

DAELIM

SERVICE MANUAL

SERVICE MANUAL



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NS 125 III

DAELIM MOTOR CO.,LTD.

SM37-0211-01E



How to use this manual

This manual describes effective maintenance procedure for the NS125 III manufactured by DAELIM Motor Co., Ltd.

To ensure safety and optimal operating conditions of the vehicle, carry out regular inspections according to the maintenance schedule(Section 3).

Sections 1 through 3 provide information on overall vehicle; section 4, assembly and disassembly procedures for external components, and section 5 describes maintenance procedure for the engine, frame and electrical systems.

To facilitate use of this manual, each page starts with disassembly and system diagrams, service information, and troubleshooting guide. If you cannot find the cause of trouble, refer to Section 20: Troubleshooting.

- Contents of this manual and specifications are subject to change without prior notice for improvement of vehicle quality.
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1. Service Information

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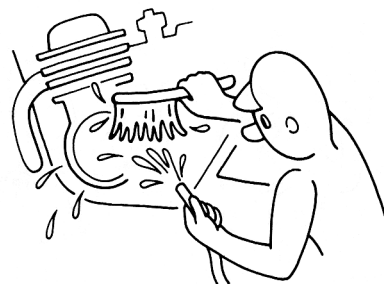
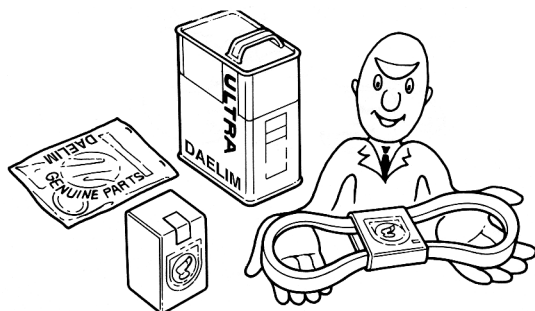
General Safety

WARNING

1. Do not run the engine for a long time in closed or not well-ventilated area because the exhaust gas contains toxic substances such as carbon monoxide, hydrocarbon, nitric oxide.
2. The battery fluid(lean sulfuric acid) is extremely toxic. It is dangerous if skin is exposed to it or if it enters into the eye. Be careful in handling. When exposed to the battery fluid, wash it with water and get a medical check up.(store the battery fluid in a safe place to avoid touching by the children)
3. Pay attention not to be burned and always put on the protection gears because the engine or the muffler is hot right after engine stops.
4. Gasoline is extremely flammable. Maintenance must performed in the place free of the open fire or electric spark.
5. When more than two person are working, always pay attention to other worker's action and always have safety in mind.
6. The skin exposed to used engine oil can be a major reason of the skin cancer. Pay attention not to exposed and wash carefully with soap and water after handling.
7. If compressed air is used to clean the brake, dust scattered in the air can be breathed in by workers. Please take action not to scatter dust in the brake cleaner, etc.
8. Flammable nitrogen gas is generated during charging the battery so charging must be performed in well-ventilated area and free of the open fire and spark.

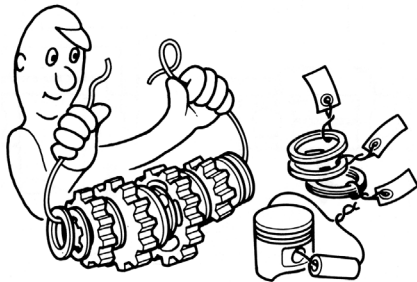
Service Rules

1. Parts and lubrication oil must be DAELIM genuine or recommended parts.
2. Before maintenance, remove deposit or dust from the chasis.



Service Information

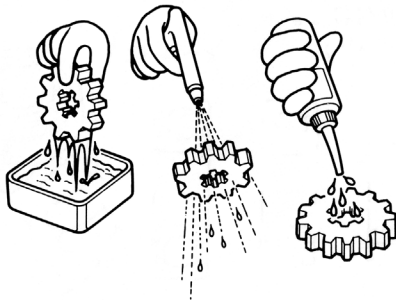
3. Store the parts of each system discriminatively to install each part in the right place.



4. After removing gasket, O-ring, piston pin clip and cotter pin, always replace them with the new one. When removing the snap ring, it can be easily missed after transformation or installation.



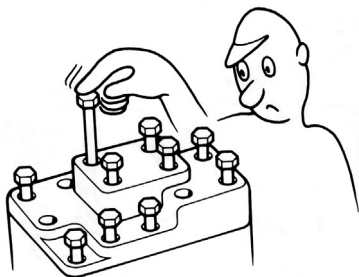
5. Clean the parts after the overhaul and before the test and remove the cleaning oil with compressed air. Apply oil to seal face during installation.



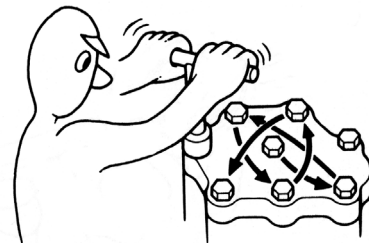
6. Check necessary place and measure necessary data during installation. When installing, return to the state before removing.



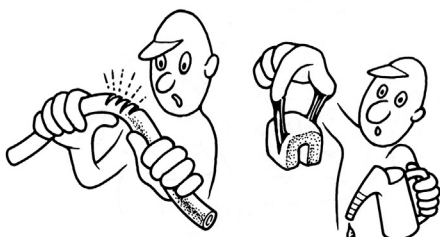
7. Align the bolts to uniform the tightening points before tightening them when you don't know the bolt length.



8. Bolts, nuts and pieces must be tightened from the bigger diameter to the smaller one, from inside to outside and diagonally with the specified torque.



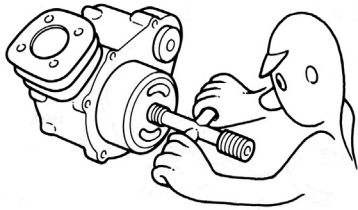
9. Check to see if the rubber part is worn out when removing it and replace it if necessary. Some rubber part is weak to gasoline and kerosene, so pay attention not to soak with gasoline or oils.



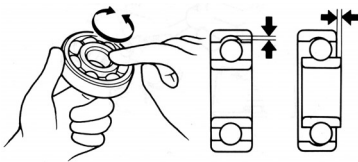
10. Recommended grease must be applied to or filled in the specified place.



11. Maintenance needed to use the specialized tools must be performed with the right tool.



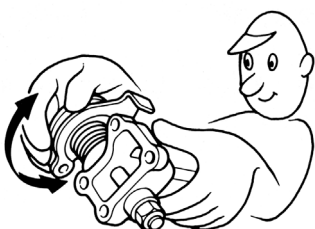
13. Check the smooth rotation of inner or outer race of the ball bearing by rotating it manually.
- Replace the ball bearing having excessive axial/longitudinal hanging.
 - Wipe the ball bearing likely to have hanging with cleaning oil.(except double-sided sealed type ball bearing)
 - Replace the ball bearing of which press-fitted part is slacked at the case or shaft.



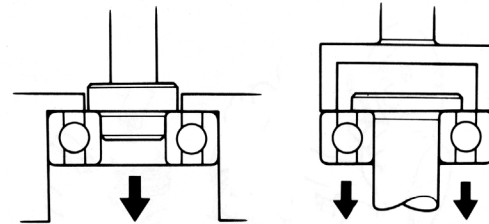
15. When blowing the ball bearing with compressed air after cleaning, keep the race from rotating. High speed rotation of the race may damage the bearing. Prior to installation, apply oil or grease to the bearing.



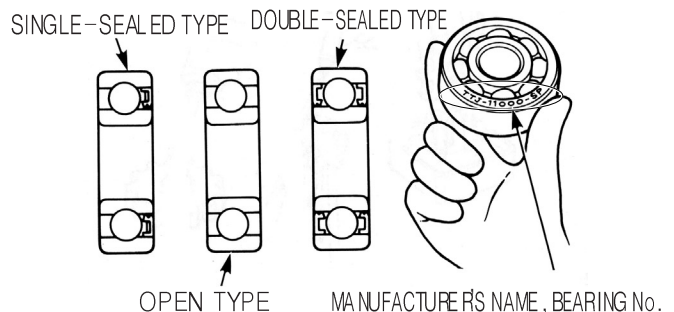
17. Check each part for proper tightening and operation after installation.



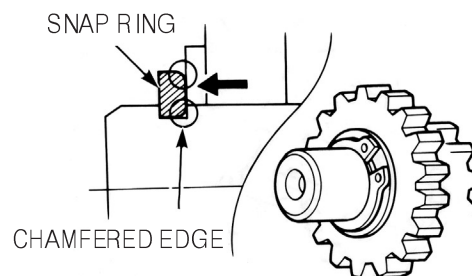
12. Never reuse the ball bearing removed with the ball applied pressure when removing press-fitted the bearing.



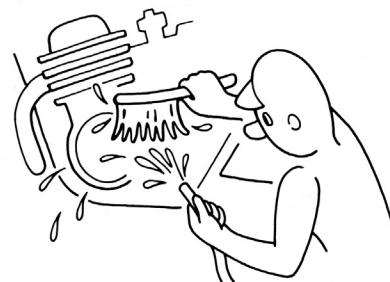
14. Pay attention to installation direction in case of the single-sided sealed ball bearing. Install the open-direction or double-sided sealed bearing in the way that the face marked with manufacturer and size should direct to the outer axle.



16. Install the snap ring so that chamfered side directs to the load-applied side. After installation, check the proper installation by rotating the snap ring.

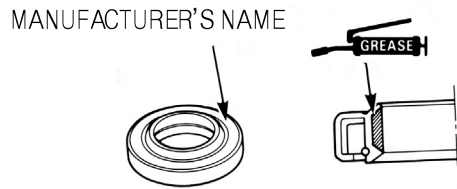


18. The brake fluid and coolant can damage the painted plastic or rubber parts. Keep these parts from contacting with them and wash these parts with water in case of contact.

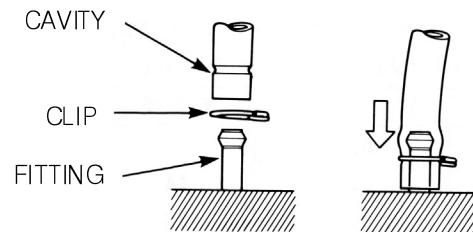


Service Information

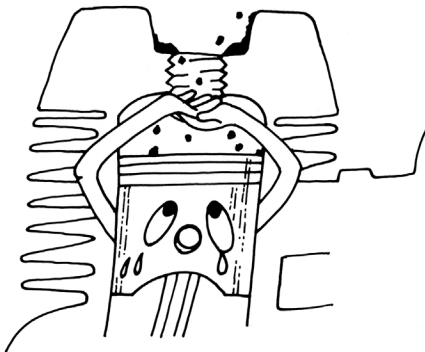
19. Install the oil seal so that the manufacturer marked surface directs outer surface.(direction not covered with oil)
- Pay attention not to bend or damage the lip
 - Apply the grease to the lip



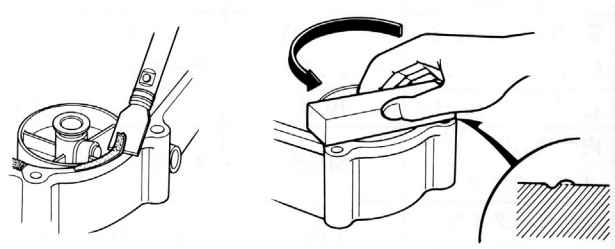
20. Connect the tube until the tube fully inserted in the joint. Install the clip if it is supplied. Replace the tube having slacked end.



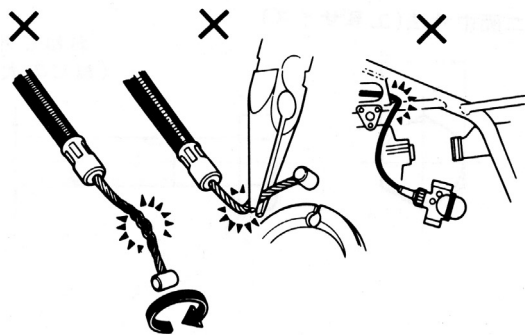
21. Keep the pneumatic system interior or the engine interior from the infiltration of dust.



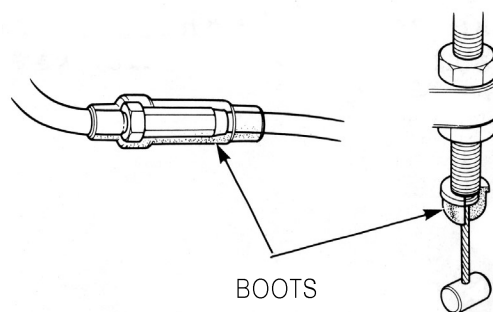
22. Install the gasket mounted in the contact surface of each case of the engine while removing gasket material completely. Remove damaged contact surface by wiping with the oil stone equally.



23. Pay attention not to bend the cable excessively. Transformed or damaged cable may cause malfunction or damage.

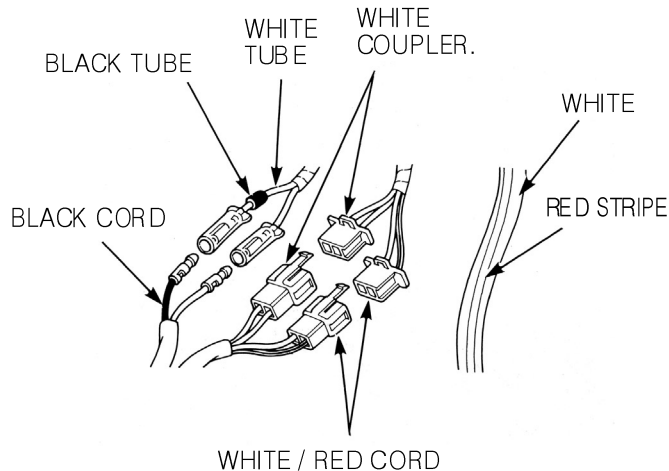


24. Install the boots with the installing groove by inserting the boots into the groove.

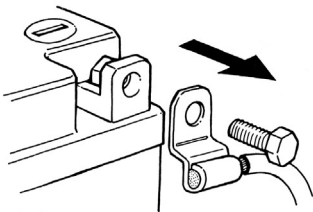


Caution when Wiring

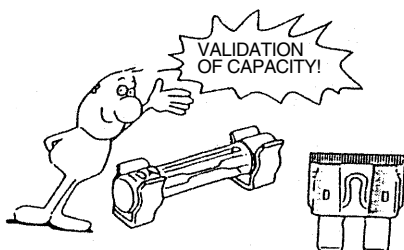
- Each cord must be connected depending on its color. When connecting different cord, attach color tube around the connector. Connect the coupler to the connector with same color and same pin number.
- Identify the two-colored cord by main color first and then striped color.



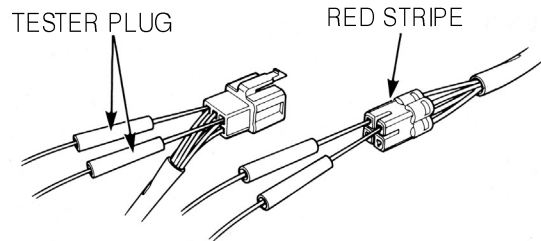
- When disconnecting the battery, the minus terminal must be disconnected first.
- Make sure that the tool such as spanner do not contact with the frame.



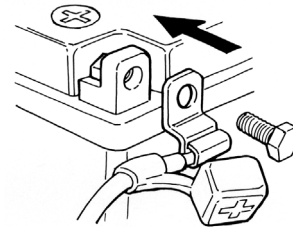
- If the fuse is short-circuited, find out the cause and repair. Replace with the fuse having the specified capacity.



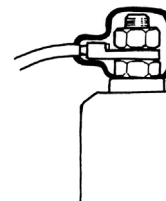
- When measuring voltage or resistance of the cord terminal using tester, contact the tester plug behind of the coupler. Pay attention not to open the cord terminal and contact the tester plug from the front of the coupler in case of water-proof coupler.



- Recheck the condition of contact, securing and continuity of each part after maintenance.
- When connecting the battery, the plus terminal must be connected first.
- After connecting the terminal, apply the grease to the terminal.



- Connect covers to the terminal after maintenance.

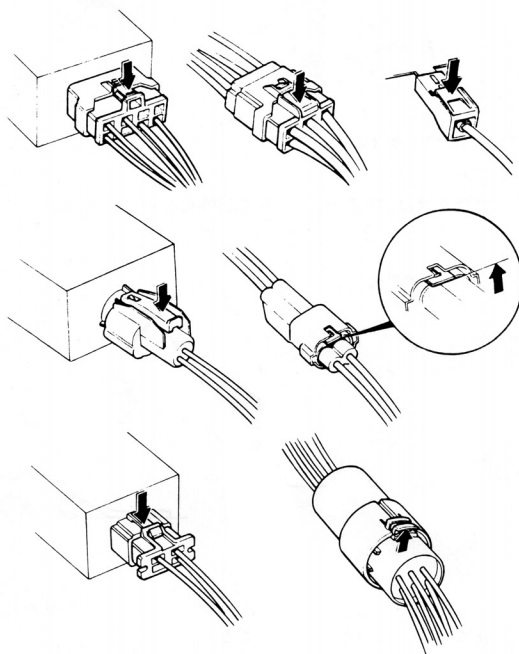


- If there is rust in the terminal, remove the rust with sand paper prior to connecting.

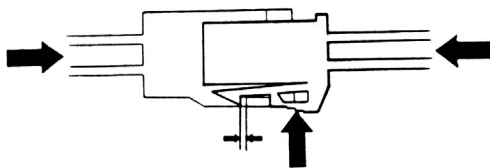


Service Information

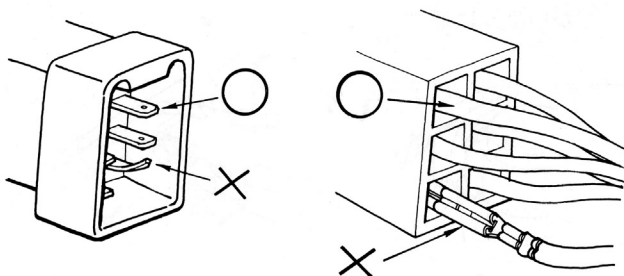
- Turn off the main switch before connecting/disconnecting.
- Release the lock to disconnect the lock of the coupler.
- The lock of the coupler has two types according to releasing method (press type and pull type) so release it properly according to the shape.
- Typical releasing method of the coupler is illustrated in the following.



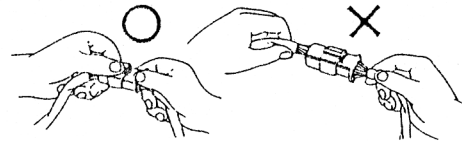
- Release the lock by inserting the coupler slightly and then narrowing connection to remove the coupler.



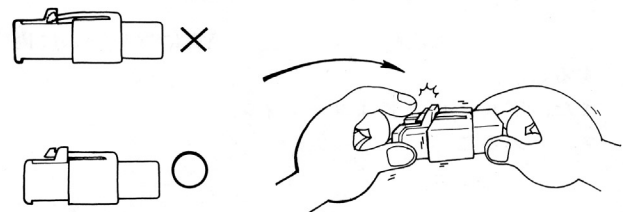
- Check to see if there is bended terminal and secure it to avoid disconnecting.



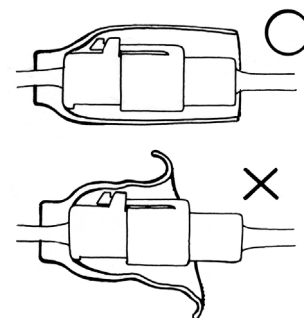
- When disconnecting the coupler, disconnect it while holding the coupler body. Pull while holding the wire harness cord and do not remove the coupler connection.



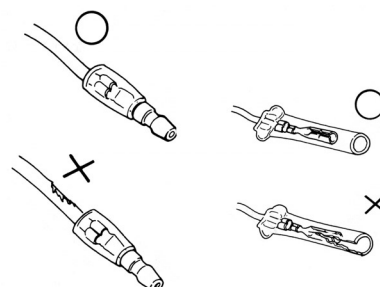
- Insert the lock of the coupler until the lock is fully secured.



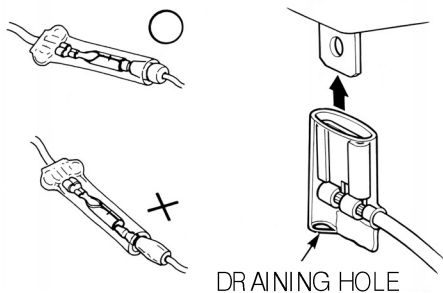
- Pay attention not to damage the vinyl cover of the coupler.



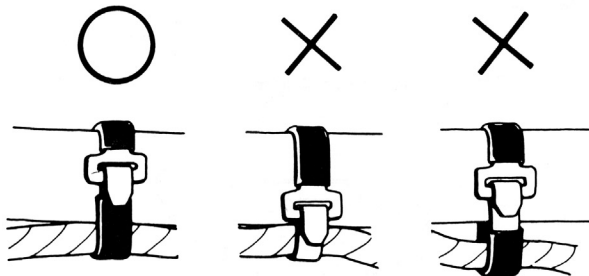
- If the wire harness coating is damaged, repair by winding vinyl tape or replace it.
- Prior to connecting the connector, make sure that the cover is not damaged and the mess terminal is not opened.



- Insert the connector until the vinyl cover is fully inserted into the terminal.
- The opening of the vinyl cover must face at the ground direction but in case of the plain connector, the draining opening must face at the sky direction.



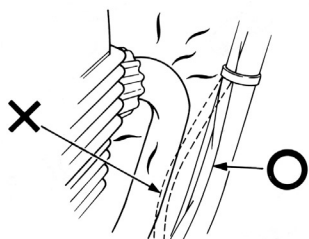
- Wire band must be secured firmly in the specified location of the frame. In case of aluminium band, secure the wire harness to the coated part.



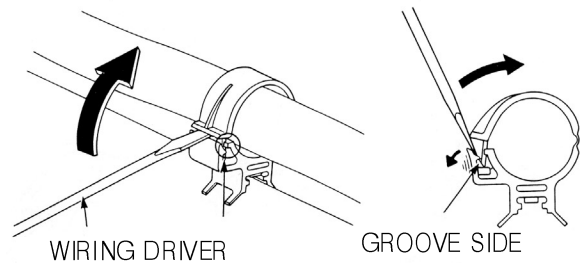
- In case of the weld clamp, do not clamp in the welded part.



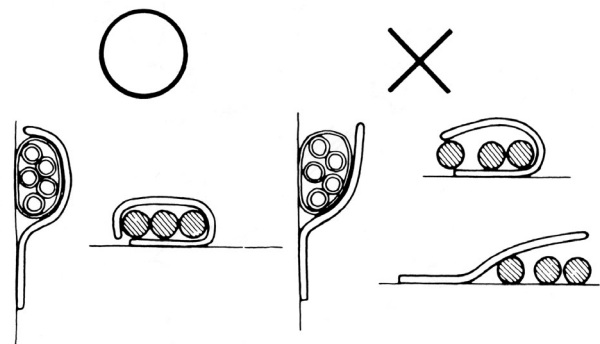
- When clamping the wire, pay attention not to contact with hot part.



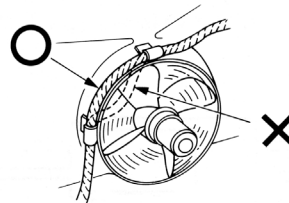
- When removing T-start, broaden the groove of T-start using the wiring driver and release the torque.
- Connect the harness and the hose to T-start and then insert until the groove is locked.
- When removing T-start from the frame, replace it with the new one.



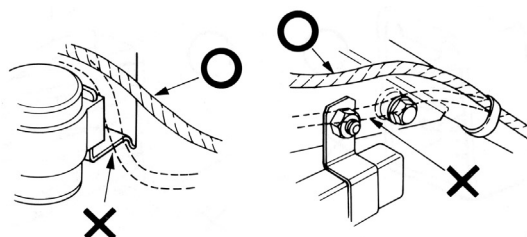
- Secure the wire harness firmly using the clamp.



- When clamping the wire harness, make sure that the harness is not contacted with the shaft or rotating part.

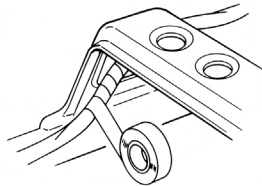


- The wire harness must be routed without contacting with the end of the lamp or any sharp edge.
- The wire harness must be routed without contacting with the end of the bolt or the piece.

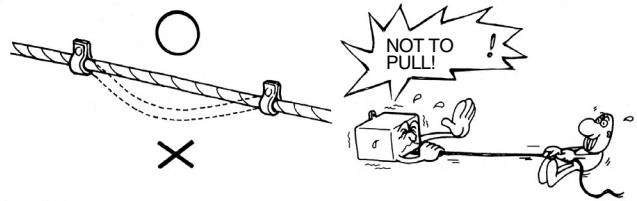


Service Information

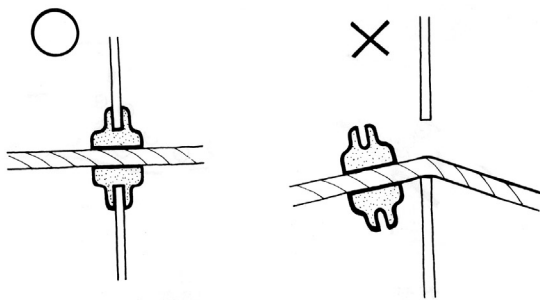
- In case that the wire harness is contacted with the end or the sharp edge, protect both parts with tube or tape.



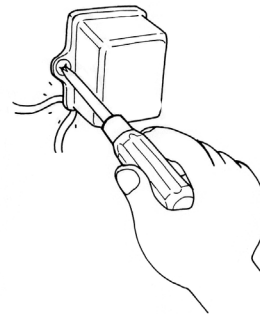
- The wire must not hang down or be pulled excessively.



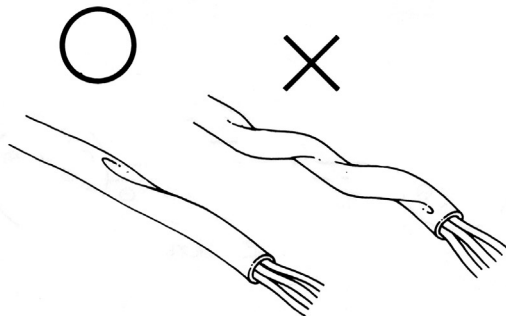
- If necessary, lock the wire harness properly.



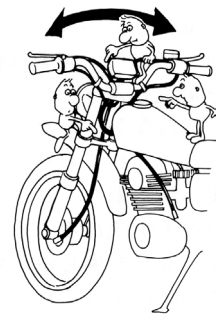
- When mounting parts, make sure that the wire harness is not pressed by the parts.



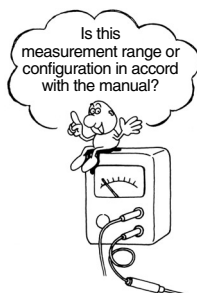
- Do not twist the wire harness.



- Wire the wire harness not to be pulled or expanded when the handle is turned to the right or the left completely. Avoid excessive bending or chewing and interference with the engine.



- Prior to using the tester, please read the manual carefully and understand the contents.
- When testing the resistance of the tester, the zero adjustment must be performed before testing.



- Do not drop or throw the parts especially semiconductor contained parts because these parts may be damaged by the impact of the drop.

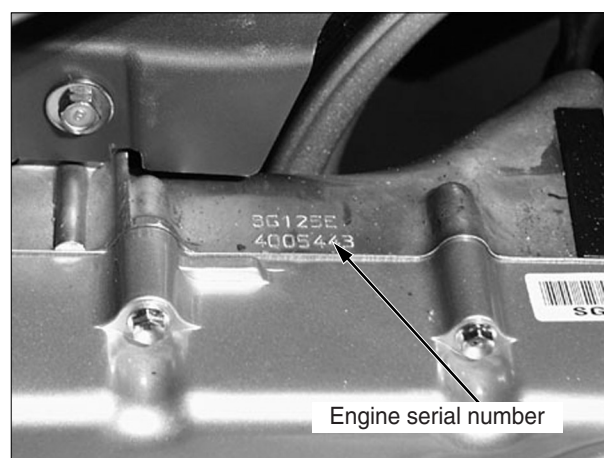


Identification Numbers



FARME SERIAL NUMBER LOCATION

- The frame serial number is stamped on the front central part of the frame.



ENGINE SERIAL NUMBER LOCATION

- The engine serial number is stamped on the central part of the left crankcase.

Specifications

Item		Specifications
Dimensions	Overall length	1,970mm
	Overall width	700mm
	Overall height	1,110mm
	Wheel base	1,350mm
	Seat height	765mm
	Ground clearance	130mm
	Dry weight	110kg
	Curb weight	240kg
Frame	Type	Underbone
	Front suspension/stroke	Telescopic/97mm
	Rear suspension/stroke	Swing arm/74mm
	Front tire size/type	120/70-13/Tubeless
	Rear tire size/type	130/60-13/Tubeless
	Tire Pressure 1 person Front	1.75kg/cm ² (175kPa)
	Rear	2.00kg/cm ² (200kPa)
	2 person Front	2.25kg/cm ² (225kPa)
	Rear	2.25kg/cm ² (225kPa)
	Front brake	Hydraulic disk
	Rear brake	Drum brake
	Fuel tank capacity Full capacity	7.5 l
	Reserve capacity	1.2 l
Engine	Caster angle	25°
	Trail	84.7 mm
	Front fork oil capacity	80 cm ³
	Type	Oil cooled/air cooled 4 cycle SOHC engine
	Cylinders/Arrangement	1(Single cylinder), front angle 80°
	Bore and stroke	56 × 50.7 mm
	Displacement	124.9 cm ³
	Compression ratio	10.8 : 1
	Valve train	SOHC chain drive
	Oil capacity	1.1 l After disassembly
		0.75 l After Oil filter change
		0.8 l After Oil change
		0.9 l After Oil change with Oil in the Oil hose removed
	Lubrication system	Forced pressure splash type
	Air cleaner type	Wet sump
	Cylinder compression	13.8kg/cm ²
	Intake valve: Open	5° BTDC
	Closed	14° ABDC
	Exhaust valve: Closed	18° BBDC
	Closed	1° ATDC
	Valve clearance(cooling-off period)	
	intake	0.12 ± 0.02 mm
	Exhaust	0.12 ± 0.02 mm

Item		Specifications
Carburetor	Type/Venturi bore Model mark Choke type Main jet Pilot screw initial setting Float level Idle speed	CV type(vacuum)24.2mm BDS 26 -112 Autoby-starter #95 1 and 1/2 trust out 13 mm 1,800±100(rpm)
Drive Train	Clutch type Primary reduction Secondary reduction	Automatic Transmission 3.231(42/14) 2.786(39/14)
Electrical Systems	Ignition system Ignition timing F mark Full advance AC generator capacity Battery type/capacity Spark plug Spark plug gap Fuse capacity starting system Headlight(high/low) Position light Turn signal light(Fr/Rr) Tail/stop light High-beam indicator Turn signal indicator Speedometer lamp Trunk lamp	C.D.I. Ignition 15° BTDC/1,800(rpm) 19° 125W/5,000(rpm) Closed type (MF)12V 8AH CR8EH-9 0.8-0.9mm(0.031-0.035in) 15A Kick/starter motor 12V 35/35W 12V 3.4W 12V 10W×4 12V 21 / 5W 12V 3.4W 12V 3.4W×2 1.7W×2 1.4W×1

Torque Values

Engine

Item	Q'ty	Thread dia(mm)	Torque value kg.m(N.m,ft-lb)	Remarks
Oil filter cap	1	20	1.5(15, 11)	Apply engine oil
Valve adjust screw lock nut	4	5	1.1(11, 8)	
Kick starter pedal bolt	1	6	1.2(12, 8)	
Flywheel bolt	1	12	5.5(55, 40)	
Drive face bolt	1	12	5.5(55, 40)	
Clutch outer bolt	1	12	5.5(55, 40)	Apply engine oil
Cam chain tensioner pivot bolt	1	8	1.0(10, 7)	
Spark plug	1	12	1.2(12, 9)	
Cam sprocket bolt	2	6	1.2(12, 9)	
Camshaft holder nut	4	8	2.0(20, 14)	
Cam chain tensioner mounting bolt	2	6	1.2(12, 9)	Apply engine oil
Cam chain tensioner sealing screw	1	6	0.4(4, 2.9)	
Cylinder head cover bolt	4	6	1.0(10, 7)	
Transmission cover bolt	8	6	1.2(12, 8)	
Transmission cover drain bolt	1	8	1.0(10, 7)	
Transmission cover check bolt	1	8	0.9(9, 6)	
Cooling fan bolt	3	6	1.0(10, 7)	
Starting clutch nut	1	22	9.5(95, 67)	
Starter motor terminal nut	2	6	0.9(9, 6)	
Radiator hose eye joint bolt	4	12	3.2(32, 23)	
Radiator hose nut	2	14	3.2(32, 23)	

Frame

Item	Q'ty	Thread dia(mm)	Torque value kg.m(N.m,ft-lb)	Remarks
Steering stem lock nut	1	26	7.5(75, 55)	Initial torque
Steering top thread nut	1	26	0.3(3, 2)	
Handle post nut	1	10	6.0(60, 44)	
Front fork bottom bridge bolt	4	10	7.5(75, 55)	Apply locking agent
Front fork socket bolt	2	8	2.0(20, 14)	
Front axle nut	1	12	5.5~6.5(55~65, 40~47)	
Front brake disk bolt	3	8	3.9(39, 28)	Apply locking agent
Ignition coil bolt	1	5	0.5(5, 4)	
Rear axle nut	1	14	6.0-8.0(60-80, 43-58)	
Engine hanger nut	2	10	7.3(73, 53)	
Engine hanger plate bolt	6	10	2.7(27, 20)	

Item	Q'ty	Thread dia(mm)	Torque value kg.m(N.m,ft-lb)	Remarks
Brake caliper bracket bolt	2	8	2.7(27, 20)	Apply locking agent
Brake caliper bleeder valve	1	8	0.6(6, 4.3)	
Brake caliper slide pin (socket bolt)	1	8	2.3(23, 17)	
Brake caliper pin bolt	1	8	1.8(18, 13)	
Brake pad pin bolt	2	8	1.8(18, 13)	
Master cylinder reservoir cap	4	4	0.13(1.3, 0.94)	
Brake hose bolt	2	10	3.5(35, 25)	
Brake lever pivot bolt	1	6	1.0(10, 7)	
Brake lever pivot lock nut	1	6	1.0(10, 7)	
Rear shock-absorber upper bolt	1	10	2.7(27, 20)	
Rear shock-absorber lower bolt	1	10	4.0(40, 29)	Apply locking agent
Rear shock-absorber damper rod lock nut	2	10	3.8(38, 27)	

Torque values listed above are for specific tightening points. Torque values for other items are listed in the following table.

SH(Small Head): Indicates 6mm bolt of 8mm flange head.

Item	Torque Value			Item	Torque Value		
	N.m	Kg-m	ft-lb		N-.m	Kg-m	ft-lb
5mm bolt, nut	5	0.5	4	5mm screw	4	0.4	3
6mm bolt, nut	10	1.0	7	6mm screw	9	0.9	7
8mm bolt, nut	22	2.2	16	6mm flange bolt, nut	9	0.9	7
10mm bolt, nut	35	3.5	25	6mm flange bolt, nut	12	1.2	9
12mm bolt, nut	55	5.5	40	8mm flange bolt, nut	27	2.7	20
				10mm flange bolt, nut	40	4.0	29

Symbols/Abbreviations

The following symbols are used in this manual to represent job-related warnings or cautions.

Symbol	Meaning	Symbol	Meaning
CAUTION	Indicates dangerous area. Serious accident may result if instructions are not followed.	WARNING	Indicates important work. Minor injury or vehicle part damage may result if instruction are not followed.
		NOTE	Indicates general safety matters. Provides safety and appropriate handling procedures.

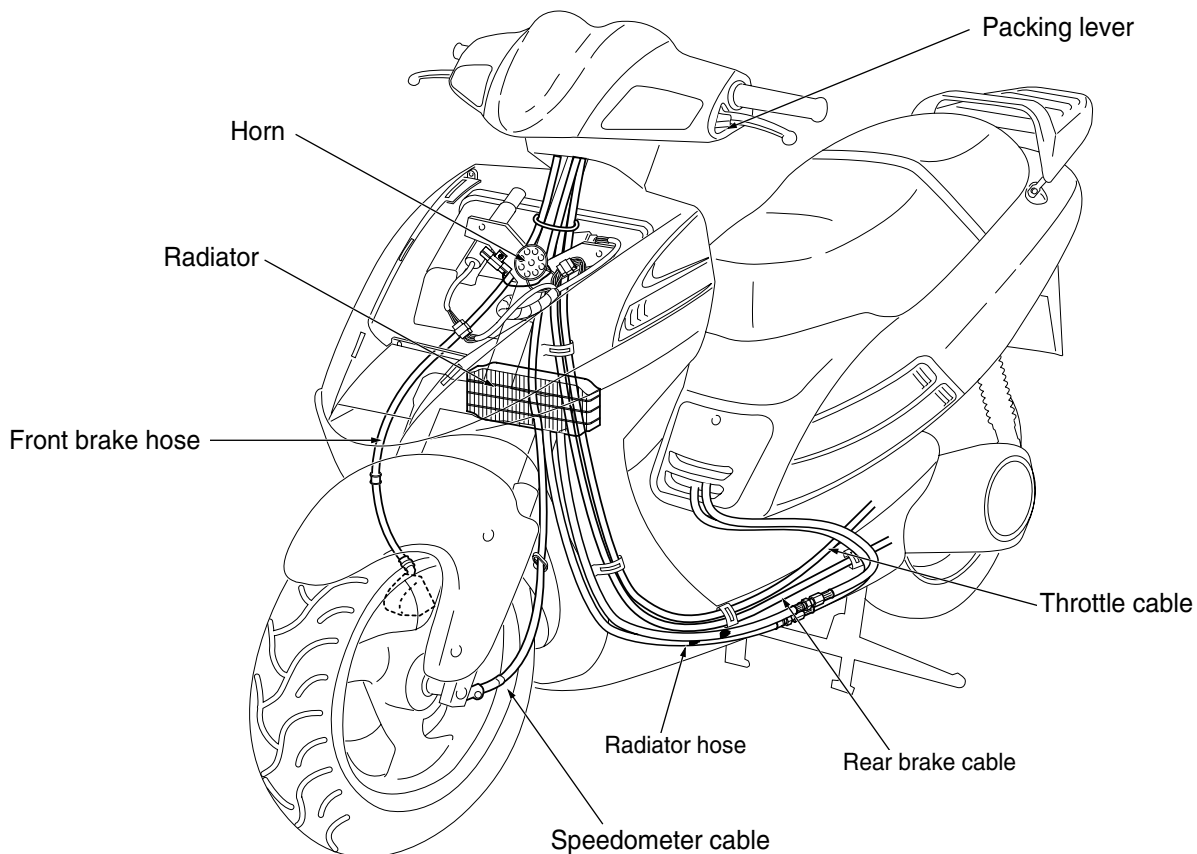
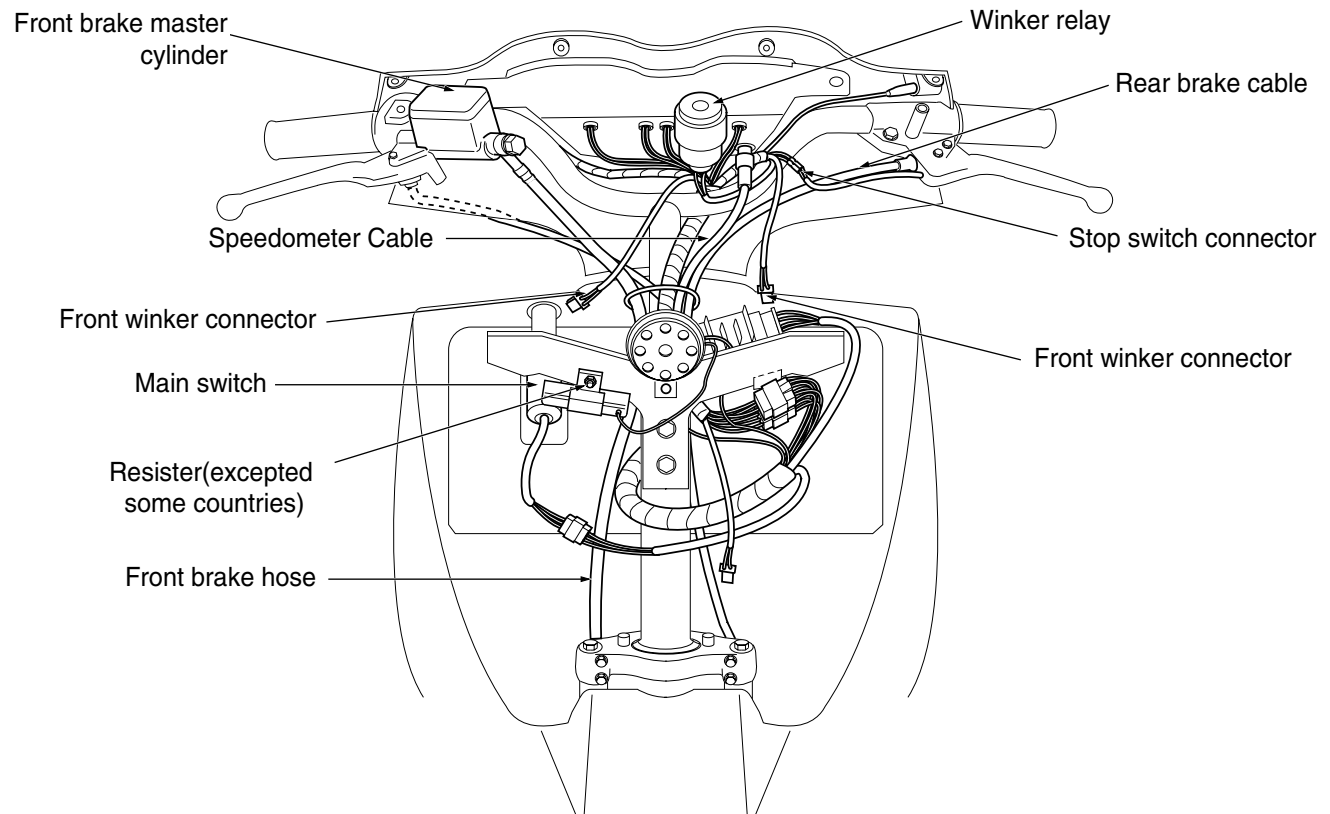
The following symbols indicate oil adding, oil change, or parts.

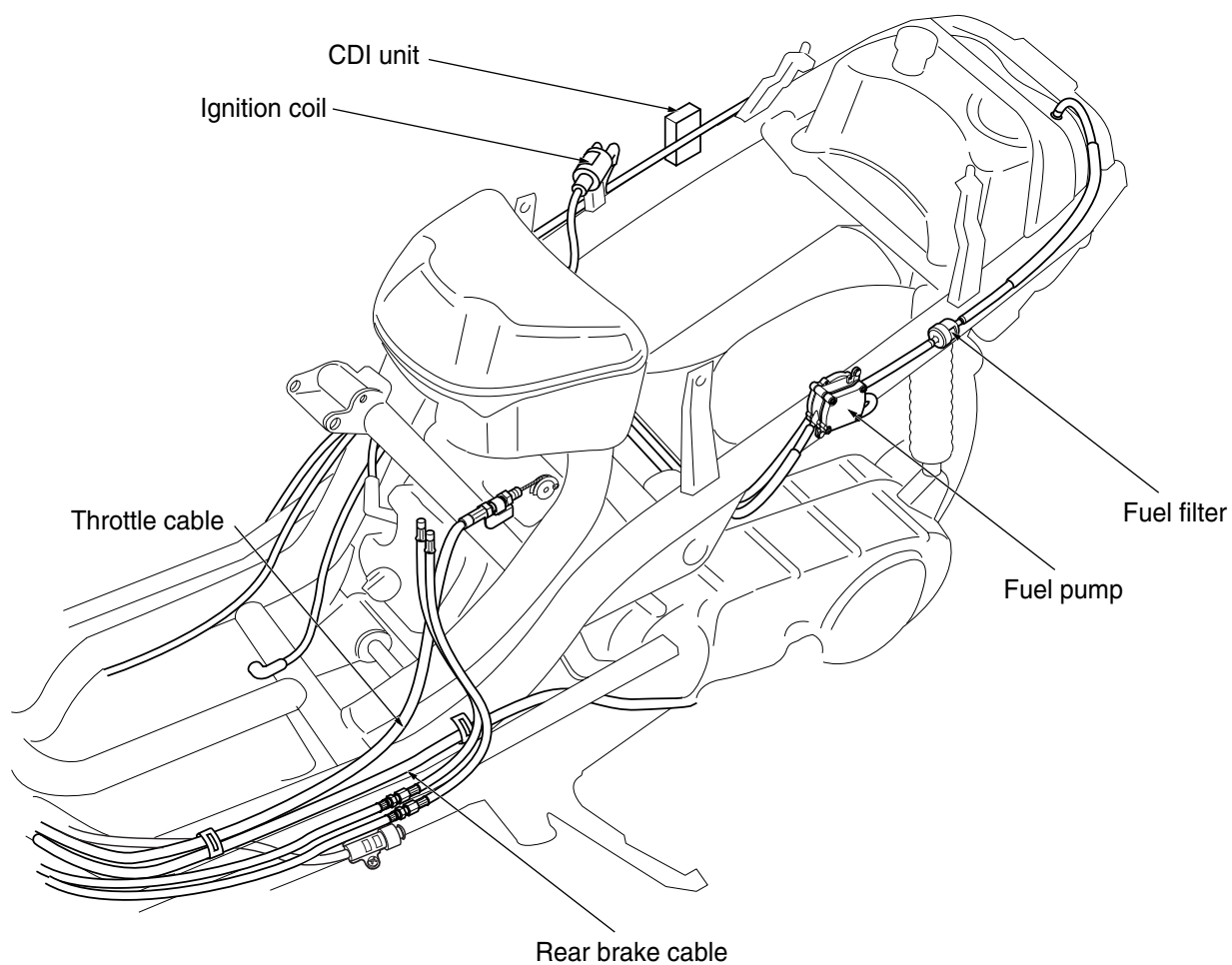
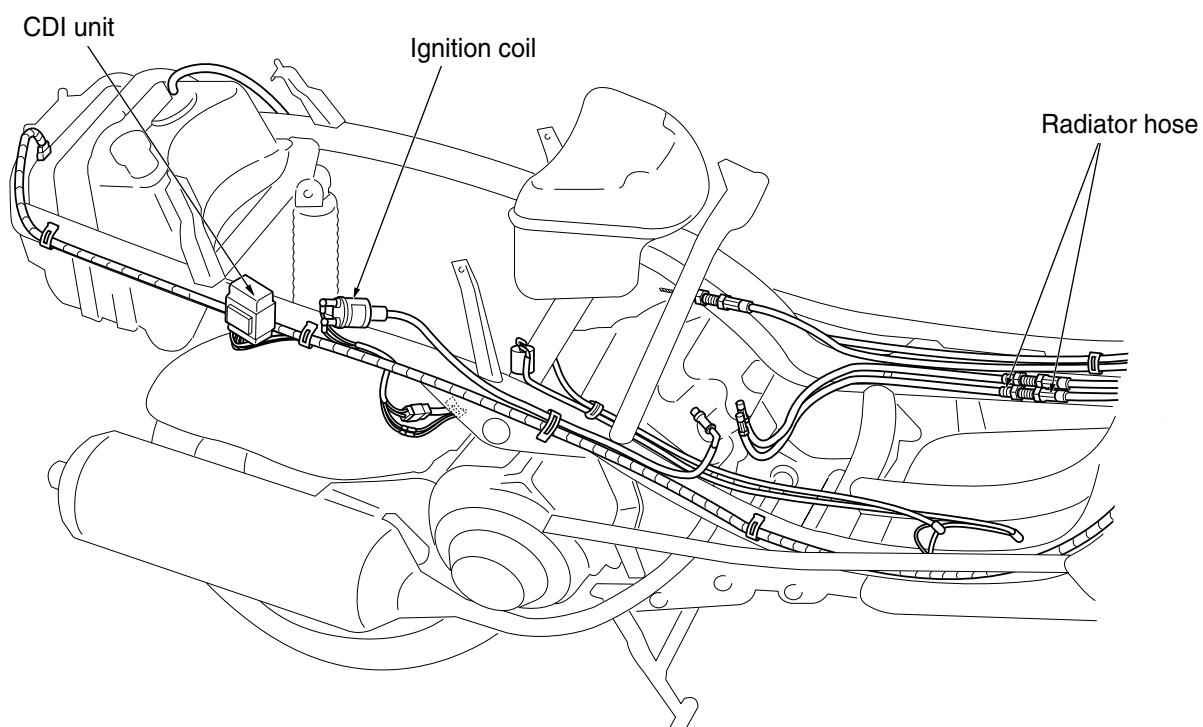
Symbol	Meaning
OIL	Add oil. If there is no specific oil indicated, use the designated or recommended engine oil.
GREASE	Apply grease
(⇒ 3-1)	Indicates reference page.(example: Refer to page 3-1)

The following abbreviations are used in this manual.

ASS' Y	Assembly
L.	Left
R.	Right

Wiring Diagram





2. Lubrication

Service information	2-1	Oil Filter Element Change	2-4
Troubleshooting	2-2	Oil Pump	2-4
Engine Oil Level Check	2-3	Radiator	2-7
Engine Oil Change	2-3	Lubrication Points	2-9

Service Information

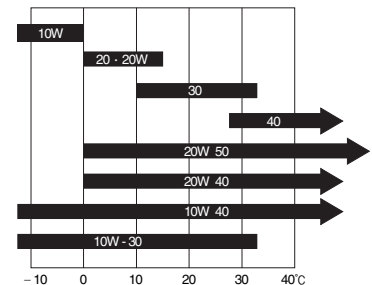
General Safety

WARNING

1. The exhaust gas contains poisonous substance. Do not keep engine idling in a closed or poorly ventilated place for a long period of time.
2. Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. It is desirable not to handle used oil frequently; however, wash your hands thoroughly with soap and water immediately after handling the used oil.
3. The oil pump can be serviced without removing the engine from the frame.

Engine Oil

Oil capacity	1.1 l (After disassembly) 0.75 l (After Oil filter change) 0.8 l (After Oil change) 0.9 l (After Oil change with Oil in the Oil hose removed)
Oil Recommendation	API service classification: SE, SF, SH grade Viscosity: SAE10W-30 (Use appropriate type of oil with viscosity satisfying the atmospheric temperature in your riding area based on the table shown on the right side.)



Oil Pump

Unit: mm(in)

Item	Standard value	Tolerance
Pump body clearance	0.08 – 0.17(0.003-0.007)	0.23(0.009)
Rotor tip clearance	0.03 – 0.13(0.001-0.005)	0.18(0.007)
Pump side clearance	0.04 – 0.09(0.002-0.004)	0.12(0.005)

Torque Values

Oil filter screen cap	1.5kg – m, (15N.m, 11ft – lb)
Oil filter cover bolt	1.1kg – m, (11N.m, 8ft – lb)
Oil pump mounting bolt	1.1kg – m, (11N.m, 8ft – lb)
Oil drain plug bolt	2.5kg – m, (25N.m, 18ft – lb)

Troubleshooting

Oil level too low - high oil consumption

- External oil leaks
- Worn piston rings
- Worn valve guide or seal

Oil contamination

- Oil or filter not changed often enough
- Head gasket faulty
- Worn piston rings

Low oil pressure

- Oil level low
- Pressure relief valve stuck open
- Plugged oil pick-up screen
- Oil pump worn
- External oil leaks

High oil pressure

- Pressure relief valve stuck closed
- Plugged oil filter, gallery, or metering orifice
- Incorrect oil being used

No oil pressure

- Oil level low
- Oil Pump drive gear broken
- Oil pump faulty
- Internal oil leakage

Engine Oil Level Check

- Erect the motorcycle on the main stand.
- Warm up the engine to heat the engine oil to an appropriate level.
- Stop the engine, and check the oil level line on the sight-glass installed on the L. crank case cover.
- If the oil level is between the lower and higher sight-glass oil level line, oil level is satisfactory. If the oil level is below or near the lower level mark, add the recommended engine oil.



Engine Oil Change

NOTE

- To completely and rapidly drain engine oil, warm up engine and erect the motorcycle on its side stand.
- Loosen the oil drain plug bolt and drain engine oil.
- Operate the kick starter arm several times to remove the remaining oil from the engine.
- Tighten the oil drain plug bolt.

Torque value: 2.0-3.0kgf · m

CAUTION

- It is extremely important to replace oil filter or clean the oil filter screen at the first maintenance interval (after 1,000Km).
- Clean the oil filter screen every 4,000Km.
- Clean the filter screen with fresh cleaning oil.
- Check the hole cap O-ring for satisfactory condition.
- Tighten the hole cap with specified tightening torque.

Torque value: 1.5kgf · m

- Loosen the special screw, remove the plug maintenance cover.
- Fill the recommended oil after opening oil filter cap of cylinder head cover.

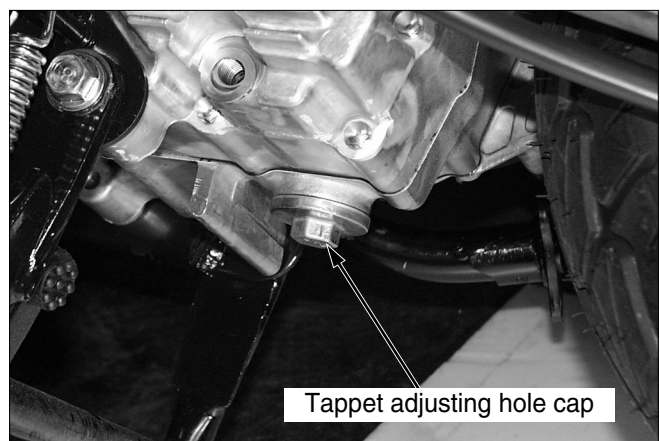
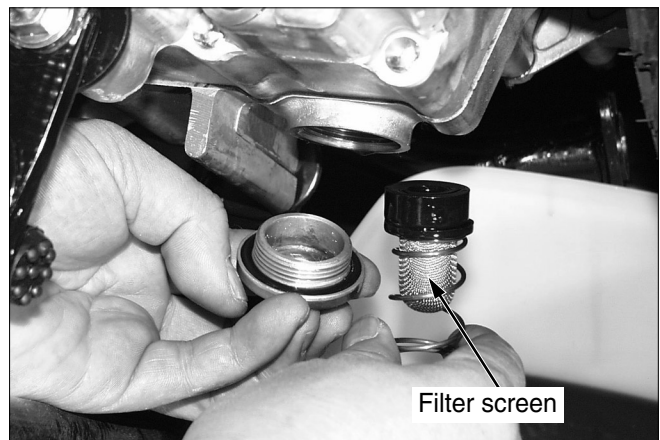
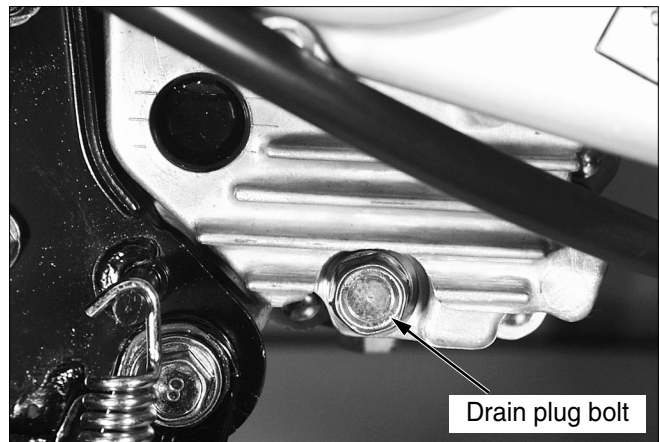
Oil Capacity: 1.1 l (After disassembly)

0.75 l (After Oil change)

0.8 l (After Oil filter change)

0.9 l (After Oil change with Oil in the Oil hose removed)

- API service classification: SE, SF, SH grade
- Start the engine and keep it idle for a few minutes.
- Stop the engine and check the oil level. If the oil level is low, add the recommended engine oil.
- Check on oil leaks.

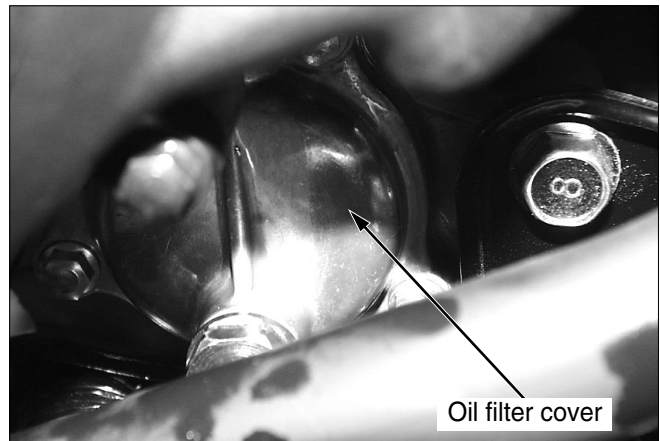


Oil Filter Element Change

- Drain engine oil. (⇒ 2-3)
- Remove the oil filter cover bolts, filter cover, filter element and spring.

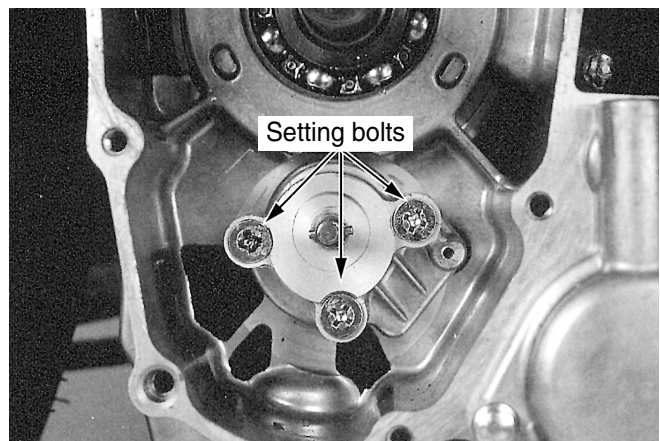
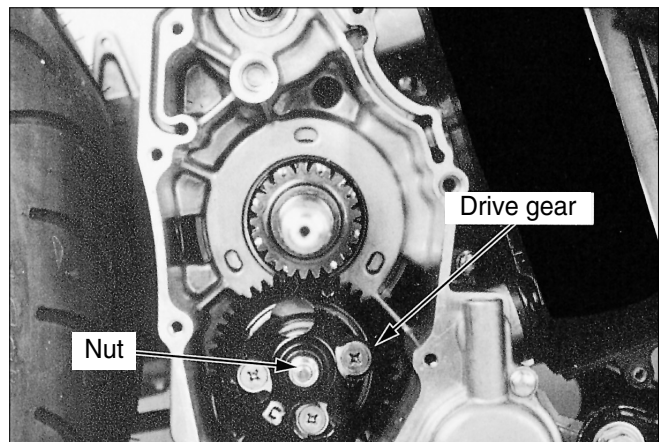
- Change the oil filter element with a new one.
- Check the relief valve inside the oil filter cover for satisfactory operation.
- Check if the oil filter seal is in good condition.
- Assemble the filter element spring and filter cover, and tighten bolts.

Torque value: Oil filter cover 1.1kg-m(11N.m.8ft-lb)

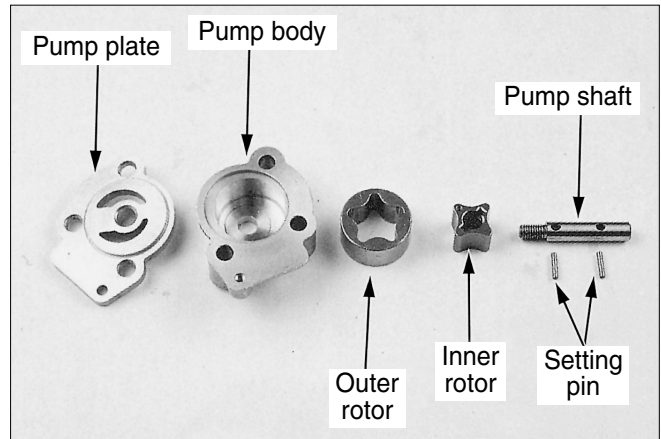


Oil Pump

- Remove the following parts:
 - Luggage box (⇒ 4-5)
 - Rear cushion bolt(⇒ 6-2)
 - RH. floor side cover(⇒ 4-5)
 - Exhaust muffler(⇒ 4-9)
 - Center cover (⇒ 4-4)
 - Shroud (⇒ 8-2)
 - Cooling fan(⇒ 8-2)
 - R. Crank cover (⇒ 8-4)
 - A.C. generator (⇒ 8-2)
 - Starter driven gear and reduction gear (⇒ 8-5)
 - Starter clutch (⇒ 8-6)
- Loosen the oil pump drive gear setting nuts.
- Remove the oil pump drive gear.
- Remove the oil pump driven gear.



- Remove the oil pump.
- Clean the oil pump body, inner and outer rotors with fresh cleaning oil.



Inspection

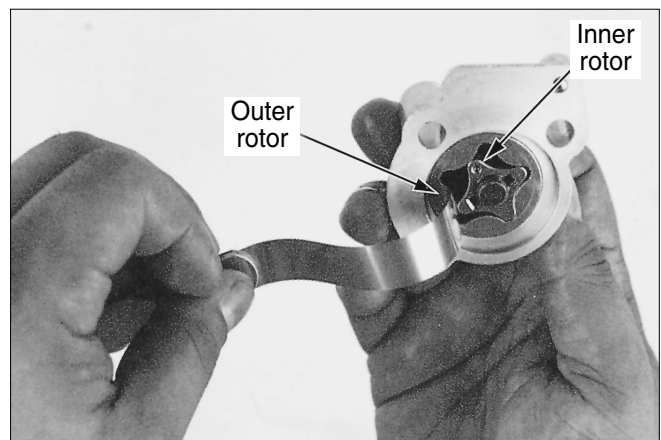
- Assemble the inner and outer rotors to the oil pump
- Measure the pump body clearance.

Service limit: 0.23mm (0.009in)



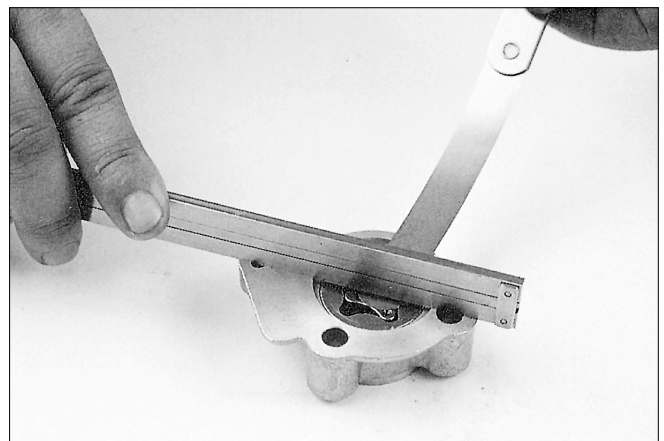
- Measure the rotor tip clearance.

Service limit: 0.18mm (0.007in)



- Measure the pump side clearance.

Service limit: 0.12mm (0.005in)

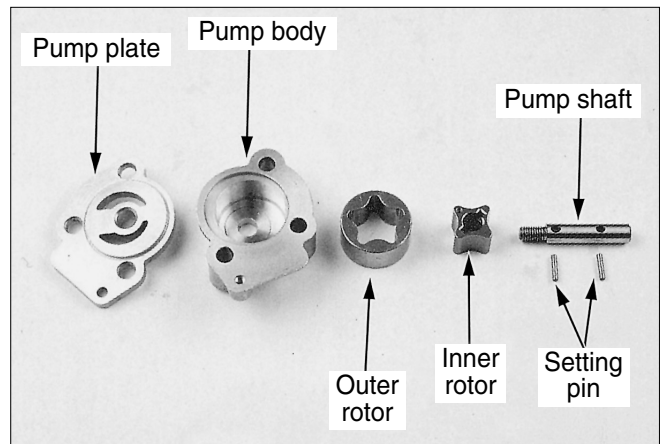


Lubrication

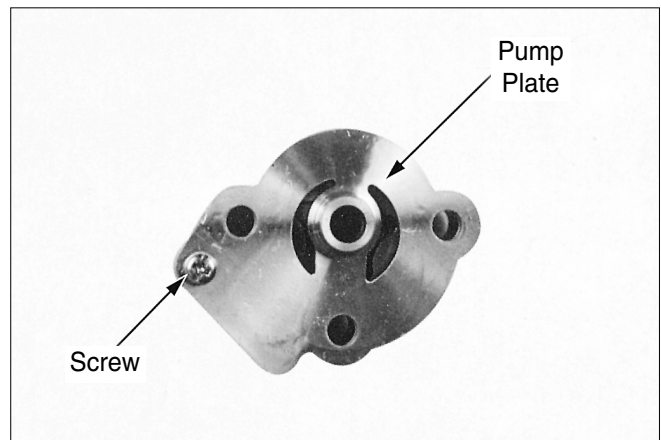
Removal/Installation

- Remove the inner and outer rotors from the pump body.
- Clean all parts with fresh cleaning oil.

- Install the inner and outer rotors.
- Assemble the pump shaft with setting pins.

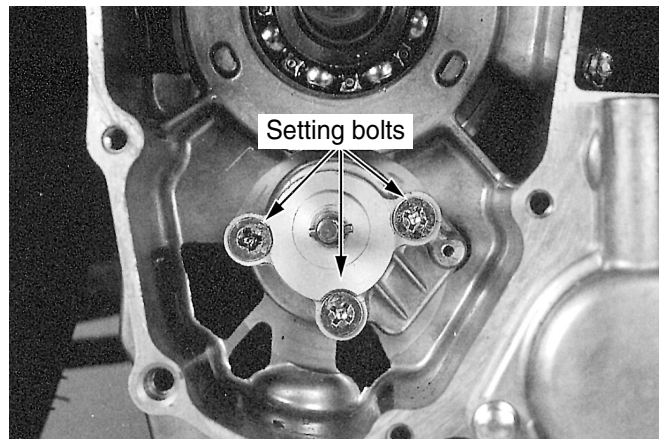


- Attach the oil pump plate to the pump body.
- Tighten screws.



Installation

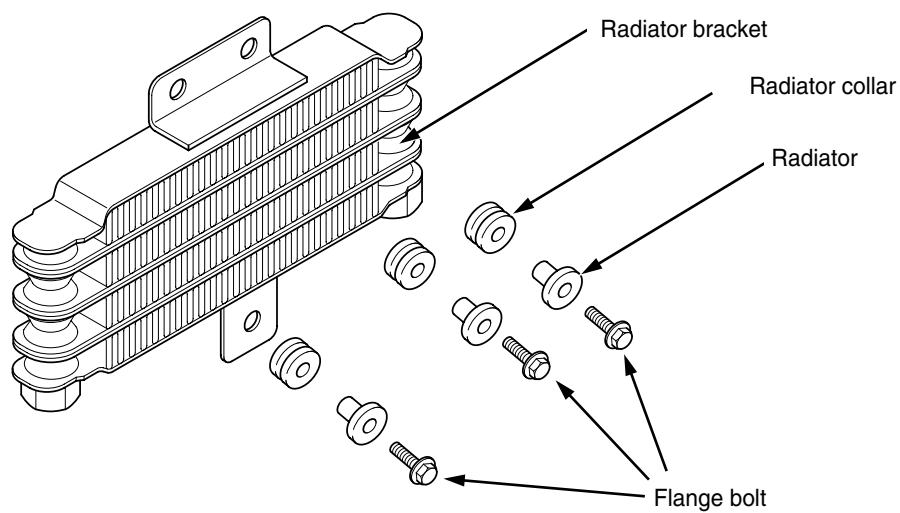
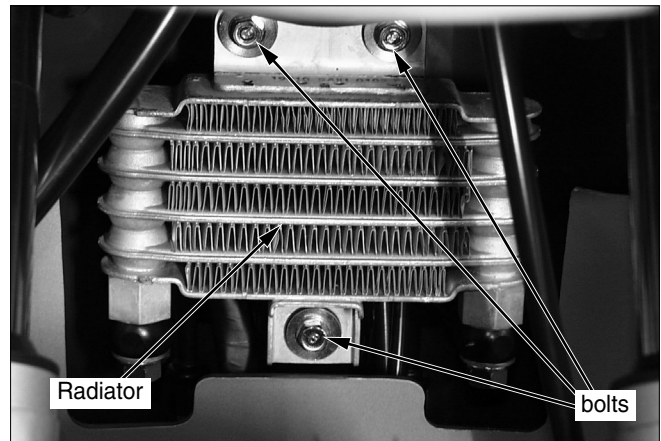
- Assemble the oil pump to the R. crank case cover.
- Install the following parts.
 - Oil pump drive gear and driven gear
 - Starter clutch
 - Starter driven gear and reduction gear
 - A.C. generator
 - R. crank case cover
 - Shroud and cooling fan
 - Center cover
 - Body cover
 - Luggage box



Radiator

Removal/Installation

- Remove the front wheel.
- Remove the front cover, front side cover and inner box.
- Loosen the flange bolt(3EA), oil bolt and remove the radiator from the main pipe bracket.



Lubrication

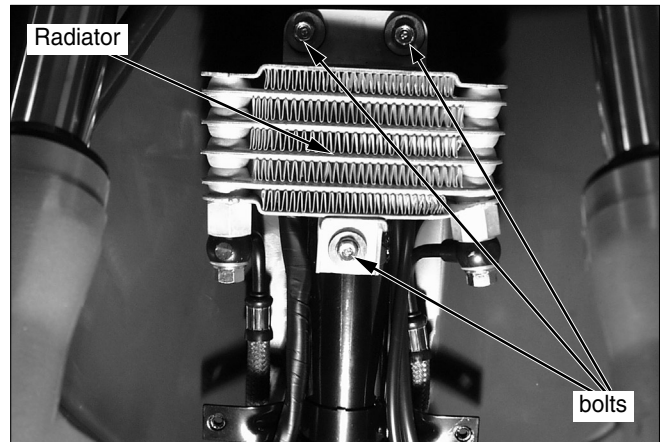
Inspection

- Check the damage or oil leaks from the radiator.



Radiator Installation

- Assemble the radiator to the main pipe bracket.
- Tighten the oil bolt.
- Install the inner box.
- Install the front side cover.

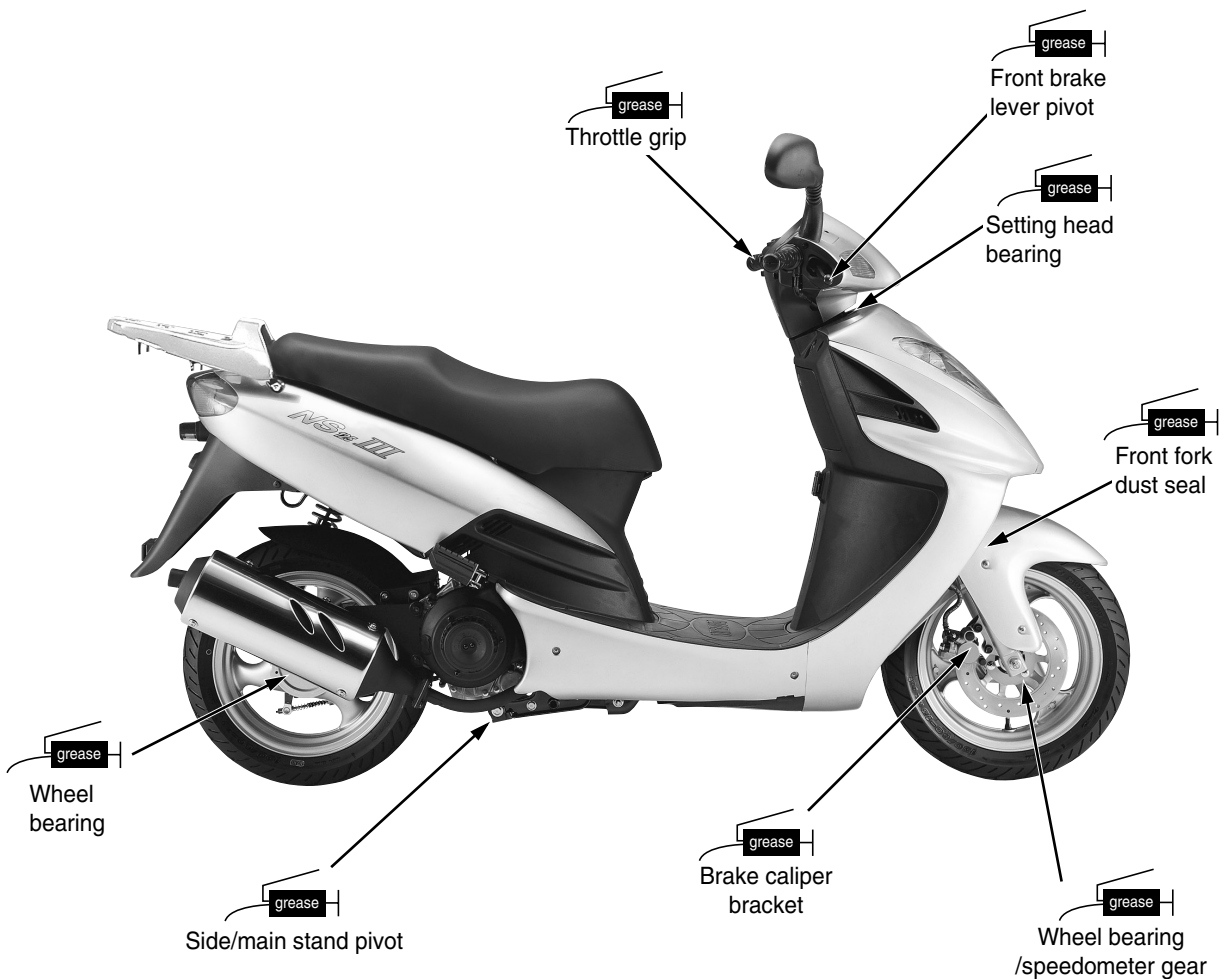


Lubrication Points

Unless specifically designated, use general grease to lubricate the lubrication points. For sliding parts not shown here, add oil or grease.

Control Cable Lubrication

Remove and clean the upper assembly of the throttle cable, and apply oil. If the cable has expanded, replace it.



MEMO

3. Inspections/Adjustments

Service Information	3-1	Brake Pad/Shoe	3-7
Regular Inspection Schedule	3-3	Brake System	3-7
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Brake Fluid	3-7		

Service Information

WARNING

- The exhaust gas contains poisonous substance. Do not keep engine idling in a closed or poorly ventilated place for a long period of time.

NOTES

- For information on engine oil and oil filter, refer to sections 2-3 and 2-4
- Stand the main stand prior to beginning work.

Specifications

Throttle grip play		2 – 6mm(1/8-1/4 in)
Spark plug		CR8EH-9
Spark plug gap		0.8 – 0.9mm(0.031-0.035in)
Valve clearance	IN	0.12 ± 0.02mm(0.005 ± 0.001 in)
	EX	0.12 ± 0.02mm(0.005 ± 0.001 in)
Carburetor idle speed		1,800 ± 100rpm
Cylinder pressure		13.8kg/cm ²

Tires

Cold tire pressure	Driver only	Front tire	175kPa (1.75kg/cm ²)
		Rear tire	200kPa (2.00kg/cm ²)
	Driver and a passenger	Front tire	225kPa (2.25kg/cm ²)
		Rear tire	280kPa (2.80kg/cm ²)
Tire size	Front tire		120/70-13(Tubeless)
	Rear tire		130/60-13(Tubeless)
Min,tread depth “㇏”	Front tire		4mm (0.16 in)
	Rear tire		7.5mm (0.3 in)

Inspections/Adjustments

Torque Values

Spark plug	1.1kg – m, (11N.m, 8ft – lb)
Cylinder head cover bolts	1.0kg – m, (10N.m, 7ft – lb)
Valve adjusting nuts	1.1kg – m, (11N.m, 8ft – lb)
Timing hole cap	0.6kg – m, (6N.m, 4.3ft – lb)

Tools

Wrench, 8×9mm

Adjusting wrench

Compression gauge

Regular Inspection Schedule

Carry out pre-operation check at each scheduled maintenance period based on the information described in the owner's manual.

