

HONDA

SERVICE MANUAL



87
CH150
ELITE150

IMPORTANT SAFETY NOTICE

 **WARNING** *Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.*

CAUTION: *Indicates a possibility of personal injury or equipment damage if instructions are not followed.*

NOTE: Gives helpful information.

Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. It is important to note that this manual contains some warnings and cautions against some specific service methods which could cause **PERSONAL INJURY** to service personnel or could damage a vehicle or render it unsafe. Please understand that those warnings could not cover all conceivable ways in which service, whether or not recommended by Honda might be done or of the possibly hazardous consequences of each conceivable way, nor could Honda investigate all such ways. Anyone using service procedures or tools, whether or not recommended by Honda *must satisfy himself thoroughly* that neither personal safety nor vehicle safety will be jeopardized by the service methods or tools selected.

HOW TO USE THIS MANUAL

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the scooter is in peak operating condition and the emission levels are within the standards set by the U.S. Environmental Protection Agency and the California Air Resources Board. Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period.

Sections 1 through 3 apply to the whole scooter, while sections 4 through 17 describe parts of the scooter, grouped according to location.

Find the section you want on this page, then turn to the table of contents on page 1 of that section.

Most sections start with an assembly or system illustration, service information and troubleshooting for the section. The subsequent pages give detailed procedures.

If you don't know the source of the trouble, go to section 18, TROUBLESHOOTING.

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HONDA MOTOR CO., LTD.
Service Publications Office

CONTENTS

| | |
|-------------------------------------|----|
| GENERAL INFORMATION | 1 |
| LUBRICATION | 2 |
| MAINTENANCE | 3 |
| FUEL SYSTEM | 4 |
| ENGINE REMOVAL/INSTALLATION | 5 |
| CYLINDER HEAD/VALVES | 6 |
| CYLINDER/PISTON | 7 |
| DRIVE PULLEY/CLUTCH/DRIVEN PULLEY | 8 |
| FINAL REDUCTION | 9 |
| ALTERNATOR/STARTER CLUTCH | 10 |
| CRANKCASE/CRANKSHAFT | 11 |
| COOLING SYSTEM | 12 |
| FRAME COVERS | 13 |
| CHASSIS | |
| STEERING/FRT WHEEL/BRAKE/SUSPENSION | 14 |
| REAR WHEEL/BRAKE/SUSPENSION | 15 |
| ELEC- TRICAL | |
| ELECTRICAL EQUIPMENT | 16 |
| WIRING DIAGRAM | 17 |
| TROUBLESHOOTING | 18 |
| INDEX | 19 |

CONTENTS

INTRODUCTION
THEORY AND METHODS

DATA AND METHODS
RESULTS AND DISCUSSION

CONCLUSION
ACKNOWLEDGEMENTS

REFERENCES
APPENDIX

APPENDIX
APPENDIX

1. GENERAL INFORMATION

| | | | |
|----------------------|-----|------------------------------|------|
| GENERAL SAFETY | 1-1 | TOOLS | 1-7 |
| SERVICE RULES | 1-1 | CABLE & HARNESS ROUTING | 1-8 |
| MODEL IDENTIFICATION | 1-2 | EMISSION CONTROL SYSTEM | 1-12 |
| SPECIFICATIONS | 1-3 | EMISSION CONTROL INFORMATION | |
| TORQUE VALUES | 1-5 | LABEL | 1-14 |

GENERAL SAFETY

WARNING

If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in a closed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead death.

WARNING

Gasoline is extremely flammable and is explosive under certain conditions. Do not smoke or allow flames or sparks in your working area.

WARNING

The battery electrolyte contains sulfuric acid. Protect your eyes, skin and clothing. In case of contact, flush thoroughly with water and call a doctor if electrolyte gets in your eyes.

WARNING

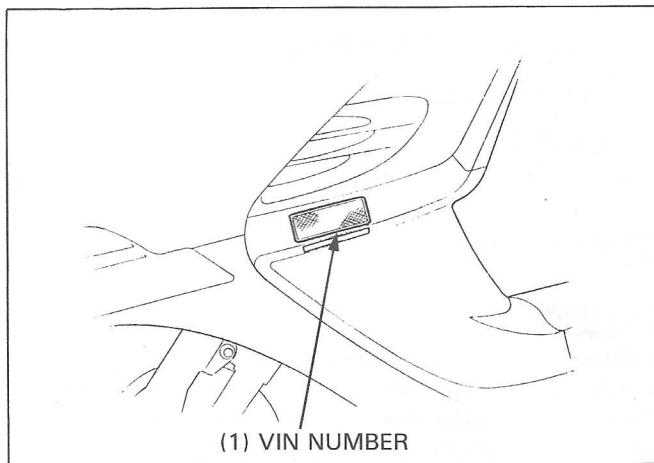
The battery generates hydrogen gas which can be highly explosive. Do not smoke or allow flames or sparks near the battery, especially while charging it.

SERVICE RULES

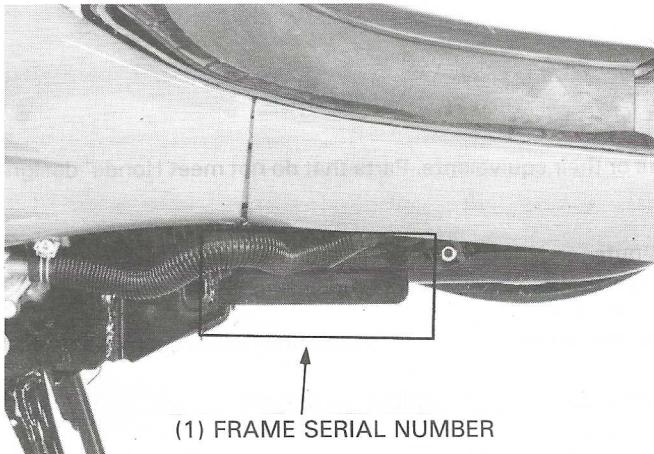
1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda' design specifications may damage the scooter.
2. Use the special tools designed for this product.
3. Use only metric tools when servicing this scooter. Metric bolts, nuts, and screws are not interchangeable with English fasteners. The use of incorrect tools and fasteners may damage the scooter.
4. Install new gaskets. O-rings, cotter pins, lock plates, etc. when reassembling.
5. When tightening a series of bolts or nuts, begin with larger-diameter or inner bolts first, and tighten to the specified torque diagonally, unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown beginning on page 1-7, Cable & Harness Routing.

GENERAL INFORMATION

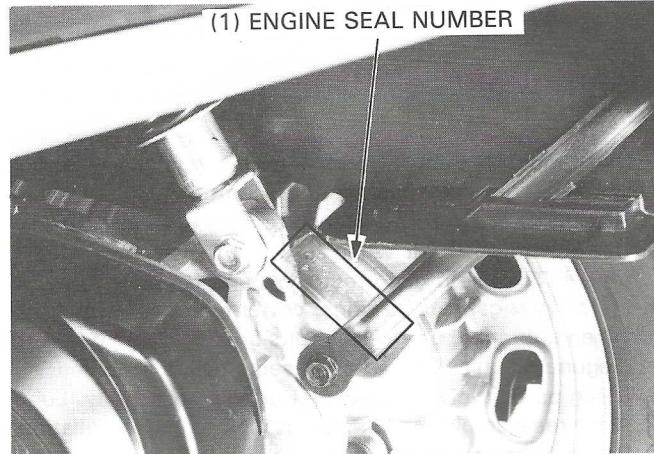
MODEL IDENTIFICATION



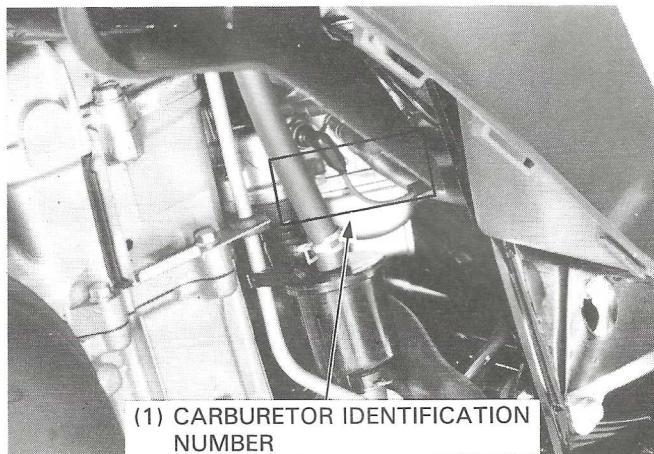
The VIN (Vehicle Identification Number) is attached to the left side of the inner box.



The frame serial number is stamped on the right side of the frame body.



The engine serial number is stamped on the back of the crankcase near the rear wheel.



The carburetor identification number is stamped on the right side of the carburetor.



The color label is attached to the fuel tank below the seat.

SPECIFICATIONS

| ITEM | | SPECIFICATION |
|------------|---|---|
| DIMENSIONS | Overall length Overall width Overall height Wheel base Ground clearance Dry weight | 1,880 mm (74.0 in) 665 mm (26.2 in) 1,140 mm (44.9 in) 1,255 mm (49.4 in) 125 mm (4.9 in) 105 kg (232 lb) |
| FRAME | Type Front suspension, travel Rear suspension, travel Maximum weight capacity Front tire size Rear tire size Front tire pressure Rear tire pressure Front brake Rear brake Fuel capacity Caster angle Trail length | Back bone Bottom link 75 mm (3.0 in) Power unit swingarm 96 mm (3.8 in) 159 kg (338 lbs) 3.50-10-4PR, tubeless 3.50-10-4PR, tubeless 150 kPa (1.5 kg/cm ² , 21 psi) 200 kPa (2.0 kg/cm ² , 28 psi) Up to 90 kg (200 lbs) load 250 kPa (2.5 kg/cm ² , 36 psi) Up to vehicle capacity load Internal expanding shoes Internal expanding shoes 8.0 liters (2.1 Us gal, 1.8 Imp gal) 27° 00' 84 mm (3.3 in) |
| ENGINE | Type Cylinder arrangement Bore and stroke Displacement Compression ratio Engine oil capacity Lubrication system Coolant capacity Air filtration Cylinder compression Intake valve Opens Closes Exhaust valve Opens closes Valve clearance (Cold) Engine weight Idle speed | Water cooled 4-stroke, OHC engine Single cylinder 58.0 x 57.8 mm (2.283 x 2.275 in) 153 cm ³ (9.3 cu in) 10.0 : 1 1.34 liter (1.42 Us qt, 1.18 Imp qt) at disassembly 0.8 liter (0.8 US qt, 0.7 lmt qt) at draining Forced pressure and wet sump 1.0 liters (1.1 US qt, 0.9 Imp qt) Paper filter 1,300 kPa (13.0 kg/cm ² , 184 psi) 0° (BTDC) 30° (ABDC) } 35° (BBDC) } at 1.1 mm lift 0° (ATDC) IN/EX: 0.1 mm (0.004 in) 27.3 kg (60.20 lb) 1,500 ± 100 rpm |

GENERAL INFORMATION

| ITEM | | SPECIFICATION |
|-------------|--|--|
| CARBURETION | Identification number Float level Pilot screw initial opening Main jet Slow jet | VE03C (VE04C, California model) 18.5 mm (0.73 in) See page 4-11 #102 (#98, High altitude type) #35 |
| DRIVE TRAIN | Clutch type Primary reduction Final reduction | Automatic centrifugal clutch, dry type 2.2—0.9 7.318 : 1 |
| ELECTRICAL | Ignition Starting system Alternator Spark plug Spark plug gap Ignition timing Battery capacity Fuse capacity | Condenser capacitive discharge ignition (CDI) Starting motor 12V—203 W/ 5,000 rpm (ND) X22EPR-U9,X20EPR-U9 (NGK) DPR7EA-9, DPR6EA-9 0.8—0.9 mm (0.032—0.035 in) 10° BTDC/ 2,100 rpm 27° BTDC/ 4,000 rpm 12 V 9 AH 20 A (Main) 10 A (Stop/tailight, License light, Position light, Turn signal relay) 10 A (Front stop switch, Rear stop light switch, Instrument, Horn) 10 A (Starter switch) 5 A (Fan motor) |
| LIGHTS | Headlight, Low/High Brake/Tail light Turn signal/Position light (front) (rear) Instrument light Turn signal indicator light High beam indicator License plate light | 12 V—55/60 W 12 V—21/5 W 12 V—21/5 W 12 V—21 W 12 V—3.4 W x 3 (2 cp) 12 V—3.4 W x 2 (2 cp) 12 V—3.4 W (2 cp) 12 V—8 W (2 cp) SEA No. 1157 SEA No. 1034 SEA No. 1073 SAE No. 158 SAE No. 158 SAE No. 158 |

TORQUE VALUES

ENGINE

| ITEM | Q'TY | THREAD DIA. (mm) | TORQUE N·m (kg-m, ft-lb) | REMARKS |
|-----------------------------------|------|------------------|--------------------------|-----------------------|
| Oil bolt | 1 | 12 | 18–22 (1.8–2.2, 13–16) | |
| Oil bolt | 2 | 8 | 8–12 (0.8–1.2, 6–9) | |
| Cylinder head cap nut | 4 | 8 | 20–24 (2.0–2.4, 14–17) | |
| Water pump impeller | 1 | 8 | 10–14 (1.0–1.4, 7–10) | |
| Cylinder head cover bolt | 5 | 6 | 8–12 (0.8–1.2, 6–9) | |
| Oil filter screen cap | 1 | 36 | 19–25 (1.9–2.5, 14–18) | |
| Cam chain tensioner sealing bolt | 1 | 8 | 8–12 (0.8–1.2, 6–9) | |
| Cam chain tensioner bolt | 2 | 8 | 12–16 (1.2–1.6, 9–12) | |
| Clutch drive plate nut | 1 | 28 | 50–60 (5.0–6.0, 36–43) | |
| Flywheel nut | 1 | 14 | 50–60 (5.0–6.0, 36–43) | |
| Crankcase bolt | 7 | 6 | 8–12 (0.8–1.2, 6–9) | |
| Drive face seal cover bolt | 3 | 4 | 3–5 (0.3–0.5, 2.2–3.6) | |
| Drive face nut | 1 | 12 | 50–60 (5.0–6.0, 36–43) | |
| Clutch outer nut | 1 | 10 | 35–45 (3.5–4.5, 25–32) | |
| Transmission case cover bolt | 7 | 6 | 10–14 (1.0–1.4, 7–10) | |
| Starter clutch socket bolt | 3 | 6 | 10–14 (1.0–1.4, 7–10) | |
| Transmission oil level check bolt | 1 | 10 | 10–15 (1.0–1.5, 7–11) | Apply a locking agent |

FRAME

| ITEM | Q'TY | THREAD DIA. (mm) | TORQUE N·m (kg-m, ft-lb) | REMARKS |
|-------------------------------------|------|------------------|------------------------------|---------------------|
| Engine hanger stopper nut | 1 | 8 | 18–22 (1.8–2.2, 13–16) | |
| Engine hanger bracket mut | 1 | 10 | 40–50 (4.0–5.0, 29–36) | Apply oil |
| Engine hanger bolt | 1 | 10 | 40–50 (4.0–5.0, 29–36) | Apply oil |
| Engine mounting bolt | 1 | 10 | 35–45 (3.5–4.5, 25–32) | |
| Front axle nut | 1 | 12 | 50–70 (5.0–7.0, 36–51) | |
| Rear axle nut | 1 | 14 | 100–120 (10.0–12.0, 72–87) | |
| Rear shock absorber mount bolt | 4 | 8 | 24–30 (2.4–3.0, 17–22) | |
| Rear shock absorber damper lock nut | 2 | 8 | 15–25 (1.5–2.5, 11–18) | |
| Top cone race | 1 | 25.4 | 2–3 (0.2–0.3, 1.4–22) | |
| Steering stem nut | 1 | 25.4 | 120–150 (12.0–15.0, 87–108) | |
| Steering stem lock nut | 1 | 25.4 | 5–13 (0.5–1.3, 4–10) | |
| Front shock absorber: | | | | |
| —lower bolt | 2 | 8 | 0.8–1.2 (0.08–0.12, 0.6–0.9) | |
| —lower nut | 2 | 8 | 15–20 (1.5–2.0, 11–14) | |
| —upper mount bolt | 2 | 8 | 24–30 (2.4–3.0, 17–22) | |
| —damper lock nut | 2 | 8 | 15–25 (1.5–2.5, 11–18) | Apply locking agent |
| Torque link bolt: | | | | |
| —brake panel side | 1 | 8 | 27–33 (2.7–3.3, 20–24) | |
| —front fork side | 1 | 8 | 27–33 (2.7–3.3, 20–24) | |
| Brake arm bolt: | 2 | 6 | 8–12 (0.8–1.2, 6–9) | |
| Pivot arm bolt: | 2 | 8 | 24–30 (2.4–3.0, 17–22) | |
| Wheel hub mut: | 6 | 8 | 28–32 (2.8–3.2, 20–23) | |
| Speedometer cable set screw | 1 | 5 | 1.5–3 (0.15–0.3, 1.1–2.2) | Apply oil |
| Exhaust muffler bolt: | 4 | 8 | 32–38 (3.2–3.8, 23–27) | |
| Exhaust pipe joint mut: | 2 | 7 | 27–33 (2.7–3.3, 20–24) | |

Torque specifications listed above are for most of the tightening points. If a specification is not listed, follow the standard torque values below.

GENERAL INFORMATION

STANDARD TORQUE VALUES

| TYPE | TORQUE N·m (kg-m, ft-lb) | TYPE | TORQUE N·m (kg-m, ft-lb) |
|-----------------|-----------------------------|---|---------------------------|
| 5 mm bolt, nut | 4.5–6.0 (0.45–0.6, 3.3–4.3) | 5 mm screw | 3.5–5 (0.35–0.5, 2.5–3.6) |
| 6 mm bolt, nut | 8–12 (0.8–1.2, 6–9) | 6 mm screw, and 6 mm bolt with 8 mm head | 7–11 (0.7–1.1, 5–8) |
| 8 mm bolt, nut | 18–25 (1.8–2.5, 13–18) | 6 mm flange bolt, nut | 10–14 (1.0–1.4, 7–10) |
| 10 mm bolt, nut | 30–40 (3.0–4.0, 22–29) | 8 mm flange bolt, nut | 24–30 (2.4–3.0, 17–22) |
| 12 mm bolt, nut | 50–60 (5.0–6.0, 36–43) | 10 mm flange bolt, nut | 35–45 (3.5–4.5, 25–32) |

TOOLS**SPECIAL**

| DESCRIPTION | TOOL NUMBER | ALTERNATE TOOL | TOOL NUMBER | REF. SECT. |
|--|----------------------------------|---|---------------|------------|
| Vacuum/pressure pump | A937X-041—XXXXX | Vacuum pump (U.S.A. only) | ST-AH-260-MC7 | 4 |
| Universal bearing puller | 07631-0010000 | Pressure pump (U.S.A. only) | ST-AH-255-MC7 | 4 |
| Socket wrench, 39 x 41 mm | 07GMA-KS40100 | Equivalent commercially available in U.S.A. | | 9 |
| Steering stem lock nut wrench | 07916-1870101 | | 07916-KM10000 | 8 |
| Steering stem wrench | 07916-GK00000 | Equivalent commercially available in U.S.A. | 07702-0020001 | 14 |
| Shaft protector | 07931-1870000 | Adjustable pin spanner | | 14 |
| Flywheel puller | 07933-KG20000 | | | 9 |
| Bearing remover, 12 mm (Spindle assy, 12 mm) | 07936-1660001 (07936-1660100) | | | 10 |
| (Remover weight) | (07741-0010201) | Remover weight | 07936-3710200 | 9, 12 |
| Bearing remover handle | 07936-3710100 | | | 9 |
| Bearing remover, 17 mm | 07936-3710300 | | | 9 |
| Remover weight | 07741-0010201 | Remover weight | 07936-3710200 | 9 |
| Valve guide driver, 5.0 mm | 07942-MA60000 | | | 6 |
| Attachment | 07945-3330300 | | | 14 |
| Water seal driver | 07945-4150400 | Water seal driver (U.S.A. only) | GN-AH-065-415 | 12 |
| Bearing driver | 07945-GC80000 | | | 8, 12 |
| Ball race remover | 07946-GA70000 | Race remover | 07946-3710400 | 14 |
| Clutch spring compressor | 07960-KM10000 | Spring compressor attachment | 07960-KM10100 | 8 |
| Seal and case assembly tool (Assembly collar) | 07965-1480010 (07965-1480100) | | 07960-KJ90000 | 8 |
| (Assembly shaft) | (07965-GM00300) | | | 9 |
| Spring holder attachment | 07967-1150100 | | | 9 |
| Rear shock absorber attachment | 07967-GA70102 | | | 15 |
| Shock absorber attachment | 07967-KM10100 | | | 14 |
| Valve guide reamer, 5.0 mm | 07984-MA60000 | | | 14 |

COMMON

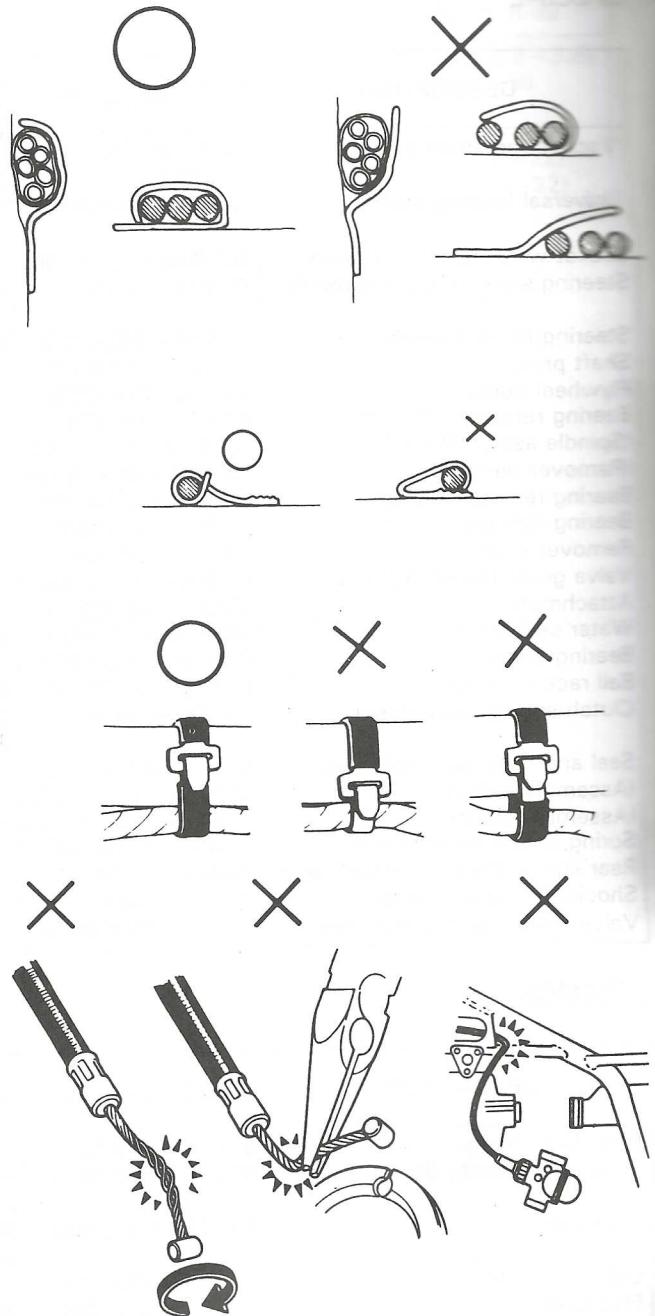
| DESCRIPTION | TOOL NUMBER | ALTERNATE TOOL | TOOL NUMBER | REF. SECT. |
|-----------------------------|---------------|---|-------------|------------|
| Float level gauge | 07401-0010000 | | | 4 |
| Lock nut wrench, 30 x 32 mm | 07716-0020400 | Equivalent commercially available in U.S.A. | | 14 |
| Extension | 07716-0020500 | Equivalent commercially available in U.S.A. | | 14 |
| Universal holder | 07725-0030000 | | | 8 |
| Flywheel holder | 07725-0040000 | | | 10 |
| Attachment, 32 x 35 mm | 07746-0010100 | | | 8, 9, 14 |
| Attachment, 37 x 40 mm | 07746-0010200 | | | 9 |
| Attachment, 42 x 47 mm | 07746-0010300 | | | 9, 14 |
| Attachment, 52 x 55 mm | 07746-0010400 | | | 14 |
| Pilot, 12 mm | 07746-0040200 | | | 9, 14 |
| Pilot, 15 mm | 07746-0040300 | | | 15 |
| Pilot, 17 mm | 07746-0040400 | | | 9 |
| Pilot, 20 mm | 07746-0040500 | | | 8, 9 |
| Bearing remover shaft | 07746-0050100 | Equivalent commercially available in U.S.A. | | 14 |
| Bearing remover head, 12 mm | 07746-0050300 | | | 14 |
| Driver | 07749-0010000 | | | |
| Valve guide driver | 07743-0020000 | | | 6 |
| Valve spring compressor | 07757-0010000 | | | 6 |
| Shock absorber compressor | 07959-3290001 | | | 14, 15 |

GENERAL INFORMATION

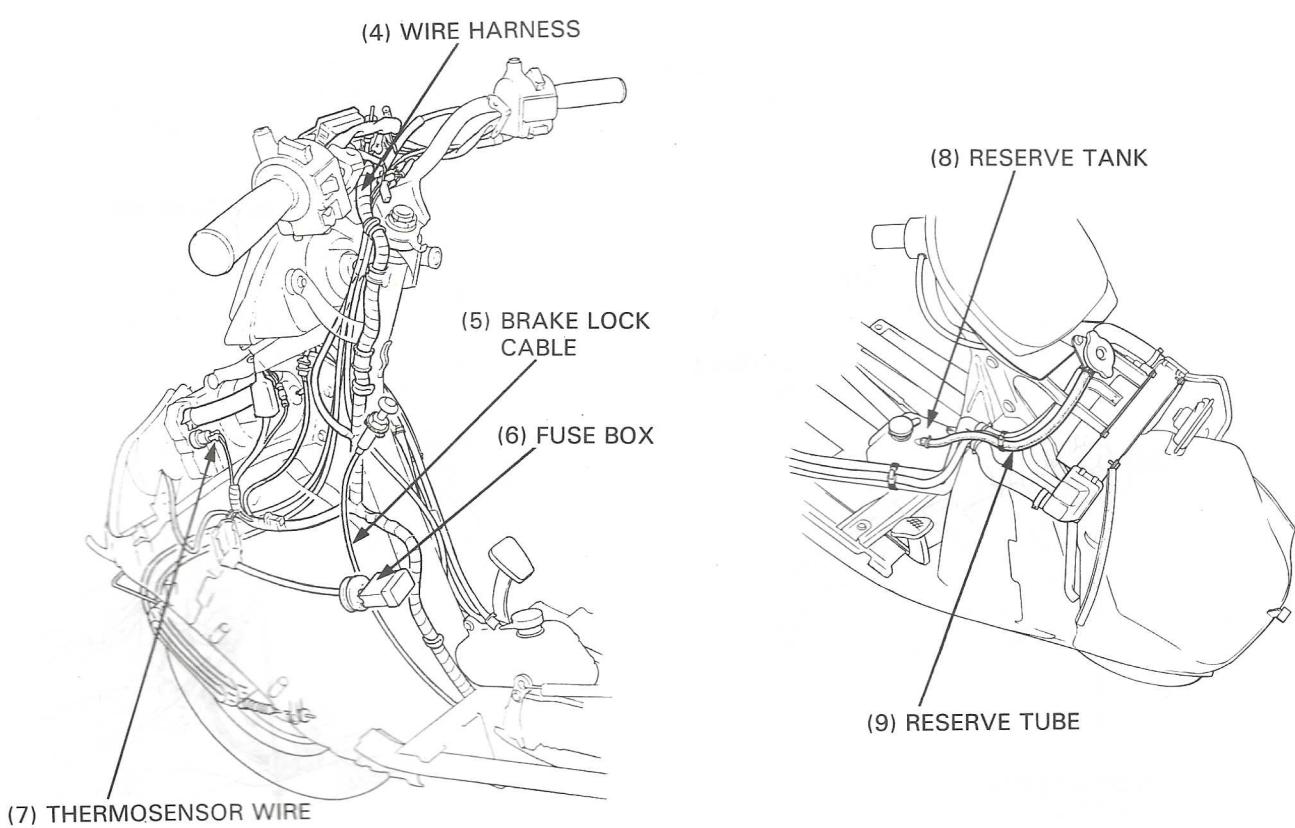
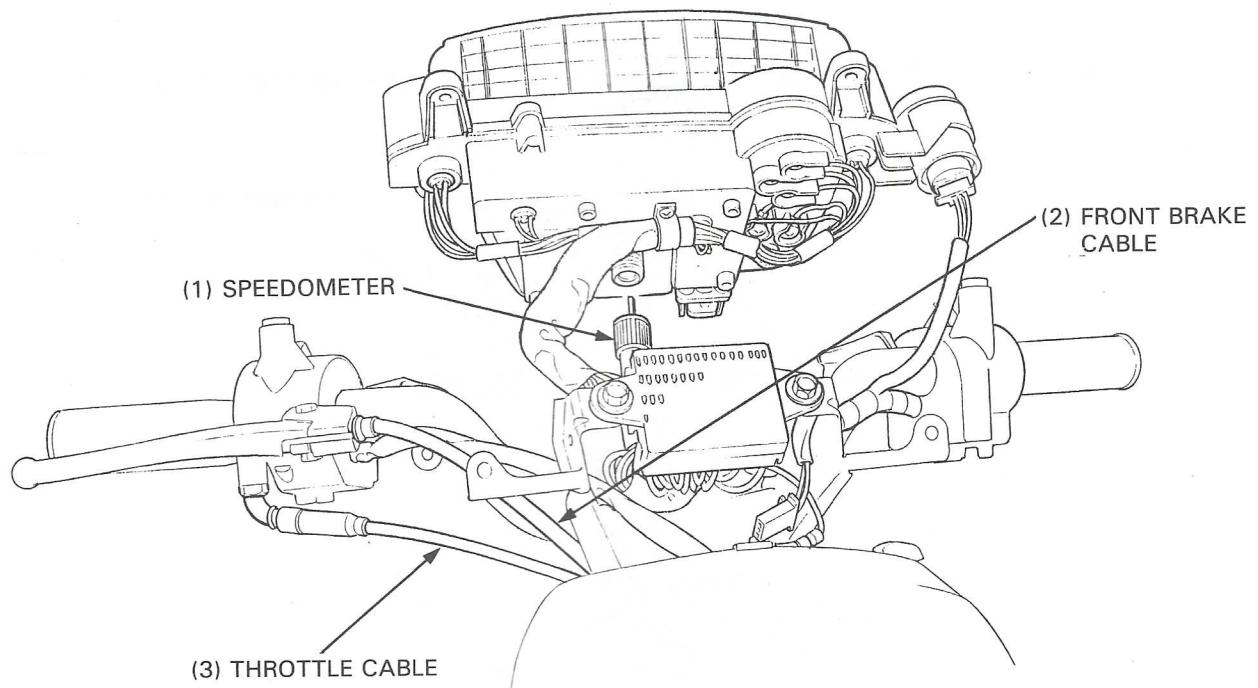
CABLE & HARNESS ROUTING

Note the following when routing cables and wire harnesses:

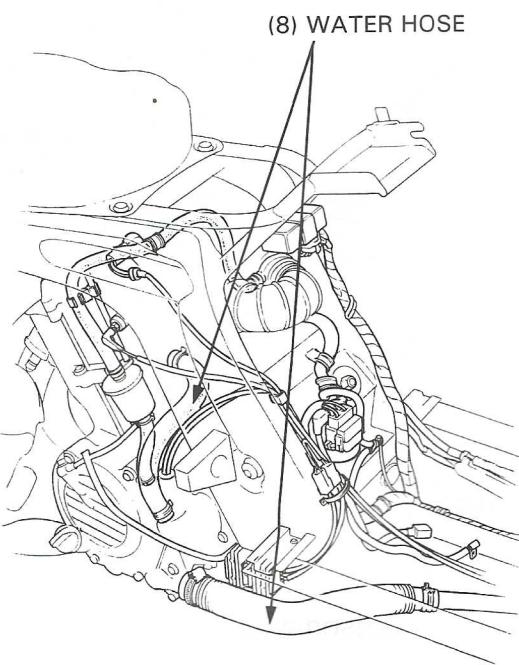
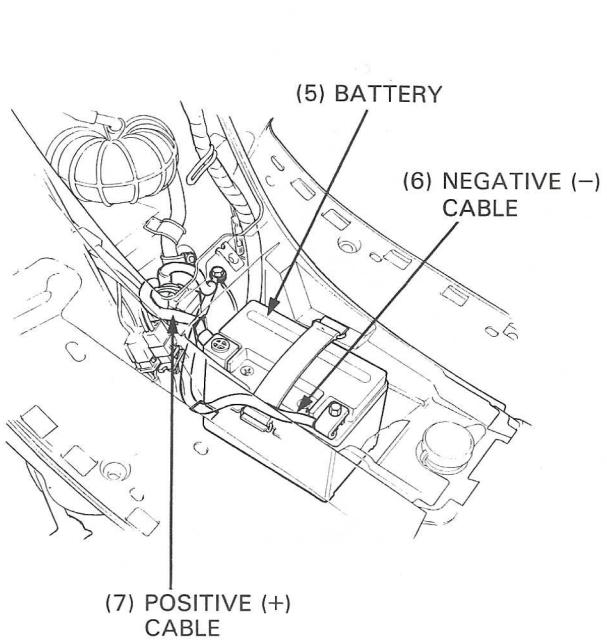
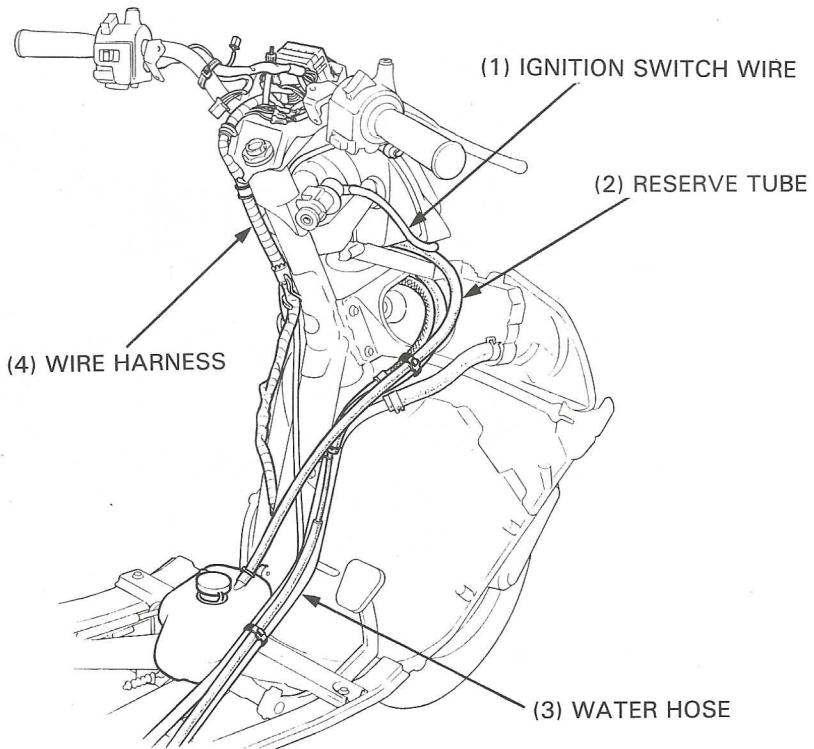
- A loose wire, harness or cable can be safety hazard. After clamping, check each wire to be sure it is secure.
- Do not squeeze wires against the weld or its clamp.
- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Tighten the bands so that only the insulated surfaces contact the wires or wire harnesses.
- Route harnesses so they are neither pulled tight nor have excessive slack.
- Protect wires and harnesses with electrical tape or tube if they contact a sharp edge or corner.
Clean the attaching surface thoroughly before applying tape.
- Do not use a wire or harness with a broken insulator. Repair by wrapping them with protective tape or replace them.
- Route wire harnesses to avoid sharp edges or corners.
- Avoid the projected ends of bolts and screws.
- Keep wire harnesses away from the exhaust pipes and other hot parts.
- Be sure grommets are seated in their grooves properly.
- After clamping, check each harness to be certain that it is not interfering with any moving or sliding parts.
- After routing, check that the wire harnesses are not twisted or kinked.
- Wire harnesses routed along the handlebars should not be pulled taut, have excessive slack, be pinched by or interfere with adjacent or surrounding parts in all steering positions.
- After routing, check that the wire harnesses are not twisted or kinked.
- Do not bend or twist control cables. Damaged control cables will not operate smoothly and may stick or bind.

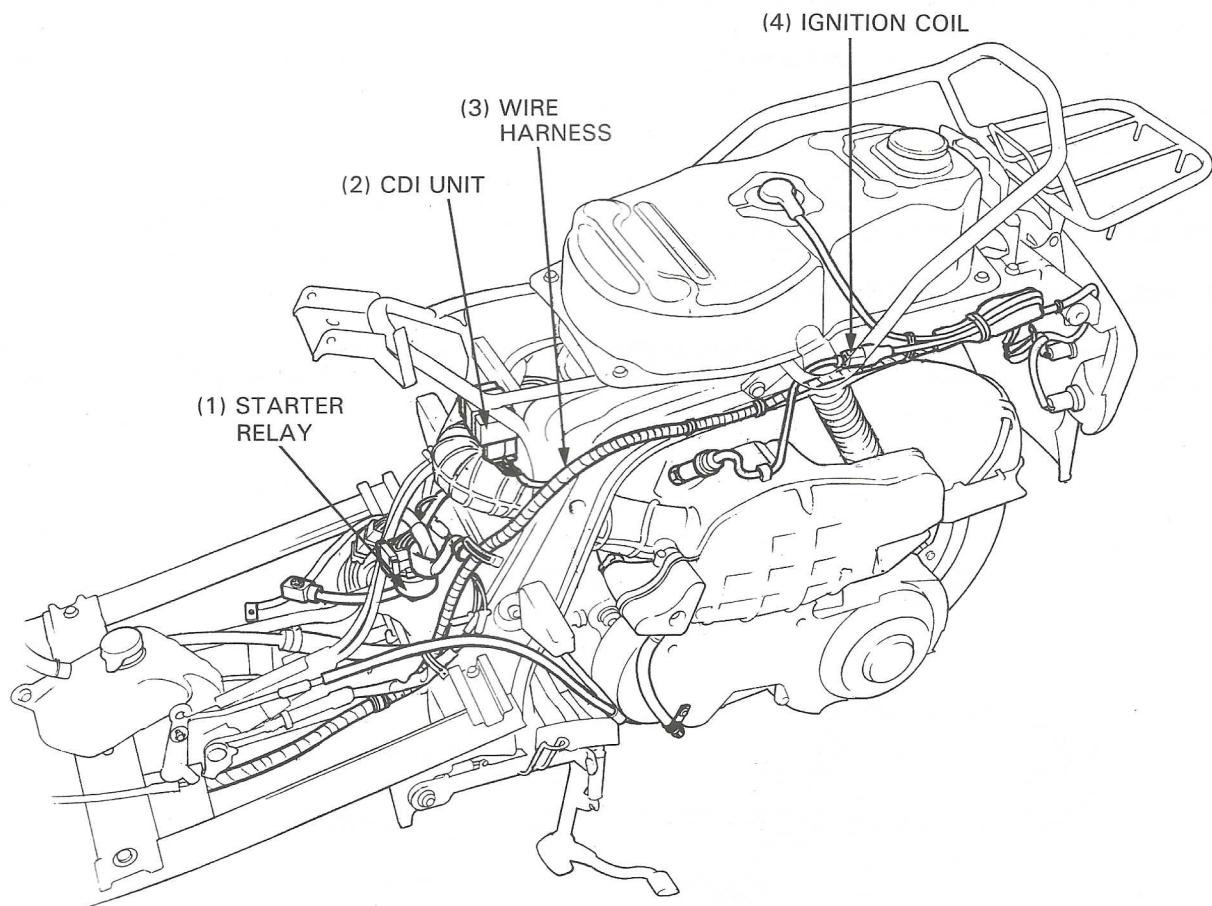


O: CORRECT
X: INCORRECT



GENERAL INFORMATION





GENERAL INFORMATION

EMISSION CONTROL SYSTEMS

The U.S. Environmental Protection Agency and California Air Resources Board (CARB) require manufacturers to certify that their motor scooters comply with applicable exhaust emissions standards during their useful life, when operated and maintained according to the instructions provided, and that motor scooters built after January 1, 1983 comply with applicable noise emission standards for one year or 6,000 km (3,730 miles) after the time of sale to the ultimate purchaser, when operated and maintained according to the instructions provided. Compliance with the terms of the Distributor's Warranty for Honda Motor Scooter Emission Control Systems is necessary in order to keep the emissions system warranty in effect.

SOURCE OF EMISSIONS

The combustion process produces carbon monoxide and hydrocarbons. Control of hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but it is toxic.

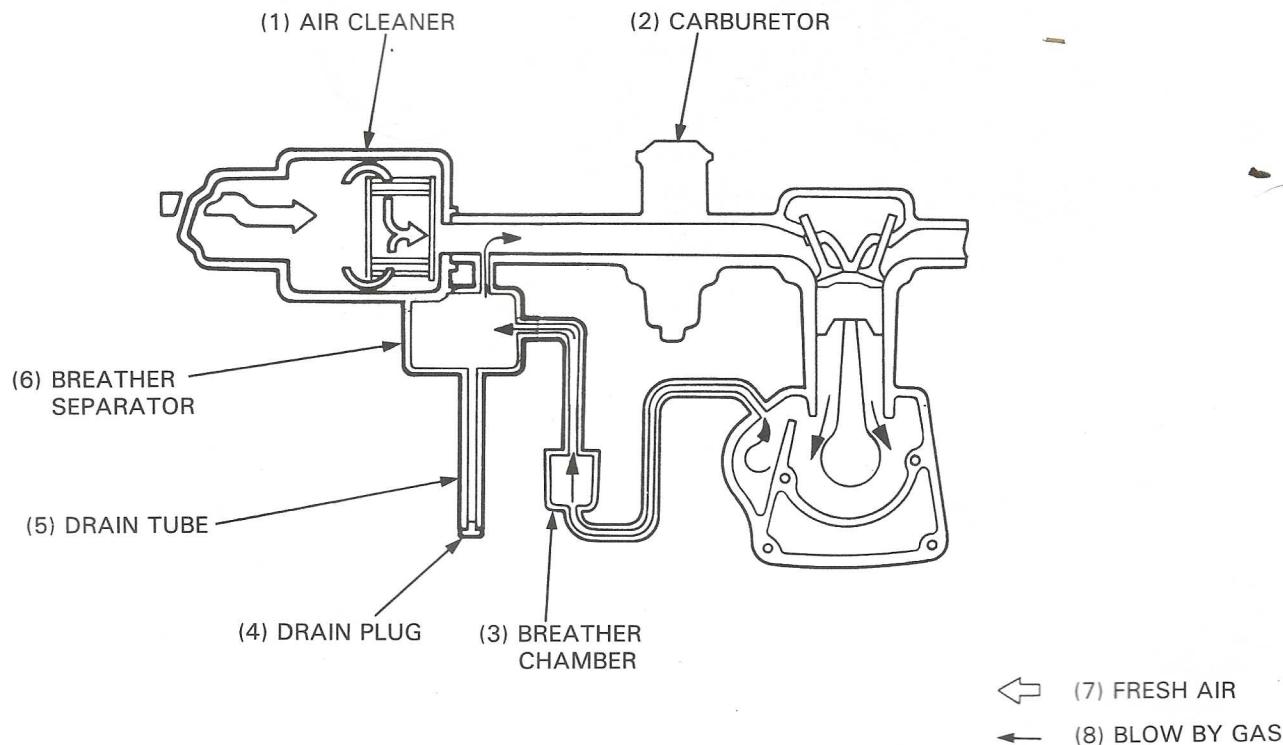
Honda Motor Co., Ltd. utilizes lean carburetor settings as well as other systems, to reduce carbon monoxide and hydrocarbons.

EXHAUST EMISSION CONTROL SYSTEM

The exhaust emission control system is composed of a lean carburetor setting, and no adjustments should be made except the idle speed adjustment with the throttle stop screw.

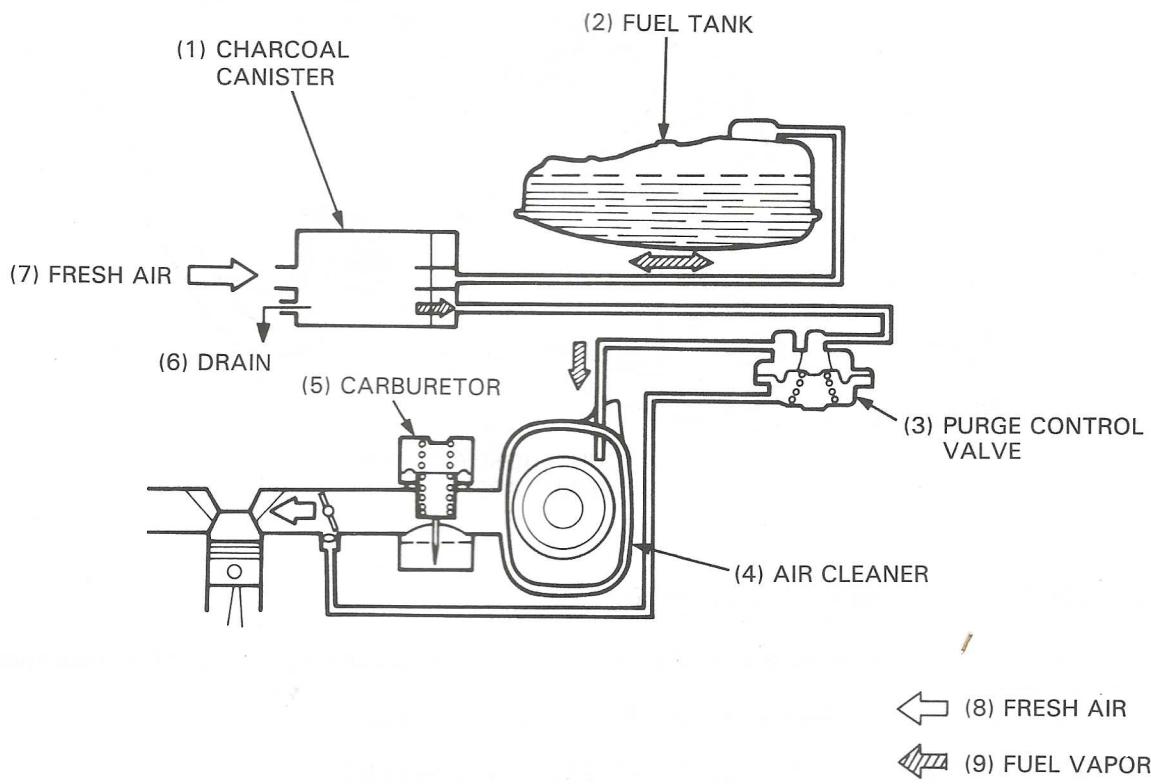
CRANKCASE EMISSION CONTROL SYSTEM

The engine is equipped with a closed crankcase system which routes crankcase emissions through the air cleaner and into the combustion chamber. Condensed crankcase vapors are accumulated in a storage tank which must be emptied periodically. See the Maintenance Schedule in section 3.



EVAPORATIVE EMISSION CONTROL SYSTEM (California model only)

This model complies with California Air Resources Board requirements for evaporative emission regulations. Fuel vapor from the fuel tank is routed into a charcoal canister where it is adsorbed and stored while the engine is stopped. When the engine is running and the purge control diaphragm valve is open, fuel vapor in the charcoal canister is drawn into the engine through the carburetor.



NOISE EMISSION CONTROL SYSTEM

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

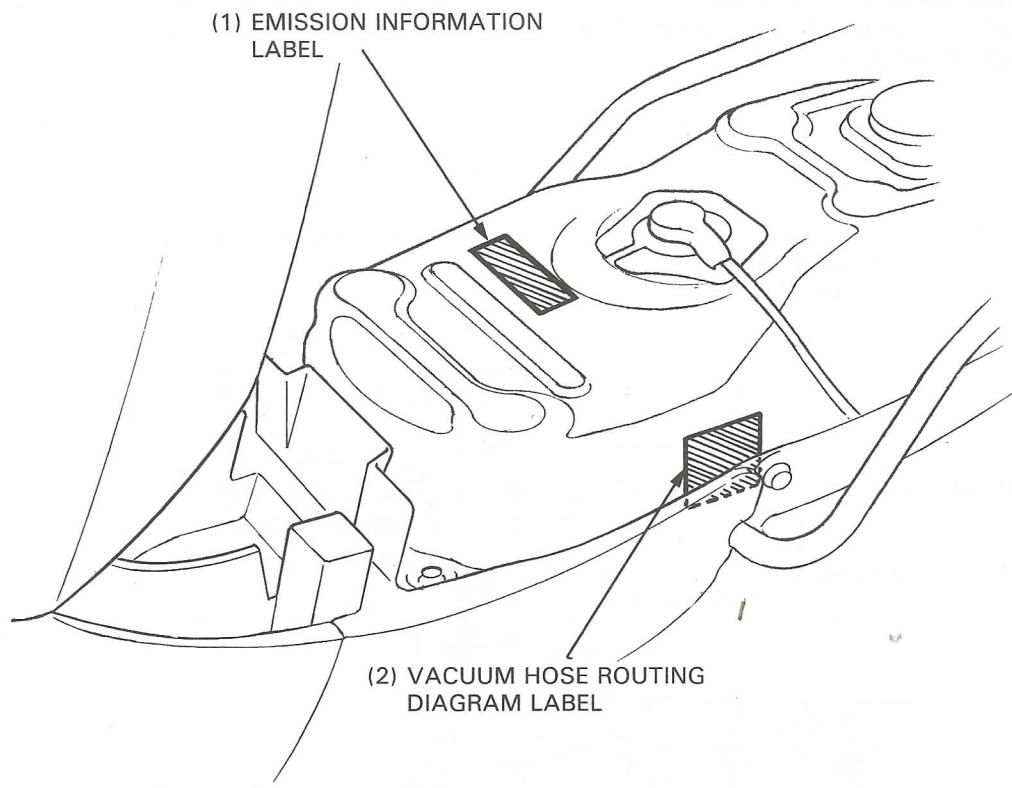
AMONG THOSE ACTS PRESUMED TO CONSTITUTE TAMPERING ARE THE ACTS LISTED BELOW:

1. Removal of, or puncturing the muffler, baffles, header pipes or any other component which conducts exhaust gases.
2. Removal of, or puncturing of any part of the intake system.
3. Lack of proper maintenance.
4. Replacing any moving parts of the vehicle, or parts of the exhaust or intake system, with parts other than those specified by the manufacturer.

GENERAL INFORMATION

EMISSION CONTROL INFORMATION LABEL

An Emission Control Information Label is located on the fuel tank as shown. It contains basic tune-up specifications.



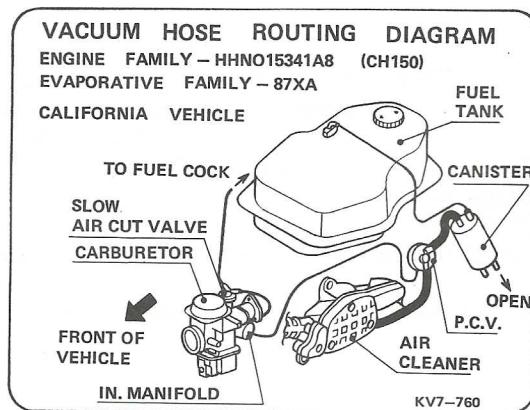
EMISSION CONTROL INFORMATION UPDATE LABEL

After making a high altitude carburetor adjustment (page 4-12), attach a vehicle emission control information update label on the fuel tank as shown.

Instructions for obtaining the update label are given in Service Letter No. 132.

VACUUM HOSE ROUTING DIAGRAM LABEL (California model only)

The Vacuum Hose Routing Diagram Label is attached to the fuel tank. Route the vacuum hoses as shown on this label.



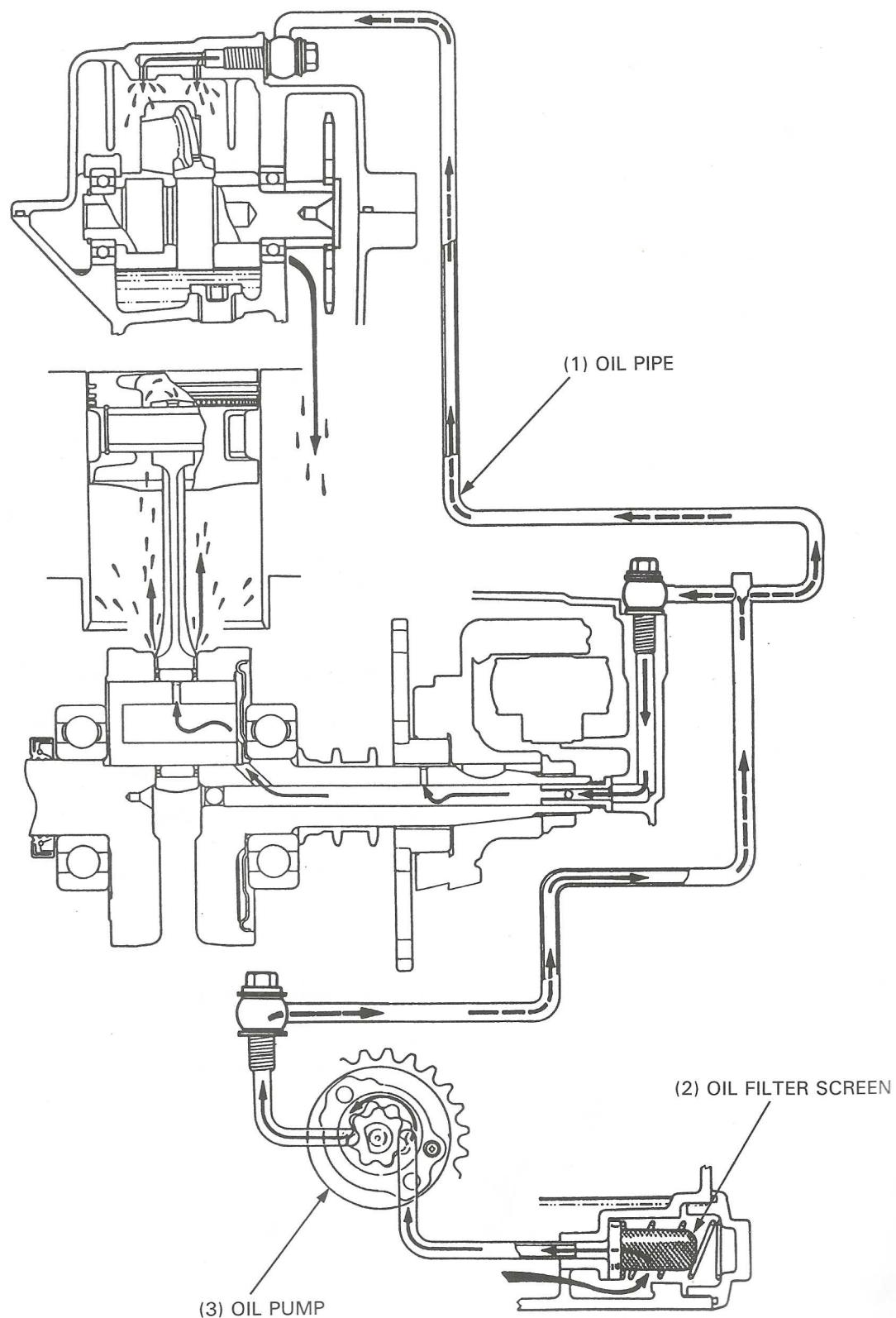
MEMO

12345
TODAY
RECEIVED
CHASER
CL. PUS
SPL.
SER
GT

12345



LUBRICATION



2. LUBRICATION

| | | | |
|-----------------------------------|-----|-----------------------|-----|
| SERVICE INFORMATION | 2-1 | OIL PUMP INSPECTION | 2-3 |
| TROUBLESHOOTING | 2-1 | OIL PUMP ASSEMBLY | 2-4 |
| ENGINE OIL | 2-2 | OIL PUMP INSTALLATION | 2-5 |
| ENGINE OIL FILTER SCREEN CLEANING | 2-2 | TRANSMISSION OIL | 2-6 |
| OIL PUMP REMOVAL | 2-2 | LUBRICATION POINTS | 2-7 |
| OIL PUMP DISASSEMBLY | 2-3 | | |

SERVICE INFORMATION

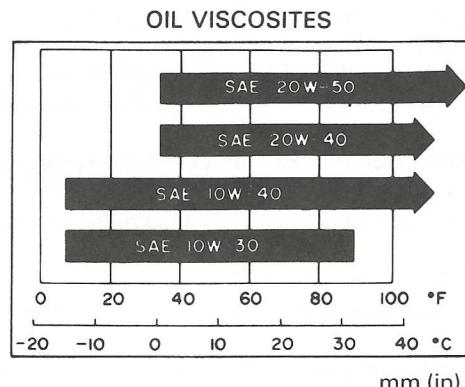
GENERAL

- This section covers maintenance of the oil pump, engine oil and transmission oil.

SPECIFICATIONS

| | |
|---------------------|--|
| Engine oil capacity | 1.0 liter (1.1 US qt, 0.9 Imp qt) at disassembly 0.8 liter (0.8 US qt, 0.7 Imp qt) at change |
| Transmission oil | 0.18 liter (0.19 US qt, 0.16 Imp qt) at disassembly 0.15 liter (0.16 US qt, 0.13 Imp qt) at change |
| Recommended oil | Use Honda 4-Stroke Oil or equivalent. API Service Classification: SE or SF VISCOSITY: SAE 10W—40 |

Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range.



| ITEM | | STANDARD | SERVICE LIMIT |
|----------|---------------------|-------------------------|---------------|
| Oil pump | Rotor tip clearance | 0.15 (0.006) | 0.20 (0.008) |
| | Body clearance | 0.15—0.20 (0.006—0.008) | 0.25 (0.010) |
| | Rotor end clearance | 0.04—0.09 (0.002—0.004) | 0.12 (0.005) |

TORQUE VALUES

| | |
|-----------------------------------|---------------------------------------|
| Oil filter screen cap | 19—25 N·m (1.9—2.5 kg-m, 14—18 ft-lb) |
| Transmission oil drain bolt | 10—14 N·m (1.0—1.4 kg-m, 7—10 ft-lb) |
| Transmission oil level check bolt | 10—15 N·m (1.0—1.5 kg-m, 7—11 ft-lb) |
| Oil pump mounting bolt | 8—12 N·m (0.8—1.2 kg-m, 6—9 ft-lb) |

TROUBLESHOOTING

Oil Level Too Low

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

Poor Lubrication Pressure

- Oil level too low.
- Clogged oil filter, oil passage, and/or oil pipe.
- Faulty oil pump.

Oil Contamination

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

LUBRICATION

ENGINE OIL

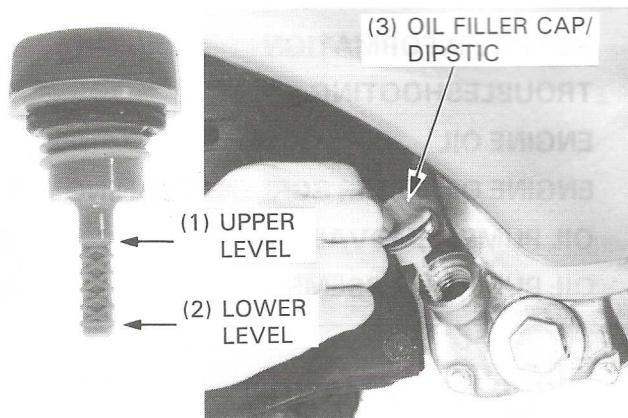
OIL LEVEL

Stop the engine and support the scooter upright on level ground.

Check the oil level with the filler cap/dipstick

Do not screw in the dipstick when making this check

If the level is near the lower level, fill to the upper level with the recommended engine oil (page 2-1).



OIL CHANGE

NOTE

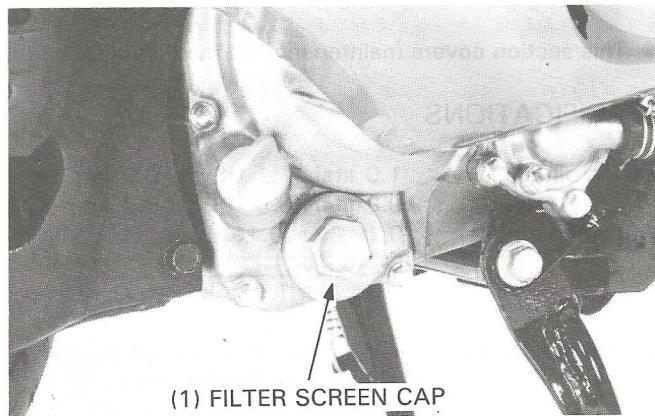
- Drain the oil from the crankcase while the engine is warm. This ensures complete and rapid draining.

Place an oil pan under the engine, and remove the oil filter screen cap.

After the oil has been completely drained, be sure the O-ring is in good condition and install the filter, spring and cap.

TORQUE: 19–25 N·m (1.9–2.5 kg-m, 14–18 ft-lb)

Pour the recommended oil (page 2-1) through the oil filler hole.



ENGINE OIL CAPACITY:

0.8 liter (0.8 US qt, 0.7 Imp qt) at oil change

Reset the indicator by inserting the key in the indicator slot below the instrument panel.

Reinstall the oil filler cap. Start the engine and let it idle for few minutes.

Stop the engine and recheck the oil level.

Check that there are no oil leaks.

ENGINE OIL FILTER SCREEN CLEANING

Drain the engine oil.

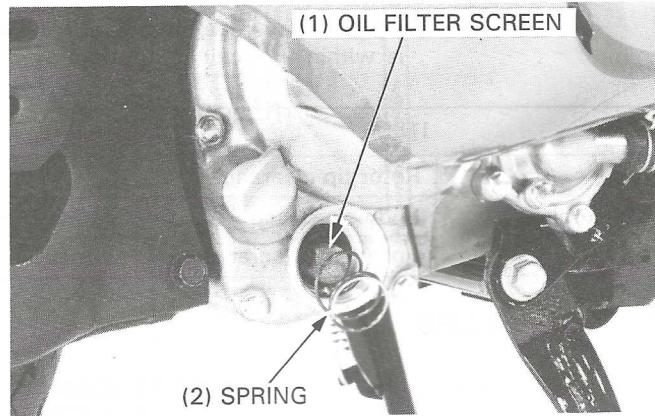
Remove the oil filter screen and spring.

Clean the oil filter screen.

Make sure that the O-ring is in good condition.

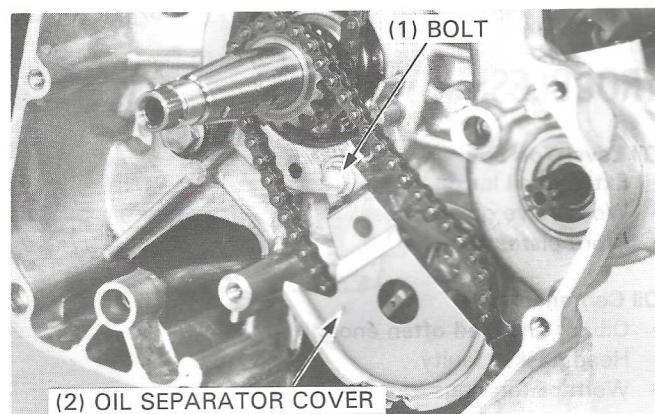
Install the oil filter screen and spring.

Install the filter screen cap.



TORQUE: 19–25 N·m (1.9–2.5 kg-m, 14–18 ft-lb)

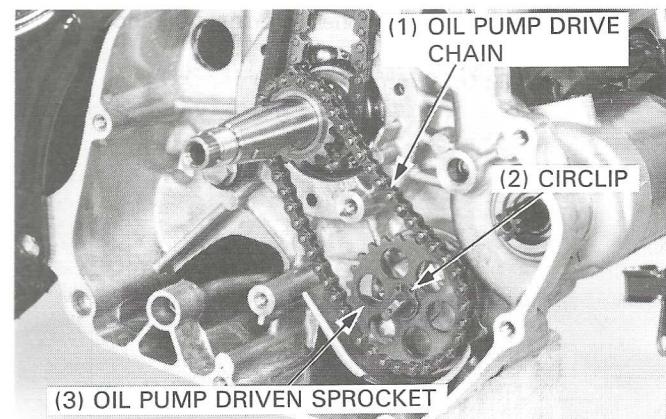
Fill the crankcase with the recommended oil (page 2-1) and check the oil level.



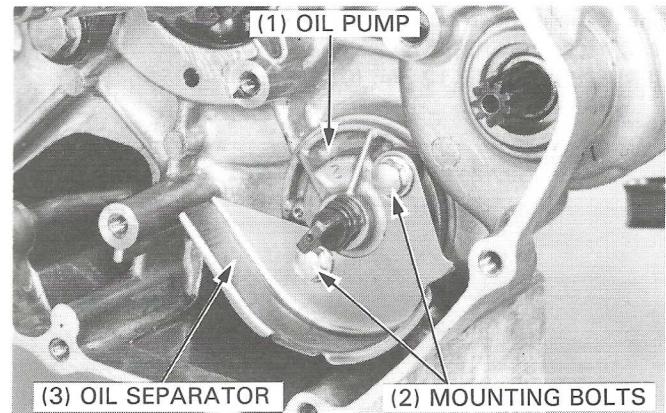
OIL PUMP REMOVAL

Remove the alternator and starter drive gear (Section 10). Remove the attaching bolt and oil separator cover.

Pry the circlip off, then remove the oil pump drive chain and oil pump driven sprocket.

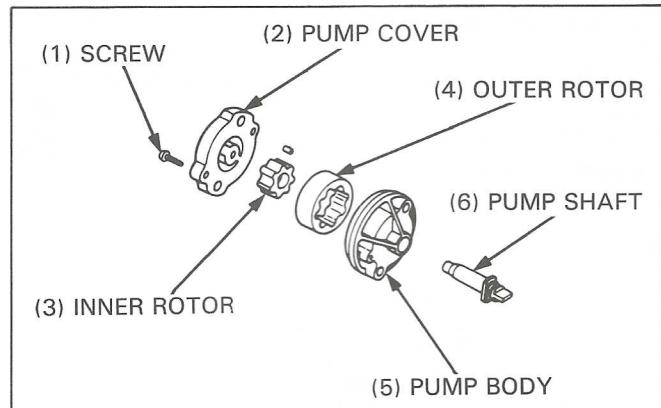


Remove the two oil pump mounting bolts, and remove the oil separator and oil pump.



OIL PUMP DISASSEMBLY

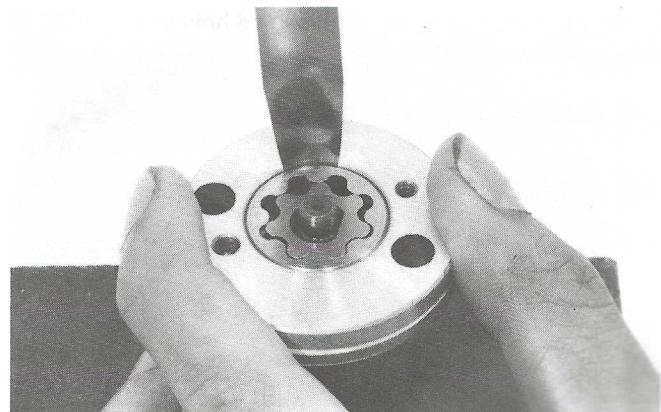
Unscrew the pump cover attaching screw and disassemble the oil pump as shown.



OIL PUMP INSPECTION

Measure the pump body-to-outer rotor clearance.

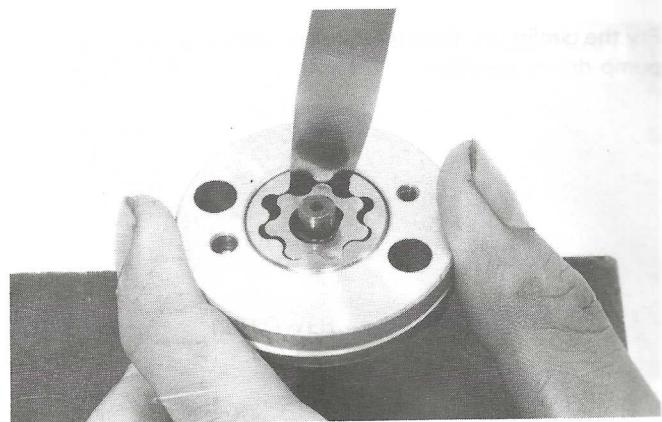
SERVICE LIMIT : 0.25 mm (0.010 in)



LUBRICATION

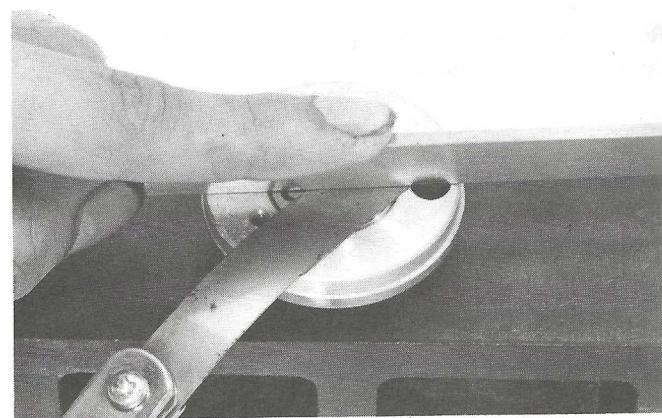
Measure the outer rotor-to-inner rotor tip clearance.

SERVICE LIMIT : 0.20 mm (0.008 in)



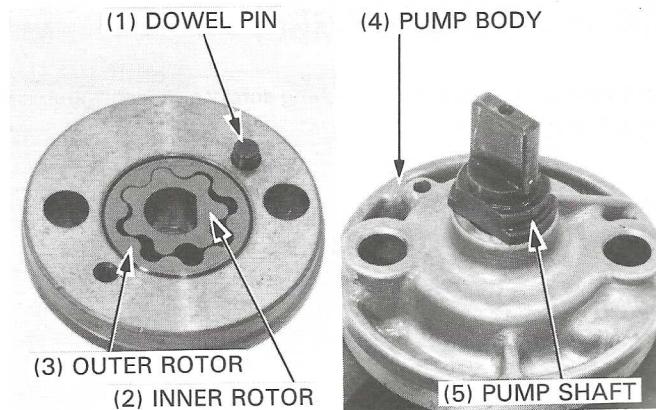
Check the rotor-to-pump body clearance.

SERVICE LIMIT : 0.12 mm (0.005 in)

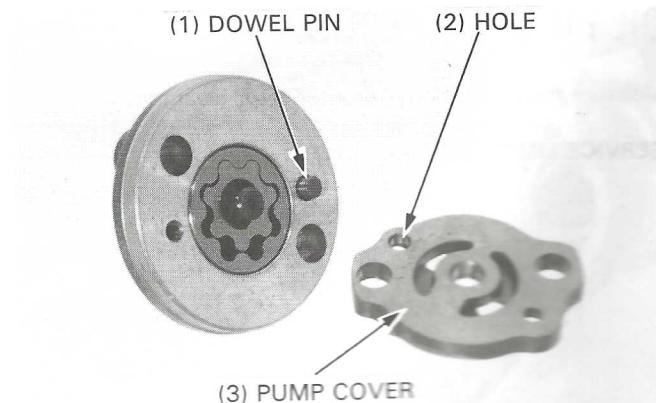


OIL PUMP ASSEMBLY

Install the outer and inner rotor into the pump body.
Insert the pump shaft by aligning the flat on the shaft with the flat in the inner rotor.
Install the dowel pin.

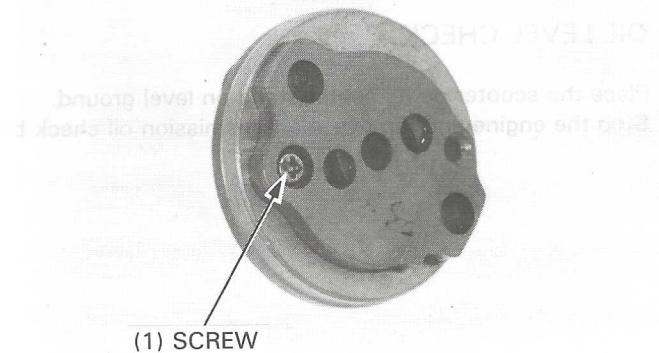


Install the pump cover by aligning the hole in the cover with the dowel pin.



Tighten the screw.

Make sure that the pump shaft rotates freely without binding.

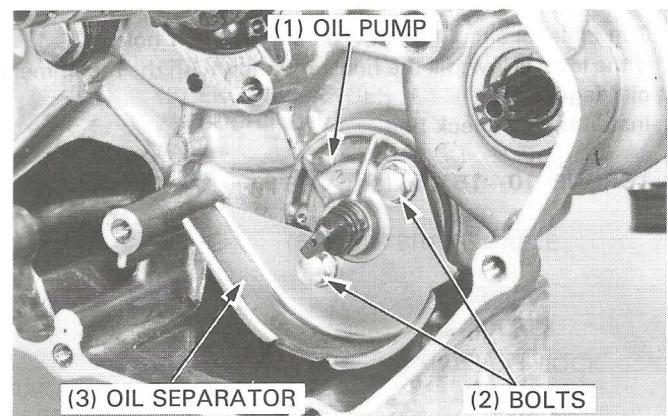


OIL PUMP INSTALLATION

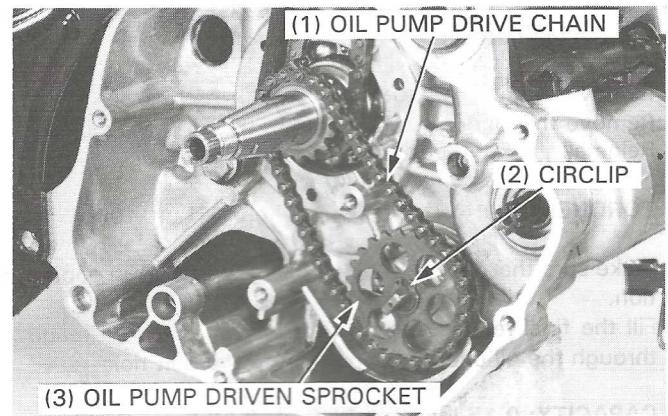
Install the oil pump and oil separator and tighten the bolts.

TORQUE: 8–12 N·m (0.8–1.2 kg·m, 6–9 ft-lb)

Make sure that the pump shaft rotates freely.

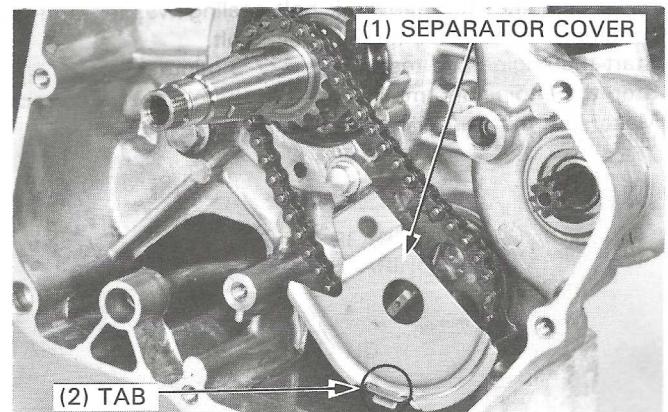


Install the oil pump driven sprocket and drive chain, then set the circlip securely on the pump shaft.



Install the oil separator cover by fitting the tab of the separator cover into the slit in the separator.

Install the starter gear and alternator (Section 10).

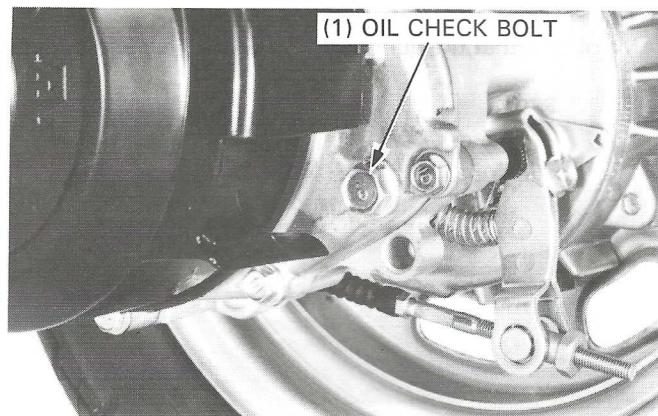


LUBRICATION

TRANSMISSION OIL

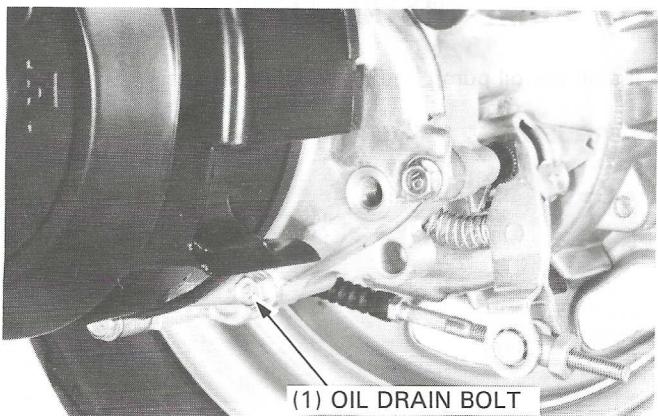
OIL LEVEL CHECK

Place the scooter on its center stand on level ground.
Stop the engine and remove the transmission oil check bolt.



The oil level should be at the oil check bolt hole.
If the level is low, fill the final reduction with the recommended oil (page 2-1).
Install the oil check bolt.

TORQUE: 10–15 N·m (1.0–1.5 kg·m, 7–11 ft-lb)



OIL CHANGE

Remove the oil check bolt.
Remove the oil drain bolt and drain the oil thoroughly.
Reinstall the drain bolt.

TORQUE: 10–14 N·m (1.0–1.4 kg·m, 7–10 ft-lb)

Make sure that the drain-bolt sealing washer is in good condition.
Fill the final reduction with the recommended oil (page 2-1)
through the oil check bolt hole up to the bolt hole.

CAPACITY: 0.15 liter (0.16 US qt, 0.13 Imp qt) at change

Make sure that the oil check bolt sealing washer is in good condition and reinstall the oil check bolt.
Start the engine and test ride for 2–3 minutes.
Stop the engine and make sure that the oil level is correct.
Make sure that there are no oil leaks.

LUBRICATION POINTS

CONTROL CABLES

Periodically, disconnect the throttle and brake cables at their upper ends. Thoroughly lubricate the cables and their pivot points with a commercially available cable lubricant or a light weight oil.



MEMO

3. MAINTENANCE

| | | | |
|---|-----|----------------------------|------|
| SERVICE INFORMATION | 3-1 | CYLINDER COMPRESSION | 3-8 |
| MAINTENANCE SCHEDULES | 3-2 | DRIVE BELT | 3-8 |
| FUEL LINE | 3-3 | DRIVE BELT AIR CLEANER | 3-9 |
| THROTTLE OPERATION | 3-3 | BRAKE SHOE WEAR | 3-9 |
| AIR CLEANER | 3-4 | BRAKE SYSTEM | 3-9 |
| CRANKCASE BREATHER | 3-4 | BRAKE LOCK KNOB | 3-10 |
| SPARK PLUG | 3-4 | BRAKE LIGHT SWITCH/STARTER | |
| VALVE CLEARANCE | 3-5 | LIMITER SWITCH | 3-11 |
| RADIATOR COOLANT | 3-6 | HEADLIGHT AIM | 3-11 |
| RADIATOR CORE | 3-6 | CLUTCH SHOE WEAR | 3-11 |
| COOLING SYSTEM HOSES & CONNECTIONS | 3-6 | SIDE STAND | 3-11 |
| CARBURETOR-IDLE SPEED | 3-7 | SUSPENSION | 3-12 |
| EVAPORATIVE EMISSION CONTROL SYSTEM (California model only) | 3-7 | NUTS, BOLTS, FASTENERS | 3-12 |
| IGNITION TIMING | 3-7 | WHEELS/TIRES | 3-13 |
| | 3-7 | STEERING HEAD BEARINGS | 3-13 |

SERVICE INFORMATION

GENERAL

| | |
|------------------------------------|--------------|
| Engine oil | See page 2-2 |
| Engine oil strainer screen | See page 2-2 |
| Transmission (final reduction) oil | See page 2-6 |

SPECIFICATIONS

ENGINE

| | |
|--|--|
| Throttle grip free play: | 2—6 mm (1/8—1/4 in) |
| Spark plug: Standard: For cold climate (below 5°C, 41°F) | DPR7EA-9 (NGK), X22EPR-U9 (ND) DPR6EA-9 (NGK), X20EPR-U9 (ND) |
| Plug gap: | 0.8—0.9 mm (0.032—0.035 in) |
| Ignition timing: "F" mark | 10° ± 3° BTDC at 1,500 rpm |
| Advance starts: | 10° BTDC at 2,100 rpm |
| Full advance: | 27° BTDC at 4,000 rpm |
| Idle speed: | 1,500 ± 100 rpm |
| Cylinder compression: | 1,300 ± 200 kPa (13 ± 2 kg/cm ² , 184 ± 28 psi) |
| Valve clearance: IN/EX | 0.1 mm (0.004 in) |

CHASSIS

| | |
|------------------------|-------------------------|
| Front brake free play: | 10—20 mm (3/8—3/4 in) |
| Rear brake free play: | 20—30 mm (3/4—1-1/8 in) |

Tire:

| Tire size | FRONT | REAR |
|---|---|--------------------------------|
| | 3.50—10—4PR | 3.50—10—4PR |
| Cold tire pressure kPa (kg/cm ² , psi) | Up to 90 kg (200 lbs) load Up to vehicle capacity load | 150 (1.5, 21) 150 (1.5, 21) |
| Tire brand (Tubeless only) | BRIDGESTONE DUNLOP | ML9 F11 |
| | | ML12 K627B |

MAINTENANCE

MAINTENANCE SCHEDULE

Perform the pre-ride inspection at each scheduled maintenance period.

I: Inspect, and Clean, Adjust, Lubricate or Replace if necessary.

C: Clean R: Replace A: Adjust L: Lubricate

| ITEM | FREQUENCY | WHICHEVER → COMES FIRST ↓ EVERY | ODOMETER READING [NOTE (4)] | | | | Refer to page | |
|----------------------------|-----------|---|-----------------------------|--|--------------------------------------|-------------------------|------------------|------|
| | | | 600 mi (1,000 km) | 2,500 mi (4,000 km) | 5,000 mi (8,000 km) | 7,500 mi (12,000 km) | | |
| EMISSION RELATED ITEMS | * | FUEL LINE | | | I | I | I | 3-3 |
| | * | THROTTLE OPERATION | | | I | I | I | 3-3 |
| | | AIR CLEANER | NOTE (1) | | | | R | 3-4 |
| | | CRANKCASE BREather | NOTE (2) | | C | C | C | 3-4 |
| | | SPARK PLUG | | | R | R | R | 3-4 |
| | * | VALVE CLEARANCE | | I | I | I | I | 3-5 |
| | | ENGINE OIL | YEAR | R | Replace every 1,250 mi (2,000 km) | | | 2-2 |
| | * | ENGINE OIL FILTER SCREEN | | | | | C | 2-2 |
| | * | CARBURETOR-IDLE SPEED | | I | I | I | I | 3-7 |
| | | RADIATOR-COOLANT | 2 YEARS *R | | | I | | 3-6 |
| | * | COOLING SYSTEM | | | | I | | 3-6 |
| NON-EMISSION RELATED ITEMS | * | EVAPORATIVE EMISSION CONTROL SYSTEM | NOTE (3) | | | | I | 3-7 |
| | * | DRIVE BELT | | I: EVERY 5,000 mi (8,000 km) R: EVERY 15,000 mi (24,000 km) | | | | 3-8 |
| | | BELT CASE AIR CLEANER | | | C | C | C | 3-9 |
| | * | FINAL DRIVE OIL | 2 YEARS *R | | | | | 2-6 |
| | | BRAKE SHOE WEAR | | | I | I | I | 3-9 |
| | | BRAKE SYSTEM | | | I | I | I | 3-9 |
| | * | BRAKE LIGHT SWITCH | | | I | I | I | 3-11 |
| | * | STARTER LIMIT SWITCH | | | I | I | I | 3-11 |
| | * | BRAKE LOCK KNOB | | I | I | I | I | 3-10 |
| | * | HEADLIGHT AIM | | | I | I | I | 3-11 |
| NON-EMISSION RELATED ITEMS | ** | CLUTCH SHOE WEAR | | | | I | | 3-11 |
| | | SIDE STAND | | | I | I | I | 3-11 |
| | * | SUSPENSION | | | I | I | I | 3-12 |
| | * | NUTS, BOLTS, FASTENERS | | I | I | I | | 3-12 |
| | ** | WHEELS/TIRES | | | I | I | I | 3-13 |
| | ** | STEERING HEAD BEARINGS | | I | | | I | 3-13 |

* Should be serviced by an authorized HONDA Dealer, unless the owner has proper tools and service data and is mechanically qualified.

** In the interest of safety, we recommend these items be serviced ONLY by an authorized HONDA Dealer.

- NOTE: 1. Service more frequently when riding in dusty areas.
 2. Service more frequently when riding in rain or at full throttle.
 3. California type only.
 4. For higher odometer readings, repeat at the frequency interval established here.

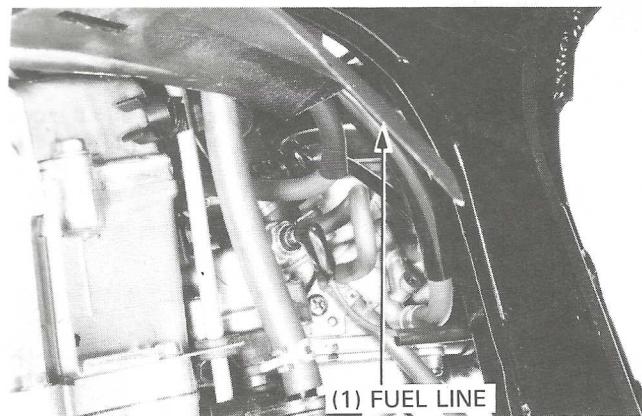
FUEL LINE

Remove the right rear cover (page 13-2).
Remove the frame center cover (page 13-2).

Check the fuel lines and replace any parts which show signs of deterioration, damage or leakage.

WARNING

- Gasoline is flammable and is explosive under certain conditions. Do not smoke or allow flames or sparks in your working area.*



THROTTLE OPERATION

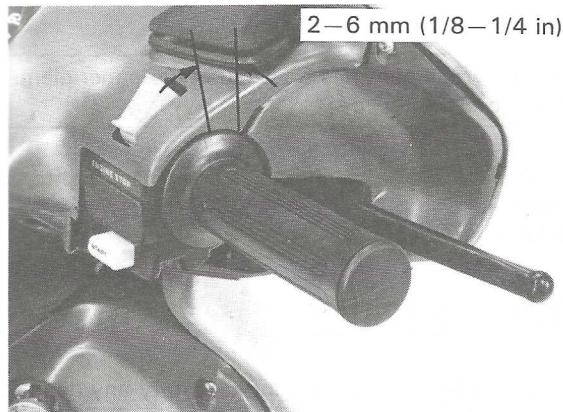
Check for smooth throttle grip movement, full opening and automatic full closing in all steering positions.

Check the throttle cable and replace it, if it is deteriorated, kinked or damaged.

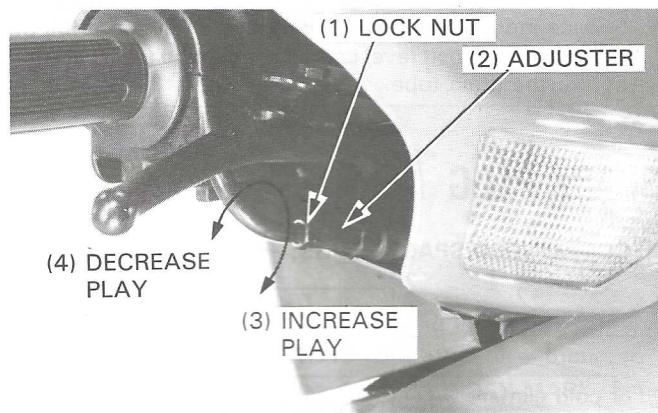
Lubricate the throttle cable (page 2-7), if throttle operation is not smooth.

Measure the throttle grip free play at the throttle grip flange.

FREE PLAY : 2–6 mm (1/8–1/4 in)

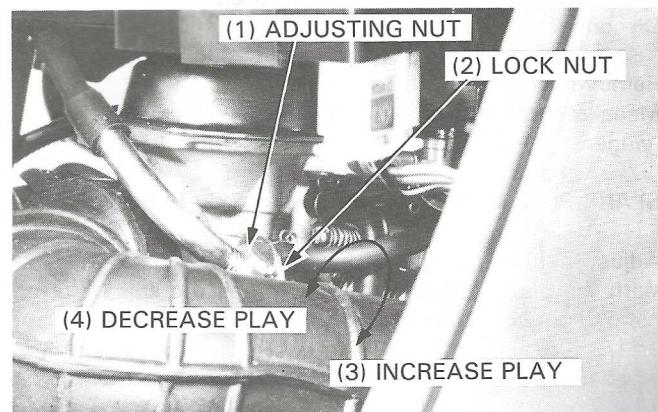


Adjustment can be made at either end of the throttle cable. Minor adjustments are made with the upper adjuster. Slide the rubber cover out and adjust by loosening the lock nut and turning the adjuster.



Major adjustments are made with the lower adjusting nut. Remove the right and left rear covers and the frame center cover (page 13-2) and then adjust by loosening the lock nut and turning the adjusting nut.

Tighten the lock nut and recheck throttle operation.



MAINTENANCE

AIR CLEANER

Remove the left rear cover (page 13-2).

Remove the three air cleaner case cover screws and the cover.

Remove the air cleaner element and discard it in accordance with the maintenance schedule.

Also, replace the element any time it is excessively dirty or damaged.

NOTE

- The air cleaner element has a viscous type paper element. do not try to clean.

Install the element and air cleaner case cover, and tighten the three screws.

Install the left rear cover.

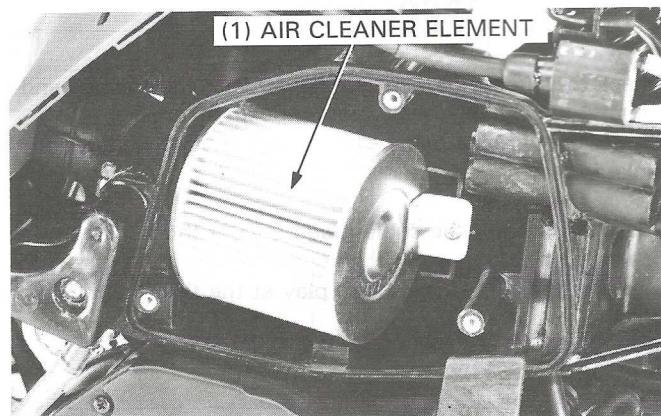


CRANKCASE BREather

Remove the plug from the drain tube to empty any deposits.

NOTE

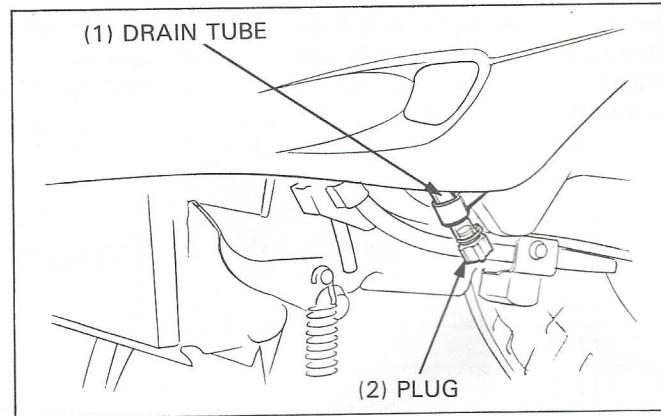
- Service more frequently when ridden in rain or at full throttle or if the deposit level can be seen in the transparent section of the drain tube.



SPARK PLUG

RECOMMENDED SPARK PLUGS:

| | NGK | ND |
|---------------------------------------|----------|-----------|
| Standard | DPR7EA-9 | X22EPR-U9 |
| For cold climate (below 5°C, 41°F) | DPR6EA-9 | X20EPR-U9 |



Remove the left rear cover (page 13-2).

