

SERVICE MANUAL

A large, stylized graphic of a gear or sprocket. The outer ring is white with a jagged, tooth-like edge. Inside this ring is a thick blue border, followed by a white circular line. The center of the gear is a solid grey circle. Overlaid on the right side of the grey center is a blue semi-circular shape.

***S2* 250**

HOW TO USE THIS MANUAL

This manual describes effective maintenance procedure for the S2-250 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 2).

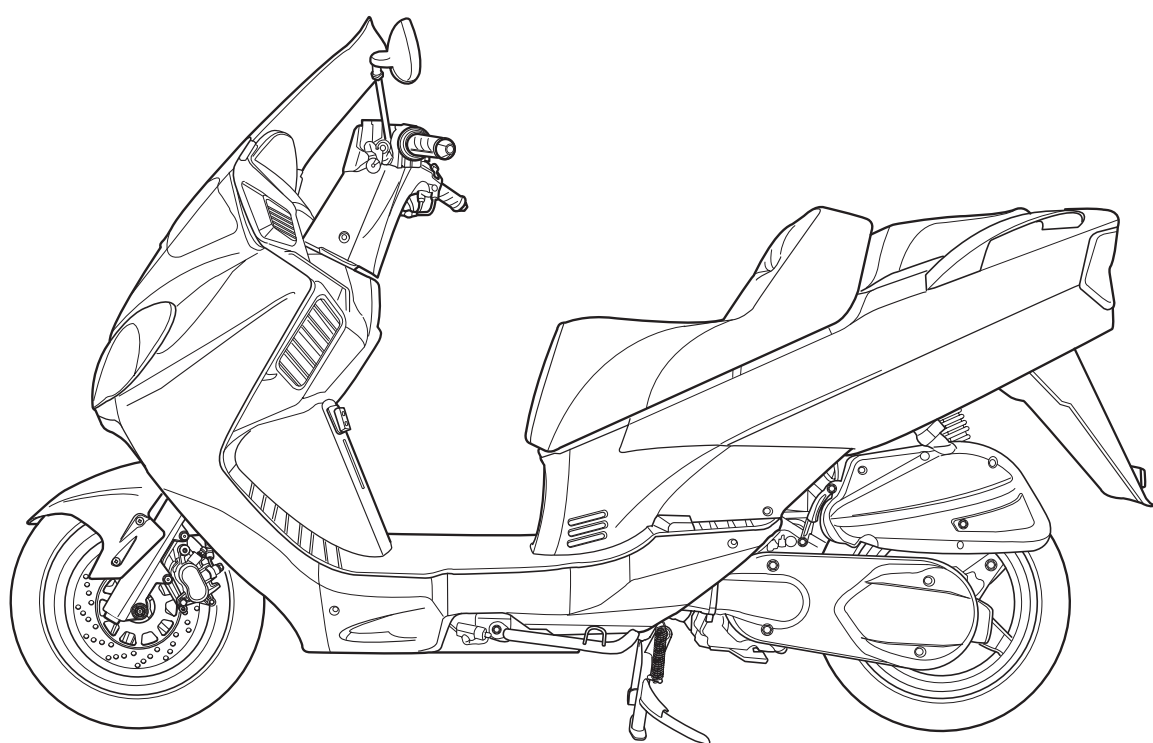
Sections 1 through 2 provide information on overall vehicle; section 3, assembly and disassembly procedures for external components, and section 4 describes maintenance procedure for the engine, frame and electrical systems.

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 18: Troubleshooting.

- Contents of this manual and specifications are subject to change without prior notice for improvement of vehicle quality.
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S2 250

1. SERVICE INFORMATION

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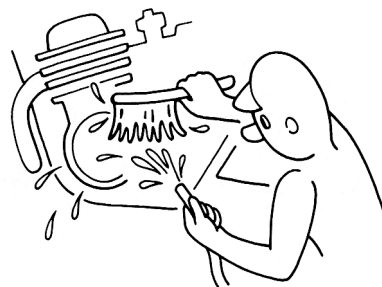
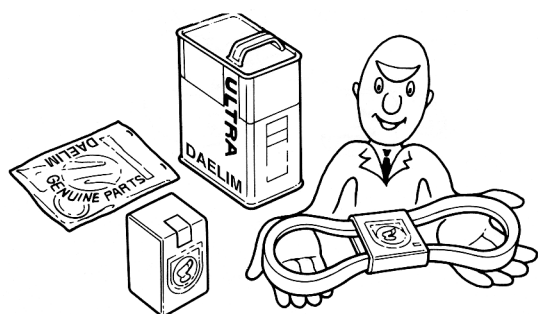
GENERAL SAFETY

⚠ 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 alway 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.

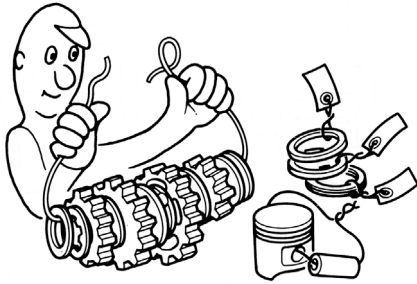
SERVICE RULES

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



SERVICE INFORMATION

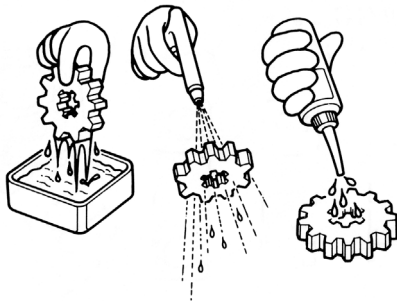
3. Store the parts of each system discriminatively to install each part in the right place.



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.



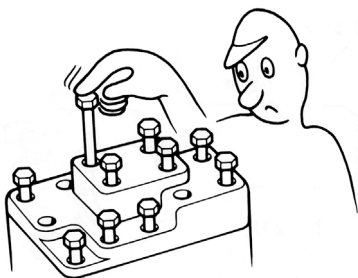
5. Clean the parts after the overhaul and before the test and remove the cleaning oil with compressed air. Apply oil to seal face during installation.



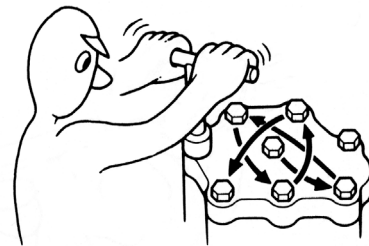
6. Check necessary place and measure necessary data during installation. When installing, return to the state before removing.



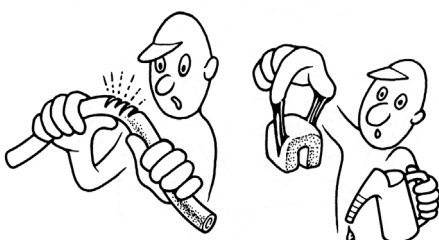
7. Align the bolts to uniform the tightening points before tightening them when you don't know the bolt length.



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.



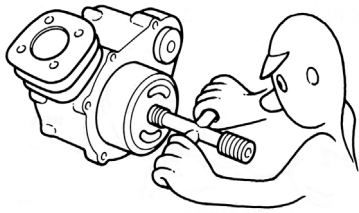
9. Check to see if the rubber part is worn out when removing it and replace it if necessary. Some rubber part is weak to gasoline and kerosene, so pay attention not to soak with gasoline or oils.



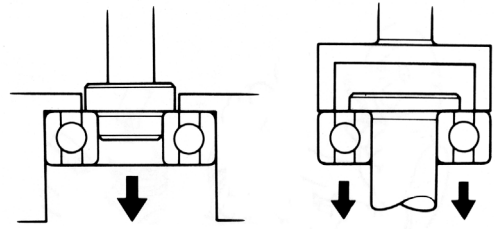
10. Recommended grease must be applied to or filled in the specified place.



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

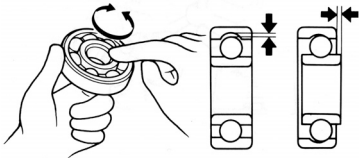


12. Never reuse the ball bearing removed with the ball applied pressure when removing press-fitted the bearing.

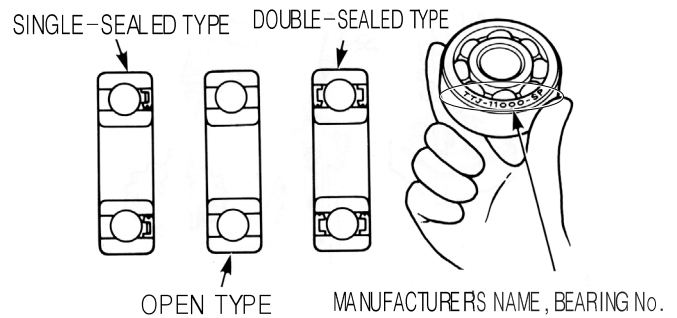


13. Check the smooth rotation of inner or outer race of the ball bearing by rotating it manually.

- 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.



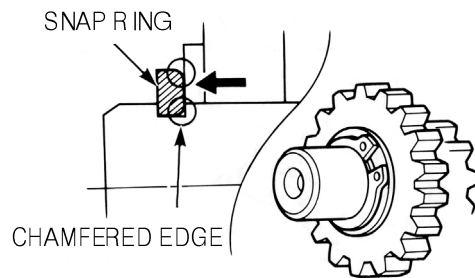
14. Pay attention to installation direction in case of the single-sided sealed ball bearing. Install the open-direction or double-sided sealed bearing in the way that the face marked with manufacturer and size should direct to the outer axle.



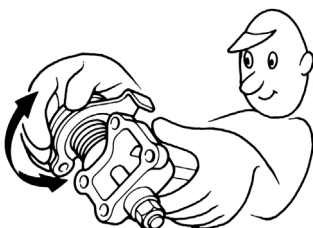
15. When blowing the ball bearing with compressed air after cleaning, keep the race from rotating. High speed rotation of the race may damage the bearing. Prior to installation, apply oil or grease to the bearing.



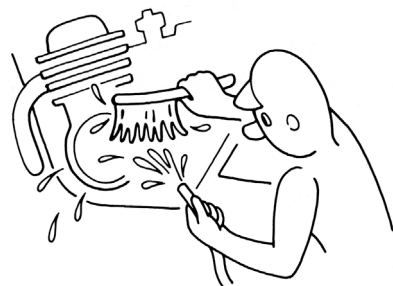
16. Install the snap ring so that chamfered side directs to the load-applied side. After installation, check the proper installation by rotating the snap ring.



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

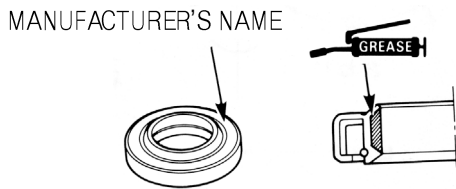


18. The brake fluid and coolant can damage the painted plastic or rubber parts. Keep these parts from contacting with them and wash these parts with water in case of contact.

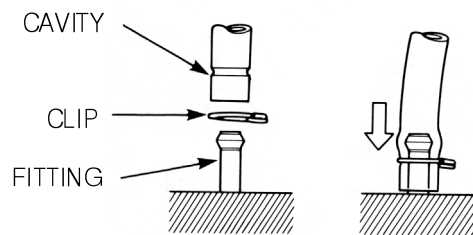


SERVICE INFORMATION

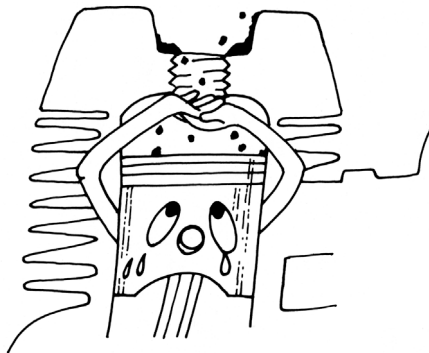
19. Install the oil seal so that the manufacturer marked surface directs outer surface.(direction not covered with oil)
- Pay attention not to bend or damage the lip.
 - Apply the grease to the lip.



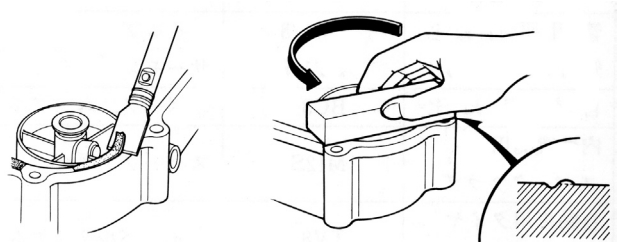
20. Connect the tube until the tube fully inserted in the joint. Install the clip if it is supplied. Replace the tube having slacked end.



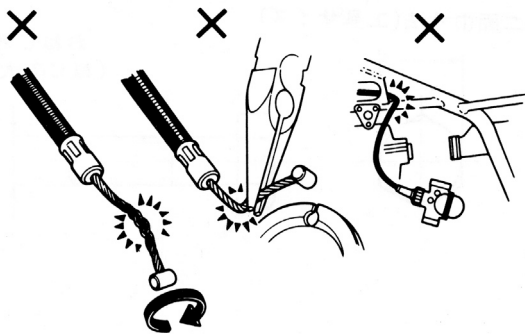
21. Keep the pneumatic system interior or the engine interior from the infiltration of dust.



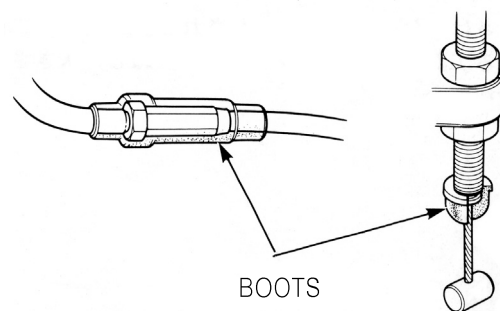
22. Install the gasket mounted in the contact surface of each case of the engine while removing gasket material completely. Remove damaged contact surface by wiping with the oil stone equally.



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

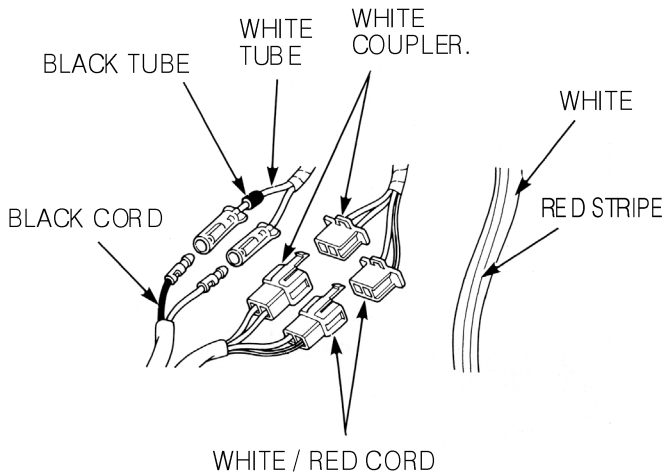


24. Install the boots with the installing groove by inserting the boots into the groove.

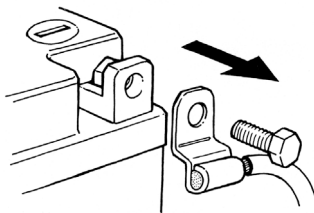


CAUTION WHEN WIRING

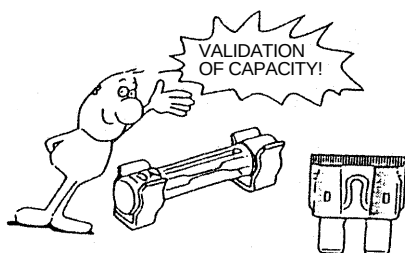
- Each cord must be connected depending on its color. When connecting different cord, attach color tube around the connector. Connect the coupler to the connector with same color and same pin number.
- Identify the two-colored cord by main color first and then striped color .



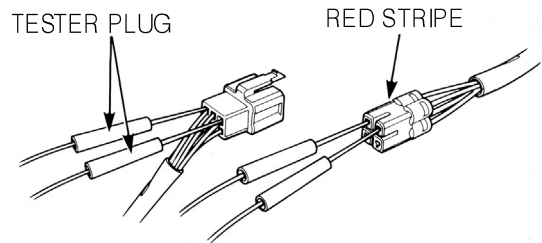
- When disconnecting the battery, the minus terminal must be disconnected first.
- Make sure that the tool such as spanner do not contact with the frame.



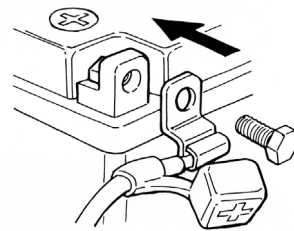
- If the fuse is short-circuited, find out the cause and repair. Replace with the fuse having the specified capacity.



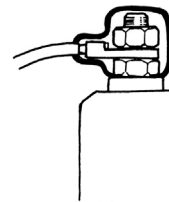
- When measuring voltage or resistance of the cord terminal using tester, contact the tester plug behind of the coupler. Pay attention not to open the cord terminal and contact the tester plug from the front of the coupler in case of water-proof coupler.



- 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.

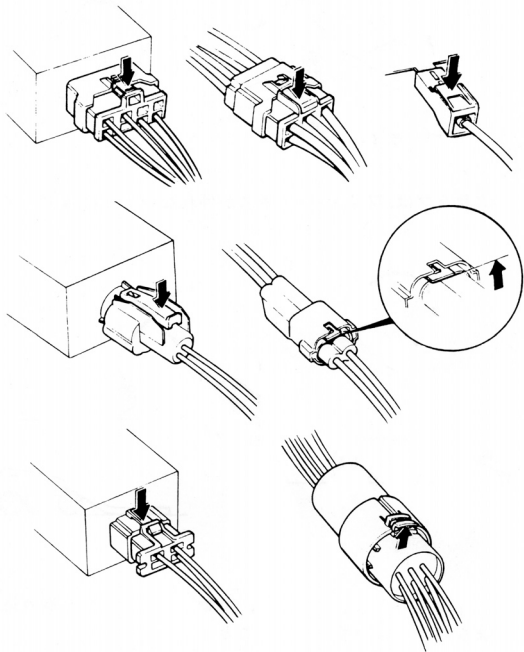


- If there is rust in the terminal, remove the rust with sand paper prior to connecting.

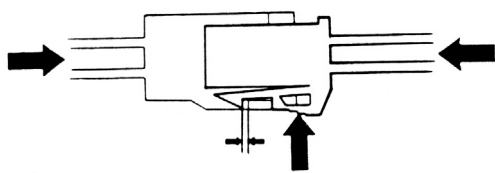


SERVICE INFORMATION

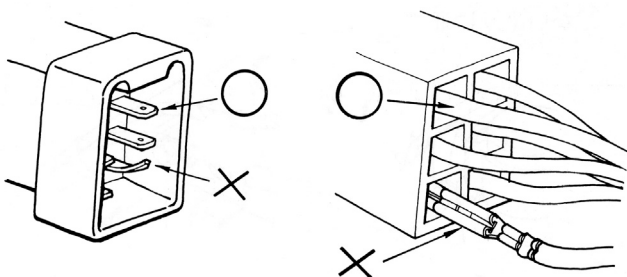
- Turn off the main switch before connecting/disconnecting.
- Release the lock to disconnect the lock of the coupler.
- The lock of the coupler has two types according to releasing method (press type and pull type) so release it properly according to the shape.
- Typical releasing method of the coupler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



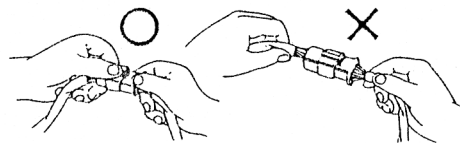
- Release the lock by inserting the coupler slightly and then narrowing connection to remove the coupler.



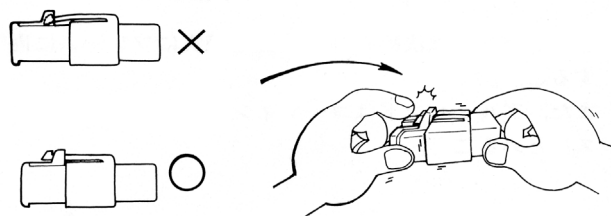
- Check to see if there is bended terminal and secure it to avoid disconnecting.



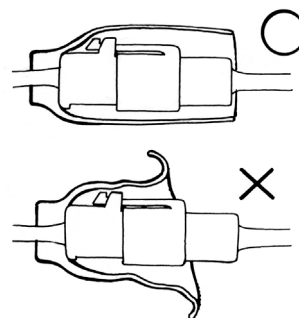
- When disconnecting the coupler, disconnect it while holding the coupler body. Pull while holding the wire harness cord and do not remove the coupler connection.



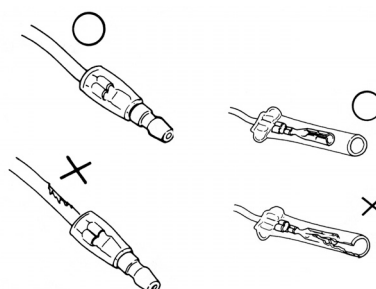
- Insert the lock of the coupler until the lock is fully secured.



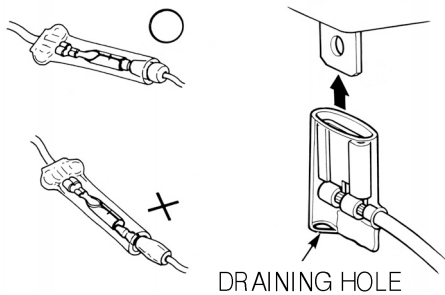
- Pay attention not to damage the vinyl cover of the coupler.



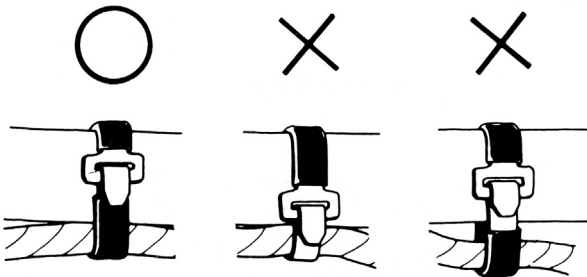
- If the wire harness coating is damaged, repair by winding vinyl tape or replace it.
- Prior to connecting the connector, make sure that the cover is not damaged and the mess terminal is not opened.



- 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.



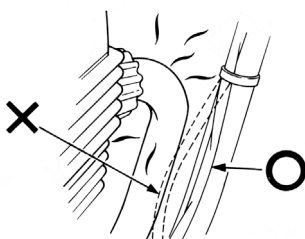
- Wire band must be secured firmly in the specified location of the frame. In case of aluminium band, secure the wire harness to the coated part.



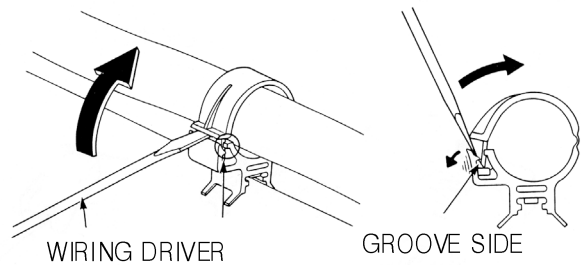
- In case of the weld clamp, do not clamp in the welded part.



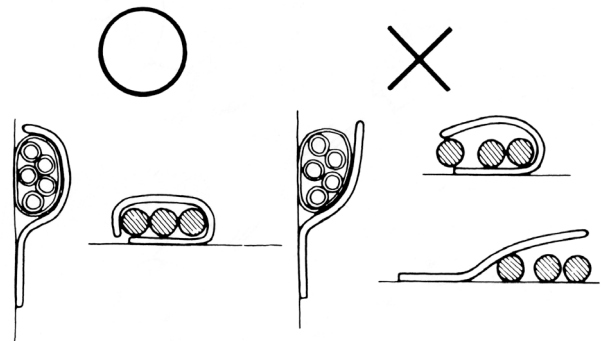
- When clamping the wire, pay attention not to contact with hot part.



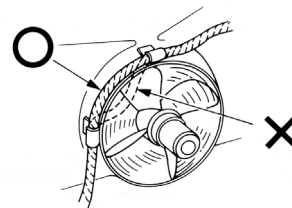
- When removing T-start, broaden the groove of T-start using the wiring driver and release the torque.
- Connect the harness and the hose to T-start and then insert until the groove is locked.
- When removing T-start from the frame, replace it with the new one.



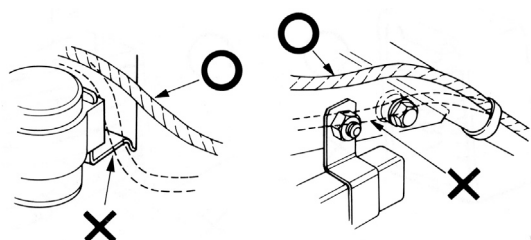
- Secure the wire harness firmly using the clamp.



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

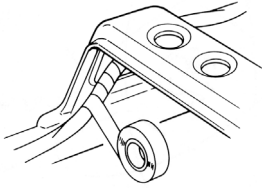


- The wire harness must be routed without contacting with the end of the lamp or any sharp edge.
- The wire harness must be routed without contacting with the end of the bolt or the piece.

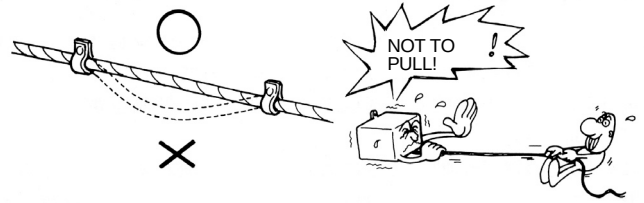


SERVICE INFORMATION

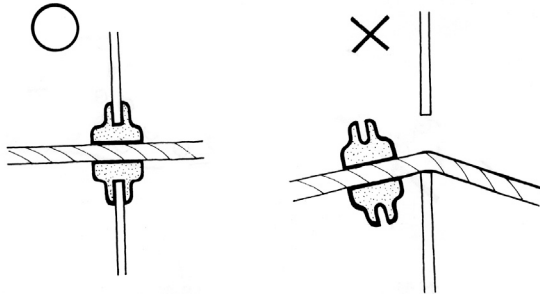
- In case that the wire harness is contacted with the end or the sharp edge, protect both parts with tube or tape.



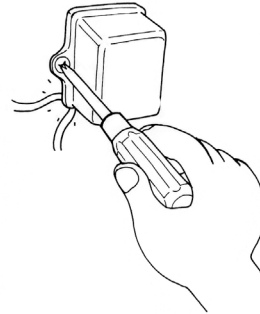
- The wire must not hang down or be pulled excessively.



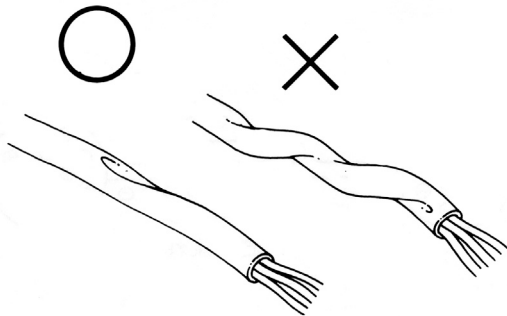
- If necessary, lock the wire harness properly.



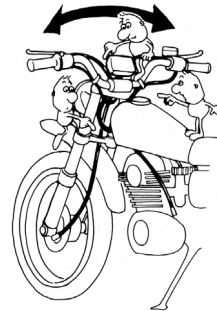
- When mounting parts, make sure that the wire harness is not pressed by the parts.



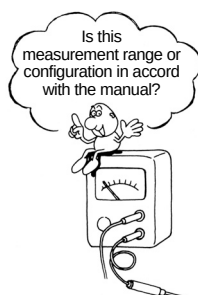
- Do not twist the wire harness.



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



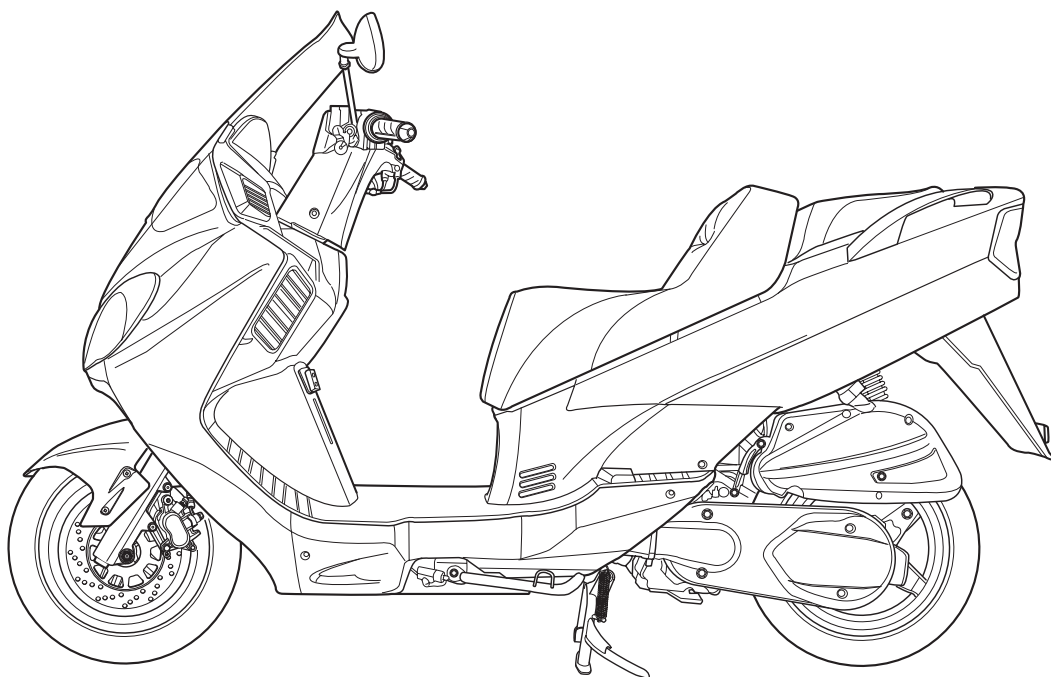
- Prior to using the tester, please read the manual carefully and understand the contents.
- When testing the resistance of the tester, the zero adjustment must be performed before testing.



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



SERIAL NUMBER LOCATION



ENGINE SERIAL NUMBER LOCATION



FRAME SERIAL NUMBER LOCATION



SPECIFICATIONS

ITEM				SPECIFICATIONS
DIMENSIONS	OVERALL LENGTH			2,110 mm
	OVERALL WIDTH			745 mm
	OVERALL HEIGHT			1,356 mm
	WHEEL BASE			1,481 mm
	SEAT HEIGHT			760 mm
	GROUND CLEARANCE			121 mm
	DRY WEIGHT			164 kg
	GROSS WEIGHT			294 kg
FRAME	TYPE			Underbone
	FRONT SUSPENSION / STROKE			Telescopic
	REAR SUSPENSION / STROKE			Swing arm
	FRONT TIRE SIZE / TYPE			120 / 70 - 12 / Tubeless
	REAR TIRE SIZE / TYPE			140 / 60 - 13 / Tubeless
	TIRE PRESSURE	1 PERSON	FRONT	2.00 Kgf / cm^2
			REAR	2.00 Kgf / cm^2
		2 PERSON	FRONT	2.00 Kgf / cm^2
			REAR	2.25 Kgf / cm^2
	FRONT BRAKE			Hydraulic disk
	REAR BRAKE			Hydraulic disk
	FUEL TANK CAPACITY	FULL CAPACITY		11 l
		RESERVE CAPACITY		2.8 l
	CASTER ANGLE			27°
TRAIL			87.1 mm	
FRONT FORK /REAR FORK OIL CAPACITY			100/65 cm^3	
ENGINE	TYPE			Water cooled 4 cycle SOHC engine
	CYLINDERS / ARRANGEMENT			1(Single cylinder), front angle 80°
	BORE AND STROKE			72.7×60 mm
	DISPLACEMENT			249 cc
	COMPRESSION RATIO			10.3 : 1
	VALVE TRAIN			SOHC chain drive
	OIL CAPACITY			1.1 l After disassembly
				0.95 l After Oil filter change
				0.9 l After Oil change
	LUBRICATION SYSTEM			Forced pressure splash type
	AIR CLEANER TYPE			Paper Filter
	CYLINDER COMPRESSION			15 kgf / cm^2 (600 rpm)
	INTAKE VALVE	OPEN		8° BTDC
		CLOSED		42° ABDC
	EXHAUST VALVE	OPEN		33° BBDC
		CLOSED		1° ATDC
	VALVE CLEARANCE (COOLING-OFF PERIOD)			
		INTAKE		0.1 mm
		EXHAUST		0.1 mm

ITEM		SPECIFICATIONS
CARBURETOR	TYPE / VENTURI BORE CHOKE TYPE MAIN JET PILOT SCREW INITIAL SETTING FLOAT LEVEL IDLE SPEED	CVK type/30 mm Butterfly # 102 2 $\frac{1}{2}$ 18.5 mm 1,700 $\pm$ 100 rpm
DRIVE TRAIN	CLUTCH TYPE PRIMARY REDUCTION SECONDARY REDUCTION	Automatic Transmission 2.8 (42/15) 2.79 (39/14)
ELECTRICAL SYSTEM	IGNITION SYSTEM IGNITION TIMING F MARK BATTERY TYPE / CAPACITY SPARK PLUG SPARK PLUG GAP STARTING SYSTEM HEADLIGHT (HIGH / LOW) POSITION LIGHT WINKER LIGHTS (FR / RR) TAIL / STOP LIGHT HIGH-BEAM PILOT SPEEDOMETER LAMP WINKER PILOT TRUNK LAMP LICENSE LAMP	Full-Transistor BTDC 5° / 1,700 (rpm) 12V 10AH (MF type) NGK DPR 7EA-9 0.9 mm Starter motor 55/ 55W 5W 10W $\times$ 2/10W $\times$ 2 5/21W 3W 1.7W $\times$ 2 3W $\times$ 2 1.4W $\times$ 1 5W $\times$ 1
COOLING SYSTEM	COOLANT/MIXTURE RATIO COOLANT CAPACITY RADIATOR AND ENGINE/AT REPLACING THERMOSTAT VALVE OPEN RADIATOR CAP VALVE OPEN PRESSURE COOLING FAN DRIVING METHOD/OPERATING TEMPERATURE	LG-Caltex Oil CX AF EQUIV/40% 1.4 l / 1.0 l 80 $\pm$ 2°C 0.9 $\pm$ 0.15kgf/cm ² Motor / 90 $\pm$ 3°C
THE OTHERS	FUEL CONSUMPTION RATIO ENGINE MAXIMUM POWER ENGINE MAXIMUM TORQUE ENGINE OIL GENERATOR TYPE HORN	43km/ l (50km/h) 22PS/7000rpm 2.2kgf · m SAE:15W 40# or 10W 30, API:SJ Triple phase wave 100 $\pm$ 5dB

TORQUE VALUES

ENGINE

ITEM	Q'TY	THREAD DIA (mm)	TORQUE VALUE	REFERENCE
CYLINDER HEAD BOLT A	2	8	3.0 kgf · m	
CYLINDER HEAD BOLT B	2	8	3.0 kgf · m	
OIL FILTER SCREEN CAP	1	30	1.47 kgf · m	
EXHAUST MUFFLER JOINT LOCK NUT	2	8	2.2 kgf · m	
CYLINDER HEAD CAP NUT	4	8	2.45 kgf · m	
VALVE ADJUST LOCK NUT	2	5	1.1 kgf · m	
CAM CHAIN TENSIONER SLIPER BOLT	1	6	1.0 kgf · m	
OIL BOLT	1	12	1.27 kgf · m	
CLUTCH OUTER NUT	1	12	5.5 kgf · m	
CLUTCH DRIVE PLATE NUT	1	12	5.5 kgf · m	
FLYWHEEL NUT	1	14	5.88 kgf · m	
OIL PUMP BOLT	2	5	0.5 kgf · m	
CYLINDER HEAD COVER BOLT	4	6	1.18 kgf · m	
SPARK PLUG	1	10	1.72 kgf · m	
WATER PUMP IMPELLER	1	6	1.18 kgf · m	
CAM CHAIN TENSIONER BOLT	1	8	1.18 kgf · m	
MUFFLER TORQUE BOLT	2	8	2.8 kgf · m	
	1	10	4.0 kgf · m	

FRAME

ITEM	Q'TY	THREAD DIA (mm)	TORQUE VALUE	REFERENCE
STEERING STEM NUT	1	26	7.0 kgf · m	Initial torque
STEERING TOP THREAD NUT	1	26	0.25 kgf · m	
FORK PIPE BOTTOM BRIDGE	1	10	7.5 kgf · m	
HANDLE POST	2	10	6.0 kgf · m	
FRONT AXLE NUT	1	12	6.0 kgf · m	
FRONT CALIPER BRACKET BOLT	2	8	3.1 kgf · m	
FRONT MASTER CYLINDER HOLDER BOLT	2	6	1.2 kgf · m	
FRONT DISK PLATE BOLT	3	8	4.25 kgf · m	
REAR AXLE NUT	1	16	12.5 kgf · m	
REAR CALIPER BRACKET BOLT	2	8	3.1 kgf · m	
REAR MASTER CYLINDER HOLDER BOLT	2	6	1.2 kgf · m	
REAR DISK PLATE BOLT	3	8	4.25 kgf · m	
SPEEDOMETER GEARBOX SCREW	1	5	0.43 kgf · m	
FRONT FORK BOLT	2	22	2.25 kgf · m	
REAR CUSHION UPPER BOLT	2	10	4.0 kgf · m	
REAR CUSHION UNDER BOLT	2	10	4.0 kgf · m	
REAR CUSHION LOCK NUT	2	10	3.5 kgf · m	
ENGINE HANGER UPPER BOLT	2	12	5.25 kgf · m	
ENGINE HANGER LOWER BOLT	1	10	4.5 kgf · m	
MAINSTAND BOLT	2	10	4.0 kgf · m	
SIDESTAND PIVET SEREW	1	10	1.5 kgf · m	
SIDESTAND PIVET NUT	1	10	4.5 kgf · m	

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

STANDARD TORQUE VALUES

ITEM	TORQUE VALUE	ITEM	TORQUE VALUE
5mm BOLT, NUT	0.5 kgf · m	5mm SCREW	0.4 kgf · m
6mm BOLT, NUT	1.0 kgf · m	6mm SCREW	0.9 kgf · m
8mm BOLT, NUT	2.2 kgf · m	6mm FLANGE BOLT, NUT	1.2 kgf · m
10mm BOLT, NUT	3.5 kgf · m	8mm FLANGE BOLT, NUT	2.7 kgf · m
12mm BOLT, NUT	5.5 kgf · m	10mm FLANGE BOLT, NUT	4.0 kgf · m

SYMBOLS / ABBREVIATIONS

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

SYMBOL	MEANING	SYMBOL	MEANING
 WARNING	Indicates dangerous area. Serious accident may result if instructions are not followed.	 CAUTION	Indicates important work. Minor injury or vehicle part damage may result if instructions 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
	Add oil. If there is no specific oil indicated, use the designated or recommended engine oil.
	Apply grease
(⇒3-1)	Indicates reference page. (example : Refer to page 3-1)

The following abbreviations are used in this manual.

ASS'Y	ASSEMBLY
LH.	Left
RH.	Right

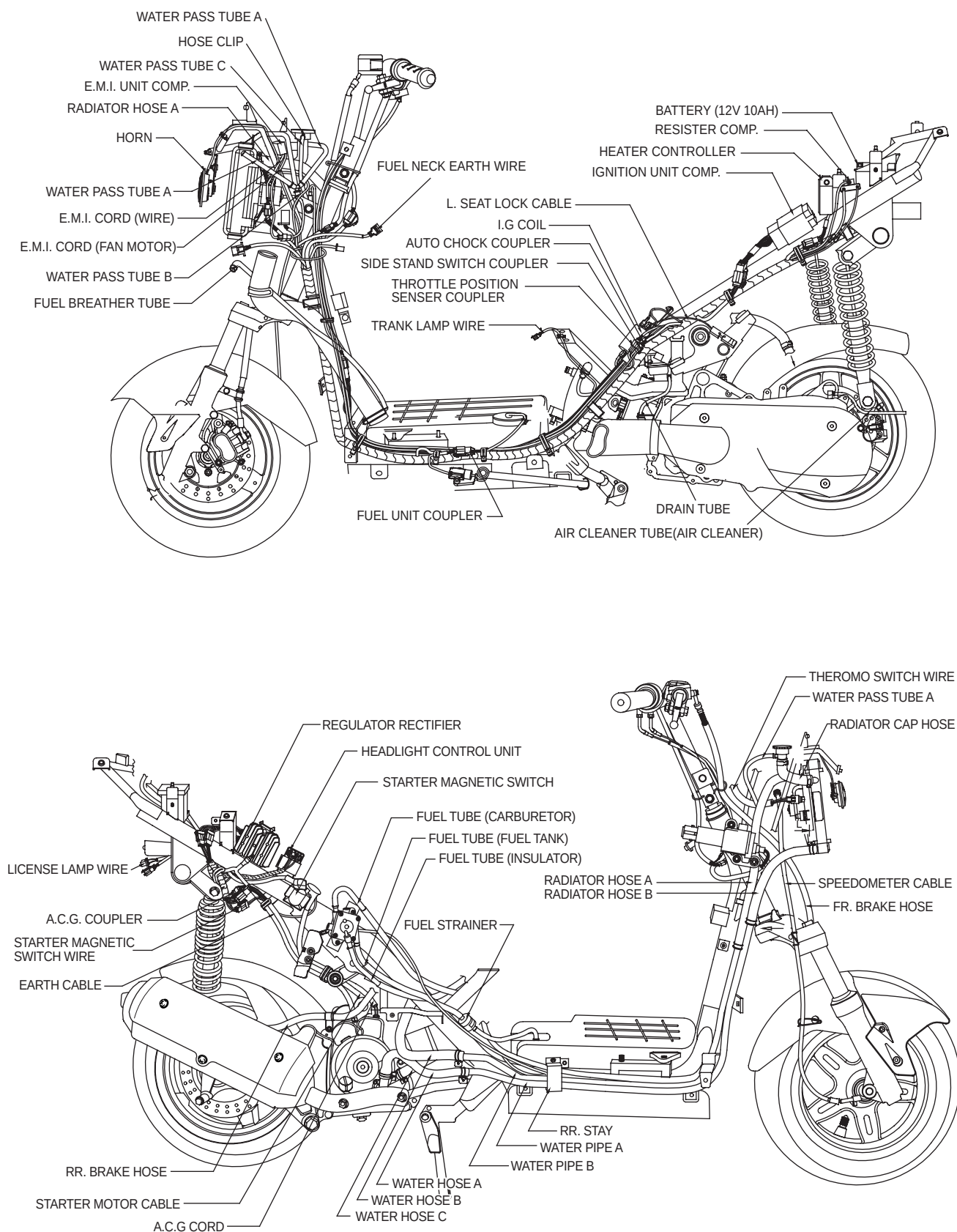
SERVICE INFORMATION

LUBRICATION OIL

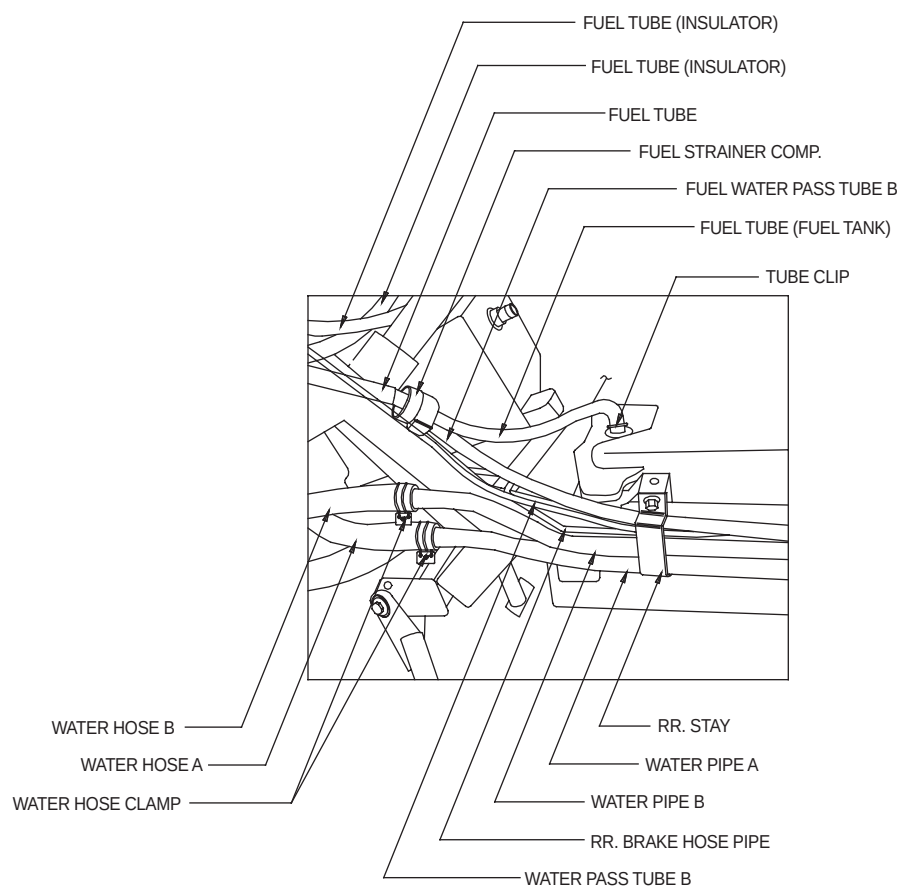
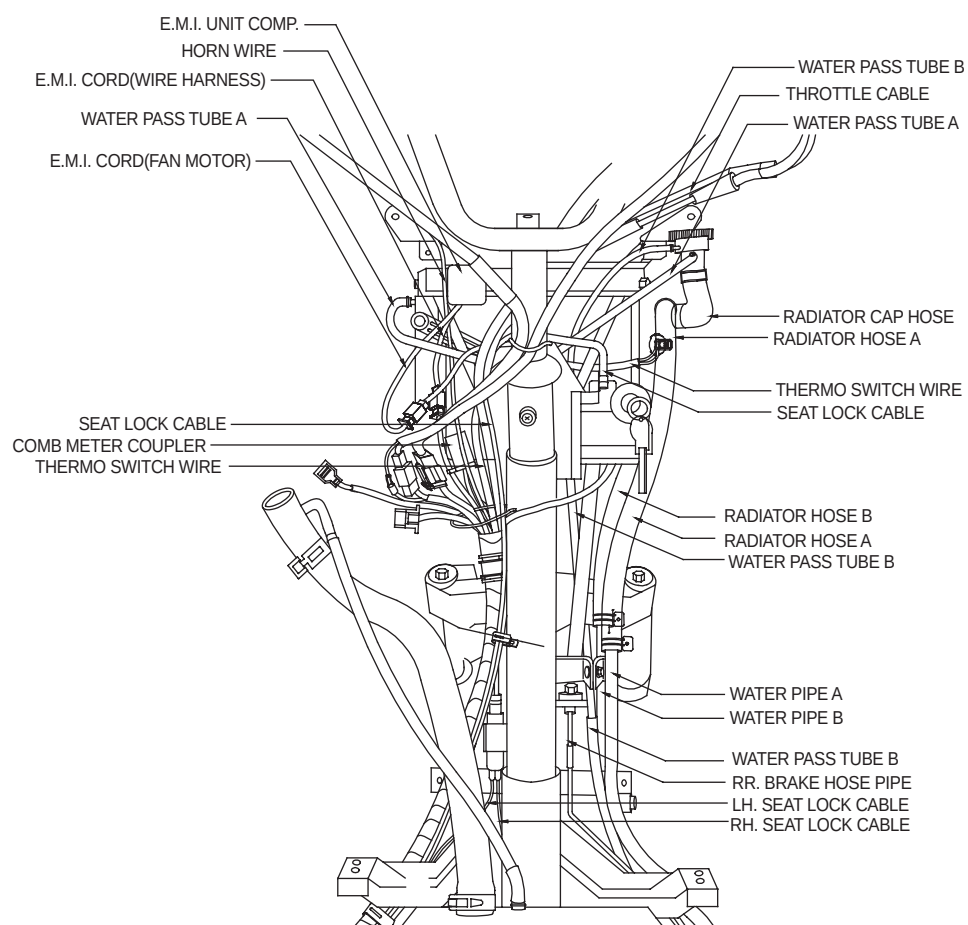
ENGINE

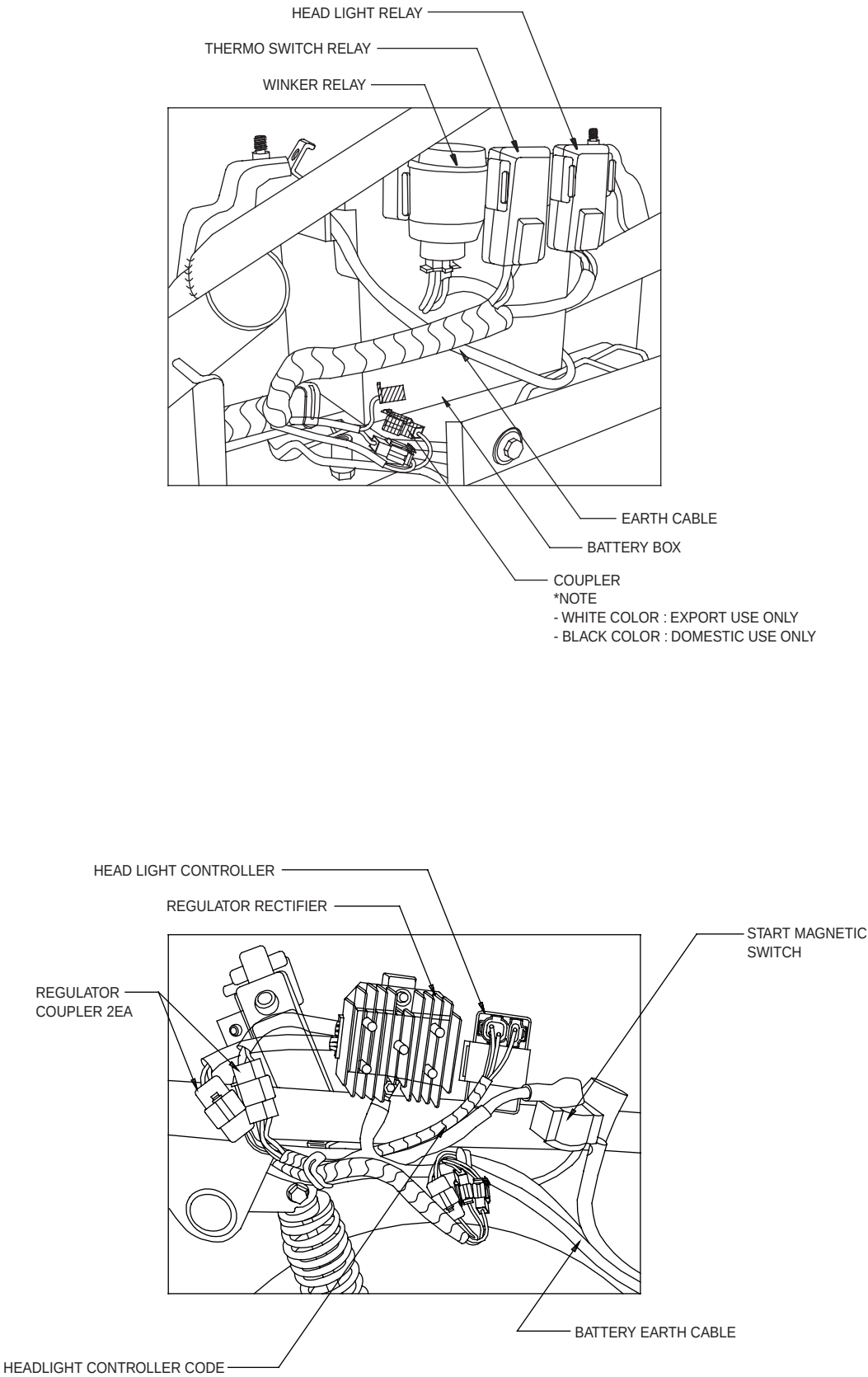
LUBRICATION POINTS	REFERENCE
VALVE GUIDE/VALVE STEM OPERATING PARTS CAM SHAFT CONTACT AREA CAM SHAFT DRIVE CHAIN CYLINDER LOCK BOLT AND NUT PISTON AROUND AND PISTON RING GROOVE PISTON PIN AROUND CONNECTING ROD, PISTON PIN HOLE CONNECTING ROD BIG END CRANK SHAFT CRANK SHAFT ONE-WAY CLUTCH OPERATING PARTS OIL PUMP DRIVE CHAIN STARTER REDUCTION GEAR PARTS COUNTER SHAFT GEAR PARTS FINAL GEAR PARTS BEARING OPERATING PARTS O-RING SURFACE OIL SEAL RIP	SAE15W-40 or SAE10W 30# API SE, SF or SG
STARTER IDLE GEAR FRICTION SPRING OPERATING PARTS/SHAFT OPERATING PARTS SHAFT OPERATING PARTS STARTER SPINDLE OPERATING PARTS	HEAT-RESISTANT GREASE
STARTER ONE-WAY CLUTCH THREAD	LOCTITE APPLIES
A.C. GENERATOR CONNECTOR TRANSMISSION CASE BLEEDER TUBE	GLUE

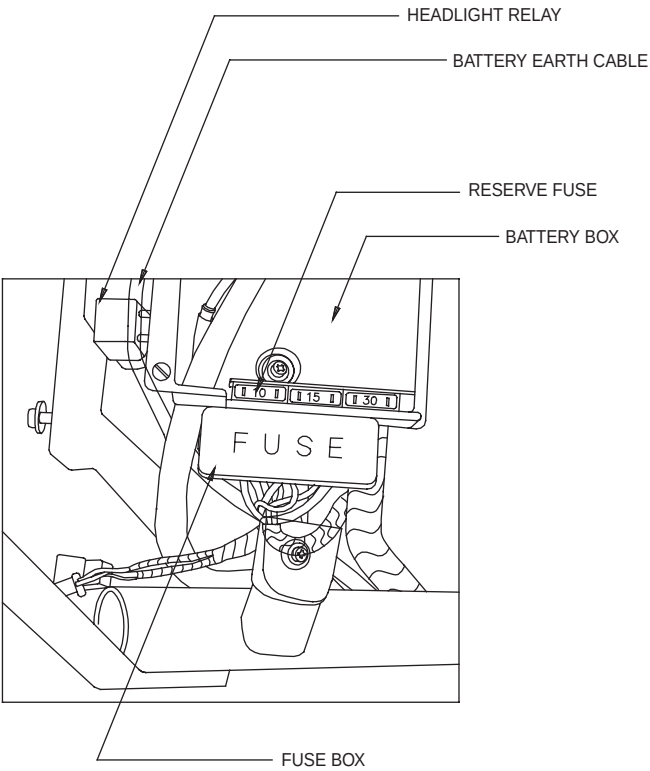
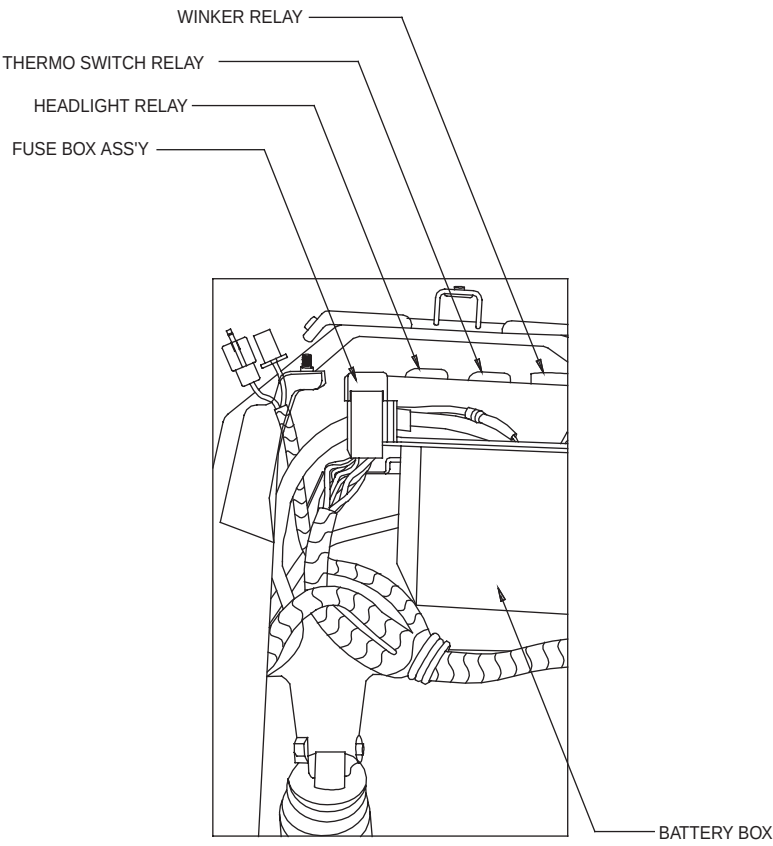
WIRING DIAGRAM

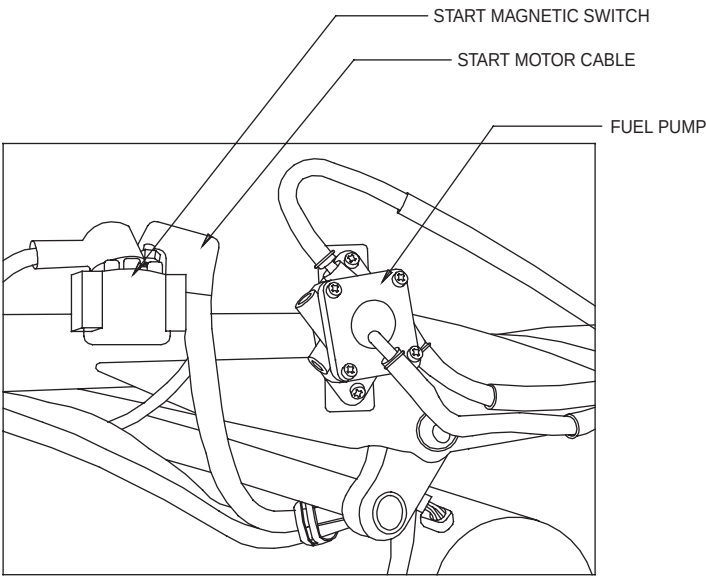
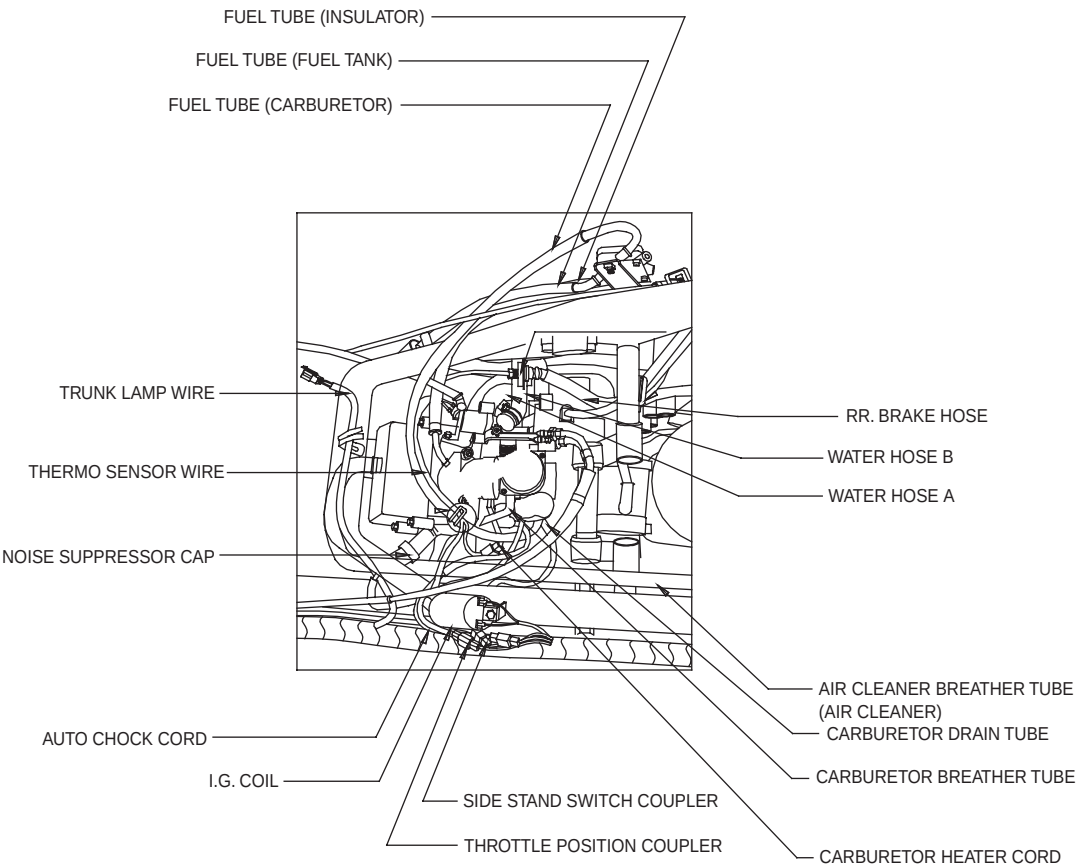


SERVICE INFORMATION









MEMO

2. INSPECTIONS/ADJUSTMENTS

SERVICE INFORMATION . . .	2-1	DRIVE BELT	2-7
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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.
- Refer to 2~3, 2~4 with respect to Engine oil and oil filter.
- Stand the main stand prior to beginning work.

SPECIFICATIONS

THROTTLE GRIP PLAY		2- 6mm
SPARK PLUG		DPR7EA-9
SPARK PLUG GAP		0.9mm
VALVE CLEARANCE	IN	0.1mm
	EX	0.1mm
CARBURETOR IDLE SPEED		1,700±100rpm
CYLINDER COMPRESSION PRESSURE		15±2kgf/cm ²
ENGINE OIL	DISASSEMBLY	1.1 ℓ
	REPLACE	0.9 ℓ
GEAR OIL	DISASSEMBLY	0.2 ℓ
	REPLACE	0.18 ℓ
RADIATOR CAPACITY		1,000 ±20cc
COOLANT CAPACITY		1,400 ±20cc
RESERVE TANK CAPACITY		400 ±20cc

INSPECTIONS / ADJUSTMENTS

TIRES

COLD TIRE PRESSURE	DRIVER ONLY	FRONT TIRE	2.00kgf/cm ²
		REAR TIRE	2.00kgf/cm ²
	DRIVER AND A PASSENGER	FRONT TIRE	2.00kgf/cm ²
		REAR TIRE	2.25kgf/cm ²
TIRE SIZE	FRONT TIRE		120/70 - 12 (Tubeless)
	REAR TIRE		140/60 - 13 (Tubeless)

MAINTENANCE 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.

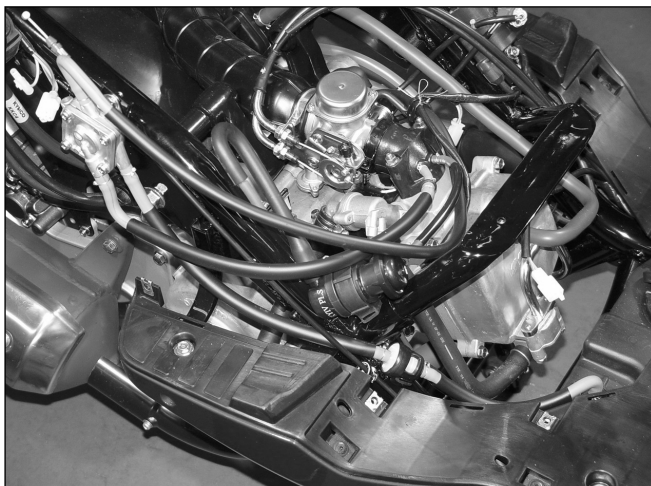
R : REPLACE L : LUBRICATE C : CLEAN

ITEM \ FREQUENCY		ODOMETER READING(NOTE 1)					REMARK
		1,000Km	4,000Km	8,000Km	12,000Km	16,000Km	
		1MONTH	6MONTH	12MONTH	18MONTH	24MONTH	
	ENGINE OIL	R(Brand new) 300Km	R	R	R	R	
**	ENGINE OIL FILTER SCREEN		I	I	I	I	
*	FUEL FILTER	R	R	R	R	R	
	GEAR OIL	R(Brand new) 300Km		R		R	
*	VALVE CLEARANCE		I	I	I	I	
*	CARB. IDLE	I	I	I	I		
	AIR CLEARER	I	I	I	I	I	
	SPARK PLUG	I	I	I	I	I	
	BRAKE SYSTEM	I	I	I	I	I	
*	DRIVE BELT		I	I	I	I	
*	SUSPENSION		I	I	I	I	
*	NUTS, BOLTS, FASTENERS	I	I	I	I	I	
**	TIRE	I	I	I			
**	STEERING HEAD BEARING	I	I	I	I	I	
	BRAKE FLUID	Daily check prior to driving					
	RADIATOR COOLANT	I	I	R	I	R	
	RADIATOR CORE	I	I	I	I	I	
	RADIATOR CAP		I	I	I	I	
	BRAKE LEVER		I	I	I	I	
	BRAKE PAD WEAR	I	I	I	I	I	
			I	I	I	I	

- * If there are no appropriate type of tools and maintenance data available, or if you do not have mechanical technology contact authorized maintenance shops, dealers or other designated repair shops for maintenance and inspections.
- ** To ensure safety, inspections and maintenance of these parts must be carried out by authorized maintenance shops, dealers or other designated repair shops.

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)

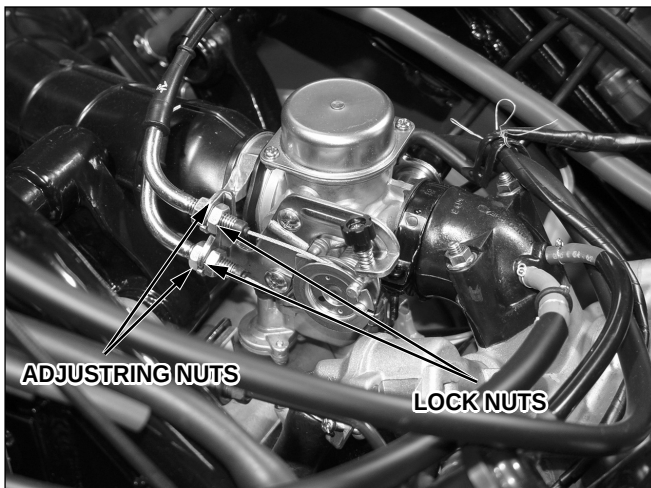
- Remove the luggage box.
- Check the fuel tube of the fuel auto cock connected to the fuel tank and carburetor. If the fuel tube is cranked, damaged or leaks, replace it.



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.

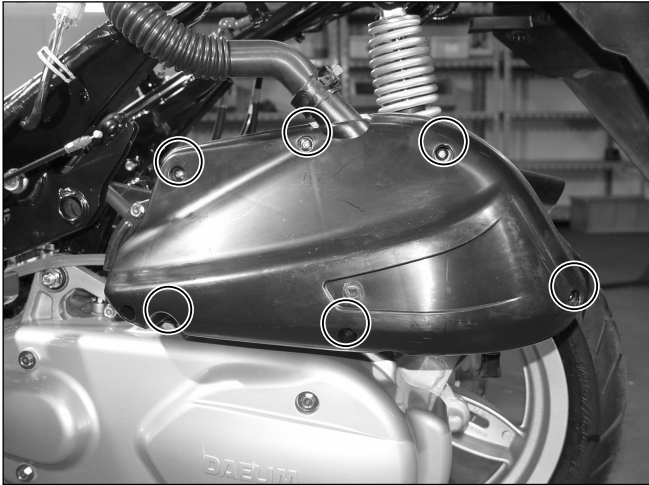
FREE PLAY : 2~6mm



- For main adjustment, loosen the lock nut and turn adjuster.
- After adjusting, tighten lock nut. After adjustment is completed, recheck the throttle grip free play.

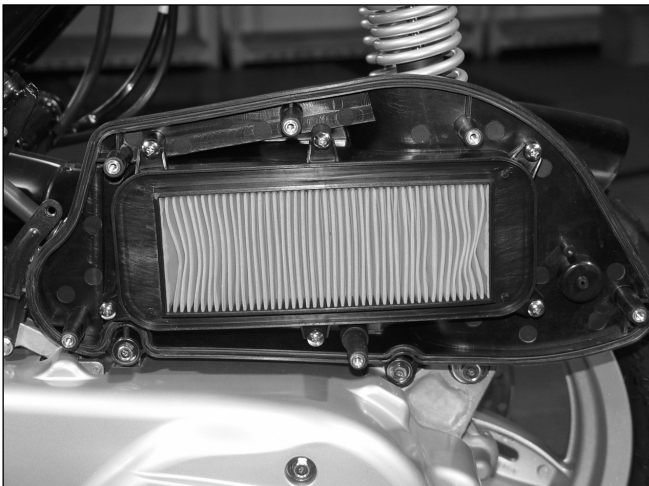


- For simple adjustment, use the adjuster under the throttle grip. RH.
- Remove the Rubber.
- Loosen the lock nut and turn the adjuster.



AIR CLEANER

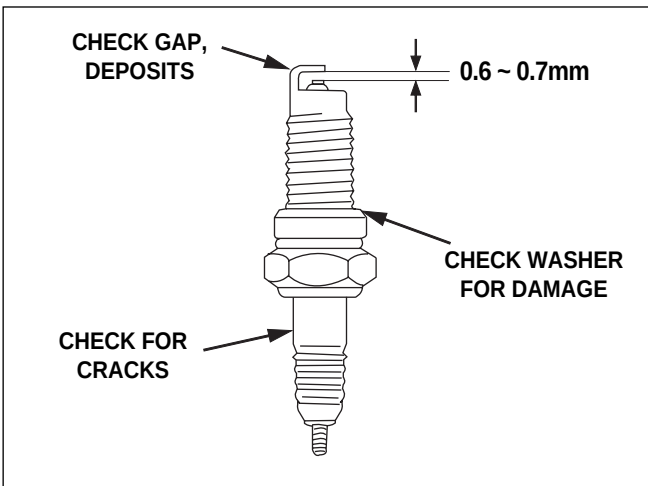
- Loosen the 6 screws securing the air cleaner case cover, remove it.
- Loosen the 2 screws securing the air cleaner element holder, remove it.



- Remove the air cleaner element.
- Wash away any accumulated dust or dirt, by gently squeezing it in non flammable or high flash point solvent.

⚠ WARNING

- Using gasoline or low flash point solvents for cleaning parts may result in a fire or explosion.



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 plug is severely contaminated or damaged, raplace with a new one. If the plug can be reused after removing only the carbon, use plug cleaner and wire brush to clean the plug.
- Always use a feeler gauge to check the gap.

