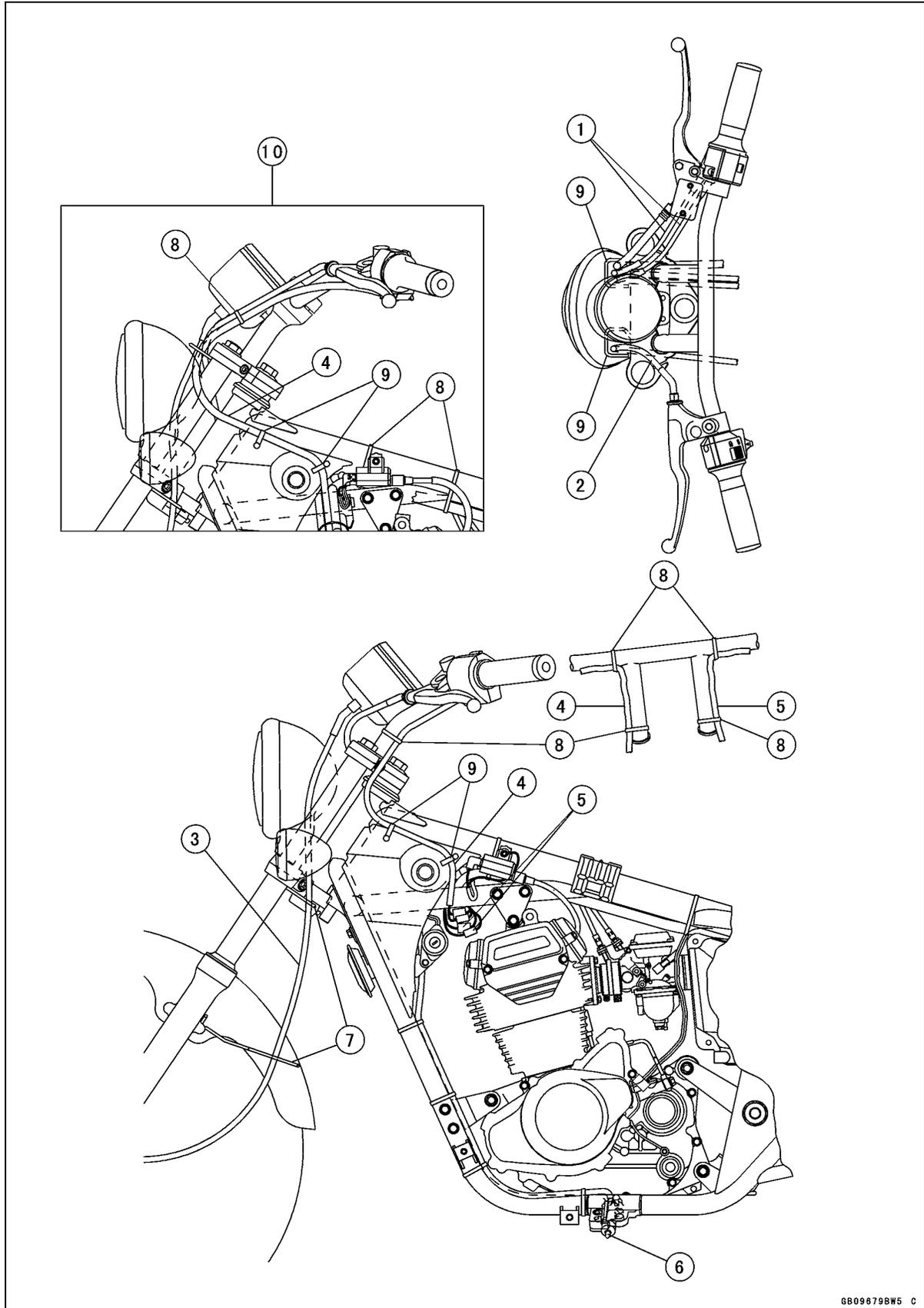
Cable, Wire, and Hose Routing

1. Rear Left Turn Signal Light
2. Tail/Brake Light
3. Rear Right Turn Signal Light
4. Rear Fender Rear
5. Rear Fender Front
6. Throttle Cables
7. Carburetor Air Vent Hose
8. Engine Breather Hose
9. Right Handlebar Switch
10. Brake Hose
11. Clutch Cable
12. Rear Brake Light Switch
13. Battery Vent Hose
14. Clamp
15. Holder
16. Band
17. Run the throttle cables inside the right handlebar switch.
18. Run the left/right rear turn signal light, tail/brake light leads between the stay and the rear fender.

