

 **HONDA**

SHOP MANUAL



HONDA

HONDA



XRV750T

IMPORTANT SAFETY NOTICE



Indicate a strong possibility of severe personal injury or death if instructions are not followed.

CAUTION:

Indicate 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.

TYPE CODES

- Throughout this manual, the following abbreviations are used to identify individual model.

| CODE | AREA TYPE | CODE | AREA TYPE |
|------|-----------------------|------|------------------------|
| ED | European direct sales | GII | Germany: 50 PS limited |
| E | U.K. | ND | North Europe |
| F | France | SW | Switzerland |
| G | Germany: Full power | AR | Austria |

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the XRV750.

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the vehicle is in peak operating condition.

Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period.

Section 1 and 3 apply to the whole motorcycle. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections.

Section 4 through 19 describe parts of the motorcycle, grouped according to location.

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

Most sections start with an assembly or system illustration, service information, specifications and troubleshooting for the section.

The subsequent pages gives detailed procedures.

If you don't know the source of the trouble, go to section 21 Troubleshooting.

ALL INFORMATION, ILLUSTRATIONS, DIRECTIONS AND SPECIFICATIONS INCLUDED IN THIS PUBLICATION ARE BASED ON THE LATEST PRODUCT INFORMATION AVAILABLE AT THE TIME OF APPROVAL FOR PRINTING. HONDA MOTOR CO., LTD. RESERVES THE RIGHT TO MAKE CHANGES AT ANY TIME WITHOUT NOTICE AND WITHOUT INCURRING ANY OBLIGATION WHATEVER. NO PART OF THIS PUBLICATION MAY BE REPRODUCED WITHOUT WRITTEN PERMISSION. THIS MANUAL IS WRITTEN FOR PERSONS WHO HAVE ACQUIRED BASE KNOWLEDGE OF MAINTENANCE ON HONDA MOTORCYCLES, MOTOR SCOOTERS OR ATVS.












HONDA MOTOR CO., LTD.
SERVICE PUBLICATION OFFICE

CONTENTS

| | | |
|-------------------------------|---|-----------|
| | GENERAL INFORMATION | 1 |
| | FRAME/BODY PANELS/EXHAUST SYSTEM | 2 |
| | MAINTENANCE | 3 |
| ENGINE AND DRIVE TRAIN | LUBRICATION SYSTEM | 4 |
| | FUEL SYSTEM | 5 |
| | COOLING SYSTEM | 6 |
| | ENGINE REMOVAL/INSTALLATION | 7 |
| | CLUTCH/GEARSHIFT LINKAGE | 8 |
| | ALTERNATOR/STARTER CLUTCH | 9 |
| | CYLINDER HEAD/VALVES | 10 |
| | CYLINDER/PISTON | 11 |
| | CRANKSHAFT/TRANSMISSION | 12 |
| CHASSIS | FRONT WHEEL/SUSPENSION/STEERING | 13 |
| | REAR WHEEL/SUSPENSION | 14 |
| | HYDRAULIC BRAKE | 15 |
| ELECTRICAL | BATTERY/CHARGING SYSTEM | 16 |
| | IGNITION SYSTEM | 17 |
| | ELECTRIC STARTER | 18 |
| | LIGHTS/METERS/SWITCHES | 19 |
| | WIRING DIAGRAMS | 20 |
| | TROUBLESHOOTING | 21 |

SYMBOLS

The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it would be explained specifically in the text without the use to the symbols.

| | |
|---|--|
|  | Replace the part(s) with new one (s) before assembly. |
|  | Use recommended engine oil, unless otherwise specified. |
|  | Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1). |
|  | Use multi-purpose grease (Lithium based multi-purpose grease NLGI #2 or equivalent). |
|  | Use molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote ® BR-2 plus manufactured by Dow Corning, U.S.A. Multi-purpose M-2 manufactured by Mitsubishi Oil Japan |
|  | Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote ® G-n Paste manufactured by Dow Corning, U.S.A. Honda Moly 60 (U.S.A. only) Rocol ASP manufactured by Rocol Limited. U.K. Rocol Paste manufactured by Sumico Lubricant. Japan |
|  | Use silicone grease. |
|  | Apply a locking agent. Use a middle strength locking agent unless otherwise specified. |
|  | Apply sealant. |
|  | Use brake fluid, DOT 4. Use the recommended brake fluid, unless otherwise specified. |
|  | Use Fork or Suspension Fluid. |

1. GENERAL INFORMATION

| | | | |
|----------------------|-----|---------------------------|------|
| GENERAL SAFETY | 1-1 | TORQUE VALUES | 1-14 |
| SERVICE RULES | 1-2 | TOOLS | 1-17 |
| MODEL IDENTIFICATION | 1-3 | LUBRICATION & SEAL POINTS | 1-19 |
| SPECIFICATIONS | 1-4 | CABLE & HARNESS ROUTING | 1-22 |

GENERAL SAFETY

CARBON MONOXIDE

If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area.

▲ WARNING

- *The exhaust contains poisonous carbon monoxide gas that can cause loss of consciousness and may lead to death.*

Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

GASOLINE

Work in a well ventilated area. Keep cigarettes, flames or sparks away the work area or where gasoline is stored.

▲ WARNING

- *Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.*

HOT COMPONENTS

▲ WARNING

- *Engine and exhaust system parts become very hot and remain hot for some time after the engine is run. Wear insulated gloves or wait until the engine and exhaust system have cooled before handling these parts.*

USED ENGINE/TRANSMISSION OIL

▲ WARNING

- *Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil. KEEP OUT OF REACH OF CHILDREN.*

BRAKE DUST

Never use an air hose or dry brush to clean brake assemblies.

▲ WARNING

- *Inhaled asbestos fibers have been found to cause respiratory disease and cancer.*

BRAKE FLUID

CAUTION

- *Spilling fluid on painted, plastic or rubber parts will damage them. Place a clean shop towel over these parts whenever the system is serviced. KEEP OUT OF REACH CHILDREN.*

GENERAL INFORMATION

COOLANT

Under some conditions, the ethylene glycol in engine coolant is combustible and its flame is not visible. If the engine ethylene glycol dose ignite, you will not see any flame, but you can be burned.

▲ WARNING

- *Avoid spilling engine coolant on the exhaust system or engine parts. They may be hot enough to cause the coolant to ignite and burn without a visible flame.*
- *Coolant (ethylene glycol) can cause some skin irritation and is poisonous if swallowed, **KEEP OUT OF REACH OF CHILDREN.***
- *Keep out of reach of pets. Some pets are attracted to the smell and taste of coolant and can die if they drink it.*
- *Do not remove the radiator cap when the engine is hot. The coolant is under pressure and could scald you.*

If it contacts your skin, wash the affected areas immediately with soap and water. If it contacts your eyes, flush them thoroughly with fresh water and get immediate medical attention. If it is swallowed, the victim must be forced to vomit then rinse mouth and throat with fresh water before obtaining medical attention. Because of these dangers, away from the reach of children. Recycle used coolant in an ecologically correct manner.

NITROGEN PRESSURE

For shock absorber with a gas-filled reservoir.

▲ WARNING

- *Use only nitrogen to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion resulting in serious injury.*
- *The shock absorber contains nitrogen under high pressure. Allowing fire or heat near the shock absorber could lead to an explosion that could result in serious injury.*
- *Failure to release the pressure from a shock absorber before disposing of it may lead to a possible explosion and serious injury if it is heated or pierced.*

To prevent the possibility of an explosion, release the nitrogen by pressing the valve core. Then remove the valve stem from the shock absorber reservoir.

Before disposal of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve stem from the shock absorber.

BATTERY HYDROGEN GAS & ELECTROLYTE

▲ WARNING

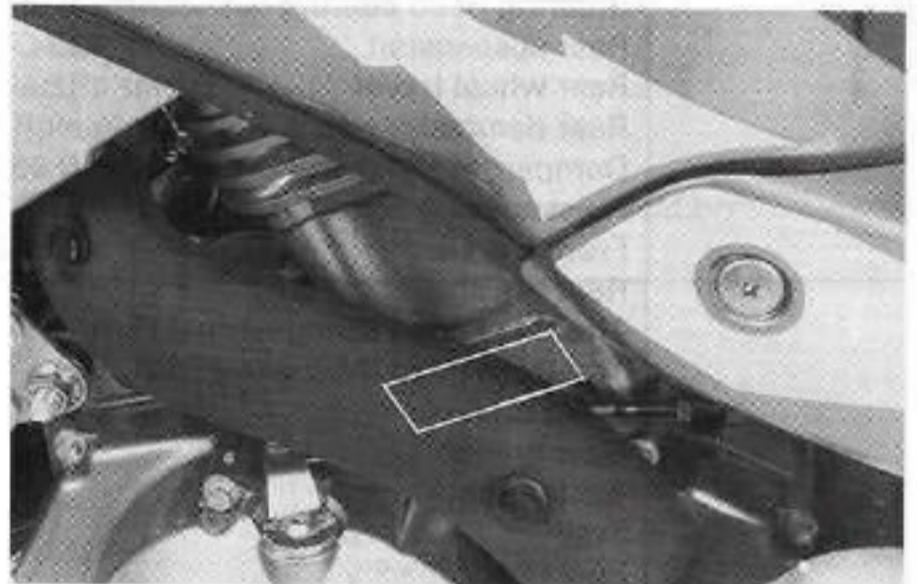
- *The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.*
- *The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and face shield.*
 - *If electrolyte gets on your skin, flush with water.*
 - *If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician.*
- *If swallowed, drink large quantities of water or milk of magnesia or vegetable oil and call a physician. **KEEP OUT OF REACH OF CHILDREN.***

SERVICE RULES

1. Use genuine HONDA or HONDA-recommended parts and lubrications or their equivalents. Parts that do not meet HONDA's design specifications may damage the motorcycle.
2. Use the special tools designed for this product.
3. Use only metric tools when servicing this motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners. The use of incorrect tools and fasteners may damage the motorcycle.
4. Install new gaskets, O-rings, cotter pins, lock plates, etc. When reassembling.
5. When tightening a series bolts or nuts, begin with the larger-diameter of inner bolts first, and tighten to specified torque diagonally, in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After assembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown on pages 1-22 through 1-28, Cable and Harness Routing.

MODEL IDENTIFICATION**(1) FRAME SERIAL NUMBER**

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

**(2) ENGINE SERIAL NUMBER**

The engine serial number is stamped on the right crankcase below the rear cylinder.

**(3) CARBURETOR IDENTIFICATION NUMBER**

The carburetor identification number is stamped on the carburetor body intake side.

**(4) COLOR CODE LABEL**

The color label is attached as shown. When ordering color coded part, always specify its designated color.

GENERAL INFORMATION

SPECIFICATIONS

| GENERAL | | |
|-----------|---|---|
| | ITEM | SPECIFICATIONS |
| DIMENSION | Overall length [G,GII, AR, SW, ND] [E,F,ED] Overall width Overall height Wheel base Seat height Foot peg height Ground clearance Dry weight Curb weight Maximum weight capacity | 2,380mm (93.7 in) 2,315mm (91.1 in) 905mm (35.6 in) 1,430mm (56.2 in) 1,565mm (61.6 in) 870mm (34.3 in) 347mm (13.7 in) 215mm (8.4 in) 205kg (451 lb) 229kg (504 lb) 196kg (432 lb) |
| FRAME | Frame type Front suspension Fork inner tube diameter Fork fluid capacity (per leg) Front wheel travel Steering head bearing Rear suspension Rear wheel travel Rear damper Damper/reservoir gas pressure Pressurized gas material Front tire size Rear tire size Tire tread coad (Bridgestone) FF/RR Tire tread coad (Michelin)FF/RR Front brake Rear brake Caster angle Trail Fuel tank capacity Fuel tank reserve capacity | Semi-double cradle with steel pipe Telescopic fork 43.0mm (1.69 in) 648 cm ³ (21.9 US oz,22.7 Imp oz) 220mm (8.7 in) Ball bearings with retainer Pro-link with mono strut swingarm 214mm (8.4 in) Double effect type with gas filled shock absorber 1,569 kPa (16 kgf/cm ³ , 228 psi) Nitrogen 90/90-21 54H tube type 140/80 R17 69H tube type TW101/TW152RADIAL T66/T66X Hydraulic double disc Hydraulic single disc 27° 30' 133mm (5.2 in) 23 liter (6.08 US gal, 5.06 Imp gal) 5.1 liter (1.34 US gal, 1.12 Imp gal) |
| ENGINE | Bore and stroke Displacement Compression ratio Valve train Intake valve opens [Except SW,AR] Intake valve closes [Except SW,AR] Exhaust valve opens [Except SW,AR] Exhaust valve closes [Except SW,AR] Intake valve opens [SW,AR] Intake valve closes [SW,AR] Exhaust valve opens [SW,AR] Exhaust valve closes [SW,AR] Lubrication system Oil pump type Cooling system Air filtration Crankshaft type | 81.0mm X 72.0 mm (3.19 in X 2.83 in) 742 cm ³ (45.3 cu-in) 9.0:1 Silent, multi-link chain driver and OHC with rocker arm 10° BTDC ———— 50° ABDC ———— at 1 mm (0.04 in) lift 50° BBDC ———— 10° ATDC ———— 0° BTDC ———— 20° ABDC ———— at 1mm (0.04 in) lift 30° BBDC ———— 0° ATDC ———— Forced pressure and wet sump Trochoid Liquid cooled dual radiator, electric fan with thermal fan motor switch operated Paper filter (Wet type) Unit type, 2 main journals |

| GENERAL(Cont'd) | | |
|-----------------|---|---|
| | ITEM | SPECIFICATIONS |
| ENGINE | Engine weight Firing order Cylinder arrangement Cylinder number | 62.5 kg(138 lb) Front-232° – Rear – 488° – Front 2 cylinders 52° V Front:#2, Rear:#1 |
| CARBURETOR | Carburetor type Throttle bore | Constant Velocity dual carburetor with fuel pump 36 mm(1.4 in) |
| DRIVE TRAIN | Clutch system Clutch operation system Transmission Primary reduction Final reduction Gear ratio 1st Gear ratio 2nd Gear ratio 3rd Gear ratio 4th Gear ratio 5th Gearshift pattern | Multi-plate, wet Cable operating 5 speeds constant mesh 1.763 (67/38) 2.812 (45/16) 2.687 (43/16) 3.083 (37/12) 2.062 (33/16) 1.550 (31/20) 1.272 (28/22) 1.083 (26/24) Left foot operated return system (1-N-2-3-4-5) |
| ELECTRICAL | Ignition system Starting system Charging system Alternator/capacity Regulator/rectifier type Lighting system | [Except SW,AR] [SW,AR] Full transistorized ignition DC-CDI Electric starter Triple phase output alternator 360 W/5,000 min ⁻¹ (rpm) SCR shorted/triple phase full-wave rectification Battery |

GENERAL INFORMATION

| LUBRICATION SYSTEM | | | Unit:mm(in) |
|--|----------------------|--|---------------|
| ITEM | | STANDARD | SERVICE LIMIT |
| Engine oil capacity | At draining | 2.4 liter (2.52 US qt, 2.11 Imp qt) | ———— |
| | At disassembly | 3.2 liter (3.41 US qt, 2.82 Imp qt) | ———— |
| | At oil filter change | 2.6 liter (2.73 US qt, 2.29 Imp qt) | ———— |
| Recommended engine oil | | Used Honda 4-stroke oil or equivalent API Service Classification: SE,SF or SG Viscosity:SAE 10W-40 | ———— |
| Oil pressure at oil pressure switch (80°C/176°F) | | 490-588 kPa (5.0-6.0 kgf/cm ² , 71-85 psi) at 5,000 min ⁻¹ (rpm) | ———— |
| Oil pump rotor | Tip clearance | 0.15 (0.006) | 0.20 (0.008) |
| | Body clearance | 0.15-0.22 (0.006-0.009) | 0.35 (0.014) |
| | Side clearance | 0.02-0.07 (0.001-0.003) | 0.10 (0.004) |

| FUEL SYSTEM | | |
|---------------------------------------|-------------------|-------------------------------------|
| ITEM | | STANDARD |
| Carburetor identification number | Except SW,AR type | VP51A |
| | SW type | VP50B |
| | AR type | VP50C |
| Choke type | | Starting enrichment circuit system |
| Main jet | Front | #115 |
| | Rear | #115 |
| Slow jet | Except SW,AR type | #40 |
| | SW,AR type | #38 |
| Pilot screw initial opening | Except SW,AR type | 2•3/8 turns out |
| | SW,AR type | 2•1/2 turns out |
| Pilot screw final opening | Except SW type | 1/2 turns out |
| | SW type | 1/4 turns out |
| Float level | | 13.7mm(0.5 in) |
| Carburetor vacuum difference | | 27 kPa (20 mmHg, 0.7 in Hg) |
| Base carburetor (for synchronization) | | Rear cylinder (#1) |
| Idle speed | Except SW type | 1,200 ± 100 min ⁻¹ (rpm) |
| | SW type | 1,200 ± 50 min ⁻¹ (rpm) |
| Throttle grip free play | | 2 – 6mm (0.08 – 0.24 in) |

| COOLING SYSTEM | | STANDARD |
|--------------------------------|---------------------|---|
| ITEM | | |
| Cooling capacity | Radiator and engine | 2.03 liter (2.13 US qt, 1.78 Imp qt) |
| | Reserve tank | 0.4 liter (0.42 US qt, 0.35 Imp qt) |
| Radiator cap relief pressure | | 108 – 137 kPa (1.1 – 1.4 kgf/cm ² , 16 – 21 psi) |
| Thermostat begin to open | | 80 – 84 °C/176 – 183 °F |
| Thermostat fully open | | 95 °C/203 °F |
| Thermostat valve lift | | 8mm (0.3 in) |
| Standard coolant concentration | | 50% mixture with soft water |

Unit:mm(in)

| CLUTCH SYSTEM | | STANDARD | SERVICE LIMIT |
|--------------------------------------|------|-----------------------------------|---------------|
| ITEM | | | |
| Clutch lever free play | | 10-20(0.4 – 0.8) | ———— |
| Clutch outer guide | O.D. | 34.968 – 34.984 (1.3767 – 1.3773) | 34.96(1.376) |
| | I.D. | 24.991 – 25.016 (0.9831 – 0.9849) | 25.03(0.985) |
| Mainshaft O.D. at clutch outer guide | | 24.967 – 24.980 (0.9830 – 0.9835) | 24.95(0.982) |
| Clutch spring free length | | 41.2 (1.62) | 39(1.5) |
| Clutch disc thickness | | 3.72 – 3.88 (0.147 – 0.153) | 3.6(0.14) |
| Clutch plate warpage | | ———— | 0.15(0.006) |
| Oil pump drive sprocket I.D. | | 35.025 – 35.075 (1.3789 – 1.3809) | 35.10(1.382) |

Unit:mm(in)

| ALTERNATOR/STARTER CLUTCH | | STANDARD | SERVICE LIMIT |
|---------------------------|------|-----------------------------------|---------------|
| ITEM | | | |
| Starter driven gear | O.D. | 57.749 – 57.768 (2.2736 – 2.2743) | 57.73(2.273) |
| | I.D. | 40.000 – 40.021 (1.5748 – 1.5756) | 40.10(1.579) |
| Starter clutch outer I.D. | | 74.414 – 74.440 (2.9297 – 2.9307) | 74.46(2.931) |

Unit:mm(in)

| CYLINDER HEAD | | STANDARD | SERVICE LIMIT |
|-------------------------------|----|--|---------------|
| ITEM | | | |
| Cylinder compression | | 1,275 ± 196 kPa (13.2 ± 2.0 kgf/cm ² , 185 ± 28 psi) at 500 min ⁻¹ (rpm) | ———— |
| Valve clearance | IN | 0.15 ± 0.02 (0.006 ± 0.001) | ———— |
| | EX | 0.20 ± 0.02 (0.008 ± 0.001) | ———— |
| Cylinder head warpage | | ———— | 0.10(0.004) |
| Cam lobe height | IN | 38.381 (1.5111) | 38.10(1.500) |
| | EX | 38.407 (1.5121) | 38.20(1.504) |
| Camshaft runout | | ———— | 0.03(0.001) |
| Camshaft oil clearance | | 0.050-0.111 (0.0020 – 0.0044) | 0.15(0.006) |
| Camshaft identification marks | | " F " : Front, " R " : Rear | ———— |
| Camshaft journal O.D. | | 21.959 – 21.980(0.8645 – 0.8654) | 21.94(0.864) |
| Camshaft holder I.D. | | 22.030 – 22.070(0.8673 – 0.8689) | 22.09(0.870) |

GENERAL INFORMATION

| CYLINDER HEAD (Cont'd) | | Unit:mm(in) | |
|--|----------|-----------------------------------|----------------------|
| ITEM | | STANDARD | SERVICE LIMIT |
| Valve stem O.D. | IN | 5.475 – 5.490 (0.2156 – 0.2161) | 5.46(0.215) |
| | EX | 6.555 – 6.570 (0.2581 – 0.2587) | 6.54(0.257) |
| Valve guide I.D. | IN | 5.500 – 5.512 (0.2165 – 0.2170) | 5.55(0.219) |
| | EX | 6.600 – 6.615 (0.2598 – 0.2604) | 6.69(0.263) |
| Stem-to-guide clearance | IN | 0.010 – 0.037 (0.0004 – 0.0015) | 0.08(0.003) |
| | EX | 0.030 – 0.060 (0.0012 – 0.0024) | 0.12(0.005) |
| Valve guide projection above cylinder head | IN | 19.5 ± 0.1 (0.768 ± 0.004) | ———— |
| | EX | 18.0 ± 0.1 (0.709 ± 0.004) | ———— |
| Valve seat width | IN | 1.1 (0.04) | 1.5(0.06) |
| | EX | 1.1 (0.04) | 1.5(0.06) |
| Valve spring free length | Outer IN | 42.14 (1.659) | 40.0(1.57) |
| | Outer EX | 42.83 (1.686) | 40.5(1.59) |
| | Inner IN | 38.11 (1.500) | 36.0(1.42) |
| | Inner EX | 38.81 (1.528) | 36.0(1.42) |
| Rocker arm I.D. | IN | 12.000 – 12.018 (0.4724 – 0.4731) | 12.04(0.474) |
| | EX | 12.000 – 12.018 (0.4724 – 0.4731) | 12.04(0.474) |
| Rocker arm shaft O.D. | IN | 11.966 – 11.984 (0.4711 – 0.4718) | 11.95(0.470) |
| | EX | 11.966 – 11.984 (0.4711 – 0.4718) | 11.95(0.470) |
| Rocker arm-to-rocker arm shaft clearance | | 0.016 – 0.052 (0.0006 – 0.0020) | 0.08(0.003) |

| CYLINDER/PISTON | | Unit:mm(in) | |
|--|--------|---|----------------------|
| ITEM | | STANDARD | SERVICE LIMIT |
| Cylinder I.D. | | 81.000-81.015(3.1890 – 3.1896) | 81.15(3.195) |
| Cylinder out of round | | ———— | 0.08(0.003) |
| Cylinder warpage | | ———— | 0.05(0.002) |
| Piston mark direction | | "IN" mark facing toward the intake side | ———— |
| Piston O.D. | | 80.970 – 80.990 (3.1878 – 3.1886) | 80.85(3.183) |
| Piston O.D.measurement point | | 10mm (0.4 in) from the bottom | ———— |
| Piston pin hole I.D. | | 20.002 – 20.008 (0.7875 – 0.7877) | 20.03(0.789) |
| Cylinder-to-piston clearance | | 0.010 – 0.045 (0.0004 – 0.0018) | 0.15(0.006) |
| Piston pin O.D. | | 19.994 – 20.000 (0.7872 – 0.7874) | 19.98(0.787) |
| Piston-to-piston pin clearance | | 0.002 – 0.014 (0.0001 – 0.0006) | 0.04(0.002) |
| Piston ring-to-ring groove clearance | | 0.015 – 0.045 (0.0006 – 0.0018) | 0.08(0.003) |
| Connecting rod-to-piston pin clearance | | 0.016 – 0.040 (0.0006 – 0.0016) | 0.06(0.0024) |
| Ring end gap | Top | 0.20 – 0.35 (0.008 – 0.014) | 0.7(0.03) |
| | Second | 0.35 – 0.50 (0.014 – 0.020) | 0.7(0.03) |
| Ring mark | Top | " R " | ———— |
| | Second | " . " | ———— |

GENERAL INFORMATION

Unit:mm(in)

| CRANKSHAFT/TRANSMISSION | | STANDARD | SERVICE LIMIT |
|-----------------------------------|----------------------------|-----------------------------------|----------------------|
| ITEM | | | |
| Connecting rod small end I.D. | | 20.016 – 20.034 (0.7880 – 0.7887) | 20.05 (0.789) |
| Connecting rod big end | side clearance | 0.15 – 0.30 (0.006-0.012) | ————— |
| | radial clearance | ————— | 0.03 (0.001) |
| Crankshaft runout | | ————— | 0.03 (0.001) |
| Crank pin oil clearance | | 0.028 – 0.052 (0.0011 – 0.0020) | 0.10 (0.004) |
| Main journal oil clearance 50 dia | | 0.025 – 0.041 (0.0010 – 0.0016) | 0.10 (0.004) |
| Transmission gear I.D. | M3,M5 | 28.000 – 28.021 (1.1024 – 1.1032) | 28.04 (1.104) |
| | C1,C2,C4 | 31.000 – 31.025 (1.2205 – 1.2215) | 31.05 (1.222) |
| Transmission gear bushing O.D. | M3,M5 | 27.959 – 27.980 (1.1007 – 1.1016) | 27.94 (1.100) |
| | C1,C2,C4 | 30.950 – 30.975 (1.2185 – 1.2195) | 30.93 (1.218) |
| Transmission gear bushing I.D. | M3 | 25.000 – 25.021 (0.9843 – 0.9851) | 25.04 (0.986) |
| | C2 | 27.995 – 28.016 (1.1021 – 1.1030) | 28.04 (1.104) |
| Gear-to-bushing clearance | M3,M5 gear | 0.020 – 0.062 (0.0008 – 0.0024) | 0.10 (0.004) |
| | C1,C2,C4 gear | 0.025 – 0.075 (0.0010 – 0.0030) | 0.11 (0.004) |
| Mainshaft O.D. | M3 gear bushing | 24.972 – 24.993 (0.9831 – 0.9840) | 24.95 (0.982) |
| | At left crankcase journal | 19.980 – 19.993 (0.7866 – 0.7871) | 19.96 (0.786) |
| | At right crankcase journal | 24.980 – 24.993 (0.9835 – 0.9840) | 24.90 (0.983) |
| Countershaft O.D. | C2 gear bushing | 27.967 – 27.980 (1.1011 – 1.1016) | 27.95 (1.100) |
| | At left crankcase journal | 27.972 – 27.990 (1.1013 – 1.1020) | 27.95 (1.100) |
| | At right crankcase journal | 19.980 – 19.990 (0.7866 – 0.7871) | 19.96 (0.786) |
| Gear bushing-to-shaft clearance | M3 | 0.007 – 0.049 (0.0003 – 0.0019) | 0.08 (0.003) |
| | C2 | 0.015 – 0.049 (0.0006 – 0.0019) | 0.08 (0.003) |
| Shift fork claw thickness | | 5.93 – 6.300 (0.233 – 0.236) | 5.9 (0.23) |
| Shift fork I.D. | | 13.000 – 13.021 (0.5118 – 0.5126) | 13.04 (0.513) |
| Shift fork shaft O.D. | | 12.966 – 12.984 (0.5105 – 0.5112) | 12.95 (0.510) |

GENERAL INFORMATION

| FRONT WHEEL/SUSPENSION/STEERING | | | Unit:mm(in) |
|-----------------------------------|----------------------|--|---------------|
| ITEM | | STANDARD | SERVICE LIMIT |
| Minimum tire tread depth | | _____ | 1.5 (0.06) |
| Cold tire pressure | Driver only | 200 kPa (2.00 kgf/cm ² , 29 psi) | _____ |
| | Driver and passenger | 200 kPa (2.00 kgf/cm ² , 29 psi) | _____ |
| Front axle runout | | _____ | 0.2 (0.008) |
| Front wheel rim run out | Radial | _____ | 2.0 (0.08) |
| | Axial | _____ | 2.0 (0.08) |
| Front wheel hub-to-rim distance | | 26 (1.0) | _____ |
| Wheel balance weight | | Max 60 g | _____ |
| Fork spring free length | A | 68.3 (2.68) | 66.9 (2.63) |
| | B | 564.1 (22.20) | 552.8 (21.76) |
| Fork spring B installed direction | | Taper would coil facing down | _____ |
| Fork tube runout | | _____ | 0.20 (0.008) |
| Recommended fork oil | | Fork fluid | _____ |
| Fork oil level | | 106 (4.1) | _____ |
| Fork oil capacity | | 648cm ³ (21.9 US oz, 22.7 Imp oz) | _____ |
| Steering bearing preload | | 1.1 – 1.6 kgf (2.43 – 3.53 lbf) | _____ |

| REAR WHEEL/SUSPENSION | | | Unit:mm(in) |
|--|----------------------|--|---------------|
| ITEM | | STANDARD | SERVICE LIMIT |
| Minimum tire tread depth | | _____ | 2.0 (0.08) |
| Cold tire pressure | Driver only | 200 kPa (2.00 kgf/cm ² , 29 psi) | _____ |
| | Driver and passenger | 250 kPa (2.50 kgf/cm ² , 36 psi) | _____ |
| Rear axle runout | | _____ | 0.2 (0.008) |
| Rear wheel rim run out | Radial | _____ | 2.0 (0.08) |
| | Axial | _____ | 2.0 (0.08) |
| Rear wheel had-to-rim distance | | 22(0.86) | _____ |
| Wheel balance weight | | Max 60 g | _____ |
| Drive chain slack | | 35 – 45 (1.4 – 1.8) | _____ |
| Drive chain link | Except AR type | 124LE with O-ring | _____ |
| | AR type | 122LE with O-ring | _____ |
| Drive chain size | DID | 525V8 | _____ |
| | RK | 525SM5 | _____ |
| Shock absorber spring free length | | 245.5 (9.66) | 240.6 (9.47) |
| Damper/reservoir gas pressure | | 1,569 kPa (16 kgf/cm ² , 228 psi) | _____ |
| Pressurize gas material | | Nitrogen | _____ |
| Damper rod compressed force at 10 mm (0.4 in) compressed | | 27 kg | _____ |
| Damper/reservoir gas release drilling point | | Reservoir cap center | _____ |
| Shock absorber spring install length (Standard) | | 242.7 (9.55) | _____ |

Unit:mm(in)

| BRAKES | | STANDARD | SERVICE LIMIT |
|--------|--|-----------------------------------|---------------|
| Front | Brake fluid | DOT 4 | _____ |
| | Brake pad wear indicator | _____ | 1.0 (0.04) |
| | Brake disc thickness | 4.0(0.16) | 3.5 (0.14) |
| | Brake disc runout | _____ | 0.30 (0.14) |
| | Master cylinder I.D. | 12.700 – 12.743 (0.5000 – 0.5017) | 12.75 (0.502) |
| | Master piston O.D.on secondary cup side | 12.657 – 12.684 (0.4983 – 0.4994) | 12.64 (0.498) |
| | Caliper cylinder I.D. | 27.000 – 27.050 (1.0630 – 1.0650) | 27.06 (1.065) |
| | Caliper piston O.D. | 26.968 – 26.935 (1.0617 – 1.0604) | 26.92 (1.060) |
| Rear | Brake fluid | DOT 4 | _____ |
| | Brake pad wear indicator | _____ | 1.0 (0.04) |
| | Brake disc thickness | 5.0 (0.20) | 4.0 (0.16) |
| | Brake disc runout | _____ | 0.30 (0.14) |
| | Master cylinder I.D. | 14.000 – 14.043 (0.5512 – 0.5529) | 14.05 (0.553) |
| | Master piston O.D. on secondary cup side | 13.957 – 13.984 (0.5495 – 0.5506) | 13.95 (0.549) |
| | Caliper cylinder I.D. | 38.180 – 38.230 (1.5031 – 1.5051) | 38.24 (1.506) |
| | Caliper piston O.D | 38.115 – 38.148 (1.5006 – 1.5019) | 38.11 (1.500) |

| BATTERY/CHARGING SYSTEM | | STANDARD |
|--|--------|---|
| ITEM | | |
| Alternator rated output | | 360 W/5,000 min ⁻¹ (rpm) |
| Alternator charging coil resistance(At 20 °C/68 °F) | | 0.1 – 1.0 Ω |
| Regulator/rectifier: regulated voltage(At 20 °C/68 °F) | | 14 – 15 V min. at 5,000 min ⁻¹ (rpm) |
| Current leakage | | 1 mA maximum |
| Battery capacity | | 12 V – 12 Ah |
| Battery type | | MF (YTX14-BS) |
| Battery charging rate | Normal | 1.4A/5 – 10 h |
| | Quick | 6.0A/1 h |

GENERAL INFORMATION

IGNITION SYSTEM

| ITEM | | | STANDARD |
|---------------------------------------|--|-------------------------------------|--|
| Spark plug | Standard | NGK | DPR8EA-9 |
| | | NIPPONDENSO | X24EPR-U9 |
| | For cold climate/below (5 °C/41 °F) | NGK | DPR7EA-9 |
| | | NIPPONDENSO | X22EPR-U9 |
| For extended high speed riding | NGK | DPR9EA-9 | |
| | NIPPONDENSO | X27EPR-U9 | |
| Ignition timing " F " mark | | | BTDC 10°/1,200 ± 200 min ⁻¹ (rpm) |
| Advance | Start | 1,700 ± 200 min ⁻¹ (rpm) | |
| | Stop | 4,500 ± 200 min ⁻¹ (rpm) | |
| Full advance | | | BTDC 28° |
| Ignition cut-out revolution | | | 8,800 ± 200 min ⁻¹ (rpm) |
| Ignition coil peak voltage | | | 100 V minimum |
| Ignition pulse generator peak voltage | | | 0.7 V minimum |

ELECTRIC STARTER

Unit:mm(in)

| ITEM | STANDARD | SERVICE LIMIT |
|----------------------------|----------|---------------|
| Starter motor brush length | 10 (0.4) | 6.5 (0.26) |

LIGHTS/METERS/SWITCHES

| ITEM | | STANDARD |
|--------------------------------|--------------------|---|
| Main fuse | | 30A |
| Fuse | Except SW, AR type | 10 A X 3,15 A X 1,20 A X 1 |
| | SW, AR type | 10 A X 4,15 A X 1,20 A X 1 |
| Headlight (High/low beam) | | 12 V – 60/55 W X 2 |
| Headlight relay | | High and low beams |
| Tail/Brake light | | 12 V – 21/5 W |
| Position light | | 12 V – 4 W X 2 |
| Front turn signal light | | 12 V – 21 W X 2 |
| Rear turn signal light | | 12 V – 21 W X 2 |
| Instruments light | Tachometer | 12 V – 1.7 W |
| | Speedometer | 12 V – 1.7 W X 2 |
| | Temperature meter | 12 V – 1.7 W |
| | Digital trip meter | 12 V – 2 W |
| Oil pressure warning indicator | | 12 V – 3 W |
| Side stand indicator | | 12 V – 3 W |
| High beam indicator | | 12 V – 1.7 W |
| Turn signal indicator | | 12 V – 3 W |
| Neutral indicator | | 12 V – 3 W |
| Fuel pump flow capacity | | Minimum 900cm ³ (30.4 US oz, 31.6 Imp oz) per minute at 13 V |

LIGHTS/METERS/SWITCHES(Cont'd)

| ITEM | | SPECIFICATIONS |
|--|---------------|------------------------------|
| Termo sensor resistance | 50 °C/122 °F | 130 – 180 Ω |
| | 100 °C/212 °F | 25 – 30 Ω |
| Fan motor switch function (Suspend 50% mixture) | OFF ⇨ ON | 98 °C/208 °F – 102 °C/216 °F |
| | ON ⇨ OFF | 93 °C/199 °F – 97 °C/207 °F |

GENERAL INFORMATION

TORQUE VALUES

| STANDARD | | STANDARD | |
|------------------------|---------------------|---------------------------------------|---------------------|
| FASTENERS TYPE | TORQUE | FASTENERS TYPE | TORQUE |
| | N·m (kgf·m, lbf·ft) | | N·m (kgf·m, lbf·ft) |
| 5 mm hex bolt and nut | 5 (0.5, 3.6) | 6 mm screw | 9 (0.9, 6.5) |
| 6 mm hex bolt and nut | 10 (1.0, 7) | 6 mm flange bolt (8 mm head) | 9 (0.9, 6.5) |
| 8 mm hex bolt and nut | 22 (2.2, 16) | 6 mm flange bolt (10 mm head) and nut | 9 (0.9, 6.5) |
| 10 mm hex bolt and nut | 34 (3.5, 25) | 8 mm flange bolt and nut | 26 (2.7, 20) |
| 12 mm hex bolt and nut | 54 (5.5, 40) | 10 mm flange bolt and nut | 39 (4.0, 29) |
| 5 mm screw | 4 (0.4, 2.9) | | |

Torque specifications listed below are for important fasteners. Others should be tightened to standard torque values listed above.

- NOTES:
1. Apply sealant to the threads.
 2. Apply a locking agent to the threads.
 3. Apply molybdenum disulfide oil to the threads and flange surface.
 4. Left hand threads.
 5. Stake.
 6. Apply oil to the threads and flange surface.
 7. Apply clean engine oil to the O-ring.
 8. UBS bolt.
 9. U-nut.
 10. ALOC bolt; Replace with a new one.

| ENGINE | | | | |
|---------------------------------------|------|------------------|----------------------------|---------|
| ITEM | Q'TY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS |
| LUBRICATION SYSTEM: | | | | |
| Oil pump driven sprocket bolt | 1 | 6 | 15 (1.5, 11) | NOTE 2 |
| Oil filter | 1 | 20 | 10 (1.0, 7) | NOTE 7 |
| Oil drain bolt | 1 | 14 | 34 (3.5, 25) | |
| Oil pressure switch | 1 | PT1/8 in | 12 (1.2, 9) | NOTE 1 |
| Oil pressure switch screw | 1 | 4 | 2.3 (0.23, 1.7) | |
| Oil cooler distributor bolt | 1 | 20 | 54 (5.5, 40) | |
| CLUTCH/GEARSHIFT LINKAGE: | | | | |
| Right crankcase cover bolt | 13 | 6 | 12 (1.2, 9) | |
| Clutch cable holder bolt | 1 | 6 | 12 (1.2, 9) | |
| Clutch lifter plate bolt | 5 | 6 | 10 (1.0, 7) | |
| Clutch center lock nut | 1 | 22 | 127 (13.0, 94) | NOTE 5 |
| Primary drive gear bolt | 1 | 12 | 88 (9.0, 65) | NOTE 8 |
| Shift drum stopper arm bolt | 1 | 6 | 10 (1.0, 7) | NOTE 2 |
| Gearshift pedal pinch bolt | 1 | 6 | 12 (1.2, 9) | |
| Shift return spring pin | 1 | 8 | 23 (2.3, 17) | |
| CYLINDER HEAD/CYLINDER/PISTON: | | | | |
| Spark plug | 4 | 12 | 14 (1.4, 10) | |
| Cylinder head cover bolt | 4 | 6 | 10 (1.0, 7) | |
| Valve adjusting screw lock nut | 6 | 7 | 23 (2.3, 17) | NOTE 6 |
| Cam sprocket bolt | 4 | 7 | 23 (2.3, 17) | NOTE 2 |
| Camshaft holder (8 mm bolt) | 6 | 8 | 23 (2.3, 17) | |
| Camshaft holder (8 mm bolt) | 4 | 8 | 23 (2.3, 17) | |
| Camshaft end holder bolt | 2 | 6 | 10 (1.0, 7) | |
| Cam chain tensioner mounting bolt | 2 | 6 | 10 (1.0, 7) | NOTE 2 |
| Cylinder head (8 mm bolt) | 4 | 8 | 23 (2.3, 17) | |
| Cylinder head (6 mm bolt) | 2 | 6 | 12 (1.2, 9) | |
| Cylinder head (10 mm bolt) | 8 | 10 | 47 (4.8, 35) | NOTE 6 |

| ENGINE (Cont'd) | | | | |
|---|------|------------------|----------------------------|-----------|
| ITEM | Q'TY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS |
| ALTERNATOR/STARTER CLUTCH: | | | | |
| Left crankcase cover bolt | 8 | 6 | 12 (1.2, 9) | |
| Crankshaft hole cap | 1 | 30 | 15 (1.5, 11) | NOTE 3, 7 |
| Timing hole cap | 1 | 14 | 10 (1.0, 7) | NOTE 3, 7 |
| Ignition pulse generator cover bolt | 3 | 6 | 12 (1.2, 9) | NOTE 3 |
| Ignition pulse generator bolt | 2 | 6 | 12 (1.2, 9) | NOTE 2 |
| Flywheel bolt | 1 | 12 | 127 (13.0, 94) | NOTE 4, 8 |
| Starter one-way clutch torx bolt | 6 | 8 | 30 (3.1, 22) | NOTE 2 |
| Starter socket bolt | 4 | 6 | 12 (1.2, 9) | NOTE 2 |
| CRANKCASE/CRANKSHAFT/TRANSMISSION: | | | | |
| Mainshaft bearing set plate bolt | 2 | 6 | 10 (1.0, 7) | NOTE 2 |
| Countershaft bearing set plate bolt | 2 | 6 | 10 (1.0, 7) | NOTE 2 |
| Crankcase bolt | 13 | 8 | 23 (2.3, 17) | |
| Connecting rod bearing nut | 4 | 9 | 42 (4.3, 31) | NOTE 6 |
| Neutral switch | 1 | 10 | 12 (1.2, 9) | NOTE 1 |
| ELECTRIC STARTER: | | | | |
| Starter motor cable nut | 1 | 6 | 10 (1.0, 7) | |

| FRAME | | | | |
|--|------|------------------|----------------------------|---------|
| ITEM | Q'TY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS |
| FRAME/BODY PANELS/EXHAUST SYSTEM: | | | | |
| Upper cowl mounting bolt | 2 | 6 | 7 (0.7, 5.1) | |
| Upper cowl mounting screw (6 mm) | 2 | 6 | 4 (0.4, 2.9) | |
| Upper cowl mounting screw (5 mm) | 6 | 5 | 0.4 (0.04, 0.3) | |
| Stone guard screw | 2 | 5 | 0.9 (0.09, 0.6) | |
| Skid plate bolt | 4 | 8 | 21 (2.1, 15) | |
| Rear carrier bolt | 4 | 8 | 27 (2.8, 20) | |
| Turn signal bracket nut | 4 | 8 | 26 (2.7, 20) | |
| Taillight bracket bolt | 2 | 8 | 26 (2.7, 20) | |
| Muffler band bolt | 1 | 8 | 21 (2.1, 15) | |
| Exhaust pipe band bolt | 1 | 8 | 21 (2.1, 15) | |
| Muffler mounting bolt | 2 | 8 | 27 (2.8, 20) | |
| Exhaust pipe joint nut | 4 | 8 | 27 (2.8, 20) | |
| Exhaust pipe protector bolt | 2 | 6 | 16 (1.6, 12) | |
| Lower exhaust pipe protector bolt | 2 | 6 | 16 (1.6, 12) | |
| MAINTENANCE: | | | | |
| Spoke nipple | 68 | 9 | 3.7 (0.38, 2.7) | |
| LUBRICATION SYSTEM: | | | | |
| Oil cooler mounting bolt | 2 | 6 | 12 (1.2, 9) | |
| Oil cooler pipe mounting bolt | 2 | 6 | 12 (1.2, 9) | |
| Oil cooler joint setting plate bolt | 2 | 6 | 12 (1.2, 9) | NOTE 7 |
| FUEL SYSTEM: | | | | |
| Fuel tank mounting bolt | 2 | 8 | 27 (2.8, 20) | |
| Fuel valve nut | 1 | 22 | 34 (3.5, 25) | |
| Air cleaner housing mounting bolt | 3 | 6 | 10 (1.0, 7) | |
| Fuel valve lever screw | 1 | 5 | 2 (0.2, 1.4) | |
| COOLING SYSTEM: | | | | |
| Radiator mounting bolt | 6 | 6 | 10 (1.0, 7) | |
| Radiator grill mounting bolt | 4 | 6 | 10 (1.0, 7) | |
| Thermostat bracket bolt | 1 | 6 | 10 (1.0, 7) | |
| Thermostat housing cover bolt | 2 | 6 | 9 (0.9, 6.5) | |
| Thermo sensor | 1 | - | 10 (1.0, 7) | NOTE 1 |
| Water hose band screw | 16 | - | 7 (0.7, 5.1) | |
| Fan motor switch | 1 | 16 | 18 (1.8, 13) | NOTE 1 |

GENERAL INFORMATION

| FRAME | | | | |
|--|------|------------------|----------------------------|---------|
| ITEM | Q'TY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS |
| ENGINE MOUNTING: | | | | |
| Engine hanger nut (10 mm) | 9 | 10 | 53 (5.4, 39) | |
| (8 mm) | 4 | 8 | 32 (3.3, 24) | |
| Sub frame bolt | 4 | 10 | 55 (5.6, 41) | |
| Cylinder head hanger plate bolt | 4 | 8 | 53 (5.4, 39) | |
| FRONT WHEEL/SUSPENSION/STEERING: | | | | |
| Front axle | 1 | 16 | 63 (6.4, 46) | |
| Front axle holder nut | 4 | 6 | 12 (1.2, 9) | |
| Front brake disc mounting bolt | 12 | 8 | 42 (4.3, 31) | NOTE 10 |
| Steering stem nut | 1 | 24 | 126 (12.8, 93) | |
| Steering top thread | 1 | 26 | 11 (1.1, 8) | |
| Handlebar upper holder bolt | 4 | 8 | 26 (2.7, 20) | |
| Handlebar lower holder nut | 2 | 10 | 39 (4.0, 29) | |
| Choke lever pivot bolt | 1 | 6 | 9 (0.9, 6.5) | |
| Throttle housing cover screw | 2 | 5 | 4.2 (0.43, 3.1) | |
| Fork top bridge pinch bolt | 4 | 8 | 25 (2.6, 19) | |
| Fork bottom bridge pinch bolt | 4 | 8 | 33 (3.4, 25) | |
| Fork cap | 2 | 39 | 22 (2.2, 16) | |
| Fork socket bolt | 2 | 6 | 20 (2.0, 14) | NOTE 2 |
| REAR WHEEL/SUSPENSION: | | | | |
| Rear axle nut | 1 | 16 | 91 (9.3, 67) | NOTE 9 |
| Rear brake disc mounting bolt | 4 | 8 | 42 (4.3, 31) | NOTE 10 |
| Driven sprocket nut | 5 | 12 | 96 (9.8, 71) | NOTE 6 |
| Swingarm pivot nut | 1 | 14 | 106 (10.8, 78) | NOTE 9 |
| Shock absorber upper mounting nut | 1 | 10 | 43 (4.4, 32) | NOTE 9 |
| Shock absorber lower mounting bolt | 1 | 10 | 43 (4.4, 32) | |
| Shock arm nut: Swingarm side | 1 | 12 | 58 (5.9, 43) | NOTE 9 |
| Shock link side | 1 | 10 | 63 (6.4, 46) | NOTE 9 |
| Shock link nut | 1 | 10 | 63 (6.4, 46) | NOTE 9 |
| BRAKE SYSTEM: | | | | |
| Front caliper mounting bolt | 4 | 8 | 29 (3.0, 22) | NOTE 10 |
| Front brake hose joint: | | | | |
| hose nut (hose-to-joint) | 1 | 10 | 17 (1.7, 12) | |
| master cylinder joint (master cylinder side) | 1 | 10 | 34 (3.5, 25) | |
| Rear caliper mounting bolt | 1 | 8 | 23 (2.3, 17) | NOTE 10 |
| Reservoir hose joint screw | 1 | 4 | 1.5 (0.15, 11) | NOTE 2 |
| Rear master cylinder push rod lock nut | 1 | 8 | 18 (1.8, 13) | |
| Brake hose oil bolt | 5 | 10 | 34 (3.5, 25) | |
| Brake pipe joint bolt | 2 | 10 | 14 (1.4, 10) | |
| Front master cylinder holder bolt | 2 | 6 | 12 (1.2, 9) | |
| Rear master cylinder mounting bolt | 2 | 6 | 12 (1.2, 9) | |
| Brake caliper bleeder | 3 | 7 | 6 (0.6, 4.3) | |
| Pad pin | 3 | 10 | 18 (1.8, 13) | |
| Pad pin plug | 3 | 10 | 2.5 (0.25, 1.8) | |
| Front caliper bracket pin bolt | 2 | 8 | 12 (1.2, 9) | |
| Front caliper pin bolt | 2 | 8 | 22 (2.2, 16) | |
| Rear caliper pin bolt | 1 | 12 | 27 (2.8, 20) | |
| OTHER FASTENERS: | | | | |
| Right step bracket bolt | 1 | 12 | 83 (8.5, 61) | NOTE 10 |
| Left step bracket bolt | 2 | 10 | 74 (7.5, 54) | NOTE 10 |
| Passenger footpeg bracket bolt | 4 | 8 | 27 (2.8, 20) | |
| Side stand pivot nut | 1 | 10 | 39 (4.0, 29) | NOTE 9 |
| Side stand switch bolt | 1 | 6 | 10 (1.0, 7) | NOTE 10 |
| Drive sprocket setting plate bolt | 2 | 6 | 10 (1.0, 7) | NOTE 10 |

TOOLS

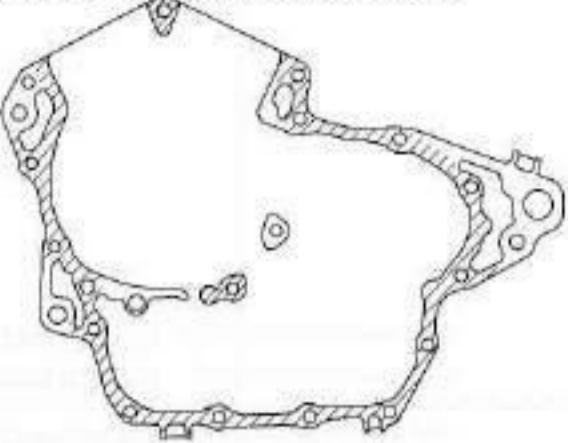
NOTES: 1. Equivalent commercially available.
2. Alternative tool.

| DESCRIPTION | TOOL NUMBER | APPLIVABILITY | REF. SEC. |
|---------------------------------------|-----------------|---------------|---------------|
| Float level gauge | 07401 - 0010000 | | 5 |
| Oil pressure gauge | 07506 - 3000000 | | 4 |
| Vacuum gauge attachment | 07510 - 3000200 | | 3 |
| Oil pressure gauge attachment | 07510 - 4220100 | | 4 |
| Compression gauge attachment | 07510-MB00101 | | 10 |
| Universal bearing puller | 07631 - 0010000 | | 12 |
| Spanner C, 5.8 X 6.1 mm | 07701 - 0020300 | | 3, 13, 14 |
| Gear holder | 07724 - 0010100 | | 8 |
| Flywheel holder | 07725 - 0040000 | | 9 |
| Flywheel puller | 07733 - 0010000 | | 9 |
| Valve guide remover, 5.5 mm (IN) | 07742 - 0010100 | | 10 |
| Valve guide remover, 6.6 mm (EX) | 07742 - 0010200 | | 10 |
| Attachment, 32 X 35 mm | 07746 - 0010100 | | 14 |
| Attachment, 37 X 40 mm | 07746 - 0010200 | | 8, 13, 14 |
| Attachment, 42 X 47 mm | 07746 - 0010300 | | 8, 12, 13, 14 |
| Attachment, 52 X 55 mm | 07746 - 0010400 | | 12 |
| Attachment, 62 X 68 mm | 07746 - 0010500 | | 12 |
| Attachment, 24 X 26 mm | 07746 - 0010700 | | 14 |
| Inner driver, 25 mm | 07746 - 0030200 | | 12 |
| Pilot, 15 mm | 07746 - 0040300 | | 14 |
| Pilot, 17 mm | 07746 - 0040400 | | 13, 14 |
| Pilot, 20 mm | 07746 - 0040500 | | 12, 14 |
| Pilot, 25 mm | 07746 - 0040600 | | 12 |
| Pilot, 35 mm | 07746 - 0040800 | | 8 |
| Pilot, 28 mm | 07746 - 0041100 | | 12 |
| Bearing remover shaft | 07746 - 0050100 | | 13, 14 |
| Bearing remover head, 17 mm | 07746 - 0050500 | | 13, 14 |
| Driver | 07749 - 0010000 | | 8, 12, 13, 14 |
| Valve spring compressor | 07757 - 0010000 | | 10 |
| Valve seat cutter, 27.5 mm (IN 45°) | 07780 - 0010200 | | 10 |
| Valve seat cutter, 35 mm (EX 45°) | 07780 - 0010400 | | 10 |
| Valve seat cutter, 28 mm (IN 32°) | 07780 - 0012100 | | 10 |
| Valve seat cutter, 35 mm (EX 32°) | 07780 - 0012300 | | 10 |
| Valve seat cutter, 30 mm (IN 60°) | 07780 - 0014000 | | 10 |
| Valve seat cutter, 37.5 mm (EX 60°) | 07780 - 0014202 | | 10 |
| Valve seat cutter holder, 5.5 mm (IN) | 07781 - 0010101 | | 10 |
| Valve seat cutter holder, 6.6 mm (EX) | 07781 - 0010202 | | 10 |
| Valve adjusting screw wrench | 07908 - KE90000 | | 3 |
| Snap ring pliers | 07914 - 3230001 | | 15 |
| Steering stem socket wrench | 07916 - KA50100 | | 13 |
| Bearing remover set | 07936 - 3710001 | | 12 |
| - Bearing remover head | 07936 - 3710600 | | 12 |
| - Remover handle | 07936 - 3710100 | | 12 |
| - Remover sliding weight | 07741 - 0010201 | | 12 |
| Steering stem driver | 07946 - 4300101 | | 13 |
| Needle bearing remover | 07946 - KA50000 | | 14 |
| Main bearing remover attachment | 07946 - ME90101 | | 12 |
| Main bearing driver attachment | 07946 - ME90200 | | 12 |
| Oil seal driver attachment | 07947 - KA40200 | | 13 |
| Slider weight | 07947 - KA50100 | | 13 |
| Ball race driver | 07953 - MJ10000 | | 13 |
| - Driver attachment | 07953 - MJ10100 | | 13 |
| - Driver handle | 07953 - MJ10200 | | 13 |
| Valve guide reamer, 5.510 mm | 07984 - 2000001 | | 10 |
| Valve guide reamer, 6.612 mm | 07984 - ZE20001 | | 10 |

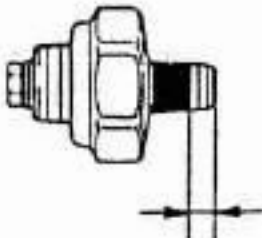
GENERAL INFORMATION

| DESCRIPTION | TOOL NUMBER | APPLIVABILITY | REF. SEC. |
|----------------------|-----------------|---------------|-----------|
| Pin driver | 07GMD - KT80100 | | 14 |
| Oil filter wrench | 07HAA - PJ70100 | | 3 |
| Peak voltage adaptor | 07HGJ - 0020100 | | 17, 19 |
| Drive chain tool set | 07HMH - MR10103 | | 3 |
| Clutch center holder | 07JMB - MN50300 | | 8 |
| Pilot screw wrench | 07KMA - MS60101 | | 3 |

LUBRICATION & SEAL POINTS

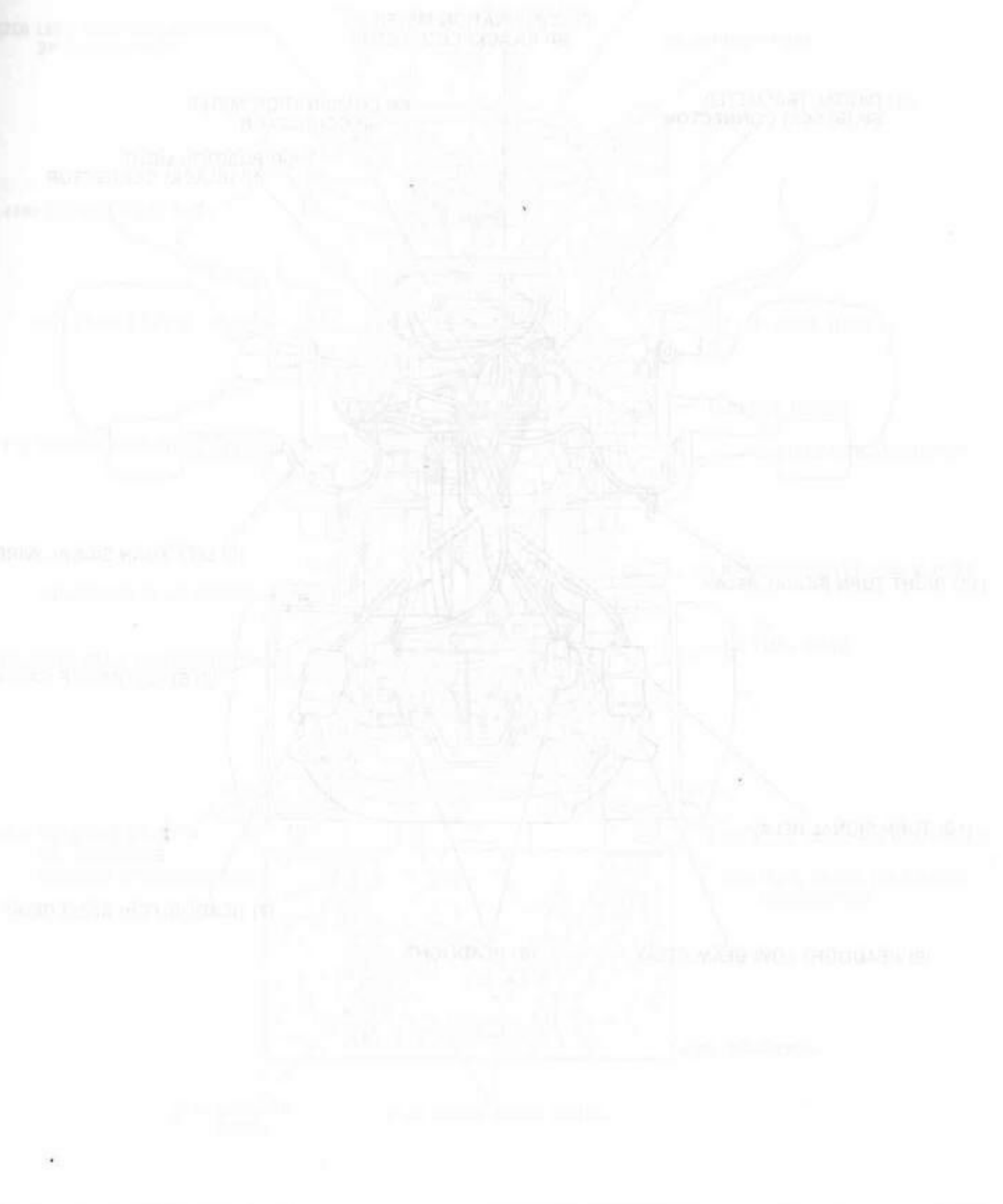
| ENGINE | LOCATION | MATERIAL | REMARKS |
|---|--|----------|---------|
| <p>Right and left crankcase mating surface</p>  | <p>Liquid sealant Example: Three Bond #1207B manufactured by 3M. Co, LTD.</p> | | |
| <p>Shift fork claw Sifter gear for groove Right and left crankcase main bearing Valve stem (Valve guide sliding surface) Connecting rod bearing (big end) Camshaft journals and cam lobes Rocker arm slipper surface Rocker arm shaft sliding surface Piston pin outer surface Crankshaft hole cap threads Transmission splined bushing outer and inner surface Transmission gear shift fork groove Clutch outer guide outer surface Connecting rod small end</p> | <p>Molybdenum disulfide oil solution (Mixture of the engine oil and molybdenum disulfide grease with the ratio 1: 1)</p> | | |
| <p>Starter reduction gear shaft Piston round surface and piston ring outer surface Piston pin outer surface Piston pin hole inner surface Each bearings Each oil seal lips Connecting rod bolt and nut: threads and flange surface Threads: Flywheel bolt Primary drive gear bolt Clutch center lock nut Valve adjusting screw Crankcase bolt Cylinder head bolt and nut Cylinder stud bolt O-rings: Water pump body Oil jet Oil cooler joint Ignition pulse generator hole cap</p> | <p>Recommended engine oil</p> | | |
| <p>Crankshaft hole cap</p> | <p>Multipurpose grease; (Lithium based grease)</p> | | |

GENERAL INFORMATION

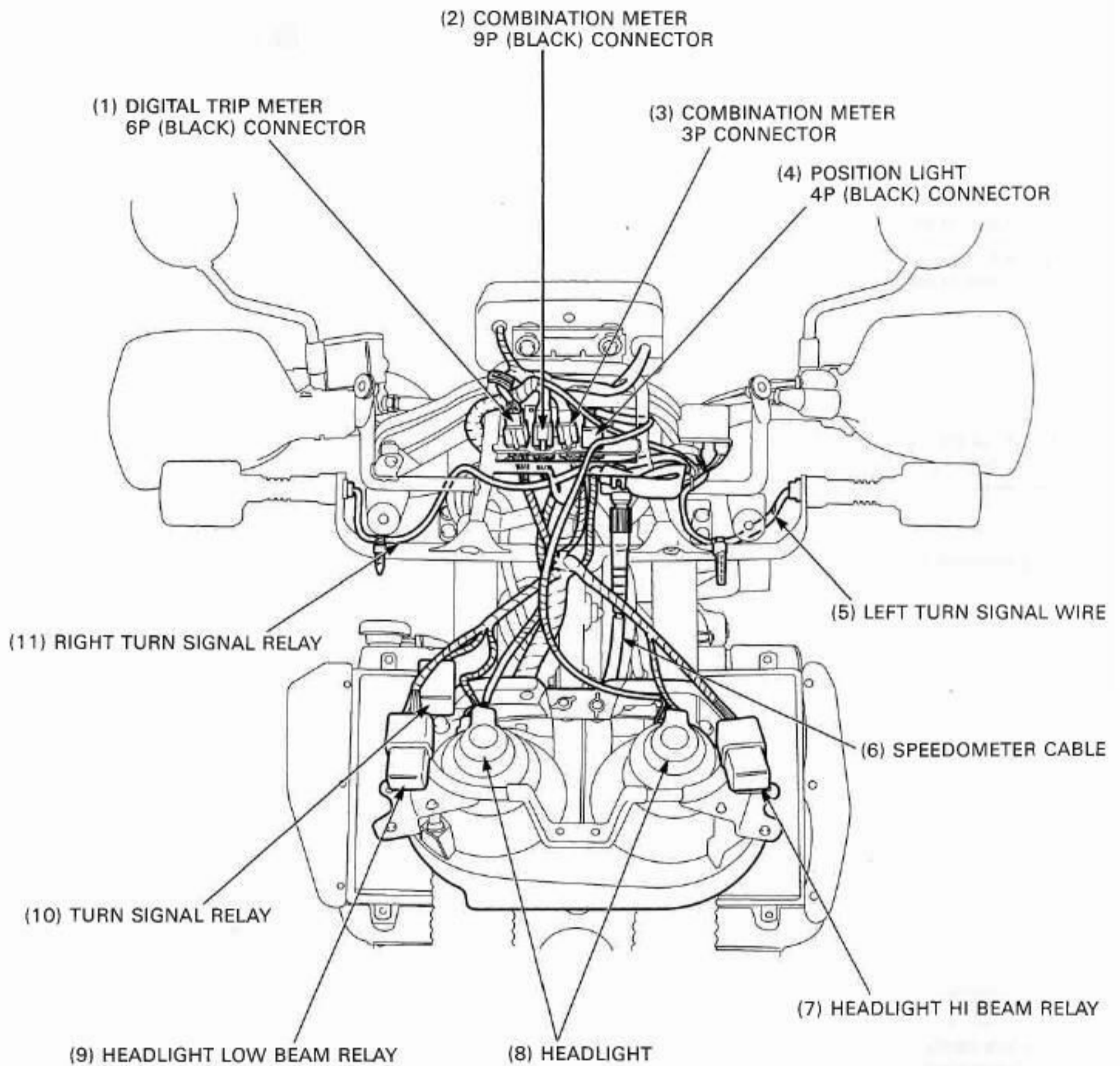
| ENGINE (Cont'd) | | |
|--|-------------------------------|--------------------------------------|
| LOCATION | MATERIAL | REMARKS |
| Oil pressure switch  | Liquid sealant | |
| Ignition pulse generator grommet Neutral switch Thermo sensor | | Clean and apply to the threads. |
| Starter one-way clutch torx bolt threads Shift drum cam plate bolt threads Shift drum stopper arm bolt threads Gearshift linkage stud pin bolt threads Crankcase bearing setting plate bolt threads Oil pump drive sprocket bolt threads Cam sprocket bolt threads | Locking agent | Clean and apply to the threads. |
| Cylinder head cover gasket | Honda bond A or an equivalent | Clean and apply to the cover groove. |

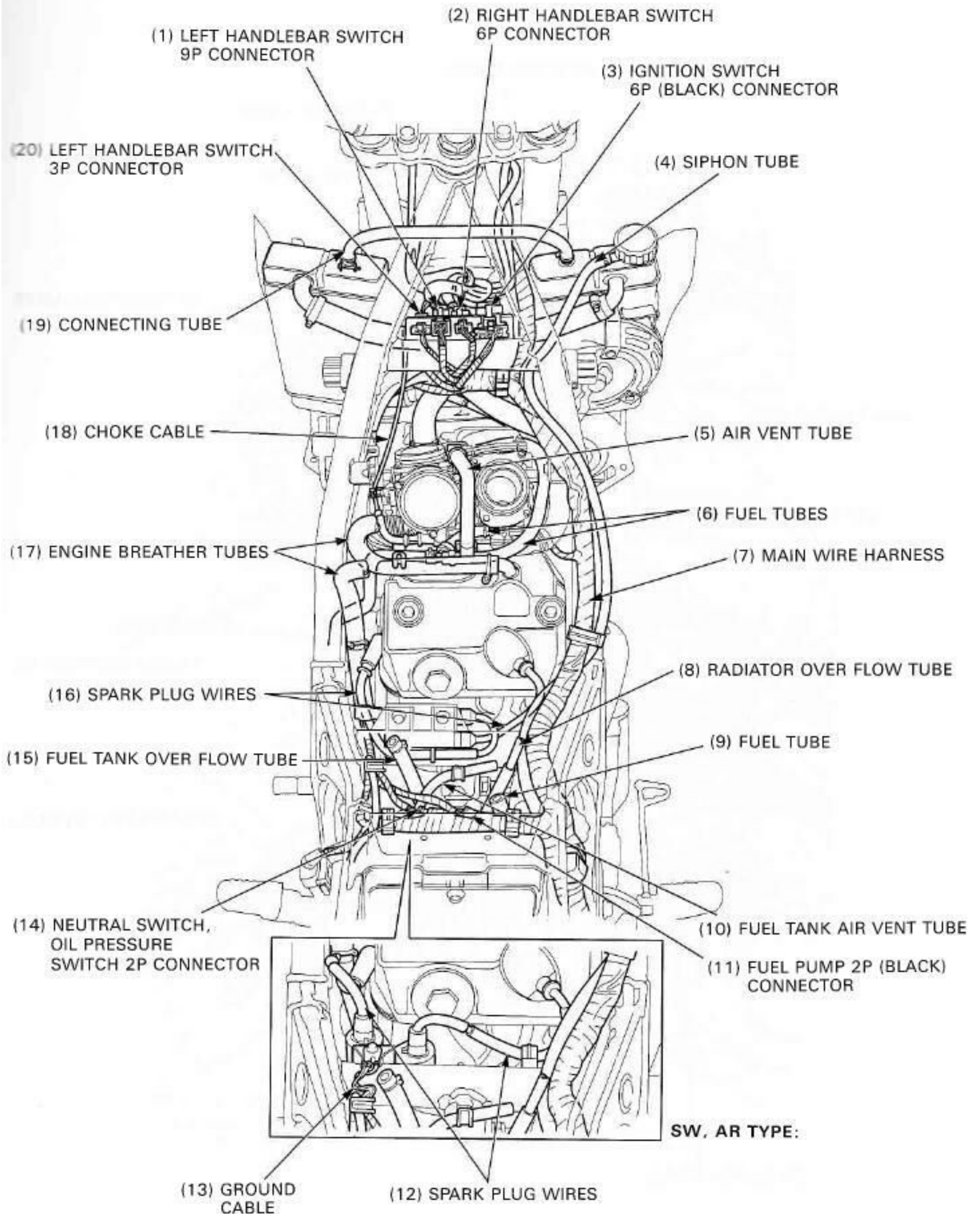
| FRAME | | |
|---|--|---|
| LOCATION | MATERIAL | REMARKS |
| Drive chain | Gear oil #80 - 90 | |
| Side stand pivot sliding surface Suspension linkage bearing and collar Shock absorber upper mounting bush Steering head bearing and cone race Swingarm pivot bearing and collar Speedometer gear box Throttle cable housing sliding surface Rear brake pedal pivot sliding surface Each dust seal lip | Multipurpose grease; (Lithium based grease) | |
| Caliper piston sliding surface Caliper inner surface Caliper piston seal Master cylinder piston cup Master cylinder inner surface Rear brake reservoir joint O-ring | DOT 4 brake fluid | |
| Right and left handlebar grip | Honda bond A or an equivalent | |
| Fork leg Fork dust seal lips Fork oil seal lips Fork cap bolt O-ring | Fork fluid | <ul style="list-style-type: none"> • Clean and apply to the threads. • Do not reuse them. |
| Brake caliper pin bolt sliding surface Brake caliper pin bolt boot inside Caliper dust seal Brake caliper pad pin and pad pin plug threads | Silicone grease | |
| Fork socket bolt threads Ignition switch mounting bolt | Locking agent | Clean and apply to the threads. Except G type |

| FRAME (Cont'd) | | |
|-----------------------------------|-----------------|---------------------------------|
| LOCATION | MATERIAL | REMARKS |
| Thermo sensor Fan motor switch | Liquid sealant | Clean and apply to the threads. |

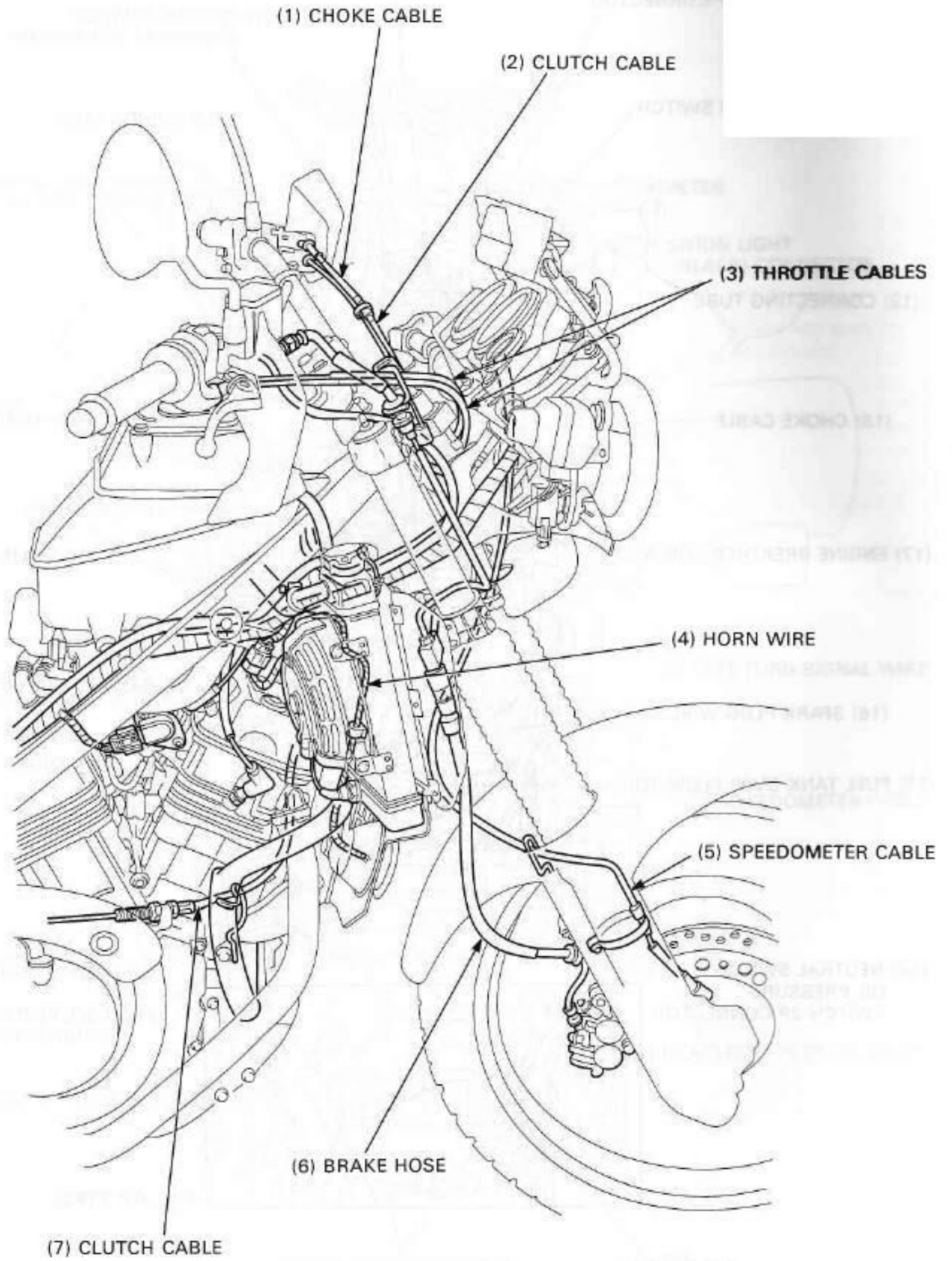


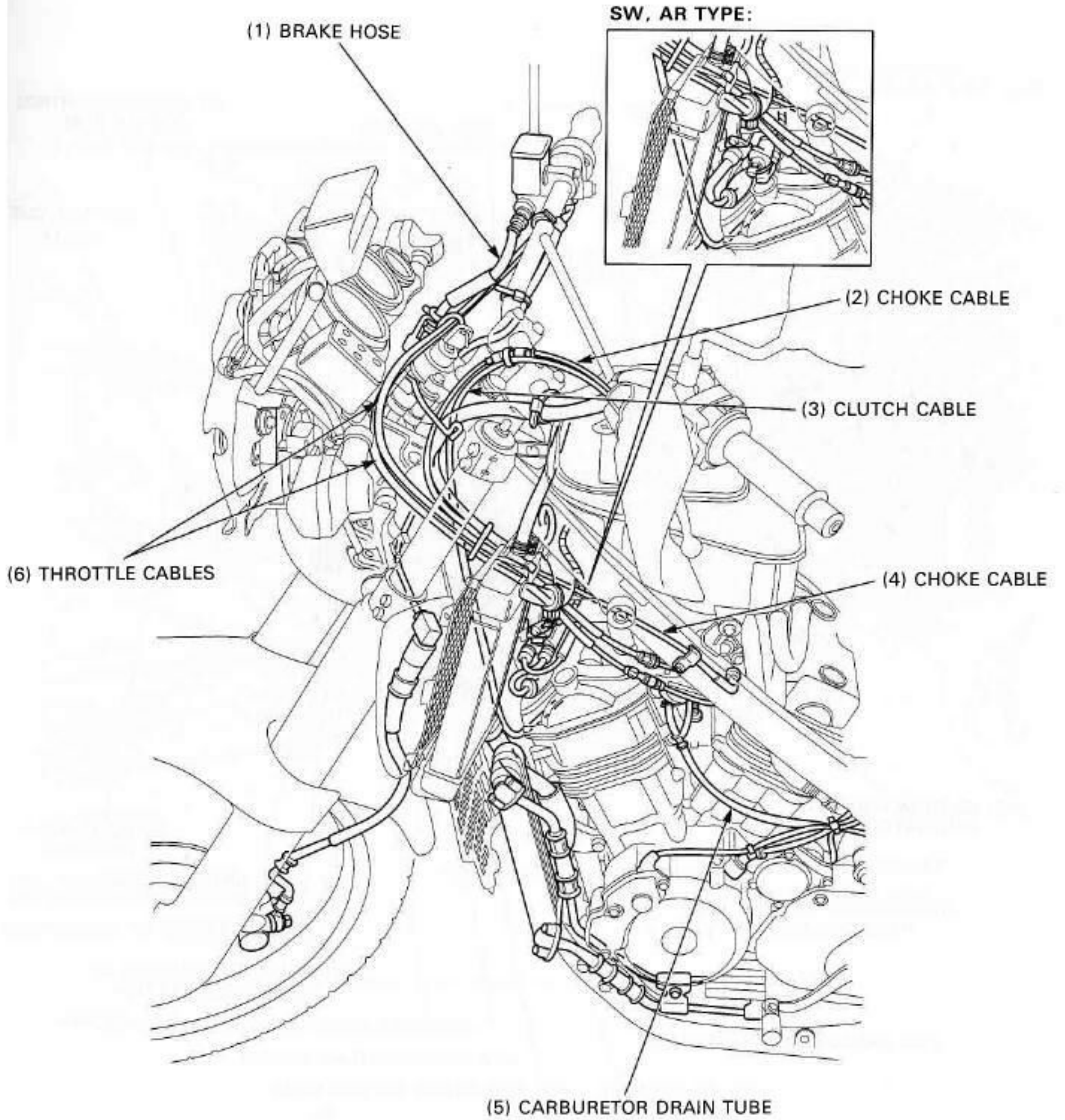
CABLE & HARNESS ROUTING



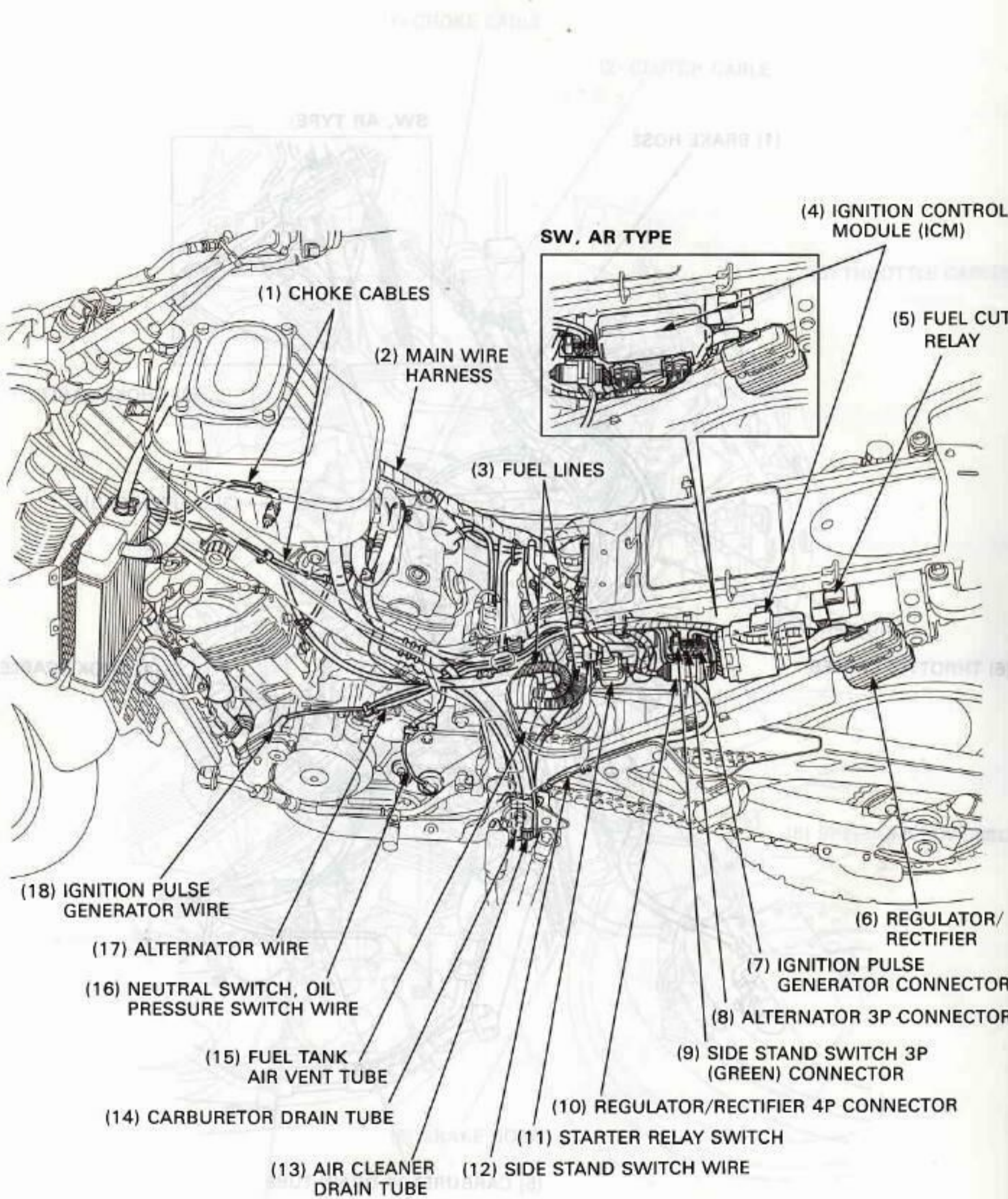


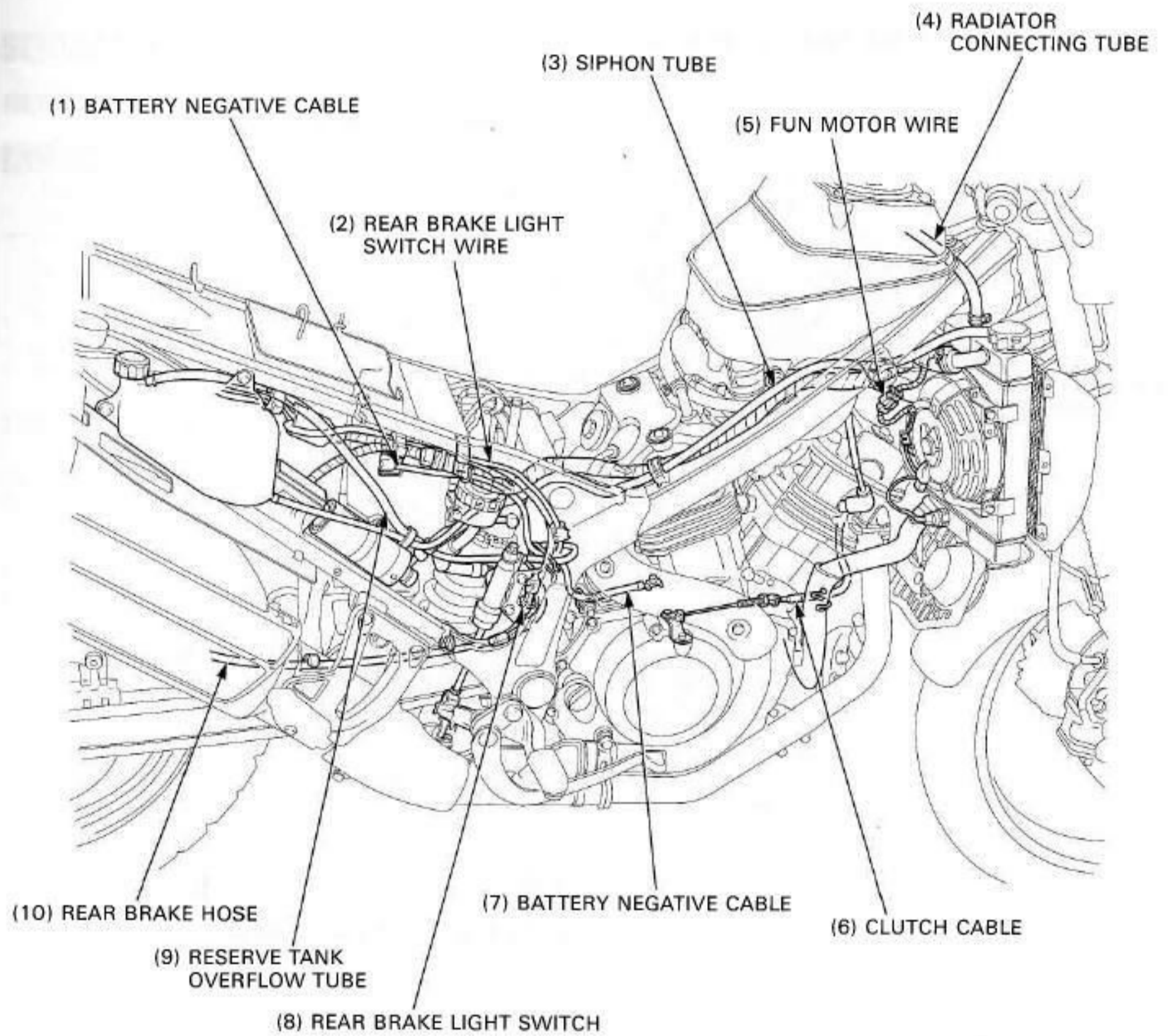
GENERAL INFORMATION



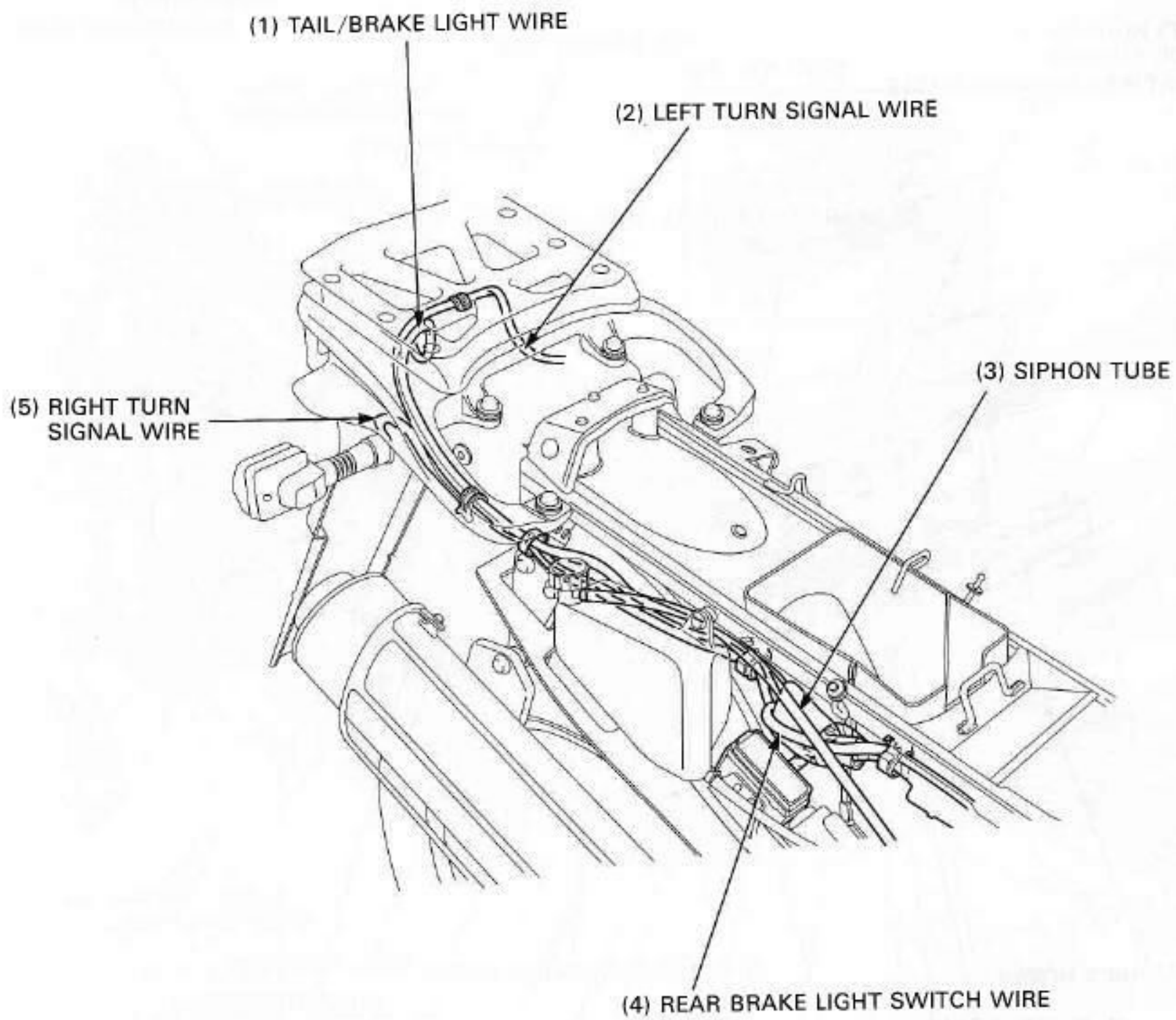


GENERAL INFORMATION





GENERAL INFORMATION



2. FRAME/BODY PANELS/EXHAUST SYSTEM

| | | | |
|-----------------------------|-----|------------------------------|------|
| SERVICE INFORMATION | 2-1 | STONE GUARD AND SKID PLATE | 2-5 |
| TROUBLESHOOTING | 2-1 | SEAT AND SIDE COVER | 2-7 |
| WINDSHIELD SCREEN | 2-2 | REAR CARRIER AND REAR FENDER | 2-8 |
| SIDE AND UPPER COWL | 2-2 | EXHAUST PIPE/MUFFLER | 2-12 |
| FORK COVER AND FRONT FENDER | 2-4 | FUEL TANK | 2-20 |

SERVICE INFORMATION

GENERAL

⚠ WARNING

- Gasoline is extremely flammable and is explosive under certain condition.
- Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.

- Work in a well ventilated area. Smoking or allowing flames or sparks in the working area or where gasoline is stored can cause a fire or explosion.
- This section covers removal and installation of the frame body panels, fuel tank and exhaust system.
- Always replace the exhaust pipe gaskets when removing the exhaust pipe from the engine.
- Always inspect the exhaust system for leaks after installation.

TORQUE VALUES

| | | |
|-----------------------------------|--------|---------------------------------|
| Upper cowl mounting bolt | | 7 N•m (0.7 kgf•m, 5.1 lbf•ft) |
| Upper cowl mounting screw | (6 mm) | 4 N•m (0.4 kgf•m, 2.9 lbf•ft) |
| | (5 mm) | 0.4N•m (0.04 kgf•m, 0.3 lbf•ft) |
| Stone guard screw | | 0.9 N•m (0.09kgf•m, 0.6 lbf•ft) |
| Skid plate bolt | | 21 N•m (2.1 kgf•m, 15 lbf•ft) |
| Rear carrier bolt | | 27 N•m (2.8 kgf•m, 20 lbf•ft) |
| Turn signal bracket nut | | 26 N•m (2.7 kgf•m, 20 lbf•ft) |
| Taillight bracket bolt | | 26 N•m (2.7 kgf•m, 20 lbf•ft) |
| Muffler band bolt | | 21 N•m (2.1 kgf•m, 15 lbf•ft) |
| Exhaust pipe band bolt | | 21 N•m (2.1 kgf•m, 15 lbf•ft) |
| Muffler mounting bolt | | 27 N•m (2.8 kgf•m, 20 lbf•ft) |
| Exhaust pipe joint nut | | 27 N•m (2.8 kgf•m, 20 lbf•ft) |
| Exhaust pipe protector bolt | | 16 N•m (1.6 kgf•m, 12 lbf•ft) |
| Lower exhaust pipe protector bolt | | 16 N•m (1.6 kgf•m, 12 lbf•ft) |
| Fuel tank mounting bolt | | 27 N•m (2.8 kgf•m, 20 lbf•ft) |
| Fuel valve nut | | 34 N•m (3.5 kgf•m, 25 lbf•ft) |
| Fuel valve lever screw | | 2 N•m (0.2 kgf•m, 1.4 lbf•ft) |

TROUBLESHOOTING

Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

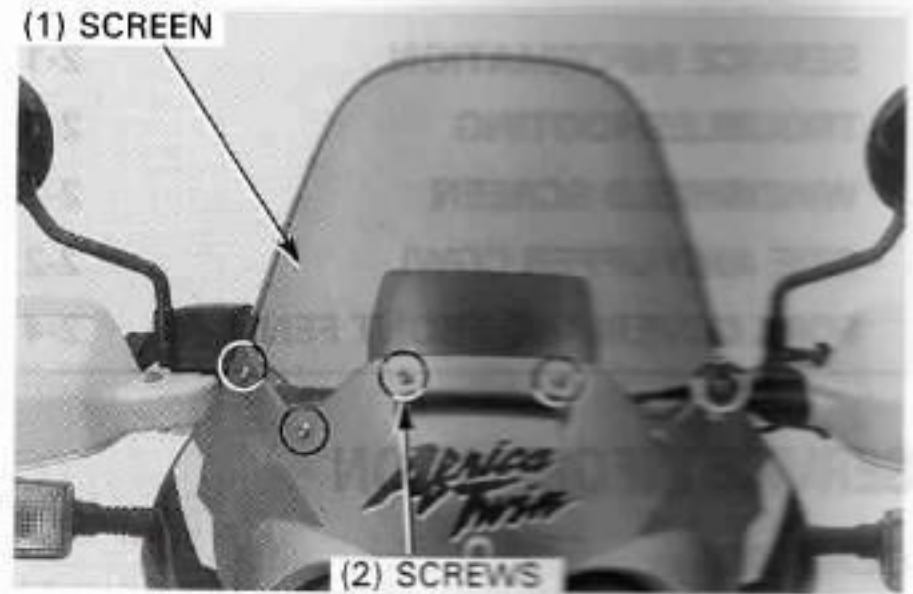
WINDSHIELD SCREEN

CAUTION

- Do not scratch and damage the windshield screen.

REMOVAL

Remove the upper cowl mounting 5 mm screws and windshield screen.



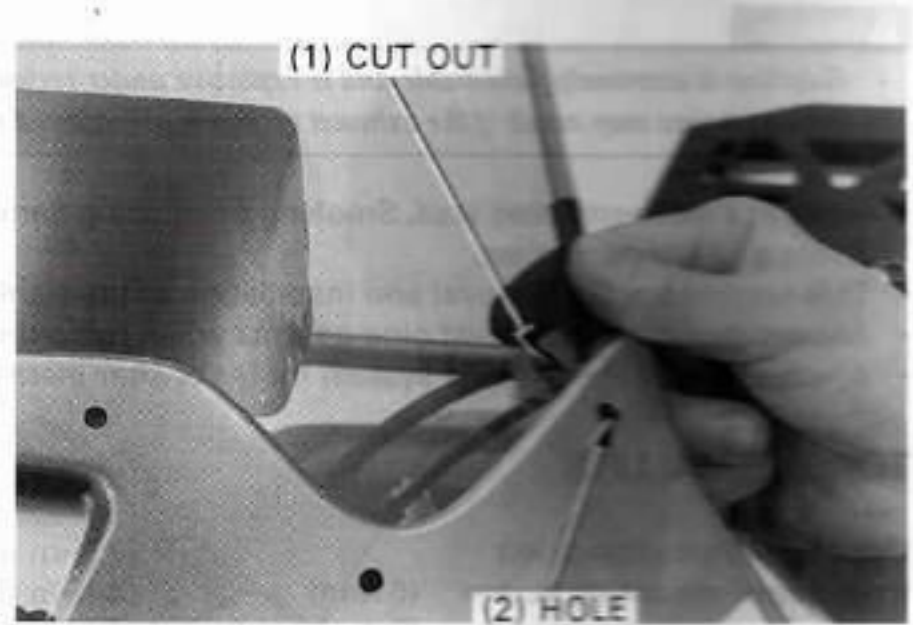
INSTALLATION

NOTE

- At windshield screen installation, align the cut out of windshield screen with the hole of the upper cowl.

Installation is in the reverse order of removal.

TORQUE: 0.4 N·m (0.04 kgf·m, 0.3 lbf·ft)



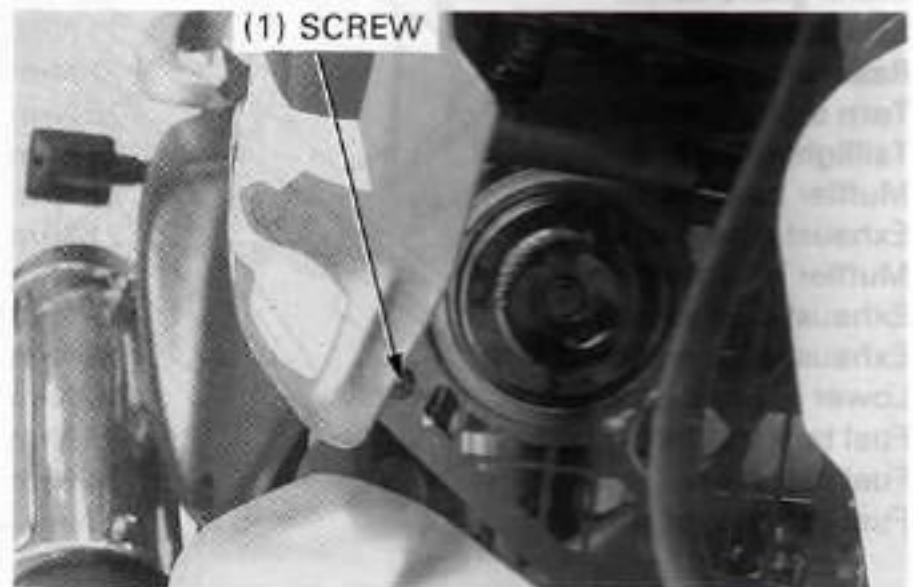
SIDE AND UPPER COWL

NOTE

- Side and upper cowl service can be done without windshield screen removal.

REMOVAL

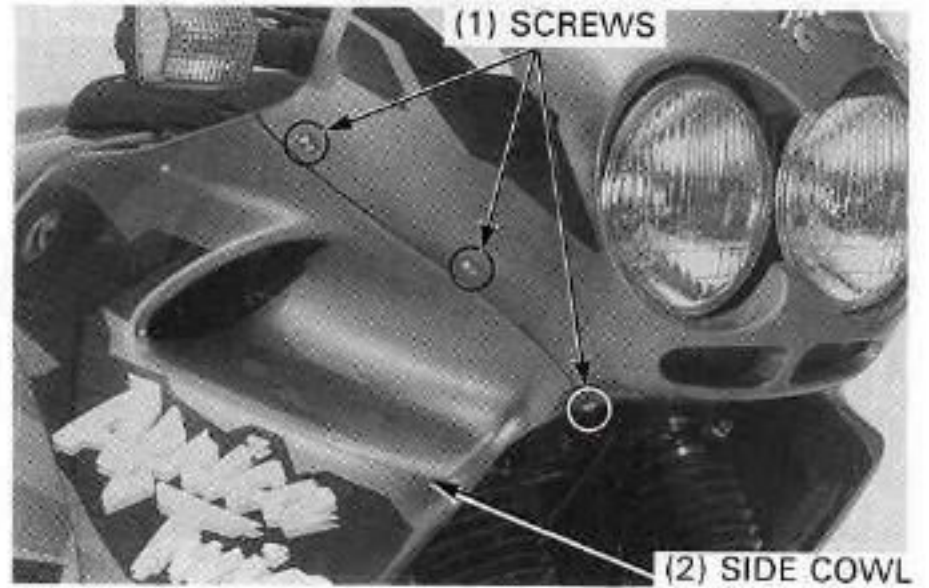
Remove the stone guard screws.



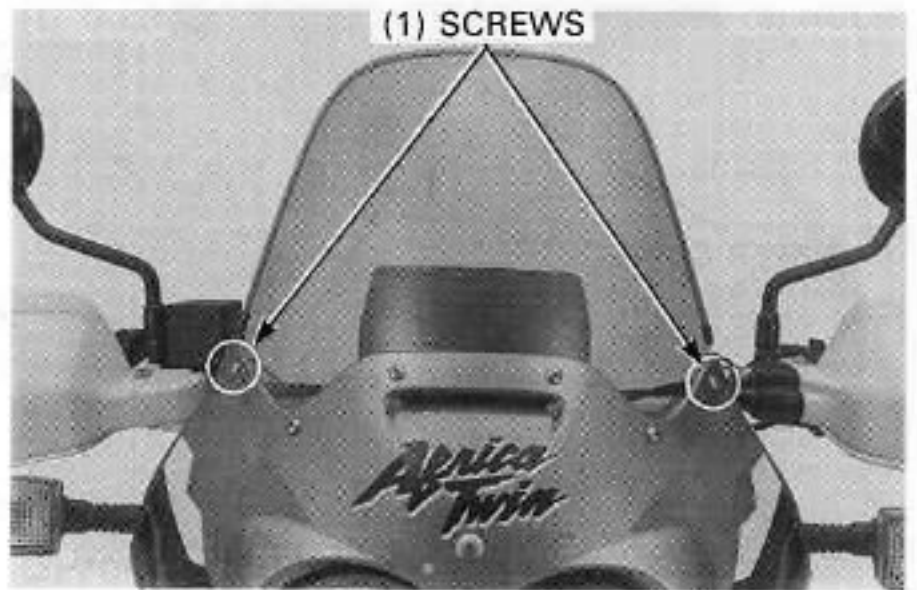
Remove the upper cowl mounting 6 mm screws.



Remove the upper cowl mounting 5 mm screws and side cowl.



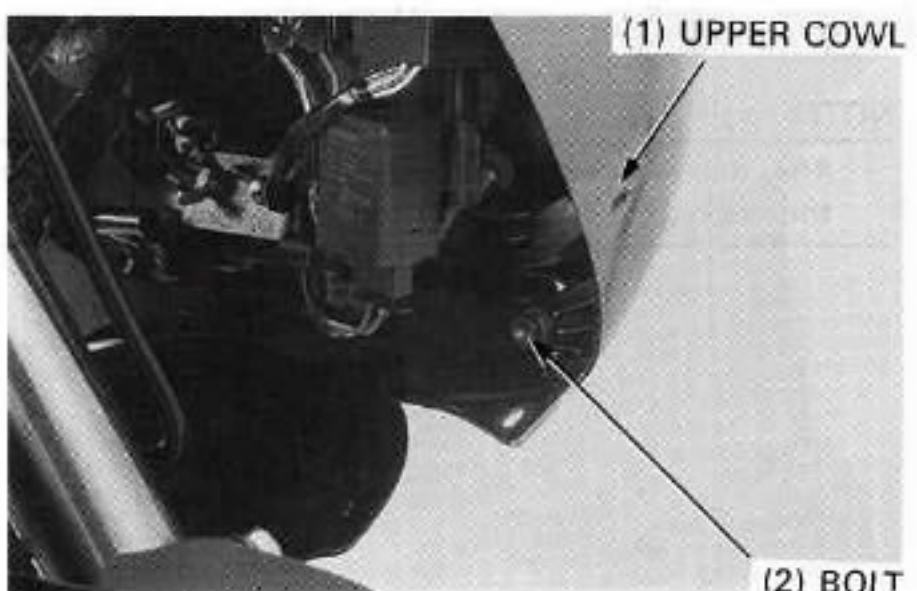
Remove the upper cowl mounting 5 mm screws.



Remove the upper cowl mounting 6 mm screw.



Remove the upper cowl mounting bolts and upper cowl.

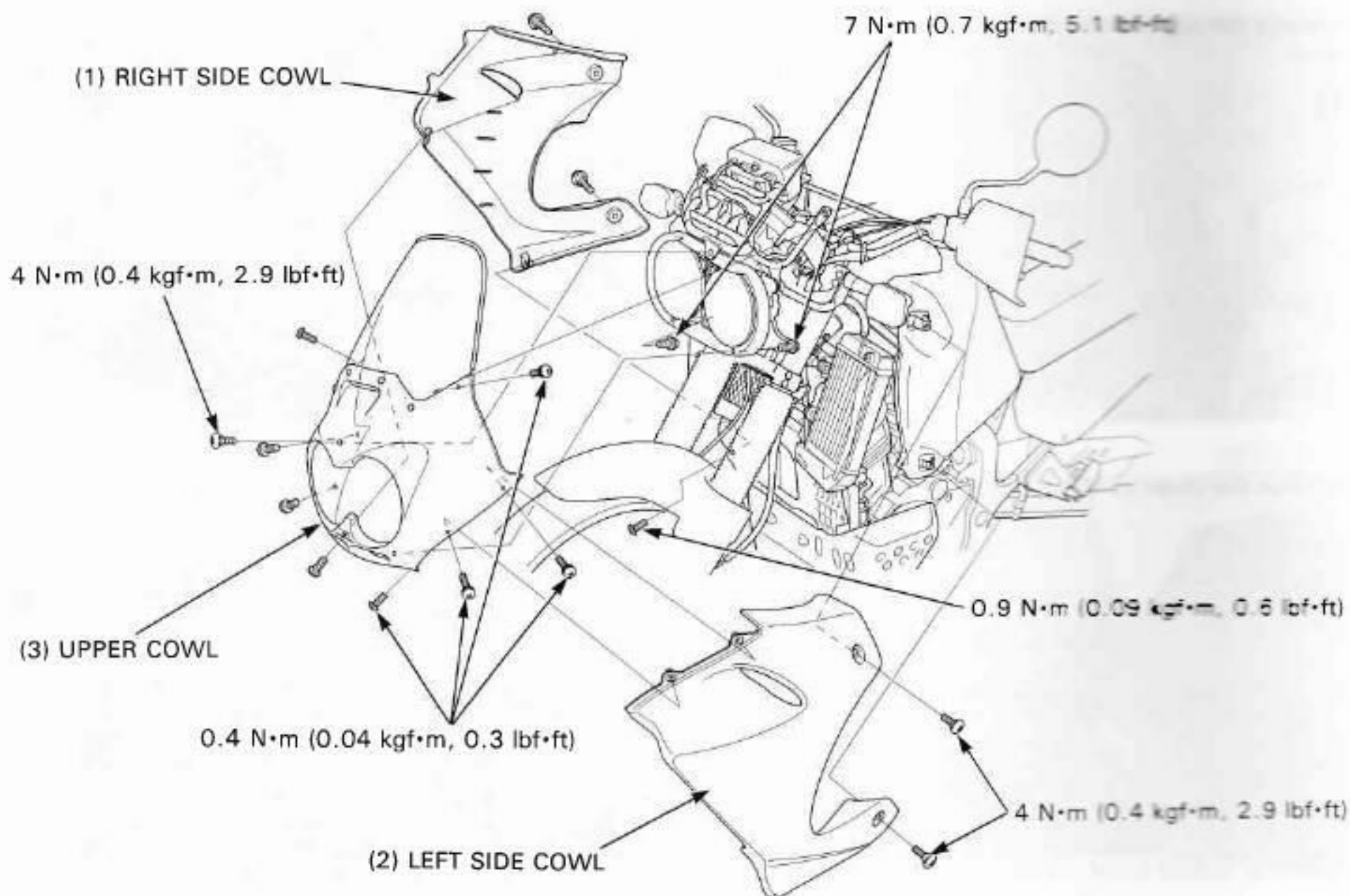


INSTALLATION

Installation is in the reverse order of removal.

TORQUE:

- Upper cowl mounting bolt: 7 N·m (0.7 kgf·m, 5.1 lbf·ft)
- Upper cowl mounting screw:
 - (6 mm): 4 N·m (0.4 kgf·m, 2.9 lbf·ft)
 - (5 mm): 0.4 N·m (0.04 kgf·m, 0.3 lbf·ft)
- Stone guard screw: 0.9 N·m (0.09 kgf·m, 0.6 lbf·ft)



FORK COVER AND FRONT FENDER REMOVAL

REMOVAL

Remove the screws.



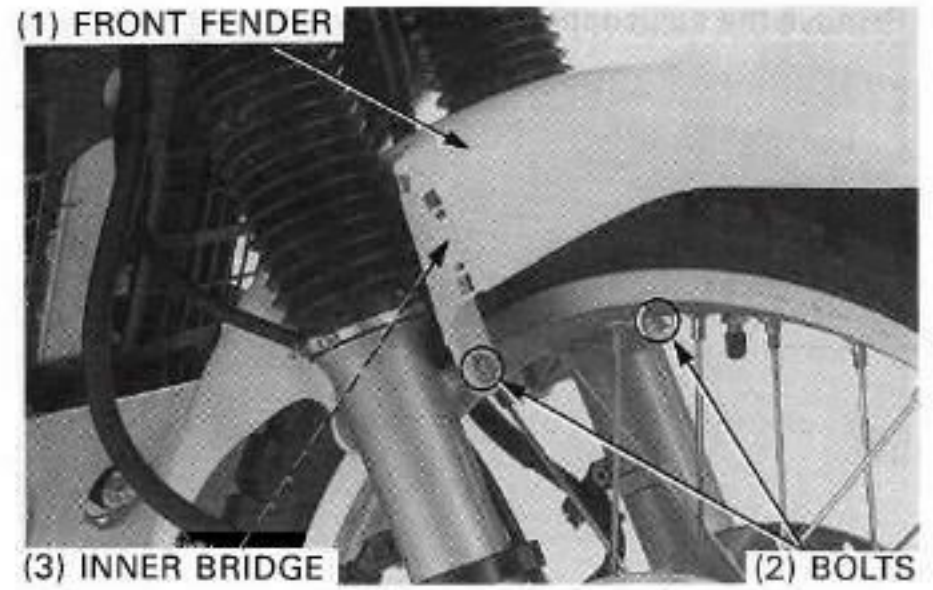
Remove the bolt and fork cover.

NOTE

- After bolt removal, remove the speedometer cable from the cable guide (right side only).



Remove the bolts.
Remove the front fender and inner bridge.

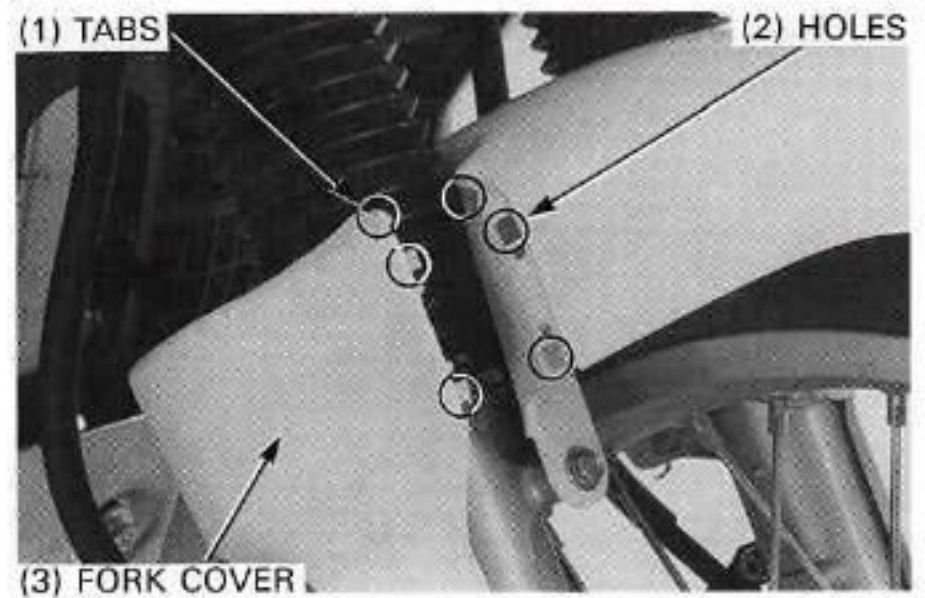


INSTALLATION

Installation is in the reverse of removal.

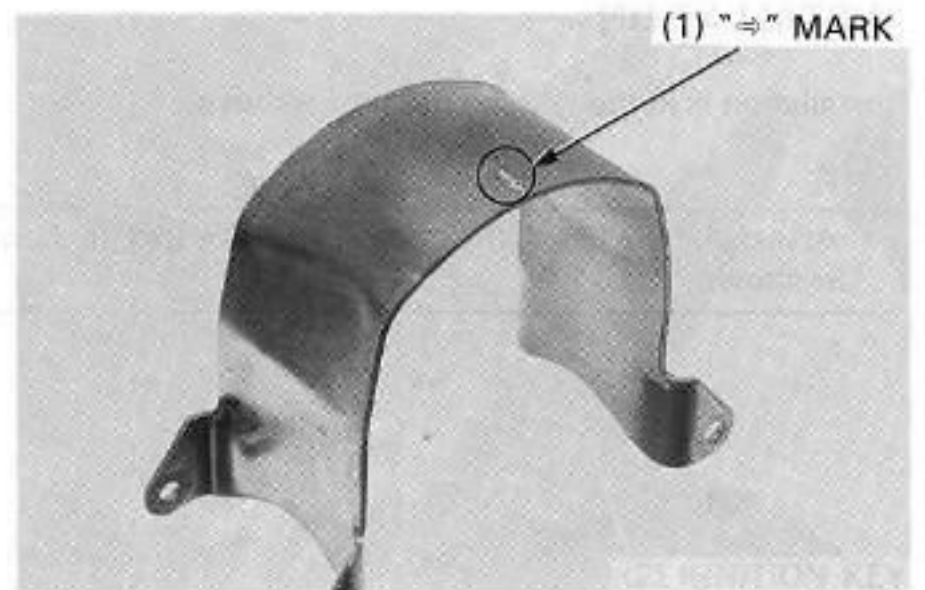
NOTE

- At installation, aligning the tab on the fork cover with the holes in the front fender as shown.



NOTE

- At installation, install the inner bridge with its "⇒" mark facing forward.



STONE GUARD AND SKID PLATE

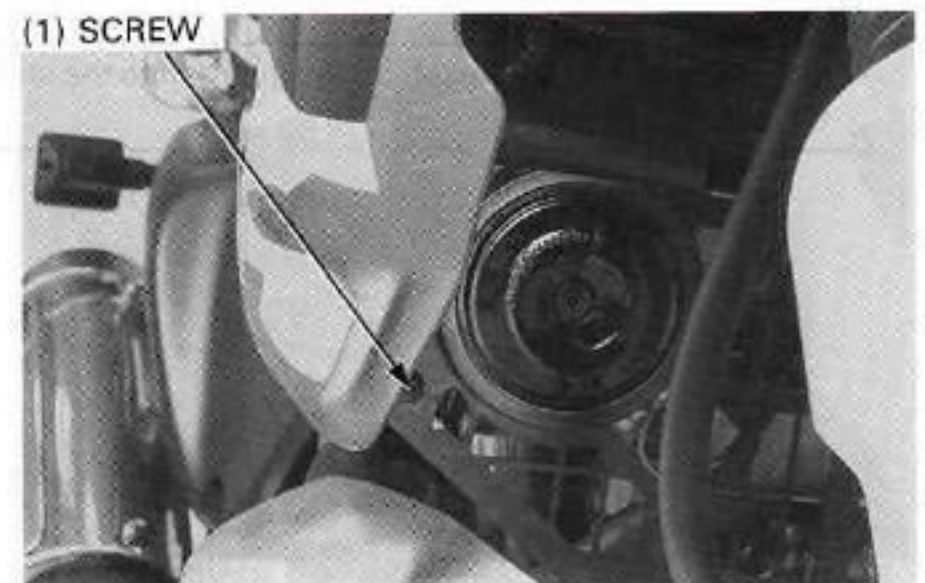
⚠ WARNING

- Do not service the exhaust system while it is hot.

STONE GUARD

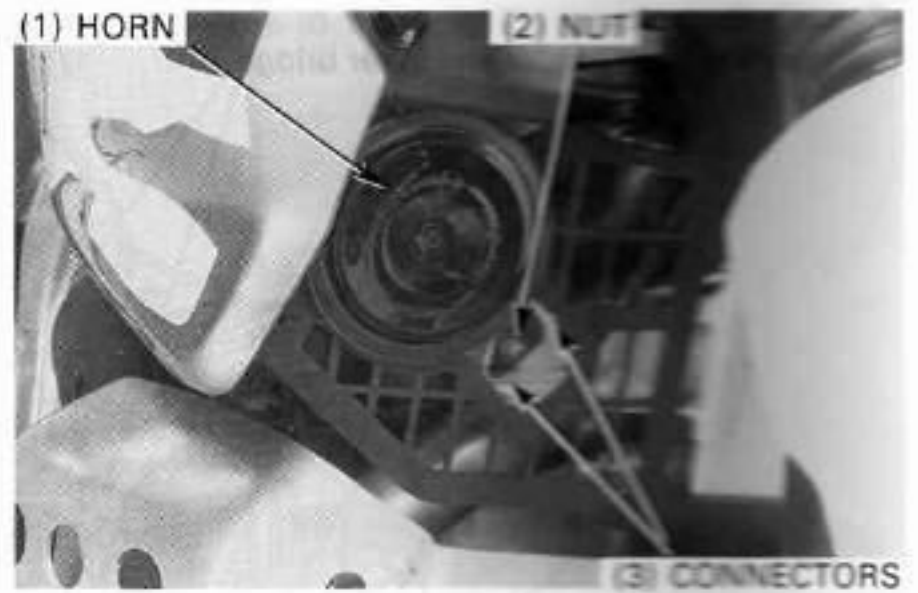
REMOVAL

Remove the screws.

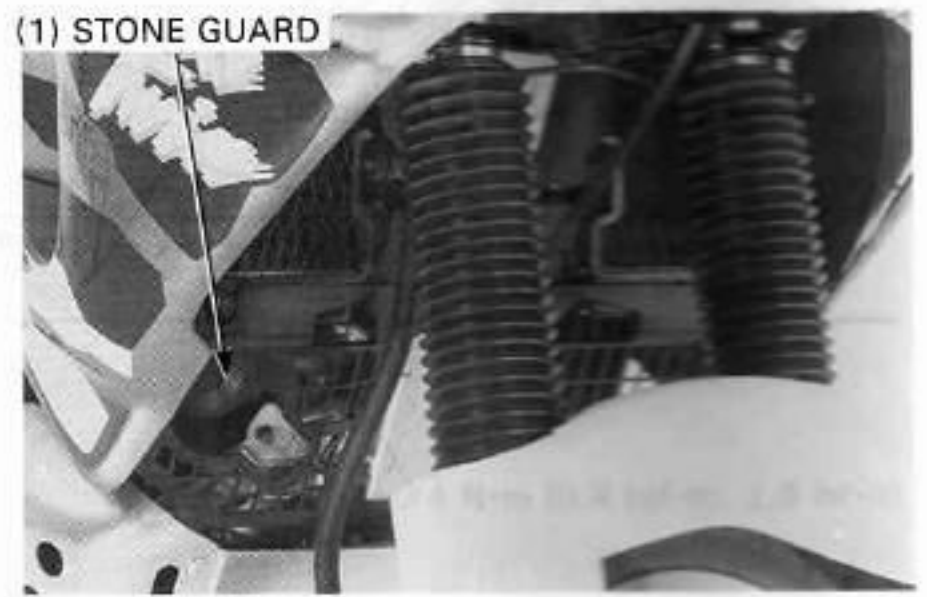


FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the nut, connectors and horn.



Remove the stone guard.

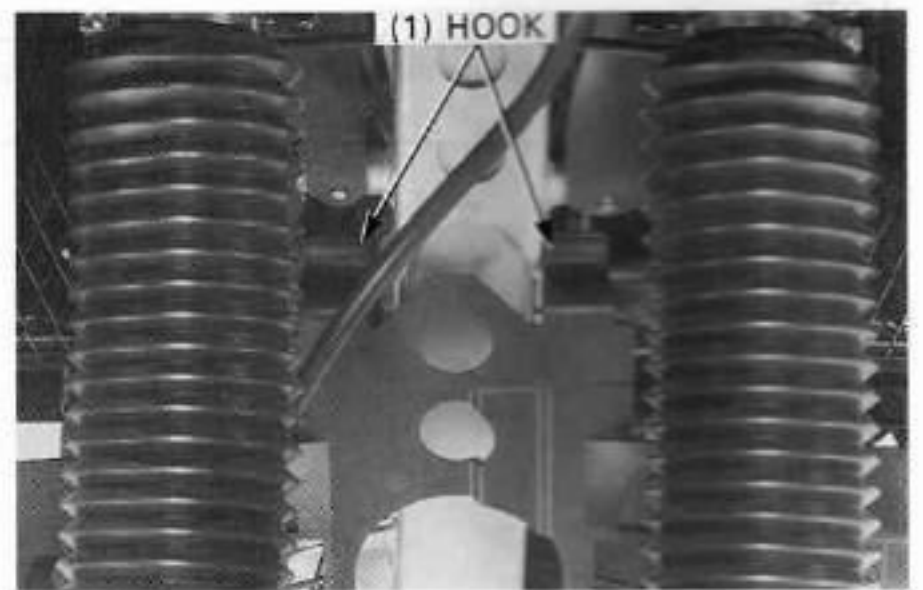


INSTALLATION

Installation is in the reverse order of removal.

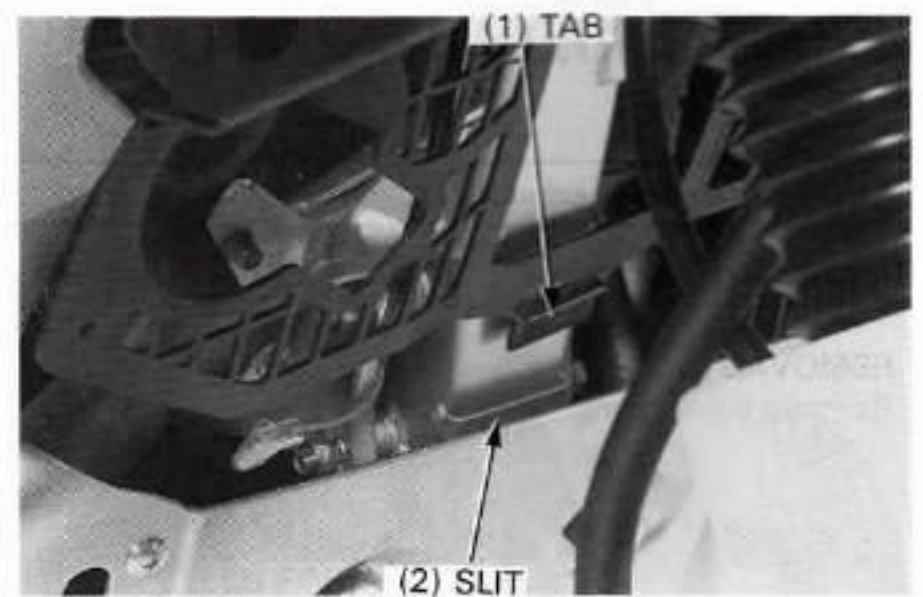
NOTE

- At installation, install the hook on the guard to the frame as shown .



NOTE

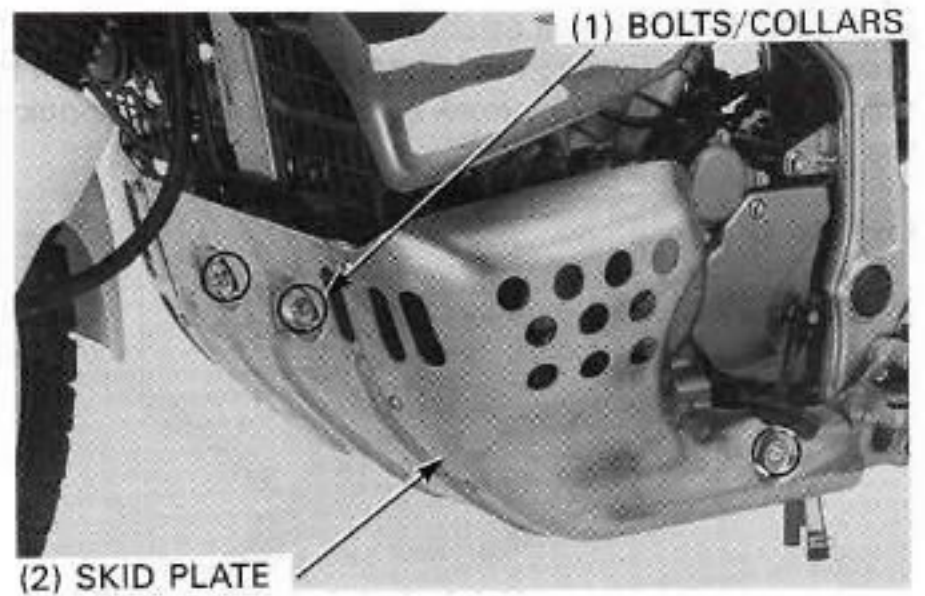
- At installation, insert the tab on the guard onto the slit in the frame as shown.



SKID PLATE

REMOVAL

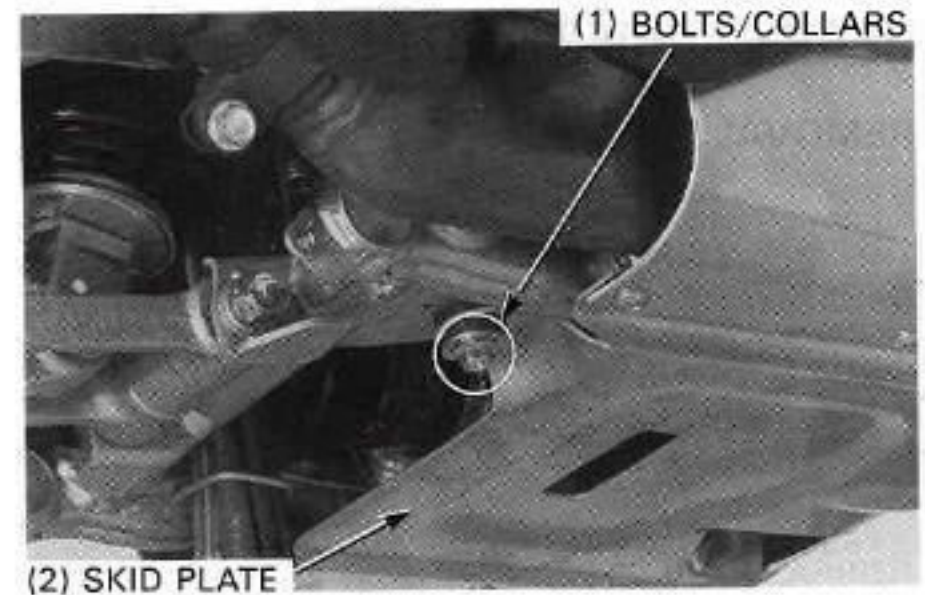
Remove the skid plate bolts and collars.
Remove the skid plate.



INSTALLATION

Install the skid plate and collars.
Install and tighten the skid plate bolts to the specified torque.

TORQUE: 21 N·m (2.1 kgf·m, 15 lbf·ft)



SEAT AND SIDE COVER

REMOVAL

Remove the seat using the ignition key.



Remove the screws and side cover.

INSTALLATION

NOTE

- At installation, align the side cover grommet on the frame boss.

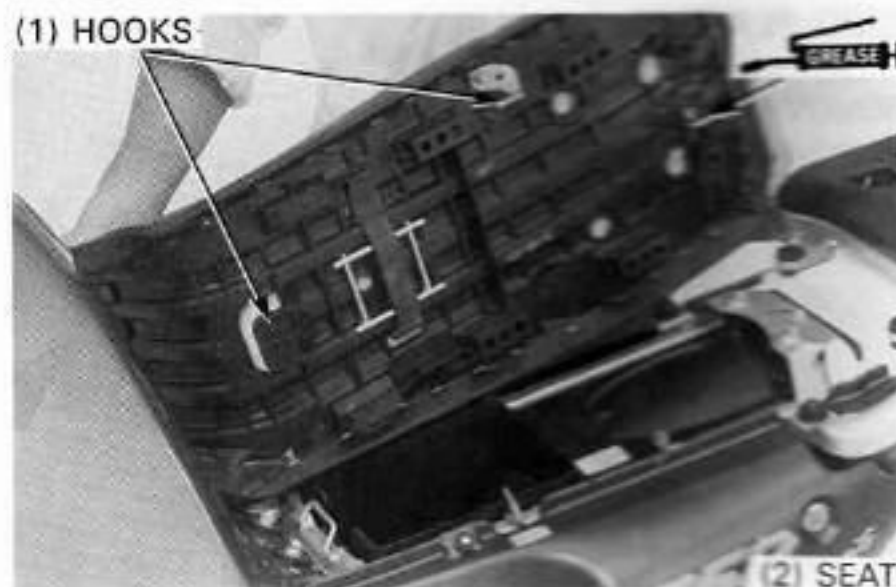
Install the side cover and tighten the screws securely.



FRAME/BODY PANELS/EXHAUST SYSTEM

Apply grease to the seat catch.
Install the seat aligning the front hook on the seat with the fuel tank bridge and side hook on the seat with the hook on the frame.

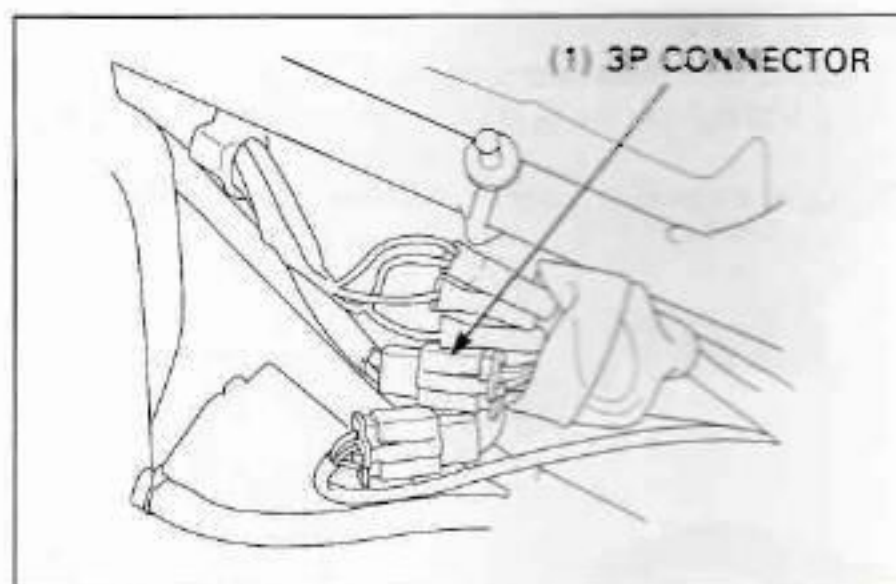
Lock the seat securely.



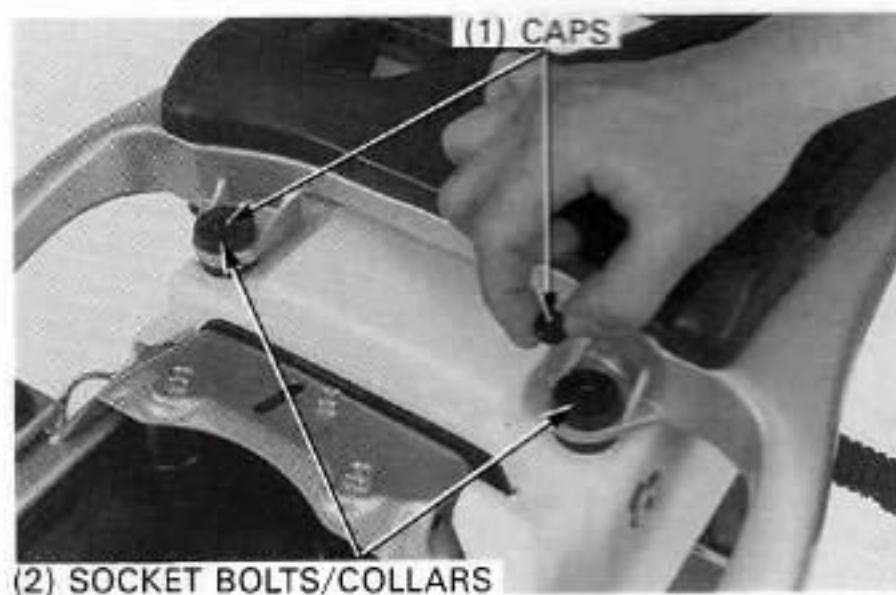
REAR CARRIER AND REAR FENDER REMOVAL

Remove the seat and side cover (page 2-6).

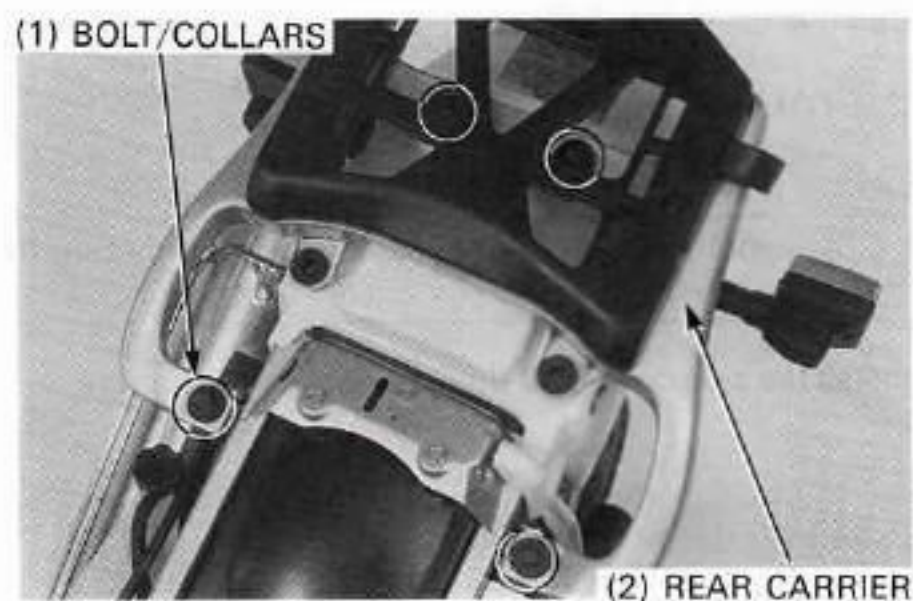
Disconnect the tail/brake light 3P connector.



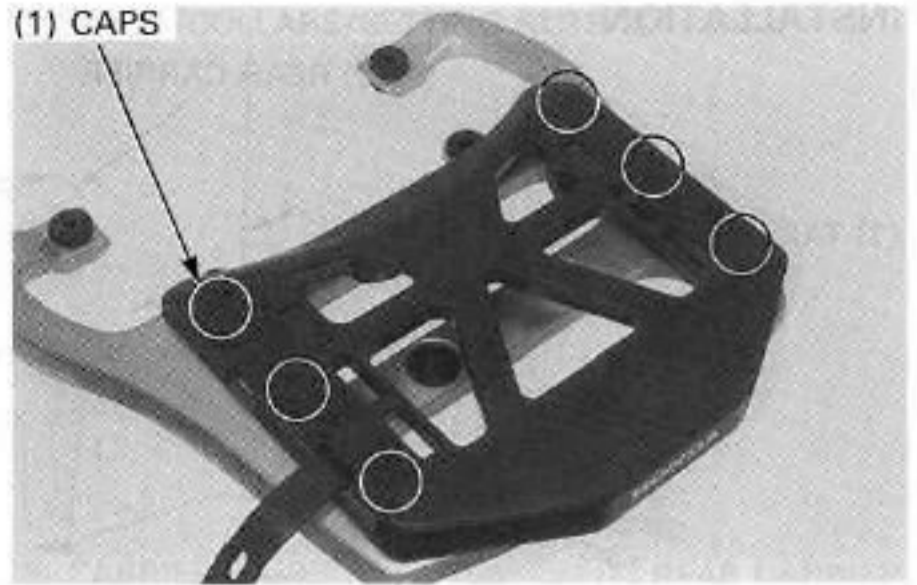
Remove the bolt caps, socket bolts and collars.



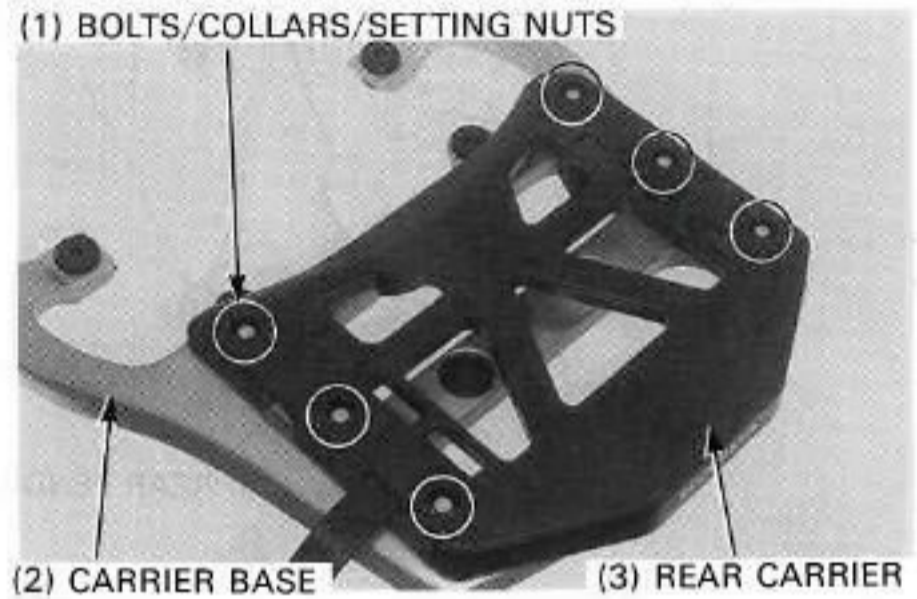
Remove the rear carrier bolts and collars.
Remove the rear carrier.



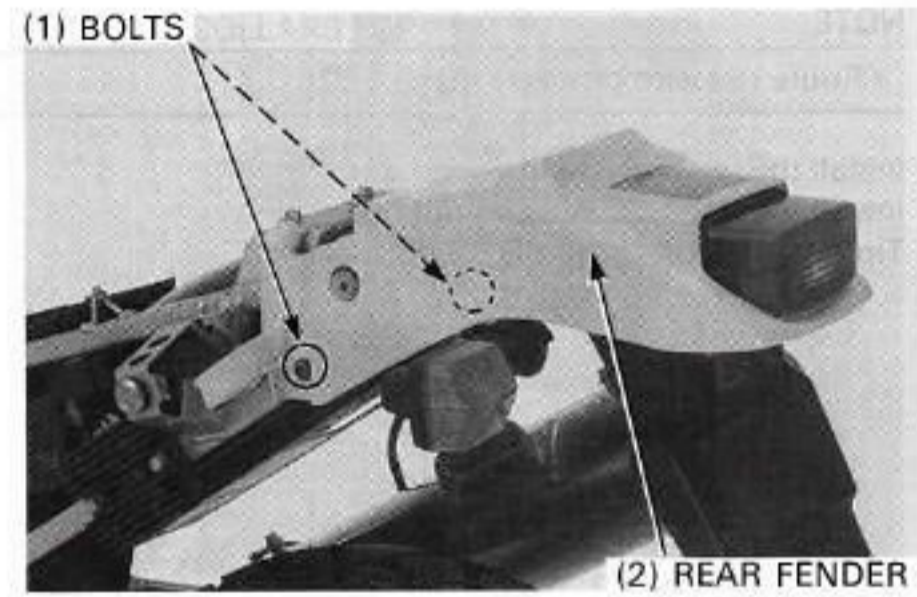
Remove the bolt caps.



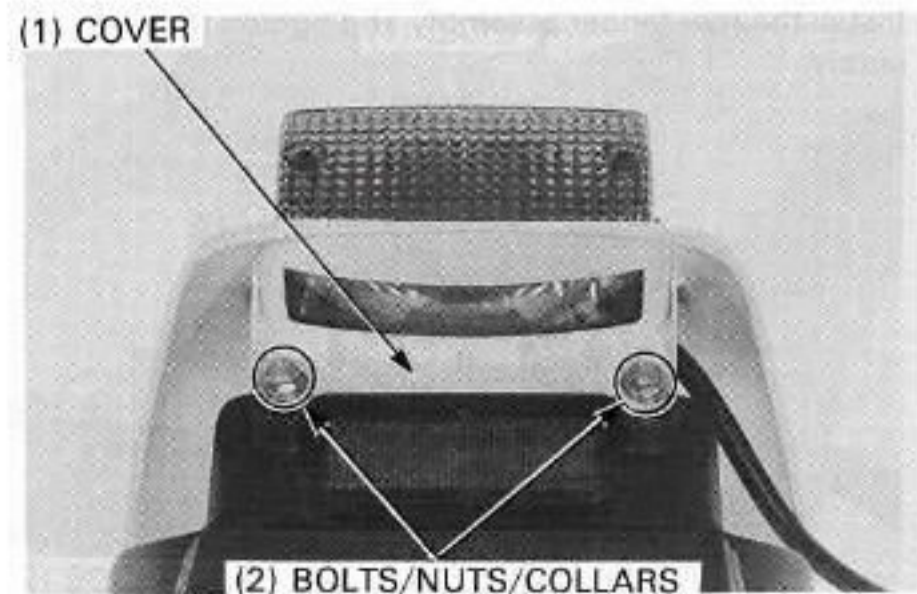
Remove the bolts, setting nuts and collars.
Remove the rear carrier from the rear carrier base.



Remove the bolts and rear fender assembly.

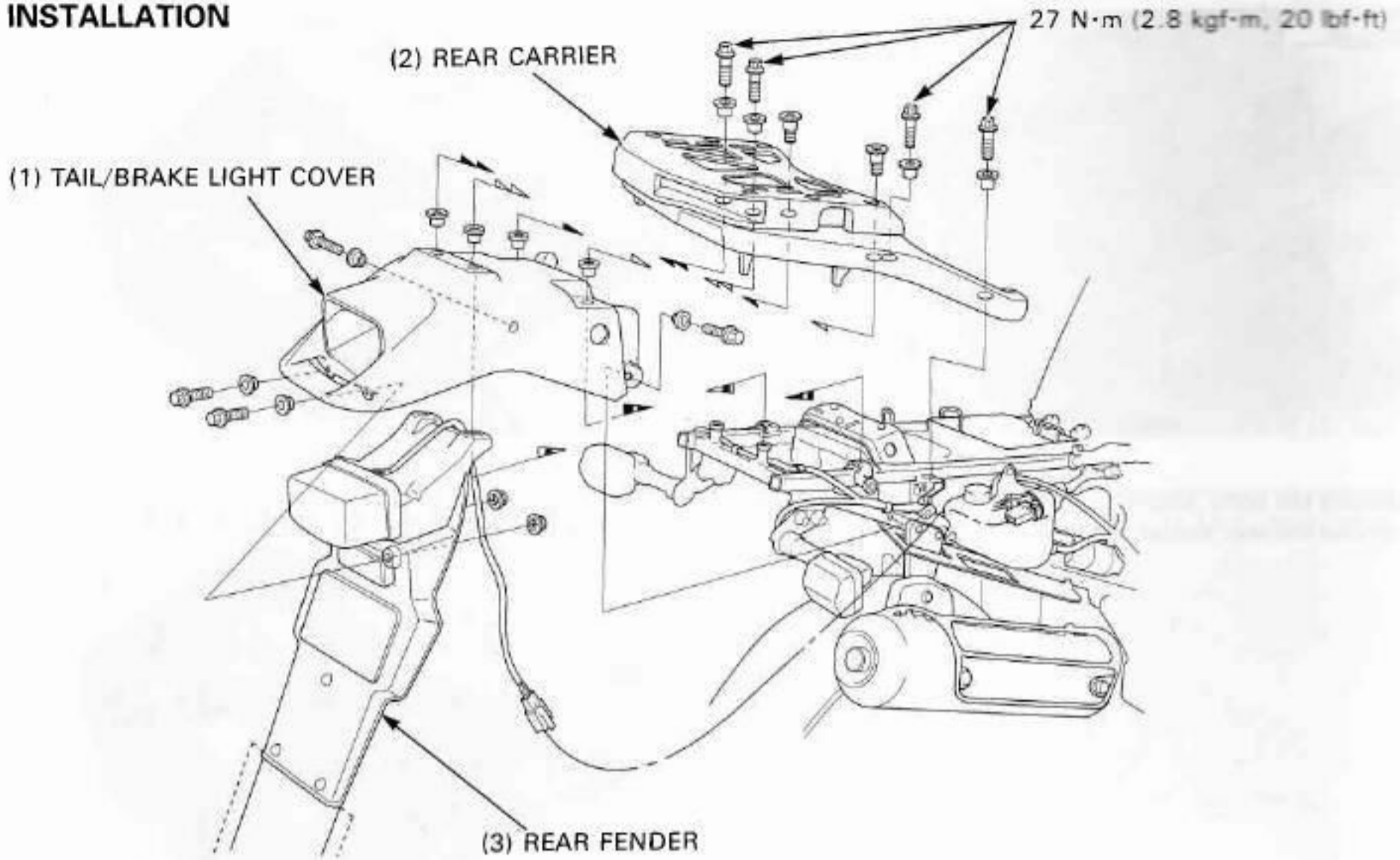


Remove the bolts, collars, nuts and Tail/brake light cover.



FRAME/BODY PANELS/EXHAUST SYSTEM

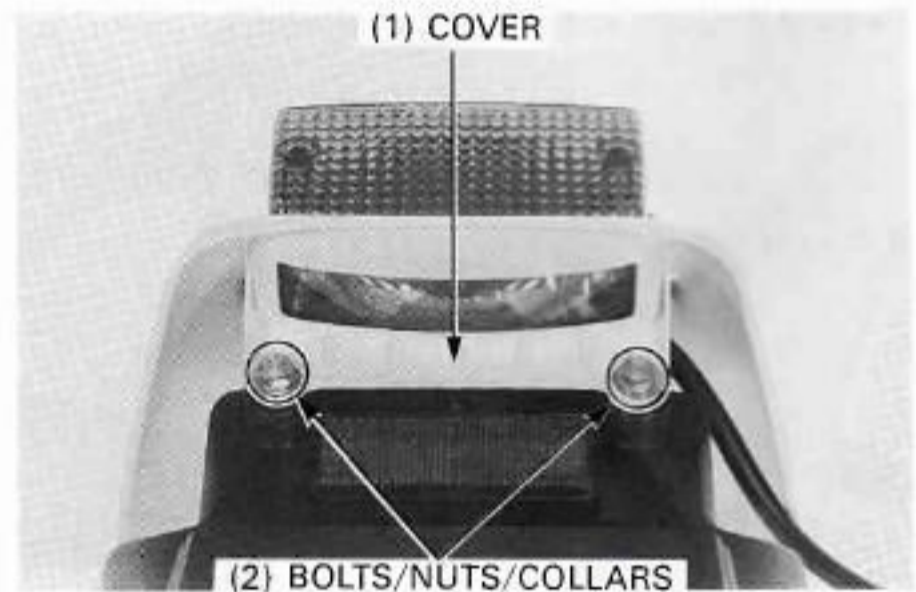
INSTALLATION



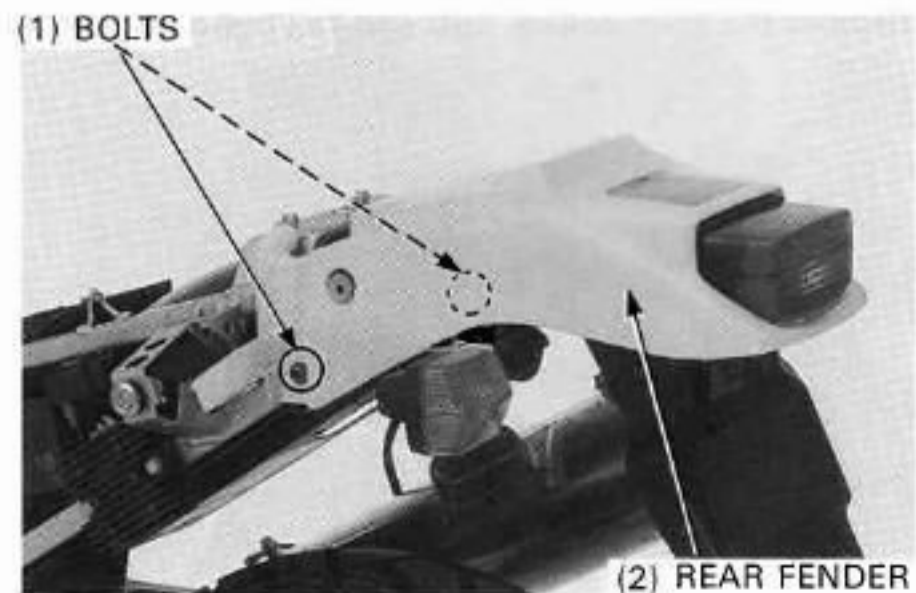
NOTE

- Route the wire properly (page 1-22).

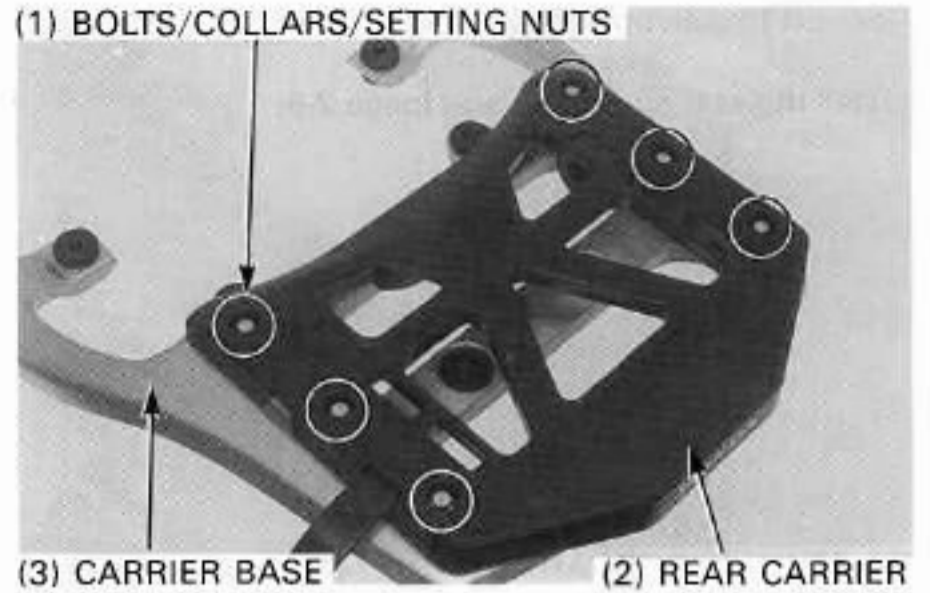
Install the tail/brake light cover.
Install the bolts, collars and nuts.
Tighten the bolts securely.



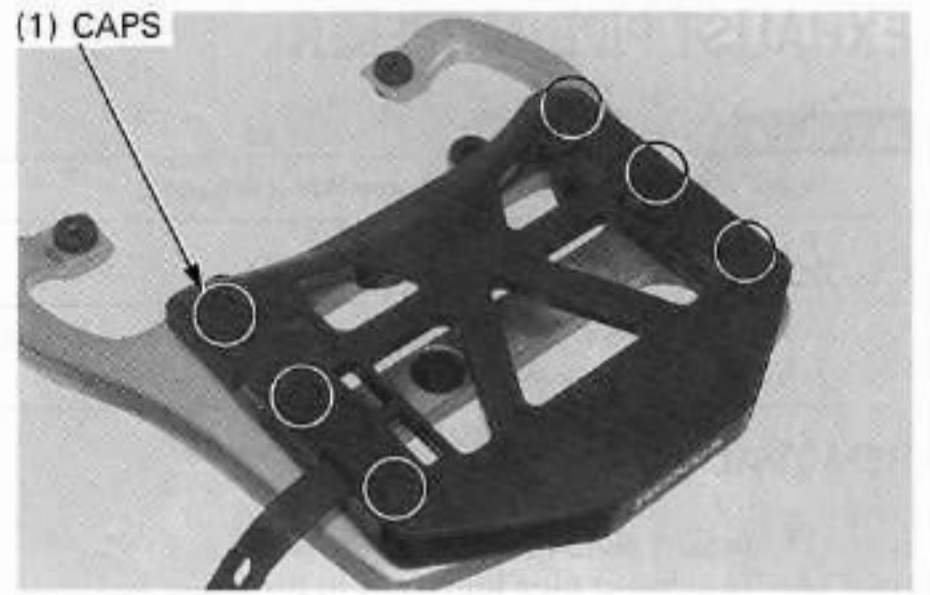
Install the rear fender assembly and tighten the bolts securely.



Install the rear carrier to the rear carrier base.
Install the setting nuts, collars and bolts.
Tighten the bolts securely.

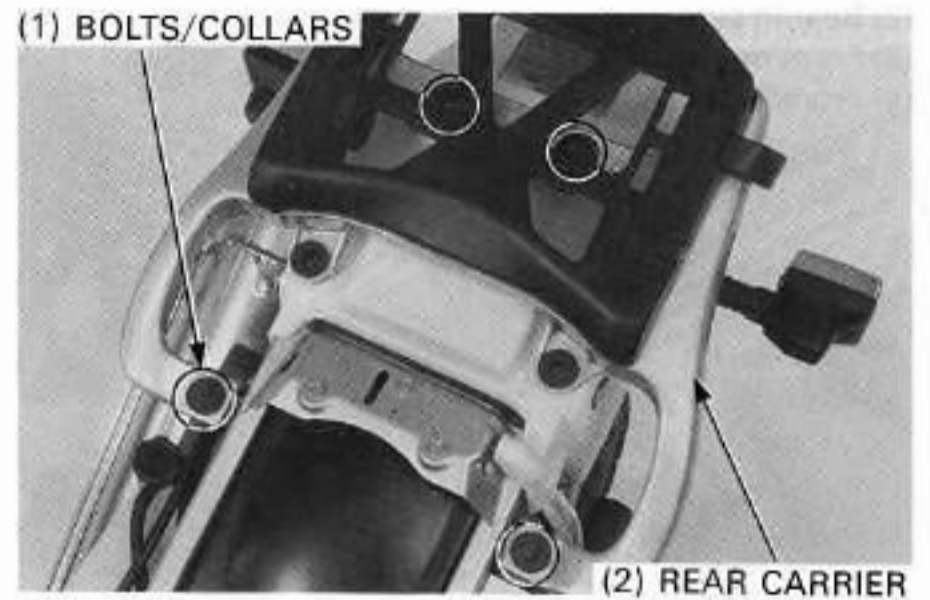


Install the bolt caps.

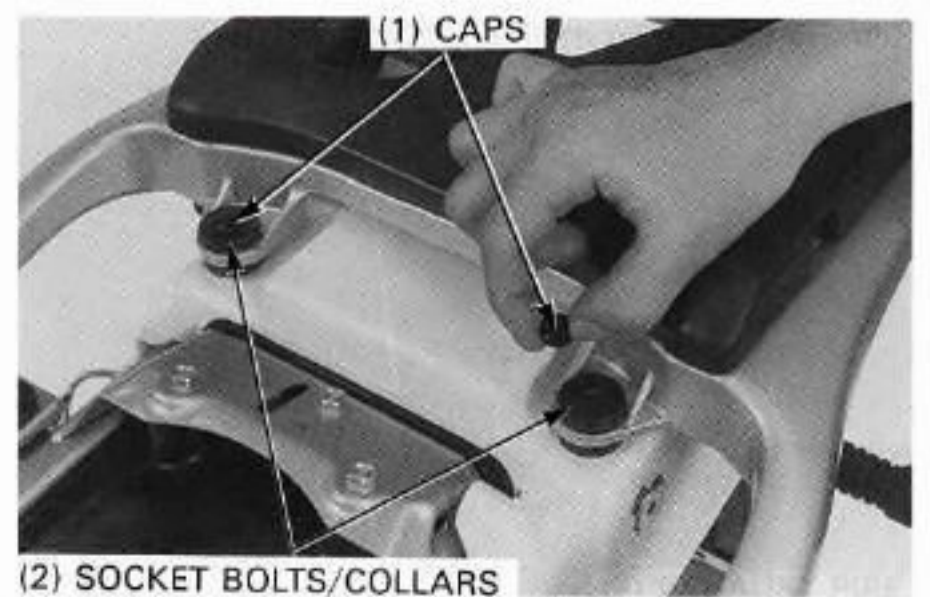


Install the rear carrier.
Install the collars and tighten the rear carrier bolts to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



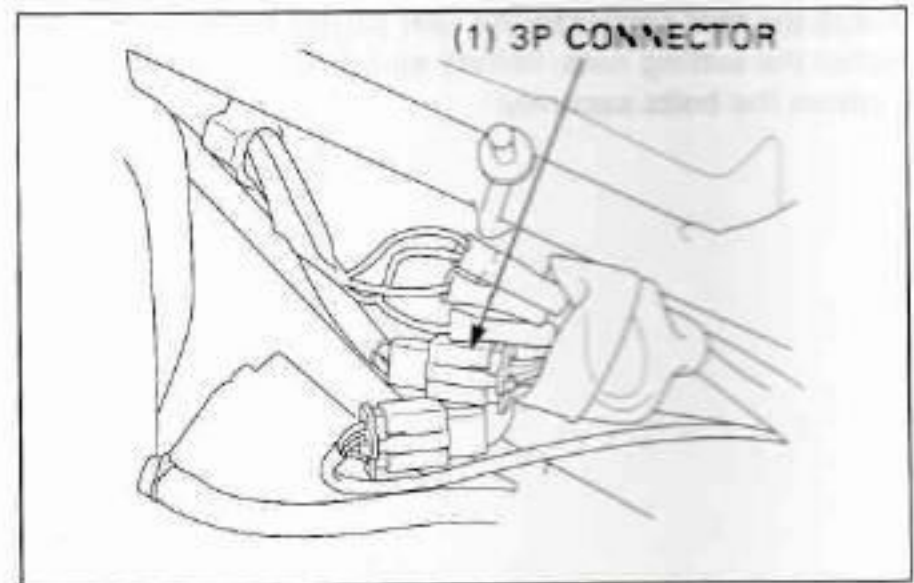
Install and tighten the socket bolts securely.
Install the bolt caps.



FRAME/BODY PANELS/EXHAUST SYSTEM

Connect the tail/brake light 3P connector.

Install the seat and side cover (page 2-6).



EXHAUST PIPE/MUFFLER

⚠ WARNING

- Do not service the exhaust system while it is hot.

CAUTION

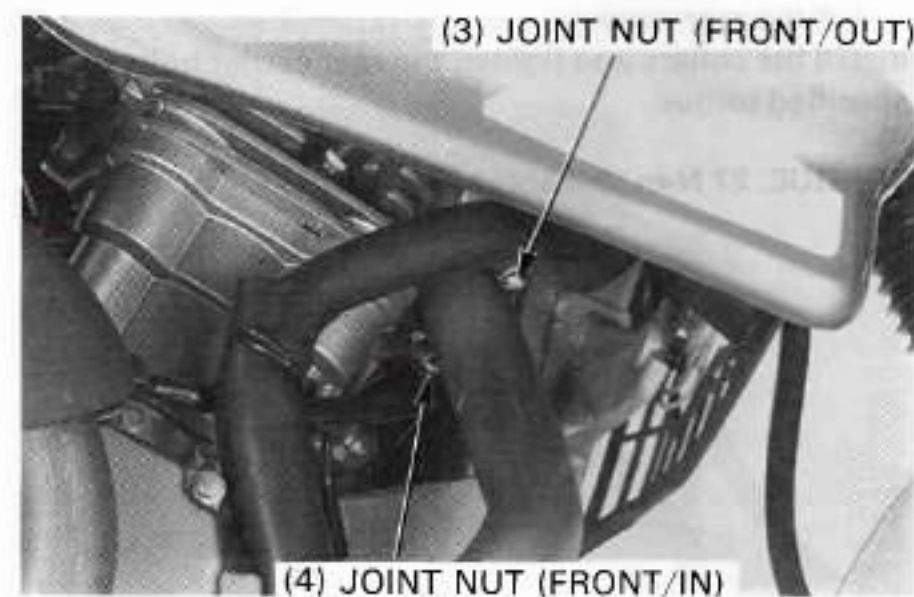
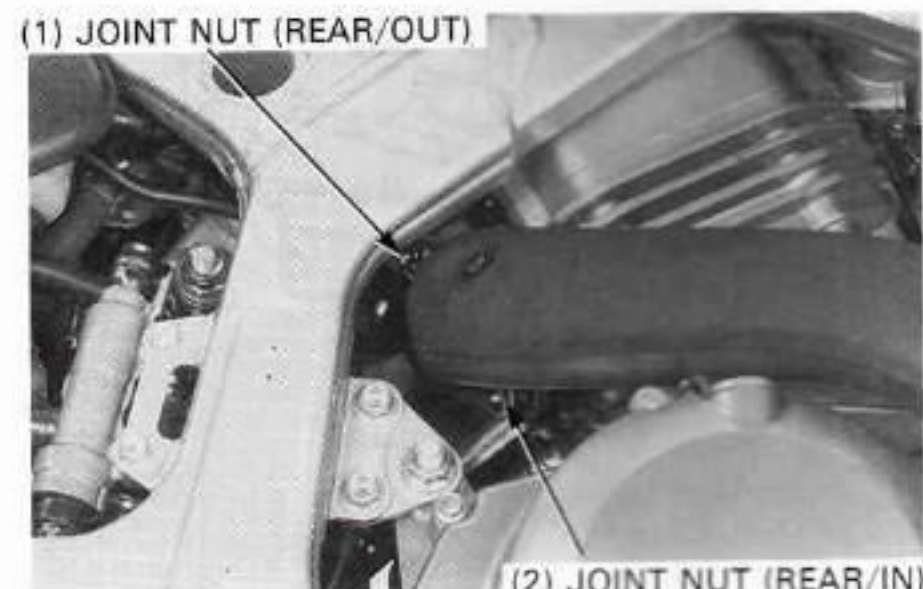
- When removing/installing the exhaust pipe/muffler, loosen/tighten the exhaust system fasteners in the order as follows.

REMOVAL

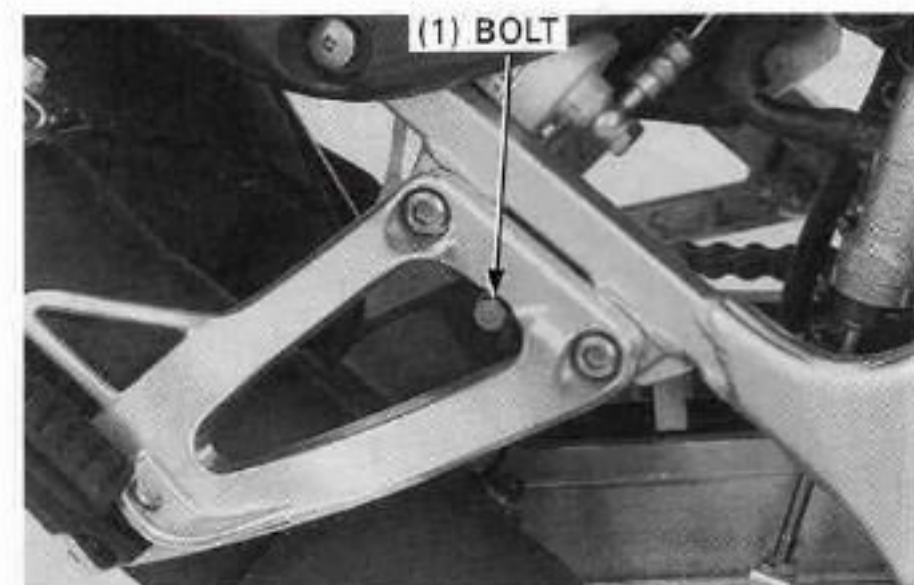
Remove the skid plate (page 2-5).