Disconnect the spark plug cap.

Clean any dirt from around the spark plug base.

Remove and discard the spark plug.

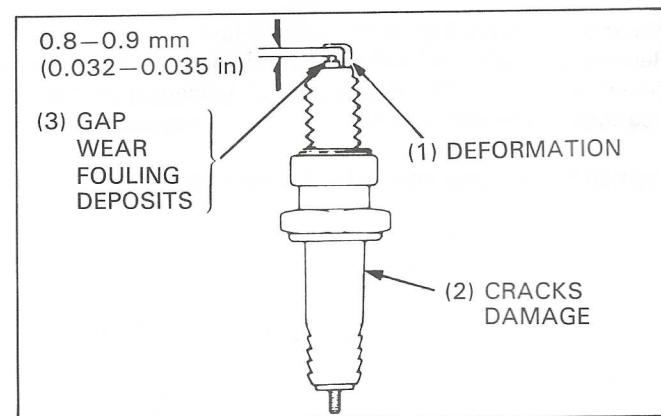
Measure the new spark plug gap using a wire-type feeler gauge.

SPARK PLUG GAP: 0.8–0.9 mm (0.032–0.035 in)

Adjust by bending the side electrode carefully.

With the plug washer attached, thread the spark plug in by hand to prevent cross-threading. Tighten the spark plug another 1/2 turn with a spark plug wrench to compress the plug washer.

Then connect the spark plug cap.



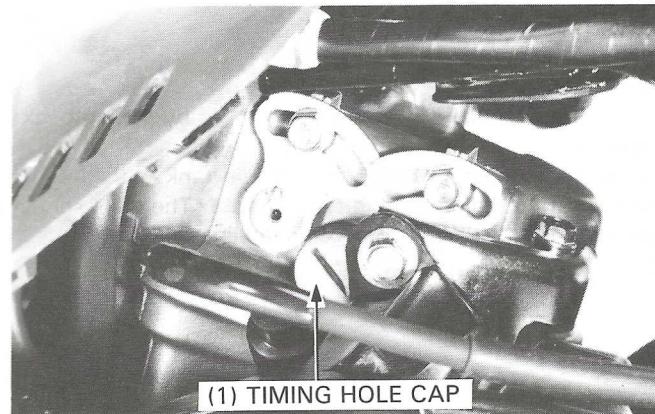
VALVE CLEARANCE

NOTE

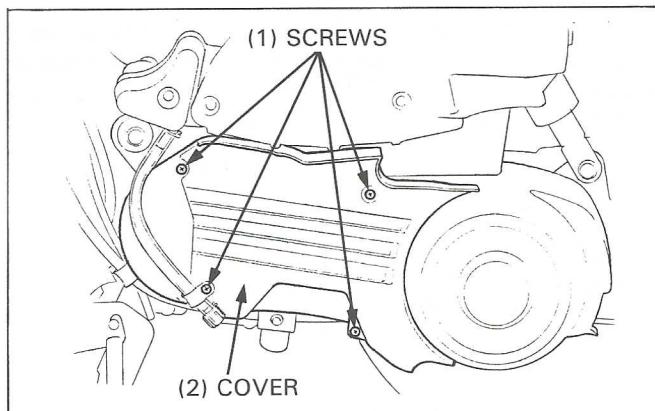
- Inspect and adjust valve clearance while the engine is cold (below 35°C/ 95°F).

Remove the left rear cover (page 13-2).

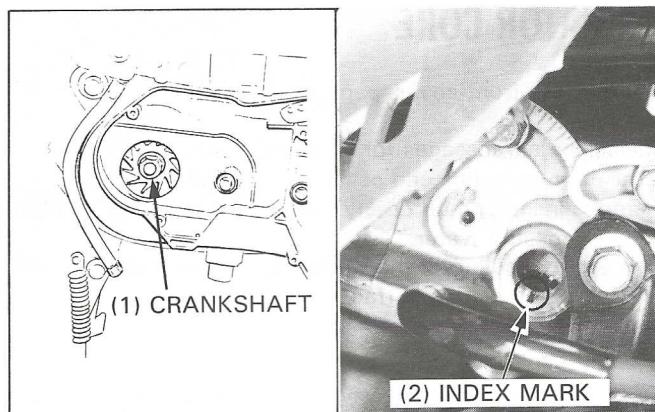
Remove the timing hole cap from the left side of the cylinder head cover.



Remove the four screws attaching the drive belt air cleaner cover to the left crankcase cover.



Rotate the crankshaft counterclockwise so that the index mark on the cam sprocket is aligned with the cylinder head mating surface as shown to bring the piston to TDC (Top Dead Center) on the compression stroke.



Loosen fully the valve adjuster lock bolts, located on the left side of the cylinder head.

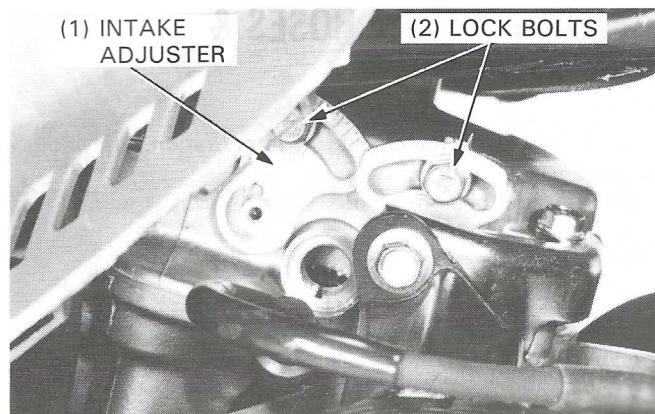
Move the intake and exhaust adjusters outward (away from each other) fully, until resistance is felt.

Then move them inwards (towards each other) the equivalent of one graduation. Tighten the adjuster lock bolts.

NOTE

- One graduation on the adjusters equals 0.10 mm (0.004 in), which is the specified clearance.

Install the removed parts in the reverse order of removal.



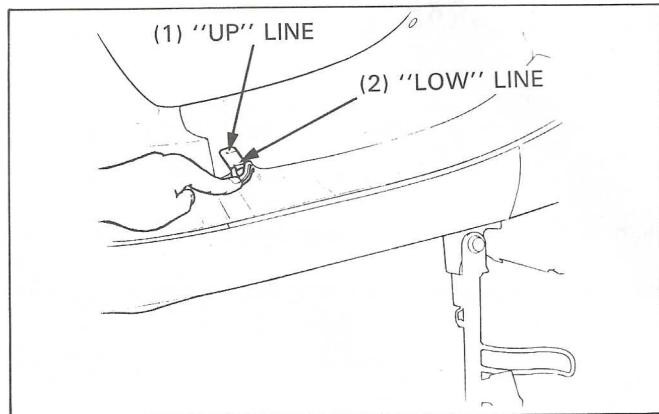
MAINTENANCE

RADIATOR COOLANT

Place the scooter on its center stand.

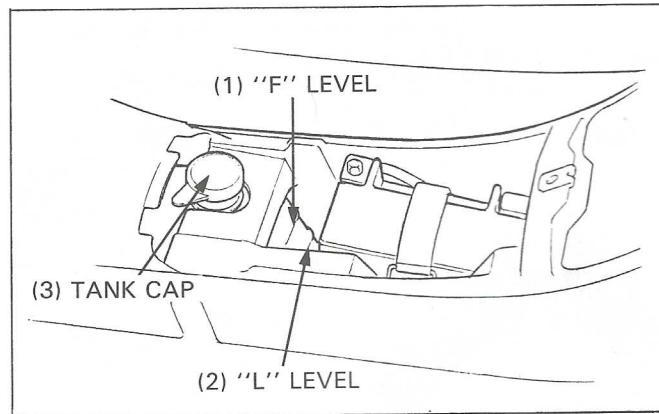
Uncover the coolant level inspection hole by pulling back the rubber tab on the left floor mat.

Check the coolant level of the reserve tank with the engine running at normal operating temperature. The level should be between the "UP" and "LOW" level lines.



If necessary, remove the reserve tank cap and fill to the "F" level line with a 50/50 mixture of distilled water and anti-freeze.

Reinstall the cap.



RADIATOR CORE

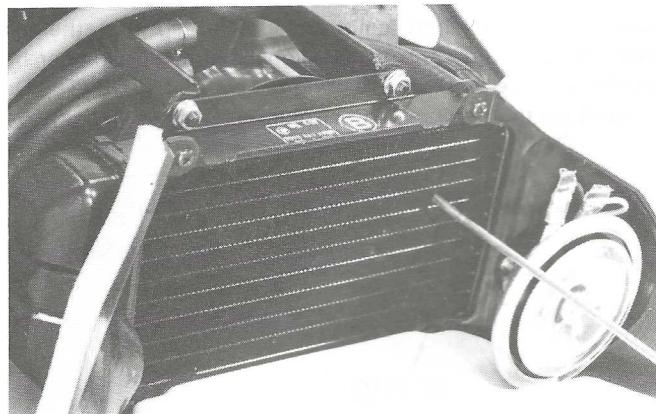
Remove the front cover (page 13-3).

Check the air passages for clogging or damage.

Straighten bent fins and collapsed core tubes.

Remove insects, mud or any obstruction with compressed air or low pressure water.

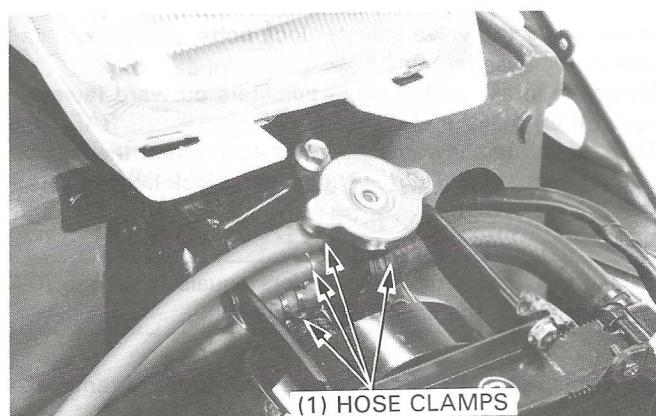
Replace the radiator if the air flow is restricted over more than 20% of the radiating surface.



COOLING SYSTEM HOSES & CONNECTIONS

Inspect the hoses for cracks or deterioration, and replace if necessary.

Check the tightness of all hose clamps.



CARBURETOR-IDLE SPEED

NOTE

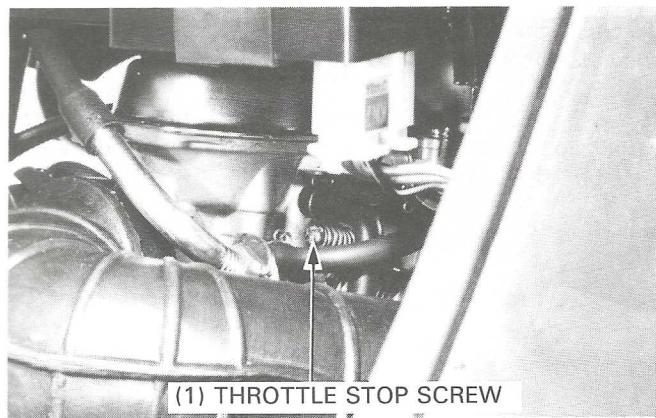
- Inspect and adjust idle speed after all other engine adjustments are within specifications.
- The engine must be warm for accurate idle inspection and adjustment. Ten minutes of stop and go riding is sufficient.

Remove the inspection cover from the center cover.

Warm up the engine and place the motorcycle on its center stand. Connect a tachometer.

Turn the throttle stop screw to obtain the specified idle speed.

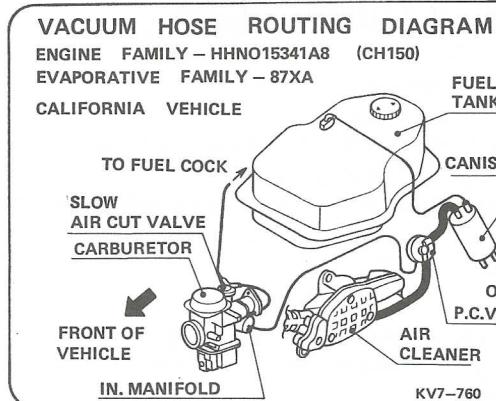
IDLE SPEED: $1,500 \pm 100$ rpm



EVAPORATIVE EMISSION CONTROL SYSTEM (California model only)

Check the hoses between the breather separator, fuel tank, charcoal canister, and air cleaner for damage or loose connections.

Replace as necessary.



IGNITION TIMING

NOTE

- The Capacitive Discharge Ignition system is factory pre-set and cannot be adjusted. Ignition timing inspection procedures are given to inspect the function of the CDI components.

Remove the right rear cover (page 13-2).

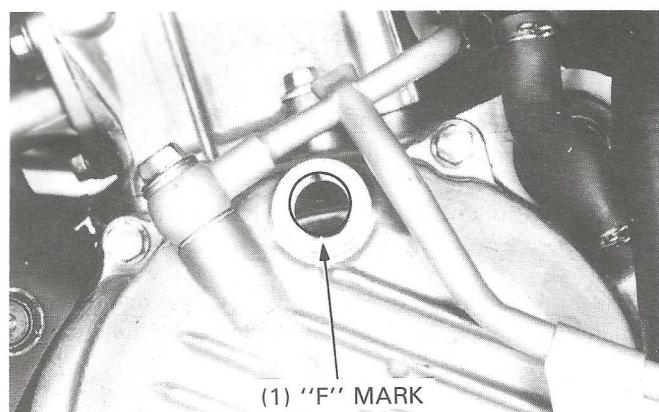
Remove the timing hole cap.



Connect a tachometer and timing light to the engine.

Start the engine.

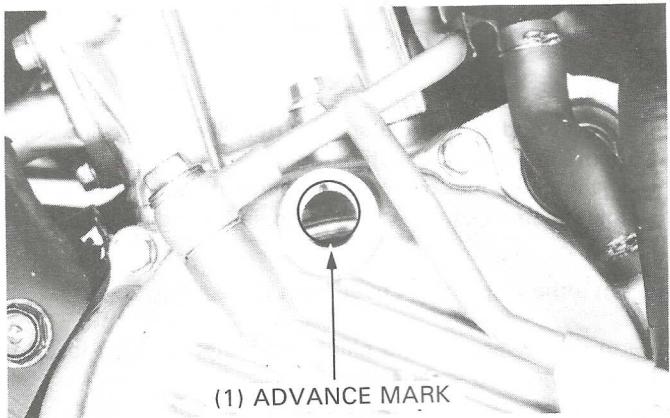
The ignition timing at idle is correct if the index notch aligns with the "F" mark at idle of 1,500 rpm.



MAINTENANCE

To check the advance, raise the engine speed to 4,000 rpm; the index notch should be between the advance marks.

If the ignition timing is incorrect, check the CDI unit, pulse rotor and pulse generator, and replace faulty parts. Refer to Section 16, Electrical Equipment.



CYLINDER COMPRESSION

Warm up the engine.

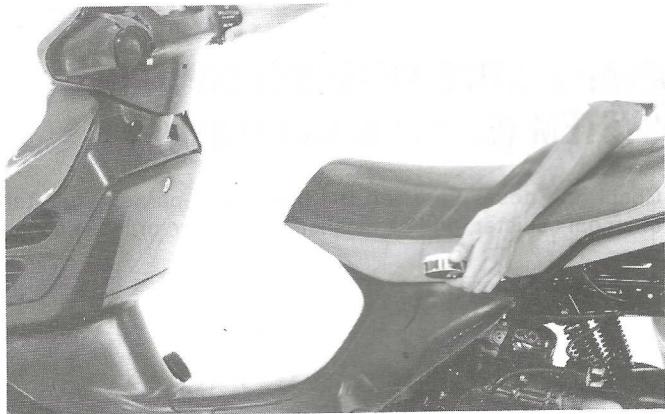
Stop the engine, then remove the left rear cover. Disconnect the spark plug cap and remove the spark plug.

Insert the compression gauge.

Open the throttle all the way and crank the engine with the starter motor.

NOTE

- Crank the engine until the gauge reading stops rising. The maximum reading is usually reached within 4–7 seconds.



COMPRESSION PRESSURE:

$1,300 \pm 200 \text{ kPa}$ ($13 \pm 2 \text{ kg/cm}^2$ $184 \pm 28 \text{ psi}$)

If compression is low, check for the following.

- Improper valve clearance
- Leaky valves
- Leaking cylinder head gasket
- Worn piston/ring/cylinder

If compression is high, it indicates that carbon deposits have accumulated on the combustion chamber and/or the piston crown.

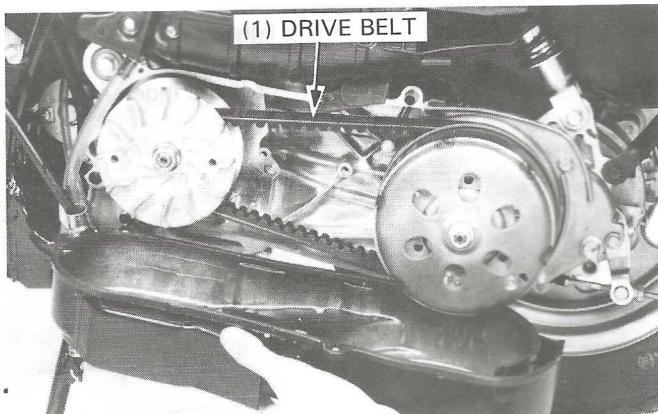
DRIVE BELT

Remove the following:

- left rear cover (page 13-2).
- left crankcase cover (page 8-3).

Inspect the drive belt for cracks, or abnormal or excessive wear.

Replace the drive belt (page 8-4) with a new one if necessary and in accordance with the maintenance schedule (page 3-2).



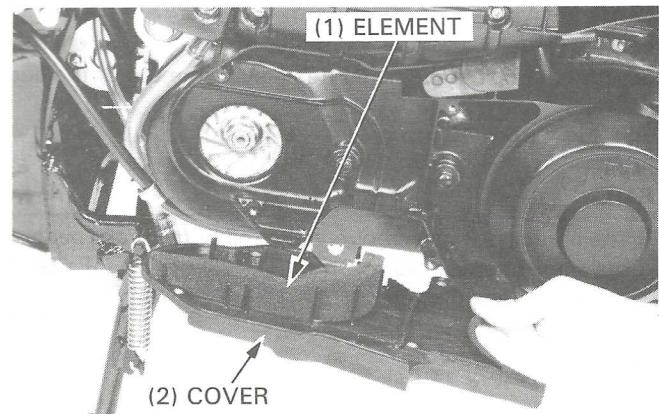
DRIVE BELT AIR CLEANER

Remove the left rear cover (page 13-2).
Remove the four drive belt air cleaner cover screws and the cover.

Remove the element from the cover and wash the element in non-flammable or high-point solvent, squeeze out the solvent thoroughly, and let it dry.

CAUTION

- *Do not oil the element.*
- *Dry the element before installing.*

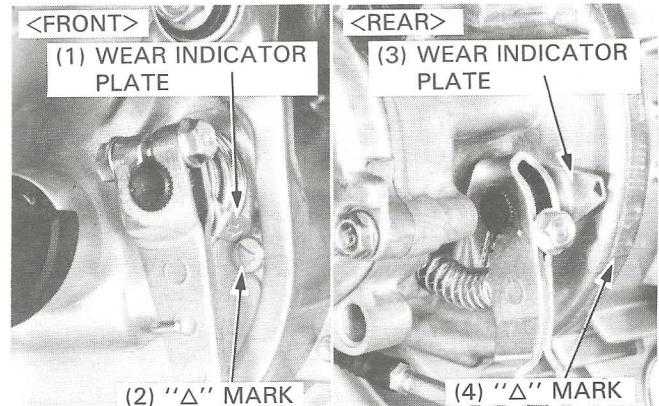


Install the following:

- the element.
- the element cover with its four screws.
- the left rear cover (page 13-2).

BRAKE SHOE WEAR

Replace the brake shoes if the arrow on the wear indicator aligns with the reference mark “△” when the brake is fully applied.

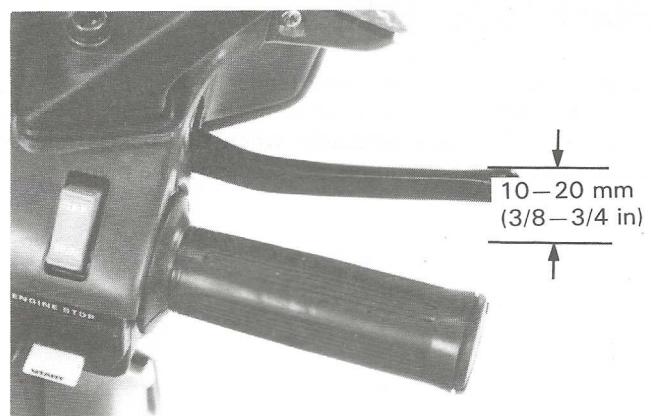


BRAKE SYSTEM

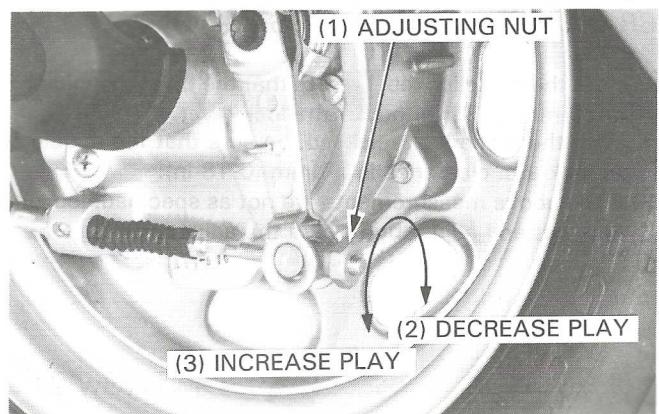
FRONT BRAKE

Measure the front brake lever free play at the tip of the brake lever.

FREE PLAY : 10–20 mm (3/8–3/4 in)



If adjustment is necessary, turn the front brake adjusting nut.



MAINTENANCE

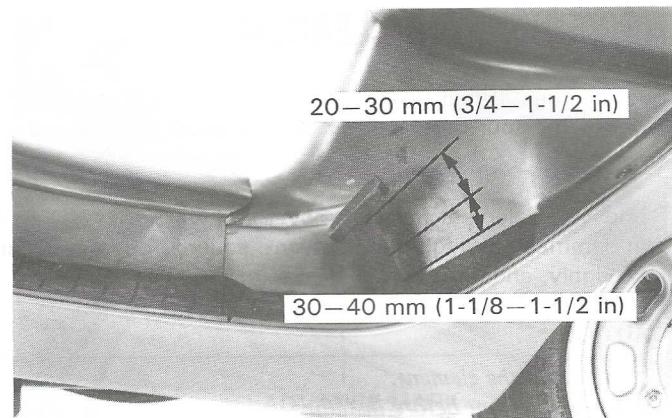
REAR BRAKE

Measure the rear brake pedal free play at the top of the pedal.

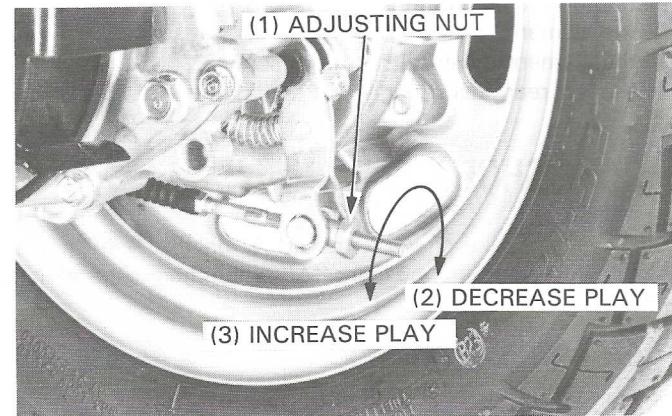
FREE PLAY : 20–30 mm (3/4–1-1/8 in)

NOTE

- The normal distance between the top of the brake pedal and the floor board is 30–40 mm (1-1/8–1-1/2 in) with the pedal depressed.



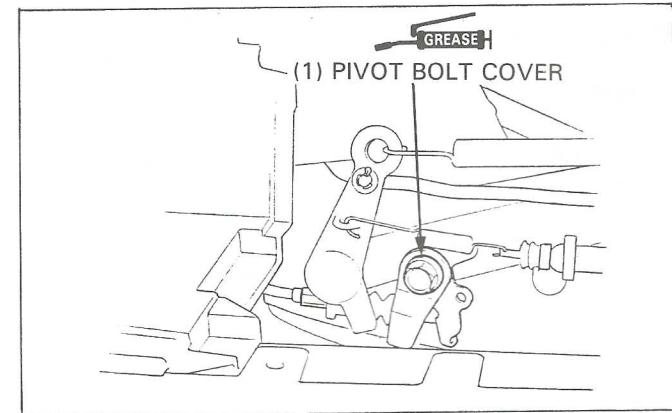
If adjustment is necessary, turn the rear brake adjusting nut.



BRAKE LOCK LEVER

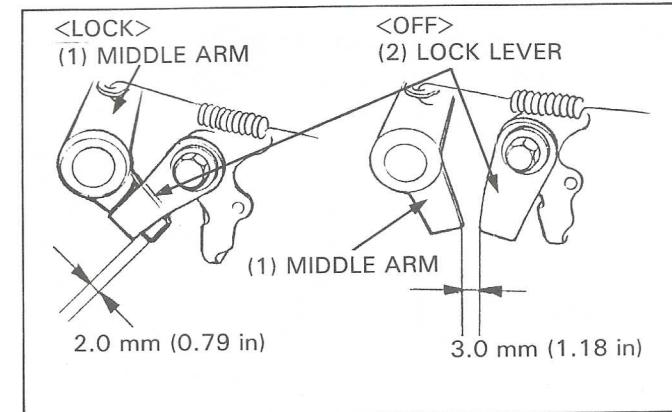
Remove the frame center cover (page 13-2).

Check the brake lock lever for smooth operation. If the lock lever does not return smoothly when the lock is released, remove the pivot bolt, and apply grease to the pivot.



BRAKE LOCK CABLE ADJUSTMENT

- With the brake locked, be sure that the tip of the middle arm is 20 mm (0.79 in) out of the lock lever.
- With the brake lock released, be sure that the middle arm-to-lock arm clearance is 30 mm (0.18 in).
- If the above measurements are not as specified, loosen the lock nut and adjust by turning the adjusting nut.



BRAKE LIGHT SWITCH/ STARTER LIMITER SWITCH

NOTE

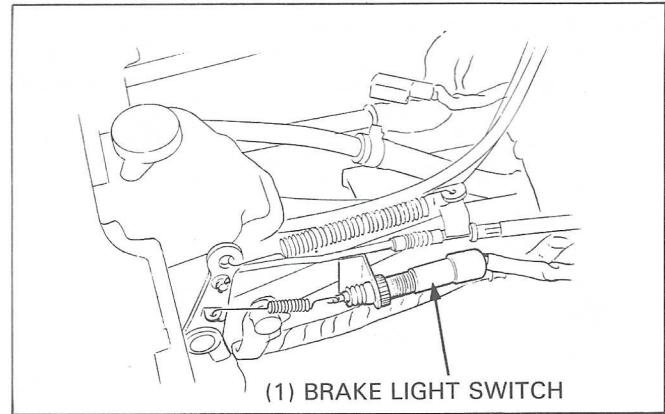
- Perform the brake light switch adjustment after adjusting the brake pedal play.

Adjust the brake light switch so that the brake light will come on when brake engagement begins.

Adjust by holding the switch body and turning the adjusting nut. Do not turn the switch body.

Make sure that the electric starter will only work when the rear brake is locked.

If not, readjust the brake light switch.



HEADLIGHT AIM

Turn the ignition switch ON.

Adjust horizontally by turning the horizontal adjusting screw.

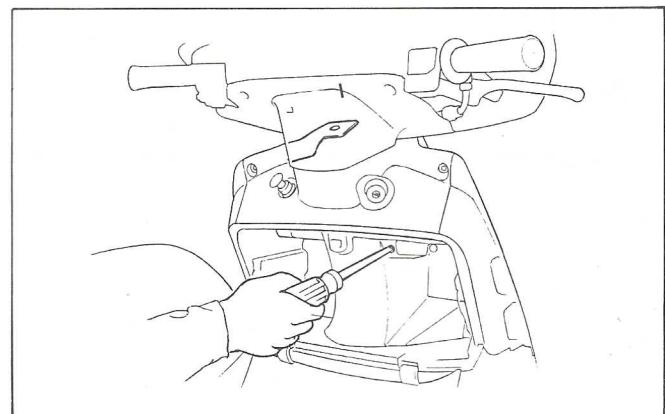
Adjust vertically by turning the vertical adjusting screw.

NOTE

- Adjust the headlight beam as specified by local laws and regulations.

WARNING

- *An improperly adjusted headlight may blind oncoming drivers, or it may fail to light the road for a safe distance.*



CLUTCH SHOE WEAR

Start the engine and check the clutch operation by revving up the engine gradually.

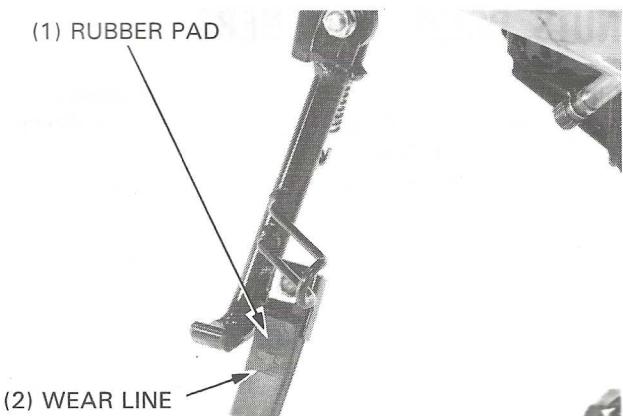
If the scooter tends to creep, or the engine stalls, check the clutch shoes for wear and replace if necessary (page 8-9).

SIDE STAND

Place the scooter on its center stand.

Check the rubber pad on the side stand for deterioration and wear.

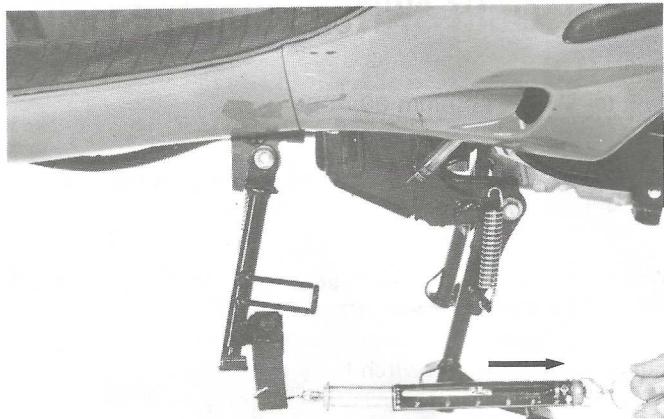
Replace the rubber pad if wear extends to the wear line.



MAINTENANCE

Check the side stand spring for damage or loss of tension. Spring tension is correct if the measurements fall under 2 kg (4.4 lbs), when pulling the side stand lower end with a spring scale.

Check the side stand assembly for freedom of movement. Make sure the side stand is not bent.



SUSPENSION

WARNING

- *Do not ride a scooter with faulty suspension. Loose, worn or damaged suspension parts impair scooter stability and control.*

FRONT

Check the action of the front fork/shocks by compressing them several times.

Check the entire fork assembly for damage.

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.



REAR

Check the action of the rear shock absorbers by compressing them several times.

Check the entire shock absorber assembly for damage and replace any damaged components which cannot be repaired.

Place the scooter on its center stand.

Move the rear wheel sideways with force to see if the engine hanger bushings are worn.

Replace the engine hanger bushings if there is any looseness.

Tighten all suspension fasteners.



NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (Section 1) at the intervals shown in the Maintenance Schedules (page 3-2).

Check all cotter pins, safety clips, hose clamps and cable stays.

WHEELS/TIRES

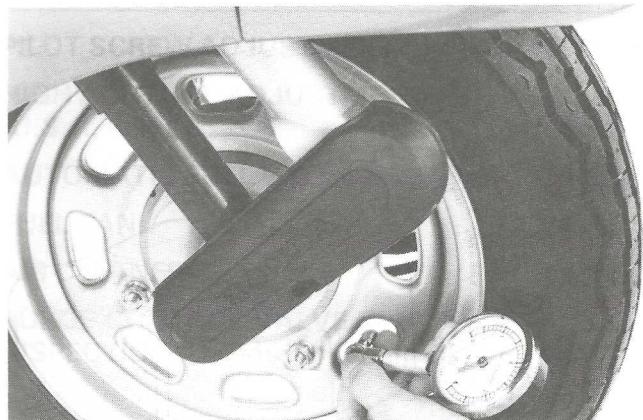
NOTE

- Tire pressure should be checked when tires are COLD.

Inspect the tires for cuts, embedded nails, or other sharp objects.

RECOMMENDED TIRES AND AIR PRESSURES

| | | FRONT | REAR |
|---|-----------------------------|------------------|------------------|
| Tire size | | 3.50–10–4PR | 3.50–10–4PR |
| Cold tire pressure kPa (kg cm ² , psi) | Up to 90 kg (200 lbs) load | 150 (1.5, 21) | 200 (2.0, 28) |
| | Up to vehicle capacity load | 150 (1.5, 21) | 250 (2.5, 36) |
| Tire brand | BRIDGE-STONE | ML9 | ML12 |
| | DUNLOP | F11 | K627B |



Check the front and rear wheels for trueness.

Measure the tread depth at the center of the tires.

Replace the tires if the tread depth reaches the following limits :

Minimum tread depth:

Front: 1.5 mm (0.06 in)

Rear: 2.0 mm (0.08 in)

STEERING HEAD BEARINGS

NOTE

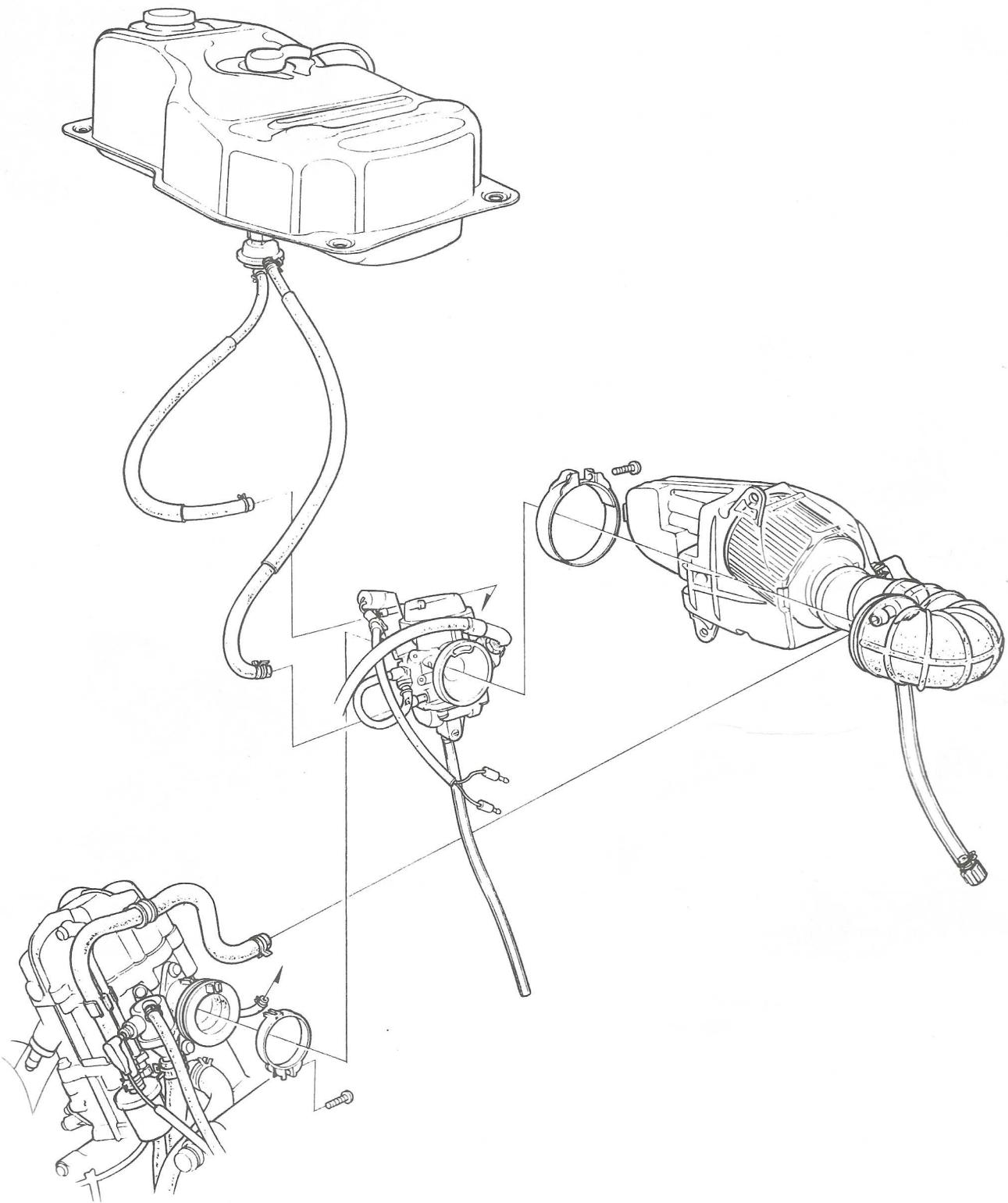
- Check that the control cables do not interfere with handlebar rotation.

Raise the front wheel off the ground and check that the handlebar rotates freely.

If the handlebar moves unevenly, binds, or has vertical movement, adjust the steering head bearings (page 14-15).



FUEL SYSTEM



| | | | |
|-------------------------|------|---|------|
| SERVICE INFORMATION | 4-1 | PILOT SCREW ADJUSTMENT | 4-11 |
| TROUBLESHOOTING | 4-2 | HIGH ALTITUDE ADJUSTMENT (U.S.A. only) | 4-12 |
| AIR CUT-OFF VALVE | 4-3 | AUTOMATIC FUEL VALVE | 4-13 |
| AUTO BYSTARTER | 4-3 | FUEL TANK | 4-14 |
| CARBURETOR REMOVAL | 4-5 | AIR CLEANER | 4-16 |
| VACUUM CHAMBER | 4-5 | PURGE CONTROL VALVE | |
| PILOT SCREW | 4-7 | INSPECTION (California model) | 4-17 |
| FLOAT/FLOAT VALVE/JETS | 4-8 | | |
| CARBURETOR INSTALLATION | 4-11 | | |

SERVICE INFORMATION

GENERAL



- Gasoline is extremely flammable and is explosive under certain conditions. Work in a well ventilated area. Do not smoke or allow flames or sparks in the work area.*

CAUTION

- Do not bend or twist control cables. Damaged control cables will not operate smoothly and stick or bind.*

- When disassembling fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- The float bowl has a drain screw that can be loosened to drain residual gasoline.
- Do not try to disassemble the auto bystarter or air cut-off valve.
- Do not bend or twist control cables. Damaged control cables will not operate smoothly and may stick or bind.

SPECIFICATIONS

< >: California model

| ITEM | | |
|-------------------------|--------------------|-----------------------|
| Venturi diameter | | 22 mm (0.87 in) |
| Identification number | | VE03C <VE04C> |
| Float level | | 18.5 mm (0.73 in) |
| Main jet | Standard type | #102 |
| | High altitude type | #98 |
| Slow jet | | #35 |
| Idle speed | | 1,500 ± 100 rpm |
| Throttle grip free play | | 2—6 mm (0.08—0.24 in) |
| Pilot screw opening | | See page 4-11. |

TORQUE VALUE

Fuel valve lock nut 15—20 N·m (1.5—2.0 kg—m, 11—14 ft—lb)

TOOL

Special

Vacuum/pressure pump A937X-041-XXXXX or
 Vacuum pump ST-AH-260-MC7 (U.S.A. only)
 Pressure pump ST-AH-255-MC7 (U.S.A. only)

Common

Float level gauge 07401—0010000

TROUBLESHOOTING

Engine cranks but won't start

- No fuel in tank
- No fuel to carburetor
- Engine flooded with fuel
- No spark at plug (ignition system faulty)
- Air cleaner clogged
- Intake air leak
- Improper auto bystarter operation
- Improper throttle operation
- Faulty purge control valve

Hard starting or stalling after starting

- Improper auto bystarter operation
- Ignition malfunction
- Carburetor faulty
- Fuel contaminated
- Intake air leak
- Idle speed incorrect
- Faulty purge control valve

Rough idle

- Ignition system faulty
- Idle speed incorrect
- Carburetor faulty
- Fuel contaminated

Misfiring during acceleration

- Ignition system faulty

Afterfiring

- Ignition system faulty
- Carburetor faulty

Poor performance (driveability) and poor fuel economy

- Fuel system clogged
- Ignition system faulty

Lean mixture

- Clogged fuel jets
- Vacuum piston stuck closed
- Faulty float valve
- Float level low
- Fuel cap vent blocked
- Fuel strainer screen clogged
- Restricted fuel line
- Air vent tube clogged
- Intake air leak

Rich mixture

- Clogged air jets
- Faulty float valve
- Float level too high
- Auto bystarter faulty
- Dirty air cleaner

AIR CUT-OFF VALVE

INSPECTION

Disconnect the vacuum and air vent tubes from the air cut-off valve.

Cap the one vacuum tube connector and connect the vacuum pump to the other vacuum tube connector, and then connect the pressure pump to the air vent tube connector.

Apply specified vacuum to the air cut-off valve.

VACUUM: 420–500 mm Hg (16.5–19.7 in Hg)

While maintaining the specified vacuum, apply light pressure to the air cut-off valve with the pressure pump.

CAUTION

- Do not exceed 600 mm Hg (23.6 in Hg) during this test or the air cut-off valve may be damaged.

The air cut-off valve is normal if there is restricted air flow through the air cut-off valve. The valve is not designed to hold pressure.

If the air flows freely out of the air cut-off valve, replace the air cut-off valve.

REMOVAL

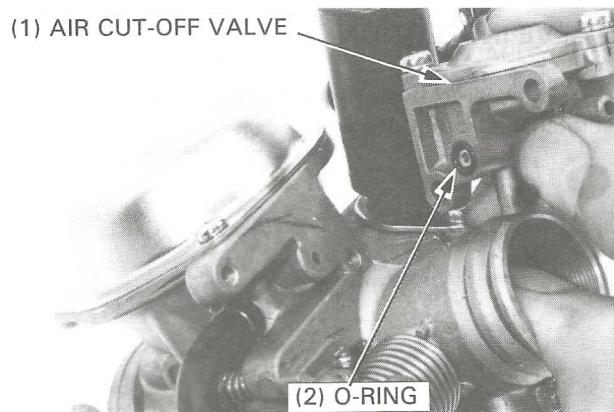
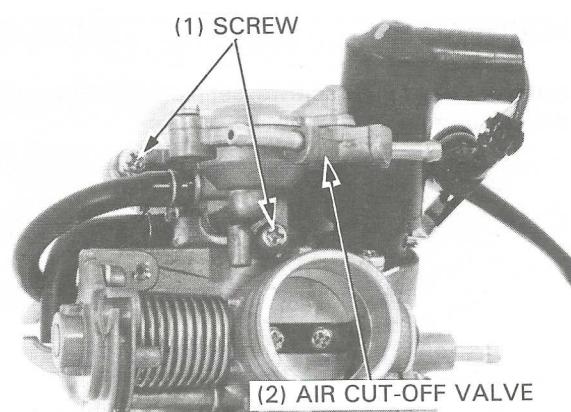
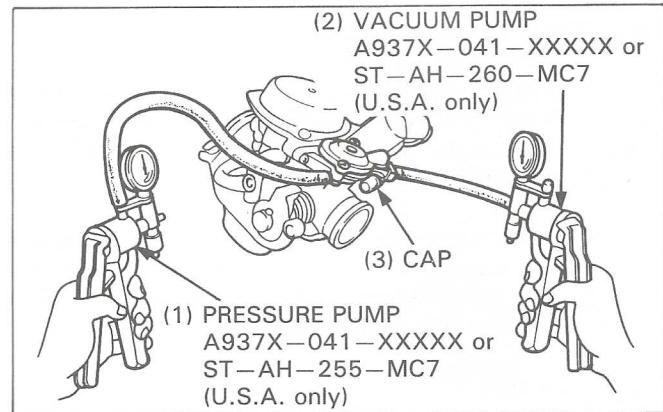
Remove the carburetor (page 4-5).

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

INSTALLATION

Install a new O-ring onto the valve body with its flat face toward the valve body side.

Install the valve body on the carburetor with two screws.



AUTO BYSTARTER

INSPECTION

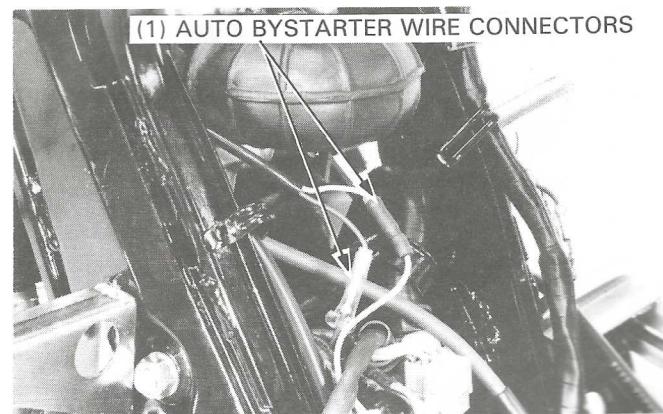
Stop the engine and allow it to cool for 10 minutes or more.

Disconnect the auto bystarter wire connectors and measure the resistance between the terminals.

RESISTANCE: 10 ohm max. (10 minutes minimum after stopping the engine)

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

Remove the carburetor and allow it to cool for 30 minutes.

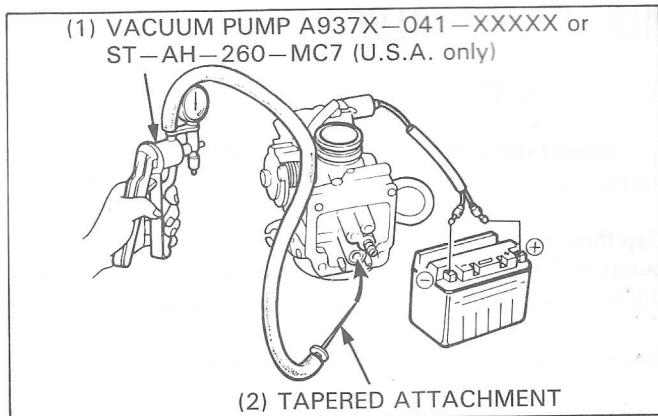


FUEL SYSTEM

Remove the carburetor (page 4-5).

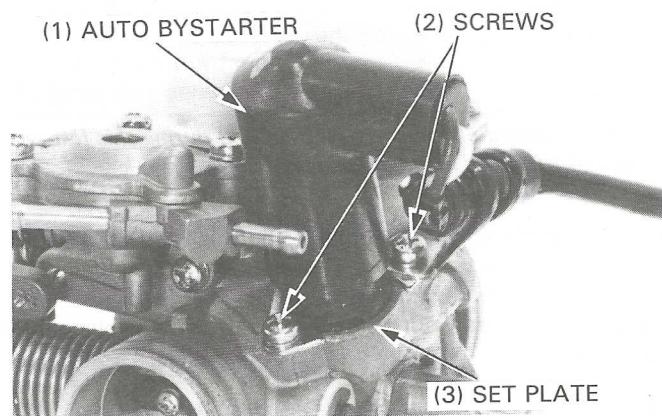
Connect a pressure tester to the enrichening circuit using the tapered attachment supplied with the vacuum/pressure pump. Apply pressure to the circuit. If the passage is blocked, replace the auto bystarter.

Connect a 12V battery to the auto bystarter wires and wait 5 minutes. Connect a pressure tester to the fuel enrichening circuit and apply pressure to it. Replace the auto bystarter if there is no restriction to the applied pressure.



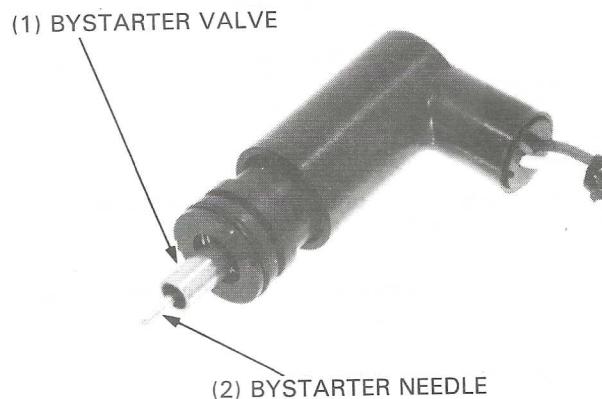
REMOVAL

Remove the set plate screws, set plate and auto bystarter from the carburetor.



VALVE INSPECTION

Check the auto bystarter valve and needle for nicks, wear, scratches or other damage.

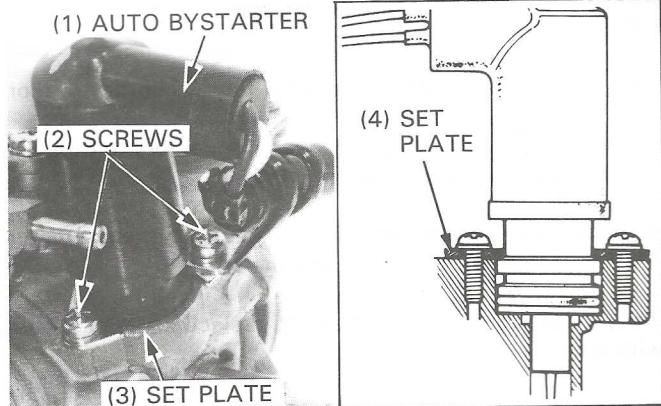


INSTALLATION

Insert the auto bystarter into the carburetor body until it bottoms.

Position the set plate into the upper groove in the bystarter with its round face toward the carburetor body.

Install and tighten the two screws.

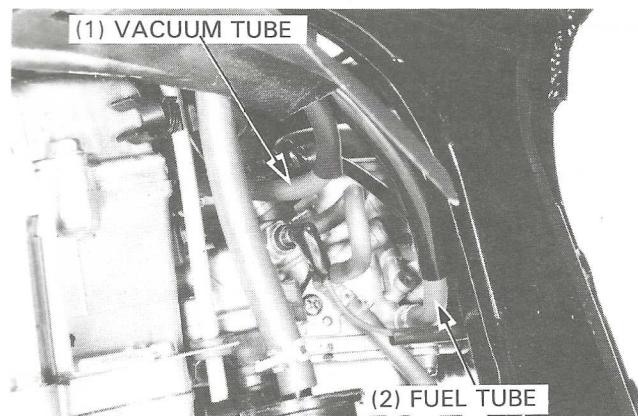


CARBURETOR REMOVAL

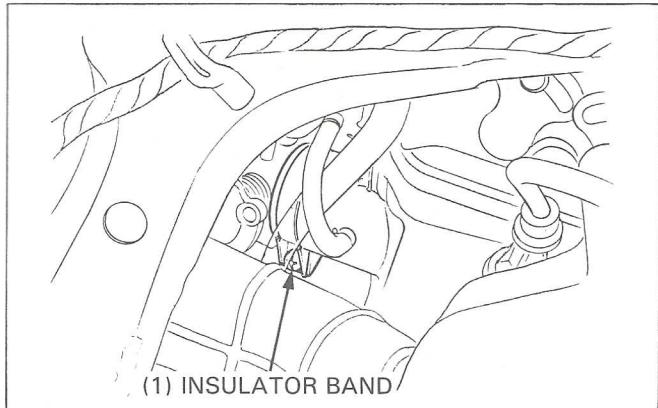
Remove the right and left rear covers, and frame center cover (page 13-2).

Disconnect the fuel line at the carburetor.

Disconnect the vacuum line from the carburetor.



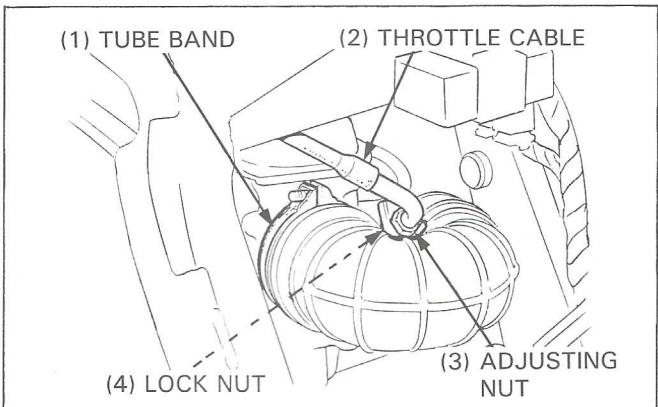
Loosen the carburetor insulator band.



Disconnect the auto bystarter wire connectors (page 4-3).

Loosen the throttle cable adjusting nut and lock nut, and disconnect the throttle cable from the carburetor.

Loosen the air cleaner connecting tube band and remove the carburetor.



VACUUM CHAMBER

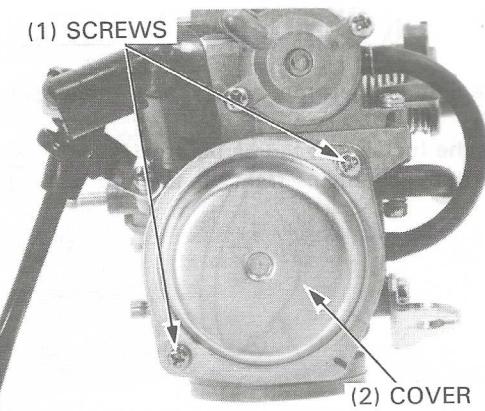
DISASSEMBLY

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

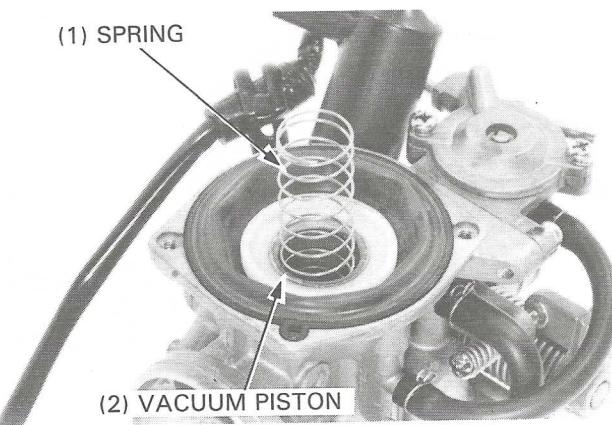


FUEL SYSTEM

Remove the two vacuum chamber cover screws and cover.



Remove the compression spring and vacuum piston.

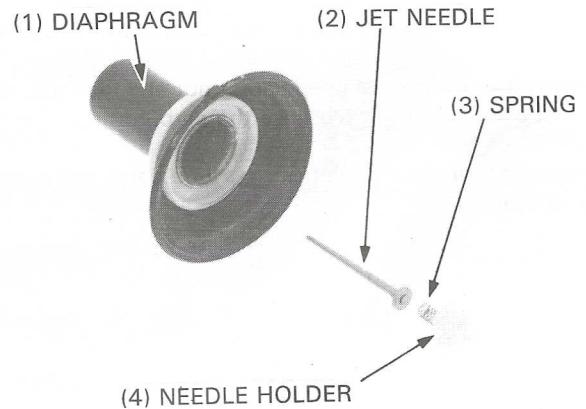


Push the needle holder in and turn it 60° with an 8 mm socket. Then remove the needle holder, spring and jet needle from the piston.

Inspect the vacuum piston for wear, nicks scratches or other damage.

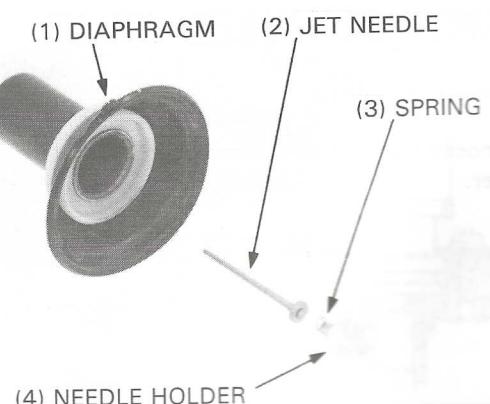
Inspect the needle for excessive wear at the tip and for bending, or other damage.

Check the diaphragm for deterioration and tears.



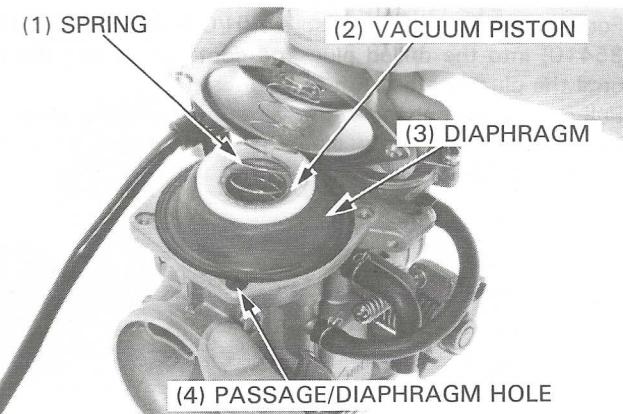
ASSEMBLY

Install the jet needle, spring and needle holder into the vacuum piston, push the needle holder in and turn it 60° .



Install the vacuum piston in the carburetor body and align the hole in the diaphragm with the vacuum passage in the carburetor body.

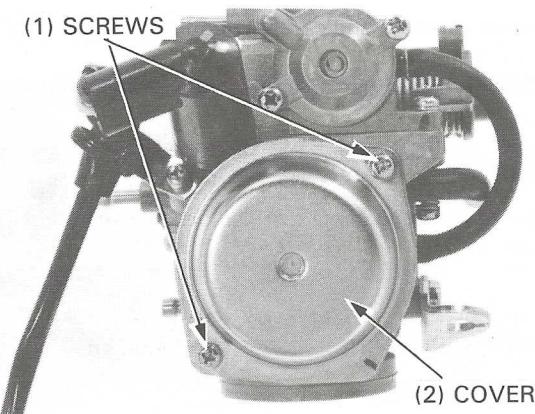
Install the compression spring.



Install the vacuum chamber cover and tighten it with the two screws.

NOTE

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

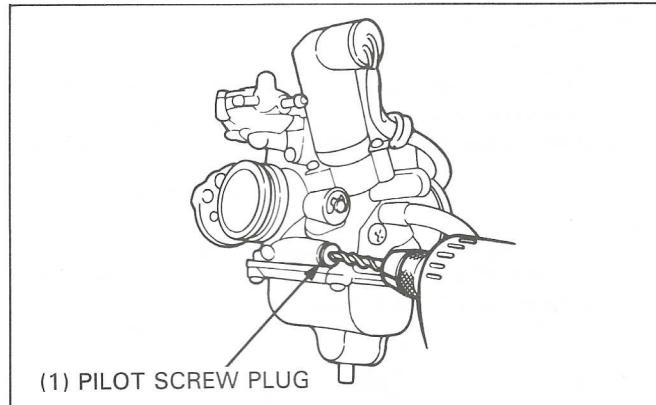


PILOT SCREW

REMOVAL

NOTE

- The pilot screw is factory pre-set and should not be removed unless the carburetors are overhauled.
- The pilot screw plug is factory installed to prevent pilot screw misadjustment. Do not remove the plug unless the pilot screw is being removed.
- Cover all openings with tape to keep metal particles out when the plug is drilled.



Center punch the pilot screw plug to center the drill point. Drill through the plug with a 4 mm (5/32 in) drill bit, being careful not to drill into the pilot screw.

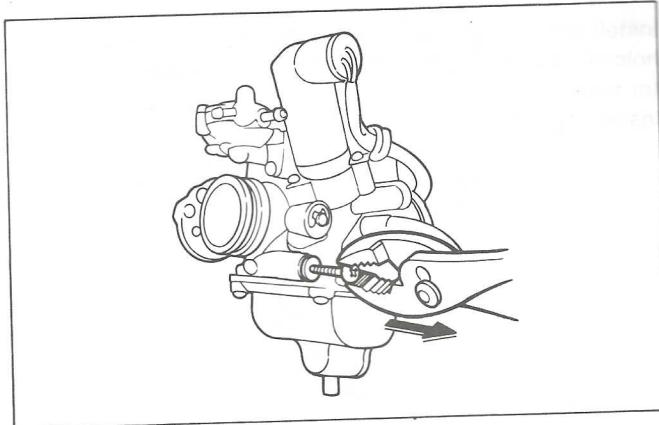
CAUTION

- Be careful not to drill into the pilot screw.

FUEL SYSTEM

Force a self-tapping 4 mm screw (H/C 069399, P/N 93903-35410) into the drilled plug and continue turning the screw until the plug rotates with the screw.

Pull on the screw head with pliers to remove the plug.
Use compressed air to clean the pilot screw area and to remove metal shavings.



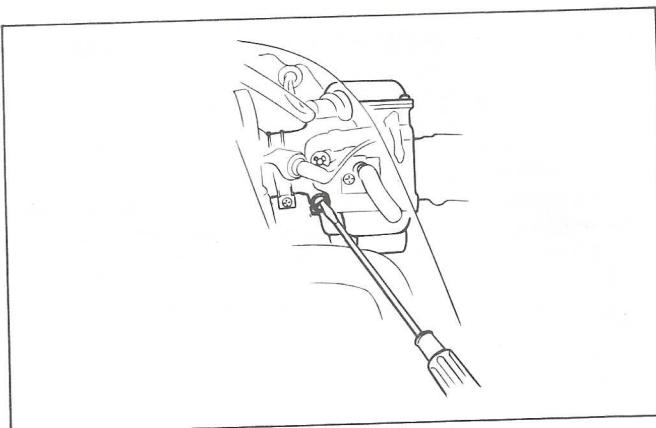
Turn the pilot screw in and carefully count the number of turns before it seats lightly.

Make a note of this to use as a reference when reinstalling the pilot screw.

CAUTION

- *Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.*

Remove the pilot screw and inspect it.
Replace the pilot screw if it is worn or damaged.



INSTALLATION

Install the pilot screw and return it to the original position as noted during removal.

Perform pilot screw adjustment if a new pilot screw is installed (page 4-11).

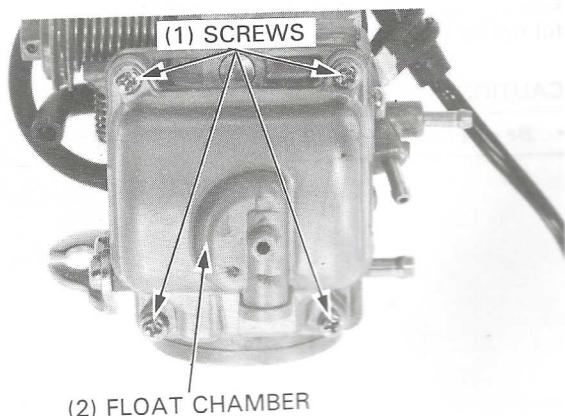
NOTE

- Do not install a new plug in the pilot screw hole until after adjustment has been made.

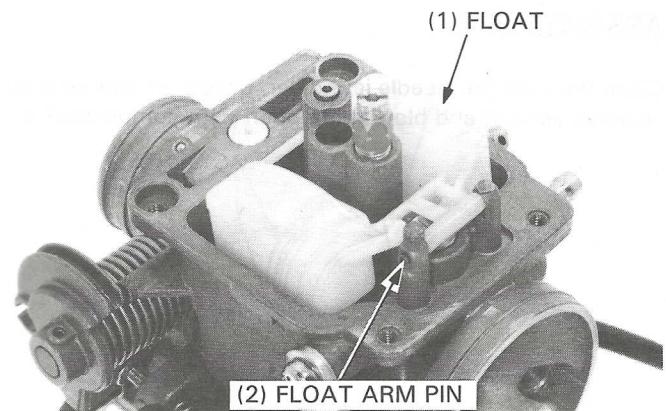
FLOAT/FLOAT VALVE/JETS

DISASSEMBLY

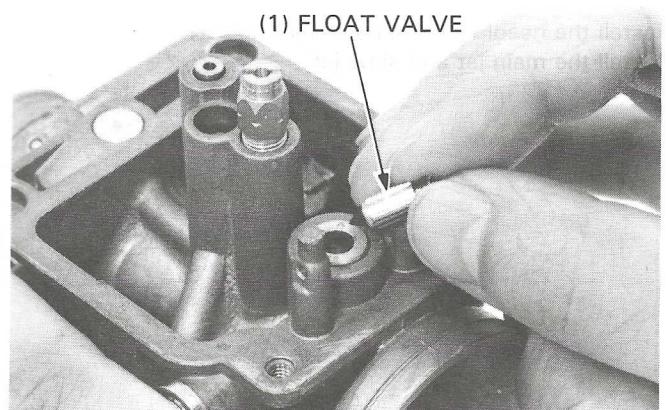
Remove the four float chamber screws and the float chamber.



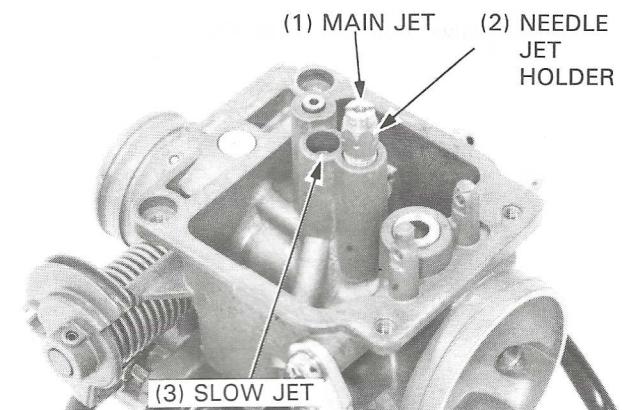
Remove the float pin, float, and float valve.



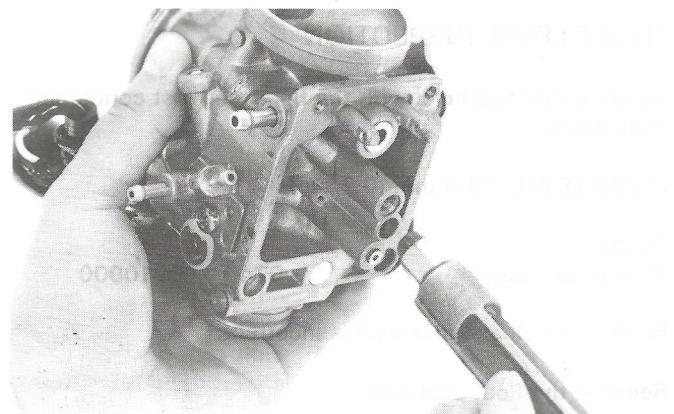
Inspect the float valve for grooves and nicks.
Inspect the operation of the float valve.



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



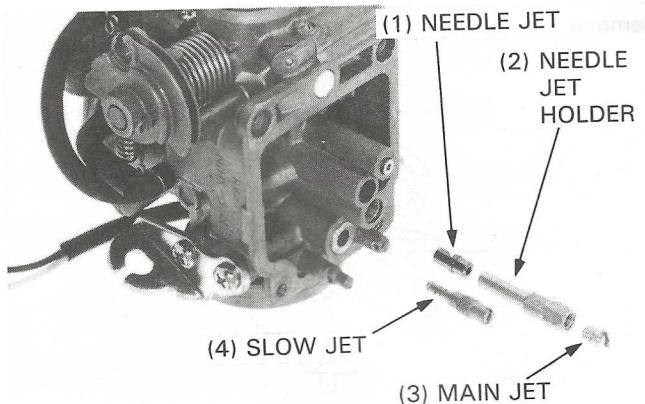
INITIAL
Blow compressed air through all passages before assembly.



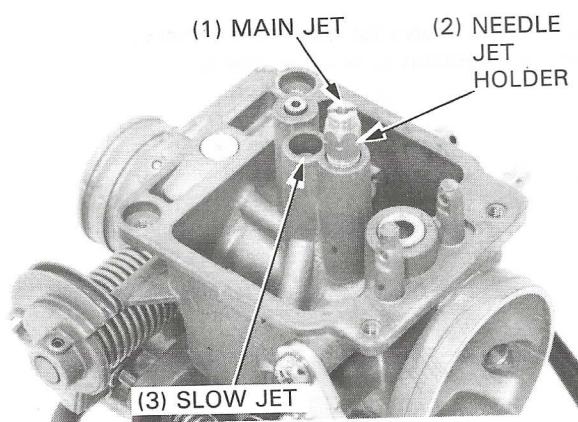
FUEL SYSTEM

ASSEMBLY

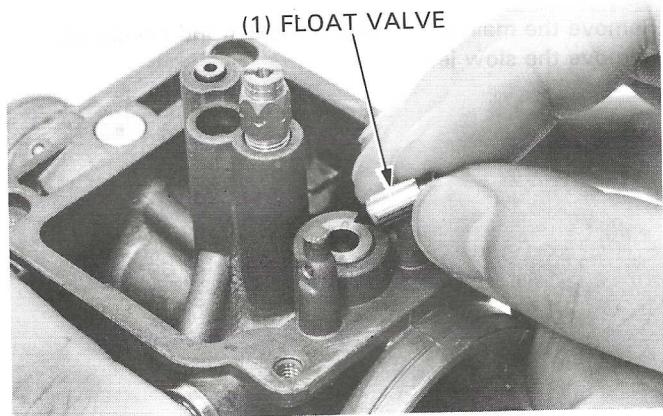
Clean the main jet, needle jet holder, needle jet and slow jet in cleaning solvent and blow them open with compressed air.



Install the needle jet and needle jet holder.
Install the main jet and slow jet.



Install the float valve, float and float pin.



FLOAT LEVEL INSPECTION

Measure the float level with the float tang just contacting the float valve.

FLOAT LEVEL: 18.5 mm (0.73 in)

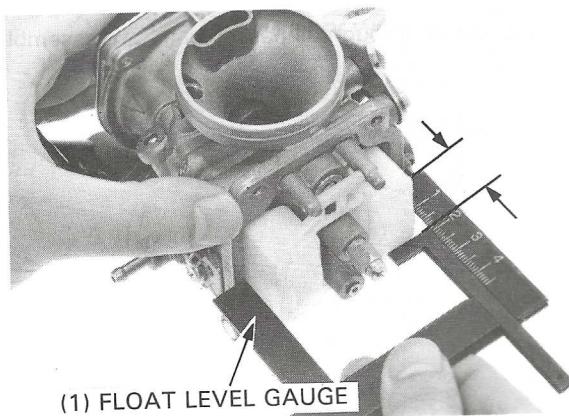
TOOL:

Float level gauge

07401-0010000

Replace the float if the level is incorrect.

- Reinstall the float chamber.



CARBURETOR INSTALLATION

Tighten the drain screw.

Install the carburetor in the carburetor insulator and connecting tube and tighten the band screws. Connect the throttle cable to the carburetor.

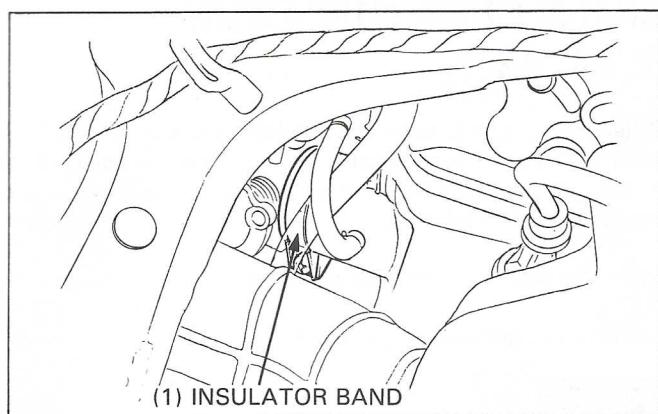
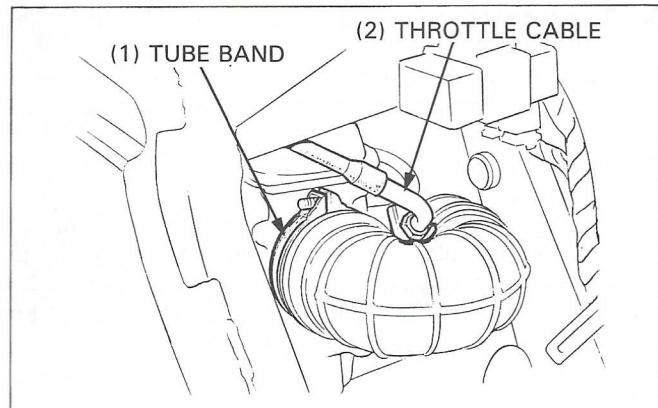
Connect the auto bypass wire connectors to the wire harness.

Connect the fuel and vacuum tubes to the carburetor.

Perform the following inspections and adjustments:

- Harness and cable routing (page 1-8).
- Throttle operation (page 3-3).
- Carburetor idle speed (page 3-7)
- Fuel leaks.

Install the center cover and the right and left rear covers (page 13-2).



PILOT SCREW ADJUSTMENT

IDLE DROP PROCEDURE (U.S.A. ONLY)

NOTE

- The pilot screw is factory pre-set and no adjustment is necessary unless the pilot screw is replaced (page 4-7).
- Use a tachometer with graduations of 100 rpm or smaller that will accurately indicate a 100 rpm change.

1. Turn the pilot screw clockwise until it seats lightly and back it out to the specification given. This is an initial setting prior to the final pilot screw adjustment.

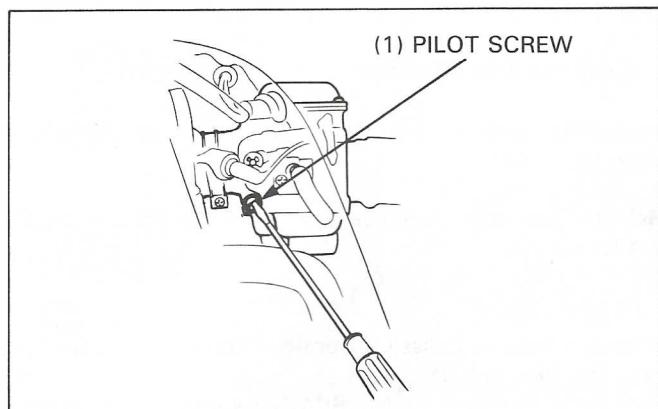
INITIAL OPENING: 1-3/4 turns out

CAUTION

- *Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.*

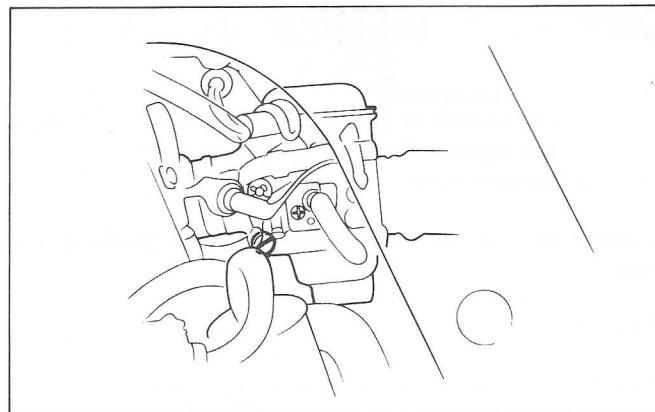
2. Warm up the engine to operating temperature.
Stop and go driving for 10 minutes is sufficient.
3. Attach a tachometer according to the manufacturer's instructions.
4. Adjust the idle speed with the throttle stop screw.

IDLE SPEED: $1,500 \pm 100$ rpm



FUEL SYSTEM

5. Turn the pilot screw in or out slowly to obtain the highest engine speed.
6. Readjust the idle speed with the throttle stop screw.
7. Turn the pilot screw in gradually until the engine speed drops 100 rpm.
8. Turn the pilot screw 1 turn out from the position obtained in step 7.
9. Readjust the idle speed with the throttle stop screw.
10. Drive a new pilot screw plug into the bore of the pilot screw with a valve guide driver (P/N 07942-8320000). When fully seated, the plug surface will be recessed 1 mm (0.04 in) into the pilot screw bore.



HIGH ALTITUDE ADJUSTMENT (U.S.A. ONLY)

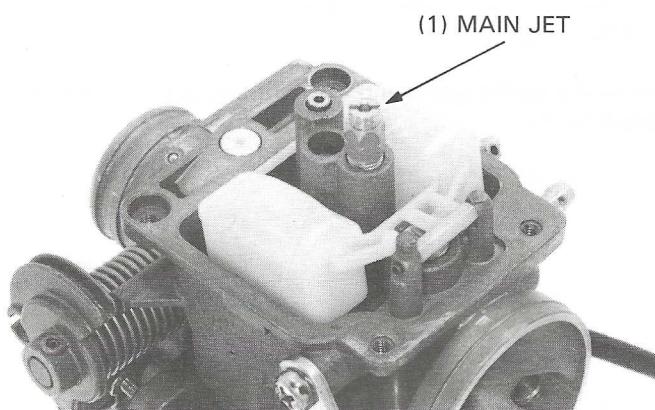
When the vehicle is to be operated continuously above 2,000 m (6,500 feet), the carburetor main jet must be replaced with a high altitude type main jet to improve driveability and decrease exhaust emissions.

Drain the fuel from the float chamber.

Remove the carburetor (page 4-5).

 **WARNING**

- *Do not smoke or allow flames or sparks in the work area.*



Remove the float chamber.

Replace the main jet (standard # 102) with a high altitude type main jet (# 98).

Reinstall the float chamber and install the carburetor (page 4-11).

| | STANDARD SIZE | HIGH ALTITUDE SIZE |
|-------------|-----------------|--------------------|
| Main jet No | #102 | #98 |
| Idle speed | 1,500 ± 100 rpm | |

Attach a Vehicle Emission Control Information Update Label onto the fuel tank as shown.

Refer to Service Bulletin No. SL 132 for information on obtaining the label.

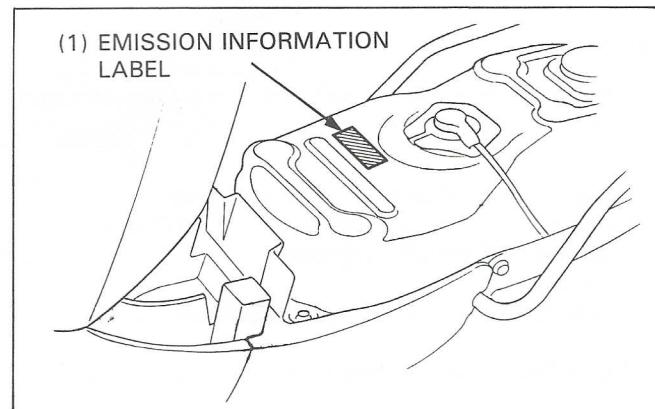
NOTE

- Do not attach the label to any part that can be easily removed from the vehicle.

CAUTION

- *Operation at an altitude lower than 1,500 m (5,000 feet) with the carburetors adjusted for high altitude may cause the engine to idle roughly and stall.*

When the vehicle is to be operated continuously below 1,500 m (5,000 feet), remove the carburetor and replace the main jet with a standard size (# 102).



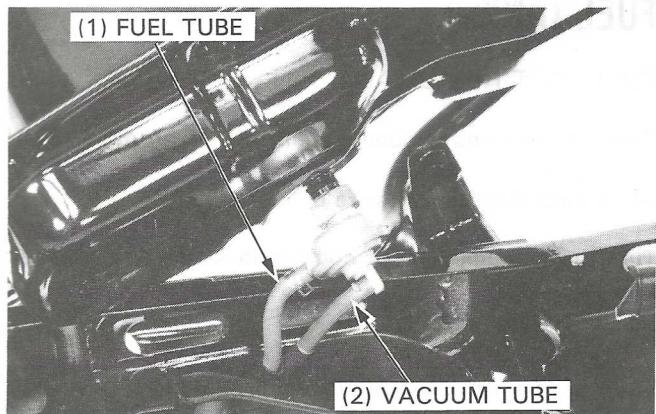
AUTOMATIC FUEL VALVE

INSPECTION

WARNING

- *Do not allow flames or sparks near gasoline.*
- *Wipe up spilled gasoline at once.*

Remove the four fuel tank mounting bolts (page 4-15). Raise the fuel tank and disconnect the fuel tube and vacuum tube from the fuel valve. Connect the vacuum pump to the tube and apply vacuum.

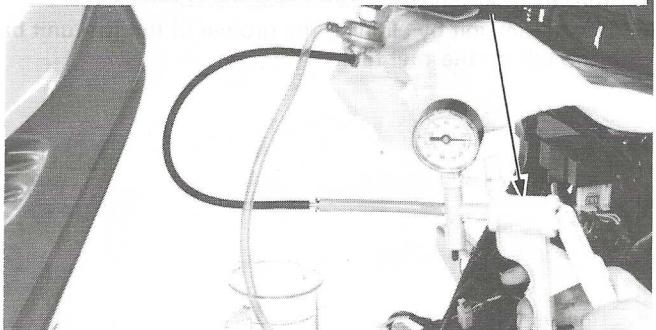


The valve is operating normally if fuel flows out of the fuel tube when the vacuum is applied and fuel stops to see that out when the vacuum pump is disconnected.

If the fuel valve does not operate normally:

- Inspect the fuel valve for clogging and clean.
- Blow air through the valve inlet side to check the flat diaphragm is in its original position.

(1) VACUUM PUMP ST-AH-260-MC7 (U.S.A. only)
or
VACUUM/PRESSURE PUMP A937X-041-XXXX



FUEL STRAINER CLEANING

WARNING

- *Do not allow flames or sparks near gasoline.*
- *Wipe up spilled gasoline at once.*

Raise the fuel tank.

Disconnect the fuel tube and vacuum tube from the fuel valve.

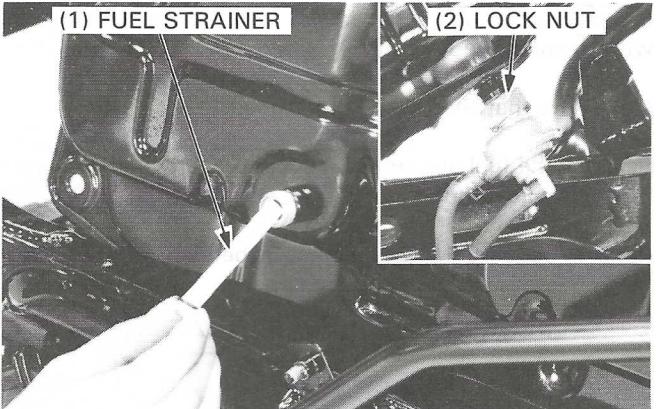
To drain the fuel from the fuel tank, draw vacuum at the disconnected vacuum tube connector.

Remove the fuel valve.

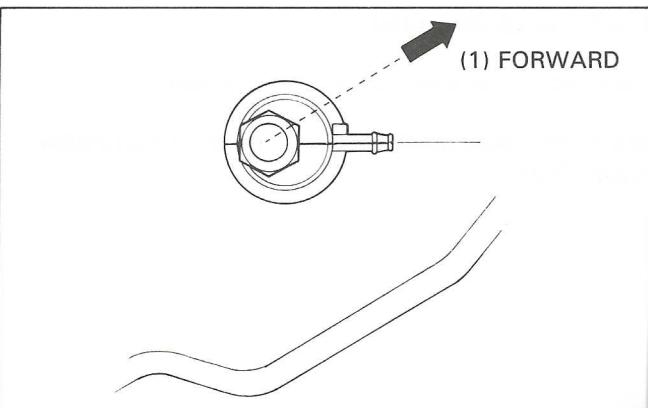
Remove the fuel strainer and clean it with compressed air.

Reinstall the strainer and automatic fuel valve in the reverse order of removal.

Hold the fuel valve at the angle shown and tighten the lock nut while holding the fuel valve.



TORQUE: 15–20 N·m (1.5–2.0 kg·m, 11–14 ft-lb)



FUEL SYSTEM

FUEL TANK

FUEL UNIT REMOVAL

Open the seat and remove the left rear cover (page 13-2).

Disconnect the fuel unit wire connectors.

Turn the fuel unit retainer counterclockwise and remove the fuel unit.

CAUTION

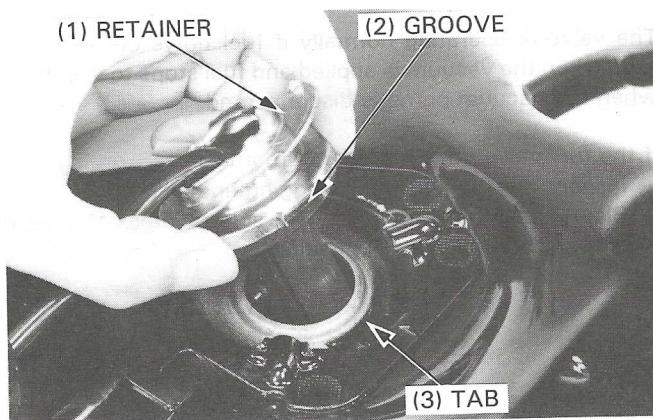
- *Do not bend the fuel unit float arm.*



FUEL UNIT INSTALLATION

Set the fuel unit gasket onto the fuel tank.

Install the fuel unit by aligning the groove of the fuel unit base with the tab on the fuel tank.

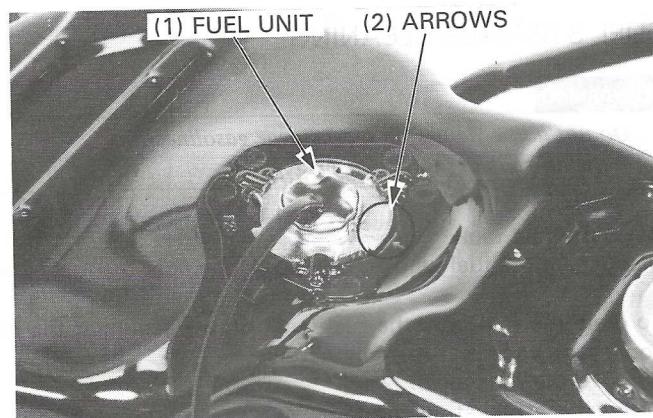


Install the fuel unit retainer and turn the retainer clockwise while holding the fuel unit.

Make sure that the arrows are aligned.

Reinstall the fuel unit terminal cover properly and connect the fuel unit wire connectors.

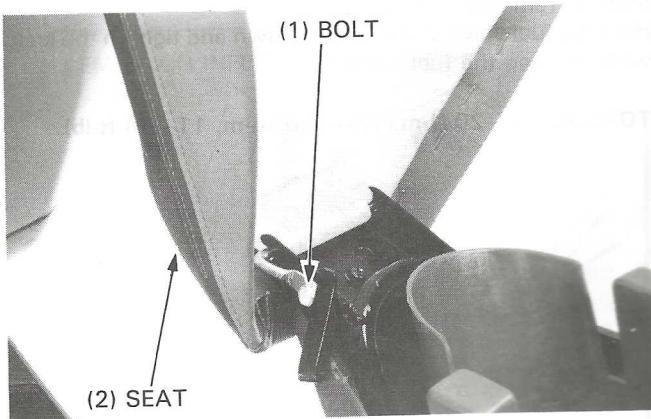
Refer to page 16-18 for fuel unit inspection.



FUEL TANK REMOVAL

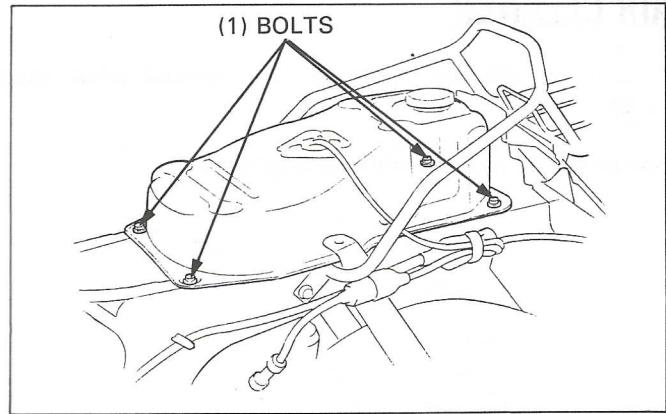
Open the seat and remove the bolt and seat.

Remove the right and left rear covers and frame center cover (page 13-2).



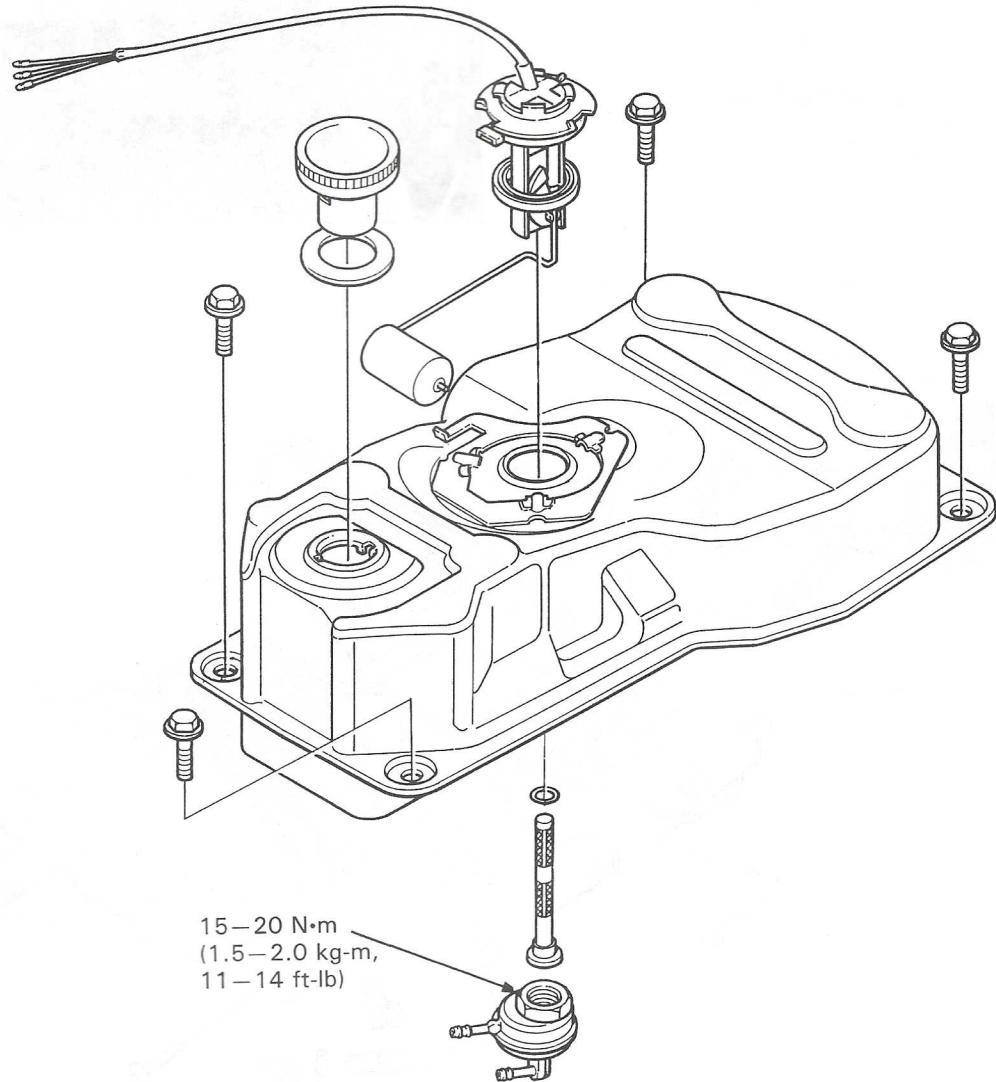
Remove the four fuel tank mounting bolts and fuel tank.

Disconnect the fuel and vacuum tubes from the fuel valve.



INSTALLATION

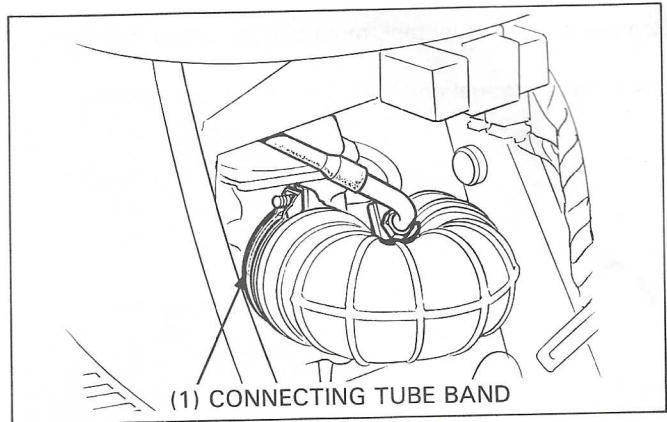
Install the fuel tank in the reverse order of removal.