16-14 APPENDIX

Cable, Wire, and Hose Routing

BN125-A1 ~



GB096796W5 C

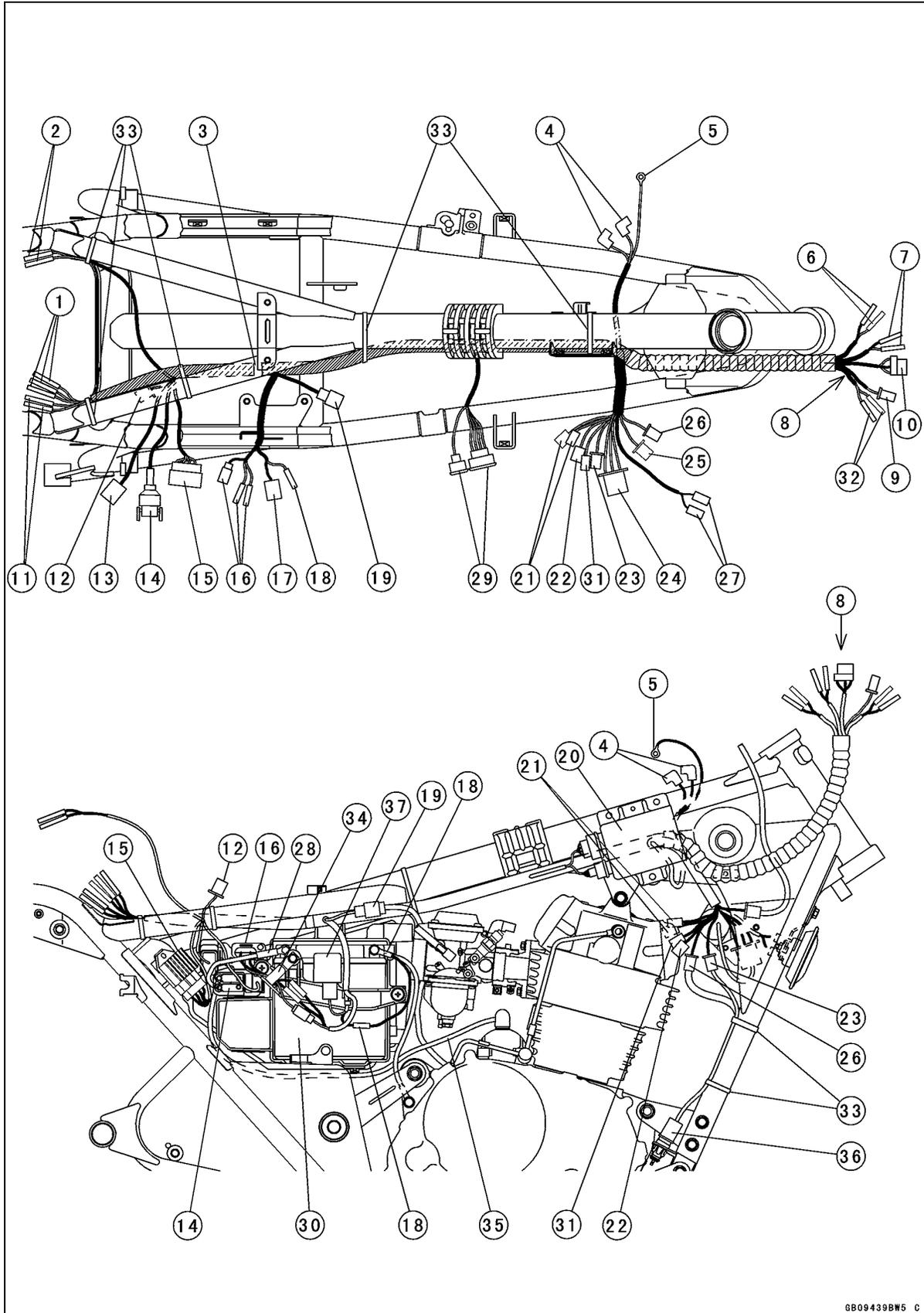
Cable, Wire, and Hose Routing

1. Throttle Cables
2. Clutch Cable
3. Speedometer Cable
4. Left Handlebar Switch Harness
5. Right Handlebar Switch Harness
6. Sidestand Switch
7. Holder
8. Band
9. Clamp
10. BN125-A3 ~

16-16 APPENDIX

Cable, Wire, and Hose Routing

BN125-A1 ~ A2



6B09439BWS C

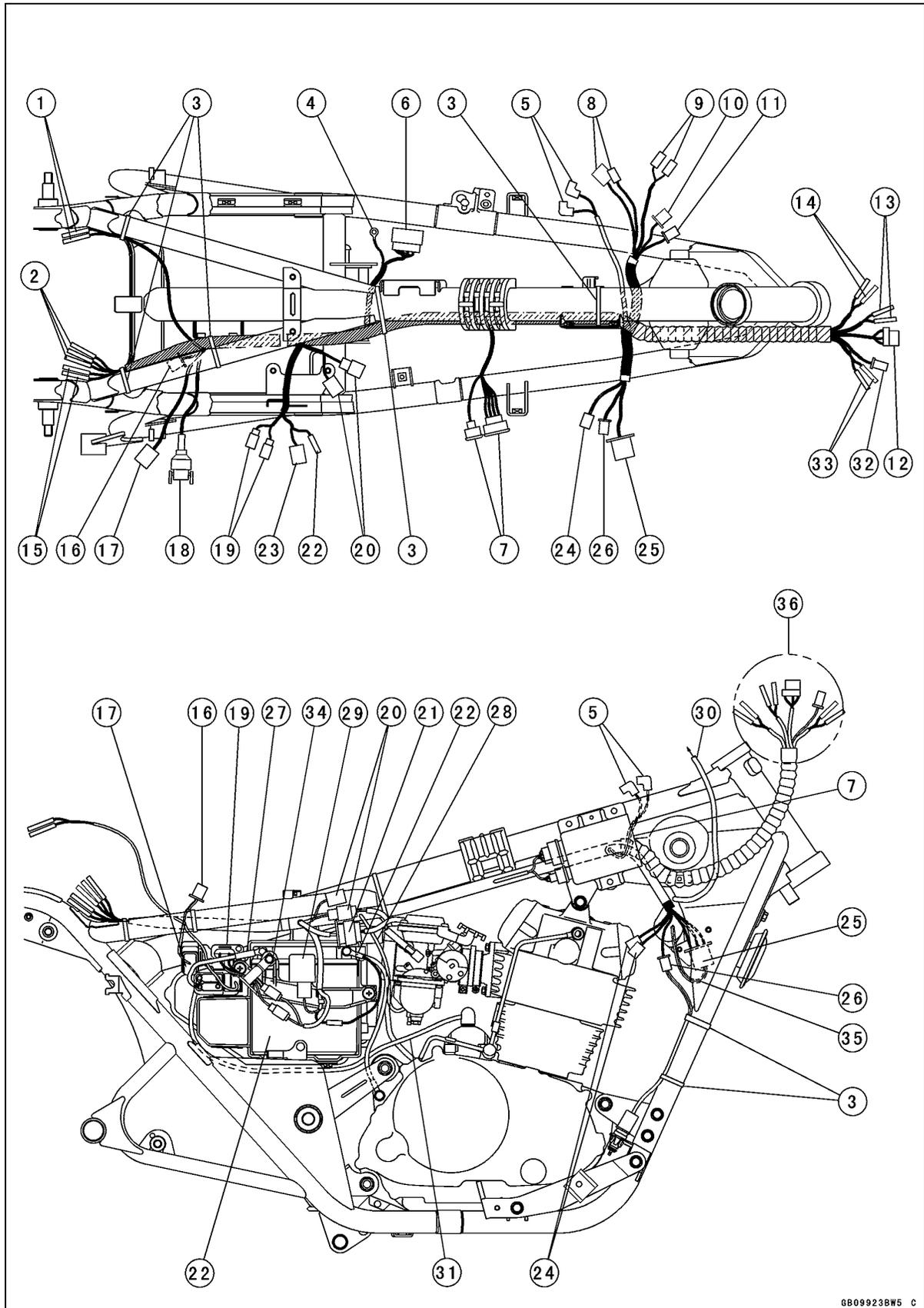
Cable, Wire, and Hose Routing

1. Tail/Brake Light Connector
2. Rear Left Turn Signal Light Connector
3. White Tape
4. Ignition Coil Connector
5. Body Ground
6. Front Left Turn Signal Light Connector
7. Front Right Turn Signal Light Connector
8. Join connectors in the headlight unit.
9. Speedometer Light Connector
10. Headlight Connector
11. Rear Right Turn Signal Light Connector
12. Interlock Diodes
13. Starter Circuit Relay Connector
14. Starter Relay Connector
15. Regulator/Rectifier Connector
16. Fuse Box Connector
17. Turn Signal Relay Connector
18. Battery Negative Lead
19. Alternator Connector
20. CDI Unit
21. Left Handlebar Switch Connector
22. Right Handlebar Switch Connector
23. Rear Brake Light Switch Connector
24. Ignition Switch Connector
25. Indicator Light Connector
26. Sidestand Light Connector
27. Horn Connector
28. Battery Positive Lead
29. CDI Unit Connector
30. Battery
31. Right Handlebar Switch Lead Connector
32. City Light Connector (Europe Model)
33. Band
34. Clamp
35. Starter Lead
36. Rear Brake Light Switch
37. Turn Signal Relay