Remove the exhaust pipe joint nuts in the order as follows.

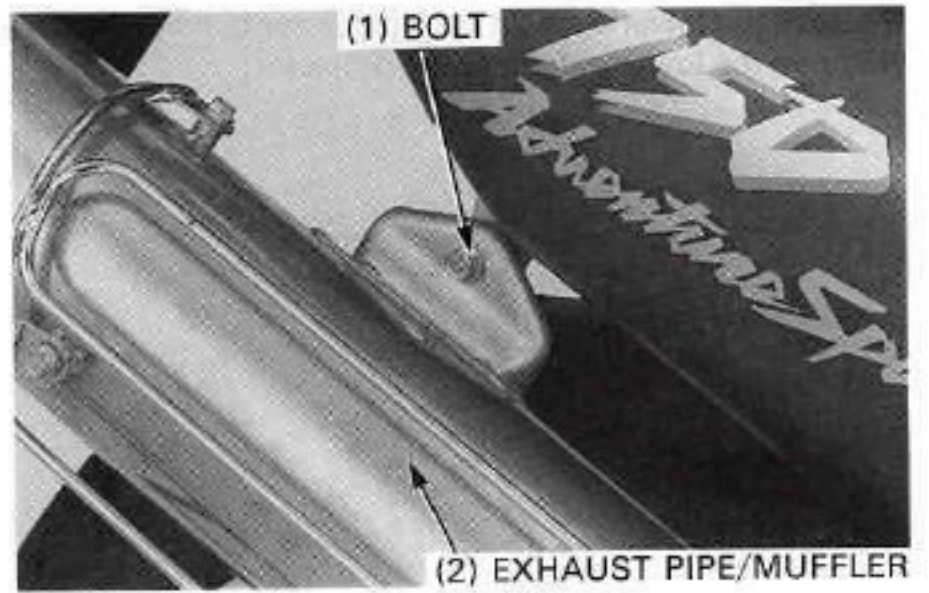
- (1) Rear/out side
- (2) Rear/in side
- (3) Front/out side
- (4) Front/in side



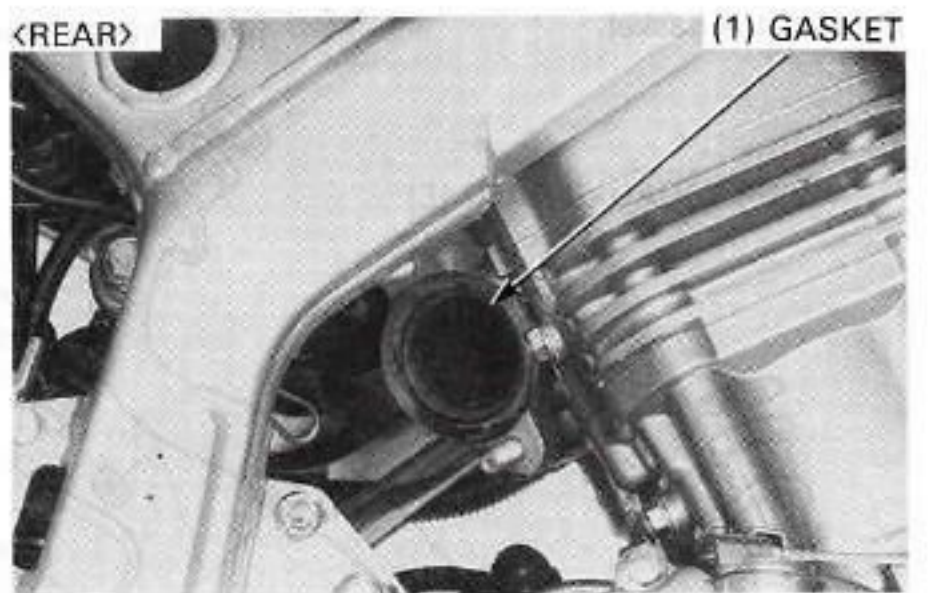
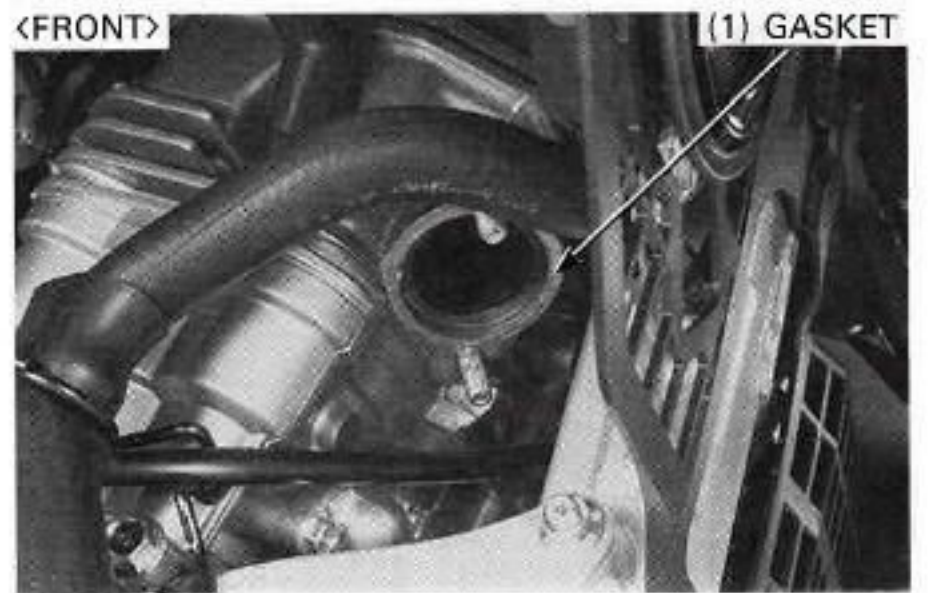
Remove the muffler mounting bolt (front).



Remove the muffler mounting bolt (rear).
Remove the exhaust pipe/muffler assembly.

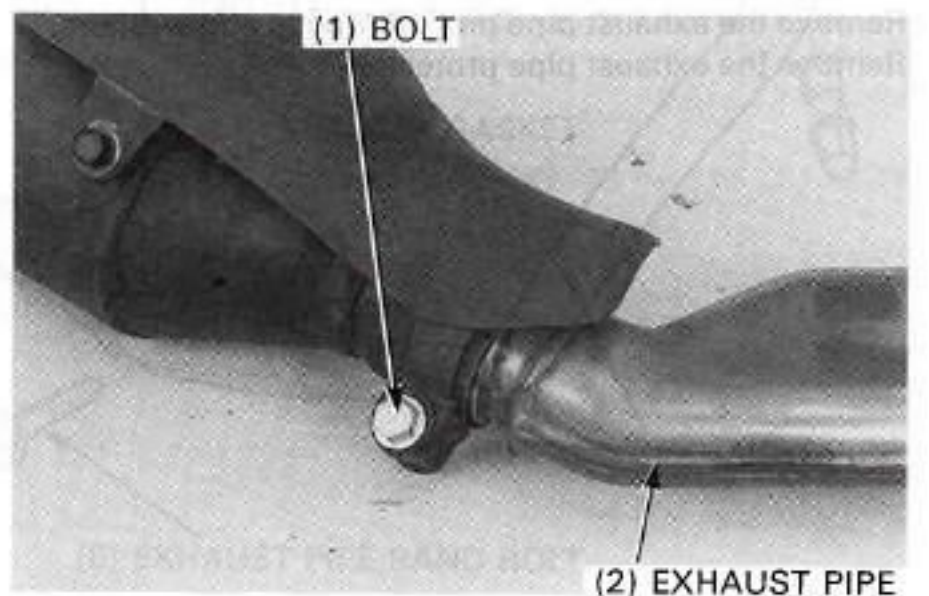


Remove the gaskets.



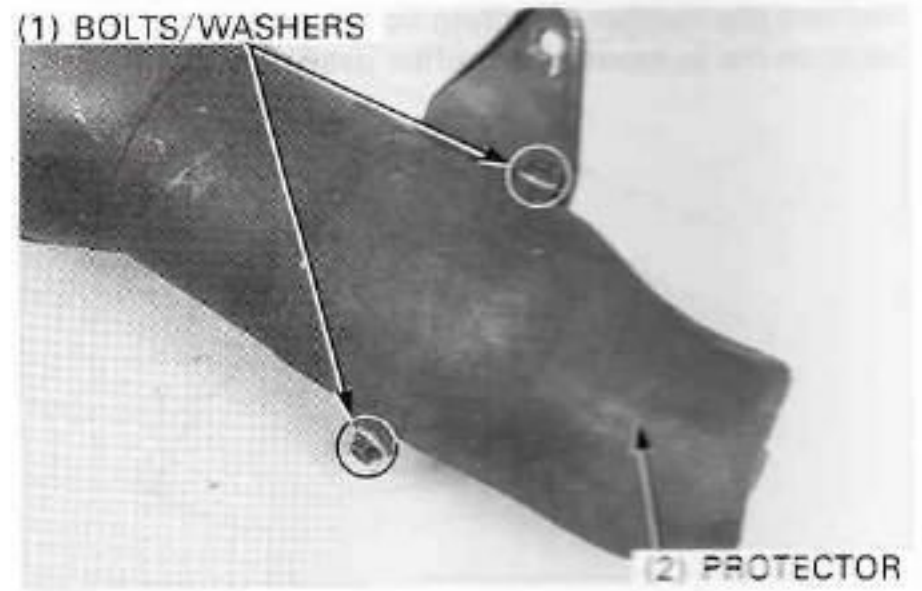
DISASSEMBLY

Loosen the muffler band bolt.
Remove the front exhaust pipe.

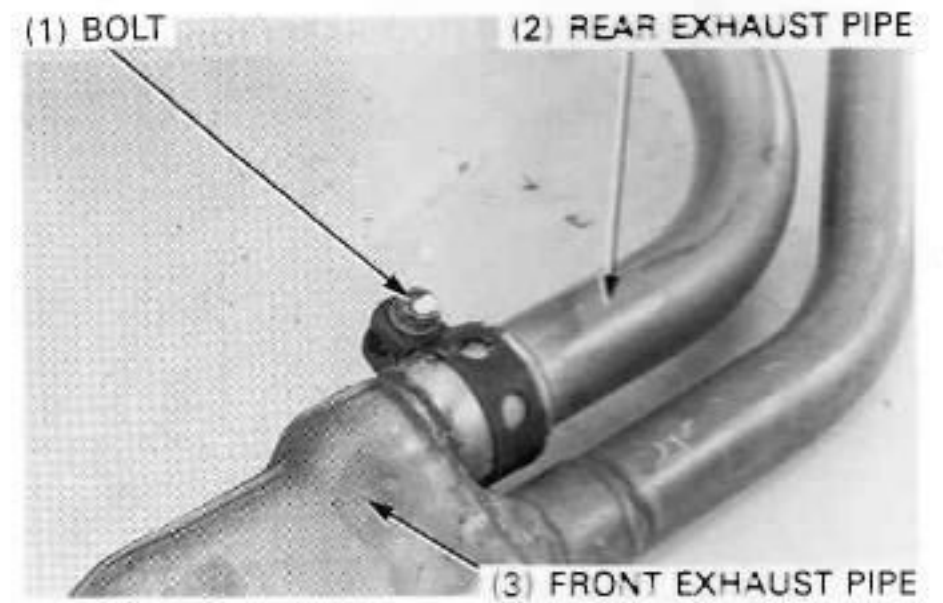


FRAME/BODY PANELS/EXHAUST SYSTEM

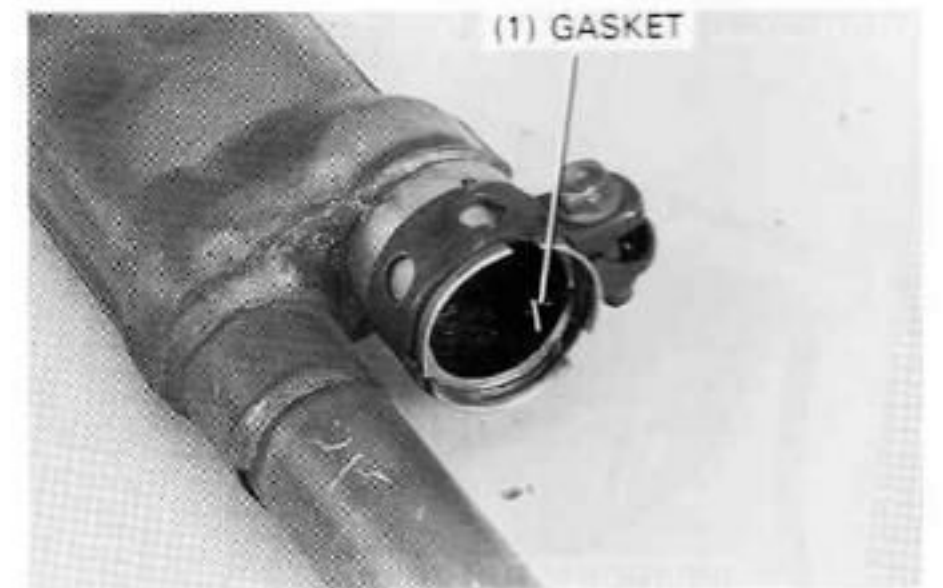
Remove the lower exhaust pipe protector bolts and washers.
Remove the lower exhaust pipe protector.



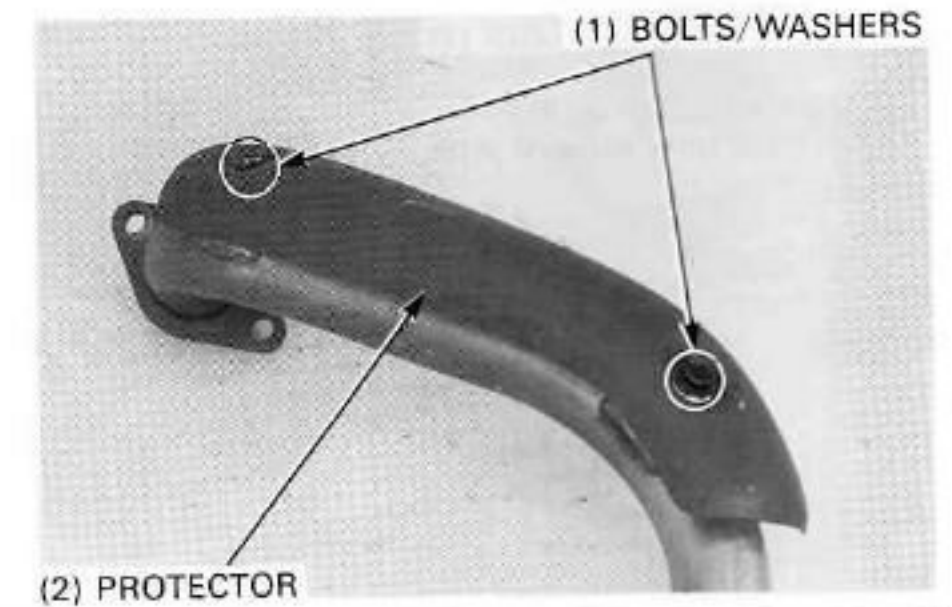
Loosen the exhaust pipe band bolt.
Remove the rear exhaust pipe.



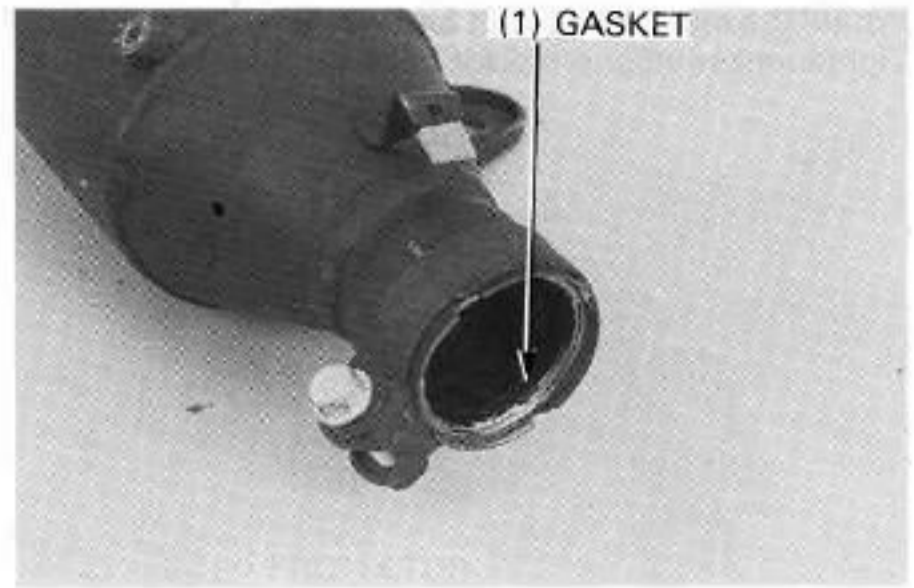
Remove the gasket.



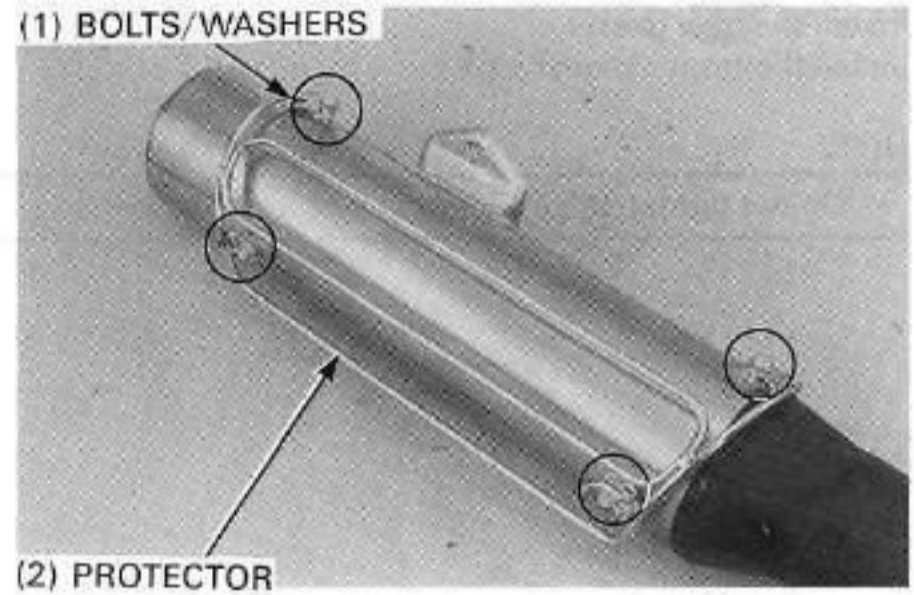
Remove the exhaust pipe protector bolts and washers.
Remove the exhaust pipe protector.



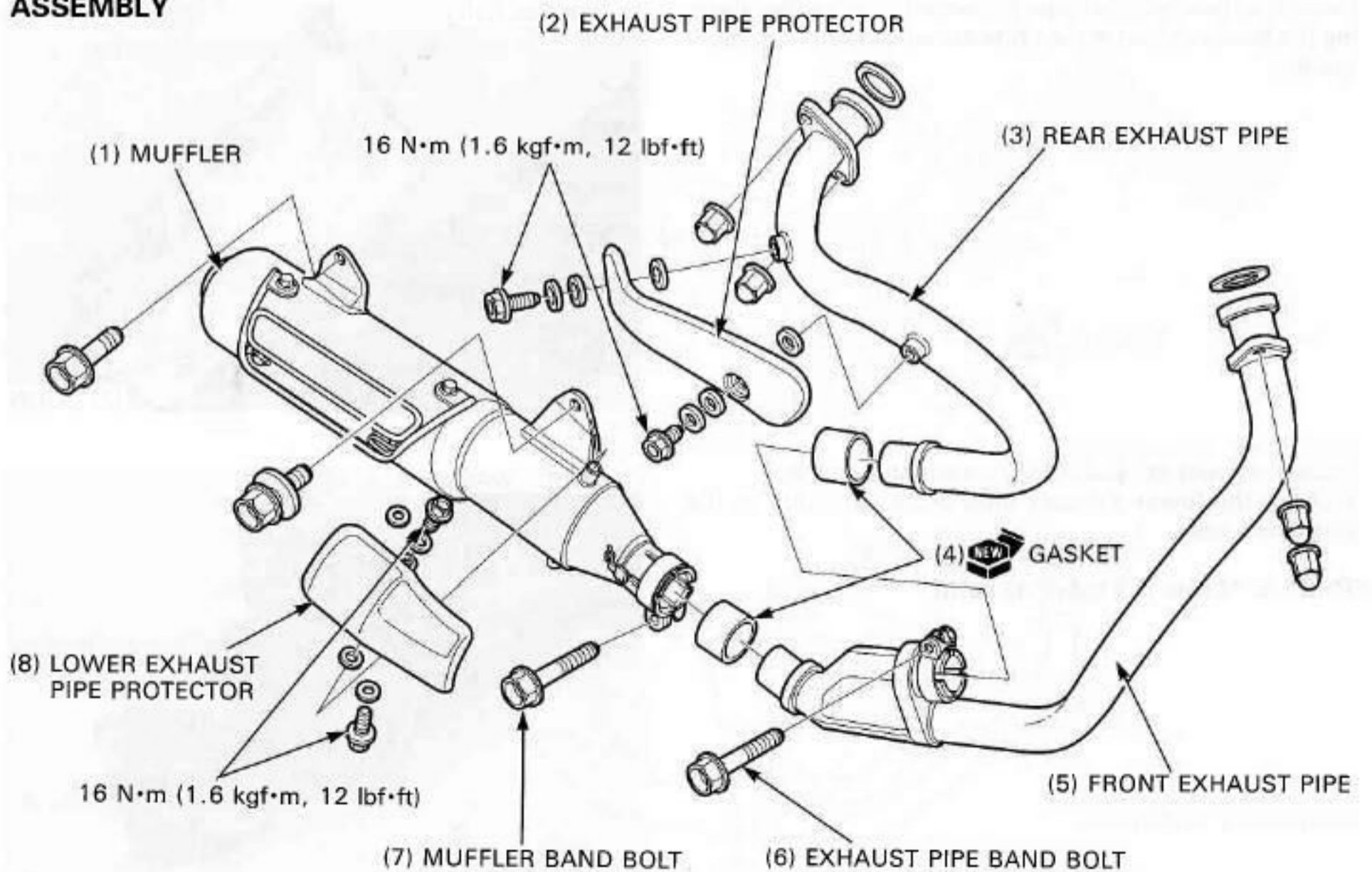
Remove the gasket.



Remove the muffler protector bolts and washers.
Remove the muffler protector.

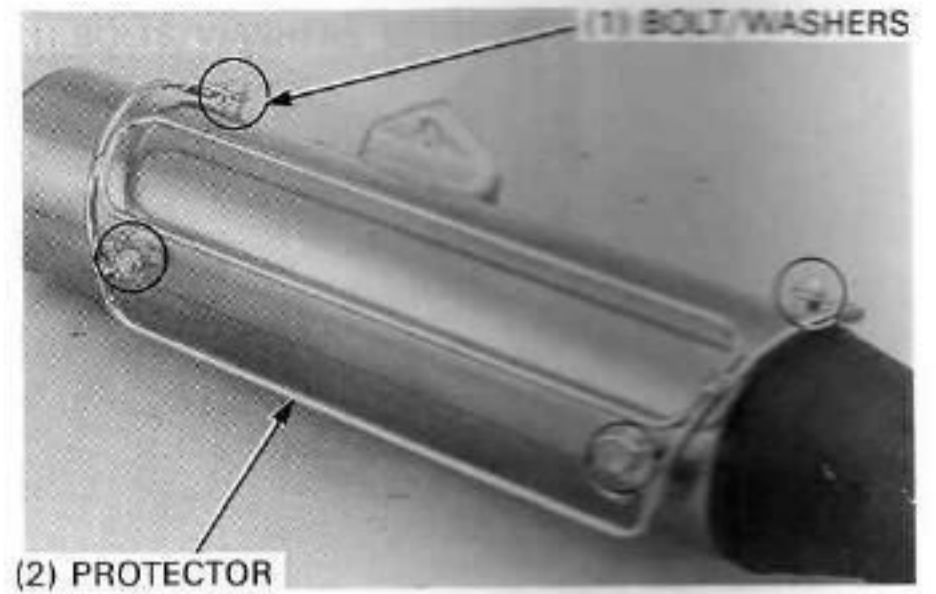


ASSEMBLY



FRAME/BODY PANELS/EXHAUST SYSTEM

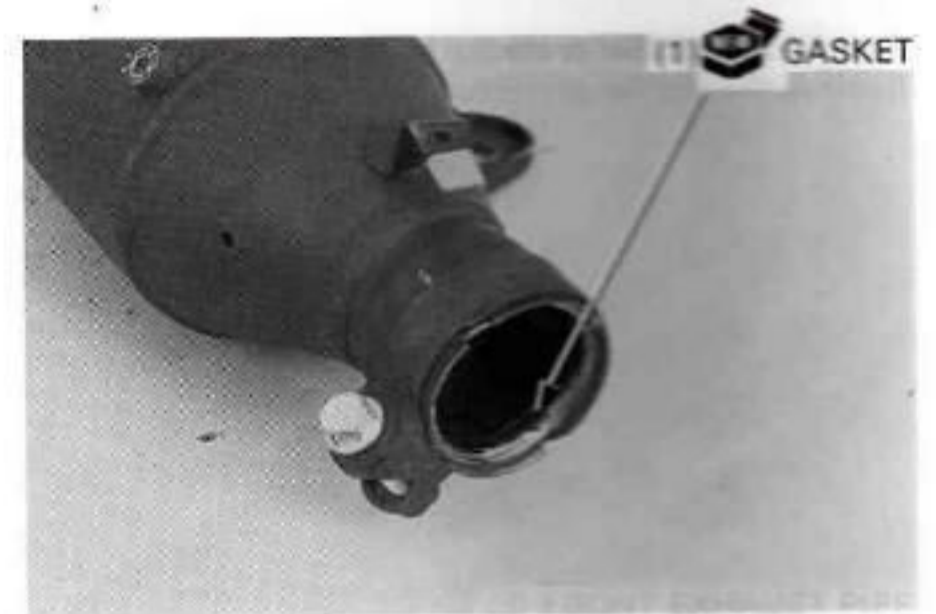
Install the muffler protector and washers.
Tighten the muffler protector bolts securely.



Install the new gasket.
Install the front exhaust pipe.

NOTE

- Do not tighten the muffler band bolt yet.

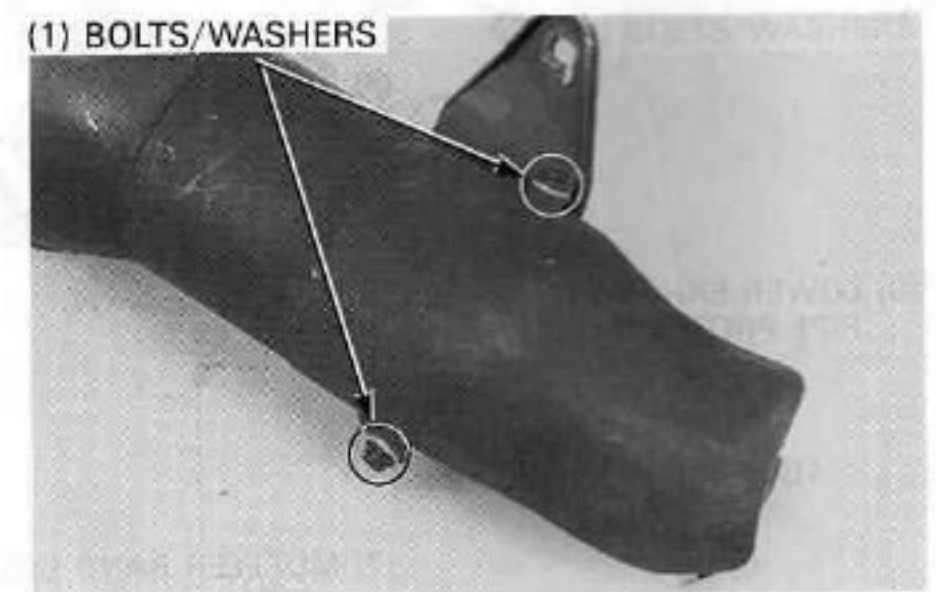


Install the lower exhaust pipe protector to the muffler aligning the hook position of the protector with the hook on the muffler.



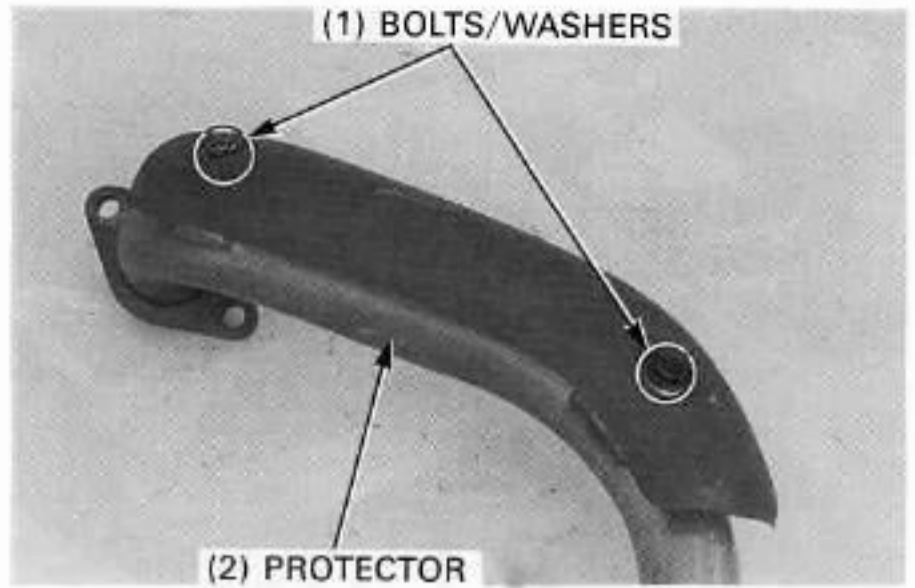
Install the lower exhaust pipe protector and washers.
Tighten the lower exhaust pipe protector bolts to the specified torque.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)



Install the exhaust pipe protector and washers.
Tighten the exhaust pipe protector bolts to the specified torque.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)



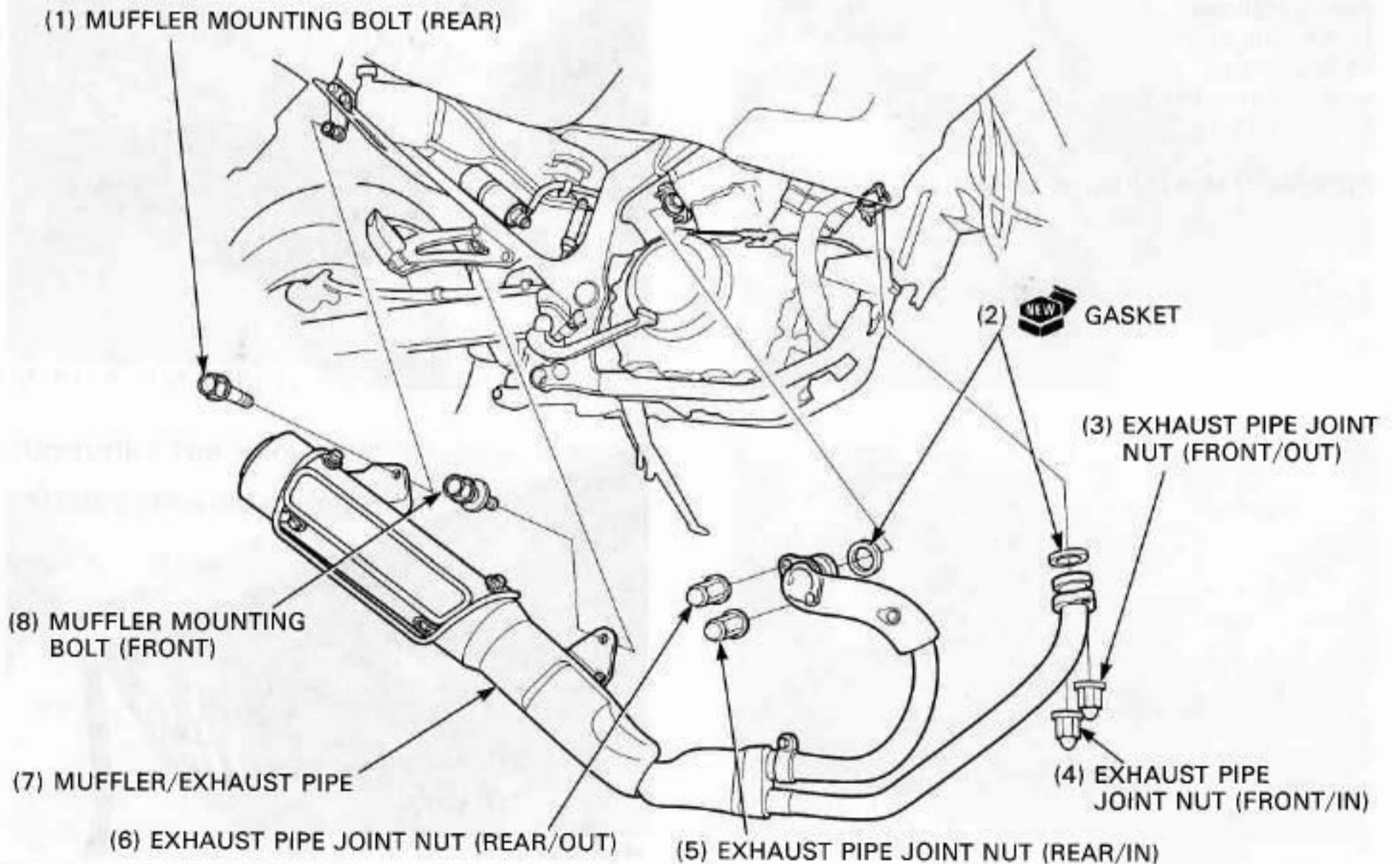
Install the new gasket.
Install the front exhaust pipe.

NOTE

- Do not tighten the exhaust pipe band bolt yet.

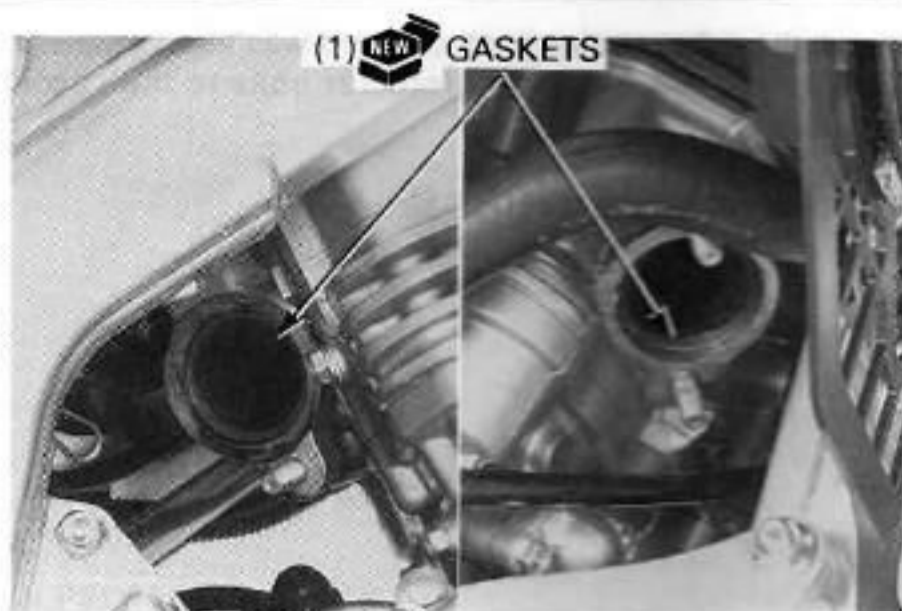


INSTALLATION

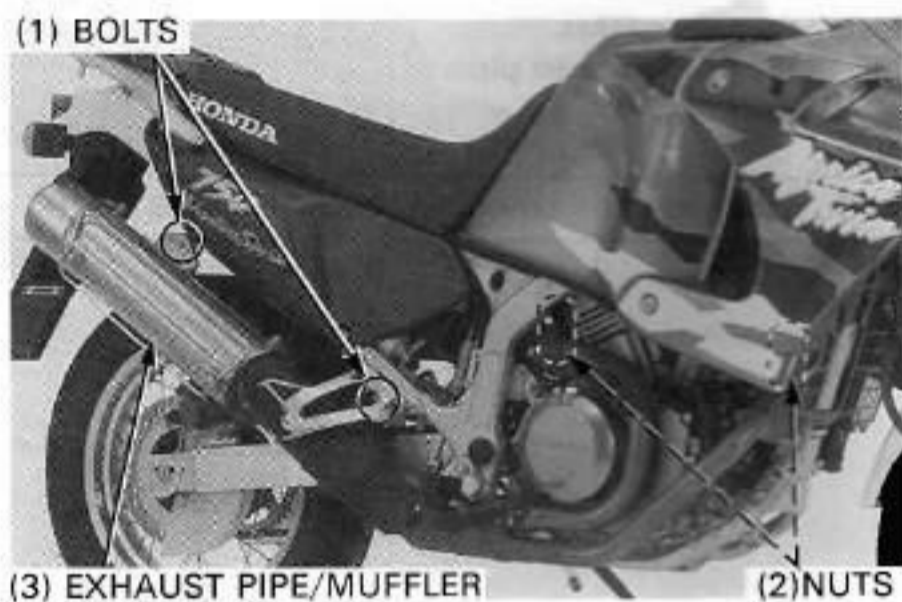


FRAME/BODY PANELS/EXHAUST SYSTEM

Install the new gaskets.



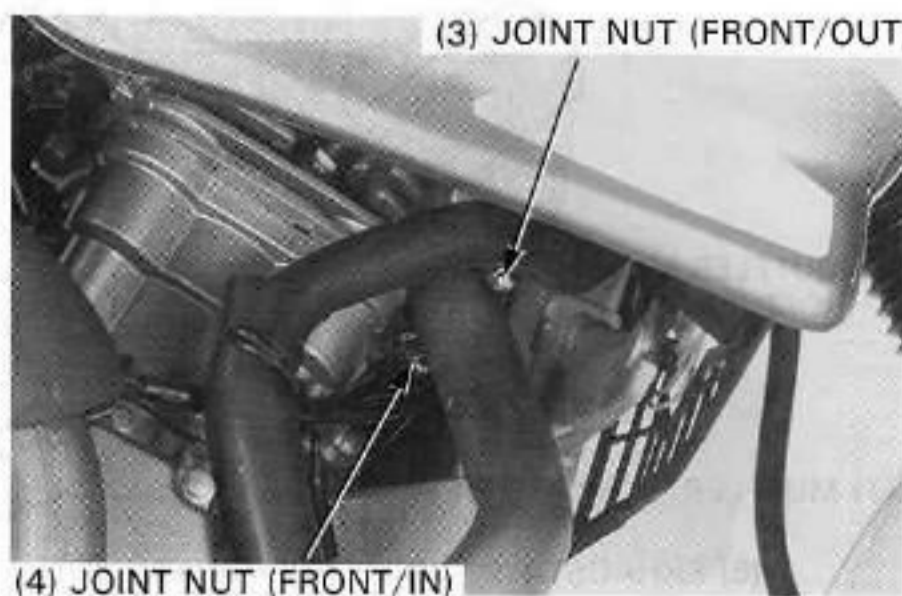
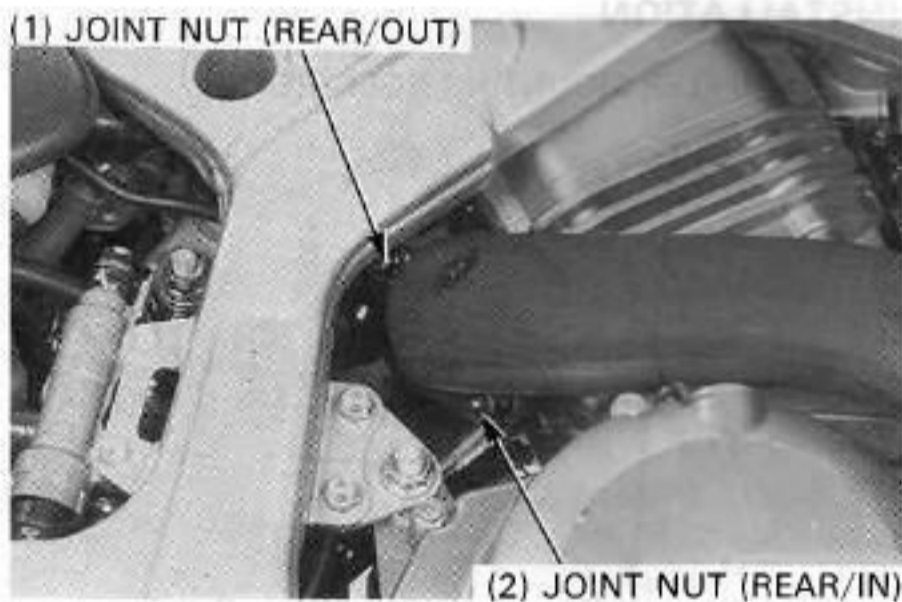
Install the exhaust pipe/muffler assembly.
Temporarily install the all bolts and nuts.



Tighten the exhaust pipe joint nuts to the specified torque in order as follows.

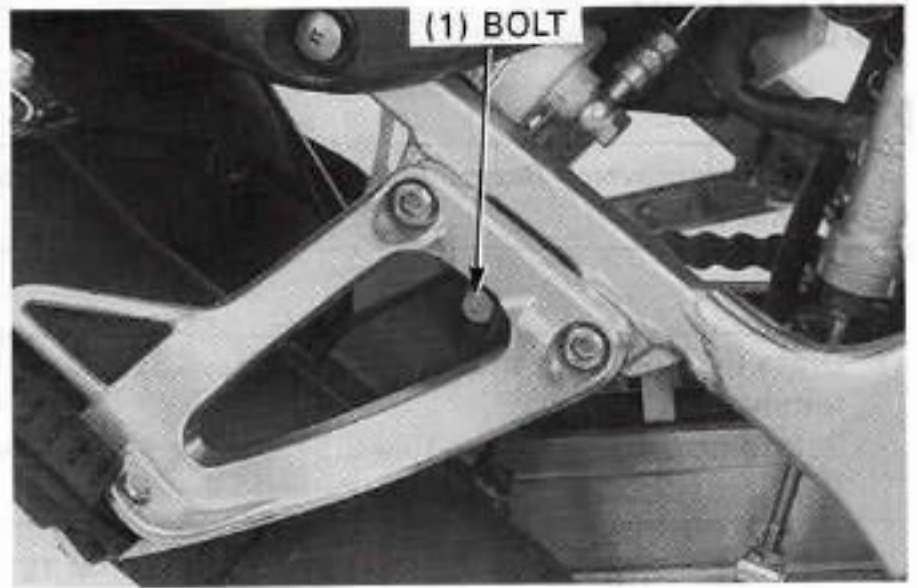
- (1) Rear/out side
- (2) Rear/in side
- (3) Front/out side
- (4) Front/in side

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



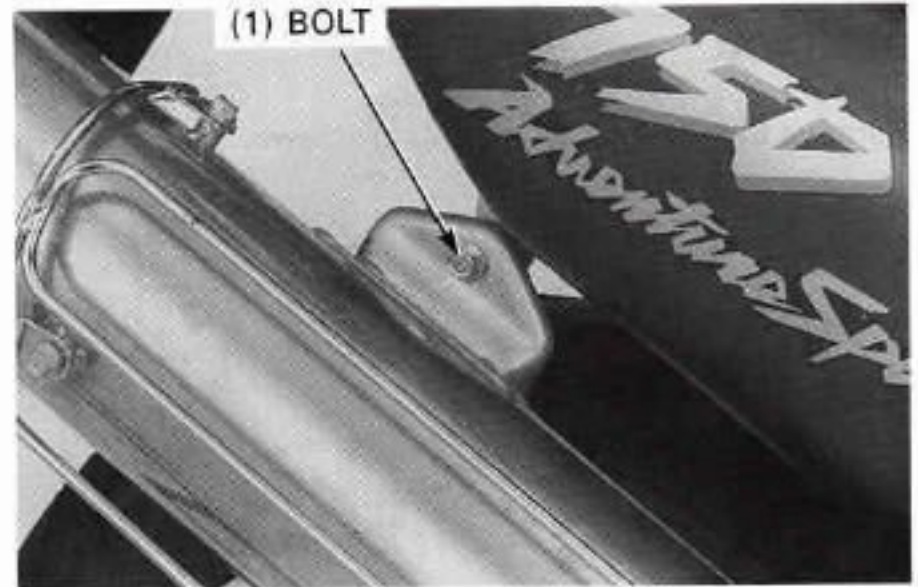
Install and tighten the muffler mounting bolt (front) to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



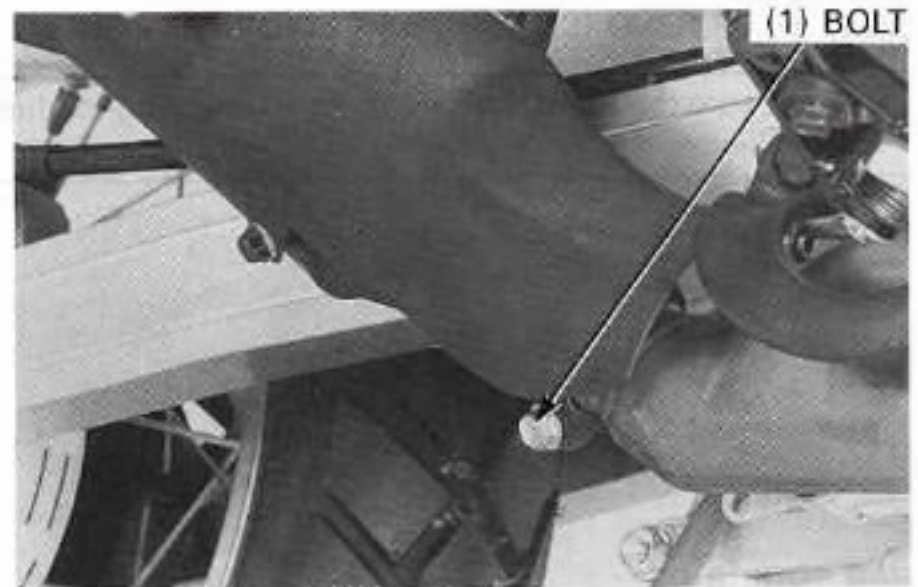
Install and tighten the muffler mounting bolt (rear) to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



Tighten the muffler band bolt to the specified torque.

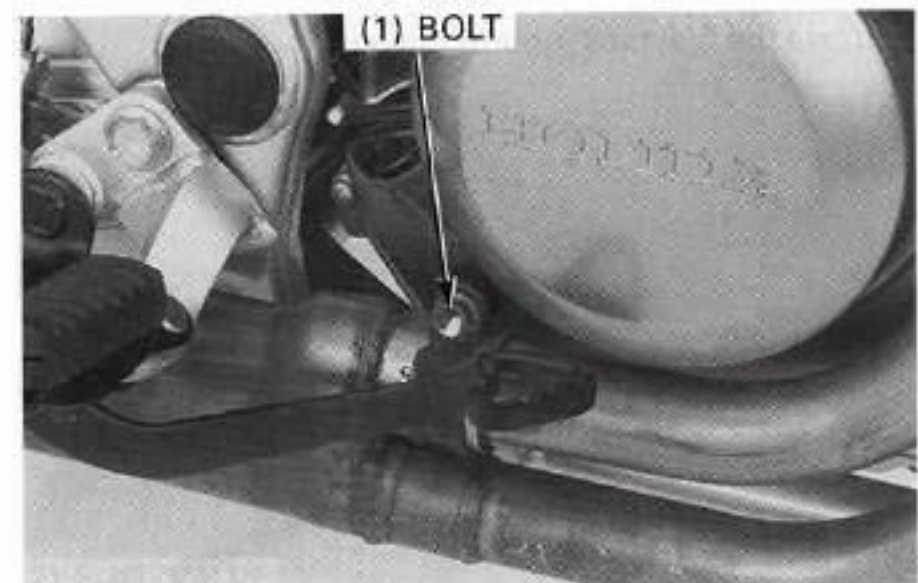
TORQUE: 21 N·m (2.1 kgf·m, 15 lbf·ft)



Tighten the exhaust pipe band bolt to the specified torque.

TORQUE: 21 N·m (2.1 kgf·m, 15 lbf·ft)

Install the skid plate (page 2-5).



FUEL TANK

⚠ WARNING

- Gasoline is extremely flammable and is explosive under certain condition.

NOTE

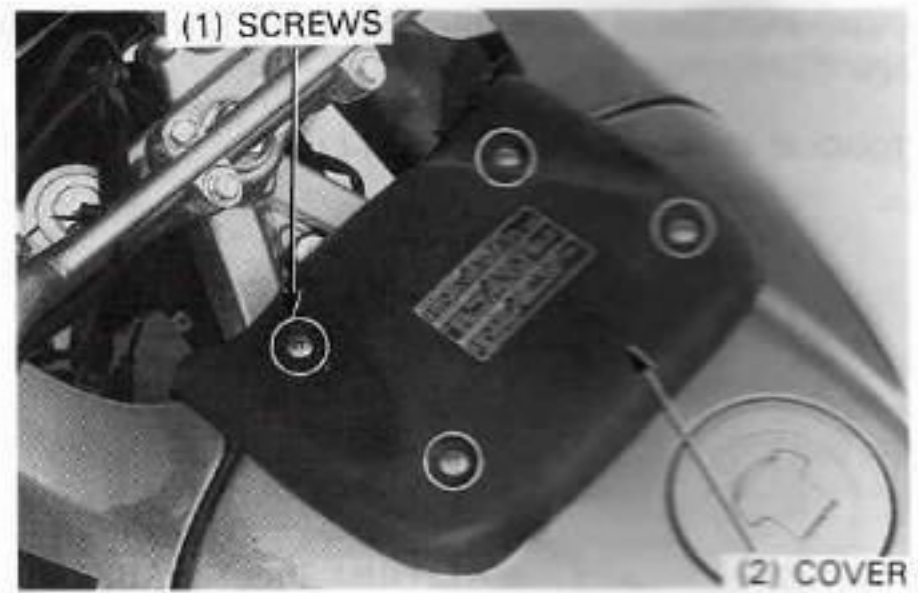
- Drain the fuel from the fuel tank for ease of fuel tank removal.
- Before disconnecting the fuel tube, turn the fuel valve OFF.



REMOVAL

Remove the upper cowl mounting screws.

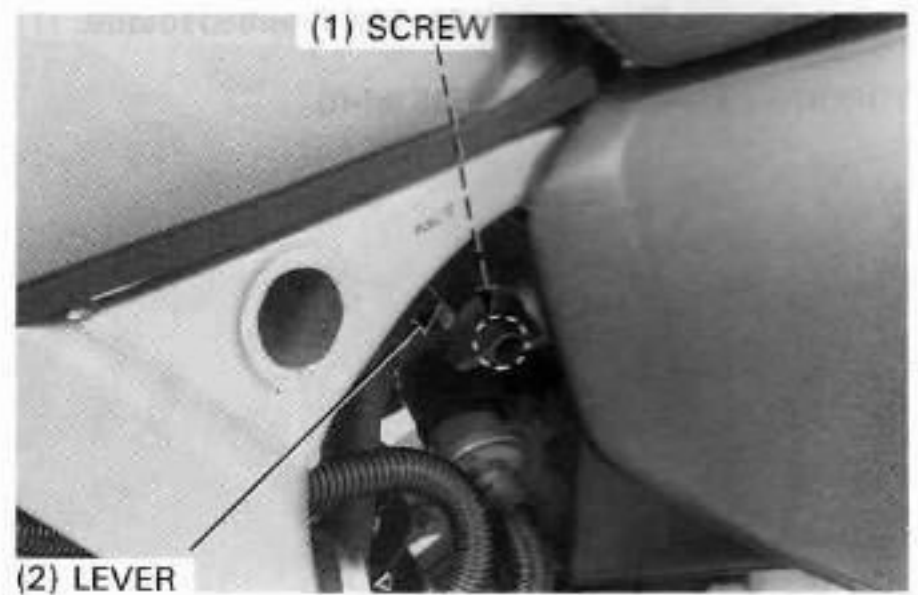
Remove the screws and air cleaner housing cover.



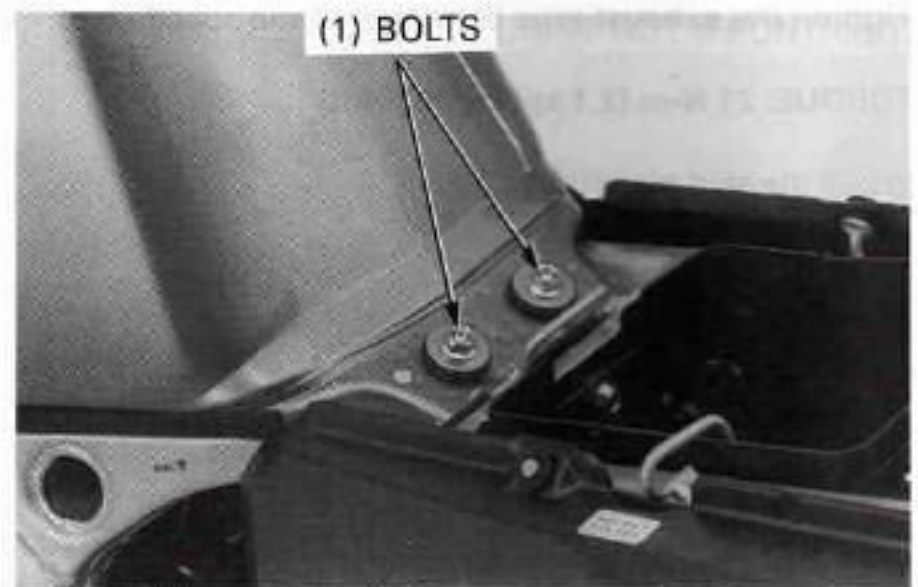
NOTE

- Make sure the fuel valve OFF, before removing the fuel valve lever.

Remove the screw and fuel valve lever.



Remove the fuel tank mounting bolts.



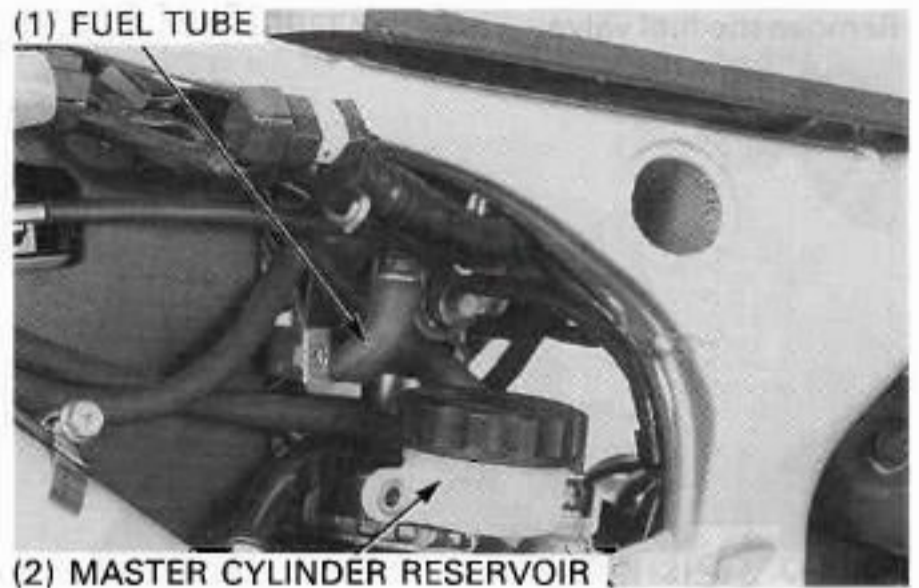
Remove the side cover (page 2-7).

Remove the bolt and rear master cylinder reservoir.

NOTE

- Keep the master cylinder upright to prevent air from entering the hydraulic system.

Disconnect the fuel tube.

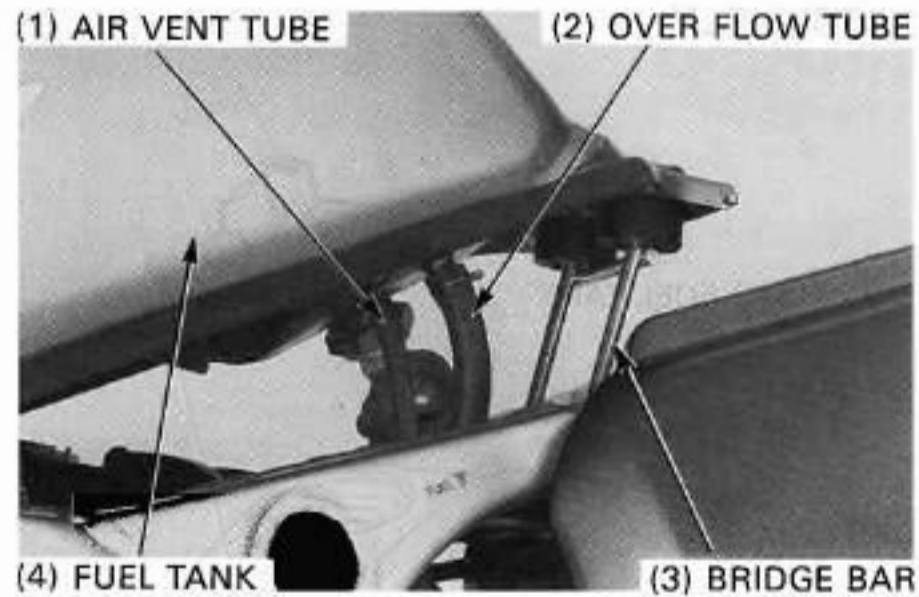


Remove the rubber band and fuel tank bridge bar from the seat.



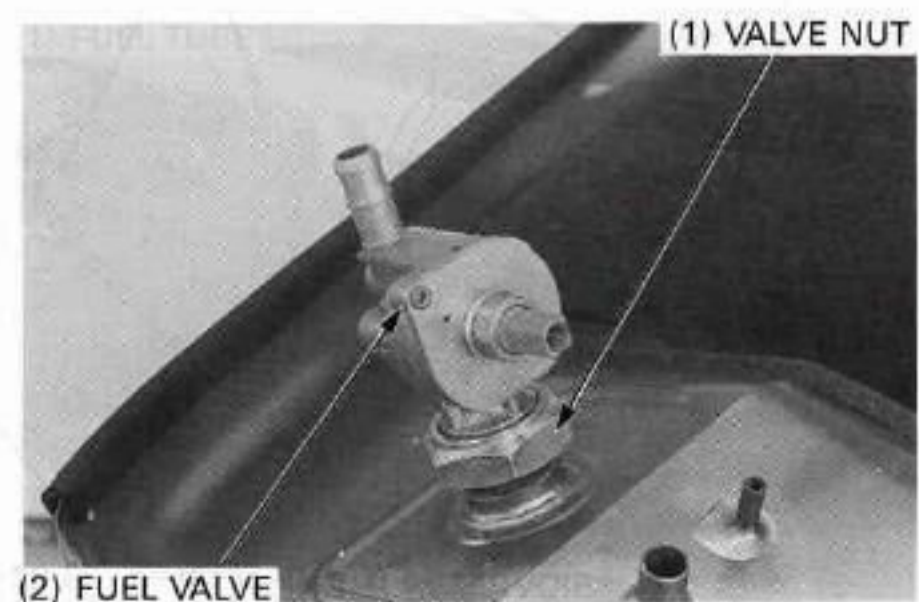
Support the fuel tank using the fuel tank bridge bar.

Disconnect the fuel tank air vent tube and fuel tank over flow tube.
Remove the fuel tank.



DISASSEMBLY

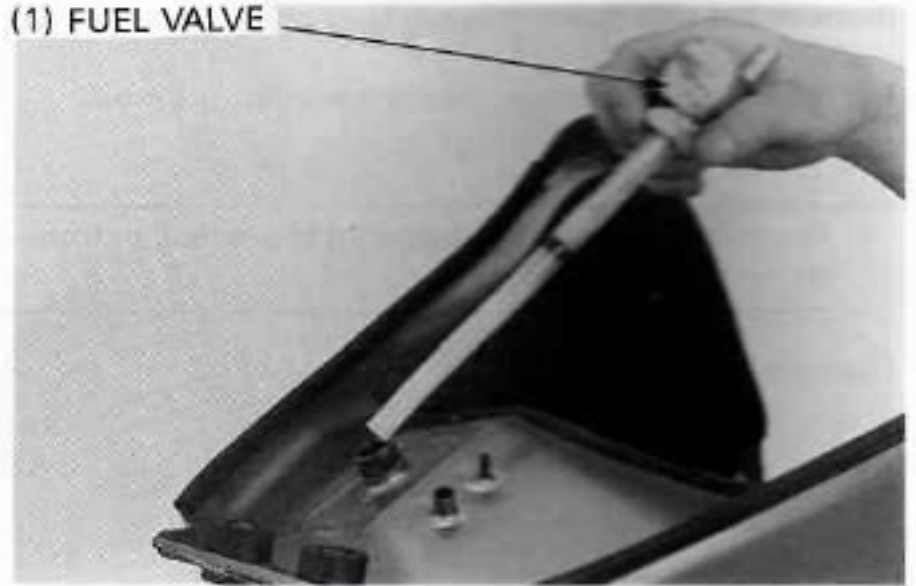
Loosen the fuel valve nut.



FRAME/BODY PANELS/EXHAUST SYSTEM

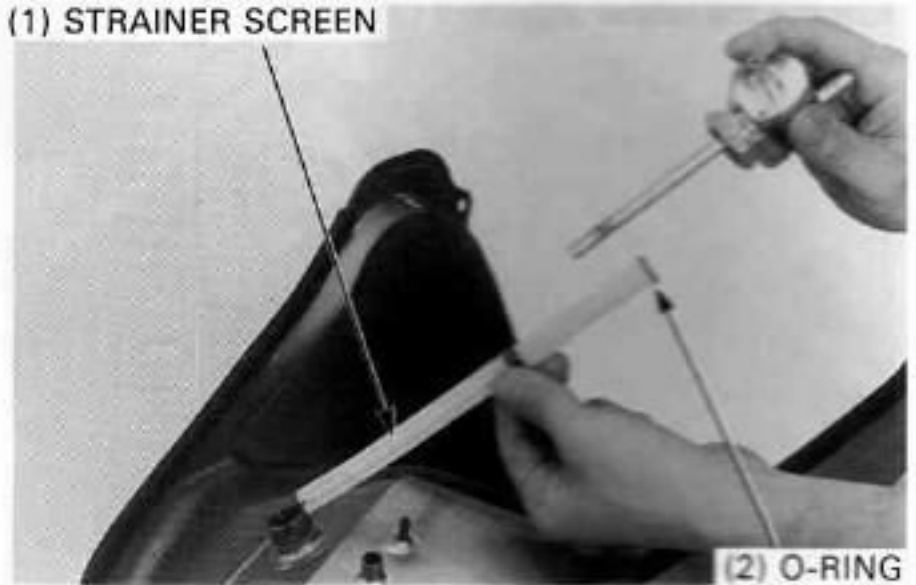
Remove the fuel valve.

(1) FUEL VALVE



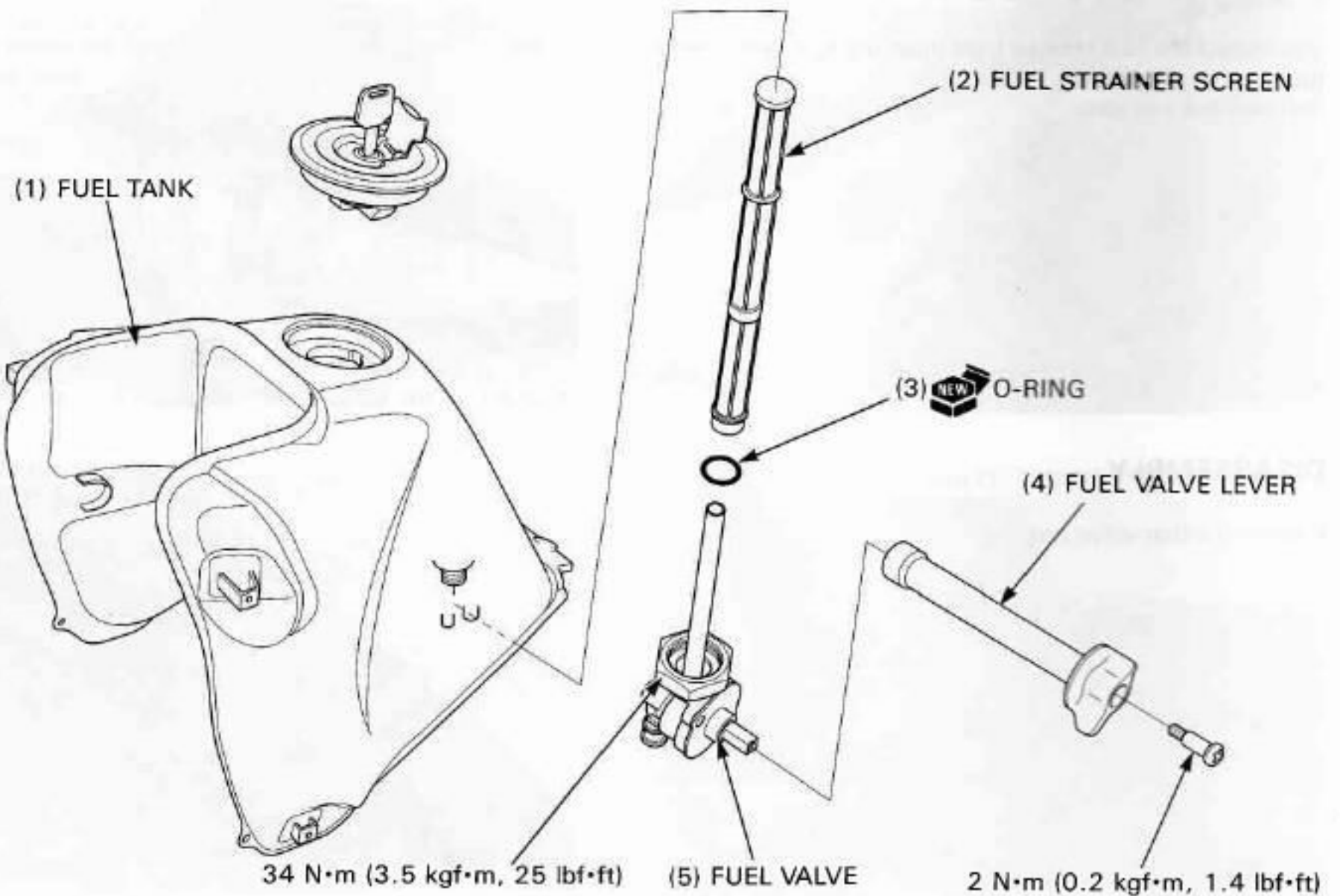
Remove the fuel strainer screen and O-ring.
Clean the fuel strainer screen.

(1) STRAINER SCREEN

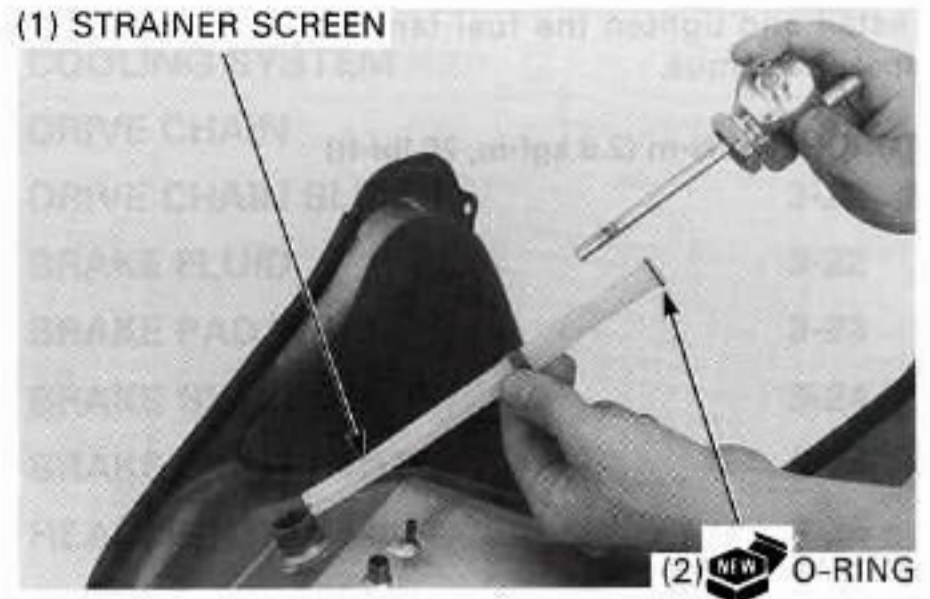


(2) O-RING

ASSEMBLY

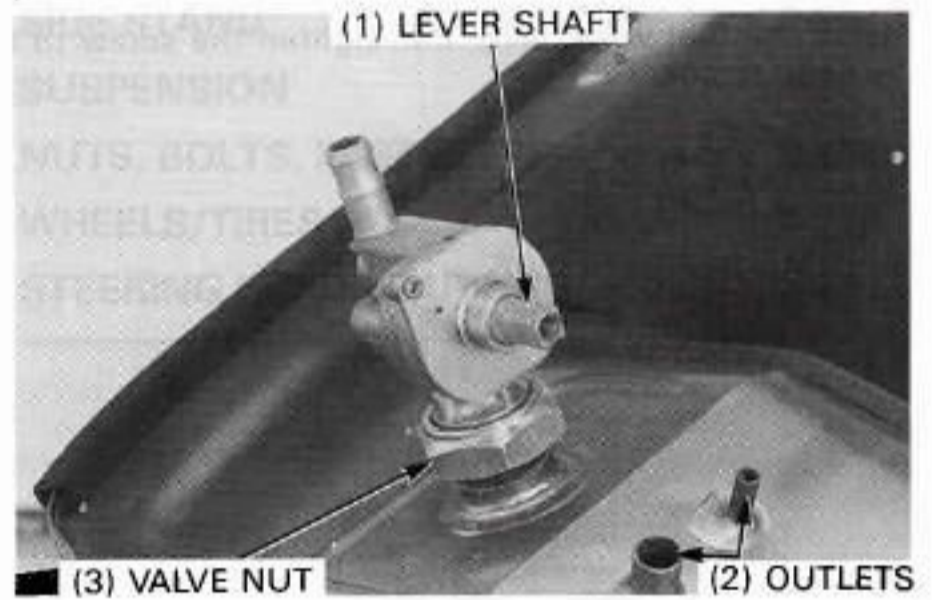


Install the new O-ring and fuel strainer screen onto the fuel valve.



Install the fuel valve into the fuel tank directing the lever shaft between the air vent tube outlet and over flow tube outlet. Tighten the fuel valve nut to the specified torque.

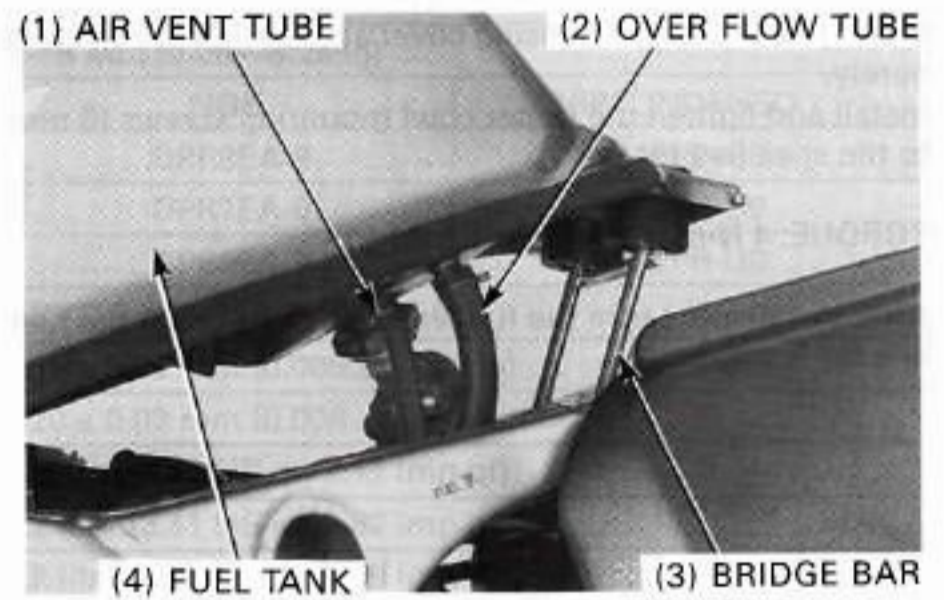
TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



INSTALLATION

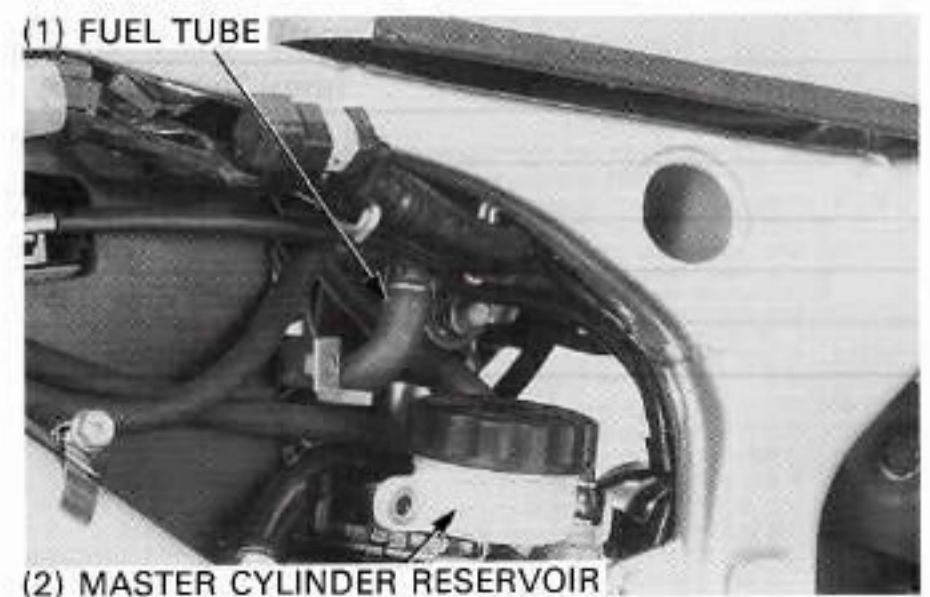
Install the fuel tank.
Support the fuel tank using the fuel tank bridge bar.

Connect the fuel tank air vent tube and fuel tank over flow tube.



Remove the fuel tank bridge bar.
Connect the fuel tube to the fuel valve.

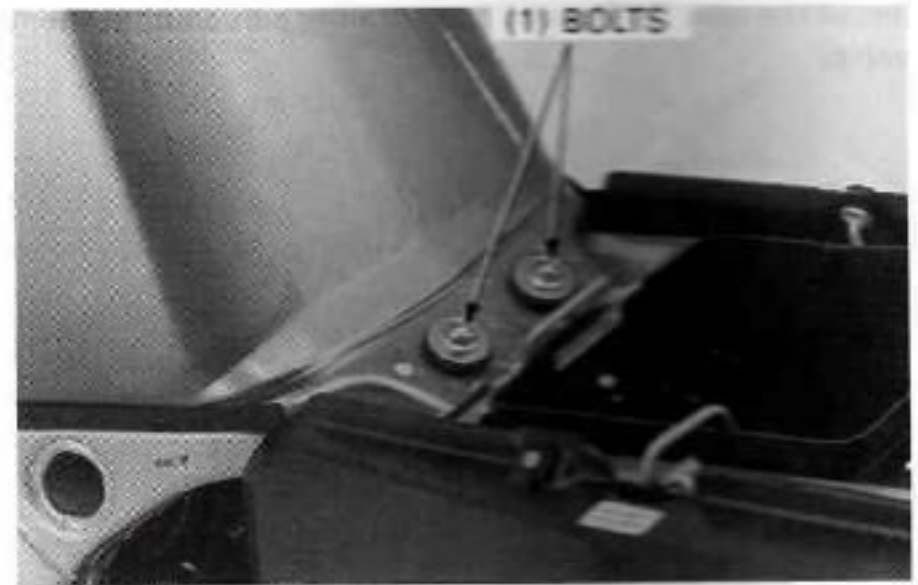
Install the rear master cylinder reservoir (page 15-31).



FRAME/BODY PANELS/EXHAUST SYSTEM

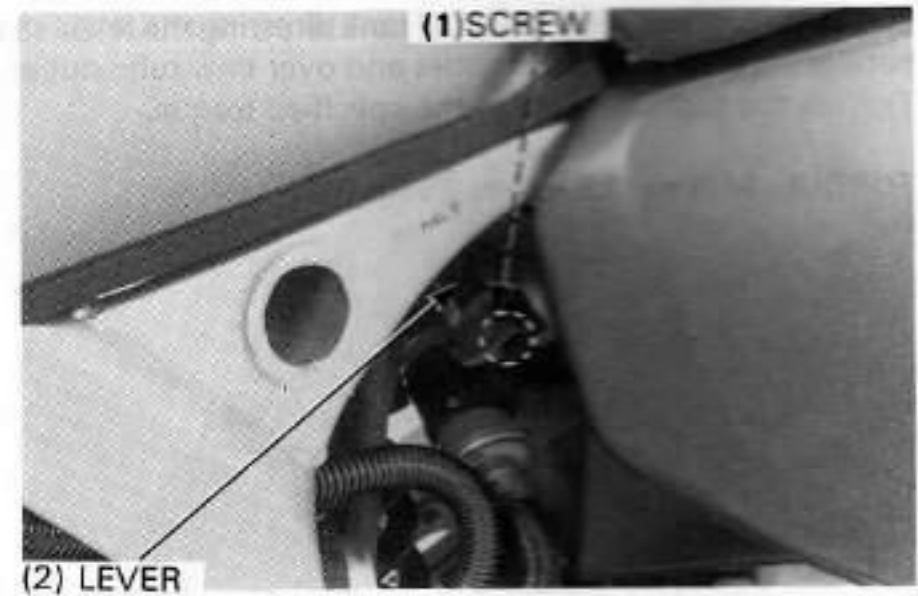
Install and tighten the fuel tank mounting bolts to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



Install the fuel valve lever and tighten the screw to the specified torque.

TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)



Install the air cleaner housing cover and tighten the screw securely.
Install and tighten the upper cowl mounting screws (6 mm) to the specified torque.

TORQUE: 4 N·m (0.4 kgf·m, 2.9 lbf·ft)

After installation, turn the fuel valve ON and check the fuel line for leakage.



3. MAINTENANCE

| | | | |
|----------------------------|------|------------------------|------|
| SERVICE INFORMATION | 3-1 | COOLING SYSTEM | 3-17 |
| MAINTENANCE SCHEDULE | 3-3 | DRIVE CHAIN | 3-18 |
| FUEL LINE | 3-4 | DRIVE CHAIN SLIDER | 3-22 |
| THROTTLE OPERATION | 3-4 | BRAKE FLUID | 3-22 |
| CARBURETOR CHOKE | 3-5 | BRAKE PAD WEAR | 3-23 |
| AIR CLEANER | 3-6 | BRAKE SYSTEM | 3-24 |
| SPARK PLUG | 3-7 | BRAKE LIGHT SWITCH | 3-24 |
| CRANKCASE BREATHER | 3-7 | HEADLIGHT AIM | 3-25 |
| VALVE CLEARANCE | 3-9 | CLUTCH SYSTEM | 3-25 |
| ENGINE OIL | 3-13 | SIDE STAND | 3-26 |
| ENGINE OIL FILTER | 3-14 | SUSPENSION | 3-26 |
| CARBURETOR SYNCHRONIZATION | 3-15 | NUTS, BOLTS, FASTENERS | 3-27 |
| ENGINE IDLE SPEED | 3-16 | WHEELS/TIRES | 3-27 |
| RADIATOR COOLANT | 3-17 | STEERING HEAD BEARINGS | 3-28 |

SERVICE INFORMATION

SPECIFICATION

| ITEM | | SPECIFICATIONS |
|------------------------------|-------------------------------------|---|
| Throttle grip free play | | 2 – 6 mm (0.08 – 0.24 in) |
| Spark plug | Standard | NGK |
| | | DPR8EA-9 |
| | For cold climate/below (5 °C/41 °F) | DPR7EA-9 |
| | For extended high speed riding | DPR9EA-9 |
| Spark plug gap | | 0.8 – 0.9 mm (0.031 – 0.035 in) |
| Valve clearance | IN | 0.15 ± 0.02 mm (0.006 ± 0.001 in) |
| | EX | 0.20 ± 0.02 mm (0.008 ± 0.001 in) |
| Engine oil capacity | At draining | 2.4 liter (2.52 US qt, 2.11 Imp qt) |
| | At disassembly | 3.2 liter (3.41 US qt, 2.82 Imp qt) |
| | At oil filter change | 2.6 liter (2.73 US qt, 2.29 Imp qt) |
| Carburetor vacuum difference | | 27kPa (20 mm Hg, 0.7 inHg) Base carburetor: Rear (#1) |
| Carburetor idle speed | Except SW type | 1,200 ± 100 min ⁻¹ (rpm) |
| | SW type | 1,200 ± 50 min ⁻¹ (rpm) |
| Drive chain slack | | 35 – 45 mm (1.4 – 1.8 in) |
| Drive chain size | DID | 525V8 |
| | RK | 525SM5 |
| Drive chain link | Except AR type | 124LE with O-ring |
| | AR type | 122LE with O-ring |

MAINTENANCE

| ITEM | | SPECIFICATIONS | |
|------------------------|----------------------|---------------------------|---|
| Clutch lever free play | | 10 – 20 mm (0.4 – 0.8 in) | |
| Cold tire pressure | Driver only | Front | 200 kPa (2.00 kgf/cm ² , 29 psi) |
| | | Rear | 200 kPa (2.00 kgf/cm ² , 29 psi) |
| | Driver and passenger | Front | 200 kPa (2.00 kgf/cm ² , 29 psi) |
| | | Rear | 250 kPa (2.50 kgf/cm ² , 36 psi) |
| Minimum tire depth | | Front | 1.5 mm (0.06 in) |
| | | Rear | 2.0 mm (0.08 in) |
| Tire size | | Front | 90/90-21 54H tube type |
| | | Rear | 140/80 R17 69H tube type |
| Tire brand | Bridgestone | Front | TW101 |
| | | Rear | TW152 Radial |
| | Michelin | Front | T66 |
| | | Rear | T66X |

TORQUE VALUES

| | | |
|--------------------------------|----------------------------------|---|
| Oil filter | 10 N•m (1.0 kgf•m, 7 lbf•m) | Apply engine oil to the O-ring |
| Oil drain bolt | 34 N•m (3.5 kgf•m, 25 lbf•ft) | |
| Spark plug | 14 N•m (1.4 kgf•m, 10 lbf•ft) | |
| Cylinder head cover bolt | 10 N•m (1.0 kgf•m, 7 lbf•ft) | |
| Valve adjusting screw lock nut | 23 N•m (2.3 kgf•m, 17 lbf•ft) | Apply oil to the threads and flange surface |
| Rear axle nut | 91 N•m (9.3 kgf•m, 67 lbf•ft) | U-nut |
| Side stand pivot nut | 38 N•m (3.9 kgf•m, 28 lbf•ft) | U-nut |
| Side stand switch bolt | 10 N•m (1.0 kgf•m, 7 lbf•ft) | ALOC bolt |
| Spoke nipple | 3.7 N•m (0.38 kgf•m, 2.7 lbf•ft) | |

TOOLS

| | |
|------------------------------|---------------|
| Valve adjusting screw wrench | 07908-KE90000 |
| Drive chain tool set | 07HMH-MR10103 |
| Oil filter wrench | 07HAA-PJ70100 |
| Vacuum gauge attachment | 07510-3000200 |

MAINTENANCE SCHEDULE

Perform the PRE-RIDE INSPECTION in the Owner's Manual at each scheduled maintenance period.

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

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

The following items require some mechanical knowledge. Certain items (particularly those marked* and **) may require more technical information and tools. Consult their authorized Honda dealer.

| ITEM | FREQUENCY | WHICHEVER ⇄ COMES FIRST ↓ | ODOMETER READING (NOTE 1) | | | | | | | | Refer to page |
|------------------------------|-----------|------------------------------------|------------------------------|-----|---|----|----|----|----|----|------------------|
| | | | X 1,000 km | 1 | 6 | 12 | 18 | 24 | 30 | 36 | |
| | | | X 1,000 mi | 0.6 | 4 | 8 | 12 | 16 | 20 | 24 | |
| | | | MONTHS | | 6 | 12 | 18 | 24 | 30 | 36 | |
| * FUEL LUNE | | | | | I | | I | | I | | 3-4 |
| * THROTTLE OPERATION | | | | | I | | I | | I | | 3-4 |
| * CARBURETOR CHOKE | | | | | I | | I | | I | | 3-5 |
| * AIR CLEANER | | NOTE 2 | | | | | R | | | R | 3-6 |
| CRANKCASE BREATHER | | | | C | C | C | C | C | C | C | 3-7 |
| SPARK PLUG | | | | I | R | I | R | I | R | | 3-7 |
| * VALVE CLEARANCE | | | I | | I | | I | | I | | 3-9 |
| ENGINE OIL | | | R | | R | | R | | R | | 3-13 |
| ENGINE OIL FILTER | | | R | | R | | R | | R | | 3-14 |
| * CARBURETOR SYNCHRONIZATION | | | | | I | | I | | I | | 3-15 |
| * ENGINE IDLE SPEED | | | I | I | I | I | I | I | I | I | 3-16 |
| RADIATOR COOLANT | | NOTE 3 | | | I | | I | | R | | 3-17 |
| * COOLING SYSTEM | | | | | I | | I | | I | | 3-17 |
| DRIVE CHAIN | | | EVERY 1,000 km (600 mi) I, L | | | | | | | | 3-18 |
| DRIVE CHAIN SLIDER | | | | I | I | I | I | I | I | I | 3-22 |
| BRAKE FLUID | | NOTE 3 | | I | I | R | I | I | R | | 3-22 |
| BRAKE PAD WEAR | | | | I | I | I | I | I | I | | 3-23 |
| BRAKE SYSTEM | | | I | | I | | I | | I | | 3-24 |
| * BRAKE LIGHT SWITCH | | | | | I | | I | | I | | 3-24 |
| * HEADLIGHT AIM | | | | | I | | I | | I | | 3-25 |
| CLUTCH SYSTEM | | | I | I | I | I | I | I | I | I | 3-25 |
| SIDE STAND | | | | | I | | I | | I | | 3-26 |
| * SUSPENSION | | | | | I | | I | | I | | 3-26 |
| * NUTS, BOLTS, FASTENERS | | | I | | I | | I | | I | | 3-27 |
| ** WHEELS/TIRES | | | I | I | I | I | I | I | I | I | 3-27 |
| ** STEERING HEAD BEARINGS | | | I | | I | | I | | I | | 3-28 |

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

** In the interest of safety, we recommended these items be serviced only by an authorized Honda dealer.

NOTES: 1. At higher odometer readings, repeat at the frequency interval established here.

2. Service more frequently when riding in unusually wet or dusty areas.

3. Replace every 2 years, or at indicated odometer interval, whichever comes first. Replacement requires mechanical skill.

4. Switzerland and Austria model only.

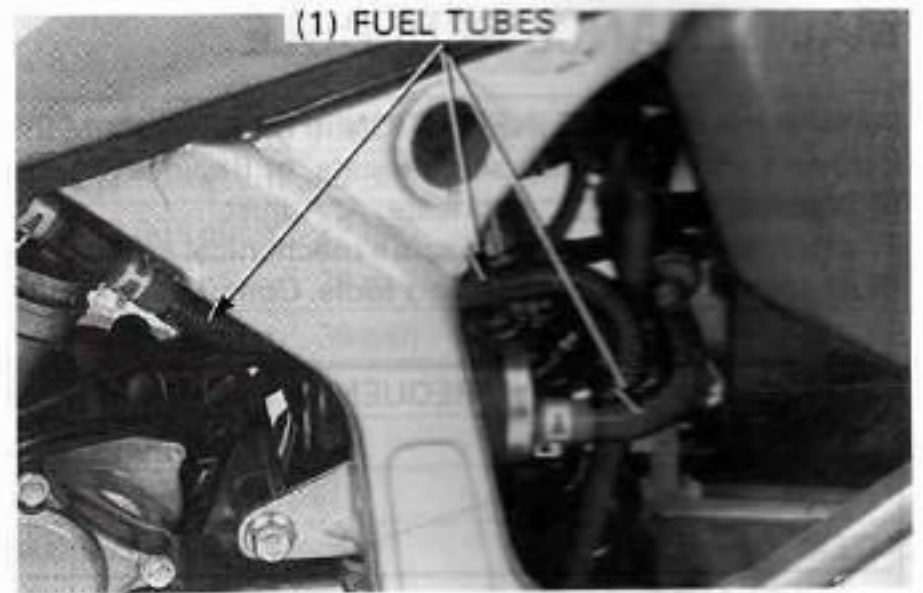
MAINTENANCE

FUEL LINE

Check the fuel lines for deterioration, damage or leakage. Replace the fuel lines if necessary.

Fuel strainer inspection (page 2-22).
Fuel filter inspection (page 5-27).

Route the tubes properly (page 1-22).



THROTTLE OPERATION

Check for any deterioration or damage to the throttle cables. Check the throttle grip for smooth operation. Check that the throttle grip returns from the full open to the full closed position smoothly and automatically in all steering positions.

If the throttle grip does not return properly, lubricate the throttle cable, overhaul and lubricate the throttle grip housing.

For cable lubrication: Disconnect the throttle cables at their upper ends (page 13-6). Thoroughly lubricate the cables and their pivot points with a commercially available cable lubricant or a light weight oil.

If the throttle grip still does not return properly, replace the throttle cables.

⚠ WARNING

- *Reusing a damaged or abnormally bent or kinked throttle cable can prevent proper throttle side operation and may lead to a loss of throttle control while riding.*

With the engine idling, turn the handlebar all the way to the right and left to ensure that idle speed does not change. If idle speed increases, check the throttle grip free play and the throttle cable connection.

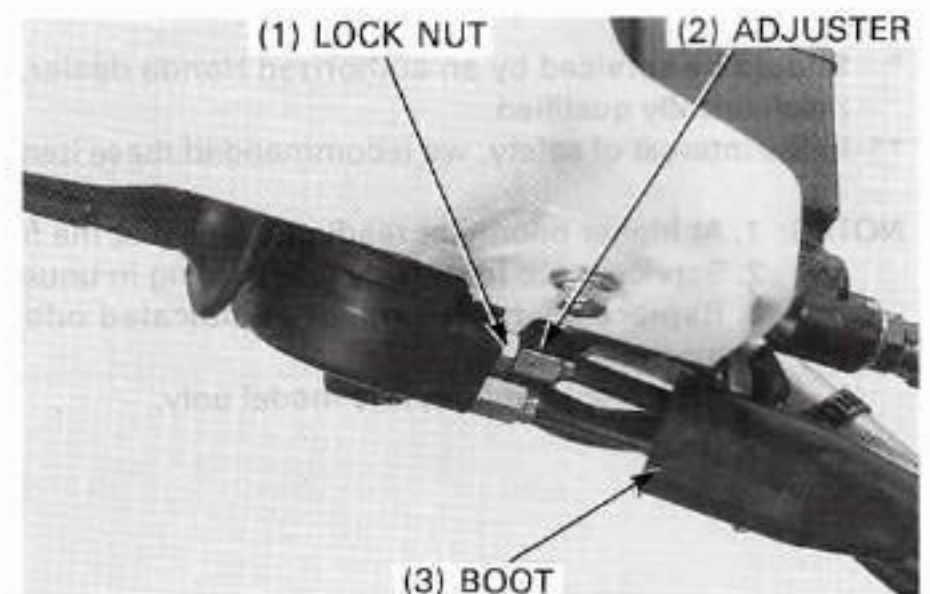
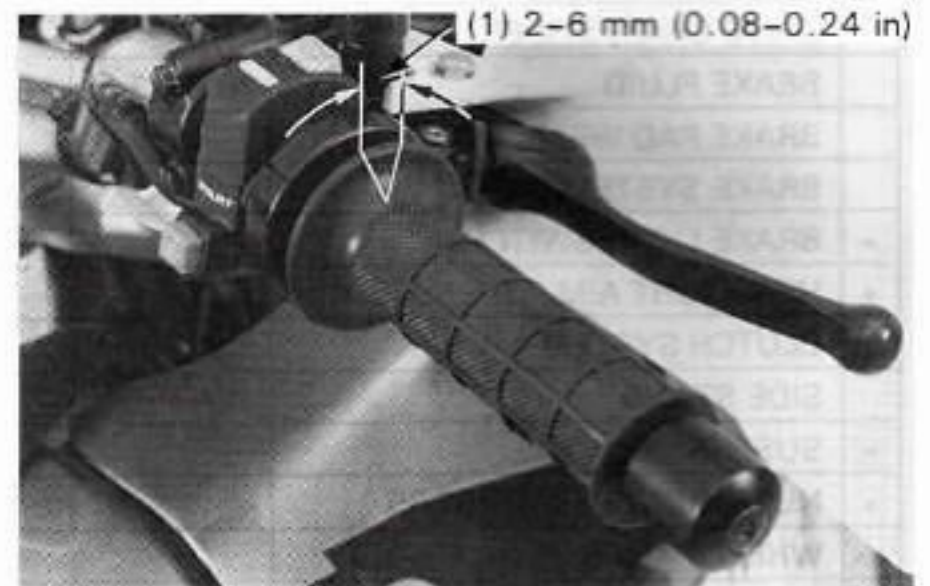
Measure the throttle grip free play at the throttle grip flange.

FREE PLAY: 2 - 6 mm (0.08 - 0.24 in)

Throttle grip free play can be adjusted at either end of the throttle cable. Minor adjustments are made with the upper adjuster.

Loosen the lock nut and turn the adjuster to obtain the free play.

After the adjustment, tighten the lock nut securely and reposition the boot properly.



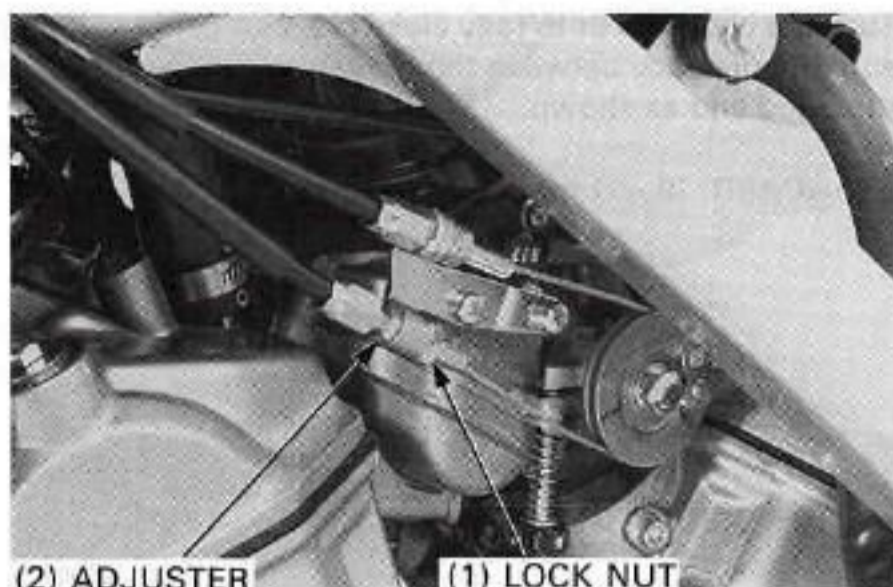
Major adjustments are made with the lower adjuster.

Remove the fuel tank (page 2-20).

Loosen the lock nuts and turn the adjusters to obtain the free play.

After the adjustment, tighten the lock nuts securely. Recheck the throttle grip free play.

Install the fuel tank (page 2-23).



CARBURETOR CHOKE

STARTING ENRICHMENT (SE) VALVE

The choke system uses a fuel enriching circuit controlled by an SE valve. The SE valve opens the enriching circuit via a cable when the choke lever on the handlebar is moved back.

Check for smooth operation of the choke lever from full open to full closed position.

Check for any deterioration or damage to the choke cable. If the operation is not smooth, lubricate the choke cable, overhaul and lubricate the choke lever.

For cable lubrication: Disconnect the choke cable at the upper ends (page 13-6). Thoroughly lubricate the cable and its pivot point with a commercially available cable lubricant or a light weight oil.

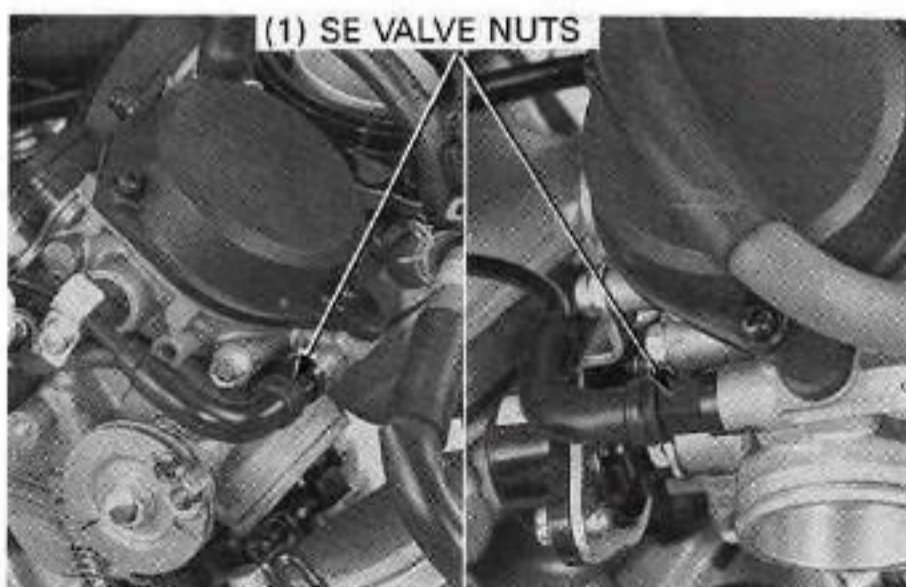
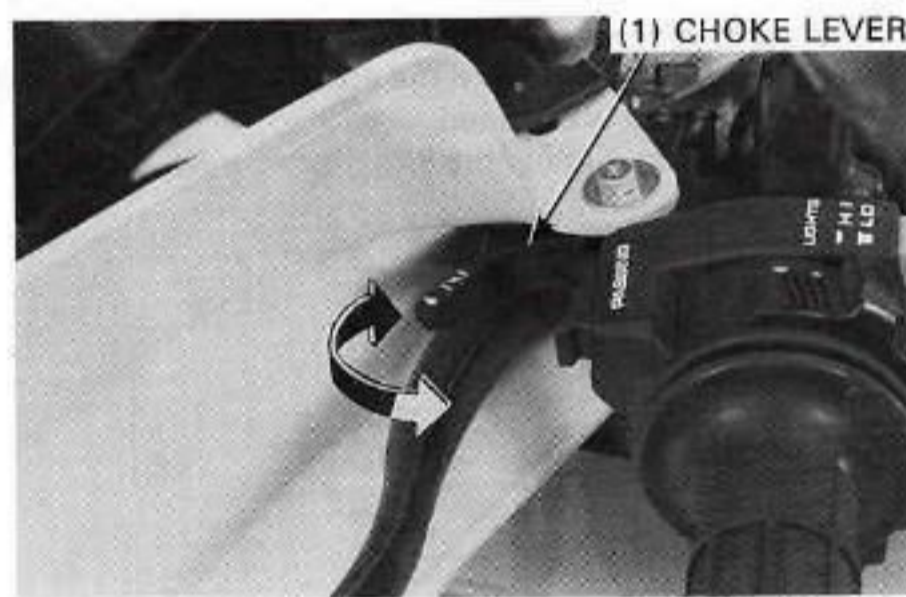
Starting enrichment system operation can be checked by the way the engine starts and runs:

- Difficulty in starting before the engine is warm up (easy once it is warmed up): SE valve is not completely opened.
- Idle speed is erratic even after warm-up (imperfect combustion): SE valve is not completely closed.

When the above symptoms occur, inspect the SE valve using the following procedure.

Remove the carburetor (page 5-5).

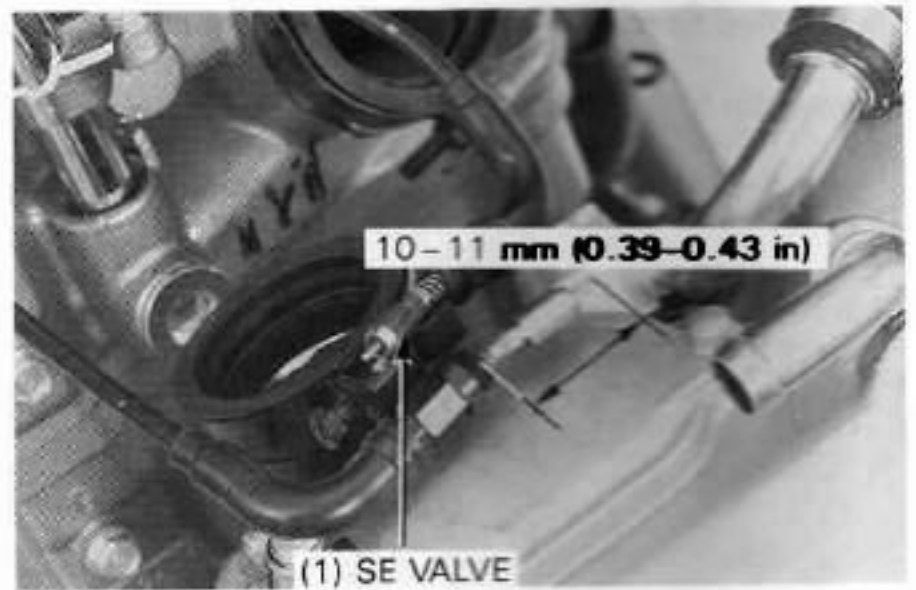
Loosen the SE valve nuts and remove them from the carburetors.



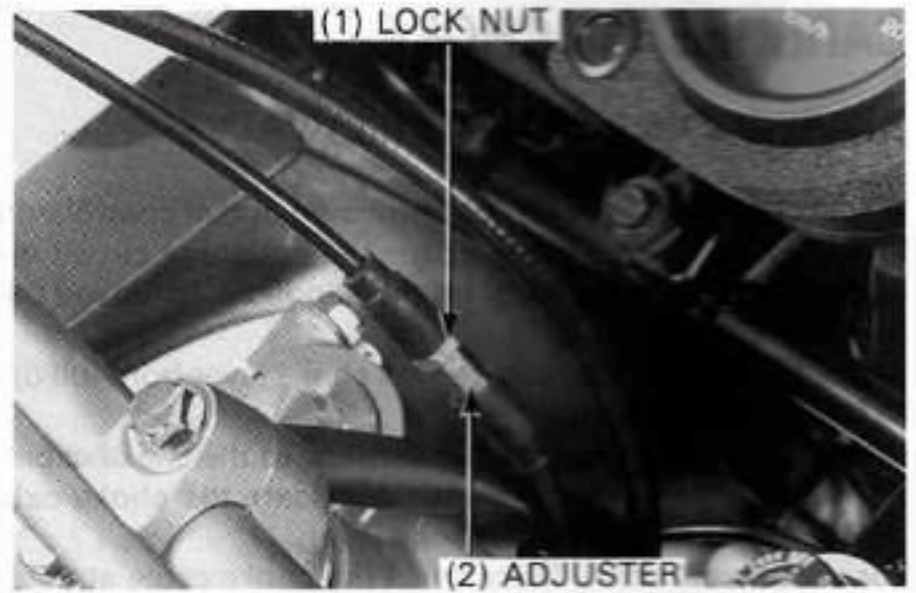
MAINTENANCE

Turn the choke lever to fully close position (OFF) and measure the distance between the SE valve end and the cable threaded end as shown.

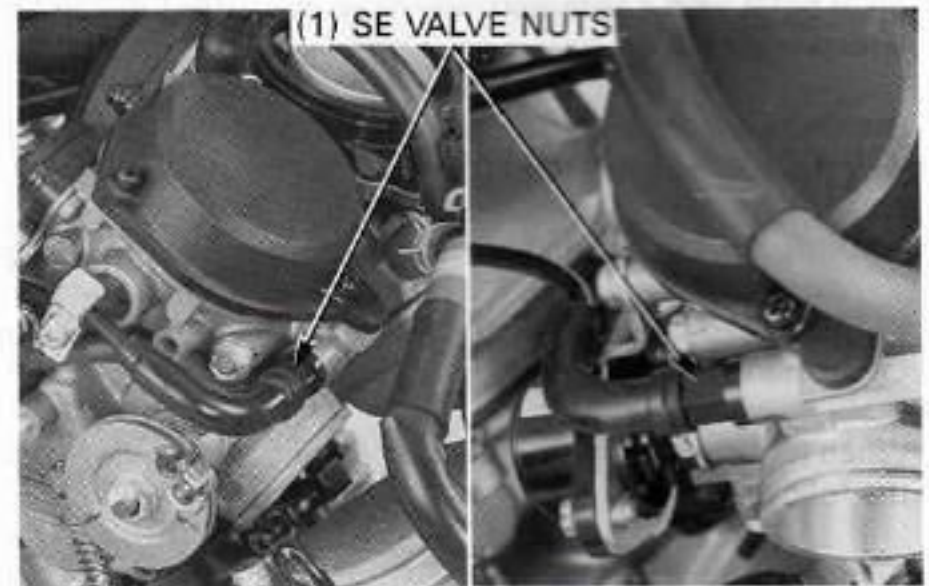
STANDARD: 10 - 11 mm (0.39 - 0.43 in)



To adjust as follows:
Loosen the lock nut and turn the adjuster until the specified SE valve distance is obtained.
After adjustment, tighten the lock nut securely.



Recheck the distance and choke lever operation.
Thread the SE valves in by hand and then tighten the SE valve nuts 1/4 turn with a 14 mm wrench.

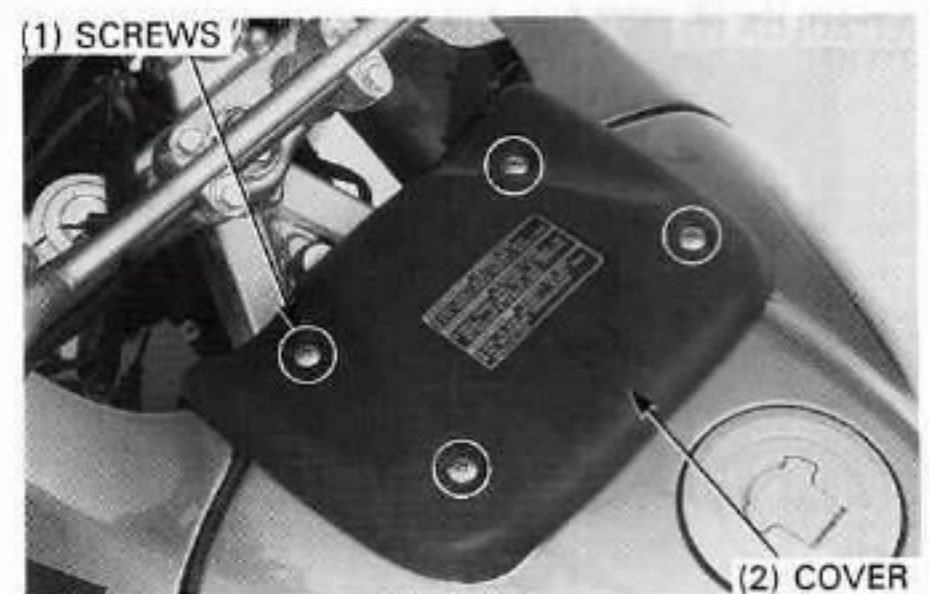


AIR CLEANER

NOTE

- The viscous paper element type air cleaner cannot be cleaned because the element contains a dust adhesive.
- If the motorcycle is used in wet or dusty areas, more frequent inspections are required.

Remove the screws and air cleaner housing cover.



Remove the air cleaner housing cover.

Replace the air cleaner in accordance with the maintenance schedule (page 3-3) or any time it is excessively dirty or damaged.

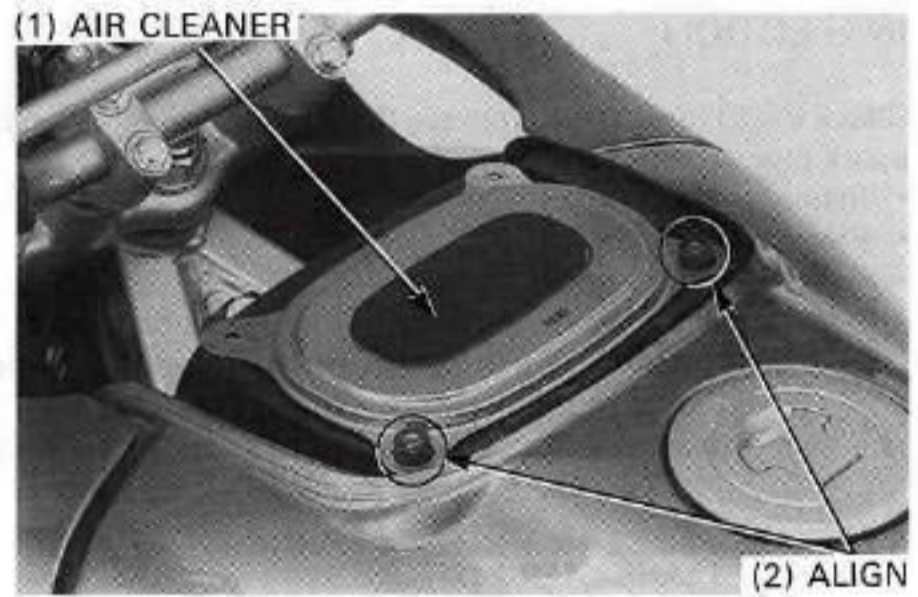


Install the air cleaner in the reverse order of removal.

NOTE

- At installation, align the holes of the air cleaner with the tabs on the air cleaner housing.

Install the removed parts in the reverse order of removal.

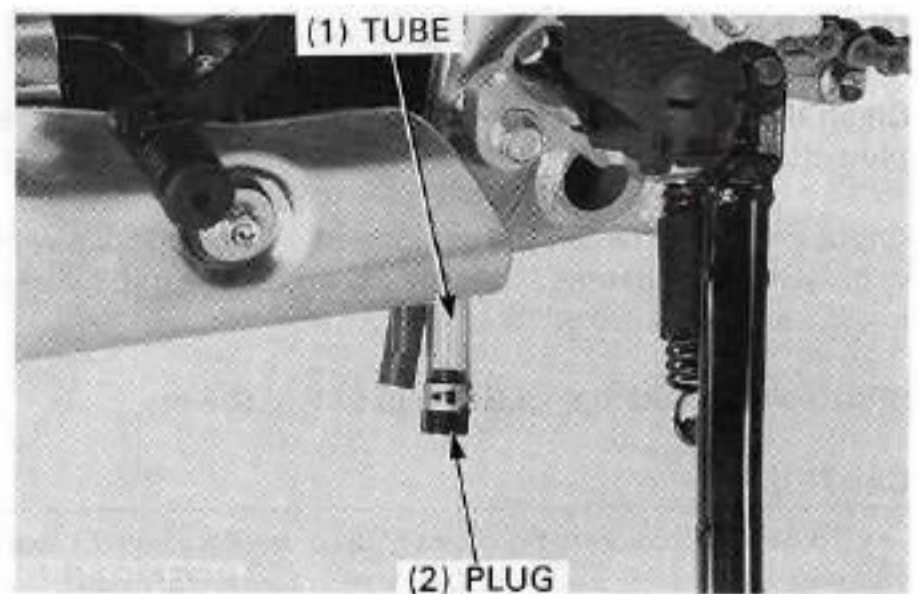


CRANKCASE BREATHER

Remove the crankcase breather tube plug from the tube end and drain deposits into a suitable container, then install the tube plug securely.

NOTE

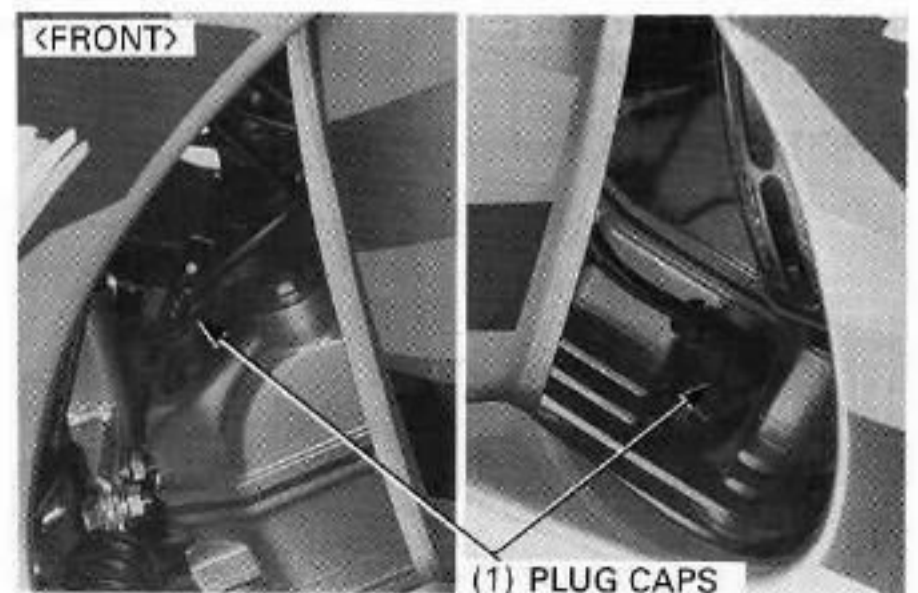
- Service more frequently when ridden in rain, at full throttle, or after the motorcycle is washed or overturned. Service if the deposits level can be seen in the transparent section of the breather tube.



SPARK PLUG

FRONT:

Disconnect the spark plug caps and clean around the spark plug bases.



MAINTENANCE

REAR:

Remove the fuel tank (page 2-20).

Disconnect the spark plug caps and clean around the spark plug bases.

NOTE

- Clean around the spark plug bases with compressed air before removing, and be sure that no debris is allowed to enter the combustion chamber.

Remove the spark plugs using the spark plug wrench. Inspect or replace as described in the maintenance schedule (page 3-3).

INSPECTION

Check the following and replace if necessary (recommended spark plugs: page 3-1).

- Insulator for damage
- Electrodes for wear
- Burning condition, coloration;
 - dark to light brown indicates good condition.
 - excessive lightness indicates malfunctioning ignition system or lean mixture.
 - wet or black sooty deposit indicates over-rich mixture.

REUSING A SPARK PLUG

Clean the spark plug electrodes with a wire brush or spark plug cleaner.

Check the gap between the center and side electrodes with a wire-type feeler gauge. If necessary, adjust the gap by bending the side electrodes carefully.

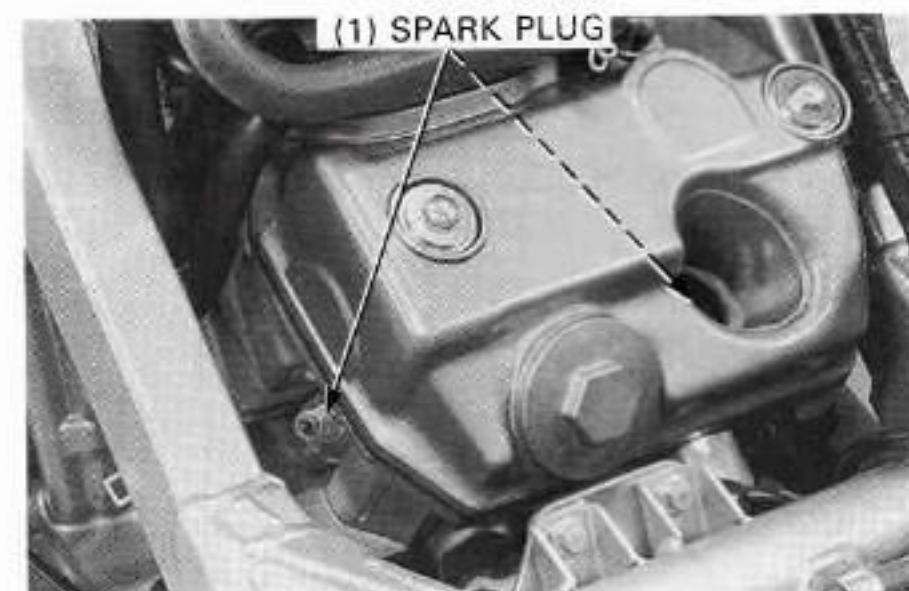
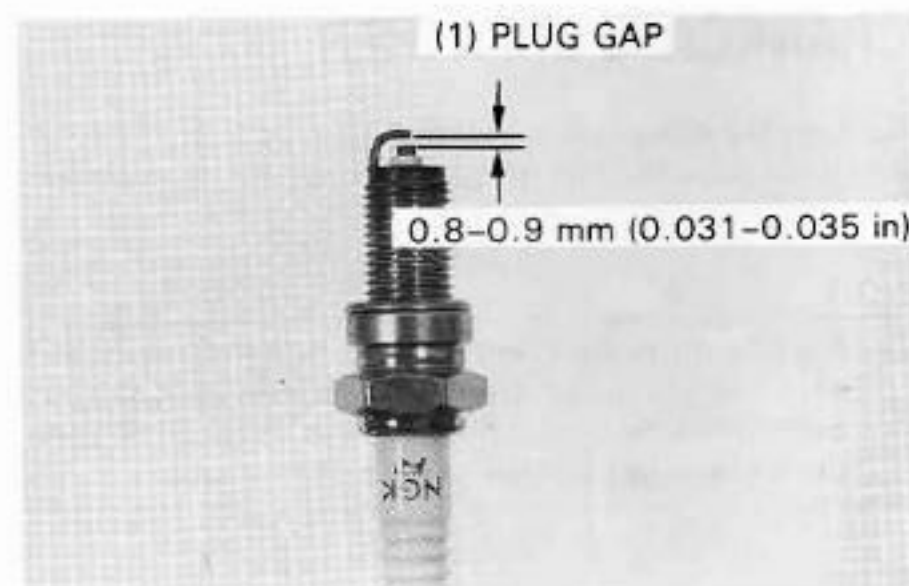
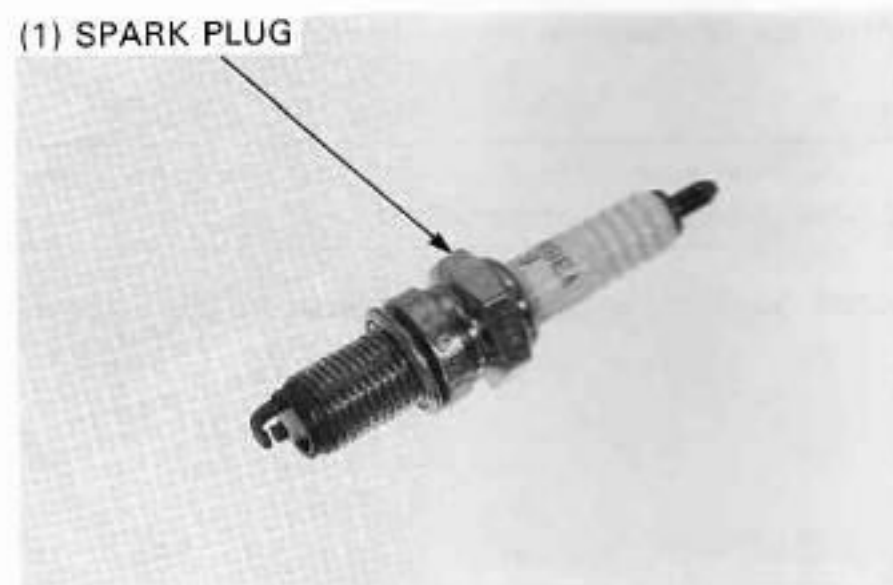
SPARK PLUG GAP: 0.8 - 0.9 mm (0.031 - 0.035 in)

CAUTION

- To prevent damage to the cylinder head, hand-tighten the spark plug before using a wrench to tighten to the special torque.

Reinstall the spark plug in the cylinder head and hand tighten, then torque to the specification.

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)



REPLACING A SPARK PLUG

Set the plug gap to specification with a wire-type feeler gauge (see previous page).

CAUTION

- Do not overtighten the spark plug.

Install and tighten the new spark plug, then tighten it about 1/4 of turn after sealing washer contacts the seat of the plug hole.

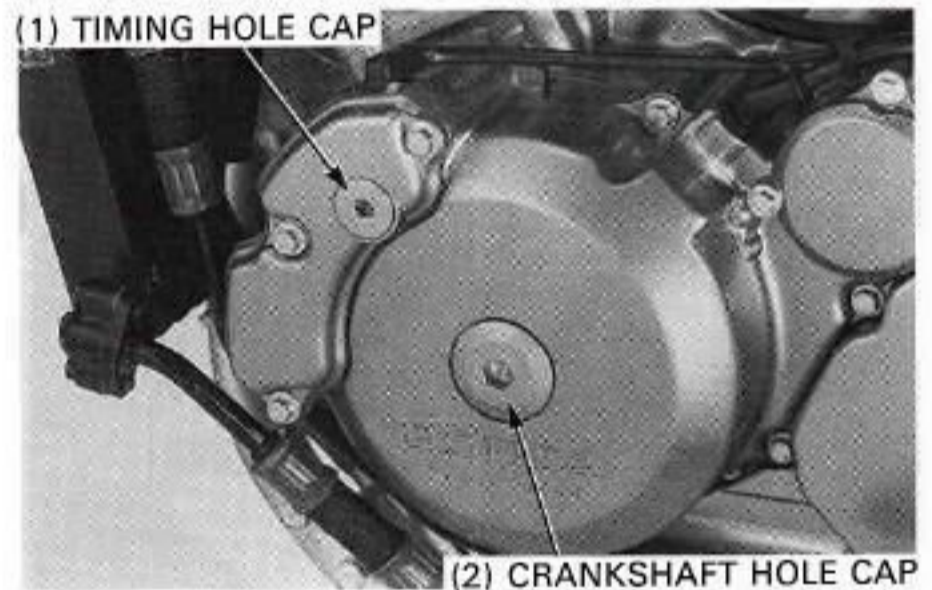
VALVE CLEARANCE

NOTE

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

Remove the fuel tank (page 2-20).

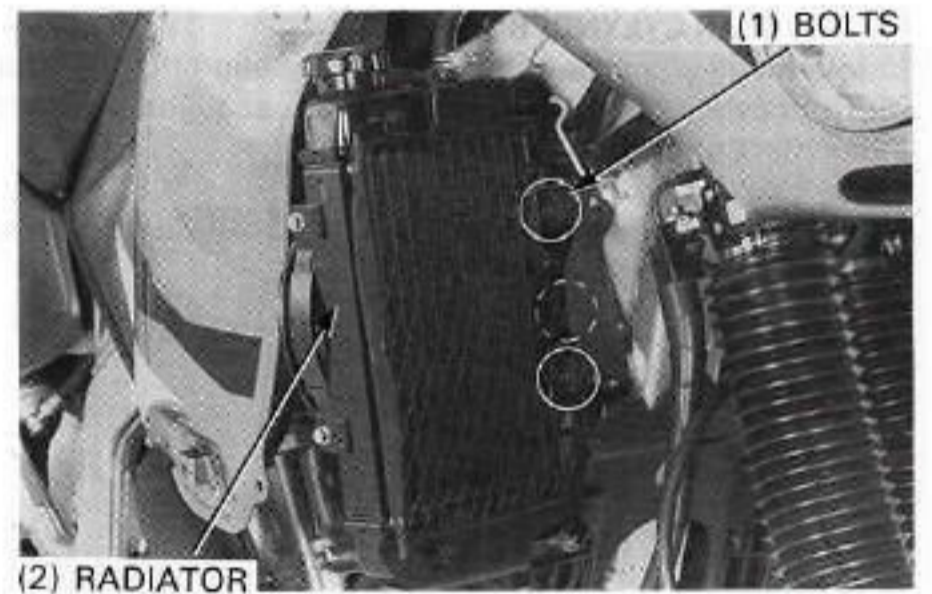
Remove the timing hole cap and crankshaft hole cap.



FRONT CYLINDER ONLY:

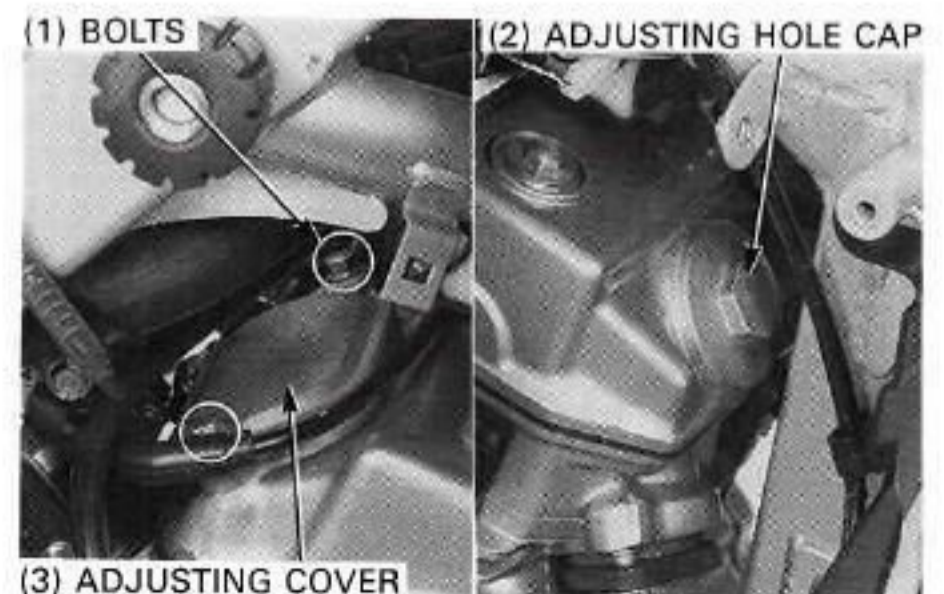
Remove the air cleaner housing (page 5-4).

Remove the radiator mounting bolts and free the radiator to access the service.



Remove the stone guard (page 2-5).

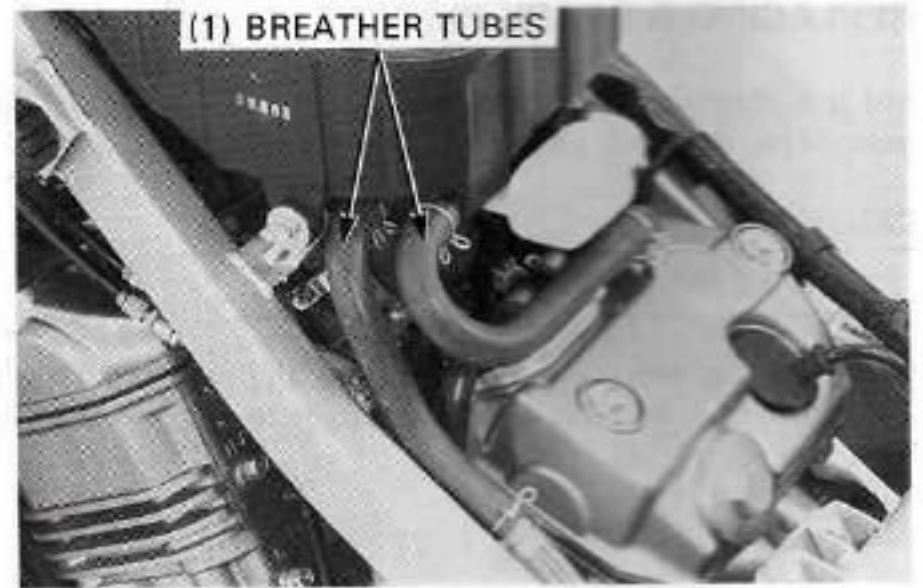
Remove the valve adjusting hole cap.
Remove the bolts and valve adjusting cover.



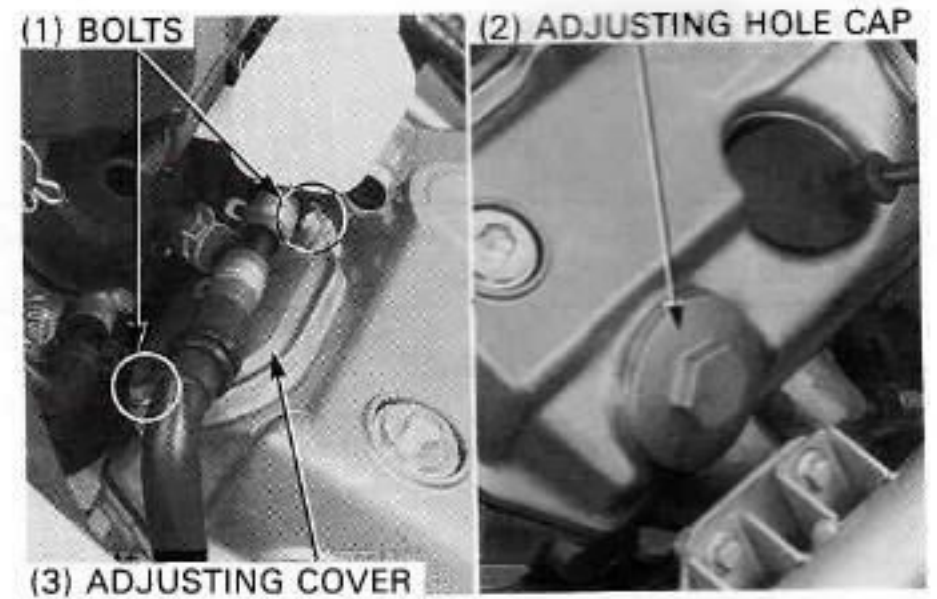
MAINTENANCE

REAR CYLINDER ONLY:

Disconnect the crankcase breather tubes.



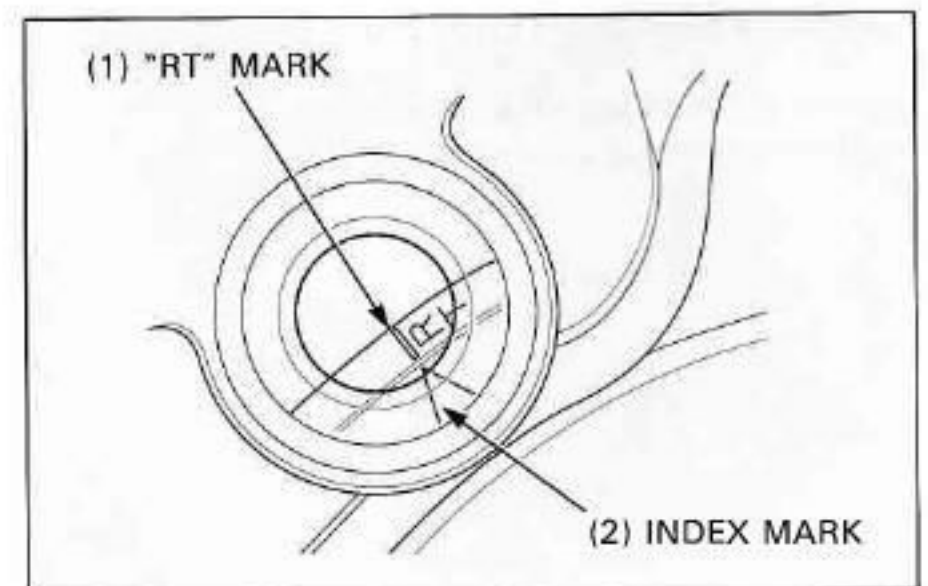
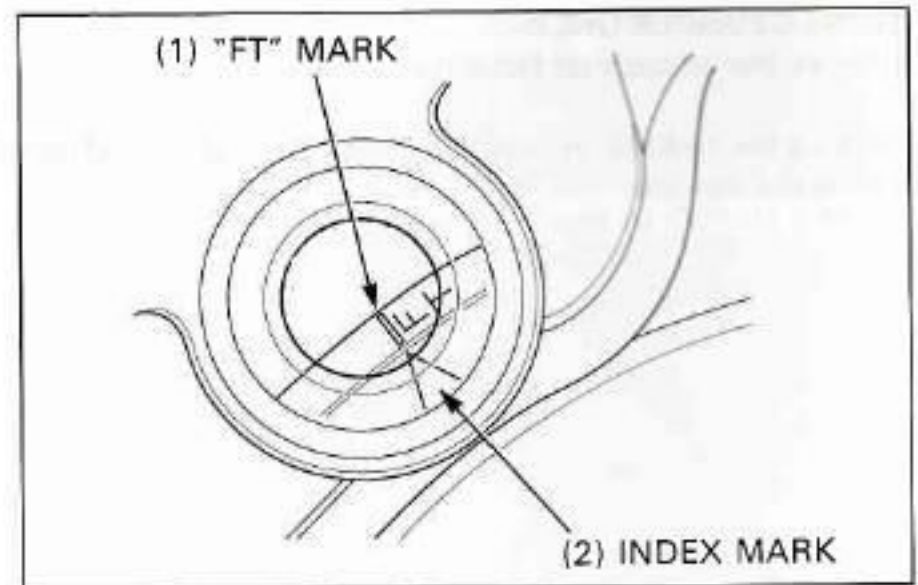
Remove the valve adjusting hole cap.
Remove the bolts and valve adjusting cover.



FRONT/REAR CYLYNDER:

Rotate the flywheel counterclockwise to align the "FT" mark for front cylinder or "RT" mark for the rear cylinder with the index mark on the left crankcase cover.

Make sure the position is at TDC (Top Dead Center) on the compression stroke.

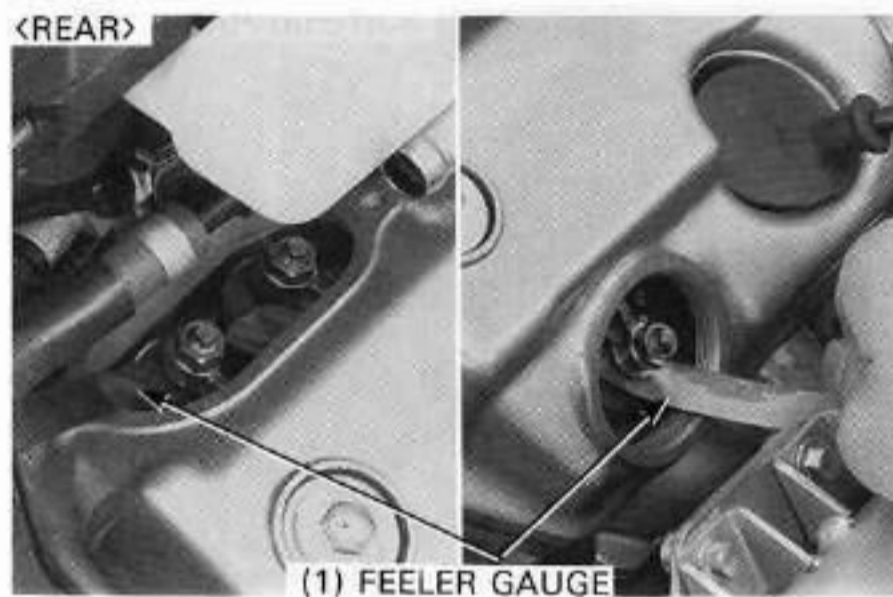
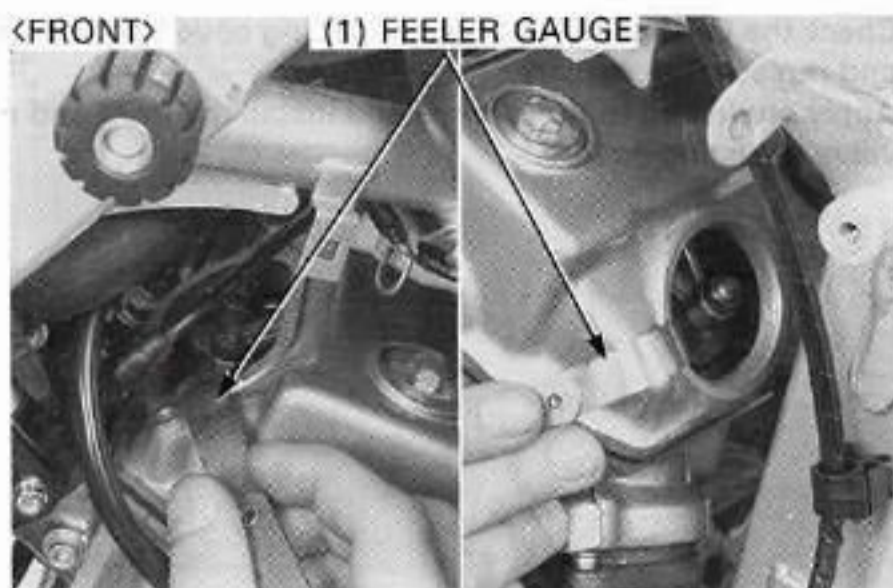


Inspect the valve clearance of all three valves by inserting a feeler gauge between the adjusting screw and valve stem end.

VALVE CLEARANCE:

IN: 0.15 ± 0.02 mm (0.006 ± 0.001 in)

EX: 0.20 ± 0.02 mm (0.008 ± 0.001 in)



ADJUSTMENT

Adjust by loosening the lock nut and turning the adjusting screw until there is a slight drag on feeler gauge.

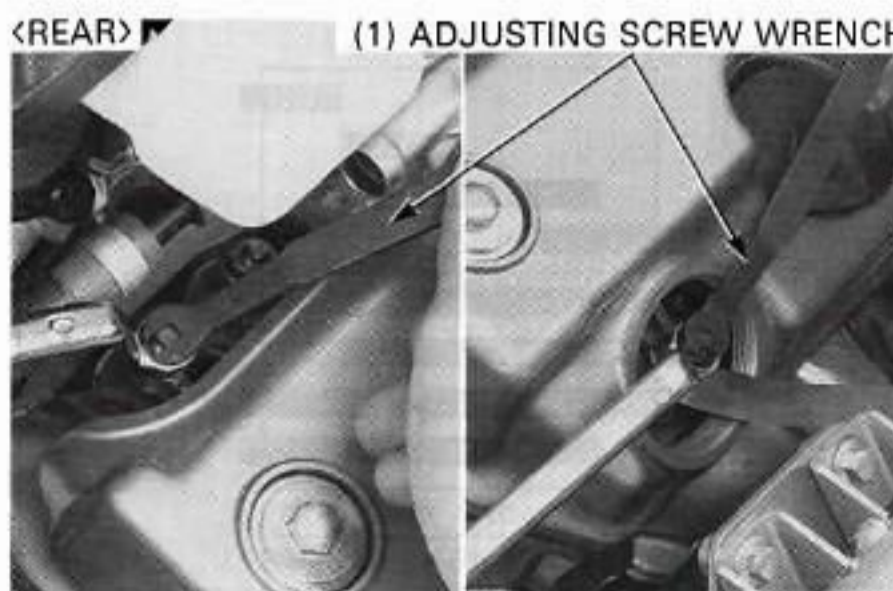
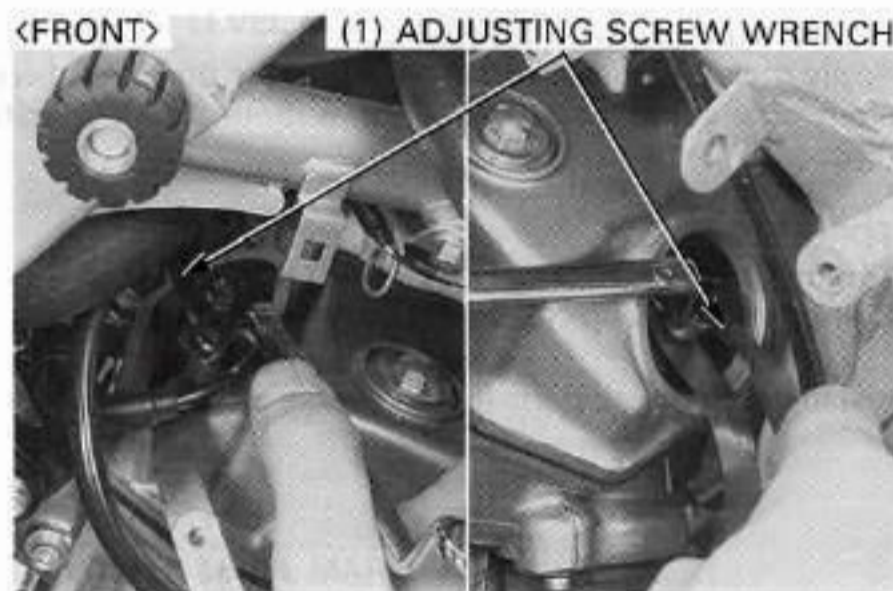
Hold the adjusting screw and tighten the lock nut.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

TOOL:

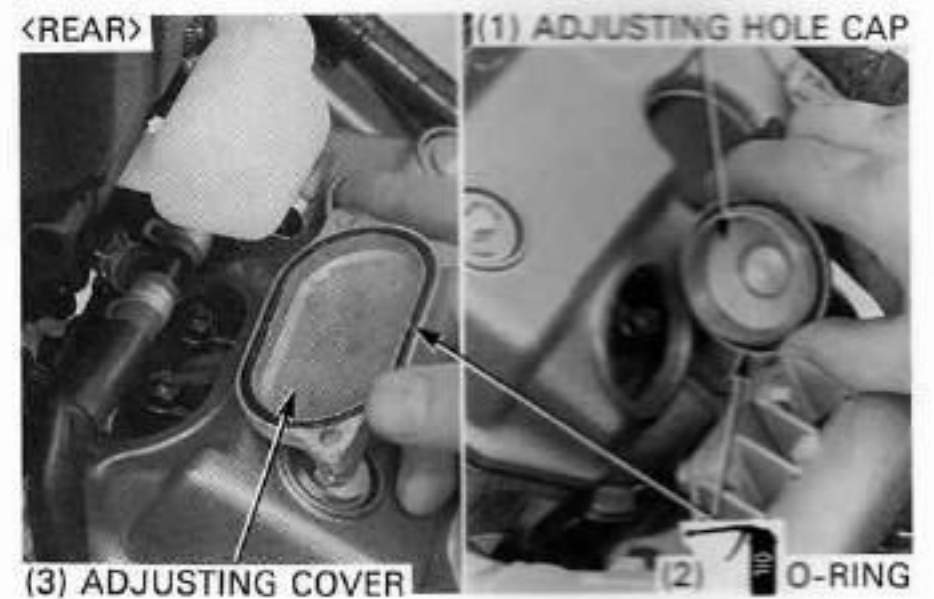
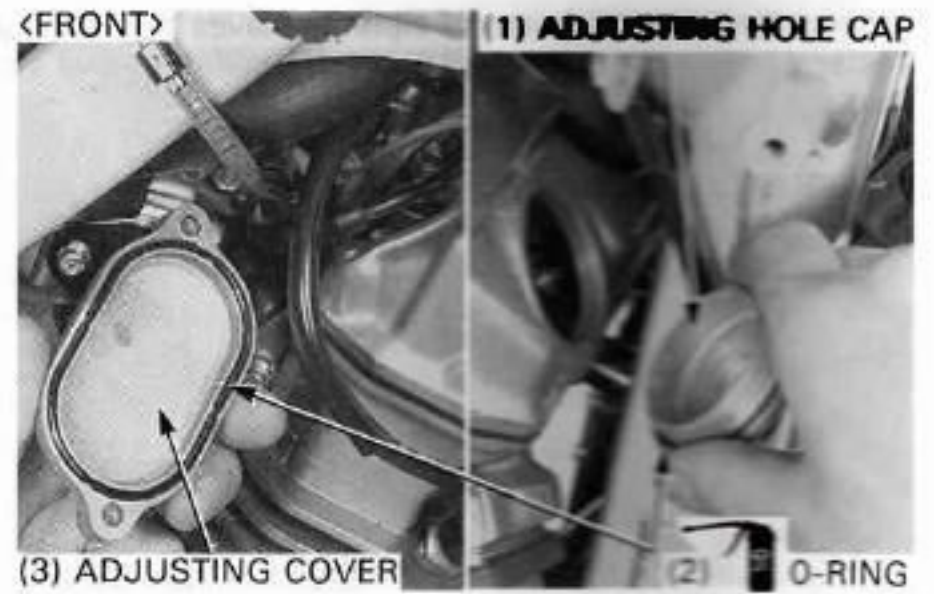
Valve adjusting screw wrench

07908-KE90000



MAINTENANCE

Check the O-rings of the valve adjusting covers for damage and replace if necessary.
Apply engine oil to the O-rings and install the front and rear valve adjusting covers.



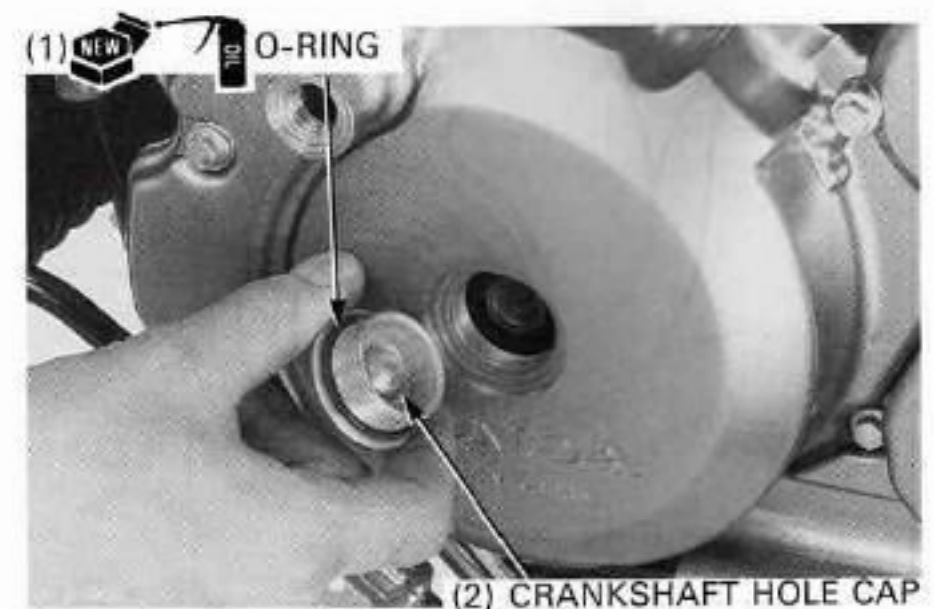
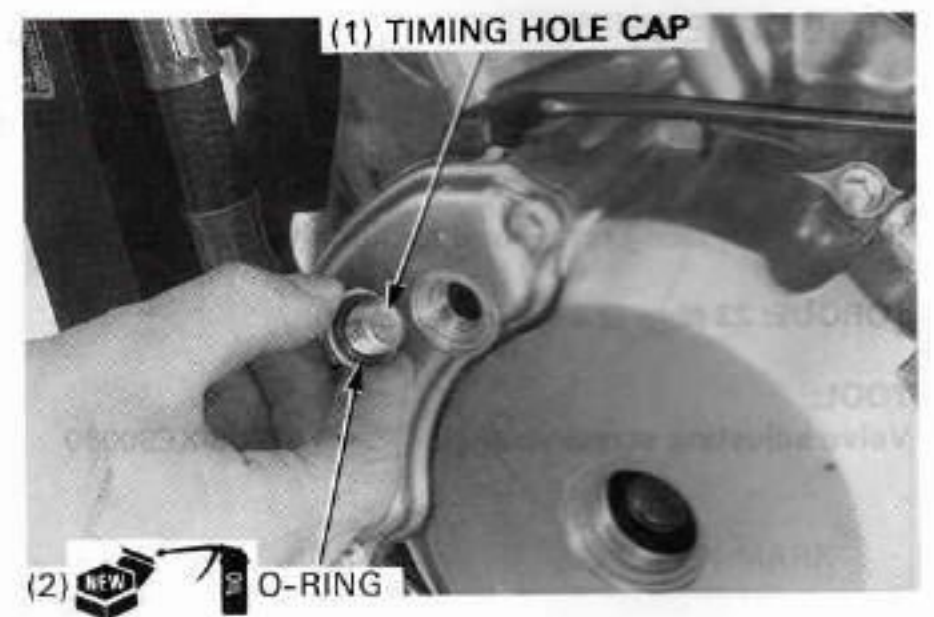
Apply oil to the new O-rings.
Apply molybdenum disulfide grease to the timing and crank shaft hole caps, install and tighten them to the specified torque.

TORQUE:

Timing hole cap: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Crankshaft hole cap: 15 N·m (1.5 kgf·m, 11 lbf·ft)

Install the removed parts in the reverse order of removal.



ENGINE OIL

OIL LEVEL INSPECTION

⚠ WARNING

- *If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area.*

NOTE

- Do not screw in the oil cap/dipstick when checking oil level.
- The oil level cannot be correctly measured if the motorcycle is not supported perfectly upright on a level surface.
- As the oil is gradually consumed, it is necessary to periodically check the oil level and replenish the oil volume to its proper level.
- If the oil level is too high, overall engine performance and the actuation of the clutch may be effected. Too little oil may cause engine overheating as well as premature wear to various parts.
- If a different brand or grade of oil or low quality oil is mixed when adding oil, the lubricating function deteriorates.

Start the engine and let it idle for a few minutes. Stop the engine and wait 2 - 3 minutes.

Remove the oil filler cap/dipstick and wipe off the oil from the dipstick with a clean cloth. With the motorcycle upright on level ground, insert the oil filler cap/dipstick in to the stick hole without screwing it in. Remove the oil filler cap/dipstick and check the oil level.

If the level is below or near the lower level mark, add the recommended oil up to the upper level mark.

RECOMMENDED ENGINE OIL:

Honda 4-stroke oil or equivalent motor oil certified to meet API service classification SE, SF or SG
Viscosity: SAE 10W-40

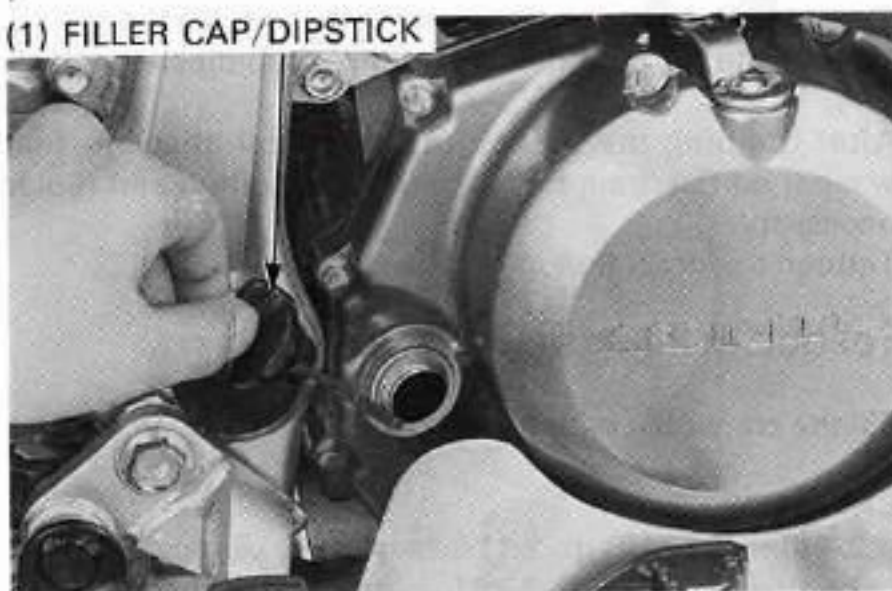
NOTE

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

Reinstall the oil filler cap/dipstick.

For engine oil change, see next page.

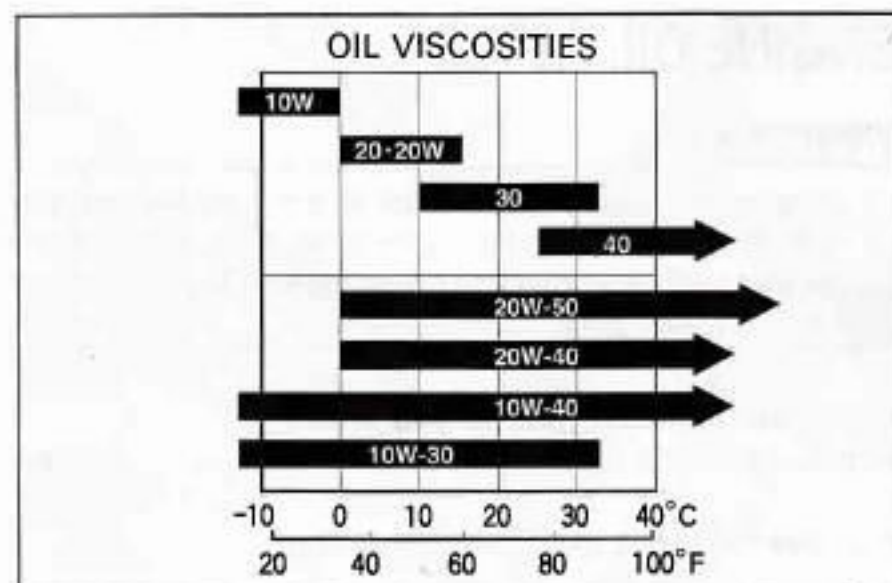
(1) FILLER CAP/DIPSTICK



(1) UPPER LEVEL MARK



(2) LOWER LEVEL MARK



MAINTENANCE

ENGINE OIL CHANGE

NOTE

- Change the engine oil with the engine warm and the motorcycle on its side stand to assure complete and rapid draining.

⚠ WARNING

- *Engine and exhaust system parts become very hot and remain hot for some time after the engine is run. Wear insulated gloves or wait until the engine and exhaust system have cooled before handling these parts.*

Warm up the engine.

Place an oil drain pan under the engine to catch the oil, then remove the oil drain bolt and oil filler cap/dipstick.

After draining the oil completely, check that the sealing washer on the drain bolt is in good condition and replace if necessary.

Tighten the drain bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill the crankcase with the recommended engine oil.

CAPACITY:

- 2.4 liter (2.52 US qt, 2.11 Imp qt) at draining
- 2.6 liter (2.73 US qt, 2.29 Imp qt) at filter change

Install the oil filler cap/dipstick.

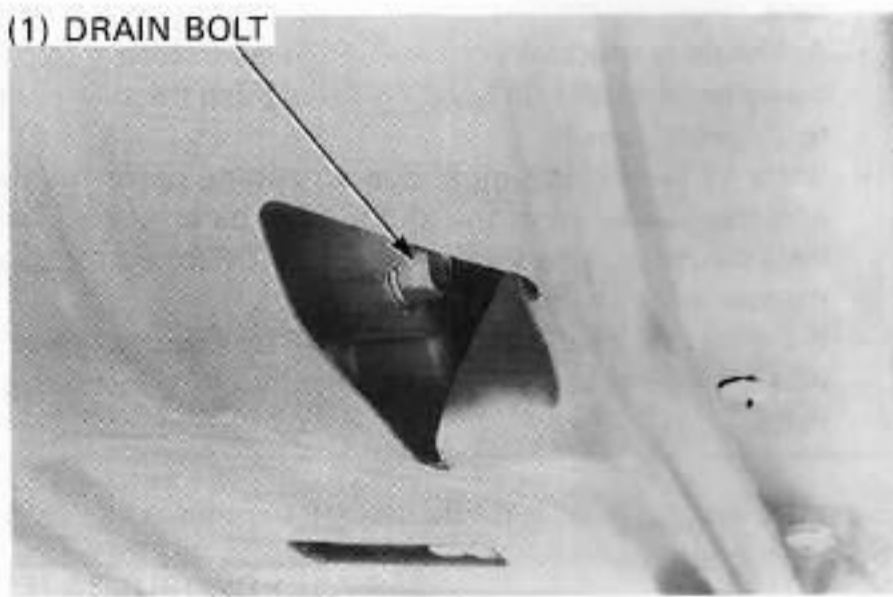
Start the engine and recheck the oil level (page 3-13).

Make sure that there are no oil leaks.

(1) FILLER CAP/DIPSTICK



(1) DRAIN BOLT



ENGINE OIL FILTER

⚠ WARNING

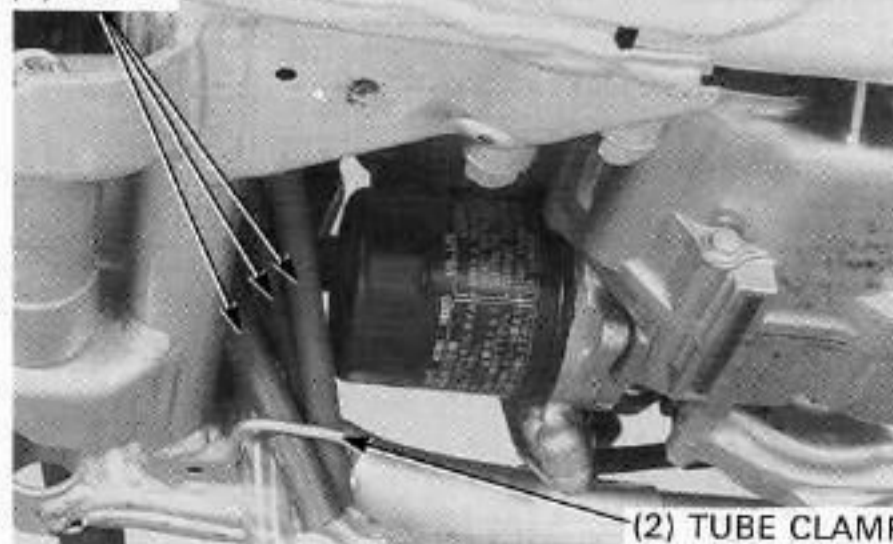
- *Engine and exhaust system parts become very hot and remain hot for some time after the engine is run. Wear insulated gloves or wait until the engine and exhaust system have cooled before handling these parts.*

Drain the engine oil (page 3-14).

Remove the skid plate (page 2-7).

Remove the tubes from the tube clamp.

(1) TUBES



(2) TUBE CLAMP

Remove the oil filter using the oil filter wrench.

TOOL:

Oil filter wrench **07HAA-PJ70100**

Apply oil to the new oil filter O-ring and oil filter threads. Install and tighten the new oil filter to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Fill the crankcase with the recommended engine oil (page 3-13).

Install the oil filler cap/dipstick.

Start the engine and recheck the oil level (page 3-13).

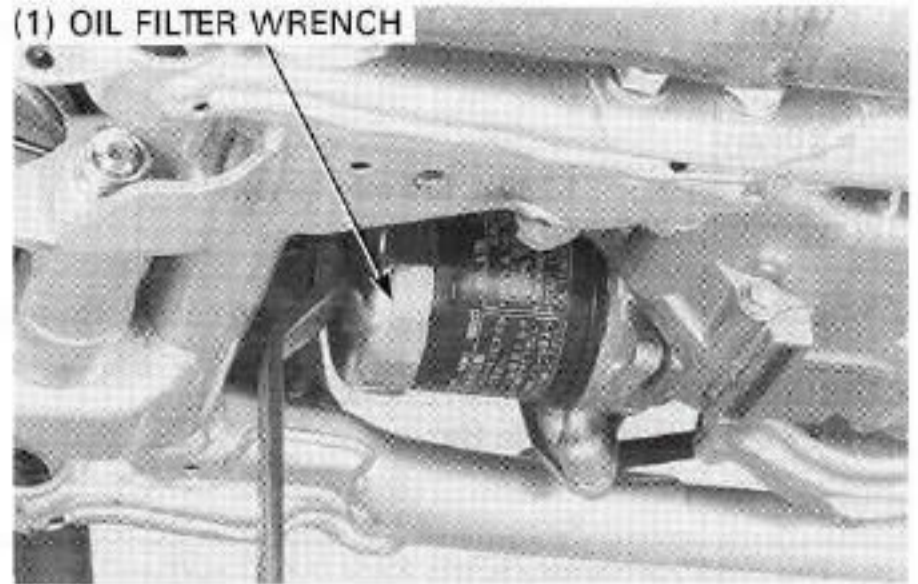
Make sure that there are no oil leaks.

NOTE

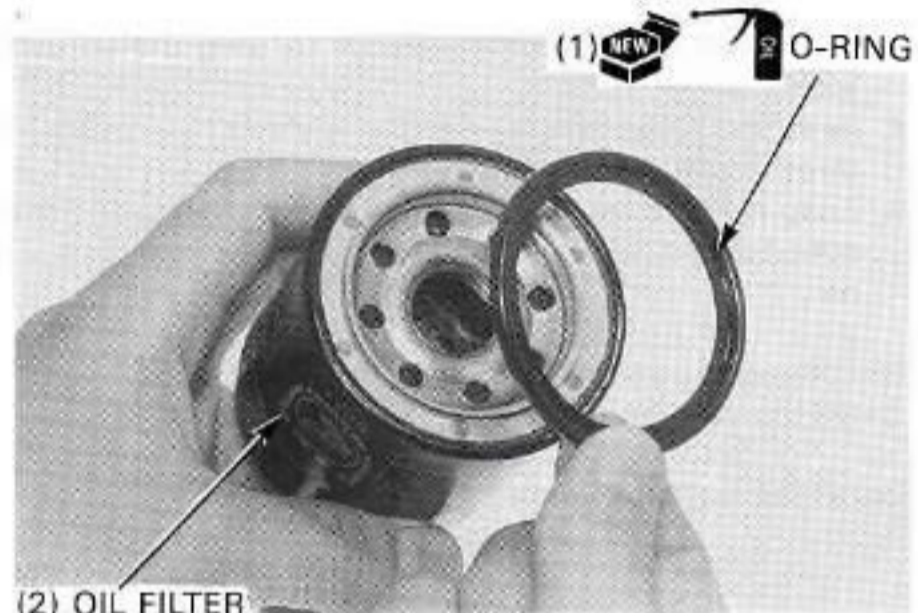
- Route the tubes properly (page 1-22).

Install the skid plate (page 2-7).

(1) OIL FILTER WRENCH



(1) NEW O-RING



(2) OIL FILTER

CARBURETOR SYNCHRONIZATION

⚠ WARNING

- *If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area.*

NOTE

- Perform this maintenance with the engine at normal operating temperature and transmission in neutral. Place the motorcycle on a level surface.

Remove fuel tank (page 2-20).

Remove the vacuum plugs and washers from the cylinder head intake port.