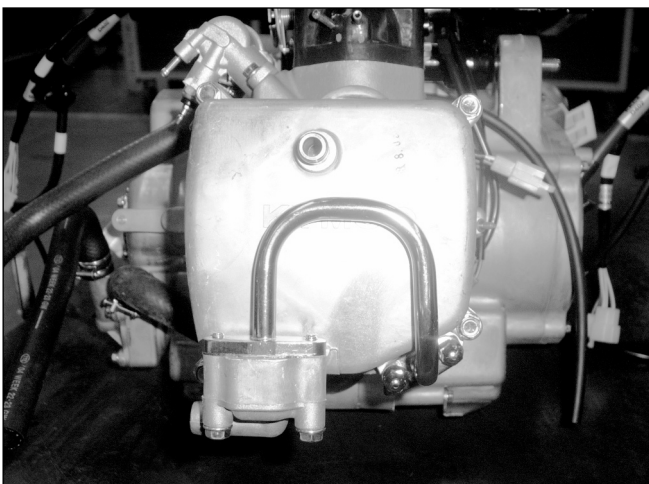
GENUINE PLUG : DPR7EA9

SPARK PLUG : 0.9~1.0mm

TORQUE VALUE : 1.47~1.96kgf · m

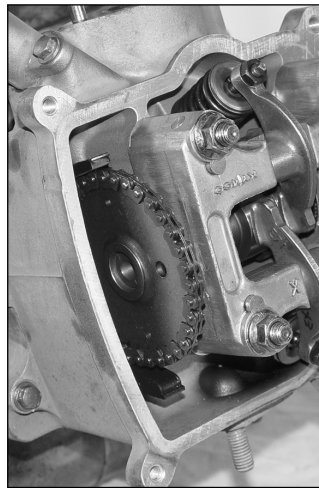
⚠ CAUTION

- Make sure there is no dirt or debris on the seat of the spark plug hole before inserting the spark plug.
- To prevent damage to the cylinder head, hand-tighten the spark plug before using a wrench to tighten to the specified torque.
- Do not overtighten the spark plug.



VALVE CLEARANCE

- Remove the cylinder head cover.



NOTE

- Inspect and adjust the valve clearance when the engine is cool. (under 35 °C / 95 °F)
- Remove the cylinder head cover.
- Turn the flywheel counterclockwise, and align the "T" mark on the flywheel with the index mark on the RH. 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 CLEARANCE : Intake : 0.1mm
Exhaust : 0.1mm**



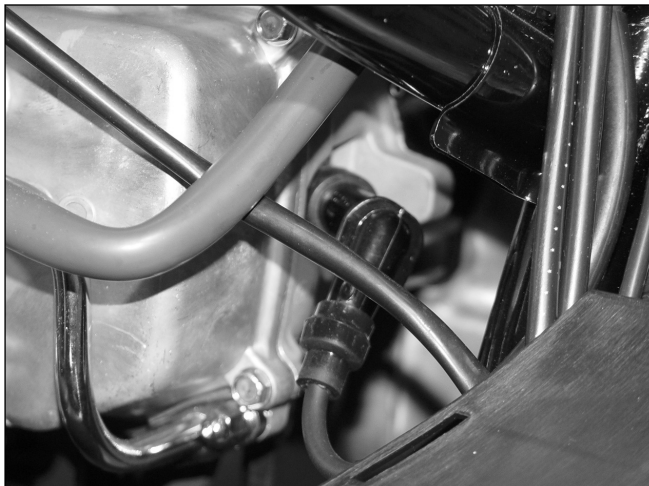
- Loosen the lock nut with a valve wrench, and set valve clearance to a prescribed level by turning the adjusting screw with a valve adjusting wrench.
- After setting clearance to the prescribed level, hold the adjuster screw with a valve adjusting wrench, and tighten the lock nut.

**TORQUE VALUES : 1.1kgf · m
TOOLS : WRENCH 8X9mm
ADJUSTING WRENCH B
FEELER GAUGE**

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

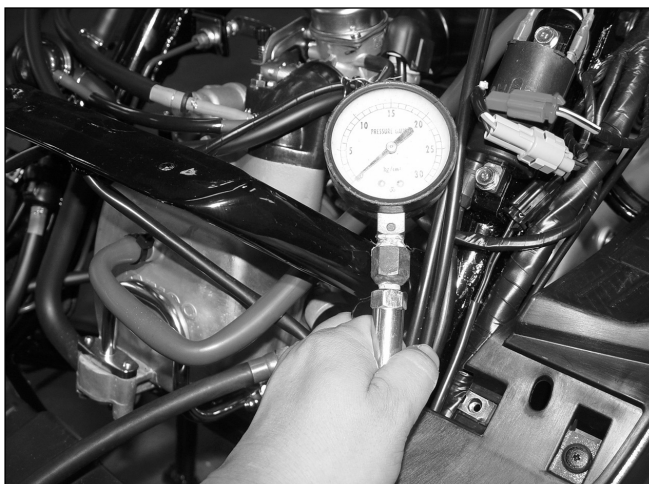
TORQUE VALUES : 1.0 kgf · m

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 : 15 ± 2 kgf/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.



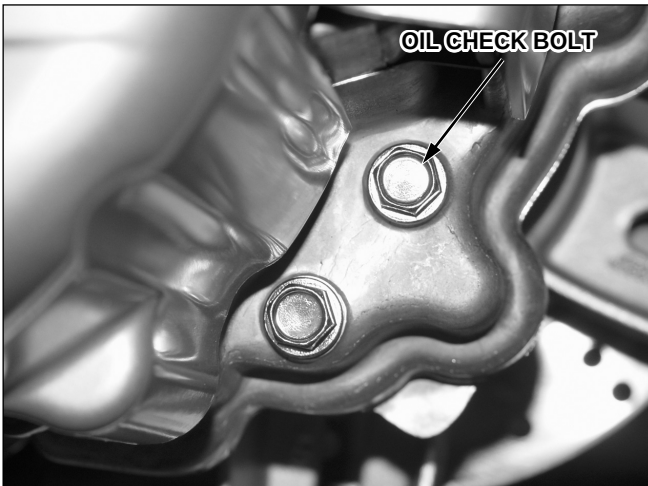
CARBURETOR IDLE SPEED

- Remove the plug maintenance cover.

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.

IDLING SPEED: 1,700 ± 100rpm



FINAL REDUCTION GEAR OIL

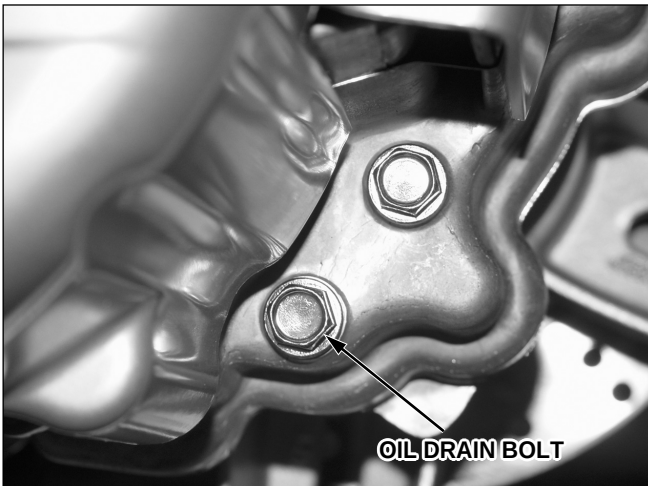
NOTE

- Erect the main stand prior to beginning work.

- Erect the main stand prior to beginning work.
- Stop the engine and remove the oil check bolt.
- Check the oil level through the oil check hole.
- If the oil level is below, fill the oil (SAE90#).
- Install and tighten the oil check bolt.

NOTE

- Make sure that the sealing washer is good condition.



GEAR OIL REPLACEMENT

- Remove the oil check bolt.
- Remove oil drain bolt and drain oil completely.
- Install and tighten the oil drain bolt.

TORQUE VALUE : 0.98kgf · m

NOTE

- Make sure that the sealing washer is good condition.

- Fill the recommended oil(SAE90#).

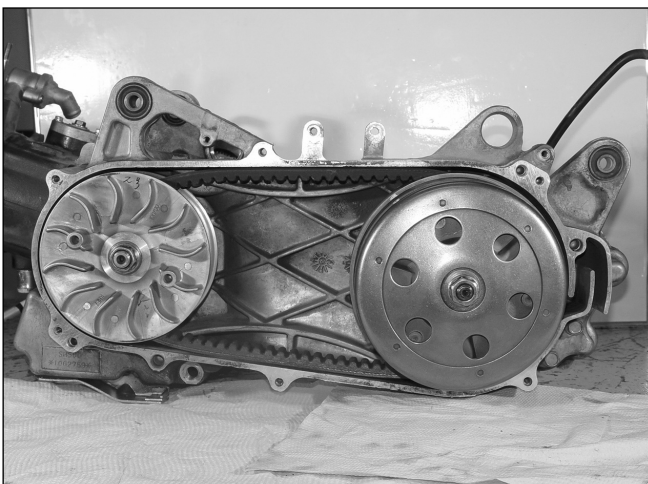
GEAR OIL CAPACITY

At disassembling: 200cc

At replacing: 180cc

DRIVE BELT

- Remove the L.crankcase cover.
- Check the drive belt for wear or damage. Check scheduled maintenance period, replace the new drive belt if possible.





COOLANT LEVEL INSPECTION

- Erect the main stand prior to beginning work.
- Check the coolant level of the reserve tank.
- The level should be between the “UPPER” and “LOWER” level lines.
- Fill the coolant with the reserve tank up to the “F” (upper level).

NOTE

- Unless the coolant is refilled or replaced, the engine temperature too high or low.
- Fill to the “F”(UPPER LEVEL) line.



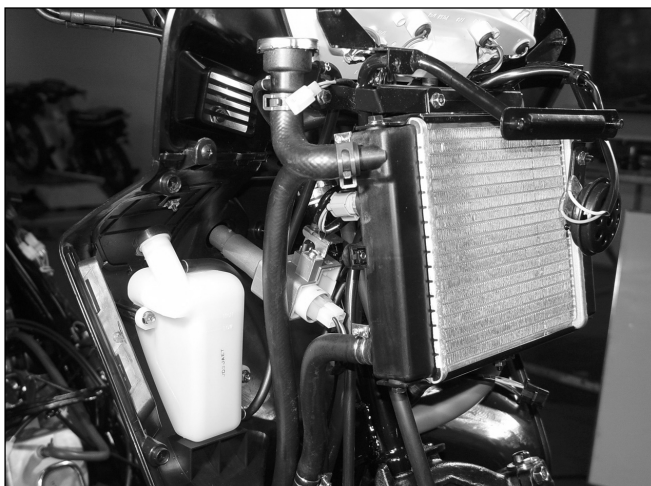
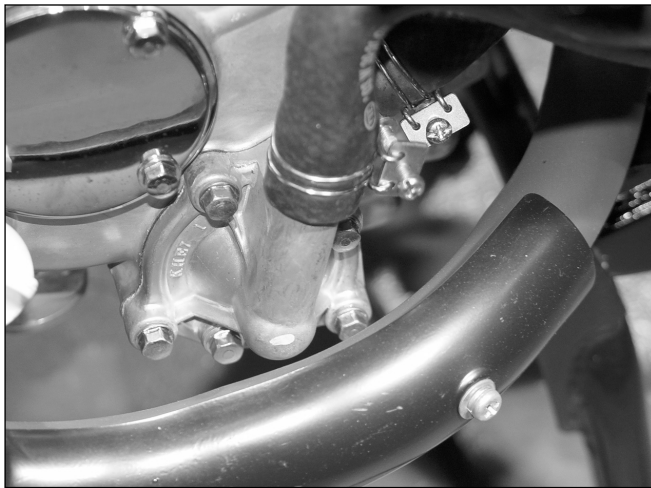
COOLANT REPLACEMENT

- Remove the drain bolt and drain the coolant. (Tilt the vehicle to the right in order to assure complete and rapid draining.)
- Remove the radiator cap.
- Install the drain bolt.
- Fill the radiator with new coolant.

COOLANT CAPACITY : $1,400 \pm 20\text{cc}$

RADIATOR CAPACITY : $1,000 \pm 20\text{cc}$

RESERVE TANK CAPACITY : $400 \pm 20\text{cc}$



- Start the engine. Bleed air from the coolant and check the level of coolant.
- Install the radiator cap.
- Fill the coolant with the reserve tank up to the upper level.

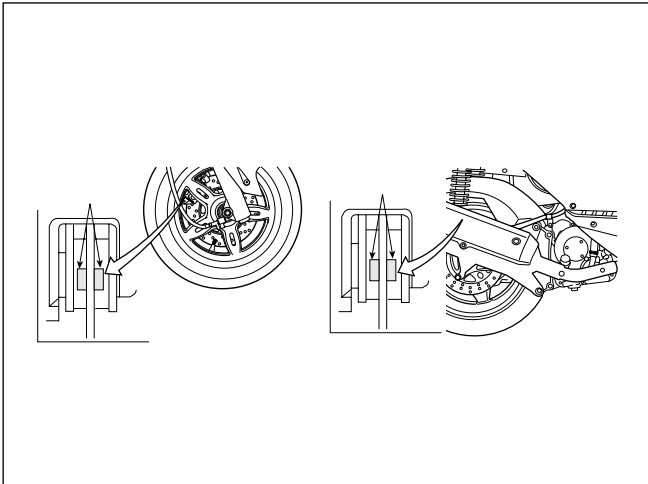


BRAKE FLUID

- 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.

⚠ CAUTION

- Brake fluid will damage painted, plastic or rubber parts.
- Mixing incompatible fluids can impair braking efficiency.
- A leak in the brake system can lead to reduced braking efficiency and possible loss of braking ability.



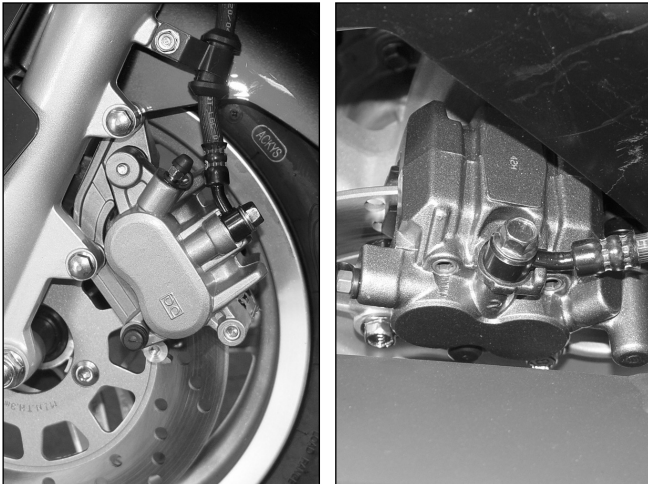
BRAKE PAD/SHOE

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 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

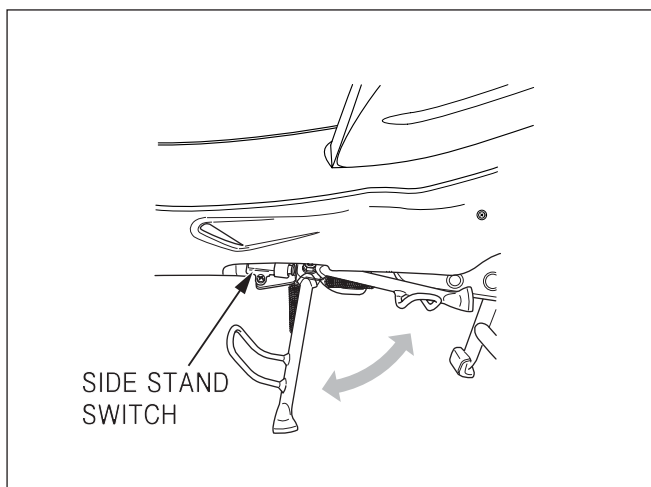
REAR : 10~20mm



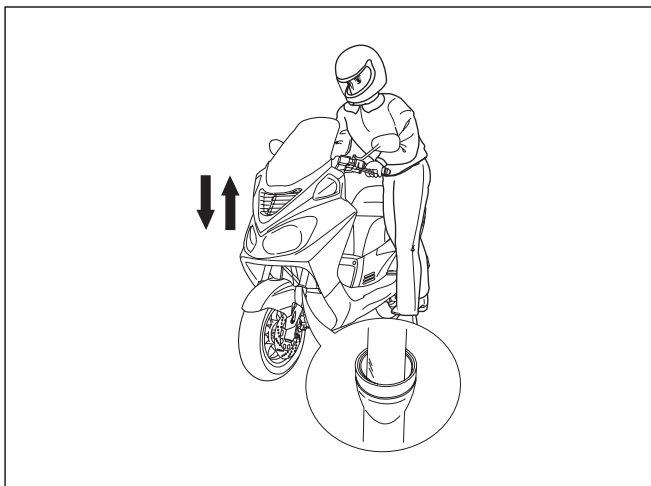


SIDE STAND

- 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

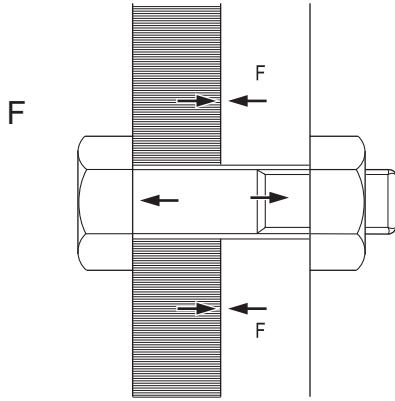
- Hold the brake lever, and compress the front cushion up and down several times to check the operating conditions.
- Check the front fork for oil leakage, parts damage or looseness.

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, NUTS, FASTENERS

- Check all nuts and bolts of the frame during the regular maintenance 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

kgf/cm² (kpa)

ITEM	FRONT WHEEL	REAR WHEEL
DRIVER ONLY	2.00(200)	2.00(200)
DRIVER AND A PASSENGER	2.00(200)	2.25(225)

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

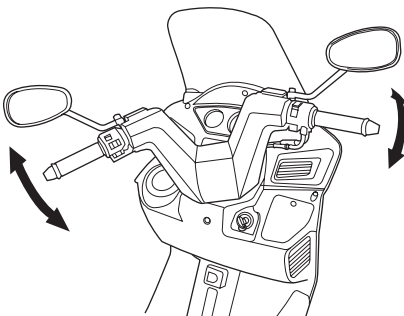
SERVICE LIMIT : 0.5mm

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.



MEMO

3. EXTERNAL PARTS

SERVICE INFORMATION	3-1	UNDER COVER	3-5
SEAT	3-2	HANDLE COVER	3-5
PILLION SEAT	3-2	FRONT COVER	3-5
LUGGAGE BOX TOP COVER	3-2	WINDSCREEN	3-6
REAR GRIP	3-2	FRONT UNDER COVER A	3-6
LUGGAGE BOX	3-3	FRONT UNDER COVER B	3-6
CENTER COVER	3-3	INNER COVER	3-7
BODY SIDE COVER	3-3	SPEEDOMETER COVER	3-7
BODY COVER	3-4	FRONT FENDER	3-8
REAR FENDER	3-4	REAR WHEEL MUDGUARD	3-8
FLOOR SIDE COVER	3-4	MUFFLER	3-8
FLOOR PANEL	3-4	EX. PIPE	3-8

SERVICE INFORMATION

 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.



SEAT

- Release the seat lock by turning the main switch key to open the seat.
- Loosen the flange nuts and remove the seat.
- Install in the reverse order of removal.



PILLION SEAT

- Release the seat lock by turning the main switch key to open seat.
- Pull the pillion seat forward and remove it.
- Install in the reverse order of removal.



LUGGAGE BOX TOP COVER

- Loosen the 5 Tapping screws and remove the top cover.
- Install in the reverse order of removal.



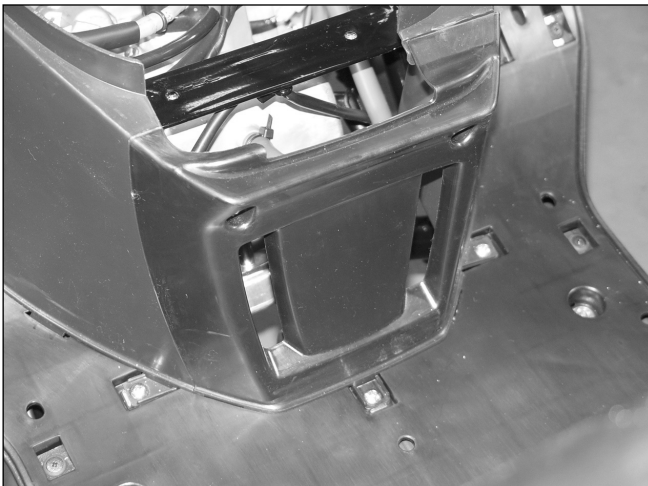
REAR GRIP

- Remove the rear grip cap (R.L)
- Loosen the 4 special bolts.
- Install in the reverse order of removal.



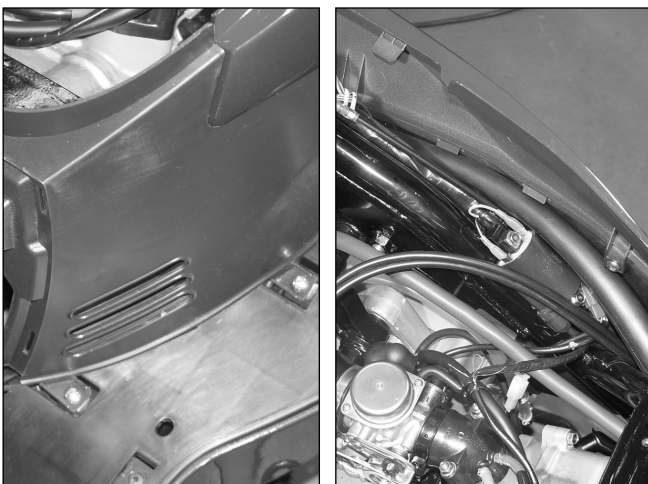
LUGGAGE BOX

- Remove the seat.
- Remove the pillion seat.
- Remove the luggage box top cover.
- Loosen the screws on the seat catch.
- Loosen the open stay nuts.
- Loosen the washer bolts.
- Remove the wire for the trunk lamp.
- Install in the reverse order of removal.



CENTER COVER

- Remove the floor mat.
- Loosen the 2 washer screws and 1 special screw.
- Install in the reverse order of removal.



BODY SIDE COVER

- Remove the center cover.
- Loosen the 2 washer screws.
- Loosen the 2 tapping screws securing the body side cover on the inside of the body cover.
- Install in the reverse order of removal.

NOTE

- Remove the air duct cover in disassembling LH. body side cover.



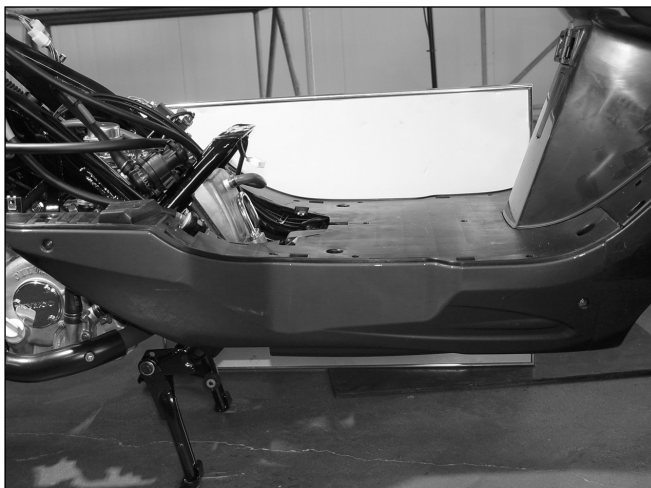
BODY COVER

- Remove the Rr. Grip R/L
- Remove the following parts
 - Seat
 - Luggage box
 - Center cover
 - Body side cover
- Loosen the special screw
- Loosen the body cover clip (R/L)
- Remove the wire for the tail light and pull the body cover backward.
- Install in the reverse order of removal



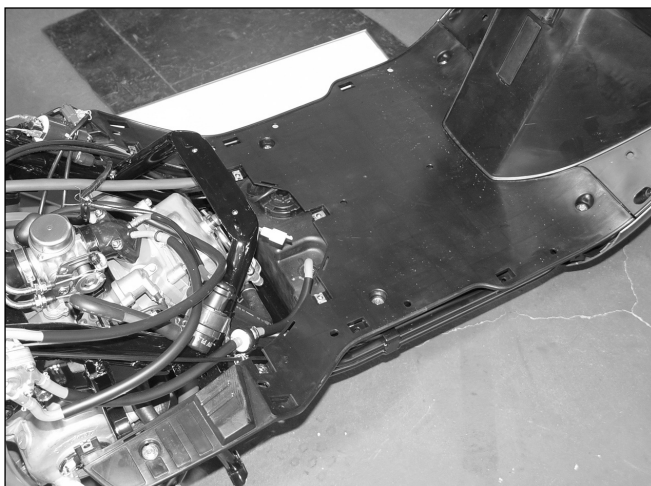
REAR FENDER

- Remove the body cover
- Loosen the 4 washer bolts and remove the Rr. fender
- Install in the reverse order of removal



FLOOR SIDE COVER

- Remove the center cover
- Loosen the 3 body cover clips, 2 washer screws and 1 tapping screw in back side of left
- Remove the floor mat
- Install in the reverse order of removal



FLOOR PANEL

- Remove the floor side cover
- Loosen the 6 washer bolts
- Pull the floor panel backward to remove it
- Install in the reverse order of removal



UNDER COVER

- Loosen the 4 special screws (R/L, 2Ea for each) to remove the under cover
- Install in the reverse order of removal



HANDLE COVER

- Loosen the washer screw and tapping screw securing the under handle cover
- Loosen the screw in the top of the upper handle cover
- Remove the under handle cover
- Loosen the 2 screws (R/L) in the upper handle cover securing the steering handle
- Install in the reverse order of removal



FRONT COVER

- Loosen the 2 tapping screws securing the front cover
- Loosen the 2 tapping screws securing the inner cover
- Install in the reverse order of removal



WINDSCREEN

- Remove the front cover
- Loosen the 4 washer bolts and remove the windscreen
- Install in the reverse order of removal

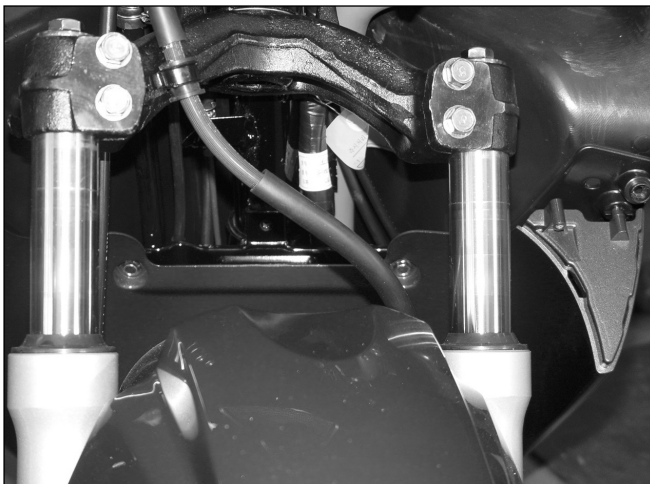


FRONT UNDER COVER A

- Remove the front cover and windscreen
- Loosen the 7 tapping screws securing the inner cover
- Install in the reverse order of removal



- Loosen the 2 washer bolts in the top of the front under cover
- Loosen the 2 tapping screws



FRONT UNDER COVER B

- Loosen the 2 flange bolts
- Loosen the 4 tapping screws securing the inner cover

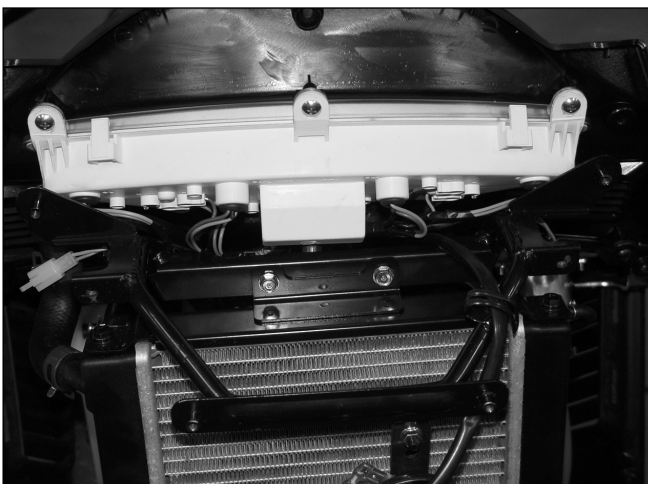
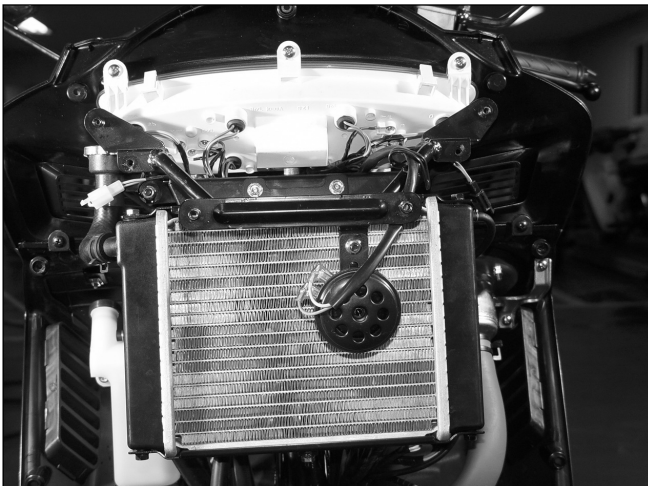


- Loosen the 4 tapping screws securing the inner cover



INNER COVER

- Remove the front cover and windscreen
- Remove the coolant reserve tank
- Remove the fuel tube clip
- Remove the breather tube
- Loosen the 3 screws securing the inner cover
- Remove the bag holder
- Loosen the 2 tapping screws securing the speedometer cover
- Install in the reverse order of removal



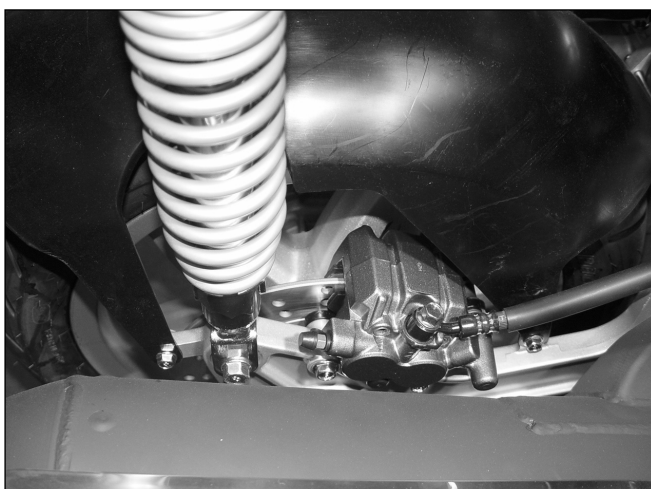
SPEEDOMETER COVER

- Remove the speedometer cable
- Remove the coupler and wire
- Loosen the 2 tapping screws securing the speedometer cover
- Install in the reverse order of removal



FRONT FENDER

- Loosen the 4 screws (R/L, 2Ea for each)
- Install in the reverse order of removal



REAL WHEEL MUDGUARD

- Loosen the 2 flange bolts of RH.
- Loosen the flange bolt securing the air cleaner and mudguard
- Remove the air cleaner
- Loosen the washer bolt securing the mudguard
- Install in the reverse order of removal

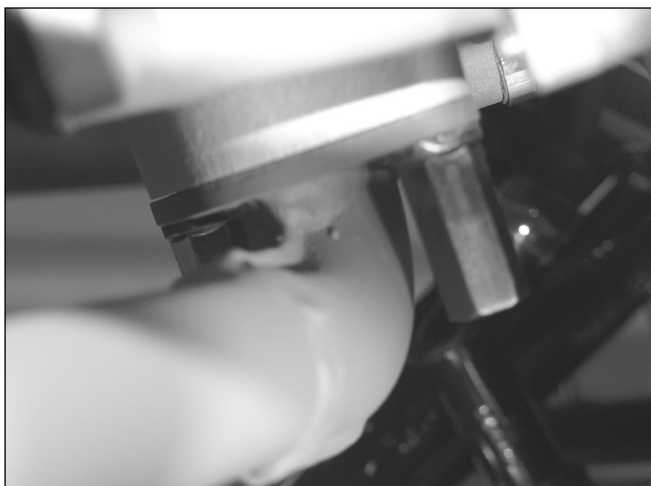


MUFFLER

- Loosen the muffler flange bolt securing Ex. pipe comp.
- Loosen the 3 bolts securing the Rr. Fork
- Remove the Ex. muffler comp.

NOTE

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



EX. PIPE

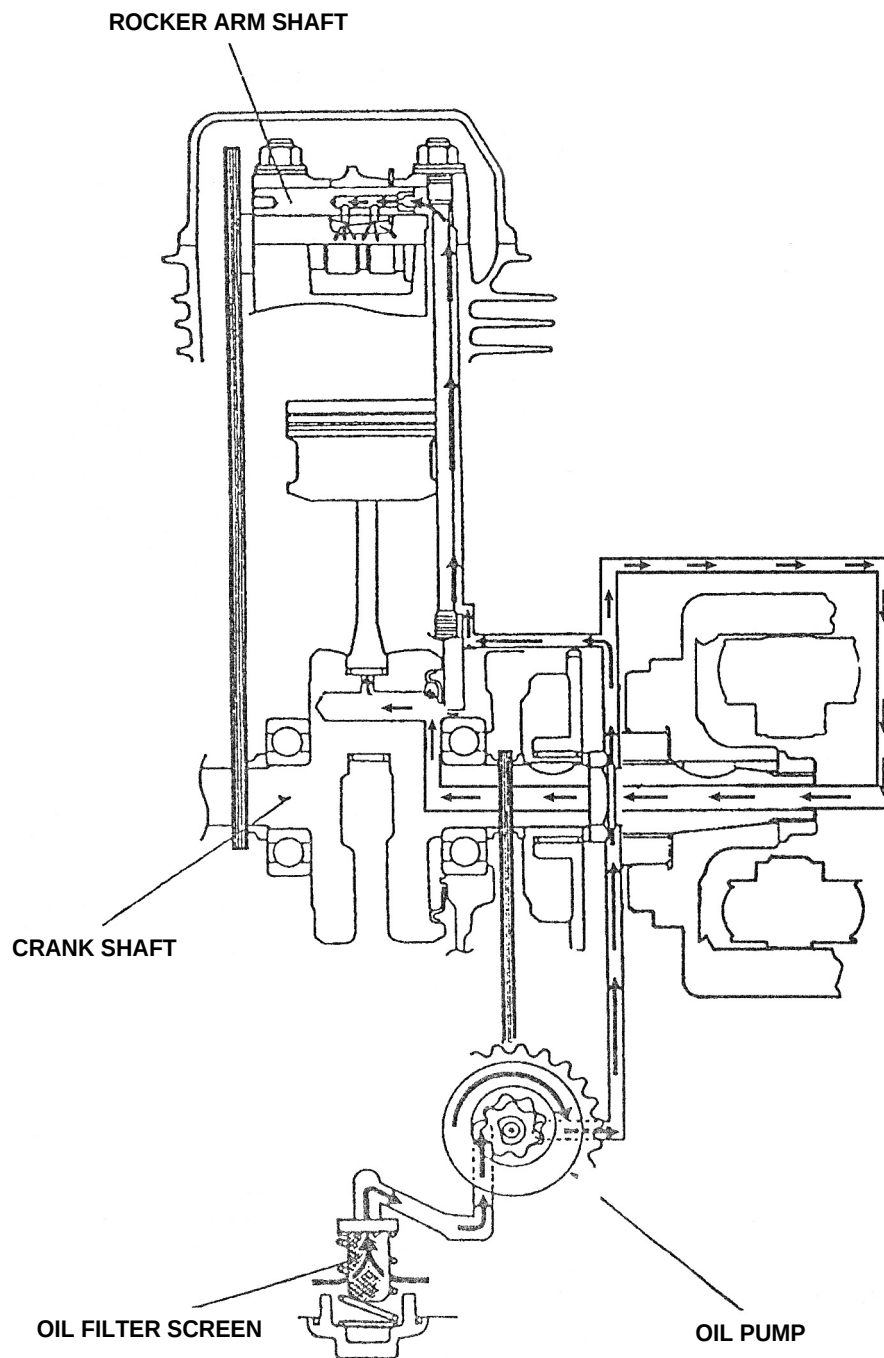
- Loosen the 2 cap nuts securing the cylinder comp.
- Pull the Ex. Pipe comp. downward to remove it
- Install in the reverse order of removal

NOTE

- Replace the packing when assembling the muffler and Ex. pipe comp.

MEMO

LUBRICATION SYSTEM



4. LUBRICATION SYSTEM

SERVICE INFORMATION	4-1	ENGINE OIL CHANGE	4-3
TROUBLESHOOTING	4-2	OIL PUMP	4-4
ENGINE OIL LEVEL INSPECTION .	4-3	OIL PUMP ASS'Y ASSEMBLY .	4-6

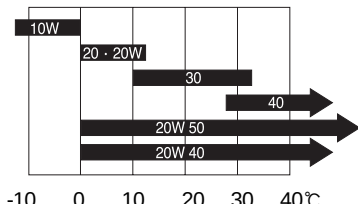
SERVICE INFORMATION

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) 0.9 l (After Oil change) 0.95 l (After Oil filter change)
RECOMMENDED OIL	API service classification : SJ grade Viscosity : SAE10W-30/15W 40# (Use appropriate type of oil with viscosity satisfying the atmospheric temperature In your riding area based on the table shown on the right side.) 

TROUBLESHOOTING

Oil level low

- Oil consumption.
- External oil leaks.
- Worn piston ring or incorrect piston ring installation.
- Worn valve guide or seal.

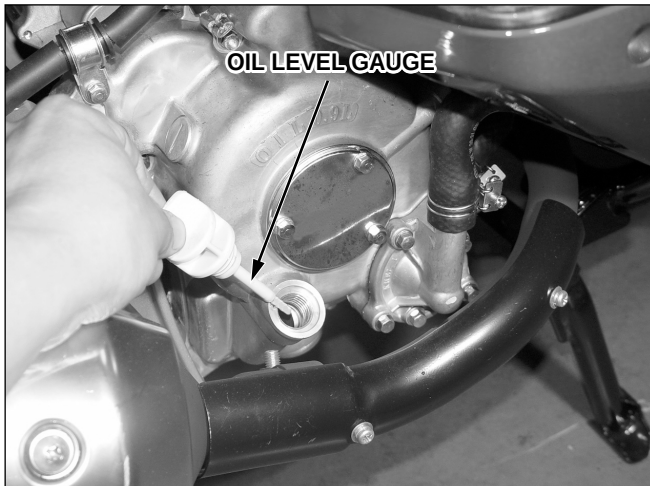
Oil contamination

- Oil or filter not changed often enough.
- Faulty head gasket.
- Worn piston rings.

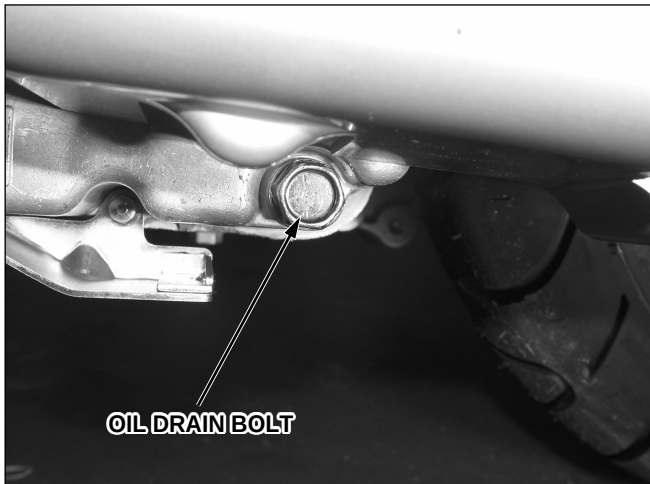
Low or no oil pressure

- Clogged oil orifice.
- Incorrect oil being used.

ENGINE OIL LEVEL INSPECTION



- 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 LH. 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.
- Tighten the oil drain plug bolt.

TORQUE VALUE : 1.4 kgf · 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 : 1.5 kgf · m

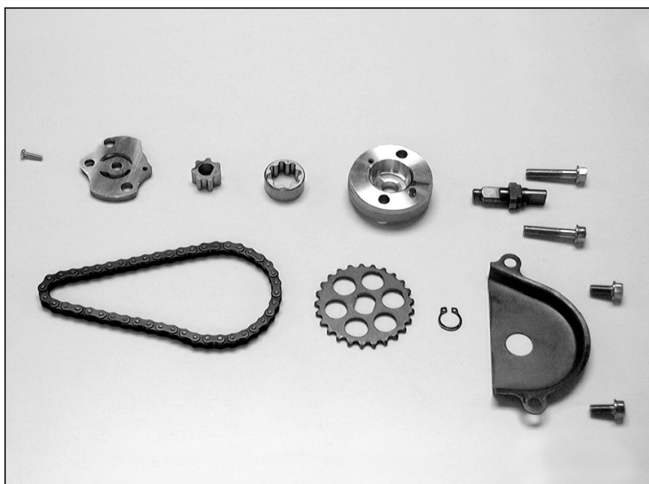
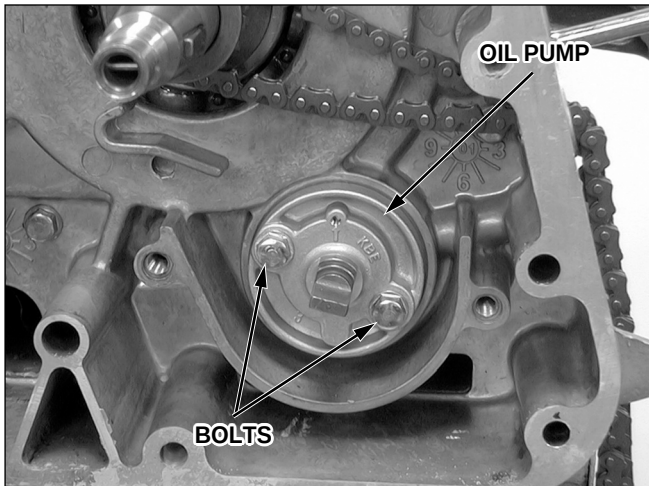
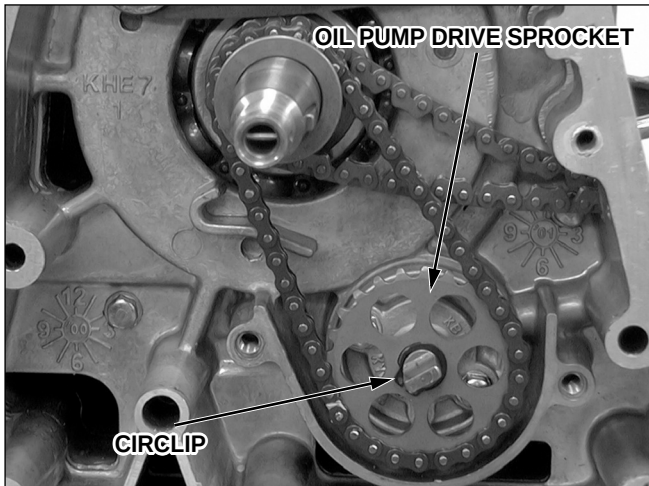
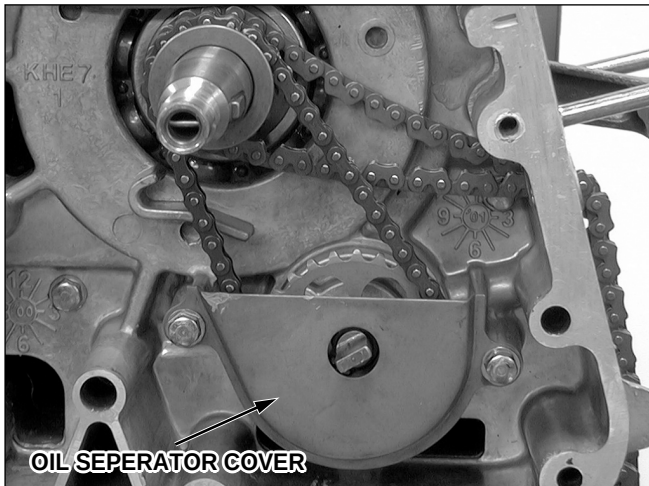
- Loosen the special screw, remove the plug maintenance cover.
- Fill the recommended oil after opening oil filter cap of cylinder head cover.

OIL CAPACITY : 1.1 ˆ (After disassembly)

0.9 ˆ (After Oil change)

0.95 ˆ (After Oil filter change)

- API service classification : SJ 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 PUMP

REMOVAL

- Drain cooling water.
- Remove the following parts.
 - RH. crank case cover
 - A.C generator
 - Starting clutch gear comp
 - Oil seperator cover and attaching bolt
- Remove the circlip.
- Remove the oil pump drive sprocket.
- Remove the oil pump drive sprocket chain.

- Loosen the 2 oil pump bolts.
- Remove the oil pump.

OIL PUMP DISASSEMBLY

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

OIL PUMP INSPECTION

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

SERVICE LIMIT : 0.25mm

TOOL : FEELER GAUGE



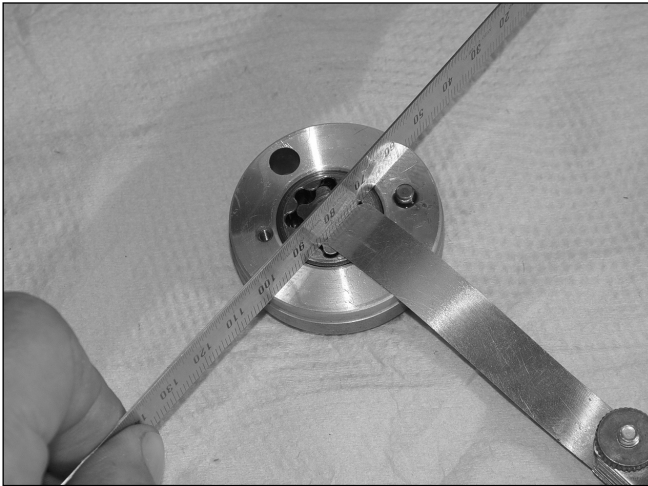
- Measure the rotor tip clearance.

SERVICE LIMIT : 0.20mm



- Measure the pump side clearance.

SERVICE LIMIT : 0.12mm

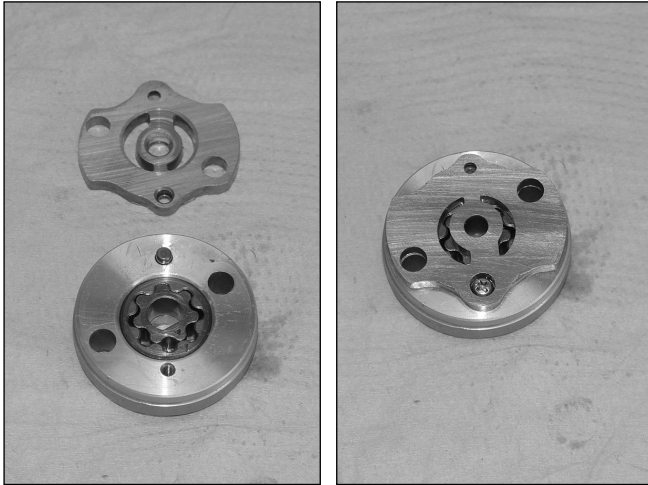


OIL PUMP ASSEMBLY

- Clean all parts with fresh cleaning oil.
- Install the inner and outer rotors to the pump body.
- Assemble the pump shaft with dowel pin.



LUBRICATION SYSTEM



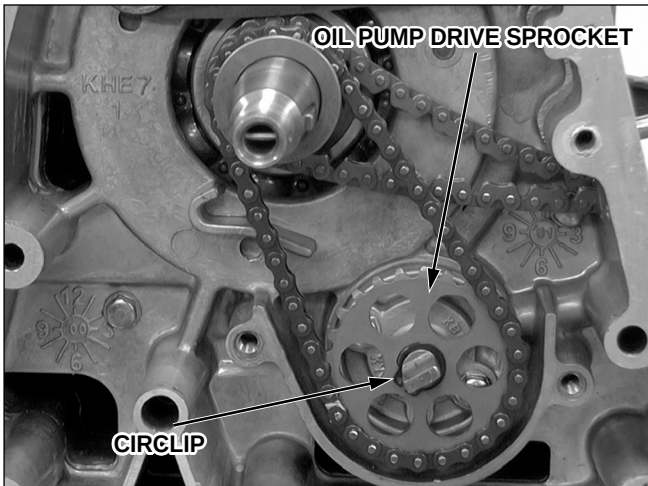
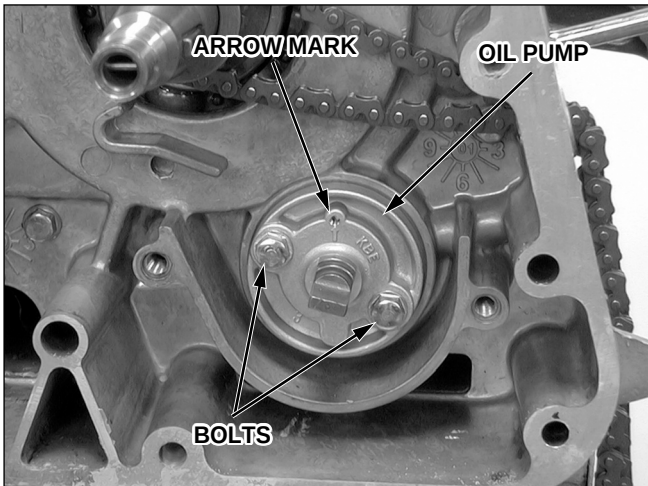
- Install in accordance with the hole of the dowel pin and pump cover.
- Tighten the pan screw.

NOTE

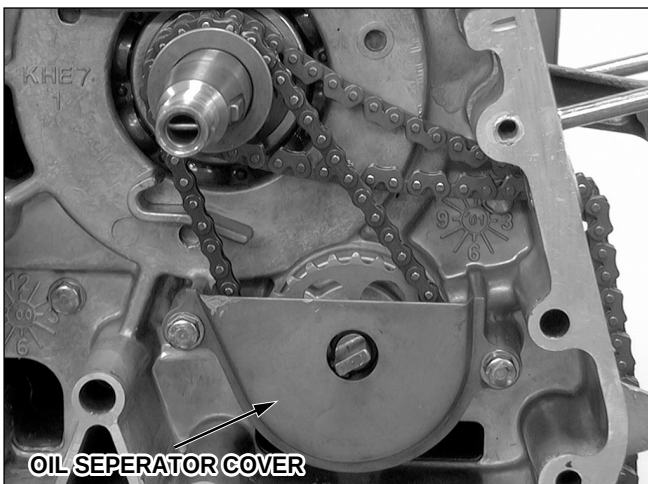
- After installing, check the oil pump to operate smoothly.

OIL PUMP INSTALLATION

- Tighten the 2 bolts to the oil pump and oil separator.
- Check the pump shaft to rotate smoothly.
- Align the arrow mark of the oil pump.



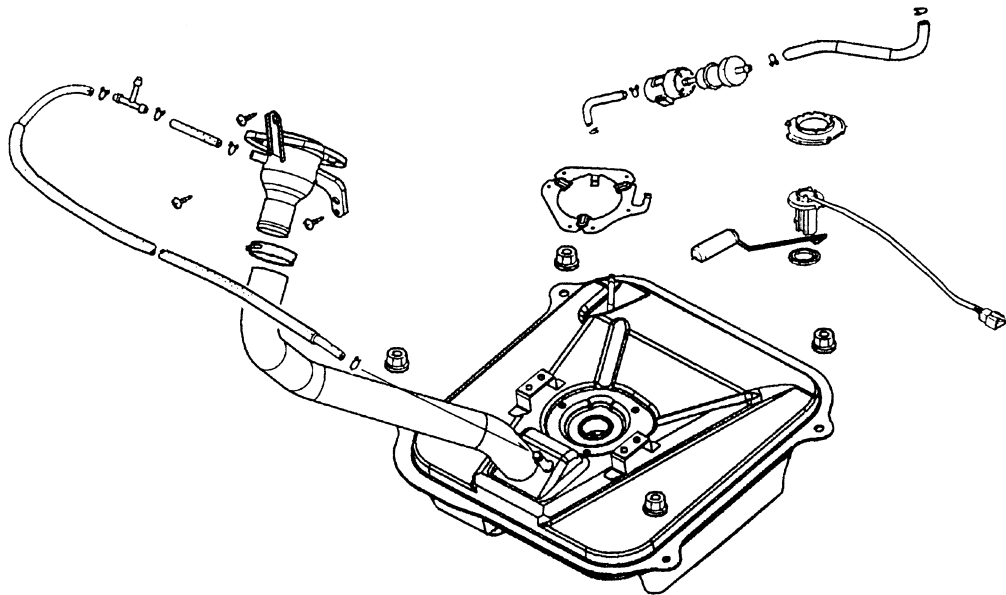
- Install the pump chain on the oil pump drive sprocket.
- Install the circlip around the pump shaft.



- Install the oil separator cover.
- Install the starting clutch gear comp.

MEMO

FUEL SYSTEM



5. FUEL SYSTEM

SERVICE INFORMATION . . .	5-1	JETS/SCREW REMOVAL . . .	5-6
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FUEL TANK	5-3	/REMOVAL	5-7
CARBURETOR . . .	5-3	FLOAT LEVEL	5-7
VACCUM CHAMBER REMOVAL .	5-4	AIR CUT-OFF VALVE (A.C.V) .	5-8
VACCUM PISTION INSPECTION .	5-5	ACCELERATING PUMP . . .	5-9
FLOAT CHAMBER REMOVAL . .	5-5	FUEL PUMP	5-9
FLOAT VALVE INSPECTION . . .	5-6		

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 3 weeks, 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 : 11 l

RESERVE FUEL CAPACITY: 2.8 l

CARBURETOR

ITEM	STANDARD
TYPE/THROTTLE BORE	CVK 30
MODEL MARK	CVK056A
MAIN JET No.	#102
PILOT SCREW OPENING	$2\frac{1}{2} \pm \frac{1}{2}$
FLOAT LEVEL	18.5mm
IDLING SPEED	$1,700 \pm 100\text{rpm}$

TOOL

FLOAT LEVEL GAUGE

TROUBLESHOOTING

The vehicle does not start.

- No gasoline in fuel tank.
- Fuel is not coming out of carburetor.
- Too much fuel is flowing into cylinder.
- No spark emitted from spark plug.
- Air cleaner is blocked.
- Suction system is experiencing secondary intake of air.
- Using low quality gasoline.
- Starter is damaged.
- Throttle cable is working improperly.
- Fuel tank is functioning improperly.

Idle is unstable and engine turns off after starting.

- Starter is damaged.
- Ignition system is damaged.
- Using low quality gasoline.
- Suction system is experiencing secondary intake of air.
- Idle is adjusted improperly.
- Air screw is adjusted improperly.
- Compression pressure is low.
- Air/Fuel mixture is either too lean or rich.
- Carburetor is blocked.

Mis-firing occurs when driving at high speeds.

- Ignition system is damaged.
- Mixture is too lean.

Back firing

- Ignition system is damaged.
- Mixture is too lean.

Insufficient power and high fuel consumption.

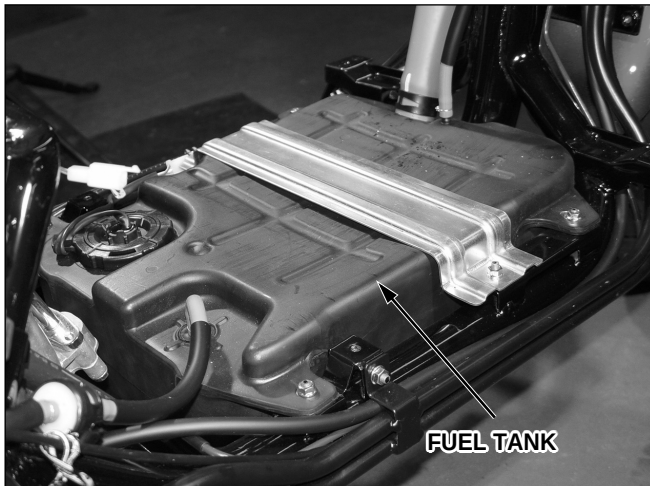
- Air cleaner is blocked.
- Ignition system is damaged.
- Mixture is too rich.

Air/Fuel mixture is extremely lean

- Fuel jet is blocked.
- Float valve is damaged.
- Oil level is low.
- Bad ventilation of air in tank cap.
- Fuel strainer screen is blocked.
- Fuel tube is bent, creased or blocked.
- Suction system is receiving secondary suction of air.

Air/Fuel mixture is extremely rich.

- Air jet is blocked.
- Float valve is damaged.
- Oil level is too high.
- Starter is damaged.
- Air cleaner is blocked.



FUEL TANK REMOVAL

⚠ 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.

- Release the seat lock by turning the main switch key to open the seat.
- Remove the following parts.
 - Luggage box. (⇒4-4)
 - Floor panel leg.
 - Center cover.
 - Rear center cover.
 - Rear carrier/Back rest.
 - Body cover.
- Remove the fuel tube from the fuel tank.
- Remove the tube between the fuel tank and the fuel filter.
- Remove the fuel vapor tub.
- Remove the fuel tank.
- Install in the revers order of removal

⚠ NOTE

- After removing the fuel tank, be sure to close the fuel tank cap.



CARBURETOR REMOVAL

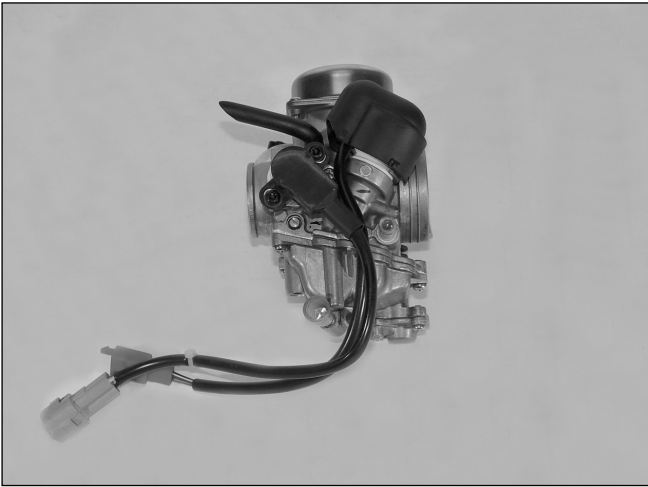
- Remove the seat.
- Remove the luggage box.
- Remove the center cover.
- Remove the fuel tube and the vaccum tube.
- Remove the wiring coupler of the auto bystarter.

FUEL SYSTEM

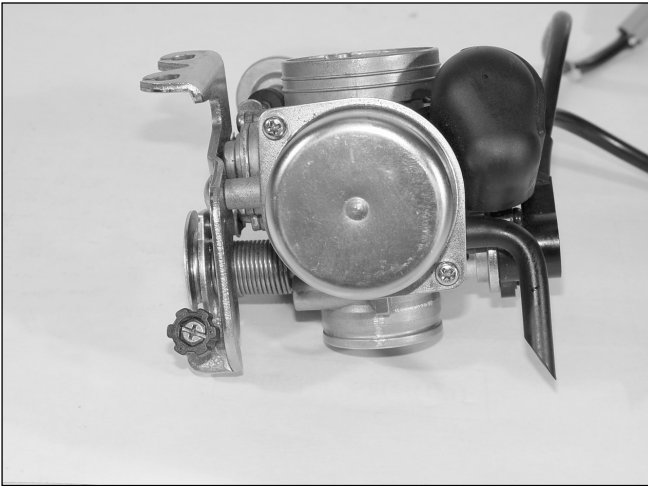


- Loosen the throttle cable lock nut, and remove the throttle cable from the carburetor.
- Loosen the air cleaner connecting tube band and the carburetor intake manifold band.
- Remove the carburetor

VACUUM CHAMBER REMOVAL



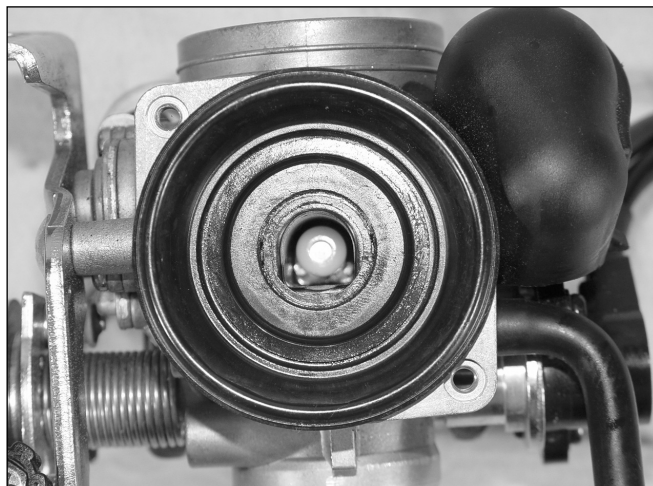
- Loosen the drain screw and drain the fuel from the float chamber.



- Remove the two vacuum chamber cover screws and the cover.



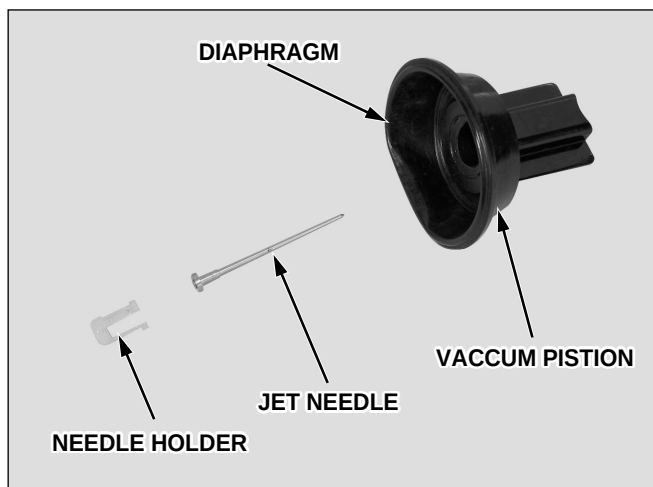
- Remove the compression spring and vacuum piston.



- Remove the needle holder, spring and jet needle from the piston.

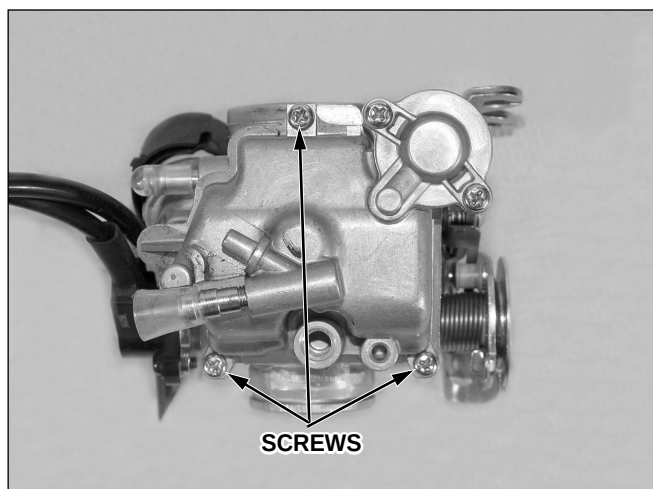
NOTE

- Be careful not to damage the vacuum piston diaphragm.



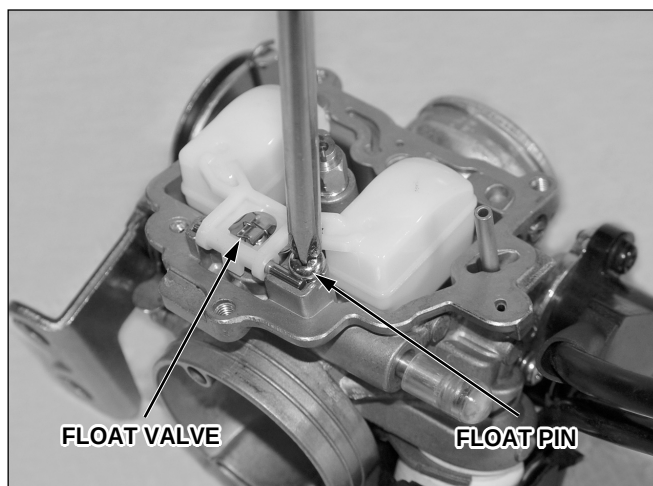
VACUUM PISTON INSPECTION

- Inspect the vacuum piston and jet needle for wear or damage.
- Inspect the diaphragm for deterioration and tears.

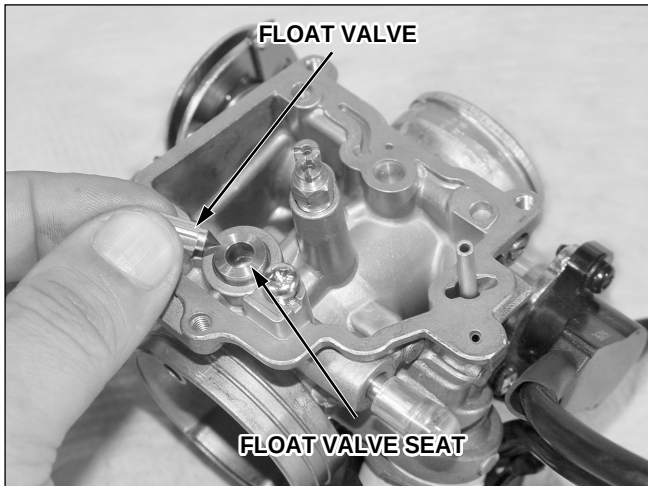


FLOAT CHAMBER DISASSEMBLY

- Remove the three float chamber screws and the float chamber.

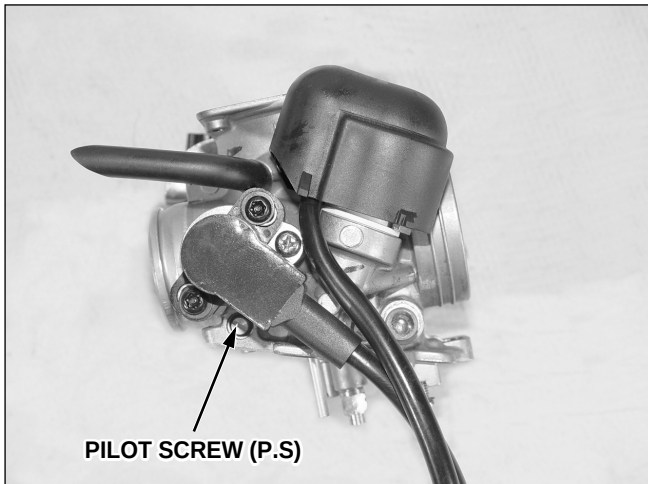


- Remove the float pin, float and float valve.



FLOAT VALVE INSPECTION

- Inspect the float valve seat contact area for wear.

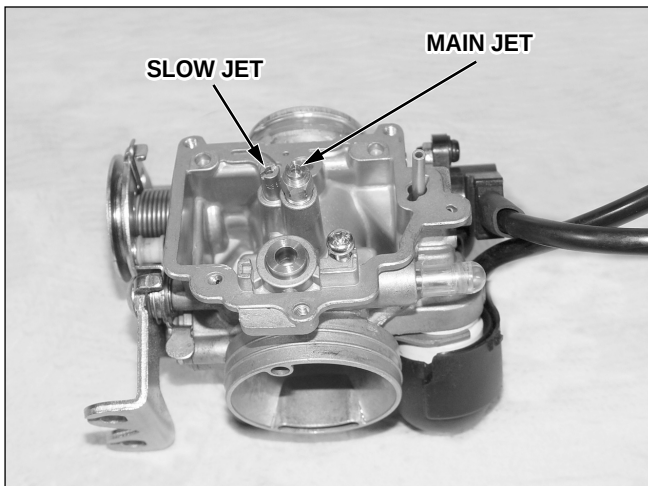


JETS/SCREWS REMOVAL

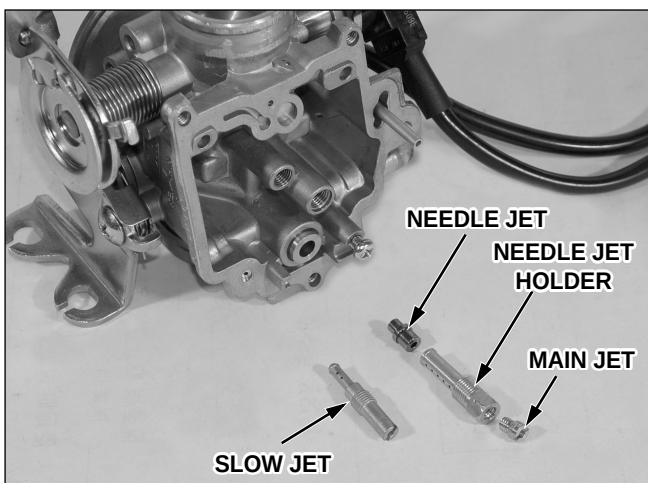
- Inspect the float valve seat contact area for wear.

NOTE

- Before removing the pilot screw, turn the pilot screw clockwise until it seats lightly and record the rotating turns.
- Do not force the pilot screw against its seat to avoid seat damage.



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



NOTE

- Be sure to use clean detergent oil.

AUTO BYSTARTER INSPECTION/REMOVAL

AUTO BYSTARTER INSPECTION

- Measure the resistance between the auto bystarter wire terminals.

Resistance : 10 Ω (minutes minimum after stopping the engine)

NOTE

- If the reading is not within the limit, replace the auto bystarter with a new one.