16-18 APPENDIX

Cable, Wire, and Hose Routing

BN125-A3 ~ A4



GB09923BW5 C

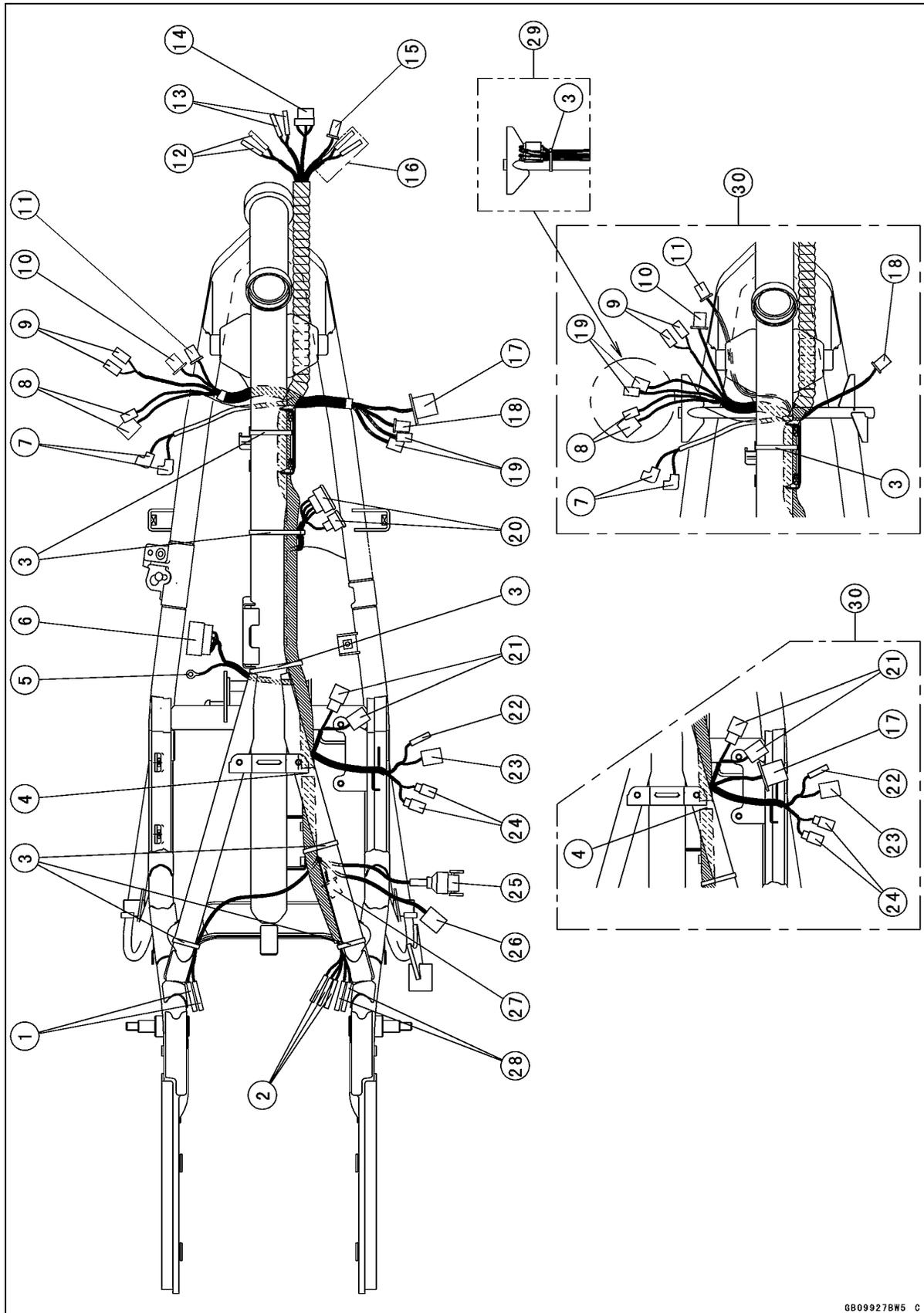
Cable, Wire, and Hose Routing

1. Rear Left Turn Signal Light Connector
2. Tail/Brake Light Connector
3. Band
4. Ground Lead
5. Ignition Coil Lead
6. Regulator/Rectifier Connector
7. CDI Unit Connector
8. Left Handlebar Switch Connector
9. Horn Connector
10. Indicator Light Connector
11. Sidestand Switch Connector
12. Headlight Connector
13. Front Right Turn Signal Light Connector
14. Front Left Turn Signal Light Connector
15. Rear Right Turn Signal Light Connector
16. Diode Connector
17. Starter Circuit Relay Connector
18. Starter Relay Connector
19. Fuse Box Connector
20. Alternator Connector
21. Ignition Switch Connector (California Model)
22. Battery Negative Lead
23. Turn Signal Relay Connector
24. Right Handlebar Switch Connector
25. Ignition Switch Connector (Other Than California Model)
26. Rear Brake Switch Connector
27. Battery Positive Lead
28. Run the throttle sensor lead to left side.
29. Turn signal relay
30. Run the indicator light lead from left side.
31. Starter Lead
32. Speedometer Connector
33. City Light Connector (Europe Model)
34. Clamp
35. Put them into the gusset after connected.
36. Connect them in the headlight housing.