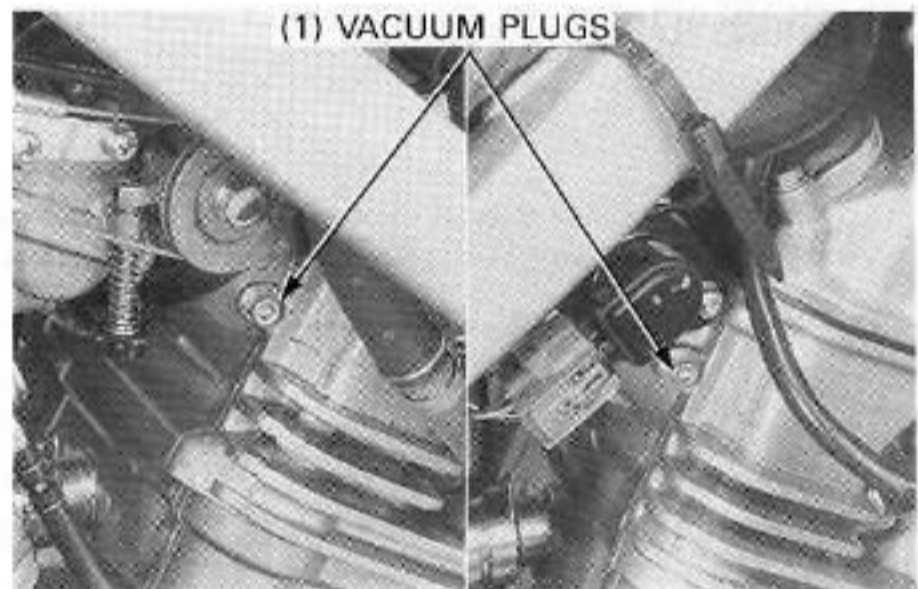
Connect the vacuum gauge and attachment.

TOOL:

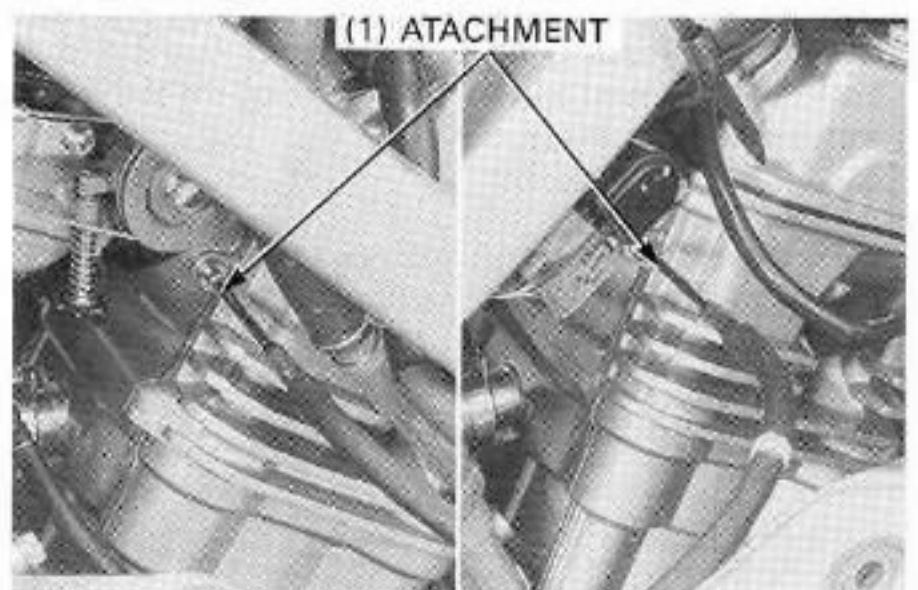
Vacuum gauge attachment **07510-3000200**

Connect the suitable tube between fuel tank and fuel tube.

(1) VACUUM PLUGS



(1) ATTACHMENT



MAINTENANCE

1. Turn the fuel valve ON. Start the engine and adjust the idle speed to the specification.

IDLE SPEED:

Except SW type: $1,200 \pm 100 \text{ min}^{-1} \text{ (rpm)}$

SW type: $1,200 \pm 50 \text{ min}^{-1} \text{ (rpm)}$

2. Check the difference in vacuum between each carburetor.

CARBURETOR VACUUM DIFFERENCE:

27kPa (20 mm Hg, 0.7 in Hg)

NOTE

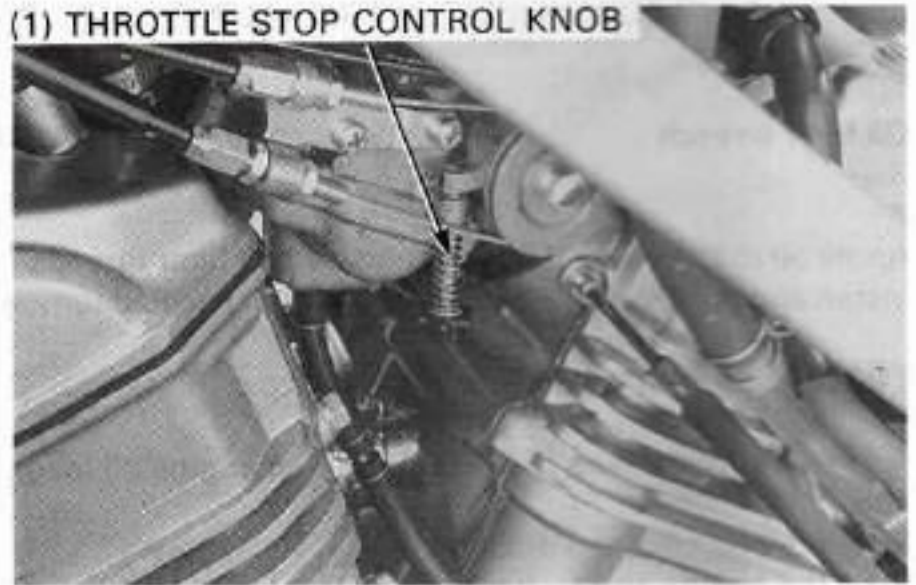
- The base carburetor is the Rear (N0.1) carburetor.

3. Synchronize to specification by turning the adjusting screw.
4. Be sure that the synchronization is stable by snapping the throttle grip several times.
5. Snap the throttle grip several times and recheck the idle speed and difference in vacuum between each carburetor.

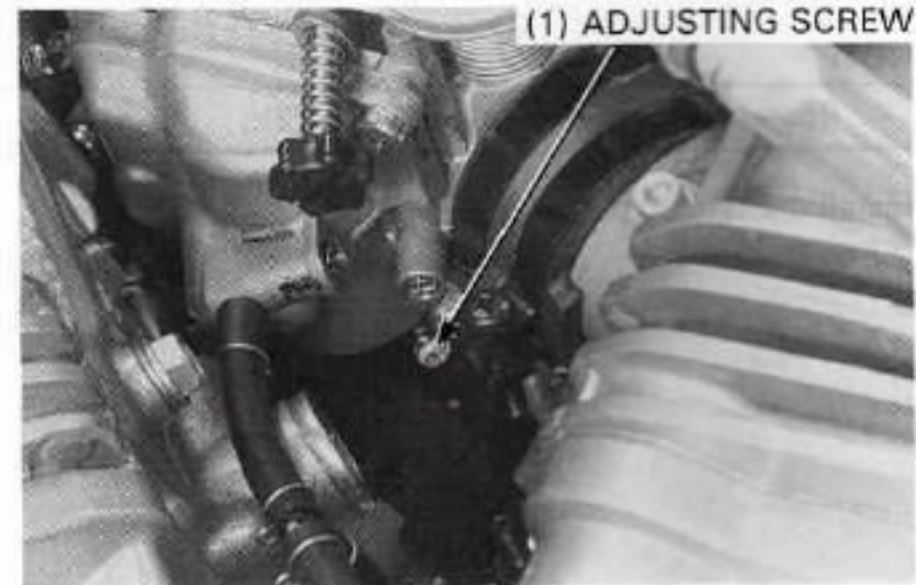
Disconnect the vacuum gauge and adaptors.
Install the vacuum plugs and washers securely.

Install the fuel tank (page 2-23).

(1) THROTTLE STOP CONTROL KNOB



(1) ADJUSTING SCREW



ENGINE IDLE SPEED

⚠ WARNING

- *If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area.*

NOTE

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

Warm up the engine and shift the transmission into neutral. Place the motorcycle on its side stand. Check the idle speed and adjust by turning the throttle stop control knob if necessary.

IDLE SPEED:

Except SW type: $1,200 \pm 100 \text{ min}^{-1} \text{ (rpm)}$

SW type: $1,200 \pm 50 \text{ min}^{-1} \text{ (rpm)}$

(1) THROTTLE STOP CONTROL KNOB



RADIATOR COOLANT

LEVEL CHECK

⚠ WARNING

- *Wait until the engine is cool before removing the radiator cap. Removing the cap while the engine is hot and the coolant is under pressure may cause serious scalding.*
- *Radiator coolant is poisonous. Take care to avoid getting coolant in your eyes, on your skin, or on your clothes.*
- *If coolant gets in your eyes, flush repeatedly with water and contact a doctor immediately.*
- *If coolant is accidentally swallowed, induce vomiting and contact a doctor immediately.*
- **KEEP OUT REACH OF CHILDREN.**

Check the coolant level of the reserve tank with the engine running at normal operating temperature. The level should be between the "UPPER" and "LOWER" level lines with the motorcycle in a vertical position on a flat, level surface.

If necessary, remove the reserve tank cap and fill to the "UPPER" level line with a 50-50 mixture of distilled water and antifreeze (coolant mixture preparation: page 6-4).

CAUTION

- *Be sure to use the proper mixture of antifreeze and distilled water to protect the engine.*
- *Use distilled water. Tap water may cause the engine to rust or corrode.*

Check to see if there are any coolant leaks when the coolant level decrease very rapidly.

If the reserve tank becomes completely empty, there is a possibility of air getting into the cooling system. Be sure to remove all air from the cooling system as described on page 6-6.

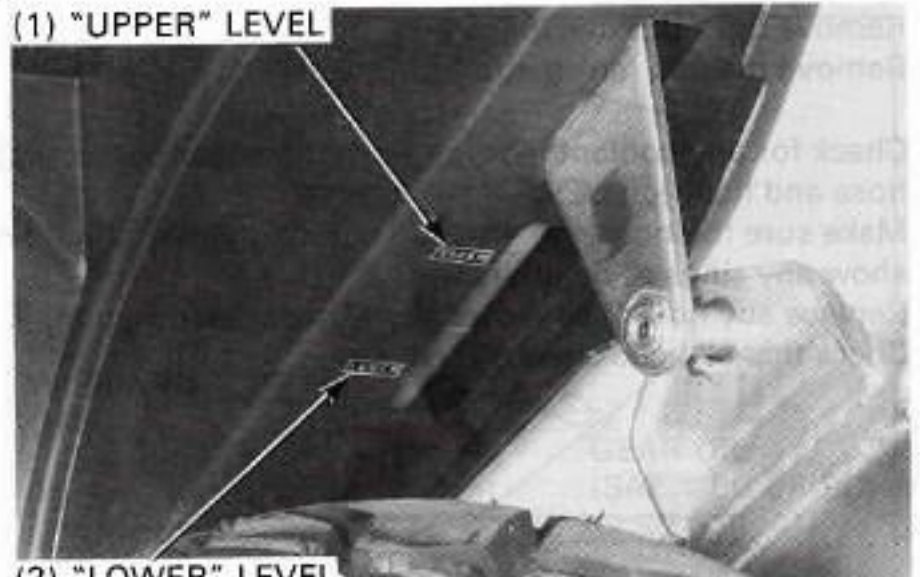
COOLING SYSTEM

⚠ WARNING

- *To prevent injury, keep your hands and clothing away from the cooling fan. It may start automatically, without warning.*

Check the radiator air passage for clogging or damage.

(1) "UPPER" LEVEL

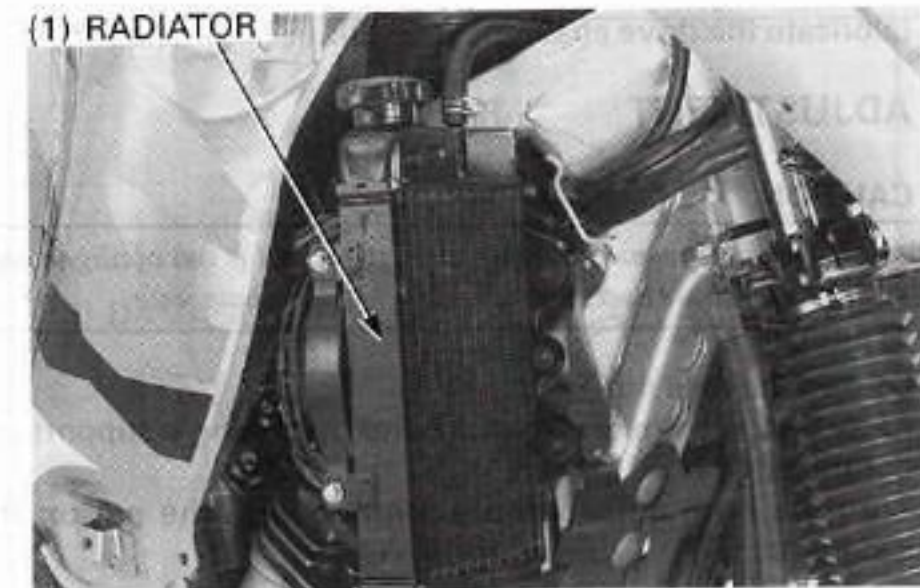


(2) "LOWER" LEVEL

(1) RESERVE TANK CAP



(1) RADIATOR

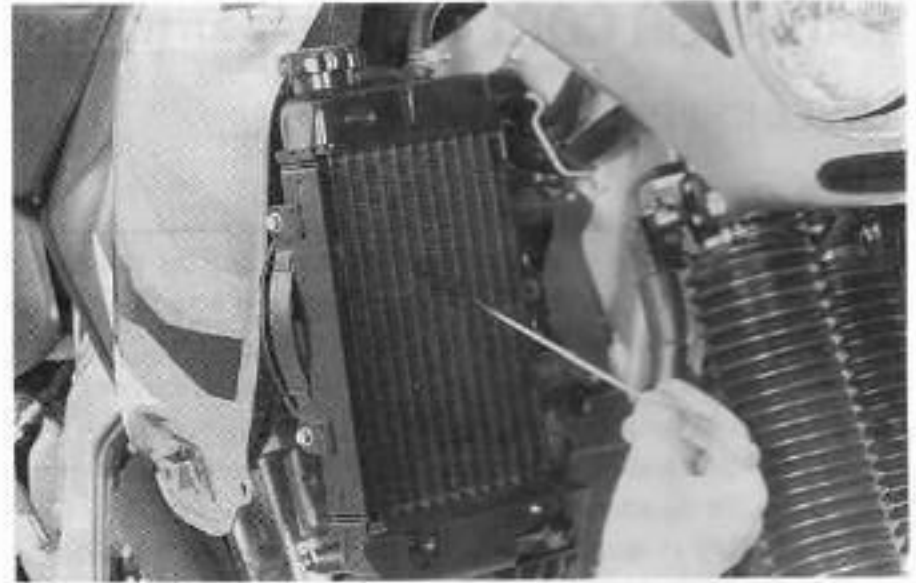


MAINTENANCE

Straighten bent fins with a small, flat blade screwdriver and remove insects, mud or other obstructions with compressed air or low pressure water.

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

For radiator replacement, refer to page 6-11.



Remove the side cowl (page 2-7).

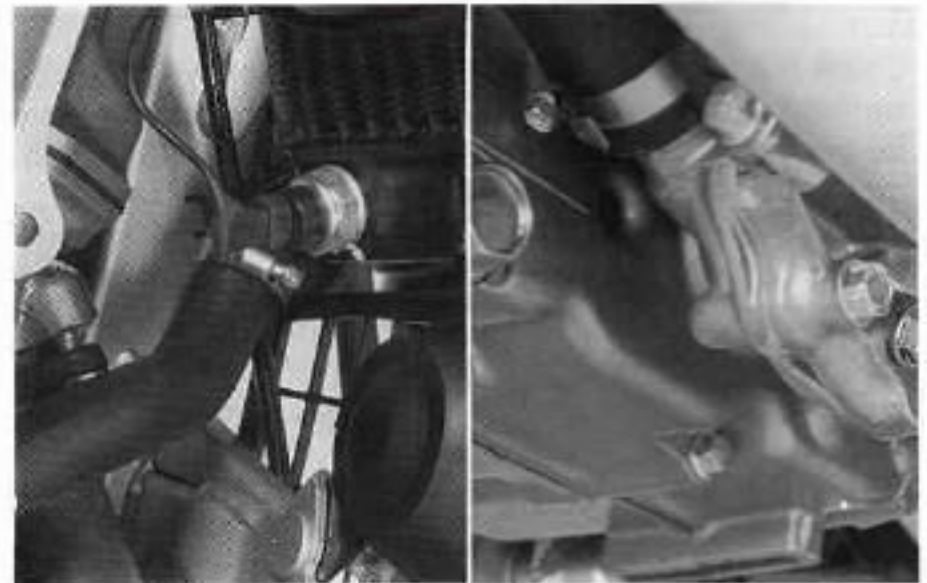
Remove the fuel tank (page 2-20).

Check for any coolant leakage from the water pump, water hose and hose joints.

Make sure the hoses are in good condition; they should not show any signs of deterioration.

Replace any hose that shows any sign of deterioration.

Check that all hose clamps are tight.



DRIVE CHAIN

⚠ WARNING

- *Inspecting the drive chain while the engine is running can result in serious hand or finger injury.*

DRIVE CHAIN SLACK INSPECTION

Turn the ignition switch OFF, place the motorcycle on its side stand and shift the transmission in neutral.

Check the slack in the drive chain lower run midway between the sprockets.

DRIVE CHAIN SLACK: 35 - 45 mm (1.4 - 1.8 in)

Lubricate the drive chain (page 3-19).

ADJUSTMENT

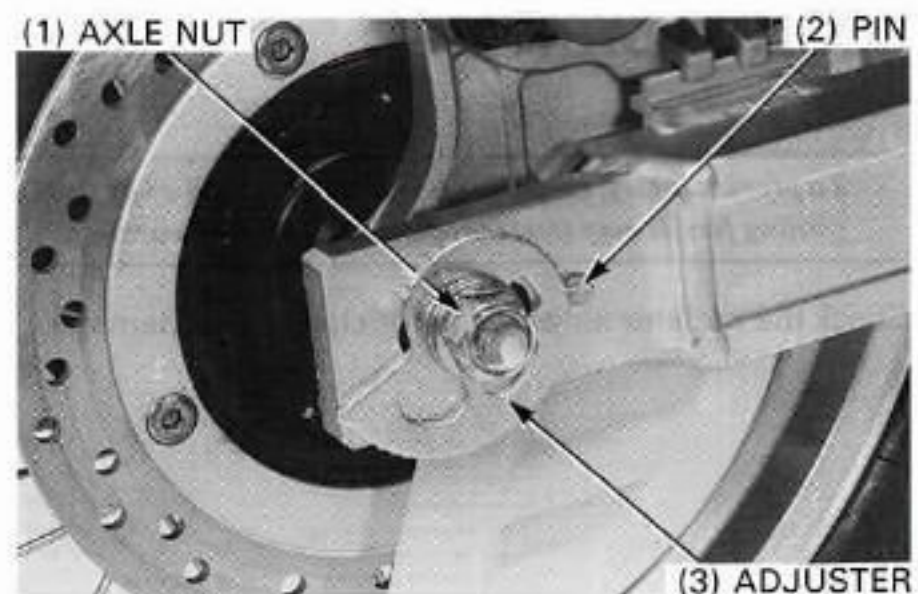
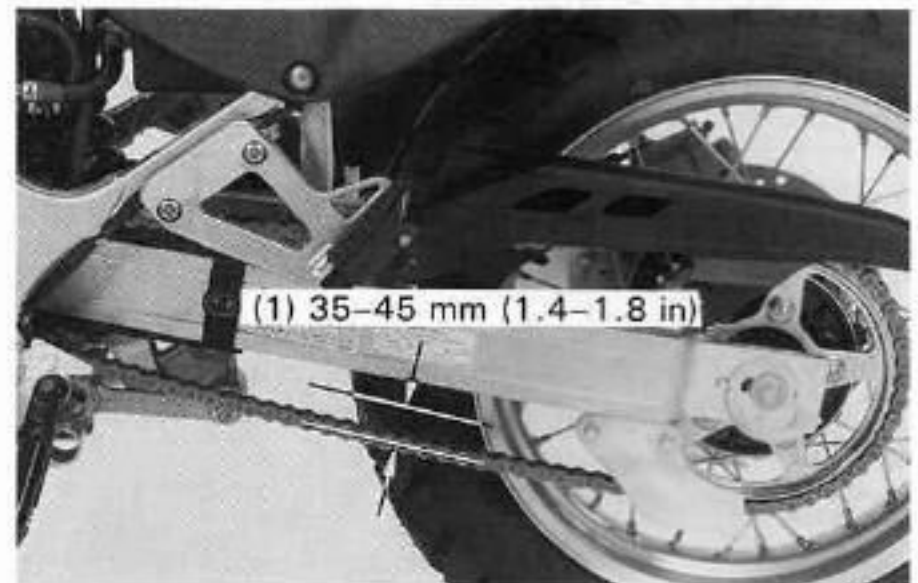
CAUTION

- *If the adjustment is not the same, the wheel is out of alignment and can cause excessive tire, sprocket and chain wear.*

Loosen the axle nut.

Raise the rear wheel off the ground by placing a support under the engine.

Turn the both adjusters are aligned with the pin on the swingarm.



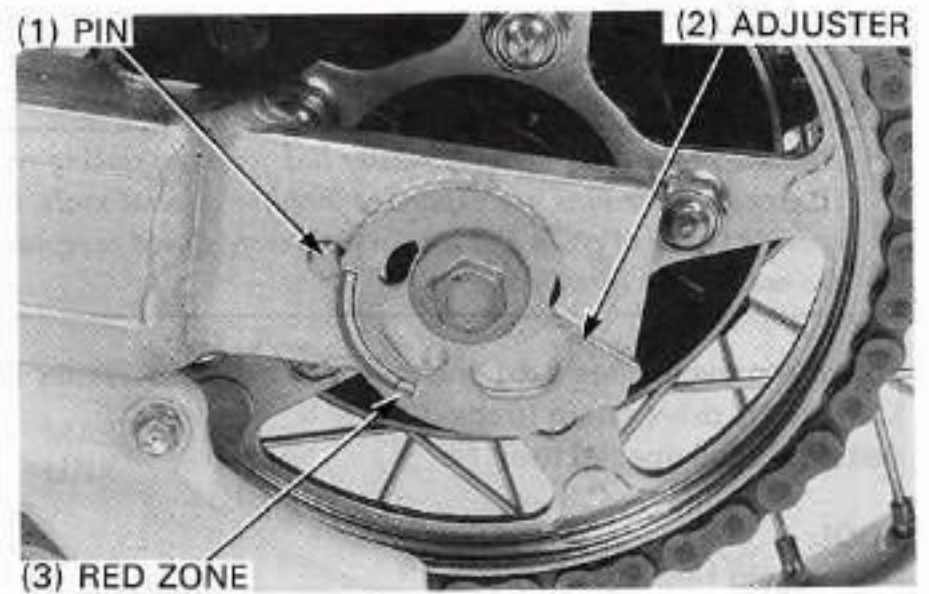
Tighten the rear axle nut to the specified torque.

TORQUE: 91 N·m (9.3 kgf·m, 67 lbf·ft)

Recheck chain slack and free wheel rotation.
Lubricate the drive chain with #80 - 90 gear oil
Wipe off the excess chain lube.

Check the chain wear label. If the red zone on the label of the chain adjuster reaches the pin on the swingarm, replace the drive chain with a new one.

**REPLACEMENT CHAIN: RK: 525SM5
DID: 525V8**



CLEANING, INSPECTION AND LUBRICATION

DRIVE CHAIN

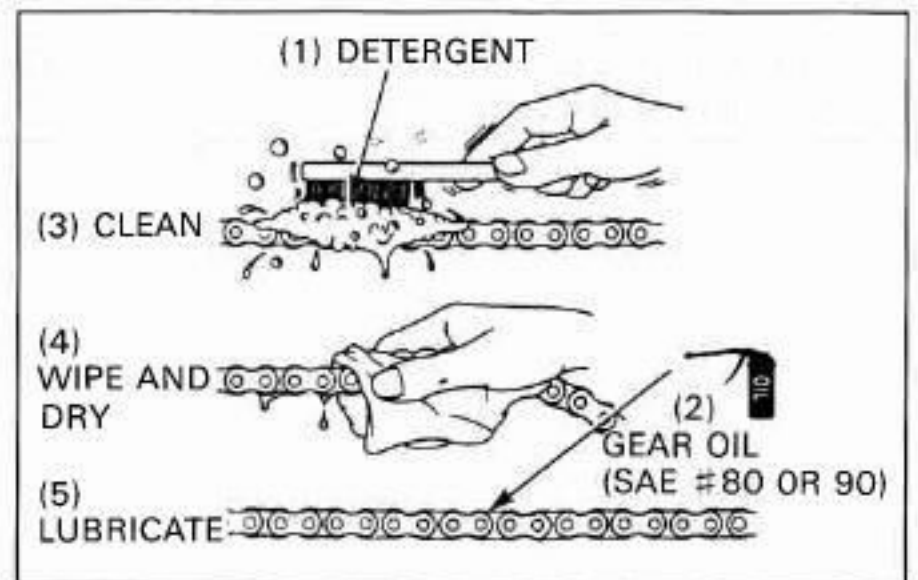
CAUTION

- Chains with O-rings should not be treated to the following cleaning and oiling procedure. This treatment will cause degradation of the O-rings and loss of grease, thus shortening chain life.
- Do not use steam or high pressure water washing. Use a chain spray containing a cleaning agent or use gasoline to clean the chain.

Clean the chain with suitable detergent and wipe it dry.
Be sure the chain has dried completely before lubricating.

Inspect the drive chain for possible damage or wear. Replace any chain that has damaged rollers, loose fitting links, or other wise appears unserviceable. Installing a new chain on badly worn sprockets will cause the new chain to wear quickly. Inspect and replace sprockets as necessary.

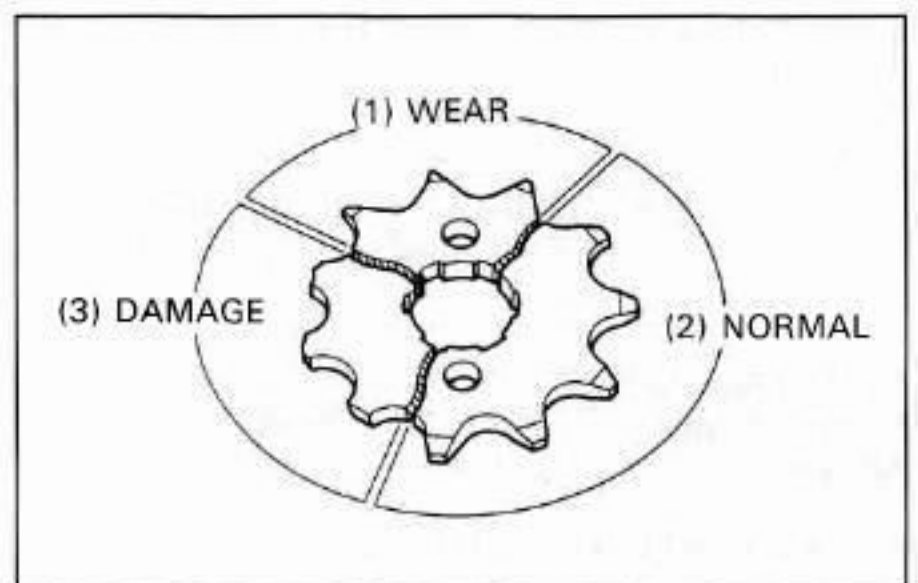
Lubricate the drive chain with #80 - 90 gear oil. Wipe off the excess chain lube.



SPROCKET

Inspect the drive and driven sprocket teeth for damage or wear. Replace if necessary.
Never use a new drive chain on worn sprockets. Both chain and sprockets must be in good condition, or the new replacement chain will wear rapidly.

Check the attachment bolt and nuts on the drive and driven sprockets. If any are loose, torque them.



MAINTENANCE

REPLACEMENT

CAUTION

- Because of the drive chain is master link joint pin staking type (the ends of the pins are expanded with the special tool), the specified types of chain and special tool must be used to replace. Do not use clip type chains.

This motorcycle uses a drive chain with a staked master link. Loosen the drive chain (page 3-18). Assemble the special tool.

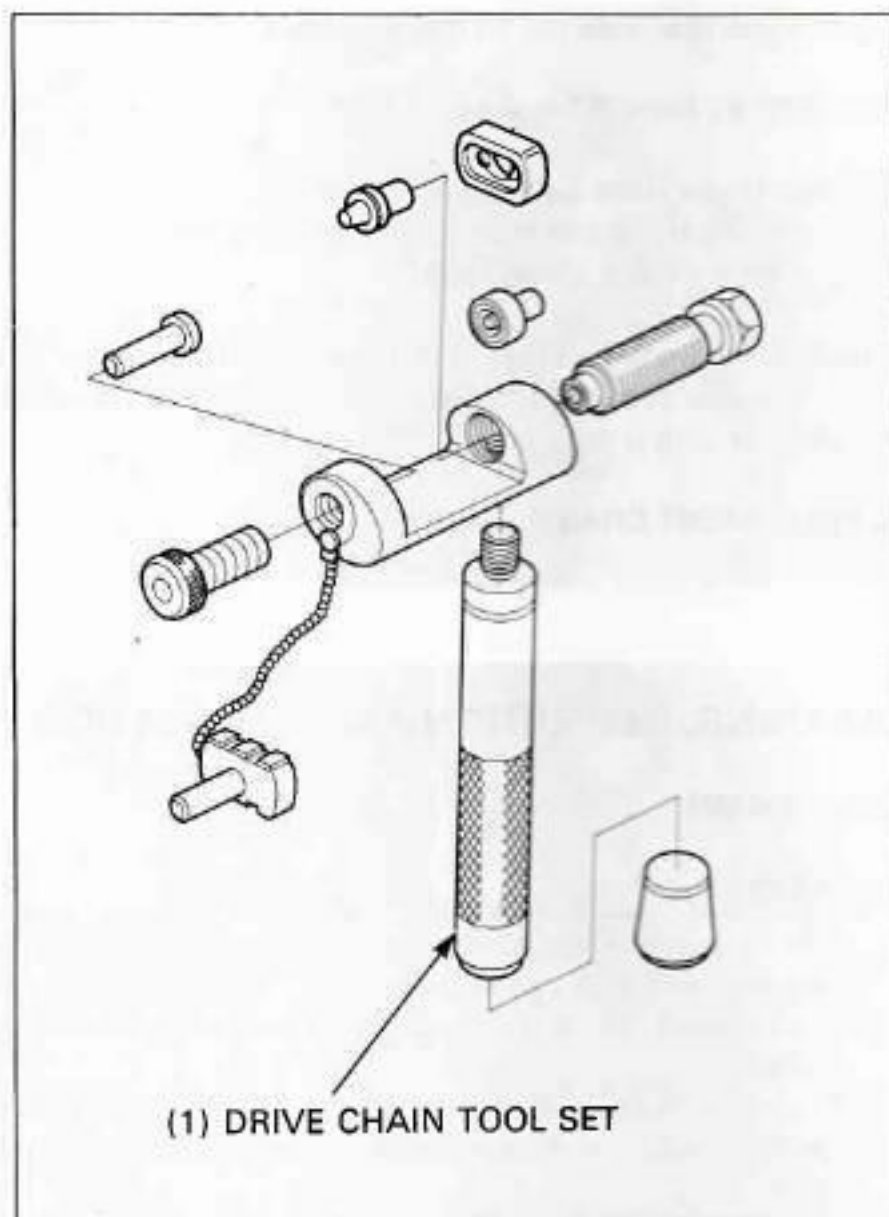
TOOL:

Drive chain tool set

07HMH-MR10103

NOTE

- When using the special tool, follow the manufacture's operating instructions.



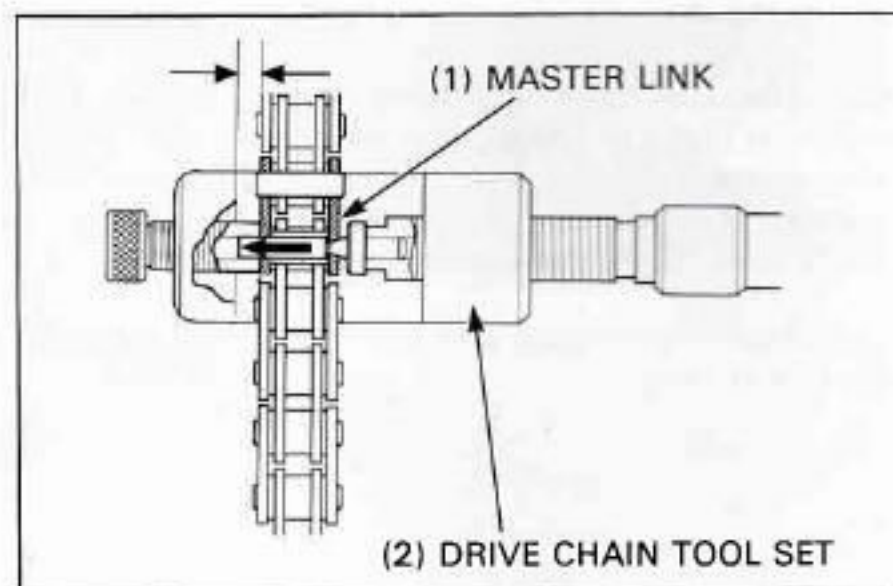
Locate the drive chain cutter on the staked part of the drive chain and cut the staked pins.

TOOL:

Drive chain tool set

07HMH-MR10103

Remove the drive chain.



Remove the excess drive chain links from the new drive chain with the drive chain cutter.

NOTE

- One (1) link is indicated as the figure on the right.
- Include the master link when you count the drive chain links

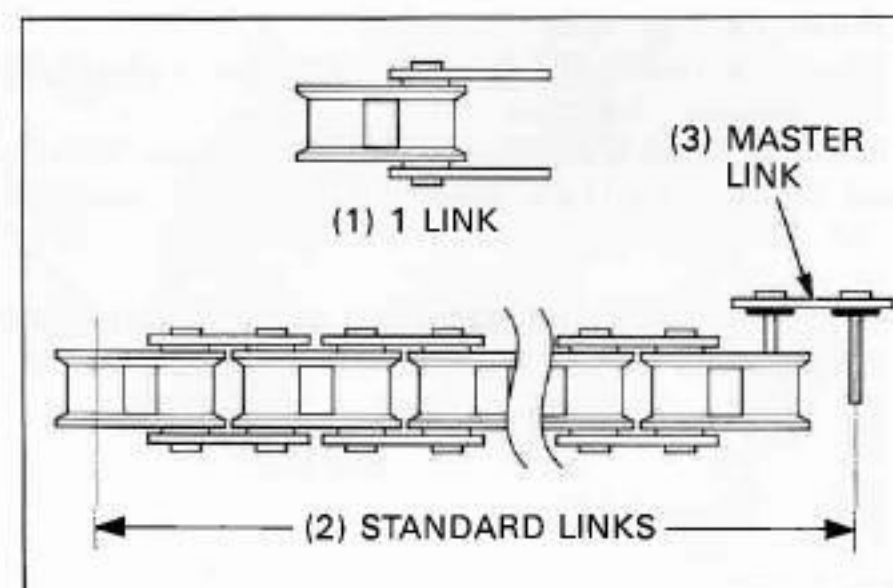
STANDARD LINKS:

Except AR type: 124 links

AR type: 122 links

REPLACEMENT CHAIN: RK: 525SM5

DID: 525V8



Install the new drive chain over the swingarm.

CAUTION

- Never reuse the old master link, master link plate and O-rings.

Install the new O-rings onto the new master link, and insert the master link from the inside of the drive chain taking care to prevent squeezing.
Install the O-rings and the link plate with the drive chain cutter.

TOOL:

Drive chain tool set

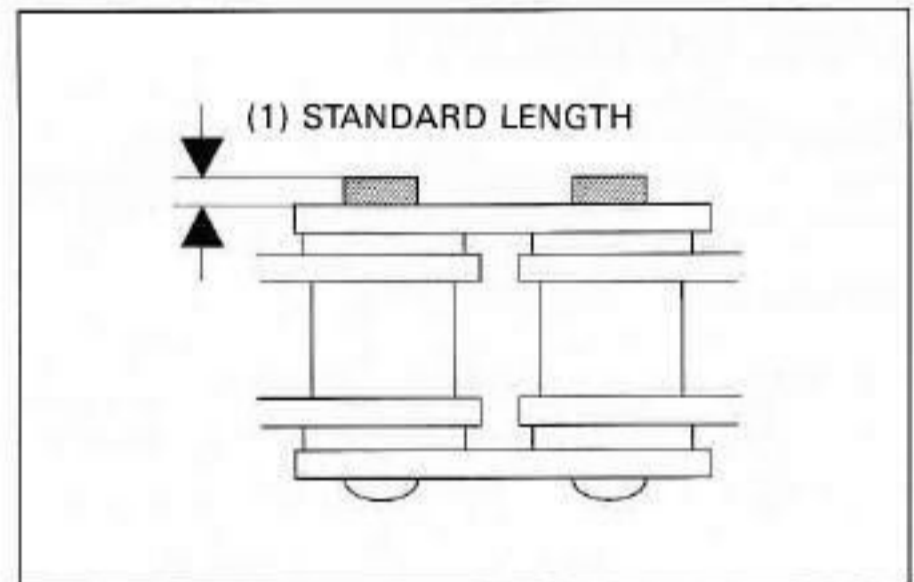
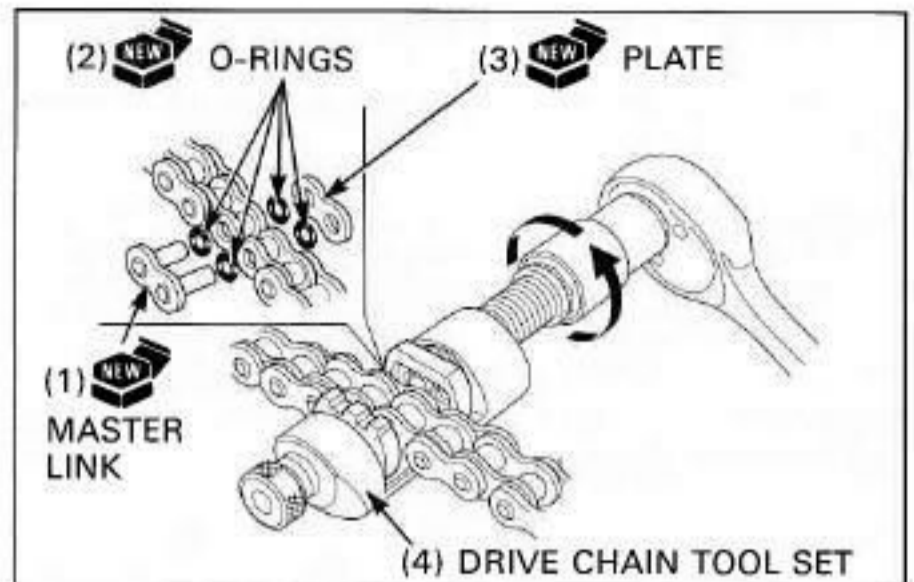
07HMH-MR10103

NOTE

- Install the link plate with the identification mark facing the outside.
- Take care to prevent squeezing of the O-rings.
- Do not remove initially applied grease from the link to lubricate.

Remove the special tool and check the master link pin length projected from the plate.

STANDARD LENGTH: 1.2 - 1.4 mm (0.05 - 0.06 in)



Install the drive chain cutter and stake the ends of the master link pins.

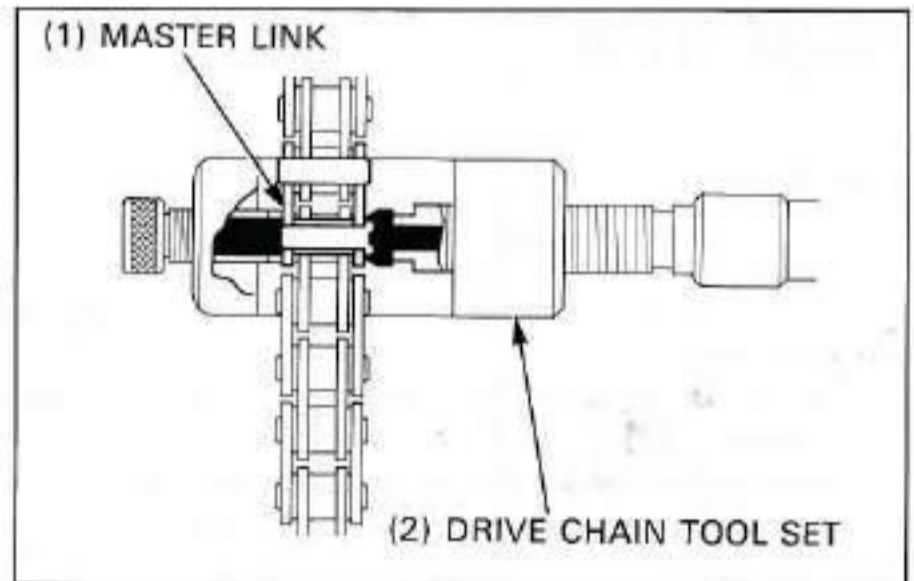
TOOL:

Drive chain tool set

07HMH-MR10103

NOTE

- To prevent over staking, stake gradually checking the diameter of the staked area using a slide calipers.



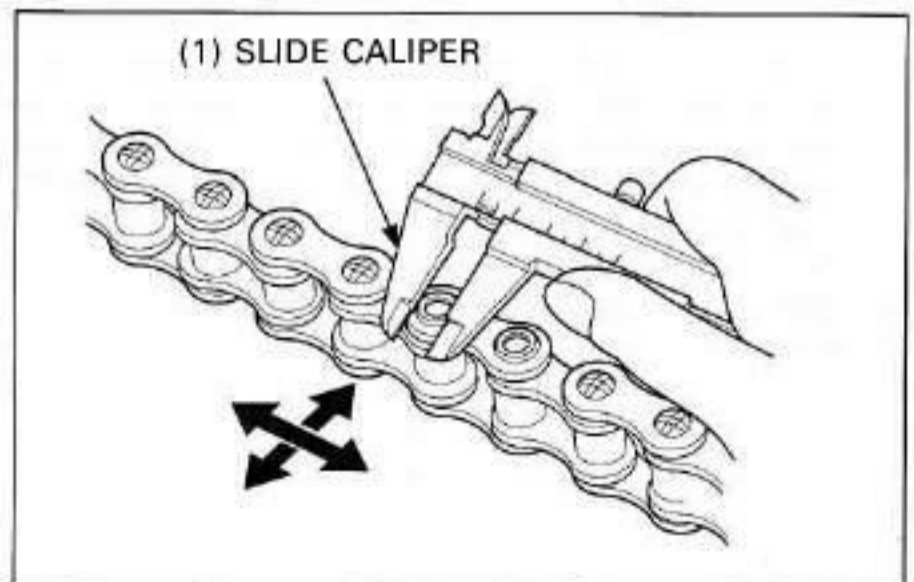
After staking, check the staked area of the master link using a slide calipers.

DIAMETER OF THE STAKED AREA:

5.50 - 5.80 mm (0.217 - 0.228 in)

NOTE

- When the measured staked area is over the prescribed value, restake using the new master link, plate and O-rings.
- When the measured staked area is below the prescribed value, reinstall the drive chain cutter and restake.



MAINTENANCE

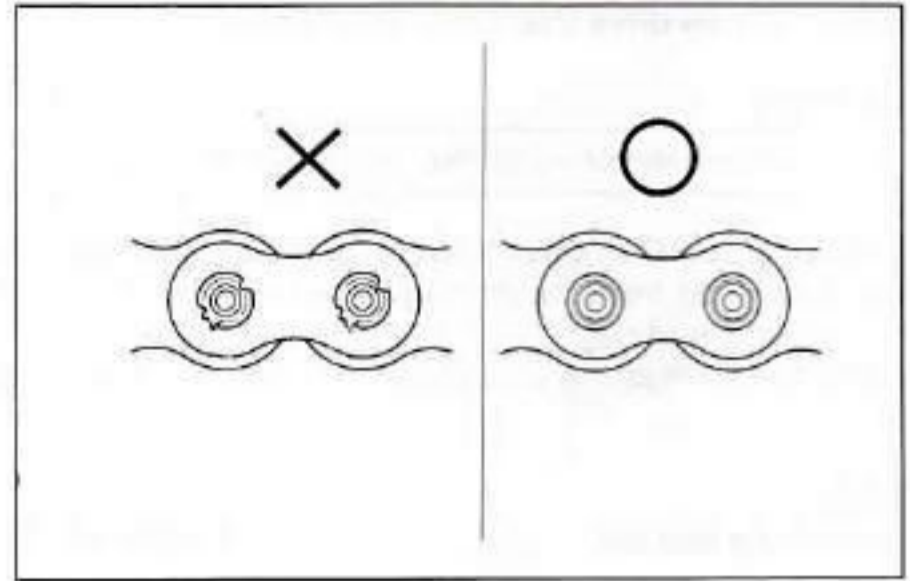
Check the staked area of the master link for cracks and the O-rings for damages.
If there is any cracking or damage, replace the master link, plate and O-rings.

CAUTION

- A drive chain with a clip-type master link must not be used.

Check that master link pivots freely on the pins.
If the movement is not smooth, restake using the new master link, plate and O-rings.

Adjust the drive chain play.



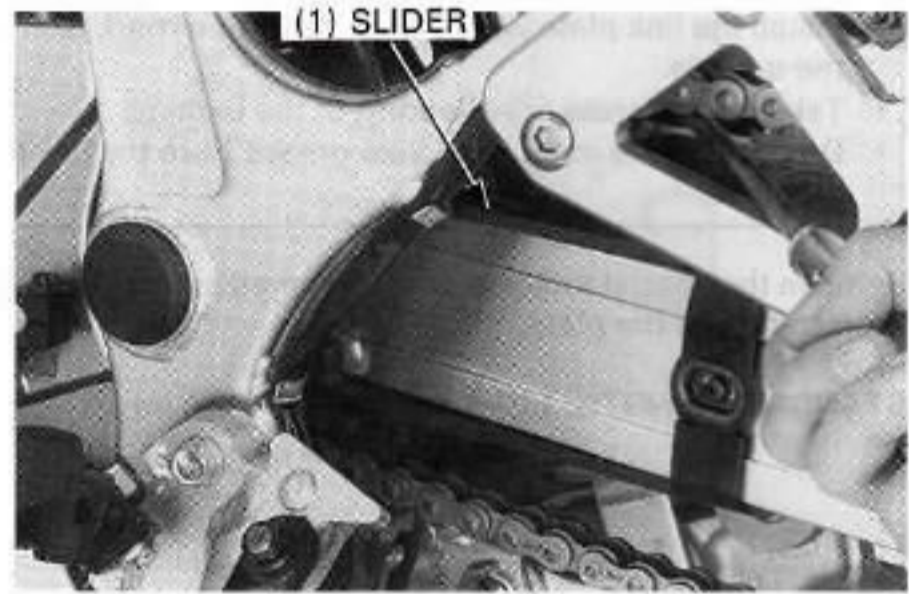
DRIVE CHAIN SLIDER

Check the drive chain slider for wear or damage.
Replace the drive chain slider if the thickness exceeds the service limit.

SERVICE LIMIT: 3 mm (1/8 in)

CAUTION

- If the chain slider becomes worn through to the swingarm, the chain will begin to wear against the swingarm.



BRAKE FLUID

CAUTION

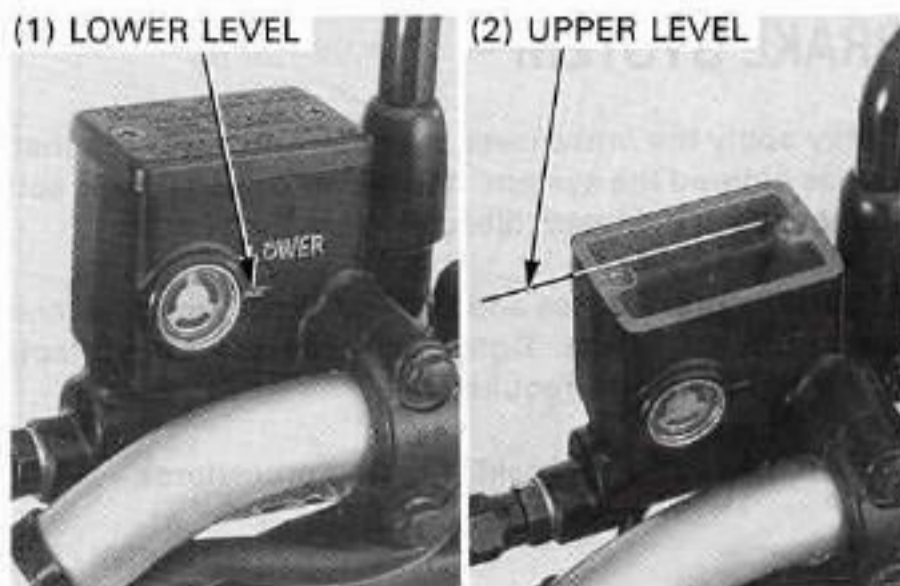
- Do not remove the cover or cap unless the reservoir is level because fluid may spill out.
- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic or rubber parts. Place a rug over these parts whenever the system is serviced.

NOTE

- When the fluid level is low, check the brake pads for wear (page 3-23). A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper piston is pushed out, and this accounts for a low reservoir level. If the brake pads are not worn and the fluid level is low, check entire system for leaks (page 3-24).
- Do not remove the level float from the reservoir when filling with brake fluid.

FRONT BRAKE

Turn the handlebar to the left side so that the reservoir is level and check the front brake reservoir level through the sight glass. If the level (float edge) is near the lower level mark, remove the cover, set plate and diaphragm and fill the reservoir to the casting ledge with DOT 4 brake fluid from a sealed container.

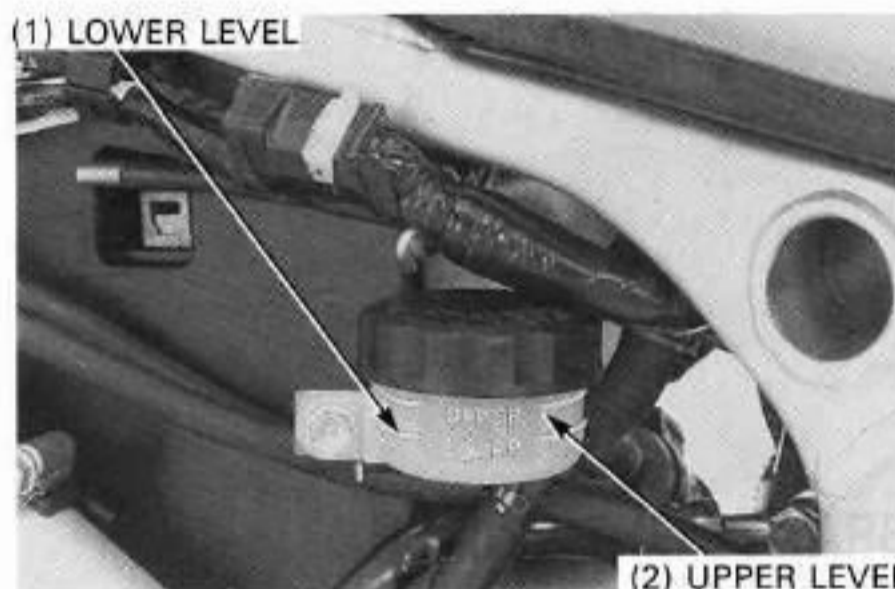


REAR BRAKE

Remove the right side cover (page 2-7).

Place the motorcycle on a level surface, and support it upright. Check the rear brake fluid reservoir level. If the level is near the lower level mark, remove the bolt and cap and fill the reservoir to the upper level mark with DOT 4 brake fluid from a sealed container.

Refer to page 15-5 for brake fluid replacement/bleeding procedures.

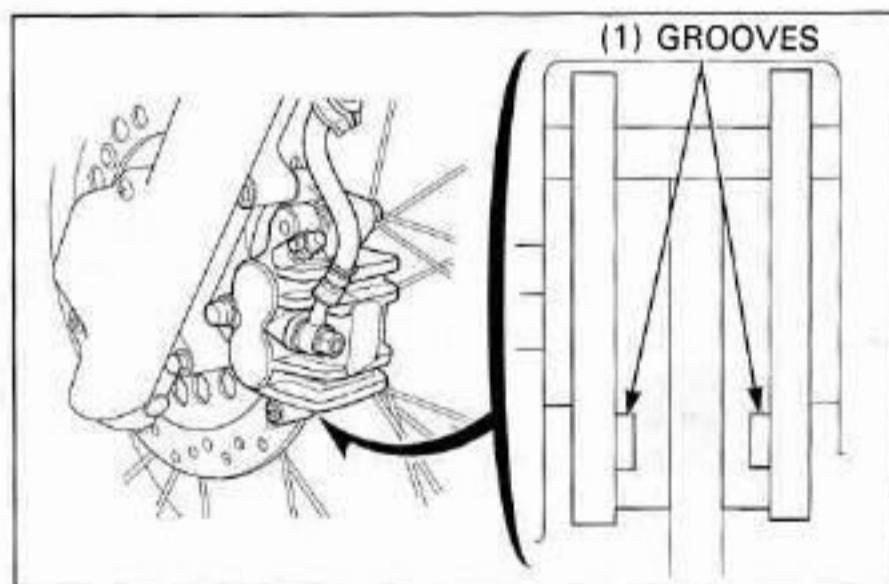


BRAKE PAD WEAR

FRONT:

Check the brake pad for wear. Replace the brake pads if either pad is worn to the bottom of wear limit groove.

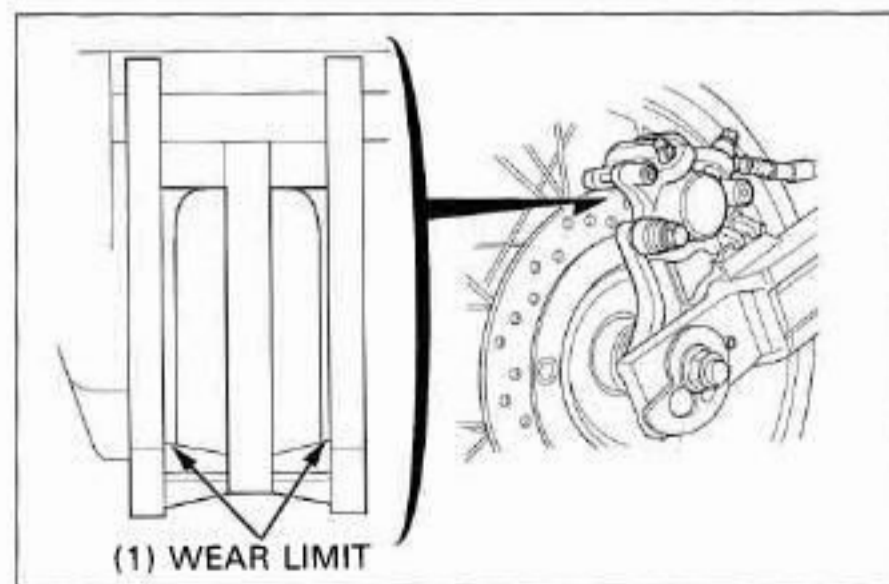
Refer to page 15-7 for brake pad replacement.



REAR:

Check the brake pad for wear. Replace the brake pads if either pad is worn to the bottom of wear limit.

Refer to page 15-8 for brake pad replacement.

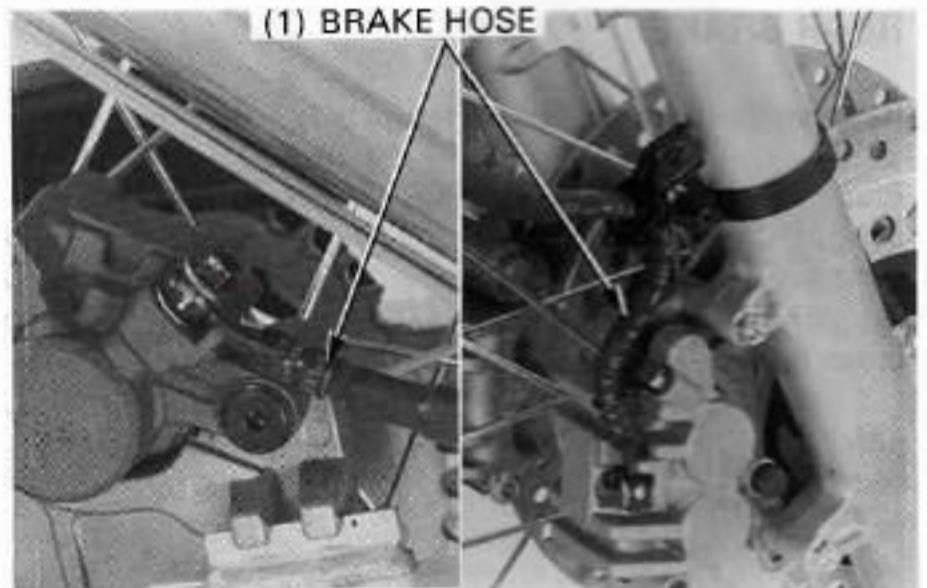
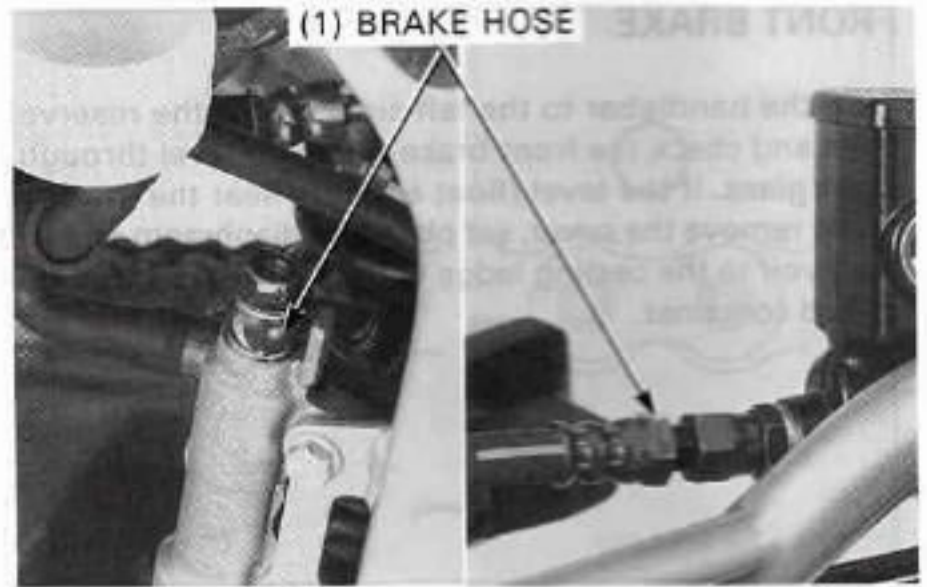


BRAKE SYSTEM

Firmly apply the brake lever or pedal, and check that no air has entered the system. If the lever or pedal feels soft or spongy when operated, bleed air from the system.

Inspect the brake hoses and fittings for deterioration, cracks and signs of leakage. Tighten any loose fittings. Replace hoses and fittings as required.

Refer to page 15-5 for brake bleeding procedures.



BRAKE LIGHT SWITCH

CAUTION

- *Allowing the switch body to turn during adjustment can break the wires in the switch.*

NOTE

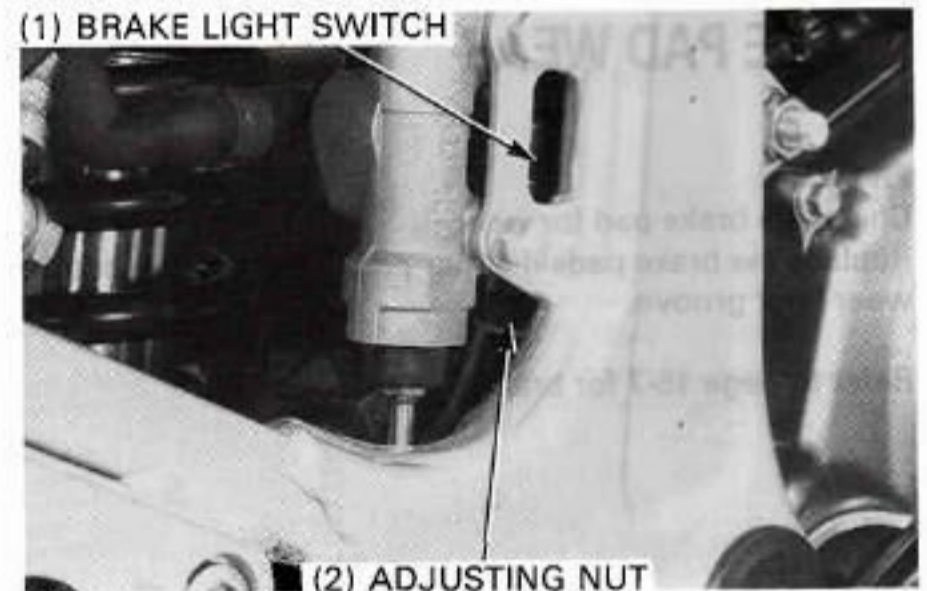
- The brake light switch on the front brake lever cannot be adjusted. If the front brake light switch actuation and brake engagement are off, either replace the switch unit or the malfunctioning parts of the system.
- Make all rear brake light switch adjustments after the height adjustment and the brake pedal free play adjustment have been made.

Check the brake light switch operation and adjustment by applying the brakes. Visually inspect for any damage and make sure the reflector plate is clean within the light. Adjust the rear brake light switch so that the brake light comes on just prior to the brake actually being engaged. If the light fails to come on, adjust the switch so that the light comes on at the proper time.

Turn the adjusting nut on the brake light switch and not the switch body and wires to make switch actuation adjustments.

Be sure to hold the switch body firmly while turning the adjusting nut.

After adjustment, recheck to be sure the brake light comes on at the proper time.



HEADLIGHT AIM

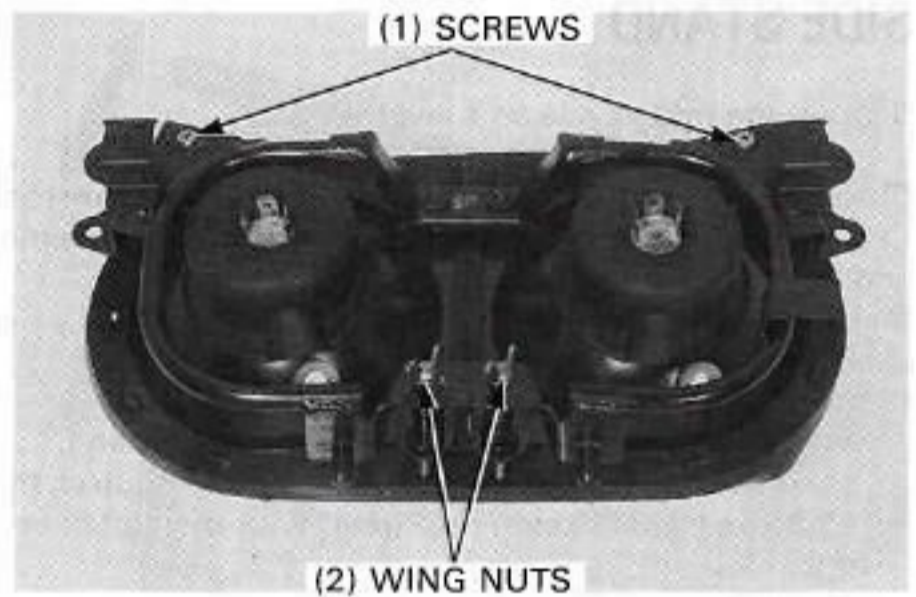
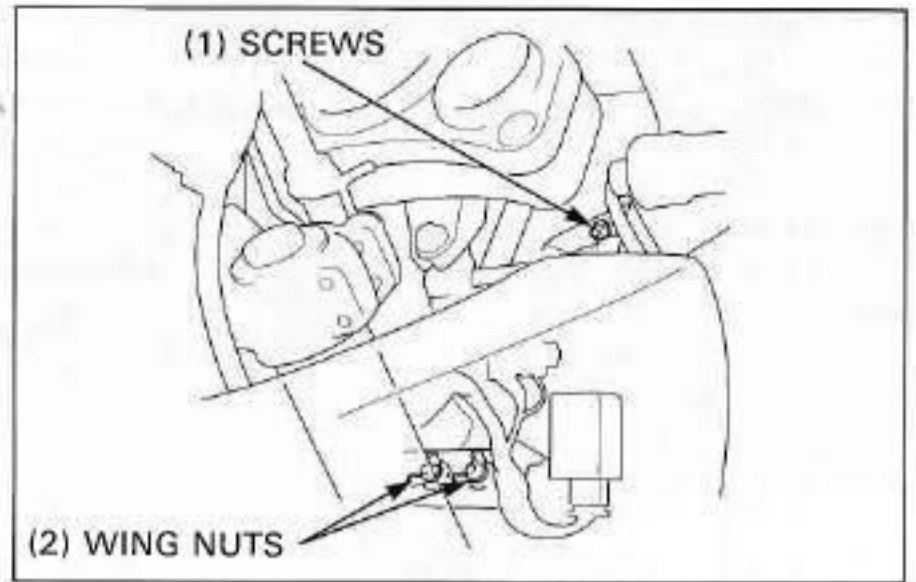
⚠ WARNING

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

NOTE

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

Adjust the headlight beam horizontally by turning the screws on the back of the headlights.
Adjust the headlight beam vertically by turning the wing nuts on the back of the headlights.



CLUTCH SYSTEM

Measure the clutch free play at the end of the clutch lever.

FREE PLAY: 10-20 mm (0.4 - 0.8 in)

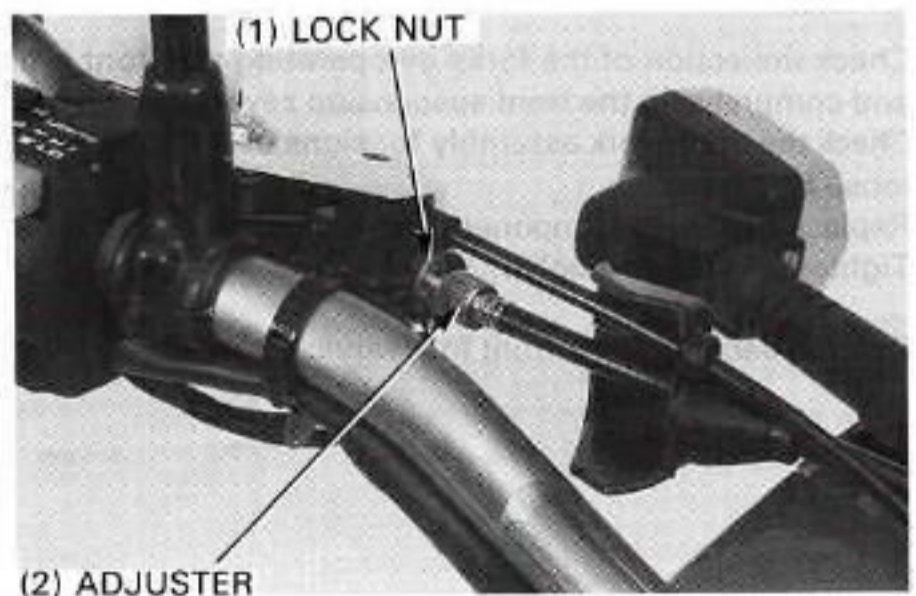
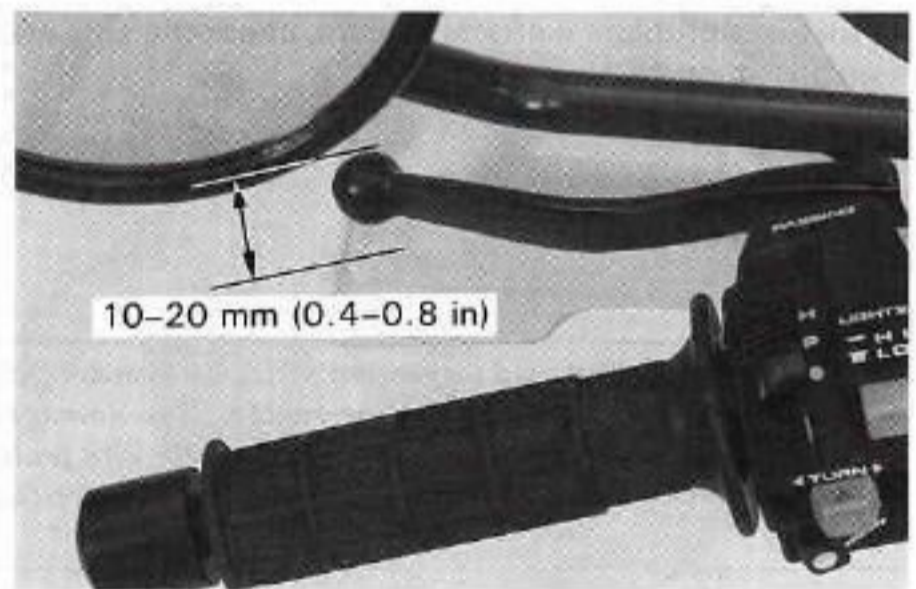
Adjust as follows:

Minor adjustments are made at the adjuster near the lever. Loosen the lock nut and turn the adjuster. Tighten the lock nut.

CAUTION

- *The adjuster may be damaged if it is positioned too far out, leaving minimal thread engagement*

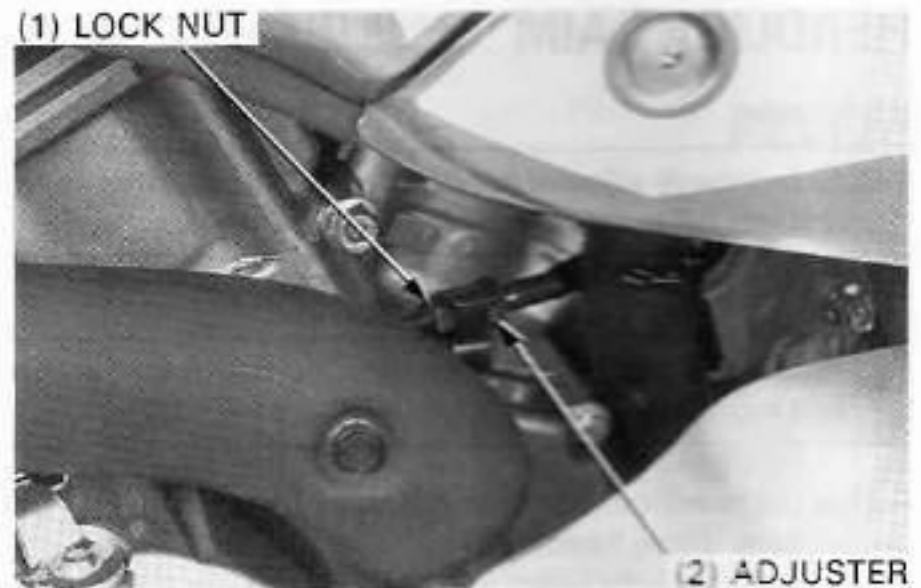
If the adjuster is threaded out near its limit and the correct free play cannot be obtained, turn the adjuster all the way in and back out one turn. Tighten the lock nut and make a major adjustment as described below.



MAINTENANCE

Major adjustment is performed at the clutch arm. Loosen the lock nut and turn the adjusting nut to adjust free play. Hold the adjusting nut securely while tightening the lock nut.

If proper free play cannot be obtained, or the clutch slips during the test ride, disassemble and inspect the clutch (see section 8).



SIDE STAND

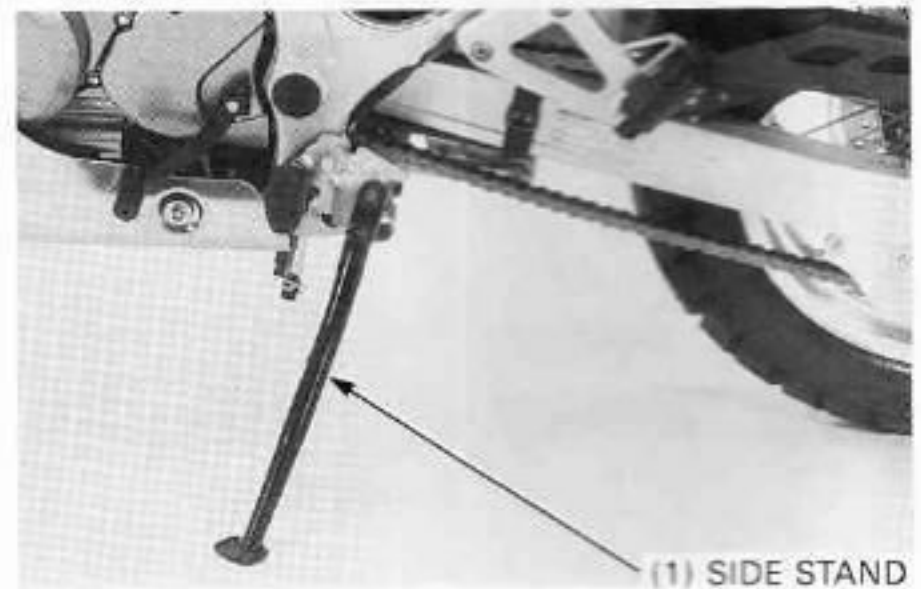
Support the motorcycle on a level surface.

Check the side stand spring for damage or loss of tension. Check the side stand assembly for freedom of movement and lubricate the side stand pivot if necessary. Make sure that the side stand is not bent.

Check the side stand ignition cut-off system:

- Sit astride the motorcycle and raise the side stand.
- Start the engine with the transmission in neutral, then shift the transmission into gear, with the clutch lever squeezed.
- Move the side stand fully down.
- The engine should stop as the side stand is lowered.

If there is a problem with the system, check the side stand switch (section 19).



SUSPENSION

⚠ WARNING

- *Loose, worn, or damaged suspension parts impair motorcycle stability and control. Repair or replace any damaged components before riding. Riding a motorcycle with faulty suspension increases your risk of an accident and possible injury.*

FRONT

Check the action of the forks by operating the front brakes and compressing the front suspension several times. Check the entire fork assembly for signs of leaks, damage or loose fasteners. Replace damaged components which cannot be repaired. Tighten all nuts and bolts.

Refer to section 13 for front fork service.



REAR

Support the motorcycle securely using safety stand or hoist and raise the rear wheel off the ground.

Check for worn swingarm bearings by grabbing the rear wheel and attempting to move the wheel side to side.

Replace the bearings if any looseness is noted (section 14).

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

Check the entire shock absorber assembly for signs of leaks, damage or loose fasteners.

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

Refer to section 14 for shock absorber service.



NUTS, BOLTS, FASTENERS

Check that all chassis nuts, bolts and screws are tightened to their correct torque values (page 1-14) at the interval shown in the Maintenance Schedule.

Check that all cotter pins, slip clips, hose clamps and cable stays are in place and properly secured.



WHEELS/TIRES

Making sure the fork is not allowed to move, raise the front wheel and check for play. Turn the wheel and check that it rotates smoothly with no unusual noises.

If faults are found, inspect the wheel bearings.

Support the motorcycle securely and raise the rear wheel off the ground.

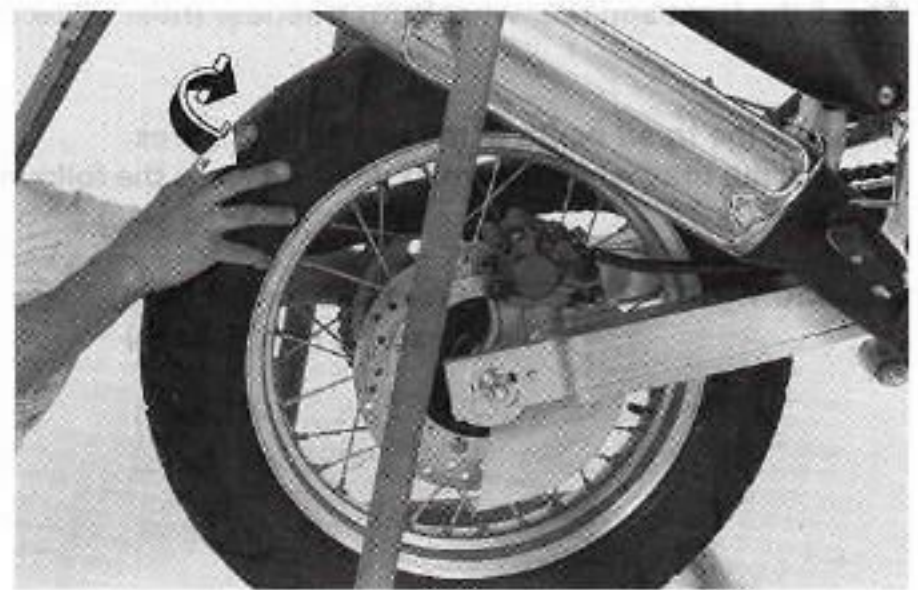
Check for play in either the wheel or the swingarm pivot.

Turn the wheel and check that it rotates smoothly with no unusual noises.

If abnormal conditions are suspected, check the rear wheel bearings.

NOTE

- As the swingarm pivot is included in this check, be sure to confirm the location of the play; i.e. from the wheel bearings or the swingarm pivot.



MAINTENANCE

Inspect the spokes for looseness by tapping them with a screwdriver.

If a spoke does not sound clearly, or if it sounds different from the other spokes, tighten it to the specified torque.

TOOL:

Spanner C, 5.8 X 6.1 mm

07701-0020300

TORQUE: 3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)

Tap on the spokes and be sure that the clear metallic sound of the same tone can be heard on all spokes.

NOTE

- Tire pressure should be checked when tires are COLD.

Check the pressure of each tire with a pressure gauge.

Recommended tire pressure and tire size

Unit: kPa (kgf/cm², psi)

| | | Front | Rear |
|-------------------------------|---------------------------|----------------|----------------|
| Cold tire pres- sure | Driver only | 200 (2.00, 29) | 200 (2.00, 29) |
| | Driver and pas- senger | 200 (2.00, 29) | 250 (2.50, 36) |
| Tire size | | 90/90-21 54H | 140/80 R17 69H |

Check the tires for cuts, embedded nails, or other damage. Check the front and rear wheels for trueness (refer to section 13-14).

Measure the tread depth at the center of the tires. Replace the tires when the tread depth reaches the following limits.

**MINIMUM TREAD DEPTH: Front: 1.5 mm (0.06 in)
Rear: 2.0 mm (0.08 in)**

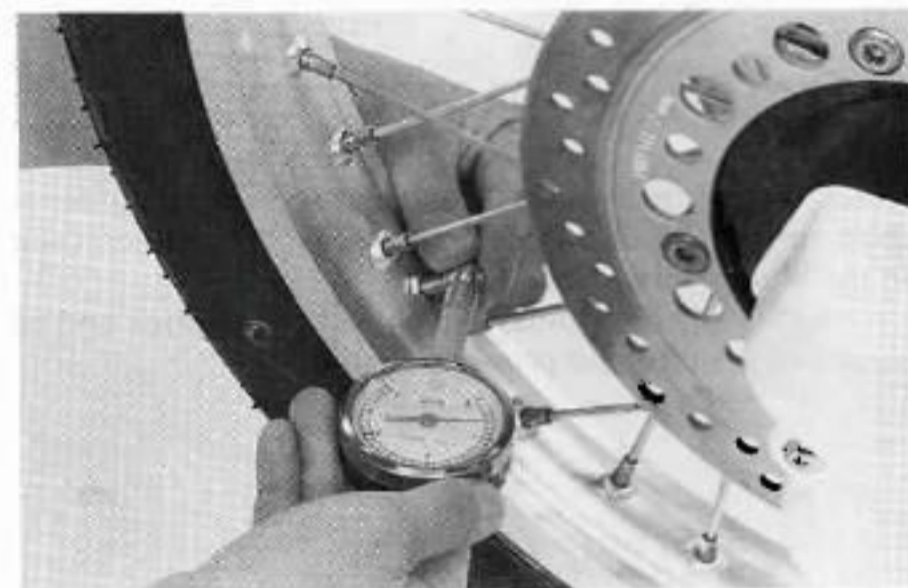
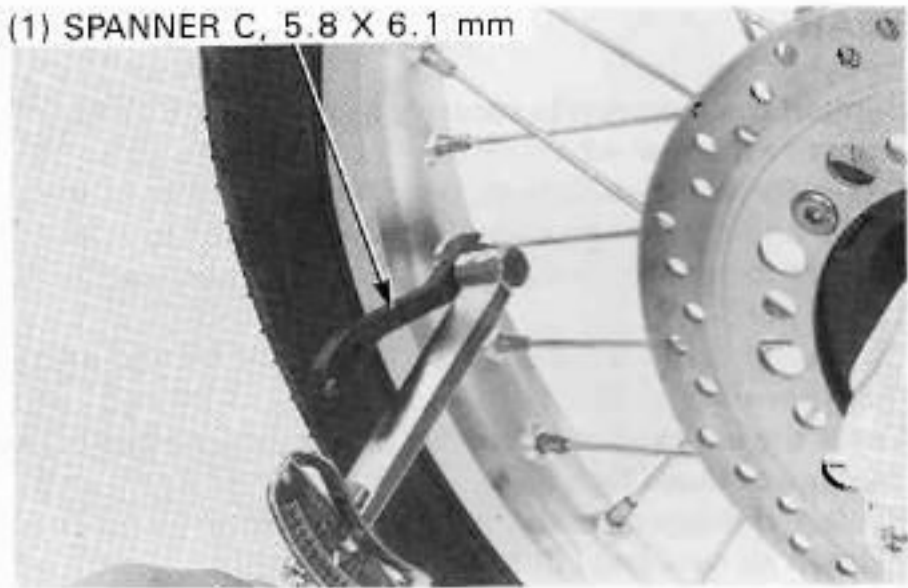
STEERING HEAD BEARINGS

NOTE

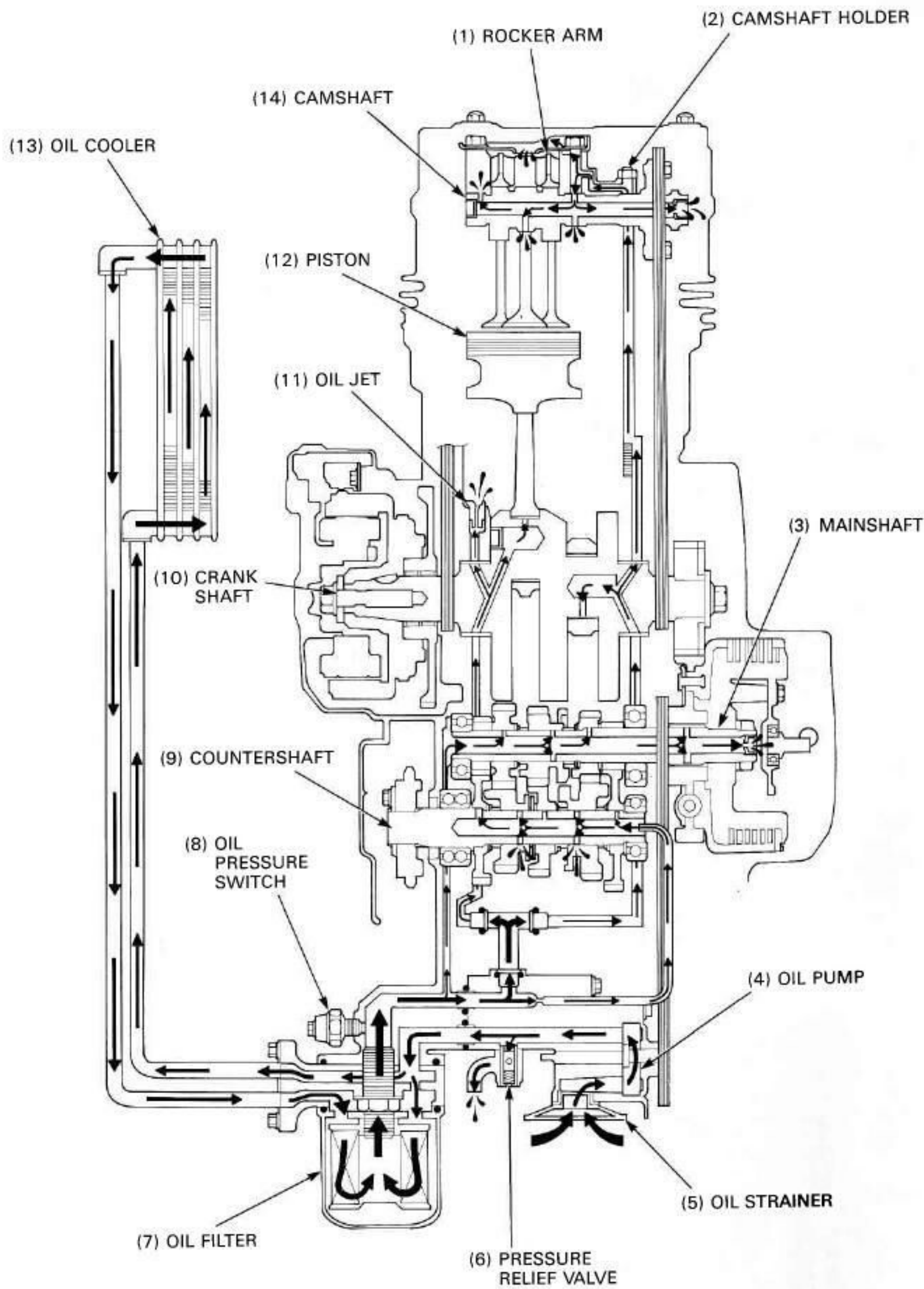
- Check that the control cables do not interfere with handlebar rotation

Support the motorcycle securely and raise the front wheel off ground check that the handlebar moves freely from side to side. If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (section 13).

(1) SPANNER C, 5.8 X 6.1 mm



LUBRICATION SYSTEM



4. LUBRICATION SYSTEM

| | | | |
|---------------------|-----|-----------------|------|
| SERVICE INFORMATION | 4-1 | OIL PUMP | 4-4 |
| TROUBLESHOOTING | 4-2 | OIL COOLER | 4-11 |
| OIL PRESSURE CHECK | 4-3 | OIL DISTRIBUTOR | 4-17 |

SERVICE INFORMATION

GENERAL

⚠ WARNING

- If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that can cause loss of consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in enclosed area.
- Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil. **KEEP OUT OF REACH OF CHILDREN.**

- The engine must be removed from the frame before servicing the oil pump.
- When removing and installing the oil pump use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the engine has been installed check that there are no oil leaks and that oil pressure is correct.
- For oil pressure indicator inspection, refer to section 19 of this manual.

SPECIFICATIONS

Unit:mm(in)

| ITEM | | STANDARD | SERVICE LIMIT |
|--|----------------------|---|---------------|
| Engine oil capacity | At draining | 2.4 liter (2.52 US qt, 2.11 Imp qt) | ———— |
| | At disassembly | 3.2 liter (3.41 US qt, 2.82 Imp qt) | ———— |
| | At oil filter change | 2.6 liter (2.73 US qt, 2.29 Imp qt) | ———— |
| Recommended engine oil | | Used Honda 4-stroke oil or equivalent API Service Classification: SE,SF or SG Viscosity: SAE 10W-40 | ———— |
| Oil pressure at oil pressure switch (80 °C/176 °F) | | 490-588 kPa (5.0-6.0 kgf/cm ² , 71-85 psi) at 5,000 min ⁻¹ (rpm) | ———— |
| Oil pump rotor | Tip clearance | 0.15 (0.006) | 0.20 (0.008) |
| | Body clearance | 0.15 – 0.22 (0.006 – 0.009) | 0.35 (0.014) |
| | Side clearance | 0.02 – 0.07 (0.001 – 0.003) | 0.10 (0.004) |

LUBRICATION SYSTEM

TORQUE VALUES

| | | |
|-------------------------------------|----------------------------------|--------------------------------------|
| Oil pump driven sprocket bolt | 15 N•m (1.5 kgf•m, 11 lbf•ft) | Apply a locking agent to the threads |
| Oil filter | 10 N•m (1.0 kgf•m, 7 lbf•ft) | Apply oil to the O-ring |
| Oil drain bolt | 34 N•m (3.5 kgf•m, 25 lbf•ft) | |
| Oil pressure switch | 12 N•m (1.2 kgf•m, 9 lbf•ft) | Apply sealant to the threads |
| Oil pressure switch screw | 2.3 N•m (0.23 kgf•m, 1.7 lbf•ft) | |
| Oil cooler distributor bolt | 54 N•m (5.5 kgf•m, 40 lbf•ft) | |
| Oil cooler mounting bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) | |
| Oil cooler pipe mounting bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) | |
| Oil cooler joint setting plate bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) | Apply oil to the O-ring |

TOOLS

| | |
|-------------------------------|---------------|
| Oil filter wrench | 07HAA-PJ70100 |
| Oil pressure gauge | 07506-3000000 |
| Oil Pressure gauge attachment | 07510-4220100 |

TROUBLESHOOTING

Oil level low

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

Oil contamination (White appearance)

- From coolant mixing with oil
 - Faulty water pump mechanical seal
 - Faulty head gasket
 - Water leak in crankcase

No oil pressure

- Oil level too low
- Oil pump drive chain or drive sprocket broken
- Oil pump damaged (pump shaft)
- Internal oil leak

Low oil pressure

- Pressure relief valve stuck open
- Clogged oil filter and strainer screen
- Oil pump worn or damaged
- Internal oil leak
- Incorrect oil being used
- Oil level too low

High oil pressure

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

Seized engine

- No or low oil pressure
- Clogged oil orifice/passage
- Internal oil leak
- Non-recommended oil used

Oil contamination

- Deteriorated oil
- Faulty oil filter
- Worn piston ring (White appearance with water or moisture)
 - Damaged water pump mechanical seal
 - Damaged head gasket
 - Oil relief not frequent enough

Oil pressure warning indicator does not work

- Faulty oil pressure switch
- Short circuit in the indicator wire
- Low or no oil pressure
- Blown bulb

OIL PRESSURE CHECK

NOTE

- If the engine is cold, the pressure reading will be abnormally high. Warm up the engine to normal operating temperature before starting this test.

Warm up the engine.
Stop the engine.
Remove the skid plate (page 2-7).
Remove the drive sprocket cover (page 7-2).

Remove the screw cover and screw.
Disconnect the oil pressure switch wire.

Remove the oil pressure switch.
Connect the oil pressure gauge attachment and gauge to the pressure switch hole.

TOOLS:

Oil pressure gauge 07506-3000000
Oil pressure gauge attachment 07510-4220100

Check the oil level and add the recommended oil if necessary (page 3-13).

Start the engine and check the oil pressure at 5,000 min⁻¹ (rpm).

OIL PRESSURE: 490 - 588 kPa (5.0 - 6.0 kgf/cm², 71 - 85 psi) at 5,000 min⁻¹ (rpm) (80°C/176°F)

Stop the engine and remove the oil pressure gauge attachment and gauge from the pressure switch hole.

Apply sealant to the oil pressure switch threads as shown and tighten it to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

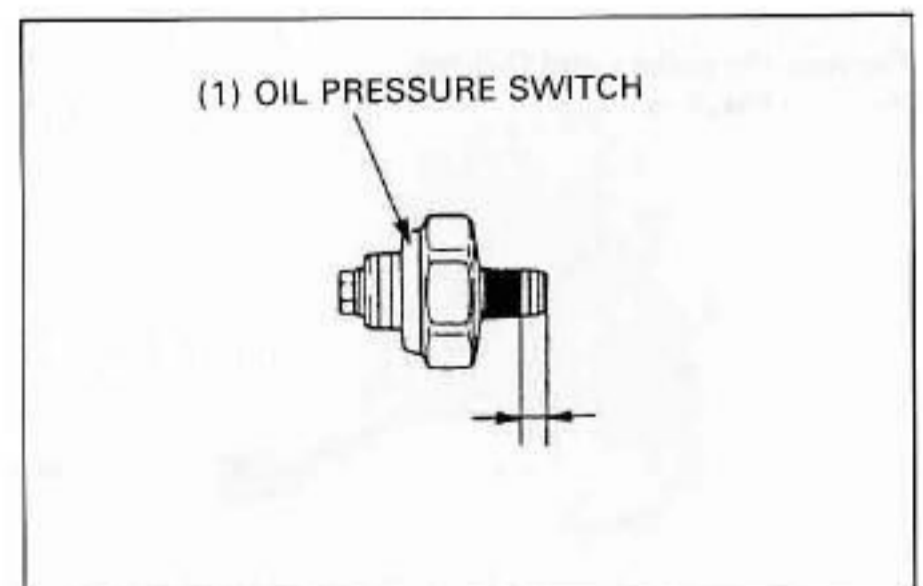
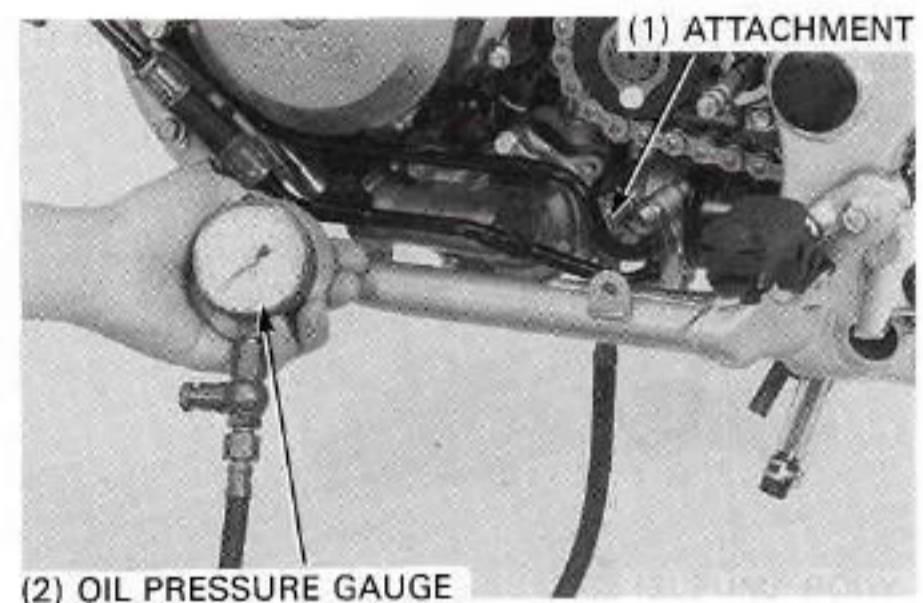
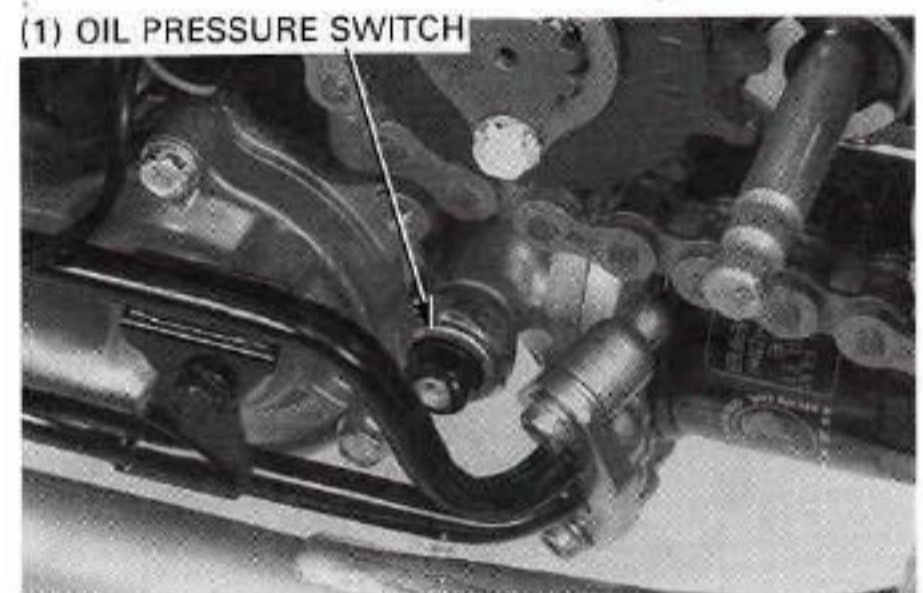
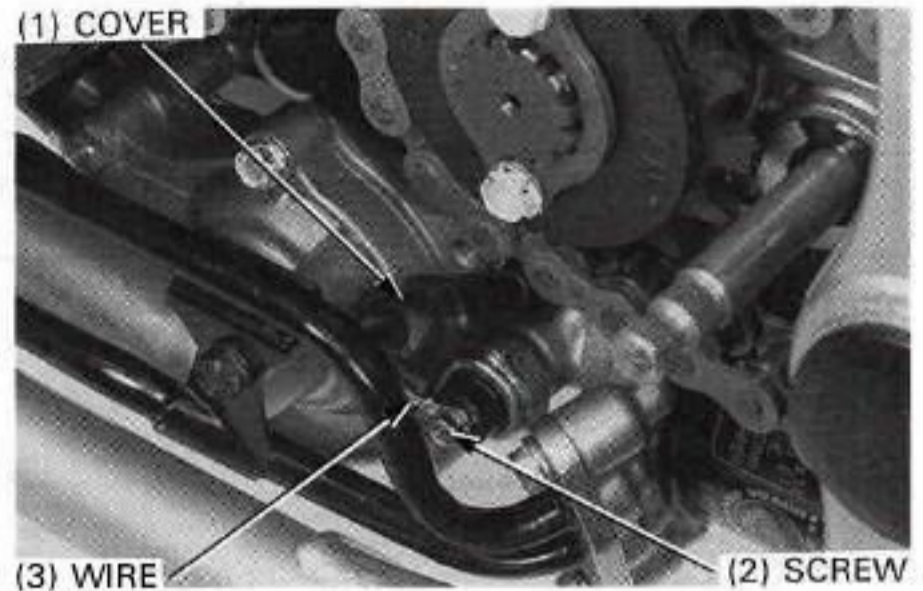
Connect the oil pressure switch wire and tighten the screw to the specified torque.

TORQUE: 2.3 N·m (0.23 kgf·m, 1.7 lbf·ft)

NOTE

- Route the oil pressure switch wire correctly (page 1-22).

Start the engine.
Check the oil pressure indicator goes out after one or two seconds. If the oil pressure indicator stay on, stop the engine immediately and determine the cause (page 19-16).



LUBRICATION SYSTEM

OIL PUMP

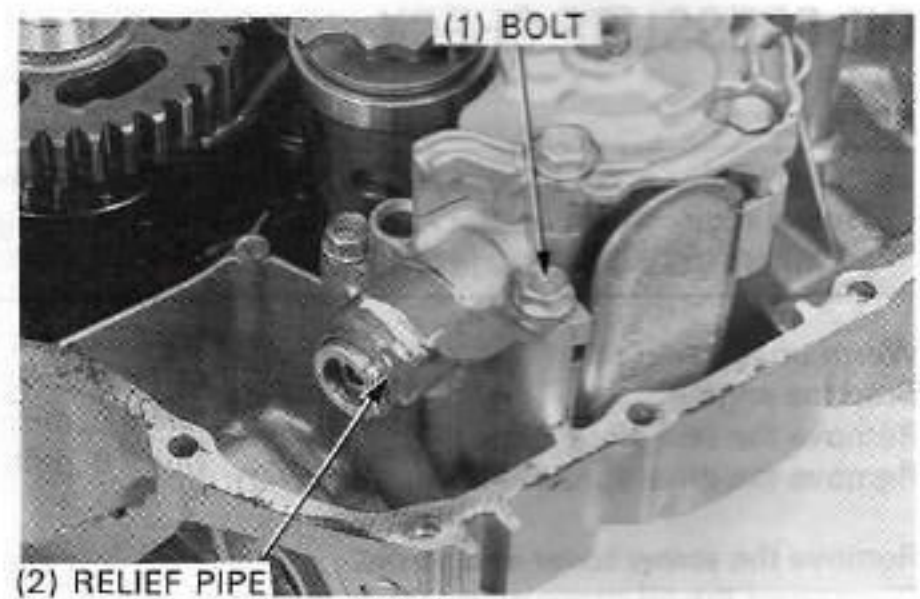
NOTE

- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.

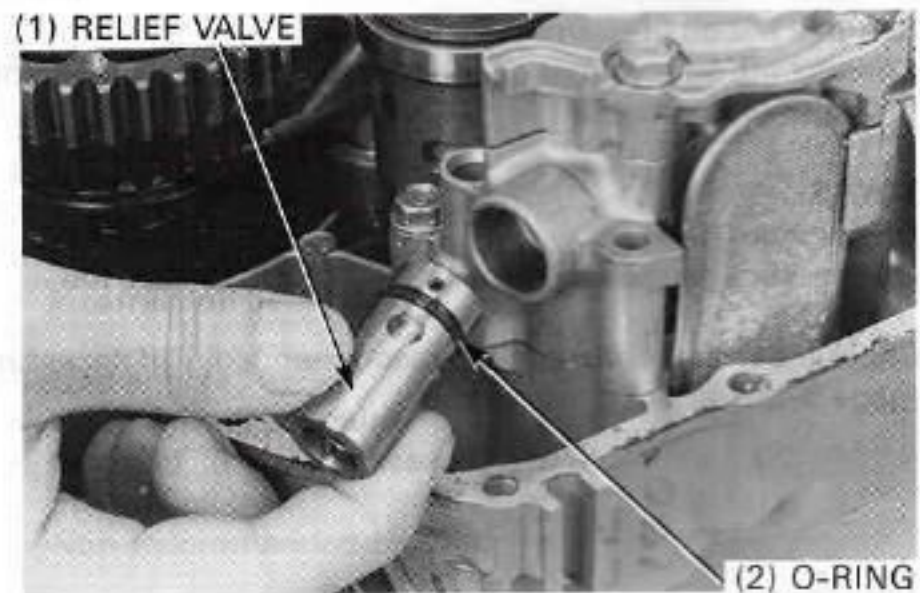
REMOVAL

Separate the crankcase (page 12-4).

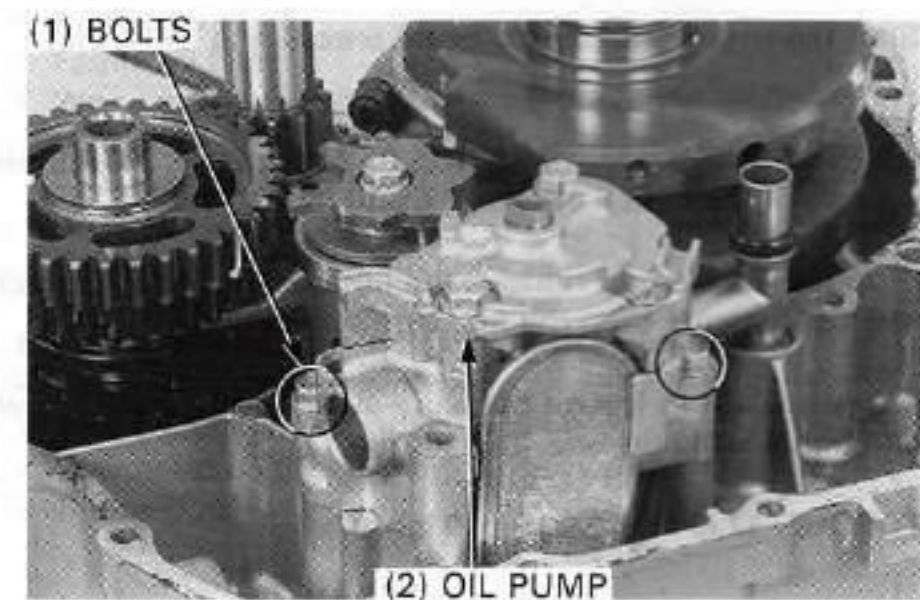
Remove the bolt and oil relief pipe.



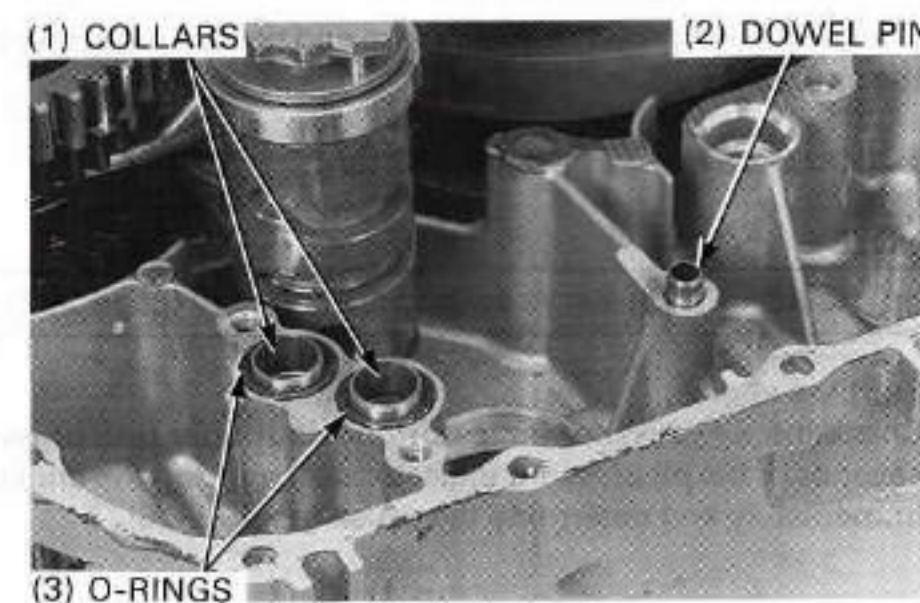
Remove the oil relief valve and O-ring.



Remove the bolts and oil pump.



Remove the collars and O-rings.
Remove the dowel pin.



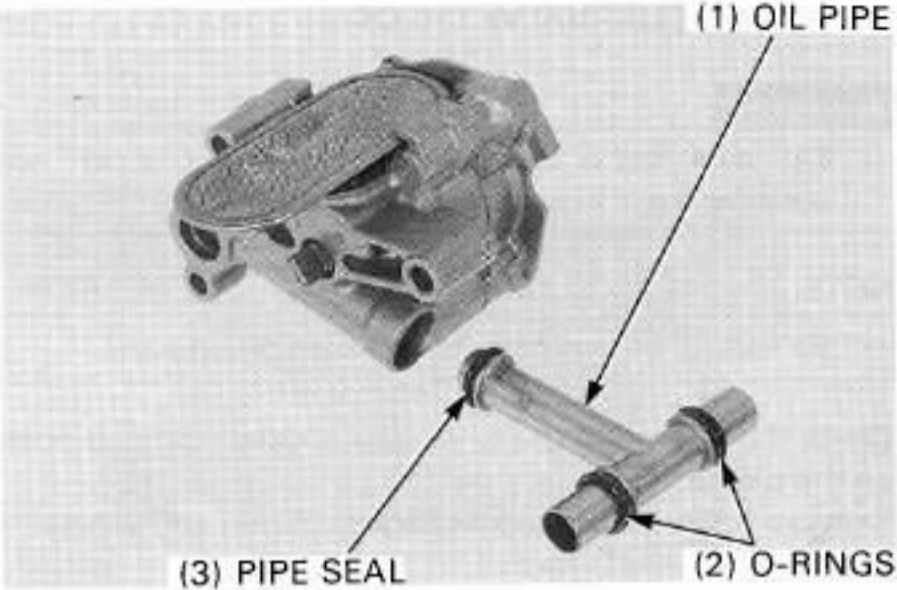
DISASSEMBLY

OIL PUMP DISASSEMBLY

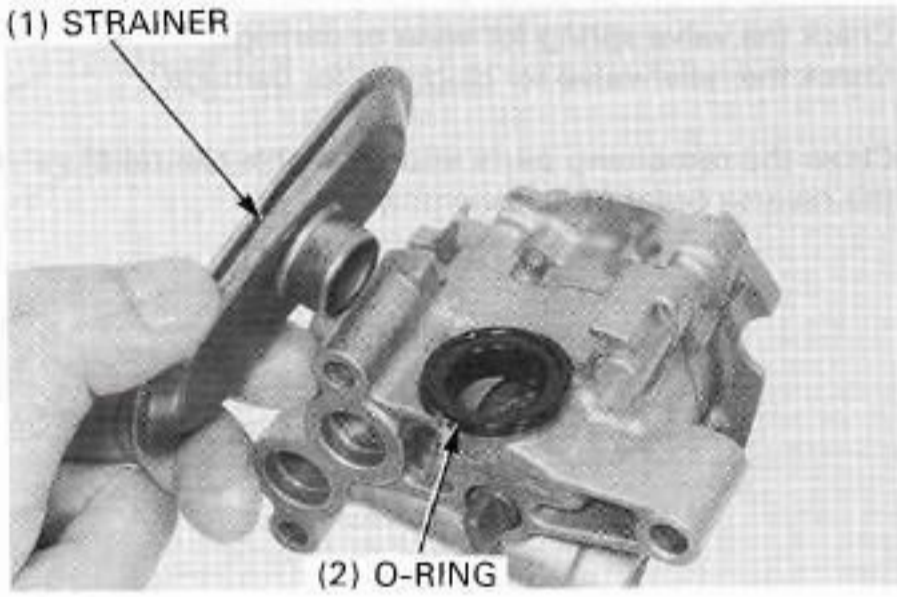
NOTE

- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.

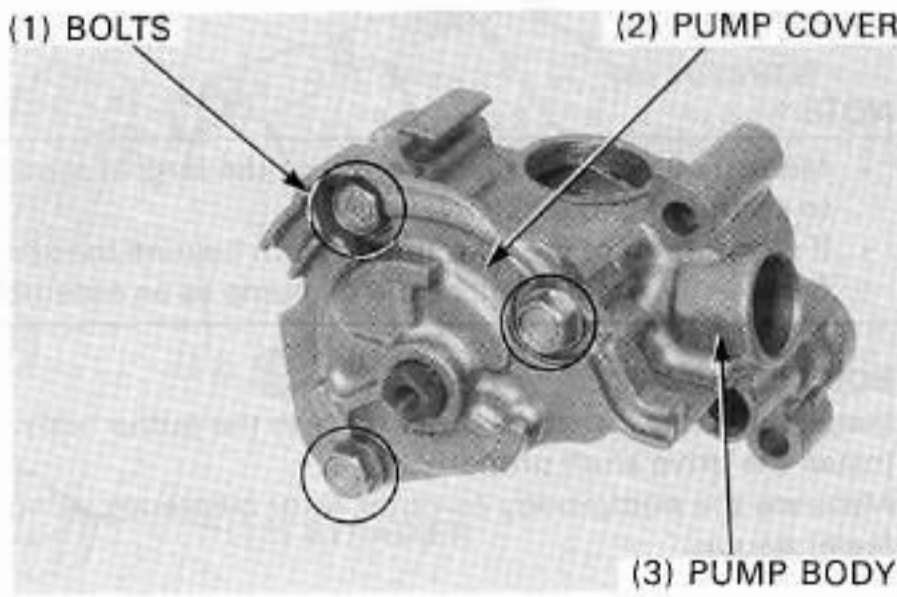
Remove the oil pipe, oil pipe seal and O-rings.



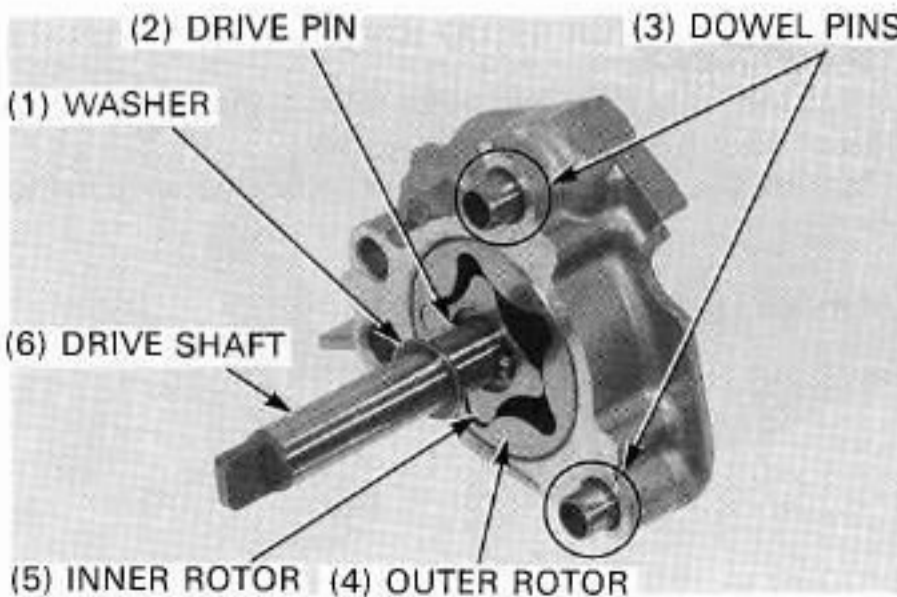
Remove the oil strainer and O-ring.



Remove the bolts and pump cover from pump body.



Remove the dowel pins.
Remove the washer, drive shaft, drive pin, inner rotor and outer rotor.



LUBRICATION SYSTEM

PRESSURE RELIEF VALVE CHECK

⚠ WARNING

- *The snap ring is under spring pressure. Use care when removing it and wear eye and face protection.*

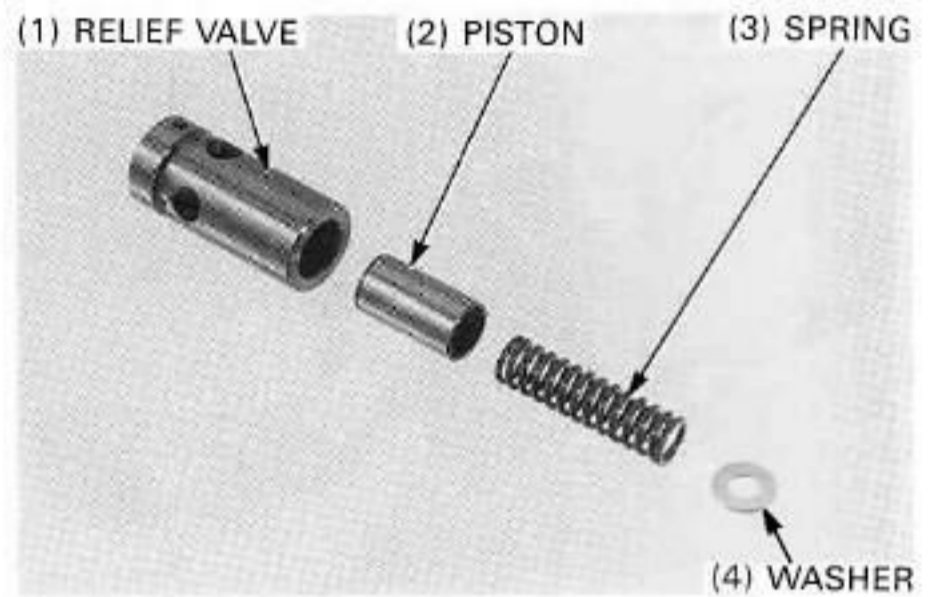
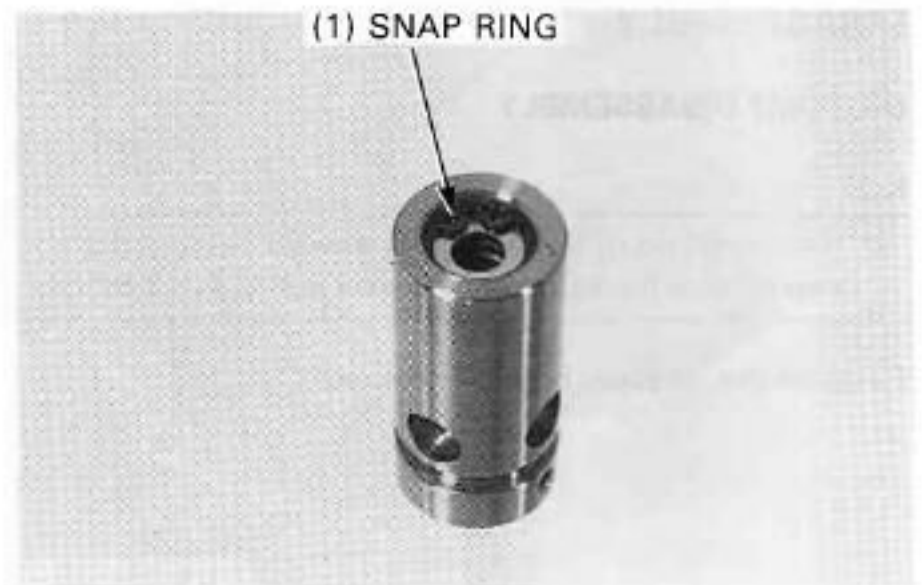
NOTE

- Be careful not to loose the disassembled parts.

Check the operation of the pressure relief valve by pushing on the piston.
Remove the pressure relief valve snap ring and disassemble the pressure relief valve.

Check the piston for wear, sticking or damage.
Check the valve spring for wear or damage.
Check the relief valve for clogging or damage.

Clean the remaining parts and assemble the relief valve in the reverse order of disassembly.



INSPECTION

NOTE

- Measure at several places and use the largest reading to compare to the service limit.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.

BODY CLEARANCE

Install the inner rotor and outer rotor to the pump body.
Install the drive shaft properly.
Measure the pump body-to-outer rotor clearance using the feeler gauge.

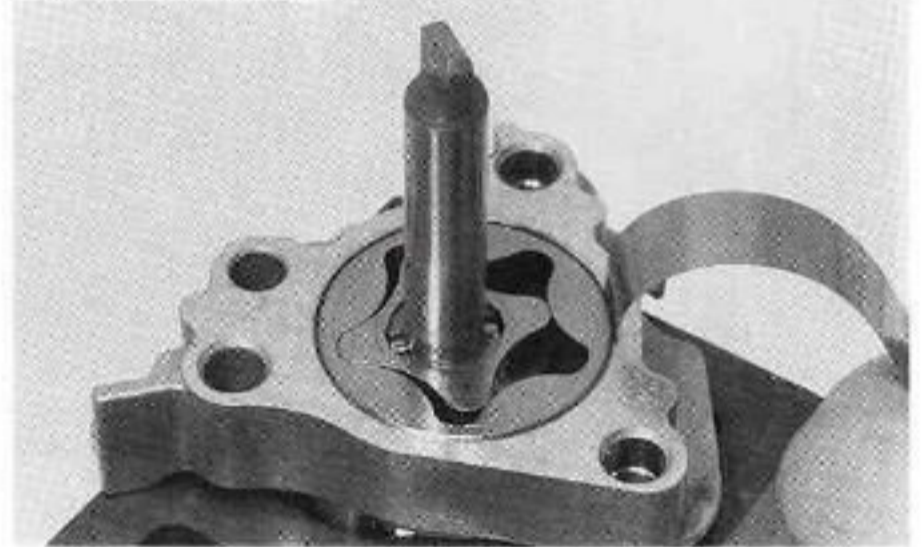
SERVICE LIMIT: 0.35 mm (0.014 in)

TIP CLEARANCE

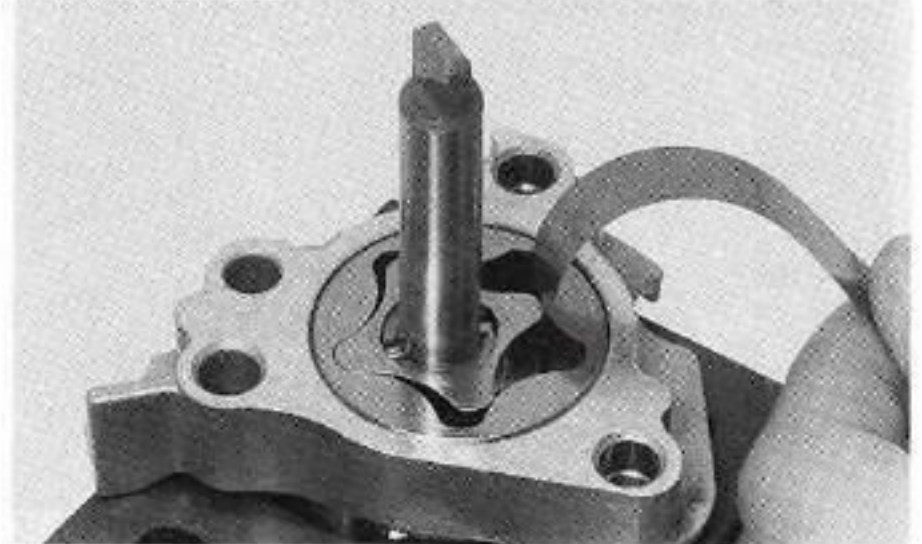
Install the inner rotor and outer rotor to the pump body.
Install the drive shaft properly.
Measure the outer rotor-to-inner rotor clearance using the feeler gauge.

SERVICE LIMIT: 0.20 mm (0.008 in)

BODY CLEARANCE



TIP CLEARANCE

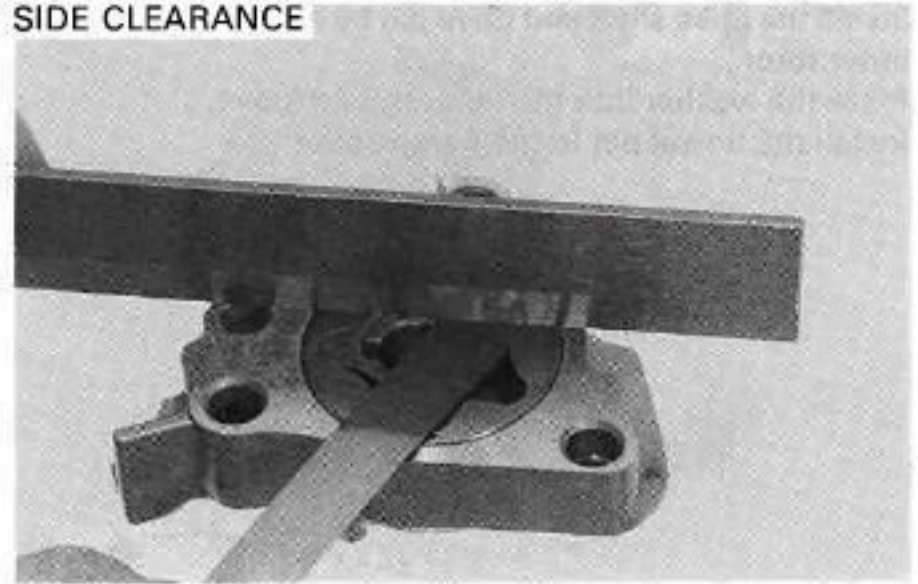


SIDE CLEARANCE

Install the inner rotor and outer rotor to the pump body. Measure the rotor side-to-pump body clearance using the feeler gauge and straight edge.

SERVICE LIMIT: 0.10 mm (0.004 in)

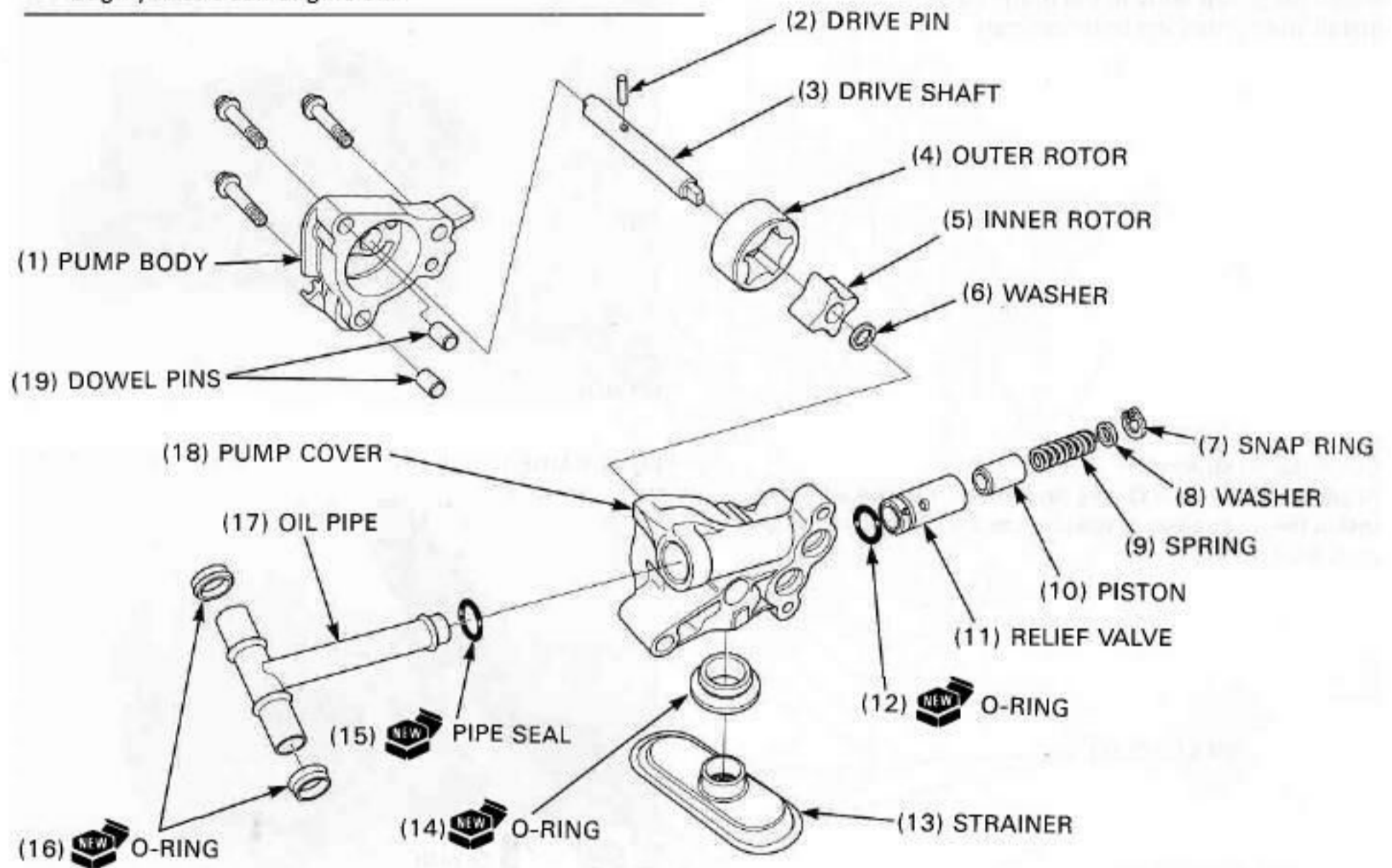
SIDE CLEARANCE



ASSEMBLY

NOTE

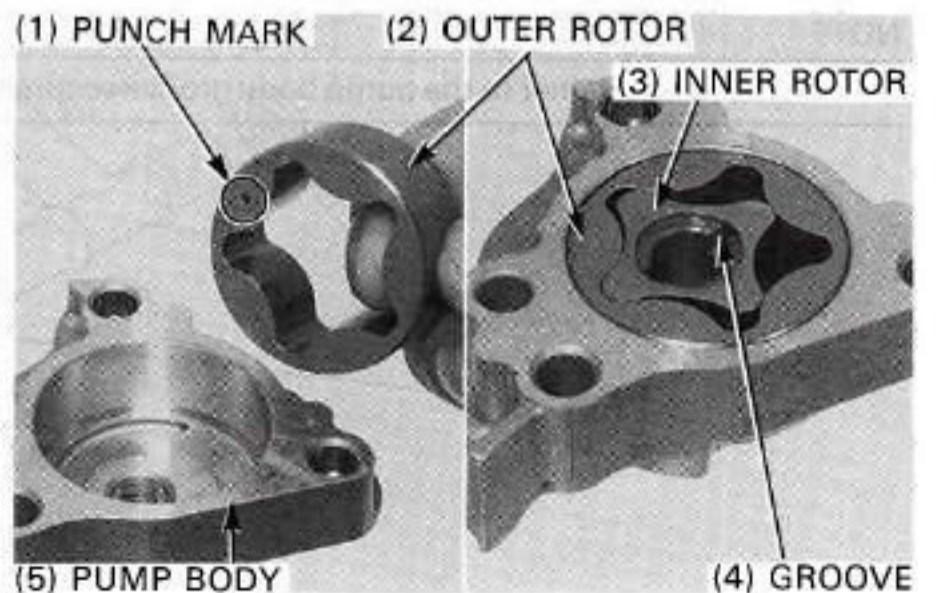
- Before assembly, clean all disassembled parts thoroughly with clean engine oil.



NOTE

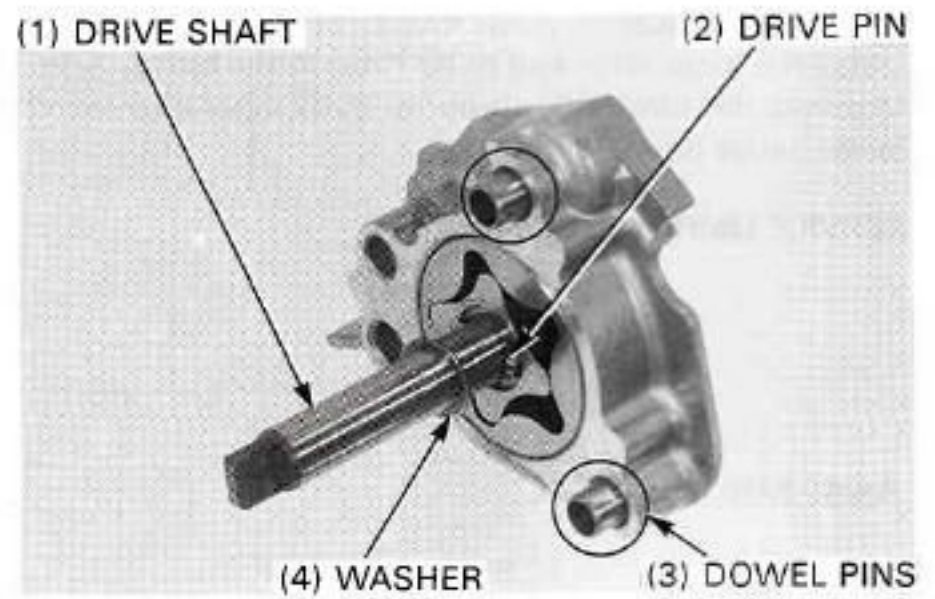
- When outer rotor installing, install it with the outer rotor punch mark facing the pump body.
- When inner rotor installing, install it with the groove side facing the pump cover.

Install the outer rotor and inner rotor to the pump body.

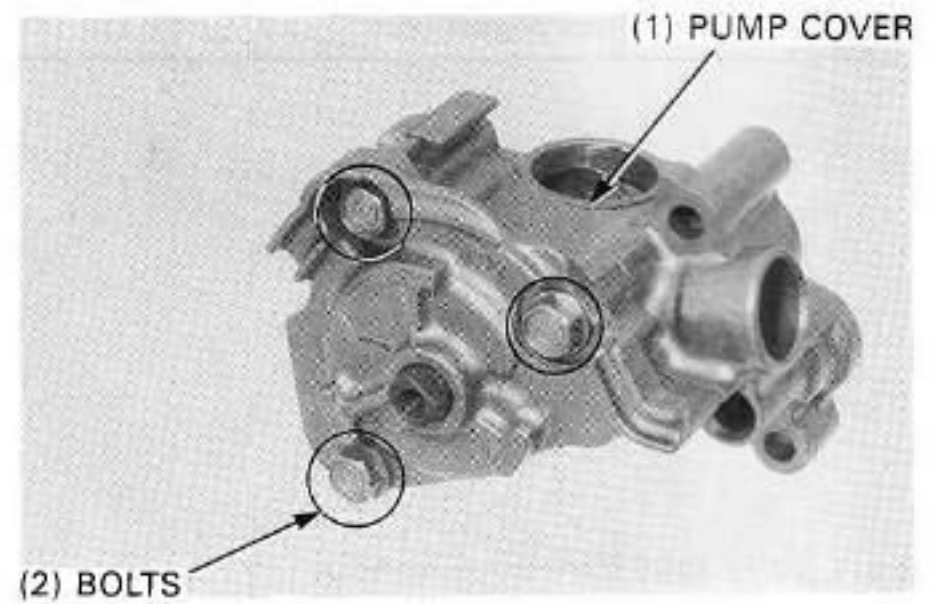


LUBRICATION SYSTEM

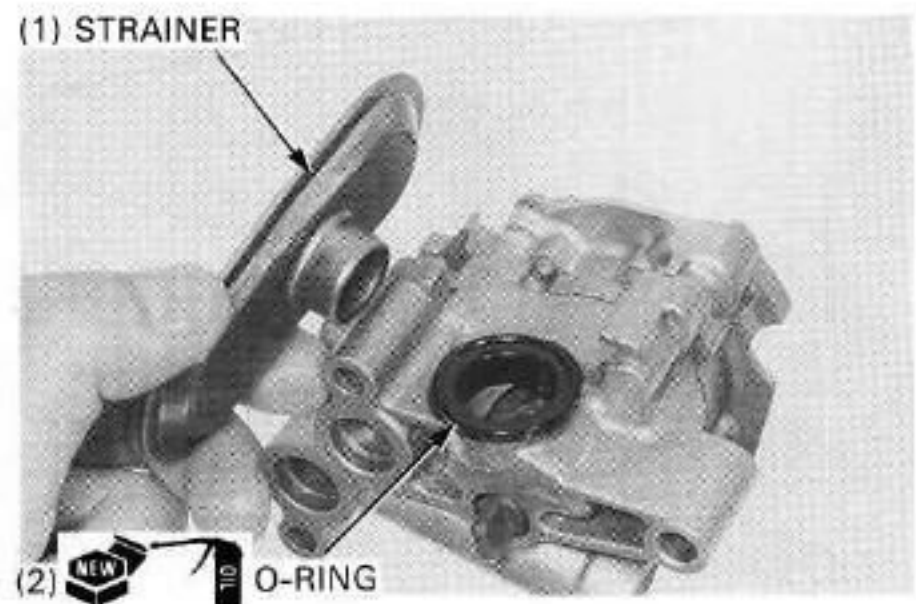
Install the drive shaft and drive pin by aligning the slots in the inner rotor.
Place the washer into the inner rotor groove.
Install the dowel pin to the pump cover.



Install the pump body to the pump cover.
Install and tighten the bolts securely.

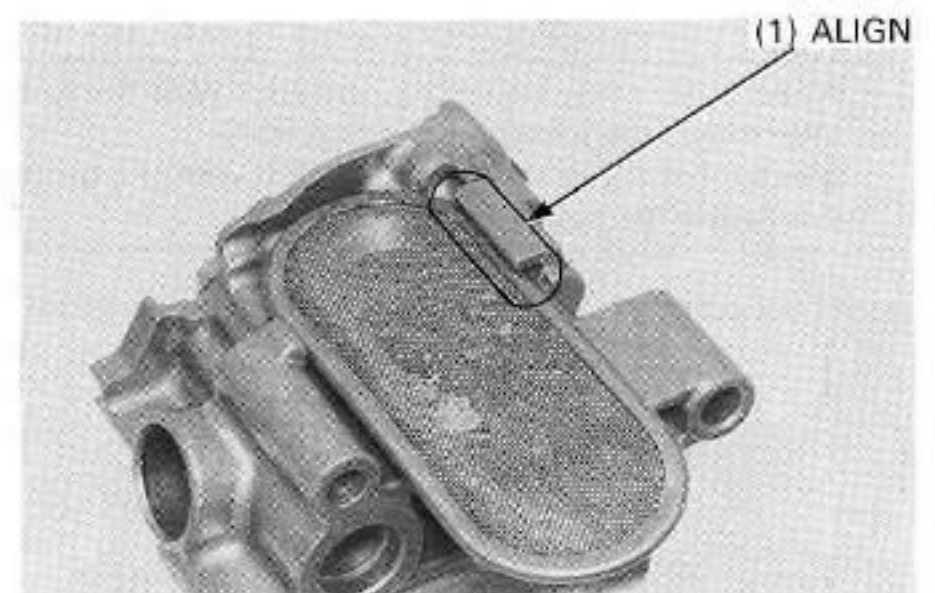


Clean the oil strainer.
Apply oil to the new O-ring and install it to the oil pump.
Install the oil strainer to the oil pump aligning it to the groove on the oil pump.



NOTE

- Install the oil strainer to the pump body groove securely.

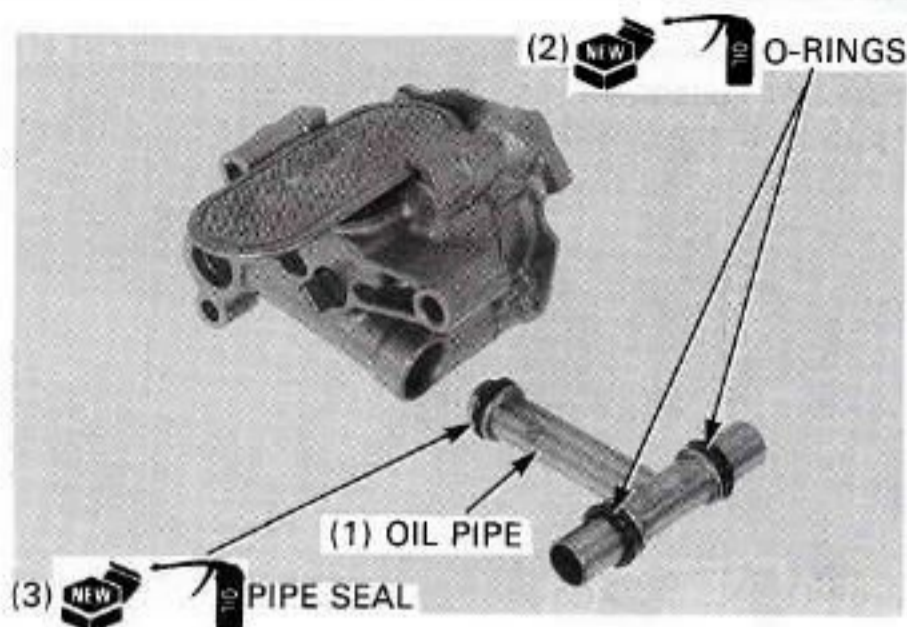


Apply oil to the new oil pipe seal and new O-rings, then install to the oil pipe.

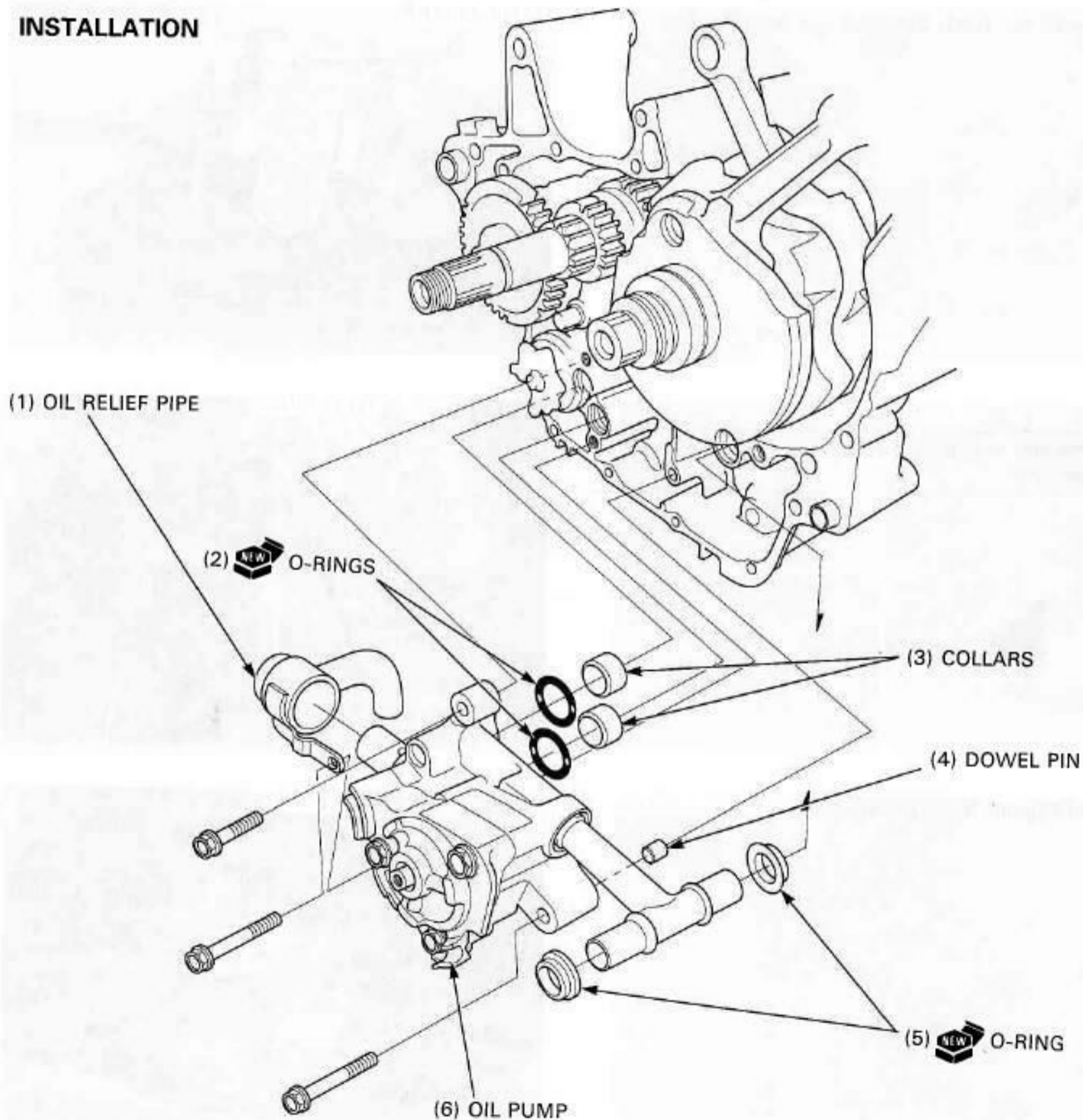
NOTE

- Install the O-rings with their tapered side facing out.

Install the oil pipe to the oil pump securely.

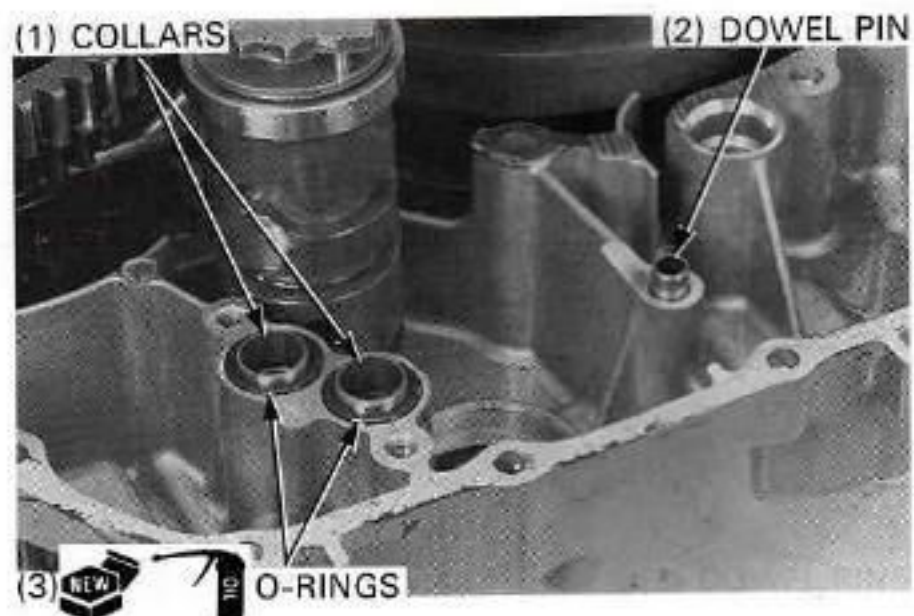


INSTALLATION

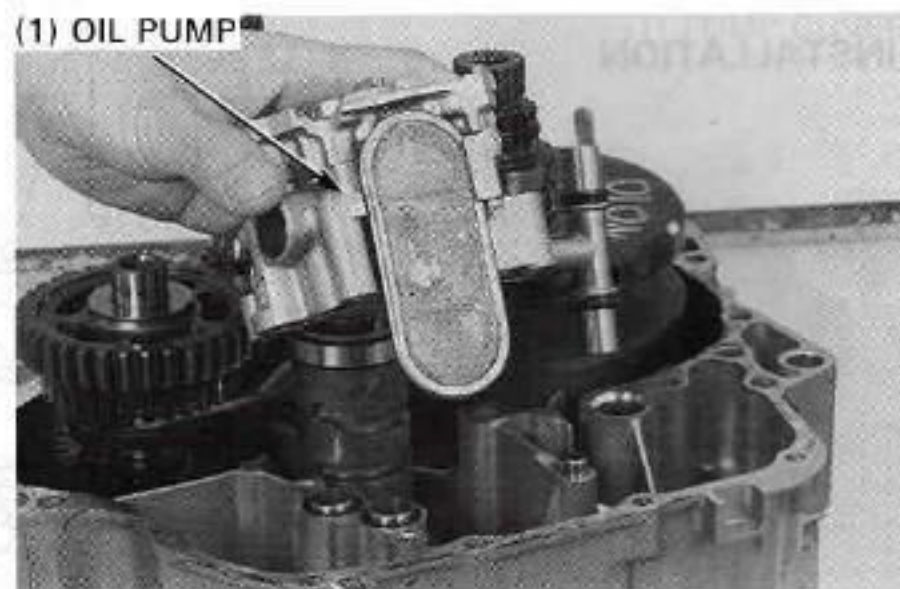


LUBRICATION SYSTEM

Install the dowel pin.
Install the collars.
Apply oil to the new O-rings and install onto the collars.

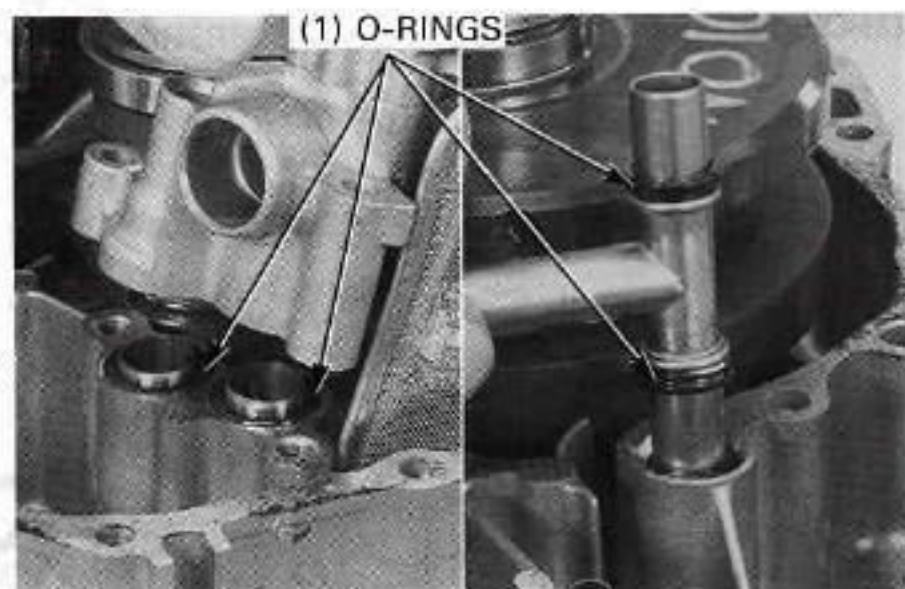


Install the oil pump into the crankcase securely.

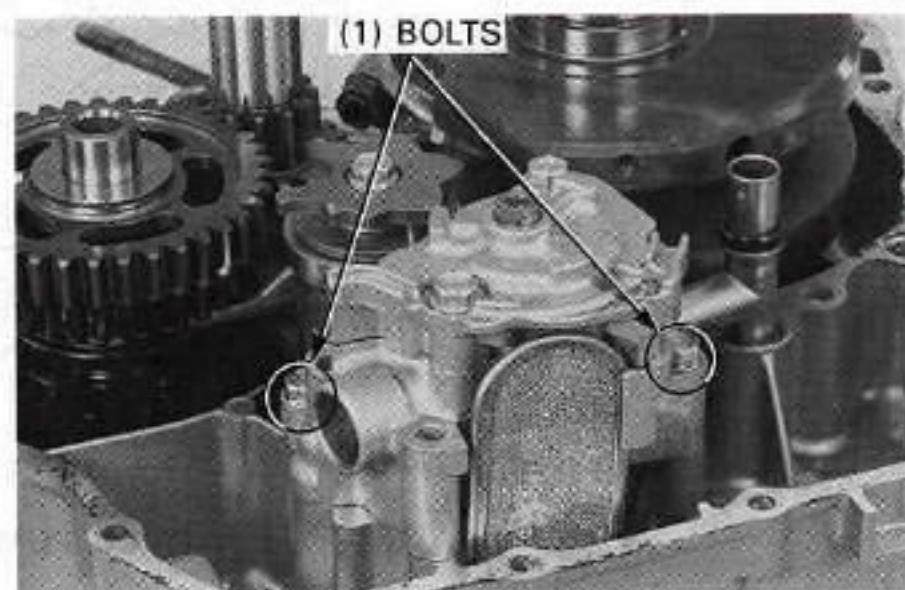


NOTE

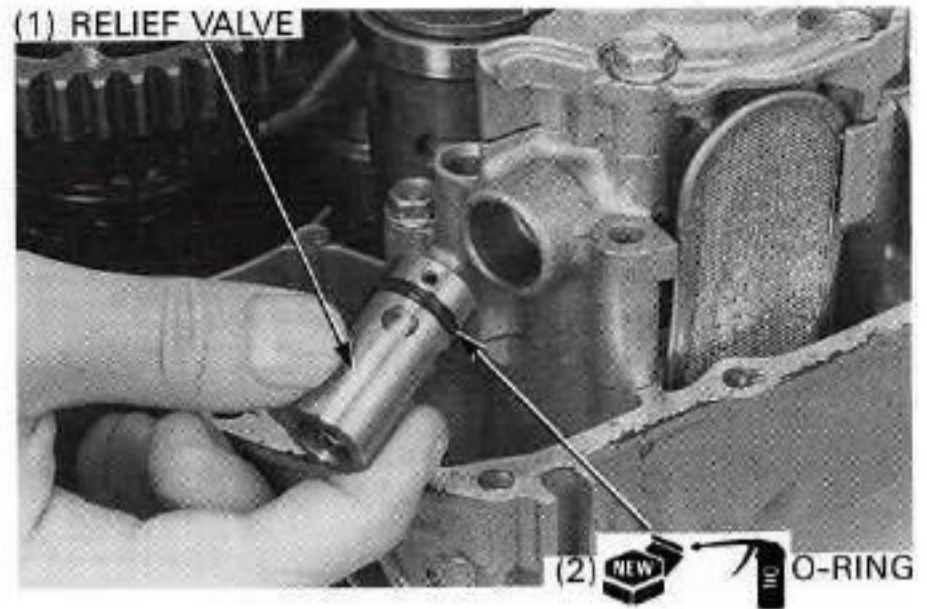
- Be careful not to damage the O-rings at oil pump installation.



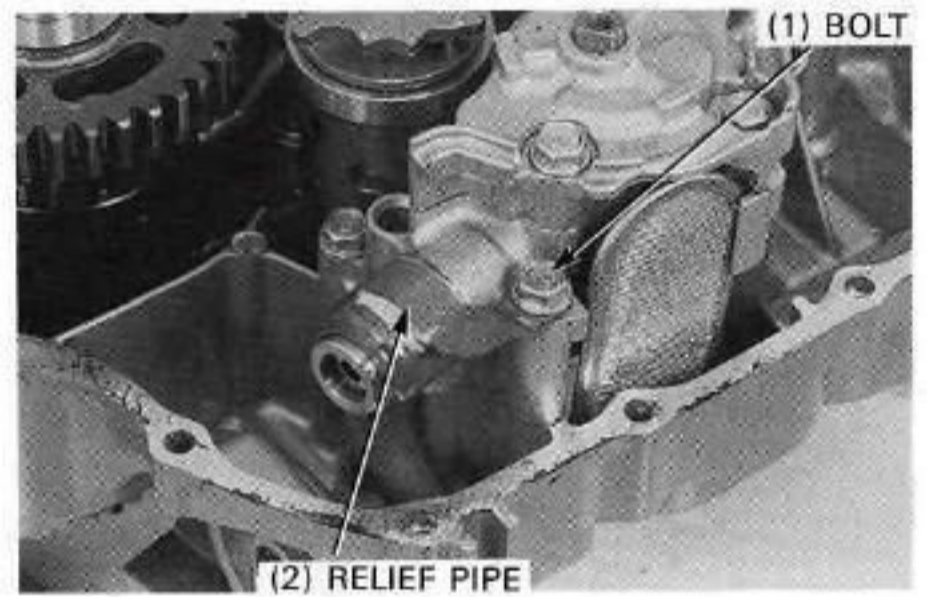
Install and tighten the bolts securely.



Apply oil to the new O-ring and install the pressure relief valve groove, and install the relief valve to the oil pump.



Install the oil relief pipe.
Install and tighten the bolt securely.

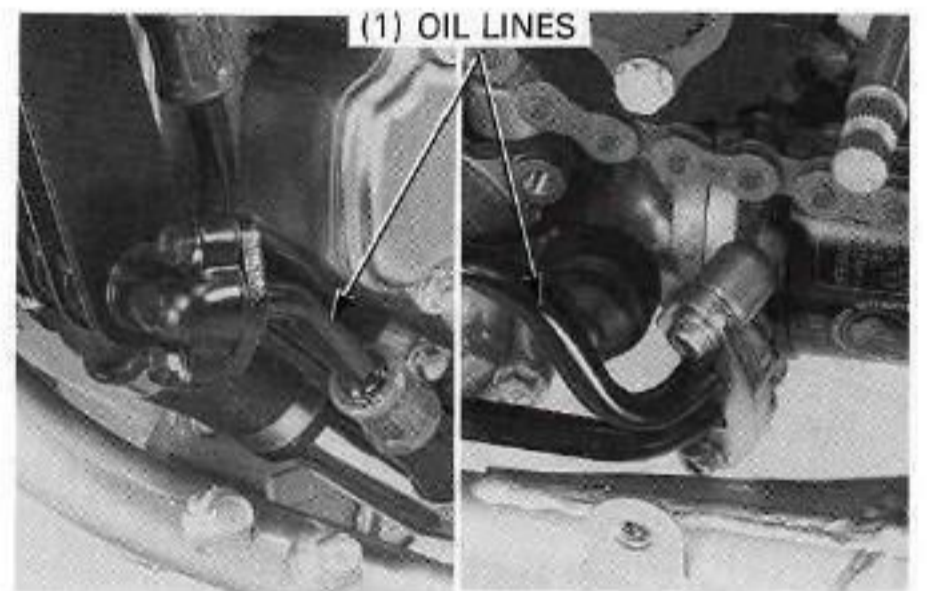


Combine the crankcase (page 12-23).
Check that there are no oil leaks and that oil pressure is correct.

OIL COOLER

NOTE

- Do not bend the oil cooler pipes while servicing the oil cooler.
- When oil cooler pipe joint removing, place the clean oil drain pan under the engine and catch the oil.

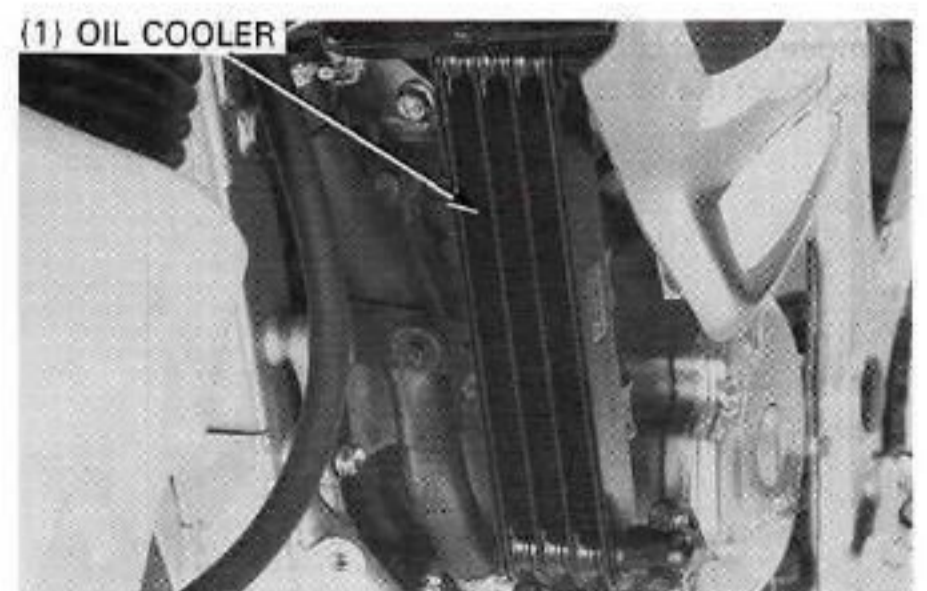


INSPECTION

Remove the stone guard and skid plate (page 2-5).
Remove the drive sprocket cover (page 7-2).

Check the oil line connections for leaks.

Check the oil cooler for bent or collapsed fins.
Straighten the bent or collapsed fins with a suitable, small, blade-type screwdriver if necessary.
Check the air passages for clogging or restriction.
Blow dirt out from between core fins with compressed air or wash off dirt with water.



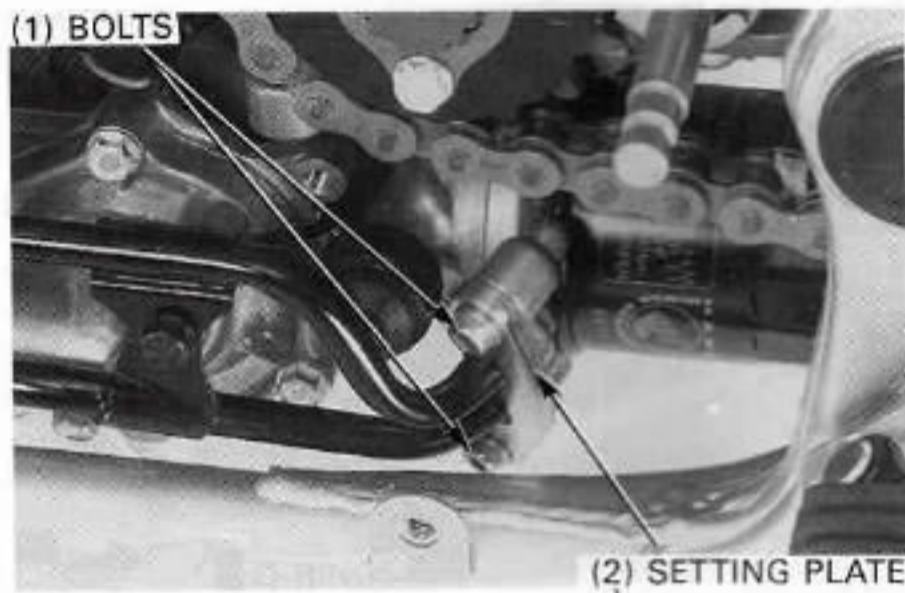
LUBRICATION SYSTEM

REMOVAL

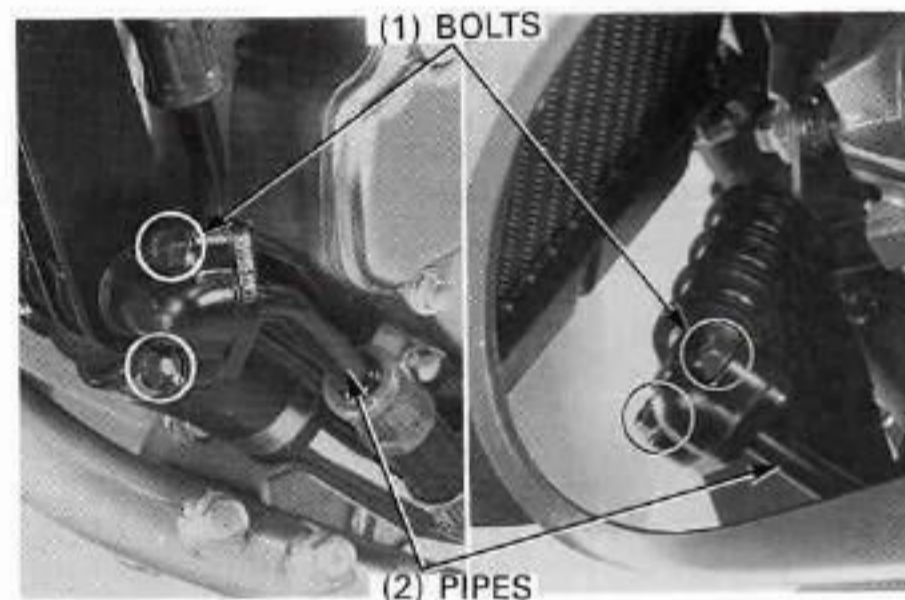
OIL COOLER PIPE REMOVAL

Remove the stone guard and skid plate (page 2-5).
Remove the drive sprocket cover (page 7-2).
Drain the engine oil (page 3-14).

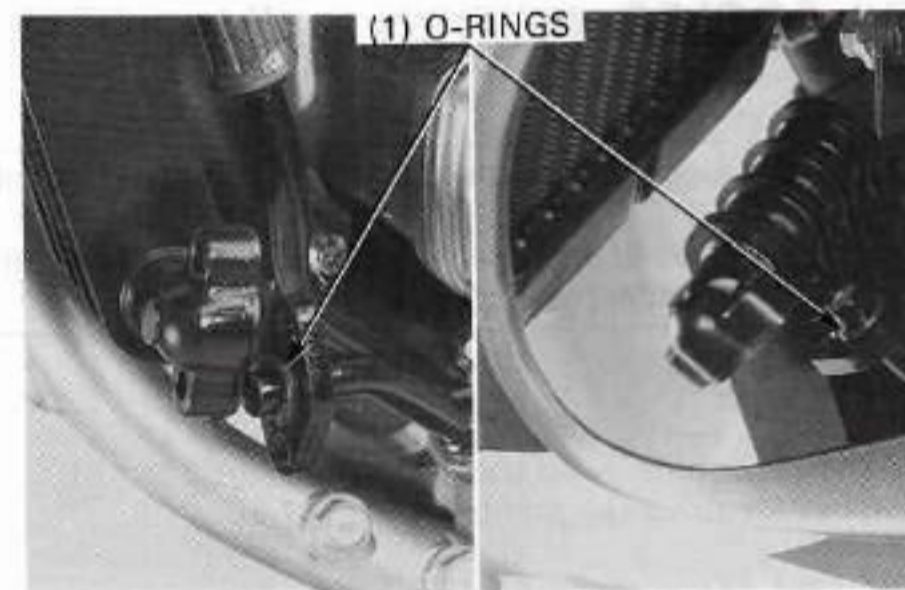
Remove the oil cooler joint setting plate bolts.
Remove the oil cooler joint setting plate.