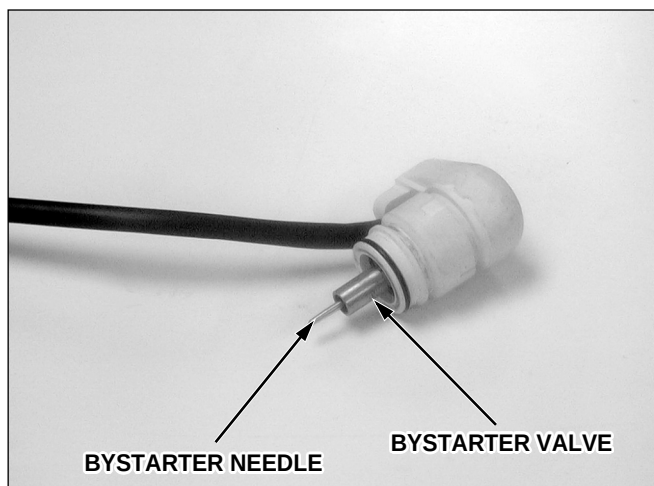
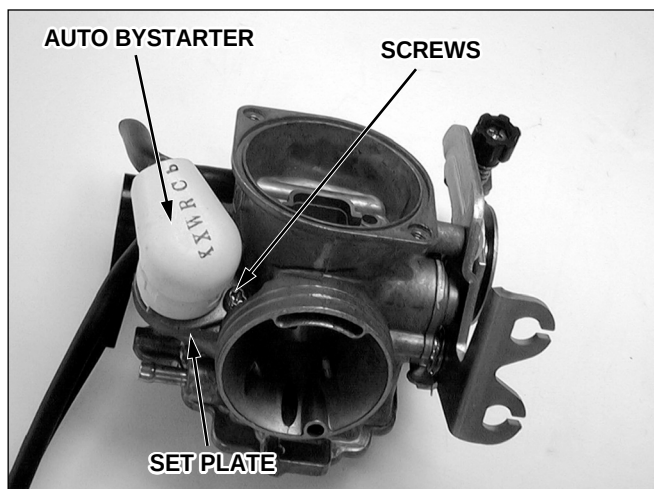
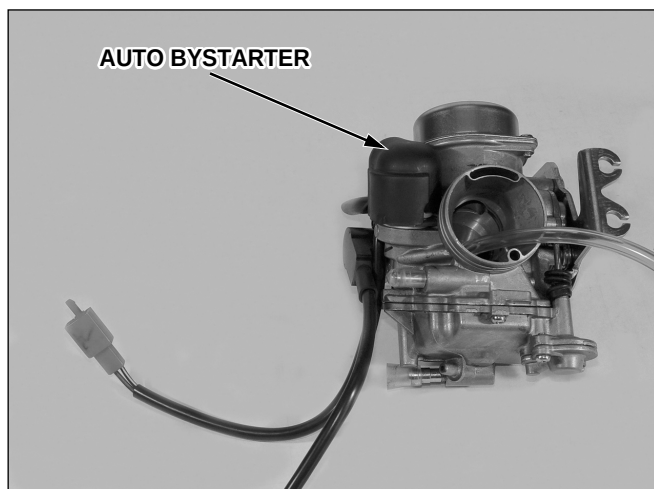
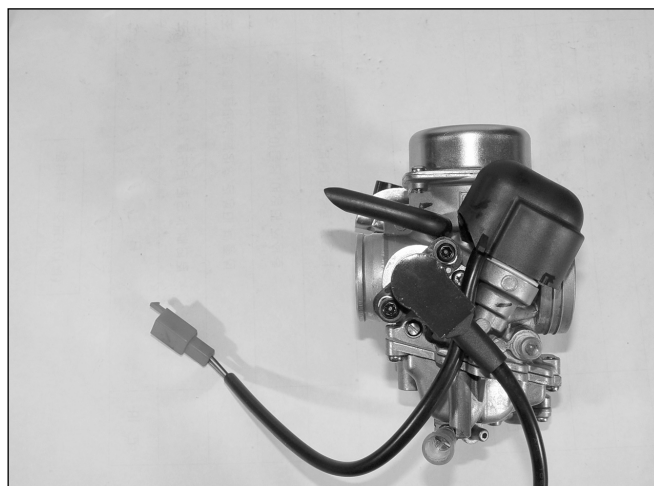
- Connect the hose to the fuel enriching circuit of the carburetor. Connect the auto bystarter green/back wire to the positive (+) terminal of a battery and black/white to the neagitive (-) terminal. Wait 5 minutes and blow the hose with mouth. If the passage is blocked, the auto bystarter is normal.

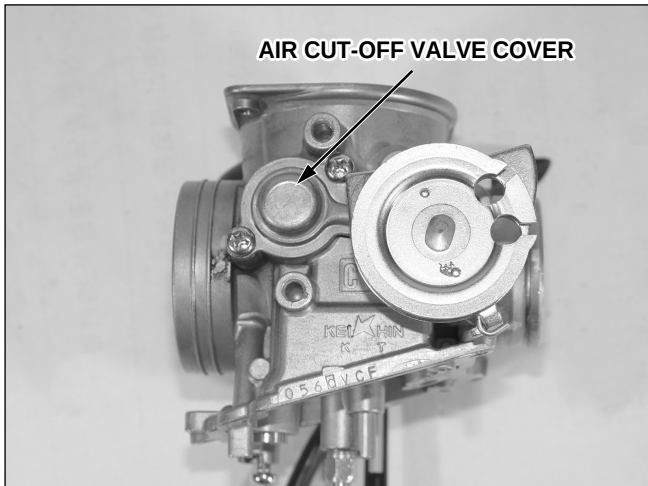
Disconnect to auto bystarter from the battery. Wait 30 minutes and blow the hose with mouth. If air can be blown into the hose, the auto bystarter is normal.

AUTO BYSTARTER REMOVAL

- Remove the one set plate screw and set plate and then remove the auto bystarter from the carburetor body.

- Check the auto bystarter valve and needle for nicks, wear or damage.
- If any faulty part is found, replace the auto bystarter with a new one.

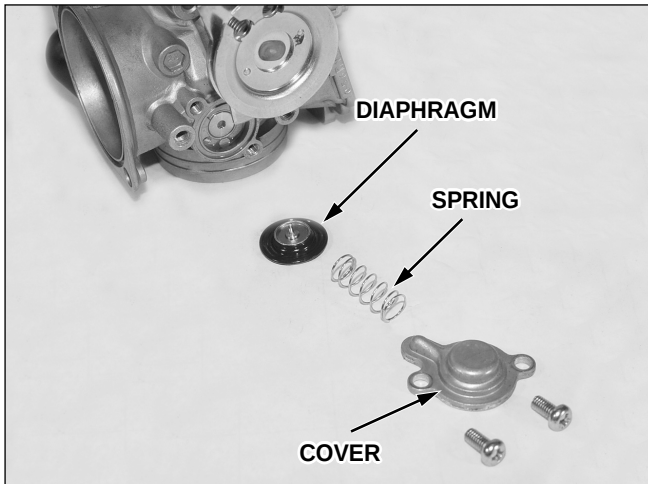




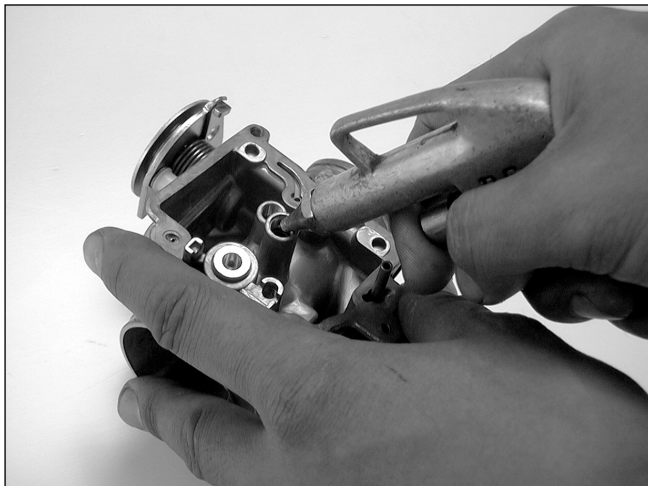
AIR CUT-OFF VALVE (A.C.V)

A.C.V REMOVAL

- Remove the two screws and the air cut-off valve cover.



- Remove the spring, diaphragm and O-rings.
- Inspect the diaphragm and spring for wear or damage.

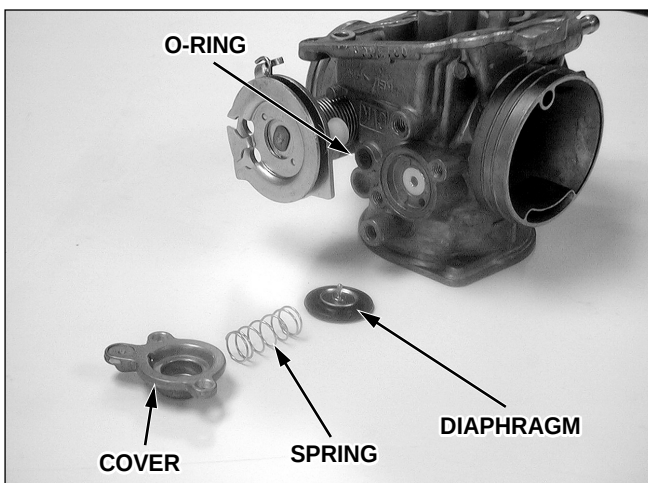


CARBURETOR BODY CLEANING

- Blow compressed air through all passages of the carburetor body.

⚠ NOTE

- Make sure that no fuel jet is clogged.

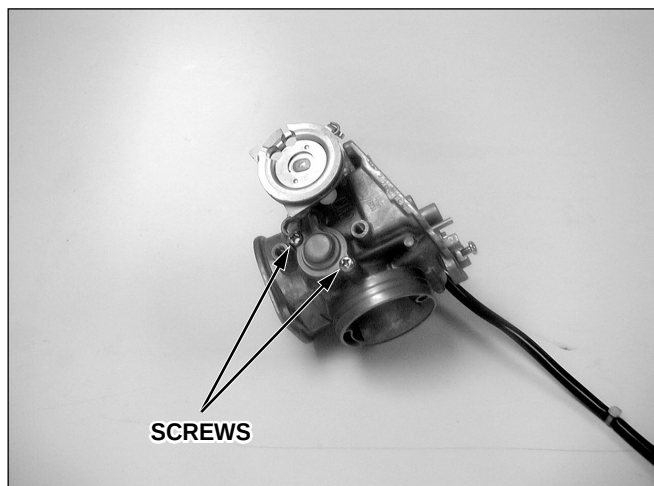


- Install the O-ring onto the air-cut-off valve body securely.

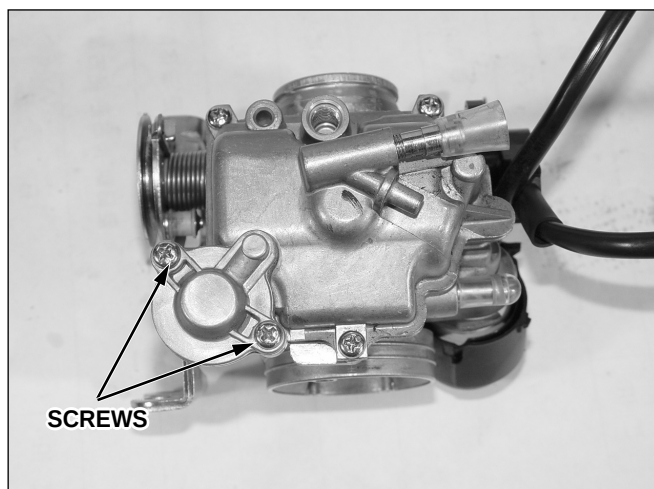
⚠ NOTE

- Install the O-ring with the flat face toward the valve body side.

- Install the diaphragm, spring, and cover.



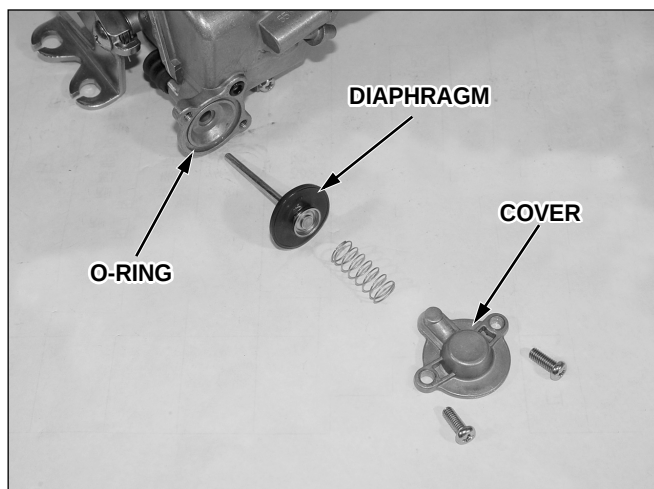
- Install and tighten the two screws attaching the air cut-off valve cover.
- Connect the hose.



ACCELERATING PUMP

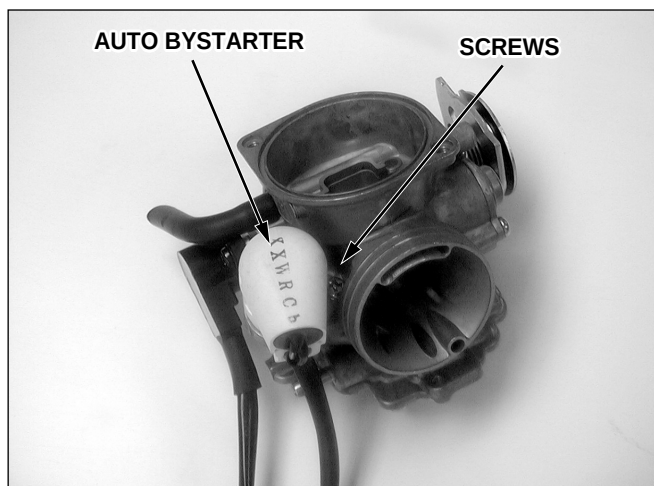
DISASSEMBLY

- Remove the two accelerating pump cover screws and accelerating pump cover.
- Remove the spring and accelerating pump diaphragm.



INSPECTION

- Inspect the accelerating pump diaphragm for cracks, damage or deterioration. Replace if necessary.
- Assemble the accelerating pump in the reverse order of disassembly.

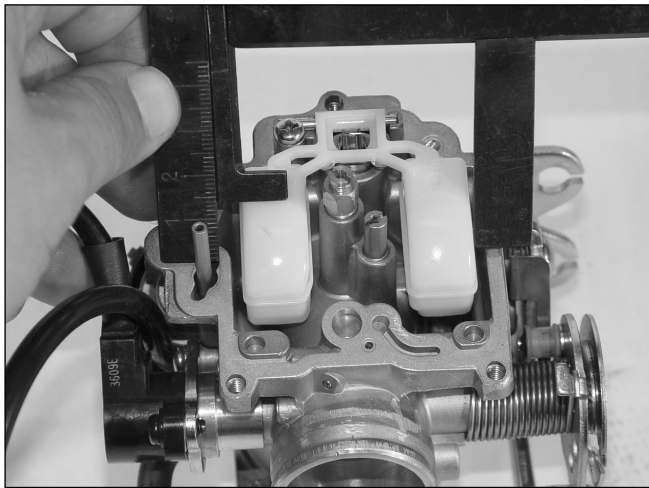


AUTO BYSTARTER INSTALLATION

- Install the auto bystarter and set plate.
- Install and tighten the two screws.

⚠ NOTE

- Insert the auto bystarter into the carburetor body until it bottoms and position the set plate into the upper groove in the bystarter.
- Install the set plate with its round face facing down.



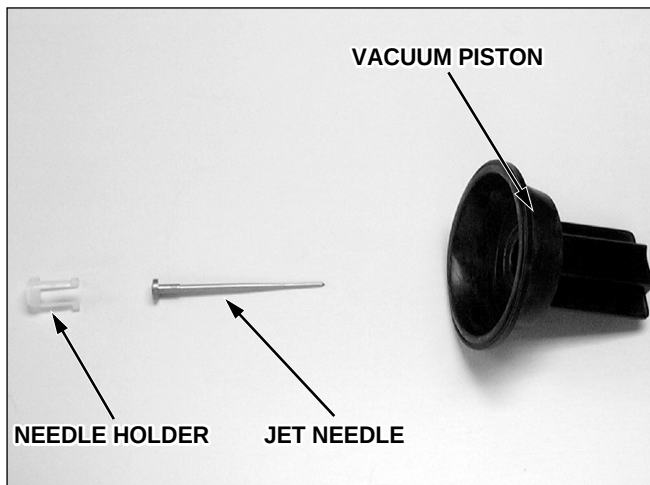
FLOAT LEVEL INSPECTION

- Install the float valve, float and float fin.
- Measure the float level at the location of the main jet (just contacting the float valve)

Float Level : $18.5 \pm 1.0\text{mm}$

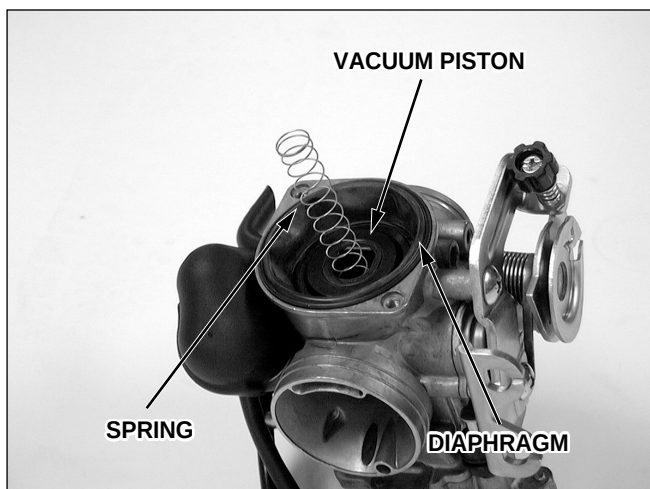
Replace the float if the level is incorrect.

Check the operation of the float and then reinstall the float chamber.



VACUUM CHAMBER ASSEMBLY

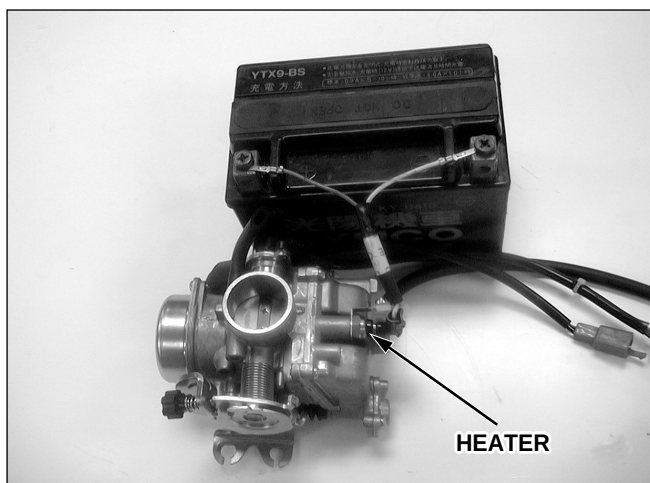
- First install the jet needle and spring into the vacuum chamber and then install the needle holder.



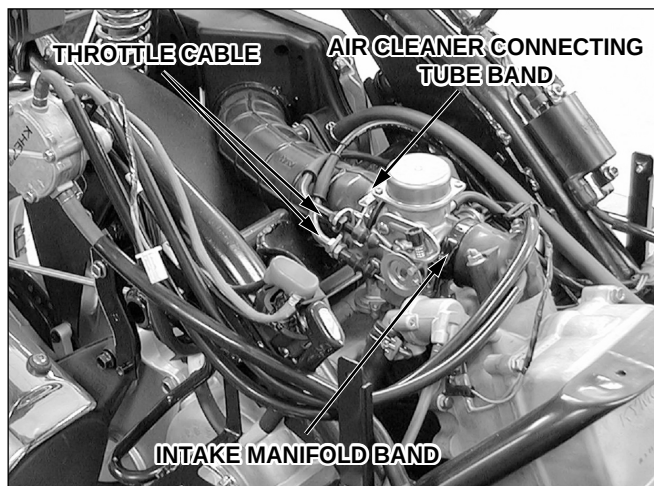
- Install the vacuum piston into the carburetor body.
- Install the spring.
- Install the vacuum chamber cover and tighten it with the two screws.

NOTE

- Be careful not to let the diaphragm slip.
- If the diaphragm cannot be positioned correctly because of expansion, dry the diaphragm before installation.



- Check the heater with battery.
- If the heater is getting hot, means the heater without problem, otherwise the heater has to be changed.

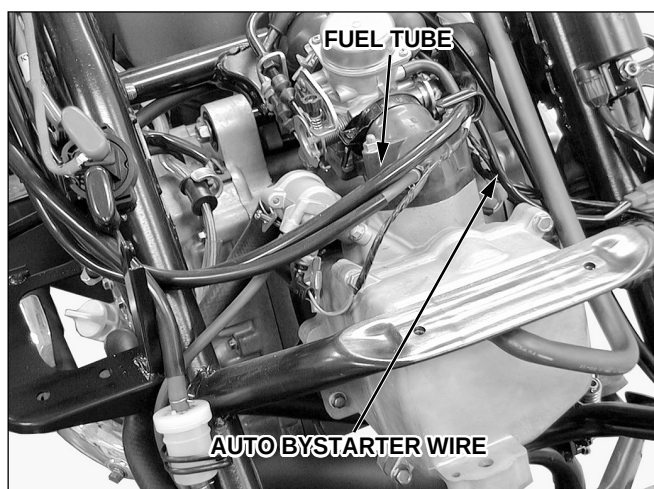


CARBURETOR INSTALLATION

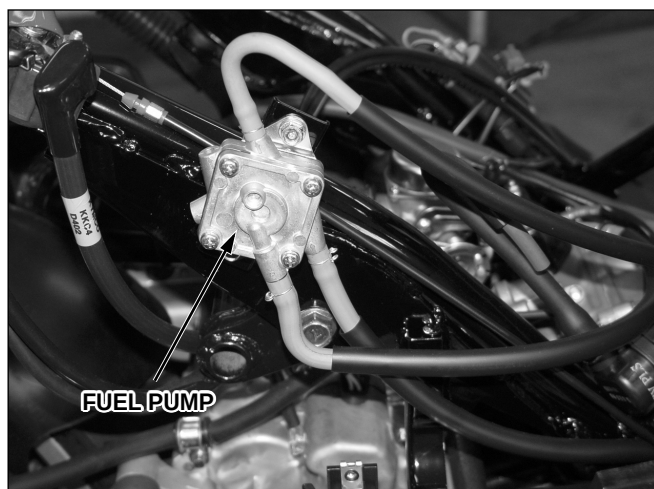
- Tighten the drain screw.
- Install the carburetor onto the intake manifold and tighten the band.
- Install the air cleaner connecting tube and tighten the band.
- Connect the throttle cable to the carburetor.

NOTE

- After connecting the throttle cable, adjust the throttle grip free play to 2~6mm.



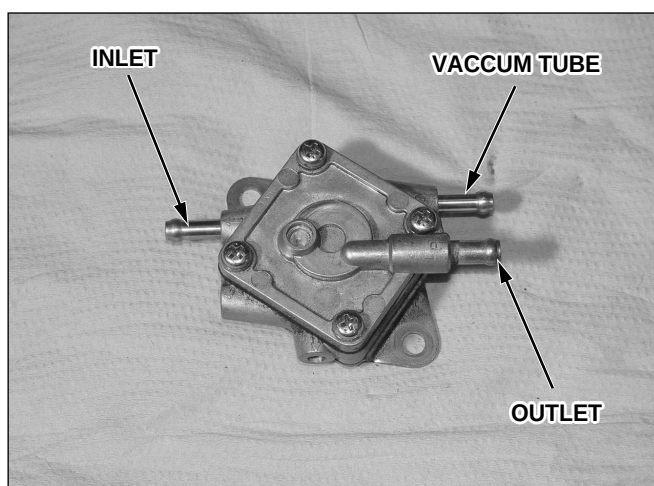
- Connect the auto bystarter wire.
- Connect the fuel tube and vacuum tube to the carburetor.
- Perform the following inspections and adjustments:
 - Throttle grip free play
 - Idle speed
- Install the seat, met-in box and frame center cover.



FUEL PUMP

REMOVAL

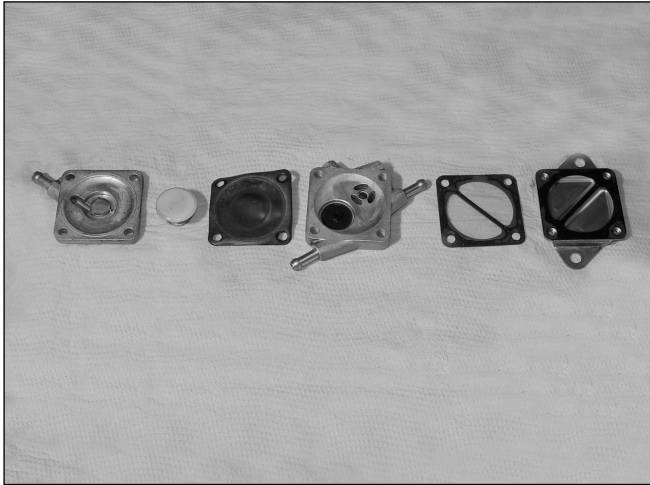
- Remove the frame center cover.
- Disconnect the fuel pump inlet, outlet and vacuum tubes.
- Remove the two fuel pump attaching bolts and the fuel pump.



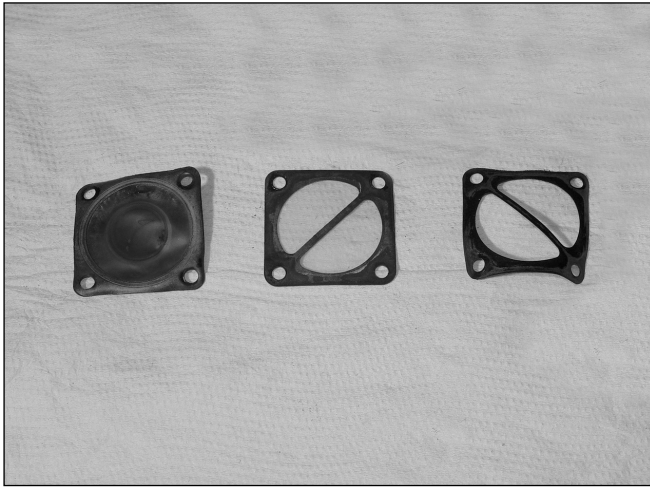
DISASSEMBLY

- Remove the four fuel pump body screws.

FUEL SYSTEM



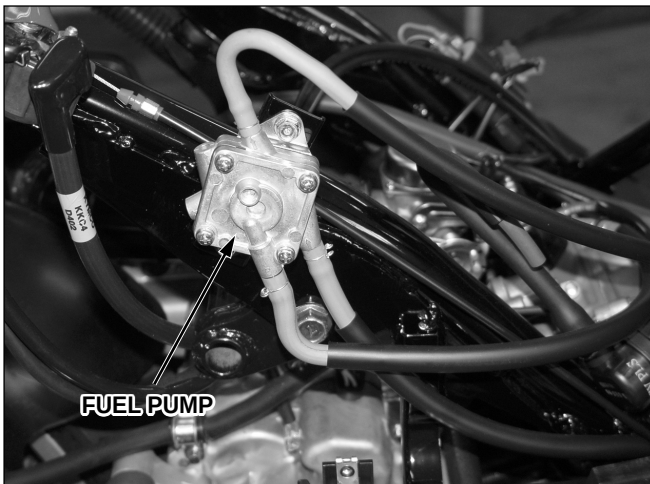
- Disassemble the fuel pump.



- Inspect the fuel pump diaphragms A and B for damage.
- Inspect each gasket for damage.



- Inspect the suction valve, outlet valve and relief valve in the fuel pump body for damage, cracks or foreign matters.
- Install in the reverse order of removal.



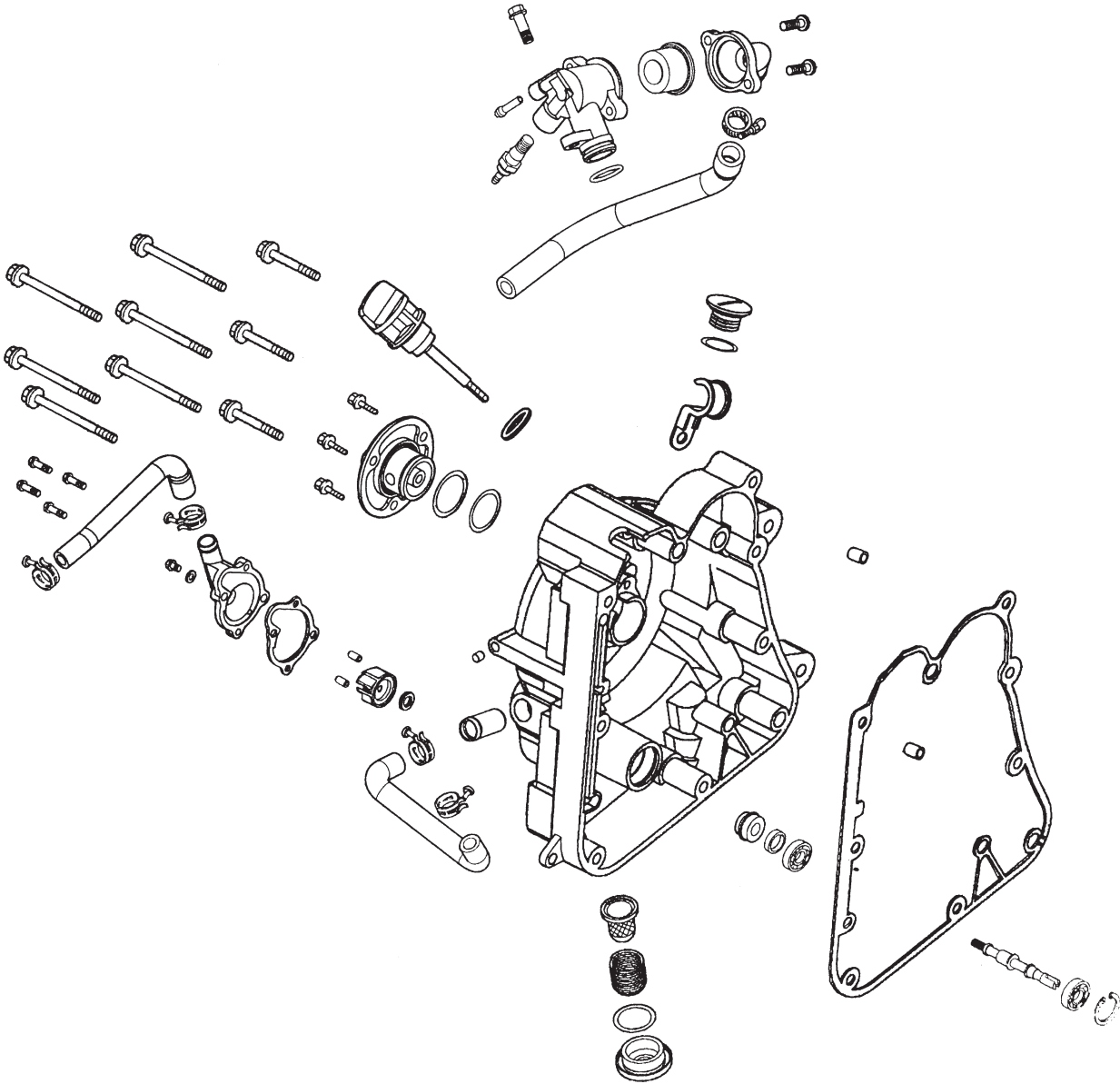
⚠ NOTE

- Measure the fuel pump output. Start the engine and disconnect the fuel outlet tube and place a clean container under the tube to check the fuel output.

OUTPUT : 40CC / 1,700rpm / 10 seconds

MEMO

COOLING SYSTEM



6. COOLING SYSTEM

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SERVICE INFORMATION

NOTE

6

- Do not remove the radiator cap if the coolant temperature is over 100°C. Removing the cap while the engine is hot and the coolant is under pressure may cause serious scalding. When the temperature is below, carefully remove the cap with a cloth.
- Cooling system service should be done while the engine is cool.
- Radiator coolant is toxic. Keep it away from skin, eyes and clothes.
 - If any coolant gets on your skin or clothes, rinse thoroughly with soap and water.
 - If any coolant gets in your eyes, rinse them with water and consults a doctor immediately.
 - If any coolant is swallowed, induce vomiting, gargle and consult a physician immediately.
 - Especially pay attention to reserve the coolant. Keep out of reach of children.

- Do not remove the radiator cap except to refill or drain the cooling system after servicing the cooling system.
- Avoid spilling coolant on painted surfaces. If contaminated, wash in water immediately.
- After disassembling or servicing the cooling system, check for leaks with a radiator cap tester.

SPECIFICATIONS

RADIATOR CAP RELIEF PRESSURE		0.9 ± 0.1kg/cm ²	
THERMOSTAT TEMPERATURE	BEGIN TO OPEN	80 ± 2°C	
	FULLY OPEN	90°C	
	VALVE LIFT	3.5~4.5mm	
COOLANT CAPACITY		Total system 1400 ± 20cc	RADIATOR: 1000 ± 20cc RESERVE TANK : 400 ± 20cc

TORQUE VALUES :

WATER PUMP IMPELLER :	0.98~1.37kgf · m
WATER PUMP COVER BOLT:	0.78~1.18kgf · m

TROUBLESHOOTING

Engine temperature too high

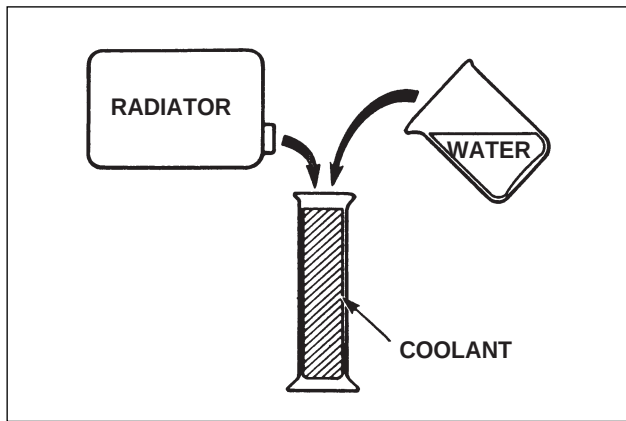
- Faulty temperature gauge or thermo sensor
- Air in cooling system
- Faulty thermostat stuck (Thermostat stuck closed)
- Passages blocked in radiator, hoses or water jacket
- Faulty fan motor switch
- Faulty water pump

Engine temperature too low or unstable

- Faulty temperature gauge or thermo sensor
- Faulty thermostat stuck (Thermostat stuck open)
- Faulty fan motor switch

Coolant leaks

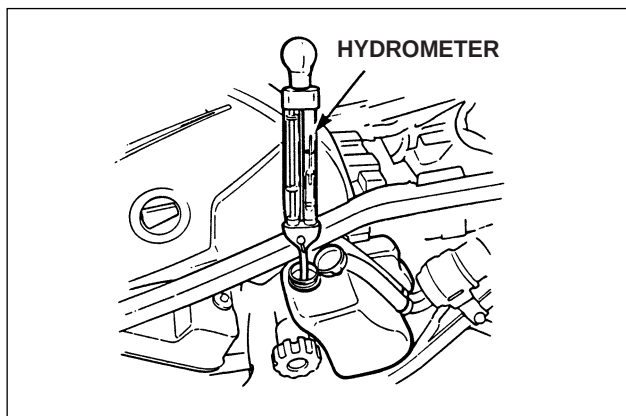
- Faulty water pump mechanical seal
- Damaged or deteriorated O-rings
- Faulty radiator cap
- Damaged or deteriorated gasket
- Loose hose connection or clamp



RADIATOR COOLANT MIXTURE CHART (ANTICORROSIVE AND ANTIFREEZE)

When the whole capacity of coolant is 2000cc (Unit:cc)

Minimum temperature	Mixture	Ratio	Hydrometer
-9°C	20%	400	1,600
-16°C	30%	600	1,400
-25°C	40%	800	1,200
-37°C	50%	1,000	1,000
-44.5°C	60%	1,100	900



COOLANT GRAVITY CHART

COOLANT TEMPERATURE °C	0	5	10	15	20	25	30	35	40	45	50
COOLANT RATIO %											
5	1.009	1.009	1.008	1.009	1.007	1.006	1.005	1.003	1.001	0.999	0.997
10	1.018	1.017	1.017	1.016	1.015	1.014	1.013	1.011	1.009	1.007	1.005
15	1.028	1.027	1.026	1.025	1.024	1.022	1.020	1.018	1.016	1.014	1.012
20	1.036	1.035	1.034	1.033	1.031	1.029	1.027	1.025	1.023	1.021	1.019
25	1.045	1.044	1.043	1.042	1.040	1.038	1.036	1.034	1.031	1.028	1.025
30	1.053	1.052	1.051	1.049	1.047	1.045	1.043	1.041	1.038	1.035	1.032
35	1.063	1.062	1.060	1.058	1.056	1.054	1.052	1.049	1.046	1.043	1.040
40	1.072	1.070	1.068	1.066	1.064	1.062	1.059	1.056	1.053	1.050	1.047
45	1.080	1.078	1.076	1.074	1.072	1.069	1.066	1.063	1.060	1.057	1.054
50	1.086	1.084	1.082	1.080	1.077	1.074	1.071	1.068	1.065	1.062	1.059
55	1.095	1.093	1.091	1.088	1.085	1.082	1.079	1.076	1.073	1.070	1.067
60	1.100	1.098	1.095	1.092	1.089	1.086	1.083	1.080	1.077	1.074	1.071

COOLANT

COOLANT INSPECTION

- Radiator coolant mixes the distilled water.

NOTE

- Coolant mixes the distilled water and radiator coolant base solution with about 5°C of tolerance in respect to the minimum temperature.

WARNING

- Radiator coolant is toxic. Keep it away from skin, eyes and clothes.
- If any coolant gets on your skin or clothes, rinse thoroughly with soap and water.
- If any coolant gets in your eyes, rinse them with water and consults a doctor immediately.
- If any coolant is swallowed, induce vomiting, gargle and consult a physician immediately.
- Especially pay attention to reserve the coolant. Keep out of reach of children.

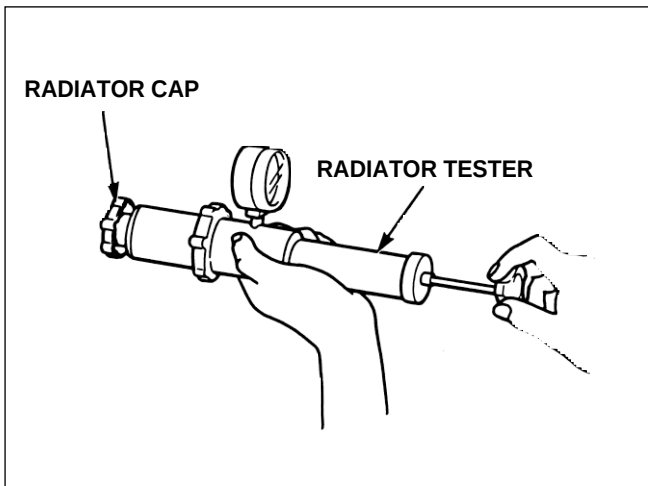
COOLING SYSTEM INSPECTION

COOLANT GRAVITY TEST

NOTE

- Follow the hydrometer manufacturer's instructions.

- Check the coolant gravity using a hydrometer.
- Look for contamination of the coolant.



COOLING SYSTEM TEST

- Install the radiator cap onto the radiator tester.
- Press it with specified pressure and it must keep the pressure for at least six seconds.

NOTE

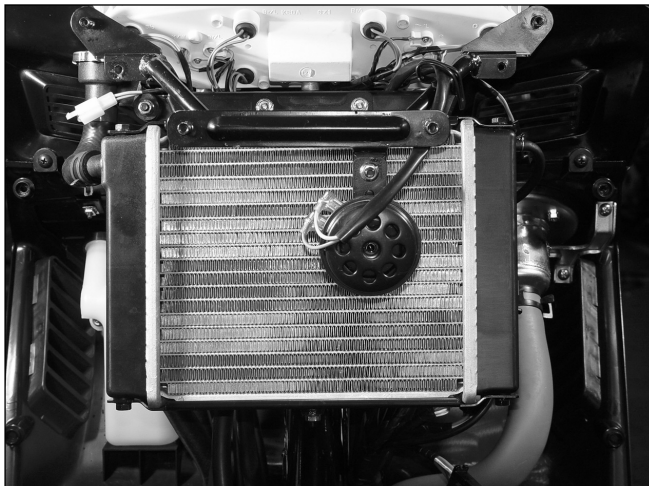
- Apply water to the cap sealing surface before the test.

Radiator Cap Relief Pressure : $0.9 \pm 0.15 \text{ kg/cm}^2$

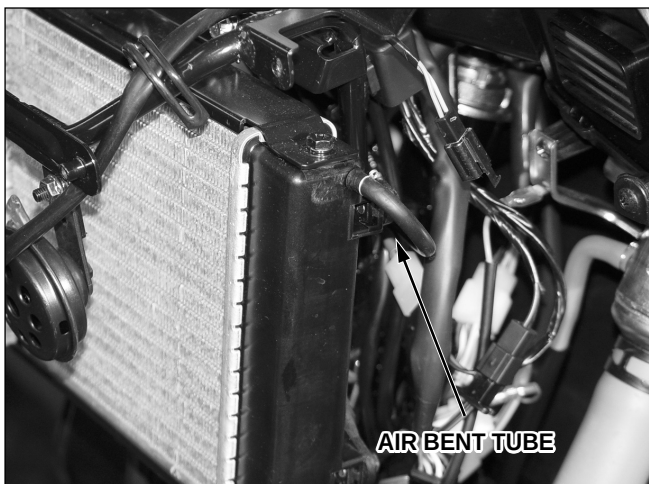


RADIATOR INSPECTION

- Remove the front cover.
- Remove the under cover A.



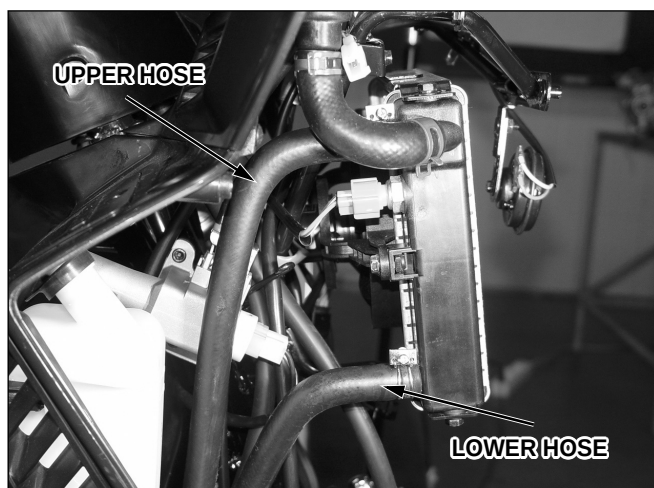
- Inspect the radiator soldered joints and seams for leaks.
- Blow dirt out from between core fins with compressed air.



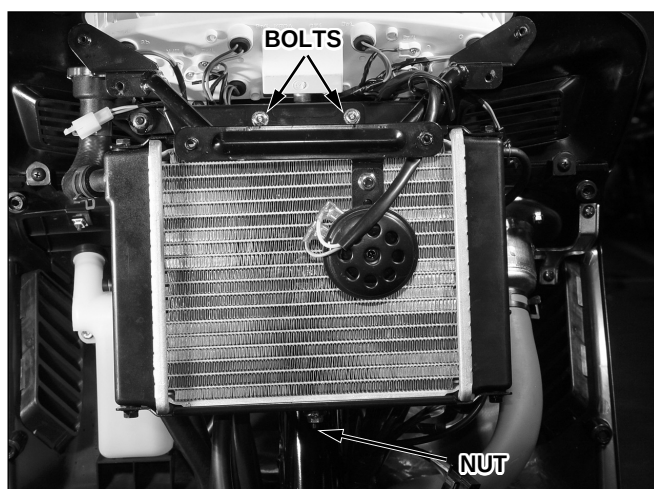
REMOVAL

- Drain the coolant.
- Disconnect the air vent tube from the radiator filler.
- Remove the overflow tube clamp and disconnect the overflow tube.

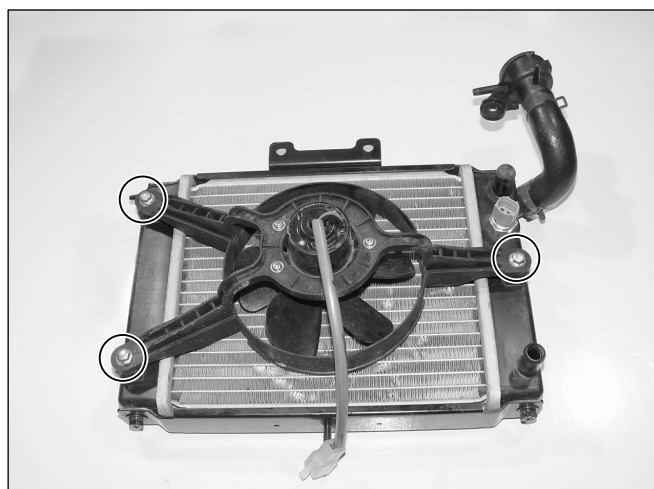
COOLING SYSTEM



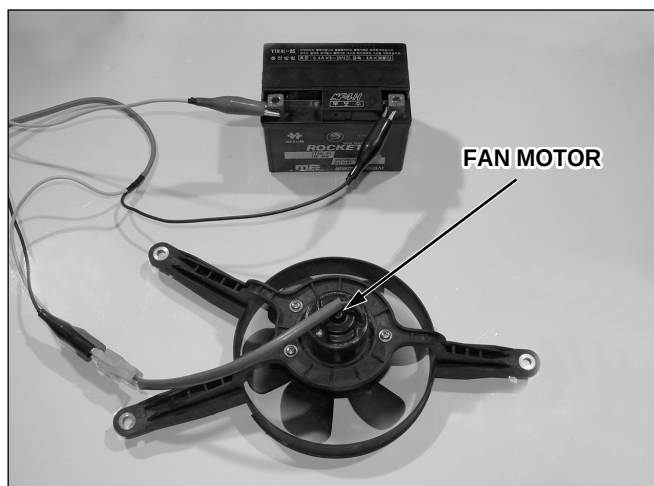
- Loosen the hose band and disconnect the upper hose and lower hose from the radiator.
- Disconnect the thermostatic switch wire coupler.
- Disconnect the fan motor wire coupler.



- Remove the 2 bolts and 1 nut on the radiator.



- Remove the 3 bolts and then remove the fan/shroud from the radiator.

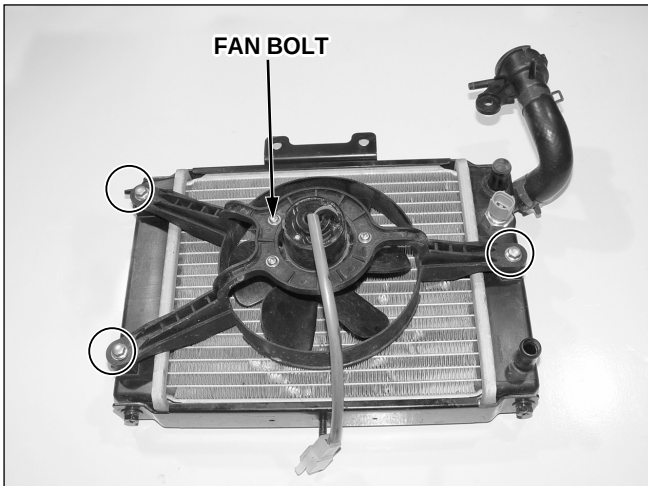


- Check fan motor by battery.

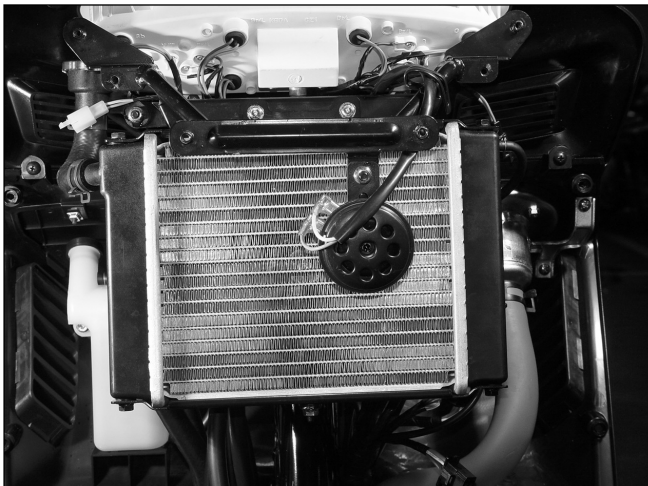


CHECK THERMOSTATIC SWITCH

- When coolant temperature lower then 83~87° C the thermostatic switch OFF.
- When coolant temperature over 88~92° C the thermostatic switch ON.

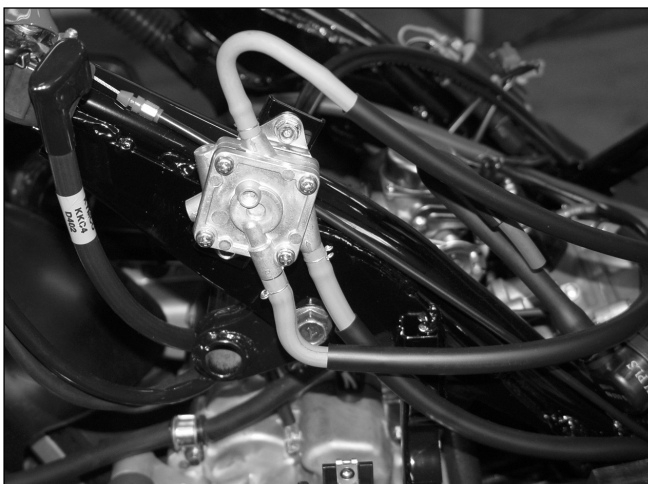


- Install the fan shroud on the radiator with the 3 bolts.

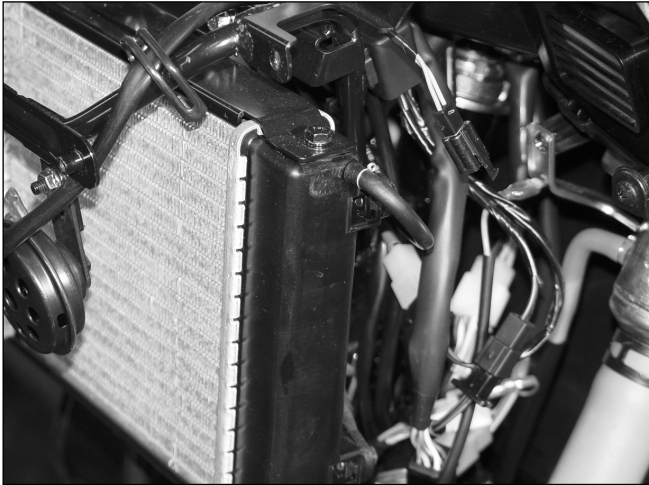


RADIATOR INSTALLATION

- Install the radiator on the radiator bracket with the 2 bolts and 1 nut.



- Connect the upper and lower hoses and secure them with hose bands.
- Connect the thermostatic switch wire and fan motor wire couplers.



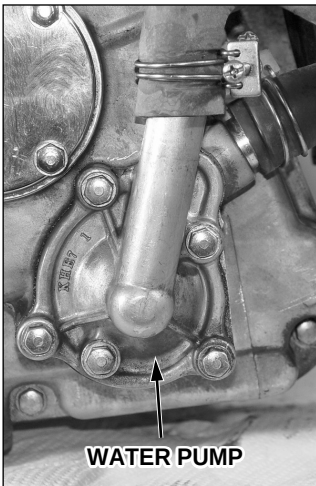
- Connect the overflow tube and secure with the tube clamp.
- Fill the radiator with coolant.
- Connect the vent tube to the radiator filler.
- After installation, check for coolant leaks.

⚠ NOTE

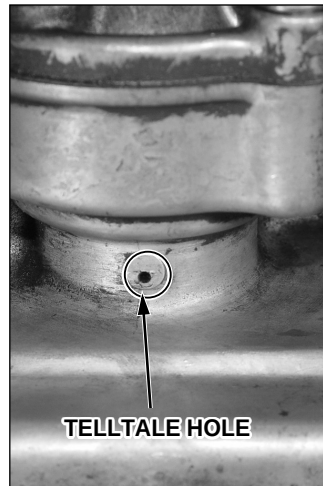
• If you want to refill the coolant, the following procedure must be checked.

1. Please make the radiator filler and the air vent tube to be separated.
2. Then start the engine, filled in the coolant till the coolant flowed out from the air vent tube.
3. Put the air vent tube on.

- Install the front cover.



WATER PUMP



TELLTALE HOLE

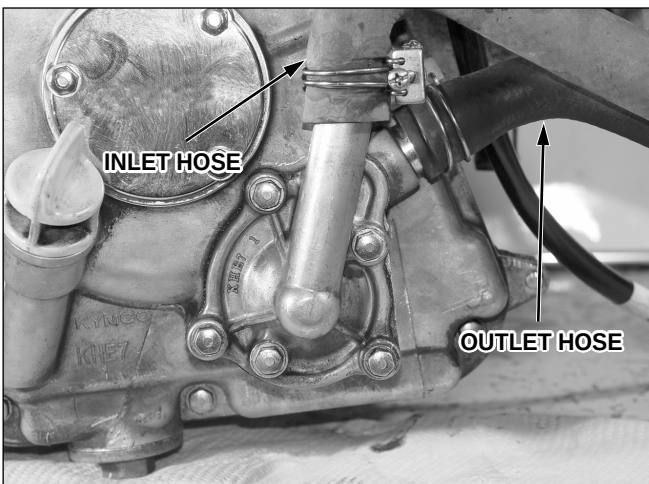
WATER PUMP

MECHANICAL SEAL (WATER SEAL) INSPECTION

- Inspect the telltale hole for signs of mechanical seal coolant leakage.
- If the mechanical seal is leaking, remove the right crankcase cover and replace the mechanical seal.

WATER PUMP/IMPELLER REMOVAL

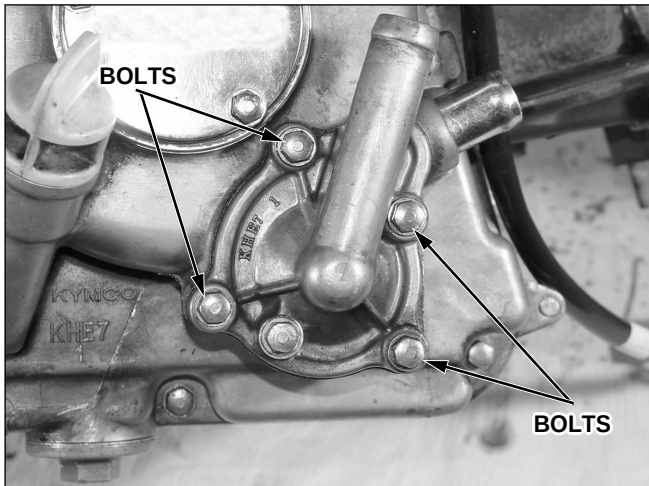
- Remove the coolant inlet hose and outlet hose.



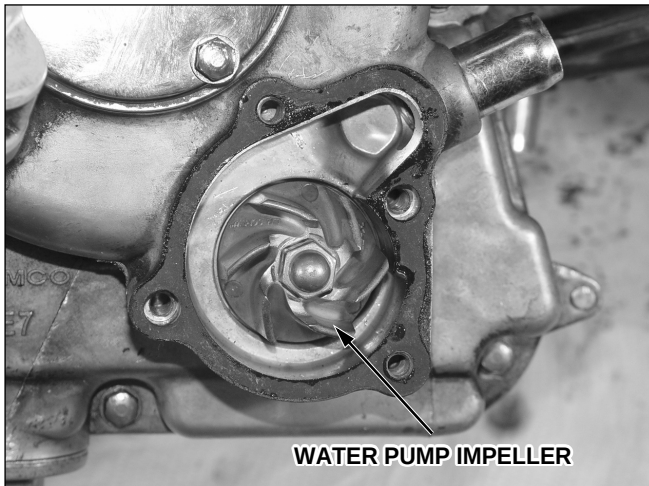
INLET HOSE

OUTLET HOSE

COOLING SYSTEM



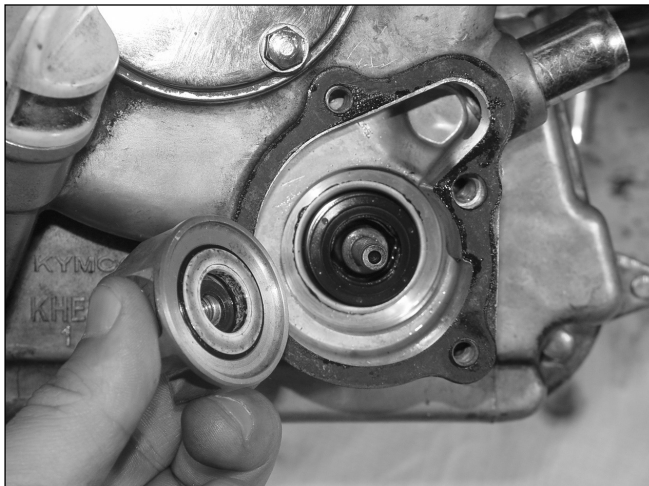
- Remove the 4 bolts and the water pump cover.
- Remove the gasket and 2 dowel pins.



- Remove the water pump impeller.

⚠ NOTE

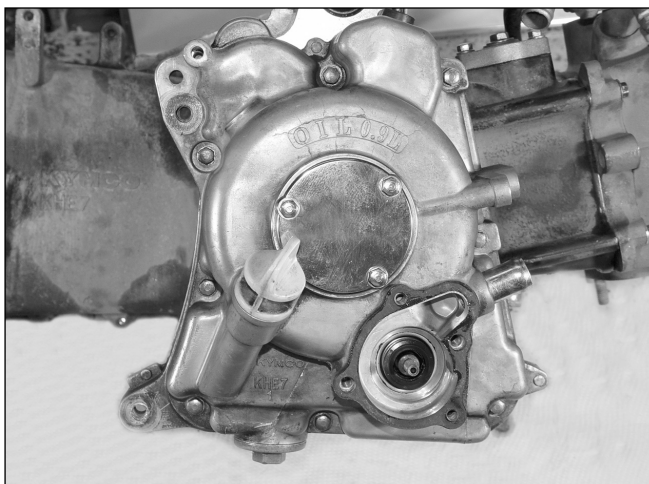
- The impeller has left hand threads.



- Inspect the mechanical (water) seal and seal washer for wear or damage.

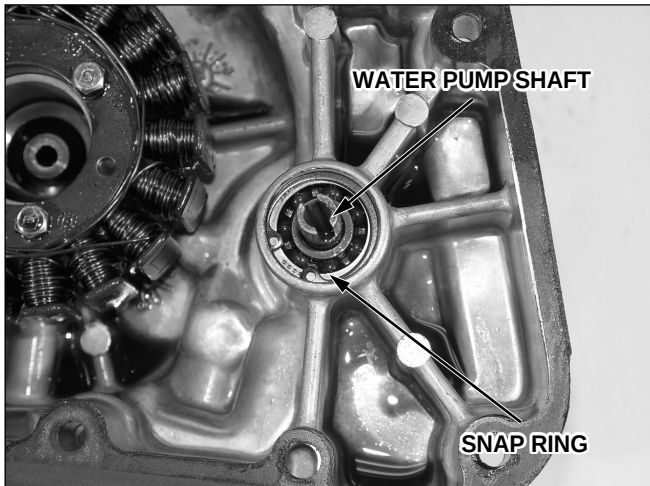
⚠ NOTE

- The impeller has left hand threads.

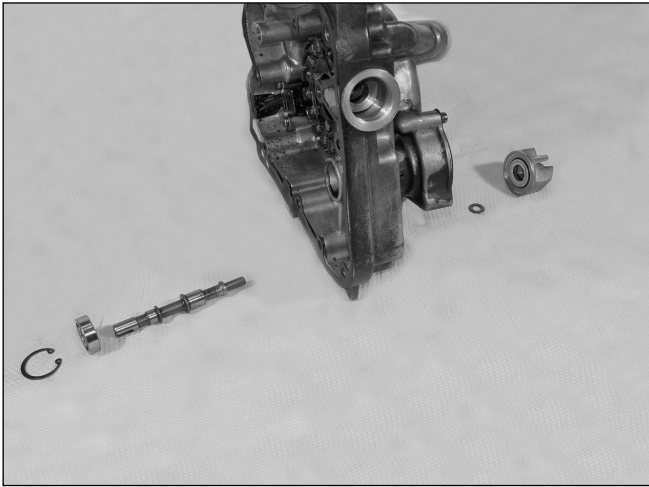


WATER PUMP SHAFT REMOVAL

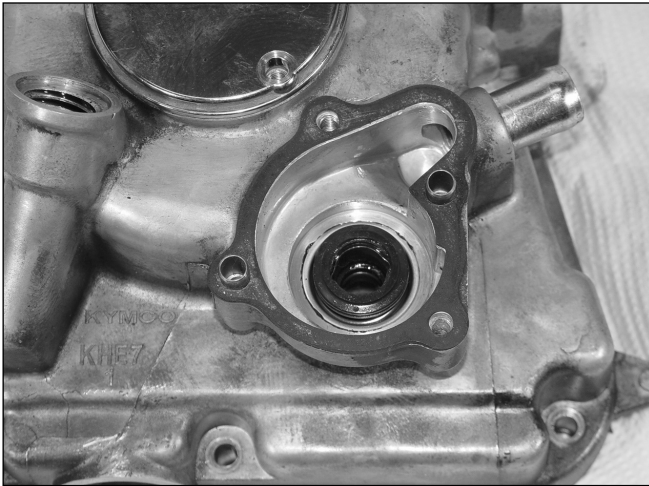
- Disconnect the water hose from the right crankcase cover.
- Remove the eight bolts attaching the right crankcase cover.



- Remove the water pump bearing snap ring from the water pump assembly.
- Remove the water pump shaft and inner bearing.



- Remove the water pump shaft outer bearing.



MECHANICAL SEAL REPLACEMENT

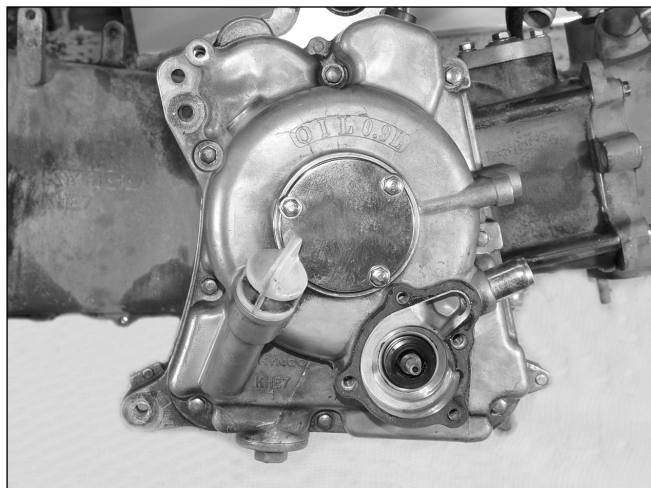
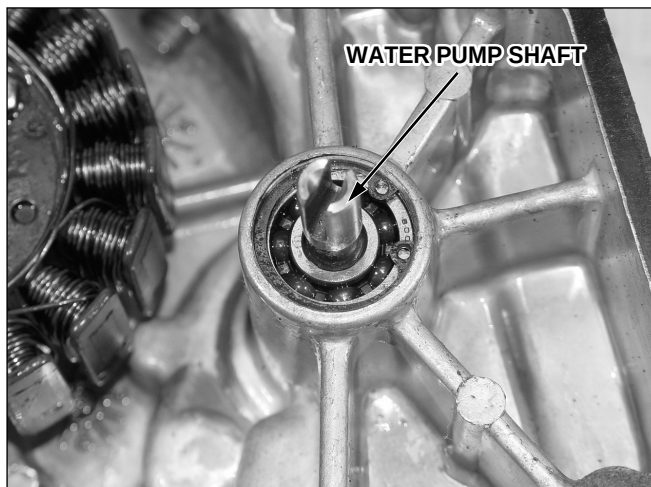
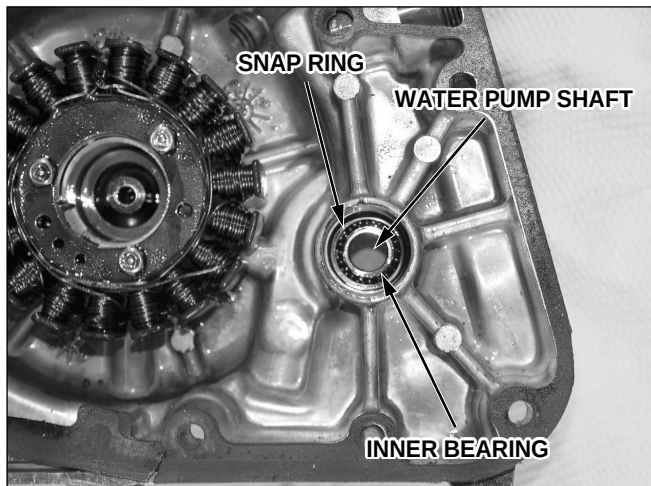
- Drive the mechanical seal out of the water pump assembly from the inside.



- Drive in a new mechanical seal using a mechanical seal driver.

⚠ NOTE

- Apply sealant to the right crankcase cover fitting surface of a new mechanical seal and then drive in the mechanical seal.



WATER PUMP SHAFT INSTALLATION

- Drive a new water pump shaft outer bearing into the water pump assembly from the inside.

- Install the water pump shaft and shaft inner bearing into the waster pump assembly.
- Install the snap ring to secure the inner bearing properly.

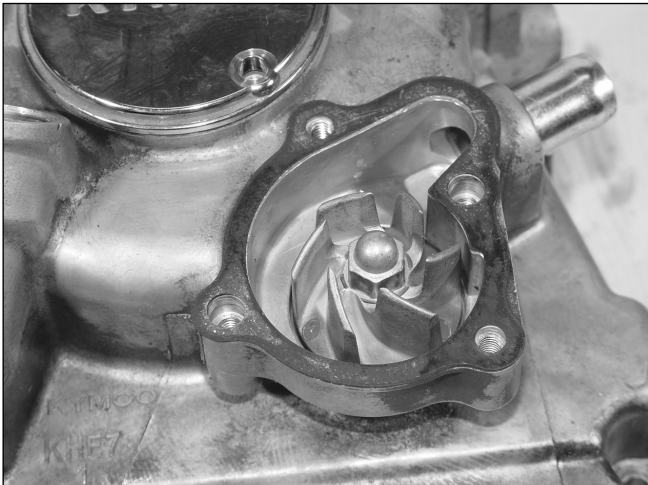
- Install the dowel pins and a new gasket and then install the water pump assembly to the right crankcase cover.
- Tighten the 8 bolts to secure the right crankcase cover.

⚠ NOTE

- When installing the water pump assembly, aligning the groove on the water pump shaft with the tab on the oil pump shaft.

WATER PUMP / IMPELLER INSTALLATION

- When the mechanical seal is replaced, a new seal washer must be installed to the impeller.

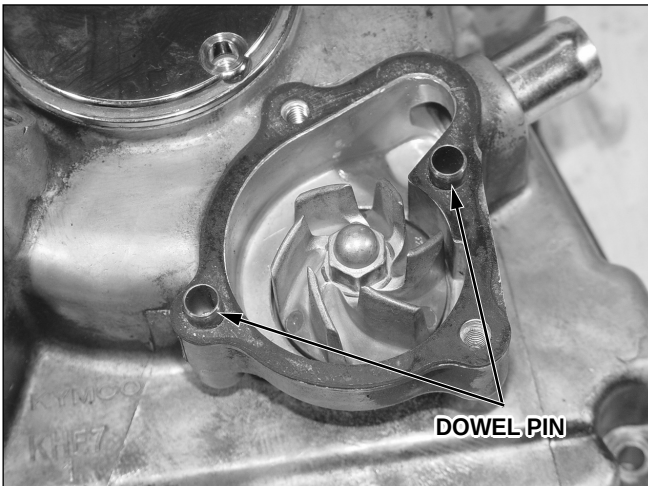


- Install the impeller onto the water pump shaft.

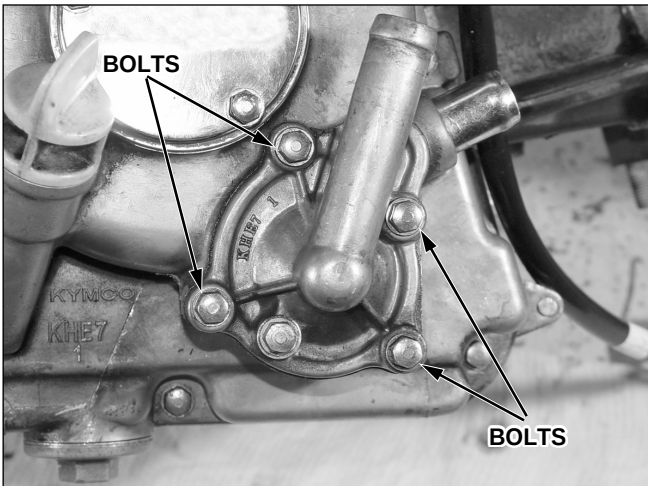
TORQUE VALUE : 0.98~1.37kgf · m



- The impeller has left hand thread.

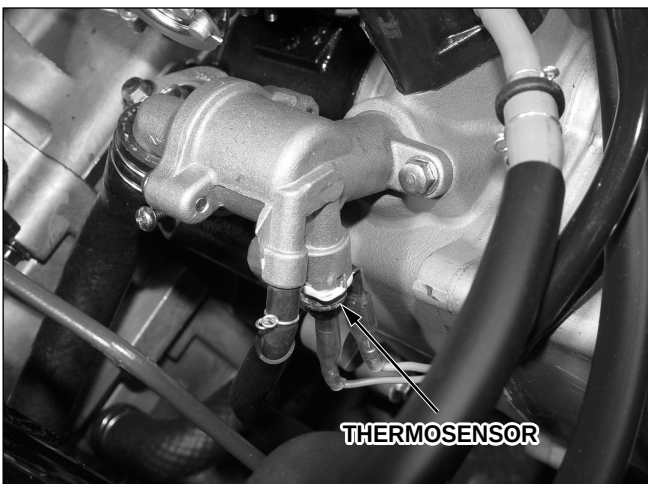


- Install the 2 dowel pins and a new gasket.



- Install the water pump cover and tighten the 4 bolts.

TORQUE VALUE : 0.78~1.18kgf · m

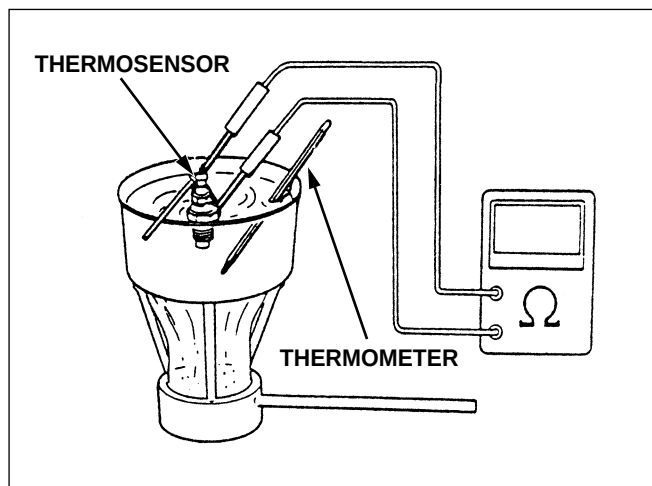


THERMOSENSOR

REMOVAL

- Remove the seat, met-in box and center cover.
- Drain the coolant.
- Disconnect the thermosensor wire.
- Remove the thermosensor.