16-20 APPENDIX

Cable, Wire, and Hose Routing

BN125-A5 ~



GB09927BWS C

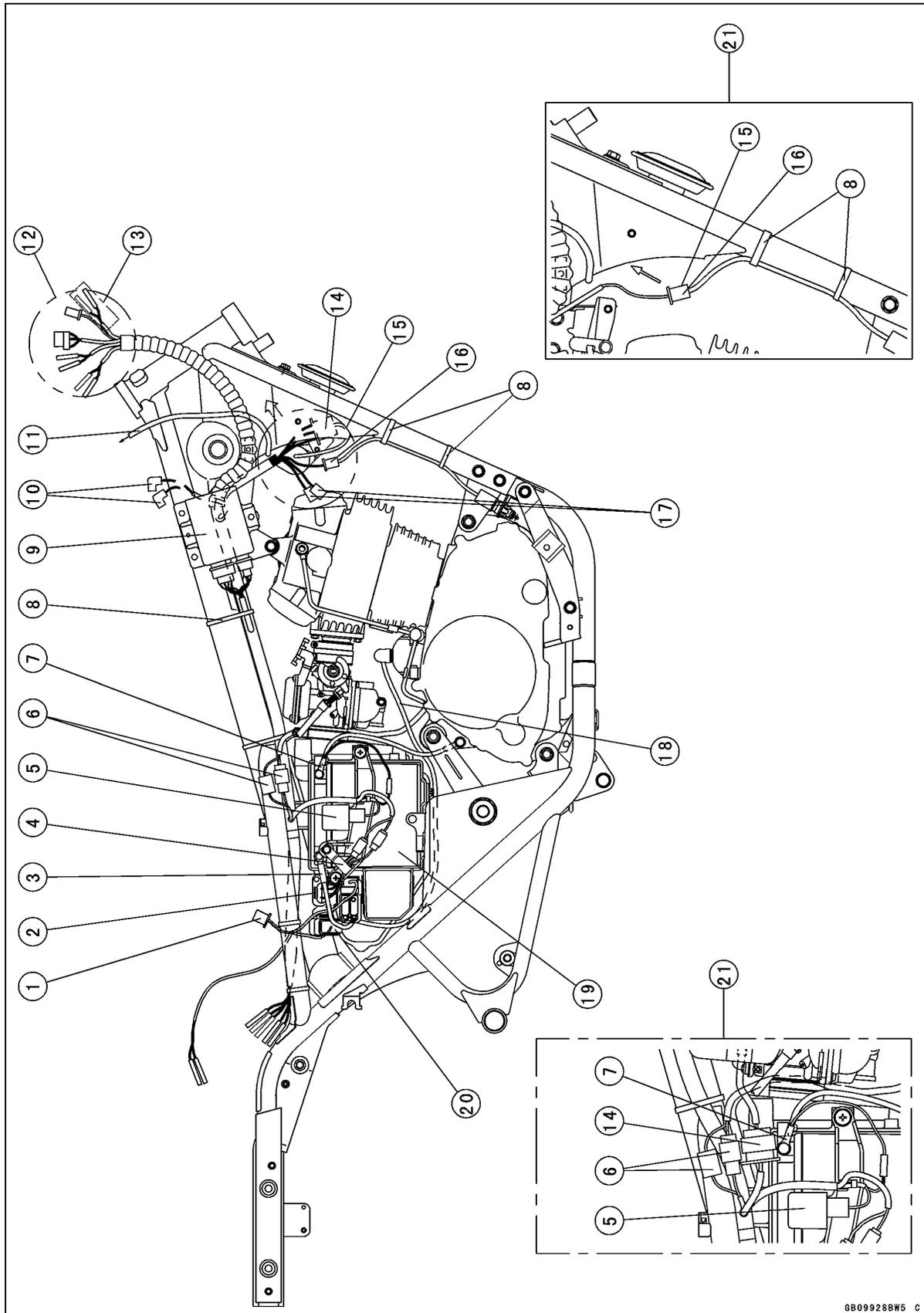
Cable, Wire, and Hose Routing

1. Rear Left Turn Signal Light Connector
2. Tail/Brake Light Connector
3. Band
4. White Tape
5. Ground Lead
6. Regulator/Rectifier Connector
7. Ignition Coil Lead
8. Left Handlebar Switch Connector
9. Horn Connector
10. Indicator Light Connector
11. Sidestand Switch Connector
12. Front Left Turn Signal Light Connector
13. Front Right Turn Signal Light Connector
14. Headlight Connector
15. Speedometer Connector
16. City Light Connector (Europe Model)
17. Ignition Switch Connector
18. Rear Brake Switch Connector
19. Right Handlebar Switch Connector
20. CDI Unit Connector
21. Alternator Connector
22. Battery Negative Lead Connector
23. Turn Signal Relay Connector
24. Fuse Box Connector
25. Starter Relay Connector
26. Starter Circuit Relay Connector
27. Diode Connector
28. Rear Right Turn Signal Light Connector
29. Tie with the stay by the band after connected.
30. California Model

16-22 APPENDIX

Cable, Wire, and Hose Routing

BN125-A5 ~



GB09926BW5 C

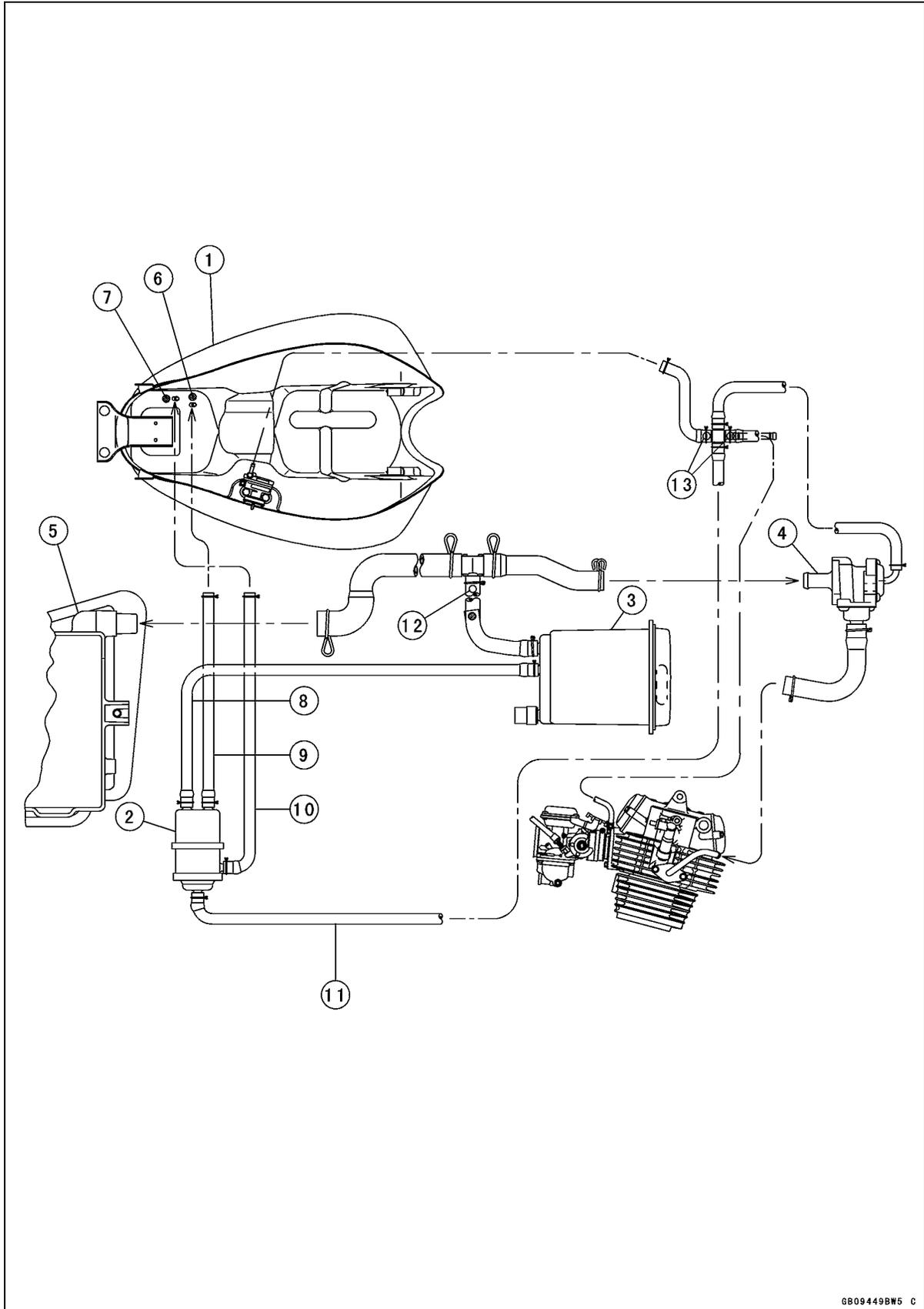
Cable, Wire, and Hose Routing

1. Diode Connector
2. Fuse Box Connector
3. Battery Positive Lead
4. Clamp
5. Turn Signal Relay
6. Alternator Connector
7. Battery Negative Lead
8. Band
9. CDI Unit Connector
10. Ignition Coil Lead
11. Run the indicator light lead from left side.
12. Connect them in the headlight housing.
13. City Light Connector (Europe Model)
14. Ignition Switch Connector
15. Put them into the gusset after connected.
16. Rear Brake Switch Connector
17. Right Handlebar Switch Connector
18. Starter Lead
19. Battery
20. Starter Circuit Relay
21. California Model