I: Inspect, and clean, adjust, lubricate or replace, if necessary.

R: Replace L: Lubricate C: Clean

Item \ Frequency		Odometer reading(Note 1)				Remark
		1000km	4000km	8000km	12000km	
			6	12	18	
*	Fuel line(Fuel tube)	I	I	I	I	
*	Fuel filter	R	R	R	R	
*	Throttle grip operation	I	I	I	I	
	Air cleaner	C for each 1,000km				Note 2
	Spark plug		I	R	I	
*	Valve clearance	I	I	I	I	
	Transmission oil				R	
	Engine oil	R	R	R	R	
* *	Engine oil filter element	R	R	R	R	
*	Carburetor idle speed	I	I	I	I	
	Brake fluid		I	I	R	Note 3
	Brake shoe/pad		I	I	I	
	Brake system	I	I	I	I	
*	Brake stop switch		I	I	I	
*	Headlight beam distance		I	I	I	
	Side stand		I	I	I	
*	Suspension		I	I	I	
*	Bolt and nut tightness	I		I		
* *	wheels/tires		I	I	I	
* *	Steering head bearing	I			I	

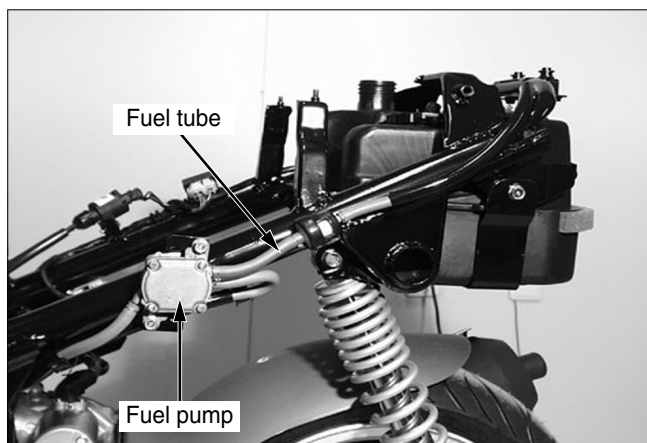
- * Should be received by an authorized DAELIM dealer, unless the owner has proper tools and service data and not mechanically qualified.
- * * In the interest of safety, we recommended these items be served only by an authorized DAELIM dealer.

NOTE

1. After the odometer reading exceeds 12,000km, repeat maintenance service at intervals indicated in the table.
2. After riding in areas with high humidity or pollution, carry out maintenance service more frequently.
3. Replace every 2 years. Proper technology is required for this job.

Fuel Line (Fuel Tube)

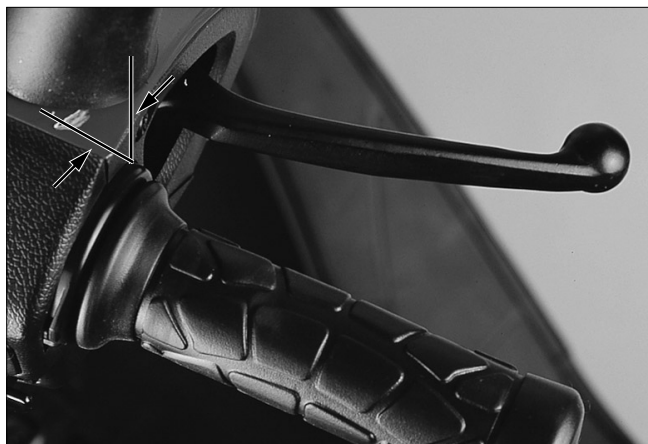
- Remove the luggage box (⇒ 4-5)
- Check the fuel tube of the fuel pump connected to the fuel tank and carburetor. If the fuel tube is cracked, damaged or leaks, replace it.



Throttle Grip Operation

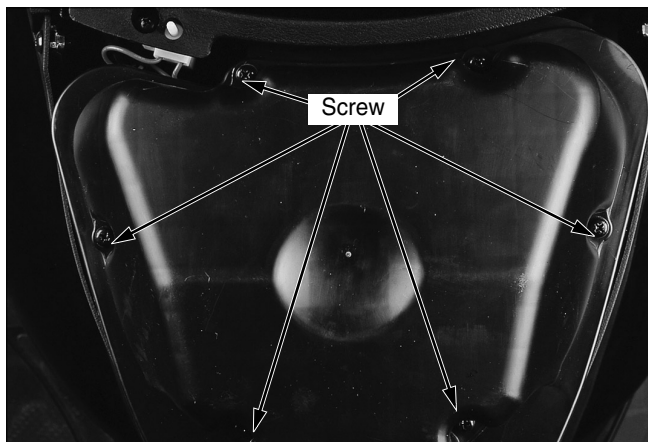
- Check if the throttle grip operates smoothly in any steering position.
- If the throttle grip does not operate properly, lubricate the throttle cable.
- If the throttle grip does not operate properly, check the throttle cable for aging, damage or kinking.
- Check the throttle grip free play.

Free play: 2~6mm(1/8~1/4in)

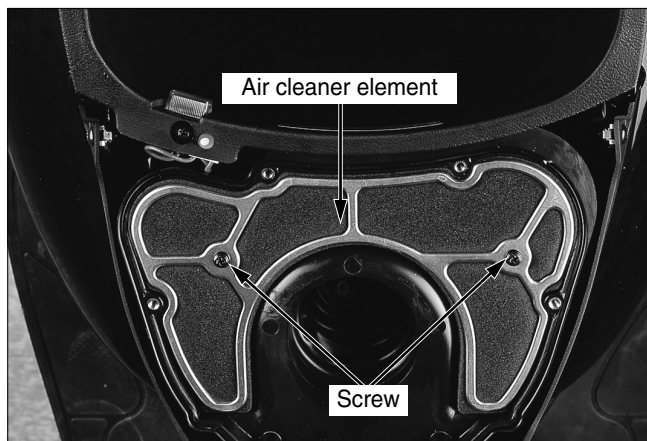


Air Cleaner

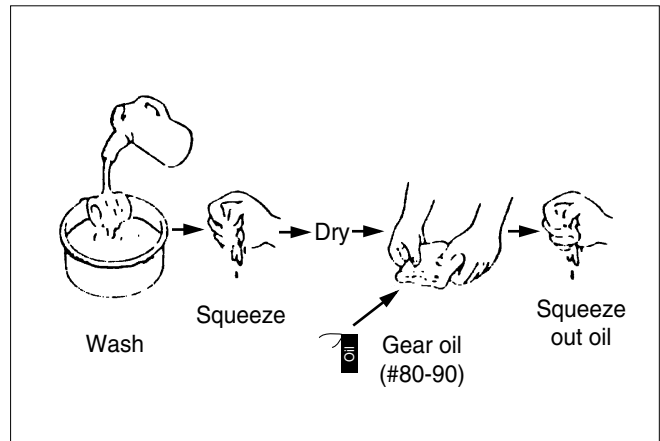
- Unlock the system with main key, and open the seat.
- Loosen the 6 setting screw assembled to the air cleaner case cover.
- Loosen the 2 setting screw assembled to the air cleaner element.



- Remove the air cleaner element.



- Soak the element in solvent, and dry completely.
- Soak in gear oil (SAE #80-90), and squeeze firmly to remove excessive oil.
- If the element is excessively contaminated or damaged, replace it.
- Assemble in the reverse order of the disassembling.



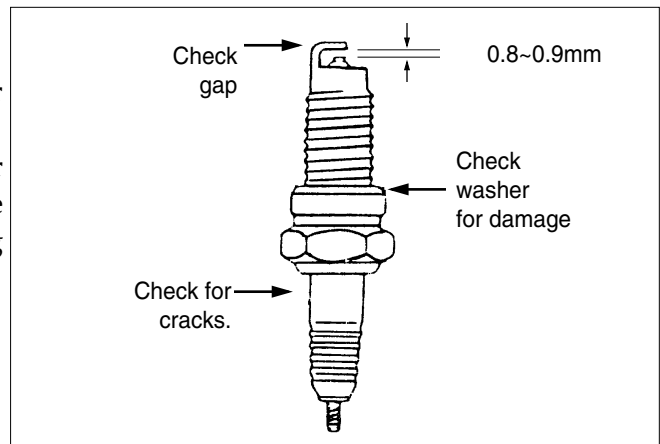
Spark Plug

- Remove the plug maintenance cover.
- Remove the spark plug cap and disassemble the plug.
- Check the plug for damage, contamination or deposits.
- If the spark plugs are severely contaminated or damaged, replace with new ones. If the plugs can be reused after removing only the carbon, use plug cleaner and wire brush to clean the plugs.
- Always use a feeler gauge to check the clearance.

Genuine plug: CREH-9

Spark plug clearance: 0.8-0.9mm

Torque value: 1.1kg-m(11N.m, 8ft-lb)



NOTE

- First, manually tighten the plugs, and use a spark plug wrench to tighten completely.

Valve Tappet Clearance

- Remove the following parts.
 - Center cover. (⇒ 4-4)
- Loosen the 4 cylinder head bolts.

NOTE

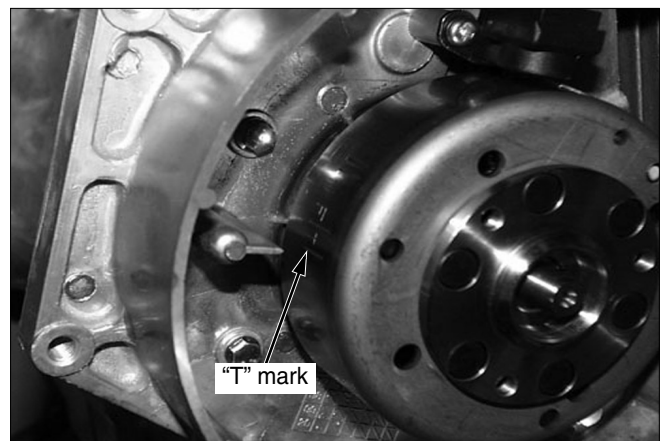
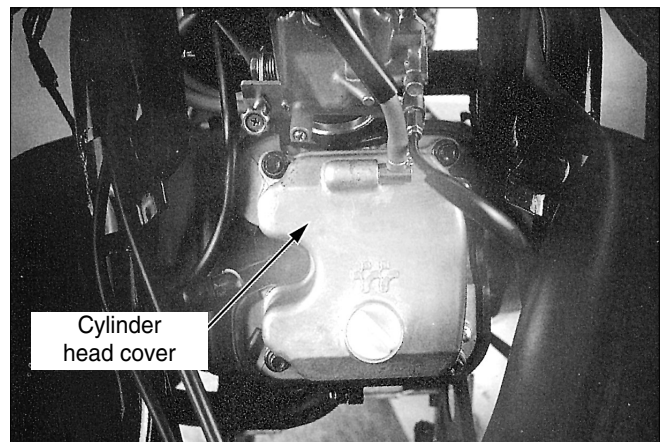
- Carry out inspection/adjustment when the engine is cold. (35°C/95F)
- Remove the cylinder head cover.
- Turn the flywheel counterclockwise, and match the "T" mark on the flywheel with the index mark on the R crank case cover.
- The piston at this time must be at the top dead center of the compression stroke.

- Measure valve clearance with a feeler gauge.

Valve tappet clearance:

Intake: $0.12 \pm 0.02\text{mm}$ ($0.05 \pm 0.001\text{in}$)

Exhaust: $0.12 \pm 0.02\text{mm}$ ($0.05 \pm 0.001\text{in}$)



- Loosen the lock nut with a valve wrench, and set valve clearance to a prescribed level by turning the adjusting screw with a valve adjusting wrench.
- After setting clearance to the prescribed level, hold the adjuster screw with a valve adjusting wrench, and tighten the lock nut.

Torque values: 1.1kg-m(11N.m,8ft-lb)

Tools: Wrench 8×9mm

Adjusting wrench B

- Measure the valve clearance again.
- Install the cylinder head cover and tighten the bolts.

Torque values: 1.0kg-m(10N.m, 7ft-lb)

Cylinder Compression Pressure

- Start and warm up the engine.
- Remove the plug maintenance cover.
- Stop engine, and remove the spark plug cap and spark plug.
- Install a compression gauge.
- Open the throttle completely, and crank the engine with the starter motor until the gauge reading rising.

Tool: Compression gauge

NOTE

- The maximum reading is usually reached within 4~7 seconds.

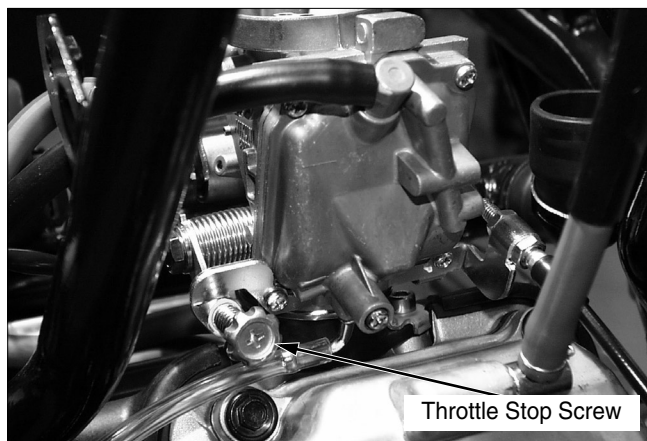
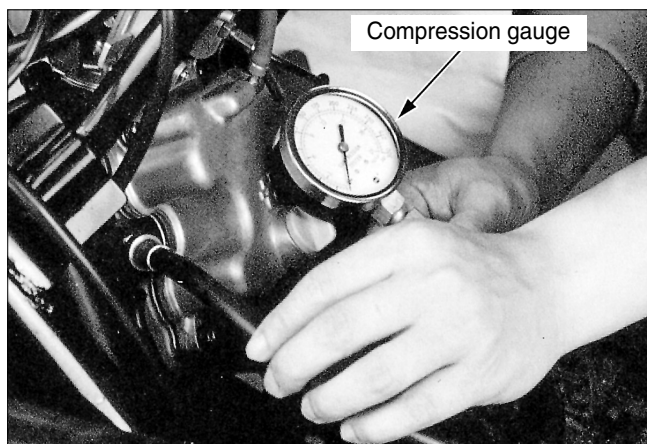
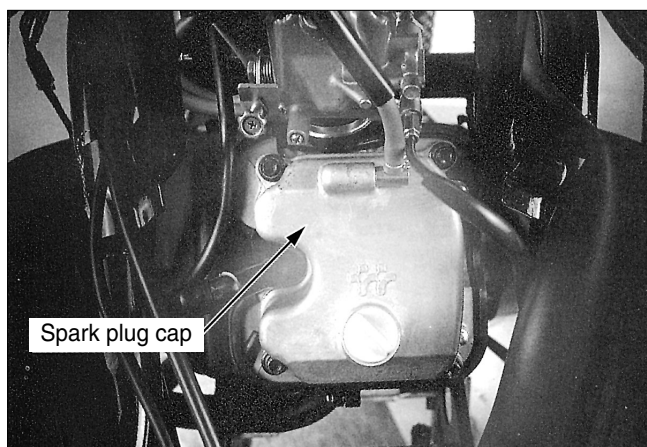
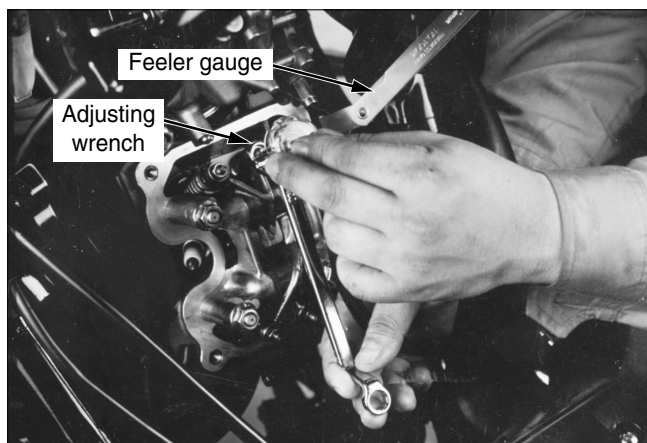
Compression pressure: 13.8kg/cm²

- If the pressure is low, check the following:
 - Inadequate valve clearance adjustment
 - Valve leakage
 - Leakage from the cylinder head gasket
 - Piston / cylinder worn
- If pressure is high, check the following:
 - Carbon deposits on the piston head, and cylinder head.

Carburetor Idling

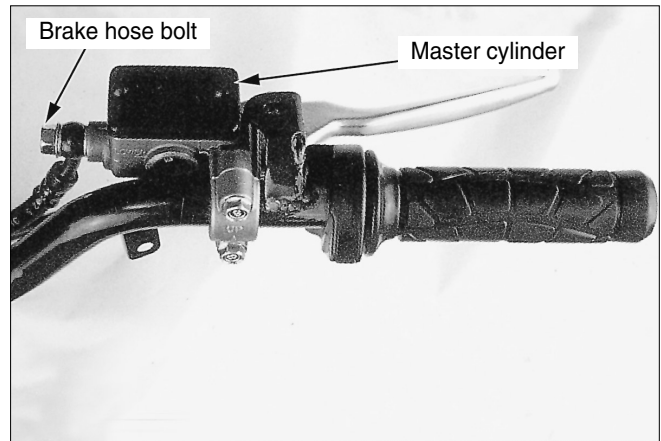
NOTE

- Verify all engine adjustments satisfy specifications. Make adjustments, if necessary.
- Heat the engine to make accurate idling inspection and adjustment. Stand the vehicle on the main stand.
- Turn the throttle stop screw and make adjustments to prescribed idling speed.



Brake Fluid

- Remove the brake fluid cover.
- Check the oil level inside the front brake reservoir.
If the oil level is near the lower limit line, remove the reservoir diaphragm and fill DOT 3 and DOT 4 brake fluid to the top limit line.
- If the brake fluid reaches the lower limit line, check the entire brake system for leaks.



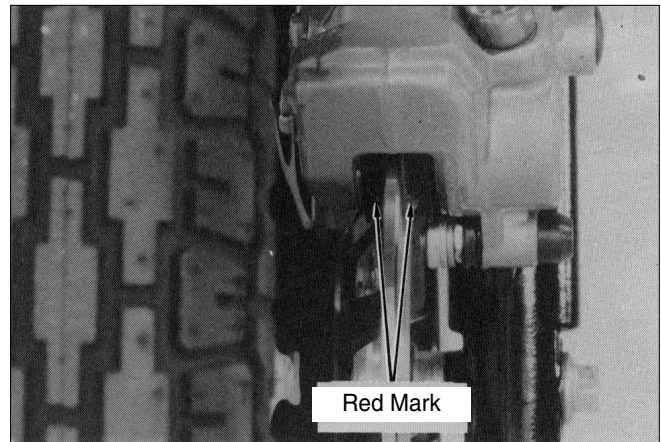
Brake Pad/Shoe

Brake pad replacement

- Check the brake pads for wear.
- If the red mark on the pad reaches the brake disc, replace the pads.

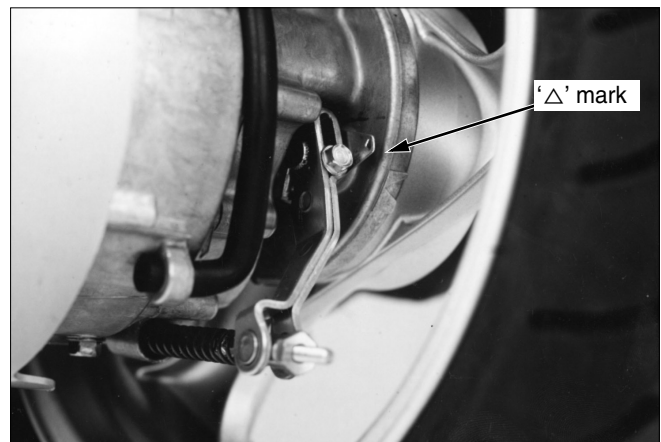
NOTE

- Replace the brake pads in sets.



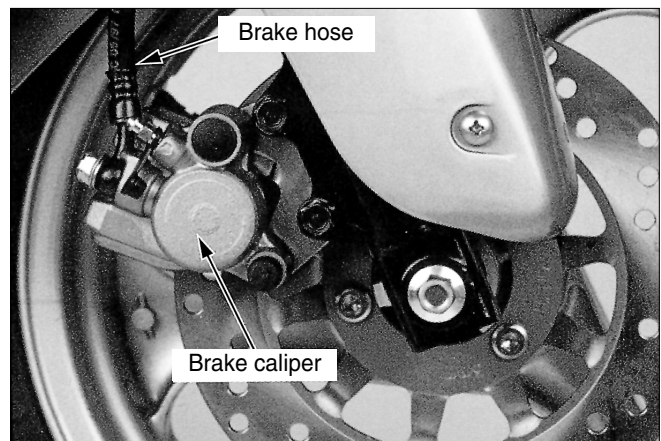
Brake Shoe Replacement

- If the arrow mark of the wear limit aligns with the '△' mark when the rear brake lever is fully pressed, it indicates the brake lining has reached the service limit. Replace the brake shoes.



Brake System

- Check the front brake hose for cracks or damage.
If any leaks are found, replace immediately.
- Check the brake rod for looseness or damage, and replace it if necessary.



Brake Lever Free Play

- Check the free play after pulling the lever.

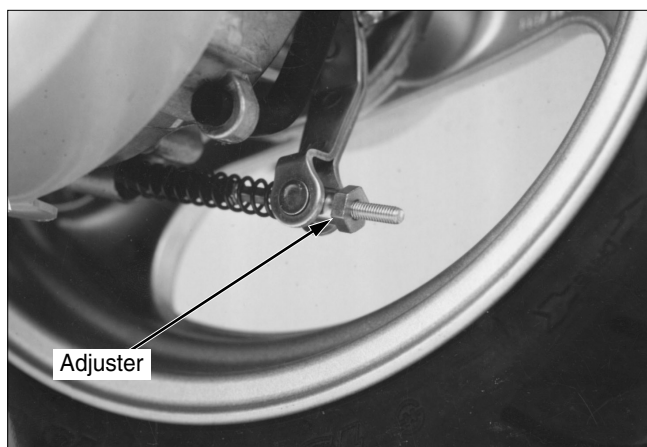
Front:10-20mm

Rear:10-20mm



Rear Brake Free Play Adjustment

- Turn the adjuster nut to adjust the free play.
- After initial adjustment, check the operation of the rear brake light switch. Make additional adjustments, if necessary.

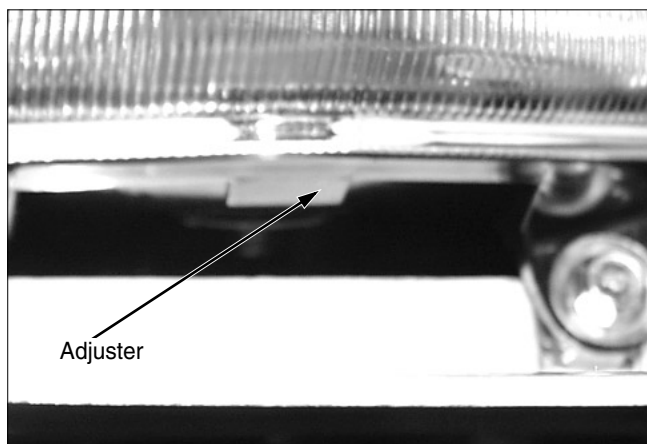


Headlight Adjustment

- Adjust the headlight beam level by operating the adjusting screw located on the upper side of the front fender.

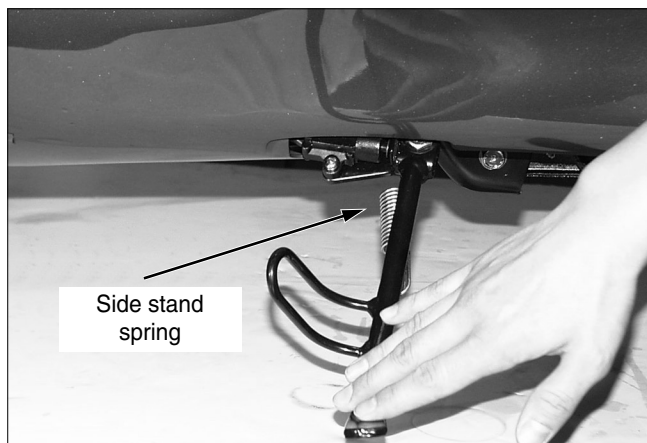
NOTE

- Adjust the beam level according to local laws and regulations.
- Improper beam level adjustment may blind on coming drivers, or may incorrectly light the road ahead.

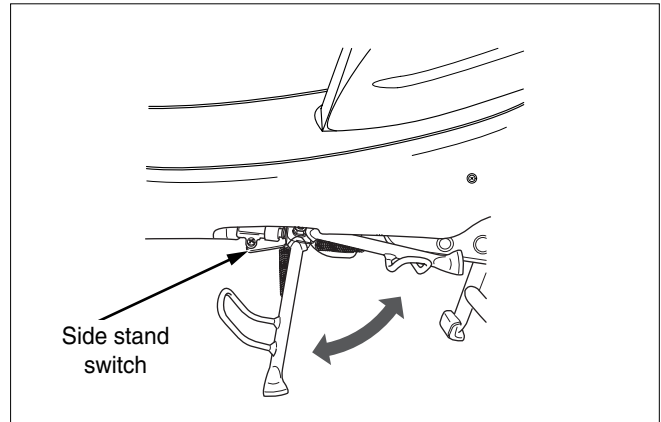


Side Stand

- Erect the main stand.
- Pull the lower end of the side stand, and see if it moves freely.
- If the side stand does not move smoothly, apply grease to the pivot area.
- If the side stand moves too freely, check the side stand spring.
- Check the axial movement of the side stand.



- Check the side stand ignition cut-off switch ;
 - Put the side stand up.
 - Start the engine.
 - Lower the side stand. The engine should stop as you put the side stand down.
- If there is a problem with the system, check the side stand switch.



Suspension

NOTE

- Do not ride motor cycle with an unsatisfactory suspension. Loose or worn suspension parts will lead to deterioration in the vehicle's safety and operation efficiency.

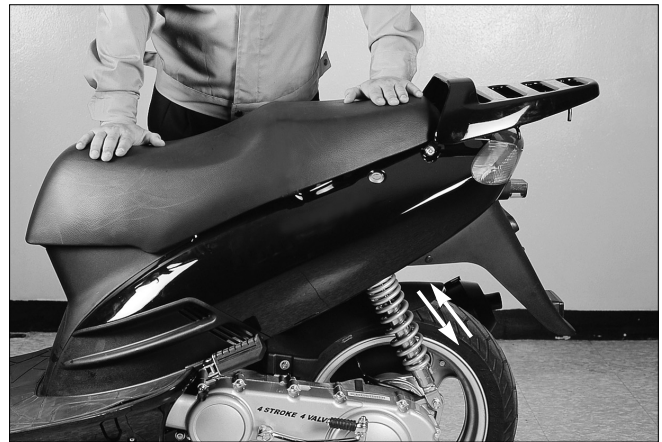
Front wheel

- Hold the brake lever, and compress the front cushion up and down several times to check the operating conditions.
- Check the front fork for oil leakage, parts damage or looseness.



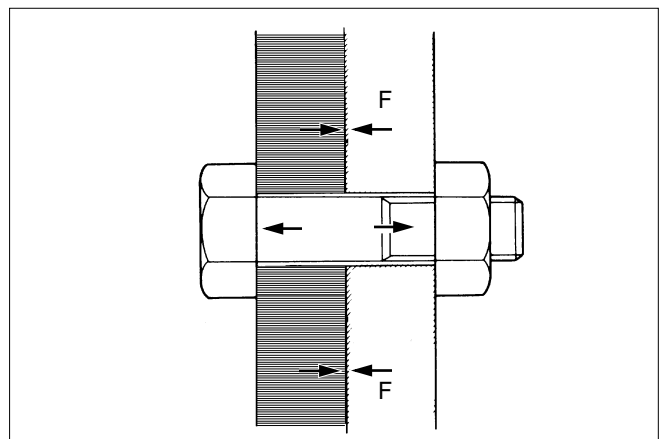
Rear wheel

- Compress the rear cushion up and down several times to check the operating conditions.
- Check the rear fork for oil leakage, parts damage or looseness.



Bolts and Nuts Tightening

- Check all nuts and bolts of the frame during the regular maintenance (⇒ 3-3) to check if they meet the prescribed torque value.
- Check all pins, clips, hose clamps and cable stays.



Wheels/Tires

NOTE

- Check the tire pressure when the tires have been cooled off. Check the tread (the part making contact with the road surface) and side for wear, cracks or damage. Replace damaged tires.

Standard Pressure

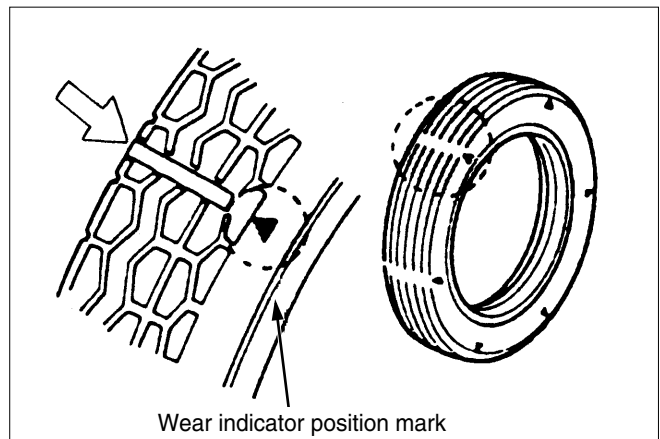
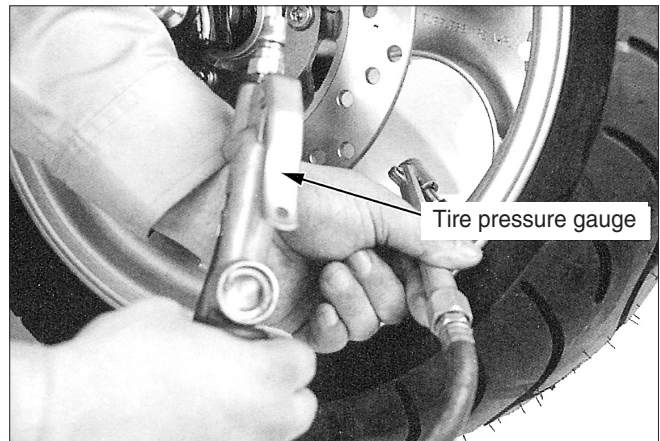
kg/cm² (kPa)

Item	Front wheel	Rear wheel
Driver only	1.75(175)	2.00(200)
Driver and a passenger	2.25(225)	2.25(225)

- Check the tread depth at the tire center.
- If the tread depth has reached the service limit, replace the tire.

Service limit: 4mm (0.16in)

7.5mm (0.3in)



Steering Head Bearing

NOTE

- Check the cable if it interferes with the handle operation.
- Lift the front wheel and check if the handle moves right and left smoothly. If the handles move heavily, check if the cable or electric cord interferes with the handle. If the handle moves satisfactorily, adjust the steering head bearing.



4. External Parts

Service Information	4-1	Muffler	4-9
Maintenance Procedure	4-2	Front Fender	4-10
External Parts Removal/Installation	4-3		

Service Information

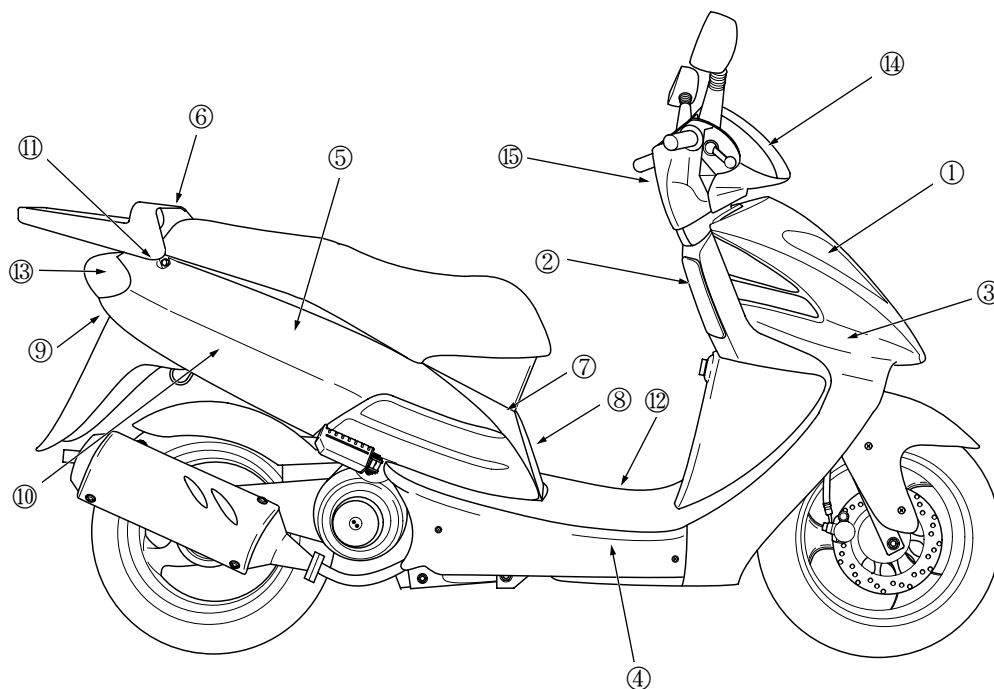
4

NOTE

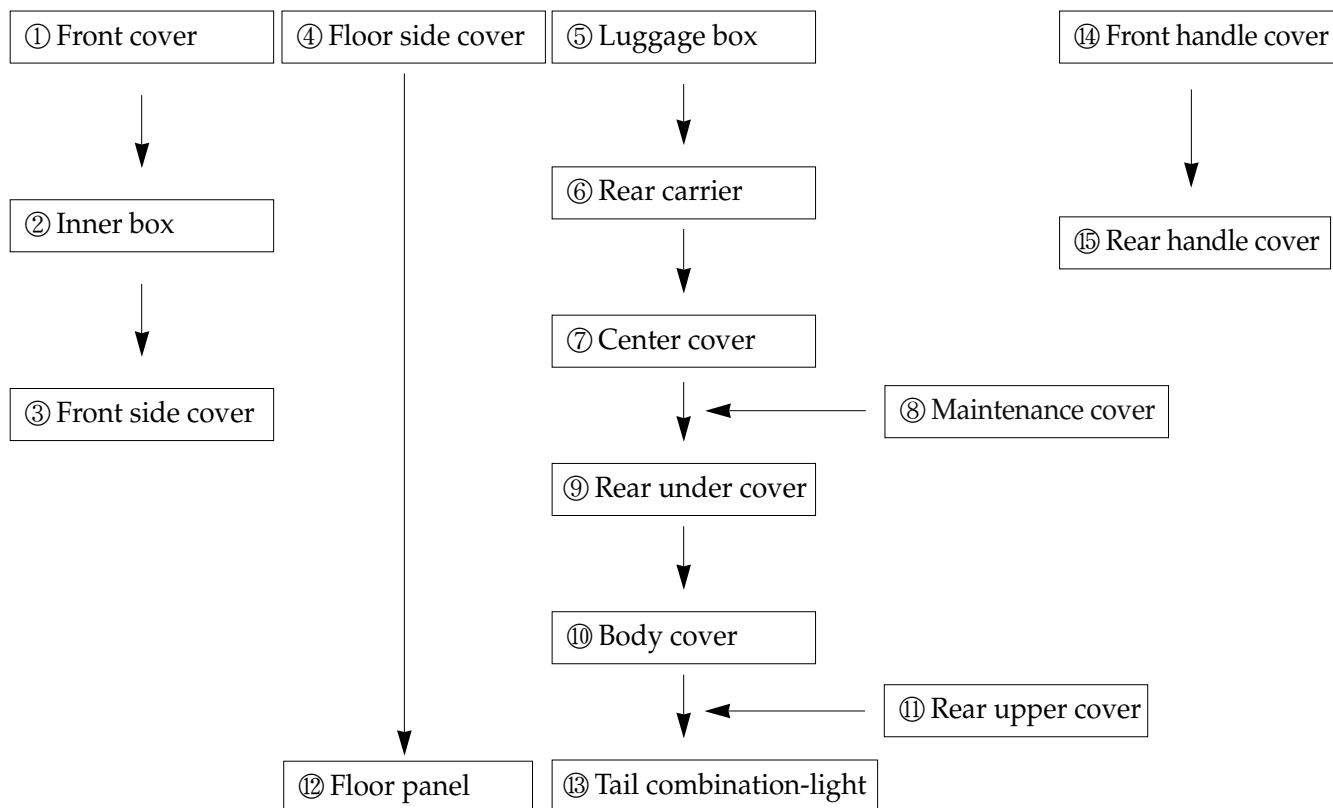
- This section describes external parts removal/installation.
- Do not apply unreasonable force when disassembling covers, to prevent possible damage.
- A muffler is hot. Do not service it immediately after the engine is stopped.

Maintenance Procedure

Names of frame covers

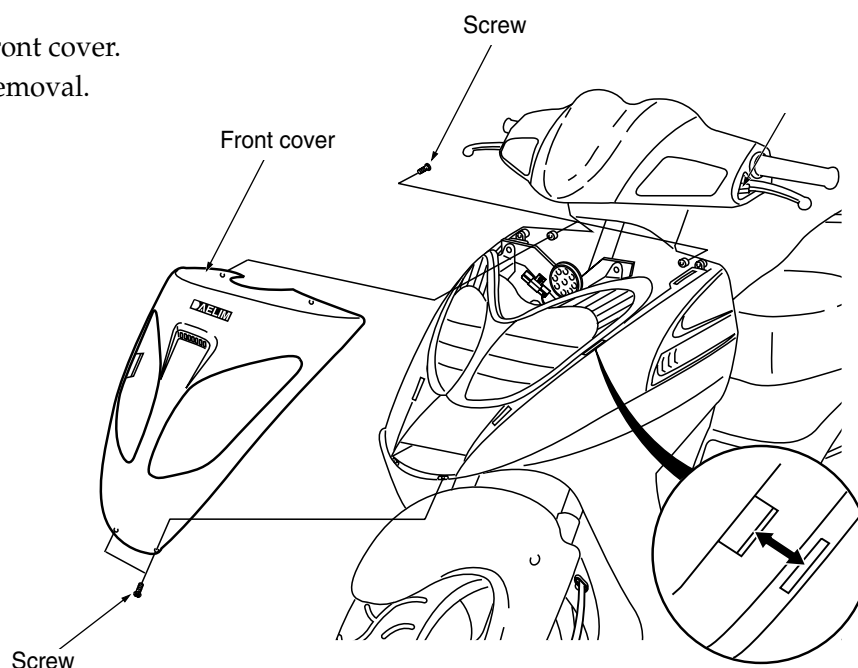


● This chart shows arrows connected in the order of disassembling covers.



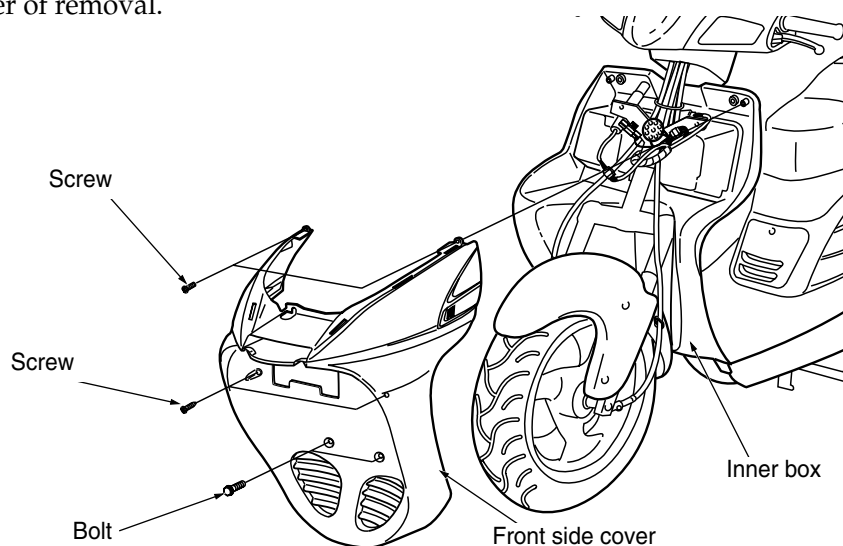
Front Cover removal/Installation

- Loosen the 2 upper screws.
- Loosen the 2 lower screws.
- Pull upward and remove the front cover.
- Install in the reverse order of removal.



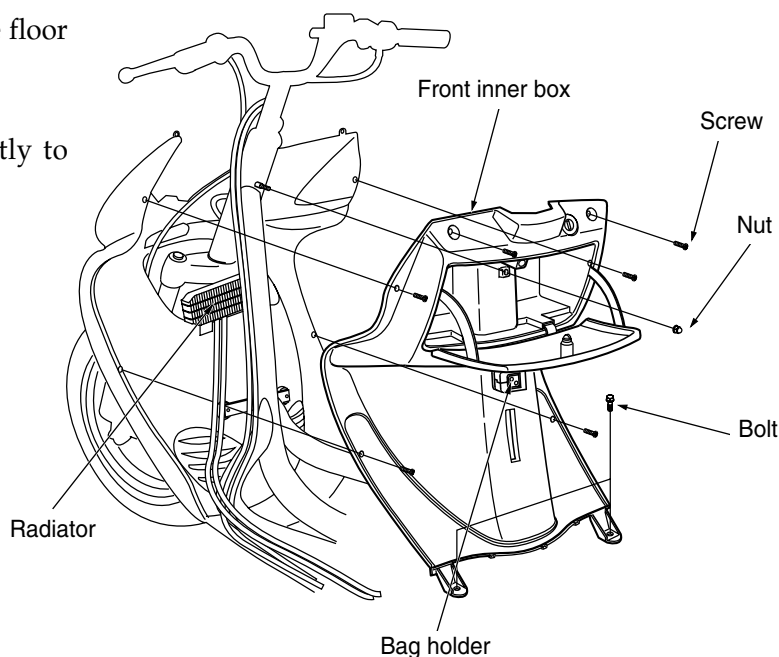
Front Side Cover Removal/Installation

- Remove the front fender. (⇒ 4-10)
- Remove the front wheel. (⇒ 12-5)
- Remove the 2 front lower flange bolts and the 2 upper screws.
- Remove the 2 inner box setting screws.
- Remove the front side cover.
- Install in the reverse order of removal.



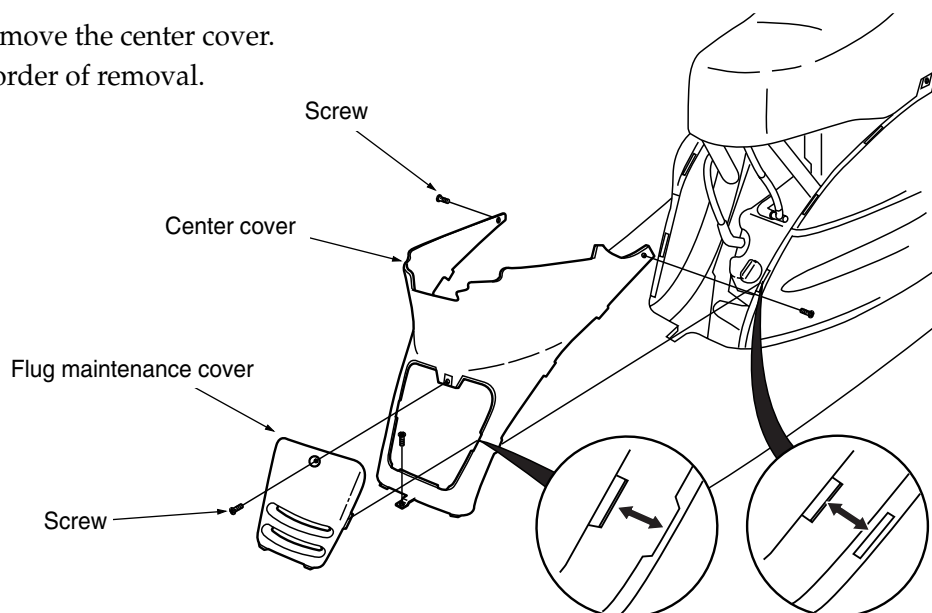
Inner Box

- Loosen the 2 bolts installed on the bag holder.
- Remove the bag holder.
- Open the inner box lid.
- Remove the 1 cap nut.
- Remove the 2 flange bolt installed on the floor panel.
- Remove the 6 front side cover screws.
- Remove turn the main key cover slightly to unlock, and remove the main key cover.
- Remove the inner box
- Install in the reverse order of removal.



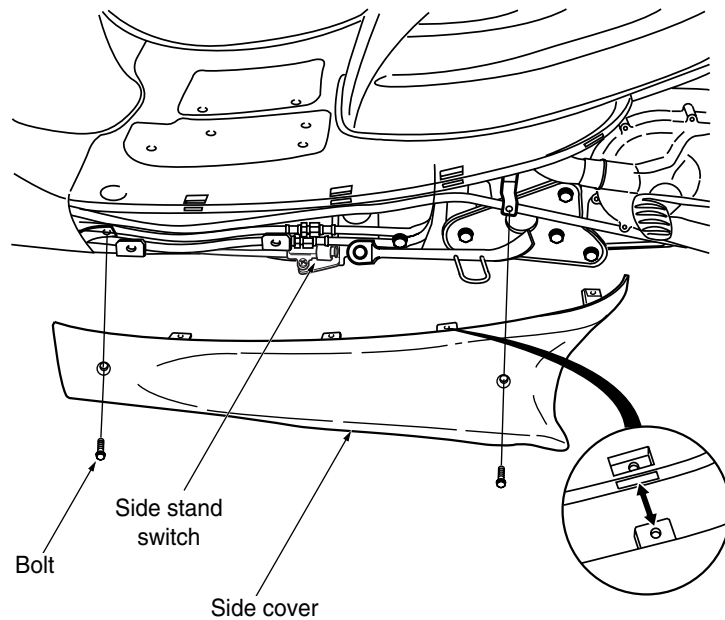
Center Cover

- Loosen the 4 setting screws assembled to the body cover.
- Remove each of the setting screws assembled to the floor panel.
- Band inwards, and remove the center cover.
- Install in the reverse order of removal.



Side Cover

- Remove the floor mat.
- Loosen the 2 screws on the side of the R/L side covers.
- Loosen 1 each of the R/L screws assembled to the floor panel.
- Loosen 3 each of the R/L body cover clips assembled to the floor panel.
- Remove R/L side covers.
- Install in the reverse order of removal.



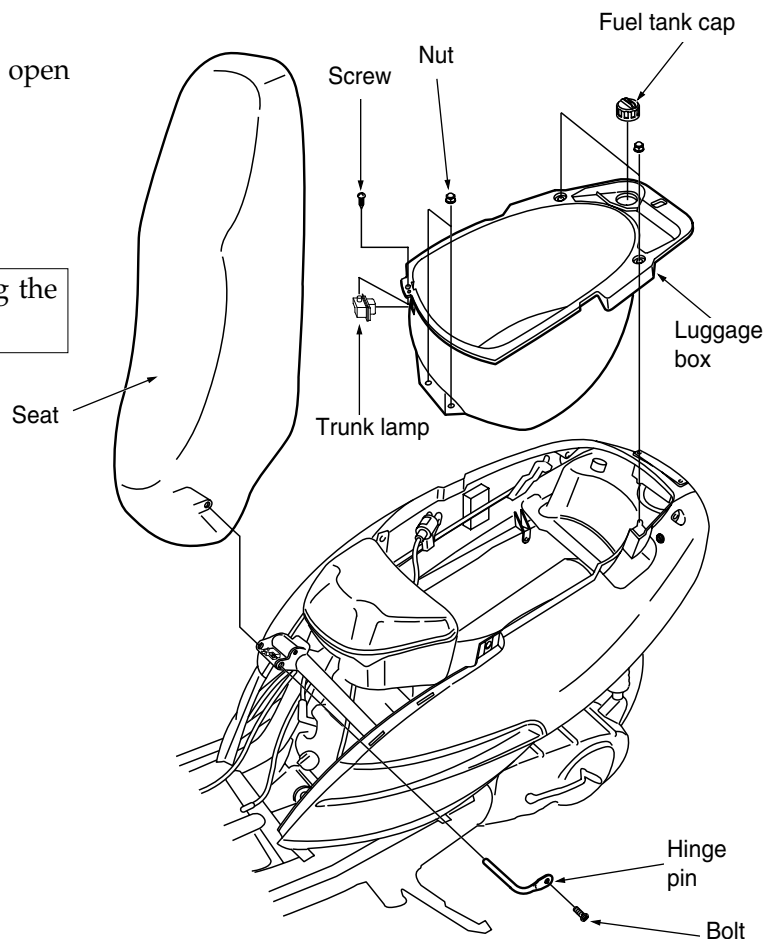
Luggage Box

- Unlock the system with the main key, and open the seat.
- Loosen the 4 cap nuts.
- Remove the fuel tank cap.

NOTE

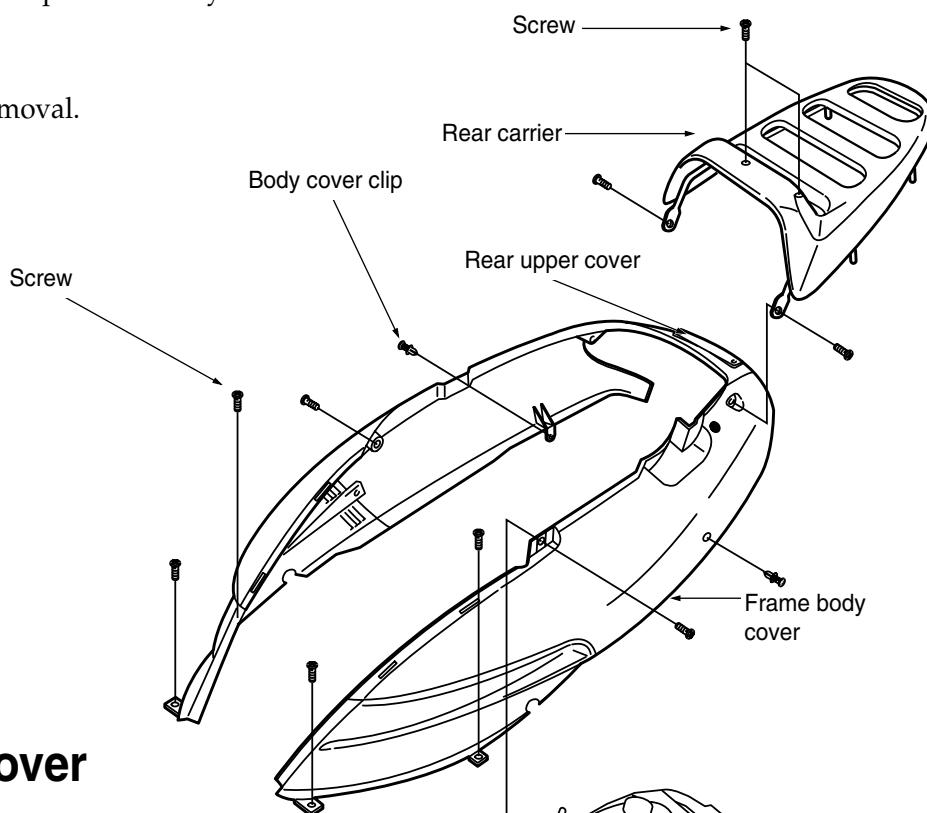
- Assemble the fuel tank cap after removing the luggage box.

- Remove the luggage box.
- Install in the reverse order of removal.
- Remove the wiring of trunk lamp.



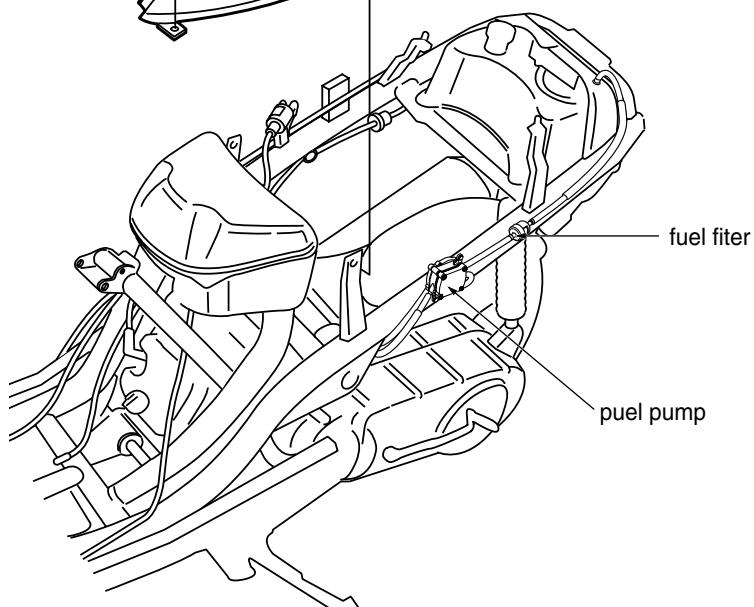
Rear Carrier

- Loosen 1 each of the R/L flange bolt set on the body cover side.
- Loosen the 2 flange bolts set on top of the body cover.
- Remove the rear carrier.
- Install in the reverse order of removal.



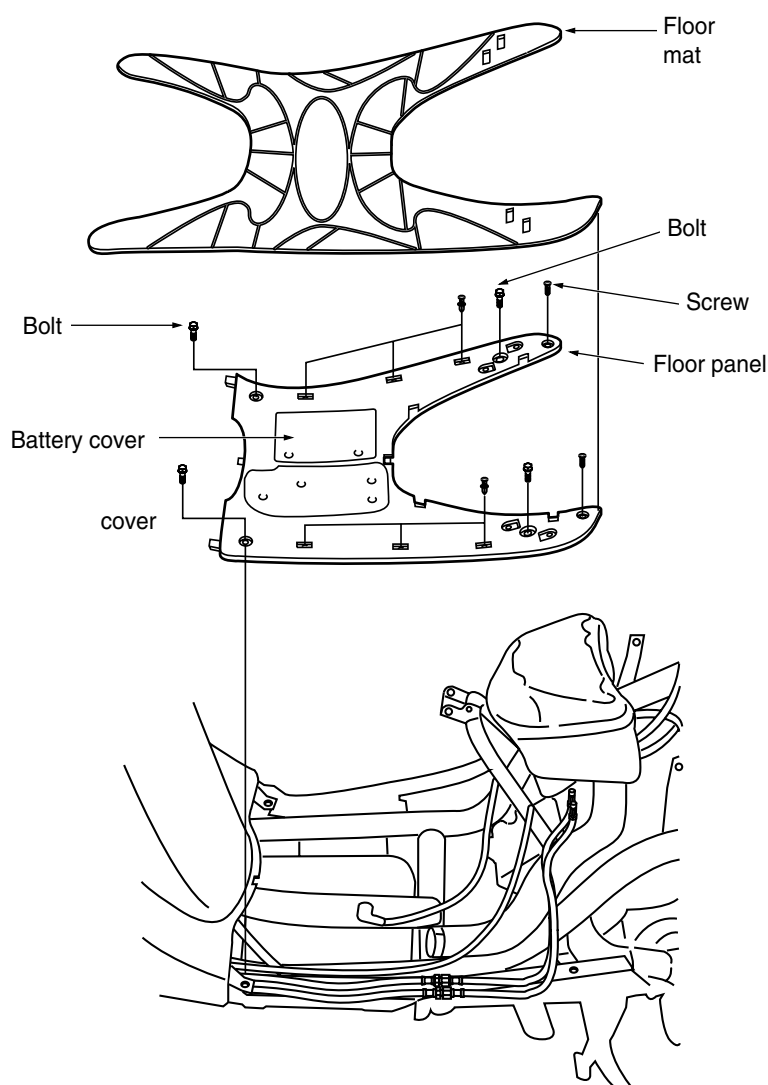
Body Cover/Rear Cover

- Remove the rear carrier. (⇒ 4-6)
- Remove the luggage box. (⇒ 4-5)
- Remove the center cover. (⇒ 4-4)
- Loosen 2 each of the R/L body cover grill screws set with the floor panel.
- Loosen 1 each of the R/L body cover clips assembled to the rear fender.
- Loosen 1 each of the R/L flange bolts set on the frame body.
- Loosen 2 rear under cover setting screws, and remove the rear under cover.
- Remove the R/L frame body cover.
- Loosen the 2 rear upper cover setting screws.
- Install in the reverse order of removal.



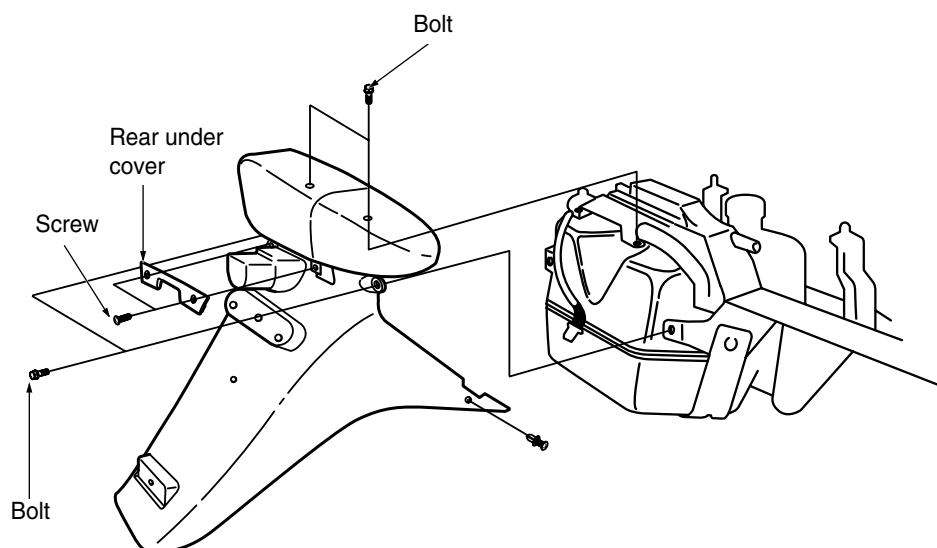
Floor Panel/Battery Cover

- Remove the center cover. (⇒ 4-4)
- Loosen 2 each of the R/L pillion step cover setting screws of the floor mat, and remove the floor mat.
- Loosen the 2 battery cover setting screws, and remove the battery cover.
- Withdraw the battery wiring, and remove the battery.
- Remove the air cleaner duct.
- Loosen the 4 setting bolts.
- Remove the side cover. (⇒ 4-5)
- Remove the 4 center cover setting screws.
- Remove the floor panel.
- Install in the reverse order of removal.



Tail Combination-Light

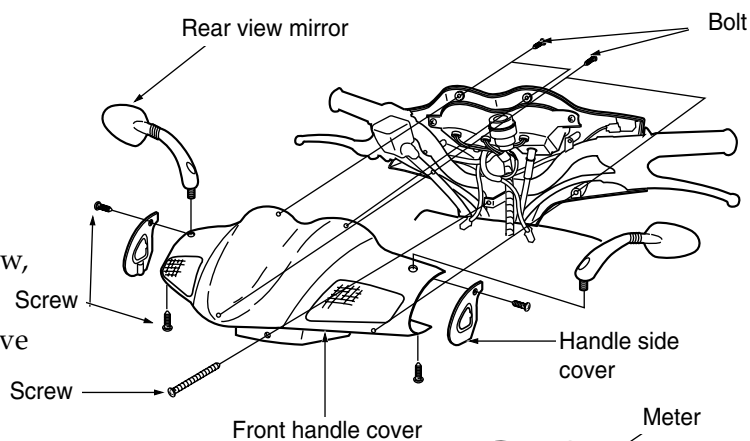
- Remove the following parts.
 - Luggage box. (⇒ 4-5)
 - Luggage carrier. (⇒ 4-6)
 - Body cover. (⇒ 4-6)
 - Rear under cover. (⇒ 4-6)
- Loosen the 2 bolts assembled to the frame rear part.
- Loosen the 2 R/L side setting bolts.
- Remove the tail combination-light wiring.
- Remove the tail combination-light
- Install in the reverse order of removal.



Handle Cover

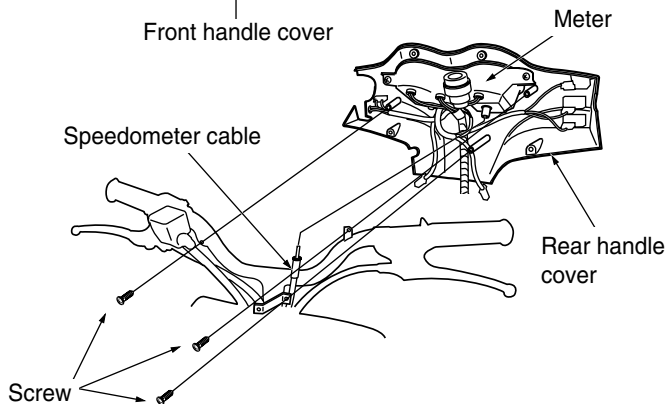
Front Handle Cover

- Loosen the 4 rear handle cover setting screws.
(1 each on R/L side, and 2 each on meter side)
- Loosen 1 front handle cover setting screw.
- Remove 1 R/L handle side cover lower screw, and 1 each of the special upper side screws.
- Pull the front handle cover forward, and remove the wiring.
- Remove the front handle cover.
- Install in the reverse order of removal.



Rear Handle Cover

- Loosen the 3 screws assembled to the handle bar.
- Loosen the 3 screws assembled to the meter.
- Remove the R/L side switch wiring.
- Remove the rear handle cover.
- Install in the reverse order of removal.



Muffler

Removal

- Loosen the 3 flange nuts securing the EX. pipe comp.
- Loosen the flange bolt securing the rear wheel mud guard.
- Loosen the 2 flange bolts securing the R. crankcase.
- Remove the EX. muffler comp.

WARNING

- Never perform the maintenance of the muffler right after stopping the vehicle because the muffler is extremely hot.

EX. Pipe removal

- Remove the plug maintenance cover.
- Loosen the 2 flange bolts securing the cylinder comp.
- Remove the EX. pipe by drawing it to the ground direction.

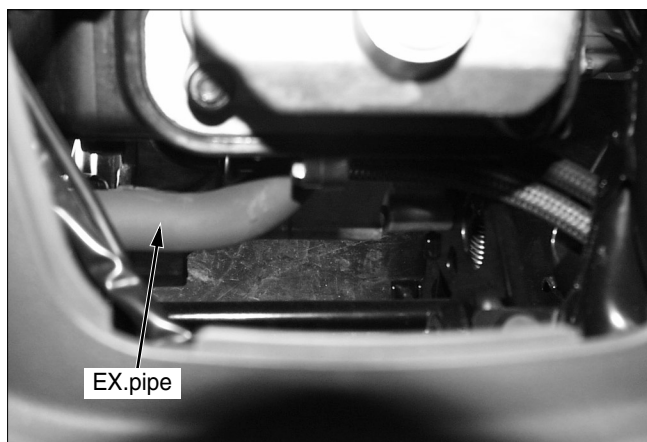
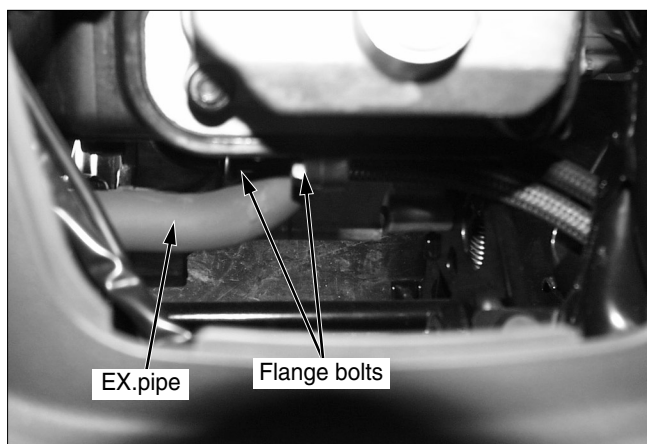
Installation

- Install the 2 flange bolts after securing the EX. pipe with the stud bolt of the cylinder comp.
- Install the gasket on the EX. muffler, connect the EX. pipe and install the 2 flange nuts temporarily.
- Install the 2 flange bolts on the R.crankcase temporarily.
- Tighten the 3 flange nuts to install the EX. muffler and EX. pipe.
- Install the flange bolt on the rear wheel mud guard.
- Tighten the muffler securing 2 flange bolts to install the R. crankcase.
- Tighten torque of the R. crankcase.

Torque: 5.5kg-m(55N.m, 40ft-lb)

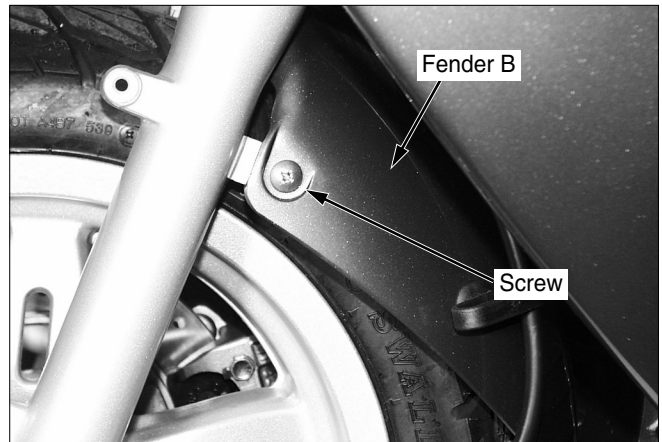
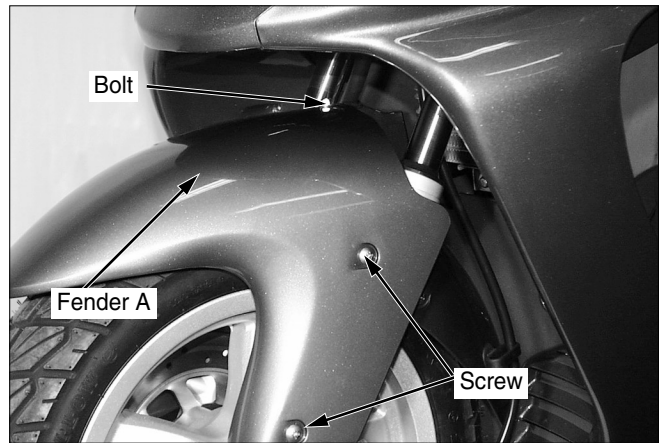
WARNING

- When installing the gasket, replace it with the new one.
- Check to see if there is any evacuation after installing the muffler.

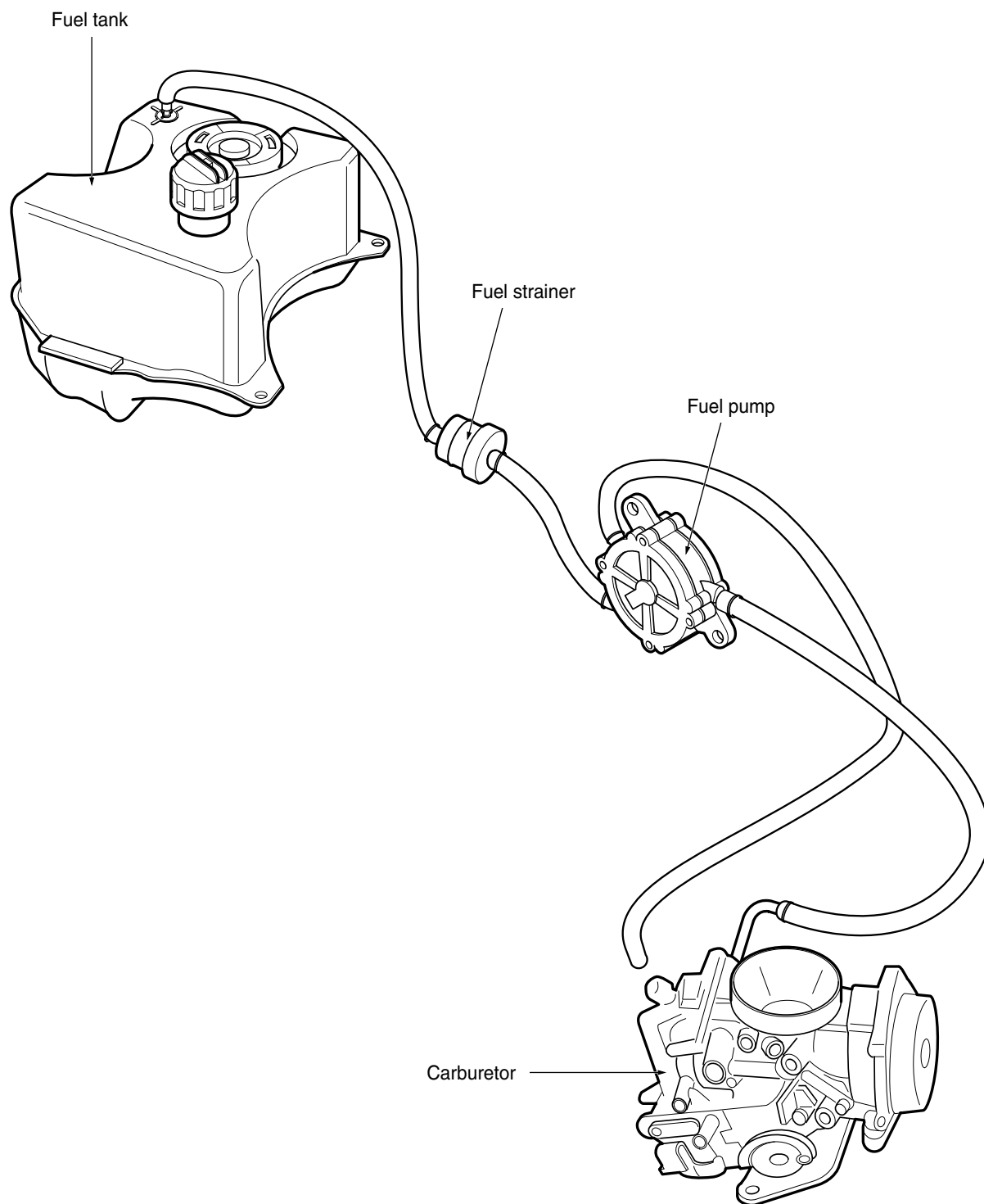


Front Fender

- Loosen the flange bolt connecting the front fender A and B.
- Loosen the 2 setting screws of the front fender A, and remove the front fender A.
- Loosen 1 setting screw of the front fender B.
- Remove the speedometer cable guide.
- Remove the front fender B.
- Install in the reverse order of removal.



MEMO



5. Fuel System

Service Information	5-1	Carburetor	5-4
Troubleshooting	5-2	Pilot Screw Adjustment	5-9
Fuel Tank	5-3	Fuel Pump Inspection	5-9
Air Cleaner Removal	5-4		

Service Information

General Safety

WARNING

- Gasoline is extremely flammable. Avoid fire in the work place, also paying particular attention to sparks. Furthermore, the evaporated (gasified) gasoline is highly explosive. Work in a well-ventilated areas.
- Exhaust gas contains poisonous substance. Do not keep engine running for a long period of time in a closed, or poorly ventilated area.

CAUTION

- Do not excessively bend or twist cable. Distorted or damaged cable may lead to mechanical malfunctions.
- Pay particular attention to the position of O-ring. Replace with new ones when disassembled.
- If it is desired to store a vehicle for a period longer than 1 month, drain gasoline out of the carburetor float chamber. Gasoline left in the float chamber will be deteriorated causing the slow jet to be clogged with deposits, and idling may become unstable.

Specifications

Fuel tank capacity: 7.5 l

Reserve fuel capacity: 1.2 l

Carburetor

Item	Standard
Type/Throttle bore	CV type (vacuum) 24.2mm
Model mark	BDS 26 -112
Main jet No.	#95
Pilot screw opening	1 and 1/2 turns
Pilot jet	13 mm
Idling speed	1800 ±100(rpm)
Throttle grip free play	2-6mm

Tool

Float level gauge

Troubleshooting

Unable to start the engine

- No fuel in the tank.
- Fuel cannot be supplied.
- Fuel excessively absorbed into the cylinder.
- Air cleaner clogged.
- No spark from plugs.

Unstable idling, unsatisfactory rotation

- Unsatisfactory idling adjustment.
- Mixture too lean or rich
- Air cleaner clogged.
- Secondary air absorbed into the intake system.
- Fuel system clogged.

Mixture too lean

- Carburetor jets clogged.
- Fuel tank cap air hole clogged.
- Fuel strainer screen clogged.
- Fuel tube kinked, pressed or clogged.
- Float valve malfunction.
- Oil level too low.

Mixture too rich

- Float valve malfunction.
- Oil level too high.
- Air jets clogged.

Fuel Tank

Remove

WARNING

- Gasoline is extremely flammable. Avoid fire during work, and pay particular attention to electric sparks. Furthermore, the evaporated (gasified) gasoline is highly explosive. Work in a well-ventilated areas.

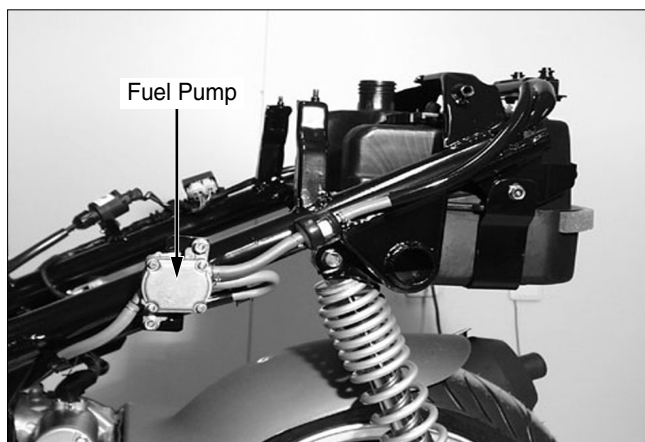
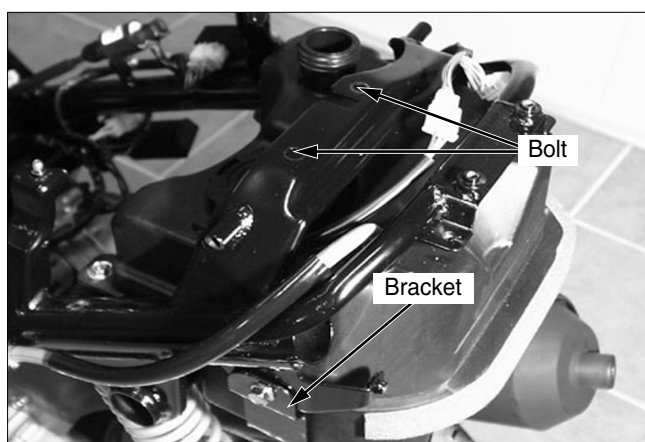
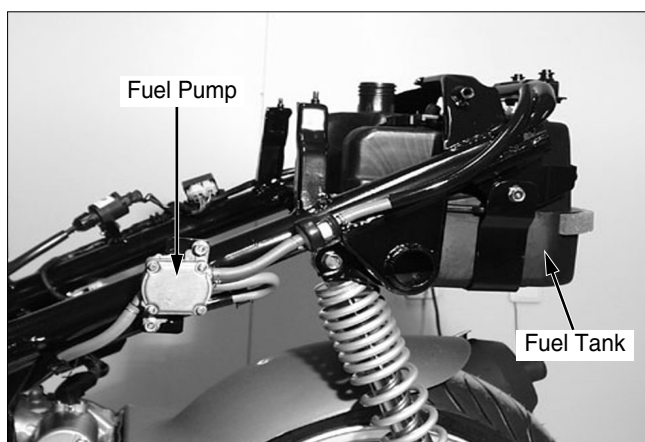
- Remove the following parts.
 - Luggage box (⇒ 4-5)
 - Rear carrier (⇒ 4-6)
 - Body cover (⇒ 4-6)
 - Center cover (⇒ 4-4)
 - Rear cover (⇒ 4-6)
 - Tail combination-light (⇒ 4-7)
- Remove the fuel tube from the fuel pump.
- Remove the fuel unit wire coupler.
- Loosen the 2 top fuel tank bolts.
- Loosen the 2 bottom fuel tank bracket bolts.
- Remove the fuel tank bracket.
- Remove the fuel tank.