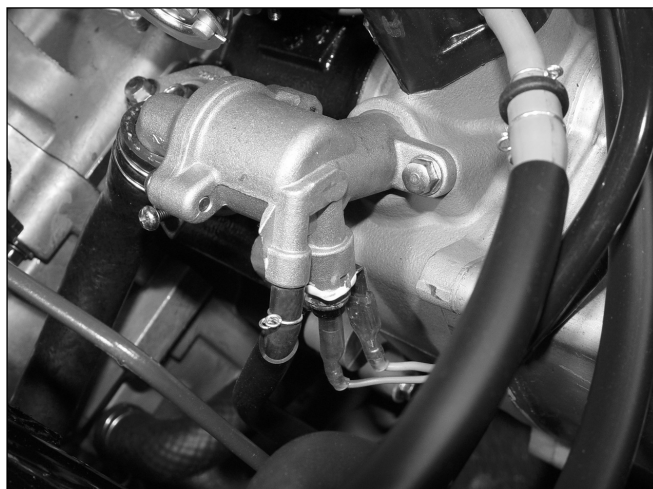
COOLING SYSTEM



INSPECTION

- Suspen the thermosensor in a pan of water over a burner and measure the resistance through the sensor as the water heats up.

Temperature(° C)	50	80	100	120
Resistance(Ω)	154	52	27	16

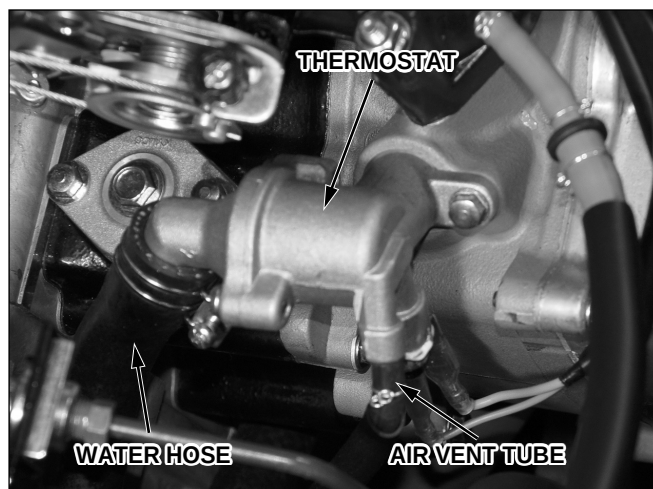


INSTALLATION

- Apply a sealant to the themosensor threads and install it into the thermostat housing.
- Connect the thermosensor wire.
- Fill the radiator with coolant.
- Install the center cover, met-in box and seat.

NOTE

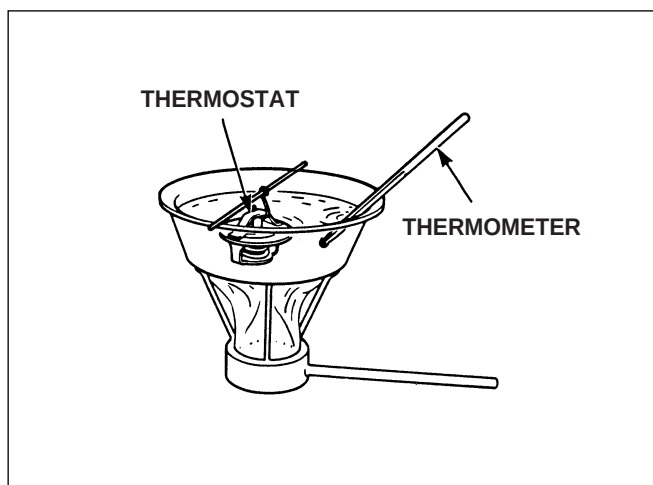
- Be sure to bleed air from the cooling system.



THERMOSTAT

REMOVAL

- Remove the seat, met-in box and center cover.
- Drain the coolant.
- Disconnect the thermosensor wire from the thermosensor.
- Disconnect the water hose from the thermostat housing.
- Disconnect the air vent tube from the thermostat housing.
- Remove the mounting bolt and the thermostat housing from the cylinder head.
- Remove the 2 bolts and separate the thermostat housing halves.
- Remove the thermostat from the thermostat housing.



INSPECTION

- Suspend the thermostat in a pan of water over a burner and gradually raise the water temperature to check its operation.

Technical Data

Begins to open	$80 \pm 2^{\circ}\text{C}$
Full-open	90°C
Valve lift	3.5~4.5mm

NOTE

- Do not let the thermostat touch the pan as it will give a false reading.
- Replace the thermostat if the valve stays open at room temperature.
- Test the thermostat after it is opened for about 5 minutes and hold the temperature at 70°C

INSTALLATION

- Install in the reverse order of removal.

NOTE

- Replace the O-ring with a new one and apply grease to it.

MEMO

7. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION	7-1
ENGINE REMOVAL	7-2
ENGINE INSTALLATION	7-3

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.

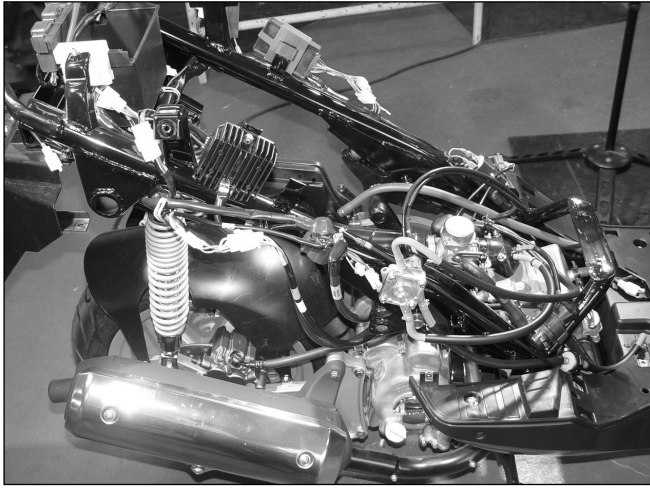
- Drain the coolant before removing the engine.
- After the engine is installed, fill the cooling system with coolant and be sure to bleed air from the water jacket.
- Start the engine to check for coolant leaks.

TORQUE VALUES :

ENGINE HANGER BOLT (ENGINE) : 4.9kgf · m
(FRAME) : 3.9kgf · m

SPECIFICATIONS :

- ENGINE DRY WEIGHT : 30Kg
- ENGINE OIL CAPACITY : 1.1 (disassembly)
- COOLANT CAPACITY
TOTAL CAPACITY : 1,400 ± 20cc
RADIATOR CAPACITY : 1,000 ± 20cc
RESERVE TANK CAPACITY : 400 ± 20cc



ENGINE REMOVAL

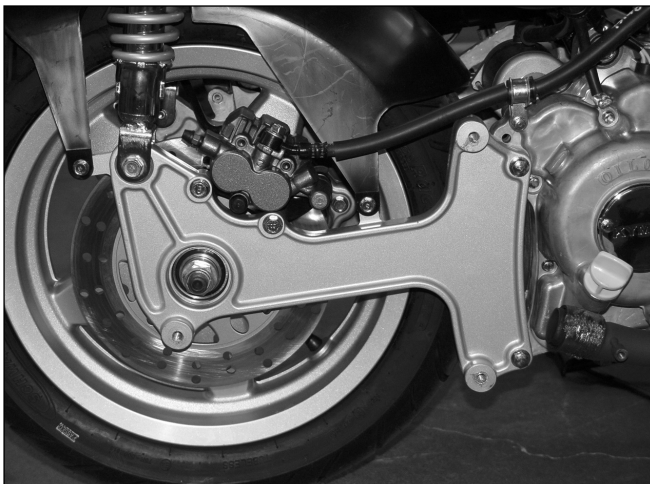
- Disconnect the battery ⊖ cable.
- Remove the frame body cover.
- Disconnect the engine ⊖ cable.
- Disconnect the A.C generator, auto bystarter, spark plug, thermosensor wire couplers and connectors.
- Disconnect the engine fuel tube.
- Drain the coolant.
- Disconnect the water hose.



- Disconnect the starter motor wire from the starter relay.



- Disconnect the fuel tube and vacuum tube.
- Disconnect the vacuum tube from the air cut-off valve (ACV)
- Disconnect the throttle cable from the carburetor.



- Remove the brake fluid tube bolt of the rear brake caliper.
- Remove the rear brake caliper bolt and the rear brake caliper.

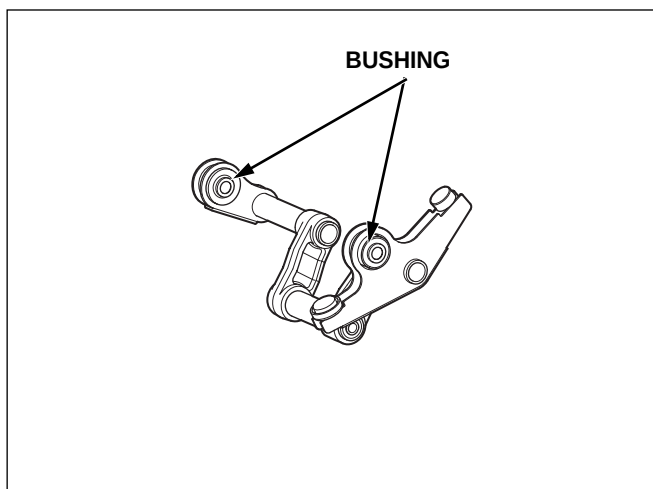
ENGINE REMOVAL/INSTALLATION



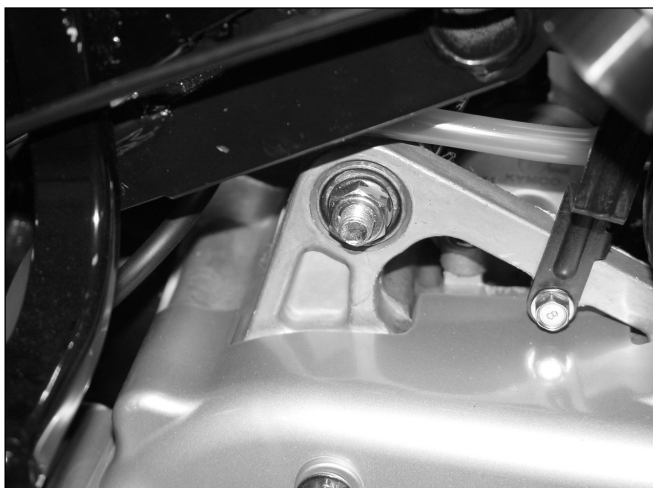
- Remove the R/L rear shock absorber upper mount bolts.



- Remove the engine mounting bolt and pull out the engine.



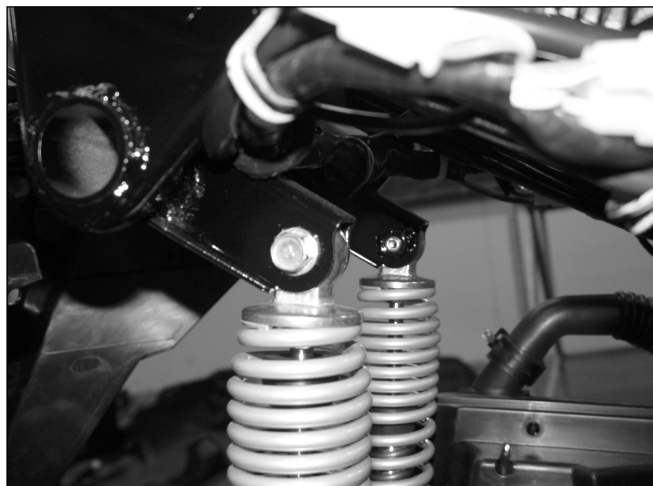
- Remove the engine hanger bolts to remove the engine hanger.
- Inspect the engine hanger bushing stopper rubber for wear or damage.



ENGINE INSTALLATION

- Tighten the engine mounting nut.

TORQUE VALUE : 4.9kgf · m



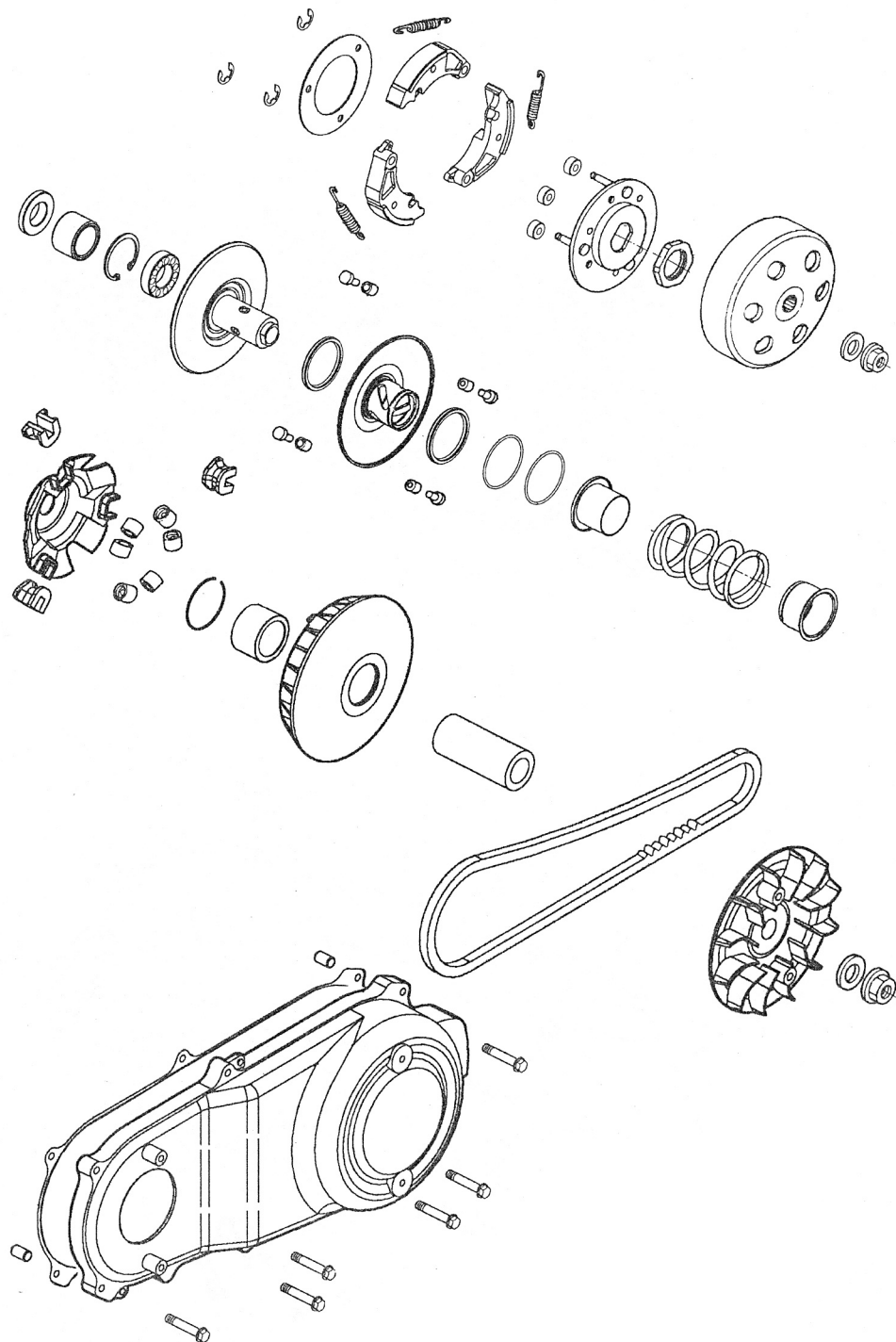
- Tighten the rear shock absorber upper mount bolts.

TORQUE VALUE : 3.92kgf · m

After installation, inspect and adjust the following:

- Throttle grip free play.
- Fill the rear brake reservoir with brake fluid and bleed air from the rear brake.
- Fill the cooling system with coolant and start the engine to bleed air from the system.

MEMO



8. LH. CRANKCASE COVER/CONTINUOUSLY VARIABLE TRANSMISSION

SERVICE INFORMATION . . . 8-1

TROUBLESHOOTING 8-1

LH. SIDE COVER REMOVAL . 8-2

DRIVE PULLY 8-3

CLUTCH DRIVEN PULLY . . . 8-7

SERVICE INFORMATION

WARNING

- Do not allow oil to contact the drive belt or the pulley face. The transmission rate of driving force is reduced with oil contact.
- Do not operate starter motor while the L. crank case front cover is removed.

SPECIFICATIONS

ITEM	STANDARD	SERVICE LIMIT
MOVABLE DRIVE FACE BUSHING INNER DIAMETER	40.000~40.025mm	40.06mm
DRIVE FACE COLLAR OUTER DIAMETER	39.965~39.955mm	39.85mm
DRIVE BELT WIDTH	23.6~24.4mm	22.0mm
CLUTCH LINING WICTH	3.963~4.037mm	2.0mm
CLUTCH OUTER AND INNER DIAMETER	153.0~153.2mm	153.5mm
WEIGHT ROLLER OUTER DIAMETER	22.92~23.08mm	22.0mm
DRIVEN FACE BOSS OUTER DIAMETER	26.960~26.974mm	26.90mm
MOVABLE DRIVEN FACE INNER DIAMETER	27.052~26.989mm	27.13mm

8

TORQUE VALUES :

DRIVE FACE NUT : 8.82~9.8kgf · m
CLUTCH OUTER NUT : 4.9~5.88kgf · m
CLUTCH DIRVE PLATE NUT : 4.9~5.88kgf · m

TROUBLESHOOTING

Engine starts but motorcycle does not work.

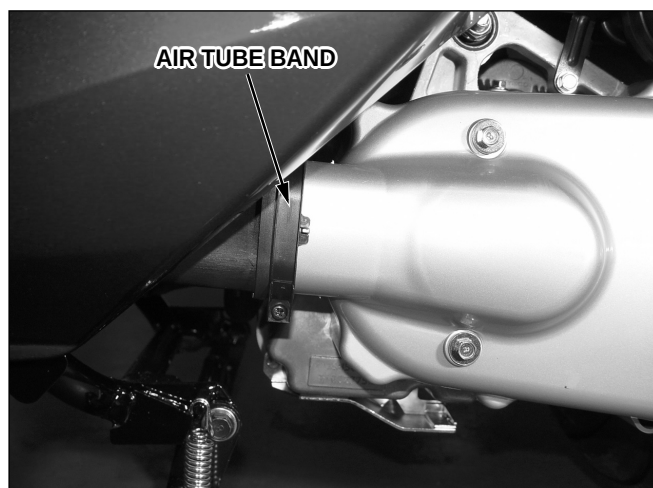
- Drive belt worn.
- Ramp plate damaged.
- Clutch shoe worn or damaged.
- Movable driven face spring cut.

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

- Clutch shoe spring cut.

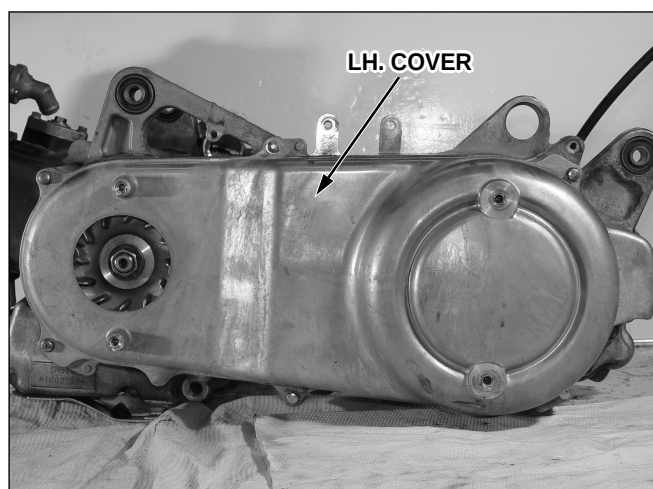
Vehicle unable to run at the maximum speed, or lack of output

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



LH. CRANKCASE COVER REMOVAL

- Remove the bolts securing LH. side cover.
- Loosen the air tube screw.
- Remove the air tube.

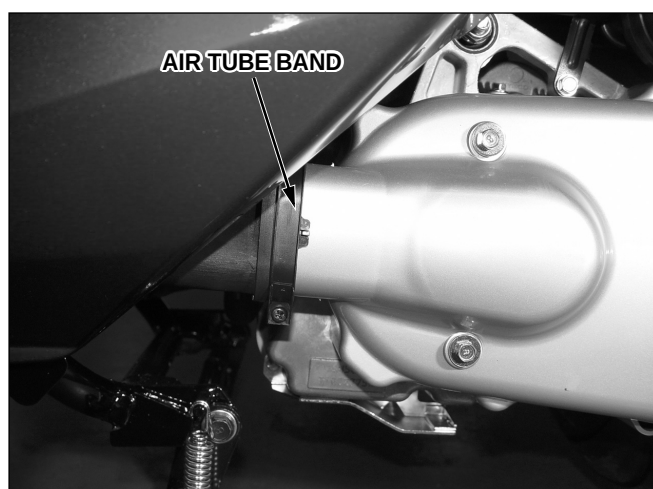


- Loosen the LH. cover bolts.
- Remove the LH. crankcase cover.
- Remove the and dowel pin.

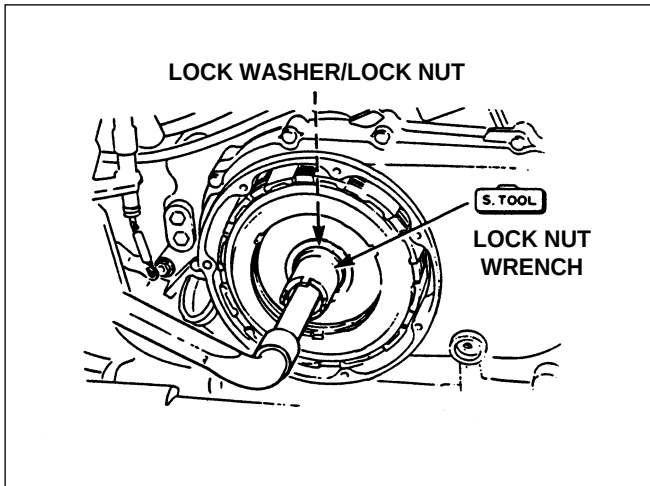


INSTALLATION

- Install the gasket and dowel pin.
- Install the LH. side cover.
- Install the cable clamp.
- Install the LH. side cover bolts.



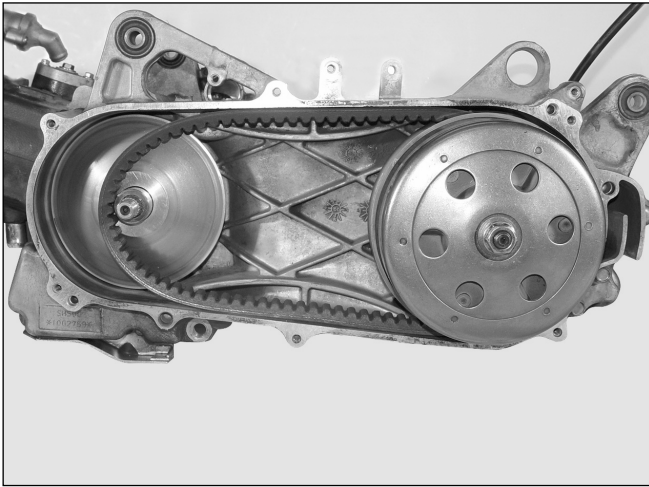
- Install the air tube and tighten it with the band screw.



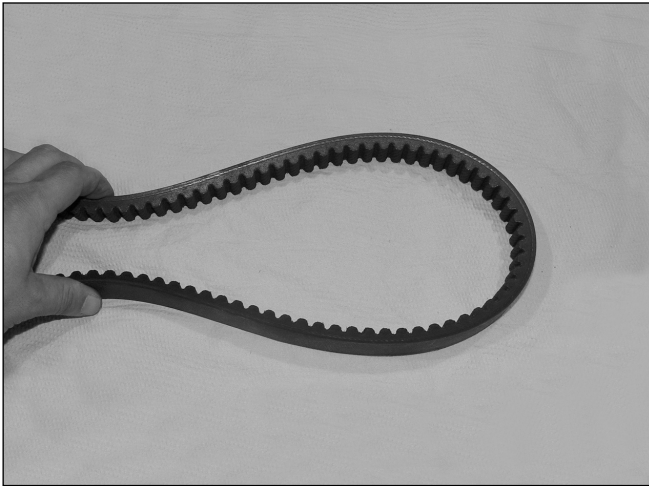
DRIVE FULLEY

REMOVAL

- Remove the LH. crankcase cover.
- Loosen the Drive face flange nut with the drive face holder.
- Remove the drive face.



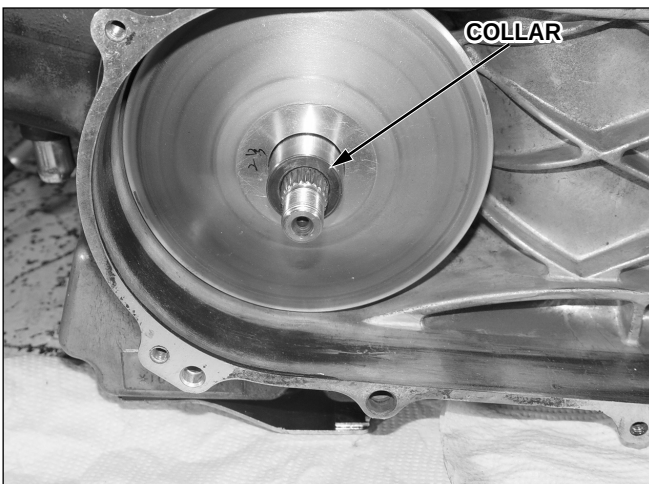
- Remove the drive bolt from the movable drive face.



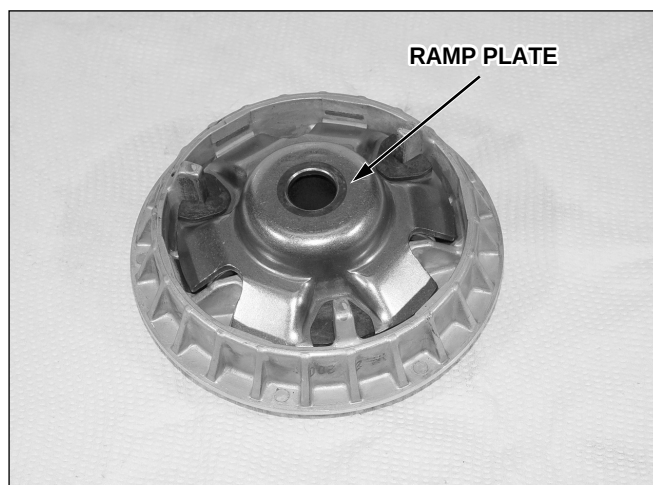
INSPECTION

- Check the drive bolt for cracks separation or abnormal or excessive wear.
- Inspect the drive belt width.

SERVICE LIMIT : 22.0mm replace if below

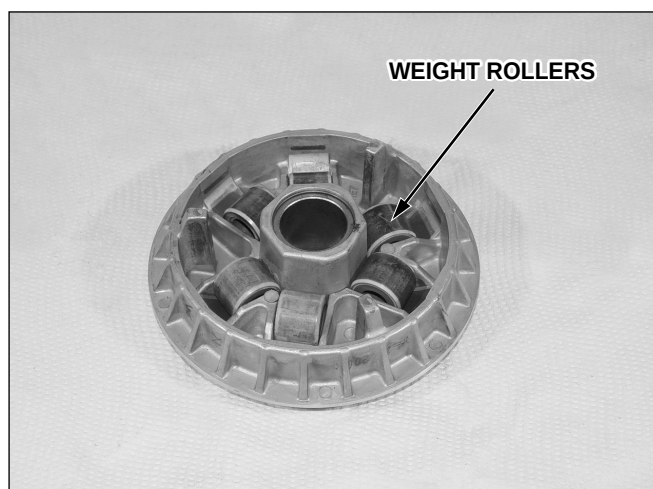


- Remove the movable drive face assembly.
- Remove the drive pulley collar.



DISASSEMBLY

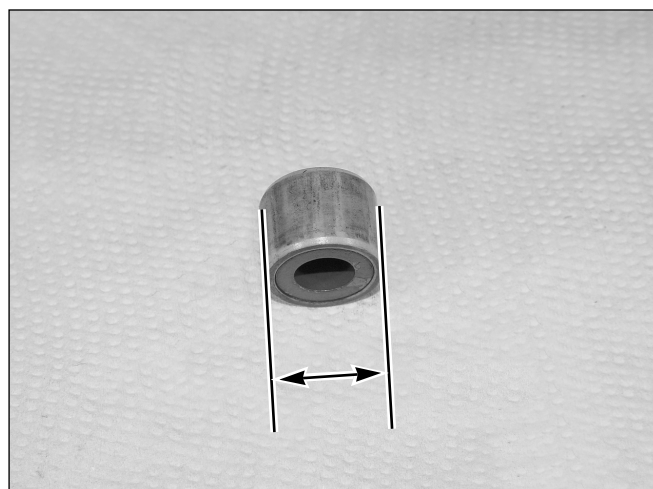
- Remove the ramp plate.



- Remove the weight rollers.

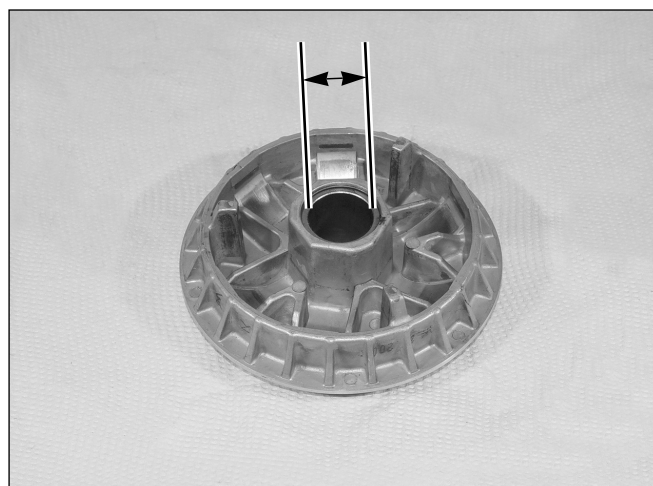
NOTE

- Check the pump shaft to rotate smoothly.



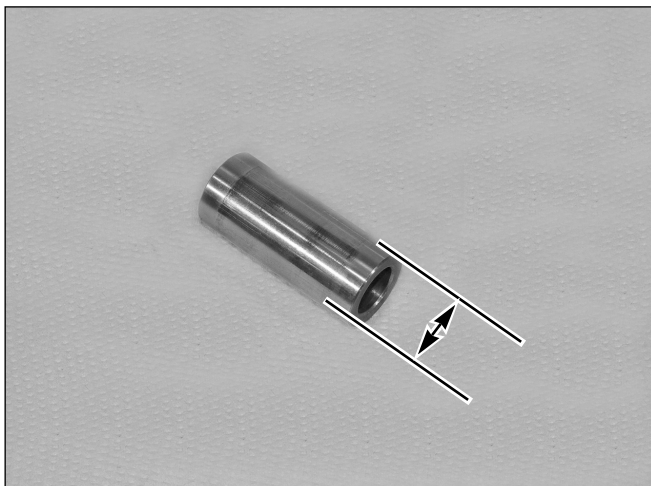
- Check the weight roller for wear or damage.
- Measure the weight roller O.D.

SERVICE LIMIT : 22mm replace if below



- Measure the movable drive face bushing I.D.

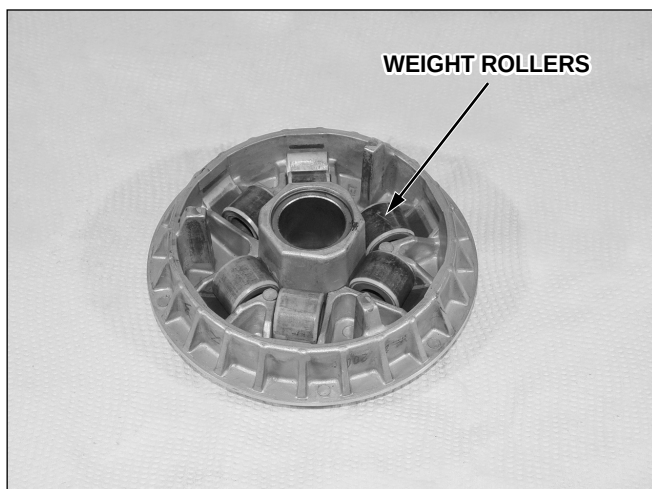
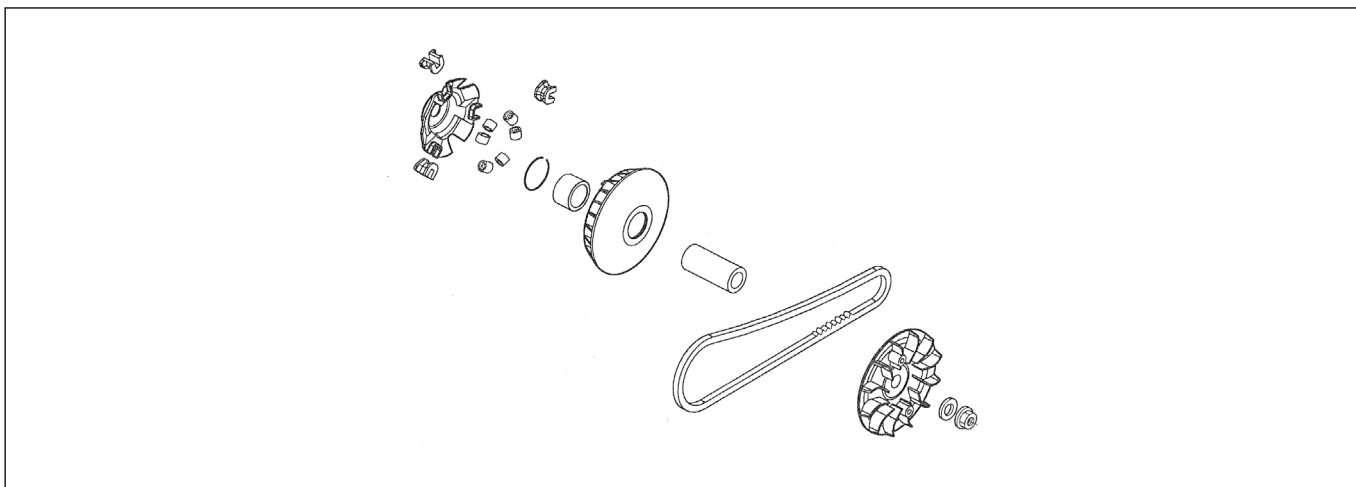
SERVICE LIMIT : 27.13mm replace if over



- Check the drive pulley collar for damage or wear.
- Measure the O.D of the drive pulley collar sliding surface.

SERVICE LIMIT : 26.9mm replace if below

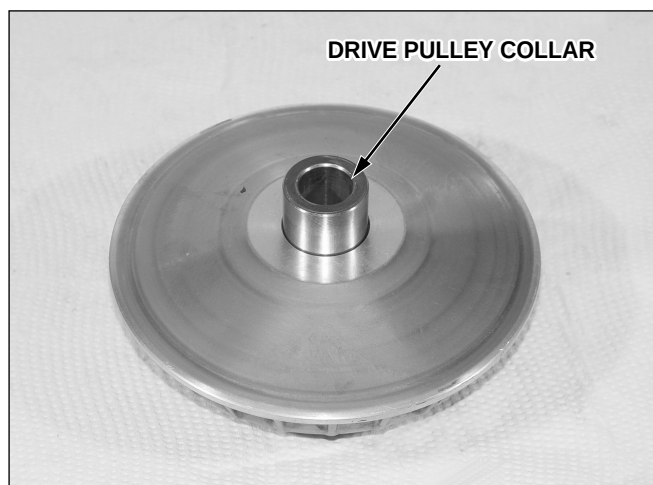
ASSEMBLY



- Install the weight rollers into the movable face.



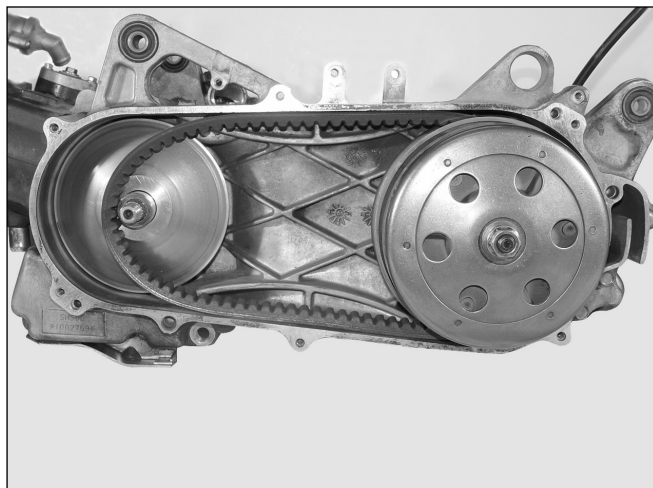
- Install the ramp plate.



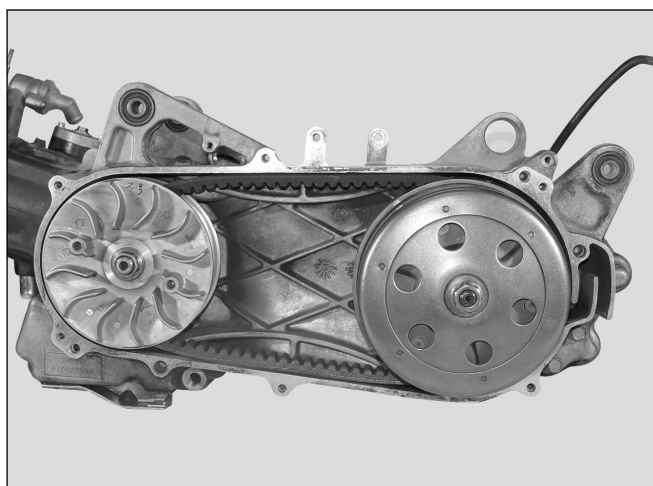
- Insert the drive pulley collar into the movable drive face.



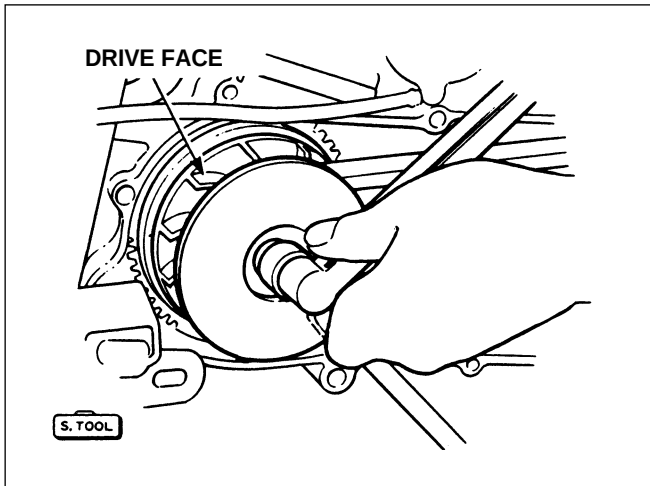
- Install the movable drive face onto the crankshaft.



- Lay the drive belt on the driven pulley.
Set the drive belt on the drive pulley collar.



- Install the washer and drive nut into the drive pulley face temporarily.

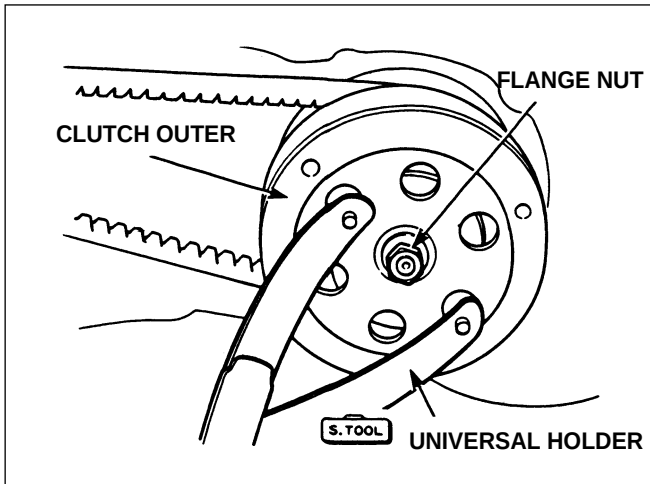


- Hold the drive pulley with the drive face holder and tighten the drive face nut.

TORQUE VALUE : 8.82~9.8kgf · m

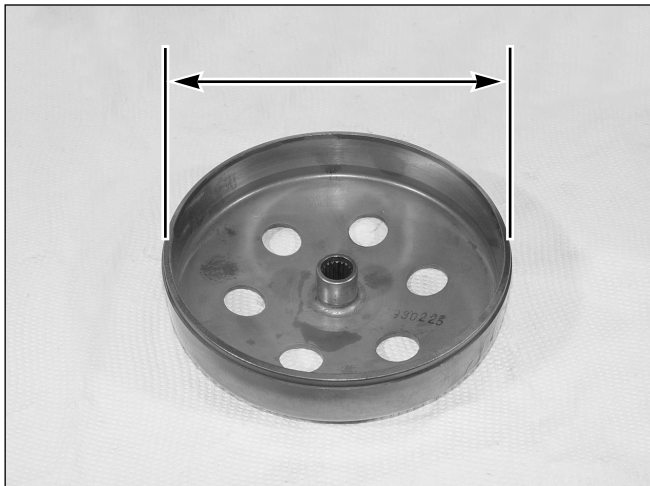
NOTE

- Do not get the grease on the drive belt or drive pulley faces.



CLUTCH/DRIVEN PULLEY

- Remove the left crankcase cover.
- Remove the drive pulley and drive belt.
- Hold the clutch outer with the universal holder and remove the clutch outer nut.
- Remove the clutch outer.



INSPECTION

- Inspect the clutch outer for wear or damage.
- Measure the clutch outer I.D.

SERVICE LIMIT : 153.5mm replace if over



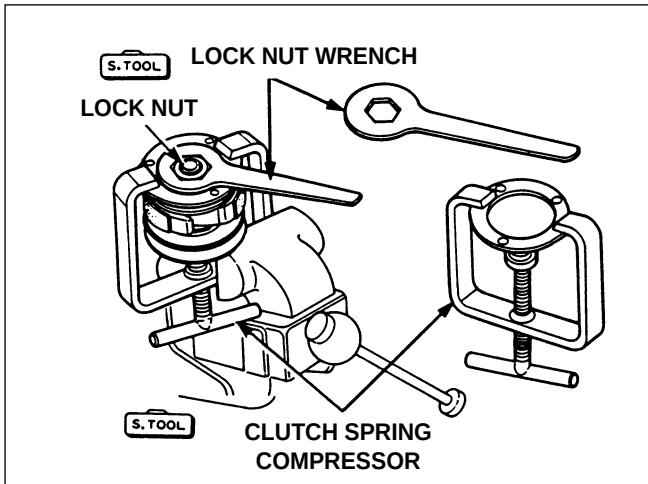
- Check the clutch shoes for wear or damage.
- Measure the clutch lining thickness.

SERVICE LIMIT : 2.0mm replace if below

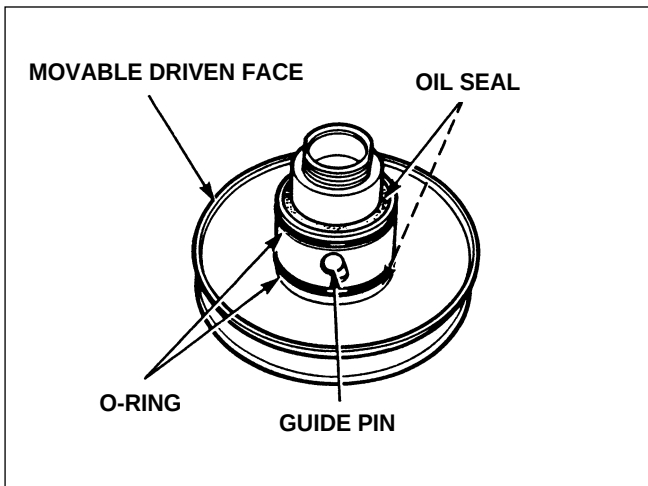
CLUTCH/DRIVEN PULLEY

DISASSEMBLY

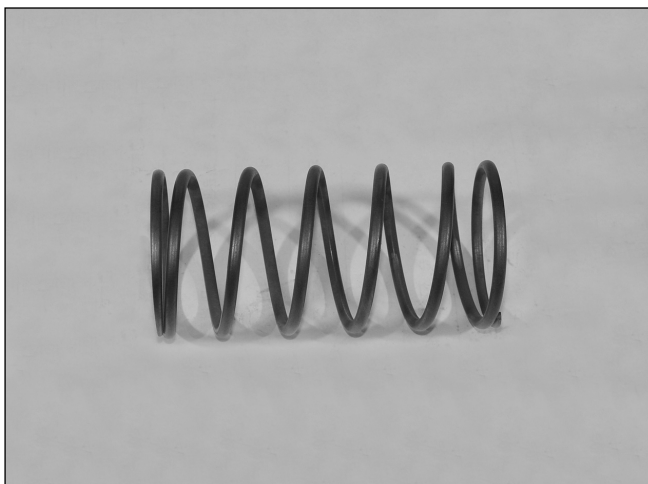
- Hold the clutch/driven pulley assembly with the clutch spring compressor.
- Set the tool in a vise and remove the clutch drive plate nut. (39mm)



- Loosen the clutch spring compressor and disassemble the clutch/driven pulley assembly.
- Remove the seal collar.



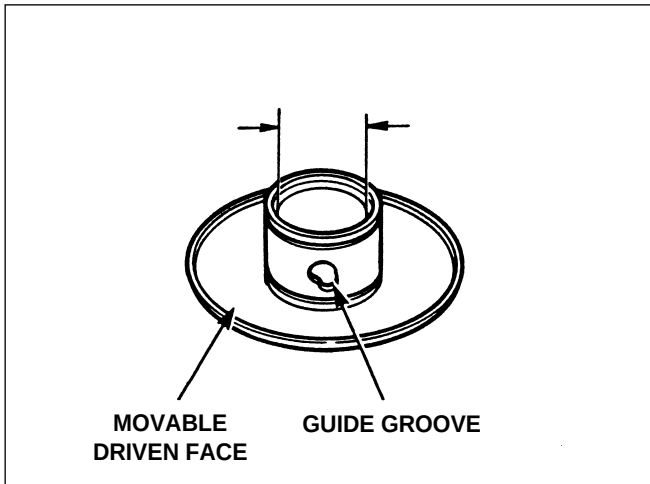
- Pull out the guide roller pins and guide rollers.
- Remove the movable driven face from the driven face.
- Remove the oil seal from the movable driven face.



INSPECTION

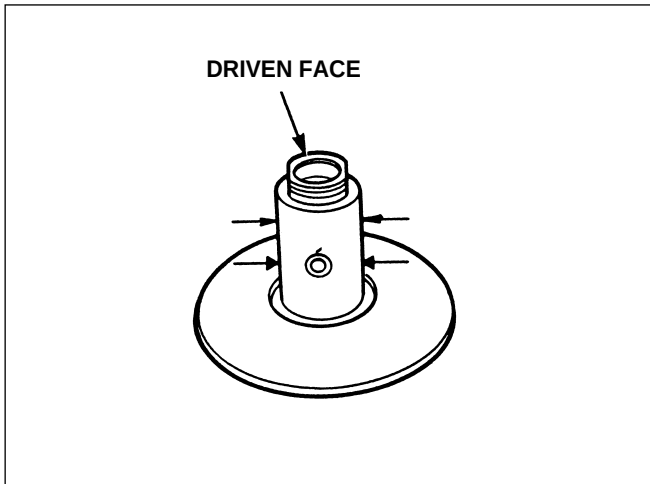
- Measure the driven face spring free length.

SERVICE LIMIT : 130.5mm replace if below



- Check the driven face assembly for wear or damage.
- Measure the driven face O.D.

SERVICE LIMIT : 39.85mm replace if below



- Check the movable driven face for wear or damage.
- Measure the movable driven face I.D.

SERVICE LIMIT : 40.06mm replace if over

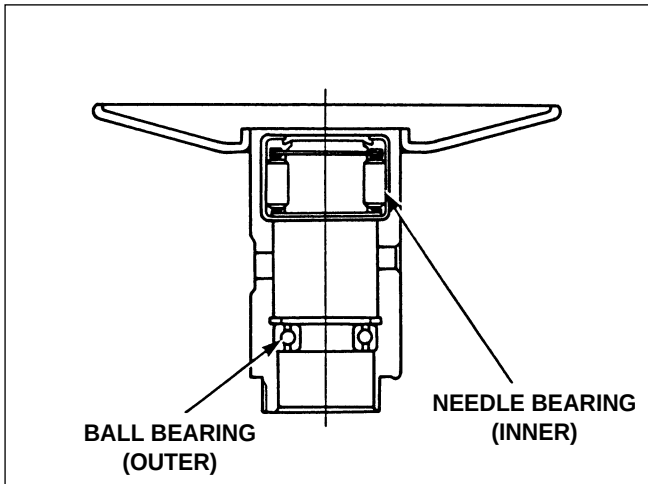


DRIVEN PULLEY FACE BEARING REPLACEMENT

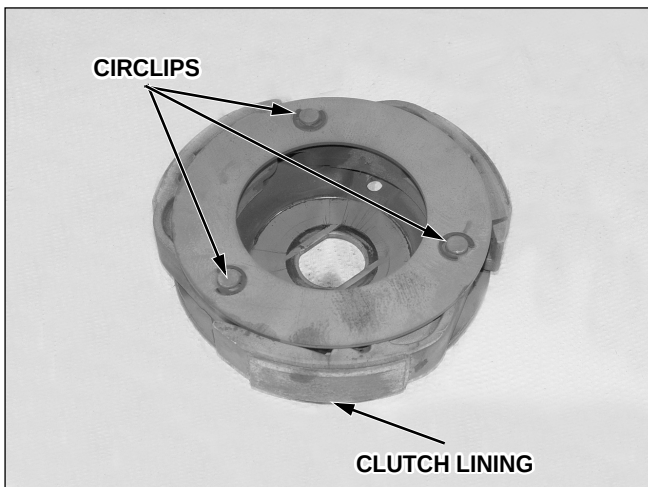
- Remove the inner needle bearing out of the driven pulley face.



- Remove the snap ring and drive the outer bearing out of the driven face.
- Apply grease to the outer bearing.
- Install a new outer bearing into the driven face with the sealed end facing up.
- Seat the snap ring in its groove.
- Apply grease to the driven face bore areas (9~9.5g)



- Press a new needle bearing into the driven face.



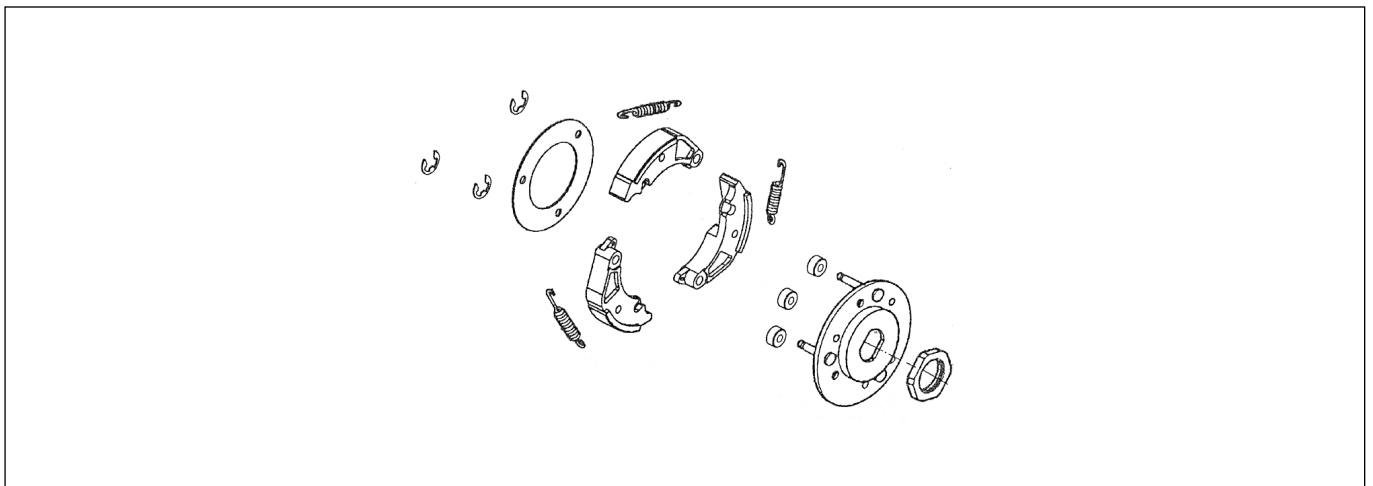
CLUTCH DISASSEMBLY

- Remove the circlips and retainer plate to disassemble the clutch.

NOTE

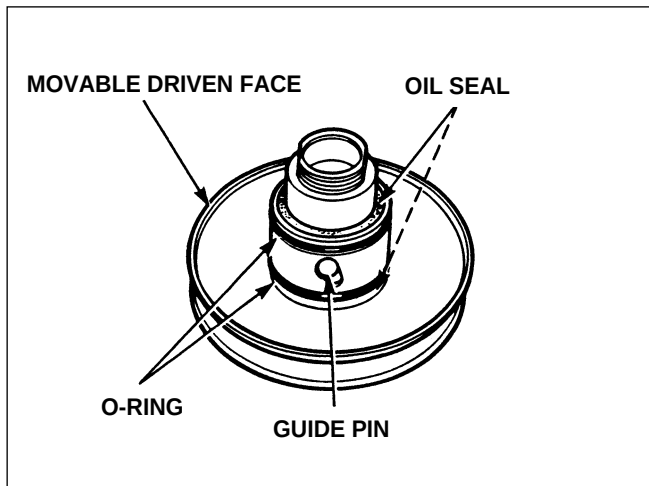
- Keep grease off the clutch linings.

CLUTCH ASSEMBLY

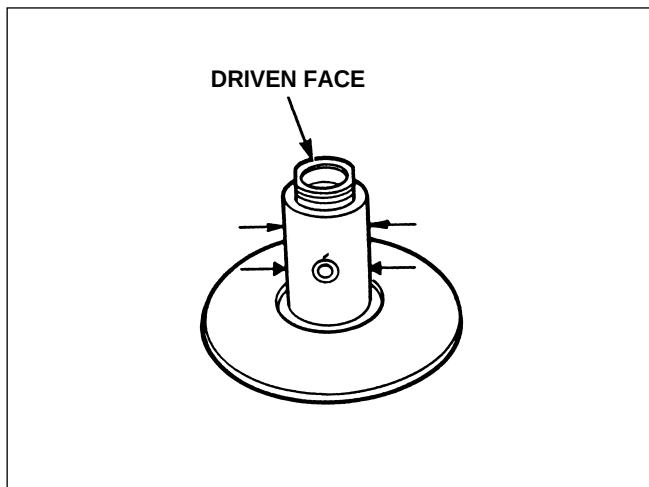


- Install the damper rubbers on the drive plate pins.
- Install the clutch weights/shoes and clutch springs onto the drive plate.
- Install the retainer plate and secure with the circlips.

CLUTCH/DRIVEN PULLEY ASSEMBLY



- Clean the pulley faces and remove any grease from them.
- Apply grease to the O-ring and install them onto the moveable driven face.



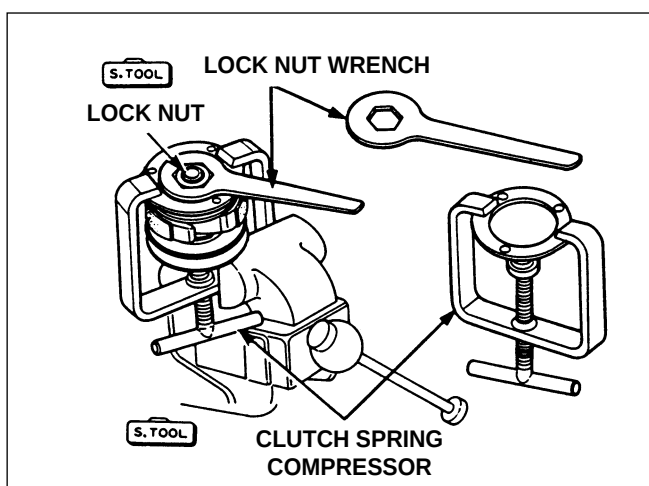
- Install the movable driven face onto the driven face.
- Apply grease to the guide rollers and guide roller pins and then install them into the holes of the driven face.



- Install new seal collar.
- Remove any excessive grease.

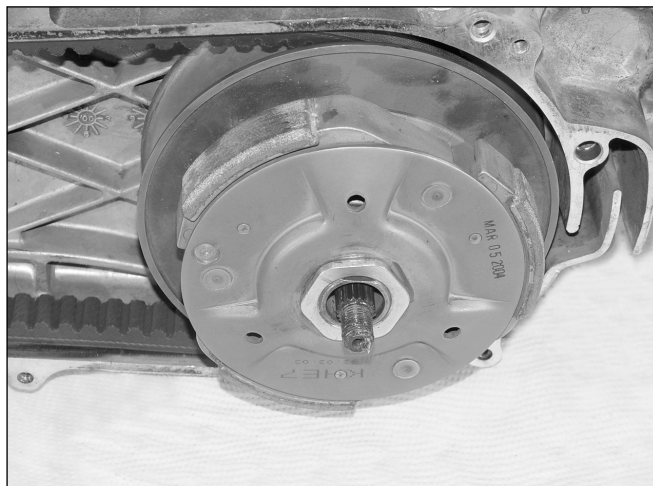
NOTE

- Be sure to clean the driven face off any grease.
- Set the driven pulley assembly, driven face spring and clutch assembly onto the clutch spring compressor

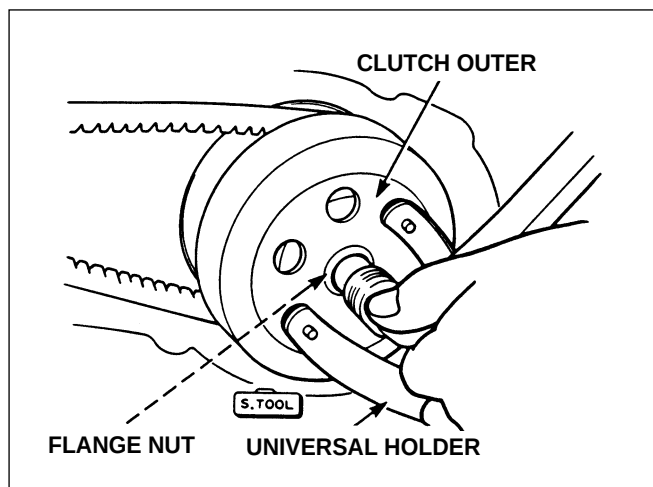


- Tighten the drive flate nut temperily.
- Set teh tool invise and righten the drive plate nut to the specified torque.

TORQUE VALUE : 4.9~5.88kgf · m



- Install the clutch/driven pulley onto the drive shaft.



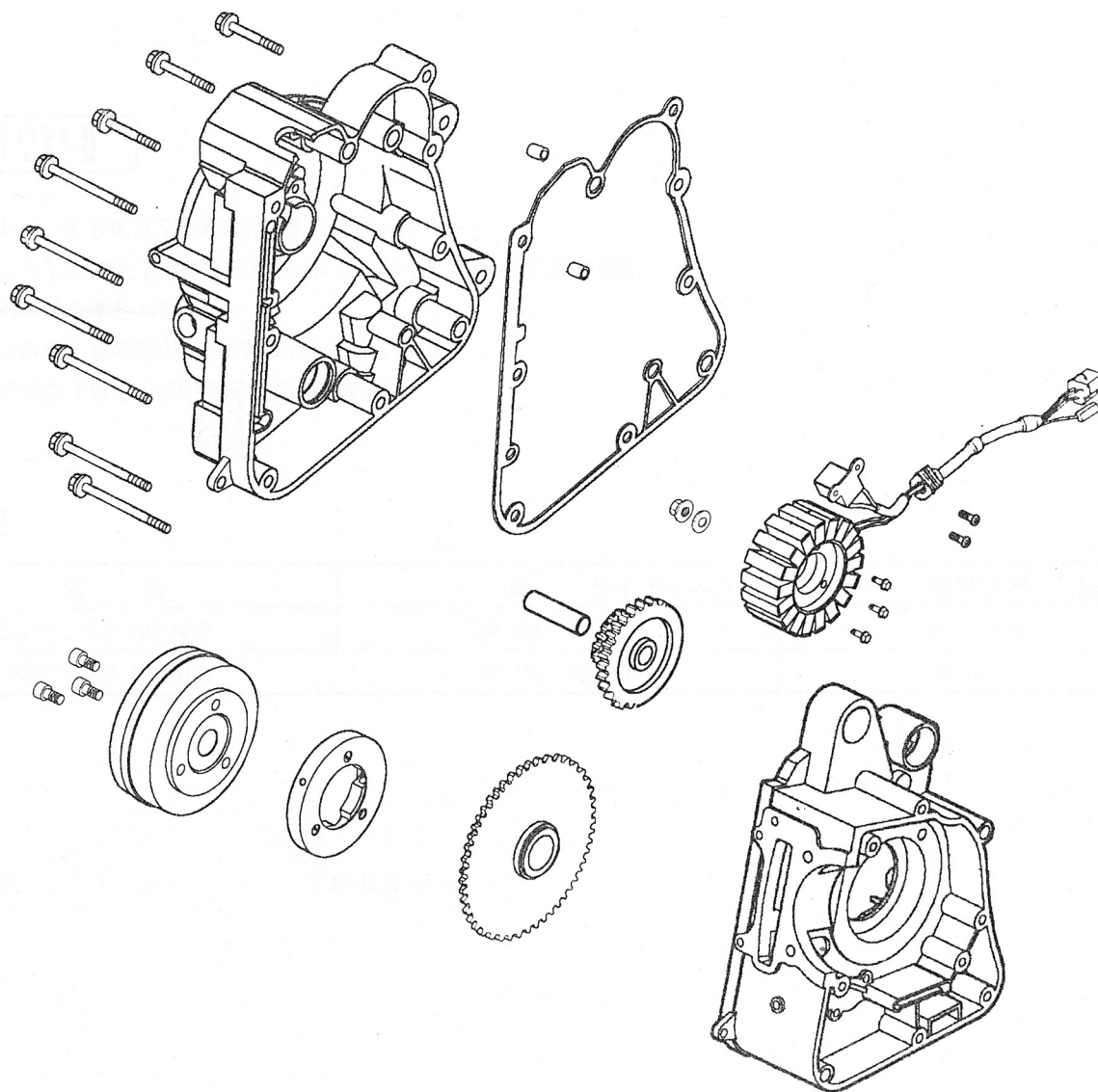
- Install the clutch outer.
- Hold the clutch outer with the universal holder.
- Install and tighten the clutch outer nut.

TORQUE VALUE : 4.9~5.88kgf · m

- Install the drive belt.
- Install the LH. crankcase cover.

MEMO

A.C GENERATOR/STARTER CLUTCH



9. A.C GENERATOR / STARTER CLUTCH

SERVICE INFORMATION 9-1

R. CRANKCASE COVER REMOVAL · 9-2

STARTER CLUTCH 9-3

FLYWHEEL INSTALLATION . . . 9-4

STATOR INSTALLATION 9-5

R. CANKCASE COVER INSTALLATION · 9-5

SERVICE INFORMATION

- Drain the coolant before removing the right crankcase cover.
- Be careful not to drain the coolant when the engine temperature is high. (Perform this operation when the engine is cold.)
- Drain the engine oil into a clean container before removing the right crankcase cover.
- When the right crankcase cover is installed, fill with the recommended engine oil and coolant. Then, bleed air from the water jacket.

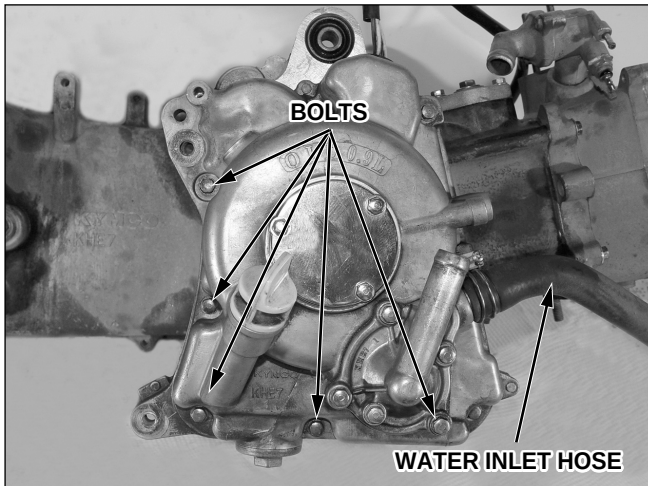
SPECIFICATIONS

ITEM	STANDARD	SERVICE LIMIT
Large end side clearance	22.026~22.045mm	22.15mm
Connecting rod large end right angle direction clearance	42.195~42.208mm	41.5mm

9

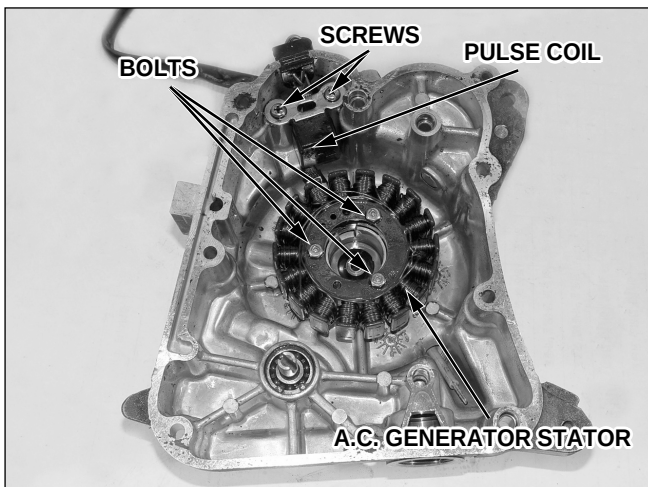
TORQUE VALUES

FLYWHEEL NUT : 5.39~6.37kgf · m



RIGHT CRANKCASE COVER REMOVAL

- Disconnect the water hoses from the right crankcase cover.
- Remove the 9 bolts securing the right crankcase cover and the cover.
- Loosen the 2 pulser coil screws and disconnect pulser coil.

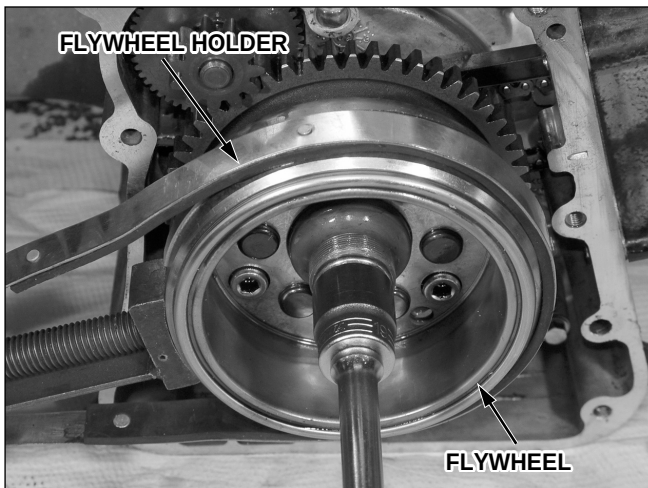


STATOR REMOVAL

- Remove the three A.C. generator stator bolts and the stator.

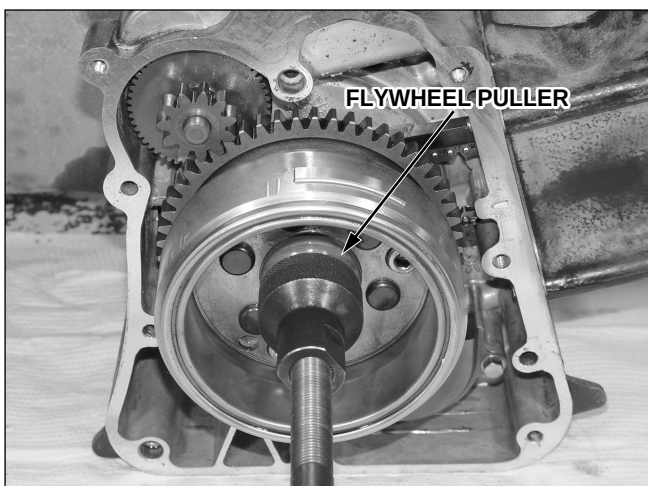
! NOTE

- When removing the pulse coil and stator, be careful not to damage them to avoid shorted or broken wire.

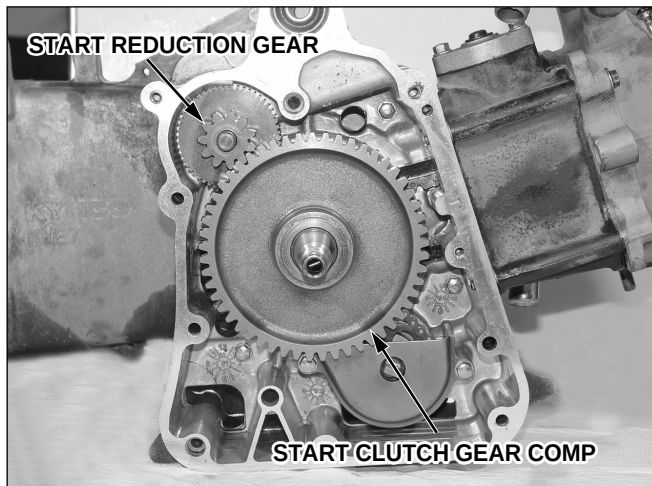


FLYWHEEL REMOVAL

- Hold the flywheel with a flywheel holder and remove the flywheel nut.