AIR CLEANER

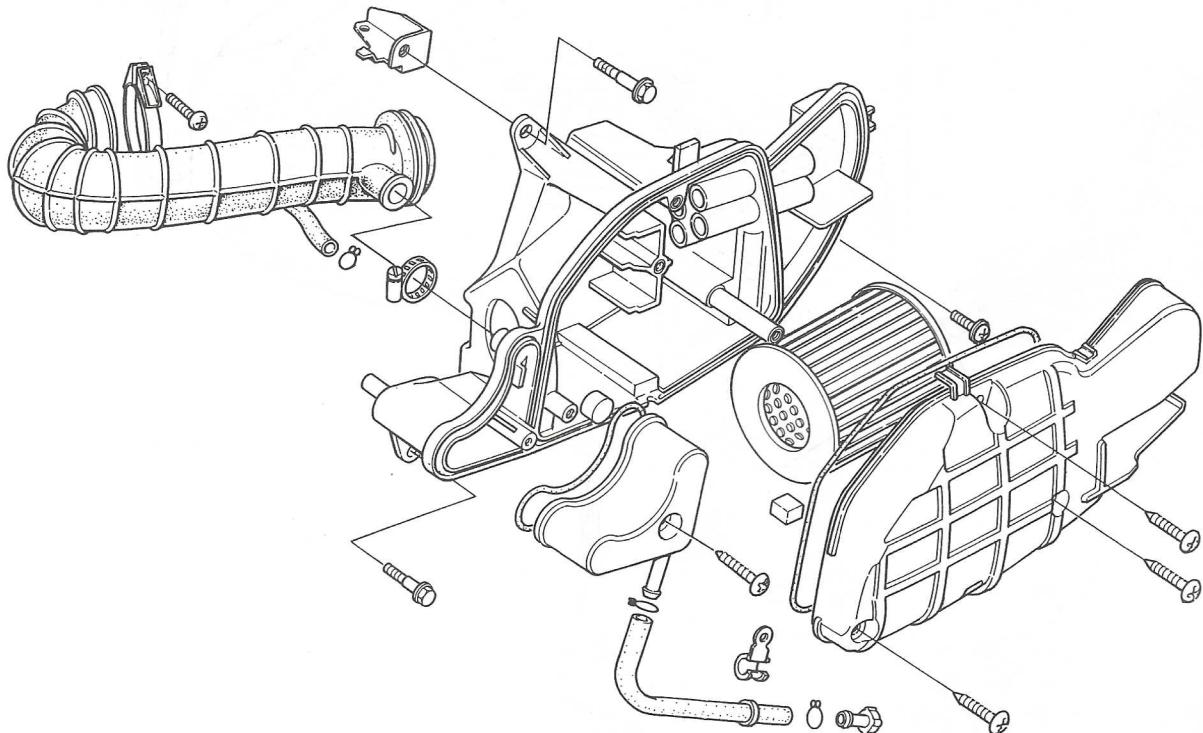
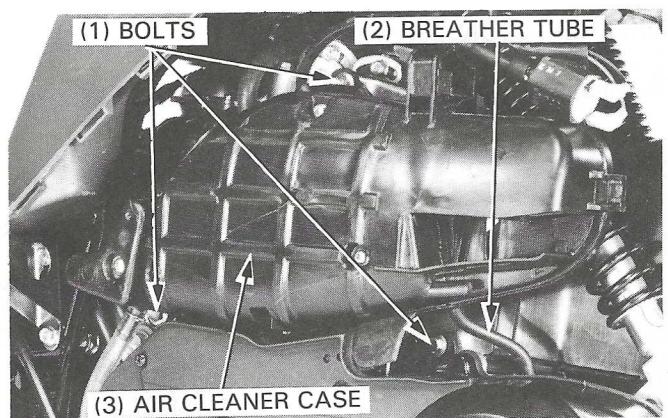
Remove the left rear cover and maintenance cover (page 13-2).

Loosen the air cleaner connecting tube band.



Disconnect the crankcase and transmission case breather tubes from the air cleaner case.

Remove the three bolts and air cleaner case.



PURGE CONTROL VALVE INSPECTION (California model)

NOTE

- The purge control valve should be inspected if hot restart is difficult.

Check all fuel tank, Purge Control Valve (PCV), and charcoal canister hoses to be sure they are not kinked and are securely connected.

Replace any hose that shows signs of damage or deterioration.

NOTE

- The PCV is located on the rear side of the left rear shock absorber.

Disconnect the PCV hoses from their connections and remove the PCV from its mount. Refer to the routing label on the fuel tank for hose connections.

Connect a vacuum pump to the 8 mm I.D. hose that goes to the air cleaner. Apply the specified vacuum to the PCV.

SPECIFIED VACUUM: 250 mm (9.8 in) Hg

The specified vacuum should be maintained.
Replace the PCV if vacuum is not maintained.

Remove the vacuum pump and connect it to the hose that goes to the carburetor.

Apply the specified vacuum to the PCV.

SPECIFIED VACUUM: 250 mm (9.8 in) Hg

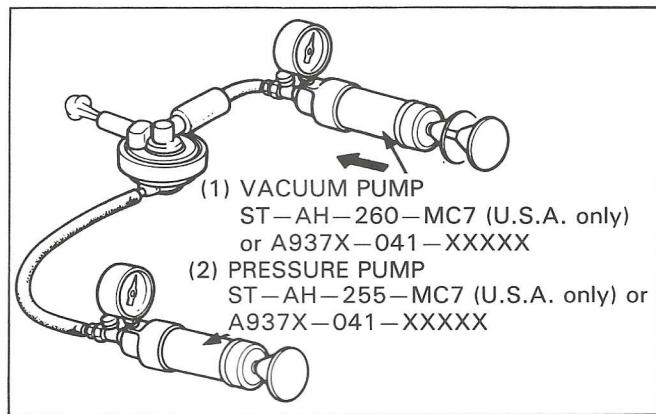
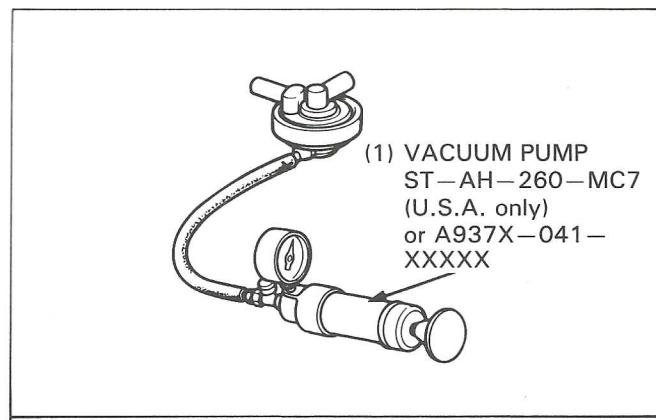
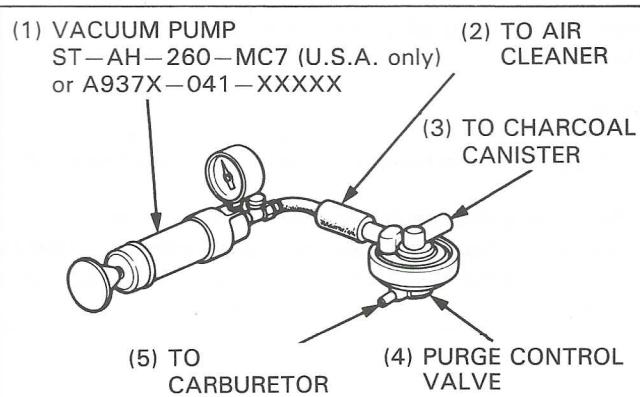
The specified vacuum should be maintained.
Replace the PCV if vacuum is not maintained.

Connect a pressure pump to the 8 mm I.D. hose that goes to the charcoal canister. While applying the specified vacuum to the PCV hose that goes to the carburetor, pump air through the canister hose. Air should flow through the PCV and out the hose that goes to the air cleaner. Replace the PCV if air does not flow out.

CAUTION

- To prevent damage to the purge control valve, do not use high air pressure sources. Use a hand operated air pump only.

Remove the pumps, install the PCV on its mount, route and re-connect the hoses according to the routing label.

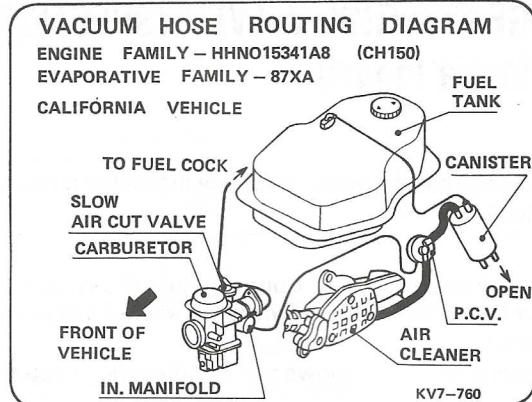


FUEL SYSTEM

Route the vacuum tubes as described on the Vacuum Hose Routing Label.

NOTE

- Be careful not to bend, twist or kink the tubes when installing.
- Slide the end of each tube fully onto its fitting.
- Secure the tube with the hose clamps whenever specified.
- Check that the hoses are not contacting sharp edges or corners.



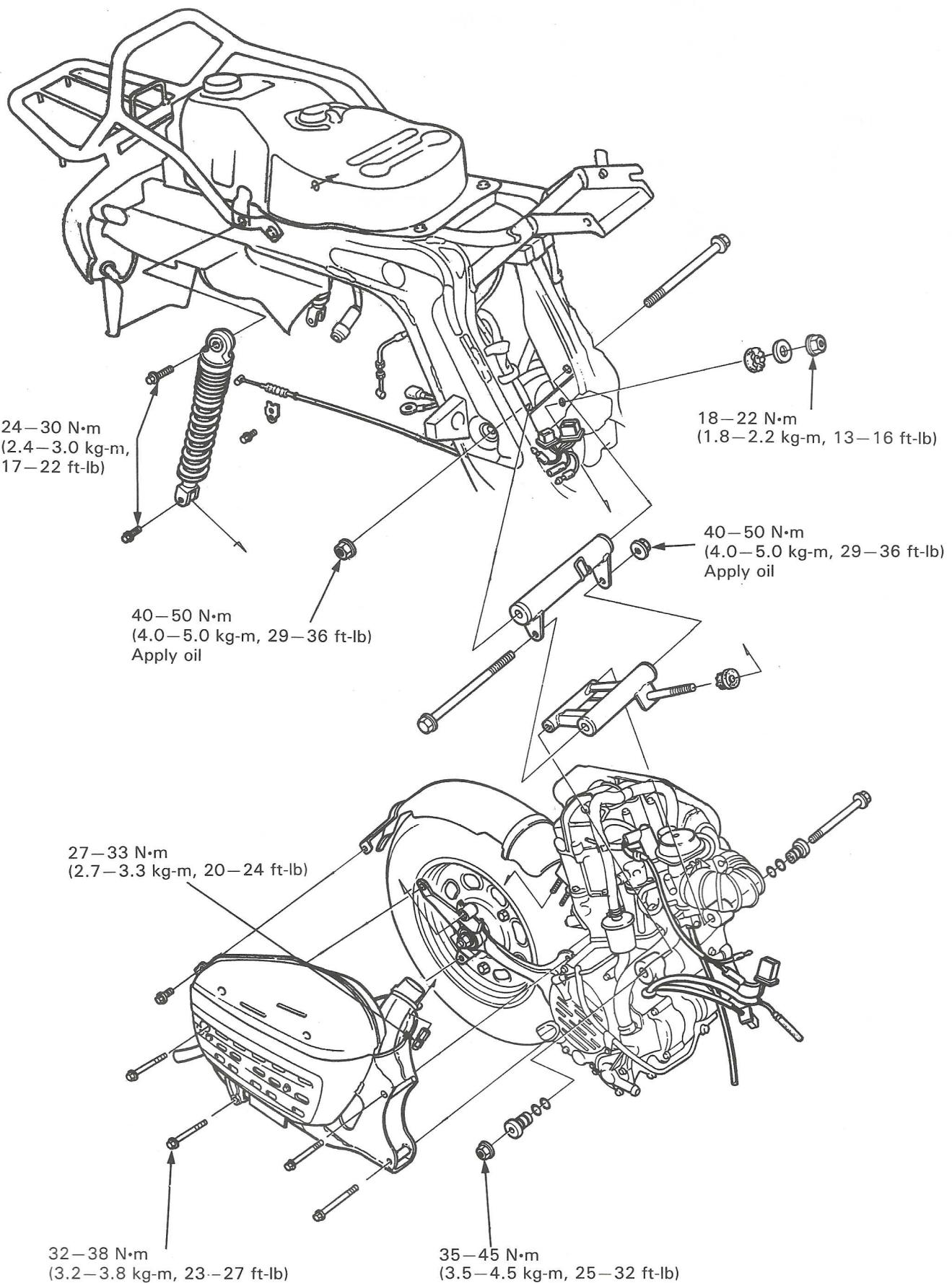
MEMO

SERVING
ENGINEER

SEA
GE

GE
S

ENGINE REMOVAL/INSTALLATION



5. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

ENGINE REMOVAL

5-1 ENGINE INSTALLATION

5-2

5-6

SERVICE INFORMATION

GENERAL

- A floor jack or other adjustable support is required to support and maneuver the engine.
- The following parts or components can be serviced with the engine installed in the frame.
 - Carburetor (Section 4).
 - Cylinder head, cylinder, piston (Section 6 and 7).
 - Drive pulley, clutch, driven pulley (Section 8).
 - Final reduction (Section 9).

SPECIFICATIONS

| ITEM | SPECIFICATION | |
|---------------------------|---------------------|--------------------------------------|
| Engine dry weight | 27.3 kg (60.20 lb) | |
| Engine oil capacity | at change | 0.8 liter (0.8 US qt, 0.7 Imp qt) |
| | at disassembly | 1.0 liter (1.1 US qt, 0.9 Imp qt) |
| Transmission oil capacity | at change | 0.15 liter (0.16 US qt, 0.13 Imp qt) |
| | at disassembly | 0.18 liter (0.19 US qt, 0.16 Imp qt) |
| Coolant capacity | engine and radiator | 0.75 liter (0.79 US qt, 0.66 Imp qt) |
| | reserve tank | 0.59 liter (0.62 US qt, 0.52 Imp qt) |
| | total capacity | 1.34 liter (1.42 US qt, 1.18 Imp qt) |

TORQUE VALUES

| | |
|-----------------------------------|---------------------------------------|
| Engine hanger bolt | 40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb) |
| Engine mounting bolt | 35–45 N·m (3.5–4.5 kg-m, 25–32 ft-lb) |
| Rear shock absorber mounting bolt | 24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb) |
| Engine hanger stopper nut | 18–22 N·m (1.8–2.2 kg-m, 13–16 ft-lb) |
| Engine hanger bracket nut | 40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb) |

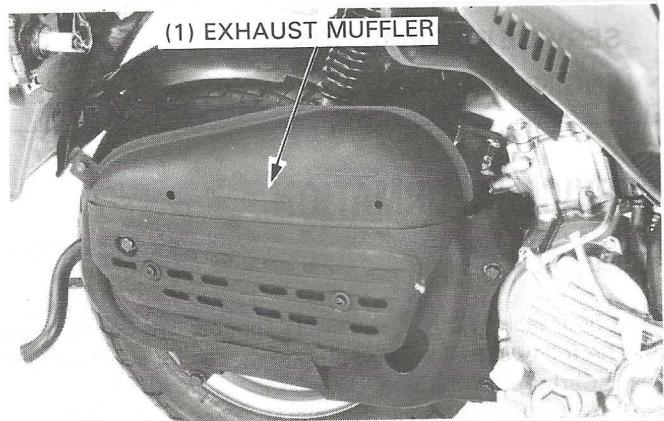
ENGINE REMOVAL/INSTALLATION

ENGINE REMOVAL

Place the scooter on its center stand.
Disconnect the battery negative cable at the battery negative terminal.

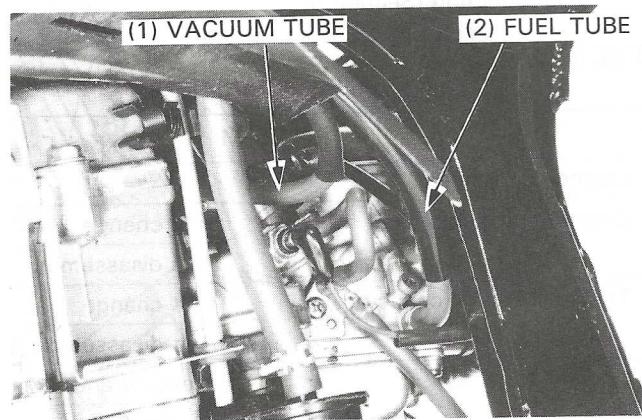
Drain the engine oil and coolant.

Remove the exhaust muffler (page 15-2).
Remove the frame center cover (page 13-2).

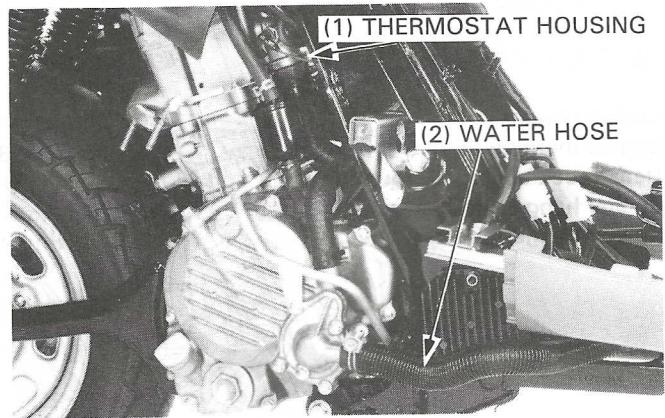


Disconnect the fuel tube at the carburetor side.

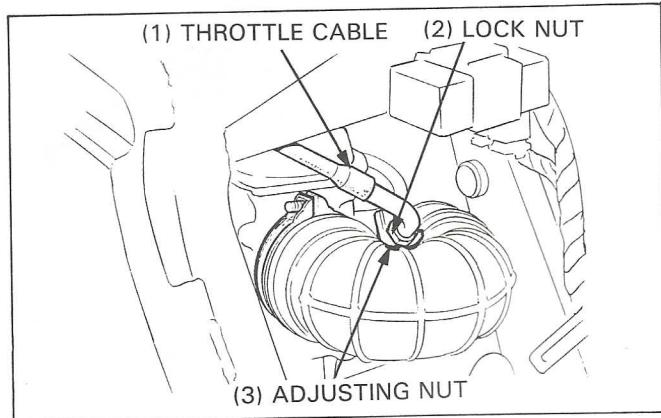
Disconnect the vacuum tube at the fuel valve side.



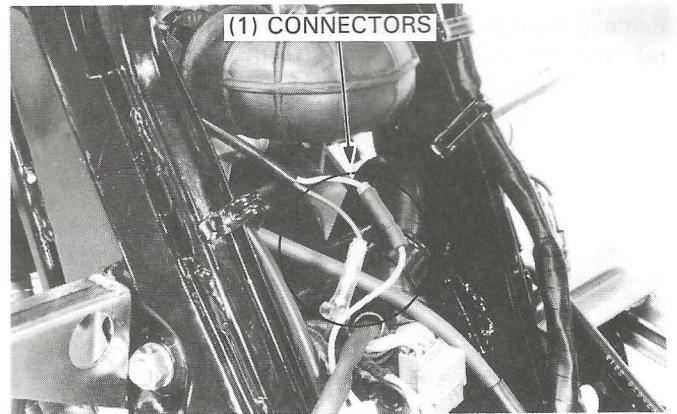
Disconnect the water hose from the water pump.
Remove the thermostat housing.



Loosen the throttle cable lock nut and adjusting nut, and disconnect cable from the carburetor.

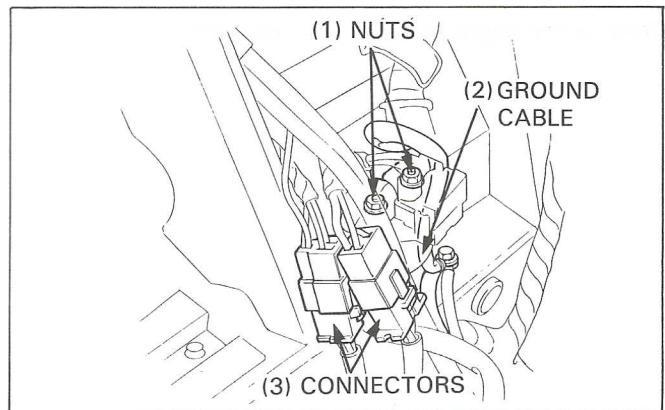


Disconnect the auto bypasser wire connectors.

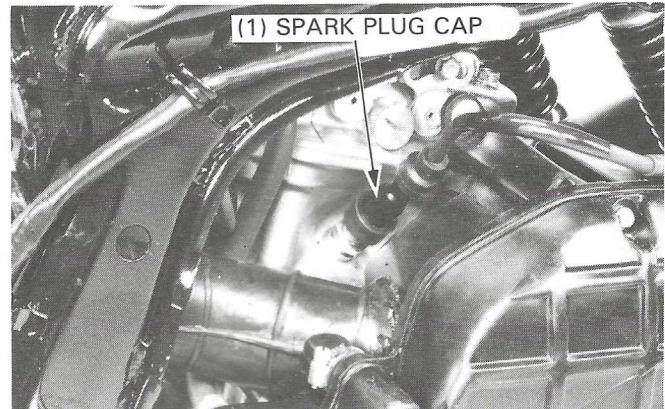


Remove the two starter relay terminal nuts and frame body ground cable.

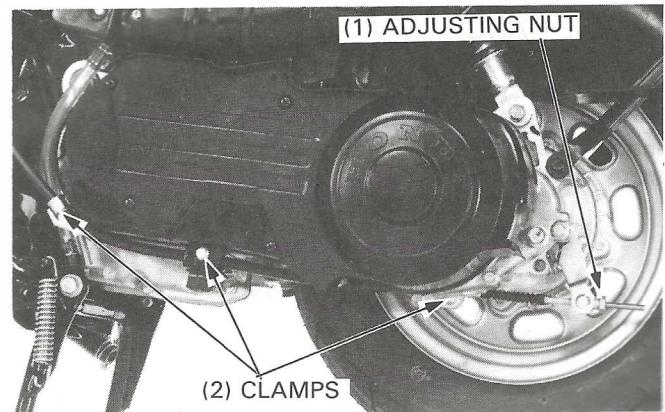
Disconnect the alternator and pulse generator wire connectors.



Remove the spark plug cap.

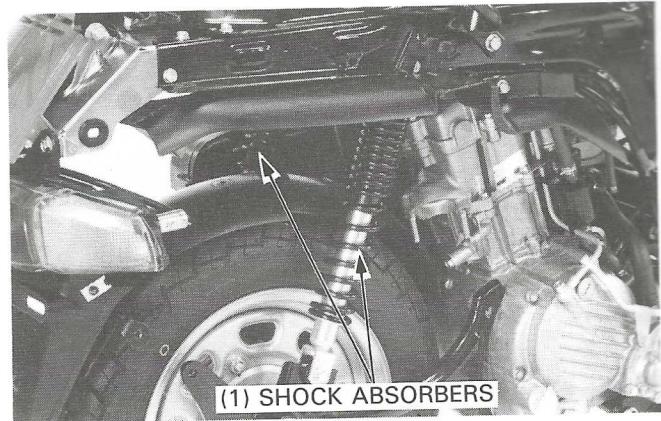


Remove the bolts attaching the brake cable clamps and remove the rear brake adjusting nut.

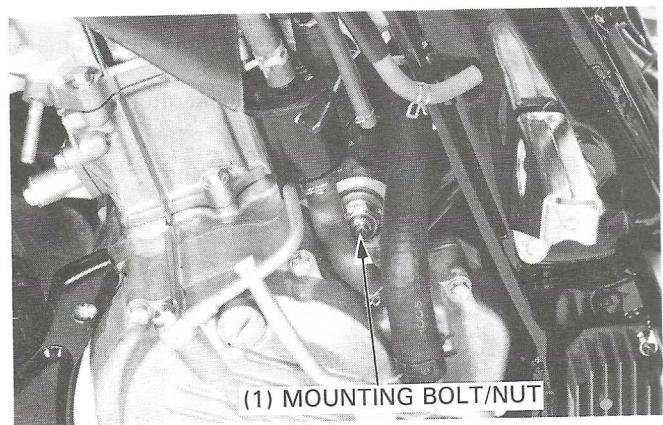


ENGINE REMOVAL/INSTALLATION

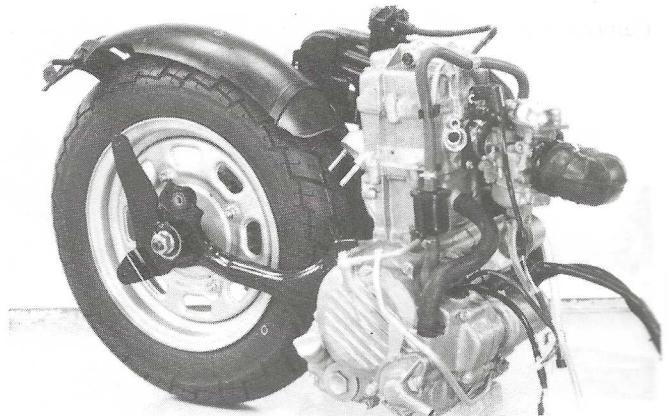
Remove the rear shock absorber mount bolts and remove the rear shock absorbers.



Remove the engine mounting bolt and nut.



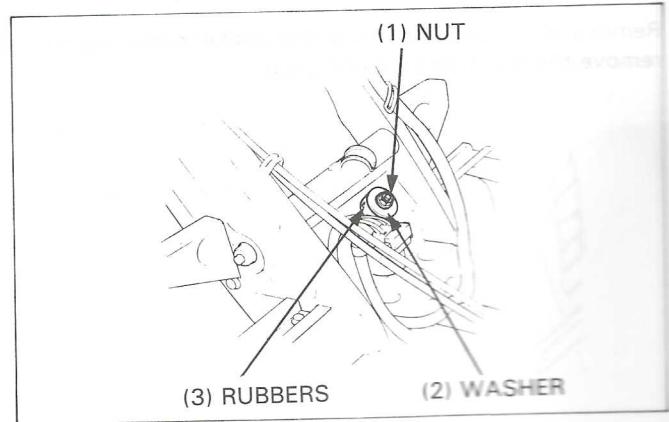
Remove the engine from the frame.



ENGINE HANGER BRACKET REMOVAL

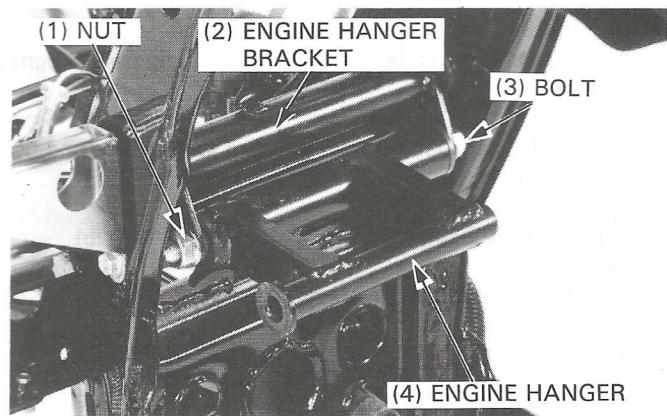
Remove the stopper nut, washer, and stopper rubbers.

Inspect the stopper rubbers for damage and replace if necessary.



Remove the engine hanger bracket bolt, nut, and engine hanger bracket.

Inspect the engine hanger bracket and engine hanger for wear or damage. Check the rubber bushing for damage and replace any parts if necessary.

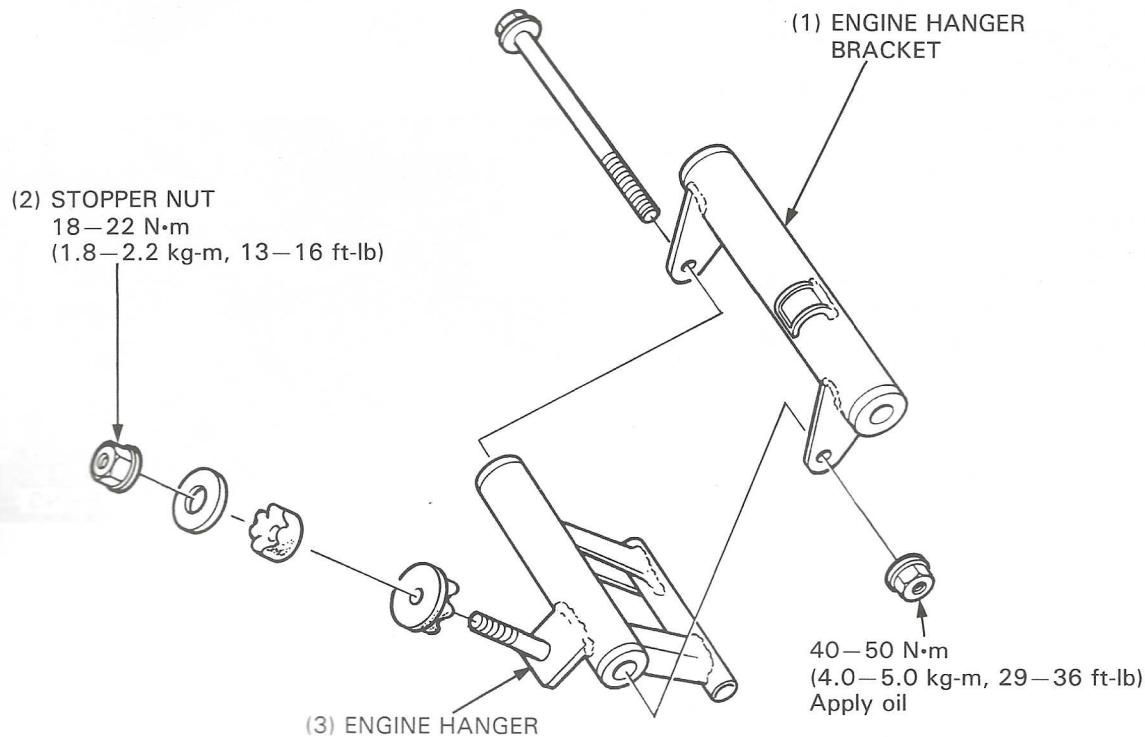


ENGINE HANGER BRACKET INSTALLATION

Assemble the engine hanger and engine hanger bracket with the bolt and nut.

NOTE

- Do not tighten the nut at this time.



ENGINE REMOVAL/INSTALLATION

Install the engine hanger assembly on the frame with the engine hanger bracket bolt and nut and temporarily tighten the nut.

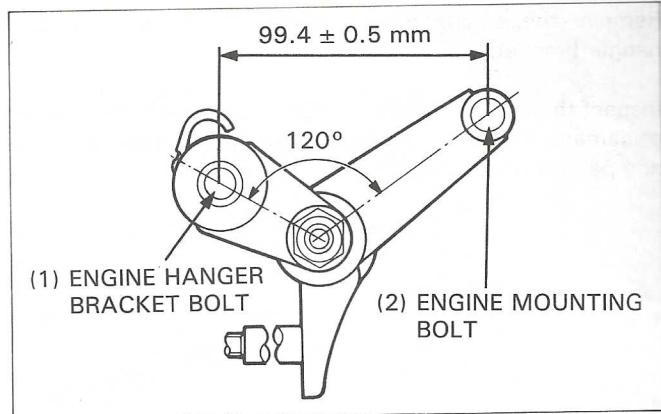
Install the stopper rubbers, washer, and stopper nut and tighten the stopper nut.

TORQUE: 18–22 N·m (1.8–2.2 kg·m, 13–16 ft-lb)

Tighten the engine hanger bracket bolt and nut.

NOTE

- Apply oil to the engine hanger bracket bolt.



TORQUE: 40–50 N·m (4.0–5.0 kg·m, 29–36 ft-lb)

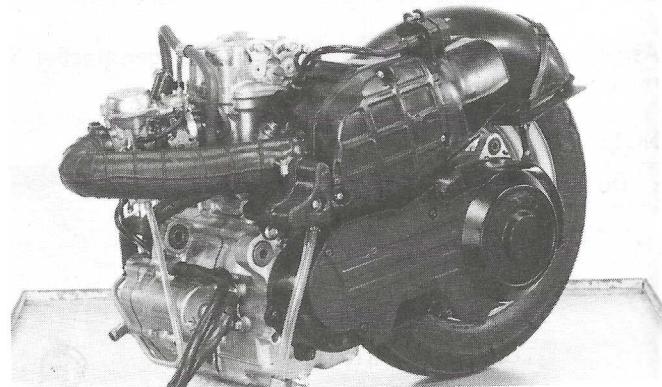
ENGINE INSTALLATION

Lubricate the engine pivot bushings with grease and make sure the O-rings are in good condition and in place.

Install the engine in the reverse order of removal.

NOTE

- Route the wires and cables properly (page 1-8).
- Fill the crankcase and final reduction case to the proper level with the recommended oil (page 2-1).
- Fill the cooling system (page 12-2).
- Perform the following inspection and adjustment:
 - Throttle operation (page 3-3)
 - Rear brake adjustment (page 3-10).



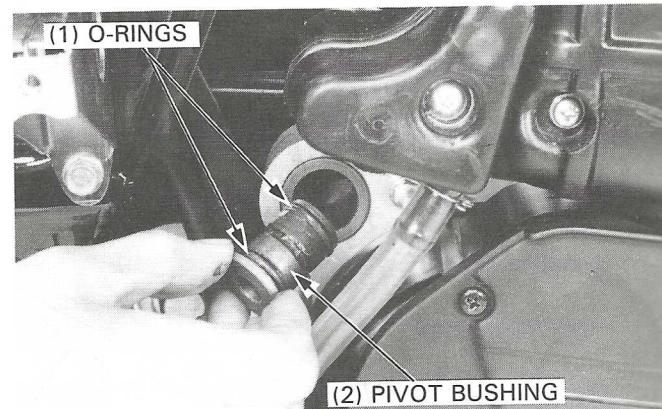
TORQUE VALUES.

Engine mounting bolt:

35–45 N·m (3.5–4.5 kg·m, 25–32 ft-lb)

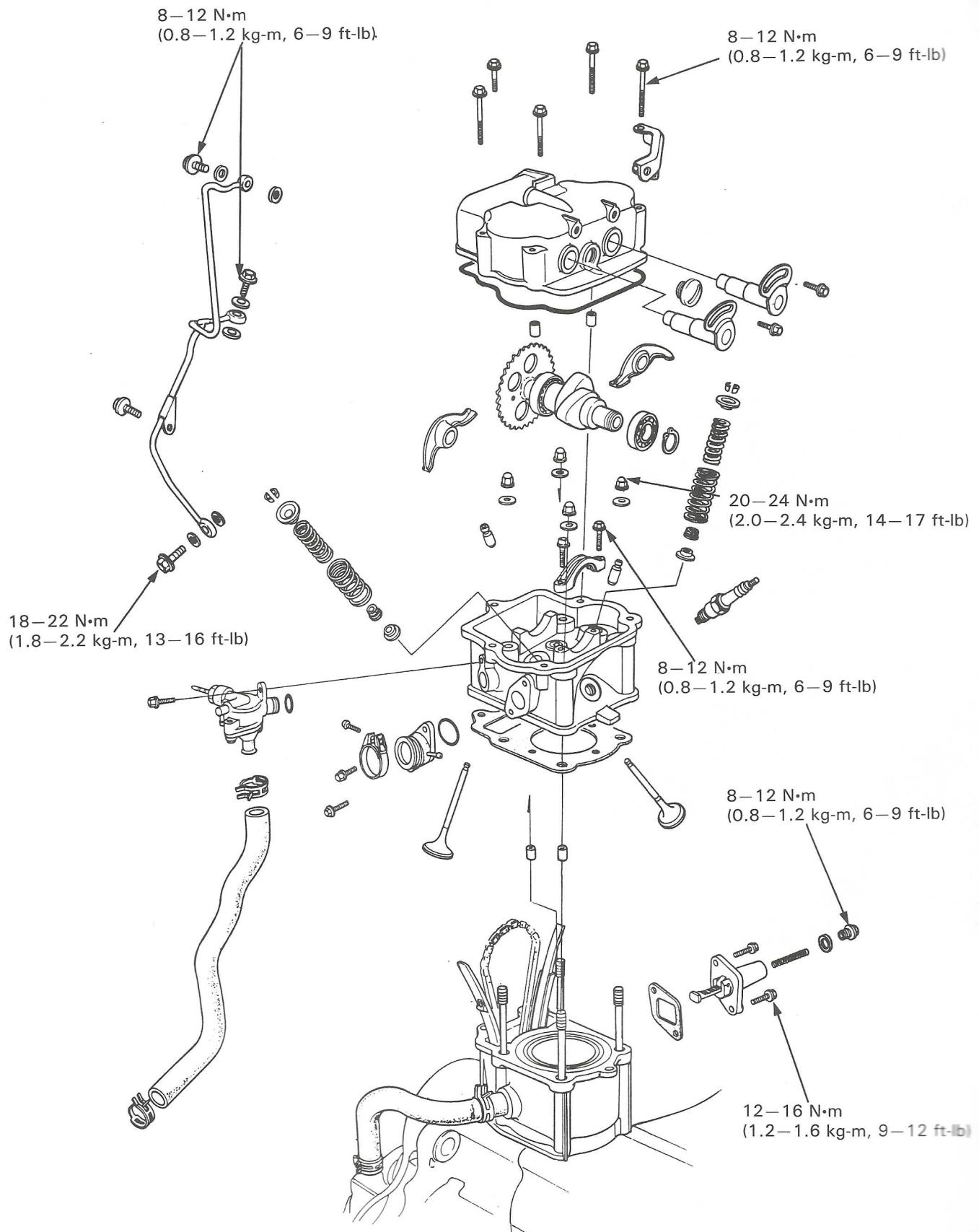
Rear shock absorber mounting bolt:

24–30 N·m (2.4–3.0 kg·m, 17–22 ft-lb)



MEMO

CYLINDER HEAD/VALVES



6. CYLINDER HEAD/VALVES

| | | | |
|------------------------------------|-----|---------------------------------------|------|
| SERVICE INFORMATION | 6-1 | VALVE SEAT INSPECTION AND REFACING | 6-10 |
| TROUBLESHOOTING | 6-2 | CYLINDER HEAD ASSEMBLY | 6-12 |
| CYLINDER HEAD COVER REMOVAL | 6-3 | CYLINDER HEAD INSTALLATION | 6-13 |
| CYLINDER HEAD COVER DISASSEMBLY | 6-4 | CAMSHAFT INSTALLATION | 6-14 |
| CAMSHAFT REMOVAL | 6-4 | CYLINDER HEAD COVER ASSEMBLY | 6-15 |
| CYLINDER HEAD REMOVAL | 6-6 | CYLINDER HEAD COVER INSTALLATION | 6-15 |
| CYLINDER HEAD DISASSEMBLY | 6-7 | | |
| VALVE GUIDE REPLACEMENT | 6-9 | | |

6

SERVICE INFORMATION

GENERAL

- This section covers maintenance of the cylinder head, valves, camshaft and rocker arms.
- The cylinder head can be serviced with the engine installed in the frame.

SPECIFICATIONS

mm (in)

| ITEM | | | STANDARD | SERVICE LIMIT | |
|-----------------------|-----------------------------|-------|--|---------------|--|
| Compression pressure | | | 1,300 ± 200 kPa (13 ± 3 kg/cm ² , 184 ± 28 psi) | — | |
| Camshaft | Cam height | IN | 30.800–30.920 (1.2126–1.2173) | 30.75 (1.211) | |
| | | EX | 30.411–30.531 (1.9728–1.2020) | 30.26 (1.191) | |
| Rocker arm | Rocker arm I.D. | | 12.000–12.018 (0.4724–0.4732) | 12.10 (0.476) | |
| | Shaft O.D. | | 11.966–11.984 (0.4711–0.4718) | 11.91 (0.469) | |
| Valve | Valve stem O.D. | IN | 4.975–4.990 (0.1959–0.1965) | 4.90 (0.193) | |
| | | EX | 4.955–4.970 (0.1951–0.1957) | 4.90 (0.193) | |
| | Valve guide I.D. | | 5.000–5.012 (0.1969–0.1973) | 5.03 (0.198) | |
| | Stem-to-guide clearance | IN | 0.010–0.037 (0.0004–0.0015) | 0.08 (0.003) | |
| | | EX | 0.030–0.057 (0.0012–0.0022) | 0.10 (0.004) | |
| | Valve spring free length | Inner | 32.3 (1.27) | 29.1 (1.16) | |
| | | Outer | 35.0 (1.38) | 31.5 (1.24) | |
| Valve seat width | | | 1.0 (0.04) | 1.6 (0.06) | |
| Cylinder head warpage | | | — | 0.05 (0.002) | |

TORQUE VALUES

| | |
|----------------------------------|---------------------------------------|
| Cylinder head cover bolt | 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb) |
| Cylinder head cap nut | 20–24 N·m (2.0–2.4 kg-m, 14–17 ft-lb) |
| Oil bolt (8 mm) | 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb) |
| Cam chain tensioner sealing bolt | 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb) |
| Cam chain tensioner bolt | 12–16 N·m (1.2–1.6 kg-m, 9–12 ft-lb) |
| Camshaft holder bolt | 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb) |

CYLINDER HEAD/VALVES

TOOLS

Special

Valve guide reamer, 5.0 mm 07984-MA60000 or 07984-MA6000A U.S.A. only
Valve guide driver, 5.0 mm 07942-MA60000

Common

Valve guide driver 07743-0020000
Valve spring compressor 07757-0010000

TROUBLESHOOTING

Engine top-end problems usually affect engine performance. These can be diagnosed by a compression test, or by tracing noises with a sounding rod or stethoscope.

Low compression

- Valves
 - Incorrect valve adjustment
 - Burned or bend valves
 - Incorrect valve timing
 - Broken valve spring
- Cylinder head
 - Leaking or damaged head gasket
 - Warped or cracked cylinder head
- Cylinder and piston (Section 7)

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
- Loose or worn cam chain
- Worn or damaged cam chain tensioner
- Worn cam sprocket teeth
- Worn rocker arm and or shaft

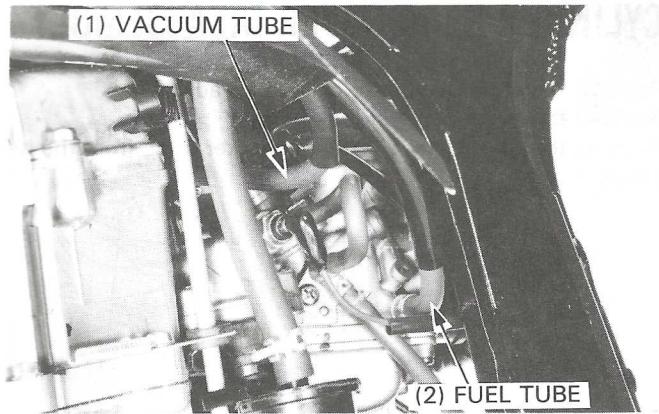
CYLINDER HEAD COVER REMOVAL

Remove the following parts:

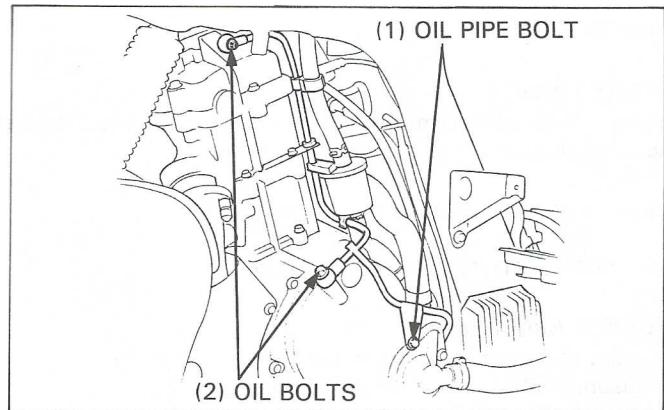
- seat.
- right and left rear cover and frame center cover (page 13-2).

Disconnect the fuel and vacuum tubes and remove the fuel tank (page 4-14).

Remove the right rear suspension (page 15-8) and heat insulator bolts and heat insulator.



Remove the two oil bolts and the oil pipe bolt.
Loosen the lower oil bolt.

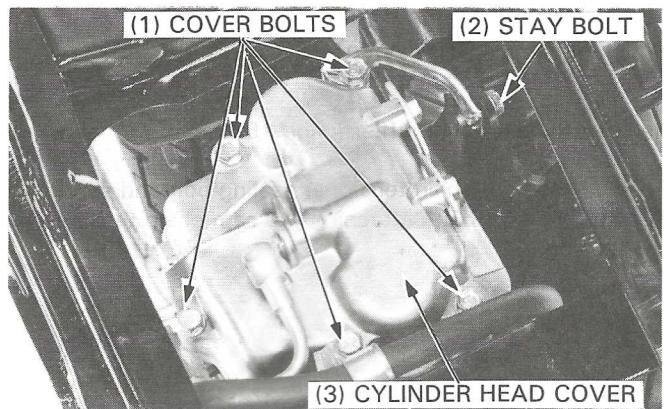


Slide the oil pipe to right side so that the cylinder head cover can be removed.

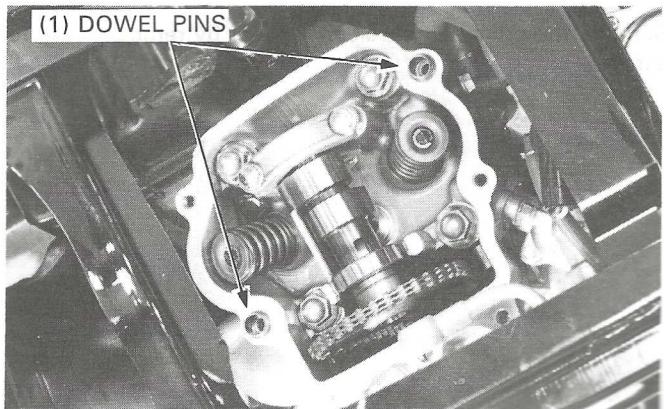
CAUTION

- *Do not bend the oil pipe to remove the cylinder head cover or the oil pipe will be damaged.*

Remove the five cylinder head cover bolts and the air cleaner stay bolt, and then remove the cylinder head cover.



Remove the dowel pins.



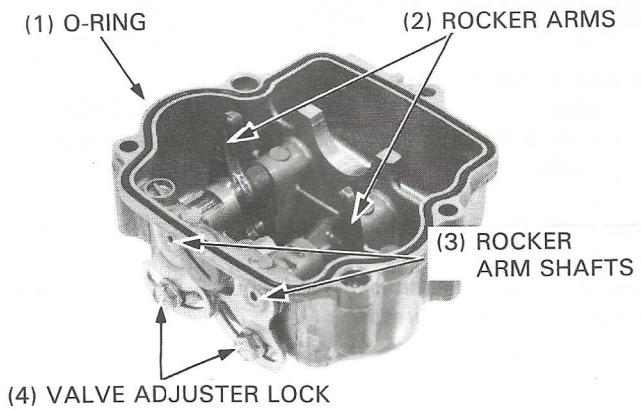
CYLINDER HEAD/VALVES

CYLINDER HEAD COVER DISASSEMBLY

Remove the O-ring from the cylinder head cover.

Remove the valve adjuster lock bolts.

Remove the rocker arm shafts and rocker arms from the head cover.



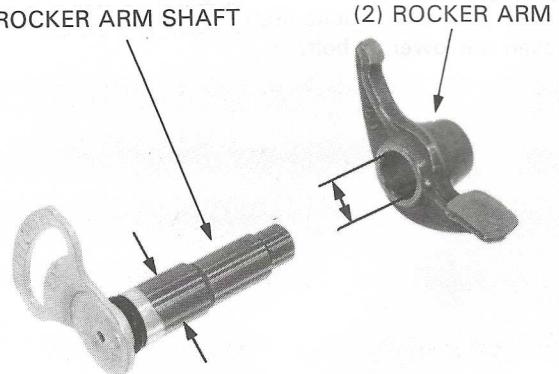
INSPECTION

ROCKER ARM

Inspect the rocker arms for wear or damage to the camshaft contact surface or for a clogged oil hole.

Measure the I.D. of each rocker arm.

SERVICE LIMIT: 12.10 mm (0.476 in)



ROCKER ARM SHAFT

Inspect the shaft for wear or damage. Measure each rocker arm shaft O.D.

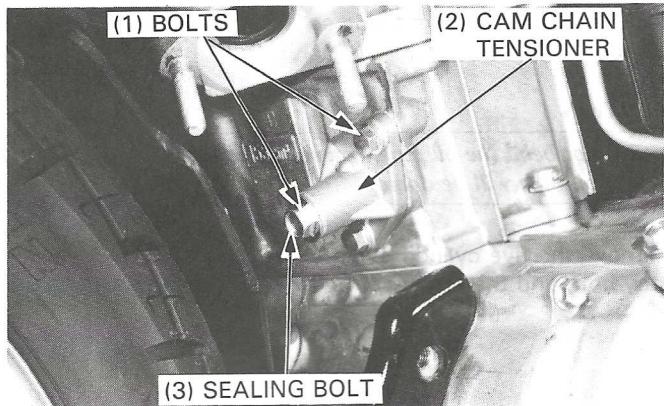
SERVICE LIMIT: 11.91 mm (0.469 in)

CAMSHAFT REMOVAL

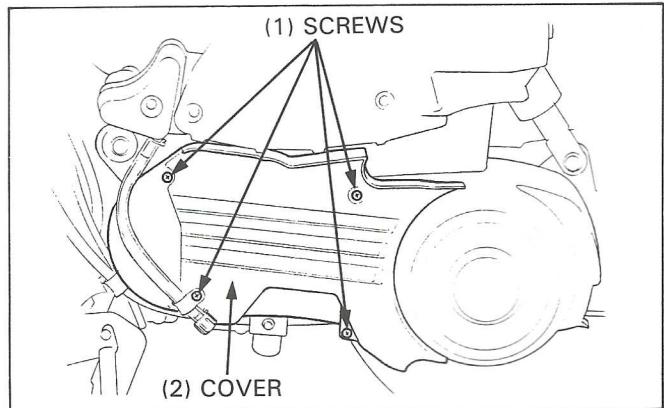
Remove the exhaust muffler (page 15-2).

Remove the cam chain tensioner sealing bolt and spring.

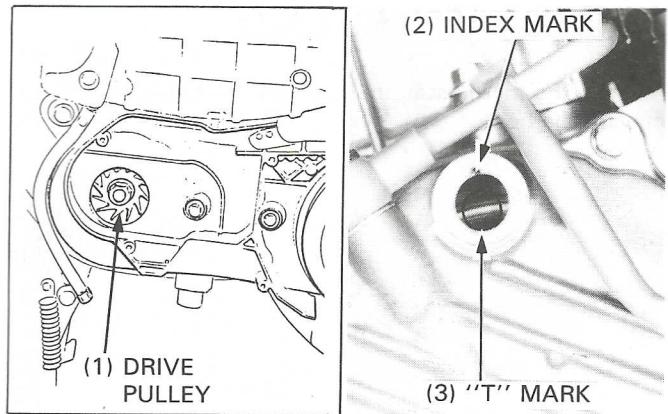
Remove the two bolts attaching the cam chain tensioner and the tensioner.



Remove the drive belt air cleaner cover by removing the four screws.



Remove the timing hole cap and turn the drive pulley so that the "T" mark on the flywheel aligns with the index mark.



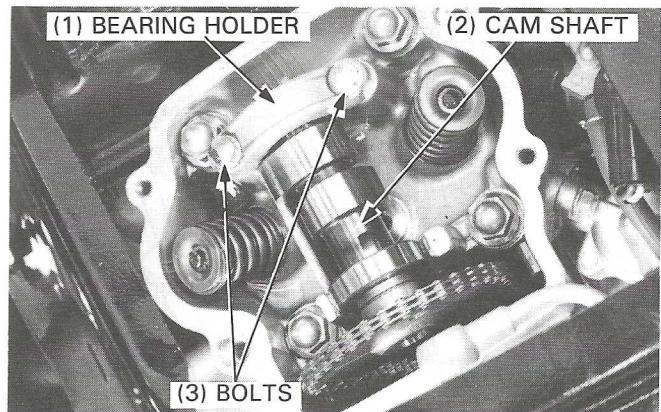
Remove the two camshaft bearing holder bolts and the bearing holder.

Remove the camshaft.

Suspend the cam chain with a piece of wire to keep it from falling into the crankcase.

NOTE

- Be careful not to drop the bolts into the crankcase.



CAMSHAFT INSPECTION

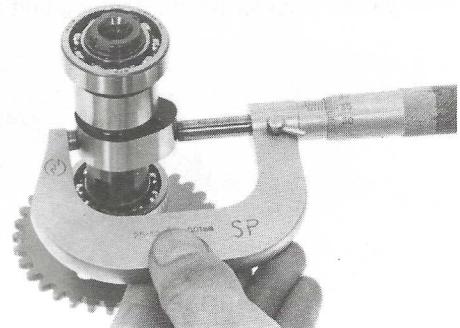
Check each cam lobe for wear or damage.

Measure the cam lobe height.

SERVICE LIMITS:

IN: 30.75 mm (1.211 in)

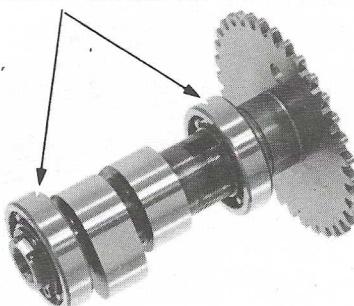
EX: 30.26 mm (1.191 in)



Check each camshaft bearing for play or damage.

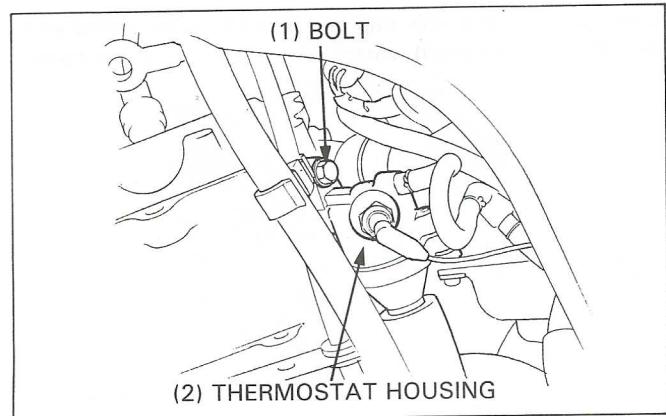
Replace the camshaft assembly with a new one if the bearings are noisy or have excessive play.

(1) CAM SHAFT BEARINGS

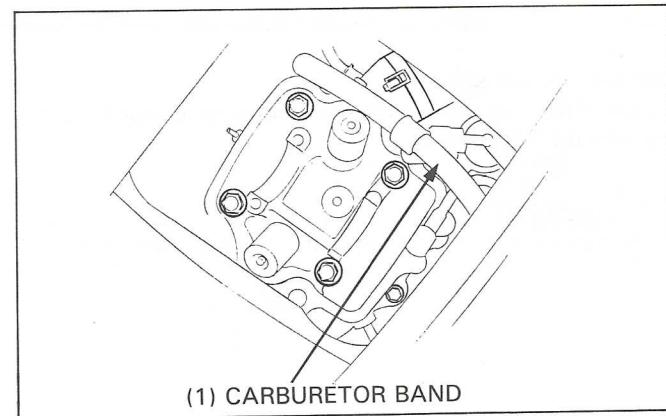


CYLINDER HEAD REMOVAL

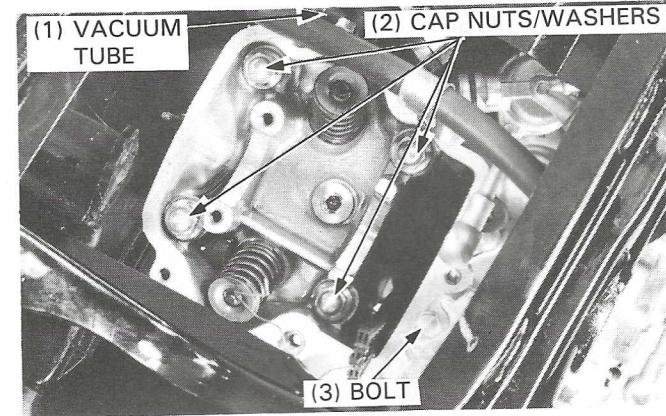
Remove the thermostat housing from the cylinder head by removing the bolt.



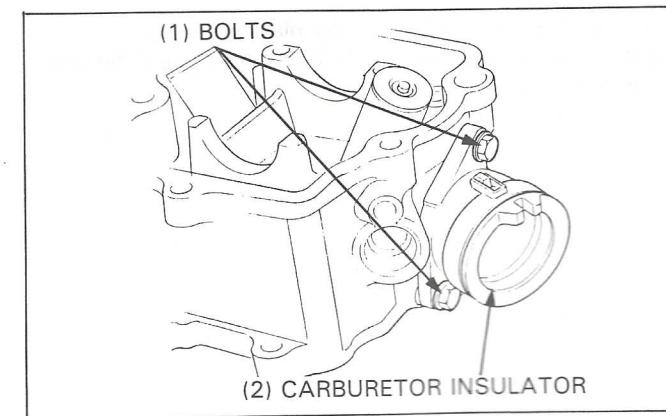
Loosen the carburetor band.



Disconnect the vacuum tube from the carburetor insulator.
Remove the four cylinder head cap nuts and washers.
Remove the cylinder head attaching bolt and cylinder head.

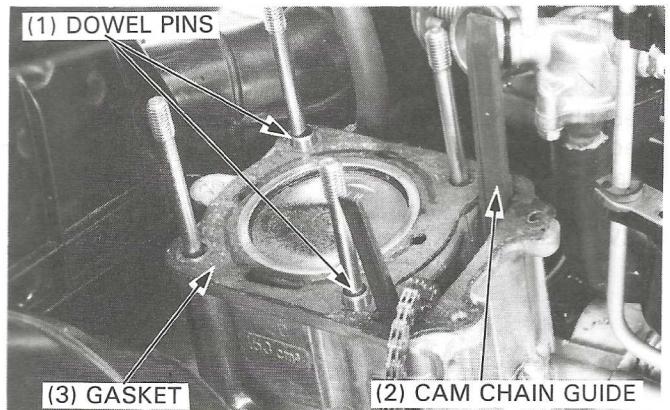


Remove the carburetor insulator by removing the two bolts.



Remove the cylinder head gasket and two dowel pins.

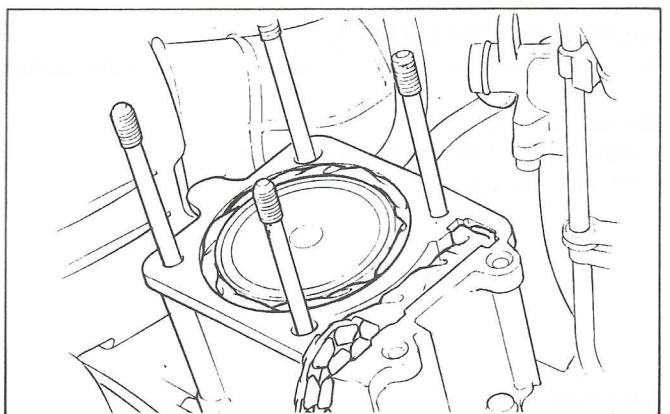
Remove the cam chain guide from the cylinder.



Remove all gasket material from the cylinder mating surface.

NOTE

- Avoid damaging the gasket surface.
- Be careful not to drop gasket material into the crankcase.



CYLINDER HEAD DISASSEMBLY

Remove the valve spring cappers, retainers, springs, spring seats and valves.

CAUTION

- To prevent loss of tension, do not compress the valve springs more than necessary to remove the cappers.

NOTE

- Mark all disassembled parts to ensure correct reassembly.

TOOL: Valve spring compressor 07757-0010000

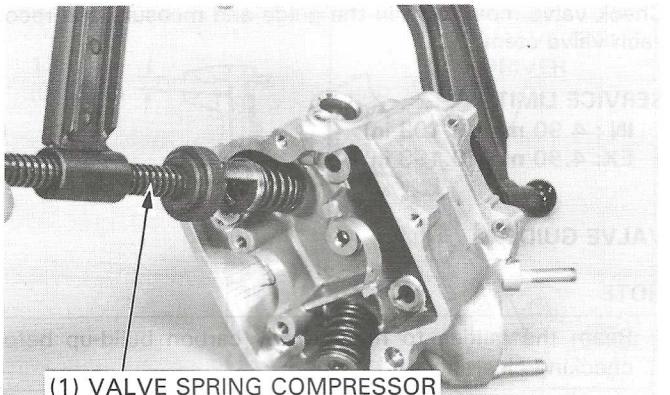
Remove the valve stem seals.

Remove carbon deposits from the combustion chamber.

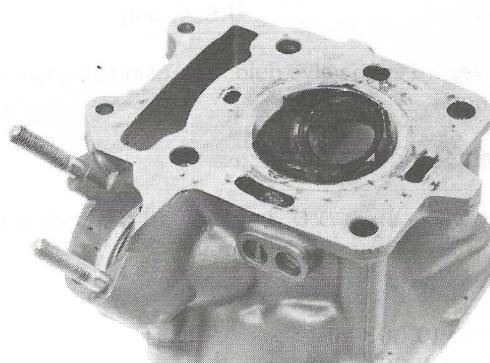
Clean off any gasket material from the cylinder head gasket surface.

NOTE

- Avoid damaging the gasket surfaces.
- Gaskets will come off easier if soaked in solvent.



(1) VALVE SPRING COMPRESSOR



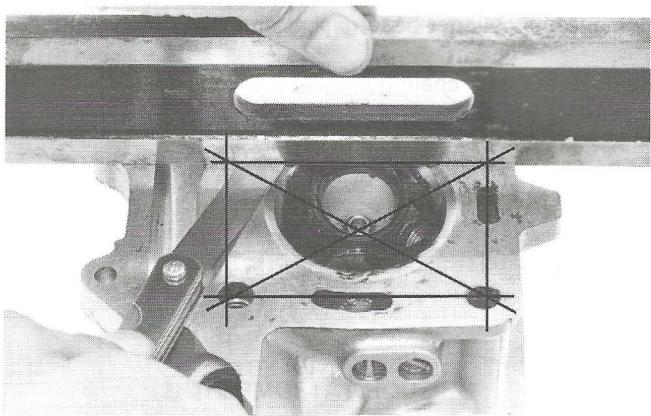
CYLINDER HEAD/VALVES

INSPECTION

CYLINDER HEAD

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

SERVICE LIMIT: 0.05 mm (0.002 in)

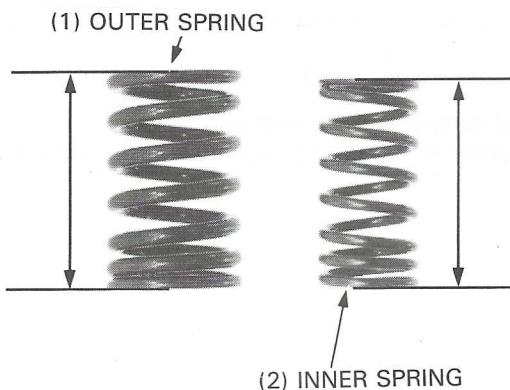


VALVE SPRING FREE LENGTH

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

SERVICE LIMITS:

INNER (IN, EX): 29.1 mm (1.16 in)
OUTER (IN, EX): 31.5 mm (1.24 in)



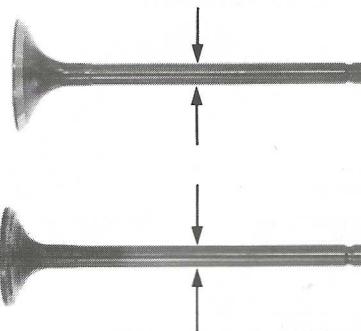
VALVE STEM

Inspect each valve for bending, burning, scratches or abnormal stem wear.

Check valve movement in the guide and measure and record each valve stem O.D.

SERVICE LIMITS:

IN : 4.90 mm (0.193 in)
EX: 4.90 mm (0.193 in)



VALVE GUIDE

NOTE

- Ream the guides to remove any carbon build-up before checking clearances.

TOOLS:

Valve guide reamer, 5.0 mm

07984-MA60000

(07984-MA6000A
U.S.A. only)

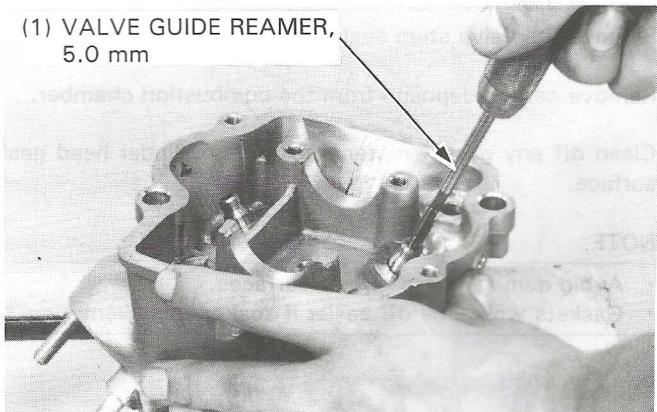
Measure and record each valve guide I.D. using a ball gauge or inside micrometer.

SERVICE LIMIT: 5.03 mm (0.198 in)

Subtract each valve stem O.D. from the corresponding guide I.D. to obtain the stem-to-guide clearance.

SERVICE LIMITS:

IN : 0.08 mm (0.003 in)
EX: 0.10 mm (0.004 in)



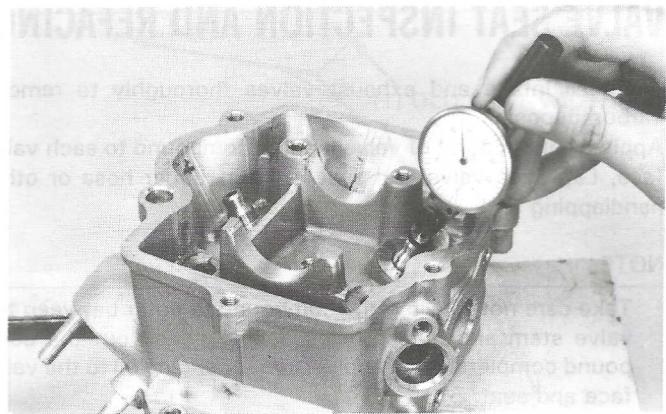
NOTE

- If the stem-to-guide clearance exceeds the service limits, determine if a new guide with standard dimensions would bring the clearance within tolerance.
- If so, replace any guide as necessary and ream to fit.

If the stem-to-guide clearance exceeds the service limits with new guides, replace the valves also.

NOTE

- Reface the valve seats whenever the valve guides are replaced.



VALVE GUIDE REPLACEMENT

Heat the cylinder head to 100–150° (212–300°F) with a hot plate or oven.

CAUTION

- Do not use a torch to heat the cylinder head; it may cause warping.*
- To avoid burns, wear heavy gloves when handling the heated cylinder head.*

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

TOOL:

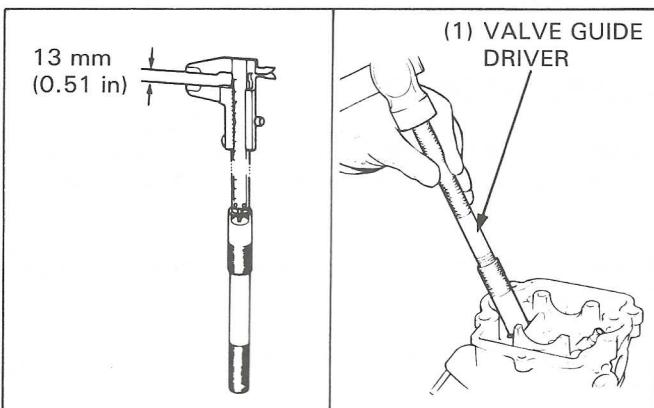
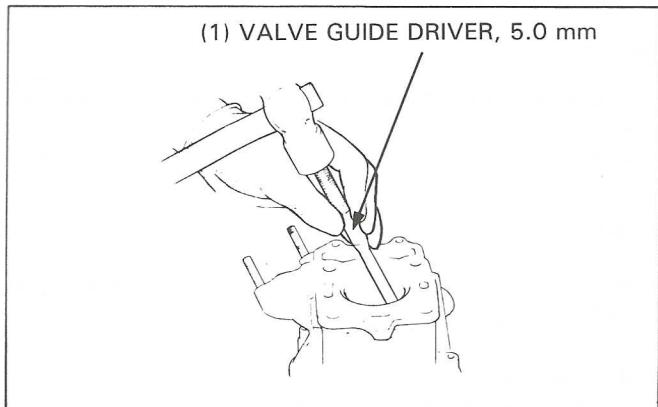
Valve guide driver, 5.0 mm 07942-MA60000

NOTE

- After driving the guides in, check them for damage.
- The cylinder head should still be at 100-150°C (212-300°F) for installation of a new guide.

Adjust the valve guide driver so that the valve guide height is 13 mm (0.51 in).

Drive a new guides into the cylinder head from the rocker arm side.

TOOL: VALVE GUIDE DRIVER 07743-0020000

Let the cylinder head cool to room temperature and ream the new valve guides.

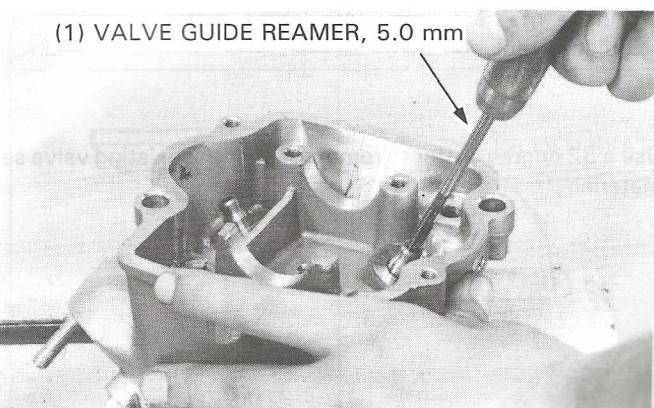
NOTE

- Use cutting oil on the reamer during this operation.
- Rotate the reamer in the same direction when inserting and removing it.

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

TOOL:

Valve guide reamer, 5.0 mm 07984-MA60000
(07984-MA6000A
U.S.A. only)



CYLINDER HEAD/VALVES

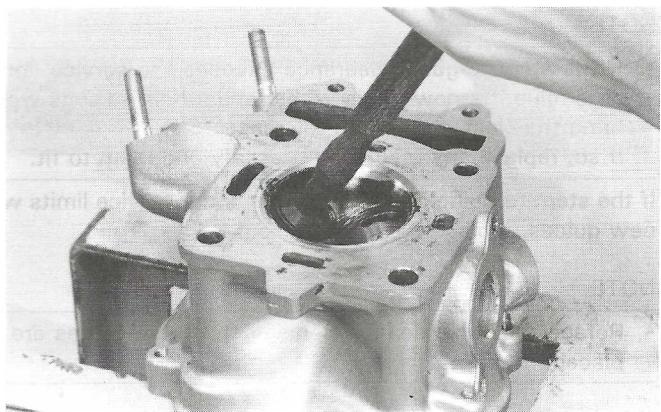
VALVE SEAT INSPECTION AND REFACING

Clean all intake and exhaust valves thoroughly to remove carbon deposits.

Apply a light coating of valve lapping compound to each valve face. Lap each valve and seat using a rubber hose or other handlapping tool.

NOTE

- Take care not to allow the compound to enter between the valve stem and guide. After lapping, wash out the compound completely and apply a coat of engine oil to the valve face and seat.



Remove the valve and inspect the face.

CAUTION

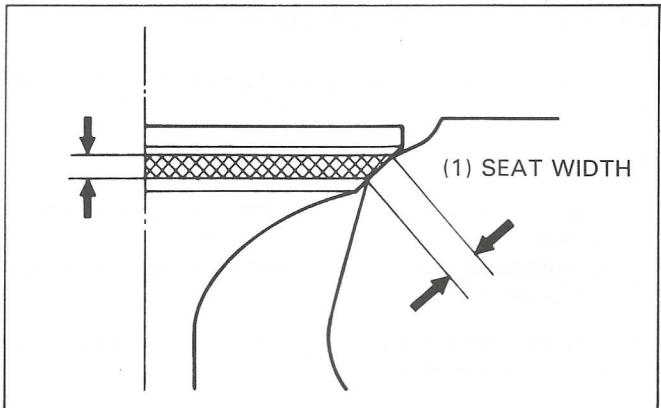
- The valves cannot be ground. If the valve face is rough, worn unevenly, or contacts the seat improperly, the valve must be replaced.

Inspect the valve seat.

If the seat is too wide, too narrow, or has low spots, the seat must be ground.

SEAT WIDTH:

Service limit: 1.6 mm (0.06 in)



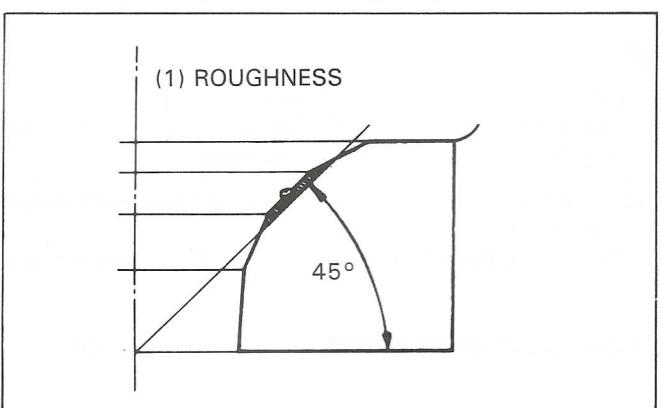
Check the valve face for even contact.

VALVE SEAT GRINDING

Honda Valve Seat Cutters, grinder or equivalent valve seat refacing equipment are recommended to correct a worn valve seat.

Follow the instructions supplied with the Valve Seat Refacing Equipment.

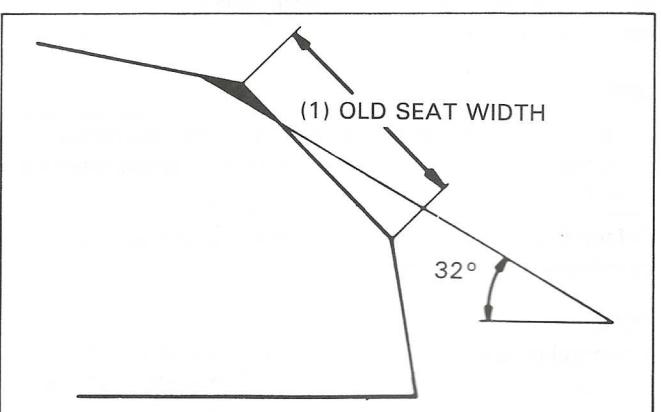
Using a 45 degree cutter, remove any roughness or irregularities from the seat.



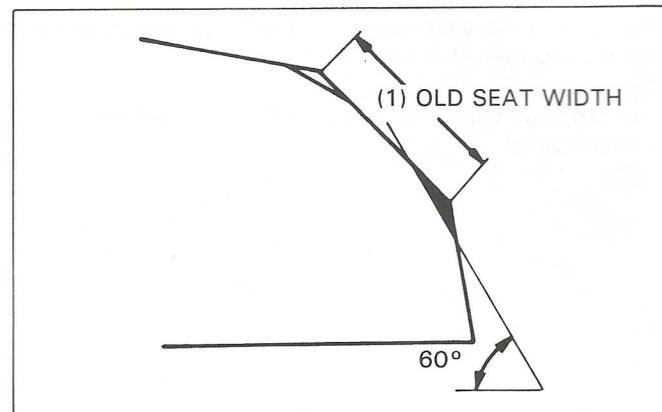
NOTE

- Reface the seat with a 45 degree cutter when the valve guide is replaced.

Use a 32 degree cutter to remove 1/4 of the existing valve seat material.



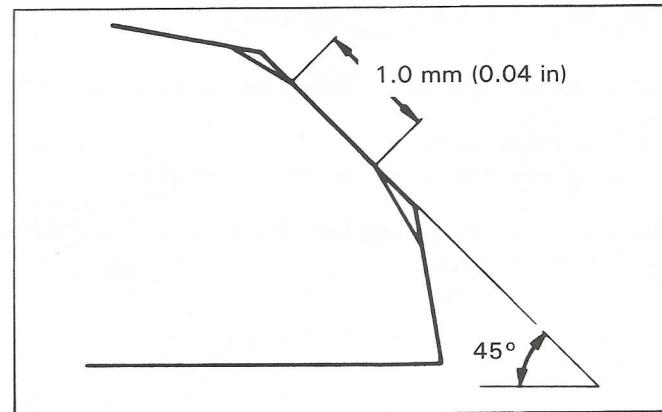
Use a 60 degree cutter to remove the lower 1/4 of the old seat. Remove the cutter and inspect the area you have just cut.



Install a 45 degree finish cutter and cut the seat to the proper width.

NOTE

- Make sure that all pitting and irregularities are removed. Refinish if necessary.



Apply a thin coating of Prussian Blue to the valve seat.

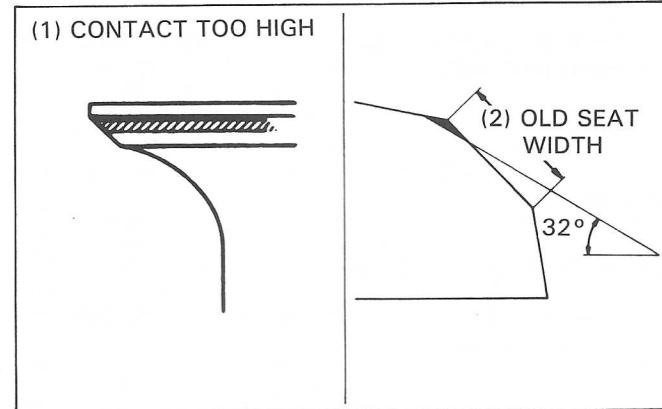
Press the valve through the valve guide and onto the seat without rotating it to make a clear pattern.

NOTE

- The location of the valve seat in relation to the valve face is very important for good sealing.

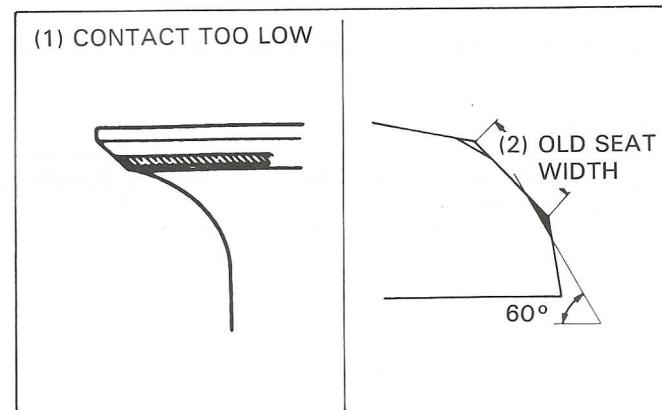
If the contact area is too high on the valve, the seat must be lowered using a 32 degree flat cutter.

Refinish the seat to specifications using a 45 degree seat cutter.



If the contact area is too low on the valve, the seat must be raised using a 60 degree inner cutter.

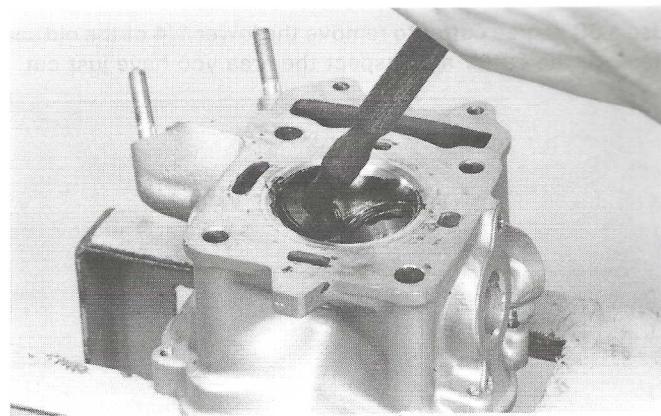
Refinish the seat to specifications using a 45 degree seat cutter.



CYLINDER HEAD/VALVES

After cutting the seat, apply lapping compound to the valve face and lap the valve using light pressure.

After lapping, wash all residual compound off the cylinder head and valve.



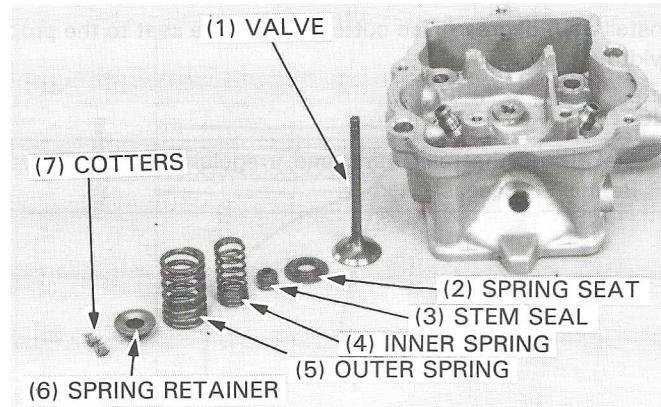
CYLINDER HEAD ASSEMBLY

Lubricate each valve stem with oil, then insert the valves into the valve guides.

Install new valve stem seals.

Install the valve spring seat, springs and retainers.

The springs' tightly wound coils should face in toward the combustion chamber.



Compress the valve springs using the valve spring compressor, then install the valve coppers.

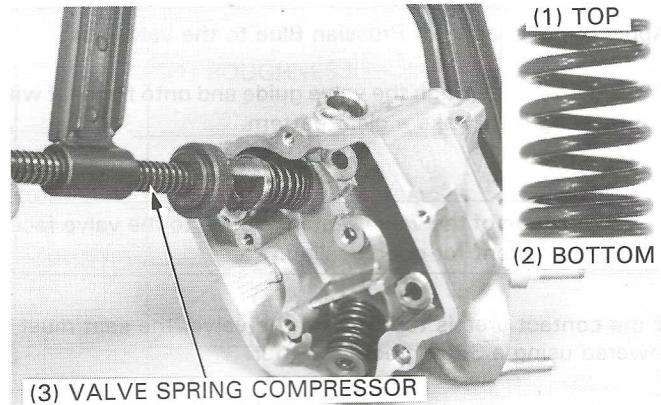
NOTE

- The springs tightly wound coils should free the cylinder head.

CAUTION

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

TOOL: Valve spring compressor 07757-0010000



Tap the valve stems gently with a plastic hammer as shown to firmly seat the coppers.

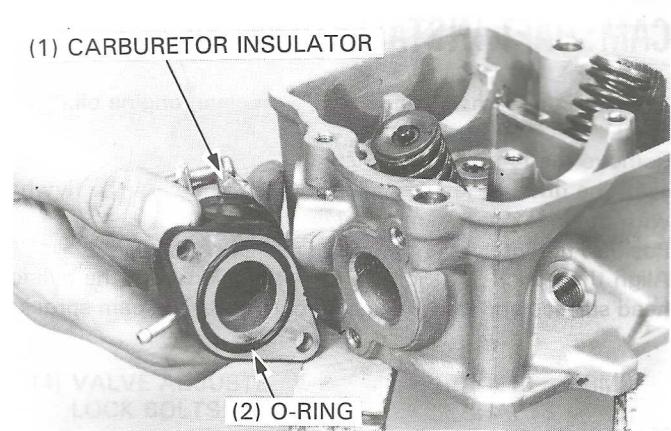
CAUTION

- *Support the cylinder head above the working bench surface to prevent possible valve damage.*



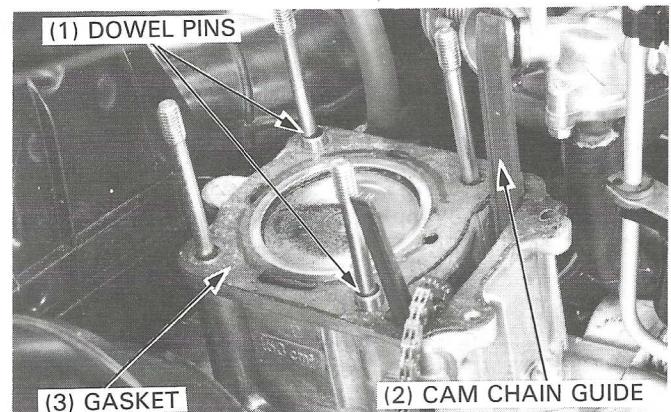
CYLINDER HEAD INSTALLATION

Install a new O-ring in the carburetor insulator groove and then install the insulator with two bolts.



Install the cam chain guide.

Install the dowel pins and new gasket.

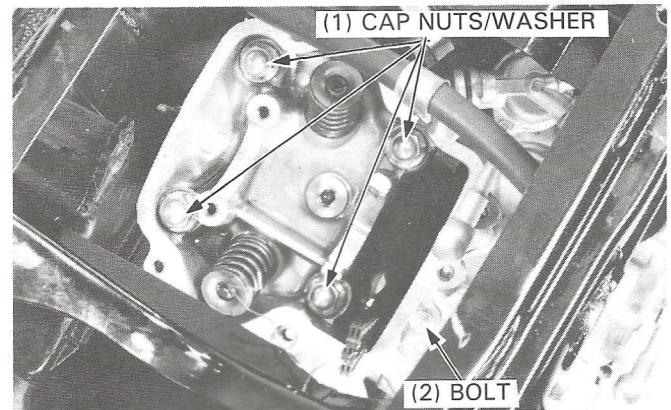


Install the cylinder head.

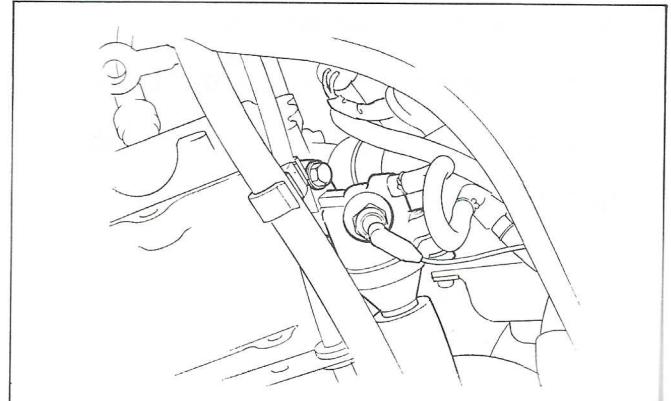
Install the cylinder head cap nuts and washers and tighten them in a crisscross pattern in two or more steps.

TORQUE: 20–24 N·m (2.0–2.4 kg·m, 14–17 ft-lb)

Install the cylinder head attaching bolt.



Install a new O-ring in the thermostat housing and install the housing with the bolt.



CYLINDER HEAD/VALVES

CAMSHAFT INSTALLATION

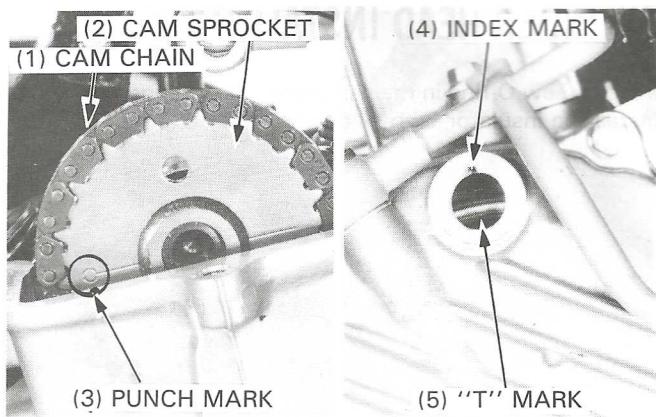
Lubricate the camshaft bearings with clean engine oil.

Remove the timing mark hole cap.

Turn the drive pulley and align the "T" mark on the flywheel with the index notch on the right crankcase.

Position the intake and exhaust cam lobes down.

Align the punch mark on the cam sprocket with the cylinder head surface and install the cam chain over the cam sprocket.

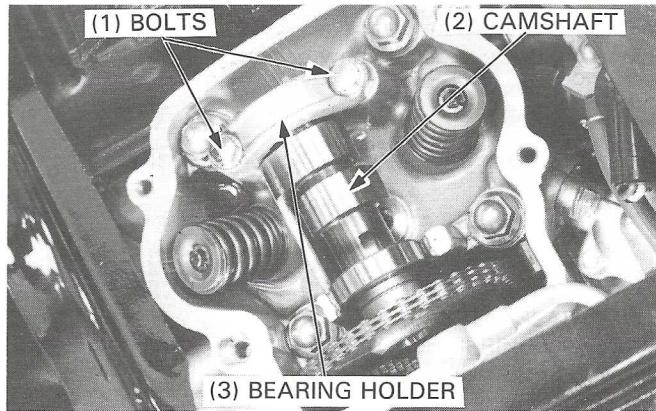


Install the camshaft bearing holder and tighten the holder bolts.

TORQUE: 8–12 N·m (0.8–1.2 kg·m, 6–9 ft-lb)

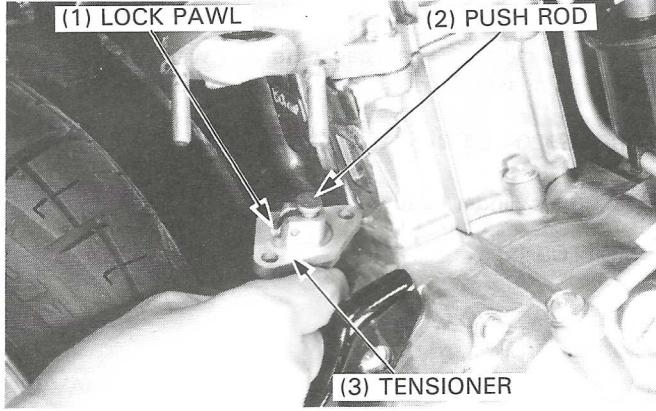
NOTE

- Be careful not to drop the bolts into the crankcase.



Install a new cam chain tensioner gasket.

Don't install the tensioner without pushing the push rod all the way in.

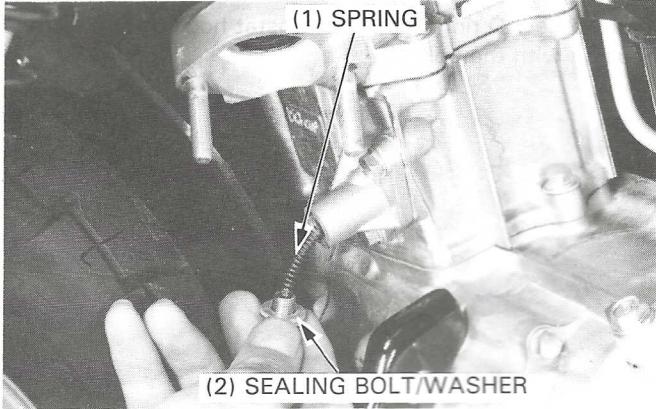


Install the tensioner using the two bolts.

TORQUE: 12–16 N·m (1.2–1.6 kg·m, 9–12 ft-lb)

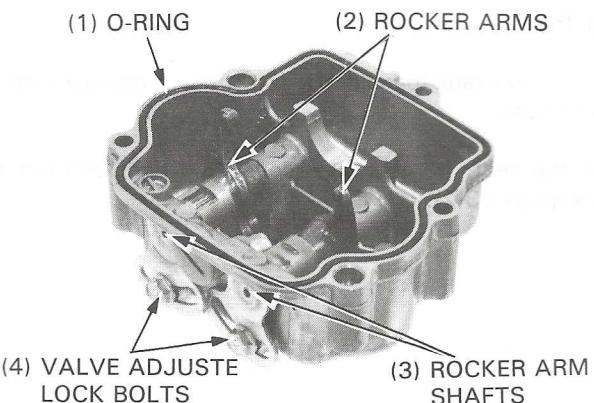
Install the tensioner spring, washer and sealing bolt.

