

SERVICE MANUAL



HOW TO USE THIS MANUAL

This manual describes effective maintenance procedure for the SC125 manufactured by DAELIM Motor Co., Ltd. To ensure safety and optimal operating conditions of the vehicle, carry out regular inspections according to the maintenance schedule (Section 3).

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

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

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

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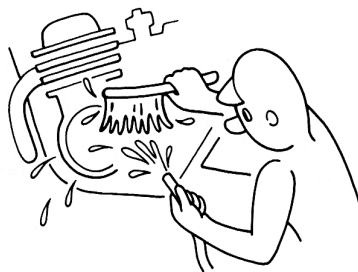
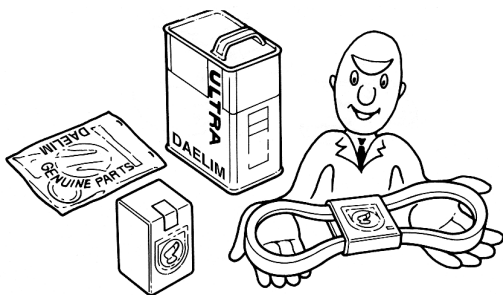
GENERAL SAFETY

WARNING

1. Do not run the engine for a long time in closed or not well-ventilated area because the exhaust gas contains toxic substances such as carbon monoxide, hydrocarbon, nitric oxide.
2. The battery fluid(lean sulfuric acid) is extremely toxic. It is dangerous if skin is exposed to it or if it enters into the eye. Be careful in handling. When exposed to the battery fluid, wash it with water and get a medical check up.(store the battery fluid in a safe place to avoid touching by the children)
3. Pay attention not to be burned and always put on the protection gears because the engine or the muffler is hot right after engine stops.
4. Gasoline is extremely flammable. Maintenance must performed in the place free of the open fire or electric spark.
5. When more than two person are working, always pay attention to other worker's action and 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.

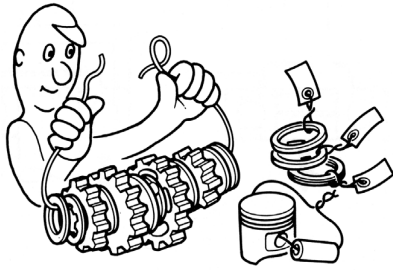
SERVICE RULES

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



SERVICE INFORMATION

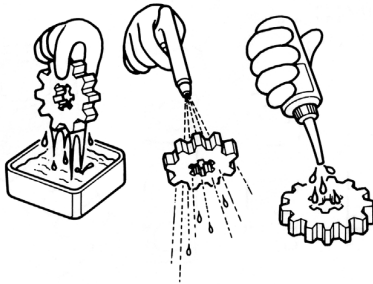
3. Store the parts of each system discriminatively to install each part in the right place.



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



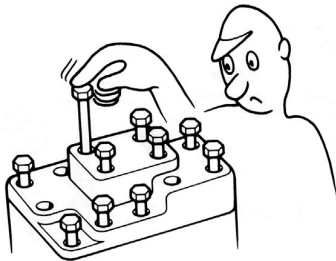
5. Clean the parts after the overhaul and before the test and remove the cleaning oil with compressed air. Apply oil to seal face during installation.



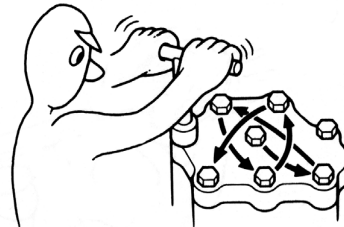
6. Check necessary place and measure necessary data during installation. When installing, return to the state before removing.



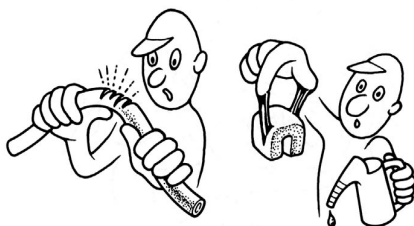
7. Align the bolts to uniform the tightening points before tightening them when you don't know the bolt length.



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



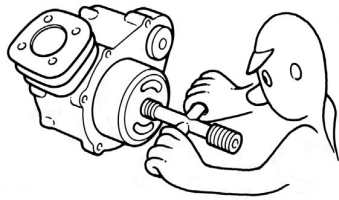
9. Check to see if the rubber part is worn out when removing it and replace it if necessary. Some rubber part is weak to gasoline and kerosene, so pay attention not to soak with gasoline or oils.



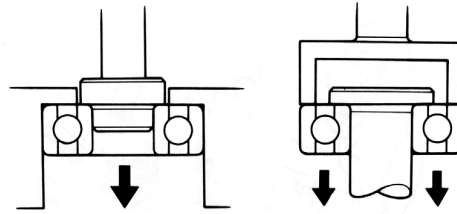
10. Recommended grease must be applied to or filled in the specified place.



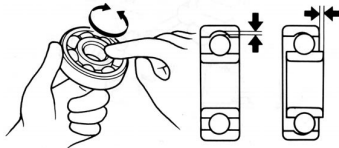
11. Maintenance needed to use the specialized tools must be performed with the right tool.



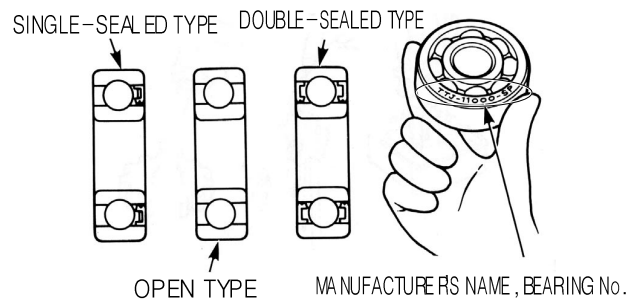
12. Never reuse the ball bearing removed with the ball applied pressure when removing press-fitted the bearing.



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.



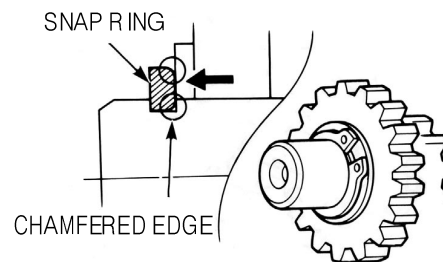
14. Pay attention to installation direction in case of the single-sided sealed ball bearing. Install the open-direction or double-sided sealed bearing in the way that the face marked with manufacturer and size should direct to the outer axle.



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.



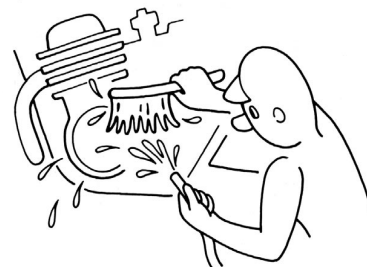
16. Install the snap ring so that chamfered side directs to the load-applied side. After installation, check the proper installation by rotating the snap ring.



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

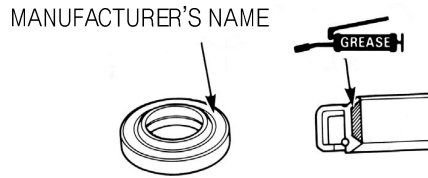


18. The brake fluid and coolant can damage the painted plastic or rubber parts. Keep these parts from contacting with them and wash these parts with water in case of contact.

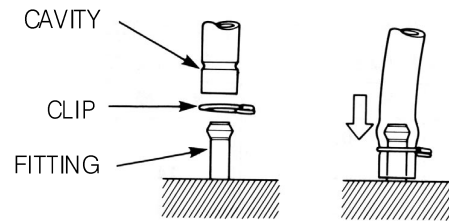


SERVICE INFORMATION

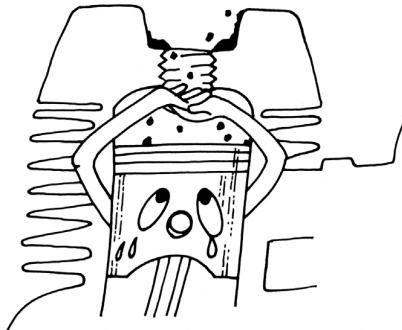
19. Install the oil seal so that the manufacturer marked surface directs outer surface.(direction not covered with oil)
- Pay attention not to bend or damage the lip
 - Apply the grease to the lip



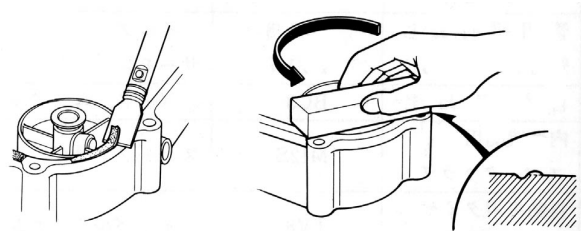
20. Connect the tube until the tube fully inserted in the joint. Install the clip if it is supplied. Replace the tube having slacked end.



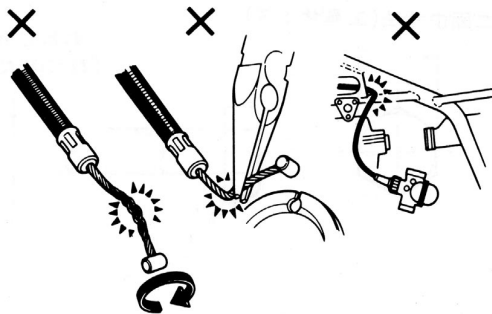
21. Keep the pneumatic system interior or the engine interior from the infiltration of dust.



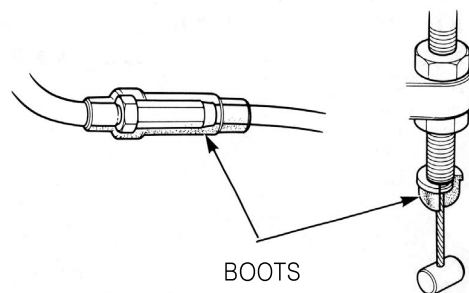
22. Install the gasket mounted in the contact surface of each case of the engine while removing gasket material completely. Remove damaged contact surface by wiping with the oil stone equally.



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

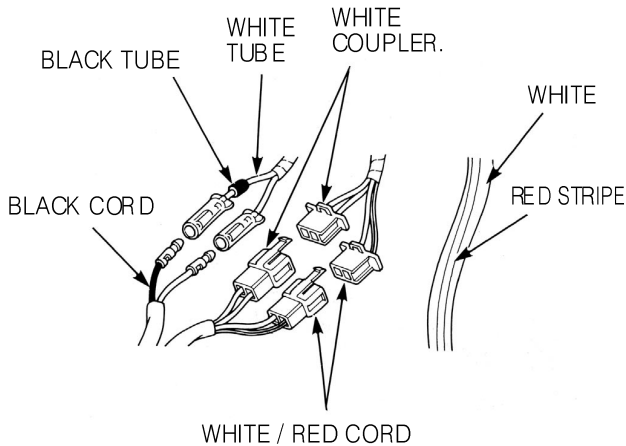


24. Install the boots with the installing groove by inserting the boots into the groove.

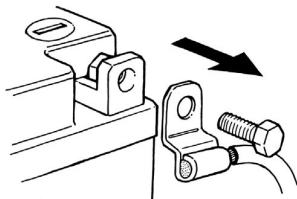


CAUTION WHEN WIRING

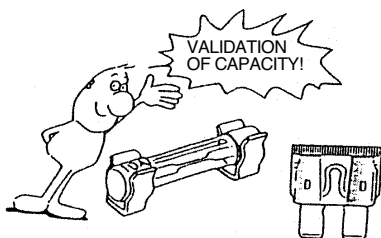
- Each cord must be connected depending on its color. When connecting different cord, attach color tube around the connector. Connect the coupler to the connector with same color and same pin number.
- Identify the two-colored cord by main color first and then striped color.



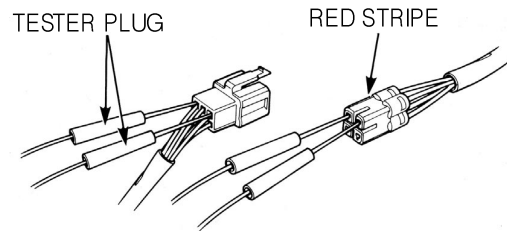
- When disconnecting the battery, the minus terminal must be disconnected first.
- Make sure that the tool such as spanner do not contact with the frame.



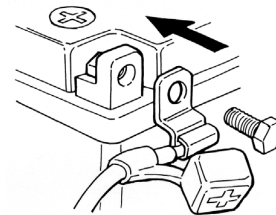
- If the fuse is short-circuited, find out the cause and repair. Replace with the fuse having the specified capacity.



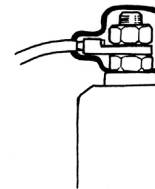
- When measuring voltage or resistance of the cord terminal using tester, contact the tester plug behind of the coupler. Pay attention not to open the cord terminal and contact the tester plug from the front of the coupler in case of water-proof coupler.



- 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.

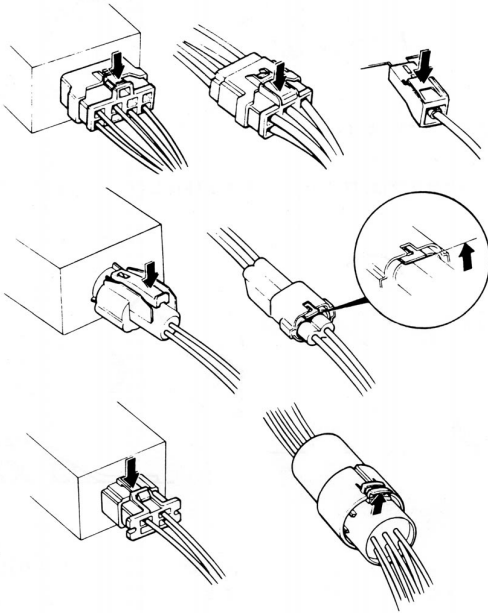


- If there is rust in the terminal, remove the rust with sand paper prior to connecting.

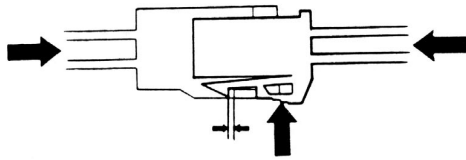


SERVICE INFORMATION

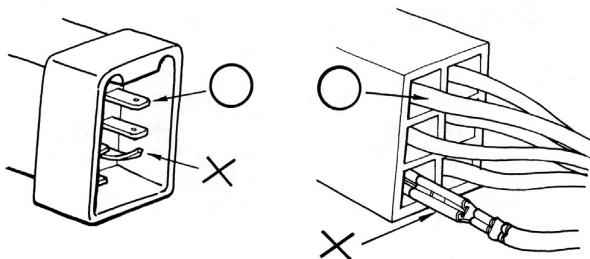
- Turn off the main switch before connecting/disconnecting.
- Release the lock to disconnect the lock of the coupler.
- The lock of the coupler has two types according to releasing method (press type and pull type) so release it properly according to the shape.
- Typical releasing method of the coupler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



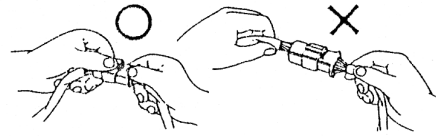
- Release the lock by inserting the coupler slightly and then narrowing connection to remove the coupler.



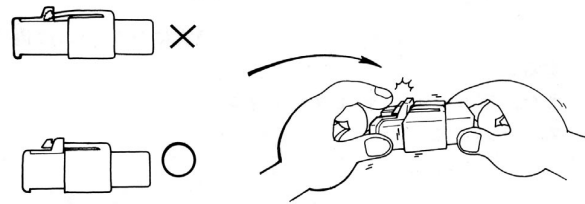
- Check to see if there is bended terminal and secure it to avoid disconnecting.



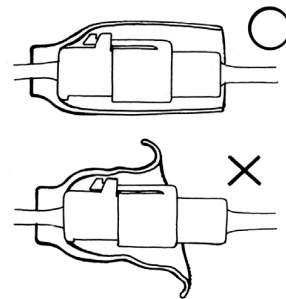
- When disconnecting the coupler, disconnect it while holding the coupler body. Pull while holding the wire harness cord and do not remove the coupler connection.



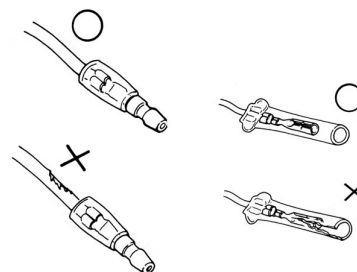
- Insert the lock of the coupler until the lock is fully secured.



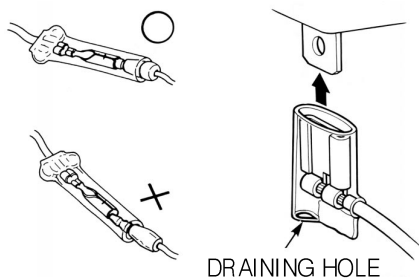
- Pay attention not to damage the vinyl cover of the coupler.



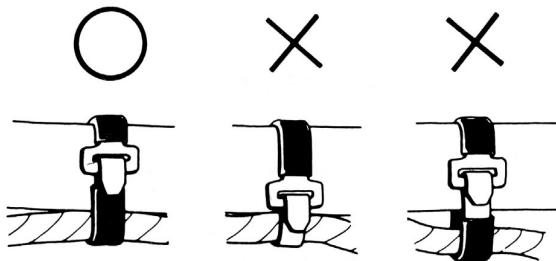
- If the wire harness coating is damaged, repair by winding vinyl tape or replace it.
- Prior to connecting the connector, make sure that the cover is not damaged and the mess terminal is not opened.



- 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.



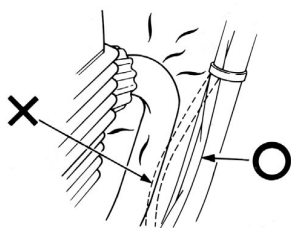
- Wire band must be secured firmly in the specified location of the frame. In case of aluminium band, secure the wire harness to the coated part.



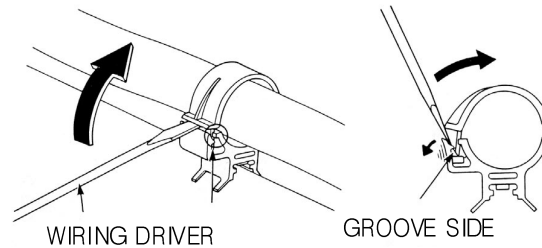
- In case of the weld clamp, do not clamp in the welded part.



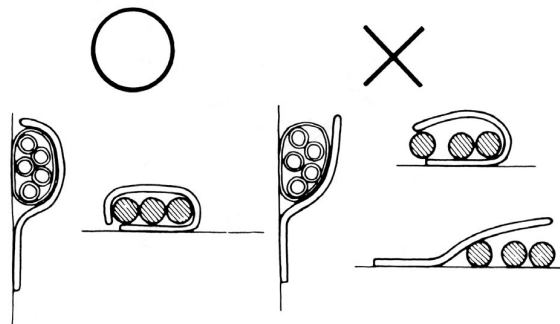
- When clamping the wire, pay attention not to contact with hot part.



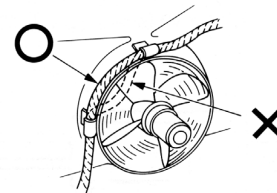
- When removing T-start, broaden the groove of T-start using the wiring driver and release the torque.
- Connect the harness and the hose to T-start and then insert until the groove is locked.
- When removing T-start from the frame, replace it with the new one.



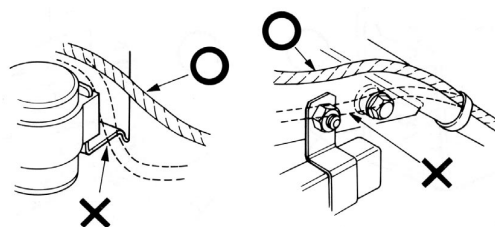
- Secure the wire harness firmly using the clamp.



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

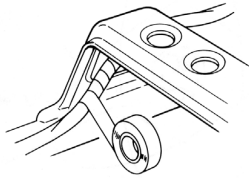


- The wire harness must be routed without contacting with the end of the lamp or any sharp edge.
- The wire harness must be routed without contacting with the end of the bolt or the piece.

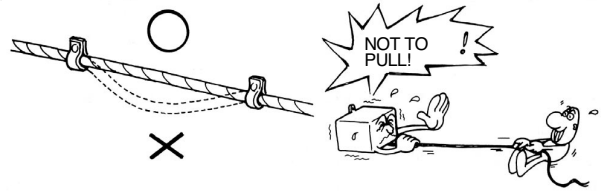


SERVICE INFORMATION

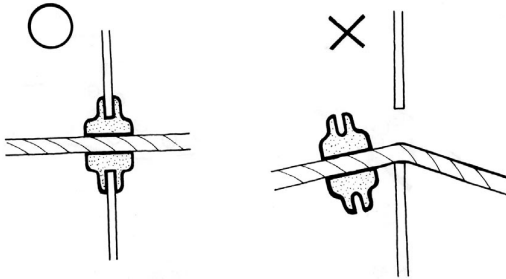
- In case that the wire harness is contacted with the end or the sharp edge, protect both parts with tube or tape.



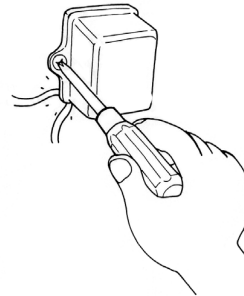
- The wire must not hang down or be pulled excessively.



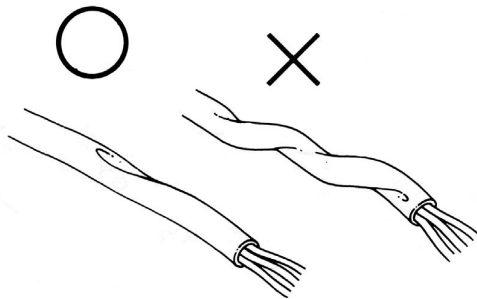
- If necessary, lock the wire harness properly.



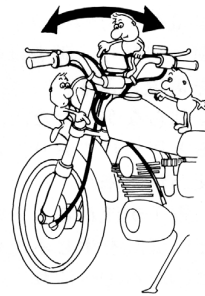
- When mounting parts, make sure that the wire harness is not pressed by the parts.



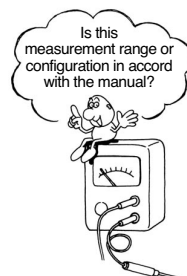
- Do not twist the wire harness.



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



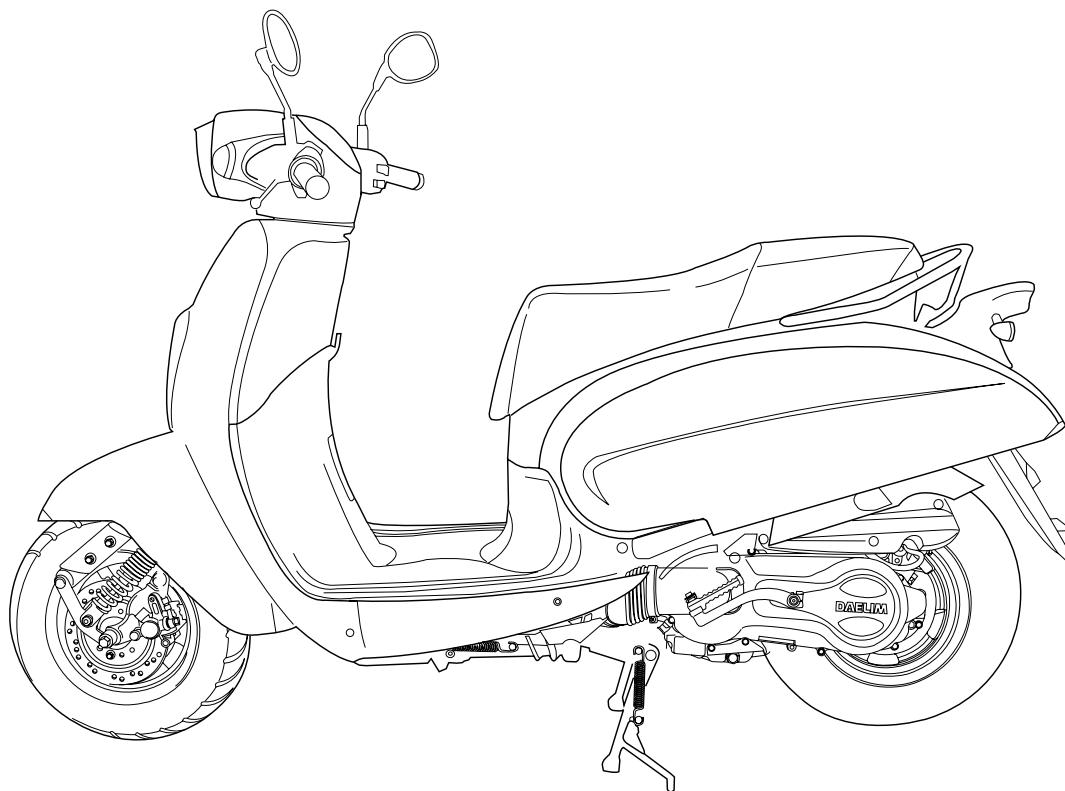
- Prior to using the tester, please read the manual carefully and understand the contents.
- When testing the resistance of the tester, the zero adjustment must be performed before testing.



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



SERIAL NUMBER LOCATION



ENGINE SERIAL NUMBER LOCATION



FRAME SERIAL NUMBER LOCATION

SPECIFICATIONS

ITEM		SPECIFICATIONS
DIMENSIONS	OVERALL LENGTH	1,820 mm
	OVERALL WIDTH	685 mm
	OVERALL HEIGHT	1,060 mm
	WHEEL BASE	1,300 mm
	SEAT HEIGHT	755 mm
	GROUND CLEARANCE	110 mm
	DRY WEIGHT	105 kg
	GROSS WEIGHT	235 kg
FRAME	TYPE	Underbone
	FRONT SUSPENSION / STROKE	Bottom link
	REAR SUSPENSION / STROKE	Swing arm / 66mm
	FRONT TIRE SIZE / TYPE	3.50 - 10 51J
	REAR TIRE SIZE / TYPE	3.50 - 10 51J
	TIRE PRESSURE	1 PERSON FRONT 1.75 Kg _f / cm ²
		REAR 2.00 Kg _f / cm ²
		2 PERSON FRONT 2.00 Kg _f / cm ²
		REAR 2.25 Kg _f / cm ²
	FRONT / REAR BRAKE	Hydraulic disk
	PARKING BRAKE	Drum brake
	FUEL TANK CAPACITY	FULL CAPACITY 8.0 l
		RESERVE CAPACITY 1.0 l
	CASTER ANGLE	26°
ENGINE	TYPE	Air cooled / 4stroke
	CYLINDERS / ARRANGEMENT	1(Single cylinder), front angle 15°
	BORE AND STROKE	52.4 × 57.8 mm
	DISPLACEMENT	124.6 cc
	COMPRESSION RATIO	9.2 : 1
	VALVE TRAIN	SOHC 2valve
	OIL CAPACITY	0.9 l After disassembly
		0.75 l After Oil change
	TRENSMISSION OIL CAPACITY	0.11 l After disassembly
		0.09 l After Oil change
	LUBRICATION SYSTEM	Forced pressure splash type
	AIR CLEANER TYPE	Dry process
	CYLINDER COMPRESSION PRESSURE	13.0 kg _f / cm ² (570 rpm)
	INTAKE VALVE	OPEN 0° BTDC
		CLOSED 25° ABDC
	EXHAUST VALVE	CLOSED 33° BBDC
		OPEN 0° BTDC
	VALVE CLEARANCE (COOLING-OFF PERIOD)	
		INTAKE 0.05 mm
		EXHAUST 0.05 mm

ITEM		SPECIFICATIONS
CARBURETOR	TYPE / VENTURI BORE MODEL MARK CHOKE TYPE MAIN JET PILOT SCREW INITIAL SETTING FLOAT LEVEL IDLE SPEED	CV type (vacuum) 23 mm PD24J Auto-bystarter # 110 2 and ¼ trust out 11 mm 1.600 ± 100 (rpm)
DRIVE TRAIN	CLUTCH TYPE PRIMARY REDUCTION SECONDARY REDUCTION	Automatic Transmission(V-belt) 2.800 3.077
ELECTRICAL SYSTEM	IGNITION SYSTEM IGNITION TIMING F MARK BATTERY TYPE / CAPACITY SPARK PLUG SPARK PLUG GAP FUSE CAPACITY STARTING SYSTEM HEADLIGHT (HIGH / LOW) WINKER LIGHTS (FR / RR) TAIL / STOP LIGHT HIGH-BEAM PILOT WINKER PILOT LAMP SPEEDOMETER LAMP LICENSE LAMP	AC-C.D.I Ignition 13° ± 2° 12V 8AH P-Z9HC(CHAMPION) 0.6 - 0.7 mm 15A Kick / starter motor 12V 35 / 35W 12V 10W × 4 12V LED 12V 1.7W × 1 12V 1.7W × 2 12V 3.4W × 2 12V 5W

TORQUE VALUES

ENGINE

ITEM	Q'TY	THREAD DIA (mm)	TORQUE VALUE	REFERENCE
OIL FILTER CAP	1	30	1.5 kgf · m	APPLY ENGINE OIL
OIL DRAIN PLUG BOLT	1	12	2.5 kgf · m	
VALVE ADJUST SCREW LOCK NUT	4	5	1.1 kgf · m	
CYLINDER HEAD BOLT	2	6	1.1 kgf · m	
FLYWHEEL BOLT	1	12	5.5 kgf · m	
DRIVE FACE NUT	1	12	7.5 kgf · m	
CLUTCH OUTER BOLT	1	12	5.5 kgf · m	
CAM CHAIN TENSIONER PIVOT BOLT	1	8	1.0 kgf · m	
SPARK PLUG	1	12	1.2 kgf · m	APPLY ENGINE OIL
DRIVE PLATE	1	30	5.5 kgf · m	
CAM SHAFT HOLDER NUT	4	8	2.9 kgf · m	
CAM CHAIN TENSIONER FLANGE BOLT	2	6	1.0 kgf · m	
CAM CHAIN TENSIONER PAN SCREW	1	6	0.4 kgf · m	
CYLINDER HEAD COVER BOLT	4	6	0.9 kgf · m	
MISSION COVER BOLT	8	6	1.2 kgf · m	
MISSION COVER DRAIN BOLT	1	8	1.0 kgf · m	
MISSION COVER CHECK BOLT	1	8	0.9 kgf · m	
COOLING FAN BOLT	3	6	1.0 kgf · m	
STARTING CLUTCH NUT	1	22	5.5 kgf · m	
STARTER MOTOR FLANGE BOLT	2	6	0.9 kgf · m	

FRAME

ITEM	Q'TY	THREAD DIA (mm)	TORQUE VALUE	REFERENCE
STEERING STEM NUT	1	26	7.0 kgf · m	
STEERING TOP THREAD NUT	1	26	0.25 kgf · m	
HANDLE POST	2	10	6.0 kgf · m	
FRONT AXLE NUT	1	12	6.0 kgf · m	
FRONT CALIPER BRACKET BOLT	1	8	3.1 kgf · m	
FRONT MASTER CYLINDER HOLD BOLT	2	6	1.2kgf · m	
FRONT DISK PLATE BOLT	3	8	4.25 kgf · m	
REAR AXLE NUT	1	16	12.5 kgf · m	
SPEEDOMETER GEAR BOX SCREW	1	5	0.4 3kgf · m	
FRONT FORK BOLT	2	22	2.25kgf · m	
REAR CUSHION UPPER BOLT	2	10	4.0 kgf · m	
REAR CUSHION UNDER BOLT	2	10	4.0 kgf · m	
REAR CUSHION ROD LOCK NUT	2	10	3.5kgf · m	
ENGINE HANGER UPPER BOLT	2	12	5.25 kgf · m	
ENGINE HANGER LAWER BOLT	1	10	4.5 kgf · m	
MAIN STAND BOLT	2	10	4.0 kgf · m	
SIDE STAND PIVOT SCREW	1	10	1.5 kgf · m	
SIDE STAND PIVOT 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.

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

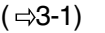
ITEM	TORQUE VALUE	ITEM	TORQUE VALUE
5mm BOLT, NUT	0.5 kgf · m	5mm SCREW	0.4 kgf · m
6mm BOLT, NUT	1.0 kgf · m	6mm SCREW	0.9 kgf · m
8mm BOLT, NUT	2.2 kgf · m	6mm FLANGE BOLT, NUT	1.2 kgf · m
10mm BOLT, NUT	3.5 kgf · m	8mm FLANGE BOLT, NUT	2.7 kgf · m
12mm BOLT, NUT	5.5 kgf · m	10mm FLANGE BOLT, NUT	4.0 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 instruction are not followed.
		NOTE	Indicates general safety matters. Provides safety and appropriate handling procedures.

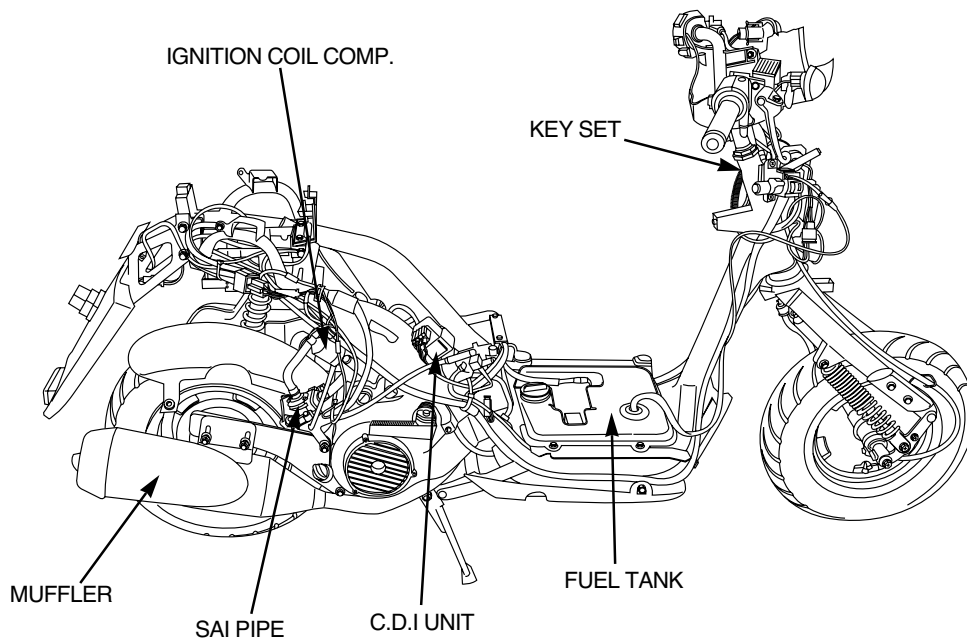
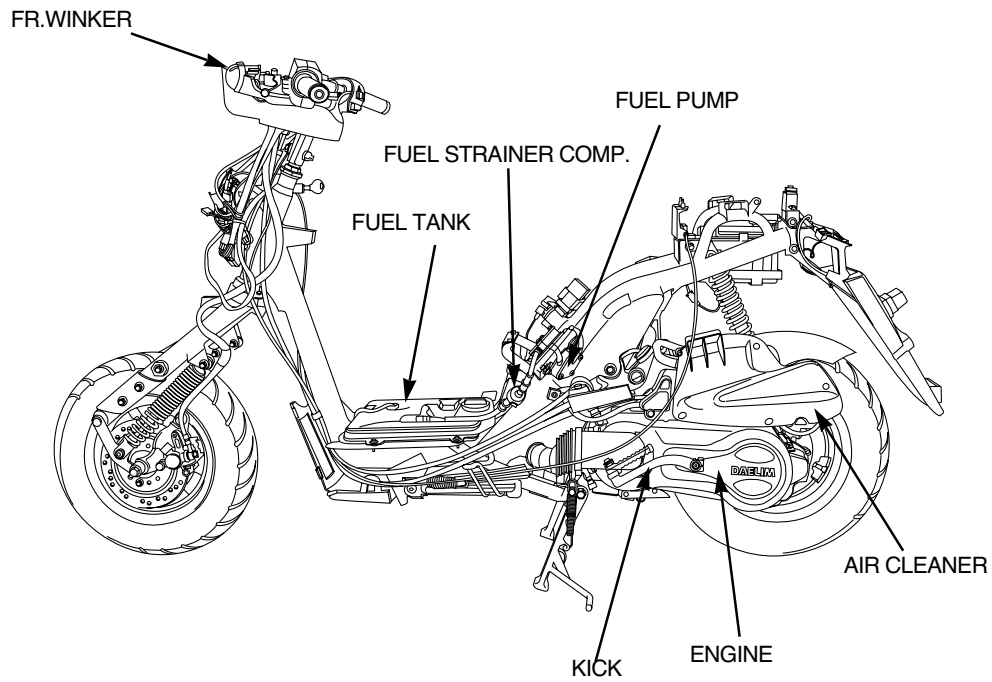
The following symbols indicate oil adding, oil change, or parts.

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

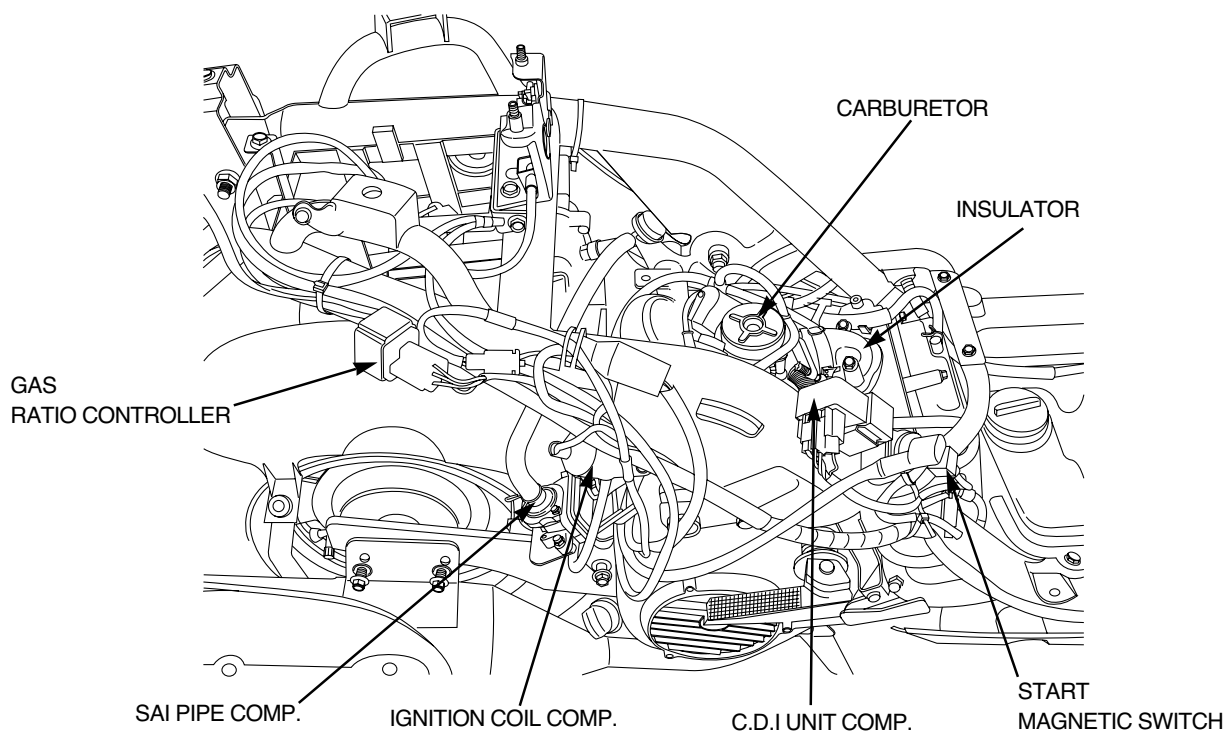
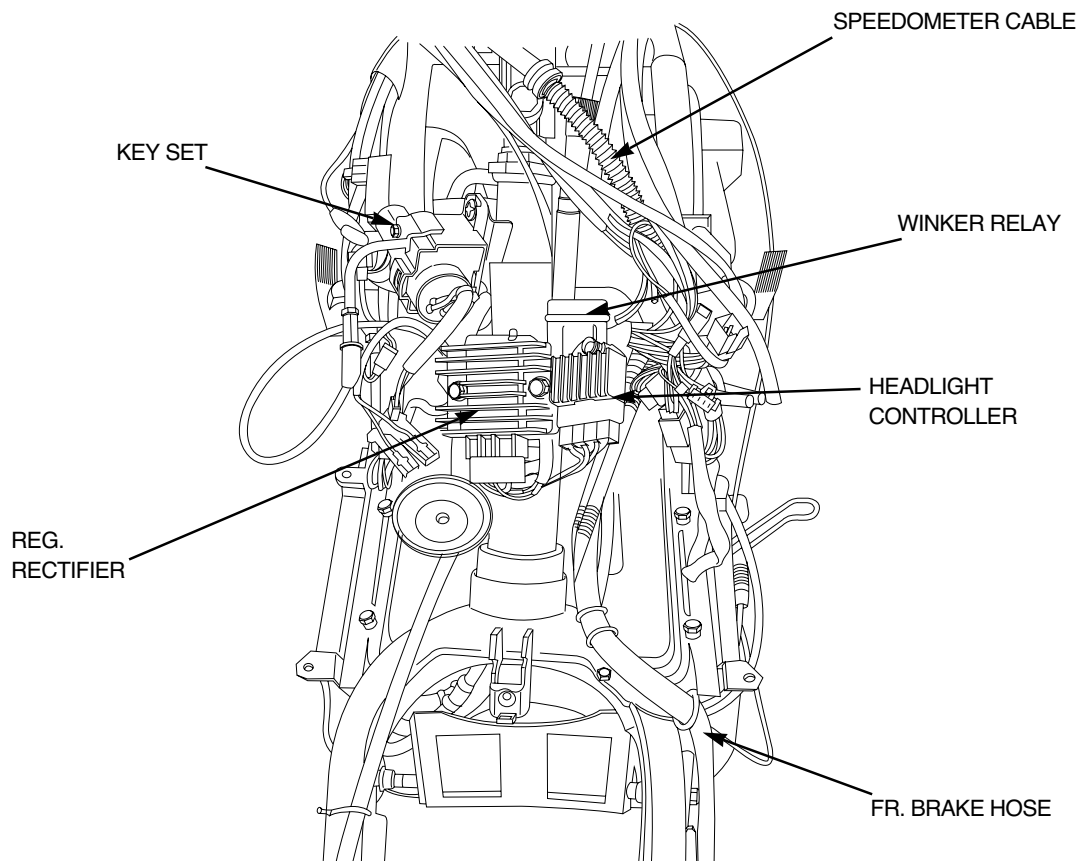
The following abbreviations are used in this manual.

ASS'Y	ASSEMBLY
LH.	Left
RH.	Right

WIRING DIAGRAM



SERVICE INFORMATION



2. LUBRICATION

SERVICE INFORMATION . . .	2-1	OIL FILTER ELEMENT CHANGE .	2-3
TROUBLE SHOOTING . . .	2-2	OIL PUMP	2-4
ENGINE OIL LEVEL INSPECTION .	2-3	TRANSMISSION OIL INSPECTION .	2-7
ENGINE OIL CHANGE . . .	2-3	LUBRICATION POINTS . . .	2-8

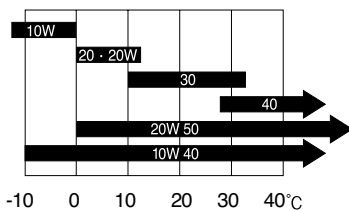
SERVICE INFORMATION

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	0.9 l (After disassembly) 0.75 l (After Oil change)
RECOMMENDED OIL	API service classification : SL grade Viscosity : SAE10W-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.) 

TRANSMISSION OIL

OIL CAPACITY	0.11 l (Full capacity) 0.09 l (After oil change)
RECOMMENDED OIL	DMC Genuine mission oil or SAE 80W/90

TORQUE VALUES

OIL FILTER SCREEN CAP	1.5 kgf · m
OIL PUMP BOLT	1.1 kgf · m
OIL DRAIN PLUG BOLT	2.5 kgf · m

TROUBLE SHOOTING

Oil level low

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

Oil contamination

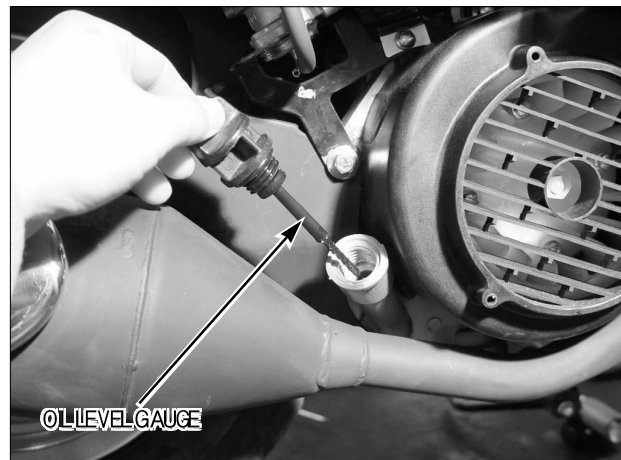
- Oil or filter not changed often enough.
- Faulty head gasket.
- Worn piston rings.

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 loosen the oil level gauge and check the oil level line.



ENGINE OIL CHANGE

NOTE

- To completely and rapidly drain engine oil, warm up engine and erect the motorcycle on side stand.

- Loosen the oil drain bolt and drain engine oil.
- Operate the kick starter arm for several times to remove the remaining oil from the engine.
- Tighten the oil drain bolt.

TORQUE VALUE : 2.5 kgf · m

CAUTION

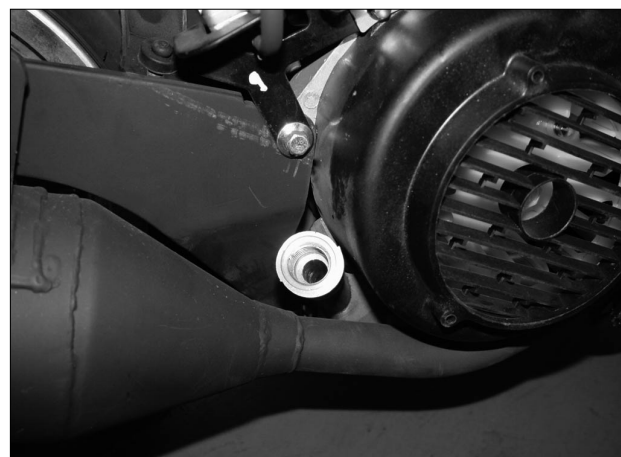
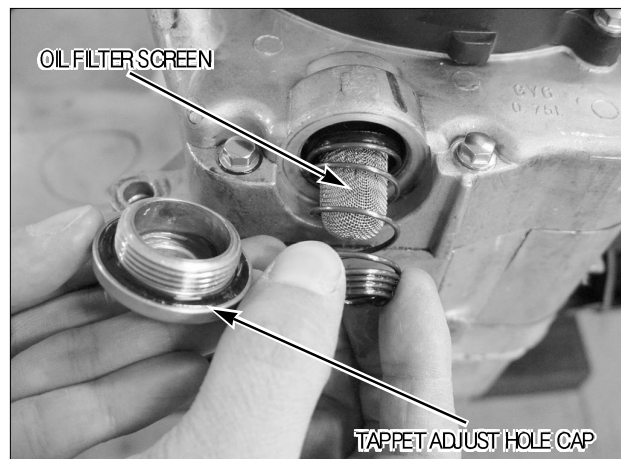
- It is extremely important to replace oil filter or clean the oil filter screen at the first maintenance interval (after 1,000Km).
- Clean the oil filter screen every 4,000Km.
- Clean the filter screen with fresh cleaning oil.
- Check the hole cap O-ring for satisfactory condition if necessary replace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

TORQUE VALUE : 1.5 kgf · m

- Fill the recommended engine oil to oil inlet.

**OIL CAPACITY : 0.9 l (After disassembly)
0.75 l (After Oil change)**

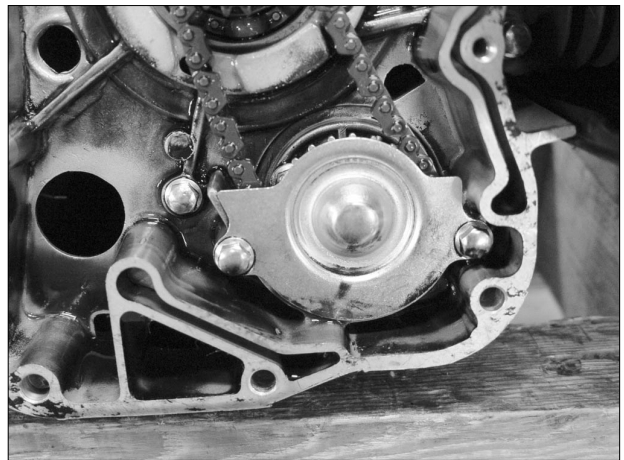
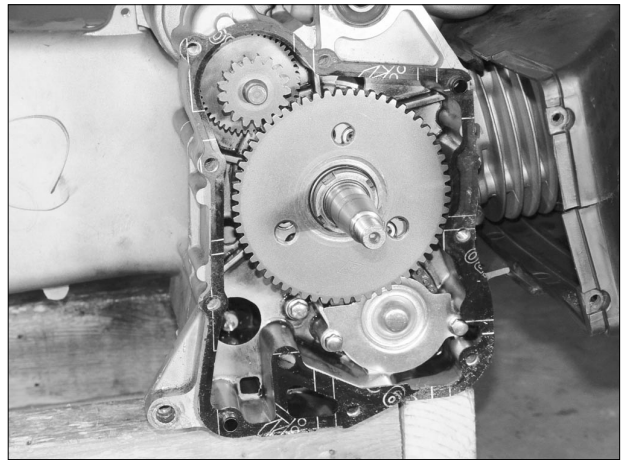
- Tighten the oil level gauge.
- API service classification : SL grade.
- Start the engine and keep it idle for a few minutes.
- Stop the engine and check the oil level. If the oil level is low, add the recommended engine oil.
- Check on oil leaks.



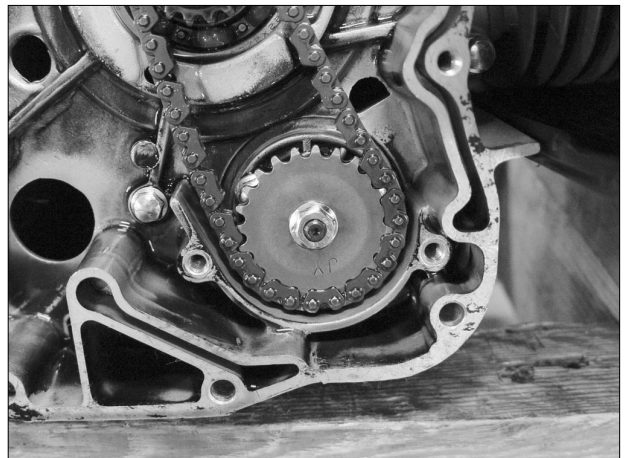
OIL PUMP

REMOVAL

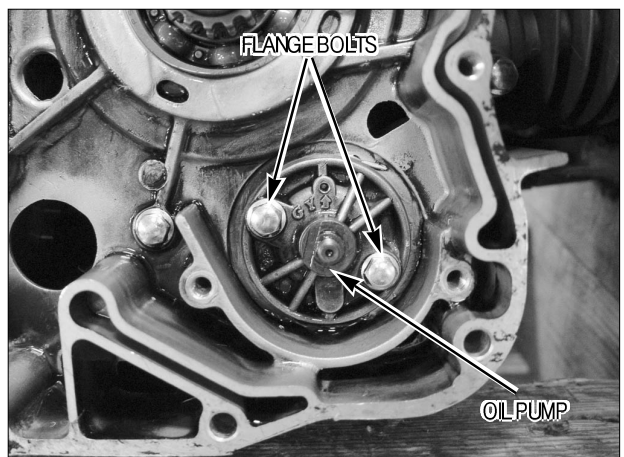
- Drain the engine oil.
- Remove the following parts :
 - Muffler (⇒4-3)
 - Cooling fan cover
 - Cooling fan (⇒8-2)
 - A.C. generator (⇒8-4)
 - RH. crankcase cover (⇒8-4)
 - Starter driven gear (⇒8-6)
 - Reduction gear (⇒8-5)
 - Starting clutch assembly (⇒8-6)



- Remove the oil separator.
- Remove the oil pump drive gear nut.
- Remove the oil pump drive gear chain.

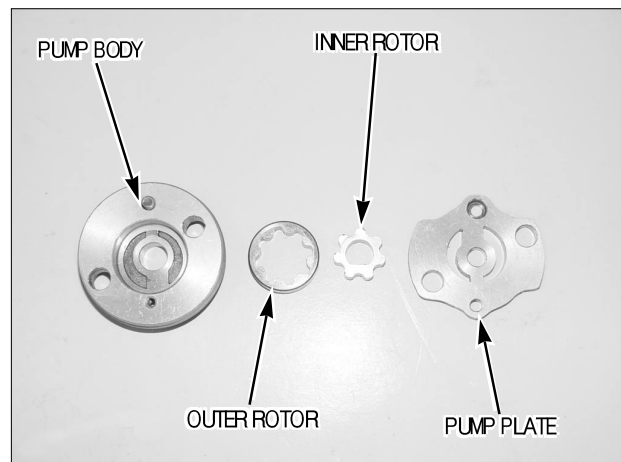


- Loosen the 2 flange bolts securing the oil pump.
- Remove the oil pump.



DISASSEMBLY

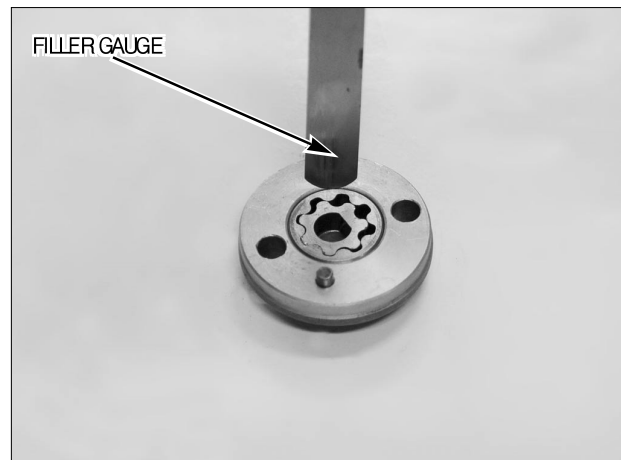
- Loosen the screw securing the oil pump plate.
- Remove the oil pump body and the oil pump plate.
- Clean the oil pump body, inner and outer rotors with fresh cleaning oil.



INSPECTION

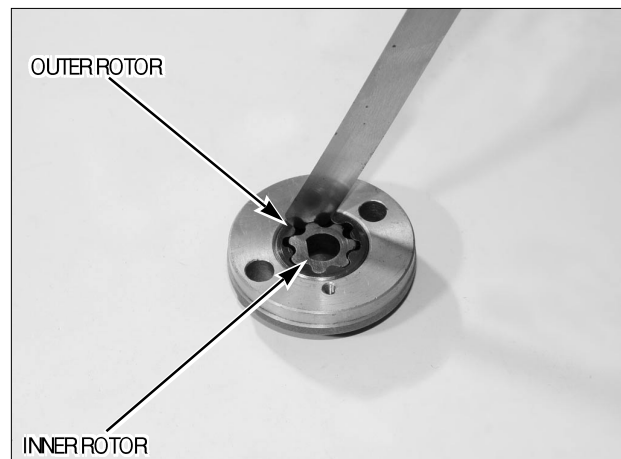
- Assemble the inner and outer rotors to the oil pump body correctly.
- Measure the clearance between the pump body and outer rotor.

SERVICE LIMIT : 0.23mm
TOOL : FEELER GAUGE



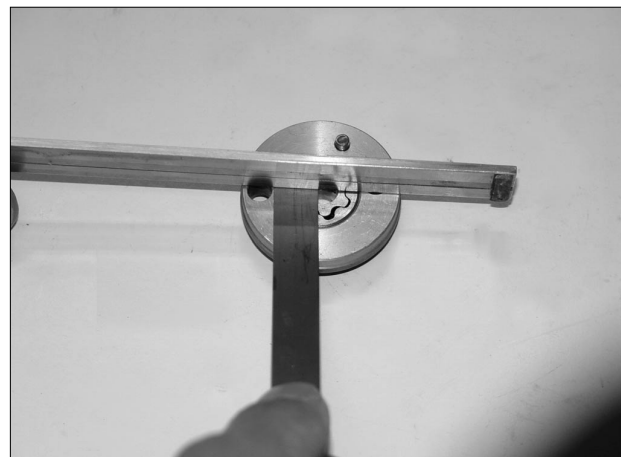
- Measure the clearance between inner and outer rotor.

SERVICE LIMIT : 0.18mm



- Measure the clearance between many faces of rotor and the pump body

SERVICE LIMIT : 0.12mm



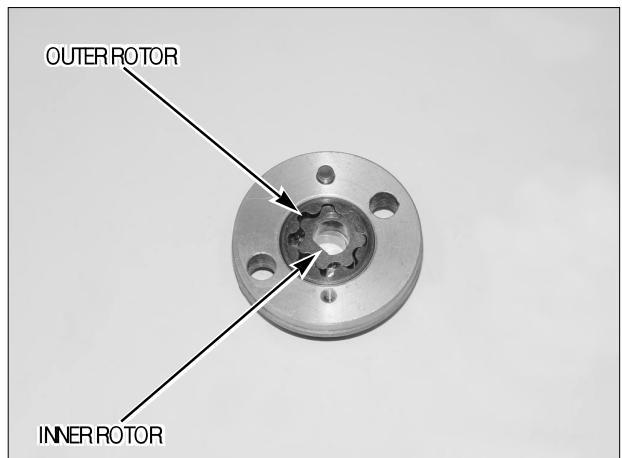
LUBRICATION

ASSEMBLY

- Clean all parts with fresh cleaning oil.



- Install the inner and outer rotors to the pump body.



- Install the oil pump plate to the pump body.
- Tighten the pan screw.

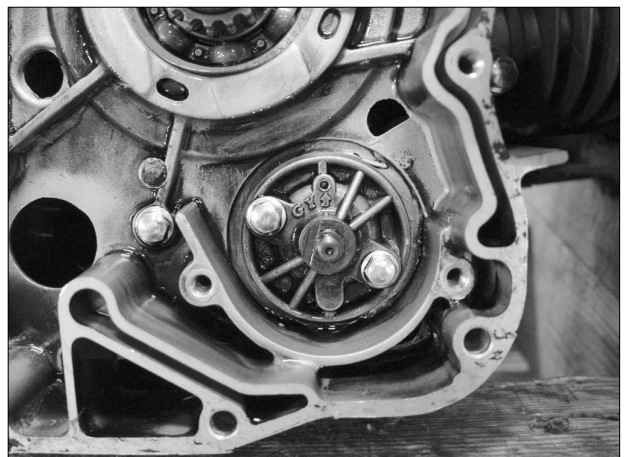
NOTE

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



INSTALLATION

- Install the oil pump to the RH. crankcase.
- Install the following parts.
 - Oil pump drive gear and chain
 - Starting clutch assembly
 - Starter driven gear and reduction gear
 - RH. crank case cover
 - A.C. generator
 - Cooling fan and cooling fan cover
 - Muffler



TRANSMISSION OIL INSPECTION

- Check the body and the connection of each engine component for any leak.
- Remove the oil check bolt and check to see if the oil overflows from the oil check hole.
- If only the small amount of oil overflows, fill the recommended transmission oil through the oil filler hole gradually.

**OIL CAPACITY : 0.11 l (FULL)
0.09 l (CHANGE)**

NOTE

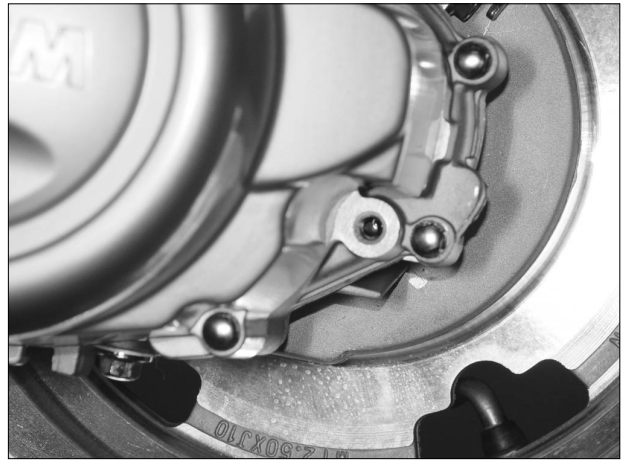
- Oil level inspection must be performed in the flat ground with the vehicle being straight by raising the main stand.

RECOMMENDED OIL : SAE 80W/90

- Tighten the oil check bolt.

TORQUE VALUE : 0.9 kgf · m

- Start the engine and check for leak.

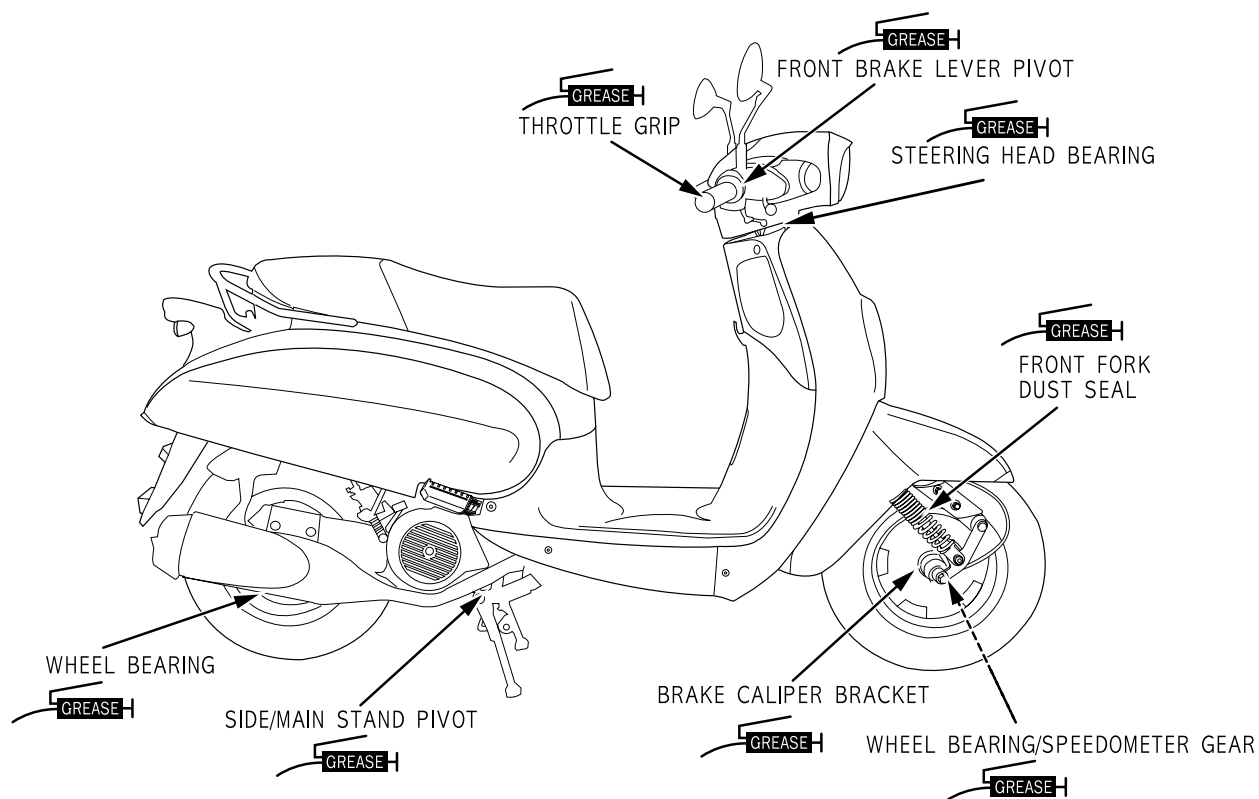


LUBRICATION POINTS

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

CONTROL CABLE LUBRICATION

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



3. INSPECTIONS/ADJUSTMENTS

SERVICE INFORMATION	3-1	BRAKE FLUID	3-6
MAINTENANCE SCHEDULE	3-3	BRAKE PAD/SHOE	3-7
FUEL LINE (FUEL TUBE)	3-4	SIDE STAND	3-7
THROTTLE GRIP OPERATION	3-4	SUSPENSION	3-8
AIR CLEANER	3-4	BOLTS, NUTS, FASTENERS	3-8
SPARK PLUG	3-5	WHEELS/TIRES	3-8
VALVE CLEARANCE	3-5	STEERING HEAD BEARING	3-9
CYLINDER COMPRESSION PRESSURE	3-6	BATTERY	3-9
CARBURETOR IDLE SPEED	3-6		

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.