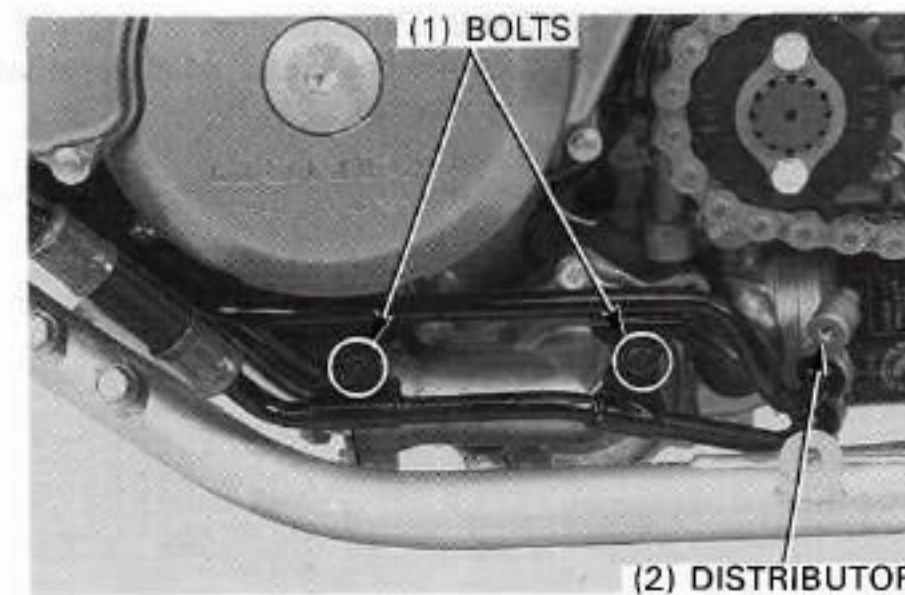
Remove the bolts.
Disconnect the oil cooler pipes from the oil cooler.



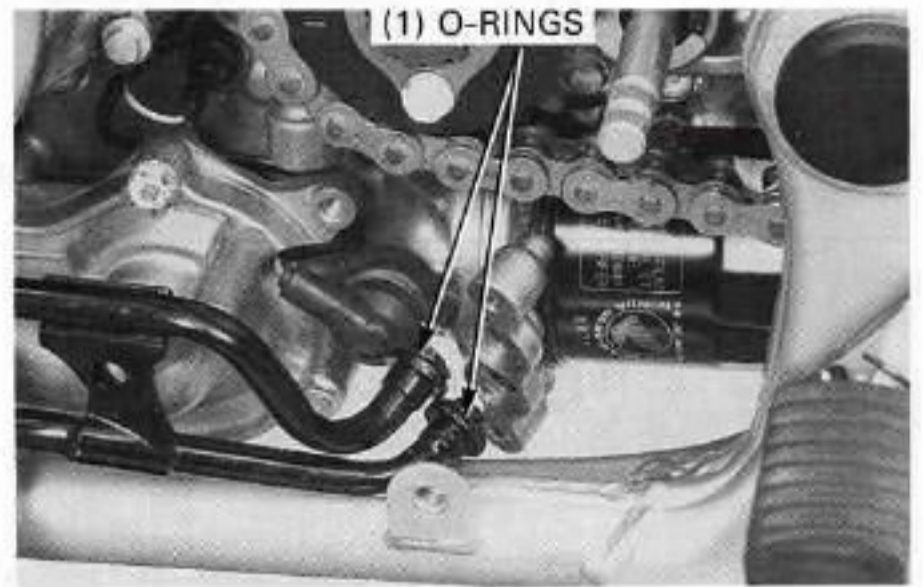
Remove the O-rings from the oil cooler pipes.



Remove the oil cooler pipe mounting bolts.
Disconnect the oil cooler pipes from the oil distributor.



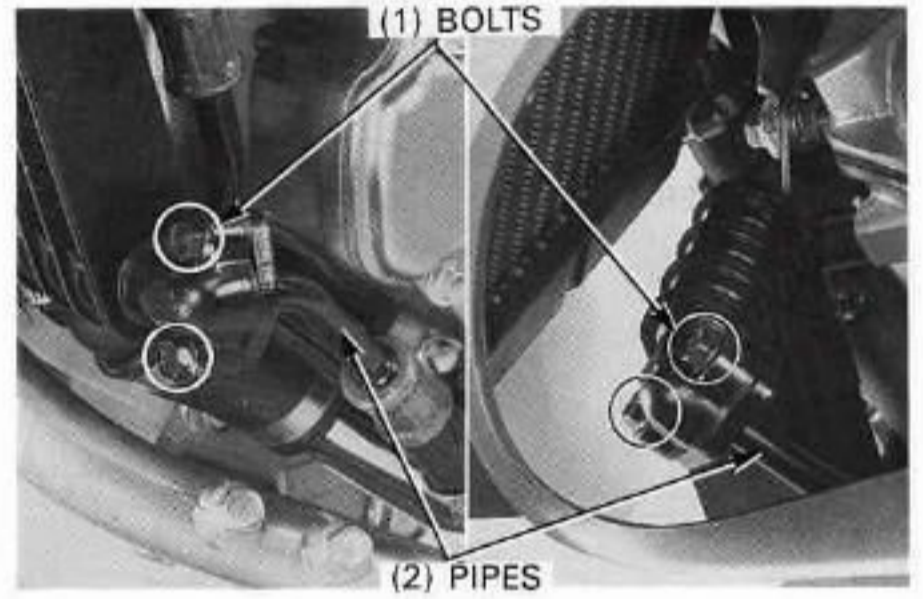
Remove the O-rings from the oil cooler pipes.
Remove the oil cooler pipes.



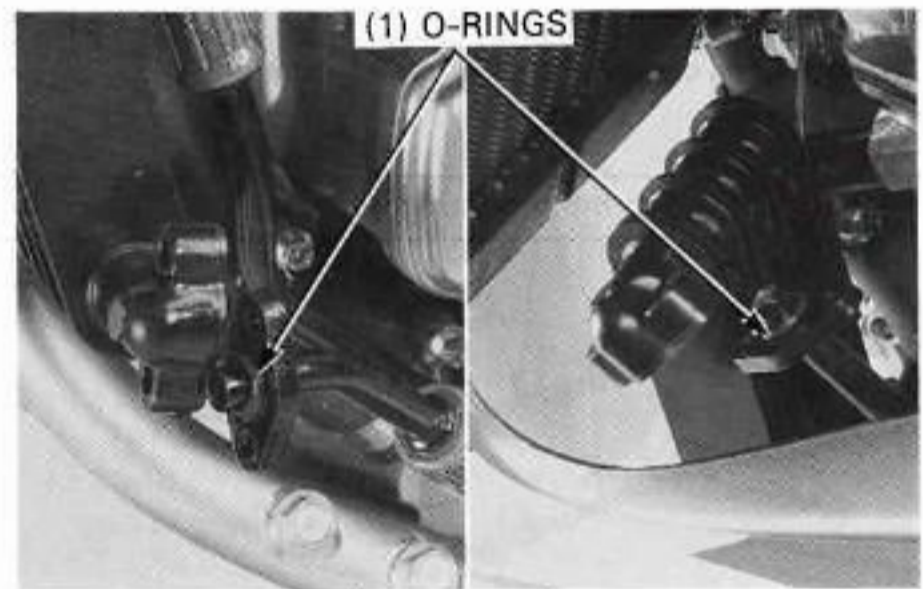
OIL COOLER REMOVAL

Remove the stone guard (page 2-5).
Drain the engine oil (page 3-14).

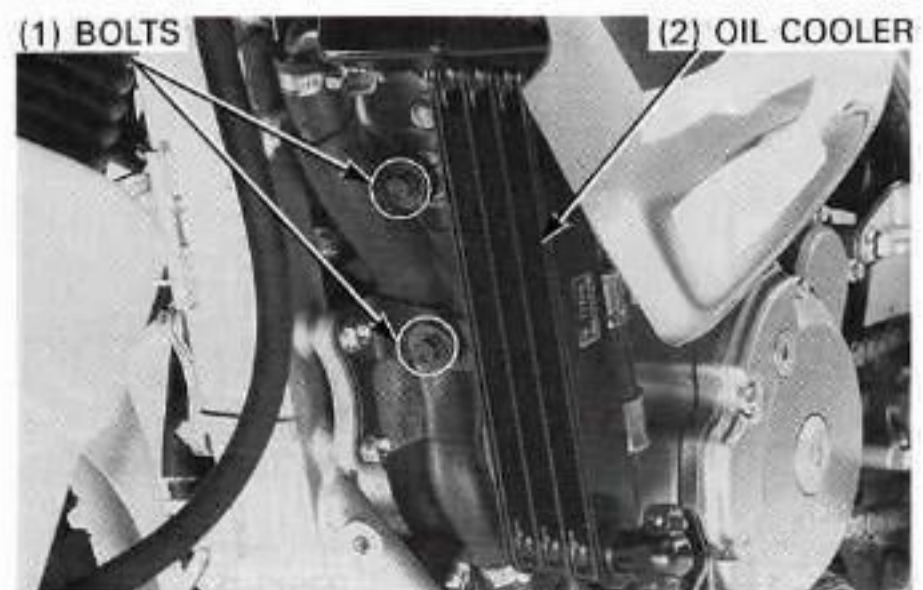
Remove the bolts.
Disconnect the oil cooler pipes from the oil cooler.



Remove the O-rings from the oil cooler pipes.



Remove the oil cooler mounting bolts and oil cooler.

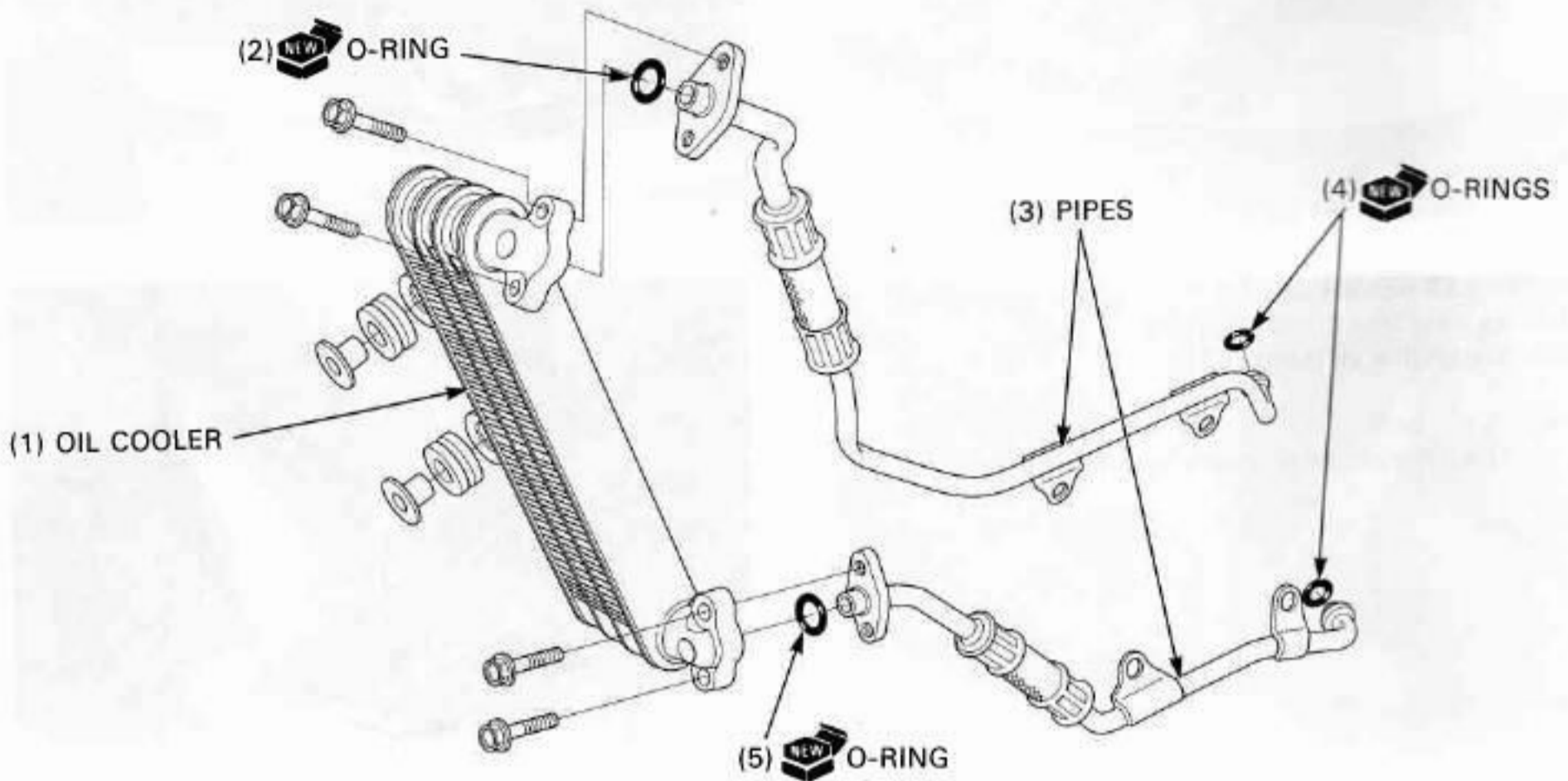


LUBRICATION SYSTEM

INSTALLATION

NOTE

- At O-ring installation, apply oil to the new O-rings and install them to the oil cooler pipes.

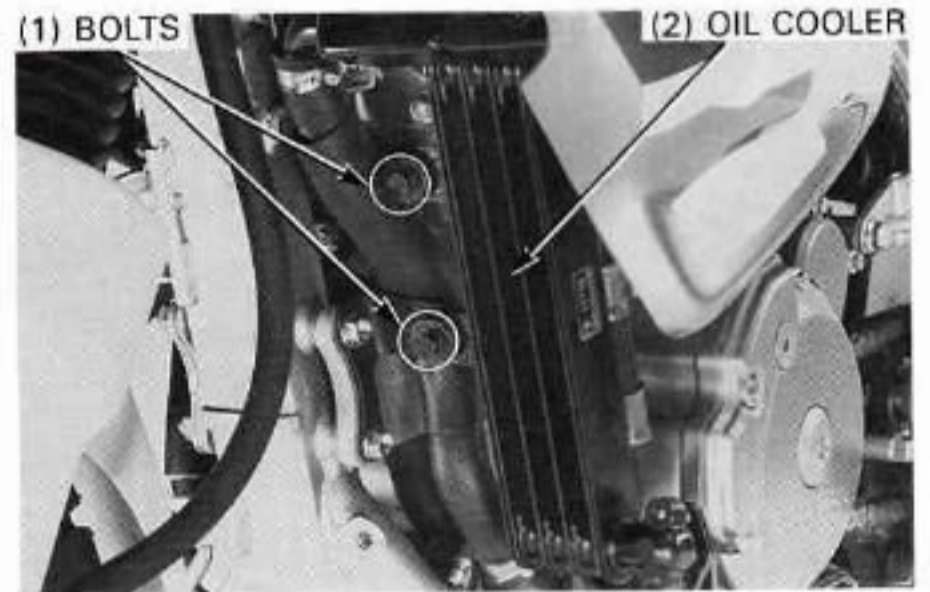


OIL COOLER INSTALLATION

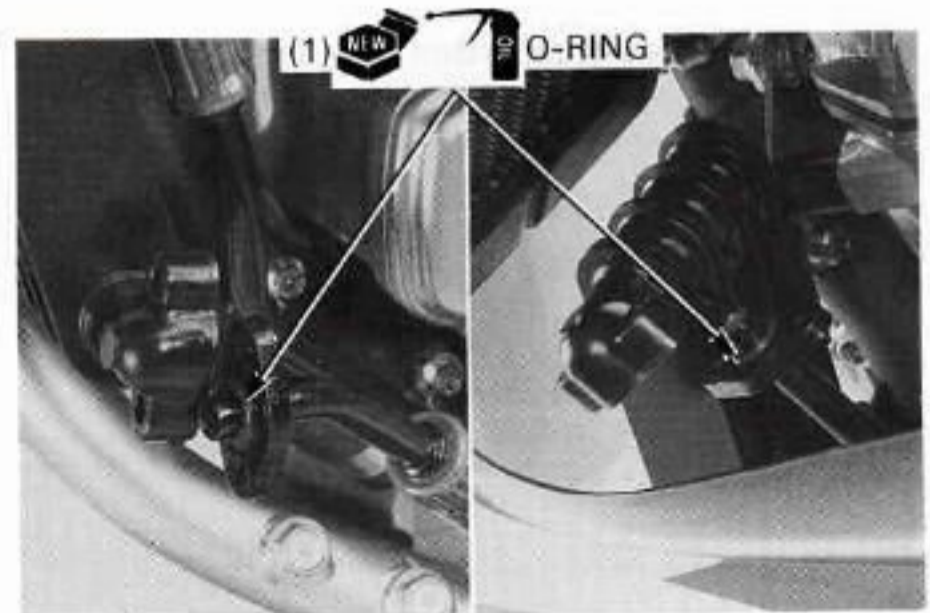
Install the oil cooler and oil cooler mounting bolts.

NOTE

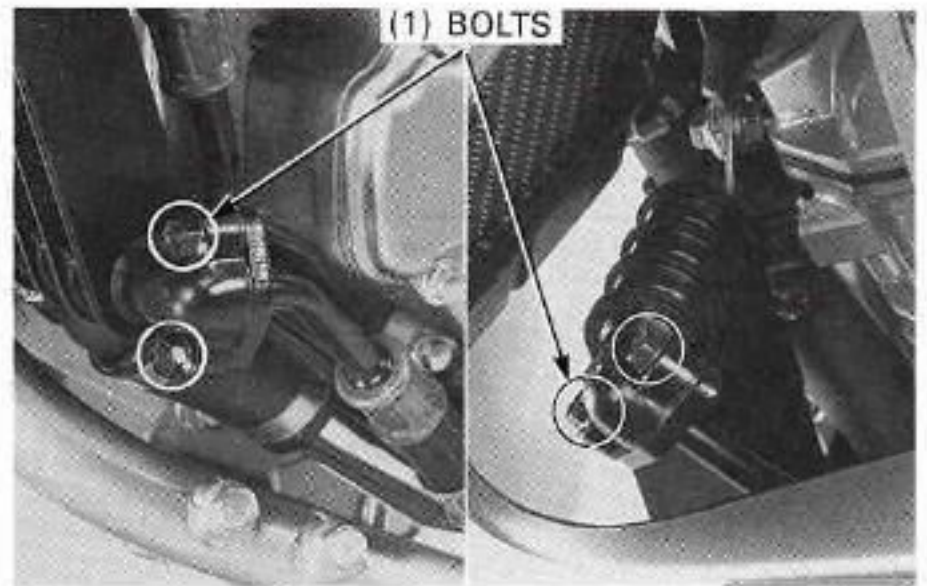
- Do not tighten the mounting bolt yet.



Apply oil to the new O-rings and install them to the oil cooler pipes.



Install and tighten the bolts securely.

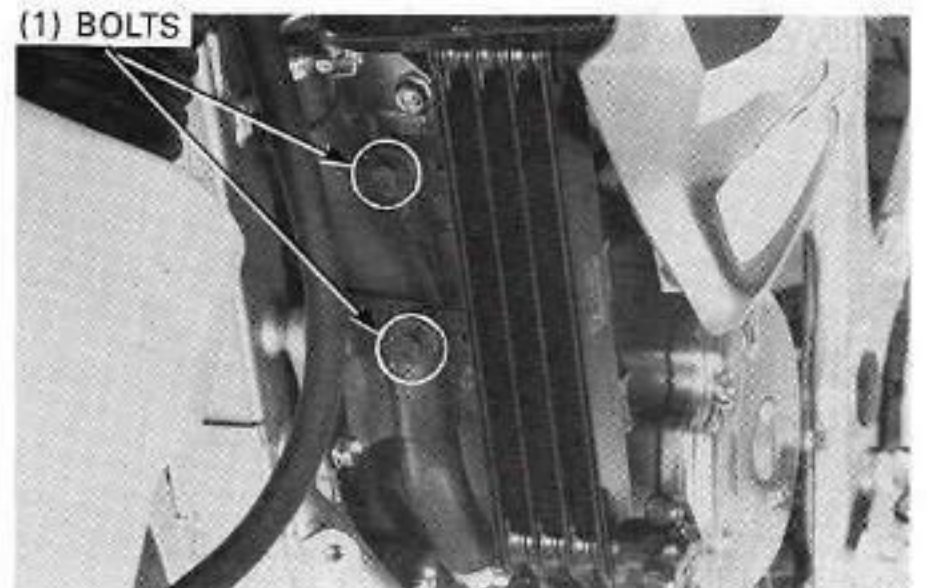


Tighten the oil cooler mounting bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

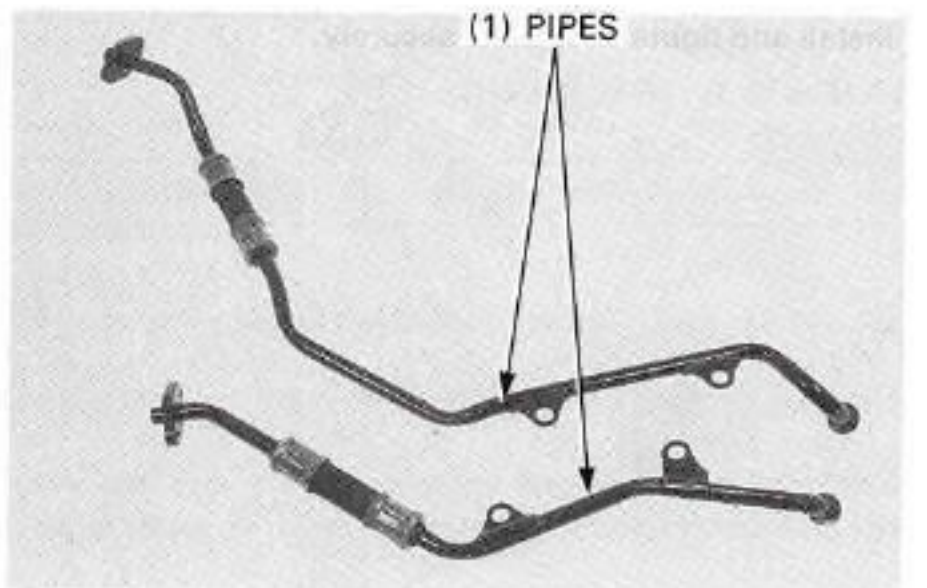
Install the stone guard (page 2-5).
Refill the engine oil (page 3-14).

Check that there are no oil leaks and that oil pressure is correct.



OIL COOLER PIPE INSTALLATION

Check the oil cooler pipes for clogging or restriction.

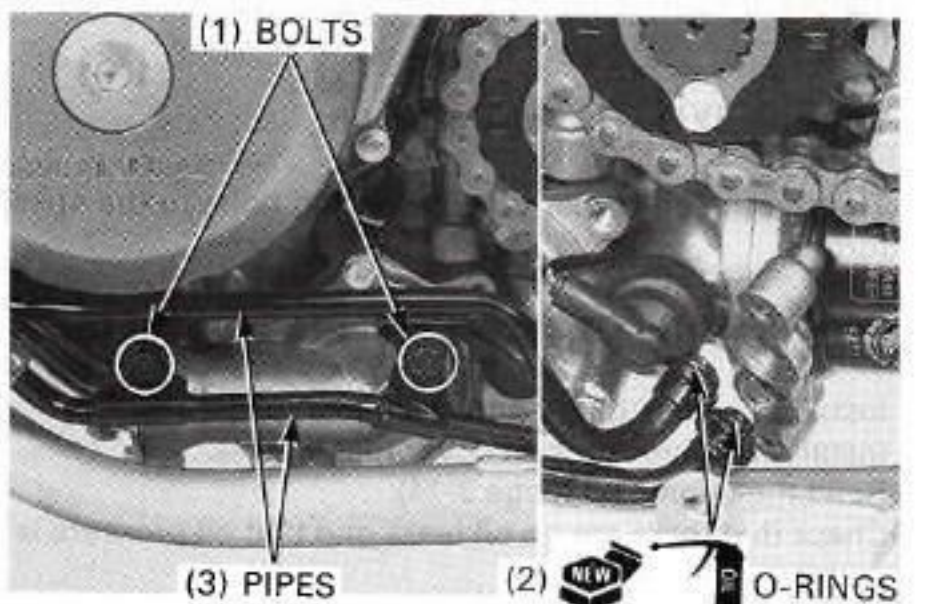


Install the oil cooler pipe mounting bolts.

NOTE

- Do not tighten the mounting bolt yet.

Apply oil to the new O-rings and install them onto the oil cooler pipes.



LUBRICATION SYSTEM

Connect the oil cooler pipe to the oil distributor.
Install the oil cooler joint setting plate.
Install the oil cooler joint setting plate bolts.

NOTE

- Do not tighten the mounting bolt yet.

Apply oil to the new O-rings and install to the oil cooler pipes.

Install and tighten the bolts securely.

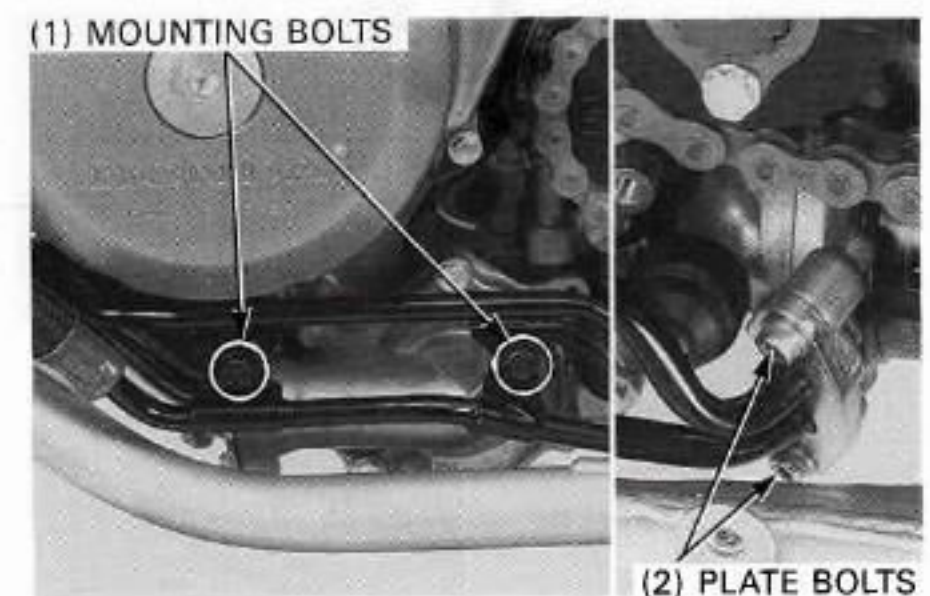
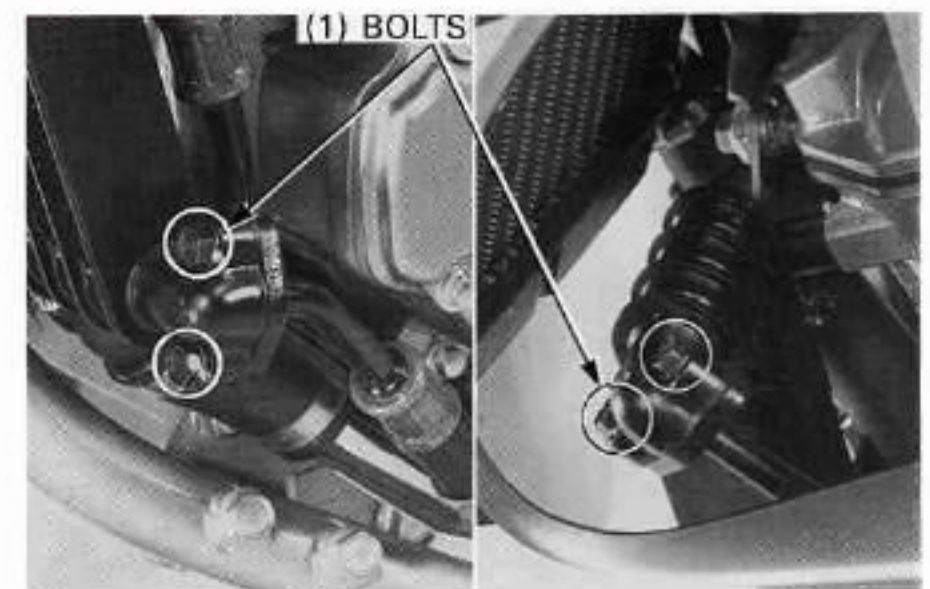
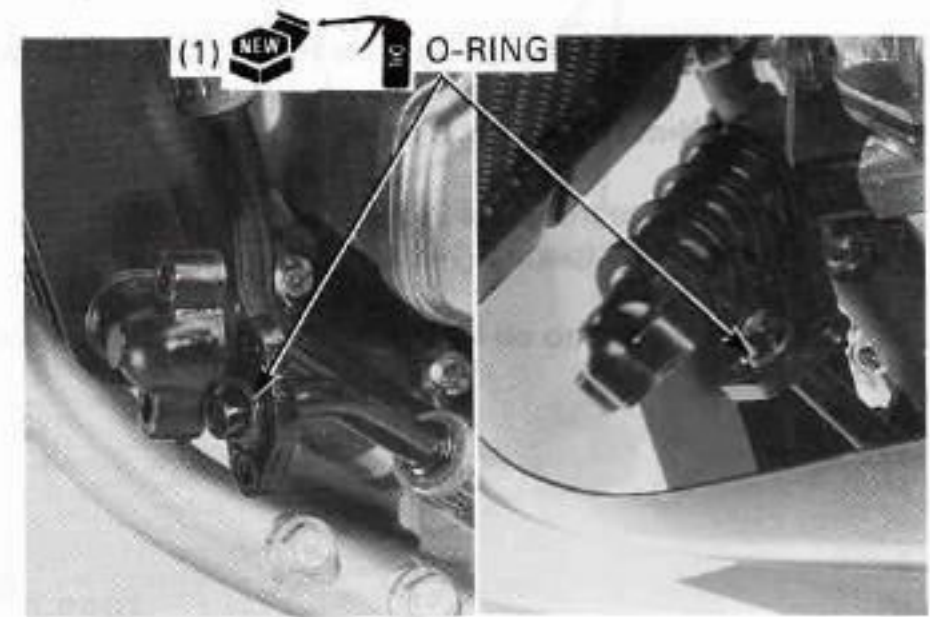
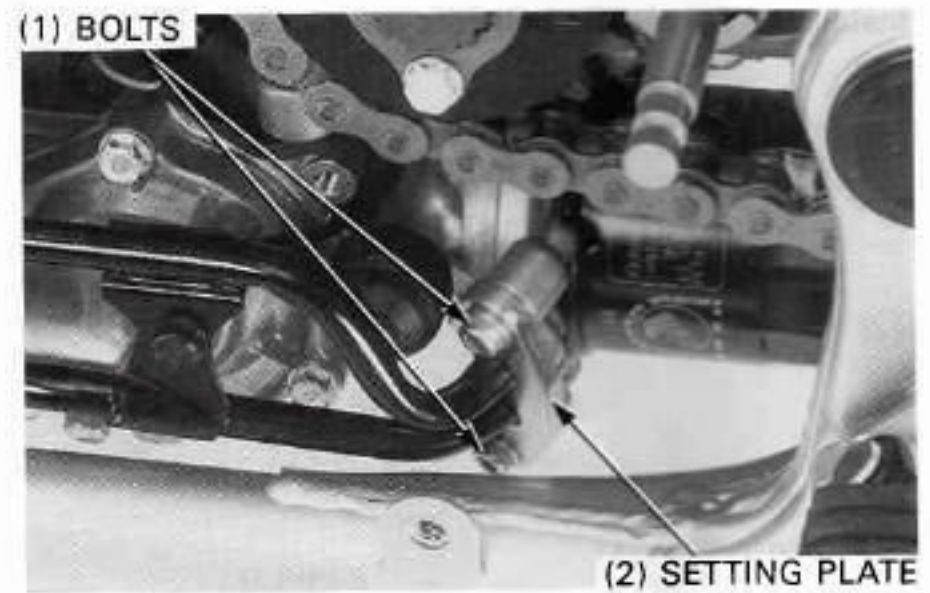
Tighten the oil cooler joint setting plate bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Tighten the oil cooler pipe mounting bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the stone guard and skid plate (page 2-6).
Install the drive sprocket cover (page 7-14).
Refill the engine oil (page 3-14).
Check that there are no oil leaks and that oil pressure is correct.



OIL DISTRIBUTOR

NOTE

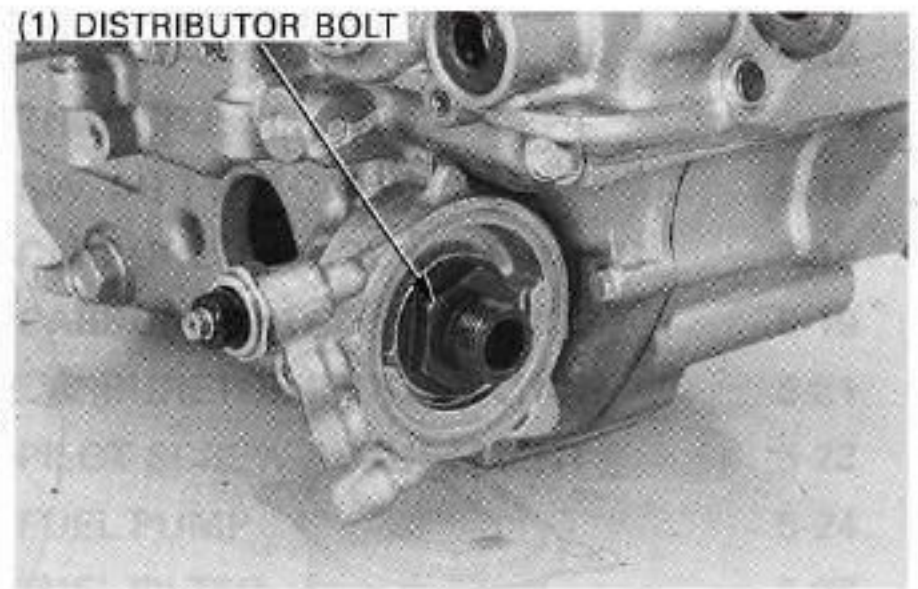
- The oil distributor removal/installation can be done with the engine in the frame.

REMOVAL

Remove the oil cooler joint setting plate (page 4-12).

Remove the oil cooler distributor bolt.

Remove the oil cooler distributor, dowel pin and O-ring.



INSTALLATION

Installation is in the reverse order of removal.

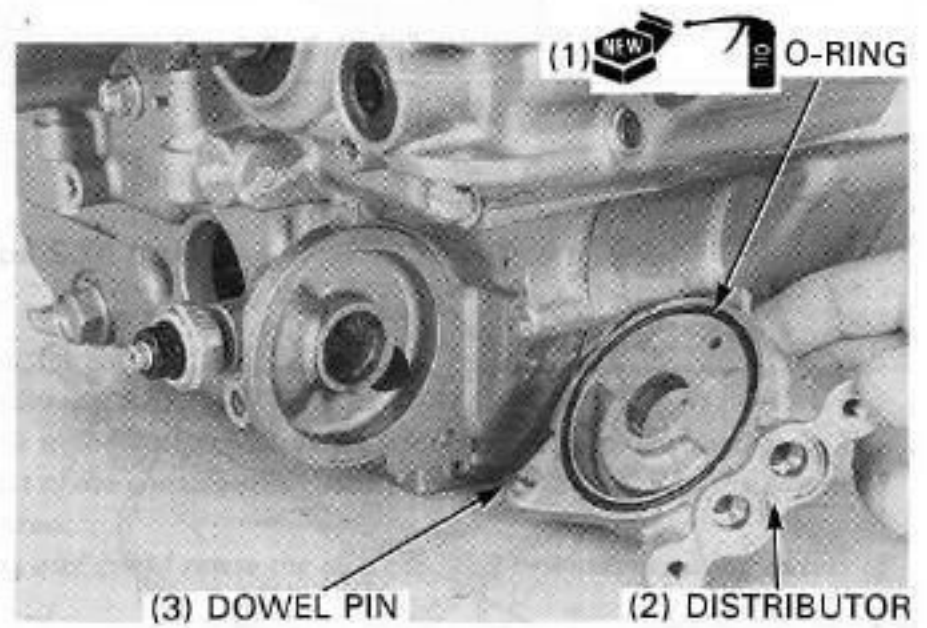
NOTE

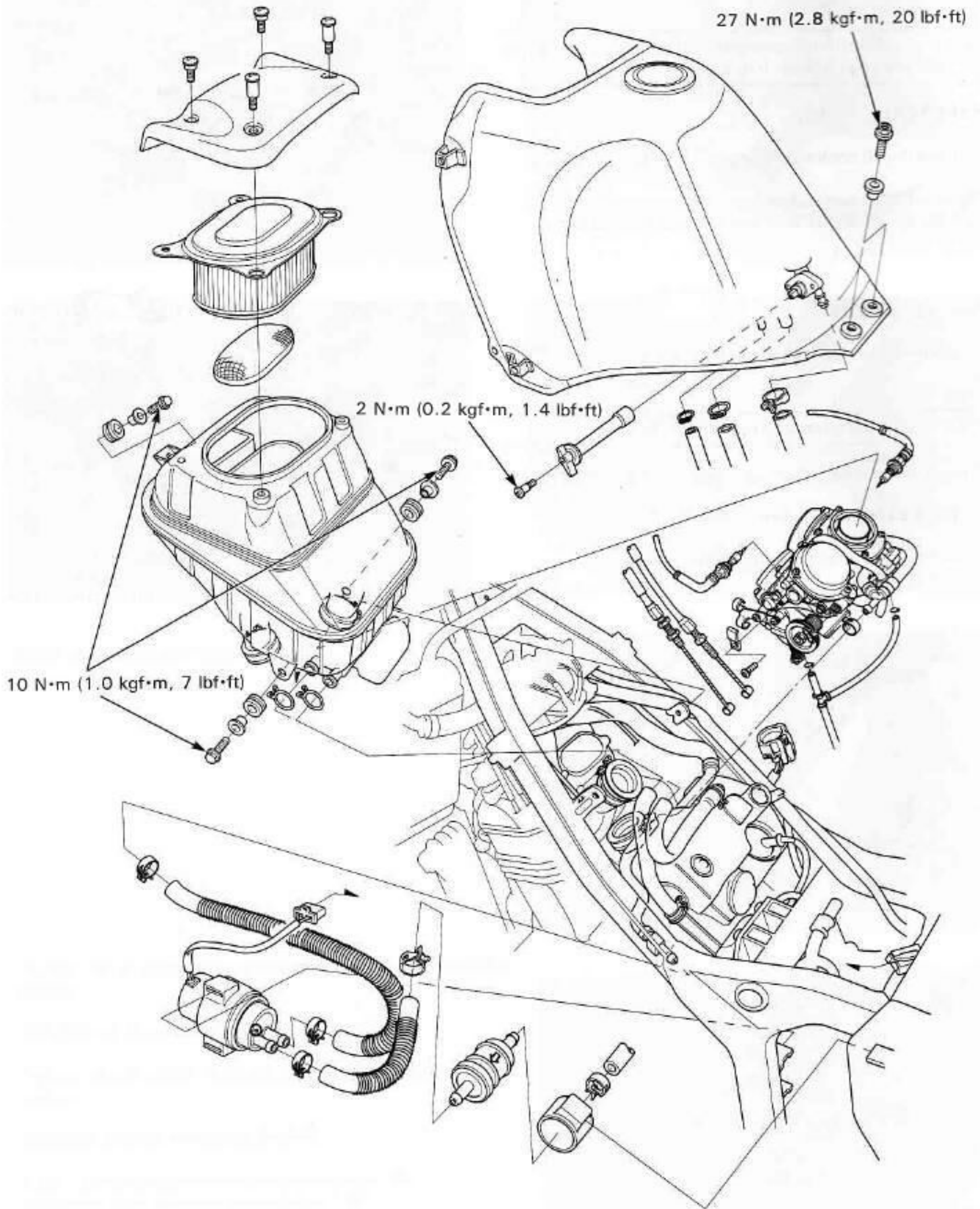
- At installation, apply oil to the new O-ring.

Tighten the oil cooler distributor bolt to the specified torque.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

Install the oil cooler joint setting plate (page 4-15).





5. FUEL SYSTEM

| | | | |
|-------------------------------------|------|--------------------------|------|
| SERVICE INFORMATION | 5-1 | AIR CUT-OFF VALVE | 5-16 |
| TROUBLESHOOTING | 5-3 | THROTTLE SENSOR (EXCEPT | |
| AIR CLEANER HOUSING | 5-4 | SW, AR TYPE ONLY) | 5-17 |
| CARBURETOR REMOVAL | 5-5 | CARBURETOR BODY CLEANING | 5-18 |
| CARBURETOR SEPARATION | 5-7 | CARBURETOR COMBINATION | 5-19 |
| CARBURETOR DISASSEMBLY/ ASSEMBLY | 5-8 | CARBURETOR INSTALLATION | 5-21 |
| VACUUM CHAMBER | 5-9 | PILOT SCREW ADJUSTMENT | 5-23 |
| FLOAT CHAMBER | 5-12 | FUEL PUMP | 5-24 |
| AIR FUNNEL | 5-15 | FUEL FILTER | 5-27 |

SERVICE INFORMATION

GENERAL

▲ WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. **KEEP OUT OF REACH OF CHILDREN.**
 - If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of the consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.
 - Bending or twisting the control cables will impair smooth operation and could cause the cable to stick or bind, resulting in loss of vehicle control.
-
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.

CAUTION

- Be sure to remove the diaphragms before cleaning air and fuel passages with compressed air. The diaphragms might be damaged.
-
- For fuel tank removal and installation, refer to Section 2.
 - Before disassembling the carburetor, place an approved gasoline container under the carburetor drain tube, loosen the carburetor drain screw and drain the carburetor.
 - When disassembling the fuel system parts, note the locations of the O-rings, Replace them with new ones on reassembly.
 - After removing the carburetor, wrap the intake ports of the engine with a shop towel or cover them with a piece of tape to prevent any foreign material from dropping into the engine. Be sure to remove the cover when reinstalling the carburetor.

NOTE

- If the vehicle is to be stored for more than one month, drain the float bowls. Fuel left in the float bowls may cause clogged jets resulting in hard starting or poor driveability.

FUEL SYSTEM

SPECIFICATIONS

| ITEM | | STANDARD |
|---------------------------------------|-------------------|-------------------------------------|
| Carburetor identification number | Except SW,AR type | VP51A |
| | SW type | VP50B |
| | AR type | VP50C |
| Choke type | | Starting enrichment circuit system |
| Main jet | Front | #115 |
| | Rear | #115 |
| Slow jet | Except SW,AR type | #40 |
| | SW,AR type | #38 |
| Pilot screw initial opening | Except SW,AR type | 2•3/8 turns out |
| | SW,AR type | 2•1/2 turns out |
| Pilot screw final opening | Except SW type | 1/2 turns out |
| | SW type | 1/4 turns out |
| Float level | | 13.7mm(0.5 in) |
| Carburetor vacuum difference | | 27 kPa (20 mmHg, 0.7 in Hg) |
| Base carburetor (for synchronization) | | Rear cylinder (#1) |
| Idle speed | Except SW type | 1,200 ± 100 min ⁻¹ (rpm) |
| | SW type | 1,200 ± 50 min ⁻¹ (rpm) |
| Throttle grip free play | | 2 – 6mm (0.08 – 0.24 in) |

TORQUE VALUES

| | |
|-----------------------------------|-------------------------------|
| Fuel tank mounting bolt | 27 N•m (2.8 kgf•m, 20 lbf•ft) |
| Fuel valve nut | 34 N•m (3.5 kgf•m, 25 lbf•ft) |
| Air cleaner housing mounting bolt | 10 N•m (1.0 kgf•m, 7 lbf•ft) |
| Fuel valve lever screw | 2 N•m (0.2 kgf•m, 1.4 lbf•ft) |

TOOLS

| | |
|--------------------|---------------|
| Pilot screw wrench | 07KMA-MS60101 |
| Float level gauge | 07401-0010000 |

TROUBLESHOOTING

Engine cranks but won't start

- No fuel in tank
- No fuel to carburetor
 - Fuel strainer clogged
 - Fuel filter clogged
 - Fuel valve stuck
 - Fuel line clogged
 - Fuel tank breather clogged
 - Float level faulty
 - Fuel pump malfunction
- Too much fuel getting to the engine
 - Air cleaner clogged
 - Flooded carburetor
- Intake air leak
- Fuel contaminated/deteriorated
 - Jet clogged
- Improper starting enrichment valve operation
- Slow circuit or starting enrichment valve circuit clogged
- Improper throttle operation
- No spark at plug (ignition system faulty)

Lean mixture

- Fuel jets clogged
- Float valve faulty
- Float level too low
- Fuel line restricted
- Intake air leak
- Throttle valve faulty
- Vacuum piston faulty
- Throttle valve faulty
- Fuel pump malfunction

Rich mixture

- Starting enrichment valve open
- Float valve faulty
- Float level too high
- Air jets clogged
- Air cleaner element contaminated
- Flooded carburetor

Engine stalls, hard to start, rough idling

- Fuel line restricted
- Ignition system malfunction
- Fuel mixture too lean/rich
- Fuel contaminated/deteriorated
 - Jet clogged
- Intake air leak
- Idle speed misadjusted
- Float level misadjusted
- Fuel tank breather clogged
- Pilot screw misadjusted
- Slow circuit or starting enrichment valve circuit clogged
- Carburetor synchronization misadjusted
- Fuel pump malfunction
- Valve clearance misadjusted
- Cylinder compression too low

Afterburn when engine braking is used

- Lean mixture in slow circuit
- Air cut-off valve malfunction

Backfiring or misfiring during acceleration

- Ignition system malfunction (Section 15)
- Fuel mixture too lean

Poor performance (driveability) and poor fuel economy

- Fuel system clogged
- Ignition system malfunction (Section 15)

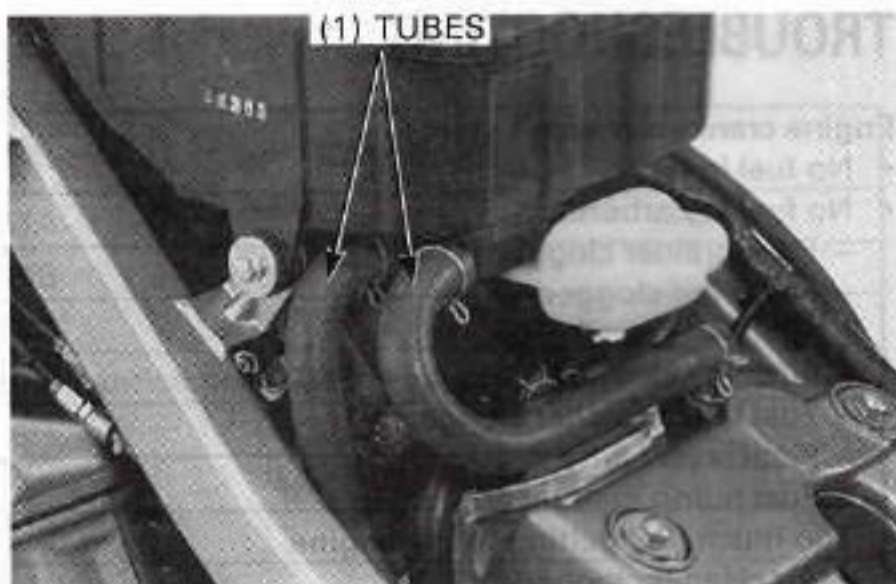
FUEL SYSTEM

AIR CLEANER HOUSING

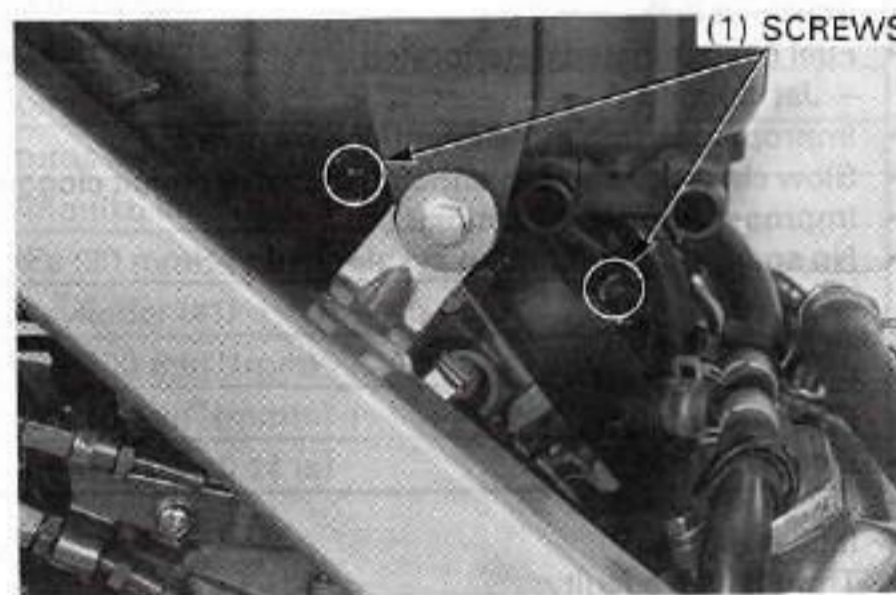
REMOVAL

Remove the fuel tank (page 2-20).

Disconnect the crankcase breather tubes from the air cleaner housing.



Loosen the screws.



Remove the air cleaner housing mounting bolts and the air cleaner housing.



INSTALLATION

NOTE

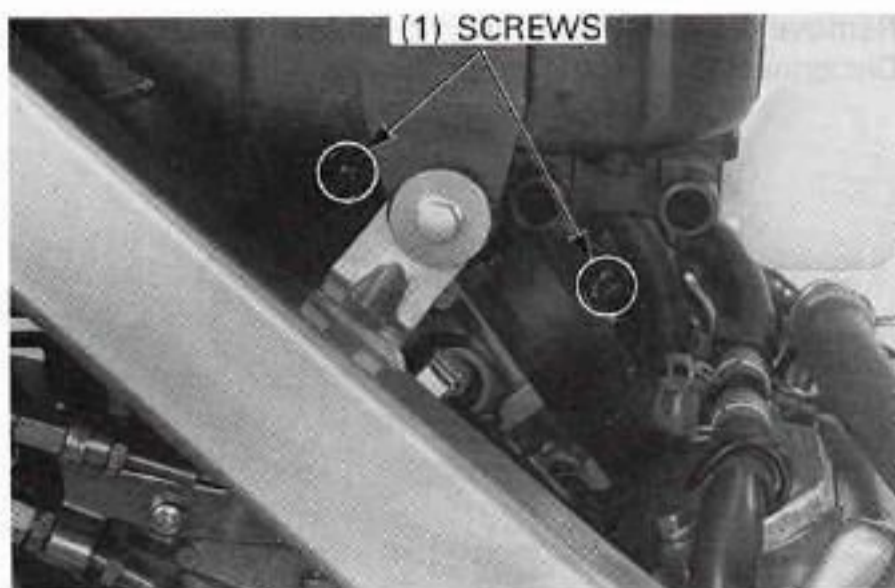
- Route the tubes correctly (page 1-22).

Install the air cleaner housing.
Install and tighten the air cleaner housing mounting bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

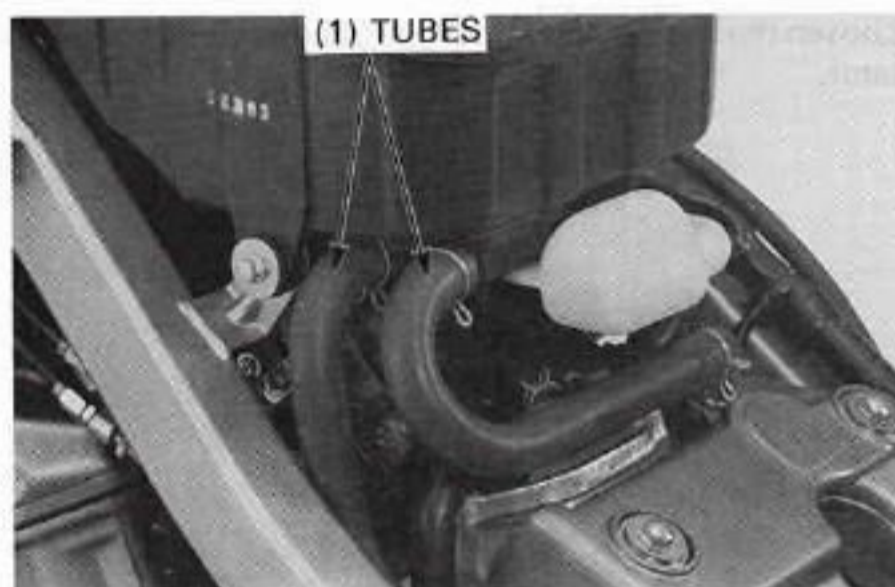


Tighten the screws securely.



Connect the crankcase breather tubes.

Install the fuel tank (page 2-23).



CARBURETOR REMOVAL

⚠ WARNING

- *Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.*

CAUTION

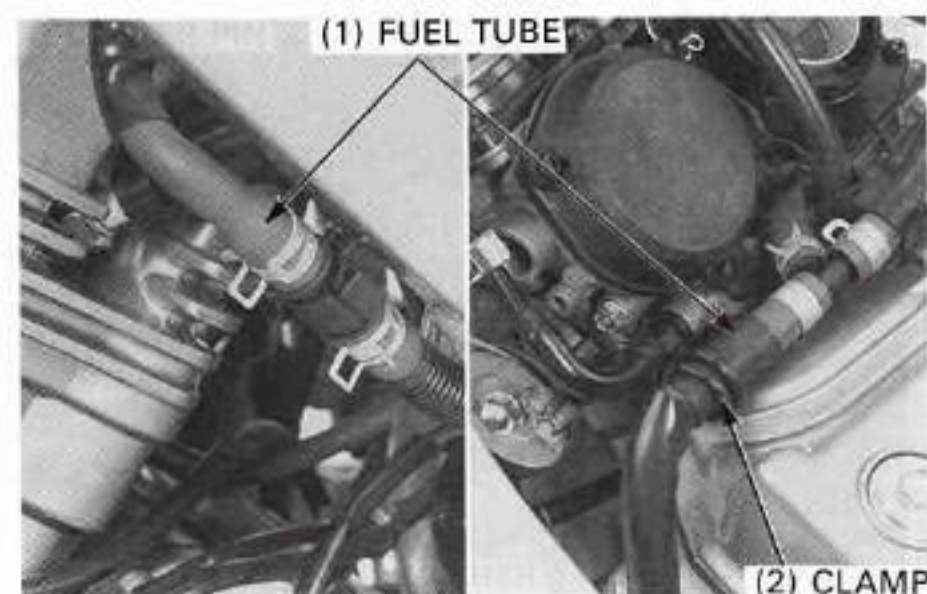
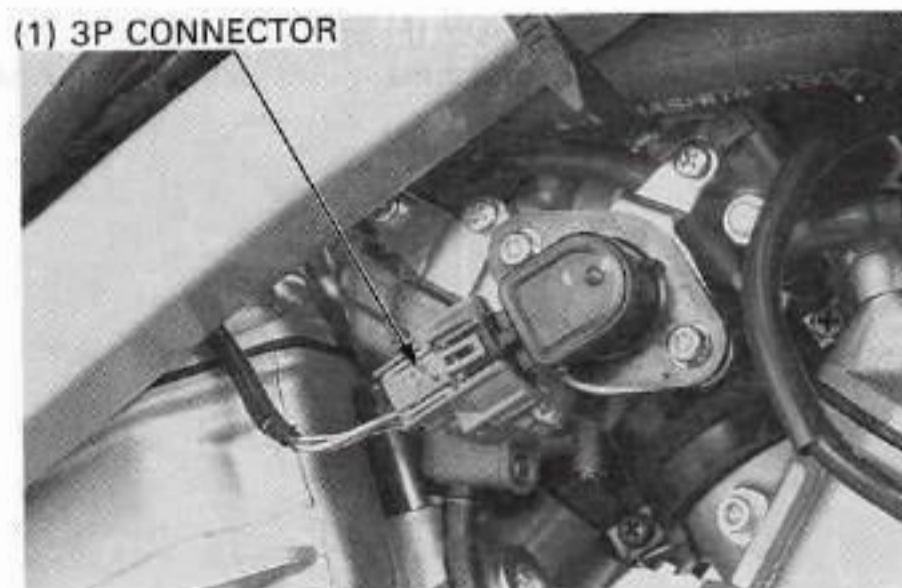
- *Be careful not to damage the throttle sensor while removing the carburetor.*

Remove the air cleaner housing (page 5-4).

Loosen the carburetor drain screw and drain the carburetor.

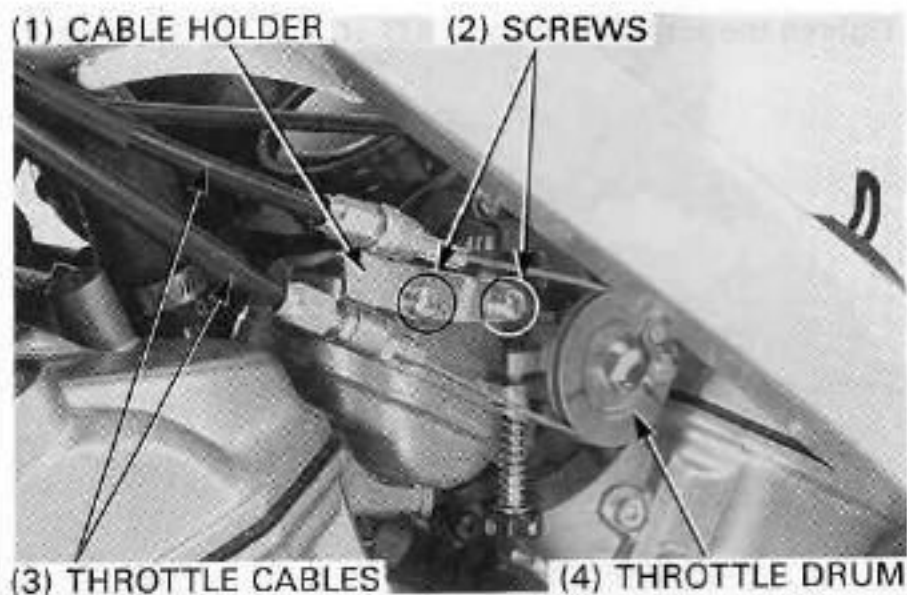
Disconnect the throttle sensor 3P connector (except SW, AR type).

Disconnect the fuel tube.
Remove the fuel tube from the clamp.

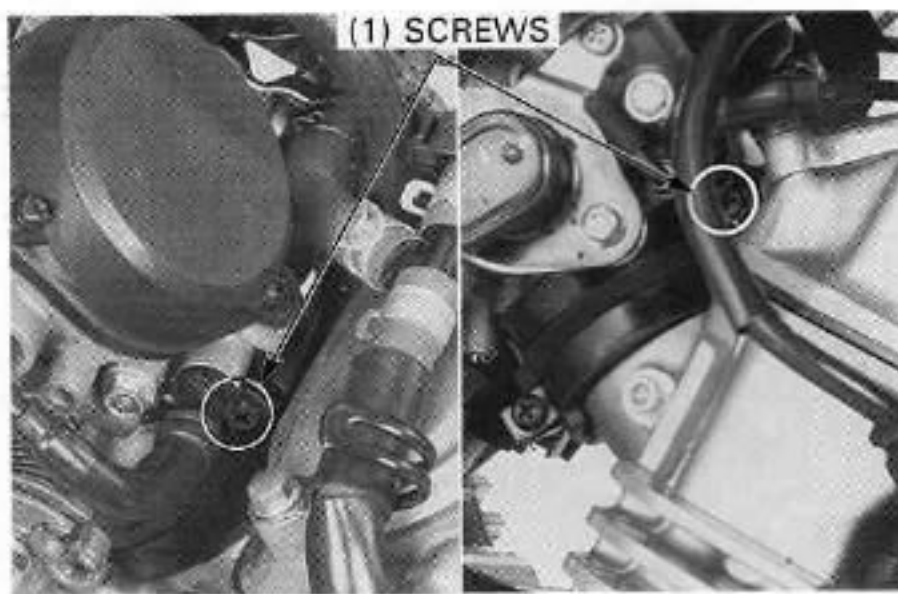


FUEL SYSTEM

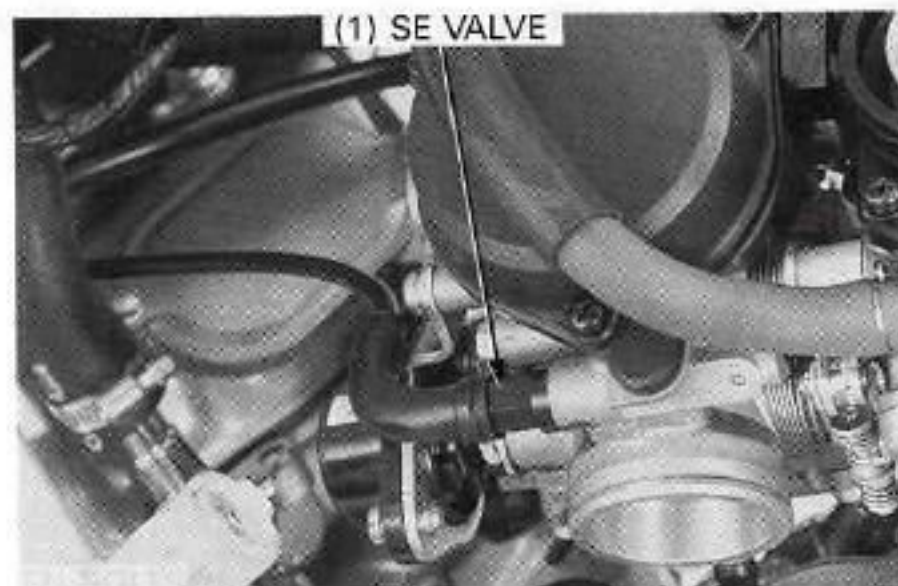
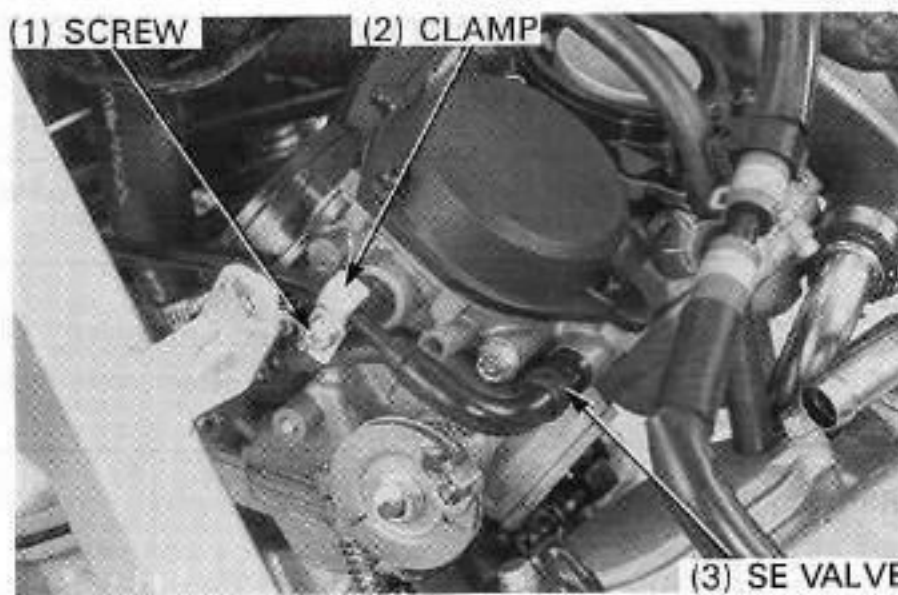
Remove the screws and throttle cable holder.
Disconnect the throttle cables from the throttle drum.



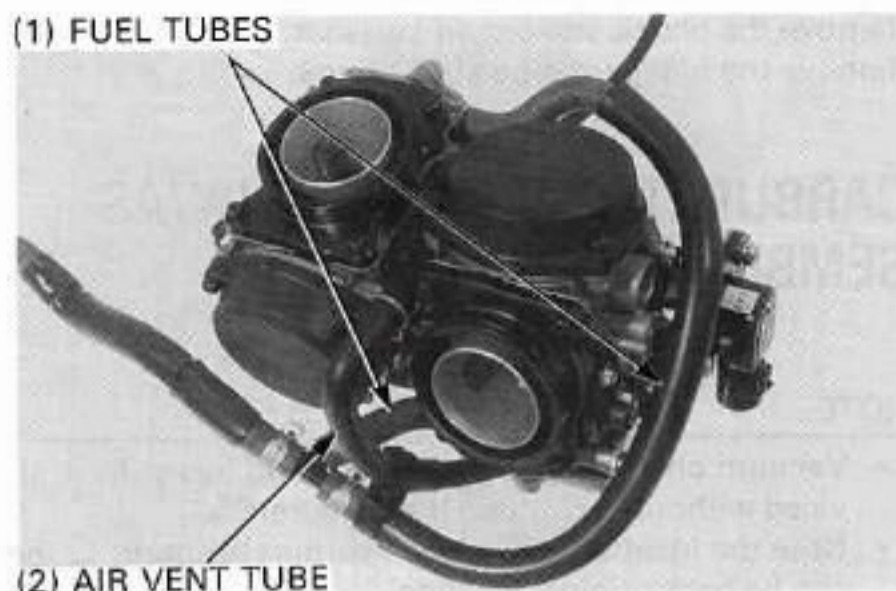
Loosen the screws and remove the carburetor from the insulator.



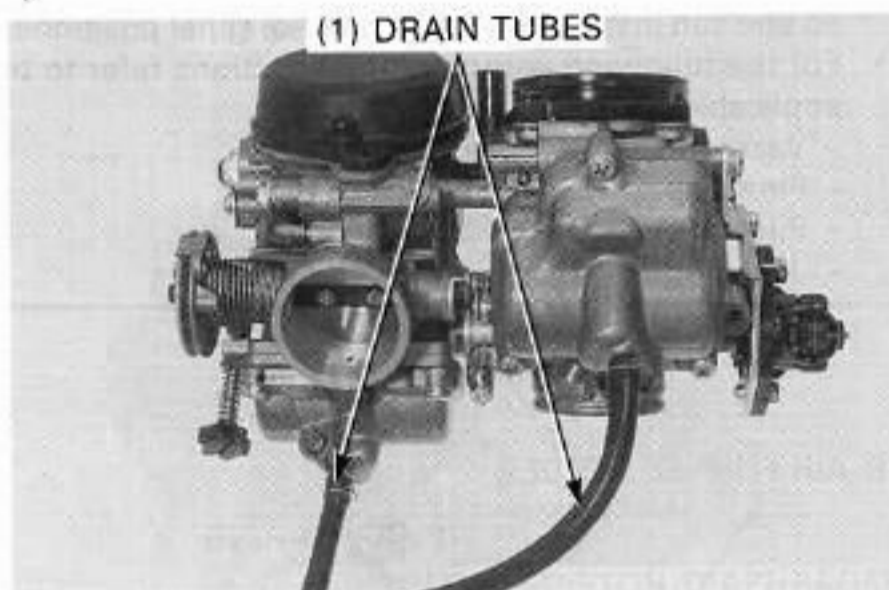
Remove the screw and loosen the cable clamp.
Disconnect the starting enrichment (SE) valve from the carburetor.



Disconnect the fuel tubes and air vent tube from the carburetor.



Disconnect the carburetor drain tubes from the carburetor.

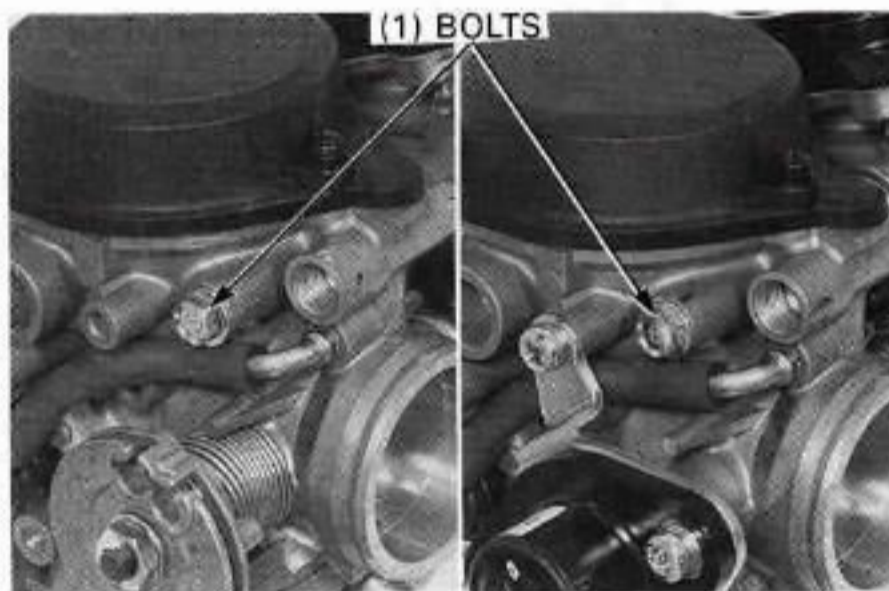


CARBURETOR SEPARATION

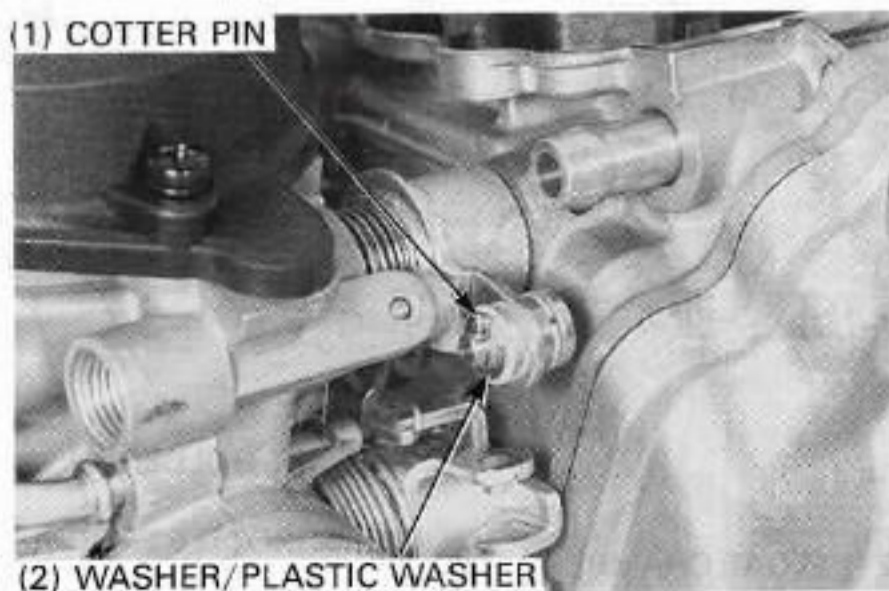
NOTE

- Vacuum chamber, float chamber and jets can be serviced without separating the carburetors.

Remove the connecting bolts.



Remove the cotter pin, washer and plastic washer.
Separate the No. 1 carburetor from the No.2 carburetor.



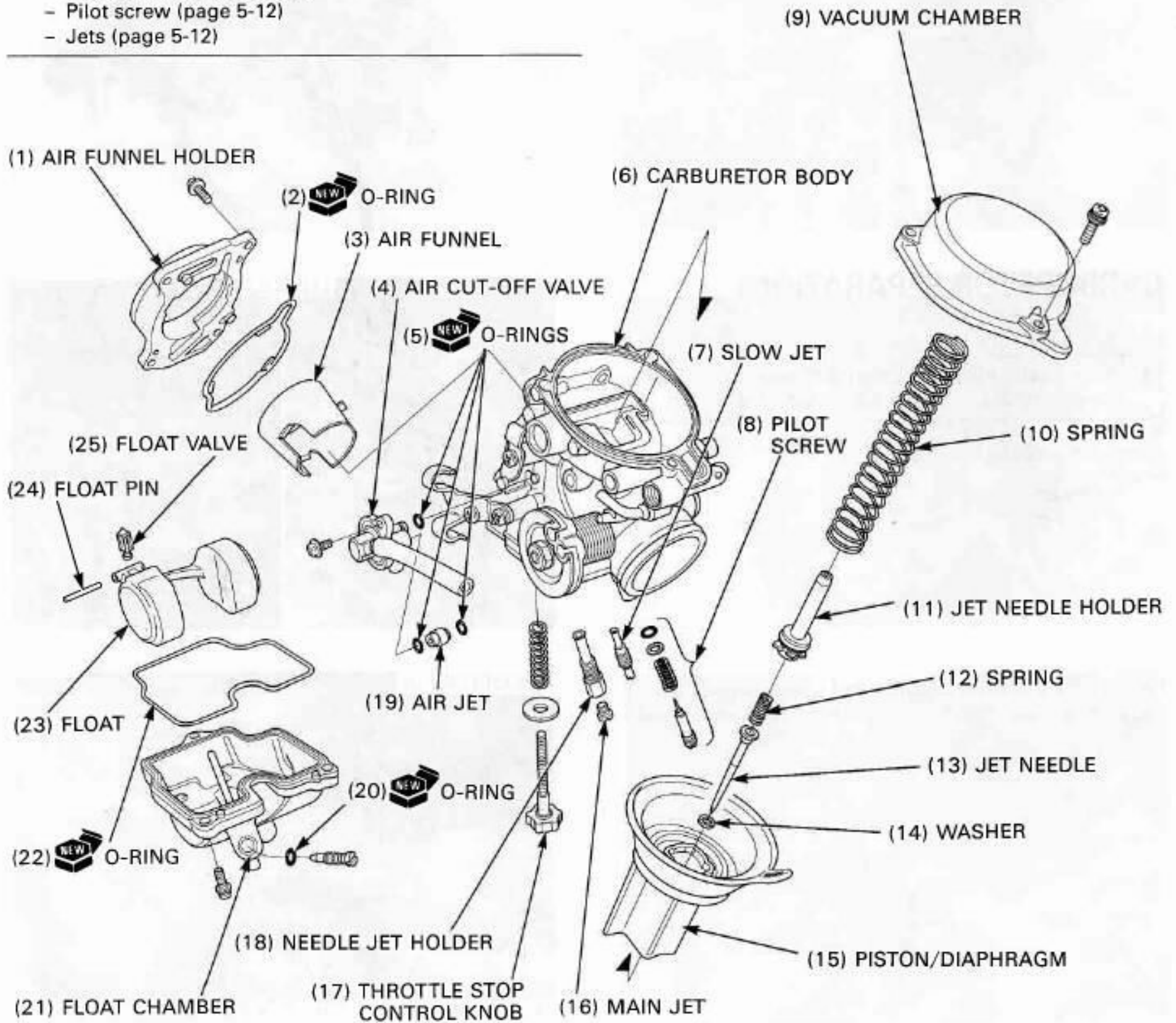
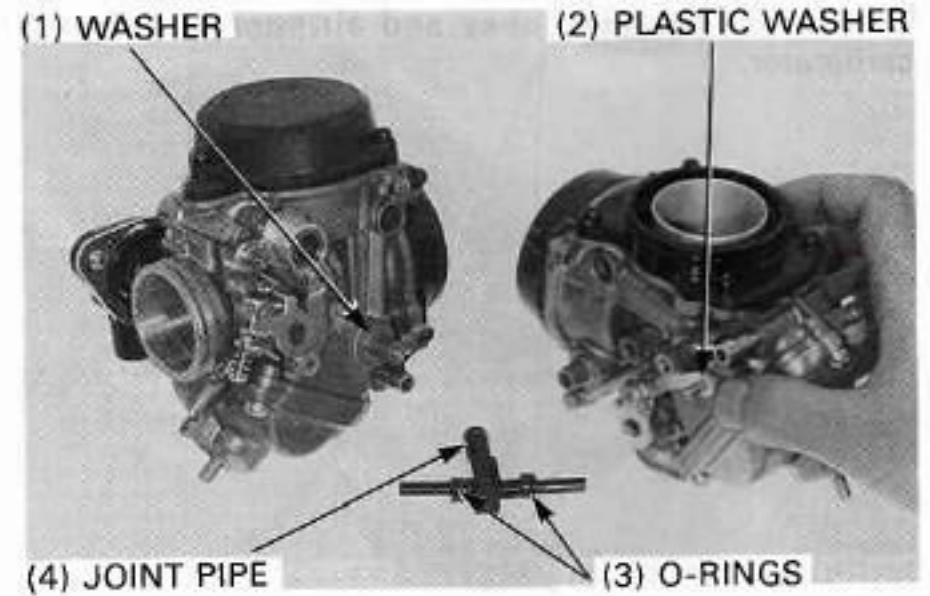
FUEL SYSTEM

Remove the plastic washer and washer.
Remove the fuel joint pipe and O-rings.

CARBURETOR DISASSEMBLY/ASSEMBLY

NOTE

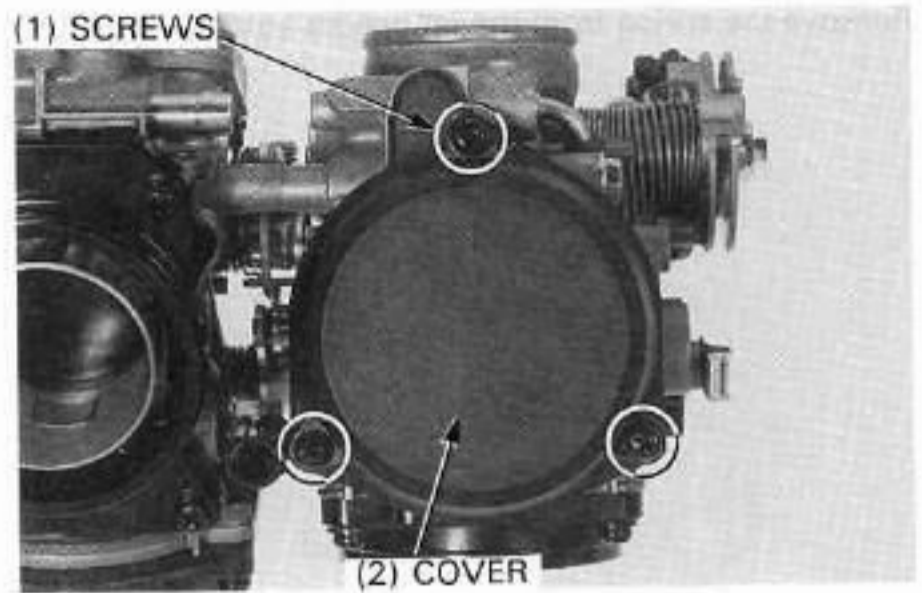
- Vacuum chamber, float chamber and jets can be serviced without separating the carburetors.
- Note the location of the each carburetor parts so they can be back original location.
- Keep each carburetor's parts separate from the other's so you can install the parts in their original positions.
- For the following component inspections refer to the applicable pages.
 - Vacuum chamber (page 5-9)
 - Float chamber (Page 5-12)
 - Pilot screw (page 5-12)
 - Jets (page 5-12)



VACUUM CHAMBER

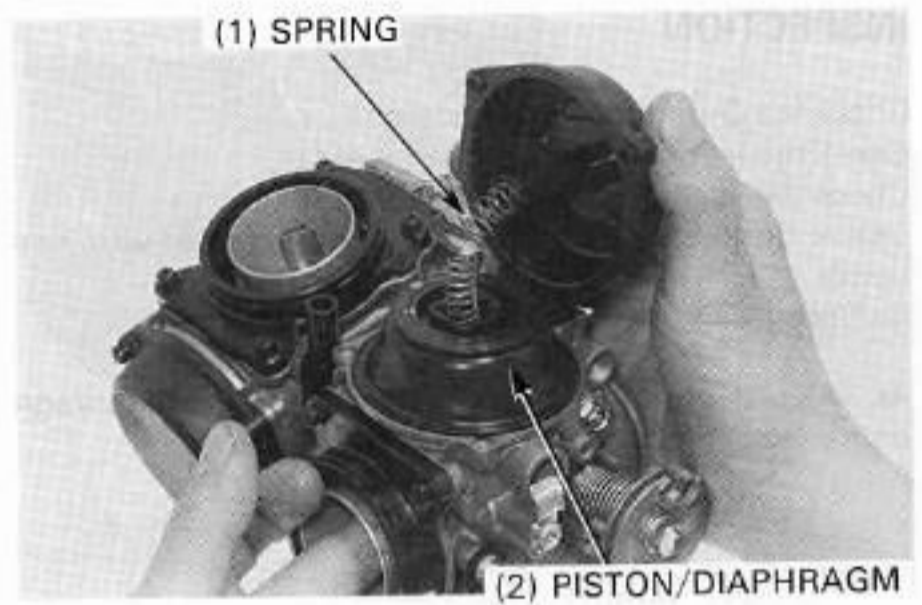
DISASSEMBLY

Remove the screws and vacuum chamber cover.



Remove the diaphragm spring and vacuum piston/diaphragm.

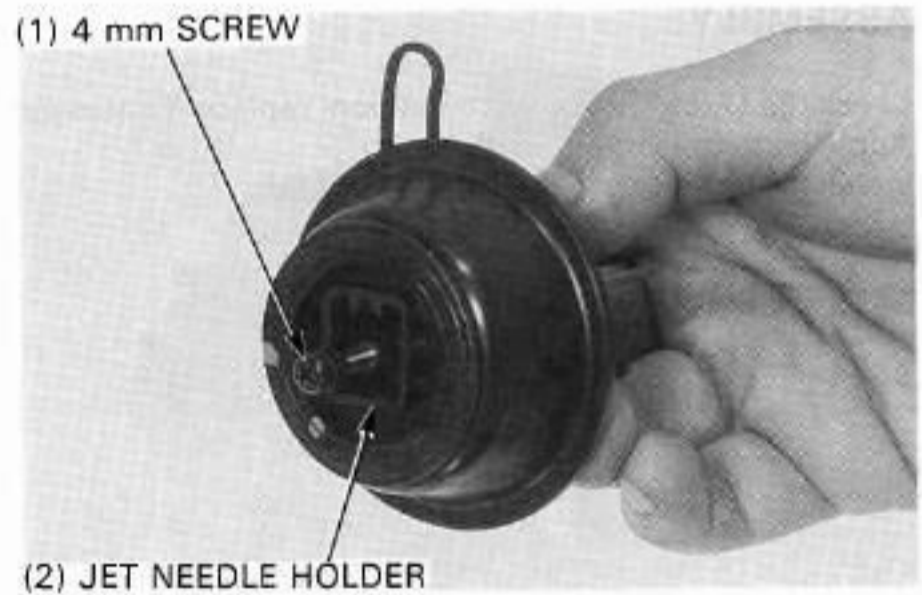
Check the vacuum piston for smooth operation up and down in the carburetor body.



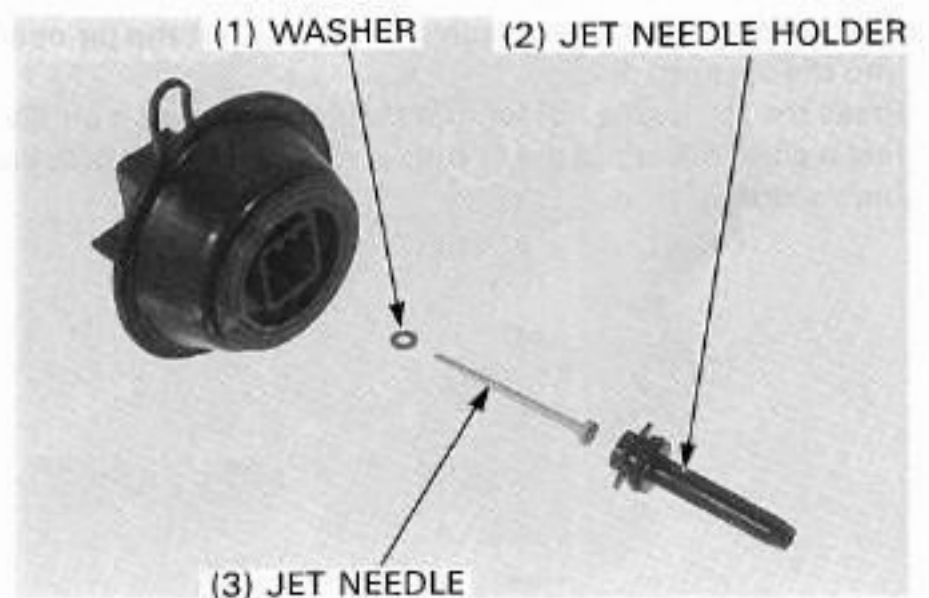
Temporarily install the 4 mm screw or equivalent (Example; vacuum chamber screw).
Pull the screw and remove the jet needle holder.

CAUTION

- *Be careful not to damage the diaphragm.*
- *Do not remove the jet needle holder by pushing on the jet needle.*

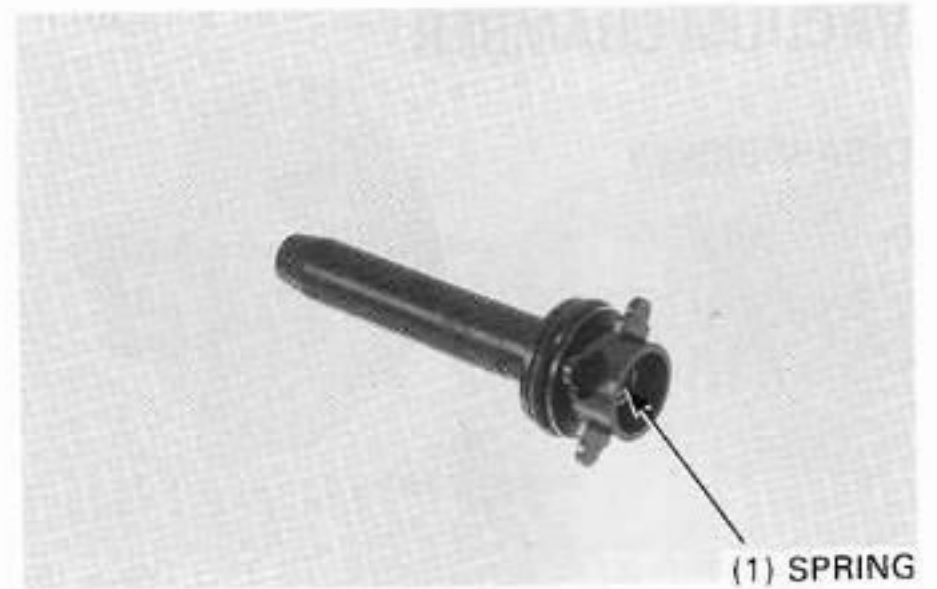


Remove the jet needle holder, jet needle and washer.



FUEL SYSTEM

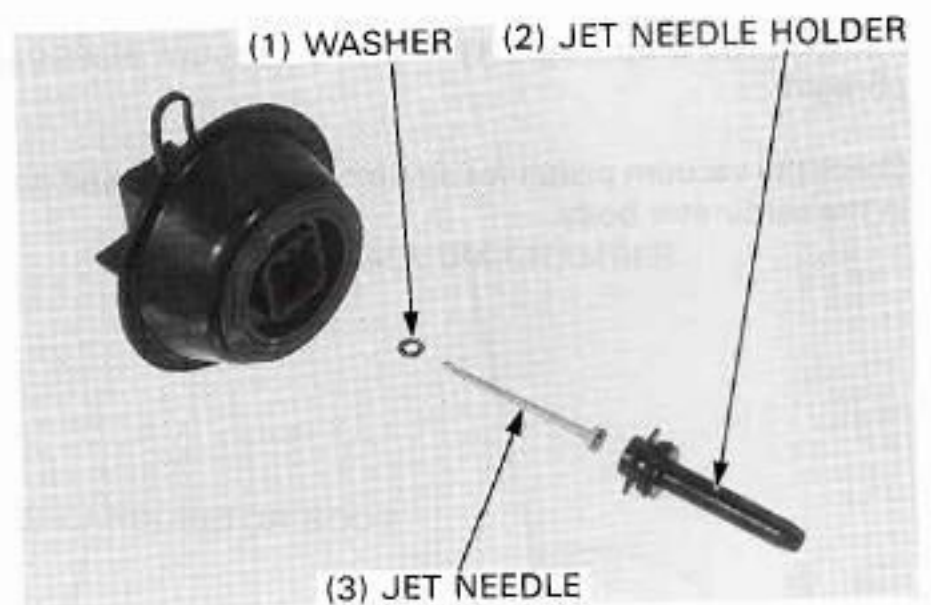
Remove the spring from the jet needle holder.



INSPECTION

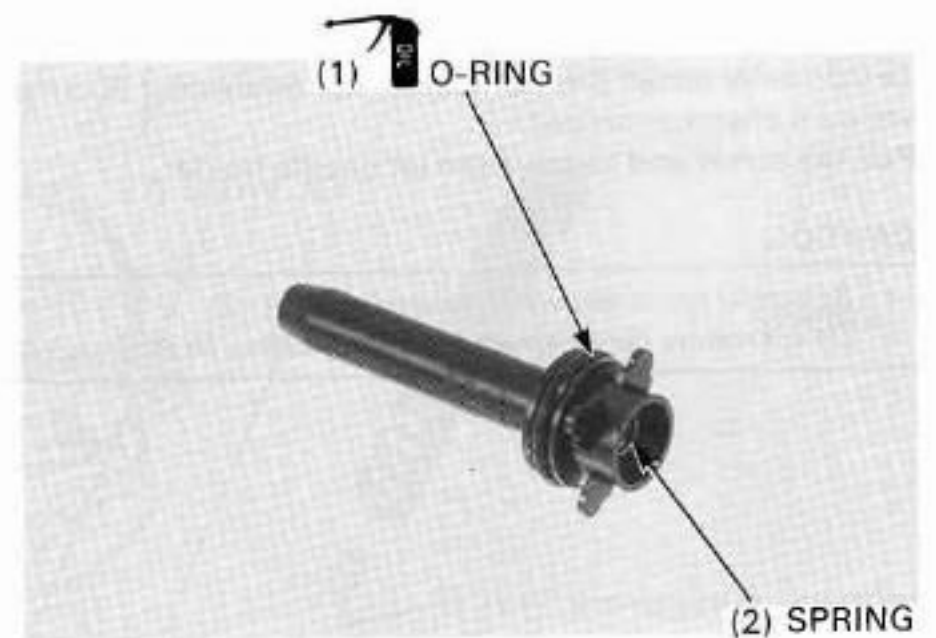
Check the O-ring for wear or damage.
Check the jet needle for stepped wear.
Check the vacuum piston for wear or damage.
Check the diaphragm for damage, pin holes, wrinkles or bends.
Replace these parts if necessary.

Air will leak out of the vacuum chamber if the diaphragm is damaged in any way—even a pin hole.

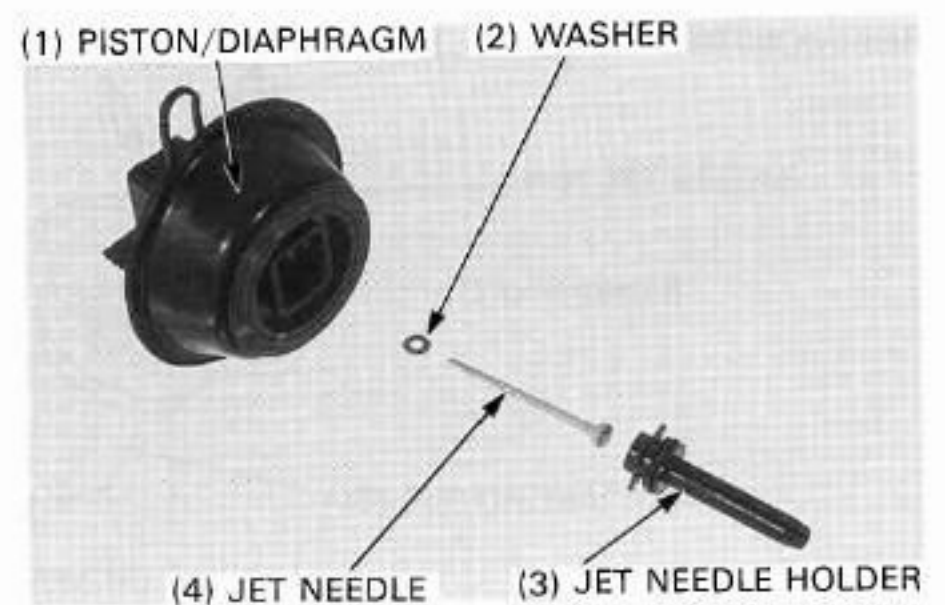


ASSEMBLY

Check the O-ring is in good condition, replace if necessary.
Apply oil to the O-ring.
Install the spring onto the jet needle holder.

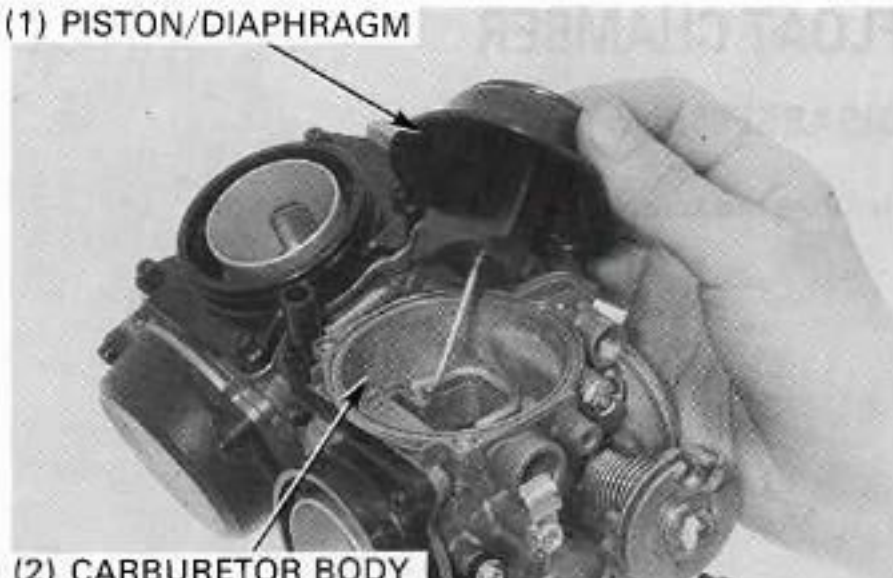


Install the washer onto the jet needle and set the jet needle into the vacuum piston.
Press the jet needle holder into the vacuum piston until you feel a click indicating the O-ring is seated into the groove in the vacuum piston.



Install the vacuum piston/diaphragm into the carburetor body.

(1) PISTON/DIAPHRAGM



(2) CARBURETOR BODY

Aligning the tab of the diaphragm with the cavity. Lift the bottom of the vacuum piston with your finger to set the diaphragm lip in the carburetor body.

(1) DIAPHRAGM

(2) ALIGN



NOTE

- Be careful not to pinch the diaphragm, and to keep the spring straight when installing the chamber cover by compressing the spring.

Install the spring and chamber cover while the piston remains in place. Secure the cover with screws before releasing the vacuum piston.

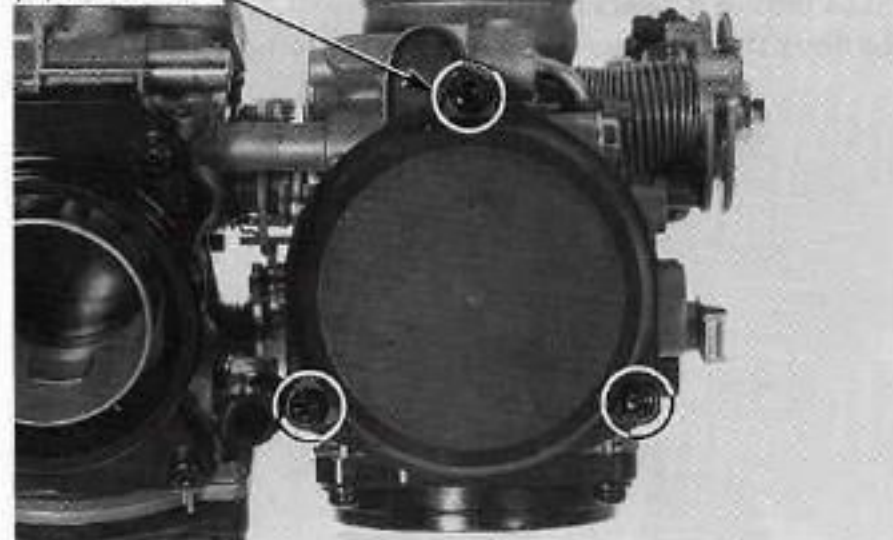
(1) SPRING

(2) COVER



Install and tighten the screws securely.

(1) SCREWS

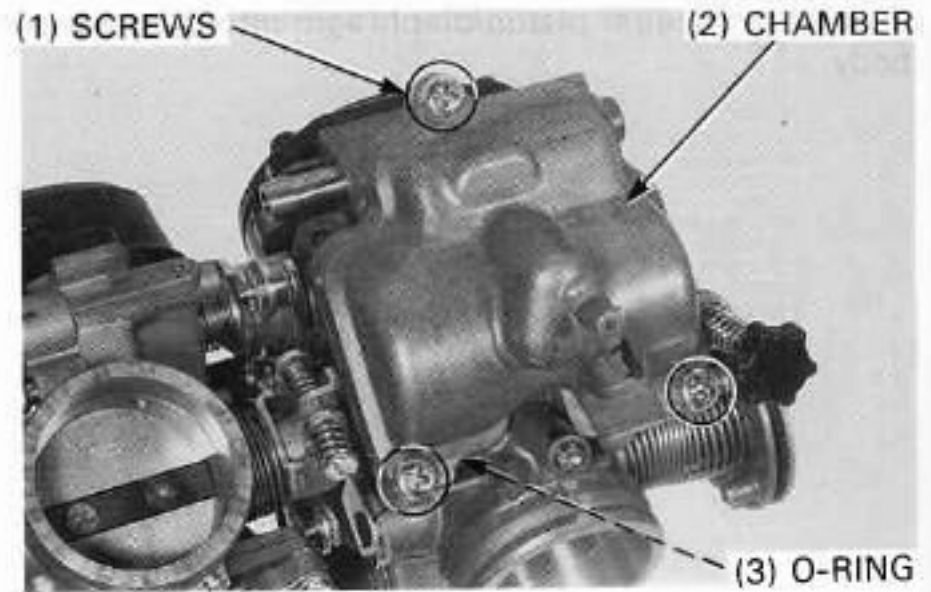


FUEL SYSTEM

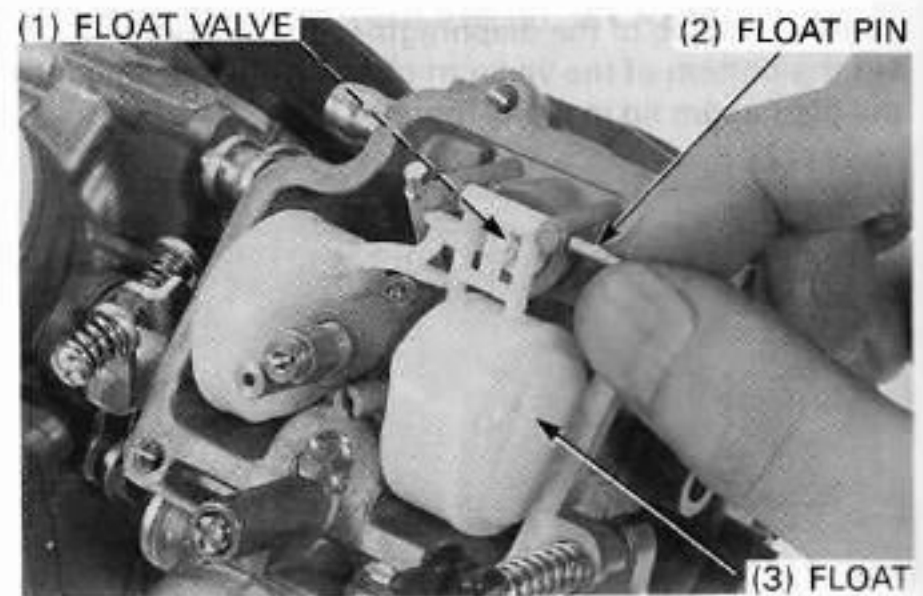
FLOAT CHAMBER

DISASSEMBLY

Remove the screws, float chamber and O-ring.



Remove the float pin, float and float valve.



CAUTION

- Handle all jets with care. They can easily be scored or scratched.

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

NOTE

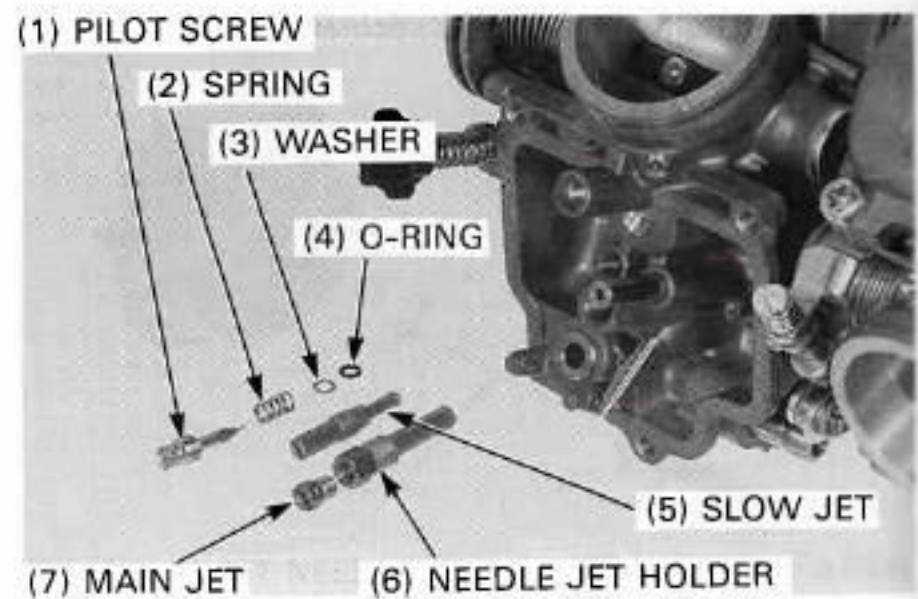
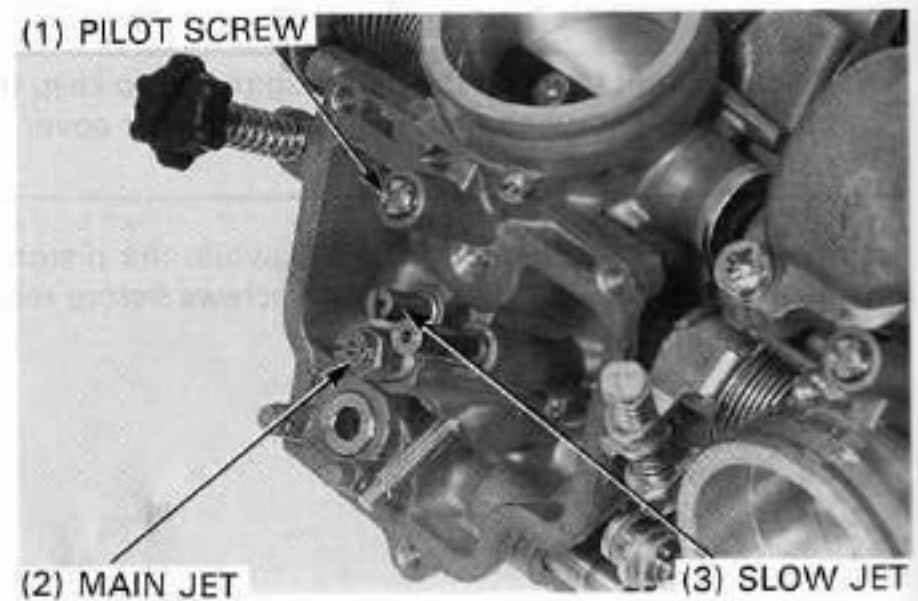
- The pilot screw is factory pre-set and should not be removed unless the carburetor is overhauled.

CAUTION

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

Turn the pilot screw in and record the number of the turns it takes before it seats lightly.

Remove the pilot screw, spring, washer and O-ring.



INSPECTION

FLOAT VALVE, VALVE SEAT

Check the float valve and valve seat for scoring, scratches, clogging or damage.

Check the tip of the float valve where it contacts the valve seat, for stepped wear or contamination.

NOTE

- A worn or contaminated valve does not seat properly and will eventually flood the carburetor.

JETS

Check the each jets for wear or damage.

Clean the jets with non-flammable or high flash solvent and blow open with compressed air.

PILOT SCREW

Check the pilot screw for stepped wear or damage.

Check the spring for damage.

Replace these parts if necessary.

ASSEMBLY

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

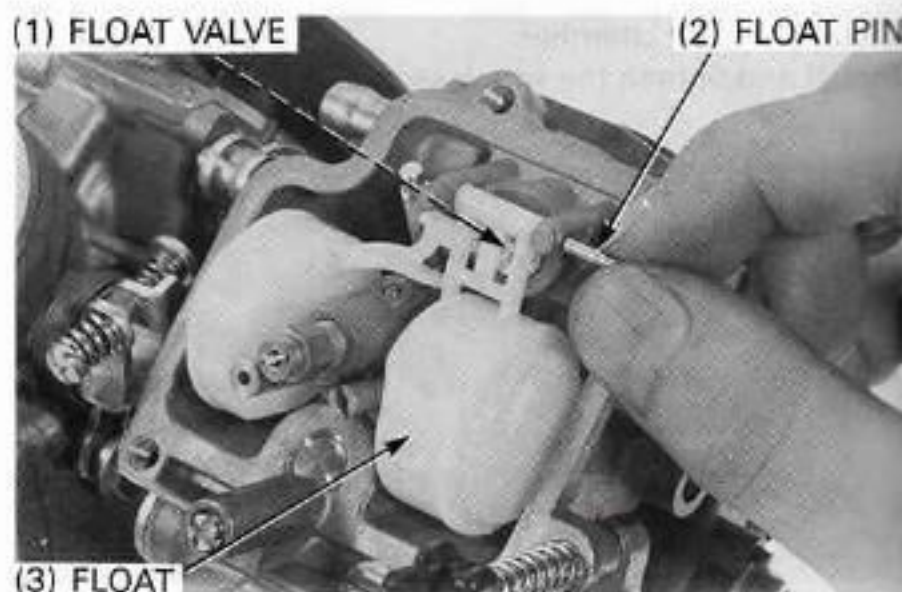
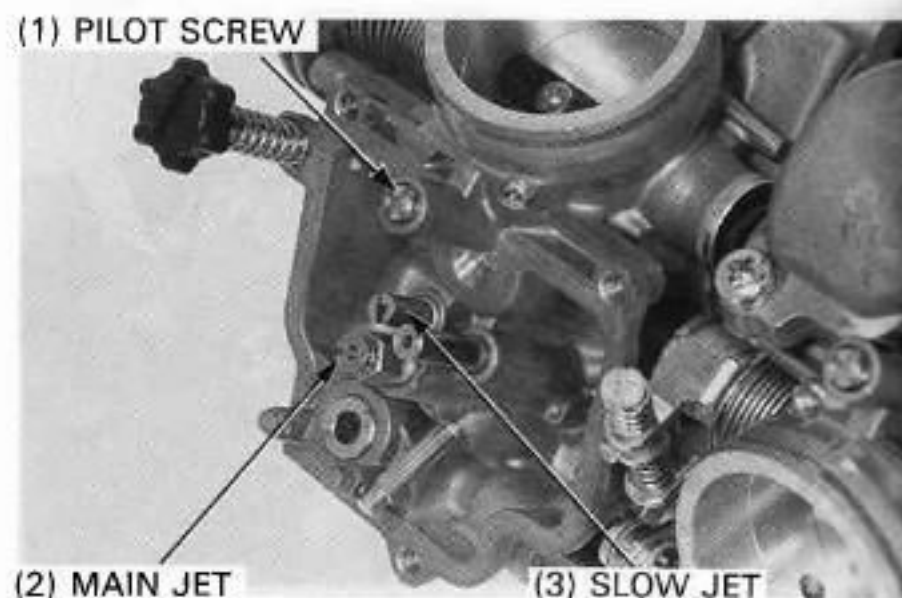
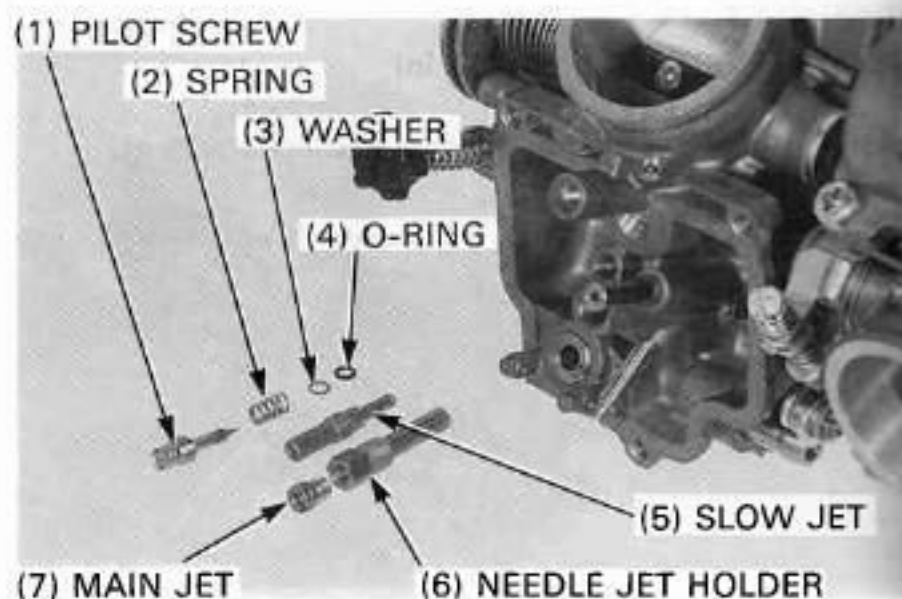
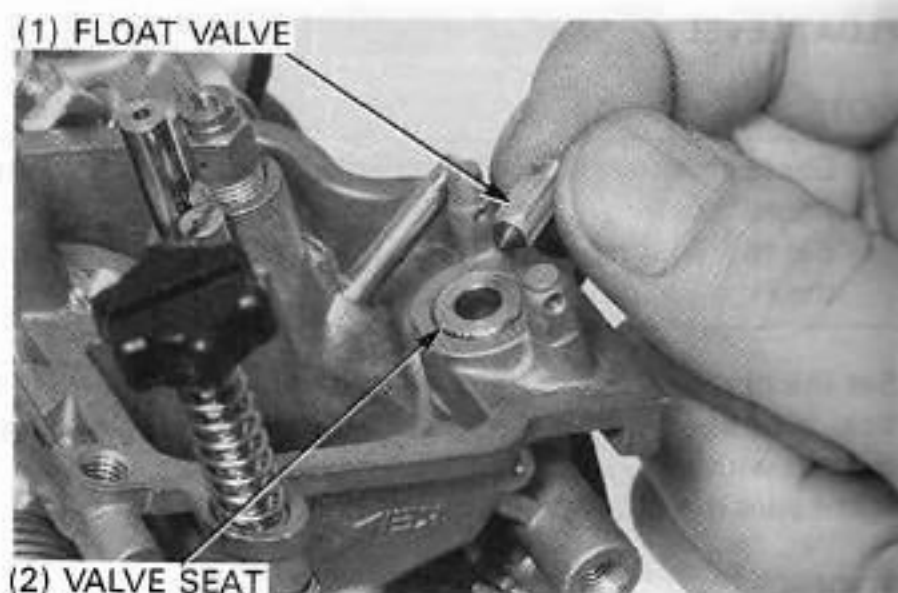
Install the O-ring, washer, spring and pilot screw.

NOTE

- Install the pilot screw and return it to its original position as noted during removal.
- Perform pilot screw adjustment if new pilot screw is installed (page 5-23).

Hang the float valve onto the float arm lip.

Install the float valve with the float in the carburetor body, then install the float pin through the body and float.



FUEL SYSTEM

FLOAT LEVEL

NOTE

- Check the float level after checking the float valve and float.
- Set the float level gauge so that it is perpendicular to the float chamber face and in line with the main jet.

Set the carburetor so that the float valve just contacts the float arm lip. Be sure that the float valve tip is securely in contact with the valve seat.

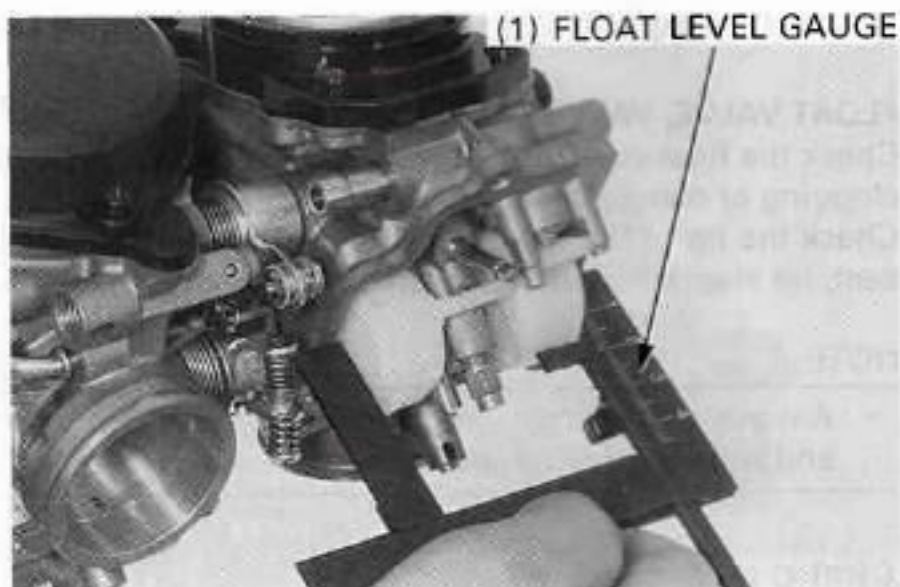
Make sure the float level with the float level gauge.

TOOL:

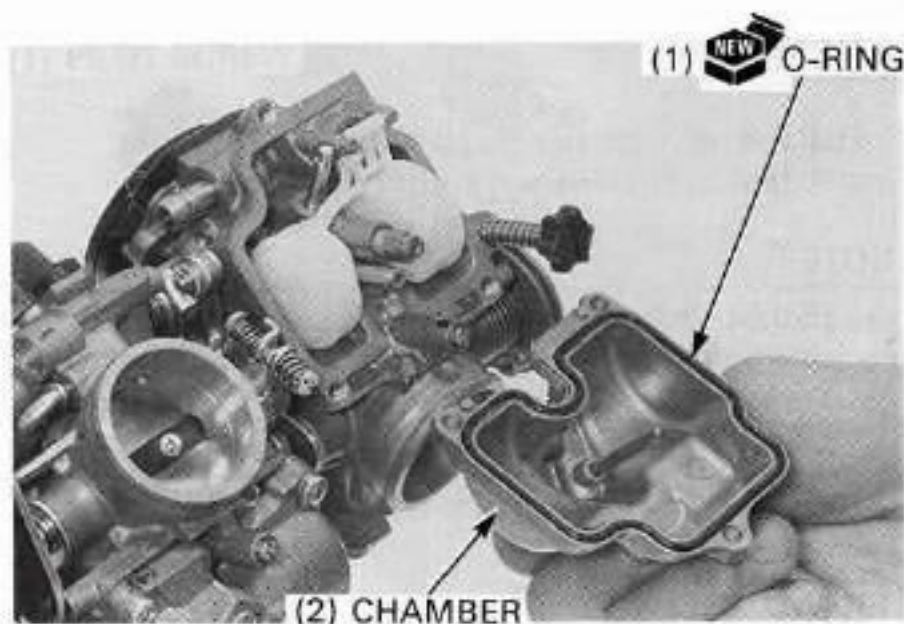
Float level gauge 07401-0010000

FLOAT LEVEL: 13.7 mm (0.5 in)

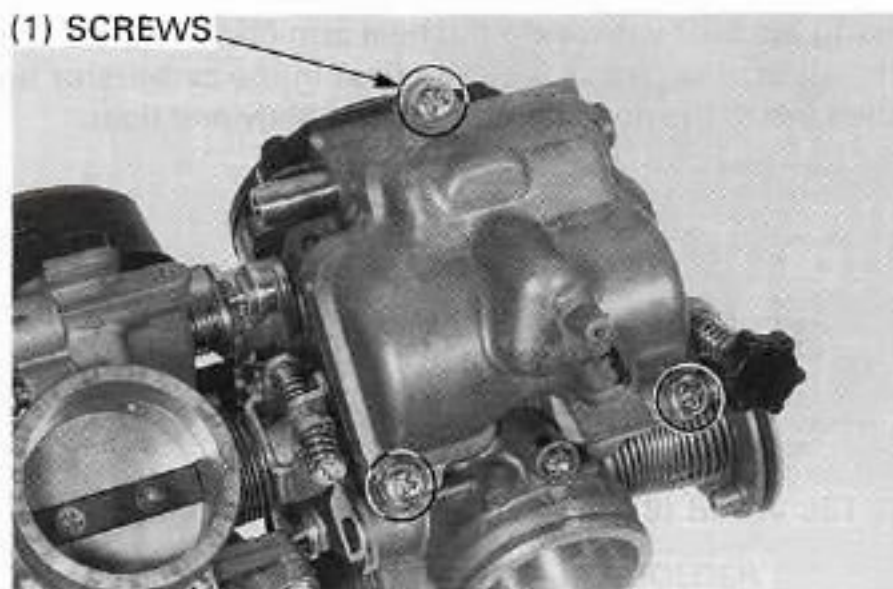
If the level is out of specification, replace the float.



Install the new O-ring into the float chamber groove.



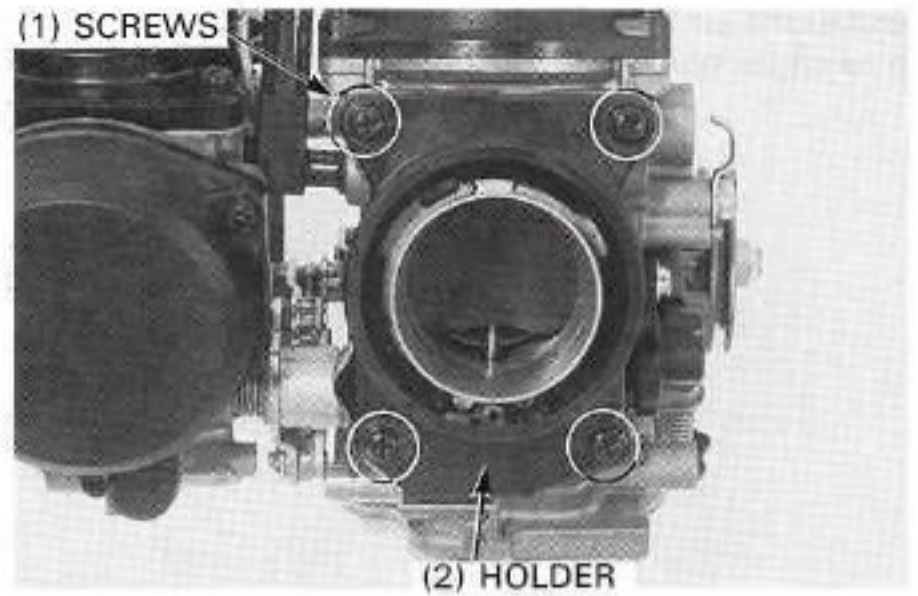
Install the float chamber.
Install and tighten the screw securely.



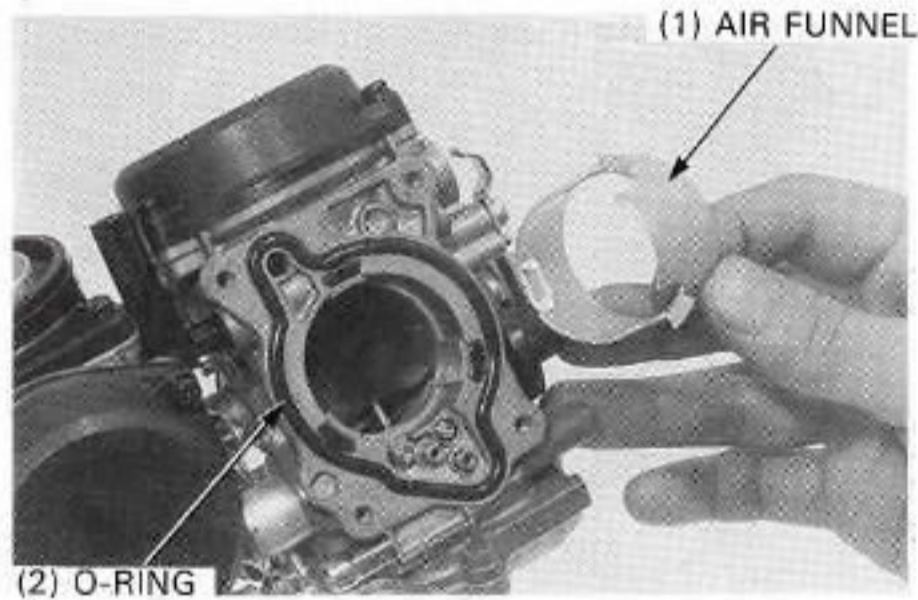
AIR FUNNEL

DISASSEMBLY

Remove the screws, air funnel holder.

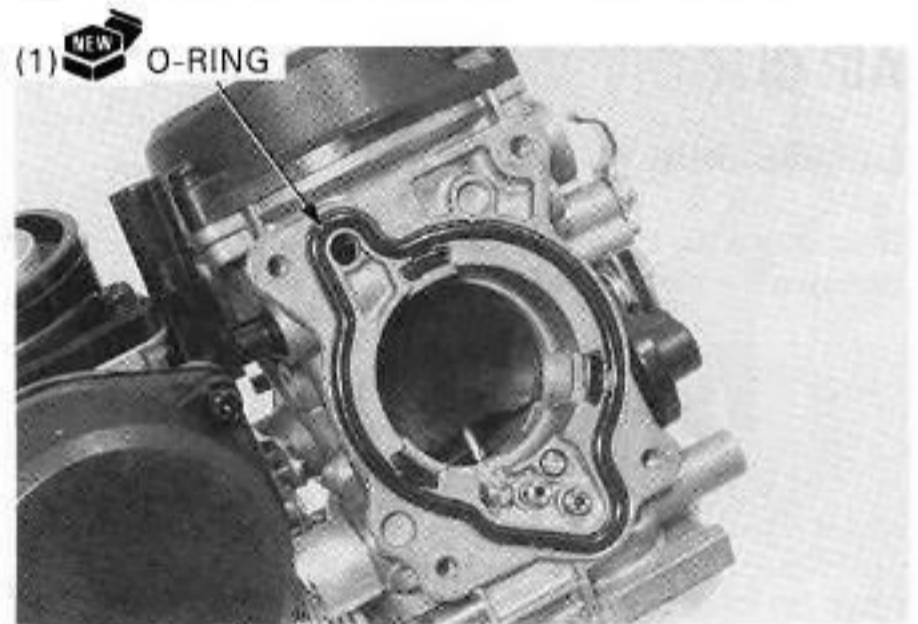


Remove the air funnel.
Remove the O-ring.

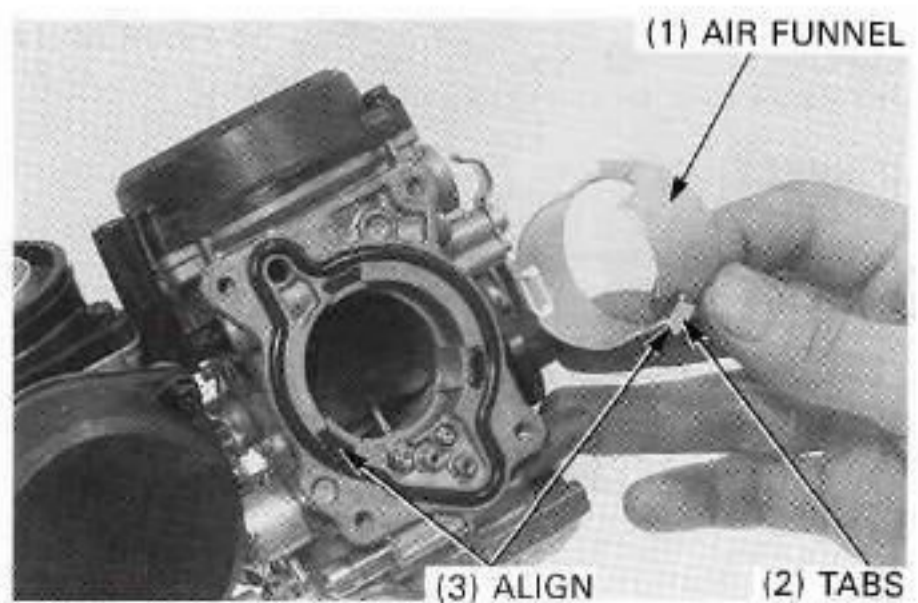


ASSEMBLY

Install the new O-ring into the carburetor body groove.

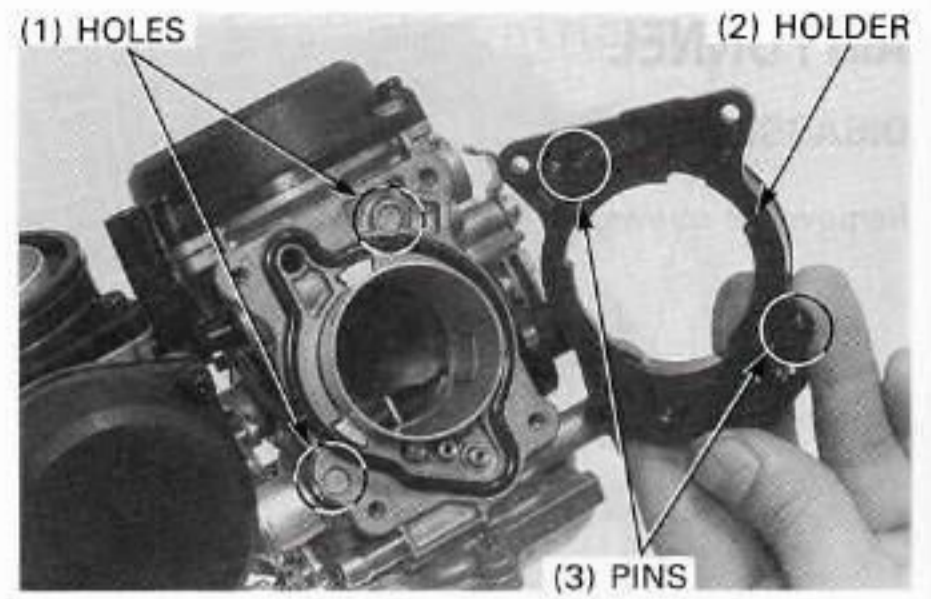


Install the air funnel to the carburetor aligning the tab of the air funnel with the tab on the O-ring.



FUEL SYSTEM

Install the air funnel holder to the carburetor aligning the pins on the holder with the holes on the carburetor body.



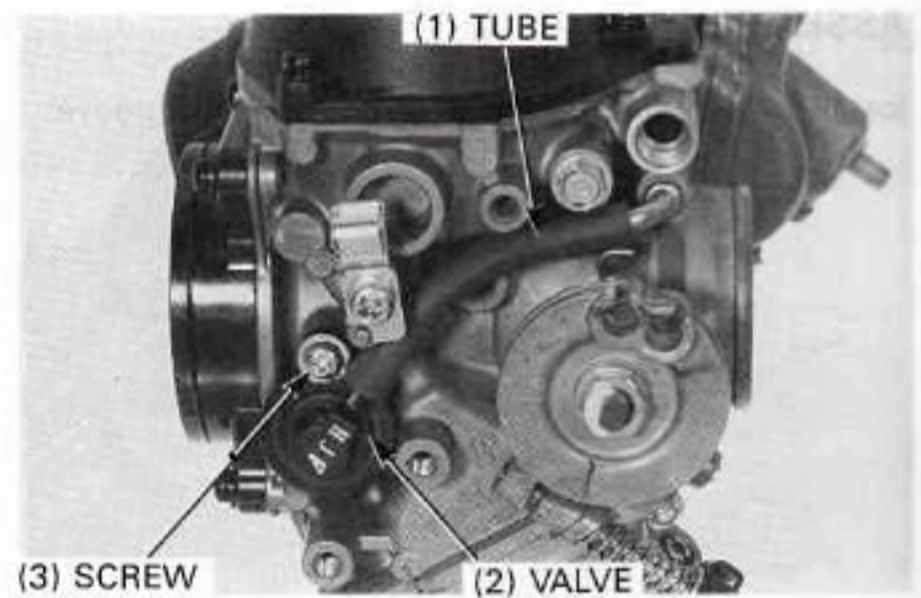
Install and tighten the screws securely.



AIR CUT-OFF VALVE

DISASSEMBLY

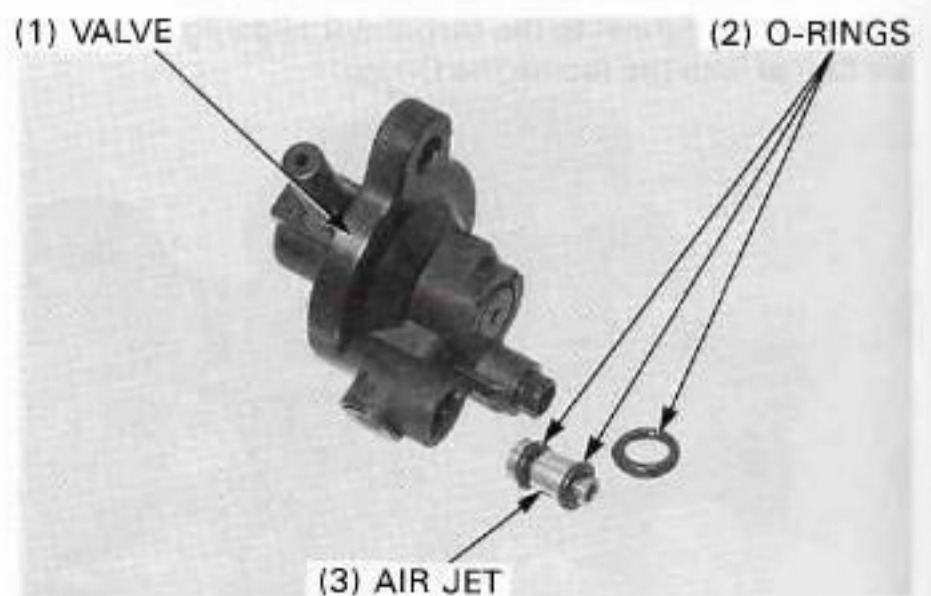
Disconnect the vacuum tube.
Remove the screw and air cut-off valve.



Remove the O-ring.
Remove the air jet and O-rings.

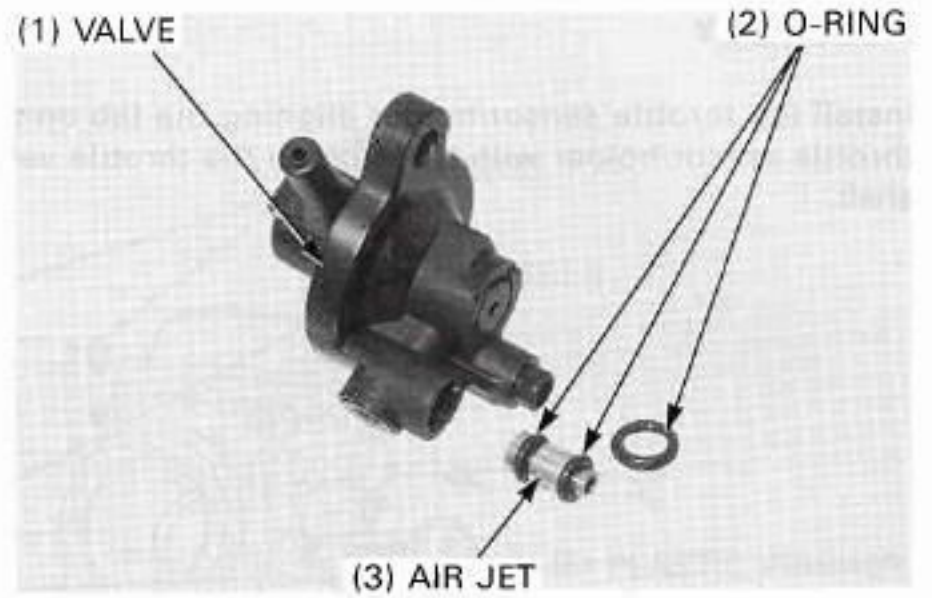
INSPECTION

Check the air jet for clogging or restriction.
Check the O-rings for wear or damage.

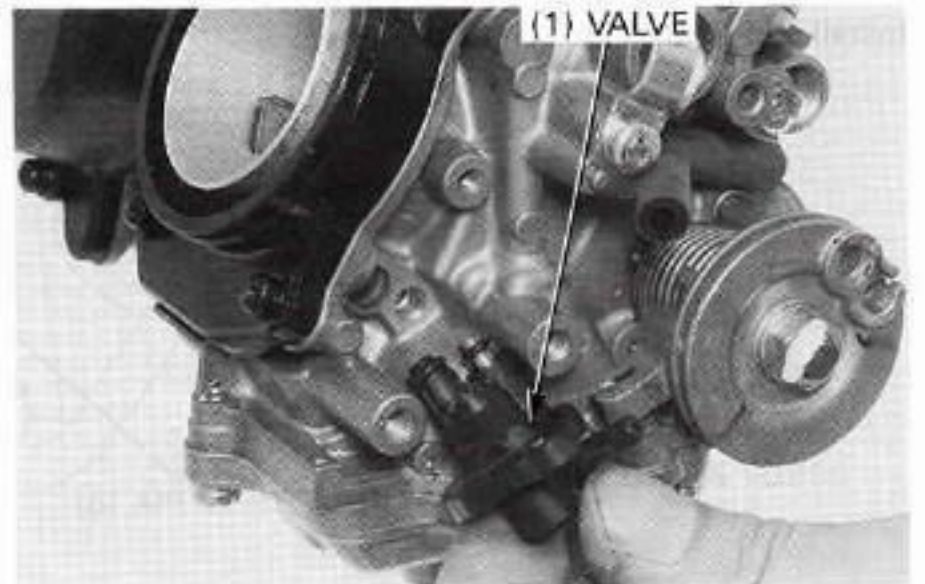


ASSEMBLY

Install the new O-rings to the air jet.
 Install the air jet/O-rings to the air cut-off valve.
 Install the new O-ring to the air cut-off valve.



Install the air cut-off valve.

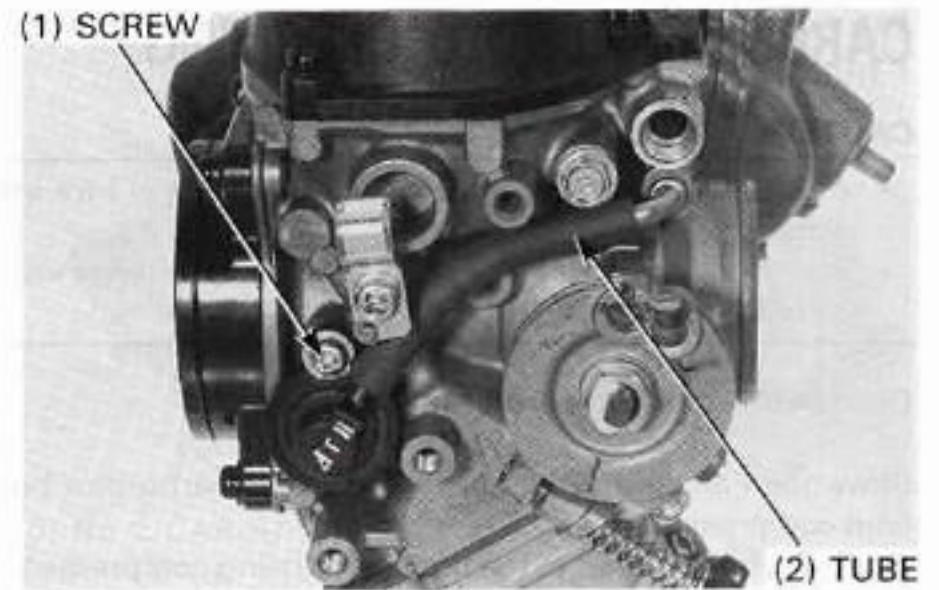


Install and tighten the screw securely.

NOTE

- Be careful not pinch the O-ring.

Connect the vacuum tube.



THROTTLE SENSOR (EXCEPT SW, AR TYPE ONLY)

NOTE

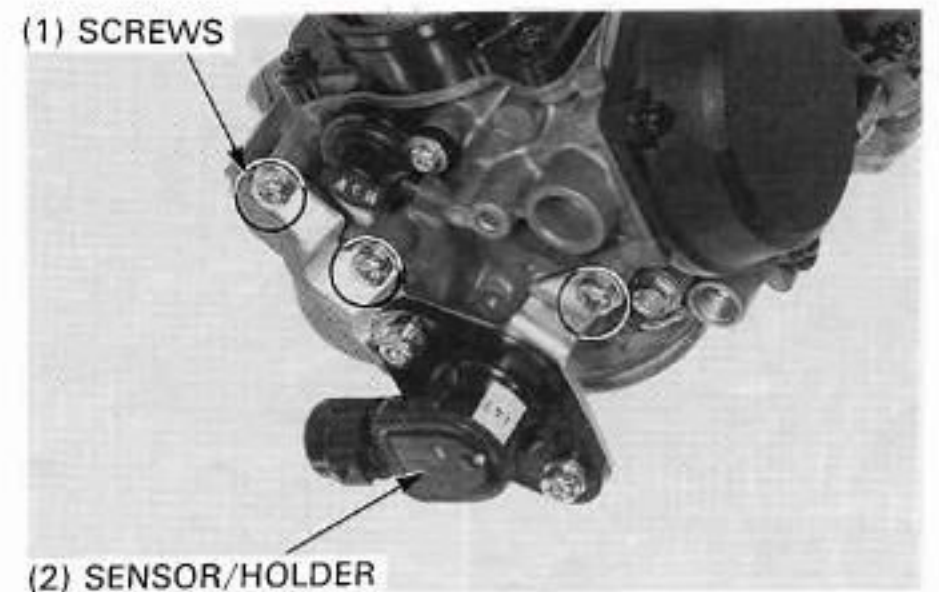
- For throttle sensor inspection, refer to Section 17.

DISASSEMBLY

Remove the screws and throttle sensor/holder.

CAUTION

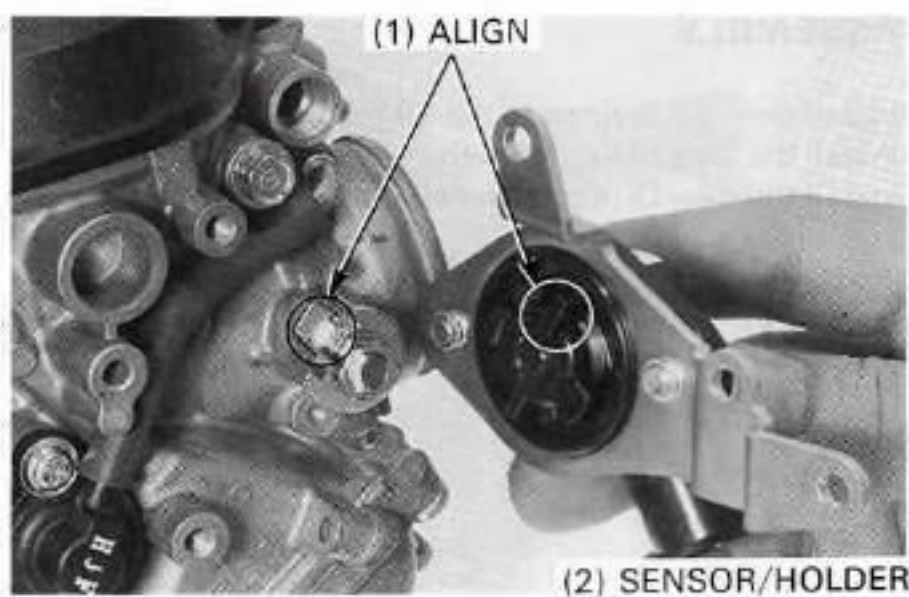
- Do not disassemble the throttle sensor from the holder.



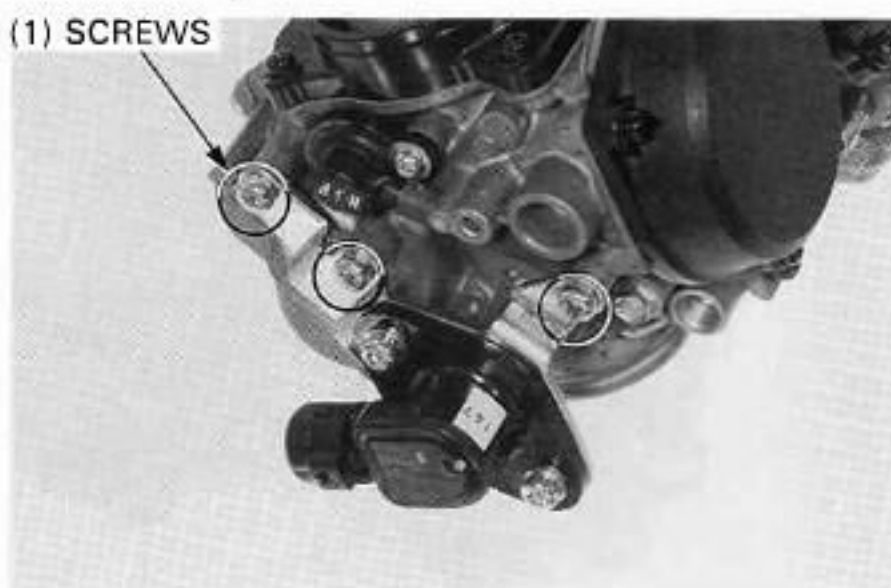
FUEL SYSTEM

ASSEMBLY

Install the throttle sensor/holder aligning the tab on the throttle sensor/holder with the tabs on the throttle valve shaft.



Install and tighten the screw securely.



CARBURETOR BODY CLEANING

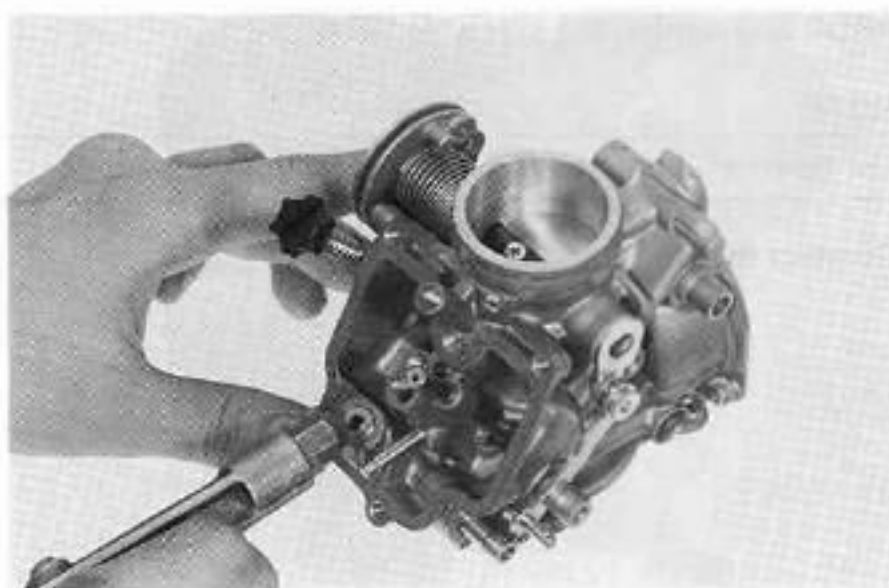
CAUTION

- *Cleaning the air and fuel passages with a piece of wire will damage the carburetor body.*
- *Remove the diaphragms to prevent damage to them before using air to blow open passage.*

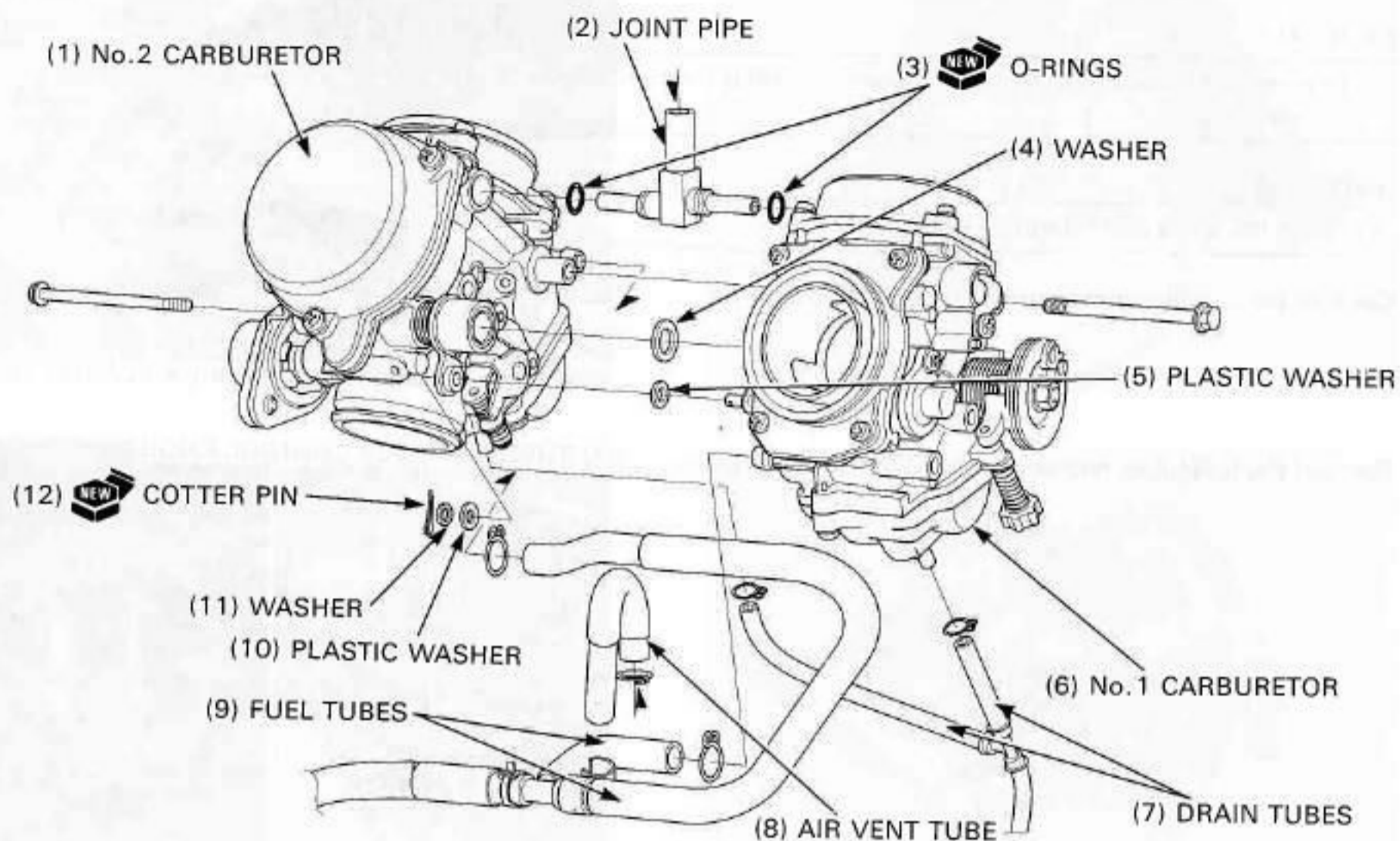
Disassembled the carburetor (page 5-8).

Blow open all air and fuel passages in the carburetor body with compressed air.

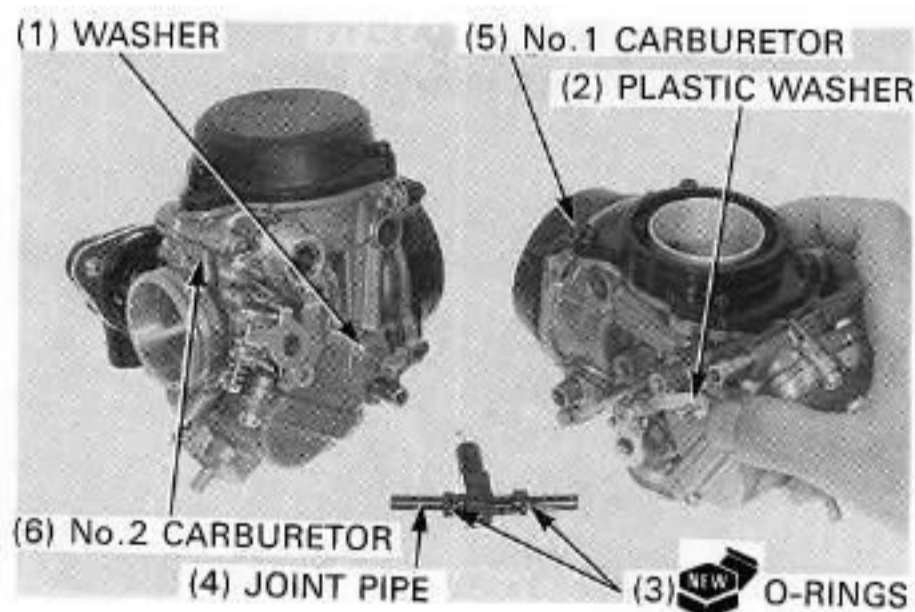
Clean the fuel strainer in the float valve using compressed air from the float valve seat side.



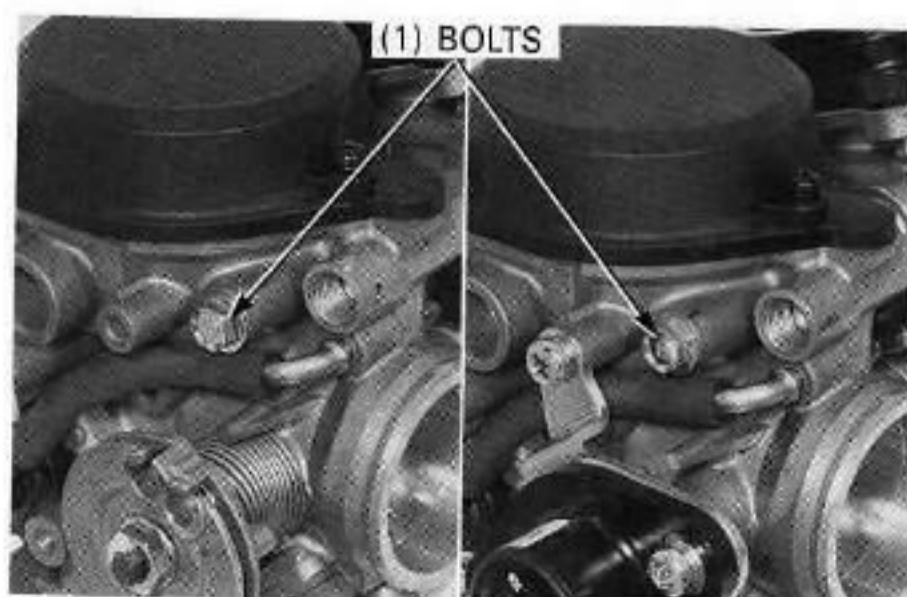
CARBURETOR COMBINATION



Install the washer and plastic washer.
 Install the new O-rings and fuel joint pipe.
 Install the No.1 carburetor to the No.2 carburetor.



Install and tighten the connecting bolts securely.



CARBURETOR INSTALLATION

CAUTION

- Be careful not to damage the throttle sensor while installing the carburetor.

NOTE

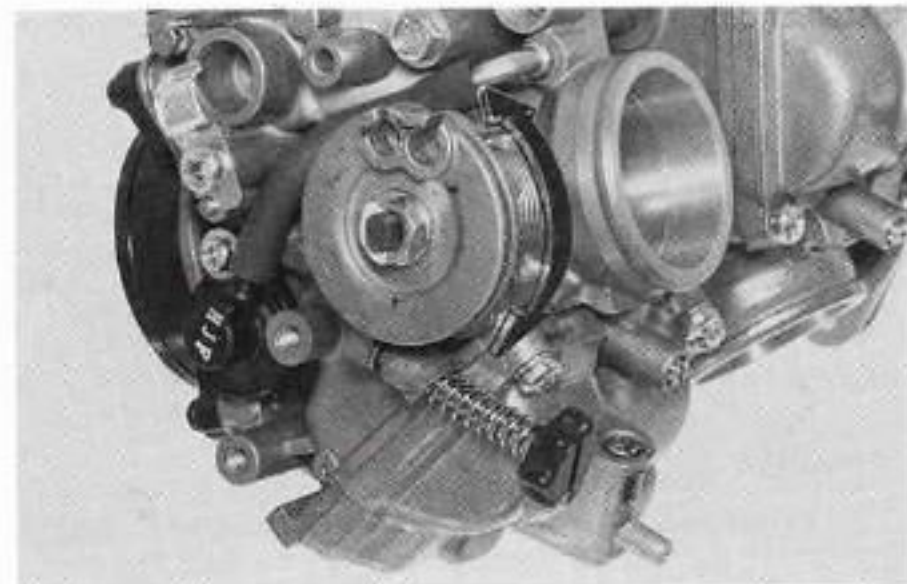
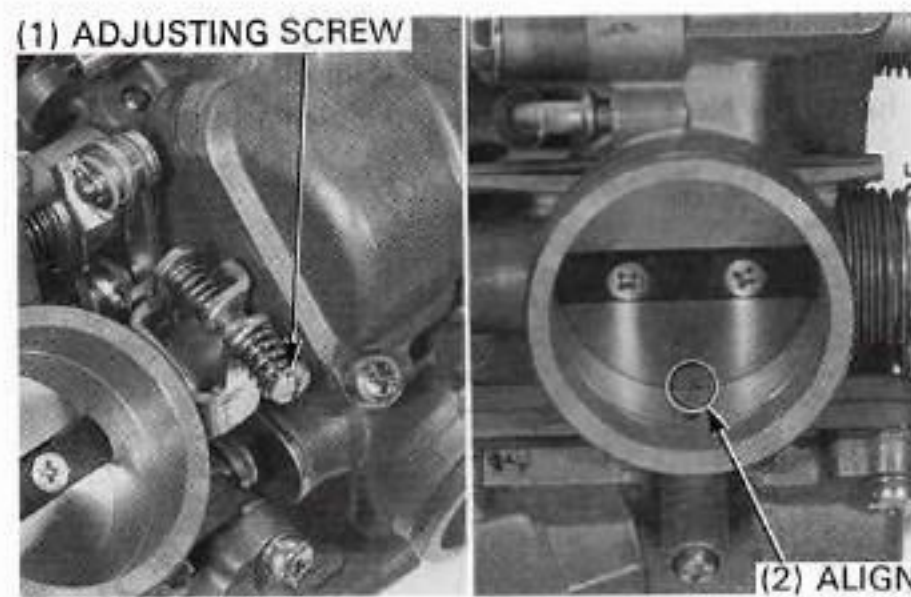
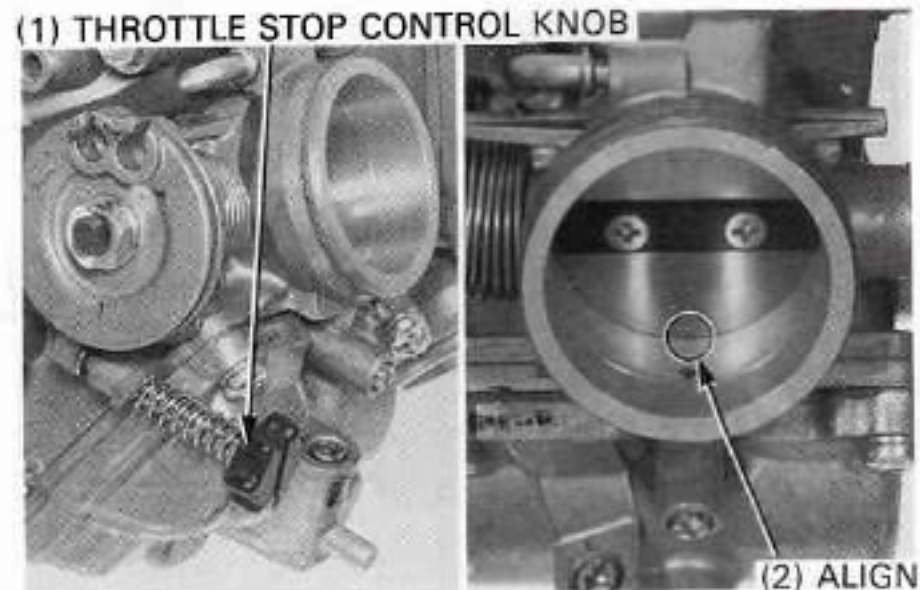
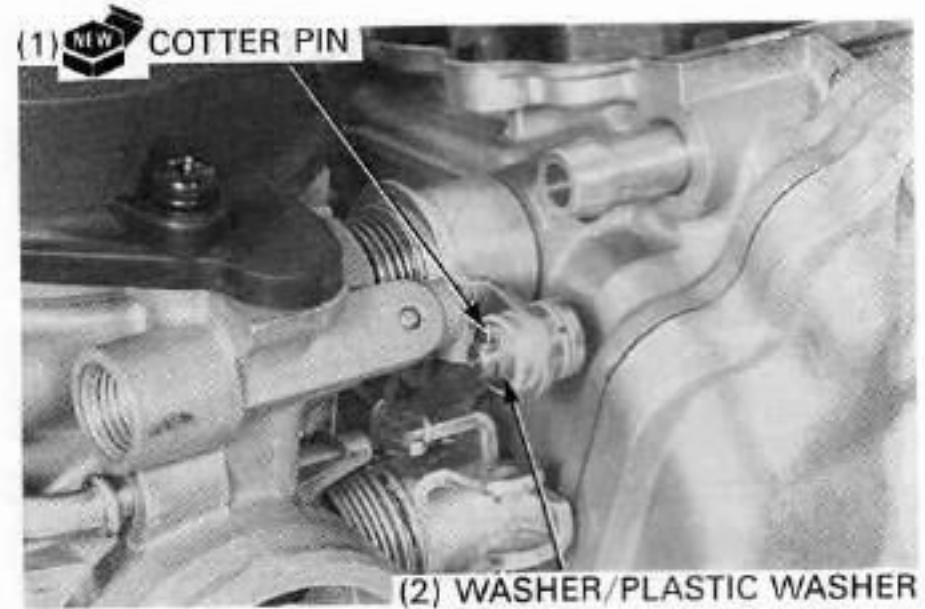
- Route the wires and tubes properly (page 1-22).

Connect the carburetor drain tubes to the carburetors.

Connect the fuel tubes and air vent tube to the carburetors.

Tighten the cable clamp screw.
Install the starting enrichment (SE) valves.

Install the carburetor to the insulator.
Tighten the screws securely.



CARBURETOR INSTALLATION

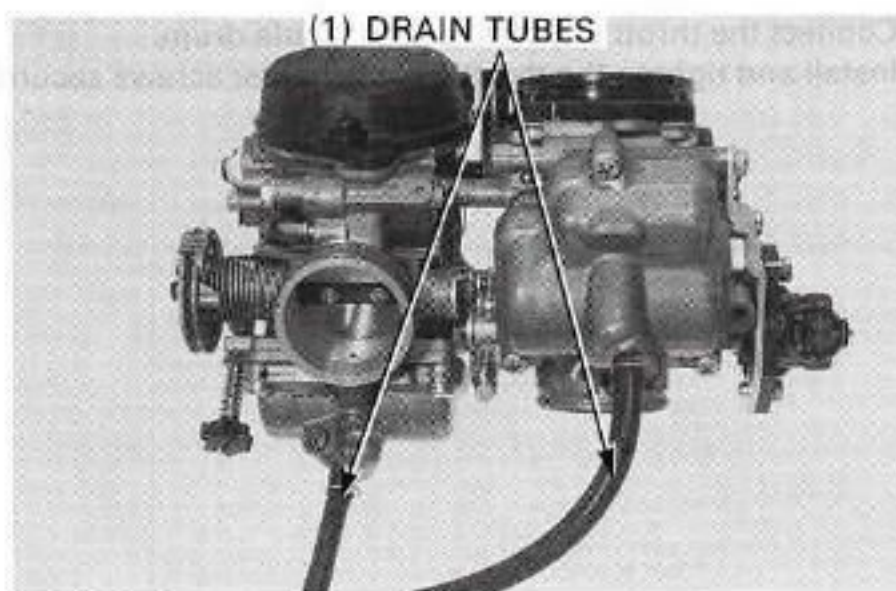
CAUTION

- Be careful not to damage the throttle sensor while installing the carburetor.

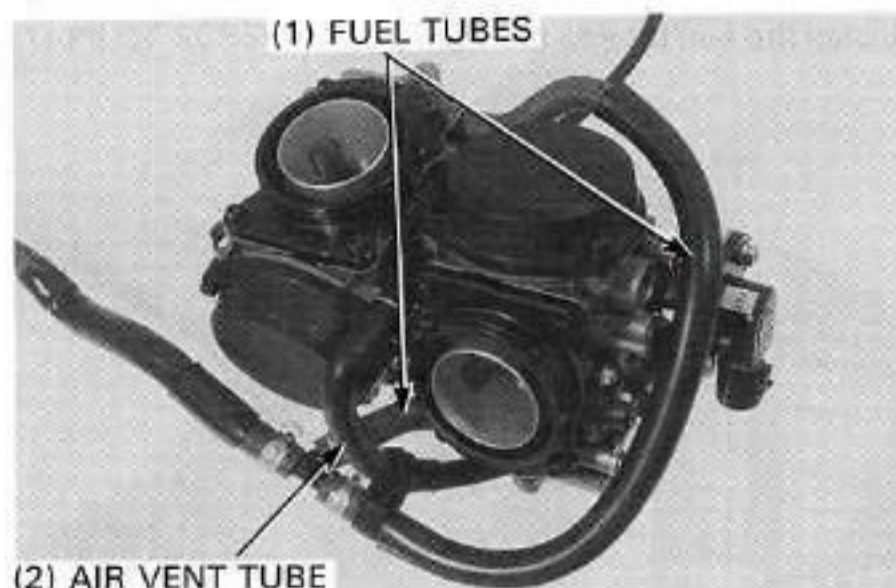
NOTE

- Route the wires and tubes properly (page 1-22).

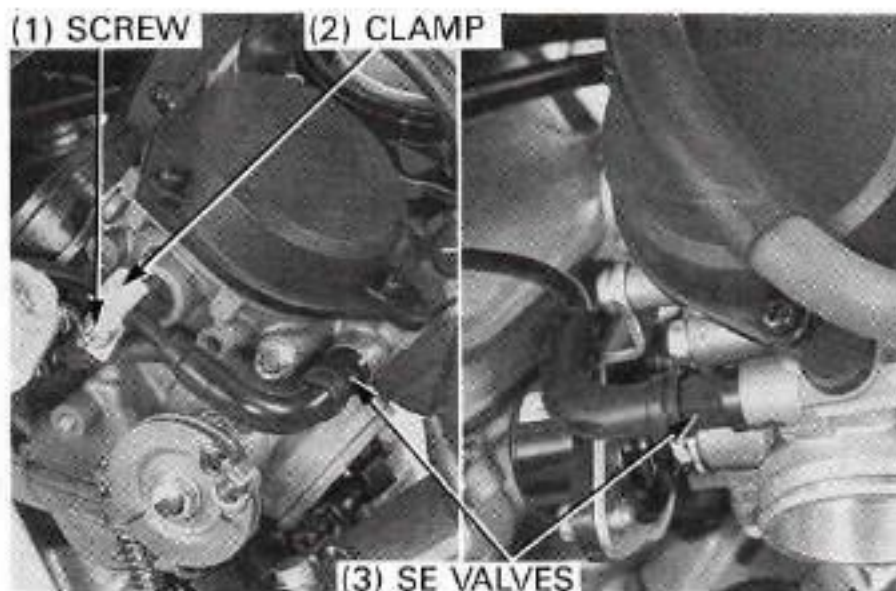
Connect the carburetor drain tubes to the carburetors.