Installation

Install in the reverse order of removal.

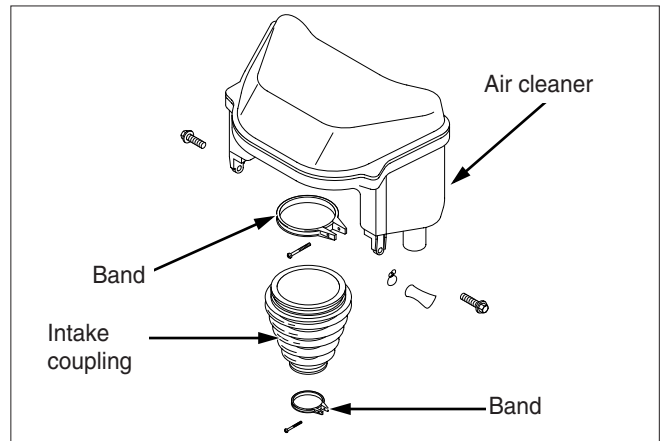
NOTES

- Check for gasoline leakage.
- "Gasoline" mark is on the fuel tank cap. Check this mark when filling gasoline.



Air Cleaner Removal

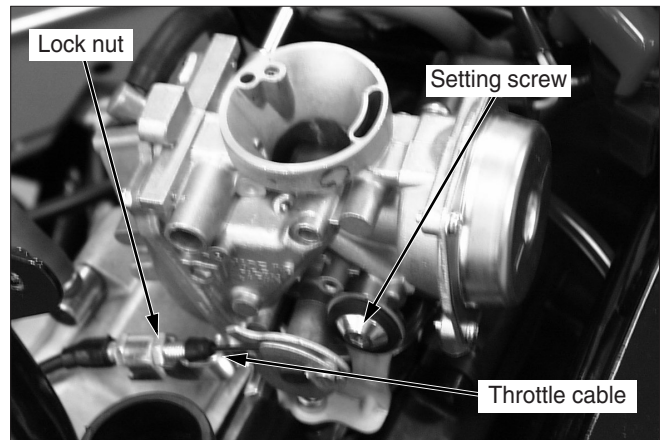
- Remove the luggage box. (⇒ 4-5)
- Loosen the 2 R/L bolts attached to the frame body.
- Loosen the band attached to the lower part(carburetor) of the intake coupling and remove the air cleaner.
- Install in the reverse order of removal.



Carburetor

Remove

- Remove the air cleaner. (⇒ 5-4)
- Loosen the throttle cable lock nut, and remove the throttle cable from the carburetor.
- Remove the auto cock cord.
- Loosen the set plate setting screw.
- Loosen the chamber connecting band and the carburetor insulator band.
- Remove the carburetor.

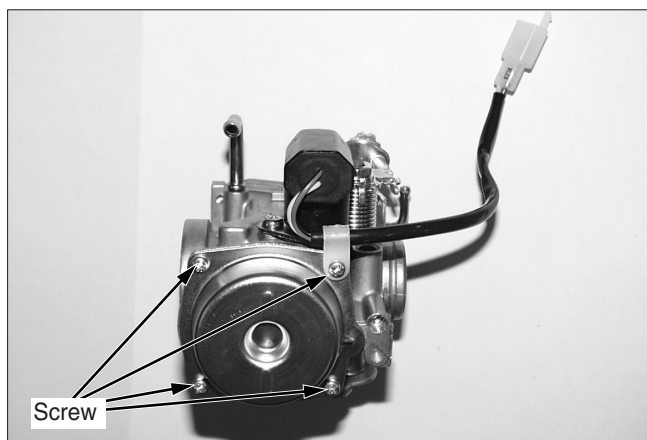


Vacuum Chamber Removal

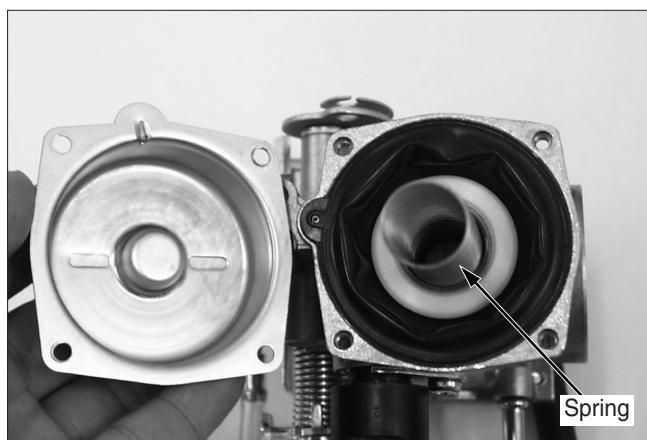
- Remove the fuel tube and drain tube.



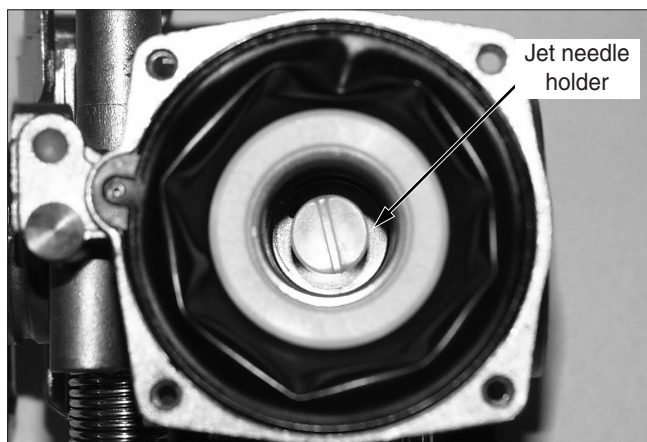
- Remove the 4 vacuum chamber screws.



- Remove the compression spring, vacuum piston, and diaphragm.

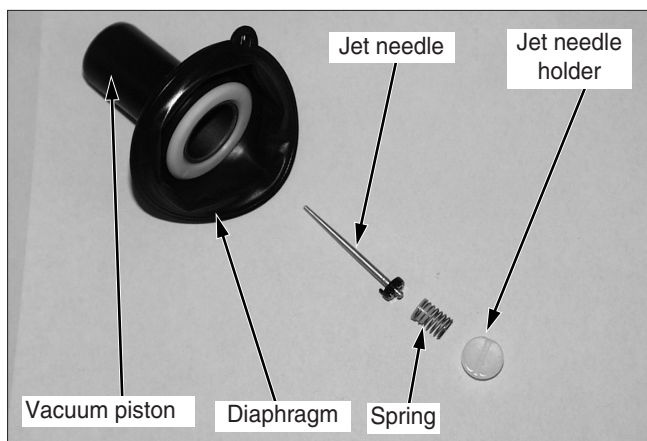


- Turn the jet needle holder with a \ominus screwdriver, and remove the jet needle holder, spring, and jet needle.



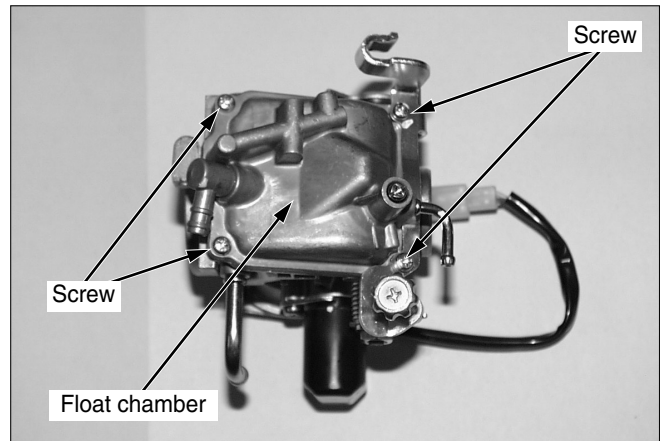
Inspection

- Check the vacuum piston for wear, cracks, scratches or other damage.
- Check the jet needle edge for extensive wear, twist or damage.
- Check if the diaphragm has become thin or cracked, and check the spring for wear or damage.

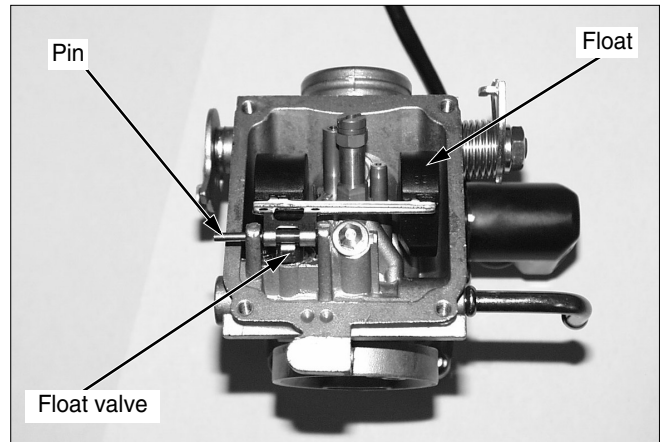


Float Chamber/Float/Jet Removal

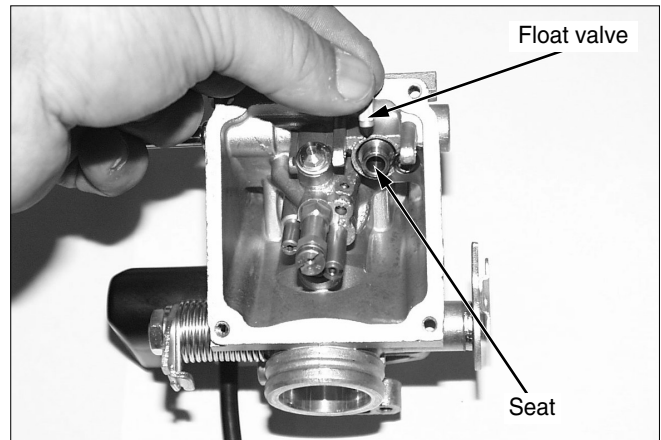
- Loosen the 4 float chamber screws.



- Remove the float pins, float, and valve.



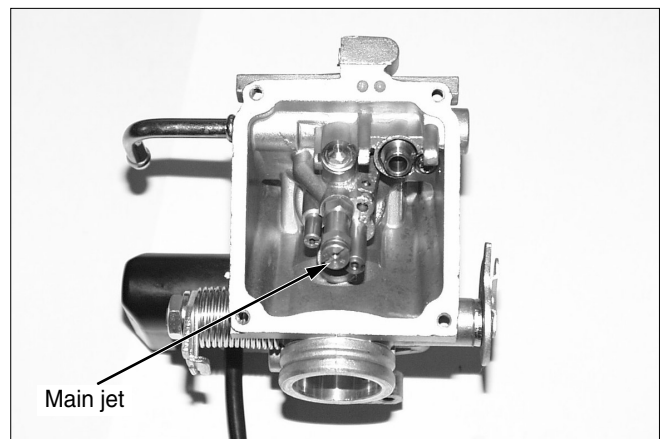
- Check the float valves and seats for cracks or damage.
- Check the float valve operation.



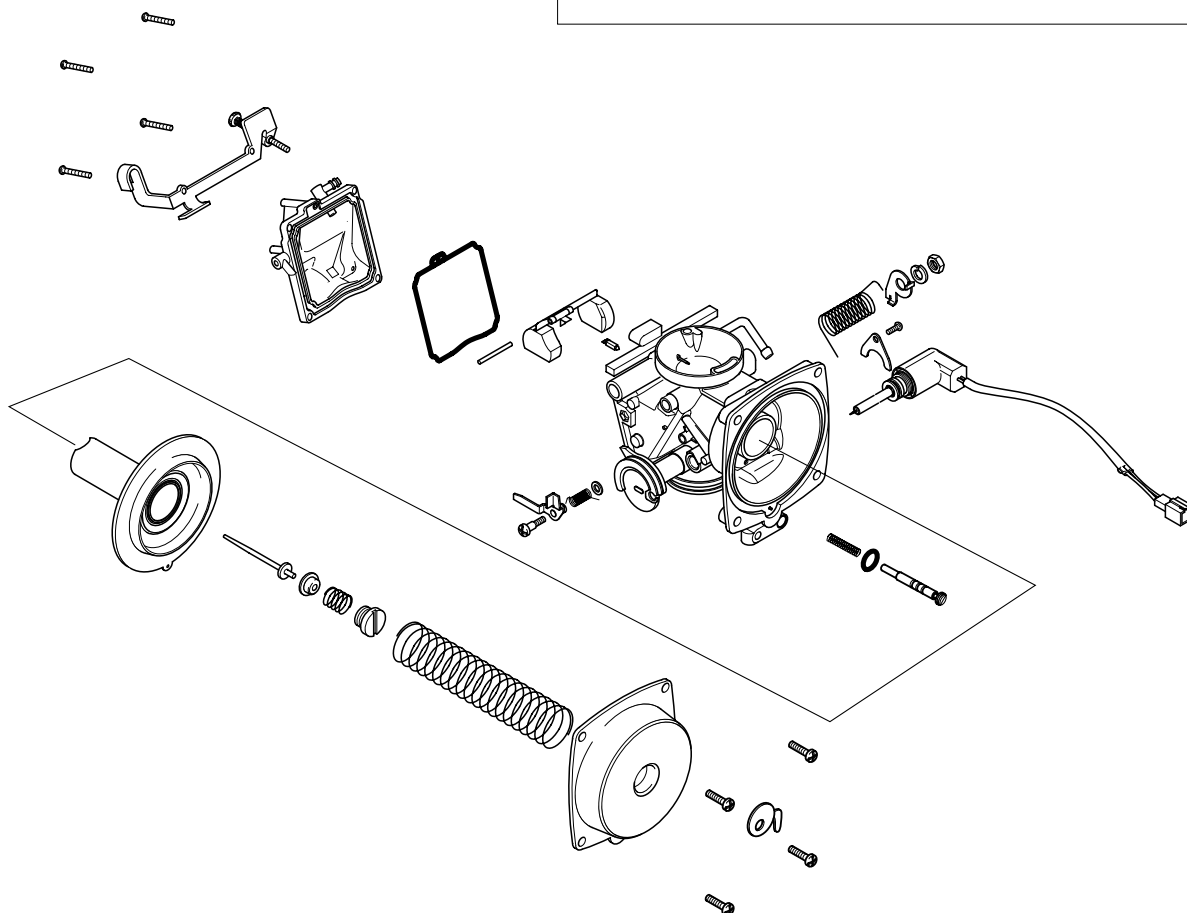
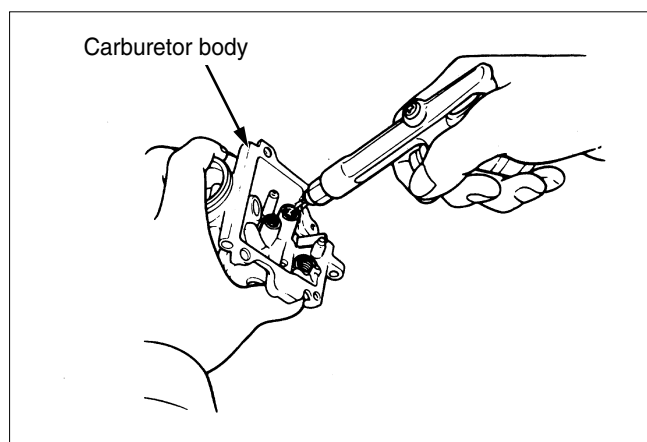
- Remove the main jet, needle jet holder, and needle jet, and remove the slow jet.

NOTE

- Prior to unfastening the pilot screws, count the number of turns until the screws are lightly tightened, so that the screws can be returned to the original condition after assembling.
- Do not tighten the pilot screws too hard as it may cause damage to the screw seat.



- Clean all jets and holes with an air hose.



- Assemble the needle jet, needle jet holder, main jet, and slow jets.
- Assemble and turn the pilot screw to the number of turns memorized.

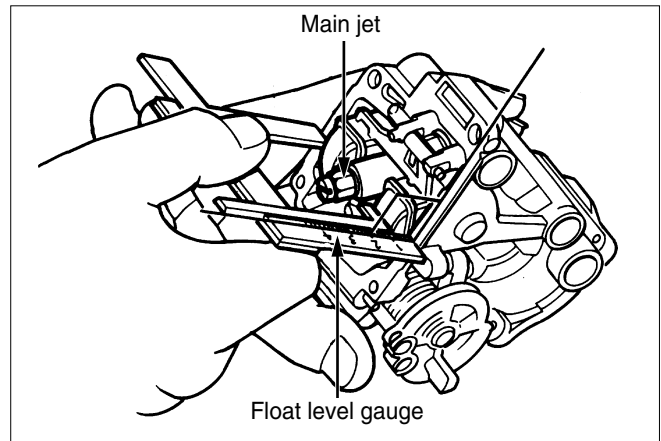
Fuel System

Float Level

- Install the float valves, and float pins.
- Check the float valve level.

Float level: 13mm

- Assemble the float chamber.



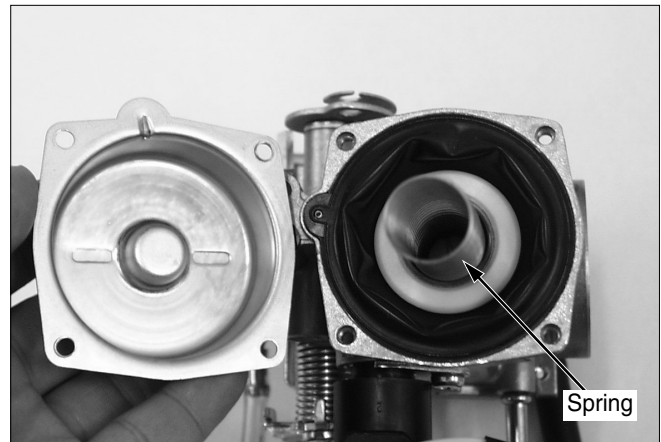
Vacuum Chamber Assembly

- Insert the jet needle and spring to the piston, and install the holder.

NOTE

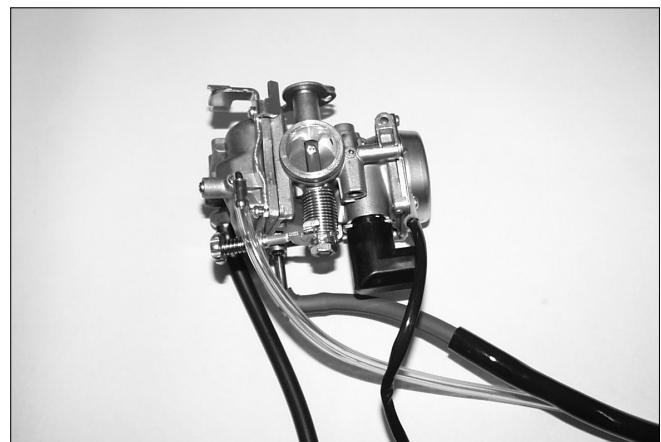
- Match the diaphragm with the body notch.

- Install the compression spring and vacuum chamber.

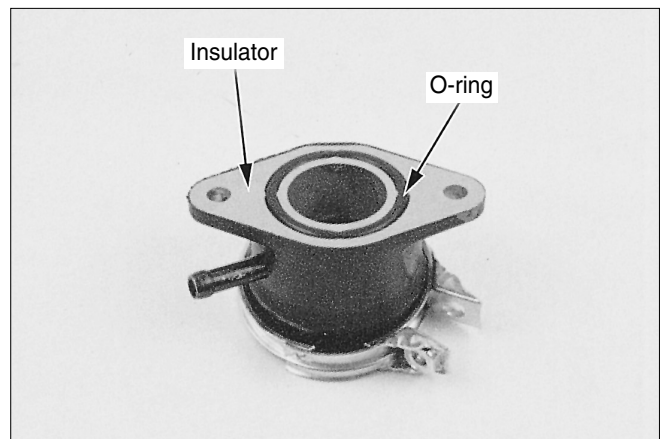


Carburetor Installation

- Assemble the air vent, fuel tubes, and drain tubes to the carburetor.



- Check the insulator O-ring for wear or damage, and install the insulator.



- Connect the Autobystarter cable to the terminal.

- Assemble the carburetor insulator and connecting tube to the carburetor, and tighten the band screw.
- Connect the throttle cable to the carburetor.
- Rearrange the tube passing positions. (⇒ 1-10)
- Adjust the throttle operation.
- Adjust the carburetor idling.
- Adjust the pilot screws.
- Check on oil leakage.

Pilot Screw Adjustment

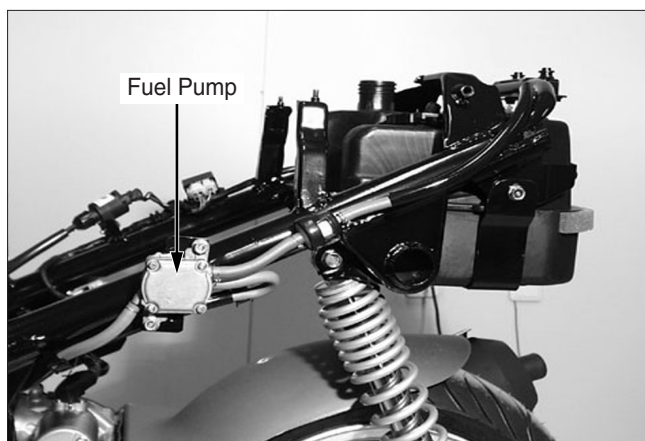
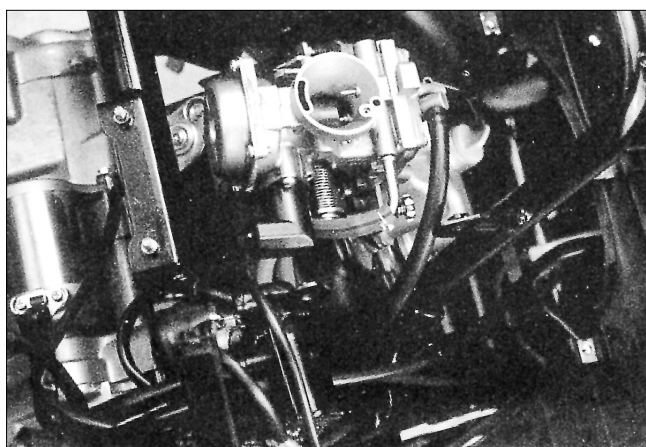
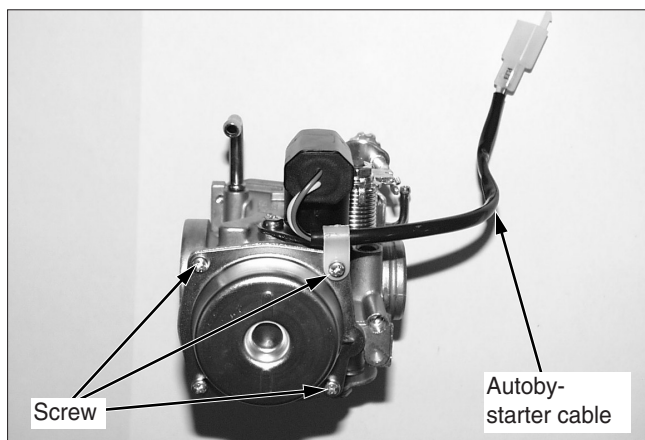
NOTE

- Take due precautions during the assembly work to prevent damage to the pilot screw seat.
- Gently tighten the pilot screw clockwise, and unscrew in reverse for 2 turns.
- This is the optimal status of the pilot screw.
- Start the engine, and warm up the engine to a normal operation level temperature.
- Adjust idling speed with the throttle stop screw.
Idling speed: $1,800 \pm 100$ rpm
- Slowly turn the pilot screw until the engine stops running, and unscrew in reverse for 1 turn.
- Start the engine, and adjust the idling speed by turning the throttle screw, if necessary.

Fuel Pump Inspection

NOTE

- Before checking dispensing volume, operate the engine in warm state to adjust idling rpm to specified range.
 - Start the engine and keep in the idling state.
 - Fuel pump is considered as satisfactory if dispensing volume of more than 28cc in 10 seconds is obtained after disconnecting fuel pump from carburetor and dispensing fuel over 5 seconds.
 - If specified dispensing volume cannot be obtained, check fuel tube, negative pressure tube fuel strainer.
- If there is no abnormality, replace fuel pump with assy.



MEMO

6. Engine Removal

Service Information	6-1
Engine Removal	6-2

Service Information

General Safety

NOTE

- Use a jack to remove or install the engine. Support the motorcycle with a jack firmly, taking precautions not to damage the frame, engine, cable or harness.
 - Attach tape to the frame to protect it during the engine removal or installation.
-
- The following works can be carried out without removing the engine from the vehicle body.
 - Transmission (⇒ Section 11)
 - A.C. generator (⇒ Section 8)
 - Kick starter, continuously variable transmission(⇒ Section 7)
 - Cylinder head, cylinder, and piston (⇒ Section 9 and 10)
 - Carburetor (⇒ Section 5)
 - Oil pump (⇒ Section 2)
 - Items to be worked after removing engine
 - Crankshaft, crankshaft bearing, crank case bearing
 - Engine oil capacity: 1.0 l -when disassembled

Torque values:

Engine hanger bolt (Front): 2.7kg-m(27N.m, 20ft-1b)
(Rear) : 3.5kg-m(35N.m, 25ft-1b)

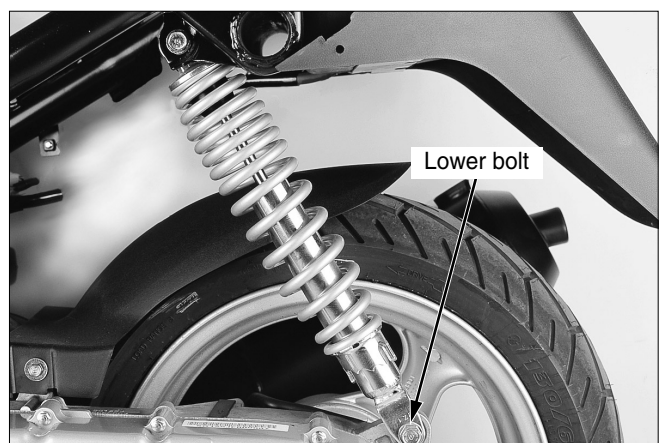
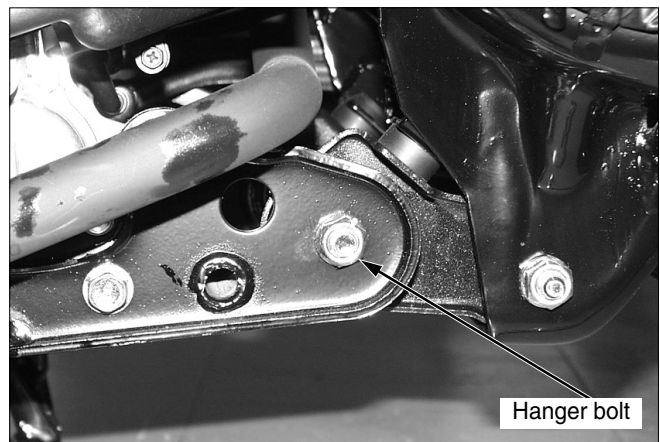
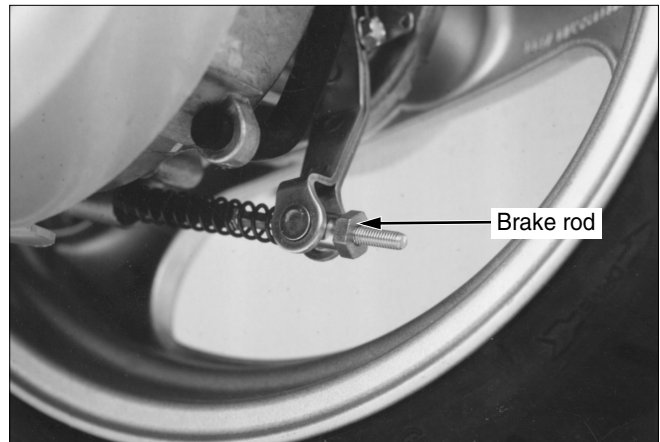
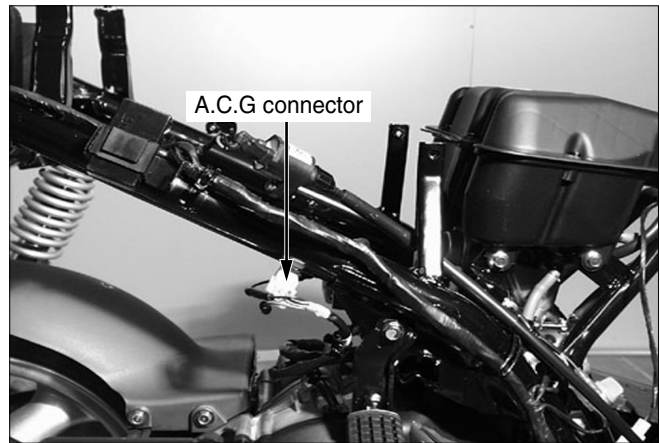
Engine Removal

- Drain the engine oil.
- Remove the following parts.
 - Luggage box (⇒ 4-5)
 - Frame body cover (⇒ 4-6)
 - Air cleaner (⇒ 5-4)
- Remove A.C. generator, and starter motor cable.

- Remove the high-tension cord.
- Remove the carburetor. (⇒ 5-6)
- Remove the rear brake rod.
- Remove the fuel tube.
- Remove the L.floor side cover.
- remove the radiator hose.

- Loosen the 3 rear mud-guard setting bolts.
- Loosen the engine hanger mounting bolt.

- Loosen the rear cushion lower bolt.



- Remove the engine.
(with the muffler and rear wheel attached)
- Remove the muffler. (⇒ 4-9)
- Remove the rear wheel. (⇒ 13-3)



Installation

- Install in the reverse order of removal.

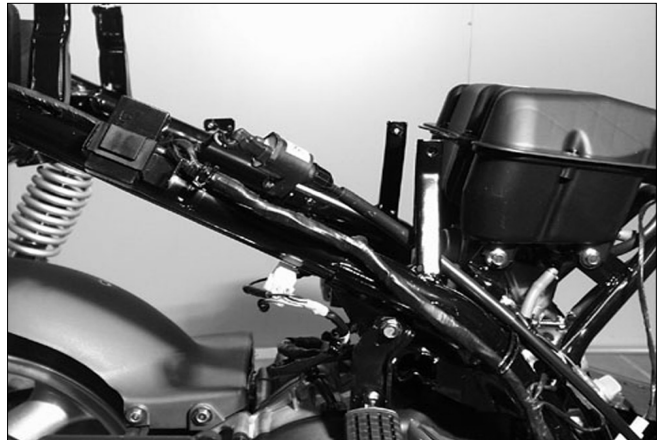
NOTE

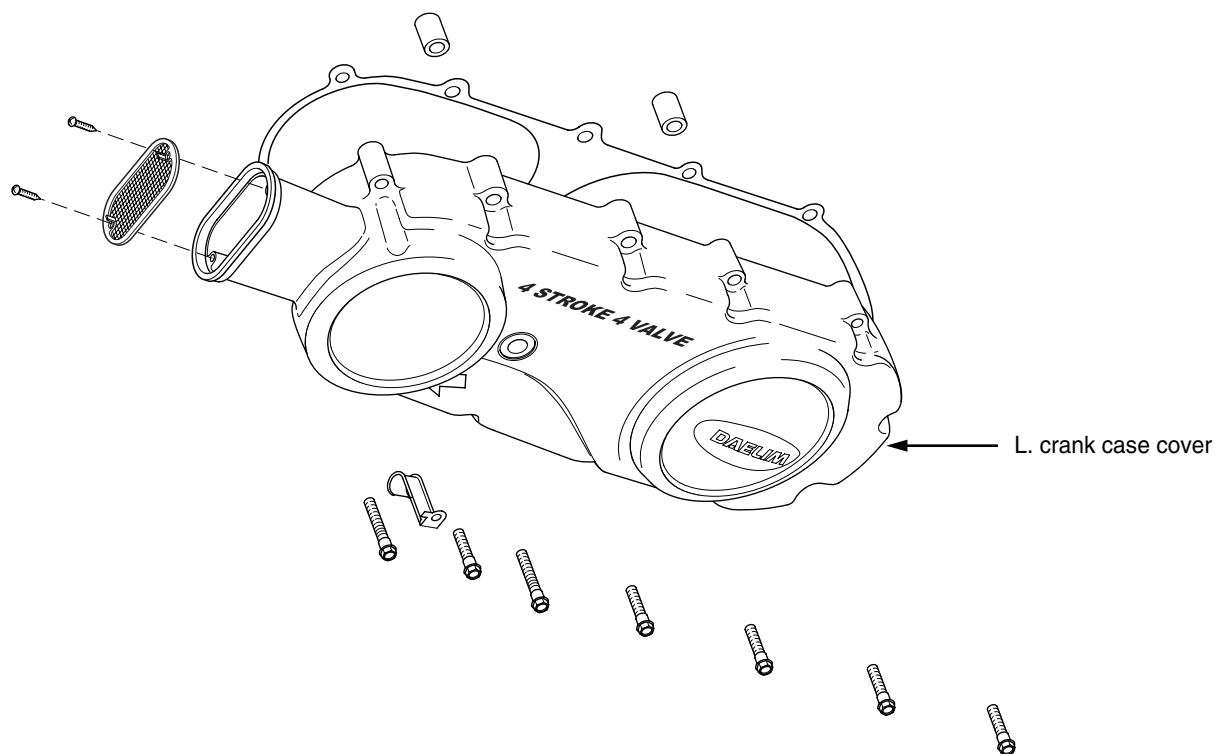
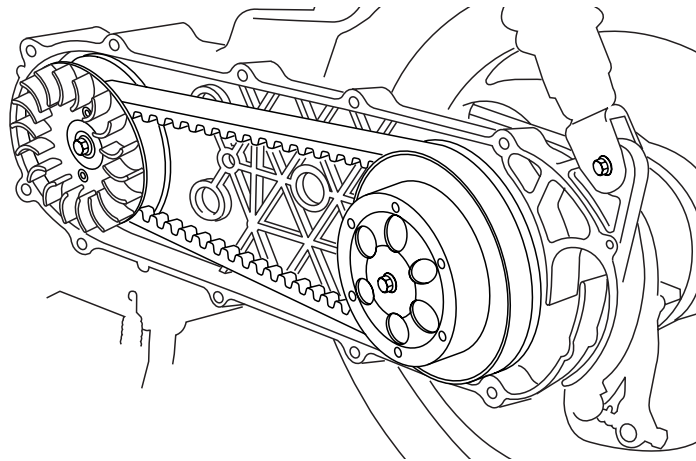
- Take precautions not to damage wiring and cable.
- Take precautions not to damage the threaded part of bolts.
- Arrange the cable, tubes and wiring in the right positions.

Toque:

**Engine hanger bolt:(Front)2.7kg-m(27N.m, 20ft-lb)
(Rear)3.5kg-m(35N.m, 25ft-lb)**

- Check the following after the engine is assembled.
 - Engine oil
 - Electric systems
 - Adjust the rear brake free play.





7. L. Crank Case Cover/Kick Starter/Continuously variable transmission

Service Information	7-1	Drive Belt	7-7
Troubleshooting	7-1	Movable Drive Face	7-9
L. Crank Case Cover	7-2	Clutch/Disassembly	7-12
Kick Starter	7-4	Driven Face Disassembly	7-12

Service Information

General Safety

- Take precautions not to apply grease or oil to the drive belt and pulley surface.

NOTE

- Take precautions not to apply the grease oil to the movable drive face or weight roller.

7

Specifications

Unit:mm(in)

Item	Standard	Service Limit
Movable drive face bushing inner diameter	24.000-24.013(0.9449-0.9454)	24.040(0.9465)
Drive face boss outer diameter	23.980-23.993(0.9441~0.9446)	23.960(0.9433)
Drive belt width	22(0.8661)	20.5(0.8071)
Weight roller outer diameter	10.95-20.05(0.4311-0.7893)	19.5(0.7677)
Clutch outer and inner diameter	120.0-120.5(4.7244-4.7441)	120.5(4.7441)
Driven face spring play	97.85(3.8524)	97.23(3.8279)
Driven face outer diameter	37.965-37.985(1.4946-1.4955)	37.911(1.4926)
Driven face inner diameter	38.0-38.025(1.4961-1.4970)	38.060(1.4984)

Troubleshooting

Engine starts but motorcycle does not work.

- Drive belt worn.
- Ramp plate damaged.
- Clutch shoe worn or damaged.
- Movable driven face spring cut.

Engine stops, or the vehicle runs suddenly, after starting.

- Clutch shoe spring cut.

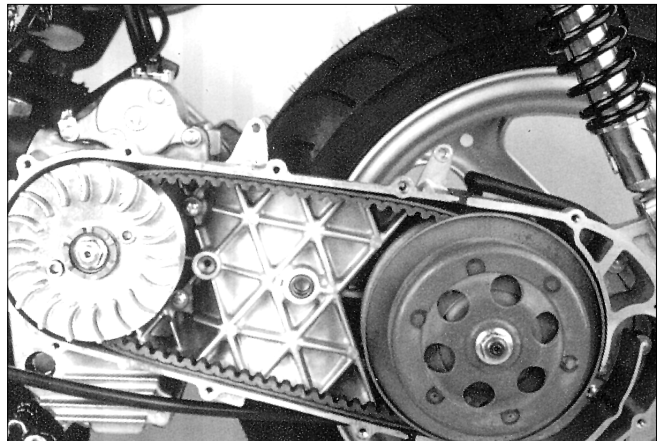
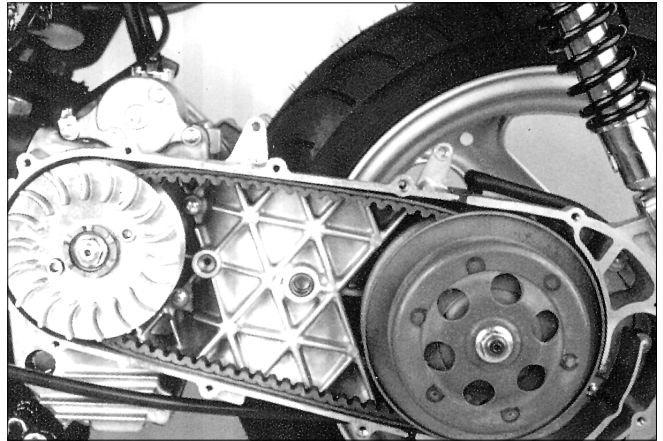
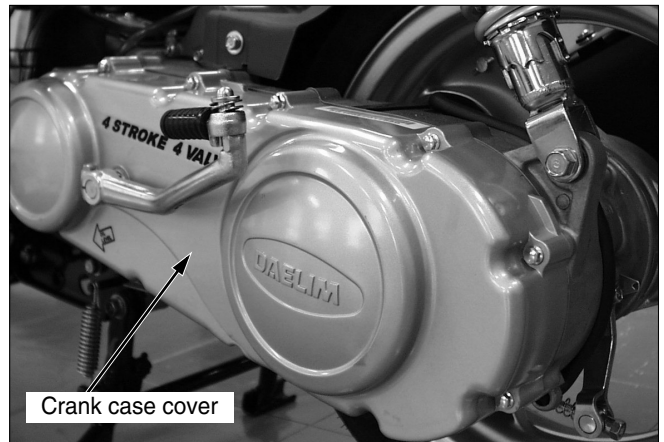
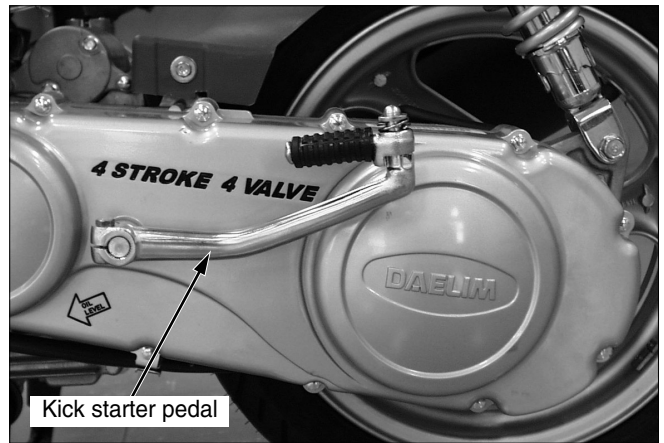
Vehicle unable to run at the maximum speed, or lack of output

- Drive belt worn.
- Defective movable driven face spring.
- Weight roller worn.
- Pulley face contaminated.

L. Crank Case Cover

Removal

- Loosen the kick starter pedal bolt.
- Remove the kick starter pedal.
- Remove the cover side cooling hose.
- Loosen the L. crank case cover bolt, and remove the cover.
- Remove the gasket and dowel pin.



Installation

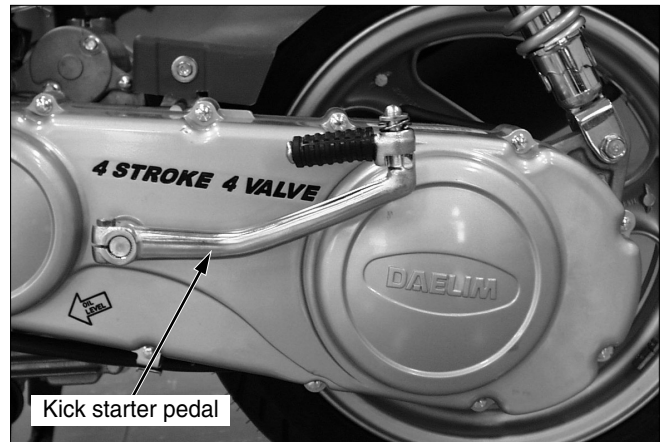
- Remove the crank case gasket, and install a new gasket and dowel pin.

L. Crank Case Cover/Kick Starter/Continuously Variable Transmission

- Tighten the L. crank case cover bolt.
- Assemble the cooling hose to the cover.



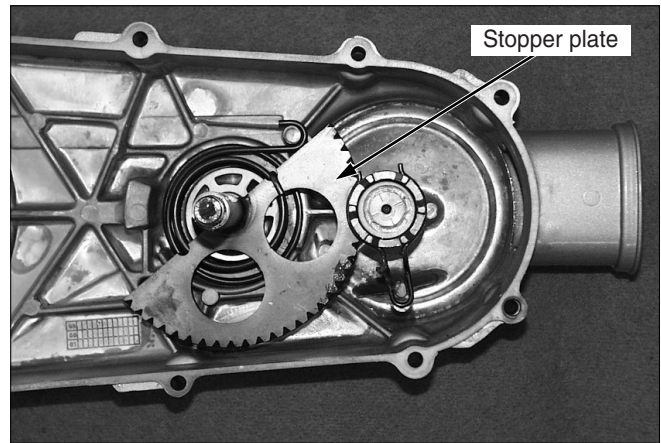
- Install the kick starter pedal and tighten bolts.
Torque value: 2.2kg-m (22N.m, 16ft-lb)
- Feed the DAELIM genuine oil to the cylinder head cover.



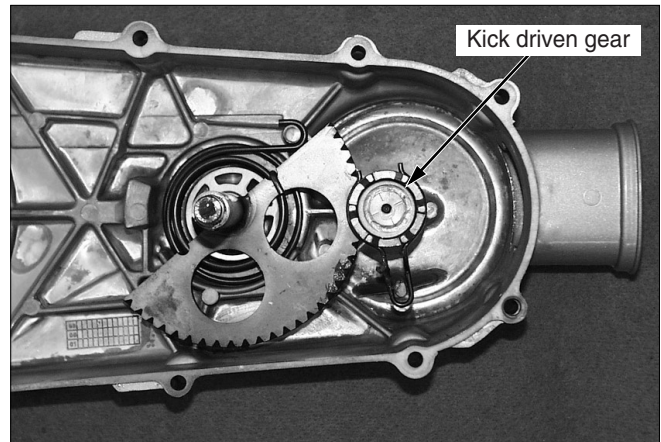
Kick Starter

Removal

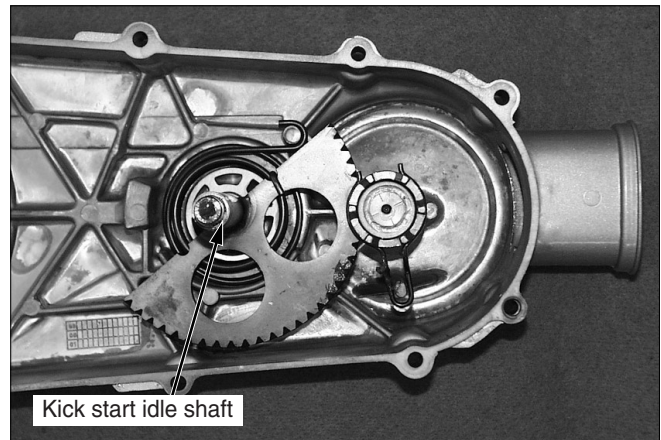
- Remove the L. crank case cover.(⇒ 7-2)
- Remove the kick starter spring from the kick return stopper plate on the L. crank case cover.
- Remove the kick starter spindle.



- Remove the kick driven gear.

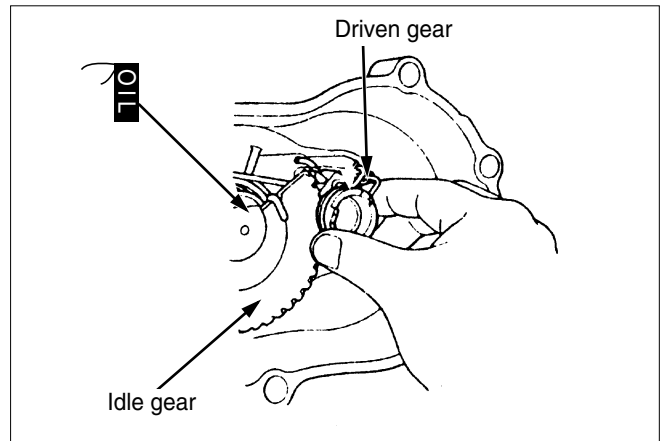


- Remove the kick starter idle shaft.



L. Crank Case Cover/Kick Starter/Continuously Variable Transmission

- Disassemble the kick starter driven gear.



- Disassemble the kick starter idle shaft.

Kick Starter Inspection

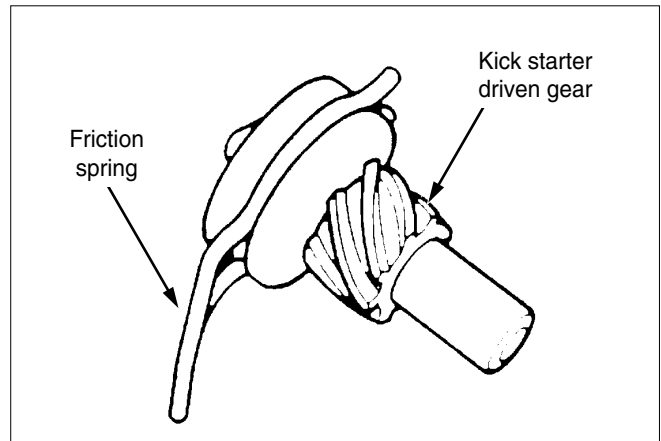
- Check the kick starter spindle for wear or damage.
- Check the return spring for defects or damage.



- Check the kick starter spindle bushing and the idle gearshaft assembly for damage.

L. Crank Case Cover/Kick Starter/Continuously Variable Transmission

- Check the kick starter driven gear for wear and damage. Check the friction spring for defects and damage.

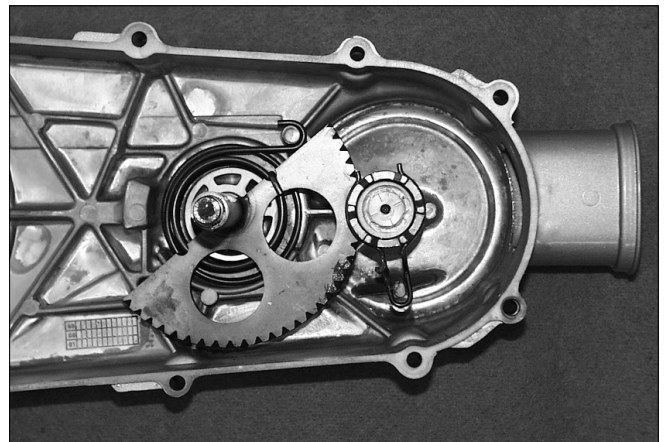
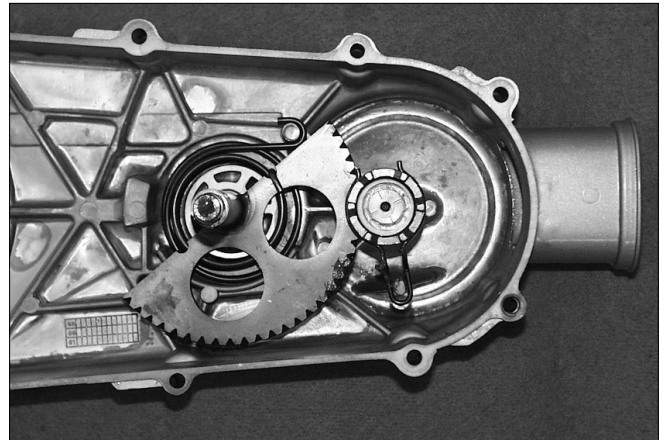
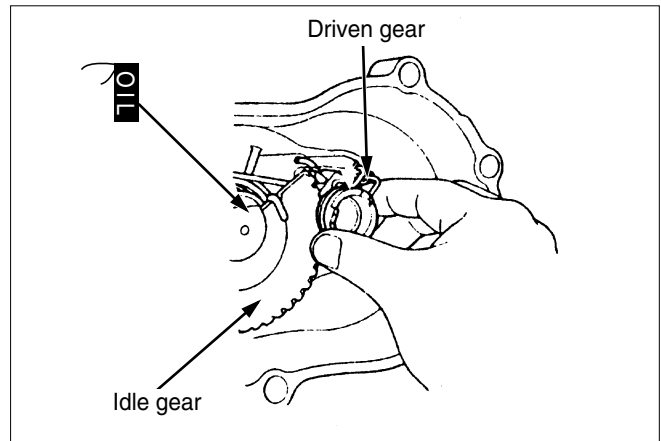


Kick Starter Assembly

- Assemble the kick starter idle gear shaft and the kick driven gear comp to the left cover.

NOTE

- Apply grease to the spring groove, kick driven gear, and idle gear wedge.
- As shown in the figure, match the kick driven gear friction spring with the L. crank case cover groove, and assemble.
- Match the kick starter spindle with the idle gear punch mark, and assemble.
- Hold, and turn, in reverse, the kick return spring arm.
- Assemble the kick stopper plate.

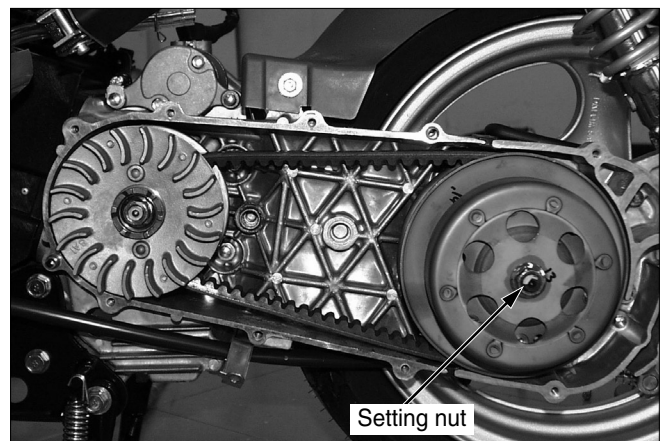


Drive Belt

Removal

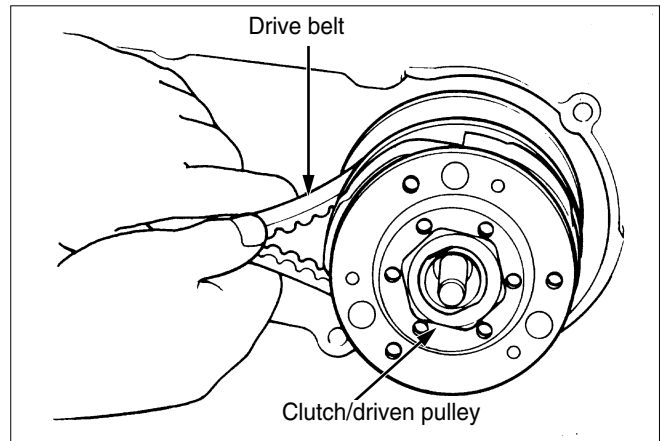
- Remove L. crank case cover. (⇒ 7-2)
- Loosen the clutch outer setting nut with a universal holder.

Tool: Universal holder



L. Crank Case Cover/Kick Starter/Continuously Variable Transmission

- Remove the drive belt from the clutch / driven pulley, as shown in the figure.



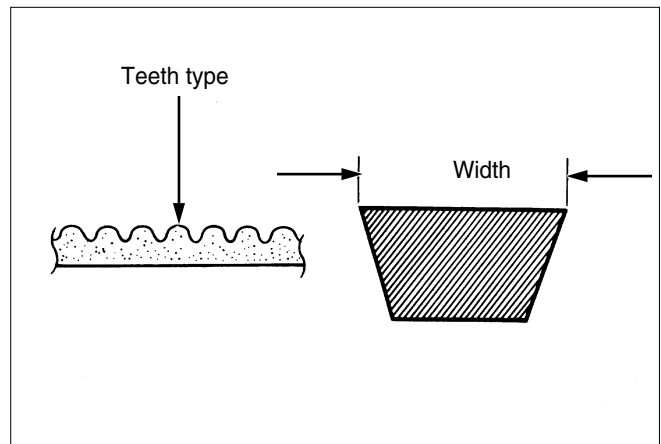
Drive Belt Inspection

- Check the drive belt for cracks, deteriorate and abnormal wear. Replace the defective drive belt.
- Check the drive belt width.

Service limit: 20.5mm (0.8071in)

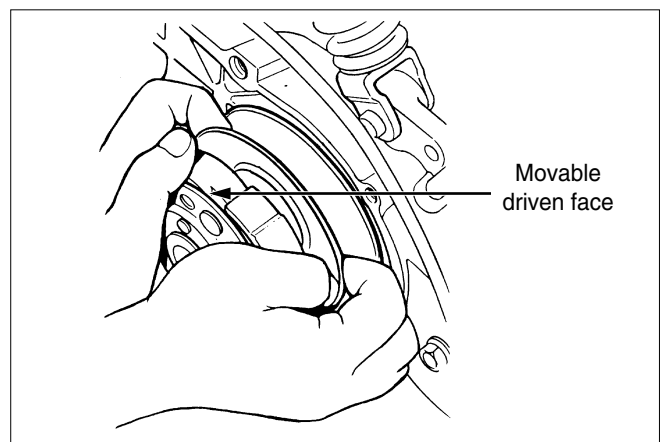
NOTE

- Use Daelim genuine parts.
- Be careful not to apply oil to the belt pulley contact.



Drive Belt Assembly

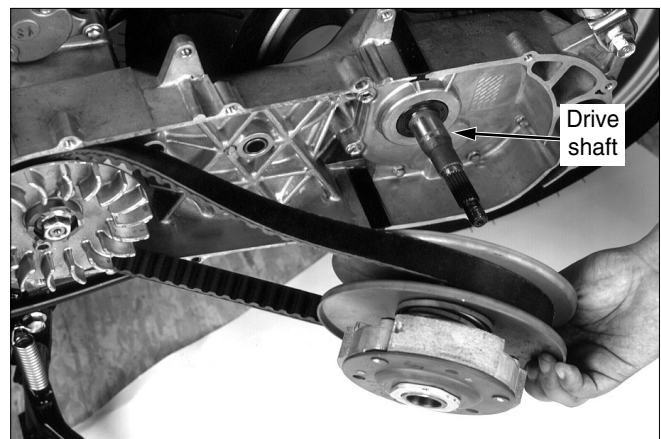
- Temporarily assemble the clutch / driven pulley to the drive shaft.
- As shown in the right side figure, turn the movable driven face clockwise, and assemble the drive belt to the driven pulley while widening the driven pulley belt contact part.



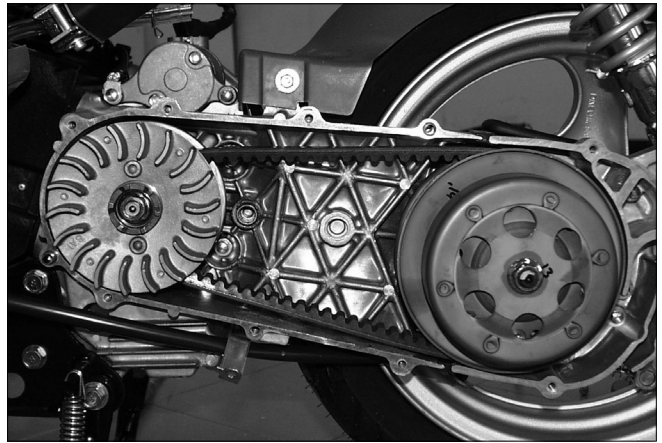
- Assemble the clutch / driven pulley to the drive shaft.

NOTE

- Make sure that the movable drive face do not return to the original position until the clutch/driven pulley are completely assembled to the drive shaft.



- Assemble the clutch outer to the drive shaft.
- Fix the clutch outer with the universal holder, and fasten with the setting nuts.
Torque value: 5.5kg-m (55N.m,40ft-lb)
Tool: Universal holder
- Assemble the L. crank case cover.

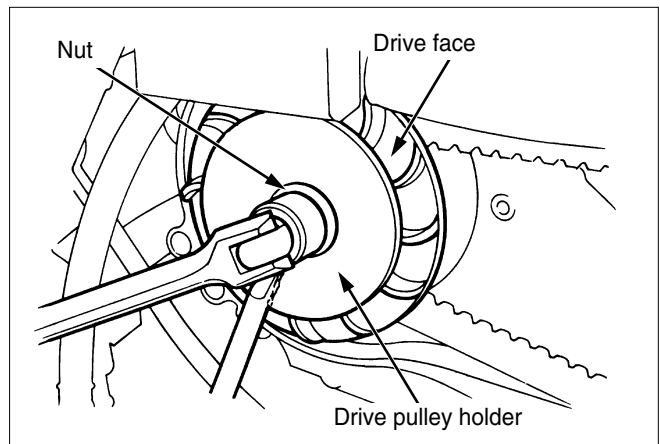


Movable Drive Face

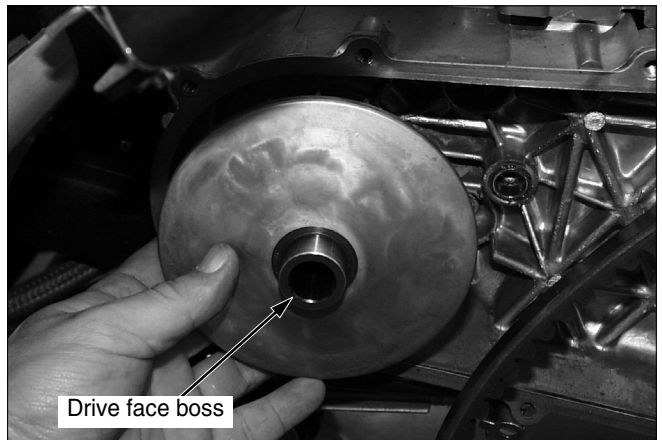
Removal

- Remove the L. crank case cover.
- Fix the drive pulley holder to the crank shaft.
- Remove the drive pulley nut, washer and drive face.

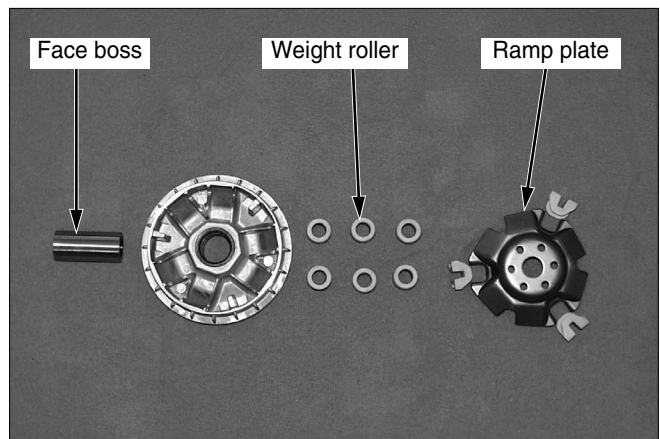
Tool: Drive pulley holder



- Remove the movable drive face and the drive face boss.



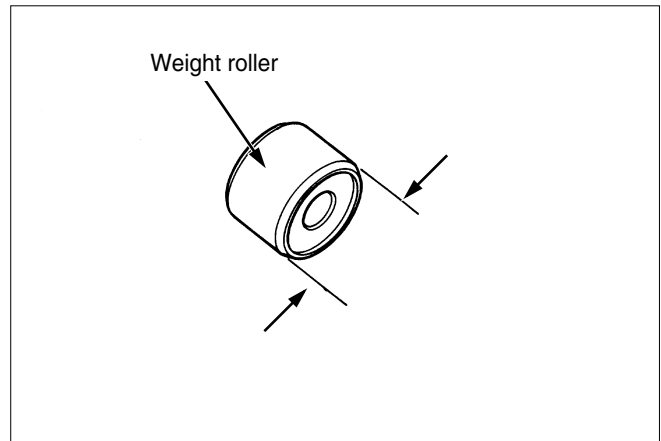
- Remove the ramp plate, weight roller, and O-ring from the movable drive face.



Movable Drive Face Inspection

- Check the weight roller for wear or damage.
- Check the weight roller outer diameter.

Service limit: 19.5mm (0.767in)

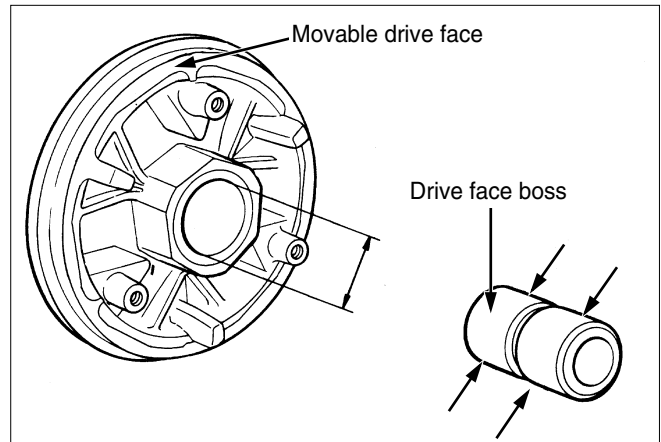


- Check the movable drive face boss for wear or damage.
- Check the outer diameter of the movable drive face boss.

Service limit: 23.96mm (0.943in)

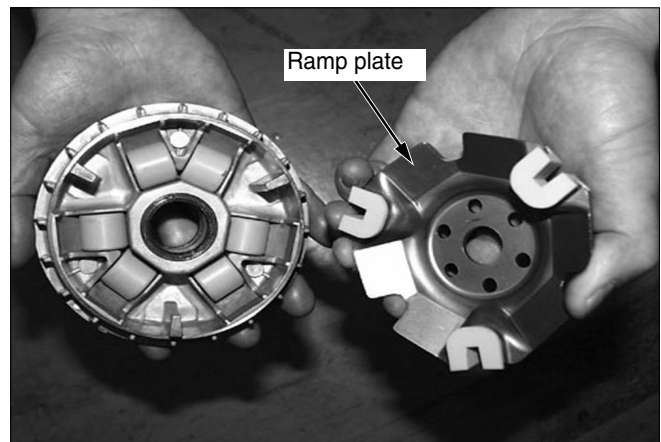
- Check the inner diameter of the movable drive face.

Service limit: 24.043mm (0.946in)



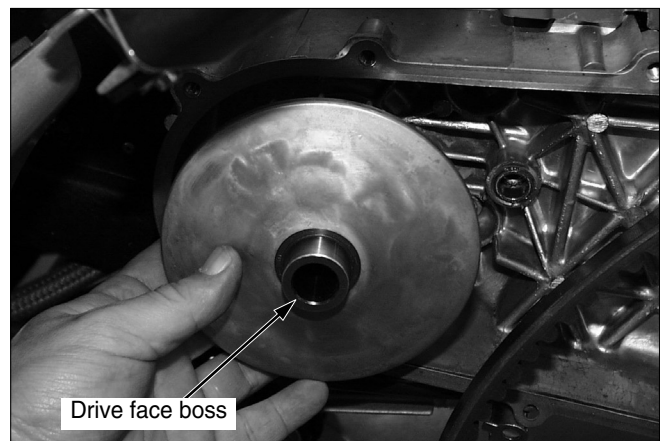
Movable Drive Face Assembly

- Supply grease on the inner side of the movable drive face boss part.
- Assemble oil seal in the both sides of the movable drive face boss part.
- Assemble the weight roller.
- Assemble the ramp plate.
- Connect the movable drive face boss together.



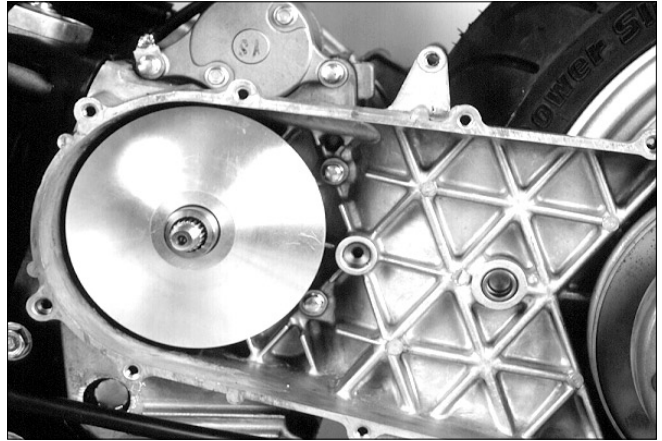
NOTE

- Do not apply the grease to the pulley surface of the movable drive face.
- If grease is applied, remove the grease.

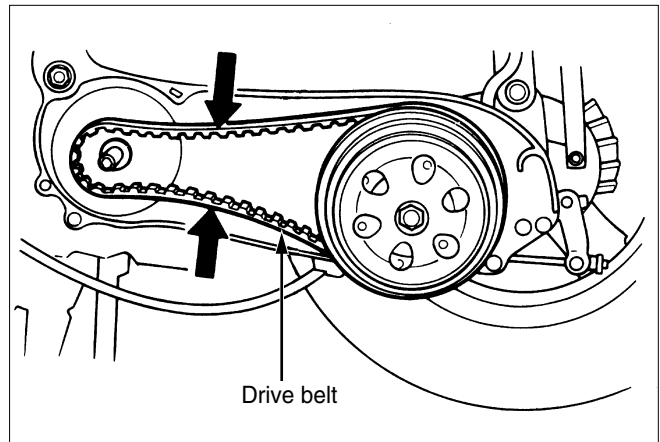


L. Crank Case Cover/Kick Starter/Continuously Variable Transmission

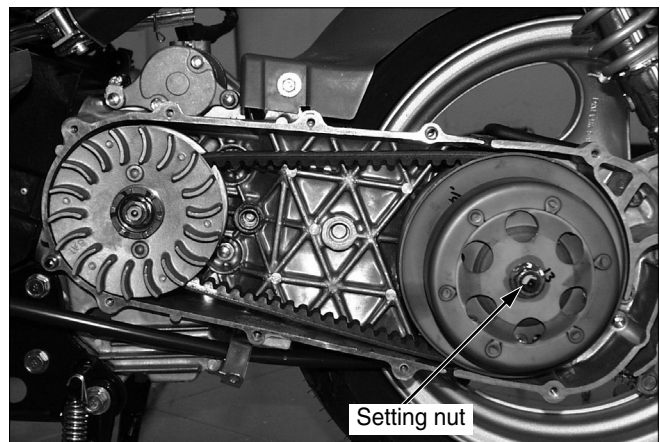
- Assemble the movable drive face boss and the movable drive face to the crank shaft.



- Assemble the assembly drive belt to the crank shaft.

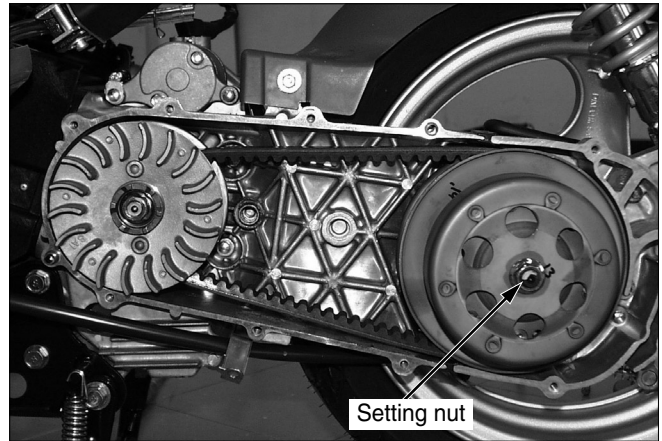


- Tighten the drive pulley nut with a drive holder.
Torque value: 5.5kg-m (55N.m,40ft-lb)
Tool: Drive pulley holder

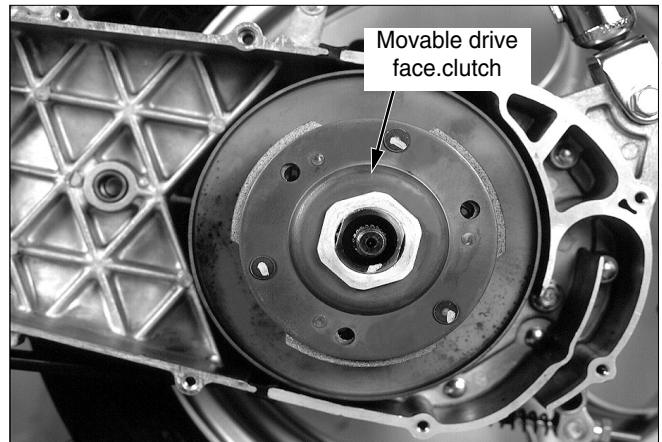


Clutch Disassembly

- Remove the L. crank case cover. (⇒ 7-2)
- Disassemble the movable drive face. (⇒ 7-9)
- Disassemble the drive belt. (⇒ 7-7)
- Use a universal holder to hold the clutch outer, and remove the clutch outer after disassembling the 12mm flange nut.

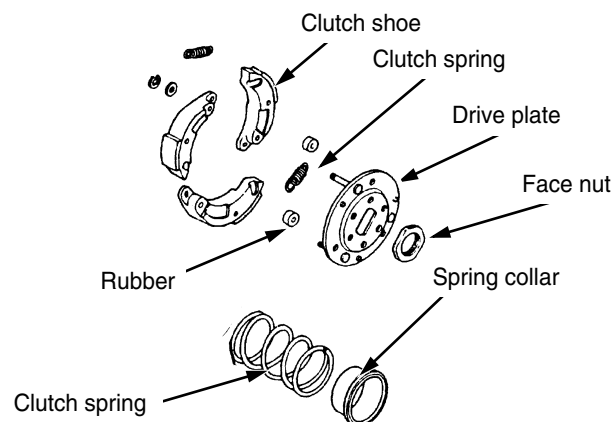
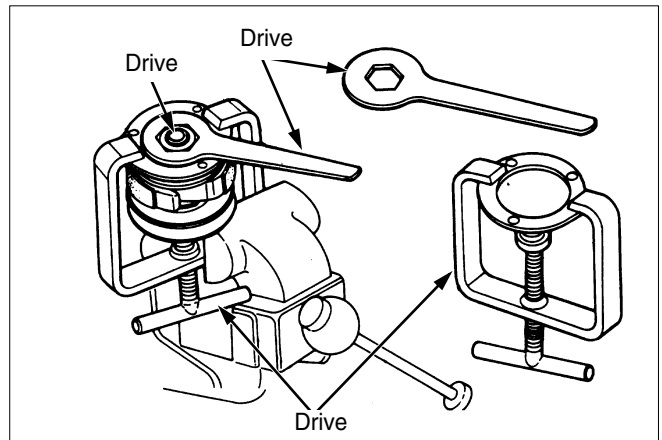


- Remove the movable driven face and the clutch from the drive shaft.



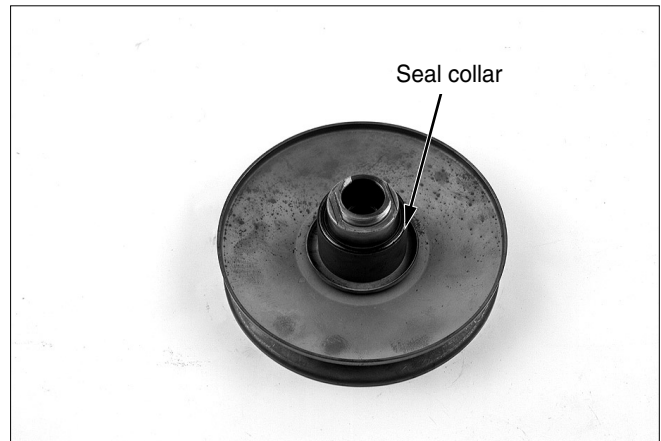
Driven Face Disassembly

- Disassemble the 30mm special nut.

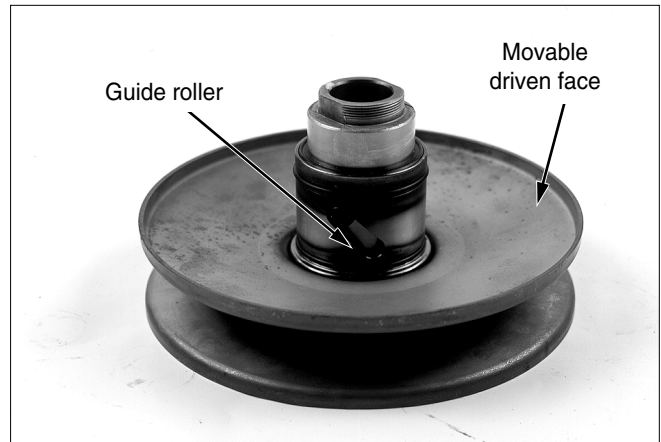


L. Crank Case Cover/Kick Starter/Continuously Variable Transmission

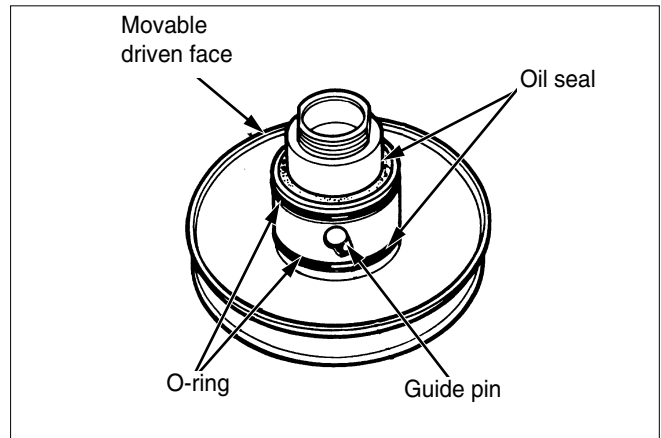
- Remove the seal collar.