16-24 APPENDIX

Cable, Wire, and Hose Routing

Evaporative Emission Control System (BN125-A5 ~ : California Model)



6B09449BW5 C

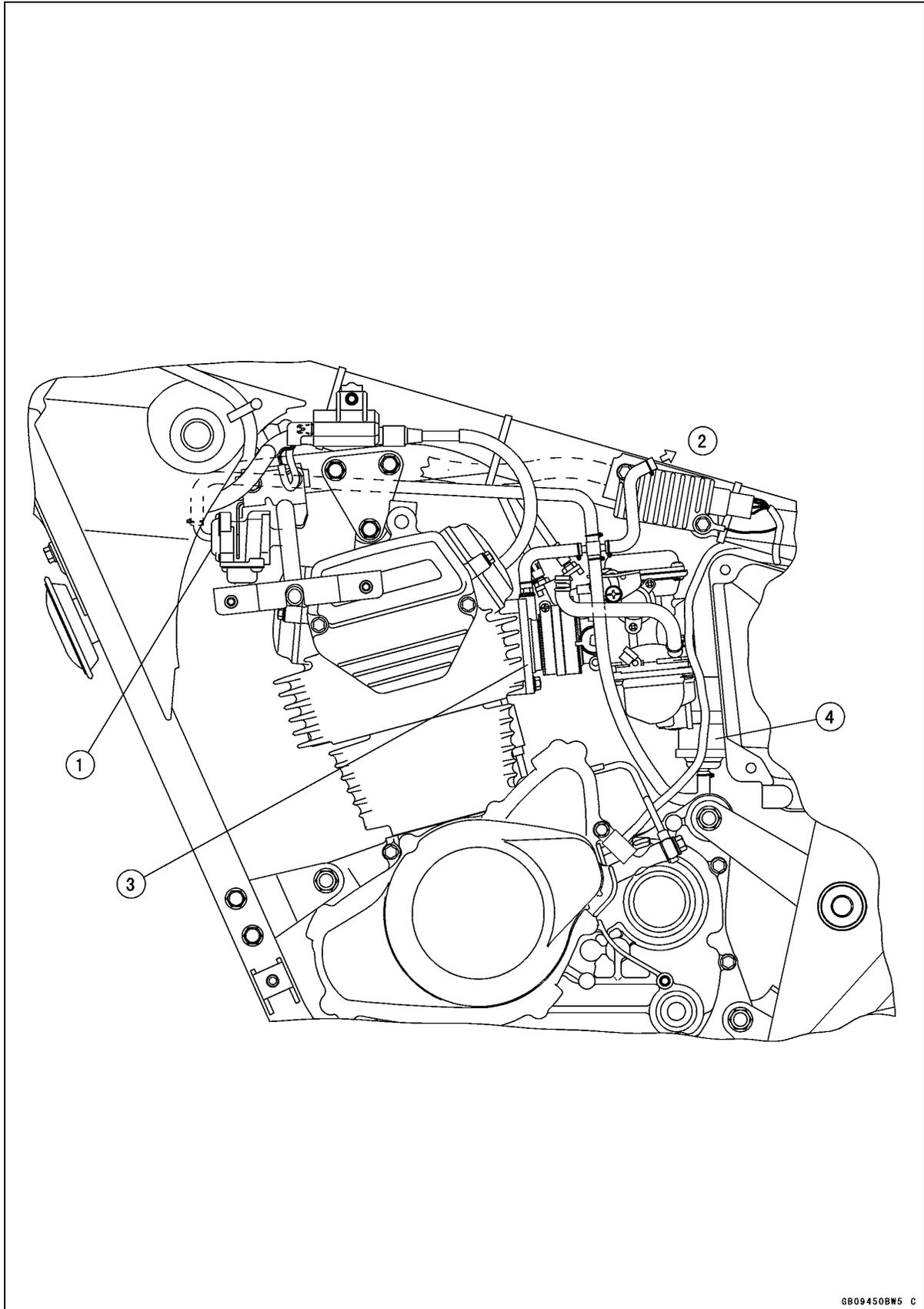
Cable, Wire, and Hose Routing

1. Fuel Tank
2. Separator
3. Canister
4. Vacuum Switch Valve
5. Air Cleaner Housing
6. Label (Blue)
7. Label (Red)
8. Hose (with blue stripe)
9. Hose (with blue stripe)
10. Hose (with red stripe)
11. Hose (with white stripe)
12. White Paint Mark
13. White Paint Mark

16-26 APPENDIX

Cable, Wire, and Hose Routing

Evaporative Emission Control System (BN125-A5 ~ : California Model)