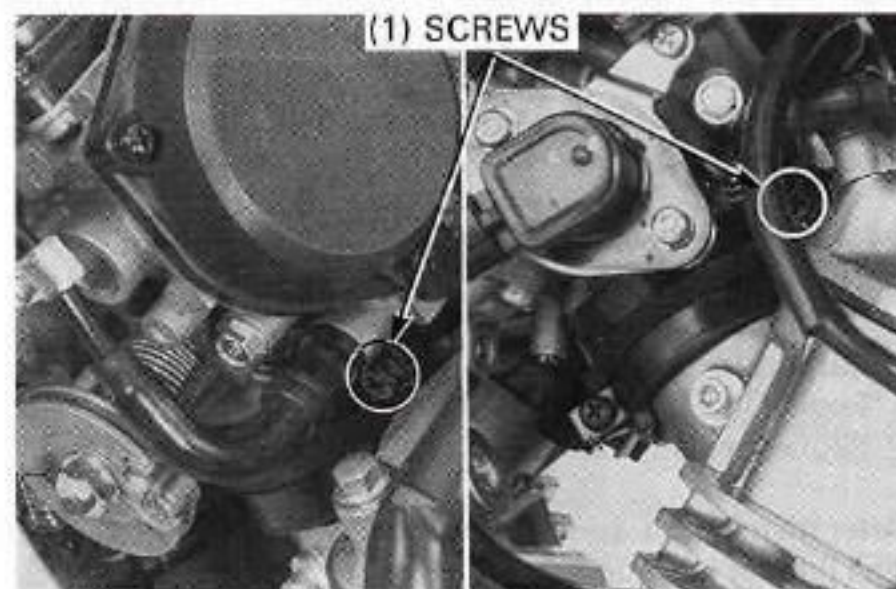
Connect the fuel tubes and air vent tube to the carburetors.



Tighten the cable clamp screw.
Install the starting enrichment (SE) valves.

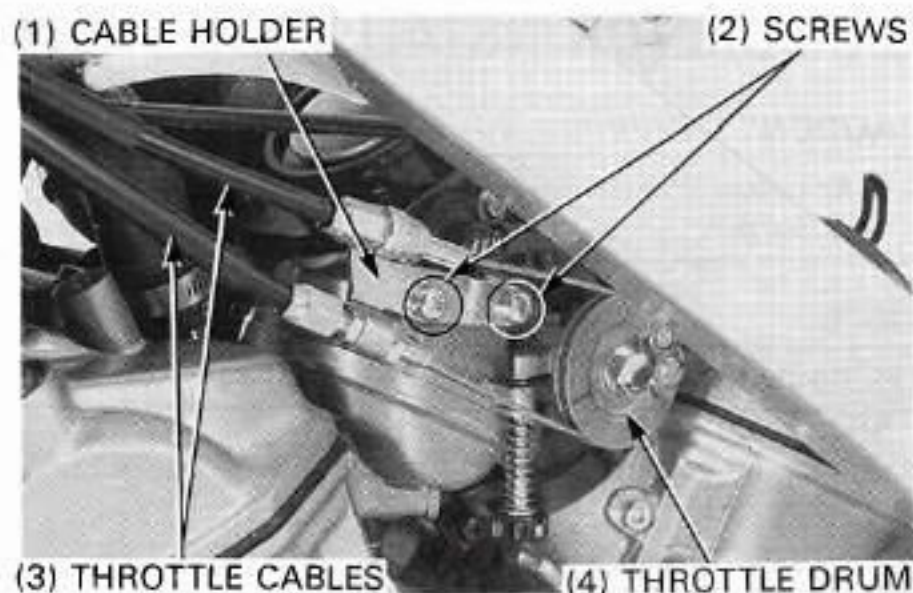


Install the carburetor to the insulator.
Tighten the screws securely.

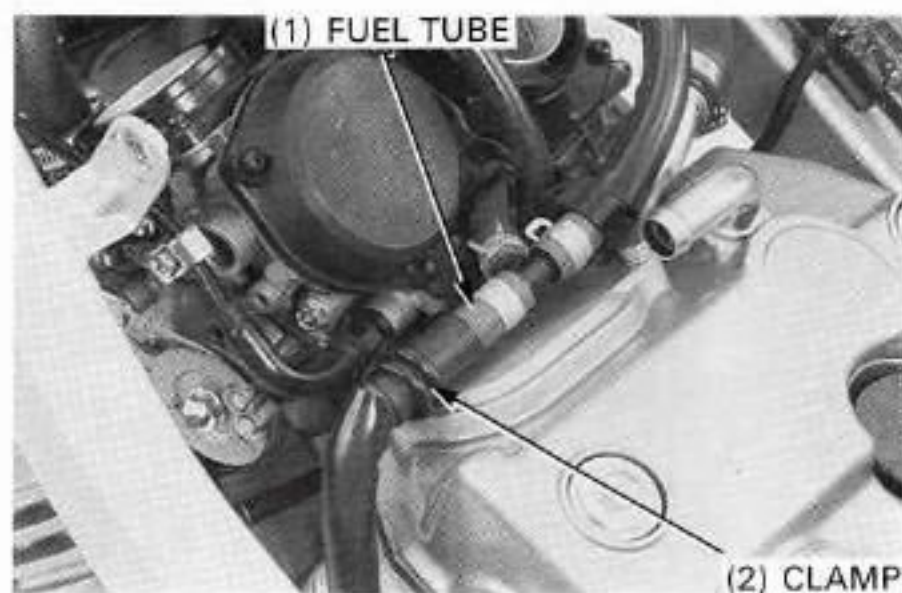


FUEL SYSTEM

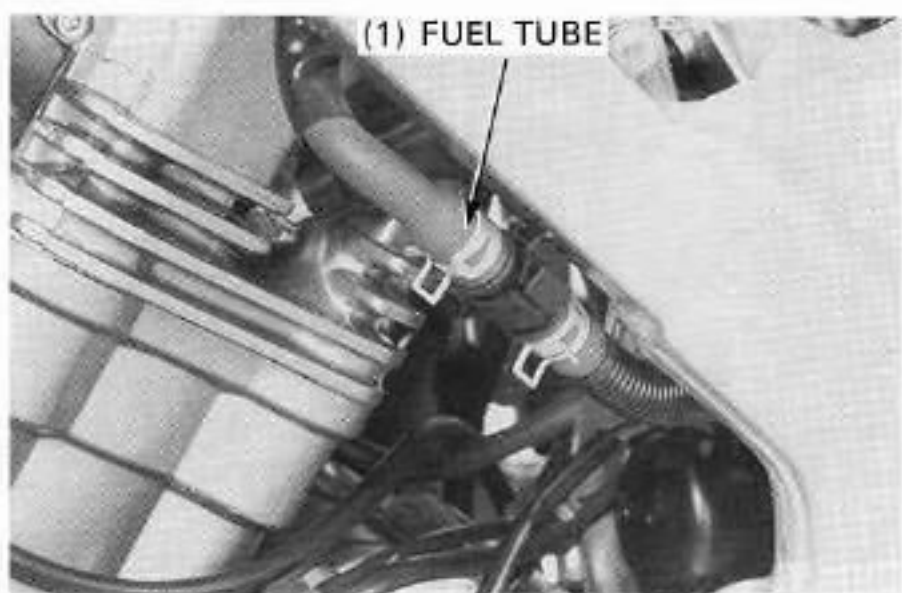
Connect the throttle cables to the throttle drum.
Install and tighten the throttle cable holder screws securely.



Install the fuel tube to the clamp.



Connect the fuel tube.



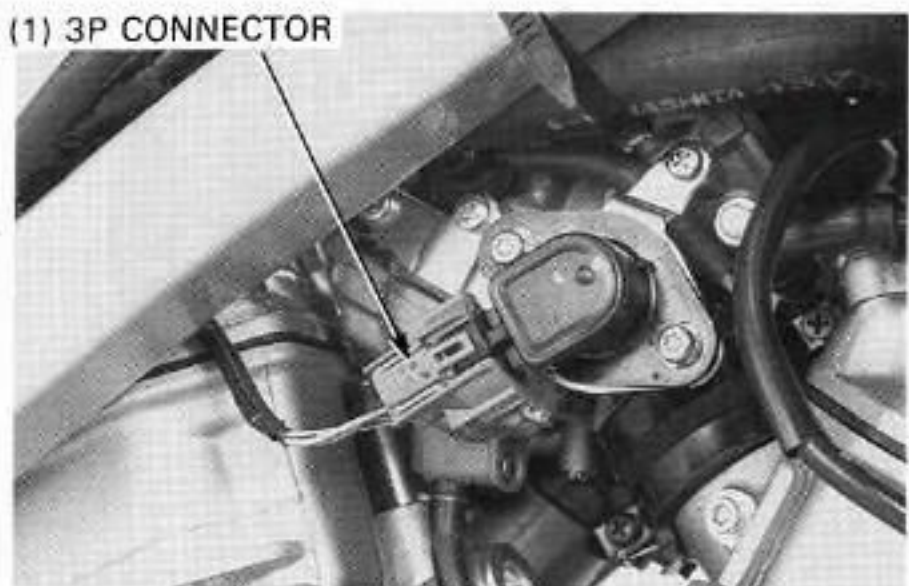
Connect the throttle sensor 3P connector (except SW, AR type).

Install the air cleaner housing (page 5-4).
Install the fuel tank (page 2-23).

Perform the following inspections and adjustment.

- Throttle operation (page 3-4)
- Carburetor choke (page 3-5)
- Carburetor synchronization (page 3-15)
- Engine idle speed (page 3-16)
- Pilot screw adjustment (page 5-23)

After installation, turn the ignition switch ON and check the fuel line for leakage.



PILOT SCREW ADJUSTMENT

IDLE DROP PROCEDURE

⚠ WARNING

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

NOTE

- Make sure the carburetor synchronization is within specification before pilot screw adjustment (page 3-15).
- The pilot screw factory pre-set and no adjustment can be done unless it is replaced.
- Use a tachometer with graduations of $50 \text{ min}^{-1}(\text{rpm})$ or smaller that will accurately indicate a $50 \text{ min}^{-1}(\text{rpm})$ change.

1. Turn each pilot screw clockwise until it seats lightly, then back it out to specification given.

TOOL:

Pilot screw wrench **07KMA-MS60101**

INITIAL OPENING:

Except SW, AR type: **2-3/8 turns out**
 SW, AR type: **2-1/2 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 riding for 10 minutes is sufficient.
3. Attach a tachometer according to its manufacture's instructions.
4. Start the engine and adjust the engine idle speed to the specified rpm with the throttle stop control knob.

IDLE SPEED:

Except SW type: **$1,200 \pm 100 \text{ min}^{-1}(\text{rpm})$**
 SW type: **$1,200 \pm 50 \text{ min}^{-1}(\text{rpm})$**

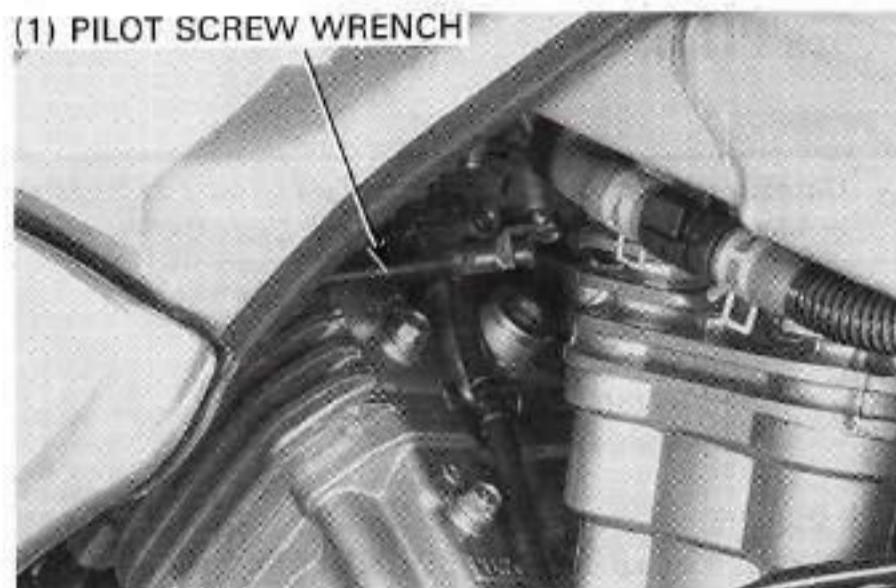
5. Turn rear (No.1) carburetor pilot screw in or out slowly to obtain the highest engine speed.

TOOL:

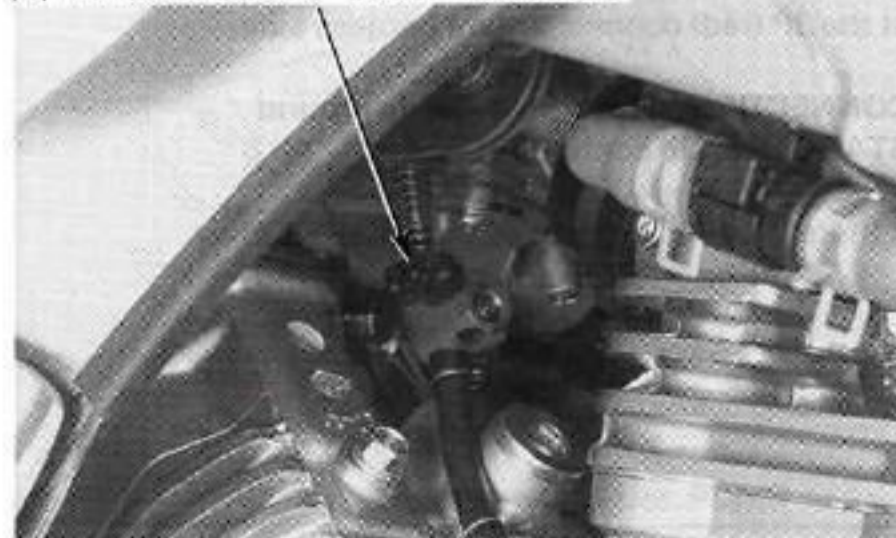
Pilot screw wrench **07KMA-MS60101**

6. Perform step 5 for front (No.2) carburetor pilot screw.

(1) PILOT SCREW WRENCH



(1) THROTTLE STOP CONTROL KNOB



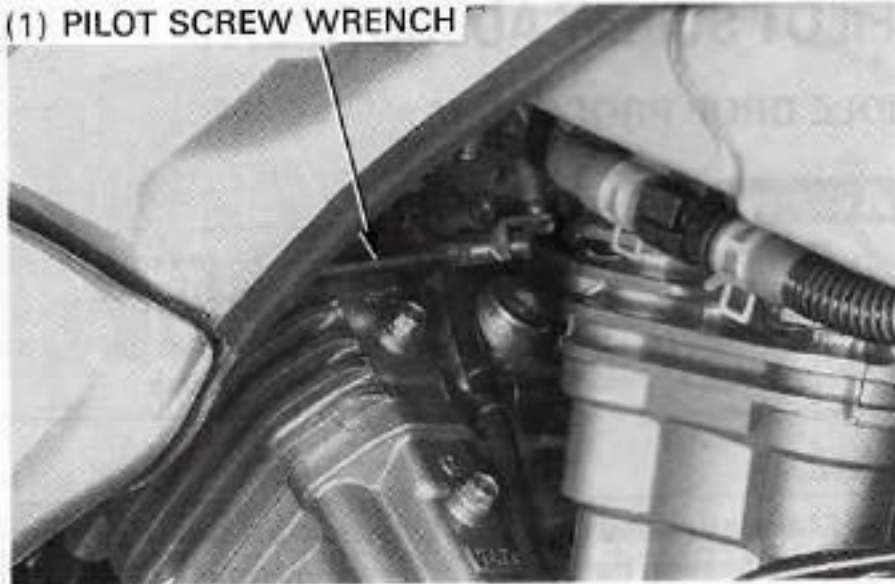
FUEL SYSTEM

7. Lightly open the throttle 2 - 3 times, then adjust the idle speed with the throttle stop control knob.
8. Turn the rear (No.1) carburetor pilot screw in gradually until the engine speed drops 50 min⁻¹ (rpm)
9. Turn the rear (No.1) carburetor pilot screw counterclockwise to the final opening from the position in step 8.

FINAL OPENING: Except SW type: 1/2 turns out
SW type: 1/4 turns out

10. Perform steps 8 and 9 for the front (No.2) carburetor pilot screw.

(1) PILOT SCREW WRENCH



FUEL PUMP

WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.

SYSTEM INSPECTION

Remove the fuel tank (page 2-20).
Remove the left side cover (page 2-7).

Turn the ignition switch OFF.
Disconnect the fuel cut relay 3P (red) connector and connect the voltmeter at the 3P (red) connector wire harness side.

CONNECTION: Black/Red (+) - body ground (-)

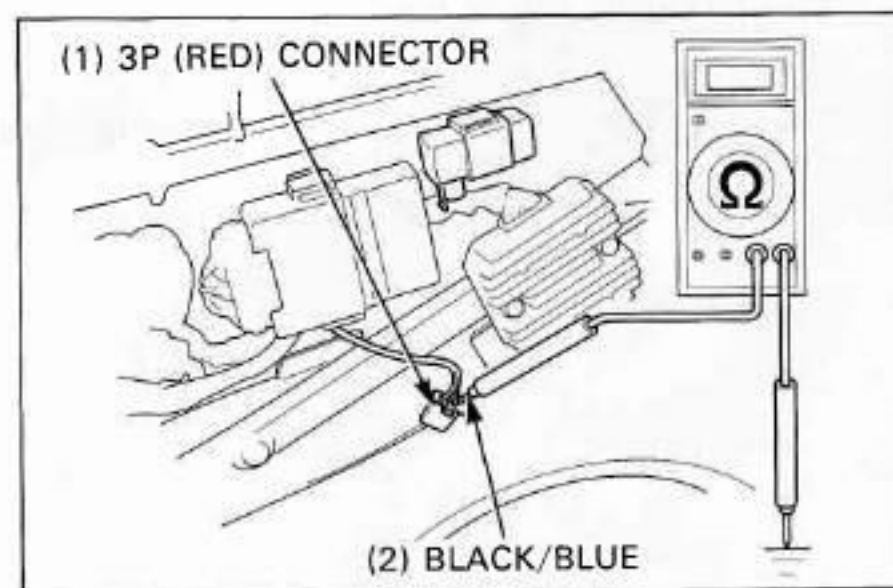
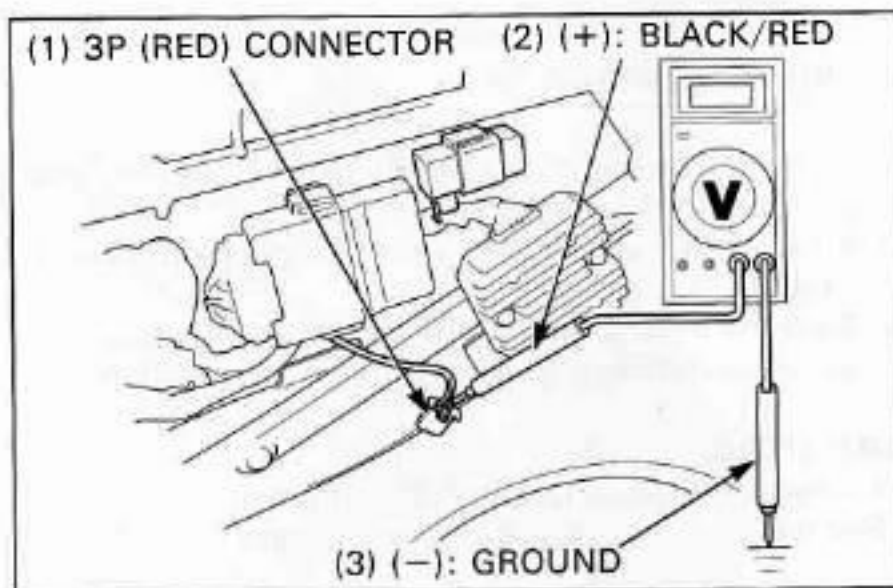
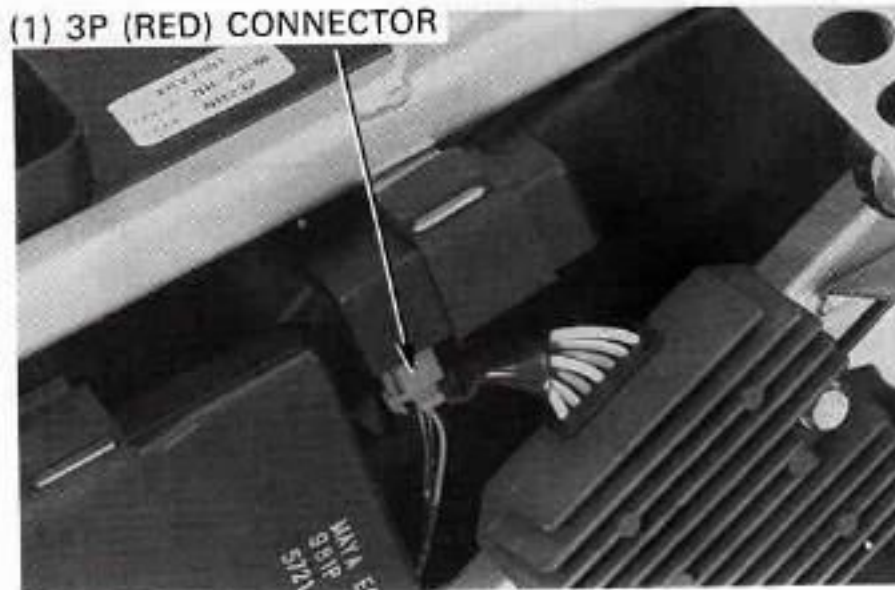
Turn the ignition switch ON.
There should be battery voltage.
If there is no voltage, check for an open circuit or loose connection in Black/Red wire.
If there is battery voltage, check for continuity in the Black/Blue wire.

Check for continuity between the Black/Blue wire and ground at the 3P (red) connector wire harness side.

CONNECTION: Black/Blue - body ground
STANDARD: No continuity

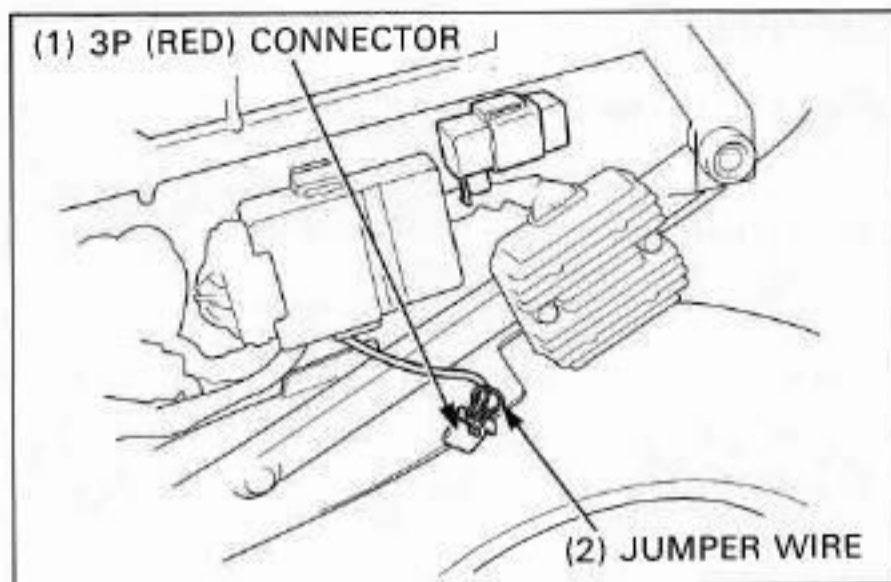
If there is continuity, replace the fuel cut relay.

(1) 3P (RED) CONNECTOR



If there is no continuity, short the terminals of the 3P (red) connector wire harness side with the suitable jumper wire.

SHORT TERMINALS: Black/Blue - Black/Red



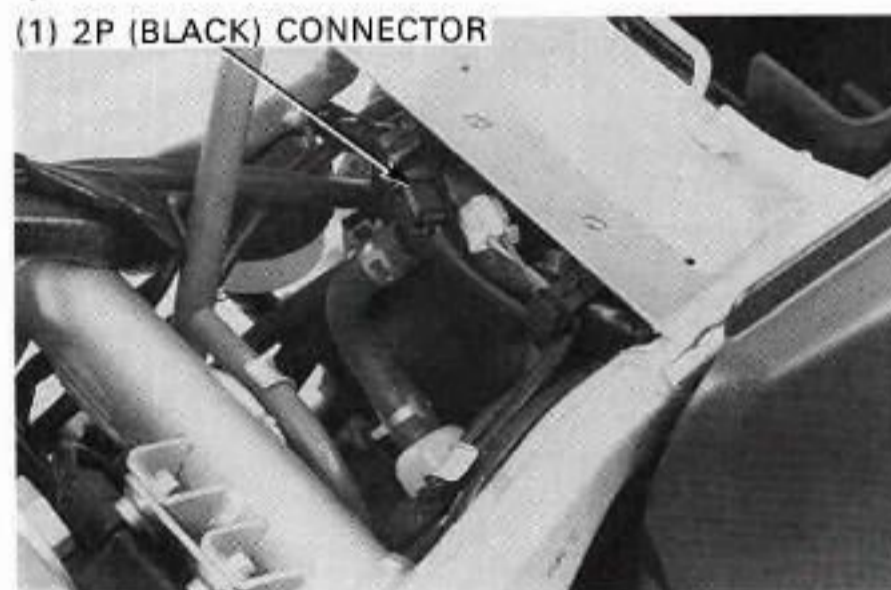
Disconnect the fuel pump 2P (black) connector and connect the voltmeter at the 2P (black) connector wire harness side.

CONNECTION: Black/Blue (+) - Green (-)

Turn the ignition switch ON and measure the voltage at the 2P (black) connector.

STANDARD: Battery voltage

If there is no voltage, check for an open circuit or loose connection in Black/Blue and Green wires.
If there is battery voltage, replace the fuel pump.



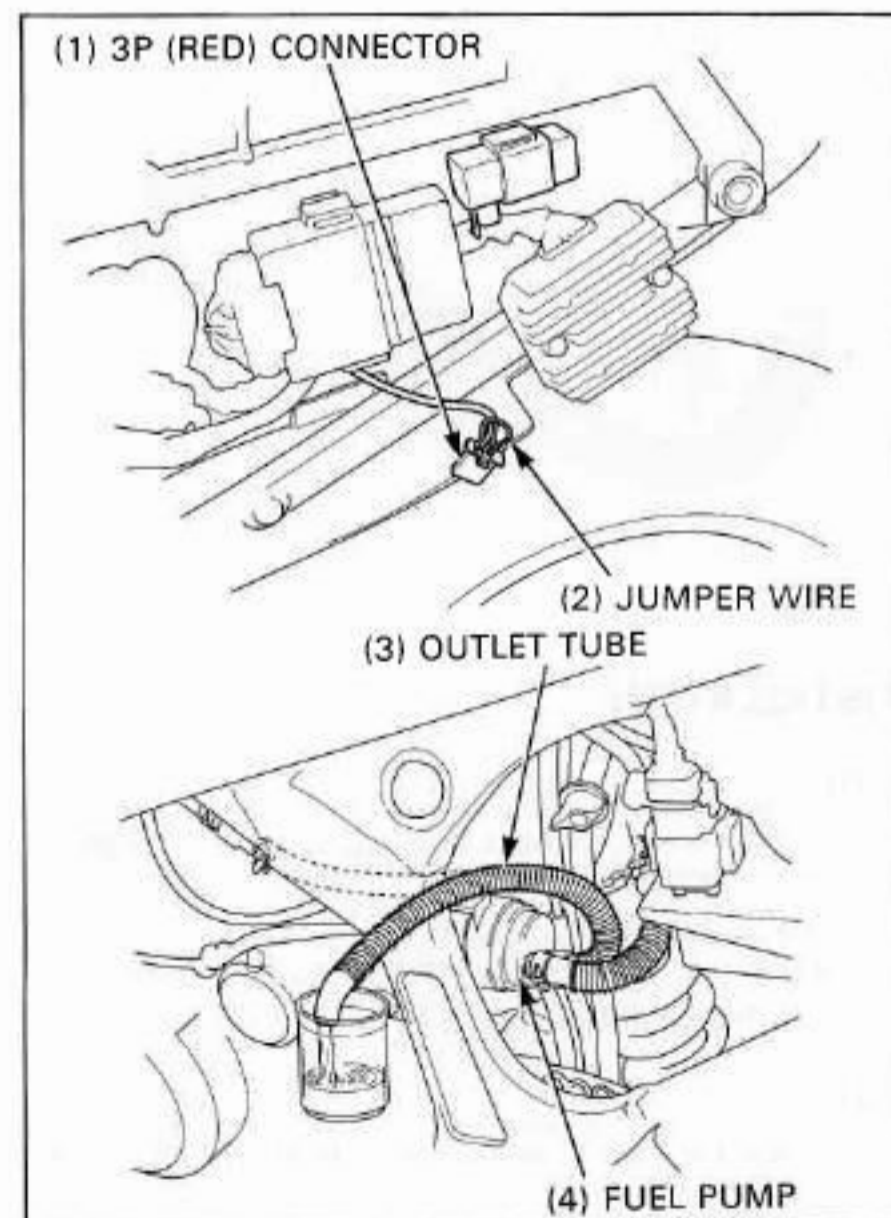
DISCHARGE VOLUME INSPECTION

Remove the fuel tank (page 2-20).
Remove the left side cover (page 2-7).

Disconnect the fuel cut relay 3P (red) connector.
Short the black/red and black/blue terminals with a suitable jumper wire.
Disconnect the fuel pump outlet tube from the tube joint.
Hold a graduated beaker under the fuel pump outlet tube.

Turn the ignition switch ON and let the fuel flow into the beaker for 5 seconds, then turn the ignition switch OFF.
Multiply the amount in the beaker by 12 to determine the fuel pump flow capacity per minute.

FUEL PUMP FLOW CAPACITY:
900 cm³ (30.4 US oz, 31.7 Imp oz) min./minute

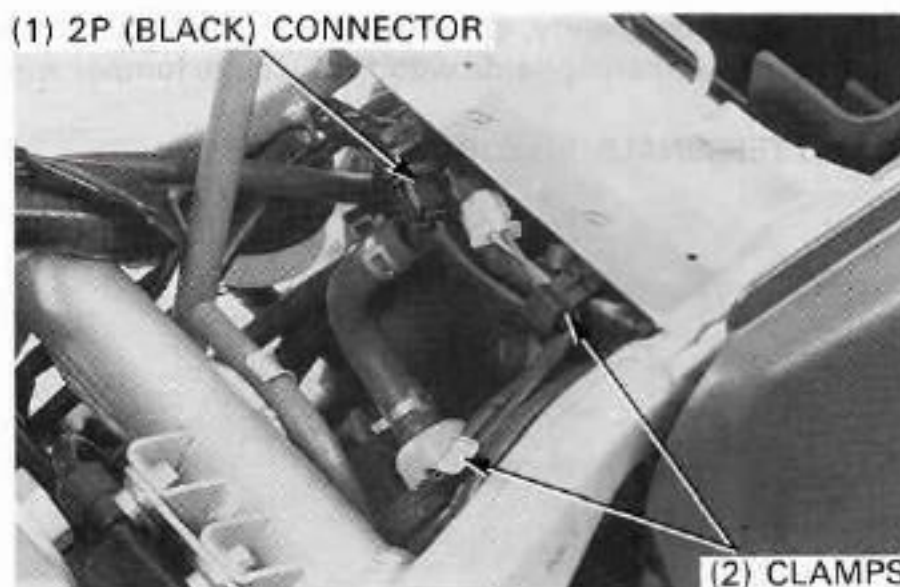


FUEL SYSTEM

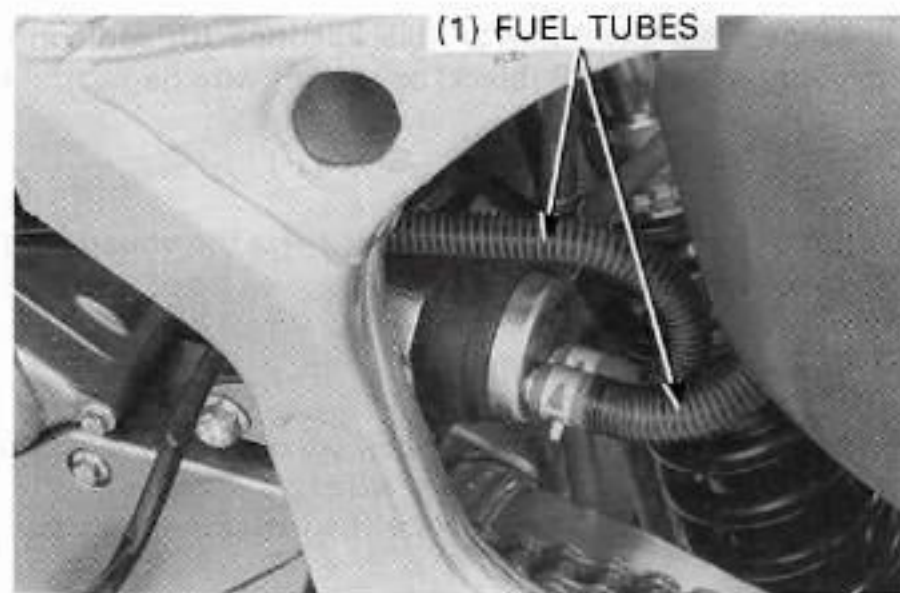
REMOVAL

Remove the fuel tank (page 2-20).

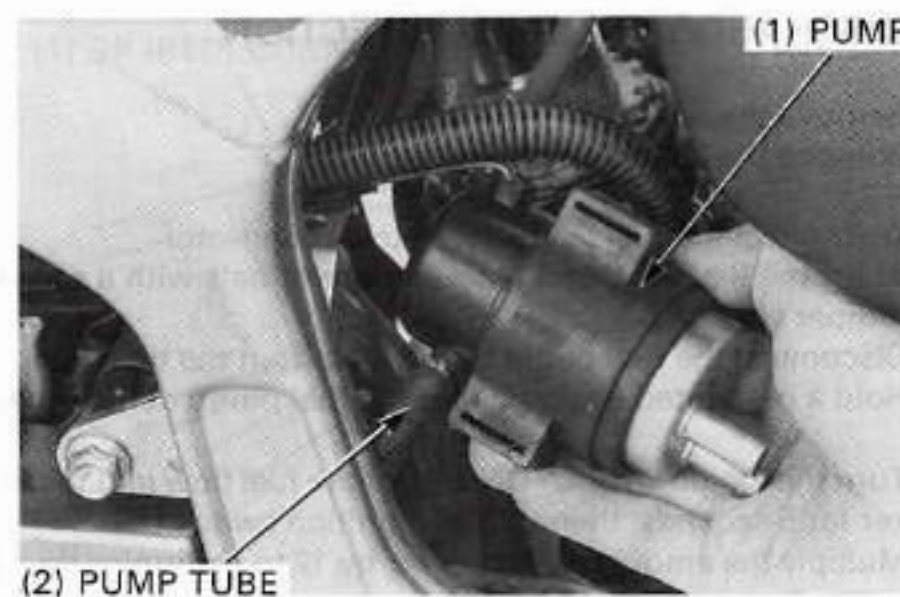
Disconnect the fuel pump 2P (black) connector and remove the fuel pump wire from the clamps.



Disconnect the fuel tubes (pump-to-filter, pump-to-carburetor).



Disconnect the fuel pump tube.
Remove the fuel pump from the pump bracket.



INSTALLATION

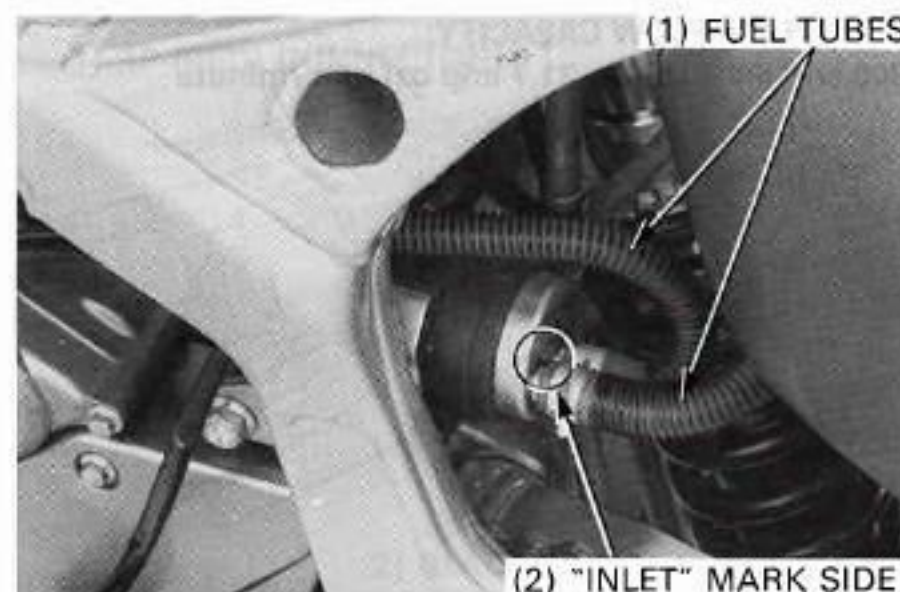
NOTE

- Route the wire harness and tubes properly (page 1-22).

Connect the fuel pump tube to the fuel pump.
Install the fuel pump to the pump bracket.
Connect the fuel tubes (pump-to-filter, pump-to-carburetor).

NOTE

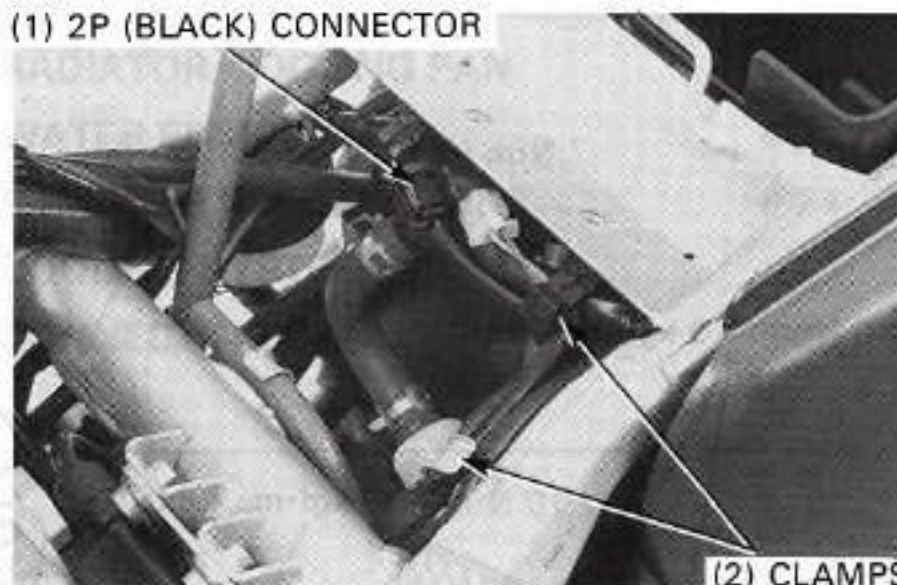
- Connect the fuel tube (pump-to-filter) to fuel pump "IN-LET" mark side.



Connect the fuel pump 2P (black) connector and install the fuel pump wire to the clamps.

Install the fuel tank (page 2-23).

(1) 2P (BLACK) CONNECTOR



(2) CLAMPS

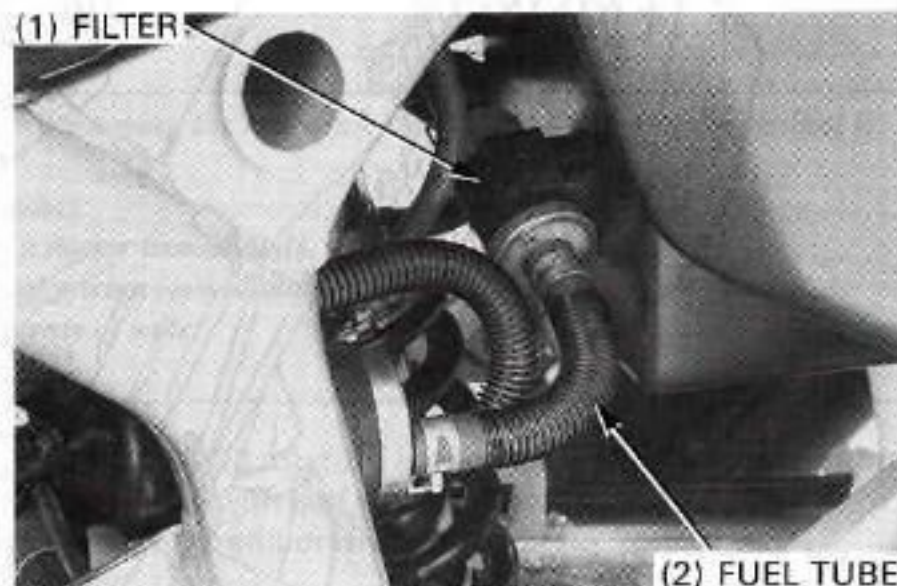
FUEL FILTER

REMOVAL

Remove the fuel tank (page 2-20).

Disconnect the fuel tube (pump-to-filter).
Remove the fuel filter and rubber cushion from the filter bracket.

(1) FILTER

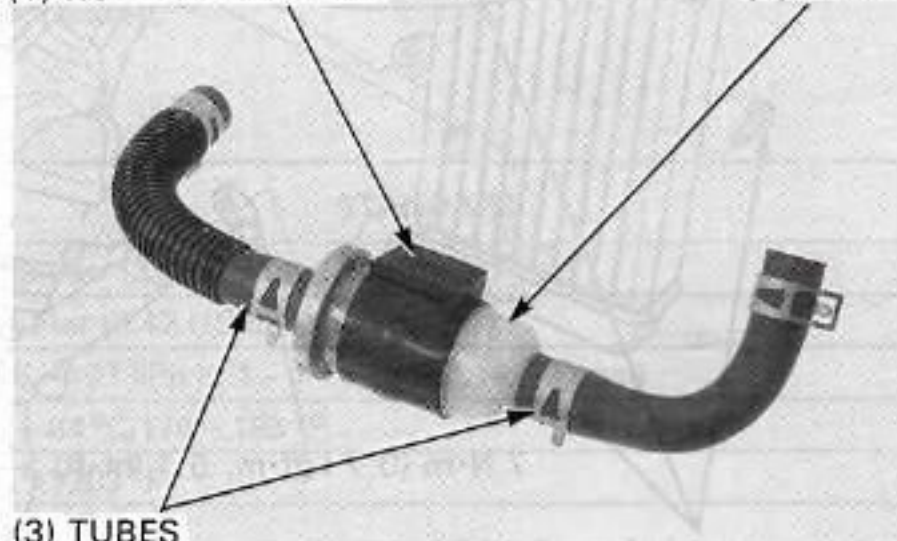


(2) FUEL TUBE

Disconnect the fuel tubes from the fuel filter.
Remove the rubber cushion from the fuel filter.

(1) RUBBER CUSHION

(2) FILTER



(3) TUBES

Check the fuel filter for damage or contamination.
Replace the fuel filter if necessary.

INSTALLATION

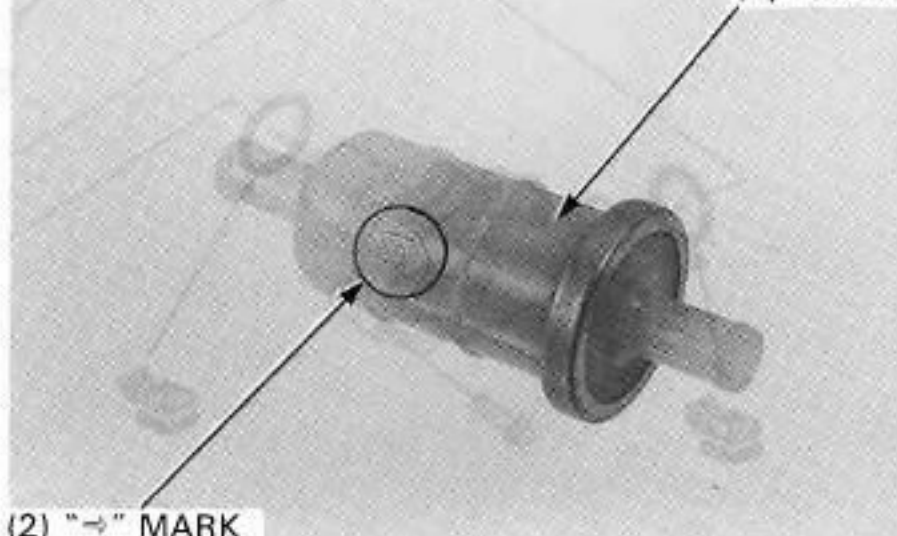
Installation is in the reverse order of removal.

NOTE

- At fuel filter and rubber cushion installation, install the filter with the "→" mark facing the fuel pump.

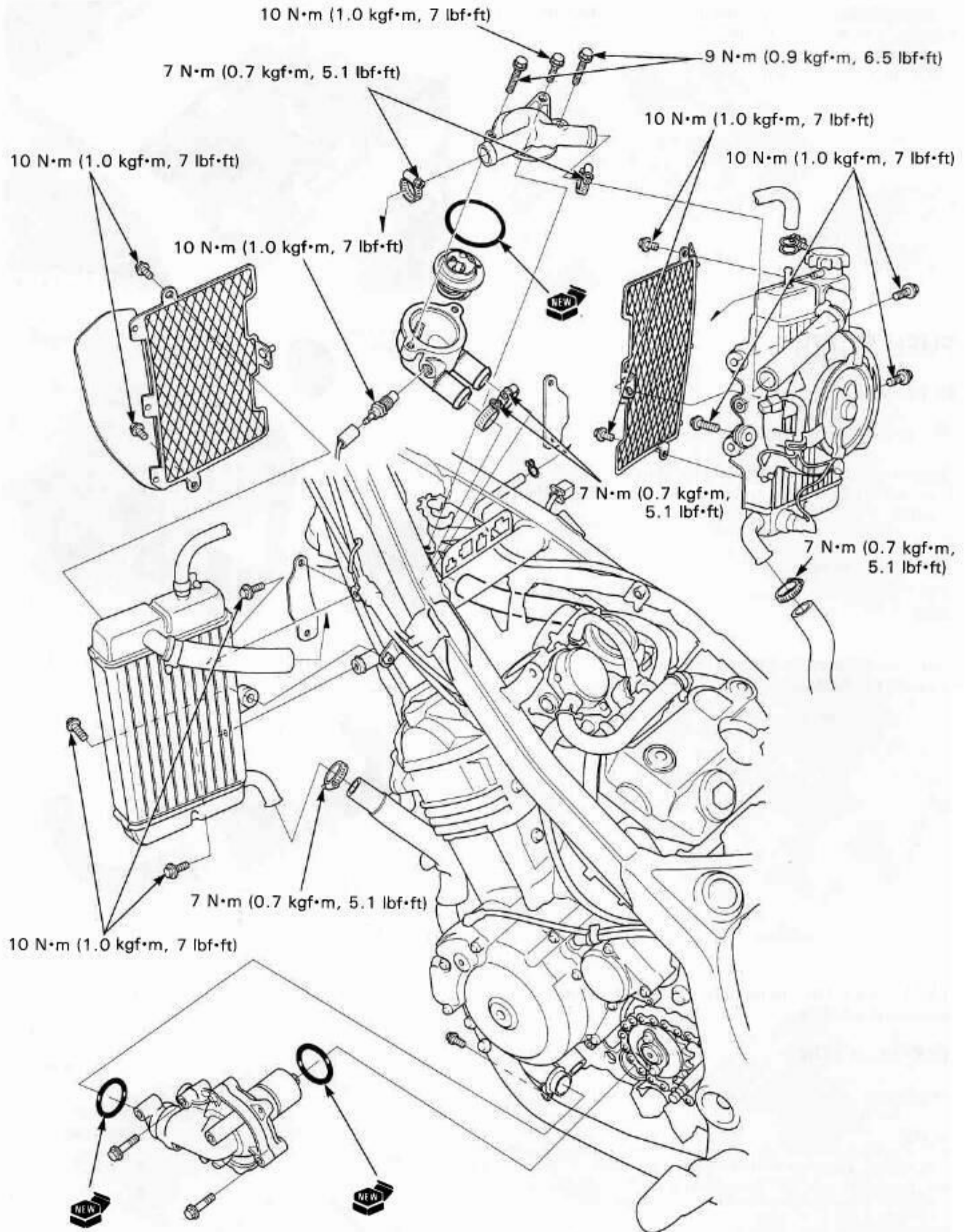
Install the fuel tank (page 2-23).

(1) FILTER



(2) "→" MARK

COOLING SYSTEM



6. COOLING SYSTEM

| | | | |
|---------------------|-----|-----------------------|------|
| SERVICE INFORMATION | 6-1 | RADIATOR/COOLING FAN | 6-11 |
| TROUBLESHOOTING | 6-2 | WATER PUMP | 6-21 |
| SYSTEM FLOW PATTERN | 6-3 | RADIATOR RESERVE TANK | 6-24 |
| SYSTEM TESTING | 6-4 | COOLING SYSTEM | |
| COOLANT | 6-5 | CONNECTING BAND | 6-25 |
| THERMOSTAT | 6-7 | | |

SERVICE INFORMATION

GENERAL

⚠ WARNING

- Wait until the engine is cool before slowly removing the radiator cap. Removing the cap while the engine is hot and the coolant is under pressure may cause serious scalding.
- Radiator coolant is toxic. Keep it away from eyes, mouth, skin and clothes.
 - If any coolant gets in your eyes, rinse them with water and consult a doctor immediately.
 - If any coolant is swallowed, induce vomiting, gargle and consult a physician immediately.
 - If any coolant gets on your skin or clothes, rinse thoroughly with plenty of water.
- **KEEP OUT OF REACH OF CHILDREN.**

- 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 or an antifreeze with self sealing properties.
- Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services 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 19 for fan motor switch and thermo sensor inspection.

SPECIFICATIONS

| ITEM | | STANDARD |
|--------------------------------|---------------------|---|
| Cooling capacity | Radiator and engine | 2.03 liter (2.13 US qt, 1.78 Imp qt) |
| | Reserve tank | 0.4 liter (0.42 US qt, 0.35 Imp qt) |
| Radiator cap relief pressure | | 108 – 137 kPa (1.1 – 1.4 kgf/cm ² , 16 – 21 psi) |
| Thermostat begin to open | | 80 – 84 °C/176 – 183 °F |
| Thermostat fully open | | 95 °C/203 °F |
| Thermostat valve lift | | 8 mm (0.3 in) |
| Standard coolant concentration | | 50% mixture with soft water |

COOLING SYSTEM

TORQUE VALUES

| | | |
|-------------------------------|-------------------------------|------------------------------|
| Radiator mounting bolt | 10 N•m (1.0 kgf•m, 7 lbf•ft) | |
| Radiator grill mounting bolt | 10 N•m (1.0 kgf•m, 7 lbf•ft) | |
| Thermostat bracket bolt | 10 N•m (1.0 kgf•m, 7 lbf•ft) | |
| Thermostat housing cover bolt | 9 N•m (0.9 kgf•m, 6.5 lbf•ft) | |
| Thermo sensor | 10 N•m (1.0 kgf•m, 7 lbf•ft) | Apply sealant to the threads |
| Water hose band screw | 7 N•m (0.7 kgf•m, 5.1 lbf•ft) | |
| Fan motor switch | 18 N•m (1.8 kgf•m, 13 lbf•ft) | Apply sealant to the threads |

TOOLS

| | |
|---------------|-----------------------------------|
| Pressure pump | Equivalent commercially available |
|---------------|-----------------------------------|

TROUBLESHOOTING

Engine temperature too high

- Faulty temperature gauge or thermo sensor (Section 19)
- Faulty radiator cap
- Insufficient coolant
- Passages blocked in radiator, hoses or water jacket
- Air in system
- Faulty water pump
- Thermostat stuck closed
- Faulty cooling fan motor
- Faulty fan motor switch

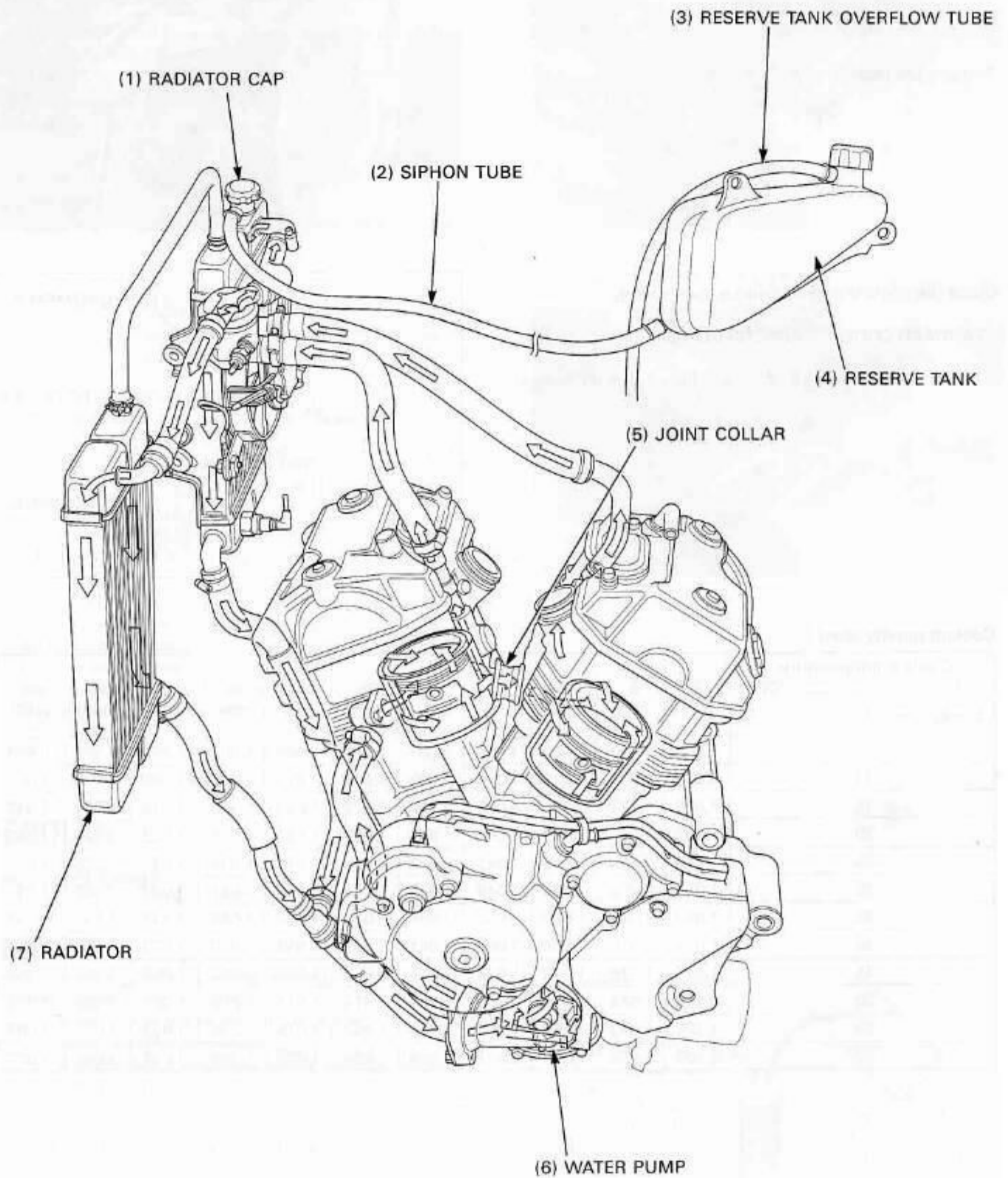
Engine temperature too low

- Faulty temperature gauge or thermo sensor (Section 19)
- Thermostat stuck open
- Faulty cooling fan motor switch

Coolant leaks

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

SYSTEM FLOW PATTERN



COOLING SYSTEM

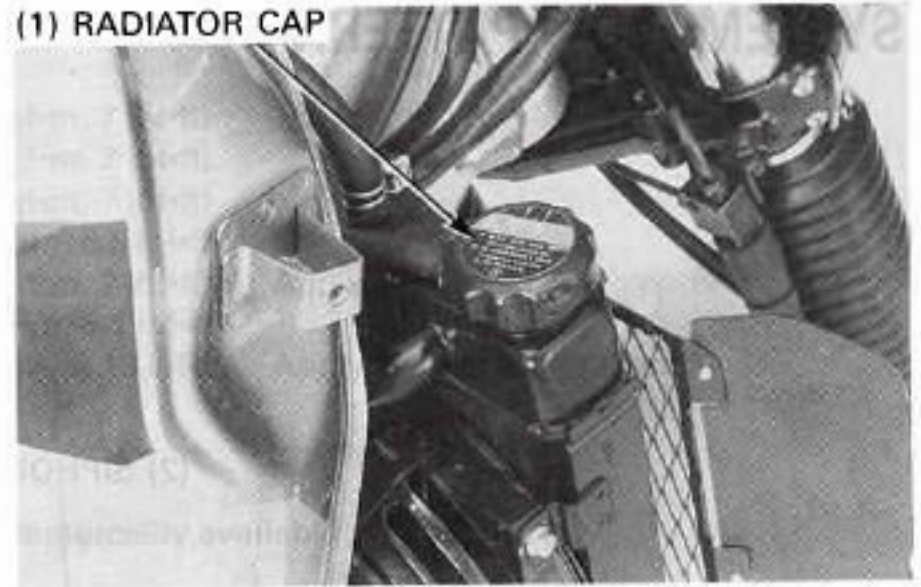
SYSTEM TESTING

COOLANT (HYDROMETER TEST)

Remove the side cowl (page 2-2).

Remove the radiator cap.

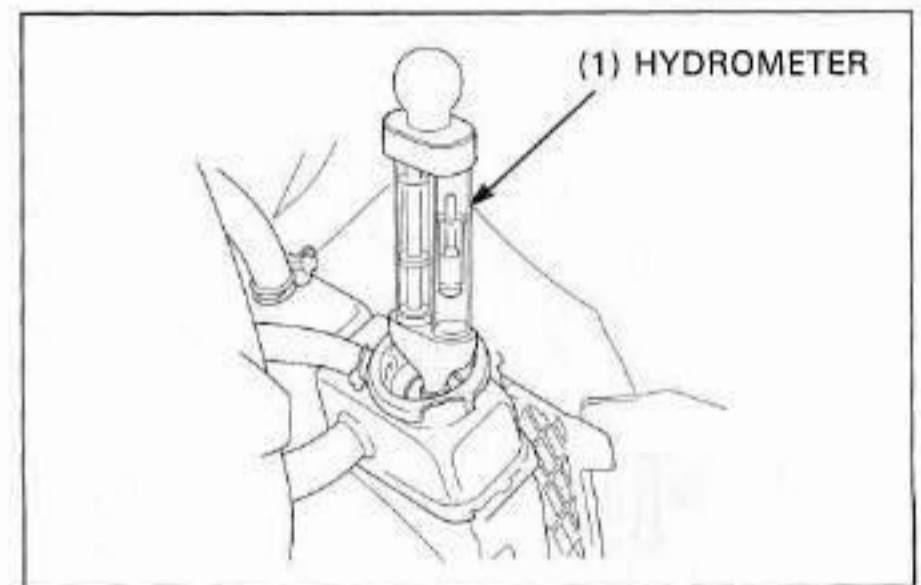
(1) RADIATOR CAP



Check the coolant gravity using a hydrometer.

STANDARD COOLANT CONCENTRATION: 50 %

Look for contamination and replace the coolant if necessary.



Coolant gravity chart

| Coolant temperature °C(°F) | Coolant ratio % | | | | | | | | | | |
|-------------------------------|-----------------|-----------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|
| | 0 (32) | 5 (41) | 10 (50) | 15 (59) | 20 (68) | 25 (77) | 30 (86) | 35 (95) | 40 (104) | 45 (113) | 50 (122) |
| 5 | 1.009 | 1.009 | 1.008 | 1.008 | 1.007 | 1.006 | 1.005 | 1.003 | 1.001 | 0.999 | 0.997 |
| 10 | 1.018 | 1.017 | 1.017 | 1.016 | 1.015 | 1.014 | 1.013 | 1.011 | 1.009 | 1.007 | 1.005 |
| 15 | 1.028 | 1.027 | 1.026 | 1.025 | 1.024 | 1.022 | 1.020 | 1.018 | 1.016 | 1.014 | 1.012 |
| 20 | 1.036 | 1.035 | 1.034 | 1.033 | 1.031 | 1.029 | 1.027 | 1.025 | 1.023 | 1.021 | 1.019 |
| 25 | 1.045 | 1.044 | 1.043 | 1.042 | 1.040 | 1.038 | 1.036 | 1.034 | 1.031 | 1.028 | 1.025 |
| 30 | 1.053 | 1.052 | 1.051 | 1.049 | 1.047 | 1.045 | 1.043 | 1.041 | 1.038 | 1.035 | 1.032 |
| 35 | 1.063 | 1.062 | 1.060 | 1.058 | 1.056 | 1.054 | 1.052 | 1.049 | 1.046 | 1.043 | 1.040 |
| 40 | 1.072 | 1.070 | 1.068 | 1.066 | 1.064 | 1.062 | 1.059 | 1.056 | 1.053 | 1.050 | 1.047 |
| 45 | 1.080 | 1.078 | 1.076 | 1.074 | 1.072 | 1.069 | 1.066 | 1.063 | 1.060 | 1.057 | 1.054 |
| 50 | 1.086 | 1.084 | 1.082 | 1.080 | 1.077 | 1.074 | 1.071 | 1.068 | 1.065 | 1.062 | 1.059 |
| 55 | 1.095 | 1.093 | 1.091 | 1.088 | 1.085 | 1.082 | 1.079 | 1.076 | 1.073 | 1.070 | 1.067 |
| 60 | 1.100 | 1.098 | 1.095 | 1.092 | 1.089 | 1.086 | 1.083 | 1.080 | 1.077 | 1.074 | 1.071 |

RADIATOR CAP/SYSTEM PRESSURE INSPECTION

⚠ WARNING

- *The engine must be cool before removing the radiator cap or sever scalding may result.*

Remove the side cowl (page 2-2).
Remove the radiator cap.

NOTE

- Before installing the cap in the tester, wet the sealing surface.

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 6 seconds.

RADIATOR CAP RELIEF PRESSURE:

108 - 137 kPa (1.1 - 1.4 kgf/cm², 16 - 21 psi)

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

CAUTION

- *Excessive pressure can damage the cooling system components. Do not exceed 137 kPa (1.4 kgf/cm², 19.9 psi).*

Check the following components if the system will not hold specified pressure for at least 6 seconds.

- All hose and connections
- Water pump installation
- Water pump seal (for leakage)
- Deformed radiator filler neck

COOLANT

REPLACEMENT

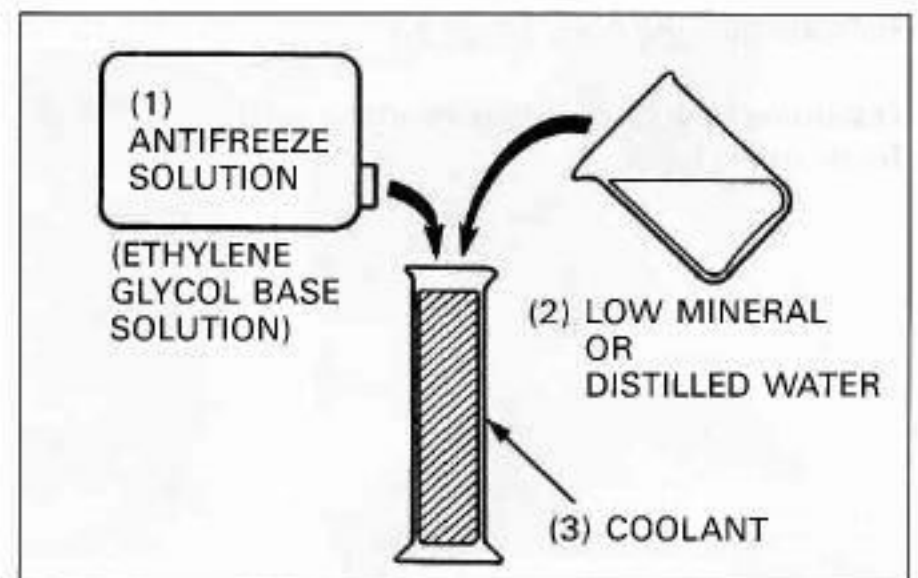
⚠ WARNING

- *Radiator coolant is toxic. Keep it away from eyes, mouth, skin and clothes.*
 - *If any coolant gets in your eyes, rinse them with water and consult a doctor immediately.*
 - *If any coolant is swallowed, induce vomiting, gargle and consult a physician immediately.*
 - *If any coolant gets on your skin or clothes, rinse thoroughly with plenty of water.*
- **KEEP OUT OF REACH OF CHILDREN**

(1) COOLING SYSTEM TESTER
COMMERCIALY AVAILABLE



(1) COOLING SYSTEM TESTER
COMMERCIALY AVAILABLE



COOLING SYSTEM

NOTE

- The effectiveness of coolant decreases with the accumulation of rust or if there is a change in the mixing proportion during usage. Therefore, for best performance change the coolant regularly as specified in the maintenance schedule.
- Mix only distilled, low mineral water with the antifreeze.

RECOMMENDED MIXTURE:

50 – 50 (Distilled water and anti freeze)

REPLACEMENT/AIR BLEEDING

⚠ WARNING

- *The engine must be cool before removing the radiator cap, or severe scalding may result.*

NOTE

- When filling the system or reserve tank with a coolant (checking the coolant level), place the motorcycle in a vertical position on a flat, level surface.

Remove the side cowl (page 2-2).

Remove the radiator cap.

Remove the skid plate (page 2-7).

Remove the drain bolt and sealing washer.
Drain the coolant.

Reinstall and tighten the drain bolt securely with a new sealing washer.

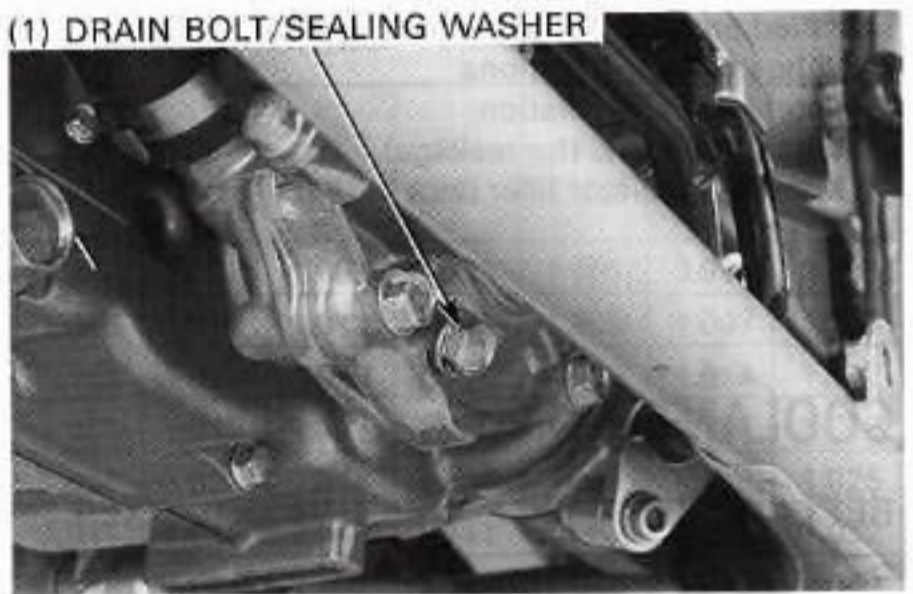
Remove the side cover (page 2-7).

Disconnect the reserve tank overflow tube.
Remove the bolts.

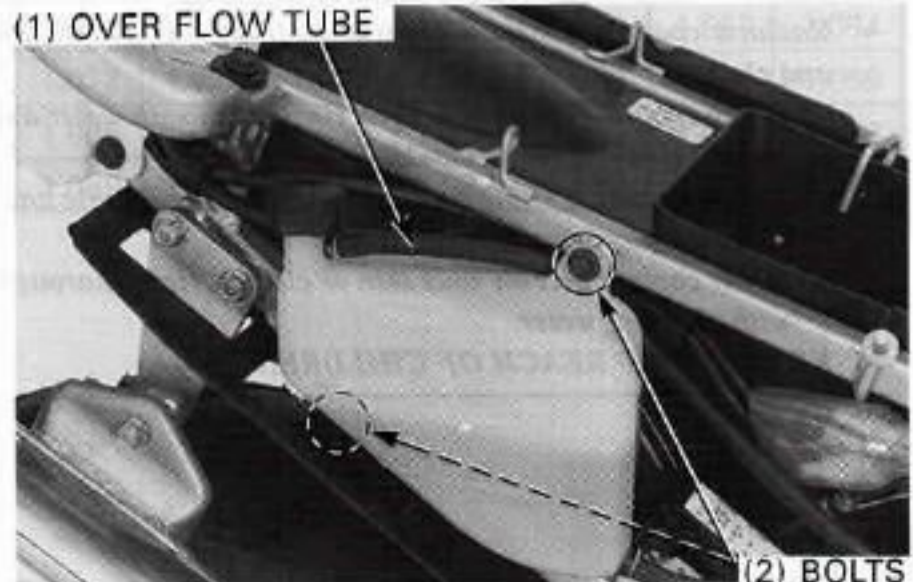
(1) RADIATOR CAP



(1) DRAIN BOLT/SEALING WASHER



(1) OVER FLOW TUBE



(2) BOLTS

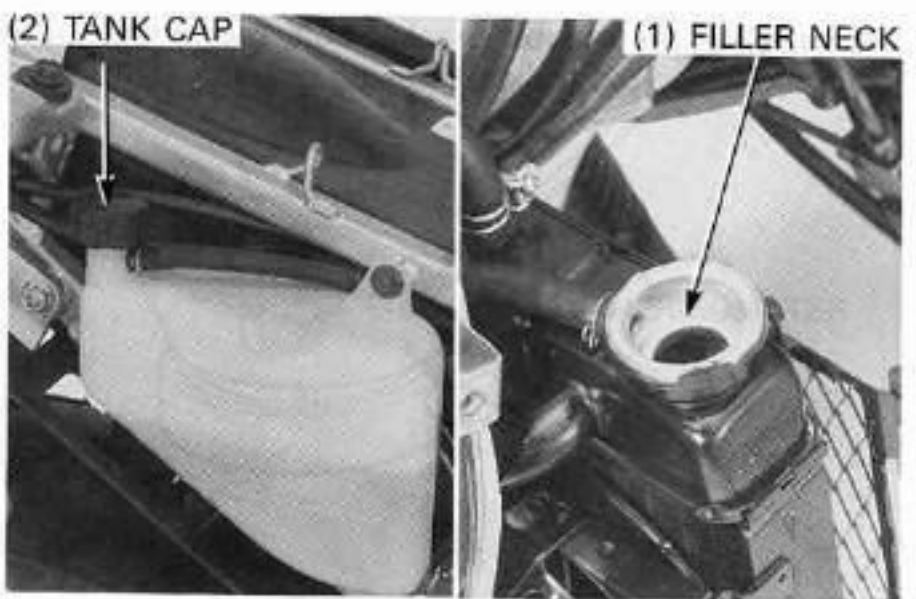
Remove the reserve tank cap from the reserve tank and drain the reserve coolant.

Empty the coolant and rinse the inside of the reserve tank with water.



Reconnect the reserve tank overflow tube.
 Install the reserve tank.
 Install and tighten the bolts securely.
 Fill the system with the recommended coolant through the filler opening up to filler neck.
 Remove the reserve tank cap and fill the reserve tank to the upper level line.
 Bleed air from the system as follows:

1. Shift the transmission into neutral.
 Start the engine and let it idle for 2 – 3 minutes.
2. Snap the throttle 3 – 4 times to bleed air from the system.
3. Stop the engine and add coolant up to the filler neck.
 Reinstall the radiator cap.
4. Check the level of coolant in the reserve tank and fill to the upper level if it is low.

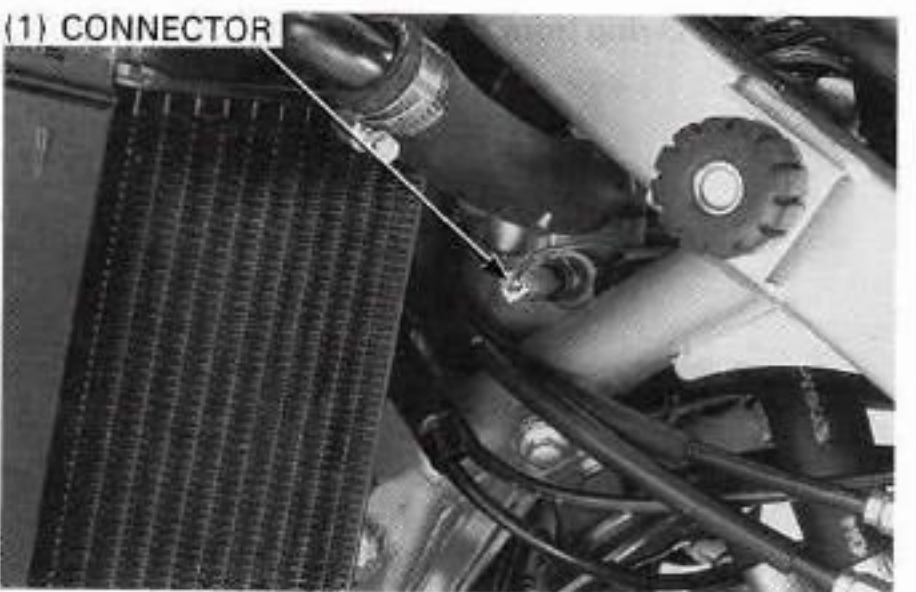


THERMOSTAT

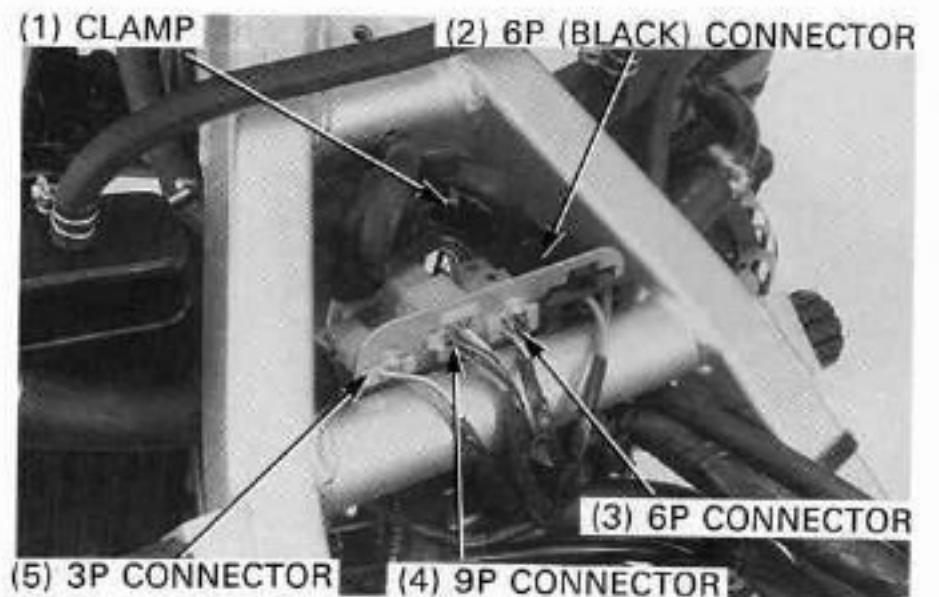
REMOVAL

Remove the fuel tank (page 2-20).
 Remove the air cleaner housing (page 5-4).
 Drain the coolant (page 6-6).

Disconnect the thermo sensor connector.

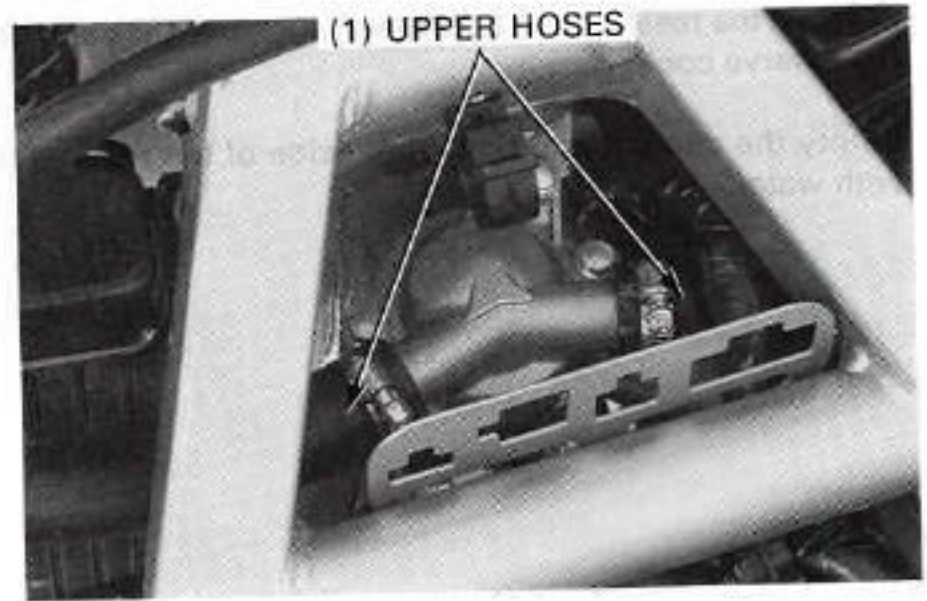


Disconnect the ignition switch 6P (black) connector, right handlebar switch 6P connector, left handlebar switch 9P, 3P connector.
 Remove the wires from the clamp.

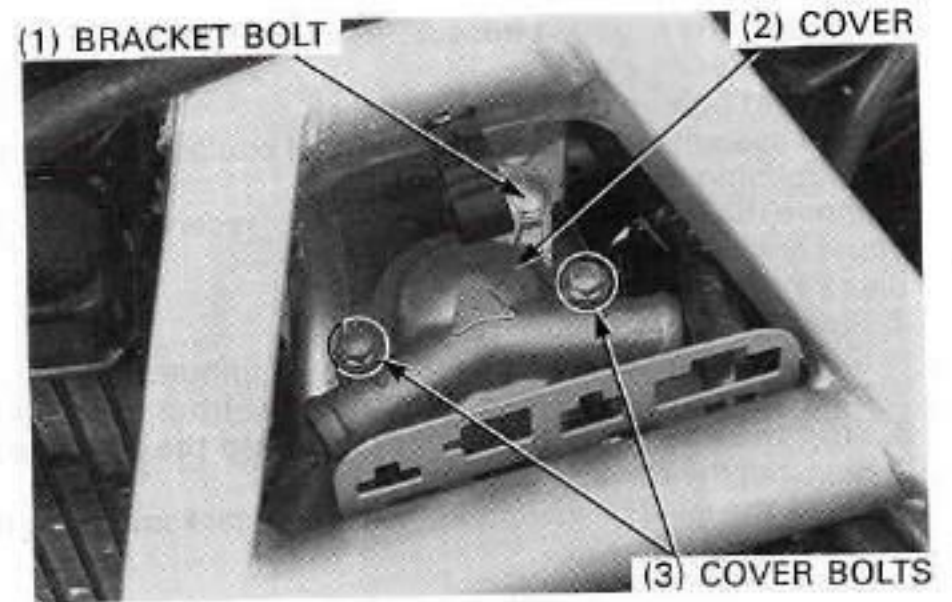


COOLING SYSTEM

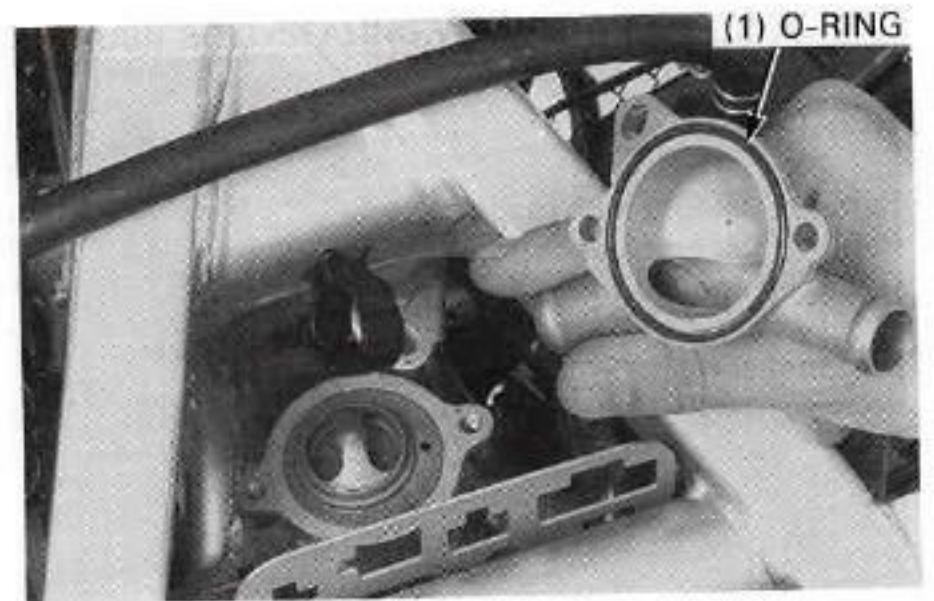
Loosen the radiator hose band screws and disconnect the radiator upper hoses from the thermostat housing cover.



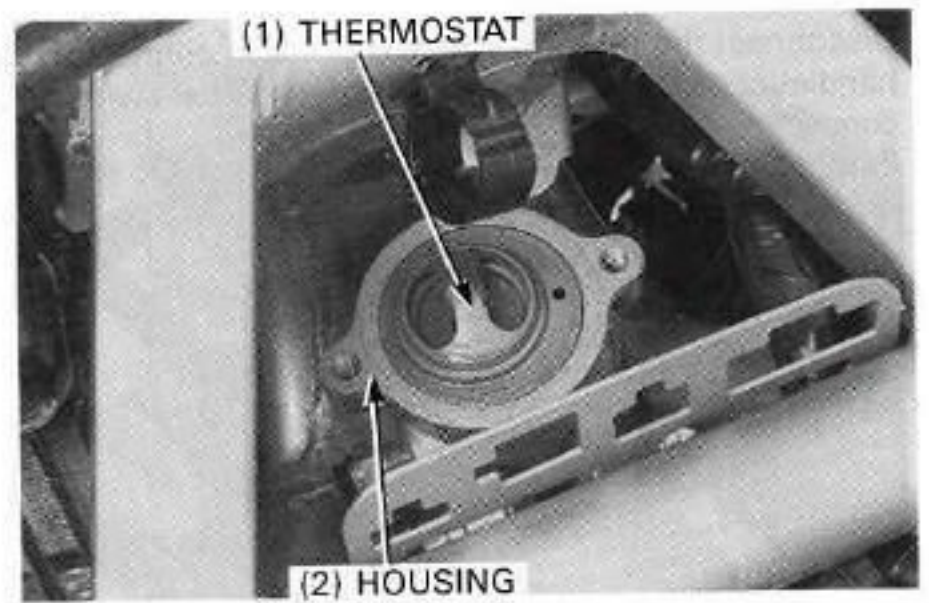
Remove the thermostat bracket bolt, thermostat housing cover bolts and thermostat housing cover.



Remove the O-ring from the thermostat housing cover.



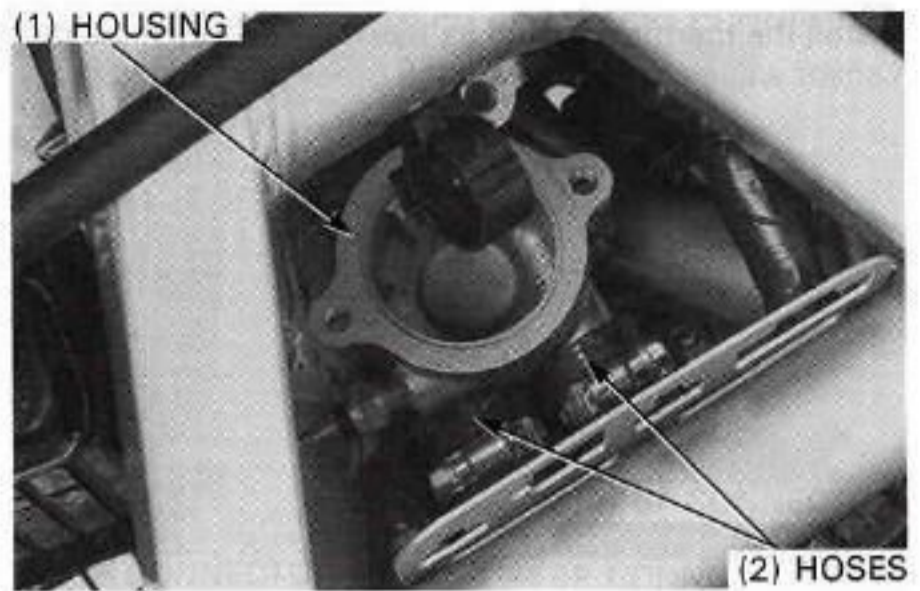
Remove the thermostat from thermostat housing.



Loosen the radiator hose band screws and disconnect the radiator hoses from the thermostat housing.

Remove the thermo sensor from the thermostat housing.

Thermo sensor removal and inspection (page 19-23).
Coolant temperature gauge inspection (page 19-23).



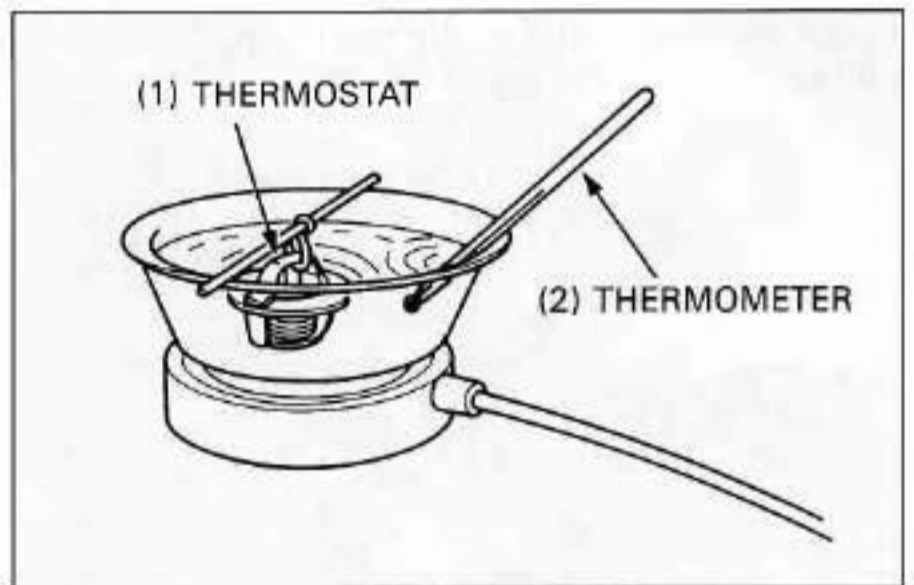
INSPECTION

⚠ WARNING

- Wear insulated gloves and adequate eye protection.
- Keep flammable materials away from the electric heating element.

NOTE

- Do not let the thermostat or thermometer touch the pan, or you will get false readings.
- Replace the thermostat if valve stays open at room temperature, or if it responds at temperatures other than those specified.



Visually inspect the thermostat for damage.

Heat the water with an electric heating element to operating temperature for 5 minutes.

Suspend the thermostat in heated water to check its operation.

THERMOSTAT BEGINS TO OPEN: 80–84 °C (176-183 °F)
VALVE LIFT: 8 mm (0.3 in) minimum at 95 °C (203 °F)

INSTALLATION

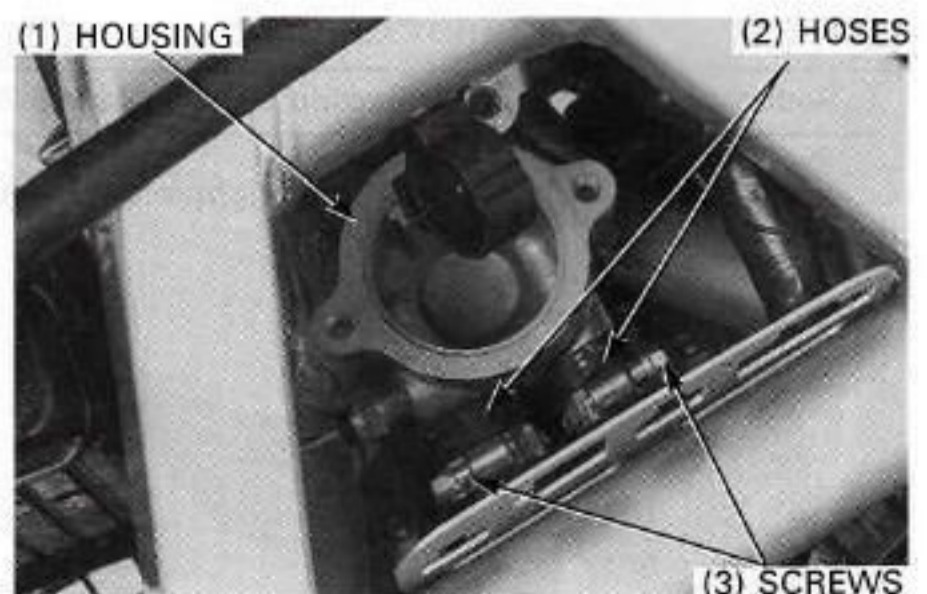
Connect the radiator hoses to the thermostat housing.

NOTE

- Radiator hose band screw direction is shown page 6-25.

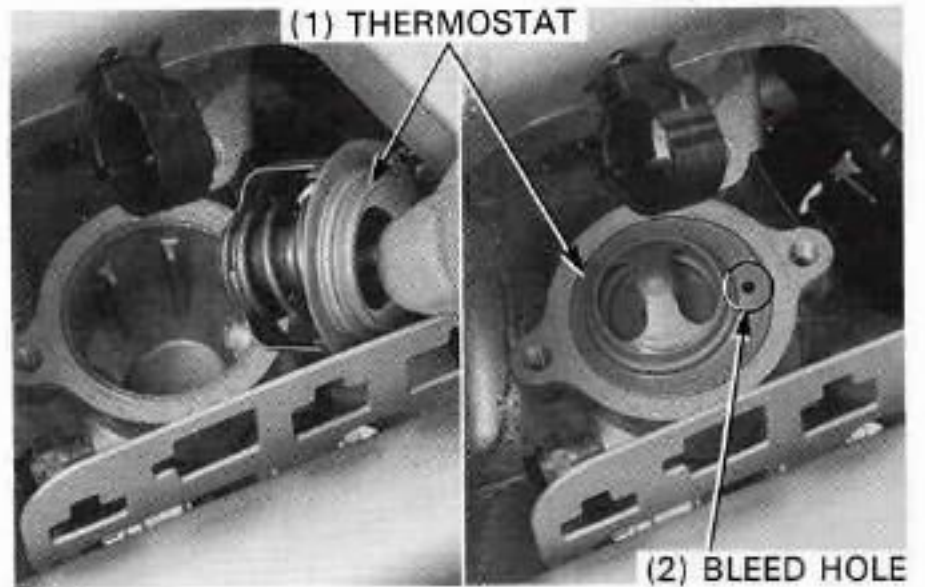
Tighten the radiator hose band screws to the specified torque.

TORQUE: 7 N·m (0.7 kgf·m, 5.1 lbf·ft)

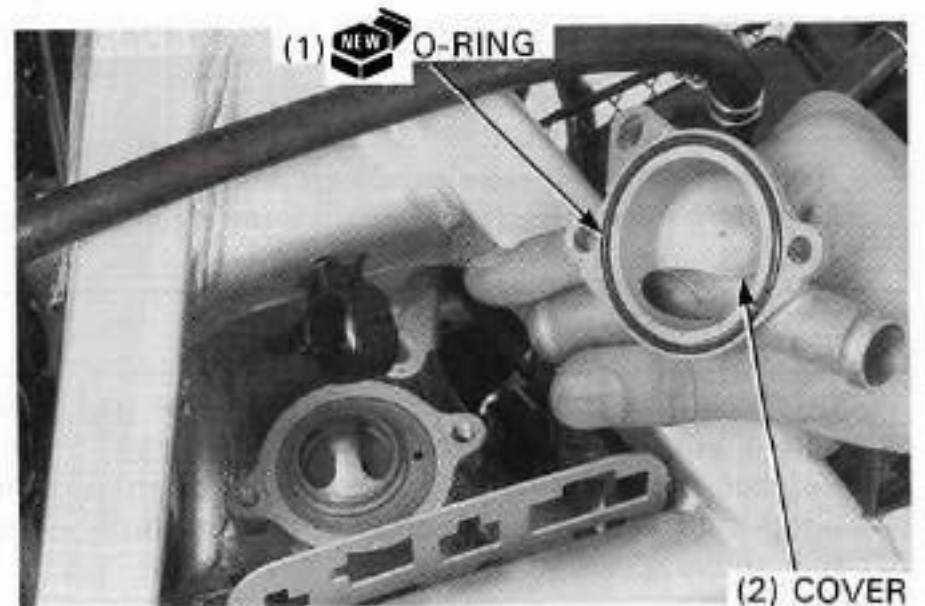


COOLING SYSTEM

Install the thermostat with its bleed hole against the thermo sensor while aligning it with the groove in the housing.



Install the new O-ring to the thermostat housing cover groove.

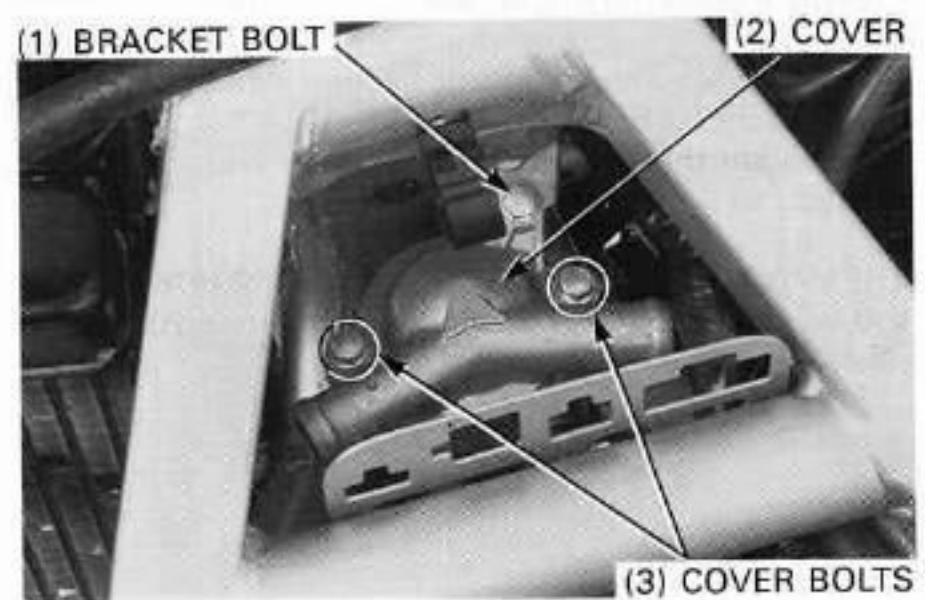


Install the thermostat housing cover.
Install and tighten the thermostat bracket bolt and thermostat housing cover bolts to the specified torque.

TORQUE:

Thermostat bracket bolt: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Thermostat housing cover bolt: 10 N·m (1.0 kgf·m, 7 lbf·ft)

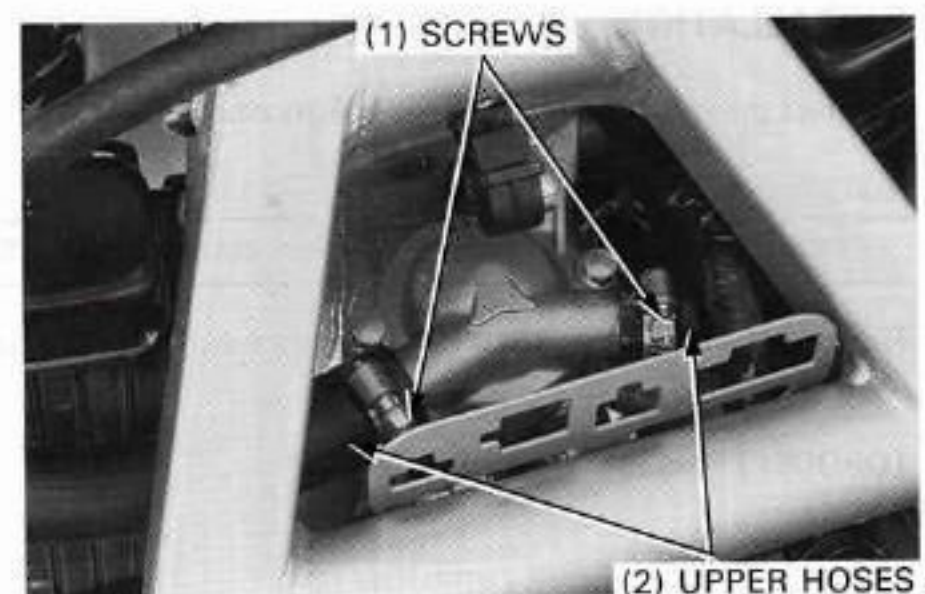


NOTE

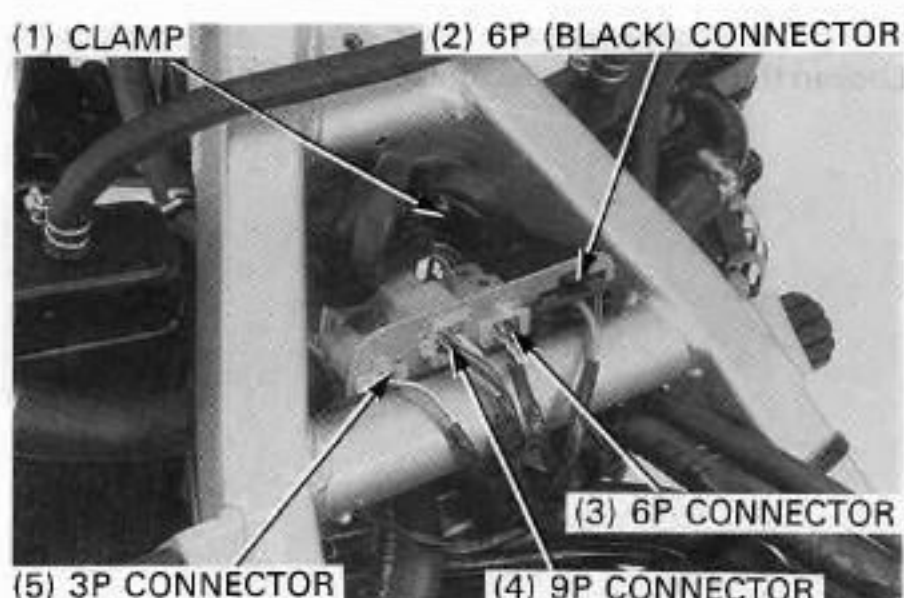
- Radiator hose band screw direction is shown page 6-25.

Connect the radiator upper hoses and tighten the radiator hose band screws.

TORQUE: N·m (0.7 kgf·m, 5.1 lbf·ft)



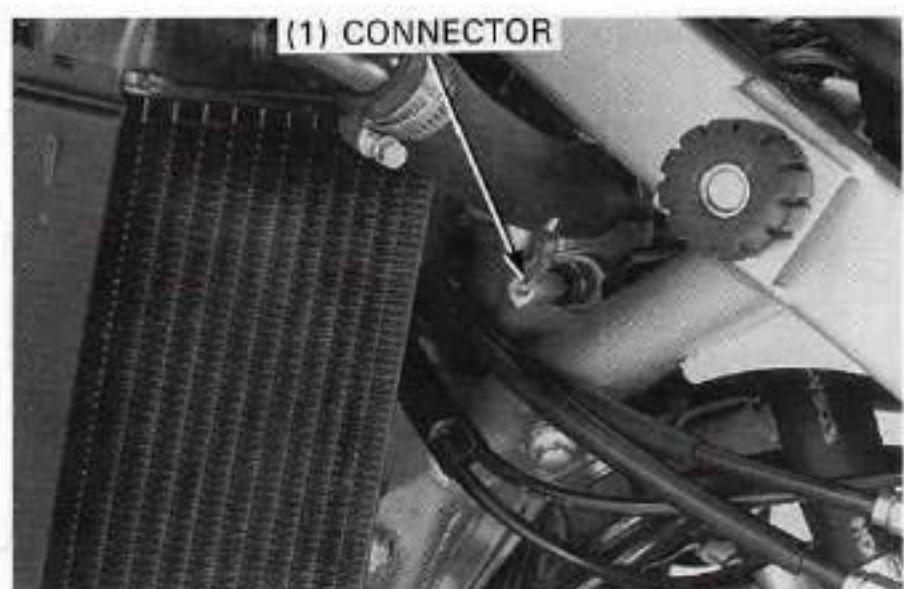
Connect the ignition switch 6P (black) connector, right handlebar switch 6P connector, left handlebar switch 9P, 3P connector.
Install the wires to the clamp.



Connect the thermo sensor connector.

Install the air cleaner housing (page 5-4).
Install the fuel tank (page 2-23).

Fill and bleed the cooling system (page 6-6)



RADIATOR/COOLING FAN

CAUTION

- Be careful not to damage the radiator fins.

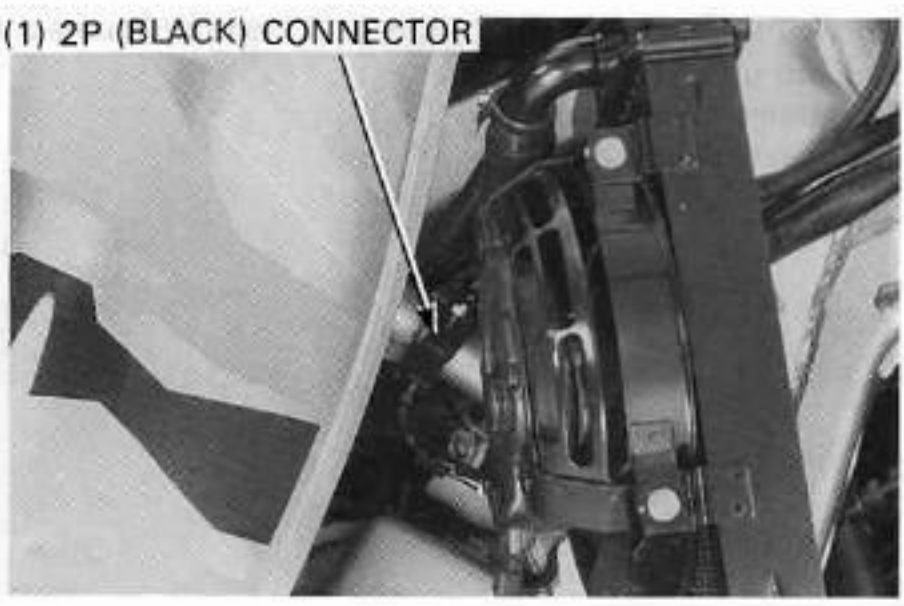
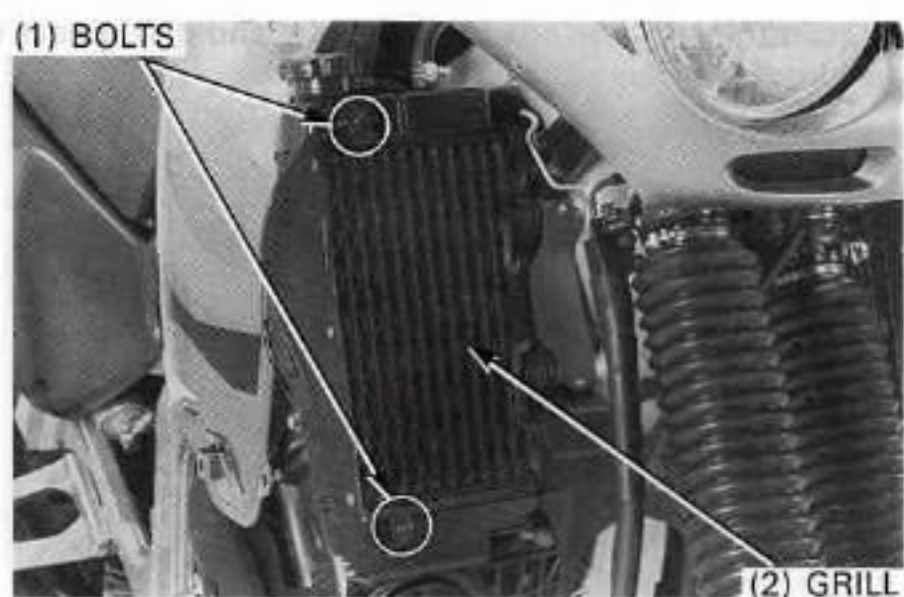
REMOVAL

Remove the side cowl (page 2-2).
Drain the coolant (page 6-6).

RIGHT RADIATOR

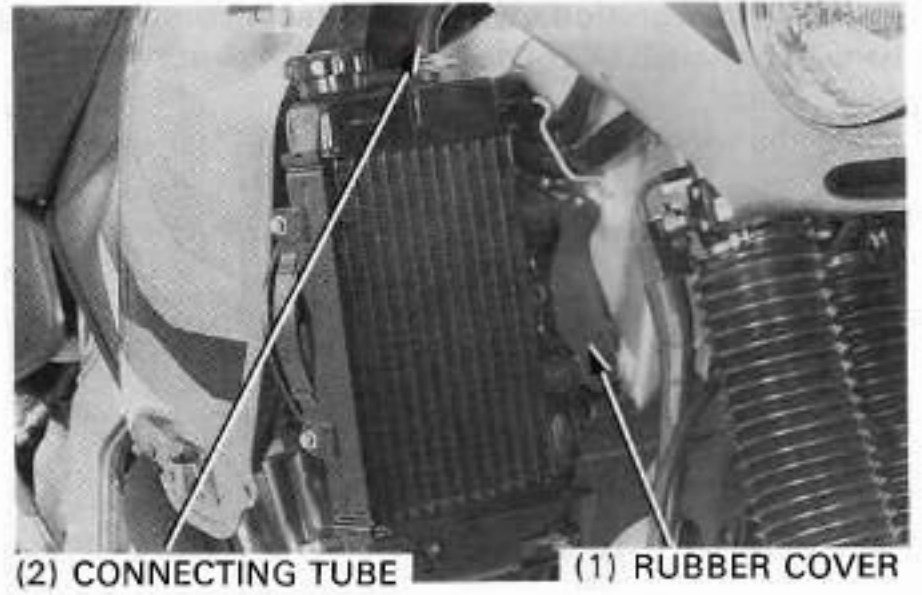
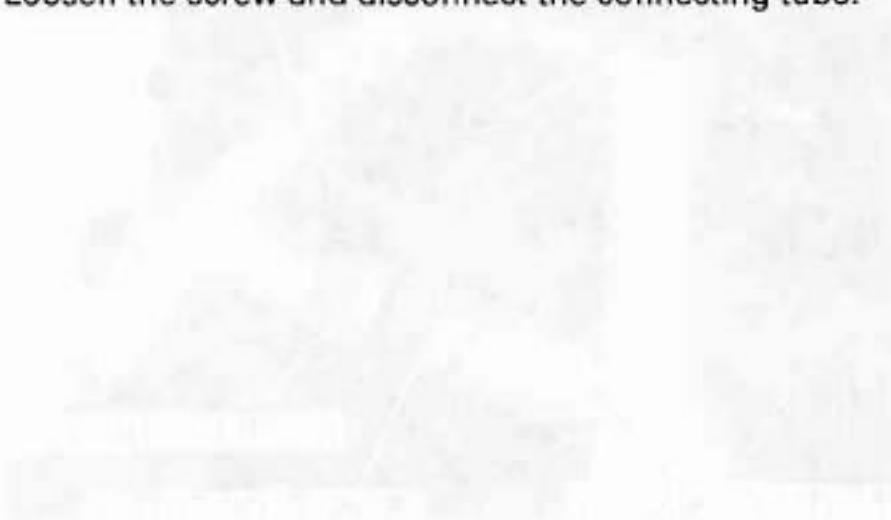
Remove the radiator grill mounting bolts and radiator grill.

Disconnect the cooling fan 2P (black) connector.

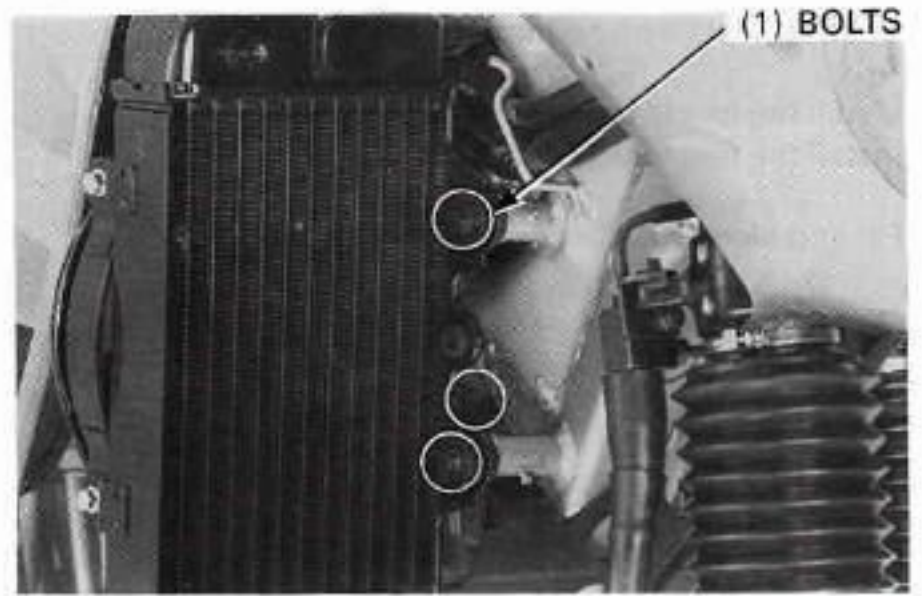
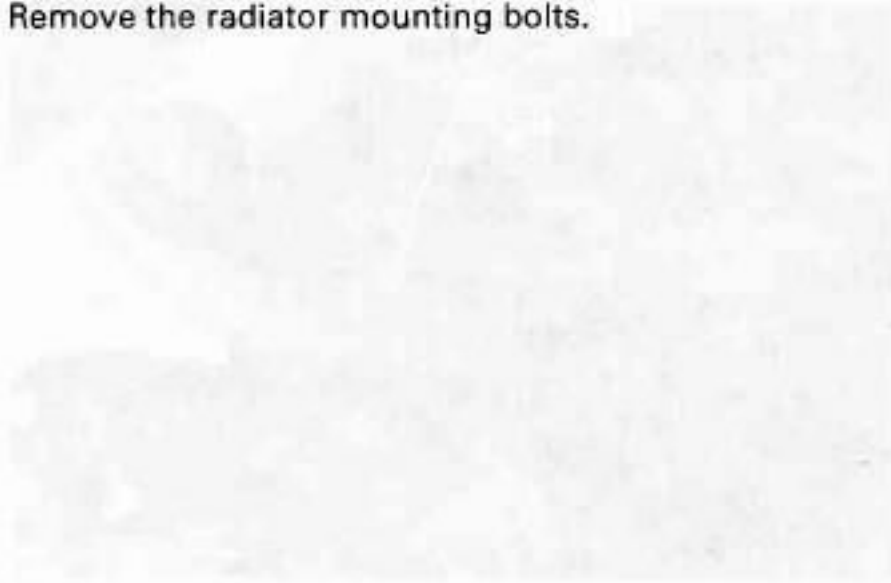


COOLING SYSTEM

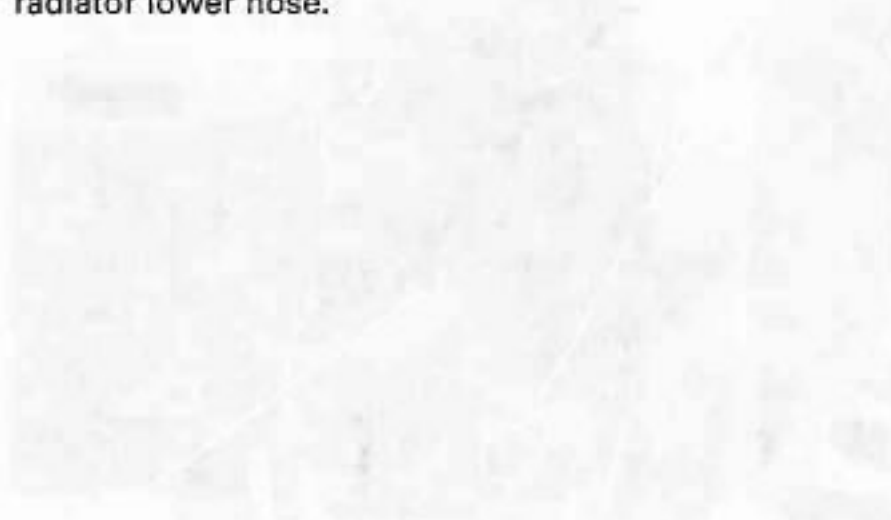
Remove the rubber cover.
Loosen the screw and disconnect the connecting tube.



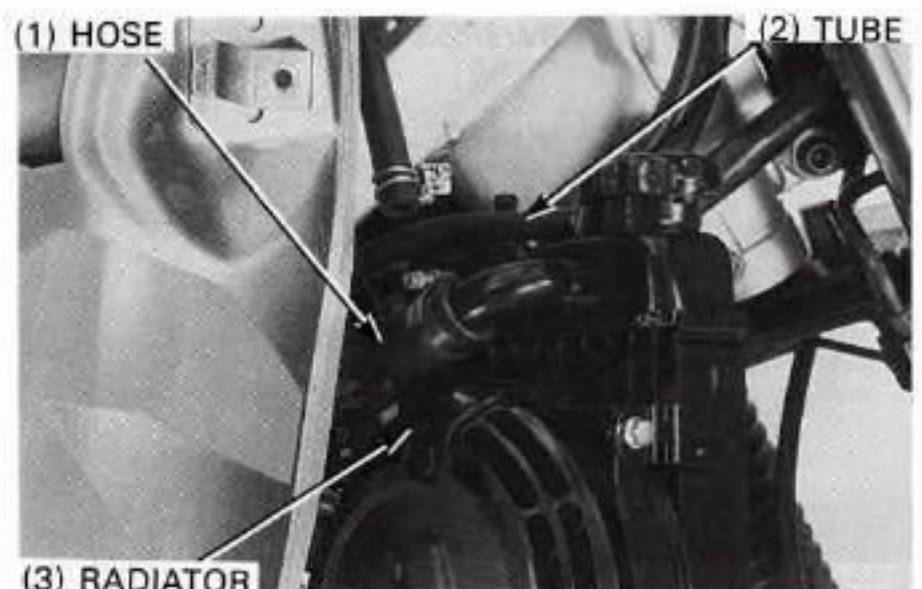
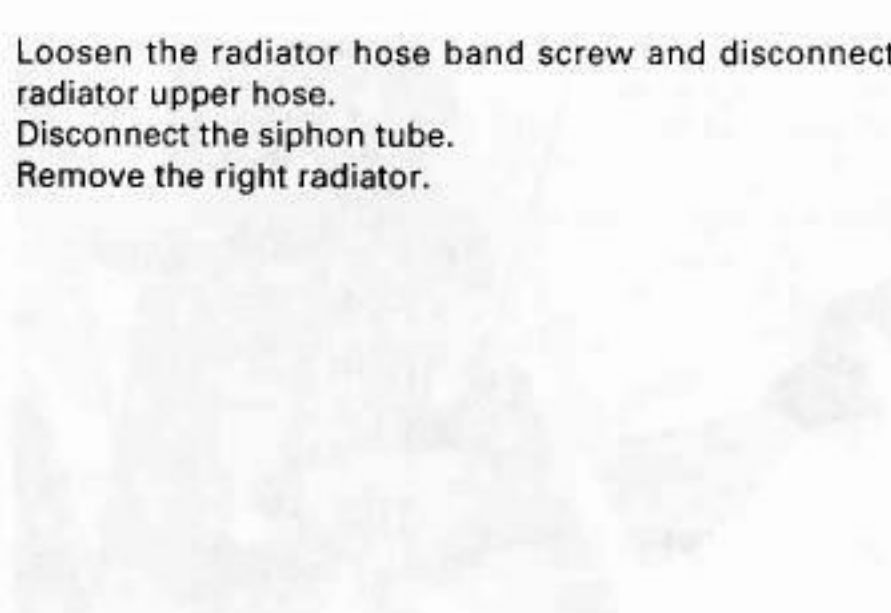
Remove the radiator mounting bolts.



Loosen the radiator hose band screw and disconnect the radiator lower hose.

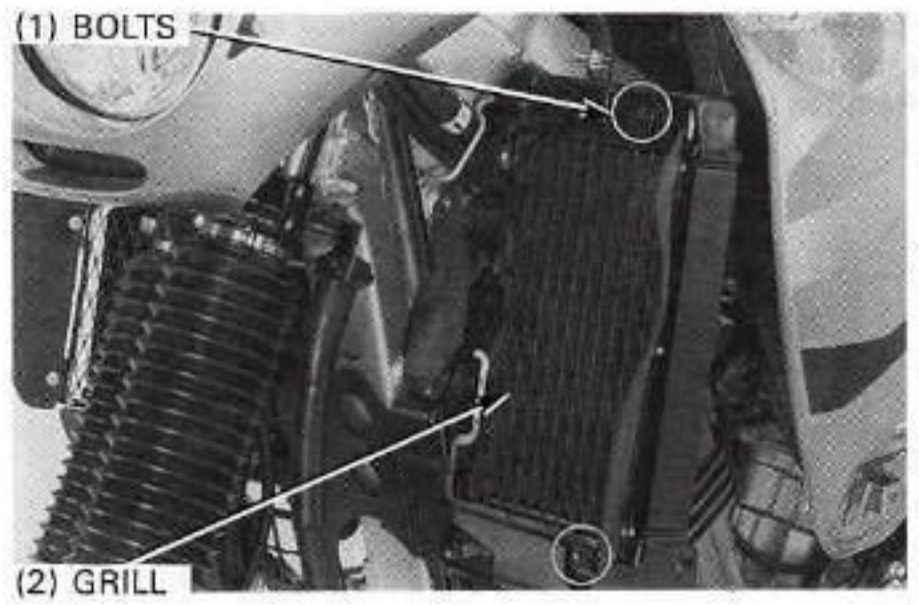


Loosen the radiator hose band screw and disconnect the radiator upper hose.
Disconnect the siphon tube.
Remove the right radiator.

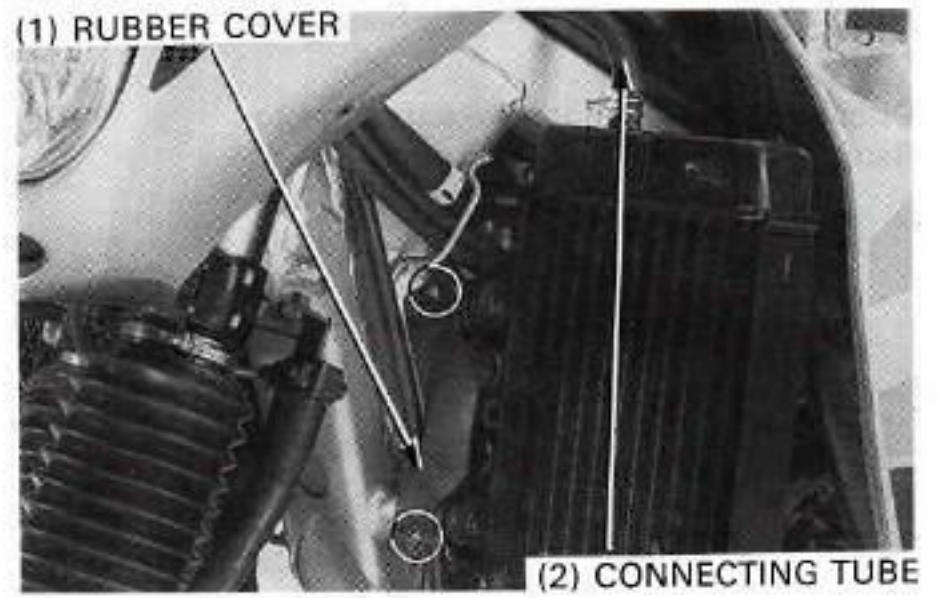


LEFT RADIATOR

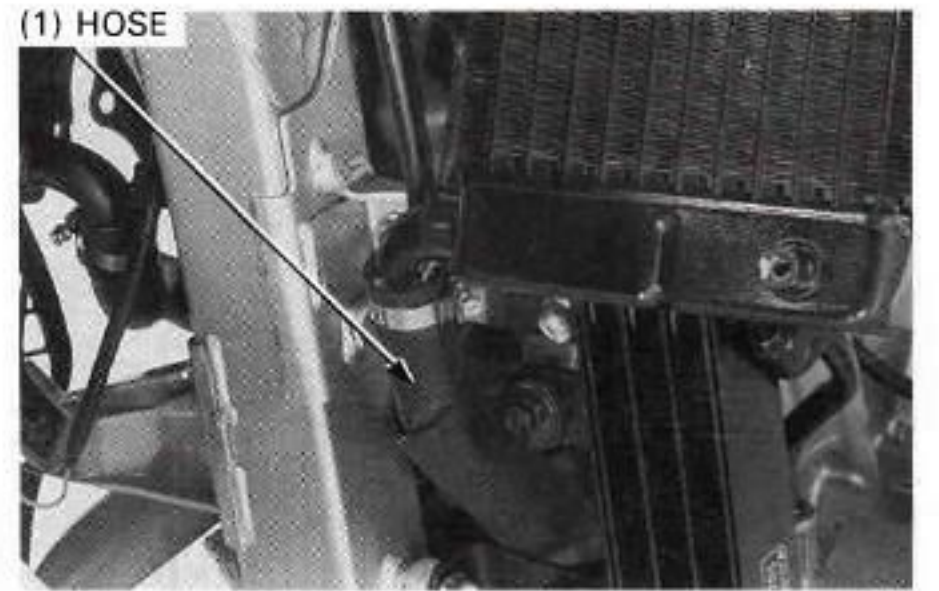
Remove the radiator grill mounting bolts and radiator grill.



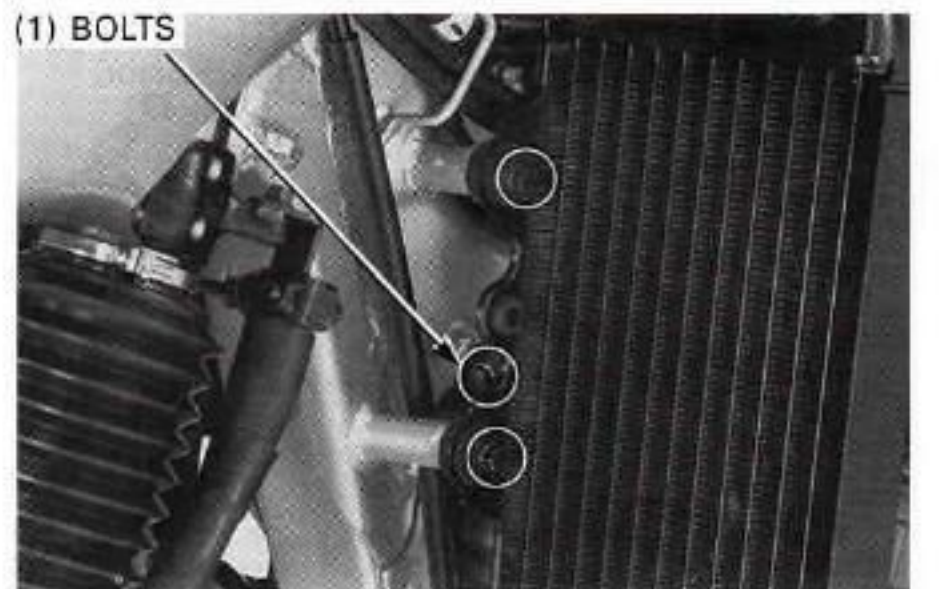
Remove the rubber cover.
Loosen the screw and disconnect the connecting tube.



Loosen the radiator hose band screw and disconnect the radiator lower hose.

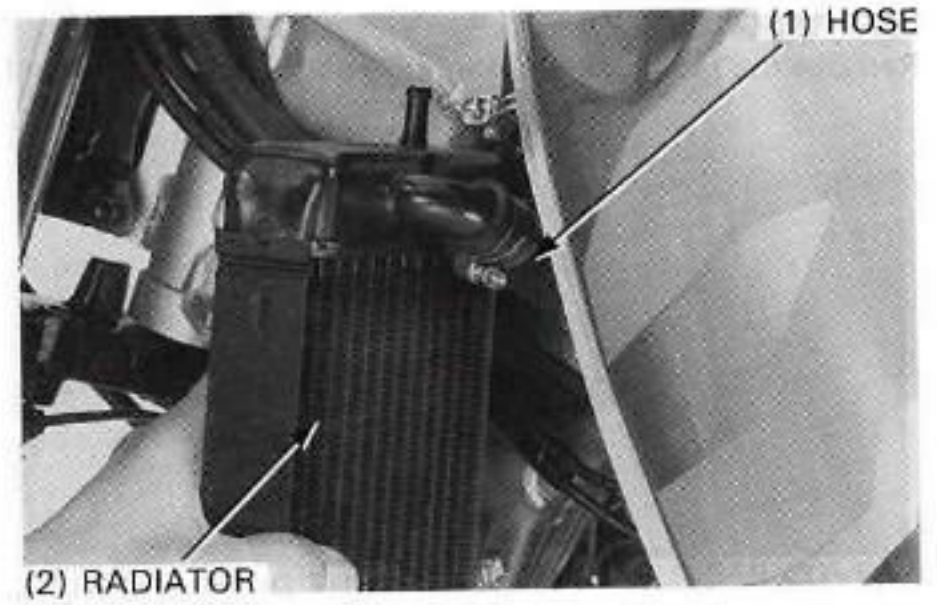


Remove the radiator mounting bolts.



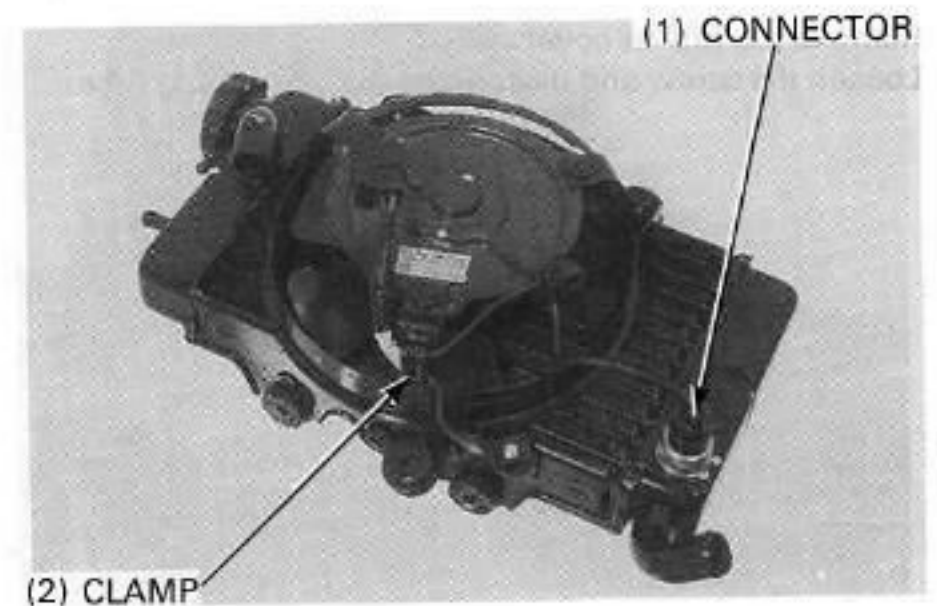
COOLING SYSTEM

Loosen the radiator hose band screw and disconnect the radiator upper hose.
Remove the left radiator.

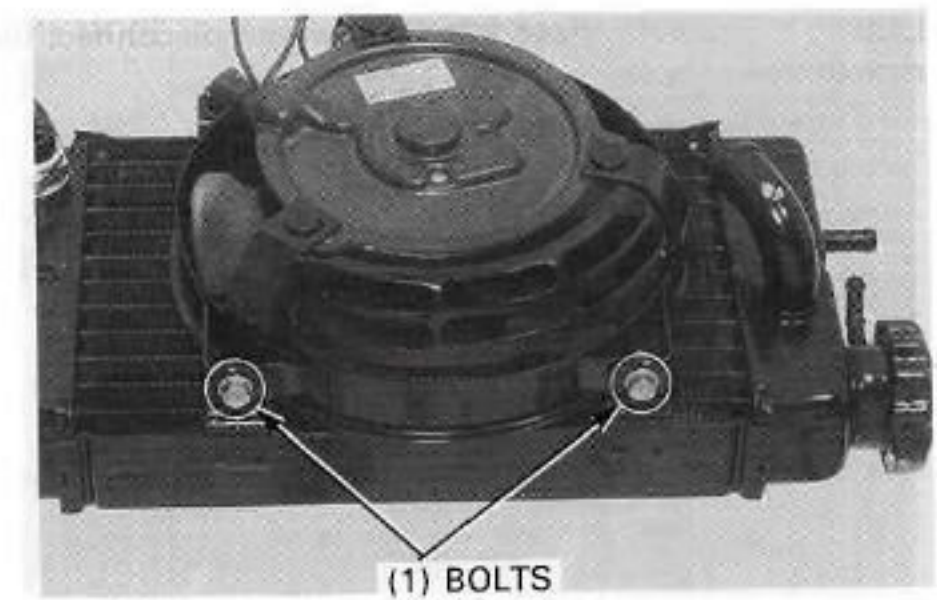


DISASSEMBLY

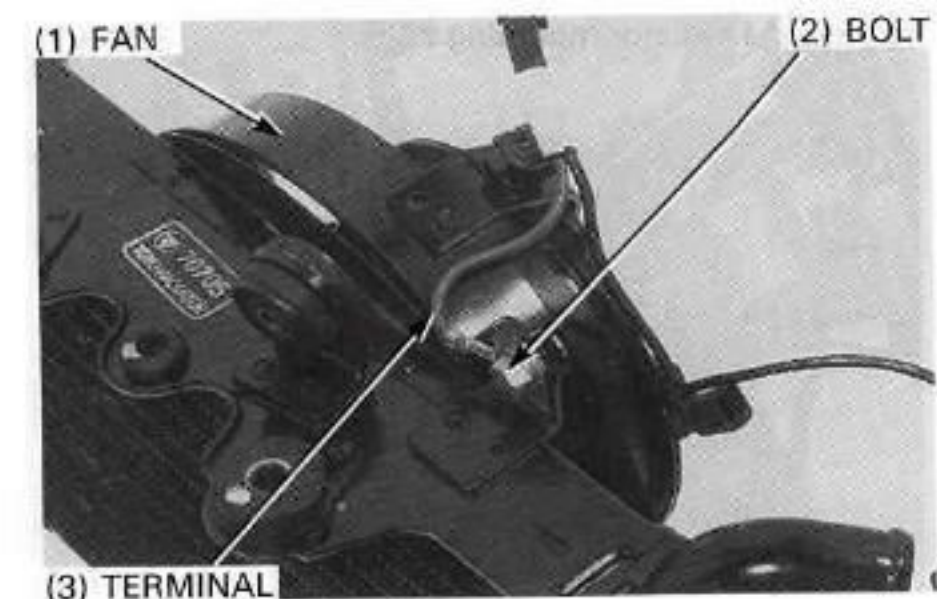
Disconnect the fan motor switch connector.
Remove the wires from the clamp.



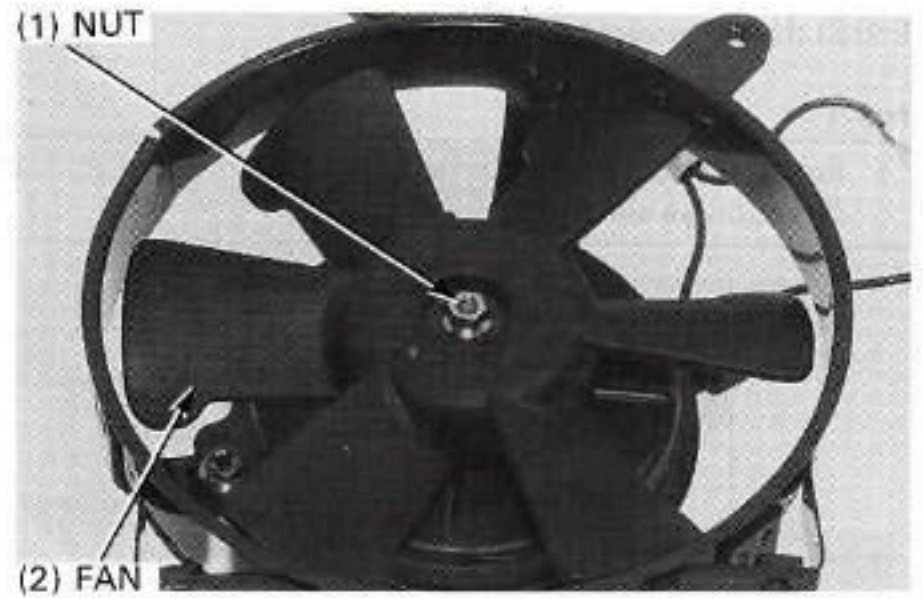
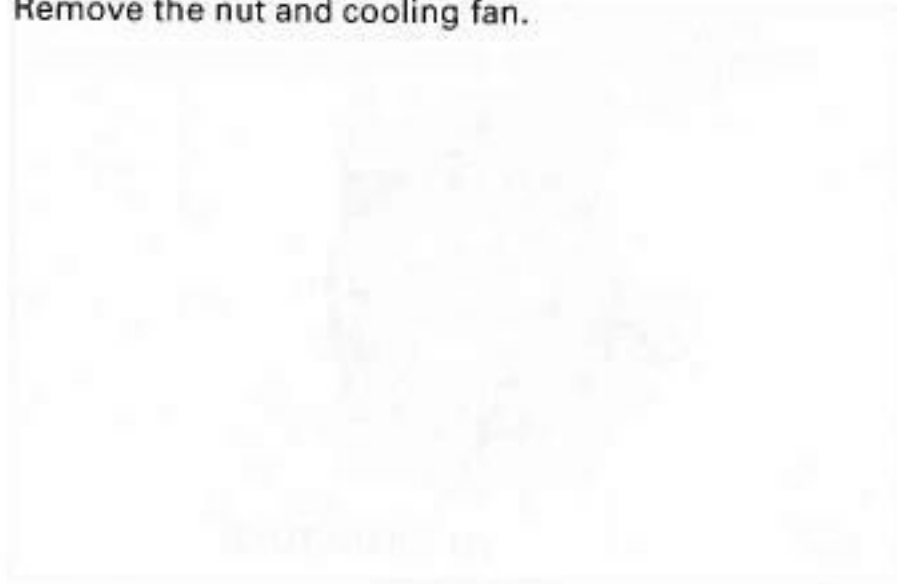
Remove the bolts.



Remove the bolt and ground terminal.
Remove the cooling fan assembly from the radiator.

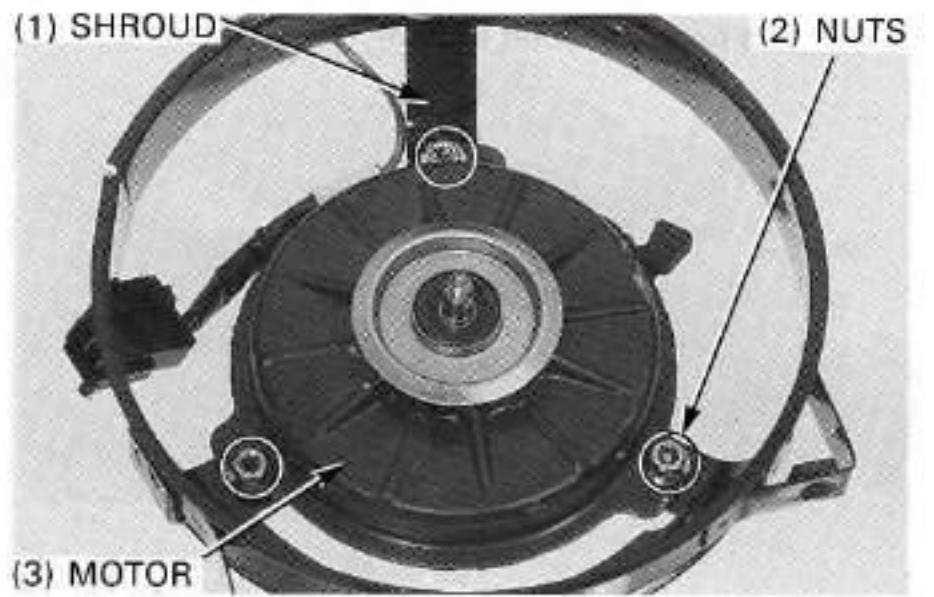


Remove the nut and cooling fan.

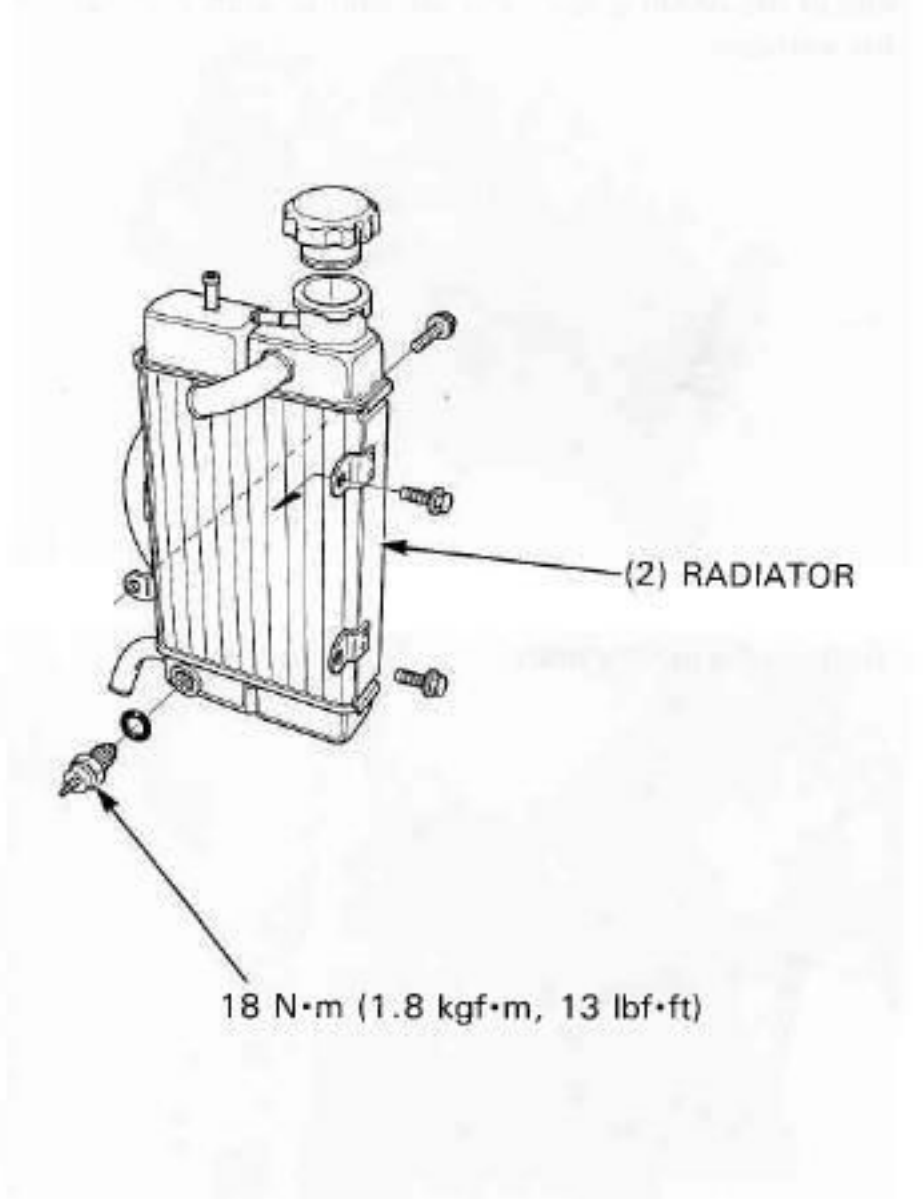
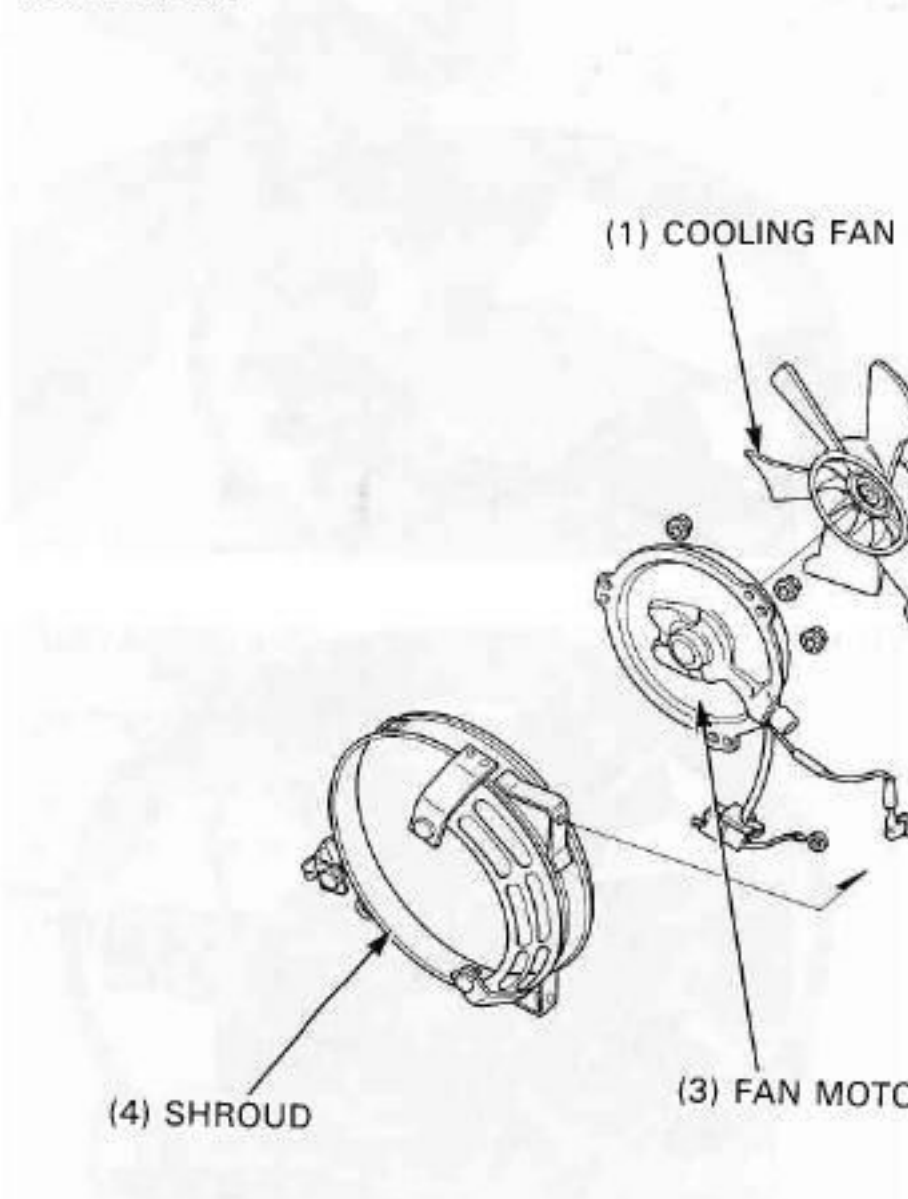


Remove the nuts and fan motor from the shroud.

Fan motor switch removal and inspection (page 19-21).



ASSEMBLY

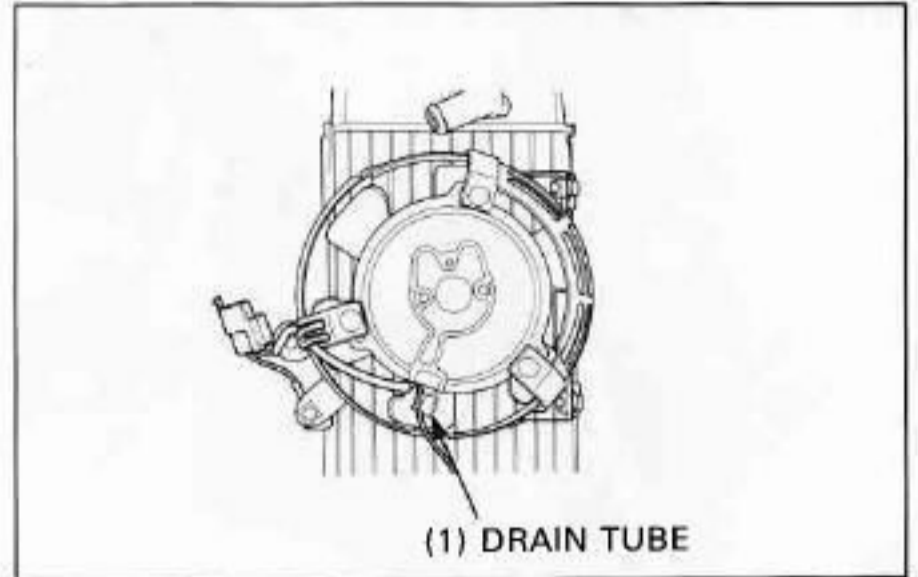


COOLING SYSTEM

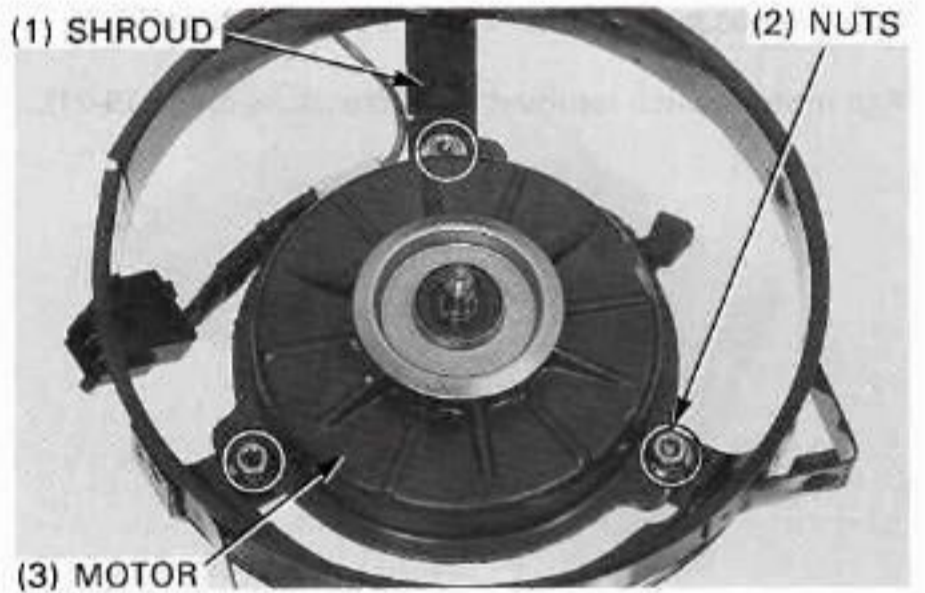
Install the fan motor to the shroud.

NOTE

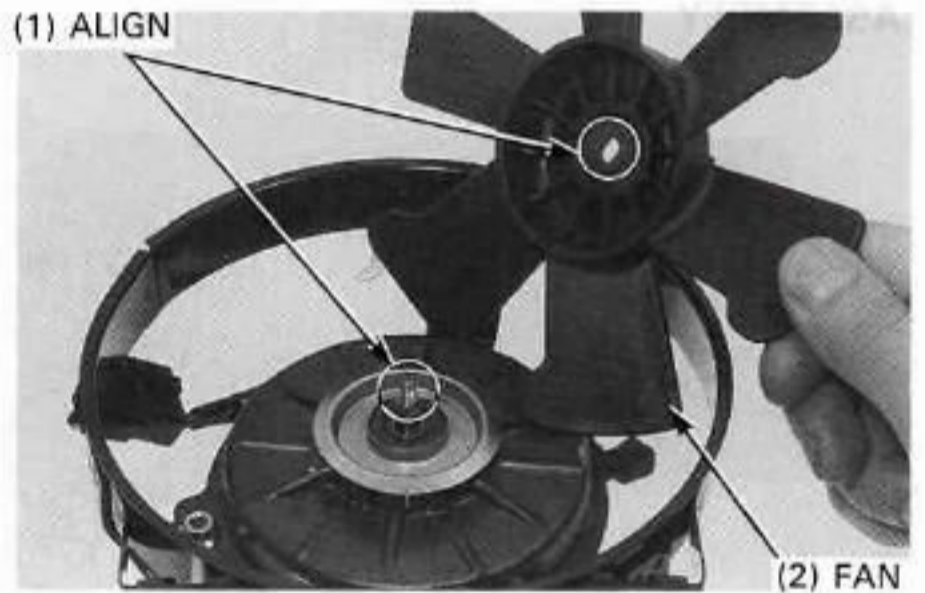
- Install the fan motor to the shroud with the drain tube direction as shown.



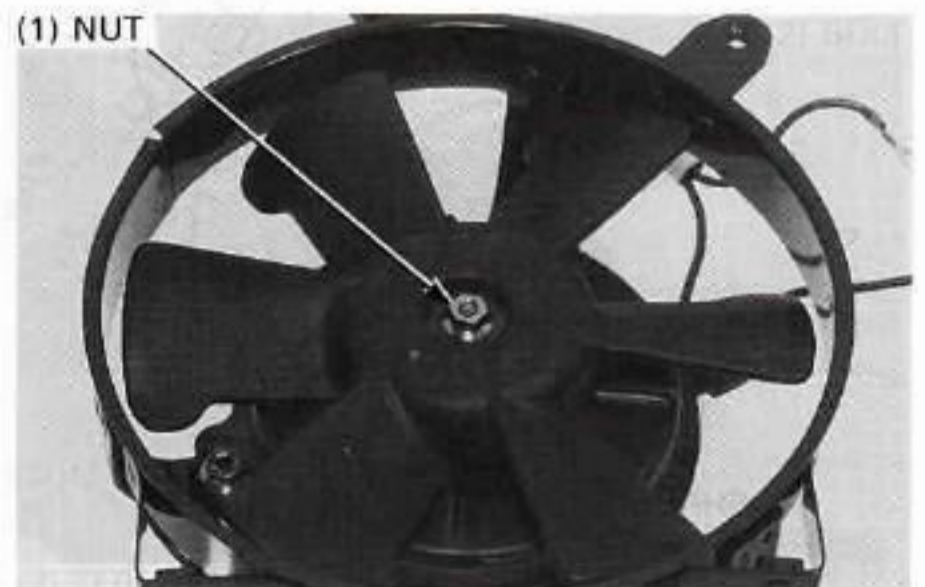
Install and tighten the nut securely.



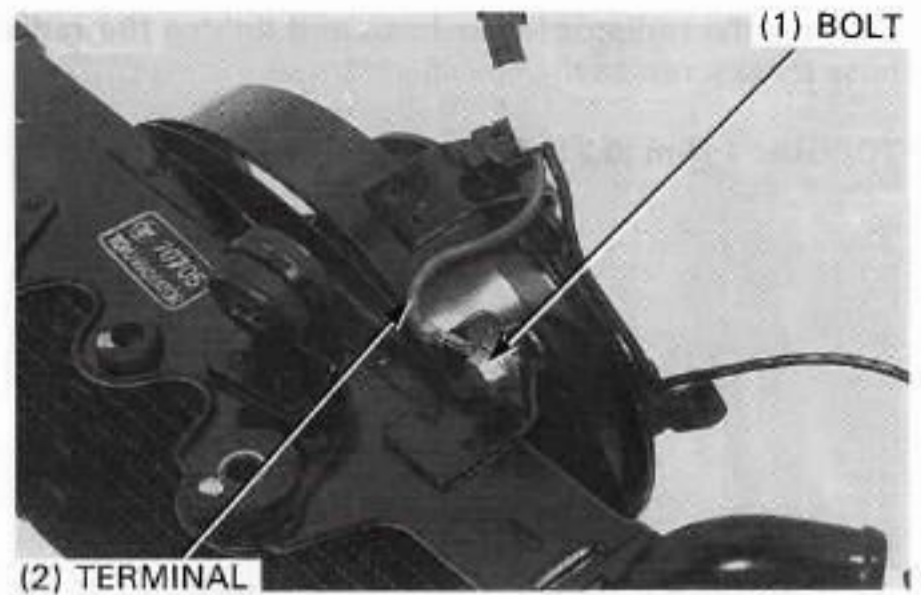
Install the cooling fan onto the motor shaft by aligning the flat surfaces.



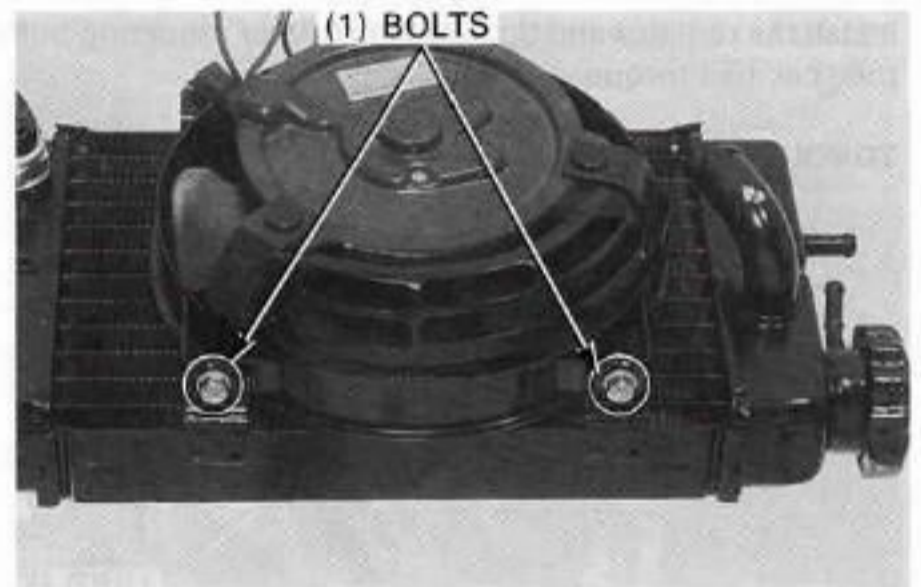
Tighten the nut securely.



Install the cooling fan assembly to the radiator.
Tighten the bolt securely with the ground terminal.

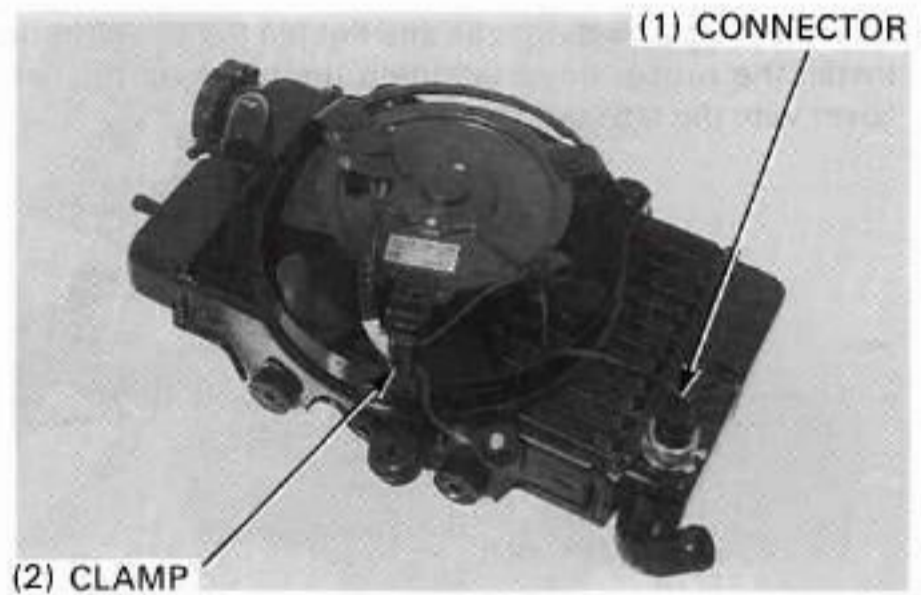


Tighten the bolts securely.



Connect the fan motor switch connector.

Route the ground wire and fan motor switch wire properly,
clamp the wires.

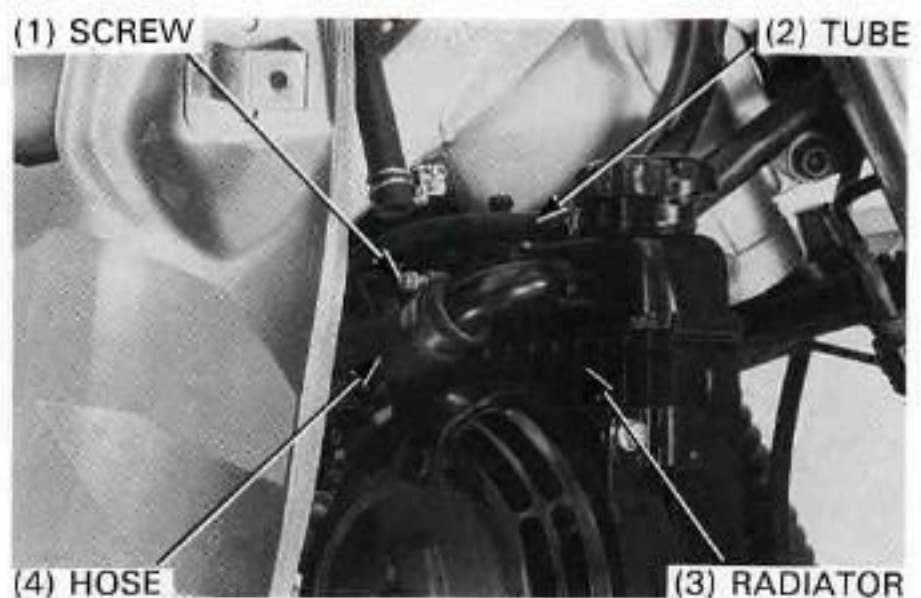


INSTALLATION

RIGHT RADIATOR

Connect the siphon tube.
Connect the radiator upper hose and tighten the radiator
hose band screw to the specified torque.

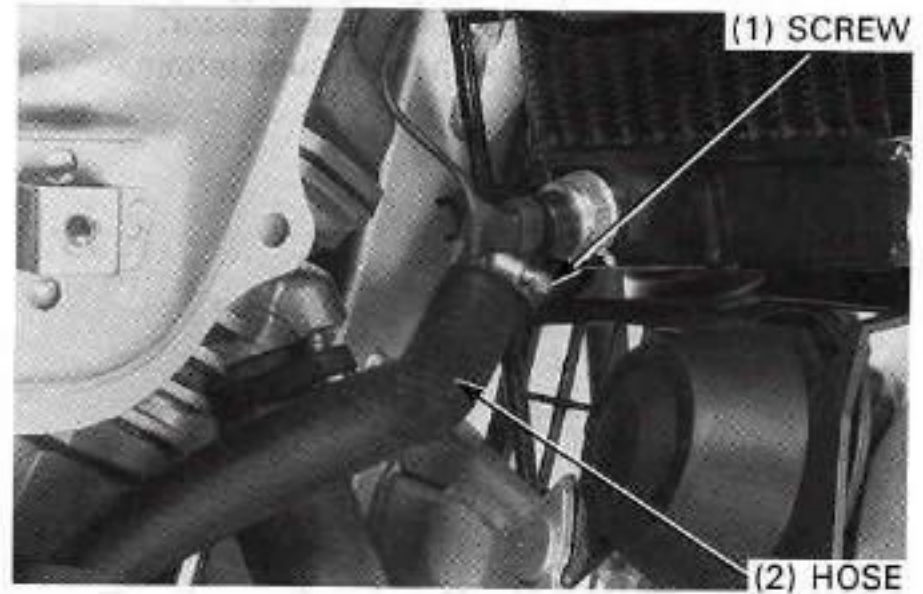
TORQUE: 7 N·m (0.7 kgf·m, 5.1 lbf·ft)



COOLING SYSTEM

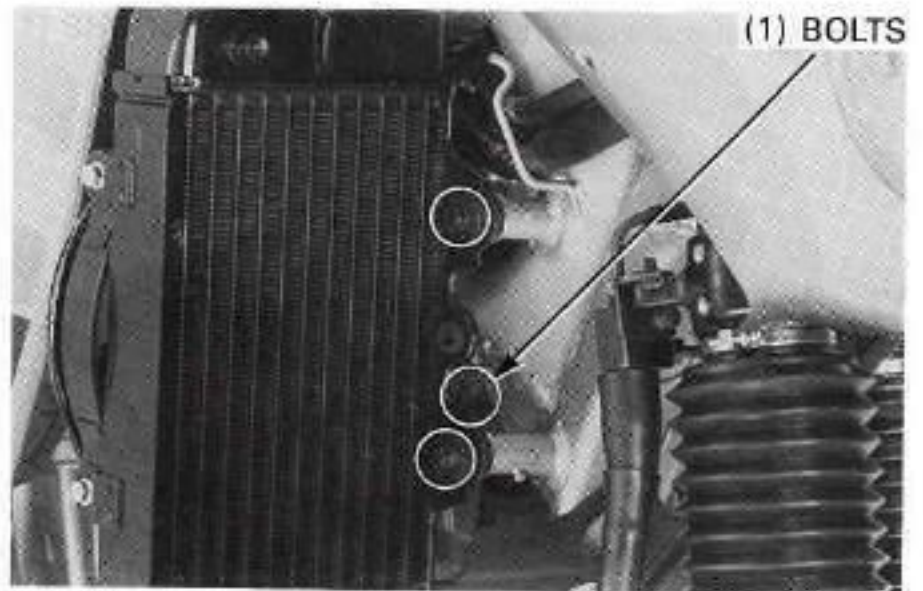
Connect the radiator lower hose and tighten the radiator hose band screw to the specified torque.