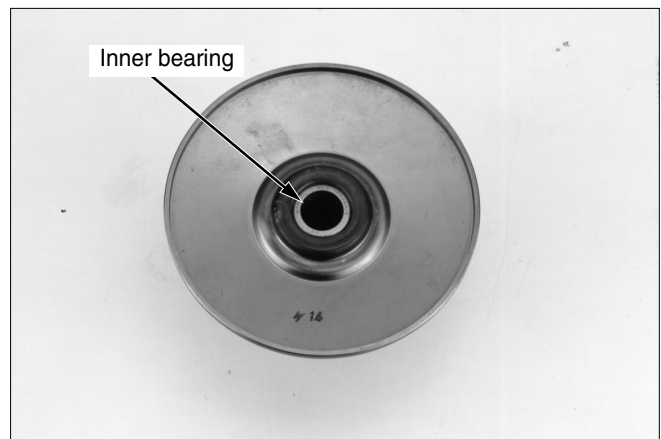
- Remove the guide roller and its pin.
- Remove the movable driven face.
- Remove the O-ring from the movable drive face.



- Remove the oil seal from the movable driven face.

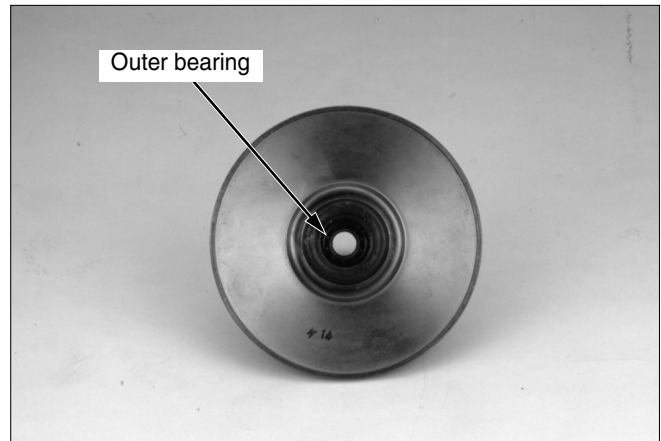


- Remove the inner bearing.



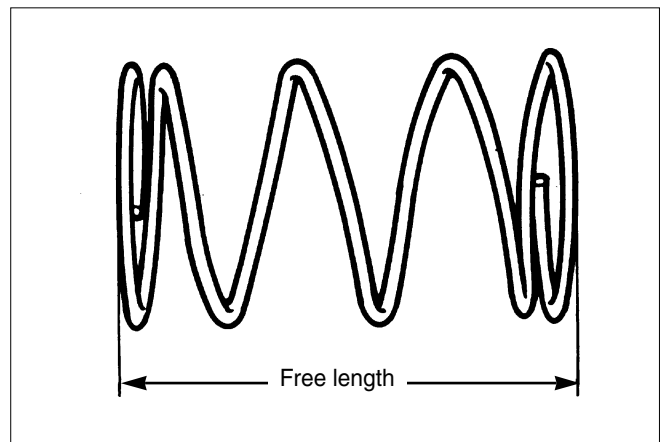
L. Crank Case Cover/Kick Starter/Continuously Variable Transmission

- Disassemble the circlip and remove the outer bearing.

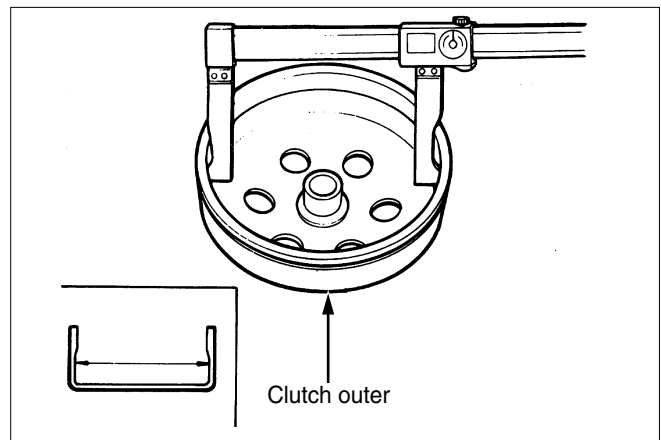


Clutch/Driven Face Inspection

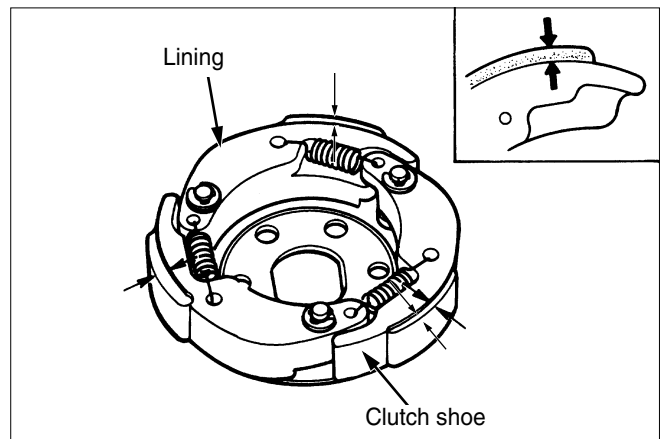
- Measure the free length of the driven face spring.
Service limit: 97.23mm (3.822in)



- Check the clutch outer for wear or damage.
- Measure the inner diameter of the clutch outer.
Service limit: 120.5mm(4.736in)

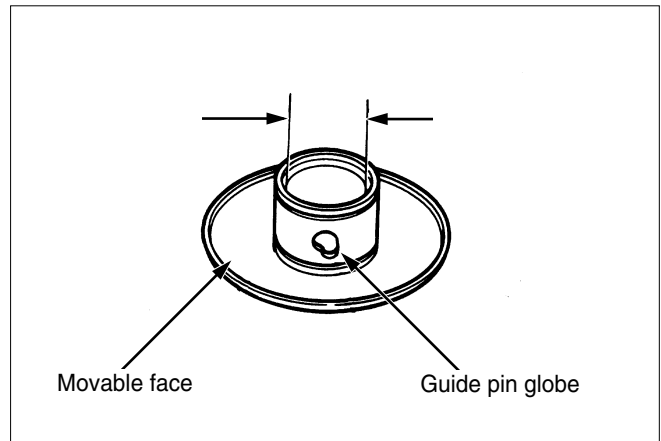


- Check the clutch shoe for wear or damage.
- Measure the thickness of each shoe.
Service limit: 2.0mm(0.078in)

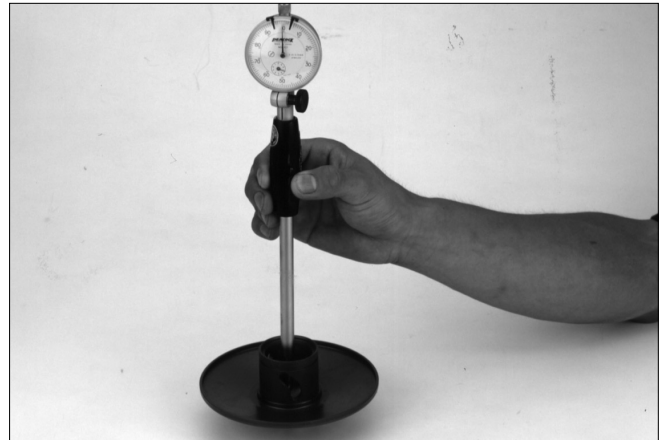


L. Crank Case Cover/Kick Starter/Continuously Variable Transmission

- Check the driven face assembly for wear or damage.
- Measure the outer diameter of the driven face.
Service limit: 37.94mm(1.491in)



- Check the movable driven face for wear or damage.
- Measure the inner diameter of movable driven face.
Service limit: 38.06mm(1.496in)
- Check the guide globe for wear or damage.
- Check the oil seal for wear, damage or other defects.



Driven Face Assembly

- Assemble the outer bearing to the movable driven face.

NOTE

- Assemble the bearing so that the sealed edge faces outward.

- Insert the circlip into the groove.
- Fill the grease into all bearing grooves.

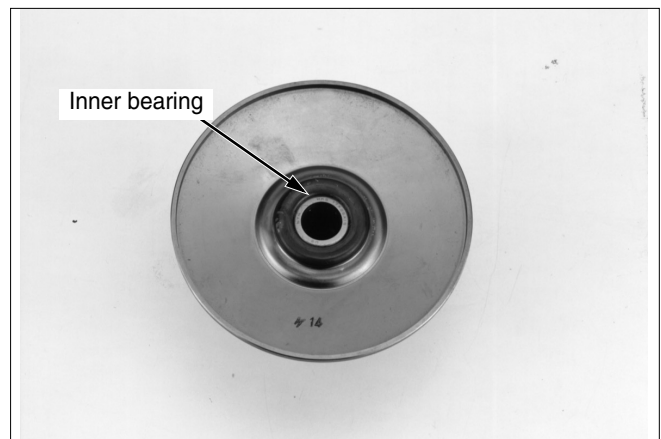
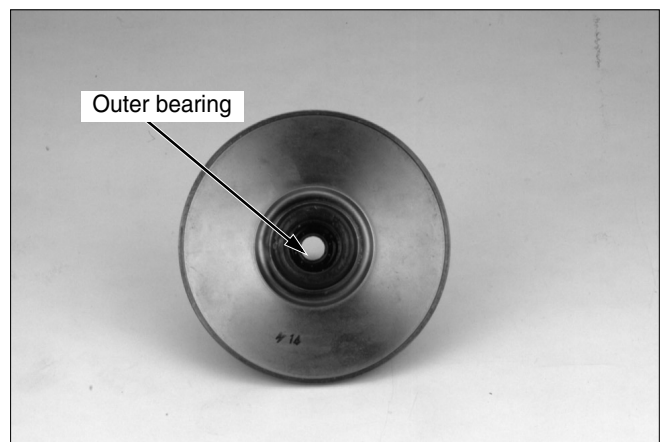
Grease application: 9.0-9.5g

- Assemble inner bearing.

NOTE

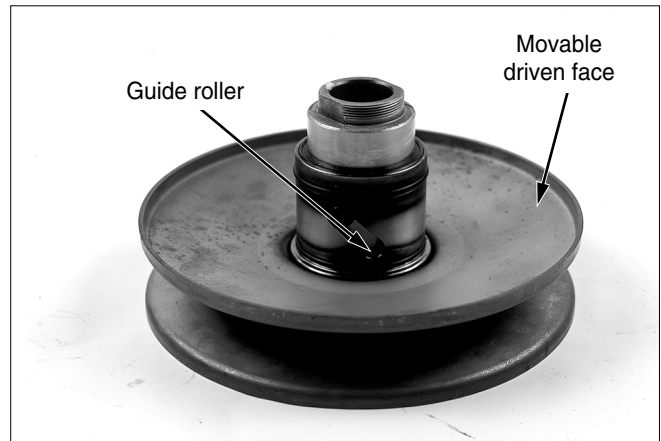
- Assemble the bearing so that the sealed edge faces outward.

**Tool: - Bearing driver attachment
- Driver pilot**

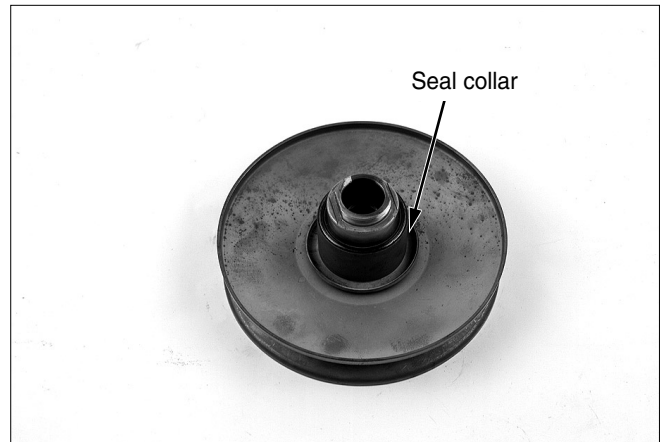


L. Crank Case Cover/Kick Starter/Continuously Variable Transmission

- Assemble the movable driven face, guide roller and roller pin



- Assemble the seal collar.

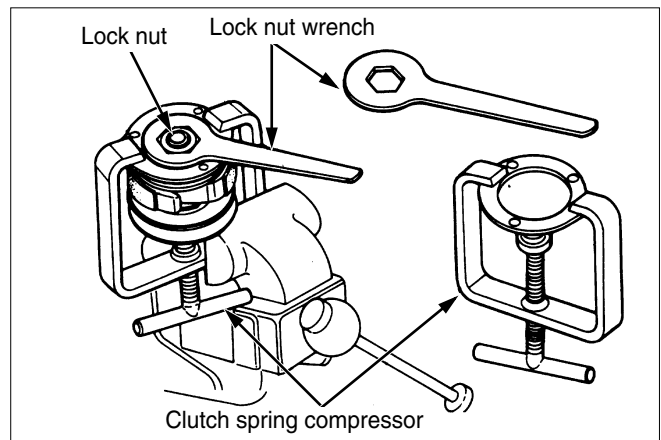


- Assemble the driven pulley, spring and clutch in the clutch spring compressor. Compress the assembly by turning the tool handle until the lock nut can be installed.
- Clamp the clutch spring compressor in a vise and tighten the lock nut to the specified torque using the lock nut wrench. Remove the spring compressor.

Torque value: 5.5kg-m(55N.m, 40ft-lb)

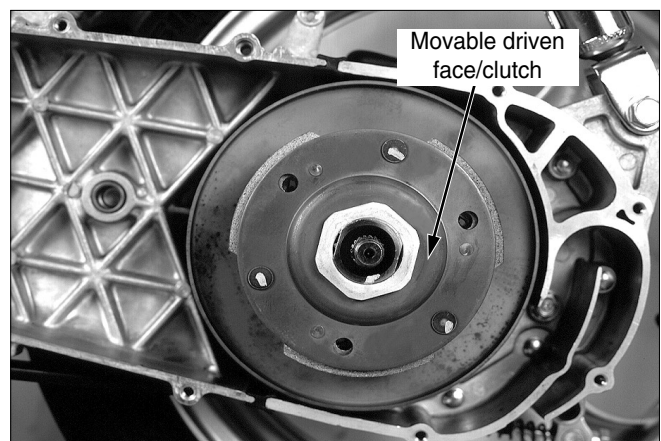
Tool: - Lock nut wrench

- Clutch spring compressor



Clutch/Driven Pulley Assembly

- Assemble the driven pulley to the drive shaft.



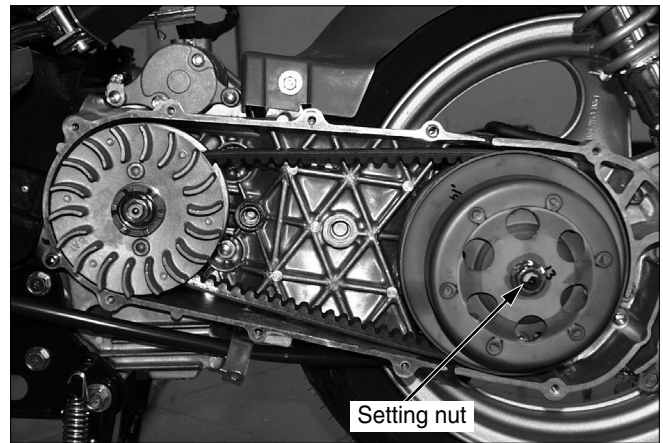
L. Crank Case Cover/Kick Starter/Continuously Variable Transmission

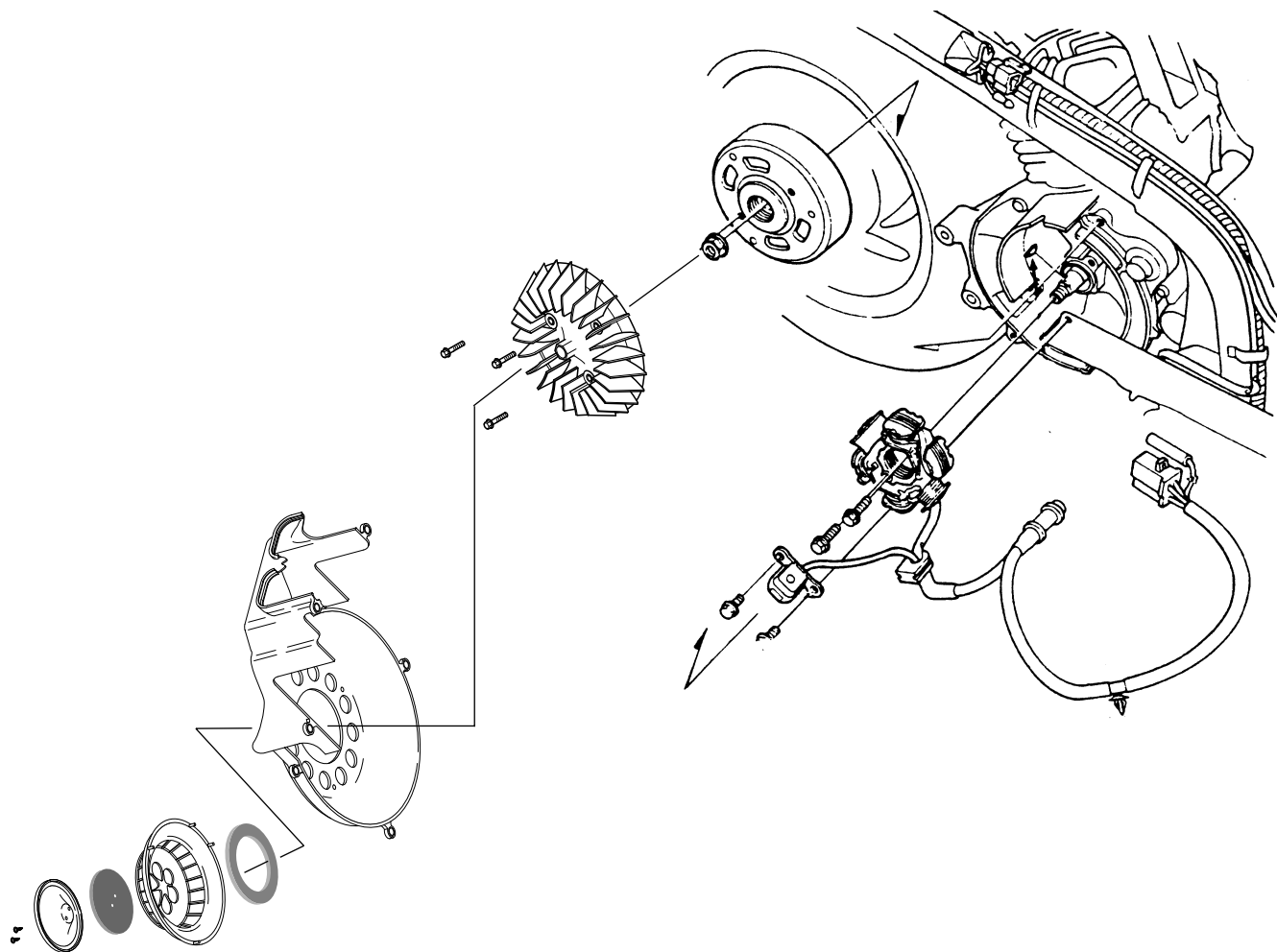
- Assemble the clutch outer. Hold the clutch outer, and tighten nuts with the prescribed torque.

Torque value: 5.5kg-m(55N.m, 40ft-lb)

Tool: Universal holder

- Assemble the drive face.
- Assemble the L. crank case cover.





8. Generator/Starter Clutch

Service Information	8-1	R.Crank Case Cover	8-4
Shroud	8-2	Starter Clutch	8-6
A.C Generator	8-2		

Service Information

General Safety

- This section describes the removal and assembling of the A.C. generator.
- For information on A.C generator inspection, refer to the section 15.
- The charging system can be maintained without removing the engine.

Specifications

Unit: mm(in)

Item	Standard value		service Limit
Starter driven gear	O.D	39.622-39.635(1.5599 -1.5604)	39.53(1.556)
	I.D	32.000-32.025(1.2578 -1.2588)	32.10(1.2618)

Reduction gear	I.D	12.016-12.034(0.4723 -0.4730)	12.10(0.4756)
Reduction gear shaft	O.D	11.966-11.984(0.4703 -0.4710)	11.97(0.4705)

Torque values

Fly wheel bolt	5.5kg.m(55N.m, 39ft-lb)
Starter clutch socket bolt	3.2kg.m(32N.m, 23ft-lb)
R. crank case cover bolt	1.1kg.m(11N.m, 8ft-lb)

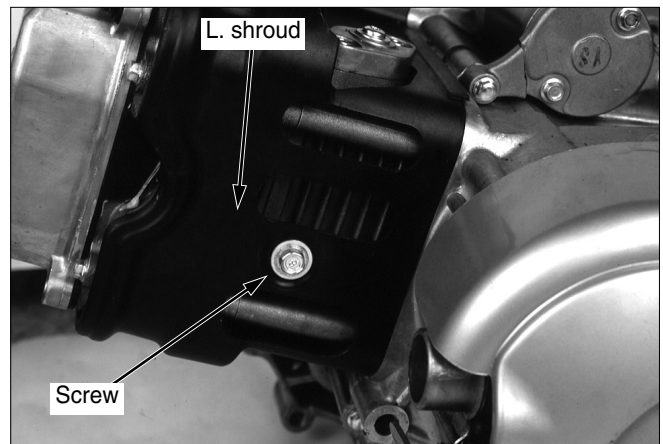
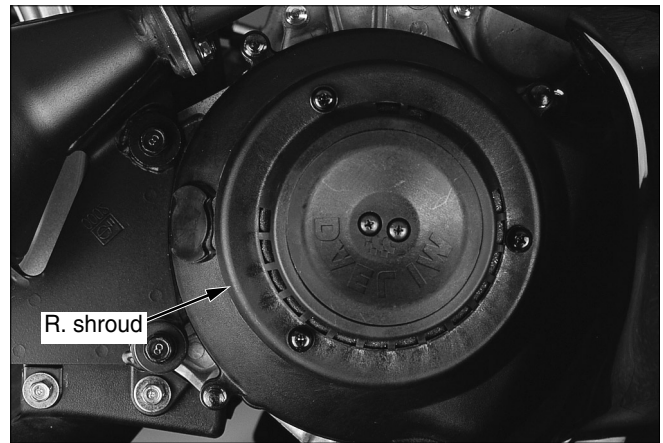
Tools

Fly wheel puller
Fly wheel holder

Shroud

Removal

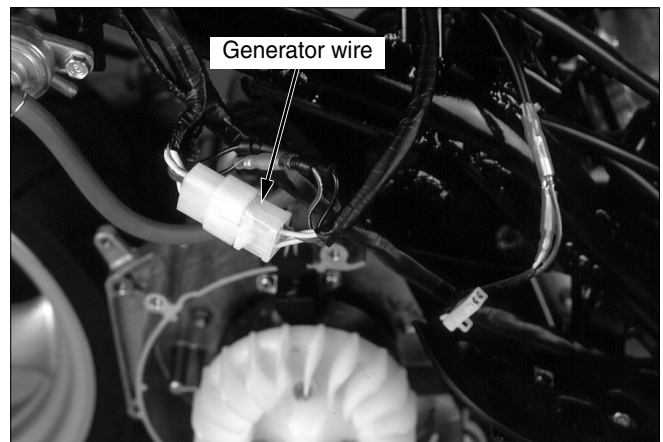
- Remove the following parts.
 - Luggage box (⇒ 4-5)
 - Body cover (⇒ 4-6)
 - Center cover (⇒ 4-4)
- Loosen the 4 R. shroud setting bolts.
- Loosen the 3 shroud R/L setting bolts.
- Loosen the shroud L setting screw.
- Remove the shroud R/L.
- Install in the reverse order of removal.



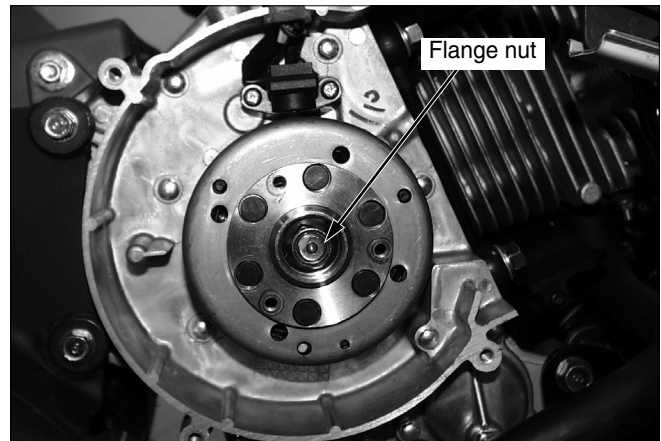
A.C. Generator

Removal

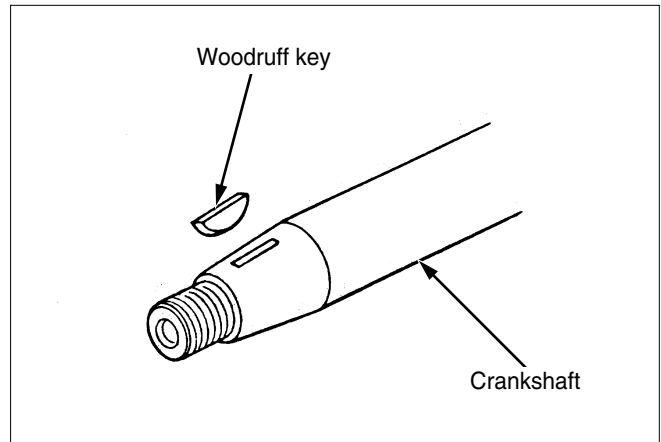
- Remove the following parts.
 - Luggage box (⇒ 4-5)
 - Body cover (⇒ 4-6)
 - Center cover (⇒ 4-4)
 - R. shroud comp (⇒ 7-2)
- Remove the A.C. generator wiring connection.
- Remove the 3 cooling fan bolts.



- Remove the A.C generator flange nut.

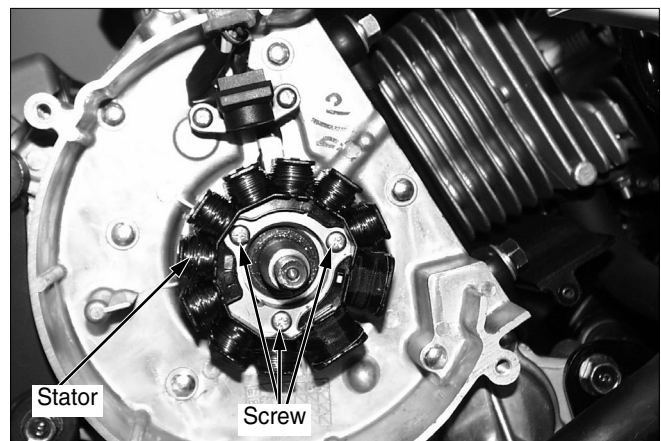
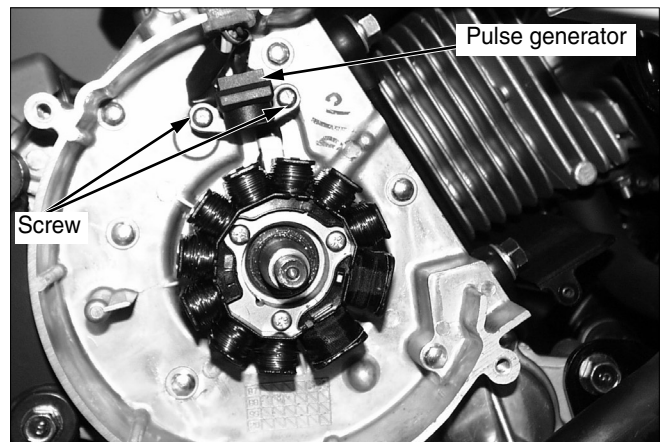


- Install the flywheel puller on the rotor, and remove the flywheel
Tool: Fly wheel puller holder
- Remove the woodruff key from the crankshaft.



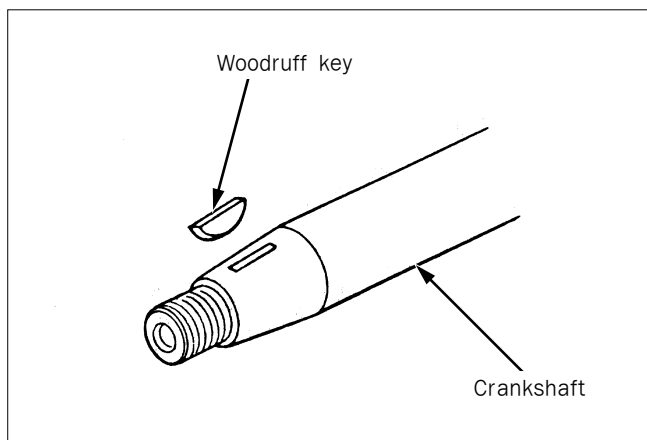
Stator Removal/Installation

- Loosen the pulse generator screw, and remove the pulse generator.
- Loosen the 3 stator setting screws to remove the stator.
- Install in the reverse order of removal.



Assembly

- Clean, and remove dust from the tapered part of the crankshaft.
- If the flywheel is installed with the tapered part contaminated by foreign matters, stress may be applied to the taper contact surface, causing damage to the key.
- Assemble the woodruff key to the crankshaft.



NOTE

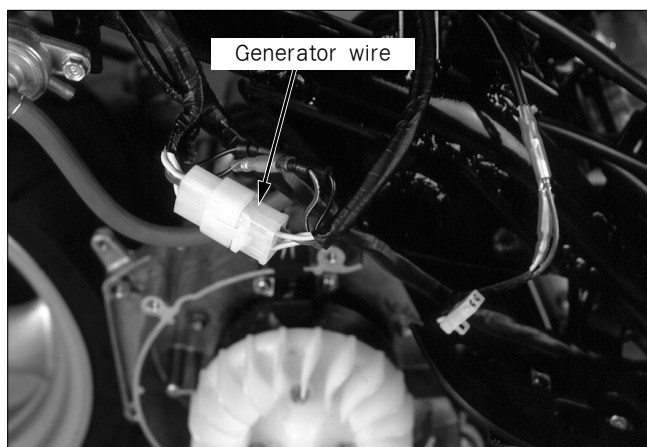
- Install the flywheel after verifying bolts and nuts are not attached to the inside of the flywheel.

- Temporarily assemble the flywheel nut, and tighten the rotor bolts after fixing the flywheel with the holder.

Tool: Flywheel holder

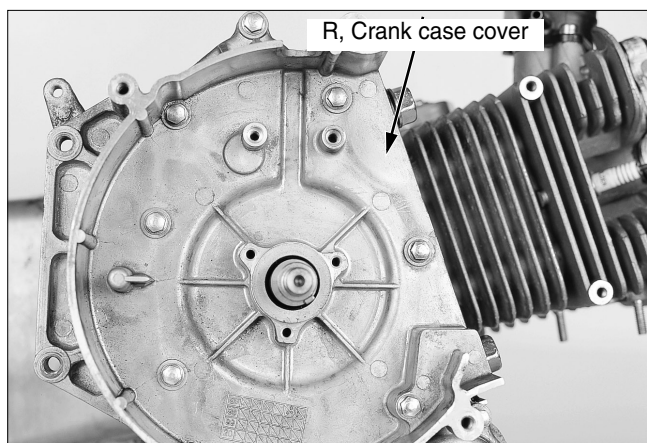
Torque value: 5.5kg-m(55N.m, 40ft-lb)

- Connect the A.C. generator wire.
- Assemble the cooling fan with bolts.
- Assemble shroud. (⇒ 8-2)
- Assemble the body cover and luggage box.

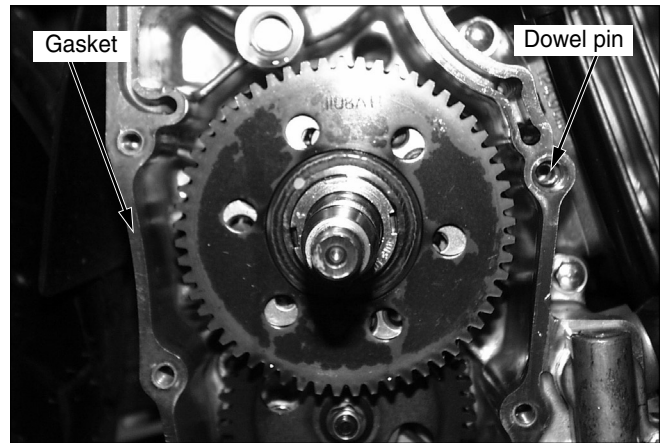


R. Crank Case Cover

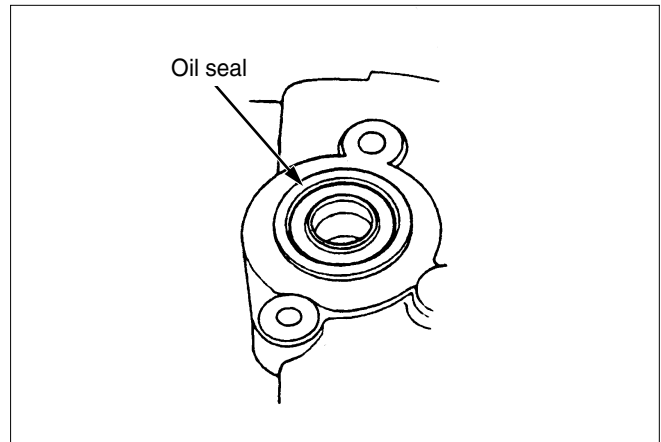
- Remove the following parts.
 - R/L shroud (⇒ 8-2)
 - A.C. generator (⇒ 8-2)
 - Radiator (⇒ 2-7)
- Loosen the R. crank case cover setting bolts.



- Remove the gasket and dowel pin.



- Remove the oil seal
- Check the oil seal for wear or damage, and replace with new oil seals, if necessary.



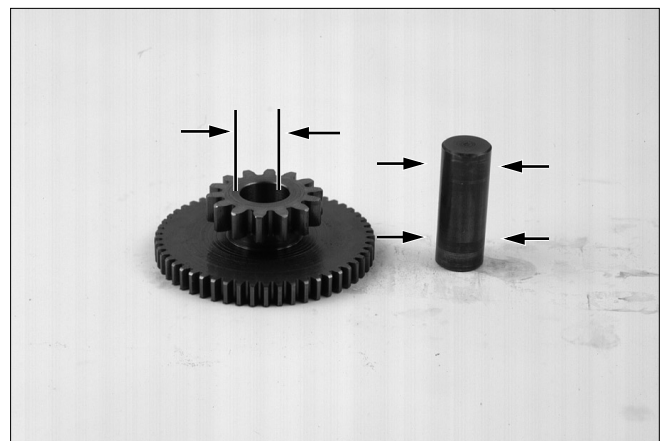
Starter Reduction Gear

- Remove the starter reduction gear and shaft.



Inspection

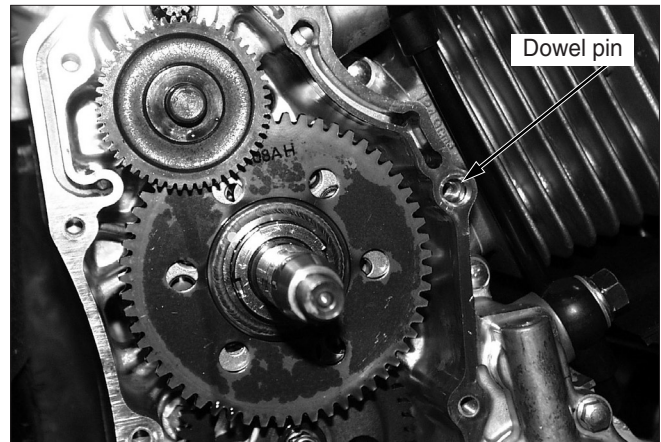
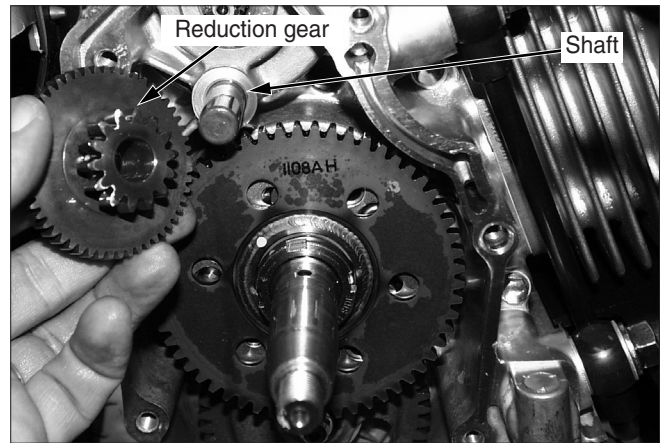
- Check the reduction gear for wear or damage.
- Measure the inner diameter of the gear.
Service limit: 12.10mm(0.475in)
- Measure the outer diameter of the gear shaft.
Service limit: 11.97mm(0.470in)



Generator/Starter Clutch

Assembly

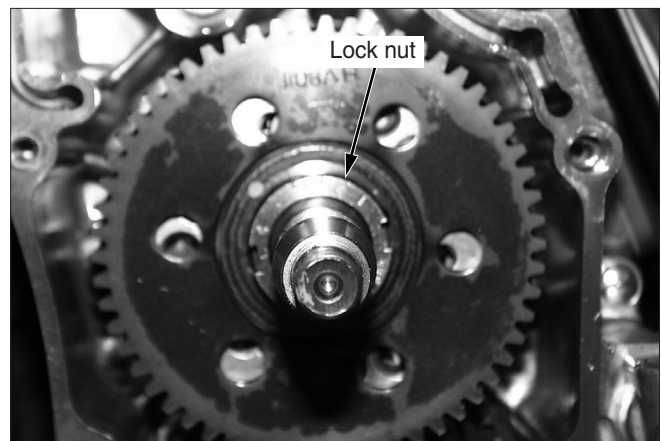
- Assemble the starter reduction gear and shaft.
- Remove the gasket residues from the R. crank case.
- Install the new gasket and dowel pin.
- Tighten the R. crank case cover with setting bolts.
- Assemble the A.C. generator. (⇒ 8-2)
- Assemble the R/L shroud. (⇒ 8-2)
 - Assemble the luggage box (⇒ 4-5)
 - Assemble the body cover (⇒ 4-6)



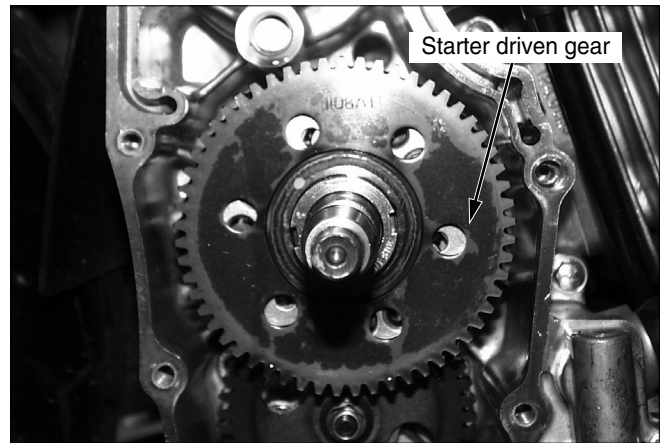
Starter Clutch

Removal

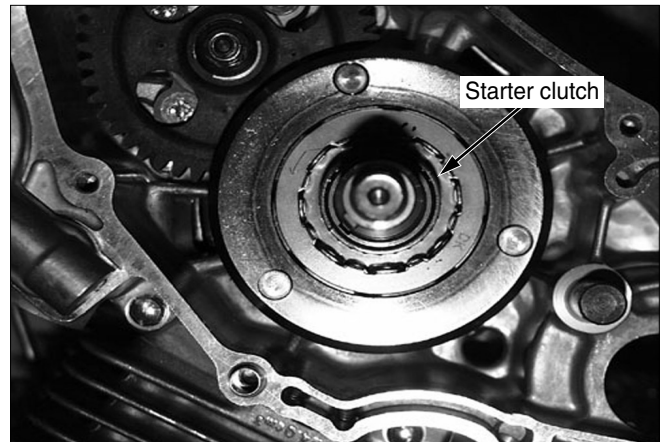
- Remove the shroud. (⇒ 8-2)
- Remove the A.C. generator. (⇒ 8-2)
- Remove the R. crank case cover (⇒ 8-4)
- Loosen the starter clutch lock nut with a special tools.
Tool: Special socket (12.7 × 28 × 120)
Torque value: 9.5kg-m (95N.m, 67ft-lb)



- Remove the washer.
- Remove the starter driven gear.



- Check the starter driven gear and starter clutch for proper operation.
- Remove the starter clutch.

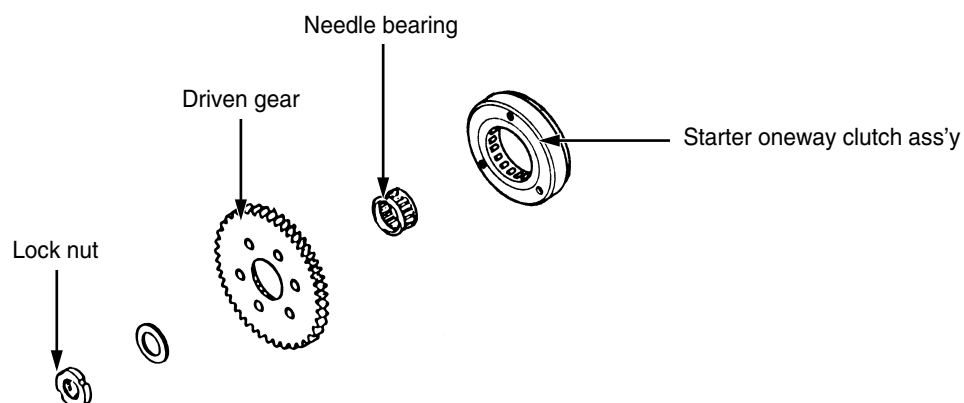


Inspection

- Check the starter driven gear for wear or damage.
- Measure the inner diameter of the starter driven gear.

Service limit: A 32.10mm(1.262in)

B 39.53mm(1.556in)

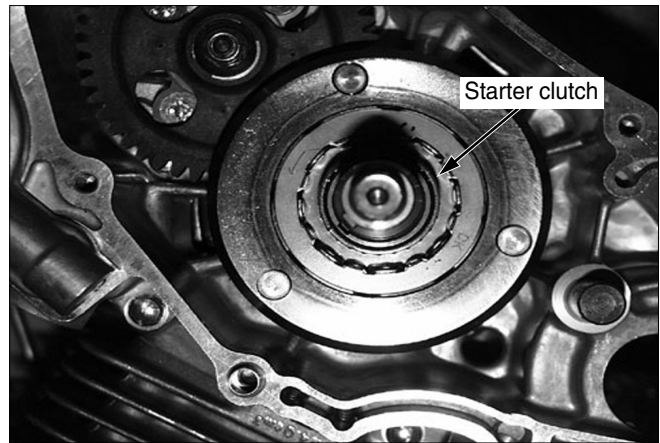


Generator/Starter Clutch

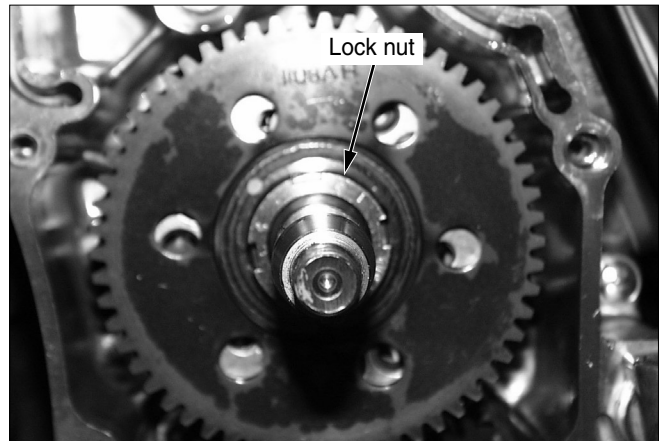
- Use a special socket to tighten the starter driven gear with lock nuts.

Torque value: 9.0kg-m(90N.m, 65ft-lb)

Tool: Special socket (12.7 × 28 × 120)



- Assemble the washer.
- Assemble the R. crank case cover (⇒ 8-4)
- Assemble the A.C. generator. (⇒ 8-2)
- Assemble the shroud. (⇒ 8-2)



9. Cylinder Head/Valve

Services information	9-1	Valve guide replacement	9-7
Troubleshooting	9-2	Valve seat Inspection/Adjustment	9-8
Camshaft Removal	9-3	Cylinder head Assembly	9-11
Cylinder Head Removal	9-5	Cylinder Head Installation	9-12
Cylinder Head Disassembly	9-5	Camshaft Assembly	9-13

Service Information

General Safety

- The rocker arm and the camshaft can be serviced without removing the engine. However, the engine must be removed from the frame to maintain the cylinder head.
- The oil of camshaft oil is supplied through the cylinder head oil hole. Clean the oil hole prior to assembling the cylinder head.

Specifications

Unit: mm(in)

Item			Standard value	Service limit
Rocker arm	Rocker arm inner diameter		12.016-12.034(0.4731-0.4738)	12.060(0.4748)
	Rocker arm shaft outer diameter		11.982-12.000(0.4717-0.4724)	11.950(0.4705)
Camshaft	Cam height	IN	33.835-33.995(1.321-1.3384)	33.625(1.3234)
		EX	33.984-34.144(1.380-1.3443)	33.765(1.3293)
	Camshaft inner diameter		15.005-15.018(0.5907-0.5913)	15.040(0.5921)
Cylinder head warpage			-	-
Valve Valve guide	Valve spring free length	IN, EX	37.21(1.465)	36.90(1.4528)
	Valve stem	IN	4.972-4.984(0.1957-0.1962)	4.920(0.1937)
		EX	4.952-4.964(0.1950-0.1954)	4.900(0.1929)
	Valve guide	IN, EX	5.000-5.012(0.1969-0.1973)	5.030(0.1980)
	Clearance between stem and guide	IN	0.016-0.040(0.0006-0.0016)	0.090(0.0035)
		EX	0.036-0.060(0.0014-0.0024)	0.120(0.0047)
	Valve seat width		0.8~1.0(0.031~0.039)	1.4(0.055)

Torque values

- Cam chain tensioner pivot bolt 1.0kg-m(10N.m, 7ft-lb)
- Spark plug 1.2kg-m(12N.m, 8ft-lb)
- Camshaft holder 8mm nut 2.0kg-m(20N.m, 14ft-lb) - Apply engine oil
- Cam chain tensioner mounting bolt 1.2kg-m(12N.m, 9ft-lb) - Apply engine oil
- Cam chain tensioner sealing screw 0.4kg-m(4N.m, 2.9ft-lb)
- Cylinder head cover bolt 0.9kg-m(9N.m, 6.5ft-lb)

Tools

Valve guide reamer

Valve guide driver

Valve spring compressor

Valve seat cutter

Seat Cutter IN 37°(21.5mm)
 EX 37°(18.5mm)
 IN 45°(22mm)
 EX 45°(22mm)
 IN 55°(20mm)
 EX 55°(20mm)

Troubleshooting

- Cylinder head operation problem can be diagnosed, in general, by a compression test, or by checking noises on the top of the engine.

Low compression or uneven compression

- Valves
 - Faulty hydraulic tappet
 - Burned or bent valves
 - Incorrect valve timing
 - Broken valve spring
- Cylinder head
 - Leaking or damaged head gasket
 - Warped or cracked cylinder head
- Cylinder and piston (Refer to Section 10)

Compression too high

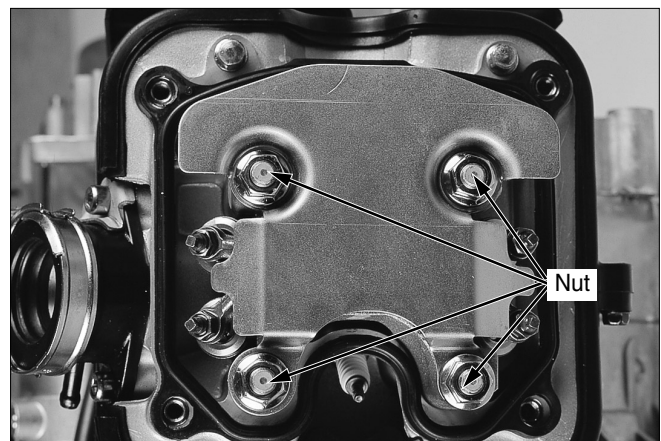
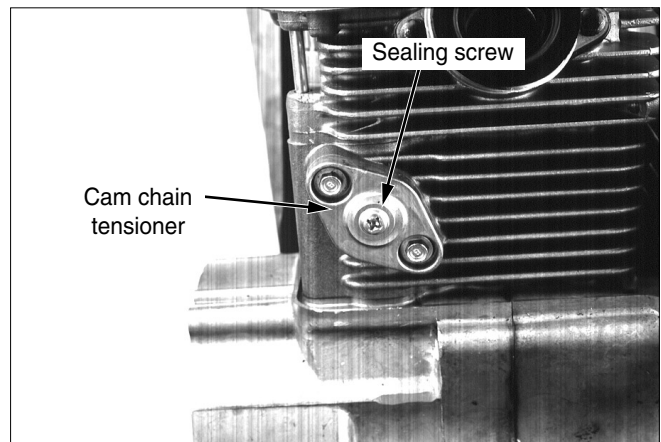
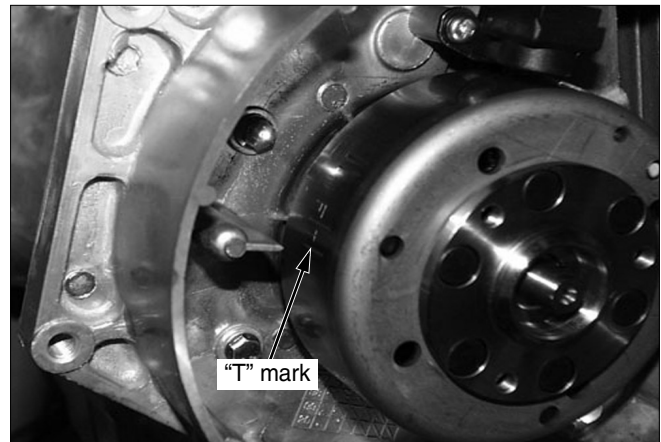
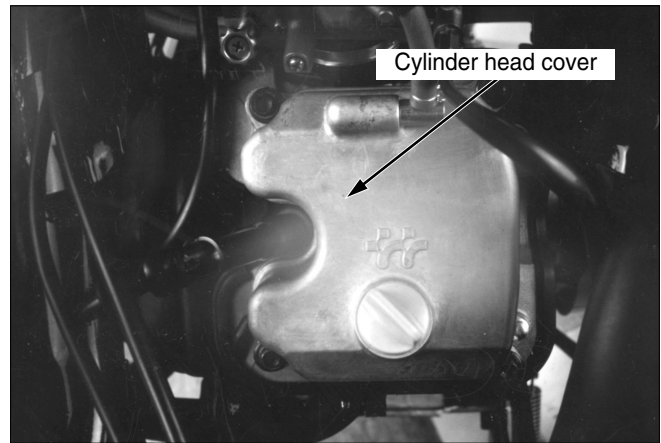
- Excessive carbon build-up on piston head or combustion chamber

Excessive noise

- Faulty hydraulic valve tappet system
 - Low engine oil level
 - Contaminated oil
 - Low oil pressure
 - Damaged hydraulic tappet
- Sticking valve or broken valve spring
- Damaged or worn camshaft
- Loose or worn cam chain
- Worn or damaged cam chain tensioner
- Worn cam sprocket teeth

Camshaft Removal

- Remove the luggage box. (⇒ 4-5)
 - Remove the center cover. (⇒ 4-4)
 - Remove the shroud R/L.(⇒ 8-2)
 - Remove the cylinder head cover bolt and cover.
-
- Remove the fan cover from the R shroud. Turn the crankshaft to the left, and align the "T" mark of the flywheel with the index mark of the R crank case cover.
 - Verify that the piston is located at the top dead center. (Make all camshaft lobes face downward.)
 - If all camshaft lobes face upward, rotate the crankshaft to the left for 1 turn (360°), and align the "T" mark with the index mark once again.
-
- Loosen the four 8mm nuts of the camshaft holder.
 - Remove the camshaft holder from the cylinder head.
-
- Loosen the four 8mm nuts of the camshaft holder.
 - Remove the camshaft holder from the cylinder head.



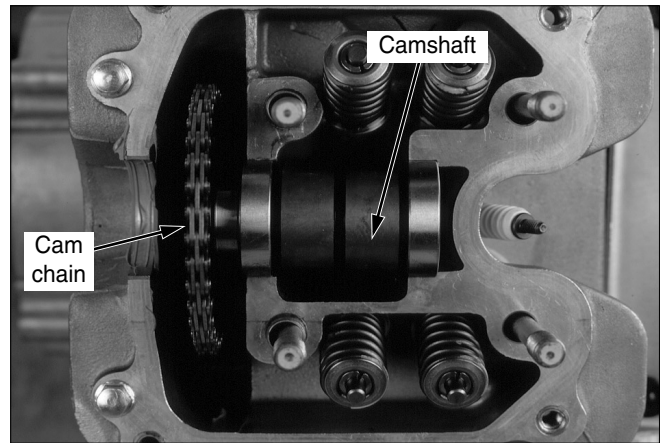
Cylinder Head/Valve

- Remove the cam chain from the camshaft.

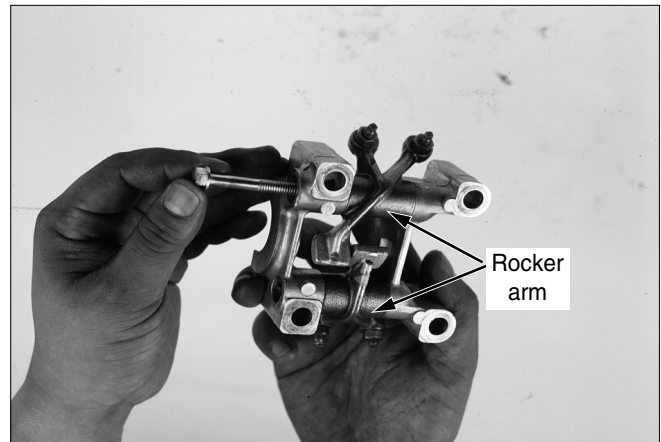
NOTE

- Take precautions not to allow the cam chain to drop into the crank case.

- Remove the camshaft.

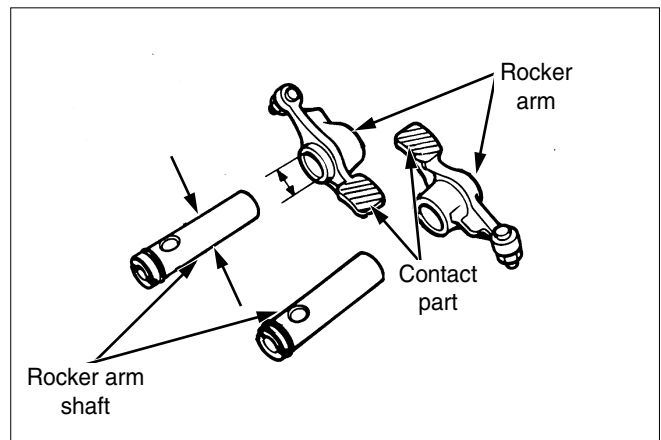


- Insert the 6mm bolt into the rocker arm shaft, and pulling bolts to remove the rocker arm shaft.
- Remove the rocker arm.
- Remove the other side rocker arm shaft and rocker arm in the same sequence.

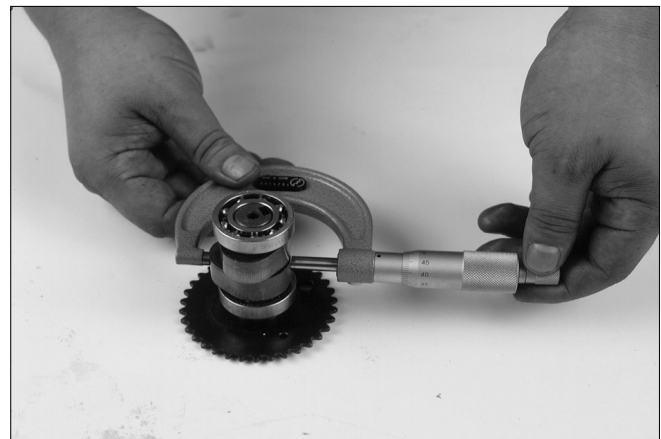


Inspection

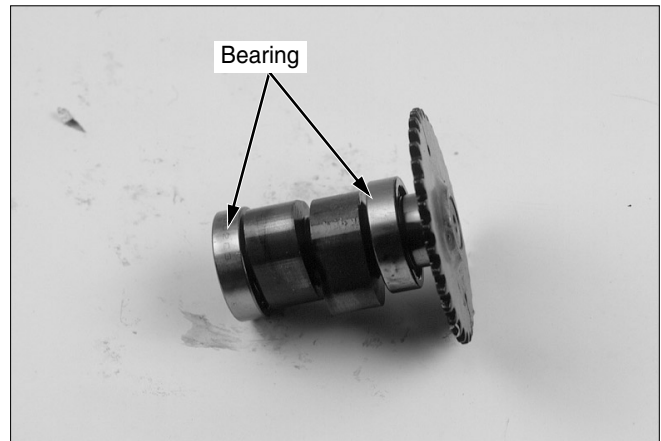
- Check the rocker arm and rocker arm shaft for wear or damage.
- Measure the inner diameter of the rocker arm.
Service limit: 12.060mm (0.4748in)
- Measure the outer diameter of the rocker arm shaft.
Service limit: 11.950mm (0.4705in)



- Check the cam lobes of the camshaft for wear or damage.
- Measure the height of the cam lobe.
Service limit: IN: 33.615mm (1.3234 in)
EX: 33.765mm (1.3293 in)

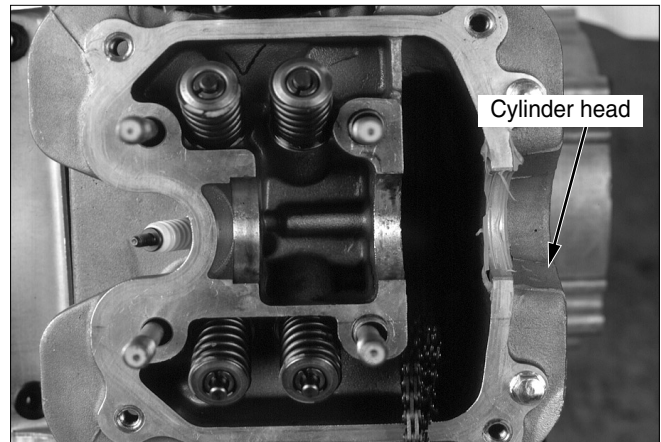


- Manually turn the camshaft bearing outer race, and check if it turns smoothly.
- Check the bearing for wear or damage.

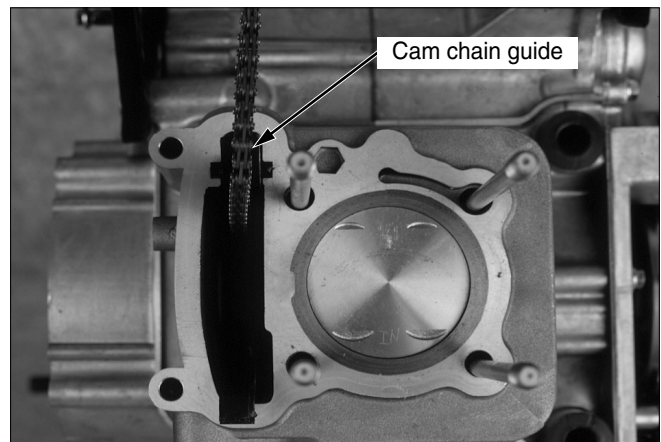


Cylinder Head Removal

- Remove the engine from the frame.(⇒ section 5)
- Remove the camshaft.
- Remove the cylinder head from the cylinder.



- Remove the gasket, dowel pin and cam chain guide from the cylinder.



Cylinder Head Disassembly

- Remove the carburetor insulator.
- Remove the spark plug from the cylinder head.



Cylinder Head/Valve

- Remove the valve spring, valve cotter, retainer, spring and valve.

Tool: Valve spring compressor

NOTE

- To prevent the loss of tension, do not compress the valve spring more than necessary.

NOTE

- Mark the disassembled parts so that they can be reassembled into the original position later.
- Remove the valve spring seat and valve stem seal. Remove carbon deposits from the inside of the combustion chamber.

Cylinder Head

- Remove gasket marks from the cylinder head gasket.

NOTE

- Take precautions not to damage the cylinder head gasket attachment.
 - Check the spark plug assembling hole and the valve seat for cracks.
 - Using a square and a feeler gauge, check the cylinder head distortion.
- Service limit: 0.1mm(0.004in)**

Valve Spring

- Measure the free length of the valve spring.
- Service limit: 36.90mm(1.4528in)**

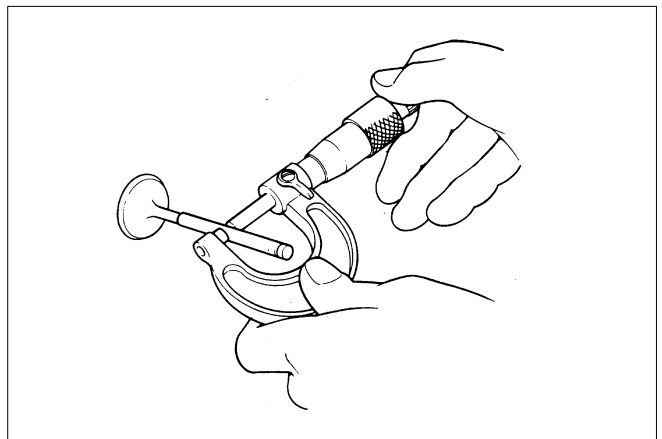
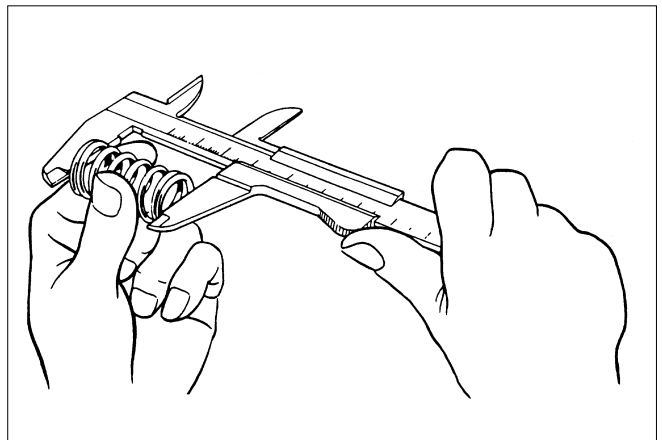
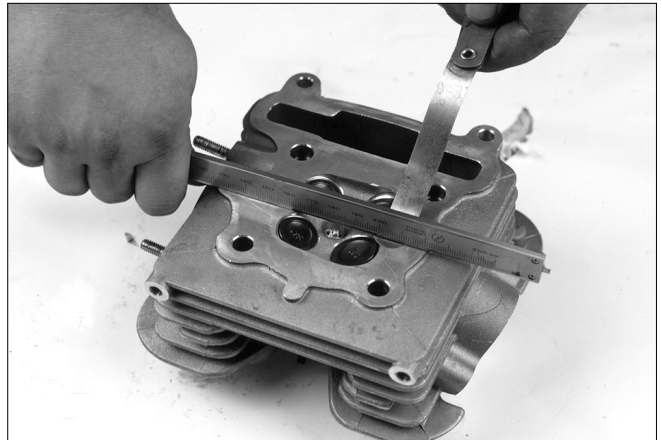
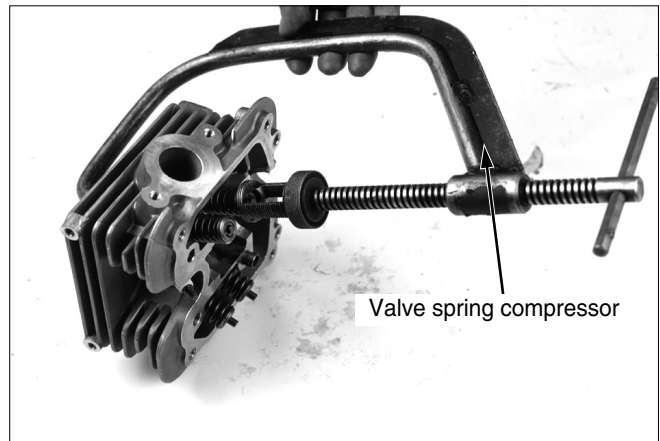
NOTE

- Replace the valve spring with new one if the length of any one is less than the service limit.

Clearance Between Valve Stem and Guide

- Check the valve for bend, seizure, or damage, and check the stem for abnormal wear.
- Insert the valve into the valve guide, and check the operation.
- Measure, and record, the outer diameter of the valve stem.

Service limit: I N: 4.920mm(0.1937in)
EX: 4.900mm(0.1929in)

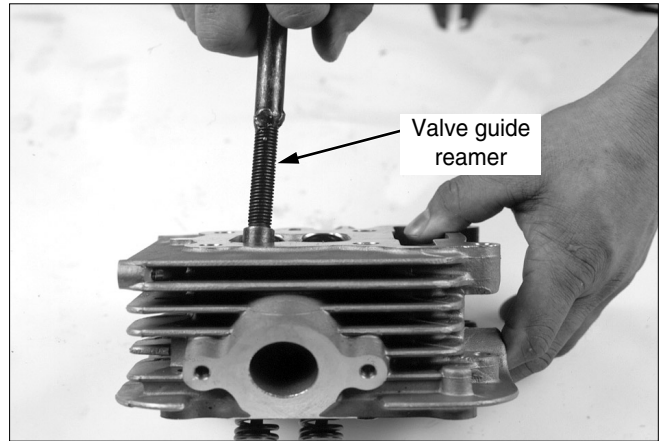


- Insert the valve guide reamer into the combustion chamber, and remove the carbon deposits.

NOTE

- Always insert the reamer while turning it right. If it is inserted without turning, or while turning left, interior part of guide will be damaged.

Tool: Valve guide reamer



- Measure, and record, the inner diameter of the valve guide.

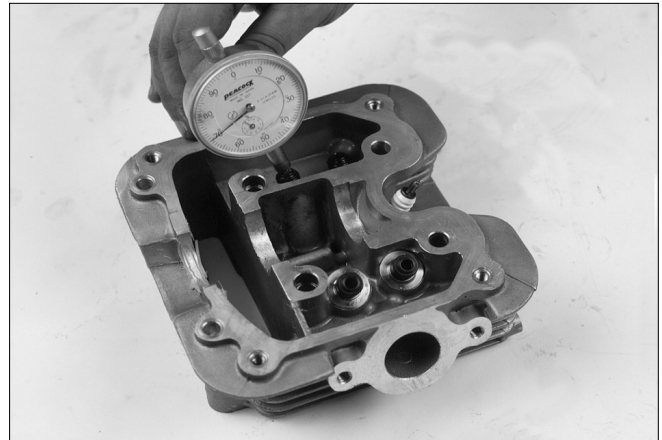
Service limit: 5.030mm(0.1980in)

- Check the clearance between the valve stem and guide.

Service limit: I N: 0.090mm(0.0035in)

EX: 0.120mm(0.0047in)

- Measure the inner diameter of the new valve guide. If the clearance is not within the service limit, replace the valve.



Valve Guide Replacement

NOTE

- After changing the valve guide, make sure to adjust the valve seat.

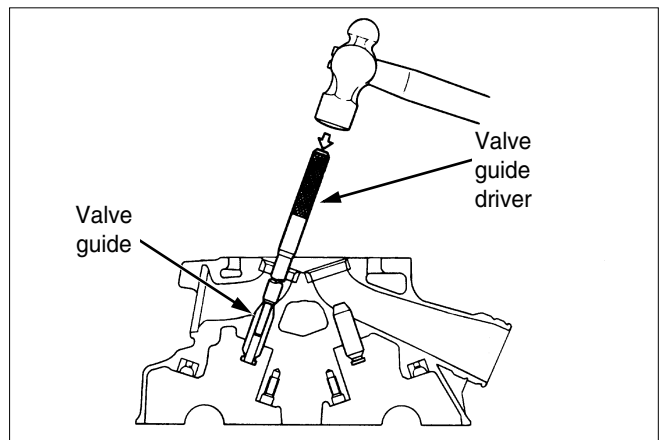
- Heat all cylinder heads uniformly to approximate levels of 130~140°C

NOTE

- Do not allow the temperature to exceed 150°C

NOTE

- Take particular precautions as poor handling may lead to serious burns.
- Do not locally heat the cylinder head with a gas burner as it may cause cylinder head distortion.



Cylinder Head/Valve

- Support the cylinder head, and strike and remove the valve guide from the combustion chamber by using a valve guide driver.

Tool: Valve guide driver

NOTE

- Take precautions not to damage the cylinder head.
- Install new O-ring and new valve guide.

- Insert the valve guide from the top of the cylinder head.

Tool: Valve guide driver

- After inserting the valve guide, insert the valve guide reamer through the cylinder head combustion chamber side to trim the valve guide.

CAUTION

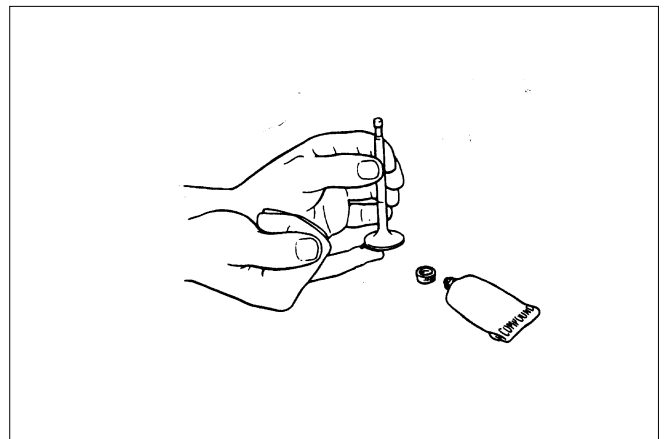
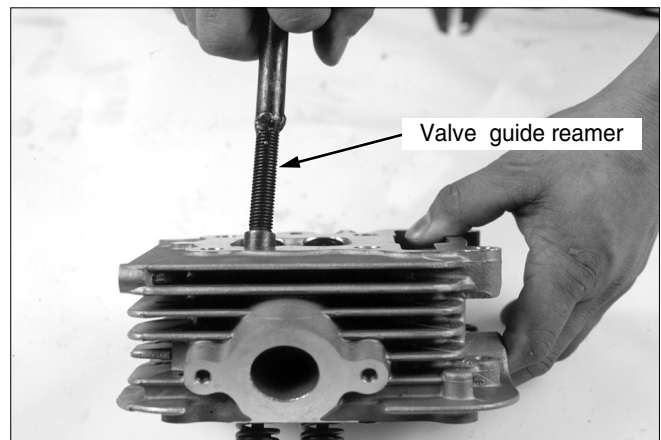
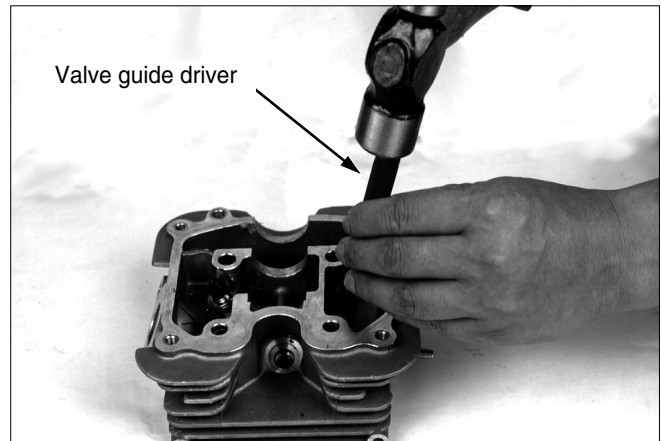
- Make sure the reamer is not tilted when trimming the valve guide. If the reamer is tilted when cutting, the valve hole will also be tilted, causing the stem seal to leak, or the valve seat border will be expanded excessively to an uncorrectable extent.
- Insert the reamer while turning it clockwise. If the reamer is inserted while turning it counterclockwise, or without turning, the guide interior part will be damaged.

Tool: Valve guide reamer

- Clean the cylinder head to remove foreign matters.
- Check the valve seat border, and adjust properly.

Valve Seat Inspection/Adjustment

- Remove carbon deposits from the valve.
- Apply a light coating of prussian blue to the cylinder head valve seat.
- Gently strike the valve with the valve guide reamer, without turning the valve, to accurately set the fit position.



- Remove the valve, and check the status of the seat contact, with a light coating of prussian blue applied to the valve face.
- If the valve seat is damaged, make necessary repair. If the valve is tilted, check the clearance between the valve guide and stem. Replace the valve guide if the clearance is abnormal.

NOTE

- Valve cannot be corrected. If the valve face is seized, excessively worn, and if the contact is poor, change the valve.

- Measure the valve seat width.

Standard value: 0.8-1.0mm(0.031-0.039in)

Service limit: 1.4mm(0.055in)

Valve Seat Cutter

- Repair the damaged valve seat by using valve seat cutters and grinders.

NOTE

- Follow the seat cutter user's manual.

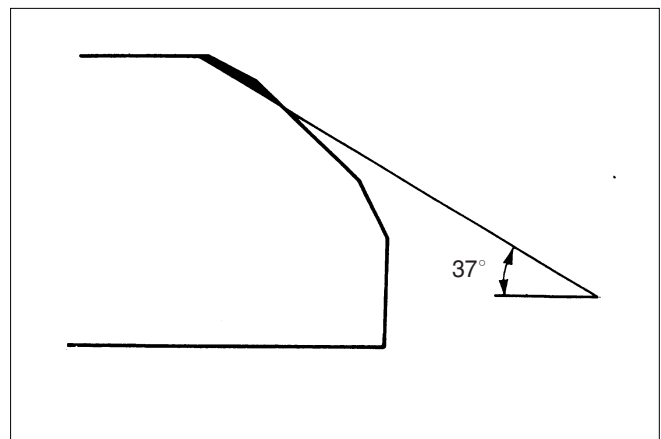
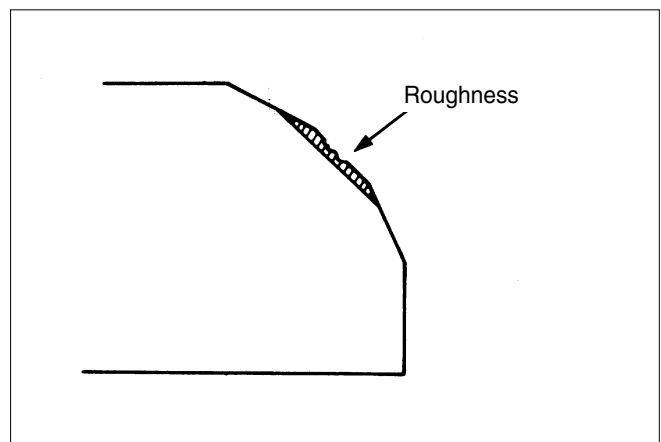
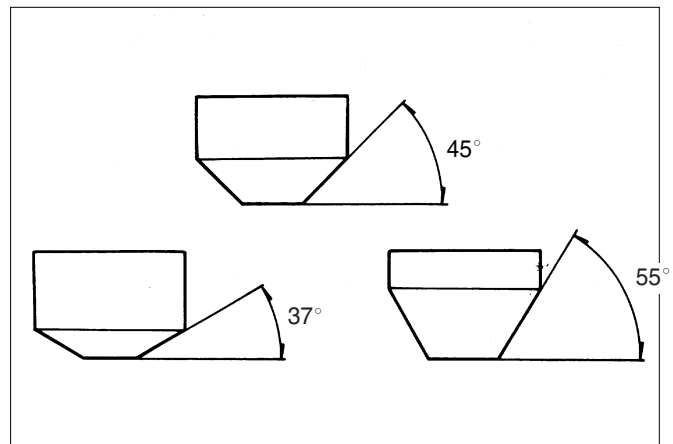
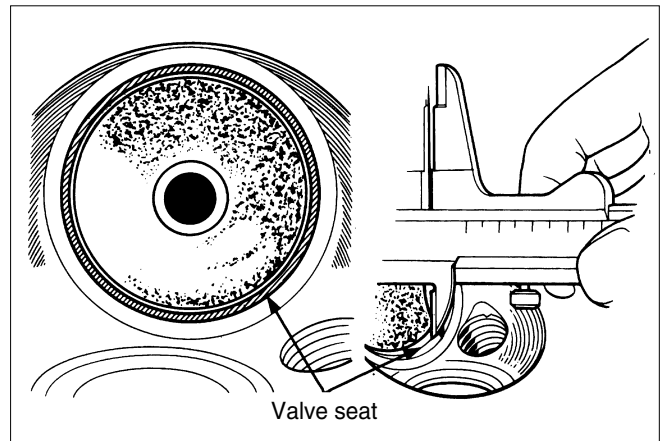
Valve Seat Repair

- If the seat surface is rough or otherwise damaged, use a 45° cutter to grind the surface.