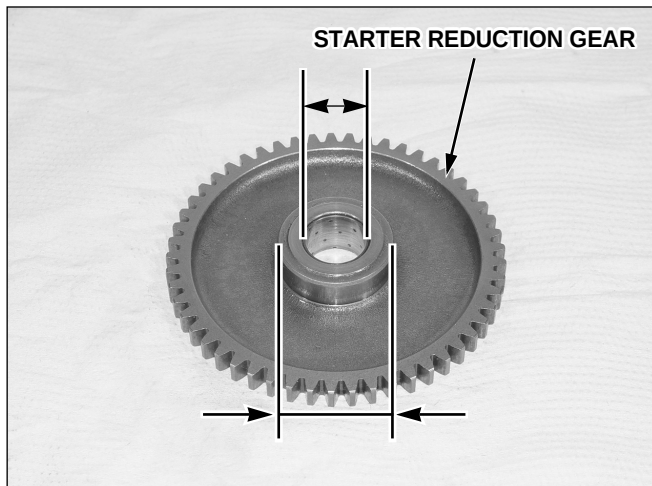
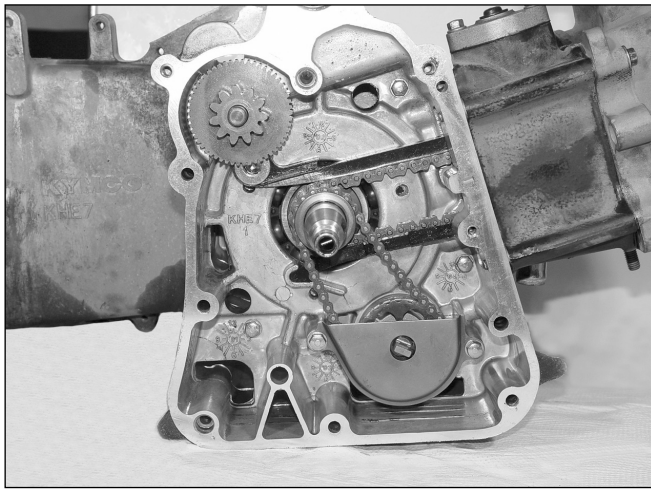


- Remove the flywheel with a flywheel puller.



STARTER CLUTCH REMOVAL

- Remove the starter clutch gear comp.
- Remove the starter reduction gear and shaft.

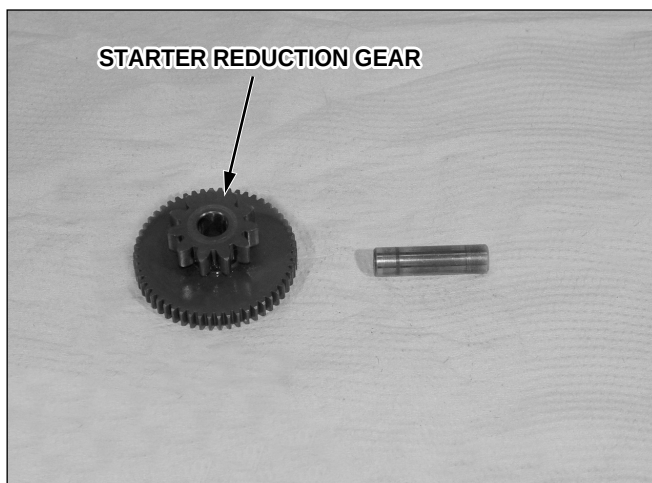


INSPECTION

- Inspect the starter clutch gear comp for wear or damage.
- Measure the starter clutch gear comp I.D. and O.D.

SERVICE LIMITS:

I.D. : 22.15mm replace if over
O.D.: 41.50mm replace if below

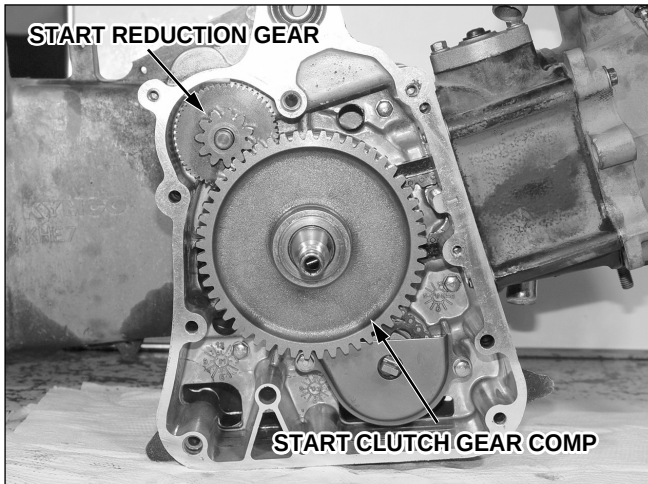


- Inspect the starter reduction gear and shaft for wear or damage.

A.C GENERATOR/STARTER CLUTCH

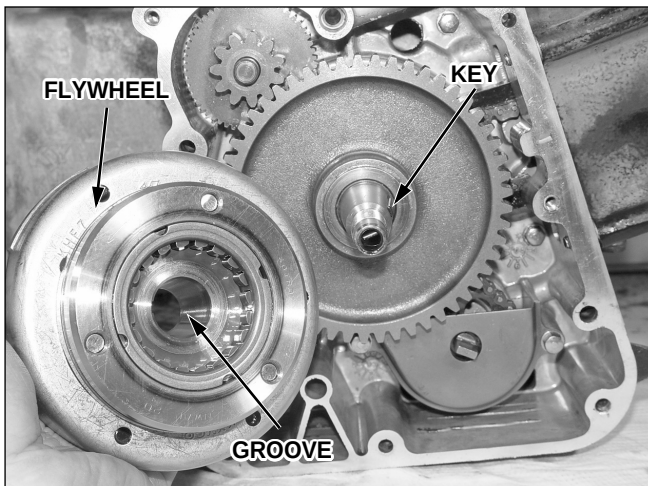


- Remove the starter one-way clutch rollers, plungers and springs.



INSTALLATION

- Install the starting clutch gear comp onto the crankshaft.
- Install the starter reduction gear and shaft.



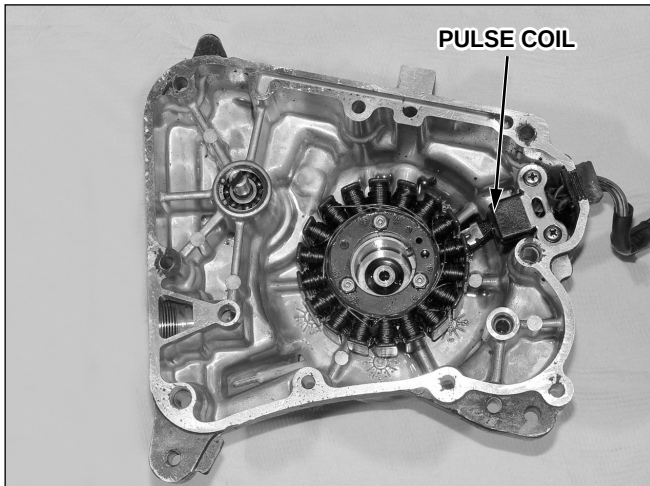
FLYWHEEL INSTALLATION

- Install the flywheel onto the crankshaft by aligning the key on the crankshaft with the groove in the flywheel.



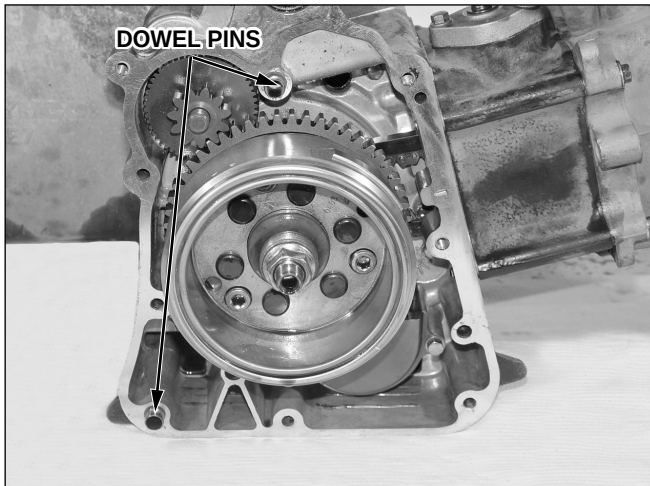
- Hold the flywheel with the flywheel holder and tighten the flywheel nut.

TORQUE VALUE : 5.39~6.37kgf · m



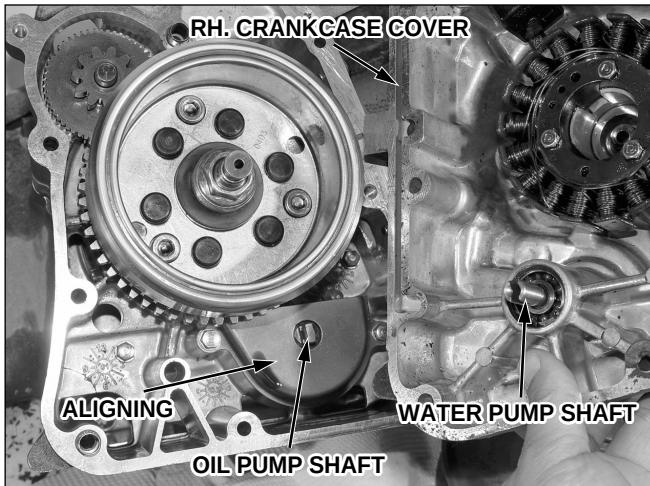
STATOR INSTALLATION

- Install the A.C. generator stator on the RH. crankcase cover and secure it with the 3 bolts.
- Install the pulse coil on the RH. crankcase cover and secure it with the 2 screws.
- Install the wire grommet in the groove in the RH. crankcase cover securely.



R. CRANKCASE COVER INSTALLATION

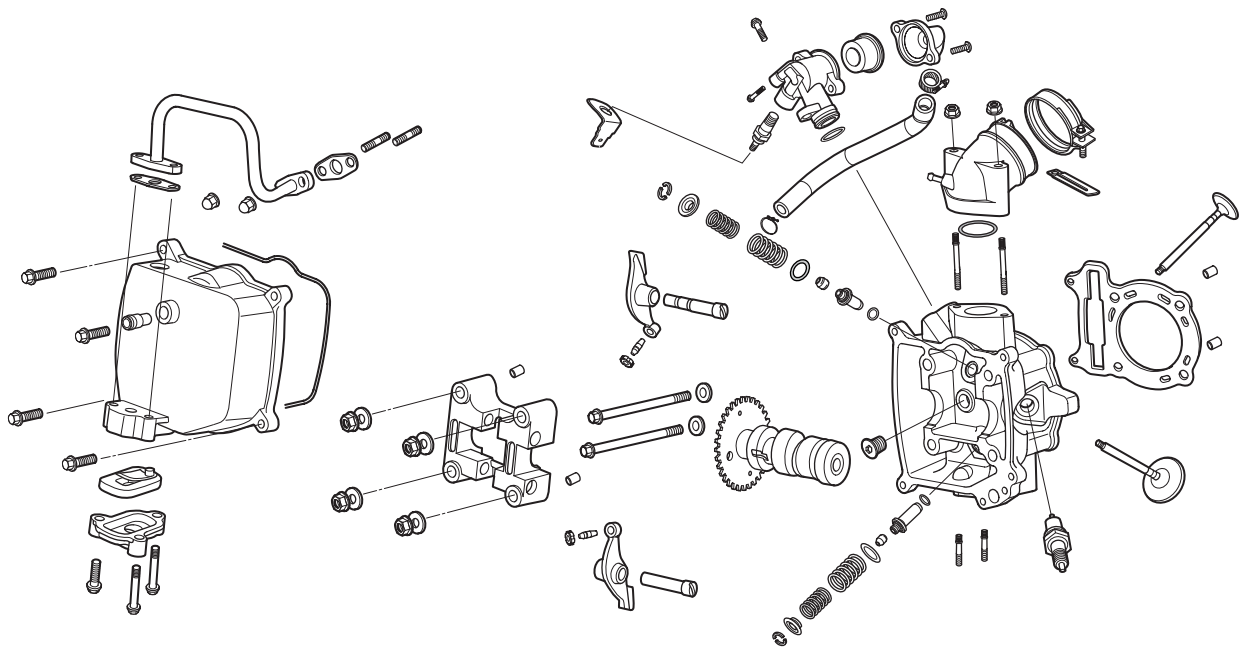
- Install the 2 dowel pins and a new gasket.



- Install the RH. crankcase cover over the crankcase, aligning the water pump shaft groove with the oil pump shaft.
- Tighten the 9 RH. crankcase cover bolts.
- Connect the water hoses to the RH. crankcase cover.
- Add the recommended engine oil.
- Fill the cooling system with the specified coolant.

⚠ NOTE

- Be sure to bleed air from the water jacket after filling the coolant.



10. CYLINDER HEAD/CYLINDER/PISTON

SERVICES INFORMATION	10-1
CYLINDER HEAD COVER	10-1
CAM SHAFT	10-2
CYLINDER HEAD	10-4

SERVICE INFORMATION

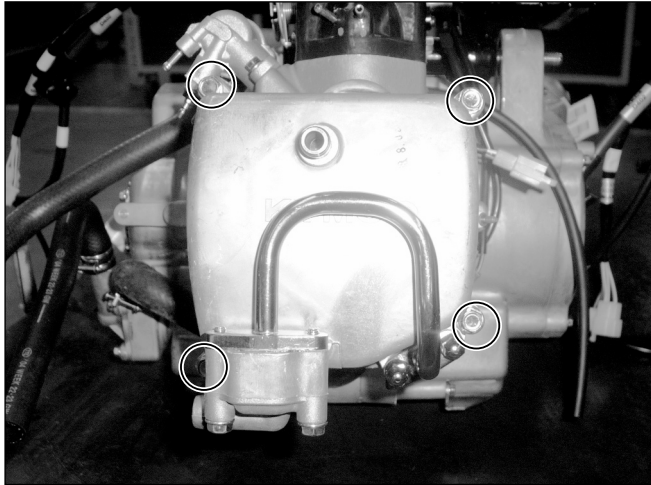
- Drain the coolant from the radiator and water.
- Apply oil to valve guide and valve arm when assembling.

SPECIFICATIONS

ITEM		STANDARD (mm)	SERVICE LIMIT(mm)
VALVE CLEARANCE (COLD)	IN	0.10	-
	EX	0.10	-
CYLINDER HEAD COMPRESSION PRESSURE		15kg/cm ²	-
CYLINDER HEAD WARPAGE		—	0.05
CAMSHAFT CAM HEIGHT	IN	34.2987	34.14
	EX	34.1721	34.02
VALVE ROCKER ARM I.D.	IN	10.00~10.015	10.10
	EX	10.00~10.015	10.10
VALVE ROCKER ARM SHAFT O.D.	IN	9.972~9.987	9.9
	EX	9.972~9.987	9.9
VALVE SEAT WIDTH	IN	1.2	1.8
	EX	1.2	1.8
VALVE STEM O.D.	IN	4.990~4.975	4.925
	EX	4.970~4.955	4.915
VALVE GUIDE I.D.	IN	5.00~5.012	5.03
	EX	5.00~5.012	5.03
VALVE STEM-TO-GUIDED CLEARANCE	IN	0.010~0.037	0.08
	EX	0.030~0.057	0.10

TORQUE VALUES

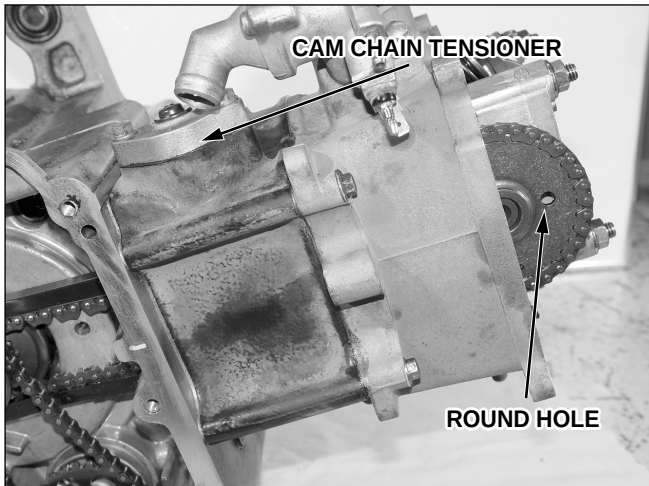
CYLINDER HEAD CAP NUT	: 2.45kgf · m
VALVE CLEARANCE ADJUSTING NUT	: 0.88kgf · m
CYLINDER HEAD COVER BOLT	: 0.78~1.18kgf · m



CYLINDER HEAD COVER

REMOVAL

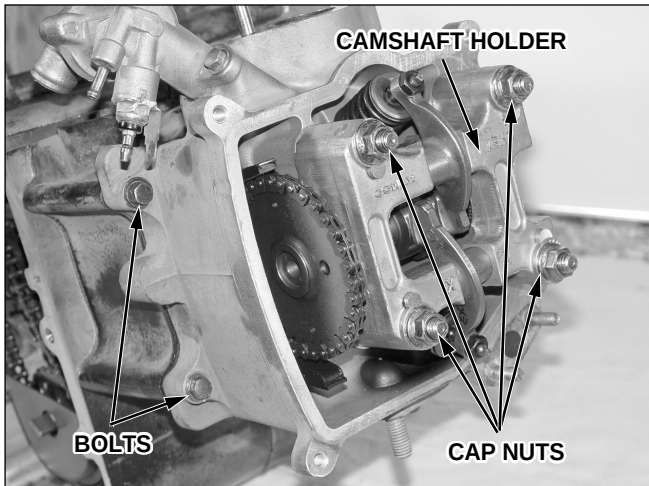
- Remove the center cover.
- Remove the luggage box.
- Remove the cylinder head cover 4 bolts and then remove the cylinder head cover.



CAMSHAFT

REMOVAL

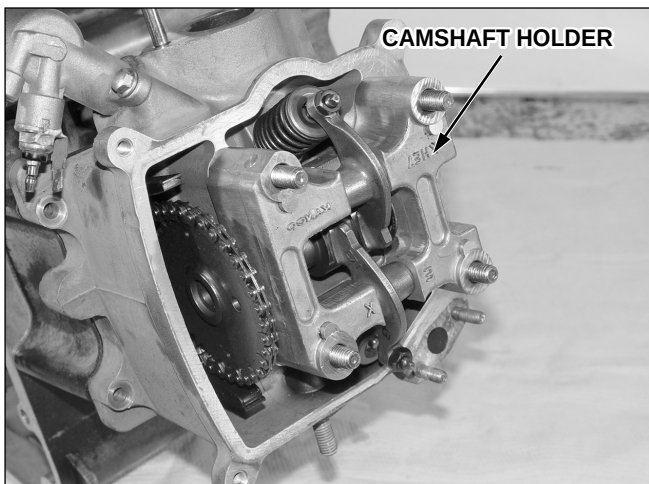
- Turn the A.C. generator flywheel so that the “T” mark on the flywheel aligns with the index mark on the crankcase.
- Hold the round hole on the camshaft gear facing up and the location is the top dead center on the compression stroke.
- Remove the 2 bolts attaching cam chain tensioner and the tensioner.



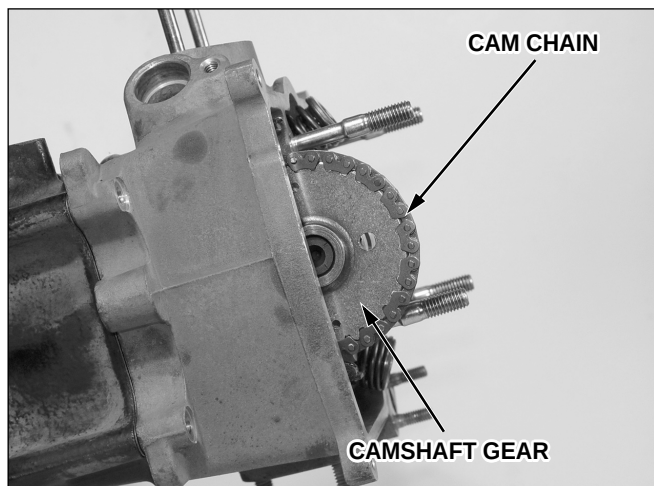
- First remove the 2 bolts between the cylinder head and cylinder.
- Remove the 4 cap nuts securing cylinder head.

⚠ NOTE

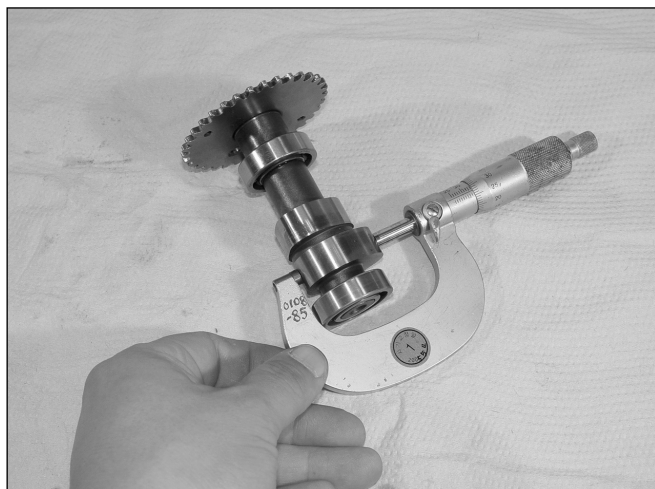
- Diagonally loosen the cylinder head cap nuts in 2 or 3 times.



- Remove the camshaft holder and dowel pins.



- Remove the camshaft gear from the cam chain to remove the camshaft.



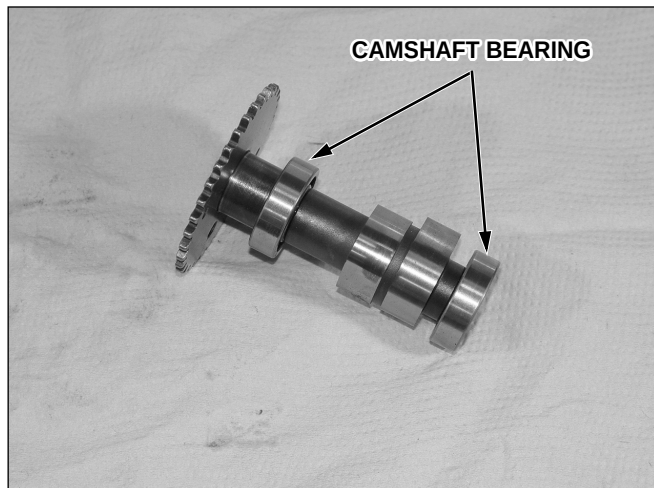
INSPECTION

- Check each cam lobe for wear or damage.
- Measure the cam lobe height.

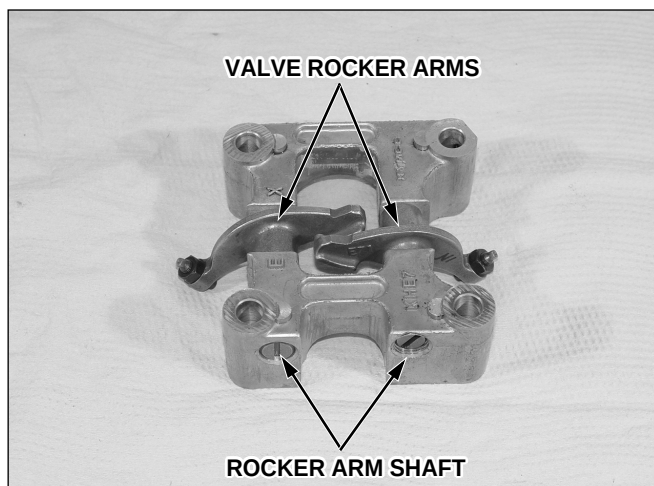
SERVICE LIMITS:

IN : 34.14mm replace if below

EX: 34.02mm replace if below

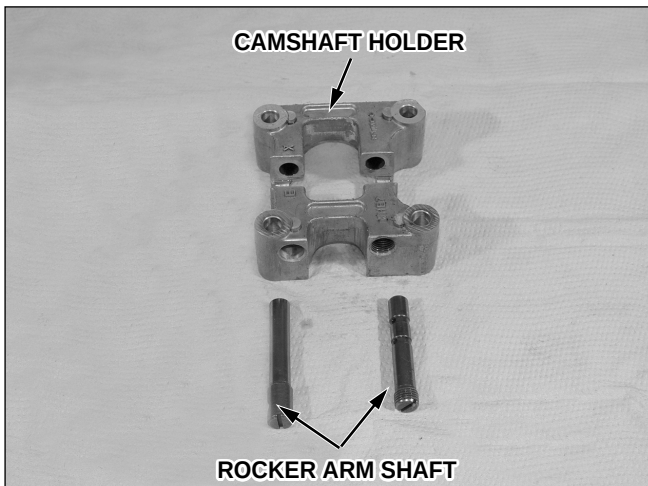


- Check each camshaft bearing for play or damage. Replace the camshaft assembly with a new one if the bearings are noisy or have excessive play.



CAMSHAFT HOLDER DISASSEMBLY

- Remove the valve rocker arms.

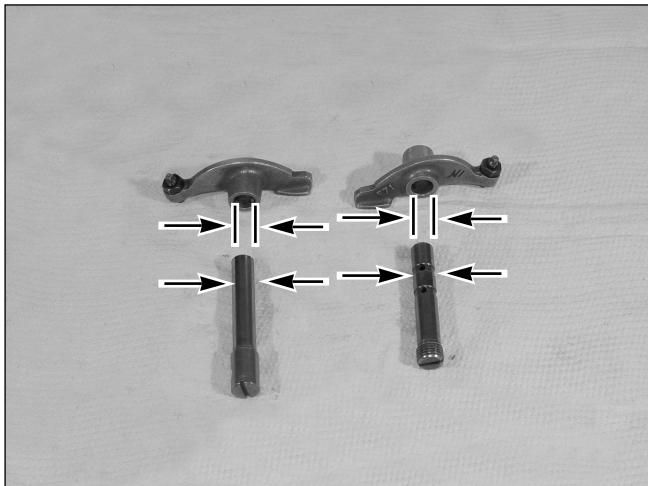


CAMSHAFT HOLDER INSPECTION

- Inspect the camshaft holder, valve rocker arms and rocker arm shafts for wear or damage.

NOTE

- If the valve rocker arm contact surface is worn, check each cam lobe for wear or damage.



- Measure the I.D. of each valve rocker arm.

SERVICE LIMITS:

IN : 10.10mm replace if over

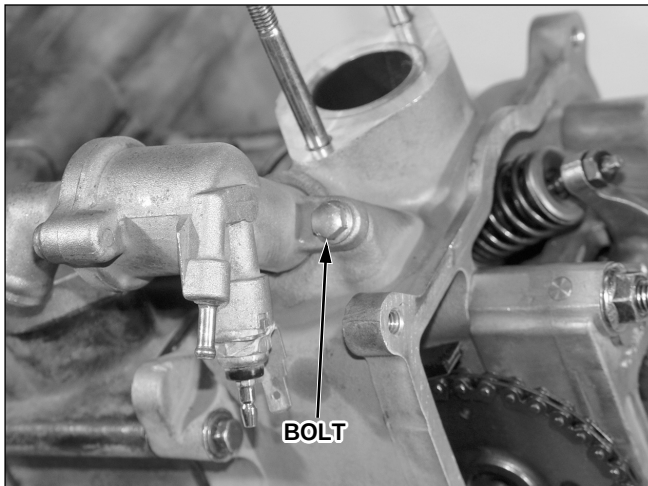
EX: 10.10mm replace if over

- Measure each rocker arm shaft O.D.

SERVICE LIMITS:

IN : 9.90mm replace if below

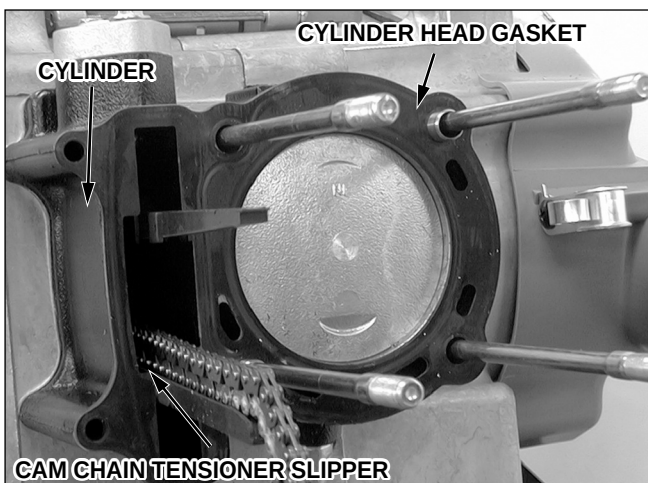
EX: 9.90mm replace if below



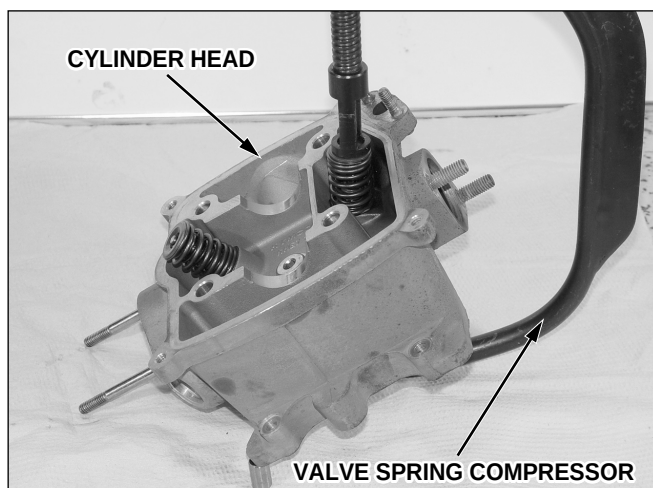
CYLINDER HEAD

REMOVAL

- First drain the coolant from the radiator and water jacket, then remove the thermostat water hose.
- Remove the camshaft.
- Remove the carburetor and intake manifold.
- Loosen the bolt securing the thermostat housing and the thermostat housing.
- Remove the cylinder head.



- Remove the dowel pins and cylinder head gasket.
- Remove the cam chain guide.
- Remove all gasket material from the cylinder head mating surface.

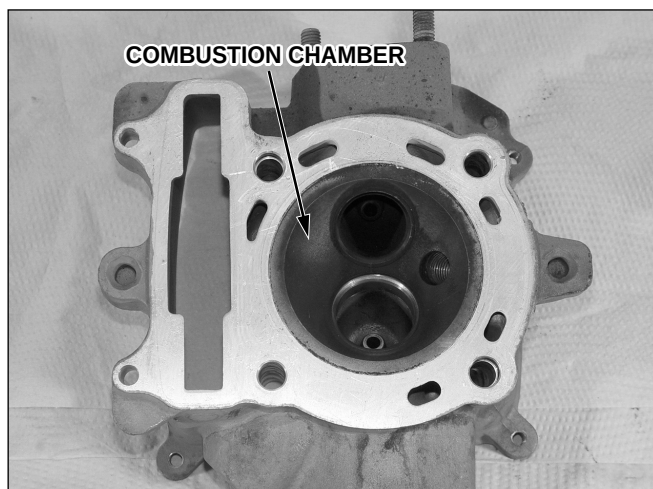


DISASSEMBLY

- Remove the valve spring cotters, retainers, springs, spring seats and valve stem seals using a valve spring compressor.

NOTE

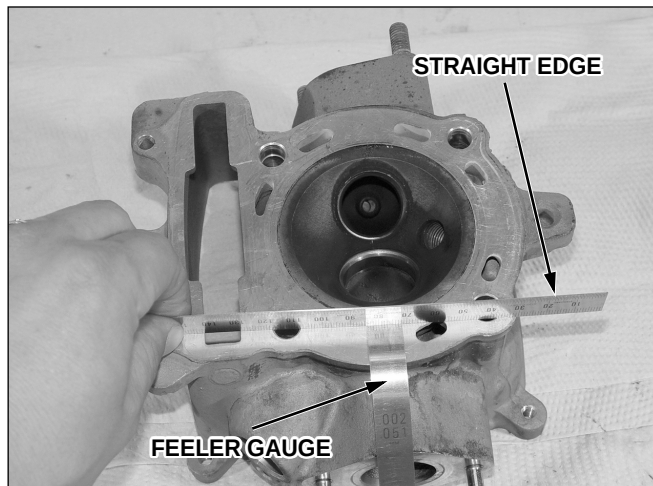
- Be sure to compress the valve springs with a valve spring compressor.
- Mark all disassembled parts to ensure correct reassembly.



- Remove carbon deposits from the exhaust port and combustion chamber.

NOTE

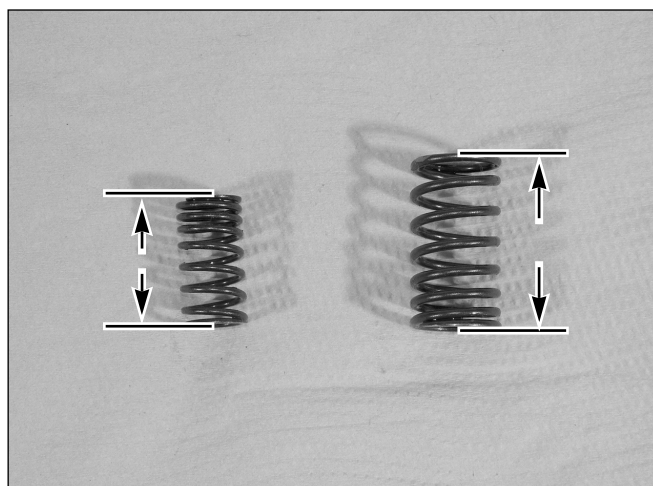
- Be careful not to damage the cylinder head mating surface.



INSPECTION

- Check the spark plug hole and valve areas for cracks.
- Check the cylinder head for warpage with a straight edge and feeler gauge.

SERVICE LIMITS : 0.05mm replace or replace if over

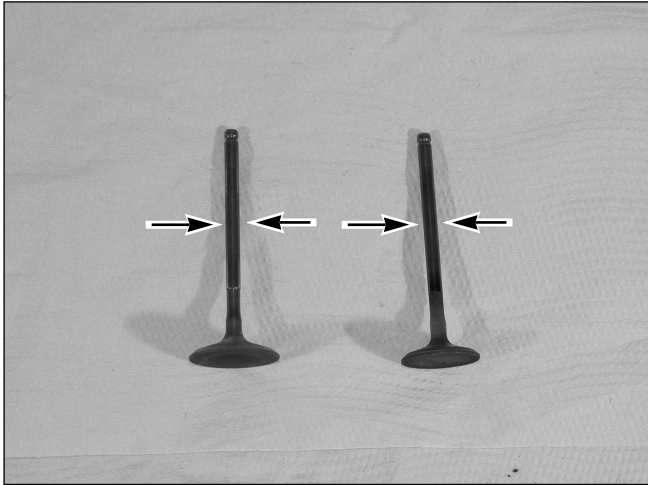


- Measure the free length of the inner and outer valve springs.

SERVICE LIMITS:

INNER (IN, EX) : 29.5mm replace if below
OUTER(IN, EX) : 39.5mm replace if below

CYLINDER HEAD / VALVE



- Inspect each valve for bending, burning, scratches or abnormal stem wear.
- Check valve movement in the guide.
- Measure each valve stem O.D.

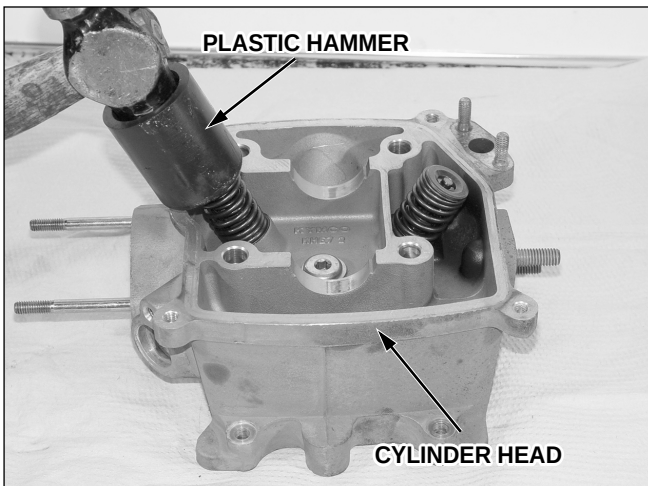
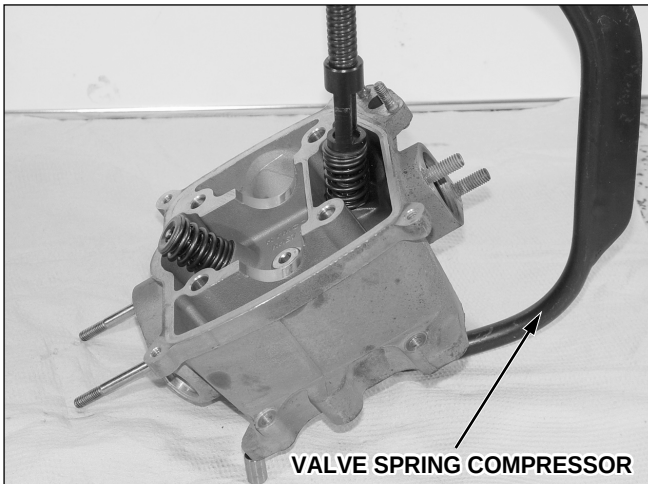
SERVICE LIMITS:

IN : 4.925mm replace if below

EX : 4.925mm replace if below

ASSEMBLY

- Install the valve spring seats and stem seals.
- Lubricate each valve stem with engine oil and insert the valves into the valve guides.



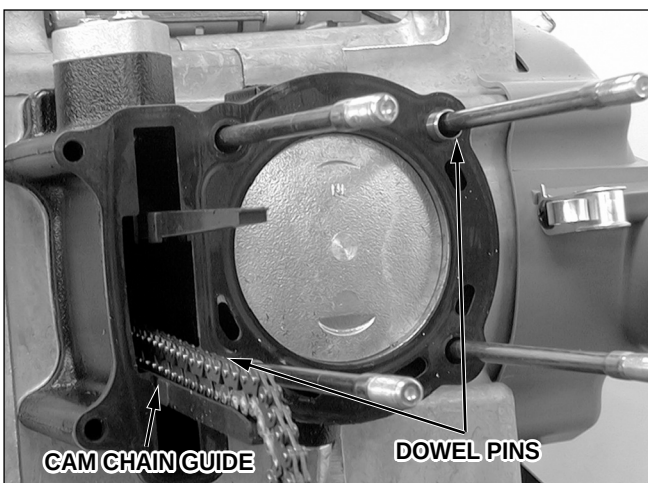
- Tap the valve stems gently with a plastic hammer to firmly seat the cotters.

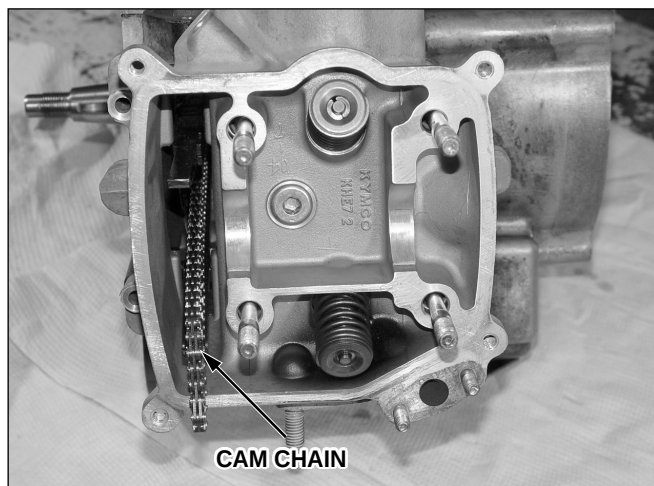
NOTE

- Be careful not to damage the valves.

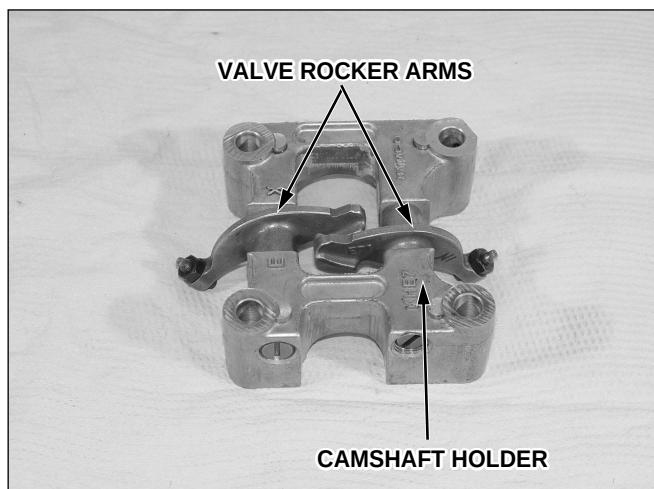
INSTALLATION

- Install the cam chain guide.
- Install the dowel pins and a new cylinder head gasket.





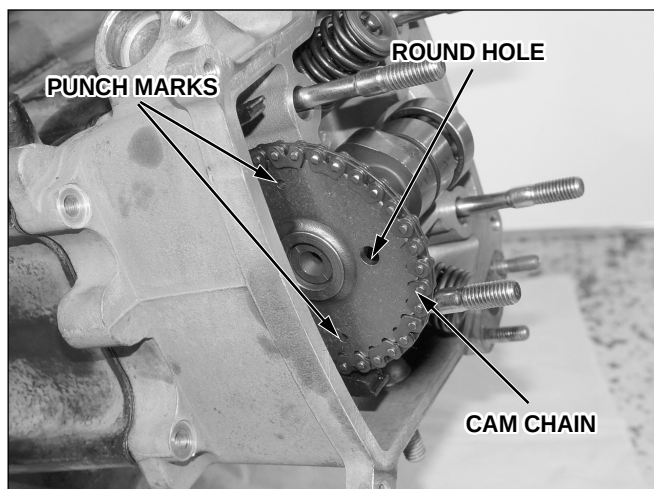
- Install the cylinder head and take out the cam chain.



- Assemble the camshaft holder.
- First install the intake and exhaust valve rocker arms ; then install the rocker arm shafts.

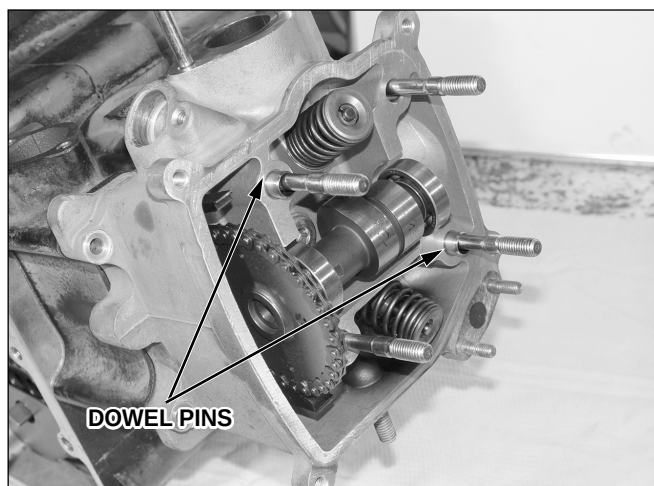
NOTE

- Install the exhaust valve rocker arm shaft on the “EX” side of the camshaft holder and the exhaust rocker arm shaft is shorter.
- Clean the intake valve rocker arm shaft off any grease before installation.
- Align the cutout on the exhaust valve rocker arm shaft with the bolt of the camshaft holder.



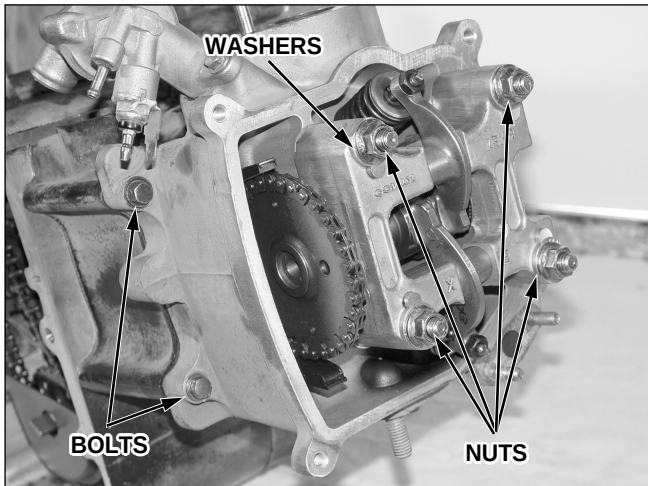
CAMSHAFT INSTALLATION

- Turn the A.C. generator flywheel so that the “T” mark on the flywheel aligns with the index mark on the crankcase.
- Keep the round hole on the camshaft gear facing up and align the punch marks on the camshaft gear with the cylinder head surface
- Install the cam chain over the camshaft gear.



- Install the dowel pins.

CYLINDER HEAD / VALVE



- Install the camshaft holder, washers and nuts on the cylinder head.
- Tighten the 4 cylinder head nuts and the 2 bolts between the cylinder head and cylinder.

TORQUE :

Cylinder head cap nut : 2.45kgf · m

Cylinder & cylinder head bolt : 0.78~1.18kgf · m

⚠ NOTE

- Apply engine oil to the threads of the cylinder head cap nuts.
- Diagonally tighten the cylinder head cap nuts in 2~3 times.
- First tighten the cylinder head cap nuts and then tighten the bolts between the cylinder and cylinder head to avoid cracks.



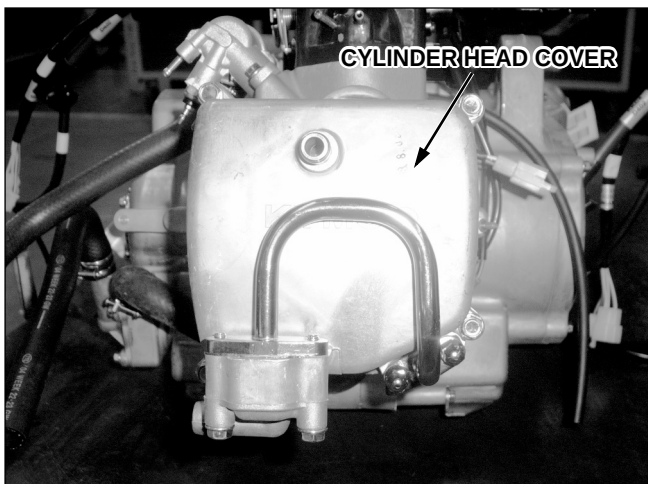
- Turn the cam chain tension screw counter clockwise to release it.



- Apply engine oil to a new O-ring and install it.
- Tighten the cam chain tension cap screw.

⚠ NOTE

- Be sure to install the gasket into the groove properly.



CYLINDER HEAD COVER INSTALLATION

- Adjust the valve clearance.
- Install a new cylinder head cover O-ring and install the cylinder head cover.

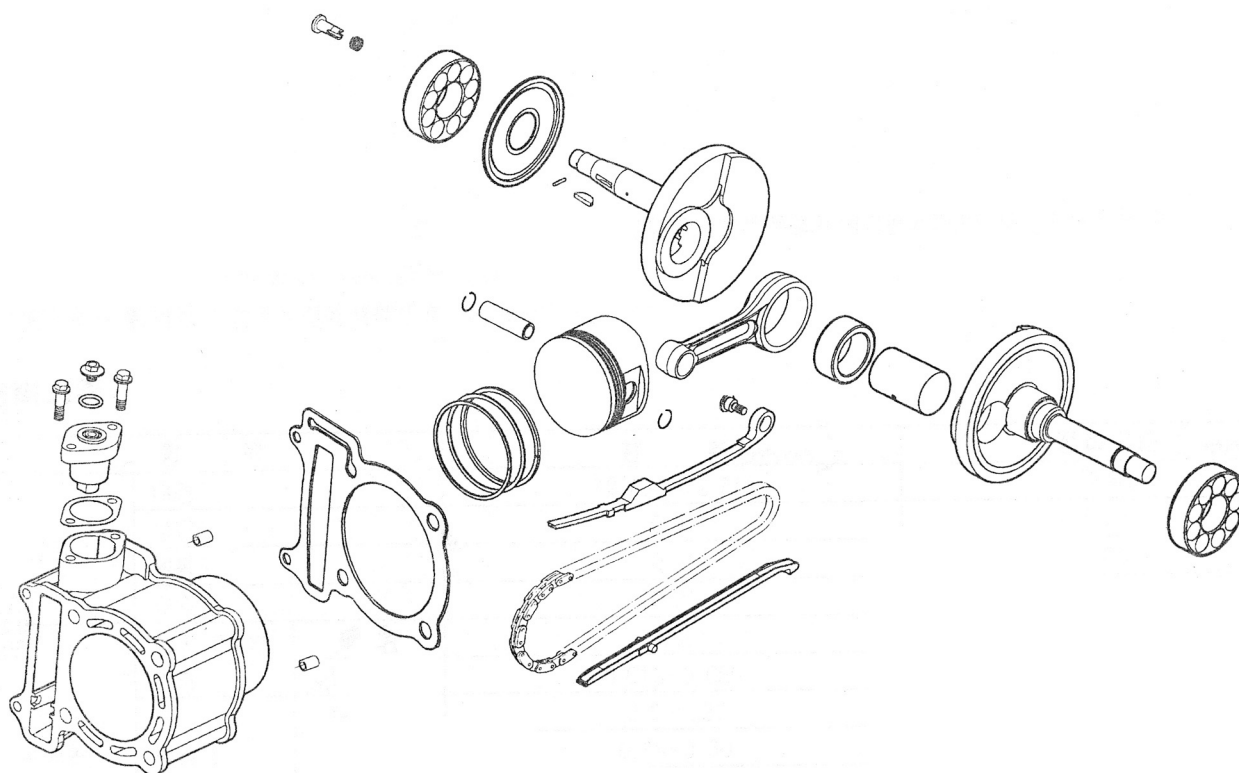
⚠ NOTE

- Be sure to install the O-ring into the groove properly.

- Install and tighten the cylinder head cover bolts.

TORQUE VALUE : 0.78~1.18kgf · m

MEMO



11. CYLINDER / PISTON

SERVICE INFORMATION . . .	11-1
TROUBLESHOOTING	11-1
CYLINDER REMOVAL	11-2
PISTON REMOVAL	11-2

PISTON RING INSTALLATION .	11-5
PISTON INSTALLATION	11-6
CYLINDER INSTALLATION . .	11-6

SERVICE INFORMATION

GENERAL SAFETY

- Be careful not to damage the mating surfaces by using a screwdriver when disassembling the cylinder. Do not strike the cylinder too hard during disassembly, even with a rubber or plastic mallet, to prevent the possibility of damage to the cylinder fins.
- Take care not to damage the cylinder wall and piston.
- Check parts after disassembling, and clean and dry with an air hose prior to taking measurements.

SPECIFICATIONS

ITEM			STANDARD (mm)	SERVICE LIMIT (mm)
CYLINDER	I.D.		72.705~72.715	72.80
	WARPAGE		0.01	0.05
	CYLINDRICITY		0.01	0.05
	TRUE ROUNDNESS		0.01	0.05
PISTON, PISTON RING	RING-TO-GROOVE CLEARANCE	TOP	0.2	0.09
		SECOND	0.015~0.050	0.09
	RING END GAP	TOP	0.1~0.25	0.50
		SECOND	0.15~0.30	0.50
		OIL RING	0.25~0.7	-
	PISTON O.D.		72.67~72.69	72.6
	PISTON-TO-CYLINDER CLEARANCE		0.010~0.040	0.01
	PISTON PIN HOLE I.D		17.002~17.008	17.04
PISTON PIN O.D			16.994~17.000	16.96
PISTON-TO-PISTON PIN CLEARANCE			0.002~0.014	0.02
CONNECTING ROD SMALL END I.D. BORE			17.016~17.034	17.06

TROUBLESHOOTING

- When hard starting or poor performance at low speed occurs, check the crankcase breather for white smoke. If white smoke is found, it means that the piston rings are worn, stuck or broken.

Comperssion too low or uneven compression

- Worn or damaged cylinder and piston ring
- Worn, stuck or broken piston rings

Comperssion too high

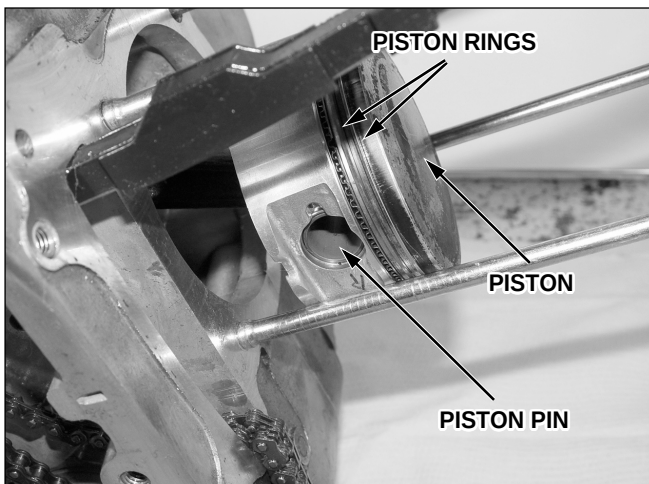
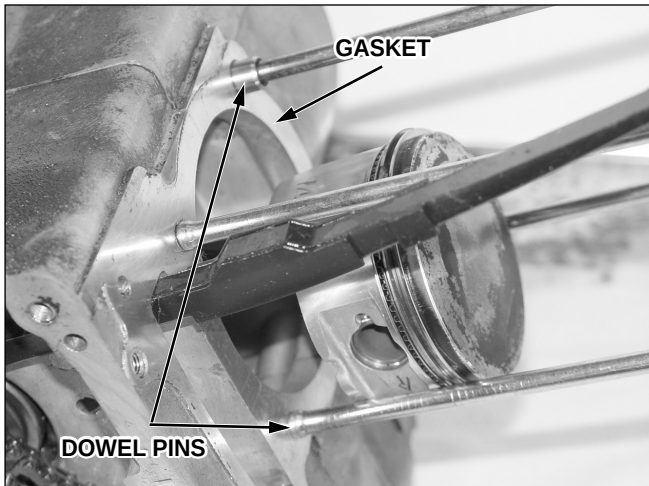
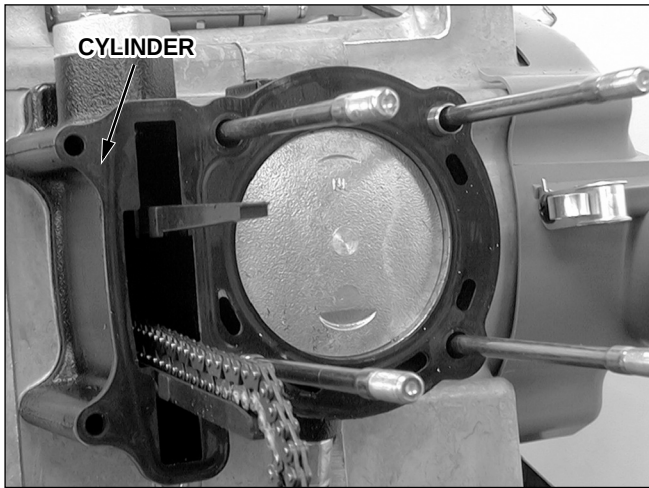
- Excessive carbon build-up in combustion chamber or on piston head

Excessive smoke from exhaust muffler

- Worn or damaged piston rings
- Worn or damaged cylinder and piston

Abnormal noise piston

- Worn cylinder, piston and piston rings
- Worn piston pin hole and piston pin
- Incorrectly installed piston



CYLINDER REMOVAL

- Remove the cylinder head.
- Remove the water hose from the cylinder.

- Remove the cam chain guide.
- Remove the cylinder.

- Remove the cylinder gasket and dowel pins.
- Clean any gasket material from the cylinder surface.

PISTON REMOVAL

- Remove the piston pin clip.
- Remove the piston pin out of the piston.

NOTE

- Place a clean shop towel in the crankcase to keep the piston pin clip from falling into the crankcase.

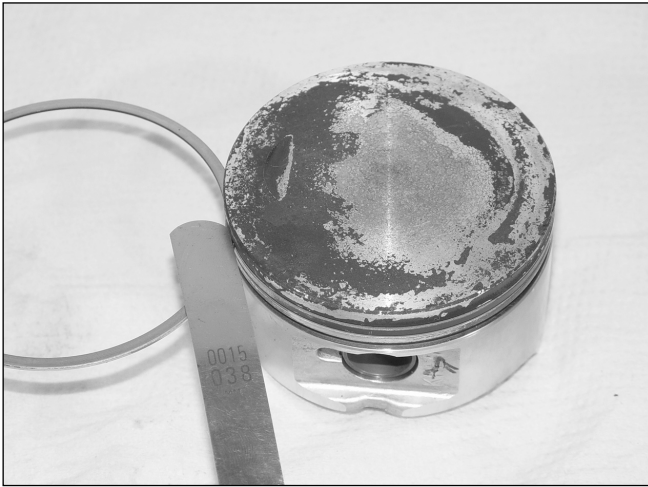


- Install the piston, piston pin and piston rings.
- Remove the piston rings.

 NOTE

- Take care not to damage or break the piston rings during removal.

- Clean carbon deposits from the piston ring grooves.

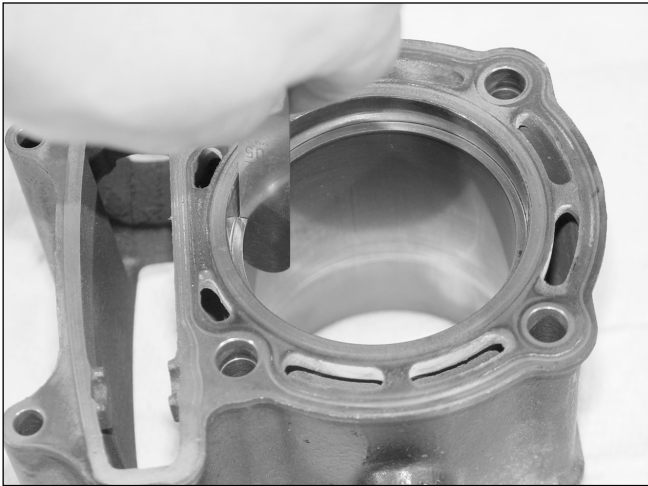


- Install the piston rings onto the piston.
- Measure the piston ring-to-groove clearance.

SERVICE LIMITS :

TOP : 0.09mm replace if over

2ND : 0.09mm replace if over



- Remove the piston rings and insert each piston ring into the cylinder bottom.

 NOTE

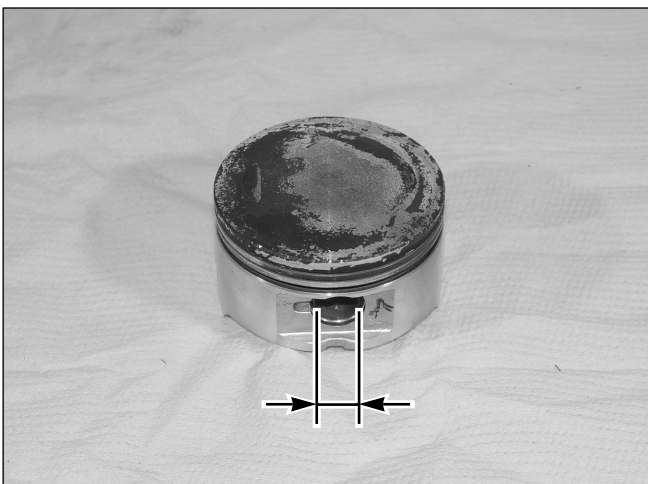
- Use the piston head to push each piston ring into the cylinder.

- Measure the piston ring end gap.

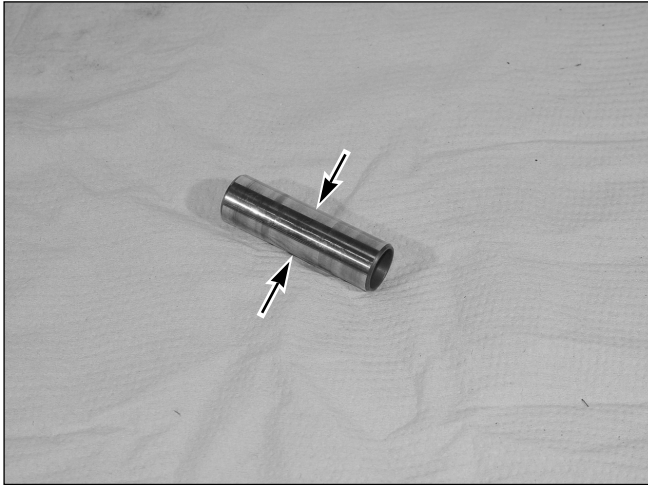
SERVICE LIMITS : 0.5mm replace if over

- Measure the piston pin hole I.D.

SERVICE LIMITS : 17.04mm replace if over

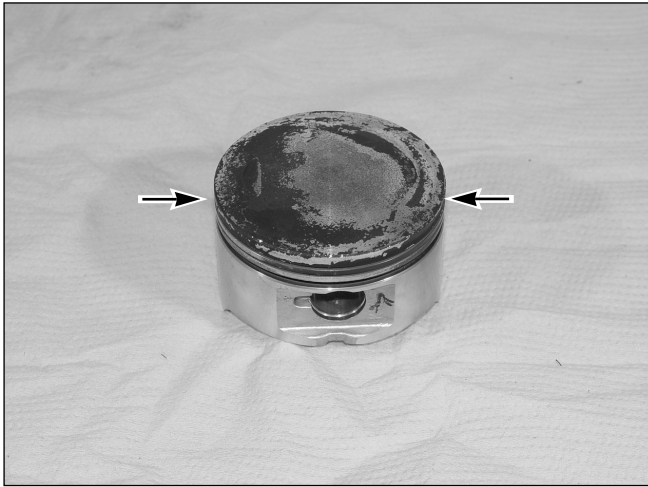


CYLINDER/PISTON



- Measure the piston pin O.D.

SERVICE LIMITS : 16.96mm replace if below



- Measure the piston O.D.

NOTE

- Take measurement at 9mm from the bottom and 90° to the piston pin hole.

SERVICE LIMITS : 72.60mm replace if below

- Measure the piston-to-piston pin clearance.

SERVICE LIMITS : 0.02mm replace if over



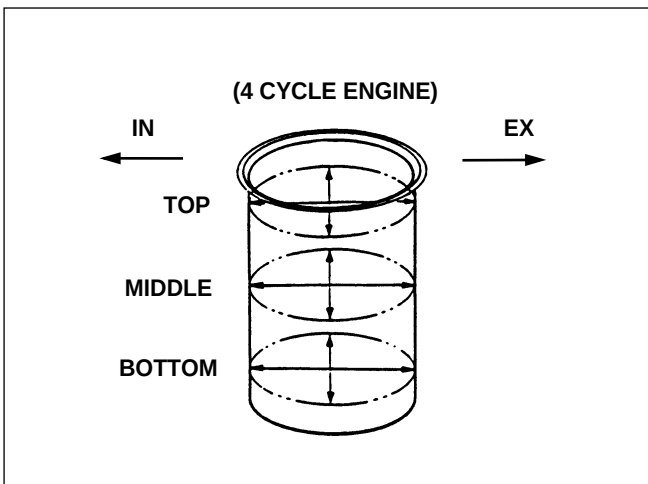
CYLINDER INSPECTION

- Inspect the cylinder bore for wear or damage.

SERVICE LIMITS : 72.80mm replace or replace if over

- Measure the cylinder-to-piston clearance.

SERVICE LIMITS : 0.1mm replace or replace if over



- The true roundness is the difference between the values measured in X and Y directions.
- The cylindricity (difference between the values measured at the three levels) is subject to the maximum value calculated.

SERVICE LIMITS :

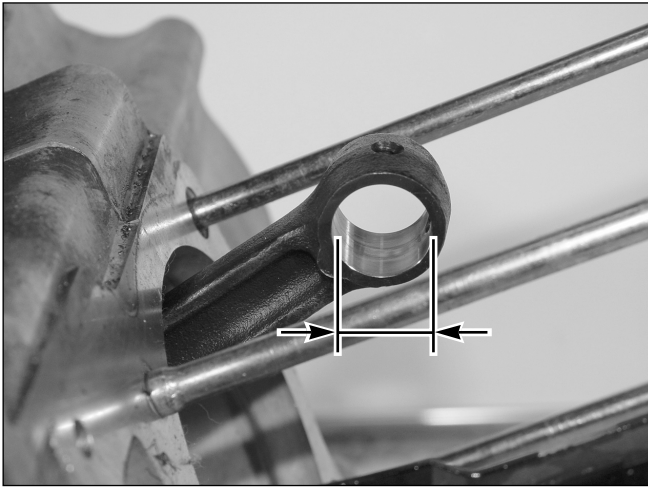
TRUE ROUNDNESS : 0.09mm replace or replace if over

CYLINDRICITY : 0.09mm replace or replace if over



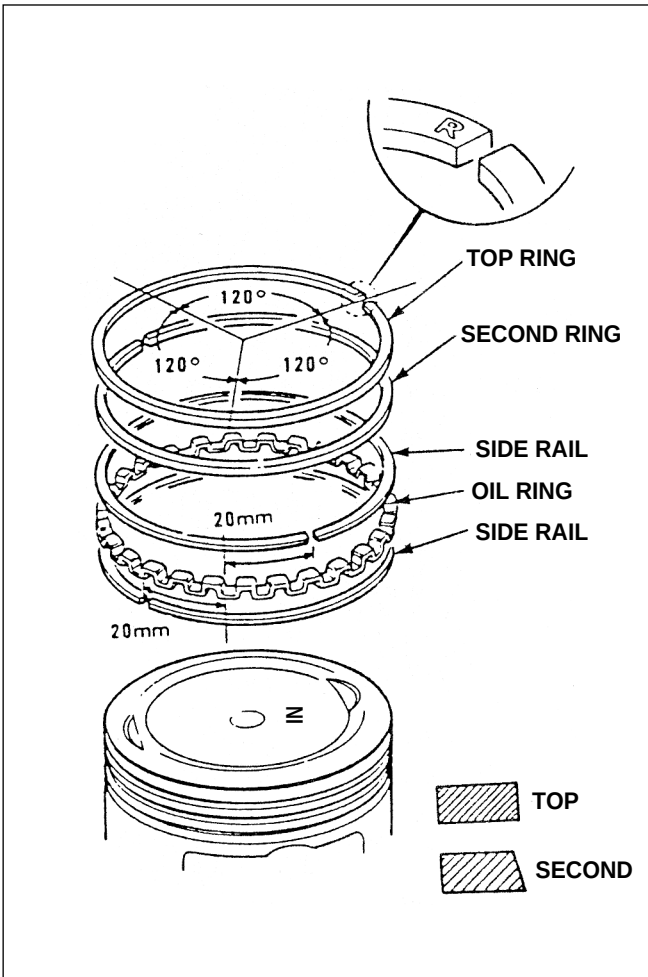
- Inspect the top of the cylinder for warpage.

SERVICE LIMITS : 0.05mm replace or replace if over



- Measure the connecting rod small end I.D.

SERVICE LIMITS : 17.06mm replace if over

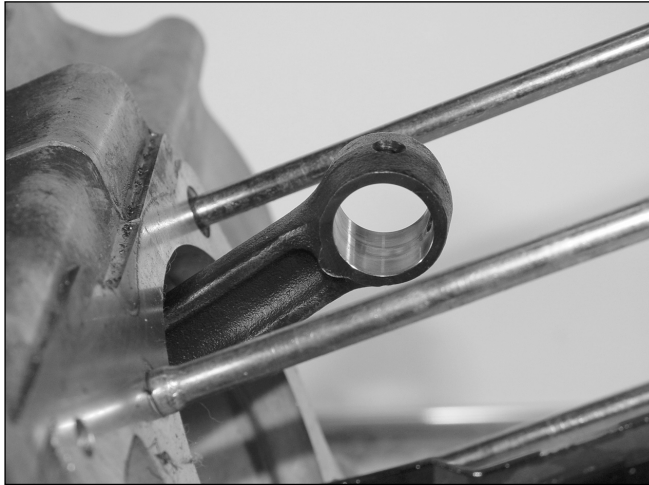


PISTON RING INSTALLATION

- Install the piston rings onto the piston.
- Apply engine oil to each piston ring.

NOTE

- Be careful not to damage the piston and piston rings during assembly.
- All rings should be installed with the markings facing up.
- After installing the rings, they should rotate freely without sticking.
- stagger the ring end gaps as the figure shown.

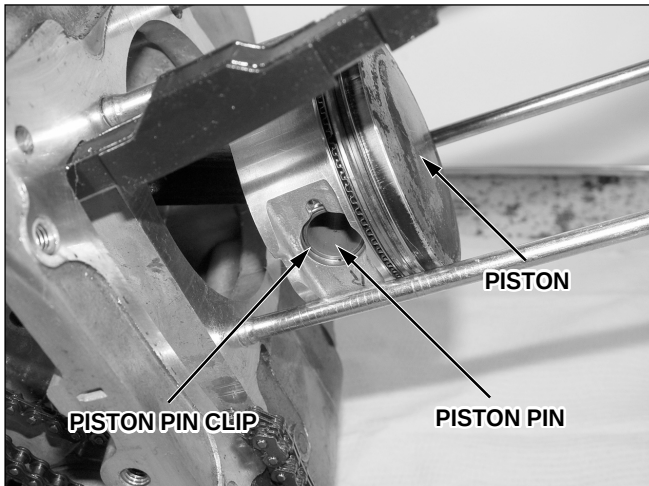


PISTION INSTALLATION

- Remove any gasket material from the crankcase surface.

⚠ NOTE

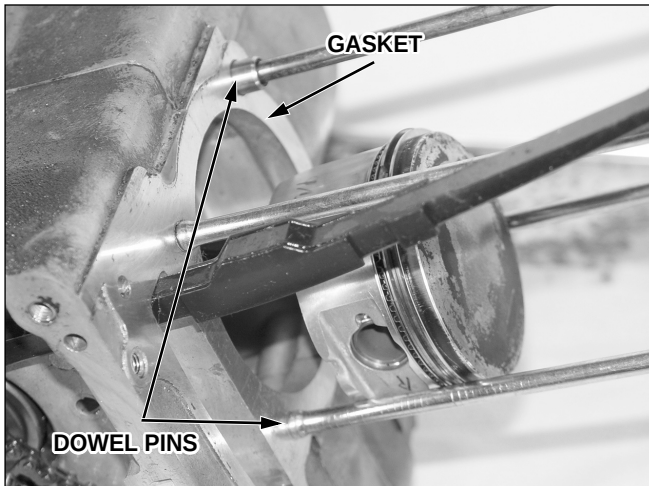
- Be careful not to drop foreign matters into the crankcase.



- Install the piston, piston pin and a new piston pin clip.

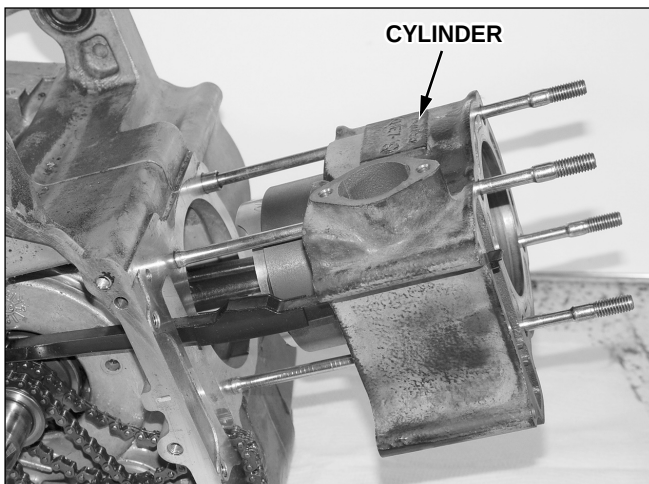
⚠ NOTE

- Position the piston “IN” mark on the intake valve side.
- Place a clean shop towel in the crankcase to keep the piston pin clip from falling into the crankcase.