TORQUE: 7 N·m (0.7 kgf·m, 5.1 lbf·ft)

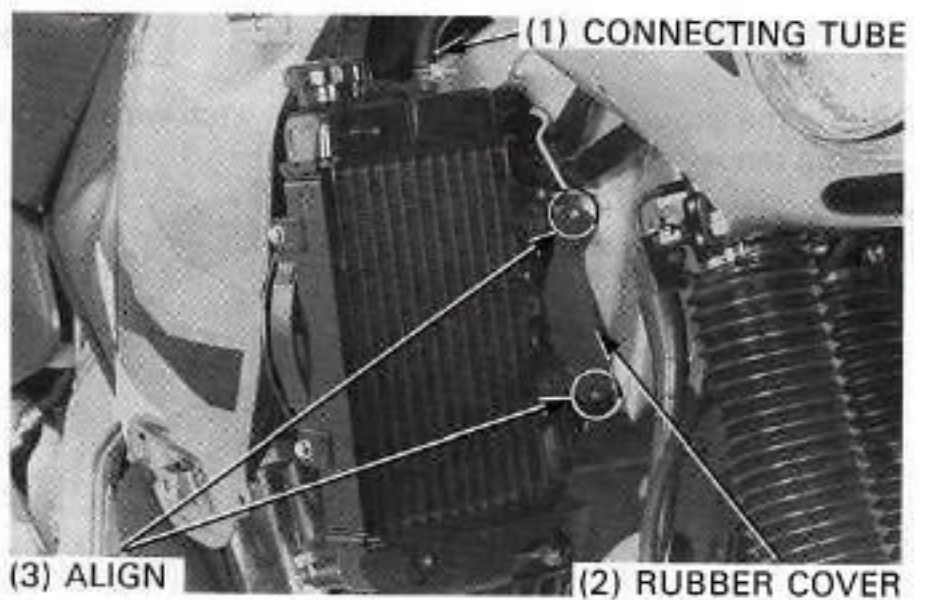


Install the radiator and tighten the radiator mounting bolts to the specified torque.

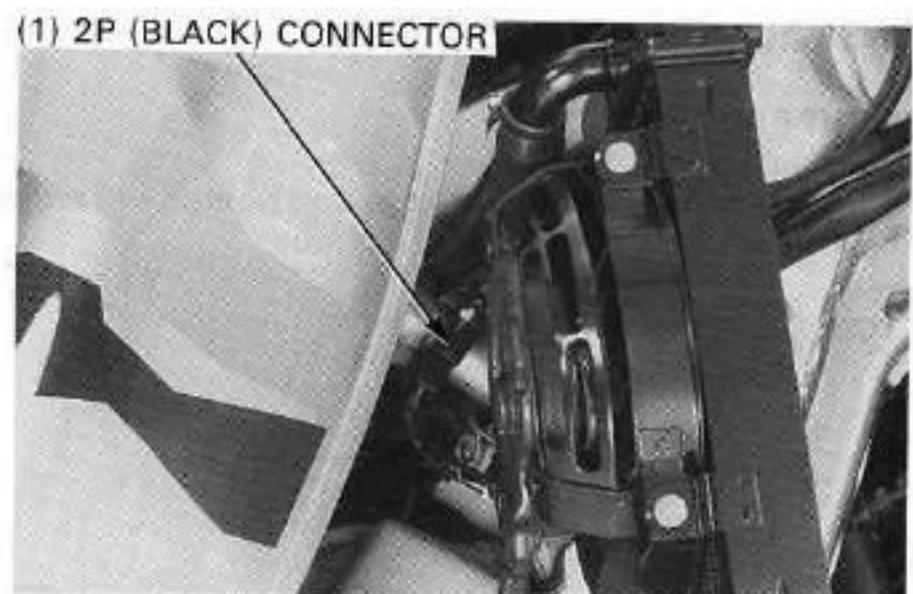
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



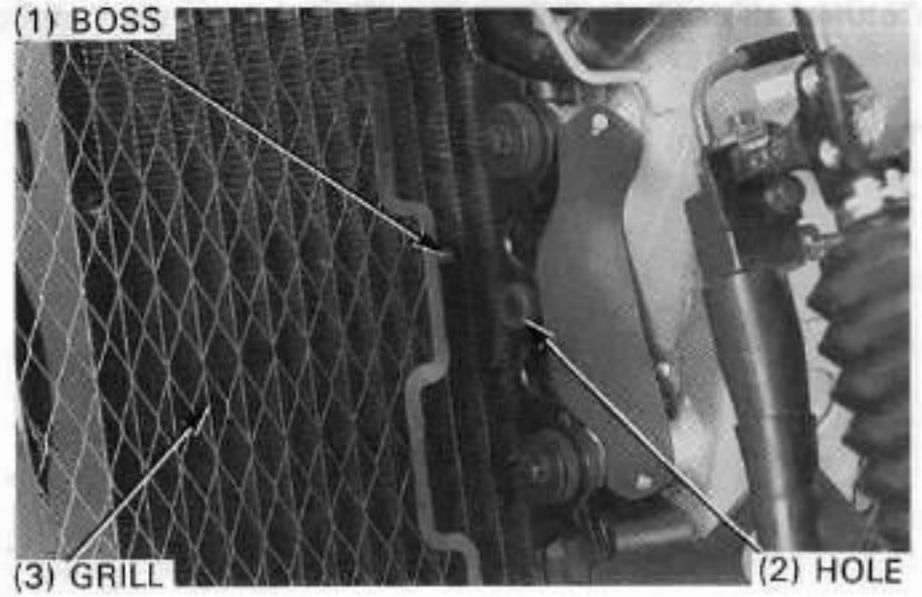
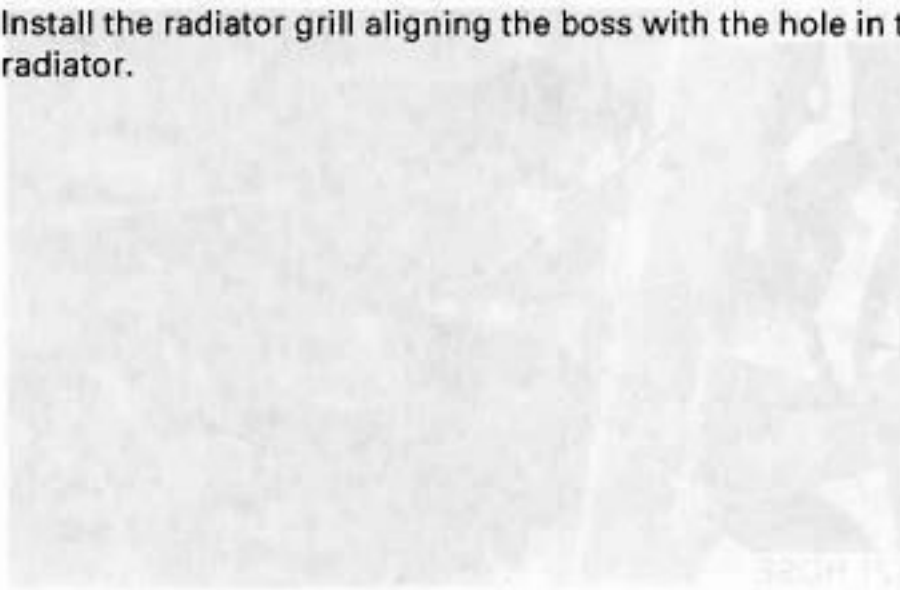
Connect the connecting tube and tighten the screw securely. Install the rubber cover aligning the holes on the rubber cover with the tabs on the frame.



Connect the cooling fan 2P (black) connector.

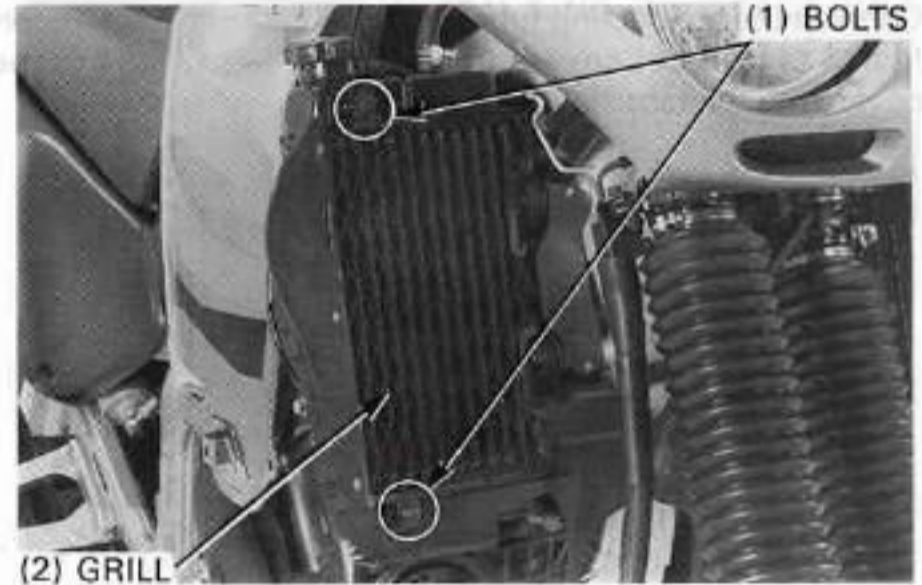


Install the radiator grill aligning the boss with the hole in the radiator.



Install and tighten the radiator grill mounting bolt to the specified torque.

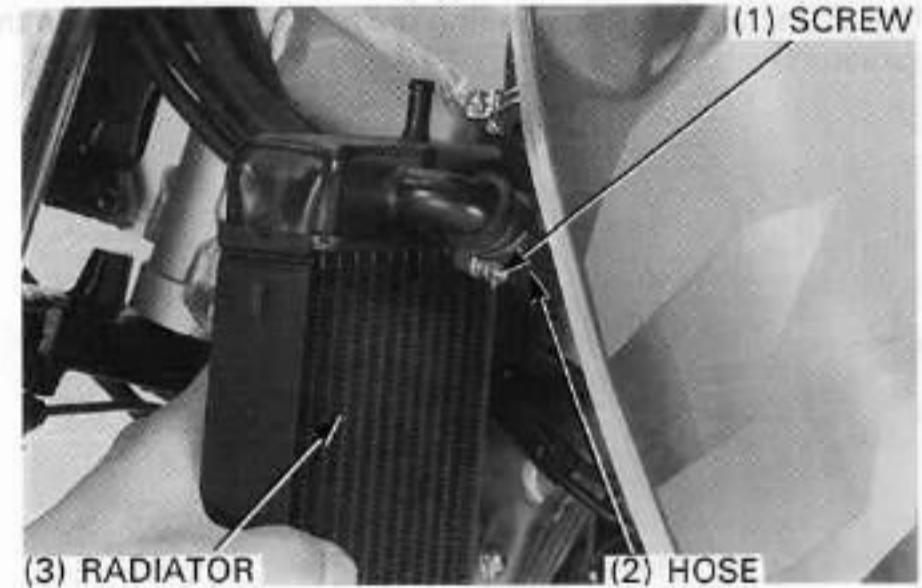
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



LEFT RADIATOR

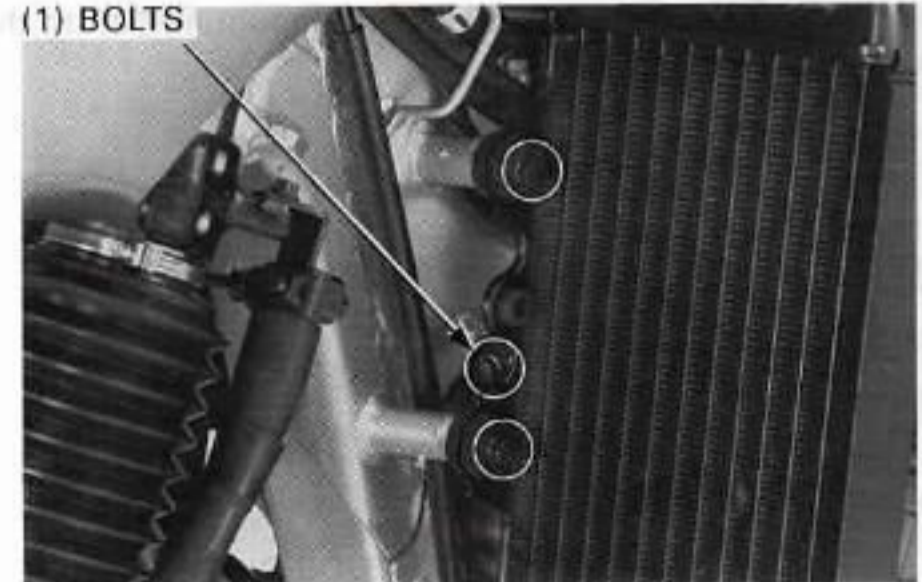
Connect the radiator upper hose and tighten the radiator hose band screw to the specified torque.

TORQUE: 7 N·m (0.7 kgf·m, 5.1 lbf·ft)



Install the radiator and tighten the radiator mounting bolts to the specified torque.

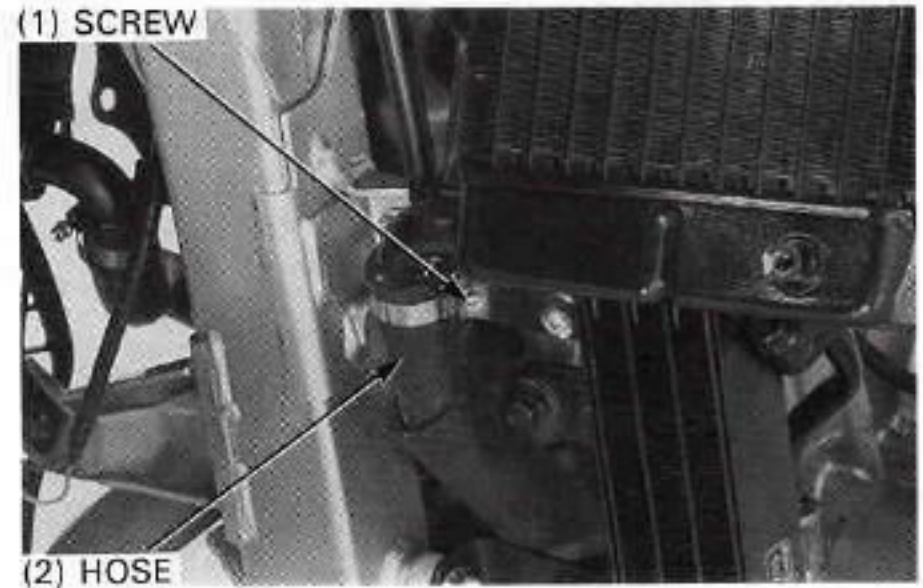
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



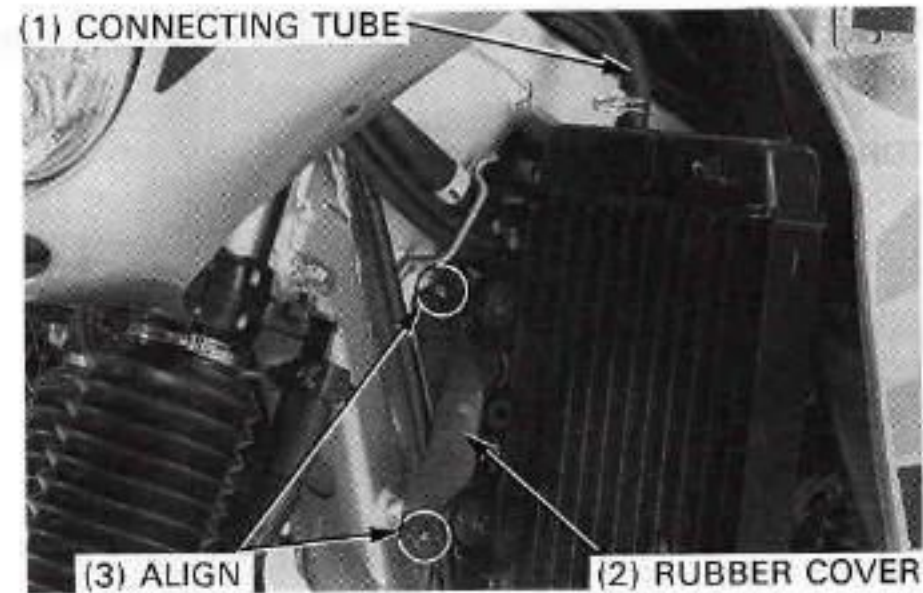
COOLING SYSTEM

Connect the radiator lower hose and tighten the radiator hose band screw to the specified torque.

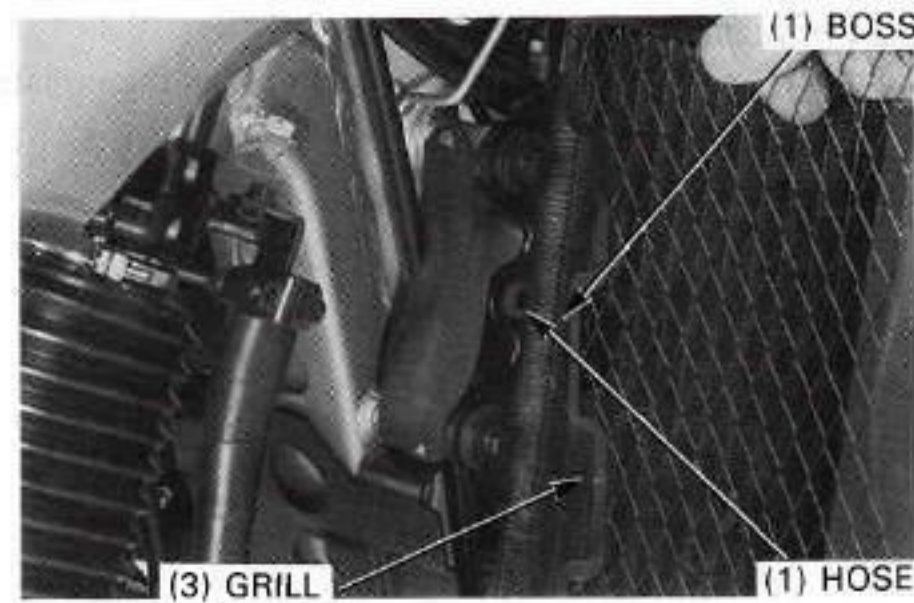
TORQUE: 7 N·m (0.7 kgf·m, 5.1 lbf·ft)



Connect the connecting tube and tighten the screw securely. Install the rubber cover aligning the holes on the rubber cover with the tabs on the frame.



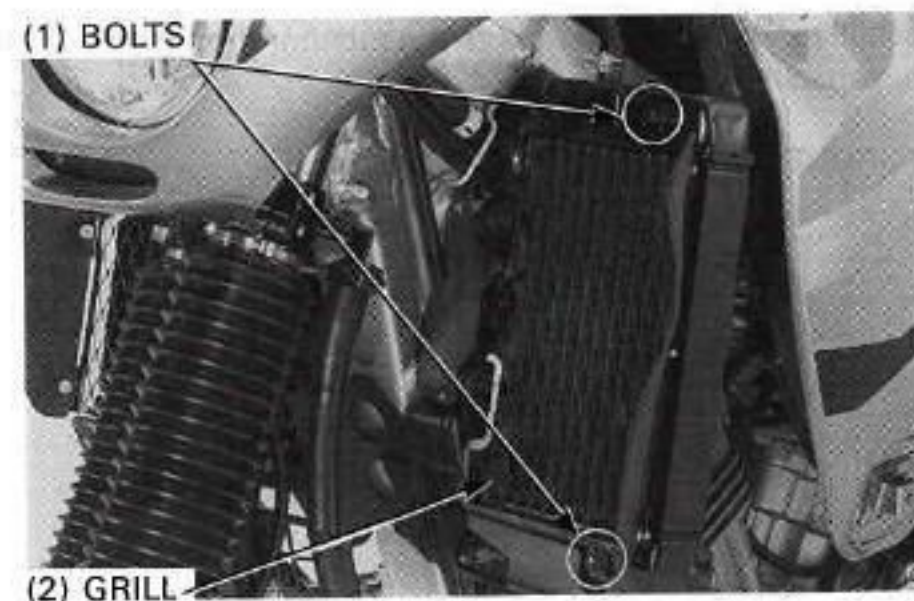
Install the radiator grill aligning the boss with the hole in the radiator.



Install and tighten the radiator grill mounting bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the side cowl (page 2-2).
Fill and bleed the cooling system (page 6-6).

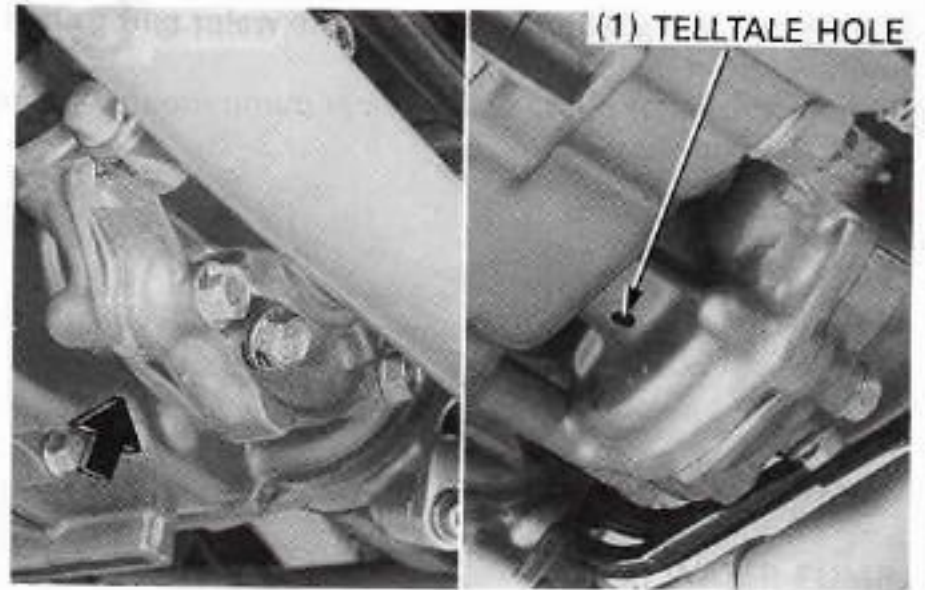


WATER PUMP

MECHANICAL SEAL INSPECTION

Remove the skid piatf (page 2-7).

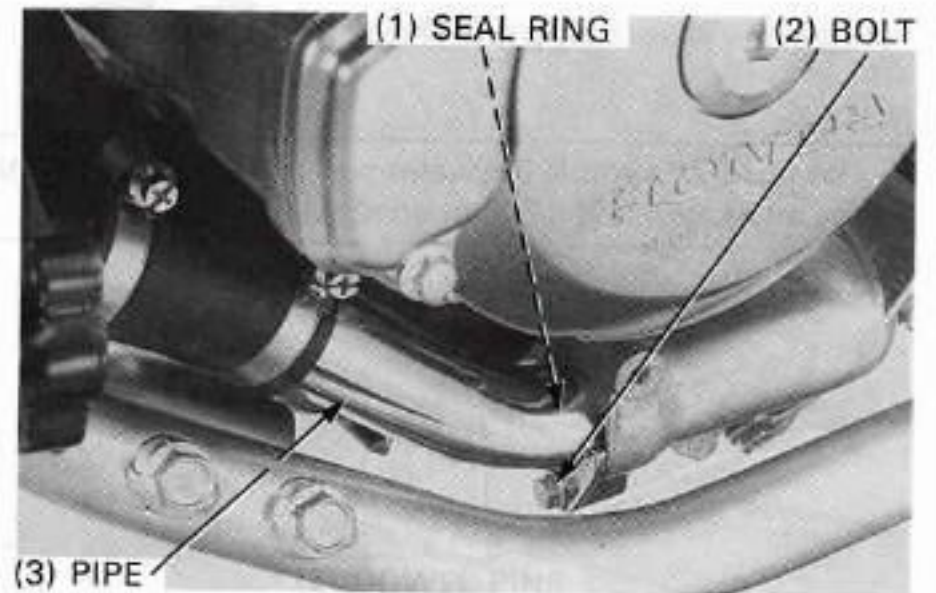
Inspect the telltale hole for signs of coolant leakage.
If there is leakage, the mechanical seal is defective and the water pump assembly must be replaced.



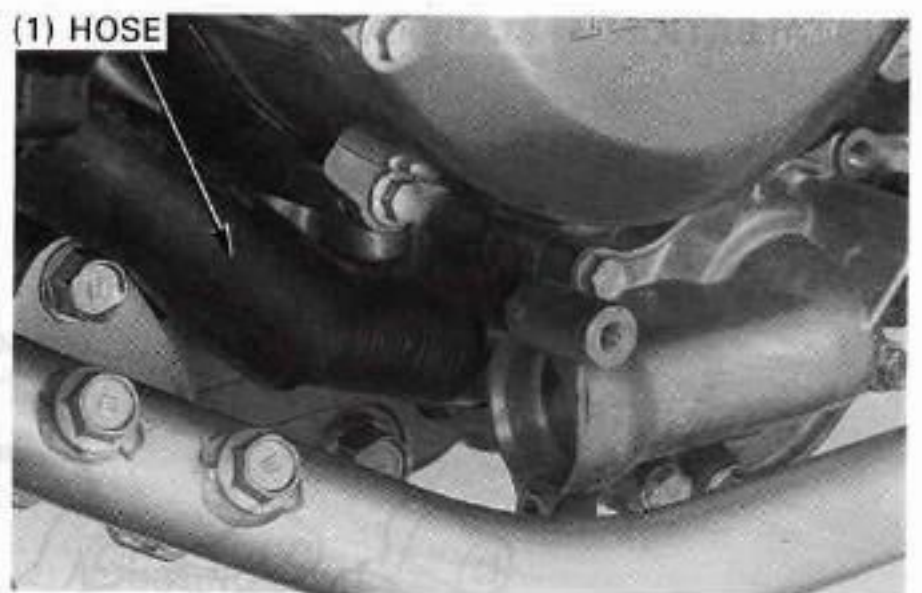
REMOVAL

Drain the coolant (page 6-5).
Remove the oil cooler (page 4-11).

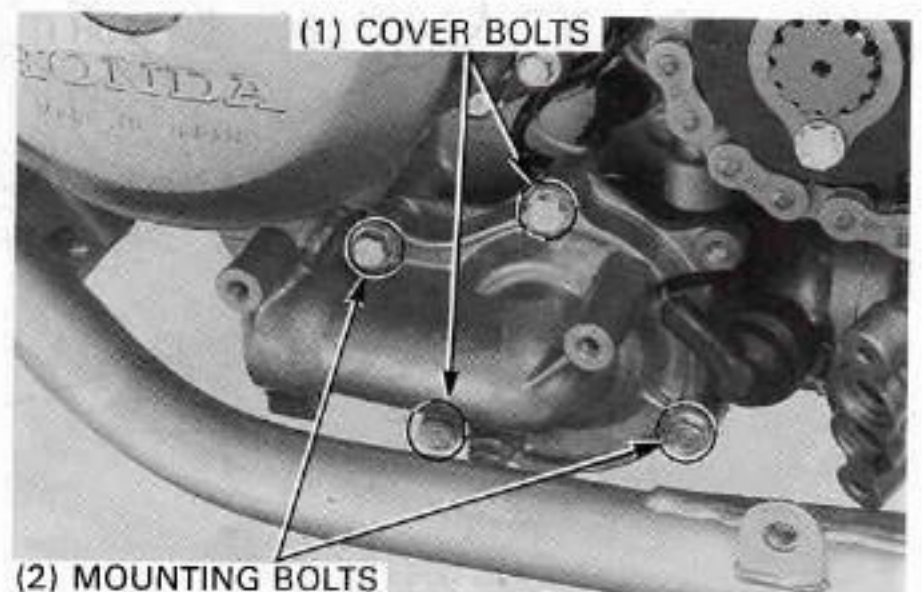
Remove the bolt and radiator lower pipe.
Remove the pipe seal ring.



Loosen the radiator hose band screw and disconnect the engine-to-pump hose.

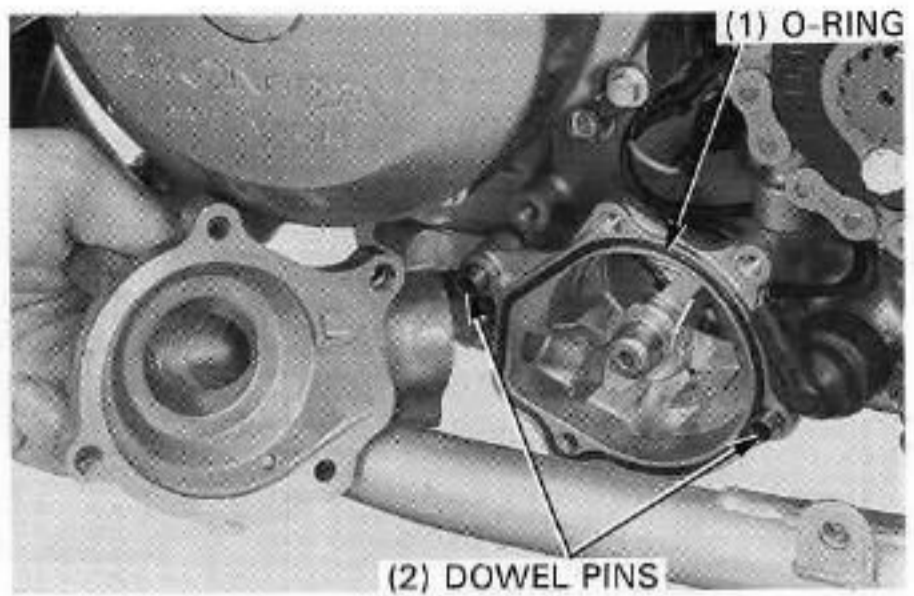


Remove the water pump cover bolts.
Loosen the water pump mounting bolts.



COOLING SYSTEM

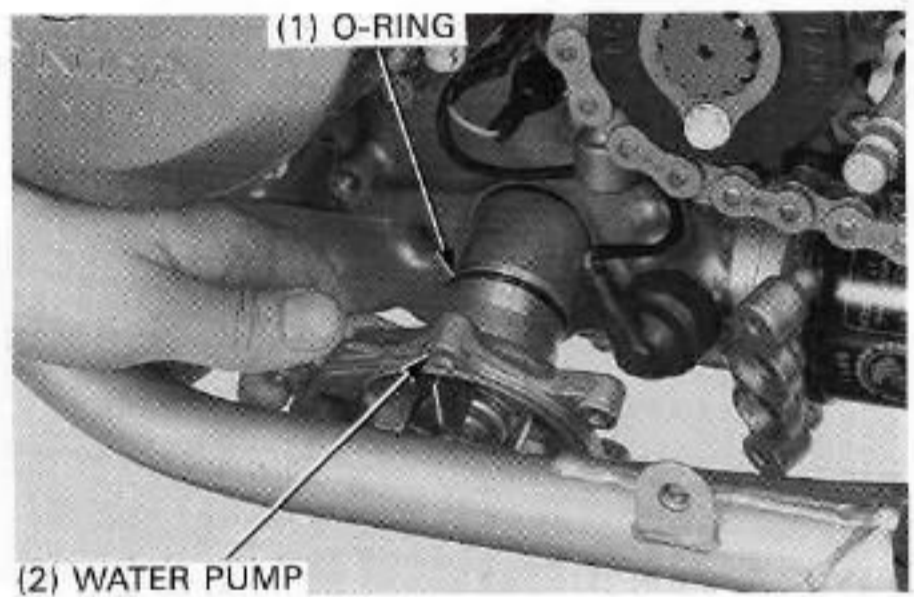
Slightly move the water pump until the water pump shaft is removed from the oil pump shaft.
Remove the water pump cover, water pump mounting bolts, O-ring and dowel pins.



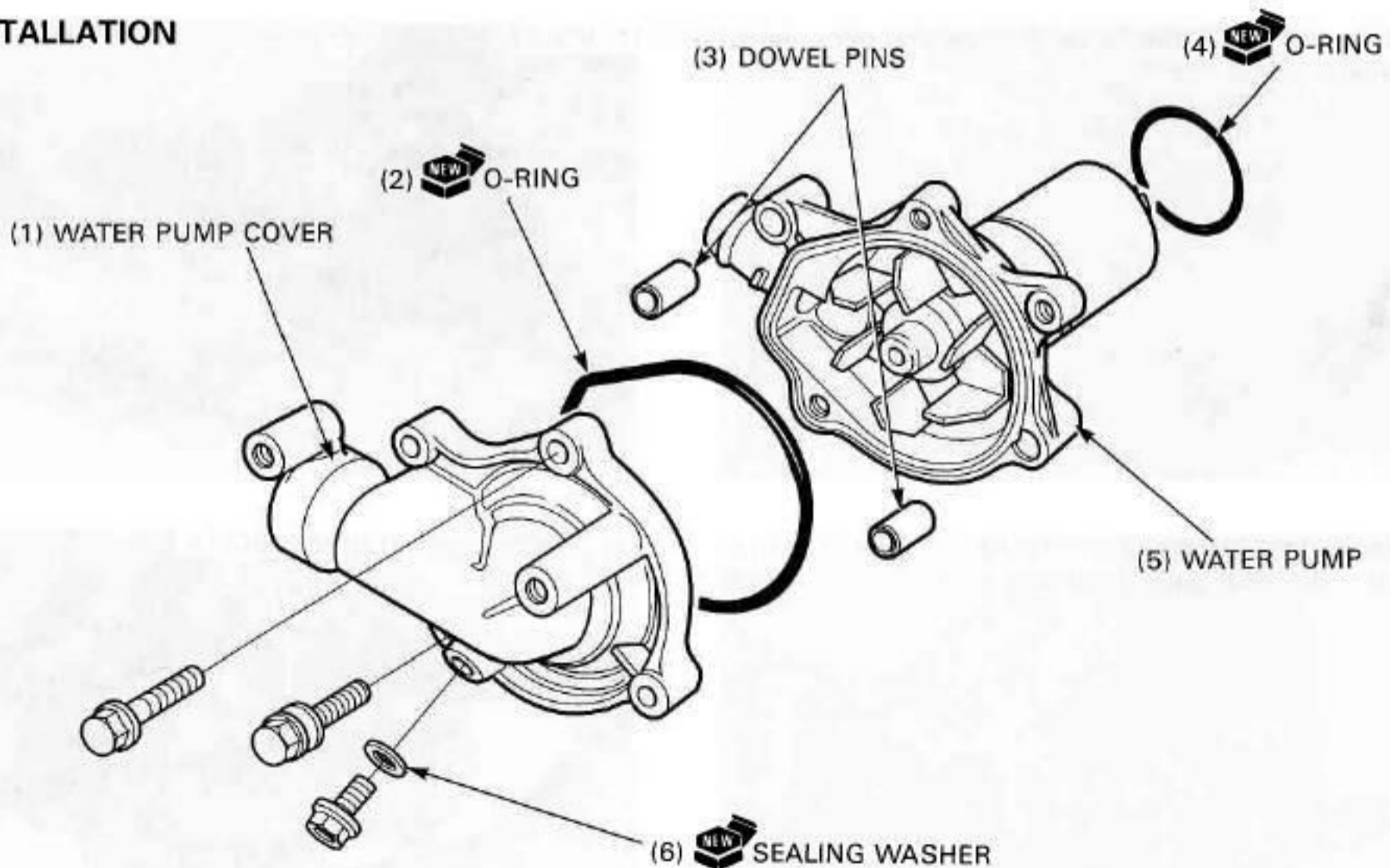
Remove the water pump and O-ring from the crankcase.

NOTE

- Do not disassemble the water pump. Replace the pump as an assembly if it is damaged.

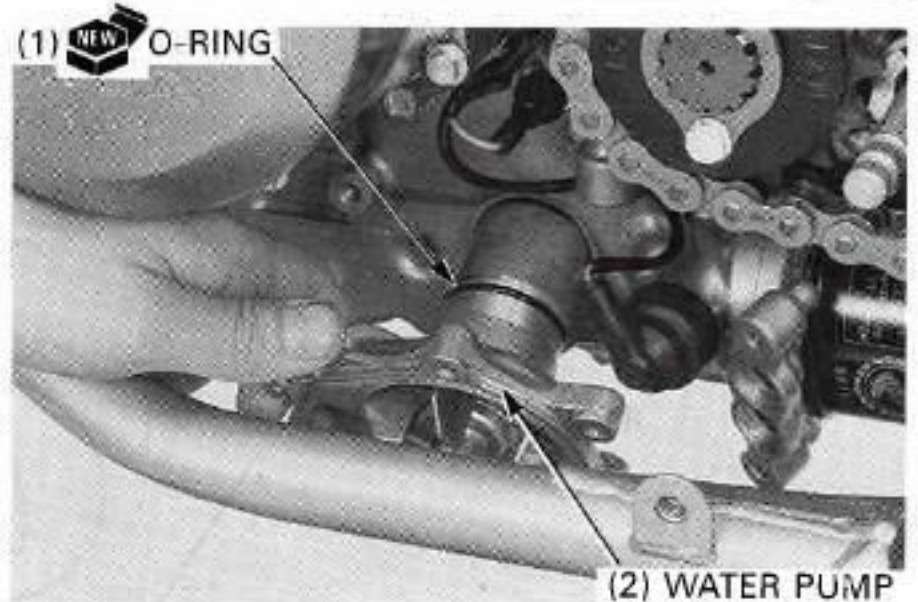


INSTALLATION

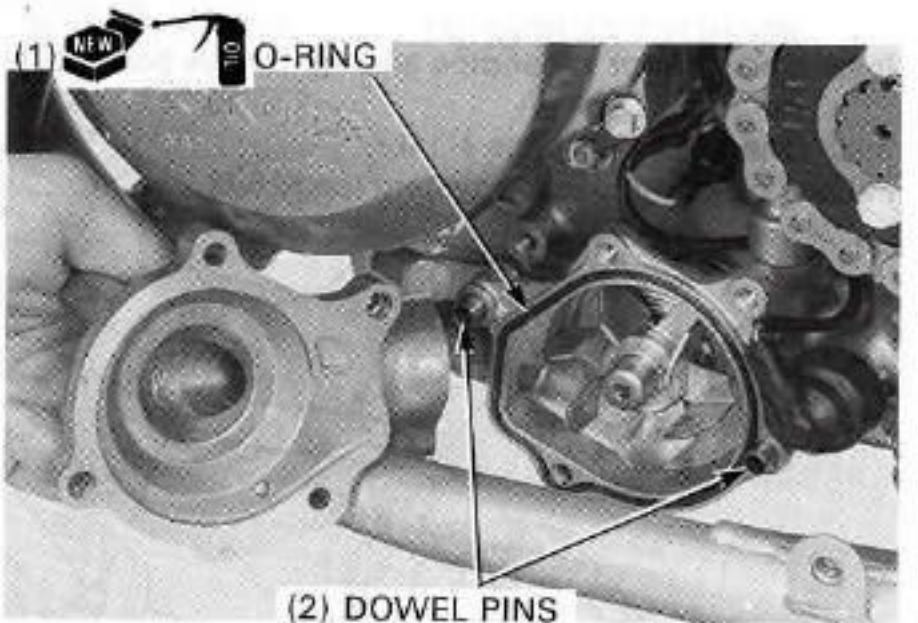


Apply engine oil to the new O-ring and install it to the stepped portion of the water pump.

Temporarily install the water pump to the crankcase.



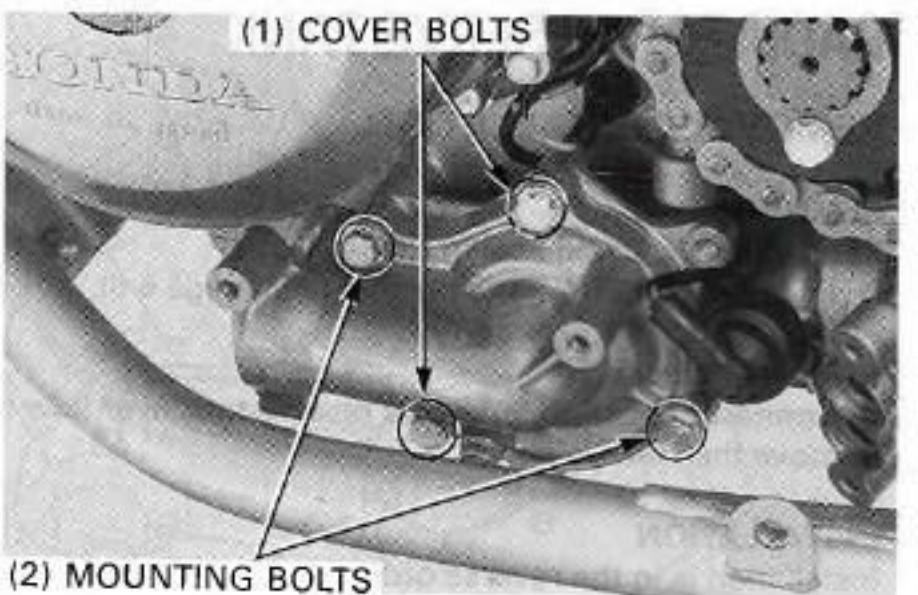
Apply engine oil to the new O-ring and install it to the water pump groove.
Install the dowel pins.
Install the water pump cover with the water pump mounting bolts.



Align the water pump shaft groove with the oil pump shaft end by turning the water pump impeller.

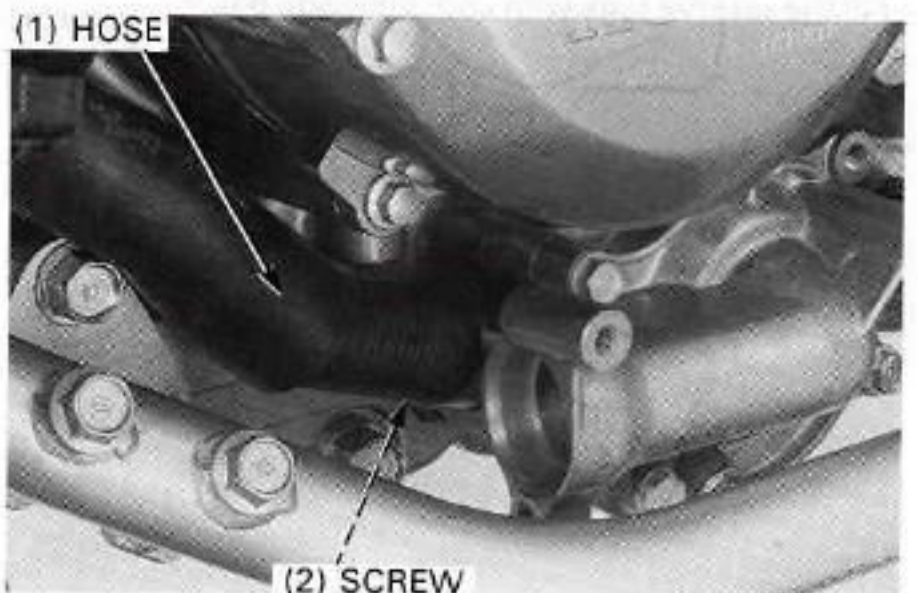
Install the water pump into the crankcase while aligning the water pump shaft groove with the oil pump shaft end.

Install the water pump mounting bolts securely.
Install the water pump cover bolts securely.



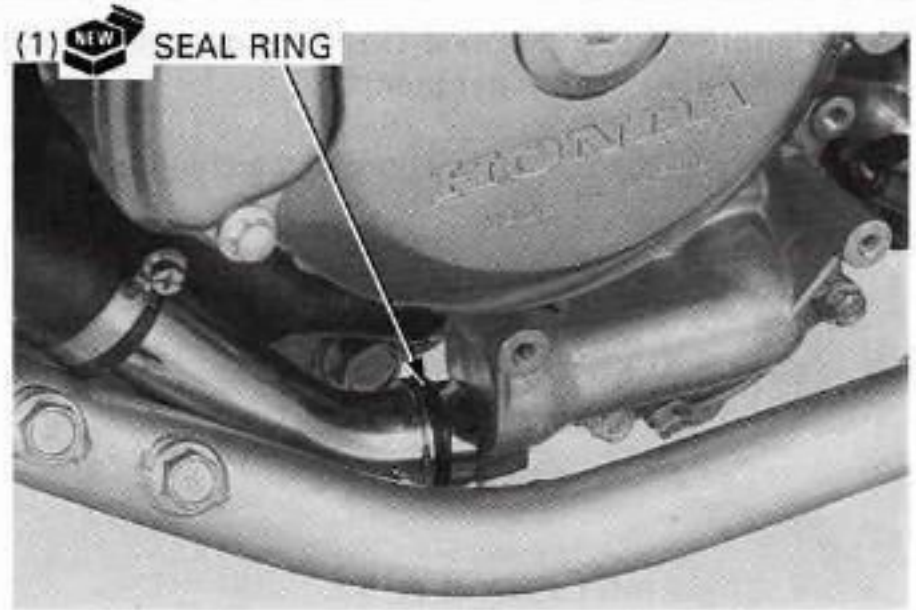
Connect the engine-to-pump hose and tighten the radiator hose band screw to the specified torque.

TORQUE: 7 N·m (0.7 kgf·m, 5.1 lbf·ft)



COOLING SYSTEM

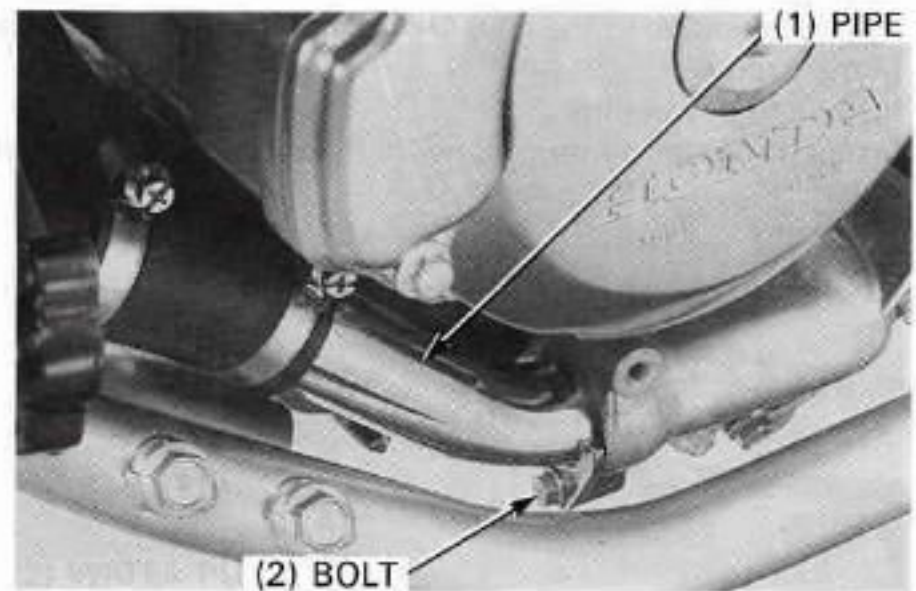
seal ring.



Install the radiator lower pipe and tighten the bolt securely.

Install the oil cooler (page 4-14).

Fill and bleed the cooling system (page 6-6).



RADIATOR RESERVE TANK

REMOVAL/INSTALLATION

REMOVAL

Remove the right side cover (page 2-7).

Drain the coolant from the reserve tank (page 6-6).

Remove the bolts.

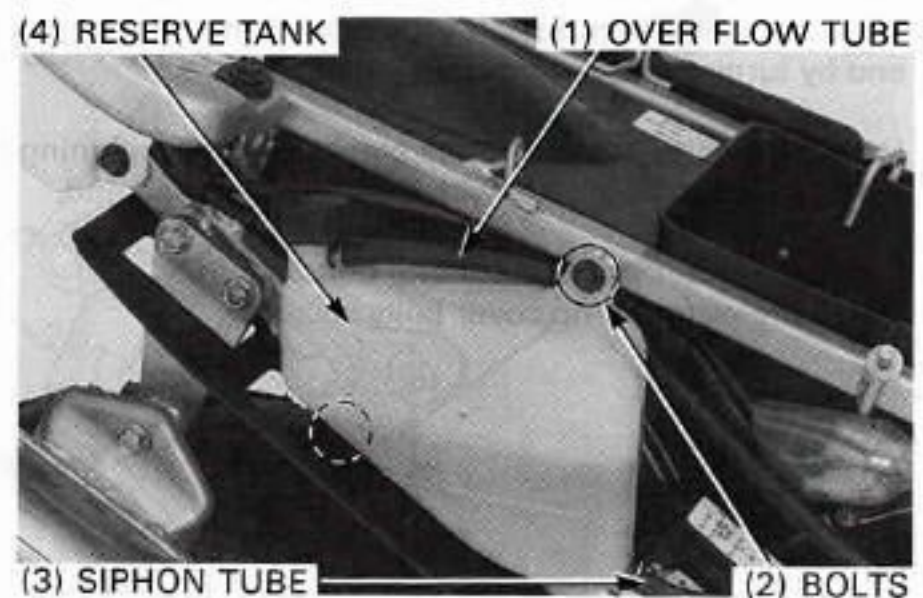
Disconnect the siphon tube and reserve tank over flow tube.

Remove the reserve tank.

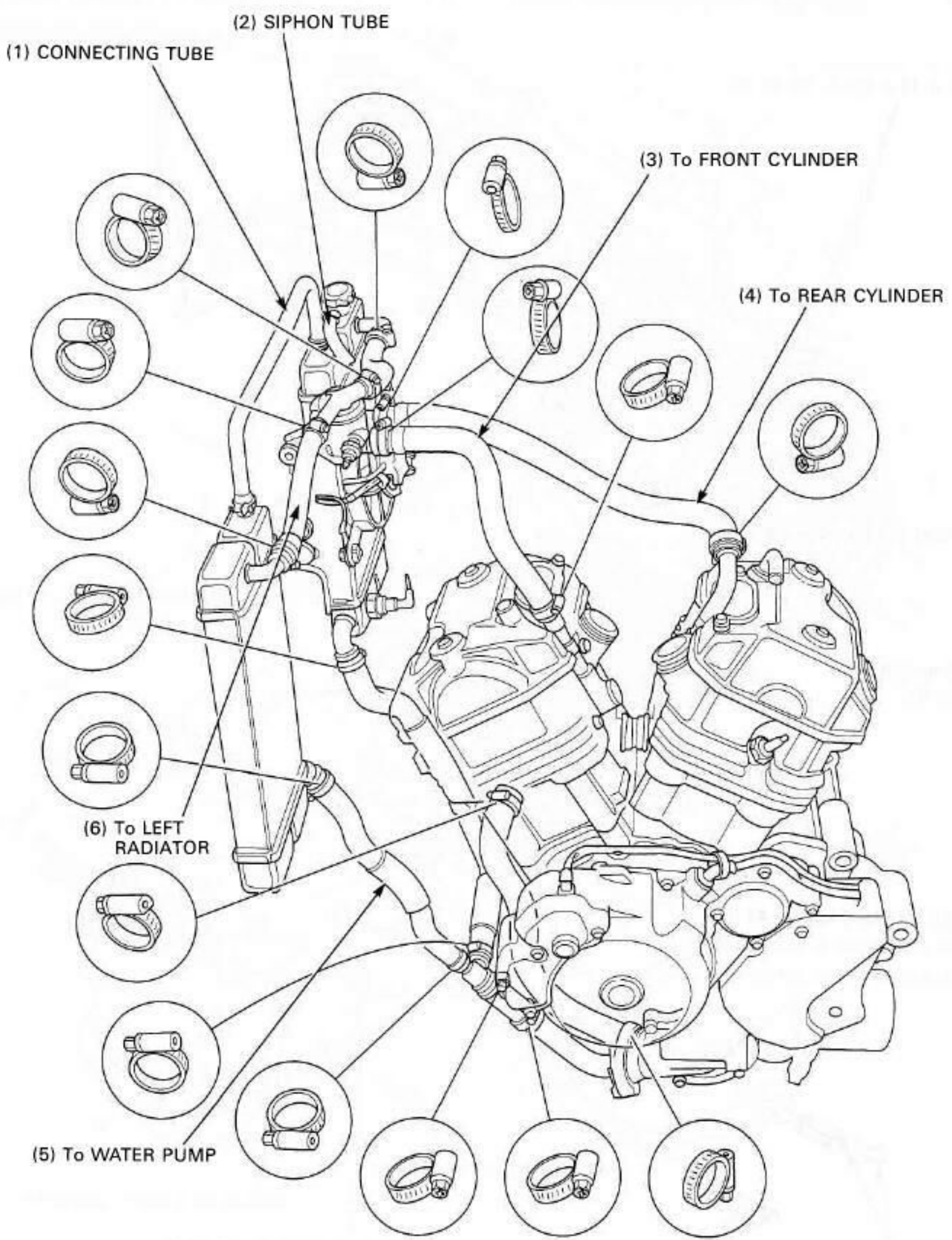
INSTALLATION

Installation is in the reverse order of removal.

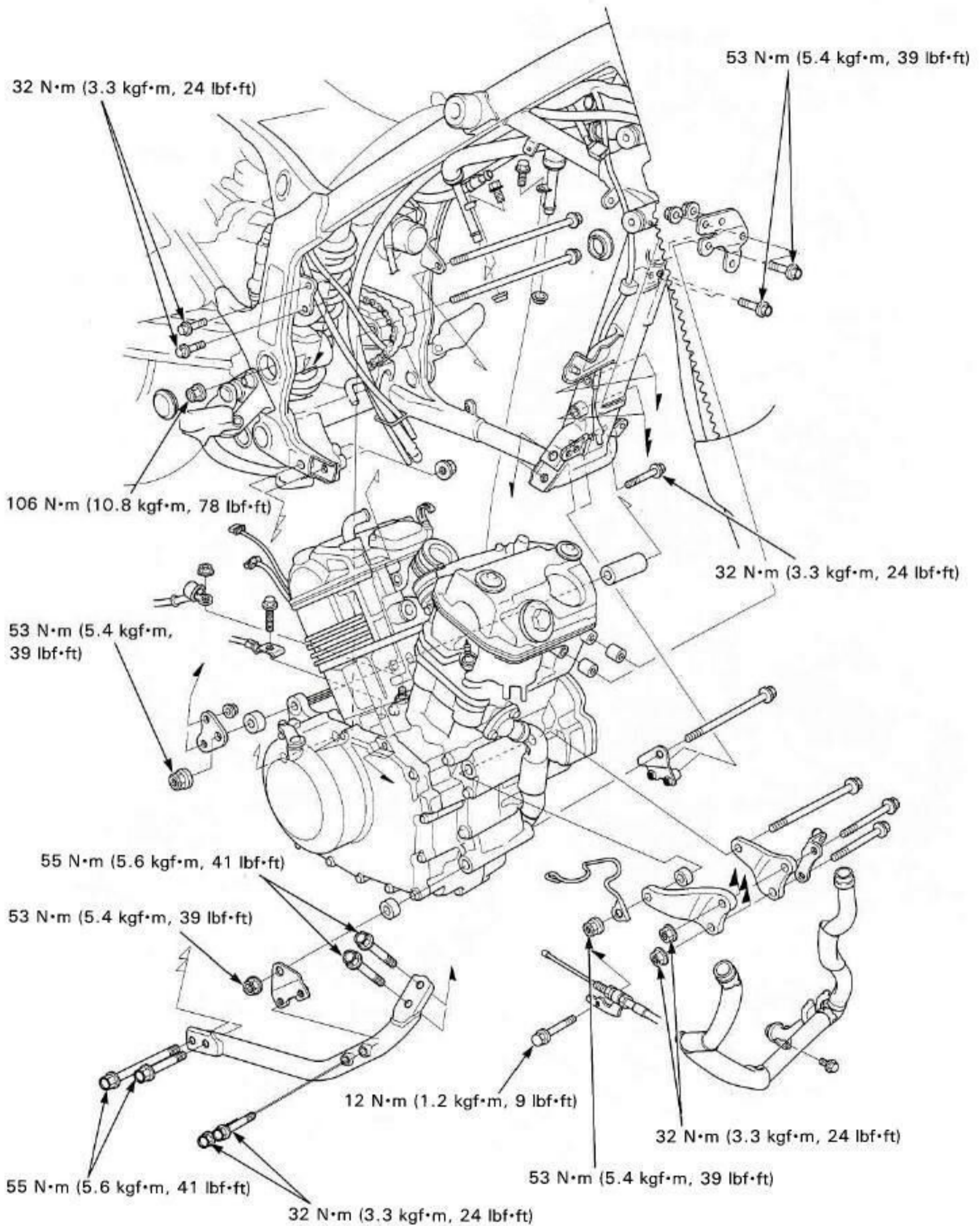
Fill the reserve tank with coolant (page 6-6).



COOLING SYSTEM CONNECTING BAND



ENGINE REMOVAL/INSTALLATION



7. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

7-2

ENGINE INSTALLATION

7-9

DRIVE SPROCKET REMOVAL

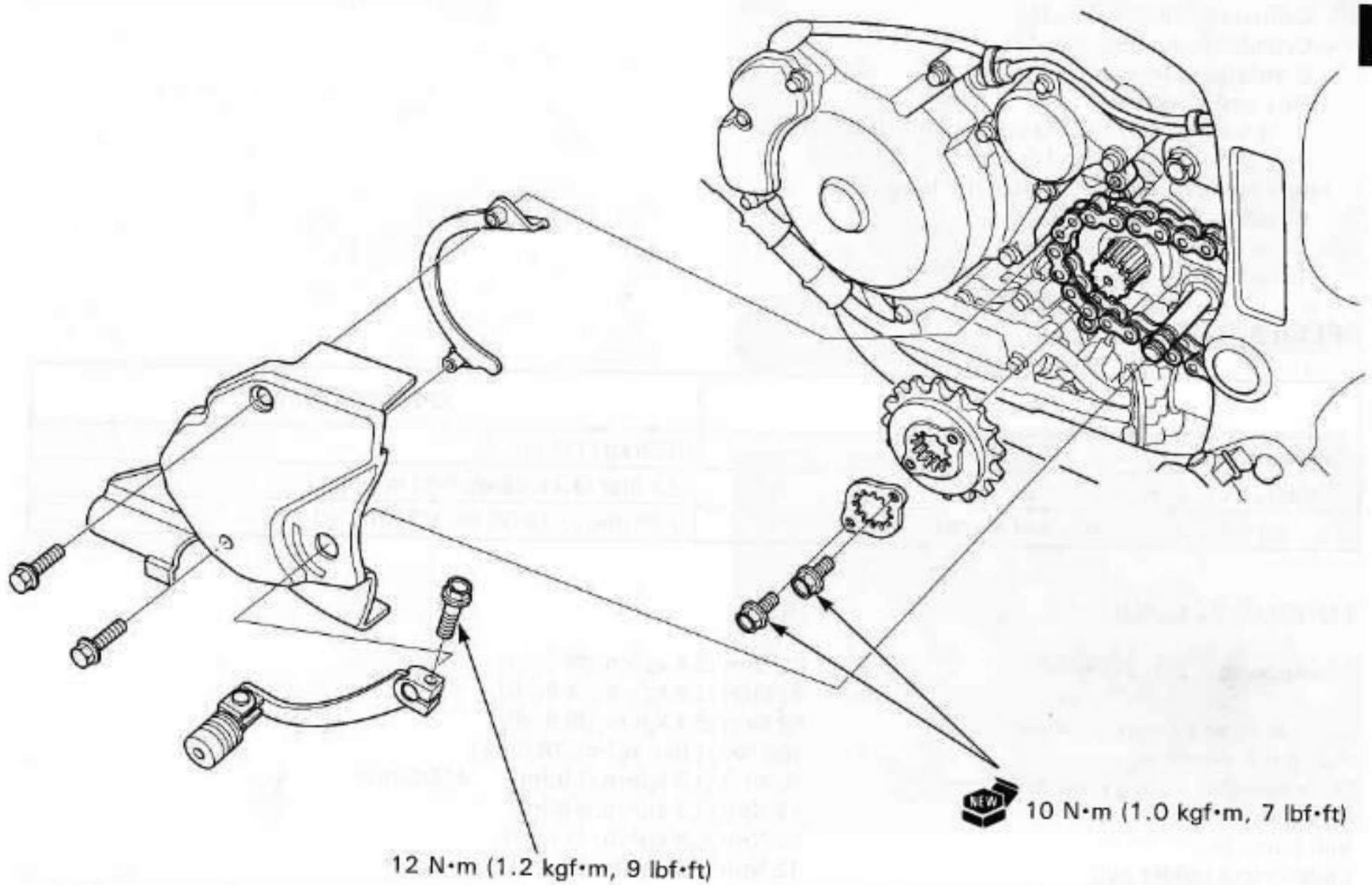
7-3

DRIVE SPROCKET INSTALLATION

7-14

ENGINE REMOVAL

7-4



ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

GENERAL

- A floor jack or other adjustable support is required to support and maneuver the engine.

CAUTION

- *Do not support the engine using the oil filter.*
- When removing/installing the engine, tape the frame around the engine beforehand for frame protection.
- The following components can be serviced with the engine installed in the frame.
 - Alternator (Section 9)
 - Camshaft (Section 10)
 - Carburetor (Section 5)
 - Clutch/gearshift linkage (Section 8)
 - Ignition pulse generator (Section 17)
 - Oil cooler (Section 4)
 - Starter motor/starter clutch (Section 18)
 - Water pump (Section 6)
- The following components require engine removal for service.
 - Cylinder head (Section 10)
 - Cylinder/piston (Section 11)
 - Crankshaft (Section 12)
 - Oil pump (Section 4)
 - Shift fork, shift drum and shift spindle (Section 12)
 - Transmission (Section 12)
- After engine installation, adjust the followings.
 - Clutch cable (page 3-25)
 - Drive chain (page 3-18)
 - Throttle cable (page 3-4)

SPECIFICATIONS

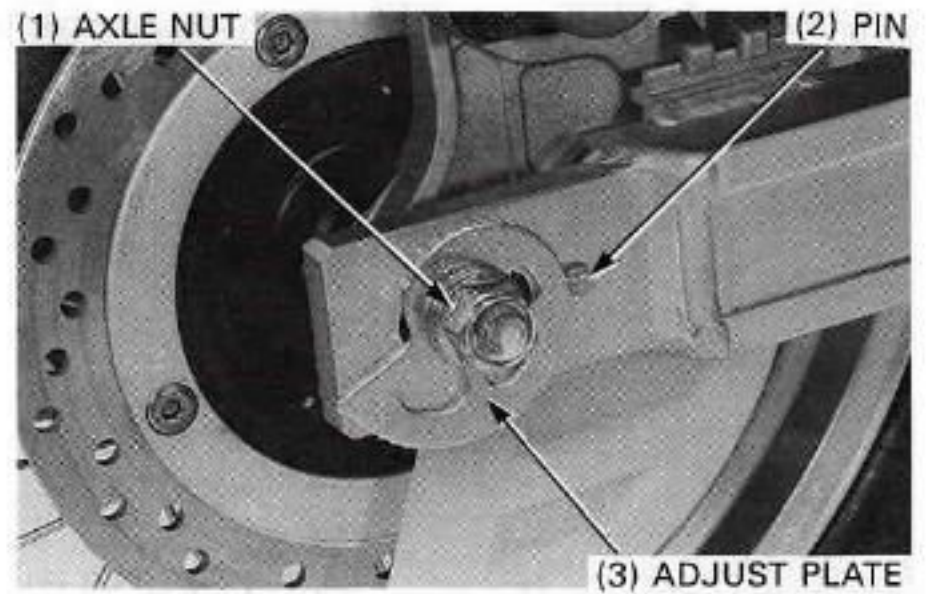
| ITEM | SPECIFICATION |
|--|--------------------------------------|
| Engine dry weight | 62.5 kg (138 lb) |
| Engine oil capacity at disassembly | 3.2 liter (3.41 US qt, 2.82 Imp qt) |
| Coolant capacity (radiator and engine) | 2.03 liter (2.13 US qt, 1.78 Imp qt) |

TORQUE VALUES

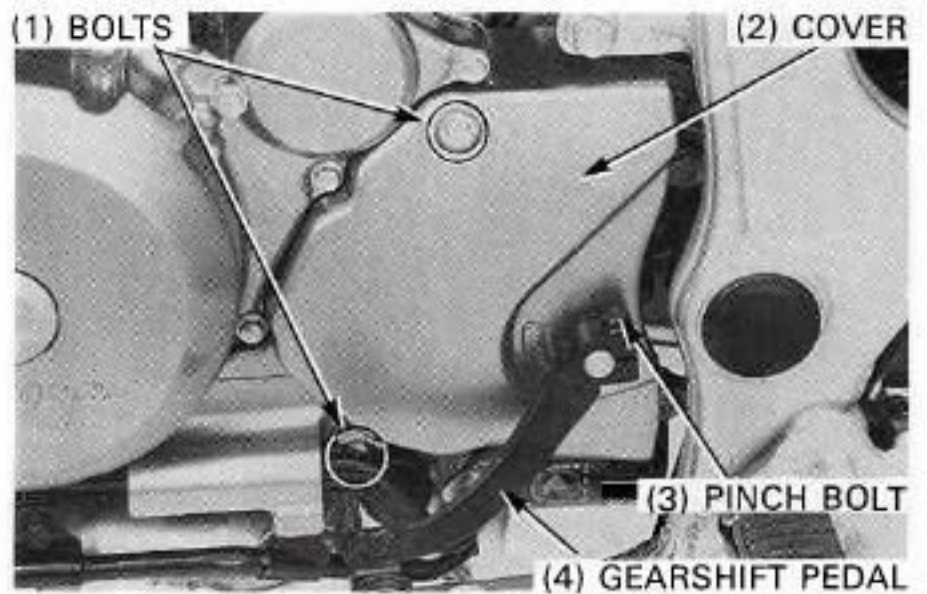
| | |
|-----------------------------------|--|
| Engine hanger nut (10 mm) | 53 N•m (5.4 kgf•m, 39 lbf•ft) |
| (8mm) | 32 N•m (3.3 kgf•m, 24 lbf•ft) |
| Cylinder head hanger plate bolt | 53 N•m (5.4 kgf•m, 39 lbf•ft) |
| Swingarm pivot nut | 106 N•m (10.8 kgf•m, 78 lbf•ft) |
| Drive sprocket setting plate bolt | 10 N•m (1.0 kgf•m, 7 lbf•ft) ALOC bolt |
| Gearshift pedal pinch bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) |
| Sub frame bolt | 55 N•m (5.6 kgf•m, 41 lbf•ft) |
| Clutch cable holder bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) |

DRIVE SPROCKET REMOVAL

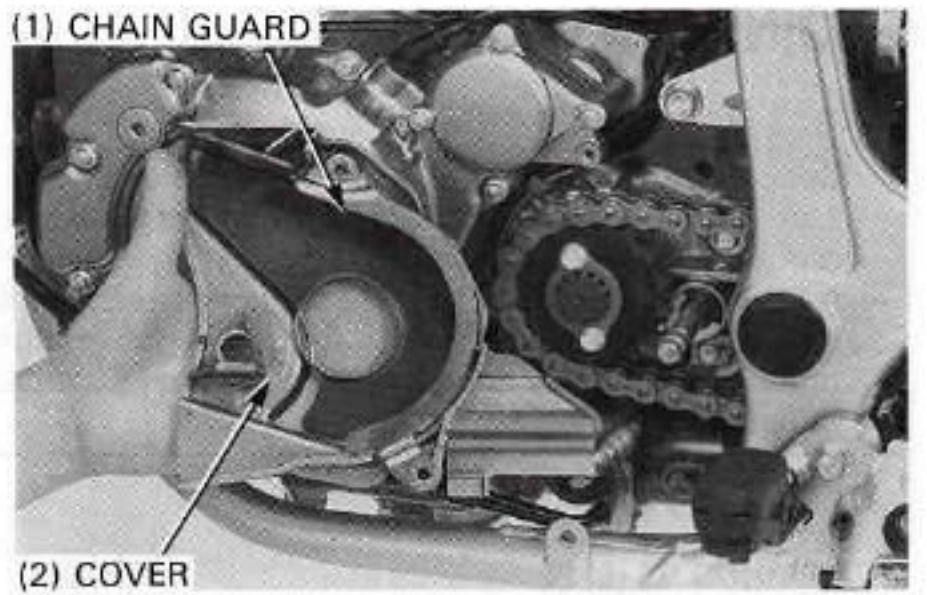
Loosen the rear axle nut.
Turn the both adjust plate and push the rear wheel forward fully, make a drive chain slack fully.



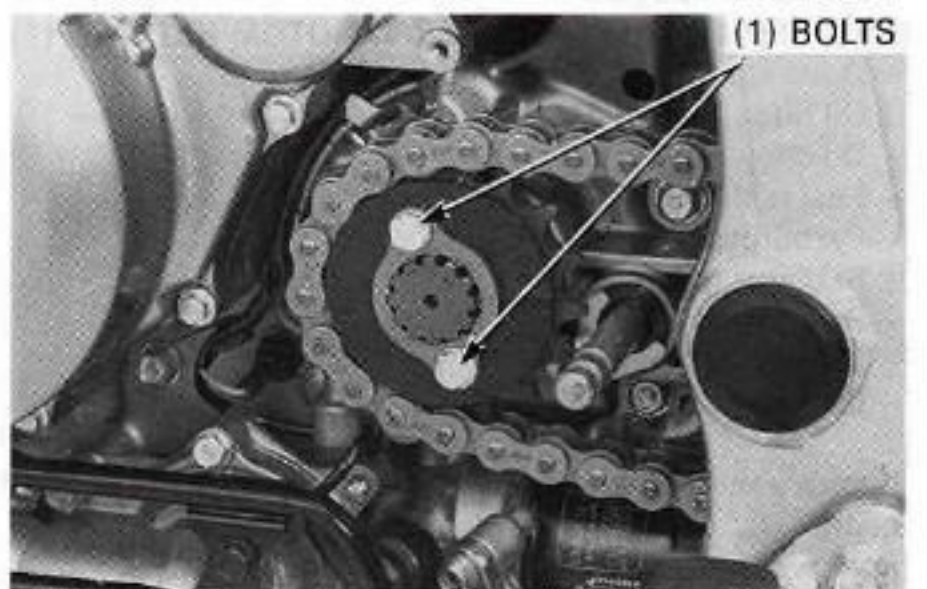
Remove the gearshift pedal pinch bolt and gearshift pedal.
Remove the bolts and drive sprocket cover.



Remove the drive chain guard from the drive sprocket cover.
Check the drive chain guard for wear or damage.
If the drive chain guard is excessively wear or damage, replace it with a new one.

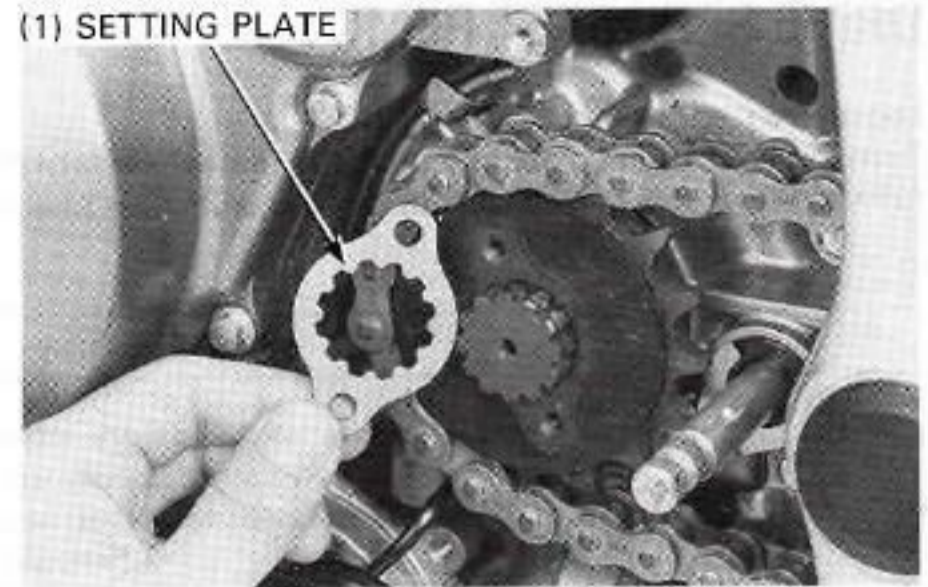


Remove the drive sprocket setting plate bolts.

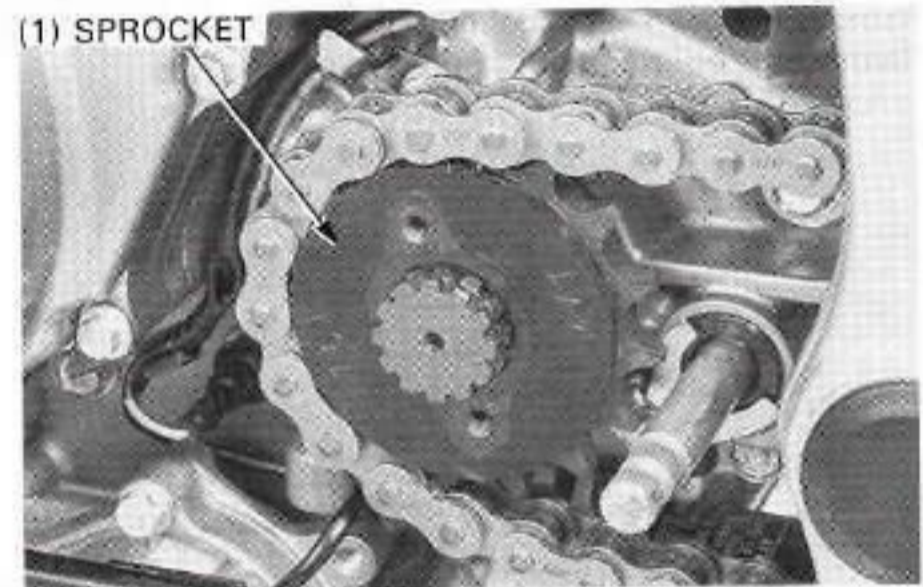


ENGINE REMOVAL/INSTALLATION

Align the drive sprocket setting plate teeth and countershaft teeth, then remove the drive sprocket setting plate.



Remove the drive sprocket.



ENGINE REMOVAL

NOTE

- Support the motorcycle using safety stand or a hoist.
- Turn the ignition switch OFF and disconnect the battery ground (-) cable (page 16-5).
- A floor jack or other adjustable support is required to support and maneuver the engine. The jack height must be continually adjusted to relieve stress for ease of bolt removal.

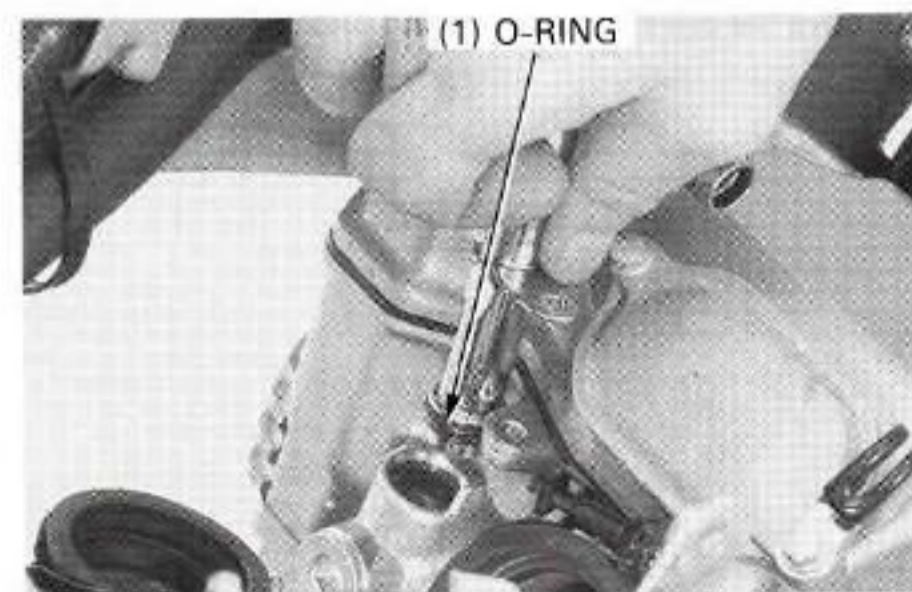
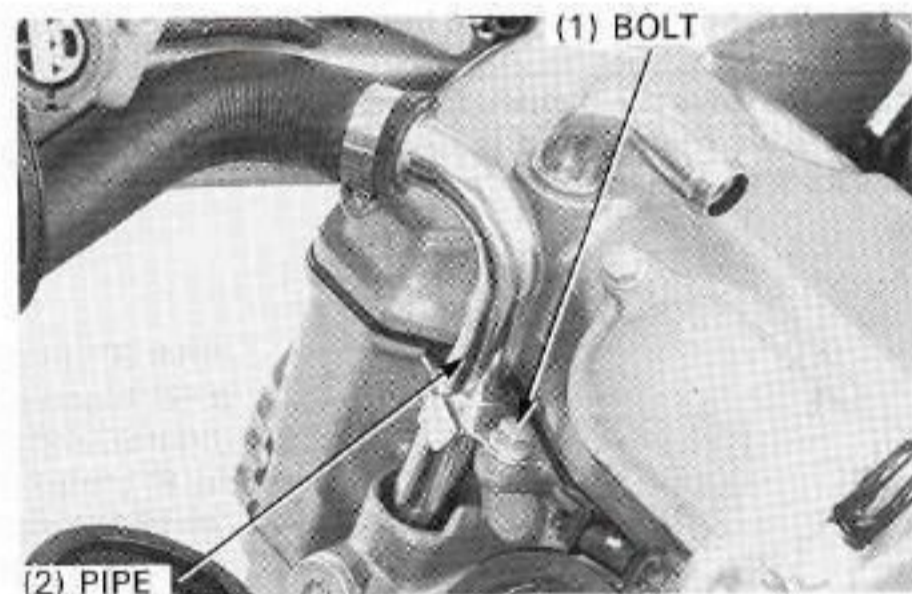
Drain the engine oil (page 3-14).

Remove the followings:

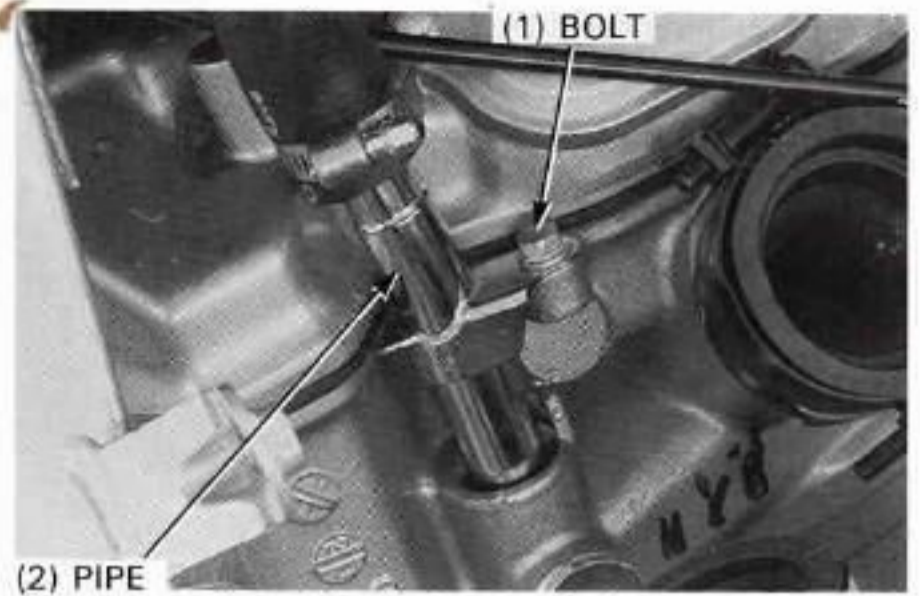
- Skid plate (page 2-7)
- Exhaust pipe/muffler (page 2-12)
- Drive sprocket (7-3)
- Oil filter (page 3-14)
- Oil cooler (page 4-11)
- Fuel tank (page 2-20)
- Carburetor (page 5-5)
- Radiator (page 6-11)
- Brake pedal (page 15-24)
- Ignition coil (page 17-11)
- Left crankcase cover (page 9-2)

Remove the bolt and rear water pipe from the rear cylinder head.

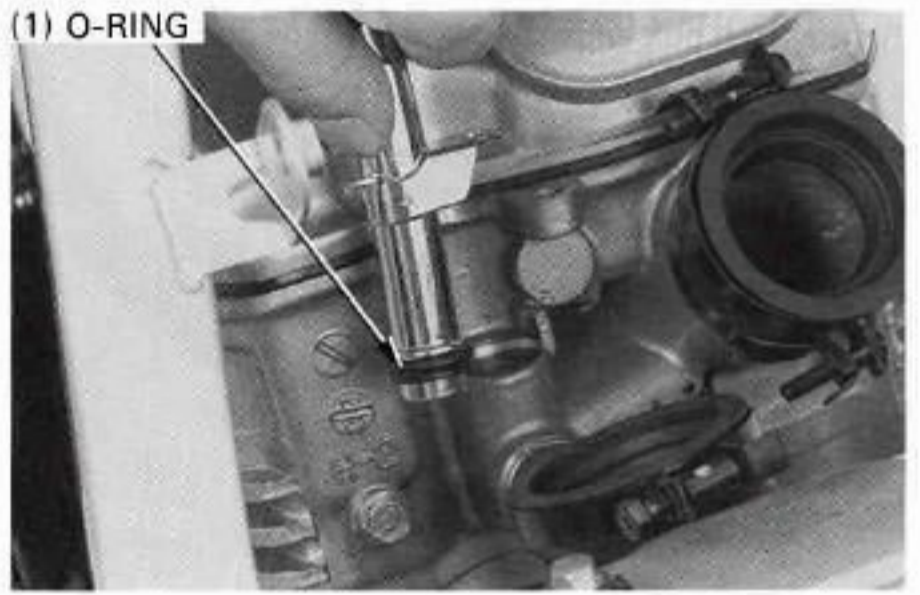
Remove the O-ring from the rear water pipe.



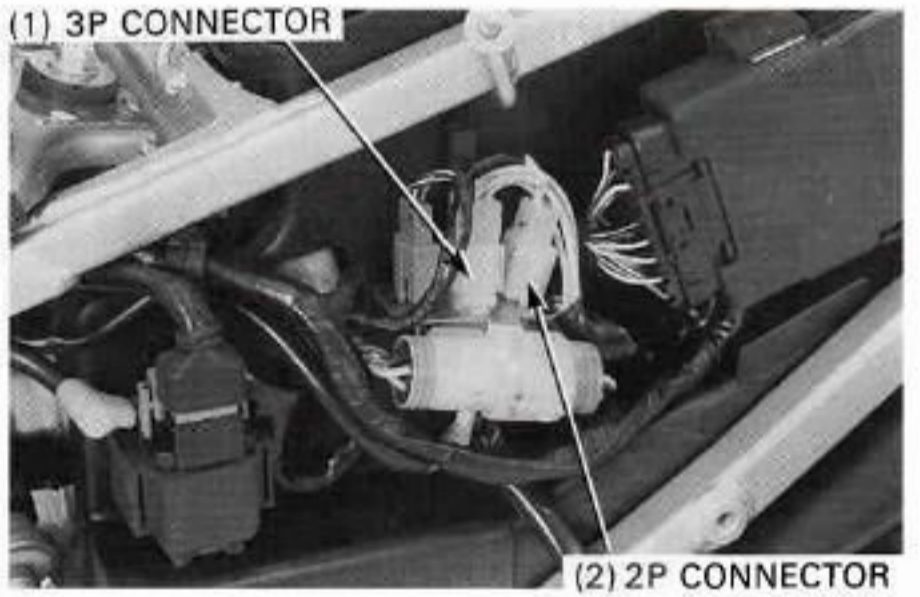
Remove the bolt and front water pipe from the front cylinder head.



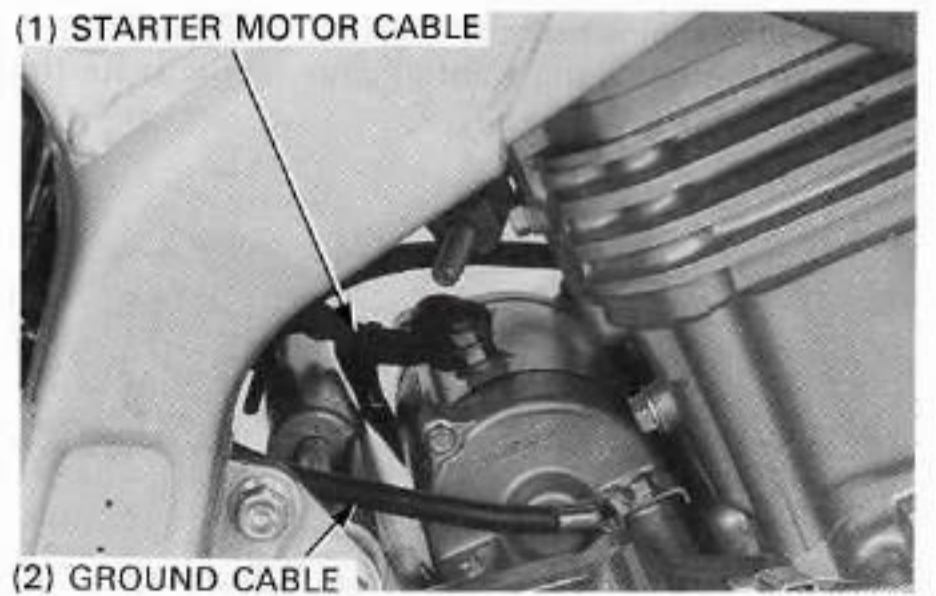
Remove the O-ring from the front water pipe.



Disconnect the alternator 3P connector and ignition pulse generator 2P connector.

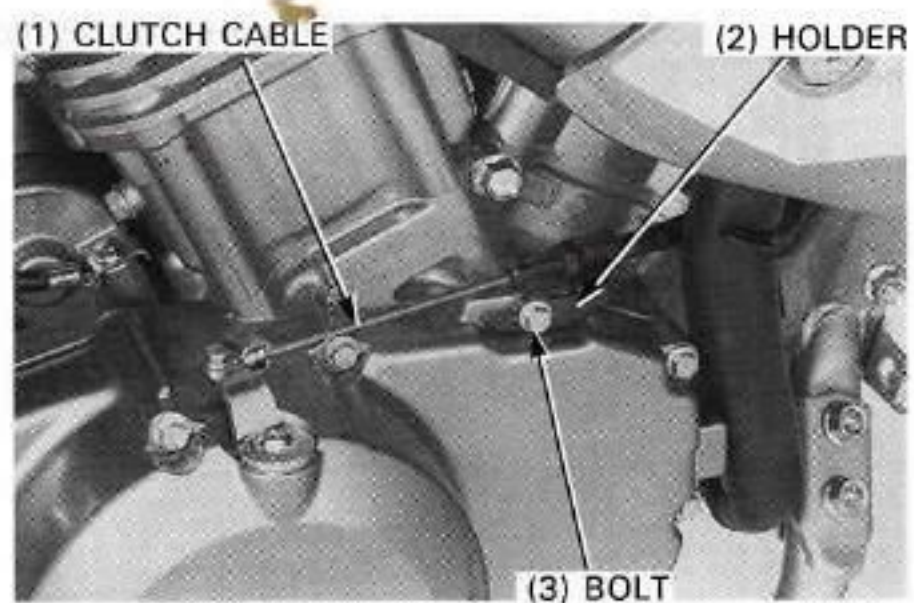


Disconnect the starter motor cable (page 18-4).
Remove the bolt and ground cable eyelet.

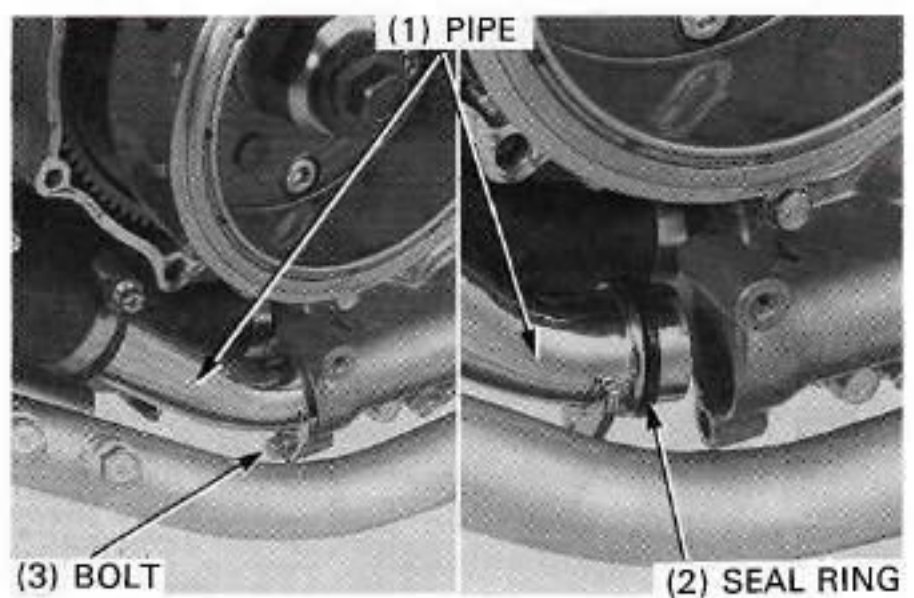


ENGINE REMOVAL/INSTALLATION

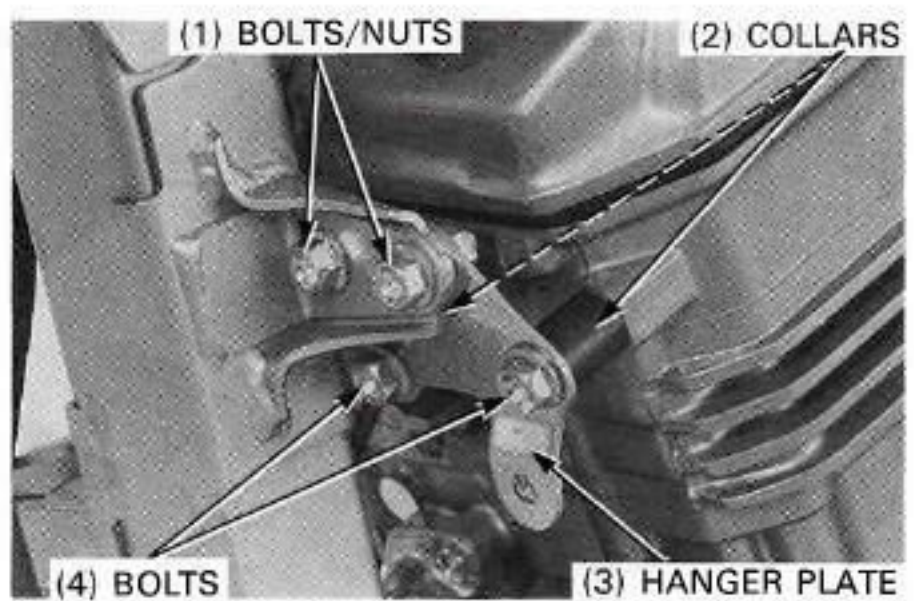
Disconnect the clutch cable and remove the cable holder bolt and holder.



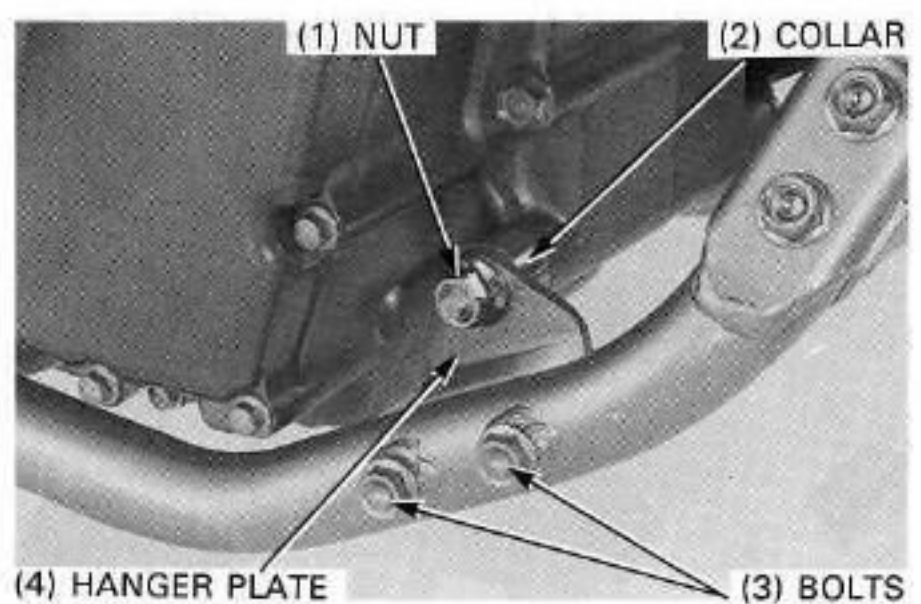
Remove the bolt and radiator lower pipe and pipe seal ring.



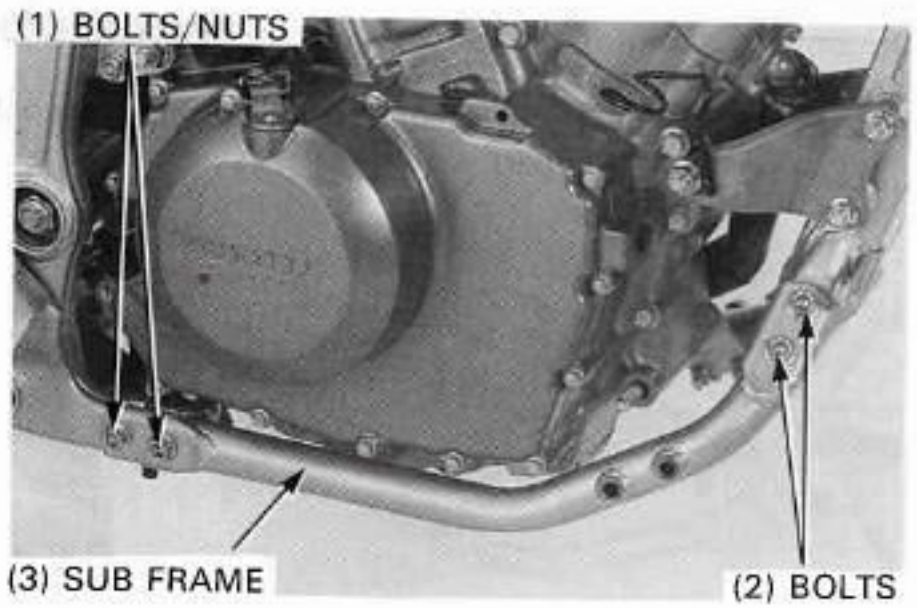
Remove the cylinder head hanger plate bolts/nuts, collar and cylinder head hanger plate.



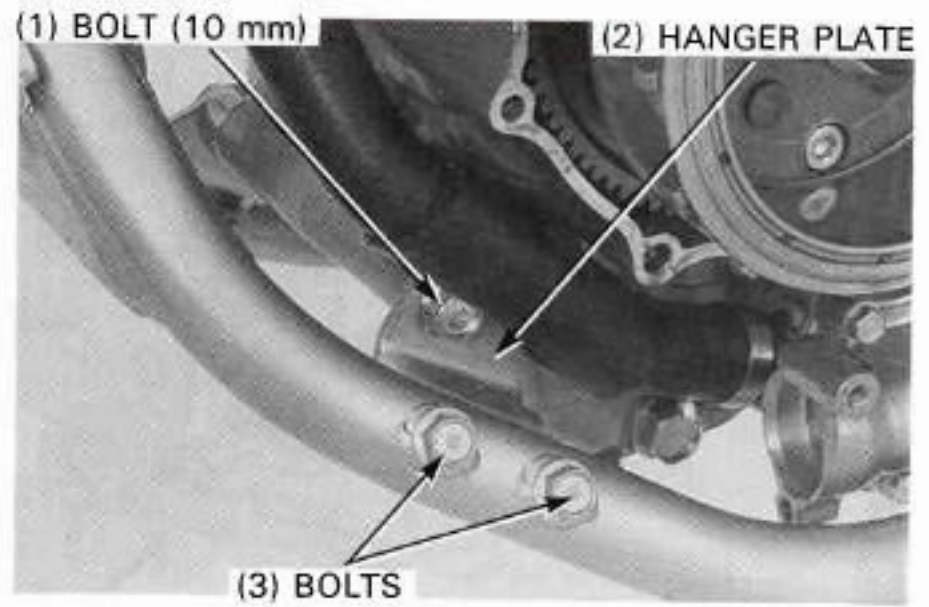
Remove the engine hanger plate nut (10 mm) and collar. Remove the bolts and right engine hanger plate (front/lower).



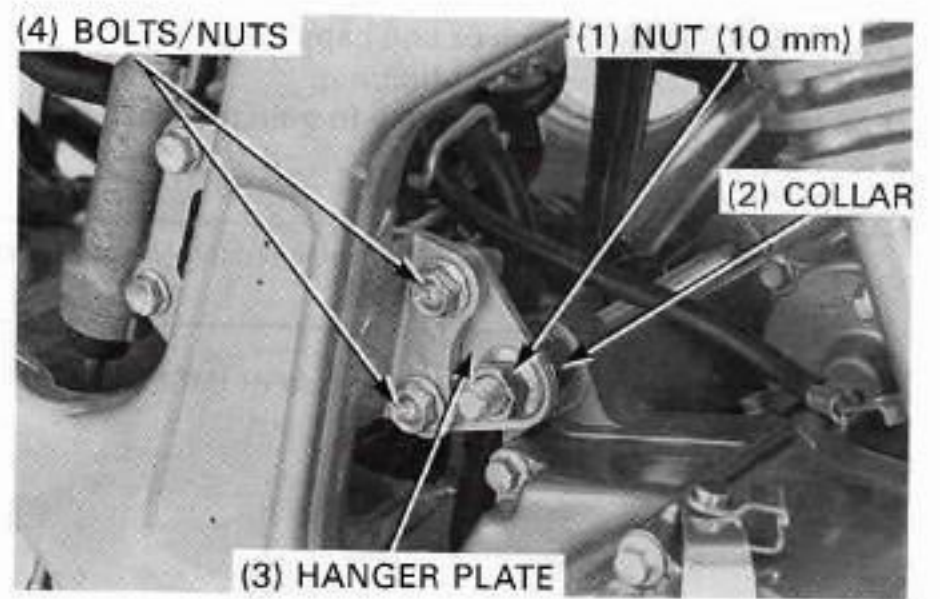
Remove the sub frame bolts/nuts and sub frame.



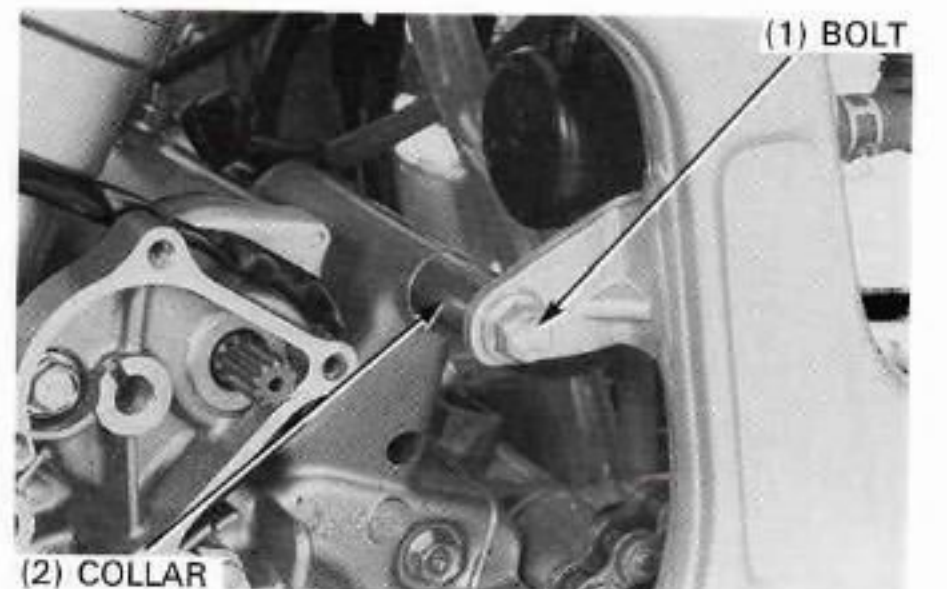
Remove the engine hanger plate bolt (10 mm).
Remove the bolts and left engine hanger plate (front/lower).



Remove the engine hanger plate nut (10 mm) and collar.
Remove the engine hanger plate bolts/nuts (8 mm) and engine hanger plate (rear).



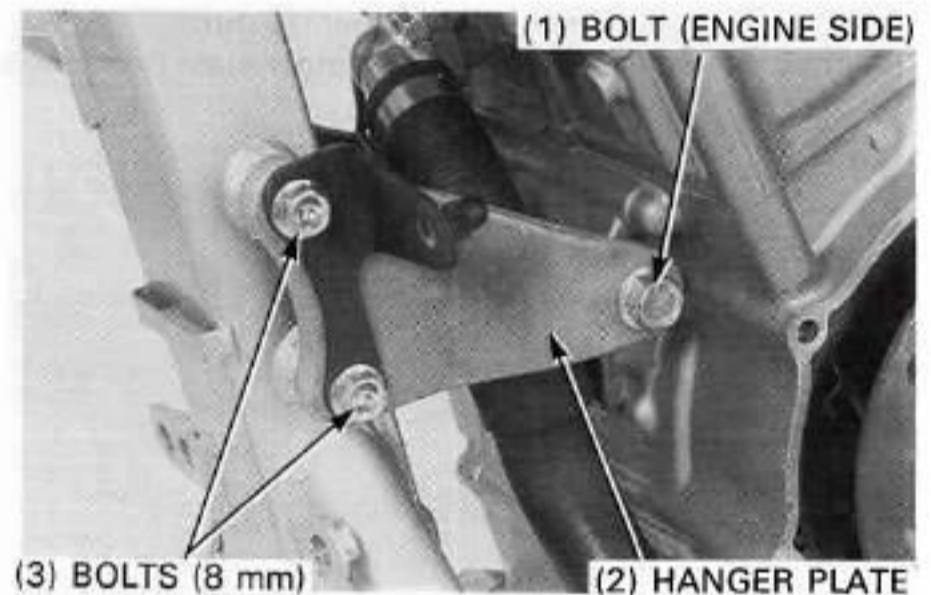
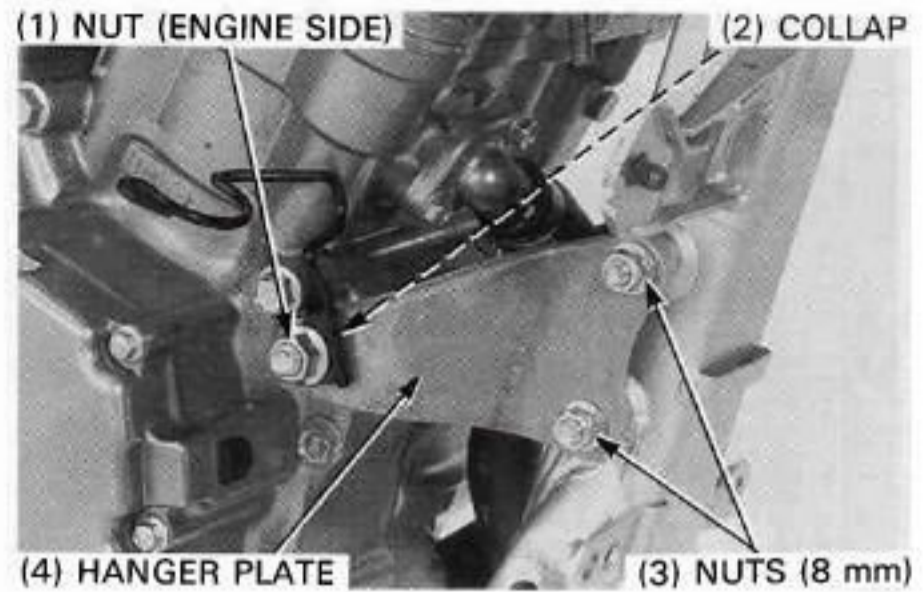
Remove the engine hanger plate bolt (10 mm) and collar.



ENGINE REMOVAL/INSTALLATION

Remove the engine hanger plate bolt/nut (engine side), collar.

Remove the engine hanger plate bolt/nut (8 mm) and engine hanger plate (front/upper).

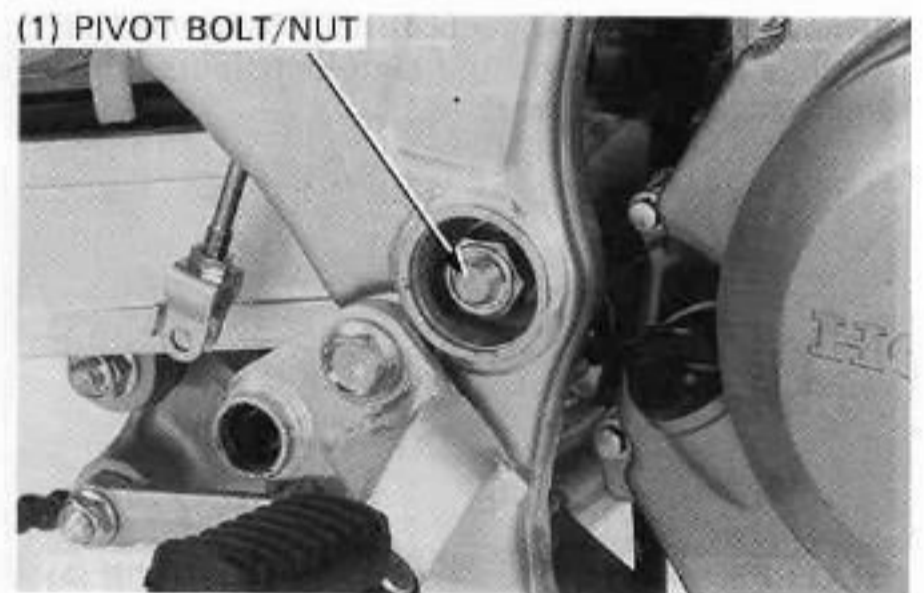


Remove the swingarm pivot bolt caps (page 14-21).
Remove the swingarm pivot bolt/nut.
Pull the rear wheel rearward fully to gain the clearance.

CAUTION

- *During engine removal, hold the engine securely and be careful not to damage the frame and engine.*

Remove the engine from the right side of the frame.



ENGINE INSTALLATION

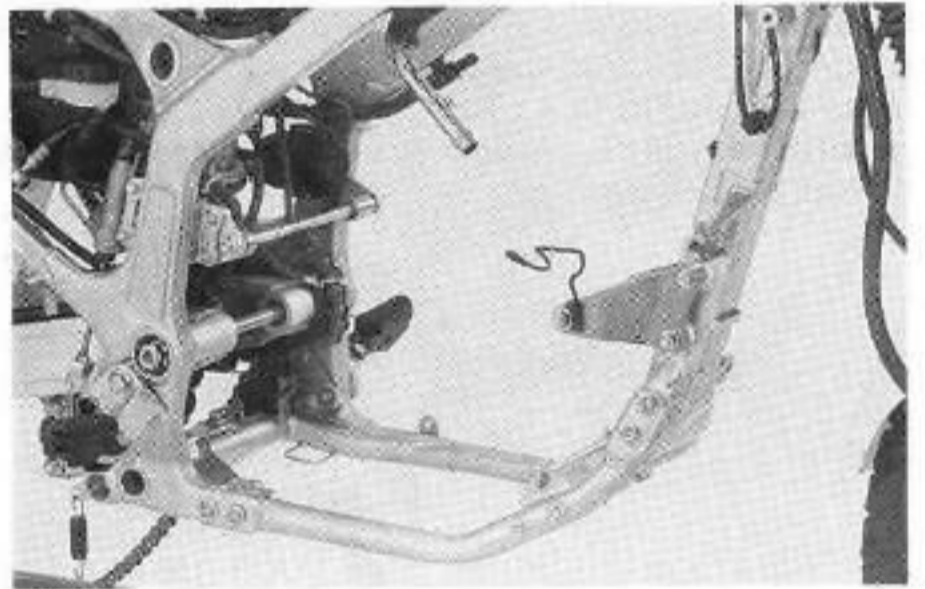
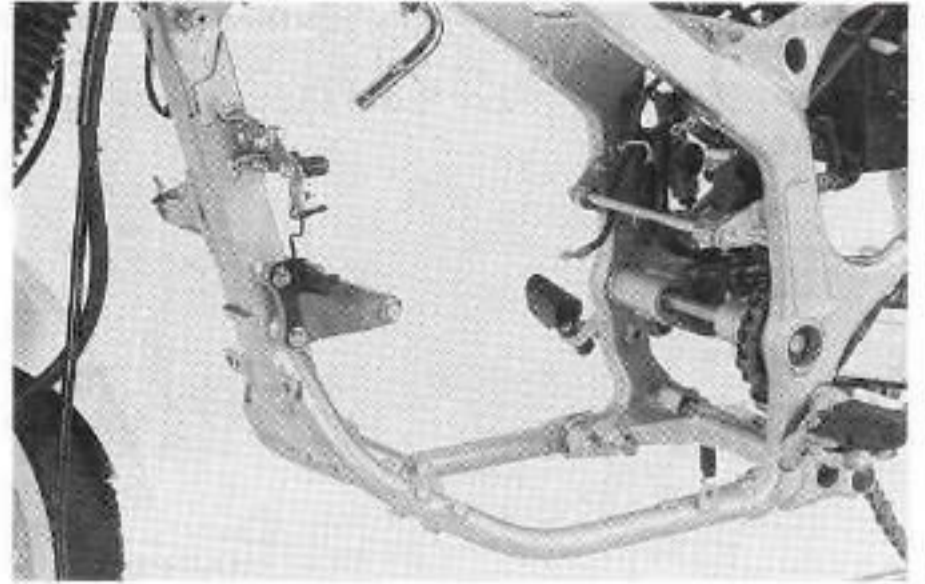
CAUTION

- Carefully align the mounting points with the jack to prevent damage to engine, frame, wires and cables.

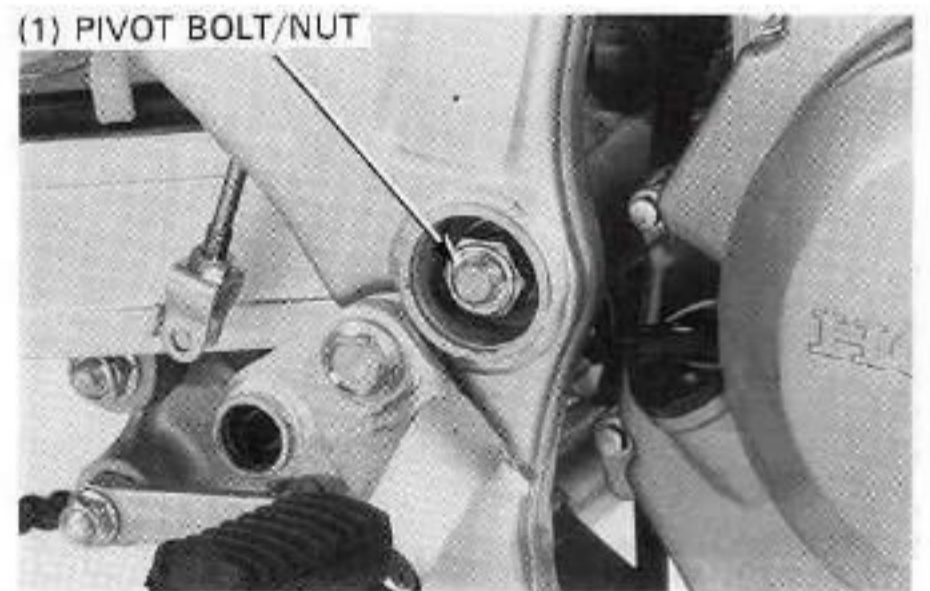
NOTE

- All the engine mounting bolts and nuts loosely install, then tighten the bolts and nuts to the specified torque.
- At engine installation, temporarily install the drive chain to the gearshift spindle.

Pull the rear wheel rearward fully to gain the clearance.
Use a floor jack or other adjustable support to carefully maneuver the engine in to place.
Carefully align the bolt holes in the frame and engine.



Install the swingarm pivot bolt and nut.



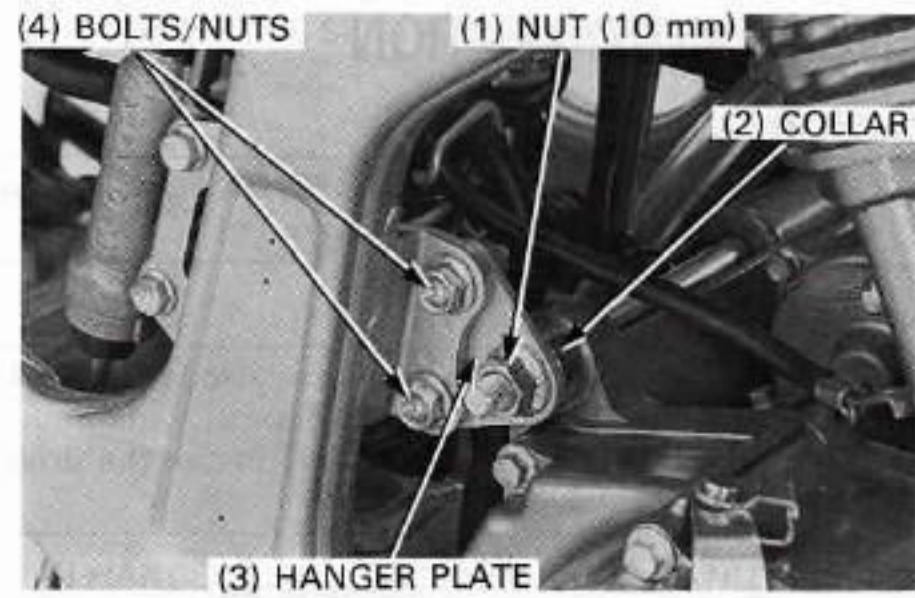
Install the collar (φ 22 X 29.5 mm) and engine hanger plate nut (10 mm).



ENGINE REMOVAL/INSTALLATION

Install the engine hanger plate (rear) and engine hanger plate bolts (8 mm).

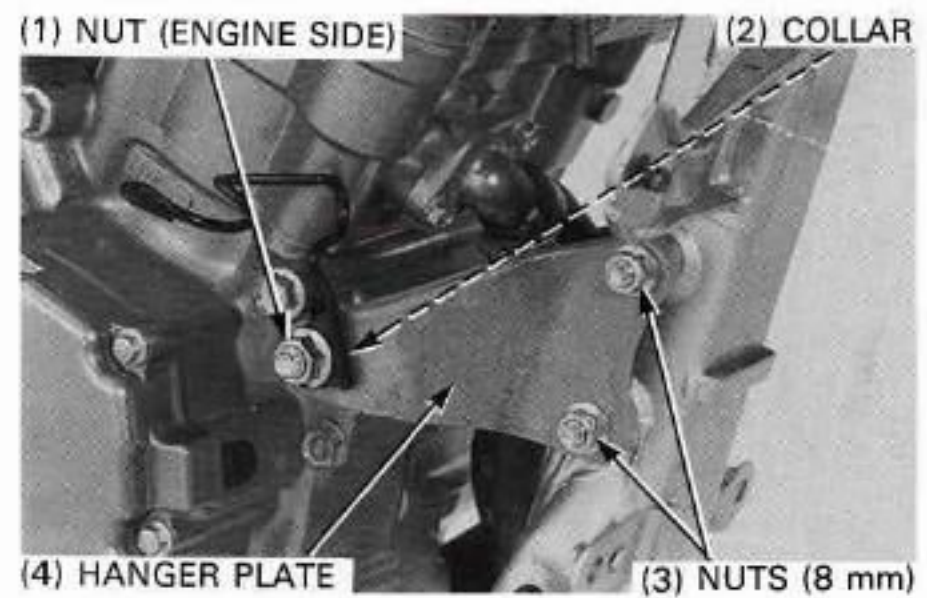
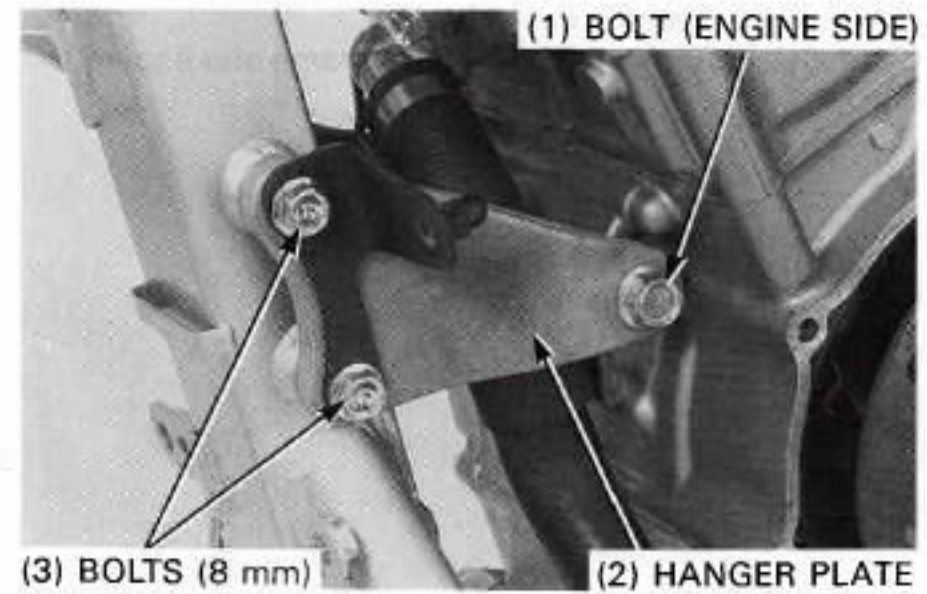
Install the collar (ϕ 24 X 12 mm) and engine hanger plate nut (10 mm).



Install the engine hanger plate (front/upper) and engine hanger plate bolt/nut (8 mm).

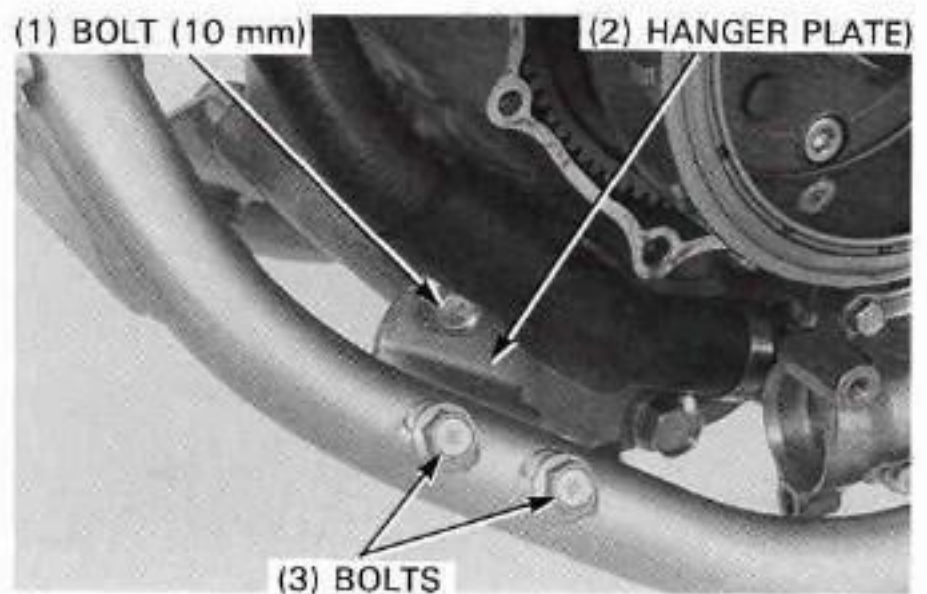
Install the collar (ϕ 20 X 7 mm).

Install the engine head hanger plate and engine hanger plate bolt/nut (engine side).

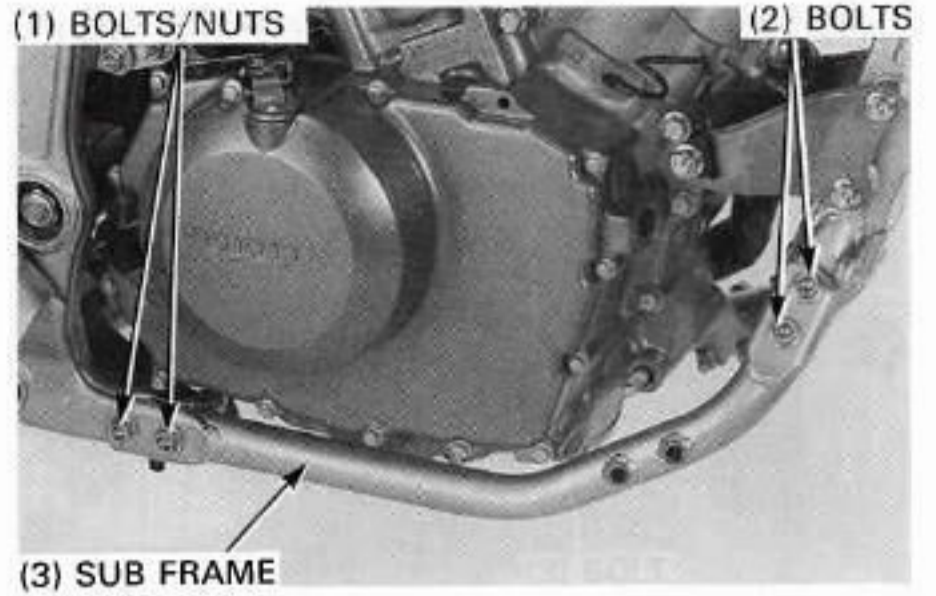


Install the right engine hanger plate (front/lower) and bolts.

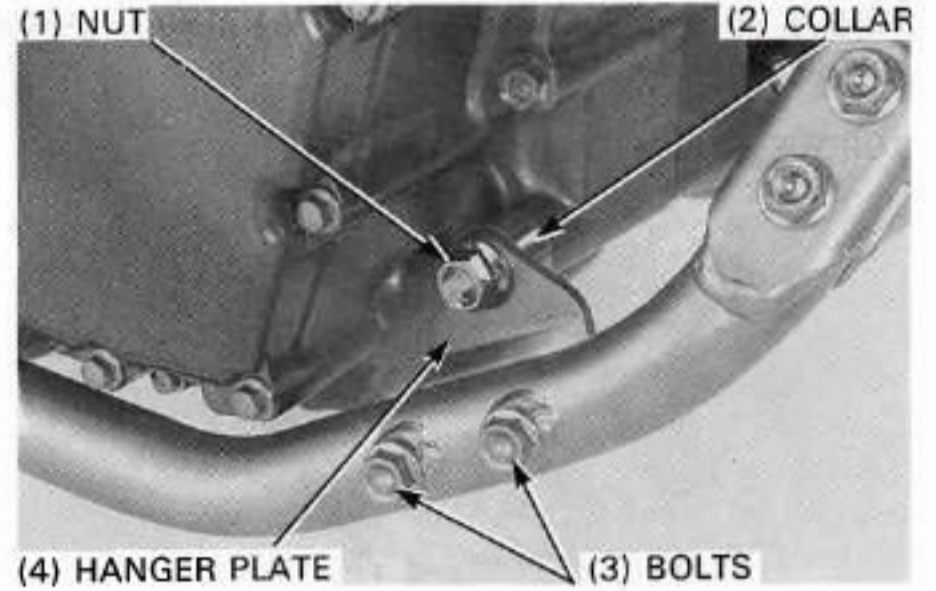
Install the engine hanger plate bolt (10 mm).



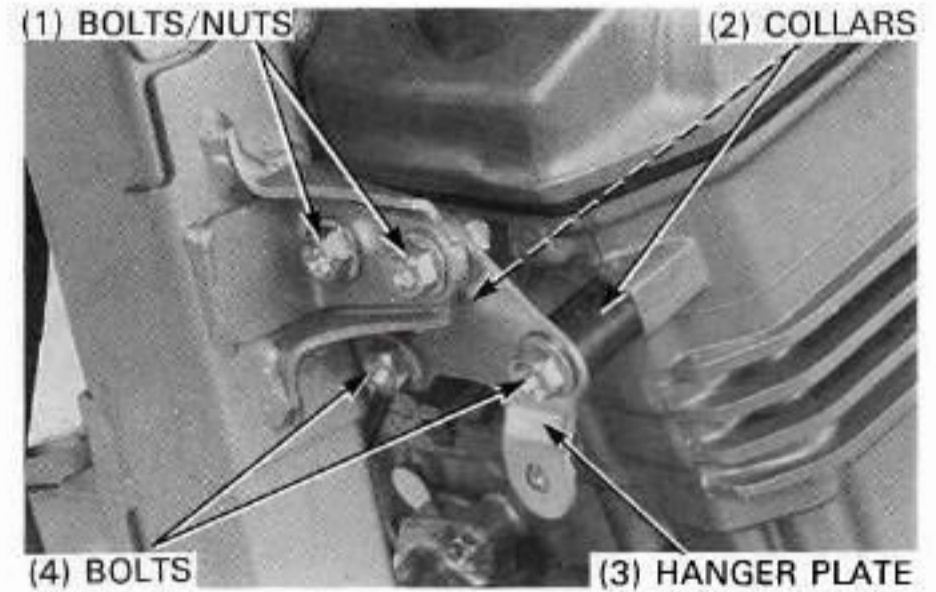
Install the sub frame and sub frame bolts.



Install the left engine hanger plate (front/lower) and bolt.
Install the collar (ϕ 24 X 12 mm) and engine hanger plate nut (10 mm).



Install the collars (ϕ 17 X 20 mm).
Install the cylinder head hanger plate and cylinder head hanger plate bolt/nut.

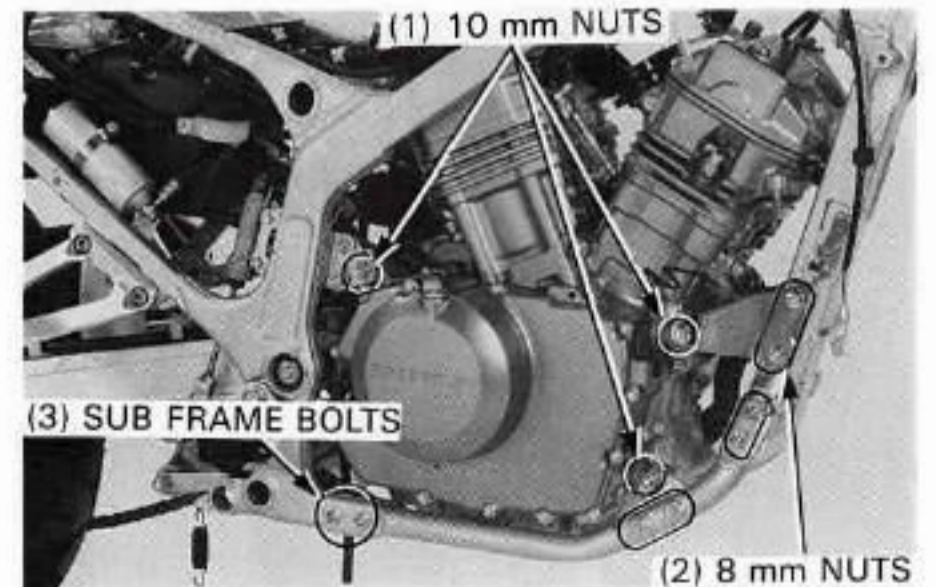


Tighten the sub frame bolt to the specified torque.

TORQUE: 55 N·m (5.6 kgf·m, 41 lbf·ft)

Tighten the engine hanger plate nut to the specified torque.

TORQUE: 10 mm: 53 N·m (5.4 kgf·m, 39 lbf·ft)
8 mm: 32 N·m (3.3 kgf·m, 24 lbf·ft)

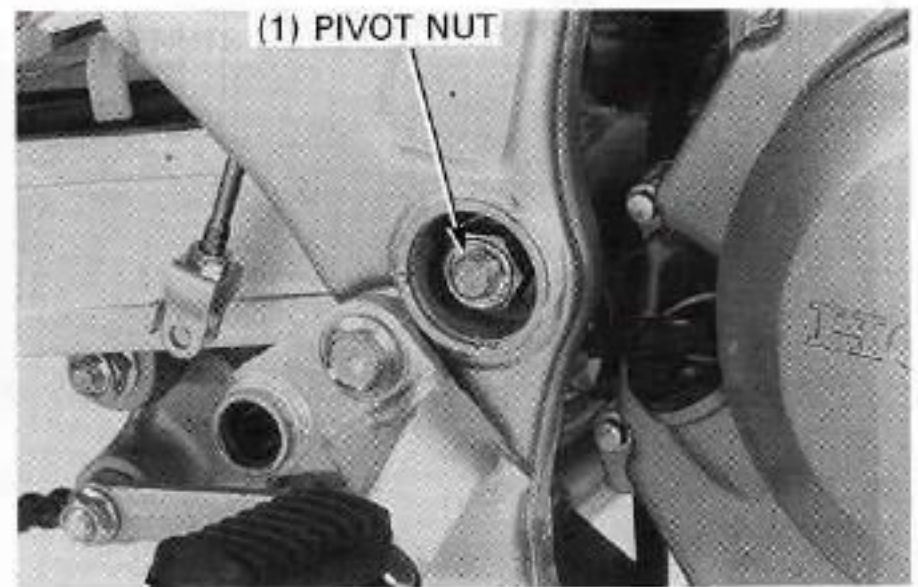


ENGINE REMOVAL/INSTALLATION

Tighten the swingarm pivot nut to the specified torque.

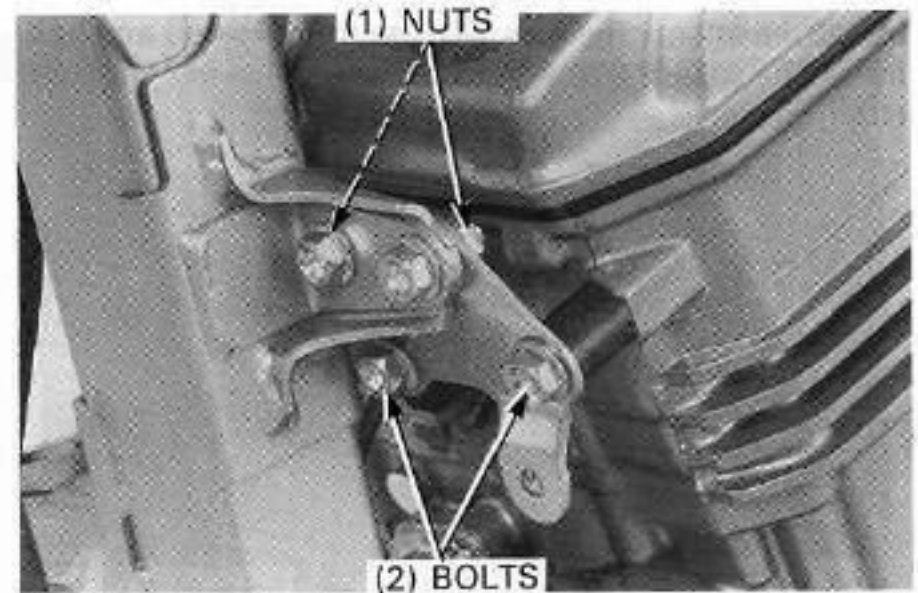
TORQUE: 106 N·m (10.8 kgf·m, 78 lbf·ft)

Install the swingarm pivot bolt cap.

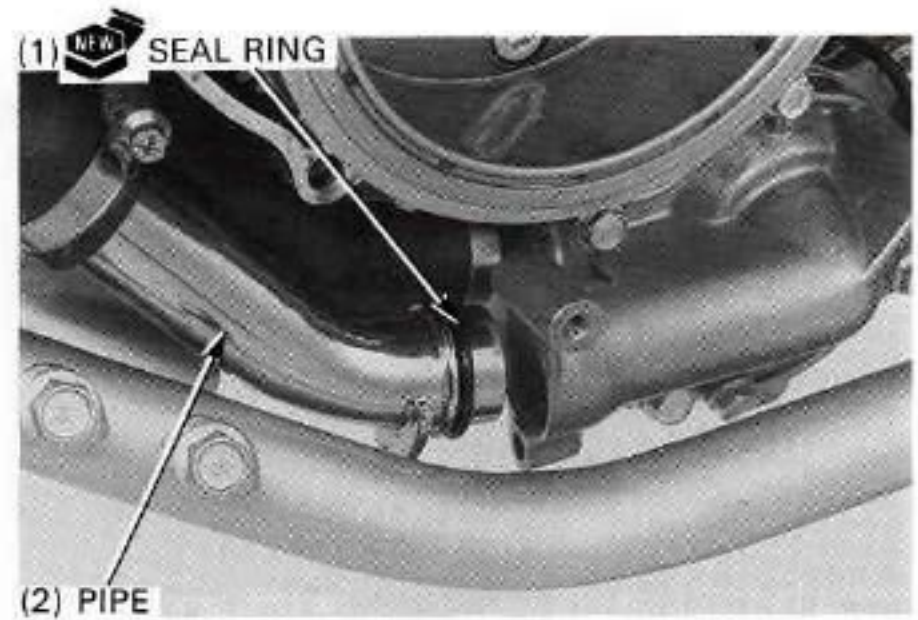


Tighten the cylinder head hanger plate nuts/bolts to the specified torque.

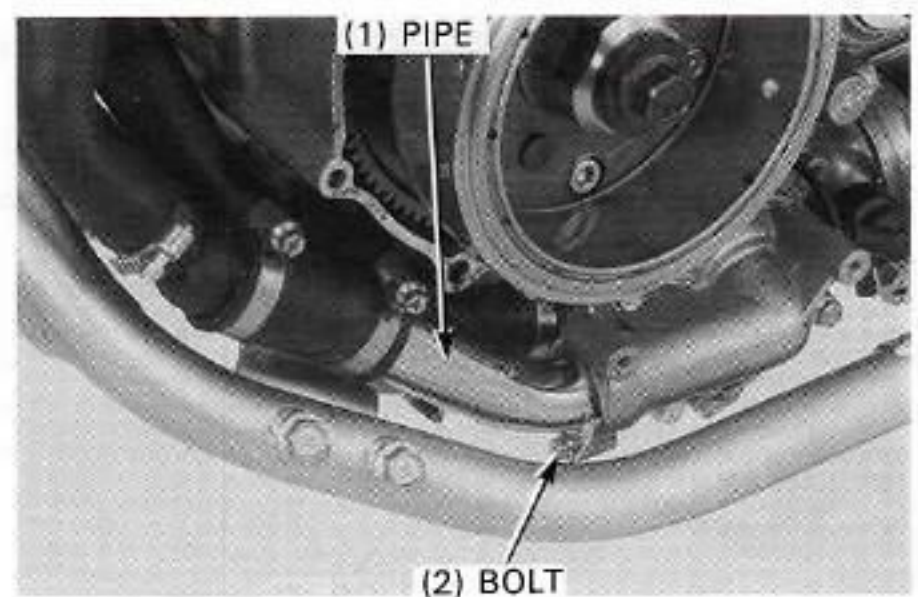
TORQUE: 53 N·m (5.4 kgf·m, 39 lbf·ft)



Install the new pipe seal ring to the lower pipe.

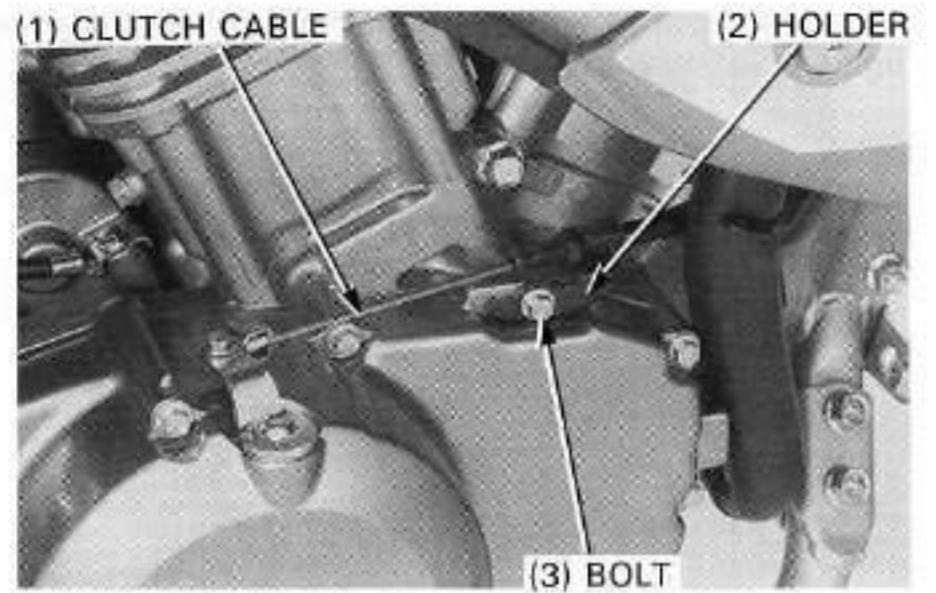


Connect the radiator lower pipe and tighten the bolt securely.

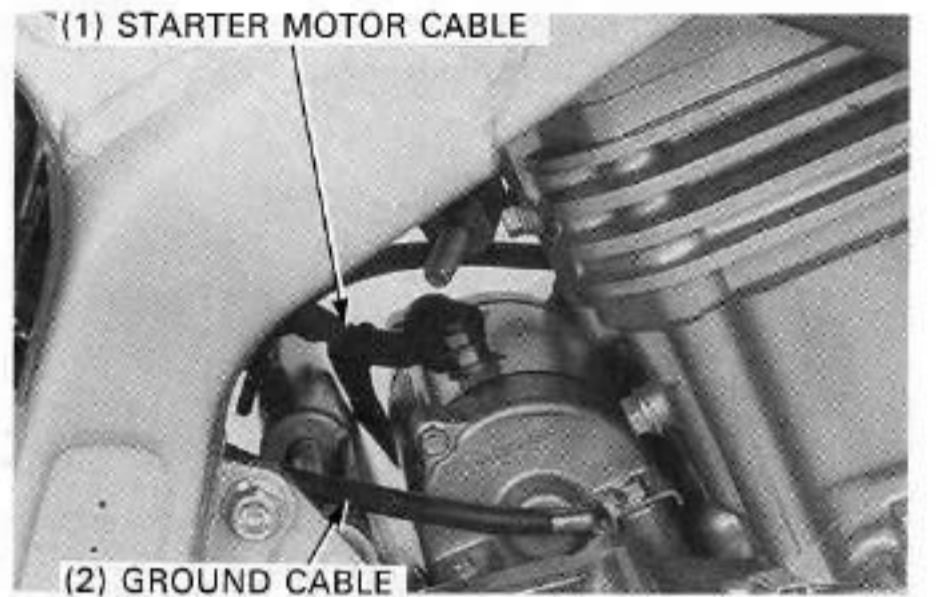


Connect the clutch cable and install the cable holder and holder bolt to the specified torque.

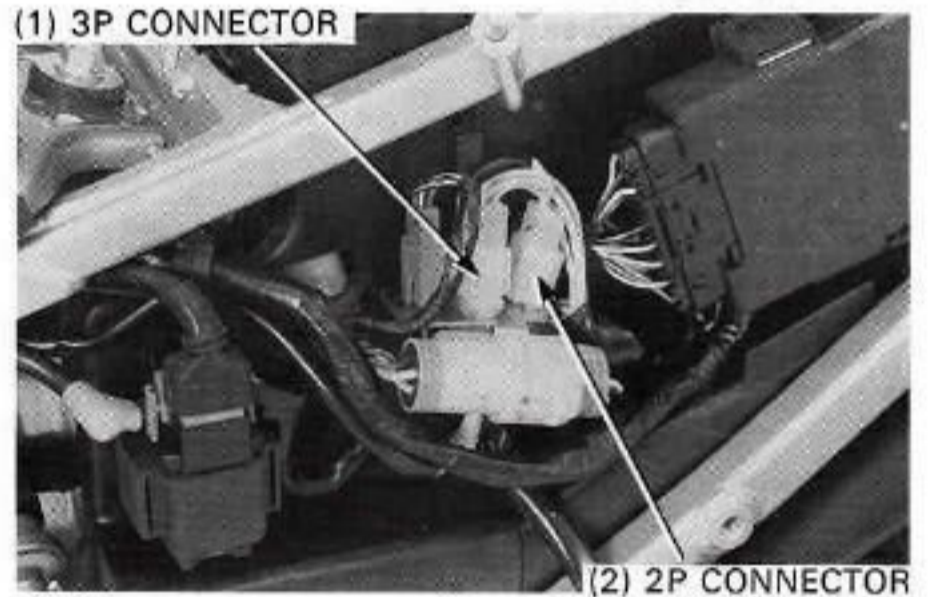
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install the ground cable eyelet and tighten the bolt securely. Connect the starter motor cable (page 18-13).



Connect the alternator 3P connector and ignition pulse generator 2P connector.

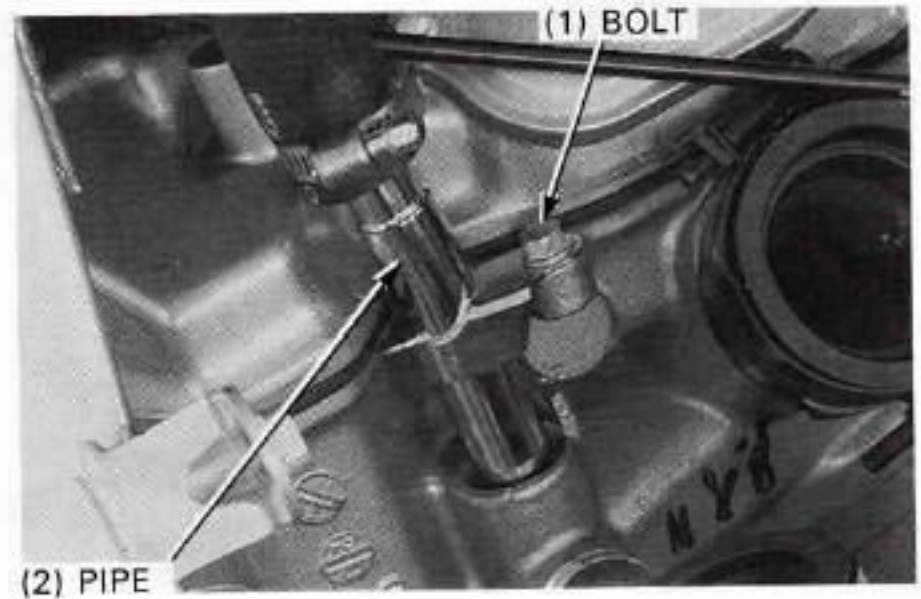


Install the new O-ring to the front water pipe with the small diameter side facing the cylinder head.

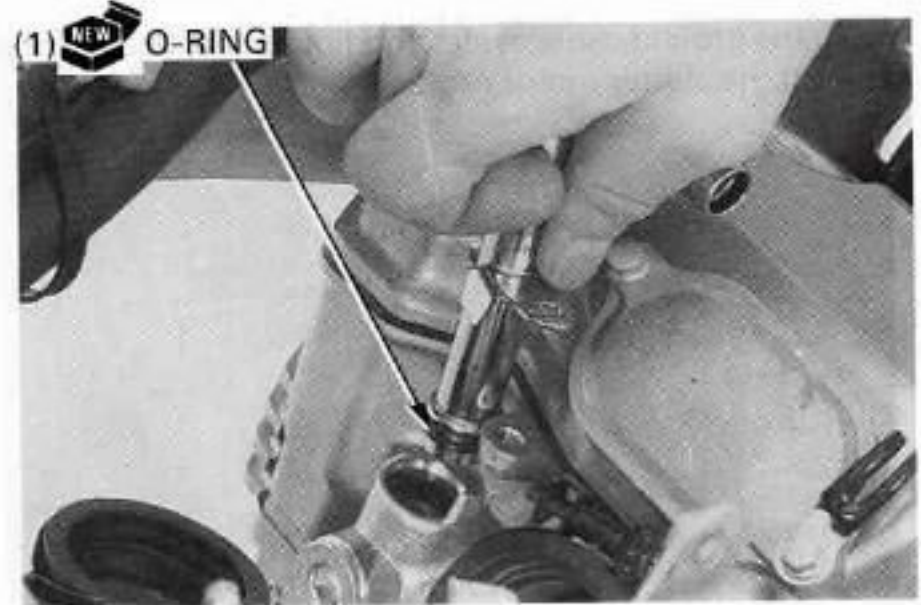


ENGINE REMOVAL/INSTALLATION

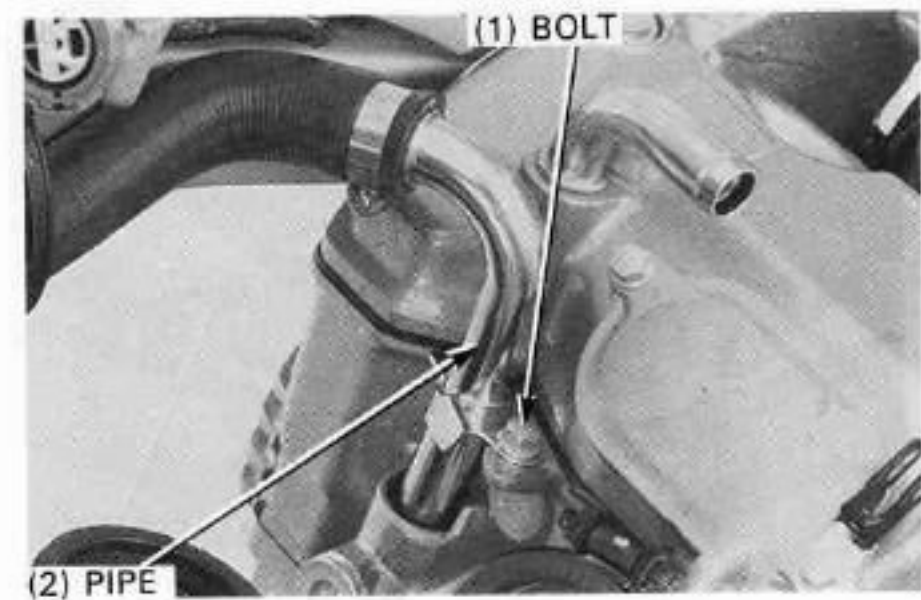
Install the front water pipe to the front cylinder head and tighten the bolt securely.



Install the new O-ring to the rear water pipe with the small diameter side facing the cylinder head.



Install the rear water pipe to the rear cylinder head and tighten the bolt securely.



Install the followings:

- Left crankcase cover (page 9-11)
- Ignition coil (page 17-11)
- Radiator (page 6-17)
- Carburetor (page 5-21)
- Fuel tank (page 2-23)
- Oil cooler (page 4-14)
- Oil filter (page 3-15)
- Drive sprocket (page 7-14)
- Exhaust pipe/muffler (page 2-17)
- Skid plate (page 2-7)

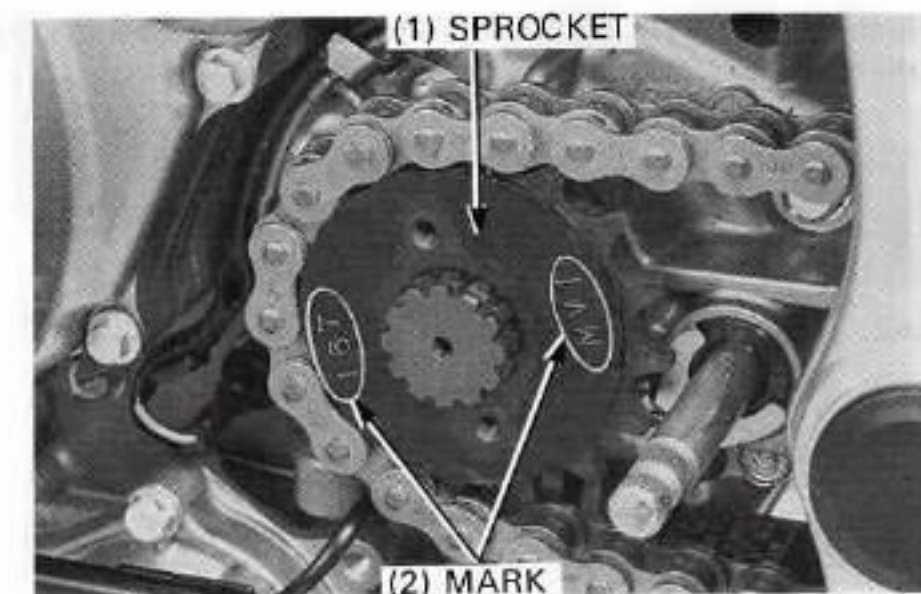
Fill the engine oil (page 3-14).

Fill and bleed the cooling system (page 6-5).

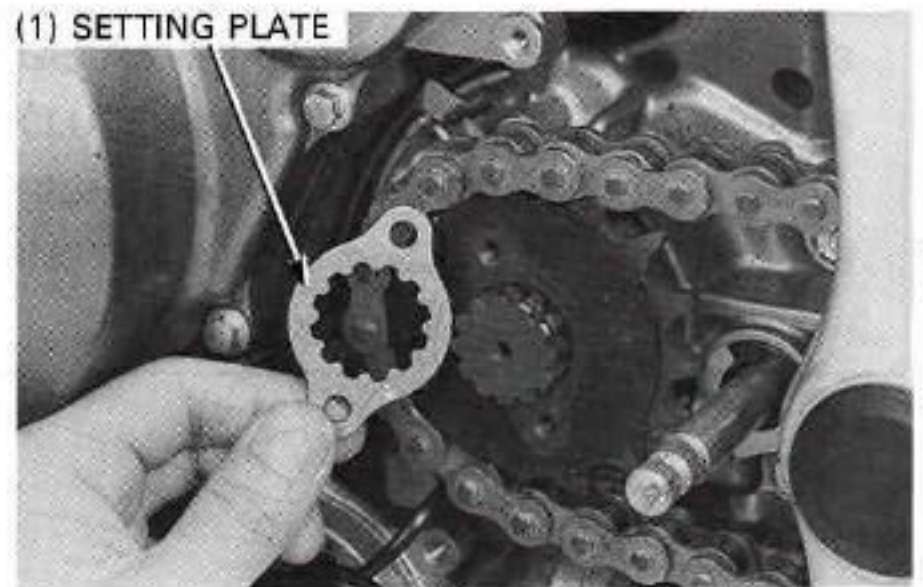
Connect the battery ground cable.

DRIVE SPROCKET INSTALLATION

Install the drive chain to the drive sprocket.
Install the drive sprocket to the countershaft with its marking side facing out.

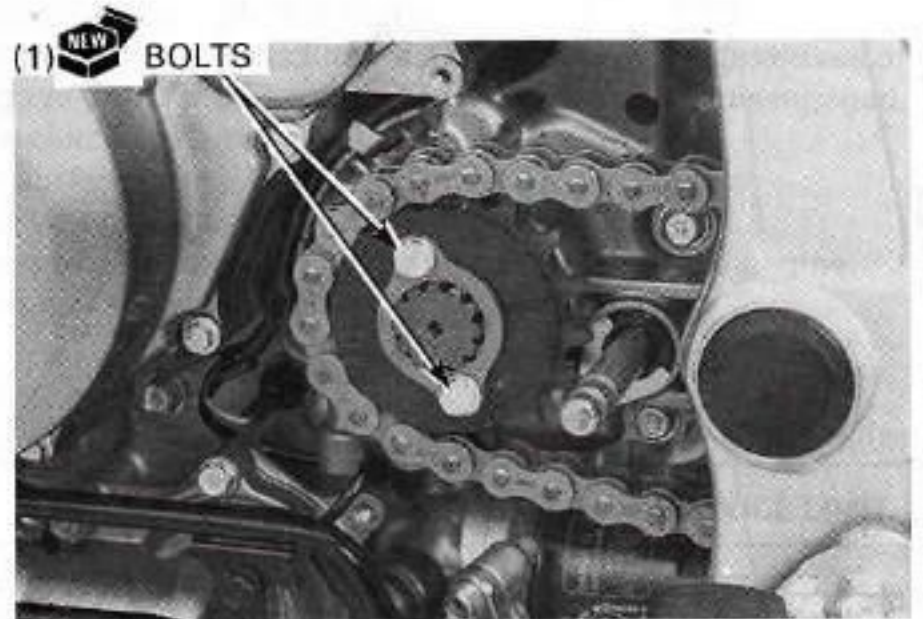


Install the drive sprocket setting plate onto the countershaft and align the bolt holes on the plate with the holes of the sprocket.

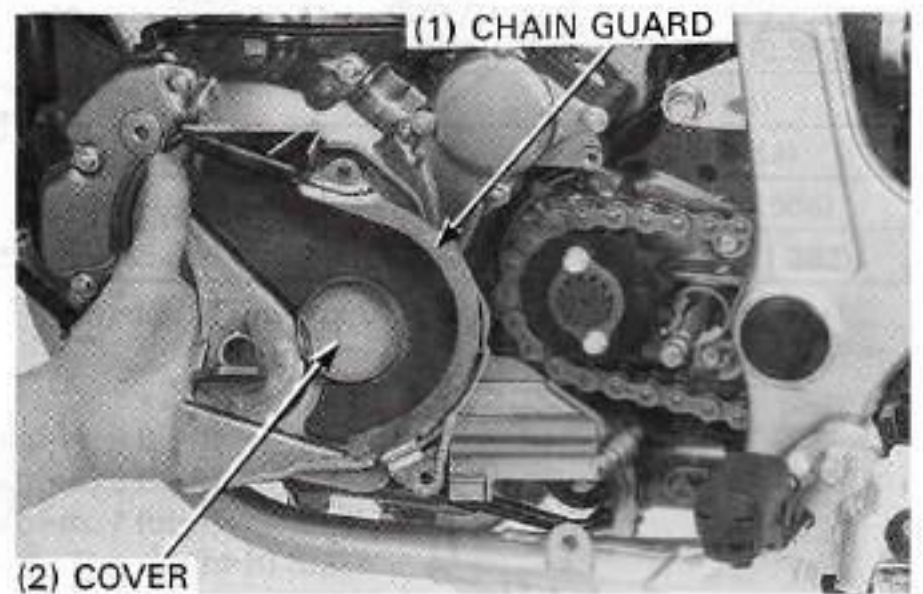


Install and tighten the new drive sprocket setting plate bolts to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



Install the drive chain guard to the drive sprocket cover.



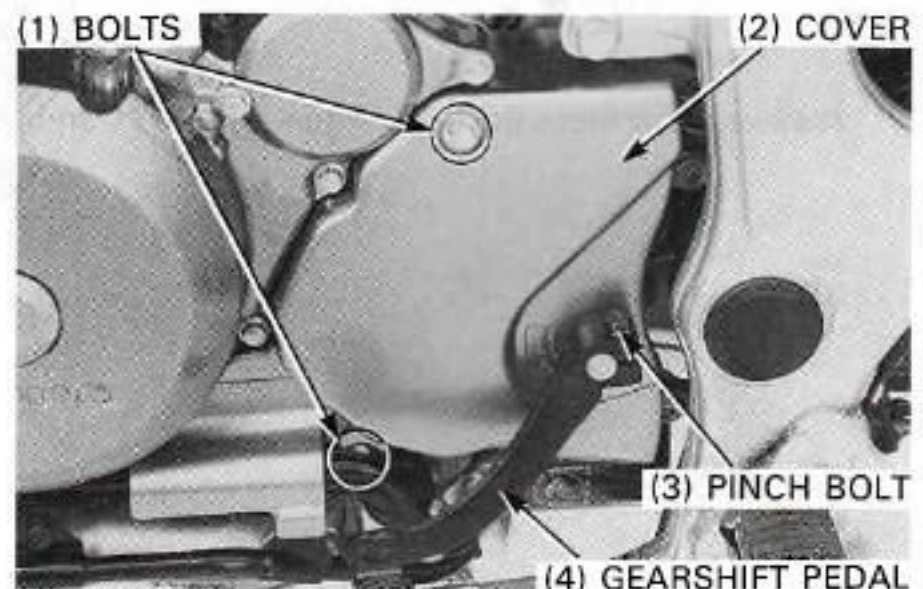
Install the drive sprocket cover and tighten the bolts securely.

Install the gearshift pedal aligning the punch mark on the spindle with the slit of the gearshift pedal.

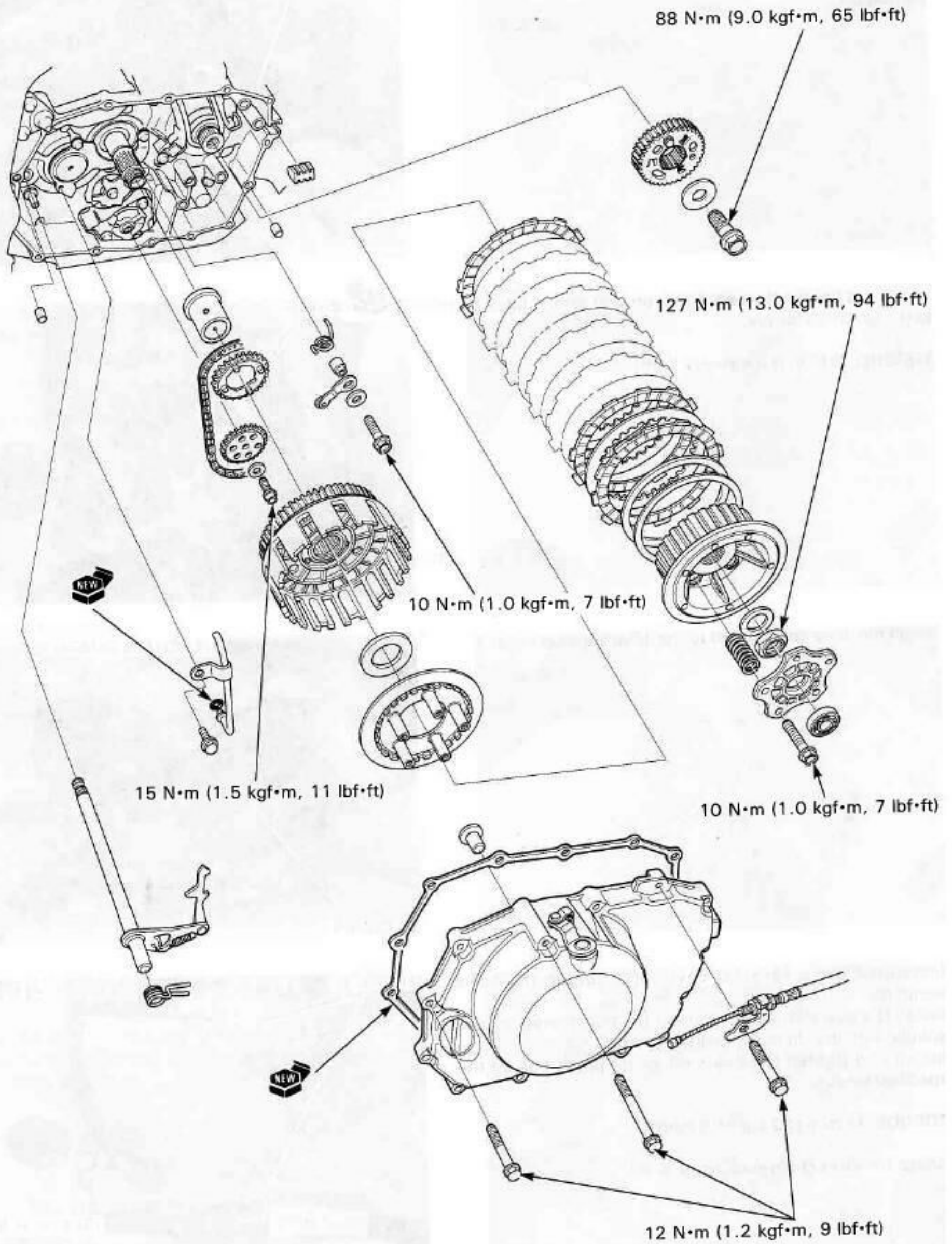
Install and tighten the gearshift pedal pinch bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Adjust the drive chain slack (page 3-18).



CLUTCH/GEARSHIFT LINKAGE



8. CLUTCH/GEARSHIFT LINKAGE

| | | | |
|-------------------------------|------|-----------------------|------|
| SERVICE INFORMATION | 8-1 | GEARSHIFT LINKAGE | 8-13 |
| TROUBLESHOOTING | 8-2 | CLUTCH INSTALLATION | 8-15 |
| RIGHT CRANKCASE COVER REMOVAL | 8-2 | RIGHT CRANKCASE COVER | |
| CLUTCH REMOVAL | 8-6 | INSTALLATION | 8-18 |
| PRIMARY DRIVE GEAR | 8-11 | | |

SERVICE INFORMATION

GENERAL

- The clutch and gearshift linkage maintenance can be done with the engine in the frame.
- Engine oil viscosity and level, and the use of oil additives have an effect on clutch disengagement. Oil additives of kind are not recommended. When the clutch does not disengage or the motorcycle creeps with the clutch disengaged, inspect the engine oil viscosity and level before servicing the clutch system.
- Clean off any gasket material from the right crankcase cover surface.
- Be careful not to damage the crankcase cover mating surface when servicing.
- When removing or servicing the clutch and gearshift linkage, use care not to allow dust or dirt to enter the engine.
- The crankcase must be separated when the transmission requires service (Section 12).