NOTE

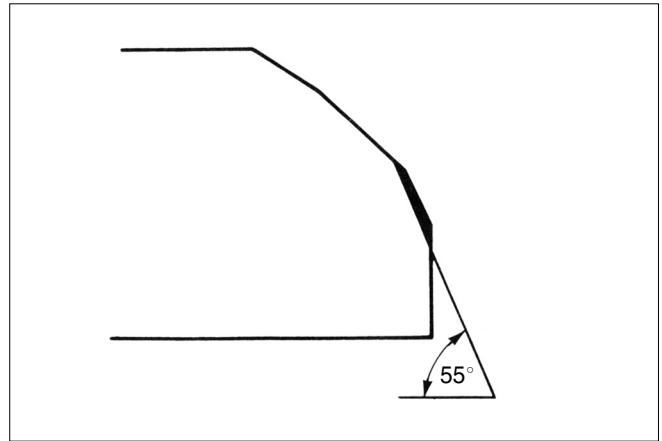
- Grind the seat surface after the valve guide is replaced.

- Correct the plane slightly using a 37° cutter.

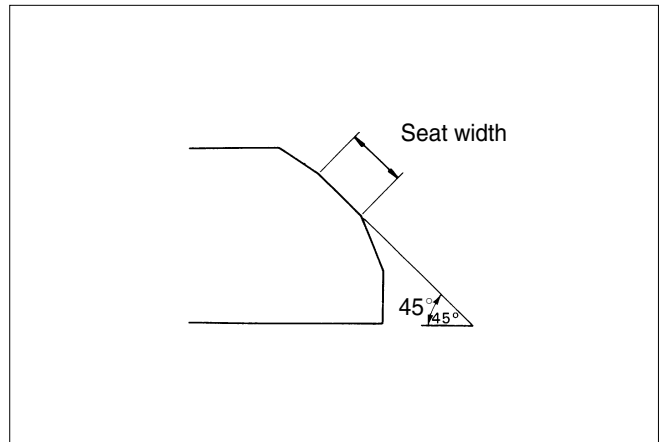


Cylinder Head/Valve

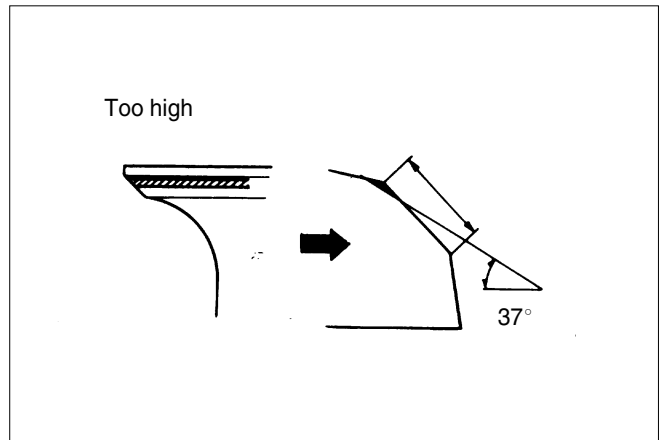
- Use a 55° cutter to make minor repairs on the inside.



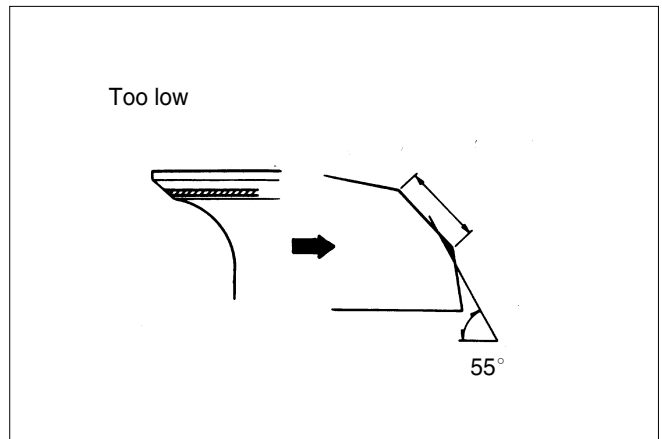
- Use a 45° cutter to make adjustment within the level of prescribed width.



- Apply a light coating of prussian blue to the valve seat. Gently strike the valve with a valve guide reamer to check the status of contact, without turning the valve.
- If the contact surface is too high, grind the surface with a 37° cutter, and finish to the prescribed width with a 45° cutter.



- If the contact surface is too low, grind the surface with a 55° cutter, and finish to the prescribed width with a 45° cutter.



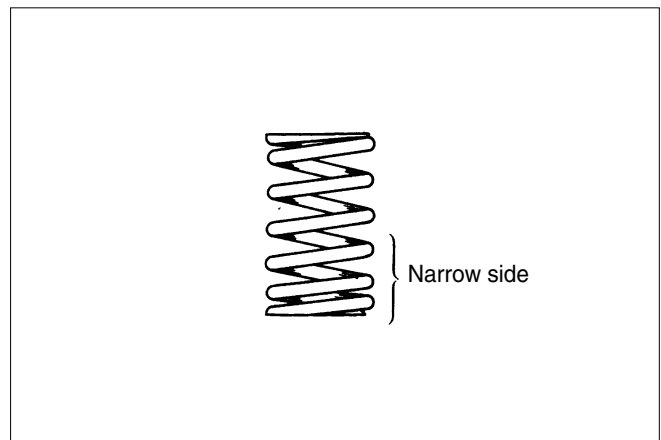
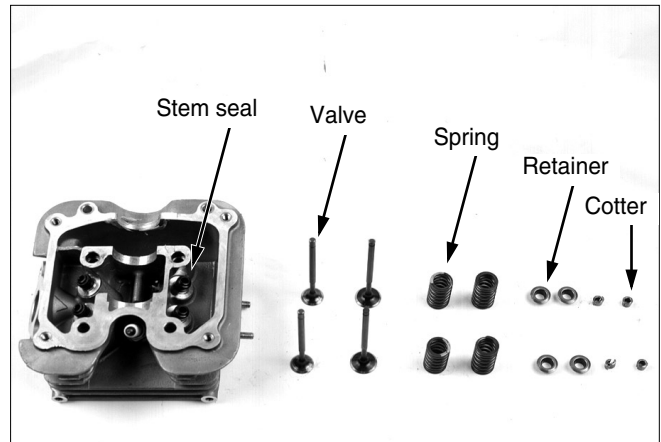
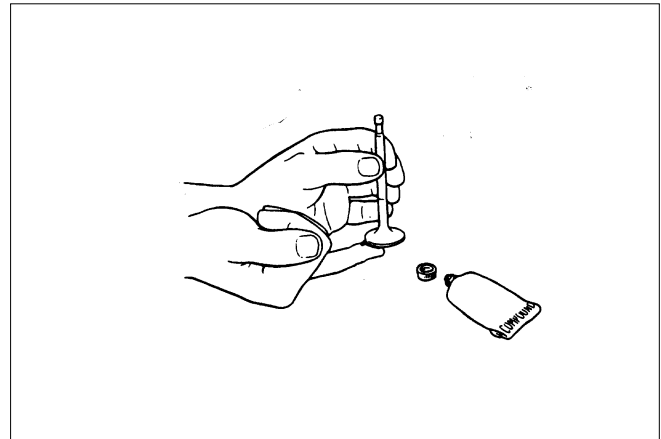
- After adjustment, apply compound evenly to the valve seat and set the valve with a valve guide reamer.

NOTE

- Do not excessively press and turn the valve to set it as it may cause damage. Gently strike and set the valve.
- The seat surface may become worn on one side if the valve is set in the same position. Turn the valve slightly when setting it.
- Take precautions not to allow compound to get into the clearance between the stem and guide while the valve is being set.

Cylinder Head Assembly

- Assemble the valve spring seat and new stem seal.
- Apply molybdenum grease to the valve stem. Turn valve slowly and insert it into the guide, taking precautions not to damage the stem seal.
- Verify that valve is moving up and down smoothly.
- Assemble the spring with its narrow side pitch facing the cylinder head.

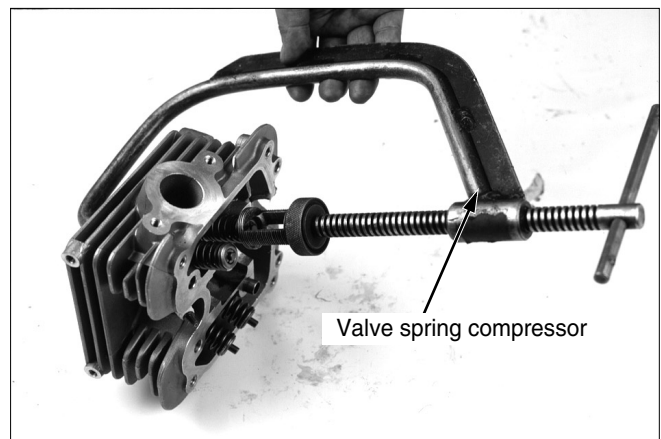


- Assemble the spring retainer.
- Compress the valve spring and install the valve cotter.

NOTE

- Do not compress the valve spring more than necessary.

Tool: Valve spring compressor



Cylinder Head/Valve

- Lightly strike the valve stem end for about 2-3 times to ensure better installation of the valve and cotter.

NOTE

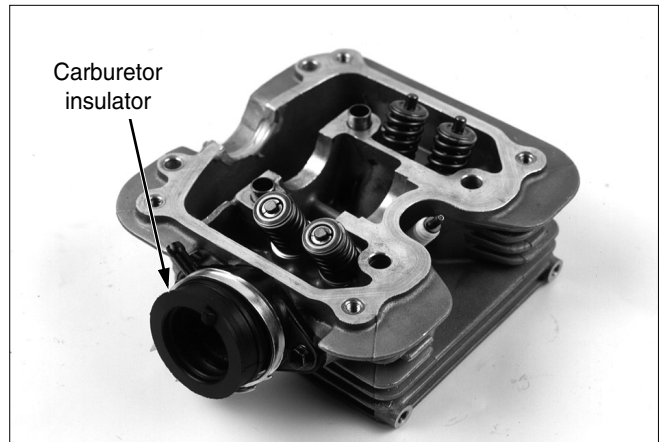
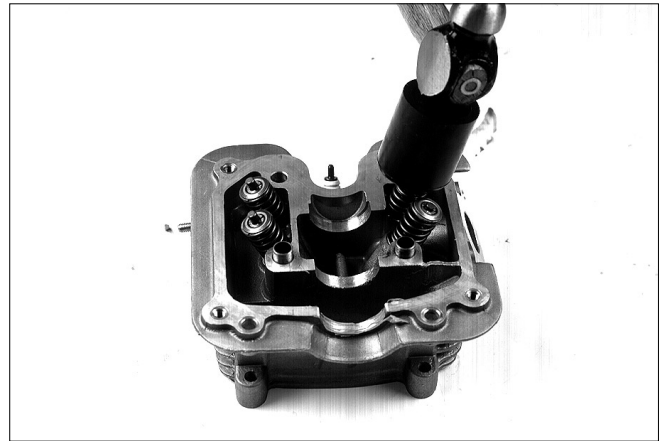
- Take necessary precautions not to damage valve.

- Apply engine oil to the new O-ring, and assemble it to the carburetor insulator groove.
- Tighten the carburetor insulator with mounting bolts.
- Install the cam chain tensioner, and assemble pivot bolts.

Torque valve: 1.0kg-m (10N.m, 7ft-lb)

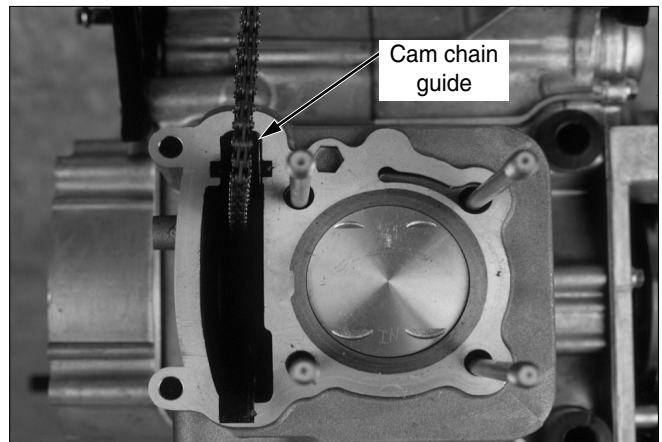
- Assemble spark plugs.

Torque valve: 1.1kg-m (11N.m, 8ft-lb)

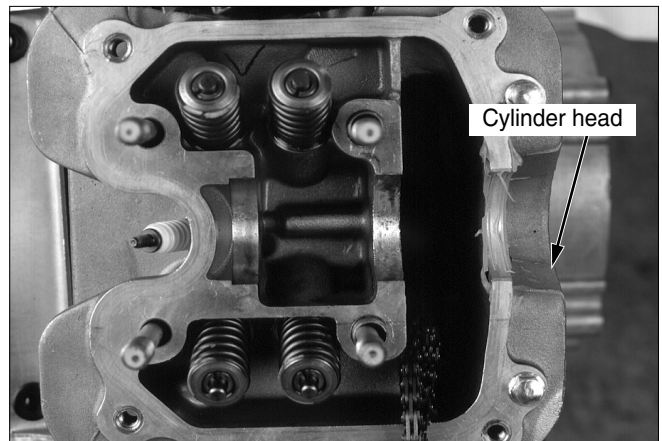


Cylinder Head Installation

- Clean the gasket marks from the cylinder head gasket.
- Assemble the cam chain guide to the cylinder.
- Assemble the dowel pins and new gaskets.

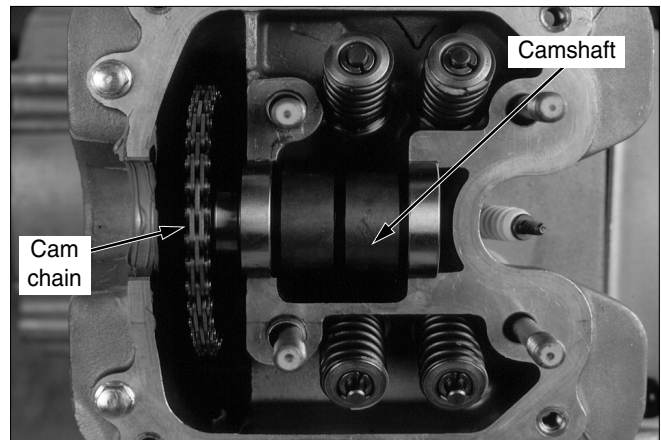
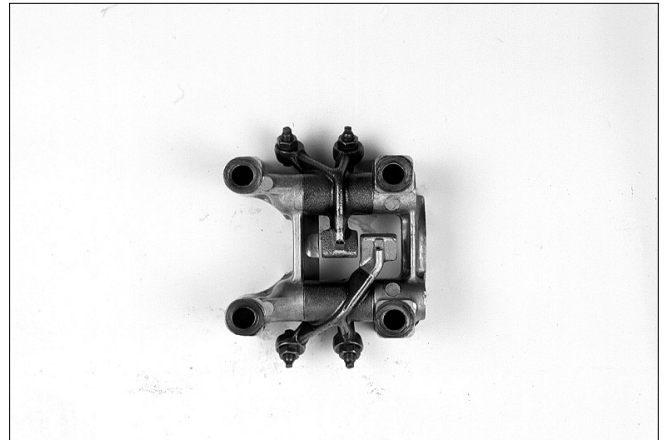
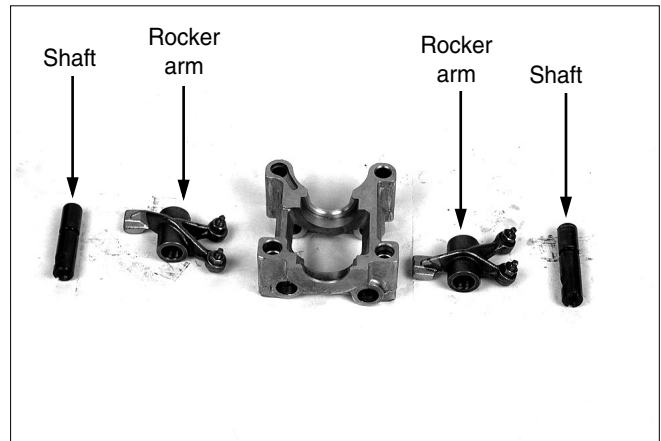


- Assemble the cylinder head.
- Install the camshaft.
- Install the engine to the frame. (⇒ section 5)



Cam Shaft Assembly

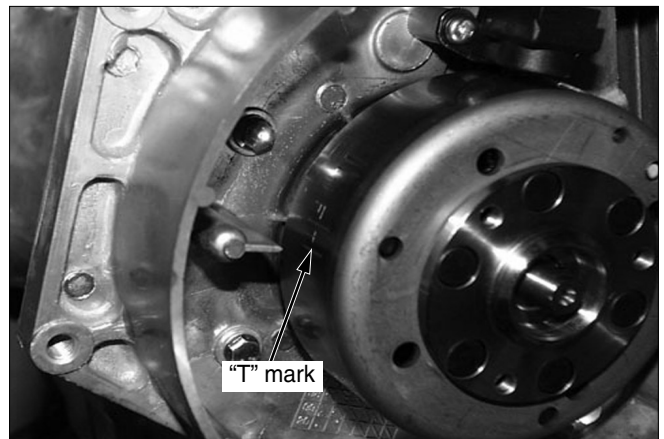
- Apply engine oil to the rocker arm shaft, and assemble the rocker arm to the camshaft holder.
- Tighten the rocker arm shaft with 6mm bolts, and align the bolt hole of the camshaft holder with the fitting side of the rocker arm shaft.
- check the camshaft assembly for abnormal condition, and place it on the cylinder head.
- Put the cam chain on the cam sprocket.



- Slowly turn the crankshaft to the left, and align the "T" mark of the flywheel with the index mark of the R. crank case cover.

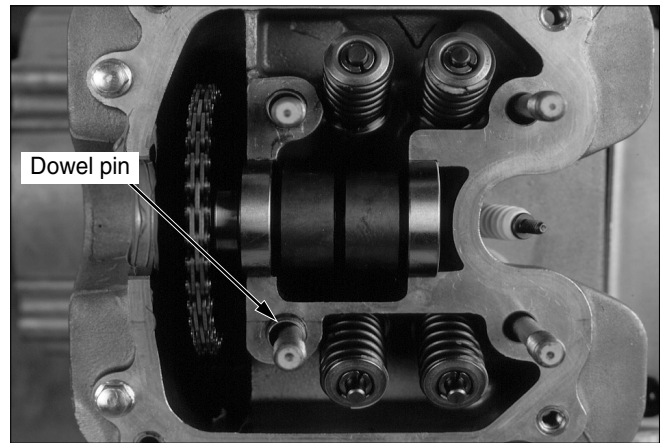
NOTE

- Take precautions not to allow the cam chain to come off the camshaft timing gear while turning the camshaft



Cylinder Head/Valve

- Apply engine oil to the camshaft, and install it on the cylinder head with the cam thread facing downward.
- Assemble the cam chain and cam sprocket after matching the cam sprocket timing mark in parallel with the top of the cylinder head.



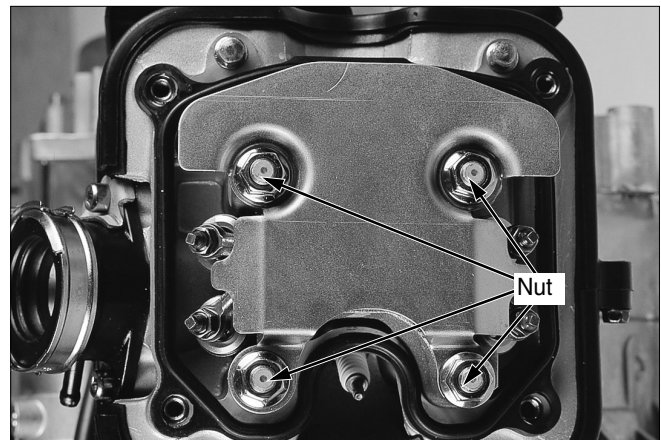
- Install the dowel pins on the cylinder head.
- Install the camshaft holder.

NOTE

- The hole of the camshaft holder and the fitting section of the rocker arm shaft fit section must be in alignment.
- Of IN and EX, the shorter rocker arm should be installed on the IN side.

- Apply engine oil to the threaded part; install the camshaft holder nut and bolts, and tighten them driving with 2 or 3 times.

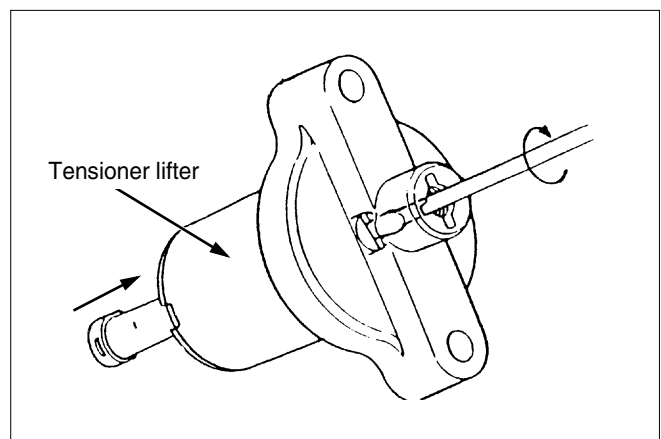
Torque values: 8mm nut 2.9kg-m(29N.m, 21ft-lb)



- Remove the sealing screws and washers from the cam chain tensioner lifter.
- Turn the tensioner shaft to the right with a small driver, and insert the shaft into the body completely.

NOTE

- If the cam chain tensioner lifter is dropped, the shaft will advance by the spring force.

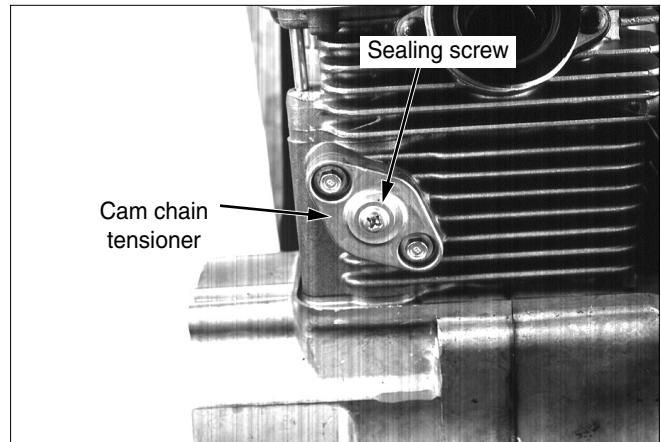


- Fix the tensioner shaft with a hard clip.
- assemble a new gasket to the tensioner lifter, and install the tensioner lifter on the cylinder.
- Tighten the tensioner mounting bolts.

Torque values: 1.2kg-m (12N.m, 9ft-lb)

- Remove the tensioner shaft clip from the tensioner lifter. Assemble sealing washers and screws to the tensioner lifter.

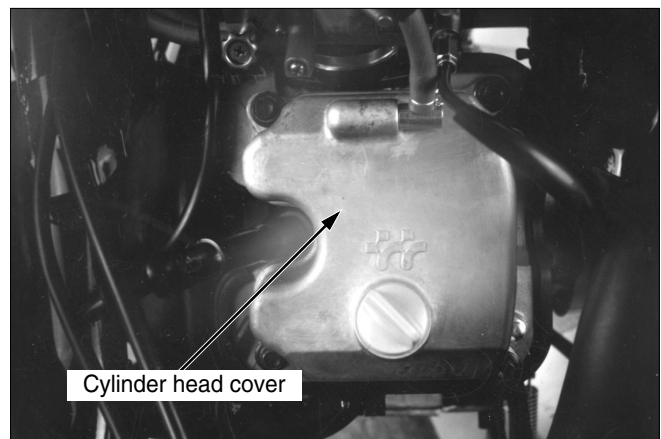
Torque values: 0.4kg-m(4N.m, 3ft-lb)

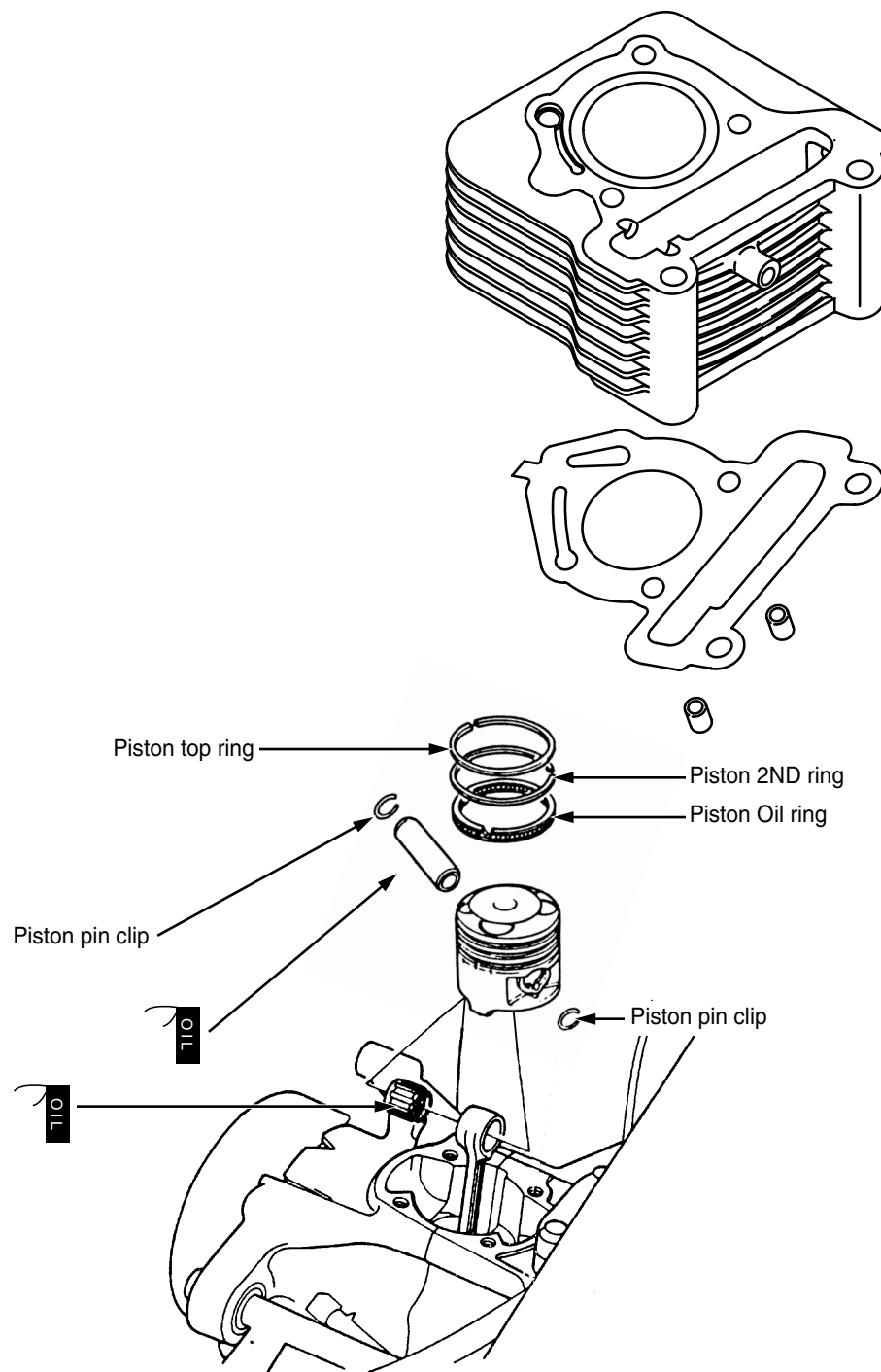


- Fill clean engine oil into the operating parts of the cylinder head.
- Adjust the valve clearance. (⇒ 3-5)



- Remove oil from the cylinder head cover grooves, and accurately assemble the gasket to the cover.
 - Assemble the cylinder head cover.
 - Tighten the cylinder head cover bolt.
- Torque values: 1.3kg-m (13N.m, 9ft-lb)**
- Install the R/L shroud. (⇒ 8-2)
 - Install the luggage box. (⇒ 4-5)
 - Install the center cover. (⇒ 4-4)





10. Cylinder/Piston

Services information	10-1	Piston	10-3
Troubleshooting	10-1	Piston/Cylinder assembly	10-5
Cylinder	10-2		

Service Information

General Safety

- Take precautions not to damage the joint part with a driver when removing the cylinder, or not to damage the cooling pin by striking the cylinder too hard.
- Take precautions not to damage the inside of the cylinder or the exterior part of the piston.
- Check parts after disassembling, and clean and dry with an air hose prior to taking measurements.

Specifications

Unit: mm(in)

Item			Standard value	Service limit
Cylinder	Inner diameter		56.000-56.010(2.2047-2.2051)	56.100(2.2087)
	Cylindricity		————	0.050(0.002)
	Out of roundness		————	0.005(0.0002)
	Head contact warpage		————	0.020(0.0008)
Piston, Piston pin, Piston ring	Piston skirt outer diameter		55.925-55.945(2.2018-2.2026)	54.832(2.1587)
	Piston pin hole inner diameter		15.002-15.008(0.5906-0.5909)	15.038(0.5920)
	Piston pin outer diameter		14.994-15.000(0.5903-0.5906)	14.960(0.5890)
	Piston-to-piston pin clearance		0.002-0.140(0.0001-0.0006)	0.020(0.0008)
	Piston ring-to groove clearance	Top	0.040-0.057(0.0016-0.0026)	0.110(0.0043)
		Second	0.025-0.052(0.0010-0.020)	0.080(0.0031)
	Piston ring joint gap	Top/second	0.10-0.25(0.004-0.010)	0.50(0.020)
		Oil(side rail)	0.20-0.70(0.008-0.028)	1.10(0.040)
Cylinder-to piston clearance			0.055-0.085(0.0022-0.0033)	0.340(0.0134)
Connecting rod small end inner diameter			15.010-15.028(0.5909-0.5917)	15.060(0.5930)
Gap between connecting rod small end and piston pin			0.010-0.034(0.004-0.0013)	0.040(0.0020)

10

Troubleshooting

Compression low

- Worn cylinder or piston rings
- Leaking valve seats

Excessive smoke

- Worn cylinder or piston
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

Overheating

- Excessive carbon build-up on the piston combustion
- Incorrect spark plug

Knocking or abnormal noise

- Worn piston and cylinder
- Excessive carbon build-up
- Low octane fuel

Cylinder

Removal

- Remove the cylinder head. (⇒ 9-5)
- Remove the cam chain guide from the cylinder.
- Remove the cylinder.

- Remove the gasket and dowel pin. Remove the gasket residues attached to the cylinder.

NOTE

- Take precautions not to damage the gasket.

Inspection

- Measure, and record, the cylinder inner diameter from the 6 top, middle and bottom places in the piston direction and the perpendicular axial (X and Y direction) direction.
- The maximum value shall be the cylinder inner diameter.

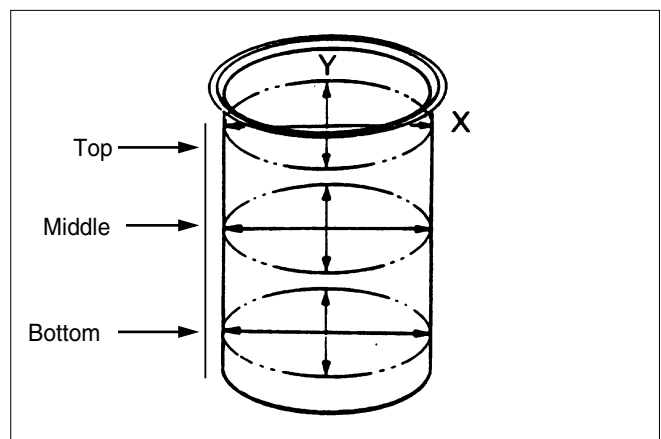
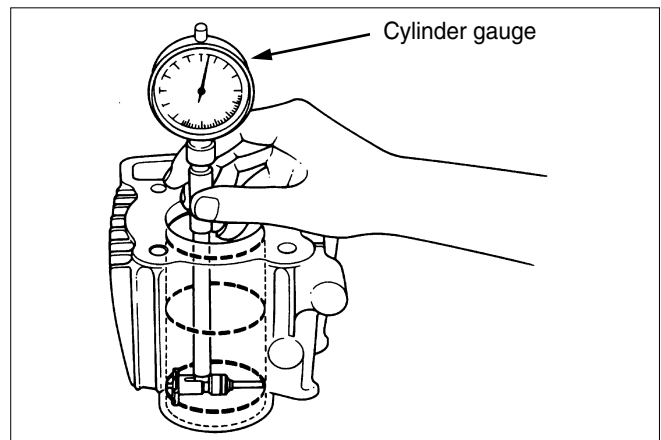
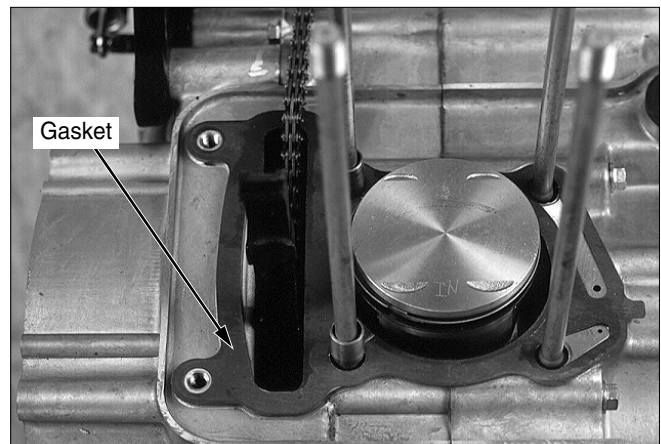
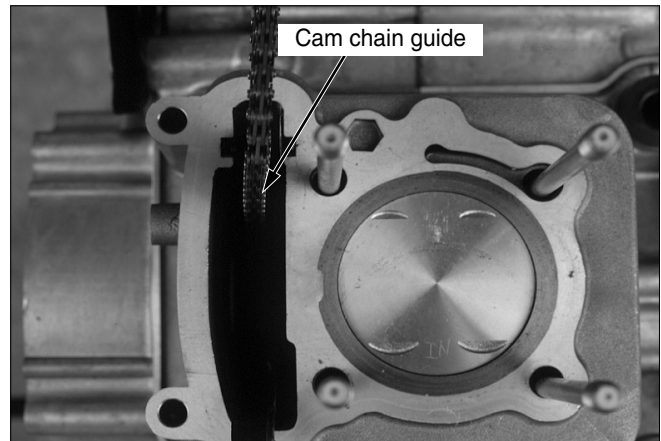
Service limit: 56.100mm(2.2087in)

- Measure the piston outer diameter.
- Subtract the piston outer diameter value from the cylinder inner diameter value, and measure the clearance between the cylinder and piston.

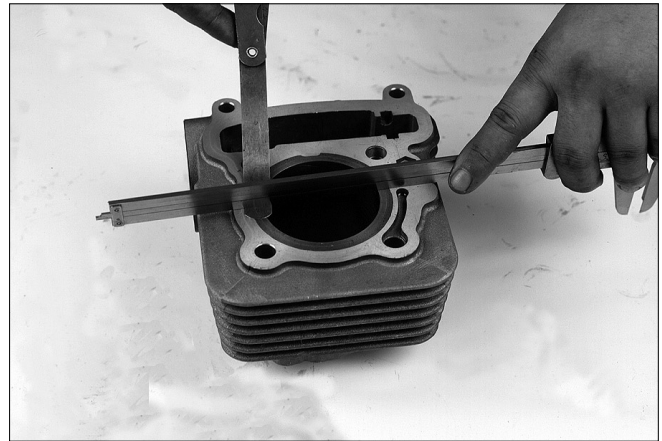
Service limit: 0.340mm(0.0134in)

- Based on each measured value, calculate the out of roundness (difference between X direction and Y direction) and cylindricity (Difference of top, middle and bottom inner diameter in the direction of X or Y).

Service limit: Out of roundness 0.005mm(0.0002in)
Cylindricity 0.05mm(0.002in)



- Check the cylinder distortion.
Service limit: 0.02mm (0.0008in)



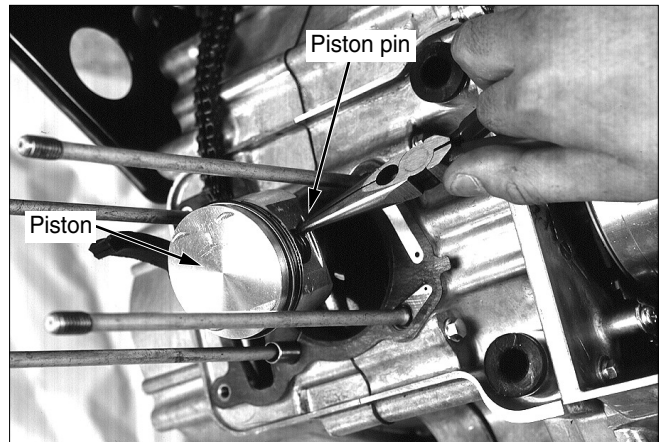
Piston

Disassembly

- Remove the piston pin clip

NOTE

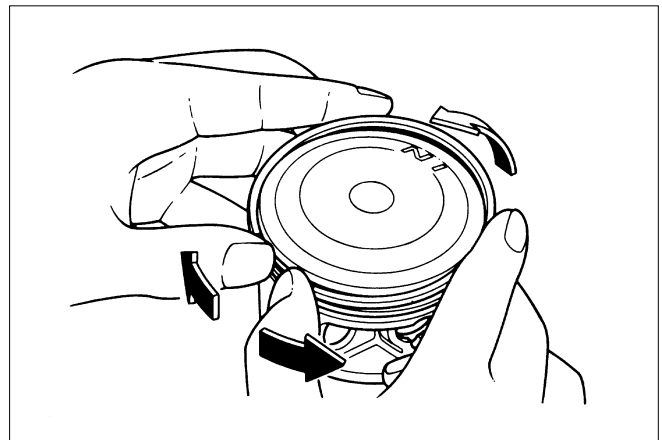
- Take precautions not to drop the piston pin clip into the crank case.
- Remove the piston pin, and separate piston.



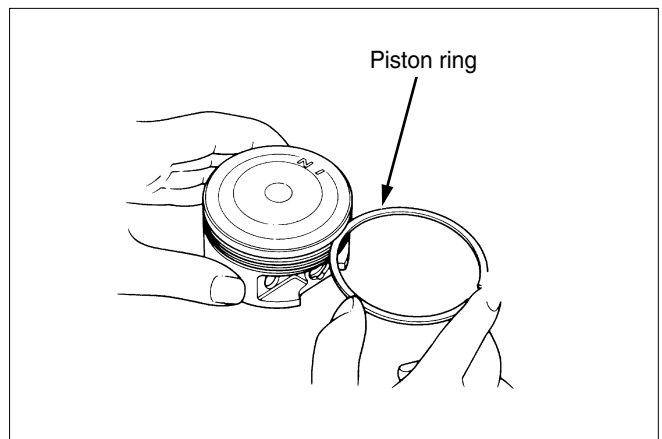
- Check the piston ring.
- Remove the piston ring.

NOTE

- Be careful not to damage the piston with the piston ring while removing the ring.



- Check the clearance between the piston ring and groove.
Service limit: Top 0.110mm(0.0043in)
Second 0.080mm (0.003in)
Oil 0.280mm(0.0110in)
- Check the piston for wear or damage.



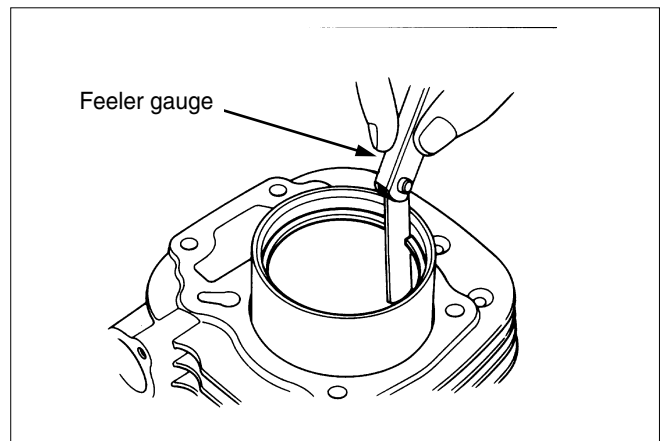
Cylinder/Piston

- Insert the piston ring into the inside of the cylinder, and check the piston ring clearance.

NOTE

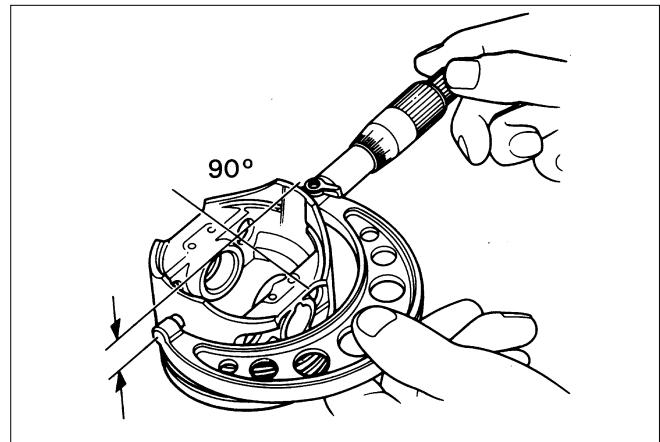
- Use the piston head to insert the piston ring so that the piston can be level.

Service limit: Top/second 0.50mm (0.020in)
Oil (side rail) 1.10mm (0.040in)



- Measure the piston outer diameter at a point 10mm from the piston bottom in the direction of 90° to the piston pin

Service limit: 55.82mm (2.198in)



- Measure the inner diameter of the piston pin hole.

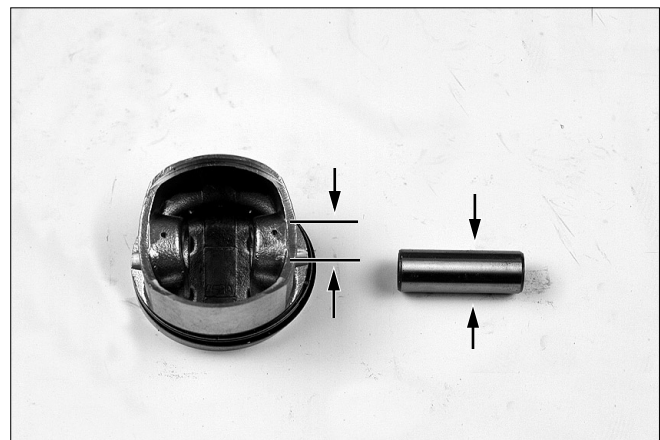
Service limit: 15.038mm (0.5920in)

- Measure the outer diameter of the piston pin.

Service limit: 14.960mm (0.5890in)

- Check the clearance between the piston and piston pin.

Service limit: 0.020mm (0.0008in)

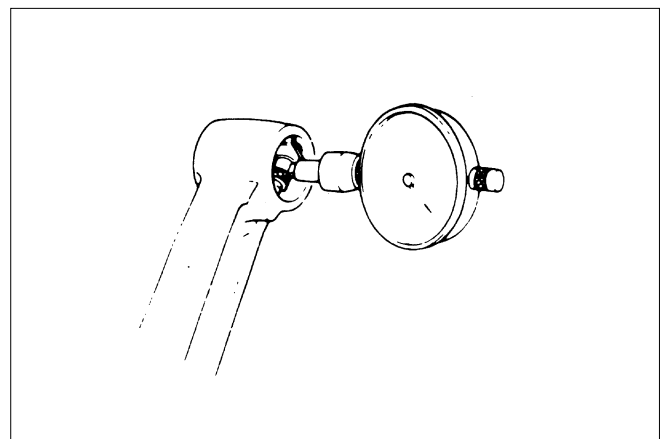


- Measure the inner diameter of the connecting rod small end.

Service limit: 15.060mm (0.5930in)

- Check the clearance between inner diameter of the connecting rod small end and the piston pin.

Service limit: 0.040mm (0.0020in)



Piston/Cylinder Assembly

Piston Ring Assembly

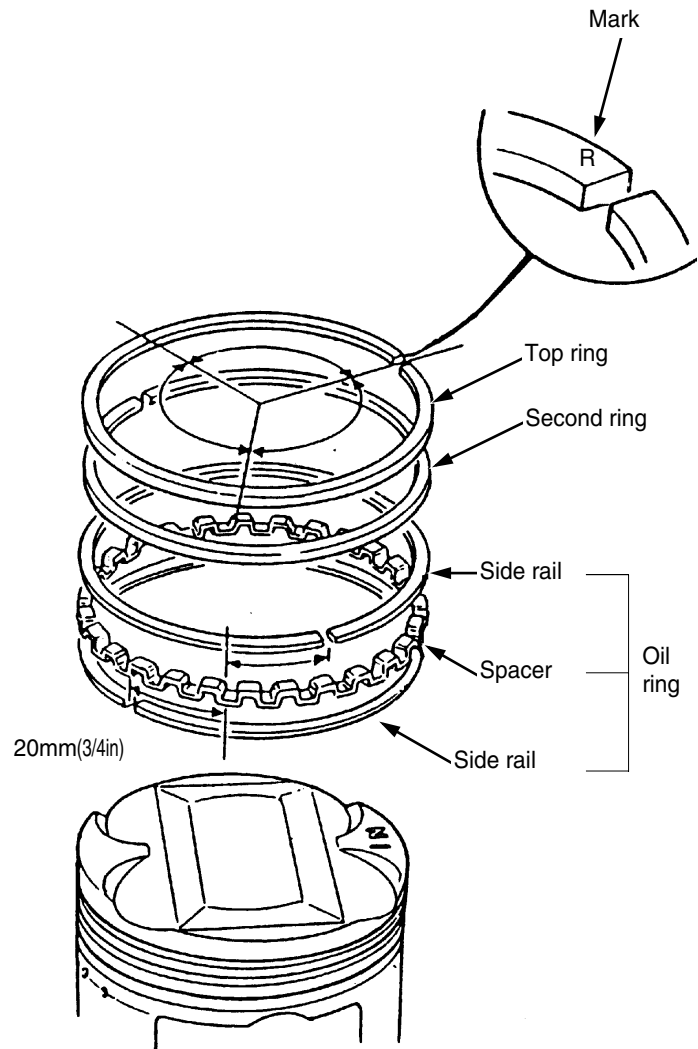
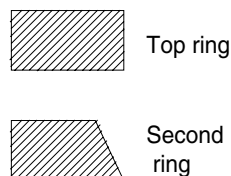
- Clean the piston ring groove with oil, and assemble the piston ring.

NOTE

- The ring is easily broken. Take necessary precautions not to break it, and not to damage the piston during assembly.
- Assemble the ring with the marked side facing upward.
- Do not confuse the top ring and the second ring.

- Stagger the ring end gaps 120° apart.
- Do not match the oil ring side rail ends with each other.

- After assembling, verify the ring is rotating smoothly.

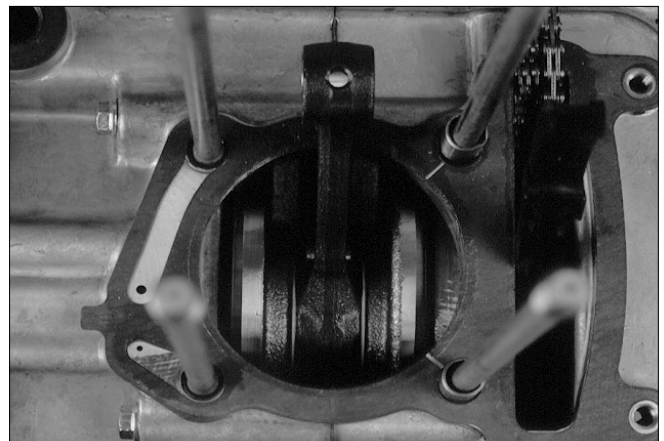


Piston/Cylinder Assembly

- Remove the gasket from the crank case.

NOTE

- Be careful not to damage the gasket surface.
- Place a piece of cloth over the crank case to prevent the gasket from falling into the crank case.



Cylinder/Piston

- Assemble the piston, and piston pin to the connecting rod.
- Assemble new piston pin clips.

NOTE

- Let the "IN" mark face towards the intake valve side.
- Place a piece of cloth over the crank case to prevent the piston pin clips from falling into the crank case.
- Make sure the piston pin clip joint is not aligned with the piston groove.

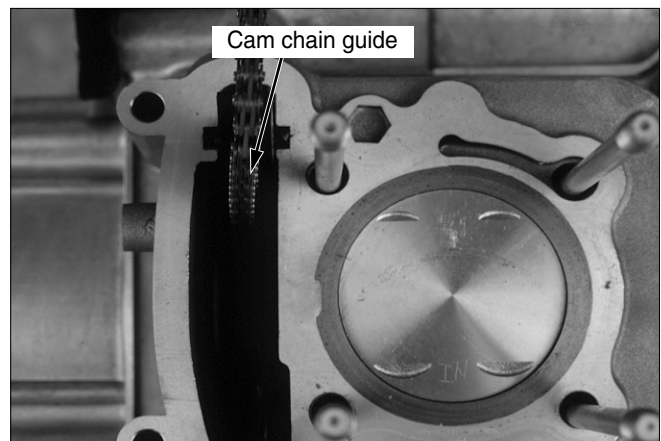
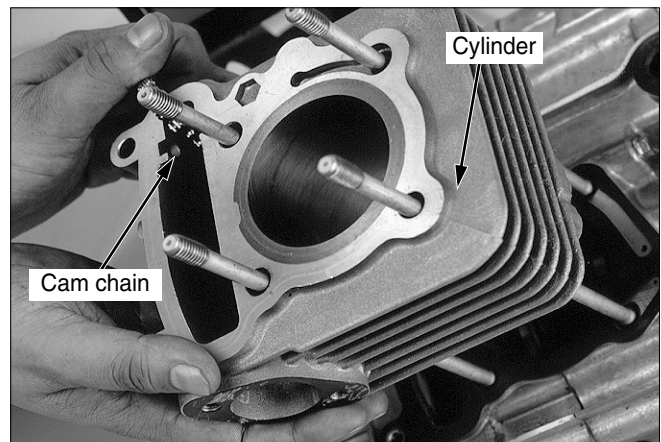
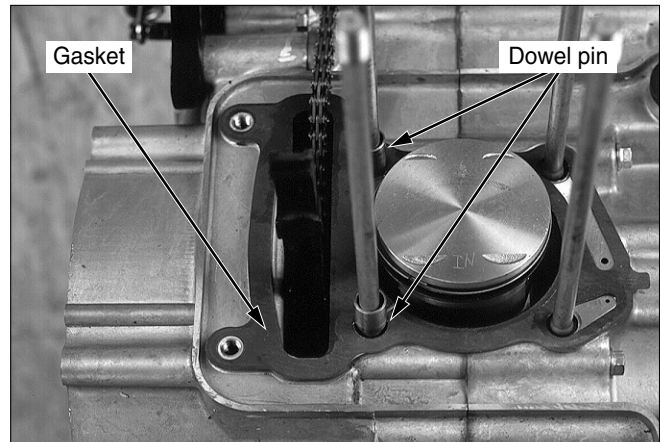
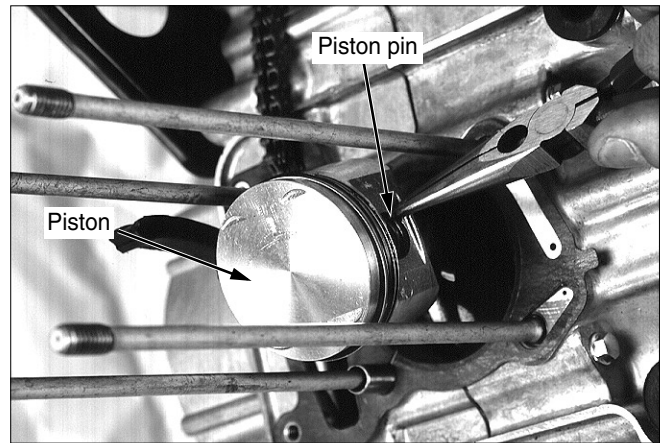
- Assemble new gaskets and dowel pins.

- Apply engine oil to the cylinder inside and the piston ring, and assemble the piston ring.

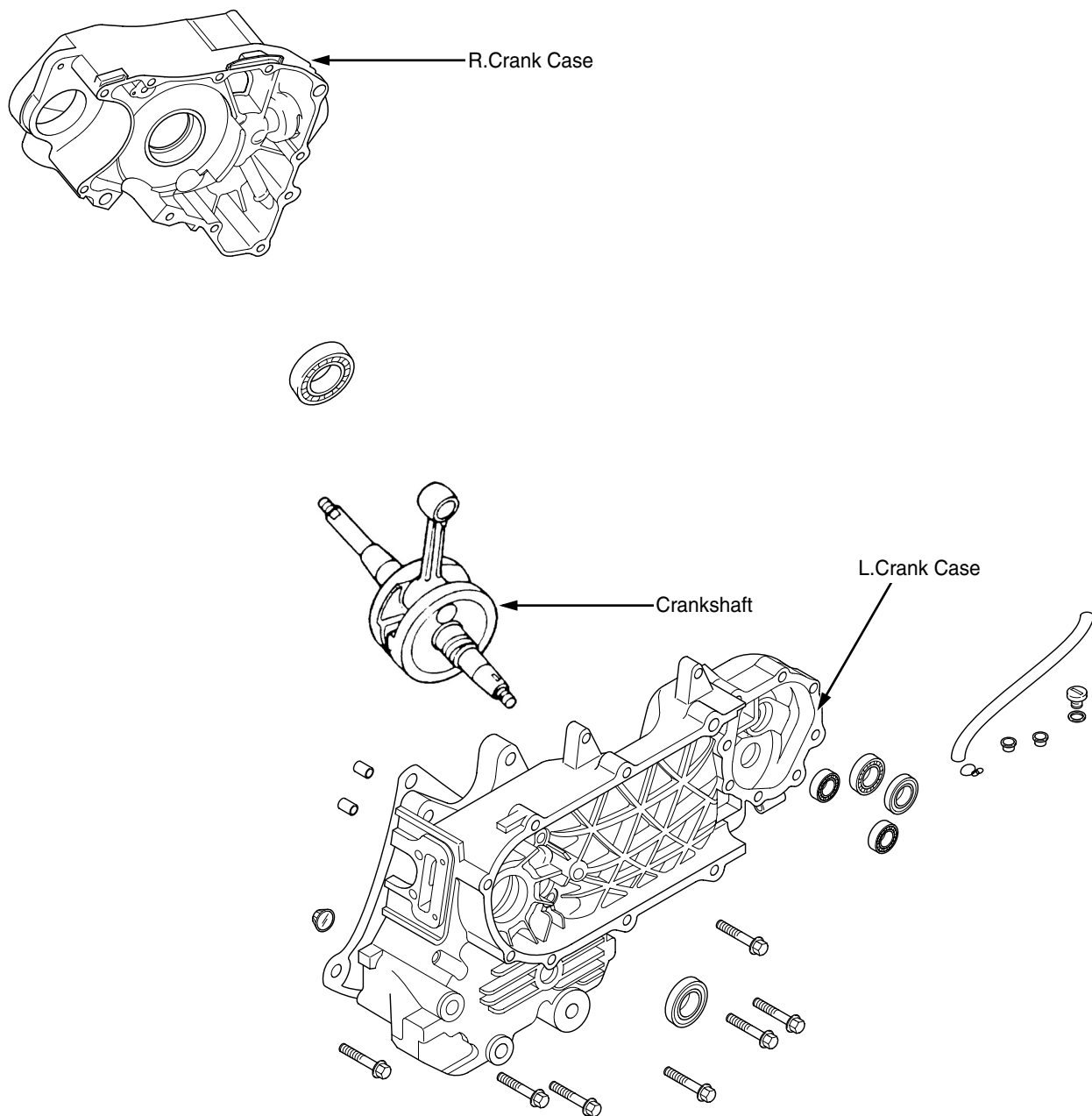
NOTE

- Be careful not to damage the piston ring.
- Take precautions to prevent the cam chain from falling into the crank case.

- Assemble the lower part of the cam chain guide to the crank case lost, and install the cam chain guide by aligning the tangs with the cylinder slots.
- Assemble the cylinder head. (⇒ 9)



MEMO



11. Transmission/Crankshaft/Crank Case

Service Information	11-1	Crankshaft Disassembly	11-7
Troubleshooting	11-2	Crankshaft Bearing	11-8
Transmission	11-3	Crankshaft Assembly	11-9
Crank Case Disassembly	11-6	Crank Case Assembly	11-10

Service Information

General Safety

- This section describes how to remove the crank case and to maintain the transmission and the crankshaft.
- Service transmission without removing the engine from the vehicle. However, to prevent damage to the L. crank case, remove the engine and disassemble the rear brake prior to changing the L. crank case bearing.
- Always use special tools to change the drive shaft. Fix the bearing inner race, and install the shaft.
- The following parts must be removed prior to removing the crank case. Follow the removal procedure specified in each section.
 - Oil pump (⇒ section 3)
 - Carburetor (⇒ section 5)
 - Engine (⇒ section 6)
 - Cylinder head, cylinder, and piston (⇒ section 9 and 10)
 - AC generator (⇒ section 8)
 - Drive pulley (⇒ section 7)
 - Clutch / driven pulley (⇒ section 7)
- The following parts must be removed prior to changing the L. crank case. Follow the removal procedure specified in each section.
 - Transmission (⇒ section 11)
 - Rear brake (⇒ section 13)
- To assemble the crank case and crankshaft, set the special tool to the inner race of the crankshaft bearing, and push and assemble. Remove the bearing from the crankshaft during disassembling work, and insert a new bearing in the case. Install the oil seal after the case is assembled.

Specifications

Unit: mm(in)

	Item		Standard value	Service Limit
Crankshaft	Connecting rod big end side clearance		0.1~0.35(0.0039-0.0138)	
	Radial clearance		0-0.008(0-0.003)	0.05(0.002)
	Crankshaft runout	Right	-	0.1(0.004)
		Left	-	0.1(0.004)

Torque value

Crank case bolt 1.0kg-m(10N.m, 7ft-lb)

Tools

- Universal bearing puller
- Bearing remover set
- Remover assembly
- Remover shaft
- Remover head
- Sliding weight
- Assembly shaft

Troubleshooting

Engine noise

- Connecting rod big and small ends loose.
- Crank pin bearing loose.

Engine started but unable to move out

- Transmission damaged.
- Transmission seized.

Noise during operation

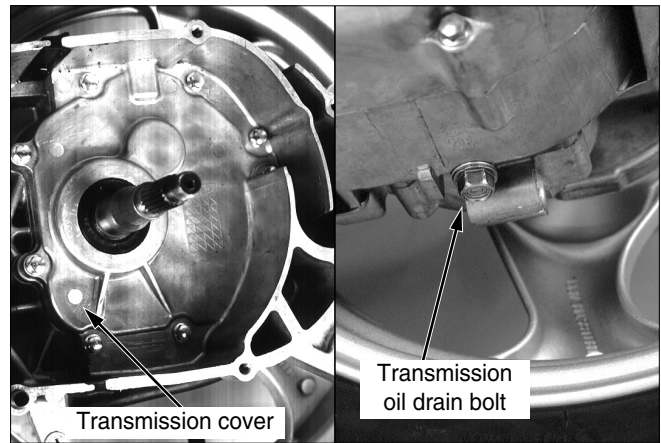
- Gear worn, overheated, or cracked.
- Bearing worn.

Oil leaks

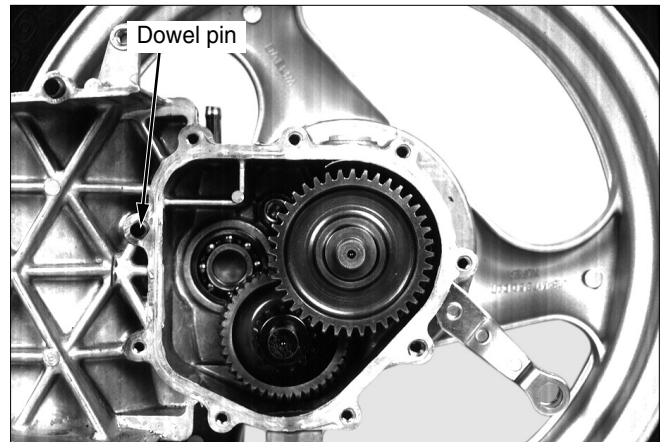
- Excessive oil level
- Oil seal worn or damaged.

Transmission

- Loosen the drain bolt and remove the transmission oil.
- Remove R. crank case cover. (⇒ section 8)
- Remove the continuously variable transmission (⇒ section 7)
- Remove the rear wheel (⇒ section 13)
- Loosen the 8 transmission cover bolts.
- Remove the transmission cover.



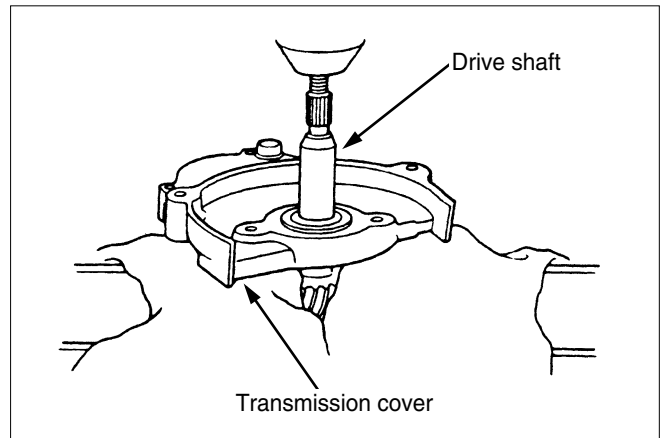
- Remove the gasket and dowel pin.



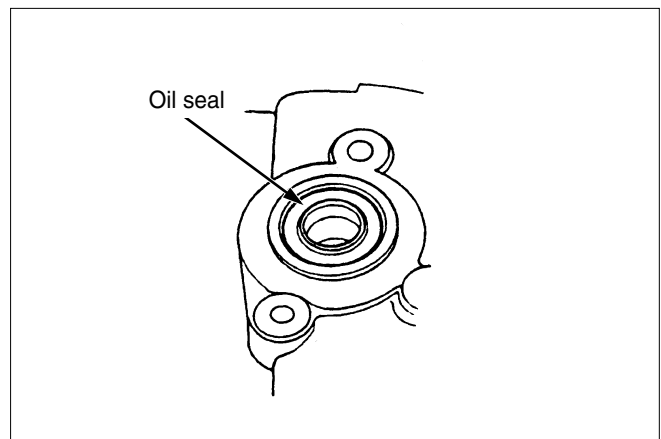
- Remove the drive shaft from the transmission cover by using a hydraulic press.

NOTE

- Take precautions not to damage the cover joints.

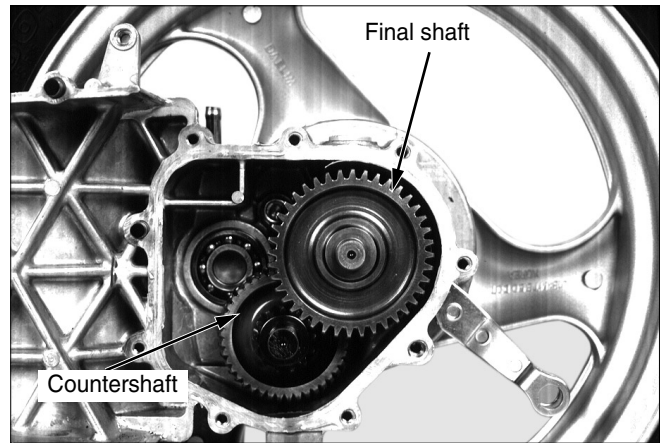


- Remove the oil seal of the drive shaft.



Transmission/Crankshaft/Crank Case

- Remove the final shaft and the countershaft comp.



Inspection

- Check the drive shaft for wear or damage.



- Check the final shaft for wear or damage.

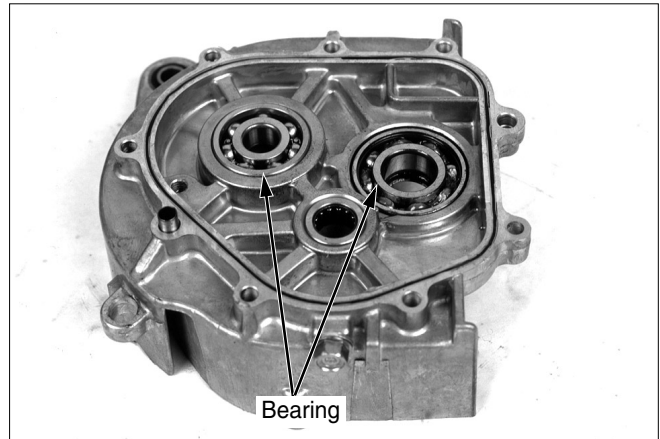


- Check the countershaft for wear or damage.



Bearing inspection

- Manually turn the bearing inner race installed inside the transmission cover, and check if the race is turning smoothly.
- Verify the outer race is accurately installed in the case.
- Replace the bearing, if necessary.



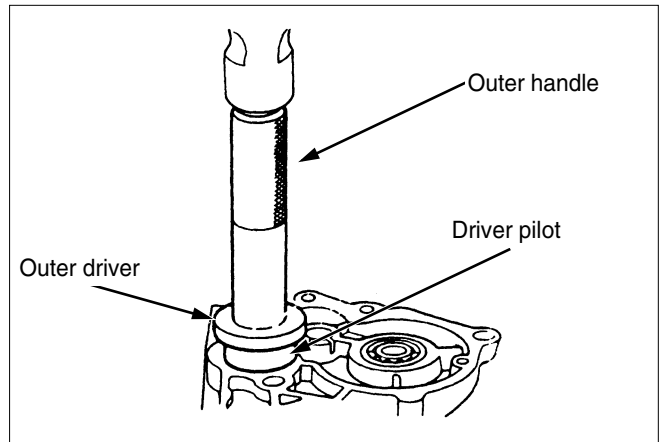
- Use special tools to push in the bearing into the case.

Tools: Driver handle A

Outer Driver

Driver pilot

- Check the L. crank case oil seal for wear or damage.

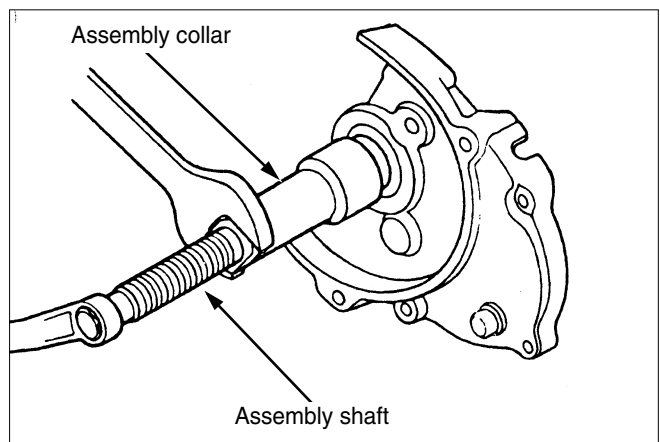


Installation

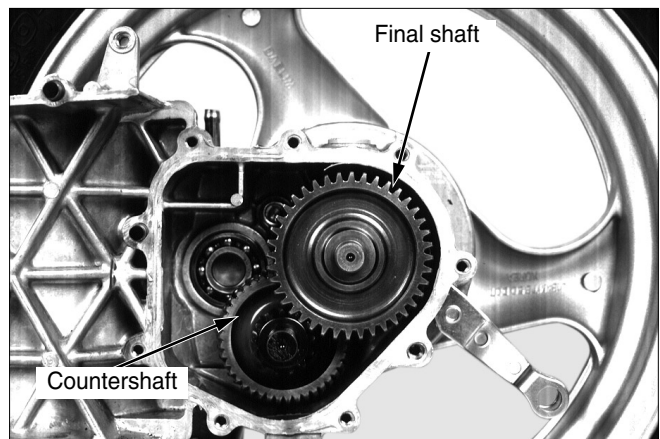
- Install the drive shaft on the transmission cover.
- Install a new drive shaft oil seal.

Tools: Crank assembly shaft

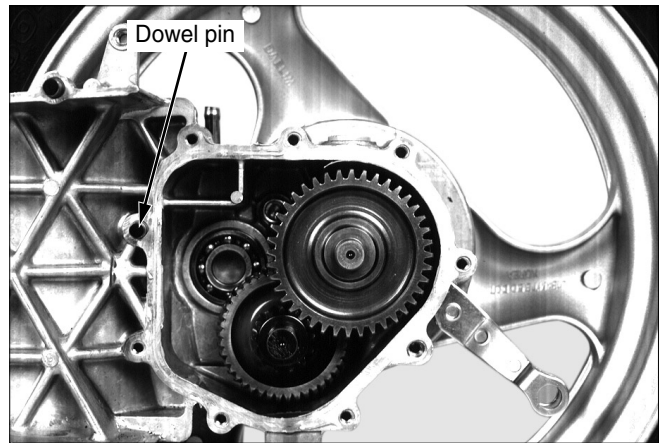
Crank assembly collar



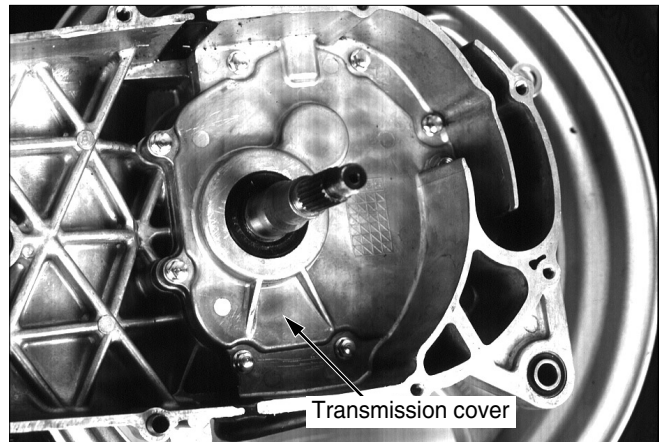
- install the final shaft and counter gear on the L. crank case.



- Install a new gasket and dowel pin.

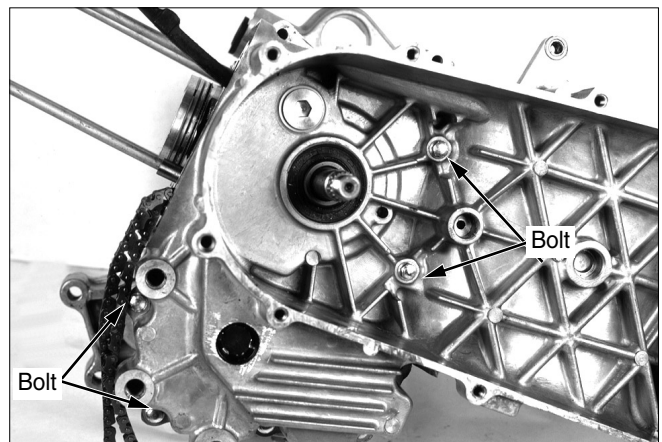


- Tighten the transmission cover with setting bolts.
 - Assemble the rear wheel (⇒ section 13)
 - Assemble continuously variable transmission (⇒ section 8)
 - Assemble the R. crank case cover (⇒ section 8)
- Fill transmission oil.



Crank Case Disassembly

- Remove the engine from the frame. (⇒ section 6)
- Remove the R/L crank case cover.
- Remove the transmission cover.
- Remove the parts to disassemble crank case.



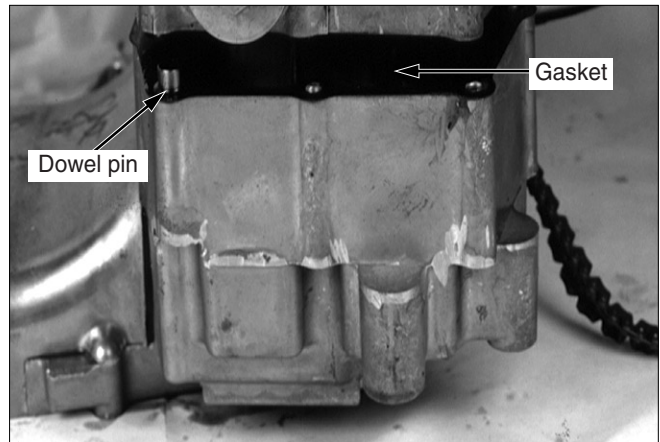
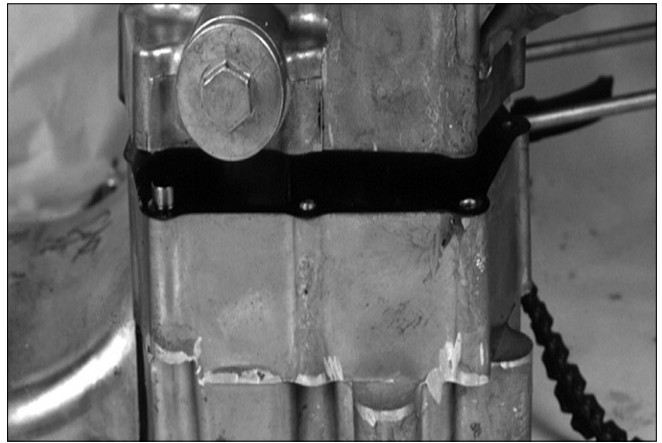
- Loosen the seven R/L crank case setting bolts.

- Remove the crank case bleeder tube.
- Face the L. crank case downward.
- Disassemble the R. crank case from the L. crank case while tapping a few places on the L. crank case with a plastic hammer.

NOTE

- Be careful not to distort the mating surface of the crank case during disassembly.

- Disassemble the dowel pin and gasket.



Crankshaft Disassembly

- Remove the R. crank case cover.(⇒ 8-4)
- Remove the L. crank case cover.(⇒ 7-2)
- Remove the crankshaft from the R. crank case by using a crankshaft remover.
- If there is the bearing left in the L. crank case, use the driver handle and the outer driver to remove it.