NOTE

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

SPECIFICATIONS

THROTTLE GRIP PLAY		2- 6mm
SPARK PLUG		P-Z9HC
SPARK PLUG GAP		0.6-0.7mm
VALVE CLEARANCE	IN	0.05mm
	EX	0.05mm
CARBURETOR IDLE SPEED		1,600±100rpm
CYLINDER COMPRESSION PRESSURE		13kgf/ cm^2 (570rpm)

TIRES

COLD TIRE PRESSURE	DRIVER ONLY	FRONT TIRE	1.75kgf/ cm^2 (25psi)
		REAR TIRE	2.00kgf/ cm^2 (29psi)
	DRIVER AND A PASSENGER	FRONT TIRE	2.00kgf/ cm^2 (25psi)
		REAR TIRE	2.25kgf/ cm^2 (33psi)
TIRE SIZE	FRONT TIRE		3.50 - 10 51J
	REAR TIRE		3.50 - 10 51J

INSPECTIONS / ADJUSTMENTS

TORQUE VALUES

SPARK PLUG	1.2kgf · m
CYLINDER HEAD COVER BOLTS	0.9kgf · m
VALVE ADJUSTING NUTS	1.1kgf · m

TOOLS

WRENCH 8X9mm
ADJUST WRENCH
COMPRESSION GAUGE

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

- These instructions are based on the assumption that the motorcycle will be used exclusively for its designed purpose. Sustained high speed operation, or operation in unusually wet or dusty conditions, will require more frequent service than specified in the following chart.

ITEM	FREQUENCY	ODOMETER READING(NOTE 1)					REMARK
		x 1000Km	1	4	8	12	
		MONTH		6	12	18	
*	FUEL LINE(FUEL TUBE)		I	I	I	I	
*	THROTTLE GRIP OPERATION			I	I	I	
	AIR CLEANER		C	C	R	C	NOTE 2
	SPARK PLUG		I	I	I	I	
*	VALVE CLEARANCE		I	I	I	I	
	TRANSMISSION OIL					R	NOTE 3
	ENGINE OIL		R	R	R	R	
**	ENGINE OIL FILTER SCREEN		R	R	R	R	
*	CARBURETOR IDLE SPEED		I	I	I	I	
	BRAKE FLUID			I	I	I	NOTE 3
	BRAKE SHOE/PAD WEAR		I	I	I	I	
	BRAKE SYSTEM		I	I	I	I	
*	BRAKE STOP SWITCH			I	I	I	
*	HEADLIGHT AIM		I	I	I	I	
	SIDE STAND			I	I	I	
*	SUSPENSION			I	I	I	
*	BOLTS, NUTS, FASTENERS		I		I		
**	WHEELS/TIRES			I	I	I	
**	STEERING HEAD BEARING		I	I	I	I	
*	DRIVE BELT			I	I	I	
*	WEIGHT ROLLER			I	I	I	
*	SLIDE PIECE			I	I	I	
**	MOVABLE DRIVE FACE INNER PART			L	L	L	

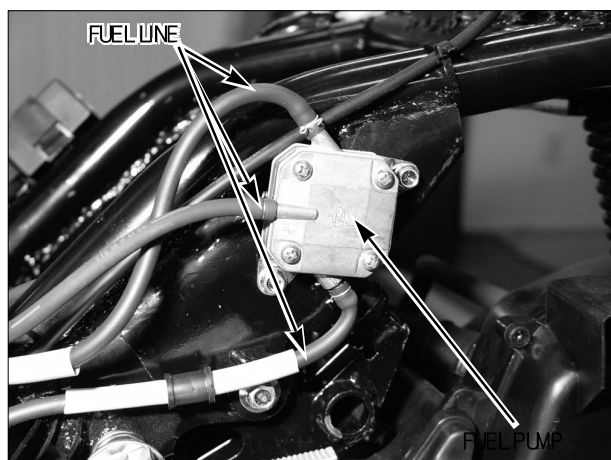
- * If there are no appropriate type of tools and maintenance data available, or if you do not have mechanical technology contact authorized maintenance shops, dealers or other designated repair shops for maintenance and inspections.
- ** To ensure safety, inspections and maintenance of these parts must 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. (⇒4-4)
- Check the fuel tube of the fuel pump connected to the fuel tank and carburetor. If the fuel tube is cracked, damaged or leaks, replace it.

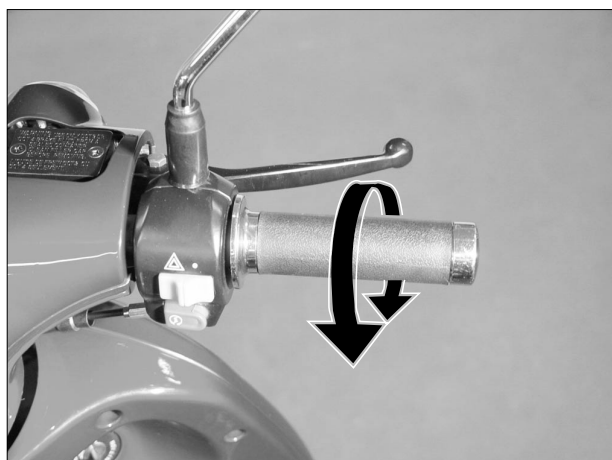


THROTTLE GRIP OPERATION

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

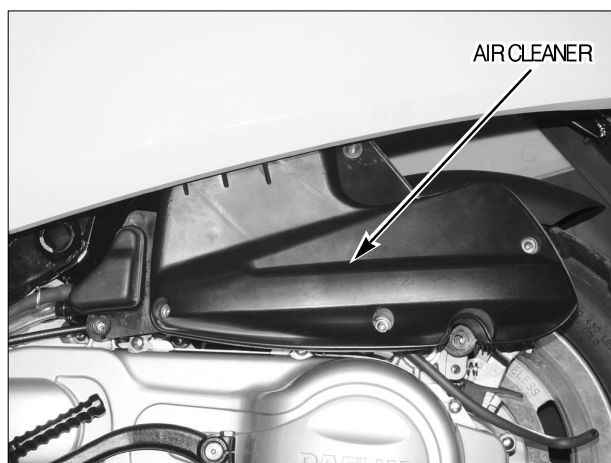
FREE PLAY : 2~6mm

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

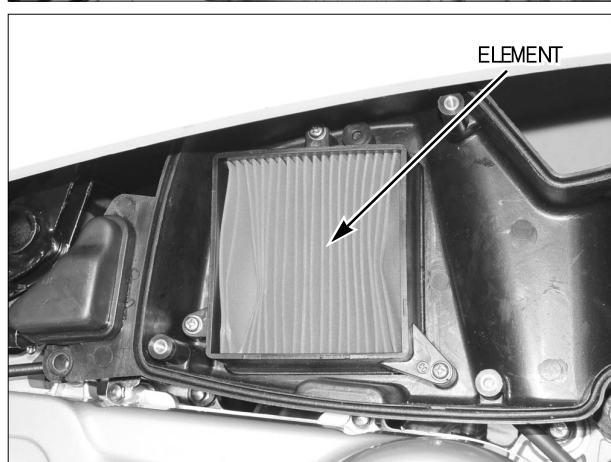


AIR CLEANER

- Remove the luggage box.
- Loosen the 5 screws securing the air cleaner case cover, remove the air cleaner case cover.



- Loosen the 3 screws securing the air cleaner element holder.
- Remove the air cleaner element.
- Check the element for dirty or damage, if necessary replace it with new one.



CAUTION

- Do not clean by compressed air blowing.

SPARK PLUG

- 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, replace 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 : P-Z9HC
SPARK PLUG GAP : 0.6~0.7mm
TORQUE VALUE : 1.2 kgf · 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 following parts.
 - Seat lock
 - Luggage box.
 - body cover
 - Center cover.
- Loosen the 4 cylinder head cover bolts.

NOTE

- Inspect and adjust the valve clearance when the engine is cool. (under 35 °C / 95 °F)
- Remove the cooling fan 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.

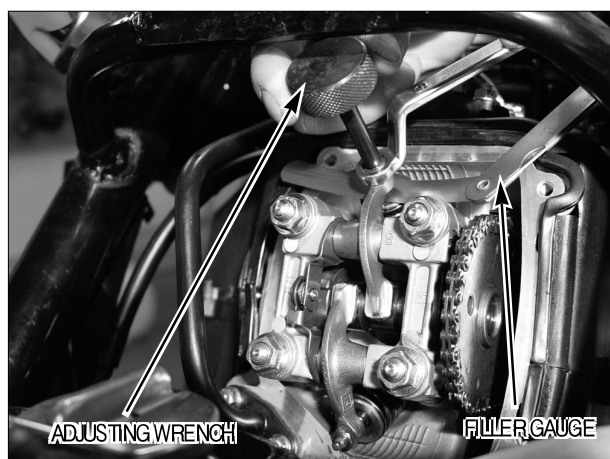
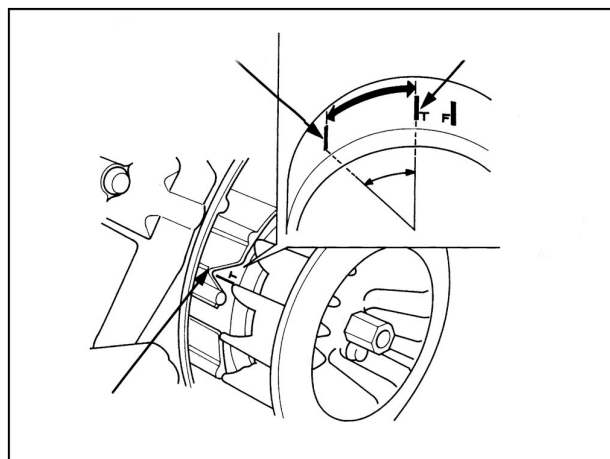
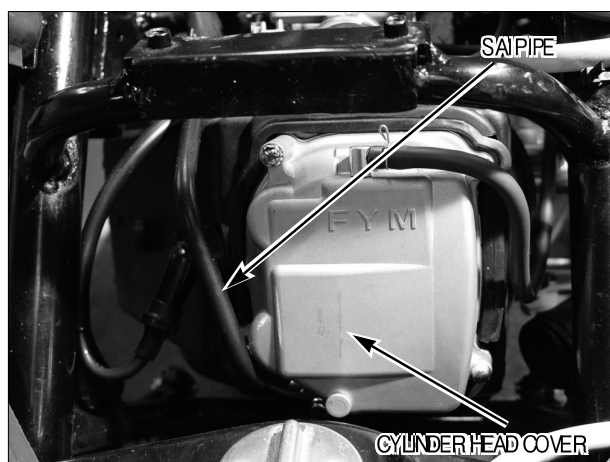
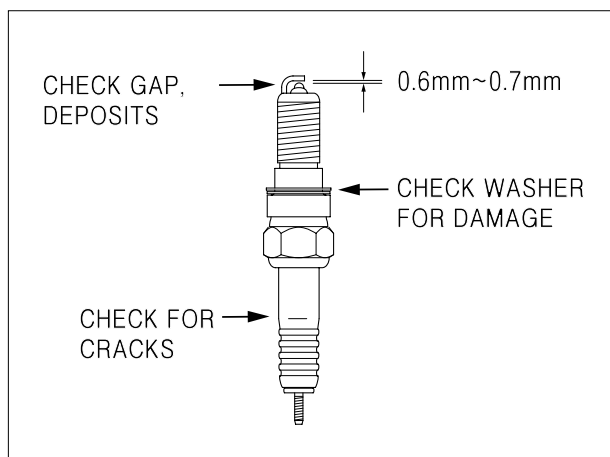
VALVE CLEARANCE : Intake : $0.05 \pm 0.02\text{mm}$
Exhaust : $0.05 \pm 0.02\text{mm}$

- 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
FEELER GAUGE

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

TORQUE VALUES : 0.9 kgf · m



CYLINDER COMPRESSION PRESSURE

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

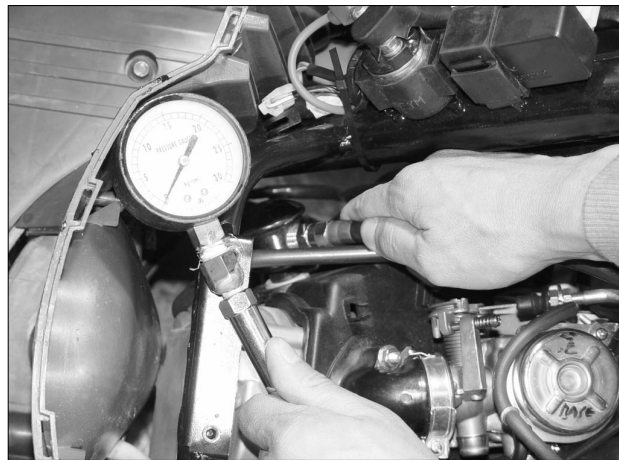
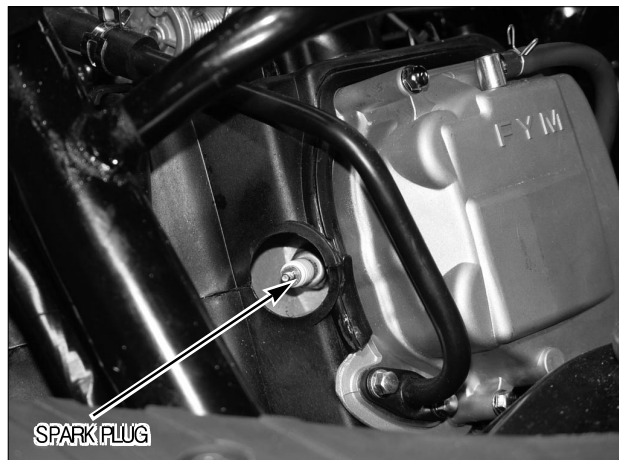
TOOL : COMPRESSION GAUGE

NOTE

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

COMPRESSION PRESSURE : 13 kg/cm² (570RPM)

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



CARBURETOR IDLE SPEED

- Turn the main key left, release the seat lock.
- Remove the luggage box.
- Adjust the throttle stop screw with (+) screw driver.

NOTE

- Erect the motorcycle on the main stand
- 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.
 - Idle speed 1600 ±100rpm

- Do not over adjustment the pilot screw, it could be effect to starting (refer to page5-9)



BRAKE FLUID

- Check the oil level inside the front reservoir, if the oil level is near the lower limit line, remove the reservoir diaphragms 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.
- Foreign materials can clog the system, causing a reduction or complete loss of braking ability.
- 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 disk, replace the pads.

NOTE

- Replace the brake pads as a sets.

BRAKE SHOE REPLACEMENT

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

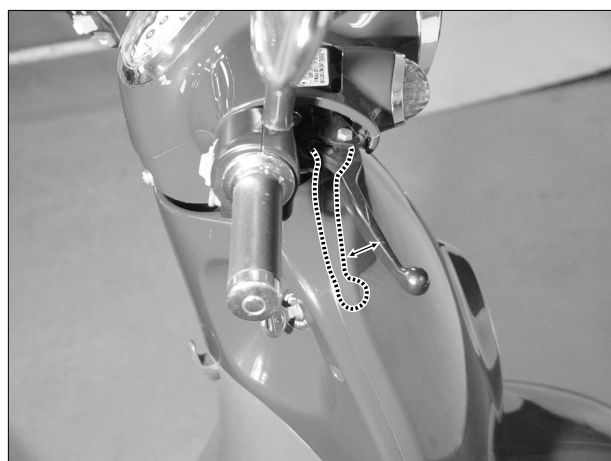
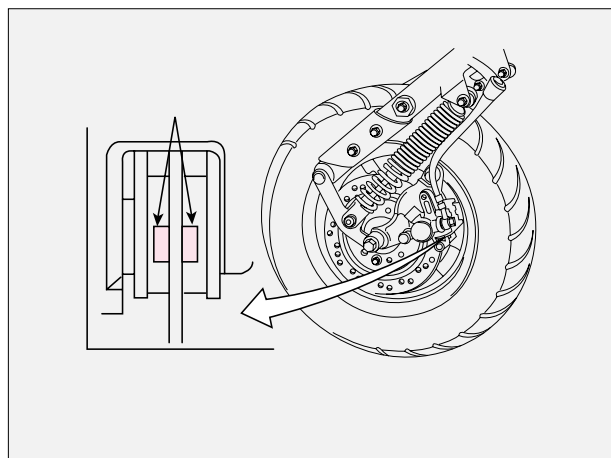
- Check the free play after pulling the lever.

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.



SUSPENSION

NOTE

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

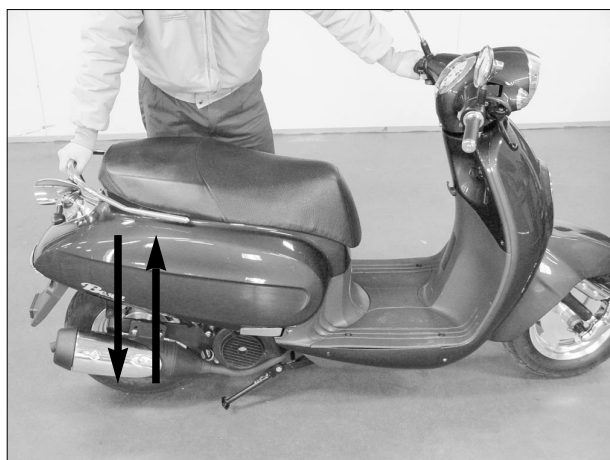
FRONT WHEEL

- 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.



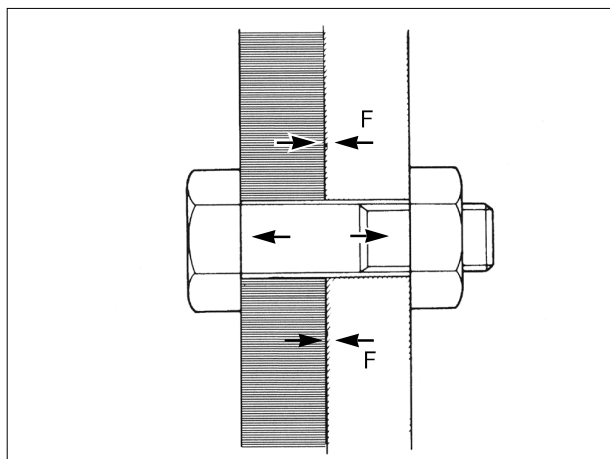
REAR WHEEL

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



BOLTS, NUTS TIGHTENER

- 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

ITEM	FRONT WHEEL	REAR WHEEL
DRIVER ONLY	1.75(25psi)	2.00(28psi)
DRIVER AND A PASSENGER	2.00(28psi)	2.25(32psi)



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.

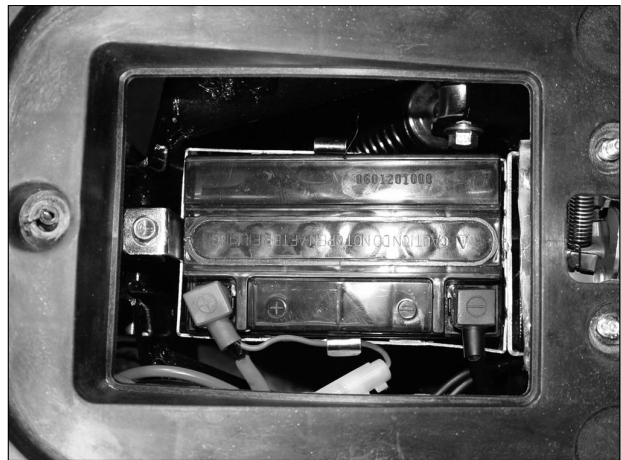


BATTERY

- Remove the battery cover.
- Check to see if the terminal has loosed.
- If the terminal is loose, check the contact, clean then tighten.
- If the terminal is corroded, remove the battery, pouring the hot water, clean with wire brush.

-When fully charged : 13.0~13.2v

-Insufficiently charged : 12.3v



MEMO

4. EXTERNAL PARTS

SERVICE INFORMATION . . . 4-1	FLOOR SIDE COVER 4-6
MAINTENANCE PRECEDURE . . 4-2	FLOOR PANDER 4-6
FRONT FENDER 4-3	UNDER COVER 4-6
REAR WHEEL MUD GUARD . . 4-3	BODY COVER 4-7
MUFFLER 4-3	CENTER COVER 4-7
INNER COVER 4-4	REAR FENDER 4-7
METER COVER 4-4	SEAT 4-8
HANDLE COVER 4-5	LUGGAGE BOX 4-8
FRONT COVER 4-5	REAR CARRIER 4-8

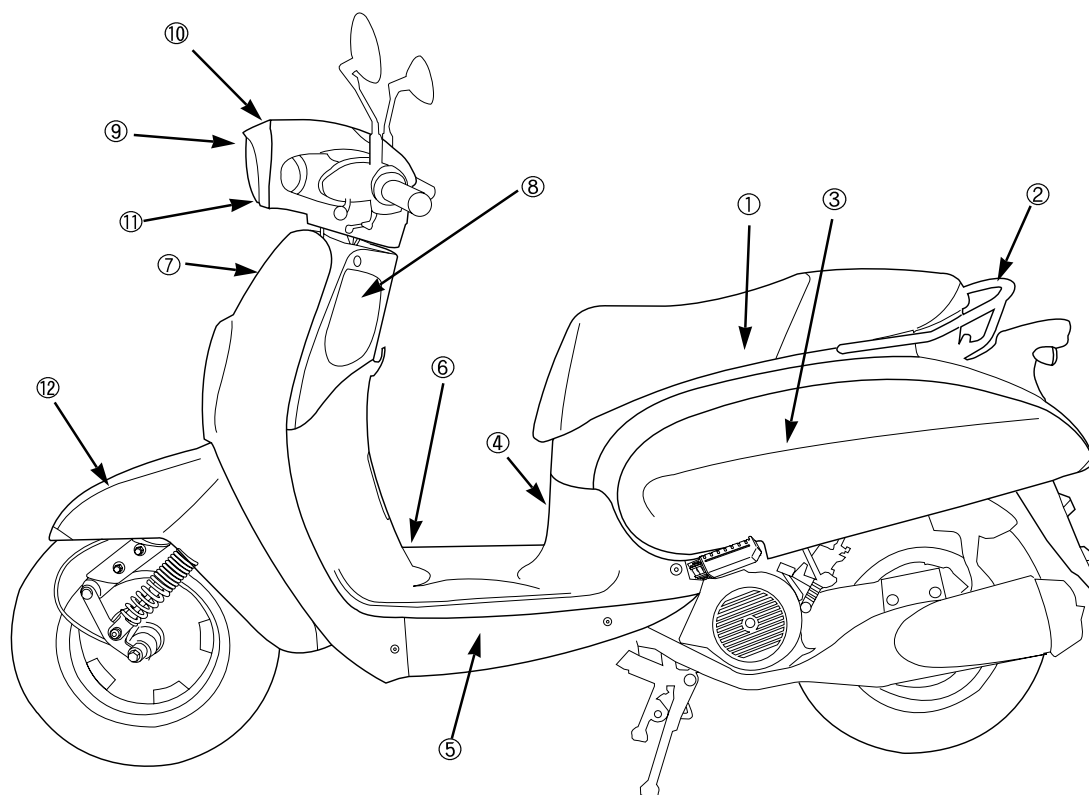
SERVICE INFORMATION

NOTE

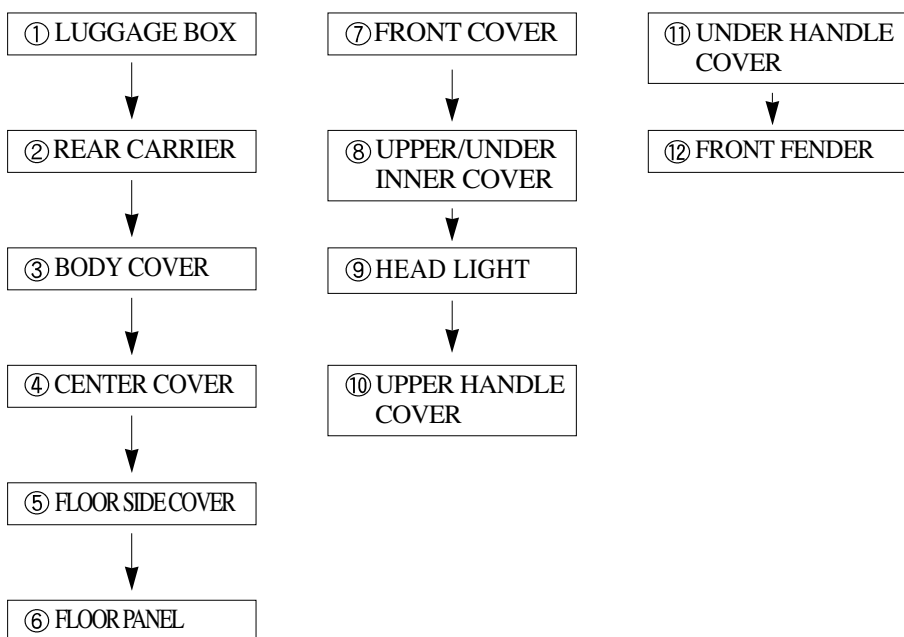
- This section describes external parts removal/installation.
- Do not apply unreasonable force when disassembling covers, to prevent possible damage.
- A muffler is hot. Do not service it immediately after the engine is stopped.

MAINTENANCE PROCEDURE

NAME OF COVERS



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

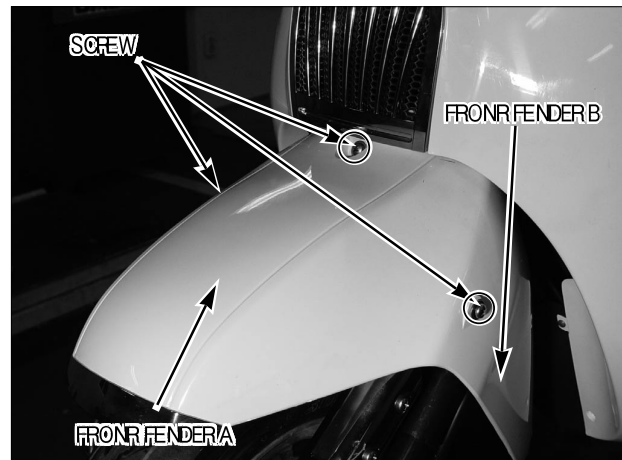


CAUTION

- Be careful not to overturn the vehicle when removing wheels.

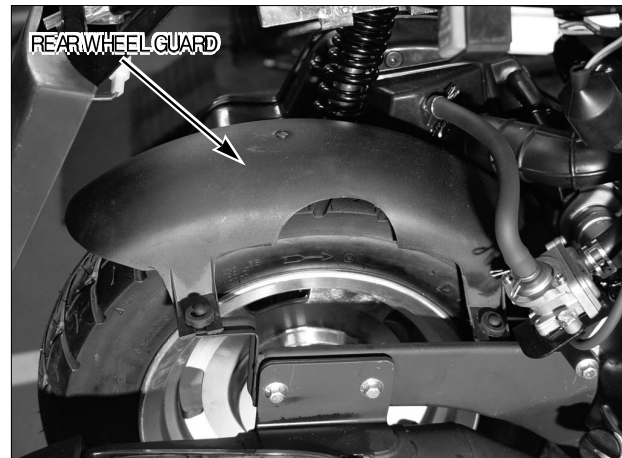
FRONT FENDER

- Remove.
 - The 3 special screw
 - The flange bolt of front fender B
 - Front fender B
 - Front fender A
- Install in the reverse order of removal.



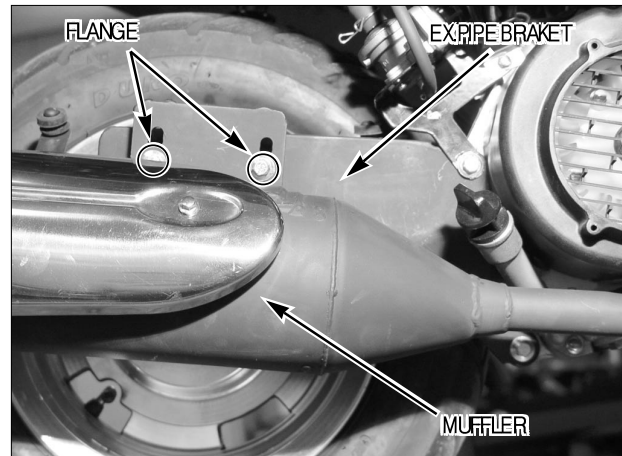
REAR WHEEL MUD GUARD

- Remove the 2 air cleaner washer bolts.
- Remove the mud guard securing the muffler .
- Remove the rear wheel mud guard.
- Install in the reverse order of removal.



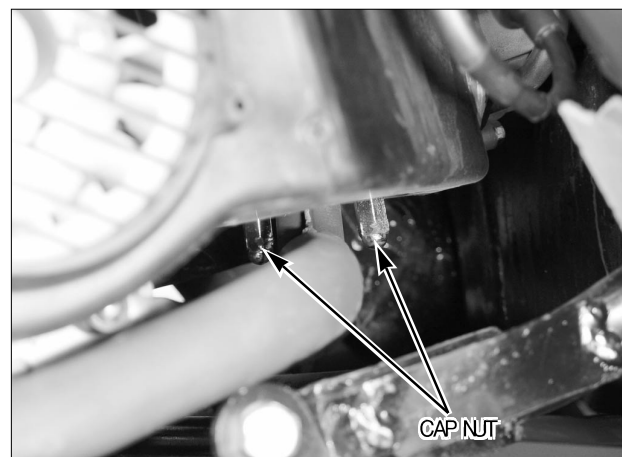
MUFFLER

- Loosen the 2 cap nuts securing the cylinder head.
- Loosen the muffler flange bolt securing muffler stay.
- Pull the Ex.pipe downward to remove the muffler comp.
- Install in the reverse order of removal.



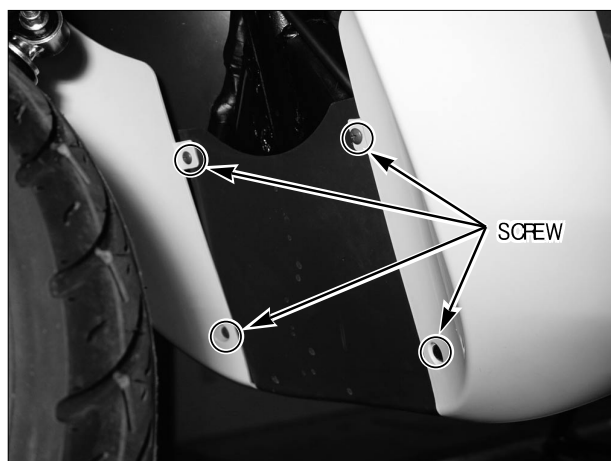
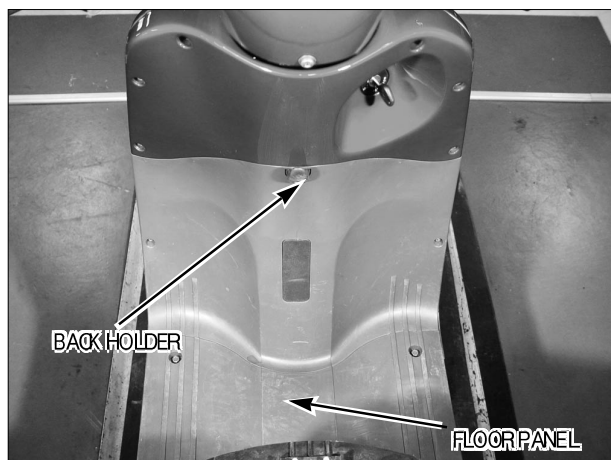
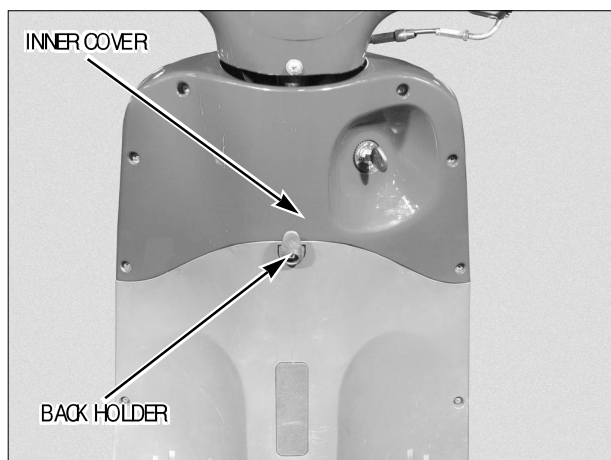
NOTE

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



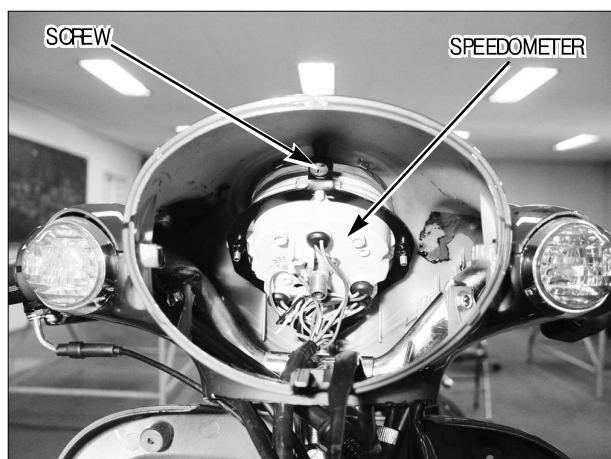
INNER COVER

- Remove.
 - The 8 screws of inner cover
 - Floor side cover screw
 - Back holder
 - Front cover
 - Floor side cover
 - Floor panel
 - Inner cover
- Install in the reverse order of removal.



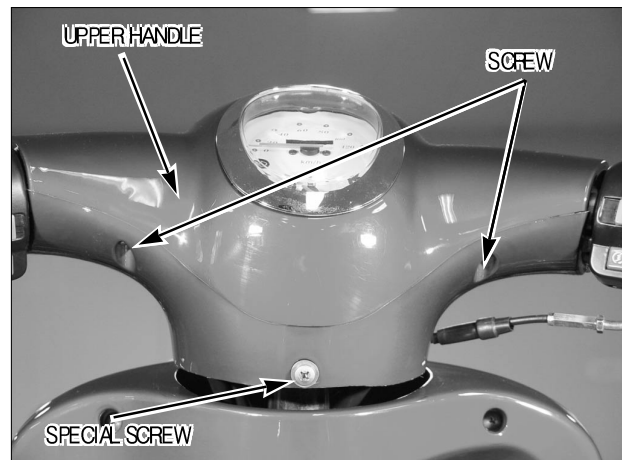
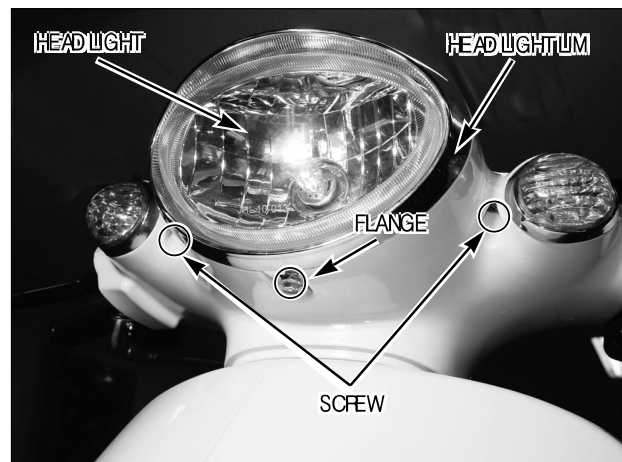
METER COVER

- Remove.
 - Head light
 - Upper handle cover
 - Speedometer cable
 - Coupler and wire
 - Screw securing meter cover
- Install in the reverse order of removal.



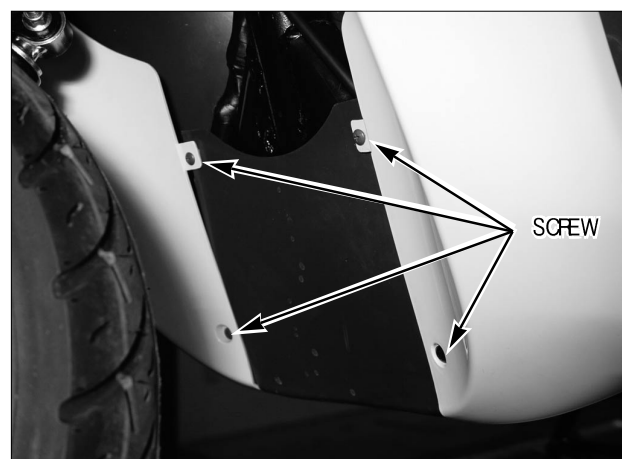
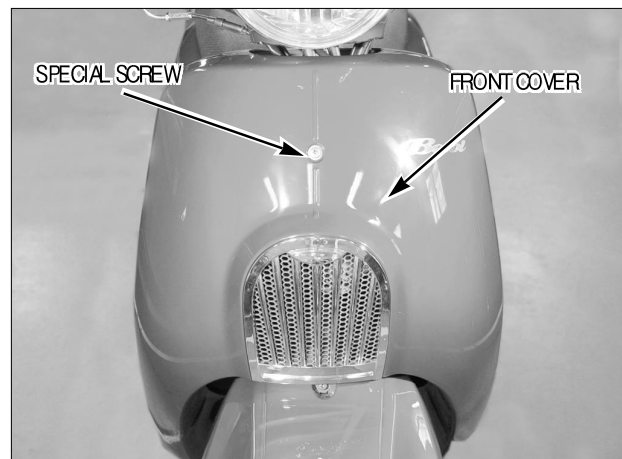
HANDLE COVER

- Remove.
 - Head light lim
 - Head light
 - The 4 tapping screws securing the under handle cover
 - Upper handle cover
- Install in the reverse order of removal.



FRONT COVER

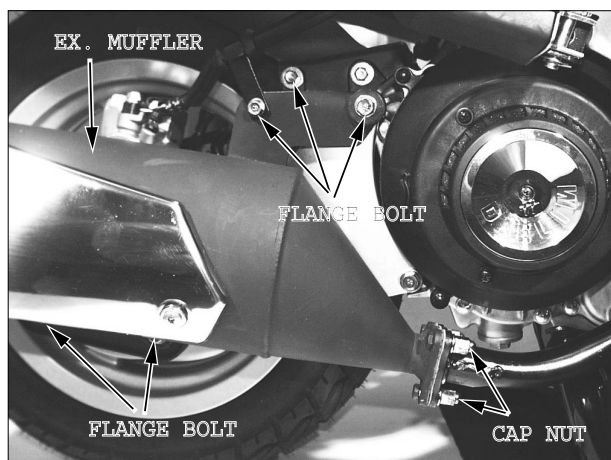
- Loosen the 1 special screw of front cover.
- Loosen the 8 tapping screws securing the inner cover.
- Loosen the 4 tapping screws securing the under cover.
- Remove the front cover.
- Install in the reverse order of removal.



EXTERNAL PARTS

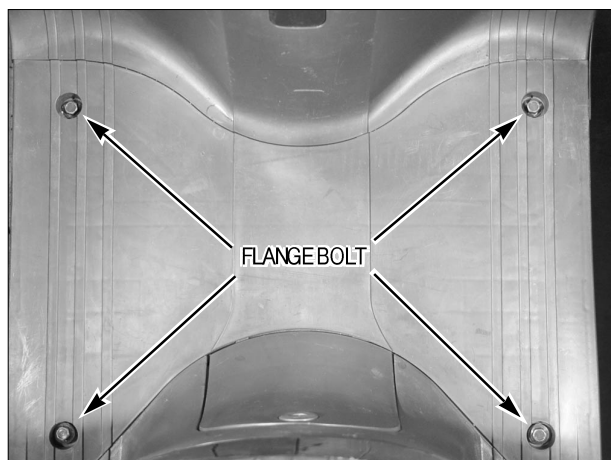
FLOOR SIDE COVER

- Loosen the floor panel fixing bolt.
- Loosen the 2 screws and pull the floor side cover backward to remove it.
- Install in the reverse order of removal.



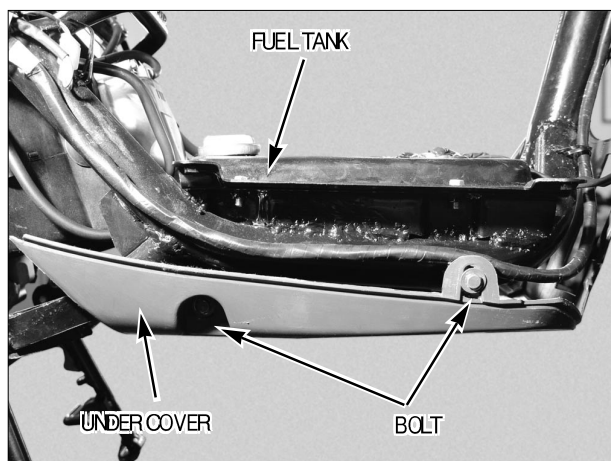
FLOOR PANEL

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



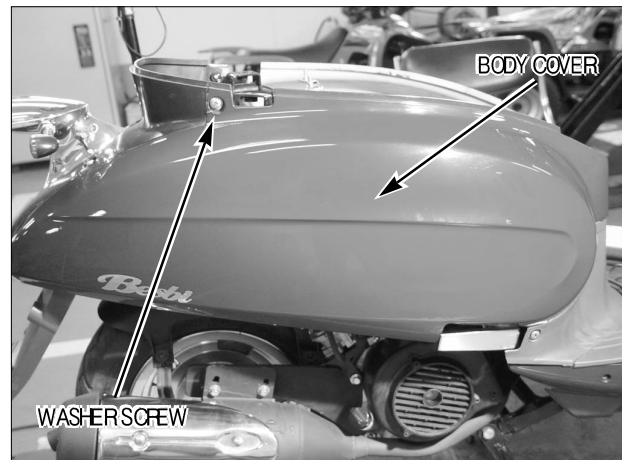
UNDER COVER

- Remove the floor side cover.
- Loosen the 4 bolts and remove the under cover.
- Install in the reverse order of removal.



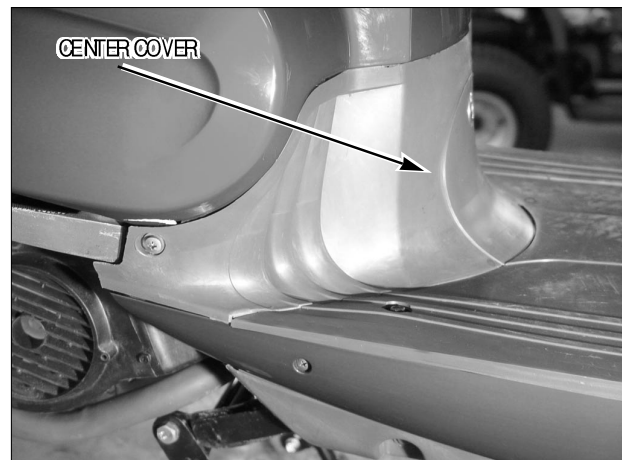
BODY COVER

- Remove.
 - Luggage box
 - Rear carrier
 - The 4 washer screw
 - Body cover
- Install in the reverse order of removal.



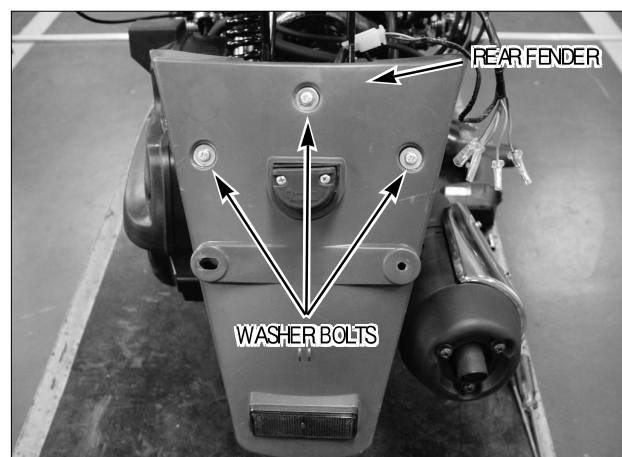
CENTER COVER

- Remove the body cover.
- Loosen the floor panel fixing bolt.
- Loosen the washer screw.
- Open the fuel lid with the key, and remove the center cover.
- Install in the reverse order of removal.



REAR FENDER

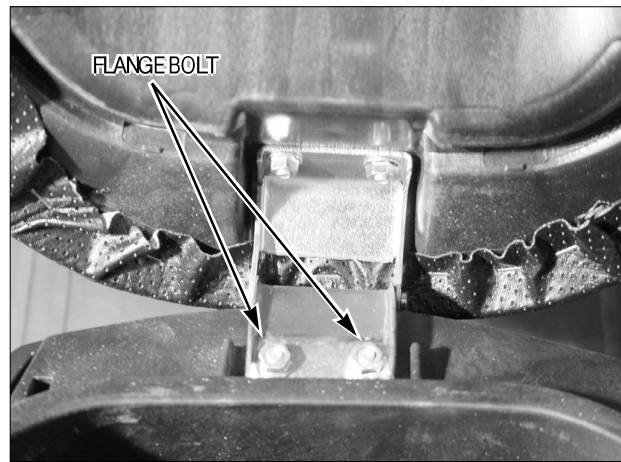
- Remove.
 - Luggage box
 - Rear carrier
 - Body cover
 - Loosen the 3 washer bolts
 - Rear fender
- Install in the reverse order of removal.



EXTERNAL PARTS

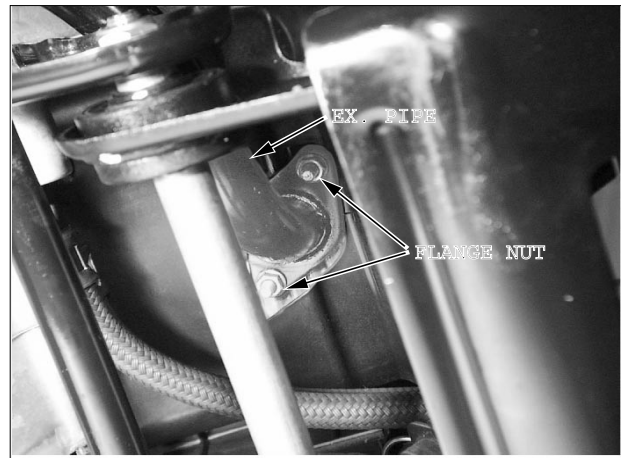
SEAT

- 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.

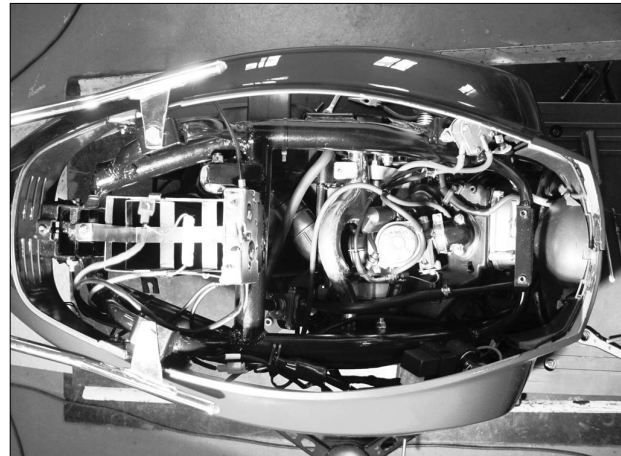


LUGGAGE BOX

- Release the seat.
- Loosen the 3 flange bolts and the 2 cap nuts.

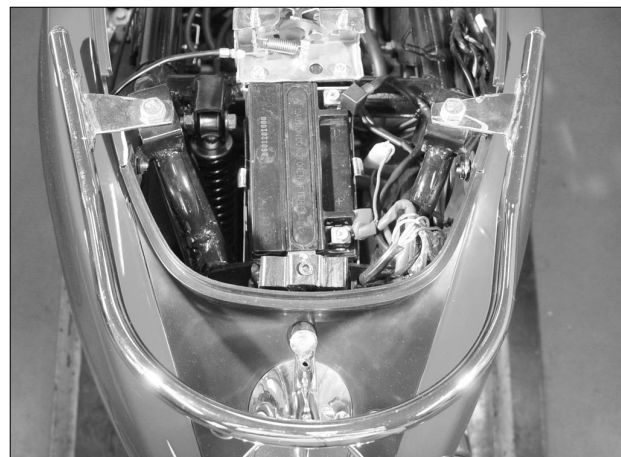


- Remove the luggage box.
- Install in the reverse order of removal.



REAR CARRIER

- Loosen the 4 flange bolts.
- Remove the rear carrier.
- Install in the reverse order of removal.



MEMO

MEMO

5. FUEL SYSTEM

SERVICE INFORMATION	5-1
TROUBLESHOOTING	5-2
FUEL TANK	5-3

CARBURETOR	5-3
PILOT SCREW ADJUSTMENT	5-3
FUEL PUMP	5-10

SERVICE INFORMATION

GENERAL SAFETY

5

WARNING

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

CAUTION

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

SPECIFICATIONS

FUEL TANK CAPACITY : 5.5 l
RESERVE FUEL CAPACITY: 1.0 l

CARBURETOR

ITEM	STANDARD
TYPE/THROTTLE BORE	CV TYPE (VACUUM)/23mm
MODEL MARK	PD24J
MAIN JET No.	#110
PILOT SCREW OPENING	2 ¼ RETURNS
FLOAT LEVEL	11mm
IDLING SPEED	1,600 ±100rpm
THROTTLE GRIP FREE PLAY	2-6mm

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

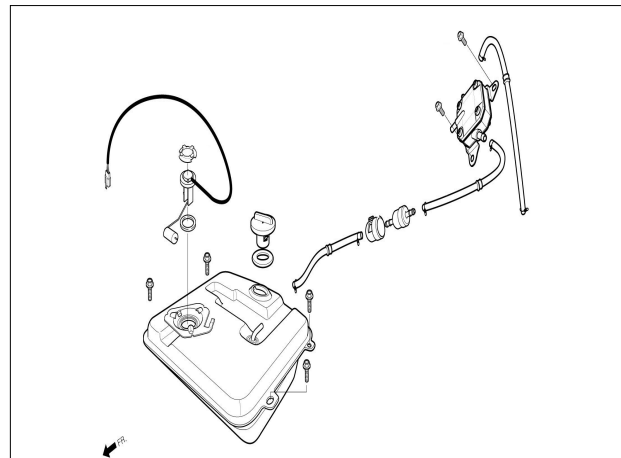
WARNING

- 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.

- Remove the following parts.
 - Luggage box.
 - Center cover.
 - Floor side cover
 - Floor panel
 - The fuel unit wire coupler
 - The fuel tube from the fuel tank
 - Fuel paper tube
 - Fuel tank
- Install in the reverse order of removal.

NOTE

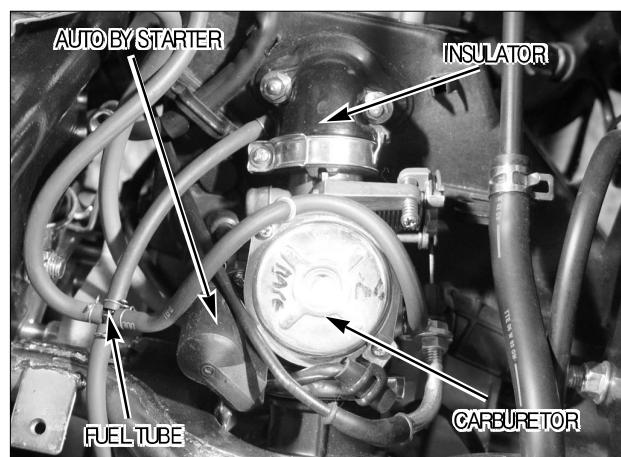
- After removing the fuel tank, be sure to close the fuel tank cap. (Gasoline is extremely flammable)
- Check for gasoline leakage.



CARBURETOR

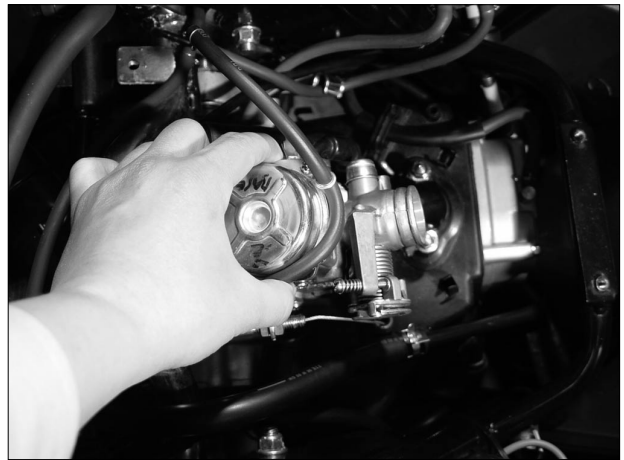
REMOVAL

- The luggage box
- The air cleaner
- Insulator band
- Loosen the throttle cable lock nut, and remove the throttle cable from the carburetor
- The fuel tube from the carburetor
- The wiring of auto by starter



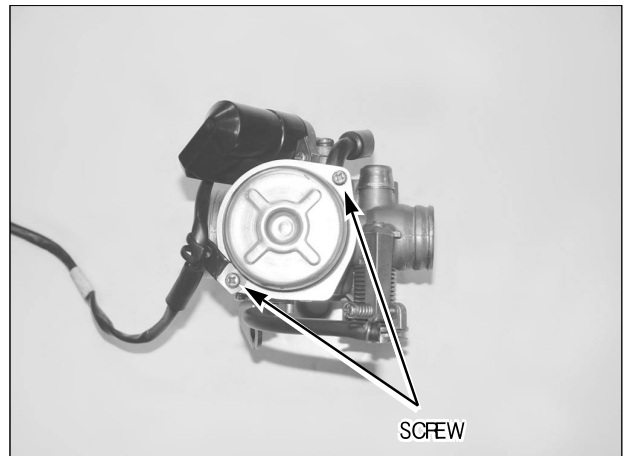
FUEL SYSTEM

- Remove the carburetor.

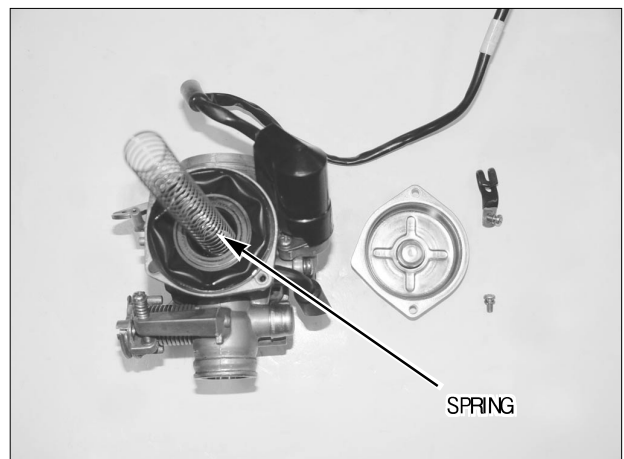


DISASSEMBLY

- Open the drain screw and drain the gasoline.
- Remove the drain tube and air band hose.
- Loosen the 4 diaphragm cover setting screws.



- Remove the diaphragm cover.
- Remove the diaphragm spring, diaphragm assembly.



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



INSPECTION

- Check the jet needle for wear, and if necessary, replace it.
- Check the vacuum piston for damage and if necessary, replace it.
- Check the diaphragm for damage, pin holes, wrinkles and bends and if necessary, replace it.

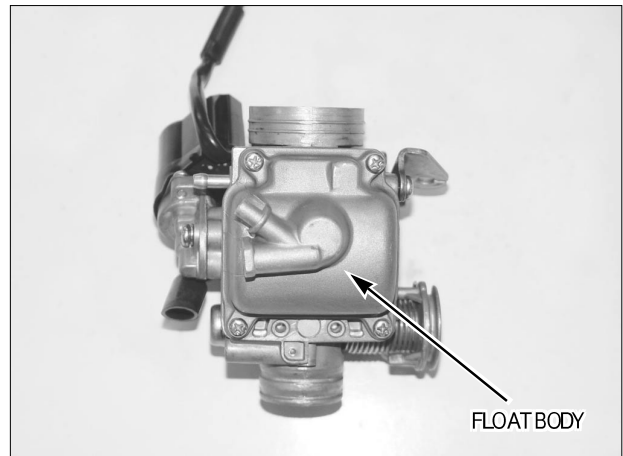
NOTE

- It is easy to get a crack at the wrinkles part and bend part of the diaphragm, check it throughly.



FLOAT CHAMBER/FLOAT/JET DISASSEMBLY

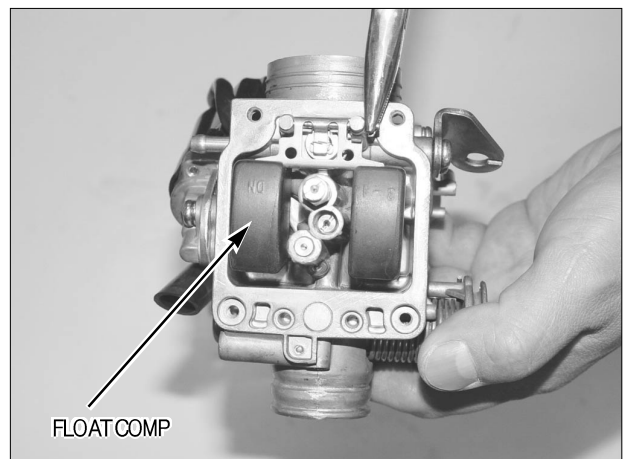
- Loosen the 4 screws securing the float body.



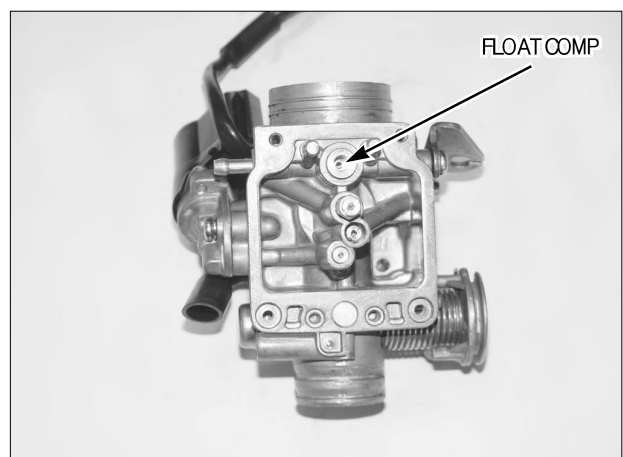
- Remove the float pin, float, and float valve.

NOTE

- Handle with care (kind of carburetor jet), because it made by soft material.
- Do not use the wire for cleaning the hole, it might cause engine unsettled due to scratch on the jet, it could be changed the quantity regulation of the fuel and air.



- Check the float valve and valve seat for scores, scratches, clogging and damage. Replace if necessary.
- Check the float valve operation.

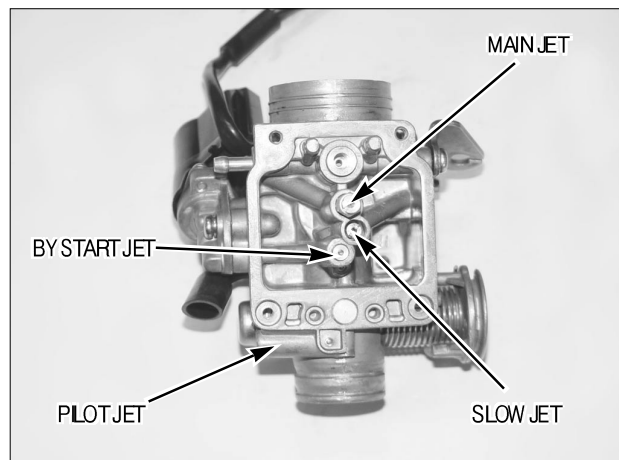


FUEL SYSTEM

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

NOTE

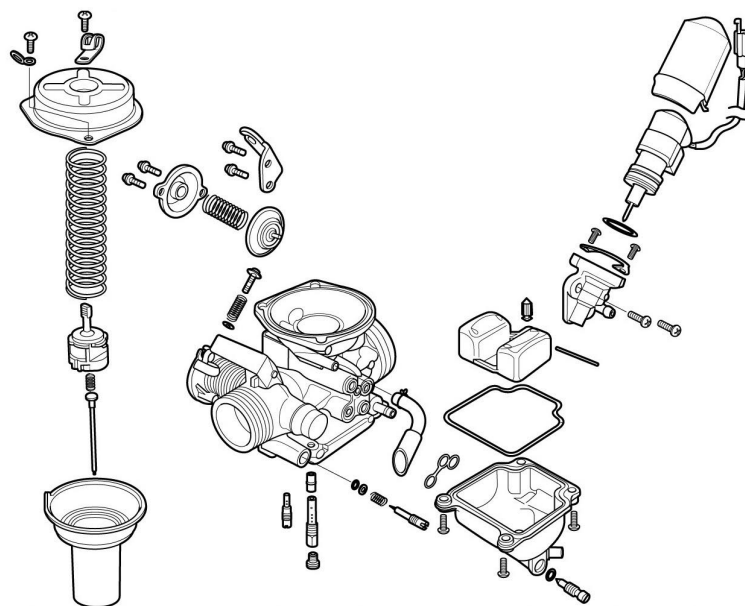
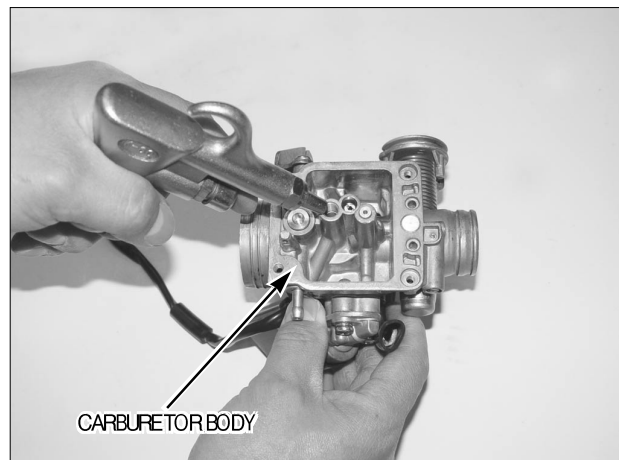
- Turn in the pilot jet and record the number of turns it takes before it seats lightly.
- Do not force the pilot screw against its seat ; the seat will be damaged.