CYLINDER INSTALLATION

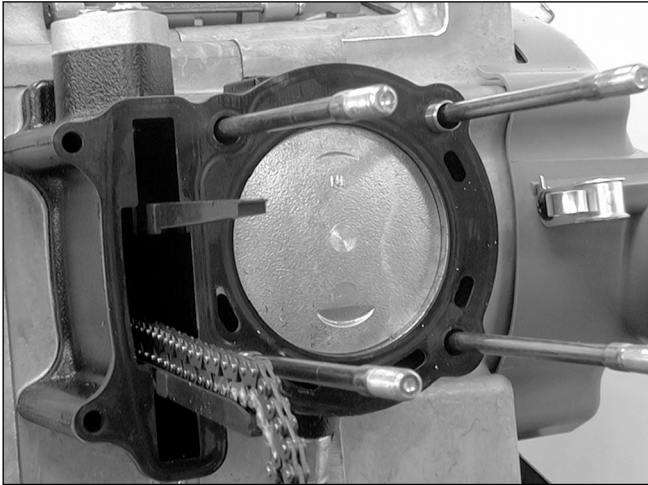
- Install the dowel pins and a new cylinder gasket on the crankcase.



- Coat the cylinder bore, piston and piston rings with clean engine oil.
- Carefully lower the cylinder over the piston by compressing the piston rings.

⚠ NOTE

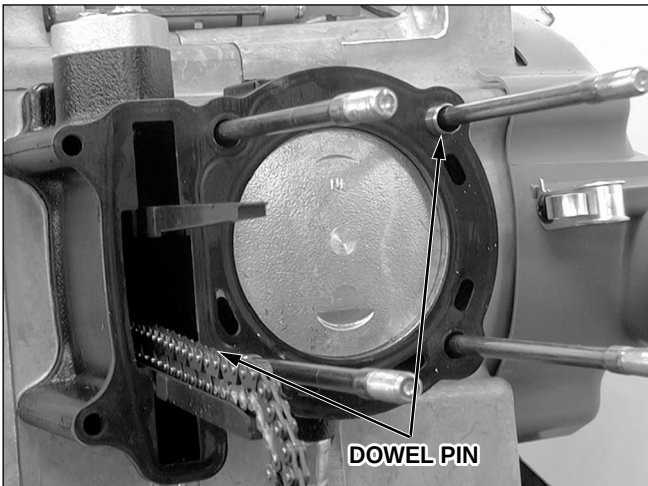
- Be careful not to damage or break the piston rings.
- The piston ring end gaps should not be parallel with or at 90° to the piston pin.



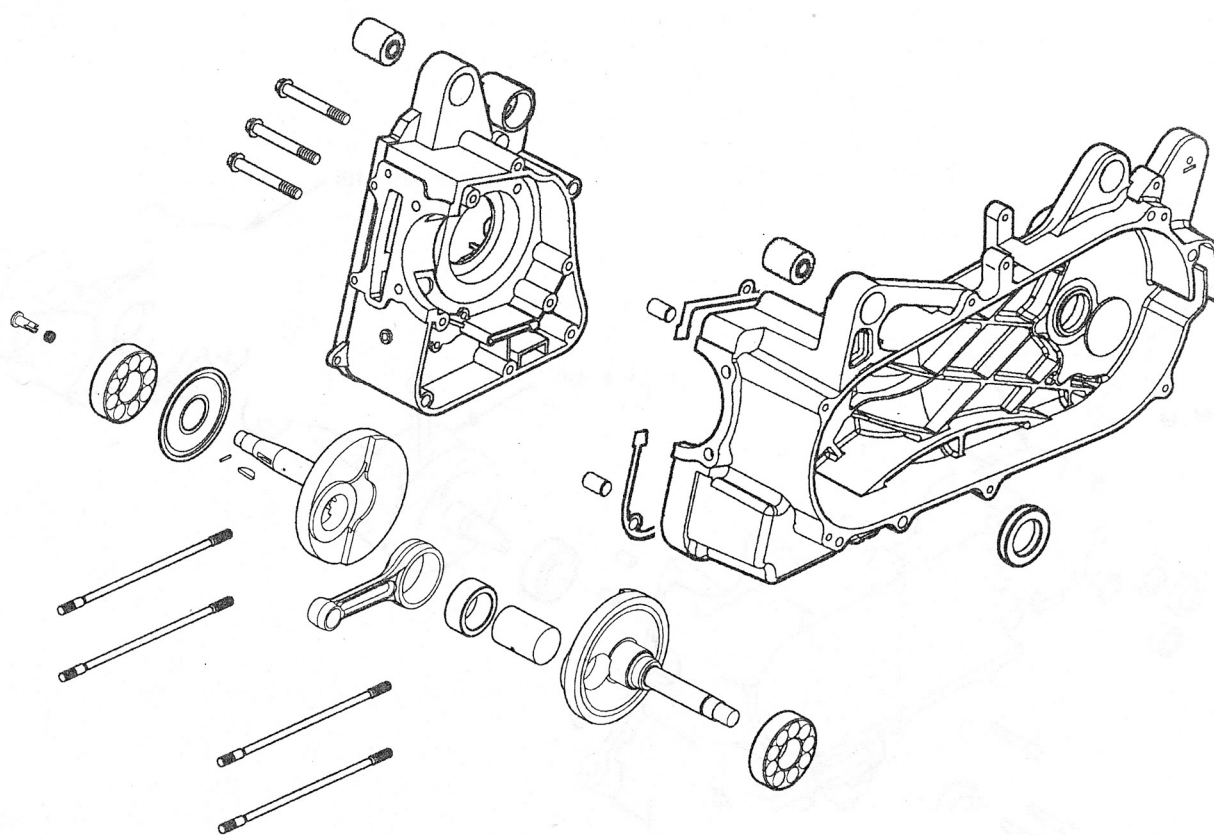
- Install the cam chain guide.

 NOTE

- Insert the tab on the cam chain guide into the cylinder groove.



- Install the cylinder gasket and dowel pins.
- Connect the water hose to the cylinder.
- Install the cylinder head.
- Tighten the cylinder base bolt.



12. CRANKSHAFT/CRANKCASE

SERVICE INFORMATION . . . 12-1

TROUBLESHOOTING 12-2

CRANKCASE REMOVAL . . . 12-3

CRANKSHAFT INSPECTION . 12-4

CRANKCASE INSTALLATION . 12-5

SERVICE INFORMATION

GENERAL SAFETY

- This section covers crankcase separation to service the crankshaft. The engine must be removed for this operation.
- When separating the crankcase, never use a driver to pry the crankcase mating surfaces apart forcibly to prevent damaging the mating surfaces.
- When installing the crankcase, do not use an iron hammer to tap it.
- The following parts must be removed before separating the crankcase.
 - Cylinder head
 - Cylinder/piston
 - Right crankcase cover/drive and driven pulley
 - A.C. generator/starter clutch
 - Rear wheel/rear shock absorber
 - Starter motor
 - Oil pump

SPECIFICATIONS

ITEM		STANDARD(mm)	SERVICE LIMIT(mm)
CRANK SHAFT	Connecting rod big end side clearance	0.15~0.55mm	0.60mm
	Connecting rod big end radial clearance	0~0.008mm	0.05mm
	Runout	-	0.10mm

12

TORQUE VALUES

CRANKCASE BOLT : 0.78~1.08kgf · m

CAM CHAIN TENSIONER SIPPER BOLT : 0.78~1.18kgf · m

CRANKSHAFT/CRANKCASE

TOOL

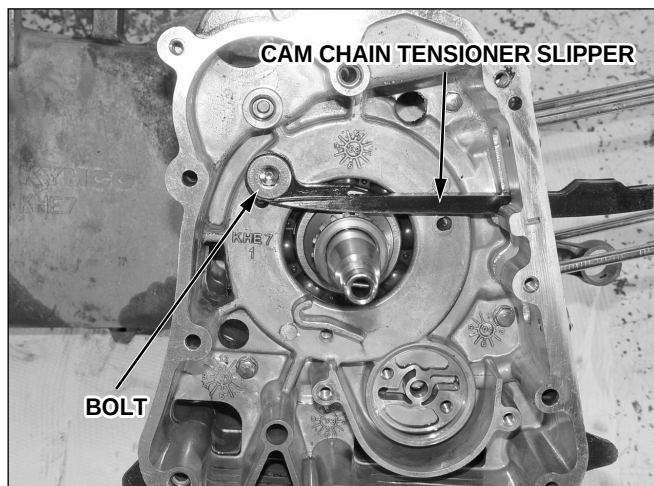
Universal bearing puller
Bearing remover set
Remover ass'y
Remover shaft
Remover head
Sliding weight
Assembly shaft

TROUBLESHOOTING

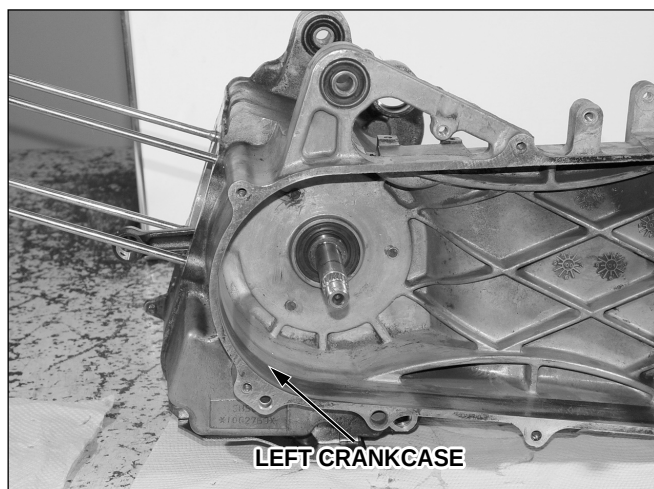
Excessive engine noise

- Excessive bearing play
- Excessive crankpin bearing play
- Worn piston pin and piston pin hole

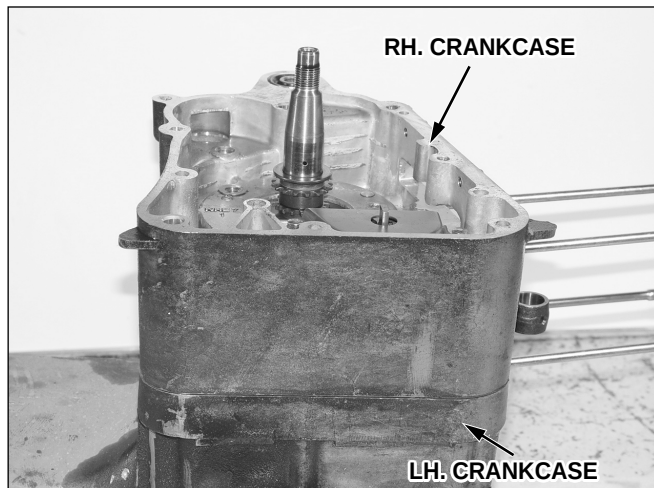
CRANKCASE REMOVAL



- Remove the cam chain tensioner slipper bolt.
- Remove the cam chain tensioner slipper and cam chain.
- Loosen the 3 bolts securing the RH. crankcase.



- Remove the LH. crankcase.

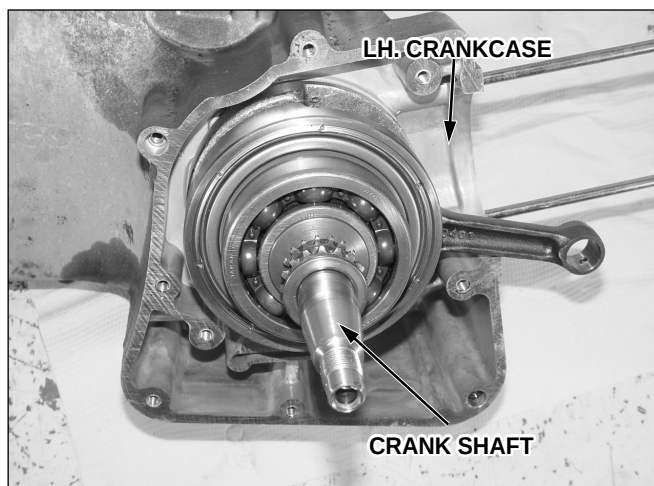


- Place the crankcase with the LH. crankcase down and remove the RH. crankcase from the LH. crankcase.

NOTE

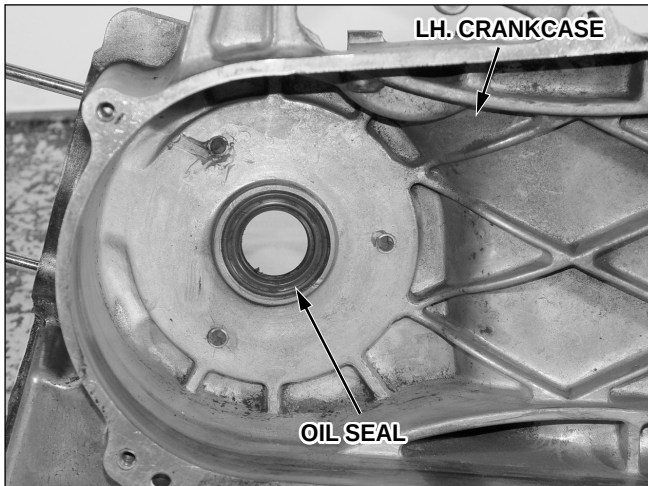
- Never use a driver to pry the crankcase mating surfaces apart.

- Remove the gasket and dowel pins.



- Remove the crankshaft from the RH. crankcase.

CRANKSHAFT/CRANKCASE

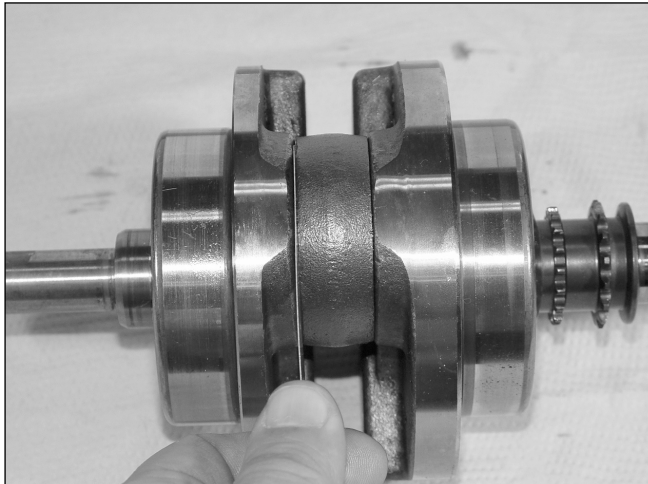


- Remove the oil seal from the LH. crankcase.
- Install a new drive shaft oil seal.

CRANKCASE INSPECTION

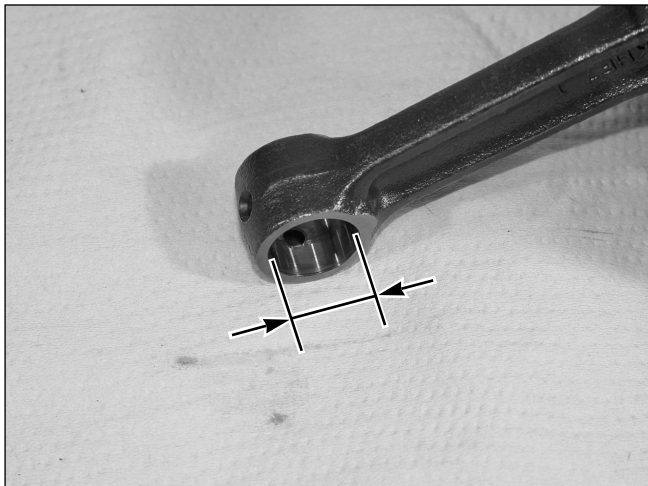
- Measure the connecting rod big end sies clearance.

SERVICE LIMITS : 0.6mm replace if over



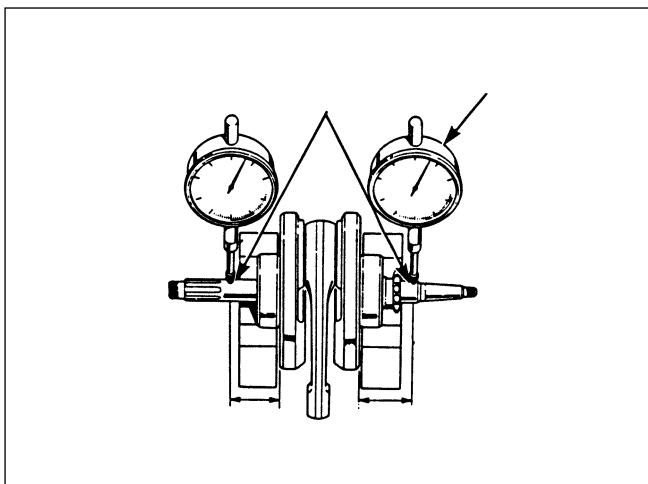
- Measure the connecting rod small end I.D.

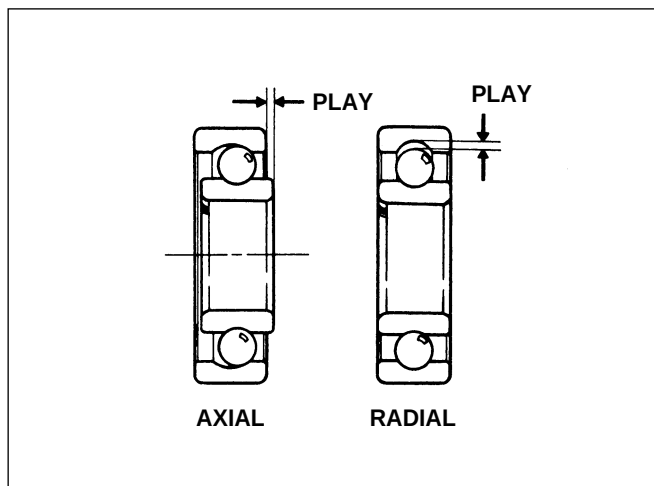
SERVICE LIMITS : 17.06mm replace if over



- Measure the crankshaft runout.

SERVICE LIMITS : 0.10mm replace if over





- Measure the crankshaft bearing play.

SERVICE LIMITS :

AXIAL : 0.20mm replace if over

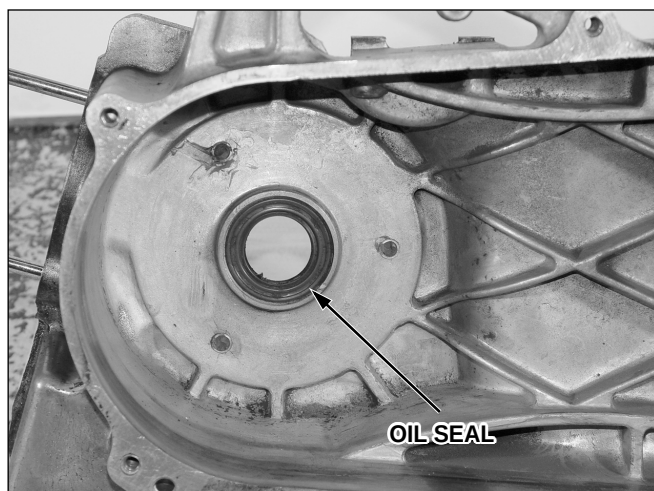
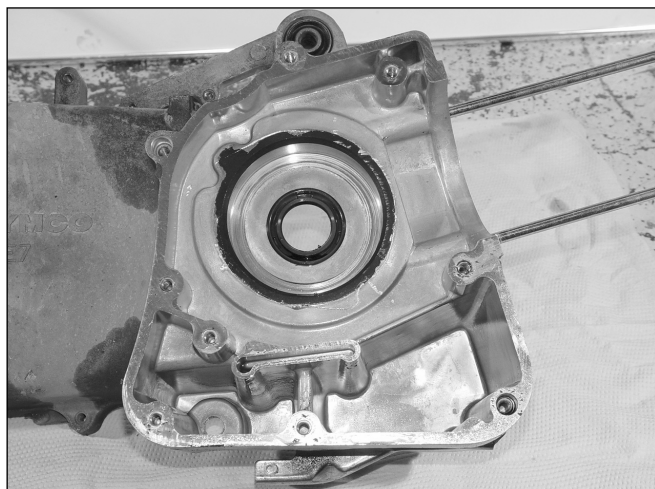
RADIAL : 0.05mm replace if over

CRANKCASE INSTALLATION

- Clean off all gasket material from the crankcase mating surfaces.

⚠ NOTE

- Avoid damaging the crankcase mating surfaces.



- Install a new oil seal into the LH. crankcase.

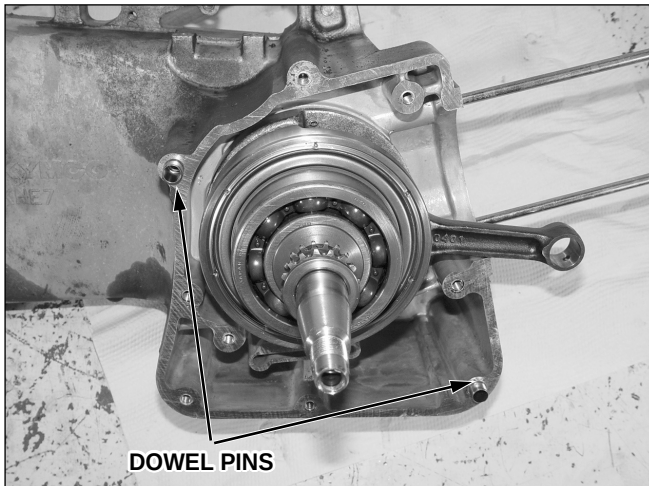


- Place the LH. crankcase down and install the crankshaft into the LH. crankcase.

⚠ NOTE

- Avoid damaging the oil seal.
- Apply grease to the lip of the oil seal.

CRANKSHAFT/CRANKCASE



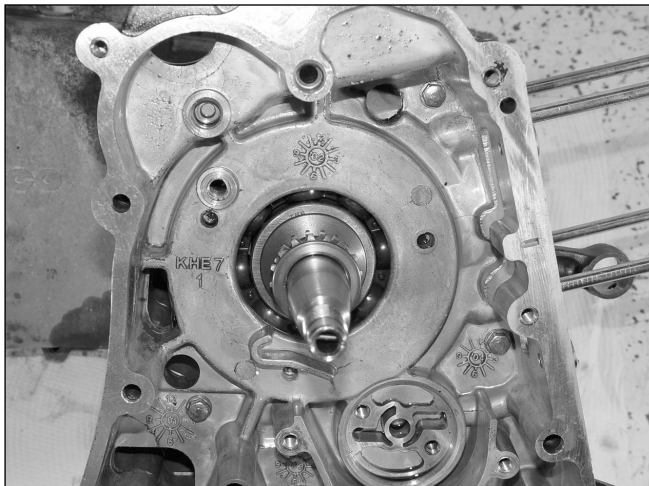
- Install the two dowel pins and a new gasket.



- Place the RH. crankcase over the crankshaft and onto the LH. crankcase.

⚠ NOTE

- Install the RH. crankcase squarely and do not tap it with an iron or plastic hammer.



- Install and tighten the R/L and left crankcase bolts.

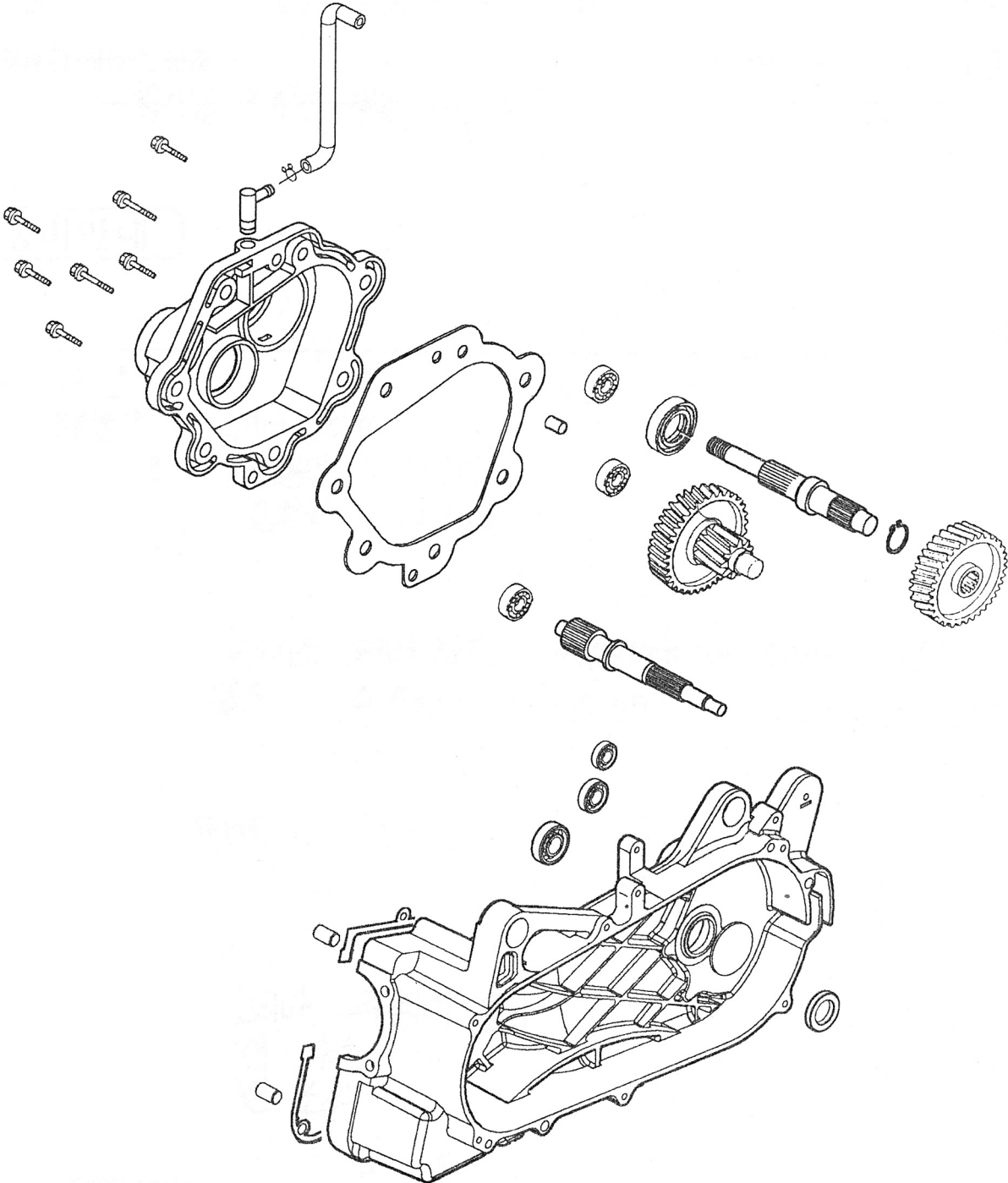
TORQUE VALUE : 0.78~1.08kgf · m



- Install the cam chain.
- Install the cam chain tensioner slipper.
- Install the tighten the cam chain tensioner slipper bolt.

TORQUE VALUE : 0.78~1.18kgf · m

MEMO



13. FINAL REDUCTION

SERVICE INFORMATION 13-1

TROUBLESHOOTING 13-1

FINAL REDUCTION DISASSEMBLY . 13-2

FINAL REDUCTION INSPECTION . 13-2

FINAL REDUCTION ASSEMBLY . 13-4

SERVICE INFORMATION

SPECIFICATIONS

Specified Oil : SAE 90#

Oil Capacity:

At disassembly : 0.2 liter

At change : 0.18 liter

TORQUE VALUES

Transmission case cover bolt : 1.17~2.16kgf · m

Cam chain tensioner : 0.78~1.18kgf · m

SPECIAL TOOLS

Bearing remover, 12mm

Bearing remover, 15mm

Pilot, 12mm

Pilot, 15mm

TROUBLESHOOTING

Engine starts but motorcycle won't move

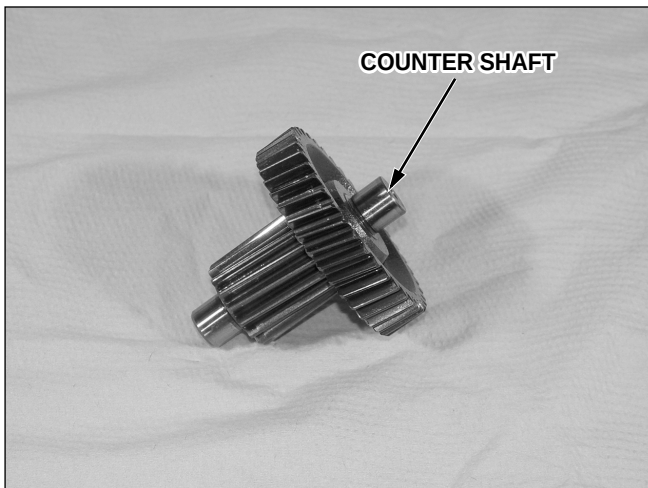
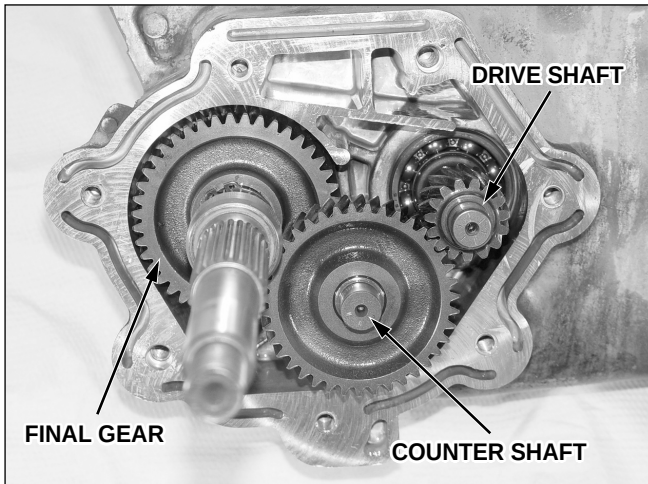
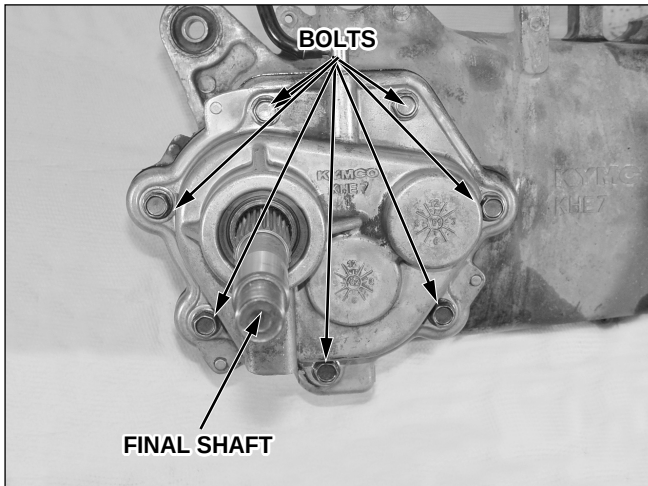
- Damaged transmission
- Seized or burnt transmission

Abnormal noise

- Worn, seized or chipped gears
- Worn, bearing

Oil leaks

- Oil level too high
- Worn or damaged oil seal



FINAL REDUCTION DISASSEMBLY

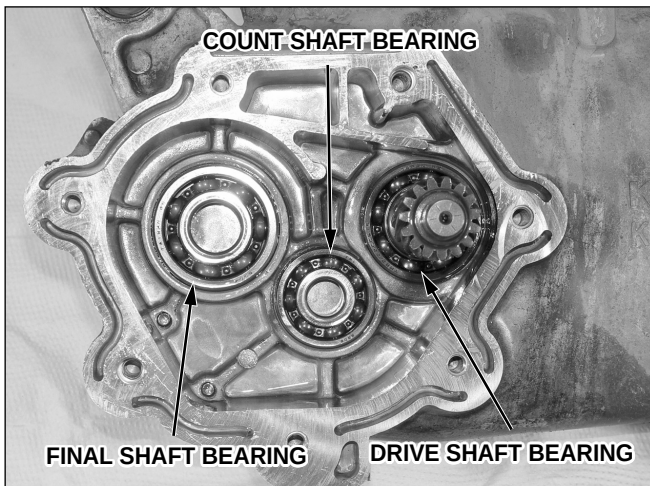
- Remove the exhaust muffler.
- Remove the rear brake caliper.
- Remove the RH. rear shock absorber.
- Remove the rear fork.
- Remove the rear wheel.
- Remove the left crankcase cover.
- Remove the clutch/driven pulleys.
- Drain the transmission gear oil into a clean container.
- Remove the transmission case cover bolts.

- Remove the transmission case cover.
- Remove the gasket and dowel pins.
- Remove the final gear and countershaft.

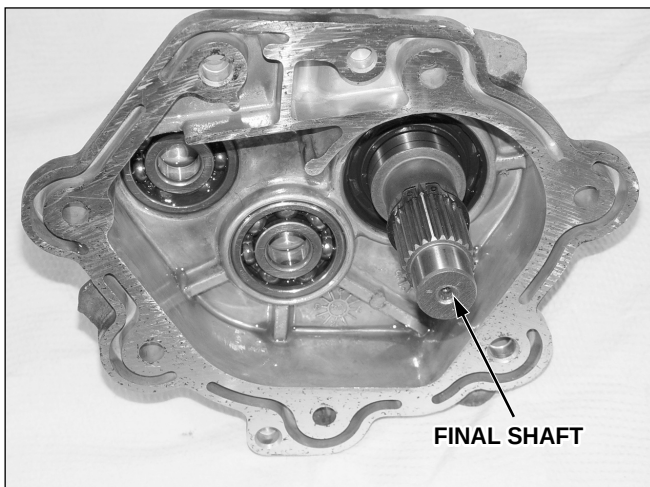
FINAL REDUCTION INSPECTION

- Inspect the countershaft and gear for wear or damage.

- Inspect the final gear and final shaft for wear, damage or seizure.



- Check the LH. crankcase bearings for excessive play and inspect the oil seal for wear or damage.



- Inspect the drive shaft and gear for wear or damage.
- Check the transmission case covers bearings for excessive play and inspect the final shaft bearing oil seal for wear or damage.

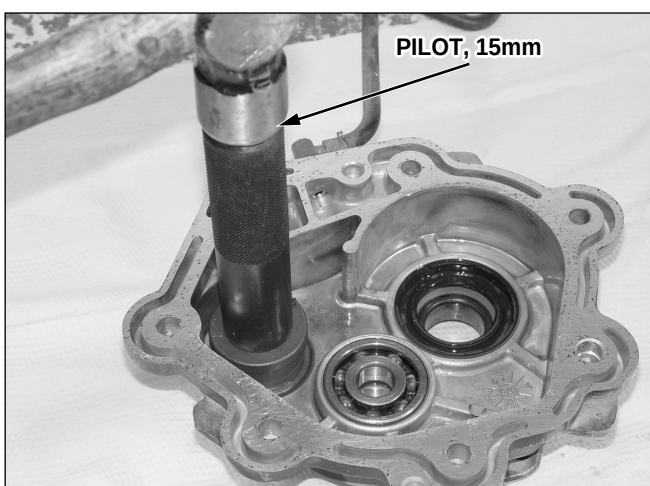
NOTE

- Do not remove the transmission case cover except for necessary part replacement. When replacing the drive shaft, also replace the bearing and

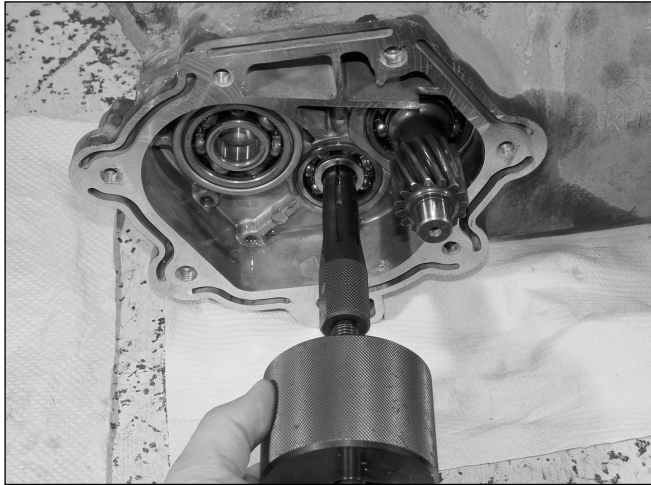


BEARING REPLACEMENT (TRANSMISSION CASE COVER)

- Remove the transmission case cover bearings using the bearing remover.
- Remove the final shaft oil seal.

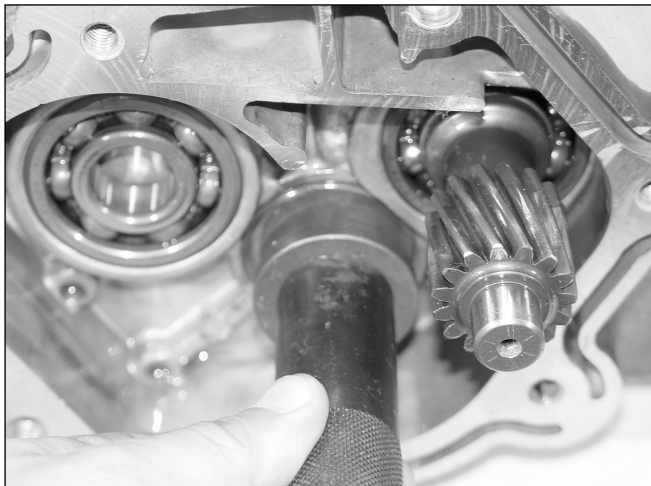


- Drive new bearings into the transmission case cover.

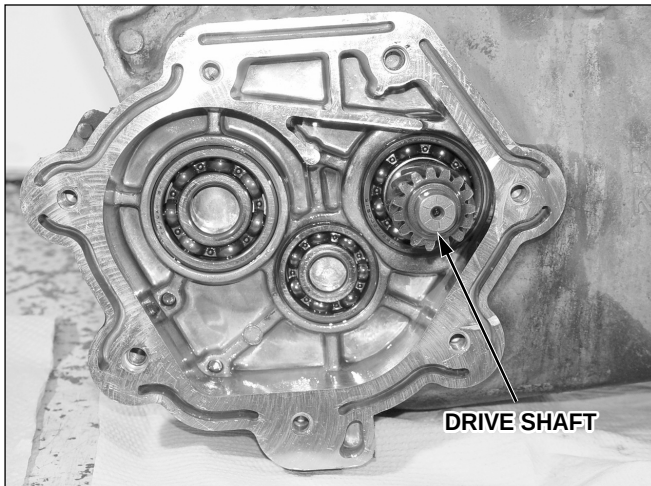


BEARING REPLACEMENT (TRANSMISSION CASE COVER)

- Remove the transmission case cover bearings using the bearing remover.
- Remove the final shaft oil seal.

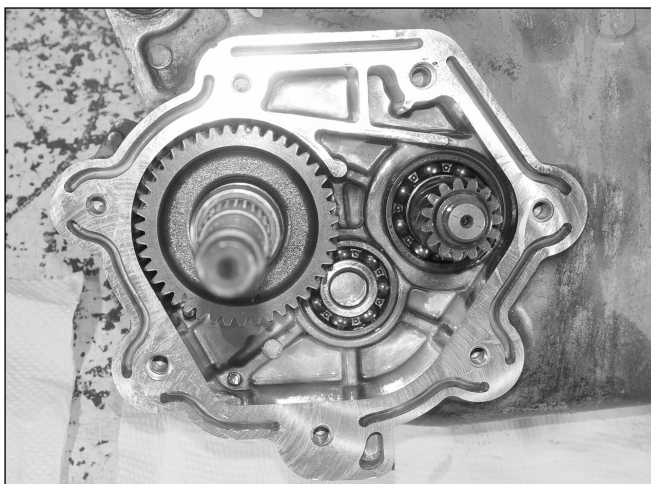


- Drive new bearings into the left crankcase.
- Install a new drive shaft oil seal.

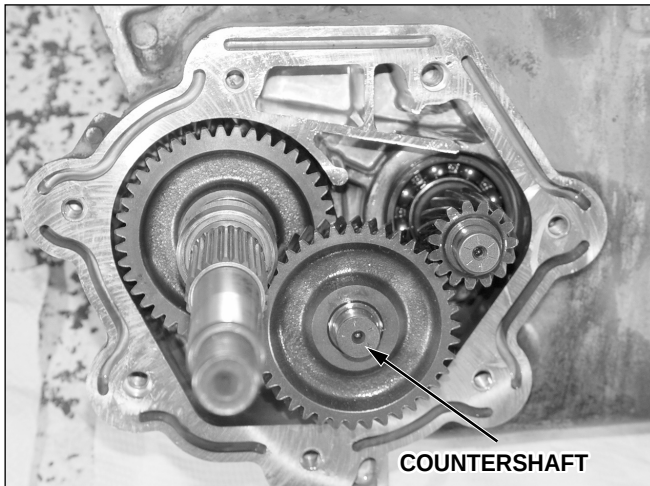


FINAL REDUCTION ASSEMBLY

- Install the drive shaft into the left crankcase.



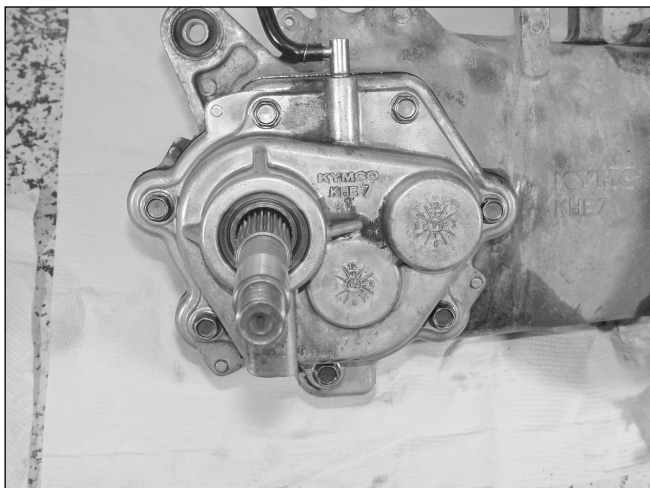
- Install the final gear and final shaft into the left crankcase.



- Install the countershaft and gear into the left crankcase.
- Install the resin washer onto the counter-shaft.
- Install the dowel pins and a new gasket.



- Install the transmission case cover.



- Install and tighten the transmission case cover bolts.
- Install the clutch/driven pulley.
- Install other removed parts in the reverse order of removal.

- After installation, fill the transmission case with the specified oil.

⚠ NOTE

- Place the motorcycle on its main stand on level ground.
- Check the oil-sealing washer for wear or damage.

- After installation, fill the transmission case with the specified oil.

SPECIFIED GEAR OIL : SAE90#

OIL CAPACITY :

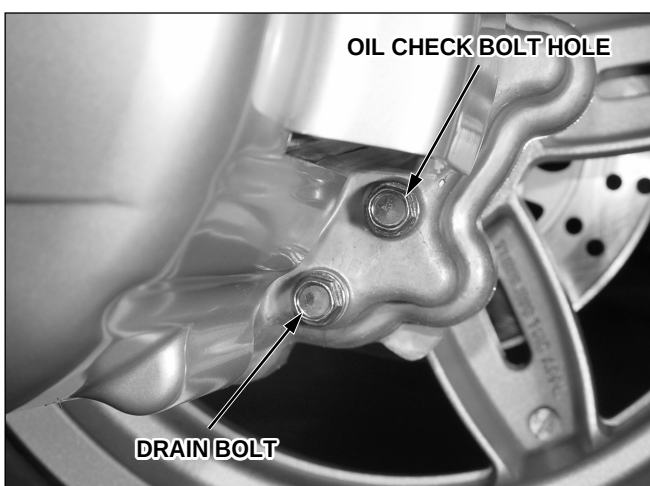
At disassembly : 0.2 ℓ

At change : 0.18 ℓ

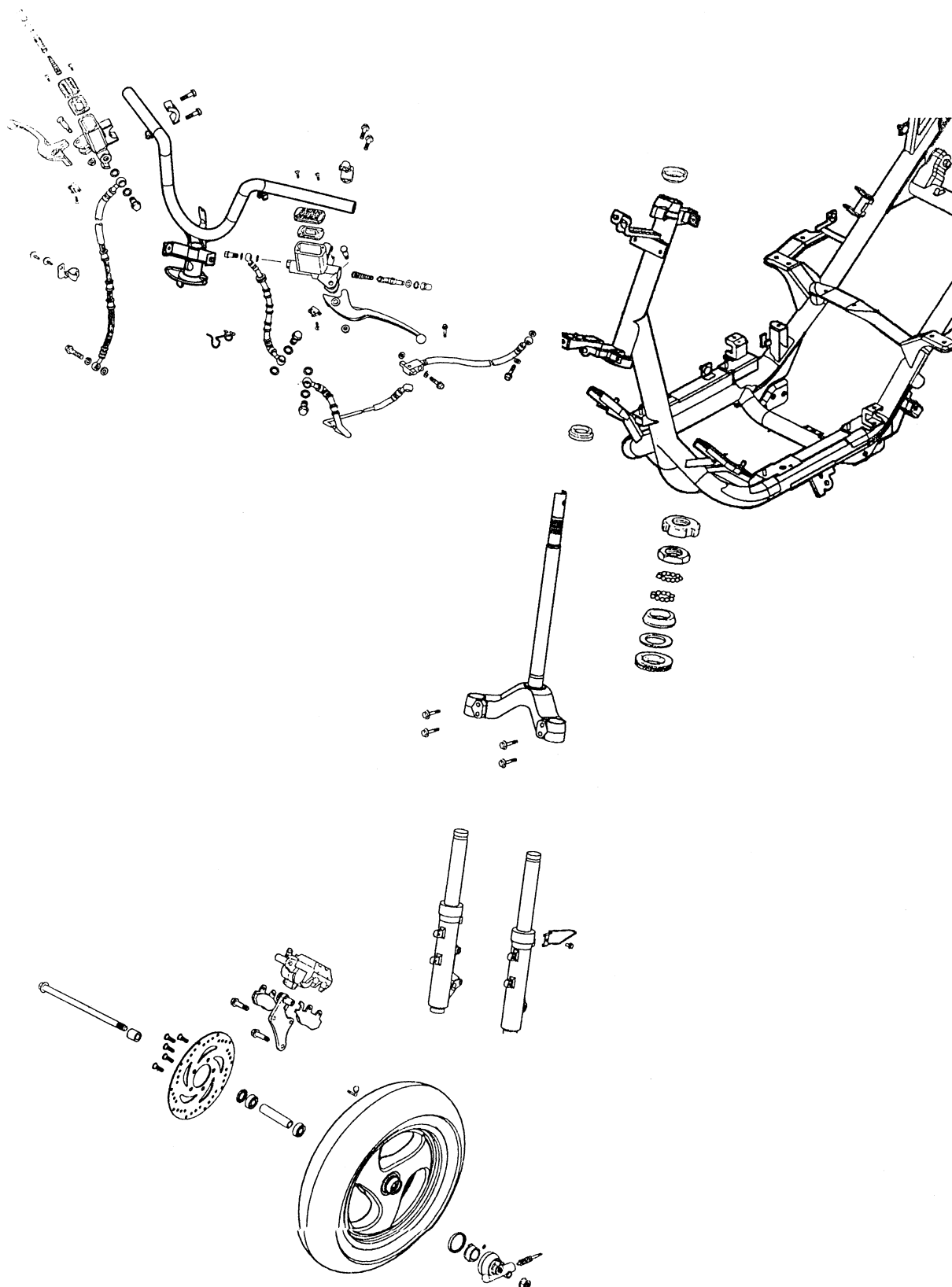
- Install and tighten the oil check bolt.

TORQUE VALUE : 0.78~1.18kgf · m

- Start the engine and check for oil leaks.
- Check the oil level from the oil check bolt hole and add the specified oil to the proper level if the oil level is low.



FRONT WHEEL/FRONT FORK/STEERING/BRAKE



14. FRONT WHEEL/FRONT FORK/STEERING/BRAKE

SERVICE INFORMATION	14-1	FRONT WHEEL INSTALLATION .	14-7
TROUBLESHOOTING	14-2	FRONT BRAKE	14-7
STEERING HANDLE	14-3	BRAKE FLUID	14-10
FRONT WHEEL	14-4	BRAKE CALIPER	14-12
FRONT WHEEL BEARING . . .	14-5	FRONT FORK	14-14
SPEEDOMETER	14-6	STEERING STEM	14-19

SERVICE INFORMATION

GENERAL SAFETY



- 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 rim from being damaged.
- Place a jack underneath the engine to support the 2-wheeled vehicle.

SPECIFICATIONS

ITEM		STANDARD (mm)	SERVICE LIMIT (mm)
AXLE SHAFT RUNOUT		-	0.2mm
FRONT WHEEL RIM RUNOUT	RADICAL	-	2.0mm
	AXIAL	-	2.0mm
FRONT SHOCK ABSORBER SPRING FREE LENGTH		240.6mm	233mm
BRAKE DISK THICKNESS		3.8~4.2mm	3.0mm
BRAKE DISK RUNOUT		-	0.30mm
TOP BRAKE CALIPER PISTON O.D.		26.94~26.97mm	26.91mm
TOP BRAKE CALIPER CYLINDER I.D.		27.00~27.05mm	27.00mm
UNDER BRAKE CALIPER PISTON O.D.		33.90~33.93mm	33.87mm
UNDER BRAKE CALIPER CYLINDER I.D.		33.96~34.01mm	34.01mm

TORQUE VALUES

STEERING STEM LOCK NUT	7.84~11.76kg · m
STEERING TOP CONE RACE	0.49~1.27kgf · m
FRONT SHOCK ABSORBER BOLT	1.98~2.45kgf · m
FRONT AXLE NUT	4.41~4.9kgf · m
BRAKE CALIPER BOLT	2.45~3.43kgf · m

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 gear box.

Brake lever soft or spongy

- Air in hydraulic system
- Mixed brake fluid and wet
- Contaminated brake pad or disk
- Worn caliper piston seal
- Worn master cylinder piston seal
- Worn brake pad
- Contaminated caliper inside
- Caliper not sliding properly
- Worn brake pad or disk
- Low brake fluid level
- Clogged fluid passage
- Warped or deformed brake disk
- Sticking or worn caliper piston
- Sticking or worn master cylinder piston
- Contaminated master cylinder inside
- Bent brake lever

Brake lever hard

- Clogged brake system
- Sticking caliper piston
- Caliper not sliding properly
- Clogged fluid passage
- Worn caliper piston seal
- Sticking or worn master cylinder piston
- Bent brake lever

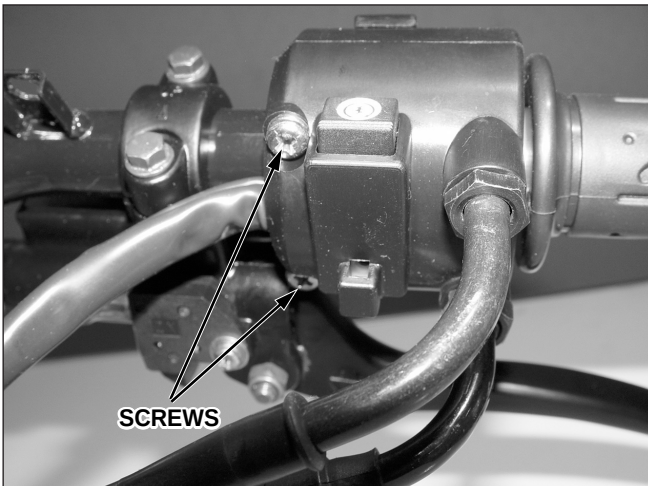
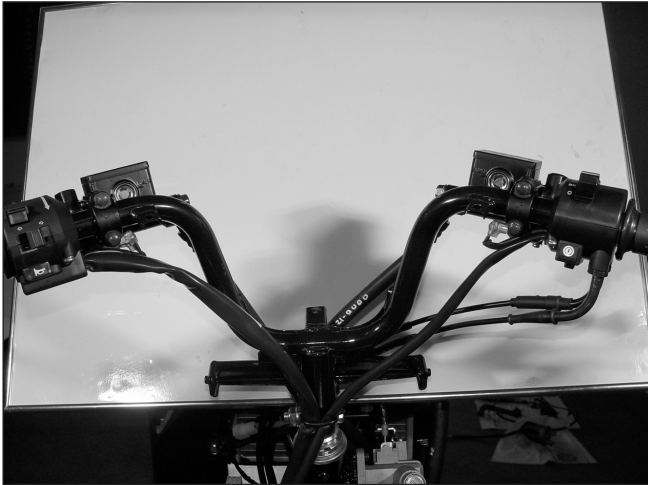
Brake drags

- Contaminated brake pad or disk
- Misaligned wheel
- Worn brake pad or disk
- Warped or deformed disk
- Caliper not sliding properly
- Hydraulic system contaminated with dust

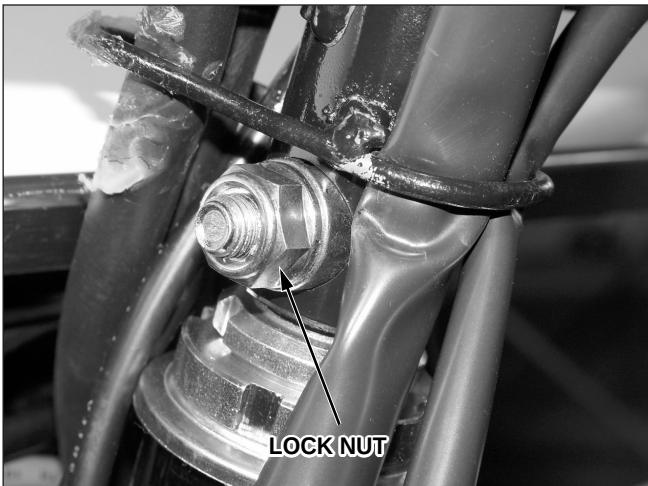
STEERING HANDLE

REMOVAL

- Remove the upper handle cover and the under handle cover from the handle bar.
- Loosen the bolts securing the front and rear break master cylinder.
- Remove the front cover, front under cover and speedometer cover.



- Loosen the 4 screws securing the housing.
- Disconnect the throttle cable from the throttle grip and remove the throttle grip from the handlebar.



- Remove the handlebar lock nut and take out the bolt.
- Remove the handlebar.

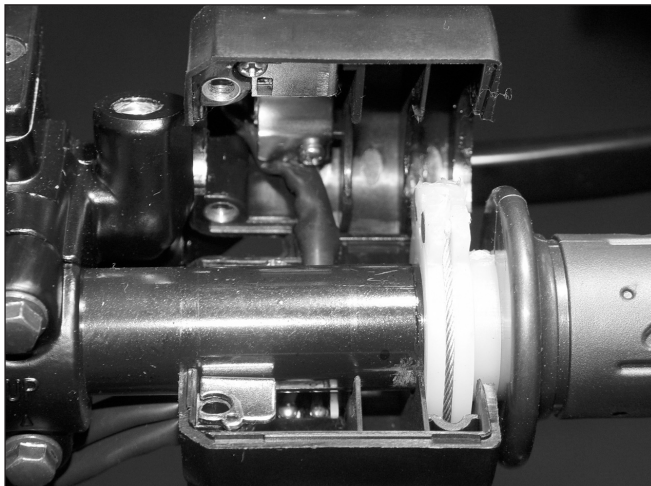


INSTALLATION

- Install the handlebar onto the steering stem and install the handlebar collar, lock nut and bolt.
- Tighten the bolt, to the specified torque.

TORQUE VALUE : 3.92~4.9kgf · m

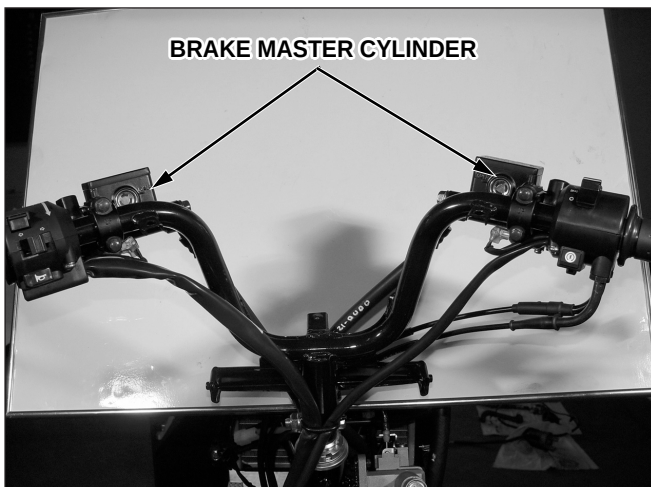
FRONT WHEEL/Front FORK/STEERING/BRAKE



- Lubricate the throttle grip front end with grease and then install the throttle grip.
Connect the throttle cable to the throttle grip.
- Install the right and left handlebar switches and tighten the screws.

NOTE

- Adjust the throttle grip free play to the specified range of 2~6mm.



- Install the front and rear brake master cylinders.

NOTE

- Install the brake master cylinders by aligning the index marks.

- Install in the reverse order of removal.



FRONT WHEEL

REMOVAL

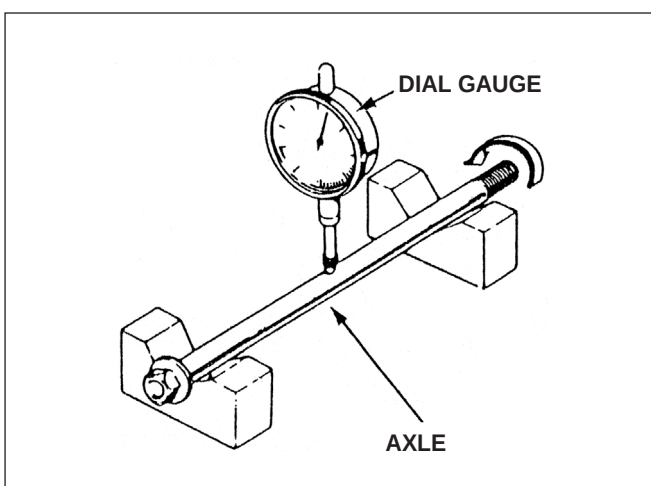
- Jack the motorcycle front wheel off the ground.
- Remove the front axle nut to pull out the axle.
- Remove the front wheel and the speedometer gear unit.

INSPECTION

AXLE RUNOUT

- Set the axle in V blocks and measure the runout using a dial gauge.
- The actual runout is 1/2 of the total indicator reading.

SERVICE LIMIT : 0.2mm replace if over





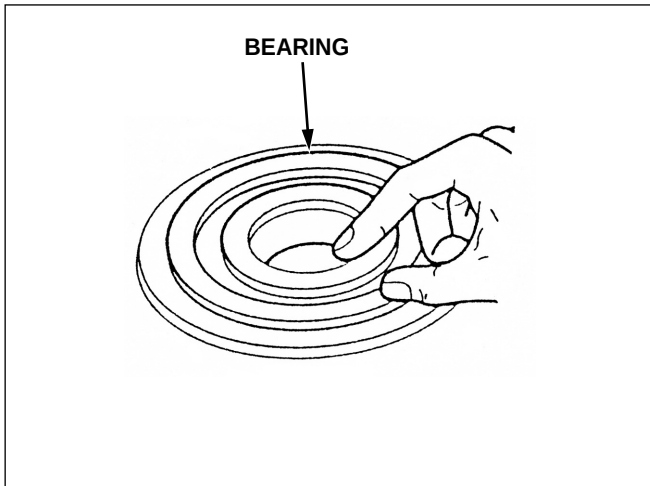
WHEEL RIM

- Check the wheel rim runout.

SERVICE LIMIT :

RADIAL : 2.0mm replace if over

AXIAL : 2.0mm replace if over



FRONT WHEEL BEARING INSPECTION

- Turn the inner race of each bearing with your finger to see if they turn smoothly and quietly. Also check if the outer race fits tightly in the hub.
- Replace the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the hub.



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

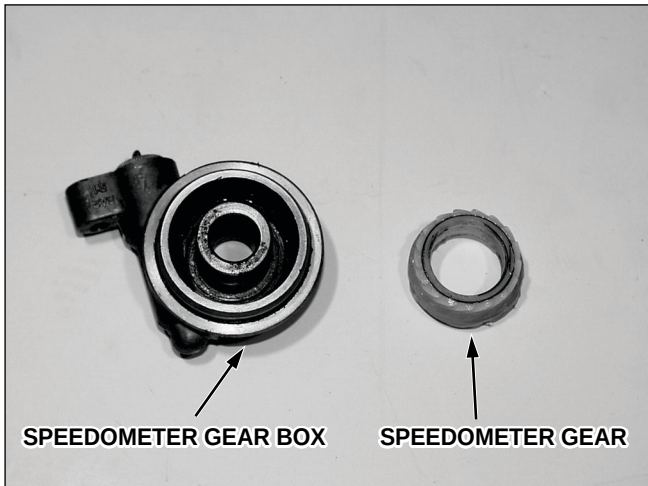
- Apply sufficient amount of grease to the bearing.
- Insert the right bearing with its seal surface facing outside.
- Do not tilt the bearing. Insert accurately.
- Upon assembling the distance collar, insert the left bearing with its seal surface facing outside.

TOOLS : DRIVER HANDLE A DRIVER PILOT OUTER DRIVER



⚠ CAUTION

- The bearing inserted in the last must be inserted until it contacts with the distance collar.
- Excessively inserted bearing can cause damage the opposite side bearing.



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.
- Install the washer.
- Apply grease to the speedometer gear unit and install.



FRONT WHEEL ASSEMBLY

- Apply grease to the left side dust seal rim.
- Install the left side dust seal.
- Install the brake disk.
- Install disk bolts.

TORQUE VALUE : 4.0~4.5kgf · m



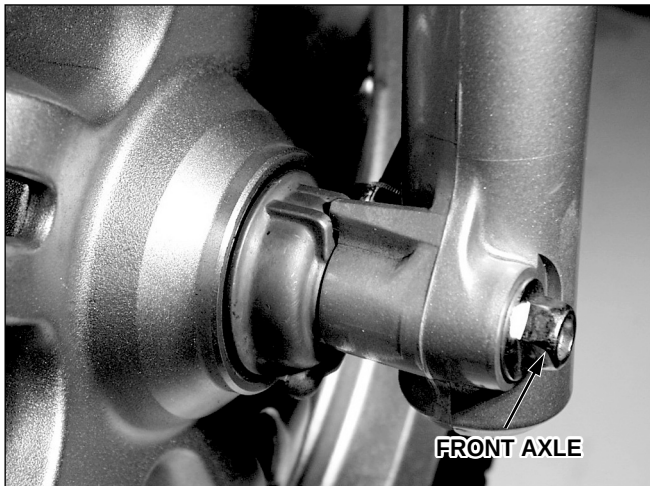
- Install the left side collar.



- Install the speedometer gear unit by aligning its retaining pawl with the hub cutout.

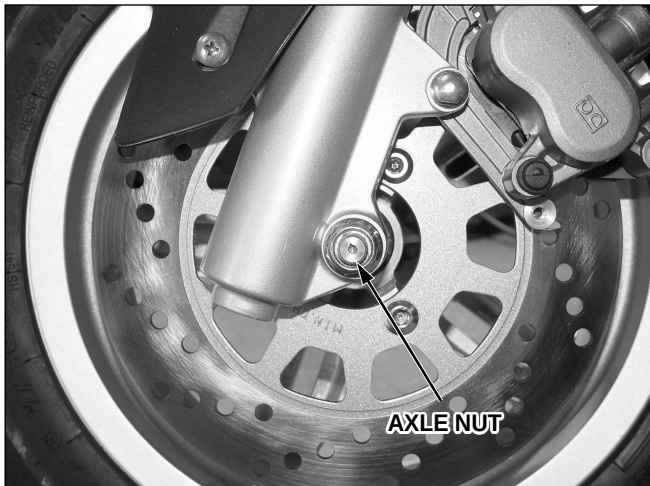


- Apply grease to the dust seal rim.
- Install the dust seal, and align the tangs of the speedometer gear retainer with the gear groove to assemble the speedometer gear box.



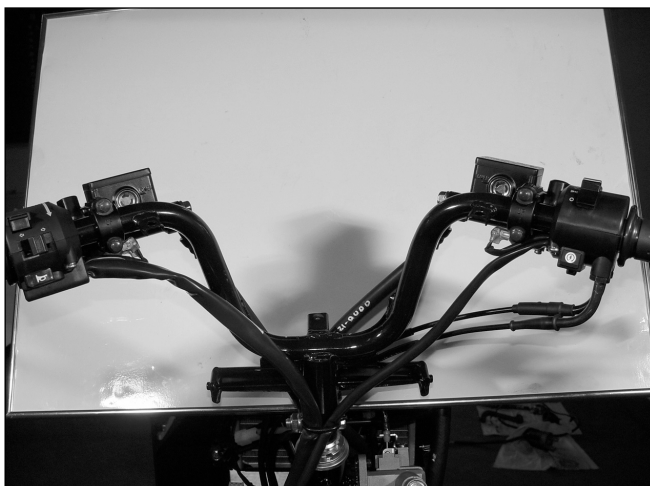
FRONT WHEEL INSTALLATION

- Insert the front wheel between the front forks.
- Insert the disk, 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.
- Install the speedometer cable, and tighten with screws.
- Place the front wheel on the ground, and tighten the axle nut to the specified torque.

TORQUE VALUE : 5.0-7.0 kgf · m



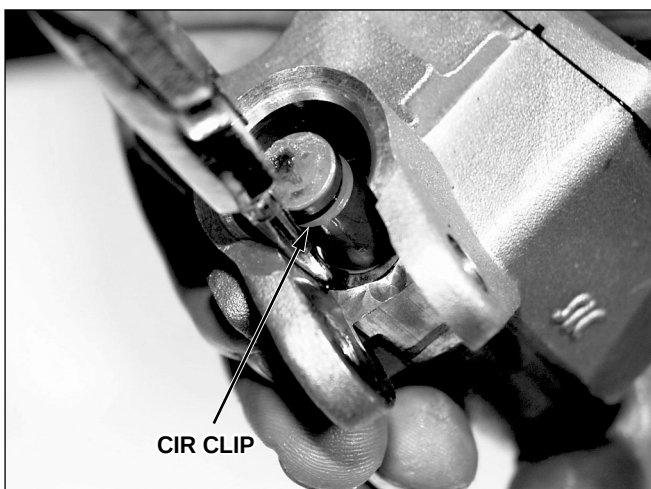
FRONT WHEEL BRAKE MASTER CYLINDER REMOVAL

- Remove the handlebar covers.
- First drain the brake fluid from the hydraulic brake system.
- Disconnect the front stop switch wire connector.
- Remove the brake fluid tube bolt.
- Remove the two bolts securing the brake master cylinder.
- Remove the brake master cylinder.



NOTE

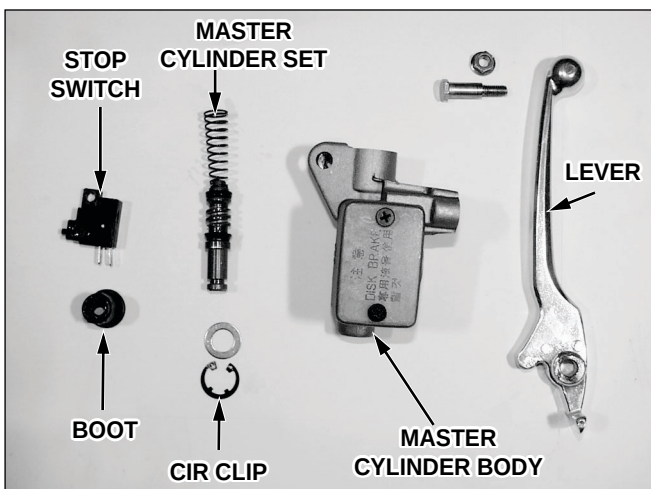
- When servicing the brake system, use shop towels to cover rubber and plastic parts and coated surfaces to avoid being contaminated by brake fluid.
- When removing the brake fluid tube bolt, be sure to plug the tube end to avoid brake fluid leakage.



DISASSEMBLY

- Remove the Fr/Rr stop switch.
- Take out the boot and circlip from the master cylinder.

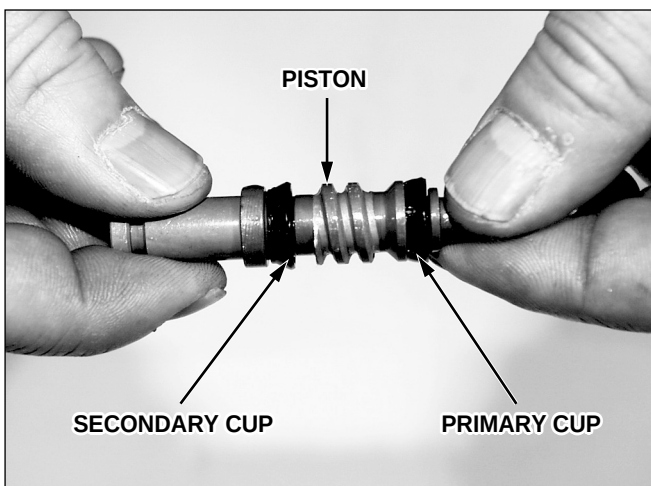
TOOLS : SNAP RING PLIERS



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

INSPECTION

- Check the piston periphery for scores, scratches or nicks and replace if necessary.
- 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.

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.

CAUTION

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

- Install the primary cup with its concaved side toward the inner side of the master cylinder.
- Install the snap ring.
- Install the rubber boot in the groove properly.