Tool : Driver

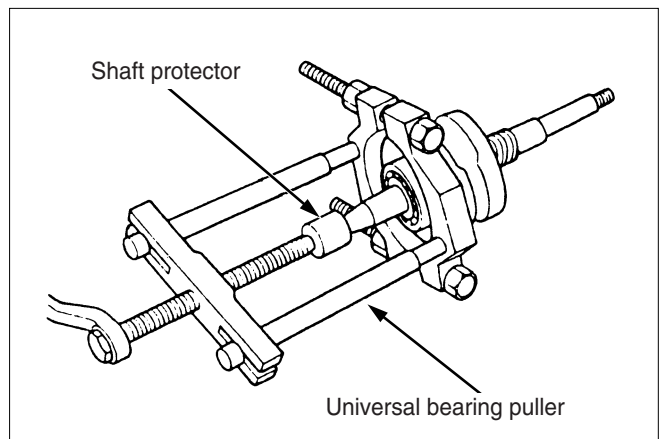
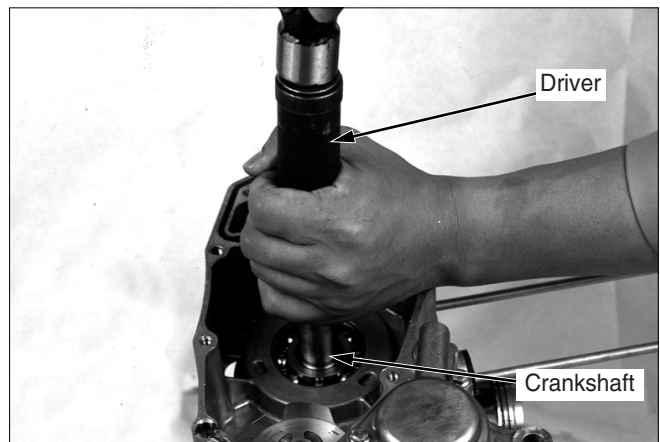
Attachment, 42 × 47mm

- If there is the bearing left in the crankshaft, use a bearing puller to remove it.

Tool: Universal bearing puller

NOTE

- After removing the crankshaft from the R. crank case, replace the R. crankshaft bearing with a new one.

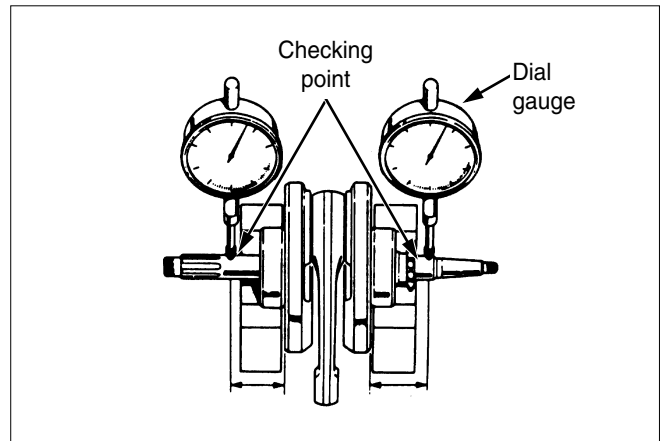


Inspection

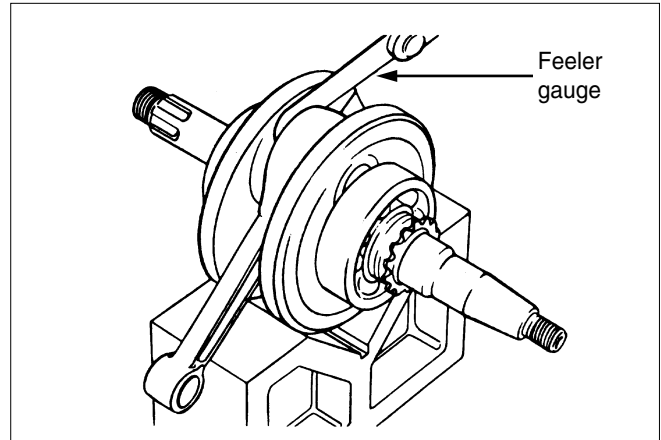
- Place the crankshaft on a stand or V-block, and check the journal vibration.

Service limit: Right side 0.1mm (0.004in)

Left side 0.1mm(0.004in)

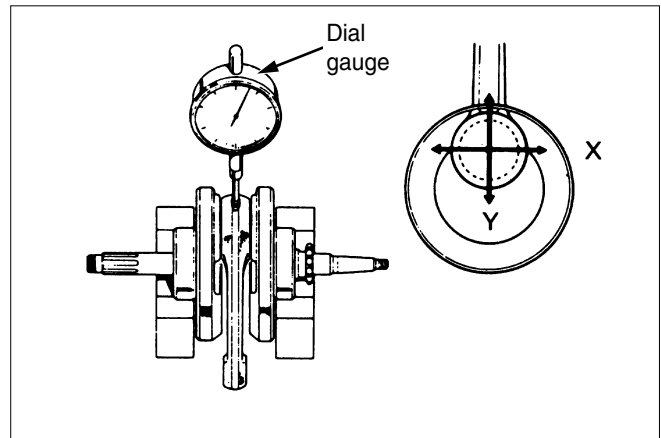


- Measure the side gap between the connecting rod big end and the crank weight.



- Check the vertical shaft play of the connecting rod big end from the X and Y direction.

Service limit: 0.05mm (0.002in)

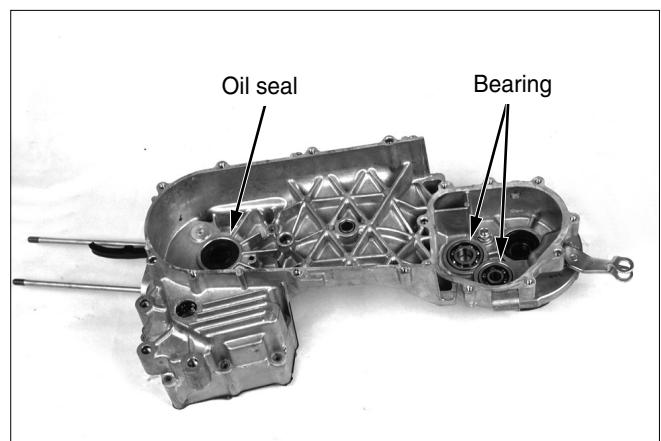


Crankshaft Bearing

- Remove the transmission and crankshaft.

Inspection

- Manually turn the bearing inner race to see if it rotates smoothly.
- Check the outer race to see if it is accurately pressed into the case.
- If the outer race is excessively loose, or is loosely pressed into the case, remove it and replace with a new one.



Replacement

L. crank case

- Use special tools to remove the drive shaft bearing.

Tools: Bearing remover set

Remover shaft

Remover head

- Remove the final shaft bearing and oil seal.
- Remove the countergear bearing.
- Apply clean engine oil to a new bearing, and assemble it to the crank case.

Tools: Main shaft bearing:

Driver

Attachment, 32 × 35mm

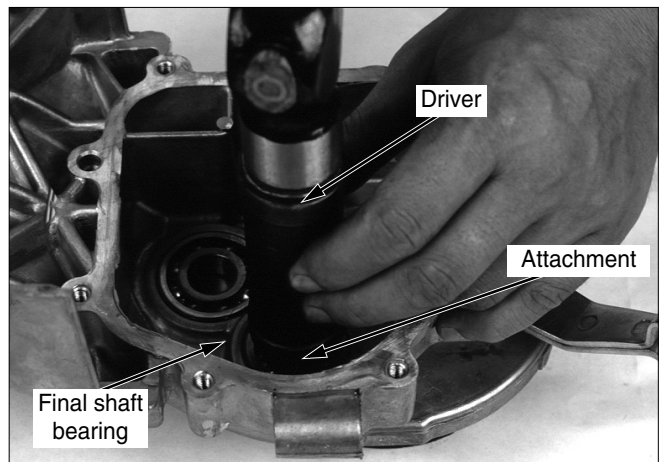
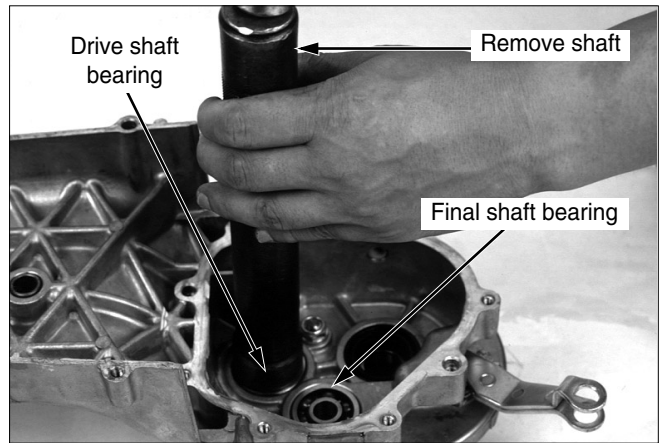
Countershaft bearing:

Driver

Attachment, 42 × 47mm

Pilot 20mm

- Install a new final shaft oil seal.



Crankshaft Assembly

- Apply clean engine oil to the new R. crankshaft bearing, and press in the bearing into the R. crank case.

Tools: Driver

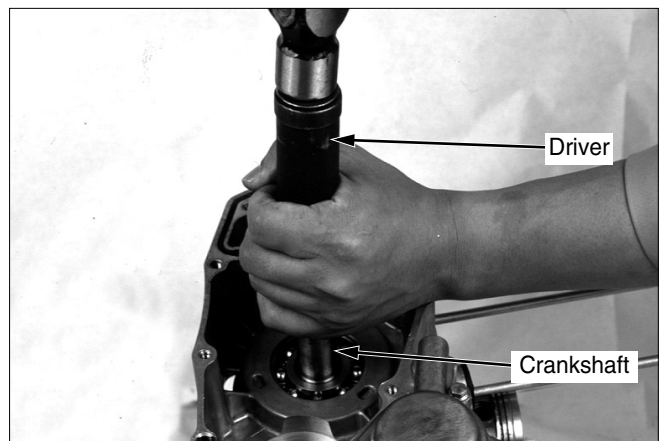
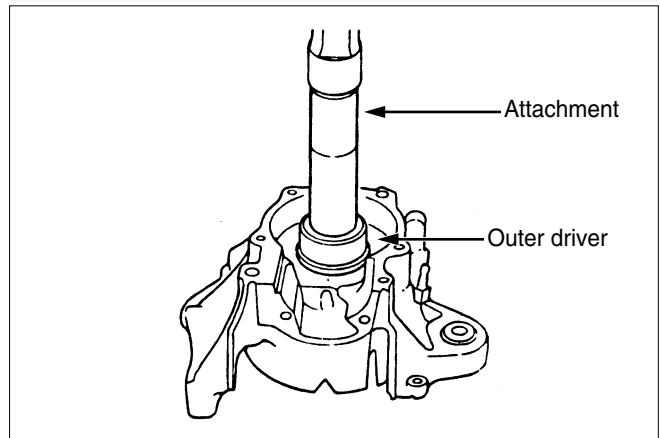
Attachment, 72 × 75mm

Pilot, 35mm

- Use special tools to assemble the crankshaft to the L. crank case.

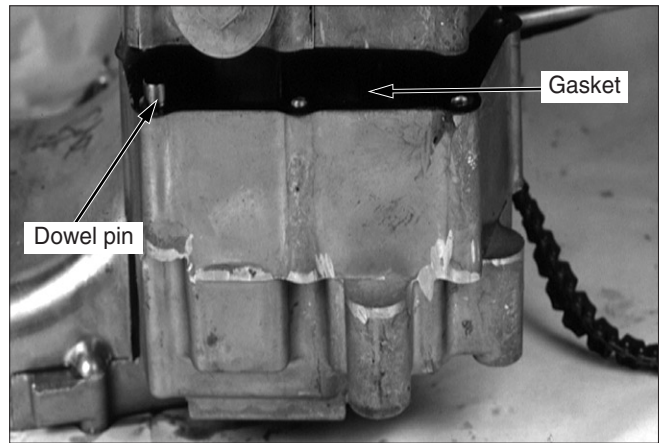
Tools: Assembly shaft

Crankshaft assembly collar



Crank Case Assembly

- Install dowel pins and new gaskets.



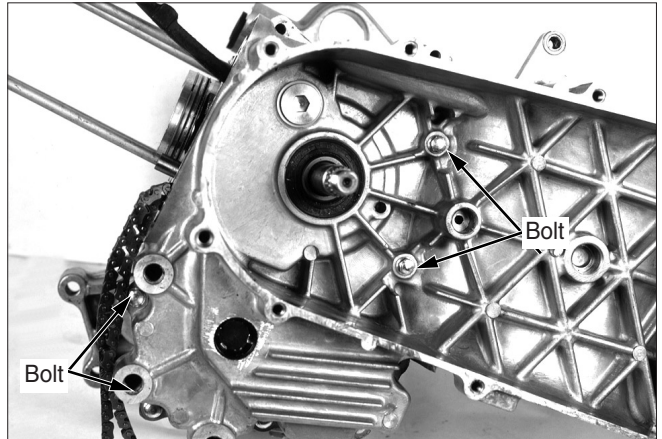
- Assemble the R. crank case to the L. crank case.

NOTE

- Make sure that the gasket is completely attached without any clearance.



- Tighten the crank case bolts.
Torque value: 1.0kg-m (10N.m,7ft-lb)
 - Install the R/L crank case cover.
 - Assemble the disassembled parts.
- Install the engine on the frame.



12. Front Wheel/Front Fork/Steering

Service Information	12-1	Front Wheel	12-5
Troubleshooting	12-2	Front Fork	12-10
Handle Bar	12-3	Steering Stem	12-15

Service Information

General Safety

CAUTION

- Keep oil or brake fluid off the brake disk and pad because the contaminated brake disk and pad reduces the braking performance. If contaminated, replace the pad with a new one, and clean the disk.
- Use special tire levers and rim protectors to remove or assemble tires to protect the the rim from being damaged.
- This section describes how to remove and maintain front wheels, front fork and steering system. For information on the front brake system, refer to section 14.
- Place a jack underneath the engine to support the 2-wheeled vehicle.

Specifications

Unit: mm(in)

Item		Standard value	Service limit
Front axle deflection		-	0.2(0.008)
Front wheel rim runout	Radical	-	2.0(0.08)
	Axial	-	2.0(0.08)
Front fork tube deflection		-	0.2(0.08)
Front fork oil level		80 ^{cm}	-
Fork spring free length		230.8(9.087)	-

Torque values

Handle setting nut	5.0kg (50N.m, 36ft-lb)
Brake disk nut	1.5kg-m (15N.m, 11ft-lb) Self lock nut
Front axle nut	5.0-7.0kg-m (50-70N.m, 36-50 ft-lb)
Front wheel stud nut	0.6kg-m (6N.m, 4ft-lb)
Fork setting bolt	3.5kg-m (35N.m, 25ft-lb)
Fork tube cap bolt	2.3kg-m (23N.m, 17ft-lb)

Troubleshooting

Hard steering

- Steering bearing adjustment nut too tight
- Faulty steering stem bearings
- Damaged steering stem bearings
- Insufficient tire pressure

Steers to one side or does not track straight

- Unevenly adjusted right and left shock absorbers
- Bent front forks
- Bent front axle: wheel installed incorrectly

Front wheel wobbling

- Bent rim
- Worn front wheel bearings
- Faulty tire
- Axle nut not tightened properly
- Wheel out of balance

Soft suspension

- Weak fork springs
- Insufficient fluid in front forks

Hard suspension

- Incorrect fluid weight in front forks
- Front fork air pressure incorrect
- Bent fork tubes
- Clogged fluid passage
- Clogged anti-dive orifice

Front suspension noise

- Worn slider or guide bushings
- Insufficient fluid in forks
- Loose front fork fasteners
- Lack of grease in speedometer gearbox

Handle Bar

Removal

- Remove the following parts.
 - Headlight (⇒ 18-2)
 - Main switch connector (⇒ 18-4)
 - Front cover (⇒ 4-3)
 - Front handle cover
 - Headlight, and winker wiring
 - Disassemble the speedometer cable from the speedometer.
 - R/L handle bar switch wire and throttle grip
 - Rear handle cover
- Loosen the master cylinder holder bolts.
- Remove the master cylinder.

CAUTION

- Support master cylinder properly to prevent brake fluid from leaking.
- If the master cylinder is dropped upside down, air may enter the hydraulic system. Fix it to the vehicle while maintaining the correct assembled location.

- Unscrew the rear brake lever holder setting bolts.
- Remove the rear brake lever.

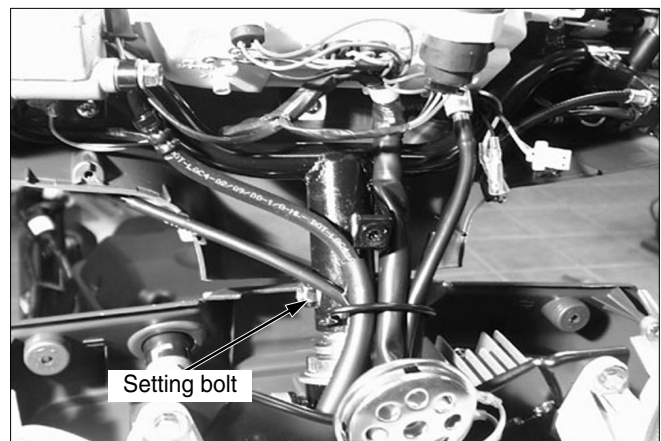
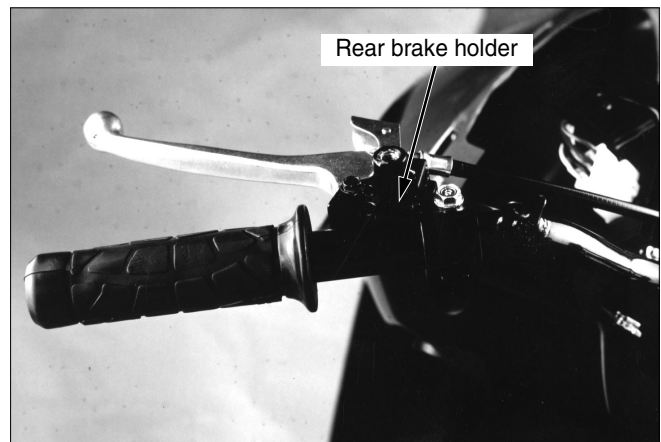
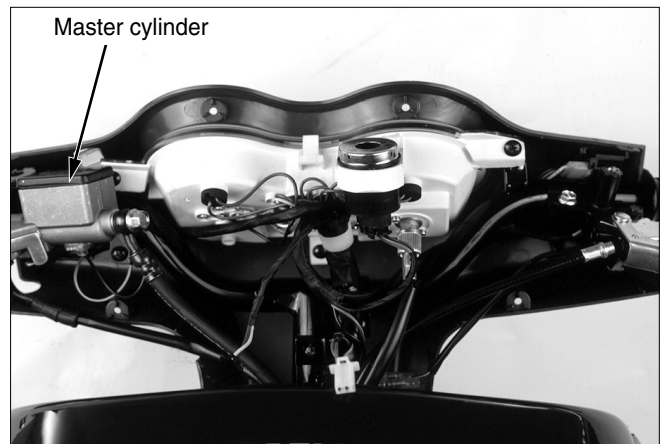
- Remove the handle setting bolts and U nuts.
- Remove the handle bar.

Installation

- Install the handle bar.
 - Assemble the handle setting bolt and U nuts.
- Torque values: 5.0kg-m(50N.m, 36ft-lb)**

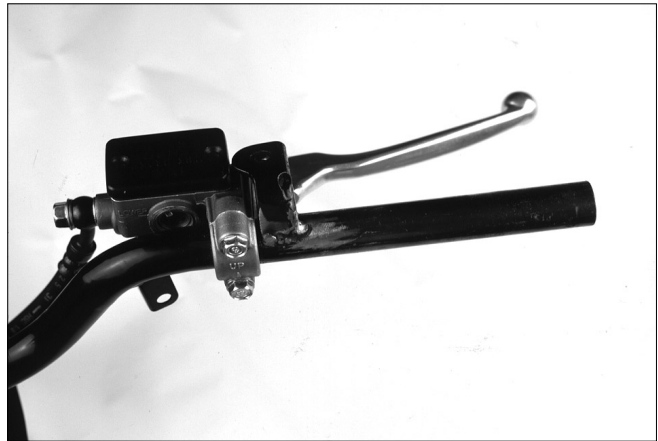
NOTE

- When installing the handle setting collar, match it with the groove accurately.



Front Wheel/Front Fork/Steering

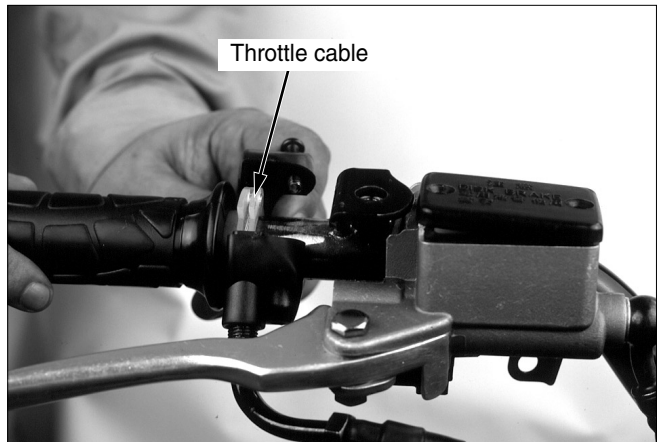
- Clean the throttle grip sliding surface.
- Apply grease to the throttle grip sliding surface and install the throttle grip.



- Apply grease to the throttle cable ends and connect the throttle cable to the groove of the grip.
- Tighten the pan screw after assembling the under and upper throttle housings.

NOTE

- Check that the throttle grip moves smoothly.
- Adjust the throttle grip free play. (⇒3-4)

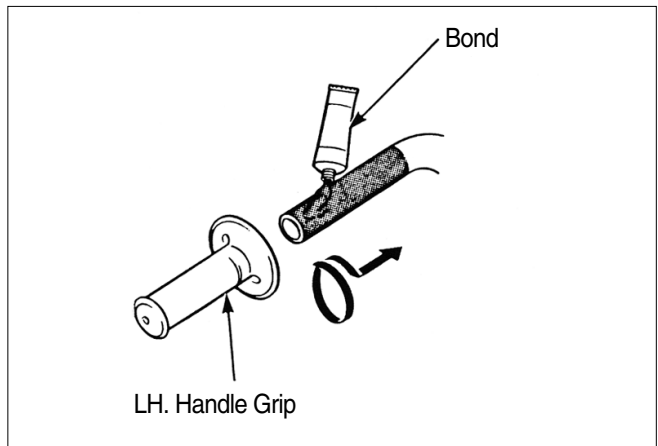


- Apply DAELIM Bond A to the inside surface of the grip and to the clean surface of the left handle bar. Wait 3~6 minutes and install the grip.

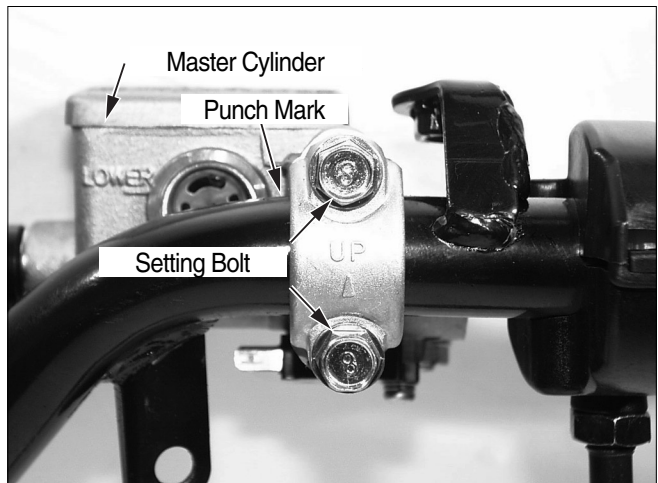
(Bond A :ROYAL BOND 1300)

NOTE

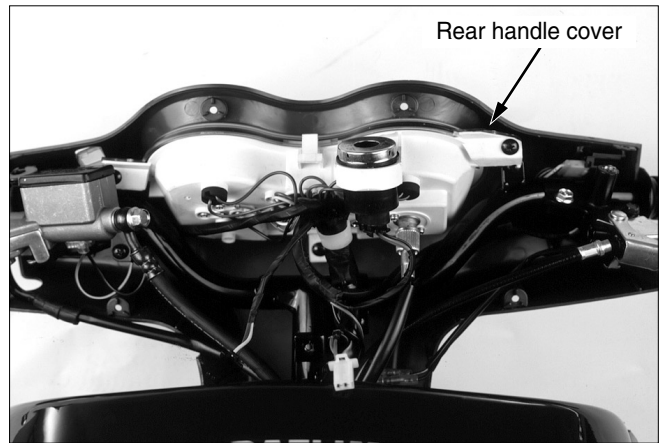
- Clean the bonding surface to avoid oil, grease or gasoline from attaching.
- Leave it for minimum 1 hour until the bond is dried.
- Use the bond according to the bond manual enclosed and install the grip while rotating it before the bond is dried completely.



- Install the front / rear brake master cylinders by aligning the punch mark on the handlebar with the master cylinder and set the master cylinder holder with the "UP" mark facing up or punch mark facing forward or up.
- Install the rear brake lever bracket on the L. handle bar.
- Tighten with the rear brake lever holder.
Torque values: 1.2kg • m(12N • m, 9ft-16)



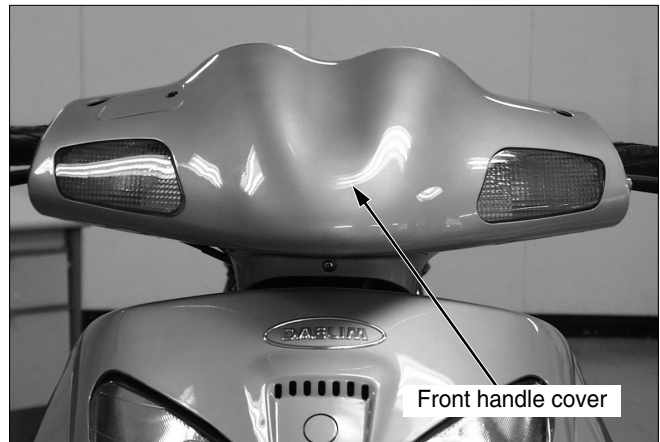
- Insert the brake cable, speedometer cable, throttle cable into the handle cable guide.
- Install the rear handle cover to the steering handle.
- Connect the speedometer cable, and tighten cable nut completely.



- Lift the front handle cover, and connect the winker wiring.
- Insert the front handle cover into the rear handle cover joint (hook type), and tighten with screws.

NOTE

- Make sure the front wiring is not interfered with.



- Install the LH. RH. front handle side cover.
- Install the front cover. (⇒ 4-3)
- Install the back mirror.



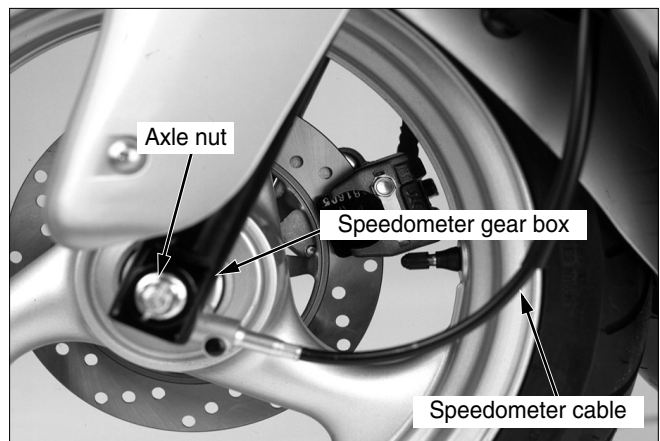
Front Wheel

Removal

- Loosen axle nuts. Support bottom of engine with a jack until the front wheel is lifted.
- Remove screws from the speedometer gear box, and separate the speedometer cable. Remove axle nuts, front axle, and front wheel.

NOTE

- Do not operate brake lever after the front wheel is removed.

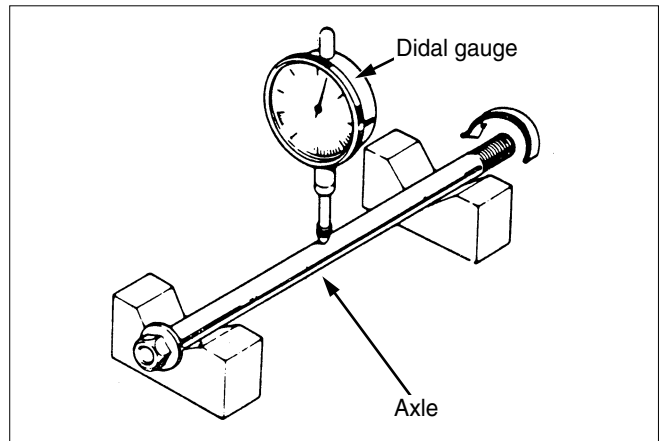


Front Wheel/Front Fork/Steering

Inspection

- Check the front axle for deflection. Place the front axle on a V-block, and measure deflection with a dial gauge.

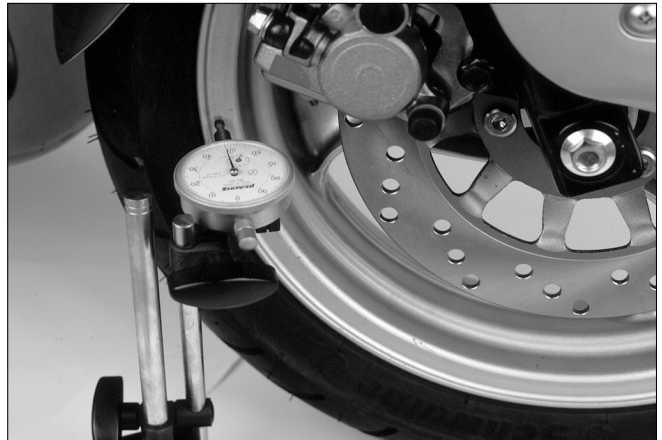
Service limit: 0.2mm (0.008in)



- Place the front wheel on an inspection stand. Slowly turn the wheel, and check the rim runout with a dial gauge.

Service limit: Radial 2.0mm (0.08in)

Axial 2.0mm (0.08in)

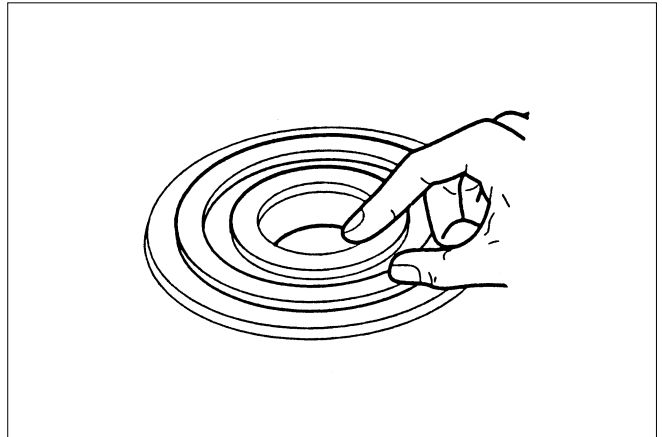


Bearing inspection

- Manually turn the bearing inner race, and replace if it makes noise or is worn. Check if the bearing outer race is accurately fitted into the wheel hub, and replace worn ones.

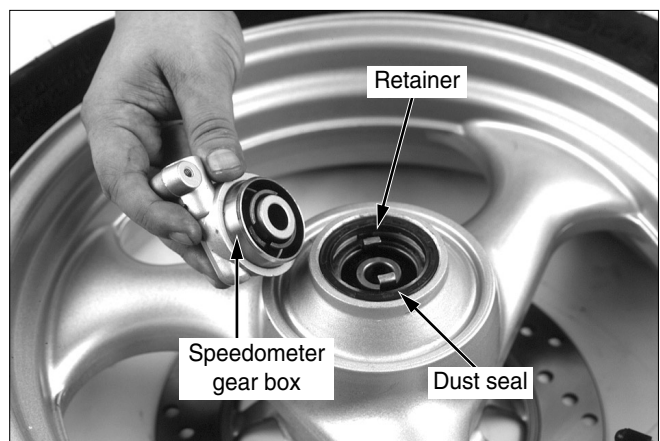
NOTE

- Replace bearings in pairs (left and right set).



Removal

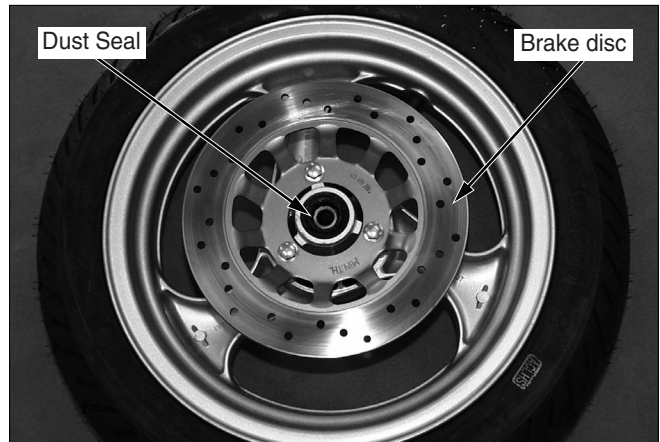
- Remove the speedometer gear box, dust seal, and speedometer gear retainer.



- Remove the right side collar.



- Remove the dust seal and brake disc.
- Check the disc for defects. (⇒ 14-5)



Wheel bearing replacement

- Install the bearing remover head and the remover shaft on the wheel, and remove the bearing and distance collar.

NOTE

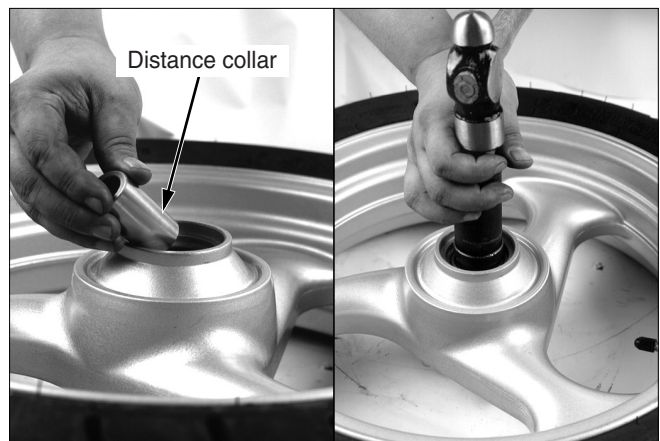
- Always replace bearings in pairs, and never use old bearings.

Tools: Bearing remover head
Bearing remover



- Apply sufficient amount of grease to the bearing.
- Insert the right bearing with its seal surface facing outside.
- Do not tilt the bearing. Insert accurately.
- Upon assembling the distance collar, insert the left bearing with its seal surface facing outside.

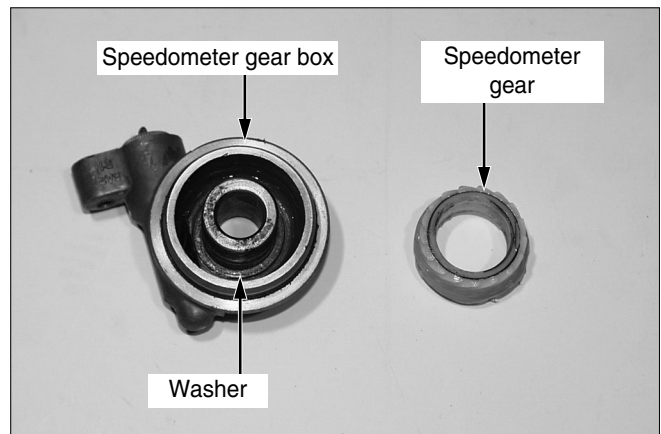
Tools: Driver
Attachment, 32 × 35mm
Pilot, 15mm



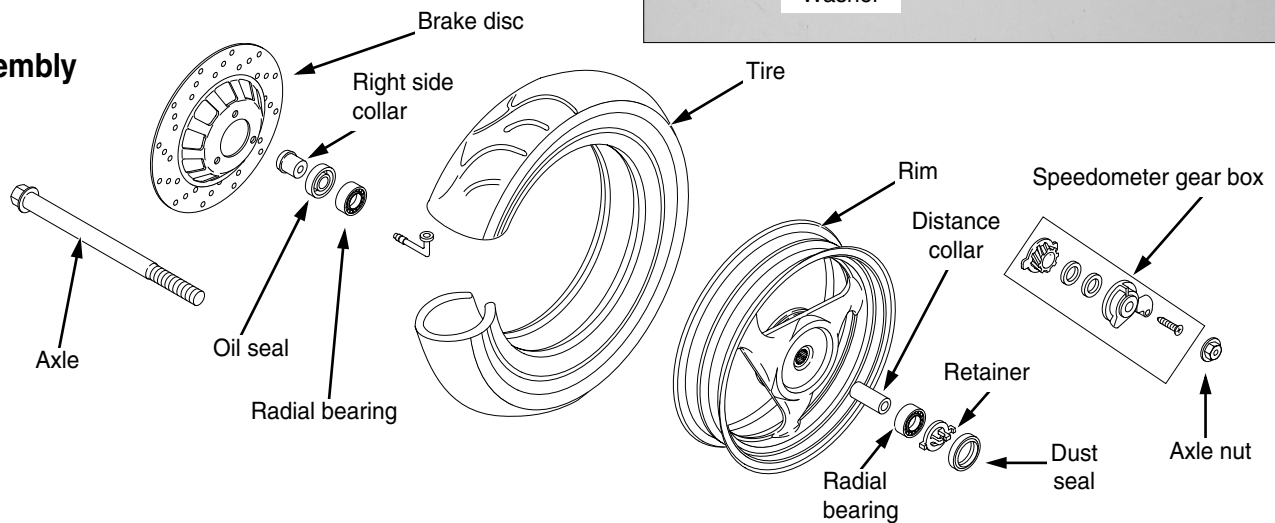
Front Wheel/Front Fork/Steering

Speedometer gear replacement

- Remove the speedometer gear and washer from the speedometer gear box.
- Check the gear for wear or damage.
- Install the washer.
- Apply grease to the speedometer gear prior to assembling.

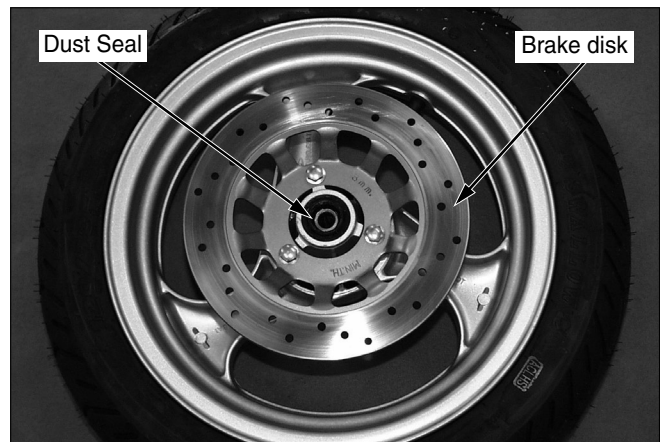


Assembly



- Apply grease to the right side dust seal rim.
- Install the right side dust seal.
- Install the brake disk.
- Install disk nuts.

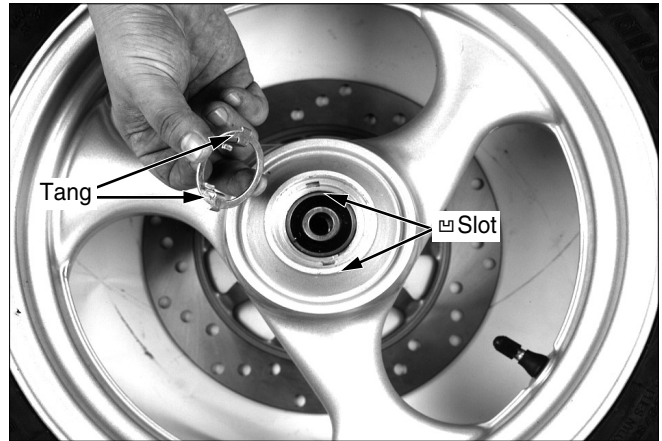
Torque value: 1.5kg-m(15N.m, 11ft-lb)



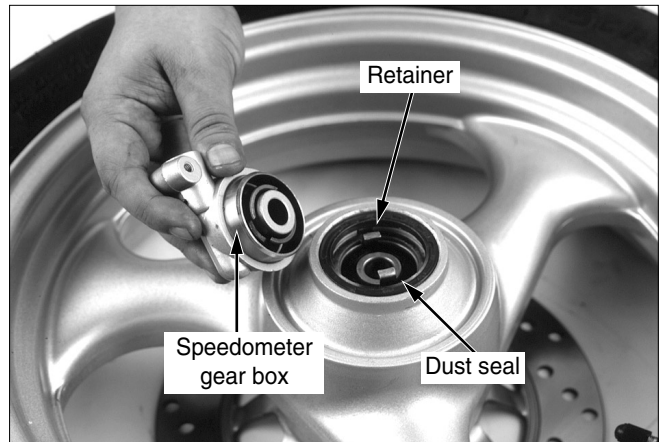
- Install the right side collar.



- Align the wheel hub tangs with the slots of the speedometer gear retainer, and assemble.



- Apply grease to the dust seal rim.
- Install the dust seal, and align the tangs of the speedometer gear retainer with the gear groove to assemble the speedometer gear box.



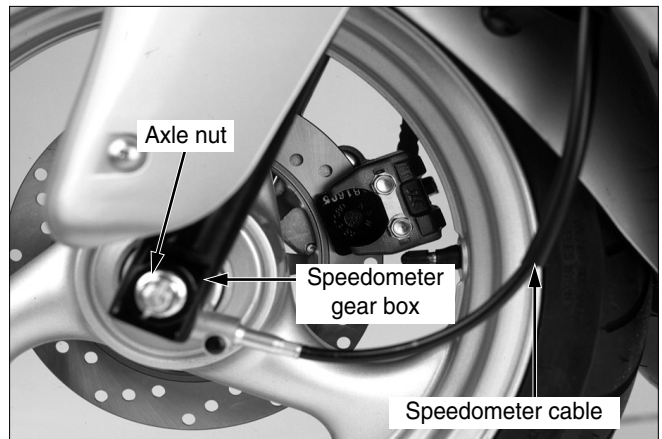
Installation

- Insert the front wheel between the front forks.
- Insert the disc, taking precautions not to damage the pad, and assemble the wheel.
- Align the slots of the speedometer gear with the tangs of the left fork slider.
- Insert the front axle into the speedometer gear box and the wheel hub.



- Install the axle nut.
- Assemble the speedometer cable, and tighten with screws.
- Place the front wheel on the ground, and tighten the axle nut to the prescribed torque.

Torque value: 5.0-70kg-m(50.70N.m, 36-50ft-lb)



Front Fork

Removal

- Remove the following parts.
 - Front cover (⇒ 4-3)
 - Front fender (⇒ 11-3)
 - Front wheel
 - Brake caliper (⇒ 14-7)

- Loosen the fork tube cap bolt and remove the front fork.

NOTE

- Loosen the fork tube cap bolt, but do not remove it.
- Loosen the 2 fork setting bolts to remove the fork tube.

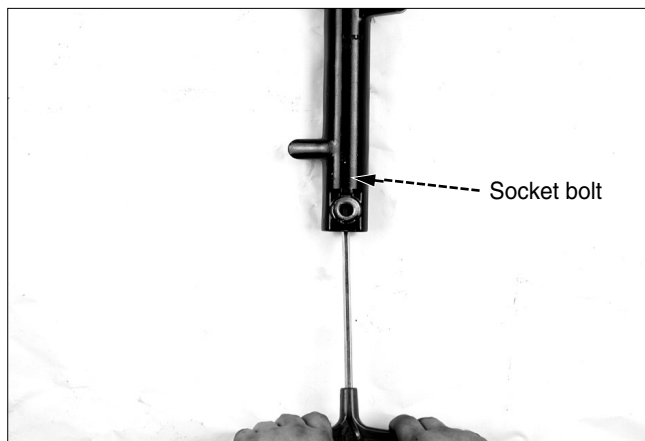
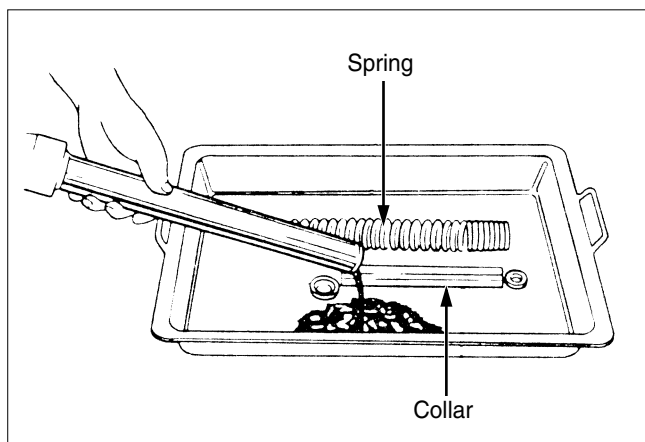
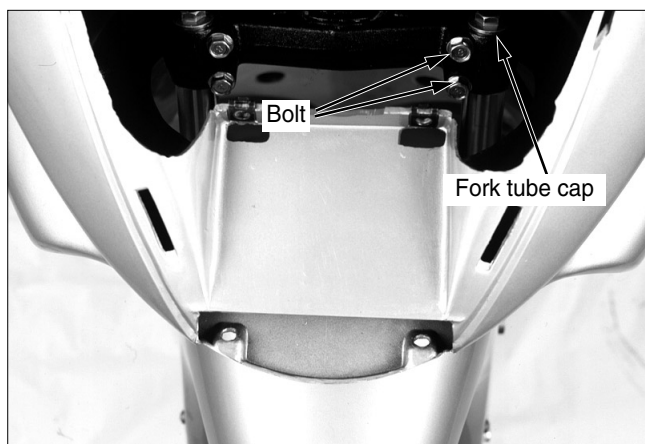
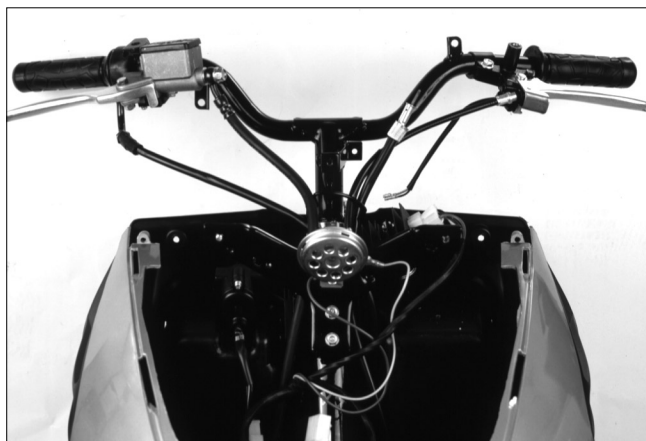
Disassembly

- Remove the fork tube cap bolt.

NOTE

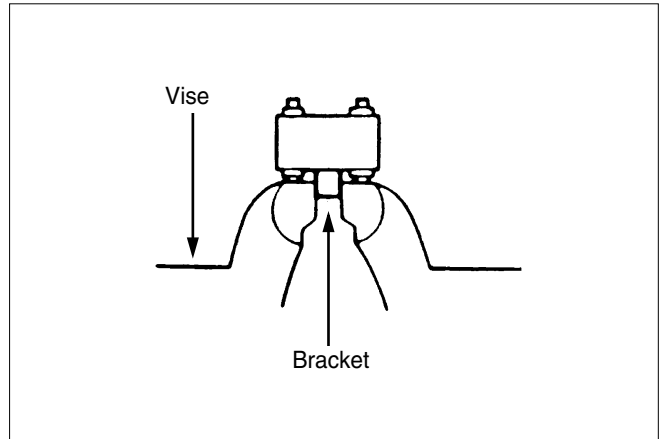
- If the screw is completely loosened, the fork tube cap bolt may spring out by the force of the spring. Take due precautions.
- Remove the fork spring, and expand and release the fork pipe several times to drain fork oil.

- Wrap the bottom case with a piece of cloth, and remove the socket bolt.

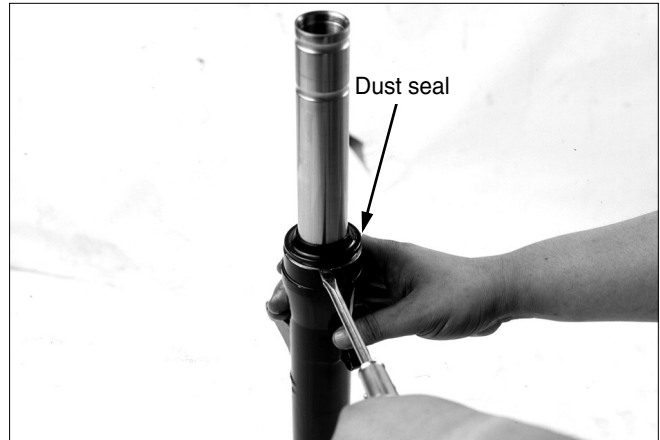


NOTE

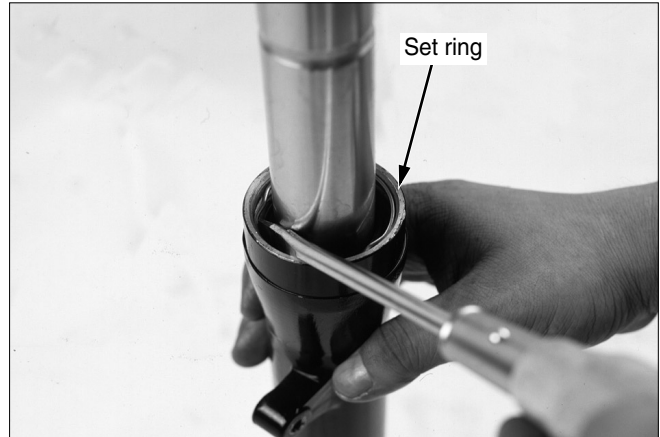
- If the socket bolt turns idle but cannot be removed, temporarily assemble the spring and the fork tube cap bolt first.
- Hold the bottom case firmly with a vise, taking precautions not to distort or damage it.



- Remove the dust seal.



- Remove the set ring.



- Remove the oil seal.

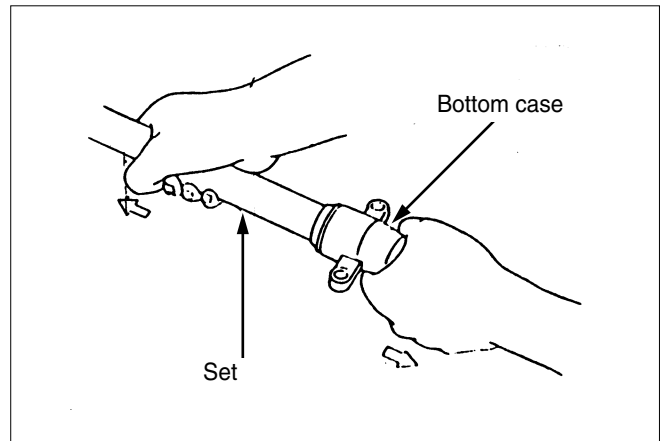
NOTE

- Take precautions not to damage the interior and exterior rim of the bottom case.



Front Wheel/Front Fork/Steering

- Remove the fork tube from the bottom case.
- Remove the piston and rebound spring from the fork tube.



Inspection

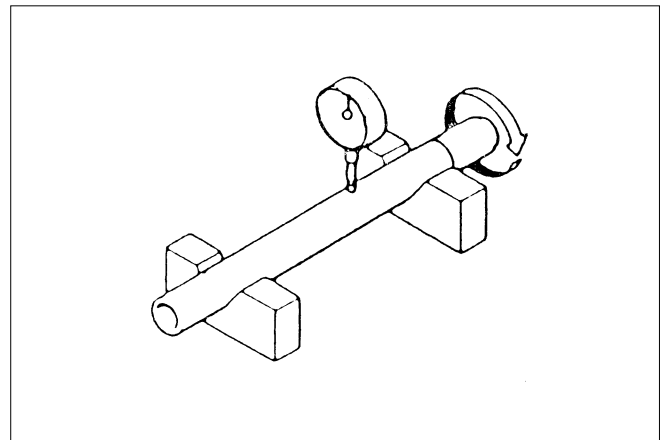
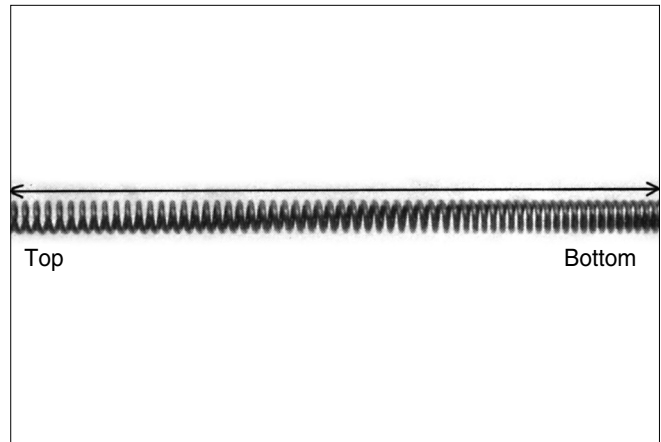
- Place the fork spring on a level place, and measure the free length.
- If the free length deviates from the service limit, replace the spring with a new one.
- Check components for damage or abnormal wear. Replace defective parts with new ones.

Service limit: 230.8mm (9.087in)

- Place the fork tube on a V-block, and measure deflection with a dial gauge.

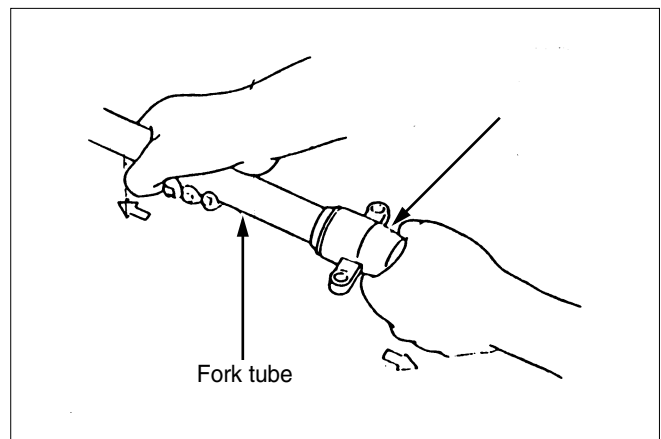
Service limit: Replace if the deflection is greater than 0.2mm (0.008in)

- Check the slider bush contact face.
- If the slider bush is extensively damaged, replace the bottom case.



Assembly

- Wash parts with clean oil prior to assembling.
- Assemble the rebound spring and the fork piston to the fork tube.
- Assemble the fork tube to the bottom case.



- Wrap the bottom case with a piece of cloth, and fix it to the vise.
- Apply screw locking agent to the socket bolt thread, and assemble the socket bolt to the fork piston.

Torque value: 2.0kg-m (20N.m, 14ft-lb)

NOTE

- When a vise is used to hold the bottom case, do not insert the case itself but insert the bracket.

- Apply ATF to a new oil seal.
- Assemble the oil seal to the bottom case.
- Insert the oil seal with special tools until the attachment groove of the bottom case set ring is exposed.

Tools: Fork seal driver

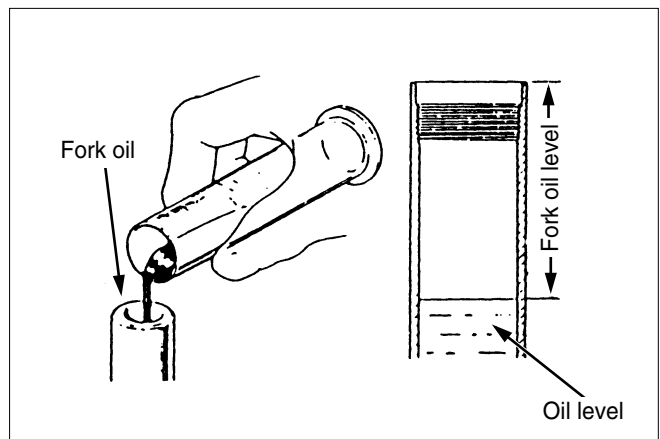
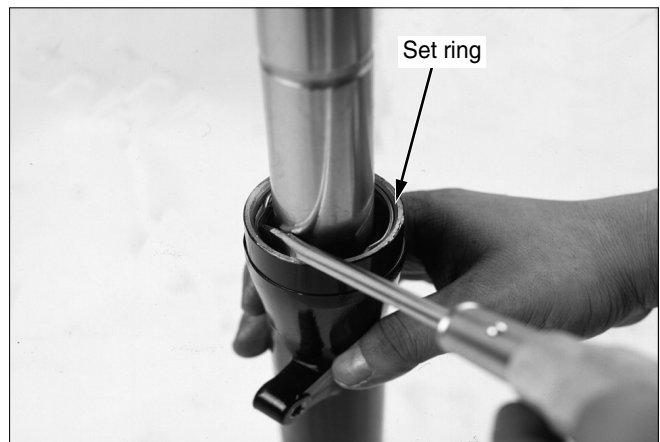
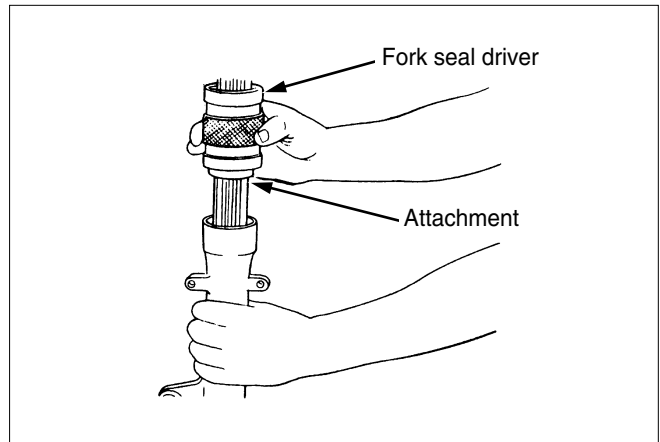
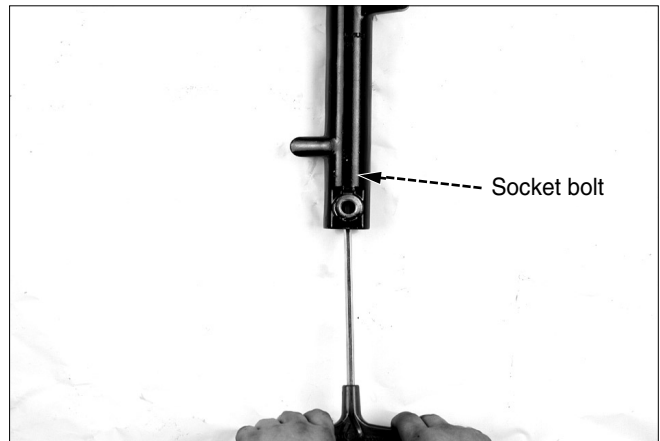
Fork seal driver body

- Install the set ring.
- Accurately assemble the set ring to the bottom case.

- Install the dust seal.
- Fill a prescribed amount of automatic transmission fluid(ATF) into the fork tube.

Capacity: 80ml

- Slowly press the fork tube 2-3 times to discharge air.

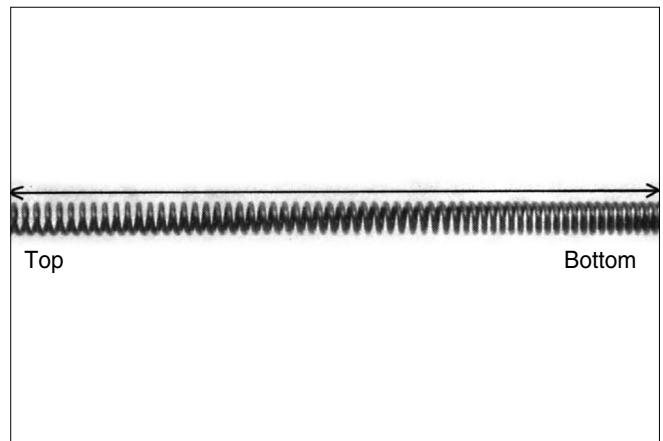


Front Wheel/Front Fork/Steering

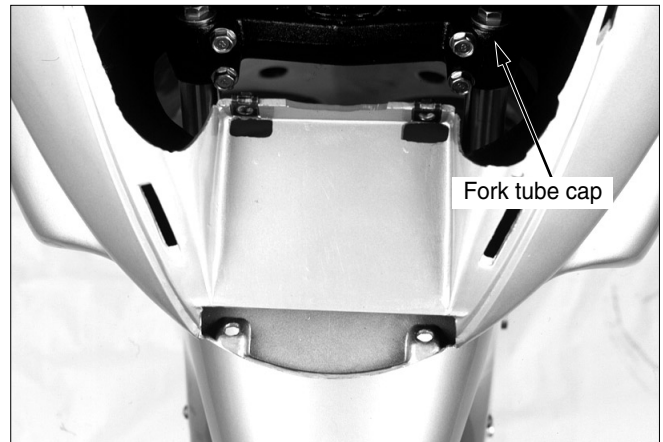
- Assemble the spring to the fork tube.

NOTE

- Install the spring with the smaller pitch side facing downward.



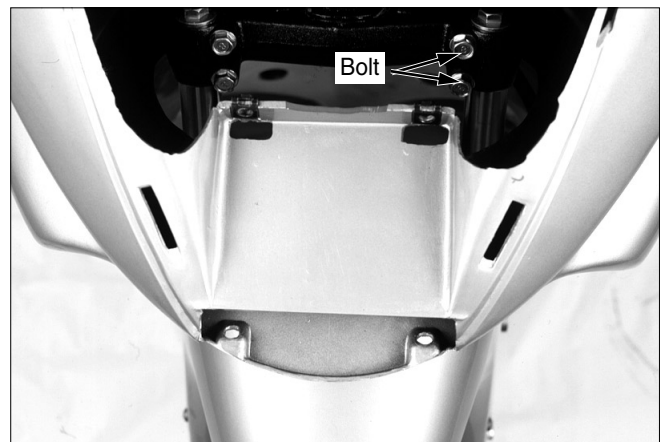
- Assemble the fork tube cap bolt to the fork tube.



Assembly (Installation)

- Assemble the front fork to the steering stem.
- Assemble the front fork setting bolt.

Torque value: 1.1kg-m(11N.m, 8ft-lb)



- Install the following parts.
 - Front wheel (⇒ 12-5)
 - Brake caliper (⇒ 14-6)
 - Front fender (⇒ 4-10)
 - Front cover (⇒ 4-3)

Steering Stem

Removal

- Remove the following parts.
 - Front cover (⇒ 4-3)
 - Headlight (⇒ 18-2)
 - Handle (⇒ 12-3)
 - Headlight stay (⇒ 18-2)
 - Main switch (⇒ 18-4)
 - Front wheel (⇒ 12-5)
 - Front fork (⇒ 12-10)

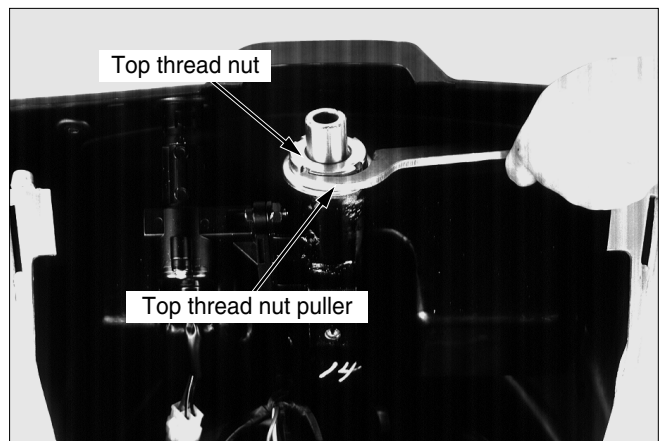
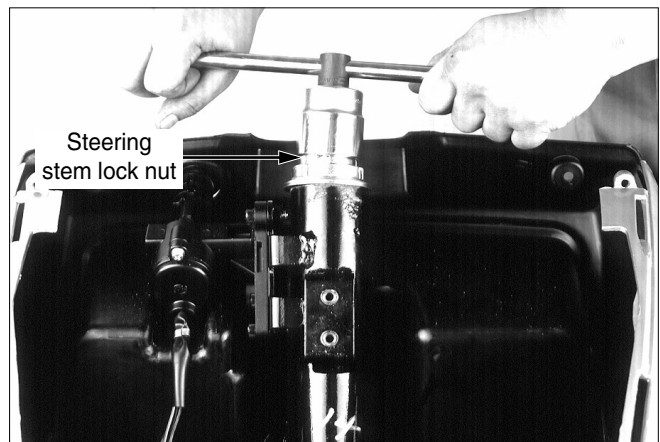
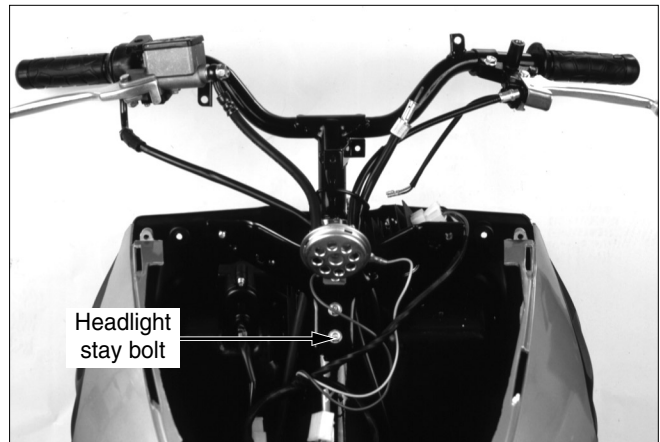
- Loosen the 2 headlight stay bolts, and remove the stay.
- Remove the front wiring and coupler.

- Remove the steering stem lock nut.

**Tools: Lock nut wrench
Extension bar**

- Remove the top thread nut.

**Tools: Steering stem socket
Extension bar
Top thread nut puller**



Front Wheel/Front Fork/Steering

- Remove the top cone race, steel ball, and steering stem.

NOTE

- Place steel balls in a pan to prevent from being lost.
- Check the steel ball, cone race, and ball race for wear or damage. Replace worn or damaged ones.

- Remove the steering bottom cone race, dust seal, dust seal washer.

- Remove the top ball race and the bottom ball race into the steering head pipe.

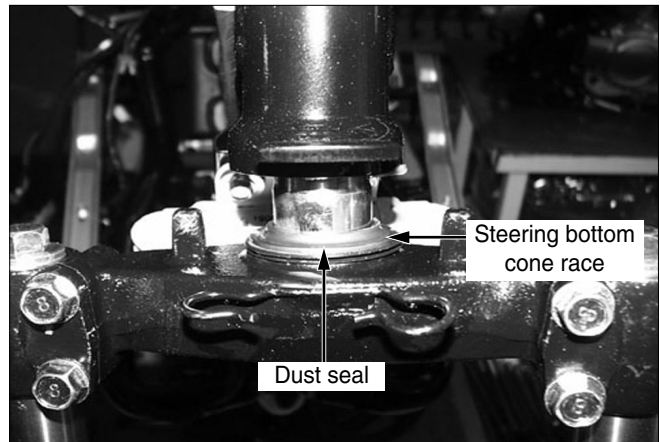
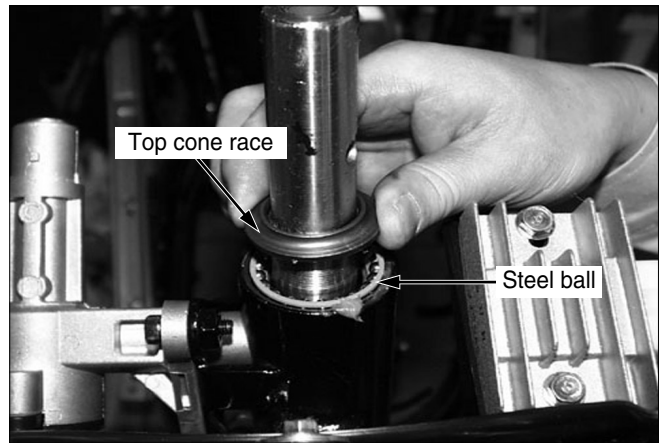
Tool: Ball race driver

Assembly

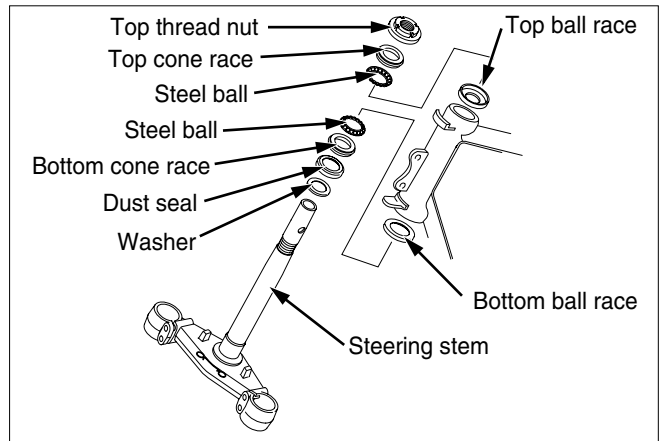
- Insert the top ball race and the bottom ball race into the steering head pipe.

Tools: Driver

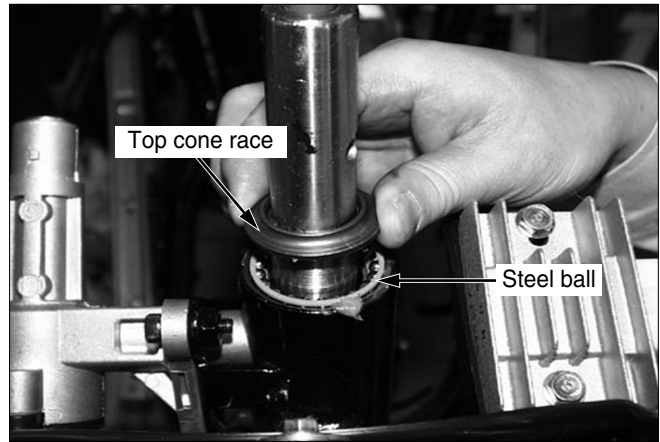
Attachment 37 × 40mm



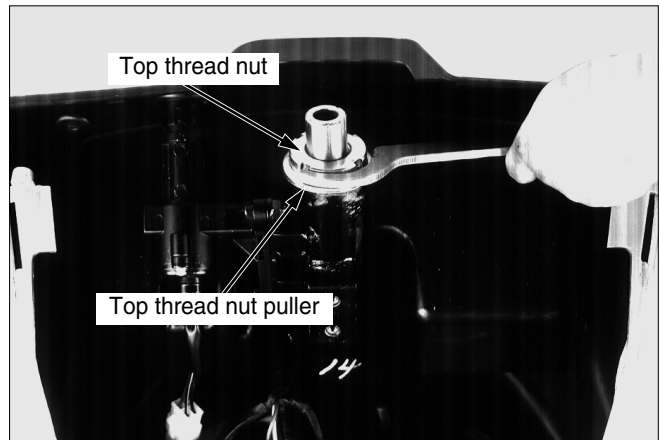
- Insert the dust seal washer and the dust seal into the steering stem.
- Using a steering stem driver, insert the steering bottom cone race into the steering stem.



- Insert the ball race after applying grease thereto.



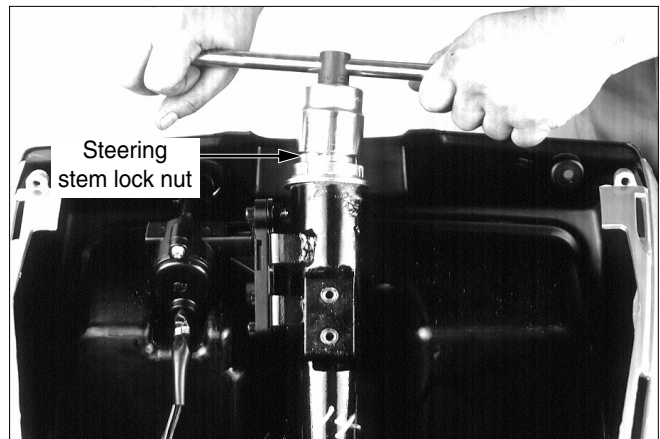
- Install the top cone race and the top thread nut over the steering head.
- Tighten the top thread nut completely, and loosen by 1/8 turn.
Torque value: 0.2-0.3kg-m (2-3N.m, 2ft-lb)
- Check the top and bottom free play, and check for smooth left and right movement.



- Temporarily install the R/L front forks first, and tighten the steering stem lock nut.

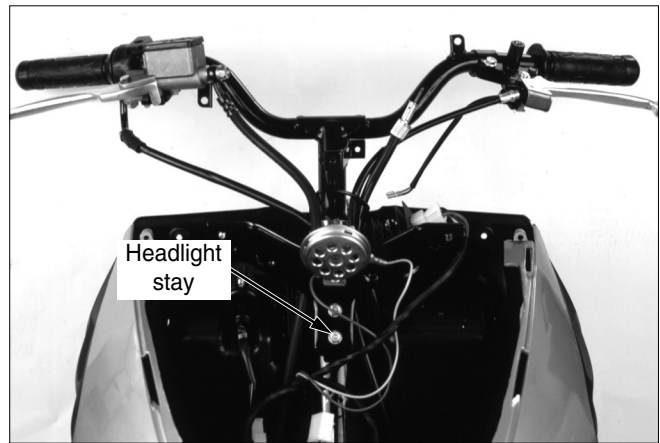
Torque value: 7.0kg-m (70N.m, 50ft-lb)

**Tools: Lock nut wrench
Extension bar**



Front Wheel/Front Fork/Steering

- Readjust and clamp the speedometer cable.
- Install the front fork.
- Install the headlight stay.
- Install the following parts.
 - Front fork
 - Front wheel
 - Main switch
 - Handle bar
 - Front cover



13. Rear Wheel/Brake/Suspension

Service Information	13-1	Rear Brake	13-4
Troubleshooting	13-2	Rear Cushion	13-6
Rear Wheel	13-3		

Service Information

General Safety

- If the brake drum or lining is contaminated with oil, braking power will be lost. If contaminated with oil, clean the brake drum, and replace the brake shoe.

Specifications

Unit: mm(in)

Item		Standard value	Service limit
Axle shaft run out		-	0.2(0.008)
Rear wheel rim runout	Radical	-	2.0(0.08)
	Axial	-	2.0(0.08)
Rear brake drum inner diameter		116.0-116.3(4.56-4.57)	117(4.60)
Rear brake lining thickness		4.0(0.16)	2.0(0.08)
Rear cushion spring free length		245(9.63)	238(9.36)

Torque values:

Rear axle nut	6.0~8.0kg-m(60-80N.m, 43-58ft-lb)
Rear cushion upper bolt	2.7kg-m(27N.m, 20ft-lb)
Rear cushion lower bolt	4.0kg-m(40N.m, 29ft-lb)

Troubleshooting

Wobble or vibration in motorcycle

- Tire pressure incorrect
- Faulty tire
- Bent rim
- Loose wheel bearing
- Swing arm bushing worn
- Wheel out of balance

Soft suspension

- Weak springs
- Shock absorber improperly adjusted

Hard suspension

- Shock absorber improperly adjusted
- Bent shock absorber rod

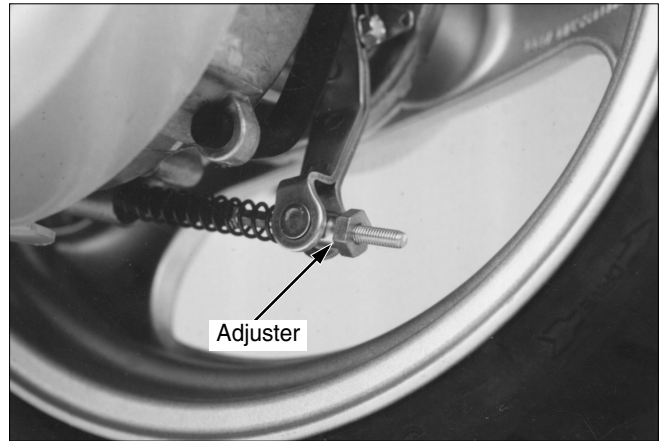
Suspension noise

- Loose fasteners
- Worn shock

Rear Wheel

Removal

- Support the motorcycle on the main stand.
- Loosen the rear brake adjuster, and remove the brake cable.
- Loosen the brake arm setting bolts, and remove the spring.