8

SPECIFICATIONS

Unit:mm(in)

| ITEM | | STANDARD | SERVICE LIMIT |
|--------------------------------------|------|-----------------------------------|---------------|
| Clutch lever free play | | 10-20(0.4 - 0.8) | _____ |
| Clutch outer guide | O.D. | 34.968 - 34.984 (1.3767 - 1.3773) | 34.96 (1.376) |
| | I.D. | 24.991 - 25.016 (0.9831 - 0.9849) | 25.03 (0.985) |
| Mainshaft O.D. at clutch outer guide | | 24.967 - 24.980 (0.9830 - 0.9835) | 24.95 (0.982) |
| Clutch spring free length | | 41.2 (1.62) | 39 (1.5) |
| Clutch disc thickness | | 3.72 - 3.88 (0.147 - 0.153) | 3.6 (0.14) |
| Clutch plate warpage | | _____ | 0.15 (0.006) |
| Oil pump drive sprocket I.D. | | 35.025 - 35.075 (1.3789 - 1.3809) | 35.10 (1.382) |

TORQUE VALUES

| | |
|-------------------------------|--|
| Right crankcase cover bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) |
| Clutch cable holder bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) |
| Clutch lifter plate bolt | 10 N•m (1.0 kgf•m, 7 lbf•ft) |
| Clutch center lock nut | 127 N•m (13.0 kgf•m, 94 lbf•ft) Stake |
| Primary drive gear bolt | 88 N•m (9.0 kgf•m, 65 lbf•ft) UBS bolt |
| Shift drum stopper arm bolt | 10 N•m (1.0 kgf•m, 7 lbf•ft) Apply a locking agent to the threads |
| Gearshift pedal pinch bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) |
| Shift return spring pin | 23 N•m (2.3 kgf•m, 17 lbf•ft) |
| Oil pump driven sprocket bolt | 15 N•m (1.5 kgf•m, 11 lbf•ft) Apply a locking agent to the threads |

CLUTCH/GEARSHIFT LINKAGE

TOOLS

| | |
|------------------------|---------------|
| Clutch center holder | 07JMB-MN50300 |
| Gear holder | 07724-0010100 |
| Attachment, 37 X 40 mm | 07746-0010200 |
| Attachment, 42 X 47 mm | 07746-0010300 |
| Pilot, 35 mm | 07746-0040800 |
| Driver | 07749-0010000 |

TROUBLESHOOTING

Clutch lever too hard

- Damaged, kinked or dirty clutch cable
- Faulty clutch lifter plate bearing
- Damaged clutch lifter mechanism
- Improperly routed clutch cable

Clutch will not disengage or motorcycle creeps with clutch disengaged

- Too much clutch lever free play
- Warped clutch plates
- Loose clutch center lock nut
- Engine oil too high, improper oil viscosity

Clutch slips

- Clutch lifter sticking
- Worn clutch discs
- Weak clutch springs
- No clutch lever free play

Hard to shift

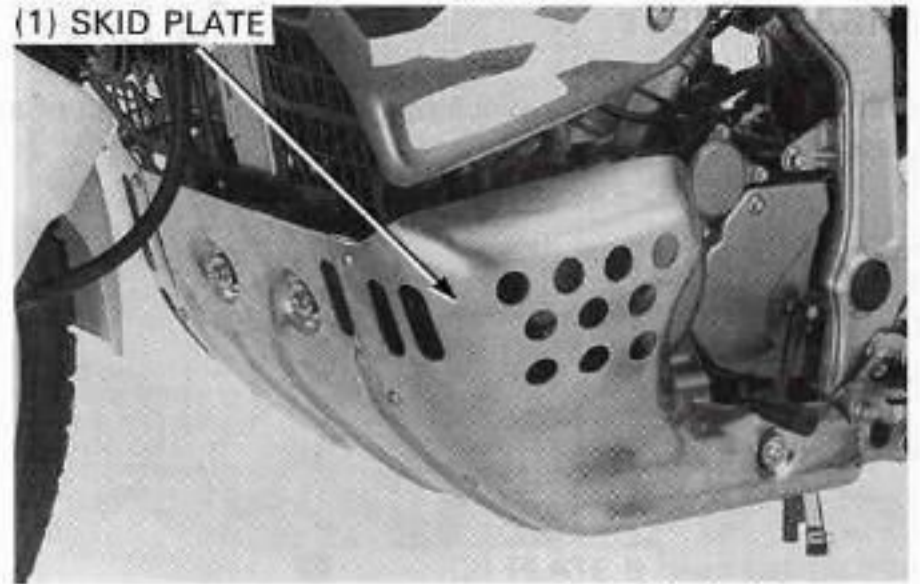
- Improper clutch operation or incorrect clutch adjustment
- Bent or damaged shift forks (Section 12)
- Bent shift fork shaft (Section 12)
- Bent or damaged gearshift spindle
- Damaged shift drum cam grooves

Transmission jumps out of gear

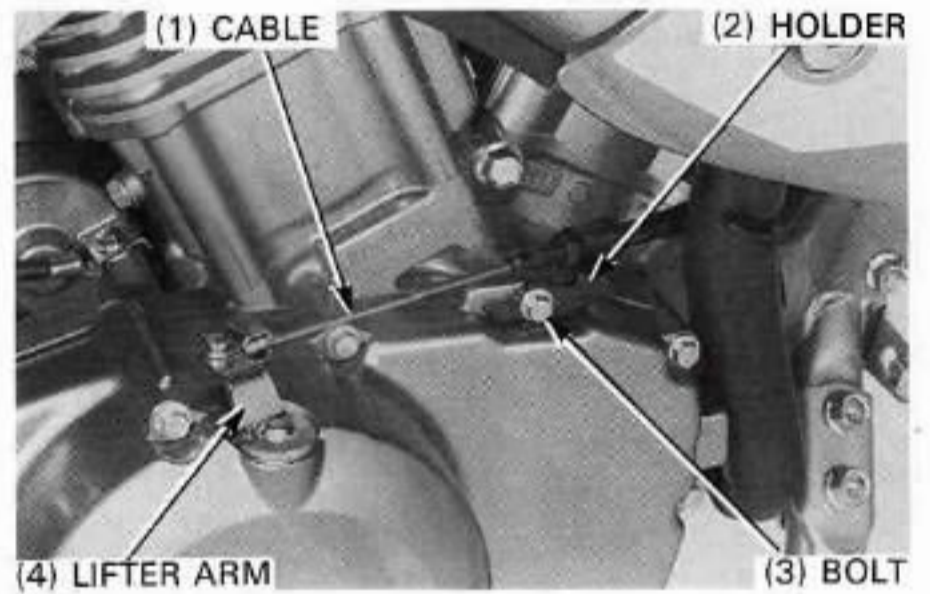
- Worn gear dogs or slots
- Bent shift fork shaft (Section 12)
- Broken shift drum stopper arm
- Worn or bent shift forks (Section 12)
- Broken shift linkage return spring

RIGHT CRANKCASE COVER REMOVAL

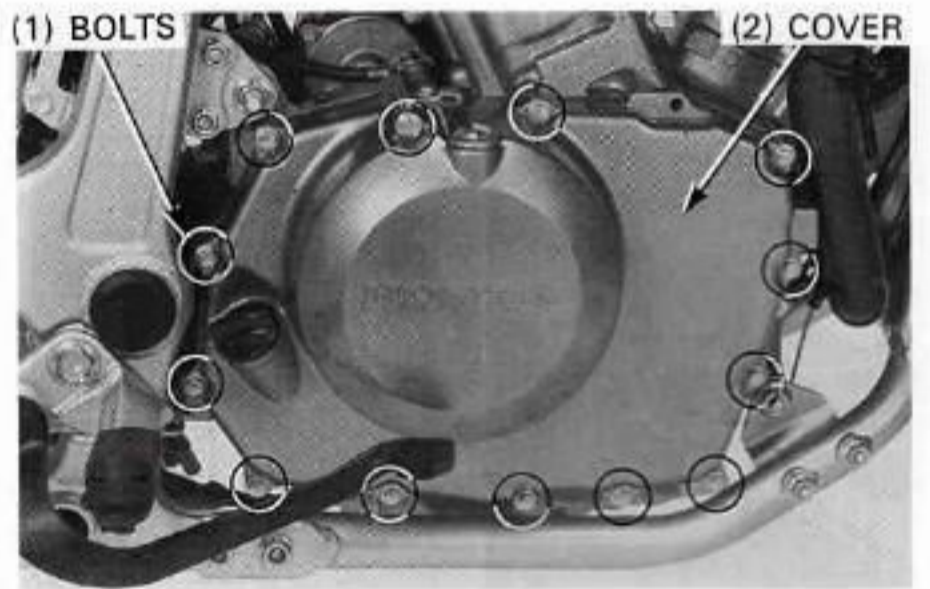
Drain the engine oil (page 3-14).
Remove the exhaust pipe (page 2-12).
Remove the skid plate (page 2-7).



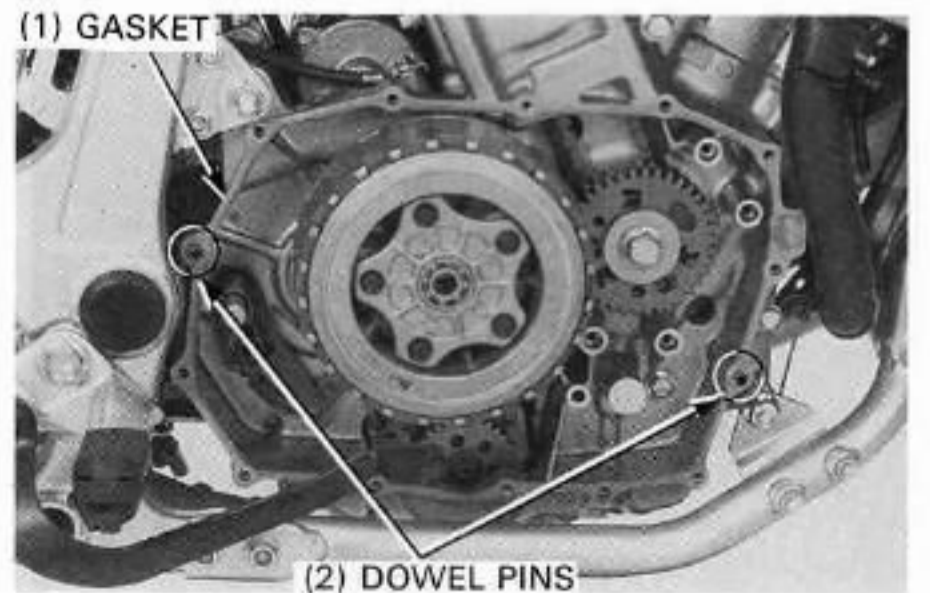
Remove the bolt and cable holder.
Disconnect the clutch cable from the clutch lifter arm.



Remove the bolts and right crankcase cover.



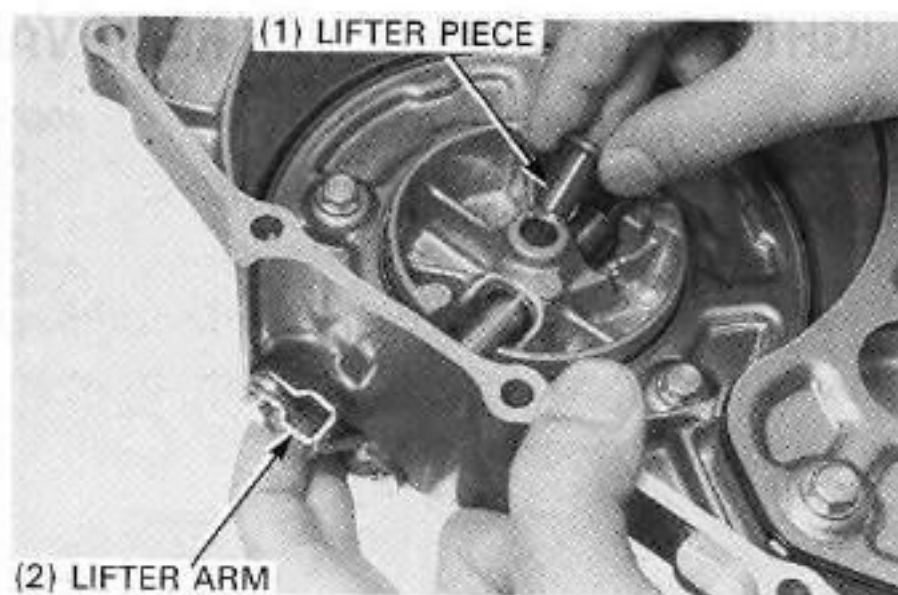
Remove the gasket and dowel pins.



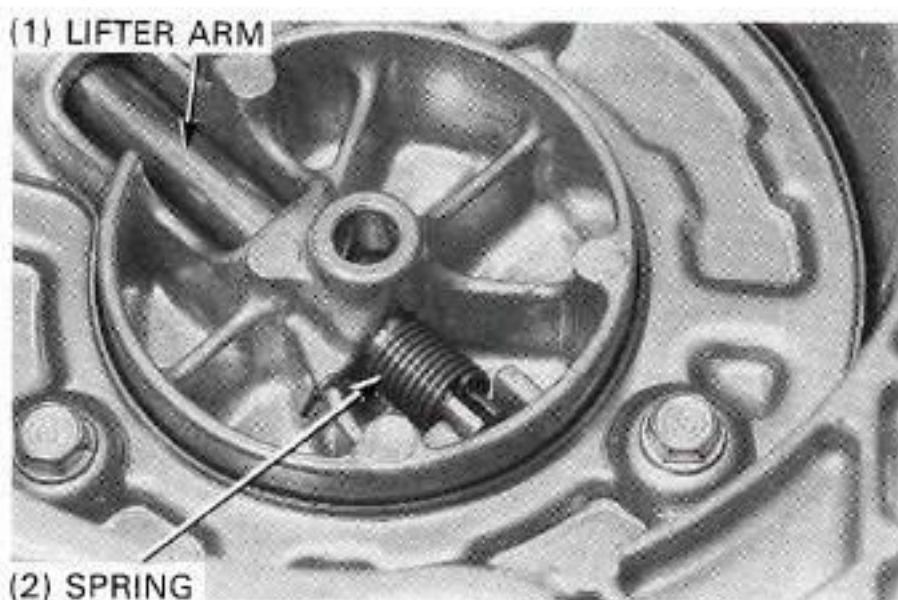
CLUTCH/GEARSHIFT LINKAGE

DISASSEMBLY

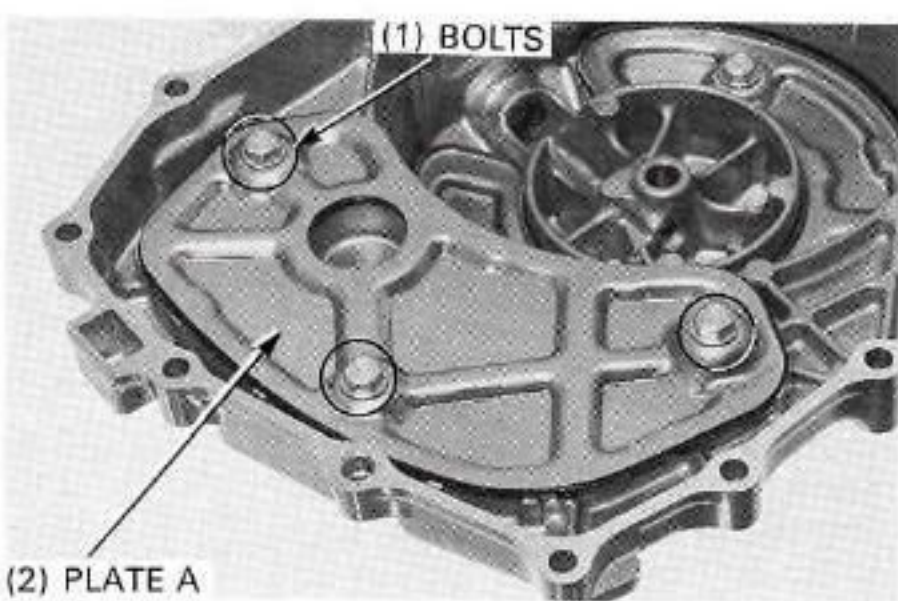
Remove the clutch lifter piece by turning the clutch lifter arm clockwise.



Remove the clutch lifter arm and spring.



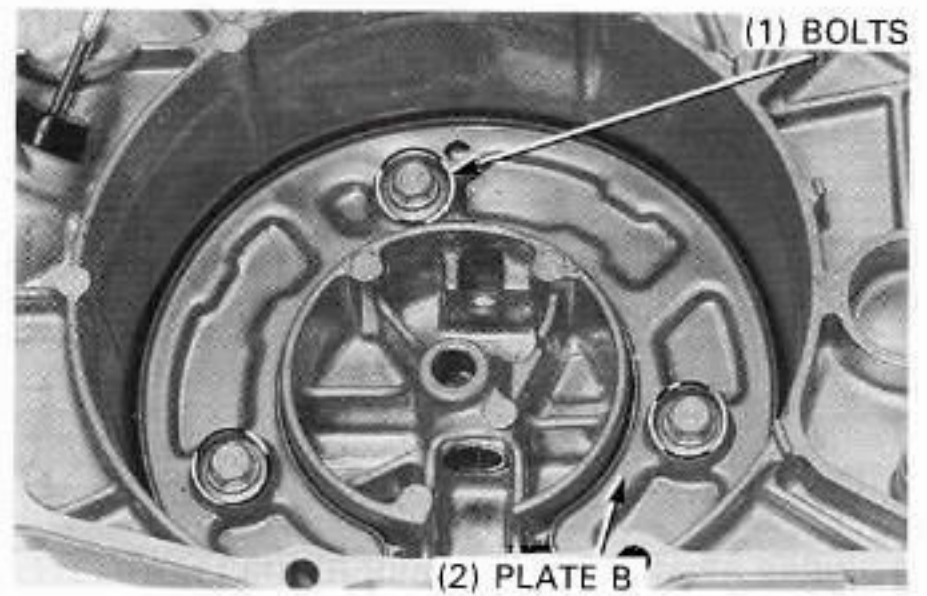
Remove the bolts and inner plate A.



Remove the inner plate rubber packing.



Remove the bolts and inner plate B.



Remove the inner plate rubber packing.

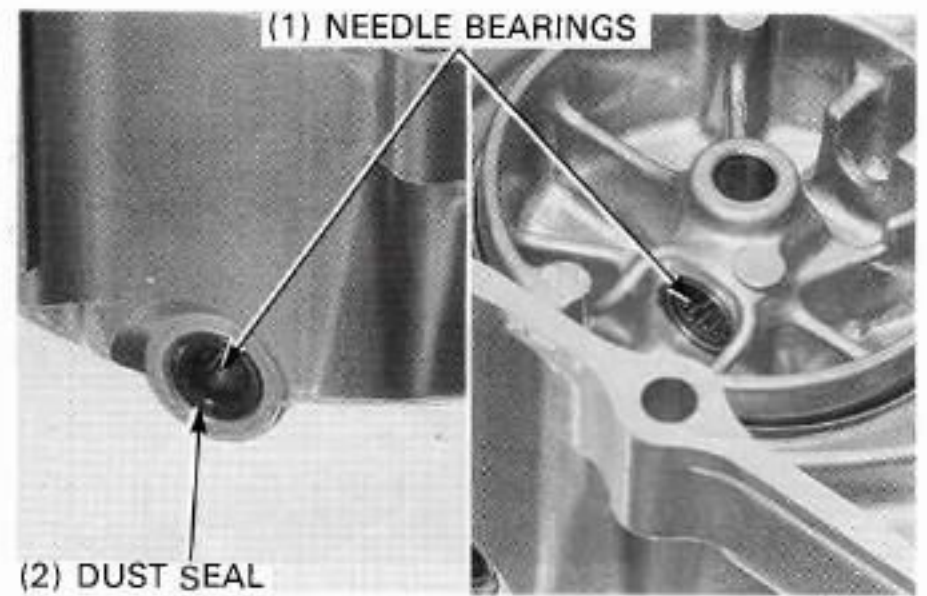


INSPECTION

Check the dust seal fatigue or damage.
Check the needle bearing for wear, damage or loose fit.
Replace these parts if necessary.

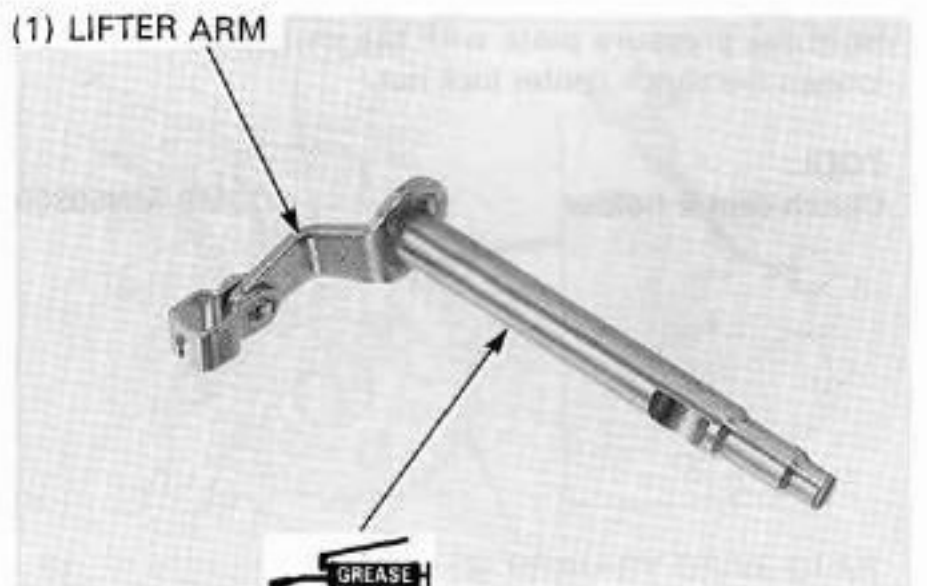
NOTE

- If the dust seal replacement is required, press the dust seal to the case surface.



Check the clutch lifter arm for damage or bending.
Check the spring for fatigue or damage.
Replace these parts if necessary.

Apply grease to the clutch lifter arm sliding surface.
Apply grease to the dust seal lips and needle bearing.



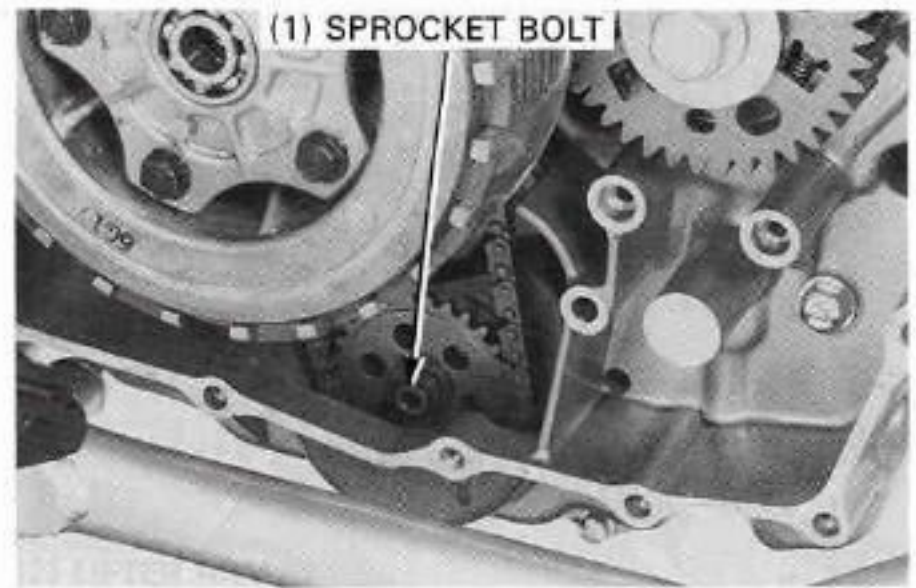
CLUTCH/GEARSHIFT LINKAGE

CLUTCH REMOVAL

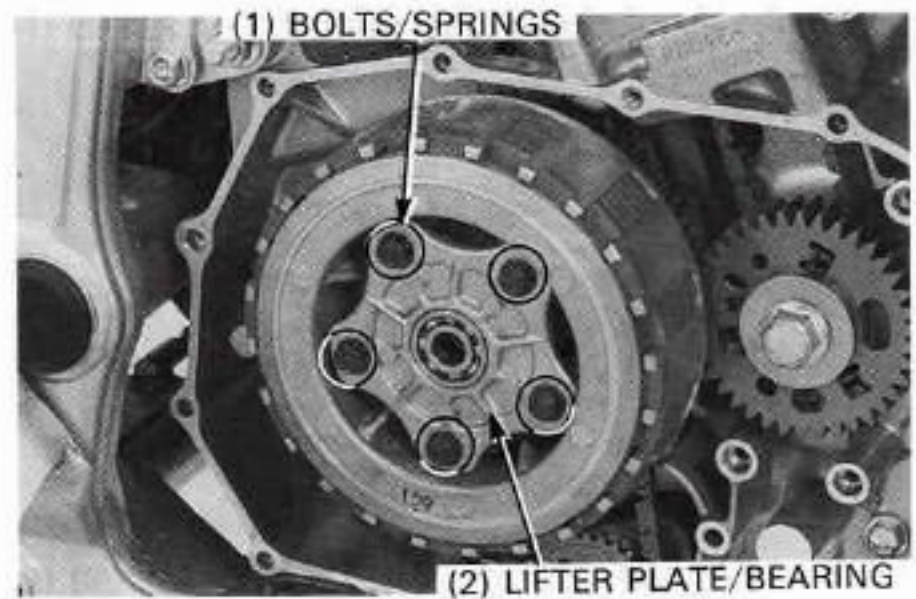
Remove the right crankcase cover (page 8-3).

NOTE

- If the oil pump driven sprocket will be removed, loosen the driven sprocket bolt with the clutch is still installed.



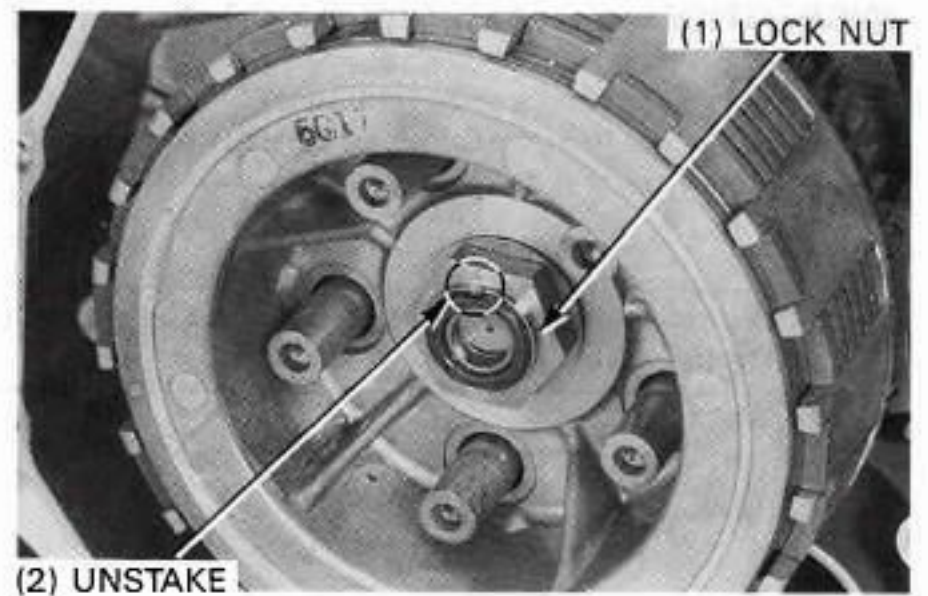
Loosen the clutch lifter plate bolts in a crisscross pattern in 2 or 3 steps.
Remove the lifter plate/bearing and clutch springs.



Unstake the clutch center lock nut.

CAUTION

- *Be careful not to damage the mainshaft threads.*

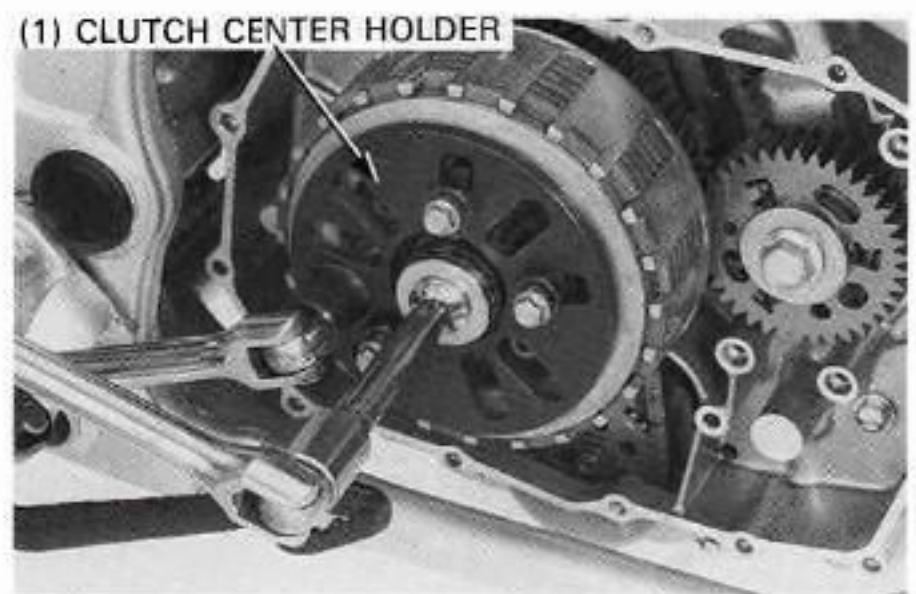


Hold the pressure plate with the clutch center holder and loosen the clutch center lock nut.

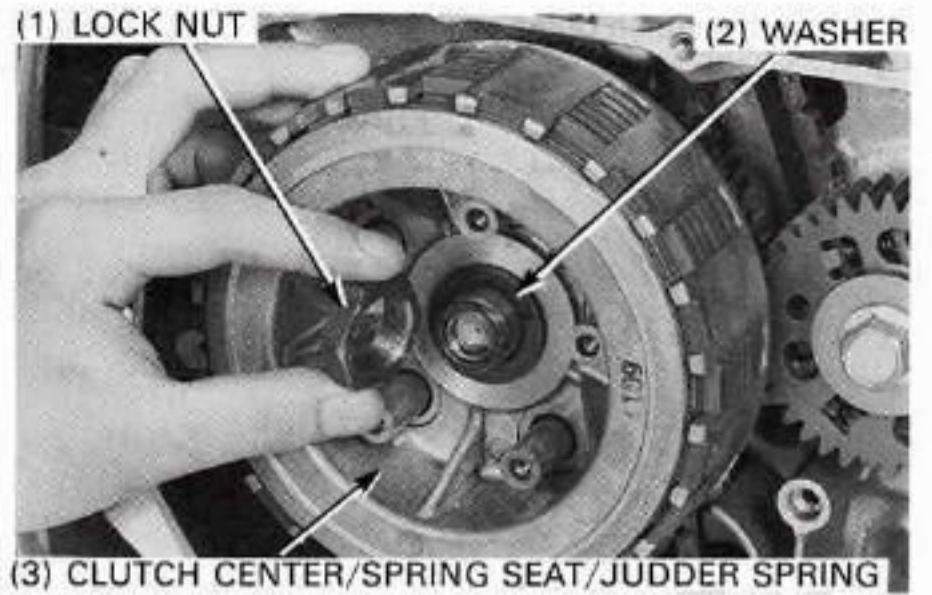
TOOL:

Clutch center holder

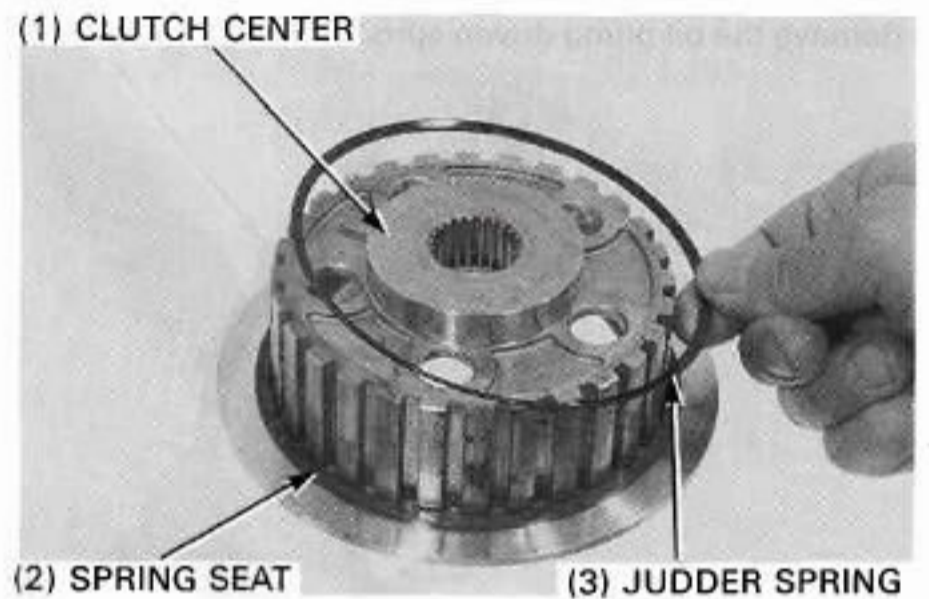
07JMB-MN50300



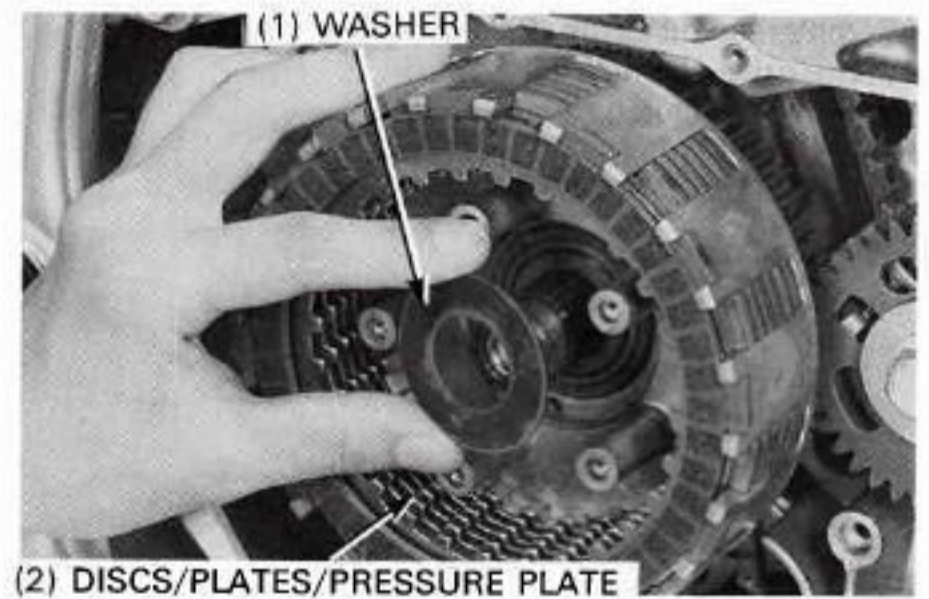
Remove the clutch center lock nut and washer.



Remove the clutch center, spring seat and judder spring.



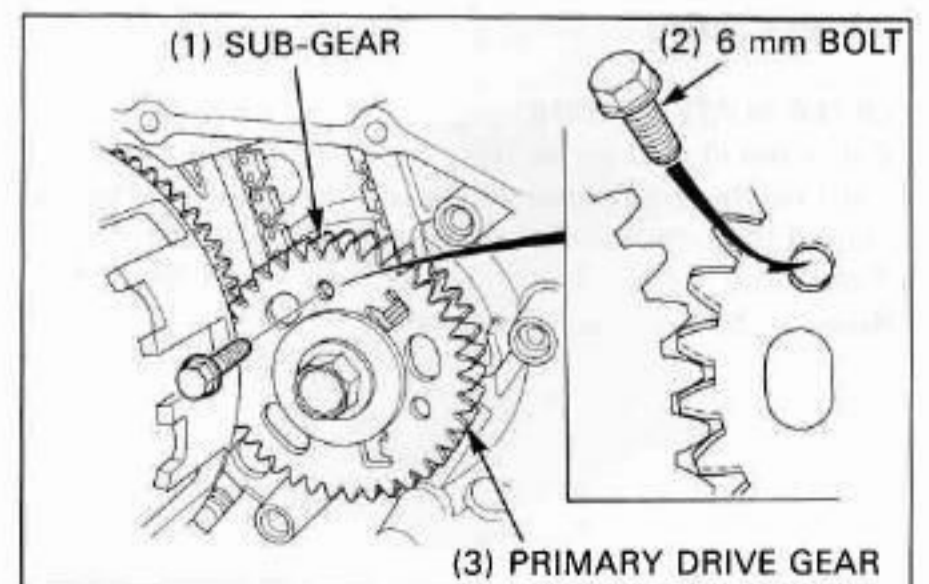
Remove the washer, seven clutch discs and six clutch plates. Remove the pressure plate.



Align the primary drive gear and sub-gear teeth (anti-backlash gear) with a slotted head screwdriver, and lock them with a suitable 6 mm bolt.

NOTE

- After clutch outer installation, remove the 6 mm bolt.



CLUTCH/GEARSHIFT LINKAGE

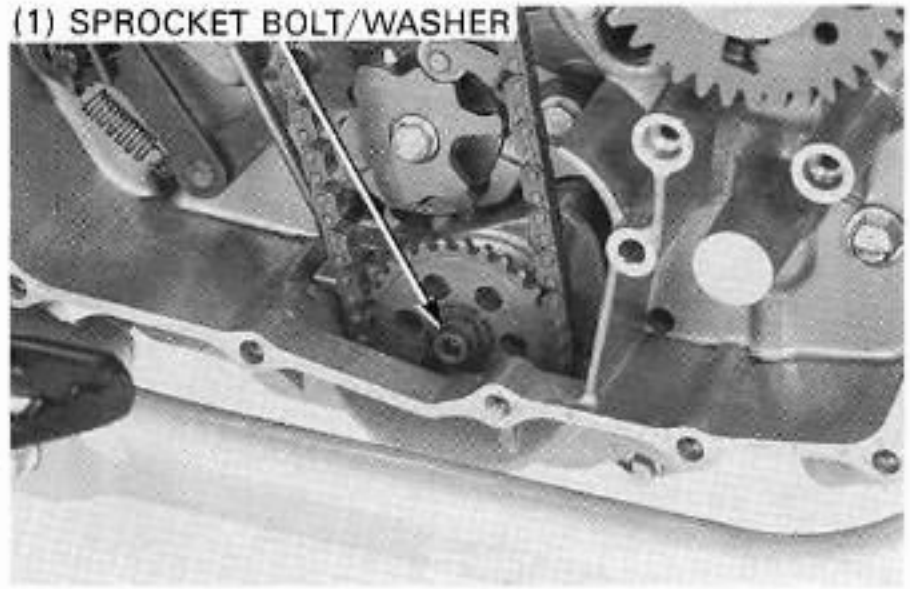
Remove the clutch outer.

(1) CLUTCH OUTER



Remove the oil pump driven sprocket bolt and washer.

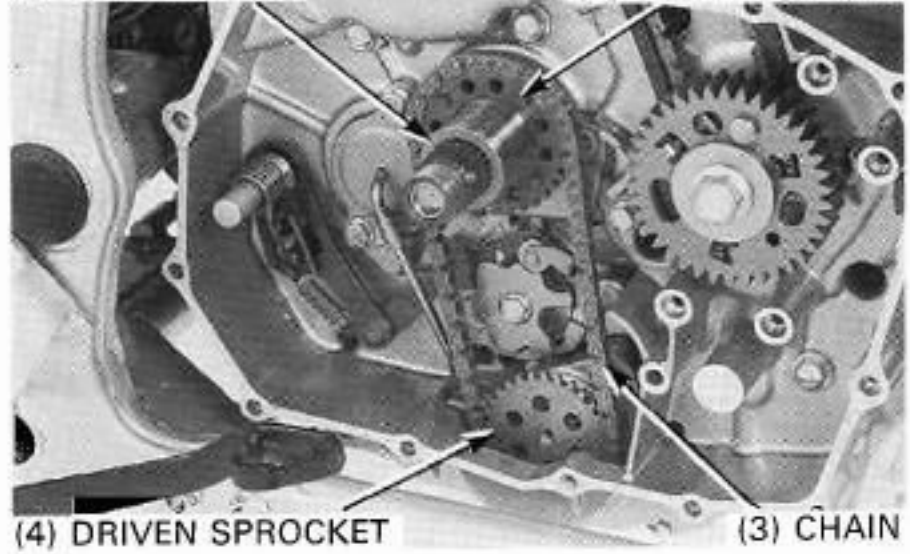
(1) SPROCKET BOLT/WASHER



Remove the oil pump drive sprocket, driven sprocket and oil pump drive chain as a set.
Remove the clutch outer guide.

(1) OUTER GUIDE

(2) DRIVE SROCKET



(4) DRIVEN SPROCKET

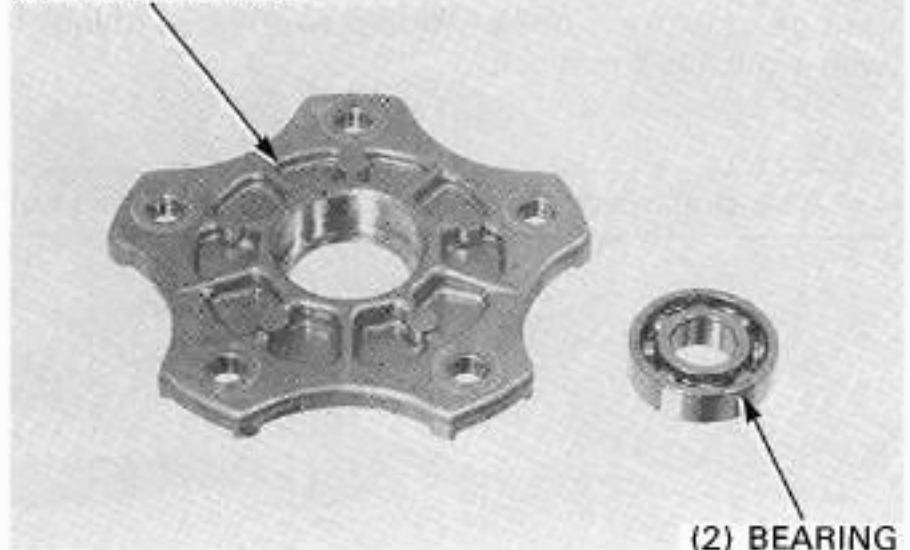
(3) CHAIN

INSPECTION

LIFTER PLATE BEARING

Check the lifter plate bearing for damage.
Turn the bearing inner race with your finger. The bearing should turn smoothly and quietly without play.
Also check that the bearing outer race fits in the plate.
Replace the bearing if necessary.

(1) LIFTER PLATE



(2) BEARING

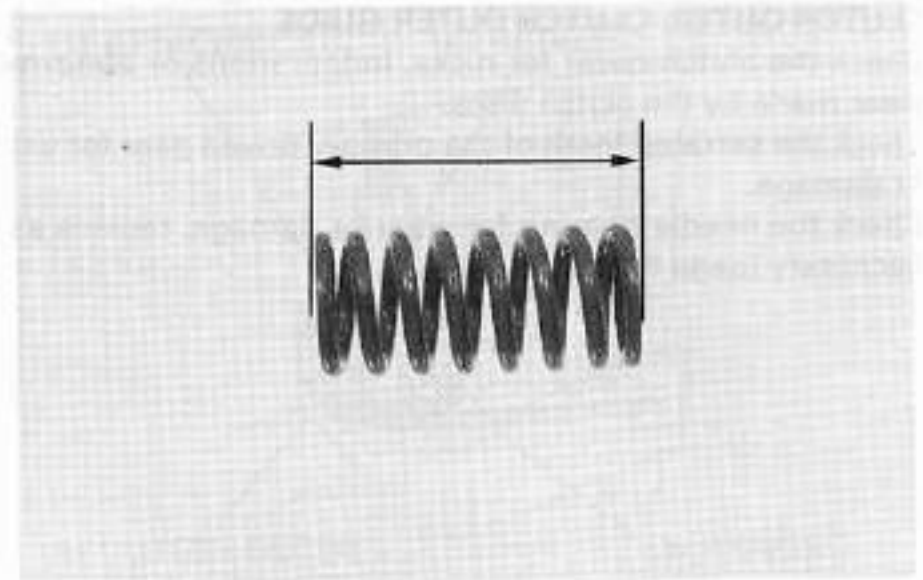
CLUTCH SPRING

Measure the clutch spring free length.

SERVICE LIMIT: 39 mm (1.5 in)

NOTE

- Replace the clutch springs as a set.



CLUTCH DISC

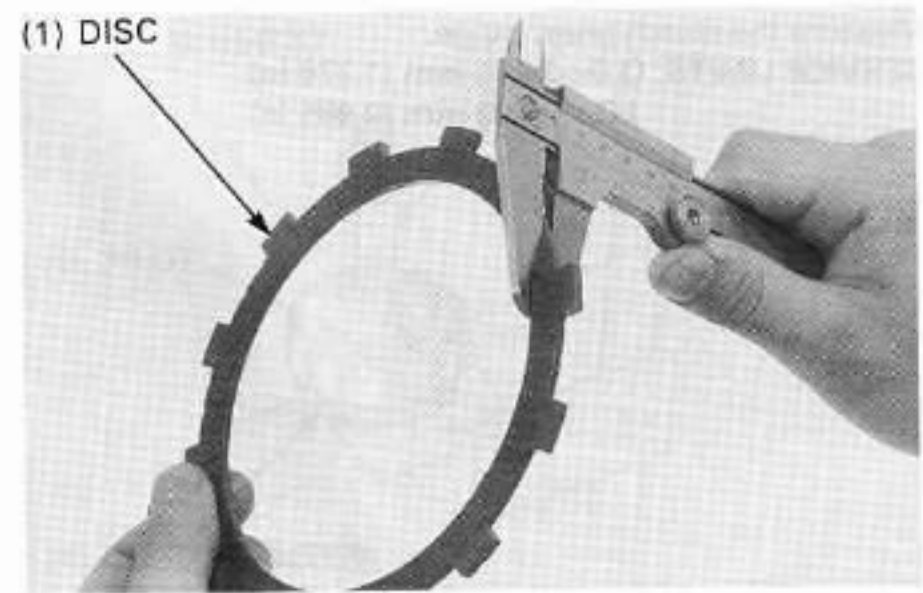
Check the clutch discs for signs of scoring or discoloration.

Measure the thickness of the discs.

SERVICE LIMIT: 3.6 mm (0.14 in)

NOTE

- Replace the discs and plates as a set.



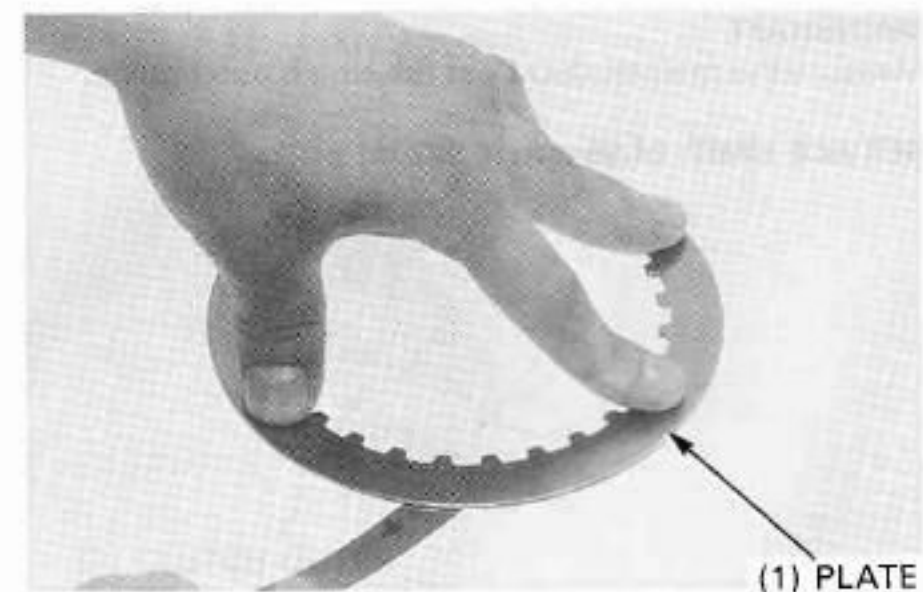
CLUTCH PLATE

Check the plate for excessive warpage or discoloration. Check the plate warpage on a surface plate using a feeler gauge.

SERVICE LIMIT: 0.15 mm (0.006 in)

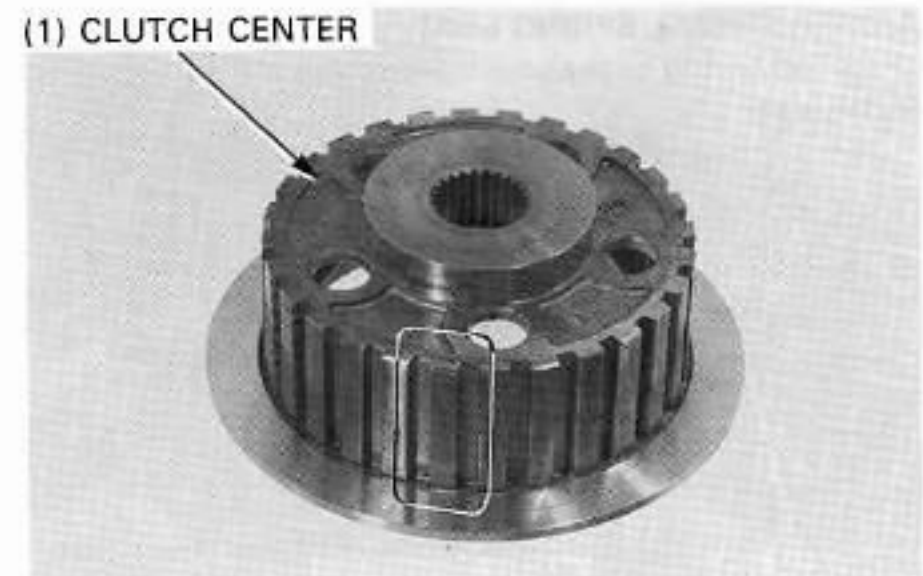
NOTE

- Replace the discs and plates as a set.



CLUTCH CENTER

Check the clutch center for nicks, indentations or abnormal wear made by the clutch plates.



CLUTCH/GEARSHIFT LINKAGE

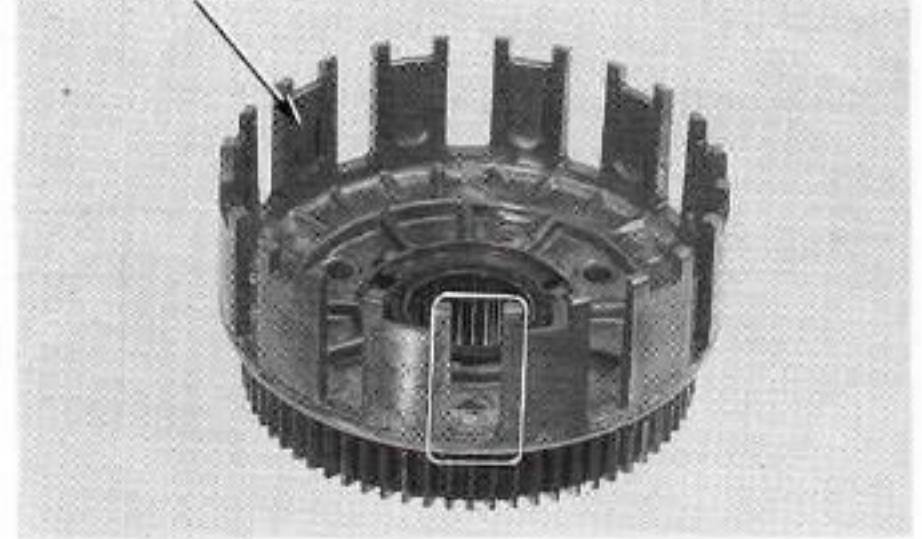
CLUTCH OUTER, CLUTCH OUTER GUIDE

Check the clutch outer for nicks, indentations or abnormal wear made by the clutch discs.

Check the serrated teeth of the primary driven gear for wear or damage.

Check the needle bearing for wear or damage; replace as a necessary (page 8-11).

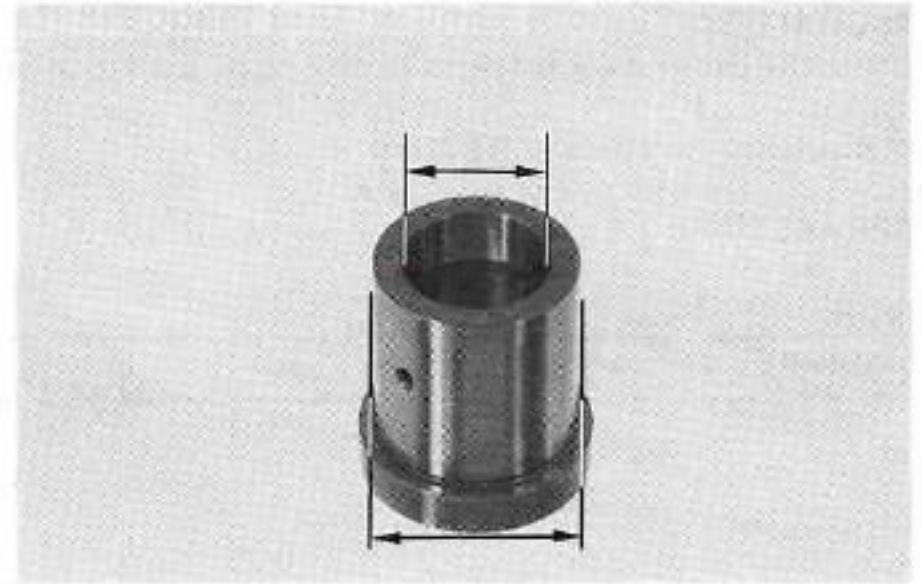
(1) CLUTCH OUTER



Measure the clutch outer guide.

SERVICE LIMITS: O.D.: 34.96 mm (1.376 in)

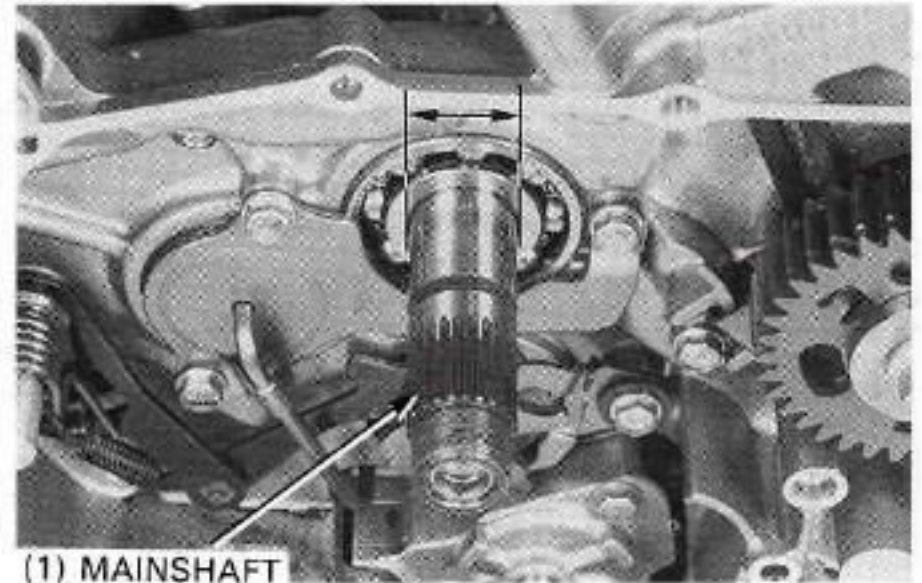
I.D.: 25.03 mm (0.985 in)



MAINSHAFT

Measure the mainshaft O.D. at the clutch outer guide.

SERVICE LIMIT: 24.95 mm (0.982 in)

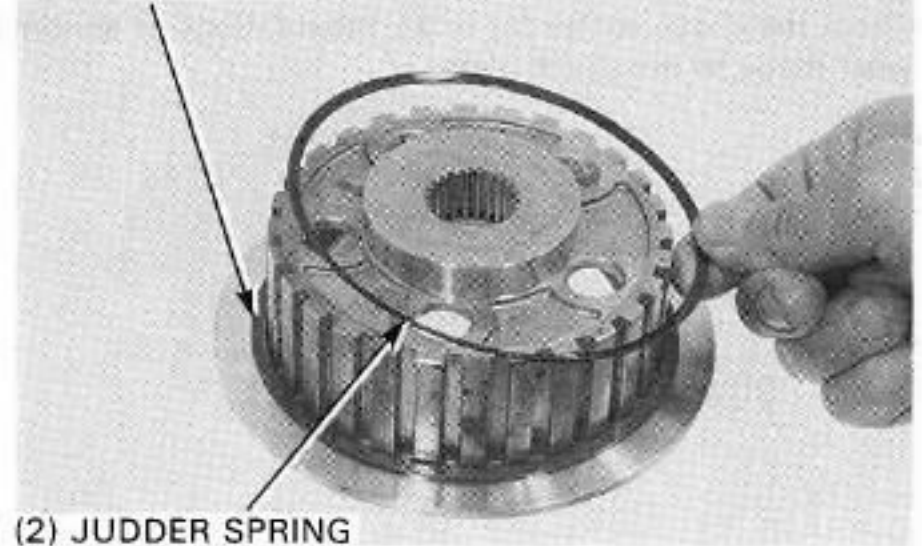


(1) MAINSHAFT

JUDDER SPRING, SPRING SEAT

Check the spring seat and judder spring for distortion, wear or damage.

(1) SPRING SEAT



(2) JUDDER SPRING

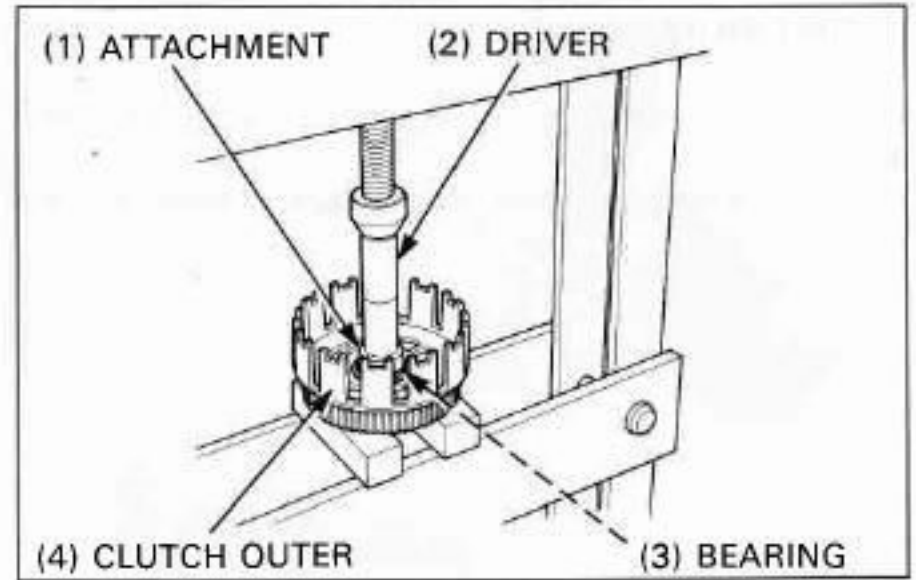
CLUTCH OUTER NEEDLE BEARING REPLACEMENT

REMOVAL

Press the needle bearing out of the clutch outer.

TOOLS:

| | |
|------------------------|---------------|
| Driver | 07749-0010000 |
| Attachment, 42 X 47 mm | 07746-0010300 |
| Pilot, 35 mm | 07746-0040800 |



INSTALLATION

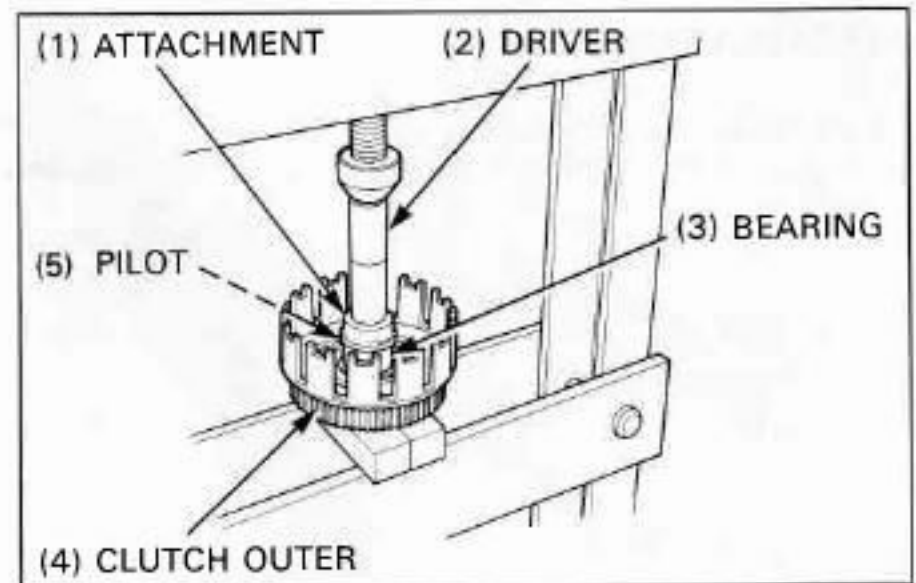
Press the new needle bearing into the clutch outer so that the edges of the needle bearing and clutch outer are flush.

TOOLS:

| | |
|------------------------|---------------|
| Driver | 07749-0010000 |
| Attachment, 37 X 40 mm | 07746-0010200 |
| Pilot, 35 mm | 07746-0040800 |

NOTE

- Install the new needle bearing with the mark facing out.



PRIMARY DRIVE GEAR

REMOVAL

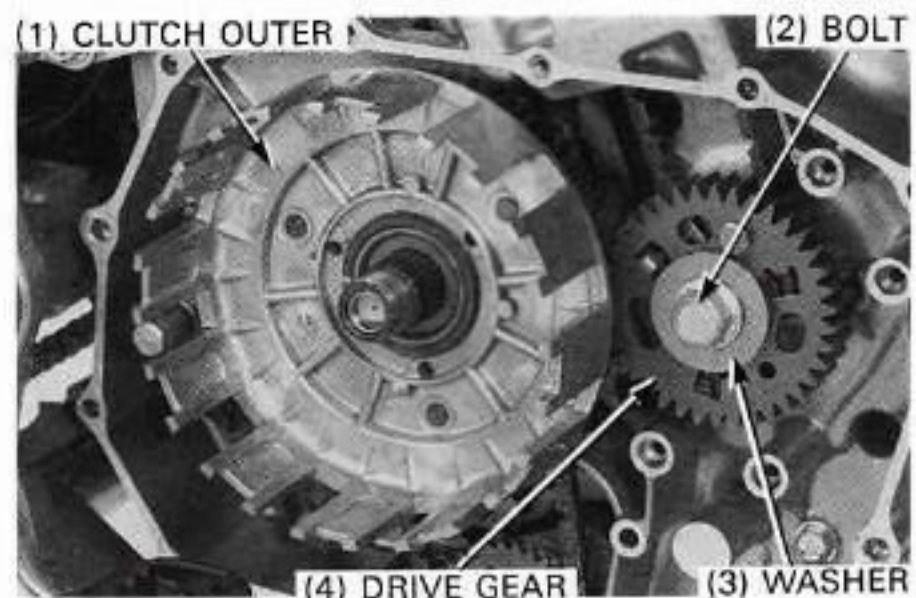
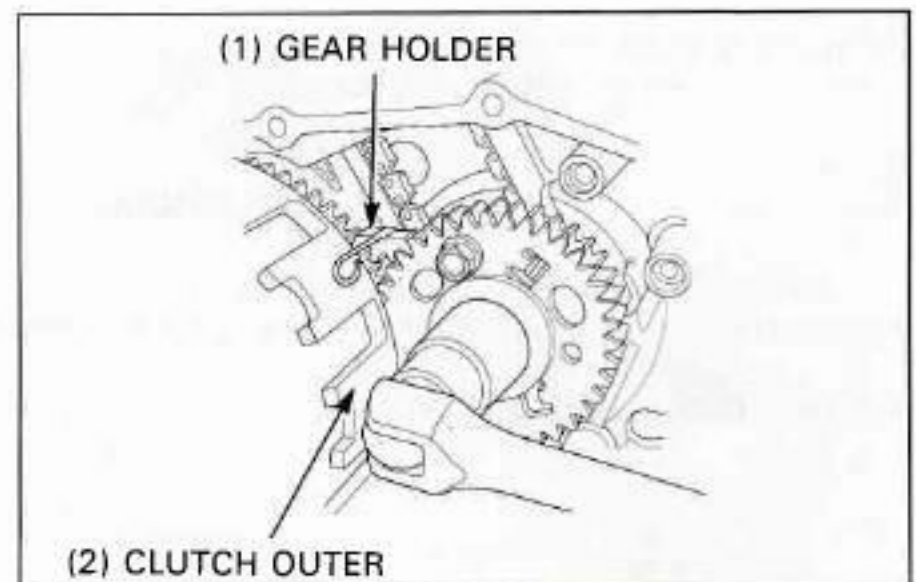
Remove the clutch (page 8-6).

Temporarily install the clutch outer onto the mainshaft. Hold the primary drive gear with the gear holder and remove the primary drive gear bolt.

TOOL:

| | |
|-------------|---------------|
| Gear holder | 07724-0010100 |
|-------------|---------------|

Remove the clutch outer.
Remove the washer and primary drive gear.



CLUTCH/GEARSHIFT LINKAGE

INSPECTION

Check the serrated teeth of the primary drive gear for wear or damage.
Check the serrated teeth of the sub gear for wear or damage.

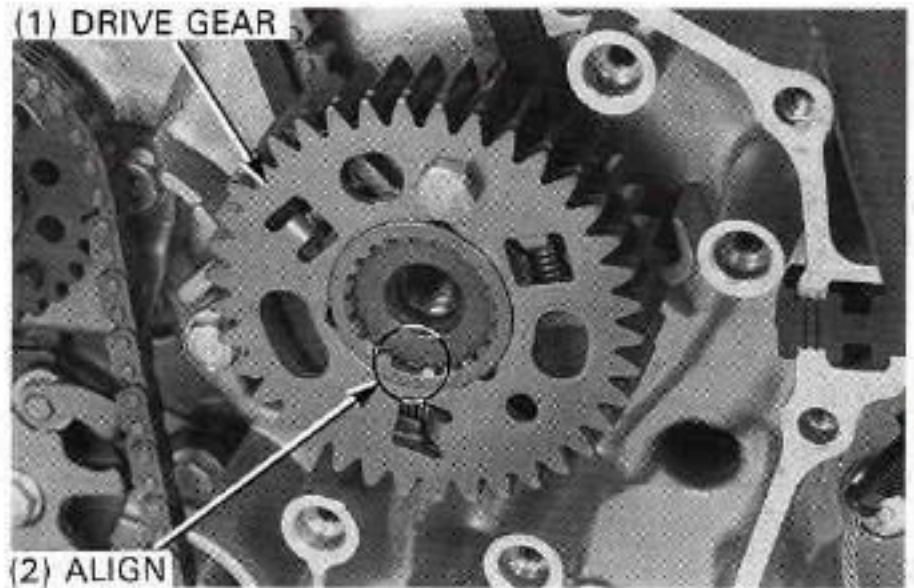
(1) DRIVE GEAR



INSTALLATION

Install the primary drive gear to the crankshaft aligning the wide groove of the primary drive gear and wide teeth on the crankshaft.

(1) DRIVE GEAR



Temporarily install the clutch outer onto the mainshaft.
Hold the primary drive gear with the gear holder

TOOL:

Gear holder

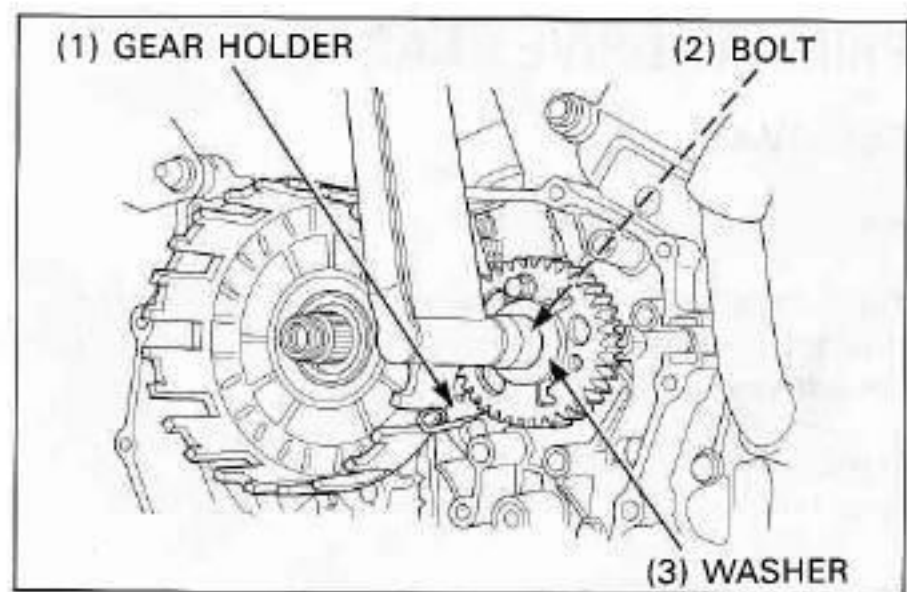
07724-0010100

Install the washer and primary drive gear bolt.
Tighten the primary drive gear bolt to the specified torque.

TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)

(1) GEAR HOLDER

(2) BOLT

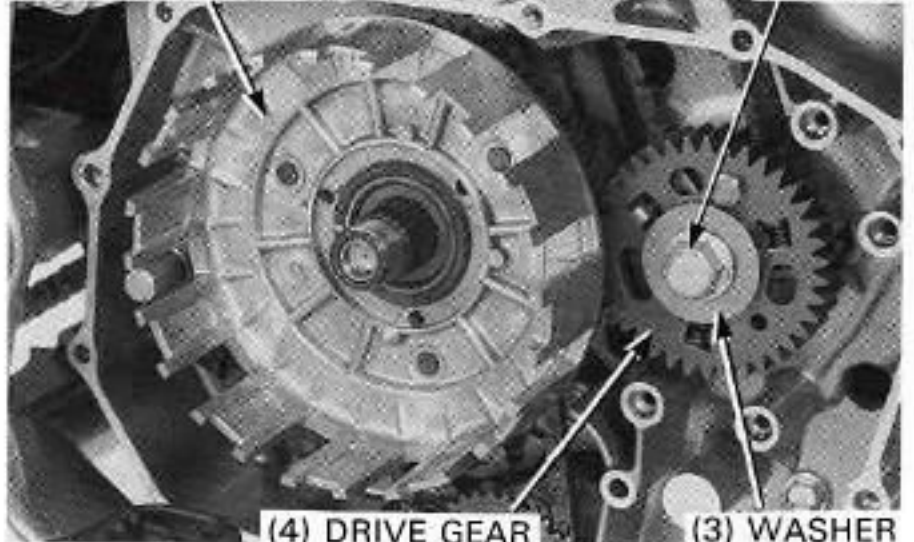


(3) WASHER

Remove the gear holder, clutch outer and clutch outer guide.
Install the clutch (page 8-15).

(1) CLUTCH OUTER

(2) BOLT



(4) DRIVE GEAR

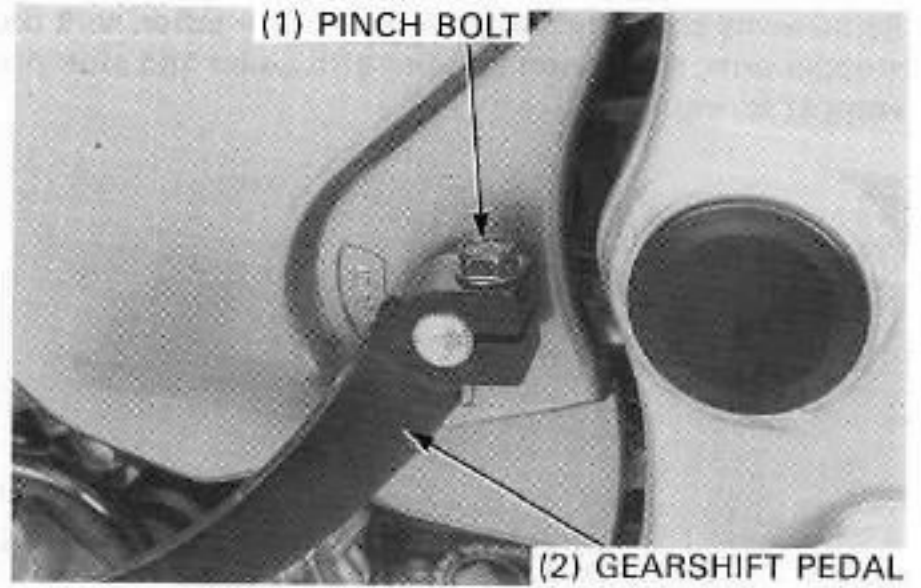
(3) WASHER

GEARSHIFT LINKAGE

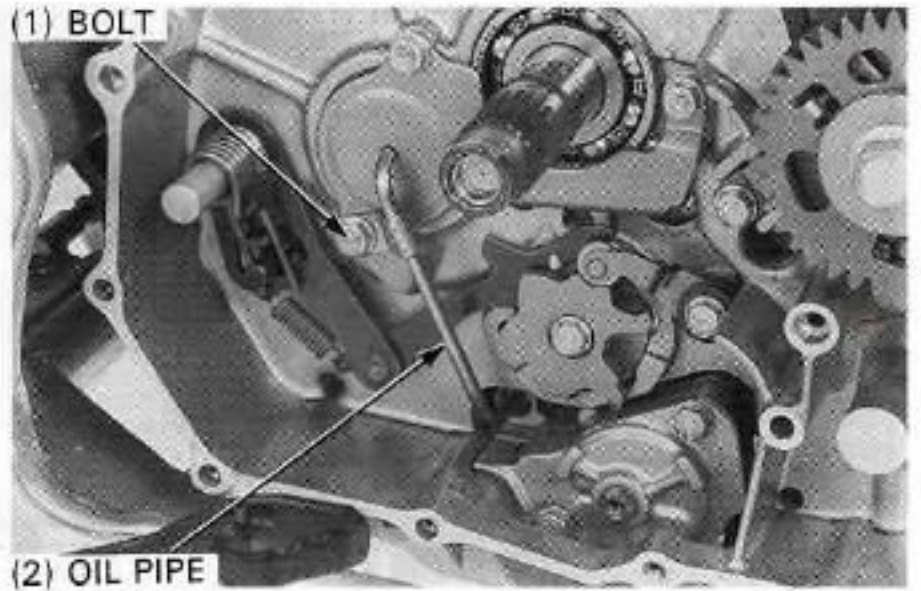
REMOVAL

Remove the clutch (page 8-6).

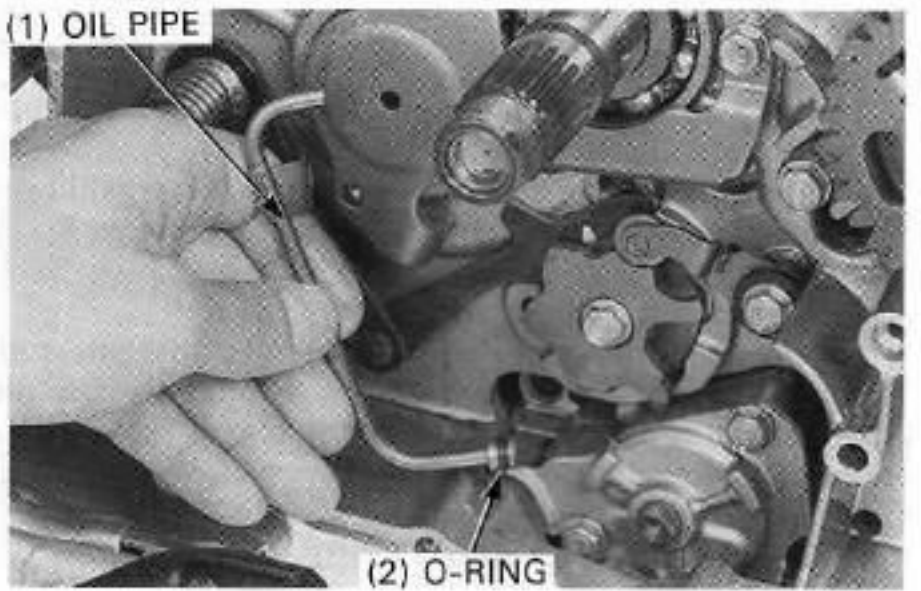
Remove the gearshift pedal pinch bolt and gearshift pedal.



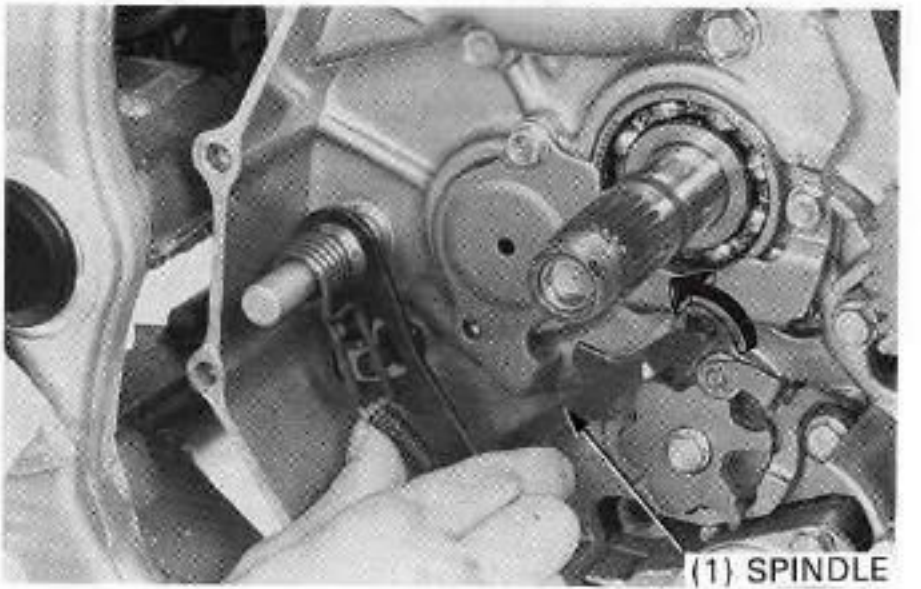
Remove the bolt and oil pipe.



Remove the O-ring from the oil pipe.

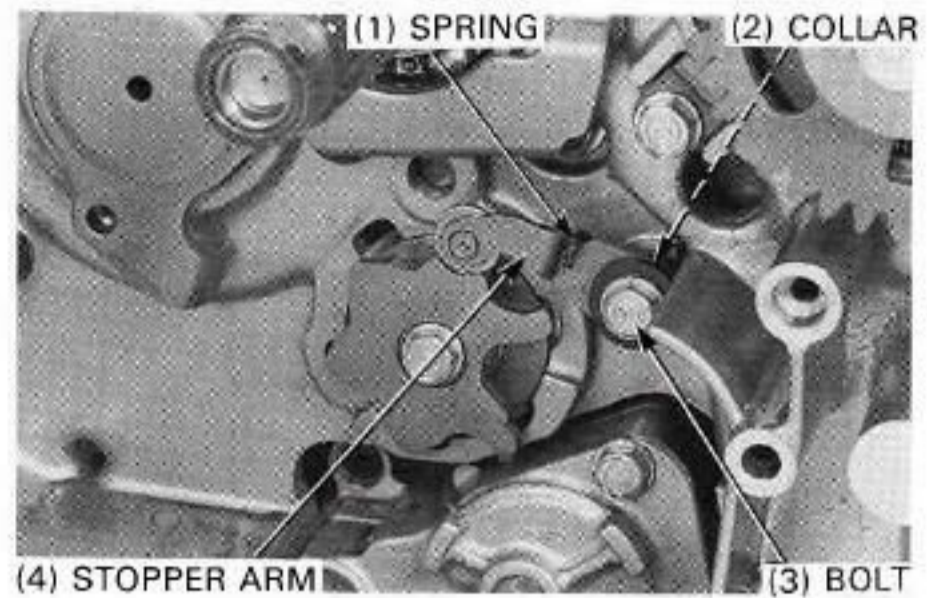


Remove the gearshift spindle from the crankcase while unhook the shifter arm from the shift cam plate.



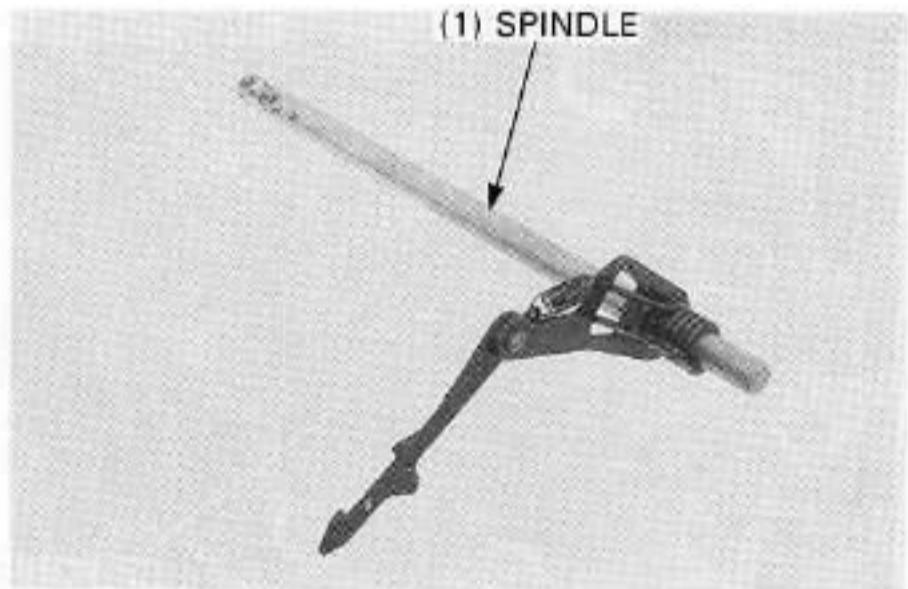
CLUTCH/GEARSHIFT LINKAGE

Remove the shift drum stopper arm bolt, washer, shift drum stopper arm, shift drum stopper arm collar and shift drum stopper spring.



INSPECTION

Check the gearshift spindle for wear or damage.
Check the return spring for fatigue or damage.



INSTALLATION

Clean and apply a locking agent to the shift drum stopper arm bolt threads.

Install the shift drum stopper arm bolt, washer, shift drum stopper arm, shift drum stopper arm collar and shift drum stopper spring.

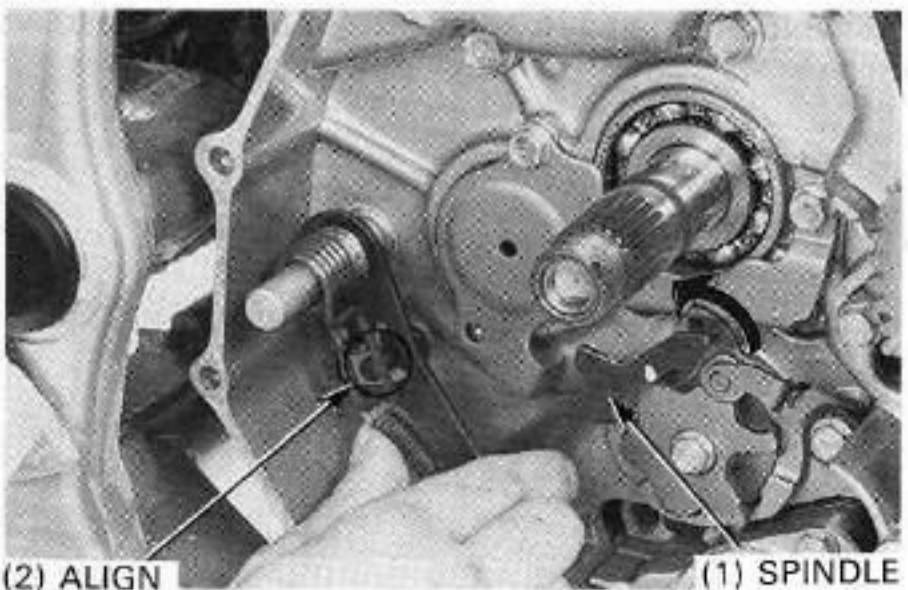
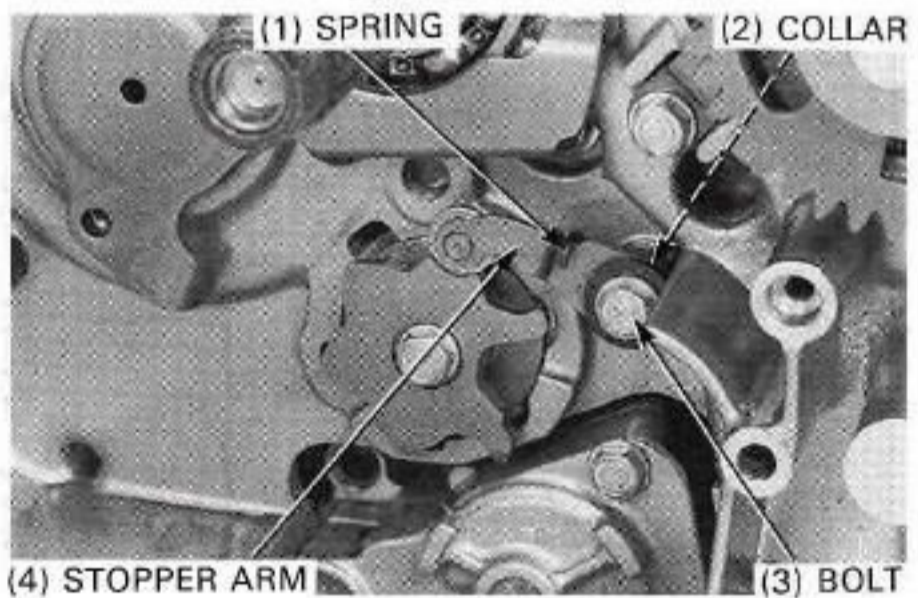
Screw the stopper arm bolt half way.

Hook the shift drum stopper spring to the shift drum stopper arm and rest the shift drum stopper arm on the cam plate, then screw the shift drum stopper arm bolt all the way in and tighten it to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

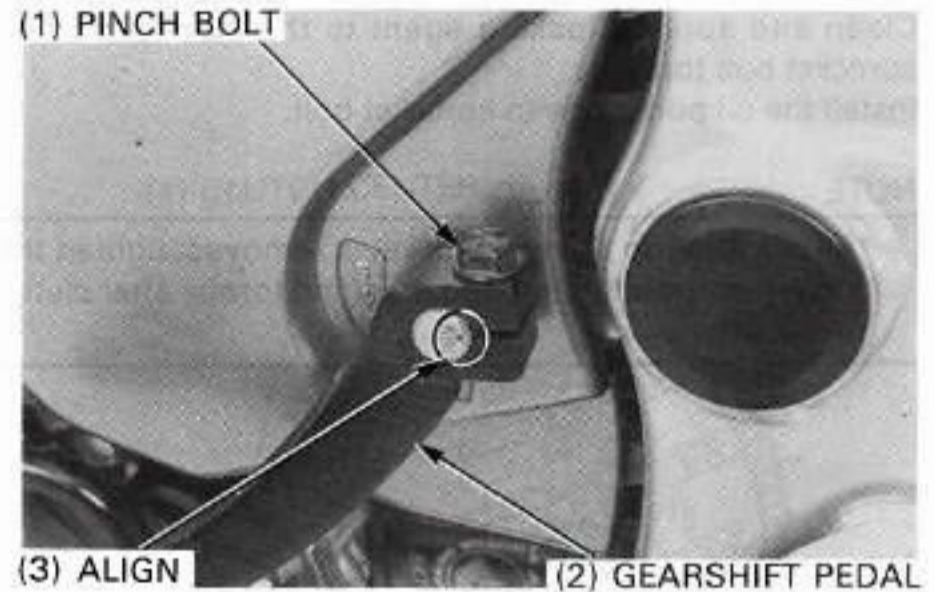
Wrap the end of the gearshift spindle with tape to avoid oil seal damage.

Insert the gearshift spindle into the crankcase with hooking the shifter arm onto the shift cam plate while aligning the spindle return spring ends with the stud pin.



Install the gearshift pedal aligning the punch mark on the spindle with the slit of the gearshift pedal.
Install and tighten the gearshift pedal pinch bolt to the specified torque.

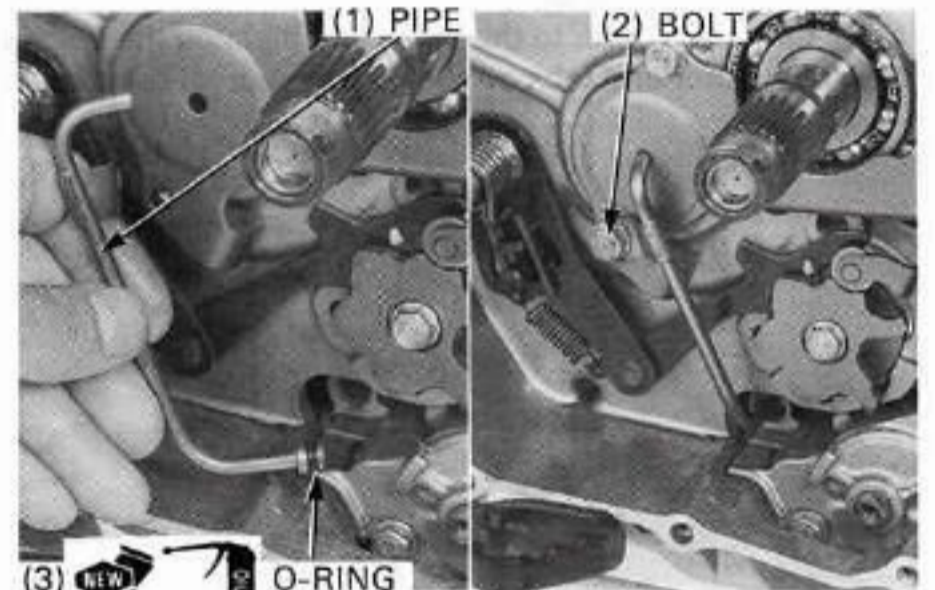
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Apply oil to the new O-ring.
Install the oil pipe/new O-ring.
Install and tighten the bolt securely.

Move the gearshift pedal and check the shift mechanism for smooth operation.

Install the clutch (see below).



CLUTCH INSTALLATION

NOTE

- If the oil pump driven sprocket is removed, tighten the driven sprocket bolt to the specified torque after clutch installation.

Apply molybdenum oil solution to the clutch outer guide outer surface.

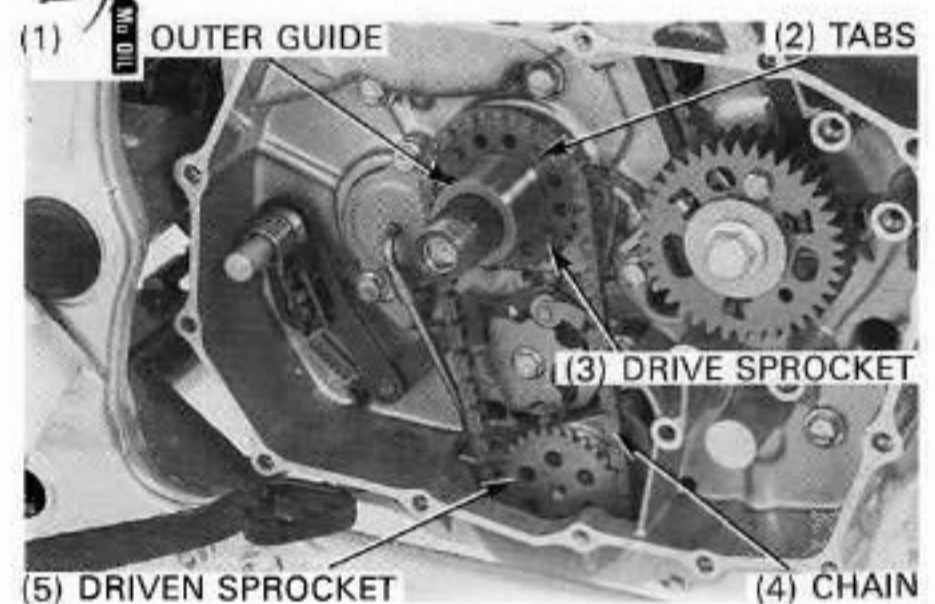
Install the clutch outer guide to the mainshaft.

Install the oil pump drive and driven sprocket and chain as an assembly with the "OUT" mark on the driven sprocket facing out.

Align the flat surfaces of the driven sprocket hole and oil pump shaft end.

NOTE

- Install the oil pump drive sprocket with its tab side facing out.



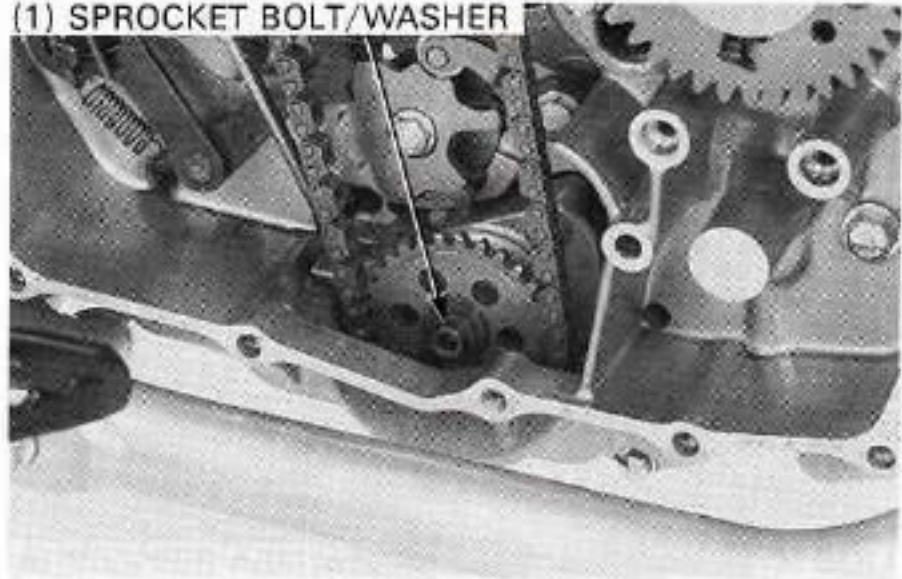
CLUTCH/GEARSHIFT LINKAGE

Clean and apply a locking agent to the oil pump driven sprocket bolt threads.
Install the oil pump driven sprocket bolt.

NOTE

- If the oil pump driven sprocket is removed, tighten the driven sprocket bolt to the specified torque after clutch installation.

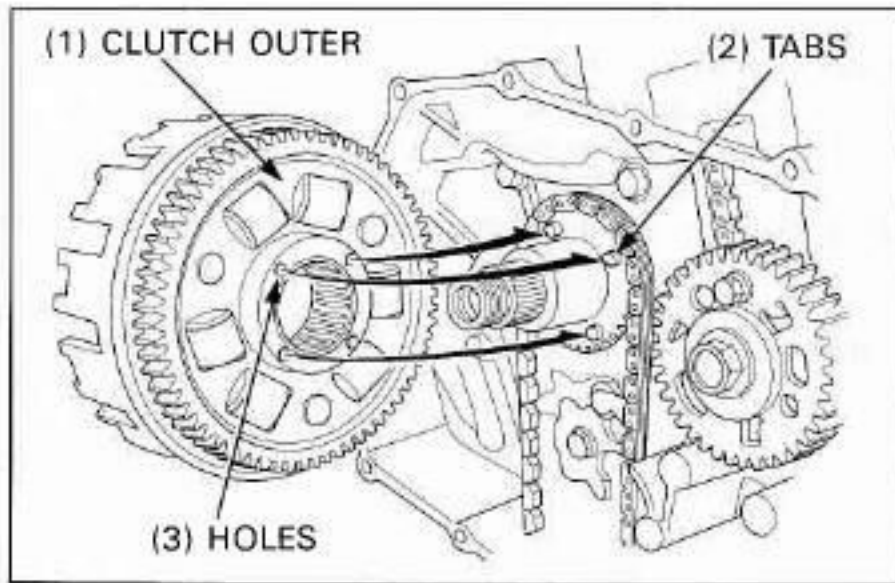
(1) SPROCKET BOLT/WASHER



Install the clutch outer to the mainshaft aligning the holes on the clutch outer and tabs on the oil pump drive sprocket.

(1) CLUTCH OUTER

(2) TABS

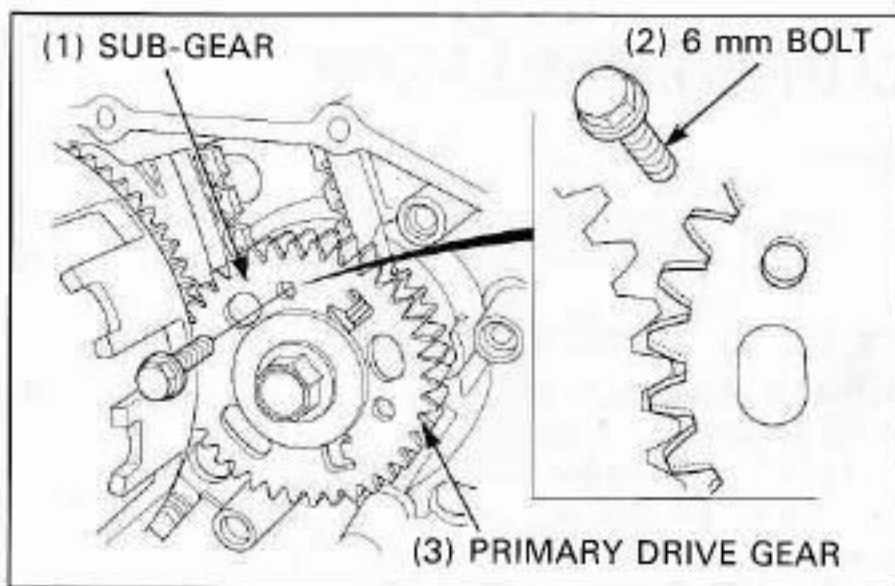


(3) HOLES

Align the primary drive gear and sub-gear teeth (anti-backlash gear) with a slotted head screwdriver, and remove a suitable 6 mm bolt.

(1) SUB-GEAR

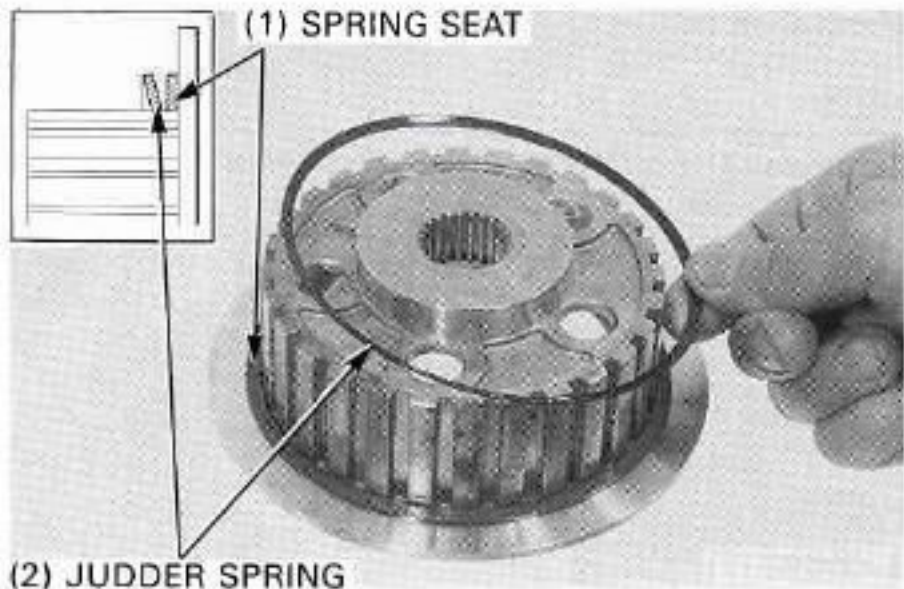
(2) 6 mm BOLT



(3) PRIMARY DRIVE GEAR

Install the spring seat and judder spring on the clutch center as shown.

(1) SPRING SEAT

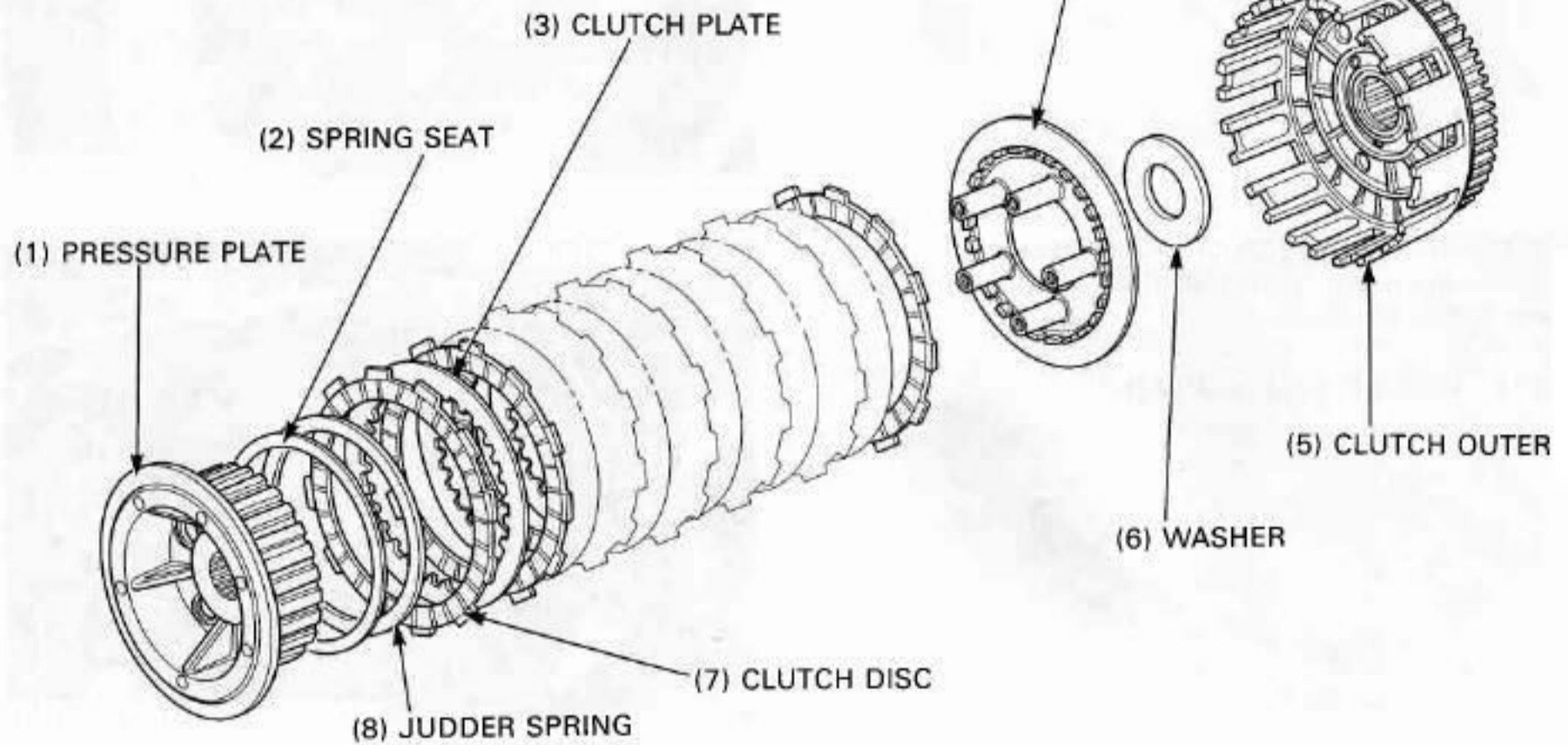


(2) JUDDER SPRING

Coat the clutch discs and clutch plates with clean engine oil. Install the seven clutch discs and six clutch plates alternately, starting with a clutch disc.

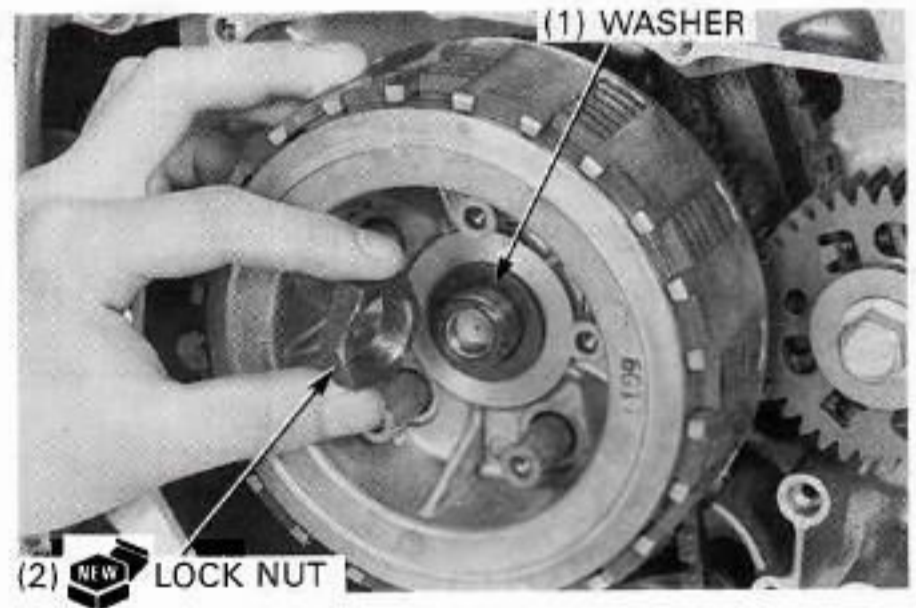
When installing the outside clutch disc, align the end grooves in the clutch outer with the tabs of disc.

Install the pressure plate/judder spring/spring seat to the clutch center.



Install the washer, pressure plate, clutch discs, clutch plates, judder spring, spring seat and clutch center as a set to the clutch outer.

Install the washer and new clutch center lock nut.



Hold the pressure plate with the clutch center holder.

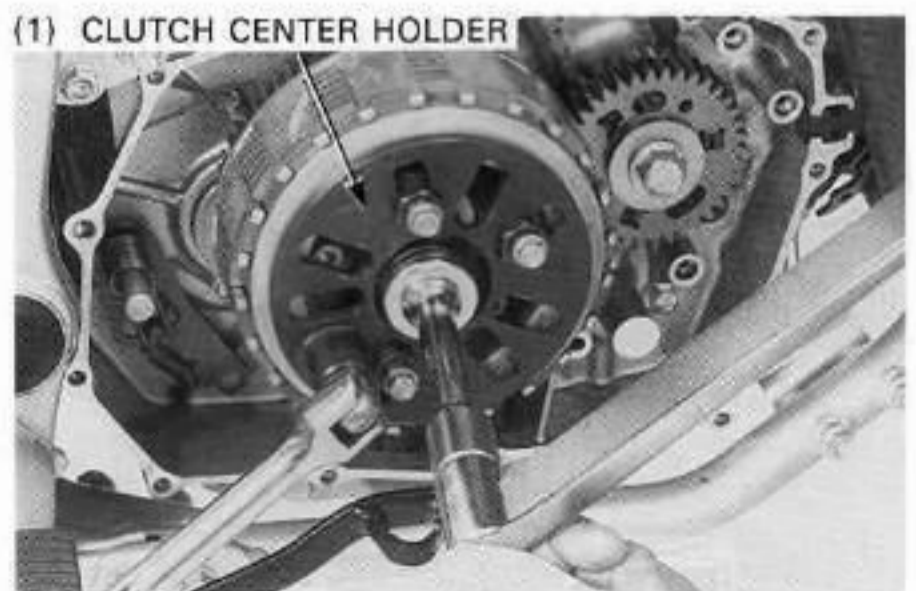
TOOL:

Clutch center holder

07JMB-MN50300

Tighten the clutch center lock nut to the specified torque.

TORQUE: 127 N·m (13.0 kgf·m, 94 lbf·ft)

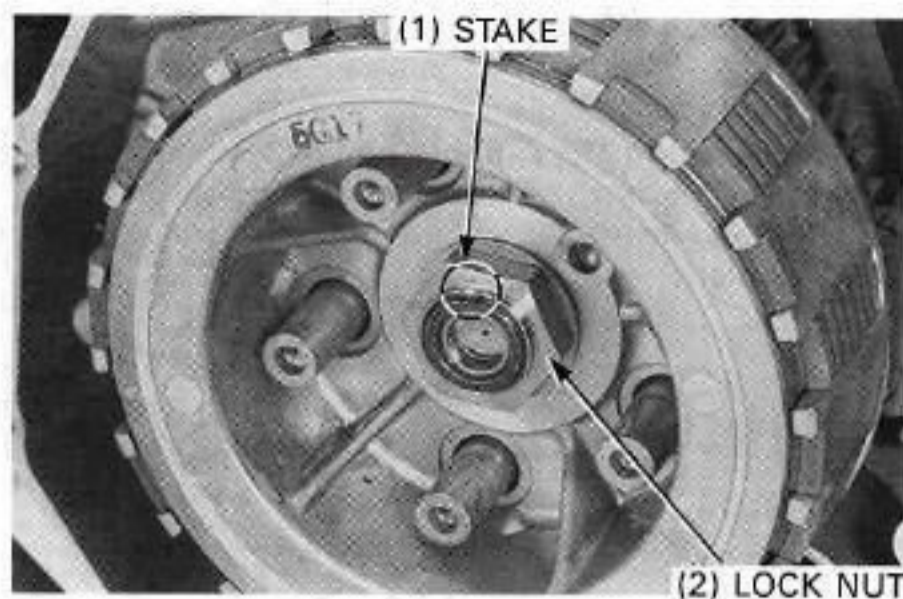


CLUTCH/GEARSHIFT LINKAGE

Remove the clutch center holder and stake the lock nut into the mainshaft groove.

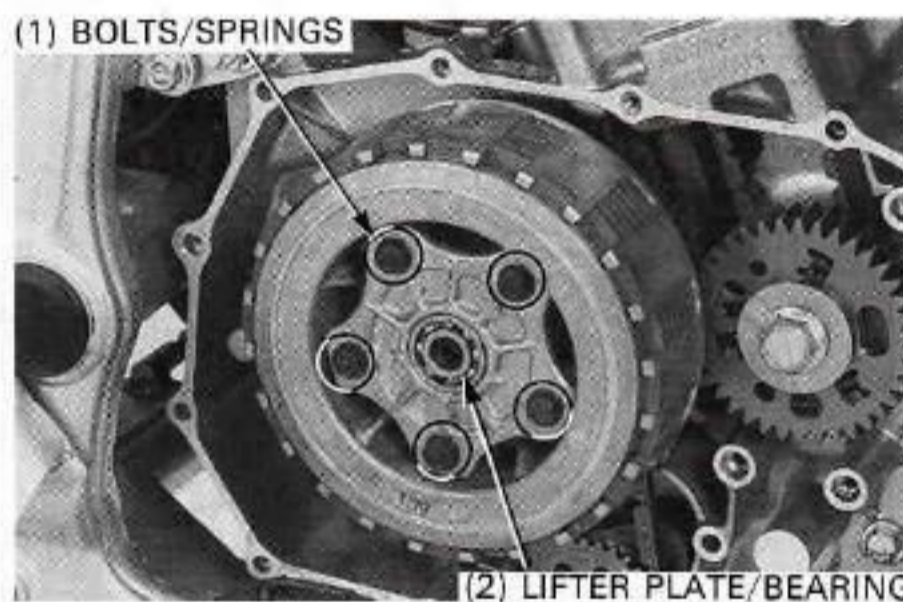
CAUTION

- *Be careful not to damage the mainshaft threads.*



Install the clutch springs and lifter plate/bearing. Install and tighten the clutch lifter plate bolts in a crisscross pattern in several steps.

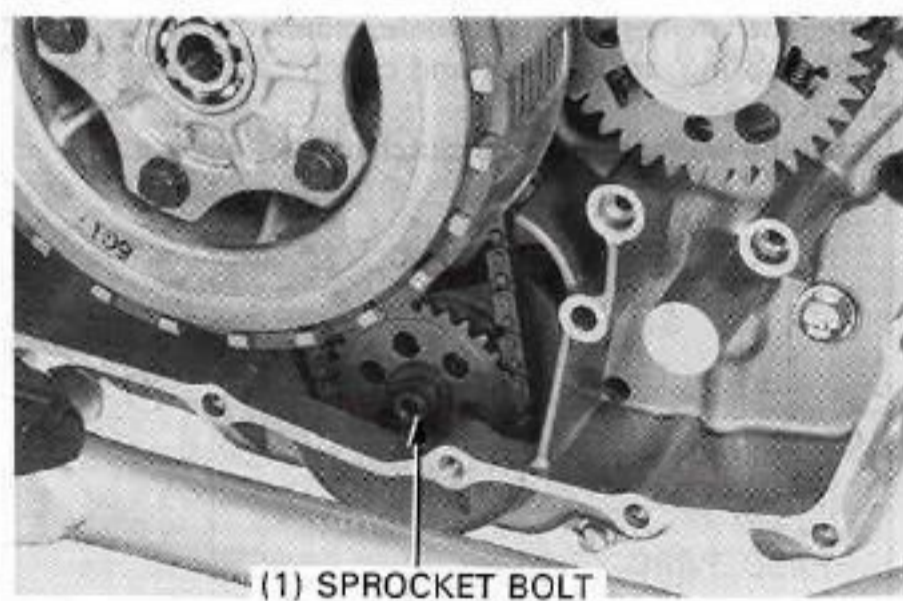
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



If the oil pump driven sprocket is removed, tighten the driven sprocket bolt to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

Install the right crankcase cover (see below).



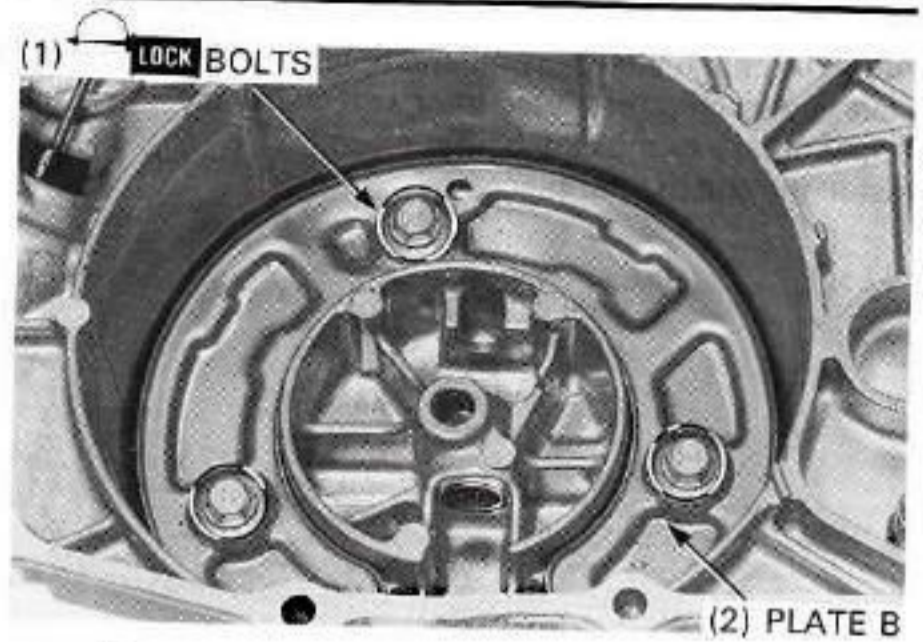
RIGHT CRANKCASE COVER INSTALLATION

ASSEMBLY

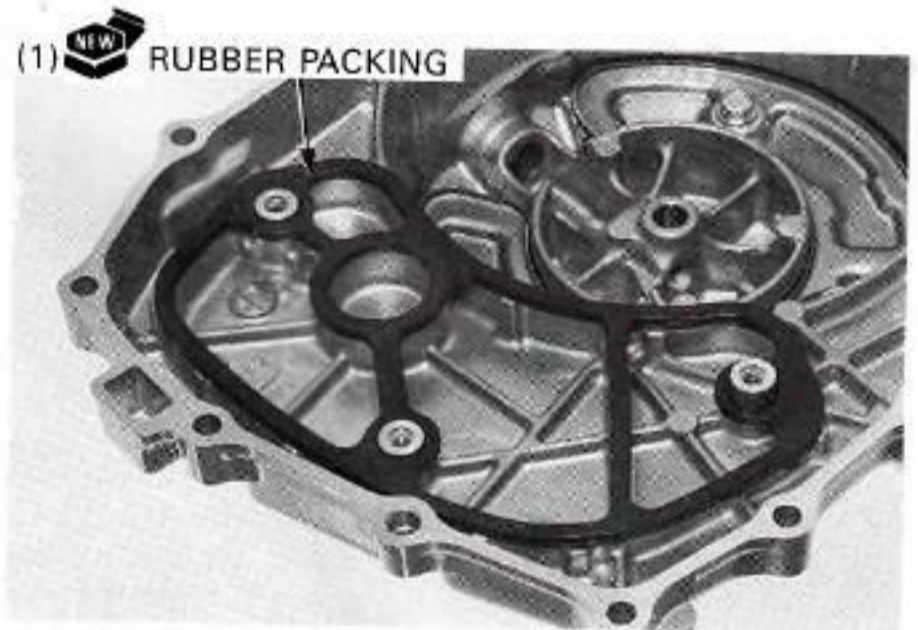
Install the new inner plate rubber packing.



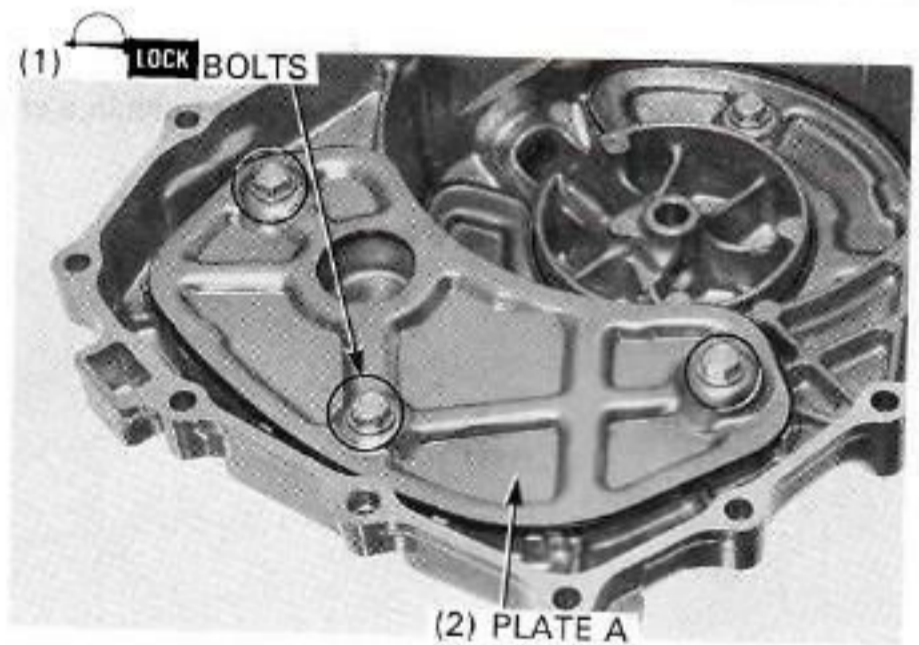
Install the inner plate B.
Clean and apply a locking agent to the bolt threads.
Install and tighten the bolts securely.



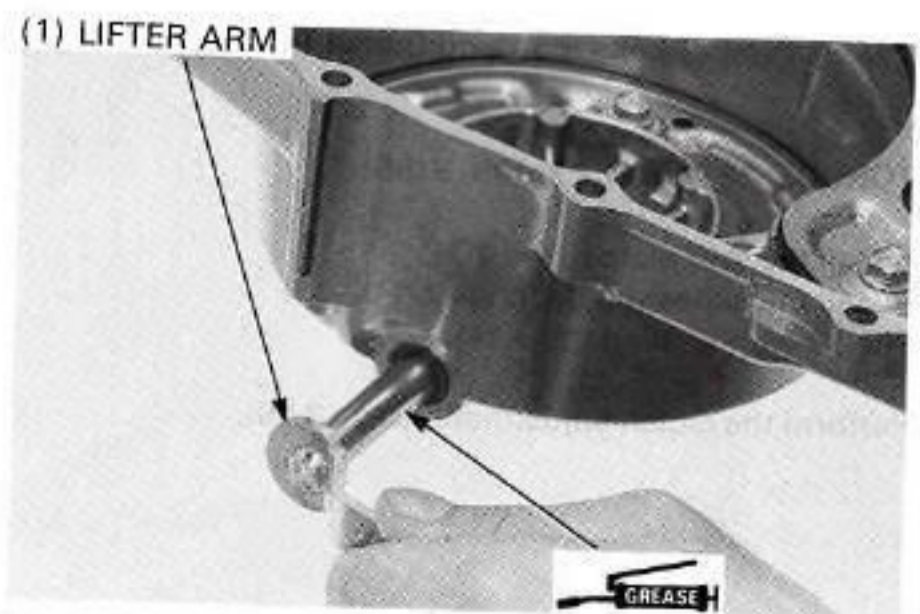
Install the new inner plate rubber packing.



Install the inner plate A.
Clean and apply a locking agent to the bolt threads.
Install and tighten the bolts securely.

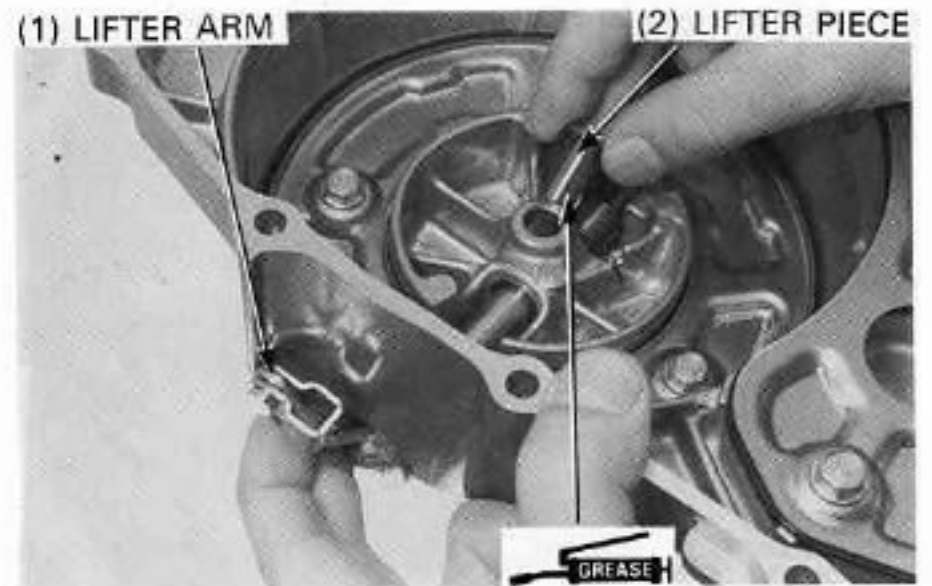


Apply grease to the needle bearing.
Apply grease to the clutch lifter arm sliding surfaces and slit.
Install the clutch lifter arm and spring.



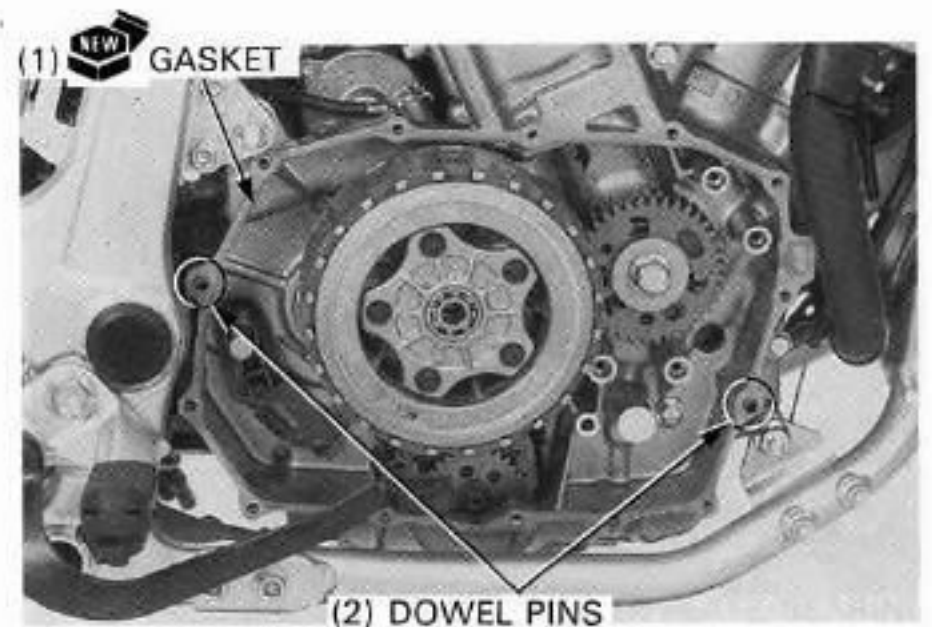
CLUTCH/GEARSHIFT LINKAGE

Align the clutch lifter arm slit and hole on the right crankcase cover by turning the clutch lifter arm clockwise.
Apply grease to the clutch lifter piece.
Install the clutch lifter piece.



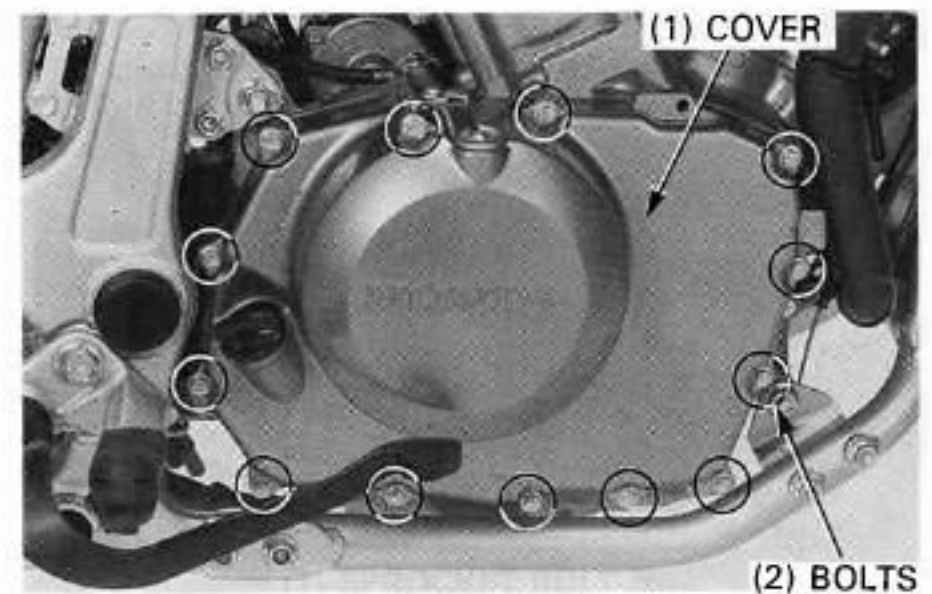
INSTALLATION

Install the dowel pins and new gasket.



Install the right crankcase cover.
Install and tighten the right crankcase cover bolts in a criss-cross pattern in several steps.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

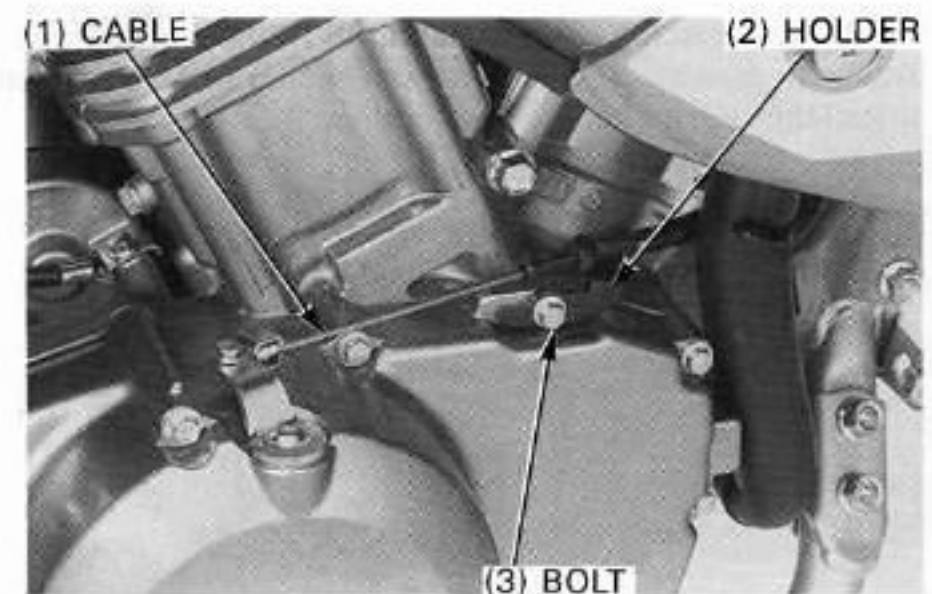


Connect the clutch cable and install the cable holder and bolt.

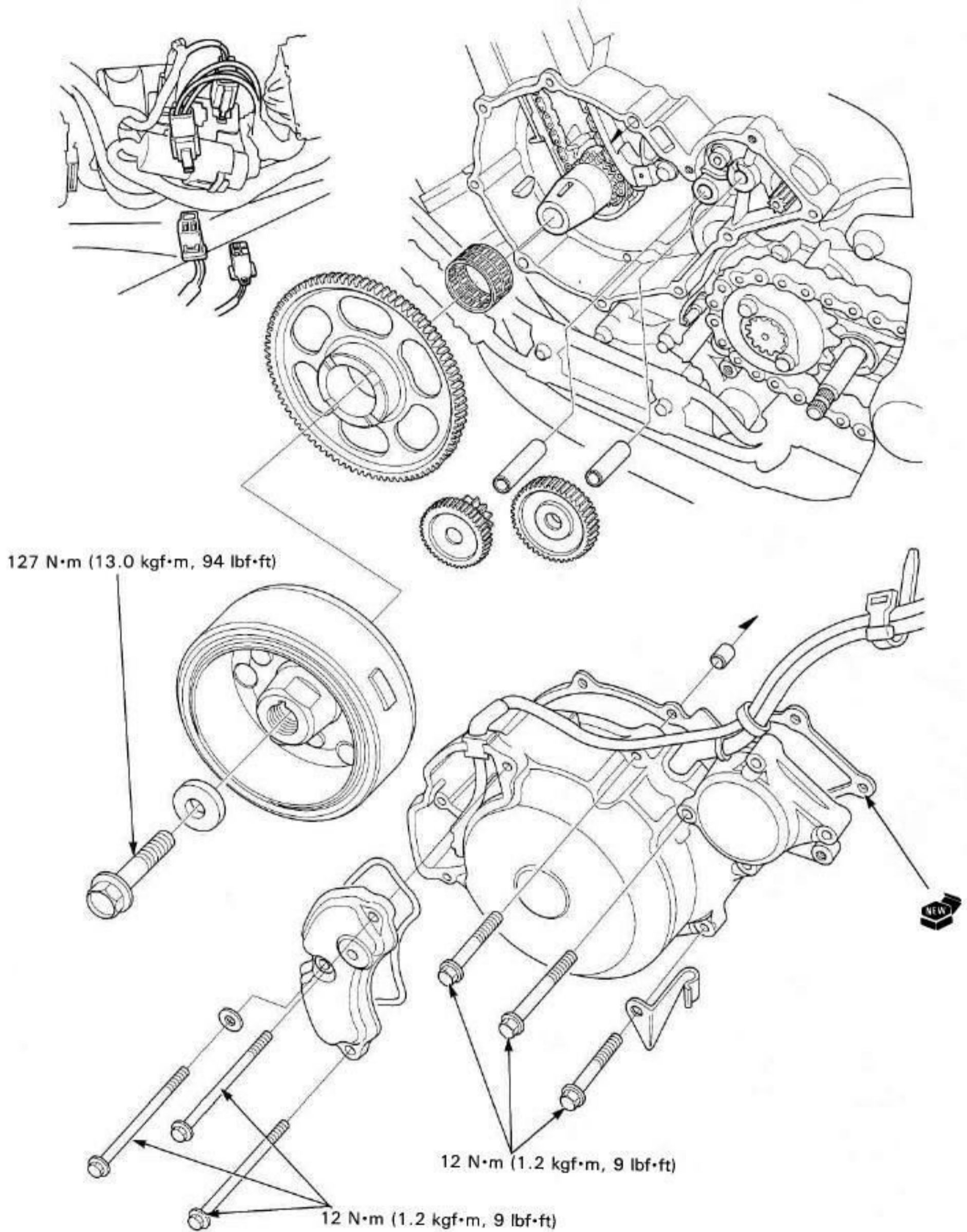
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the skid plate (page 2-7).
Install the exhaust pipe (page 2-17).
Fill the engine oil (page 3-14).

Perform the clutch adjustment (page 3-25).



ALTERNATOR/STARTER CLUTCH



9. ALTERNATOR/STARTER CLUTCH

| | | | |
|---------------------|-----|--------------------------|-----|
| SERVICE INFORMATION | 9-1 | FLYWHEEL, STARTER CLUTCH | 9-3 |
| TROUBLESHOOTING | 9-1 | STATOR INSTALLATION | 9-9 |
| STATOR REMOVAL | 9-2 | | |

SERVICE INFORMATION

GENERAL

- The alternator and starter clutch maintenance can be done with the engine in the frame.
- Refer to section 16 for alternator inspection, and to section 17 for ignition pulse generator inspection.

SPECIFICATIONS

Unit:mm(in)

| ITEM | | STANDARD | SERVICE LIMIT |
|---------------------------|------|-----------------------------------|---------------|
| Starter driven gear | O.D. | 57.749 – 57.768 (2.2736 – 2.2743) | 57.73(2.273) |
| | I.D. | 40.000 – 40.021 (1.5748 – 1.5756) | 40.10(1.579) |
| Starter clutch outer I.D. | | 74.414 – 74.440 (2.9297 – 2.9307) | 74.46(2.931) |

TORQUE VALUES

| | | |
|-------------------------------------|---------------------------------|--|
| Left crankcase cover bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) | |
| Flywheel bolt | 127 N•m (13.0 kgf•m, 94 lbf•ft) | Left hand threads |
| Starter one-way clutch torx bolt | 30 N•m (3.1 kgf•m, 22 lbf•ft) | Apply a locking agent to the threads |
| Starter socket bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) | Apply a locking agent to the threads |
| Ignition pulse generator cover bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) | Apply molybdenum disulfide oil to the threads and flange surface |

TOOLS

| | |
|-----------------|---------------|
| Flywheel holder | 07725-0040000 |
| Flywheel puller | 07733-0010000 |

TROUBLESHOOTING

Starter motor turns, but engine does not turn

- Faulty starter clutch
- Damaged reduction gear
- Damaged starter idle gear

STATOR REMOVAL

NOTE

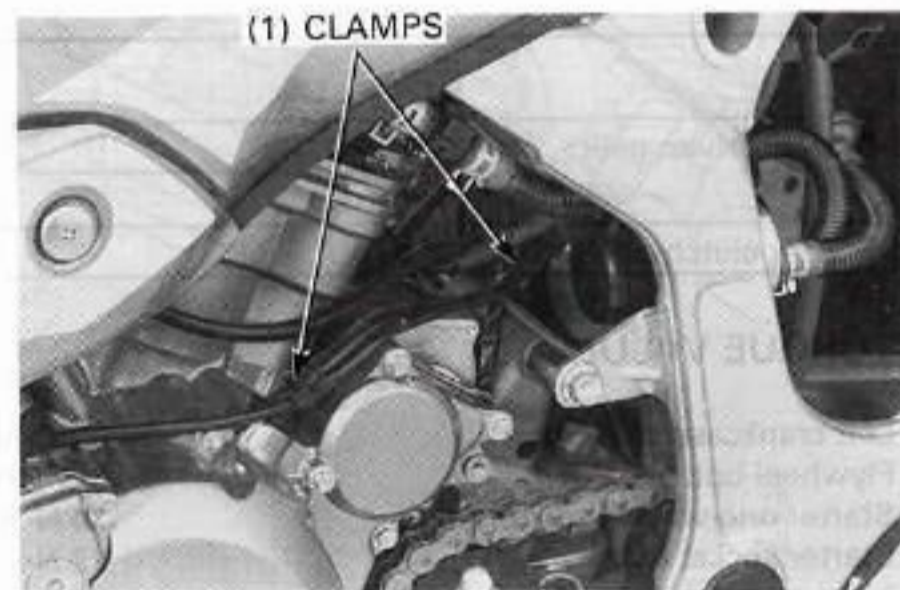
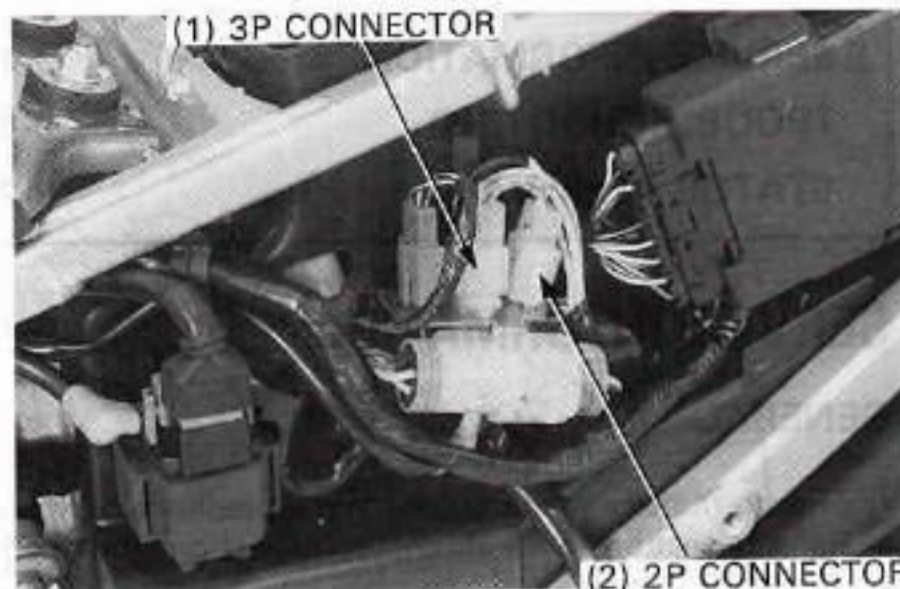
- Refer to page 16-9 for alternator (charging coil) inspection.

Remove the followings:

- Skid plate (page 2-7)
- Fuel tank (page 2-20)
- Drive sprocket cover (page 7-2)
- Left side cover (page 2-7)

Disconnect the alternator 3P connector and ignition pulse generator 2P connector.

Remove the wires from the clamps.

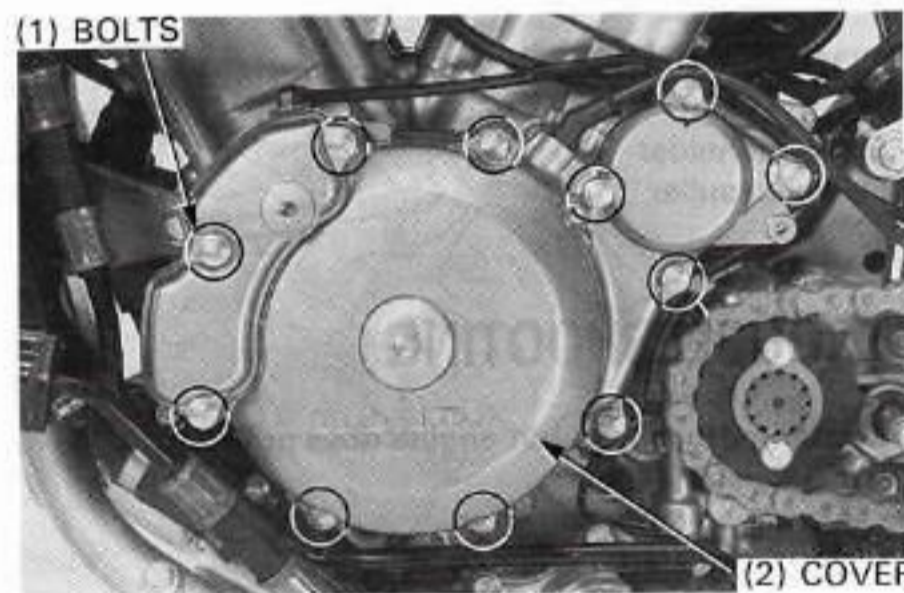


Set the clean oil pan under the engine.

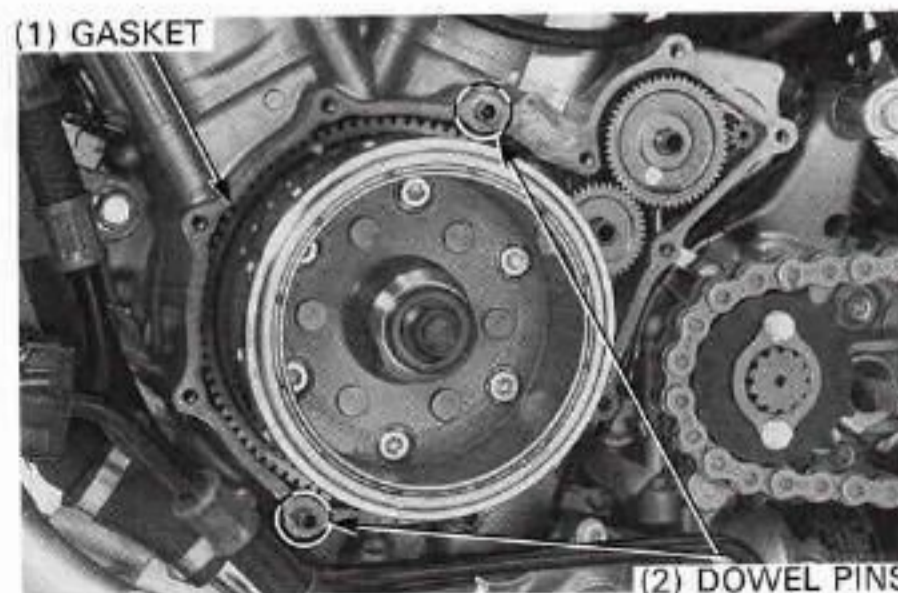
Remove the left crankcase cover bolts and the left crankcase cover.

NOTE

- Loosen the left crankcase cover bolts in a crisscross pattern in several steps.
- The left crankcase cover (stator) is magnetically attached to the flywheel, be careful to removal.

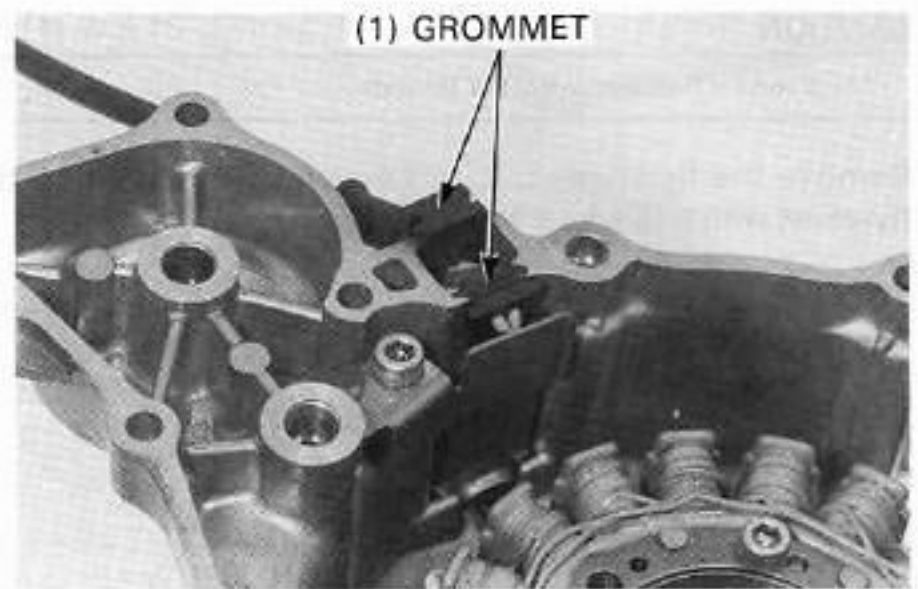


Remove the gasket and dowel pins.

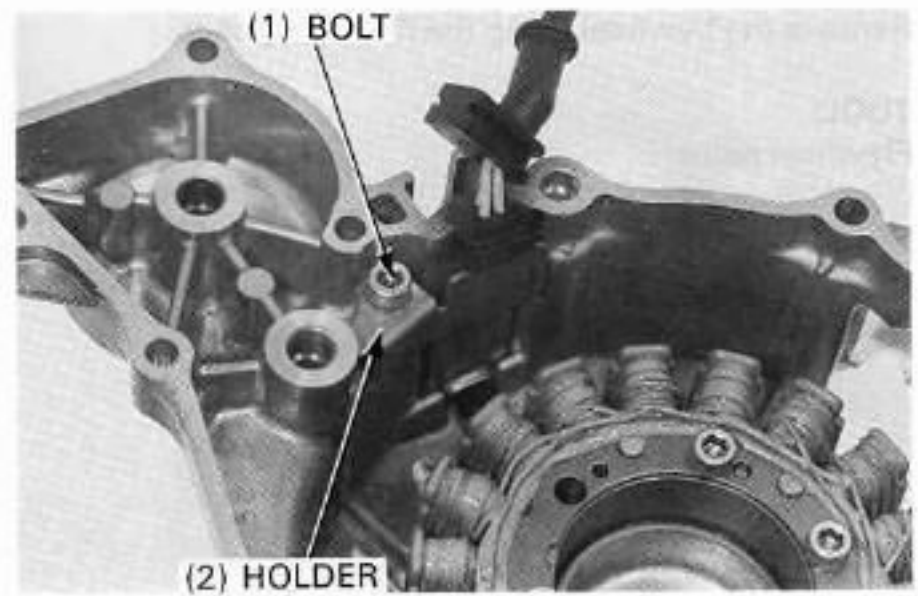


Remove the ignition pulse generator (page 17-10).

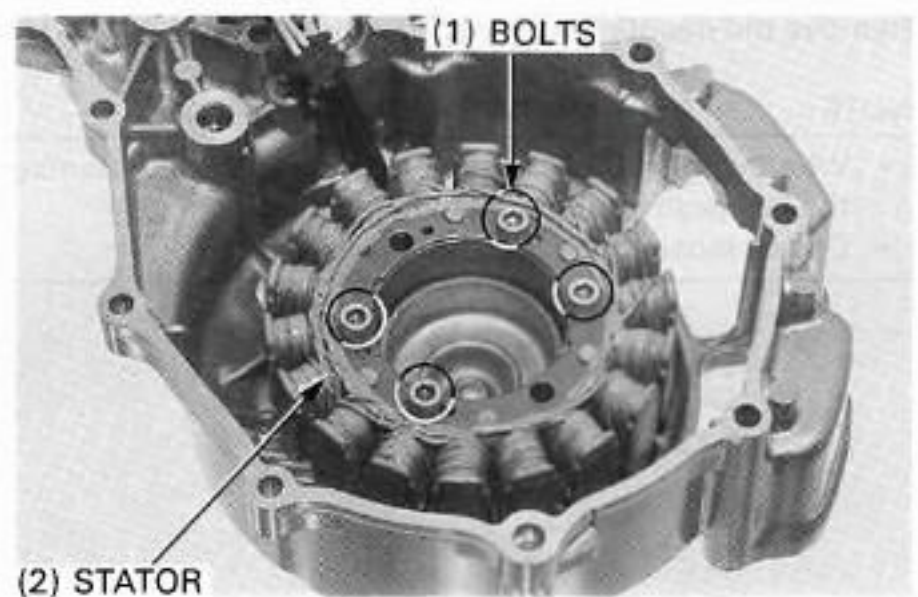
Remove the stator grommets from the left crankcase cover.



Remove the socket bolt and stator wire holder from the left crankcase cover.



Remove the socket bolts and stator from the left crankcase cover.

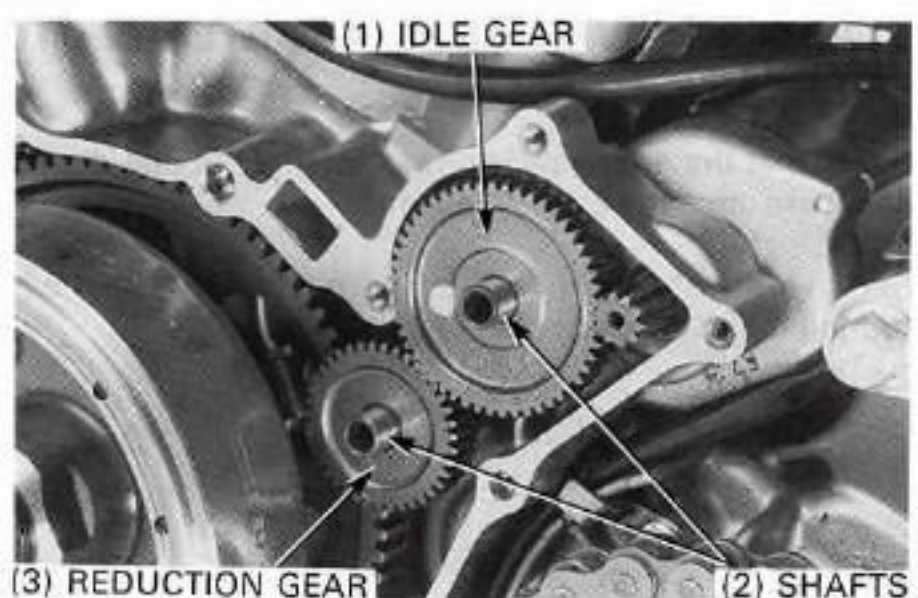


FLYWHEEL, STARTER CLUTCH

FLYWHEEL REMOVAL

Remove the left crankcase cover (page 9-2).

Remove the starter idle gear and shaft.
Remove the starter reduction gear and shaft.



ALTERNATOR/STARTER CLUTCH

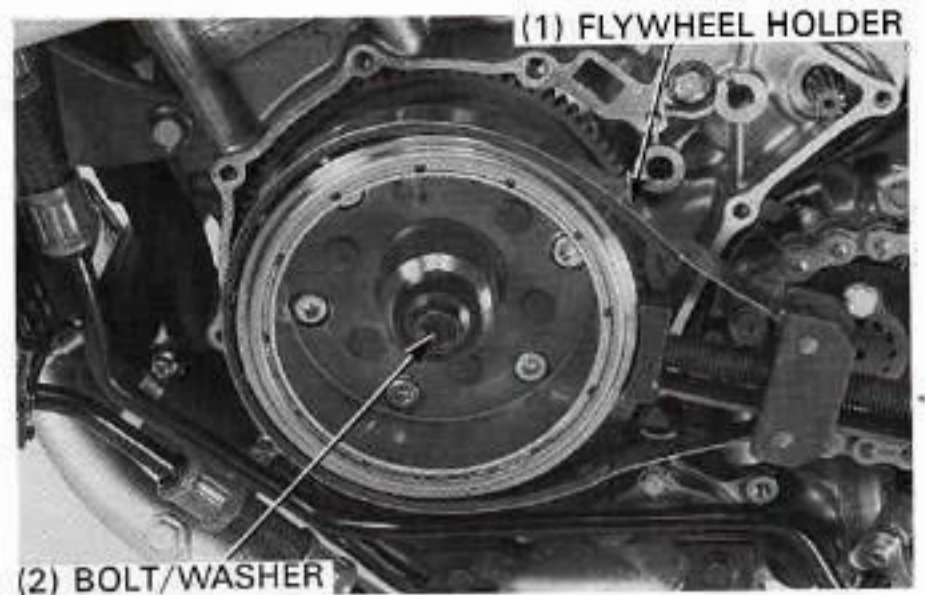
CAUTION

- *The flywheel bolt has left hand threads.*

Remove the flywheel bolt and washer while holding the flywheel with a flywheel holder.

TOOL:

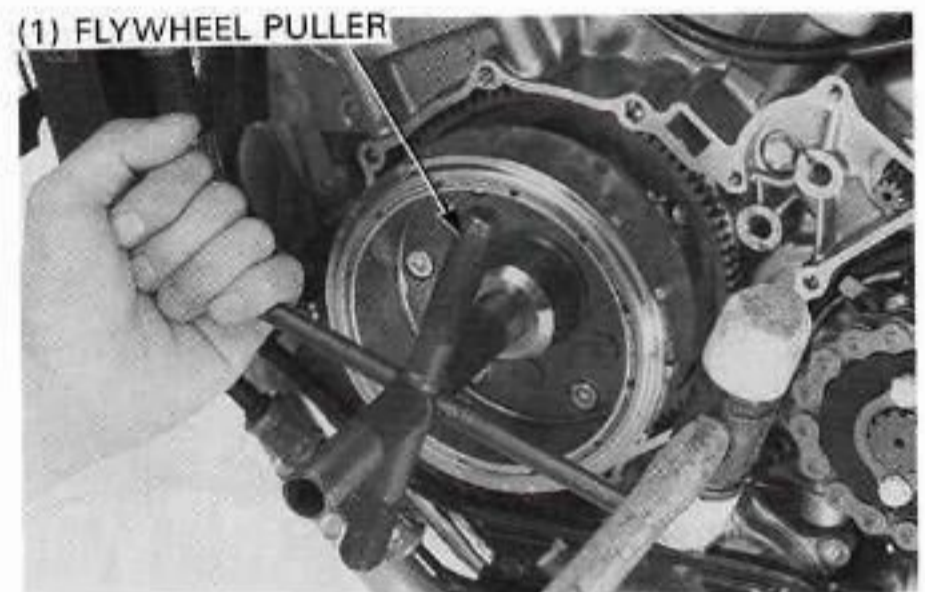
Flywheel holder **07725-0040000**



Remove the flywheel using the flywheel puller.

TOOL:

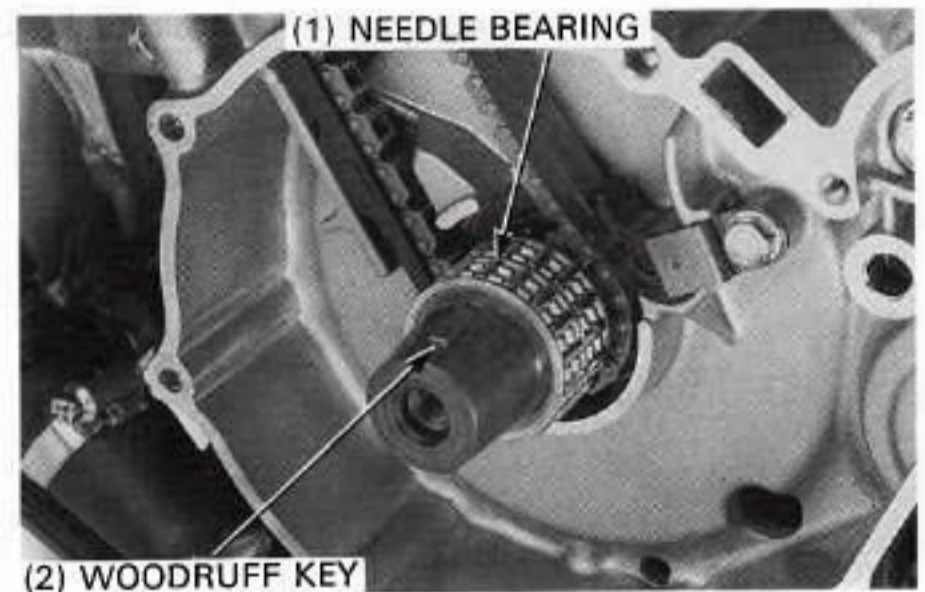
Flywheel puller **07733-0010000**



Remove the needle bearing and woodruff key.

NOTE

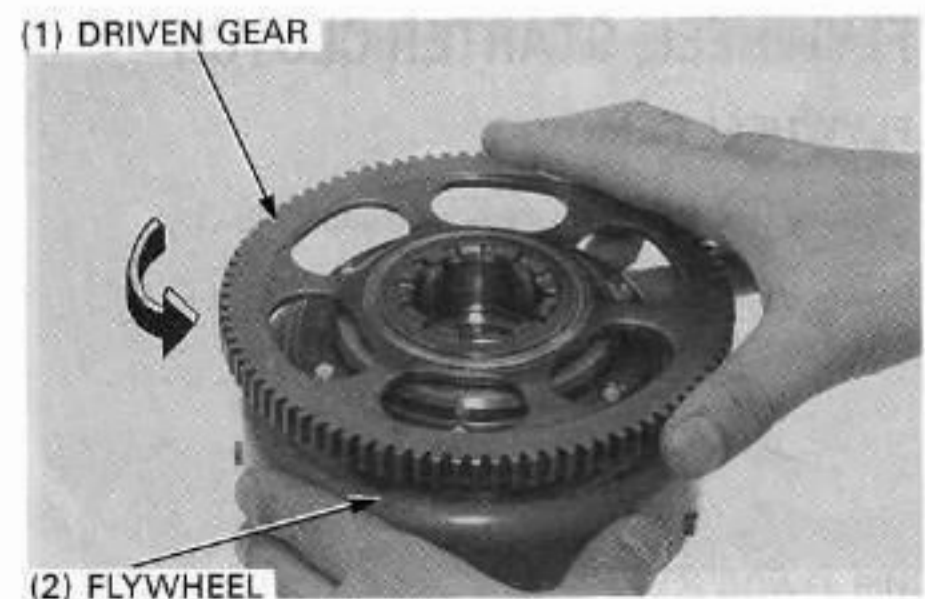
- When woodruff key removal, be careful not to damage the key groove or crankshaft.
- Do not loose the woodruff key.



STARTER DRIVEN GEAR, STARTER CLUTCH REMOVAL

Check that the driven gear turns smoothly in one direction and locks up in the other direction.

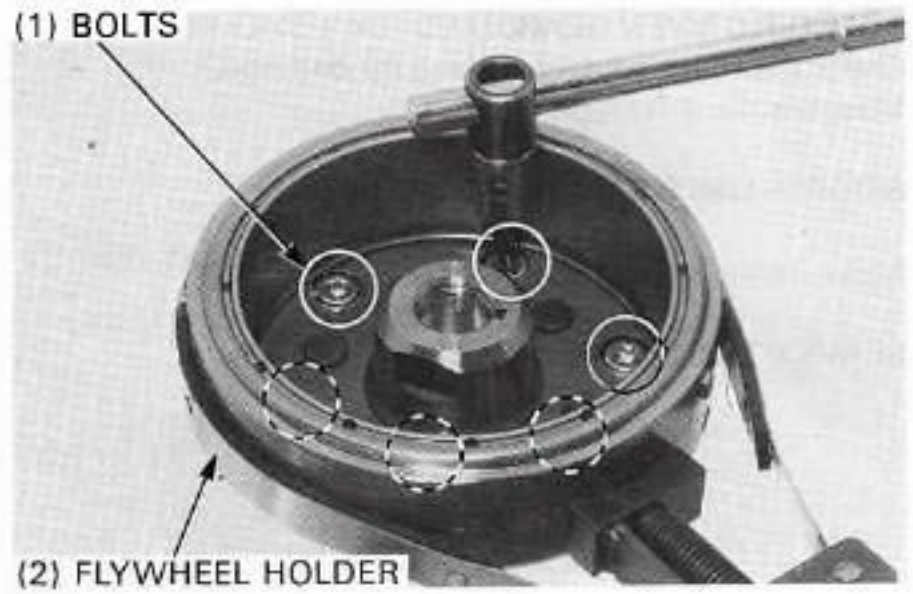
Remove the starter driven gear from the flywheel while turning the driven gear counterclockwise.



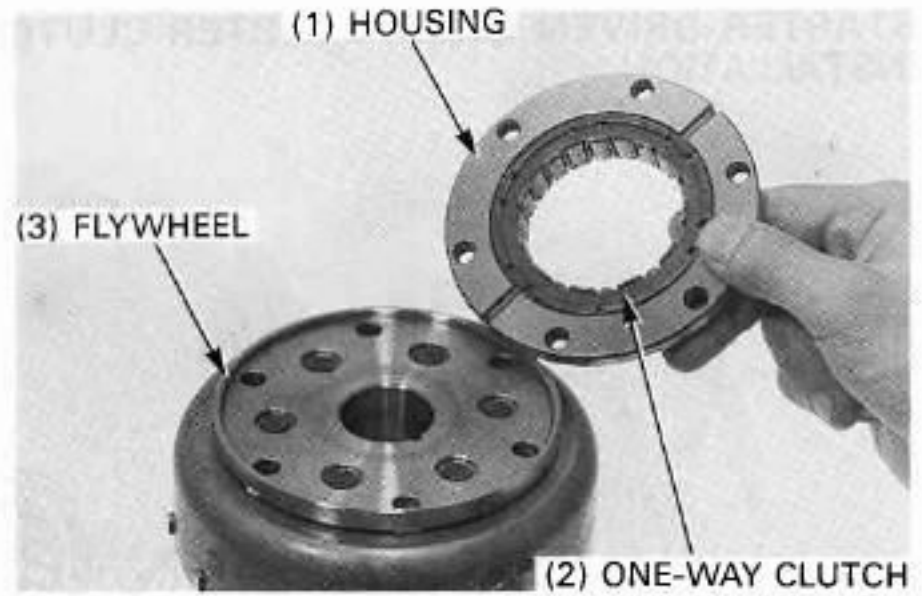
Remove the starter one-way clutch torx bolts while holding the flywheel with a flywheel holder.

TOOL:
Flywheel holder

07725-0040000



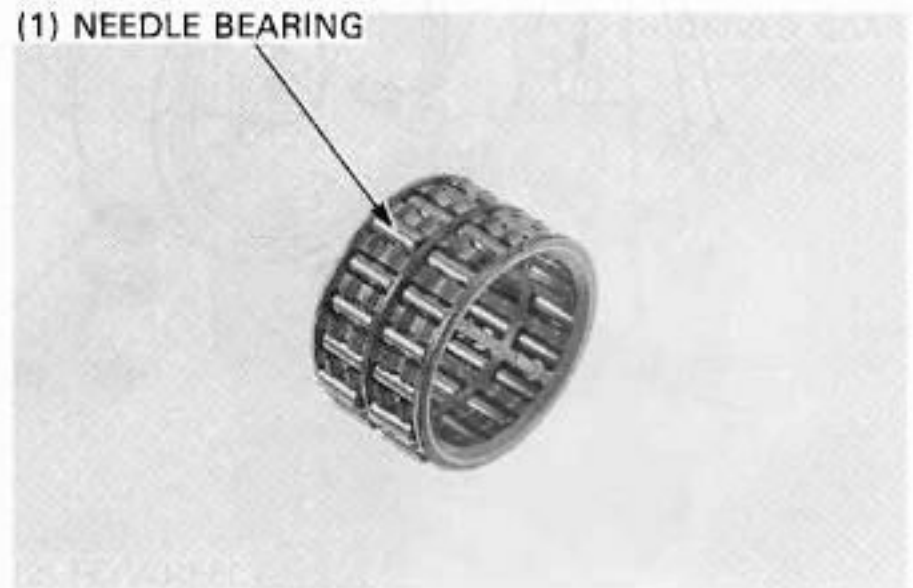
Remove the clutch housing and one-way clutch from the flywheel.



STARTER CLUTCH INSPECTION

NEEDLE BEARING

Check the needle bearing clutch sprag for abnormal wear, damage.

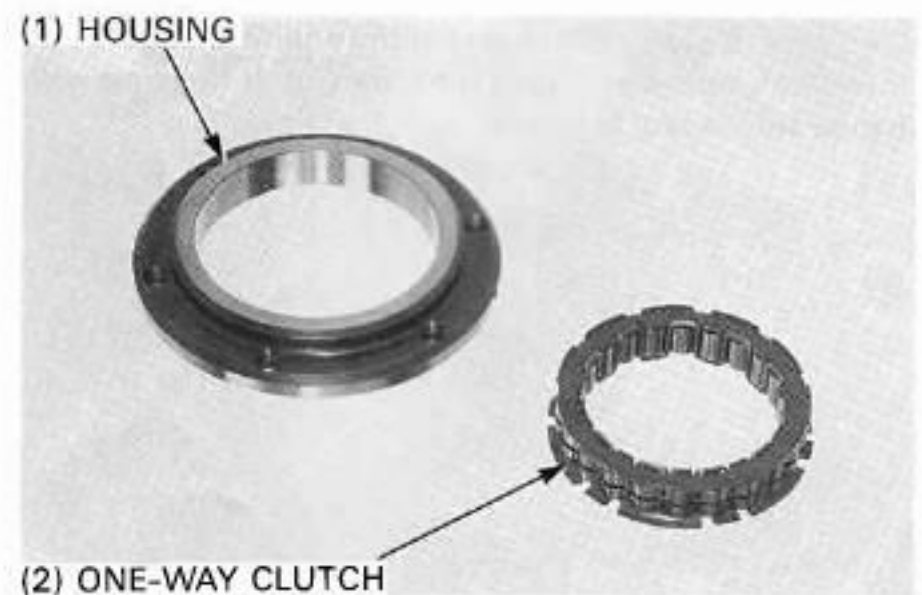


ONE-WAY CLUTCH

Check the one-way clutch sprag for abnormal wear, damage or irregular movement.