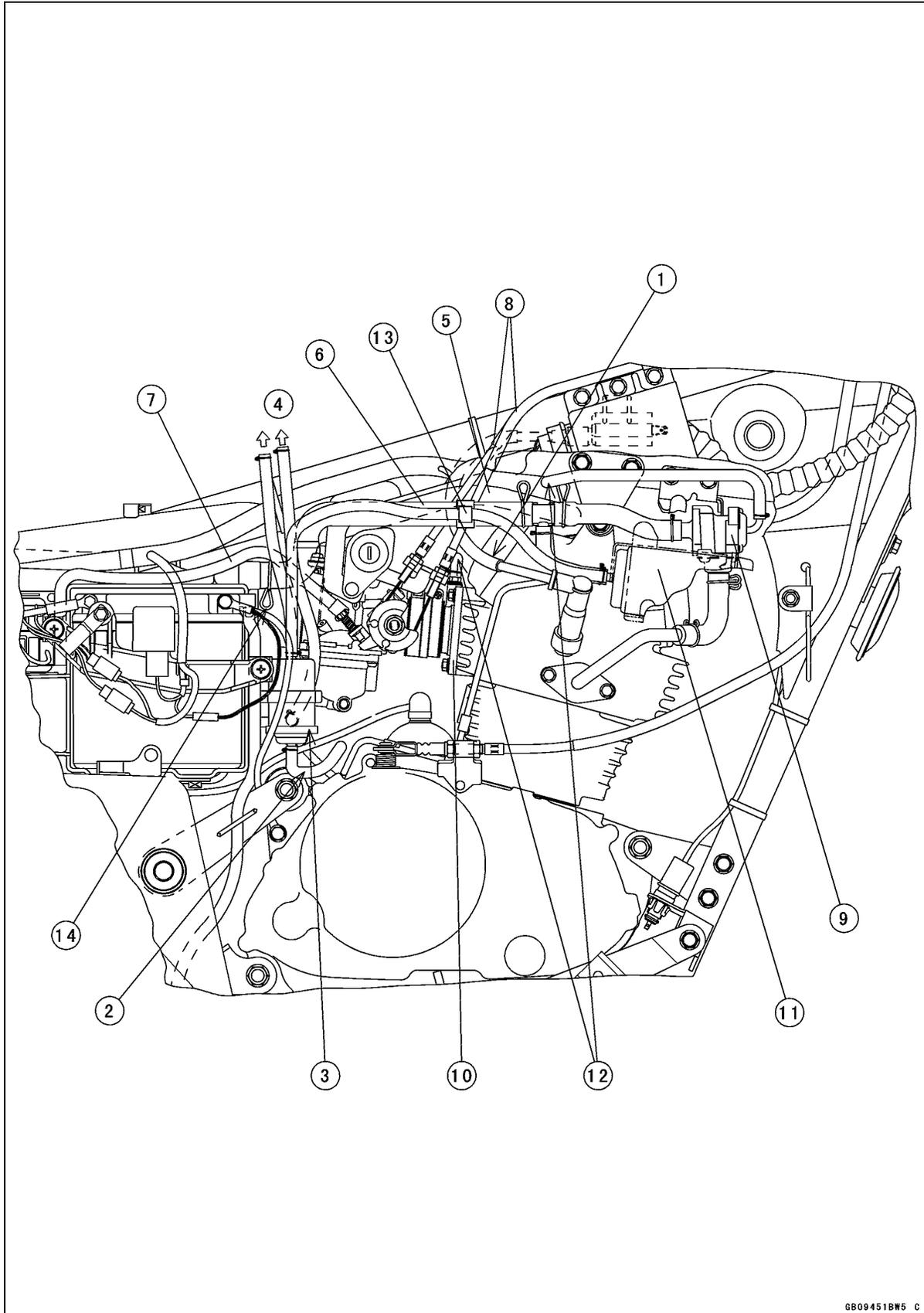
Cable, Wire, and Hose Routing

1. Vacuum Switch Valve
2. Go to the fuel tap
3. Carburetor Holder
4. Separator

16-28 APPENDIX

Cable, Wire, and Hose Routing

Evaporative Emission Control System (BN125-A5 ~ : California Model)



6B09451BW5 C

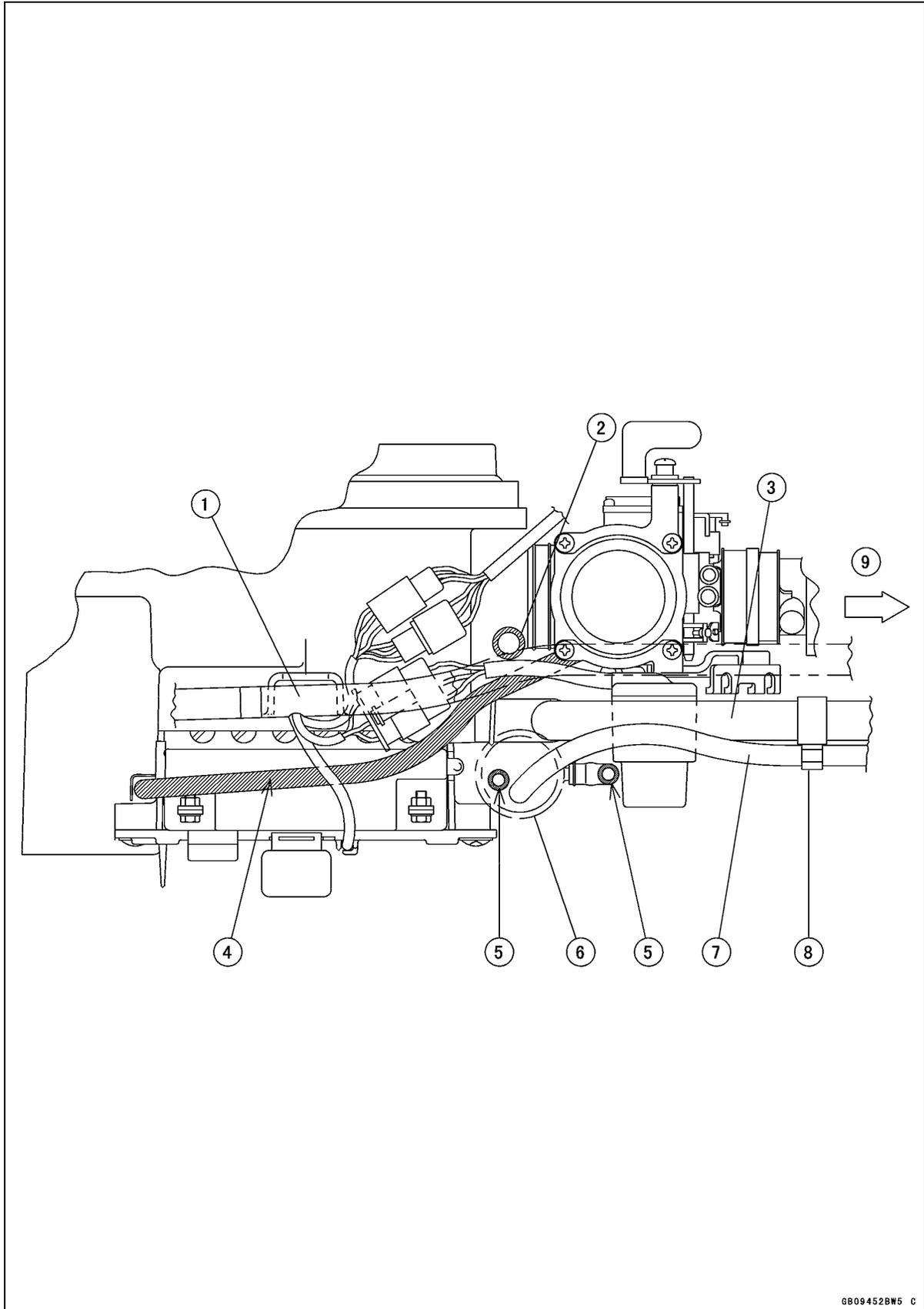
Cable, Wire, and Hose Routing

1. Run the ignition coil primary lead under the throttle cables, secondary air hose and breather hose.
2. Go To Left Side
3. Separator
4. Go To The Fuel Tank
5. Breather Hose
6. Secondary Air Hose
7. Air Vent Hose
8. Throttle Cables
9. Vacuum Switch Valve
10. Carburetor Holder
11. Canister
12. Go To Left Side
13. Clamp
14. Knob of clip shall be installed downward.