CLEANING

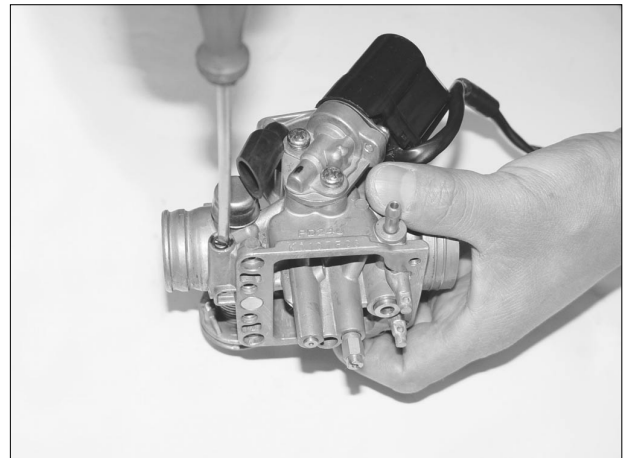
CAUTION

- Cleaning the air and fuel passages with a piece of wire will damage the carburetor body or fuel pump.



FLOAT CHAMBER/FLOAT/JET ASSEMBLY

- Install the needle jet, main jet holder, main jet and slow jet.
- Install the pilot screw O-ring washer, spring screw.



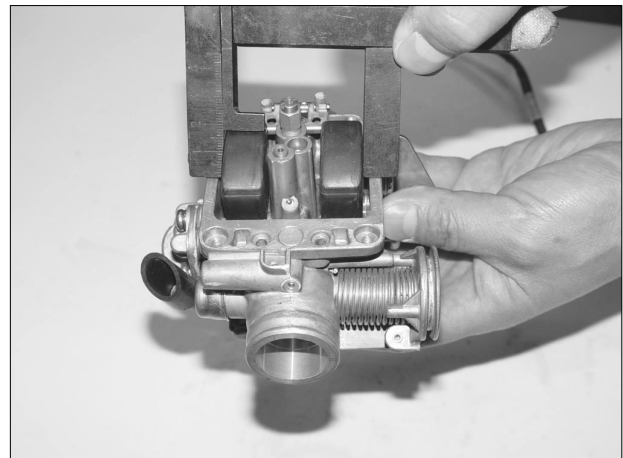
FLOAT LEVEL INSPECTION

- Measure the float level with the float level gauge.

FLOAT LEVEL : 11 mm

TOOL : FLOAT LEVEL GAUGE

- Install the float valve, float, float pin(4).
- If the level is out of specification and the float arm lip can be bent, adjust the float level by bending the lip. Non-adjustable floats must be replaced.



NOTE

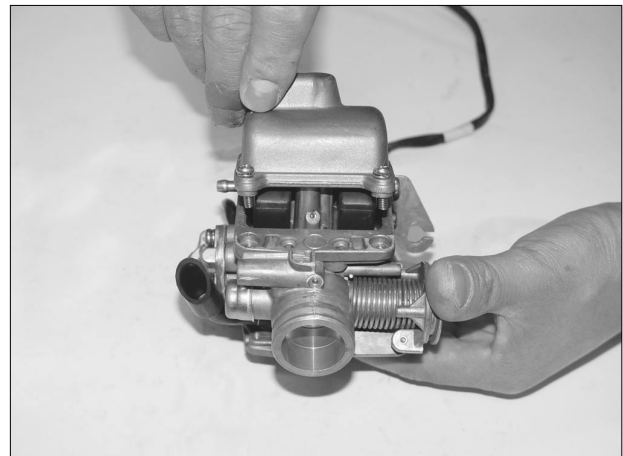
- Be sure to keep the float level at the specified height. If the float level is low / high, fuel mixture becomes lean / rich.

- Install the float body assembly, install the bracket and 4 pan screws.

NOTE

- Be sure to replace the float chamber body O-ring with the new one.

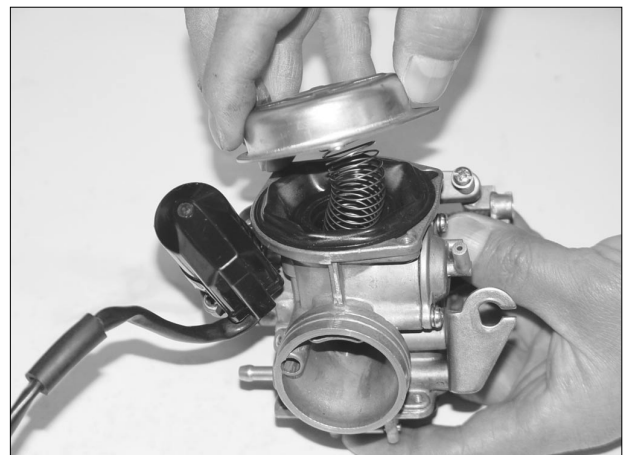
- Insert the jet needle, needle spring holder, needle spring, diaphragm assembly, and install the needle screw.



NOTE

- Install the jet needle aligned with the grooves in the diaphragm.

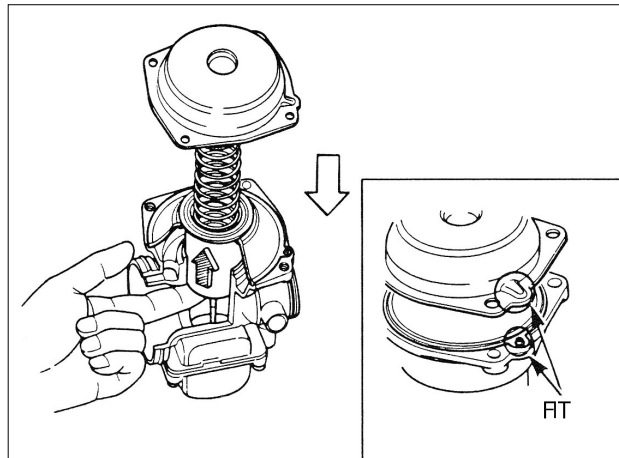
- Install the diaphragm assembly on the carburetor body.
- Install the diaphragm spring.
- Install the diaphragm cover with its cutout aligned with the hole in the tab of diaphragm.



FUEL SYSTEM

NOTE

- Be careful not to pinch the diaphragm, and to keep the spring straight.
- Install the auto bystarter wiring plate to the diaphragm, and tighten the 4 pan screws.
- Install the drain tube and air-hose.

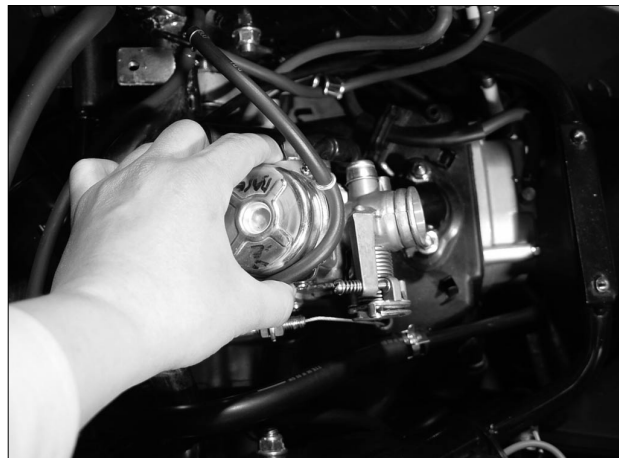


CABURETOR INSTALLATION

- Install the carburetor to the carburetor insulator.
- Tighten the carburetor insulator band screw.
- Tighten the setting screw securing the carburetor and set plate.
- Install the fuel tube to the carburetor.
- Install the wiring coupler of the auto bystarter.
- Install the throttle cable to the carburetor.
- Install the air cleaner.
- Install the luggage box.

NOTE

- After adjusting the carburetor, check the throttle grip free play.



CABURETOR INSULATOR REMOVAL

- The luggage box
- The carburetor
- Remove the fuel pump negative pressure tube
- Loosen the carburetor insulator fixing nuts(2), and remove the carburetor insulator.
- Remove the carburetor insulator band.



INSPECTION

- Check the carburetor insulator O-ring for wear or damage.
- Install in the reverse order of removal.

PILOT SCREW ADJUSTMENT

- Remove the luggage box.
- ① Turn the pilot screw clockwise until it seats lightly, then back it out to the specification given ($1\frac{3}{4}$).
 - ② Warm up the engine to operating temperature (60°C).
 - ③ Adjust the idle speed with the throttle stop screw.

IDLE SPEED : $1,600 \pm 100$ rpm

NOTE

- The pilot screw is factory pre-set. Adjustment is not necessary unless the carburetor is overhauled or a new pilot screw is installed.
- Before adjusting the pilot screw, check the following items.
 - Fuel system, electrical system for troubleshooting.
 - Spark plug for cleaning and gap adjusting.
 - Valve clearance for adjusting.

CAUTION

- Be sure of tightening the pilot screw, not to damaged the pilot screw seat.

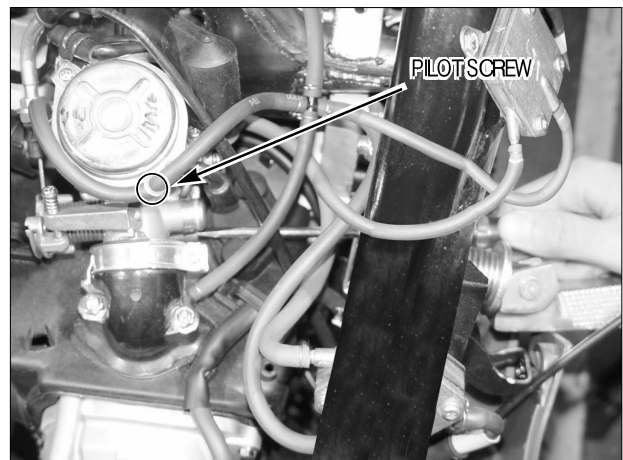
- ④ Rev the engine up slightly from the idle speed and make sure that engine speed rises and returns smoothly.
- ⑤ When turning the throttle stop screw in gradually until the engine speed drops 1,000rpm, make sure that the engine does not run.
Adjust by turning the pilot screw with a $\frac{1}{8}$ turn and repeat steps ④ and ⑤

CAUTION

- If the engine cannot be adjusted by turning the pilot screw within a $\frac{1}{4}$ turn, check for other engine problems.

- ⑥ Readjust the idle speed with the throttle stop screw, if necessary.

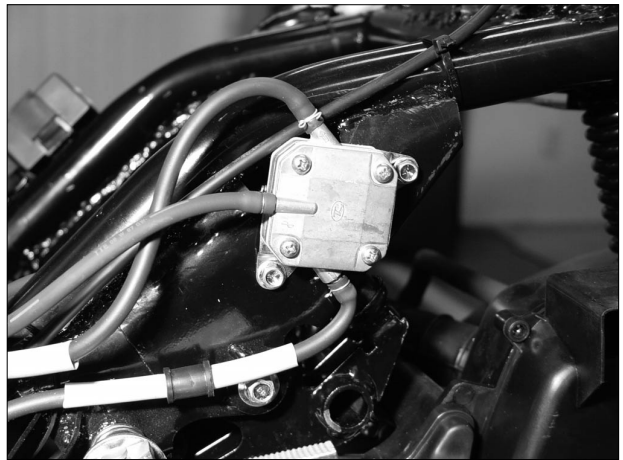
- Install the luggage box.



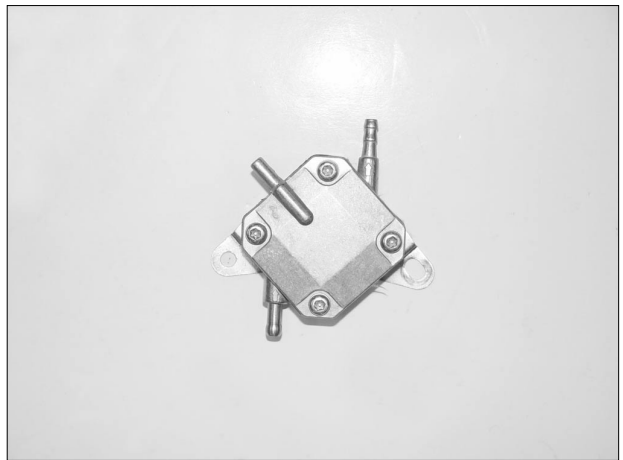
FUEL SYSTEM

FUEL PUMP

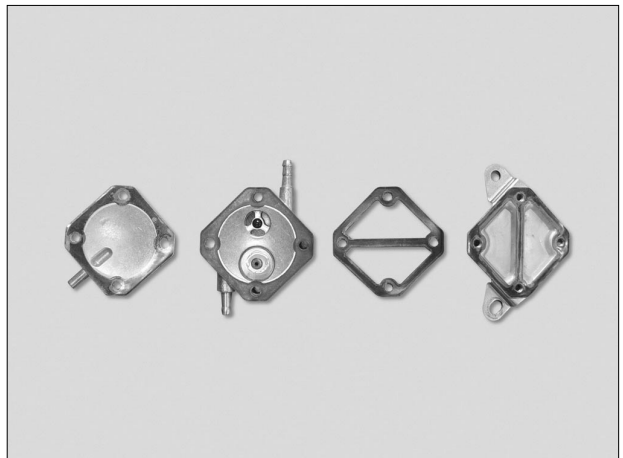
- Removal.
 - Luggage box
 - Inlet,outlet, vacuum tube in the fuel pump
 - Loosen the 2 securing fuel pump, and remove the fuel pump



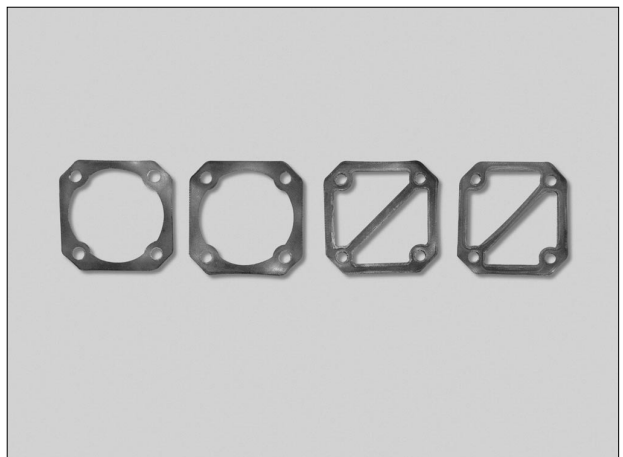
- Removal.
 - Loosen the 4 body screw



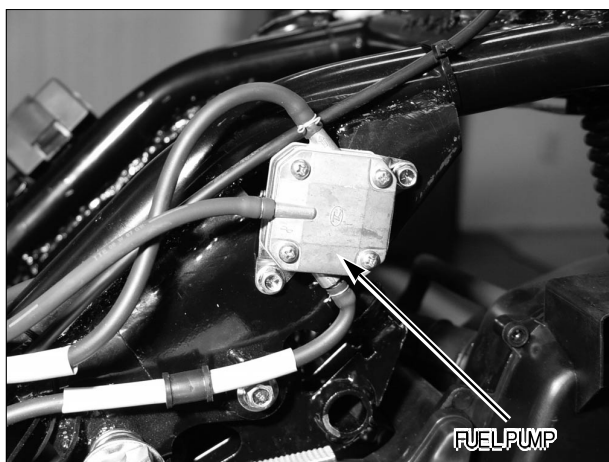
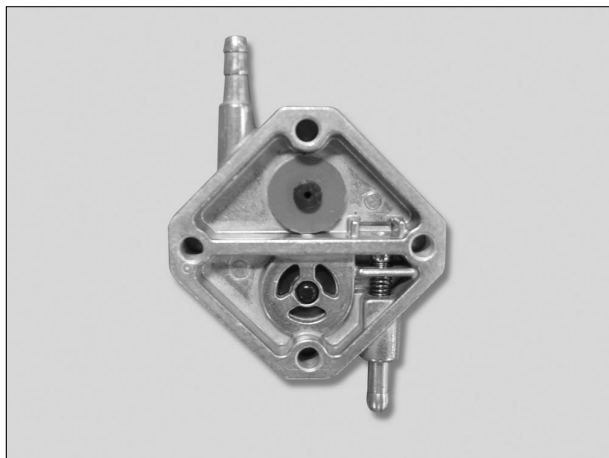
- Remove the fuel pump.
- Check the fuel pump diaphragm A and B for damage.



- Check the each gasket.



- Check the section valve, out valve and relief valve for damage and crack.
- Install in the reverse order of removal.



MEMO

6. ENGINE REMOVAL

SERVICE INFORMATION	6-1
ENGINE REMOVAL	6-2

SERVICE INFORMATION

GENERAL SAFETY

NOTE

- Use a jack to remove or install the engine. Support the motorcycle with a jack firmly, taking precautions not to damage the frame, engine, cable or harness.
- Attach tape to the frame to protect it during the engine removal or installation.

- The following works can be carried out without removing the engine from the vehicle body.

- TRANSMISSION (⇒SECTION 11)
- STARTING CLUTCH (⇒SECTION 8)
- OIL PUMP (⇒SECTION 2)
- A.C. GENERATOR (⇒SECTION 8)
- STARTER MOTOR (⇒SECTION 17)
- KICK STARTER/ CONTINUOUSLY VARIABLE TRANSMISSION (⇒SECTION 7)
- CYLINDER HEAD/ CYLINDER/ PISTON (⇒SECTION 9,10)
- EX. MUFFLER (⇒SECTION 4)
- CARBURETOR (⇒SECTION 5)
- REAR SWING ARM (⇒SECTION 13)

- Items to be worked after removing engine.
 - CRANKSHAFT, CRANKSHAFT BEARING, CRANK CASE BEARING
- Engine oil capacity : 0.9 l - when disassembled.

TORQUE VALUES :

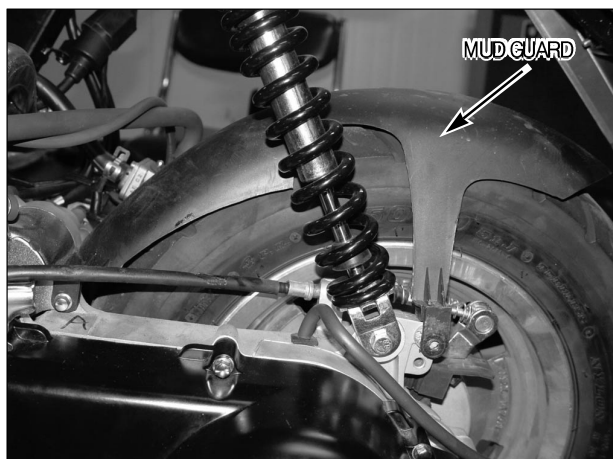
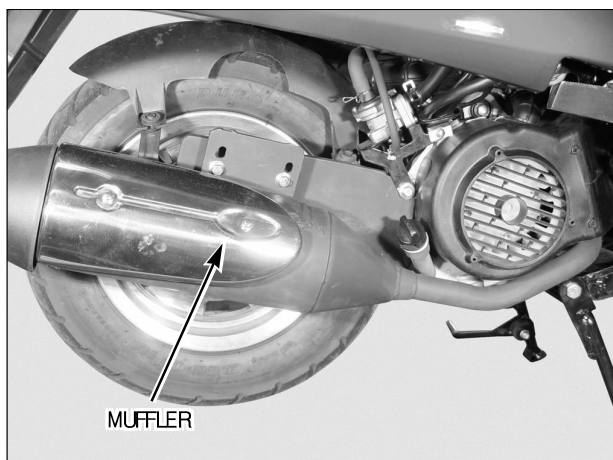
ENGINE HANGER BOLT (FRONT) : 2.7_{kgf} · m
(REAR) : 3.5_{kgf} · m

ENGINE REMOVAL

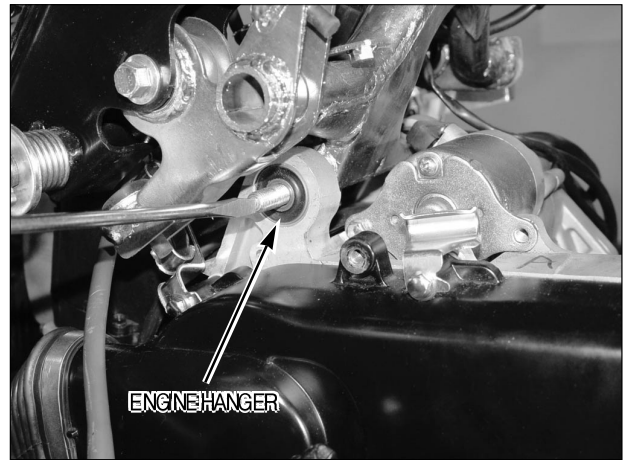
ENGINE REMOVAL

- Drain the engine oil.
- Release the seat lock by turning the main switch key to open the seat.
- Remove the following parts.
 - Luggage box
 - Air cleaner
 - Body cover
 - Carburetor
- Disconnect the A.C generator coupler and connector wiring connected to the A.C generator, disconnect the starter motor wiring cable.
- Remove the battery earth cable from the cooling fan cover clamp.
- Disconnect the high-tension cord from the engine.
- Remove the bleeder tube from the cylinder head cover.
- Remove the EX. muffler.
- Remove the rear brake caliper.
- Loosen the rear brake adjust nut, and remove the brake arm joint B, and disconnect the rear brake cable.

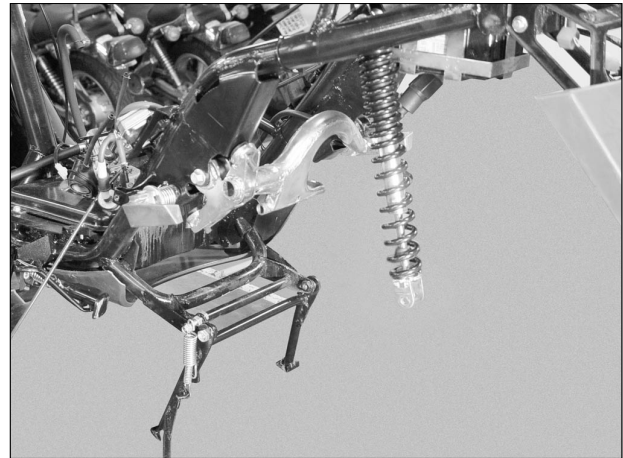
- Remove.
 - Rear wheel
 - Mud guard



- Remove the nut from the engine hanger.



- Lifting the frame end lightly, remove the flange bolt securing engine hanger and separate the frame from the engine.



ENGINE INSTALLATION

- Install in the reverse order of removal.

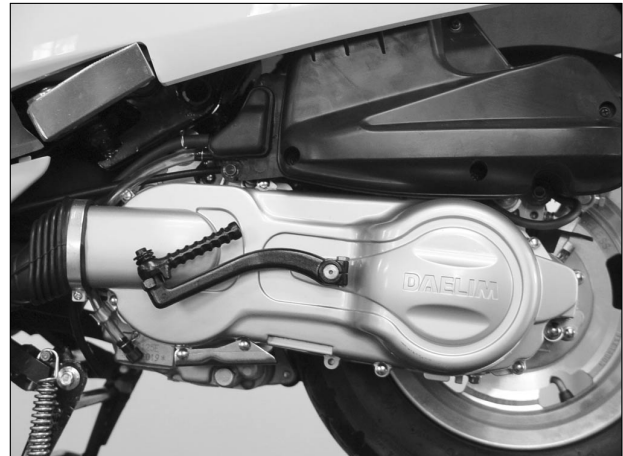
NOTE

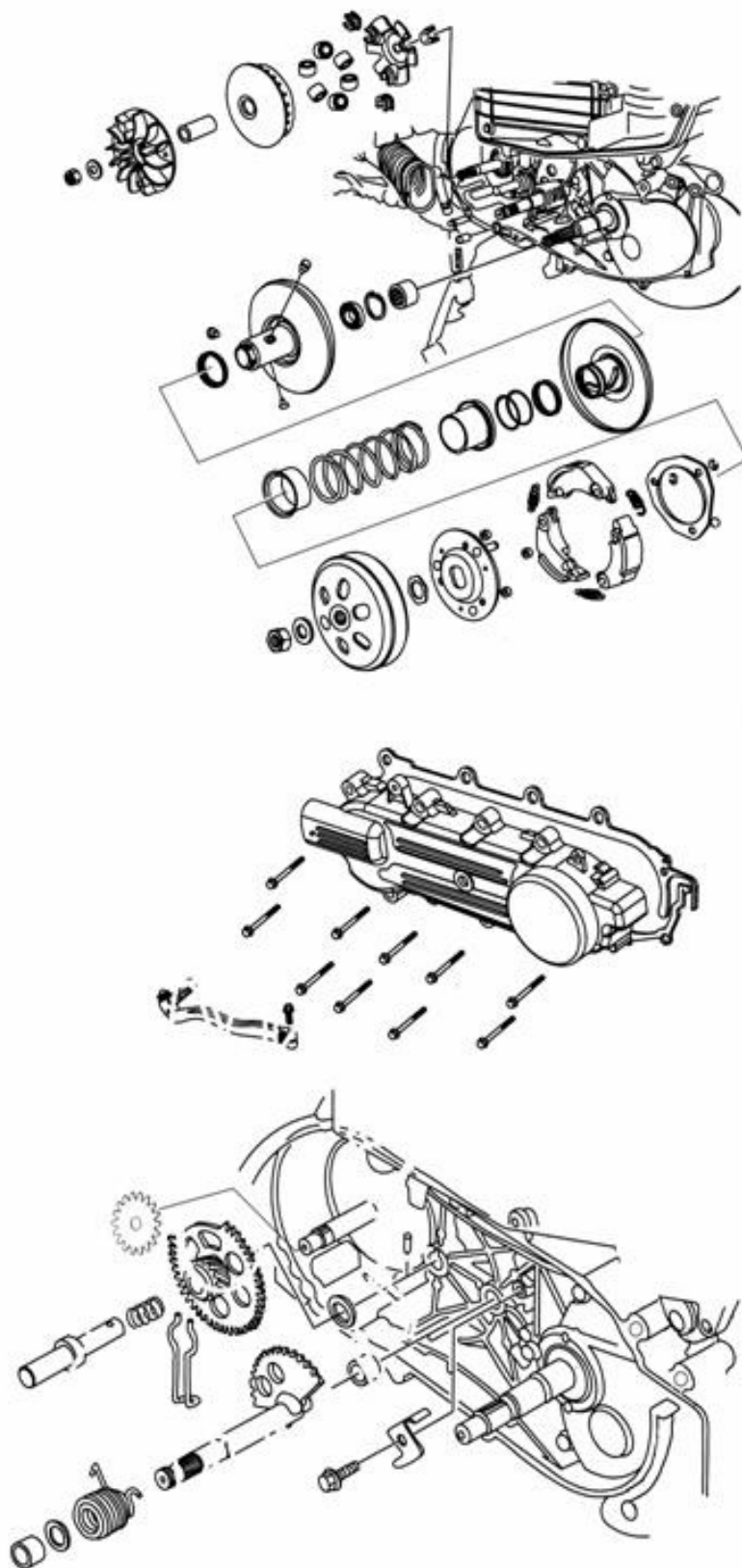
- Take precautions not to damage wiring and cable.
- Take precautions not to damage the threaded part of bolts.
- Arrange the cable, tubes and wiring in the right positions.

TORQUE VALUE

ENGINE HANGER NUT : 4.5kgf · m

- Check the following after the engine is installed.
 - Engine oil
 - Electric systems.





7. LH. CRANKCASE COVER/KICK STARTER /CONTINUOUSLY VARIABLE TRANSMISSION

SERVICE INFORMATION . . . 7-1	DRIVE BELT 7-6
TROUBLE SHOOTING . . . 7-1	MOVABLE DRIVE FACE . . . 7-8
LH. CRANKCASE COVER . . 7-2	DRIVEN PULLEY 7-11
KICK STARTER 7-3	

SERVICE INFORMATION

GENERAL SAFETY

- 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 LH. crank case cover is removed.

NOTE

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

7

SPECIFICATIONS

ITEM	STANDARD	SERVICE LIMIT
MOVABLE DRIVE FACE BUSHING INNER DIAMETER	24.01-24.05mm	24.06mm
DRIVE FACE BOSS OUTER DIAMETER	23.960-23.974mm	23.94mm
DRIVE BELT WIDTH	20.0mm	19.0mm
WEIGHT ROLLER OUTER DIAMETER	18.0-18.10mm	17.9mm
CLUTCH OUTER INNER DIAMETER	125.0-125.2mm	120.50mm
DRIVEN FACE SPRING PLAY	97.85mm	163.7mm
DRIVEN FACE OUTER DIAMETER	33.965-33.985mm	33.94mm
DRIVEN FACE INNER DIAMETER	34.000-34.025mm	34.06mm

TROUBLE SHOOTING

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.

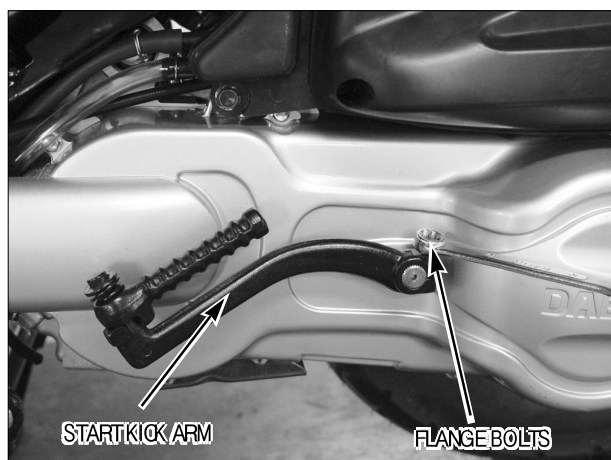
- Clutch shoe spring cut.

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

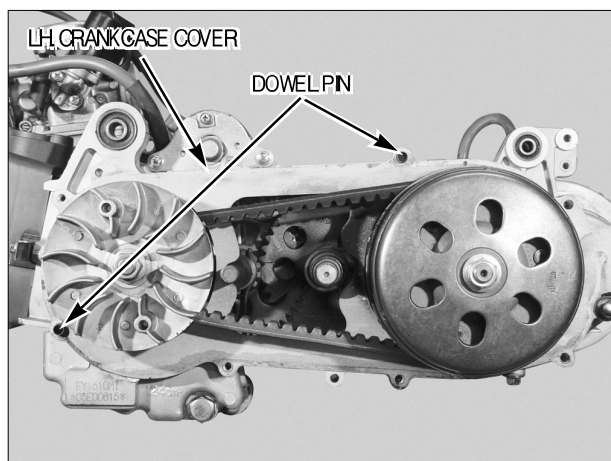
- Remove the kick start arm flange bolts and remove the kick start arm.



- Remove.
 - Air cleaner 2 securing bolt
 - Flange bolt securing LH. crankcase cover
 - LH. crankcase cover



- Remove the gasket and dowel pin.

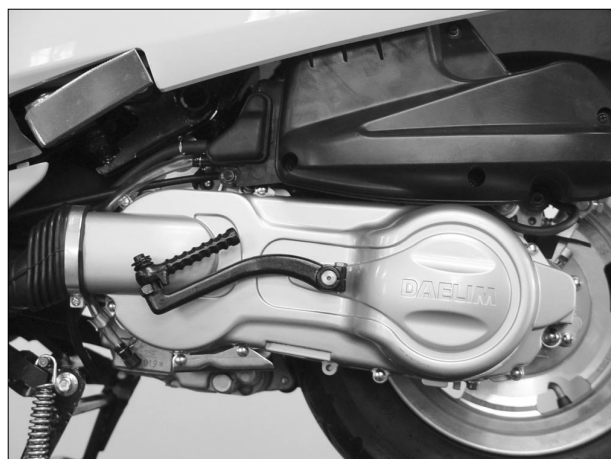


INSTALLATION

- Install the new gasket and dowel pin after removing the gasket of the crankcase surface.

NOTE

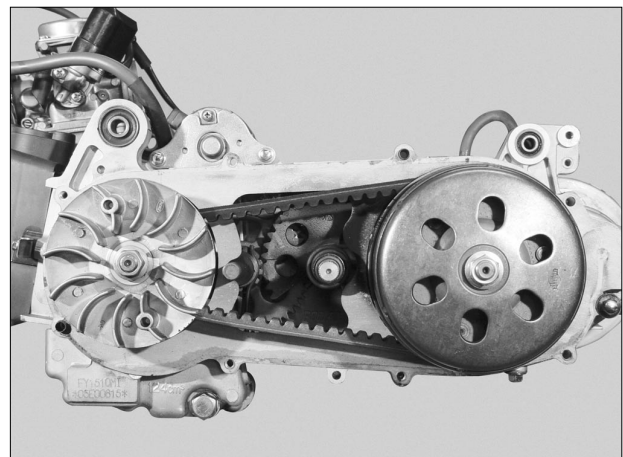
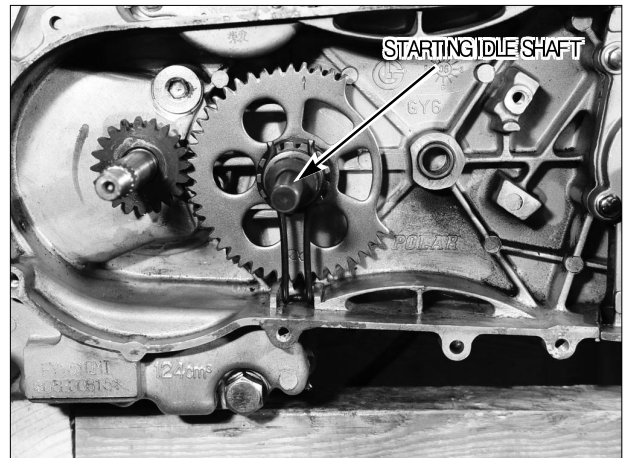
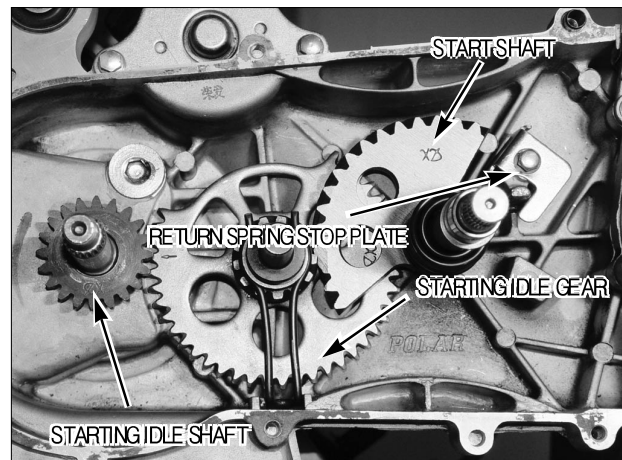
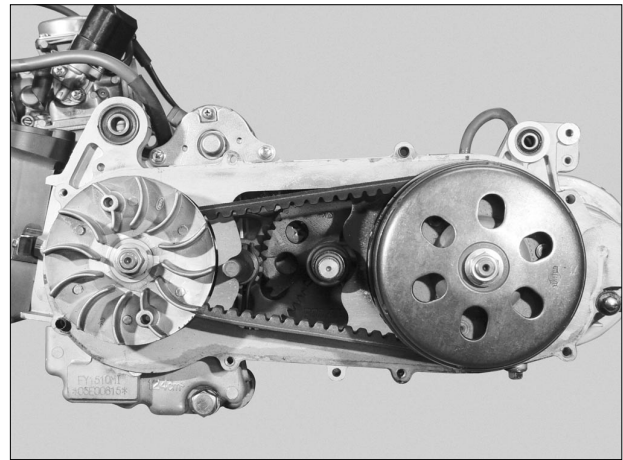
- Tighten the bolts diagonally with specified tightening torque.
- Be sure to replace a new gasket and dowel pin



KICK STARTER

REMOVAL

- Remove.
 - LH. Crankcase cover
 - Movable drive face, driven pulley
 - Gasket
- Loosen the return spring stop plate securing bolt.
- Remove the return spring.
- Remove the starting shaft
- Remove the starting idle gear.
- Put the tool (pipe, etc) over the starting drive gear and remove it beating lightly with hammer.



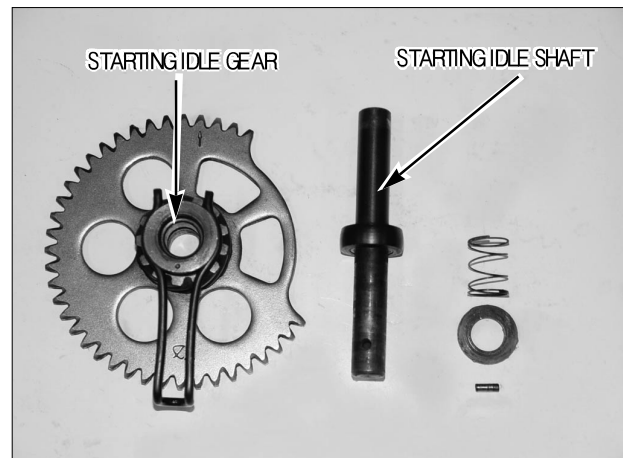
INSPECTION

- CHECK.

- The kick starting shaft for wear or damage
- The return spring for defects or damage



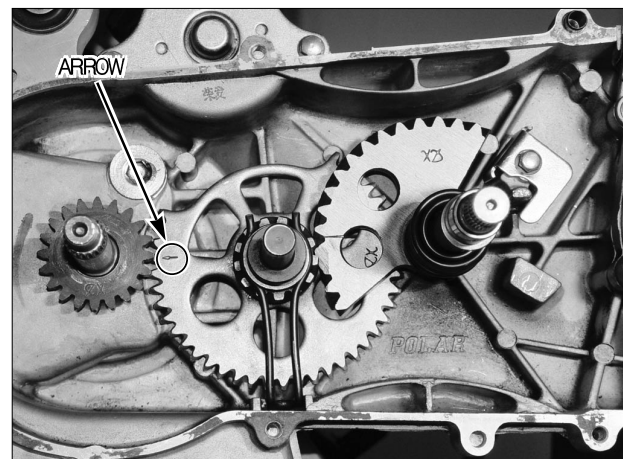
- Check the starting idle gear for wear or damage.



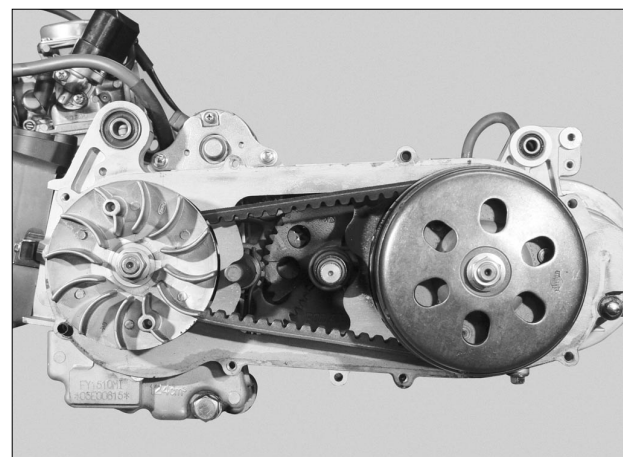
INSTALLATION

- INSTALL.

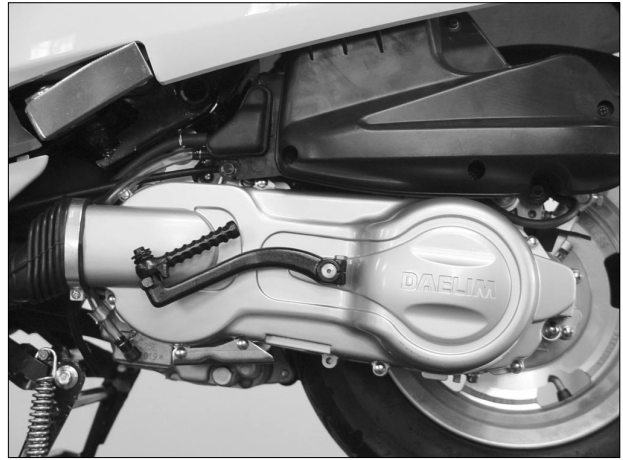
- Driven gear
- Starting idle gear as arrow direction
- Return spring stop plate



- Install the movable drive face, driven pulley



- Install the LH. crankcase cover



DRIVE BELT

REMOVAL

- Remove the LH. crankcase cover. (⇒7-2)
- Hold the clutch outer using the universal holder and remove the nut.
- Remove the clutch outer.

TOOL: UNIVERSAL HOLDER

CAUTION

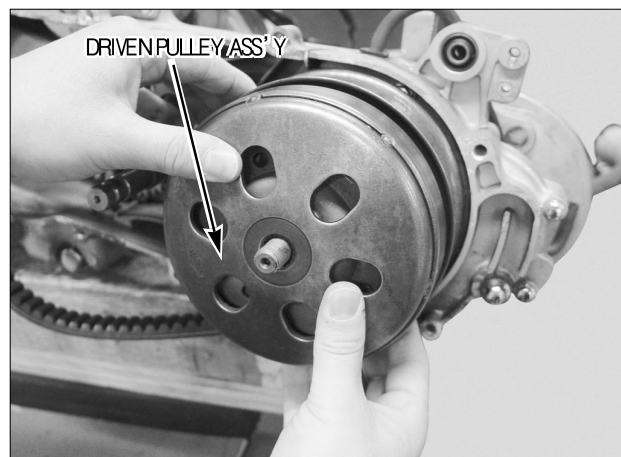
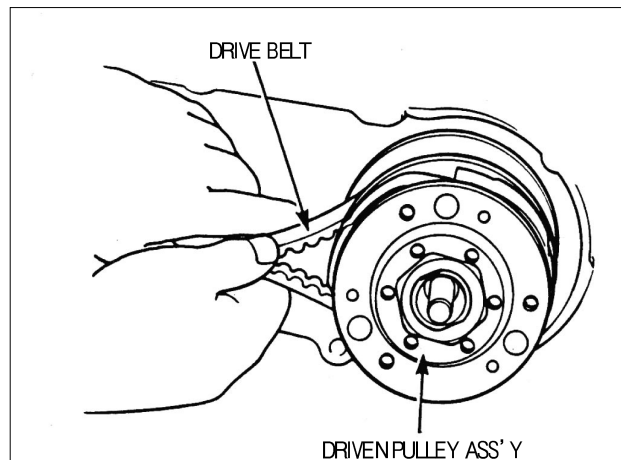
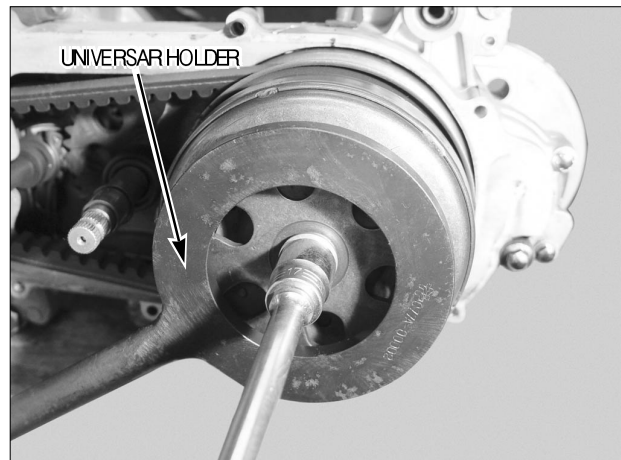
- Use the special tool when loosening the lock nut. Holding the rear wheel or rear brake will damage the final reduction system.

- Squeeze the drive belt into the pulley groove as shown so that it slackens enough to remove the driven pulley from the drive shaft.

- Loosen the drive face setting nut with the drive face holder.
- Remove the drive face.

TOOL : DRIVE FACE HOLDER

- Remove the driven pulley sub assembly with the drive belt in place.
- Remove the drive belt from the driven pulley groove and drive pulley groove.



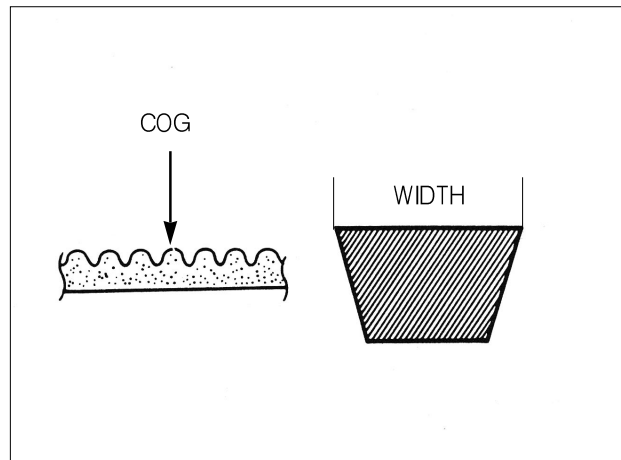
DRIVE BELT INSPECTION

- Check the drive belt for cracks, pry separation and wear; replace as necessary.
- Measure the width of the drive belt as shown.
- Replace the belt if the service limit is exceeded.

SERVICE LIMIT : 19.0mm

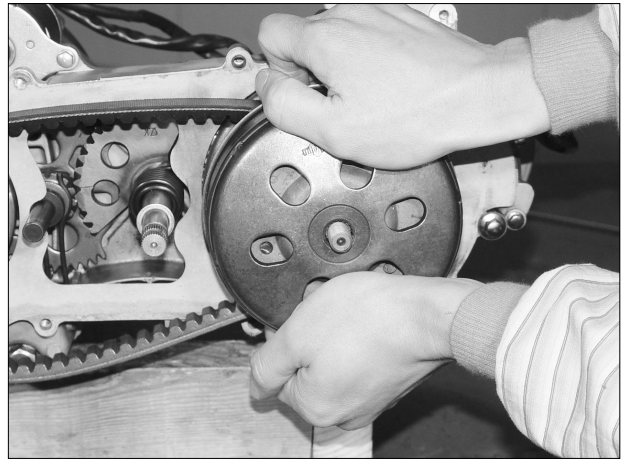
NOTE

- Use only a genuine DAELIM replacement drive belt.
- Do not get oil or grease on the drive belt or pulley faces. Clean off any grease or oil before reinstalling.

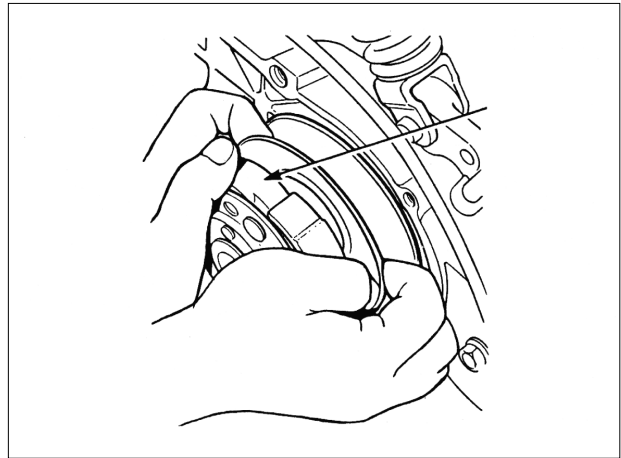


DRIVE BELT INSTALLATION

- Install the driven pulley sub assembly on the drive shaft.



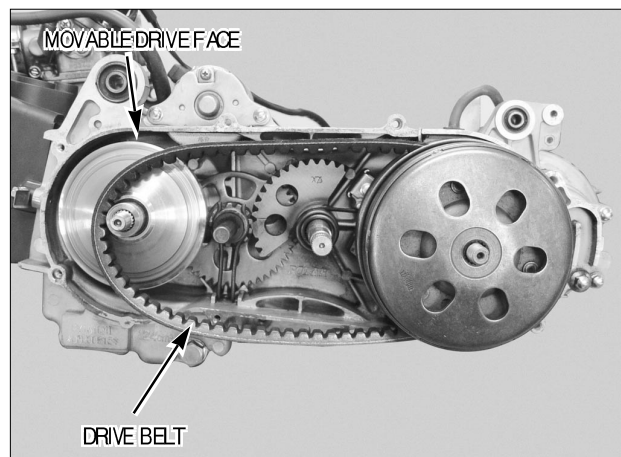
- Turn the pulley clockwise and spread the faces apart while installing the drive belt.
- Remove the pulley assembly once with the drive belt installed.



- Put the drive belt on the movable drive face and remove it.

NOTE

- Hold the movable drive faces not to rotate back again, until the drive pulley installed completely on the drive shaft.



LH. CRANKCASE COVER/KICK STARTER/CONTINUOUSLY VARIABLE TRANSMISSION

- Install the drive face into the LH. crankshaft serration, then install the thrust washer, and install the flange nut temporarily.
- Tighten the nut to the specified torque using the drive face holder.

TORQUE : 4.0 kgf · m

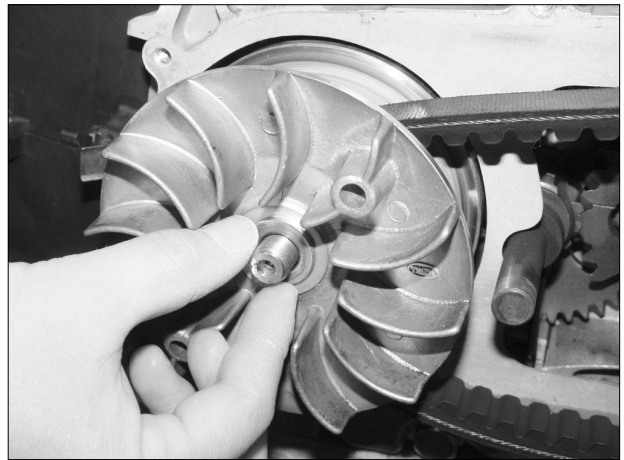
NOTE

- Install the drive face face accurately into the LH.crankshaft serration

- Hold the clutch outer using the universal holder, tighten the nut to the specified torque.
- Tighten the nut to the specified torque using the drive face holder.

TORQUE : 4.0 kgf · m

TOOL : UNIVERSAL HOLDER



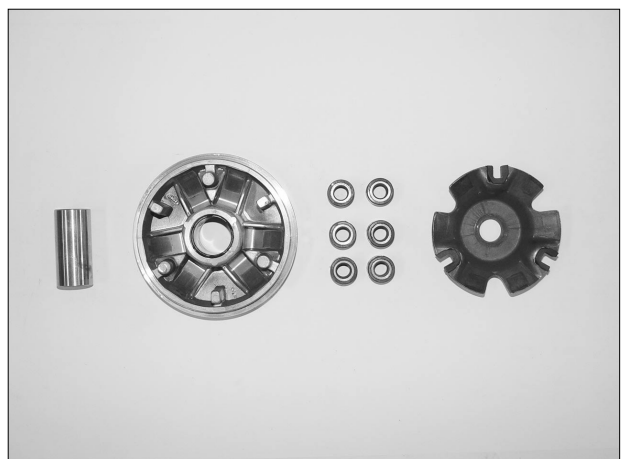
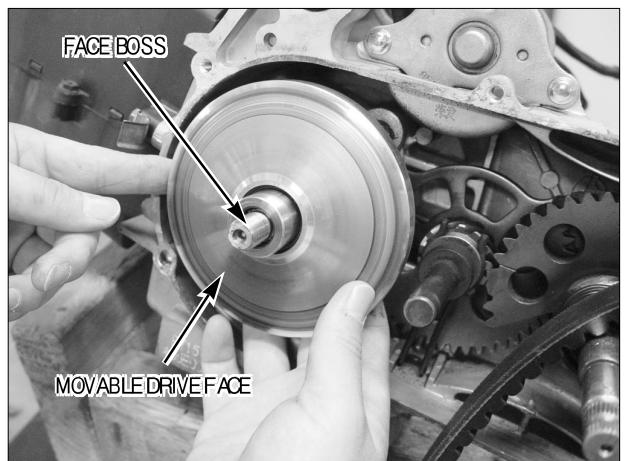
MOVABLE DRIVE FACE

REMOVAL

- Remove the LH. crankcase cover.
- Fix the drive face holder into the drive face.
- Remove the drive face nut, thrust washer, drive face.

TOOL : UNIVERSAL HOLDER

- Remove the movable drive face and drive face boss.
- Remove the ramp plate, weight rollers and oil seal from the movable drive face.



MOVABLE DRIVE FACE INSPECTION

- Check the rollers for wear or damage and replace as necessary.
- Measure the O.D. of each roller, replace if the service limit is exceeded.

SERVICE LIMIT : 17.9mm

- Measure the one side wear..

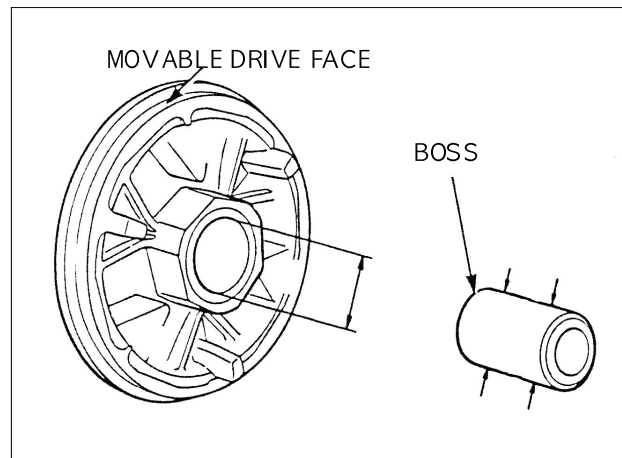
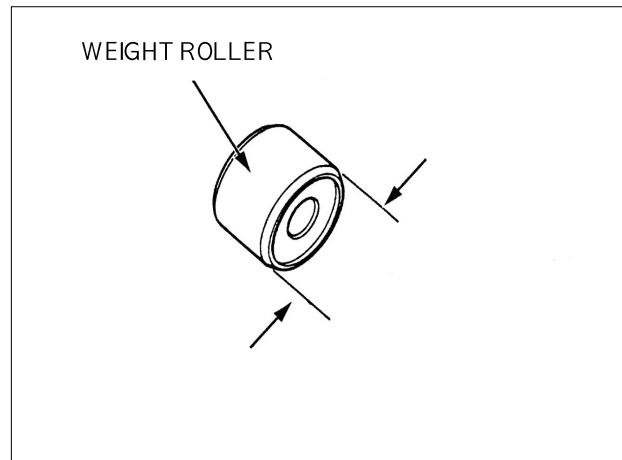
SERVICE LIMIT : 2mm

- Check the drive face boss for wear or damage and replace as necessary.
- Measure the O.D of the drive face boss. Replace the boss if the service limit is exceeded.
- Measure the I.D. of the drive face. Replace it if the service limit is exceeded.
- Movable drive face boss outer diameter.

SERVICE LIMIT : 23.94mm

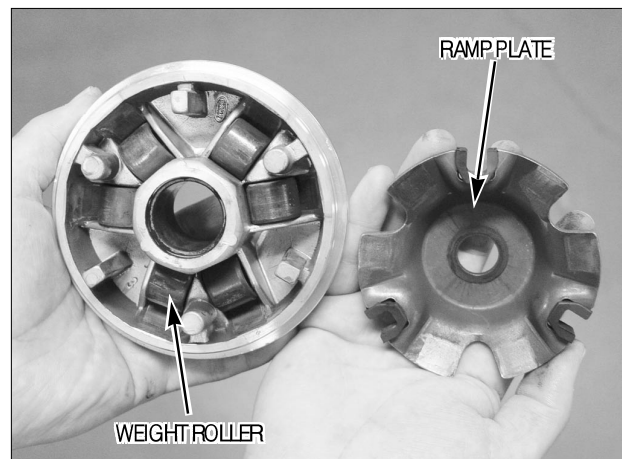
- Movable drive face inner diameter.

SERVICE LIMIT : 24.06mm



MOVABLE DRIVE FACE INSTALLATION

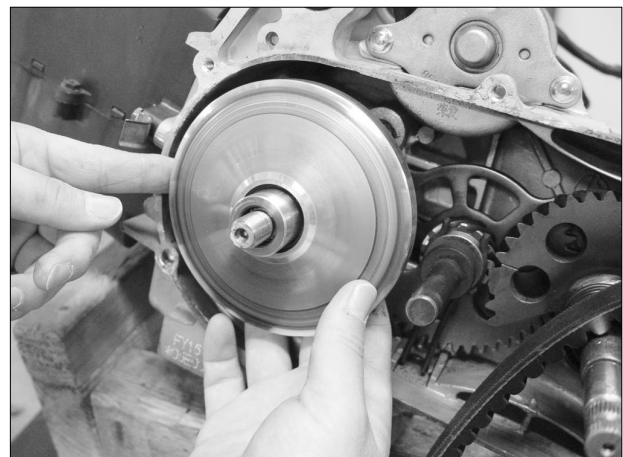
- Install the weight roller on the movable drive face.
- Install the ramp plate.



- Install the movable drive face boss.

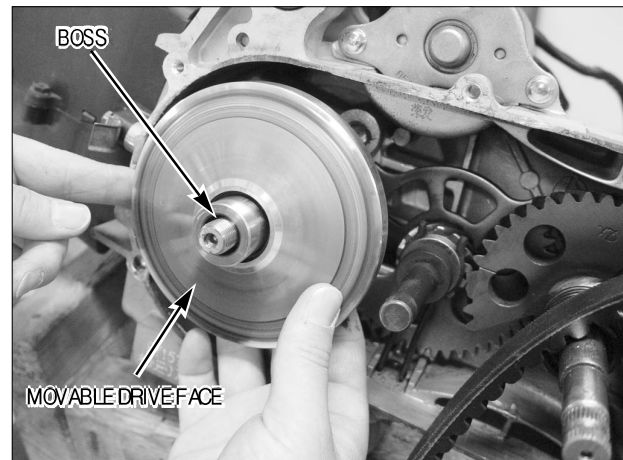
NOTE

- Do not get the grease on the drive face.
- Remove any misplaced grease.
- Use only the specified grease in the specified amount.

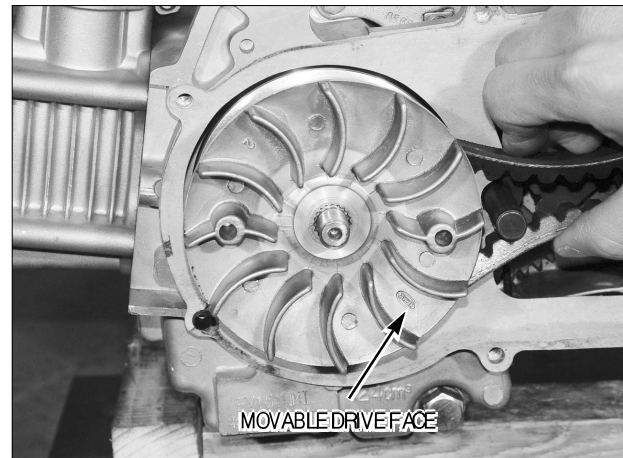


LH. CRANKCASE COVER/KICK STARTER/CONTINUOUSLY VARIABLE TRANSMISSION

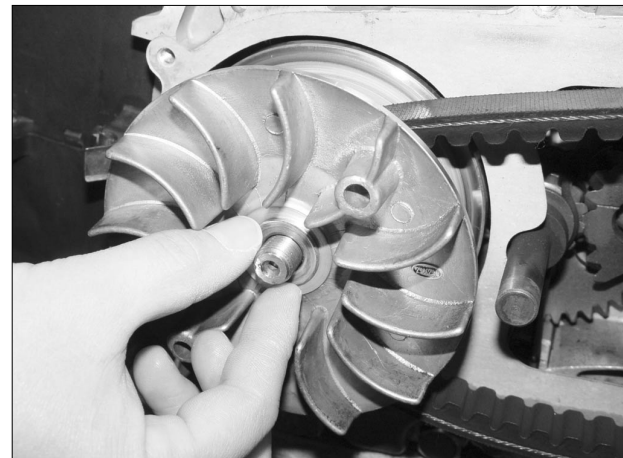
- Install the movable drive face and movable drive face boss on the crank shaft.



- Install the drive belt into the drive face.



- Install the washer and nut temporarily on the drive face.



- Tighten the nut to the specified torque using the drive face holder.

TORQUE VALUE : 4.0 kgf · m

TOOL : DRIVE FACE HOLDER

NOTE

- Tighten the drive face nut to the specified torque.
- Correctly match the drive face and crank shaft serration when assembling.
- If the drive face holder cannot be used, remove the cooling fan and hold the flywheel with the universal holder.

- Install the LH. crankcase cover.



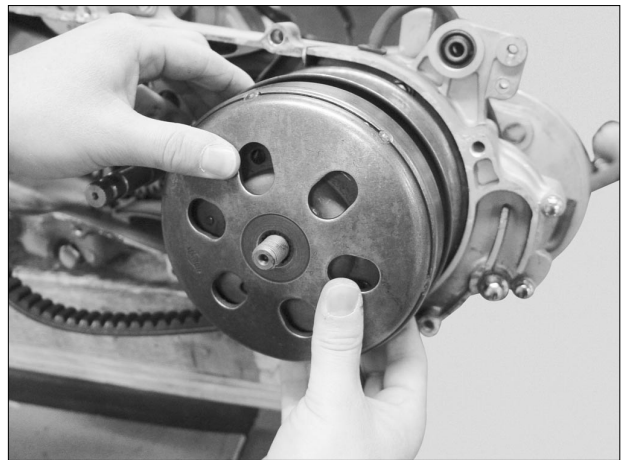
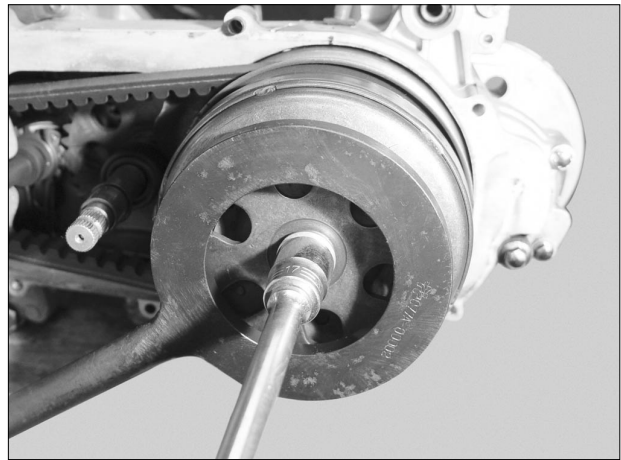
DRIVEN PULLEY

REMOVAL

- Remove the LH. crankcase cover. (⇒7-2)
- Remove the drive face. (⇒7-8)
- Hold the clutch outer using the universal holder and remove the flange nut, then remove the clutch outer.

**TOOLS : UNIVERSAL HOLDER
DRIVE FACE HOLDER**

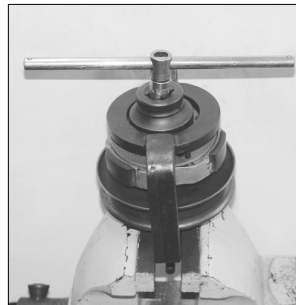
- Remove the driven pulley sub assembly from the drive shaft.
- Remove the drive belt.