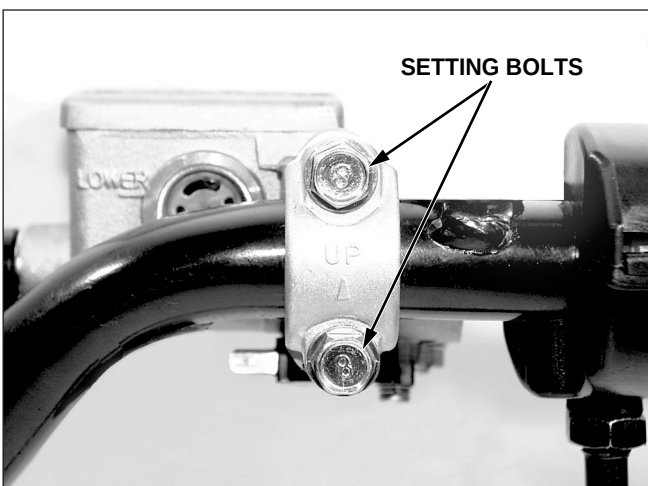
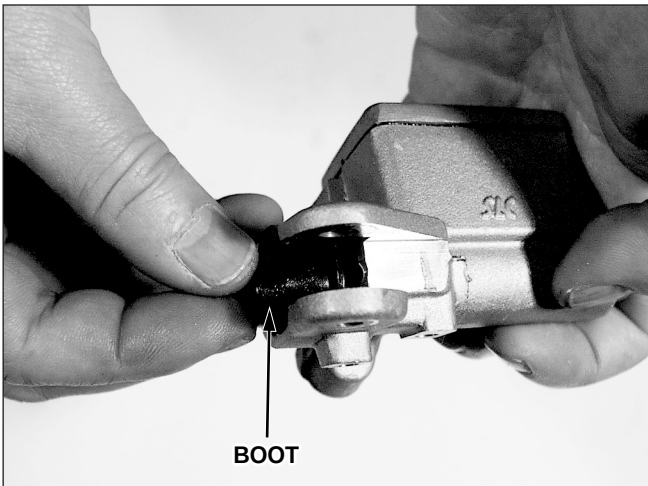
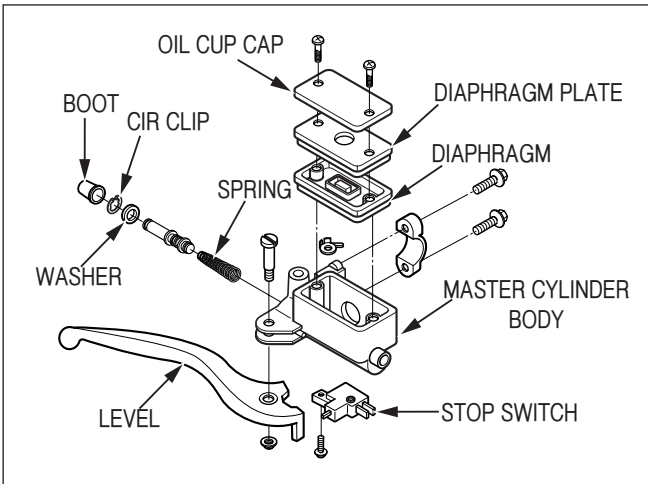
TOOL : SNAP RING PLIERS

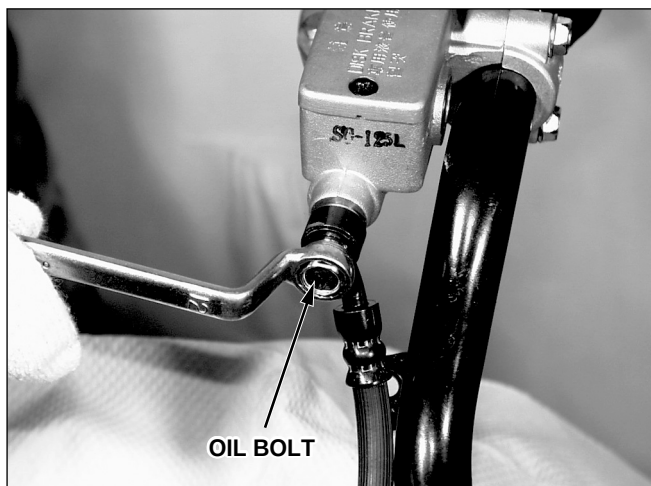
INSTALLATION

- Install the front / rear 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.





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

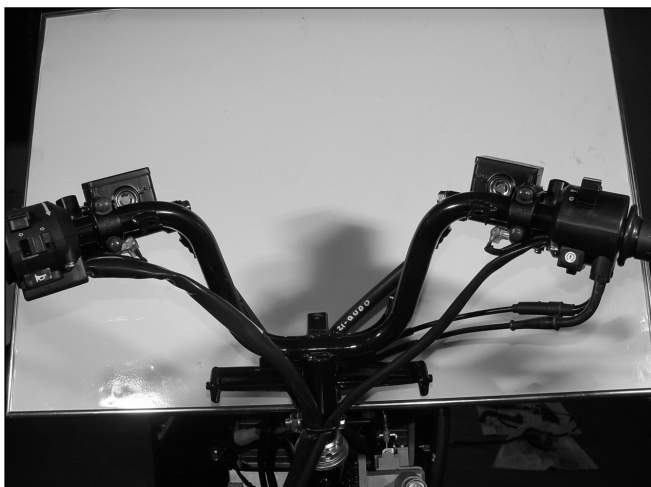
TORQUE VALUE : 2.5~3.5 kgf · m

- Loosen the 2 flat screws, remove the oil cup cap, diaphragm plate and diaphragm.
- Fill the brake fluid, and bleed air.
- Install the diaphragm, diaphragm plate and the oil cup cap, tighten the 2 flat screws.

BRAKE FLUID

⚠ CAUTION

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



- Remove the wind screen.
- Remove the oil cup cap, diaphragm 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.

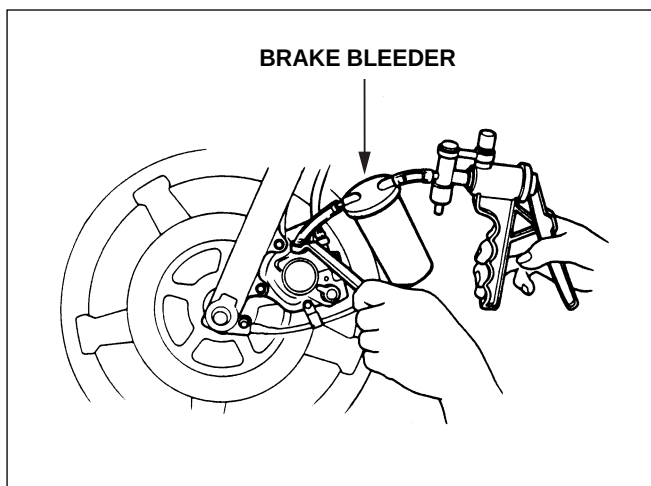
AIR BLEEDING

<When the brake bleeder is available>

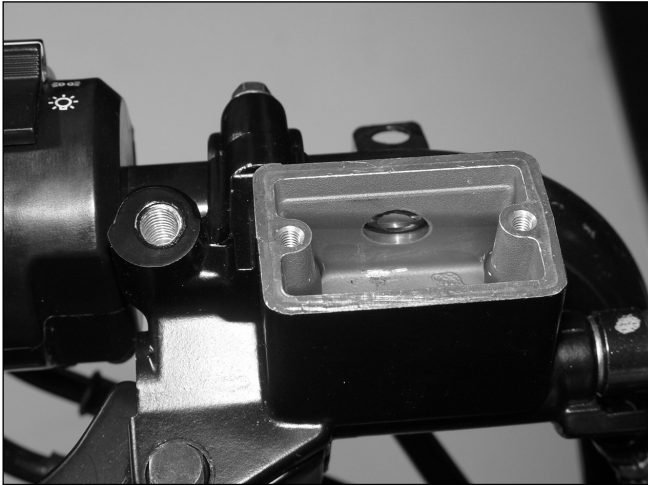
- Fill the reservoir with DOT 3 or 4 brake fluid up to the upper level.

⚠ CAUTION

- To prevent chemical changed, 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 the 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 procedures until no air bubbles appear in the bleeder hose.
- Squeeze the bleeder valve and operate the brake lever to check the ingress of air.

<When the brake bleeder is not available>

- Fill the brake fluid up to the upper limit line.
- Connect the transparent bleeder hose to the bleeder valve and place the other end of the hose in a container.

- ① Squeeze the brake lever, then open the bleeder valve 1/2 turn, and close the valve.

⚠ NOTE

- Do not release the brake lever until the bleeder valve has been closed.
- Check the brake fluid level often while bleeding the system to prevent air from being pumped into the system.

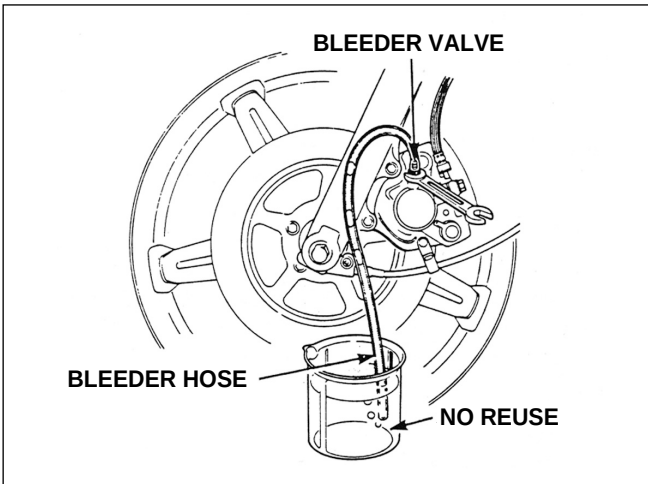
- ② Release the brake lever slowly and wait several seconds after it reaches the end of its travel.
- ③ Repeat the above steps ① and ② until bubbles cease to appear in the fluid at the end of the hose.

- 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.
- Tighten the bleeder valve.

TORQUE VALUE : 0.4~0.7 kgf · m

- Be sure that the brake fluid is up to the upper level of the master cylinder and refill if necessary
- Reinstall the diaphragm, diaphragm plate and oil cup cap.

TORQUE VALUE : 1.0 kgf · m





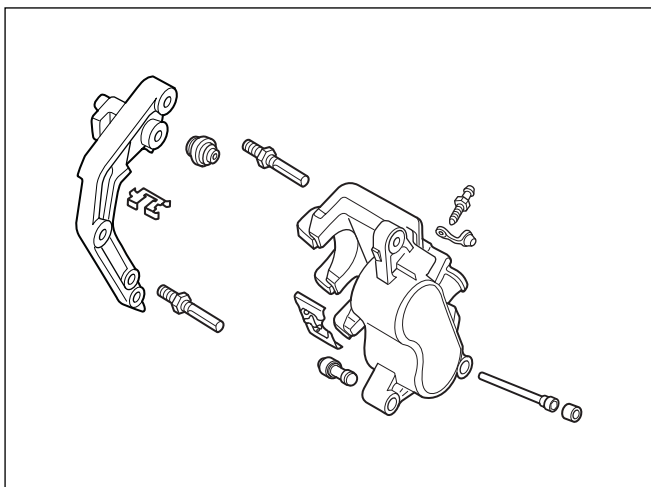
BRAKE CALIPER

REMOVAL

- First drain the brake fluid from the hydraulic brake system.
- Remove the brake fluid tube bolt.
- Remove the two bolts securing the brake master cylinder.
- Remove the brake caliper.

⚠ 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 LH. 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 a 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

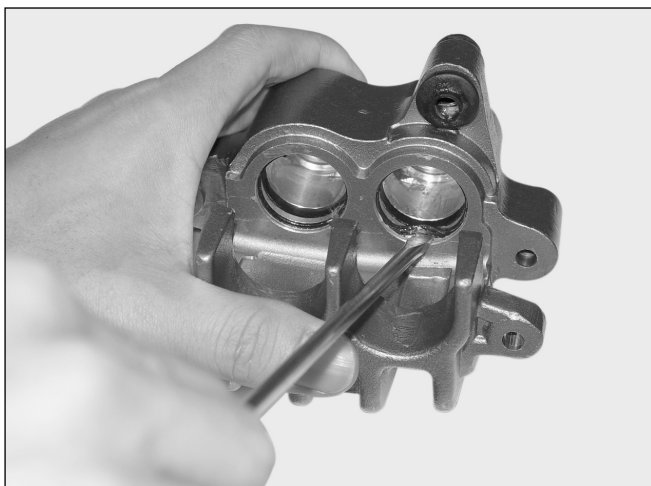
- Never use the high-pressure air or bring the air gun too close.
- Never touch the inside of the caliper

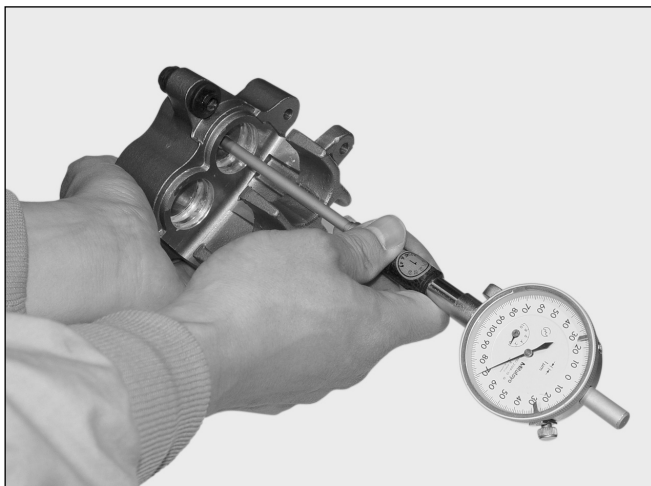
- Disassemble the piston seal and the dust seal

⚠ 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

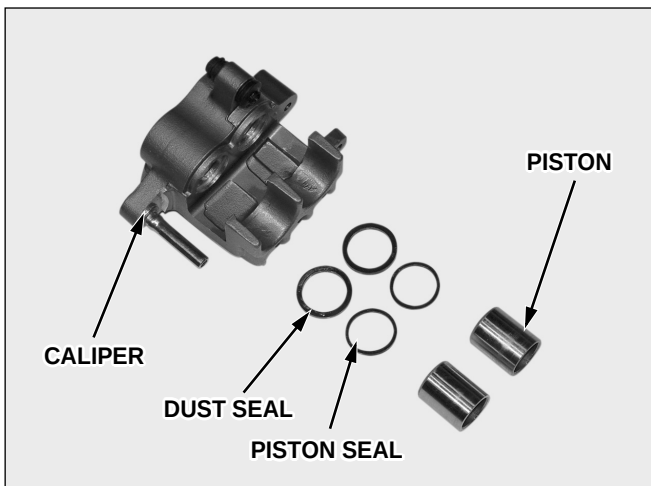
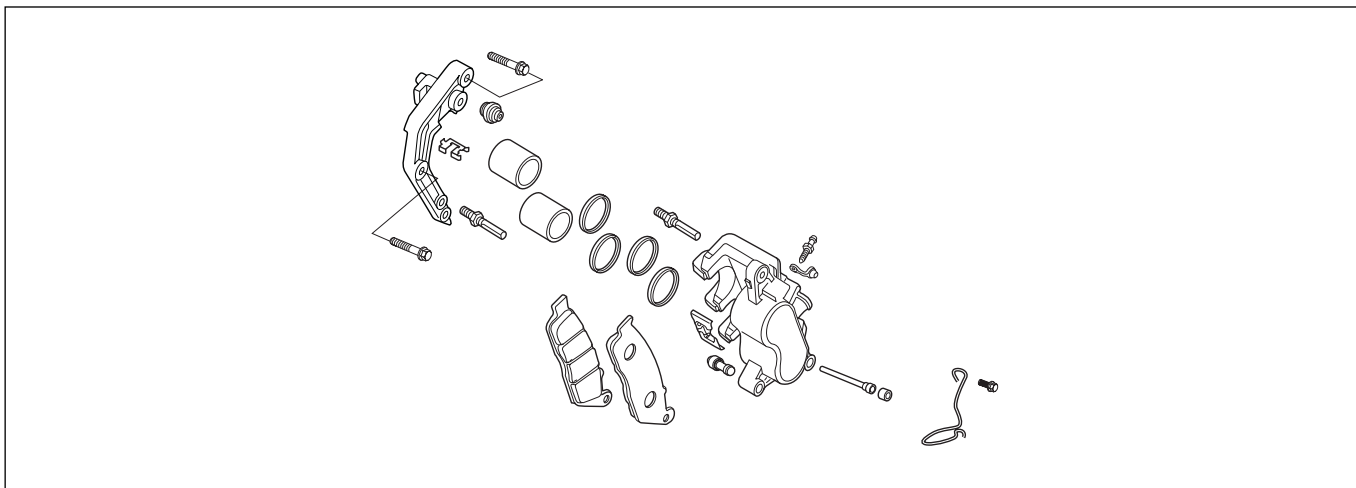
- Check the caliper cylinder bore for scoring, scratches or other damage.
- Measure the caliper I.D.

SERVICE LIMIT : 25.42mm



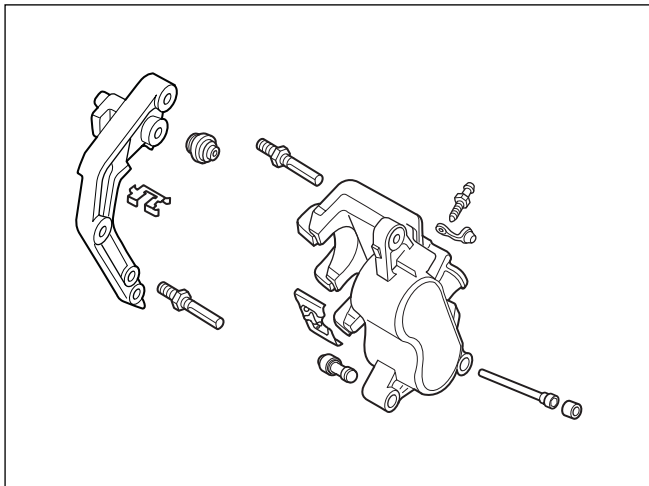
- Check the piston for scratches or wear.
- Measure the piston O.D. with a micrometer gauge.

SERVICE LIMIT : 25.27mm



- 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.

FRONT WHEEL/Front FORK/STEERING/BRAKE



- Apply the silicone grease to the boot.
- Connect the boot 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 front caliper to the front fork
- Tighten the bolt to the specified torque.

TORQUE VALUE : 3.0kgf · m

- Connect the brake hose to the caliper and install 2 sealing washers and oil bolt.
- Tighten the oil bolt to the specified torque

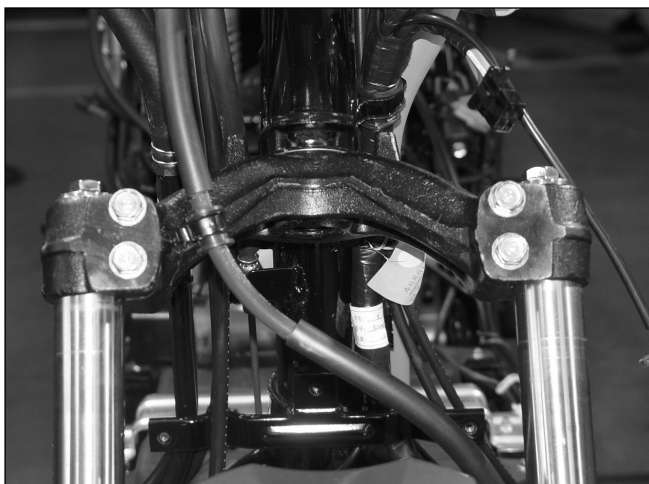
TORQUE VALUE : 3.4kgf · m

- Fill the brake fluid to the upper limit line and bleed air.



FRONT FORK REMOVAL

- Remove the following parts.
 - Front under cover
 - Front brake caliper
 - Front fender
 - Front wheel

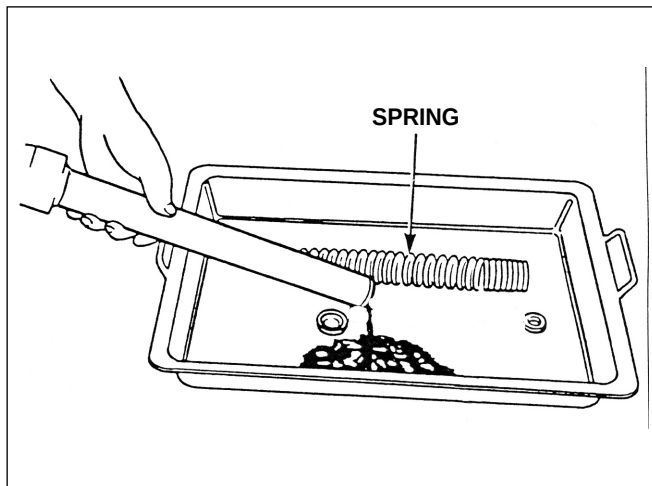


- When removing the front fork, loosen the fork pipe bolt lightly.

⚠ NOTE

- Support the vehicle securely under the engine not to turn over it.
- Loosen the fork pipe bolt, but do not remove it.

- Loosen the 4 setting bolts securing the RH./LH. front fork, remove the RH./LH. front fork.
- After removal of RH. front fork, loosen the flange bolt and remove the front brake hose clamp A.

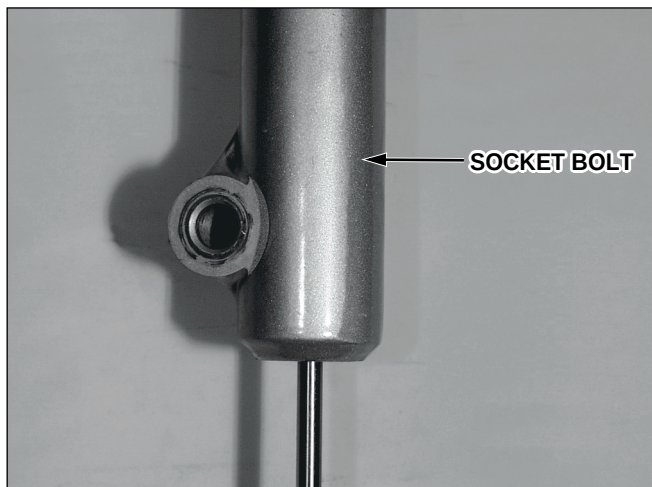


DISASSEMBLY

- Remove the fork pipe bolt.

⚠ NOTE

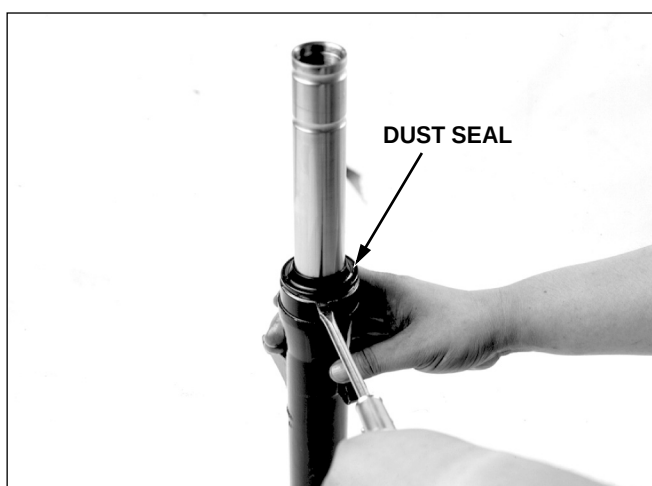
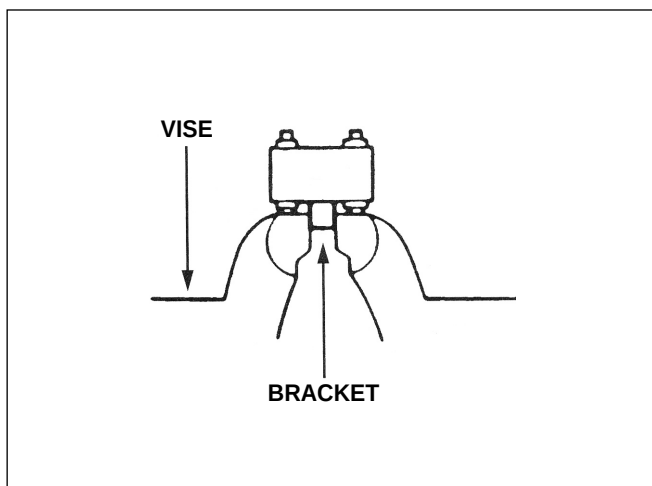
- If the screw is completely loosened, the fork tube cap bolt may spring out by the force of the spring. Take due precautions.
- Remove the fork spring, and expand and release the fork pipe several times to drain fork oil.



- 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.



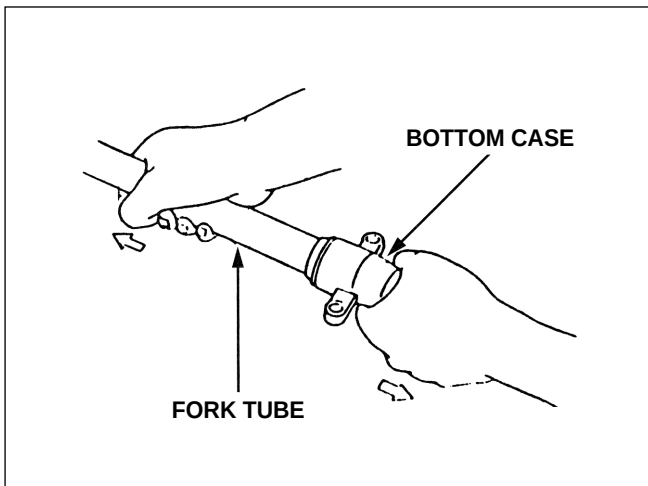
- Remove the oil seal stop ring.



- Remove the oil seal.

NOTE

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



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

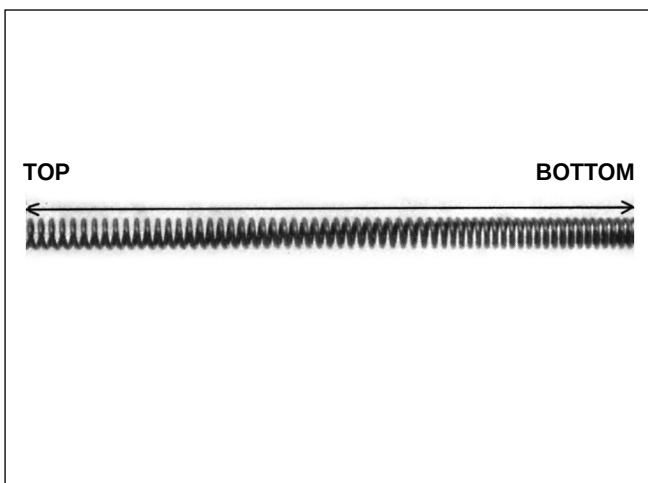
FRONT FORK INSPECTION

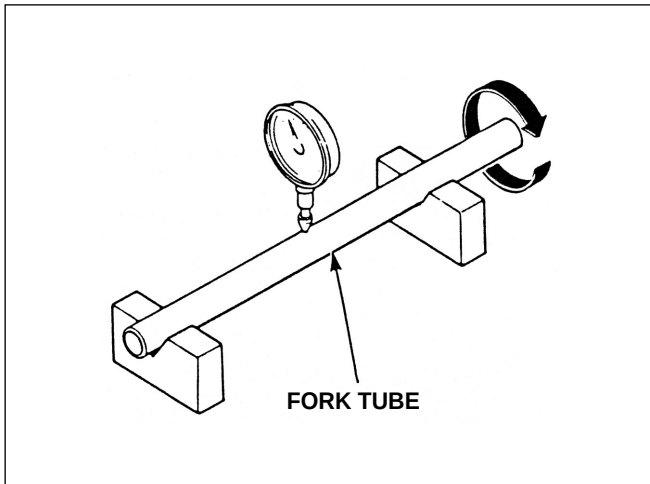
- Place the fork spring on a level place, and measure the free length.
- If the free length deviates from the service limit, replace the spring with a new one.
- Check components for damage or abnormal wear. Replace defective parts with new ones.

SERVICE LIMIT : FORK SPRING 235mm

- Set the fork pipe on a V-blocks, and measure fork pipe deflection by rotating with a dial gauge.

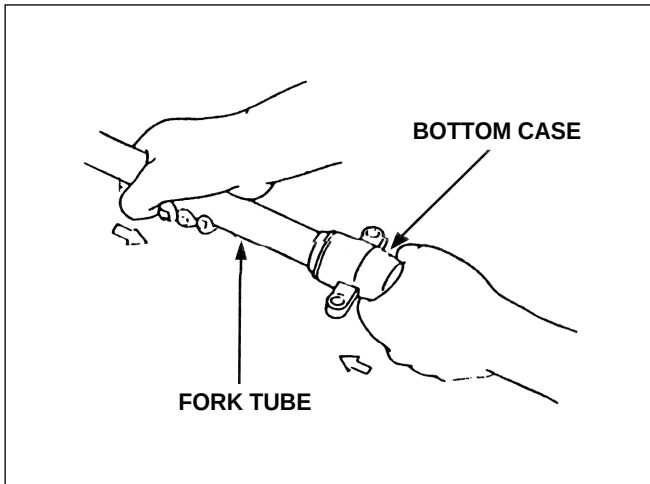
SERVICE LIMIT : Replace if the deflection is greater than 0.2mm



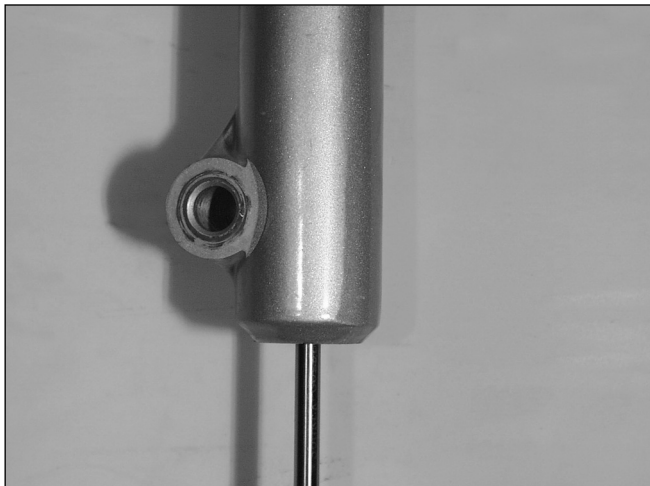


- Check the slider bush contact face.
- If the slider bush is extensively damaged, replace the bottom case.

FRONT FORK 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.

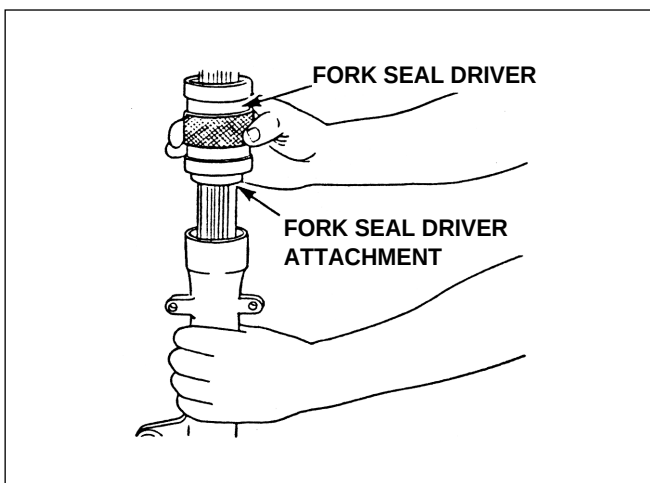


- Wrap the bottom case with a piece of cloth, and fix it to the vise.
- Apply screw locking agent to the socket bolt thread, and assemble the socket bolt to the fork piston.

TORQUE VALUE : 2.0kgf · m



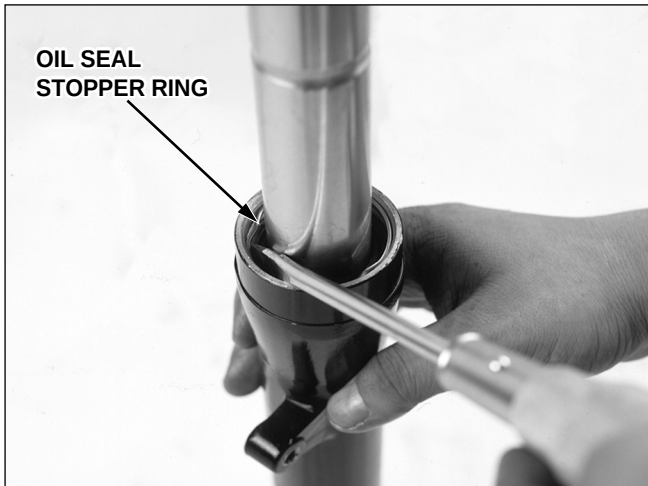
- When a vise is used to hold the bottom case, do not insert the case itself but insert the bracket.



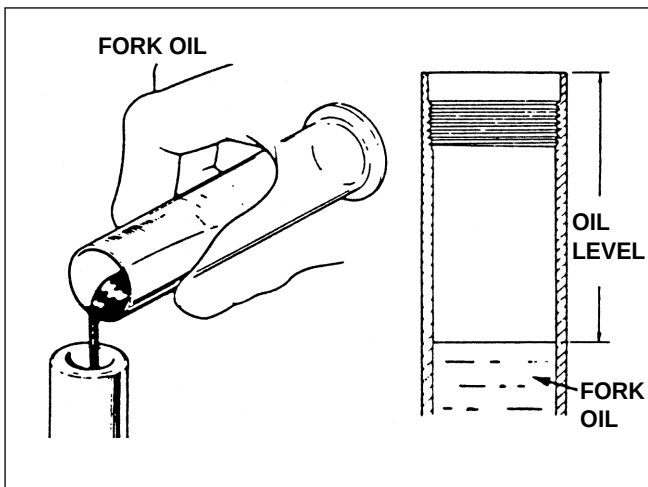
- Apply ATF to a new oil seal.
- Assemble the oil seal to the bottom case.
- Insert the oil seal with special tools until the attachment groove of the bottom case set ring is exposed.

**TOOLS : FORK SEAL DRIVER
FORK SEAL DRIVER BODY**

FRONT WHEEL/Front FORK/STEERING/BRAKE



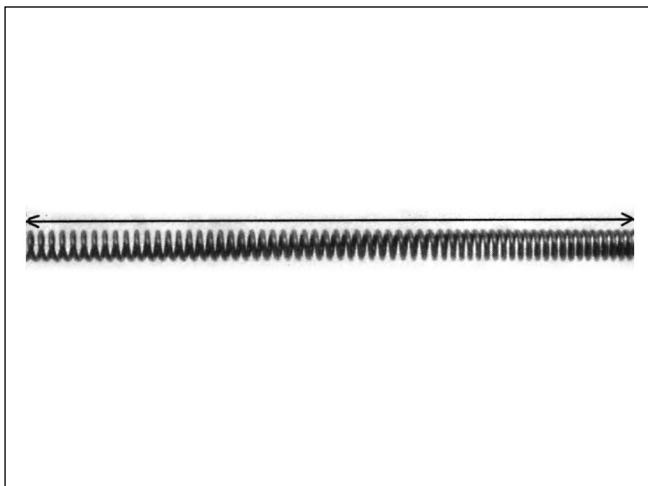
- Install the oil seal stopper ring
- Accurately assemble the oil seal stop ring to the bottom case.



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

CAPACITY : 90cm³

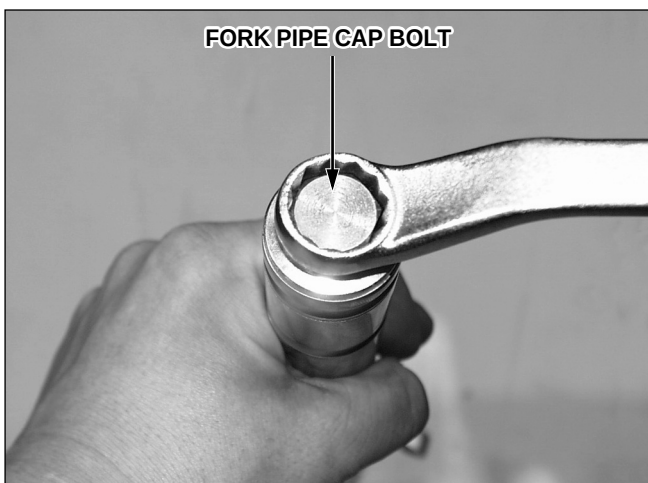
- Slowly press the fork tube 2-3 times to discharge air.



- Assemble the spring to the fork pipe.

NOTE

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



- Assemble the fork bolt to the fork pipe.



- Install the front fork to the steering stem.
- Install the front fork setting bolts.

TORQUE VALUE : 7.5 kgf · m

- Install the brake hose clip A to the RH. front fork.



STEERING STEM REMOVAL

- Remove the following parts.
 - Handle cover
 - Handle bar
 - Front cover
 - Front under cover
 - Inner cover
 - Front wheel
 - Front fork

NOTE

- Be careful not to turn over the vehicle.



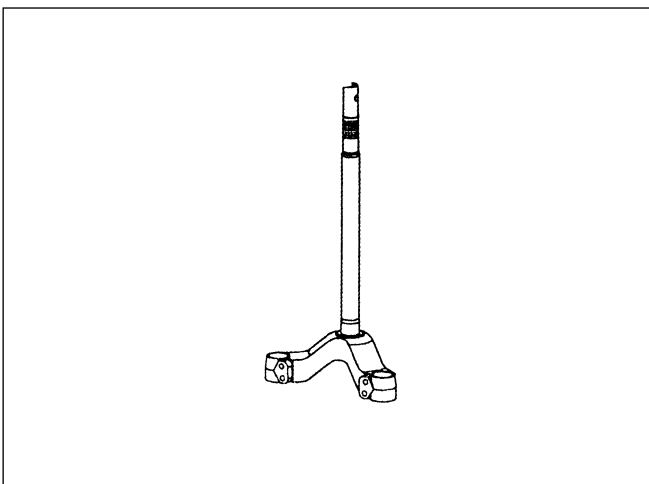
- Remove the steering stem nut using the steering stem nut socket.

TOOL : STEERING STEM NUT SOCKET

- Remove the steering top thread nut using the steering stem socket.

TOOL : STEERING STEM SOCKET

- Remove the top cone race.
- Check the upper ball assembly, top cone race and ball race for damage or abnormal and replace as necessary.
- Check the bottom cone race for wear and damage.





- Remove the steering top ball race from the head pipe.
- Remove the steering bottom race.

NOTE

- Check all of the races and balls for damage or abnormal wear and replace as necessary.
- If the vehicle has been involved in an accident, examine the area around the steering head for crack.



INSTALLATION

- Install the steering head dust seal washer and dust seal onto the steering stem.
- Press in the steering bottom cone race using the steering stem driver.
- Install the under ball ass'y into the steering stem.

TOOL : STEERING STEM DRIVER

- Install the steering stem into the head pipe.
- Install the steering upper ball ass'y into the steering stem.
- Install the top cone race and steering top thread onto the steering head.
- Tighten the top thread to specified torque, then loosen the top thread 1/8 turn

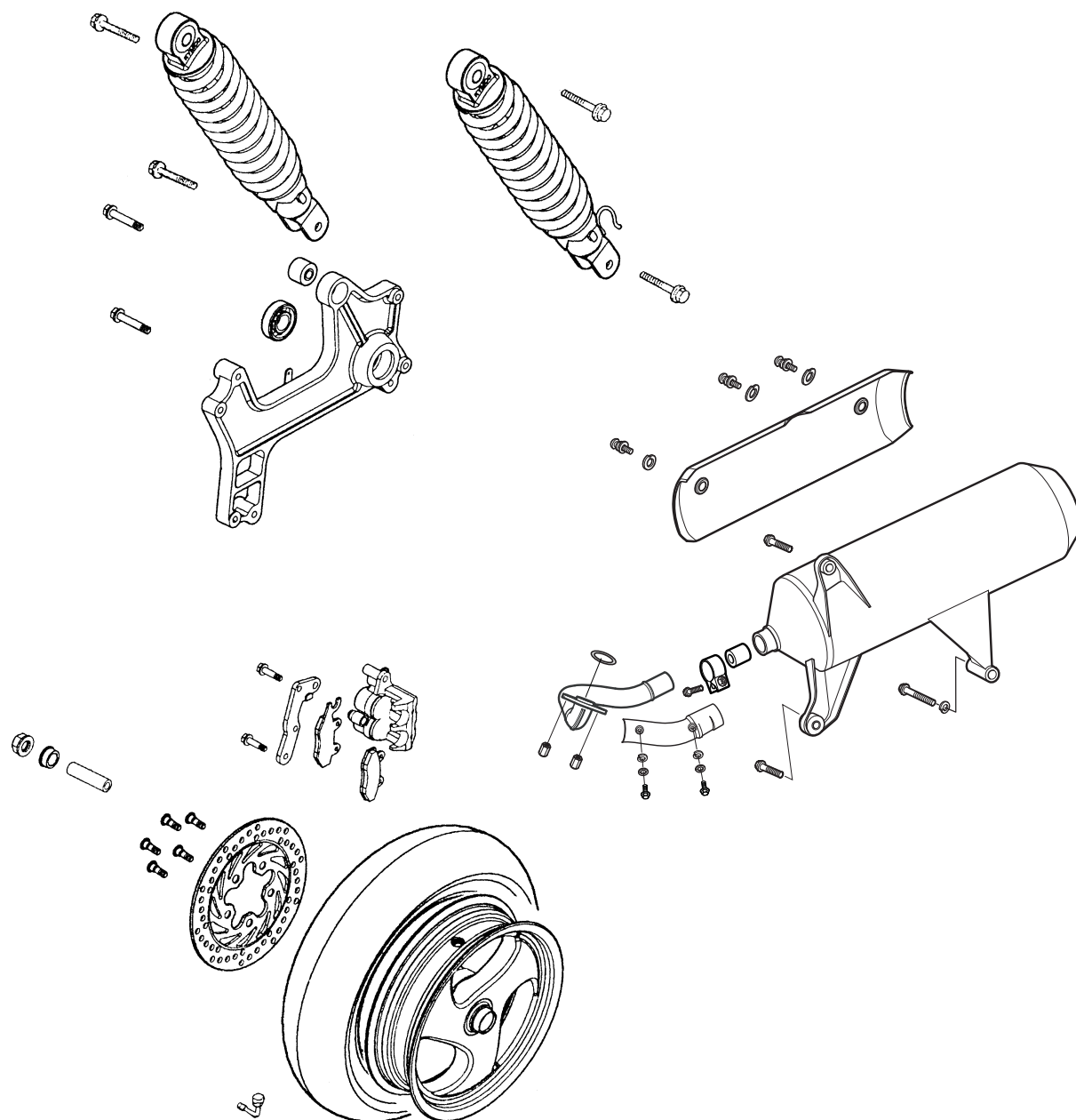
TORQUE VALUE : 0.15~0.25kgf · m

- Recheck that the steering stem moves smoothly without play or binding.
- Tighten the steering stem lock nut temporarily.

TOOLS : STEERING STEM LOCK NUT SOCKET STEERING STEM SOCKET

- Install the following parts.
 - Front fork
 - Front wheel
 - Inner cover
 - Front under cover
 - Front cover
 - Handle bar
 - Handle cover

MEMO



15. REAR WHEEL/BRAKE/SUSPENSION/SWING ARM

SERVICE INFORMATION . . .	15-1	REAR WHEEL	15-5
TROUBLESHOOTING	15-2	REAR CUSHION ADJUST . . .	15-6
REAR BRAKE	15-3	REAR CUSHION	15-6
REAR FORK	15-5		

SERVICE INFORMATION



- During servicing, keep oil or grease off the brake pads and brake disk.
- Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use a brake cleaner, designed to minimize the hazard caused by airborne asbestos fibers.

SPECIFICATIONS

ITEM	STANDARD (mm)	SERVICE LIMIT(mm)
REAR WHEEL RIM RUNOUT	-	2.0
REAR SHOCK ABSORBER SPRING FREE LENGTH	232.9	235
REAR BRAKE DISK THICKNESS	3.5~3.8	3.0
REAR BRAKE DISK RUNOUT	-	0.30
REAR BRAKE MASTER CYLINDER I.D.	14.000~14.040	14.050
REAR BRAKE MASTERCYLINDER PISTON O.D.	13.950~13.980	13.940

TORQUE VALUES :

EXHAUST MUFFLER LOCK BOLT	2.94~3.92kgf · m
REAR AXLE NUT	7.84~9.8kgf · m
REAR SHOCK ABSORBER LOWER MOUNT BOLT	1.96~2.94kgf · m
REAR SHOCK ABSORBER UPPER MOUNT BOLT	3.92kgf · m
REAR BRAKE CALIPER BOLT	1.96~2.94kgf · m

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

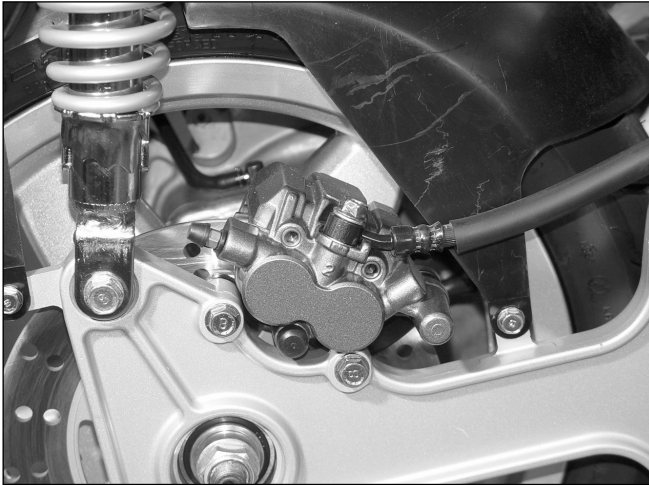
- Weak springs
- Rear damper improperly adjusted, oil leakage

Hard suspension

- Rear damper improperly adjusted
- Bent shock absorber rod

Suspension noise

- Loose fasteners
- Worn shock



REAR BRAKE

REMOVAL

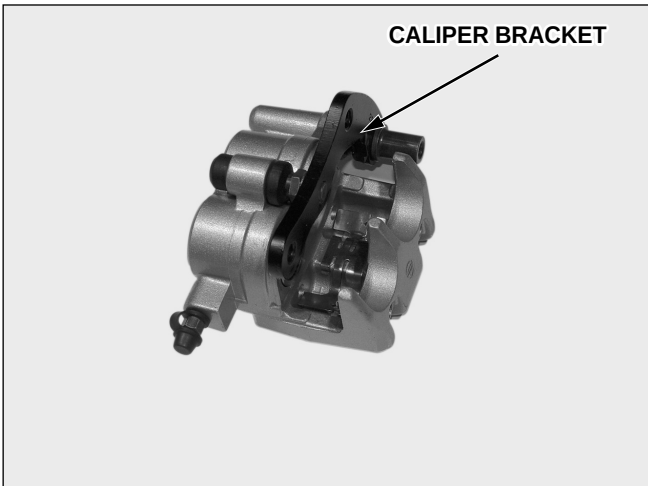
- Remove the muffler.
- Loosen the rear break tube bolt and remove the break tube.
- Loosen 2 bolts and remove rear break caliper.



INSPECTION

- Inspect break pad and disk.
- Measure the break disk thickness.

SERVICE LIMIT : 3mm



DISASSEMBLY

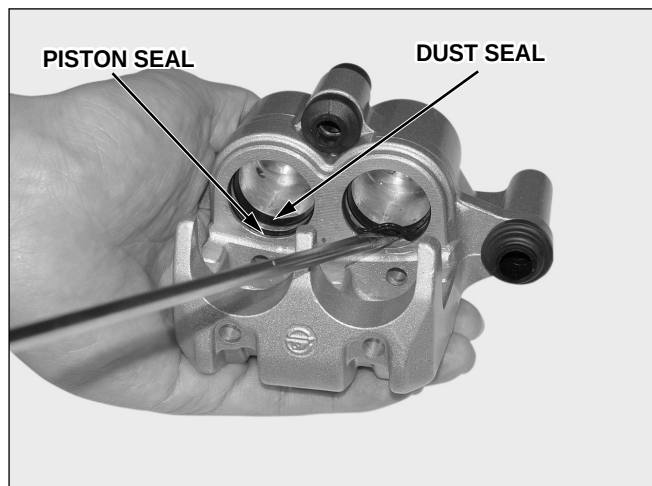
- Remove the rear break caliper.
- Inspect caliper assembly.
- Remove the pad spring, slide pin, caliper bracket, and boot from the caliper body.
- Check the boot for wear and damage and replace if necessary.



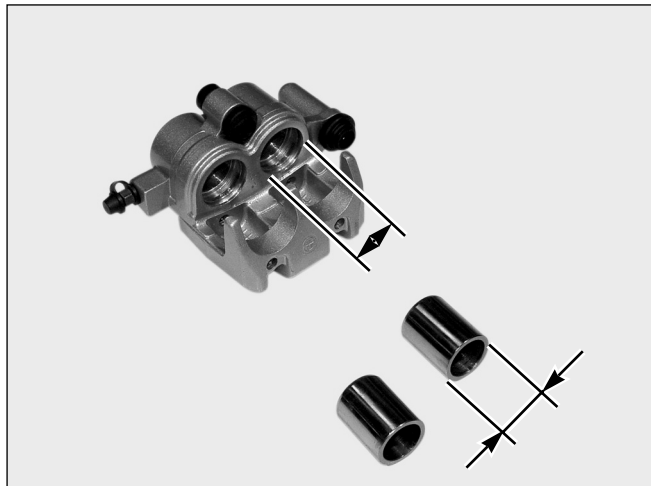
- Wind the caliper facing down with cloth to prevent the piston or break fluid from leaking.
- Remove the piston from the caliper while blowing the low-pressure air in the opening of the break hose.

⚠ 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.
- Clean the piston and inside of caliper with break fluid.



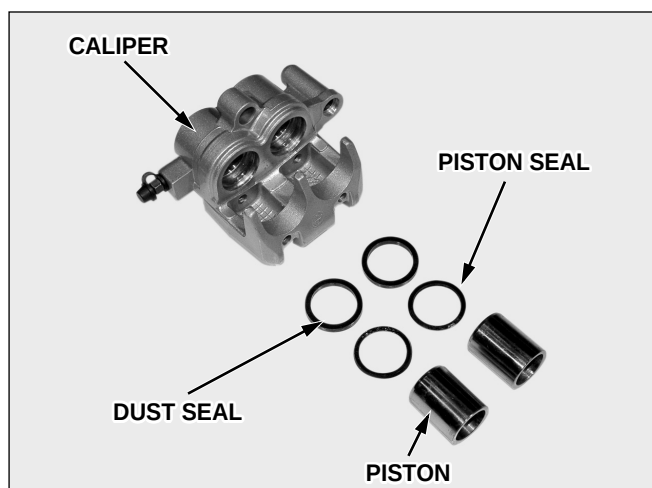
INSPECTION

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

SERVICE LIMIT : 25.07mm

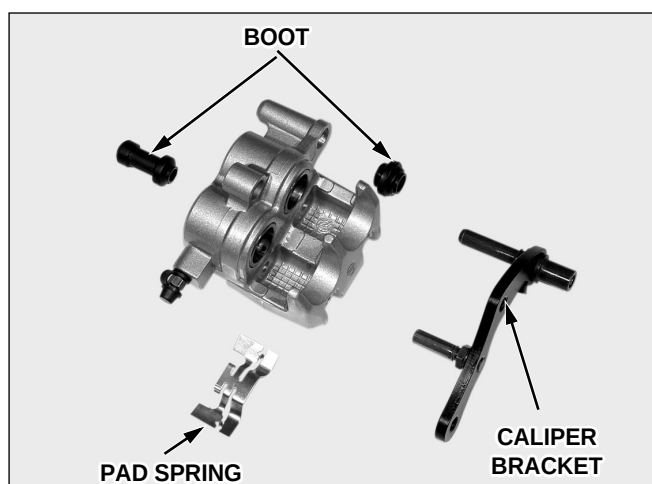
- Inspect piston surface for scratch or damage.
- Measure the piston O.D.

SERVICE LIMIT : 24.8mm

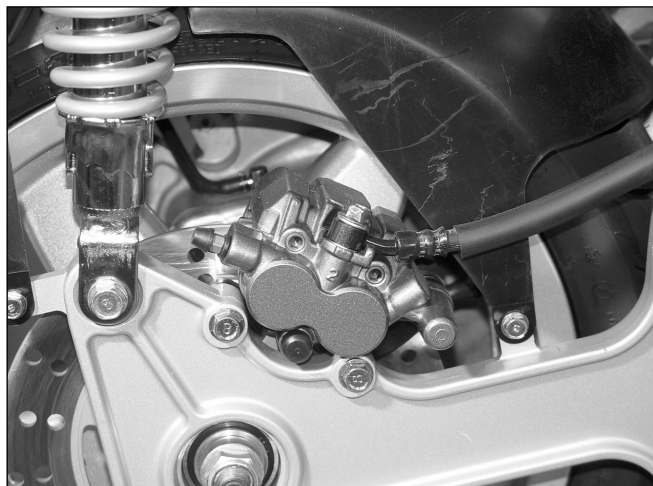


BRAKE CALIPER ASSEMBLY

- 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.



- 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 caliper bracket in the caliper.
- Install the brake pad in the caliper.



INSTALLATION

- Install the brake caliper to the front fork and tighten the bolt to specified torque.

TORQUE VALUE : 3.0kgf · m

- Connect the brake hose to the caliper body and tighten 2 oil bolts and washers to specified torque.

TORQUE VALUE : 3.4kgf · m

- Fill the brake fluid to the upper limit line and bleed air.

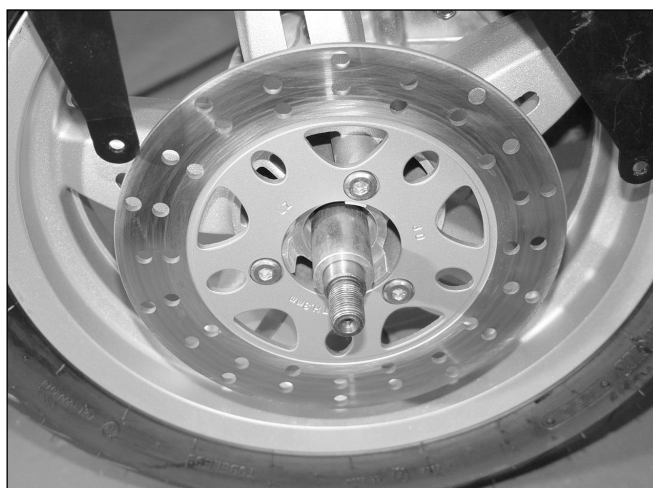


REAR FORK

- Remove the muffler.
- Remove the rear brake caliper.
- Loosen the lower bolt securing the RH. rear cushion.
- Loosen 2 bolts securing the mud guard.
- Loosen the axle nut and remove the collar.
- Loosen 2 bolts securing the engine and remove the rear fork.



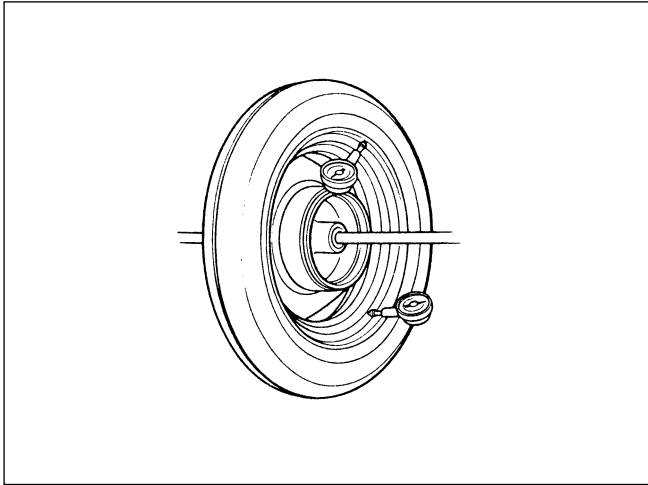
- Rotate the inner bearing with finger and check it for smooth operation.
- Check the malfunction and replace if necessary.



REAR WHEEL

REMOVAL

- Remove the exhaust muffler.
- Remove the rear brake caliper.
- Remove the rear fork.
- Remove the rear axle collar.
- Remove the rear wheel.



INSPECTION

- Measure the rear wheel rim runout.

SERVICE LIMIT :

RADIAL : 1.0mm replace if over

AXIAL : 1.0mm replace if over



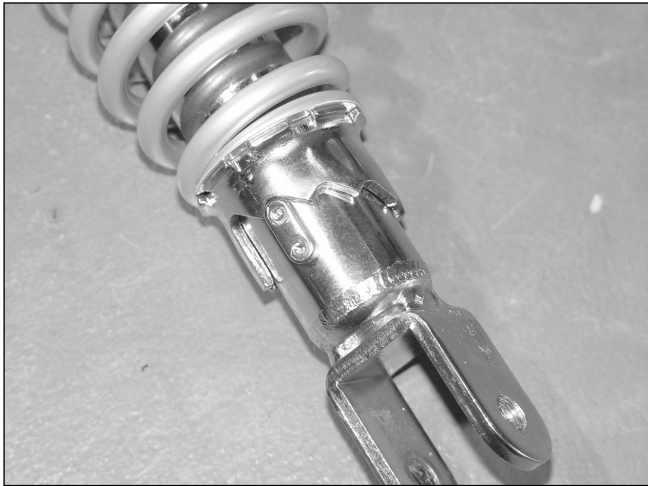
ASSEMBLY

- Install in the reverse order of removal.

TORQUE VALUE

Rear cushion lower bolt: 1.96~2.94kgf · m

Rear axle nut: 7.84~9.8kgf · m



REAR CUSHION ADJUST

- Adjust the cushion spring according to the load condition.

- The rear cushion can be adjusted as below.

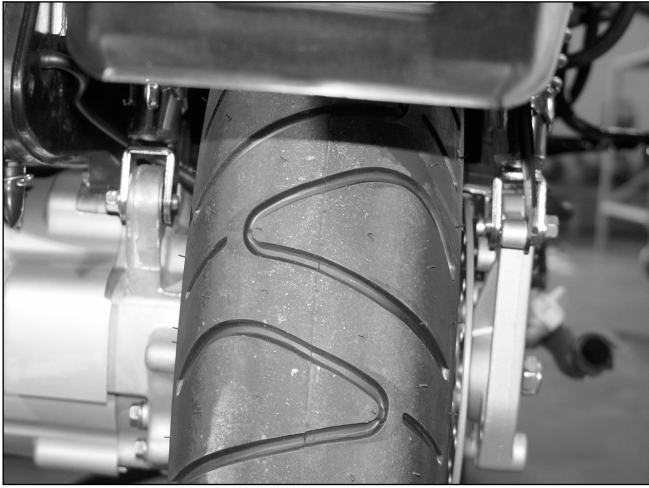
1	-	2	-	3	-	4	-	5
soft				medium				hard



REAR CUSHION

REMOVAL

- Remove the luggage box.
- Remove the air cleaner.
- Remove the upper bolt.
- Remove the lower bolt.
- Remove the rear cushion.

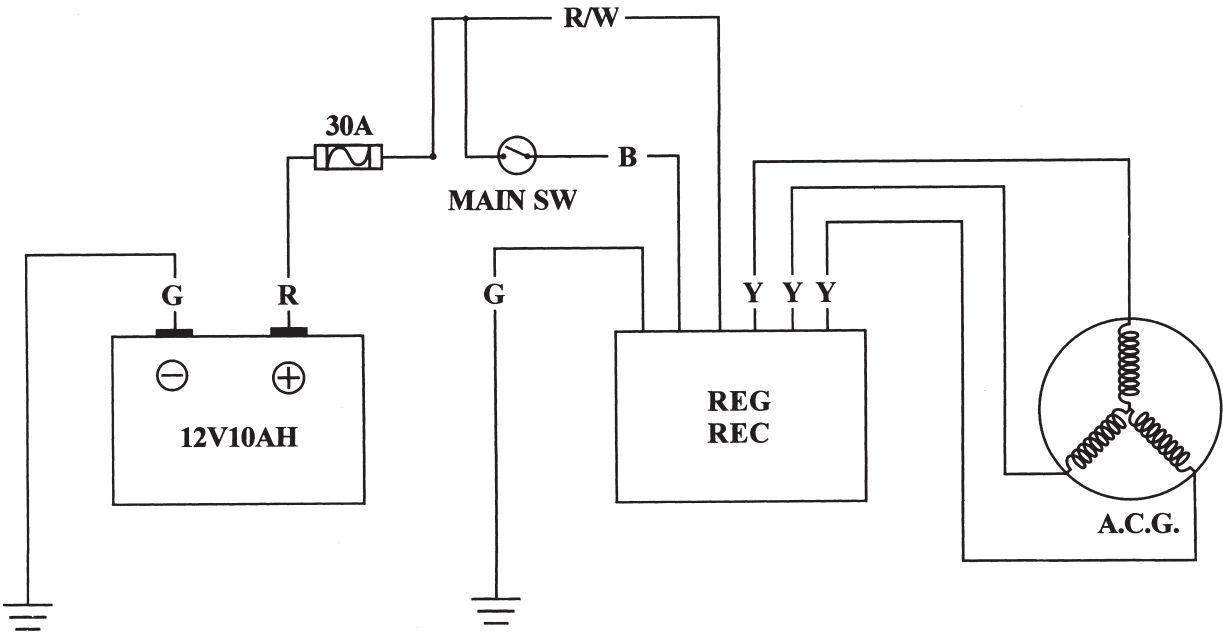
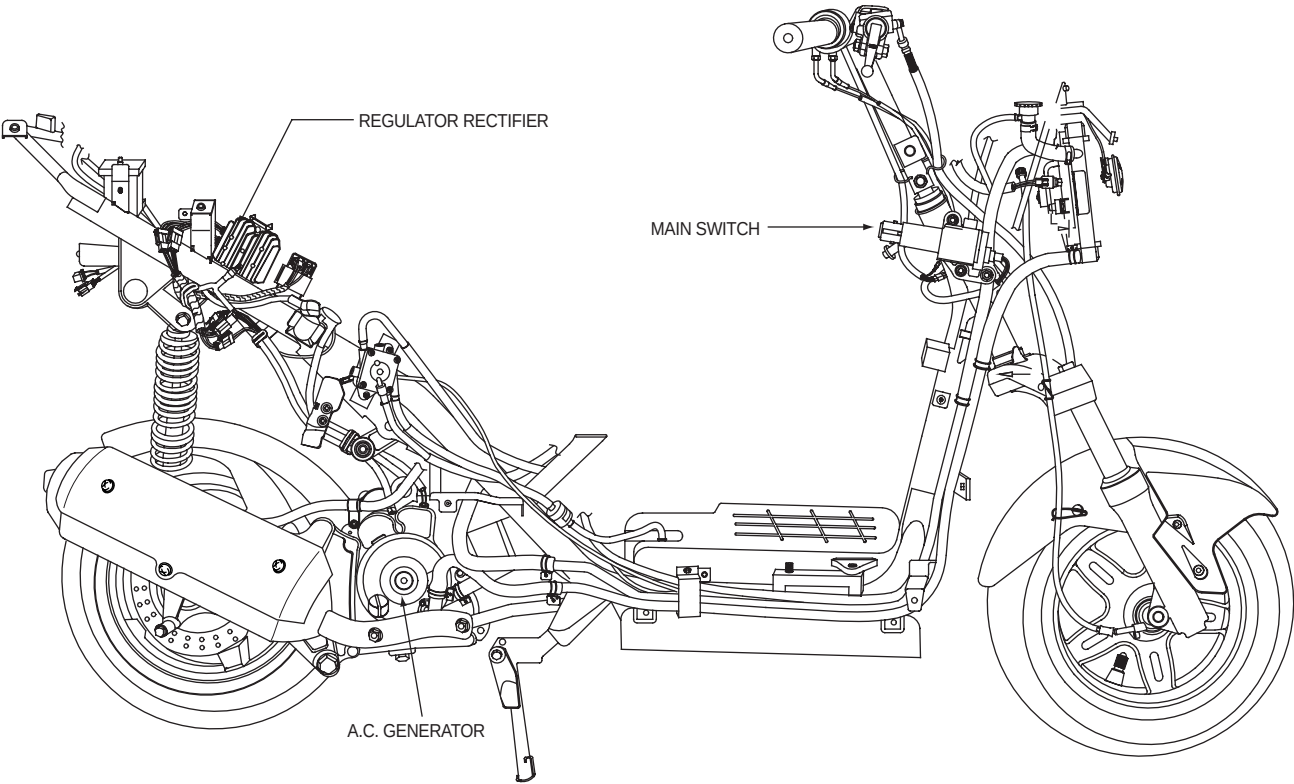


INSTALLATION

- Install in the reverse order of removal.

TORQUE VALUE : 3.92kgf · m

CHARGING SYSTEM



16. CHARGING SYSTEM

SERVICE INFORMATION 16-1

TROUBLESHOOTING 16-2

BATTERY 16-2

CHARGING SYSTEM INSPECTION • 16-3

A.C. GENERATOR INSPECTION • 16-4

REGULATOR RECTIFIER INSPECTION • 16-5

SERVICE INFORMATION

WARNING

- Do not place flammable materials near battery when charging. This can be a fire hazard as hydrogen gas is created during charging battery.
- Do not allow battery acid to come into contact with clothes, skin or eyes. Battery acid contact can cause burns or loss of eye sight. If contact occurs, thoroughly clean with water, and if acid enters eyes, flush with water and see a doctor.
- If battery acid gets on clothing, as it can seep through or make a hole through the clothing and make its way to the skin, make sure to change clothing that has come into contact with battery acid and wash the battery acid from the clothes.

CAUTION

- This vehicle has a maintenance-free(MF) battery. Because MF batteries use different charging equipment, take special care when performing maintenance and especially when replacing parts. Not all regular battery equipment is compatible with MF batteries.
 - When charging the battery, remove the battery from the frame and do not open stopper.
 - There is the possibility of damaging the regulator/rectifier, etc. if the terminal or coupler is separated/connected when electricity is over flowing through the electrical devices. Make sure to turn the main switch OFF when performing maintenance to the charging equipment.
-
- If the battery is allowed to repeatedly lose all its charge, is repeatedly over-charged, or if it is left in an un-charged state, the battery can be damaged, its life can be reduced, or it can lose some of its strength. It is important to note here that the battery will naturally last 2-3 years of normal use, and although it will re-charge, its load is reduced, leading to a loss in battery strength.
 - It is possible for the battery to become overcharged from battery body load. If a battery cell becomes short-circuited and if a state develops where voltage is not created between the terminals, the regulator will not operate and excessive voltage will develop in the battery and normal cell electrolytes will decrease.
 - If the vehicle is not used for a long period, make sure to charge the battery every three months. If not so, the battery ability to store electricity is reduced.
 - For information on generator disassembly, refer to section 8.

SPECIFICATIONS

ITEM		STANDARD VALUES
BATTERY	Capacity	12V - 10AH (MF)
	Terminal-to-terminal voltage (When fully charged)	13.0 - 13.2V
A.C.GENERATOR	Charging coil resistance value (20° C)	0.6 - 1.6 Ω
	rpm at charging start	1,300rpm
REGULATOR /RECTIFIER	Regulator voltage	14.5 $\pm$ 0.5V

TOOLS

DIGITAL TESTER, PVA MULTI-TESTER, RPM TESTER, BATTERY 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)

- Battery undercharged.
 - Low fluid level.
 - Low specific gravity.
- Charging system failure.
- Loose battery connection.

Low power (Engine running)

- Battery undercharged.
- Battery is failing.
- Charging system failure.

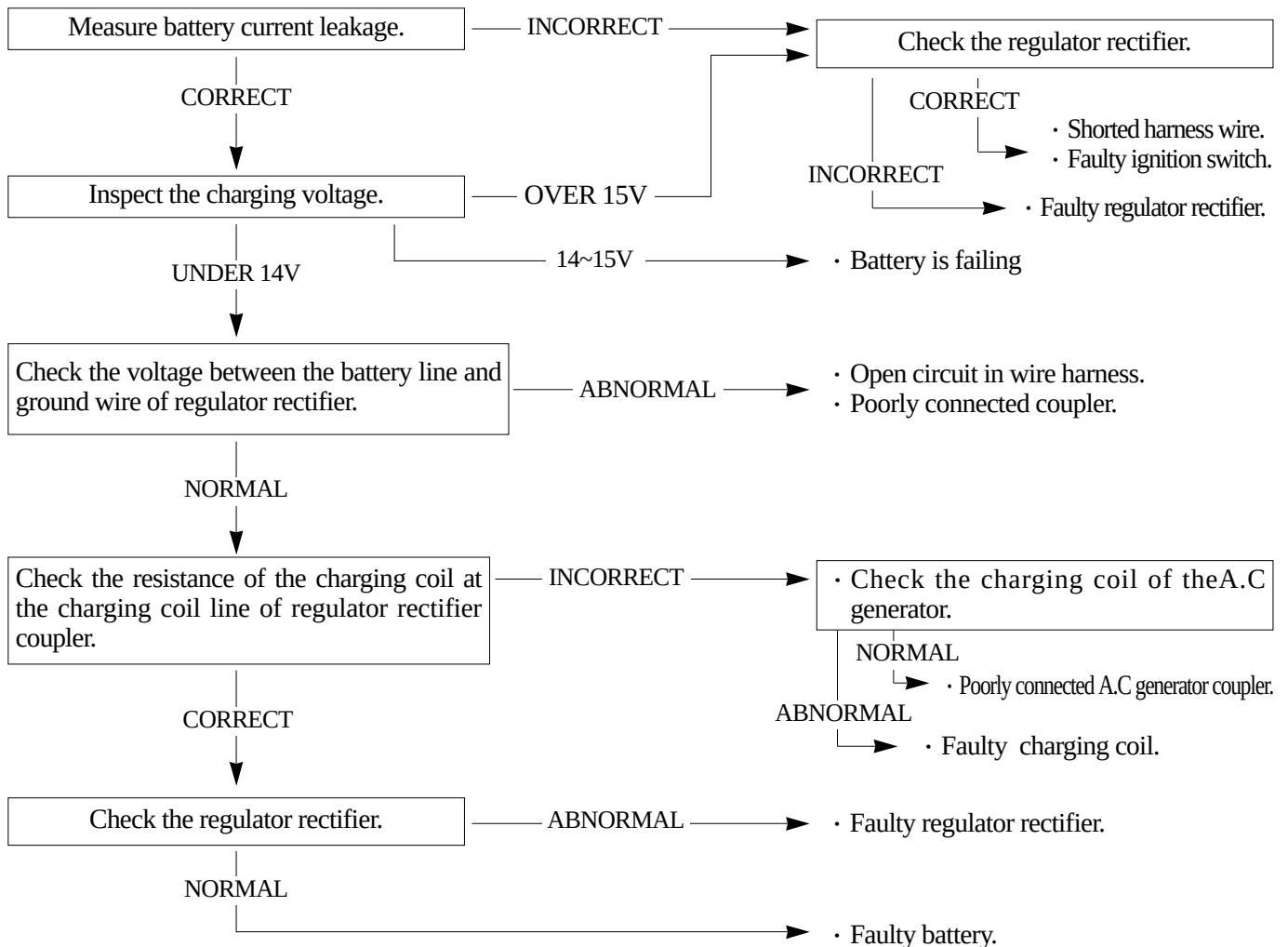
Intermittent power

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

Charging system failure

- Loose, broken or shorted wire or connection.
- Faulty regulator rectifier.
- Faulty A.C generator.

CHARGING SYSTEM



BATTERY

- Remove the seat and luggage box.
- Loosen the screws securing the battery cover and remove the battery cover.



- Remove the battery.
- First disconnect the negative “⊖” battery cable, and then disconnect the positive “⊕” cable.

⚠ NOTE

- When disconnecting the battery positive ⊕ cable, do not touch the frame with tool ; otherwise it will cause short circuit and sparks to fire the fuel.

- The installation sequence is the reverse of removal.

⚠ NOTE

- First connect the positive ⊕ cable and then negative ⊖ cable to avoid short circuit.