16-30 APPENDIX

Cable, Wire, and Hose Routing

Evaporative Emission Control System (BN125-A5 ~ : California Model)



6B09452BW5 C

Cable, Wire, and Hose Routing

1. Main Harness
2. Breather Hose
3. Secondary Air Hose
4. Air Vent Hose
5. Go to the fuel tank
6. Separator
7. Go to the canister
8. Clamp
9. Front

NOTE

○ *This is not an exhaustive list, giving every possible cause for each problem listed. It is meant simply as a rough guide to assist the troubleshooting for some of the more common difficulties.*

Engine Doesn't Start, Starting Difficulty:

Starter motor not rotating:

- Starter lockout switch or neutral switch trouble
- Starter motor trouble
- Battery voltage low
- Starter relay not contacting or operating
- Starter button not contacting
- Wiring open or shorted
- Ignition switch trouble
- Engine stop switch trouble
- Fuse blown

Starter motor rotating but engine doesn't turn over:

- Starter motor clutch trouble
- Torque limiter trouble

Engine won't turn over:

- Valve seizure
- Rocker arm seizure
- Cylinder, piston seizure
- Crankshaft seizure
- Connecting rod small end seizure
- Connecting rod big end seizure
- Transmission gear or bearing seizure
- Camshaft seizure
- Torque limiter seizure
- Balancer bearing seizure

No fuel flow:

- No fuel in tank
- Fuel tank air vent obstructed
- Fuel tap vacuum hose clogged
- Fuel tap clogged
- Fuel line clogged
- Float valve clogged

Engine flooded:

- Fuel level in carburetor float bowl too high
- Float valve worn or stuck open
- Starting technique faulty (When flooded, crank the engine with the throttle fully opened to allow more air to reach the engine.)

No spark; spark weak:

- Battery voltage low
- Ignition switch not on
- Engine stop switch turned off
- Clutch lever not pulled in or gear not in neutral
- Spark plug dirty, broken, or gap maladjusted

- Spark plug cap or high tension wiring trouble
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- CDI unit trouble
- Neutral, starter lockout switch, or sidestand switch trouble
- Crankshaft sensor trouble
- Ignition coil trouble
- Ignition or engine stop switch shorted
- Wiring shorted or open
- Fuse blown

Fuel/air mixture incorrect:

- Pilot screw and/or idle adjusting screw maladjusted
- Pilot jet, or air passage clogged
- Air cleaner clogged, poorly sealed, or missing
- Starter jet clogged

Compression Low:

- Spark plug loose
- Cylinder head not sufficiently tightened down
- No valve clearance
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/groove clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Valve spring broken or weak
- Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface)

Poor Running at Low Speed:

Spark weak:

- Battery voltage low
- Spark plug dirty, broken, or gap maladjusted
- Spark plug cap or high tension wiring trouble
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- CDI unit trouble
- Crankshaft sensor trouble
- Ignition coil trouble

Fuel/air mixture incorrect:

- Pilot screw maladjusted
- Pilot jet, or air passage clogged
- Needle jet bleed holes or needle jet clogged
- Pilot passage clogged
- Air cleaner clogged, poorly sealed, or missing
- Starter plunger stuck open

Troubleshooting Guide

Fuel level in carburetor float bowl too high or too low
 Fuel tank air vent obstructed
 Carburetor holder loose
 Air cleaner duct loose
 Fuel tap clogged
 Air cleaner O-ring damaged

Compression low:

Spark plug loose
 Cylinder head not sufficiently tightened down
 No valve clearance
 Cylinder, piston worn
 Piston ring bad (worn, weak, broken, or sticking)
 Piston ring/groove clearance excessive
 Cylinder head warped
 Cylinder head gasket damaged
 Valve spring broken or weak
 Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface)

Other:

CDI unit trouble
 Carburetor vacuum piston doesn't slide smoothly
 Carburetor vacuum piston diaphragm damaged
 Engine oil viscosity too high
 Drive train trouble
 Brake dragging
 Overheating
 Clutch slipping
 Air suction valve trouble (AT, DE, SG, CH)
 Vacuum switch valve trouble (AT, DE, SG, CH)
 Coasting enricher trouble

Poor Running or No Power at High Speed:

Firing incorrect:

Spark plug dirty, broken, or gap maladjusted
 Spark plug cap or high tension wiring trouble
 Spark plug cap shorted or not in good contact
 Spark plug incorrect
 CDI unit trouble
 Crankshaft sensor trouble
 Ignition coil trouble

Fuel/air mixture incorrect:

Starter plunger stuck open
 Main jet clogged or wrong size
 Jet needle or needle jet worn
 Air jet clogged

Fuel level in carburetor float bowl too high or too low
 Needle jet bleed holes or needle jet clogged
 Air cleaner clogged, poorly sealed, or missing
 Air cleaner duct loose
 Fuel to carburetor insufficient
 Water or foreign matter in fuel
 Carburetor holder loose
 Fuel tank air vent obstructed
 Fuel tap clogged
 Fuel line clogged

Compression low:

Spark plug loose
 Cylinder head not sufficiently tightened down
 No valve clearance
 Cylinder, piston worn
 Piston ring bad (worn, weak, broken, or sticking)
 Piston ring/groove clearance excessive
 Cylinder head gasket damaged
 Cylinder head warped
 Valve spring broken or weak
 Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface.)

Knocking:

Carbon built up in combustion chamber
 Fuel poor quality or incorrect
 Spark plug incorrect
 CDI unit

Miscellaneous:

Throttle valve won't fully open
 Carburetor vacuum piston doesn't slide smoothly
 Carburetor vacuum piston diaphragm damaged
 Brake dragging
 Clutch slipping
 Overheating
 Engine oil level too high
 Engine oil viscosity too high
 Drive train trouble
 Air suction valve trouble (AT, DE, SG, CH)
 Vacuum switch valve trouble (AT, DE, SG, CH)
 Balancer mechanism malfunctioning
 Coasting enricher trouble

Overheating:

Firing incorrect:

Spark plug dirty, broken, or gap maladjusted
 Spark plug incorrect
 CDI unit trouble

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Troubleshooting Guide

Fuel/air mixture incorrect:

- Main jet clogged or wrong size
- Fuel level in carburetor float bowl too low
- Carburetor holder loose
- Air cleaner duct loose
- Air cleaner poorly sealed, or missing
- Air cleaner O-ring damaged
- Air cleaner clogged

Compression high:

- Carbon built up in combustion chamber

Engine load faulty:

- Clutch slipping
- Engine oil level too high
- Engine oil viscosity too high
- Drive train trouble
- Brake dragging

Lubrication inadequate:

- Engine oil level too low
- Engine oil poor quality or incorrect

Clutch Operation Faulty:

Clutch slipping:

- No clutch lever play
- Clutch inner cable catching
- Clutch cable unadjusted
- Friction plate worn or warped
- Steel plate worn or warped
- Clutch spring broken or weak
- Clutch release mechanism trouble
- Clutch hub or housing unevenly worn

Clutch not disengaging properly:

- Clutch lever play excessive
- Clutch plate warped or too rough
- Clutch spring compression uneven
- Engine oil deteriorated
- Engine oil viscosity too high
- Engine oil level too high
- Clutch housing frozen on drive shaft
- Clutch release mechanism trouble
- Clutch hub nut loose
- Clutch hub spline damaged

Gear Shifting Faulty:

Doesn't go into gear shift pedal doesn't return:

- Clutch not disengaging
- Shift fork bent or seized
- Gear stuck on the shaft
- Gear set lever binding
- Shift return spring weak or broken
- Shift return spring pin loose
- Shift mechanism arm spring broken
- Shift mechanism arm broken
- Shift pawl broken

Jumps out of gear:

- Shift fork ear worn, bent
- Gear groove worn
- Gear dogs and/or dog holes worn
- Shift drum groove worn
- Gear set lever spring weak or broken
- Shift fork guide pin worn
- Drive shaft, output shaft, and/or gear splines worn

Overshifts:

- Gear set lever spring weak or broken
- Shift mechanism arm spring broken

Abnormal Engine Noise:

Knocking:

- CDI unit trouble
- Carbon built up in combustion chamber
- Fuel poor quality or incorrect
- Spark plug incorrect
- Overheating

Piston slap:

- Cylinder/piston clearance excessive
- Cylinder, piston worn
- Connecting rod bent
- Piston pin, piston pin hole worn

Valve noise:

- Valve clearance incorrect
- Valve spring broken or weak
- Camshaft bearing worn
- Rocker arm worn
- Rocker shaft worn

Other noise:

- Connecting rod small end clearance excessive
- Connecting rod big end clearance excessive
- Piston ring worn, broken, or stuck
- Piston seizure, damage
- Cylinder head gasket leaking
- Exhaust pipe leaking at cylinder head connection
- Crankshaft runout excessive
- Engine mounts loose
- Crankshaft bearings worn
- Primary gear worn or chipped
- Camshaft chain tensioner trouble
- Camshaft chain, sprocket, guide worn
- Air suction valve damaged (AT, DE, SG, CH)
- Vacuum switch valve damaged (AT, DE, SG, CH)
- Balancer gear worn or chipped
- Balancer shaft gear position maladjusted
- Balancer bearing worn
- Alternator rotor loose

Troubleshooting Guide

Abnormal Drive Train Noise:

Clutch noise:

- Clutch rubber damper weak or damaged
- Clutch housing finger/friction plate tang clearance excessive
- Clutch housing gear worn
- Metal chips jammed in clutch housing gear

Transmission noise:

- Bearings worn
- Transmission gears worn or chipped
- Metal chips jammed in gear teeth
- Engine oil insufficient

Drive chain noise:

- Drive chain adjusted improperly
- Drive chain worn
- Rear and/or engine sprocket worn
- Chain lubrication insufficient
- Rear wheel misaligned (Right wheel bearings are not bottomed out)

Abnormal Frame Noise:

Front fork noise:

- Oil insufficient or too thin
- Spring weak or broken

Rear shock absorber noise:

- Shock absorber damaged
- Spring weak or broken

Disc brake noise:

- Pad installed incorrectly
- Pad surface glazed
- Disc warped
- Caliper trouble
- Master cylinder damaged

Drum brake noise:

- Brake linings overworn or worn unevenly
- Drum worn unevenly or scored
- Brake springs weak or broken
- Foreign matter in hub
- Brake not properly adjusted

Other noise:

- Bracket, nut, bolt, etc. not properly mounted or tightened

Exhaust Smokes Excessively:

White smoke:

- Piston oil ring worn
- Cylinder worn
- Valve oil seal damaged
- Valve guide worn
- Engine oil level too high

Black smoke:

- Air cleaner clogged
- Main jet too large or fallen off
- Starter plunger stuck open
- Fuel level in carburetor float bowl too high

Brown smoke:

- Main jet too small

Fuel level in carburetor float bowl too low

Air cleaner duct loose

Air cleaner O-ring damaged

Air cleaner poorly sealed or missing

Handling and/or Stability

Unsatisfactory:

Handlebar hard to turn:

- Cable routing incorrect
- Hose routing incorrect
- Wiring routing incorrect
- Steering stem nut too tight
- Steering stem bearing damaged
- Steering stem bearing lubrication inadequate
- Steering stem bent
- Tire air pressure too low

Handlebar shakes or excessively vibrates:

- Tire worn
- Swingarm pivot bearings worn
- Handlebar nut loose
- Rim warped, or not balanced
- Wheel bearing worn
- Spokes loose
- Steering stem head bolt loose
- Front, rear axle runout excessive

Handlebar pulls to one side:

- Frame bent
- Wheel misalignment (Right wheel bearings are not bottomed out)
- Swingarm bent or twisted
- Swingarm pivot shaft bent
- Steering maladjusted
- Front fork bent
- Right and left front fork oil level uneven
- Right and left shock absorber adjustment uneven

Shock absorption unsatisfactory:

- (Too hard)
- Front fork oil excessive
- Front fork oil viscosity too high
- Rear shock absorber adjustment too hard
- Tire air pressure too high
- Front fork bent
- (Too soft)
- Tire air pressure too low
- Front fork oil insufficient and/or leaking
- Front fork oil viscosity too low
- Rear shock adjustment too soft
- Front fork, rear shock absorber spring weak
- Rear shock absorber oil leaking

Brake Doesn't Hold:

Disc brake:

- Air in the brake line
- Pad or disc worn
- Brake fluid leakage

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Troubleshooting Guide

Disc warped
Contaminated pad
Brake fluid deteriorated
Primary or secondary cup damaged in master cylinder
Brake master cylinder scratched inside

Drum brake:

Brake maladjusted
Brake linings or drum worn
Overheated
Water in brake drum
Brake cam, camshaft worn
Oil on brake linings

Battery Trouble:

Battery discharged:

Battery faulty (e.g., plates sulphated, shorted through sedimentation, electrolyte insufficient)
Battery leads making poor contact
Load excessive (e.g., bulb of excessive wattage)
Ignition switch trouble
Alternator trouble
Wiring faulty
Regulator/rectifier trouble

Battery overcharged:

Regulator/rectifier trouble
Battery faulty

MODEL APPLICATION

Year	Model	Beginning Frame No.
1998	BN125-A1	BN125A000001 or JKABN125AAA000001
1999	BN125-A2	BN125A016001 or JKABN125AAA016001
2000	BN125-A3	JKABN125AADA00001
2001	BN125-A4	JKABNRA1□1DA00574
2002	BN125-A5	JKABNRA1□2DA04626 or JKABN125AADA04626
2003	BN125-A6	JKABNRA1□3DA08070 or JKABN125AADA08170
2004	BN125-A7	JKABNRA1□4DA09073 or JKABN125AADA09929
2005	BN125-A8	JKABNRA1□5DA11506 or JKABN125AADA11856
2006	BN125A6F	JKABNRA1□6DA13459 or JKABN125AADA13359
2007	BN125A7F	JKABNRA1□7DA17901 or JKABN125AADA17951

□: This digit in the frame number changes from one machine to another.



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