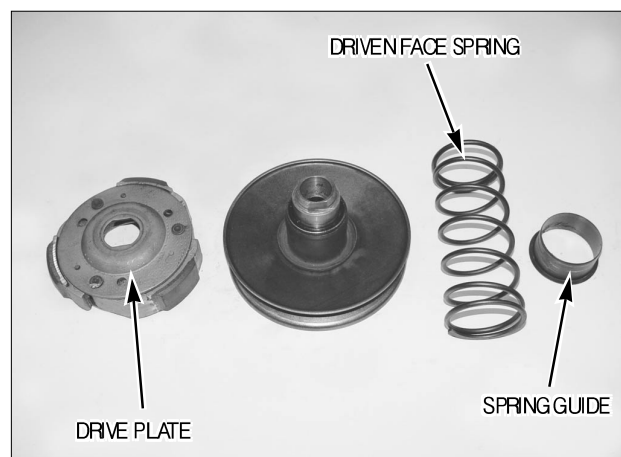
DISASSEMBLY

- Remove the special nut.

**TOOLS : CLUTCH SPRING COMPRESSOR
LOCK NUT WRENCH**

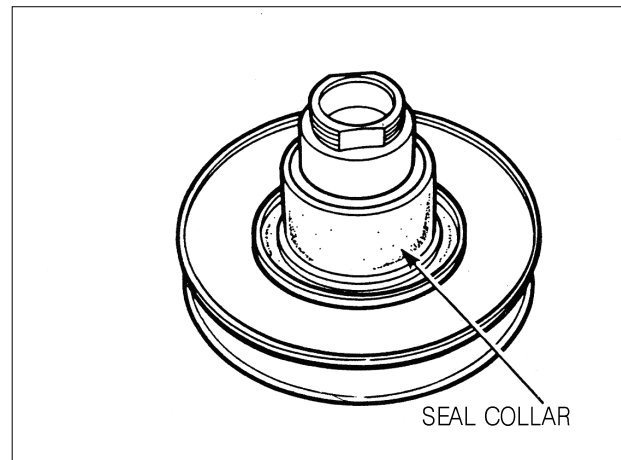


- Remove the drive plate, driven face spring and driven face spring guide.

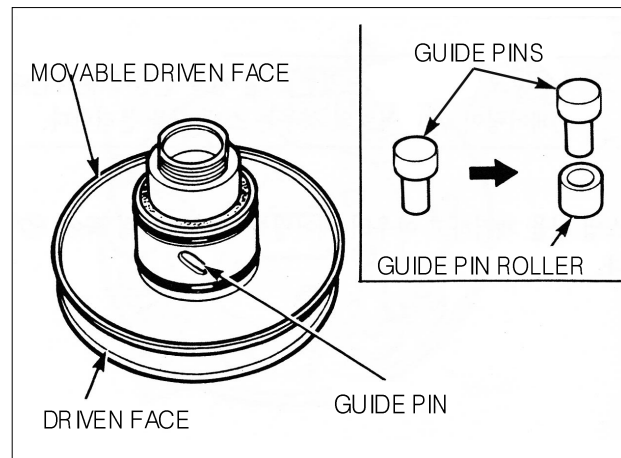


LH. CRANKCASE COVER/KICK STARTER/CONTINUOUSLY VARIABLE TRANSMISSION

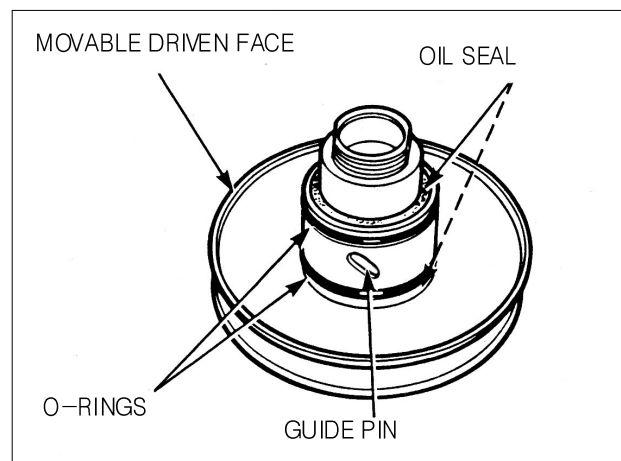
- Remove the seal collar from the driven pulley.



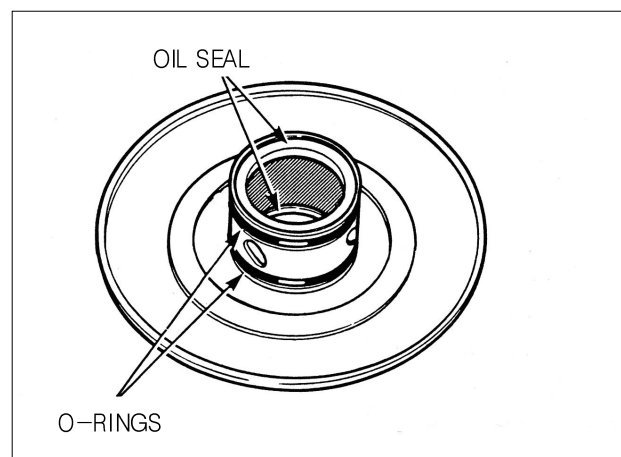
- Remove the guide pins and guide pin rollers and the movable driven face.



- Remove the O-ring and oil seals from the movable driven face



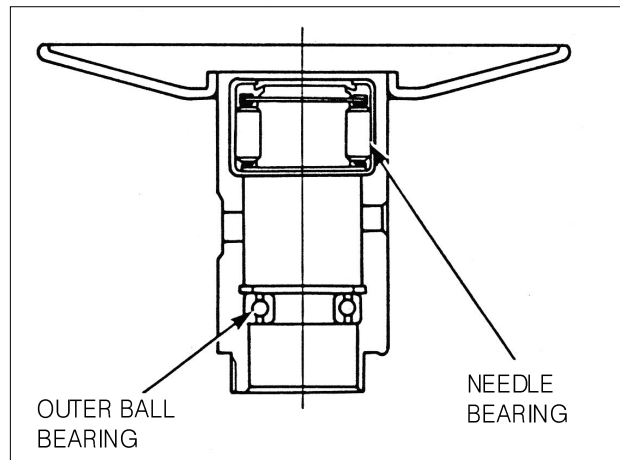
- Remove the movable driven face.



CLUTCH / DRIVEN PULLEY INSPECTION

Driven Face Bearing Inspection

- Check the inner bearing oil seal (if installed) for damage; replace as necessary.
- Check the needle bearing for damage or excessive play and replace as necessary.
- Turn the inner race of the outer bearing with your finger. Check that the bearing turns smoothly and quietly, and that the bearing outer race fits securely. Replace the bearing if necessary.

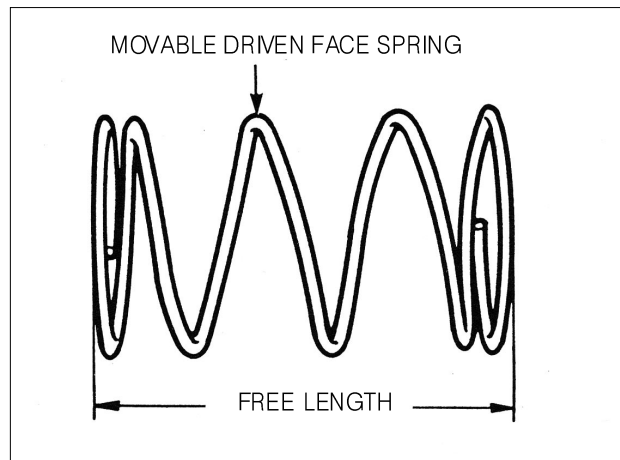


Movable Driven Face Spring Inspection

- Measure the free length of the driven pulley spring and replace if the service limit is exceeded.

SERVICE LIMIT : 163.7mm

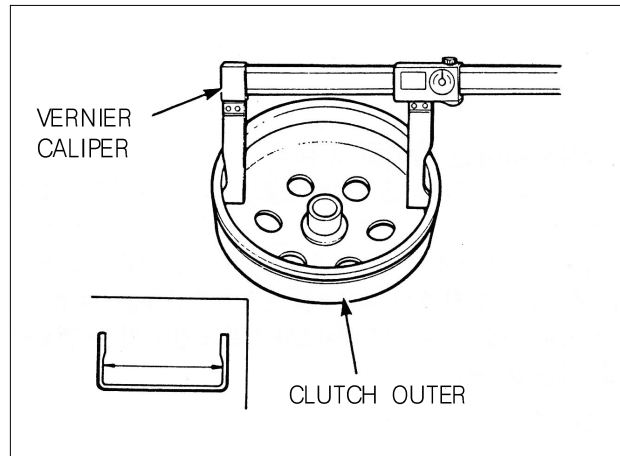
TOOL : VERNIER CALIPER



Clutch Outer

- Measure the I.D. at shoe contact surface of the clutch outer. Replace the outer if the service limit is exceeded.

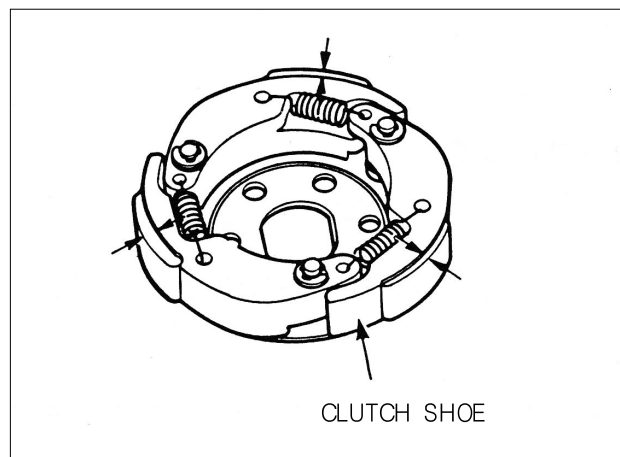
SERVICE LIMIT : 125.5mm



Clutch Shoe Inspection

- Measure the thickness of each shoe ; replace if the service limit is exceeded.

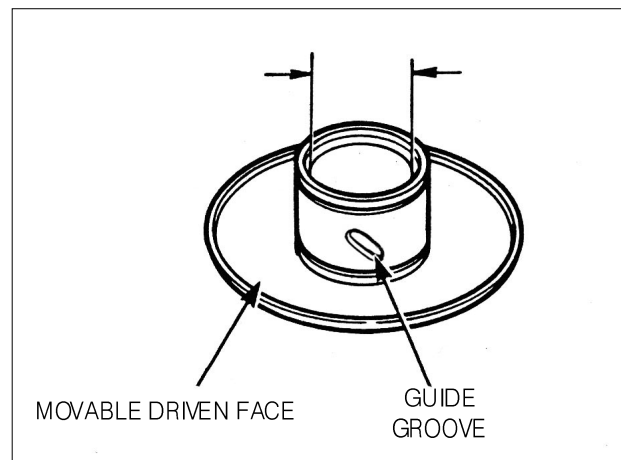
SERVICE LIMIT : 1.5mm



LH. CRANKCASE COVER/KICK STARTER/CONTINUOUSLY VARIABLE TRANSMISSION

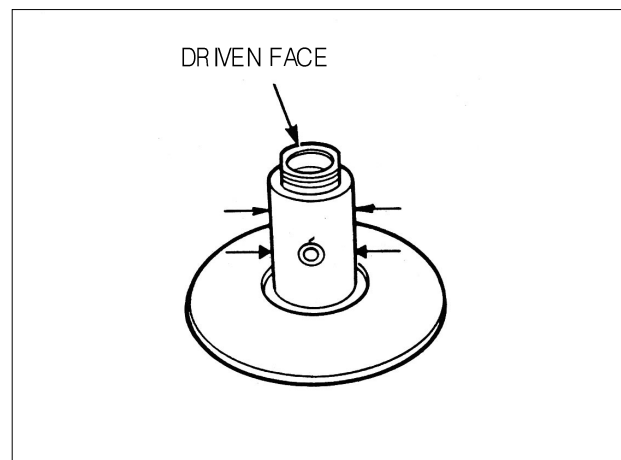
- Check the following;
 - Movable driven face for damage or excessive wear.
 - Guide pin groove for damage or deformation.
- Replace damaged or worn parts as necessary.
- Measure the I.D. of the movable driven face; replace if the service limit is exceeded.

SERVICE LIMIT : 34.06 mm



- Check the driven face for damage or excessive wear; replace as necessary
- Measure the O.D. of the driven face; replace if the service limit is exceeded.

SERVICE LIMIT : 34.06 mm



DRIVEN FACE BEARING REPLACEMENT

- Remove the inner bearing.

NOTE

- If the driven face has an oil seal at inner bearing side, remove the oil seal first.
- If a ball bearing is used on the inside, remove the snap ring first then remove the bearing.

- Remove the snap ring then drive out the outer bearing toward the inner bearing side.
- Drive a new outer bearing into place with the sealed end toward the outside. Install the snap ring securely.

NOTE

- Apply the specified amount of specified grease as shown.

GREASE APPLICATION : 9.0-9.5 g

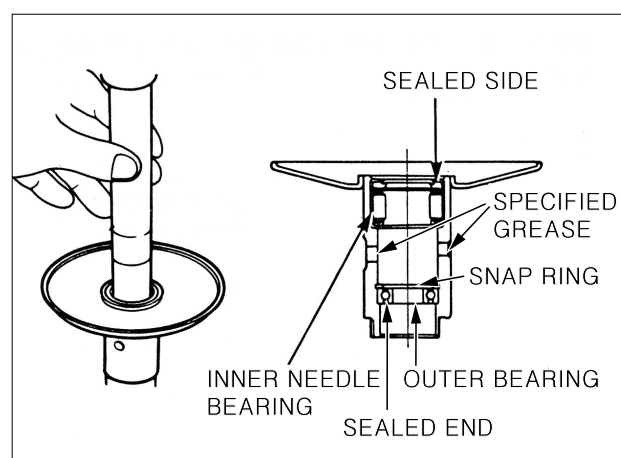
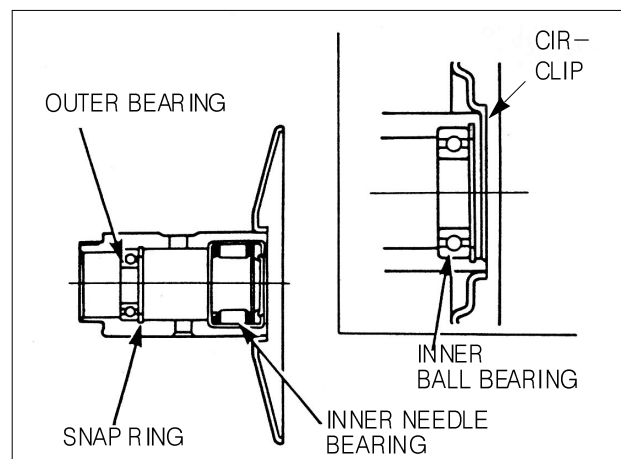
- Install in a new inner bearing.

NOTE

- Install the bearing with the sealed side facing out.
- Install the needle bearing using a hydraulic press.
- Install the ball bearing by driving it in or using a hydraulic press.

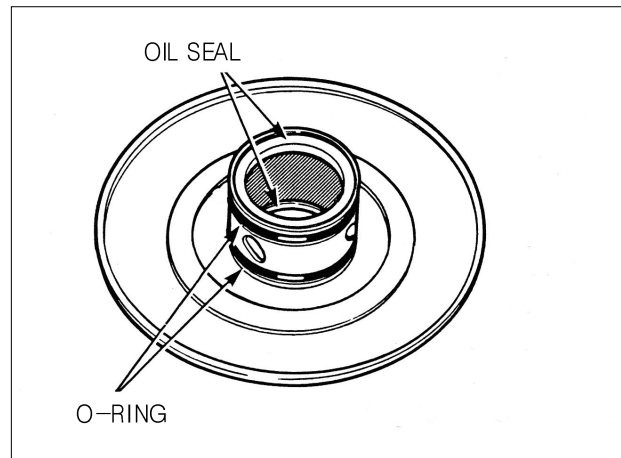
- Install the snap ring into the groove in the driven face.
- Install a new oil seal with the lip toward the bearing (if required).

**TOOLS : BEARING DRIVER ATTACHMENT
DRIVE PILOT**

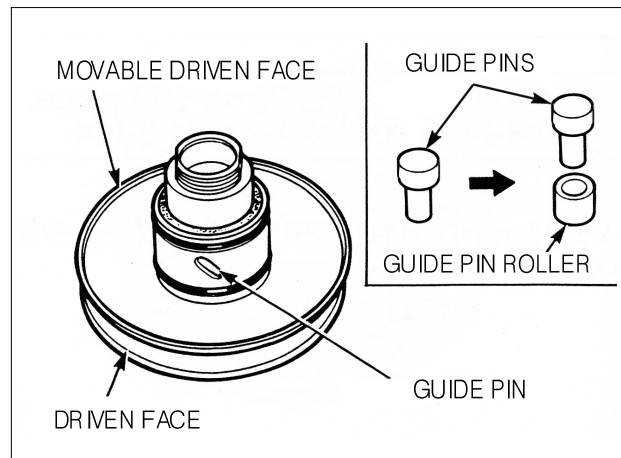


CLUTCH / DRIVEN PULLEY ASSEMBLY

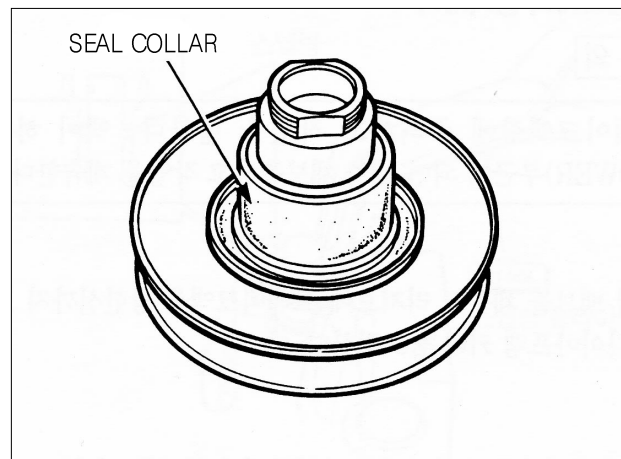
- Install new oil seals and O-rings on the movable driven pulley face.



- Install the movable face on the driven pulley face.
- Install the guide pins, or guide pins and guide pin rollers.



- Install the seal collar.

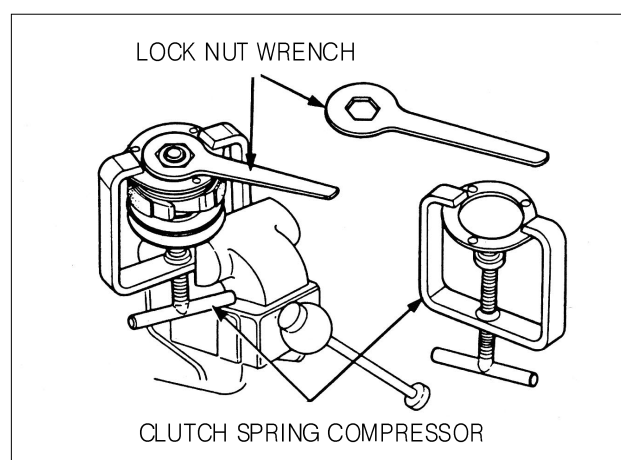


- Assemble the driven pulley, spring and clutch in the clutch spring compressor. Compress the assembly by turning the tool handle until the lock nut can be installed.
- Clamp the clutch spring compressor in a vise and tighten the lock nut to the specified torque using the lock nut wrench.

TORQUE VALUE : 5.0 kgf · m

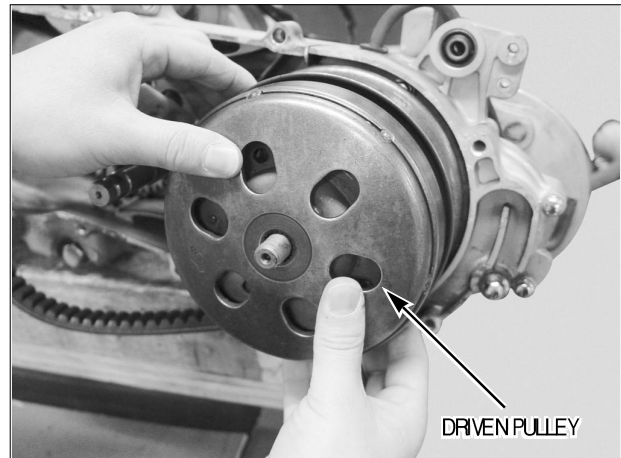
- Remove the spring compressor.

**TOOLS : CLUTCH SPRING COMPRESSOR
LOCK NUT WRENCH**

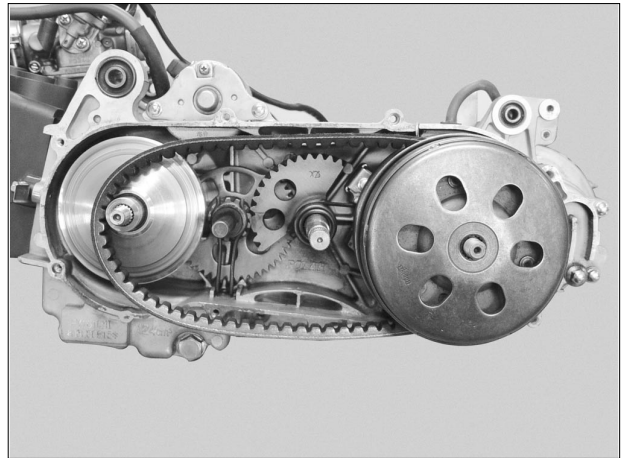


INSTALLATION DRIVEN PULLEY ASS'Y

- Turn the driven pulley ass'y clockwise, enlarge the belt assembly groove to maximum.
- Install the drive belt into the driven pulley sub ass'y, and install to the drive shaft.



- Install the drive belt into the movable drive face.



- Install the drive face, and install the drive pulley nut temporarily.
- Tighten to the specified torque using the face.

TORQUE : 4.0 kgf · m

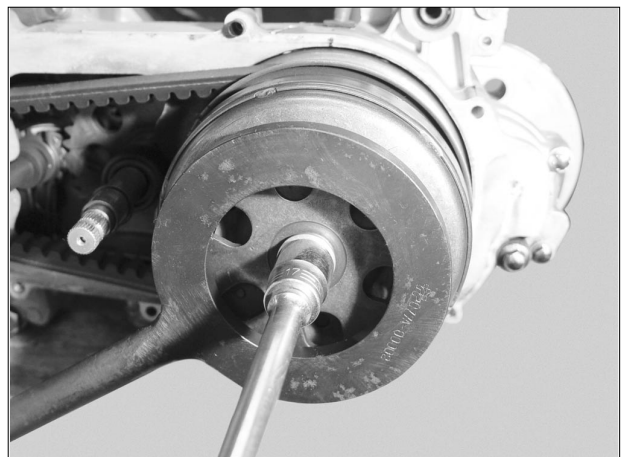
TOOLS : DRIVE FACE HOLDER



- Install the clutch outer into the driven pulley sub ass'y, install the special nut temporarily.
- Hold the clutch out using the universal holder, tighten the flange nut to the specified torque.

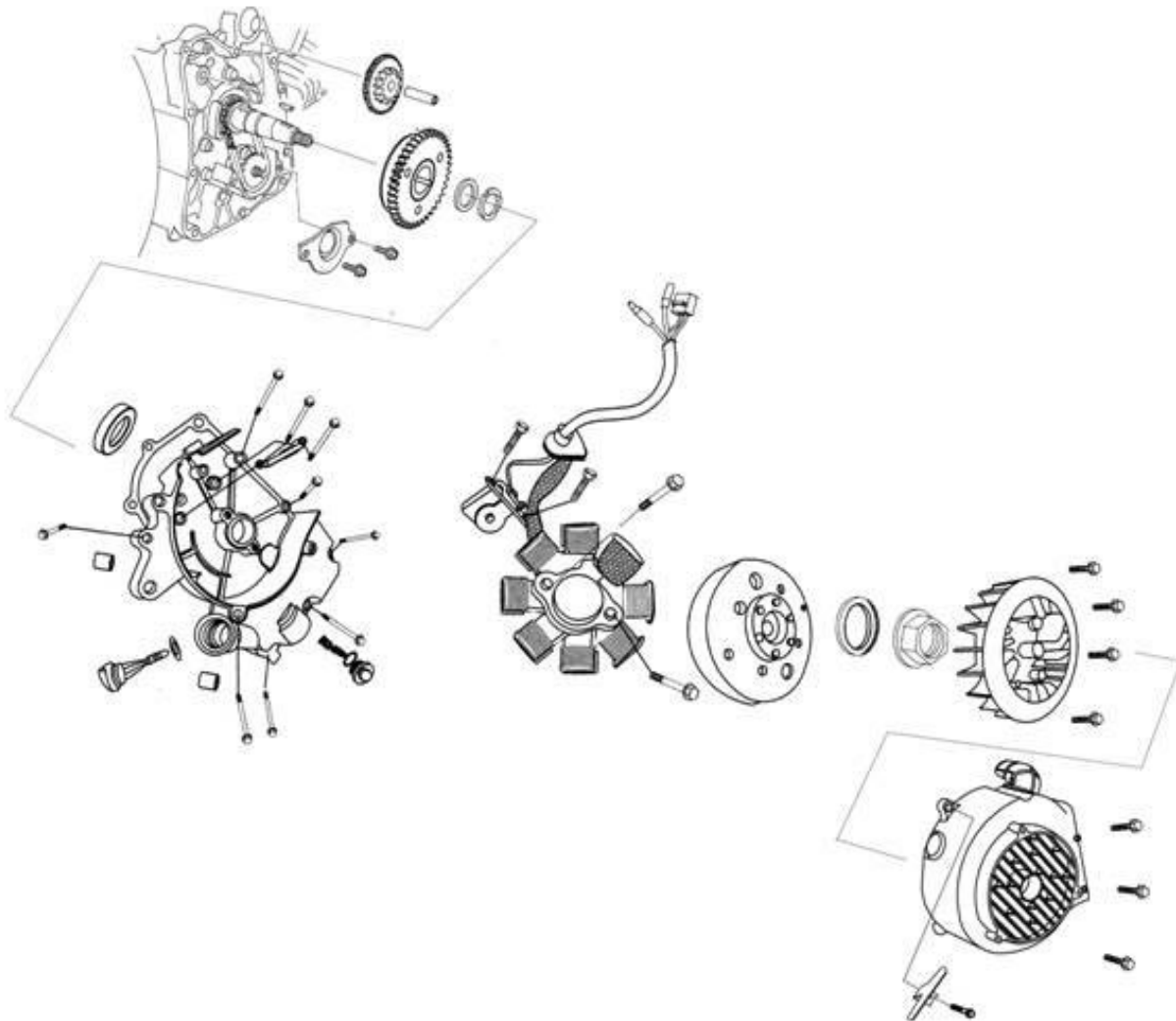
TORQUE : 4.0 kgf · m

TOOLS : UNIVERSAL HOLDER



MEMO

A.C GENERATOR / STARTER CLUTCH



8. A.C GENERATOR / STARTER CLUTCH

SERVICE INFORMATION	8-1	RH. CRANKCASE COVER	8-4
SHROUD	8-2	STARTER REDUCTION GEAR	8-5
A.C GENERATOR	8-2	STARTER CLUTCH	8-6

SERVICE INFORMATION

GENERAL SAFETY

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

SPECIFICATIONS

Unit : mm

ITEM	STANDARD VALUE		SERVICE LIMIT
STARTER DRIVEN GEAR	O.D	32.000 - 32.025	32.1
	I.D	27.972 - 27.993	27.9
REDUCTION GEAR REDUCTION GEAR SHAFT	I.D	9.000 - 9.022	9.08
	O.D	8.972 - 8.987	8.95

8

TORQUE VALUES

FLY WHEEL BOLT	5.5 kgf · m
STARTER CLUTCH LOCK NUT	5.5 kgf · m
RH. CRANKCASE COVER BOLT	1.1 kgf · m

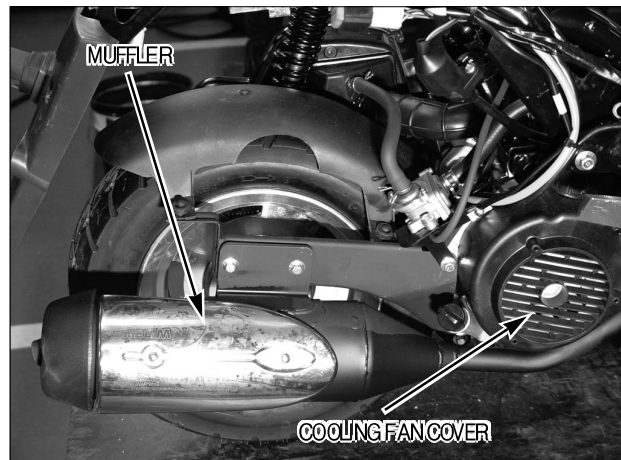
TOOLS

SPECIAL SOCKET (12.7 x 28 x 120)
A.C.G ROTOR PULLER

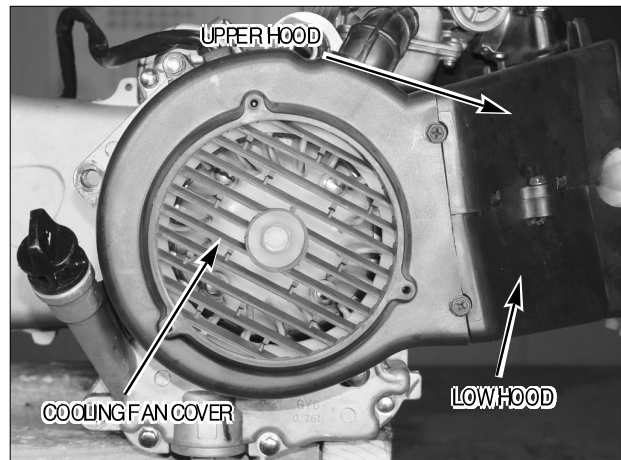
SHROUD

REMOVAL

- Remove the muffler.



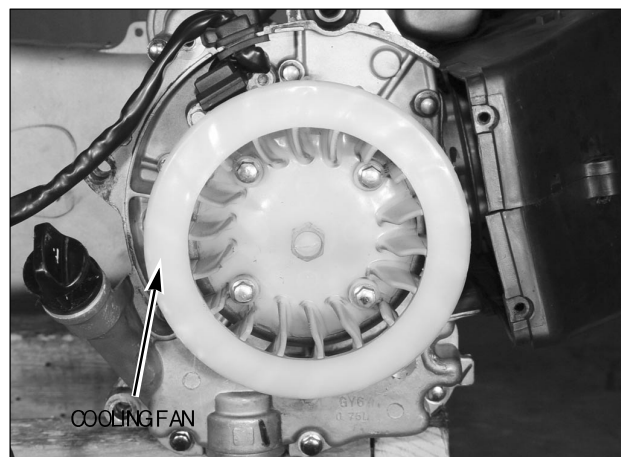
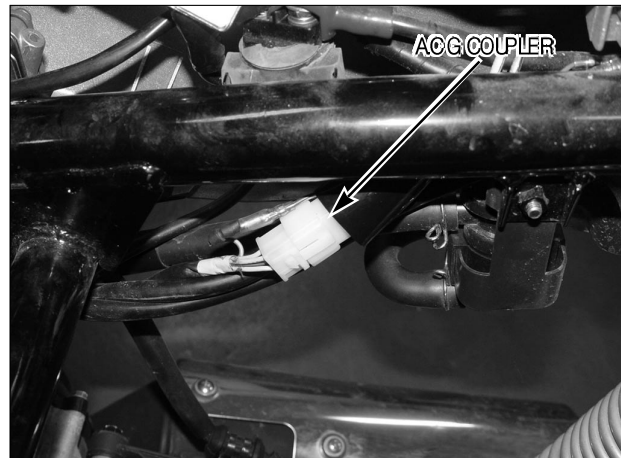
- Remove the cooling fan cover.
- It could be possible to remove the upper hood, and low hood when disassemble the engine.



A.C GENERATOR

REMOVAL

- ① Remove the cooling fan cover.
- ② Loosen the 4 cooling fan bolts.
- ③ Remove the A.C.G wiring coupler and connector connected to the wire harness.
- ④ Remove the A.C.G wiring from the A.C.G wiring setting clamp securing the engine and frame.



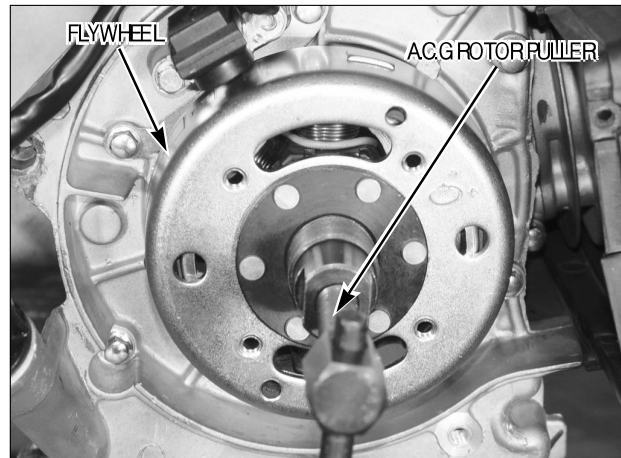
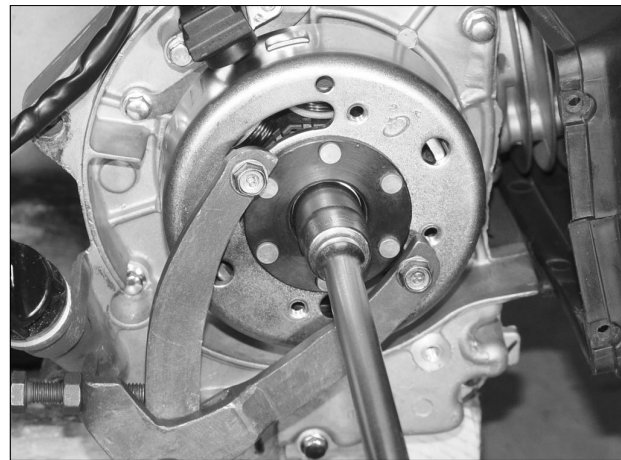
DISASSEMBLY

- Install the universal holder on the flywheel.
- If the universal holder cannot be used, remove the LH. crankcase cover at the left side of the crankshaft, and hold the drive face with the drive face holder.
- Loosen the flange nut securing the fly wheel, and remove the flywheel using the A.C.G rotor puller.

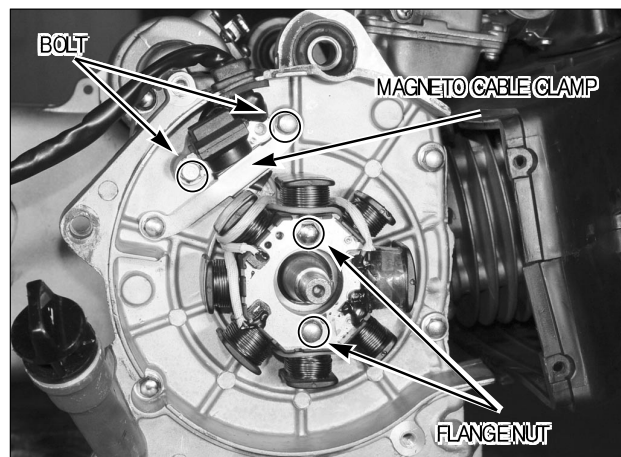
CAUTION

- Insert the puller shaft and remove the flywheel after inserting the A.C.G rotor puller and securing it with spanner.
- The flywheel may easily removed if you rotate the puller while tapping the roller shaft with metal hammer.
- Always use a holder and a puller to remove the flywheel. Do not try to remove the flywheel by hammering directly on it. The crankshaft or components could be damaged.
- After removing the flywheel, check the woodruff key for damage and wear.

**TOOLS : A.C.G ROTOR PULLER
UNIVERSAL HOLDER
DRIVE FACE HOLDER**



- Loosen the bolt securing the magneto cable clamp.
- Loosen the 2 stator fixing flange bolt and remove the stator.
- Loosen the 2 bolts securing pulse generator and remove the pulse generator.



A.C GENERATOR / STARTER CLUTCH

A.C GENERATOR INSTALLTION

- Install the stator to the RH. crankcase cover.
- Clean the tapered portion of the crankshaft.
- Clean the inside part of the flywheel.
- Check the woodruff key, install the flywheel by aligning the groove with the woodruff key.
- Temporarily install the flywheel nut, hold the flywheel with the universal holder, and tighten the flywheel nut with the specified torque.

TORQUE VALUE : 5.0 - 6.0 kgf · m

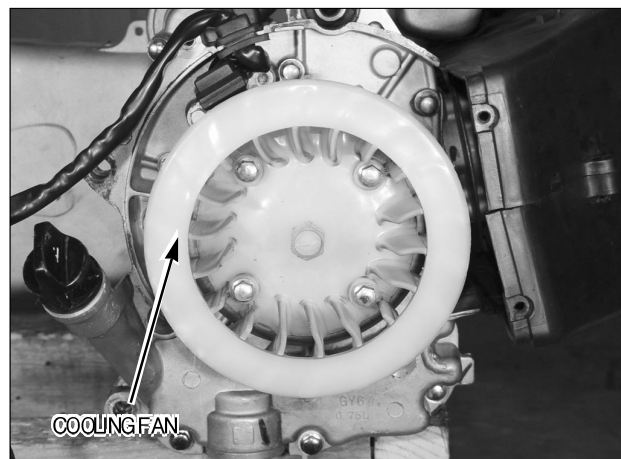
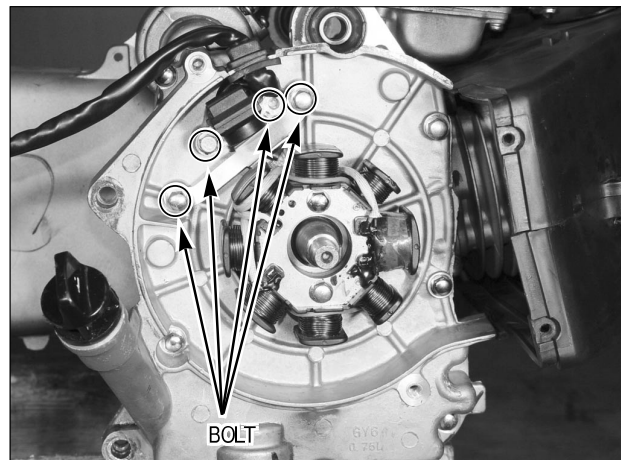
TOOL : UNIVERSAL HOLDER

- If the universal holder cannot be used, remove the LH. crankcase cover and hold the drive face with the drive face holder.

TORQUE VALUE : 0.8 - 1.2 kgf · m

TOOL : DRIVE FACE HOLDER

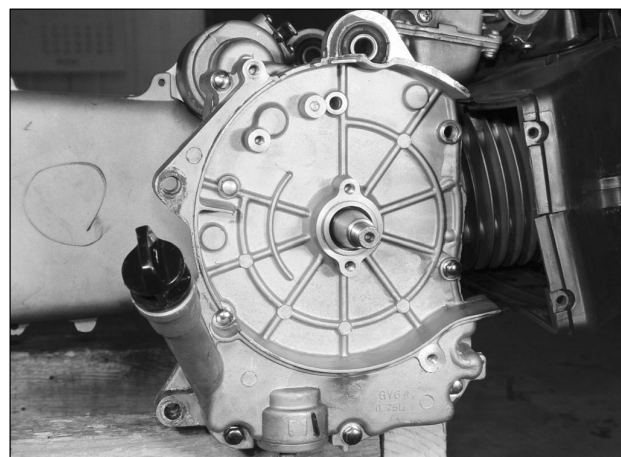
- Install the cooling fan .
- Connect the A.C.G wiring coupler and connector to the wire harness, and install the wiring with the clamp.
- Install the muffler.



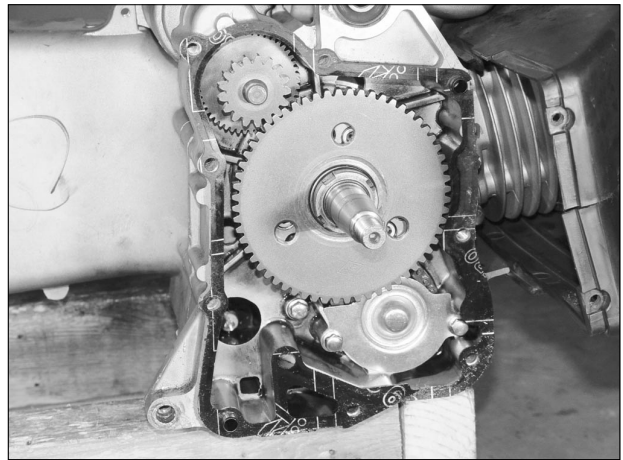
RH. CRANKCASE COVER

REMOVAL

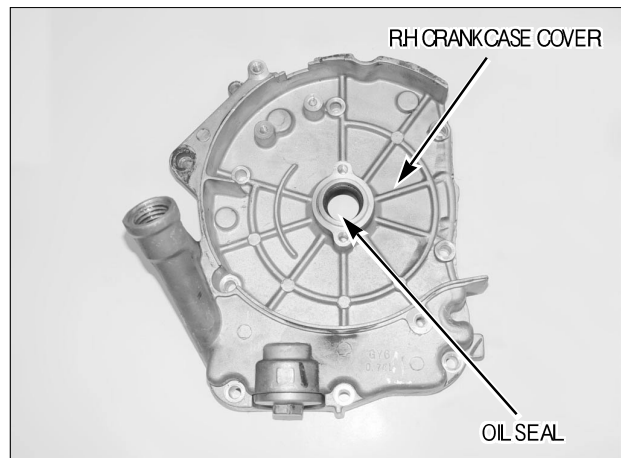
- Remove the following parts.
 - EX. muffler
 - Cooling fan cover
 - Cooling fan
 - A.C Generator
- Loosen the crankcase cover setting bolt.
- Remove the RH. crank case cover.



- Remove the gasket and dowel pin.



- Remove the RH. crankcase cover oil seal.
- Check the oil seal for wear or damage and replace with a new one as necessary.



STARTER REDUCTION GEAR REMOVAL

- Remove the RH. crankcase cover.
- Remove the starting clutch.
- Remove the starter reduction gear and shaft.



INSPECTION

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

SERVICE LIMIT : 9.08 mm

- Measure the outer diameter of the gear shaft.

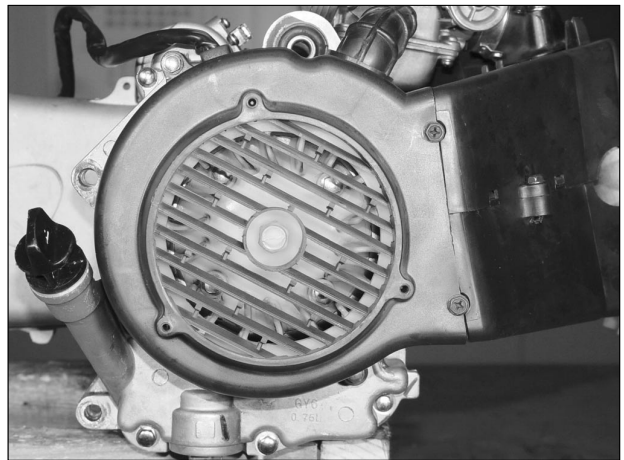
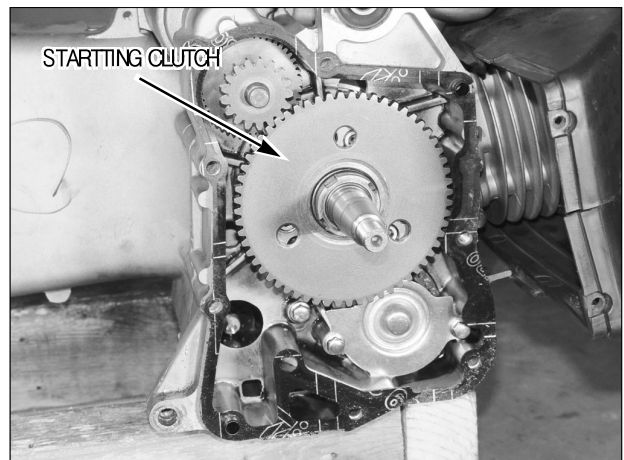
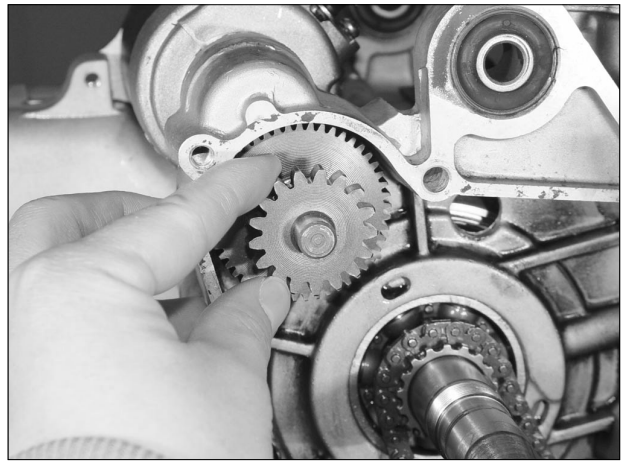
SERVICE LIMIT : 8.95 mm



A.C GENERATOR / STARTER CLUTCH

STARTER REDUCTION GEAR INSTALLATION

- Install the starter reduction gear and shaft.
 - Install the starting clutch.
-
- Remove the gasket residues from the RH. crankcase.
 - Install a new gasket and dowel pin.
 - Tighten the RH. crankcase cover with setting bolts.
 - Install the following parts.
 - A.C.Generator.
 - Cooling fan.
 - Cooling fan cover.
 - EX. muffler.



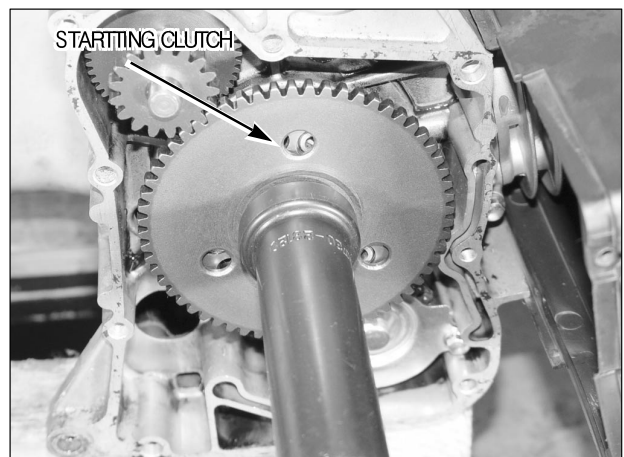
STARTER CLUTCH

REMOVAL

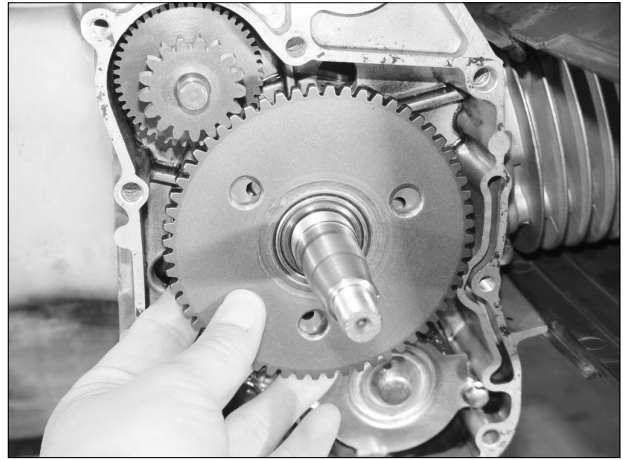
- Remove the following parts.
 - Muffler
 - Cooling fan cover
 - Cooling fan
 - A.C Generator
 - RH. crankcase cover
- Loosen the starter clutch lock nut with a special socket.

TORQUE VALUE : 5.5 kgf · m

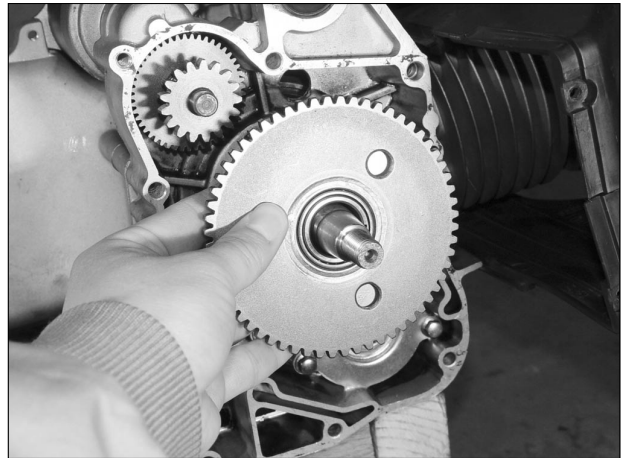
**TOOLS : SPECIAL SOCKET (12.7x28x120)
DRIVE FACE HOLDER**



- Remove the washer.
- Remove the starter clutch.



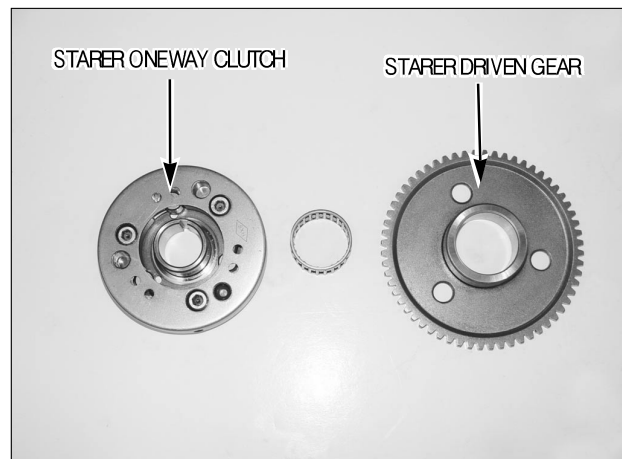
- Check the starter clutch for proper operation.



STARTER CLUTCH INSPECTION

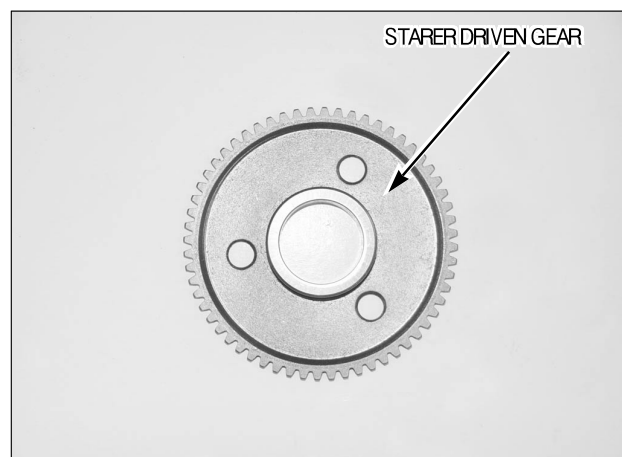
- Remove the starter driven gear, needle bearing and starter oneway clutch set from the starter clutch assembly.
- Measure the outer diameter of the start clutch oneway set.

SERVICE LIMIT : 29.7 mm



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

SERVICE LIMIT : 32.10 mm



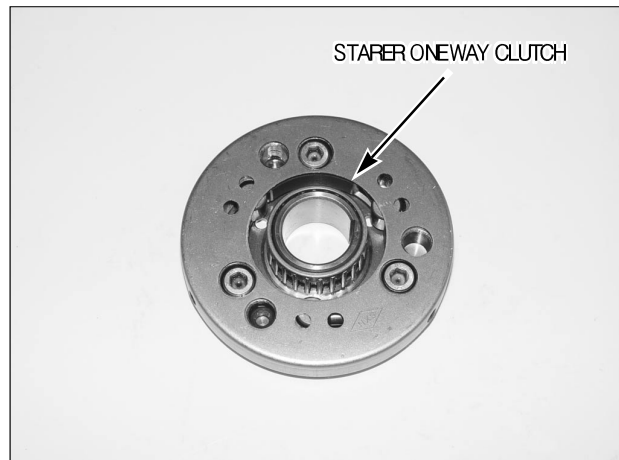
A.C GENERATOR / STARTER CLUTCH

STARTER CLUTCH INSTALLATION

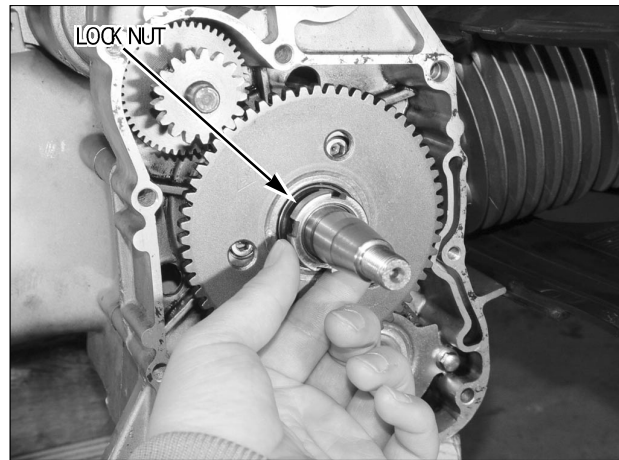
- Install the starter oneway clutch set, starter driven gear and needle bearing to the starter clutch assembly.
- Install the starter clutch to the RH. crankshaft.

NOTE

- When installing the starter clutch, match it with the groove accurately



- Install the thrust washer.
- Temporarily install the starter clutch lock nut.



- Hold the drive face with the drive face holder.
- Tighten the starter clutch lock nut with a special socket.

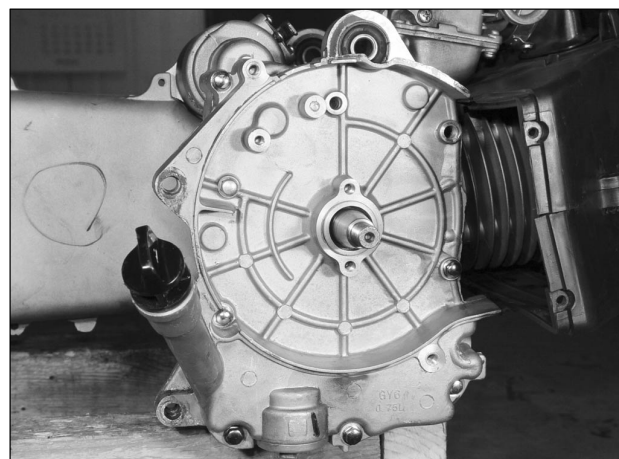
NOTE

- Tighten the lock nut with specified torque.

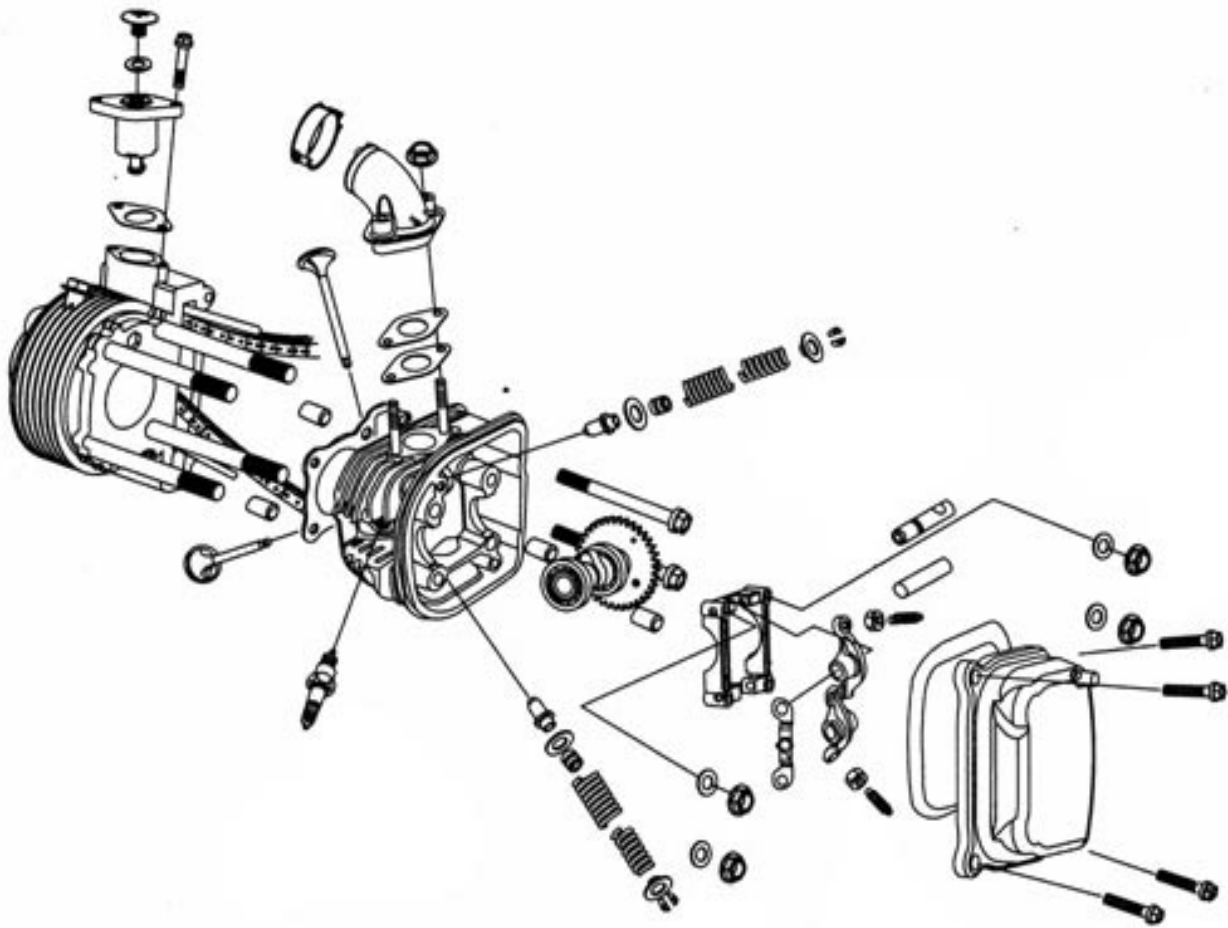
TORQUE VALUE : 5.5 kgf · m

TOOLS : SPECIAL SOCKET (12.7x28x120)
DRIVE FACE HOLDER

- Install the following parts.
 - RH. crankcase cover
 - A.C Generator
 - Cooling fan
 - Cooling fan cover
 - EX. muffler (⇒4-3)



MEMO



9. CYLINDER HEAD / VALVES

SERVICE INFORMATION	9-1	VALVES	9-6
TROUBLESHOOTING	9-2	VALVE GUIDES	9-7
CAMSHAFT	9-3	VALVE SEATS	9-8
CYLINDER HEAD	9-5	CYLINDER HEAD ASSEMBLY	9-12
VALVE SPRINGS	9-6	CAMSHAFT ASSEMBLY	9-13

SERVICE INFORMATION

GENERAL SAFETY

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

SPECIFICATIONS

Unit : mm

9

ITEM			STANDARD VALUE	SERVICE LIMIT
ROCKER ARM	ROCKER ARM INNER DIAMETER		10.000 - 10.015	10.10
	ROCKER ARM SHAFT OUTER DIAMETER		9.972 - 9.987	9.91
CAMSHAFT	CAM HEIGHT	IN	25.965	25.57
		EX	25.810	25.41
	CAMSHAFT OUTER DIAMETER		15.005 - 15.018	15.040
CYLINDER HEAD WARPAGE			-	0.05
VALVE VALVE GUIDE	VALVE SPRING FREE LENGTH	IN,EX	31.2/34.1	30.2/33.1
	VALVE STEM OUTER DIAMETER	IN	4.975 - 4.990	4.900
		EX	4.955 - 4.970	4.900
	VALVE GUIDE INNER DIAMETER	IN,EX	5.000 - 5.012	5.030
	CLEARANCE BETWEEN STEM AND GUIDE	IN	0.010 - 0.037	0.080
		EX	0.030 - 0.057	0.100
VALVE SEAT WIDTH			1.0	1.8

TORQUE VALUES

CAM CHAIN TENSIONER PIVOT BOLT	1.0 kgf · m
SPARK PLUG	1.2 kgf · m
CAMSHAFT HOLDER 8mm NUT	2.9 kgf · m
CAM CHAIN TENSIONER MOUNTING BOLT	1.2 kgf · m
CAM CHAIN TENSIONER SEALING SCREW	0.4 kgf · m
CYLINDER HEAD COVER BOLT	0.9 kgf · m
CYLINDER HEAD BOLT	1.1 kgf · m
TAPPET ADJUST NUT	1.1 kgf · m

TOOLS

VALVE GUIDE REAMER
VALVE GUIDE DRIVER
VALVE SPRING COMPRESSOR
VALVE SEAT CUTTER
SEAT CUTTER IN 37° (21.5mm)
EX 37° (18.5mm)
IN 45° (22.0mm)
EX 45° (22.0mm)
IN 55° (20.0mm)
EX 55° (20.0mm)

TROUBLESHOOTING

Enging top-end problems useally affect engine performance. These can be diagnosed by a compression or leak down test, or by tracing noises to the top-end with a sounding rod or stethoscope.

Low comperssion

- Valves
 - Incorrect valve adjustment (see section 3)
 - Burned or bent valves
 - Incorrect valve timing
 - Broken valve spring
 - Uneven valve seating
- Cylinder head
 - Leaking or damage head gasket
 - Warped or cracked cylinder head
- Cylinder, piston (see section 10)

Excessive white smoke

- Worn valve guide or valve stem
- Damaged valve stem seal
- Worn or damaged piston ring

Rough idle

- Low cylinder compression

Compression too high

- Excessive carbon build-up on piston or combustion chamber

Excessive noise

- Incorrect valve adjustment
- Sticking valve or broken valve spring
- Damaged or worn camshaft
- Worn rocker arm and / or shaft
- Loose or worn cam chain
- Worn or damaged cam chain tensioner
- Damaged cylinder head gasket
- Incorrect spark plug installation

CAMSHAFT

REMOVAL

- Remove the luggage box.
- Remove the center cover.
- Loosen the cylinder head cover bolts, remove the cover.