TORQUE: 8–12 N·m (0.8–1.2 kg·m, 6–9 ft-lb)



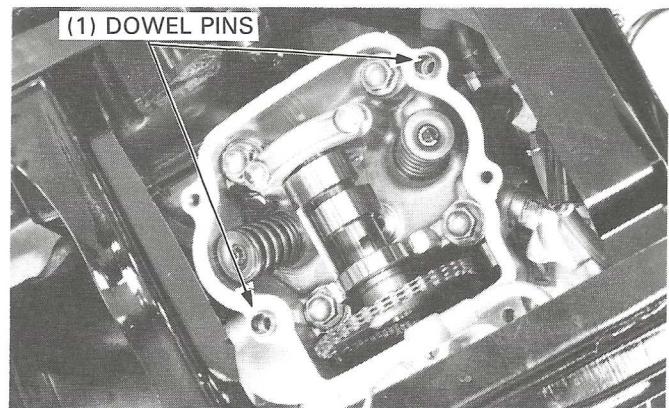
CYLINDER HEAD COVER ASSEMBLY

Install new O-rings onto each rocker arm shaft.
Apply engine oil to the rocker arm shafts.
Install the rocker arms and shafts onto the cylinder head cover.
Install the valve adjuster lock bolts loosely.



CYLINDER HEAD COVER INSTALLATION

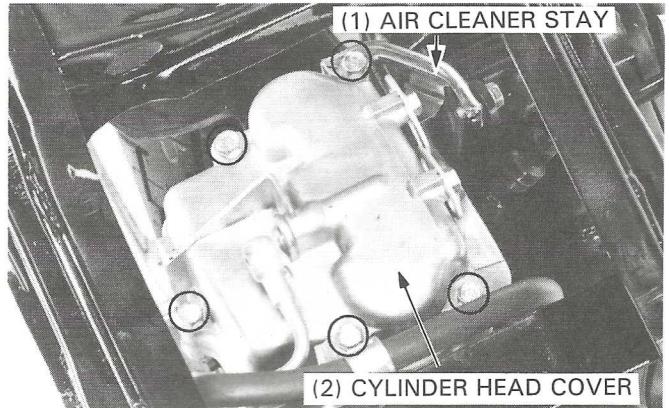
Fill the oil pocket in the cylinder head with clean engine oil to provide initial lubrication for the cam shaft when the engine is started.
Install two dowel pins in the cylinder head.
Install the seal rubber into the groove in the cylinder head cover.
Install the cylinder head cover.



Install the air cleaner stay and five 6 mm flange bolts.
Tighten the 6 mm flange bolts in a crisscross pattern in two or more steps.

TORQUE: 8–12 N·m (0.8–1.2 kg·m, 6–9 ft-lb)

Attach the air cleaner case to the stay with the bolt.



Install and tighten the two oil bolts and oil pipe bolt.
Tighten the lower oil bolt.

NOTE

- Make sure that the sealing washers are in good conditions.

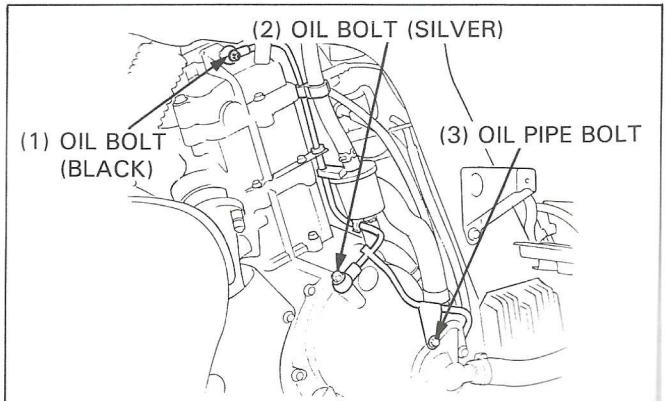
TORQUE:

OIL PIPE-TO-CYLINDER HEAD BOLT (BLACK)

8–12 N·m (0.8–1.2 kg·m, 6–9 ft-lb)

OIL-PIPE-TO-RIGHT CRANKCASE COVER BOLT (SILVER)

8–12 N·m (0.8–1.2 kg·m, 6–9 ft-lb)

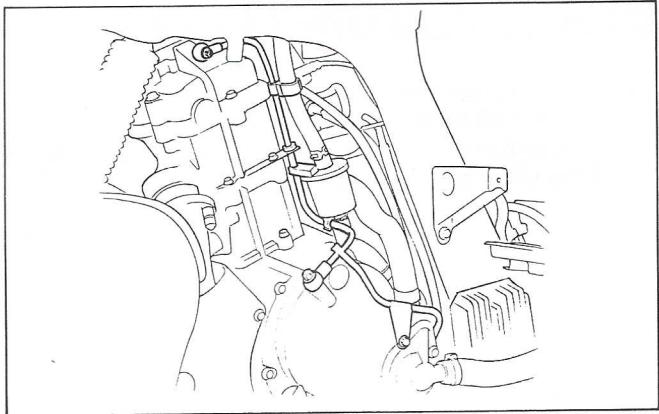


CYLINDER HEAD/VALVES

Install the heat insulator.

Install the fuel tank (page 4-15) and connect the fuel tube and vacuum tube.

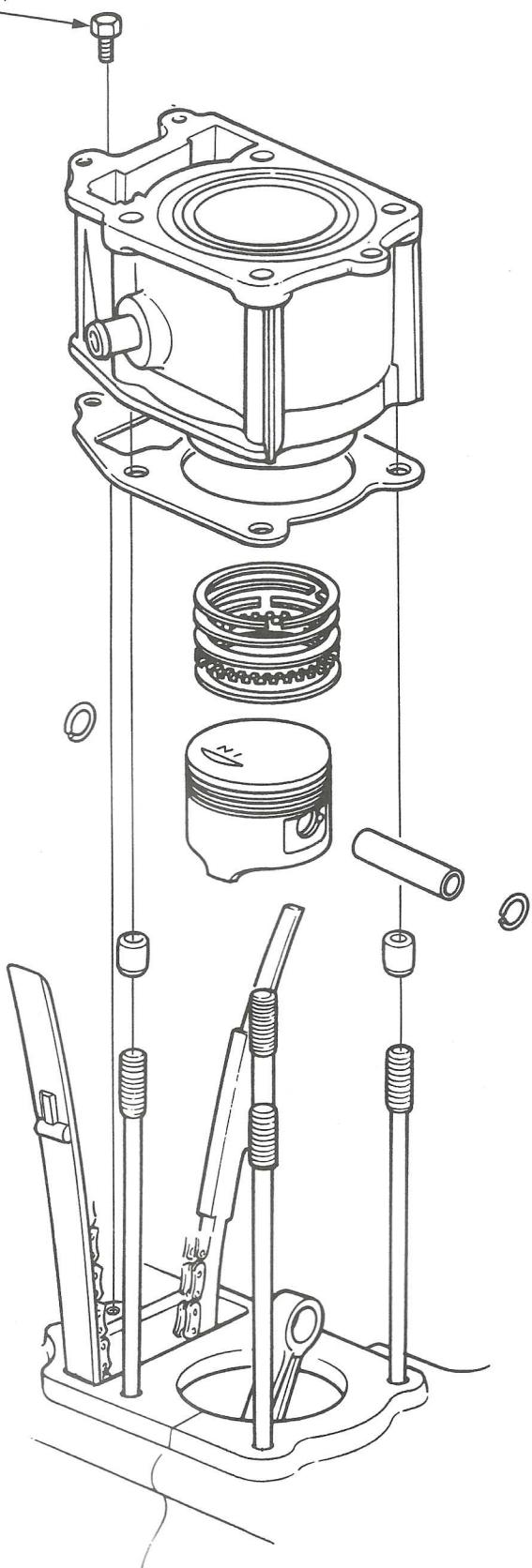
Install the seat, frame center cover and right and left rear covers (page 13-2).



MEMO

CYLINDER/PISTON

8–12 N·m
(0.8–1.2 kg·m, 6–9 ft-lb)



| | | | |
|----------------------------|------------|------------------------------|------------|
| SERVICE INFORMATION | 7-1 | PISTON REMOVAL | 7-3 |
| TROUBLESHOOTING | 7-1 | PISTON INSTALLATION | 7-6 |
| CYLINDER REMOVAL | 7-2 | CYLINDER INSTALLATION | 7-6 |

SERVICE INFORMATION

GENERAL

- The cylinder and piston can be serviced with the engine in the frame.

SPECIFICATIONS

mm (in)

| ITEM | | STANDARD | | SERVICE LIMIT | |
|--------------------------------|-----------------------------|-------------------------------|-----------------------------|---------------|--|
| Cylinder | I.D. | 58.000–58.010 (2.2835–2.2839) | | 58.10 (2.287) | |
| | Warpage | — | | 0.05 (0.002) | |
| Piston, Piston ring | Ring-to-groove clearance | Top | 0.015–0.050 (0.0006–0.0020) | 0.09 (0.004) | |
| | | Second | 0.015–0.050 (0.0006–0.0020) | 0.09 (0.004) | |
| | Ring end gap | Top | 0.15–0.30 (0.006–0.012) | 0.50 (0.020) | |
| | | Second | 0.15–0.30 (0.006–0.012) | 0.50 (0.020) | |
| | | Oil (Side rail) | 0.2–0.9 (0.008–0.035) | — | |
| Piston O.D. | | 57.975–57.995 (2.2825–2.2833) | | 57.90 (2.280) | |
| Piston-to-cylinder clearance | | 0.010–0.040 (0.0004–0.0016) | | 0.10 (0.004) | |
| Piston pin bore | | 15.002–15.008 (0.5906–0.5909) | | 15.04 (0.592) | |
| Piston pin O.D. | | 14.994–15.000 (0.5903–0.5906) | | 14.96 (0.589) | |
| Piston-to-piston pin clearance | | 0.002–0.014 (0.0001–0.0006) | | 0.02 (0.001) | |
| Connecting rod small end I.D. | | 15.016–15.034 (0.5912–0.5919) | | 15.06 (0.593) | |

TORQUE

Cylinder base bolt 8–12 N·m (0.8–1.2 kg·m, 6–9 ft-lb)

TROUBLESHOOTING

Low compression or uneven compression

- Worn cylinder or piston ring

Excessive smoke

- Worn cylinder, piston or piston rings
- Improperly installed piston rings
- Damaged piston or cylinder

Overheating

- Excessive carbon build-up on piston head
- Blocked or restricted flow of coolant
- Sticking thermostat

Knocking or abnormal noise

- Worn piston and cylinder
- Excessive carbon build-up on piston head

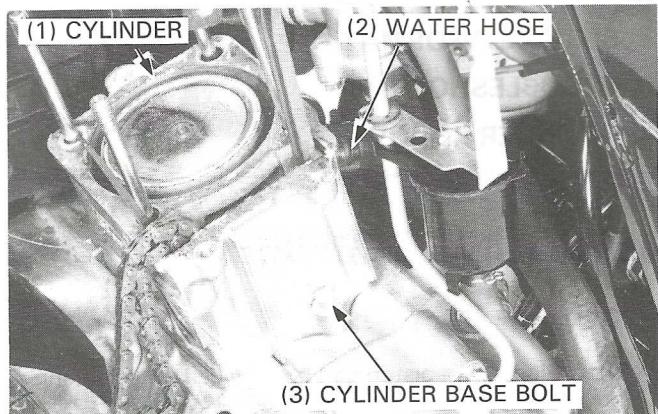
CYLINDER/PISTON

CYLINDER REMOVAL

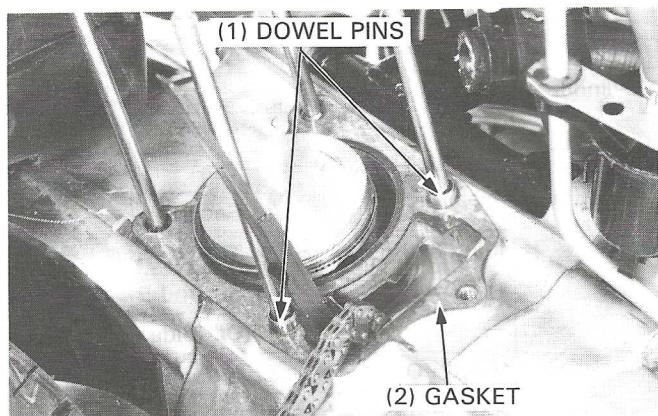
Remove the cylinder head (Section 6).

Remove the water hose from the cylinder.

Remove the cylinder base bolt and cylinder.



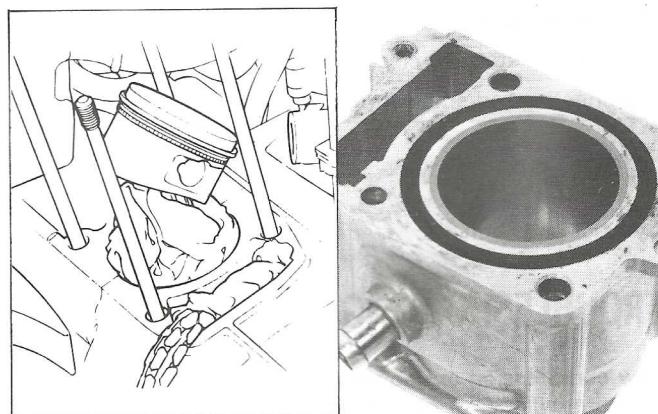
Remove the cylinder gasket and dowel pins.



Clean any gasket material from the cylinder surface.

NOTE

- Gasket material will come off easier if it is soaked in solvent.

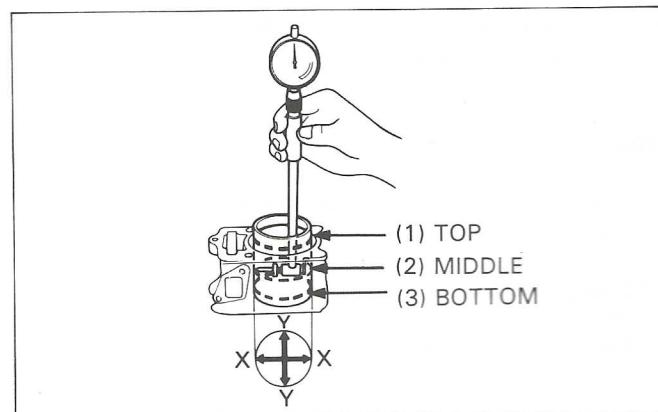


INSPECTION

Inspect the cylinder bore for wear or damage.

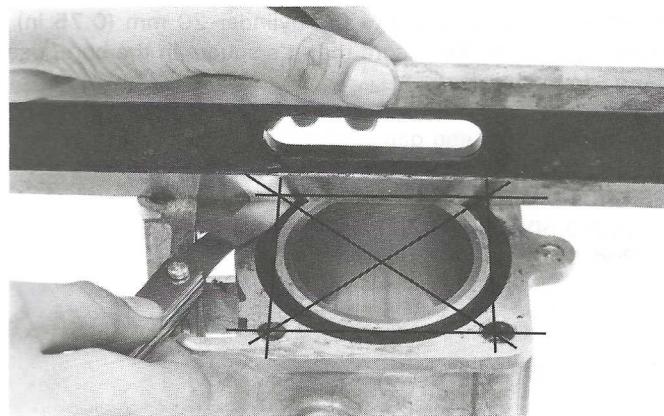
Measure the cylinder I.D. at three levels in both the X and Y axis.

SERVICE LIMIT: 58.10 mm (2.287 in)



Inspect the top of the cylinder for warpage.

SERVICE LIMIT: 0.05 mm (0.002 in)

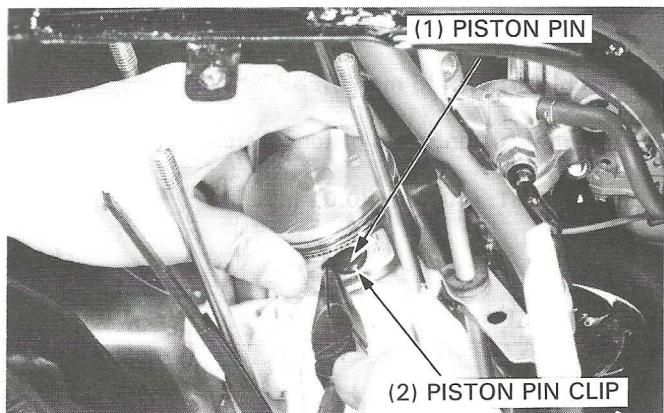


PISTON REMOVAL

Place clean shop towels in the crankcase to keep the piston pin clips, or other parts from falling into the crankcase.

Remove the piston pin clips with pliers.

Press the piston pin out of the piston.



INSPECTION

Measure the piston ring-to-groove clearance.

SERVICE LIMITS:

TOP 0.09 mm (0.004 in)
2nd 0.09 mm (0.004 in)



Remove the piston rings.

Inspect the piston for damage and the ring grooves for wear.

CAUTION

- Piston rings are easily broken; take care not to damage them during removal.



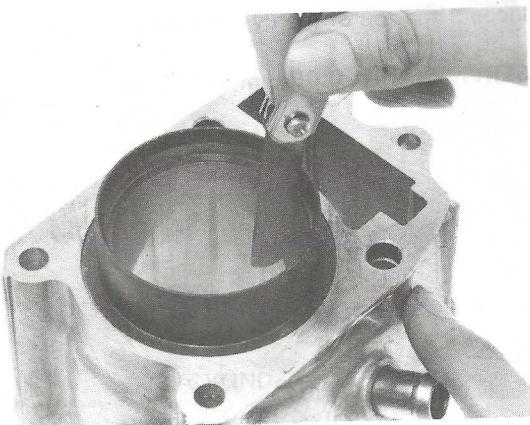
CYLINDER/PISTON

Insert each piston ring into the cylinder 20 mm (0.75 in) in from the bottom. To ensure that it's square in the bore, use a piston to push it in.

Measure the ring end gap.

SERVICE LIMITS:

TOP 0.50 mm (0.020 in)
2nd 0.50mm (0.020 in)



Measure piston pin O.D.

SERVICE LIMIT: 14.96 mm (0.589 in)

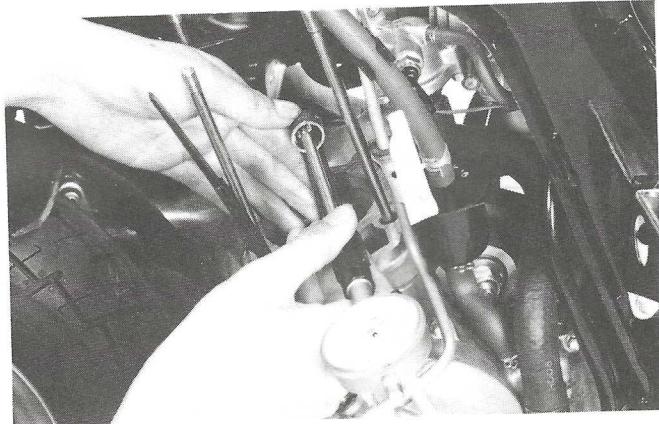
Calculate the piston pin-to-piston clearance.

SERVICE LIMIT: 0.02 mm (0.01 in)



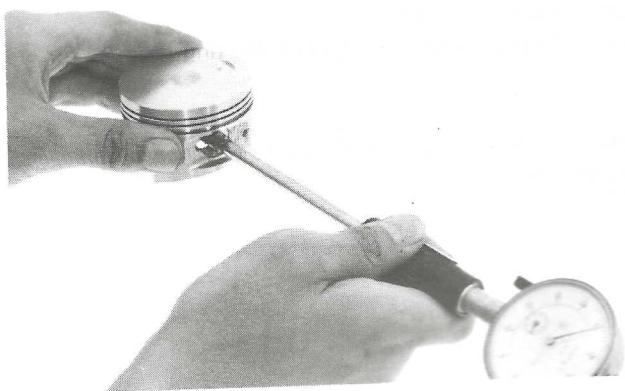
Measure the connecting rod small end I.D.

SERVICE LIMIT: 15.06 mm (0.593 in)



Measure the piston pin hole I.D.

SERVICE LIMIT: 15.04 mm (0.592 in)



Measure the piston O.D.

NOTE

- Take measurements at 10mm (0.4 in) from the bottom, and 90° to the piston pin hole.

SERVICE LIMIT: 57.90 mm (2.280 in)

Compare this measurement against the service limit and to calculate piston-to-cylinder clearance.

Refer to page 7-2 for measuring the cylinder.



PISTON RING INSTALLATION

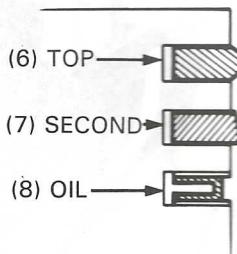
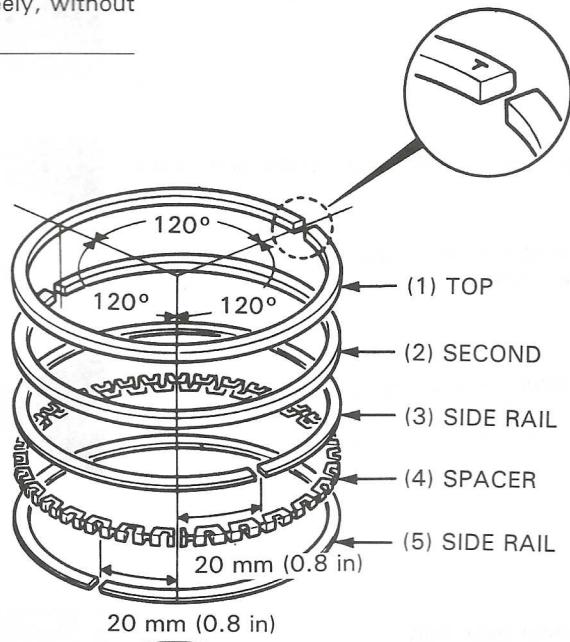
Clean the piston head, ring lands, and skirts.

Carefully install the piston rings onto the piston.

Stagger the ring end gaps as shown.

NOTE

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



CYLINDER/PISTON

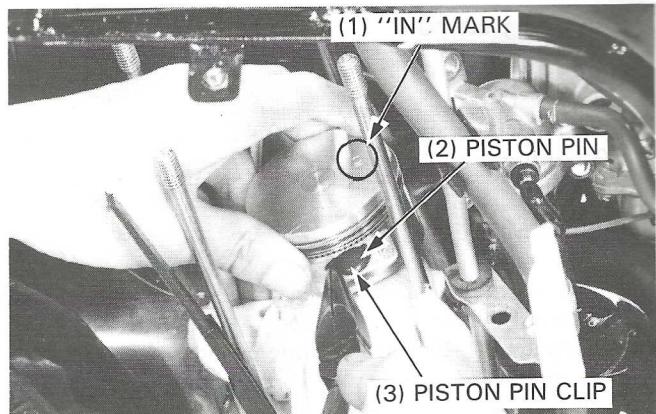
PISTON INSTALLATION

Install the piston and piston pin. Position the piston "IN" mark on the intake valve side.

Install new piston pin clips.

NOTE

- Do not align the piston pin clip end gap with the piston cut-out.
- Place a shop towel around the piston skirt and in the crankcase to prevent the piston pin clips from falling into the crankcase.



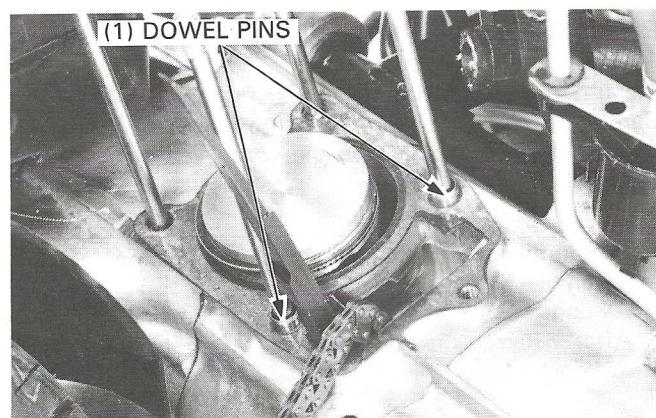
CYLINDER INSTALLATION

Remove any gasket material from the crankcase surface being careful not to get any in the crankcase.

NOTE

- Gasket material will come off easier if it is soaked in solvent.

Install the two dowel pins and a new cylinder gasket.

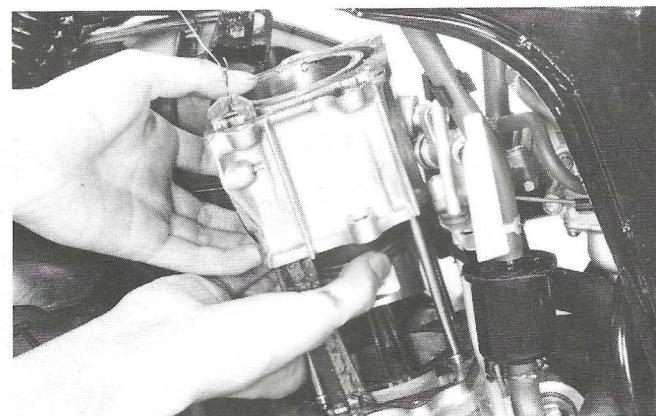


Coat the cylinder bore, piston and piston rings with fresh engine oil.

Carefully lower the cylinder over the piston by compressing the piston rings, one at a time.

CAUTION

- *Do not force the cylinder over a ring; you may damage the piston and piston rings.*



Loosely install the cylinder base bolt.
Connect the water hose to the cylinder.

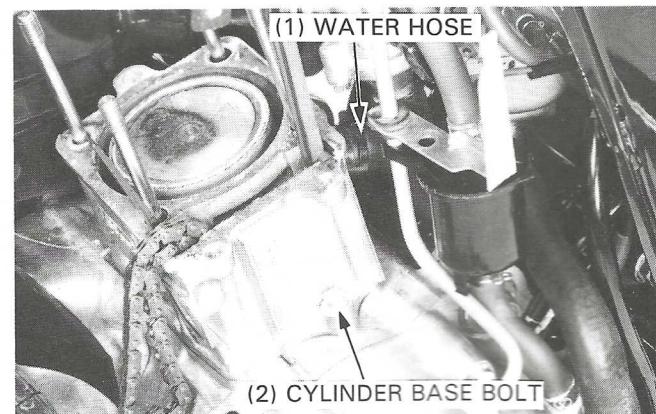
Install the cam chain guide.

NOTE

- Push the guide in until it bottoms in the crankcase guide hole.

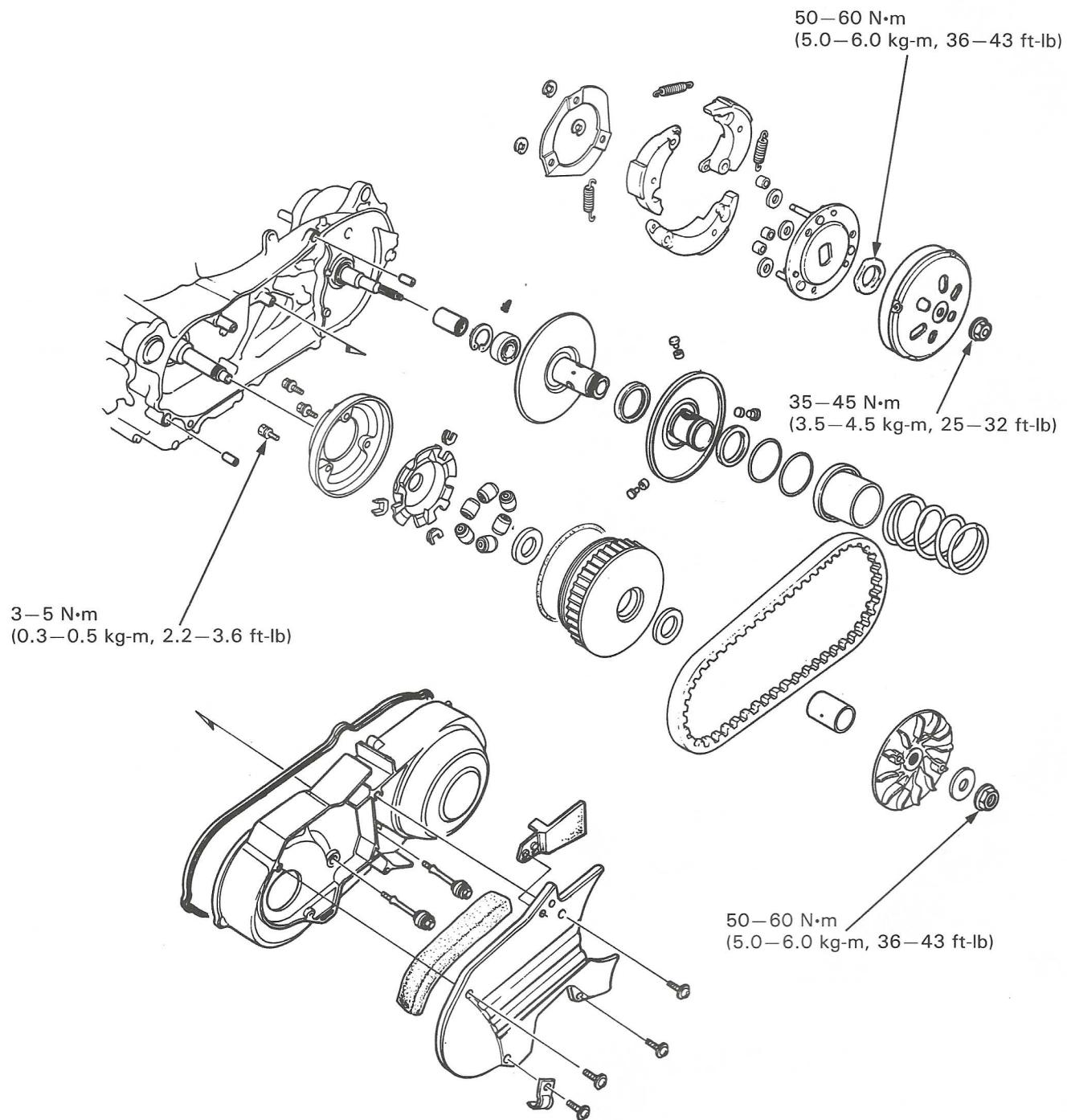
Install the cylinder head (Section 6).
Tighten the cylinder base bolt.

TORQUE: 8–12 N·m (0.8–1.2 kg·m, 6–9 ft-lb)



MEMO

DRIVE PULLEY/CLUTCH/DRIVEN PULLEY



8. DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

| | | |
|----------------------|--------------------------|-----|
| SERVICE INFORMATION | 8-1 DRIVE PULLEY | 8-3 |
| TROUBLESHOOTING | 8-2 CLUTCH/DRIVEN PULLEY | 8-8 |
| LEFT CRANKCASE COVER | 8-3 | |

SERVICE INFORMATION

GENERAL

- The drive pulley, clutch and driven pulley can be serviced with the engine installed.
- Avoid getting grease and oil on the drive belt and pulley faces.

SPECIFICATIONS

mm (in)

| ITEM | STANDARD | SERVICE LIMIT |
|---------------------------------|-------------------------------|---------------|
| Movable drive face bushing I.D. | 27.000–27.021 (1.0630–1.0638) | 27.06 (1.065) |
| Drive face boss O.D. | 26.970–26.990 (1.0618–1.0626) | 26.94 (1.061) |
| Drive belt width | 19.0 (0.75) | 17.5 (0.689) |
| Clutch lining thickness | — | 2.0 (0.08) |
| Clutch outer I.D. | 130.0–130.2 (5.12–5.13) | 130.5 (5.14) |
| Driven face spring free length | 88.3 (3.476) | 83.2 (3.28) |
| Driven face O.D. | 33.965–35.985 (1.3372–1.4167) | 33.94 (1.336) |
| Movable driven face I.D. | 34.000–34.025 (1.3386–1.3396) | 34.06 (1.362) |
| Weight roller O.D. | 19.95–20.10 (0.785–0.791) | 19.5 (0.77) |

TORQUE VALUES

| | |
|----------------------------|---------------------------------------|
| Clutch drive plate nut | 50–60 N·m (5.0–6.0 kg-m, 36–43 ft-lb) |
| Drive face seal cover bolt | 3–5 N·m (0.3–0.5 kg-m, 2.2–3.6 ft-lb) |
| Clutch outer nut | 35–45 N·m (3.5–4.5 kg-m, 25–32 ft-lb) |
| Drive face nut | 50–60 N·m (5.0–6.0 kg-m, 36–43 ft-lb) |

TOOLS

Special

| | |
|---------------------------|--|
| Socket wrench, 39 x 41 mm | 07GMA-KS40100 or 07916-1870002 |
| Clutch spring compressor | 07960-KM10000 (07960-KM1000A USA only) |
| Bearing driver | 07945-GC80000 |

Common

| | |
|------------------------|---------------|
| Universal holder | 07725-0030000 |
| Driver | 07749-0010000 |
| Pilot, 20 mm | 07746-0040500 |
| Attachment, 32 x 35 mm | 07746-0010100 |

TROUBLESHOOTING

Engine starts but scooter won't move

- Worn drive belt
- Damaged ramp plate
- Worn or damaged clutch lining

Engine stalls or scooter creeps

- Broken clutch weight spring

Poor performance at high speed or lack of power

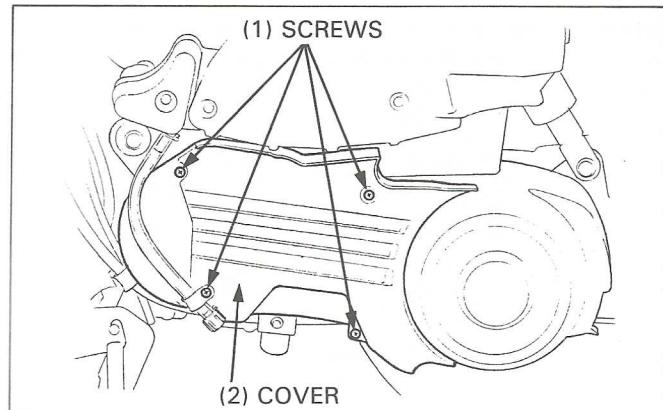
- Worn drive belt
- Weak driven face spring
- Faulty driven face

LEFT CRANKCASE COVER

REMOVAL

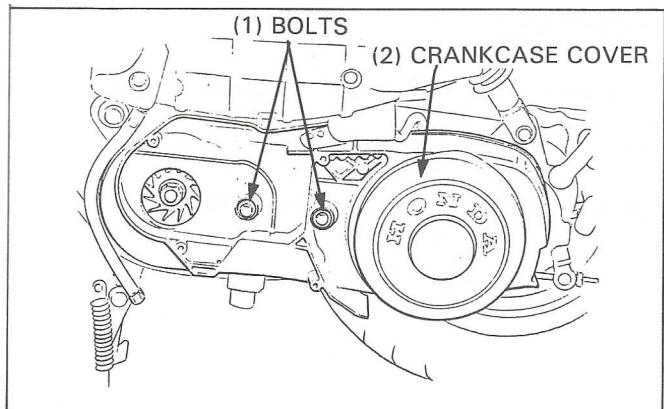
Remove the left rear cover (page 13-2).

Remove the drive belt air cleaner cover screws and cover.



Remove the rear brake cable clamps.

Remove the left crankcase cover bolts and left crankcase cover



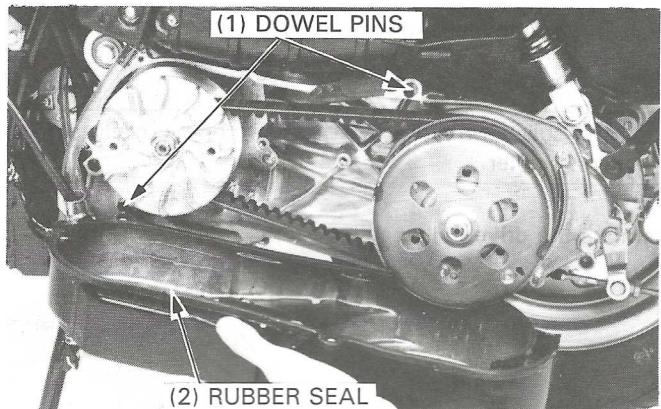
INSTALLATION

Install the dowel pins.

Install the seal rubber on the left crankcase cover.

Install the left crankcase cover and tighten the two attaching bolts, being careful that the rubber seal is in position.

Install the brake cable clamp.



DRIVE PULLEY

REMOVAL

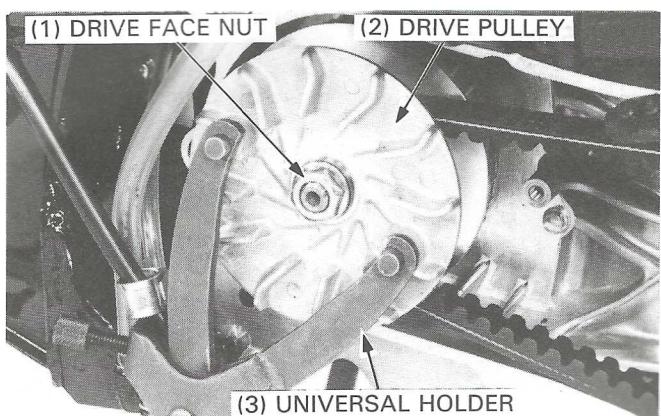
Remove the left crankcase cover.

Hold the drive pulley and remove the drive face nut, washer and drive pulley face.

TOOL:

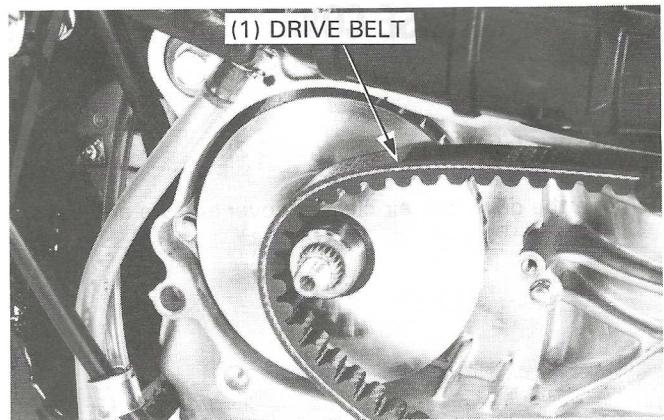
Universal holder

07725-0030000



DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

Pull out the drive belt from the drive pulley face collar and then remove the drive belt from the driven pulley to avoid damaging the belt.

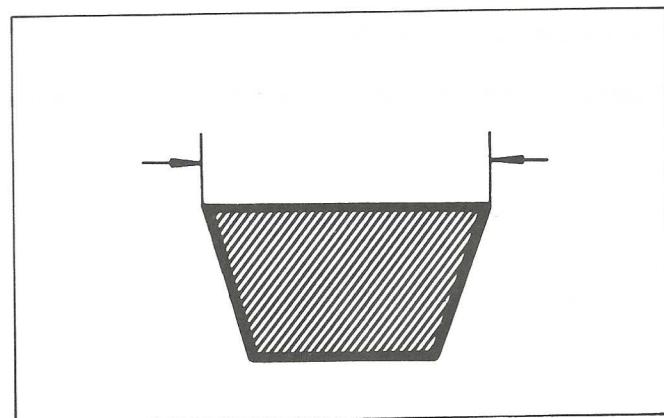


INSPECTION

Check the drive belt for cracks, separation or abnormal or excessive wear.

- Measure the drive belt width.

SERVICE LIMIT: 17.5 mm (0.689 in)

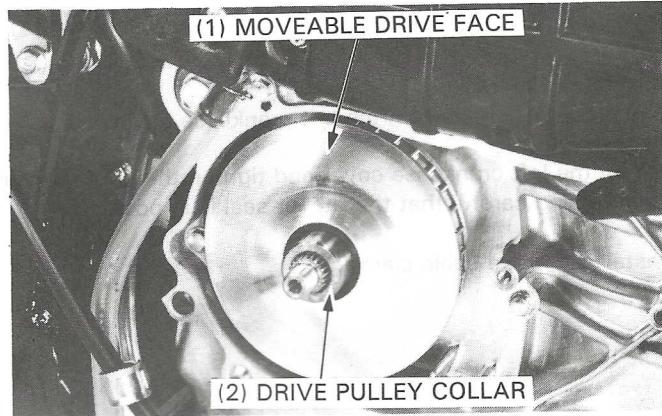


Remove the moveable drive face assembly.

NOTE

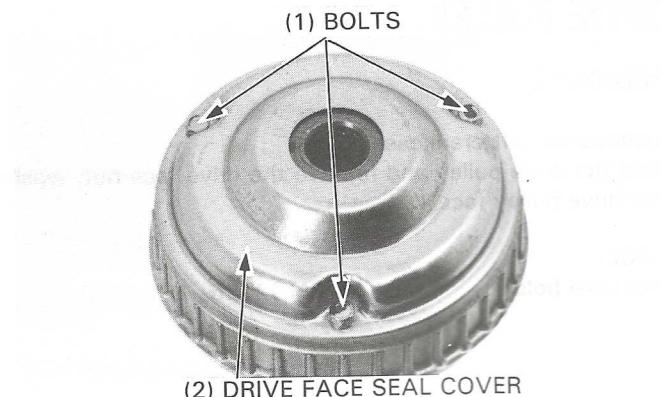
- If the spline fitting is tight, use a commercially available bearing puller.

Remove the drive pulley collar.

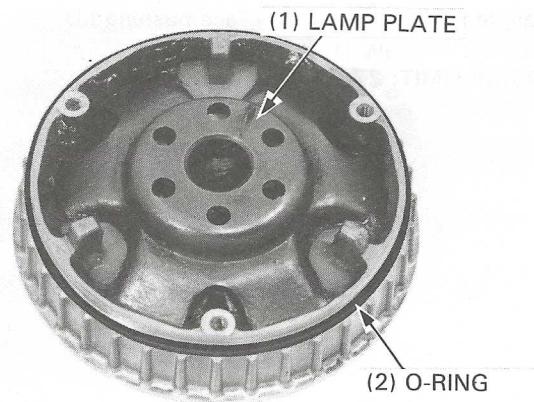


DISASSEMBLY

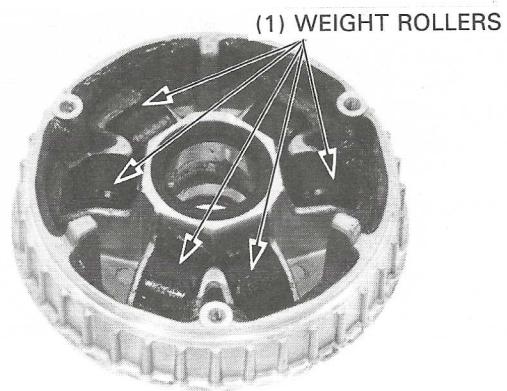
Remove the three bolts and remove the drive face seal cover.



Remove the ramp plate and O-ring.



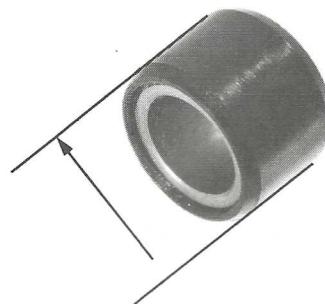
Remove the weight rollers.



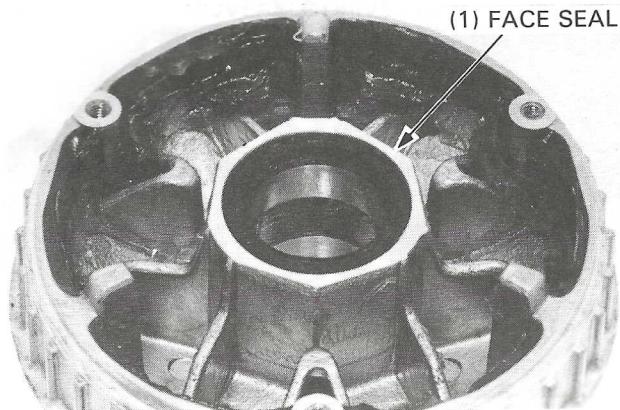
INSPECTION

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

SERVICE LIMIT: 19.5 mm (0.77 in)



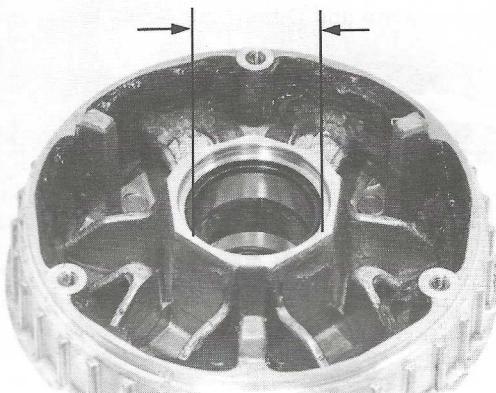
Check the face seal for wear or damage.
Replace the face seal with a new one if necessary.



DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

Measure the moveable drive face bushing I.D.

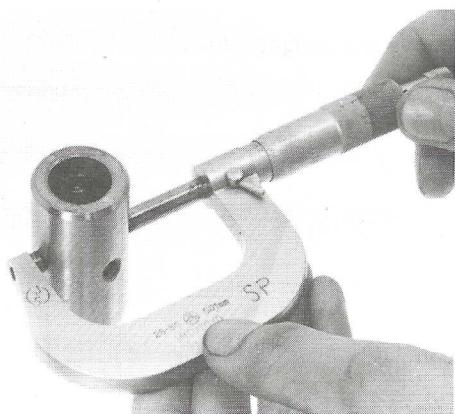
SERVICE LIMIT: 27.06 mm (1.065 in)



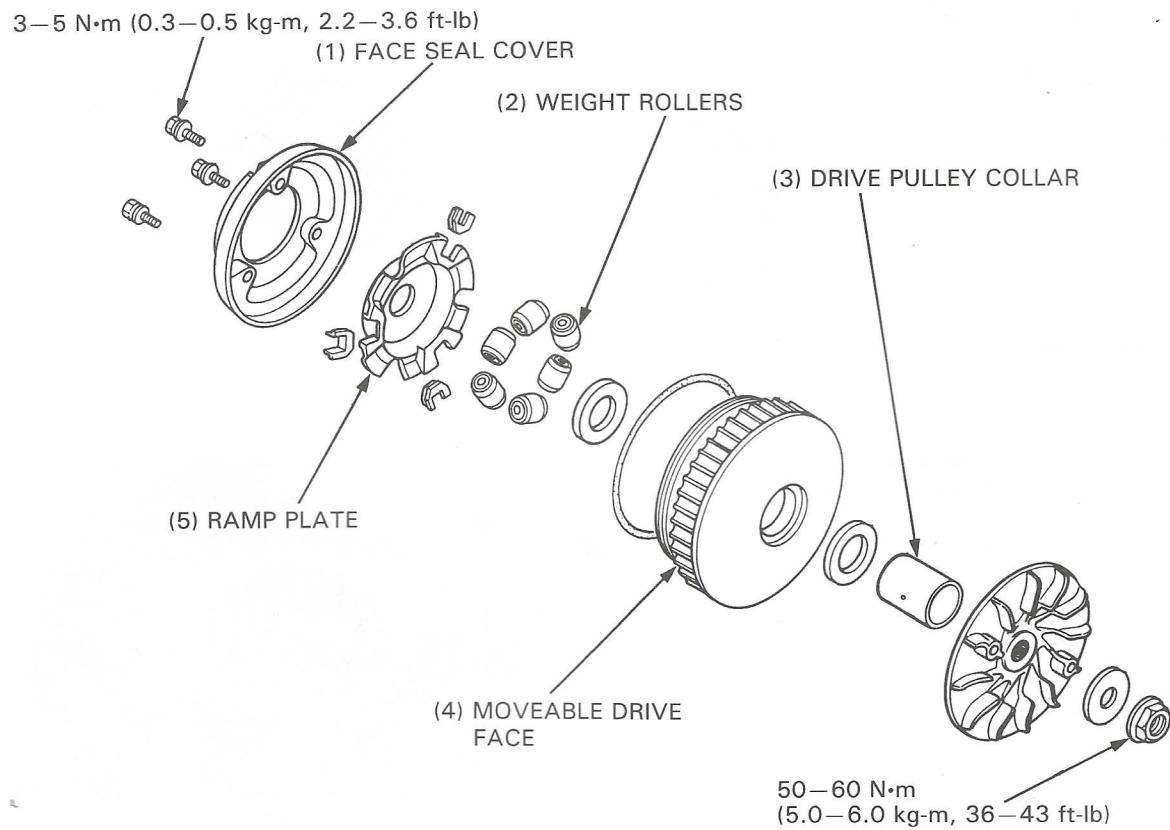
Check the drive face boss for wear or damage.

Measure the O.D. at the drive face sliding surface.

SERVICE LIMIT: 26.94 mm (1.061 in)



ASSEMBLY



Lubricate the inside of the drive face with grease, then install the weight rollers.

NOTE

Use 25–30 g of grease and apply evenly to the inside.
Specified grease:

Lithium based grease

- Mitsubishi: HD-3

- Nippon Sekiyu: Lipanox Deluxe 3

- Idemitsu: Autolex B

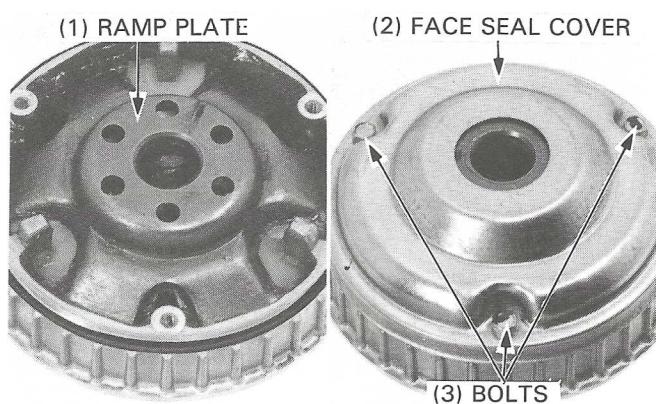
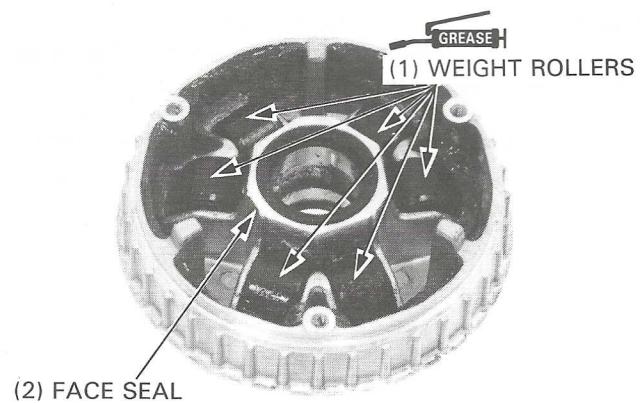
- Bel-Ray Moly Lube 126 EP#0

- Sta-Lube MP Grease #3141

Apply grease to the O-ring and install it.

Install the ramp plate and face seal cover, and tighten the cover attaching bolts.

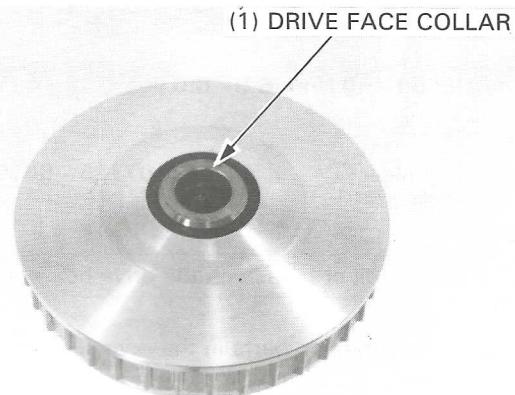
TORQUE: 3–5 N·m (0.3–0.5 kg·m, 2.2–3.6 ft-lb)



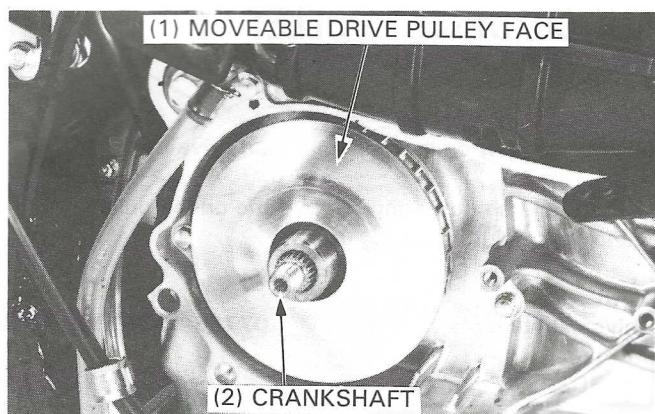
INSTALLATION

Apply grease to the drive pulley collar and insert it into the moveable drive pulley face.

Clean off any grease or oil from the drive pulley faces.



Install the moveable drive face onto the crankshaft.

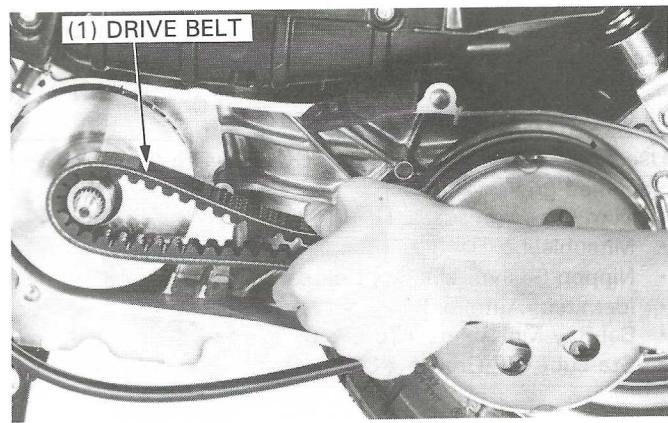


DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

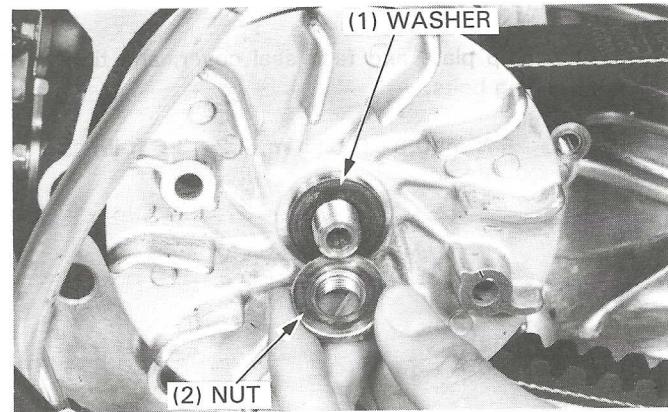
Lay the drive belt on the driven pulley.

Squeeze the drive belt to widen the driven pulley faces then set the drive belt on the drive pulley face collar.

Clean the drive pulley face and install the pulley face on the crankshaft.



Set the washer on the crankshaft and loosely install the drive face nut.



Hold the drive pulley and tighten the drive face nut.

TORQUE: 50–60 N·m (5.0–6.0 kg·m, 36–43 ft-lb)

TOOL:

Universal holder

07725-0030000

NOTE

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



CLUTCH/DRIVEN PULLEY

REMOVAL

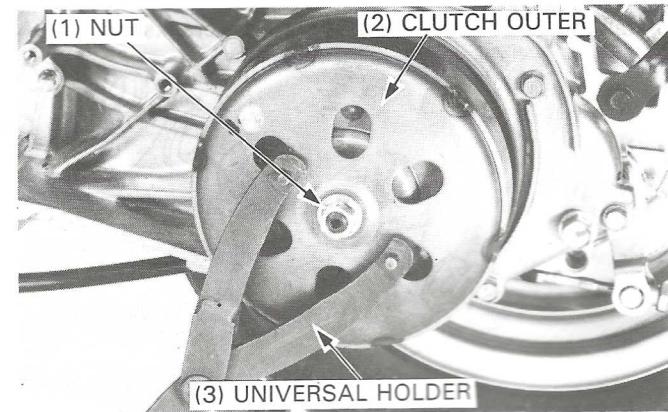
Remove the left crankcase cover and drive belt (page 8-3).

Hold the clutch outer and remove the driven pulley nut.
Remove the clutch outer.

TOOL:

Universal holder

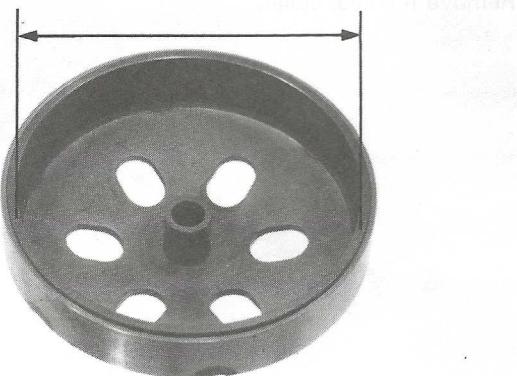
07725-0030000



INSPECTION

Check the clutch outer for wear or damage.
Measure the clutch outer I.D.

SERVICE LIMIT: 130.5 mm (5.14 in)



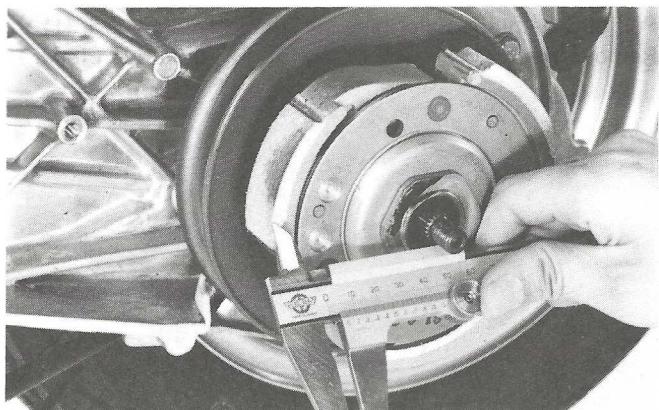
Check the clutch shoes for wear or damage.
Measure the clutch lining thickness.

SERVICE LIMIT: 2.0 mm (0.08 in)

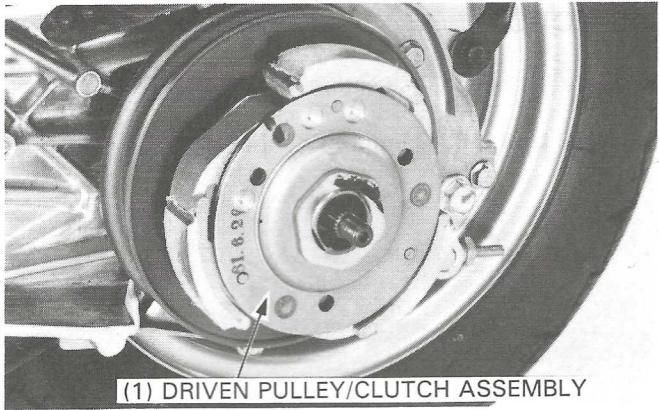
See page 8-12 for clutch shoe replacement.

NOTE

- Replace the clutch shoes as a set.



Remove the driven pulley/clutch assembly.

**DISASSEMBLY**

Hold the driven pulley/clutch assembly with the clutch spring compressor.

CAUTION

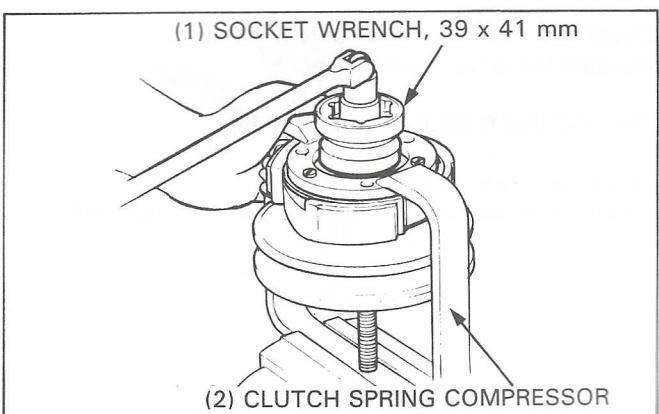
- *Do not tighten the tool more than necessary or the drive plate may be damaged.*

Set the tool in a vise and remove the 28 mm drive plate nut.

Loosen the tool and disassemble the driven pulley/clutch assembly.

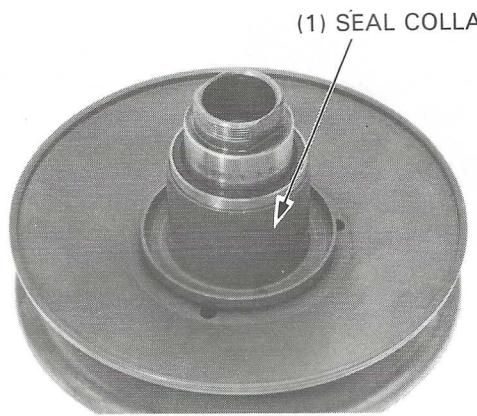
TOOLS:

| | |
|---------------------------|--|
| Socket wrench, 39 x 41 mm | 07GMA-KS40100 or 07916-1870002 |
| Clutch spring compressor | 07960-KM10000 (07960-KM1000A USA only) |

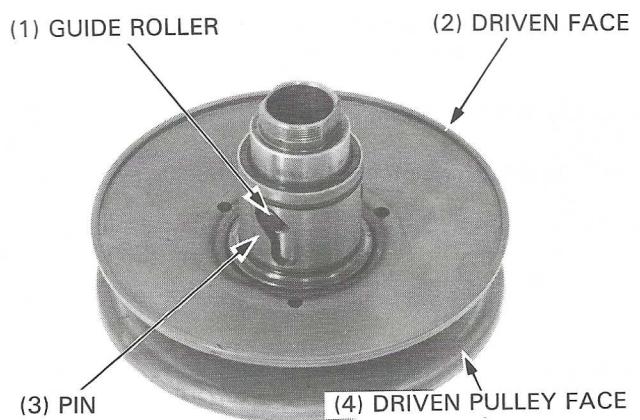


DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

Remove the seal collar.



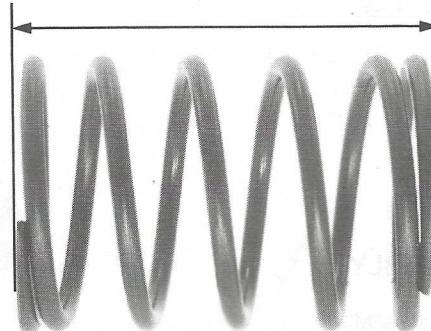
Pull out the guide roller pins and guide rollers.
Remove the moveable driven face from the driven face.



INSPECTION

Measure the driven face spring free length.

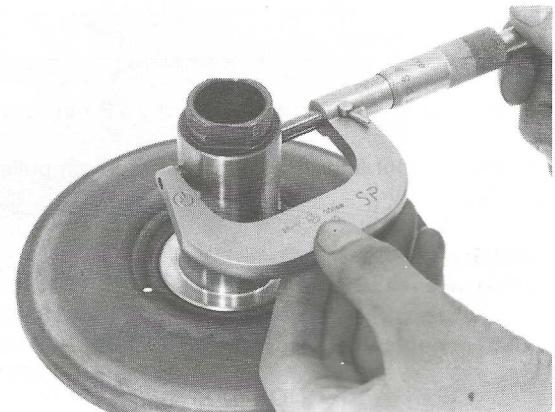
SERVICE LIMIT: 83.2 mm (3.28 in)



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

SERVICE LIMIT: 33.94 mm (1.336 in)

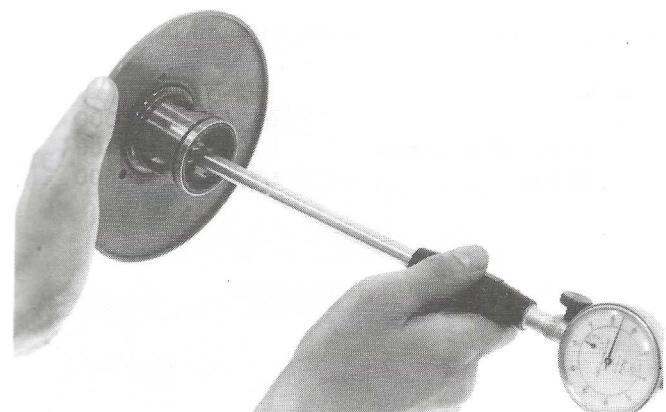
Check the bearings for play.
Replaced the bearing if it has excessive play (page 8-11).



Check the moveable driven face for wear, scratches or scoring.
Measure the moveable driven face I.D.

SERVICE LIMIT: 34.06 mm (1.362 in)

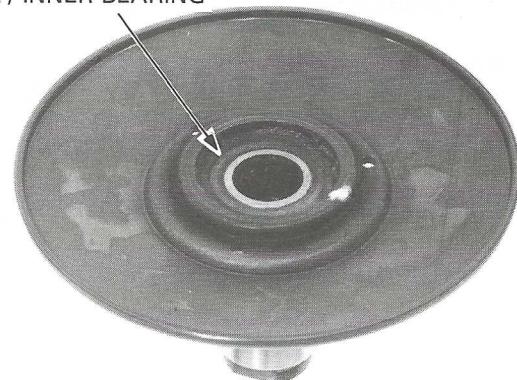
Check the guide groove for stepped wear.
Check the oil seal and O-ring for damage or wear.
Replace if necessary.



DRIVEN PULLEY FACE BEARING REPLACEMENT

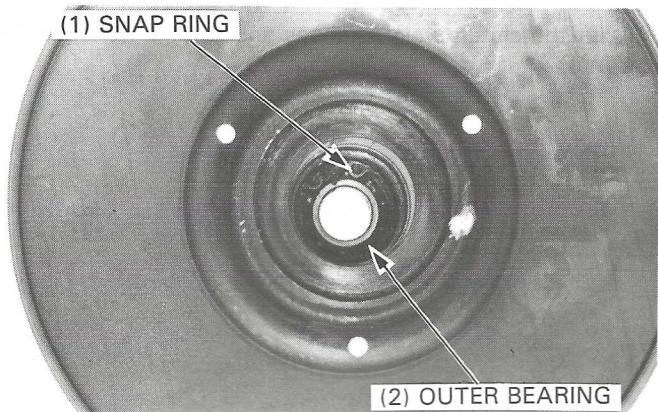
Drive the needle bearing out of the driven pulley face.

(1) INNER BEARING



Remove the snap ring and drive the outer bearing out of the driven face

(1) SNAP RING



(2) OUTER BEARING

Pack all bearing cavities with 8.0–8.5g grease.

NOTE

Specified grease:

- Nippon sekiyu 3, Sta-Lub MP grease #3141, or Bel-Ray Moly Lube 126 Ep#0

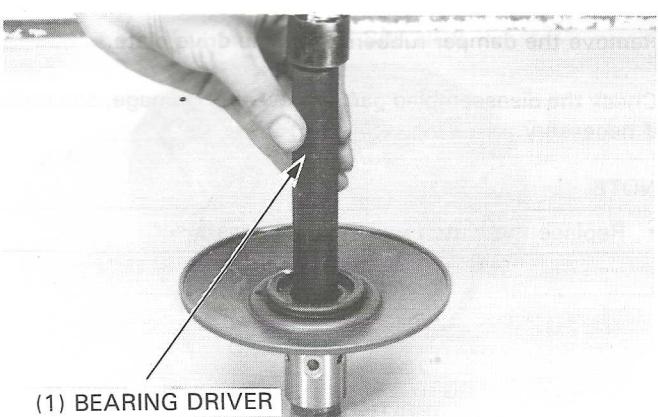
Use a bearing driver to drive the outer bearing into the driven face with the sealed end facing out.

TOOL:

Bearing driver

07945-GC80000

Seat the snap ring in its groove.



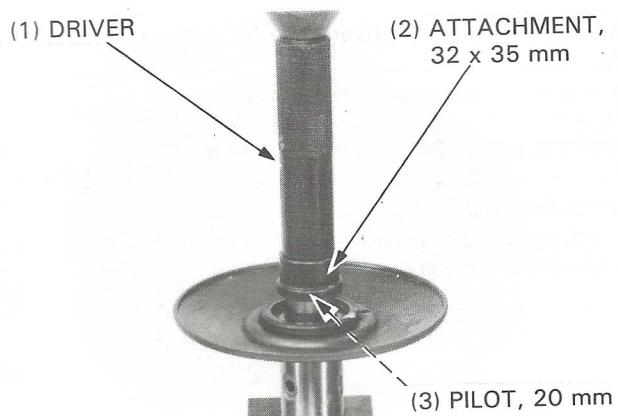
(1) BEARING DRIVER

DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

Press the needle bearing into the driven face.

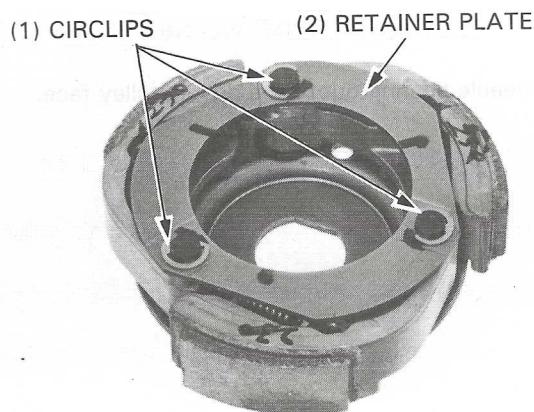
TOOLS:

| | |
|------------------------|---------------|
| Driver | 07749-0010000 |
| Attachment, 32 x 35 mm | 07746-0010100 |
| Pilot, 20 mm | 07746-0040500 |

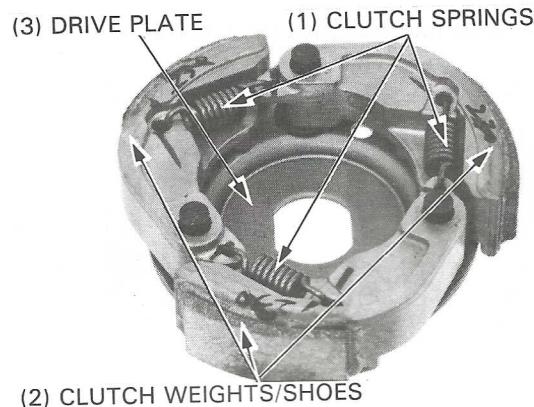


CLUTCH DISASSEMBLY

Remove the circlips and retainer plate.



Pull out the clutch weights/shoes and springs from the drive plate.



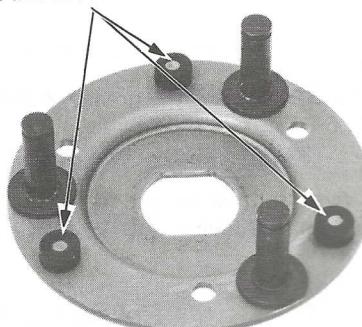
Remove the damper rubbers from the drive plate.

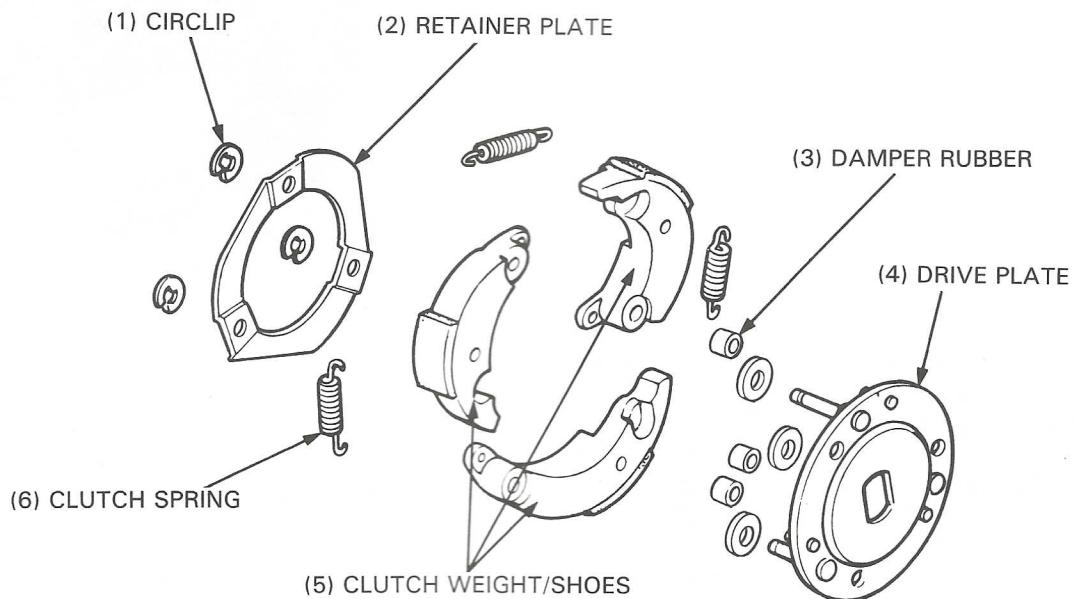
Check the disassembled parts for wear or damage, and replace if necessary.

NOTE

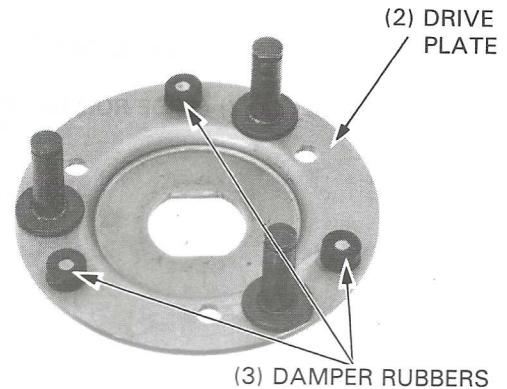
- Replace the clutch weights/shoes as a set.

(1) DAMPER RUBBERS

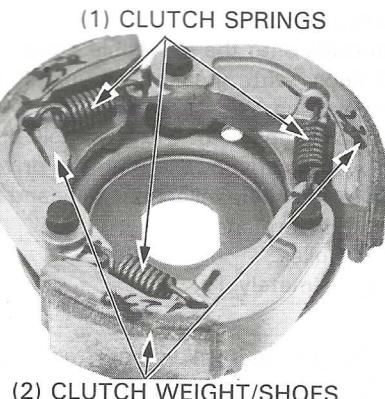




Install the damper rubbers on the short pins on the drive plate.

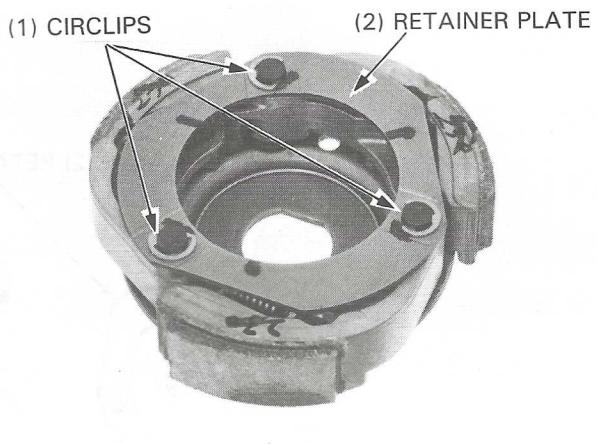


Set the clutch weights/shoes and clutch springs and then install them onto the drive plate.

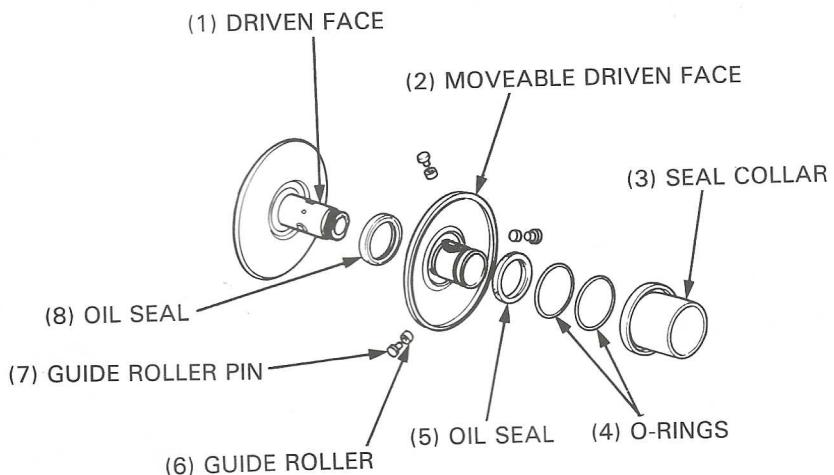


DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

Install the retainer plate and secure with the circlips.



ASSEMBLY



Clean the pulley faces.

Install the oil seals onto the moveable driven face.

Coat the O-rings with grease and install them onto the moveable driven face.

Apply grease to the inside of the moveable driven face.

Install the moveable driven face onto the driven face.

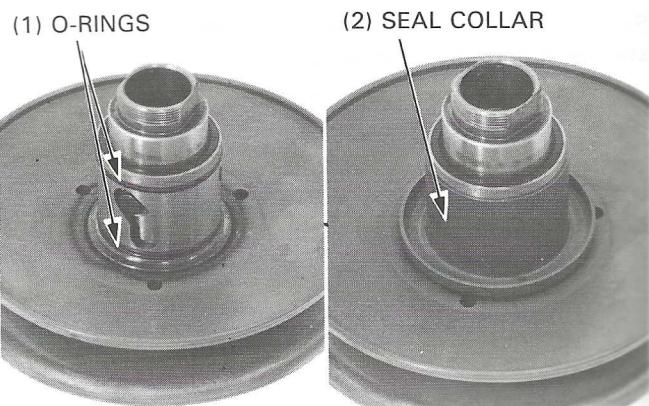
Apply grease to the guide rollers and pins and install them into the hole of the driven face.

Install the seal collar.

GREASE: Approximately 1g.

NOTE

- Wipe off the grease, if leaked out, from the movable driven face.



Set the driven pulley assembly, driven face spring and clutch assembly onto the clutch compressor.

Align the flat surface of the driven face with the flat on the clutch drive plate.

Compress the tool and install the 28 mm drive plate nut loosely.

Set the tool in a vice and tighten the drive plate nut to the specified torque.

TORQUE: 50–60 N·m (5.0–6.0 kg-m, 36–43 ft-lb)

TOOLS:

Socket wrench, 39 x 41 mm 07GMA-KS40100 or
 07916-1870002

Clutch spring compressor 07960-KM10000
 (07960-KM1000A USA
 only)

Remove the driven pulley/clutch assembly from the tool.

INSTALLATION

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

NOTE

- Be sure to wipe off the grease, if leaked out, from the drive shaft.

Install the clutch outer and tighten the nut while holding the clutch outer with the universal holder.

TORQUE: 35–45 N·m (3.5–4.5 kg-m, 25–32 ft-lb)

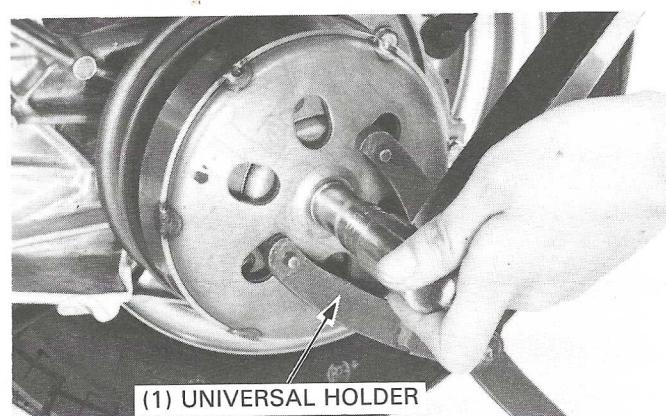
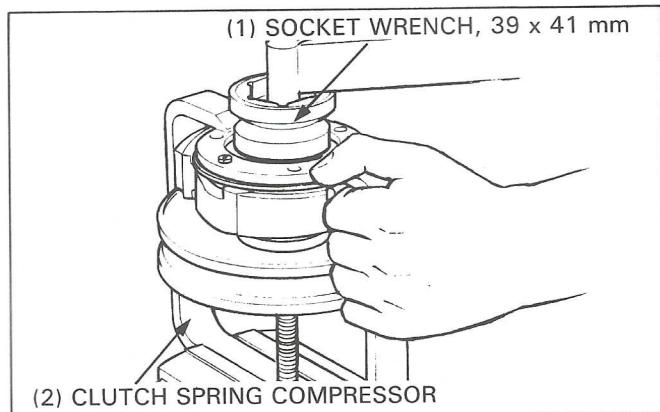
TOOL:

Universal holder 07725-0030000

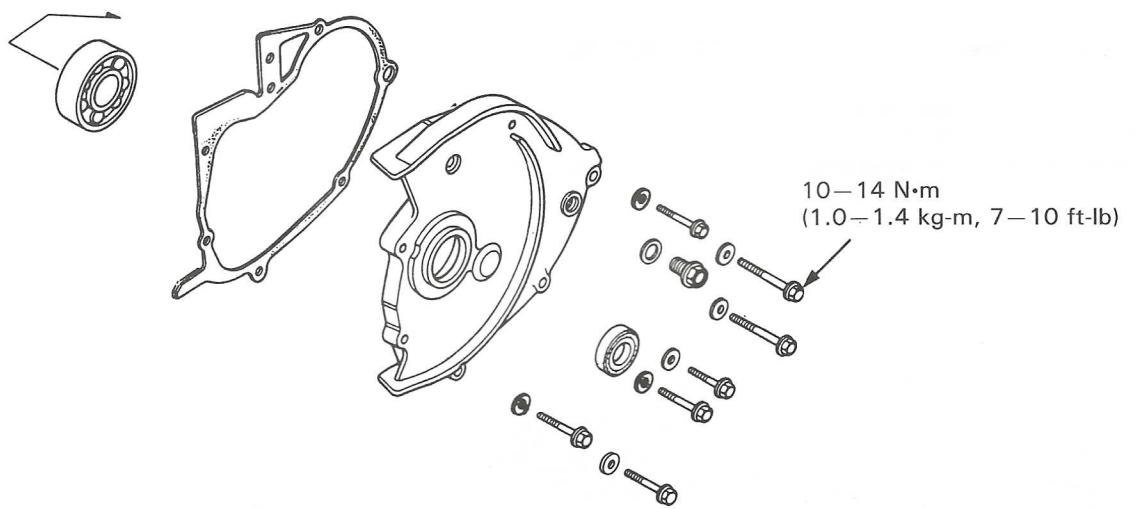
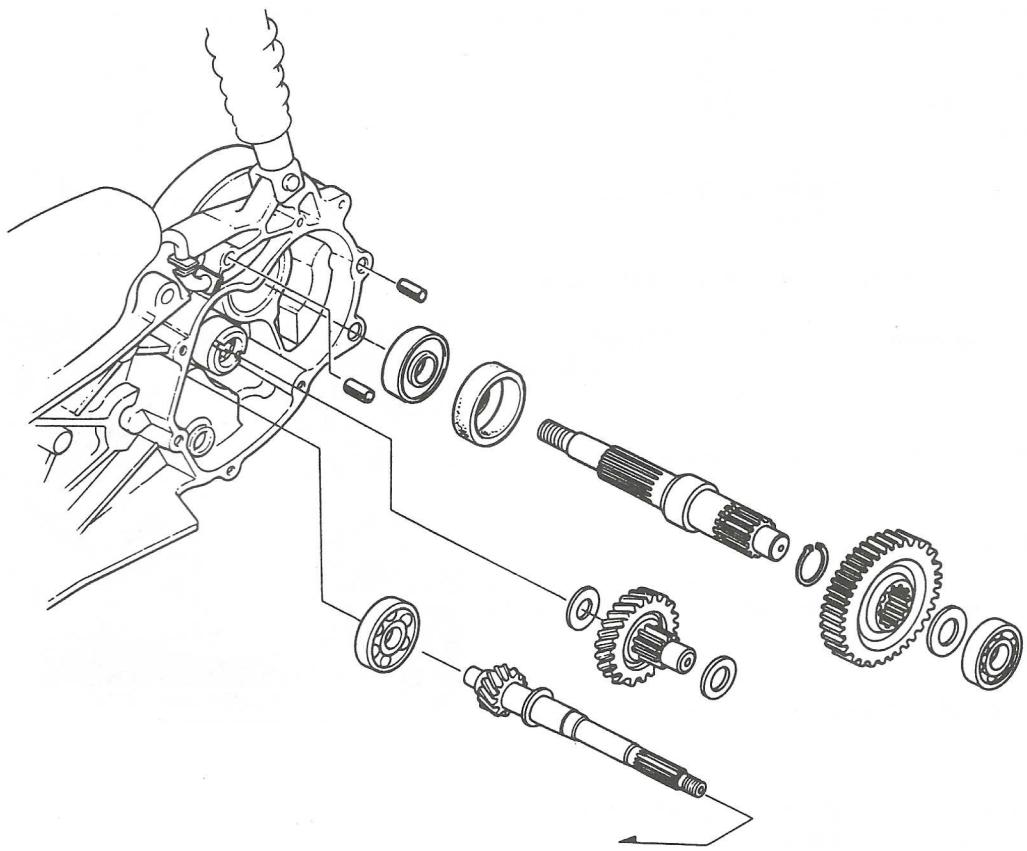
Install the drive belt (page 8-7).

Install the left crankcase cover (page 8-3).

Install the removed parts in reverse order of the removal.



FINAL REDUCTION



9. FINAL REDUCTION

| | | | |
|-----------------------------|-----|----------------------------|-----|
| SERVICE INFORMATION | 9-1 | FINAL REDUCTION INSPECTION | 9-2 |
| TROUBLESHOOTING | 9-1 | FINAL REDUCTION ASSEMBLY | 9-5 |
| FINAL REDUCTION DISASSEMBLY | 9-2 | | |

SERVICE INFORMATION

SPECIFICATIONS

Specified oil: Honda 4-stroke oil, SAE 10W-40 or equivalent
Oil capacity: 0.18 liter (0.19 US qt, 0.16 Imp qt) at disassembly
0.15 liter (0.16 US qt, 0.13 Imp qt) at change

TORQUE VALUE

Transmission case cover bolt 10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

TOOLS

Special

| | |
|-----------------------------|---|
| Bearing remover, 12 mm | 07936-1660001 |
| —spindle assy | (07936-1660100) |
| —remover weight | (07741-0010201 or 07936-3710200) |
| Bearing remover handle | 07936-3710100 |
| Bearing remover, 17 mm | 07936-3710300 |
| Shaft protector | 07931-1870000 |
| Seal and case assembly tool | 07965-1480010 Not available in U.S.A. |
| —assembly collar | (07965-1480100) |
| —assembly shaft | (07965-GM00300) |
| Universal bearing puller | 07631-0010000 Equivalent commercially available in U.S.A. |

Common

| | |
|------------------------|---------------|
| Attachment, 32 x 35 mm | 07746-0010100 |
| Attachment, 37 x 40 mm | 07746-0010200 |
| Attachment, 42 x 47 mm | 07746-0010300 |
| Pilot, 12 mm | 07746-0040200 |
| Pilot, 20 mm | 07746-0040500 |
| Driver | 07749-0010000 |

TROUBLESHOOTING

Engine starts but scooter won't move

- Damaged transmission
- Seized transmission

Abnormal noise

- Worn, seized or chipped gears
- Worn bearing

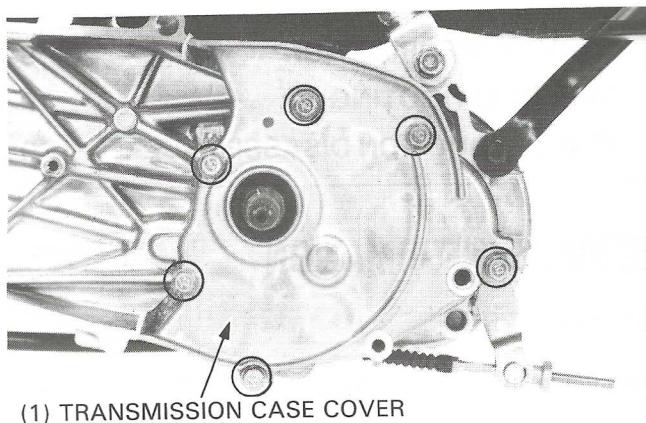
Oil leaks

- Oil level too high
- Worn or damaged oil seal

FINAL REDUCTION

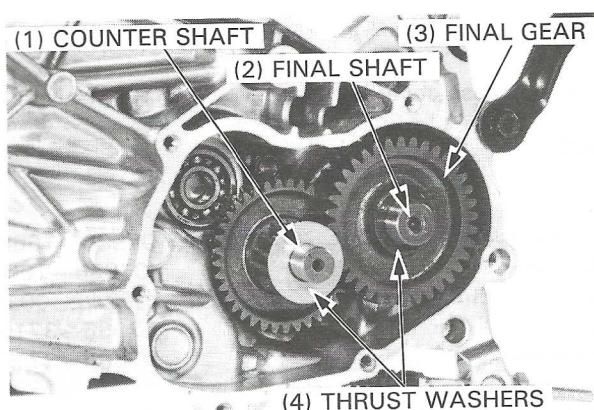
FINAL REDUCTION DISASSEMBLY

Remove the driven pulley (page 8-8).
Drain the final reduction oil (page 2-6).
Remove the rear wheel (page 15-2).
Remove the transmission case cover by removing the attaching bolts.
Remove the gasket and dowel pins.

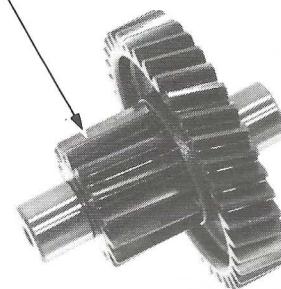


(1) TRANSMISSION CASE COVER

Remove the thrust washers.
Remove the final gear and final shaft.
Remove the counter shaft and washer.



(1) COUNTER SHAFT AND GEAR



(1) FINAL GEAR

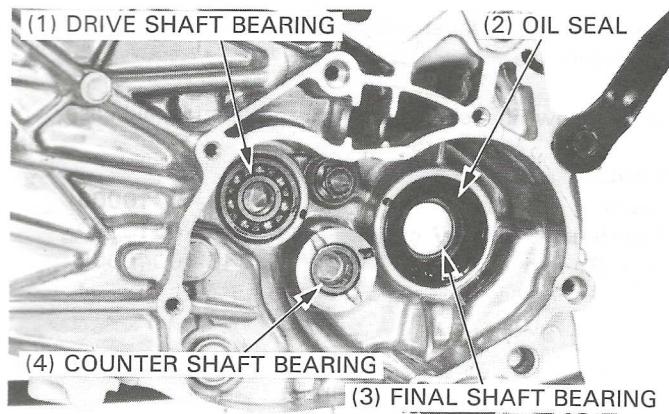


Inspect the counter shaft and gear for wear or damage.

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

Inspect the transmission case bearings:

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the crankcase. Remove and discard the bearings if they do not turn smoothly, quietly, or if they fit loosely in the case.

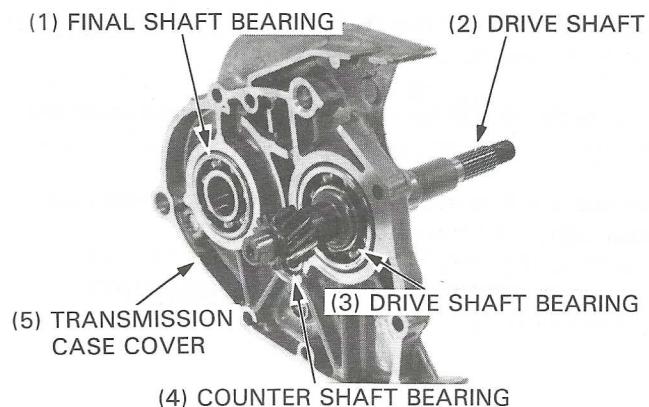
Inspect the oil seal for wear or damage; replace if necessary.

Inspect the transmission case cover bearings as above, and replace them if necessary.

NOTE

- Do not remove the drive shaft from the cover. If the drive shaft is removed from the cover, the drive shaft bearing must be replaced with a new one.

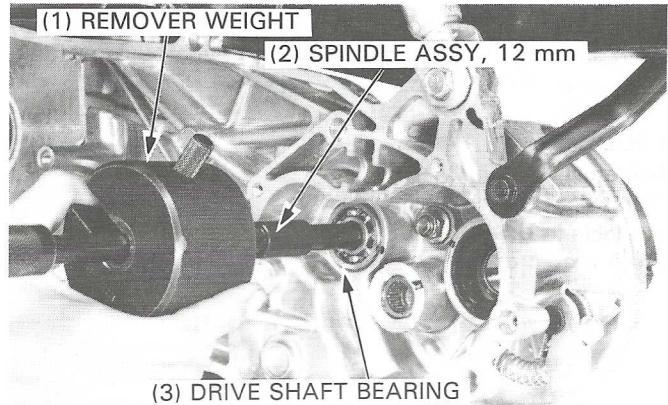
Inspect the drive shaft and gear for wear or damage.

**BEARING REPLACEMENT****CAUTION**

- Never reinstall a used bearing, once the bearings are removed, they must be replaced with new ones.