BATTERY (OPEN-CIRCUIT VOLTAGE) INSPECTION

- Remove the battery cover.
- Disconnect the battery terminals from the battery.
- Measure the voltage between the battery terminals.

- FULLY CHARGED : 13.2V

- INSUFFICIENTLY CHARGED : UNDER 12.3V

TOOL : DIGITAL TESTER



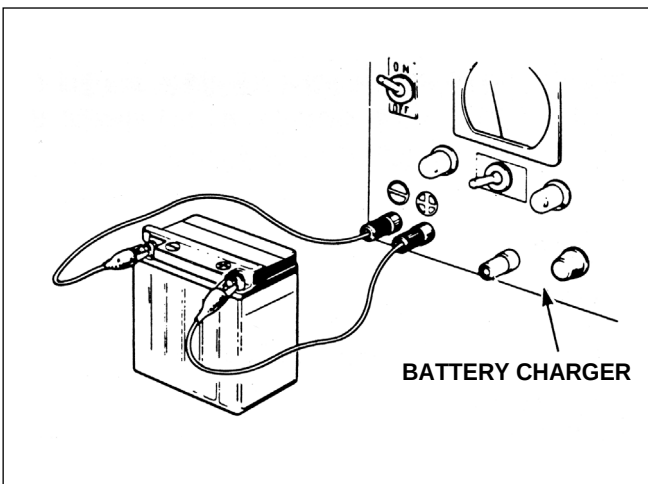
⚠ NOTE

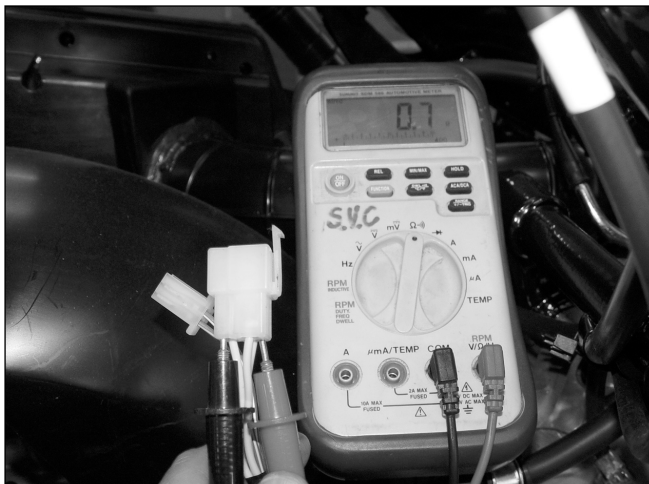
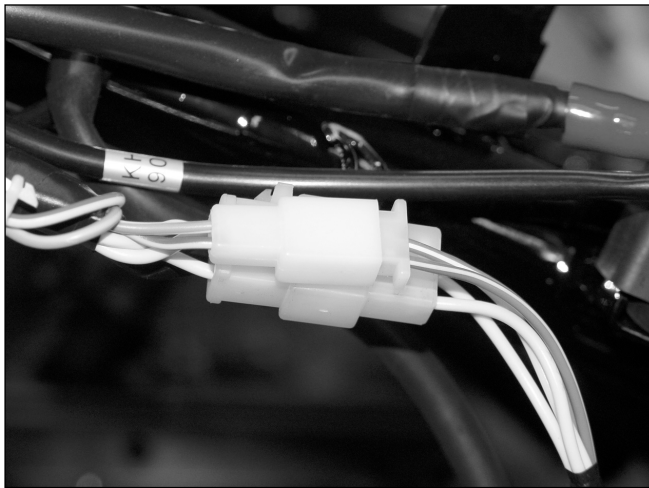
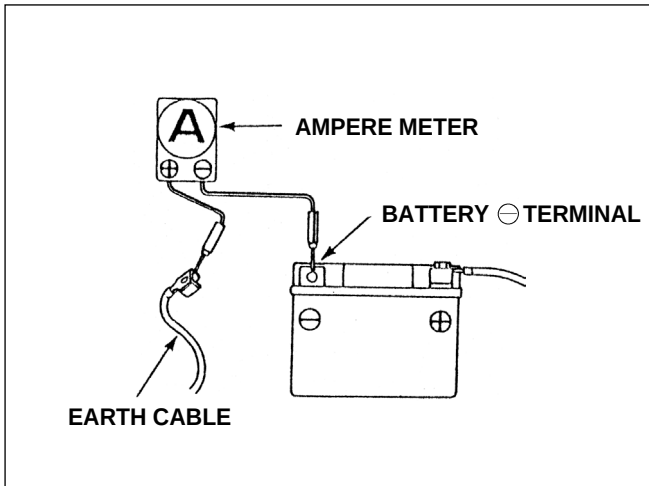
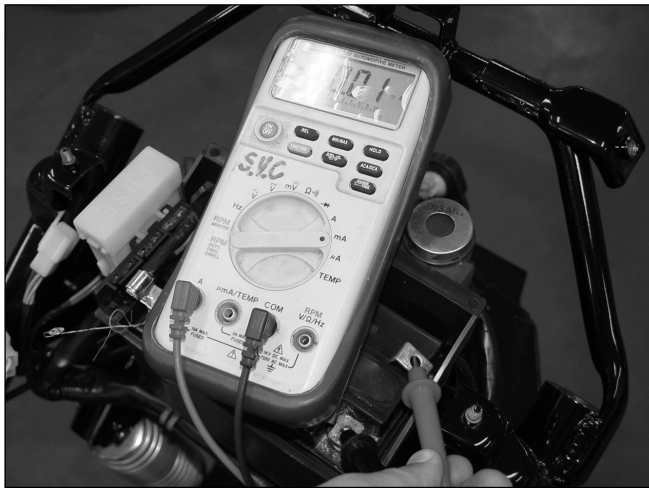
- Use a voltmeter that will accurately indicate 0.1V difference.
- When measuring the battery voltage after charging, leave it for at least 30 minutes, or the accurate results cannot be obtained because the battery voltage fluctuates just after charging.

- Connect the charger positive (+) cable to the battery positive (+) terminal.
- Connect the charger negative (-) cable to the battery negative (-) terminal.

⚠ NOTE

- Keep flames and sparks away from a charging battery.
- Turn power ON/OFF at the charger, not at the battery terminals to prevent sparks near the battery.
- Charge the battery according to the current specified on the battery.
- During quick charging, the battery temperature should not exceed 45°C





CHARGING SYSTEM INSPECTION

LEAK TEST

- Turn off the ignition switch, and disconnect the ground (-) cable from the battery.
- Connect an ammeter between negative (-) terminal and ground cable.
- With the ignition switch off, measure the leakage current.

LEAK CURRENT : Not to exceed 0.5A(max)

TOOL : DIGITAL TESTER

⚠ NOTE

- When measuring current using a tester, set it to a large range, and then bring it down the range to an appropriate level.
- Current flow larger than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition on. A sudden surge of current may blow out the fuse in the tester.

A.C. GENERATOR INSPECTION

⚠ NOTE

- This test can be made without removing the stator from the engine. Disconnect the yellow wire from the auto bystarter.

- Remove the frame center cover.
- Disconnect the A.C. generator connector.

- Measure the resistance between the yellow wires.
- Replace the stator if resistance value is high or there is continuity between each yellow wire and ground.
- Resistance : yellow~yellow 0.6~1.6Ω



REGULATOR RECTIFIER INSPECTION

- Remove the luggage box.
- Remove the regulator rectifier coupler.
- Measure each terminal.

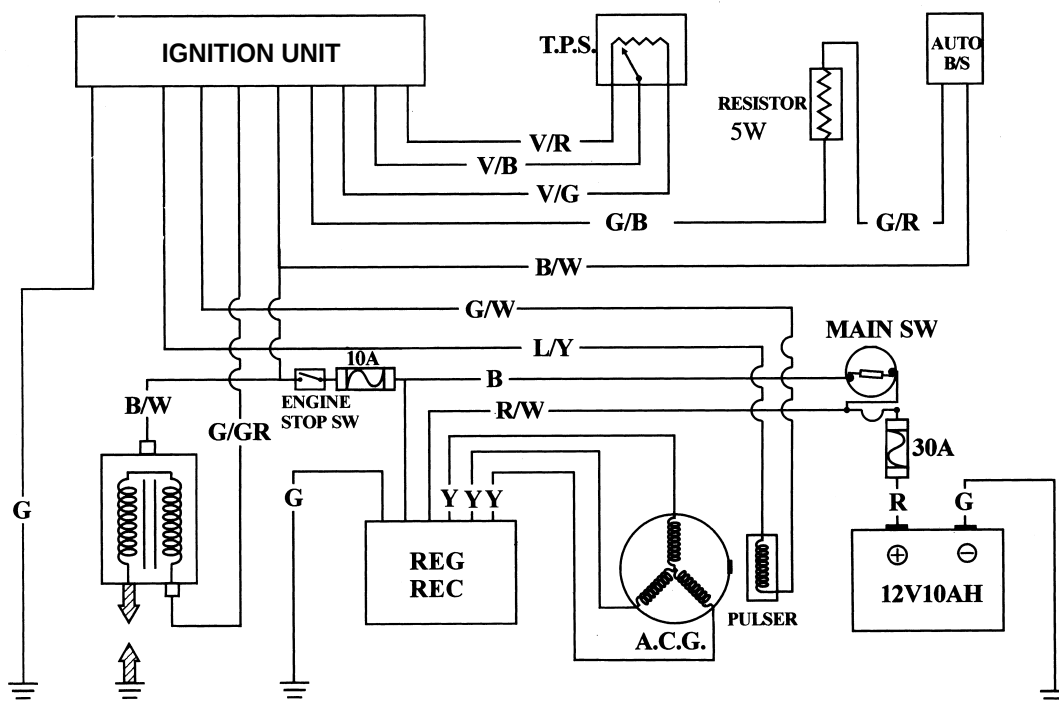
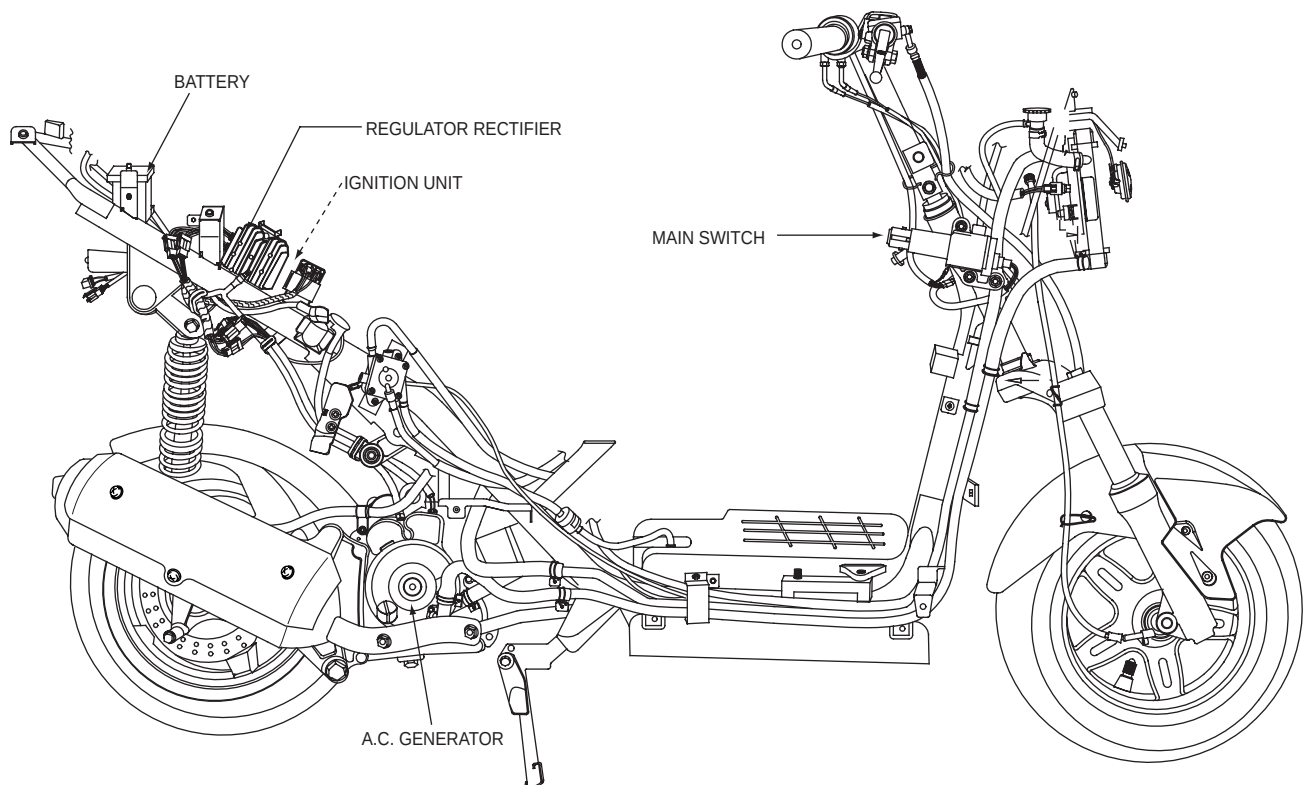
RESISTANCE VALUE

Unit : k Ω , (20°C)

Tester $\oplus$ Tester $\ominus$	R	B	Y	Y	Y	G
R		0-5	1-3	1-3	1-3	1-4
B	∞		∞	∞	∞	25-40K
Y	∞	1-4		∞	∞	1-4
Y	∞	1-4	∞		∞	1-4
Y	∞	1-4	∞	∞		1-4
G	∞	25-40K	∞	∞	∞	

- Replace the regulator rectifier unit if the resistance value between the terminals is abnormal.

IGNITION SYSTEM



17. IGNITION SYSTEM

SERVICE INFORMATION	17-1	A.C. GENERATOR INSPECTION .	17-4
TROUBLESHOOTING	17-2	IGNITION UNIT	17-4
IGNITION COIL INSPECTION . . .	17-3		

SERVICE INFORMATION

GENERAL SAFETY

- Follow the steps described in the troubleshooting flow chart when servicing the ignition system.
- The CDI unit may be damage if dropped. Also, if the connector is disconnected when current is flowing, the excessive voltage may damage the unit. Always turn off the ignition switch before servicing.
- The CDI unit use an electrically controlled ignition timing system. No adjustments can be made to the ignition timing.
- Use spark plug of the correct heat range. Using spark plug with an incorrect heat range can damage the engine.
- Connect the same color cords. Pay particular attention to colors prior to removing wiring. Connect the same color couplers.
- A faulty ignition system is often related to poorly connected connectors. Check those connections before proceeding.
- This manual gives explanations on inspections to receive peak voltage. As inspections for coil resistance values are also included, it may be difficult to make a correct determination.
- Conduct inspection on the main switch by referring to the wiring diagram continuity chart.

SPECIFICATIOIS

ITEM			STANDARD VALUE
SPARK PLUG			NGK DPR7EA9
SPARK PLUG GAP			0.8~1.0mm
IGNITION COIL RESISTANCE	PRIMARY COIL		1.5~3.5 Ω
	SECONDARY COIL	WITHOUT PLUG CAP	12~16 Ω
		WITH PLUG CAP	17~21 Ω
PULSER COIL RESISTANCE			50~170 Ω

TOOLS

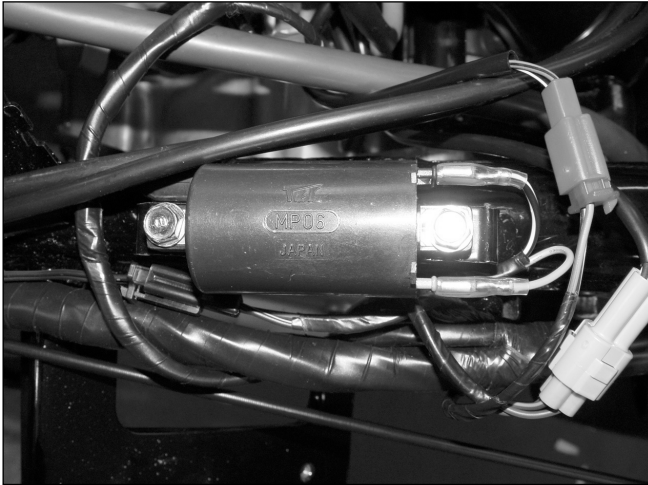
DIGITAL TESTER
PVA MULTI-TESTER
CDI TESTER
BATTERY TESTER

TROUBLESHOOTING

No spark at plug.

UNUSUAL CONDITION		PROBABLE CAUSE (CHECK IN NUMERICAL ORDER)
IGNITION COIL PRIMARY VOLTAGE	Low peak voltage.	1. The multimeter impedance is too low. 2. Cranking speed is too slow. - 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 coil. 6. Faulty ignition unit (in case when above No. 1~5 are normal).
	No peak voltage.	1. Incorrect peak voltage adaptor connections. 2. Faulty ignition switch. 3. Loose or poorly connected ignition unit connector. 4. Open circuit or poor connection in ground cord of the CDI unit. 5. Faulty peak voltage adaptor. 6. Faulty ignition unit (in case when above No. 1~5 are normal).
	Peak voltage is normal, but no spark jumps at plug.	1. Faulty spark plug or leaking ignition coil secondary current ampere. 2. Faulty ignition coil.
PULSE GENERATOR	Low peak voltage.	1. The multimeter impedance is too low. 2. Cranking speed is too slow. - 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.	1. Faulty peak voltage adaptor. 2. Faulty pulse generator.

IGNITION COIL INSPECTION



NOTE

- Since the resistance value of the primary coil is inherently very small, it is difficult to distinguish it from a shorted wire.



- Measure the resistance between the two terminals of the ignition primary coil.
- If the resistance value is within the specified range the coil is good.
- If resistance is ∞ (infinite), replace the coil with a new one.

STANDARD VALUE : 1.5~3.5 Ω



- With the spark plug cap on, measure the resistance between the primary coil terminal and the spark plug cap.
- If the resistance value is within the specified range, then the coil is good.
- If the resistance is ∞ (open wire), disconnect the spark plug cap and measure the secondary coil resistance.

STANDARD VALUE : 17~21 $k\Omega$

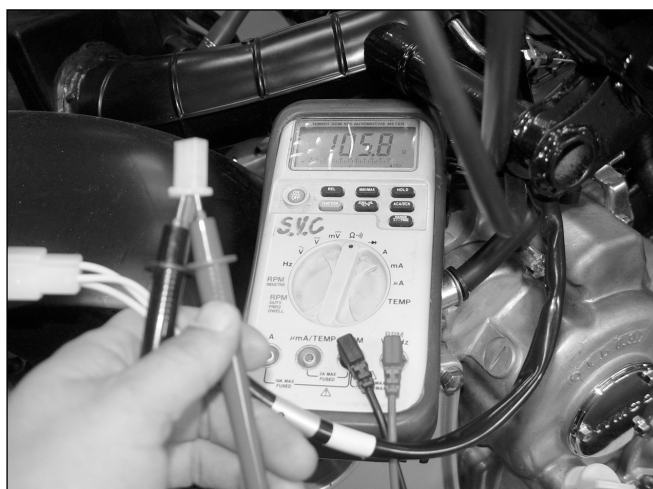


- Measure resistance between the primary coil terminal and high-tension cord.
- If the resistance value is within the specified range, then the coil is good.
- If the resistance is ∞ (open wire), replace the coil with a new one.

STANDARD VALUE : 12~16 $k\Omega$

REPLACEMENT

- Remove the high-tension cord from the plug, remove the plug cap.
- Remove the wire from the ignition coil.
- Remove the primary wire from the ignition coil.
- Loosen the ignition coil fixing bolt securing the frame, Remove the ignition coil.
- Install in the reverse order of removal.



A.C. GENERATOR INSPECTION

EXCITER/PUISER COIL INSPECTION

- Remove the luggage box.
- Disconnect the A.C. generator connector.
- Measure the exciter coil resistance between the black/white wire terminal and ground.

• Black/white~Ground	23~35 KΩ
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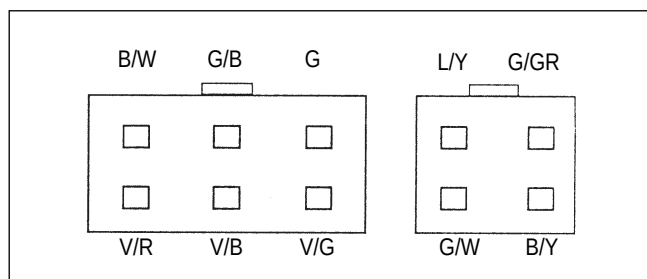
- Disconnect the pulser coil wire coupler.
- Measure the pulser coil resistance between the blue/white and green/white wire terminals.

• Black/white~Green/white	50~170 KΩ
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IGNITION UNIT

INSPECTION

- Measure the resistance between terminals.

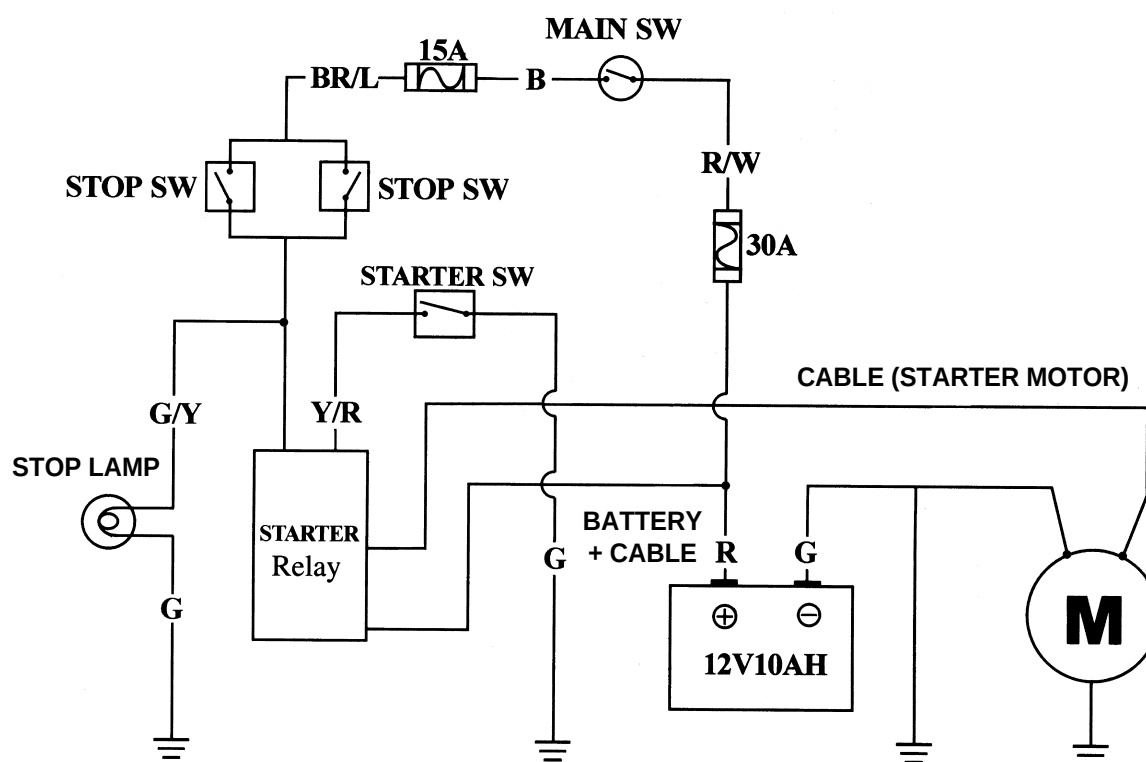
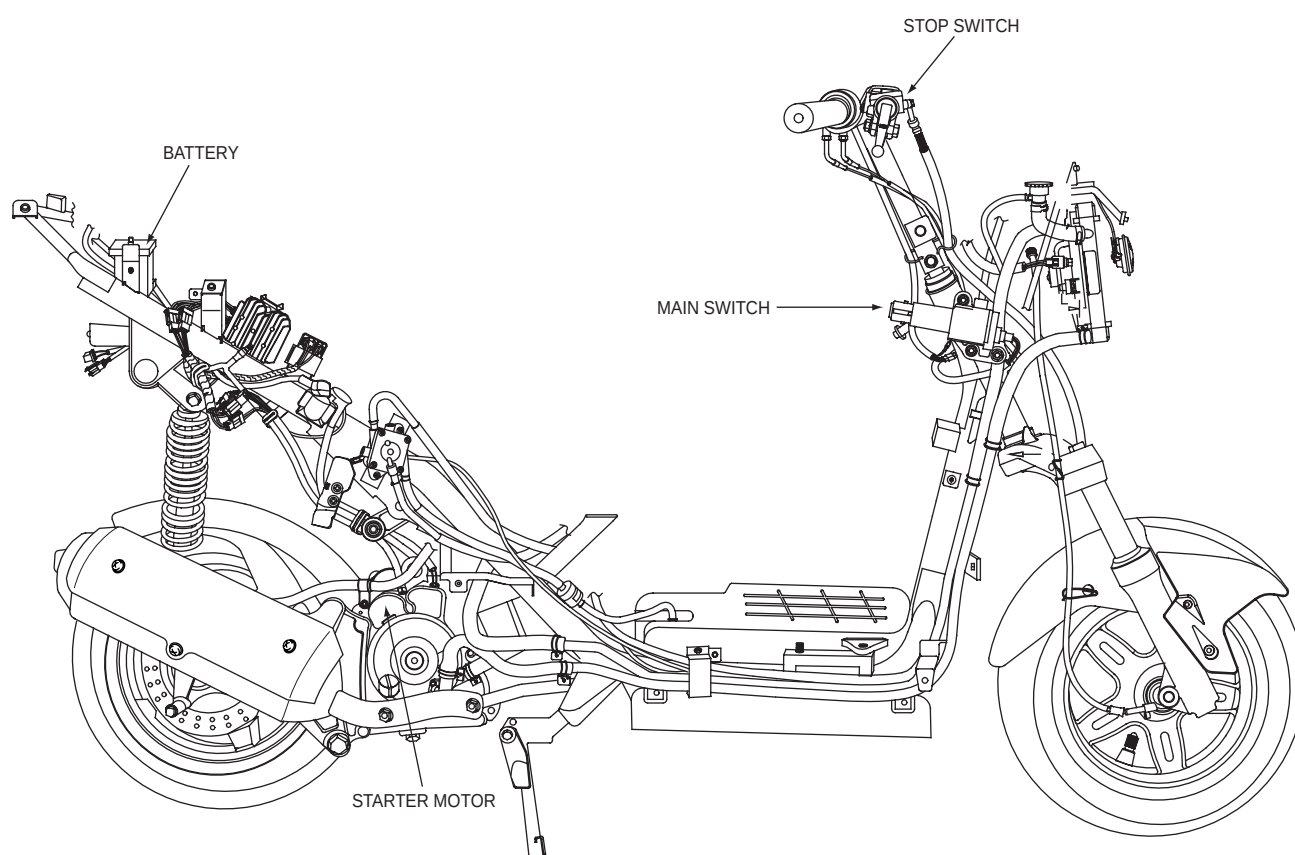


Unit : Ω

(-) (+)	L/Y	B/Y	G/R	G/W	B/W	G/B	V/R	V/B	V/G	G
L/Y		∞	∞	67~125KΩ	∞	∞	36~67KΩ	110~200KΩ	36~67KΩ	36~67KΩ
B/Y	11~22MΩ		∞	11~22MΩ	0.5~2KΩ	∞	11~22MΩ	11~22MΩ	11~22MΩ	11~22MΩ
G/GR	∞	∞		∞	∞	∞	∞	∞	∞	∞
G/W	67~125KΩ	∞	∞		∞	∞	36~67KΩ	110~200KΩ	36~67KΩ	36~67KΩ
B/W	11~22MΩ	0.5~2KΩ	∞	11~22MΩ		∞	11~22MΩ	11~22MΩ	11~22MΩ	11~22MΩ
G/B	∞	∞	∞	∞	∞		∞	∞	∞	∞
V/R	36~67KΩ	∞	∞	36~67KΩ	∞	∞		72~133KΩ	2~5KΩ	2~5KΩ
V/B	110~200KΩ	∞	∞	110~200KΩ	∞	∞	72~133KΩ		72~133KΩ	72~133KΩ
V/G	36~67KΩ	∞	∞	36~67KΩ	∞	∞	2~5KΩ	72~133KΩ		0.1~1 Ω
G	36~67KΩ	∞	∞	36~67KΩ	∞	∞	2~5KΩ	72~133KΩ	0.1~1 Ω	

MEMO

STARTER SYSTEM



18. STARTER SYSTEM

SERVICE INFORMATION 18-1	STARTER MOTOR 18-3
TROUBLESHOOTING 18-2	STARTER MAGNETIC SWITCH . 18-5

SERVICE INFORMATION

GENERAL SAFETY

 WARNING

- Always turn the ignition switch OFF before servicing the starter motor. The moter 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.

SPECIFICATION

ITEM	STANDARD VALUE	SERVICE LIMIT
STARTER MOTOR BRUSH LENGTH	12.5 mm	5 mm

TORQUE

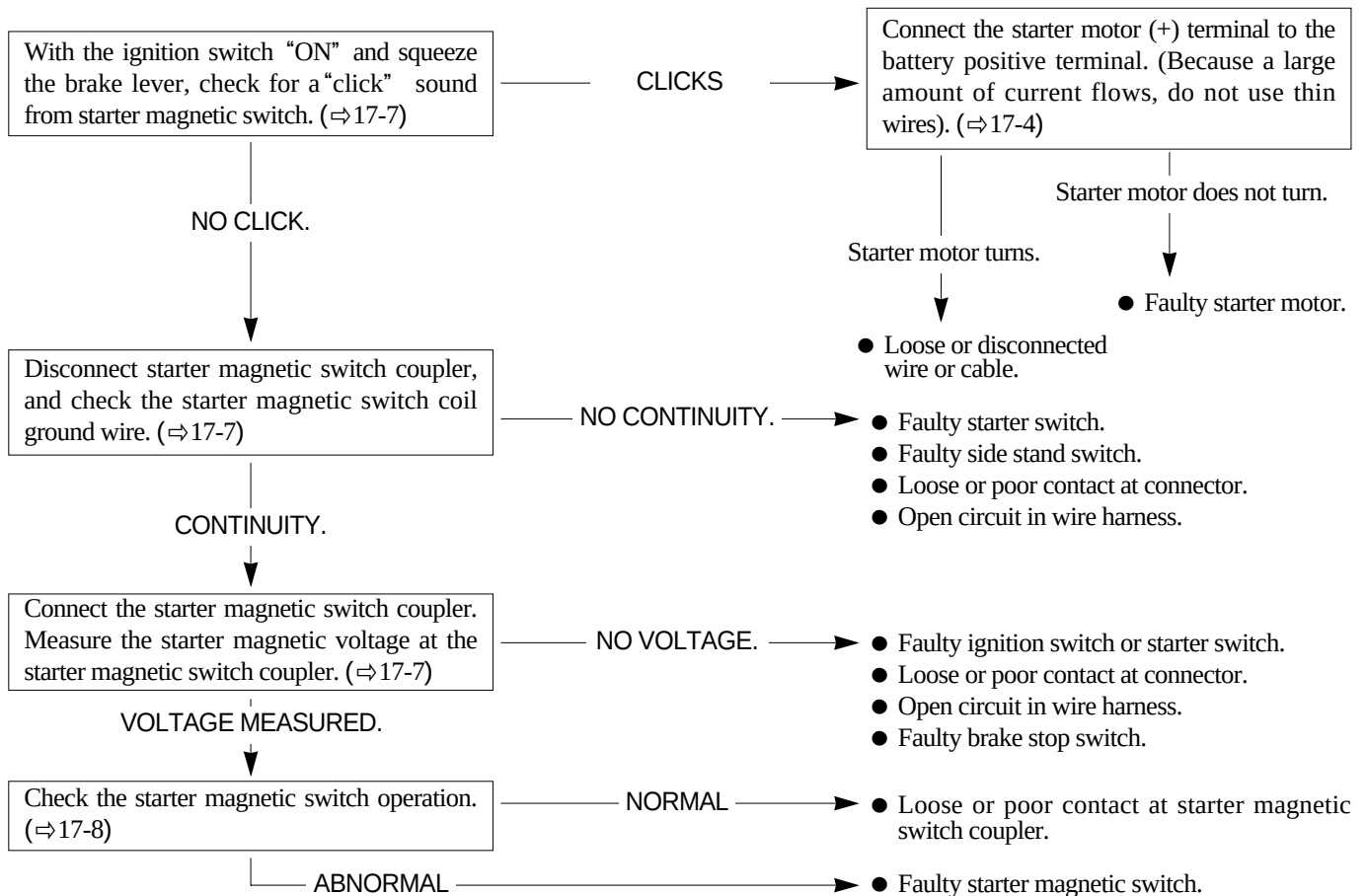
STARTER MOTOR MOUNTING BOLT : 0.67~1.08kgf · m
STARTER MOTOR CASE SCREW : 0.29~0.49kgf · m
STARTER CLUTCH BOLT : 0.98~1.37kgf · m

STARTER SYSTEM

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.

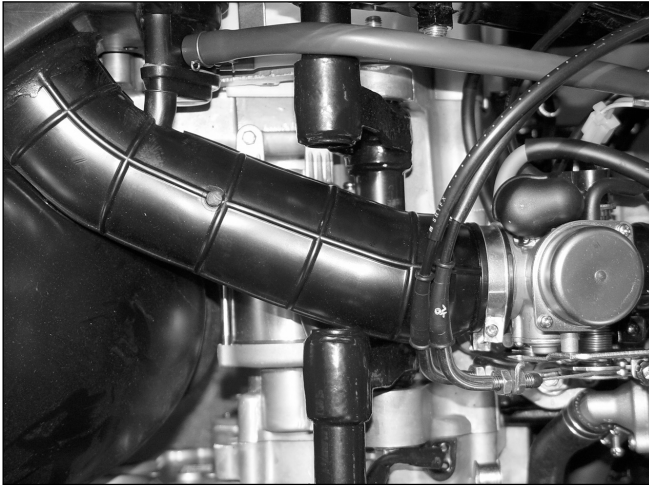
- Low specific gravity in battery. (or dead battery)
- Poorly connected battery terminal cable.
- Poorly connected starter motor cable.
- Faulty starter motor.
- Poorly connected battery ground cable.
- Damaged or worn brush.

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

- Release the seat lock with the main key.
- Remove the luggage box.
- Remove the core tube band from the carburetor
- Remove the starter motor cable from the starter magnetic switch.
- Loosen the 2 flange bolts securing the engine case, remove the battery earth cable and starter motor.
- Install in the reverse order of removal.



DISASSEMBLY

- Release the two starter motor case screws, front cover, rear cover, motor case and other parts.



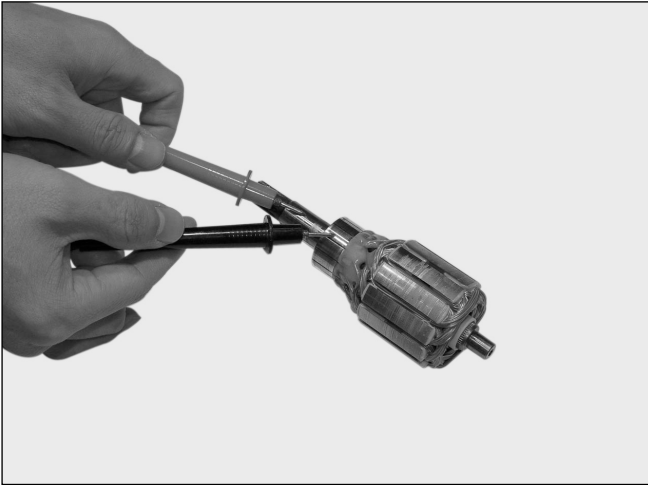
INSPECTION

- Inspect the removed parts for wear, damage or discoloration. Replace if necessary.
- Clean the commutator if there is metal powder between the segments.

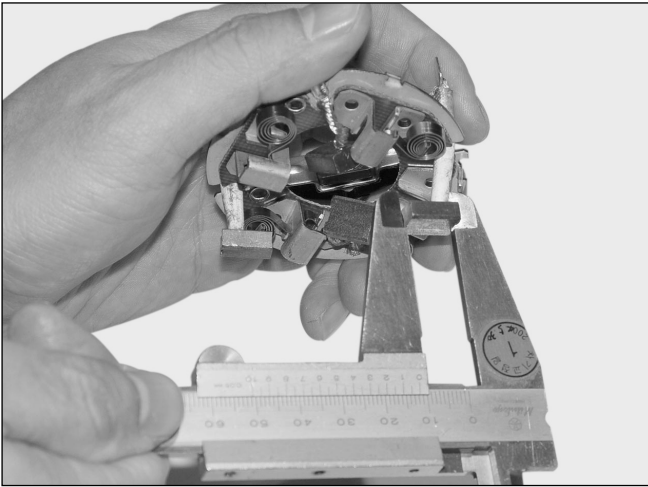


- Check for continuity between pairs of the commutator segments and there should be continuity.

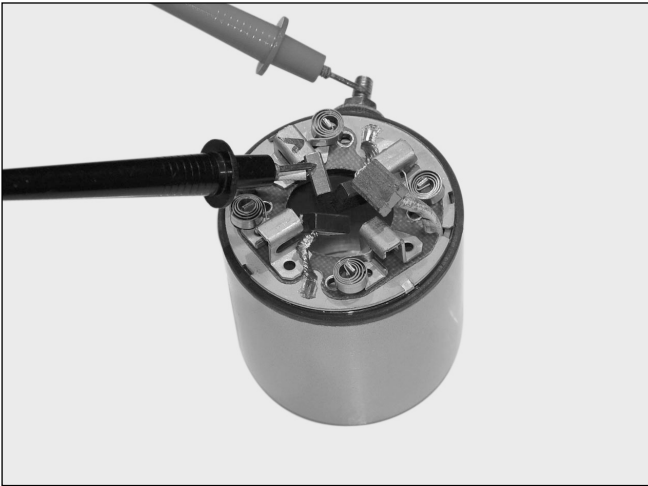
STARTER SYSTEM



- Make a continuity check between individual commutator segments and the armature shaft. There should be no continuity.



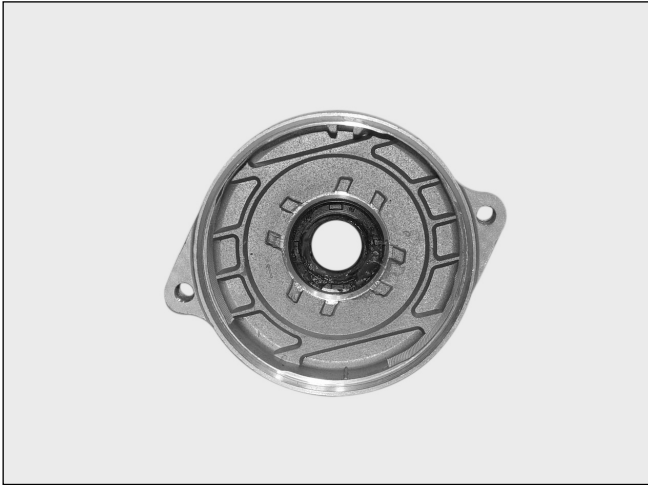
- Measure the length of the brushes.
SERVICE LIMIT : 8.5m replace if below



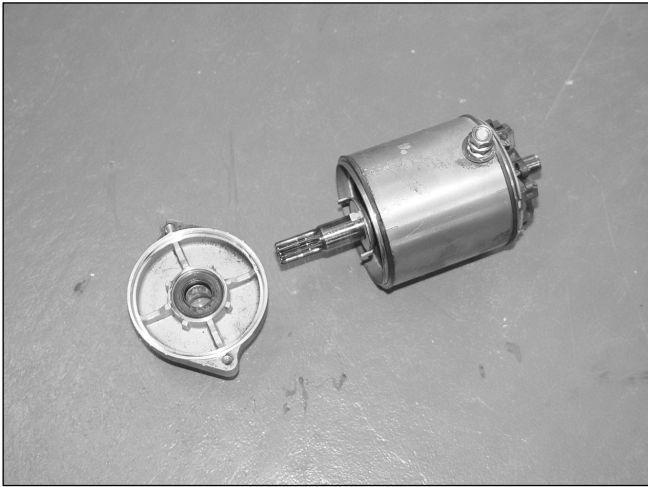
- Check the continuity between brush ⊕ and cord terminal.
- Normal if there is continuity.



- Check the continuity between cord terminal and case.
- Normal if there is no continuity.

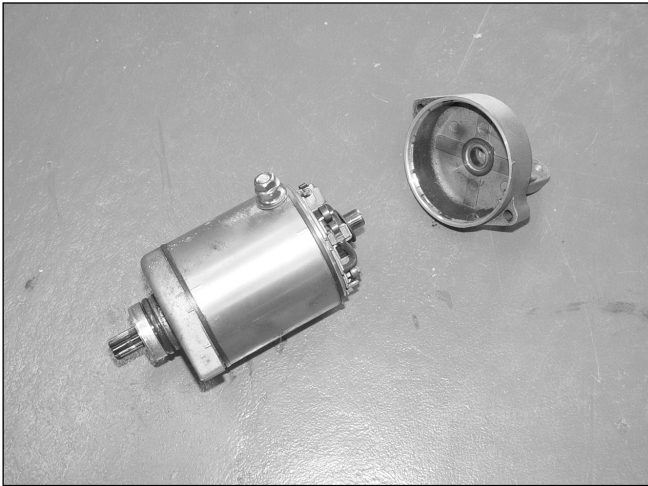


- Check if the needle bearing in the front cover turns freely and has no excessive play. Replace if necessary.
- Check the dust seal for wear or damage.



ASSEMBLY

- Apply grease to the dust seal in the front cover.
- Install the brushes onto the brush holders.
Apply a thin coat of grease to the two ends of the armature shaft.
- Insert the commutator into the front cover.



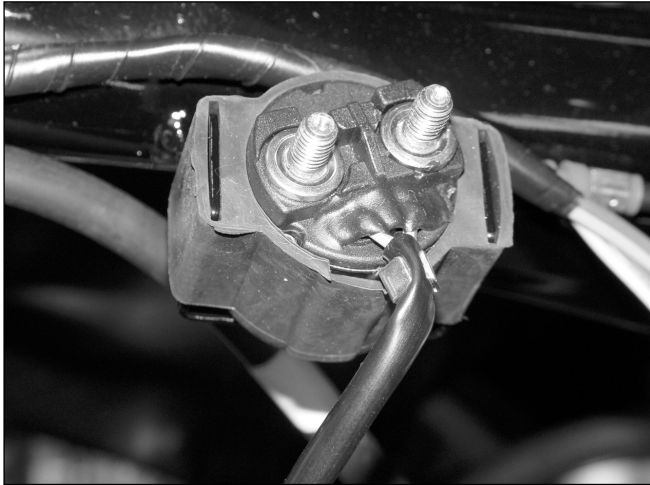
- Install a new O-ring to the front cover.
- Install the starter motor case, aligning the tab on the motor case with the groove on the front cover.
- Tighten the starter motor case screws.



STARTER MAGNETIC SWITCH

INSPECTION

- Check if the starter magnetic switch “clicks” when it is turned ON.
 - Clicks → • Poorly connected battery terminal and motor terminal of the switch. (Check the starter magnetic switch)
 - No clicks → • No starter magnetic switch input voltage. (Faulty relay ground line and starter magnetic switch)

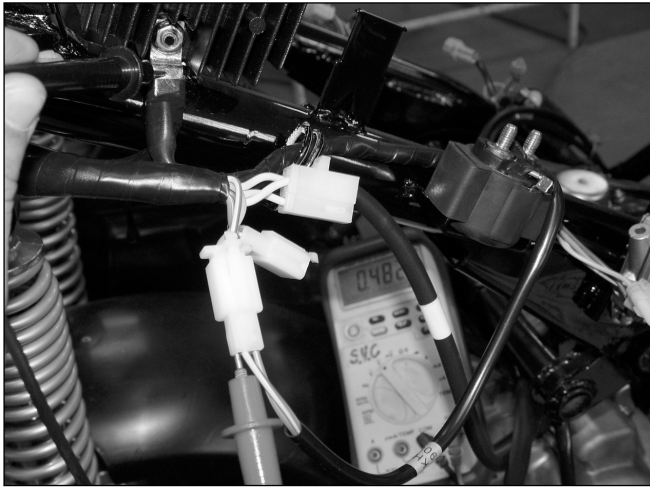


REMOVAL

- Release the seat lock with the main key.
- Remove the luggage box.
- Remove the center cover.
- Remove the battery (+) cable from the starter magnetic switch terminal.
- Remove the starter motor cable from the starter magnetic switch terminal.
- Disconnect the yellow / red connector and green / yellow connector from the wire harness.
- Remove the starter magnetic switch from the switch setting bracket securing the frame.
- Install in the reverse order of removal.

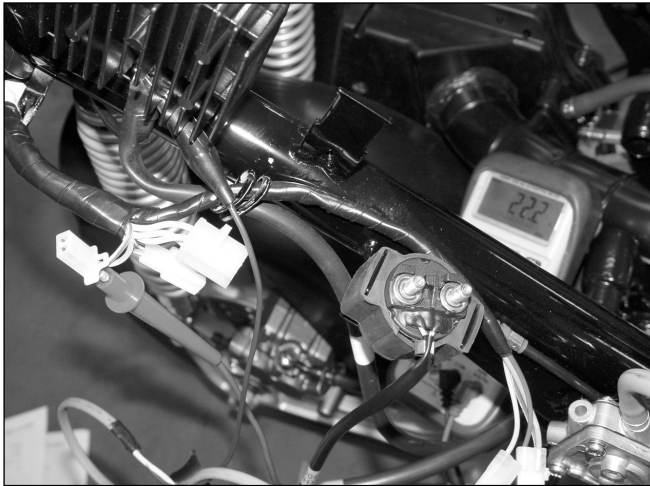
Starter magnetic switch voltage

- Measure the voltage between the yellow / red wire (+) and ground at the starter magnetic switch connector.
- If battery voltage appears only when the starter switch is pressed, it is normal.



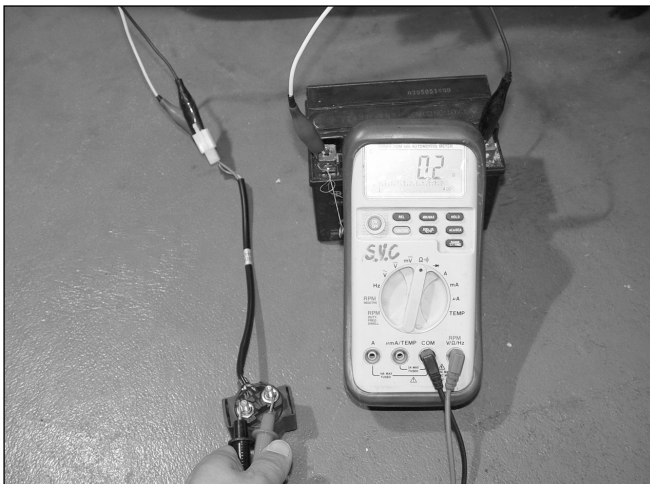
Starter magnetic switch ground line

- Disconnect the wire connector from the starter magnetic switch and check for continuity between the ground wire (green / yellow) and ground.



OPERATION CHECK

- Disconnect the magnetic switch wire connector.
- Apply battery voltage between terminals, when the yellow / red wire is connected to the positive (+) battery terminal and the green / yellow wire to the negative (-) battery terminal.
- If there is continuity between battery and motor terminal, it is normal.



MEMO

MEMO

19. LIGHTS/SWITCHES/HORN

SERVICE INFORMATION	19-1	HEADLIGHT CONTROLLER .	19-4
TROUBLESHOOTING	19-1	COOLANT TEMPERATURE GAUGE .	19-5
MAIN SWITCH	19-2	THROTTLE POSITION SENSOR .	19-5
HANDLE SWITCH	19-2	HEADLIGHT BULB REPLACEMENT .	19-6
HORN	19-3	FRONT WINKER REPLACEMENT . .	19-6
FUEL UNIT	19-3	TAIL LIGHT/REAR WINKER BULB	
THERMOSTATIC SWITCH . . .	19-4	REPLACEMENT	19-6
HEATER CONTROLLER UNIT .	19-4	FUSE CAPACITY .	19-7

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

Light 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

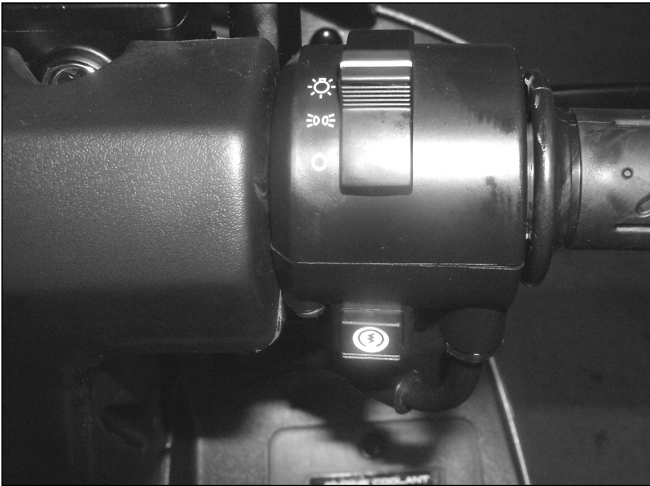
- Faulty light bulb
- Faulty dimmer switch

Fuel meter indicator malfunctioning

- Coupler separated.
- Harness disconnected.
- Float operation malfunction.
- Fuel unit damaged.

Fuel meter needle unstable

- Coupler loose.
- Fuel unit damaged.
- Meter damaged.



MAIN SWITCH

- Remove the front covers.
- Disconnect the ignition switch wire couplers.
- Check for continuity between the wire terminals.

	RED/WHITE	BLACK
OFF		
ON		

HANDLE SWITCH

- Remove the headlight.
- Disconnect the connector of handle switch.
- Check for continuity between teminals.
- Remove the Fr. cover.
- Remove the coupler wire.
- Test each teminal of handle switch.

HEADLIGHT SWITCH

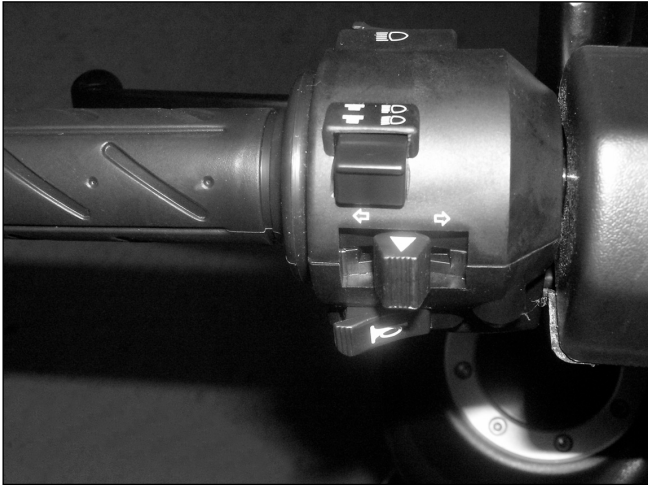
LIGHTING			
	BAT3	TL	HL
OFF			
P			
H			
COLOR	Br/L	Br	Br/W

WINKER SWITCH

	BAT3	TL	HL
R			
N			
L			
COLOR	GREY	SKY BLUE	ORANGE

HORN SWITCH

	HO	BAT3
FREE		
PUSH		
COLOR	GREEN	BLACK



PASSING SWITCH

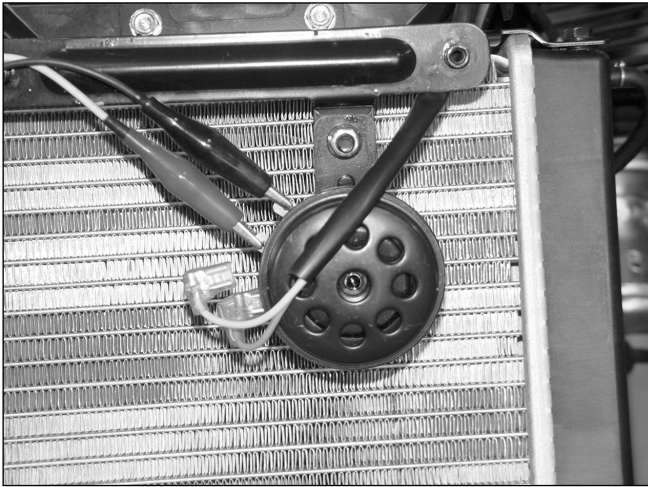
	BAT3	HI
HI		
COLOR	BLACK	BLUE

WINKER SWITCH

	BAT3	HI	LO	BAT3
HI				
(N)				
LO				
COLOR	BROWN/WHITE	BLUE	WHITE	BLACK

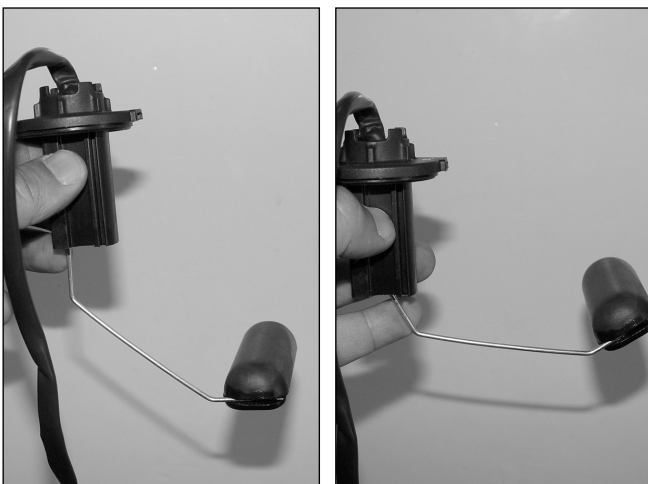
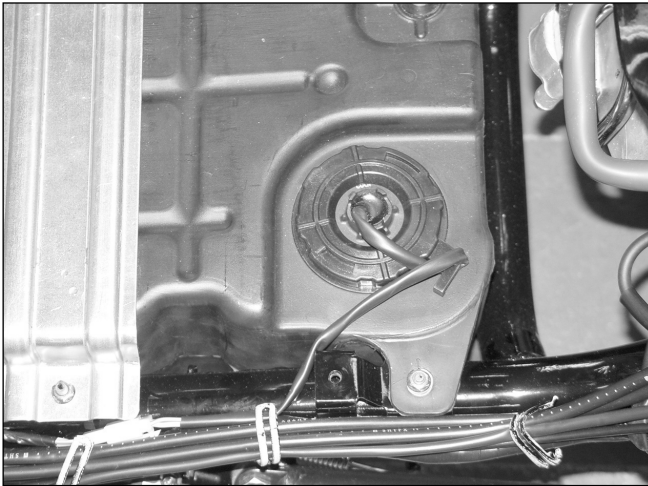
HORN

- Remove the horn from the wire connector.
- Connect the horn terminal with 12V battery.
- Normal if it sounds.

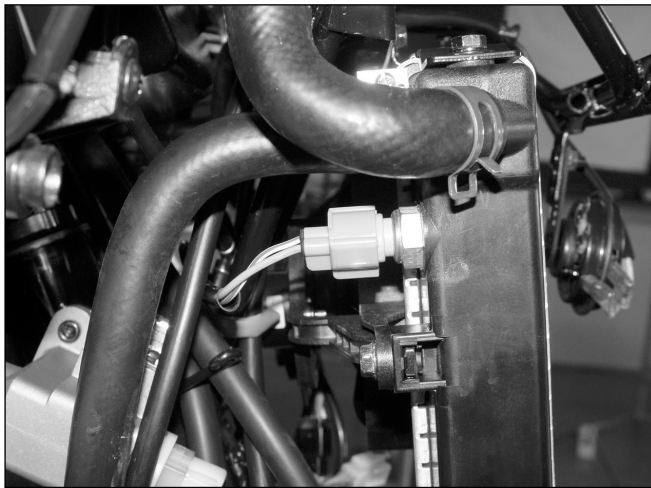


FUEL UNIT

- Remove the foor panel.
- Be cover full not to be damaged for the wire.
- Check the base packing for damage.
- Measure the resistance between the fuel unit upper and lower.



COLOR	UPPER	LOWER
Y/W~B/W	1.8~1.2 Ω	70~130 Ω



THERMOSTATIC SWITCH

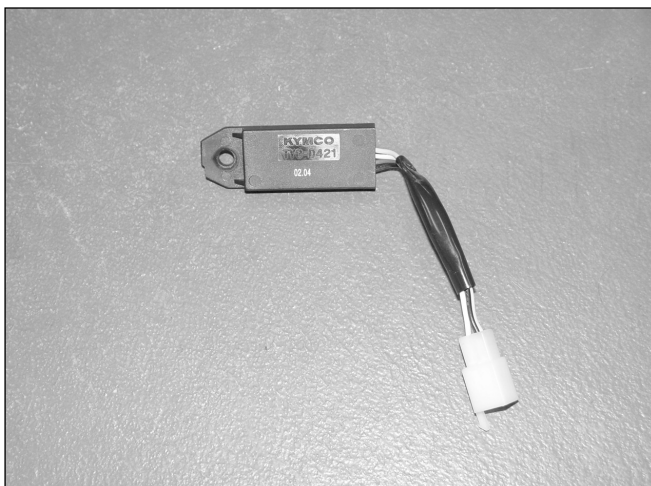
- Remove the front covers.
- Start and run engine to make the water temperature reaches 85° C~90° C and check if the cooling fan motor operates.
- Lower the water temperature to 85° C and check if the fan motor stops.



- If the fan motor does not start, disconnect the wires from the thermostatic switch and then connect a jumper wire between the wire harness and thermosensor wires (black and green wires).



- Turn the ignition switch ON.
- The thermostatic switch is faulty if the cooling fan motor runs properly.
- If it does not start, check for voltage between the fan motor coupler wire terminals (black~green).
- If there is no voltage, check for the following:
- Blown or faulty fuse.
- Loose terminals or connectors.
- Shorted wire in the wire harness.

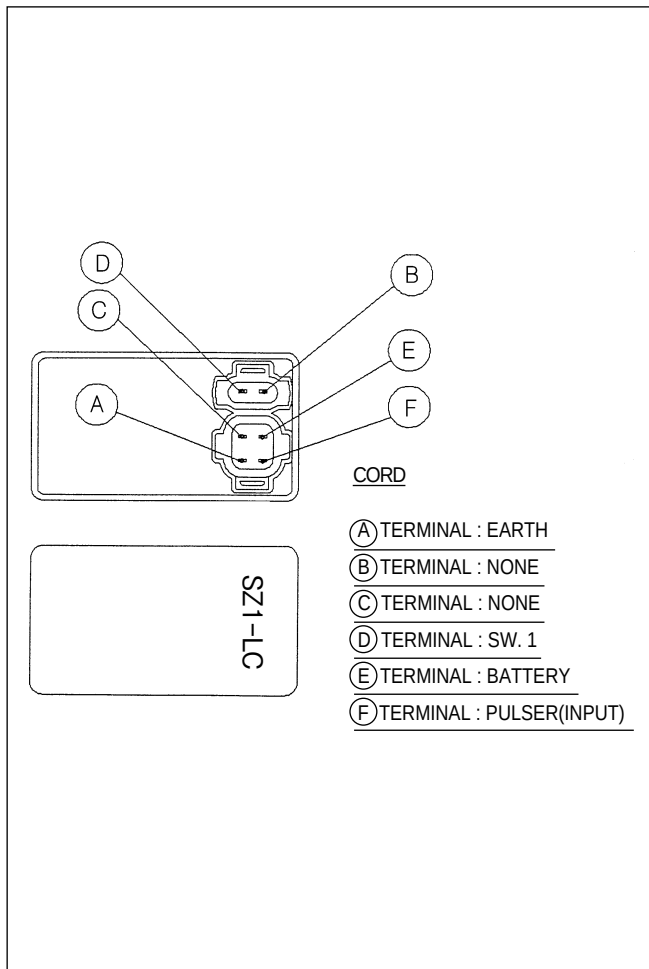


HEATER CONTROLLER UNIT

- Open ignition switch to check if the brown blue wire of it is enough voltage.
- Put the heater controller unit in refrigerator. Start engine after keeping the temperature under 0° C.
- Check if the yellow wire of heater controller unit has output voltage. Start engine and if the temperature of heater controller unit is under 0° C. Check if the white/yellow wire of heater controller unit has output voltage.
- If it has not any voltage, it is damaged.

HEADLIGHT CONTROLLER

- When the main switch turns ON, the headlight (low), meter illumination, taillight, position light and license light turns on during a second and turns off.
- If the engine RPM becomes over 1,100rpm, the headlight (low), the meter illumination, taillight, position light and license light turns on



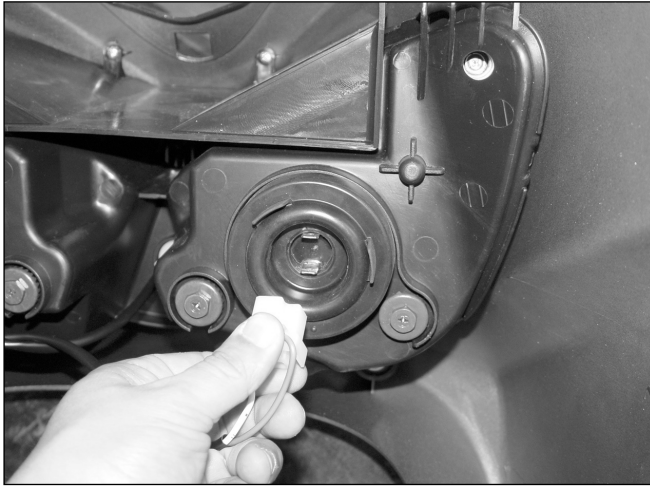
COOLANT TEMPERATURE GAUGE

- If the gauge needle indicates the red zone when idling or running, turn the main switch OFF.
Wait until the engine is cool and perform the following.
- Disconnect the wire from the thermo sensor.
- Ground the thermo sensor wire with a jumper wire.
- Turn the main switch ON. Disconnect the thermo sensor wire from the ground immediately if the gauge needle moves fully to H. (If it moves fully to H, the gauge can be damaged.)



THROTTLE POSITION SENSOR

$\ominus$ \ $\oplus$	V/A	V/G	V/B
V/A		4~6	∞
V/G	4~6		0~5 $\pm$ 1
V/B	∞	0~5 $\pm$ 1	



HEADLIGHT BULB REPLACEMENT

- Remove the front cover.
- Remove the headlight coupler and winker coupler.
- Remove the bulb socket of rubber boots.
- Remove the rubber boots.
- Replace the headlight bulb.

⚠ NOTE

- When replacing the bulb, be sure not to put finger and contaminated gloves prints on the headlight bulb, as they may create hot spots on the bulb and cause it to fail.
- Note the following when replacing the bulb.
 - Do not replace while the headlight is ON. After it is turned OFF, be sure to let it cool down before servicing.
 - Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb.
 - If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol and clean it with a clean cloth again.
 - Be sure to install the rubber cover after replacing the bulb.



FRONT WINKER BULB REPLACEMENT

- Loosen the 2 screws, remove the winker lens.
- Replace the winker bulb.



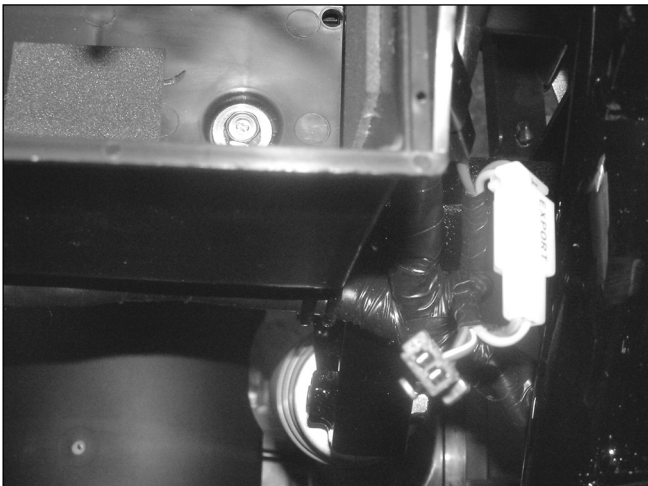
TAILLIGHT/REAR WINKER BULB REPLACEMENT

- Loosen the 2 screws of taillight.
- Remove the taillight lens and winker lens.
- Replace the taillight bulb and winker bulb.



FUSE CAPACITY

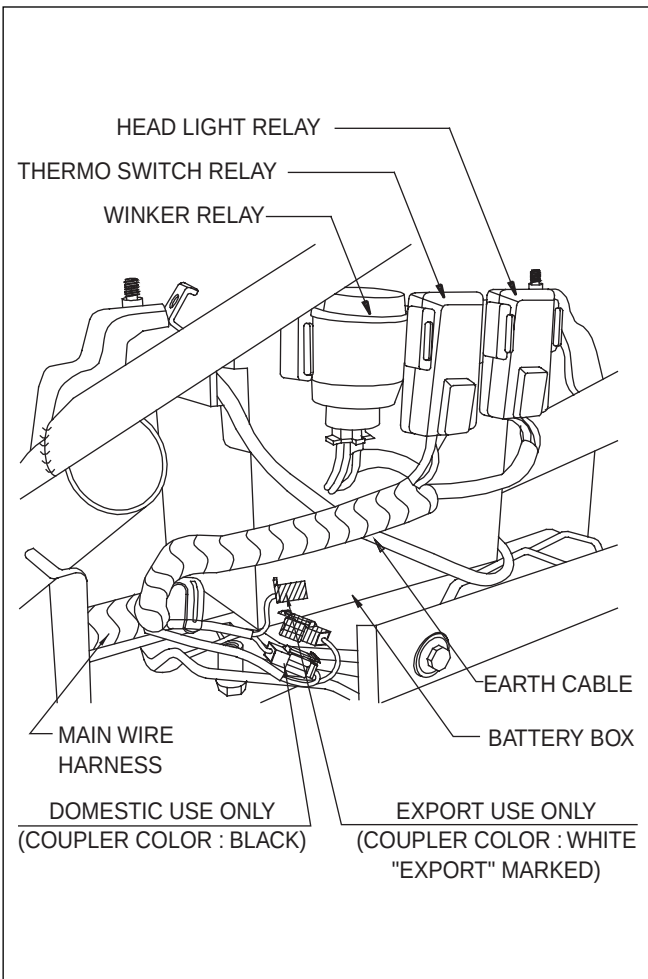
Fuse A	30A	Charging, combi S/W, trunk lamp, regulator
Fuse B	15A	Winker relay, meter lighting, horn, headlight (HI), front/rear stop switch, taillight, heater control, fuel meter, water temp. meter
Fuse C	10A	Ignition coil, auto bi-starter
Fuse D	10A	Fan motor
Fuse F	10A	Headlight (LO)



COUPLER CONNECTION

- Connect the coupler carefully according to the type of vehicle.

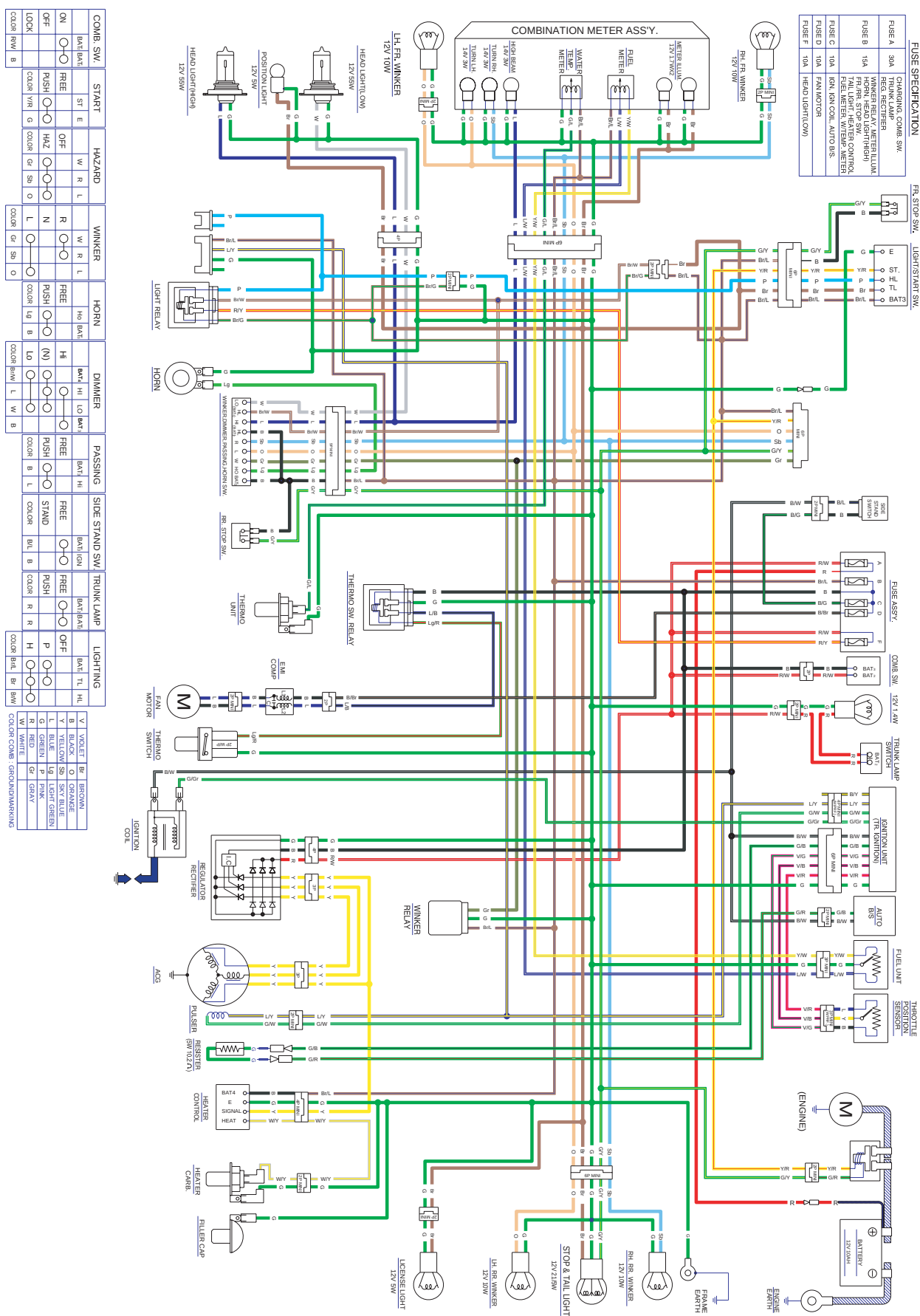
TYPE SPEC.	COLOR
EXPORT	WHITE
DOMESTIC	BLACK



- If headlight switch is mounted with the vehicle, connect the white colored coupler only.
- If hazard switch is mounted with the vehicle connect the black colored coupler only.

MEMO

20. WIRING DIAGRAM



MEMO

***52* 250 SERVICE MANUAL**

2004. 9. PRINTED

2004. 9. PUBLICATION

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 **DAELIM MOTOR CO.,LTD.**



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