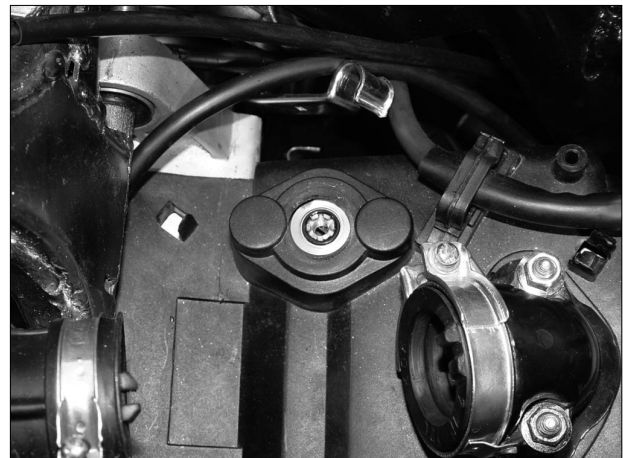
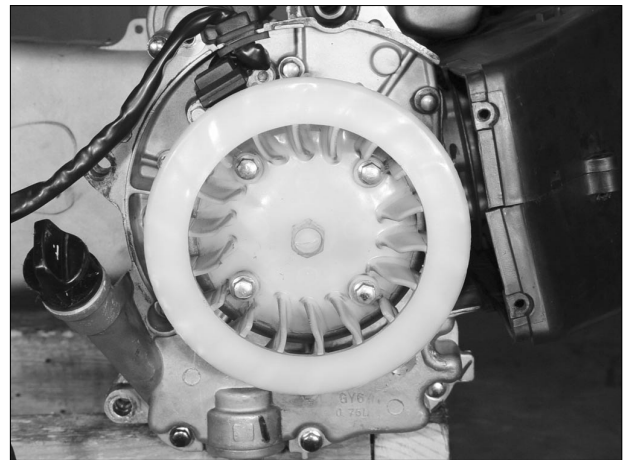
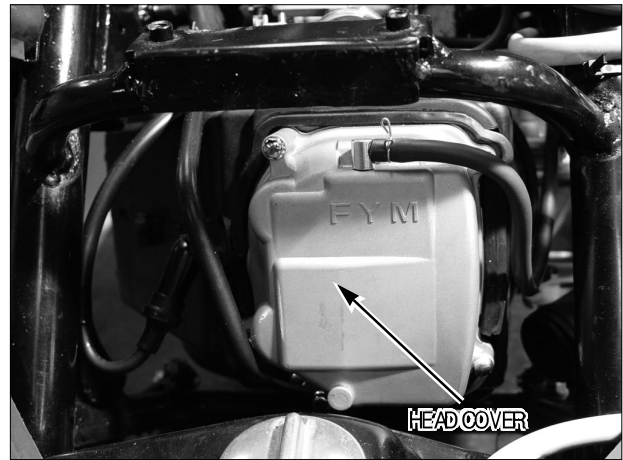
NOTE

- The camshaft can be maintained without removing the engine.

- Turn the crankshaft to the left, and align the "T" mark of the flywheel with the index mark of the RH. crankcase cover.
- Verify that the piston is located at the top dead center. (Make all camshaft lobes face downward.)
- If all camshaft lobes face upward, rotate the crankshaft to the left for 1 turn (360°), and align the "T" mark with the index mark once again.

- Loosen the pan screw of the cam chain, remove the tensioner flange bolts and tensioner lifter.

- Loosen the 4 camshaft holder 8mm nuts.
- Remove the camshaft holder from the cylinder head.



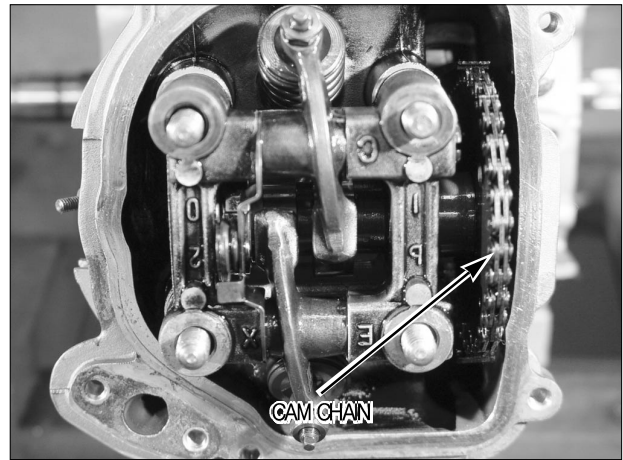
CYLINDER HEAD / VALVES

- Remove the cam chain from the camshaft.

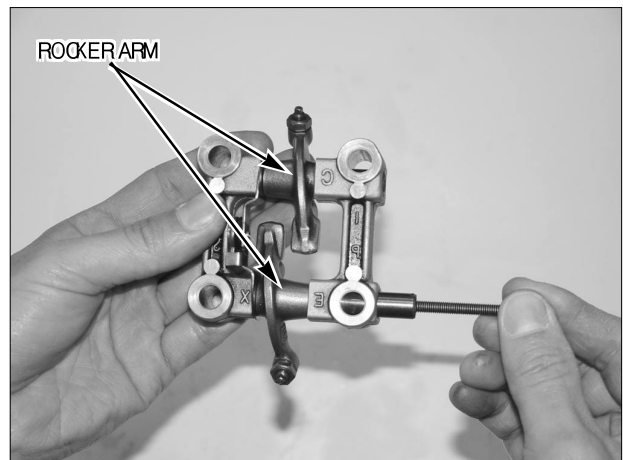
NOTE

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

- Remove the camshaft.



- Insert the 5mm bolt into the rocker arm shaft, and pulling bolts to remove the rocker arm shaft.
- Remove the rocker arm.
- Remove the other side rocker arm shaft and rocker arm in the same sequence.



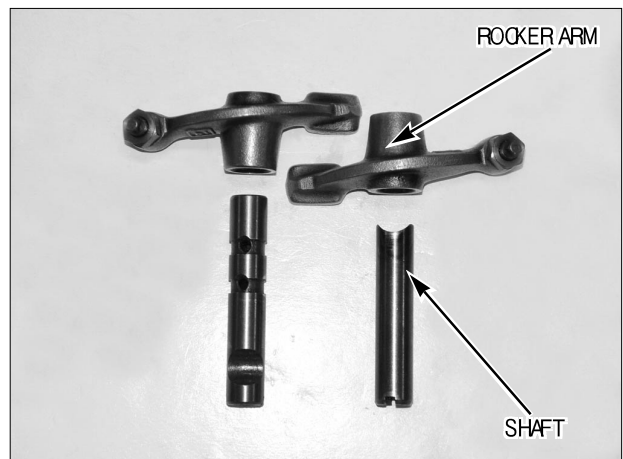
CAMSHAFT INSPECTION

- Check the rocker arm and rocker arm shaft for wear or damage.
- Measure the inner diameter of the rocker arm.

SERVICE LIMIT : 10.10 mm

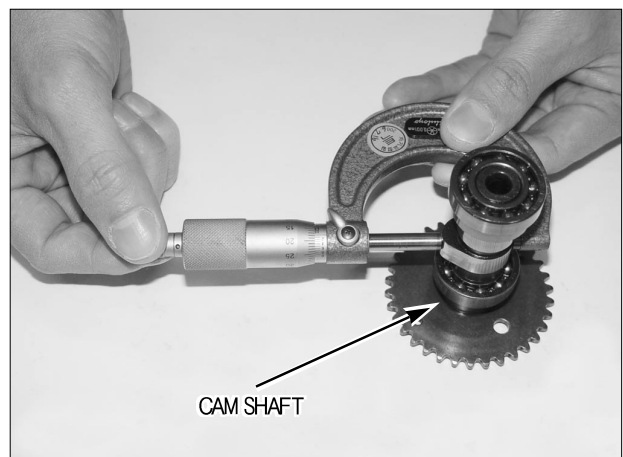
- Measure the outer diameter of the rocker arm shaft.

SERVICE LIMIT : 9.91 mm



- Check the cam lobes of the camshaft for wear or damage.
- Measure the height of the cam lobe.

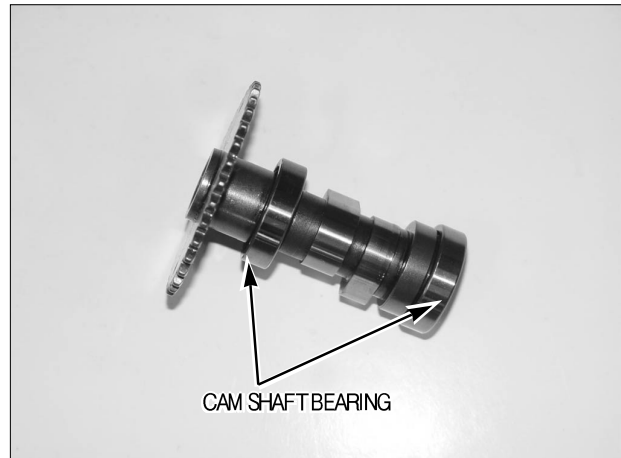
**SERVICE LIMIT : IN : 25.57 mm
EX: 25.41 mm**



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

CAUTION

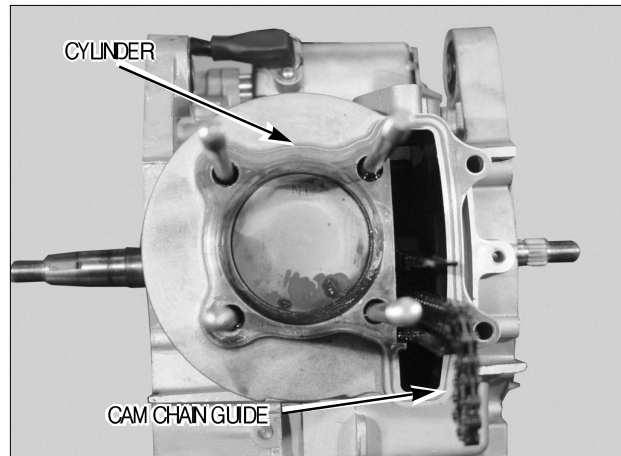
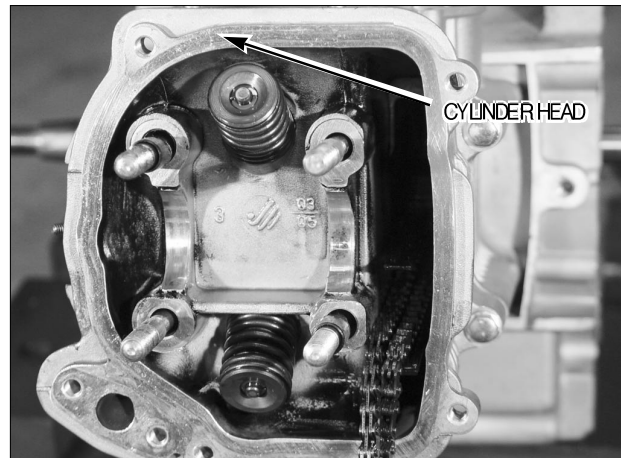
- Be sure to check the valve clearance.



CYLINDER HEAD

REMOVAL

- Luggage box.
 - Body cover
 - Engine from the frame.
 - Carburetor
 - Cylinder head cover
- Shroud comp (upper, under)
 - Cam shaft
 - SAI pipe
 - Cylinder head
- The cylinder head gasket, dowel pin and cam chain guide from the cylinder.



DISASSEMBLY

- Remove the spark plug from the cylinder head.



CYLINDER HEAD / VALVES

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

TOOL : VALVE SPRING COMPRESSOR

NOTE

- To prevent the loss of tension, do not compress the valve spring more than necessary.
- Mark the disassembled parts so that they can be reassembled into the original position later.

- Remove the valve spring seat and valve stem seal. Remove carbon deposits from the inside of the combustion chamber.

CYLINDER HEAD INSPECTION

- Remove gasket marks from the cylinder head gasket.

NOTE

- Take precautions not to damage the cylinder head gasket attachment.

- Check the spark plug assembling hole and the valve seat for cracks.
- Using a square and a feeler gauge, check the cylinder head distortion.

SERVICE LIMIT : 0.05 mm

VALVE SPRINGS

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

**SERVICE LIMIT : A : 30.2 mm
B : 33.1 mm**

NOTE

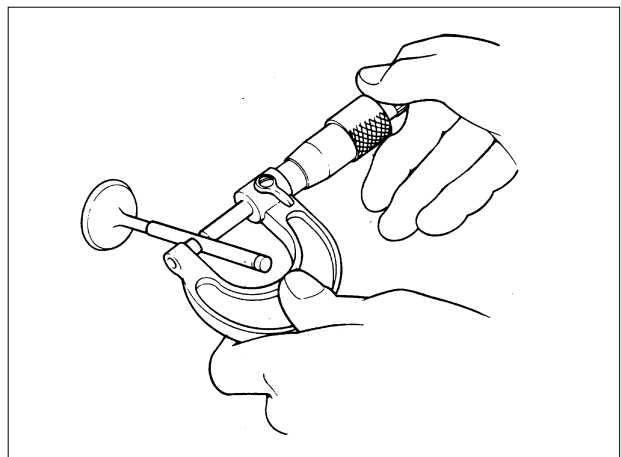
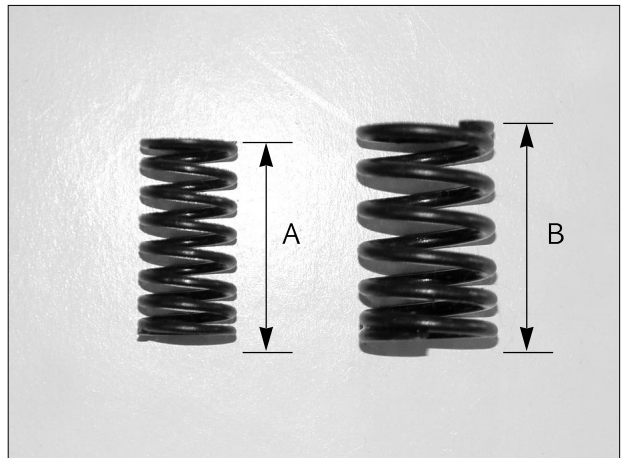
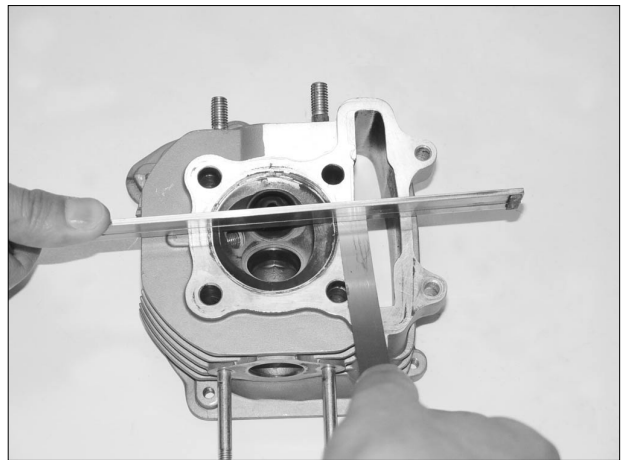
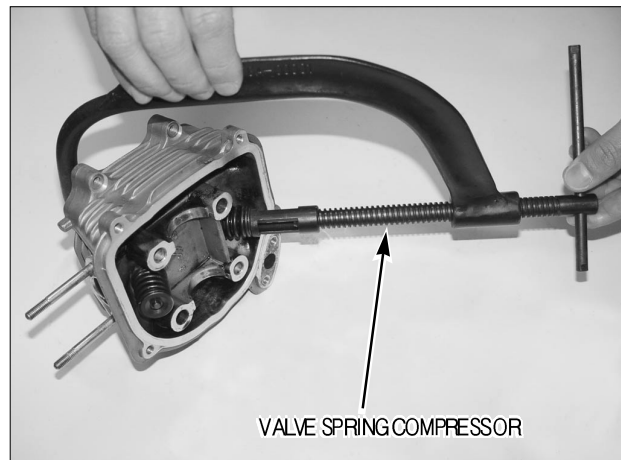
- Replace the valve spring with new one if the length of any one is less than the service limit.

VALVES

- Inspect each valve for bending, burning, scratches or abnormal wear.
- Insert the valves in their original positions in the cylinder head. Check that each valve moves up and down smoothly, without binding.
- Measure and record the valve stem outer diameter in three places along the valve guide sliding area.

**SERVICE LIMIT : IN : 4.90 mm
EX: 4.90 mm**

- Replace the valve with a new one if the service limit is exceeded.



VALVE GUIDES

INSPECTION

- Insert the valve guide reamer from the combustion chamber side and ream the guide to remove any carbon build-up before measuring the guide.

NOTE

- Take care not to tilt or lean the reamer in the guide while reaming.
Otherwise, the valve is installed slanted, that causes oil leaks from the stem seal and improper valve seat contact and results in the valve seat refacing not able to be performed.
- Rotate the reamer clockwise, never counterclockwise when inserting and removing.

TOOL : VALVE GUIDE REAMER

- Measure and record each valve guide inner diameter.

SERVICE LIMIT : 5.030 mm

- Measure the guide-to-stem clearance with a dial indicator while rocking the stem in the direction of normal thrust.

SERVICE LIMIT : IN : 0.080 mm EX: 0.100 mm

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

REPLACEMENT

NOTE

- Refinish the valve seats whenever the valve guides are replaced to prevent uneven seating.

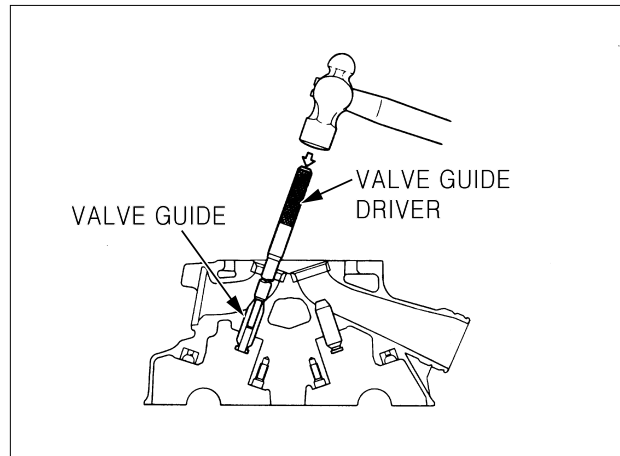
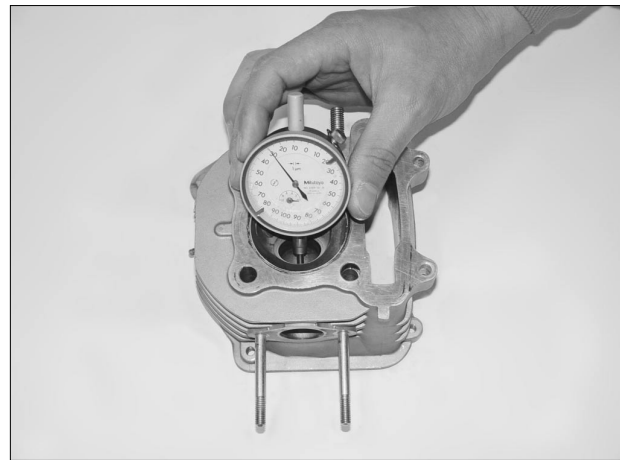
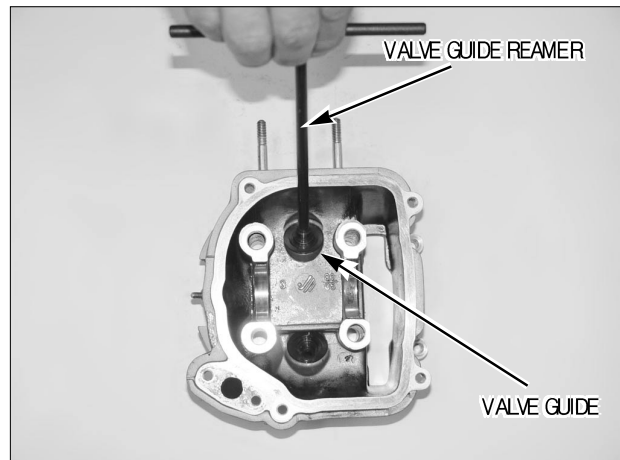
- Heat the cylinder head to 130°C - 140°C (275°F - 290°F).
- Do not heat the cylinder head beyond 150°C (300°F).
- Use temperature indicator sticks, available from welding supply stores, to be sure the cylinder head is heated to the proper temperature.

CAUTION

- Using a torch to heat the cylinder head may cause warping.

WARNING

- Wear insulated gloves to avoid burns when handling the heated cylinder head.



CYLINDER HEAD / VALVES

- Support the cylinder head and drive the old guides out of the combustion chamber side of the cylinder head.

TOOL : VALVE GUIDE DRIVER

CAUTION

- Avoid damaging the head when driving the valve guide out.

- Apply oil to a new O-ring and install it onto a new valve guide.
- Drive the new guide in from the camshaft side of the cylinder head while the cylinder head is still heated.

TOOL : VALVE GUIDE DRIVER

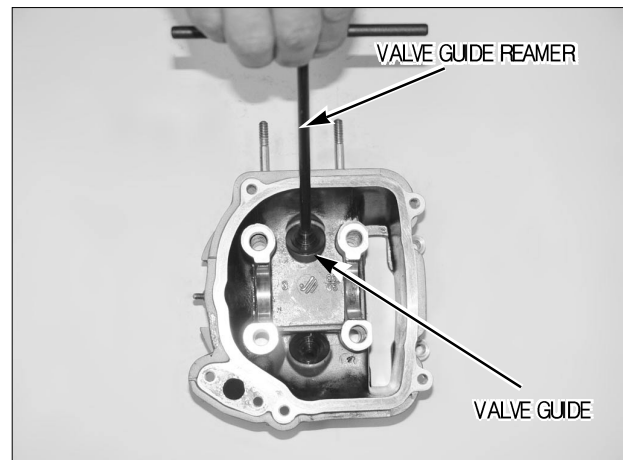
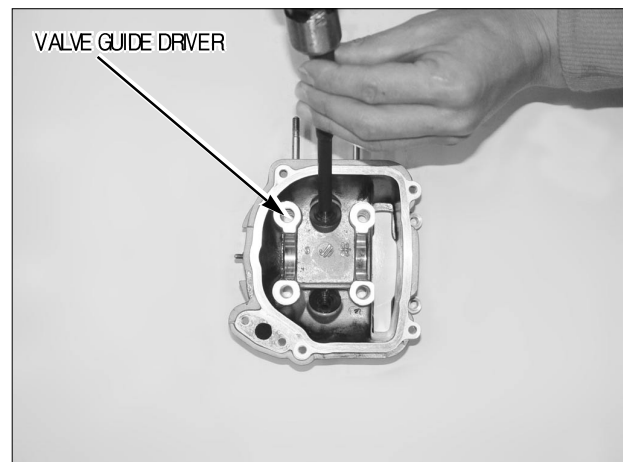
- When reaming new valve guides, insert the valve guide reamer from the combustion chamber side.

NOTE

- Take care not to tilt or lean the reamer in the guide while reaming. Otherwise, the valve is installed slanted, that causes oil leaks from the stem seal and improper valve seat contact and results in the valve seat refacing not able to be performed.
- Use cutting oil on the reamer during this operation
- Rotate the reamer clockwise, never counterclockwise when inserting and removing.

TOOL : VALVE GUIDE DRIVER

- Reface the valve seats and clean the cylinder head thoroughly to remove any metal particles.



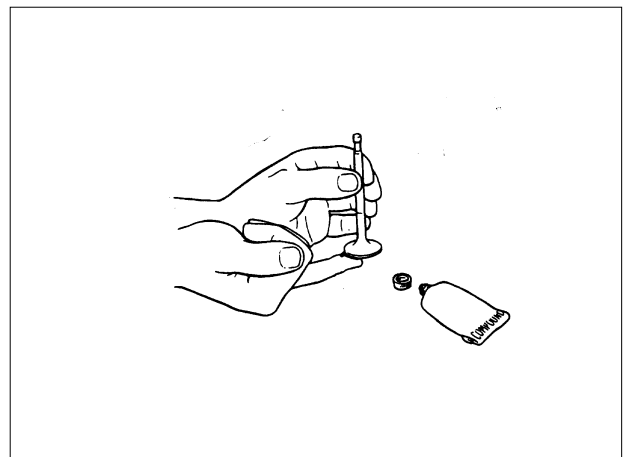
VALVE SEATS

INSPECTION

- Clean all intake and exhaust valves thoroughly to remove carbon deposits.
- Apply a light coating of Prussian Blue to each valve face.

NOTE

- Tap the valve against the valve seat several times with the valve guide reamer, without rotating the valve, to check for proper valve seat contact.



- Remove the valve and inspect the valve seat face.
- The valve seat contact should be within the specified width and evenly all around the circumference.
If the valve seat width is not within specification, reface the valve seat.

NOTE

- Valve faces and stem tips cannot be ground. If a valve face or stem tip is rough, worn unevenly, or contacts the seat improperly, the valve must be replaced.

- Measure the valve seat width.

STANDARD VALUE : 0.8 -1.0 mm

SERVICE LIMIT : 1.4 mm

VALVE SEAT REFACING

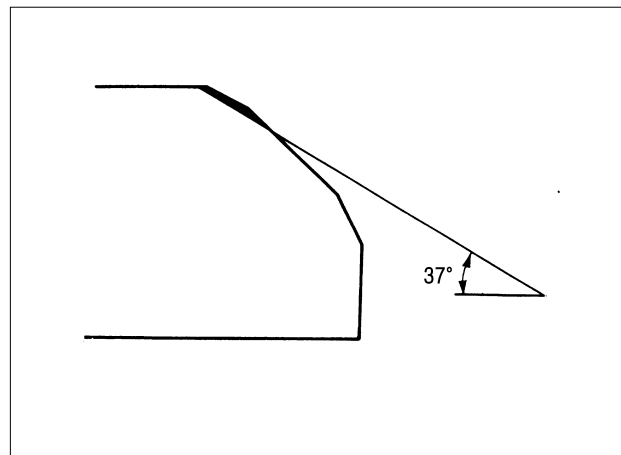
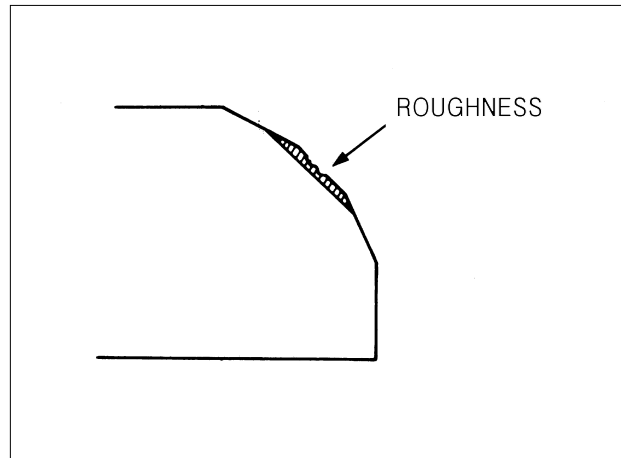
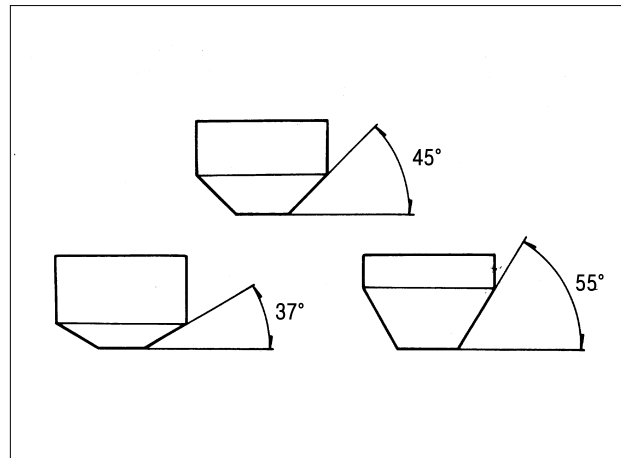
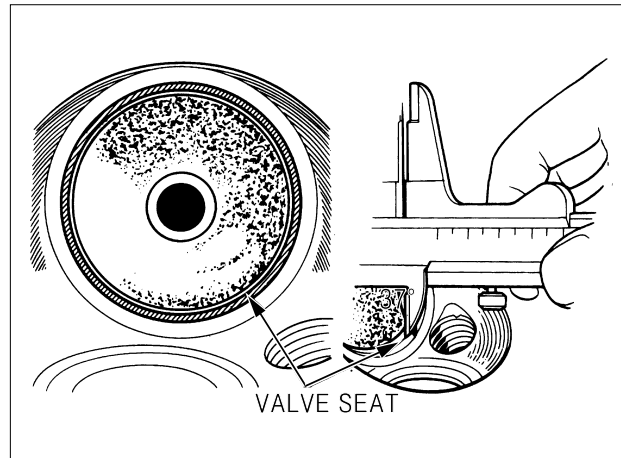
- Reface the worn valve seat by using valve seat cutters and grinders.

NOTE

- Follow the refacer manufacturer's operating instructions.
- Reface the valve seat whenever the valve guide has been replaced.
- Be careful not to grind the seat more than necessary.

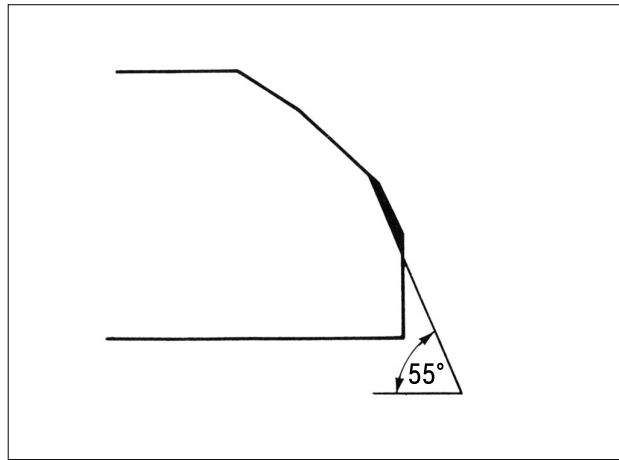
- Using a 45 degree cutter, remove any roughness or irregularities from the seat.

- Using a 37 degree cutter, remove $\frac{1}{4}$ of the existing valve seat material.

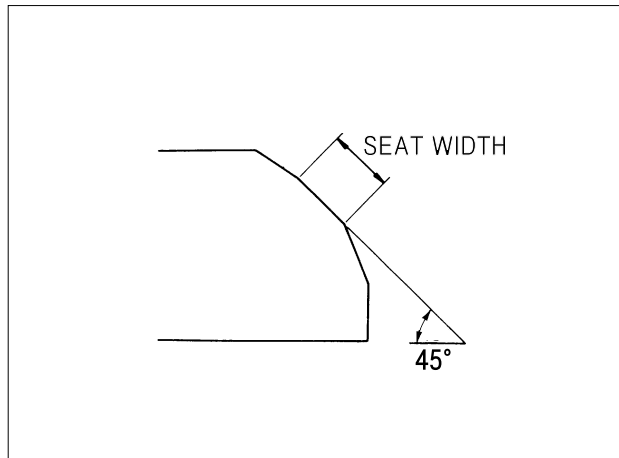


CYLINDER HEAD / VALVES

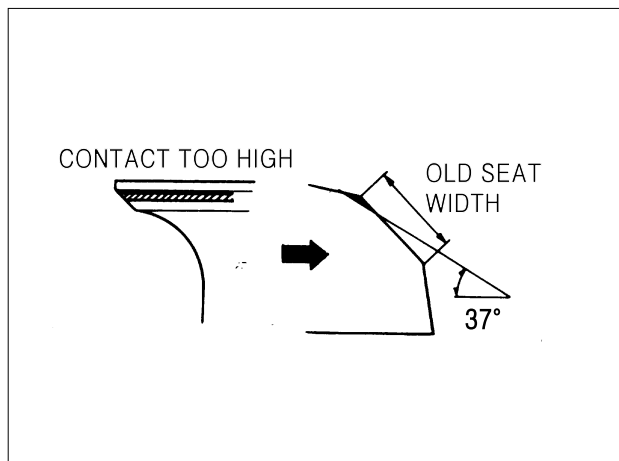
- Using a 55 degree cutter, remove the bottom ¼ of the old seat.



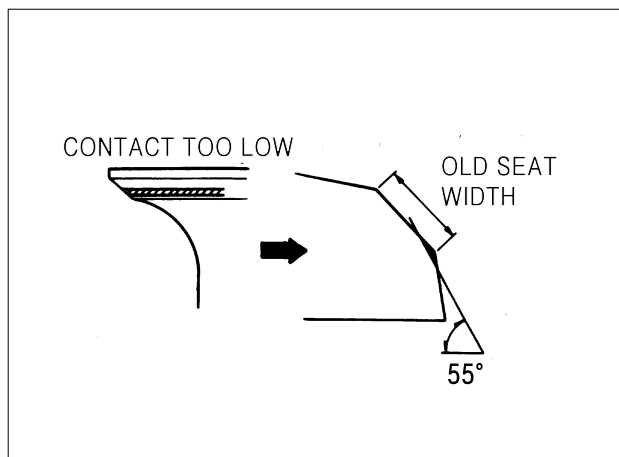
- Using a 45 degree cutter, cut the seat to the proper width.



- If the contact area is too high on the valve, the seat must be lowered using a 37 degree flat cutter. Refinish the seat to specifications, using a 45 degree finish cutter.



- If the contact area is too low on the valve, the seat must be raised using a 55 degree inner cutter. Refinish the seat to specifications, using a 45 degree finish cutter.



- After cutting the valve seat, apply lapping compound to the valve face, and insert the valve with a valve guide reamer.

NOTE

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

IN,EX VALVE

- Install new stem seals.

NOTE

- Replace the stem seals with new ones whenever a stem seal is removed.

- Lubricate each valve stem with molybdenum disulfide grease and insert the valve into the valve guide.

CAUTION

- Turning a valve too fast can damage the stem seals.

- Install the spring seats, valve springs and retainers.

NOTE

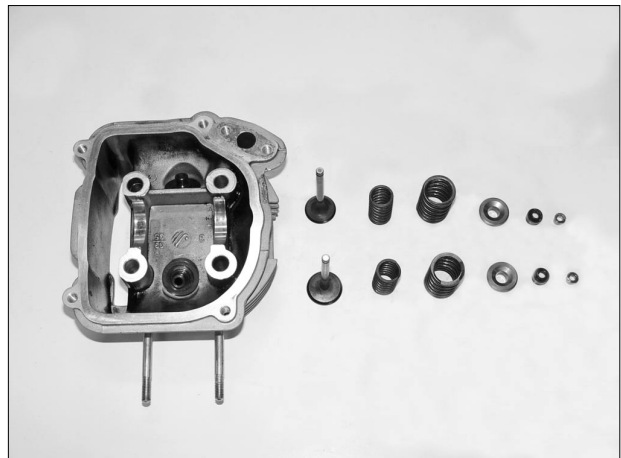
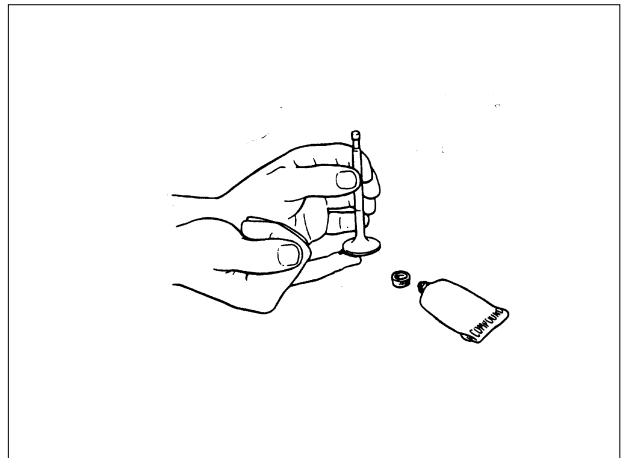
- For valve spring with varying pitch, install the valve springs with the narrow pitch end facing down.

- Compress the valve springs with the valve spring compressor and install the valve cotters.

CAUTION

- Compressing the valve spring more than necessary when installing the valve cotters may cause loss of valve spring tension.

TOOL : VALVE SPRING COMPRESSOR

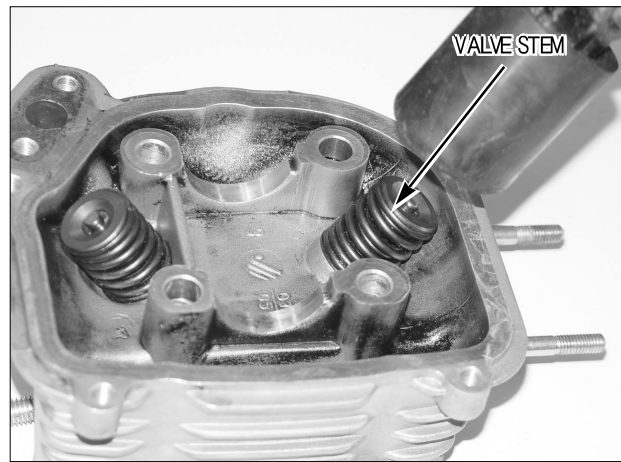


CYLINDER HEAD / VALVES

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

CAUTION

- Take necessary precautions not to damage the valve.



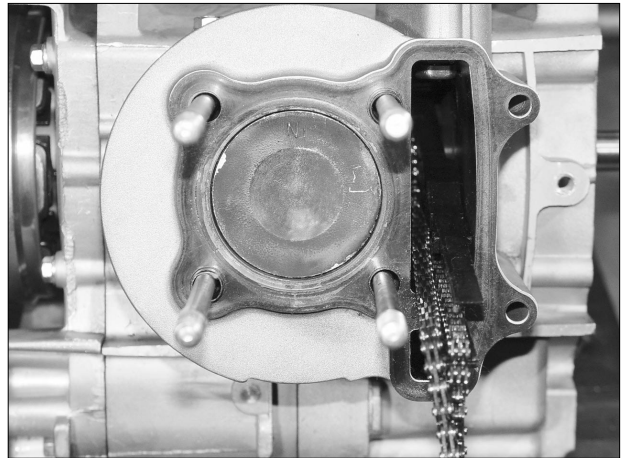
- Install the spark plug.

TORQUE : 1.2 kgf · m



CYLINDER HEAD ASSEMBLY

- Clean any gasket material from the cylinder mating surface.
- Install the cam chain guide to the cylinder.
- Install the dowel pins and new gasket.



- Install the cylinder head.

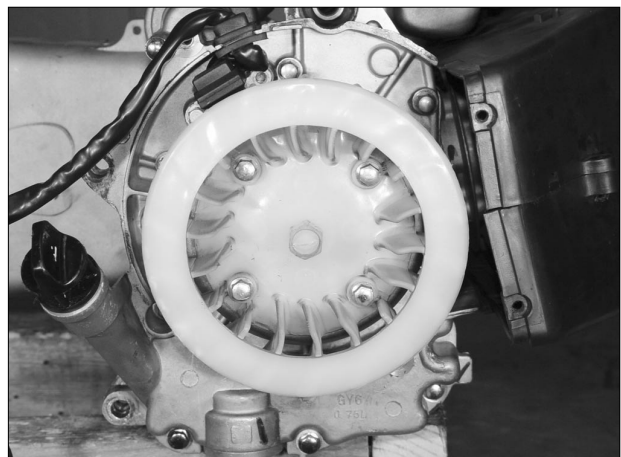
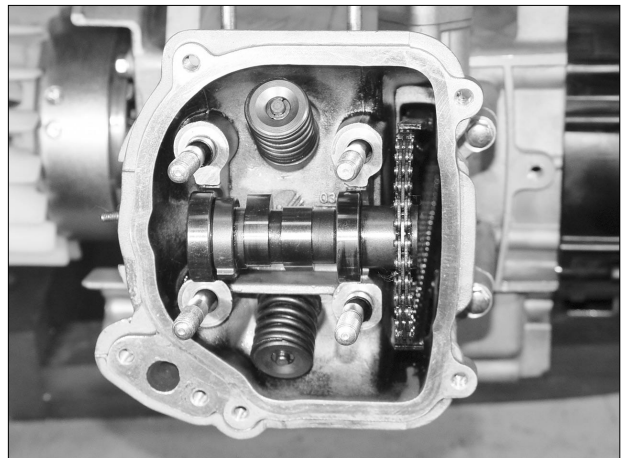
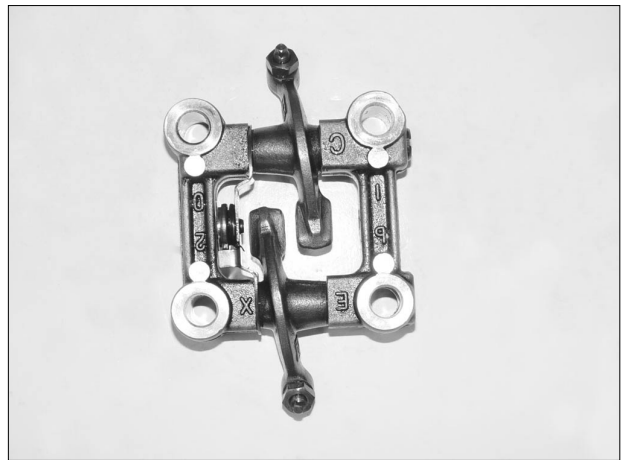
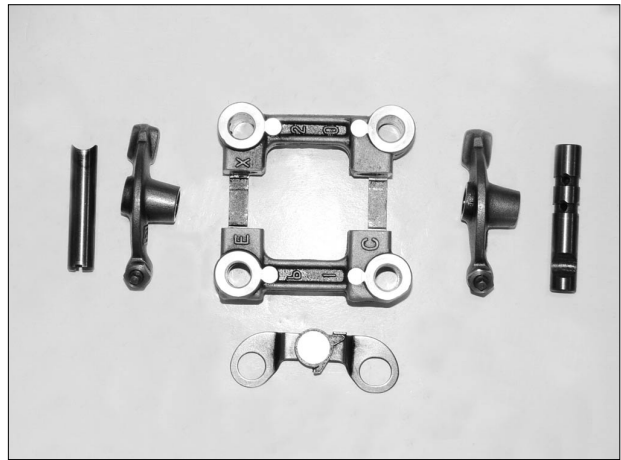


CAMSHAFT ASSEMBLY

- Apply engine oil to the rocker arm shaft, and assemble the rocker arm to the camshaft holder.
- Tighten the rocker arm shaft with 5mm bolts, and align the bolt hole of the camshaft holder with the fitting side of the rocker arm shaft.
- Check the camshaft assembly for abnormal condition, and place it on the cylinder head.
- Put the cam chain on the cam sprocket.
- Slowly rotate the crankshaft counterclockwise, and align the "T" mark of the flywheel with the index mark of the RH. crank case cover.

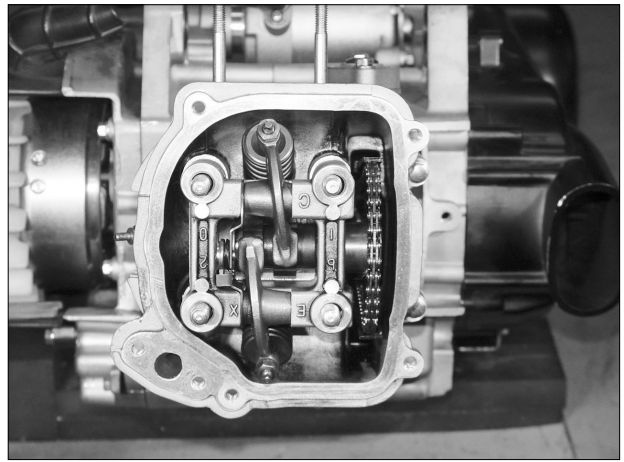
CAUTION

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



CYLINDER HEAD / VALVES

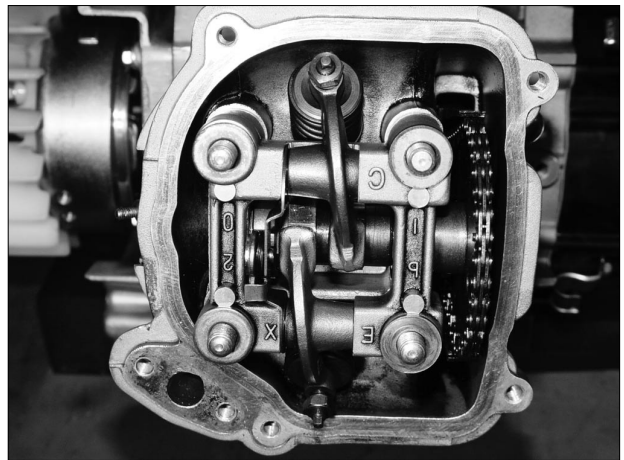
- Apply engine oil to the camshaft, and install it on the cylinder head with the cam thread facing downward.
- Assemble the cam chain and cam sprocket after matching the cam sprocket timing mark in parallel with the top of the cylinder head.



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

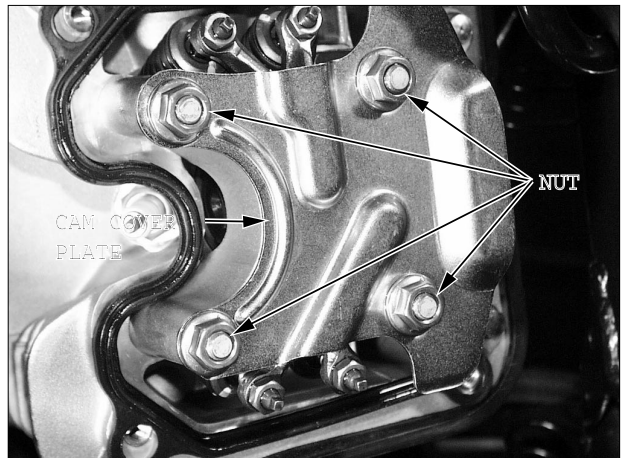
CAUTION

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



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

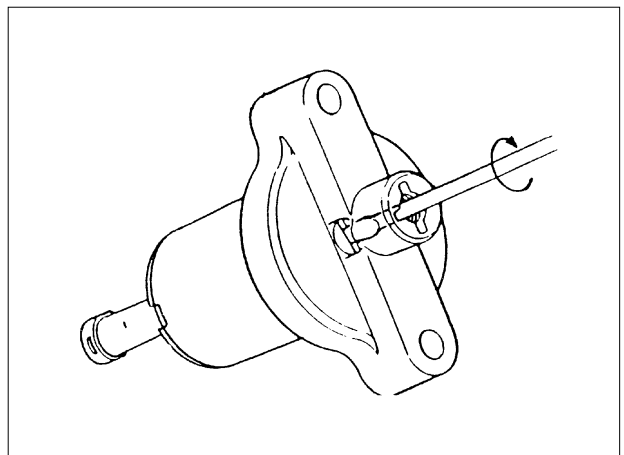
TORQUE VALUE : 2.9 kgf · m



- Remove the pan screws and seals from the cam chain tensioner lifter.
- Rotate the tensioner shaft clockwise with a small driver, and insert the shaft into the body completely.

CAUTION

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



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

TORQUE VALUE : 1.2 kgf · m

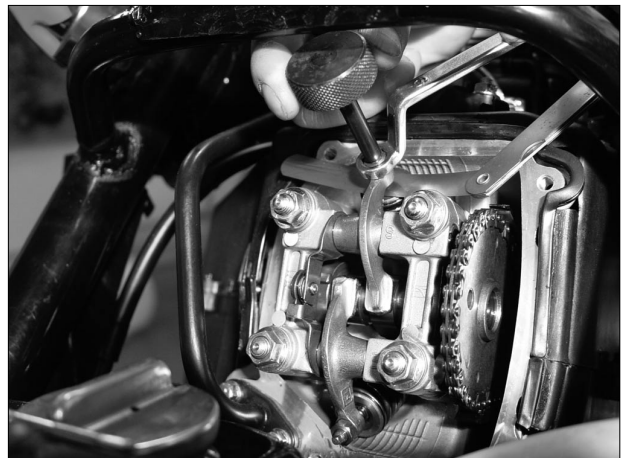


- Remove the tensioner shaft clip from the tensioner lifter. Assemble the O-ring and pan screws to the tensioner lifter.

TORQUE VALUE : 0.4 kgf · m



- Fill clean engine oil into the operating parts of the cylinder head.
- Adjust the valve clearance.
- Remove oil from the cylinder head cover grooves, and accurately assemble the gasket to the cover.



- Install the cylinder head cover.
- Tighten the cylinder head cover bolts.

TORQUE VALUE : 0.9 kgf · m

- Shroud comp.
- Install the carburetor.
- Install the engine to the frame.



10. CYLINDER / PISTON

SERVICE INFORMATION . . . 10-1
TROUBLE SHOOTING . . . 10-1
CYLINDER 10-2

PISTON / PISTON RING . . 10-3
CYLINDER INSTALLATION . 10-6

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

Unit : mm

ITEM			STANDARD VALUE	SERVICE LIMIT
CYLINDER	INNER DIAMETER		52.400-52.410 mm	52.500 mm
	TAPER		-	0.050 mm
	OUT-OF-ROUND		-	0.005 mm
	HEAD CONTACT WARPAGE		-	0.05 mm
PISTON, PISTON PIN, PISTON RING	PISTON SKIRT OUTER DIAMETER		52.370-52.390 mm	52.30 mm
	PISTON PIN HOLE INNER DIAMETER		15.002-15.008 mm	15.040 mm
	PISTON PIN OUTER DIAMETER		14.996-15.000 mm	14.960 mm
	PISTON-TO-PISTON PIN CLEARANCE		0.002-0.014 mm	0.105 mm
	PISTON RING-TO-GROOVE CLEARANCE	TOP	0.03-0.07 mm	0.095 mm
		SECOND	0.02-0.06 mm	0.050 mm
	PISTON RING JOINT GAP	TOP / SECOND	0.15-0.30 mm	0.50 mm
		OIL RING (SIDE RAIL)	0.20-0.70 mm	-
CYLINDER-TO-PISTON CLEARANCE			0.015-0.045 mm	0.105 mm
CONNECTING ROD SMALL END INNER DIAMETER			15.002-15.013 mm	15.037 mm
GAP BETWEEN CONNECTING ROD SMALL END AND PISTON PIN			0.002-0.014 mm	0.020 mm

10

TROUBLE SHOOTING

ComperSSION too low

- Worn piston
- Worn, damaged piston ring
- Worn cylinder

Excessive smoke

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

Overheating

- Excessive carbon build-up on top of piston

Abnormal noise

- Worn cylinder and piston
- Worn connecting rod small end bearing or piston pin
- Damaged piston ring
- Excessive carbon build-up on top of piston

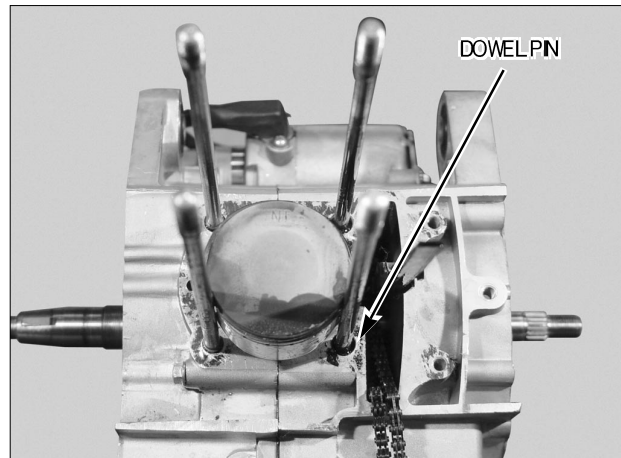
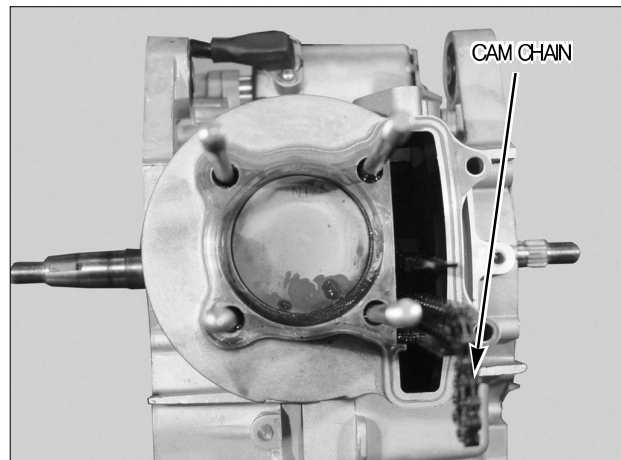
CYLINDER

REMOVAL

- Remove the engine from the frame.
 - Cylinder-head cover
 - Cam shaft holder
 - Cam shaft
 - Cylinder head
 - The cam chain guide from the cylinder
 - The cylinder
- Remove the gasket and dowel pin. Carefully remove any adhering gasket material from the cylinder / head mating surface. Do not scratch the surface.

NOTE

- Take care not to damage the cylinder mating surface.



WEAR INSPECTION

- Inspect the cylinder wall for scratches and wear.
- Measure and record the cylinder inner diameter at three levels in both an X and Y axis.
- Take the maximum reading to determine the cylinder wear.

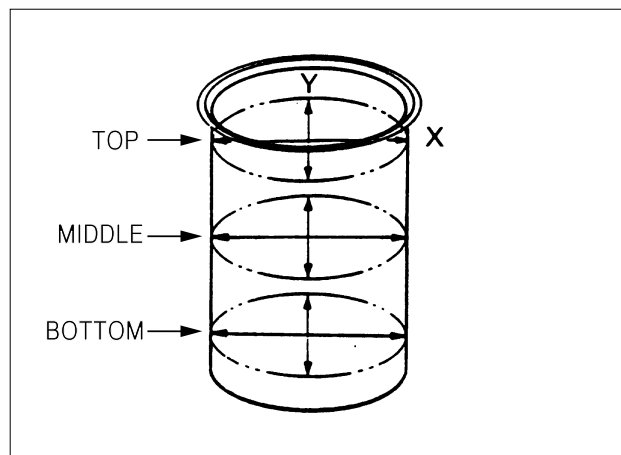
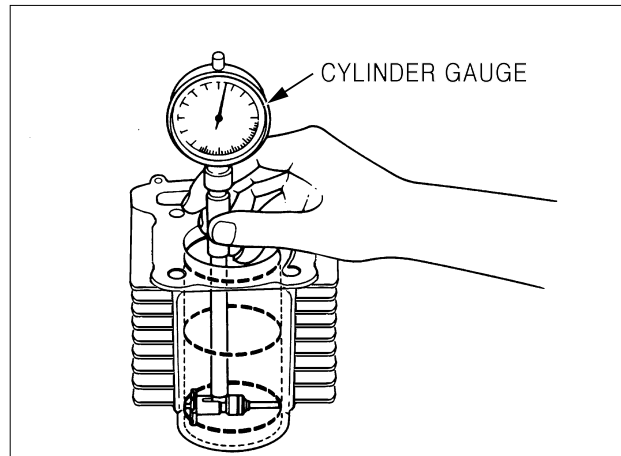
SERVICE LIMIT : 52.50 mm

- Measure the piston outer diameter.
- Calculate the piston-to-cylinder clearance. Take the maximum reading to determine the clearance.

SERVICE LIMIT : 0.105 mm

- Calculate the cylinder for out-of-round at three levels in an X and Y axis. Take the maximum reading to determine the out-of-round.
- Calculate the cylinder for taper at three levels in an X and Y axis. Take the maximum reading to determine the taper.
- If any of the cylinder measurements exceed the service limits, replace the cylinder.

SERVICE LIMIT : OUT-OF-ROUND : 0.005 mm
TAPER : 0.05 mm



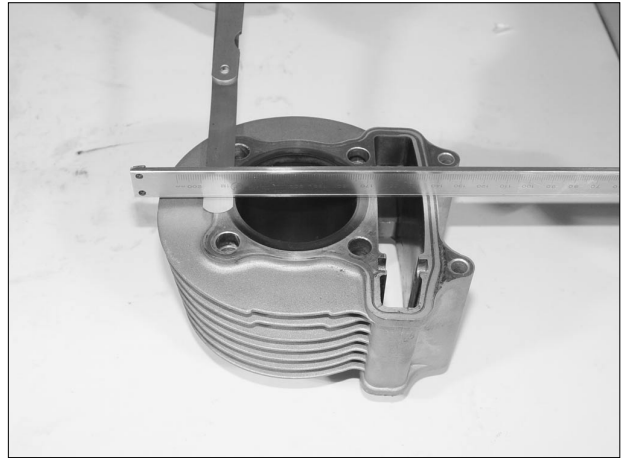
WARPAGE INSPECTION

- Check the cylinder for warpage by placing a straight edge and feeler gauge across the stud holes. Replace the cylinder if the service limit is exceeded.

SERVICE LIMIT : 0.05 mm

NOTE

- Any clearance between the cylinder and head due to damage or warpage will result in compression leaks and reduced performance.



PISTON / PISTON RING

REMOVAL

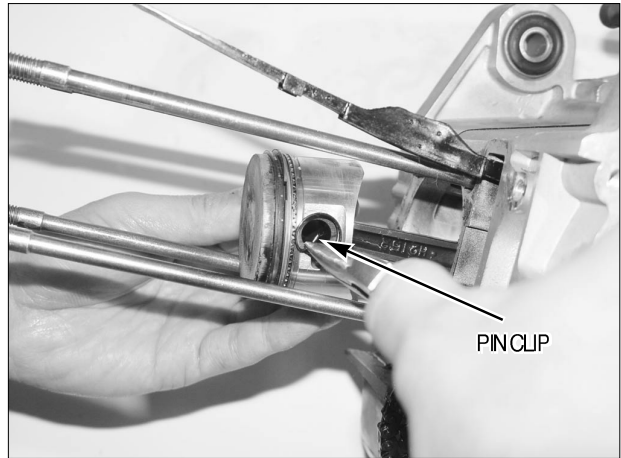
NOTE

- Place a clean shop towel over the crankcase to prevent the possibility of the clip falling into the crankcase.

- Remove the piston pin clip using a pair of pliers.
- Press the piston pin out of the piston.

NOTE

- Do not damage or scratch the piston.
- Do not apply side force to the connecting rod.
- Do not let the clip fall into the crankcase.



INSPECTION

- Clean carbon deposits from the piston.
- Inspect the piston rings for movement by pressing the rings. The rings should be able to move in its groove without catching.
- Spread each piston ring and remove it by lifting it up at a point just opposite the gap.

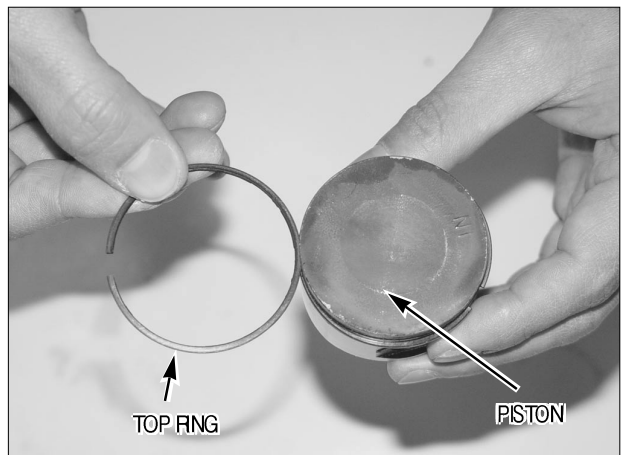
CAUTION

- Do not damage the piston ring by spreading the ends too far.

- Measure the clearance between the piston ring and piston grooves.

**SERVICE LIMIT : TOP : 0.105 mm
SECOND : 0.095 mm**

- Inspect the piston for wear or damage.



CYLINDER / PISTON

- Insert the piston ring into the top of the cylinder squarely, using the piston.
- Measure the end gap using a feeler gauge. Replace the ring if the service limit is exceeded.

NOTE

- Always replace piston ring as a set.

SERVICE LIMIT : TOP / SECOND : 0.50 mm
OIL RING (SIDE RAIL) : 1.10 mm
TOOL : FEELER GAUGE

- Measure and record the piston outer diameter 90° to the piston pin bore and at the point specified (10mm), near the bottom of the piston skirt.
- Replace the piston if the service limit is exceeded.

SERVICE LIMIT : 52.30 mm

PISTON PIN INSPECTION

- Measure the piston pin bore inner diameter in an X and Y axis. Take the maximum reading to determine the inner diameter.
- Replace the piston if the inner diameter is over the service limit.

SERVICE LIMIT : 15.04 mm

- Measure the piston pin outer diameter at three points.
- Replace the piston pin if the service limit is exceeded.

SERVICE LIMIT : 14.960 mm

- Calculate the piston pin-to-pin bore clearance by subtracting the piston pin outer diameter from the pin bore inner diameter.

SERVICE LIMIT : 0.020 mm

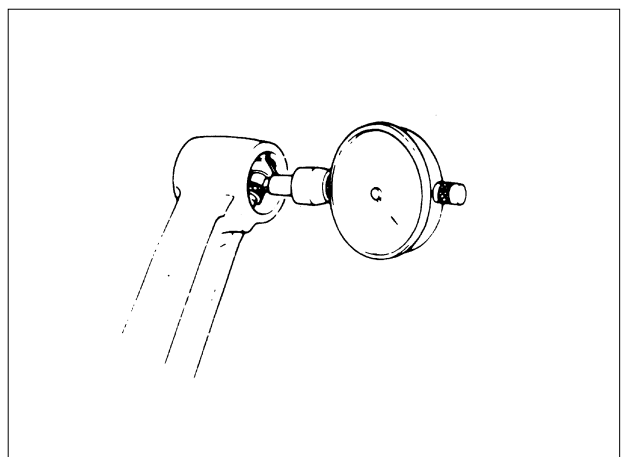
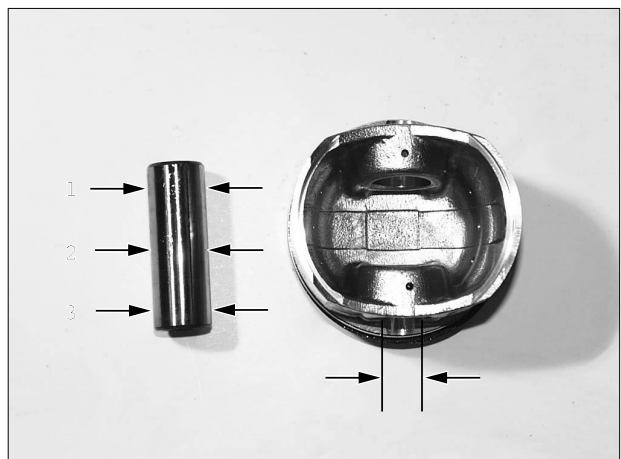
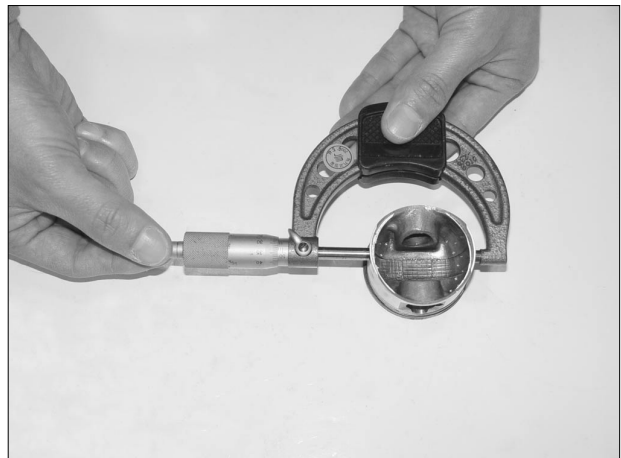
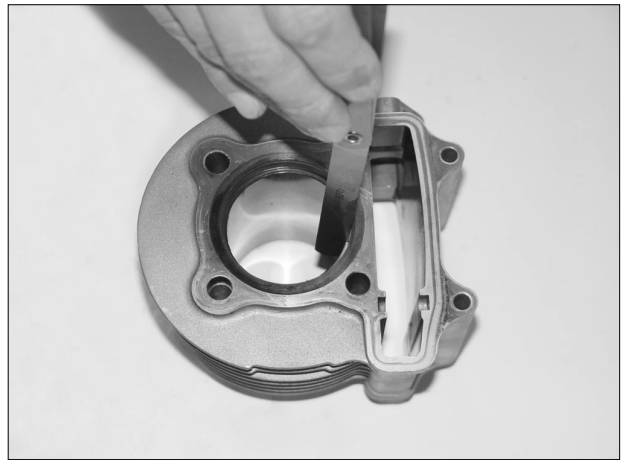
SMALL END BEARING SURFACE INSPECTION

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

SERVICE LIMIT : 15.037 mm

- Calculate the connecting rod small end-to-piston pin clearance.