Remove the drive shaft bearing from the left crankcase using the following tools;

| | |
|----------------------------|-----------------------------------|
| Bearing remover set, 12 mm | 07936-1660001 |
| Spindle assy, 12 mm | 07936-1660100 |
| Remover weight | 07741-0010201 or 07936-3710201 |

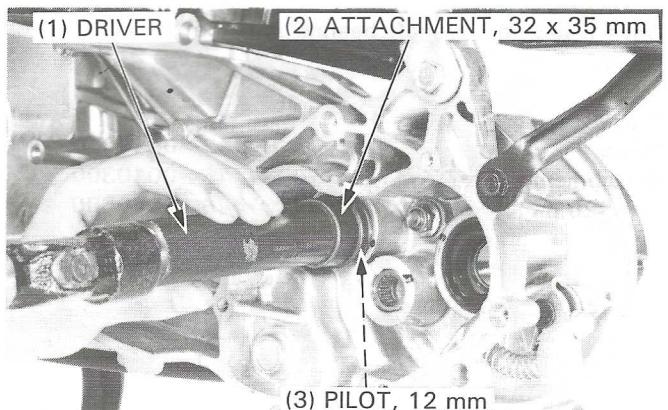
**NOTE**

- The countershaft needle bearings cannot be replaced.
- If the bearing in the transmission case cover fails, the cover must be replaced; the same is true for the countershaft needle bearing in the left crankcase.

Drive a new drive shaft bearing into the left crankcase.

TOOLS:

| | |
|------------------------|---------------|
| Driver | 07749-0010000 |
| Attachment, 32 x 35 mm | 07746-0010100 |
| Pilot, 12 mm | 07746-0040200 |



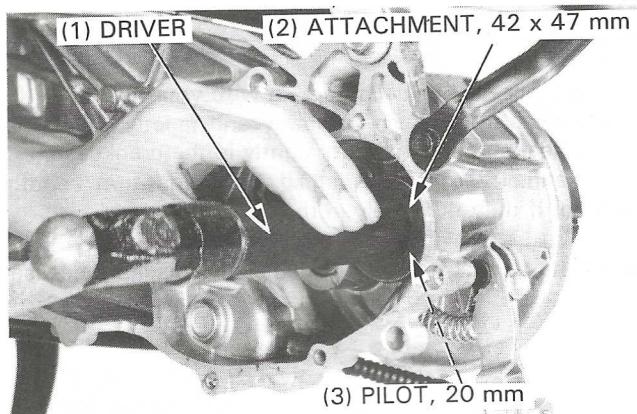
FINAL REDUCTION

Remove the oil seal and drive the final shaft bearing from the left crankcase.

Drive a new final shaft bearing into the left crankcase.

TOOLS:

| | |
|------------------------|---------------|
| Driver | 07749-0010000 |
| Attachment, 42 x 47 mm | 07746-0010300 |
| Pilot, 20 mm | 07746-0040500 |

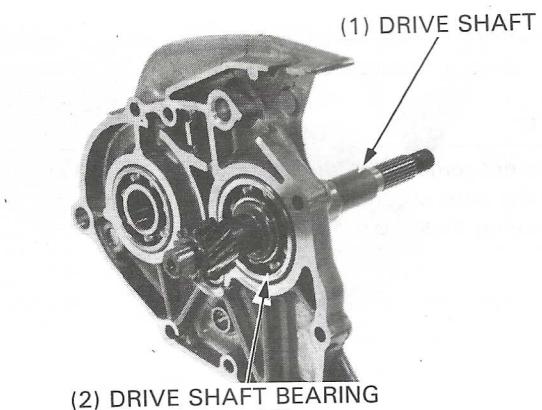


Press the drive shaft out of the transmission case cover using the shaft protector 07931-1870000.

Remove the oil seal from the transmission case cover and discard it.

Remove the final shaft bearing from the transmission case cover using a following tools;

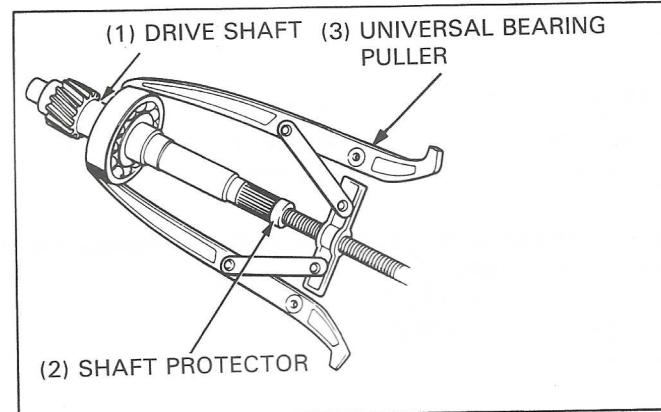
| | |
|------------------------|-----------------------------------|
| Bearing remover, 17 mm | 07936-3710300 |
| Remover handle | 07936-3710100 |
| Remover weight | 07741-0010201 or 07936-3710201 |



If the drive shaft bearing has been removed with the drive shaft, remove the bearing from the drive shaft using a Bearing puller and Shaft Protector.

TOOLS:

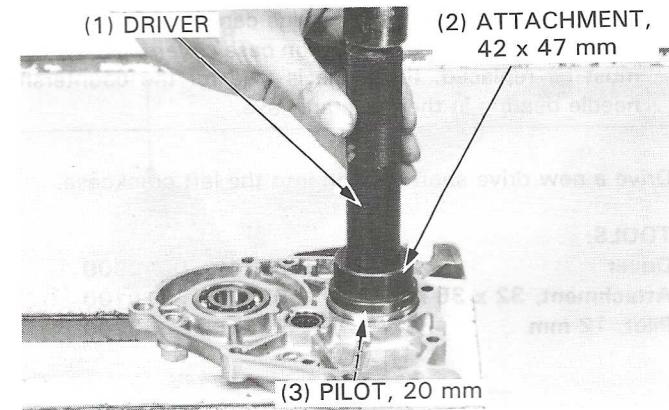
| | |
|---|---------------|
| Universal bearing puller | 07631-0010000 |
| (Equivalent commercially available in U.S.A.) | |
| Shaft protector | 07931-1870000 |



Drive a new drive shaft bearing into the transmission case cover.

TOOLS:

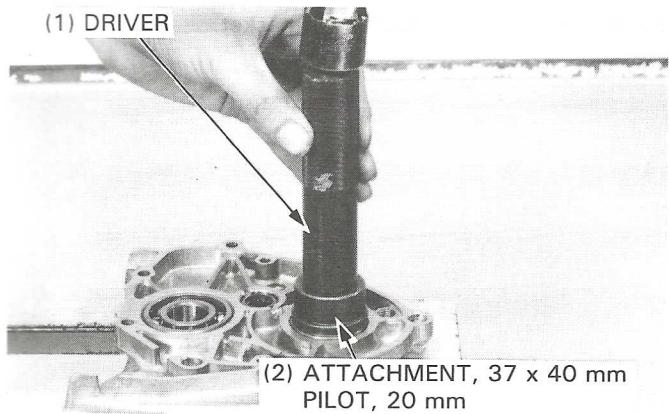
| | |
|------------------------|---------------|
| Driver | 07749-0010000 |
| Attachment, 42 x 47 mm | 07746-0010300 |
| Pilot, 20 mm | 07746-0040500 |



Drive a new final shaft bearing into the transmission case cover.

TOOL:

| | |
|------------------------|---------------|
| Driver | 07749-0010000 |
| Attachment, 37 x 40 mm | 07746-0010200 |
| Pilot, 20 mm | 07746-0040500 |

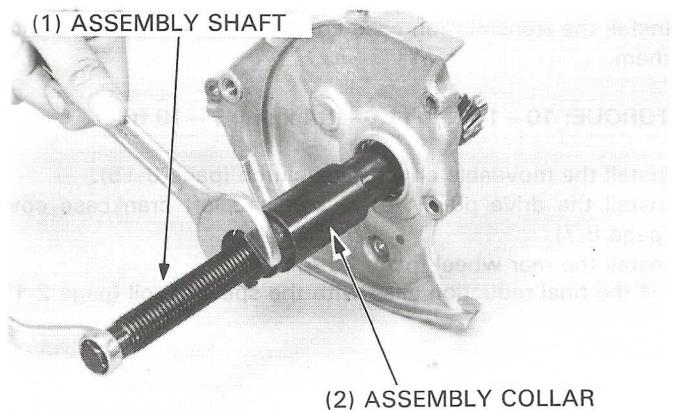


Set the drive shaft into the transmission case cover and pull it using a seal.

TOOLS:

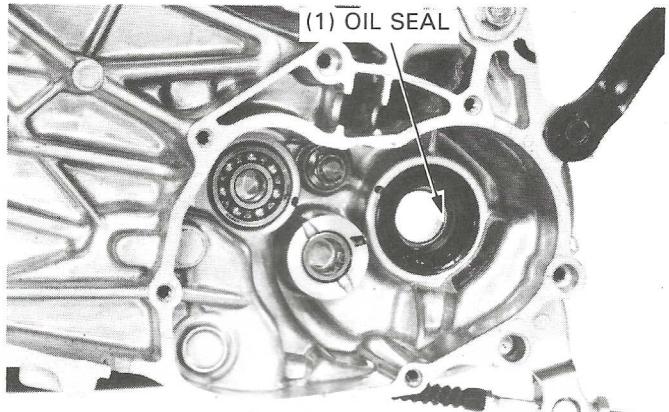
| | |
|-----------------|---------------|
| Assembly shaft | 07965-GM00300 |
| Assembly collar | 07965-1480100 |

Apply grease to the lip of a new oil seal and install it.

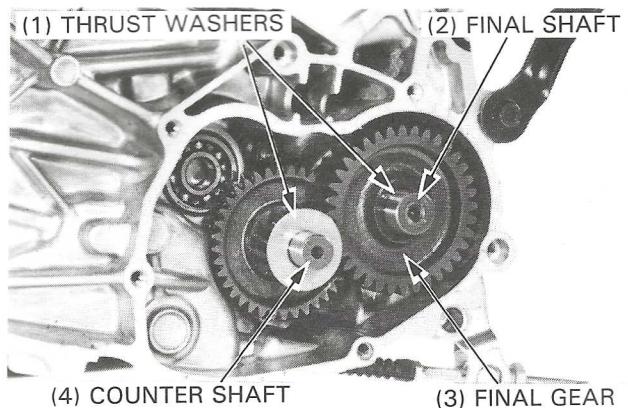


FINAL REDUCTION ASSEMBLY

Apply grease to the lip of the final shaft oil seal.

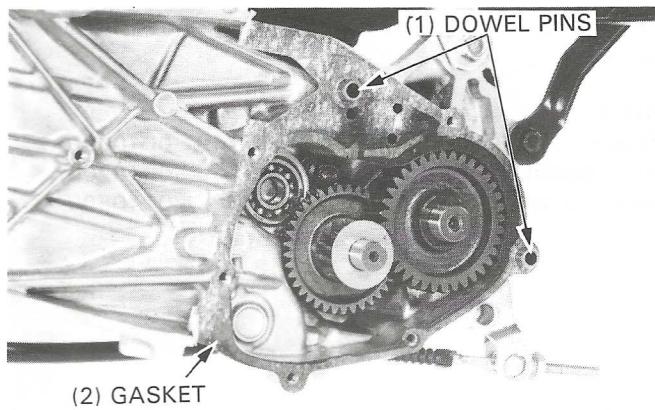


Install the countershaft, final shaft, final gear and thrust washers.



FINAL REDUCTION

Install the dowel pins and a new gasket.



Install the transmission case cover with six bolts and tighten them.

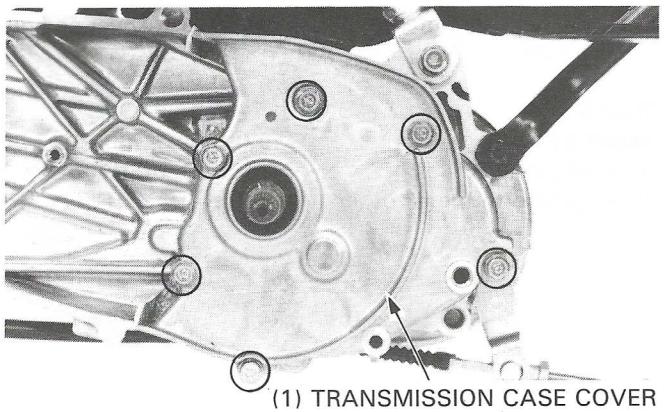
TORQUE: 10–14 N·m (1.0–1.4 kg·m, 7–10 ft-lb)

Install the moveable driven face/clutch (page 8-15).

Install the drive pulley, drive belt and left crankcase cover (page 8-7).

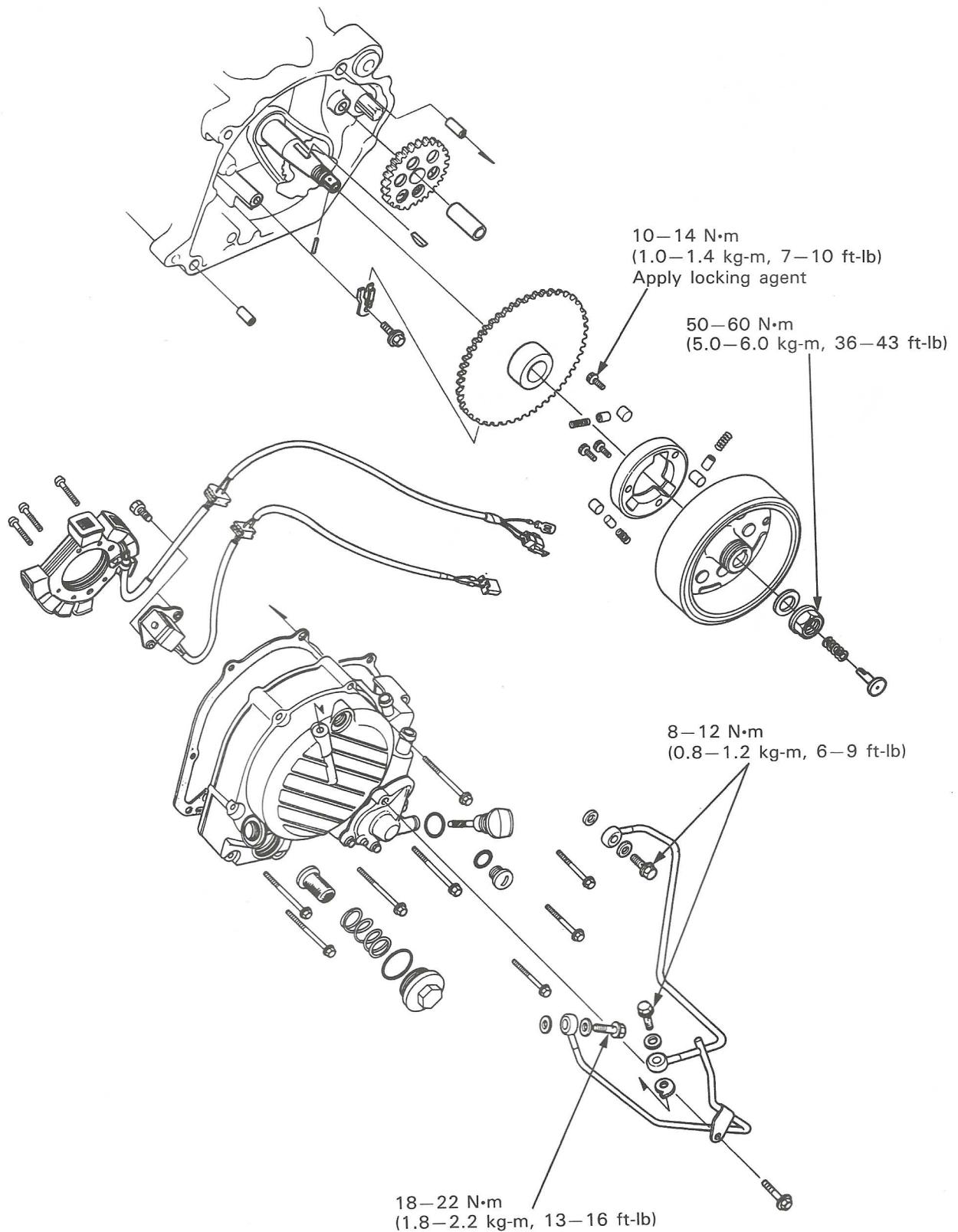
Install the rear wheel (page 15-4).

Fill the final reduction case with the specified oil (page 2-1).



MEMO

ALTERNATOR/STARTER CLUTCH



10. ALTERNATOR/STARTER CLUTCH

| | | | |
|-------------------------------|------|---------------------------------------|------|
| SERVICE INFORMATION | 10-1 | FLYWHEEL INSTALLATION | 10-6 |
| RIGHT CRANKCASE COVER REMOVAL | 10-2 | STATOR INSTALLATION | 10-6 |
| STATOR REMOVAL | 10-2 | RIGHT CRANKCASE COVER INSTALLATION | 10-6 |
| FLYWHEEL REMOVAL | 10-2 | | |
| STARTER CLUTCH | 10-3 | | |

SERVICE INFORMATION

GENERAL

- Refer to section 5 for engine removal/installation.
- Refer to section 16 for troubleshooting and inspection of the alternator.
- Refer to section 16 for service procedures and information about the starter motor.

SPECIFICATIONS

| ITEM | STANDARD | mm (in) |
|--------------------------|-------------------------------|---------------|
| Starter driven gear I.D. | 20.026–20.045 (0.7884–0.7892) | 20.10 (0.791) |
| Starter driven gear O.D. | 42.175–42.200 (1.6604–1.6614) | 42.10 (1.657) |

10

TORQUE VALUES

| | |
|----------------------------|---|
| Flywheel nut | 50–60 N·m (5.0–6.0 kg-m, 36–43 ft-lb) |
| Oil bolt 8mm 12mm | 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb) 18–22 N·m (1.8–2.2 kg-m, 13–16 ft-lb) |
| Starter clutch socket bolt | 10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb) Apply a locking agent. |

TOOLS

Special

Flywheel puller 07933–KG20000 or 07933–4300000

Common

Flywheel holder 07725–0040000 or Band strap wrench (commercially available in U.S.A.)

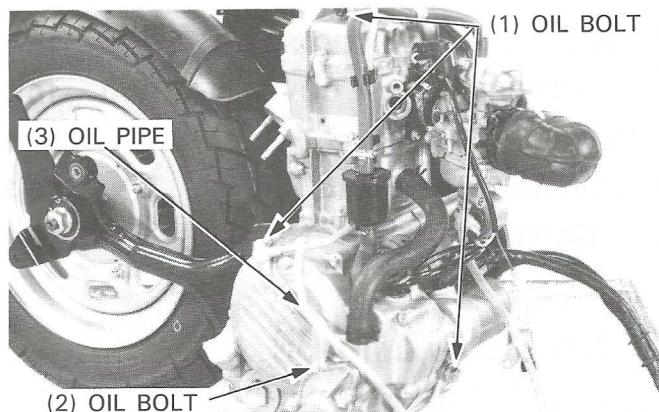
ALTERNATOR/STARTER CLUTCH

RIGHT CRANKCASE COVER REMOVAL

Remove the engine (page 5-2).

Disconnect the crankcase breather tube from the right crankcase cover.

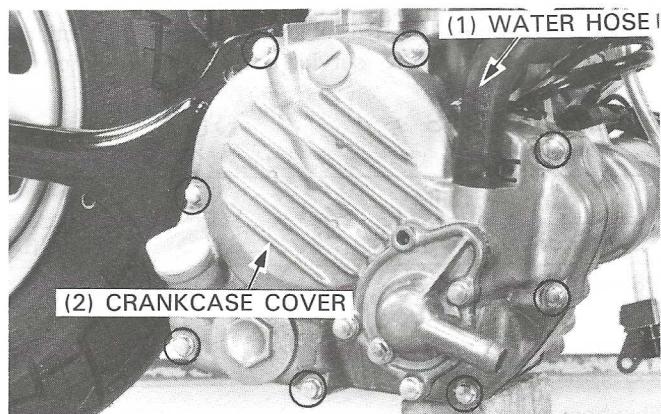
Remove the three oil bolts and the oil pipe bolt, and remove the oil pipe.



Disconnect the water hose from the right crankcase cover.

Remove the right crankcase cover bolts and cover.

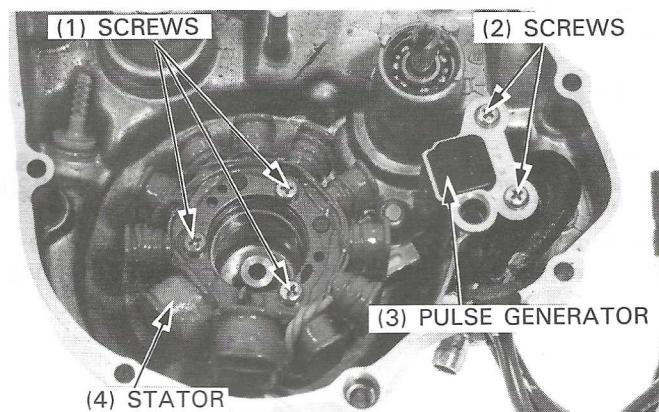
Remove the dowel pins and gasket.



STATOR REMOVAL

Remove the pulse generator attaching screws and the pulse generator.

Remove the three screws and the stator from the right crankcase cover.



FLYWHEEL REMOVAL

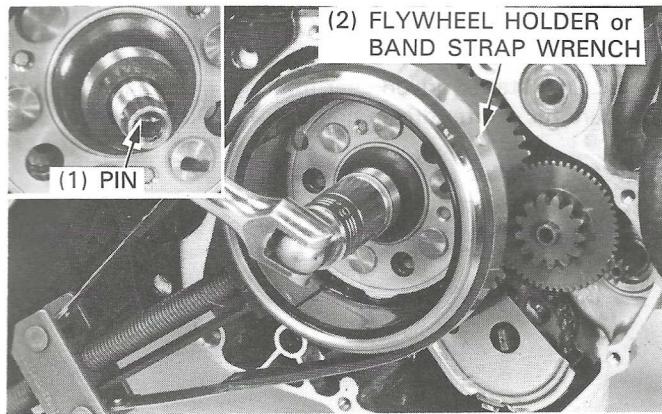
Remove the oil orifice from the end of the crankshaft.



Remove the pin from the crankshaft.
Hold the flywheel with a flywheel holder and remove the flywheel nut.

TOOL:
Flywheel holder
Band strap wrench

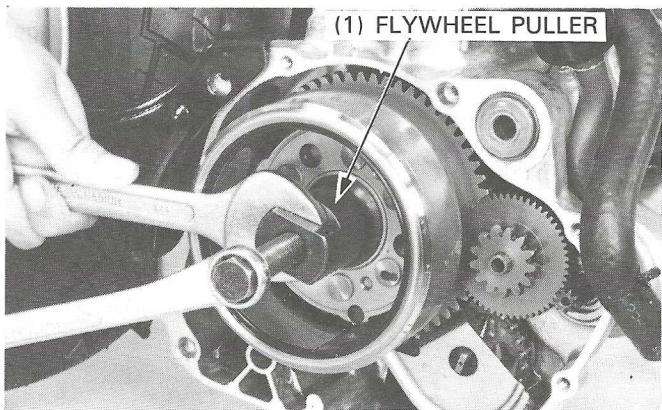
07725-0040000 or
(Commercially available in
U.S.A.)



Remove the flywheel with a flywheel puller.

TOOL:
Flywheel puller

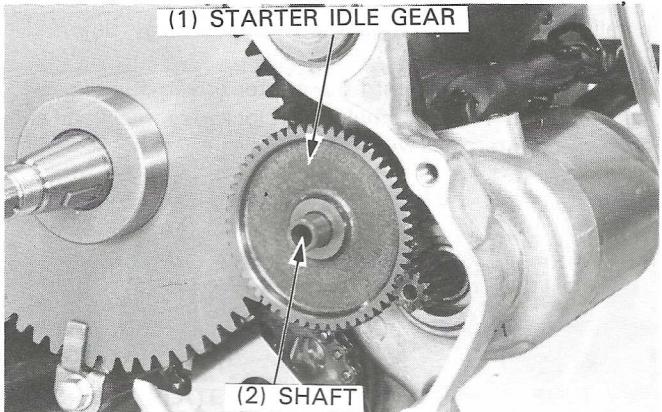
07933-KG20000 or
07933-4300000



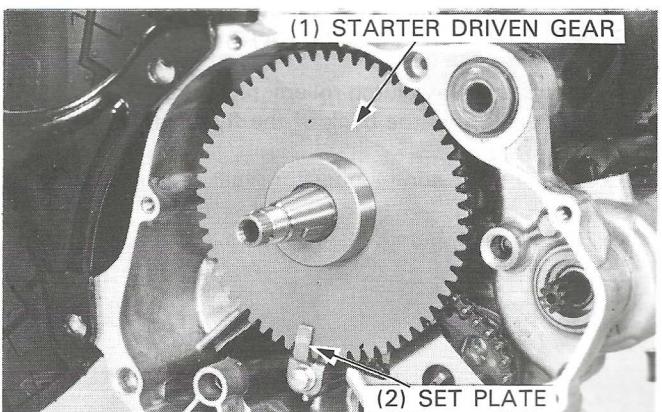
STARTER CLUTCH

REMOVAL

Remove the starter idle gear and shaft.



Remove the set plate and starter driven gear.



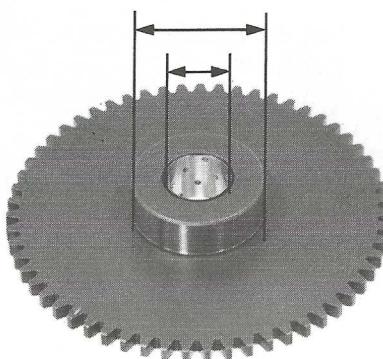
ALTERNATOR/STARTER CLUTCH

STARTER CLUTCH INSPECTION

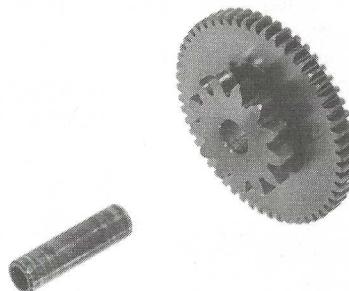
Inspect the starter driven gear for wear or damage.
Measure the starter driven gear I.D. and O.D.

SERVICE LIMIT:

I.D.: 20.10mm (0.791 in)
O.D.: 42.10mm (1.657 in)

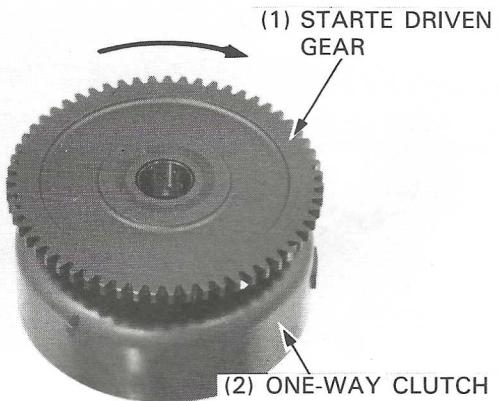


Inspect the starter idle gear and shaft for wear or damage.



Install the starter driven gear onto the one-way clutch.

Hold the flywheel and turn the starter driven gear.
The starter driven gear should turn clockwise freely and should not turn counterclockwise.

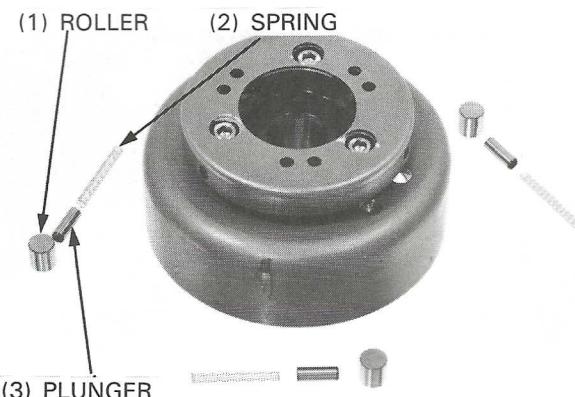


DISASSEMBLY

Remove the one-way clutch rollers, plungers and springs from the starter clutch on the back of the flywheel.

Inspect each roller and plunger for wear or damage.

Install the springs, plungers and rollers.



Remove the three hex socket bolts using an impact driver and a 6 mm hex socket bit.



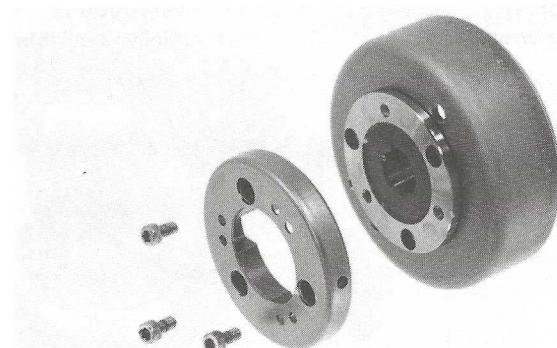
ASSEMBLY

Assembly is the reverse order of disassembly.

NOTE

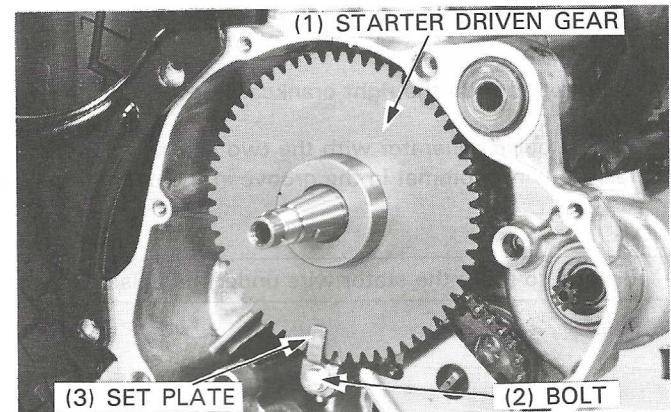
- Apply Loctite® to the thread of the socket bolts.

TORQUE: 10–14 N·m (1.0–1.4 kg·m, 7–10 ft-lb)

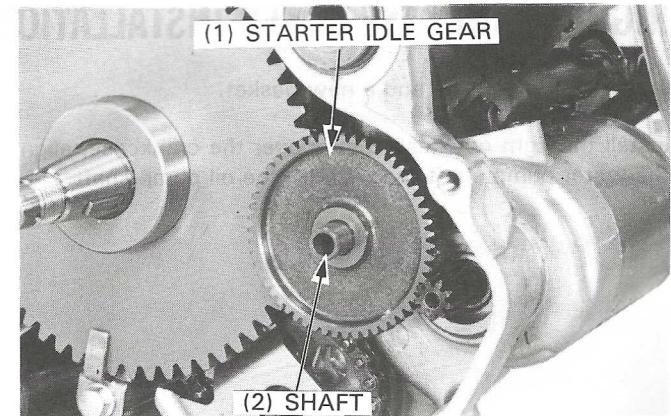


INSTALLATION

Install the starter driven gear onto the crankshaft.
Install the set plate and tighten the set plate bolt securely.



Install the starter idle gear by inserting the shaft through the idle gear and into the case.



ALTERNATOR/STARTER CLUTCH

FLYWHEEL INSTALLATION

Install the pin in the crankshaft.

Make sure that the inside of the flywheel is not contaminated and clean if necessary.

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

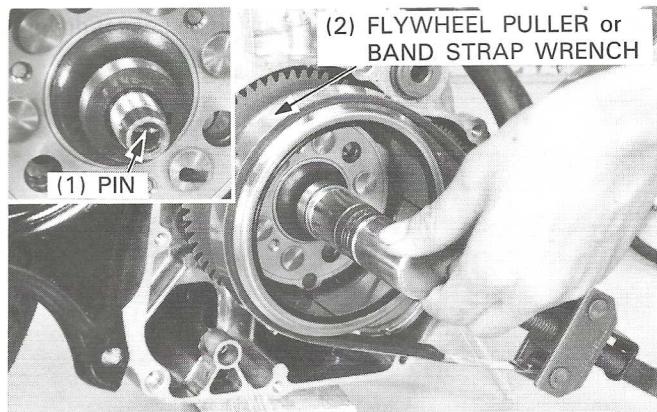
Hold the flywheel with the flywheel holder and tighten the flywheel nut.

TORQUE: 50–60 N·m (5.0–6.0 kg·m, 35–43 ft-lb)

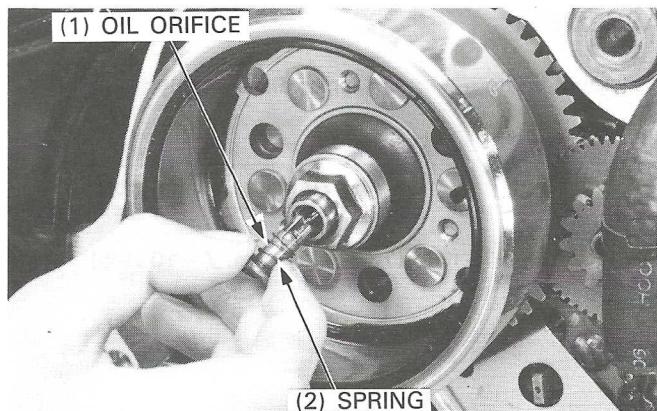
TOOL:

Flywheel puller
Band strap wrench

07725-0040000 or
(Commercially available in
U.S.A.)



Install the spring and oil orifice.



STATOR INSTALLATION

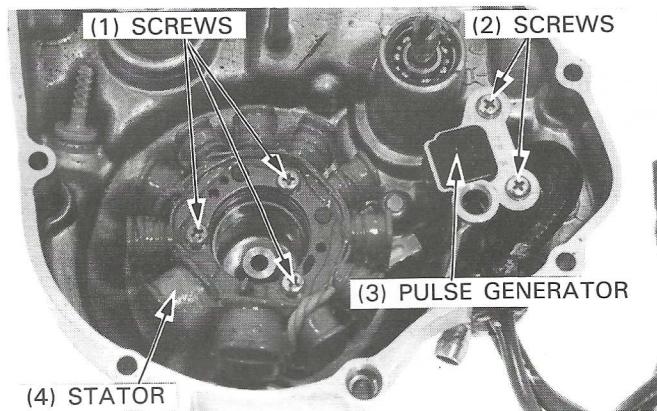
Install the stator on the right crankcase cover with the three screws.

Install the pulse generator with the two screws.

Install the wire grommet in the groove in the cover securely.

NOTE

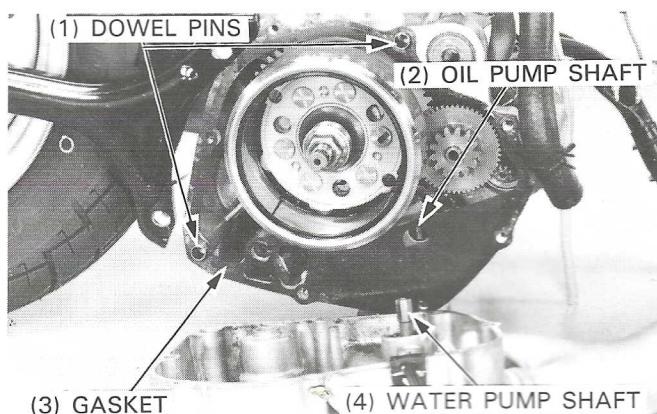
- Be sure to route the stator wire under the pulse generator.



RIGHT CRANKCASE COVER INSTALLATION

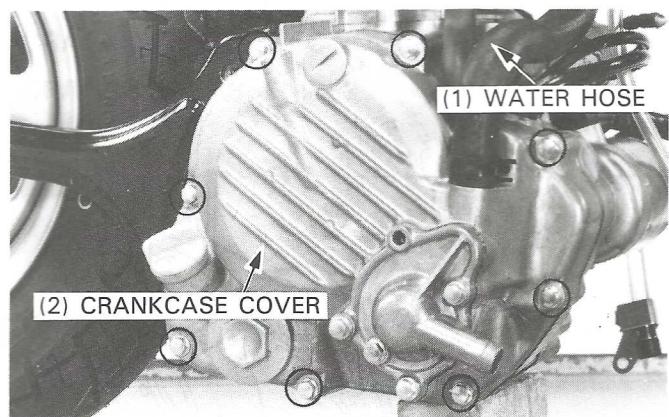
Install the dowel pins and a new gasket.

Install the right crankcase cover over the crankcase, aligning the water pump shaft groove with the oil pump shaft.



Install the right crankcase cover with eight bolts.

Connect the water hose to the right crankcase cover.



Install the oil pipe and tighten the bolts.

TORQUE:

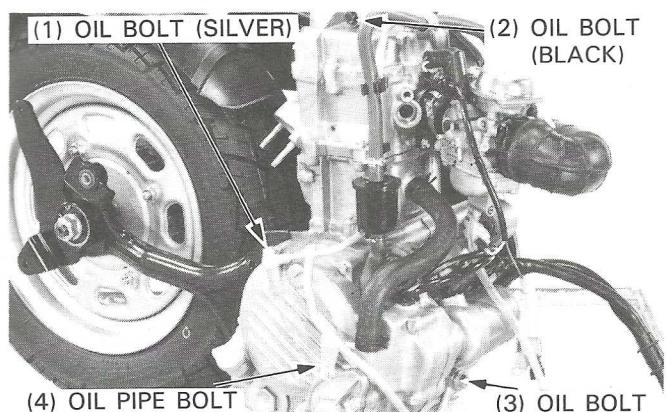
OIL PIPE—TO—CYLINDER HEAD COVER (BLACK)
8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

OIL PIPE—TO—RIGHT CRANKCASE BOLT (SILVER)
8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

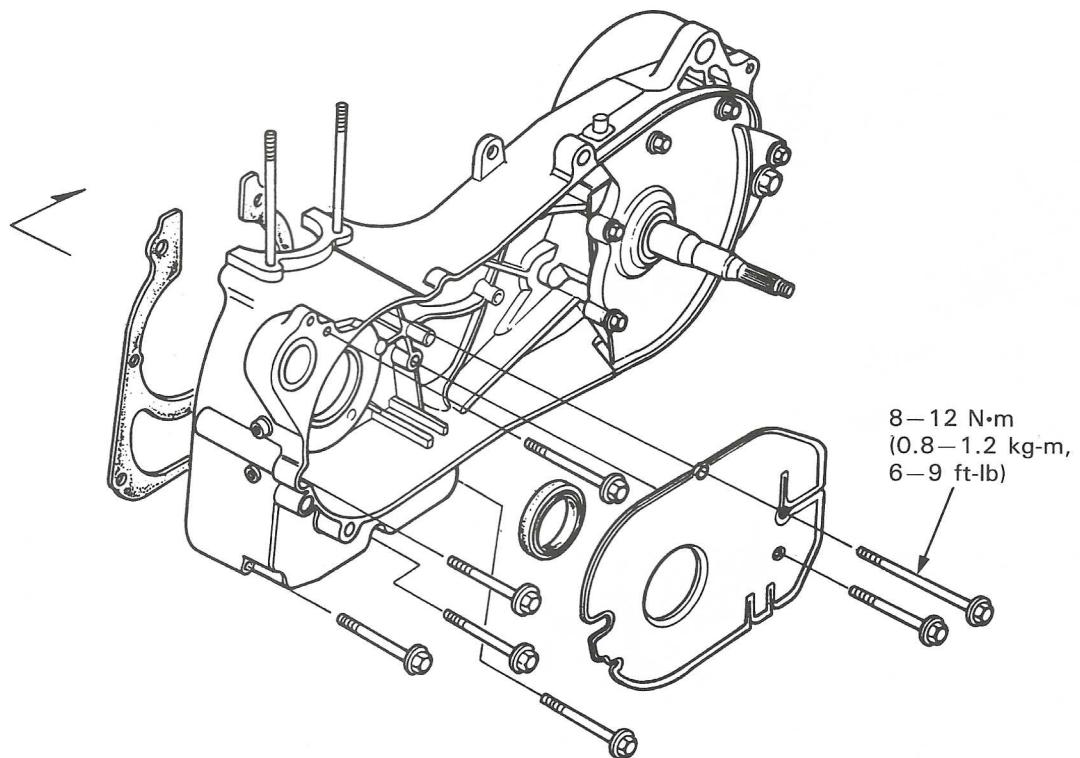
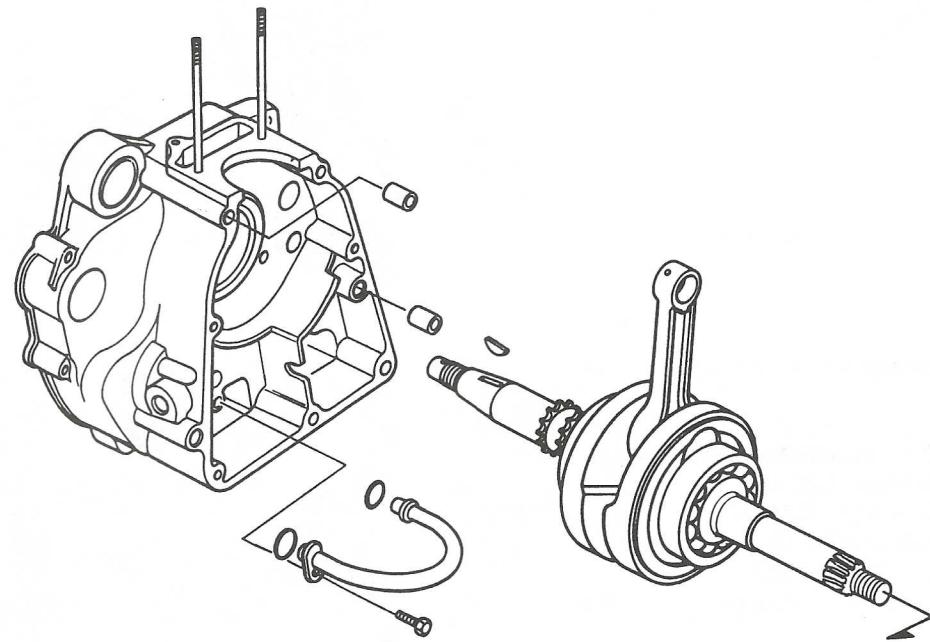
OIL PIPE—TO—CRANKCASE (12 mm)
18–22 N·m (1.8–2.2 kg-m, 13–16 ft-lb)

Connect the crankcase breather tube to the right crankcase cover.

Install the engine (page 5-6).



CRANKCASE/CRANKSHAFT



11. CRANKCASE/CRANKSHAFT

| | | | |
|----------------------|------|-----------------------|------|
| SERVICE INFORMATION | 11-1 | CRANKSHAFT INSPECTION | 11-4 |
| TROUBLESHOOTING | 11-1 | CRANKCASE ASSEMBLY | 11-5 |
| CRANKCASE SEPARATION | 11-2 | | |

SERVICE INFORMATION

GENERAL

- This section covers crankcase separation to service the crankshaft.
- The following parts must be removed before separating the crankcase.

| | |
|--------------------------------|------------|
| Engine | Section 5 |
| Cylinder head | Section 6 |
| Cylinder/piston | Section 7 |
| Drive and driven pulleys | Section 8 |
| Alternator/starter driven gear | Section 10 |
| Starter motor | Section 16 |
- If the crankshaft bearings, oil pump driven sprocket or timing sprocket need replacement, the crankshaft assembly must be replaced.

SPECIFICATIONS

| ITEM | STANDARD | mm (in) |
|---|-----------------------------|--------------|
| Connecting rod big end side clearance | 0.15–0.40 (0.006–0.016) | 0.6 (0.02) |
| Connecting rod big end radial clearance | 0.004–0.012 (0.0002–0.0005) | 0.05 (0.002) |
| Crankshaft runout | — | 0.10 (0.004) |

TORQUE VALUE

| | |
|--------------------------------|--------------------------------------|
| Crankcase bolts | 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb) |
| Cam chain tensioner pivot bolt | 12–16 N·m (1.2–1.6 kg-m, 9–12 ft-lb) |

TROUBLESHOOTING

Excessive engine noise

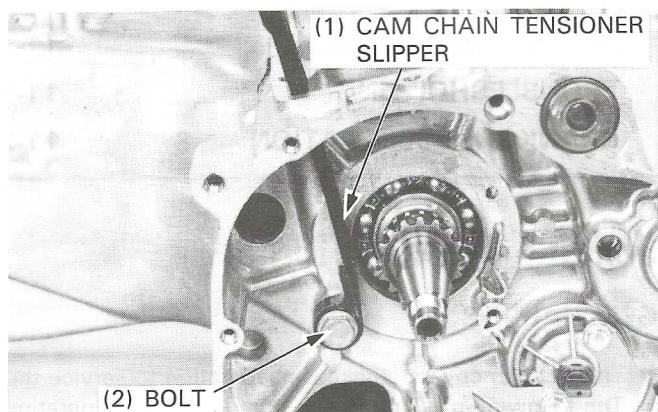
- Excessive bearing play
- Excessive crankpin bearing play
- Worn piston pin and piston pin hole

CRANKCASE/CRANKSHAFT

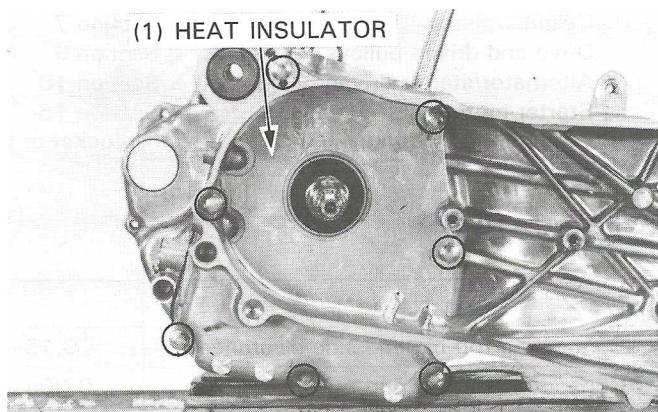
CRANKCASE SEPARATION

Remove the cam chain.

Remove the cam chain tensioner slipper by removing the bolt.



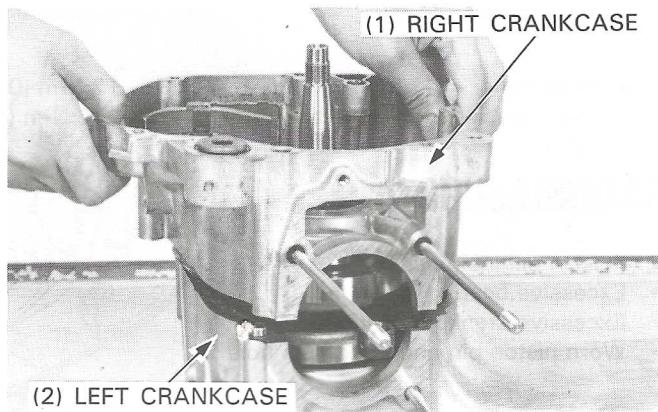
Remove the seven crankcase attaching bolts and heat insulator.



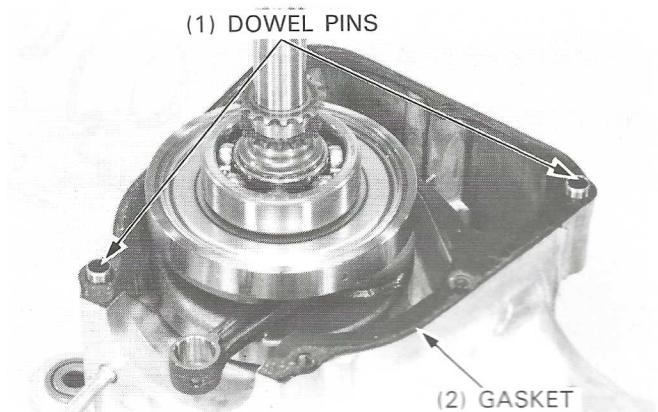
Place the crankcase with the left crankcase down and remove the right crankcase from the left crankcase.

CAUTION

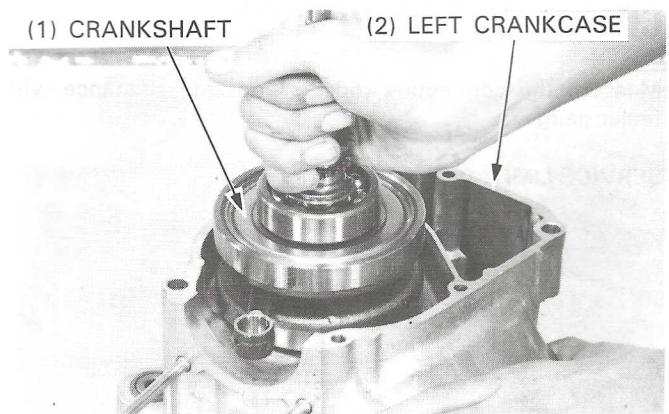
- Never pry the crankcase mating surfaces apart.
Damage to the machined mating surfaces may result.



Remove the gasket and dowel pins.



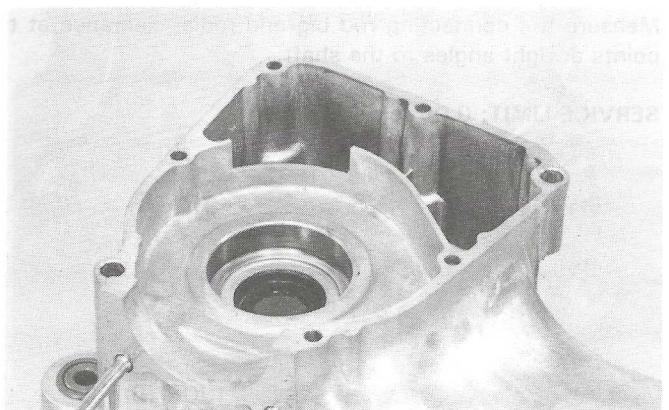
Remove the crankshaft from the left crankcase.



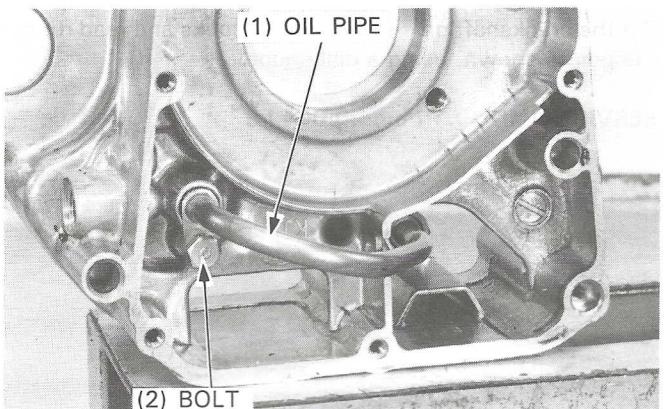
Clean off all gasket material from the crankcase mating surface.

NOTE

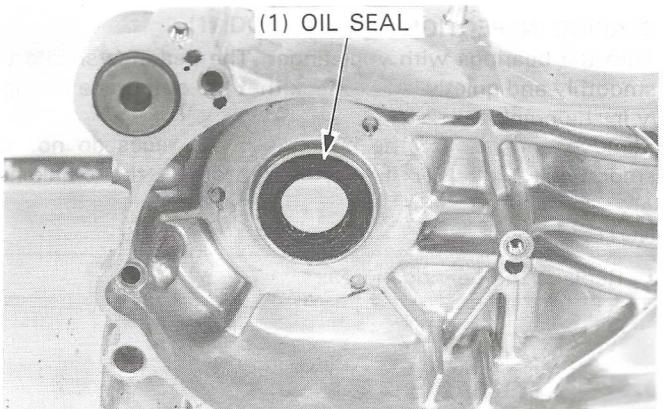
- Avoid damaging the gasket surface.
- The gasket will come off easier if soaked in solvent.



Remove the oil pipe by removing the bolt.



Check the oil seal for wear or damage.
Replace the oil seal if necessary.

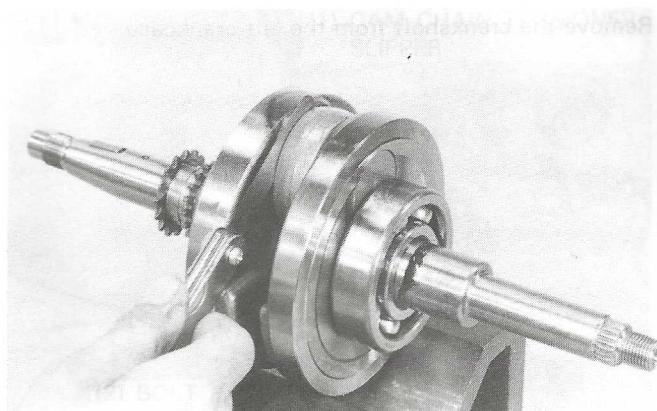


CRANKCASE/CRANKSHAFT

CRANKSHAFT INSPECTION

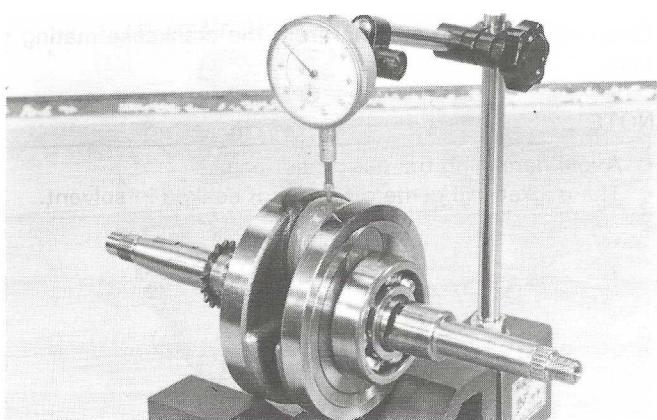
Measure the connecting rod big end side clearance with a feeler gauge.

SERVICE LIMIT: 0.6 mm (0.02 in)



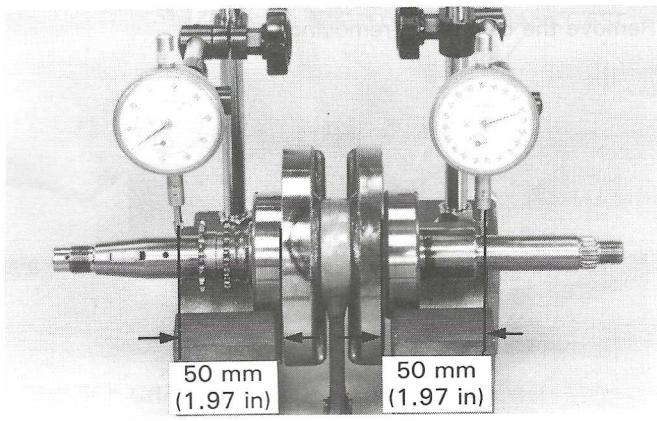
Measure the connecting rod big end radial clearance at two points at right angles to the shaft.

SERVICE LIMIT: 0.05 mm (0.002 in)



Set the crankshaft on a stand or in V blocks and read runout at the points shown, using a dial gauge.

SERVICE LIMIT: 0.10 mm (0.004 in)



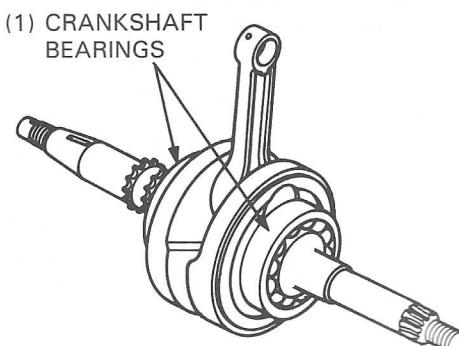
BEARING INSPECTION

Turn the bearings with your finger. The bearings should turn smoothly and quietly. Also check that the outer race fits tightly in the crankshaft.

Remove and discard the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the crankshaft.

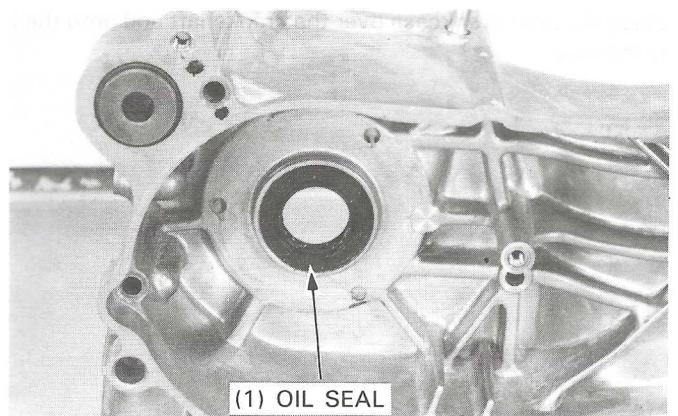
NOTE

- Replace the bearings in pairs.



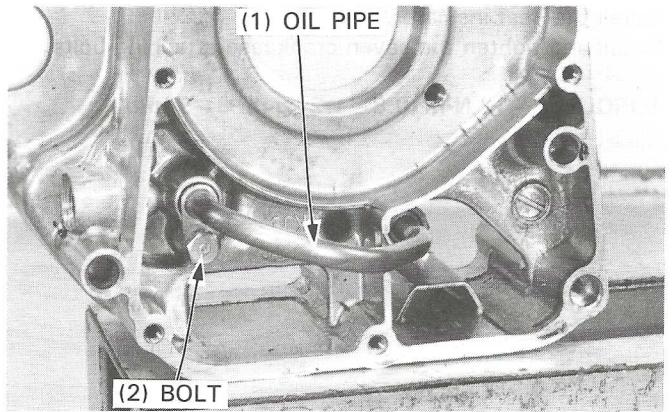
CRANKCASE ASSEMBLY

Install a new oil seal into the left crankcase.
Apply grease to the lip of the oil seal.

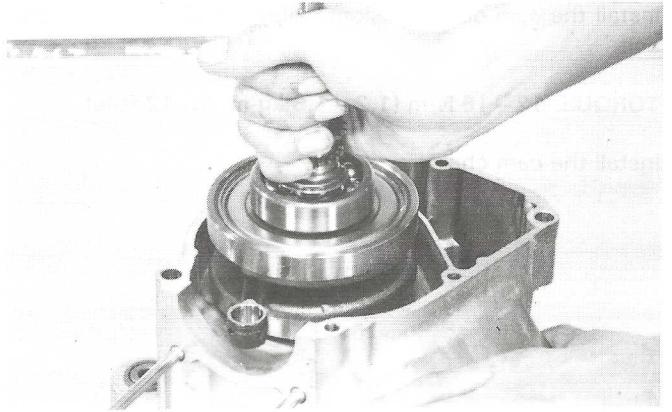


Wash the oil pipe in cleaning solvent and install a new O-ring on both ends of the pipe.

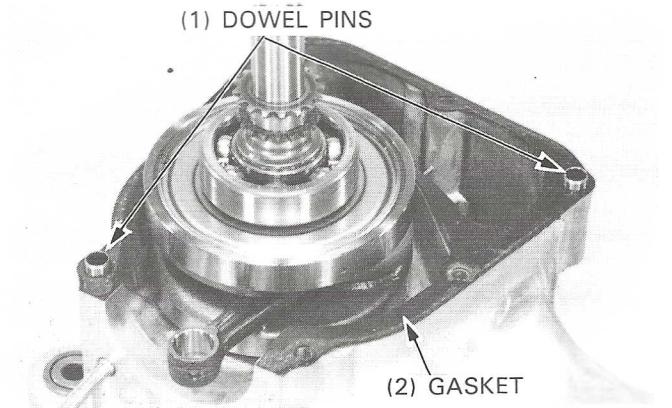
Install the oil pipe on the right crankcase and secure it with the bolt.



Install the crankshaft into the left crankcase being careful not to damage the oil seal lip.

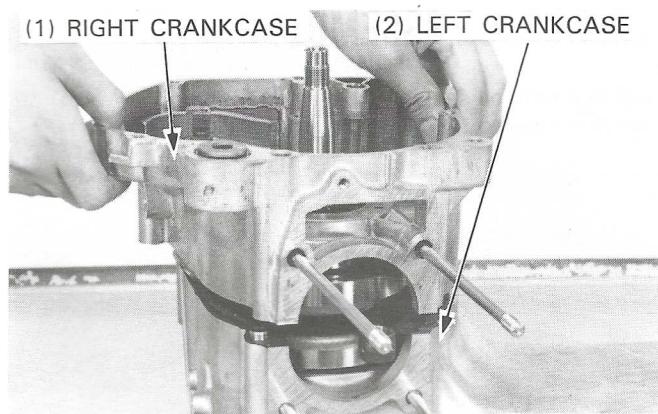


Install the dowel pins and a new gasket.



CRANKCASE/CRANKSHAFT

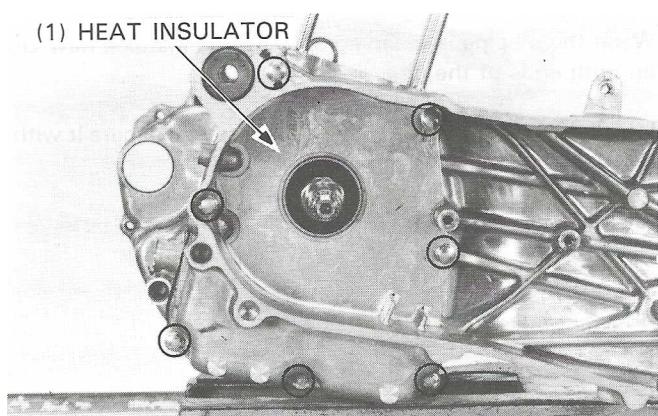
Place the right crankcase over the crankshaft and onto the left crankcase.



Install the heat insulator.

Install and tighten the seven crankcase attaching bolts.

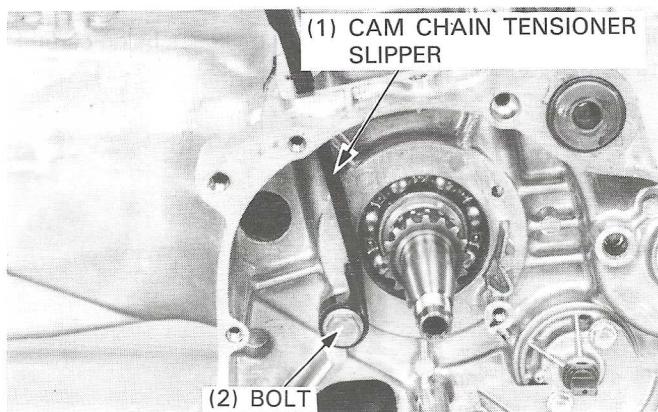
TORQUE: 8–12 N·m (0.8–1.2 kg·m, 6–9 ft-lb)



Install the cam chain tensioner slipper and secure it with the bolt.

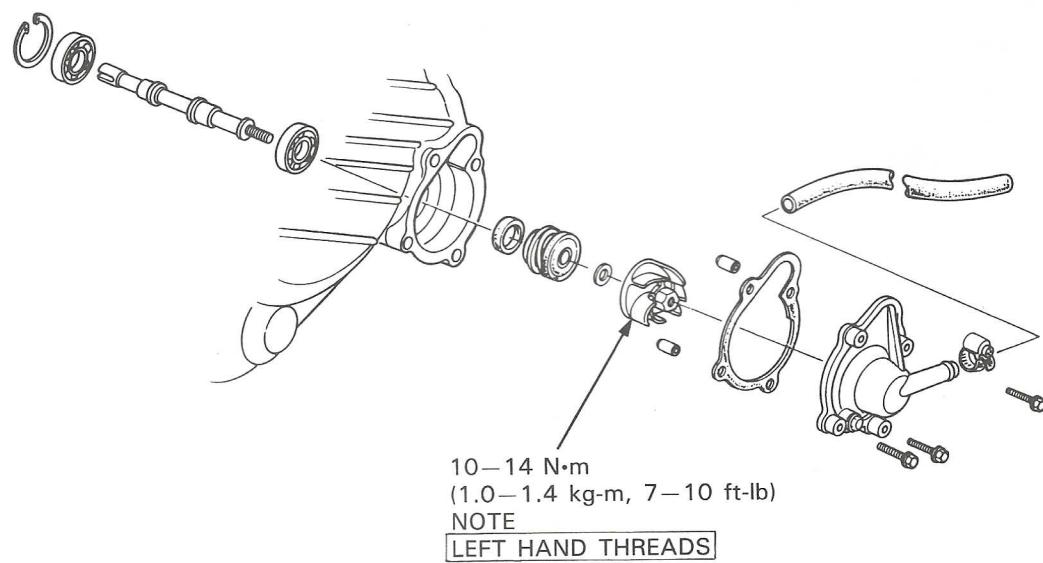
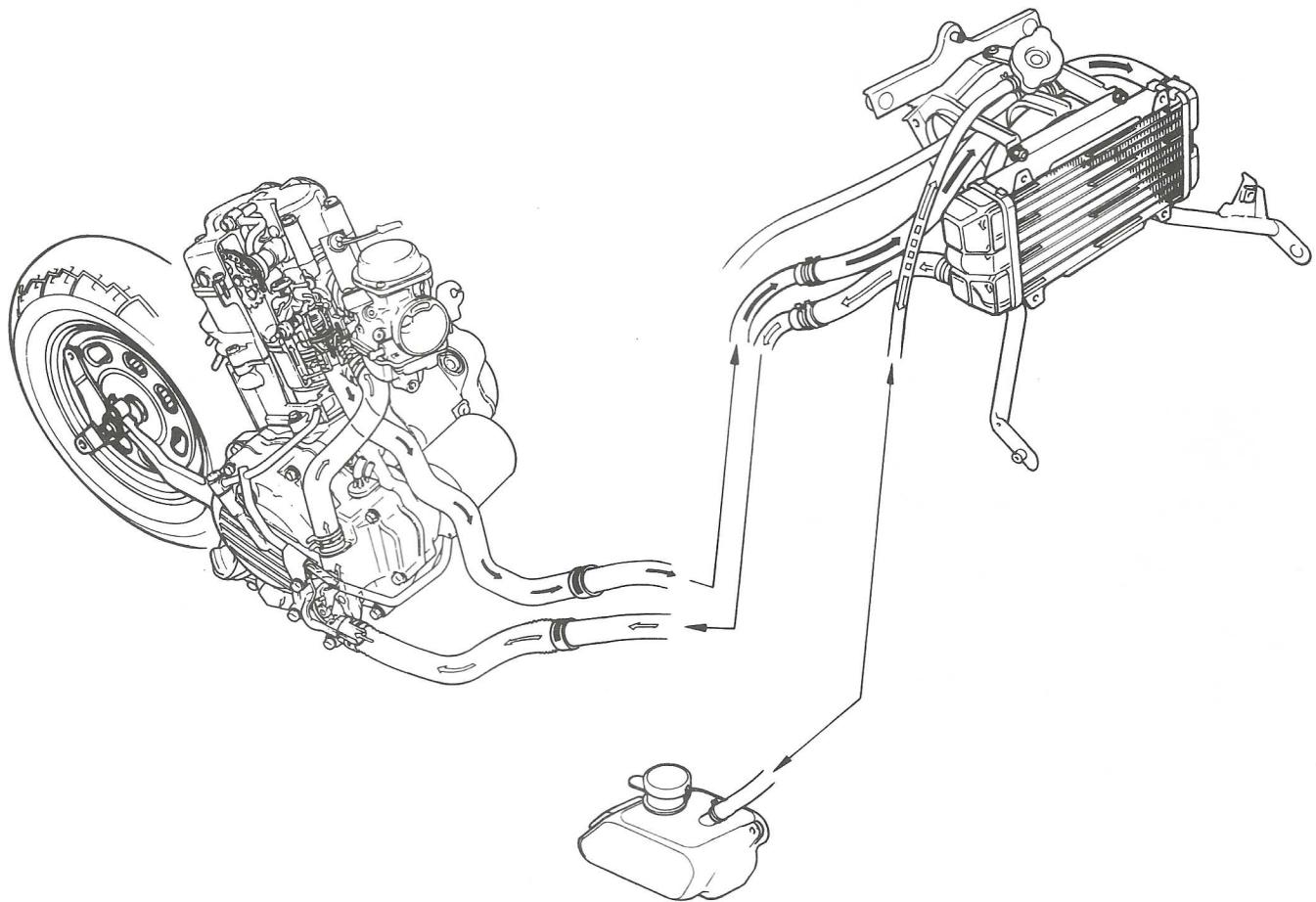
TORQUE: 12–16 N·m (1.2–1.6 kg·m, 9–12 ft-lb)

Install the cam chain.



MEMO

COOLING SYSTEM



| | | | |
|---------------------|------|--------------|------|
| SERVICE INFORMATION | 12-1 | RADIATOR | 12-3 |
| TROUBLESHOOTING | 12-1 | WATER PUMP | 12-5 |
| SYSTEM TESTING | 12-2 | THERMOSENSOR | 12-9 |
| COOLANT REPLACEMENT | 12-2 | THERMOSTAT | 12-9 |

SERVICE INFORMATION

GENERAL



- Do not remove the radiator cap when the engine is hot. The coolant is under pressure and severe scalding could result. The engine must be cool before servicing the cooling system.*

- Use only distilled water and ethylene glycol in the cooling system. A 50–50 mixture is recommended for maximum corrosion protection. Do not use alcohol-based antifreeze.
- Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- The water pump must be serviced after removing the engine. Other cooling system service can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- Refer to section 16 for fan motor thermostatic switch and temperature gauge inspections.

SPECIFICATIONS

| ITEM | SPECIFICATIONS |
|---|--|
| Radiator cap relief pressure | 75–105 kPa (0.75–1.05 kg/cm ² , 10.7–14.9 psi) |
| Freezing point (Hydrometer test) | 55% distilled water + 45% ethylene glycol: -32°C (-26°F) 50% distilled water + 50% ethylene glycol: -37°C (-35°F) 45% distilled water + 55% ethylene glycol: -44.5°C (-48°F) |
| Coolant capacity: Radiator and engine Reserve tank Total system | 0.75 liter (0.79 US qt, 0.66 Imp qt) 0.59 liter (0.62 US qt, 0.52 Imp qt) 1.34 liter (1.42 US qt, 1.20 Imp qt) |
| Thermostat | Begins to open: 71° to 80°C (160°–176°F) Valve lift: 3.5–4.5 mm (0.138–0.177 in) at 80°C (176°F) |
| Boiling point (with 50–50 mixture) | Unpressurized: 107.7°C (226°F) Cap on, pressurized: 125.6°C (258°F) |

TORQUE VALUE

Water pump impeller 10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

TOOLS

Special

| | |
|------------------------|--|
| Bearing driver | 07945-GC80000 |
| Water seal driver | 07945-4150400 or GN-AH-065-415 (U.S.A. only) |
| Bearing remover, 12 mm | 07936-1660001 |
| —remover weight | 07936-3710200 or 07741-0010201 |
| —spindle assy | 07936-1660100 |

TROUBLESHOOTING

Engine temperature too high

- Faulty temperature gauge or gauge sensor
- Faulty radiator cap
- Thermostat stuck closed
- Insufficient coolant
- Passages blocked in radiator, hoses or water jacket
- Faulty water pump
- Faulty fan motor

Engine temperature too low

- Faulty temperature gauge or gauge sensor
- Thermostat stuck open

Coolant leaks

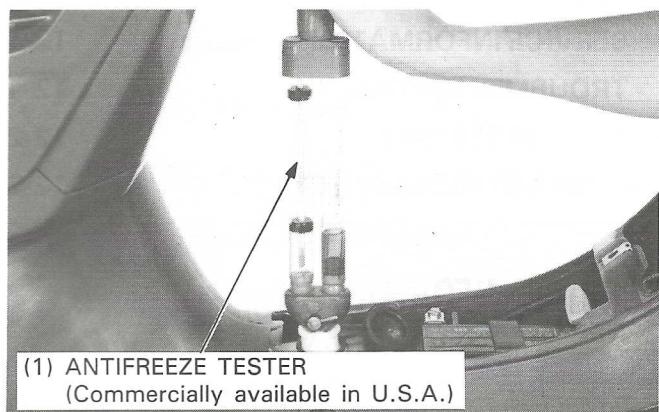
- Faulty pump mechanical seal
- Deteriorated O-rings
- Damaged or deteriorated hoses

COOLING SYSTEM

SYSTEM TESTING

COOLANT

Test the coolant mixture with an antifreeze tester. For maximum corrosion protection, a 50–50% solution of ethylene glycol and distilled water is recommended.

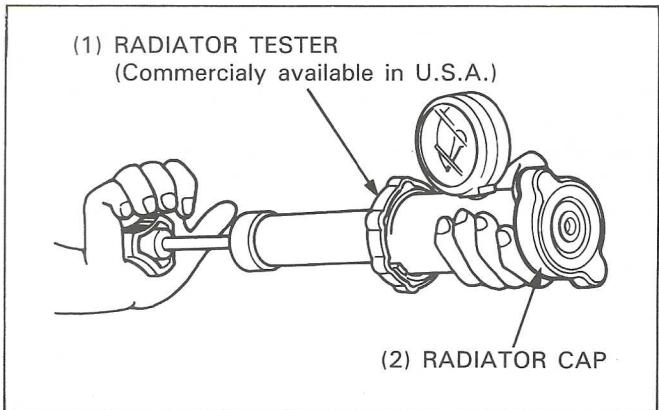


RADIATOR CAP INSPECTION

Apply water to the cap sealing surface and pressure test the radiator cap. Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low. It must hold specified pressure for at least six seconds.

RADIATOR CAP RELIEF PRESSURE:

75–105 kPa (0.75–1.05 kg/cm², 10.7–14.9 psi)

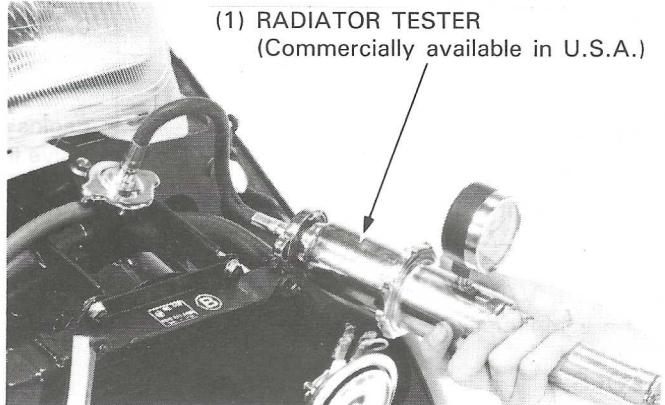


Pressurize the radiator, engine and hoses, and check for leaks.

CAUTION

- *Excessive pressure can damage the radiator. Do not exceed 105 kPa (1.05 kg/cm², 14.9 psi)*

Repair or replace components if the system will not hold the specified pressure for at least six seconds.

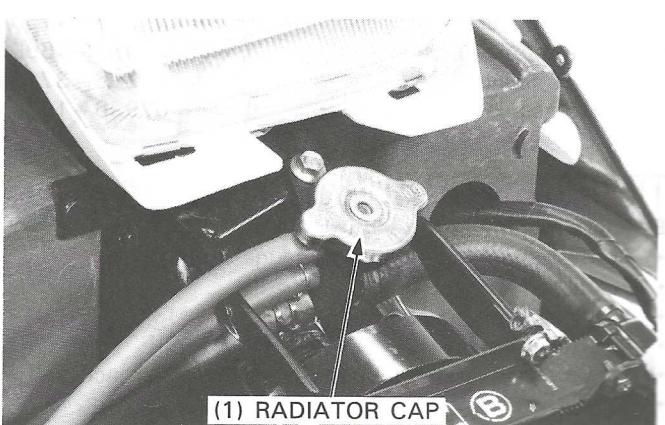


COOLANT REPLACEMENT

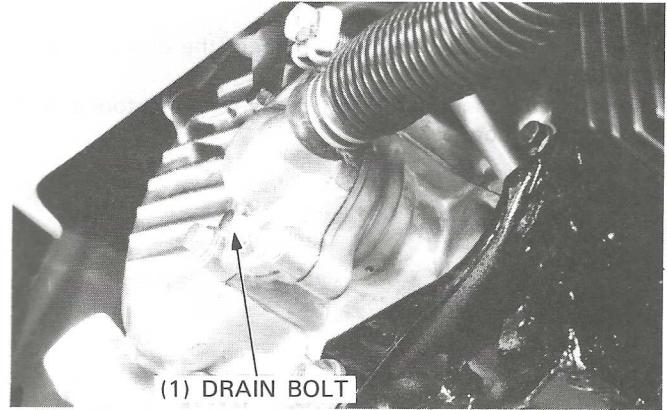
WARNING

- *The engine must be cool before servicing the cooling system, or severe scalding may result.*

Remove the front cover (page 13-3) and remove the radiator cap.



Place a drain pan under the water pump and drain the coolant from the system by removing the drain bolt.
Reinstall the drain bolt.



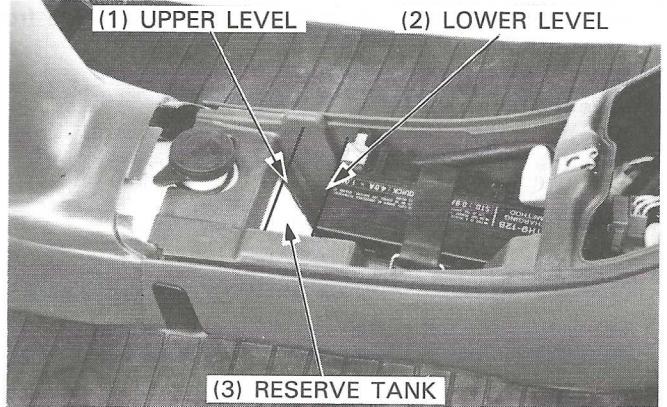
Fill the system with a 50—50 mixture of distilled water and ethylene glycol.

Bleed air from the system.

- Start the engine and allow it to run until there are no air bubbles in the coolant, and the level stabilizes.
- Stop the engine and add coolant up to the proper level if necessary.
- Reinstall the radiator cap.

Remove the maintenance cover (page 13-2).

- Check the level of coolant in the reserve tank and fill to the correct level if the level is low.
- Install the maintenance cover.



RADIATOR

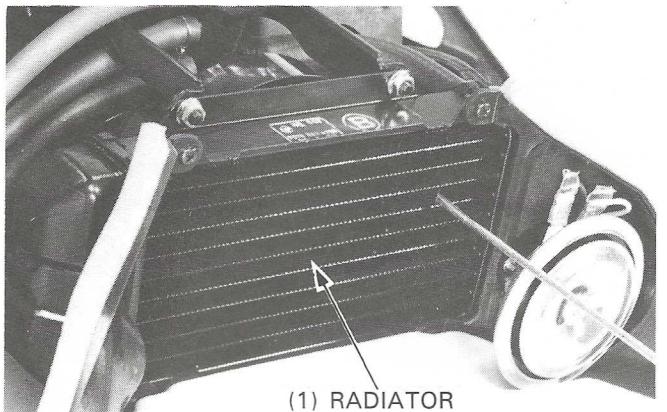
REMOVAL

Remove the front cover (page 13-3).

Inspect the radiator soldered joints and seams for leaks.

Blow dirt out from between core fins with compressed air. If insects, etc., are clogging the radiator, wash them off with low pressure water.

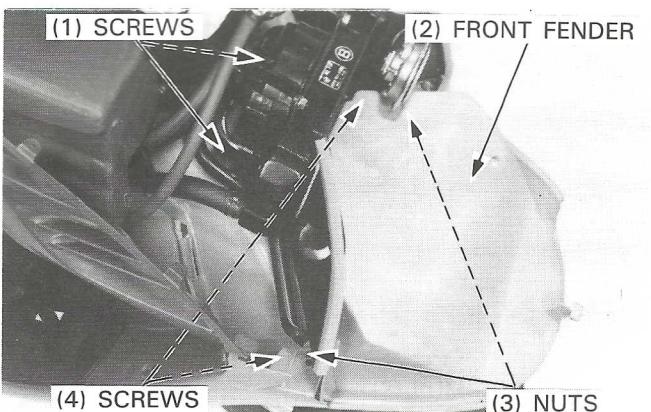
Carefully straighten any bent fins.



Drain the coolant (page 12-2).

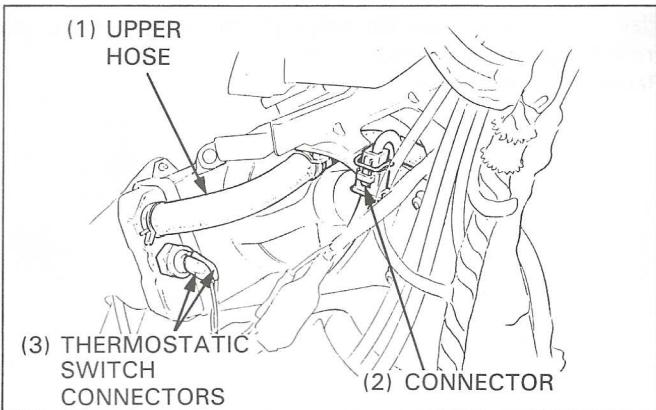
Remove the two nuts and four screws.

Slide the front fender forward.



COOLING SYSTEM

Remove the leg shield (page 13-3).
Loosen the hose clamp and disconnect the upper hose from the radiator.
Disconnect the thermostatic switch wire connectors and cooling fan motor connector.

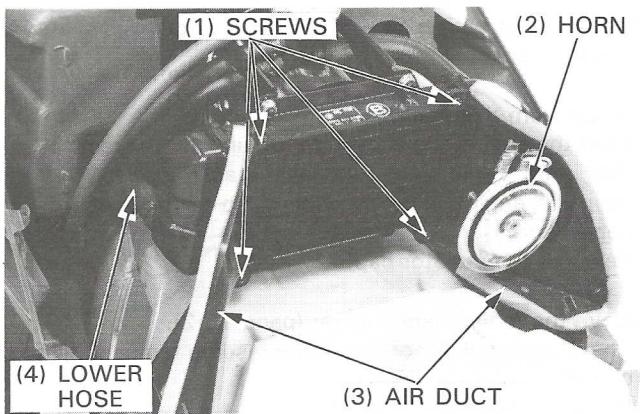


Loosen the hose clamp and disconnect the lower hose from the radiator.

Remove the horn.

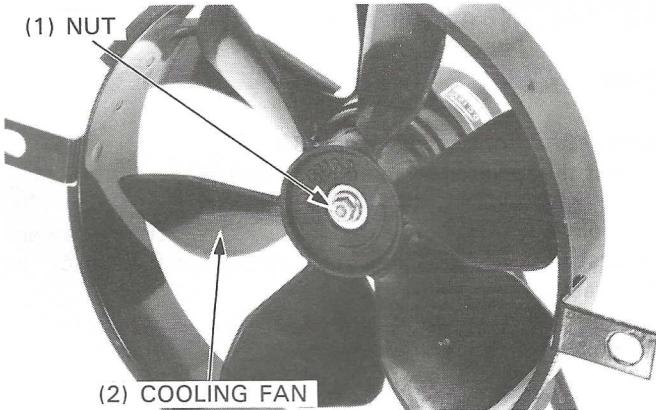
Remove the four screws and air ducts.

Remove the radiator and fan motor.

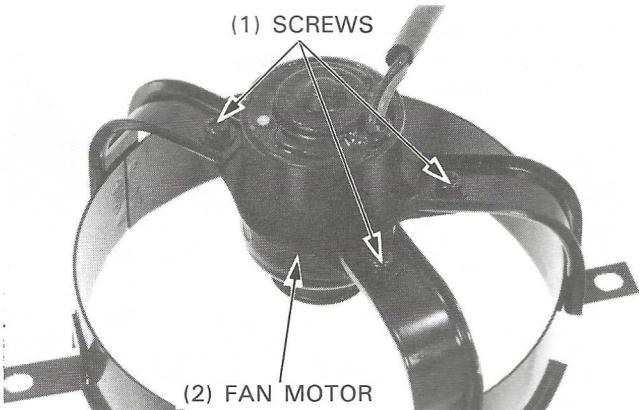


DISASSEMBLY

Remove the fan from the motor by removing the nut.



Remove the fan motor from the shroud by removing three screws.



ASSEMBLY

Install the fan motor on the fan shroud.

Install the fan onto the motor shaft.

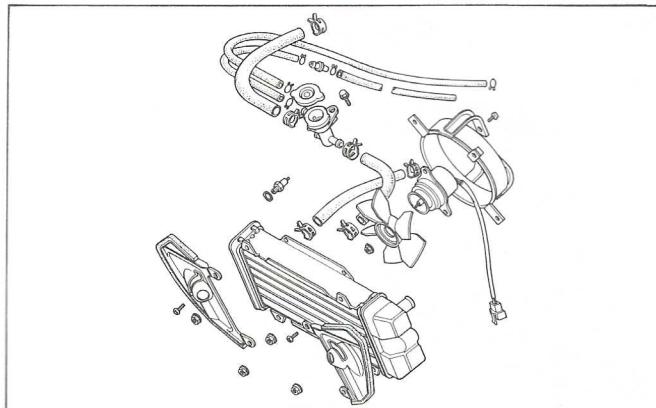
Apply a locking agent to the threaded portion of the motor shaft and install the plain washer, lock washer and nut.

Install the fan shroud on the radiator with the four bolts.

See page 16-20 for thermostatic switch inspection.

NOTE

- Apply liquid sealant to the threads of the thermo switch and install it to avoid damaging the radiator body.



Install the removed parts in the reverse order of removal.

INSTALLATION

Install the radiator in the reverse order of removal.

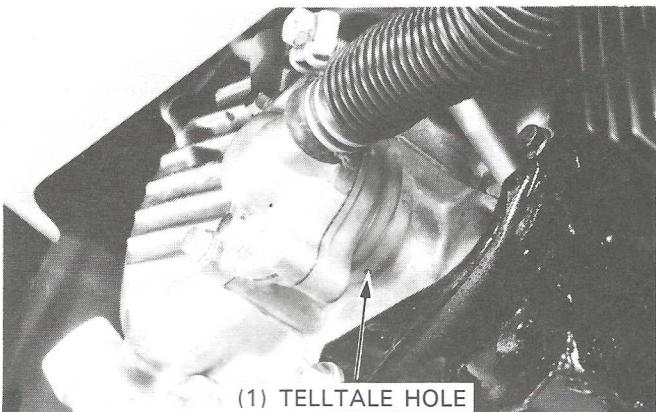
After installation, check for leaks.

WATER PUMP

MECHANICAL SEAL INSPECTION

Inspect the telltale hole for signs of mechanical seal coolant leakage.

If the mechanical seal is leaking, remove the right crankcase cover and replace the mechanical seal.



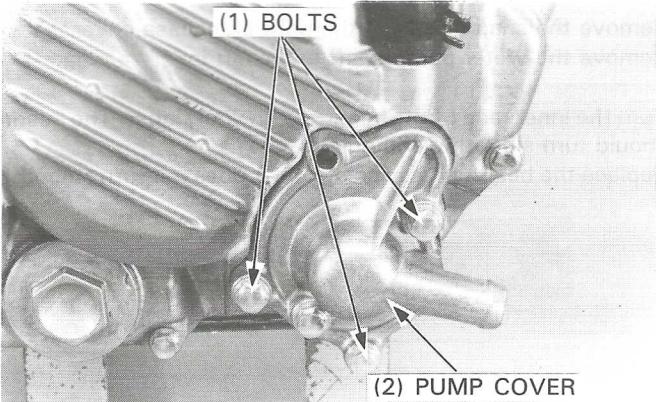
WATER PUMP REMOVAL

Remove the engine (Section 5).

Remove the oil pipe (page 10-2).

Remove the three bolts and the water pump cover.

Remove the gasket and dowel pins.

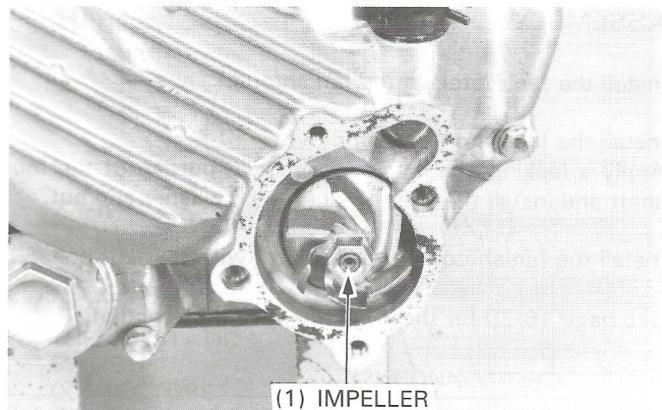


COOLING SYSTEM

Remove the water pump impeller by turning it clockwise.

NOTE

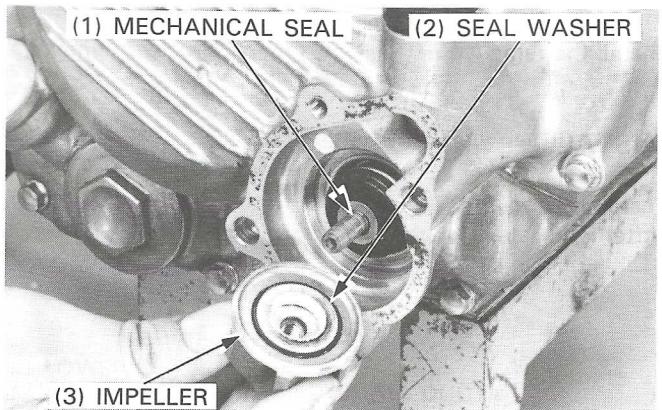
- The impeller has left hand threads.



Inspect the mechanical seal and seal washer for wear or damage.

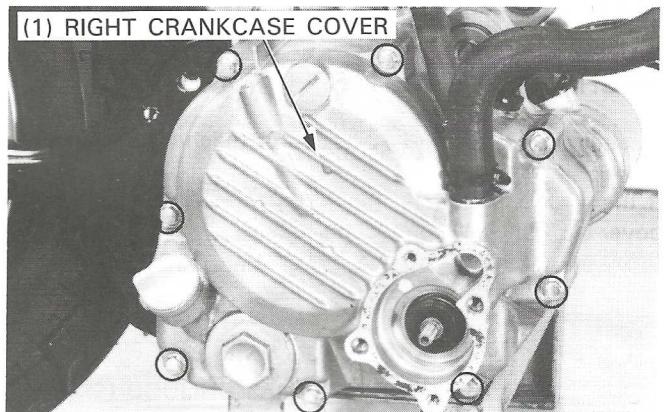
NOTE

- The mechanical seal and seal washer must be replaced as a set.



WATER PUMP SHAFT REMOVAL

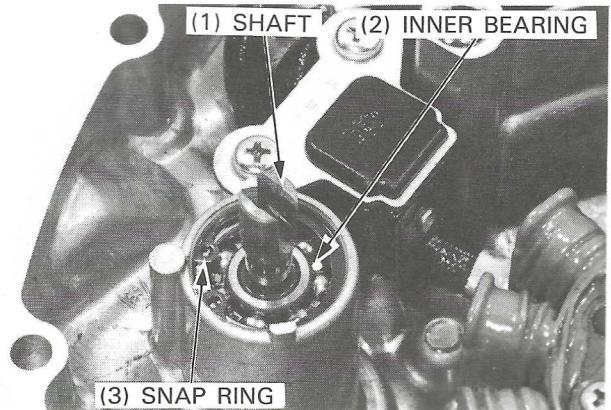
Disconnect the water hose from the right crankcase cover. Remove the right crankcase cover, gasket and dowel pins (page 10-2)



Remove the snap ring from the right crankcase cover. Remove the water pump shaft and shaft inner bearing.

Turn the inner race of the bearing with your finger. The bearing should turn smoothly and quietly.

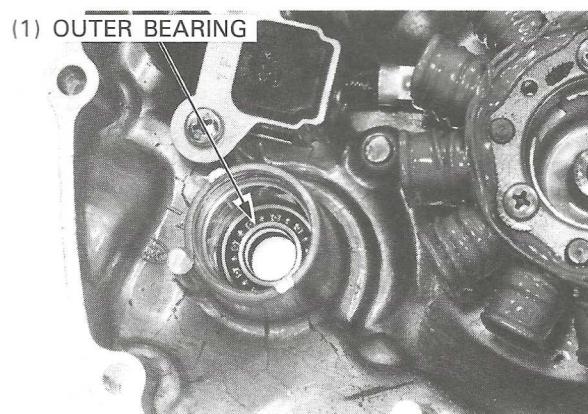
Replace the bearing if it is noisy or if it does not turn smoothly.



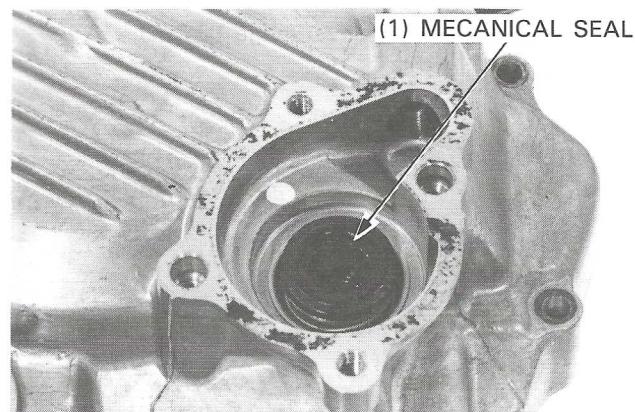
MECHANICAL SEAL REPLACEMENT

Drive the outer bearing out of the right crankcase cover using a following tools;

| | |
|------------------------|-----------------------------------|
| Bearing remover, 12 mm | 07936-1660001 |
| Spindle assy, 12 mm | 07936-1660100 |
| Remover weight | 07741-0010201 or 07936-3710200 |



Drive the mechanical seal out of the right crankcase cover from the inside.