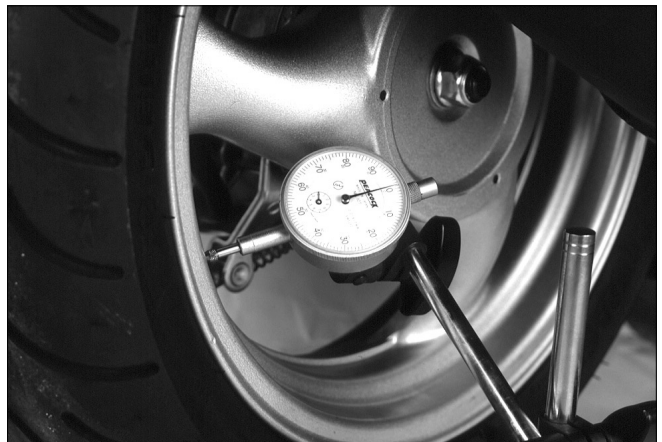


- Remove the muffler. (⇒ 4-9)
- Loosen the rear wheel axle nut.
- Remove the lock washer.
- Remove the rear wheel.



Inspection

- Turn the wheel, and check the rim for wobbles.
Service limit:Radical 2.0mm (0.08in)
Axial 2.0mm (0.08in)



Assembly

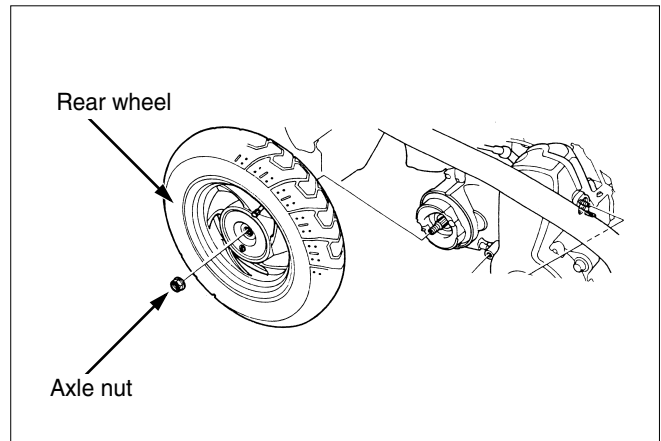
- Insert the rear wheel over the drive shaft.



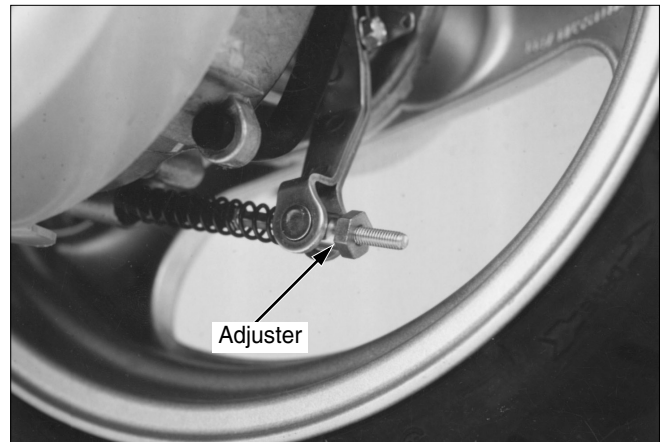
Rear Wheel/Brake/Suspension

- Insert the lock washer, and tighten with the axle nuts.

Torque value: 6.0-8.0kg-m (60-80N.m, 43-58ft-lb)



- Assemble the brake cable cable and adjust nuts.
- Install the spring on the brake arm, and tighten with setting bolts.



Rear Brake

- Remove the rear wheel.

Inspection

- Measure the brake drum of inner diameter
Service limit: 117mm (4.60in)

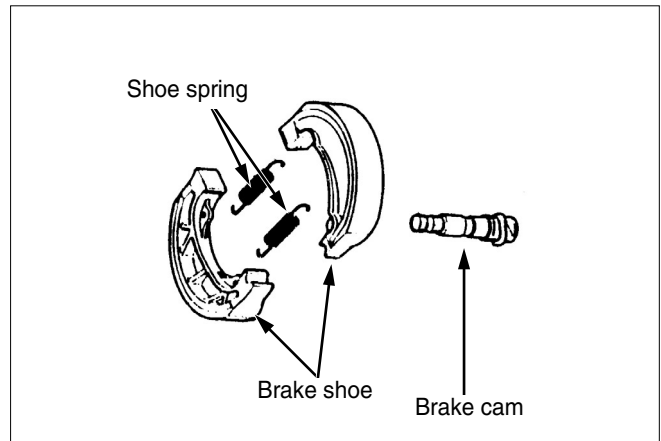


- Measure the thickness of the brake lining.
Service limit: 2.0mm (0.08in)

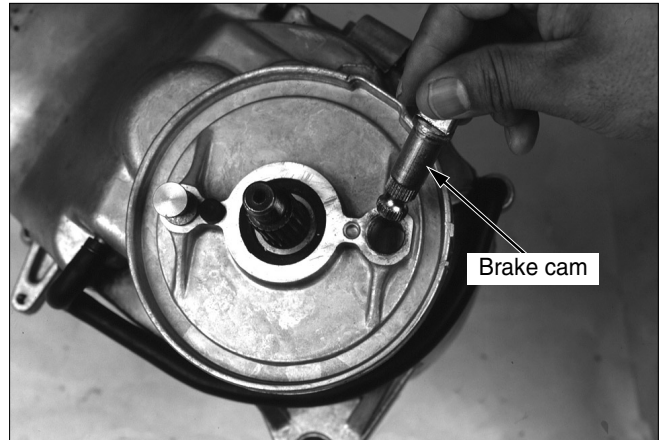


Disassembly

- Manually open the brake shoe and remove it.
- Remove the shoe spring from the brake shoe.

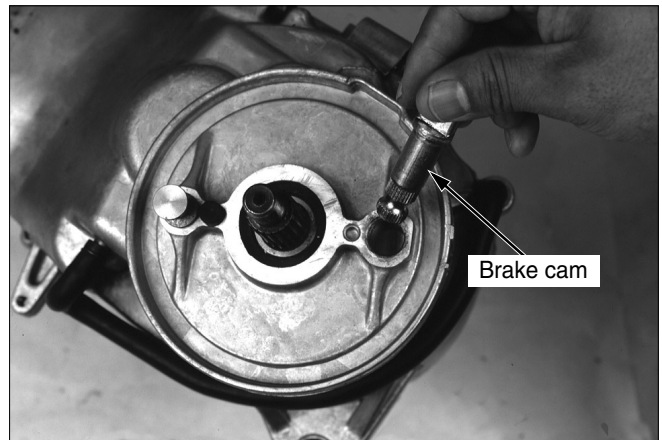


- Remove the brake cam.

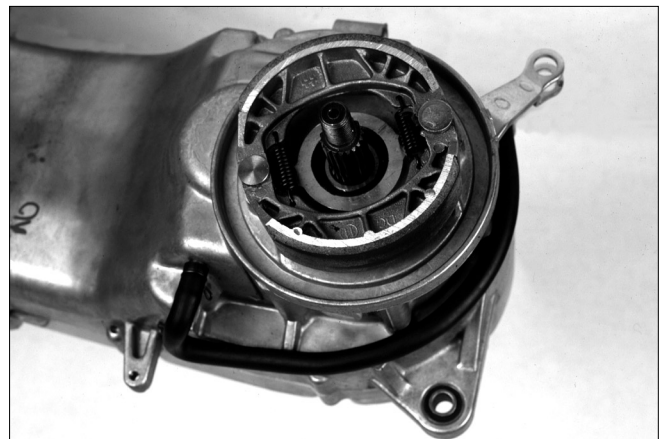


Assembly

- Apply small amount of grease to the brake cam and anchor pin.
- Assemble the brake cam.



- Assemble the brake shoe and spring.
- Assemble the rear wheel.



Rear Cushion

Removal

- Remove the body cover (⇒ 4-6)
- Remove the luggage box (⇒ 4-5)
- Loosen the top and bottom rear cushion setting bolts.

NOTE

- Support the frame firmly prior to working.

Disassembly

- Install the compressor attachment as shown in the figure.
- Install the cushion on the cushion compressor, and compress the spring.

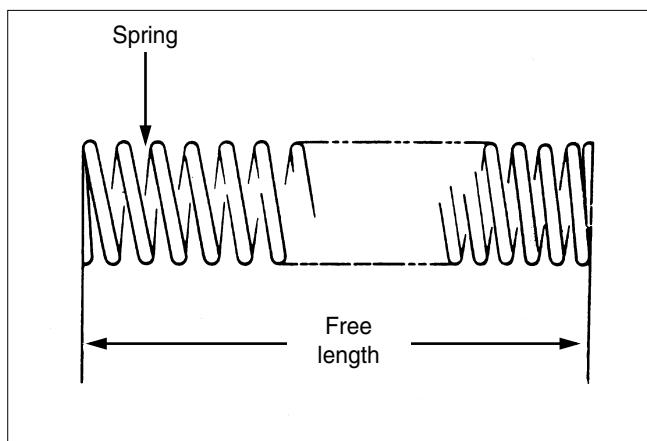
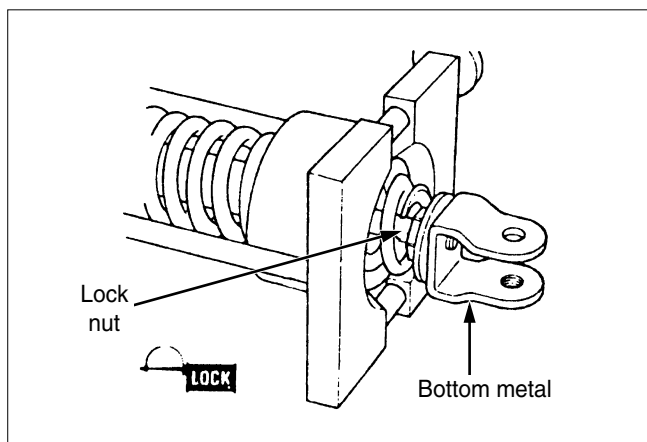
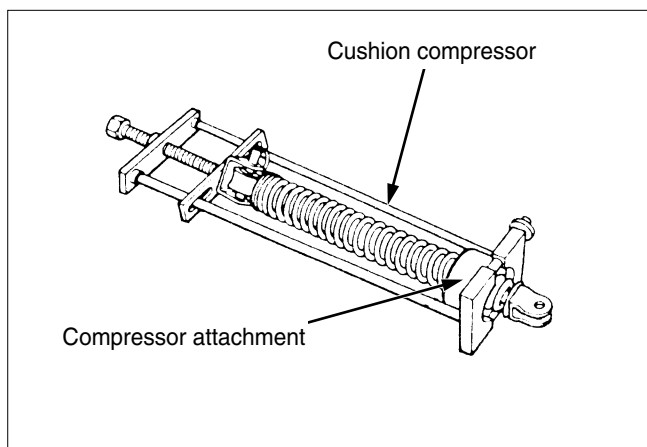
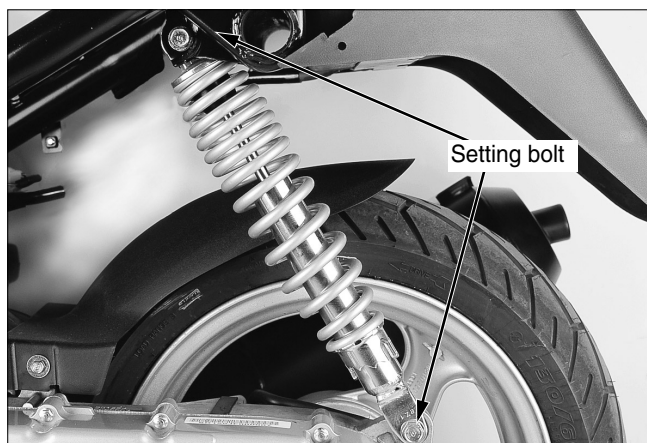
**Tools: Rear cushion compressor attachment
Rear compressor**

- Fix the bottom metal, and loosen the lock nut.
- Remove the bottom metal.
- Remove the lock nut, bottom metal, stopper rubber, spring, and spring guide from the damper component.

Inspection

- Measure the rear cushion spring free length.
- Check the damper rod for deflection or damage.

Service limit: 238mm(9.36in)



Assembly

- Assemble the spring, spring guide, and stopper rubber.

NOTE

- Install the spring with its narrow pitch side facing upward
- Apply thread locking agent to the lock nut, and install the rear cushion compressor attachment on the damper rod.
- Fix the upper joint, and tighten the lock nut.

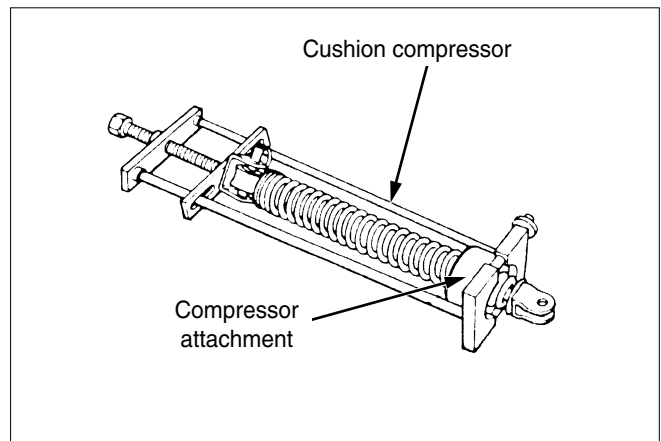
Torque value: 2.0kg-m(20N.m, 14ft-lb)

Tools: Rear compressor

Rear cushion compressor attachment

Installation

- Assemble the rear cushion.
 - Tighten the top and bottom of the cushion with bolt.
- Torque value: Upper side 2.7kg-m(27N.m, 20ft-lb)**
Lower side 4.0kg-m(40 N.m, 29ft-lb)



MEMO

14. Brake System

Service Information	14-1	Brake Disk	14-5
Troubleshooting	14-1	Brake Caliper	14-6
Brake Fluid/Bleeding	14-2	Master Cylinder	14-8
Brake Pad	14-3		

Service Information

General Safety

- Do not allow foreign material to enter the system when replenishing brake fluid.
- To prevent chemical changes, do not mix different types of brake fluid.
- Do not use the old brake fluid again.
- Brake fluid can cause damage to painted, plastic, and rubber surfaces. Take precautions not to allow parts to be contaminated by the brake fluid.
- Do not reuse sealing washers.
- Clean the disassembled parts with brake fluid, and check for any clogged passage with compressed air.
- Bleed the brake hose after removing it.

Troubleshooting

Braking power unsatisfactory

- Air in the brake system
- Moisture in brake fluid
- Brake pad and disk contaminated
- Caliper piston seal worn
- Master cylinder piston seal worn
- Brake pad worn
- Caliper inside contaminated
- Unsatisfactory caliper sliding part operation
- Lopsided wear of brake pad and disk
- Low brake fluid level
- Clogged brake fluid line
- Disk bent or distorted
- Caliper piston seized or worn
- Master cylinder piston seized or worn
- Disk worn
- Master cylinder inside contaminated
- Brake lever bent

Hard brake lever movement or unsatisfactory return

- Brake system clogged
- Caliper piston seized or worn
- Unsatisfactory caliper sliding part operation
- Brake fluid line clogged
- Caliper piston seal worn
- Master cylinder piston seized or worn
- Brake lever bent

Brake drag

- Brake pad and disk contaminated
- Improper wheel alignment
- Lopsided wear of brake pad and disk
- Disk bent or distorted
- Unsatisfactory caliper sliding part operation
- Hydraulic system contaminated with dust.

Brake Fluid/Bleeding

Brake fluid change

CAUTION

- A contaminated disk or pad reduces braking power. Do not allow the disk or pad to be contaminated by oil.
- Replace contaminated pads, and remove pollutants from the disk completely.

NOTE

- Check the brake fluid level often, and replenish new fluid as required. Do not spill fluid on painted, plastic or rubber parts.

- Remove the front handle cover. (⇒4-8)
- Remove the master cylinder cap, set plate, and diaphragm from the master cylinder.
- Connect the bleeder hose to the bleeder valve. Loosen the bleeder valve, and pump the brake lever repeatedly.
- When there is no more fluid flowing out of the bleeder valve, stop pumping the brake lever.

Air Bleeding

- Fill the reservoir with DOT3 or 4 brake fluid up to the upper level.

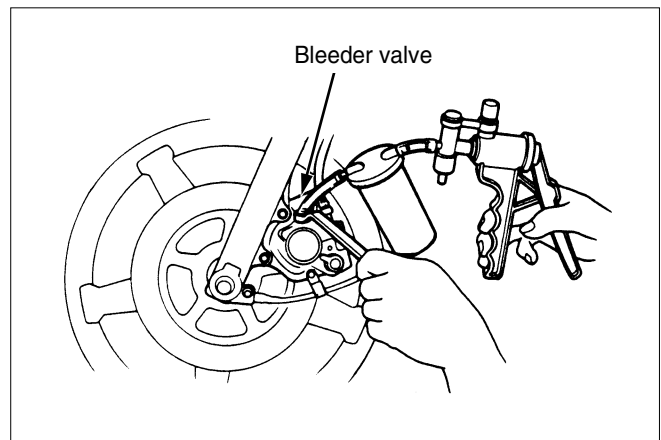
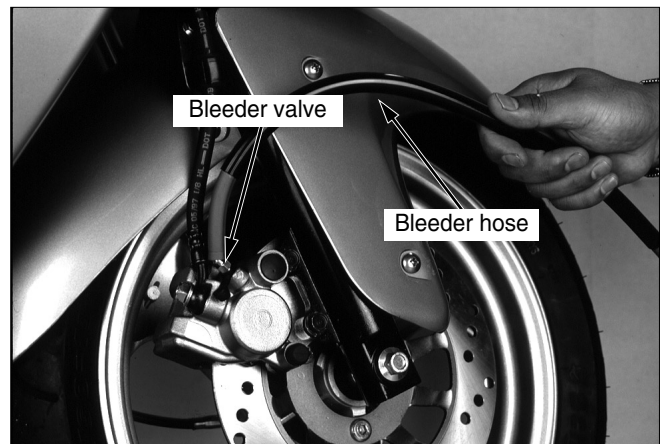
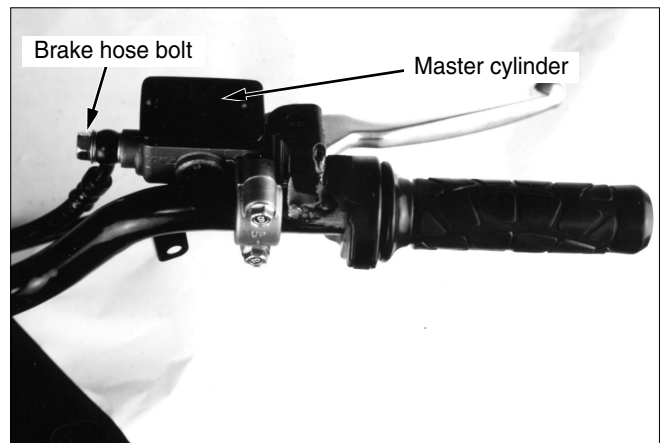
CAUTION

- To prevent chemical changes, do not use different types of brake fluid.

- Connect the recommended brake bleeder to the bleeder valve.
- Loosen the bleeder valve while pumping the brake lever.
- Repeat this operation until the brake fluid flows out of the brake bleeder.
- Add brake fluid.

NOTE

- Check fluid level often, and replenish fluid if the amount of fluid is reduced to the lower level.
- Read the user's manual carefully prior to disassembling or using the brake bleeder.
- Protect the bleeder valve with tape to prevent air from entering the bleeder valve.
- Repeat the above operation until there is no air flowing out of the bleeder hose.
- Squeeze the bleeder valve and operate the brake lever to check the ingress of air.

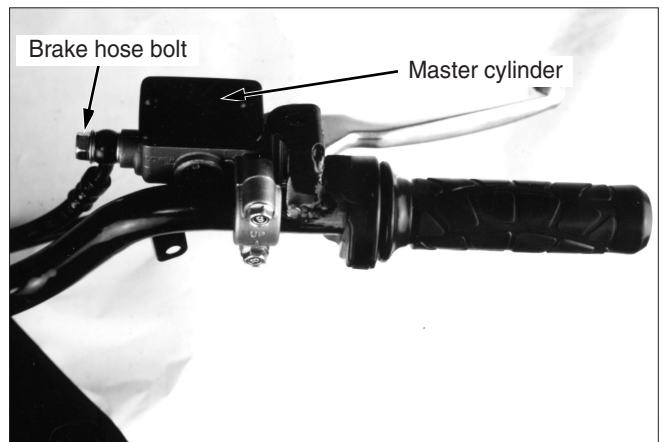
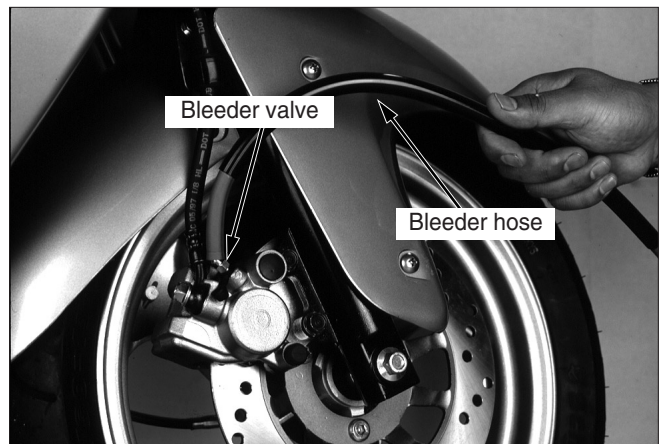
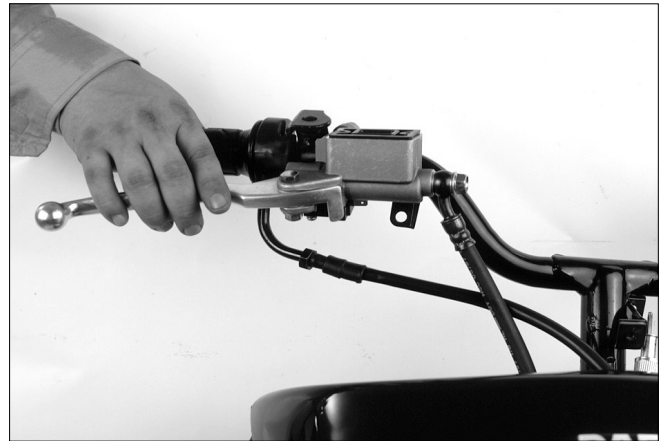


- If the brake bleeder is not used, do the following.
- First, fill the brake fluid up to the upper limit line.
Connect the hose to the bleeder valve to receive brake fluid.
- ① Squeeze the brake lever completely loosen the bleeder valve 1/2 turn, and tighten it again.

NOTE

- Do not release the brake lever until the bleeder valve is tightened.
- ② Release the brake lever slowly to its fullest extent, and leave it unattended for a few seconds.
- ③ Repeat the process specified in item ① and ② until there is no more air bubbles coming out of the bleeder valve.
- Check the fluid level often, and add fluid if the fluid level is near the lower level.
- If no air leaks out of the bleeder hose, operate the brake lever to check the presence of air.
- Assemble the bleeder valve.
Torque value: 0.6kg – m(6N.m, 4ft-lb)

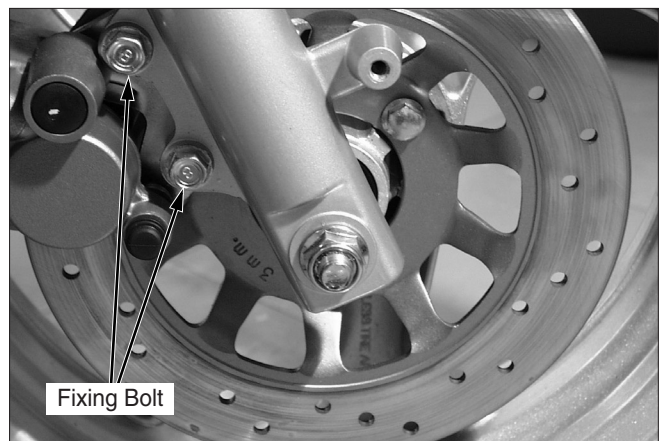
- Add brake fluid up to upper level. Install diaphragm and mater cylinder cap.
Torque value: 1.0kg – m(10N.m, 7ft-lb)



Brake Pad

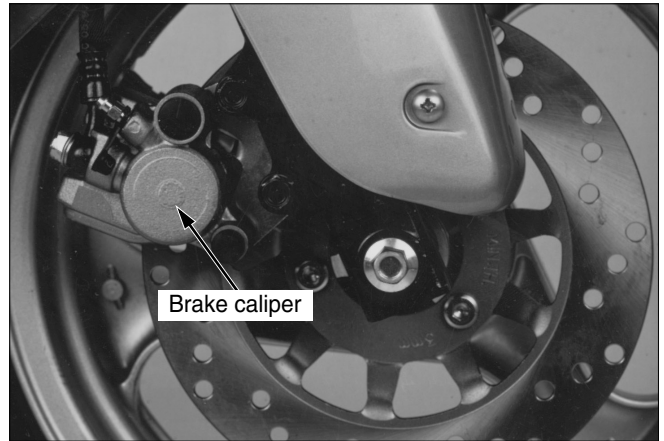
Replacement

- Always replace the brake pads in pairs.
- Open the lock plate tangs, and loosen the pad pin bolt.

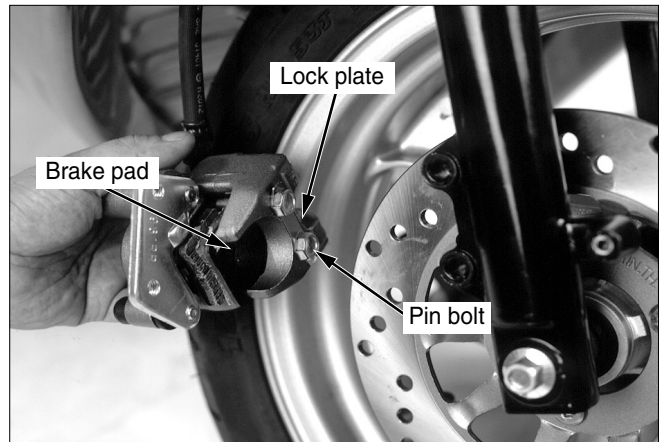


Brake System

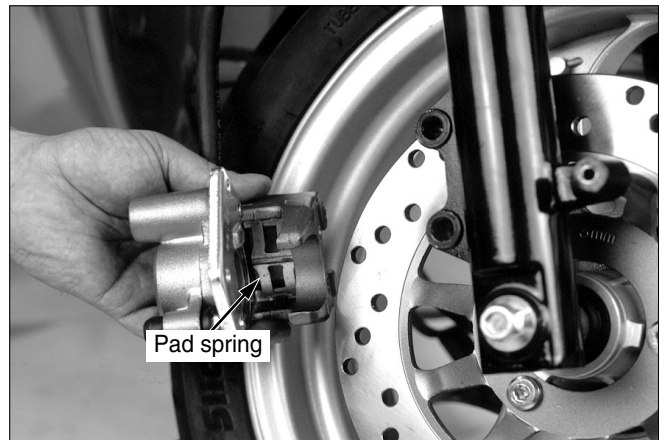
- Remove the brake caliper from the right front fork.



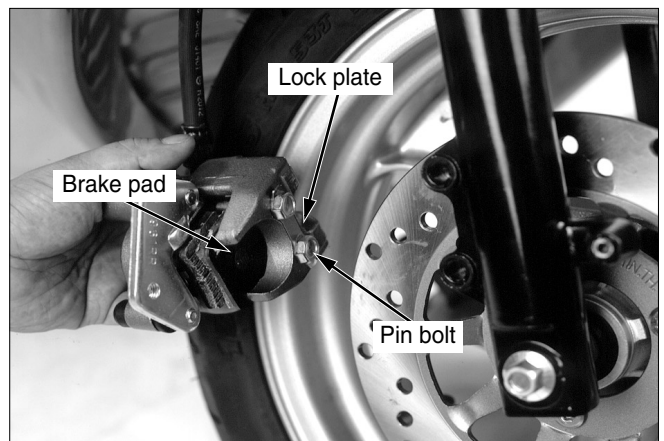
- To install a new brake pad into the brake, press the piston to return to the original position.
- Remove the pad pin bolt, lock plate, and brake pad.



- Verify that the pad spring is installed in specific position.



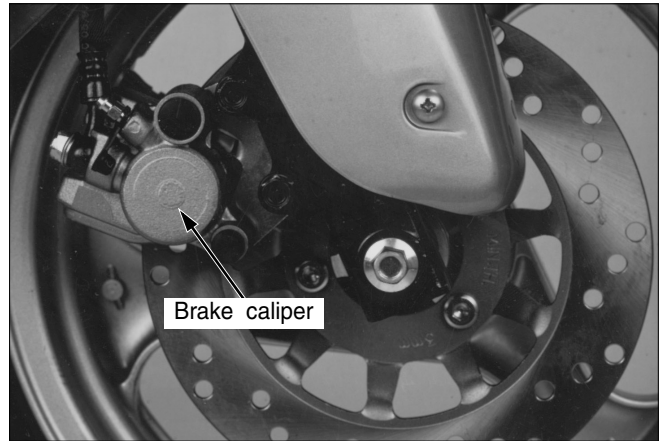
- Install a new brake pad, lock plate, and pad pin bolt.



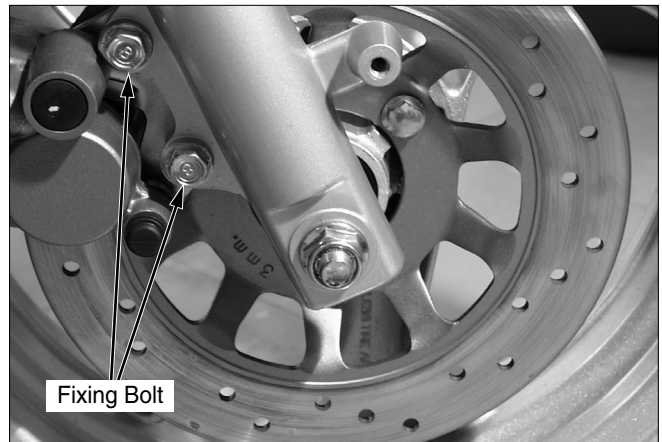
- Install the brake caliper into the right front fork.

NOTE

- Be careful not to damage the brake pad.
- Tighten the caliper bracket bolt.
Torque value: 2.7kg – m(27N.m, 19ft-lb)



- Install pad pin bolt.
Torque value: 1.8kg – m(18N.m, 13ft-lb)
- Bend the lock plate tangs, and fix the pad pin bolt.



Brake Disk

Inspection

- Measure the thickness of the disk.
Torque value: 3.0mm(0.1181in)



- Check the brake disk for vibration.
Service limit: 0.02mm(0.0008in)



Brake Disk

Removal

- Remove the brake oil bolt and the brake hose from the brake caliper.
- Remove the caliper from the R. front fork and remove the pad spring, hanger pin and brake pad.

CAUTION

- Pay attention not to let the brake fluid adhere to the parts because it can damage the painted surface.
- Wind the hose joint with cloth to prevent the brake fluid from leaking.
- Clean the removed parts with the brake fluid and make sure that the each port isn't clogged with the compressed air.
- Keep the removed parts in order to avoid dust from adhering.

Disassembly

- Remove the slide pin, the L. bracket, the pin bush, the boot and the pin boot, and the pin bolt from the caliper.
- If there is any wear or damage in the boot, replace it with the new one.
- Wind the caliper with cloth to prevent the piston or brake fluid from leaking.
- Remove the piston from the caliper while blowing the low-pressure air in the opening of the brake hose.

CAUTION

- Never use the high-pressure air or bring the air gun too close.
- Never touch the inside of the caliper.

- Disassemble the piston seal and the dust seal.

NOTE

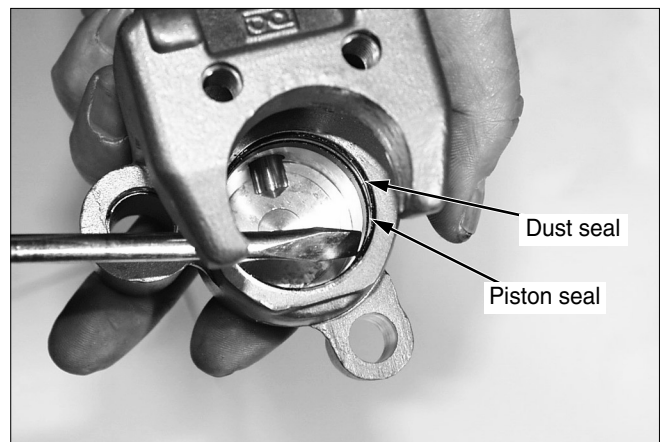
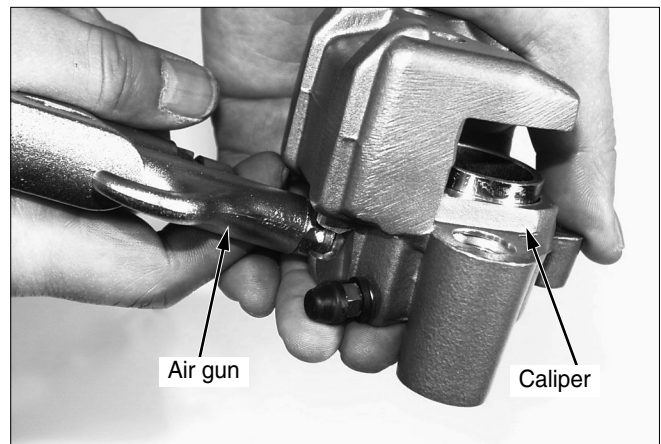
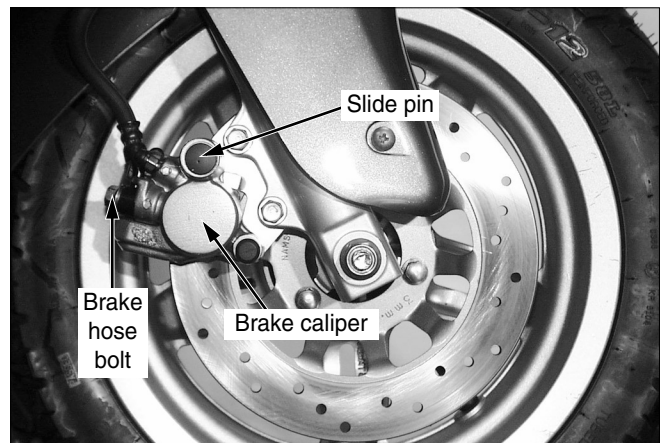
- Pay attention not to damage the inner surface of the caliper.

- Clean the piston and the inside of the caliper and remove the oil from the seal groove.

Inspection

Caliper cylinder

- Check the caliper cylinder bore for scoring, scratches or other damage.



Caliper piston

- Check the caliper piston O.D. part for scratches or other damage.

Installation

- Clean the piston seal and the dust seal with the brake fluid and install them in the caliper. Install the piston in the caliper with the groove side of the piston facing the pad.

NOTE

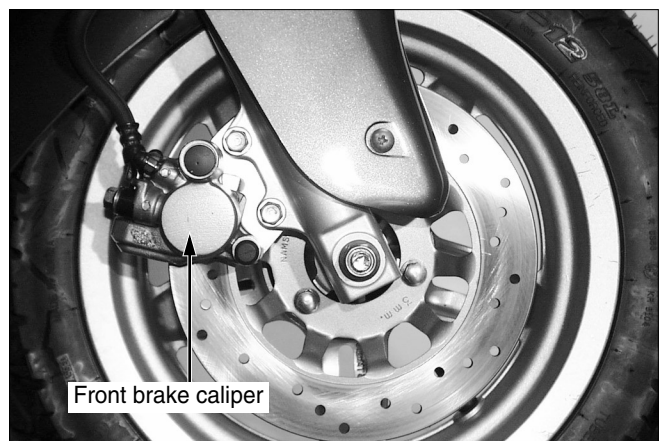
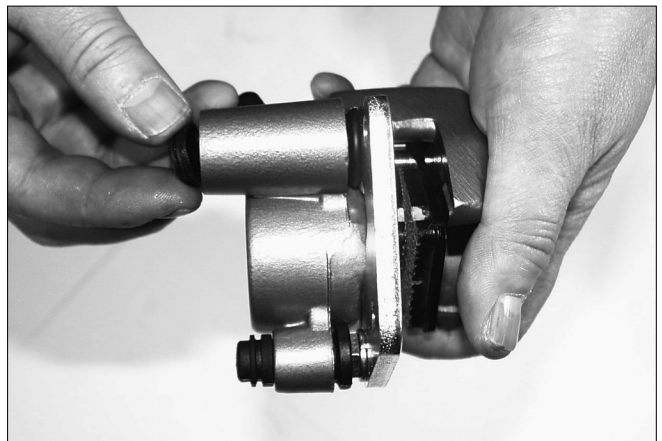
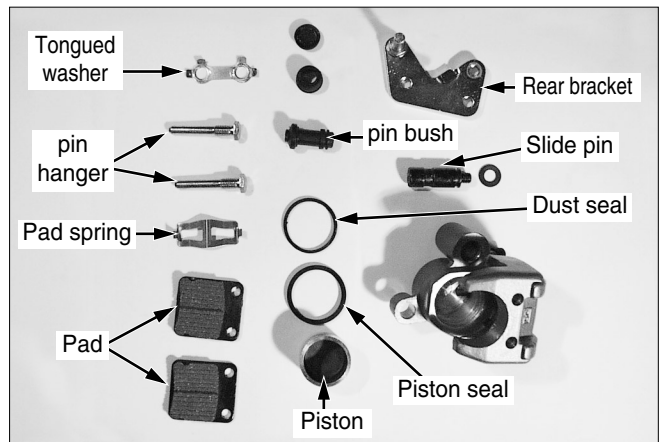
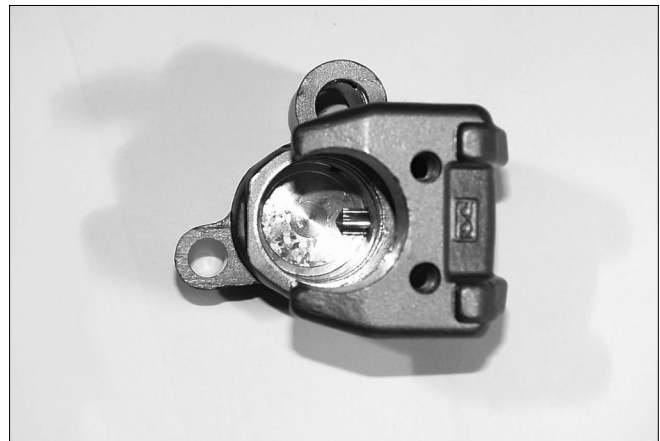
- Make sure that each part is free from dust or dirt before reassembly.
- Replace the dust seals and piston seals as a set whenever they are removed.
- When cleaning with the brake fluid, use the specified brake fluid.

- Apply the silicone grease to the pin bush.
- Connect the pin bush to the portion of the caliper.
- Install the pad spring in the caliper.
- Install the caliper pin bolt and the slide pin in the caliper.
- Install the brake pad and the hanger pin in the caliper.
- Install the plug dust in the slide pin.

- Install the brake caliper to the front fork, and connect the brake hose to the caliper, and install 2 sealing washers and the brake hose bolt.

Torque: 3.5kg-m (35N · m, 25ft-16)

- Install the slide pin cap.
- Fill the brake fluid, and bleed air. (⇒14-2)



Master Cylinder

Removal

- Remove the back mirror.
- Remove the front handle cover. (⇒ 4 - 8)
- Remove the rear handle cover. (⇒ 4 - 8)
- Disconnect the front brake switch wire.
- Drain the brake fluid.
- Remove the front brake hose from the master cylinder.

CAUTION

- Brake fluid causes damage to the painted, plastic or rubber parts. Do not spill fluid on these parts.
- If contaminated, gently wipe off the fluid with a piece of cloth or wash in water. Close hose joints properly to prevent leakage of brake fluid.
- Clean the disassembled parts with brake fluid, and use compressed air to verify each passage is not clogged.
- Do not allow the disassembled parts to be contaminated by waste material or dust.

- Remove the front master cylinder holder, and lift out the master cylinder.

Disassembly

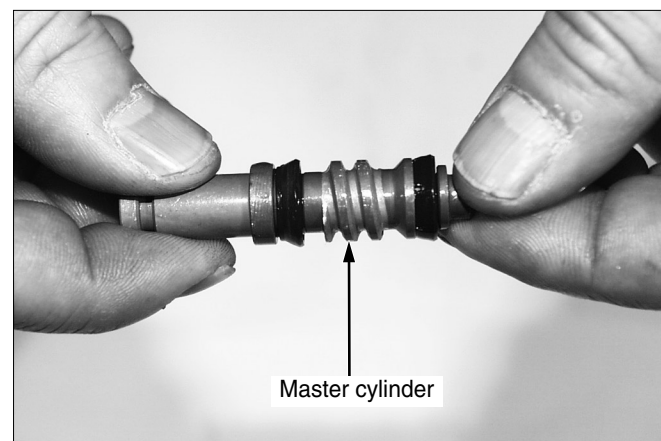
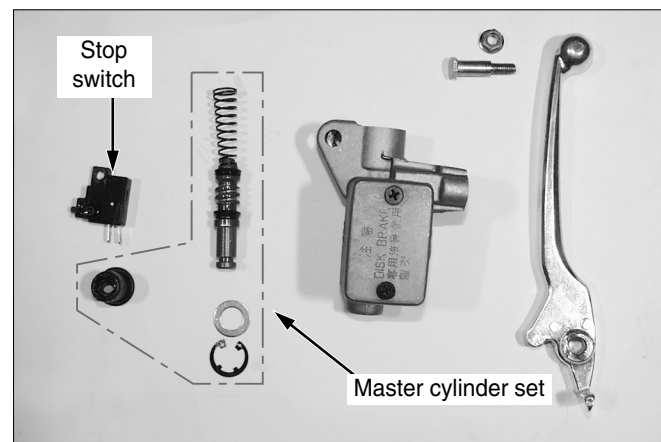
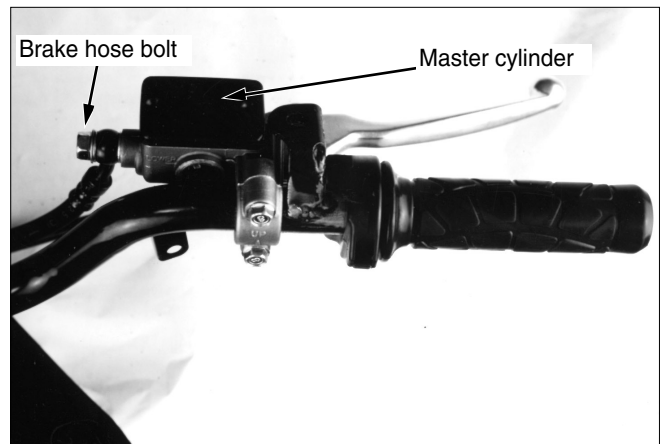
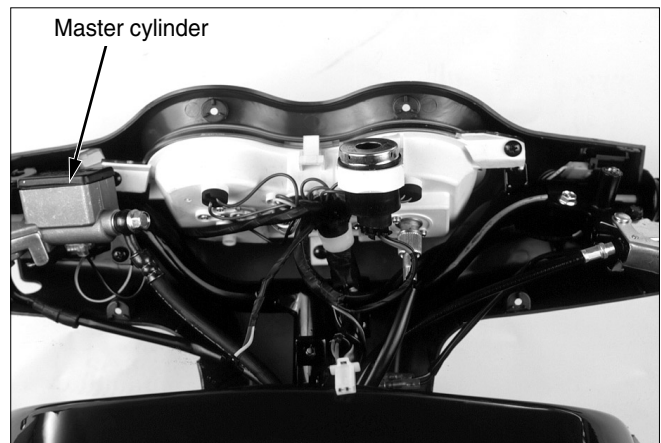
- Remove the front stop switch.
- Disassemble the piston boot, cir clip from the master cylinder.

TOOL : SNAP RING PLIERS

- Disassemble the washer, piston, spring from the master cylinder.
- Clean the master cylinder, reserve, master piston with the recommended brake fluid.

Master cylinder inspection

- Check the piston periphery for kink or scratch.
- Check the primary and secondary cups for wear.



NOTE

- If there is any leak of fluid when installing new piston, it may indicate the side wear of the cylinder by the direction of the piston contacting face. In this case, the master cylinder must be replaced also.
- Check the master cylinder for scores, scratches or nicks and replace if necessary.

Master cylinder assembly

CAUTION

- Replace the piston, spring, cups and snap ring as a set.
- Be sure that each part is free from dust or dirt before reassembly.
- When cleaning with the brake fluid, use the specified brake fluid.
- Coat the piston cup with the fresh brake fluid and install it on the piston. Install the spring with its larger diameter end toward the master cylinder.
- Install the primary cup with its concaved side toward the inner side of the master cylinder.
- Install the snap ring.

TOOL : SNAP RING PLIERS

CAUTION

- When installing the cups, do not allow the lips to turn inside out.(Refer to the drawing.)
- Note the installing direction of the snap ring.
- Be certain that the snap ring is seated firmly in the groove.

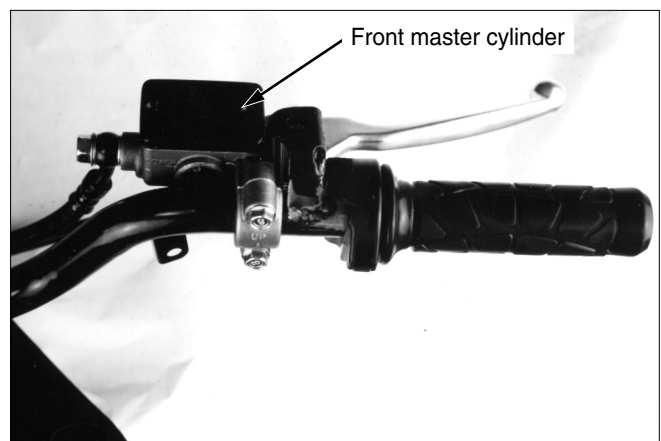
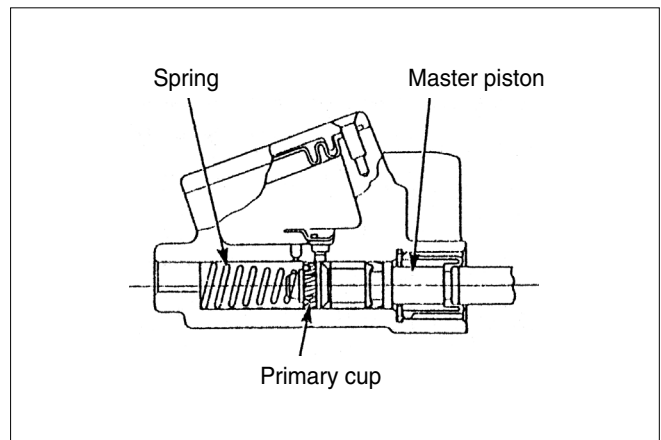
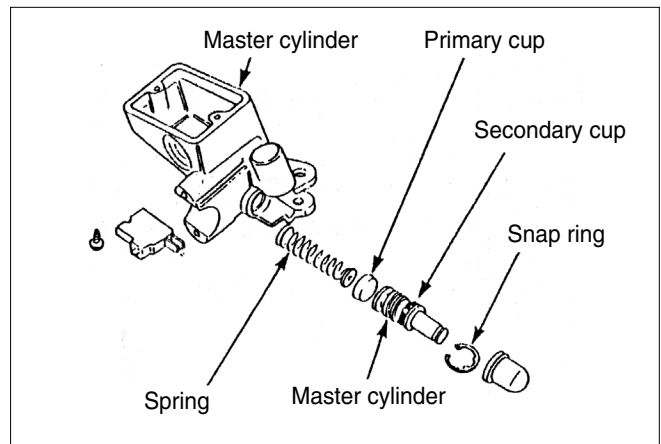
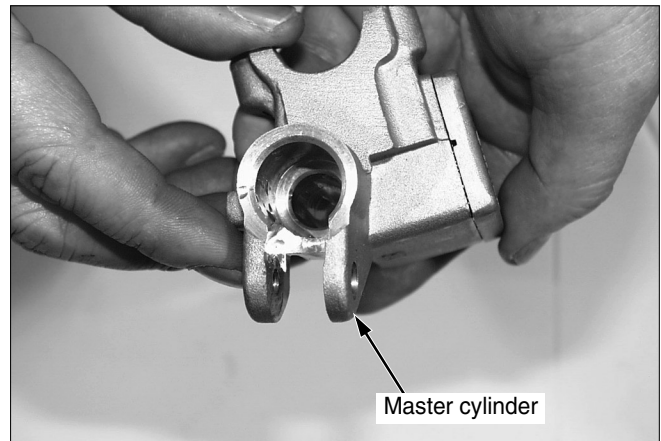
- Install the rubber boot in the groove properly.

Master cylinder installation

- Install the front master cylinder to the handle bar.

NOTE

- Install the holder with its "UP" mark facing upwards, and align the holder joint with the punch mark on the handle bar.
- Tighten the holder upper bolt first.

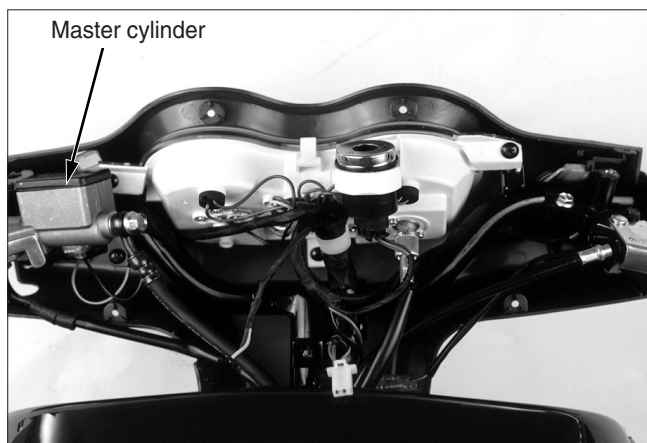


Brake System

- Install the brake hose to the master cylinder with 2 new sealing washers and the hose bolt.

Torque value: 3.5kgf · m(35N · m, 25ft-1b)

- Connect the front brake stop switch wire.
- Fill the brake fluid, and bleed air.
- Install the rear handle cover.(⇒4-8)
- Install the front handle cover.(⇒4-8)
- Install the back mirror.



15. Charging System/Battery

Service Information	15-1	Charging System Inspection	15-3
Troubleshooting	15-2	Regulator/Rectifier	15-5
Battery	15-3	A.C generator Inspection	15-6

Service Information

General Safety

- The maintenance-free (MF) battery does not require battery acid level inspection. Do not replenish distilled water.
- To charge the battery, remove the battery from the frame, and charge it with its seal-cap closed.
- Unless required in an emergency, do not carry out battery quick-charging.
- Always charge battery based on the current and time specified on top of the battery.
- Use a tester to check the charging status (open voltage).
- Do not replace the battery with a general-type battery.
- Check the charging system in sequence based on troubleshooting table.
- Test-charging systems while they are mounted on the motorcycle.
- For information on generator disassembly, refer to section 8.

Specifications

Item		Standard values
Battery	Capacity	12V – 8AH(MF)
	Terminal-to-terminal voltage (When fully charged)	13.0 – 13.2V
	Charging current	0.8A
	Leakage current	Not to exceed 1mA
Generator	Charging coil resistance value (20°C)	0.1~1.0 Ω (20°C)
	rpm at charging start	1,800rpm(night load)
Regulator/rectifier	Type	Thyristor system
	Regulator voltage	14.5±0.5V/5.000/rpm

15

Tools

Measuring instruments
 Digital circuit tester
 PVA Multi-tester.

Troubleshooting

No power - key turned on

- Dead battery
 - Low fluid level
 - Low specific gravity
 - Charging system failure
- Disconnected battery cable
- Main fuse burned out
- Faulty ignition switch

Low power - key turned on

- Weak battery
 - Low fluid level
 - Low specific gravity
 - Charging system failure
- Loose battery connection

Low power - engine running

- Battery undercharged
 - Low fluid level
 - One or more dead cells
- Charging system failure

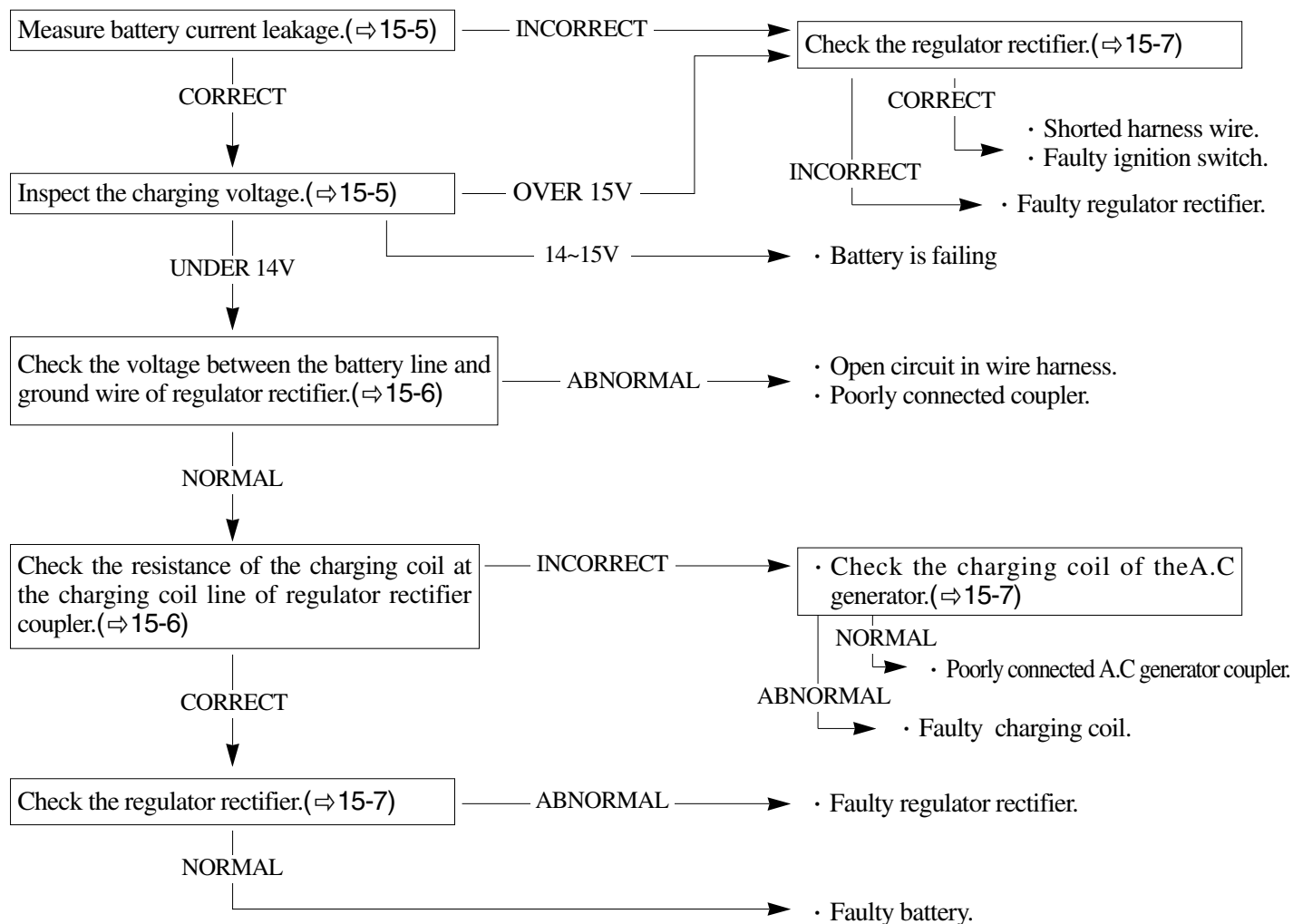
Intermittent power

- Loose battery connection
- Loose charging system connection
- Loose starting system connection
- Loose connection or short circuit in ignition system

Charging System Failure

- Loose, broken or shorted wire or connection
- Faulty voltage regulator
- Faulty rectifier
- Faulty alternator

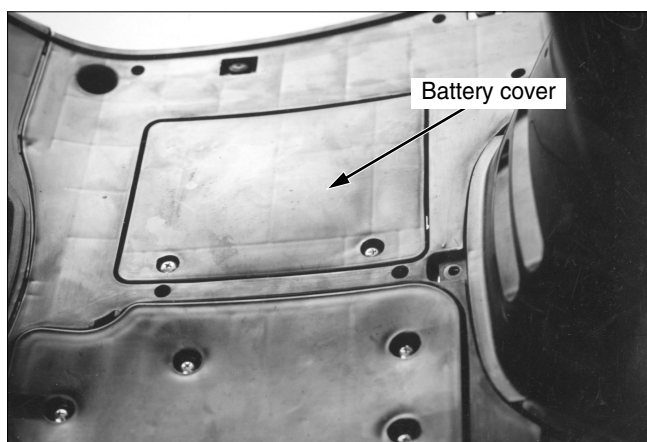
CHARGING SYSTEM



Battery

Removal

- Remove the floor panel mat.
- Loosen the 2 battery cover setting bolts.
- Remove the battery cover.



Charging Status (Open Voltage) Inspection

- Remove the battery terminal from the battery. Check the battery terminal voltage.

Fully charged: 13.0-13.2V

Under charged: Not to exceed 12.3V

NOTE

- Use a PVA multi-tester to check the status of charging.



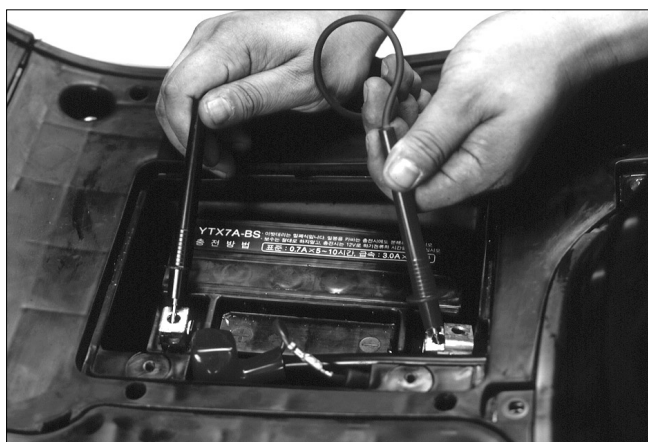
Charging System Inspection

Leakage Test

- Turn off the main switch, and remove the earth cable from the battery. Connect an ampere meter between the battery terminal and the earth cable, and check current when the main switch is turned off.

NOTE

- Use an ampere meter while sequentially changing its measuring range from large to small. If the current level greater than the measuring limit is measured, the ampere meter fuse may be cut.
- Do not turn on the main switch while current is being measured.



Leakage current: Not to exceed 1mA

Charging System/Battery

Charging Status Inspection

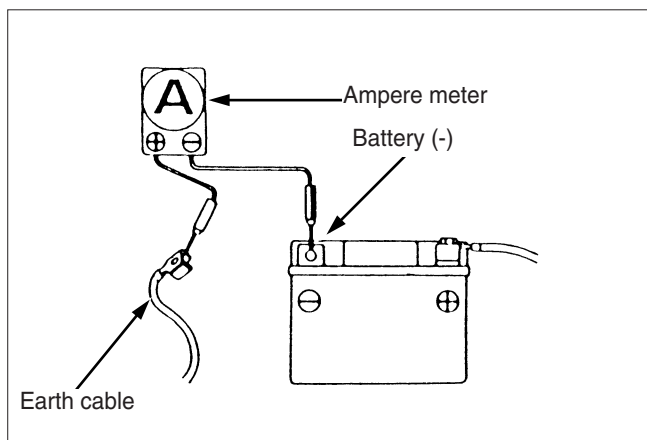
NOTE

- Current level changes according to the status of battery charging. Inspect the fully charged battery with its voltage running at 13.0~13.2V between battery terminal.
- If the engine is started by a starter motor, large level of current may flow sometimes because the battery power is consumed during starting.

- Warm up the engine, and install a fully charged battery.
 - Connect a voltmeter between battery terminals.
- Tester: PVA multi-tester**
- Connect an ampere meter between the main fuse terminals. Start engine increase the engine speed slowly, and check the charging voltage and current.

Charging current: 0-0.5A/5,000rpm

Controlled voltage: 14.5±0.5V/ 5,000rpm



Lighting System Control voltage Check

- Remove the front cover. (⇒ 4-3)
- Loosen the 4 headlight setting screws, and remove the headlight.

NOTE

- Check voltage with the headlight coupler connected.
- Start engine turn the light switch on set the dimmer switch to Hi, and check voltage between the blue (+) and green (-) (lamp side).



NOTE

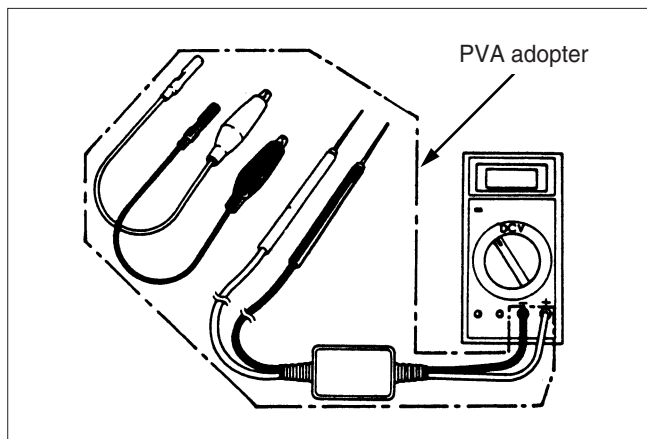
- Use an AC range for checking.

Controlled voltage : 14.5±0.5V

NOTE

- Contact with the tester handle bar during test may induce electric-shock.

Tester: PVA multi-tester



Regulator/Rectifier

Harness side circuit inspection

- Remove the regulator / rectifier coupler, and check the wiring circuits at each terminal of the main harness coupler.

Inspection Items

Item	Judgment criteria
Battery (red)	Battery voltage must be between red(+) and earth(-)
Ground wire (green)	Power must be connected between the green and the earth.
Charging coil lead(yellow)	Yellow-to-yellow standard Resistance value. Power should not be connected between The yellow and the earth.
Voltage detection Lead(black)	The battery must carry voltage when the main switch is turned ON between the black (+) and green(-)

Regulator/Rectifier Inspection

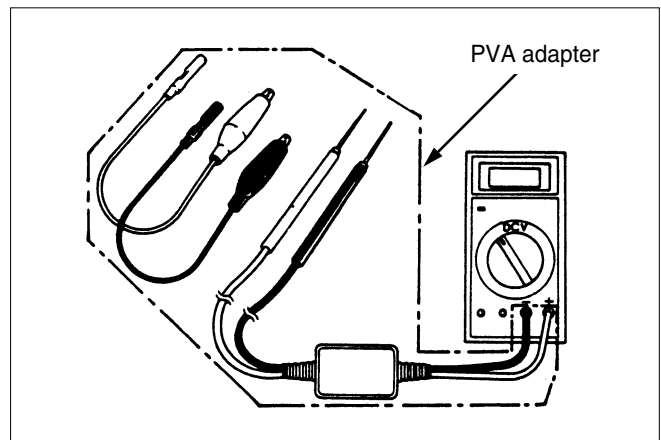
- If the inspection of the harness side proves to be satisfactory, check the regulator / rectifier coupler for faulty connection, and measure the resistance between the terminals of the regulator / rectifier.

NOTE

- If the metal part of the tester knob makes contact with fingers during test, body resistance will be displayed. Take due precautions.
- Use designated testers for the inspection. If nondesignated testers are used, accurate testing cannot be carried out because abnormal resistance values are displayed.

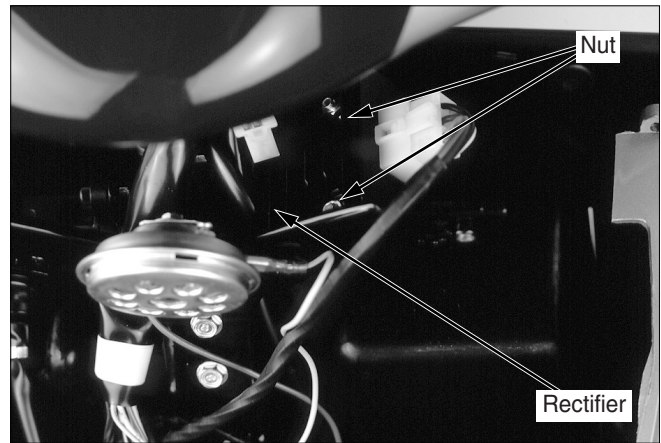
Tester: PVA multi-tester

- If the terminal-to-terminal resistance values deviate from the specified values, replace the regulator / rectifier.



Replacement

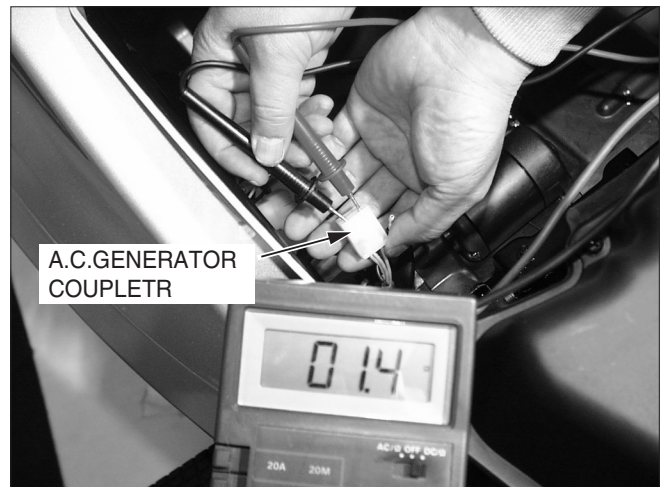
- Remove the front cover. (⇒ 4-3)
- Disconnect the regulator / rectifier wire coupler. Remove the 2 regulator / rectifier setting bolts attached to the headlight stay.
- Install in the reverse order of removal.



A.C Generator Inspection

NOTE

- This test is carried out with the stator assembled to the engine.
- Disconnect the 4P coupler of the generator cord.
- Measure the resistance between the yellow leads.
Resistance value: 1.0-1.5 Ω (20°C/68 °F)
- Measure the resistance between the yellow leads and the engine earth.
- If the resistance value is great, or if power is connected between terminals and the earth terminals, replace the stator with a new one.



16. Ignition system

Service Information	16-1	Pulse Generator Inspection	16-5
Troubleshooting	16-2	Ignition Timing Check	16-6
CDI Unit Inspection	16-3	Side Stand Ignition Cut-off Switch	16-6
Ignition Coil Inspection	16-4		

Service Information

General Safety

- Carry out inspection in sequence based on the troubleshooting table.
- If the CDI unit is dropped, or if strong shock is applied thereto, CDI unit malfunction may result. Take due precautions when handling it. Also, if the connector or coupler is connected or disconnected when there is current flowing, overvoltage may occur on the unit leading to circuit damage. Always turn off the main switch prior to servicing.
- Ignition timing cannot be adjusted because the ignition system is of CDI type.
- Spark plug check. (⇒ 3 - 5)
- Connect the same color cords. Pay particular attention to colors prior to removing wiring. Connect the same color couplers.
- The resistance value may slightly differ from the standard values depending on each measuring situation.

Specifications

Item			Standard value
Ignition coil Resistance value 20°C (68°F)	Primary coil		0.1~0.2 Ω
	Secondary coil	With plug cap	7.3~11k Ω
		Without plug cap	3.6~4.6K Ω
Pulse generator coil resistance value 20°C (68°F)			90~150 Ω

Tools

Measuring instruments
Digital circuit tester
PVA multi-tester
CDI tester
Spark adapter

TROUBLESHOOTING

No spark at plug.

UNUSUAL CONDITION		PROBABLE CAUSE (CHECK IN NUMERICAL ORDER)
IGNITION COIL PRIMARY VOLTAGE	Low peak voltage.	<ol style="list-style-type: none"> 1. The multitester impedance is too low. 2. Cranking speed is too slow. <ul style="list-style-type: none"> - Battery is undercharged (or operating force of the kick starter is weak). 3. The sample timing of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 4. Poorly connected connectors or an open circuit in ignition system. 5. Faulty ignition system control circuit such as side stand switch. 6. Faulty ignition coil. 7. Faulty CDI unit (in case when above No. 1~6 are normal).
	No peak voltage.	<ol style="list-style-type: none"> 1. Incorrect peak voltage adaptor connections. 2. Faulty ignition switch. 3. Loose or poorly connected CDI unit connector. 4. Open circuit or poor connection in ground cord of the CDI unit. 5. Faulty ignition system control circuit such as side stand switch. 6. Faulty peak voltage adaptor. 7. Faulty CDI unit (in case when above No. 1~6 are normal).
	Peak voltage is normal, but no spark jumps at plug.	<ol style="list-style-type: none"> 1. Faulty spark plug or leaking ignition coil secondary current ampere. 2. Faulty ignition coil.
PULSE GENERATOR	Low peak voltage.	<ol style="list-style-type: none"> 1. The multitester impedance is too low. 2. Cranking speed is too slow. <ul style="list-style-type: none"> - Battery is undercharged (or operating force of the kick starter is weak). 3. The sample timing of the tester and measured pulse were not synchronized.(System is normal if measured voltage is over the standard voltage at least once.) 4. Faulty pulse generator (in case when above No. 1~3 are normal).
	No peak voltage.	<ol style="list-style-type: none"> 1. Faulty peak voltage adaptor. 2. Faulty pulse generator.

CDI Unit Inspection

CDI ignition circuit inspection

NOTE

- Inspect the ignition system in proper sequence based on the troubleshooting table.
- Remove the luggage box. (⇒ 4-5)
- Remove the body cover. (⇒ 4-6)
- Remove the coupler from the CDI unit, and check the ignition system circuits from the wiring coupler side.

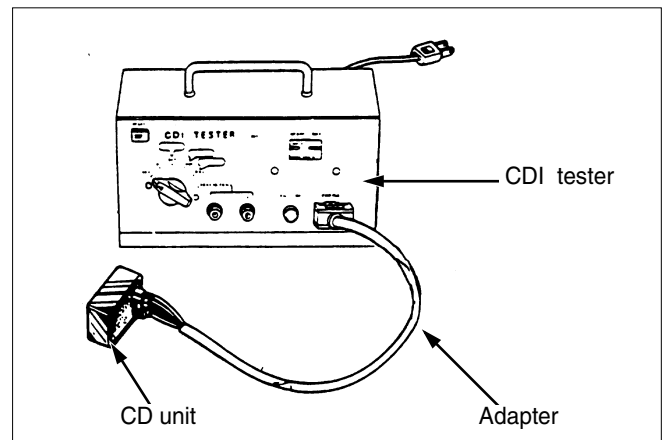


Inspection item	Terminal	Standard value
Pulse generator	Blue/yellow and green	90-150 Ω 20°C (68°F)
Ignition coil (primary coil)	Black/yellow and earth	0.1-0.2 Ω 20°C (68°F)
Main switch	Black/white (+) and earth(-)	No power connection when the main switch is ON
Wire harness earth	Green and earth	Power connected

Testing by CDI Tester

- Check the CDI unit spark performance by using a CDI tester.

Tool: CDI tester



NOTE

- Read tester manual carefully prior to using the tester.
- Replace defective CDI unit.

Ignition Coil Inspection

- Remove the luggage box. (⇒ 4-5)
- Remove the body cover. (⇒ 4-6)
- Remove the center cover. (⇒ 4-4)
- Remove the primary wire.

NOTE

- This test is inaccurate. Conduct the ignition coil performance test with an ignition coil tester.

- Measure the primary resistance between the ignition coil terminal and earth.

Standard value: 0.1-0.2 Ω

- Remove the spark plug cap from the plug.
- Measure the secondary resistance between the ignition coil spark plug cap and earth.

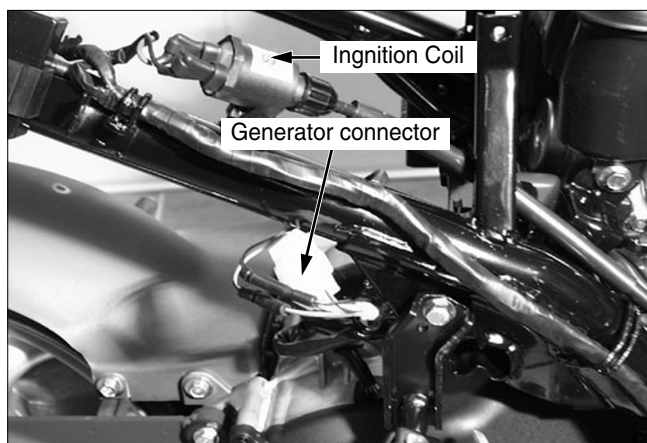
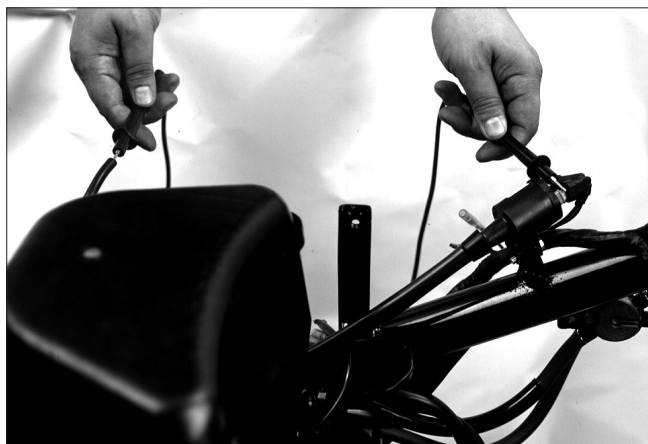
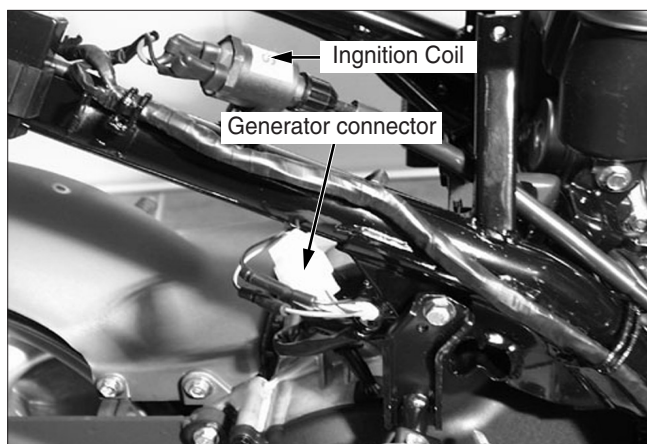
Standard value: 7.3-11K Ω

- If the measured value deviates from the prescribed value, remove the plug cap from the high-tension cord, and measure the secondary resistance.

Standard value: 3.6-4.6K Ω

Replacement

- Remove the high-tension cord from plugs and clamps. Remove the primary wire from the ignition coil. Loosen 2 bolts to disassemble the ignition coil.
- Install in the reverse order of removal.



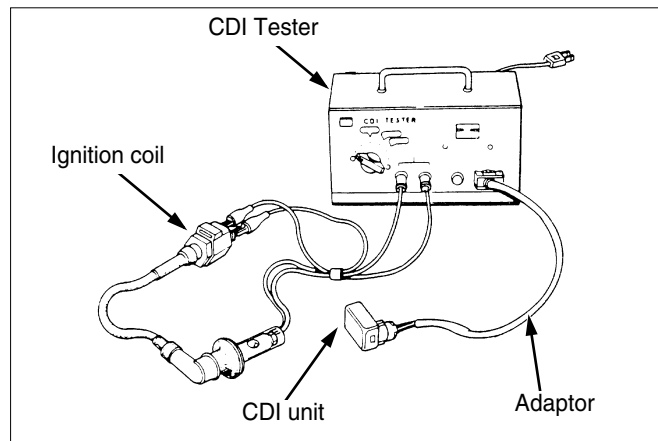
Performance Test

- Remove the ignition coil.
- Use a CDI unit to test spark performance of the ignition coil. If there is no spark from the spark cap of the spark adaptor, replace coil.