SERVICE LIMIT : 0.02 mm

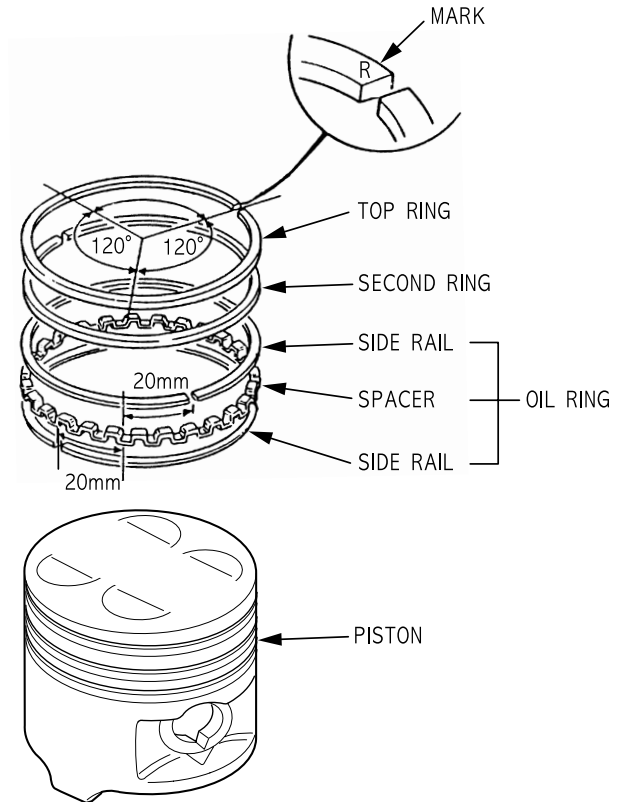


PISTON / PISTON RING INSTALLATION

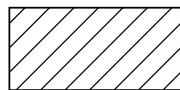
- Clean the piston heads, ring lands and skirts.
- Carefully install the piston rings onto the piston with the markings facing up.

NOTE

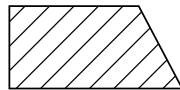
- Be careful not to damage the piston and rings during assembly.
- Do not confuse the top and second rings.
- Space the ring end gaps 120 degrees apart.
- Space the side rail gaps 40mm or more apart as shown.



- After installing the rings they should rotate freely, without sticking.



TOP RING



SECOND RING

PISTON INSTALLATION

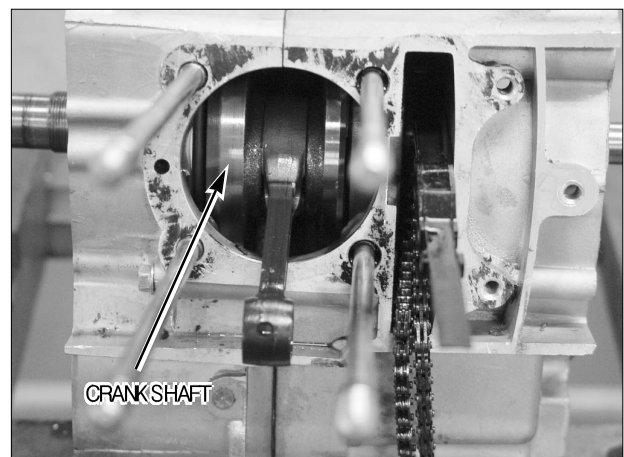
NOTE

- Place a clean shop towel over the crankcase to prevent the clip from falling into the crankcase.

- Install the piston and insert the piston pin.

NOTE

- The mark that is stamped on the piston head should be facing the correct direction.
 'IN' MARK : TO INTAKE SIDE
 'EX' MARK : TO EXHAUST SIDE



CYLINDER / PISTON

- Install new piston pin clips.

CAUTION

- Always use new piston pin clips. Reinstalling used piston pin clips may lead to serious engine damage.

NOTE

- Take care not to drop the piston pin clip into the crankcase.
- Set the piston pin clip in the groove properly.
- Do not align the clip's end gap with the piston cutout.

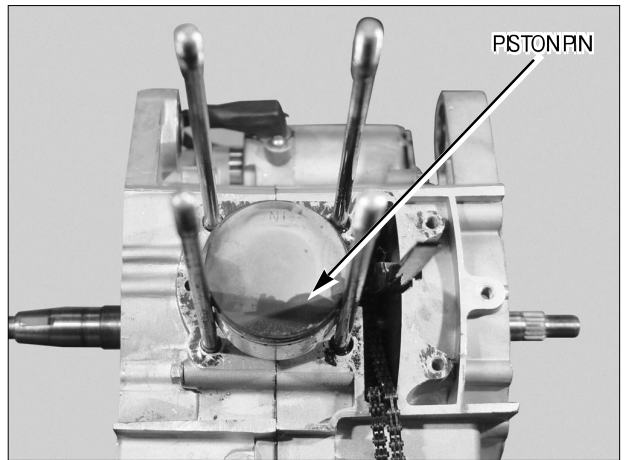


CYLINDER INSTALLATION

- Make sure that the piston ring end gap is correct.
- Carefully remove any adhering gasket material from the cylinder / head mating surface. Do not scratch the surface.
- Install a new cylinder gasket and dowel pins.

NOTE

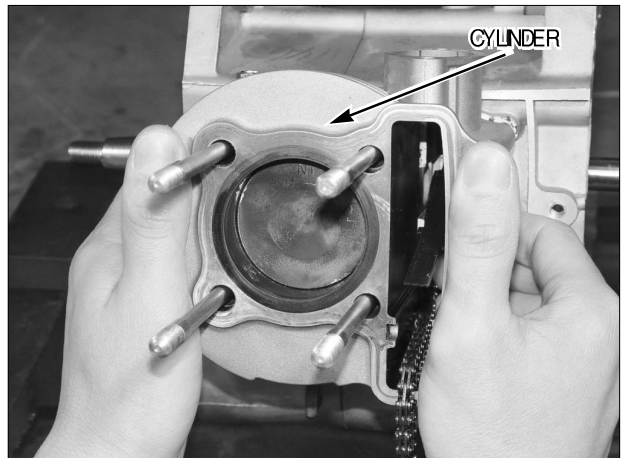
- Take care not to damage the cylinder mating surface.



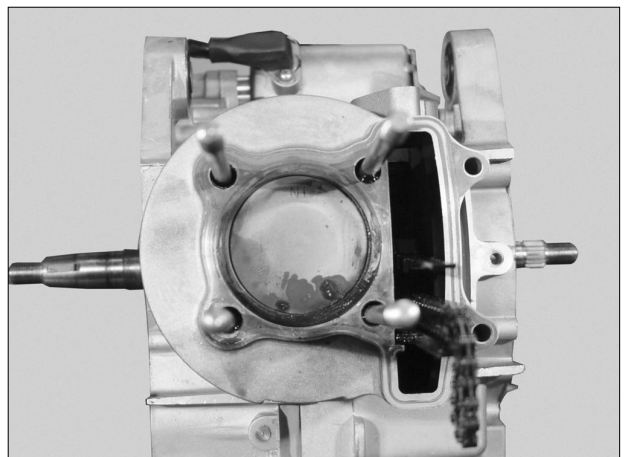
- Coat the cylinder wall with clean engine oil and lubricate the piston rings and install the cylinder.

NOTE

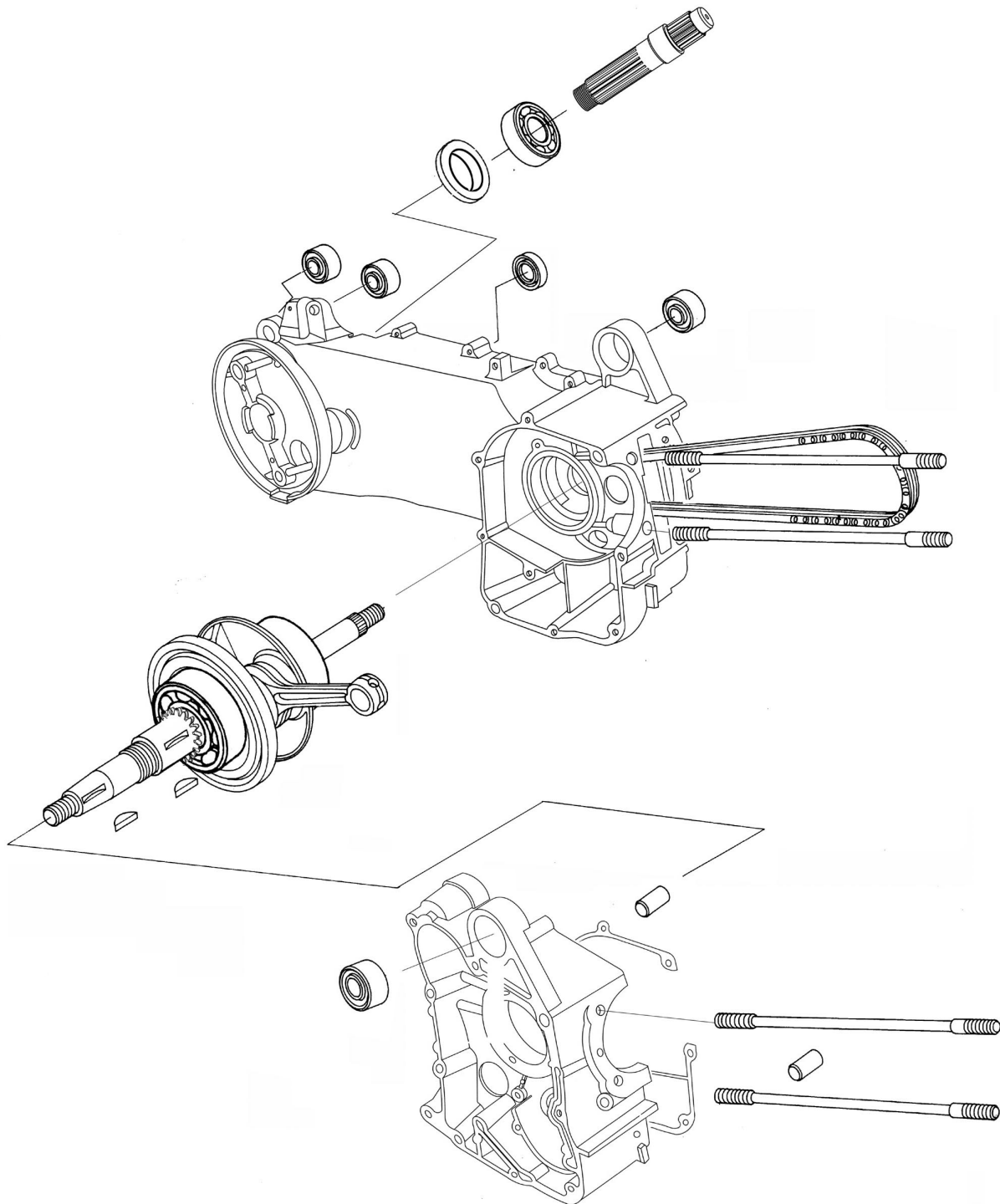
- Be careful not to damage the piston rings.
- Be careful not to drop the cam chain into the crankcase.



- Install the lower part of the cam chain guide to the “凹” part of the crankcase, and install the cam chain guide by aligning the projection part with the “凹” part of cylinder.
- Install the cylinder head.
- Install the camshaft.
- Install the cylinder head cover.
- Install the engine to the frame.



MEMO



11. TRANSMISSION/CRANK SHAFT/CRANK CASE

SERVICE INFORMATION 11-1

TROUBLE SHOOTING 11-2

TRANSMISSION 11-3

CRANK CASE REMOVAL 11-6

CRANK SHAFT REMOVAL . . . 11-7

TRANSMISSION BEARING. . . 11-8

CRANK SHAFT INSTALLATION . 11-9

CRANK CASE INSTALLATION . 11-10

SERVICE INFORMATION

GENERAL SAFETY

- This section describes how to remove the crank case and to maintain the transmission and the crankshaft.
- Service transmission without removing the engine from the vehicle. However, to prevent damage to the LH. crank case, remove the engine and disassemble the rear brake prior to changing the LH. crank case bearing.
- Always use special tools to change the drive shaft. Fix the bearing inner race, and install the shaft.
- The following parts must be removed prior to removing the crank case. Follow the removal procedure specified in each section.
 - OIL PUMP (⇒SECTION 2)
 - CARBURETOR (⇒SECTION 5)
 - ENGINE (⇒SECTION 6)
 - CYLINDER HEAD/ CYLINDER/ PISTON (⇒SECTION 9 AND 10)
 - AC GENERATOR (⇒SECTION 8)
 - DRIVE PULLEY (⇒SECTION 7)
 - CLUTCH/DRIVEN PULLEY (⇒SECTION 7)
- The following parts must be removed prior to changing the LH. crank case. Follow the removal procedure specified in each section.
 - TRANSMISSION (⇒SECTION 11)
 - BRAKE(⇒SECTION 14)
- To assemble the crank case and crankshaft, set the special tool to the inner race of the crankshaft bearing, and push and assemble. Remove the bearing from the crankshaft during disassembling work, and insert a new bearing in the case. Install the oil seal after the case is assembled.

11

SPECIFICATIONS

ITEM			STANDARD VALUE	SERVICE LIMIT
CRANK SHAFT	LARGE END SIDE CLEARANCE		0.1 ~ 0.35 mm	0.55 mm
	CONNECTING ROD BIG END		0 ~ 0.008 mm	
	CRANKSHAFT SHAKING	RIGHT		0.1 mm
		LEFT		0.1 mm

TRANSMISSION OIL

OIL CAPACITY	0.11 l (Full capacity) 0.09 l (After oil change)
RECOMMENDED OIL	DMC Pure mission oil or SAE 80W/90

TORQUE VALUE

CRANK CASE BOLT 1.0kg-m

TOOLS

- UNIVERSAL BEARING PULLER
- BEARING REMOVER SET
- REMOVER ASSEMBLY
- REMOVER SHAFT
- REMOVER HEAD
- SLIDING WEIGHT
- ASSEMBLY SHAFT

TROUBLESHOOTING

Engine Noise

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

Engine started but unable to move out

- Transmission damage.
- Transmission seized.

Noise during operation

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

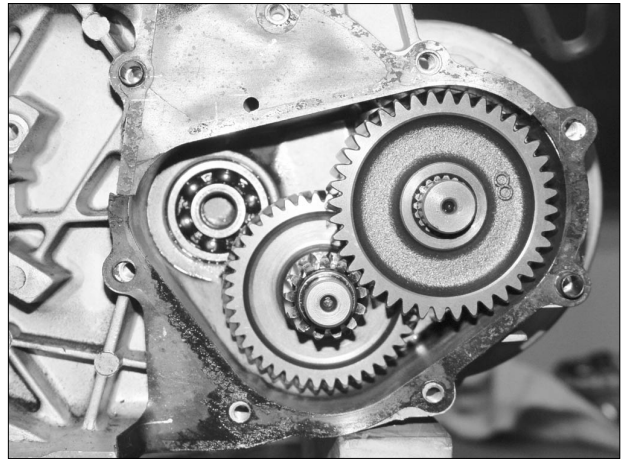
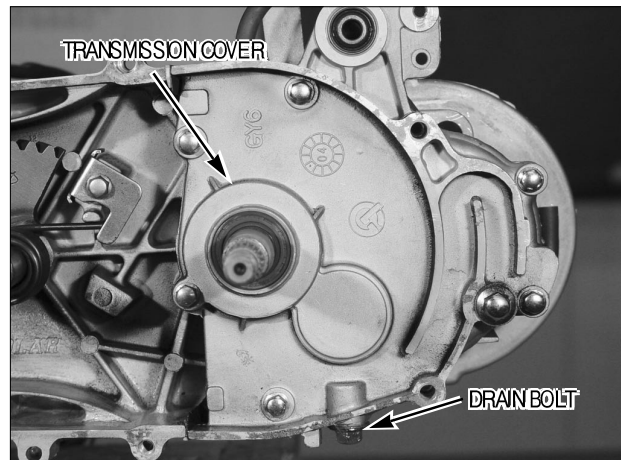
Oil leaks

- Excessive oil level.
- Oil seal worn or damaged.

TRANSMISSION

DISASSEMBLY

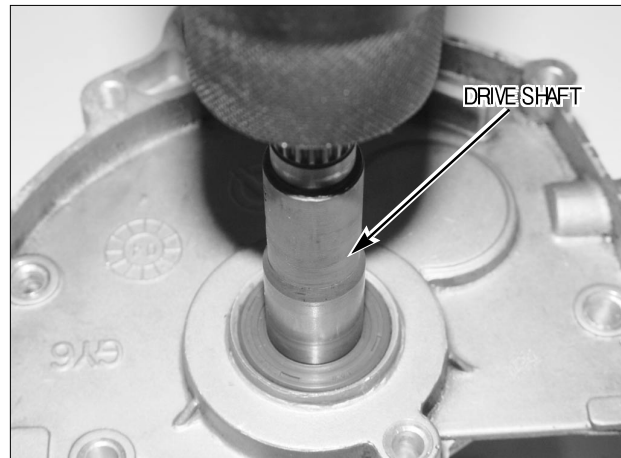
- Loosen the drain bolt, drain the mission oil.
- Remove the LH. crankcase cover.
- Driven pulley / drive face.
- Remove the EX. muffler. (⇒4-3)
- Remove the rear wheel. (⇒13-3)
- Loosen the transmission cover bolts.
- Remove the transmission cover.
- Remove the gasket and dowel pin.



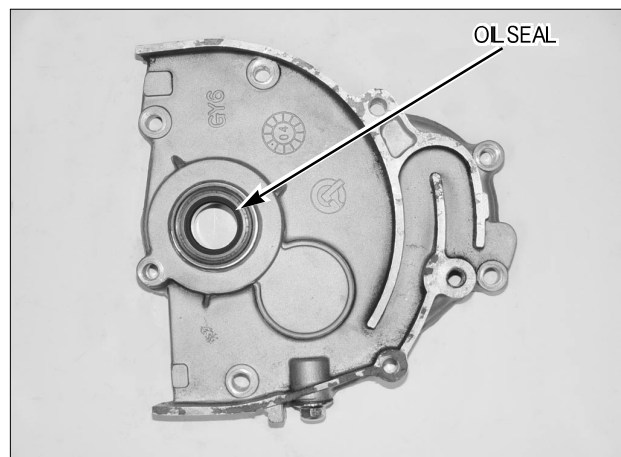
- Remove the drive shaft from the transmission cover by using a hydraulic press.

NOTE

- Take precautions not to damage the cover joints.

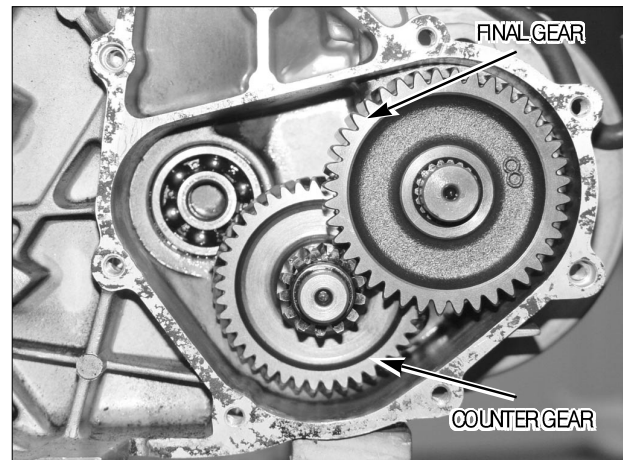


- Remove the oil seal of the transmission cover.



TRANSMISSION/CRANK SHAFT/CRANK CASE

- Remove the final shaft and the counter shaft comp.

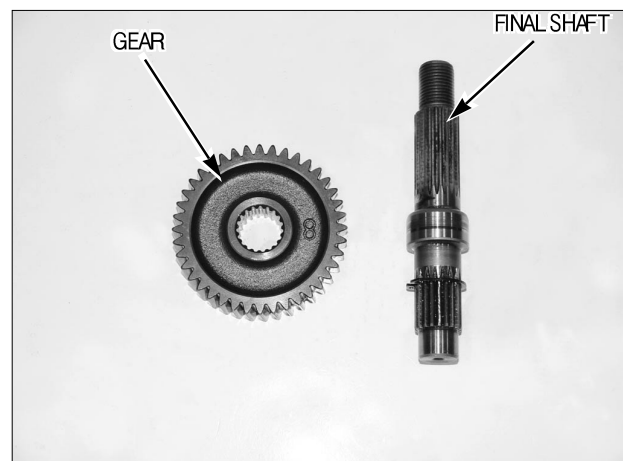


TRANSMISSION INSPECTION

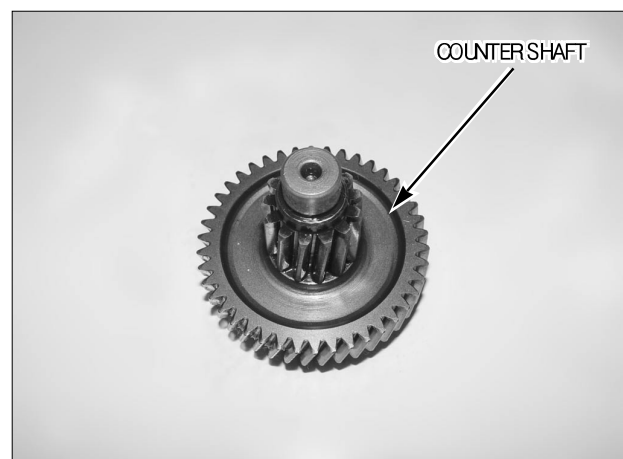
- Check the drive shaft for wear or damage.



- Check the final shaft for wear or damage.

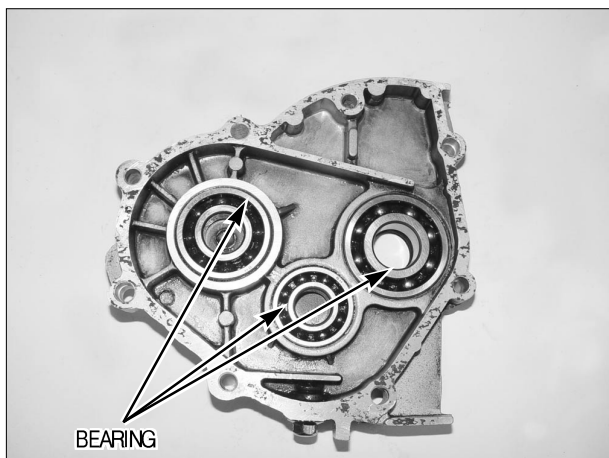


- Check the counter shaft for wear or damage.



TRANSMISSION BEARING INSPECTION

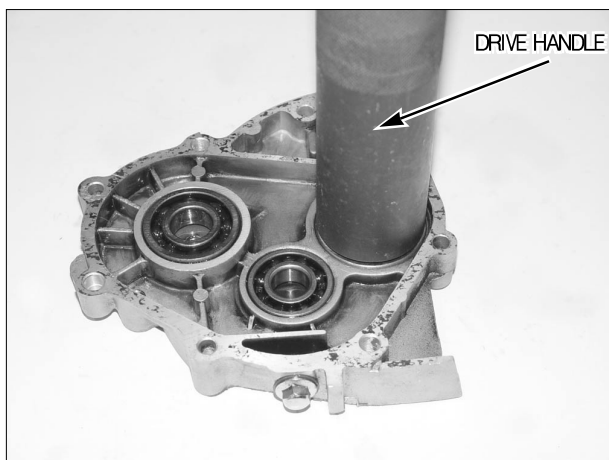
- Check that the bearing outer race fits the case tightly without play.
- Turn the inner race and check that the bearing turns smoothly and quietly.
- Replace the bearings if necessary.



- Install the bearing to the case with special tools.

**TOOLS : DRIVE HANDLE A
OUTER DRIVER
DRIVER PILOT**

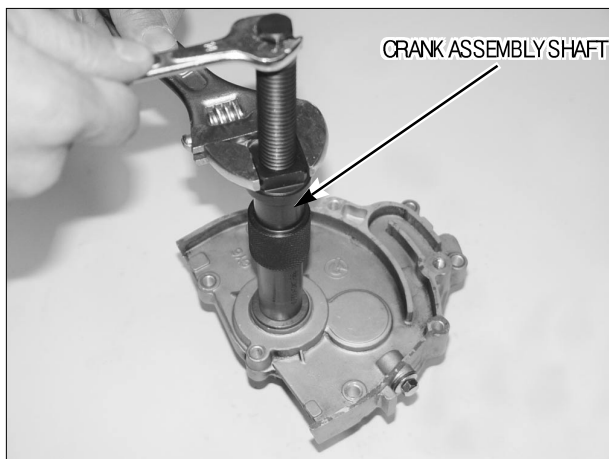
- Check the LH. crankcase oil seal for wear or damage.



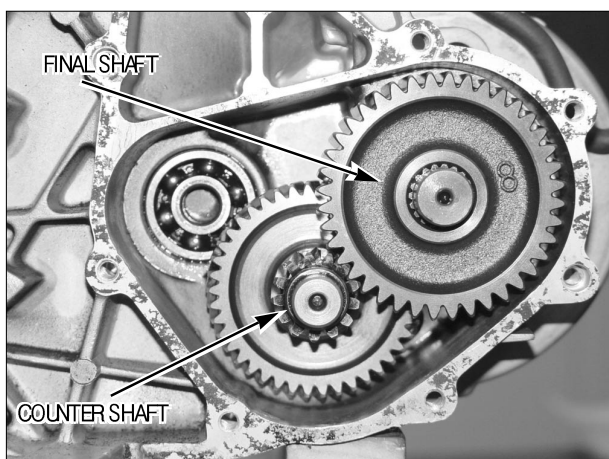
TRANSMISSION ASSEMBLY

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

**TOOLS : CRANK ASSEMBLY SHAFT
CRANK ASSEMBLY COLLAR**



- Install the final shaft and counter shaft on the LH. crank case.

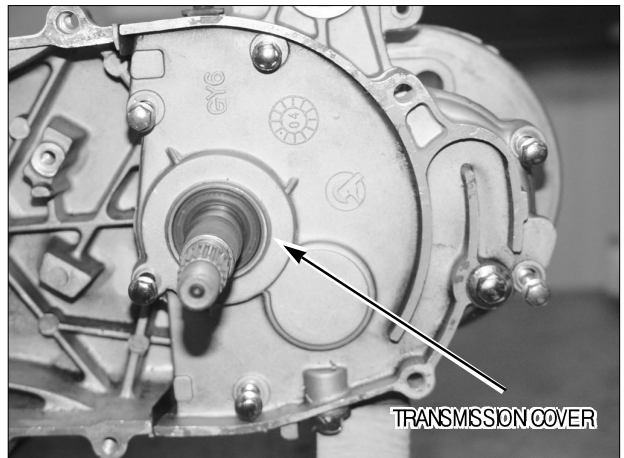
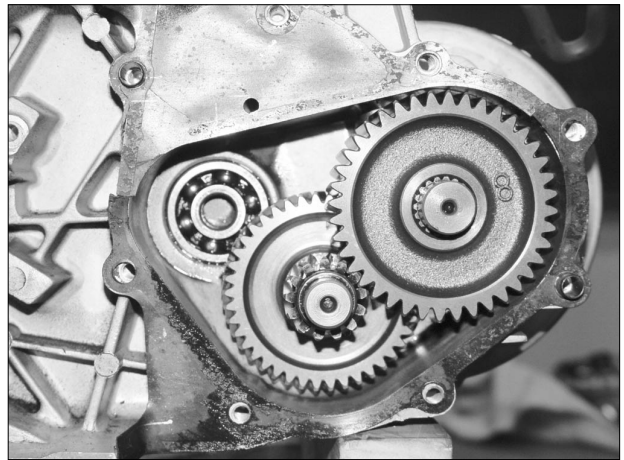


TRANSMISSION/CRANK SHAFT/CRANK CASE

- Install a new gasket and dowel pin.

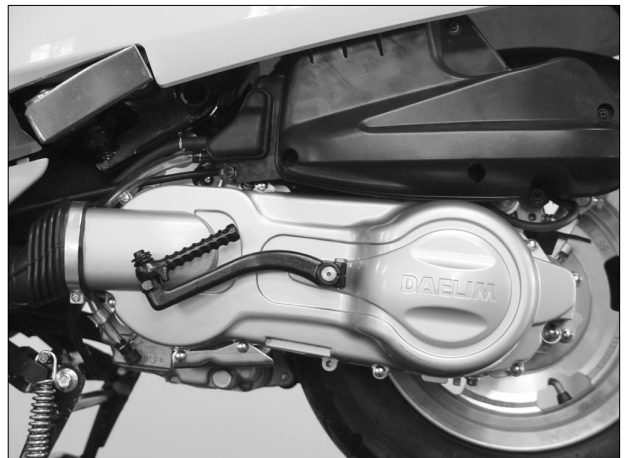
- Tighten the transmission cover with the setting bolts.
- Install the following parts.
 - Rear wheel
 - EX. muffler
 - Continuously variable transmission
 - LH. crank case cover
- Remove the oil check bolt, and fill the recommended oil slowly.

RECOMMENDED OIL : SAE 80W- 90
TRANSMISSION OIL AMOUNT : 0.11 l

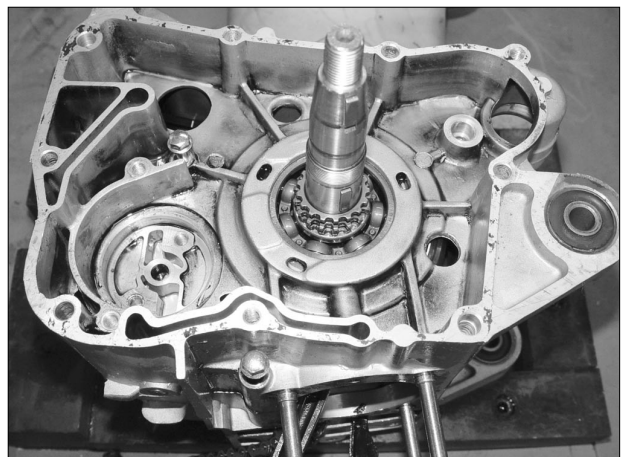


CRANK CASE REMOVAL

- Remove the engine from the frame.
- Remove the RH./LH. crankcase cover.
- Remove the parts to disassemble crankcase.



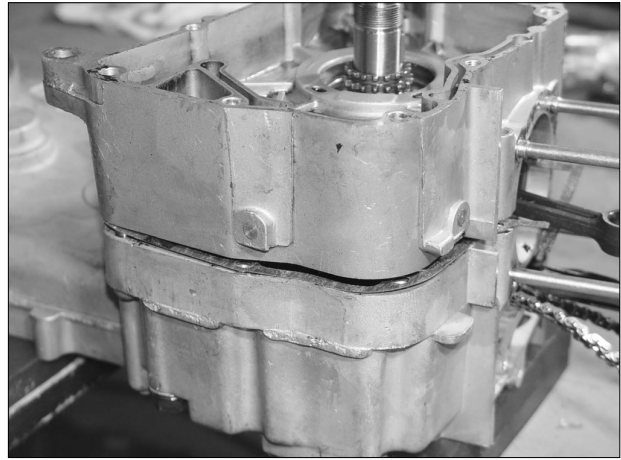
- Loosen the RH. crankcase setting bolts.



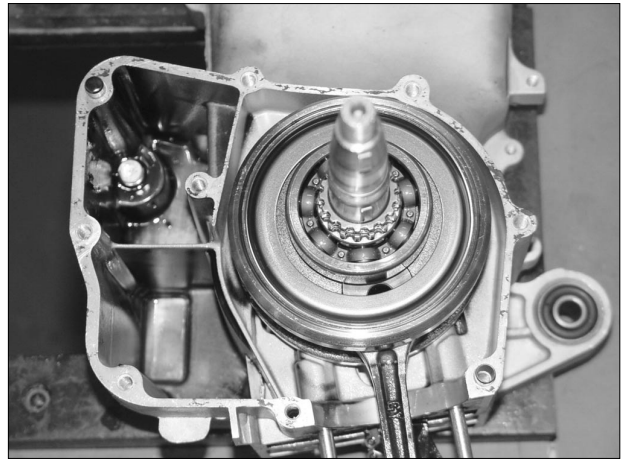
- Face the LH. crankcase downward, and remove the RH. crankcase from the LH. crankcase while tapping a few places on the LH. crankcase with a plastic hammer.

NOTE

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



- Remove the dowel pin and gasket.



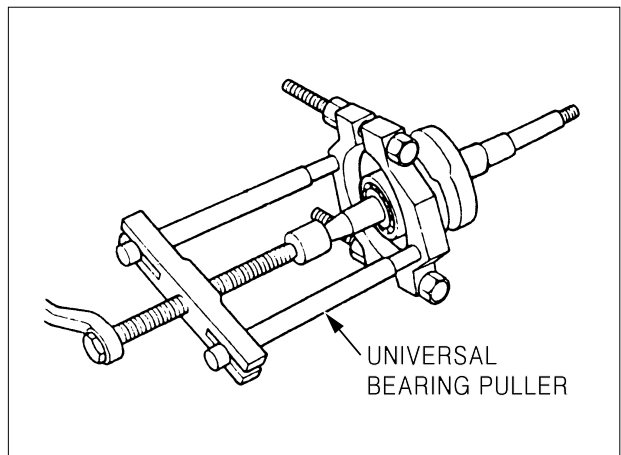
CRANK SHAFT REMOVAL

- Remove the crankshaft.



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

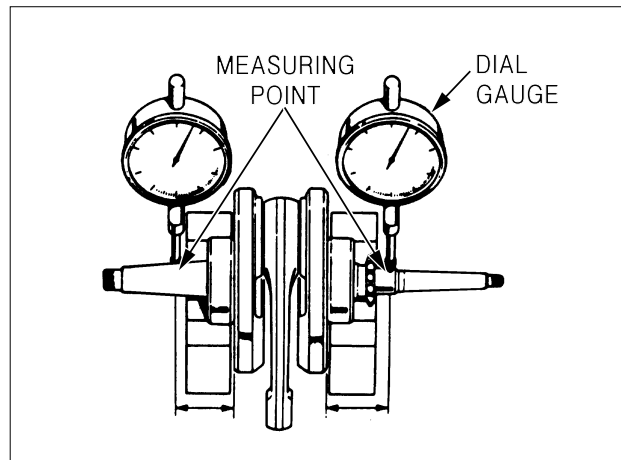
TOOL : UNIVERSAL BEARING PULLER



CRANKSHAFT INSPECTION

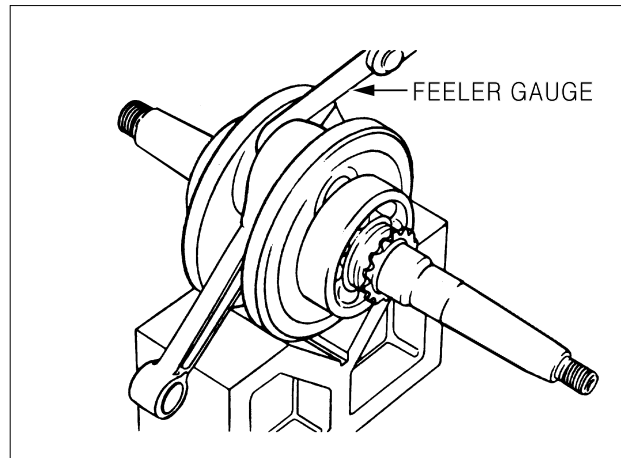
- Place the crankshaft on a stand or V-block, and measure the crankshaft runout using dial gauge.

SERVICE LIMIT : RIGHT : 0.1 mm
LEFT : 0.1 mm



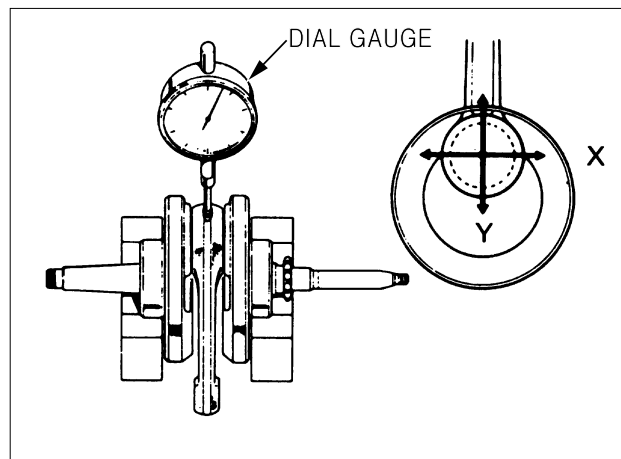
- Measure the side clearance by inserting the feeler gauge between the crankshaft and connecting rod big end as shown.

TOOL : FEELER GAUGE
SERVICE LIMIT : 0.05 mm



- Measure the connecting rod radial clearance in both X and Y directions.
- Replace the crankshaft if the service limit is exceeded.

SERVICE LIMIT : 0.05 mm

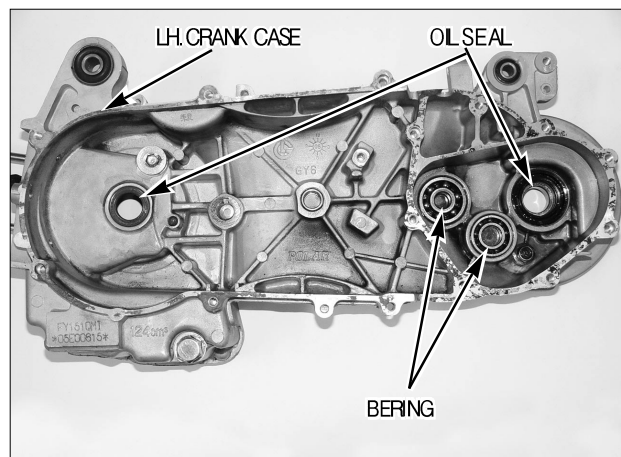


TRANSMISSION BEARING

- Remove the transmission and crankshaft.

INSPECTION

- Check that the bearing outer race fits the case tightly without play.
- Turn the inner race and check that the bearing turns smoothly and quietly.
- Replace the bearing if necessary.



TRANSMISSION BEARING REPLACEMENT

LH. crankcase

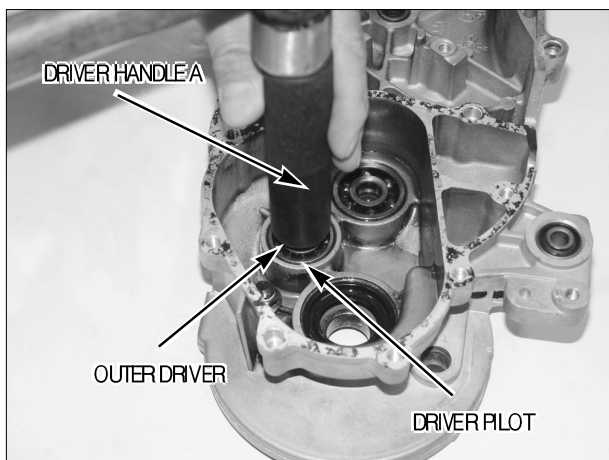
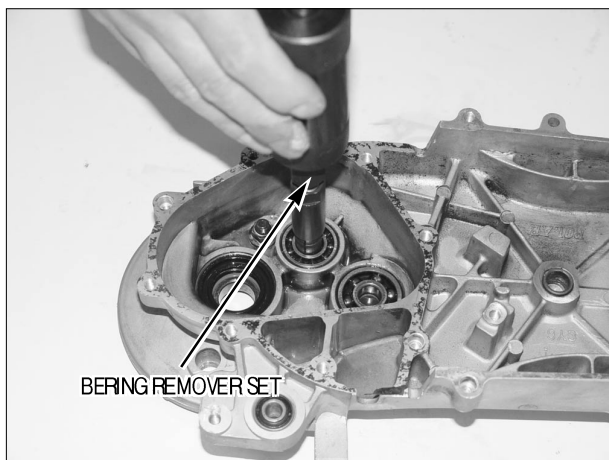
- Use the special tools to remove the drive shaft bearing.

**TOOLS : BEARING REMOVER SET
REMOVER SHAFT
REMOVER HEAD**

- Remove the final shaft bearing and oil seal.
- Remove the counter gear bearing.
- Apply clean engine oil to a new bearing, and assemble it to the crankcase.

**TOOLS : DRIVER HANDLE A
DRIVER PILOT
OUTER DRIVER**

- Install a new final shaft oil seal.

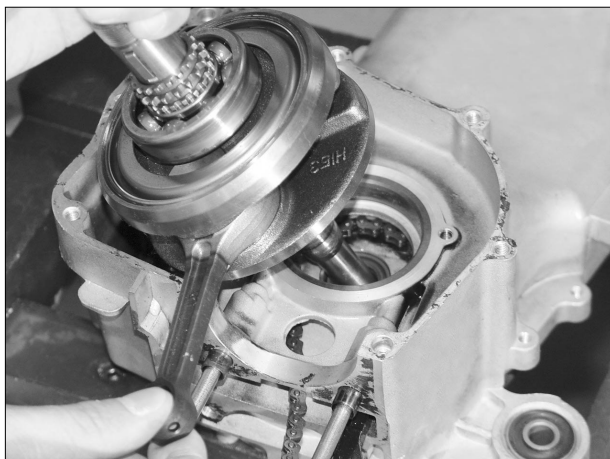


CRANK SHAFT INSTALLATION

- Put the LH. crank case downward, hang up the cam chain to the crank case inside



- Insert the crank shaft.



CRANKCASE INSTALLATION

- Install the dowel pins and a new gasket.
- Pull the cam chain in order to check to see if the crankshaft has assembled or not.



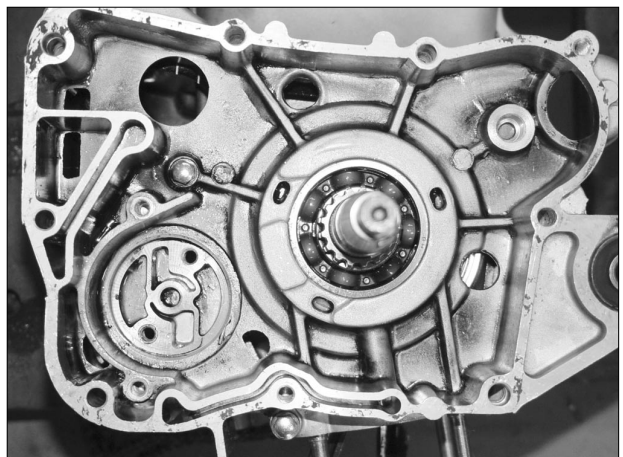
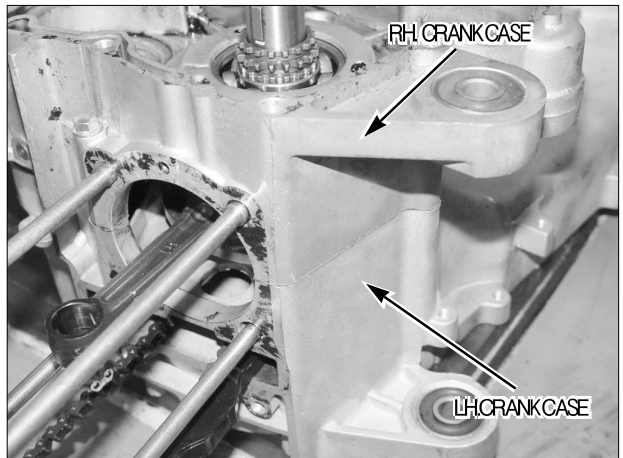
- Install the RH. crankcase to the LH. crankcase.

NOTE

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



- Install, refer to 11-1
- Install the engine on the frame.



MEMO

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12. FRONT WHEEL/FRONT FORK/STEERING

SERVICE INFORMATION 12-1	FRONT WHEEL 12-5
TROUBLE SHOOTING 12-2	FRONT FORK 12-8
STEERING HANDLE 12-3	STEERING STEM 12-10

SERVICE INFORMATION

GENERAL SAFETY

CAUTION

- Keep oil or brake fluid off the brake disk and pad because the contaminated brake disk and pad reduces the braking performance. If contaminated, replace the pad with a new one, and clean the disk.
- Use special tire levers and rim protectors to remove or assemble tires to protect the rim from being damaged.
- This section describes how to remove and maintain front wheels, front fork and steering system. For information on the front brake system, refer to section 10.
- Place a jack underneath the engine to support the 2-wheeled vehicle.

SPECIFICATIONS

ITEM		STANDARD VALUE	SERVICE LIMIT
AXLE SHAFT DEFLECTION		-	0.2mm
FRONT WHEEL WOBBLES	RADIAL	-	2.0mm
	AXIAL	-	2.0mm
FRONT CUSHION SPRING FREE LENGTH		220	215
THICKNESS OF BRAKE DISK		3.5	2.5
INNER DIAMETER OF MASTER CYLINDER		11.000~11.043	11.055
OUTER DIAMETER OF MASTER CALIPER PISTON		10.957~10.984	10.945
OUTER DIAMETER OF BRAKE CALIPER PISTON		26.918~26.968	26.91
INNER DIAMETER OF BRAKE CALIPER CYLINDER		27.000~27.050	27.06

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TORQUE VALUES

STEERING STEM NUT	7.0 kgf · m
STEERING TOP THREAD	0.25kgf · m
BRAKE CALIPER BOLT	3.1 kgf · m
FRONT CUSHION BOLT	2.25kgf · m
FRONT AXLE NUT	6.0 kgf · m

TROUBLE SHOOTING

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.

STEERING HANDLE

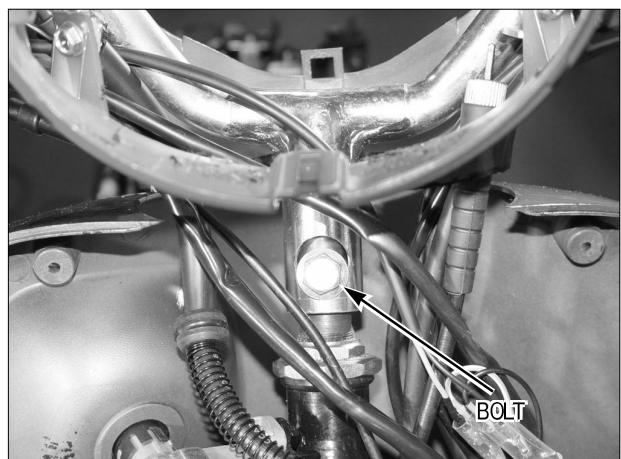
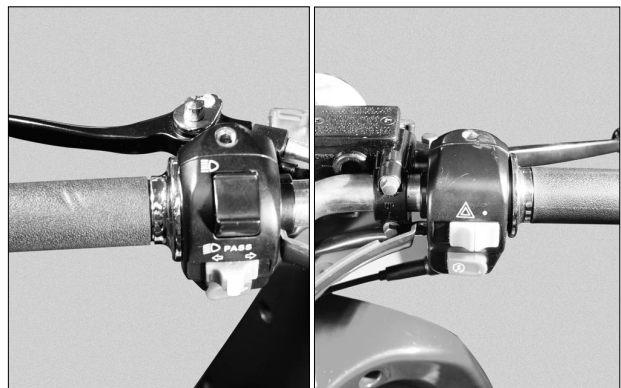
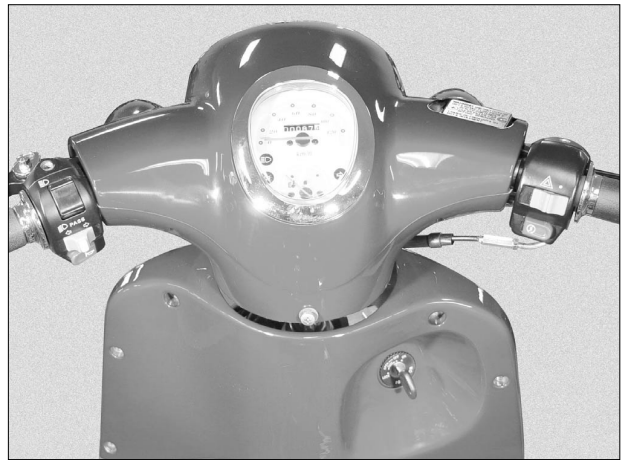
REMOVAL

- Remove the following parts.
 - Head light
 - Handle upper cover from the handle bar
 - Remove the speedometer cable from the speedometer.

- Loosen the front master cylinder holder bolts, remove the front master cylinder.

- Loosen the throttle housing fixing screw, remove the RH. / LH. housing.
- Remove the throttle cable from the throttle grip.

- Remove the handle bolt and handle bar.
- Apply grease to the throttle cable and install the under/upper housing.
- Install the front/rear brake master cylinder.

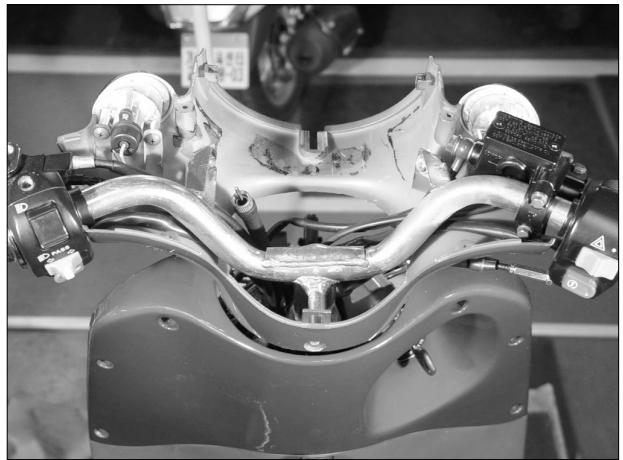


FRONT WHEEL/Front FORK/STEERING

INSTALLATION

- Install the steering handle to the steering stem.
- Insert the flange bolt and tighten with locknut

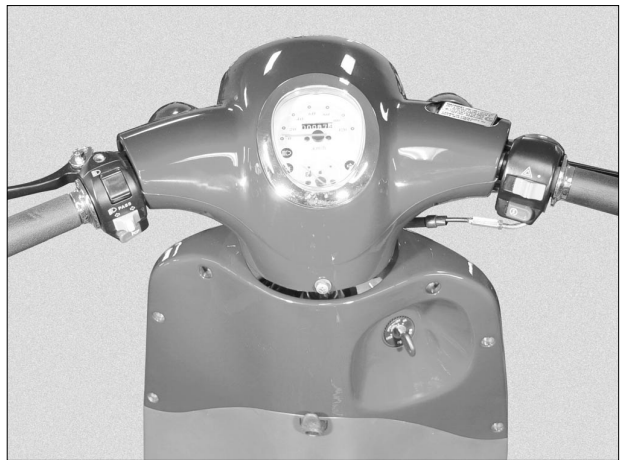
TORQUE VALUE : 3.92~4.9 kgf · m



NOTE

- Check that the throttle grip moves smoothly.
- Adjust the throttle grip free play to 2~6mm.

- Install in the reverse order of removal.



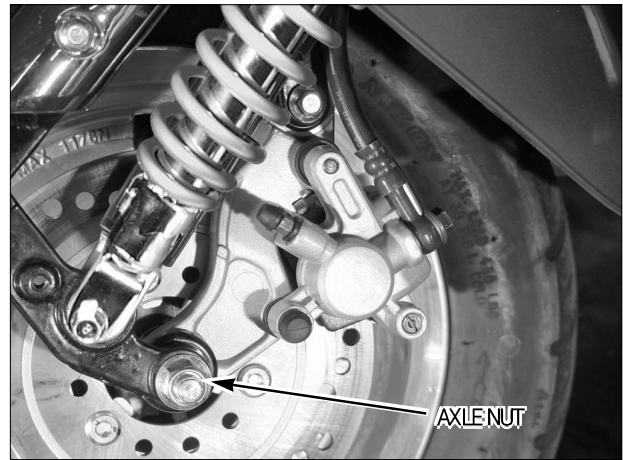
FRONT WHEEL

REMOVAL

- Loosen the axle nut. Support the vehicle securely under the engine to raise the front wheel.
- Loosen the oval screw securing the speedometer gear box, remove the speedometer cable.
- Remove the axle nut, front axle, front wheel.

NOTE

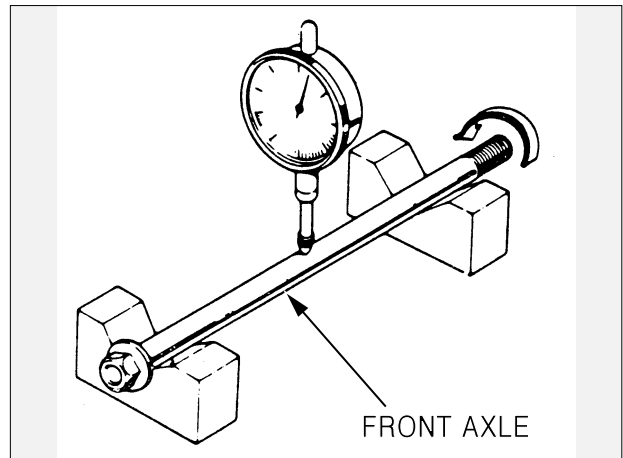
- Do not operate brake lever after the front wheel is removed.



FRONT WHEEL INSPECTION

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

SERVICE LIMIT : 0.2mm



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

**SERVICE LIMIT : Radial 2.0mm
Axial 2.0mm**



WHEEL BEARING

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

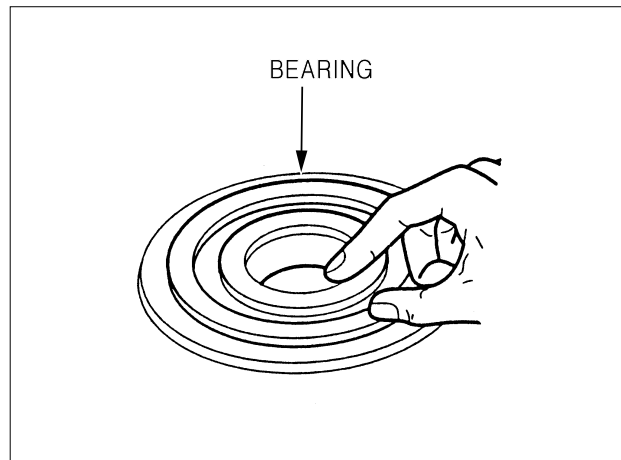
**TOOLS : BEARING REMOVER HEAD
BEARING REMOVER**



FRONT WHEEL/FRONT FORK/STEERING

Bearing Inspection

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



- 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**

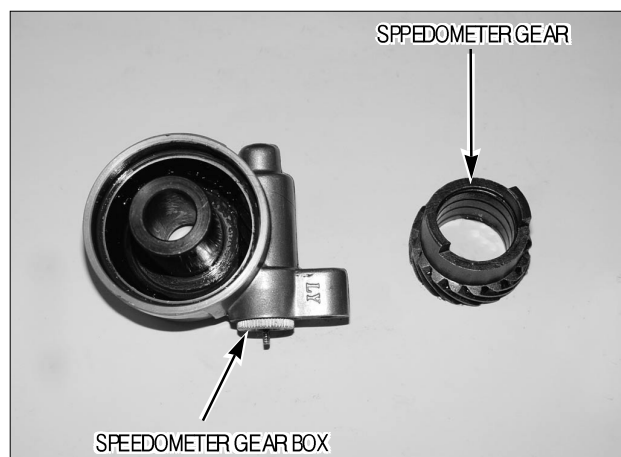
CAUTION

- 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 BOX

- Remove the speedometer box from the speedometer gear box.
- Check the gear for wear or damage.



ASSEMBLY

- Install the gear box retainer.
- Install the side color into the LH.wheel



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

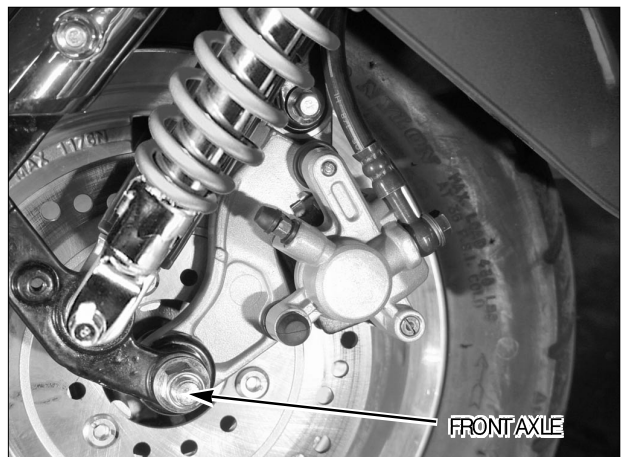


FRONT WHEEL INSTALLATION

- 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 RH. fork slider.



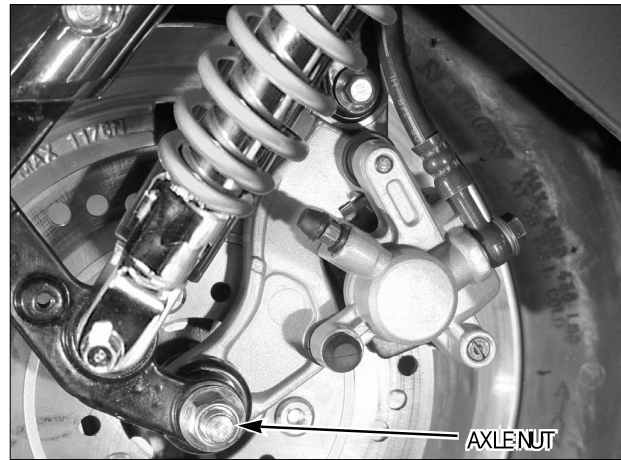
- Insert the front axle into the speedometer gear box and the wheel hub.



FRONT WHEEL/Front FORK/STEERING

- 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



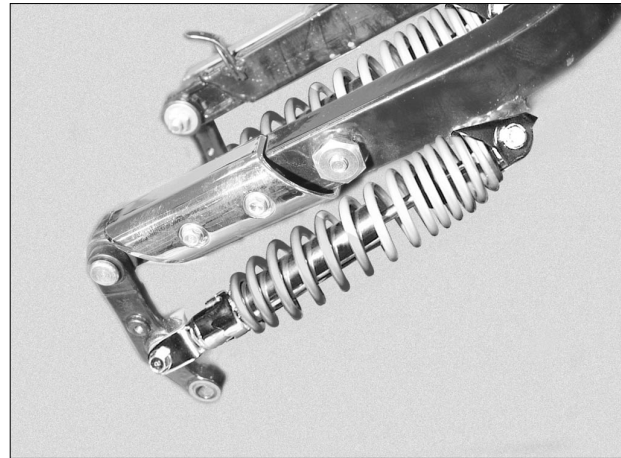
FRONT FORK

REMOVAL

- Remove the following parts.
 - Front fender
 - Front caliper
 - Loosen the upper/under fixing bolts, and remove the front cushion.

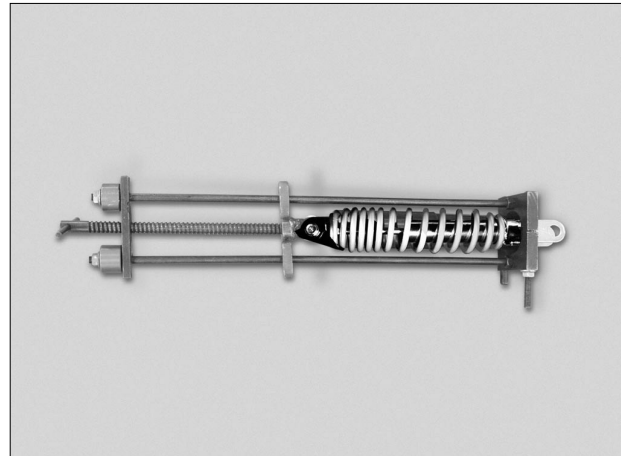
NOTE

- Support the vehicle securely under the engine not to turn over it.

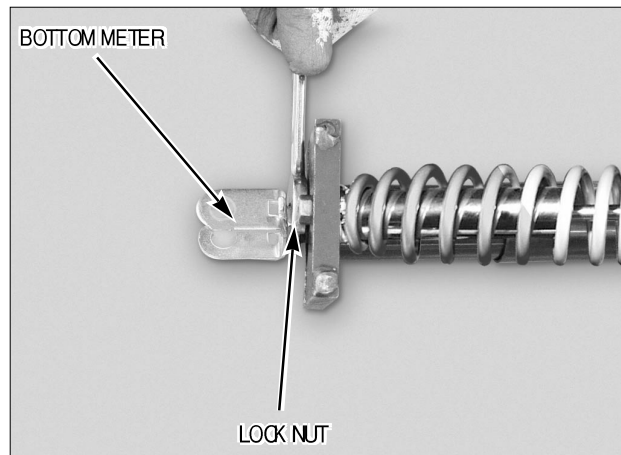


DISASSEMBLY

- Set up the attachment as like photo.
- Install the cushion into the cushion compressor, press the spring.

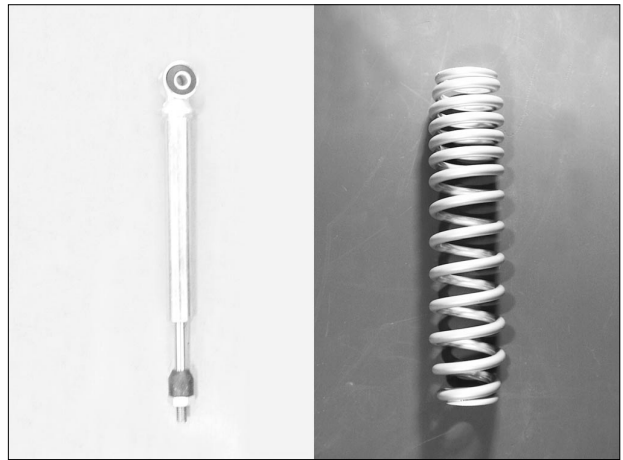


- Hold the bottom metal and loosen the locknut.
- Remove the bottom metal.



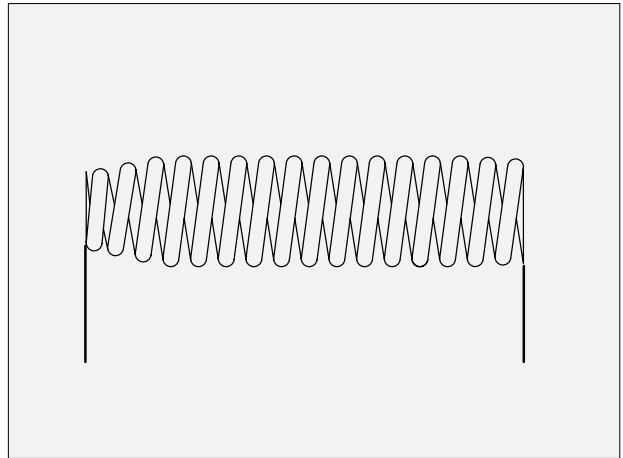
INSPECTION

- Check components for damage or abnormal wear.
Replace defective parts with new ones.