Apply sealant to the right crankcase cover fitting surface of a new mechanical seal.

Install the mechanical seal into the right crankcase cover.

TOOLS:

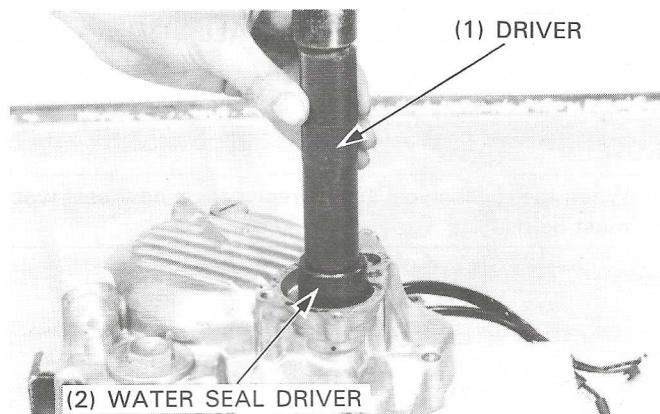
Driver

Water seal driver

07749-0010000

07945-4150400 or

GN-AH-065-415 (U.S.A.
only)



Drive a new water pump shaft outer bearing into the right crankcase cover.

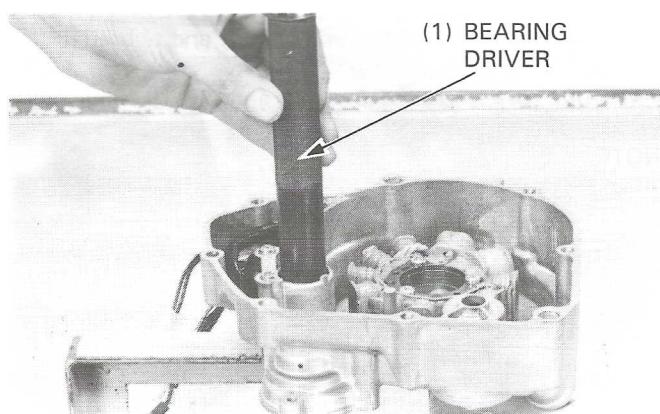
TOOL:

Bealing driver

07945-GC80000

NOTE

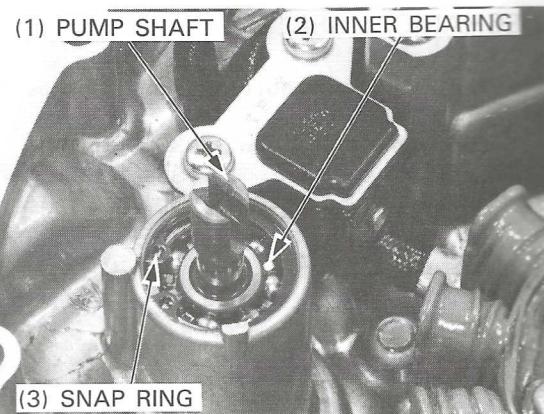
- Never reinstall the old bearing, once removed, it must be replaced with a new one.



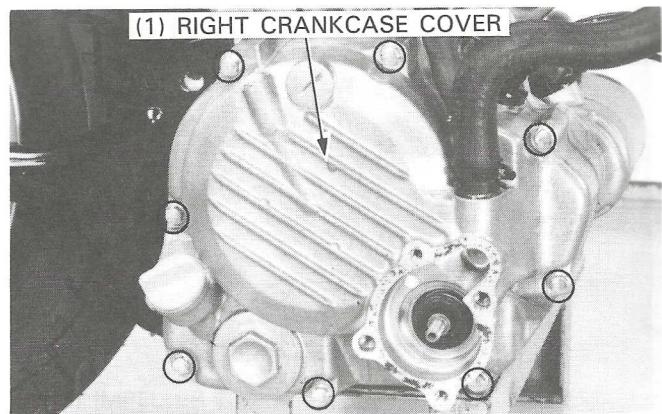
COOLING SYSTEM

Install the water pump shaft and inner bearing into the right crankcase cover.

Install the snap ring into the ring groove to secure the inner bearing.



Install the right crankcase cover (page 10-6).

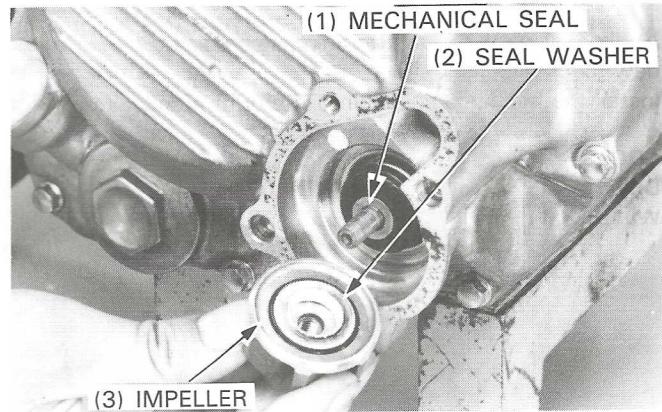


WATER PUMP IMPELLER INSTALLATION

Install the seal washer into the impeller.

NOTE

- When the mechanical seal is replaced, a new seal washer must be used.

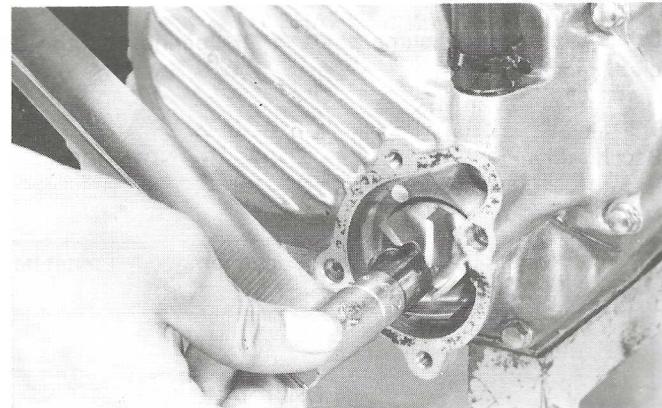


Install the impeller onto the pump shaft and tighten it.

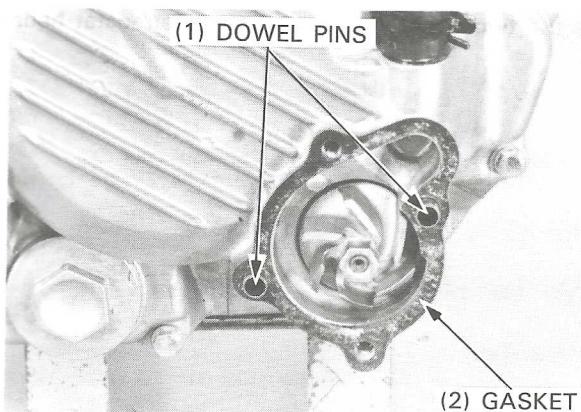
TORQUE: 10–14 N·m (1.0–1.4 kg·m, 7–10 ft-lb)

NOTE

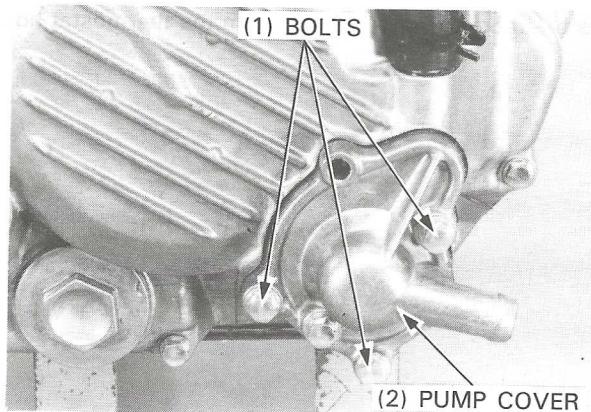
- The impeller has left hand threads.



Install the dowel pins and a new gasket.



Install the water pump cover with the three bolts.
Install the oil pipe (page 10-7).
Install the engine (Section 5).

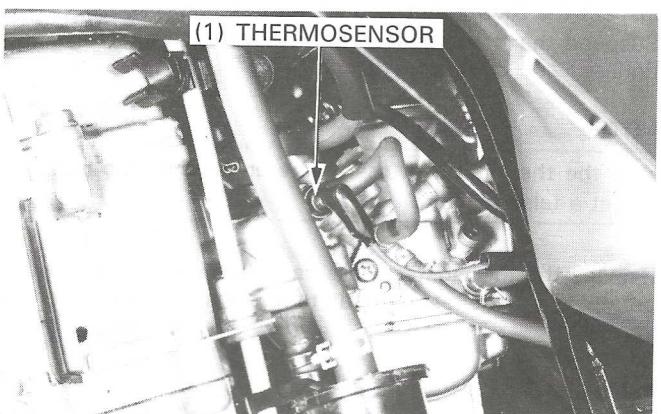


THERMOSENSOR

See page 16-20 for thermosensor inspection.

REMOVAL

Remove the right rear cover (page 13-2).
Drain the coolant (page 12-2).
Disconnect the thermosensor wire.
Remove the thermosensor.



INSTALLATION

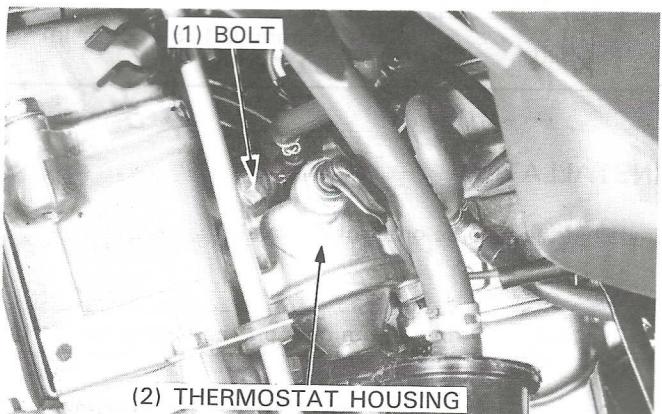
Apply 3-BOND No. 1212 sealant or equivalent to the thermosensor threads and install it into the thermostat housing.
Connect the thermosensor wire.
Fill and bleed the cooling system (page 12-3).
Install the right rear cover.

THERMOSTAT

REMOVAL

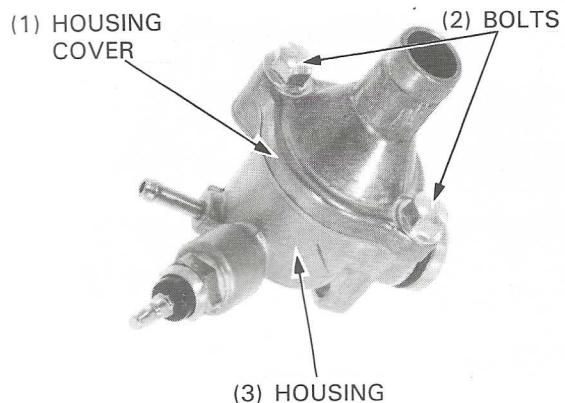
Remove the right rear cover.
Drain the coolant (page 12-2).
Disconnect the thermosensor wire from the sensor.

Disconnect the water hose from the thermostat housing.
Disconnect the air vent tube from the housing.
Remove the mounting bolt and thermostat housing from the cylinder head.

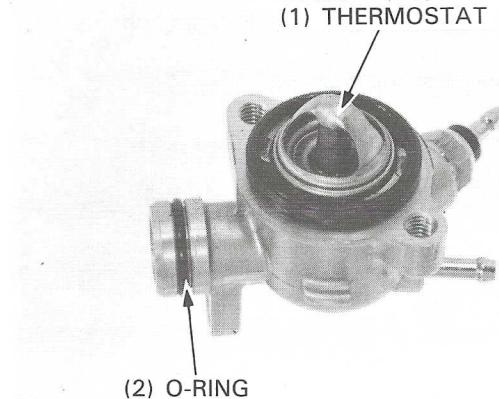


COOLING SYSTEM

Remove the two bolts and separate the thermostat housing halves.



Remove the thermostat and O-ring from the thermostat housing.



INSPECTION

Inspect the thermostat visually for damage.

Suspend the thermostat in heated water to check its operation.

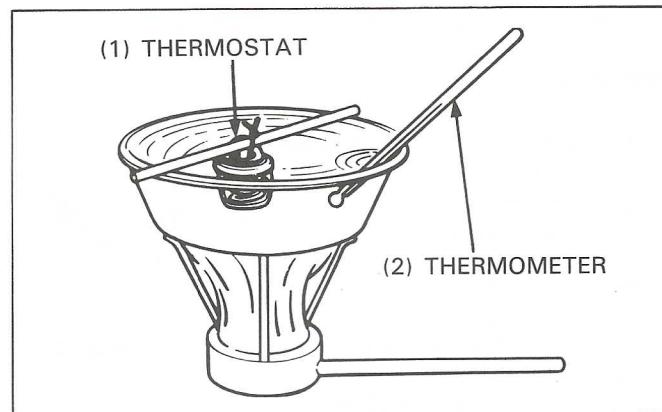
NOTE

- If the thermostat or thermometer touches the pan, you'll get a false reading.

Replace the thermostat if the valve stays open at room temperature, or if it responds at temperatures other than those specified.

Technical Data

| | |
|---------------|--|
| Start to open | 71° – 80°C (160° – 176°F) |
| Valve lift | 3.5 – 4.5 mm (0.138 – 0.177 in) at 80°C (176°F) |



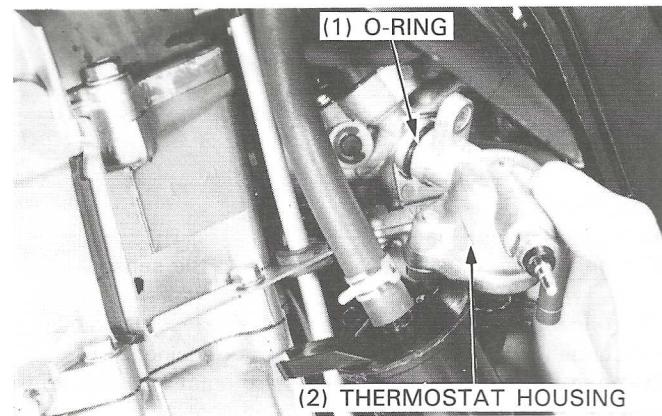
INSTALLATION

Install in the reverse order of removal.

NOTE

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

Fill the cooling system with the specified coolant (page 12-3).



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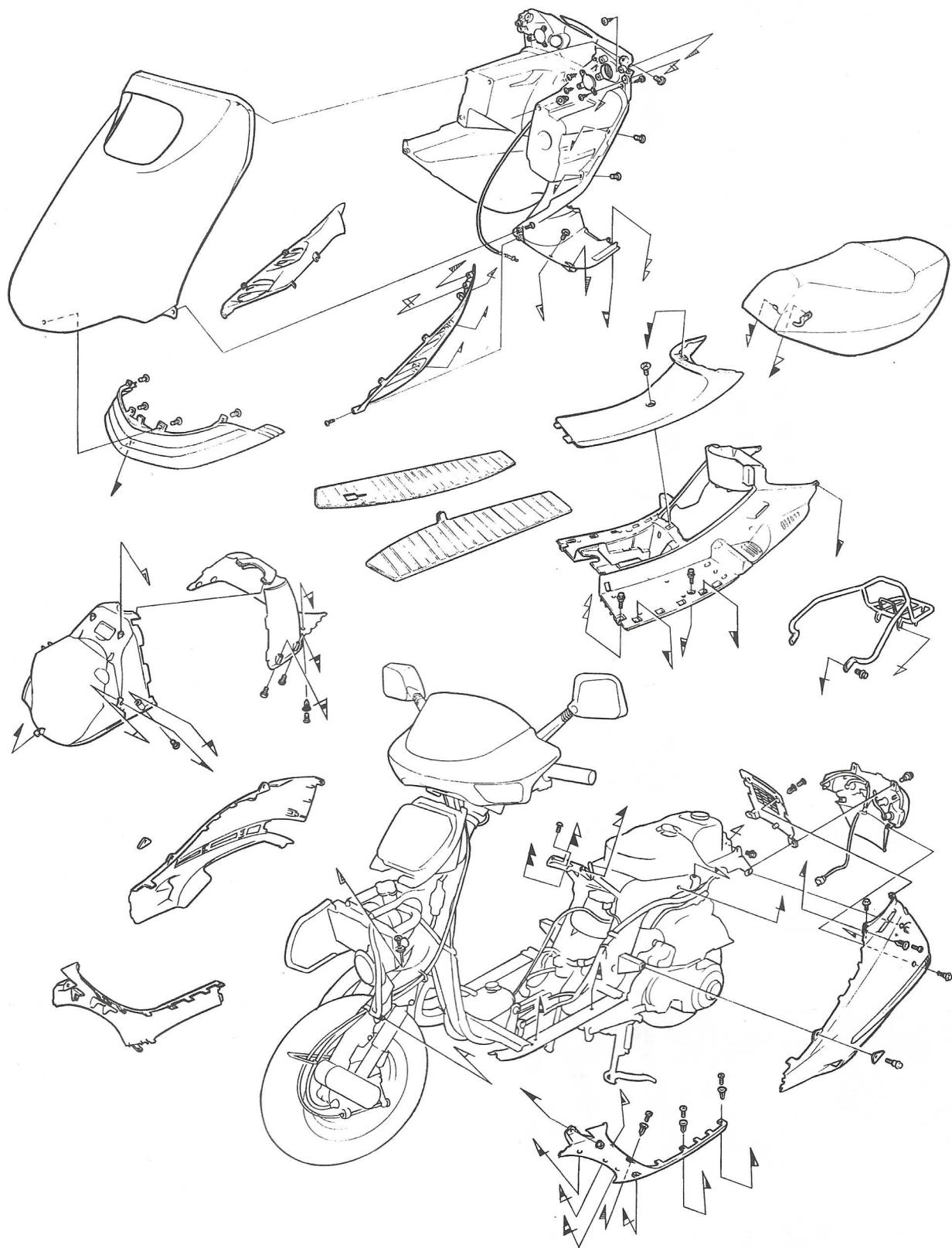
R

R

R

O-86

FRAME COVERS



13. FRAME COVERS

| | | | |
|-----------------------|------|--------------------|------|
| SERVICE INFORMATION | 13-1 | FRAME CENTER COVER | 13-2 |
| LEFT/RIGHT REAR COVER | 13-2 | FRONT COVER | 13-3 |
| MAINTENANCE COVER | 13-2 | LEG SHIELD | 13-3 |

SERVICE INFORMATION

GENERAL

- This section covers the frame covers (left and right rear cover, center cover, front cover, radiator grilles, floor board and leg shield) maintenance.

LEFT/RIGHT REAR COVER

REAR PROTECTOR MOULDING

FRAME CENTER COVER

RIGHT AND LEFT REAR COVERS

↓
SEAT

↓
FLOOR MAT

RADIATOR GRILLE

FRONT COVER

FLOORBOARD

RIGHT AND LEFT REAR COVERS

↓
FRAME CENTER COVER

FRAME COVERS

LEFT/RIGHT REAR COVER

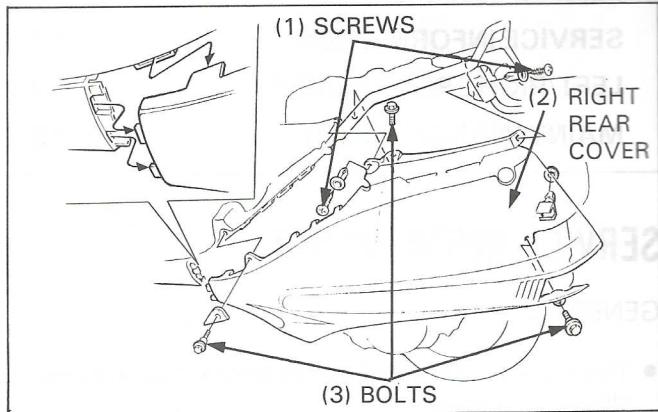
REMOVAL

Open the seat.

Remove the right and left rear covers by removing the two screws and three bolts.

INSTALLATION

Install the rear covers in the reverse order of removal.



MAINTENANCE COVER

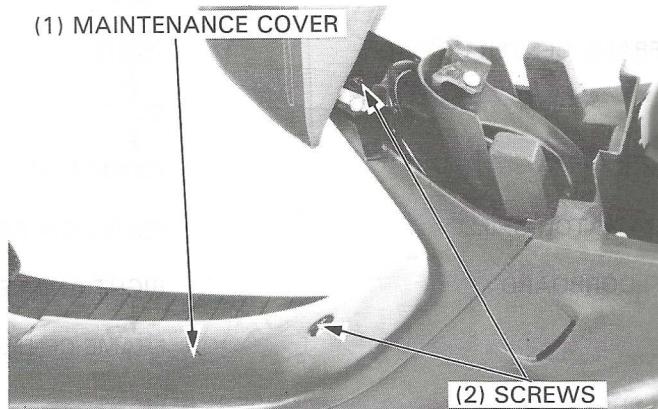
REMOVAL

Lift up the seat.

Remove the two screws and then maintenance cover.

INSTALLATION

Install maintenance cover in the reverse order of removal.



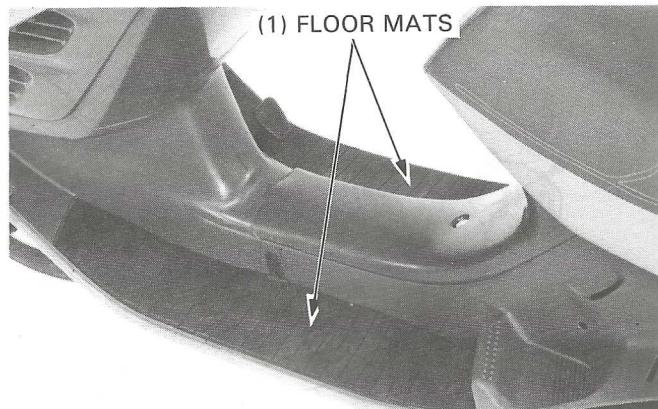
FRAME CENTER COVER

REMOVAL

Lift the seat and remove maintenance cover.

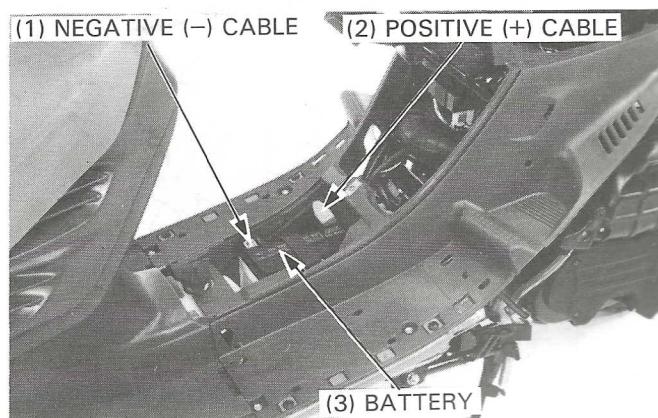
Remove the floor mats.

Remove the seat.



Disconnect the battery negative (-) cable first, then disconnect the positive (+) cable.

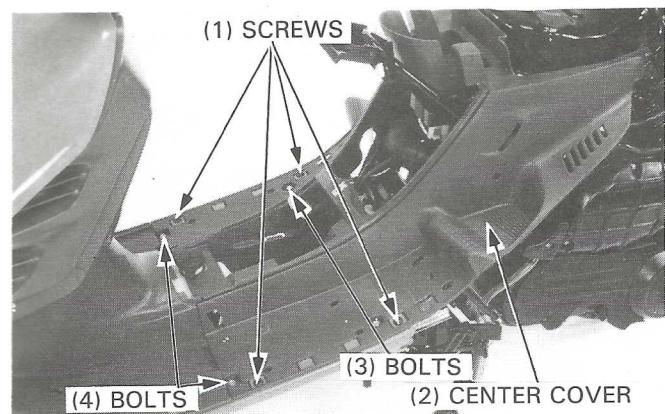
Remove the battery.



Remove the four screws and four bolts and remove the frame center cover.

INSTALLATION

Install the frame center cover in the reverse order of removal.



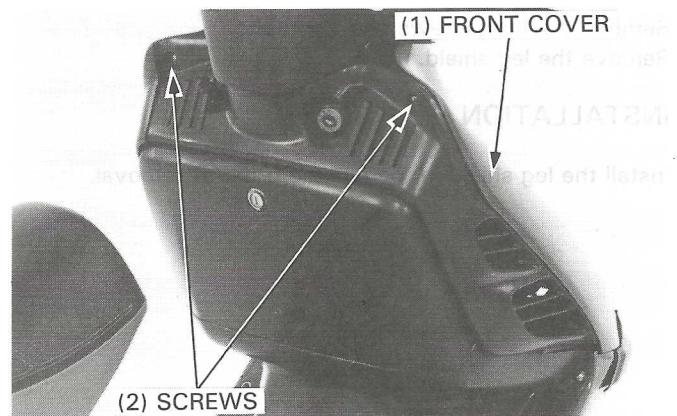
FRONT COVER

REMOVAL

Remove the four screws and front cover.

INSTALLATION

Install the front cover in the reverse order of removal.

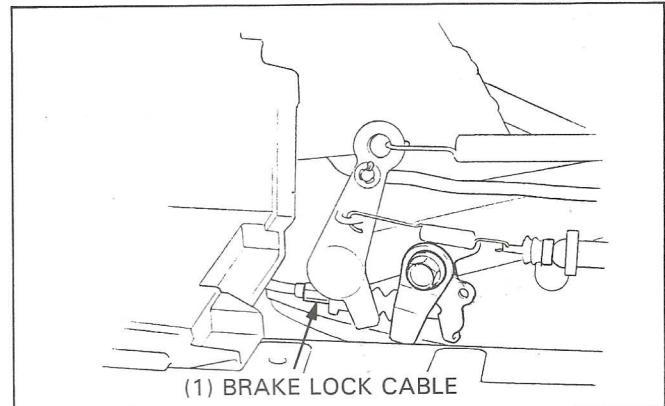


LEG SHIELD

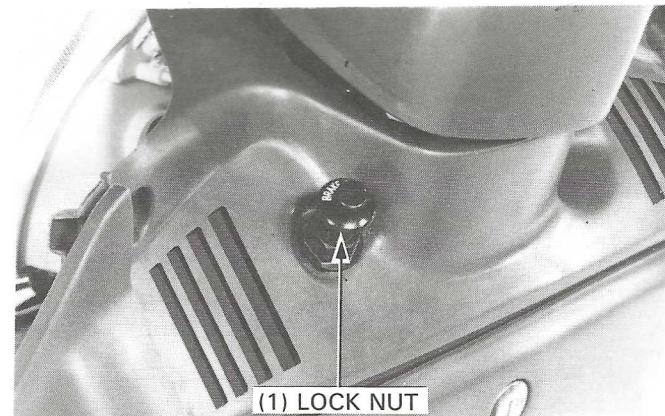
REMOVAL

Remove the right and left rear covers, frame center cover and front cover.

Disconnect the brake lock cable at the lower end.

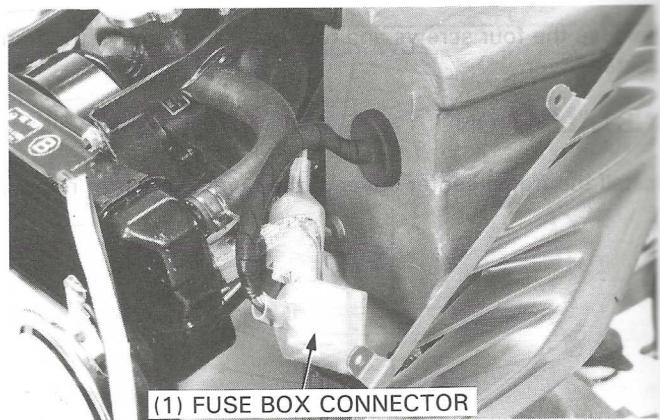


Loosen the lock nut and remove the brake lock cable.



FRAME COVERS

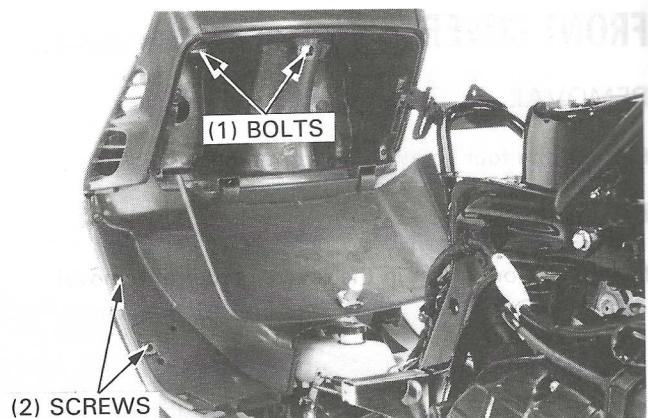
Disconnect the fuse box connector.
Remove the fuse box.



Remove the four screws and two bolts.
Remove the leg shield.

INSTALLATION

Install the leg shield in the reverse order of removal.



MEMO

SERVICE
TICKET
NUMBER
NAME
FROM
TO

SERVICE
GEN
Ref
SPR

Re: Service Request
Date: 10/10/2010
Time: 10:00 AM
(Detailed description of problem)

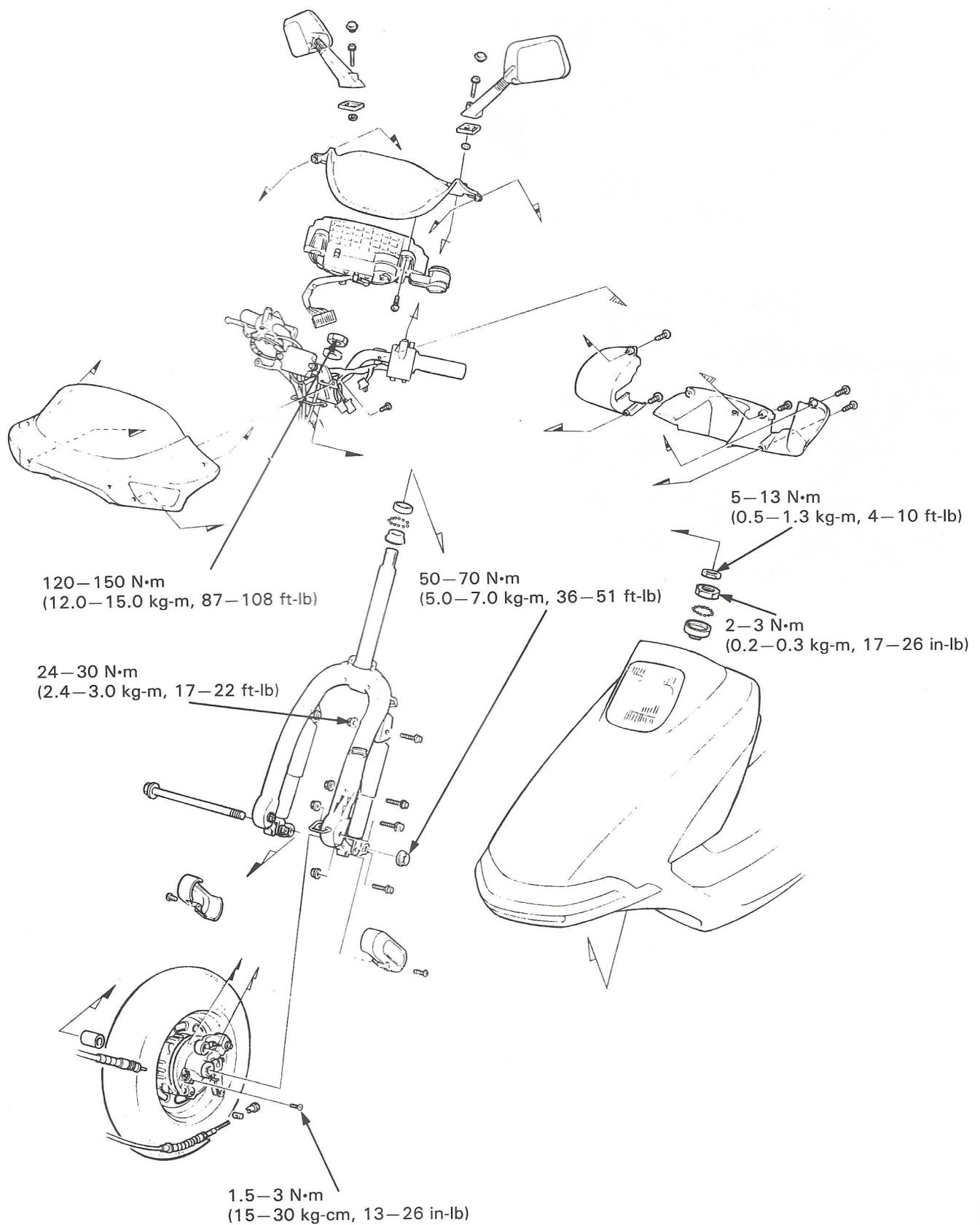
To: [REDACTED]
From: [REDACTED]
Subject: [REDACTED]
Priority: [REDACTED]

Re: [REDACTED]
Ticket # [REDACTED]



041

STEERING/FRONT WHEEL/BRAKE/SUSPENSION



14. STEERING/FRONT WHEEL/BRAKE/SUSPENSION

| | | | |
|---------------------|------|------------------|-------|
| SERVICE INFORMATION | 14-1 | FRONT BRAKE | 14-9 |
| TROUBLESHOOTING | 14-2 | FRONT SUSPENSION | 14-12 |
| HANDLEBAR | 14-3 | FORK/STEERING | 14-15 |
| FRONT WHEEL | 14-6 | | |

SERVICE INFORMATION

GENERAL

Refer to the Tubeless Tire Repair Manual for tire removal, repair, and remounting procedures.

SPECIFICATIONS

mm (in)

| ITEM | STANDARD | SERVICE LIMIT |
|--------------------------|--------------|---------------|
| Axle shaft runout | — | 0.2 (0.01) |
| Rim runout | radial | 2.0 (0.08) |
| | axial | 2.0 (0.08) |
| Shock spring free length | 213.5 (8.40) | 209.2 (8.24) |
| Front brake drum I.D. | 110.0 (4.33) | 111.0 (4.37) |
| Brake lining thickness | 4.0 (0.16) | 2.0 (0.08) |

TORQUE VALUES

| | |
|-----------------------------------|--|
| Front axle nut | 50–70 N·m (5.0–7.0 kg-m, 36–51 ft-lb) |
| Steering stem nut | 120–150 N·m (12.0–15.0 kg-m, 87–108 ft-lb) |
| Steering stem lock nut | 5–13 N·m (0.5–1.3 kg-m, 4–10 ft-lb) |
| Steering top cone race | 2–3 N·m (20–30 kg-cm, 17–26 in-lb) |
| Front brake lever pivot: | |
| bolt | 2–5 N·m (20–50 kg-cm, 17–43 in-lb) |
| nut | 3–5 N·m (30–50 kg-cm, 26–43 in-lb) |
| Front wheel hub nut | 28–32 N·m (2.8–3.2 kg-m, 20–23 ft-lb) Apply oil. |
| Front brake arm bolt | 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb) |
| Speedometer cable attaching screw | 1.5–3 N·m (0.15–3.0 kg-m, 1.1–2.2 ft-lb) |
| Front shock absorber: | |
| —upper mount bolt | 24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb) Apply oil |
| —lower bolt | 0.8–1.2 N·m (8–12 kg-cm, 7–10 in-lb) |
| —lower nut | 15–20 N·m (1.5–2.0 kg-m, 11–15 ft-lb) |
| —damper lock nut | 15–25 N·m (1.5–2.5 kg-m, 11–18 ft-lb) Apply a locking agent. |
| Fork pivot arm nut | 24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb) |
| Torque link bolt: | |
| —brake panel side | 27–33 N·m (2.7–3.3 kg-m, 20–24 ft-lb) |
| —front fork side | 27–33 N·m (2.7–3.3 kg-m, 20–24 ft-lb) |

TOOLS

Special

| | |
|--------------------------------|---|
| Steering stem wrench | 07916–1870101 Equivalent commercially available in U.S.A. |
| Steering stem wrench | 07916–GK00000 or 07702–0020001 |
| Ball race remover | 07946–GA70000 (Not available in U.S.A.) or 07946–3710400 |
| Attachment | 07945–3330300 |
| Rear shock absorber attachment | 07967–GA70102 |
| Shock absorber attachment | 07967–KM10100 |

STEERING/FRONT WHEEL/BRAKE/SUSPENSION

Common

| | |
|-----------------------------|---|
| Lock nut wrench, 30 x 32 mm | 07716-0020400 Equivalent commercially available in U.S.A. |
| Extension | 07716-0020500 Equivalent commercially available in U.S.A. |
| Attachment, 32 x 35 mm | 07746-0010100 |
| Attachment, 42 x 47 mm | 07746-0010300 |
| Pilot, 12 mm | 07746-0040200 |
| Bearing remover shaft | 07746-0050100 |
| Bearing remover head, 12 mm | 07746-0050300 |
| Driver | 07749-0010000 |
| Shock absorber compressor | 07959-3290001 |
| Fork seal driver | 07947-3550000 |

TROUBLESHOOTING

Hard steering

- Steering stem nut too tight
- Steering head bearings damaged
- Steering ball and cone races damaged
- Insufficient tire pressure

Steers to one side or does not track straight

- Uneven front shocks
- Bent fork
- Bent front axle

Front wheel wobbling

- Bent rim
- Axle nut tightened improperly
- Bent spoke plate
- Faulty or unevenly worn tire
- Excessive wheel bearing play

Soft suspension

- Weak fork springs
- Damper oil leaks

Front suspension noise

- Fork link binding
- Loose fork fasteners

HANDLEBAR

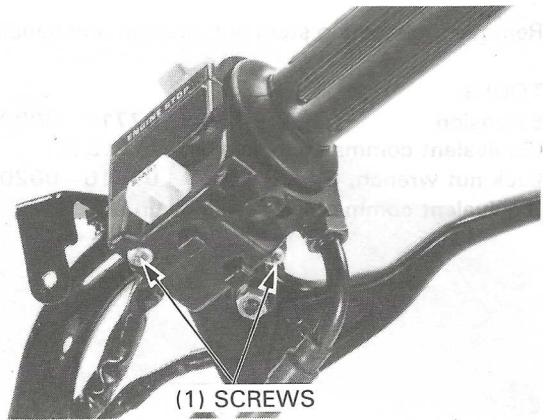
REMOVAL

Remove the instruments (page 16-12).

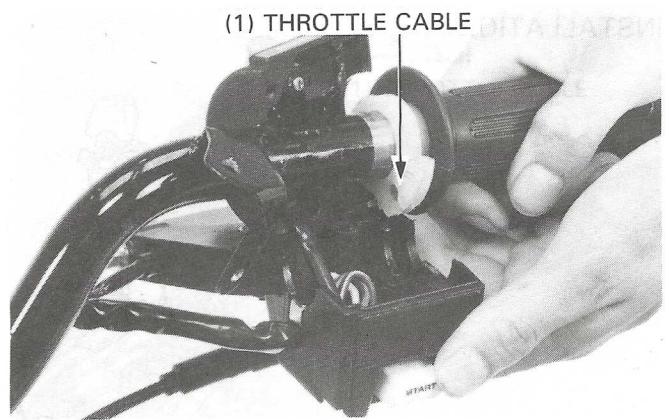
Disconnect the right handlebar switch wire connectors.

Loosen the front brake adjusting nut.

Remove the two right handlebar switch housing screws and separate the housing.

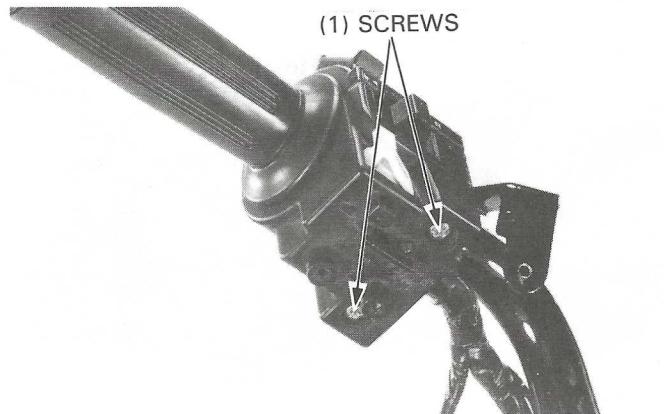


Disconnect the throttle cable from the throttle grip and remove the throttle grip from the right handlebar.

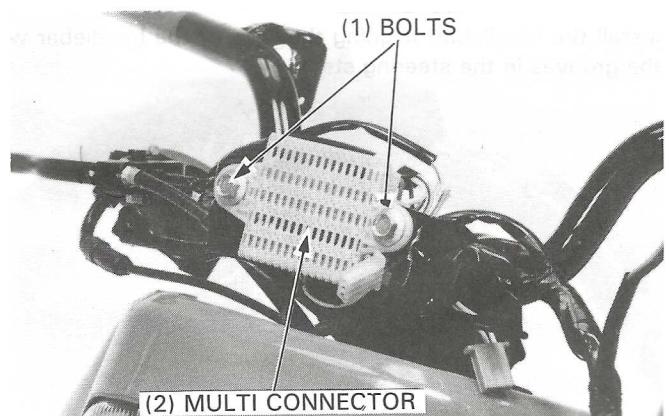


Disconnect the left handlebar switch wire connectors.

Remove the two left handlebar switch housing screws, then separate and remove the housing.



Remove the two bolts and multi connector.

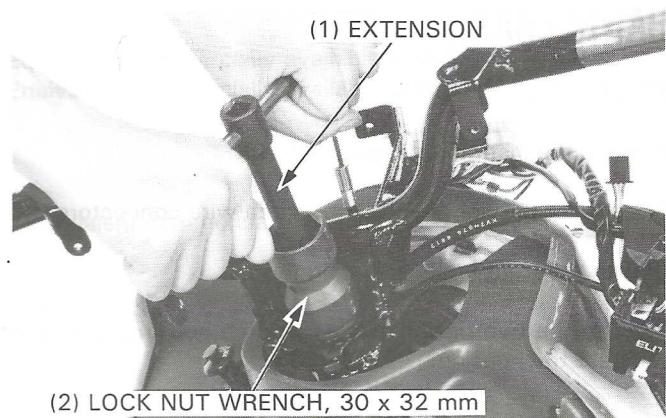


STEERING/FRONT WHEEL/BRAKE/SUSPENSION

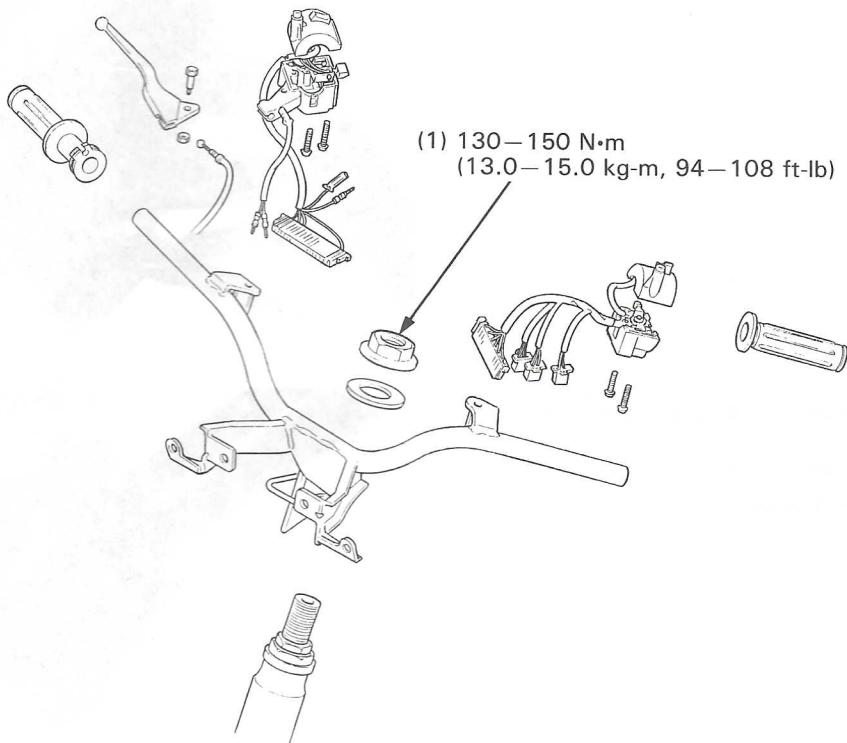
Remove the steering stem nut, washer and handlebar.

TOOLS:

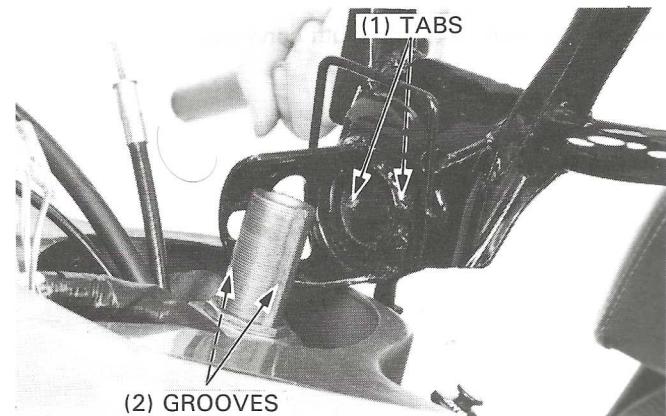
Extension 07716-0020500
(Equivalent commercially available in U.S.A.)
Lock nut wrench, 30 x 32 mm 07716-0020400
(Equivalent commercially available in U.S.A.)



INSTALLATION



Install the handlebar, aligning the tabs of the handlebar with the grooves in the steering stem.



Install the washer and steering stem nut and tighten the steering stem nut.

TORQUE: 120–150 N·m (12.0–15.0 kg-m, 87–108 ft-lb)

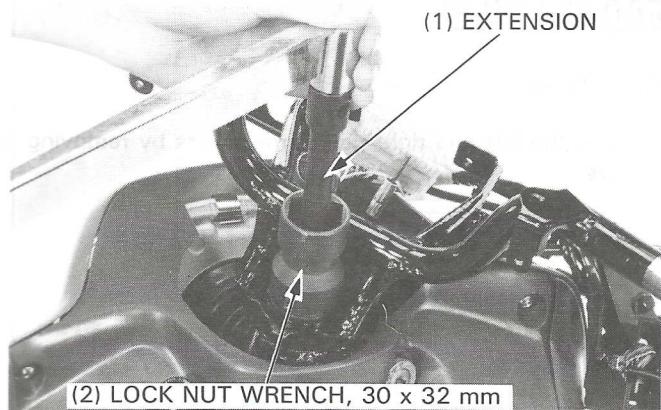
TOOLS:

Extension 07716–0020500

(Equivalent commercially available in U.S.A.)

Lock nut wrench, 30 x 32 mm 07716–0020400

(Equivalent commercially available in U.S.A.)

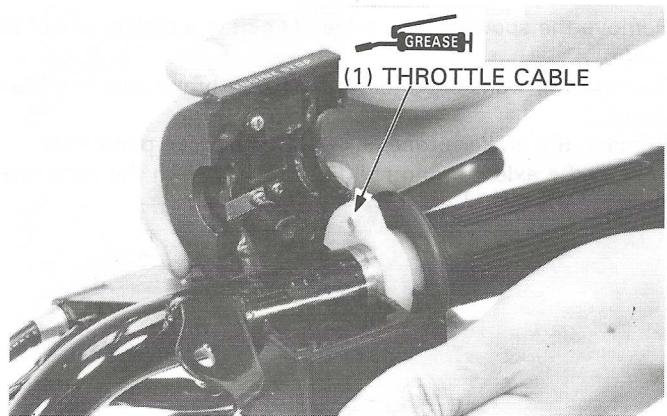


Apply Honda Bond A, Honda Hand Grip Cement (U.S.A. only) or an equivalent to the inside surface of the grips and to the clean surface of the left handlebar and throttle pipe. Wait 3–5 minutes and install the grips. Rotate the grips for even application of the adhesive.

NOTE

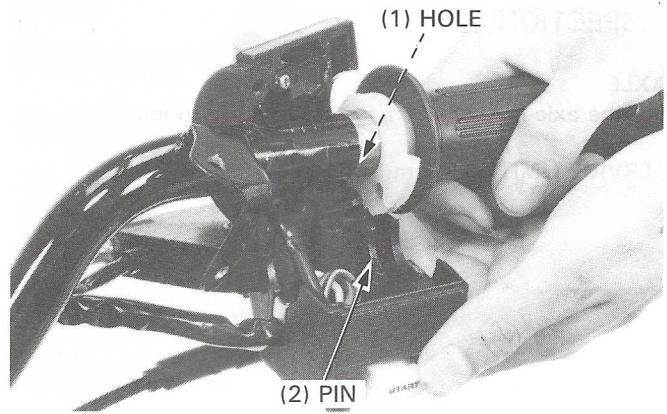
- Allow the adhesive to dry for an hour before using.

Apply grease to the end of the throttle cable and connect it to the throttle grip.



Set the right handlebar switch housing on the right handlebar and align the hole in the handlebar with the pin on the lower housing.

Tighten the forward screw first, then tighten the rear screw.



Set the left handlebar switch housing on the left handlebar and align the hole in the handlebar with the pin on the lower housing.

Tighten the forward screw first, then tighten the rear screw.

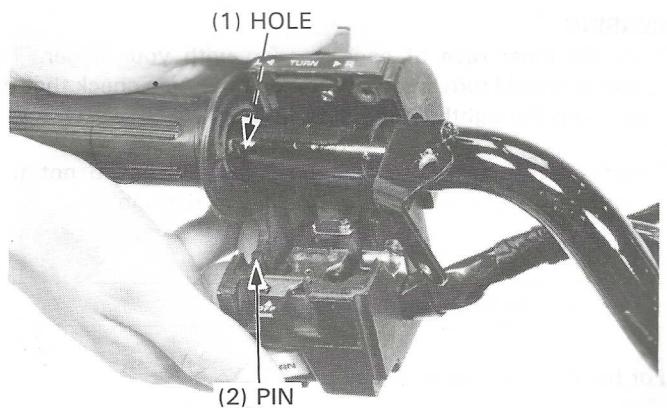
Install the instruments (page 16-14).

NOTE

- After installing the handlebar, check that the throttle grip rotates freely in all steering positions.

Perform the following inspections and adjustments:

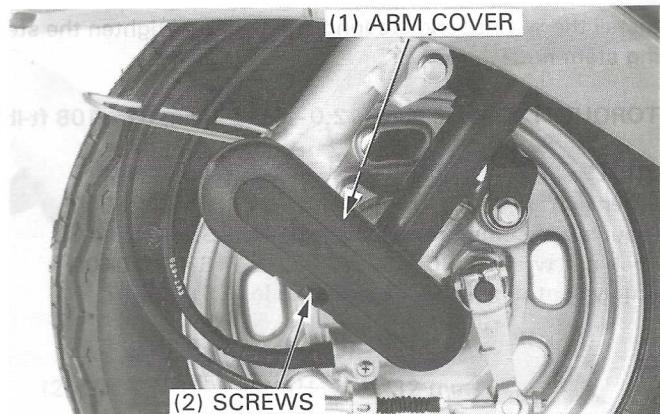
- Throttle operation (page 3-3)
- Brake lever free play (page 3-9)
- Operation of all electrical equipments (Section 16)



FRONT WHEEL

REMOVAL

Remove the left and right pivot arm covers by removing the screws.



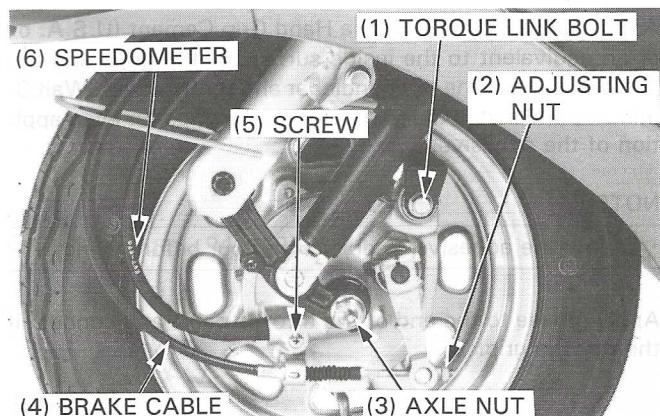
Remove the speedometer cable set screw and disconnect the cable.

Remove the front brake cable from the brake arm and brake panel.

Remove the brake torque link bolt from brake panel side.

Loosen the axle nut and pull the axle out from the right side.

Remove the front wheel.

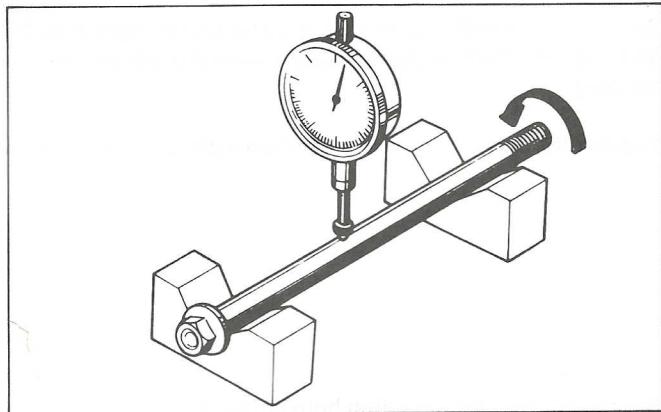


INSPECTION

AXLE

Set the axle in V blocks and measure the runout.

SERVICE LIMIT: 0.2 mm (0.01 in)



BEARING

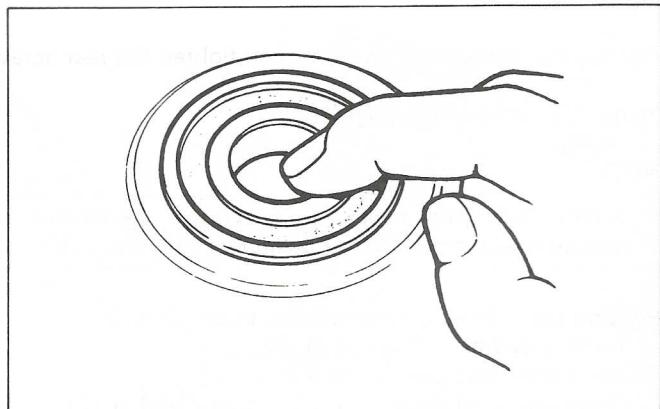
Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the outer race fits tightly in the hub.

Remove and discard the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the hub.

NOTE

- Replace the bearings in pairs.

For bearing replacement, see page 14-7.

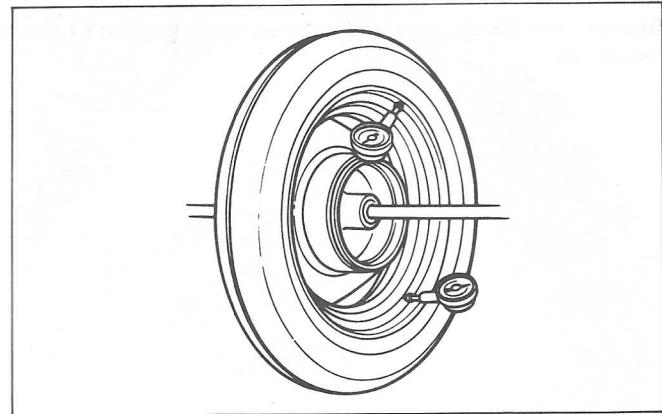


WHEEL RIM

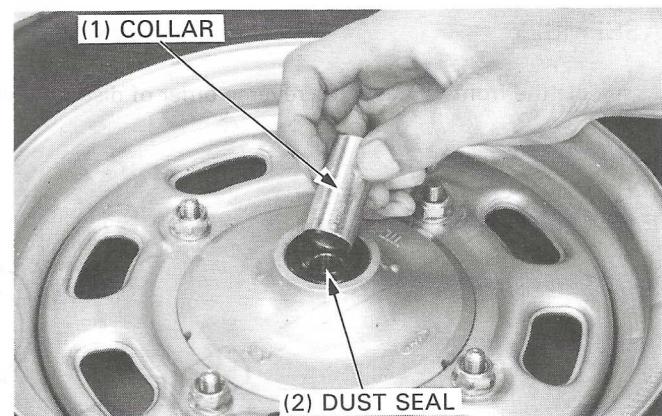
Place the wheel in a truing stand.
Spin the wheel by hand and measure the rim runout using a dial gauge.

SERVICE LIMITS:

RADIAL: 2.0 mm (0.08 in)
AXIAL: 2.0 mm (0.08 in)

**DISASSEMBLY**

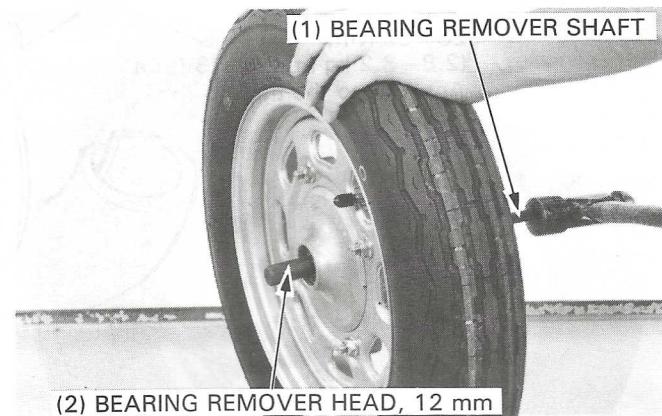
Remove the side collar and dust seal.



Insert the bearing remover head into the bearing.
From the opposite side install the bearing remover shaft and drive the bearing out of the wheel.
Remove the distance collar and drive out the other bearing.

TOOLS:

Bearing remover shaft 07746-0050100
(Equivalent commercially available in U.S.A.)
Bearing remover head, 12 mm 07746-0050300
(Equivalent commercially available in U.S.A.)



Pack grease into the bearing cavities.

Drive in the left bearing squarely until it seats.
Install the center collar and drive in the right bearing squarely until it seats.

NOTE

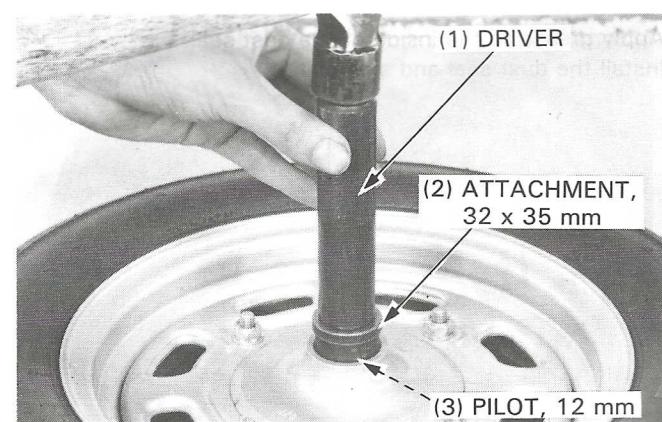
- Do not allow the bearings to tilt while driving them in.

CAUTION

- Never install the old bearing, once the bearing is removed, the bearing must be replaced with a new one.

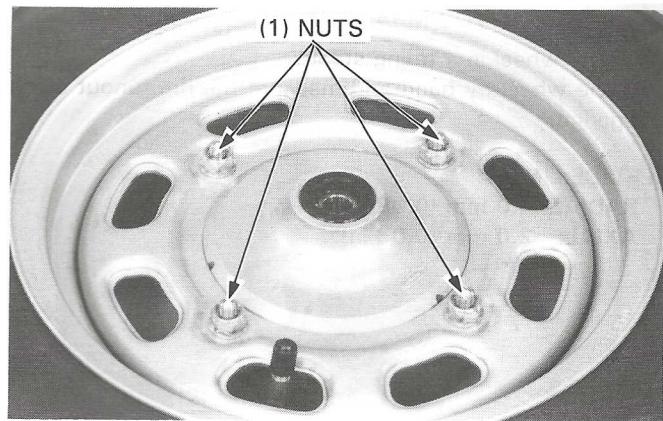
TOOLS:

Driver 07749-0010000
Attachment, 32 x 35 mm 07746-0010100
Pilot, 12 mm 07746-0040200



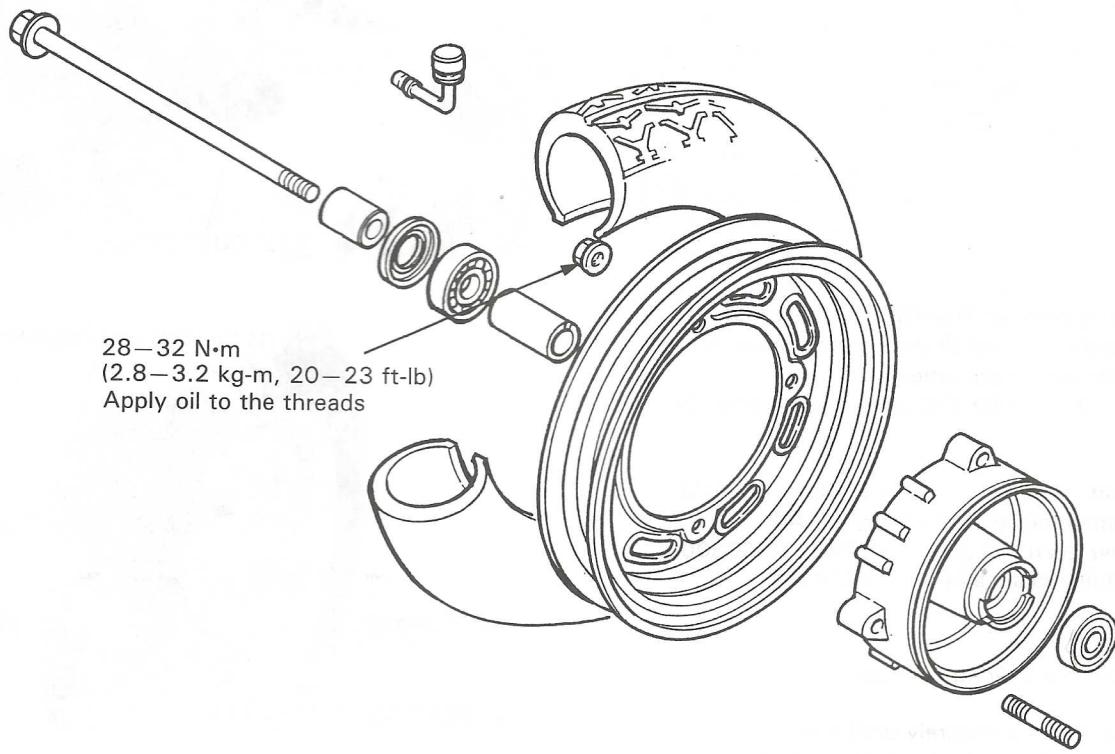
STEERING/FRONT WHEEL/BRAKE/SUSPENSION

Remove the flange nuts and remove the wheel hub from the wheel rim.

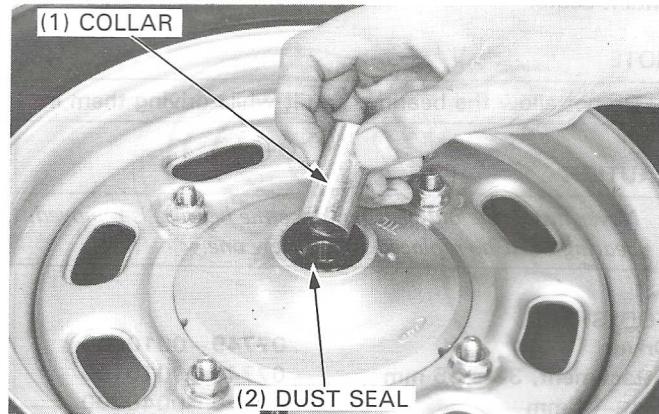


ASSEMBLY

Assemble the front wheel in the reverse order of disassembly.



- Apply grease to the inside of the dust seal.
Install the dust seal and side collar.

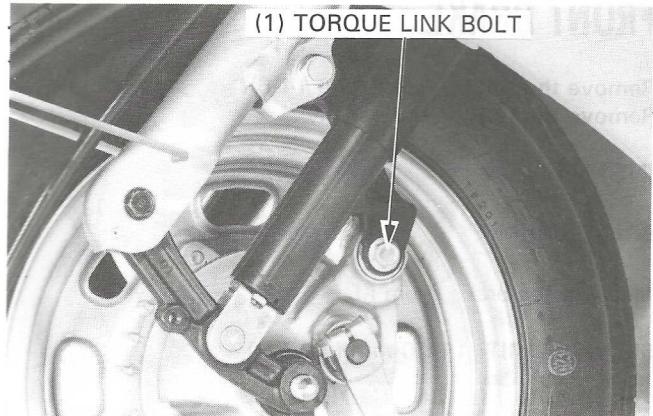


INSTALLATION

Connect the brake torque link to the brake panel using the bolt and nut and tighten the nut.

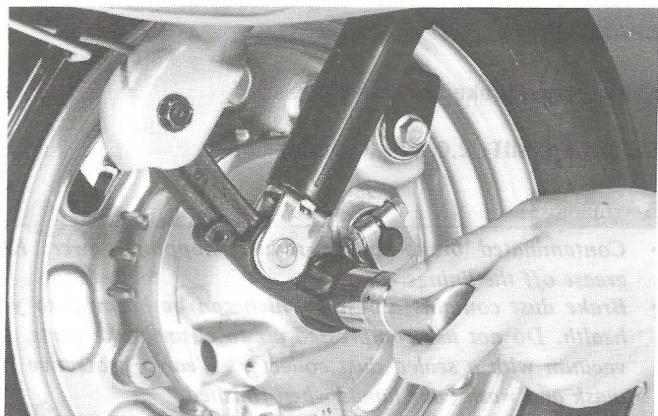
TORQUE: 27–33 N·m (2.7–3.3 kg·m, 20–24 ft-lb)

Insert the axle shaft through the wheel hub from the right side.



Install and tighten the axle nut.

TORQUE: 50–70 N·m (5.0–7.0 kg·m, 36–51 ft-lb)

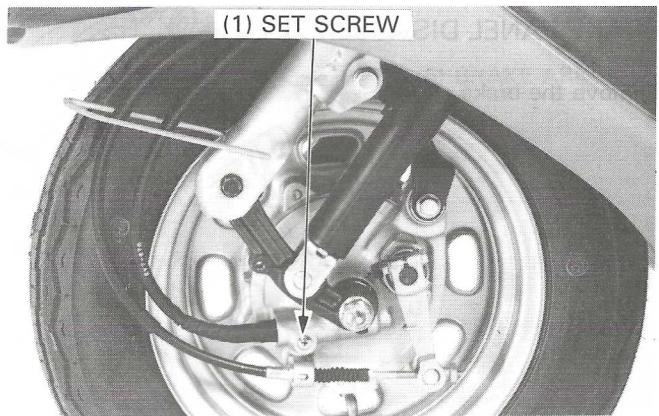


Install the speedometer cable and tighten the set screw.

TORQUE: 1.5–3 N·m (0.15–0.3 kg·m, 1.1–2.2 ft-lb)

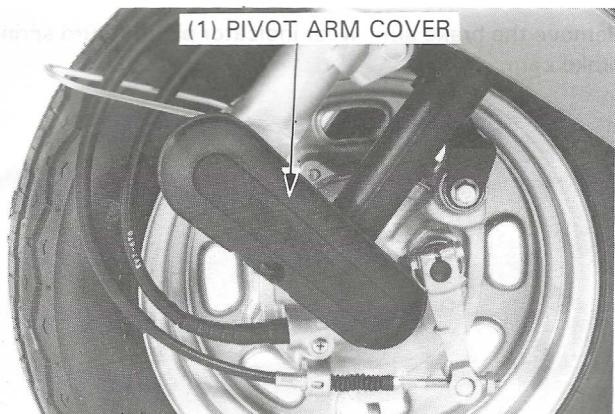
Install the brake cable through the brake panel and to the brake arm.

Adjust the front brake lever free play (page 3-9).



Install the right and left pivot arm cover.

Make sure that the hook on the arm cover is inserted into the pivot arm.



FRONT BRAKE

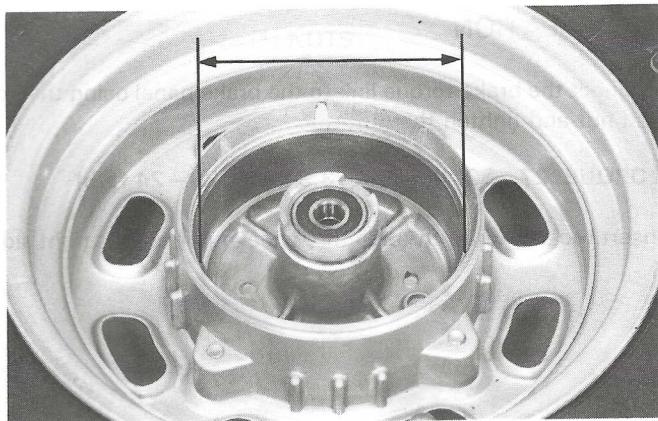
Remove the front wheel (page 14-6).
Remove the front brake panel.

INSPECTION

BRAKE DRUM

Measure the brake drum I.D.

SERVICE LIMIT: 111.0 mm (4.37 in)



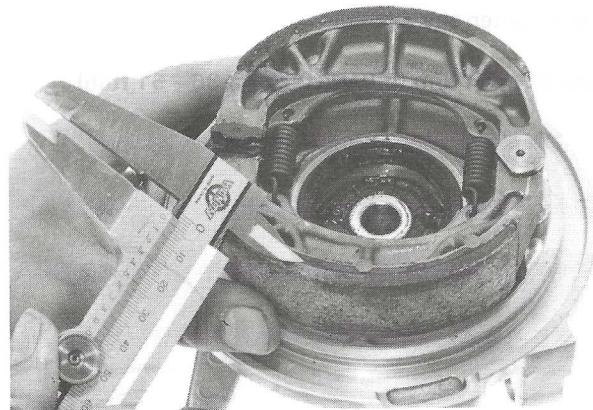
BRAKE LINING

Measure the brake lining thickness.

SERVICE LIMIT: 2.0 mm (0.08 in)

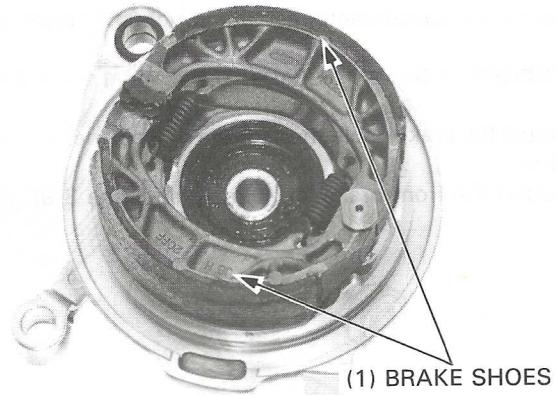
WARNING

- Contaminated brake linings reduce stopping power. Keep grease off the linings.
- Brake dust contains asbestos which can be harmful to your health. Do not use compressed air to clean brake parts. Use vacuum with a sealed dust collector. Wear a protective face mask and wash your hands when finished.

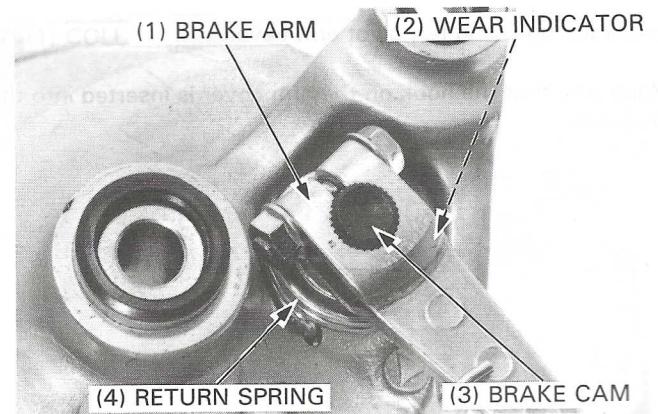


BRAKE PANEL DISASSEMBLY

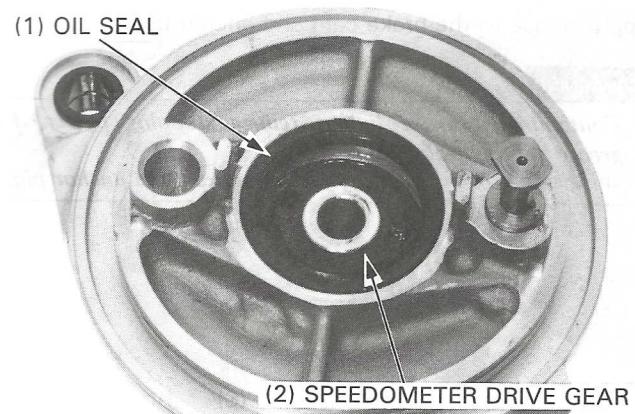
Remove the brake shoes.



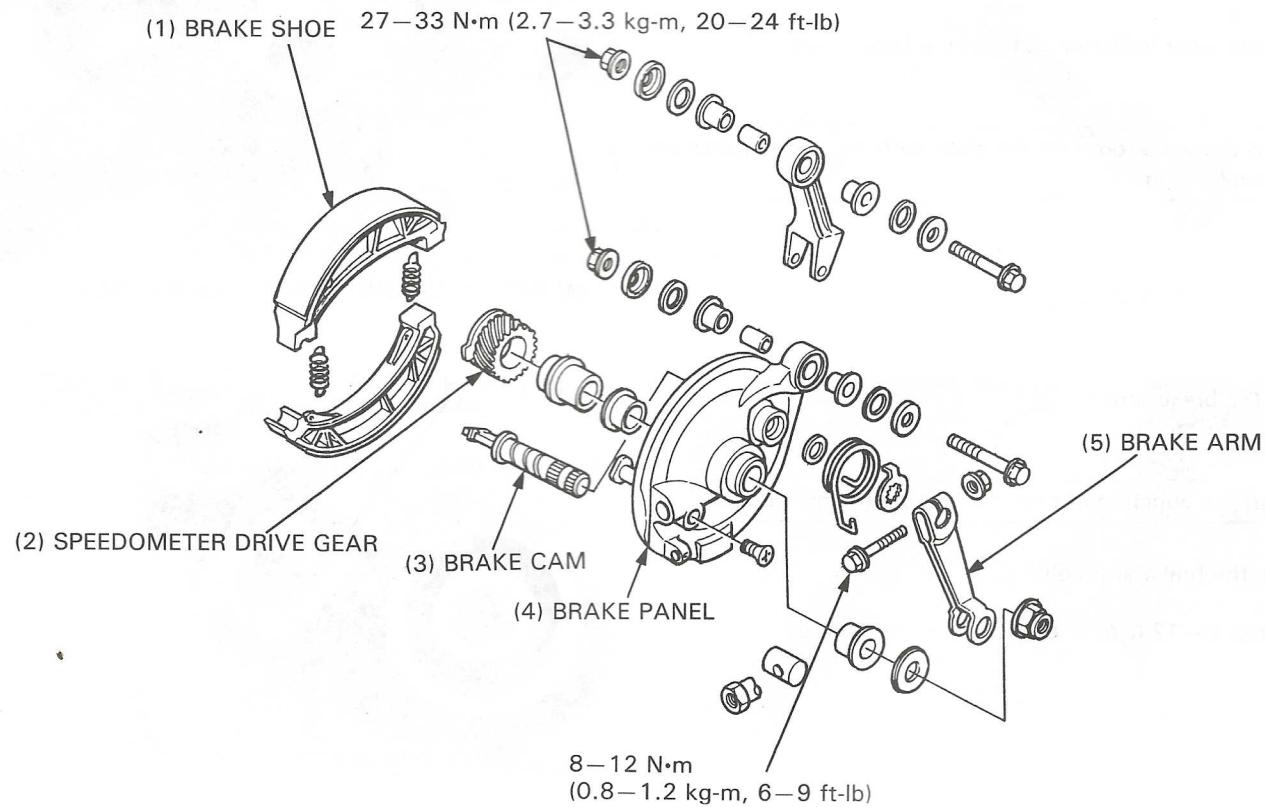
Remove the brake arm, wear indicator plate, return spring and brake cam.



Remove the oil seal and speedometer drive gear.

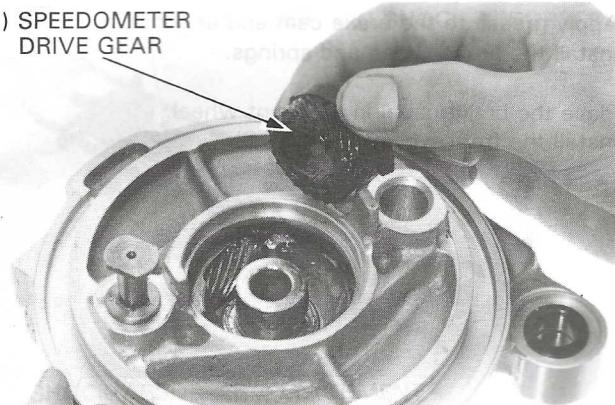


BRAKE PANEL ASSEMBLY



Lubricate the speedometer drive gear with grease and install the drive gear in the brake panel.
Install the oil seal.

(1) SPEEDOMETER DRIVE GEAR

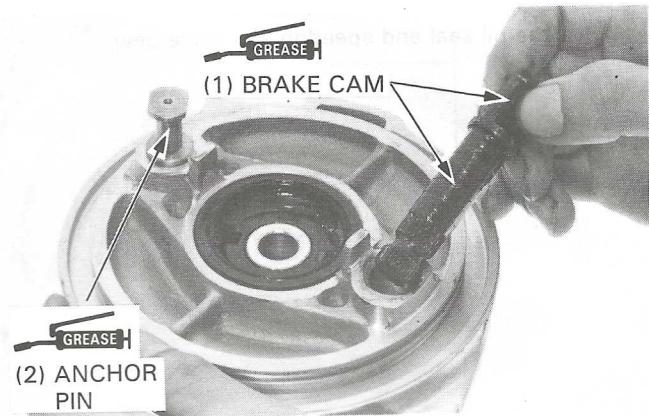


STEERING/FRONT WHEEL/BRAKE/SUSPENSION

Apply grease to the brake cam and anchor pin.

WARNING

- Contaminated brake linings reduce stopping power. Keep grease off the brake linings.
- Wipe any excess grease off the brake cam and anchor pin.



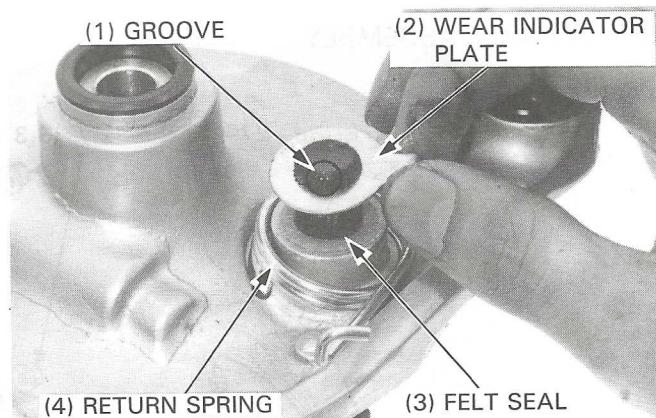
Apply oil to the felt seal and install it to the brake panel.

Install the return spring.

Install the wear indicator plate on the brake cam.

NOTE

- Align the wide tooth on the plate with the wide groove on the brake cam.



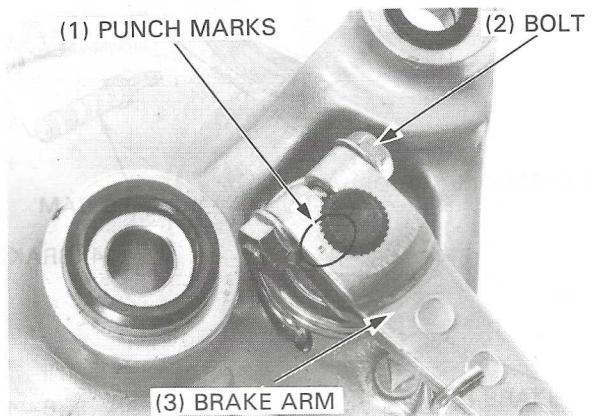
Install the brake arm.

NOTE

- Align the punch marks on the brake arm and cam.

Torque the brake arm bolt.

TORQUE: 8–12 N·m (0.8–1.2 kg·m, 6–9 ft-lb)

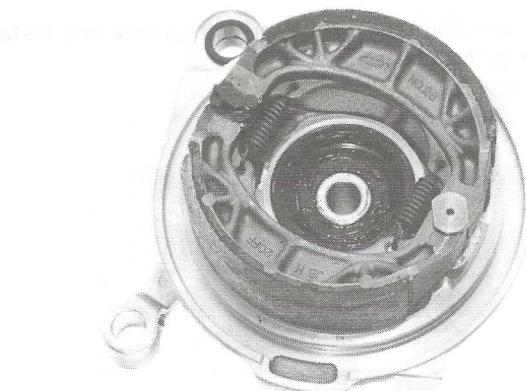


Apply grease to the brake cam and anchor pin.

Install the brake shoes and springs.

Place the brake panel in the front wheel.

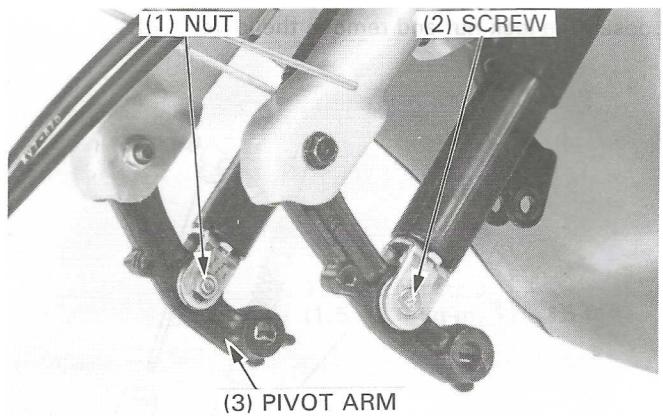
Install the front wheel (page 14-8).



FRONT SUSPENSION

PIVOT ARM REMOVAL

Remove the front wheel (page 14-6).
 Remove the front shock absorber lower mount nut and screw.
 Remove the pivot arm bolt and the arm.



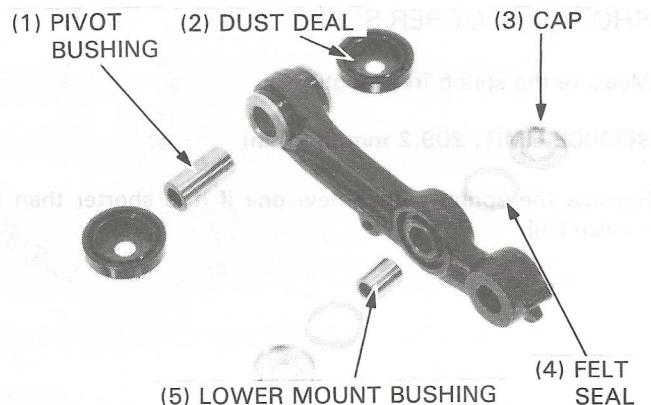
PIVOT ARM INSPECTION

Remove the pivot arm dust seal, pivot bushing, dust cap, felt seal, and shock absorber lower mount bushing.

Inspect the lower mount bushing and pivot bushing for wear or damage.

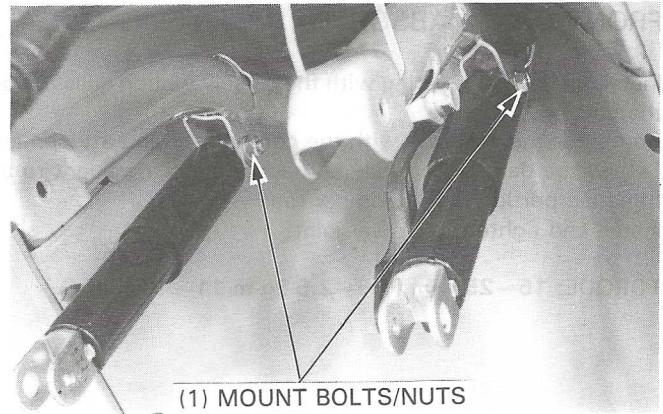
PIVOT ARM INSTALLATION

Apply grease to the pivot bushing, dust seal and shock absorber lower mount bushing and install in the pivot arm.
 Apply oil to the felt seal and install it in the pivot arm.
 Install the dust cap.



FRONT SHOCK ABSORBER REMOVAL

Remove the front shock absorber upper mount bolts, nuts and shock absorbers.

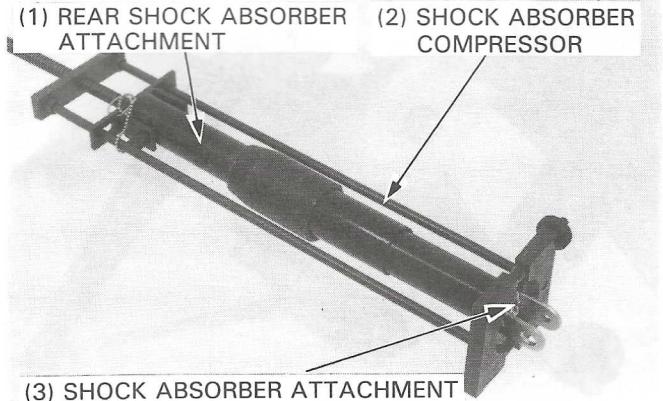


FRONT SHOCK ABSORBER DISASSEMBLY

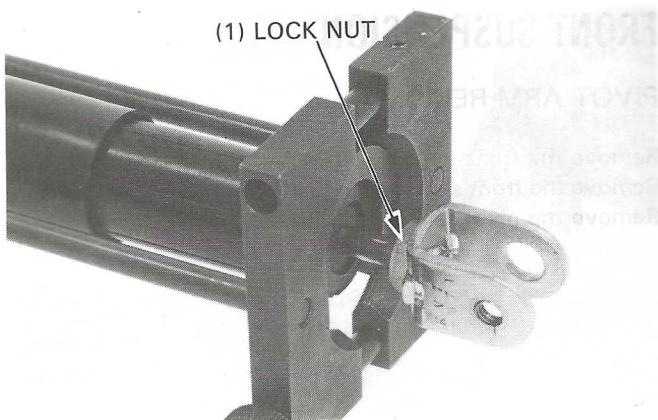
Set the spring compressor as shown and compress the spring.

TOOLS:

| | |
|--------------------------------|---------------|
| Shock absorber compressor | 07959-3290001 |
| Rear shock absorber attachment | 07967-GA70102 |
| Shock absorber attachment | 07967-KM10100 |



Loosen the lock nut and remove the lower joint.

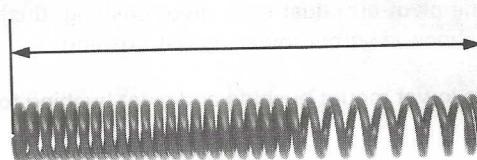


SHOCK ABSORBER SPRING INSPECTION

Measure the spring free length.

SERVICE LIMIT: 209.2 mm (8.24 in)

Replace the spring with a new one if it is shorter than the service limit.



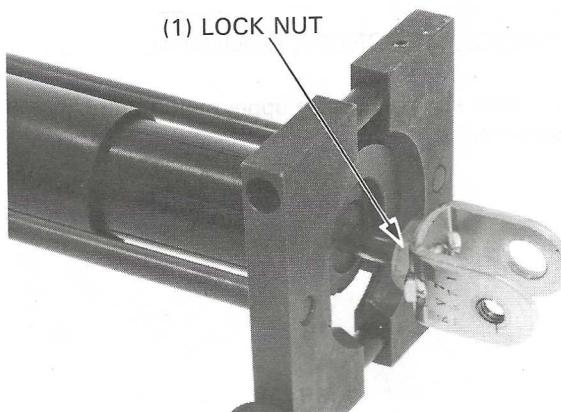
FRONT SHOCK ABSORBER ASSEMBLY

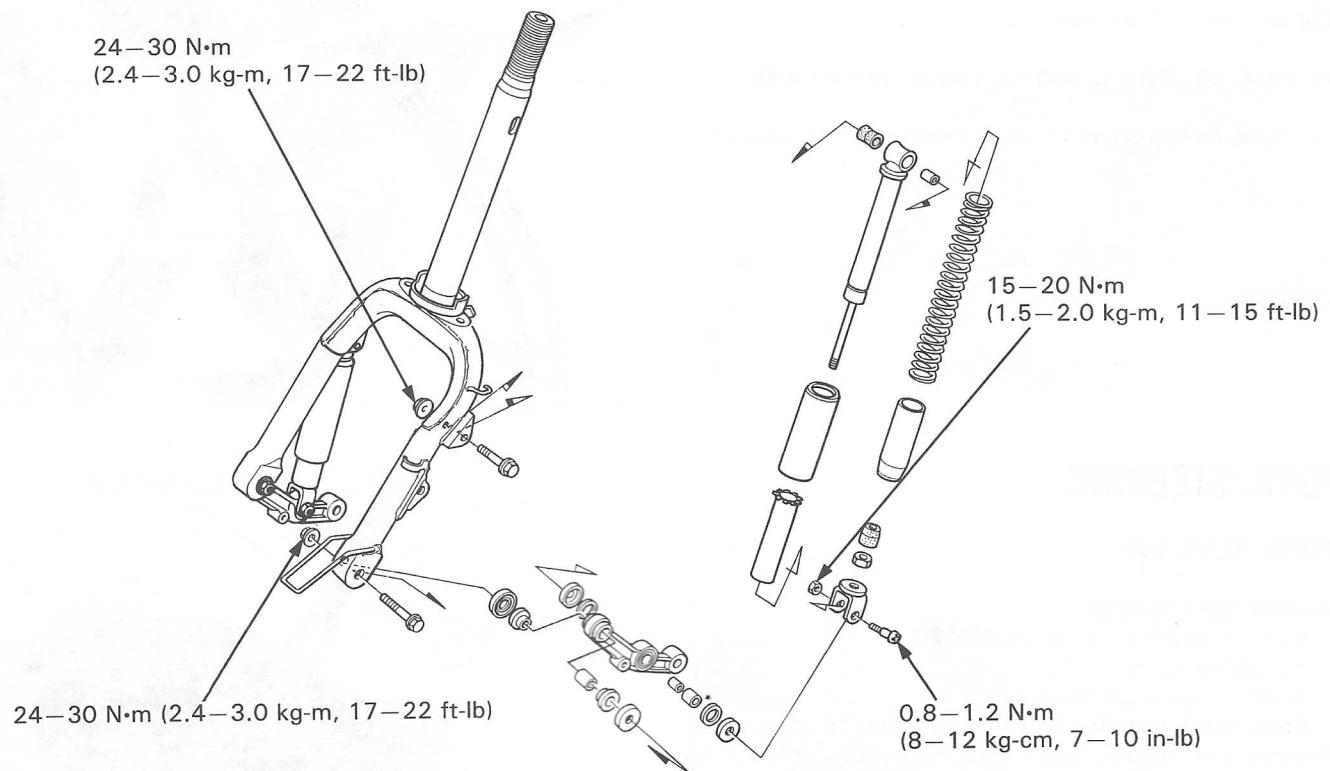
Install the absorber spring with the closely wound coils toward the bottom.

Compress the absorber with the compressor and attachment. Extend the damper rod fully and apply a locking agent to the threaded portion of the damper rod.

Install and tighten the lower joint.

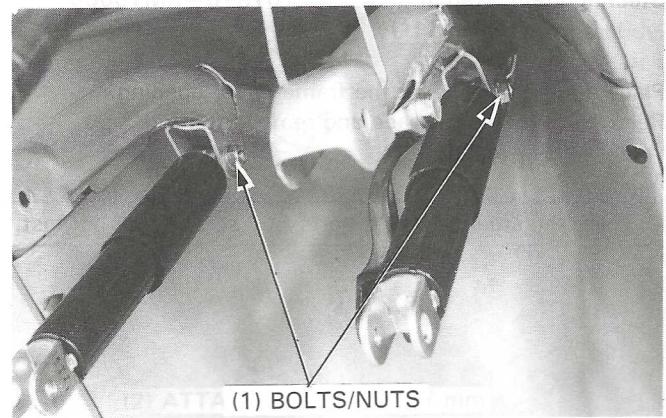
TORQUE: 15–25 N·m (1.5–2.5 kg·m 11–18 ft-lb)





Install the front shock absorber into the fork.
Tighten the bolts and nuts.