**Tools: Spark adaptor
CDI tester**

NOTE

- Read the tester manual carefully prior to using the tester.



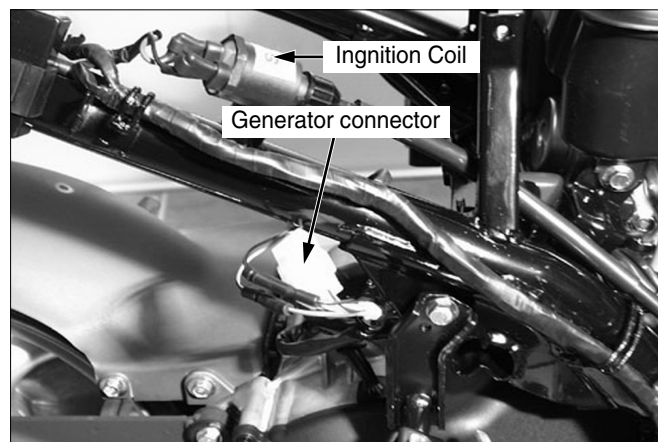
Pulse Generator Inspection

- Remove the luggage box. (⇒ 4-5)
- Disconnect the A.C. generator 4P coupler and the blue/yellow wire connector.
- Measure the resistance between the green and blue/yellow wire.

Standard value: 90-150 Ω (20°C/68°F)

NOTE

- Even if the resistance value slightly deviates from the standard value, sometimes performance is not affected. In such case, check all related parts to determine if the cause of trouble exists in other areas.
- For information on pulse generator change, refer to section 8.



PVA Measurement

- Disconnect the A.C generator blue/yellow wire connector.
- Connect the peak voltage adaptor probes to the pulse generator wire terminal of the wire harness side connector and ground.
- Crank the engine with the kick starter or starter motor and measure the peak voltage of pulse generator.

Peak voltage: over 1.5V

Tool: PVA multi tester

- Install in the reverse order of removal.

Ignition Timing Check

NOTE

- As the system uses the CDI unit, the ignition timing need not be adjusted. Check the ignition system if the ignition timing is incorrect.

- Start and warm up the engine.
- Connect the timing light to the high-tension cord.

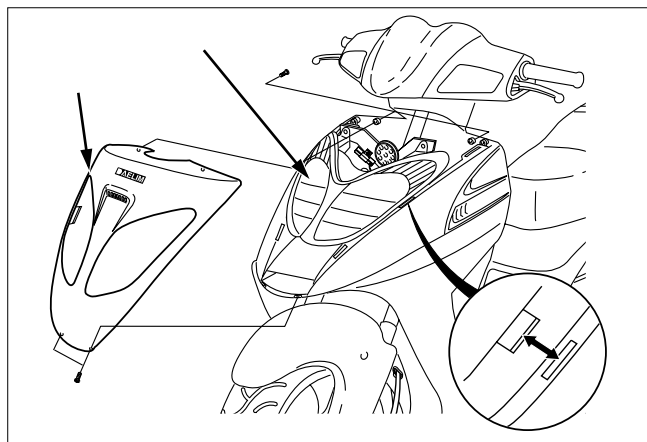
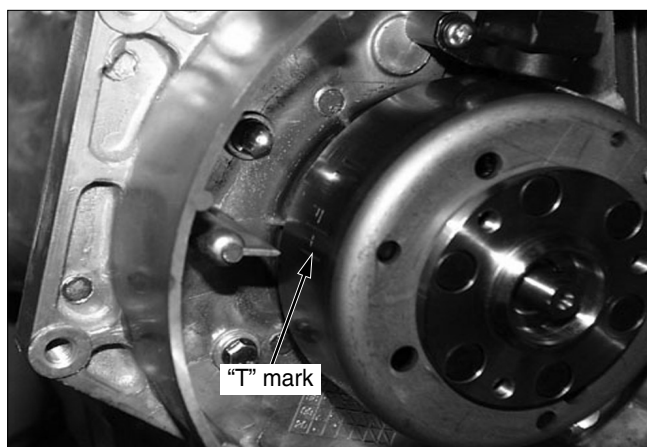
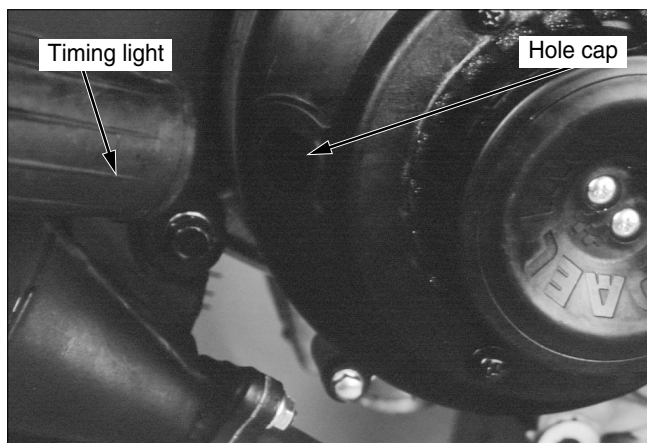
NOTE

- Read the timing light manual prior to using it.

- Remove the timing hole cap from the shroud, and start the engine.
- Align the "F" mark on the rotor with the index mark on the case when the engine is idling to specified rpm.

Idle speed: 15° BTDC 1,800 rpm.

- Gradually increase the engine speed. If the index mark is set within the advanced "F" mark at the engine speed greater than 3,900(rpm), it indicates the advance system is correct.

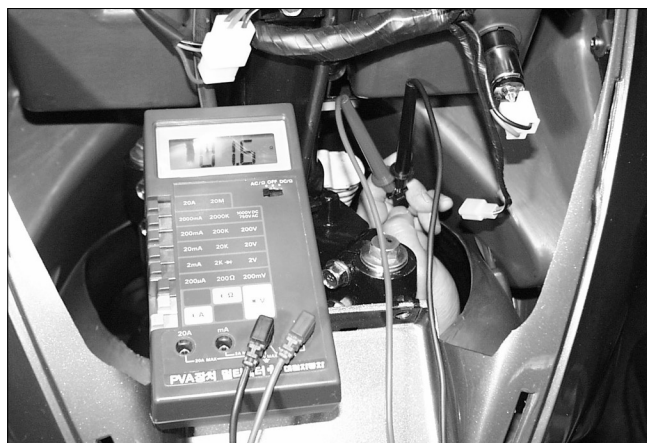


Side Stand Ignition Cut-off Switch

Inspection

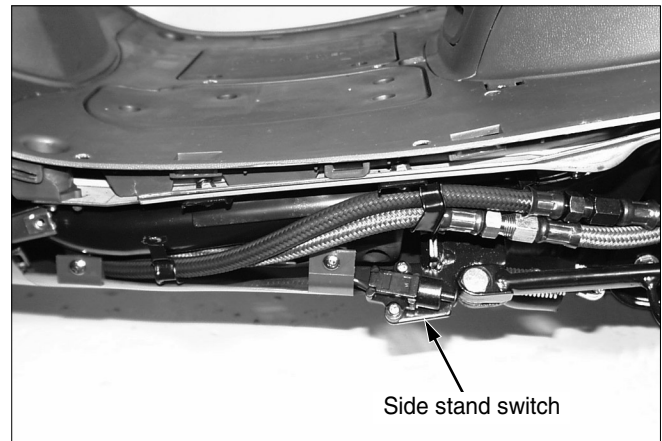
- Remove the front cover.(⇒ 4-3)
- Remove the headlight.(⇒ 18-2)
- Remove the coupler of the side stand switch.
- Check for continuity between the terminal as shown below ;

ITEM	TERMINAL	SPECIFICATION
ON (side stand is lowered)	BLACK/BLUE AND GREEN	NO CONTINUITY
OFF (side stand is retracted)	BLACK/BLUE AND GREEN	CONTINUITY



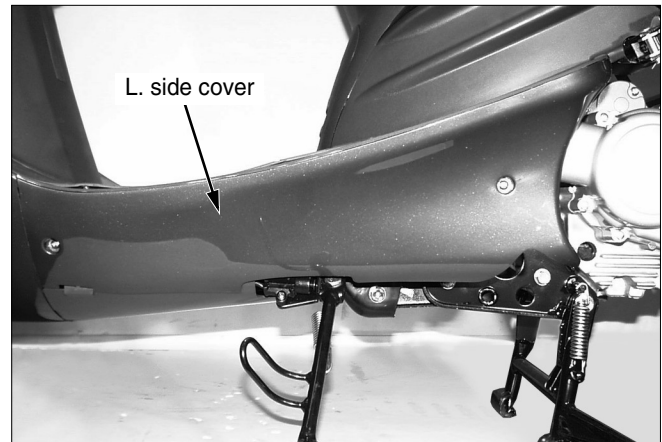
Removal

- Remove the front cover.(⇒ 4-3)
- Remove the headlight.(⇒ 18-2)
- Remove the coupler of the side stand switch.
- Remove the L. side cover.(⇒4-5)
- Loosen the side stand switch mounting 2 bolts.
- Release the wire clamps and remove the side stand switch.



Installation

- Install in the reverse order of removal.



MEMO

17. Starter System

Service Information	17-1	Starter Motor	17-3
Troubleshooting	17-2	Starter Magnetic Switch	17-6

Service Information

General Safety

WARNING

- Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.

- The starter motor can be maintained without removing the engine from the vehicle.
- A weak battery may be unable to turn the starter motor quickly enough, or , supply adequate ignition current.
- The starter motor may be damaged if current is allowed to flow to it when the engine cannot turn over.
- The engine may not be turned over if the stop switch is faulty.

Specifications

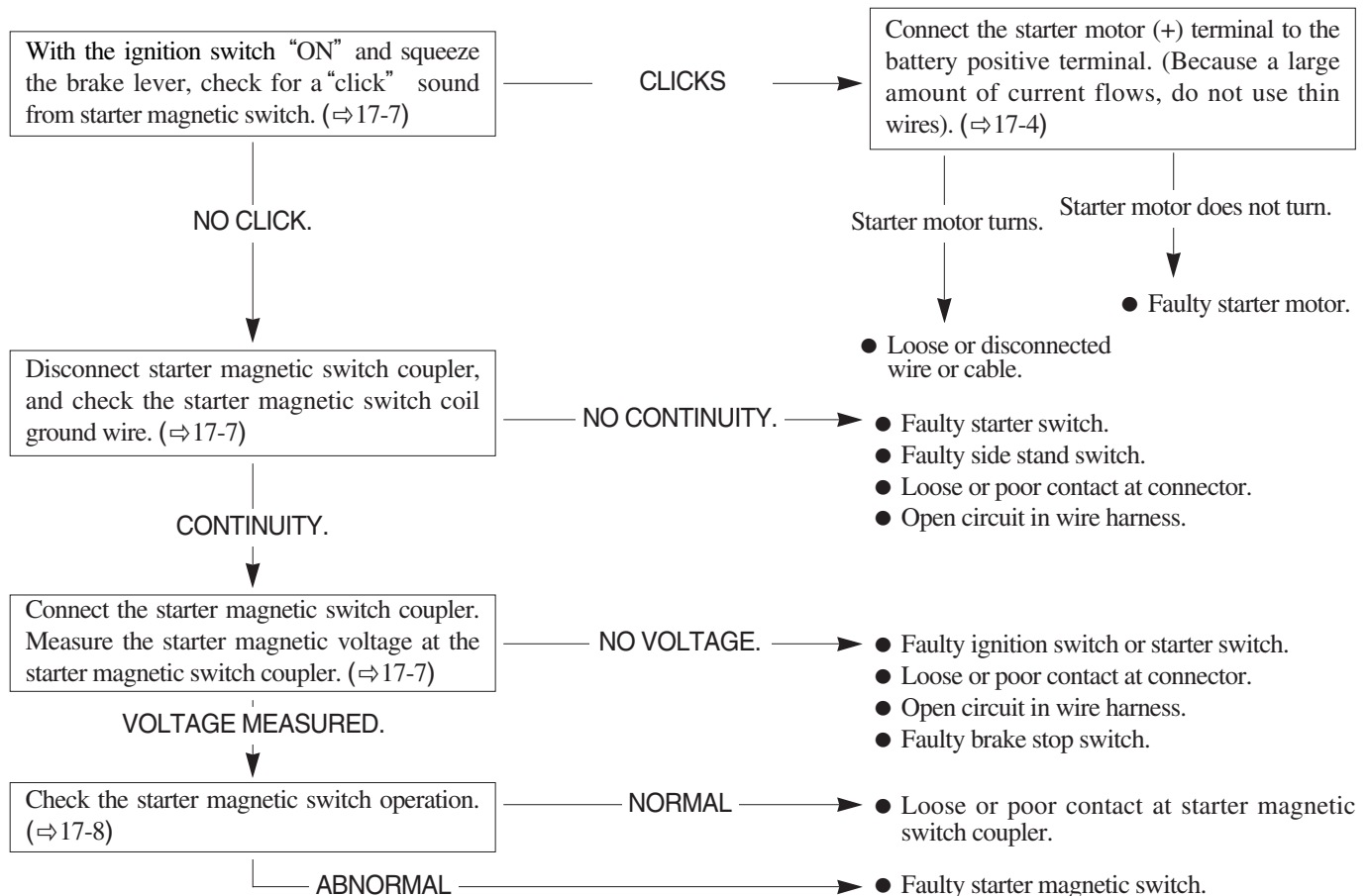
Unit: mm(in)

Item	Standard value	Service limit
Starter motor brush length	10.2 (0.400)	5.0 (0.96)

Troubleshooting

Starter motor will not turn.

- Check for a blown main fuse before servicing.
- Check that the stop light is correctly adjusted.
- Check that the side stand is positioned in the condition under which the engine can be started.



Starter motor turns slowly.

- Low specific gravity in battery. (or dead battery)
- Poorly connected battery terminal cable.
- Poorly connected starter motor cable.
- Faulty starter motor.
- Poorly connected battery ground cable.
- Damaged or worn brush.

Starter motor and engine turns, but engine does not start.

- Faulty ignition system.
- Engine problems.

Starter motor turns, but engine does not turn over.

- Starter motor is running backwards.
 - Brushes assembled improperly.
 - Case assembled improperly.
 - Terminals connected improperly.
- Faulty starter clutch.
- Damaged starter gear.

Starter Motor

Removal

- Remove the luggage box. (⇒ 4-5)
- Remove the body cover (⇒ 4-6)
- Remove the starter motor cable from the motor.
- Unfasten the 2 starter motor mounting bolts, and remove the starter motor.

NOTE

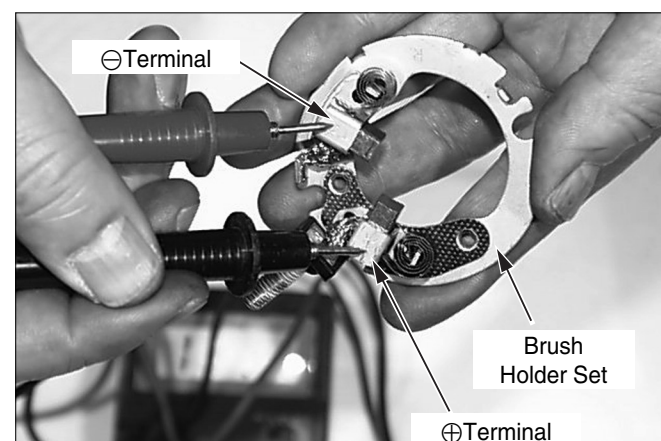
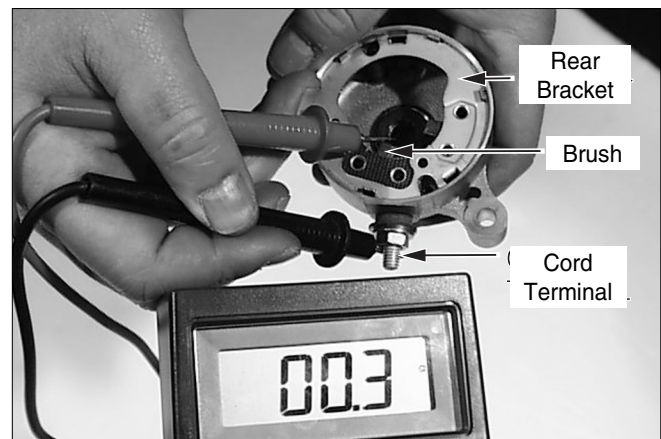
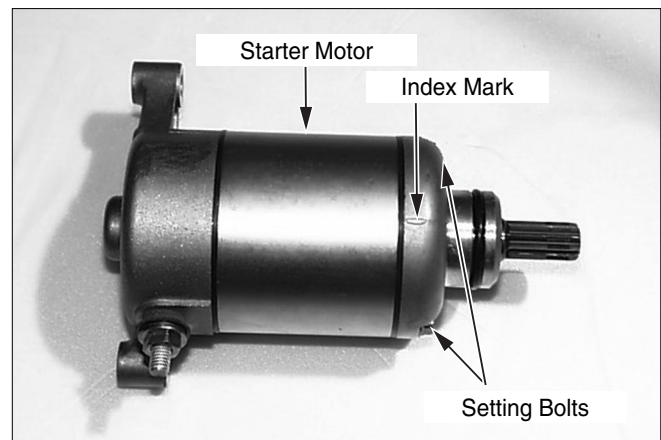
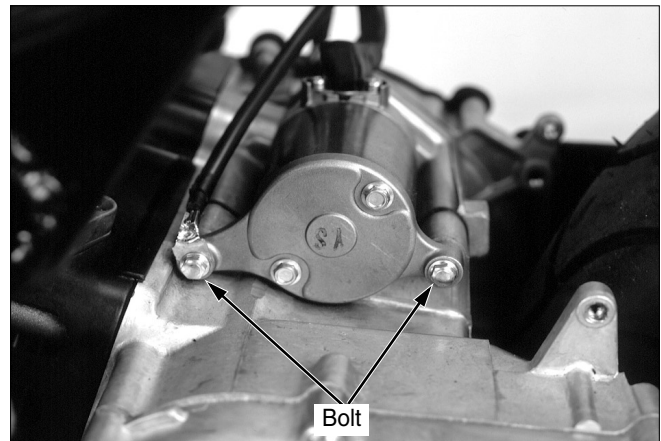
- Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.
- Accurately tighten the battery earth cable.

Disassembly

- Remove the starter motor cable.
- Before disassembling the starter motor mark the position of the case and cover so the starter can be assembled correctly later.
- Loosen the starter motor case bolts and remove the motor cover.

Inspection

- Check for continuity of the starter motor case.
 - Between cord terminal“⊕” and bracket“⊖”: normal if no continuity.
 - Between cord terminal and brush : normal if there is continuity.
- If abnormal, replace with a new one.
- Loosen the brush terminal setting nut, remove the brush holder set.
- Check for continuity between “⊕” and “⊖” terminals of the brush holder.
- If there is continuity, replace with a new one.



Starter System

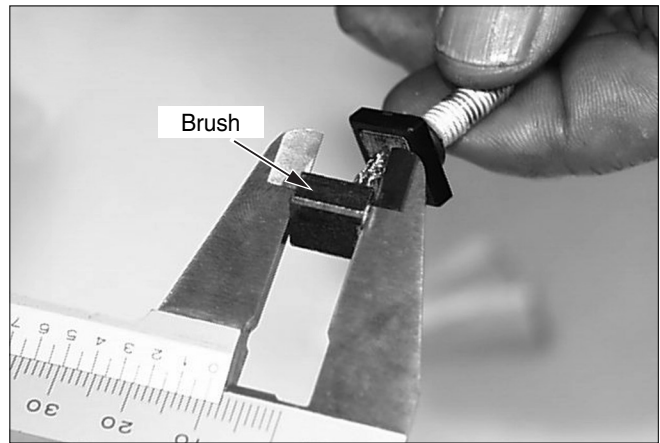
- Remove the brush spring, and then remove the brush.
- Measure the brush length. Replace the brush if it is worn beyond the service limit.

Service Limit : 5 mm

Tool : Vernier Caliper

NOTE

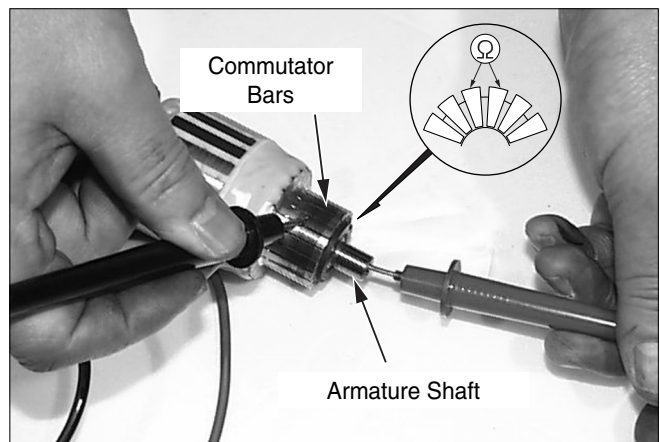
- If replacement, replace with a brush holder set.



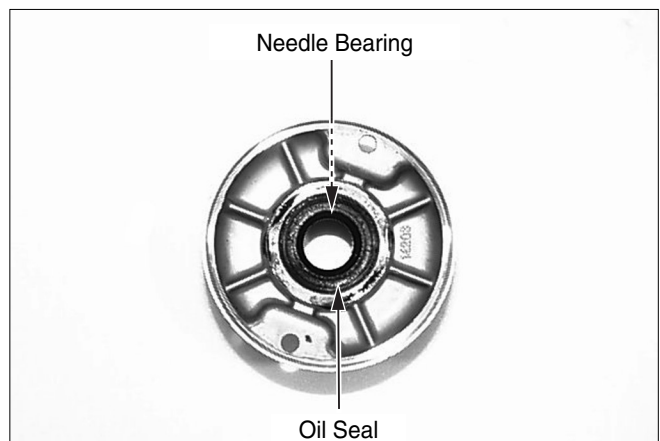
- Check the commutator for :
 - Damage or abnormal wear. → Replace with a new one.
 - Discoloration of the commutator bar. → Replace with a new one.
 - Metallic debris between commutator bars.→ Clean it off.



- Check for continuity between pairs of commutator bars.
- Make a continuity check between individual commutator bars and the armature shaft.
- There should be no continuity.

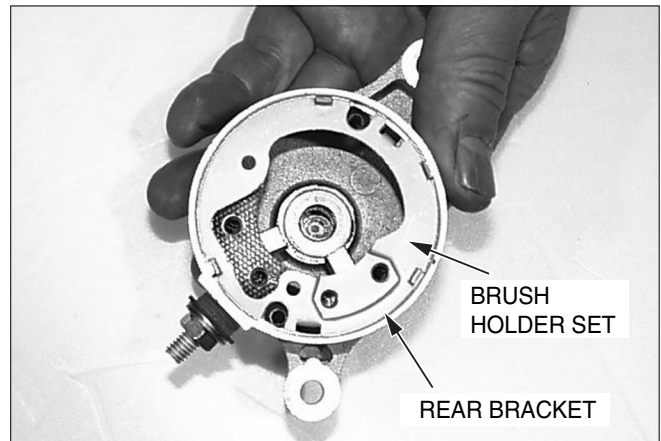


- Check the needle bearing and oil seal.
 - Do not rotate smoothly. → Replace with a new one.
 - Damage oil seal. → Replace with a new one.

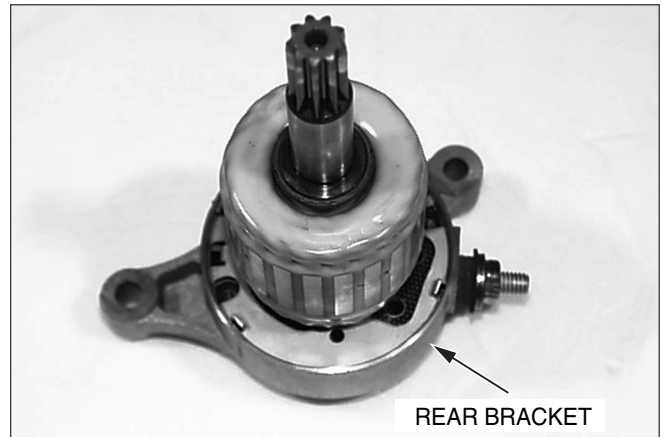


Starter Motor Assembly

- Install the brush and brush spring to the brush hold set.
- Insert the brush terminal into the rear bracket, and install the terminal set and flange nut.
- Align the brush holder set with the rear bracket groove, and install the brush holder set.
- Apply grease to both ends of the armature shaft, and install the 2 washers.

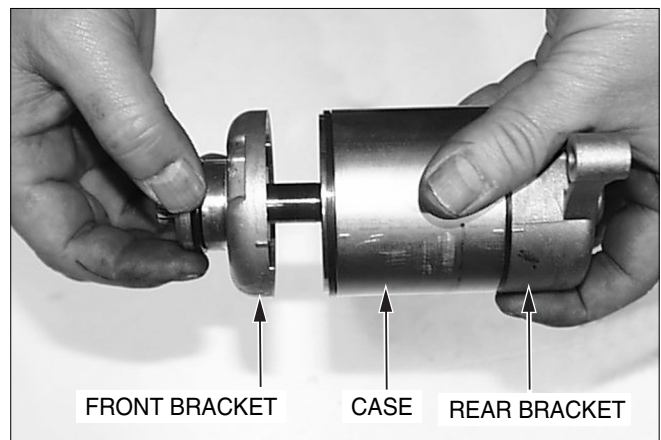


- Push and hold the brush inside the rear bracket, and insert the armature into the rear bracket groove.
- Align the case mark with the rear bracket mark, and install the case.
- Insert the thrust washer (0.5t), thrust washer (0.2t), slip washer and thrust support.



CAUTION

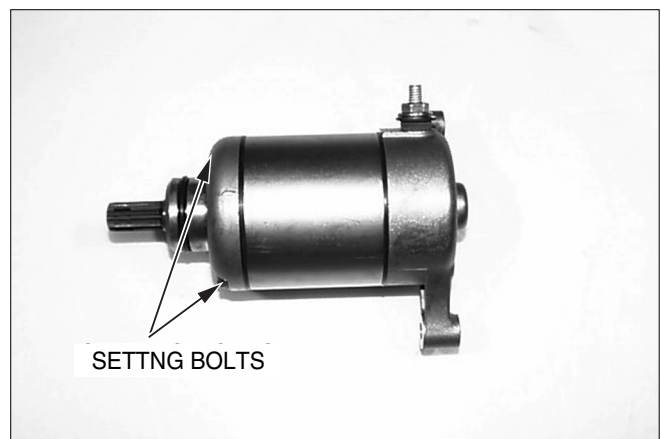
- The sliding surfaces of the brushes can be damaged if they are not installed properly.
- When inserting the armature into the case, hold the armature tightly to keep the magnet from pulling the armature against the case.
- Align the front bracket with the case mark, and install the front bracket.



- Tighten the motor cover bolts.

CAUTION

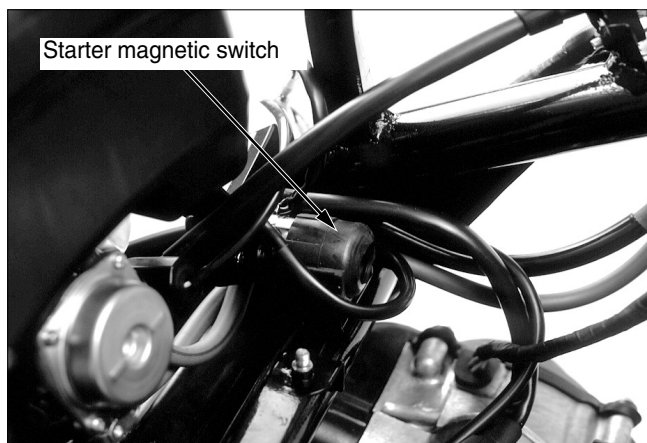
- When installing the cover, take care to prevent damaging the oil seal lip with the shaft.
- Overtightening the starter motor cable terminal nuts may cause the inside the starter motor, resulting in serious damage to the inner connectors.



Starter Magnetic Switch

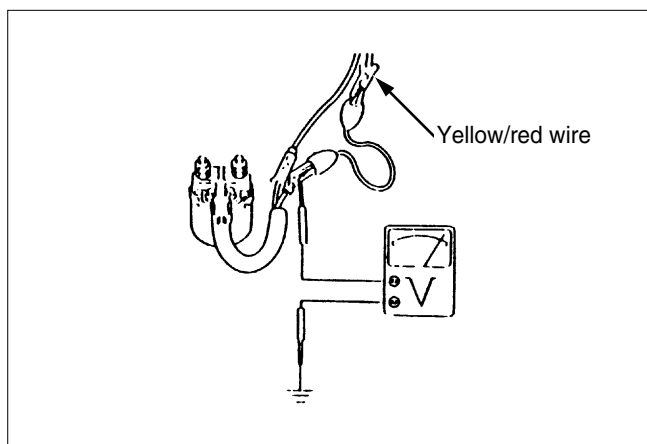
Inspection

- Turn on the main switch, and press the starter button. If the starter magnet switch generates operation signal tone at this time, it indicates satisfactory condition.



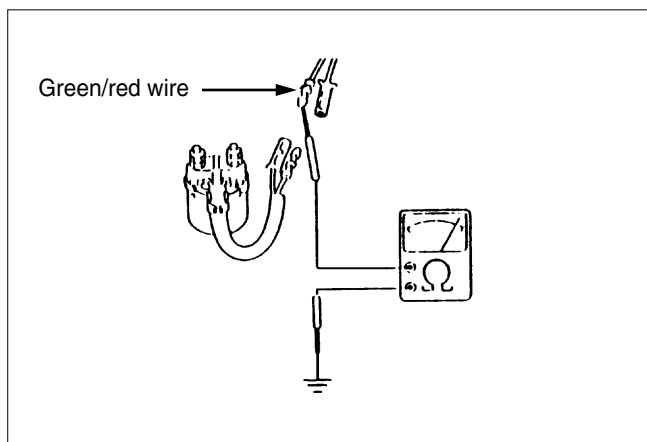
Voltage Check

- Measure the voltage between the yellow/red wire (+) of the starter magnetic switch and the vehicle earth.
- Turn main switch on and press the starter switch. If there is battery voltage displayed, it indicates operation condition is satisfactory.



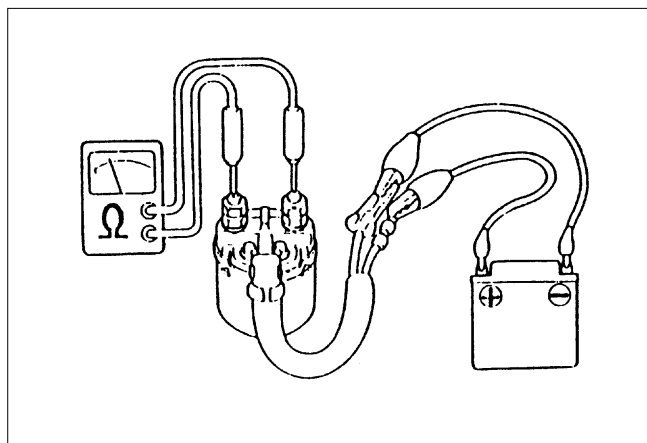
Earth Circuit Inspection

- Disconnect the green/yellow wire connector of the starter magnetic switch. If power is connected between the harness terminal and the vehicle earth, it indicates satisfactory condition.



Operation Inspection

- Disconnect the magnetic switch wire connector. If power is connected between terminals, as shown in the figure, when the yellow/red wire is connected to the positive (+) battery terminal and the green/yellow wire to the negative (-) battery terminal, it indicates the switch is functioning satisfactorily.



18. Light/Switch/Horn

Service Information	18-1	Handle Bar Switch	18-4
Troubleshooting	18-1	Front Stop Light Switch	18-5
Headlight	18-2	Fuel Gauge/Fuel Sensor	18-5
Front Winker	18-2	Horn/Clock	18-6
Tail-Stop Light/Rear Winker	18-2	Clock	18-6
Meters(Measuring instruments)	18-3	Trunk Lamp Switch	18-7
Main Switch	18-4		

Service Information

General Safety

- Connect the same color wires together. Connect couplers carrying the same color and the same number of pins together.
- All couplers are equipped with tabs which can be locked. Remove these locks prior to disassembling; and insert these tabs all the way until locked when assembling.
- Carry out continuity test on circuits or parts to diagnose electric systems. The continuity test on normal parts can be carried out without removing the parts from the vehicle. Simply disconnect the wires and connect a continuity tester or an ohmmeter to the coupler terminals or connectors.
- The continuity test is conducted to check if electric power is connected between 2 terminals. If there is coil resistance within circuits, or to check the large resistance resulting from the connector corrosion, an ohmmeter is required to check the circuit resistance value.

Troubleshooting

Lights not turned on when the main switch is ON

- Faulty light bulb
- Faulty switch
- Faulty or disconnected wiring
- Fuse cut
- Battery discharged

Dim headlight

- Battery discharged
- Wiring and switch resistance high

Headlight Hi-Low beam cannot be changed

- Faulty light bulb
- Faulty dimmer switch

Headlight

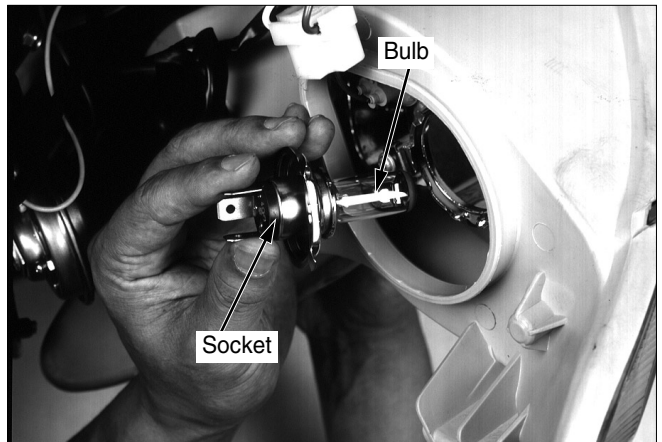
Removal

- Remove the front cover. (⇒ 4-3)
- Loosen the 4 headlight setting bolts.
- Remove the headlight wiring
- Check the headlight wiring for disconnection. (⇒ 15-3)



Bulb Replacement

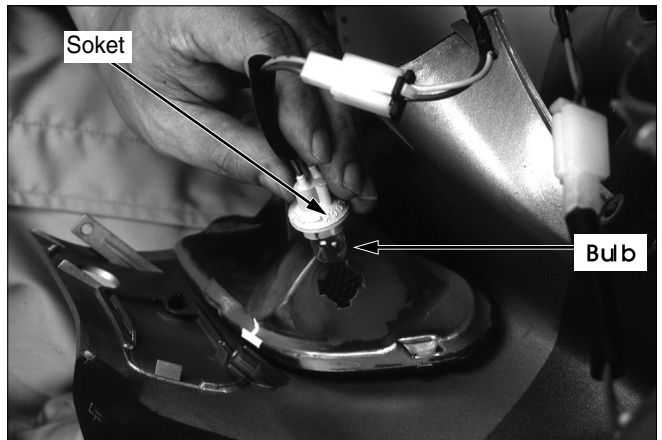
- Remove the headlight socket and position light socket, and replace the light bulb.
- Install in the reverse order of removal.



Front Winker

Bulb Replacement

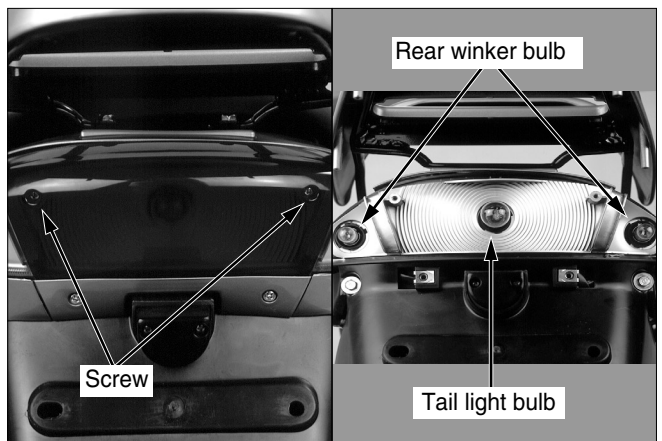
- Remove the front handle cover. (⇒ 4-8)
- Remove the R/L winker light bulb socket from the handle cover, and replace bulbs.



Tail-Stop Light/Rear Winker

Bulb Replacement

- Remove the rear undercover.
- Loosen the 2 screws from the tail stop light lens, and replace the tail stop light and rear winker light bulbs.

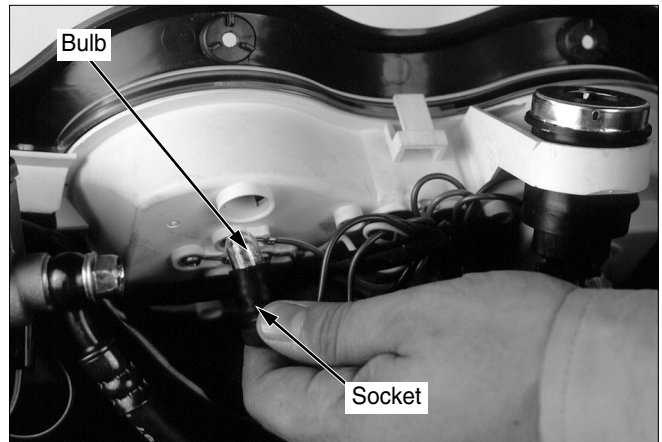


Meters (Measuring Instruments)

Bulb Replacement

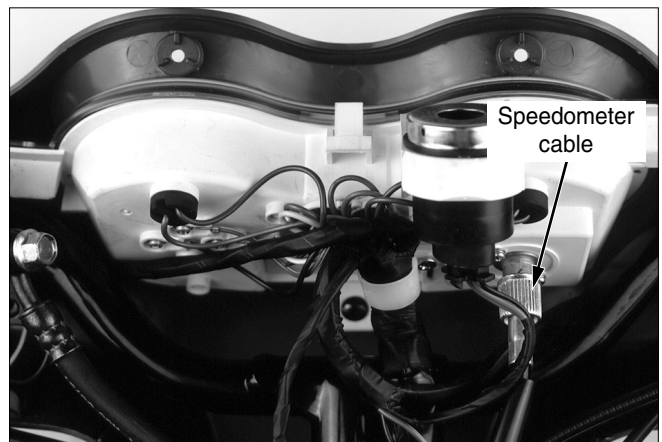
- Remove the front handle cover.(⇒ 4-8)
- Disconnect the winker and headlight wiring.

- Remove the bulb socket, and replace bulbs.



Meter Replacement

- Loosen the speedometer setting screws, and remove the front wheel side speedometer.
- Remove the speedometer cable from the meter, and remove the speedometer.



- To disassemble the meter, release the hook from the meter upper case, and loosen the speedometer and fuel meter assembly screws.
- Install in the reverse order of removal.

NOTE

- The fuel meter and wire must be connected accurately.



Main Switch

Inspection

- Remove the front cover. (⇒ 4-3)
- Remove the headlight case.
- Remove the main switch terminal.
- Carry out continuity test between the following the same-color wires, as shown on the following table.

COLOR	BLACK/WHITE	GREEN	RED	BLACK
TERMINAL	IG	E	BAT	HO
LOCK	○—○	○		
OFF	○—○	○		
ON			○—○	○

Removal

- Remove inner box. (⇒ 4-4)
- Loosen the 3 main switch socket bolts, and remove the main switch.
- Install in the reverse order of removal.

Handle Bar Switch

- Remove the front handle cover. (⇒ 4-8)
- Loosen the headlight, and remove the handle bar switch terminals. Carry out inspection based on the following table.

Starter switch

COLOR	YELLOW /RED	BLACK
TERMINAL	ST	E
FREE		
PUSH	○—○	○

Lighting switch

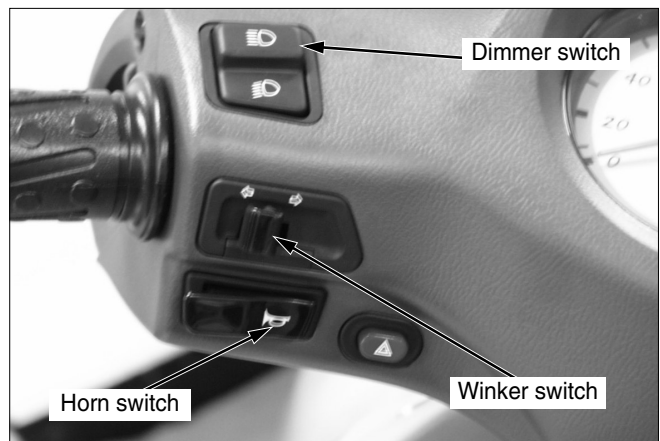
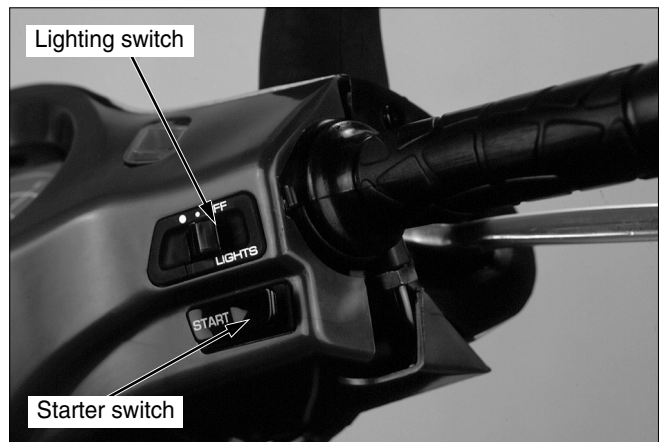
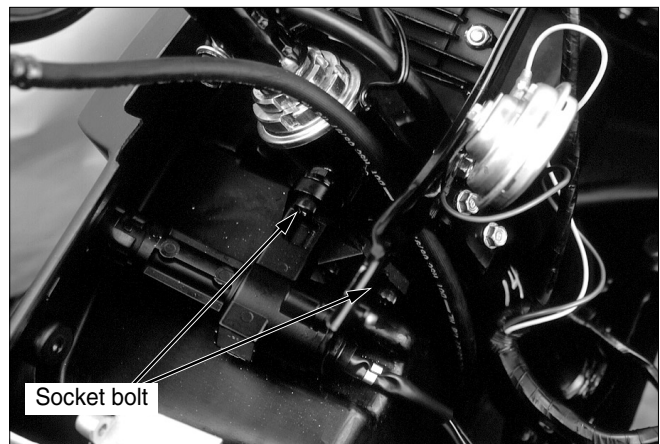
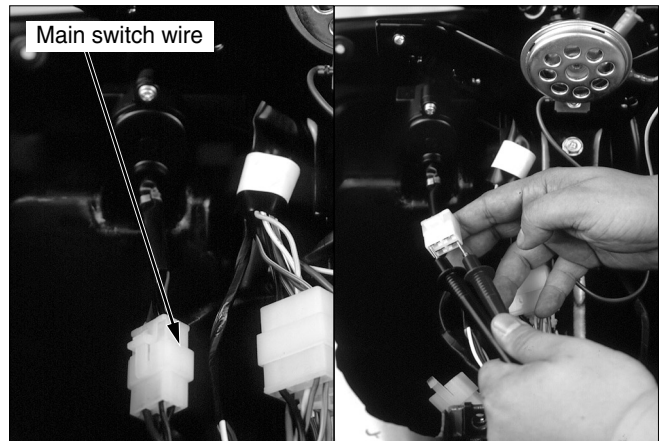
COLOR	BLACK	BROWN	BROWN /WHITE	PINK
TERMINAL	BAT	TL	HL	RE
OFF	○			○
PO	○—○			
(N)	○—○			
H	○—○	○—○		

Dimmer switch

COLOR	BLUE	BROWN /WHITE	WHITE
TERMINAL	HI	HL	LO
LO		○—○	
(N)	○—○	○—○	○
H	○—○	○—○	

Winker switch

COLOR	SKY /BLUE	GRAY	ORANGE
TERMINAL	R	WR	L
R	○—○		
N			
L		○—○	

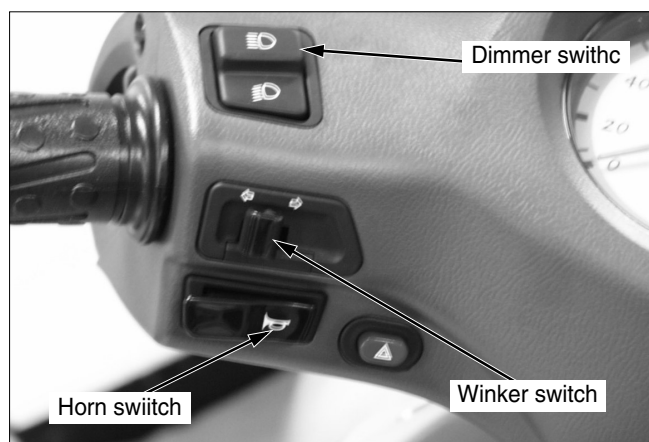


Horn switch

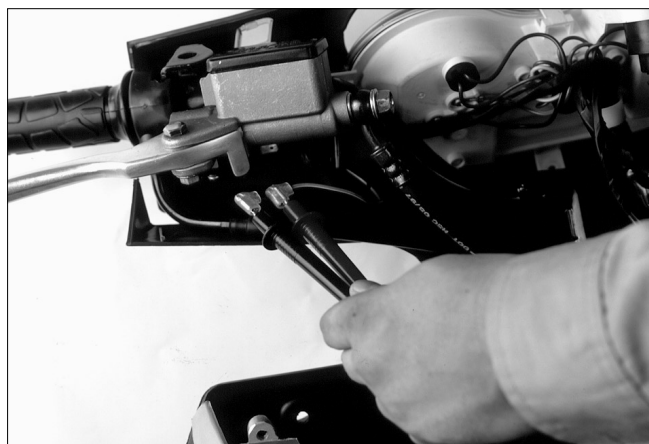
COLOR	LIGHT GREEN	BLACK
TERMINAL	HO	BAT
FREE		
PUSH	○	○

Hazard switch

COLOR	SKY BLUE	GRAY	ORANGE
Terminal	R	WR	L
FREE			
PUSH	○	○	○

**Front Stop Light Switch**

- Remove the front handle cover. (⇒ 4-8)
- Remove the black wire and green/yellow wire terminals inside the headlight case, and check the following.
- When the brake lever is pulled-power connected
- When the brake lever is released-power is not connected

**Fuel Gauge/Fuel Sensor****Removal**

- Open the seat, and remove the retainer and fuel sensor from the fuel tank.

Fuel gauge

- Turn the ignition switch on.
- Remove the fuel tank. (⇒ 5-3)

NOTE

- Check the winker operation condition to check if the battery is in satisfactory condition.
- Check the fuel gauge while moving the fuel sensor float up and down.
Up: No fuel
Down: Fuel amount sufficient

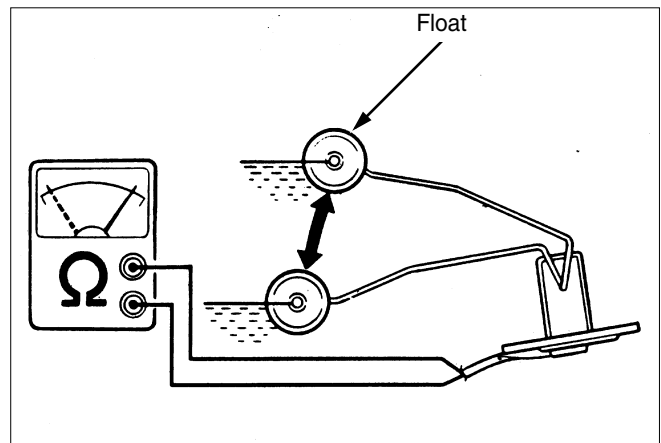


Fuel Sensor

- Remove the fuel sensor terminal, and connect the resistance tester to each terminal. Check the resistance while moving the float up and down.

Resistance Ratio Calculation

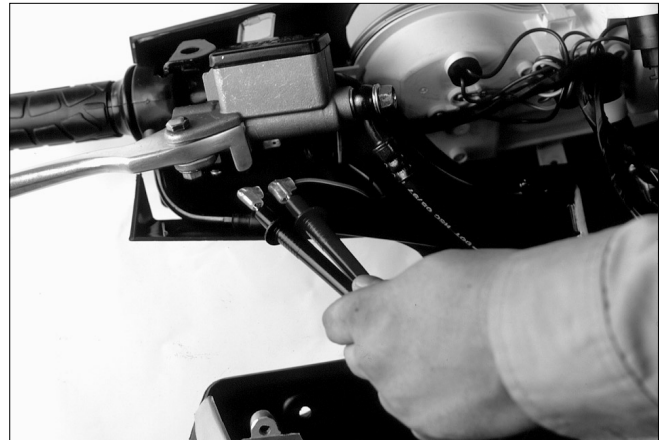
Float position	Resistance ratio
Fuel amount sufficient	0.02-0.1
Reserve	2.5-4.5
No fuel	13-25.5



Horn

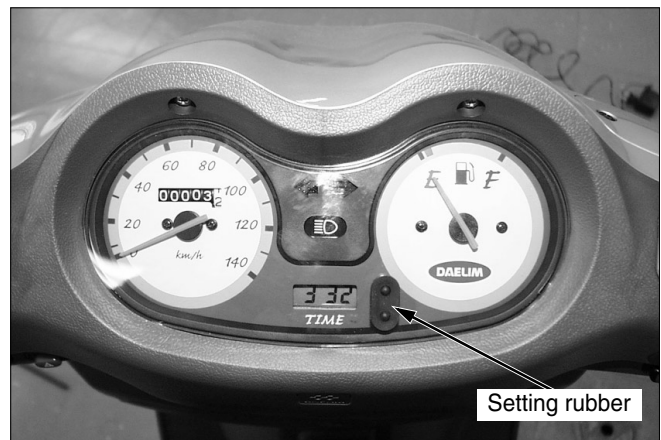
Inspection

- Remove the front cover. (⇒ 4-3)
- Remove the headlight.
- Remove the horn wiring, and connect a fully charged 12V battery. Check the sound quality for any abnormalities.



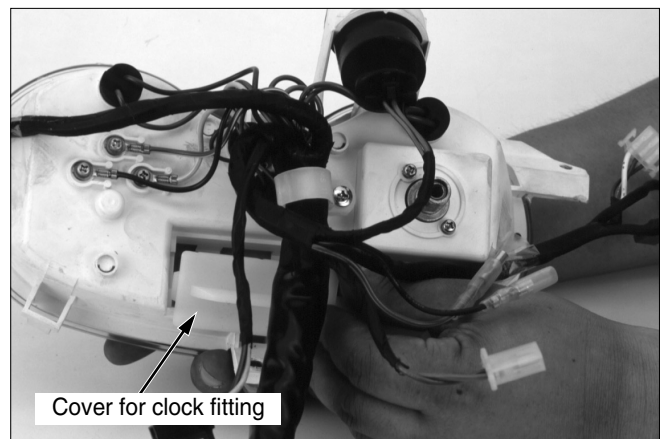
Clock

- The current time is displayed at the bottom of the combination-meter.
- If the time is incorrect, make adjustments with the setting rubber.



Replacement



- Remove the front handle cover. (⇒ 4-8)
- Open the battery (for clock) cover inside the meter-case, and replace the battery.

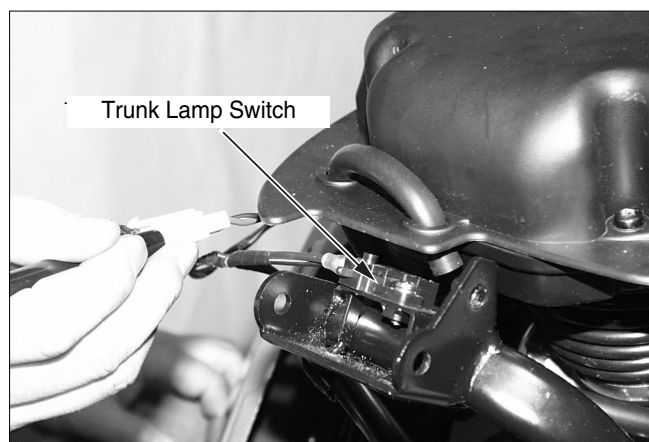


Trunk Lamp Switch

INSPECTION

- Release the seat lock with the main key, open the seat.
- Disconnect the trunk lamp switch, check for continuity between the terminals.

COLOR	BLACK	RED
TERMINAL	TR/L	BAT
PUSH		
FREE		



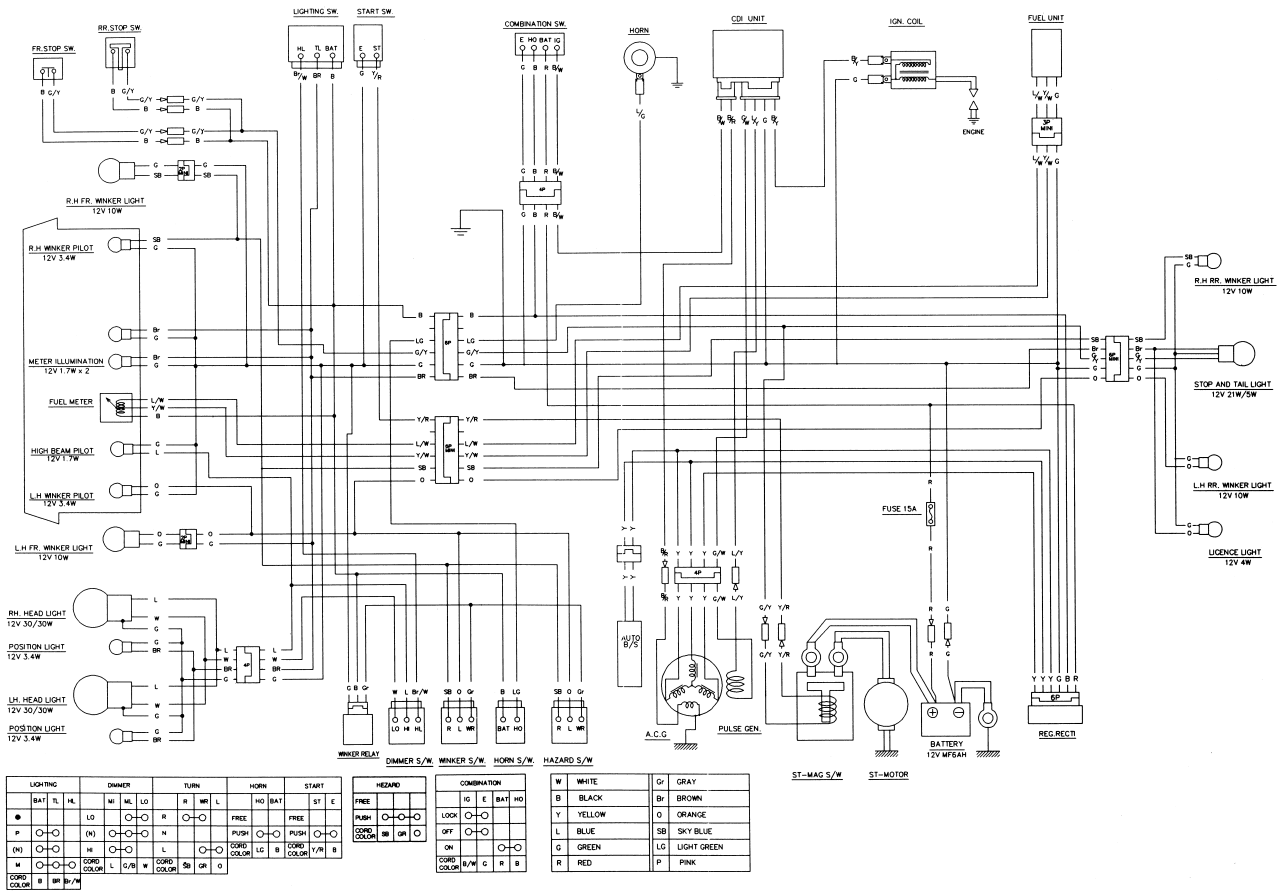
MEMO

MEMO

MEMO

Wiring Diagram

19. Wiring Diagram



20. Troubleshooting

Engine Does Not Start or Is Hard to Start	20-1
Engine Output Insufficient	20-2
Poor Performance at Low Speed and Idling	20-3
Poor Performance at High Speed	20-3
Unsatisfactory Operation	20-4
Fuel Gauge	20-6
Starter Motor	20-7

Engine Does Not Start or Is Hard to Start

1. Open the drain screw, and check fuel flow to the carburetor.

Fuel is supplied.



2. Check spark plugs

Good spark



3. Test cylinder pressure.

Pressure normal



4. Start engine in the following procedure

Engine will not start.



5. Remove spark plugs.

Dry plugs

Fuel not supplied to the carburetor



Cause of Trouble

- (1) Fuel tank empty
- (2) Fuel tube up to the fuel tank clogged, or the vacuum tube or fuel tube up to the inlet pipe clogged
- (3) Float valve clogged
- (4) Fuel tank cap air hole clogged
- (5) Fuel supply pipe frozen
- (6) Fuel strainer clogged.

weak or no spark



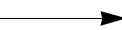
- (1) Faulty spark plug
- (2) Contaminated spark plug
- (3) Faulty CDI unit
- (4) Faulty A.C. generator
- (5) Disconnected or shorted high tension cord
- (6) Disconnected or shorted ignition coil
- (7) Faulty main switch

Low cylinder pressure



- (1) Piston ring seized
- (2) Cylinder and piston ring worn
- (3) Cylinder and cylinder head cracked
- (4) Crank case air leaks
- (5) Cylinder head gasket damaged

Engine start but stops immediately



- (1) Manifold air leaks
- (2) Inadequate ignition timing

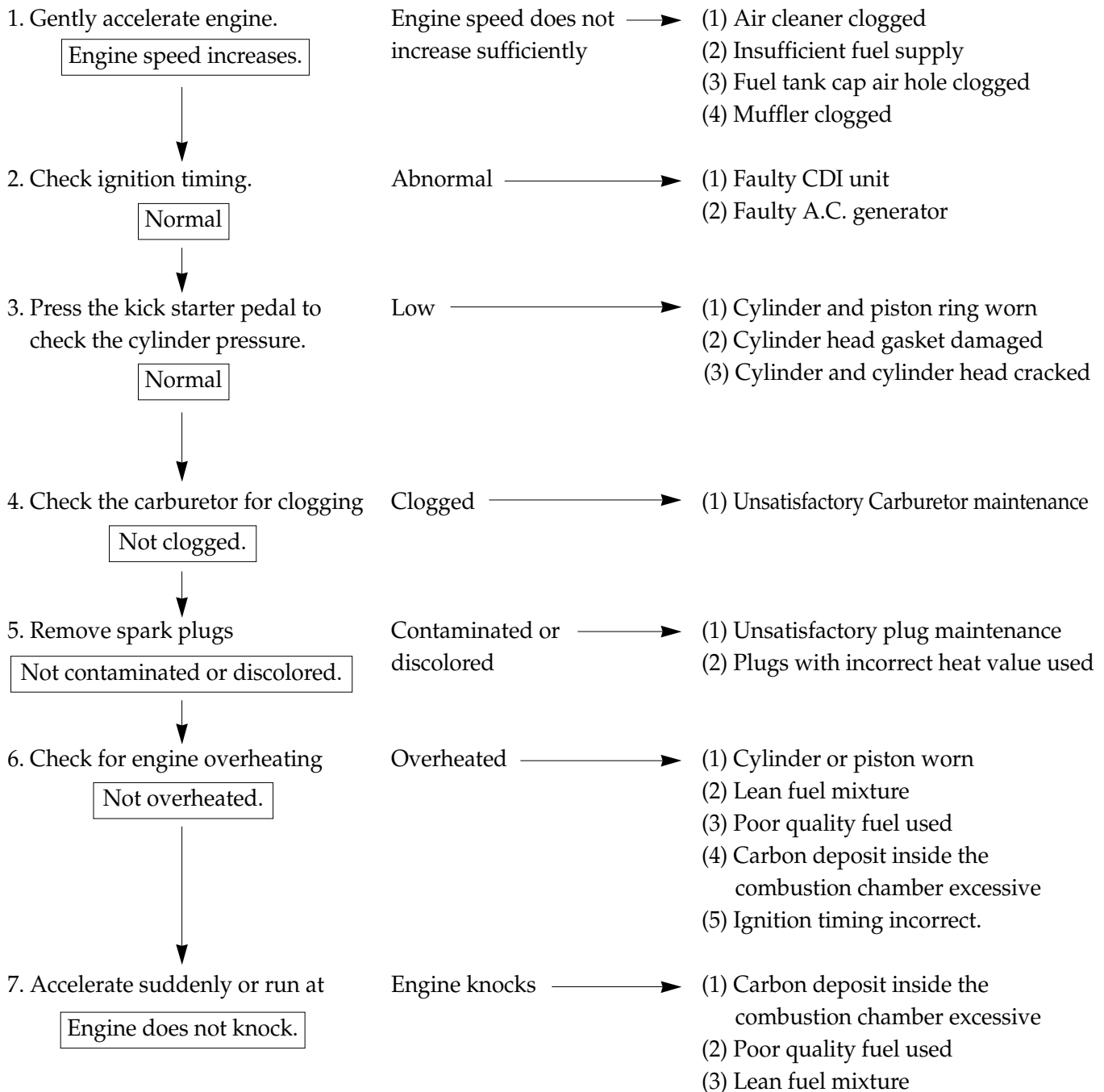
Plugs wet



- (1) Carburetor flooded
- (2) Faulty control box
- (3) Throttle valve excessively opened

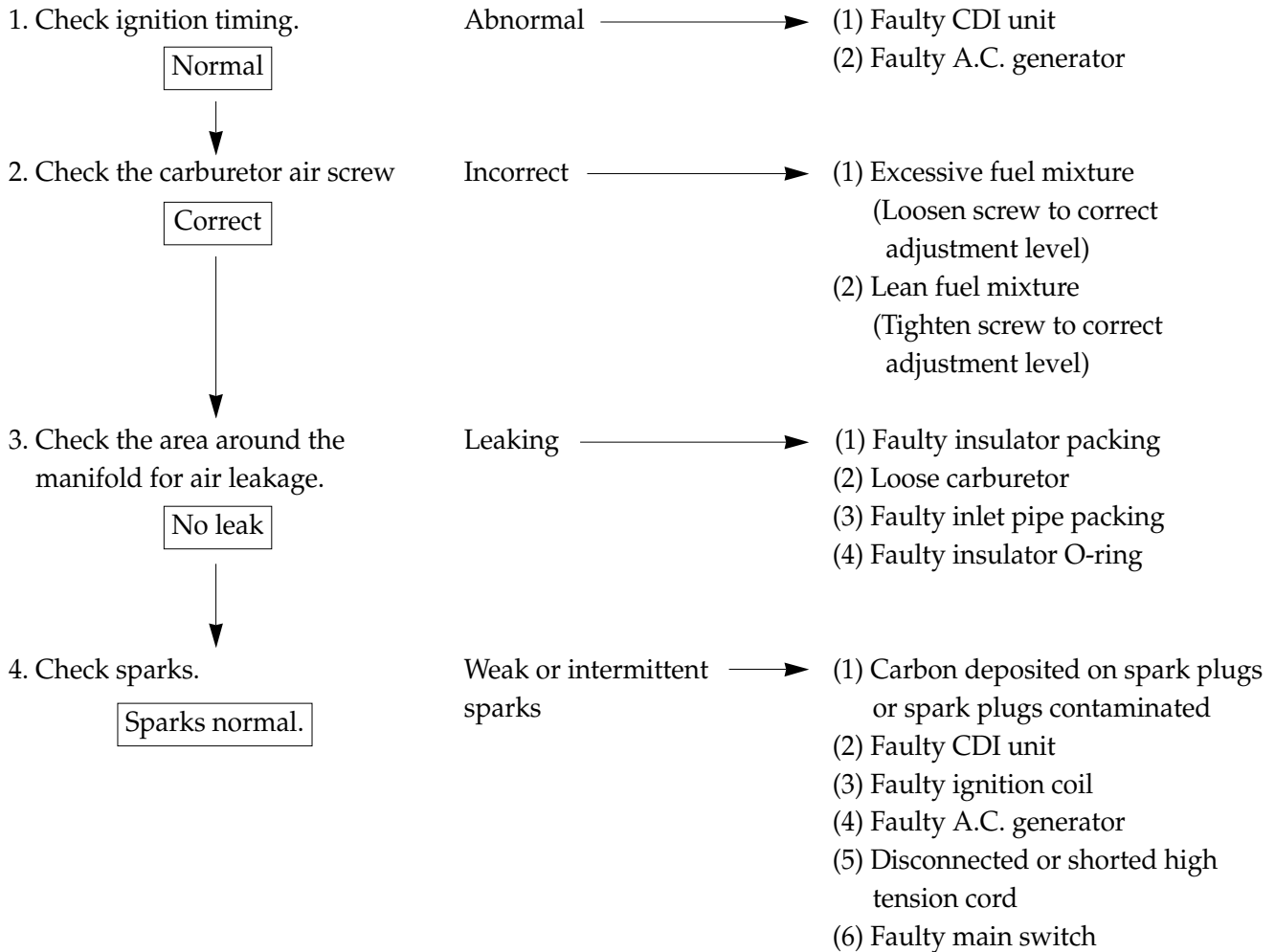
Engine output Insufficient

Cause of Trouble



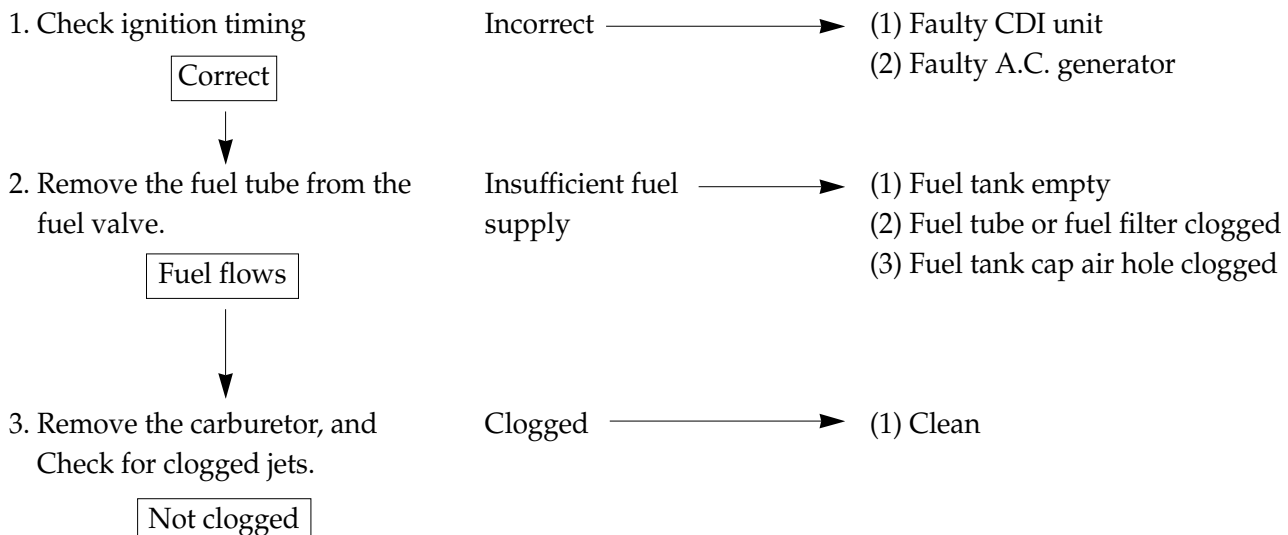
Poor Performance at Low Speed and Idling

Cause of Trouble



Poor Performance at High Speed

Cause of Trouble



Unsatisfactory Operation

Clutch Drive/Driven Pulley

1. Engine starts but motorcycle does not move. —>



2. Vehicle moves slow, engine starts but stops immediately



3. Engine weak at start.



4. Engine weak at high speed.



5. Abnormal noise or odor.

Cause of Trouble

- (1) Drive belt worn or slips
 - (2) Ramp plate damaged
 - (3) Drive face spring damaged
 - (4) Clutch lining came off
 - (5) Driven pulley shaft spline damaged
 - (6) Faulty transmission
 - (7) Transmission seized
-
- (1) Shoe spring damaged
 - (2) Clutch outer and weight seized
 - (3) Pivot seized
-
- (1) Drive belt worn or slips
 - (2) Weight roller worn
 - (3) Drive pulley bearing seized
 - (4) Weak drive face spring
 - (5) Drive pulley bearing worn or seized
-
- (1) Drive belt worn or slips
 - (2) Weight roller worn
 - (3) Drive pulley bearing worn
-
- (1) Oil or grease spilled on the drive belt and inside pulley
 - (2) Drive belt worn
 - (3) Weak drive face spring
 - (4) Driven pulley bearing worn or seized

Poor Mechanical Performance

..... Check tire pressure

1. Steering is heavy



2. Wheels wobbling



3. Motorcycle pulls to one side

Cause of Trouble

- (1) Steering head adjuster excessively tightened
 - (2) Steering cone race or steel ball damaged
-
- (1) Excessive wheel bearing play
 - (2) Rim bent
 - (3) Axle nut loose
-
- (1) Front wheel and rear wheel not aligned
 - (2) Front fork bent

Poor Front/Rear Suspension Performance

..... Check tire pressure

1. Suspension excessively soft



2. Suspension excessively Hard



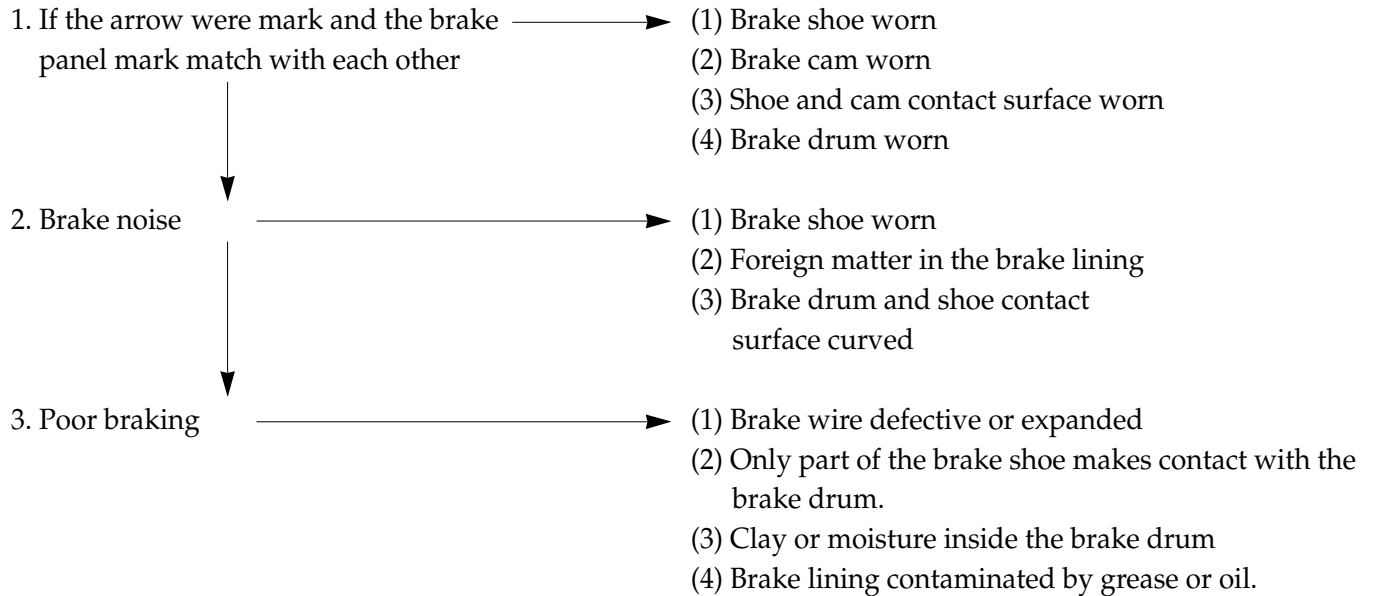
3. Noise from the suspension

Cause of Trouble

- (1) Cushion spring weak
 - (2) Overloaded
 - (3) Damper oil leaks
-
- (1) Fork pipe or cushion rod bent
-
- (1) Sliders stuck
 - (2) Cushion stopper rubber damaged

Poor Brake Performance Check brake adjustment

Cause of Trouble



Fuel Gauge

Gauge Reading Inaccurate (Ignition switch ON)

1. Operate the turn signal to check the battery circuit.

Signal operates satisfactorily

Signal continuously operates dim or does not operate at all

Cause of Trouble

- (1) Fuse cut
- (2) Battery weak or totally discharged
- (3) Faulty ignition switch
- (4) Faulty terminal connection
- (5) Wire harness damaged

2. Remove the fuel level sensor, and move float to check the status of operation

Float up : Full position

Float down : Empty position

Needle moves.

- (1) Faulty float

Needle not moving

3. Short-circuit the tank unit terminal on the wire harness side.

Needle not moving

- (1) Balance coil damaged or shorted

Needle not moving

4. Terminal joints loose or faulty connection

Unsatisfactory

- (1) Terminal loose
- (2) Faulty terminal connection

Check

- (1) Balance coil/lead shorted or damaged

Gauge needle shakes or vertically wobbles. (Ignition switch ON)

1. Operate the turn signal to check the battery circuit

Signal operates satisfactorily

Signal continuously operates dim or does not operate at all

Cause of Trouble

- (1) Fuse cut
- (2) Battery weak or totally discharged
- (3) Ignition switch damaged or shorted
- (4) Terminal loose or faulty connection
- (5) Wire harness damaged

2. Remove the tank and operate the float

Needle moving

Needle not moving

- (1) Faulty fuel level sensor connection

3. Move the float rapidly.
One Up/down motion per second.

Needle moving

Needle not moving

- (1) Damper oil inside the meter insufficient.

4. Start the engine, and measure the fuel level sensor resistance.

Resistance not changed

Resistance changed significantly

- (1) Faulty connection between the sliding arm and the resistance

5. Check each joint

Unsatisfactory

- (1) Terminal connection loose or faulty connection

Satisfactory

- (1) Balance coil/lead shorted or damaged

Starter Motor

Starting motor will not turn

1. Apply the brake and check the brake stop light for operation

Light is activated

Light not activated —→

Cause of Trouble

- (1) Fuse cut
- (2) Battery weak or totally discharged
- (3) Faulty stop right switch
- (4) Faulty terminal connection
- (5) Ignition switch damaged or shorted

2. Operate the turn signal to check the battery circuit.

Signal operates satisfactorily.
(60~120 signaling/second)

Signal continuously operates dim or does not operate at all —→

- (1) Battery totally discharged.

3. Press the starter switch to check the starter magnetic.

Satisfactory

Unsatisfactory —→

- (1) Faulty starter switch connection
- (2) Starter magnetic damaged or shorted
- (3) Connector and terminals loose

4. Connect the starter to battery and check operation. Light not activated

Starter turns

Starter does not turn —→

- (1) Worn Brush worn.
- (2) Rotor winding damaged or shorted
- (3) Starter motor subwire damaged
- (4) Terminal loose

- (1) Wire harness damaged

Starter Motor turns slow or fails to crank motor

- 1 Operate the turn signal to check the battery circuit

Signal operates satisfactorily.

Signal continuously operates dim or does not operate at all —→

Cause of Trouble

- (1) Battery totally discharged.

2. Connect the starter subwire to the battery.

Turns slowly
(with speed not changing)

Operates satisfactory —→

- (1) Connector/terminal loose
- (2) Faulty starter magnetic connector.

3. Operate the kick starter.

Operates light

Operates heavy —→

- (1) Engine seized
- (1) Starter motor winding damaged or shorted

Starter turns without stopping

1. Turn off the ignition switch

Will not stop

Cause of Trouble

- (1) Pinion seized

- Starter magnet disconnected or seized

MEMO

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 **DAELIM MOTOR CO., LTD.**