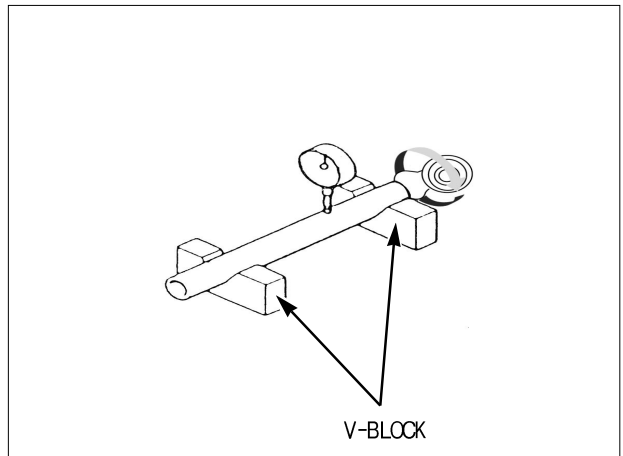
- Place the spring on a level place, and measure the free length.

SERVICE LIMIT : 215mm



- 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



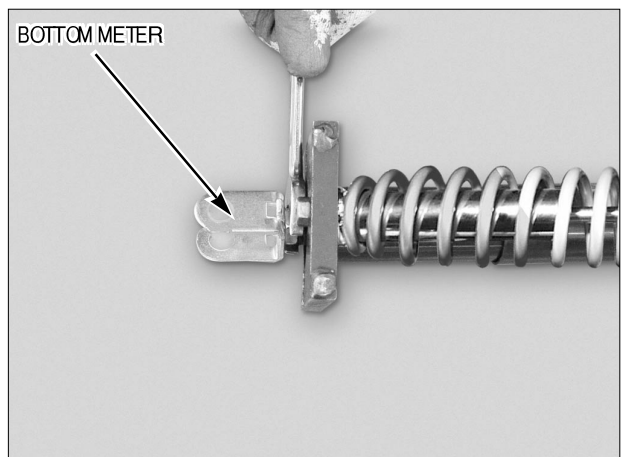
INSTALLATION

- Install the spring, stopper loper to the damper comp.

TORQUE VALUE : 7.5 kgf · m

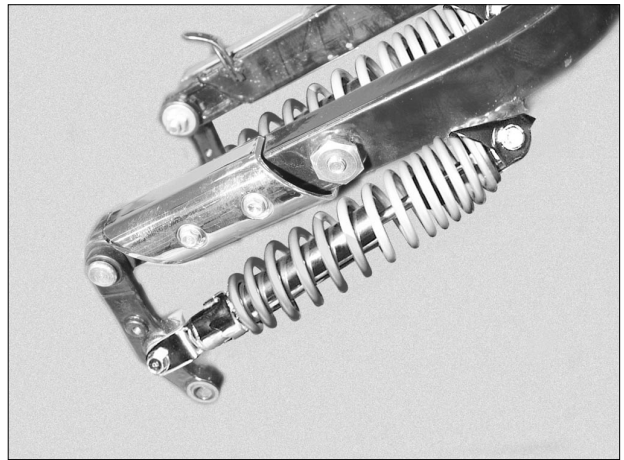
NOTE

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



FRONT WHEEL/Front FORK/STEERING

- Install the compressor attachment to the damper comp.
- Hold the bottom metal and tighten the locknut.
- Install the front cushion.
- Install the front wheel.



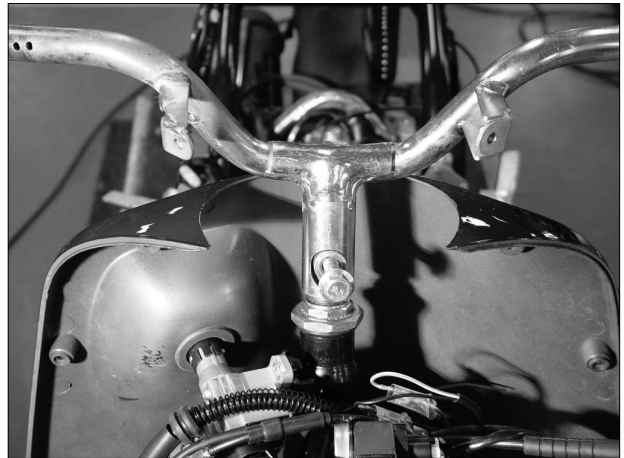
STEERING STEM

REMOVAL

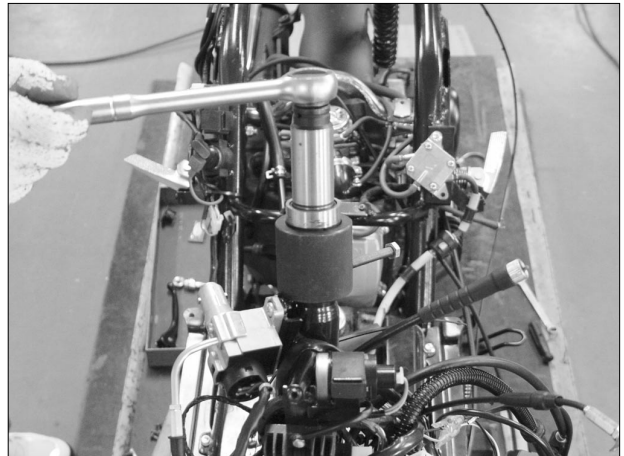
- Remove the following parts.
 - Handle cover
 - Handle bar
 - front cover
 - front wheel

NOTE

- Be careful not to turn over the vehicle.



- Remove the steering stem nut using the steering stem nut socket.
- Remove the steering top thread nut using the steering stem socket.
- Remove the front fork.
- Check to see if there is the damage or wear in the steel ball, con race, ball race, if necessary, replace it.
- Check to see if there is the damage or wear in the bottom con race.



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

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.
- Apply grease to the bottom cone race. Install the under ball assembly onto the bottom cone race making sure you have the correct amount.

TOOL : STEERING STEM DRIVER

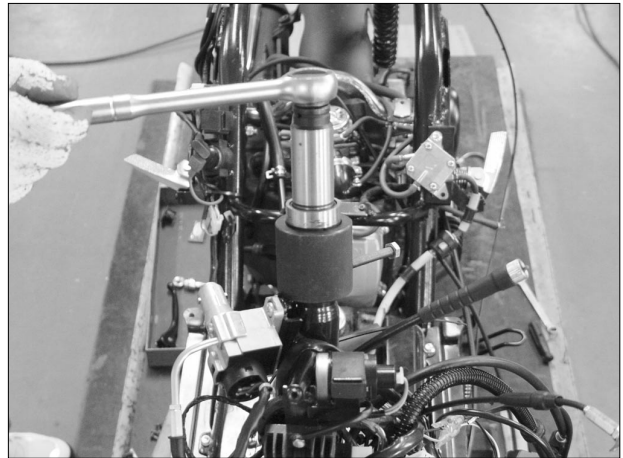
- Install the steering bottom and top ball races into the head pipe.
- Insert the front fork into the head pipe.
- Install the steering upper ball assembly.
- Retighten the top thread to specified torque, then loosen the top thread $\frac{1}{8}$ turn.

TORQUE VALUE : 0.15~0.25 kgf · 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 front cover.
- Insert the handle bar.
- Insert the handle cover.



MEMO

13. REAR WHEEL/BRAKE/SUSPENSION/REAR SWING ARM

SERVICE INFORMATION . . .	13-1	REAR BRAKE	13-4
TROUBLE SHOOTING	13-2	REAR CUSHION	13-6
REAR WHEEL	13-3		

SERVICE INFORMATION

GENERAL SAFETY

- If the brake drum or lining is contaminated with oil, braking power will be lost. If contaminated with oil, clean the brake drum, and replace the brake shoe.
- 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 VALUE	SERVICE LIMIT
AXLE SHAFT DEFLECTION		-	0.2 mm
REAR WHEEL RIM WOBBLES	RADICAL	-	2.0 mm
	AXIAL	-	2.0 mm
REAR BRAKE DRUM INNER DIAMETER		110.0 mm-110.3 mm	111.0 mm
REAR BRAKE LINING THICKNESS		4.0 mm	2.0 mm
REAR CUSHION SPRING FREE LENGTH		272 mm	267 mm

TORQUE VALUES :

REAR CUSHION UPPER BOLT	3.5~4.5 kgf · m
REAR CUSHION LOWER BOLT	3.5~4.5 kgf · m
REAR CUSHION ROD LOCK NUT	3.0~4.5 kgf · m
REAR AXLE NUT	6.0~8.0 kgf · m

TROUBLE SHOOTING

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 WHEEL

REMOVAL

- Support the motorcycle on the main stand.



- Remove the muffler.
- Remove the rear wheel mud guard.
- Loosen the rear wheel fixing u-nut.
- Remove the rear wheel.

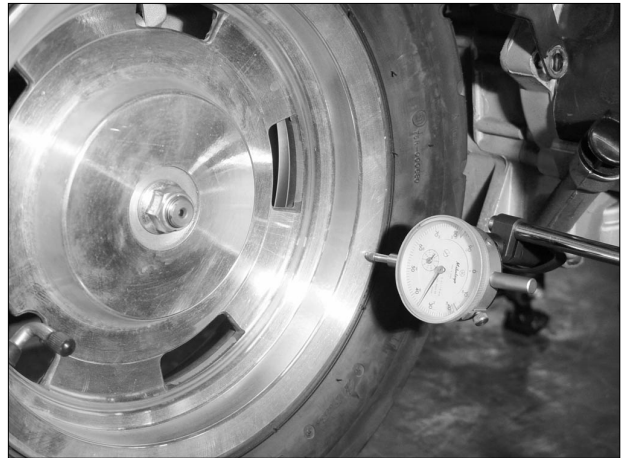


REAR WHEEL INSPECTION

- Check the rim for wobbles by rotating the wheel.

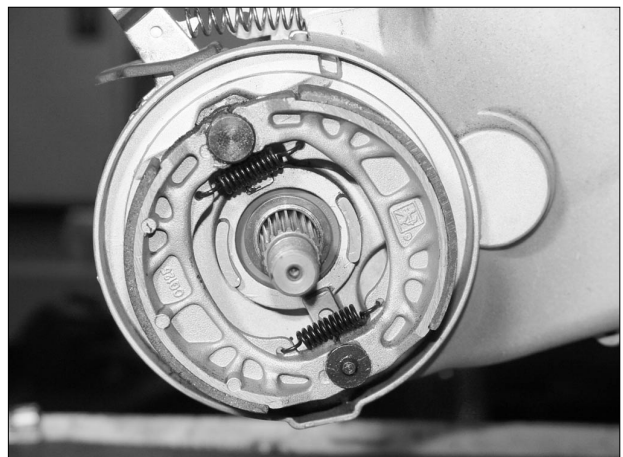
SERVICE LIMIT : Radical 2.0mm
Axial 2.0mm

TOOL : DIAL GAUGE



REAR WHEEL INSTALLATION

- Install the rear brake disk.
- Insert the rear wheel over the final shaft.



REAR WHEEL/REAR BRAKE/SUSPENSION/REAR SWING ARM

- Tighten the rear axle U-nut to the specified torque.

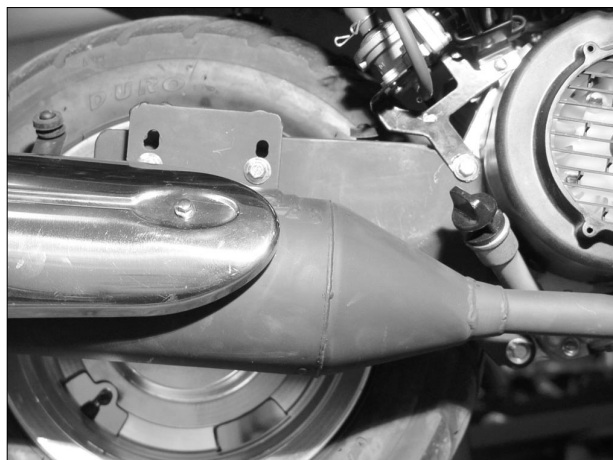
TORQUE VALUE : 6.0~8.0 kgf · m



- Install the EX. muffler. (⇨4-12)
- Install the rear wheel mudguard. (⇨4-11)

NOTE

- After installing the parking brake, be sure to adjust the parking brake free play.



REAR BRAKE

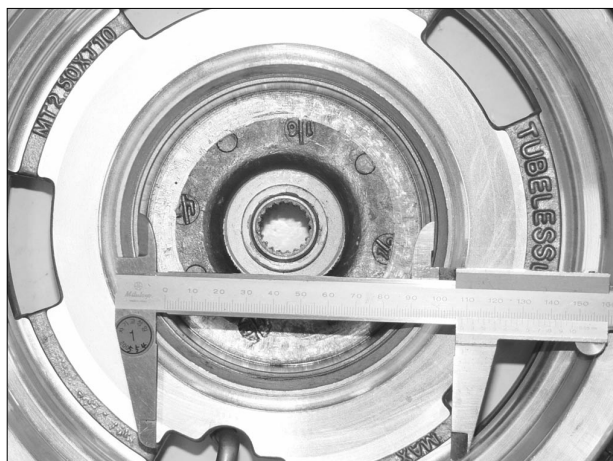
REMOVAL

- Remove the rear wheel.

INSPECTION

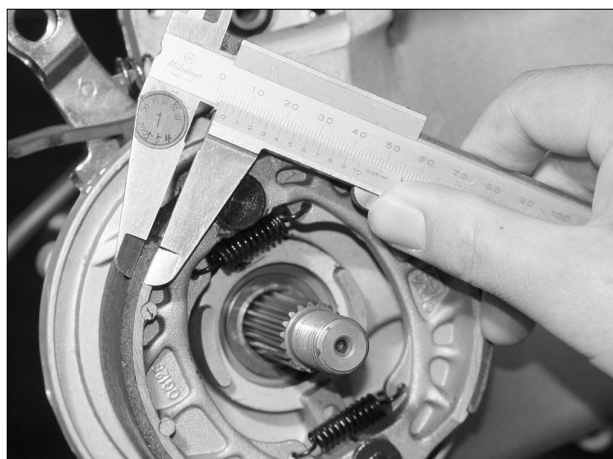
- Measure the brake drum for inner diameter

SERVICE LIMIT : 111mm



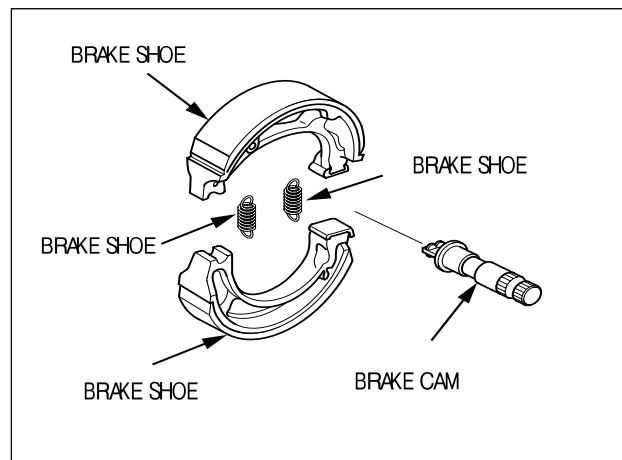
- Measure the brake lining for thickness.

SERVICE LIMIT : 2.0mm

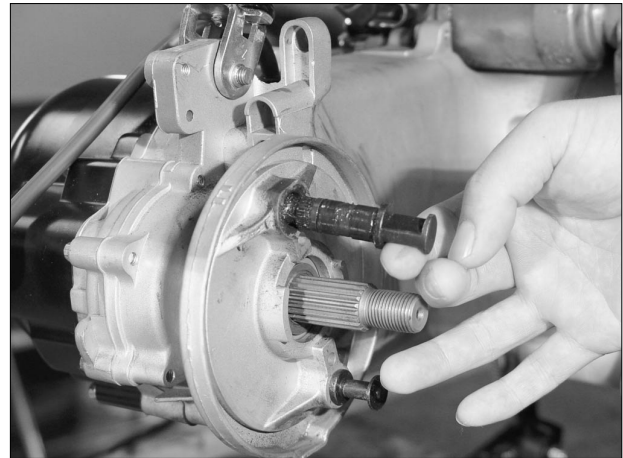


DISASSEMBLY

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



- Loosen the brake arm fixing bolt.
- Remove the rear brake arm.
- Remove the rear brake cam.

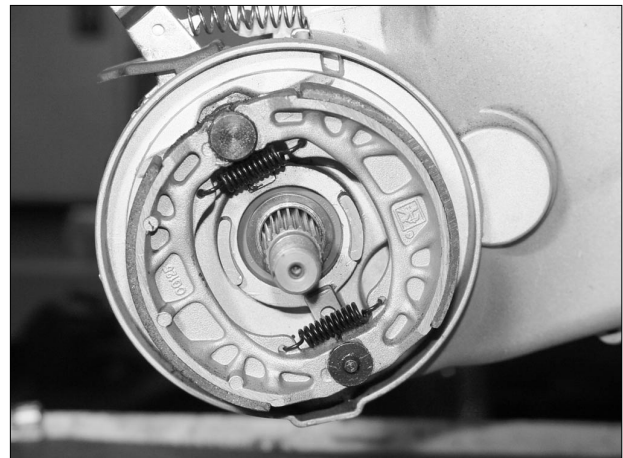


INSTALLATION

- Apply small amount of grease to the brake cam.
- Install the brake cam.
- Install the rear brake arm.

NOTE

- Align the punch marks of the brake arm and the brake cam before assembly.
- Remove the excessive grease after assembling the shoe.



- Install the brake shoe and spring.
- Install the brake shoe into the rear brake cam.
- Install the rear wheel.
- Install the u-nut.

NOTE

- Check the brake for smooth operation.
- After installing the parking brake, be sure to adjust the parking brake free play.



REAR CUSHION

REMOVAL

- Remove the luggage box and body cover.
- Loosen the top and bottom rear cushion setting bolts.

NOTE

- Support the frame firmly prior to working.

DISASSEMBLY

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

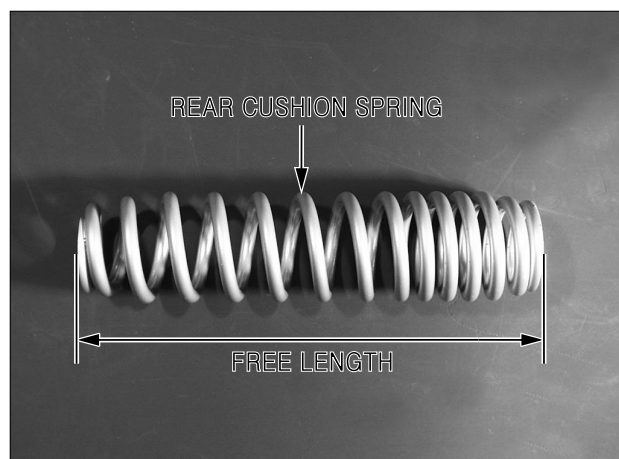
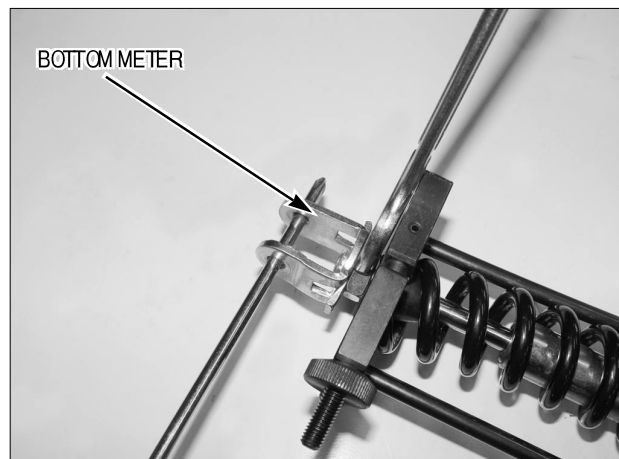
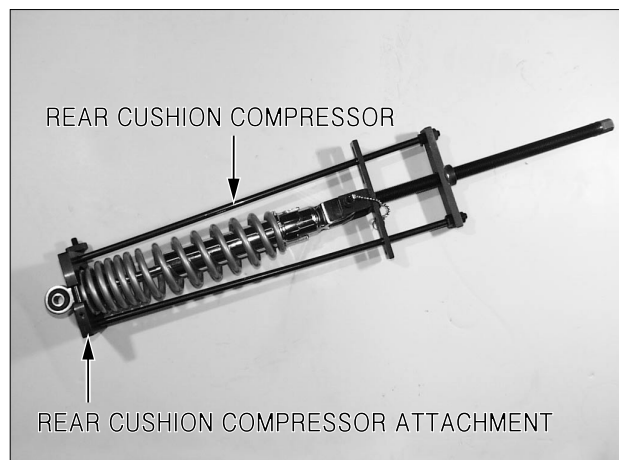
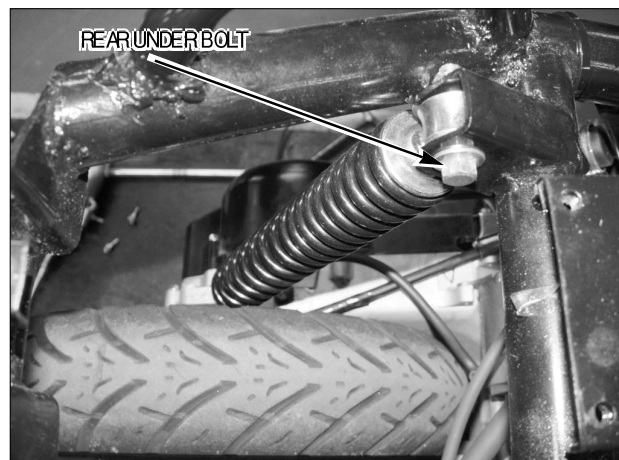
**TOOLS : REAR CUSHION COMPRESSOR ATTACHMENT
REAR CUSHION COMPRESSOR**

- Fix the upper metal, and loosen the hex nut.
- Remove the upper metal.
- Remove the hex nut, stopper rubber, spring from the rear damper component.

INSPECTION

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

SERVICE LIMIT : 267mm

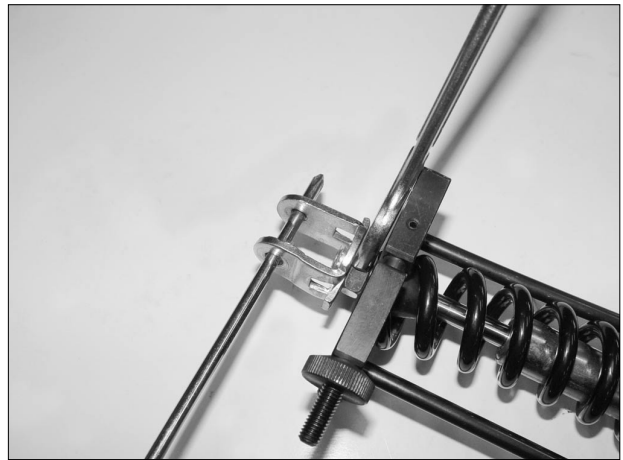


INSTALLATION

- Install the spring, stopper rubber to the damper component.
- Apply thread locking agent to the hex nut, and install the rear cushion compressor attachment on the damper rod.
- Fix the upper metal, and tighten the hex nut.

TORQUE VALUE : 4.0kgf · m

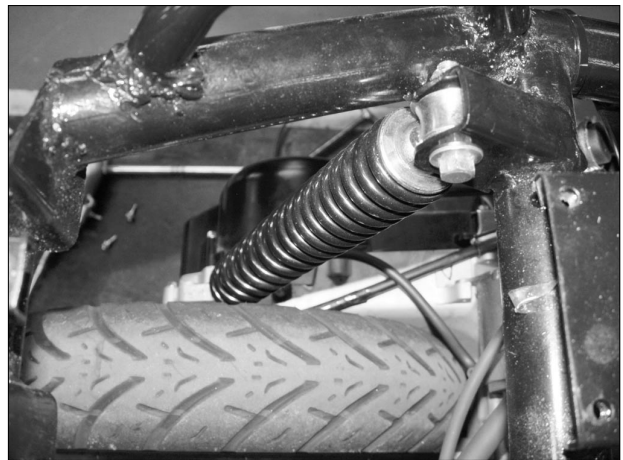
**TOOLS : REAR CUSHION COMPRESSOR
REAR CUSHION COMPRESSOR ATTACHMENT**



- Install the rear cushion.
- Tighten the top and bottom of the cushion with bolts.

**TORQUE VALUE : UPPER SIDE 3.5kgf · m
LOWER SIDE 3.5kgf · m**

- Install the luggage box.



MEMO

14. BRAKE SYSTEM

SERVICE INFORMATION . . .	14-1	BRAKE CALIPER	14-4
TROUBLE SHOOTING	14-1	MASTER CYLINDER	14-6
BRAKE FLUID/BLEEDING . .	14-2		

SERVICE INFORMATION

GENERAL SAFETY

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

TROUBLE SHOOTING

Brake lever / pedal soft or spongy

- Air bubbles in the hydraulic system.
- Leaking hydraulic system.
- Contaminated brake pad / disk .
- Worn caliper piston seal.
- Worn master cylinder piston seal.
- Worn brake pad.
- Contaminated caliper.
- Caliper not sliding properly.
- Worn brake pad / disk.
- Low fluid level.
- Clogged fluid passage.
- Warped / deformed brake disk.
- Sticking / worn caliper piston.
- Sticking / worn master cylinder piston.
- Worn brake disk.
- Contaminated master cylinder.
- Bent brake lever / pedal.

Brake lever / pedal hard

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

Brakes grab or pull to one side

- Contaminated brake pad / disk.
- Misaligned wheel.
- Clogged / restricted brake hose.
- Warped / deformed brake disk.
- Caliper not sliding properly.
- Clogged / restricted brake hose joint.

Brakes drag

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

BRAKE SYSTEM

BRAKE FLUID/BLEEDING

BRAKE FLUID CHANGE

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 cylinder cover.
- Remove the cylinder 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

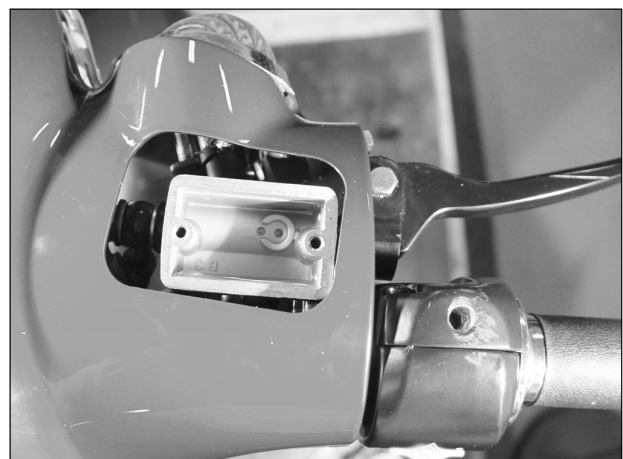
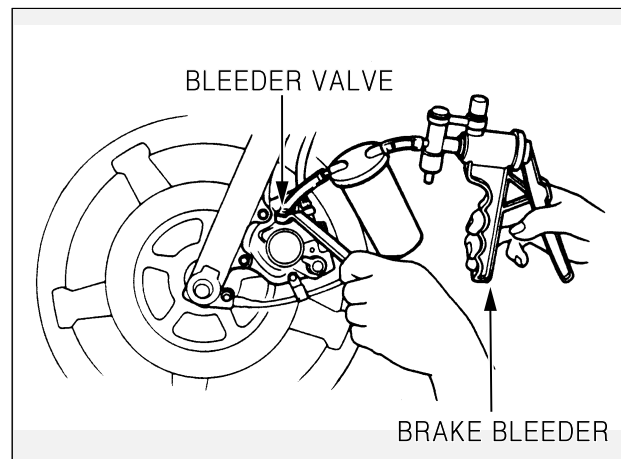
- To prevent chemical changed, do not use different types of brake fluid.

- 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.

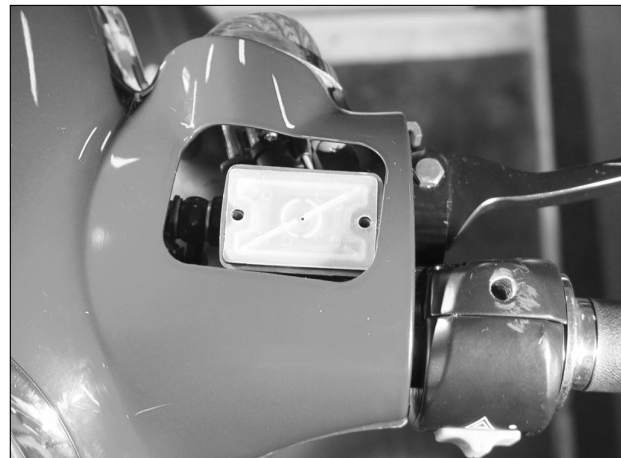
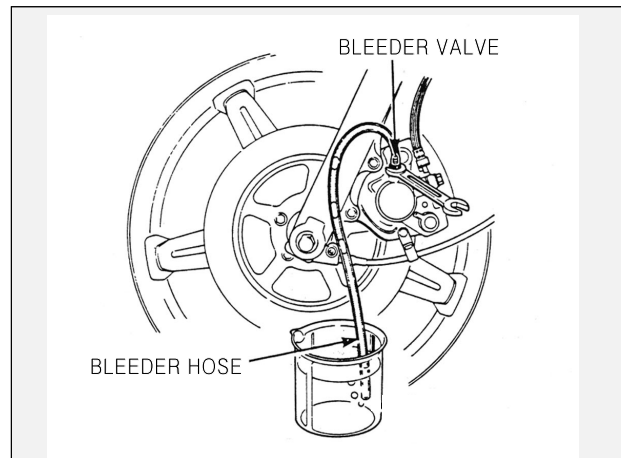
- ② Release the brake lever slowly and wait several seconds after it reaches the end of its travel.
- ③ Repeat the above steps ① and ② until bubbles cease to appear in the fluid at the end of the hose.

- 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 master cylinder cap.

TORQUE VALUE : 1.0 kgf · m

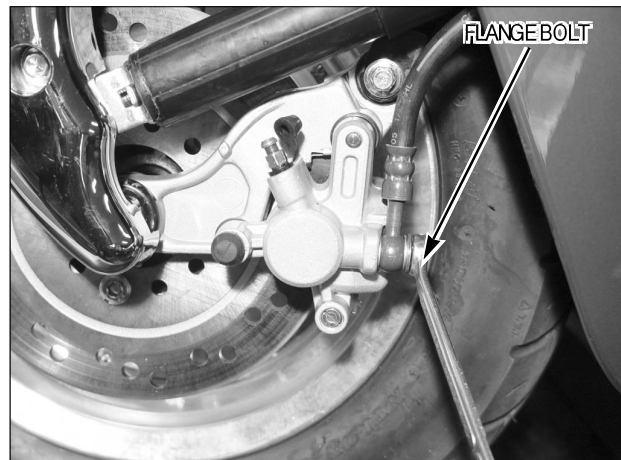


BRAKE SYSTEM

BRAKE CALIPER

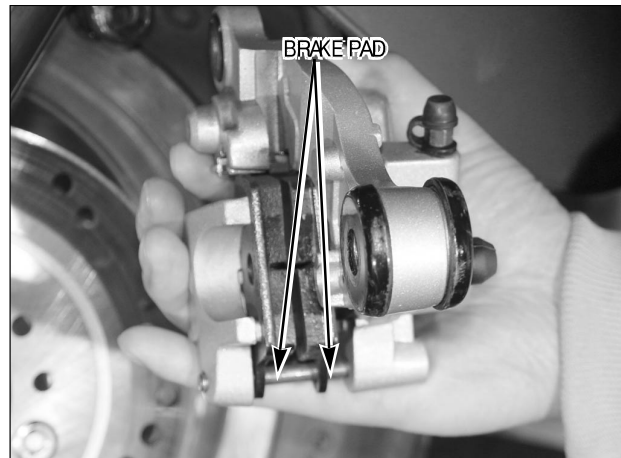
REMOVAL

- Drain the brake fluid.
- Remove the brake tube bolt.
- Remove the flange bolt securing the caliper and remove front axle.



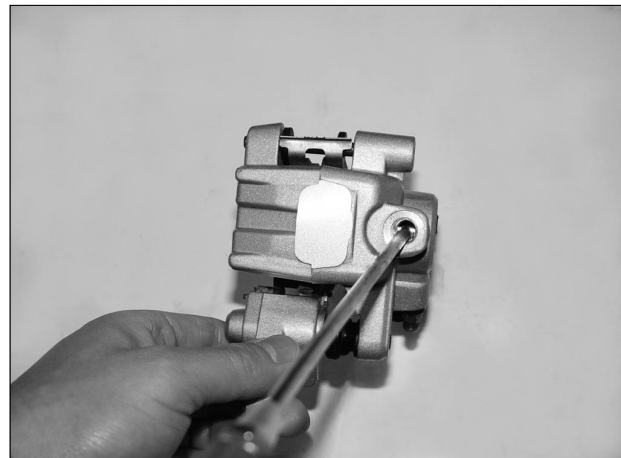
CAUTION

- 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, caliper bracket, pad spring, the boot 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

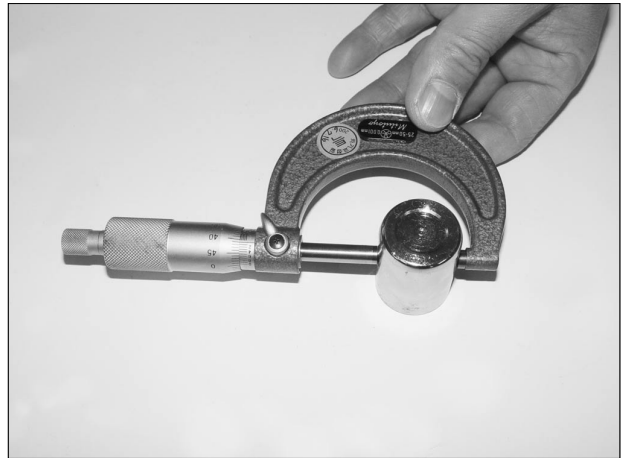
- Check the caliper cylinder bore for scoring, scratches or other damage.
- Measure the inner diameter of caliper.

SERVICE LIMIT: 27.06 mm



- Check the caliper piston outer diameter part for scratches or other damage.
- Measure the out diameter of piston.

SERVICE LIMIT: 26.91 mm

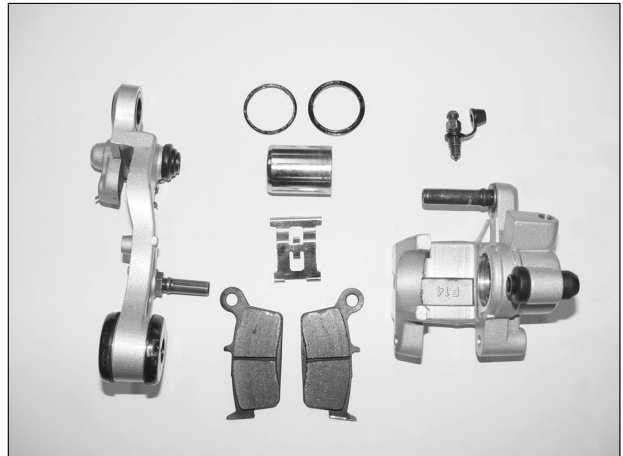


ASSEMBLY

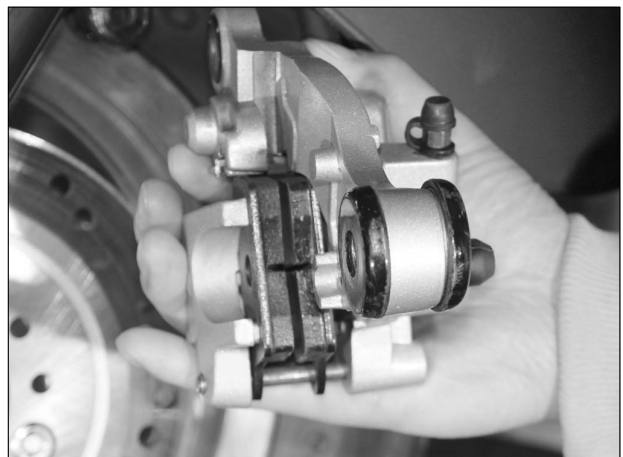
- Clean the piston seal and the dust seal with the brake fluid and install them in the caliper. Install the piston in the caliper with the groove side of the piston facing the pad.

NOTE

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



- Install the boot to the groove 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.



BRAKE SYSTEM

INSTALLATION

- Install the frontcaliper between the front fork and front axle.
- Tighten the caliper fixing bolts to the specided torgue.

TORQUE VALUE : 3.0 kgf · m

- Install the brake hose to the caliper body with the 2 new oil bolt washer and oil bolt.
- Tighten the oil bolt to the specified torgue.

TORQUE VALUE: 3.4 kgf · m

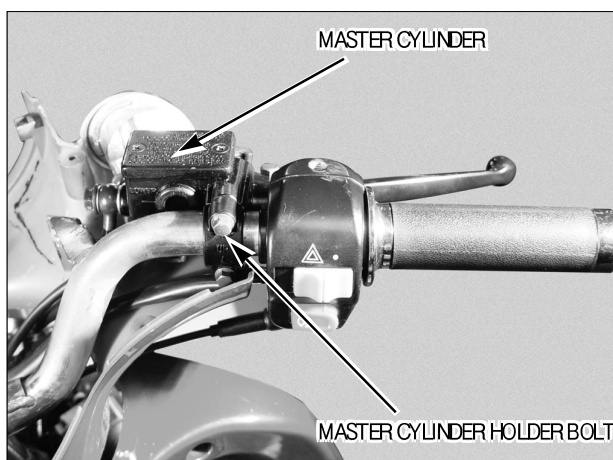
- Fill the brake fluid, and bleed air. (⇒14-2)



MASTER CYLINDER

REMOVAL

- Handle cover.
- Drain the brake fluid.
- Disconnect the front brake switch wire.
- Brake tube bolt.
- Master cylinder holder bolt.
- Master cylinder .



CAUTION

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



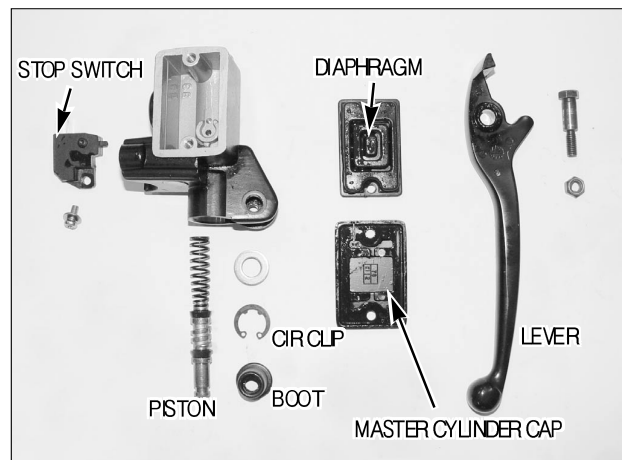
DISASSEMBLY

- Remove the front stop switches.
- Remove the boot, cir clip from the master cylinder.

TOOL : SNAP RING PLIERS

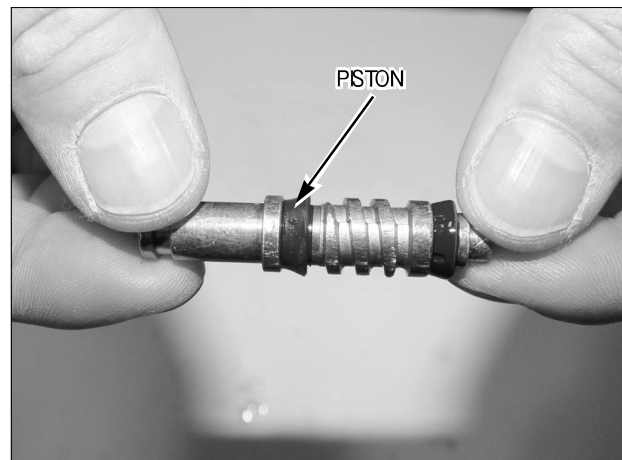


- Remove the washer, piston, spring from the master cylinder.
- Clean the master cylinder, reserve, master piston with the recommended brake fluid.



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

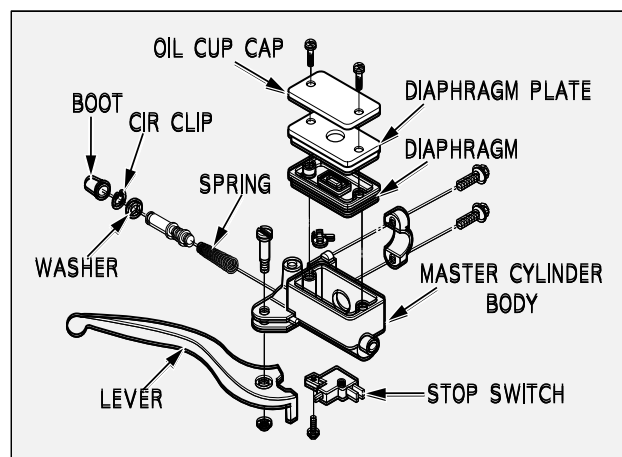
CAUTION

• 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.



BRAKE SYSTEM

- Install the primary cup with its concaved side toward the inner side of the master cylinder.
- Install the snap ring.

TOOL : SNAP RING PLIERS

CAUTION

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

- Install the rubber boot in the groove properly.

INSTALLATION

- Install the front / rear master cylinder to the handle bar.

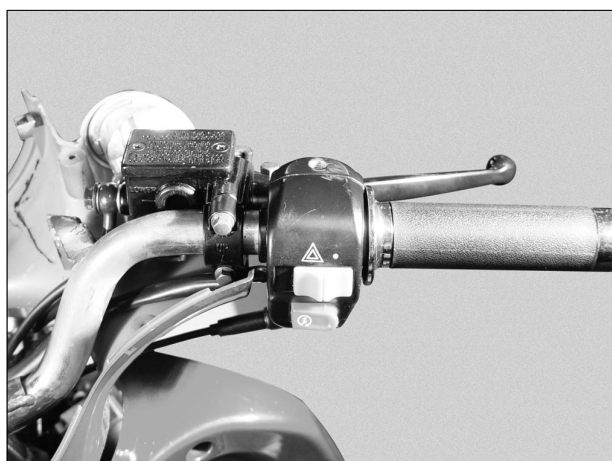
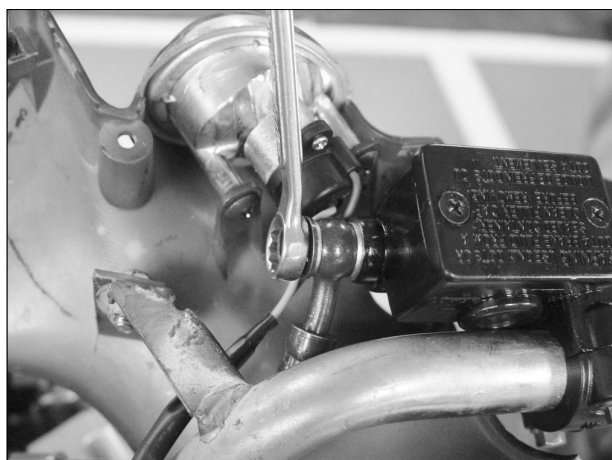
NOTE

- 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.



MEMO

15. BATTERY/CHARGING SYSTEM

SERVICE INFORMATION 15-1	CHARGING SYSTEM INSPECTION . 15-5
CHARGING DEVICES LOCATION . 15-2	A.C. GENERATOR CHARGING COIL
TROUBLE SHOOTING 15-3	INSPECTION 15-6
BATTERY 15-4	

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.

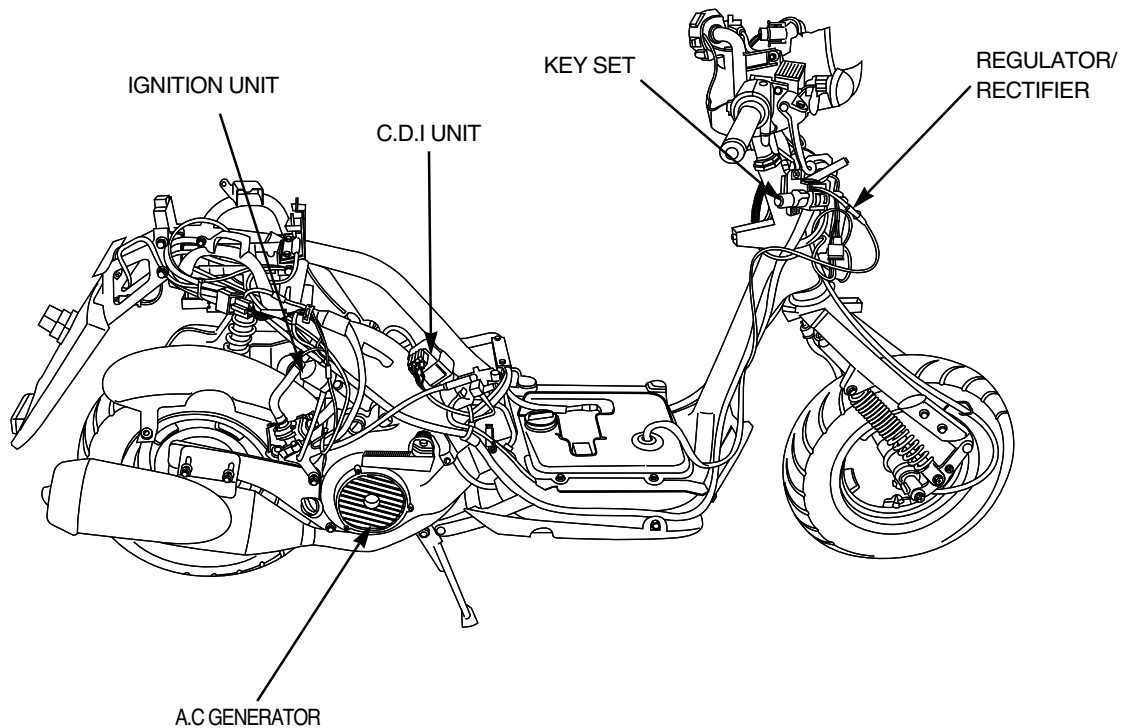
SPECIFICATIONS

ITEM		STANDARD VALUES
BATTERY	Capacity	12V - 8AH (MF)
	Terminal-to-terminal voltage (When fully charged)	12.8 - 13.0V
A.C.GENERATOR	Charging coil resistance value (20°C)	0.5 - 1.5 Ω (20°C)
	rpm at charging start	-
REGULATOR/ RECTIFIER	Regulator voltage	14.0 $\pm$ 15.0V / 5,000rpm

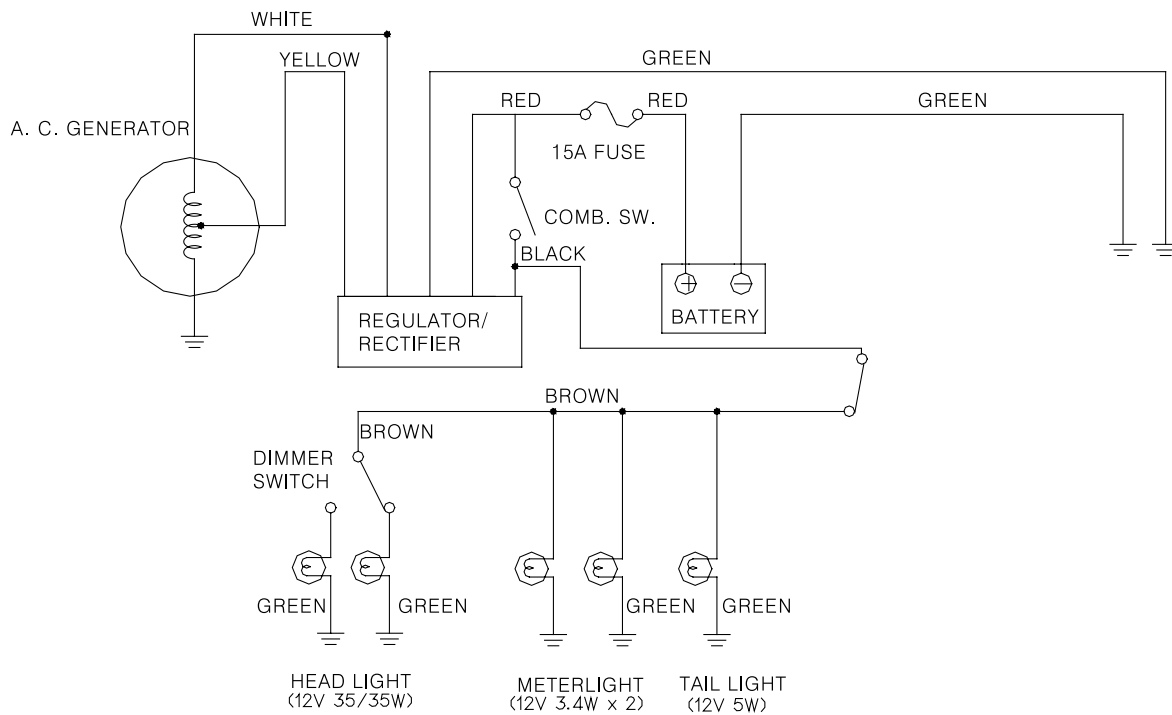
TOOLS

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

CHARGING DEVICE LOCATION



CHARGING DEVICE LOCATION



TROUBLE SHOOTING

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.

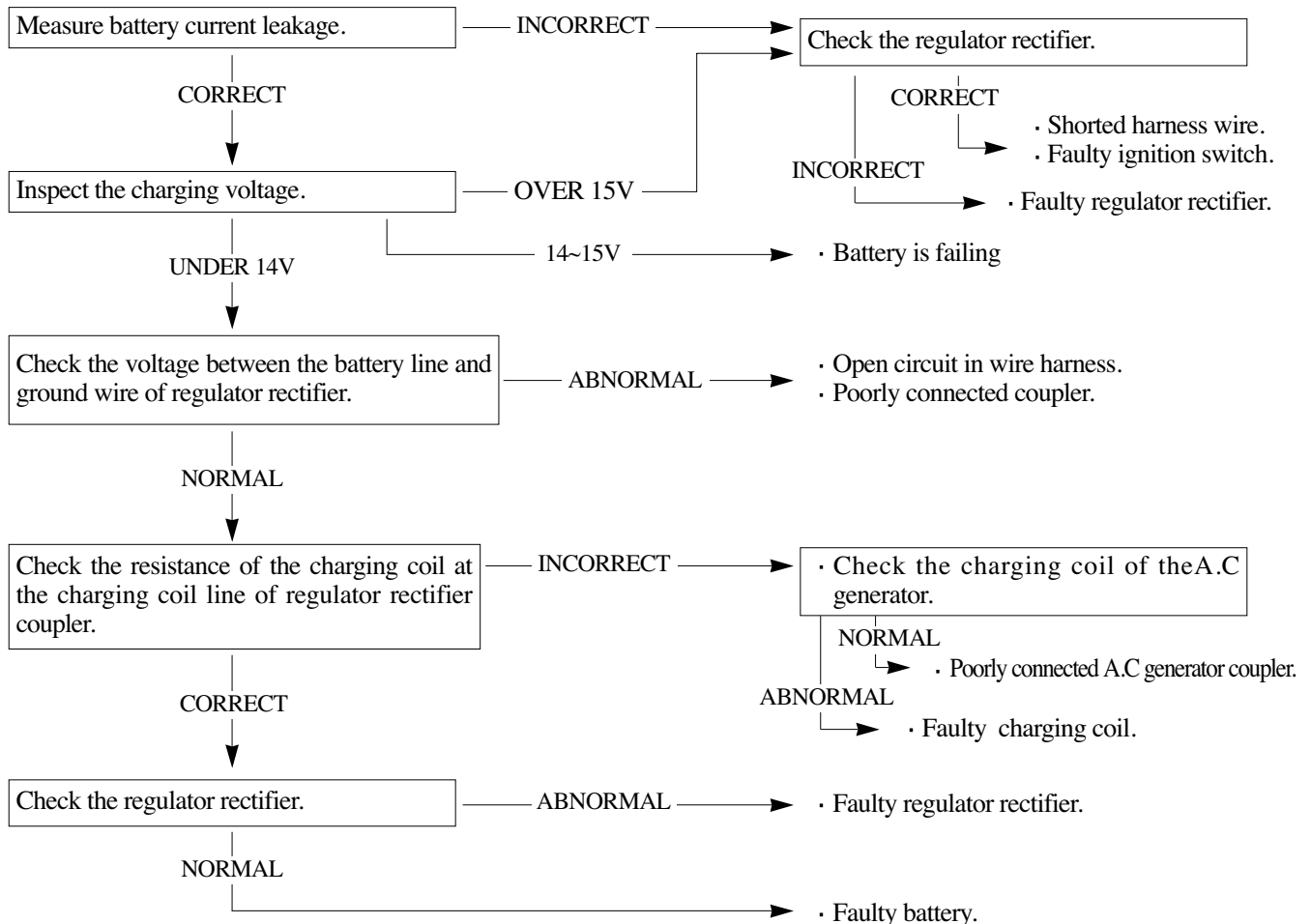
Intermittent power

- 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.

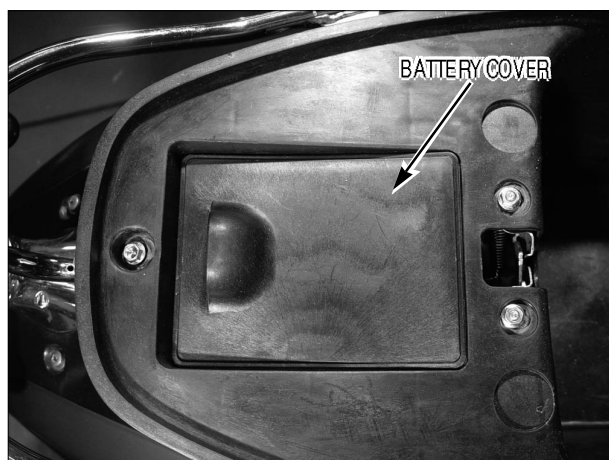
CHARGING SYSTEM



BATTERY

REMOVAL

- Turn off the ignition switch.
- Remove the battery cover.



- Remove the battery.
- Disconnect the negative “⊖” battery cable first, and then disconnect the positive “⊕” cable.
- Install in the reverse order of removal.

WARNING

- Disconnecting the positive “⊕” cable first could cause an accidental direct short between the two terminals when the tool disconnecting the terminal contacts the frame. The spark could ignite or damage the battery.
- To prevent shorting, always connect the positive “⊕” cable first.

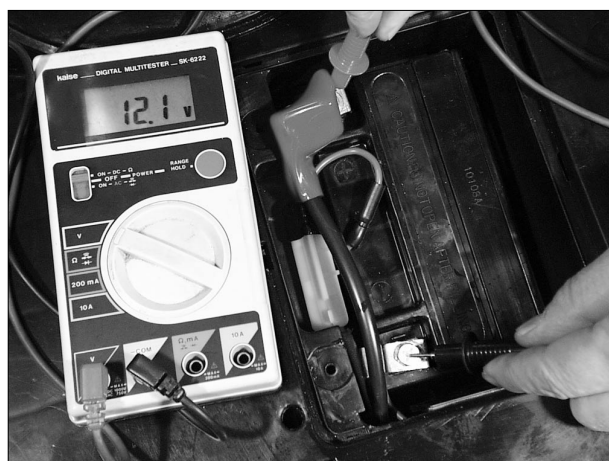


BATTERY (OPEN-CIRCUIT VOLTAGE) INSPECTION

- Remove the battery cable.
- Measure the voltage between the battery terminals.

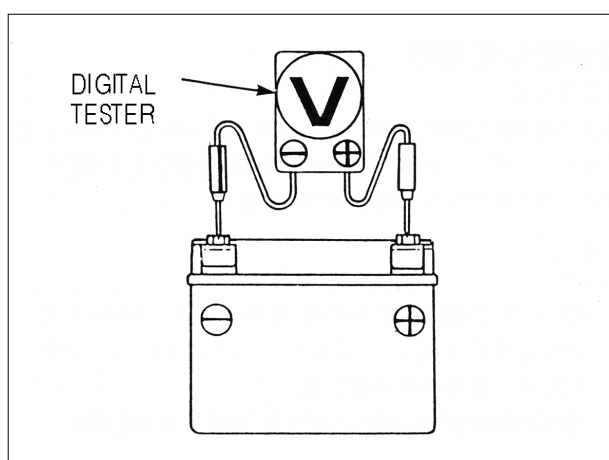
- FULLY CHARGED : 13.0-13.2V

- INSUFFICIENTLY CHARGED : UNDER 12.3V



NOTE

- Use a voltmeter that will accurately indicate 0.1V difference.
- Never open the sealed filler cap.
- 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.



CHARGING SYSTEM INSPECTION

LEAK TEST

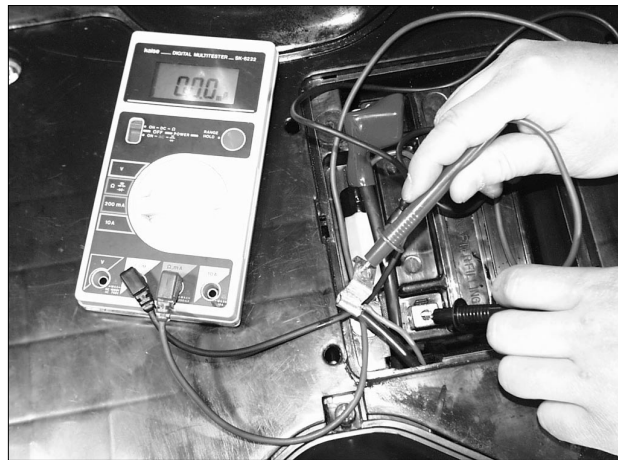
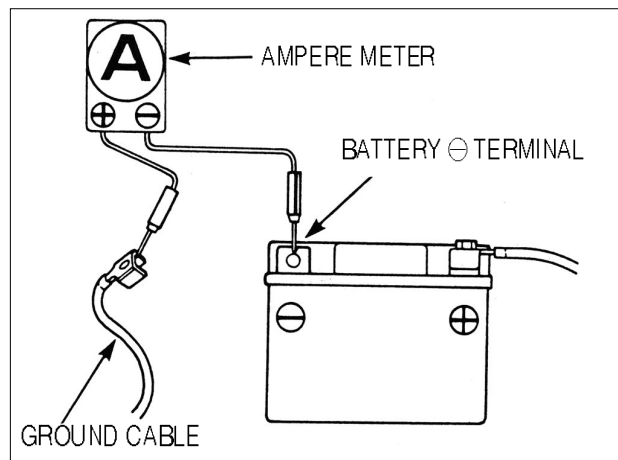
- Turn off the ignition switch, and disconnect the ground (-) cable from the battery.
- Connect an ampere meter between negative (-) terminal and ground cable.
- With the ignition switch off, measure the leakage current.

LEAK CURRENT : Not to exceed 1mA

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.



CHARGING VOLTAGE INSPECTION

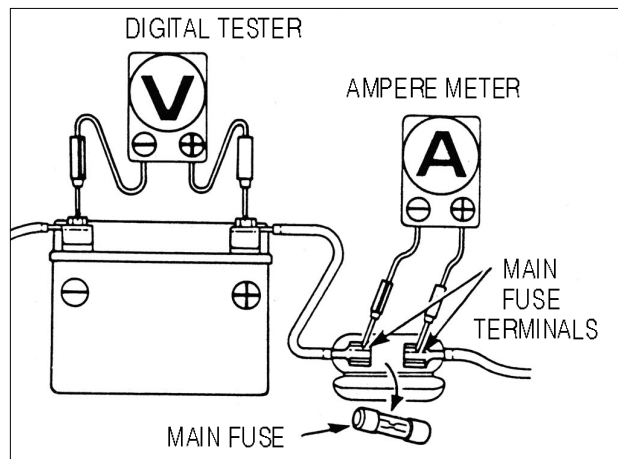
NOTE

- Be sure that the battery is fully charged before performing this test. The amount of current flow may change abruptly if not sufficiently charged. Use a battery whose voltage between its terminals is 13.0~13.2V
- When the engine is started using the starter motor, a large amount of current may flow from the battery temporarily. Use the kick starter to start the engine.

- After warming up the engine, replace the battery with a fully charged battery.
- Connect a tester between the battery terminals.
- Connect an ampere meter between the terminals of the main fuse.

NOTE

- If the probes are connected in reverse order, the registered current flow direction when charging and discharging the battery will be reversed as well.



- Connect a RPM tester to the high-tension cord.
- Start the engine.
- Gradually increase the engine speed and measure the charging voltage and charging current.

CHARGING CURRENT : 2.5~3.5A / 3,000rpm

CONTROL VOLTAGE : 14.5 ±0.5V / 5,000rpm

TOOLS : RPM TESTER

DIGITAL TESTER

- Install in the reverse order of removal.

A.C GENERATOR COIL INSPECTION

NOTE

- This test is done with the starter mounted to the engine.

- Release the seat lock with the main key.
- Disconnect the coupler of the A.C generator.
- Measure the resistance between the yellow leads.

RESISTANCE VALUE : 1.0~1.5 Ω (20°C)

- If the resistance values are much larger than the specified value, or if there is continuity between terminals and earth terminals, replace the stator with a new one.
- Install in the reverse order of removal.

REGULATOR RECTIFIER

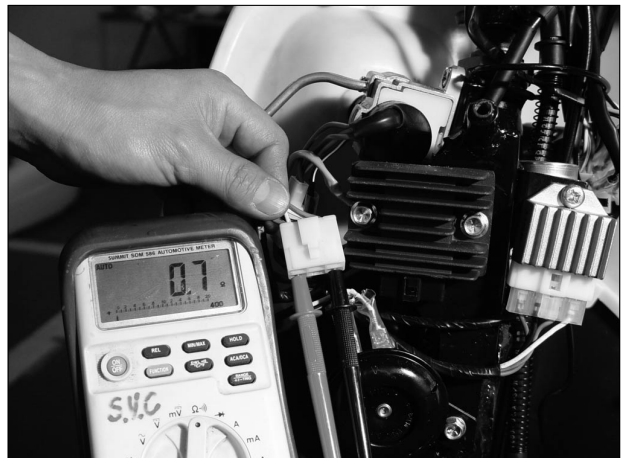
- Remove the luggage box.
- Disconnect the regulator rectifier coupler.
- Measure the resistance between the terminals.