TORQUE: 24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)



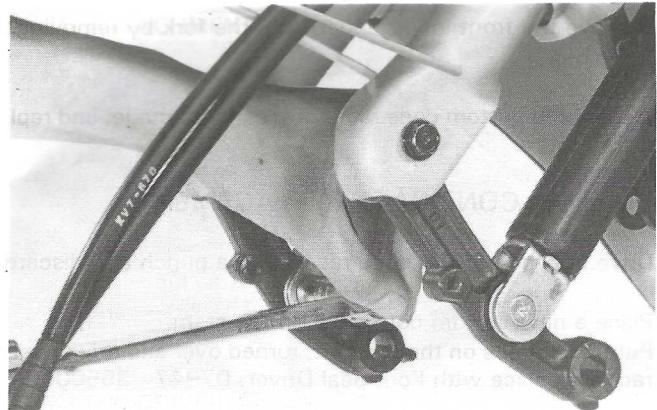
Attach the pivot arm to the front fork.
Connect the pivot arm to the shock absorber lower joint.

Install and tighten the lower mount screw.

TORQUE: 0.8–1.2 N·m (8–12 kg-cm, 7–10 in-lb)

Install and tighten lower lock nut.

TORQUE: 15–20 N·m (1.5–2.0 kg-m, 11–15 ft-lb)

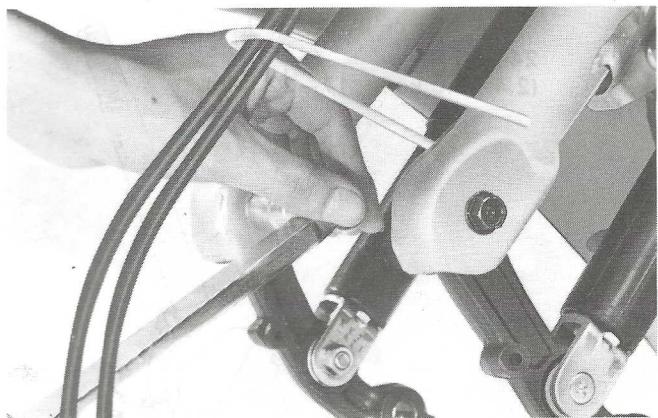


STEERING/FRONT WHEEL/BRAKE/SUSPENSION

Tighten the pivot arm nut.

TORQUE: 24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)

Install the removed parts in the reverse order of removal.



FORK/STEERING

FORK REMOVAL

Remove the following:

- Instrument assembly (page 16-12).
- Handlebar (page 14-3).
- Front wheel (page 14-6).
- Front shock absorber if necessary (page 14-13).

Remove the steering stem lock nut using steering stem wrench.

TOOLS:

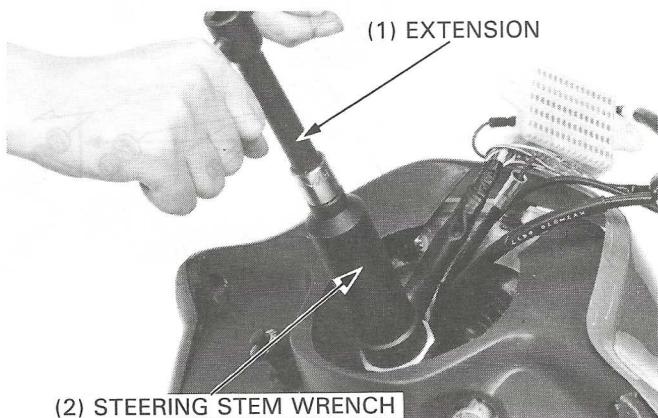
| | |
|---|---------------|
| Extension | 07716-0020500 |
| (Equivalent commercially available in U.S.A.) | |
| Steering stem wrench | 07916-KM10000 |

Place a shop towel over the frame cover opening.

Remove the top cone race and remove the fork.

NOTE

- Place the steel balls in a parts tray so they are not lost.



Remove the front inner fender from the fork by removing the three bolts.

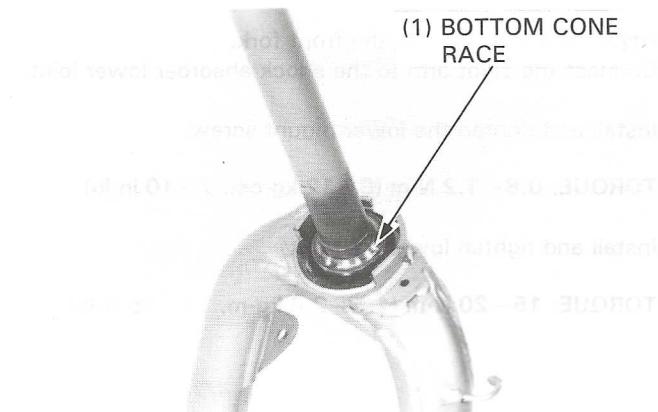
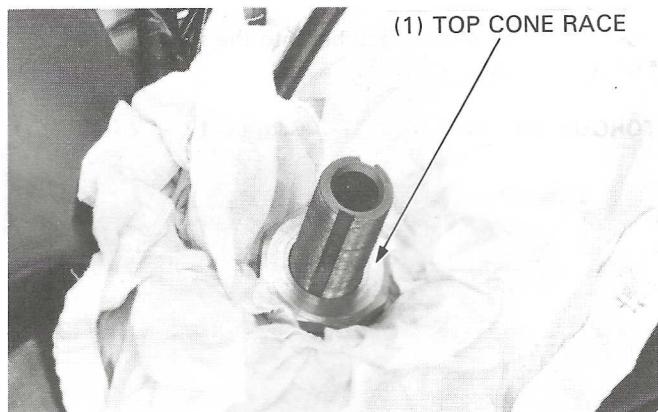
Inspect the bottom cone race for wear or damage, and replace if necessary.

BOTTOM CONE RACE REPLACEMENT

Drive out the bottom cone race using a punch and discard it.

Place a new bottom cone race on the stem.

Put the old race on the top of it, turned over and drive the new race into place with Fork Seal Driver, 07947-3550000.



BALL RACE INSPECTION

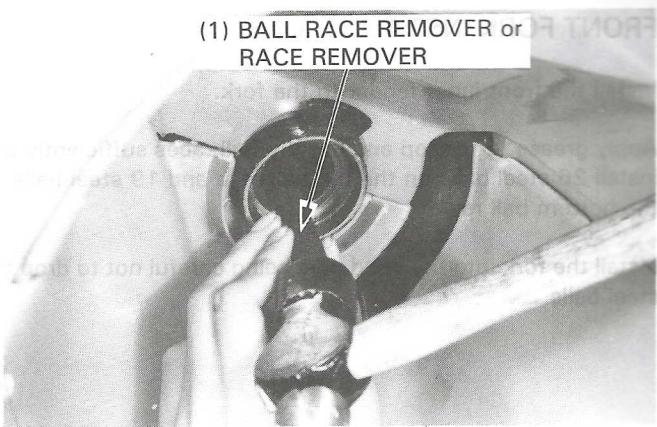
Inspect the top and bottom ball races for wear or damage, replace if necessary.

BALL RACE REPLACEMENT

Drive the top ball race out of the steering head using a ball race remover.

TOOL:

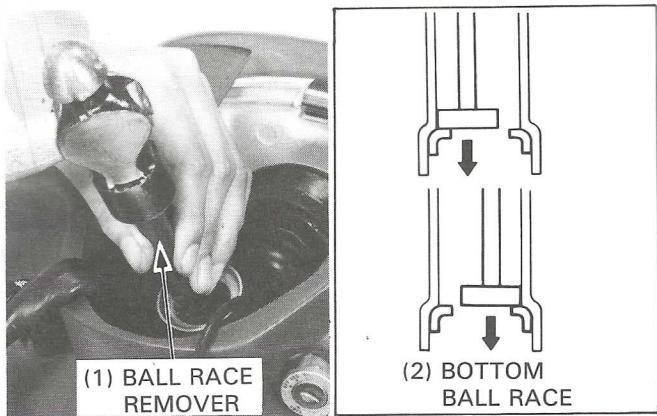
Ball race remover 07946-GA70000
 (Not available in U.S.A.)
 Race remover 07946-3710400



Drive the bottom ball race out of the steering head using a ball race remover and attachment.

NOTE

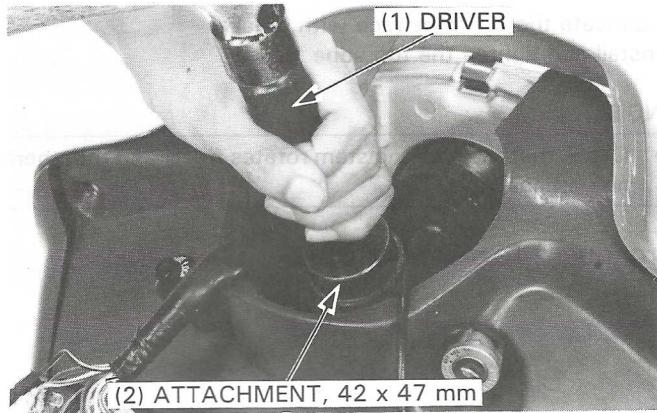
- Use common drift for bottom race removal if not available the ball race remover 07946-GA70000.



Drive the top ball race into the steering head using an attachment and driver.

TOOLS:

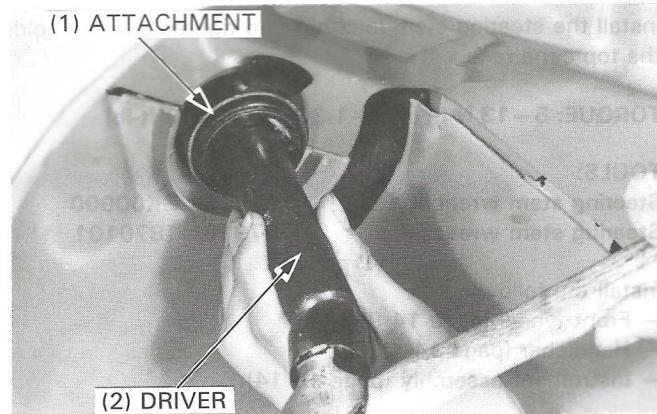
Driver 07749-0010000
 Attachment, 42 x 47 mm 07746-0010300



Drive the bottom ball race into the steering head using an attachment and driver.

TOOLS:

Driver 07749-0010000
 Attachment 07945-3330300

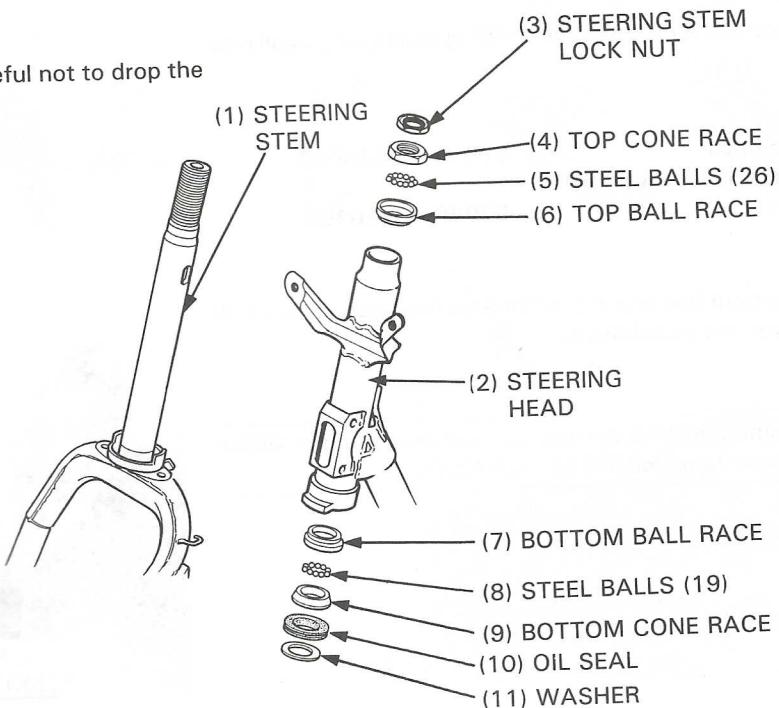


FRONT FORK INSTALLATION

Install the front inner fender to the fork.

Apply grease to the top and bottom ball races sufficiently and install 26 steel balls on the top ball race and 19 steel balls on the bottom ball race.

Install the fork into the head pipe being careful not to drop the steel balls.



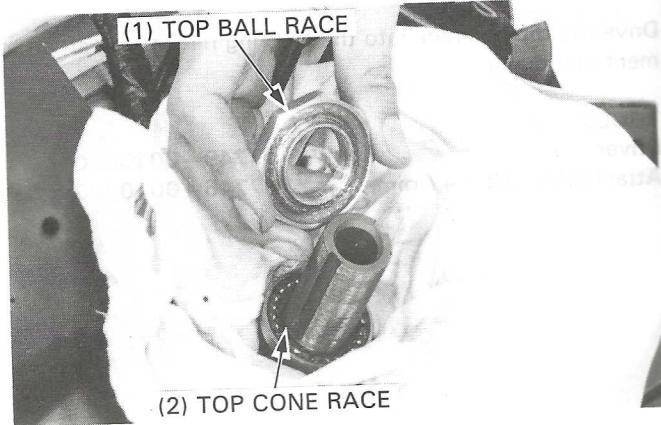
Lubricate the top cone race with grease.

Install and tighten the top cone race.

NOTE

- Check that the steering stem rotates freely and that there is no vertical play.

TORQUE: 2–3 N·m (20–30 kg·cm, 17–26 in-lb)



Install the steering stem lock nut and tighten it while holding the top cone race.

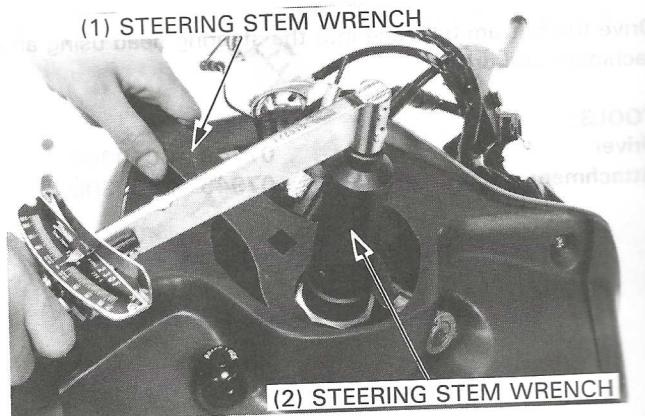
TORQUE: 5–13 N·m (0.5–1.3 kg·m, 4–10 ft-lb)

TOOLS:

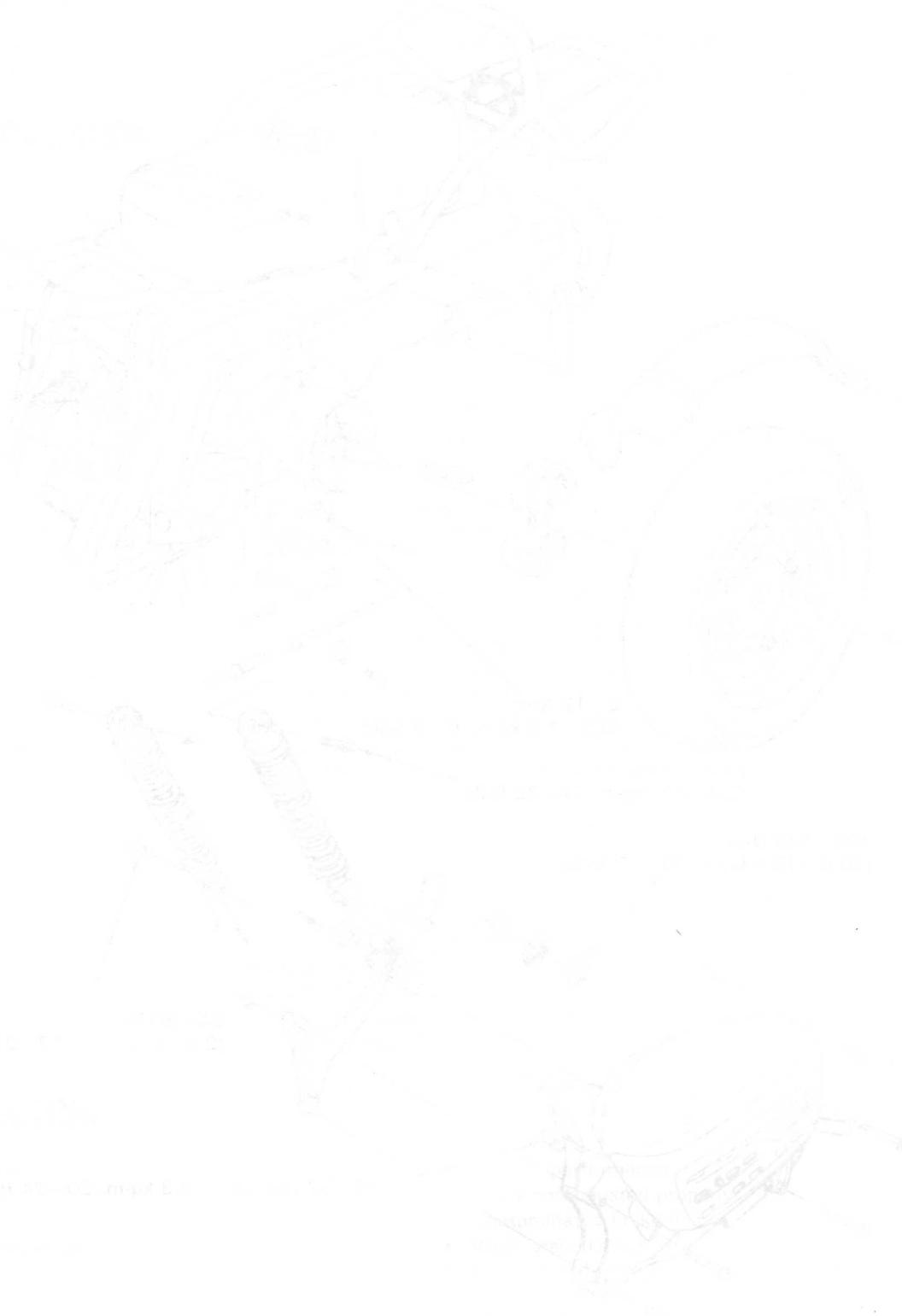
| | |
|----------------------|---------------|
| Steering stem wrench | 07916-GK00000 |
| Steering stem wrench | 07916-1870101 |

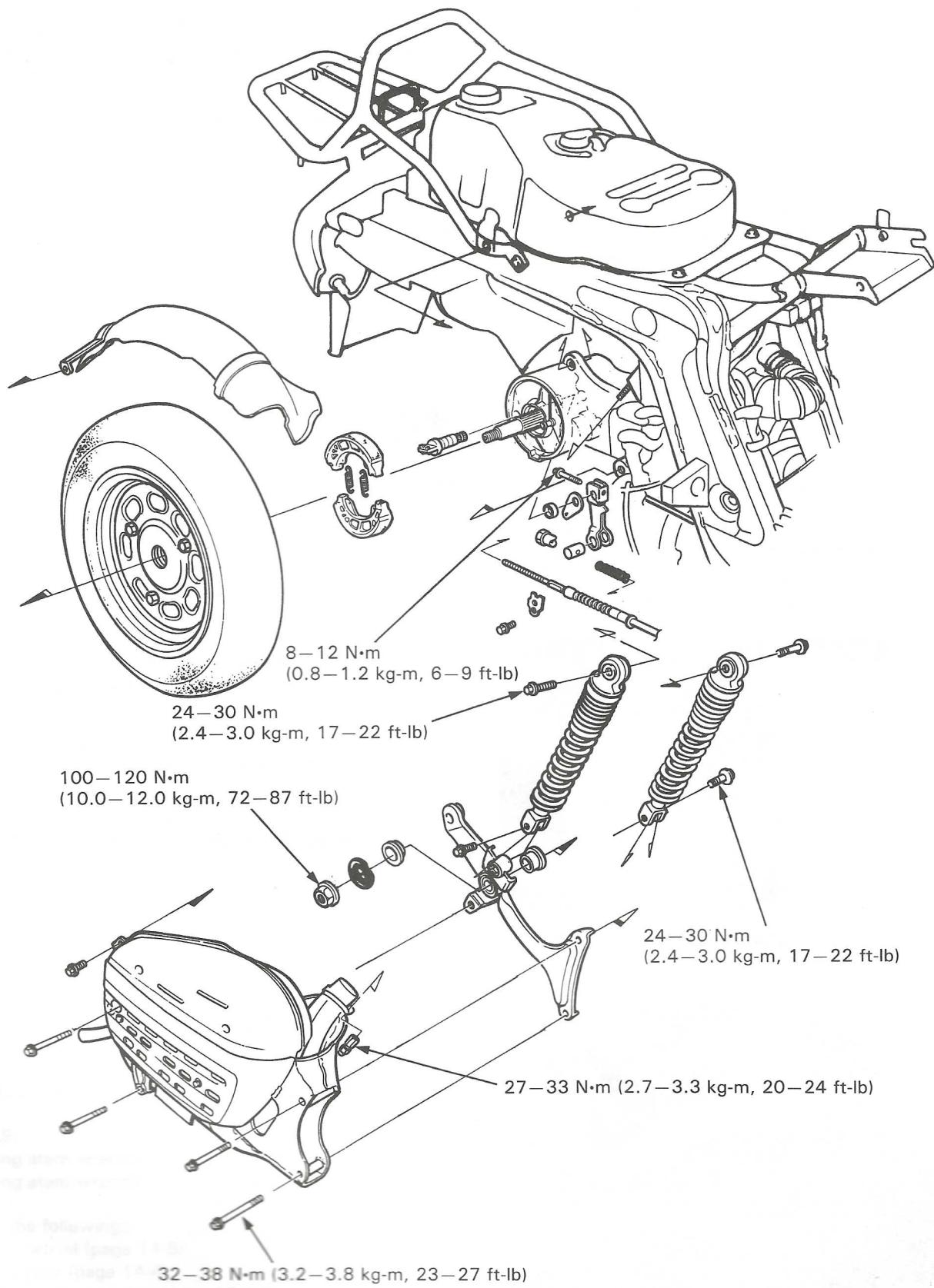
Install the following:

- Front wheel (page 14-8).
- Handlebar (page 14-4).
- Instrument assembly (page 16-14).



MEMO





15. REAR WHEEL/BRAKE/SUSPENSION

| | | | |
|---------------------|------|---------------------|------|
| SERVICE INFORMATION | 15-1 | REAR WHEEL | 15-2 |
| TROUBLESHOOTING | 15-1 | REAR BRAKE | 15-5 |
| EXHAUST MUFFLER | 15-2 | BRAKE ROCK SYSTEM | 15-7 |
| REAR FENDER | 15-2 | REAR SHOCK ABSORBER | 15-8 |

SERVICE INFORMATION

GENERAL

Refer to the Tubeless Tire Repair Manual for tire, removal, repair, and remounting procedures.

SPECIFICATIONS

mm (in)

| ITEMS | STANDARD | SERVICE LIMIT |
|--|--------------|---------------|
| Rear wheel rim runout | Radial | — |
| | Axial | — |
| Rear brake drum I.D. | 110.0 (4.33) | 111.0 (4.37) |
| Rear brake lining thickness | 4.0 (0.16) | 2.0 (0.08) |
| Rear shock absorber spring free length | 238.6 (9.39) | 233.8 (9.20) |

TORQUE VALUES

| | |
|---------------------------------|---|
| Rear wheel hub nut | 28—32 N·m (2.8—3.2 kg-m, 20—23 ft-lb) apply 0.1 |
| Rear axle nut | 100—120 N·m (10.0—12.0 kg-m, 72—87 ft-lb) |
| Rear brake arm bolt | 8—12 N·m (0.8—1.2 kg-m, 6—9 ft-lb) |
| Rear shock absorber mount bolt | 24—30 N·m (2.4—3.0 kg-m, 17—22 ft-lb) |
| Rear shock absorber damper nut | 15—25 N·m (1.5—2.5 kg-m, 11—18 ft-lb) |
| Rear brake pedal shaft stay nut | 8—12 N·m (0.8—1.2 kg-m, 6—9 ft-lb) |
| Exhaust muffler mount bolt | 32—38 N·m (3.2—3.8 kg-m, 23—27 ft-lb) |
| Exhaust pipe joint nut | 27—33 N·m (2.7—3.3 kg-m, 20—24 ft-lb) |

TOOLS

Special

| | |
|--------------------------|---------------|
| Spring holder attachment | 07967—1150100 |
|--------------------------|---------------|

Common

| | |
|---------------------------|---------------|
| Shock absorber compressor | 07959—3290001 |
| Driver | 07746—0010000 |
| Attachment, 42 x 47 mm | 07746—0010300 |
| Pilot, 15 mm | 07746—0040300 |

TROUBLESHOOTING

Rear wheel wobbling

- Bent rim
- Faulty tire
- Axle not tightened properly

Soft suspension

- Weak shock absorber spring

Brake squeaks

- Worn brake linings
- Foreign matter on linings
- Rough brake drum shoe contacting lining.

Poor brake performance

- Brake not adjusted properly
- Contaminated brake linings
- Worn brake linings
- Worn brake shoes at cam contacting area
- Worn brake cam
- Worn brake drum
- Improper engagement between brake arm and cam-shaft serrations

EXHAUST MUFFLER

REMOVAL

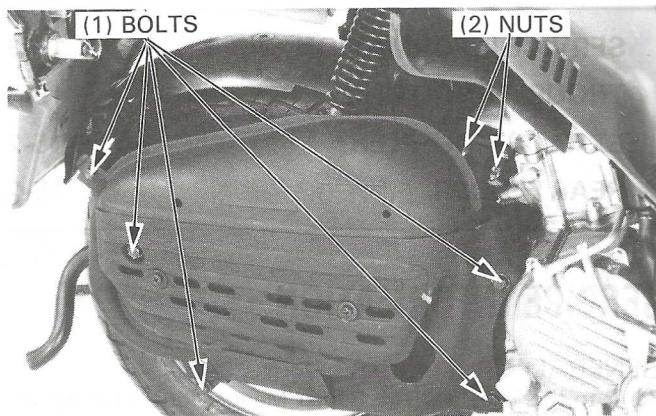
Remove the right rear cover (page 13-2).

Remove the rear fender stay bolt and four exhaust muffler mounting bolts and two exhaust muffler joint nuts.

Remove the exhaust muffler.

INSTALLATION

Loosely install the exhaust muffler in the reverse order of removal, then tighten the two joint nuts, four exhaust muffler mounting bolts and rear fender stay bolt.



TORQUE VALUES:

Exhaust muffler mounting bolt:

32–38 N·m (3.2–3.8 kg-m, 23–27 ft-lb)

Exhaust pipe joint nut:

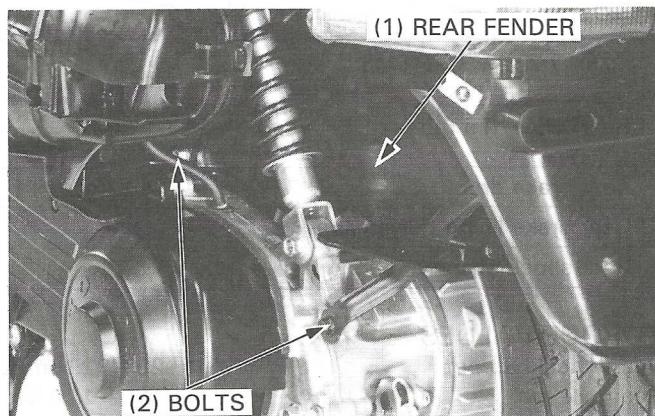
27–33 N·m (2.7–3.3 kg-m, 20–24 ft-lb)

REAR FENDER

Remove the right and left rear covers (page 13-2).

Remove the exhaust muffler.

Remove the two bolts and rear fender.

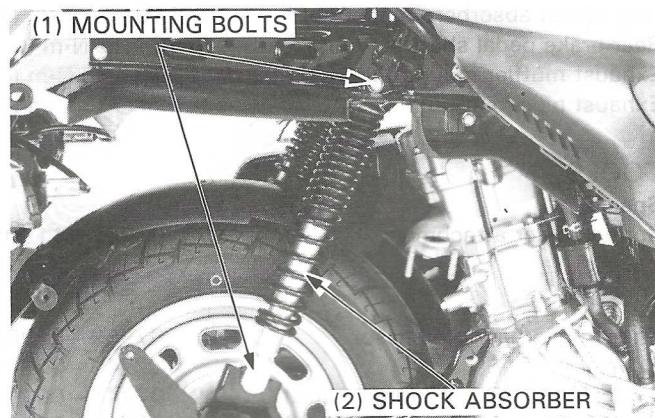


REAR WHEEL

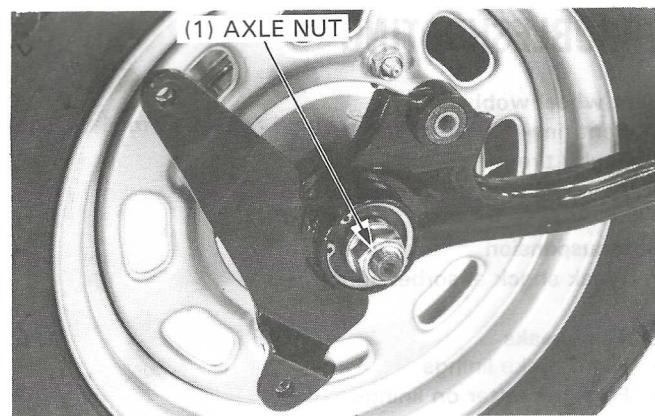
Remove the right rear cover (page 13-2).

Remove the exhaust muffler.

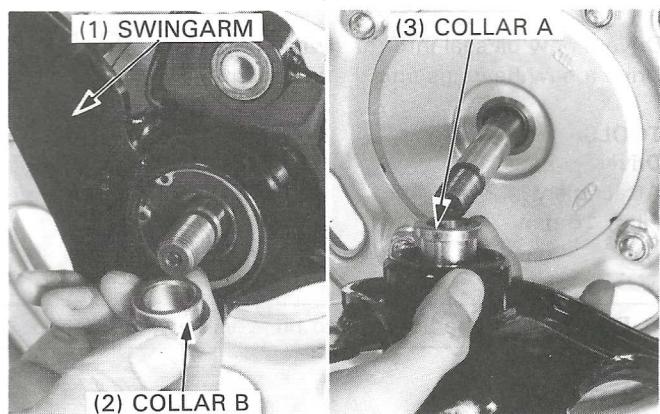
Remove the right rear shock absorber mounting bolts and right rear shock absorber.



Remove the rear axle nut.



Remove the collar B, swingarm, collar A and the rear wheel.



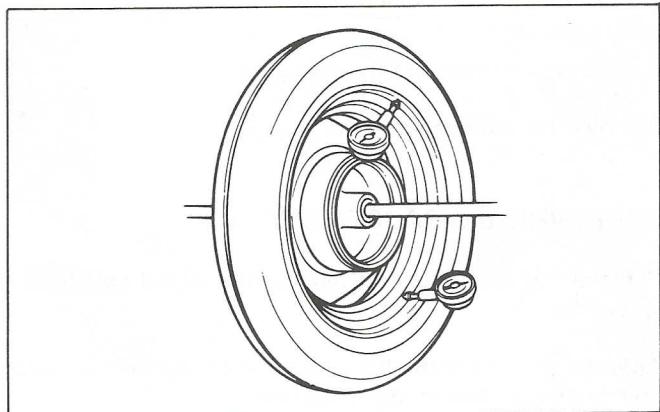
INSPECTION

WHEEL RIM

Place the rear wheel in a truing stand.
Spin the wheel by hand and measure the rim runout using a dial gauge.

SERVICE LIMIT:

AXIAL: 2.0 mm (0.08 in)
RADIAL: 2.0 mm (0.08 in)



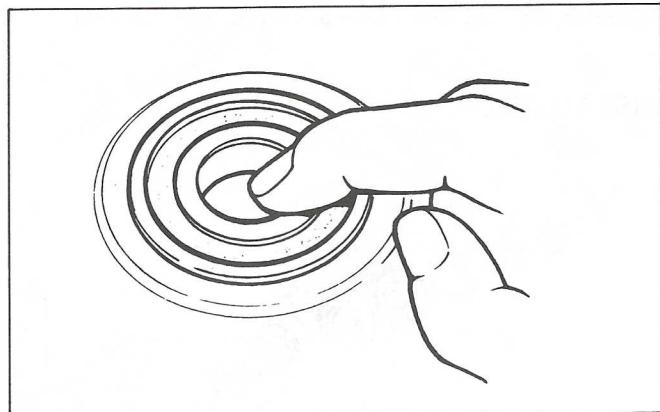
BEARING

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the outer race fits tightly in the crankshaft.

Remove and discard the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the swingarm.

NOTE

- Replace the bearings in pairs.

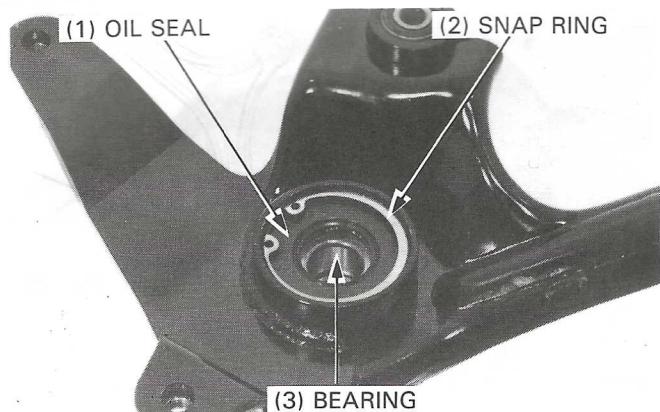


REAR WHEEL BEARING REPLACEMENT

Remove the snap ring and oil seal from the swingarm.

Drive the rear wheel bearings out of the swingarm.

Remove the outer oil seal.



REAR WHEEL/BRAKE/SUSPENSION

Drive a new oil seal into the swingarm.

Drive a new bearings into the swingarm.

TOOLS:

| | |
|------------------------|---------------|
| Driver | 07749-0010000 |
| Attachment, 42 x 47 mm | 07746-0010300 |
| Pilot, 15 mm | 07746-0040300 |

NOTE

- Do not allow the bearings to tilt while driving them in.

CAUTION

- *Never reinstall the old bearing. Once the bearing is removed, it must be replaced with a new one.*

Drive a new oil seal into the swingarm.

Remove the snap ring into the swingarm.

REAR WHEEL DISASSEMBLY

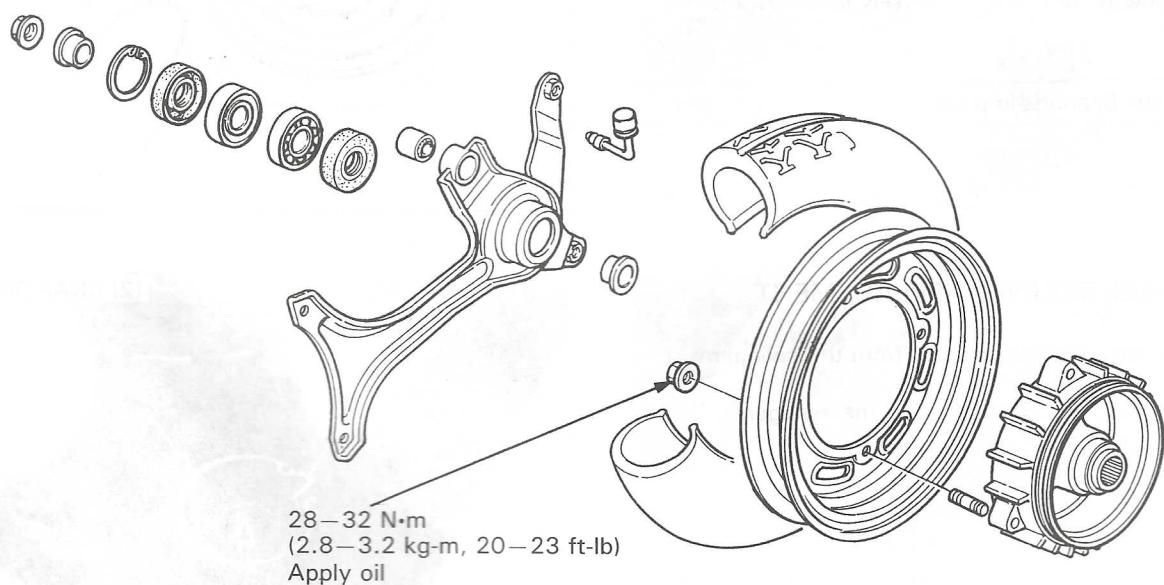
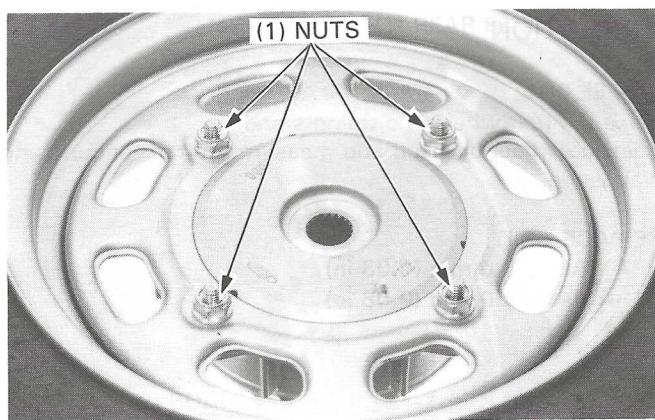
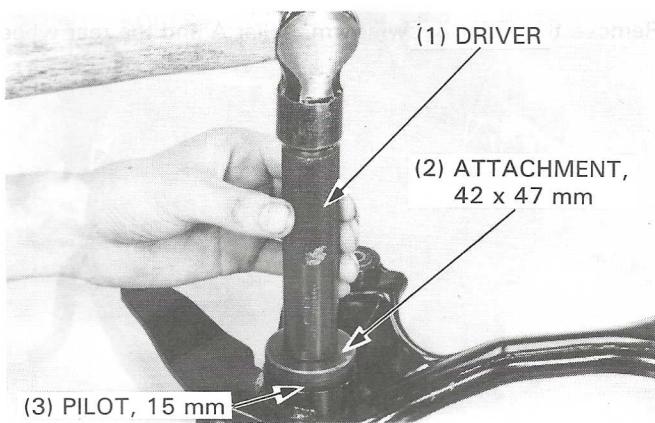
Remove the four nuts and remove the wheel hub from the wheel rim.

Coat the threads of the flange nuts and bolts with oil, and install the wheel hub on the wheel rim.

Tighten the flange nuts.

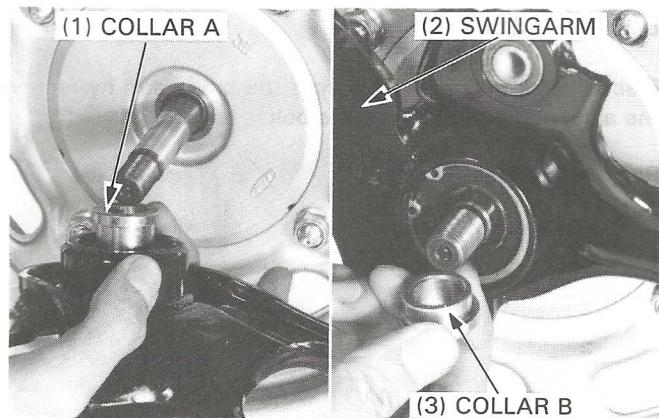
TORQUE: 28–32 N·m (2.8–3.2 kg·m, 20–23 ft-lb)

INSTALLATION



Install the rear wheel.

Install collar A, swingarm and collar B.

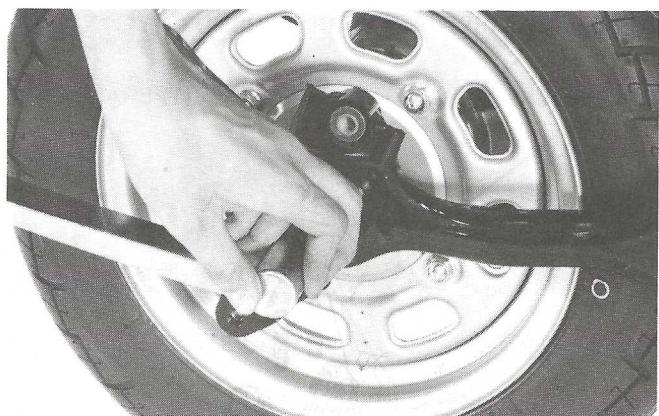


Install and tighten the rear axle nut.

TORQUE: 100–120 N·m (10.0–12.0 kg-m, 72–87 ft-lb)

Install the exhaust pipe (page 15-2).

Install the right rear cover (page 13-2).



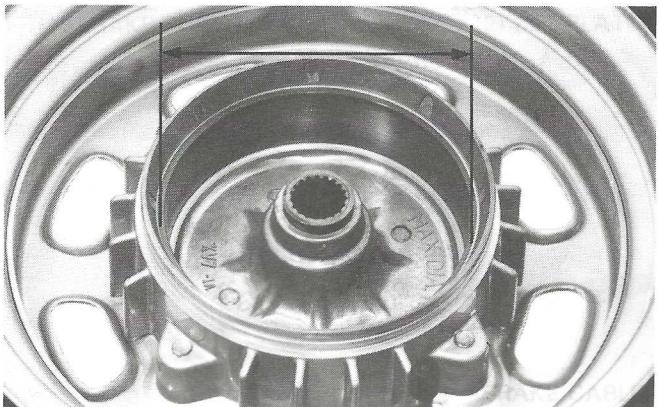
REAR BRAKE

Remove the rear wheel (page 15-2).

INSPECTION

Measure the brake drum I.D.

SERVICE LIMIT: 111.0 mm (4.37 in)

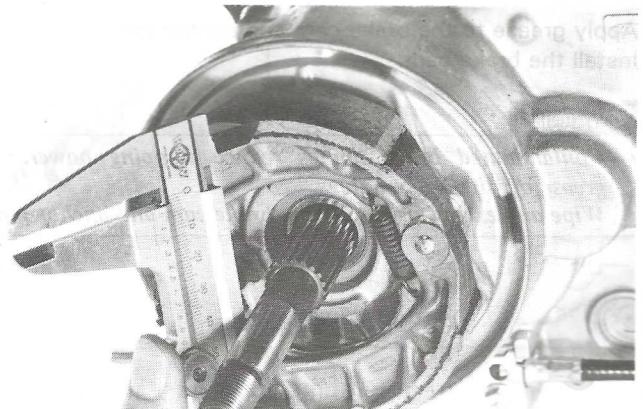


Measure the rear brake lining thickness.

SERVICE LIMIT: 2.0 mm (0.08 in)

WARNING

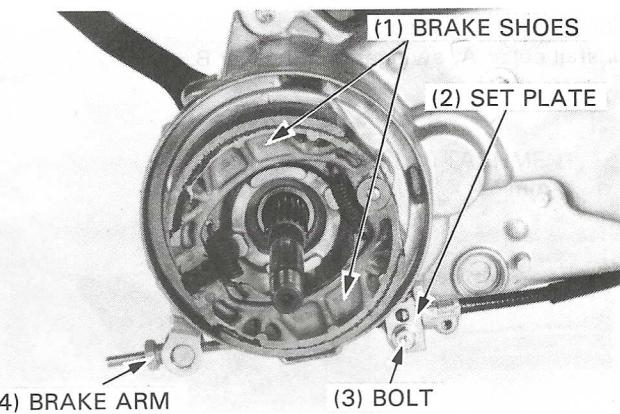
- Contaminated brake linings reduce stopping power. Keep grease off the linings.
- Brake dust contains asbestos which can be harmful to your health. Do not use compressed air to clean brake parts. Use vacuum with a sealed dust collector. Wear a protective face mask and wash your hands when finished.



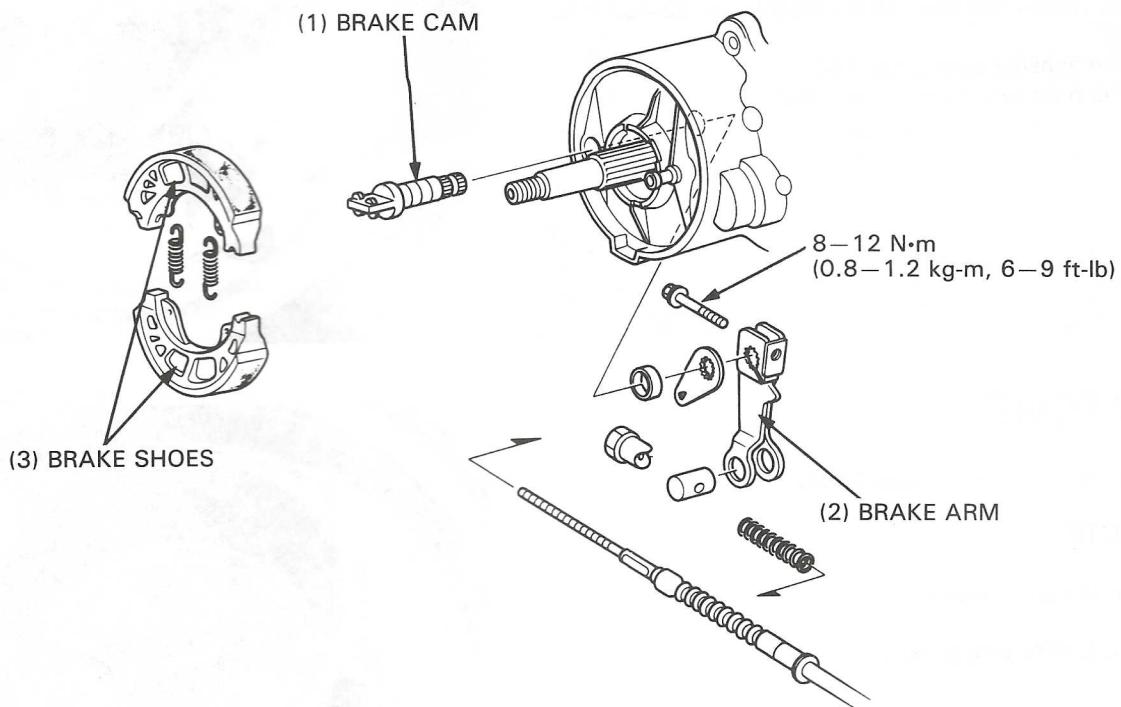
DISASSEMBLY

Disconnect the brake cable from the brake arm by removing the adjusting nut and set plate bolt.

Remove the brake shoes.



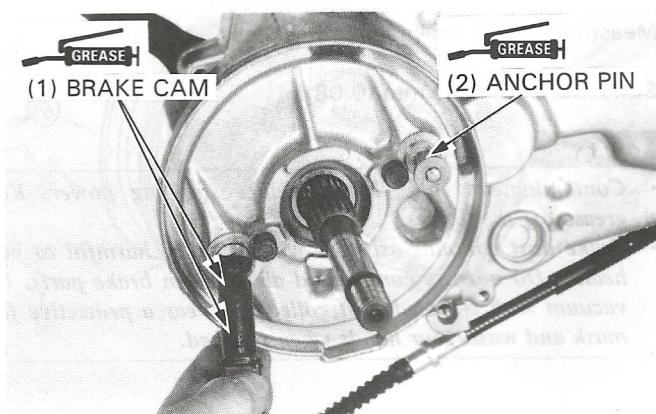
ASSEMBLY



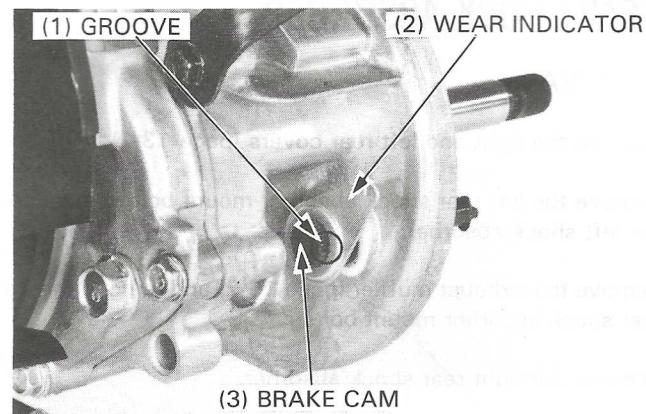
Apply grease to the brake cam and anchor pin.
Install the brake cam.

WARNING

- Contaminated brake linings reduce stopping power. Keep grease off the brake linings.
- Wipe any excess grease off the brake cam and anchor pin.



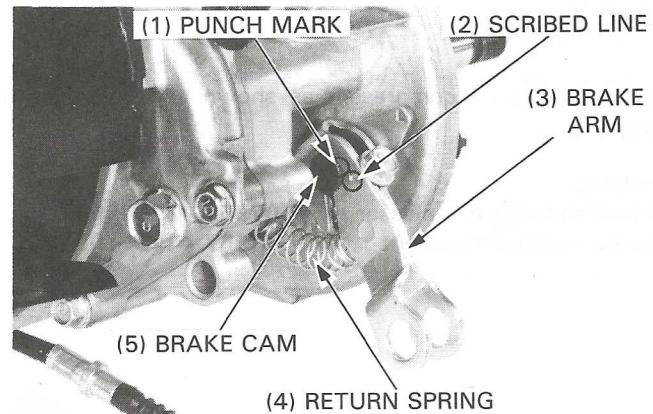
Install the wear indicator plate, aligning the wide tooth of the plate with the wide groove on the brake cam.



Install the brake arm onto the brake cam, aligning the punch mark on the cam with the scribed line on the arm.
Tighten the brake arm bolt.

TORQUE: 8–12 N·m (0.8–1.2 kg·m, 6–9 ft-lb)

Install the brake arm return spring.



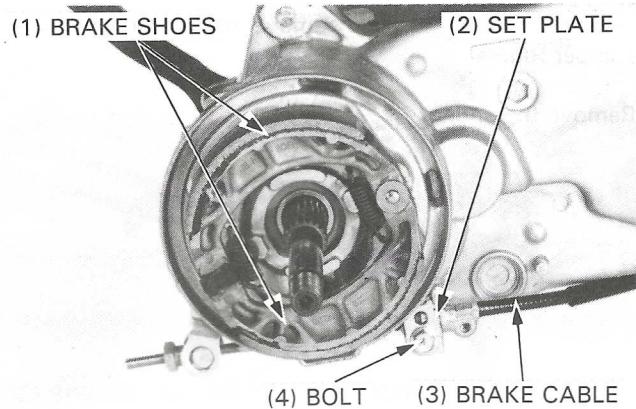
Install the brake shoes.

Connect the brake cable to the brake arm.

Insert the brake cable into the groove in the left crankcase and install the plate as shown.

Install the rear wheel (page 15-4).

Adjust the rear brake free play (page 3-10).



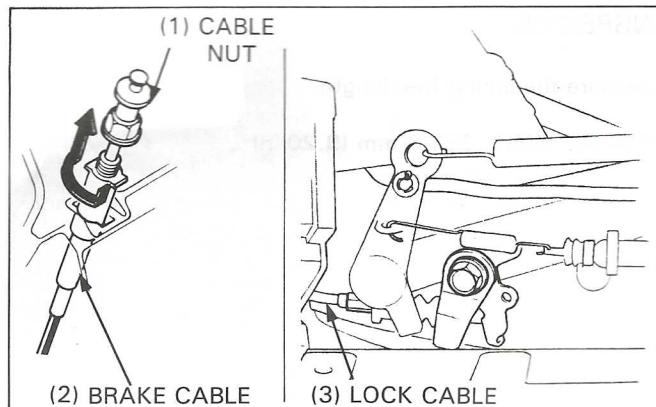
REAR BRAKE LOCK SYSTEM

BRAKE LOCK CABLE REMOVAL

Remove the frame center cover (page 13-2).

Loosen the brake lock cable lock nut and disconnect the brake lock cable from the brake lock plate and spring.

Remove the brake lock cable from the leg shield by loosening the cable nut.



REAR SHOCK ABSORBER

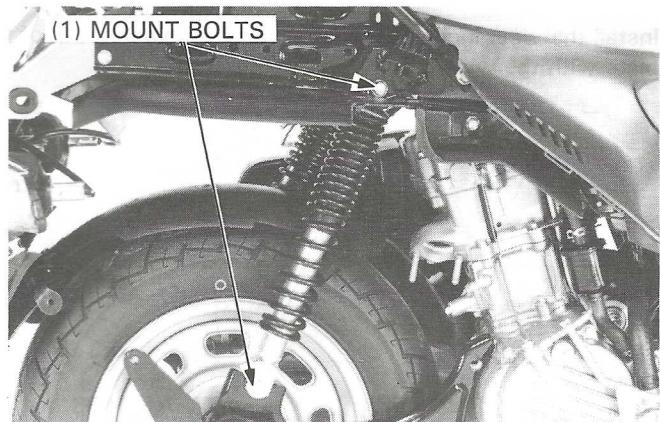
REMOVAL

Remove the right and left rear covers (page 13-2).

Remove the left rear shock absorber mount bolts and remove the left shock absorber.

Remove the exhaust muffler (page 15-2) and remove the right rear shock absorber mount bolts.

Remove the right rear shock absorber.

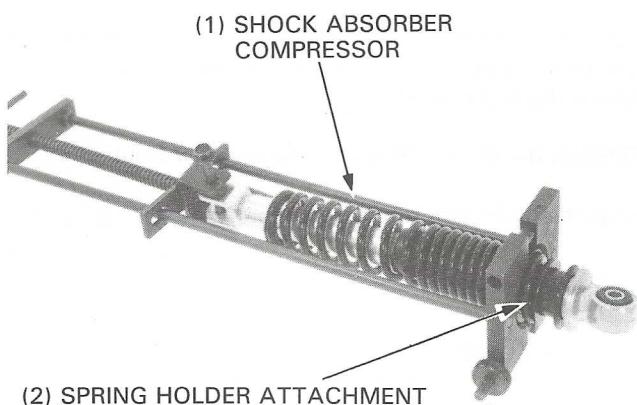


DISASSEMBLY

Install the spring compressor as shown and compress the spring.

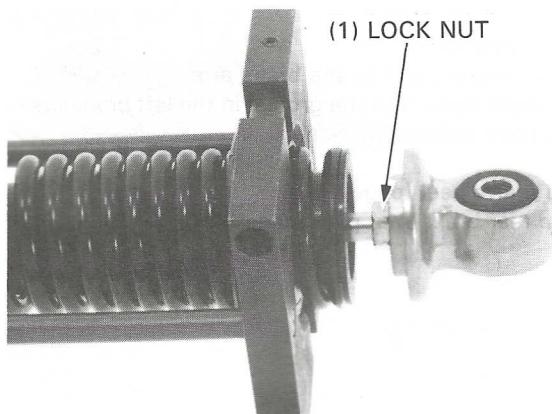
TOOLS:

| | |
|---------------------------|---------------|
| Shock absorber complessar | 07959-3290001 |
| Spring holder attachment | 07967-1150100 |



Loosen the lock nut and remove the lower joint from the damper rod.

Remove the spring.

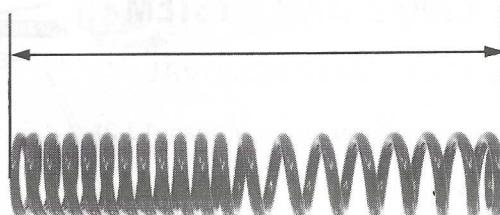


INSPECTION

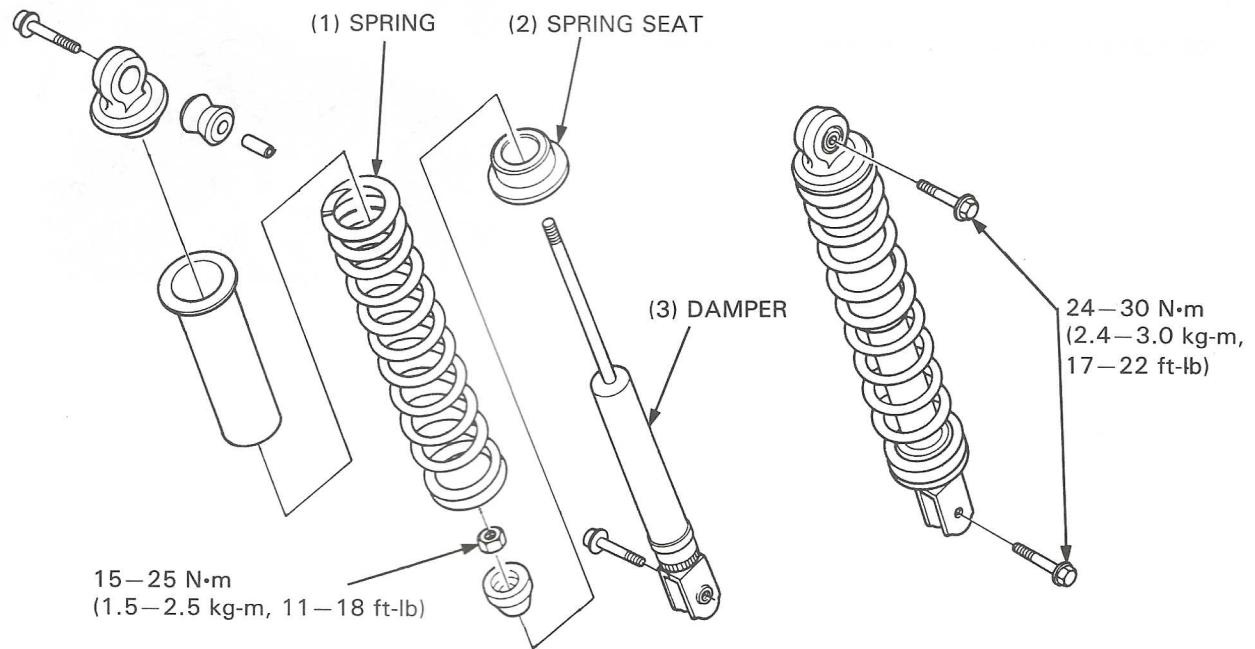
Measure the spring free length.

SERVICE LIMIT: 233.8 mm (9.20 in)

Inspect the damper for damage and replace if necessary.



ASSEMBLY

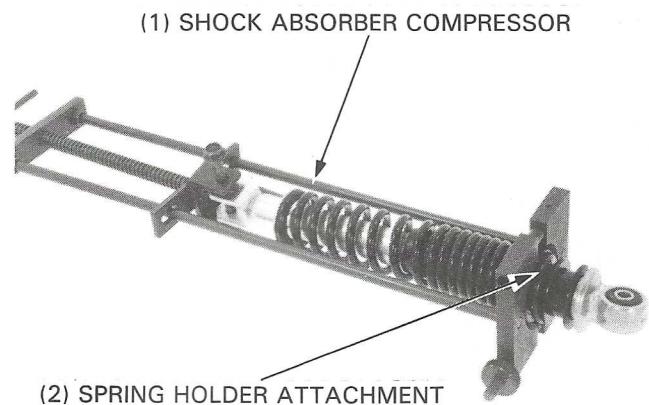


Install the shock absorber spring with the closely wound coils toward the top.

Compress the shock absorber with the compressor and attachment as shown.

TOOLS:

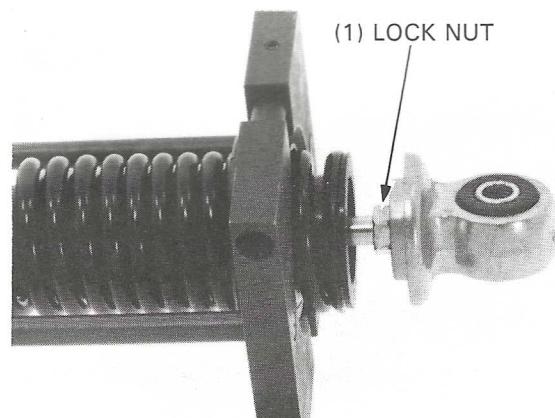
Shock absorber compressor 07959-3290001
Spring holder attachment 07967-1150100



Extend the damper rod fully and apply a locking agent to the threaded portion of the damper rod.

Install the lower joint and tighten the lock nut.

TORQUE: 15–25 N·m (1.5–2.5 kg-m, 11–18 ft-lb)

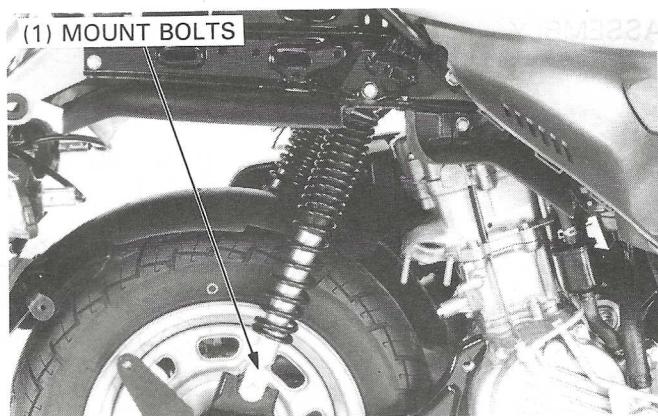


REAR WHEEL/BRAKE/SUSPENSION

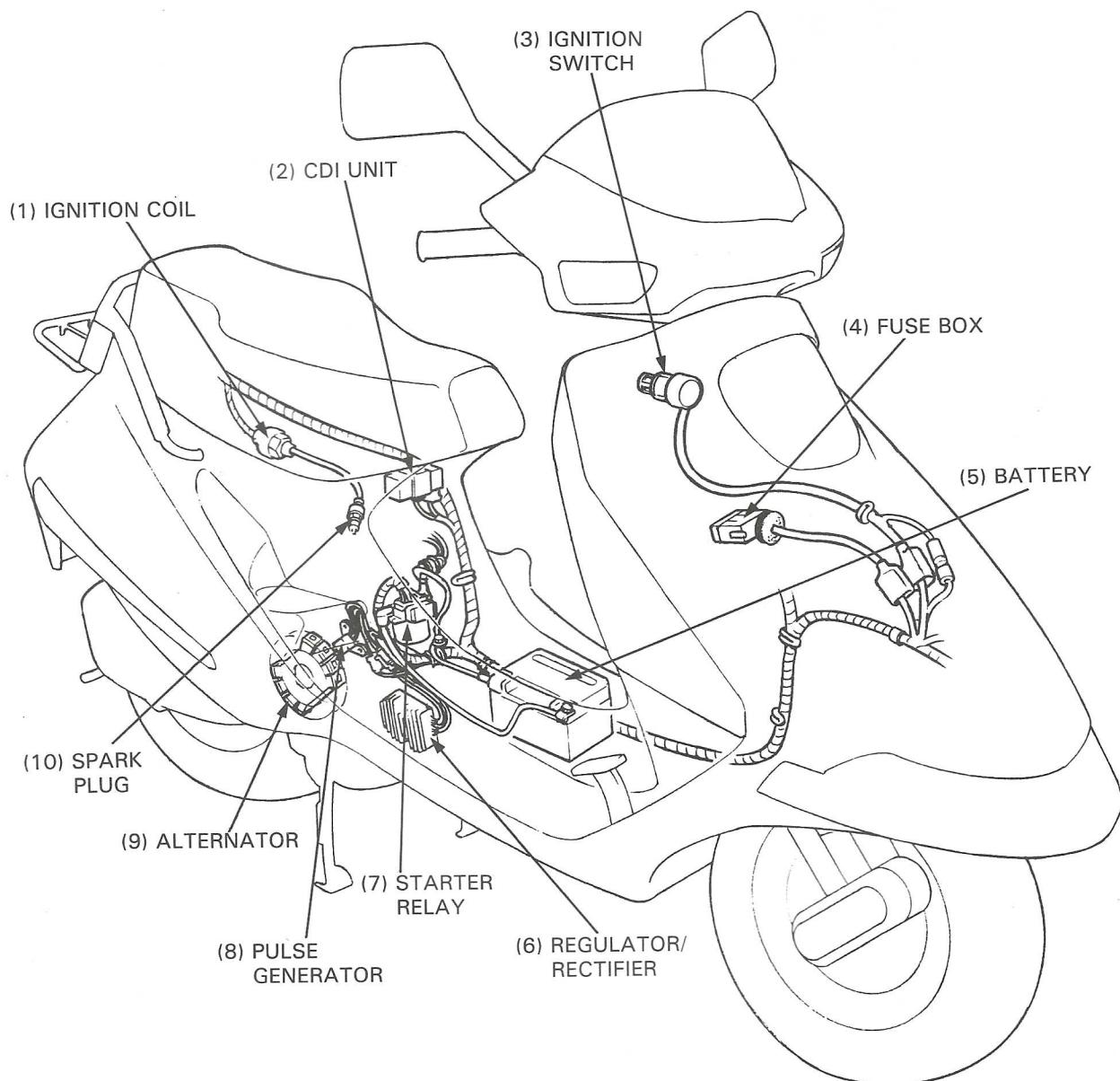
INSTALLATION

Install the rear shock absorber in the reverse order of removal and tighten the upper and lower mount bolts.

TORQUE: 24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)



MEMO



16. ELECTRICAL EQUIPMENT

| | | | |
|---------------------|------|---------------------|-------|
| SERVICE INFORMATION | 16-1 | INSTRUMENTS | 16-12 |
| TROUBLESHOOTING | 16-3 | LIGHTS/BLUBS | 16-15 |
| BATTERY | 16-4 | SWITCHES/HORN | 16-16 |
| CHARGING SYSTEM | 16-5 | FUEL UNIT/GAUGE | 16-18 |
| IGNITION SYSTEM | 16-7 | THERMOSTATIC SWITCH | 16-20 |
| STARTING SYSTEM | 16-9 | TEMPERATURE GAUGE | 16-21 |

SERVICE INFORMATION

GENERAL

- Quick charge a battery, only in an emergency. Slow-charging is preferred.
- Remove the battery from the scooter for charging. If the battery must be charged on the scooter, disconnect the battery cables.
- The battery on this motorcycle is permanently sealed type. Never remove the filler hole caps even when the battery is being charged.
- Be sure to charge the battery with the amount of current and for the time indicated on the battery level and as given below. Charging with excessive current and/or too fast may cause battery failure.

WARNING

- *Do not smoke, and keep flames away from a charging battery. The gas produced by a battery will explode if flames or sparks are brought near.*

- Ignition timing cannot be adjusted. If the timing is incorrect, inspect the CDI unit and pulse generator and replace any faulty parts.
- Some wires have different colored bands around them near the connector. These are connected to other wires which correspond with the band color.
- All plastic plugs have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.
- The following color codes used are indicated throughout this section and on the wiring diagram.

Bu = Blue

G = Green

Lg = Light Green

R = Red

Bl = Black

Gr = Gray

O = Orange

W = White

Br = Brown

Lb = Light Blue

P = Pink

Y = Yellow

- To isolate an electrical failure, check the continuity of the electrical path through the part. A continuity check can usually be made without removing the part from the scooter. Simply disconnect the wires and connect a continuity tester or volt-ohmmeter to the terminals or connections.
- A continuity tester is useful when checking to find out whether or not there is an electrical connection between two points. An ohmmeter is needed to measure the resistance of a circuit, such as when there is a specific coil resistance involved, or when checking for high resistance caused by corroded connections.

ELECTRICAL EQUIPMENT

SPECIFICATIONS

| ITEM | | | STANDARD | | |
|---|------------------|-------------|-------------|--|--|
| Battery | Capacity | | 12 V – 8 AH | | |
| | Charging current | Standard | 0.9 A | | |
| | | Maximum | 4.0 A | | |
| | Charging time | Standard | 5 H | | |
| | | Maximum | 1 H | | |
| Voltage at 20°C (68°F) | | | Over 12.5 V | | |
| Regulator/rectifier at 20°C (68°F) | Type | | C.Y.L. | | |
| | Battery voltage | | 14.0–15.0 V | | |
| Charging coil resistance at 20°C (68°F) | | | 0.1–1.0 Ω | | |
| Exciter coil at 20°C (68°F) | | | 50–350 Ω | | |
| Pulse generator at 20°C (68°F) | | | 50–170 Ω | | |
| Ignition coil | Primary | | 0.1–0.2 Ω | | |
| | Secondary | Without cap | 3.6–4.6 kΩ | | |
| | | With cap | 7.3–11 kΩ | | |

TROUBLESHOOTING

CHARGING SYSTEM

No power

- Dead battery
 - Low water level.
 - Battery sulfation.
 - Internally shorted battery.
 - Charging system failure.
- Disconnected battery cable
- Fuse burned out
- Faulty ignition switch

Low power

- Weak battery
- Loose battery connection
- Charging system failure

IGNITION SYSTEM

No spark at plug

- Faulty spark plug
- Poorly connected, broken or shorted wire
 - Between pulse generator and CDI unit.
 - Between CDI unit and ignition coil.
 - Between CDI unit and ignition switch.
 - Between ignition coil and spark plug.
- Faulty ignition switch
- Faulty ignition coil
- Faulty CDI unit
- Faulty pulse generator

Intermittent power

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

Charging system failure

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

STARTING SYSTEM

Starter won't turn

- Fuse burned out
- Weak battery
- Faulty ignition switch
- Faulty starter switch
- Faulty front or rear brake light switch
- Faulty starter relay
- Open circuit or poor connection of the wire
- Faulty starter motor

Starter rotates poorly

- Weak battery
- Loose or bare wire or connection
- Foreign matter stuck in starter or starter gear
- Faulty starter pinion
- Low battery

ELECTRICAL EQUIPMENT

BATTERY

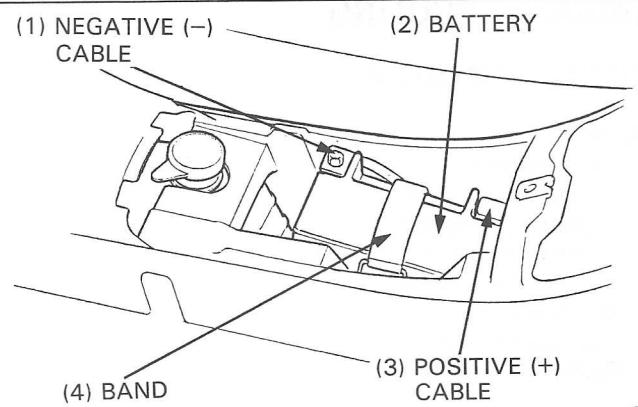
REMOVAL

Remove the maintenance cover (page 13-2).

Remove the battery band.

Disconnect the negative (-) cable from the battery first, then the positive (+) cable.

Remove the battery.



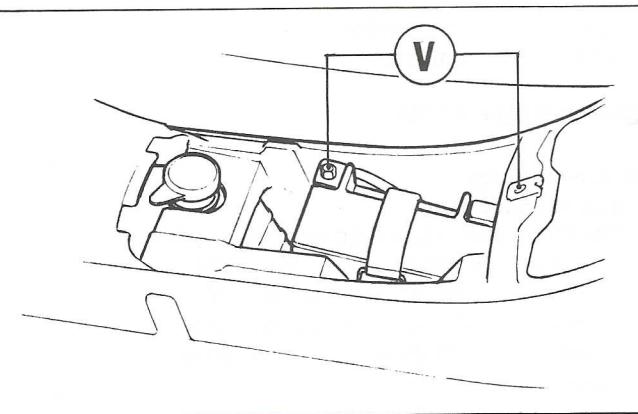
VOLTAGE INSPECTION

Measure the battery voltage using a digital voltmeter (07411-0020000).

VOLTAGE:

Fully charged: 13.0–13.2 V at 20°C (68°F)

Under charged: Below 12.3 V at 20°C (68°F)

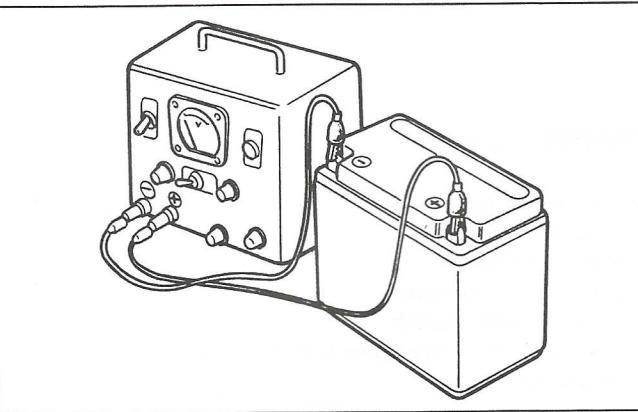


CHARGING

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

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

| | Standard | Maximum |
|------------------|----------|---------|
| Charging current | 0.9 A | 4.0 A |
| Charging time | 5 H | 1 H |



WARNING

- Keep flames and sparks away from a charging battery.
- Turn power ON/OFF at the charger, not at the battery terminals.

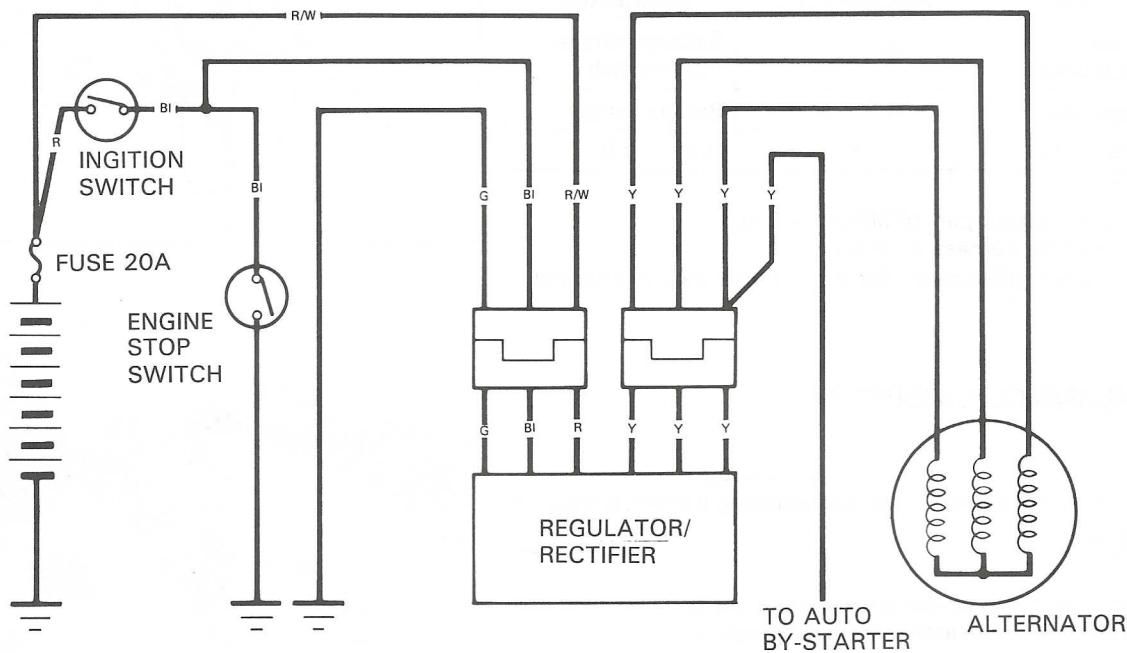
CAUTION

- Quick-charging should only be done in an emergency; slowcharging is preferred.
- Be sure to charge the battery with the correct current and for the time indicated above.
- Charging with excessive current and/or too fast may cause battery failure.

After installing the battery, coat the terminals with clean grease.

CHARGING SYSTEM

CHARGING CIRCUIT



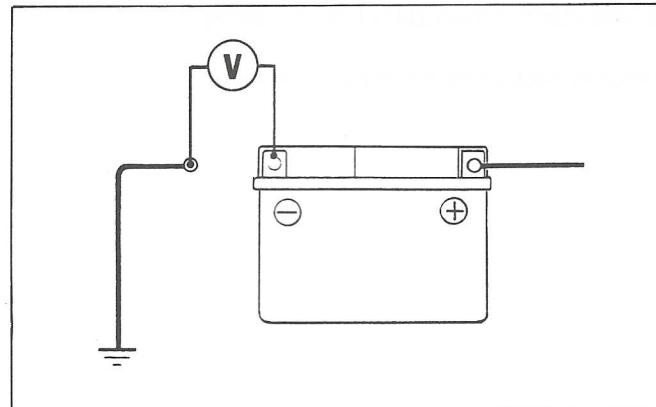
LEAK TEST

Remove the maintenance cover (page 13-2).

If undercharged, disconnect the negative (-) cable from the battery and connect the voltmeter to the battery terminal and battery ground cable.

There should be no voltage with the ignition switch turned OFF.

If there is voltage, check the wire harnesses, couplers and connectors for short circuit and the main switch for function.



REGULATE INSPECTION

NOTE

- Be sure that the battery is fully charged before performing this test.

Warm up the engine.

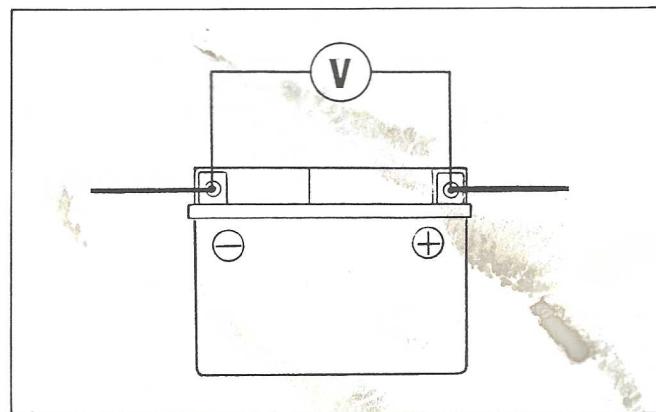
Stop the engine and remove the right rear cover (page 13-2). Connect the voltmeter across the battery terminals.

Start the engine and gradually raise the engine speed and measure the voltage.

NOTE

- Avoid short circuiting to the tester during the test.

VOLTAGE: 14.0–15.0 V



ELECTRICAL EQUIPMENT

REGULATOR/RECTIFIER INSPECTION

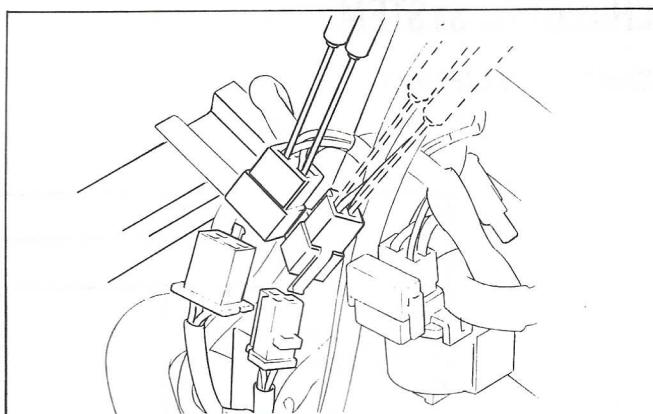
Remove the frame center cover (page 13-2).
Disconnect the regulator/rectifier 3P and 4P connectors.

| ITEM | MEASURE AT: | STANDARD |
|----------------------|-------------|-----------------------------|
| Ignition switch wire | BI-G | Battery voltage (Switch ON) |
| Battery wire | R/W-G | Battery voltage |
| Charging coil | Y-Y | 0.1—1.0 Ω |

If abnormal, check part of abnormal line.

If normal, wire harness is faulty.

Replace the regulator/rectifier if the above item is satisfied.



CHARGING COIL INSPECTION

NOTE

- This test can be made without removing the stator from the engine.

Remove the frame center cover (Section 13).
Disconnect the regulator/rectifier connector.

Check the resistance between the each yellow connector terminals (alternator side).

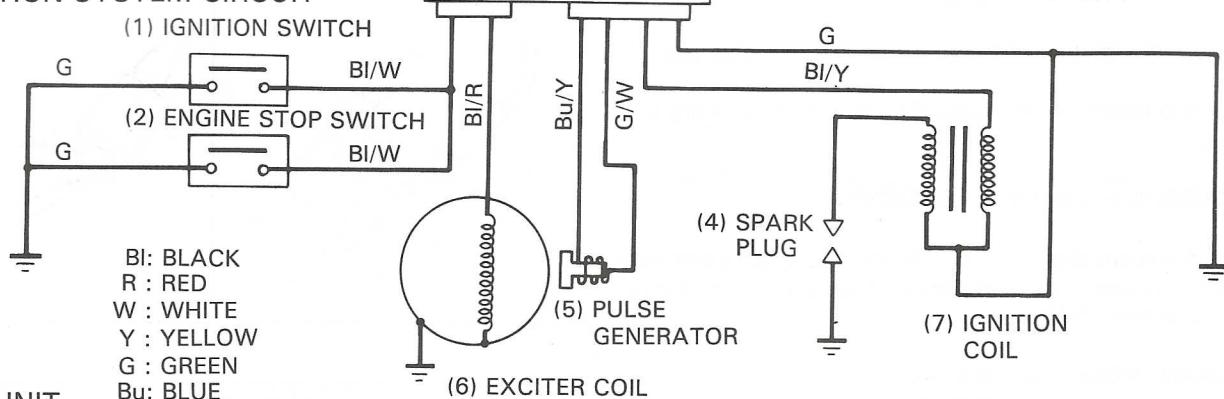
STANDARD: 0.1—1.0 Ω at 20°C (68°F)

Refer to section 10 for stator removal.



IGNITION SYSTEM

IGNITION SYSTEM CIRCUIT



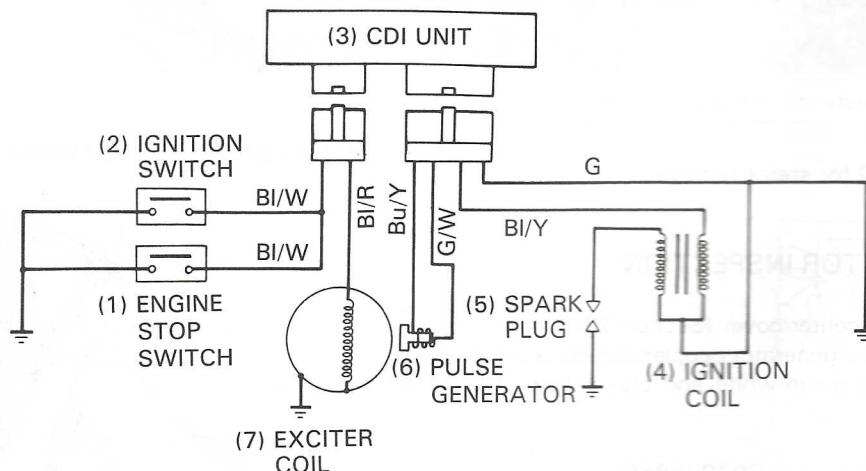
Remove the maintenance cover (page 13-2).

Disconnect the connector from CDI unit.

Make the following inspection at each terminal of the harness-side connector.

| ITEM | MEASURE AT: | RESULT |
|-----------------|----------------------------|---|
| Ignition switch | BI/W—G | There should be no continuity with the ignition switch ON and the engine stop switch at RUN |
| Exciter coil | BI/R—G | 50—350 Ω |
| Pulse generator | G/W—Y | 50—170 Ω |
| Ignition coil | Primary BI/Y—G | 0.1—0.2 Ω |
| | Secondary BI/Y—Without cap | 3.6—4.6 kΩ |
| | BI/Y—With cap | 7.3—11 kΩ |

Replace the regulator/rectifier if the above items match the specifications.



ELECTRICAL EQUIPMENT

IGNITION COIL INSPECTION

Remove the left rear cover (page 13-2).

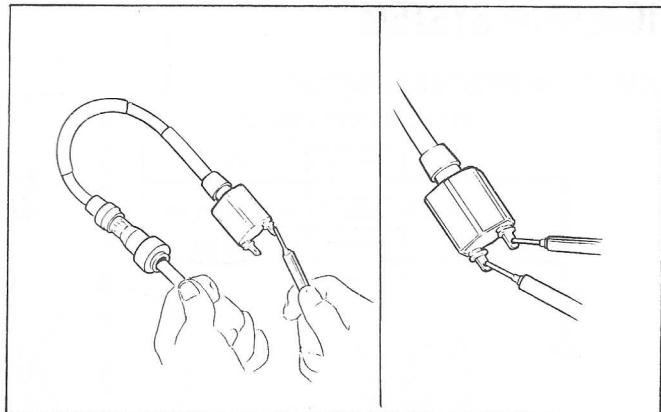
Disconnect the ignition coil wires and the spark plug cap.

Measure the resistance between the ignition coil primary wire terminals.

STANDARD: 0.1–0.2 Ω at 20°C (68°F)

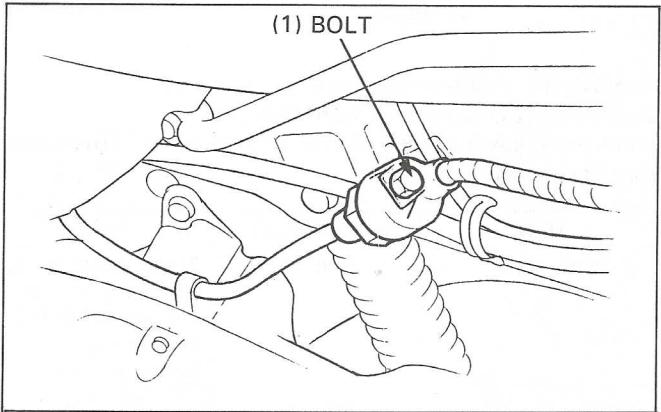
Remove the spark plug cap from the spark plug wire and measure the resistance between the spark plug wire and the primary coil terminal (BI/Y).

**STANDARD: Without cap: 3.6–4.6 kΩ
With cap: 7.3–11 kΩ**



REPLACEMENT

Remove the ignition coil mounting bolt and replace the coil if necessary.



EXCITER COIL INSPECTION

NOTE

- This test can be performed with the stator installed in the engine.

Remove the frame center cover (Section 13).

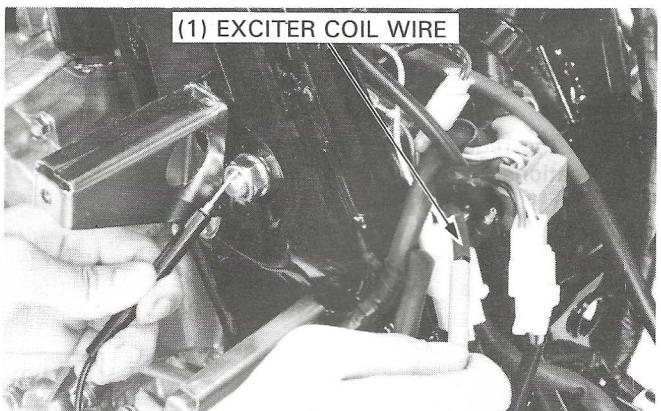
Disconnect the stator wire connector.

Measure the resistance between the black/red wire terminal and ground.

STANDARD: 50–350 Ω at 20°C (68°F)

NOTE

- Measure the resistance in the $\times 1\Omega$ range.



Refer to section 10 for stator removal.

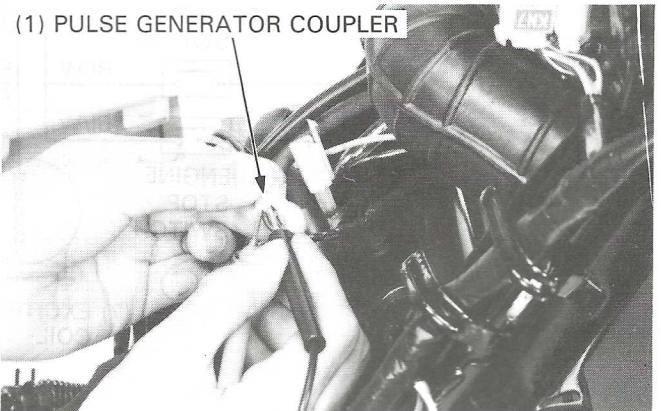
PULSE GENERATOR INSPECTION

Remove the frame center cover (Section 13).

Disconnect the pulse generator coupler and measure the resistance between the green/white and blue/yellow wire terminals.

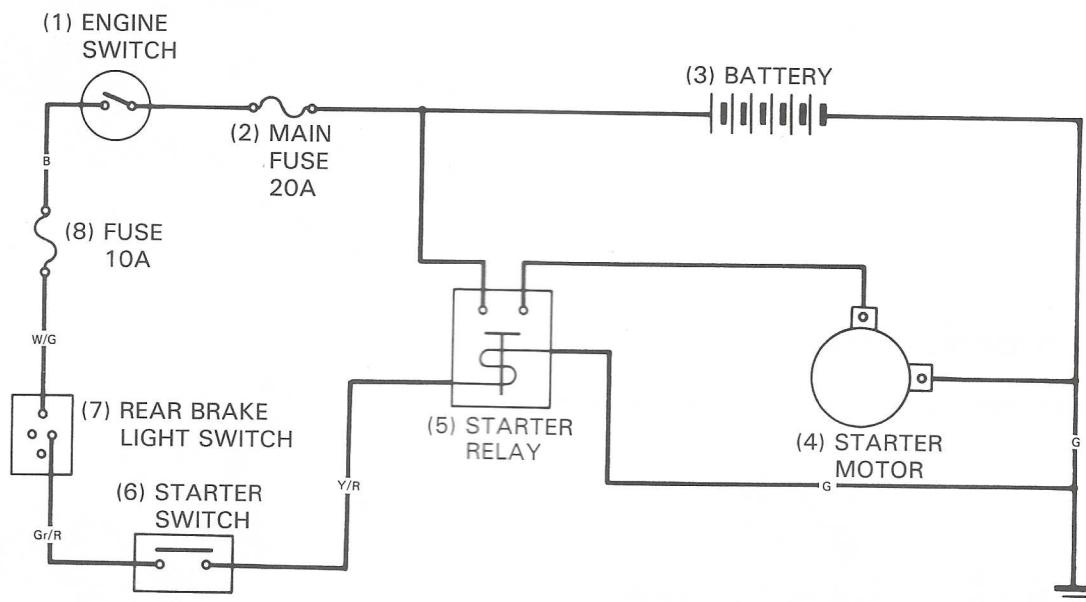
STANDARD: 50–170 Ω at 20°C (68°F)

For pulse generator replacement, refer to page 10-2.



STARTING SYSTEM

STARTING CIRCUIT

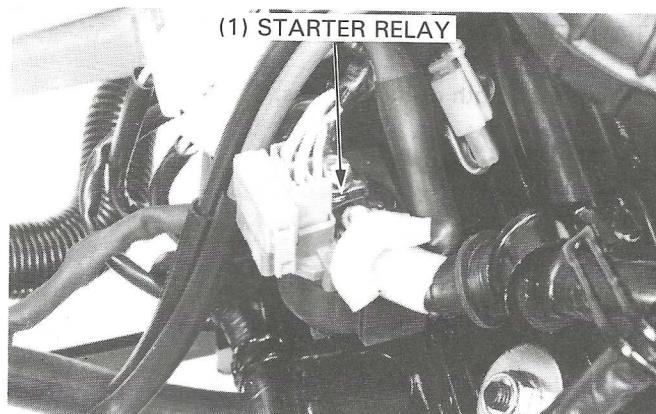


STARTER RELAY INSPECTION

Remove the frame center cover (page 13-2).

Depress the rear brake pedal and pull the brake lock knob to the "LOCK" position.

The relay coil is normal if you hear a click when starter button is depressed with the ignition switch ON.



Disconnect the battery positive cable and the starter motor cable from the starter relay.

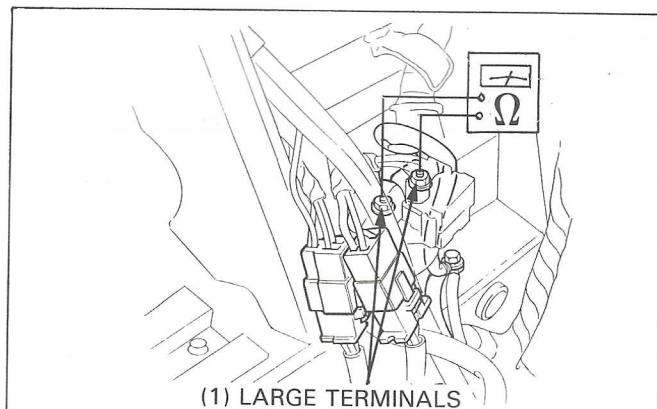
Disconnect the starter relay coil wire connectors.

Connect an ohmmeter between the large starter relay terminals.

Connect the yellow/red wire to the battery positive terminal and the green wire to the battery negative terminal using jumper wires.

Check for continuity between the starter relay large terminals.