RESISTANCE VALUE

Unit : Ω

Tester $\oplus$	R	B	Y	G	W
Tester $\ominus$					
R		0-5	1253	2747	1242
B	∞		∞	∞	∞
Y	∞	1-4		1248	∞
G	2751	1-4	1248		1234
W	1241	1-4	∞	1234	

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



16. IGNITION SYSTEM

SERVICE INFORMATION 16-1
IGNITION DEVICES LOCATION . 16-2
TROUBLE SHOOTING 16-3

CDI UNIT INSPECTION 16-4
PULSE GENERATOR INSPECTION . 16-4
IGNITION COIL INSPECTION . . 16-5

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. (⇒chapter 19)

SPECIFICATIONS

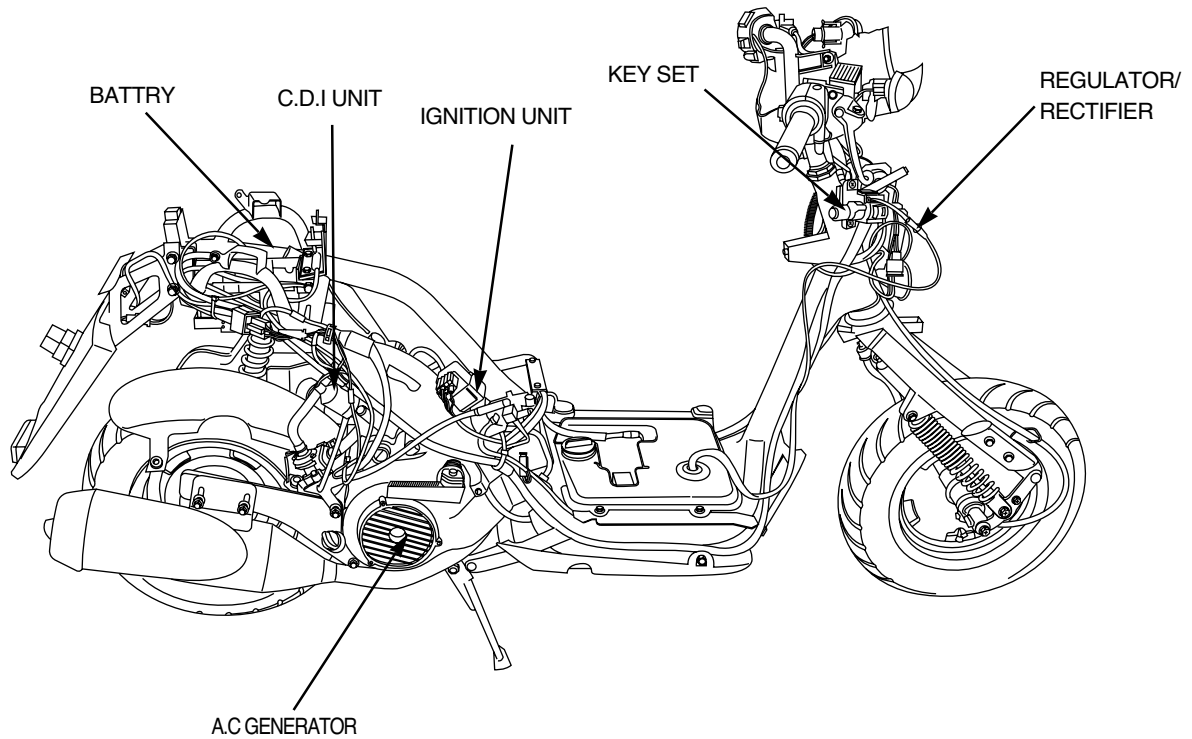
ITEM			
IGNITION COIL RESISTANCE VALUE 20℃	PRIMARY COIL		
	SECONDARY COIL	WITH PLUG CAP	STANDARD VALUE 0.1 ~ 0.5 Ω
		WITHOUT PLUG CAP	6.5 ~ 9.8 kΩ
PULSE GENERATOR COIL RESISTANCE VALUE 20℃			2.7 ~ 3.5 kΩ
SPARK PLUG			
SPARK PLUG CLEARANCE			50 ~ 200 Ω
TOOLS			P-Z9HC
			0.6 ~ 0.7mm

TOOLS

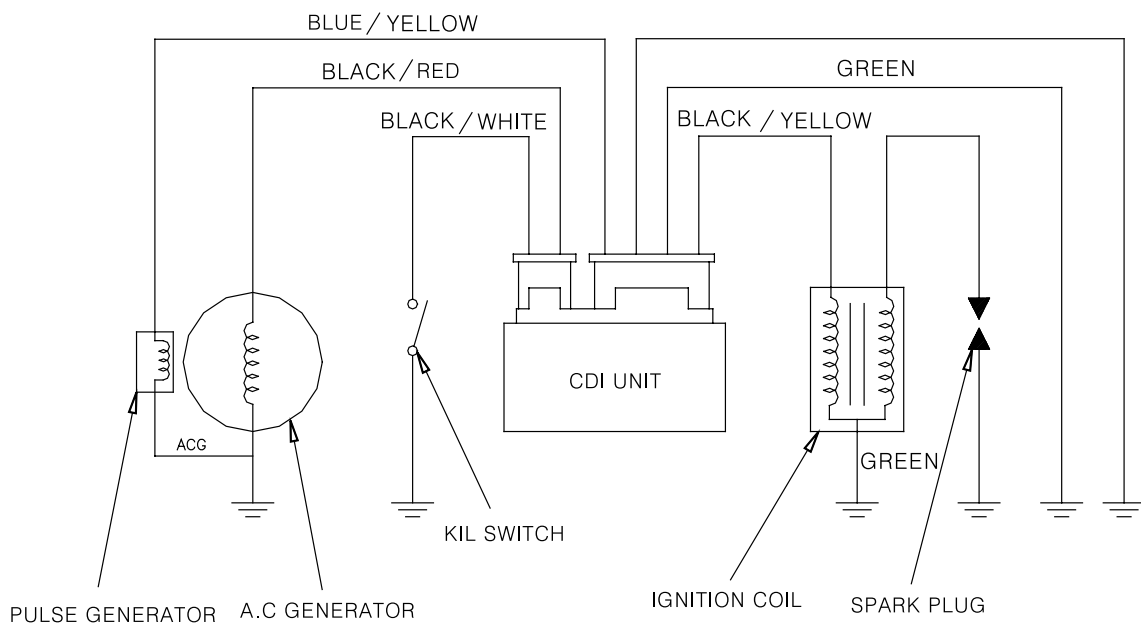
DIGITAL TESTER
PVA MULTI-TESTER
CDI TESTER

IGNITION SYSTEM

IGNITION DEVICES LOCATION



IGNITION SYSTEM



TROUBLE SHOOTING

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 system control circuit such as side stand switch. 6. Faulty ignition coil. 7. Faulty CDI unit (in case when above No. 1~6 are normal).
	No peak voltage.	1. Incorrect peak voltage adaptor connections. 2. Faulty ignition switch. 3. Loose or poorly connected CDI unit connector. 4. Open circuit or poor connection in ground cord of the CDI unit. 5. Faulty ignition system control circuit such as side stand switch. 6. Faulty peak voltage adaptor. 7. Faulty CDI unit (in case when above No. 1~6 are normal).
	Peak voltage is normal, but no spark jumps at plug.	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 SYSTEM

CDI UNIT INSPECTION

CDI IGNITION CIRCUIT INSPECTION

NOTE

- Follow the steps described in the troubleshooting flow chart when servicing the ignition system.

- Release the seat lock with the main key.
- Remove the luggage box.
- Disconnect the coupler from the CDI unit, and check the ignition system circuits from the wiring coupler side.

Inspection Items

ITEM	INSPECTION
MAIN SWITCH	Check that there is battery voltage between main switch wire (black) and ground wire when the ignition is ON
PULSE GENERATOR	Check that the resistance of coil (between blue / yellow and green) is within the specified range. (50~200 Ω)
IGNITION COIL (PRIMARY COIL)	Check that the resistance of coil (between black / yellow and green) is within the specified range. (0.1~0.5 Ω)
GROUND WIRE	Check continuity between ground and frame.

- If there are a normality in the diagnosis above, and if there is no spark at plug, check the CDI unit and ignition coil by using a CDI tester.

**TOOLS : CDI TESTER
DIGITAL TESTER**

NOTE

- Read tester manual carefully prior to using the tester.

- Replace the CDI unit if faulty.
- Install in the reverse order of removal.

PULSE GENERATOR INSPECTION

RESISTANCE MEASUREMENT

- Release the seat lock with the main key.
- Remove the luggage box.
- Disconnect the A.C generator 4P coupler and the blue / yellow wire connector.
- Measure the resistance between the green and blue / yellow.

STANDARD VALUE : 50~200 Ω

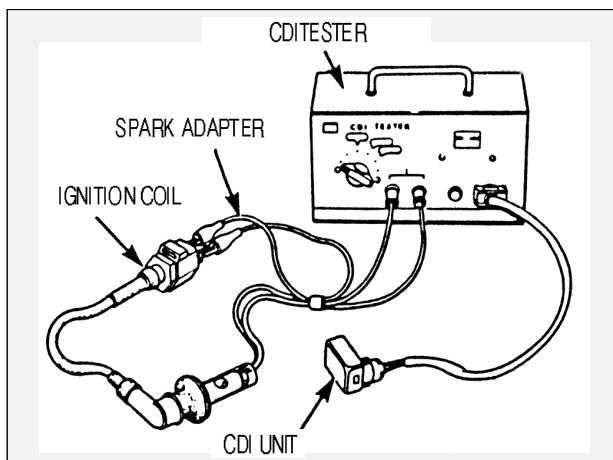
PVA MEASUREMENT

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

PEAK VOLTAGE : OVER 1.5V

TOOL : PVA MULTI TESTER

- Install in the reverse order of removal.



IGNITION COIL INSPECTION

- Remove the luggage box.
- Remove the primary wire.

NOTE

- Measure the peak voltage of the ignition coil primary side first.
- Since the resistance value of the primary coil is inherently very small, it is difficult to distinguish it from a shorted wire.

PRIMARY COIL INSPECTION

- 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 : 0.1~0.5 Ω

SECONDARY COIL INSPECTION

- 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.

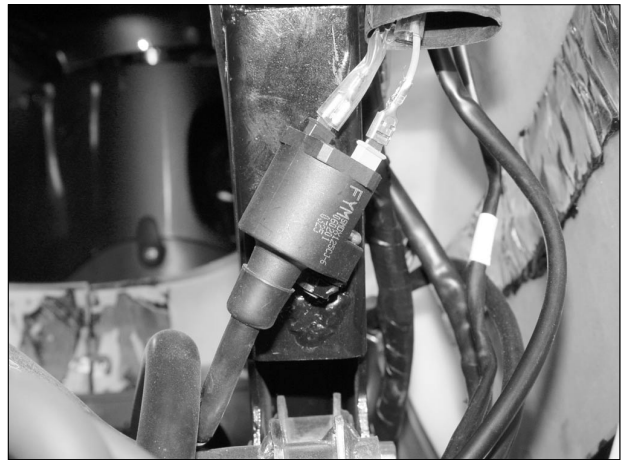
STANDARD VALUE : 6.5~9.8 $k\Omega$

- 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 : 2.7~3.5 $k\Omega$

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.



MEMO

17. STARTER SYSTEM

SERVICE INFORMATION 17-1	STARTER MOTOR 17-4
STARTER DEVICES LOCATION . 17-2	STARTER MAGNETIC SWITCH . 17-7
TROUBLE SHOOTING 17-3	

SERVICE INFORMATION

GENERAL SAFETY

WARNING

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

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

SPECIFICATION

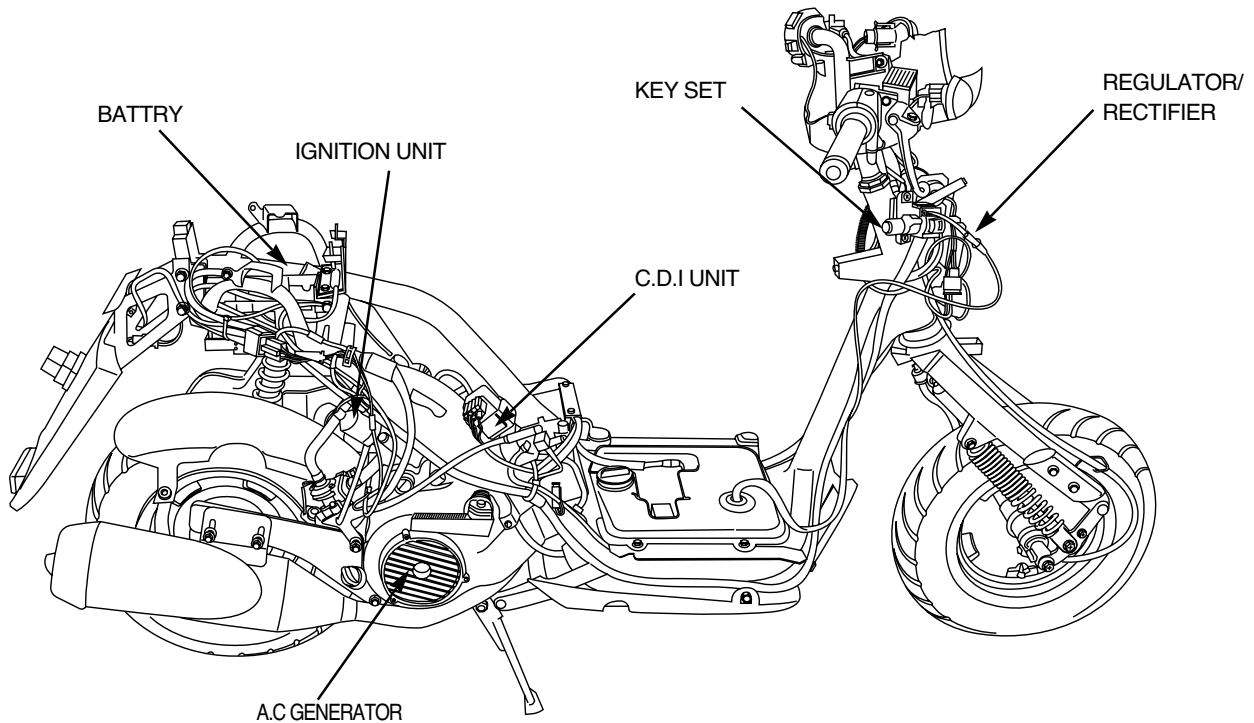
ITEM	STANDARD VALUE	SERVICE LIMIT
STARTER MOTOR BRUSH LENGTH	11.0 ~ 11.05 mm	6.5 mm

TOOLS

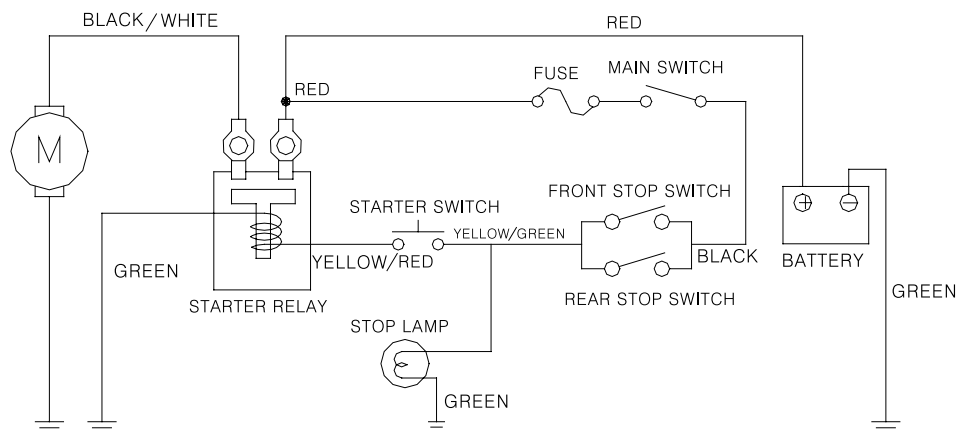
DIGITAL TESTER
VERNIER CALIPER

STARTER SYSTEM

STARTER DEVICES LOCATION



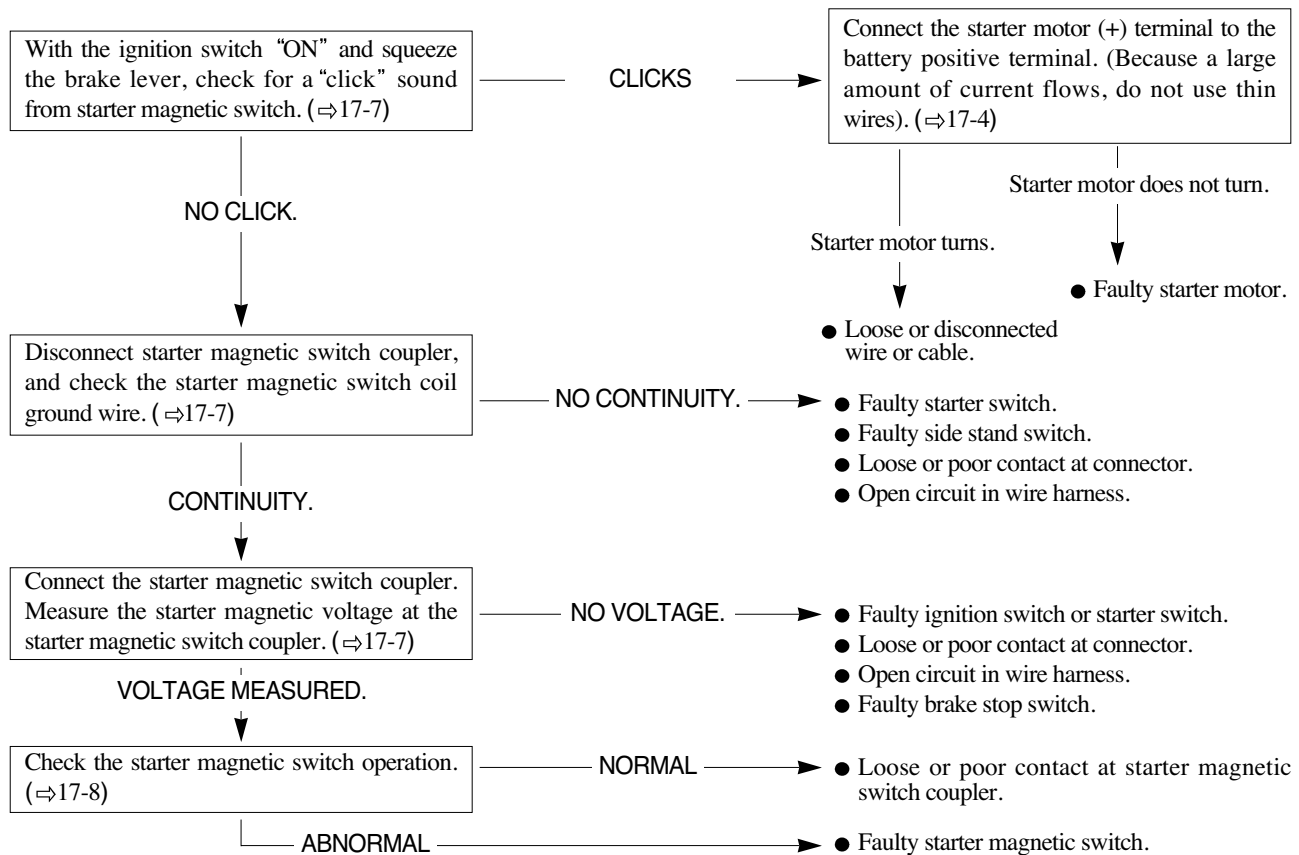
STARTER SYSTEM



TROUBLE SHOOTING

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 SYSTEM

STARTER MOTOR

REMOVAL

- Release the seat lock with the main key.
- Remove the luggage box.
- 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.

NOTE

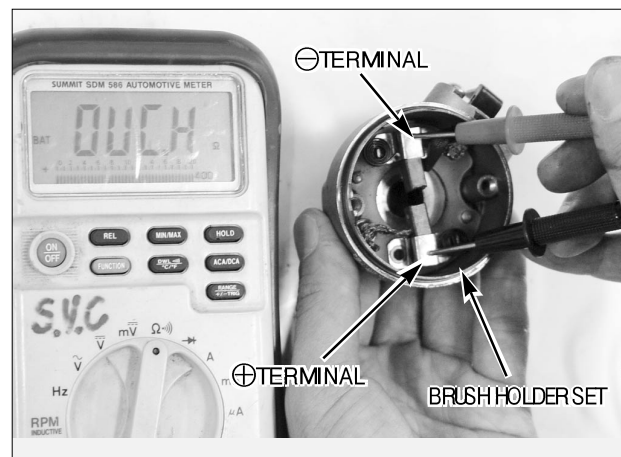
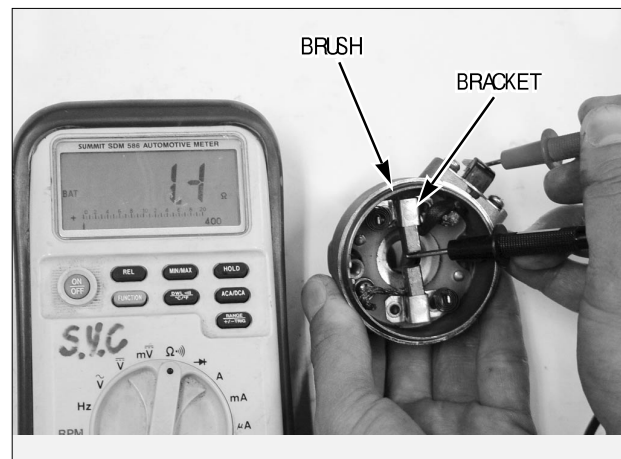
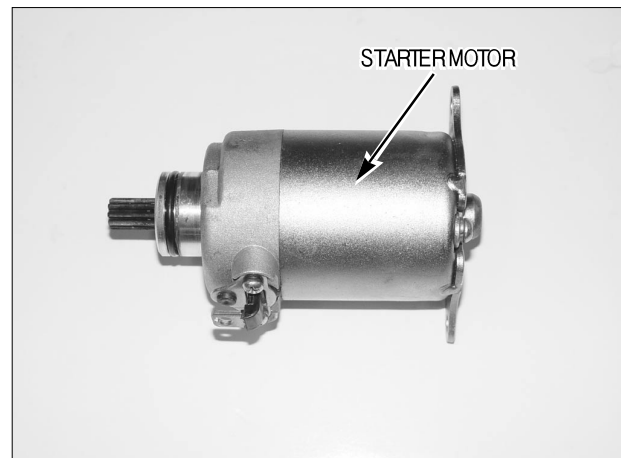
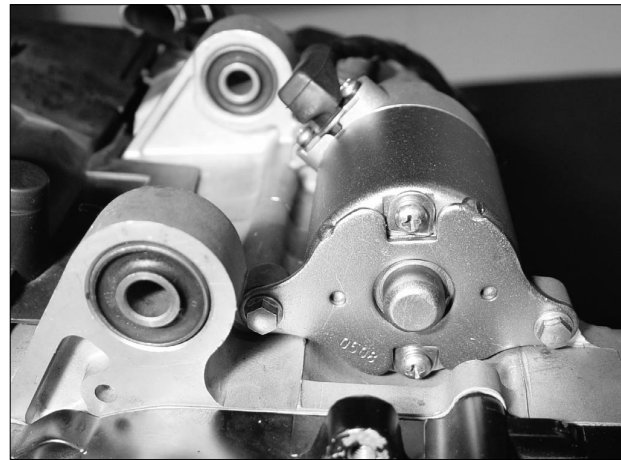
- Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.
- Accurately tighten the battery earth cable.

DISASSEMBLY

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

INSPECTION

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



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

SERVICE LIMIT : 6.5 mm

TOOL : VERNIER CALIPER

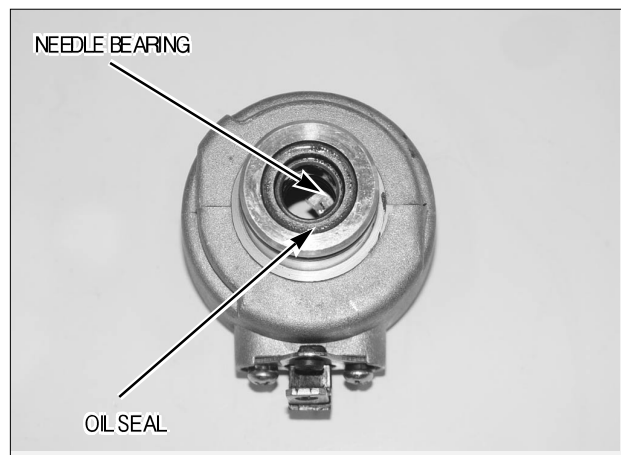
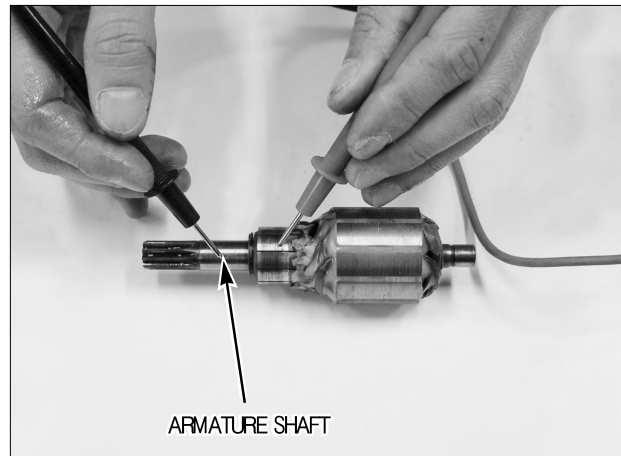
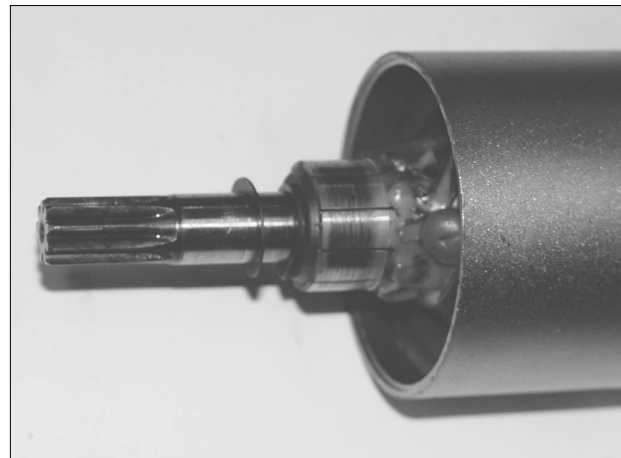
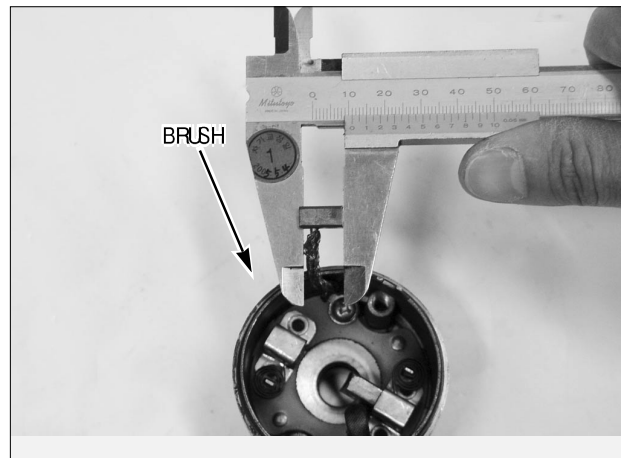
NOTE

- If replacement, replace with a brush holder set.

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

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

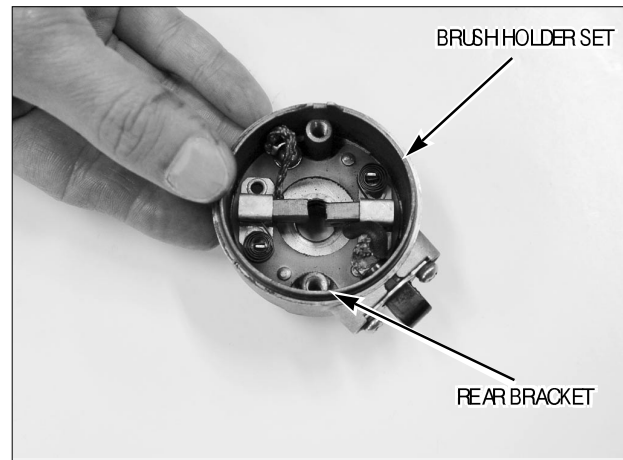
- Check the needle bearing and oil seal.
 - Do not rotate smoothly. → Replace with a new one.
 - Damage oil seal. → Replace with a new one.



STARTER SYSTEM

STARTER MOTOR ASSEMBLY

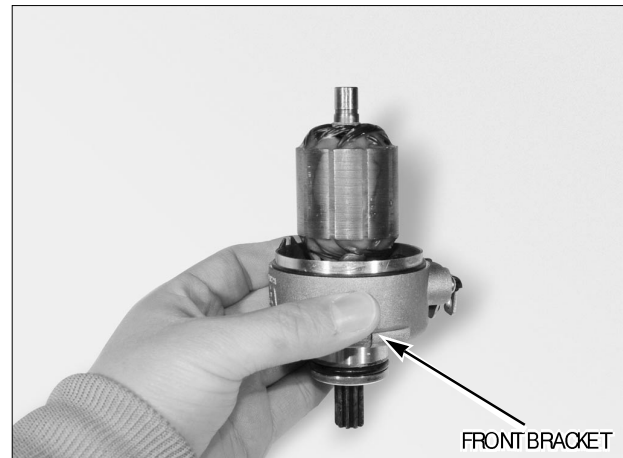
- Install the brush and brush spring to the brush hold set.
- Insert the brush terminal into the rear bracket, and install the terminal set and flange nut.
- Align the brush holder set with the rear bracket groove, and install the brush holder set.
- Apply grease to both ends of the armature shaft, and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



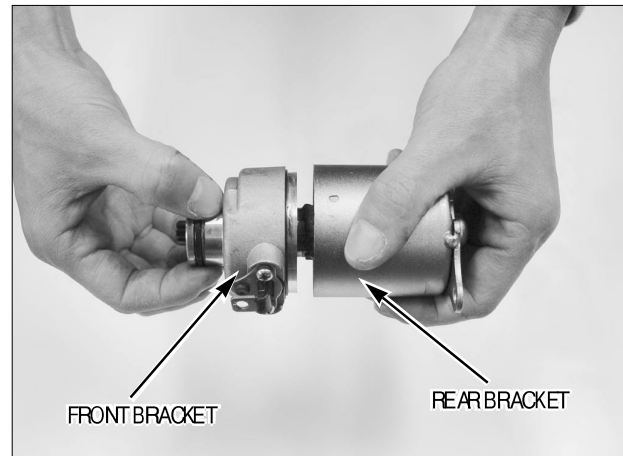
- Push and hold the brush inside the rear bracket, and insert the armature into the rear bracket groove.
- Align the case mark with the rear bracket mark, and install the case.
- Insert the thrust washer (0.5t), thrust washer (0.2t), slip washer and thrust support.

CAUTION

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



- Align the front bracket with the case mark, and install the front bracket.



- Tighten the motor cover bolts.

CAUTION

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



STARTER MAGNETIC SWITCH

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.



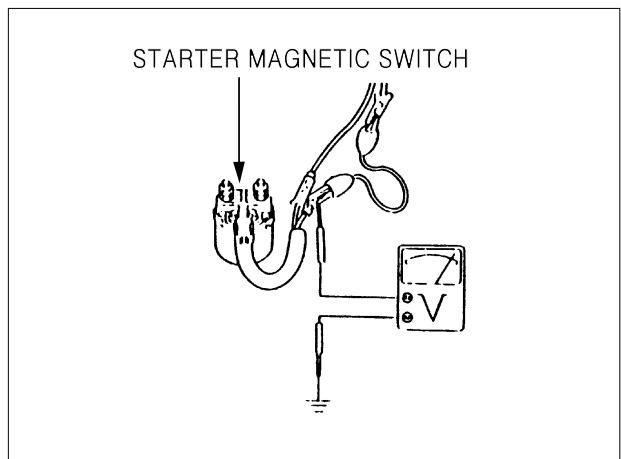
INSPECTION

- 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)



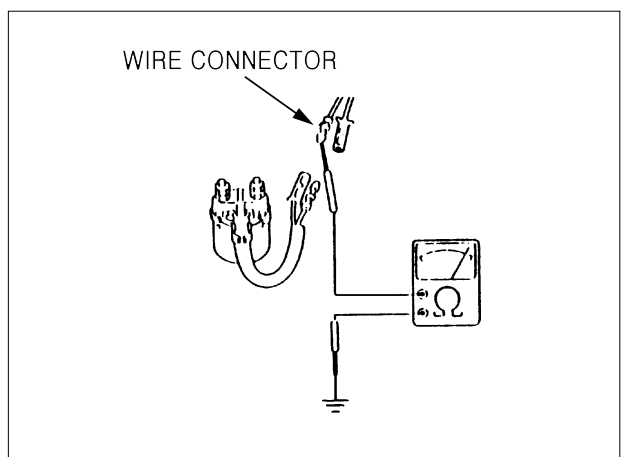
Starter magnetic switch voltage

- 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

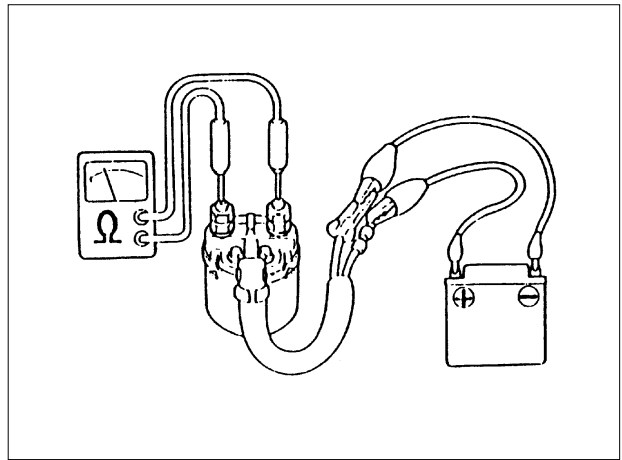
- Disconnect the wire connector from the starter magnetic switch and check for continuity between the ground wire (green / yellow) and ground.



STARTER SYSTEM

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.



18. LIGHTS/METER/SWITCHES

SERVICE INFORMATION	18-1	MAIN SWITCH	18-3
TROUBLE SHOOTING	18-1	HANDLE BAR SWITCH	18-3
HEADLIGHT	18-2	TRUNK LAMP SWITCH	18-4
FRONT WINKER BULB REPLACEMENT	18-2	FRONT/REAR STOP SWITCH	18-4
TAIL LIGHT / REAR WINKER BULB		FUEL UNIT	18-5
REPLACEMENT	18-2		

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.

TROUBLE SHOOTING

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.

HEADLIGHT

REMOVAL

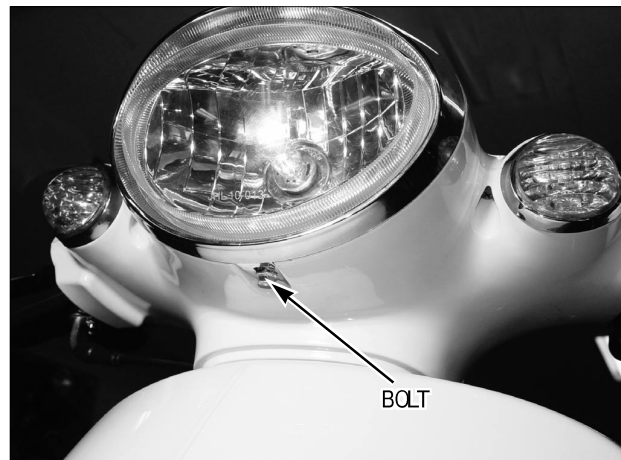
- Remove the front cover.
- Disconnect the headlight.
- Remove the headlight coupler.
- Remove the valve socket from the rubber booth.
- Remove the rubber booth.
- Remove the bulb.

NOTE

- Before replacing the bulb, be sure to check the switches for loose connection of the connectors.
- If you touch the bulb with your bare hands, clean it with a cloth moistened with denatured alcohol to prevent early bulb failure.
- Avoid touching Halogen headlight bulb. Finger prints can create hot spots that cause a bulb to break.
- Be sure to install the dust cover after replacing the bulb.

WARNING

- Headlight bulbs become very hot while the headlight is ON, and remain hot for a while after they are turned OFF. Be sure to turn the ignition switch OFF and let the bulb cool down before replacement.



FRONT WINKER BULB REPLACEMENT

- Remove the upper handle cover.
- Replace the bulb.



TAIL LIGHT /REAR WINKER BULB REPLACEMENT

- Remove the body cover and tail light.
- Replace the tail light lens as a set, it is LED.
- Replace with a bulb, after remove the winker lens.
- Install in the reverse order of removal.

NOTE

- Pay attention not to damage the lens.
- Do not apply excessive force when removing the lens.



MAIN SWITCH

REMOVAL

- Remove the front cover. (⇒4-3)
- Disconnect the main switch coupler.
- Release the lock, remove the main key cover.
- Remove the seat lock cable.
- Loosen the 3 screws and remove the main switch.
- Install in the reverse order of removal.

INSPECTION

- Check for continuity between the terminals
- There should be continuity between the O—O positions on the continuity chart.

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

HANDLE BAR SWITCH

INSPECTION

- Remove the back mirror.
- Remove the wind screen. (⇒4-10)
- Remove the front handle cover. (⇒4-10)
- Disconnect the RH./LH. winker wire.
- Disconnect the handle bar switch connector and coupler, check for continuity between the terminals.
- There should be continuity between the O—O positions on the continuity chart.

STARTER SWITCH

COLOR	YELLOW/RED	GREEN
TERMINAL	ST	E
FREE		
PUSH	○	○

LIGHTING SWITCH

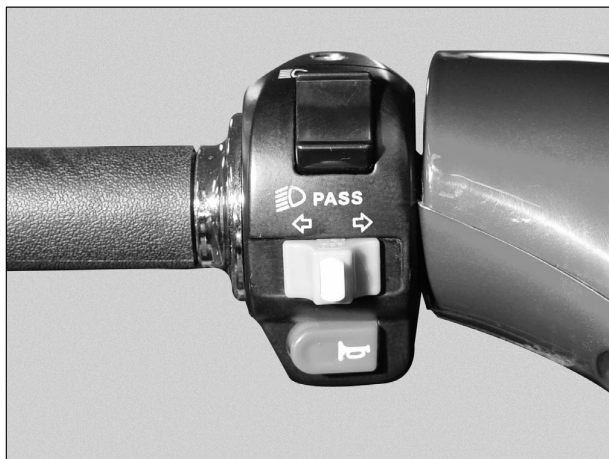
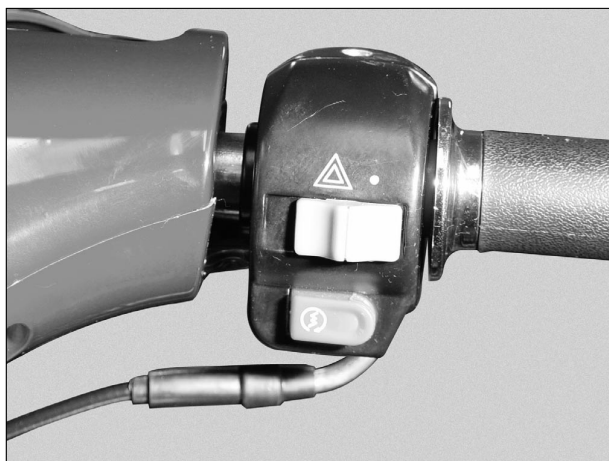
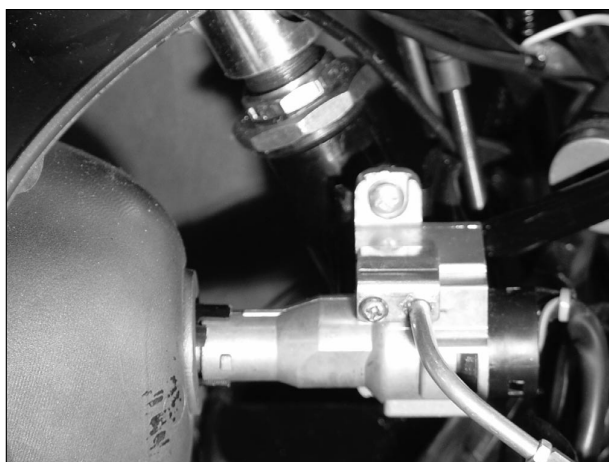
COLOR	BROWN/WHITE	BROWN	BLACK
TERMINAL	HL	TL	BAT
OFF			○
PO		○	○
(N)		○	○
H	○	○	○

DIMMER SWITCH

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

WINKER SWITCH

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



LIGHTS/METER/SWITCHES

HORN SWITCH

COLOR	LIGHT GREEN	BLACK
TERMINAL	HO	BATO
FREE		
PUSH		

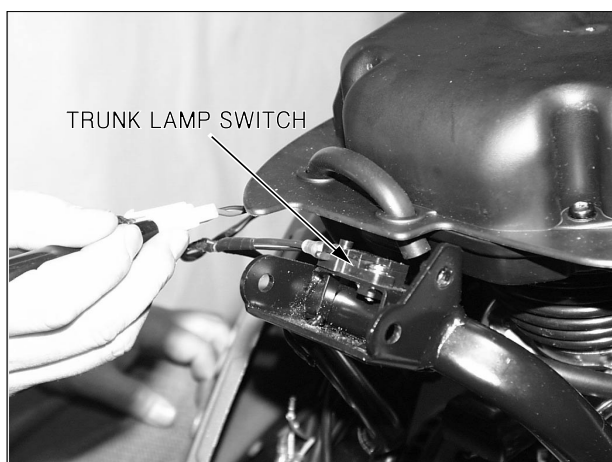
- Install in the reverse order of removal.



TRUNK LAMP SWITCH

INSPECTION

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



FRONT/REAR STOP SWITCH

INSPECTION

- Remove the wind screen. (⇒4-10)
- Remove the front handle cover. (⇒4-10)
- Check for continuity between the black and green / yellow wire terminals inside the speedometer assembly.
 - When the brake lever is pulled - CONTINUITY.
 - When the brake lever is released - NO CONTINUITY.
- Install in the reverse order of removal.

COLOR	BLACK/LIGHT GREEN	RED
TERMINAL	TR	BAT
PUSH		
FREE		



FUEL UNIT

REMOVAL

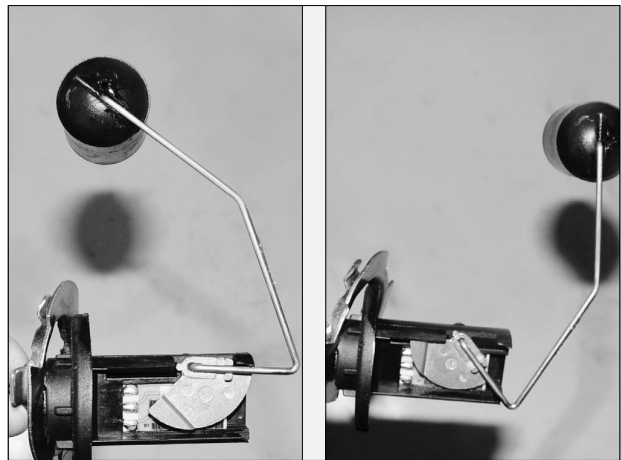
- Remove the front cover, inner cover.
- Remove the floor panel.

NOTE

- Be careful not to damage the wire.
- Be careful not to damage the float arm.
- Check the base packing for damage.

- Measure the resistance between the upper and lower of fuel unit.

FLOAT POSITION	RESISTANCE RATE
FULL FUEL (MAXIMUM)	30~40 Ω
RESERVE	500~600 Ω
NO FUEL(MINIMUM)	550~650 Ω



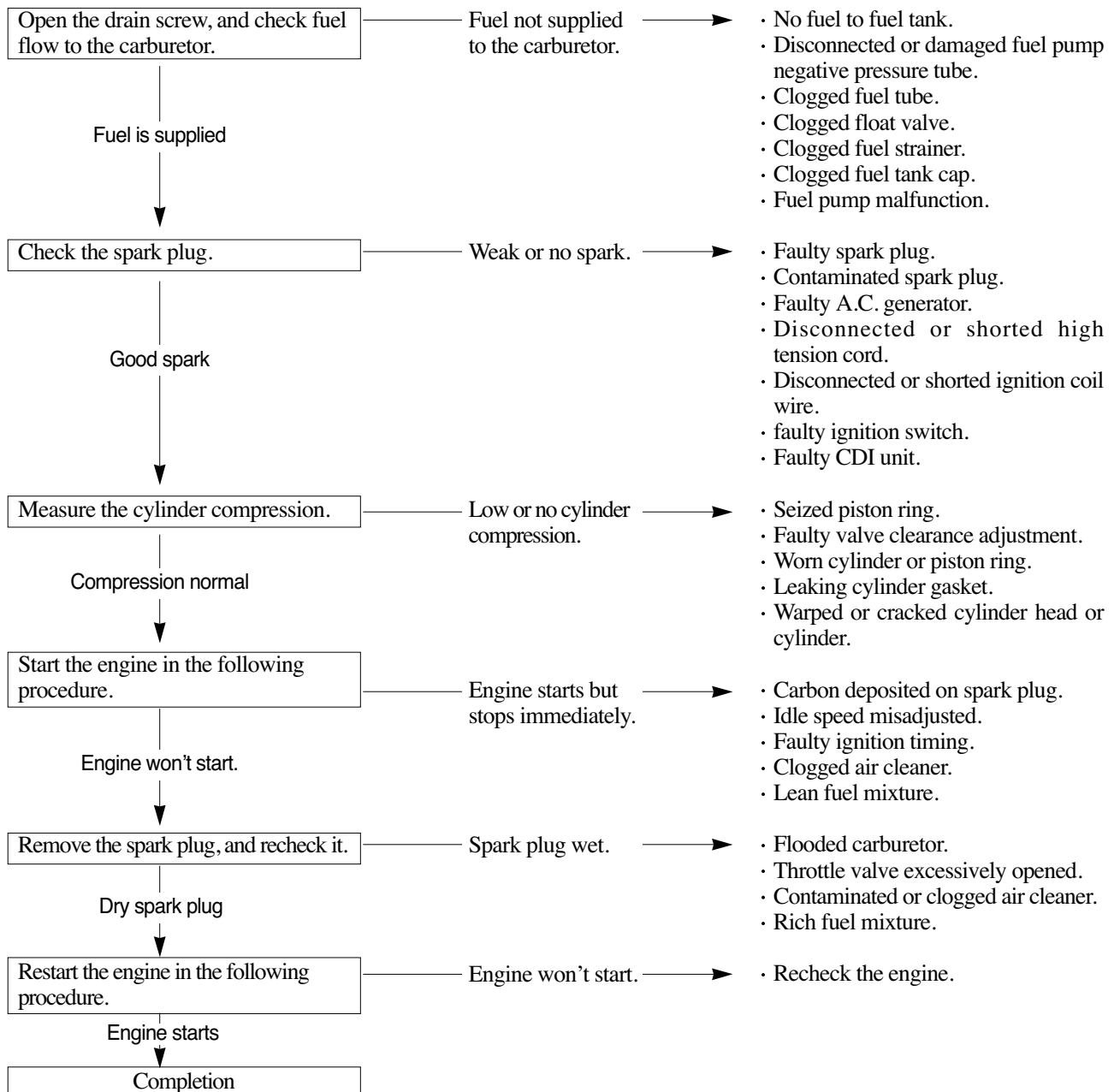
MEMO

19. TROUBLESHOOTING

ENGINE WON'T START OR HARD TO START	20-1
ENGINE STALLS, HARD TO START, ROUGH IDLING	20-2
POOR PERFORMANCE AT LOW SPEED AND IDLING	20-3
POOR OPERATION	20-4

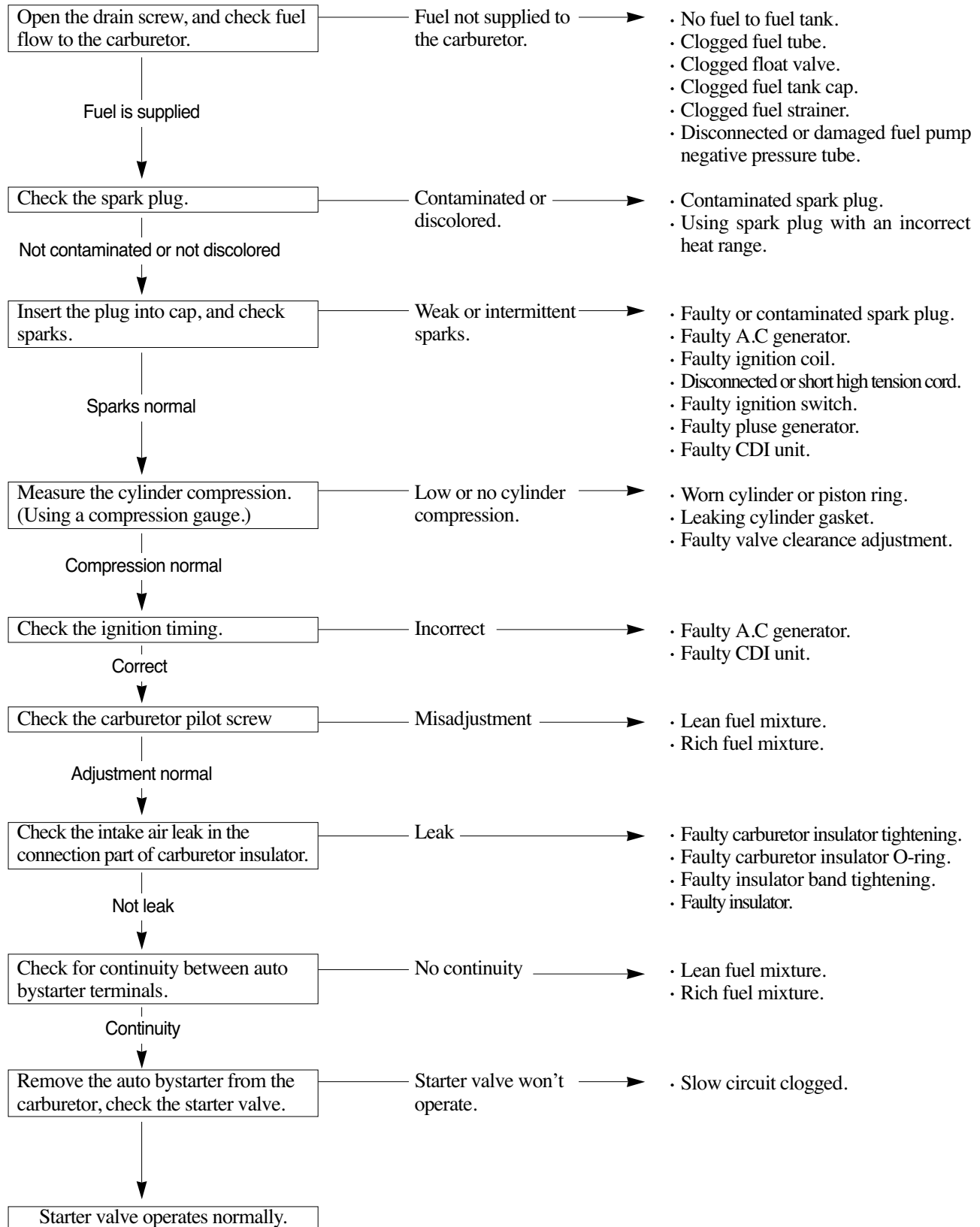
ENGINE WON'T START OR HARD TO START

CAUSE OF TROUBLE



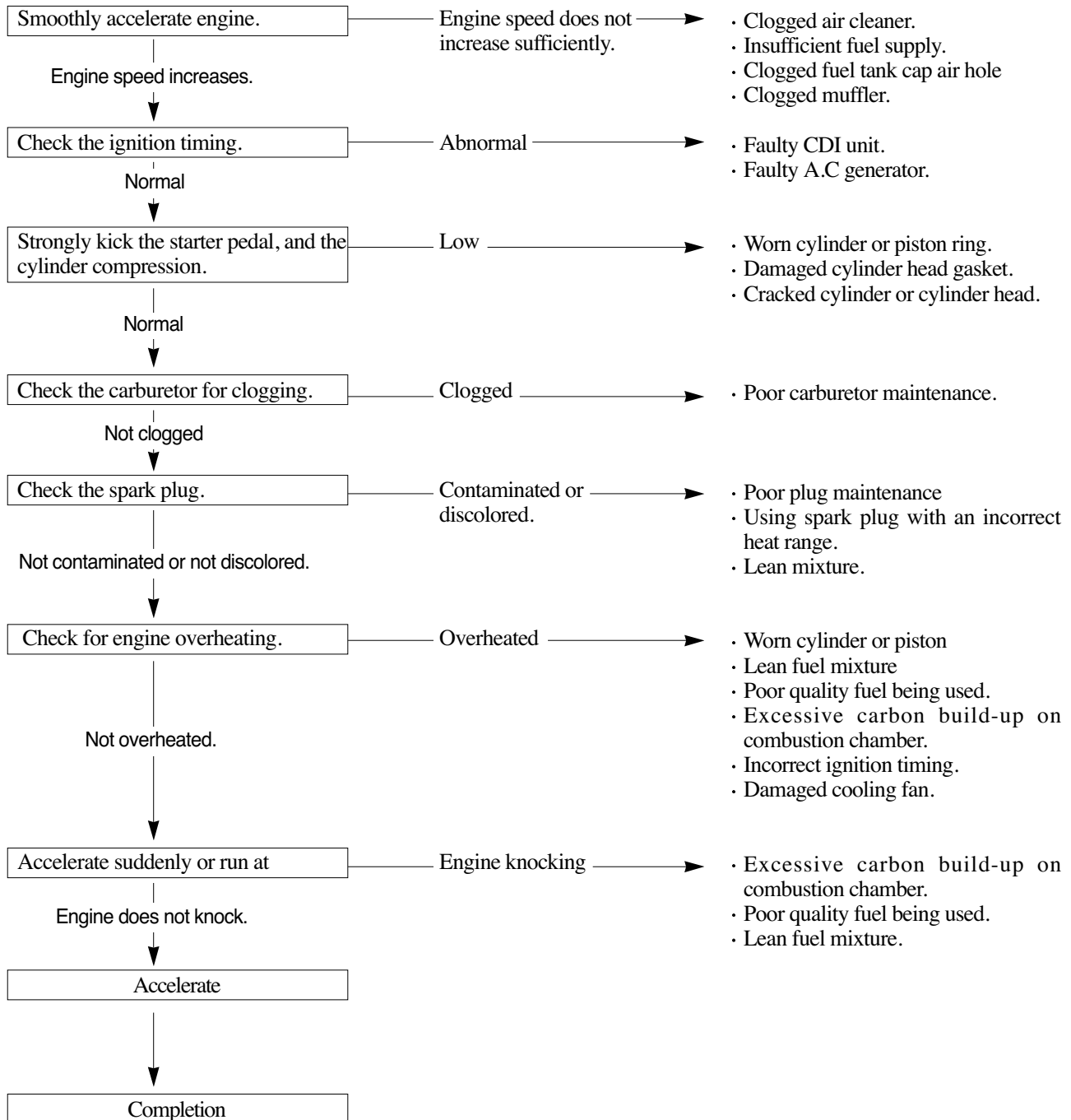
ENGINE STALLS, HARD TO START, ROUGH IDLING

CAUSE OF TROUBLE



POOR PERFORMANCE AT LOW SPEED AND IDLING

CAUSE OF TROUBLE



POOR OPERATION

CLUTCH DRIVE / DRIVEN PULLEY

CAUSE OF TROUBLE

Engine starts but vehicle won't move.	→	• Worn or damaged drive belt. • Damaged ramp plate. • Faulty weight roller. • Faulty movable drive face. • Damaged driven pulley weight shoe spring. • Faulty transmission. • Seized transmission.
Engine stalls or vehicle creeps.	→	• Broken driven pulley weight spring. • Seized clutch outer and weight.
Poor performance at start or lack of power.	→	• Worn or slipped drive belt. • Worn weight roller. • Seized driven face bearing. • Weak driven spring. • Faulty movable driven face.
Poor performance at high speed or lack of power.	→	• Worn or slipped drive belt. • Worn weight roller. • Worn driven pulley bearing.
Abnormal noise or odor.	→	• Oil or grease spilled on the drive belt and inside pulley. • Worn drive belt. • Damaged driven face weight spring. • Worn or seized driven pulley bearing.

HANDLE / WHEEL

Hard steering.	→	• Steering top thread too tight. • Insufficient tire pressure. • Damaged steering bearing. • Damaged ball race. • Faulty tire.
Steering wobbling.	→	• Insufficient tire pressure. • Worn or faulty tire. • Faulty wheel valance. • Bent rim. • Worn or damaged wheel bearing. • Loose axle shaft.
Steers to one side or does not track straight.	→	• Front and rear wheels not aligned. • Bent front cushion. • Bent rear cushion. • Faulty engine hanger. • Poor steering operation. • Faulty wheel alignment.
Wheel turns hard.	→	• Faulty wheel bearing. • Bent axle shaft. • Bent brake disk. • Faulty caliper piston.

POOR FRONT/REAR SUSPENSION PERFORMANCE

CAUSE OF TROUBLE

Soft suspension.

- Weak cushion spring
- Overloaded
- Oil leakage from damper unit

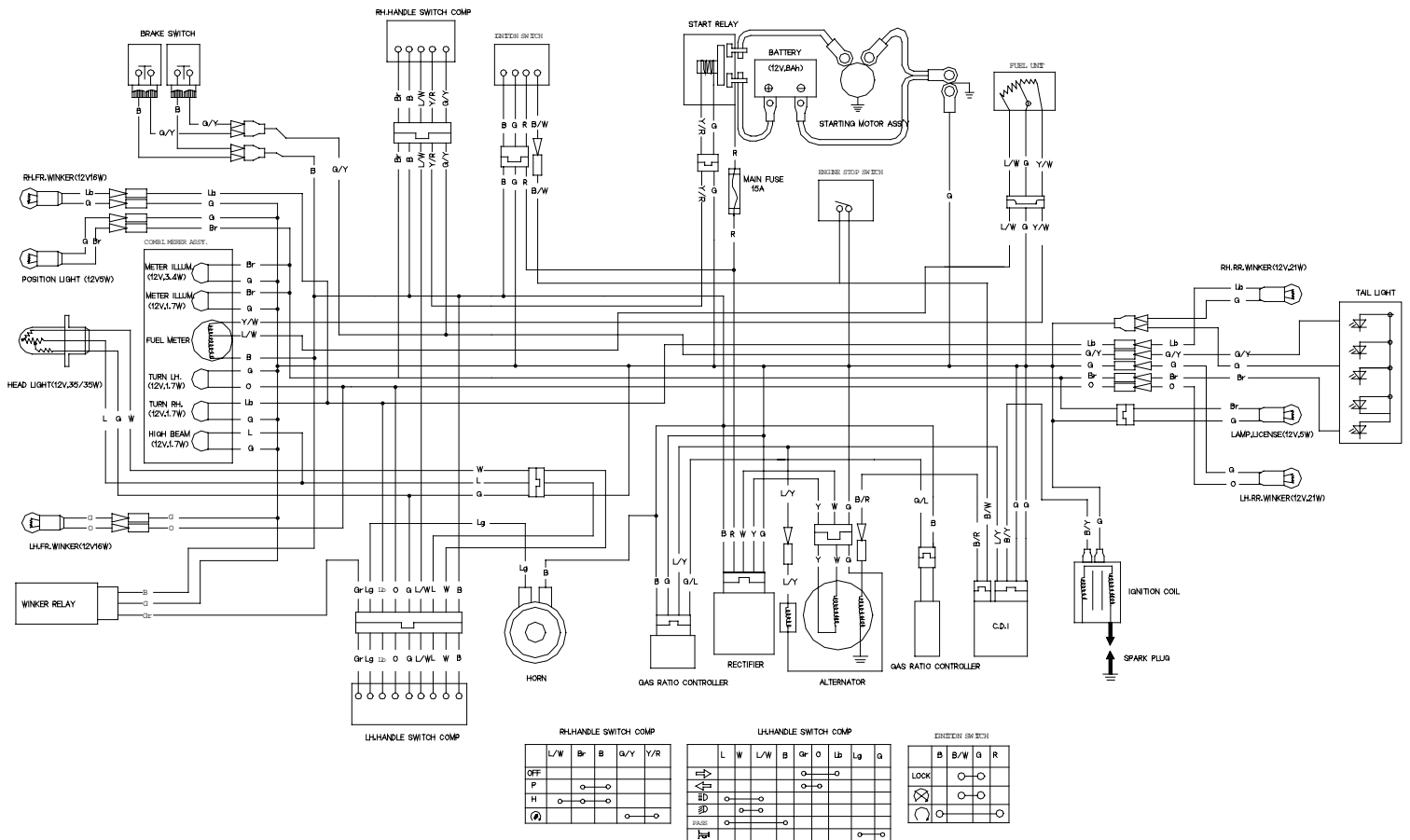
Hard suspension.

- Bent fork pipe or cushion rod

Suspension noisy.

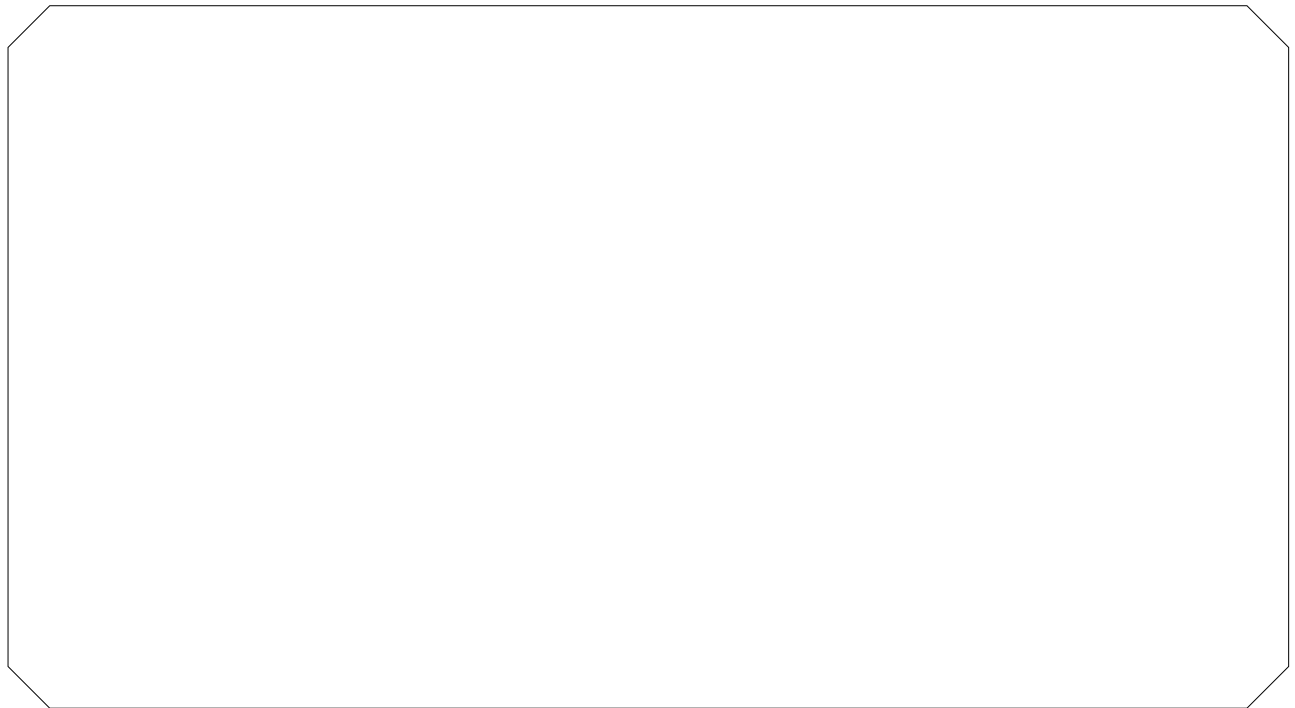
- Worn slider
- Damaged cushion stopper rubber

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