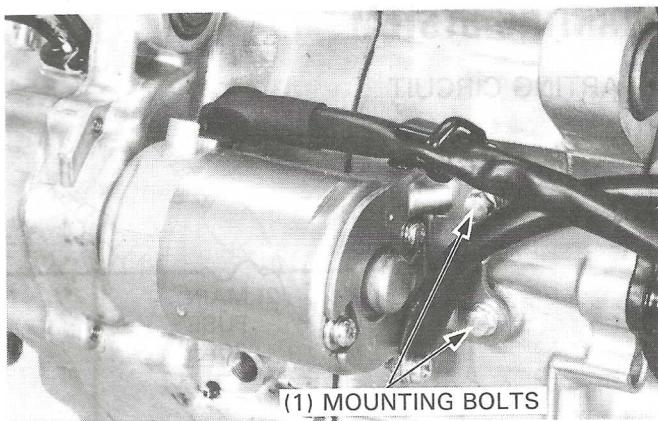
Replace the starter relay with a new one if there is no continuity.



ELECTRICAL EQUIPMENT

STARTER MOTOR REMOVAL

Remove the engine from the frame (Section 5).
Remove the starter motor mounting bolts and the motor.



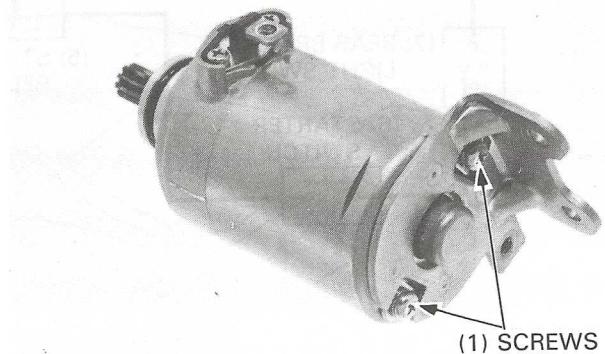
STARTER MOTOR DISASSEMBLY

Remove the two starter motor case screws and remove the motor housing.

Pull out the commutator from the front cover.

NOTE

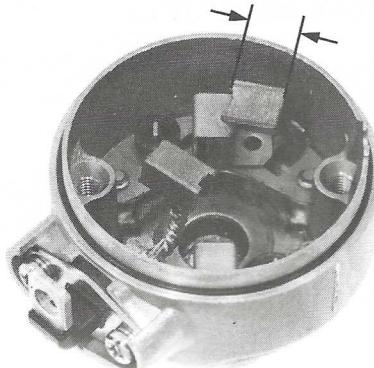
- Note the number and location of the thrust washers.



STARTER MOTOR INSPECTION

Measure the length of the brushes.

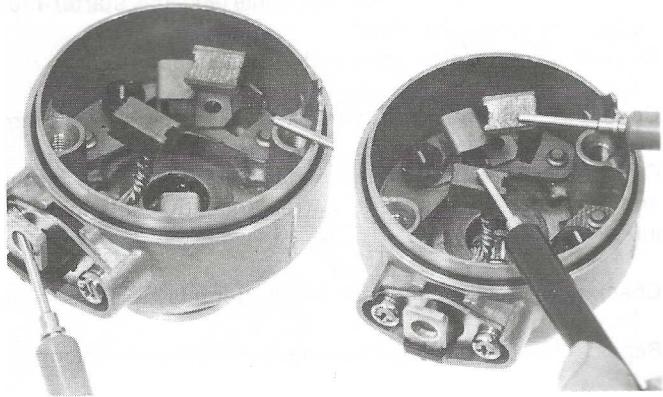
SERVICE LIMIT: 6.5 mm (0.26 in)



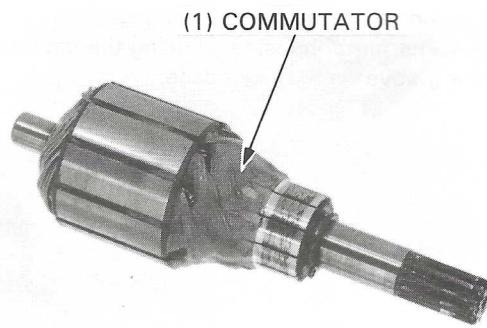
Check to see that there is no continuity between the starter motor wire terminal and the motor front cover.

Confirm that there is for no continuity between the brushes.

If there is continuity, check for a shorted circuit and repair or replace the front cover.



Check the commutator bars for discoloration and other visual faults. Bars discolored in pairs indicate shorted coils.

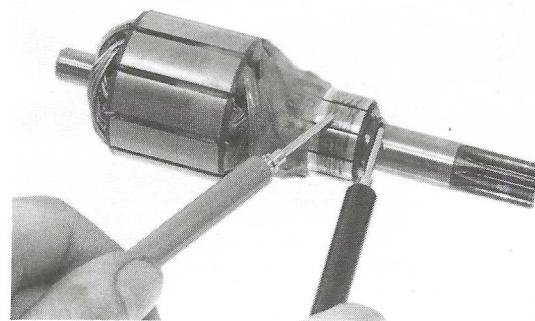


Check for continuity between pairs of commutator bars.

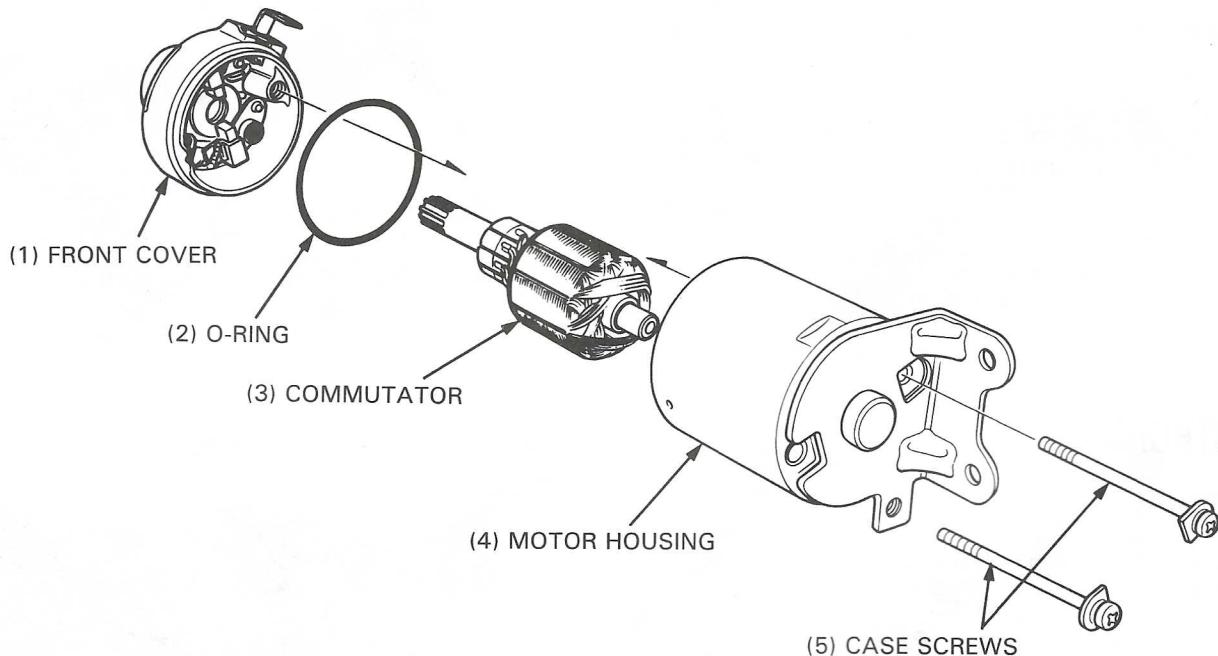
There should be continuity.

Also, make a continuity check between individual commutator bars and the armature shaft.

There should be no continuity.



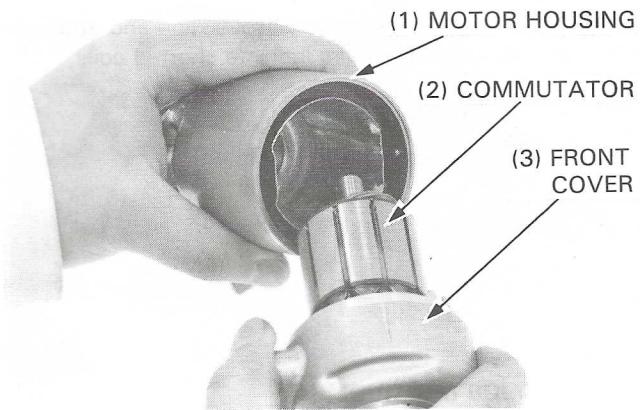
STARTER MOTOR ASSEMBLY



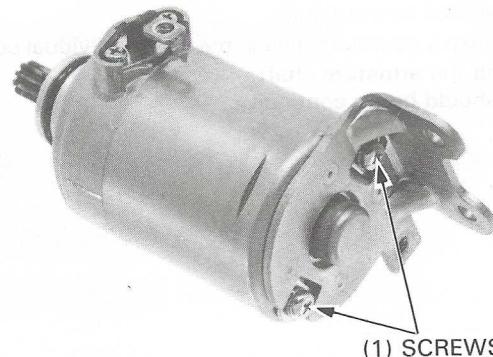
ELECTRICAL EQUIPMENT

Insert the commutator into the front cover.

Install the starter motor housing, aligning the tab on the housing with the groove on the front case.



Install and tighten the starter motor case screws.

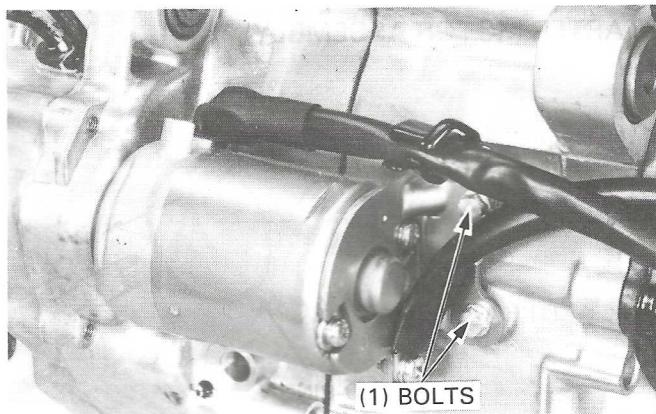


STARTER MOTOR INSTALLATION

Install the starter motor in the reverse order of removal.

NOTE

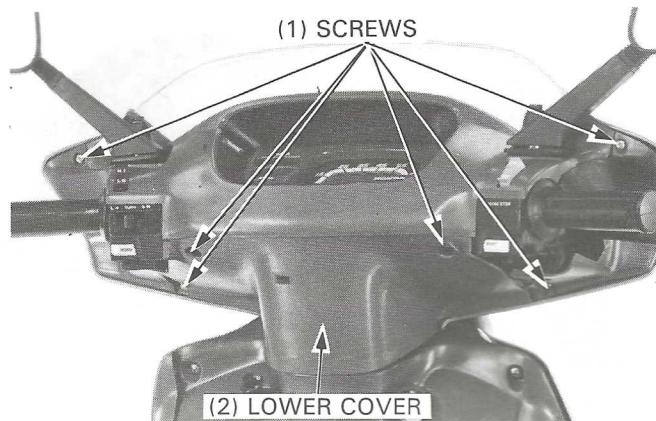
- Before installing the starter motor, check its operation by connecting the starter motor wires to the starter relay.



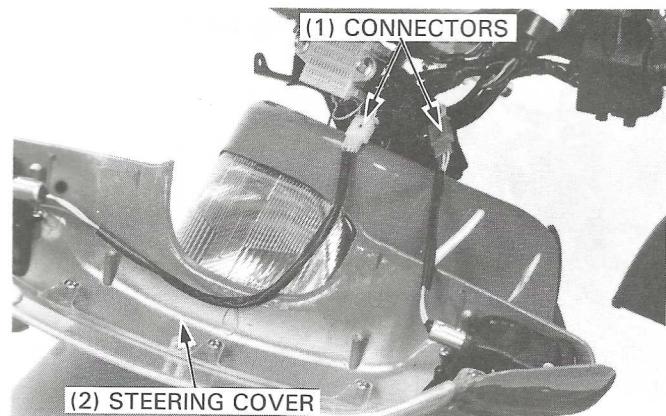
INSTRUMENTS

REMOVAL

Remove the handlebar lower cover by removing the six screws.

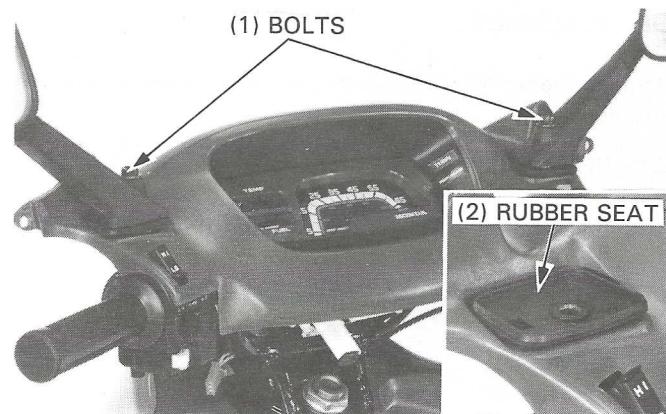


Disconnect the turn signal connector.
Remove the steering cover.

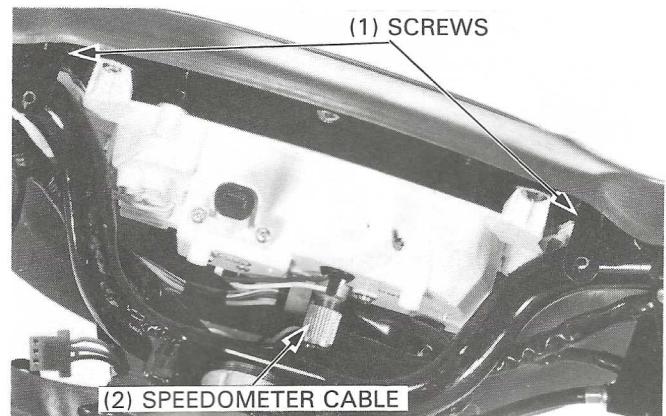


Remove the left and right rear view mirrors by removing the mounting bolts.

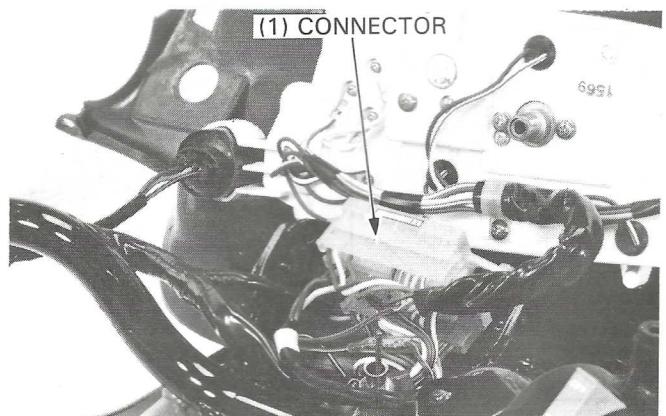
Remove the rear view mirror rubber seats.



Remove the two screws.
Disconnect the speedometer cable.



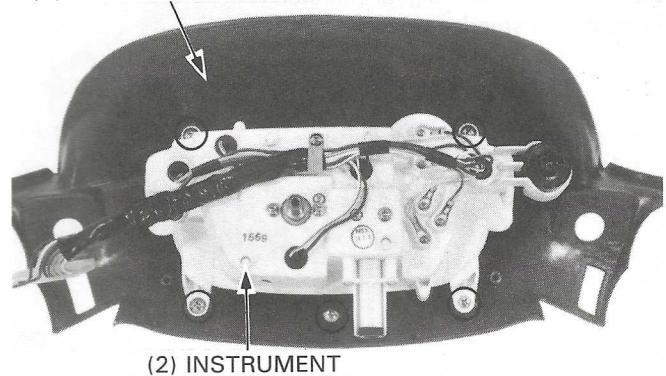
Disconnect the instrument wire connector from the multi connector.



ELECTRICAL EQUIPMENT

Remove the five screws and the instrument from the instrument cover.

(1) INSTRUMENT COVER

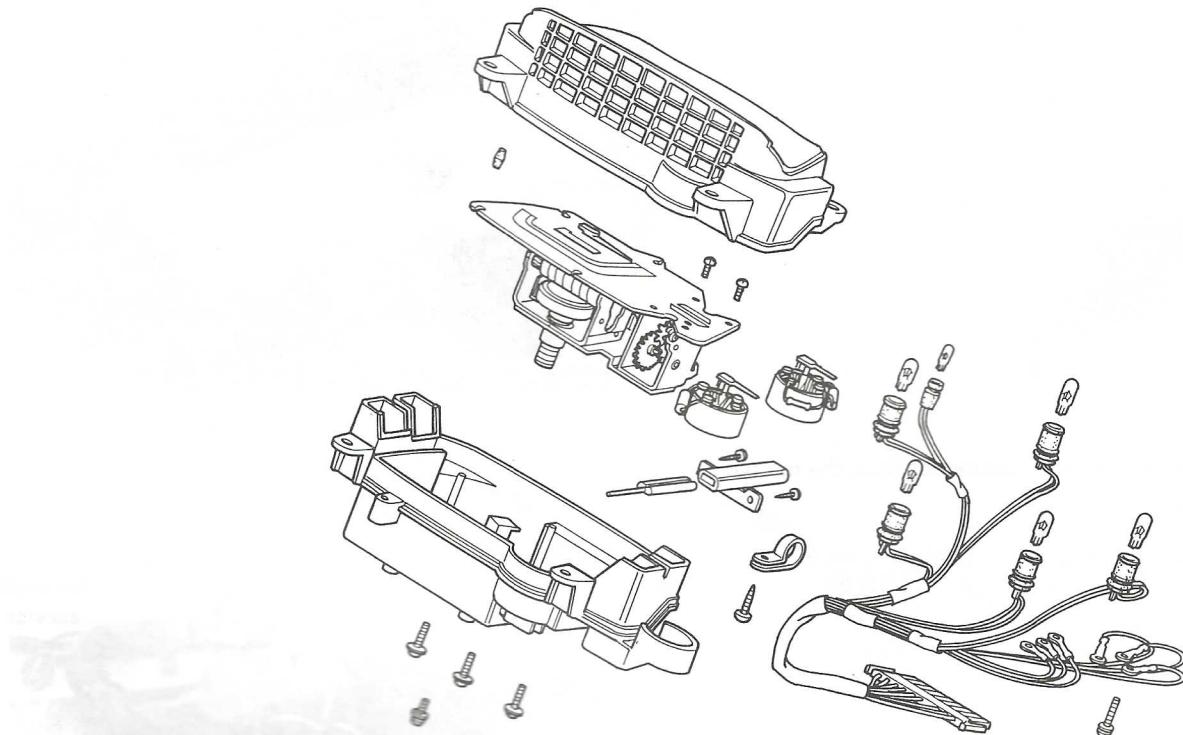


DISASSEMBLY

Remove the terminal nuts and screws and disassemble the instruments.

ASSEMBLY/INSTALLATION

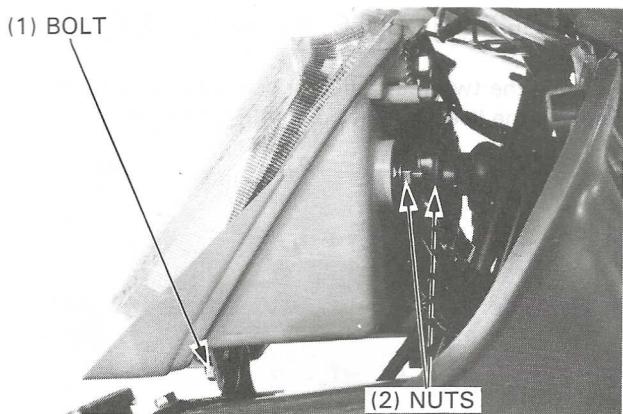
Assemble and install the instruments in the reverse order of disassembly and removal.



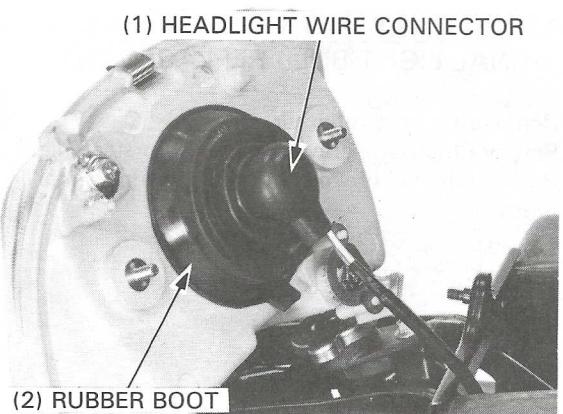
LIGHTS/BULBS

HEADLIGHT BULB REPLACEMENT

Remove the front cover (page 13-3).
Remove the two nuts and bolt.



Disconnect the headlight wire connector and remove the rubber boot.



Remove the bulb spring retainer and bulb from the headlight.

Replace the headlight bulb with a new one if necessary. Wear gloves when handling the bulb.

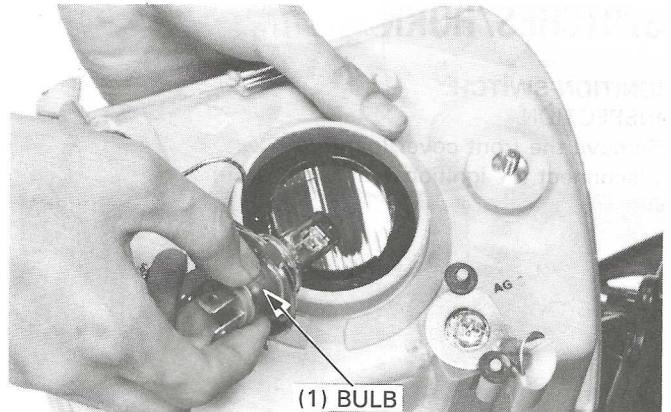
CAUTION

- Do not put finger prints on the headlight bulb, they may create hot spots on the bulb.*
- If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.*

Install the headlight in the reverse order of removal.

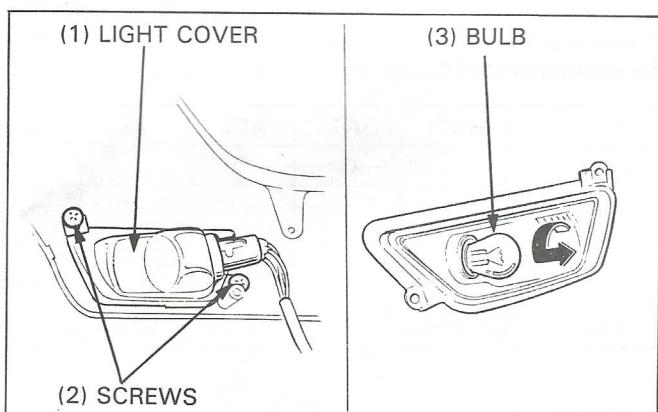
Check the headlight for proper operation after installing by turning the ignition switch to the ON and OFF positions.

After replacing the headlight bulb adjusting the headlight aim (page 3-11).



FRONT TURN SIGNAL LIGHT BULB REPLACEMENT

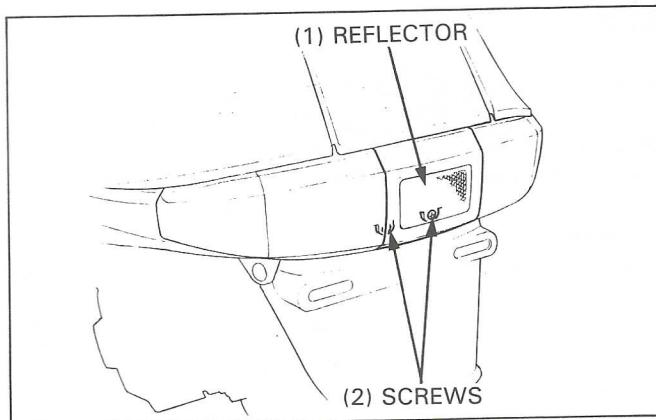
Remove the steering cover (page 16-13).
Remove the two screws and turn signal light cover.
Replace the turn signal light bulb with a new one.



ELECTRICAL EQUIPMENT

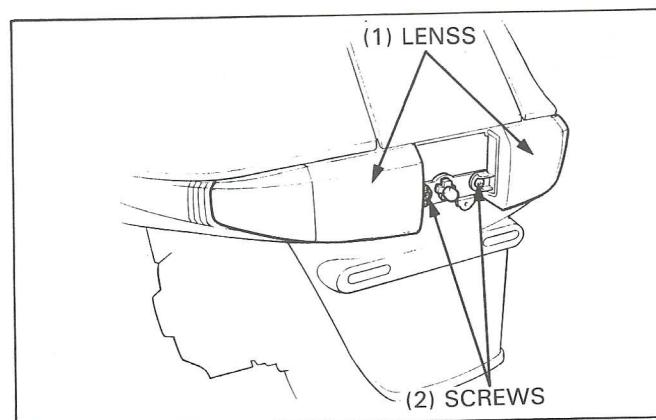
LICENSE LIGHT BULB REPLACEMENT

Remove the two rear reflector screws and reflector. Replace the license light bulb with a new one.



TAIL/BRAKE LIGHT BULB AND REAR TURN SIGNAL LIGHT BULB REPLACEMENT

Remove the rear reflector.
Remove the two screws and tail/turn signal light lens.
Replace the tail/brake light bulb and turn signal light bulb with a new one.

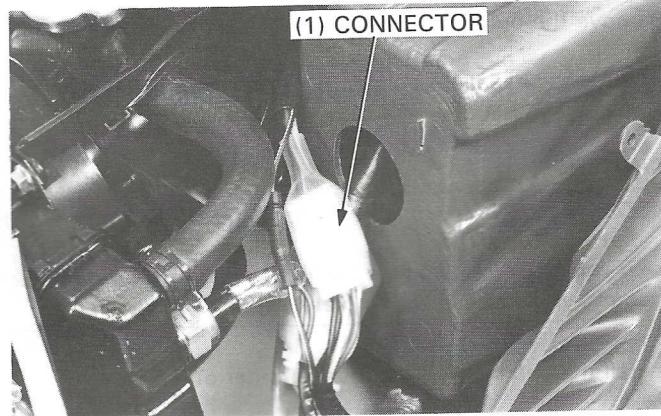


SWITCHES/HORN

IGNITION SWITCH

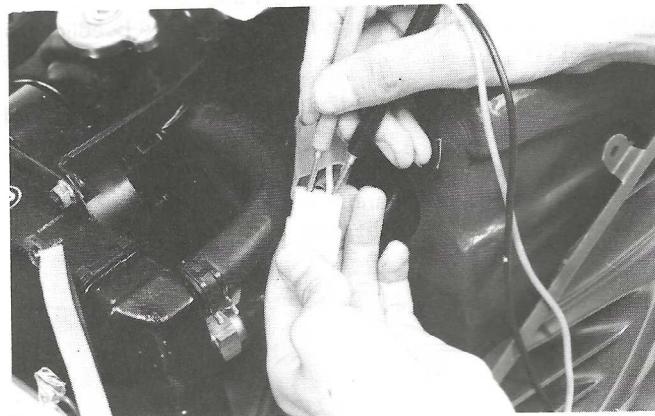
INSPECTION

Remove the front cover (page 13-3).
Disconnect the ignition switch connector.



Continuity should exist between color coded wires indicated by interconnected circles on the chart below.

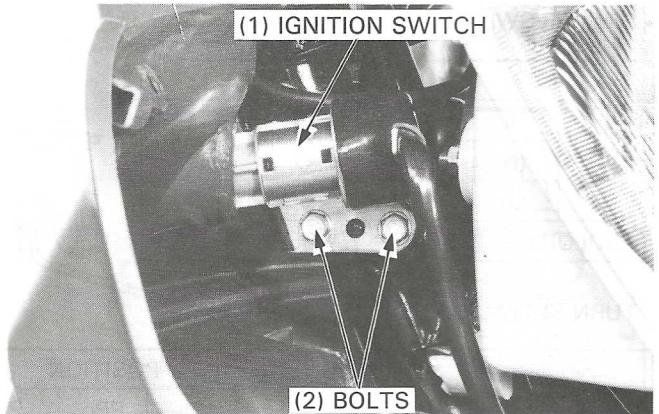
| | BAT ₁ | BAT ₂ | ACC | IG | E |
|-------|------------------|------------------|-------|------|---|
| ON | ○ | ○ | ○ | | |
| ACC | ○ | | ○ | ○ | ○ |
| OFF | | | ○ | ○ | |
| LOCK | | | | ○ | ○ |
| COLOR | R | Bl | Lg/Bl | Bl/W | G |



REPLACEMENT

Disconnect the ignition switch wire connector and remove the two switch mounting bolts and the ignition switch.

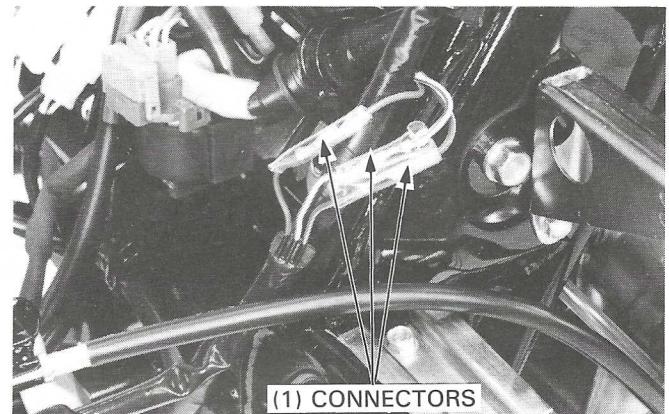
Install a new switch and tighten the two bolts.

**REAR BRAKE SWITCH**

Remove the frame center cover (page 13-2).

Disconnect the rear brake switch wire connectors from the harness.

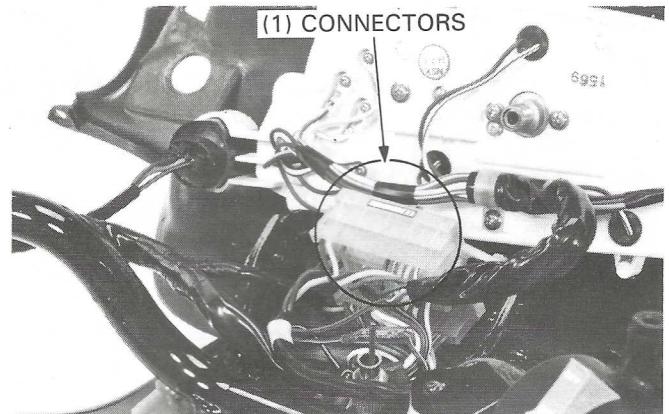
Check for continuity with the rear brake applied. There should be continuity between W/G and G/Y, and W/G and G/R terminals.

**HANDLEBAR SWITCHES**

Raise the instrument (page 16-12).

Disconnect the handlebar switch connectors.

Continuity should exist between color coded wires indicated by interconnected circles on each chart.

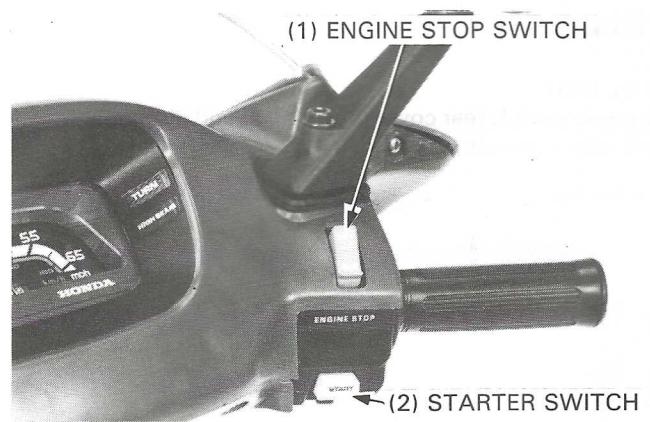


• ENGINE STOP SWITCH

| | IG | E |
|-------|------|---|
| OFF | ○ | ○ |
| RUN | | |
| COLOR | BL/W | G |

• STARTER SWITCH

| | HL | BAT ₃ | ST1 | ST2 |
|-------|------|------------------|-----|-----|
| FREE | ○ | ○ | | |
| (N) | | | | |
| PUSH | | | ○ | ○ |
| COLOR | Bu/W | Br/W | Y/R | G/R |



ELECTRICAL EQUIPMENT

- DIMMER SWITCH

| | | HL | Hi | Lo |
|-------|------|----|----|----|
| ON | Hi | O | O | |
| | (N) | O | O | O |
| | Lo | O | | O |
| COLOR | Bu/W | Bu | W | |

- TURN SIGNAL SWITCH

| | WINKER | | | POSITION | | |
|----------|--------|----|---|----------|------|-----|
| | W | R | L | Po | RPo | LPo |
| R | O | O | | O | | O |
| PUSH (N) | | | | O | O | O |
| (N) | | | | O | O | O |
| L | O | | O | O | O | |
| COLOR | Gr | Lb | O | Bl/Br | Lb/W | O/W |

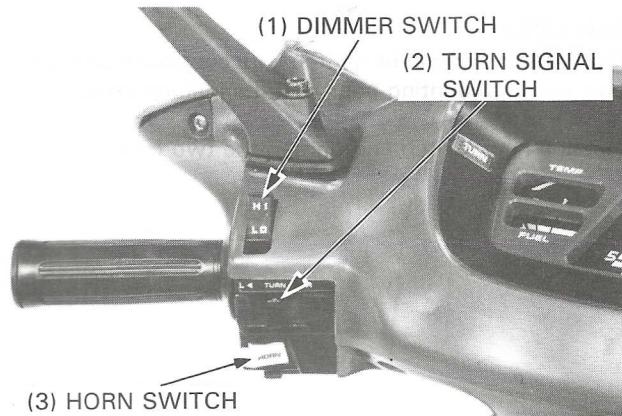
FRONT BRAKE SWITCH

The switch is normal if there is continuity between the black and green/yellow wires when the front brake lever is applied. Replace the switch if it is faulty.

HORN

Open the front cover.

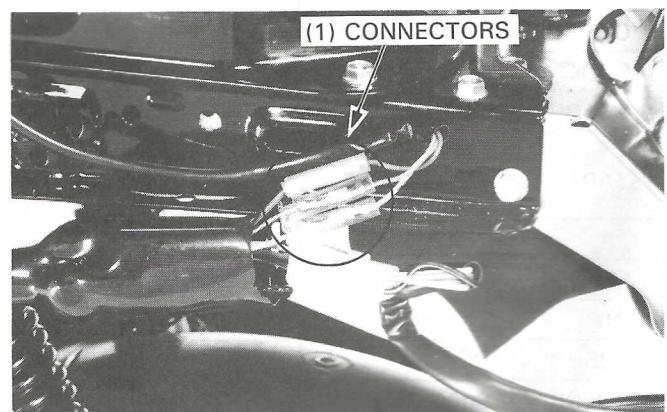
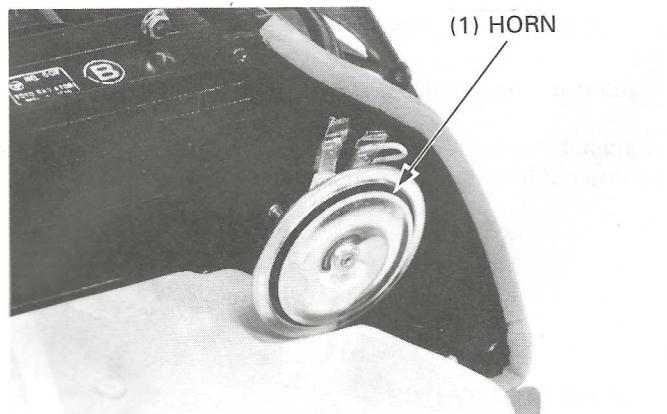
The horn is normal if it sounds when a 12 V battery is connected across the horn wire terminals. Replace the horn if necessary.



FUEL UNIT/GAUGE

FUEL UNIT

Remove the left rear cover (page 13-2) and disconnect the fuel unit wire connectors.

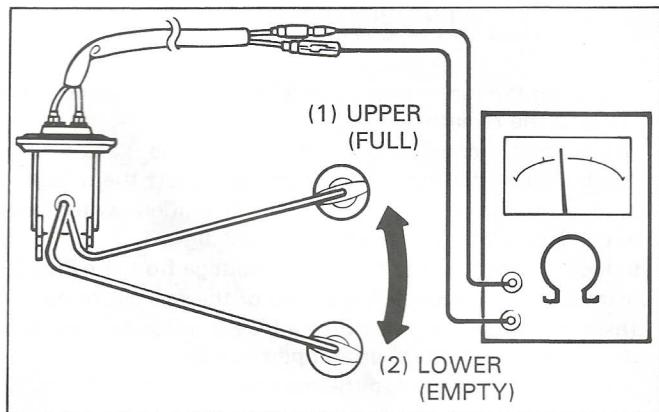


Remove the fuel unit from the fuel tank being careful not to damage or bend the fuel unit float arm. (page 4-14).

Measure the resistance between the Yellow/White and Green, and Blue/ White and Green terminals with the float at UPPER (FULL) and LOWER (EMPTY) positions.

RESISTANCES:

| FLOAT POSITION | UPPER (FULL) | LOWER (EMPTY) |
|----------------|--------------|---------------|
| STANDARD | G/O—L/W | 566 Ω |
| | G/O—Y/W | 33 Ω |
| | Y/W—L/W | 600 Ω |



FUEL GAUGE

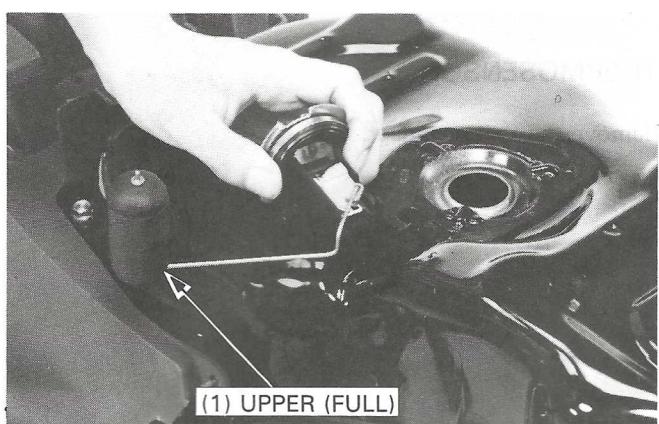
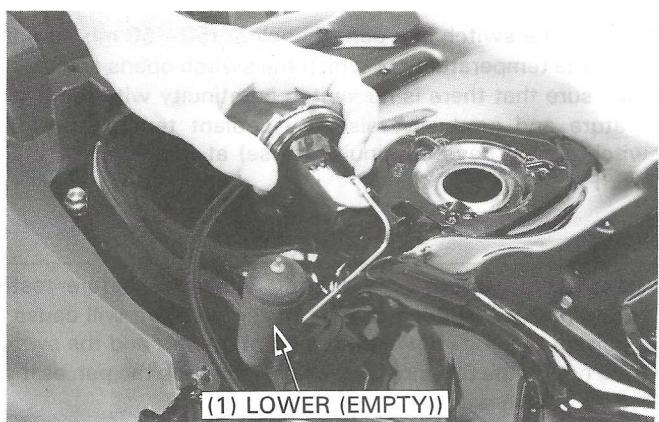
Connect the fuel unit wire connectors to the wire harness and turn the ignition switch ON.

NOTE

- Before performing the following test, operate the turn signals to determine that the battery circuit is normal.

Check the fuel gauge needle for the correct indication by moving the float up and down.

| FLOAT POSITION | NEEDLE POSITION |
|----------------|-----------------|
| UPPER (FULL) | "F" (FULL) |
| LOWER (EMPTY) | "E" (EMPTY) |



ELECTRICAL EQUIPMENT

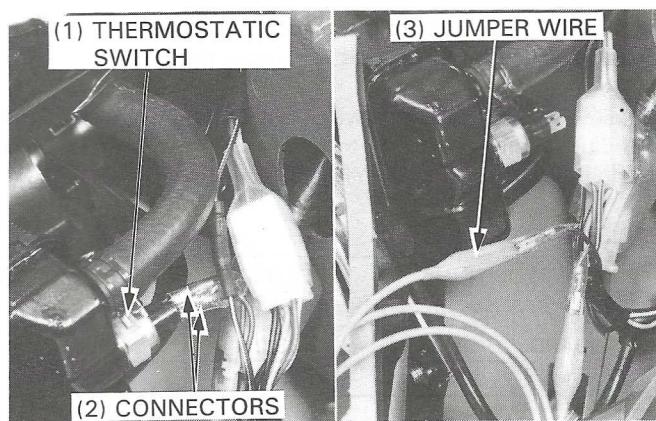
THERMOSTATIC SWITCH

The cooling fan motor is actuated by the thermostatic switch located in the radiator.

If the fan motor does not start, disconnect the Black and Blue leads from the thermostatic switch and short them together with a jumper wire as shown. Turn the ignition switch on. The cooling fan motor should start running.

If it does not start, check for battery voltage from the Blue lead (positive) to Green/Black (negative) of the fan motor coupler. If there is no voltage, check for a blown or faulty fuse, loose terminals or connectors, or an open circuit.

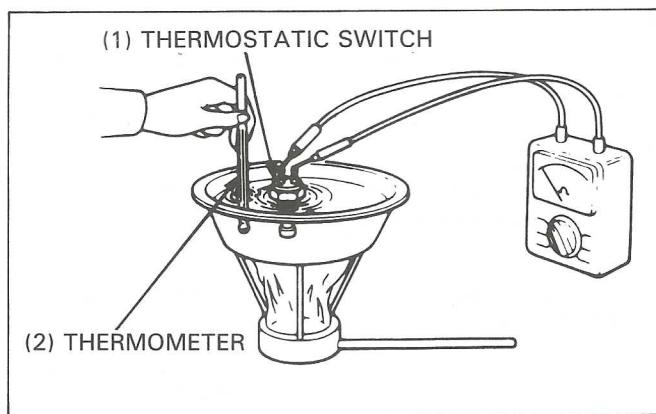
If it starts, inspect the fan thermostatic switch as follows:



Suspend the switch in a pan of coolant (50–50 mixture) and check the temperatures at which the switch opens and closes. Make sure that there is no switch continuity with room temperature and gradually raise the coolant temperature. The switch should have continuity (close) at 98–102°C (208–215°F).

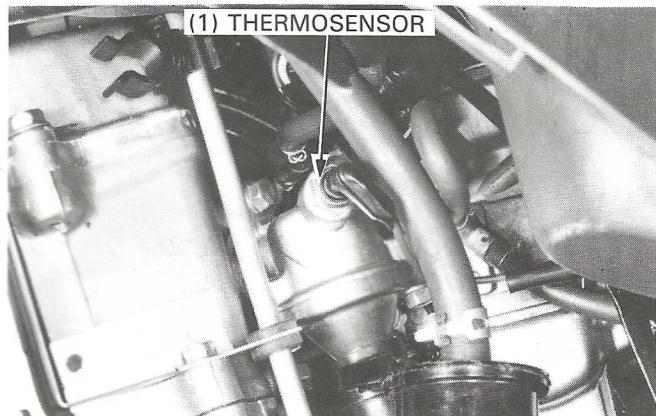
NOTE

- Keep temperature constant for 3 minutes before testing continuity. A sudden change of temperature will cause incorrect readings between the thermometer and the switch.
- Do not let the thermometer or switch touch the pan as it will give a false reading.
- Soak the switch in coolant up to its threads.



THERMOSENSOR

Remove the thermosensor.



Suspend the sensor in oil over a burner and measure the resistance through the sensor as the oil heats up.

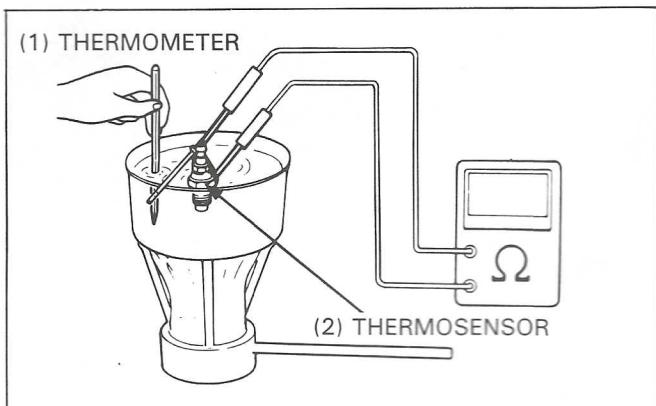
| TEMPERATURE | 50°C (122°F) | 80°C (176°F) | 100°C (212°F) | 120°C (248°F) |
|-------------|-----------------|-----------------|------------------|------------------|
| STANDARD | 144–179 Ω | 47.5–57.0 Ω | 26–29 Ω | 14.8–17.2 Ω |

WARNING

- Wear gloves and eye protection.

NOTE

- Oil must be used as the heated liquid to check the function above 100°C (212°F).
- You'll get false readings if either the thermometer or thermosensor touches the pan.



TEMPERATURE GAUGE

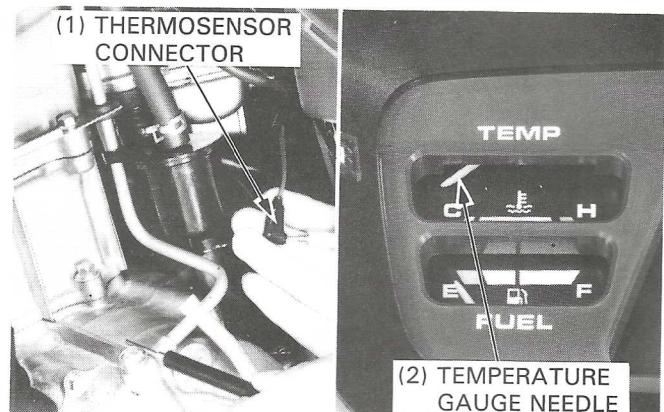
Disconnect the wire from the thermosensor and ground it to the engine.

Turn the ignition switch ON.

The temperature gauge needle should move all the way to the H (Hot).

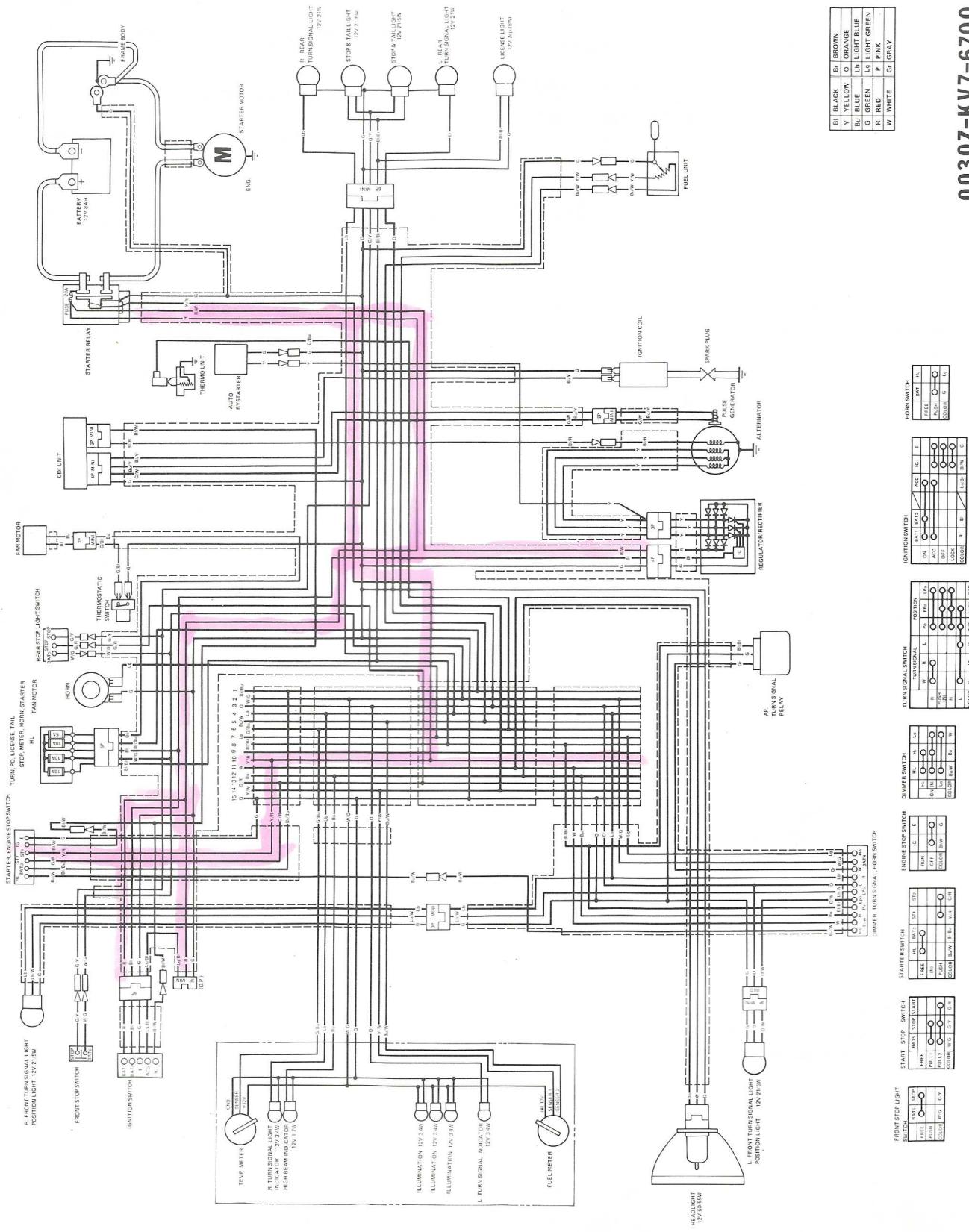
CAUTION

- Do not leave the thermosensor wire grounded for longer than 5 seconds or the temperature gauge will be damaged.*



MEMO

17. WIRING DIAGRAM



0030Z-KV7-6700

17

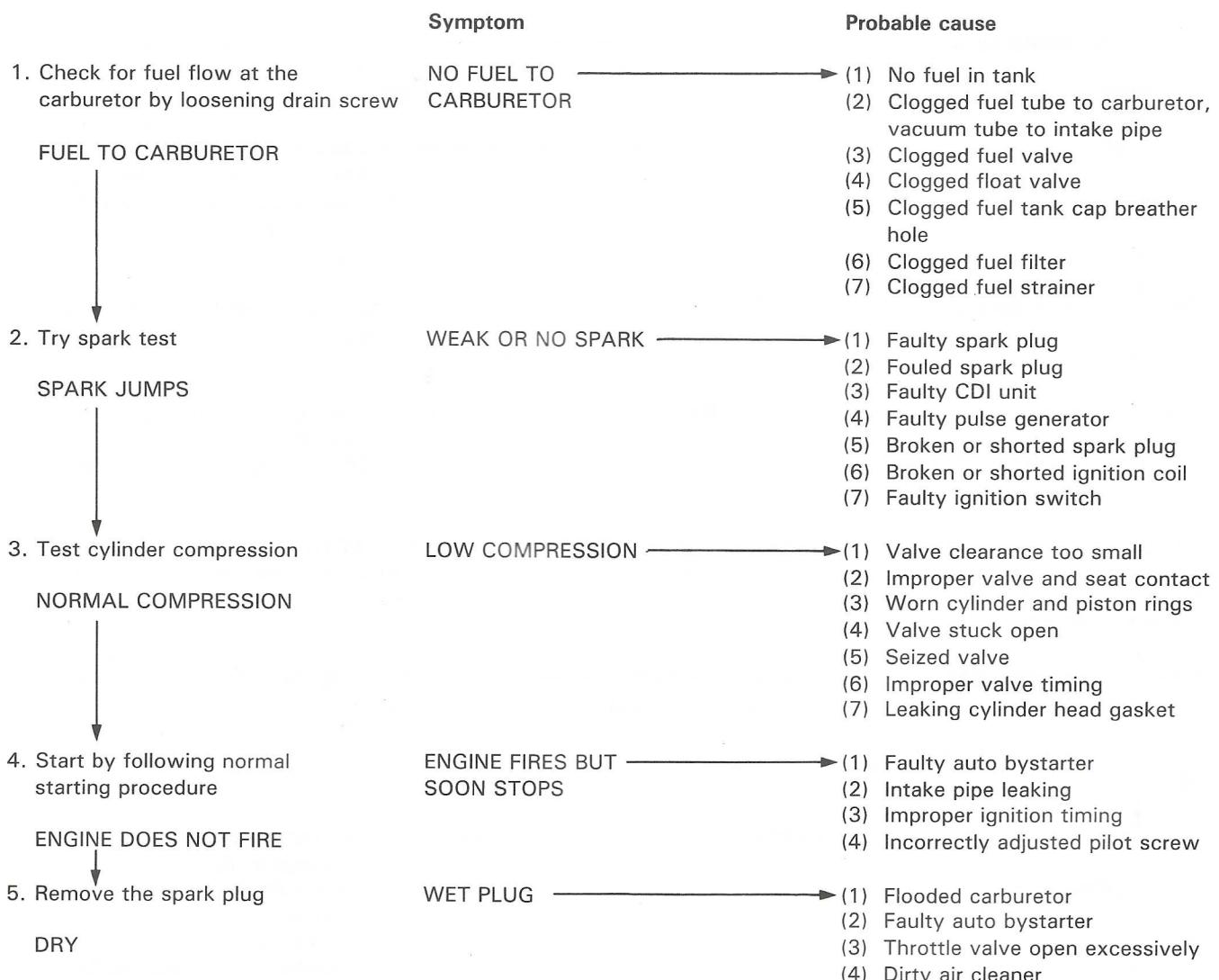
MEMO



18. TROUBLESHOOTING

| | | | |
|---|------|----------------------------------|------|
| ENGINE DOES NOT START OR IS HARD TO START | 18-1 | CLUTCH, DRIVE AND DRIVEN PULLEYS | 18-4 |
| ENGINE LACKS POWER | 18-2 | HANDLING | 18-5 |
| POOR PERFORMANCE AT LOW AND IDLE SPEEDS | 18-3 | POOR SUSPENSION PERFORMANCE | 18-5 |
| POOR PERFORMANCE AT HIGH SPEED | 18-3 | POOR BRAKE PERFORMANCE | 18-5 |
| ENGINE NOISE | 18-4 | FUEL GAUGE | 18-6 |
| | | STARTER MOTOR | 18-7 |

ENGINE DOES NOT START OR IS HARD TO START



TROUBLESHOOTING

ENGINE LACKS POWER

| | Symptom | Probable cause |
|--|---|---|
| 1. Accelerate lightly ENGINE SPEED INCREASES | ENGINE SPEED DOES NOT INCREASE SUFFICIENTLY | (1) Clogged air cleaner (2) Restricted fuel flow (3) Clogged fuel tank breather hole (4) Clogged muffler (5) Faulty auto-bystarter (6) Split carburetor vacuum piston diaphragm |
| 2. Check ignition timing CORRECT | INCORRECT | (1) Faulty CDI unit (2) Faulty pulse generator |
| 3. Check valve clearance CORRECT | INCORRECT | (1) Improper valve clearance adjustment (2) Worn valve seat |
| 4. Test cylinder compression NORMAL | TOO LOW | (1) Improper valve and seat contact (2) Worn cylinder and piston rings (3) Leaking cylinder head gasket (4) Flaws in cylinder head (5) Improper valve timing |
| 5. Check carburetor for clogging NOT CLOGGED | CLOGGED | Carburetor not serviced frequently enough |
| 6. Remove spark plug NOT FOULED OR DISCOLORED | FOULED OR DISCOLORED | (1) Plug not serviced frequently enough (2) Use of plug with improper heat range |
| 7. Check oil level and condition CORRECT AND NOT CONTAMINATED | INCORRECT OR CONTAMINATED | (1) Oil level too high (2) Oil level too low (3) Oil not changed |
| 8. Remove cylinder head oil pipe bolt and inspect VALVE TRAIN LUBRICATED PROPERLY | VALVE TRAIN NOT LUBRICATED PROPERLY | (1) Clogged oil pipe (2) Faulty oil pump |
| 9. Check for engine overheating NOT OVERHEATING | OVERHEATING | (1) Insufficient coolant (2) Thermostat stuck closed (3) Worn cylinder and piston rings (4) Lean mixture (5) Fuel contaminated (6) Excessive carbon build-up in combustion chamber (7) Ignition timing too advanced |
| 10. Accelerate or run at high speed ENGINE DOES NOT KNOCK | ENGINE KNOCKS | (1) Excessive carbon build-up in combustion chamber (2) Use of poor quality fuel (3) Clutch slipping (4) Lean mixture (5) Ignition timing too advanced |

POOR PERFORMANCE AT LOW AND IDLE SPEEDS

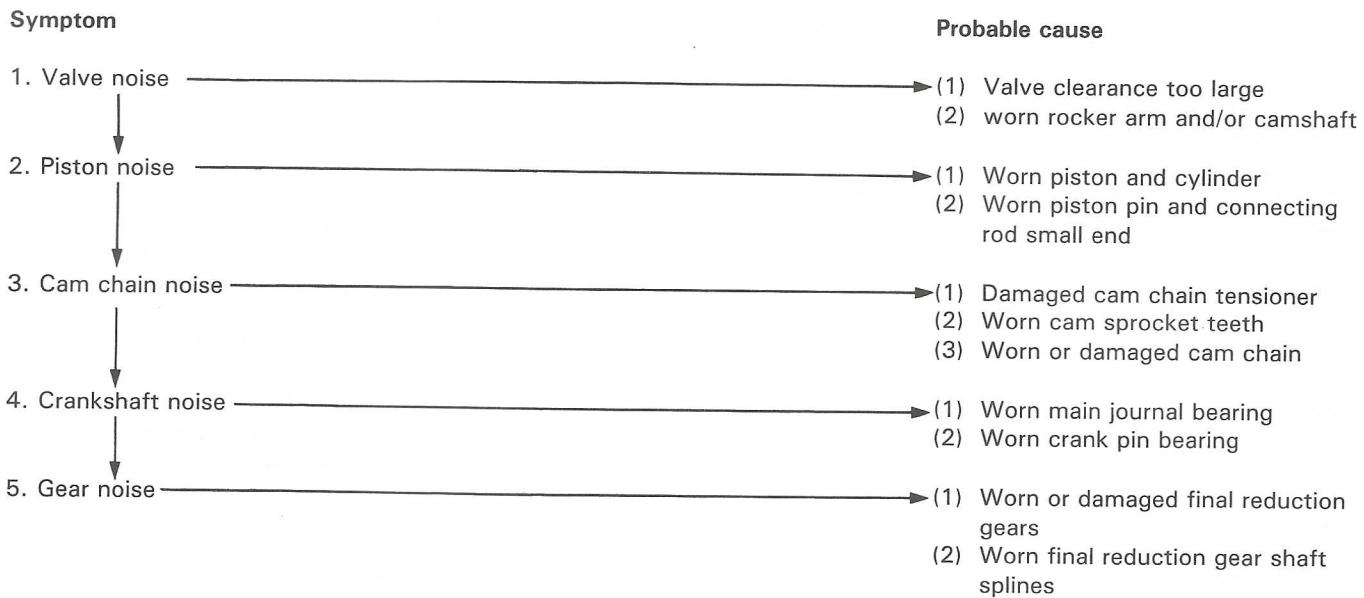
| | Symptom | Probable cause |
|---|----------------------------|---|
| 1. Check ignition timing CORRECT | INCORRECT | (1) Faulty CDI unit (2) Faulty pulse generator |
| 2. Check carburetor pilot screw adjustment CORRECT | INCORRECT | (1) Fuel air mixture too rich (Turn screw in) (2) Fuel air mixture too lean (Turn screw out) |
| 3. Check for leaking intake pipe NOT LEAKING | LEAKING | (1) Deteriorated O-ring (2) Loose carburetor (3) Damaged insulator rubber (4) Air leaking past intake pipe vacuum joint |
| 4. Perform spark test GOOD SPARK | WEAK OR INTERMITTENT SPARK | (1) Faulty, carbon or wet fouled spark plug (2) Faulty CDI unit (3) Faulty pulse generator (4) Faulty ignition coil (5) Broken or shorted spark plug wire (6) Faulty ignition switch |

POOR PERFORMANCE AT HIGH SPEED

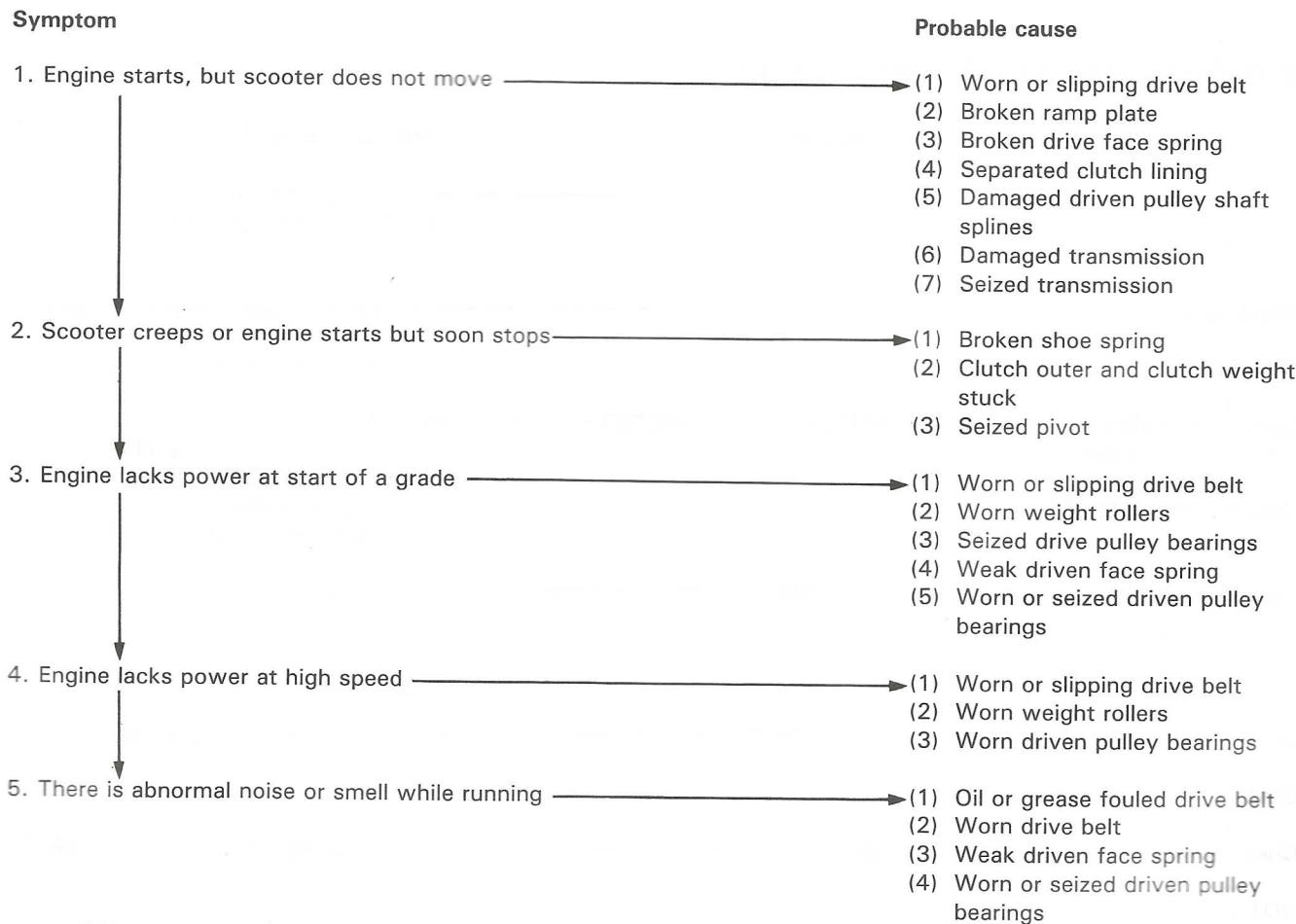
| | Symptom | Probable cause |
|--|----------------------|---|
| 1. Check ignition timing CORRECT | INCORRECT | (1) Faulty CDI unit (2) Faulty pulse generator |
| 2. Check valve clearance CORRECT | INCORRECT | (1) Improper valve clearance adjustment (2) Worn valve seat |
| 3. Disconnect fuel tube at automatic fuel valve FUEL FLOWS FREELY | FUEL FLOW RESTRICTED | (1) No fuel in fuel tank (2) Clogged fuel tube or filter (3) Clogged fuel tank cap breather hole (4) Faulty fuel valve |
| 4. Remove carburetor and check for clogged jet NOT CLOGGED | CLOGGED | Clean |
| 5. Check valve timing CORRECT | INCORRECT | Cam sprocket aligning marks not aligned |
| 6. Check valve spring tension NOT WEAKENED | WEAK | Faulty spring |

TROUBLESHOOTING

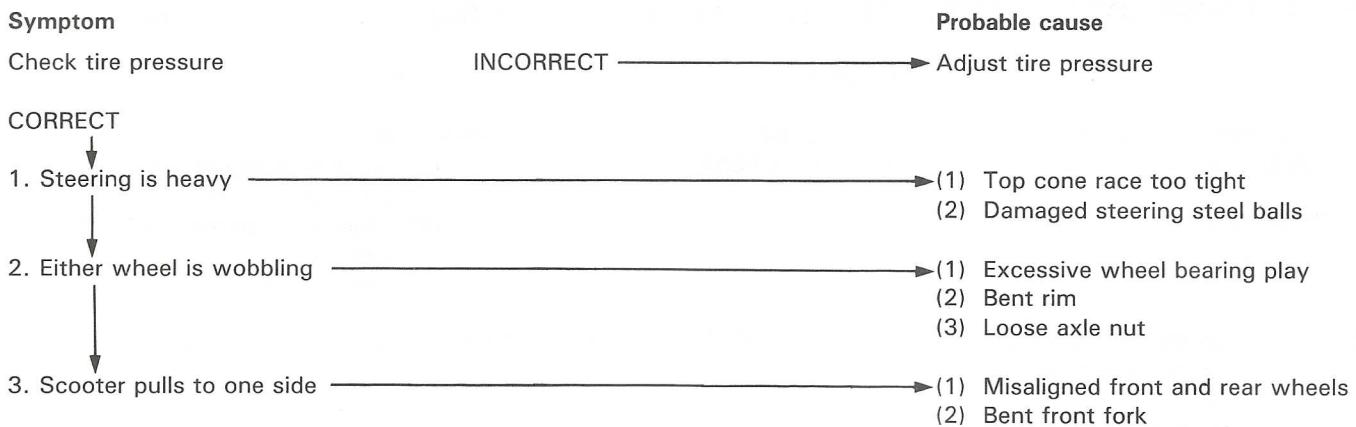
ENGINE NOISE



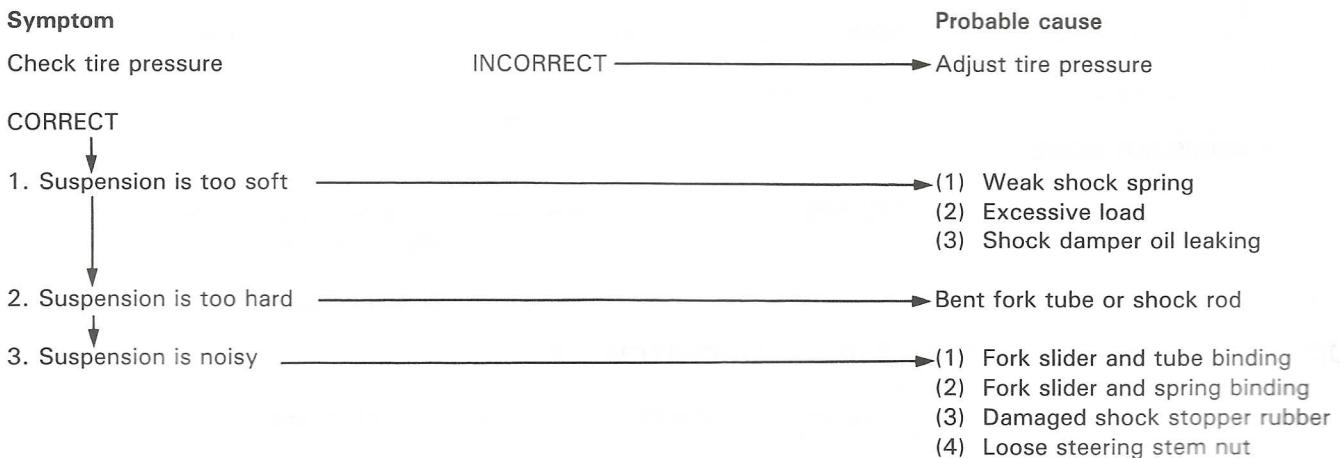
CLUTCH, DRIVE AND DRIVEN PULLEYS



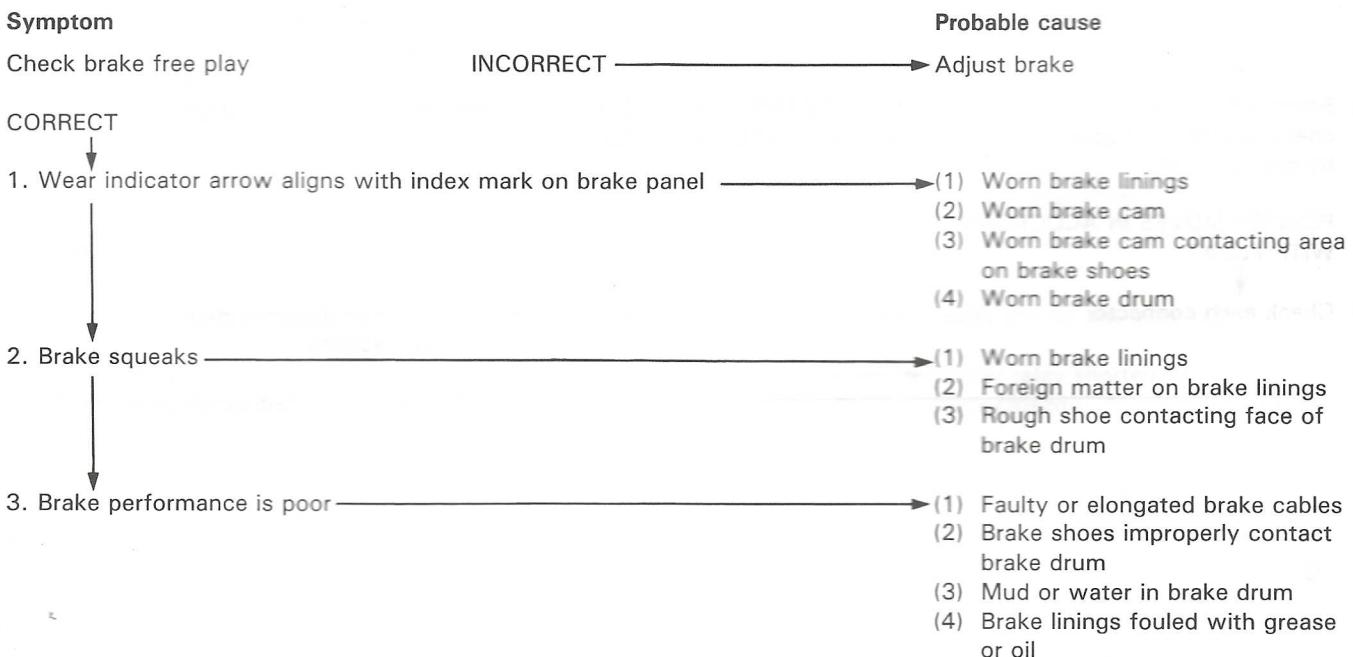
HANDLING



POOR SUSPENSION PERFORMANCE



POOR BRAKE PERFORMANCE



TROUBLESHOOTING

FUEL GAUGE

POINTER DOES NOT REGISTER CORRECTLY (IGNITION SWITCH ON)

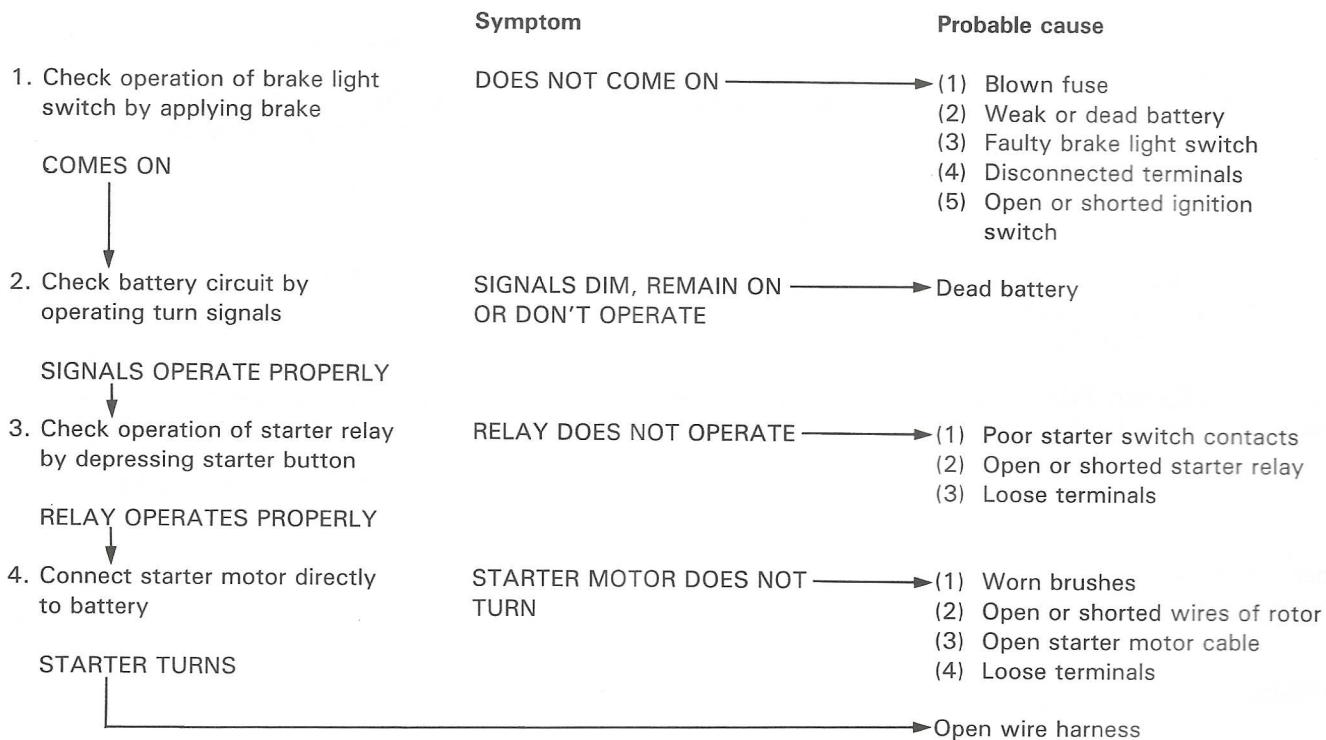
| Symptom | Probable cause |
|---|---|
| 1. Check battery circuit by operating turn signals SIGNALS OPERATE PROPERLY | SIGNALS DIM, REMAIN ON OR DON'T OPERATE (1) Blown fuse (2) Weak or dead battery (3) Faulty ignition switch (4) Loose or disconnected connectors (5) Open circuit |
| 2. Remove fuel unit from tank and check operation of pointer by moving float Float up: Pointer at FULL Float down: Pointer at EMPTY | POINTER MOVES Faulty float |
| 3. Check operation of pointer by opening and shorting fuel unit terminal on harness side | POINTER MOVES Open or shorted fuel unit |
| 4. Check for loose, disconnected or incorrect connections CORRECT | INCORRECT (1) Disconnected connector (2) Incorrectly connected connector Open or shorted circuit in meter |

POINTER FLUCTUATES OR SWINGS (IGNITION SWITCH ON)

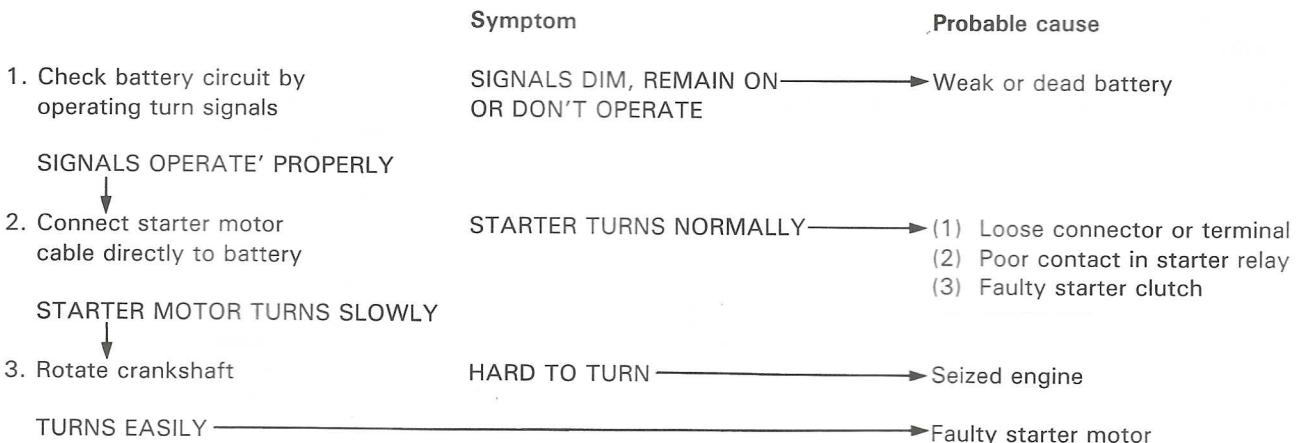
| Symptom | Probable cause |
|--|---|
| 1. Check battery circuit by operating turn signals SIGNALS OPERATE PROPERLY | SIGNALS DIM, REMAIN ON OR DON'T OPERATE (1) Blown fuse (2) Weak or dead battery (3) Open or shorted ignition switch (4) Loose or disconnected connections (5) Open circuit |
| 2. Remove fuel unit from tank and check operation of pointer by moving float | POINTER DOES NOT MOVE IN ACCORDANCE WITH FLOAT Poor contact in fuel unit |
| 3. Check each connector CORRECT | INCORRECT Loose or disconnected connections Open or shorted circuit in meter |

STARTER MOTOR

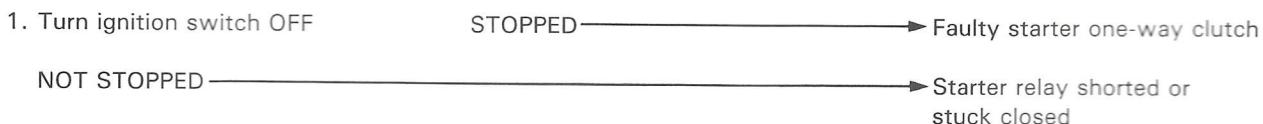
STARTER MOTOR WILL NOT TURN



STARTER MOTOR TURNS SLOWLY



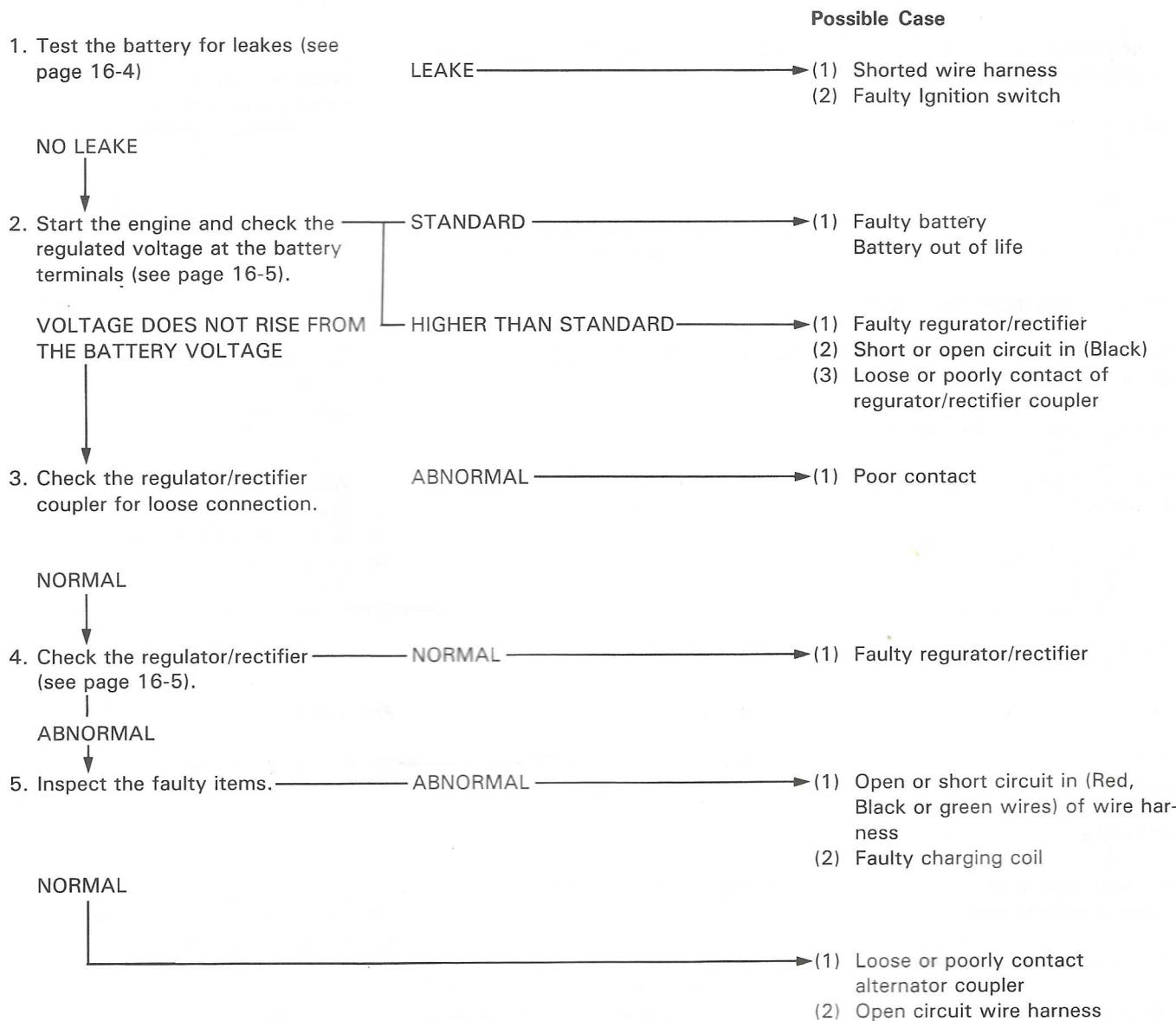
STARTER MOTOR WON'T STOP TURNING



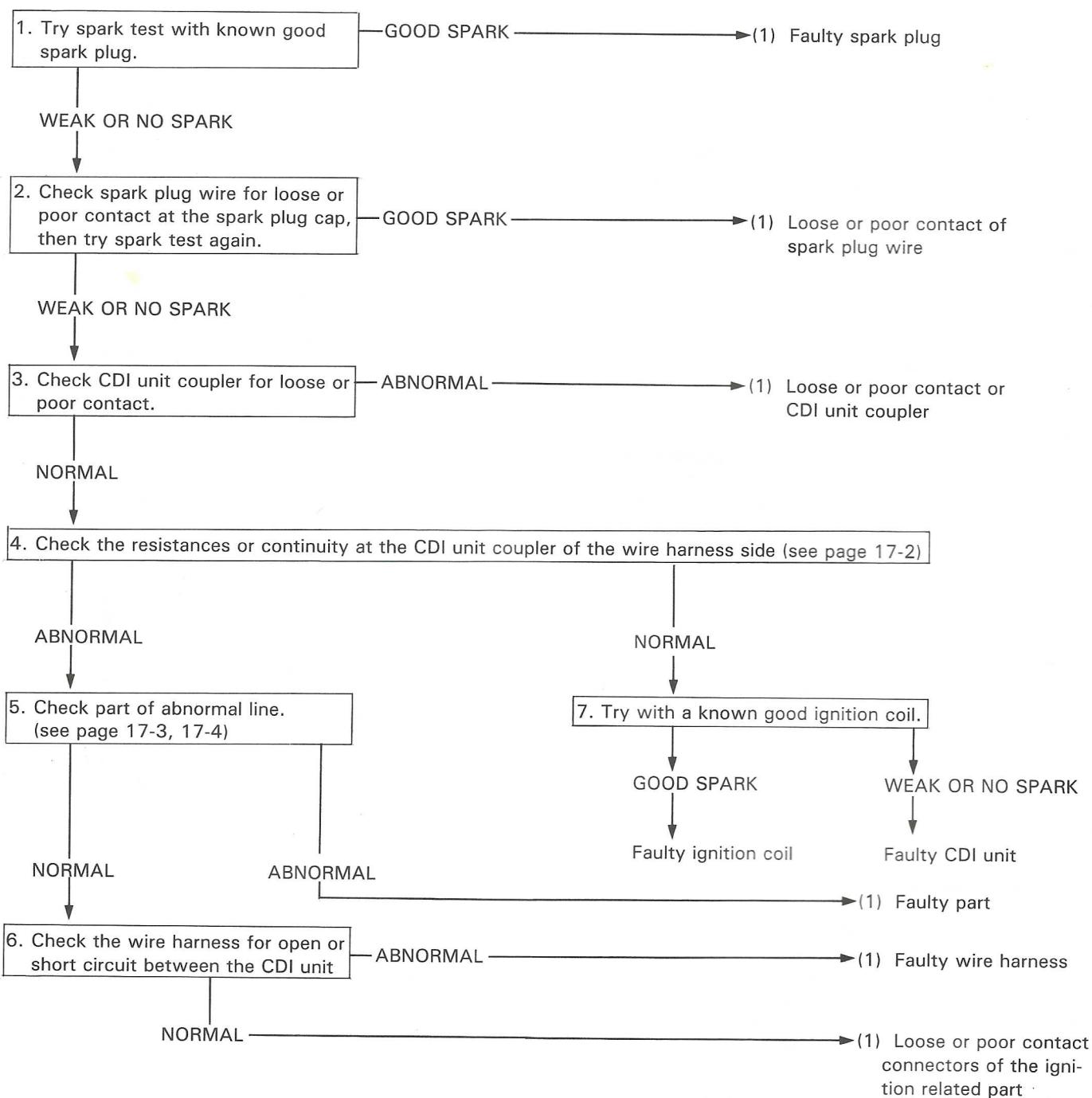
TROUBLESHOOTING

UNDER CHARGE/OVER CHARGE OF THE BATTERY

NOTE: Make sure that the battery is in good condition, use a known-good battery if necessary.



WEAK OR NO SPARK



MEMO

19. INDEX

| | | | |
|--|-----------|--|-------|
| Air Cleaner | 3-4, 4-16 | Flywheel Removal | 10-2 |
| Cut-off Valve | 4-3 | Fork/Steering | 14-15 |
| Alternator/Starter Clutch | 10-1 | Frame Covers | 13-1 |
| Auto Bystarter | 4-3 | Center Cover | 13-2 |
| Automatic Fuel Valve | 4-13 | Front Brake | 14-9 |
| Battery | 16-4 | Cover | 13-3 |
| Brake Light Switch/Starter Limiter Switch | 3-11 | Suspension | 14-12 |
| Lock Knob | 3-10 | Wheel | 14-6 |
| Rock System | 15-7 | Fuel System | 4-1 |
| Shoe Wear | 3-9 | Line | 3-3 |
| System | 3-9 | Tank | 4-14 |
| Cable & Harness Routing | 1-8 | Unit/Gauge | 16-18 |
| Camshaft Installation | 6-14 | General Information | 1-1 |
| Removal | 6-4 | Safety | 1-1 |
| Carburetor Installation | 4-11 | Handlebar | 14-3 |
| Removal | 4-5 | Headlight Aim | 3-11 |
| Carburetor-idle Speed | 3-7 | High Altitude Adjustment (U.S.A. only) | 4-12 |
| Charging System | 16-5 | Ignition System | 16-7 |
| Clutch Shoe Wear | 3-11 | Timing | 3-7 |
| Clutch/Driven Pulley | 8-8 | Instruments | 16-12 |
| Coolant Replacement | 12-2 | Left Crankcase Cover | 8-3 |
| Cooling System | 12-1 | Left/Right Rear Cover | 13-2 |
| Hoses & Connections | 3-6 | Leg Shield | 13-3 |
| Crankcase/Crankshaft | 11-1 | Lights/Blubs | 16-15 |
| Crankcase Assembly | 11-5 | Lubrication | 2-1 |
| Breather | 3-4 | Points | 2-7 |
| Separation | 11-2 | Maintenance | 3-1 |
| Crankshaft Inspection | 11-4 | Cover | 13-2 |
| Cylinder Head/Valves | 6-1 | Schedules | 3-2 |
| Cylinder/Piston | 7-1 | Model Identification | 1-2 |
| Cylinder Compression | 3-8 | Nuts, Bolts, Fasteners | 3-12 |
| Cylinder Head Assembly | 6-12 | Oil Pump Assembly | 2-4 |
| Cover Assembly | 6-15 | Disassembly | 2-3 |
| Cover Disassembly | 6-4 | Inspection | 2-3 |
| Cover Installation | 6-15 | Installation | 2-5 |
| Cover Removal | 6-3 | Removal | 2-2 |
| Disassembly | 6-7 | Pilot Screw | 4-7 |
| Installation | 6-13 | Adjustment | 4-11 |
| Removal | 6-6 | Piston Installation | 7-6 |
| Cylinder Installation | 7-6 | Removal | 7-3 |
| Removal | 7-2 | Purge Control Valve Inspection (California model) | 4-17 |
| Drive Pulley/Clutch/Driven Pulley | 8-1 | Radiator | 12-3 |
| Drive Belt | 3-8 | Coolant | 3-6 |
| Belt Air Cleaner | 3-8 | Core | 3-6 |
| Pulley | 8-3 | Rear Wheel/Brake/Suspension | 15-1 |
| Electrical Equipment | 16-1 | Rear Brake | 15-5 |
| Emission Control Information Label | 1-14 | Fender | 15-2 |
| System | 1-12 | Shock Absorber | 15-8 |
| Engine Removal/Installation | 5-1 | Wheel | 15-2 |
| Installation | 5-6 | Right Crankcase Cover Installation | 10-6 |
| Oil | 2-2 | Removal | 10-2 |
| Oil Filter Screen Cleaning | 2-2 | Service Information | |
| Removal | 5-2 | Alternator/Starter Clutch | 10-1 |
| Evaporative Emission Control System (California model only) | 3-7 | Cooling System | 12-1 |
| Exhaust Muffler | 15-2 | Crankcase/Crankshaft | 11-1 |
| Final Reduction | 9-1 | Cylinder Head/Valves | 6-1 |
| Assembly | 9-5 | Cylinder/Piston | 7-1 |
| Disassembly | 9-2 | Drive Pulley/Clutch/Driven Pulley | 8-1 |
| Inspection | 9-2 | Electrical Equipment | 16-1 |
| Float/Float Valve/Jets | 4-8 | Engine Removal/Installation | 5-1 |
| Flywheel Installation | 10-6 | Final Reduction | 9-1 |

INDEX

| | |
|---|-------|
| Frame Covers | 13-1 |
| Fuel System | 4-1 |
| Lubrication | 2-1 |
| Maintenance | 3-1 |
| Rear Wheel/Brake/Suspension | 15-1 |
| Steering/Front Wheel/Brake/Suspension | 14-1 |
| Service Rules | 1-1 |
| Side Stand | 3-11 |
| Spark Plug | 3-4 |
| Specifications | 1-3 |
| Starter Clutch | 10-3 |
| Starting System | 16-9 |
| Stator Installation | 10-6 |
| Removal | 10-2 |
| Steering/Front Wheel/Brake/Suspension | 14-1 |
| Steering Head Bearings | 3-13 |
| Suspension | 3-12 |
| Switches/Horn | 16-16 |
| System Testing | 12-2 |
| Temperature Gauge | 16-21 |
| Thermosensor | 12-9 |
| Thermostat | 12-9 |
| Thermostatic Switch | 16-20 |
| Throttle Operation | 3-3 |
| Tools | 1-7 |
| Torque Values | 1-5 |
| Transmission Oil | 2-6 |
| Troubleshooting | |
| Cooling System | 12-1 |
| Crankcase/Crankshaft | 11-1 |
| Cylinder Head/Valves | 6-2 |
| Cylinder/Piston | 7-1 |
| Drive Pulley/Clutch/Driven Pulley | 8-2 |
| Electrical Equipment | 16-3 |
| Final Reduction | 9-1 |
| Fuel System | 4-2 |
| Lubrication | 2-1 |
| Rear Wheel/Brake/Suspension | 15-1 |
| Steering/Front Wheel/Brake/Suspension | 14-2 |
| Vacuum Chamber | 4-5 |
| Valve Clearance | 3-5 |
| Guide Replacement | 6-9 |
| Seat Inspection And Refacing | 6-10 |
| Water Pump | 12-5 |
| Wheels/Tires | 3-13 |
| Wiring Diagram | 17-1 |



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