CLUTCH HOUSING

Check the clutch inner contact surface of the housing for damage.



ALTERNATOR/STARTER CLUTCH

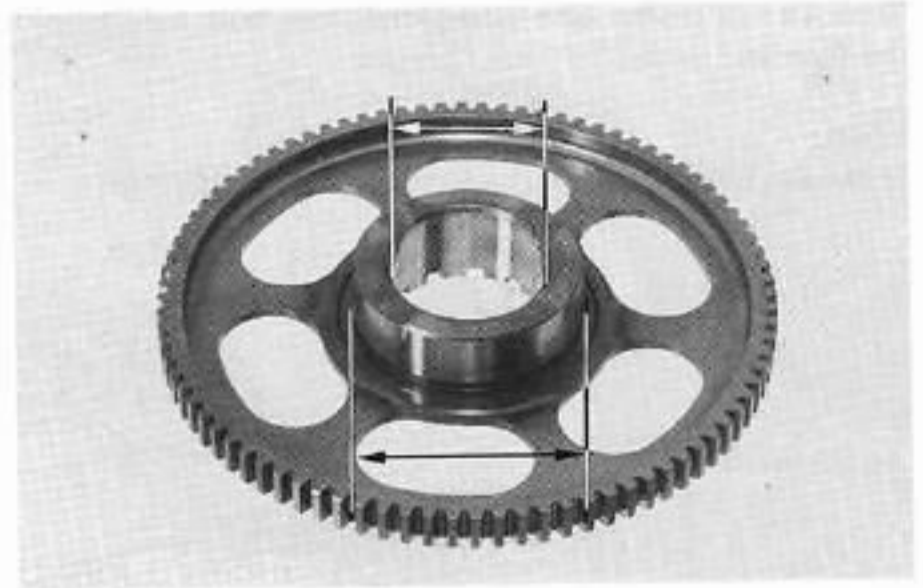
STARTER DRIVEN GEAR

Check the roller contact surface for damage.
Measure the driven gear O.D.

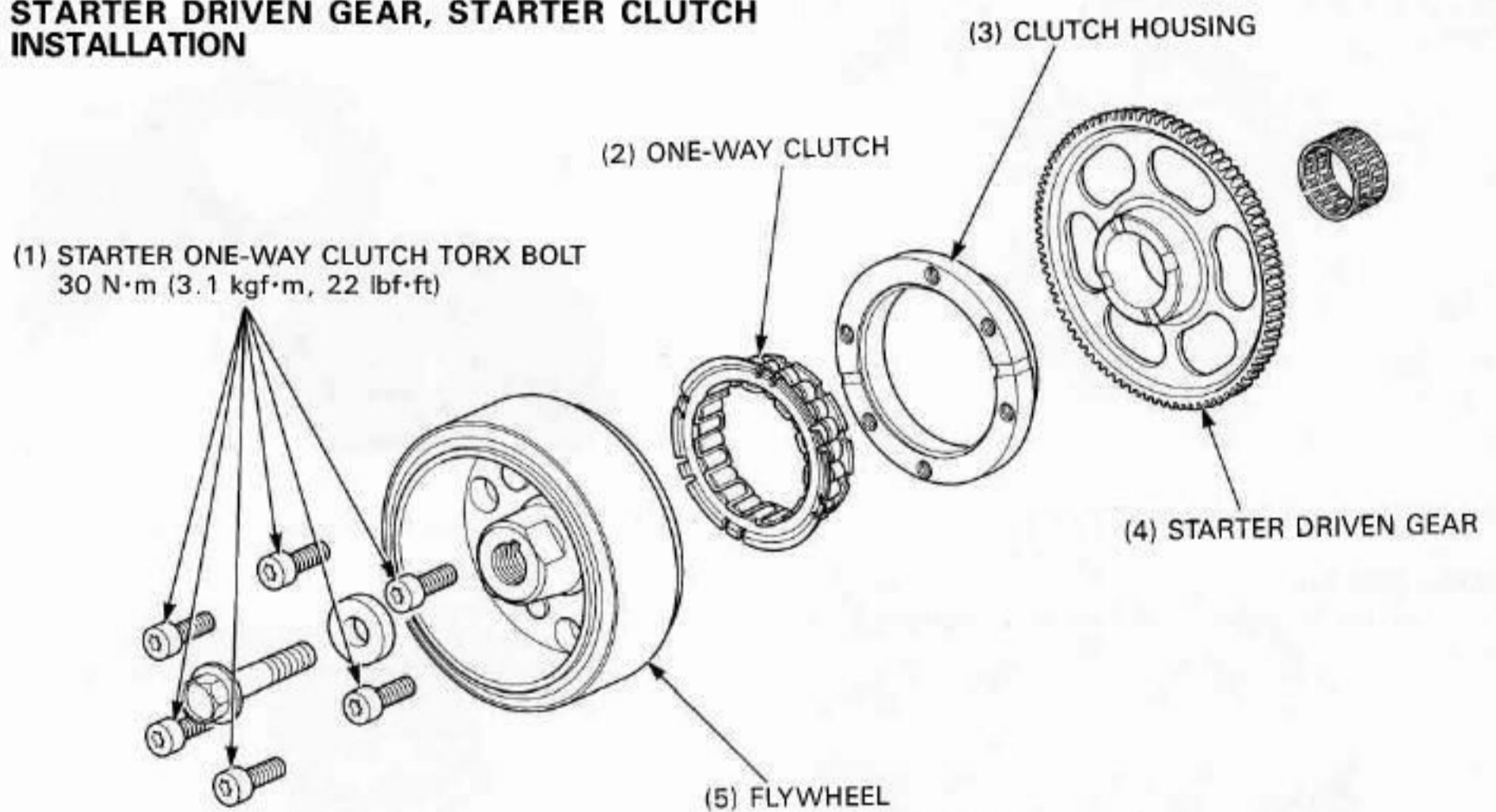
SERVICE LIMIT: 57.53 mm (2.273 in)

Measure the driven gear I.D.

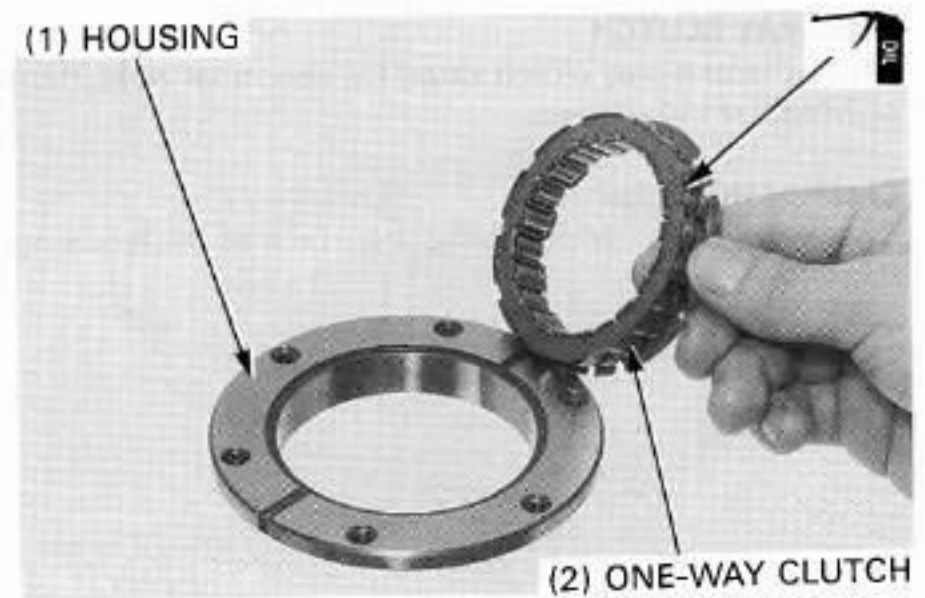
SERVICE LIMIT: 40.10 mm (1.579 in)



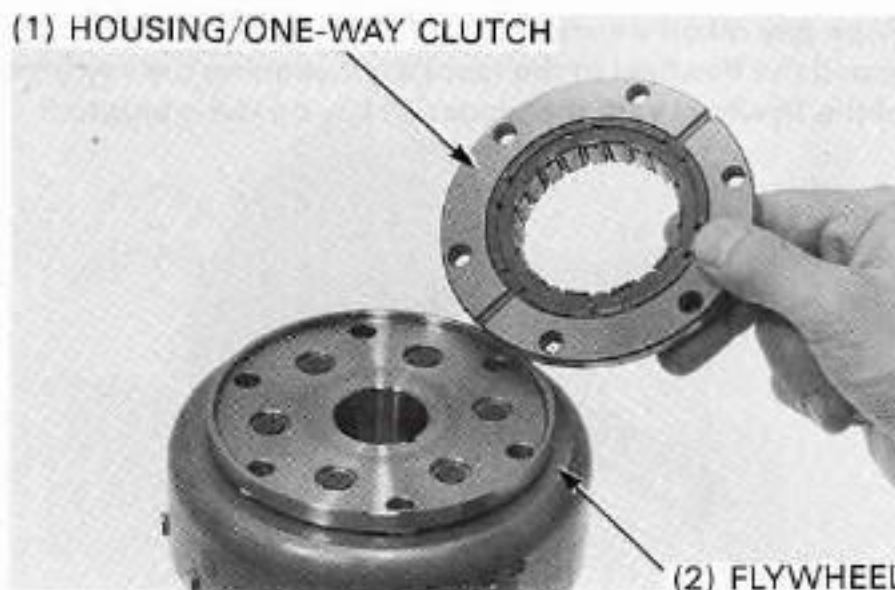
STARTER DRIVEN GEAR, STARTER CLUTCH INSTALLATION



Clean the one-way clutch and apply engine oil to the sprag.
Install the one-way clutch into the clutch housing with its
flange side facing flywheel.



Install the clutch housing/one-way clutch to the flywheel.

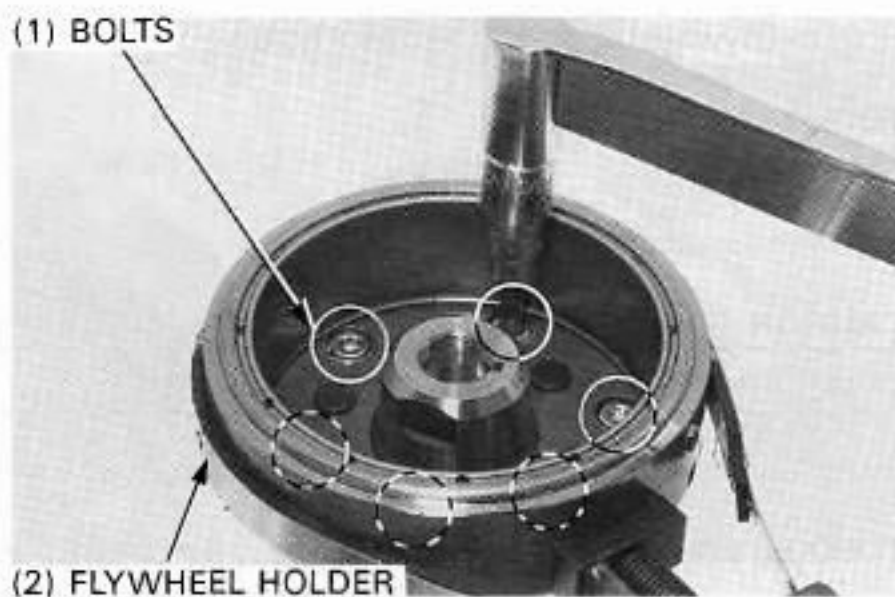


Hold the flywheel using the flywheel holder.

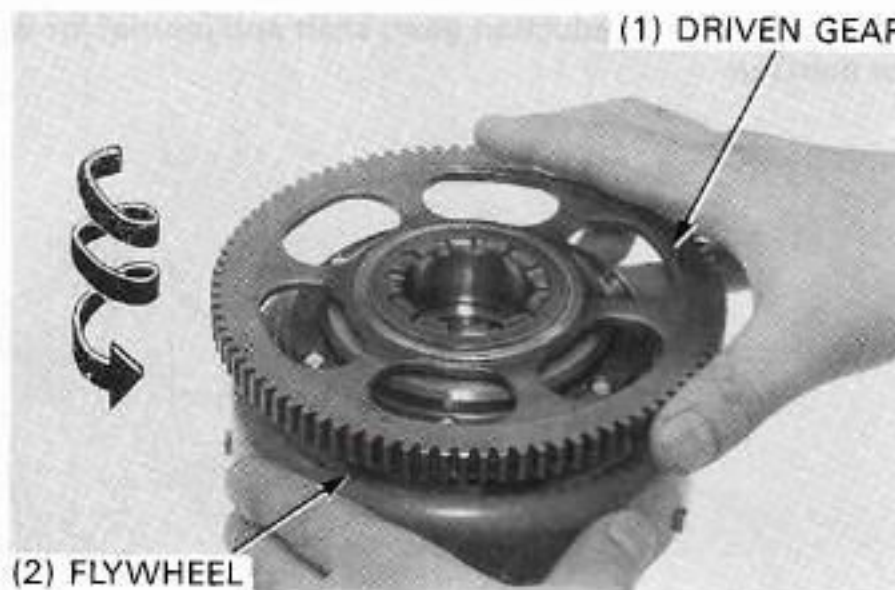
TOOL:
Flywheel holder **07725-0040000**

Clean and apply a locking agent to the starter one-way clutch torx bolt threads.
Install and tighten the starter one-way clutch torx bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



Install the starter driven gear to the flywheel while turning the driven gear counterclockwise.

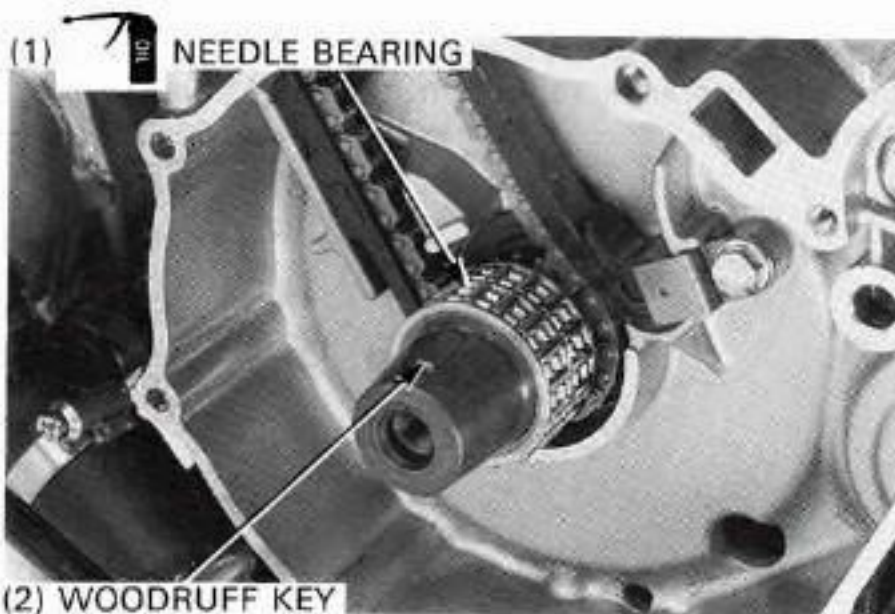


FLYWHEEL INSTALLATION

Apply engine oil to the needle bearing and install it to the crankshaft.
Wipe any oil off the mating surface of the crankshaft.
Install the woodruff key to the key groove of crankshaft.

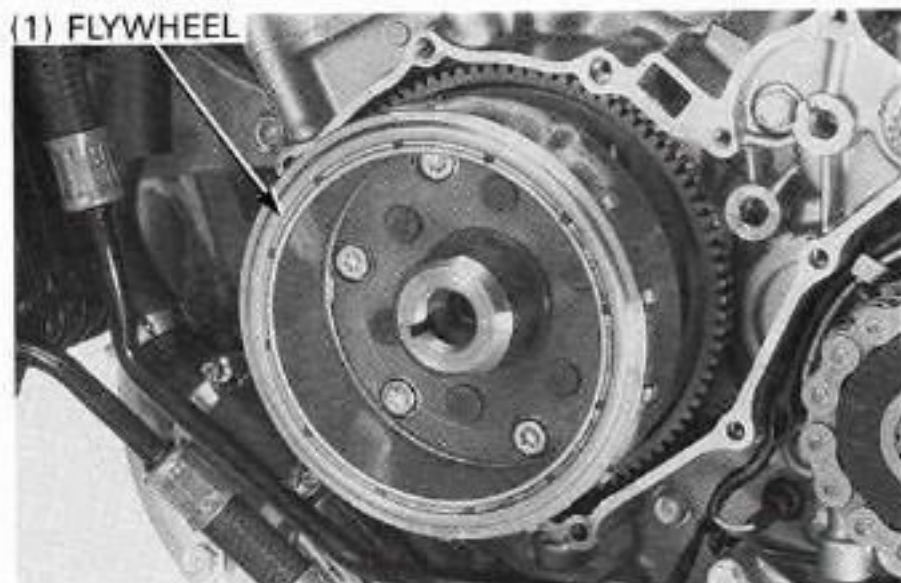
NOTE

- When woodruff key installation, be careful not to damage the key groove or crankshaft.



ALTERNATOR/STARTER CLUTCH

Wipe any oil off the mating surface of the flywheel.
Install the flywheel to the crankshaft aligning the key groove of the flywheel with the woodruff key on the crankshaft.



Hold the flywheel using the flywheel holder.

TOOL:
Flywheel holder **07725-0040000**

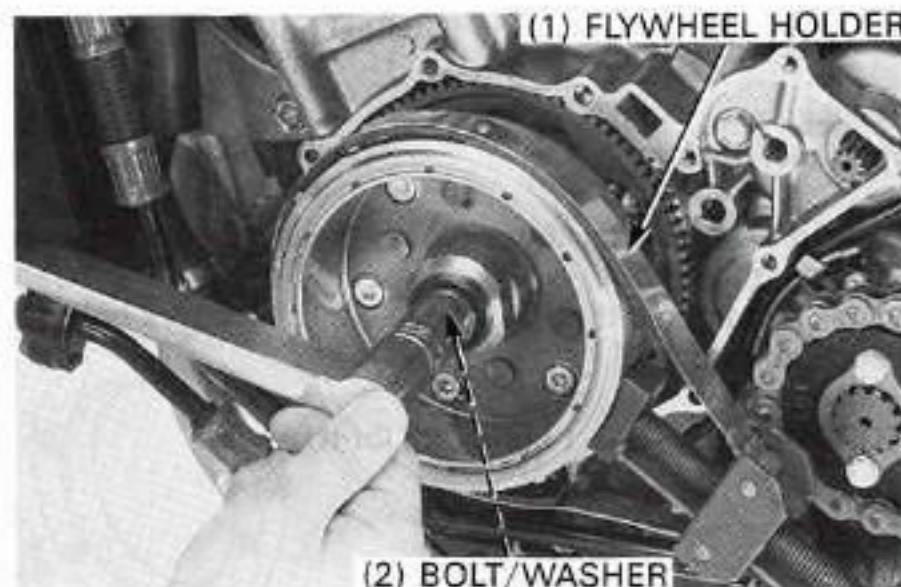
Install the washer.

CAUTION

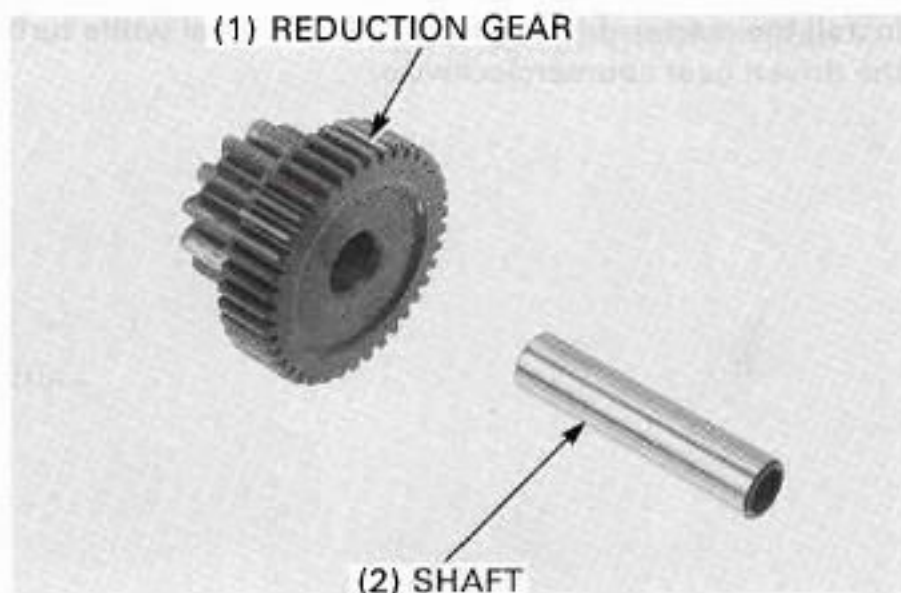
- *The flywheel bolt has left hand threads.*

Install and tighten the flywheel bolt to the specified torque.

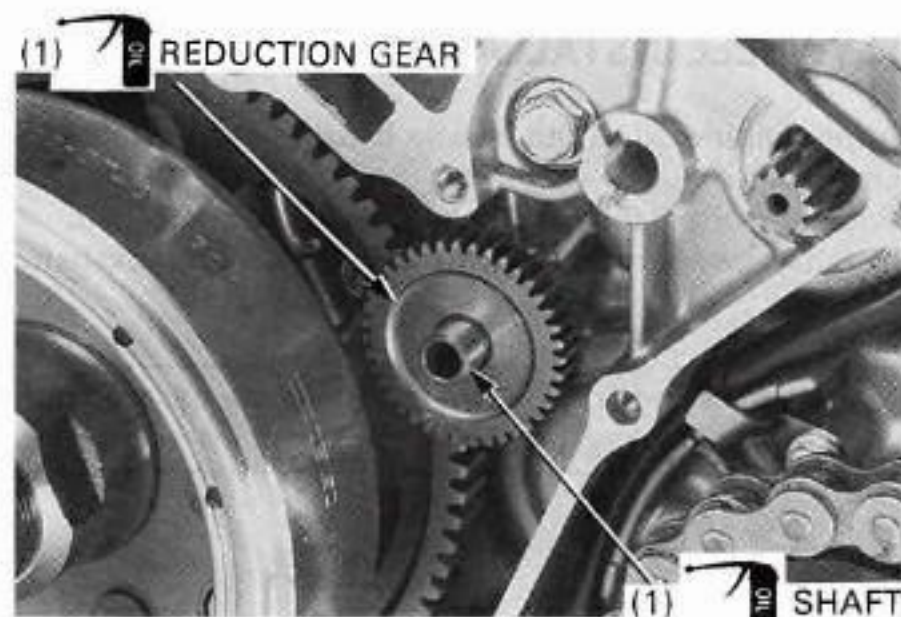
TORQUE: 127 N·m (13.0 kgf·m, 94 lbf·ft)



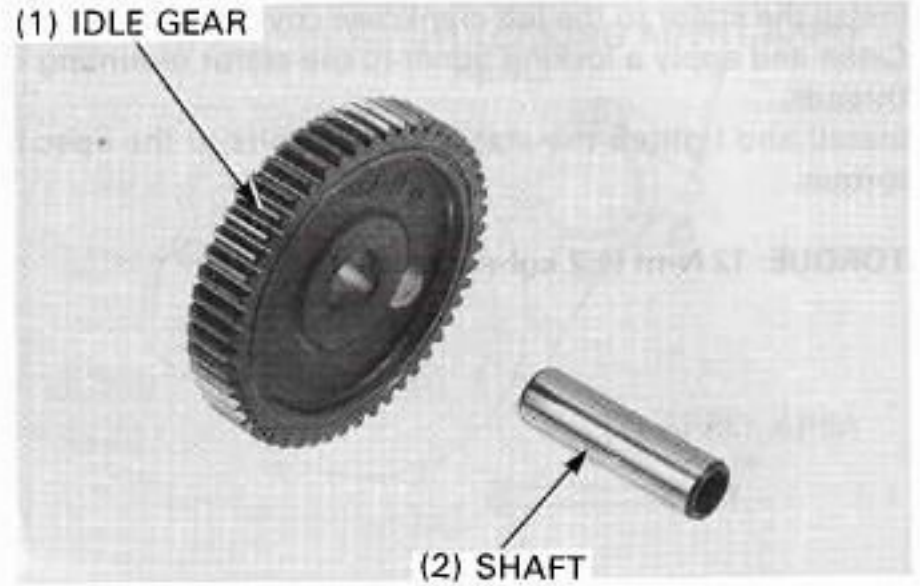
Check the starter reduction gear, shaft and journal for wear or damage.



Apply engine oil to the starter reduction gear and shaft.
Install the starter reduction gear and shaft to the left crankcase.

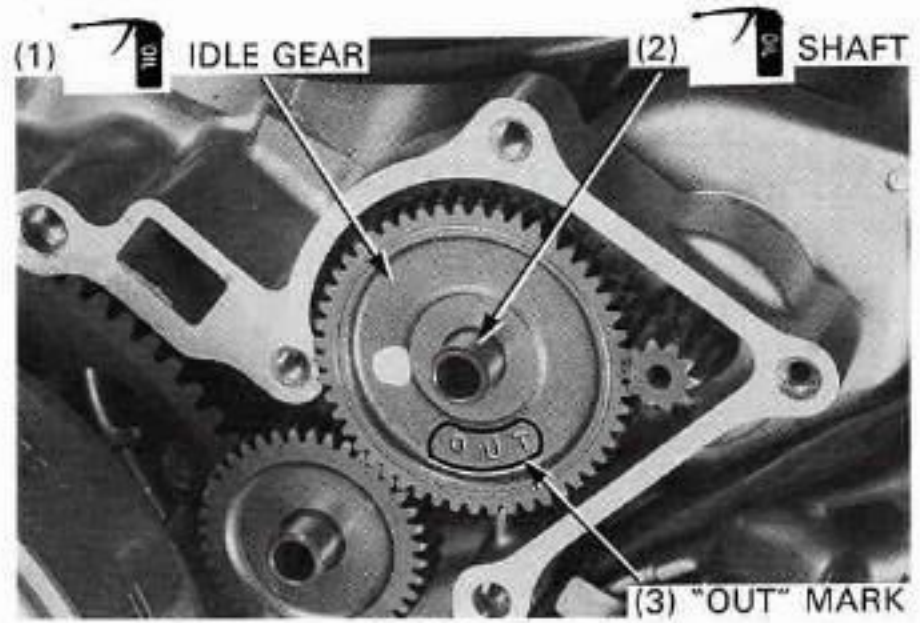


Check the starter idle gear, shaft and journal for wear or damage.

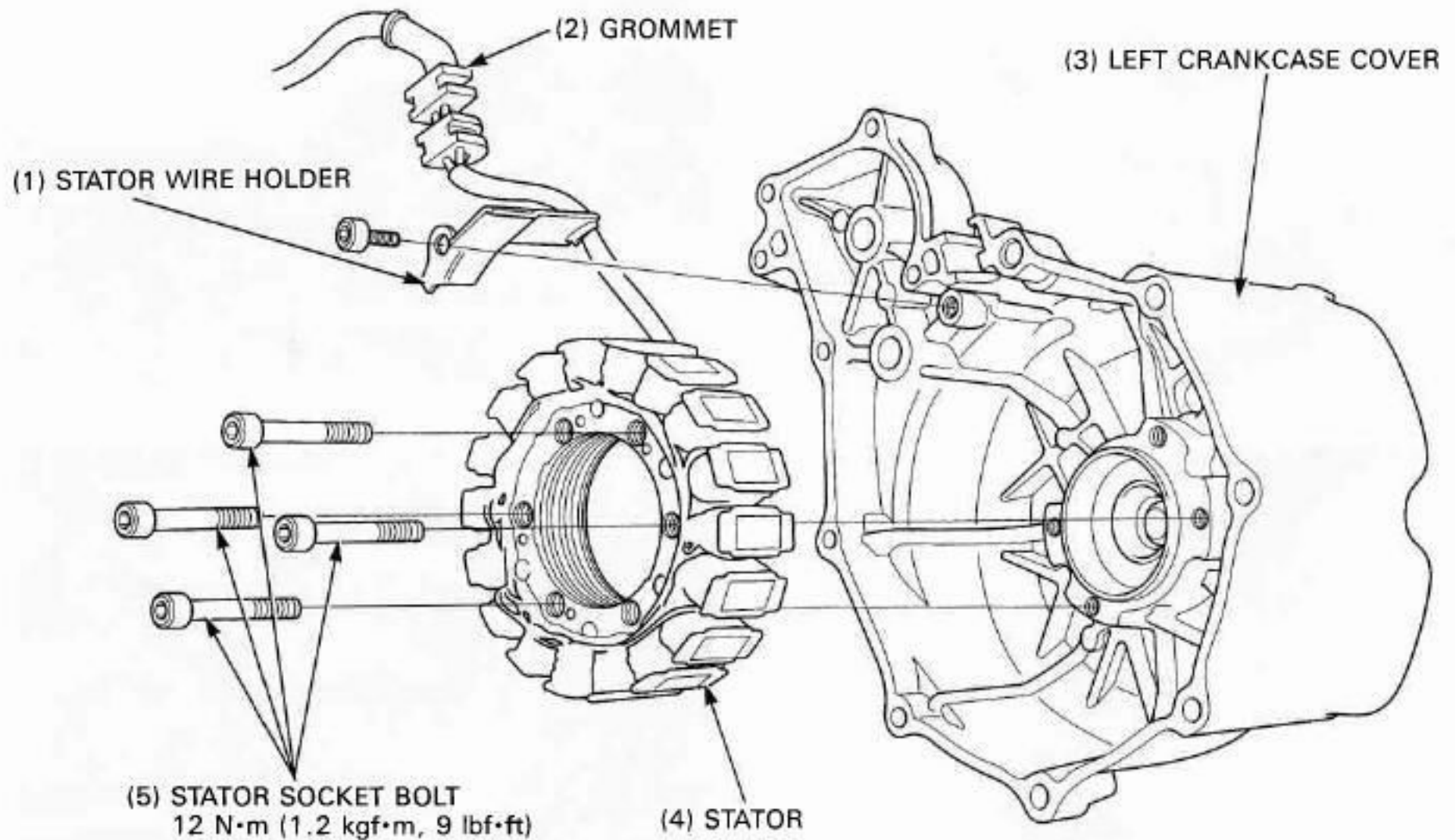


Apply engine oil to the starter idle gear and shaft.
Install the starter idle gear to the left crankcase with the "OUT" mark facing out.
Install the shaft to the left crankcase.

Install the stator and left crankcase cover (page 9-10).



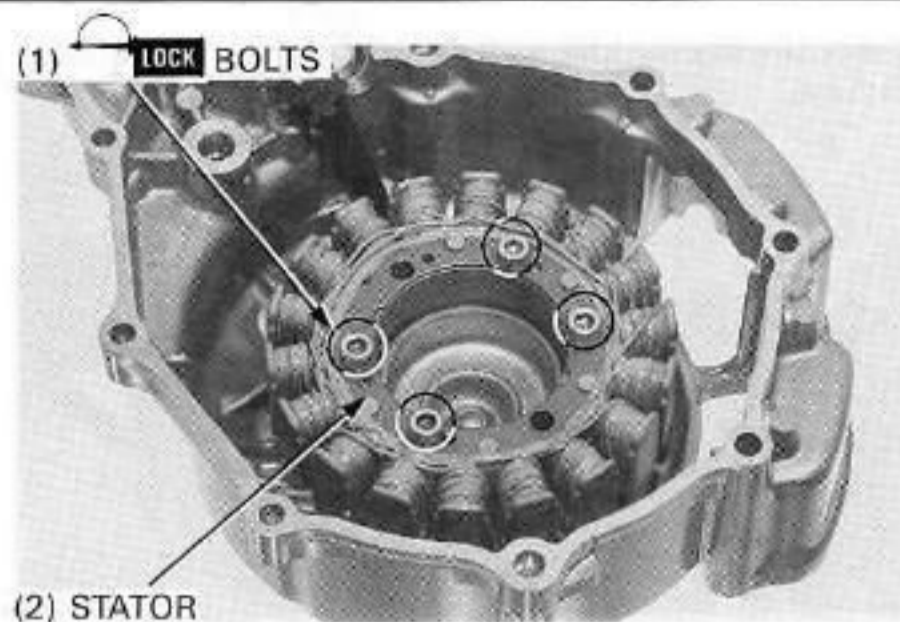
STATOR INSTALLATION



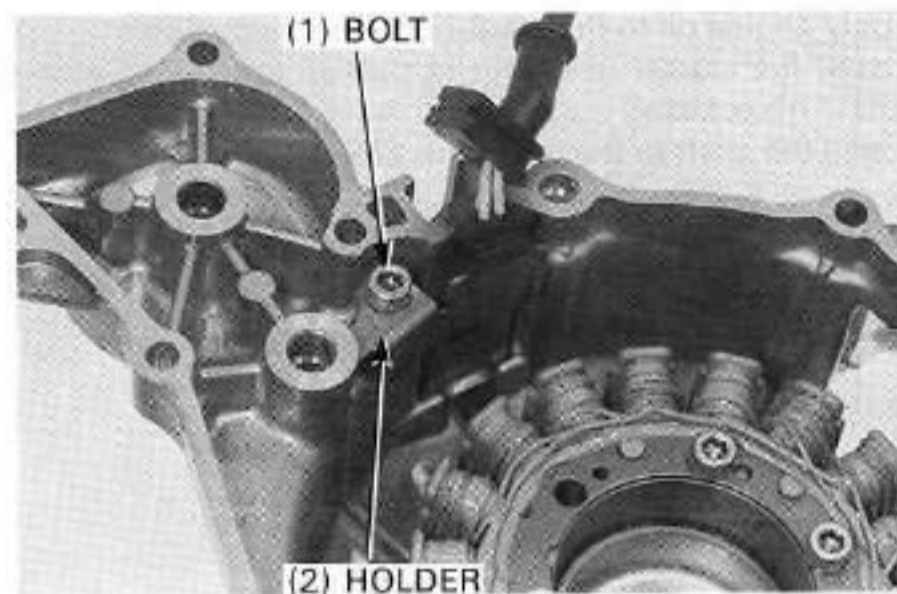
ALTERNATOR/STARTER CLUTCH

Install the stator to the left crankcase cover.
Clean and apply a locking agent to the stator mounting bolt threads.
Install and tighten the stator socket bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

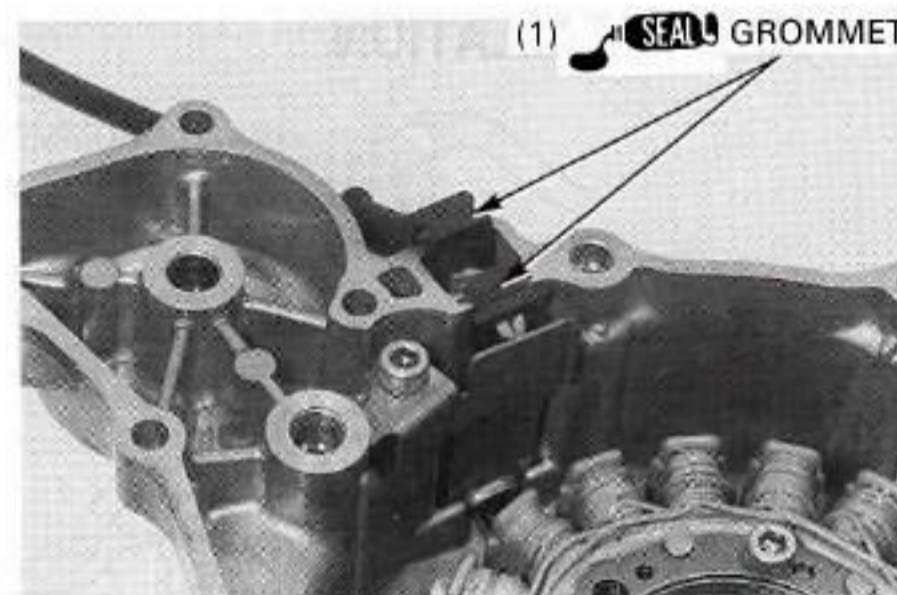


Install the stator wire holder to the left crankcase cover and tighten the socket bolt securely.

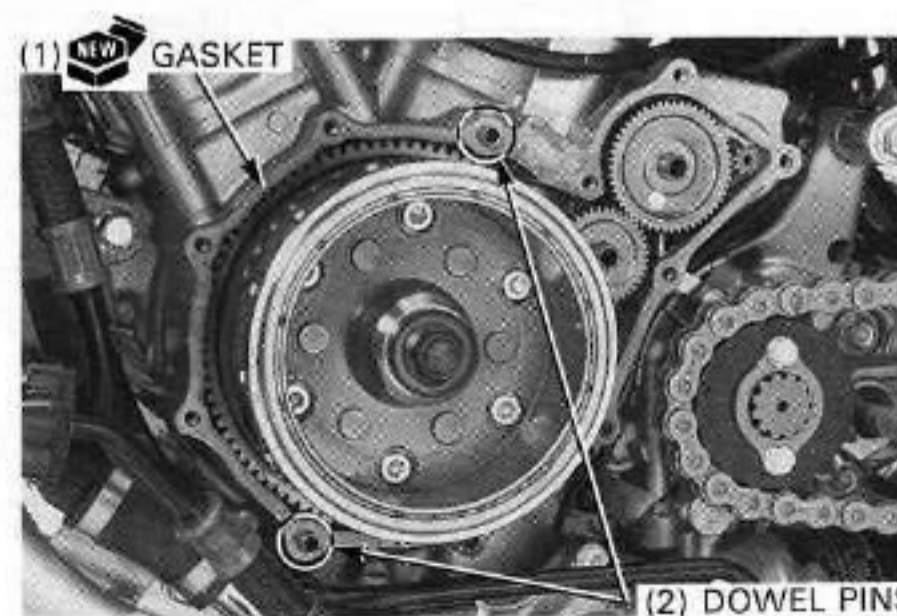


Clean and apply sealant to the wire grommets seating surface and install the grommets into the grooves in the left crankcase cover.

Install the ignition pulse generator (page 17-10).



Install the dowel pins and new gasket.



Install the left crankcase cover.

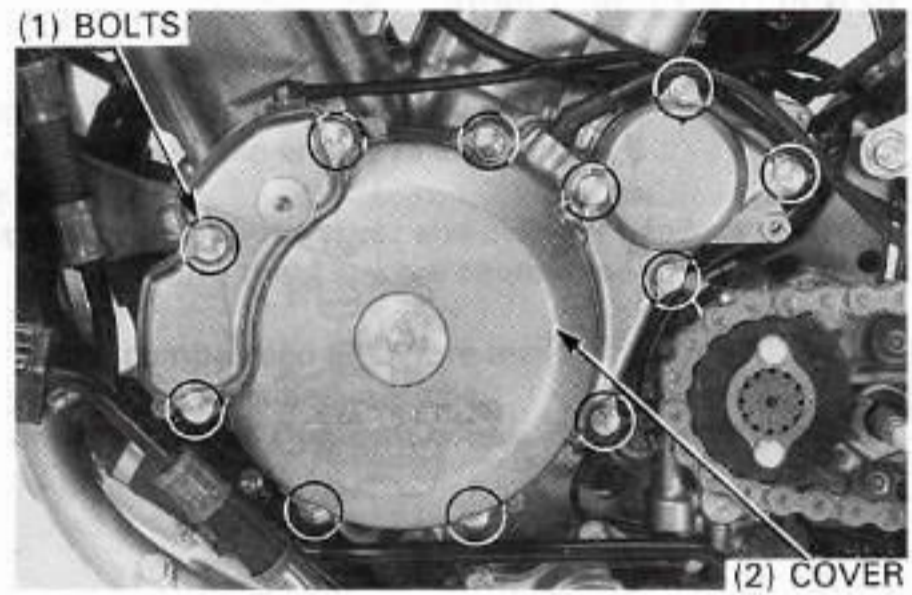
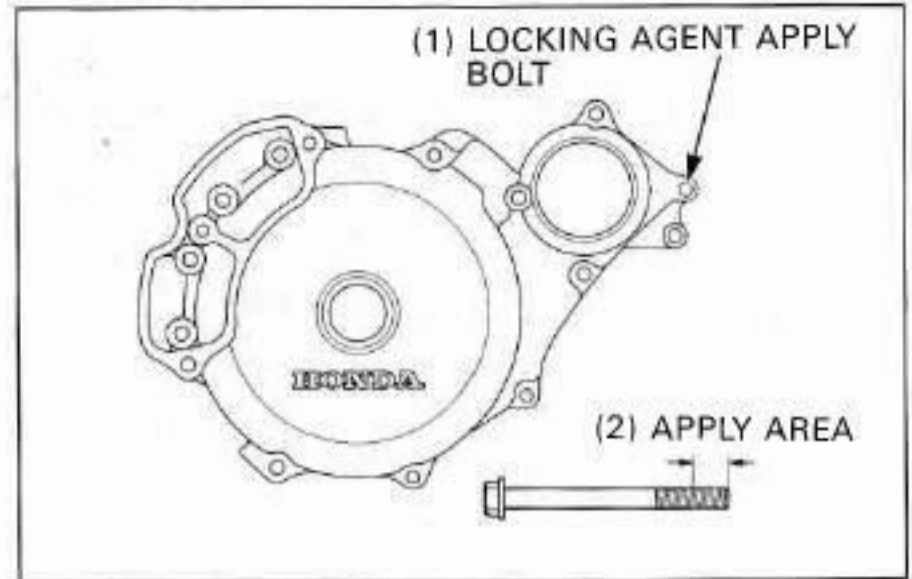
NOTE

- The left crankcase cover (stator) is magnetically attached to the flywheel, be careful to installation.

Clean and apply a locking agent to the left crankcase cover bolt threads as shown.

Install and tighten the left crankcase cover bolts to the specified torque in a crisscross pattern in several steps.

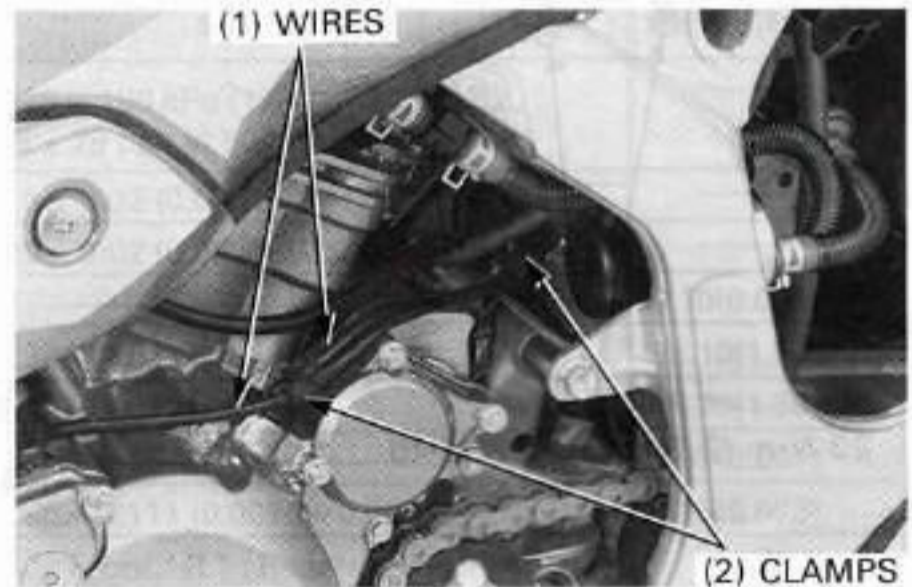
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



NOTE

- Route the wire harness properly (page 1-22).

Install the wires to the clamps.

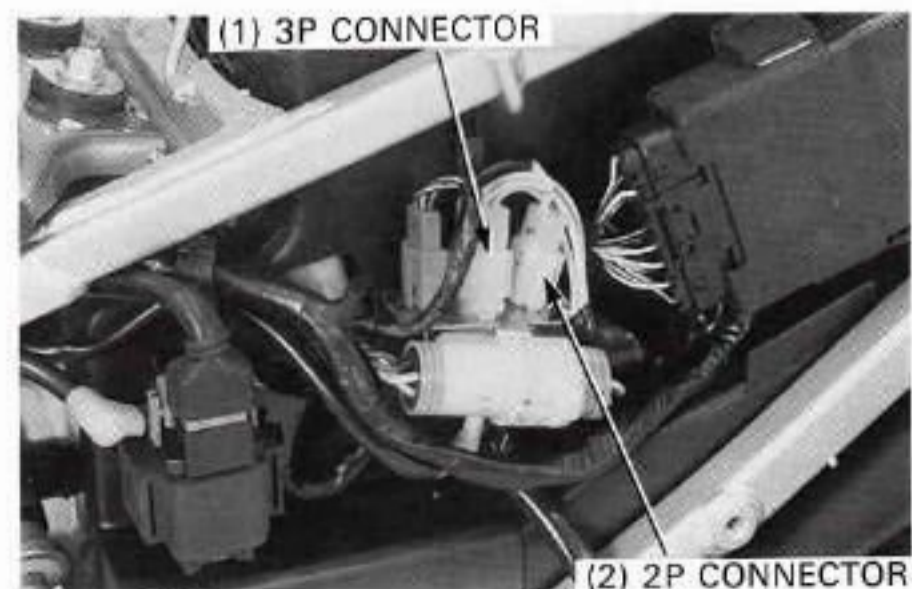


Connect the alternator 3P connector and ignition pulse generator 2P connector.

Install the followings:

- Left side cover (page 2-7)
- Drive sprocket cover (page 7-14)
- Fuel tank (page 2-23)
- Skid plate (page 2-7)

Check the engine oil level (page 3-14).



10. CYLINDER HEAD/VALVES

| | | | |
|-----------------------------|-------|-------------------------------------|-------|
| SERVICE INFORMATION | 10-1 | VALVE GUIDE REPLACEMENT | 10-17 |
| TROUBLESHOOTING | 10-3 | VALVE SEAT INSPECTION/REFACING | 10-18 |
| CYLINDER COMP RESSION | 10-4 | CYLINDER HEAD ASSEMBLY | 10-21 |
| CYLINDER HEAD COVER REMOVAL | 10-5 | CYLINDER HEAD INSTALLATION | 10-22 |
| CAMSHAFT REMOVAL | 10-6 | CAMSHAFT INSTALLATION | 10-25 |
| CYLINDER HEAD REMOVAL | 10-13 | CYLINDER HEAD COVER INSTALLATION | 10-32 |
| CYLINDER HEAD DISASSEMBLY | 10-14 | | |

SERVICE INFORMATION

GENERAL

- The engine must be removed from the frame before servicing the front cylinder head.
- The rear cylinder head and front cylinder head cover can be serviced with the engine in the frame.
- The camshaft can be serviced with the engine in the frame.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with clean solvent and dry them using compressed air before inspection.
- When camshaft installation, apply molybdenum disulfide oil to the cam lobes and journals.
- Camshaft lubricating oil is fed through oil passages in the cylinder head and camshaft holder. Clean the oil passages before assembling the cylinder head and camshaft holder.

10

SPECIFICATIONS

Unit:mm(in)

| ITEM | | STANDARD | SERVICE LIMIT |
|-------------------------------|----|---|---------------|
| Cylinder compression | | 1,275 ± 196 kPa (13.2 ± 2.0 kgf/cm ² , 185 ± 28 psi) at 500 min ⁻¹ (rpm) | ———— |
| Valve clearance | IN | 0.15 ± 0.02 (0.006 ± 0.001) | ———— |
| | EX | 0.20 ± 0.02 (0.008 ± 0.001) | ———— |
| Cylinder head warpage | | ———— | 0.10(0.004) |
| Cam lobe height | IN | 38.381 (1.5111) | 38.10(1.500) |
| | EX | 38.407 (1.5121) | 38.20(1.504) |
| Camshaft runout | | ———— | 0.03(0.001) |
| Camshaft oil clearance | | 0.050 – 0.111 (0.0020 – 0.0044) | 0.15(0.006) |
| Camshaft identification marks | | " F " : Front, " R " : Rear | ———— |
| Camshaft journal O.D. | | 21.959 – 21.980(0.8645 – 0.8654) | 21.94(0.864) |
| Camshaft holder I.D. | | 22.030 – 22.070(0.8673 – 0.8689) | 22.09(0.870) |

CYLINDER HEAD/VALVES

| (Cont'd) | | Unit:mm(in) | |
|--|----------|-----------------------------------|---------------|
| ITEM | | STANDARD | SERVICE LIMIT |
| Valve stem O.D. | IN | 5.475 – 5.490 (0.2156 – 0.2161) | 5.46(0.215) |
| | EX | 6.555 – 6.570 (0.2581 – 0.2587) | 6.54(0.257) |
| Valve guide I.D. | IN | 5.500 – 5.512 (0.2165 – 0.2170) | 5.55(0.219) |
| | EX | 6.600 – 6.615 (0.2598 – 0.2604) | 6.69(0.263) |
| Stem-to-guide clearance | IN | 0.010 – 0.037 (0.0004 – 0.0015) | 0.08(0.003) |
| | EX | 0.030 – 0.060 (0.0012 – 0.0024) | 0.12(0.005) |
| Valve guide projection above cylinder head | IN | 19.5 ± 0.1 (0.768 ± 0.004) | ———— |
| | EX | 18.0 ± 0.1 (0.709 ± 0.004) | ———— |
| Valve seat width | IN | 1.1 (0.04) | 1.5(0.06) |
| | EX | 1.1 (0.04) | 1.5(0.06) |
| Valve spring free length | Outer IN | 42.14 (1.659) | 40.0(1.57) |
| | Outer EX | 42.83 (1.686) | 40.5(1.59) |
| | Inner IN | 38.11 (1.500) | 36.0(1.42) |
| | Inner EX | 38.81 (1.528) | 36.0(1.42) |
| Rocker arm I.D. | IN | 12.000 – 12.018 (0.4724 – 0.4731) | 12.04(0.474) |
| | EX | 12.000 – 12.018 (0.4724 – 0.4731) | 12.04(0.474) |
| Rocker arm shaft O.D. | IN | 11.966 – 11.984 (0.4711 – 0.4718) | 11.95(0.470) |
| | EX | 11.966 – 11.984 (0.4711 – 0.4718) | 11.95(0.470) |
| Rocker arm-to-rocker arm shaft clearance | | 0.016 – 0.052 (0.0006 – 0.0020) | 0.08(0.003) |

TORQUE VALUES

| | | |
|-----------------------------------|-------------------------------|---|
| Spark plug | 14 N•m (1.4 kgf•m, 10 lbf•ft) | |
| Cylinder head cover bolt | 10 N•m (1.0 kgf•m, 7 lbf•ft) | |
| Valve adjusting screw lock nut | 23 N•m (2.3 kgf•m, 17 lbf•ft) | Apply oil to the threads and flange surface |
| Cam sprocket bolt | 23 N•m (2.3 kgf•m, 17 lbf•ft) | Apply a locking agent to the threads |
| Camshaft holder (8 mm bolt) | 23 N•m (2.3 kgf•m, 17 lbf•ft) | |
| (8 mm nut) | 23 N•m (2.3 kgf•m, 17 lbf•ft) | |
| Camshaft end holder bolt | 10 N•m (1.0 kgf•m, 7 lbf•ft) | |
| Cam chain tensioner mounting bolt | 10 N•m (1.0 kgf•m, 7 lbf•ft) | Apply a locking agent to the threads |
| Cylinder head (8 mm bolt) | 23 N•m (2.3 kgf•m, 17 lbf•ft) | |
| (6 mm bolt) | 12 N•m (1.2 kgf•m, 9 lbf•ft) | |
| (10 mm nut) | 47 N•m (4.8 kgf•m, 35 lbf•ft) | Apply oil to the threads and flange surface |

TOOLS

| | |
|---------------------------------------|---------------|
| Compression gauge attachment | 07510-MB00101 |
| Valve guide remover 5.510 mm | 07984-2000001 |
| Valve guide remover 6.612 mm | 07984-ZE20001 |
| Valve spring compressor | 07757-0010000 |
| Valve guide remover, 5.5 mm (IN) | 07742-0010100 |
| Valve guide remover, 6.6 mm (EX) | 07742-0010200 |
| Valve seat cutter, 27.5 mm (IN 45°) | 07780-0010200 |
| Valve seat cutter, 35 mm (EX 45°) | 07780-0010400 |
| Valve seat cutter, 28 mm (IN 32°) | 07780-0012100 |
| Valve seat cutter, 35 mm (EX 32°) | 07780-0012300 |
| Valve seat cutter, 30 mm (IN 60°) | 07780-0014000 |
| Valve seat cutter, 37.5 mm (EX 60°) | 07780-0014202 |
| Valve seat cutter holder, 5.5 mm (IN) | 07781-0010101 |
| Valve seat cutter holder, 6.6 mm (EX) | 07781-0010202 |

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These can be diagnosed by a compression test, or by tracking noises to the top-end.
- If performance is poor at low speeds, check for white smoke in the crankcase breather tube. If the tube is smoky, check for a seized piston ring.

Compression too low, hard starting or poor performance at low speed

- Valves
 - Incorrect valve adjustment
 - Burned or bent valves
 - Incorrect valve timing
 - Broken valve spring
 - Uneven valve seating
- Cylinder head
 - Leaking or damaged cylinder head gasket
 - Warped or cracked cylinder head
- Loose spark plug
- Cylinder, piston (Section 11)

Compression too high

- Excessive carbon build-up in cylinder head or on top of piston

Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Faulty cylinder, piston (Section 11)

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
- Faulty cylinder, piston (Section 11)

Rough idle

- Low cylinder compression

CYLINDER COMPRESSION

⚠ WARNING

- If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area.

Warm up the engine to normal operating temperature.

Stop the engine, disconnect the spark plug caps and remove one spark plug cap at a time.

NOTE

- To measure the cylinder compression of each cylinder, remove only one plug at a time.

Shift the transmission into neutral.
Install the compression gauge attachment in a spark plug hole.

TOOL:

Compression gauge attachment **07510-MB00101**

Connect the compression gauge to the attachment.
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.

STANDARD: 1,275 ± 196 kPa (13.2 ± 2.0 kgf/cm², 185 ± 28 psi) at 500 min⁻¹(rpm)

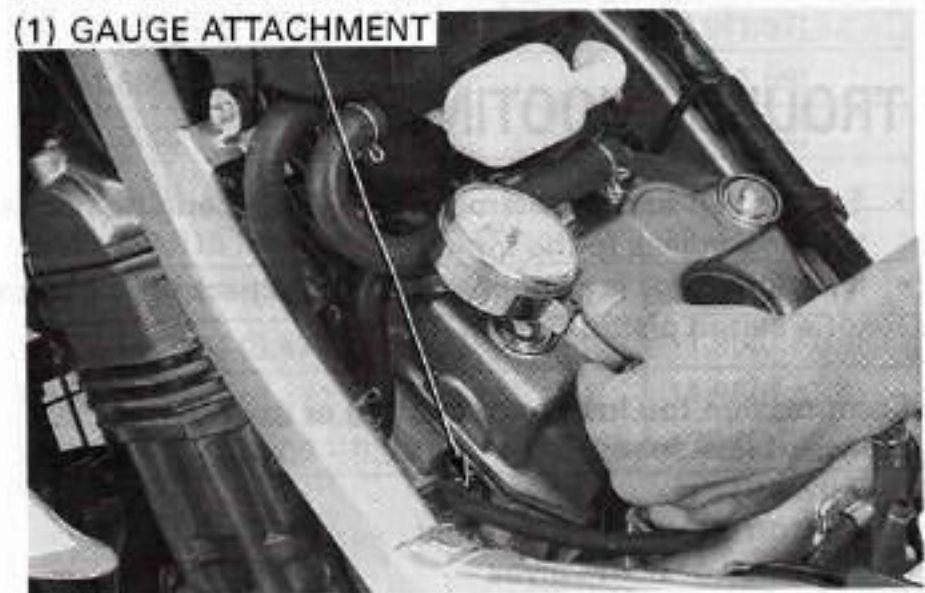
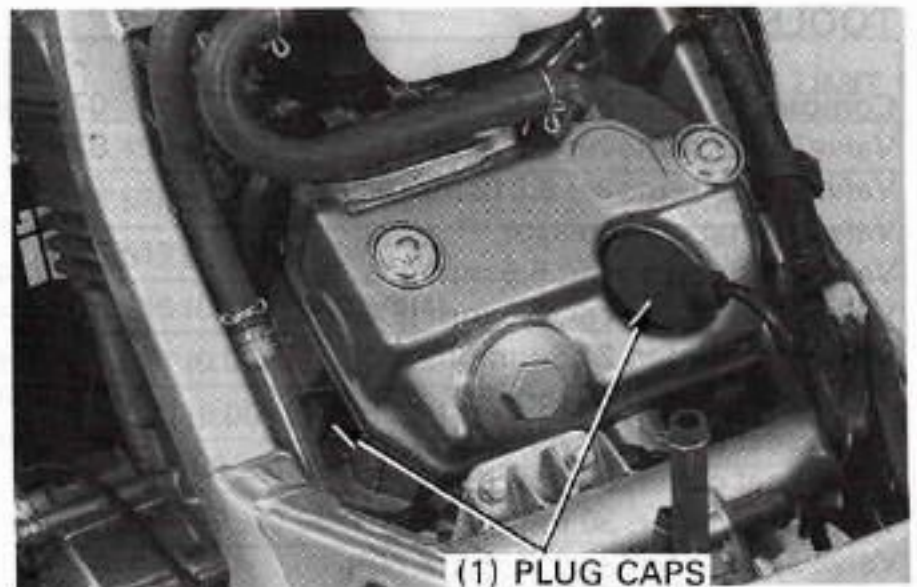
If compression is high, it indicates that carbon deposits have accumulated on the combustion chamber and/or the piston crown.

If compression is low, pour 3-5 cc (0.1-0.2 oz) of clean engine oil into the cylinder through the spark plug hole and recheck the compression.

If the compression increases from the previous value, check the cylinder, piston and piston rings.

- Leaking cylinder head gasket
- Worn piston ring
- Worn cylinder and piston

If compression is the same as the previous value, check the values for leakage.

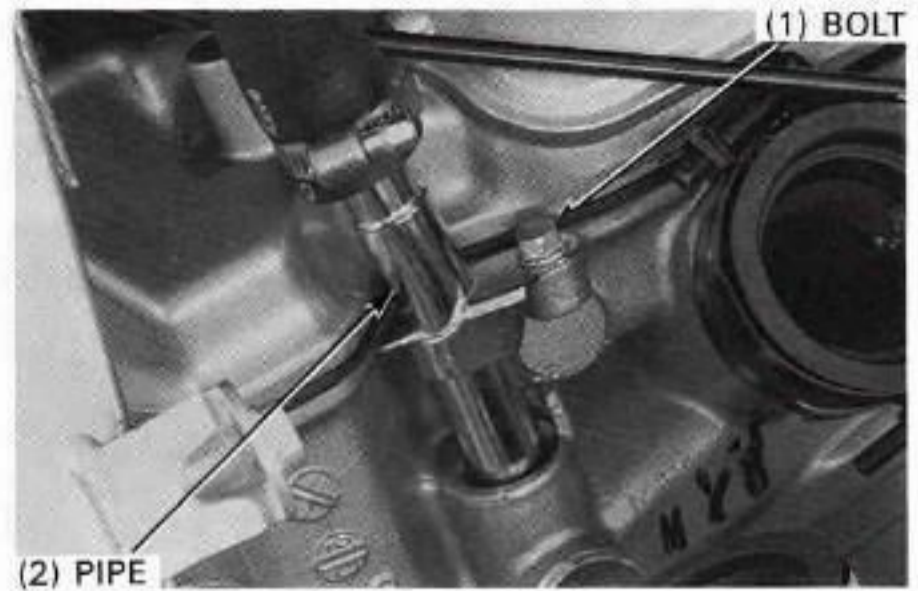


CYLINDER HEAD COVER REMOVAL

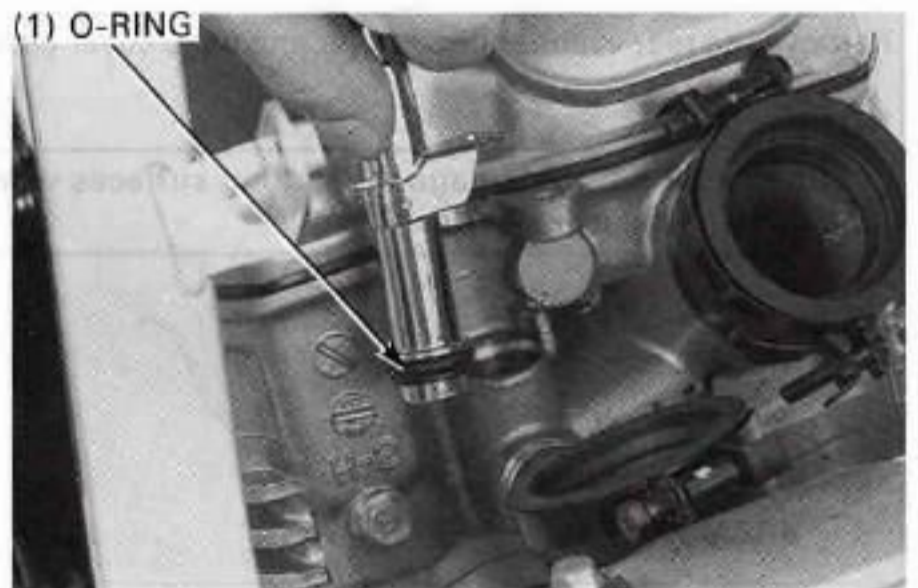
FRONT

Drain the coolant (page 6-6).
 Remove the fuel tank (page 2-20).
 Remove the radiator (page 6-11).
 Remove the carburetor (page 5-5).
 Remove the front ignition coil (page 17-8).

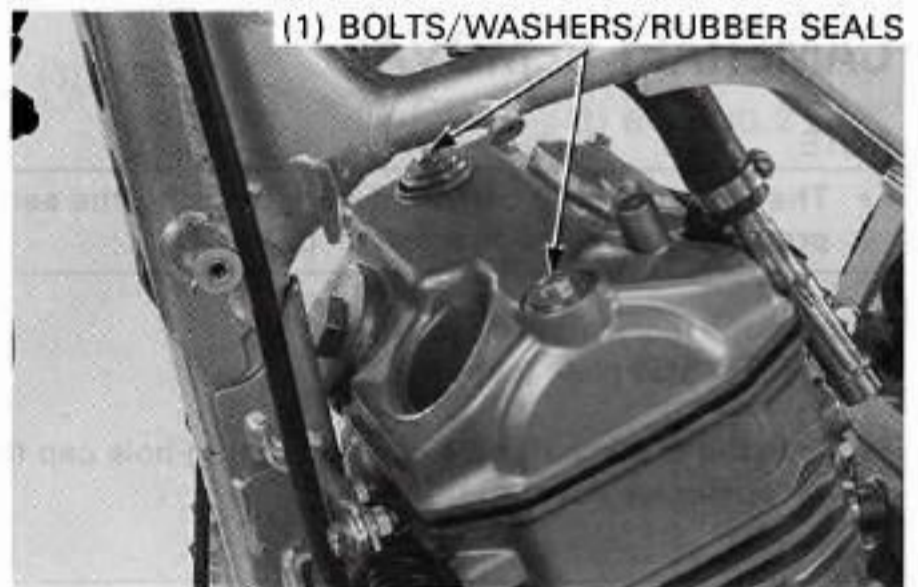
Remove the bolt and disconnect the water pipe from the cylinder head.



Remove the O-ring from the water pipe.



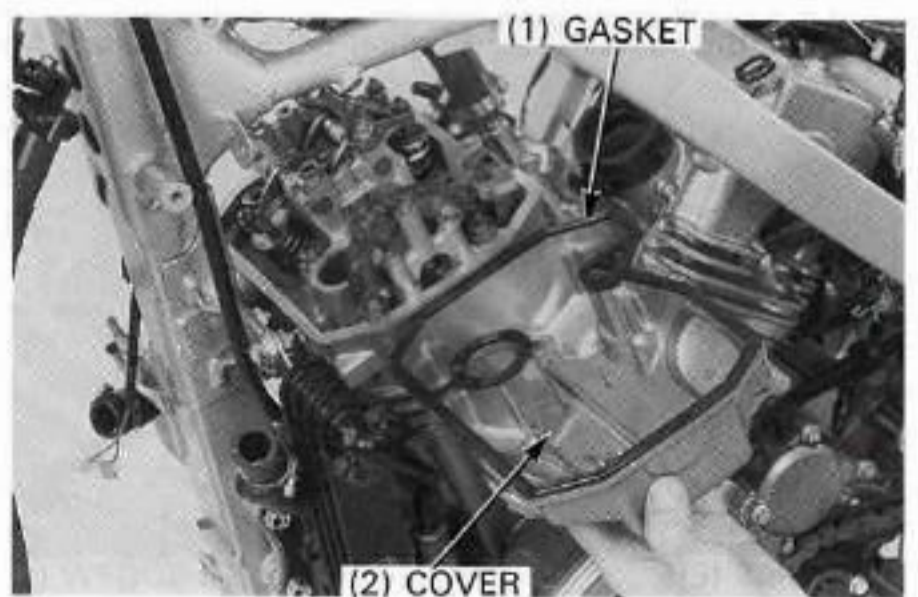
Remove the cylinder head cover bolts, washers and rubber seals.



Remove the front cylinder head cover and head cover gasket.

NOTE

- Be careful not to damage the mating surfaces when removing the cylinder head cover.

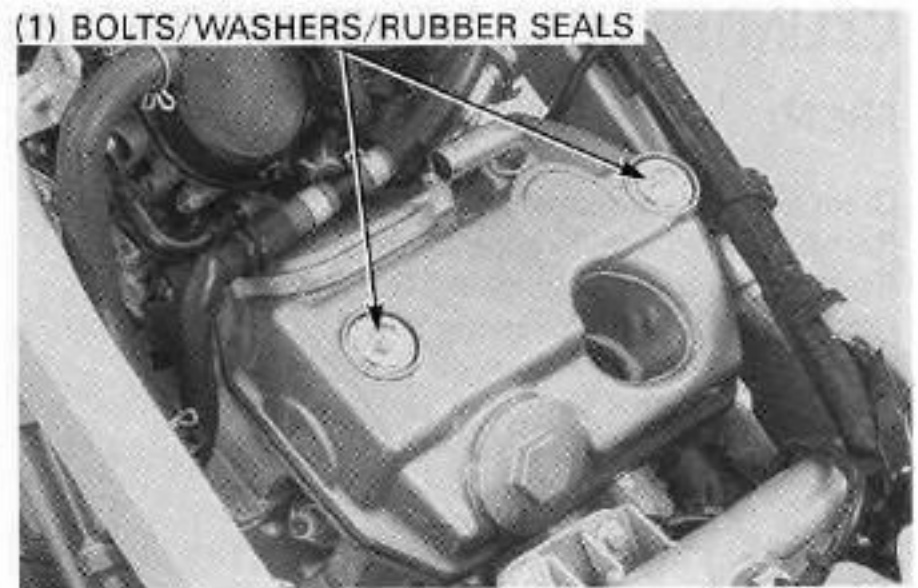


CYLINDER HEAD/VALVES

REAR

Drain the coolant (page 6-5).
Remove the air cleaner housing (page 5-4).
Disconnect the spark plug caps (page 17-11).

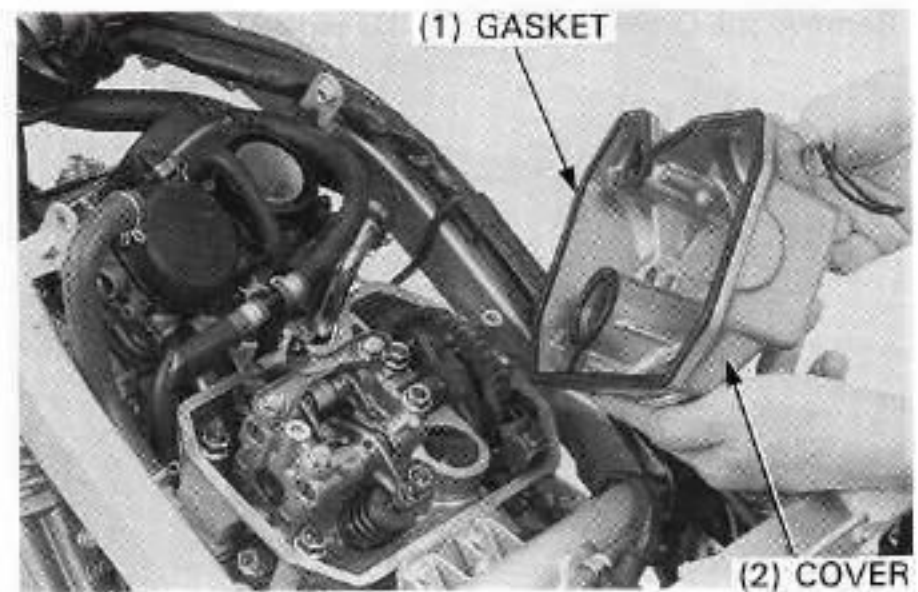
Remove the cylinder head cover bolts, washers and rubber seals.



Remove the rear cylinder head cover and head cover gasket.

NOTE

- Be careful not to damage the mating surfaces when removing the cylinder head cover.



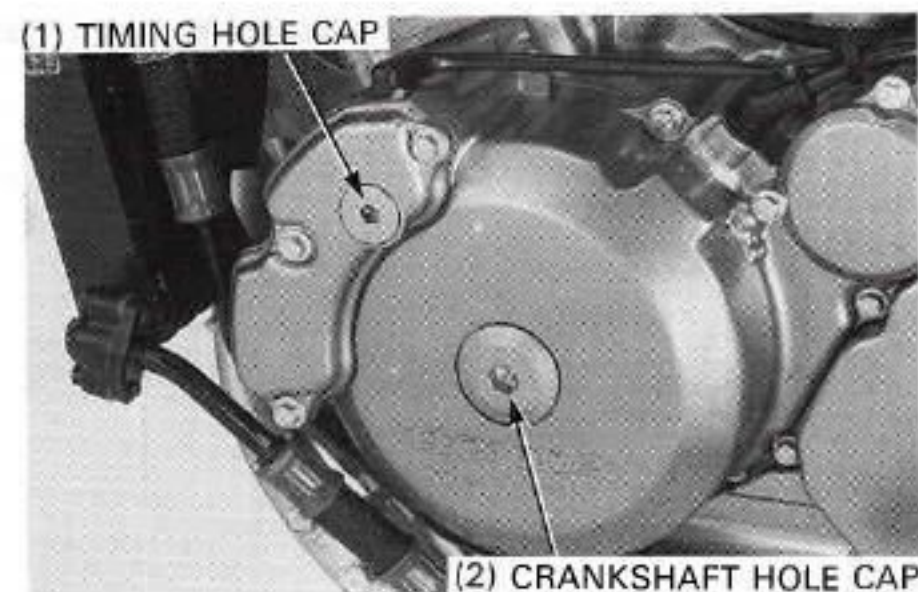
CAMSHAFT REMOVAL

NOTE

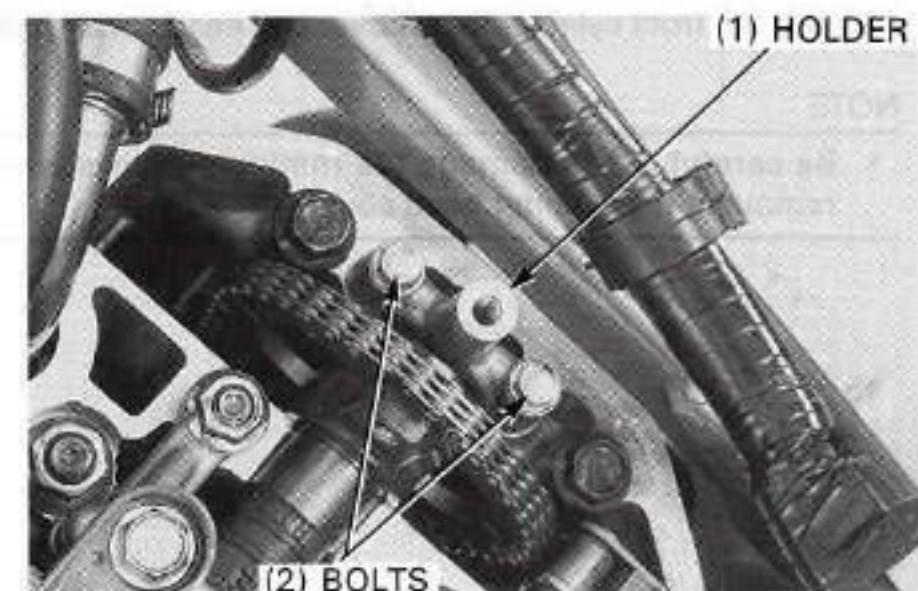
- The front cylinder camshaft service using the same procedure as for the rear cylinder.

Remove the rear cylinder head cover.
Remove the skid plate (page 2-7).

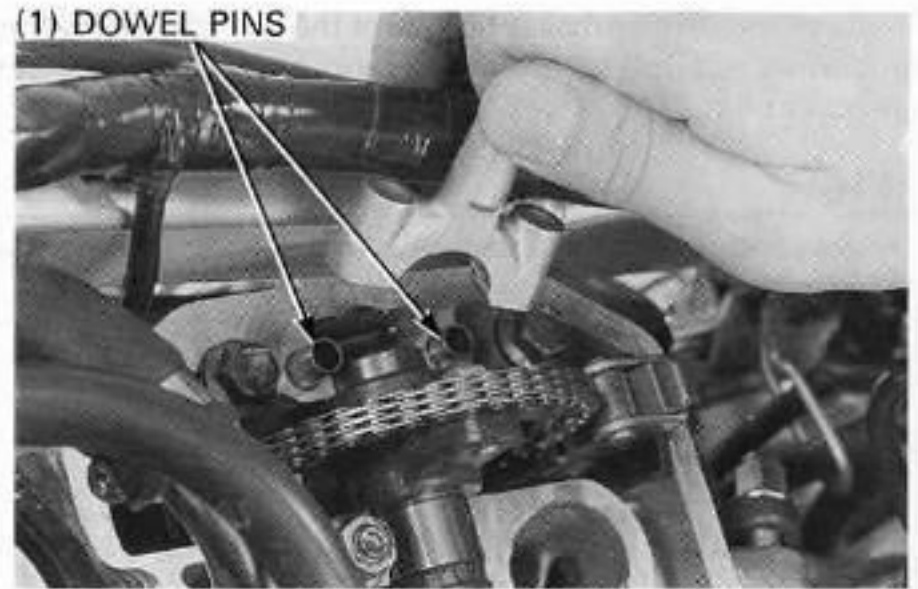
Remove the crankshaft hole cap and timing hole cap from the left crankcase cover.



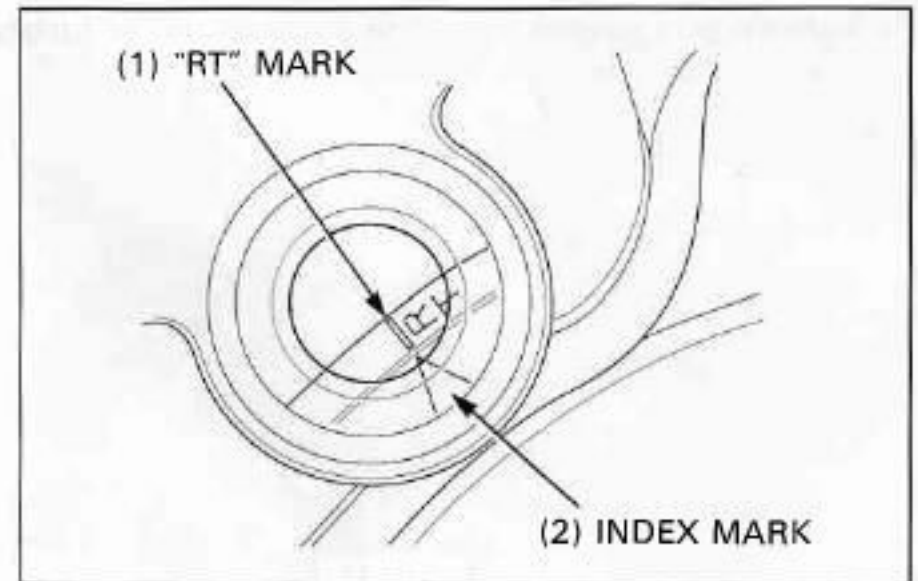
Remove the camshaft end holder bolts and camshaft end holder.



Remove the dowel pins.



Turn the crankshaft counterclockwise and align the "RT" mark (front cylinder: "FT" mark) with the index mark on the left crankcase cover. Make sure the rear cylinder is at TDC (top dead center).



Measure the cam chain tensioner wedge B length as shown.

SERVICE LIMIT: 6 mm (0.2 in)

When the service limit is exceeded, replace the cam chain.

Replace the cam chain is after following parts removal:

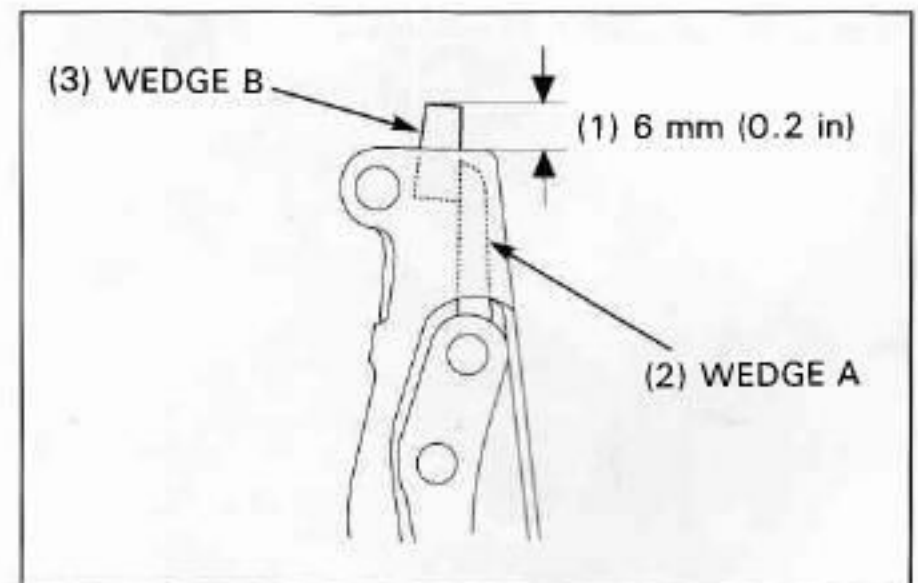
FRONT:

- Front camshaft
- Flywheel (Section 9)

REAR:

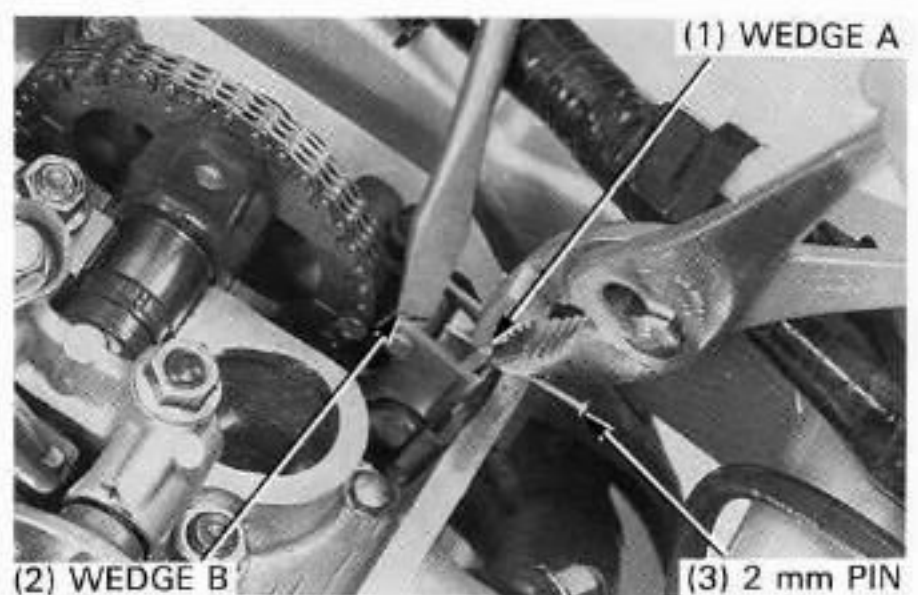
- Rear camshaft
- Primary drive gear (Section 8)

Pull the cam chain tensioner wedge A straight up while holding wedge B push down. Secure wedge A with a 2 mm pin as shown.



NOTE

- Be careful not to let the 2 mm pin fall into the crankcase.

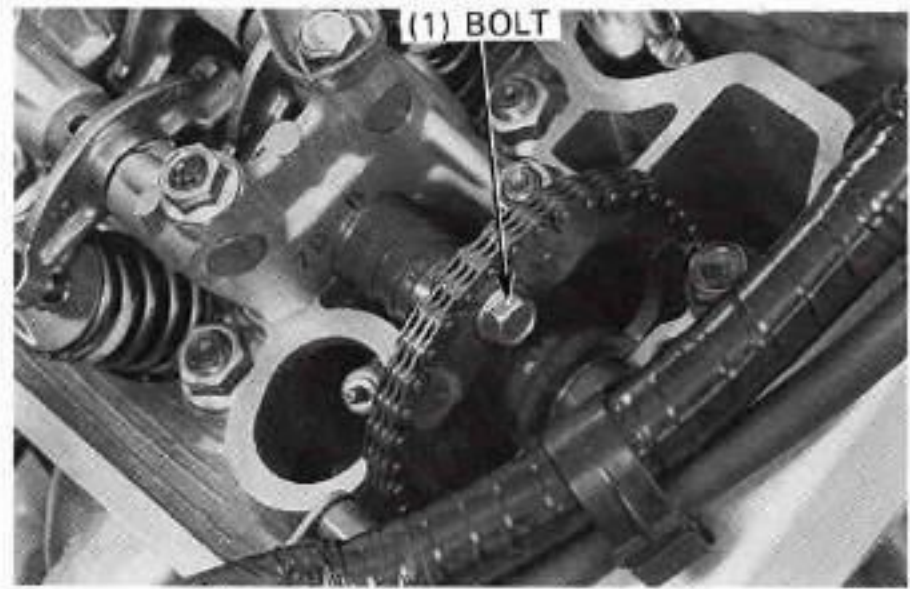


CYLINDER HEAD/VALVES

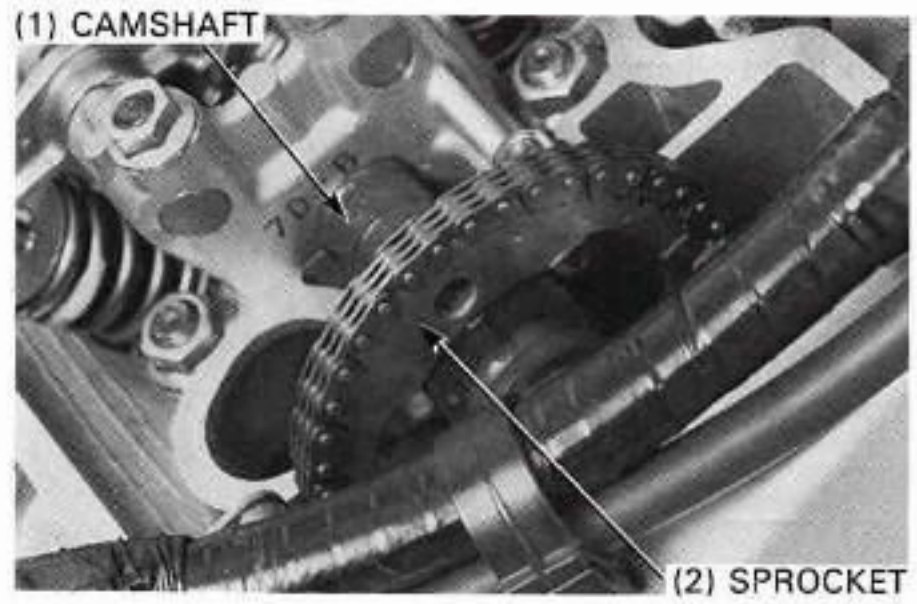
Remove the cam sprocket bolt, turn the crankshaft counterclockwise one full turn (360°) and remove the other cam sprocket bolt.

NOTE

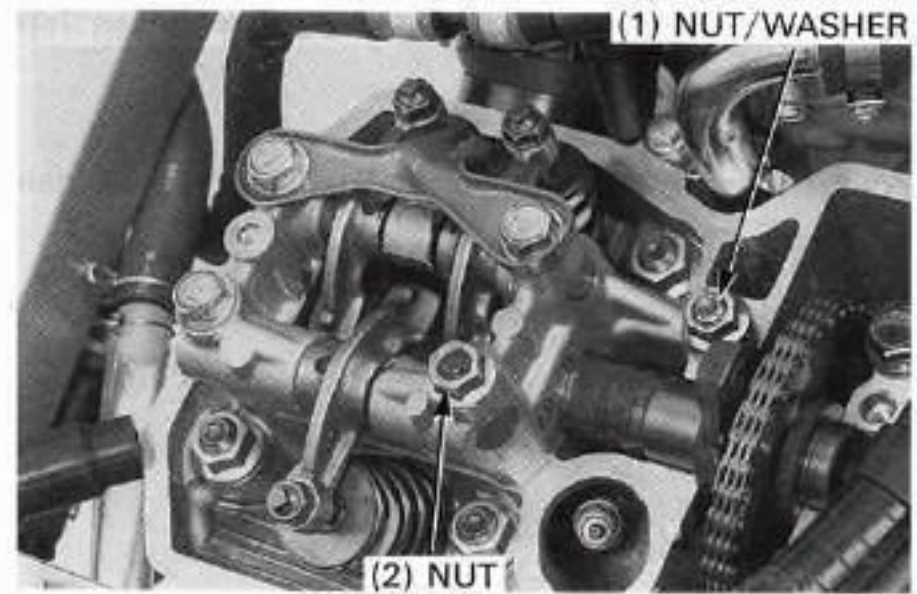
- Be careful not to let the cam sprocket bolts fall into the crankcase.



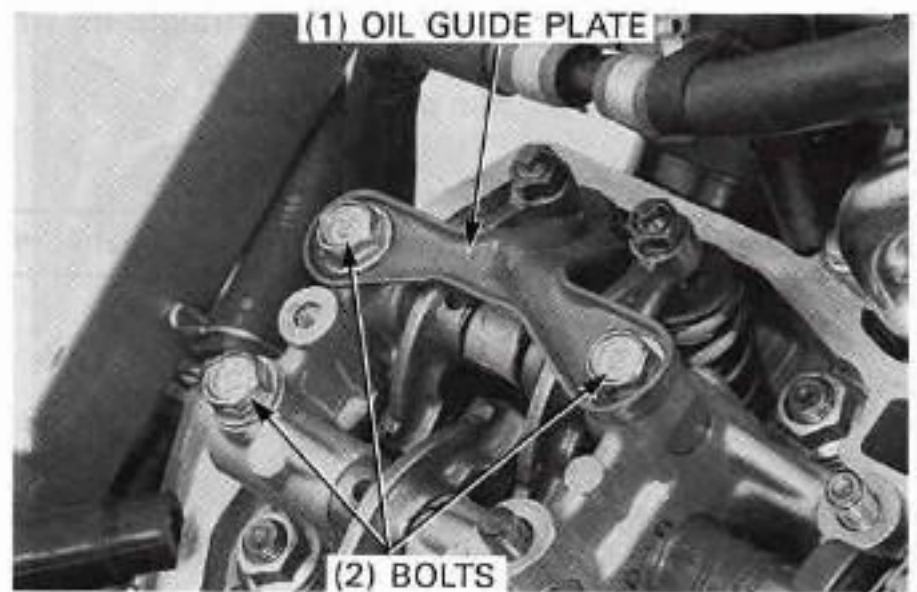
Remove the cam sprocket from the camshaft flange surface.



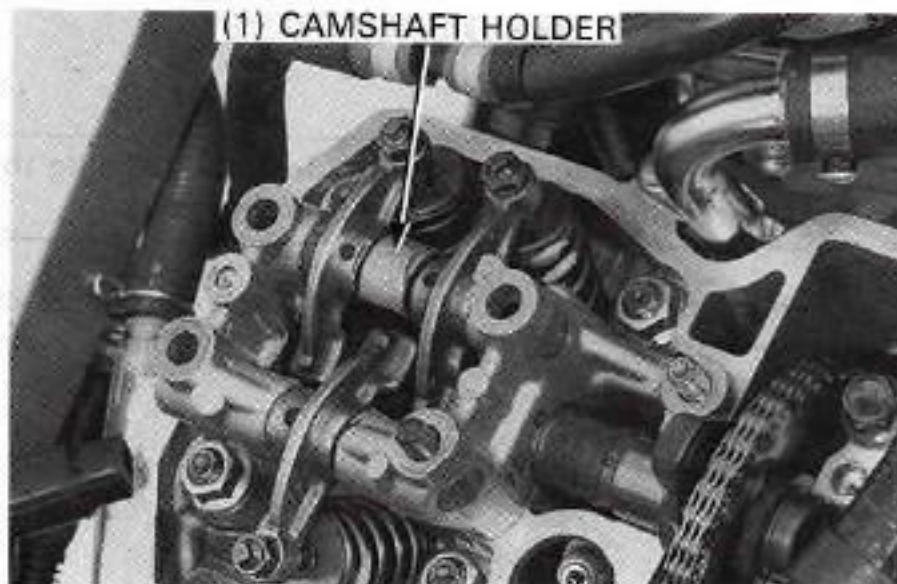
Remove the camshaft holder nuts/washer (8 mm).



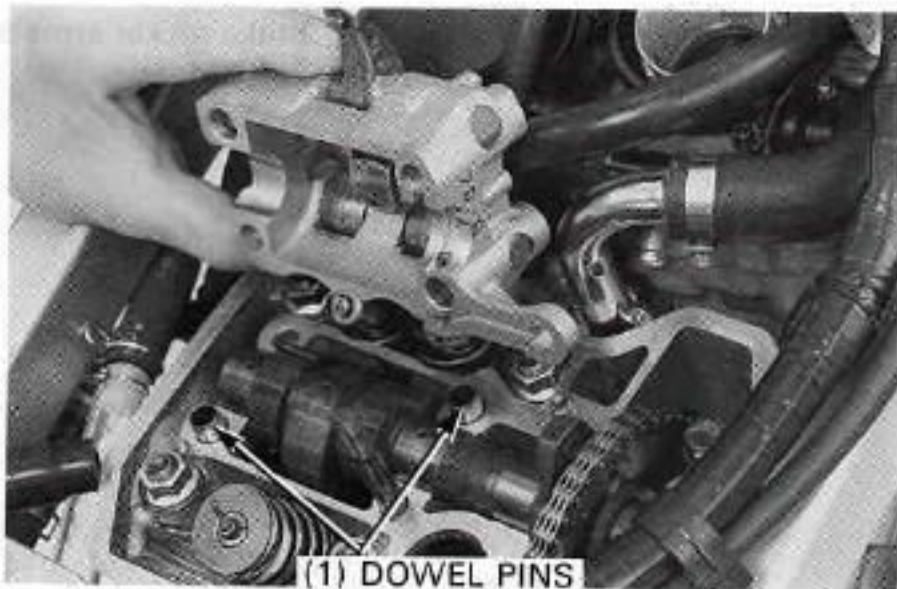
Remove the camshaft holder bolts (8 mm) and oil guide plate.



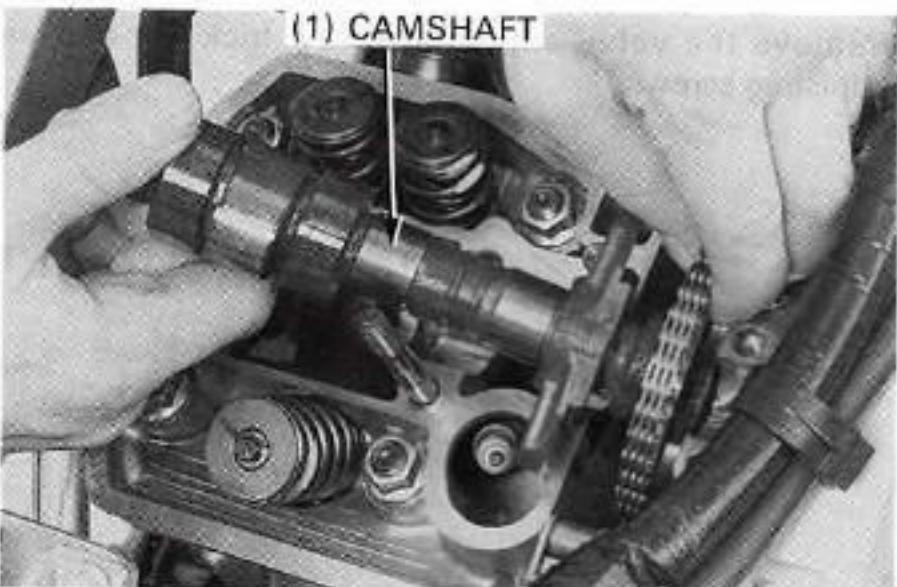
Remove the camshaft holder assembly.



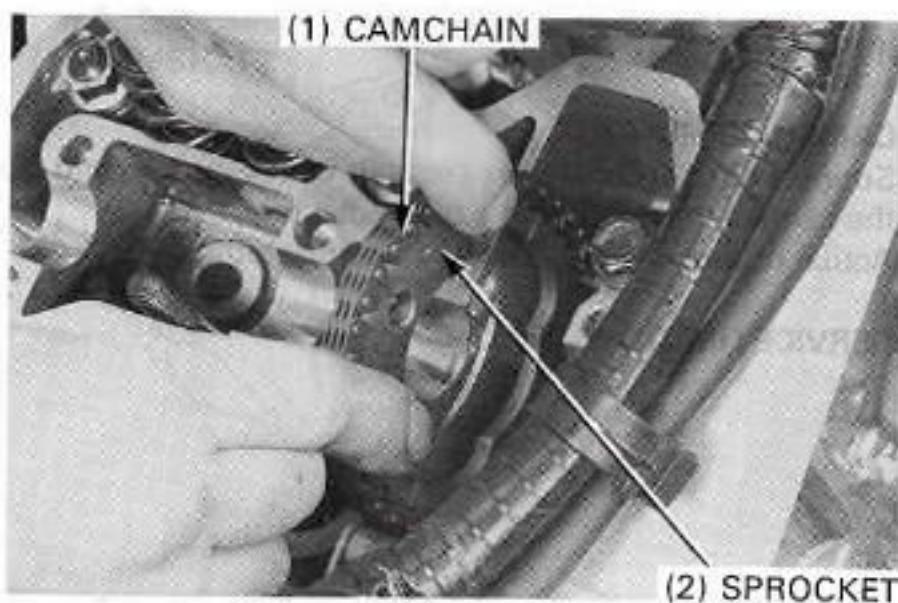
Remove the dowel pins.



Remove the camshaft.



Remove the cam sprocket from cam chain.
Attach a piece of mechanic's wire to the cam chain to prevent it from being dropped into the crankcase.



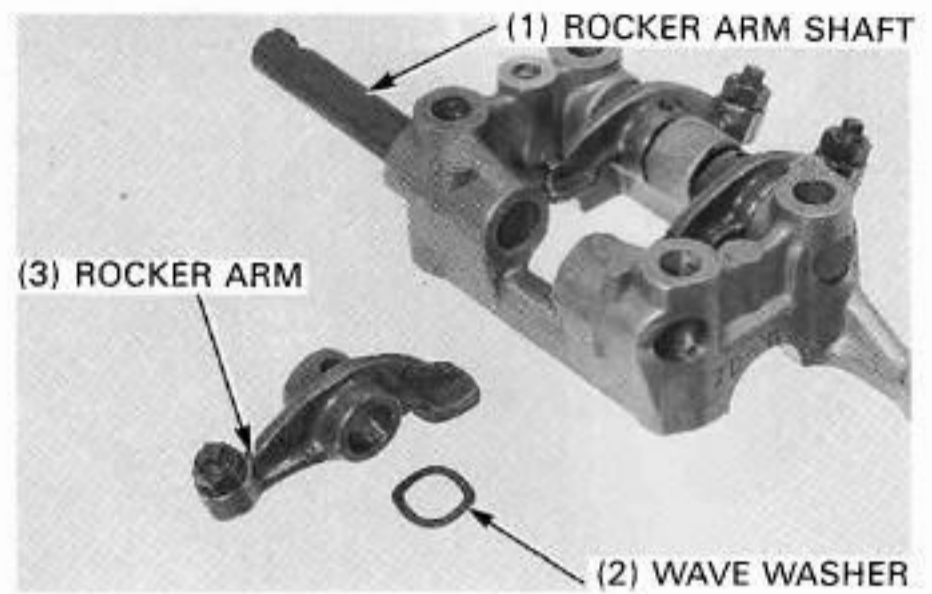
CYLINDER HEAD/VALVES

CAMSHAFT HOLDER DISASSEMBLY

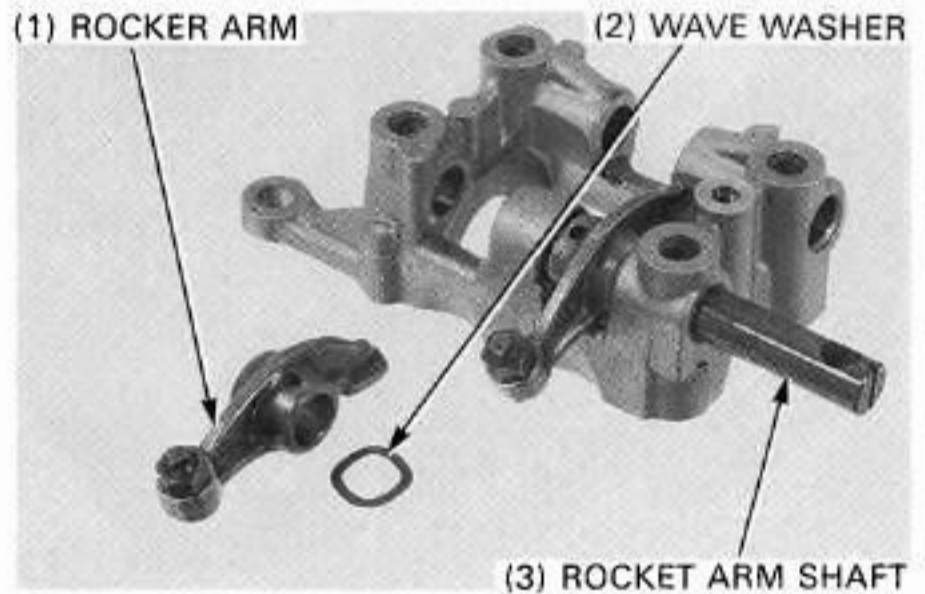
NOTE

- The front cylinder camshaft holder service using the same procedure as for the rear cylinder holder.

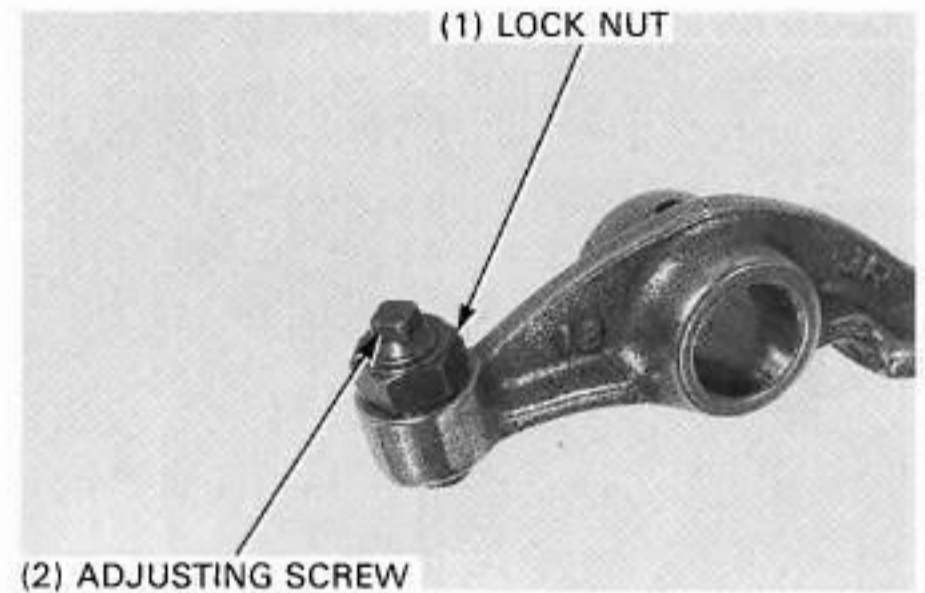
Remove the exhaust rocker arm shaft, exhaust rocker arm and wave washer, 12 mm from the camshaft holder.



Remove the intake rocker arm shaft, intake rocker arms and wave washers, 12 mm from the camshaft holder.



Remove the valve adjusting screw lock nut and valve adjusting screw.

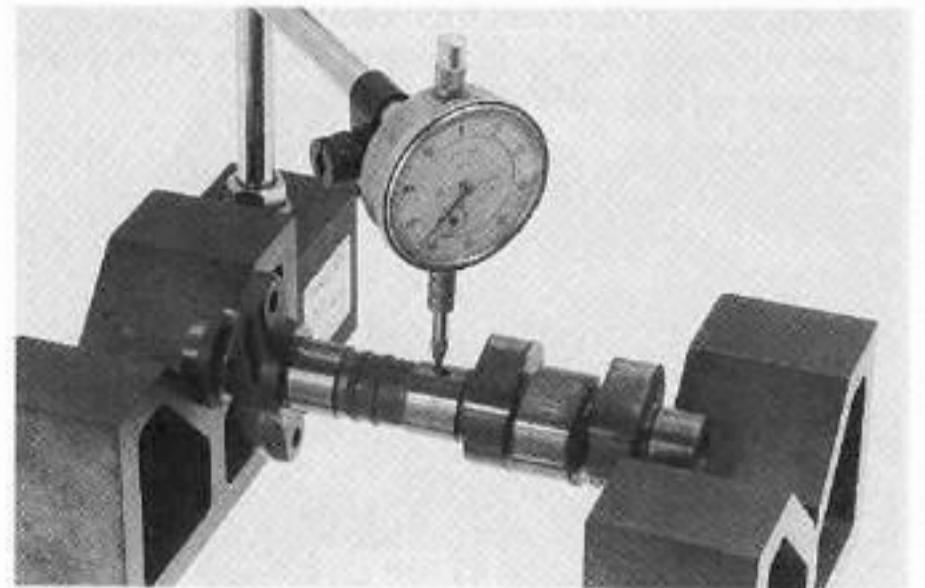


INSPECTION

CAMSHAFT RUNOUT

Support both ends of the camshaft with V-brocks and check the camshaft runout with a dial indicator. Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.03 mm (0.001 in)



CAM LOBE HEIGHT

Inspect the camlobe surfaces for scoring or evidence of insufficient lubrication.
Measure the height of each cam lobe using a micrometer.

SERVICE LIMITS:

- IN: 38.10 mm (1.500 in)
- EX: 38.20 mm (1.504 in)

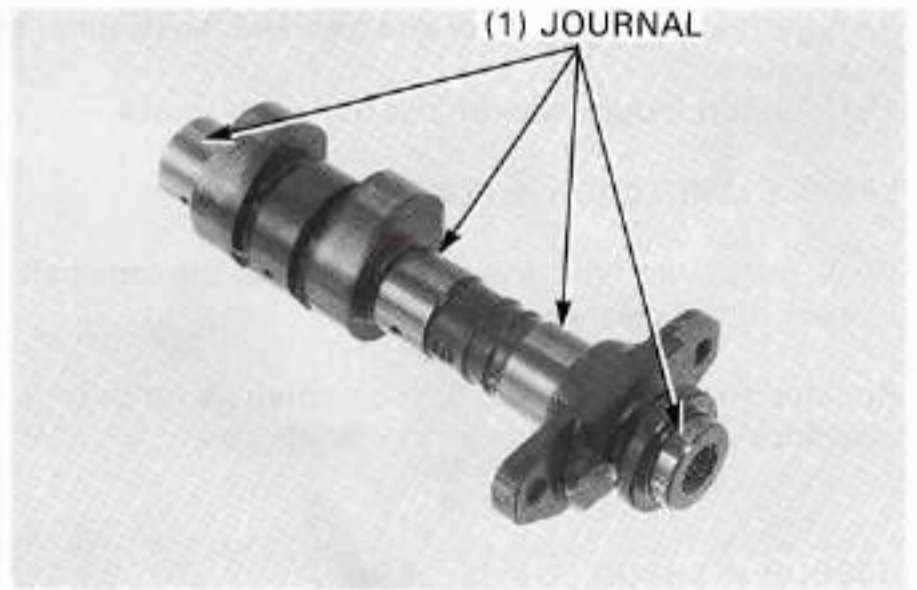
NOTE

- Inspect the rocker arm if the cam lobe is worn or damaged.



CAMSHAFT JOURNAL

Inspect the camshaft journal surfaces for scoring or evidence of insufficient lubrication.

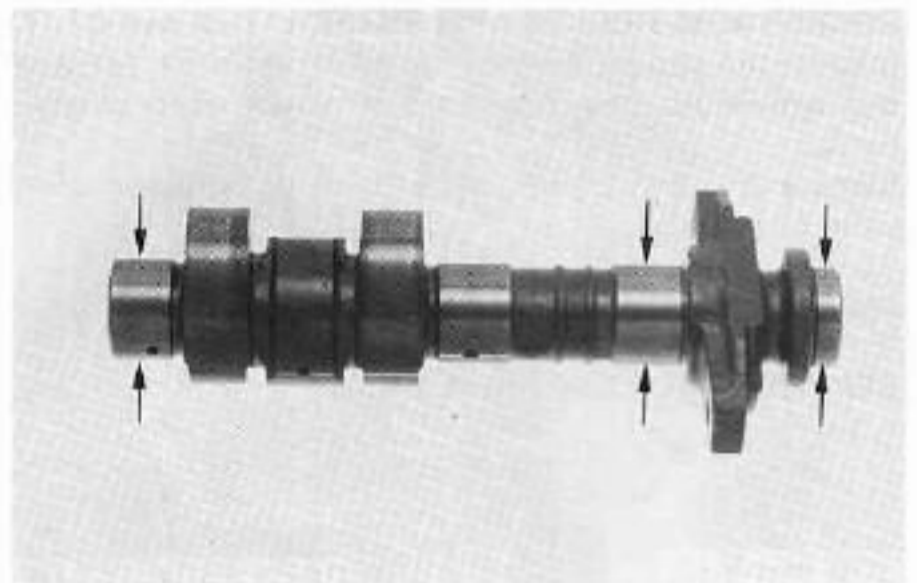


Measure the O.D. of each camshaft journal.

SERVICE LIMIT: 21.94 mm (0.864 in)

NOTE

- Inspect the oil passages and camshaft holder for wear or damage if the journal surface is worn or damaged.

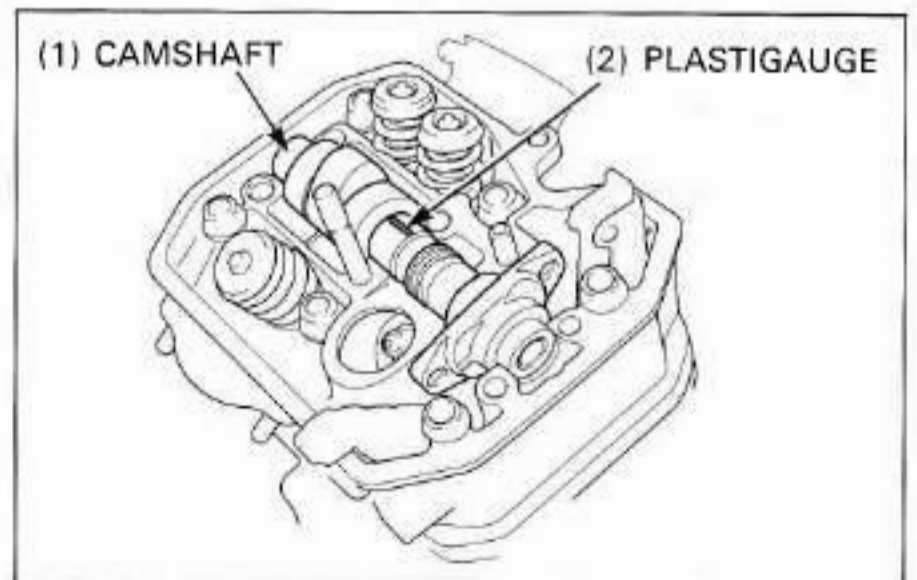


CAMSHAFT OIL CLEARANCE

Clean off any oil from the journals of the camshaft holders, head and camshafts.
Put the camshaft onto the cylinder head and lay a strip of plastigauge lengthwise on the top of each camshaft journal.

NOTE

- Do not block any oil holes with the plastigauge.
- Do not rotate the camshaft during inspection.



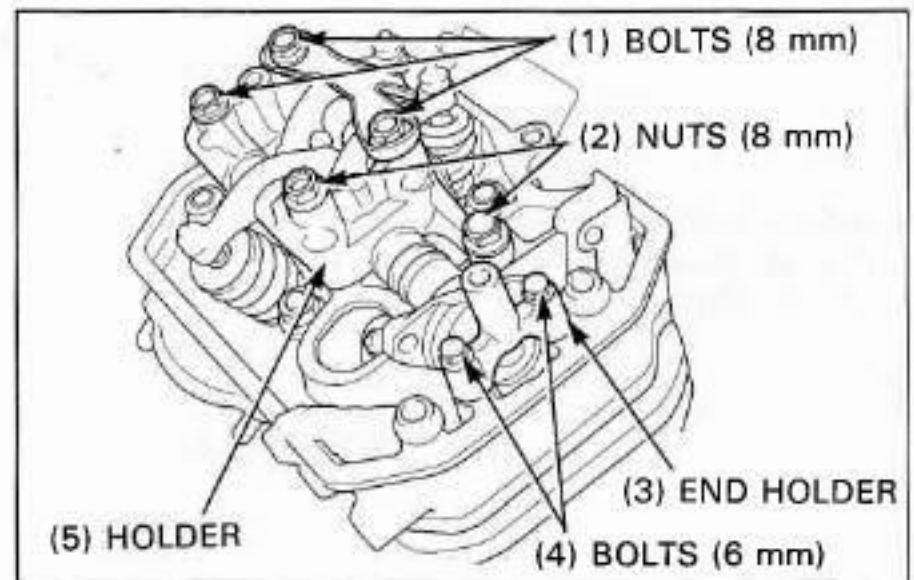
CYLINDER HEAD/VALVES

Install the camshaft holder and camshaft end holder.
Install and tighten the camshaft holder bolts/nuts (8 mm) to the specified torque in 2-3 steps.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Install and tighten the camshaft holder bolts (6 mm) to the specified torque in 2-3 steps.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

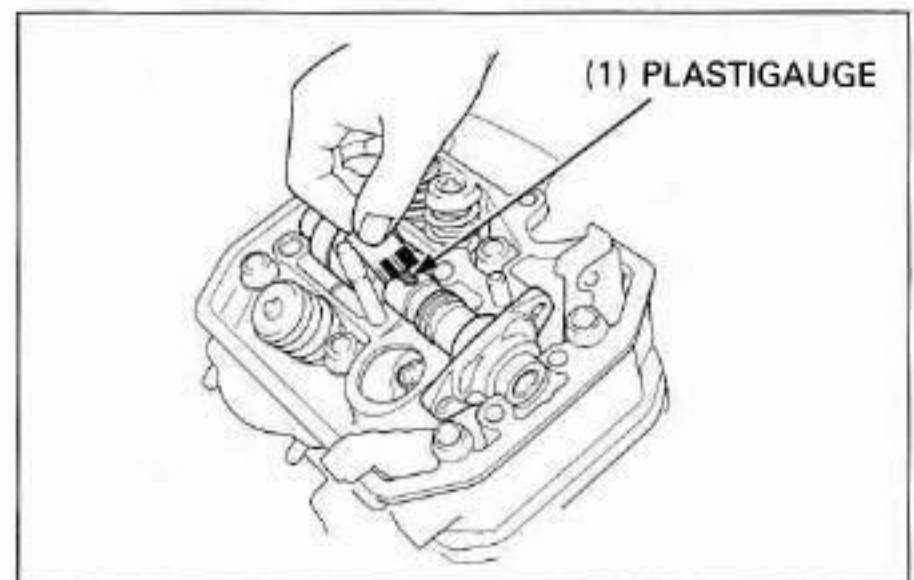


Remove the camshaft holder and measure the width of each plastigauge.
The widest thickness determines the oil clearance

SERVICE LIMIT: 0.15 mm (0.006 in)

When the service limit is exceeded, replace the camshaft and recheck the oil clearance.

Replace the cylinder head and camshaft holders if the clearance still exceeds the service limit.



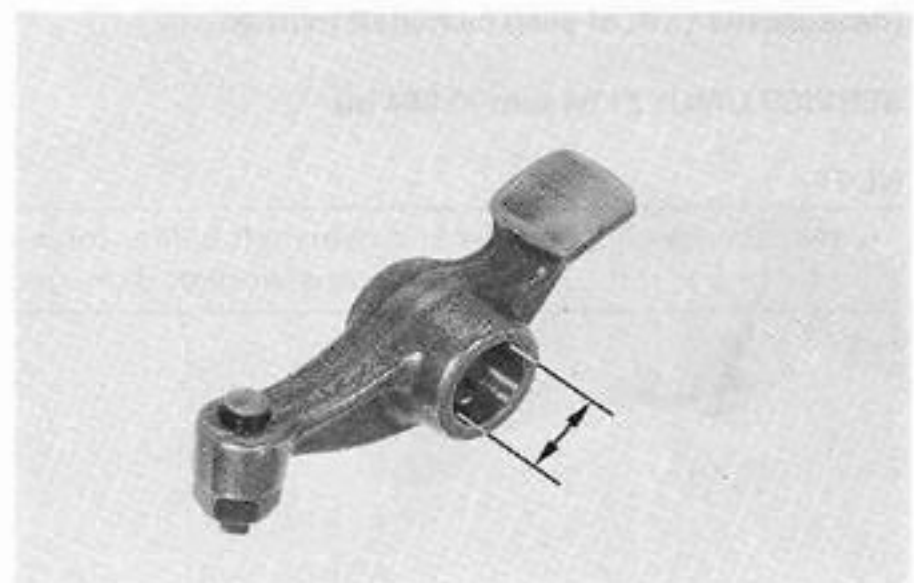
ROCKER ARM, ROCKER ARM SHAFT

Inspect the sliding surface of the rocker arms for wear or damage where they contact the camshaft, or for clogged oil holes.

Inspect the contact surface of the valve adjuster screw for wear or damage.

Measure the I.D. of each rocker arm

SERVICE LIMIT: 12.04 mm (0.474 in)



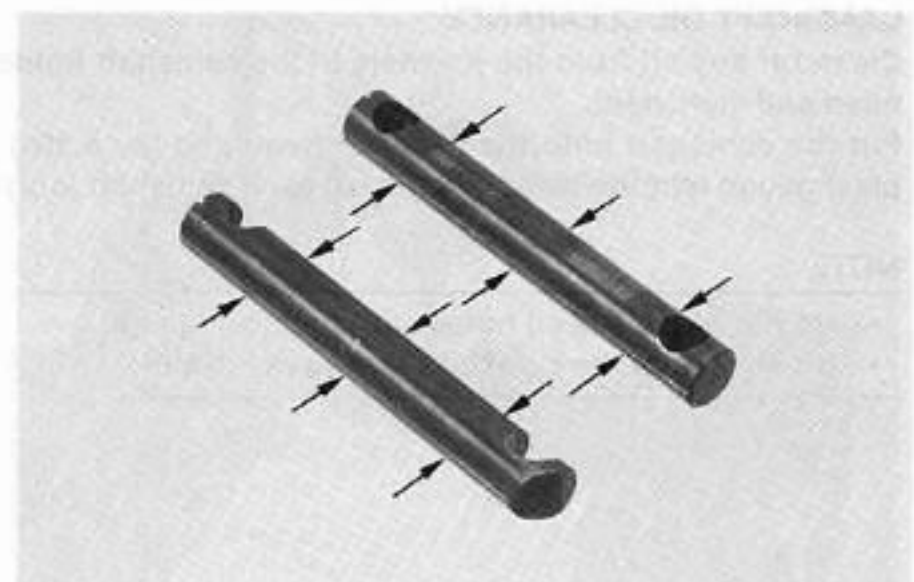
Measure the each rocker arm shaft O.D..

SERVICE LIMIT: 11.95 mm (0.470 in)

Inspect the shaft for wear or damage and calculate the shaft to rocker arm clearance.

SERVICE LIMIT: 0.08 mm (0.003 in)

Replace the rocker arm and/or shaft if necessary.



CYLINDER HEAD REMOVAL

NOTE

- The engine must be removed from the frame before servicing the front cylinder head.
- The rear cylinder head and front cylinder head cover can be serviced with the engine in the frame.
- The front cylinder head service using the same procedure as for the rear cylinder head.

Remove the engine from the frame (front cylinder only/ Section 7).

Remove the cylinder head cover (page 10-5).

Remove the camshaft (page 10-6).

Remove the cam chain tensioner mounting bolts and sealing washers.

Remove the cam chain tensioner and cushion rubber.

Remove the following cylinder head bolts and nuts:

- 8 mm bolt/washer
- 6 mm bolt
- 10 mm nut/washer

NOTE

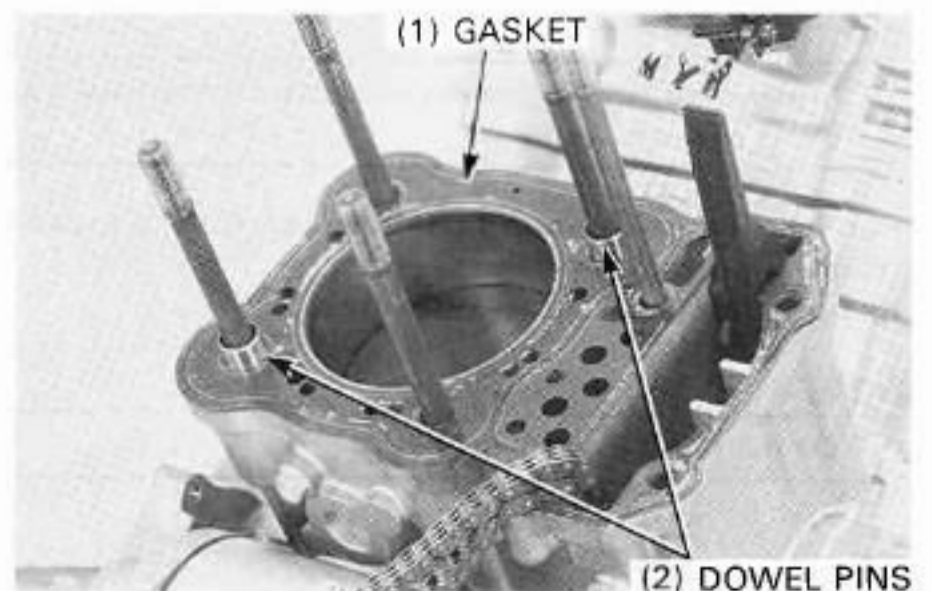
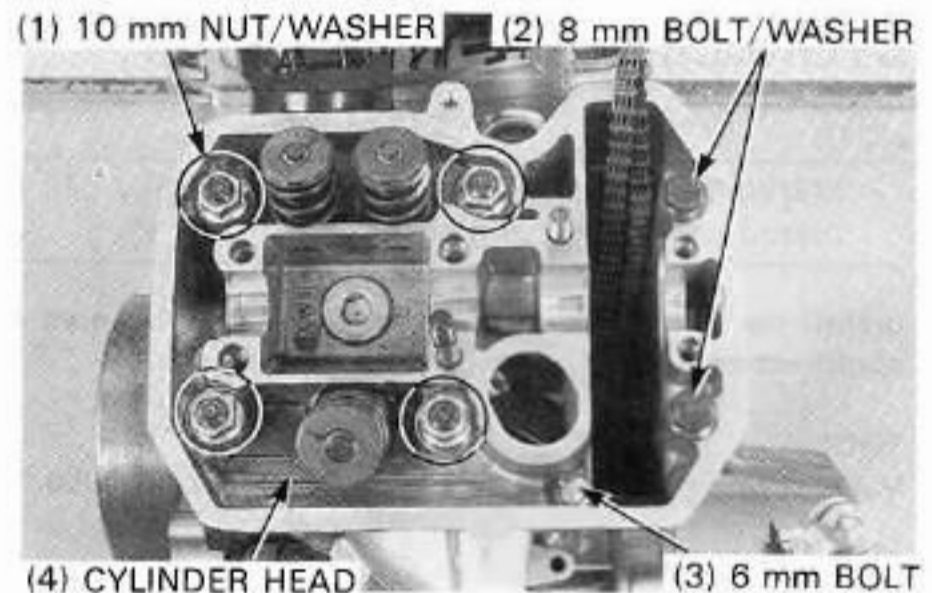
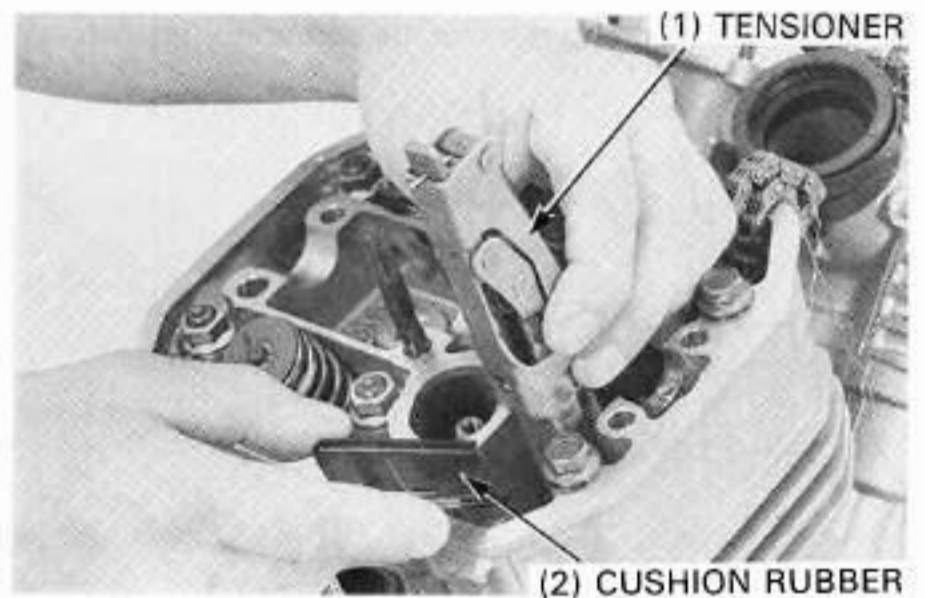
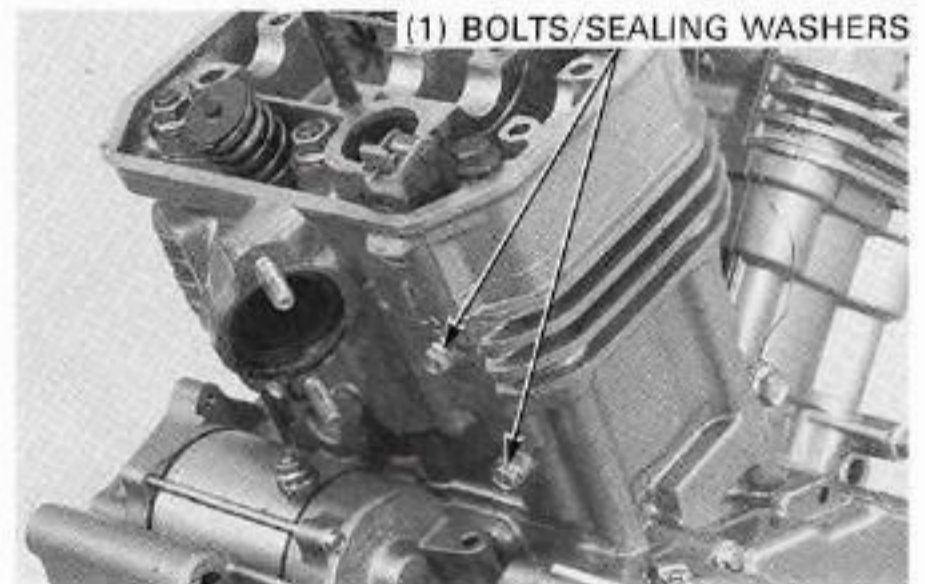
- Loosen the bolts and nuts in a crisscross pattern in several times.

Remove the cylinder head.

NOTE

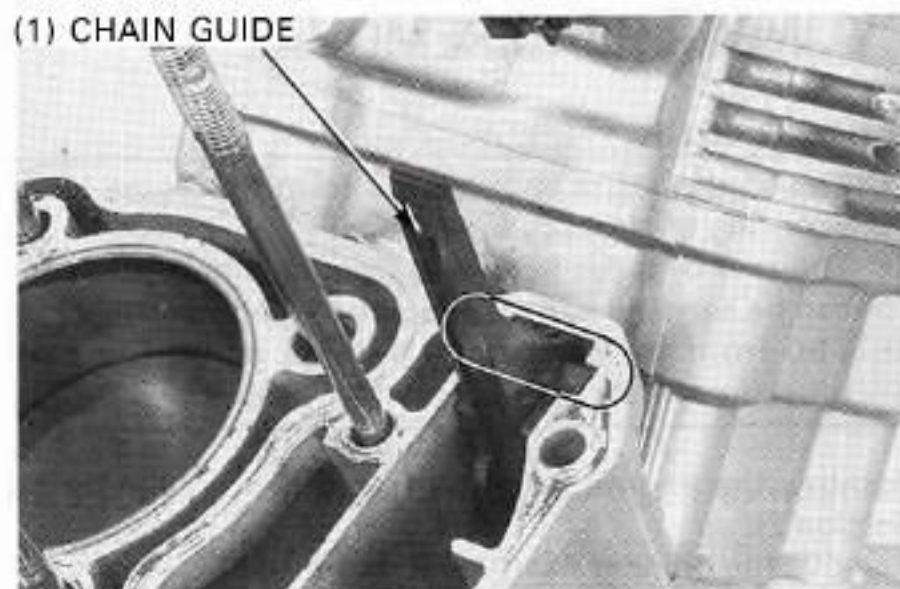
- Be careful not to damage the mating surfaces when removing the cylinder head.

Remove the gasket and dowel pins.

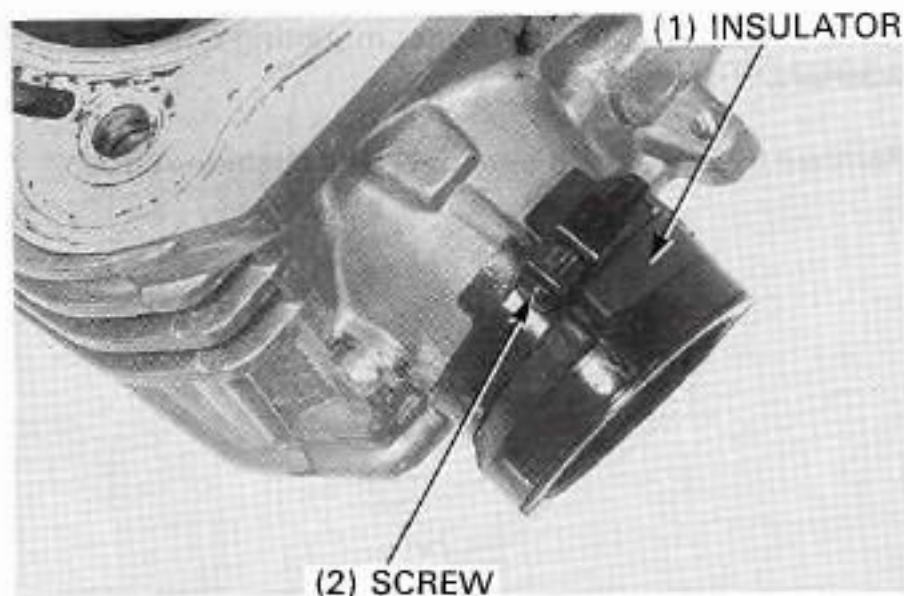


CYLINDER HEAD/VALVES

Remove the cam chain guide.



Loosen the screw and remove the carburetor insulator.



CYLINDER HEAD DISASSEMBLY

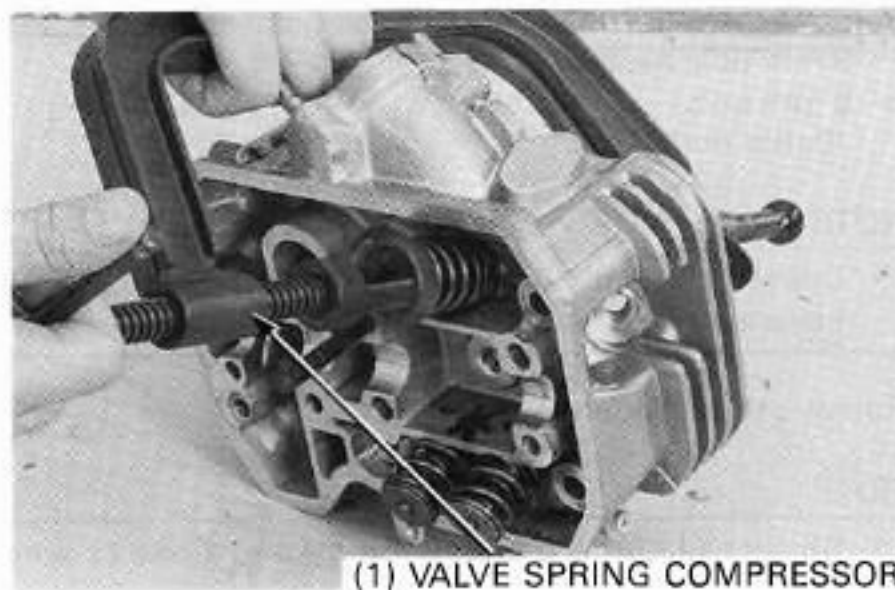
NOTE

- Mark all parts during disassembly so they can be placed back in their original position.

Install the valve spring compressor onto the valve and compress the valve spring.

TOOL:

Valve spring compressor 07757-0010000



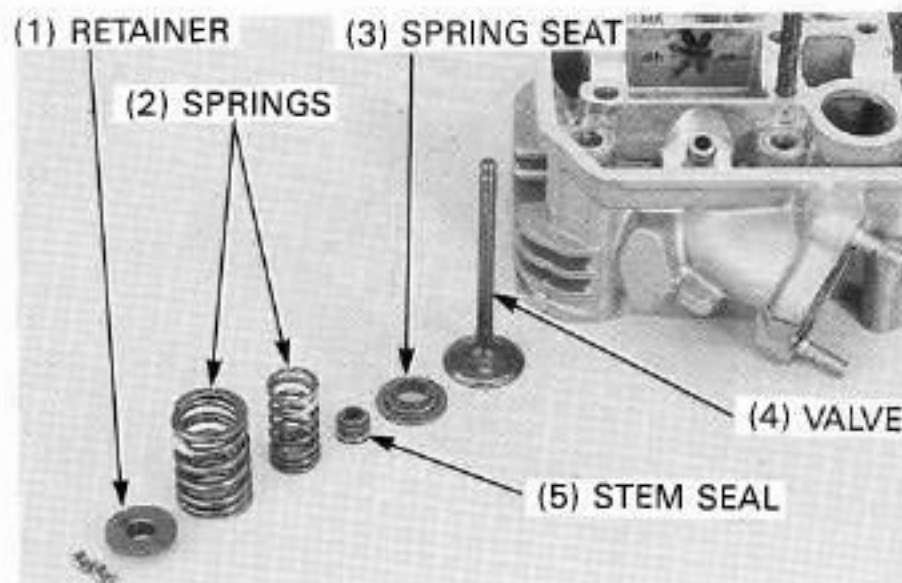
CAUTION

- *Compressing the valve springs more than necessary will cause loss of valve spring tension.*

Remove the valve spring compressor, then remove the retainers, springs and valves.
Remove the stem seals and spring seats.

NOTE

- Do not reuse a removed stem seals.

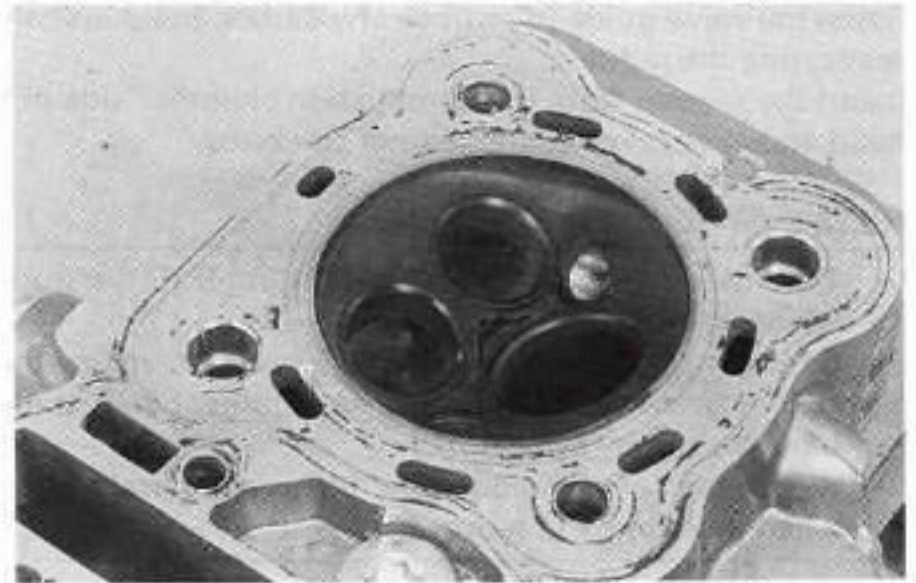


Remove carbon deposits from the combustion chamber and clean off the head gasket surface.

CAUTION

- *Avoid damaging the gasket and valve seat surface.*

Check the spark plug hole and valve areas for cracks.

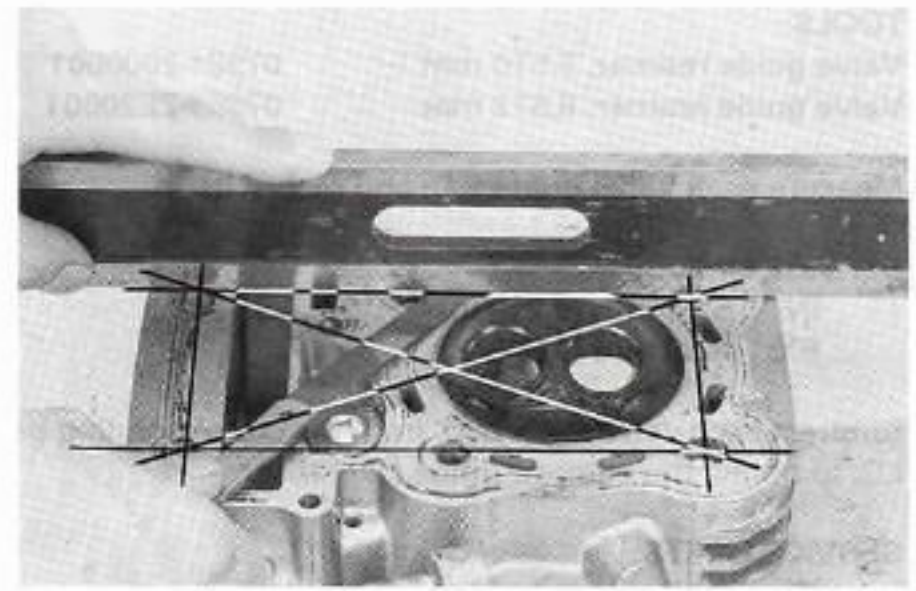


INSPECTION

CYLINDER HEAD

Check the cylinder head for warpage with a straight edge and feeler gauge.

SERVICE LIMIT: 0.10 mm (0.004 in)

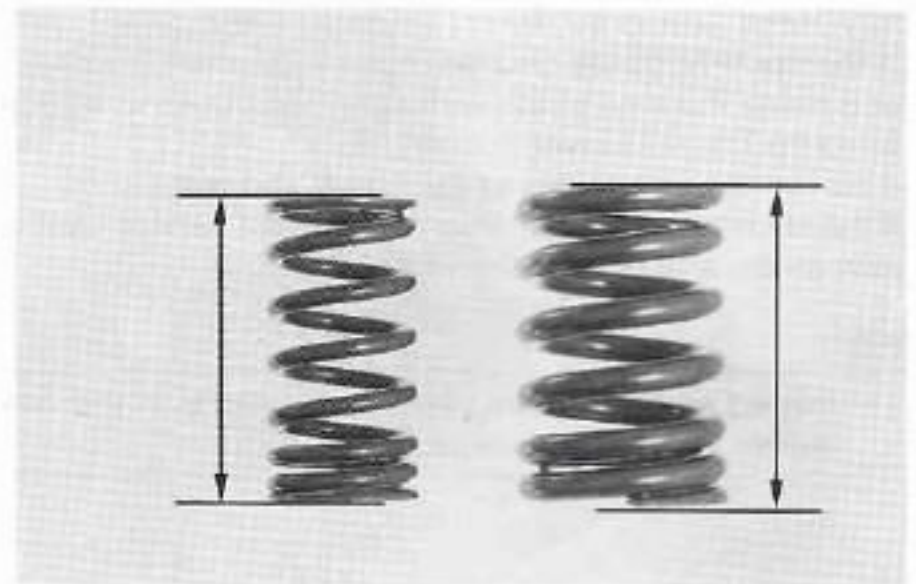


VALVE SPRING

Check the valve spring for fatigue or damage. Measure the free length of inner and outer valve springs.

SERVICE LIMITS:

- Inner (IN): 36.0 mm (1.42 in)
- (EX): 36.0 mm (1.42 in)
- Outer (IN): 40.0 mm (1.57 in)
- (EX): 40.5 mm (1.59 in)



VALVE STEM, VALVE GUIDE

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

Insert the valves in their original positions in the cylinder head. Check that each valve moves up and down smoothly, without binding.

Measure the each valve stem O.D. and record it.

SERVICE LIMITS:

- IN: 5.46 mm (0.215 in)
- EX: 6.54 mm (0.257 in)



CYLINDER HEAD/VALVES

Ream the valve guide to remove any carbon build-up before measuring the guide.

Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

NOTE

- Take care not to tilt or lean the reamer in the guide while reaming.
- If reaming irregular, oil will leak past the valve stem seal. If could cause improper seat contact that cannot be corrected by refacing.
- Rotate the reamer clockwise, never counterclockwise when inserting and removing.

TOOLS:

Valve guide reamer, 5.510 mm 07984-200001
Valve guide reamer, 6.612 mm 07984-ZE20001

Measure each valve guide I. D. and record it.

SERVICE LIMITS:

IN: 5.55 mm (0.219 in)
EX: 6.69 mm (0.263 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: 0.12 mm (0.005 in)

If the stem-to-guide clearance exceeds the service limit, determine if a new guide with standard dimensions would bring the clearance within tolerance.

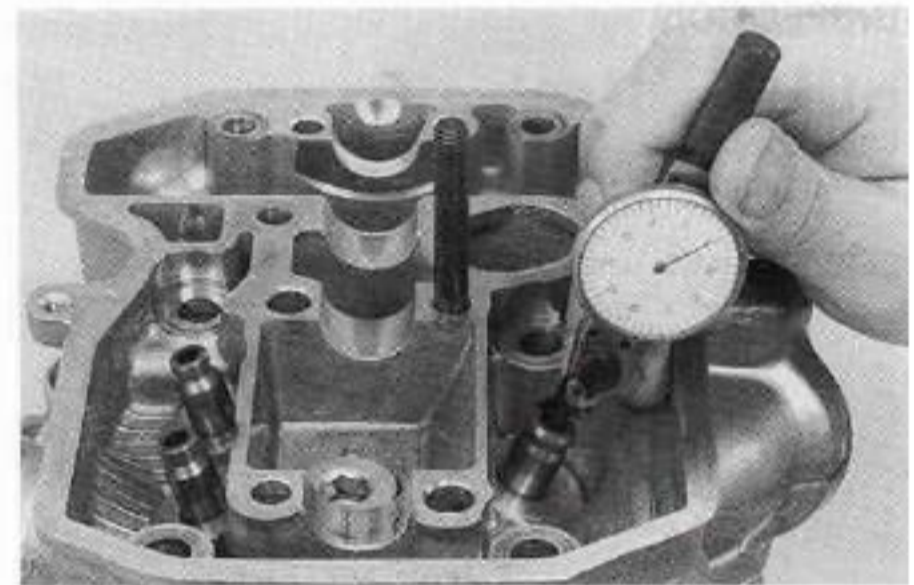
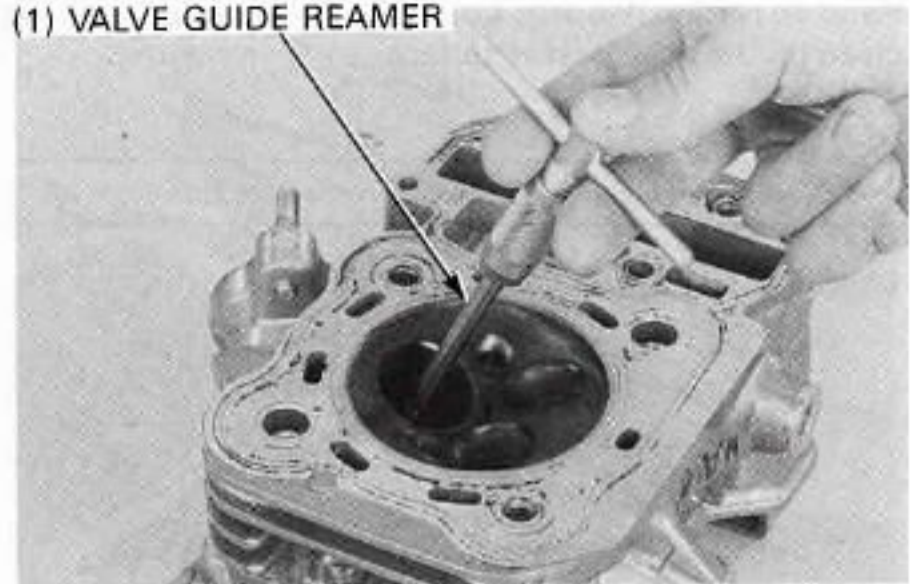
If so, replace any guides as necessary and ream to fit.

If the stem-to guide clearance exceeds the service limit with new guide, also replace the valve.

NOTE

- Inspect and reface the valve seats whenever the valve guides are replaced (page 10-17).

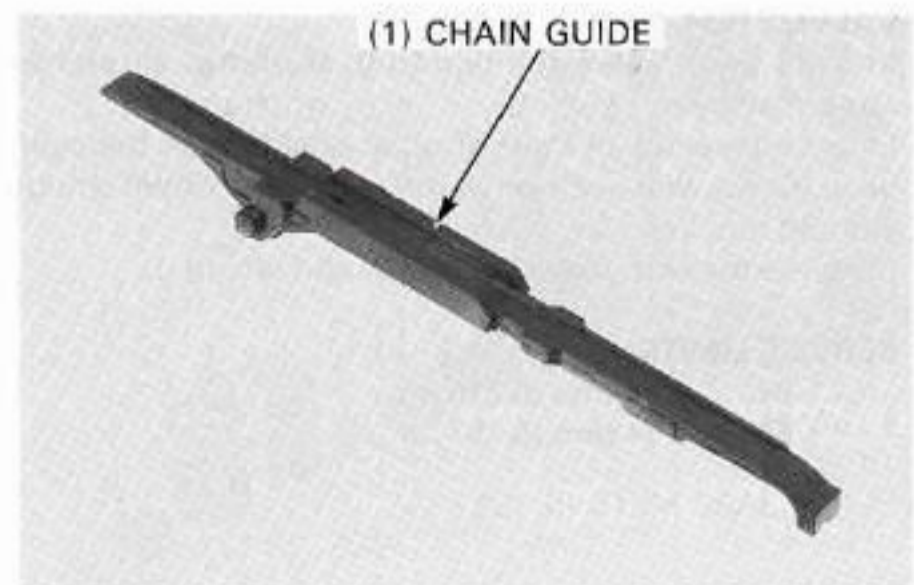
(1) VALVE GUIDE REAMER



CAM CHAIN GUIDE

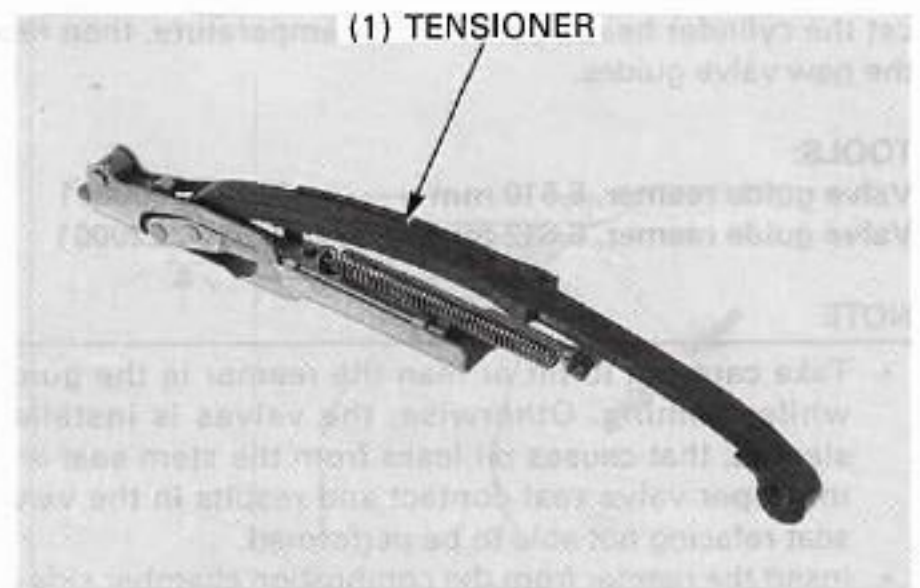
Check the cam chain guide for wear or damage.
Replace the cam chain guide if necessary.

(1) CHAIN GUIDE



CAM CHAIN TENSIONER

Check the cam chain tensioner for wear or damage.
Replace the cam chain tensioner if necessary.

**VALVE GUIDE REPLACEMENT****NOTE**

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

Chill the valve guides in the freezer section of refrigerator for about an hour.

⚠ WARNING

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

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

CAUTION

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

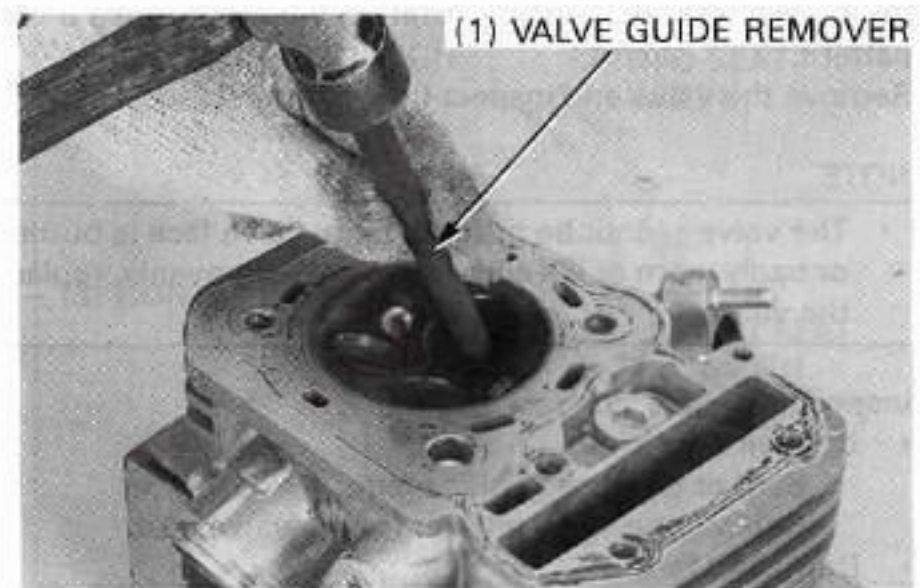
Support the cylinder head and drive out the old guides from the combustion chamber side of the cylinder head.

TOOLS:

Valve guide remover, 5.5 mm (IN) 07742-0010100
Valve guide remover, 6.6 mm (EX) 07742-0010200

CAUTION

- *Be careful not to damage the cylinder head.*



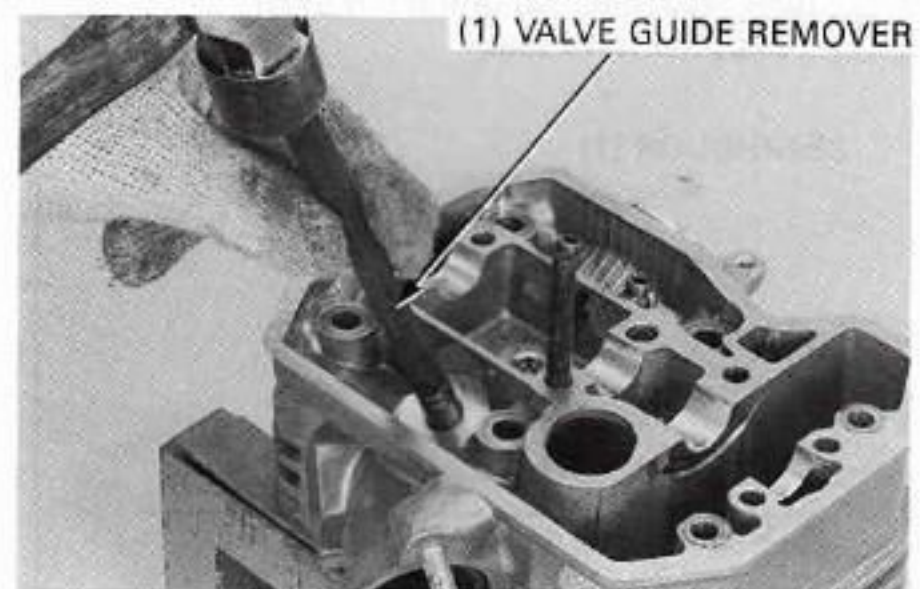
Drive the new guides in from the camshaft side of the cylinder head to the valve guide height while the cylinder head is still heated.

TOOLS:

Valve guide remover, 5.5 mm (IN) 07742-0010100
Valve guide remover, 6.6 mm (EX) 07742-0010200

VALVE GUIDE PROJECTION:

IN: 19.5±0.1 mm (0.768±0.004 in)
EX: 18.0±0.1 mm (0.709±0.004 in)



CYLINDER HEAD/VALVES

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

TOOLS:

Valve guide reamer, 5.510 mm 07984-200001
Valve guide reamer, 6.612 mm 07984-ZE20001

NOTE

- Take care not to tilt or lean the reamer in the guide while reaming. Otherwise, the valves is installed slanted, that causes oil leaks from the stem seal and improper valve seat contact and results in the valve seat refacing not able to be performed.
- Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

Clean the cylinder head thoroughly to remove any metal particles after reaming and refacing the valve seat.

VALVE SEAT INSPECTION/REFACING

INSPECTION

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

Apply a light coating of Prussian Blue to each valve face. Tap the valve against the valve seat several times using a hand-lapping tool, without rotating valve, to make a clear pattern.

Remove the valve and inspect the valve seat face.

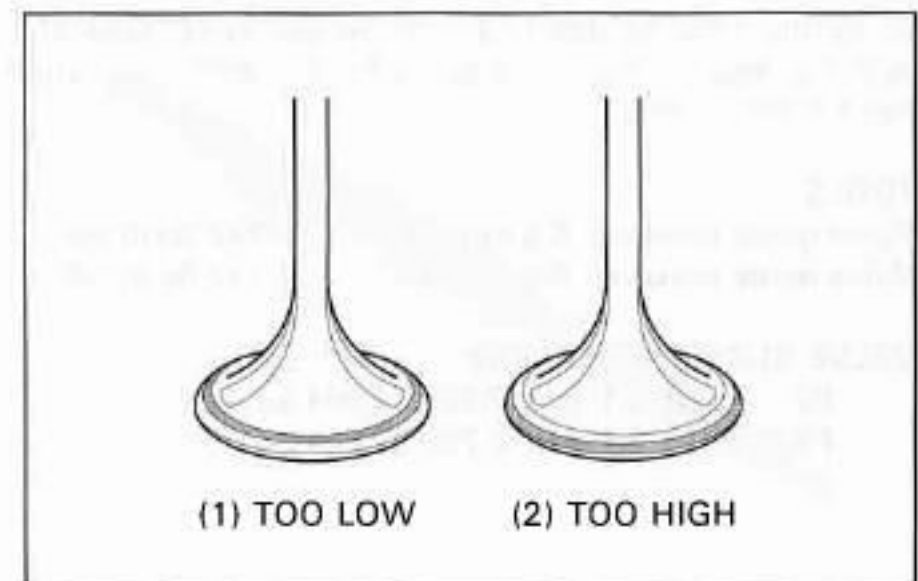
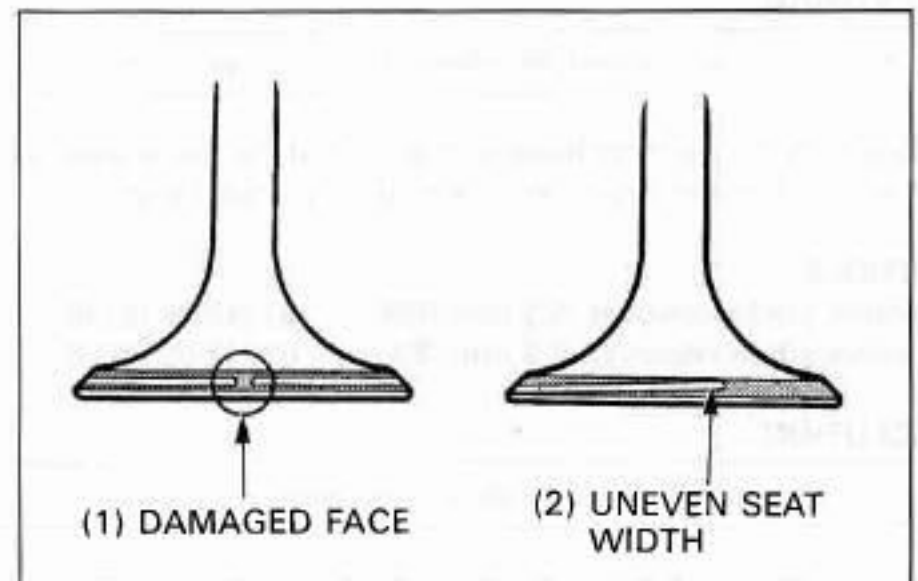
NOTE

- The valve cannot be ground. If the valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.

Inspect the valve seat face for:

- Uneven seat width:
 - Bent or collapsed valve stem;
 - Replace the valve and reface the valve seat.
- Damaged face:
 - Replace the valve and reface the valve seat.
- Contact area (too high or too low area):
 - retace the valve seat.

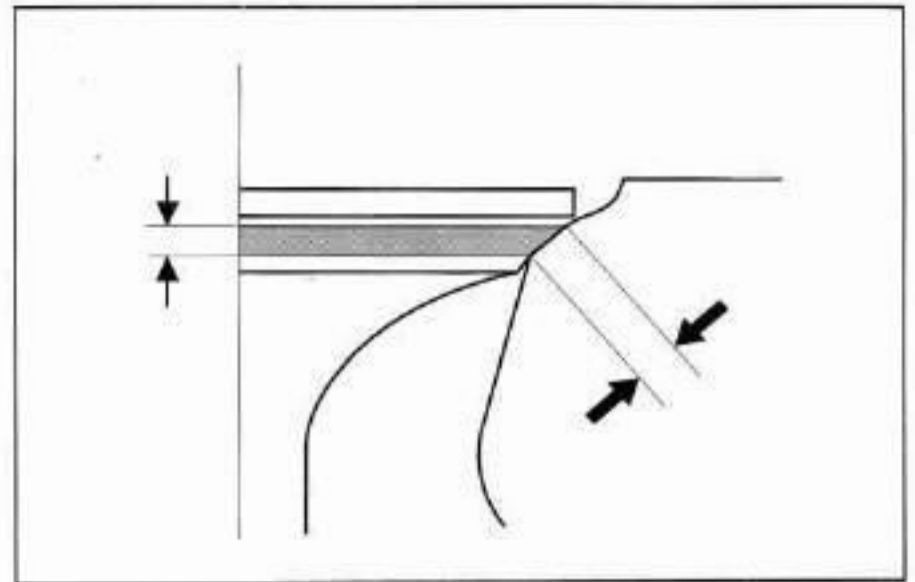
(1) VALVE GUIDE REAMER



Inspect the width of the valve seat.
The valve seat contact should be within the specified width and even all around the circumference.

STANDARD: 1.1 mm (0.04 in)
SERVICE LIMIT: 1.5 mm (0.06 in)

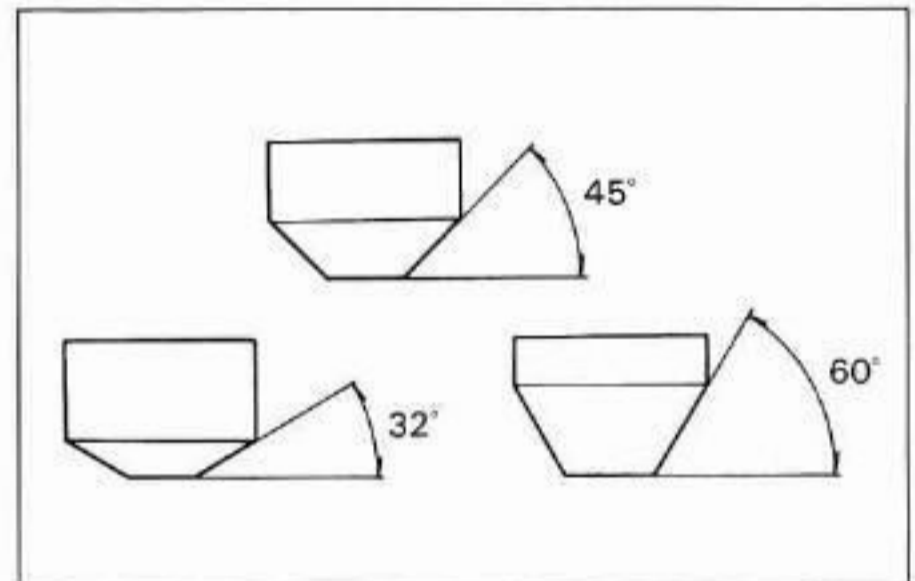
Valve seat width is not within specification, reface the valve seat.



VALVE SEAT REFACING

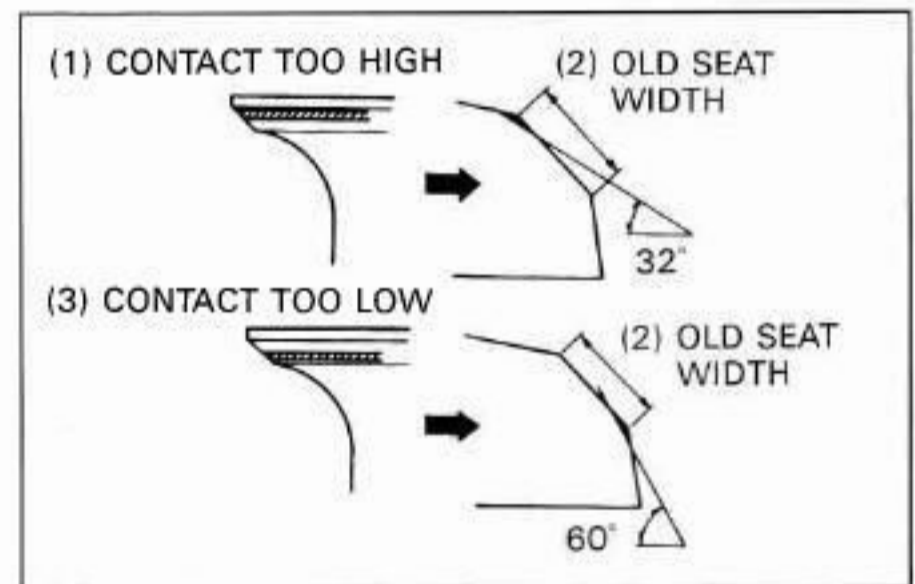
NOTE

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

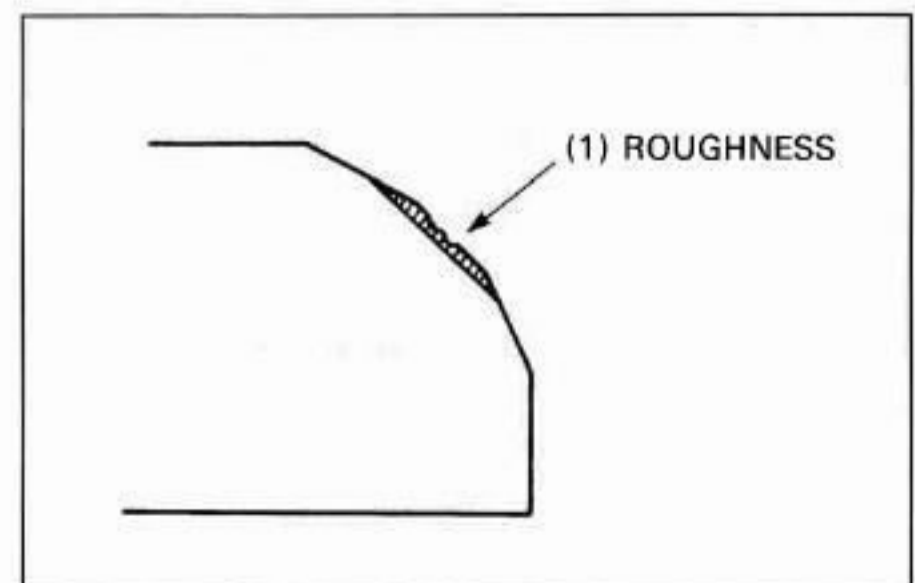


If the contact area is too high on the valve, the seat must be lowered using a 32° flat cutter.

If the contact area is too low on the valve, the seat must be raised using a 60° inner cutter. Refinish the seat to specifications, using a 45° finish cutter.

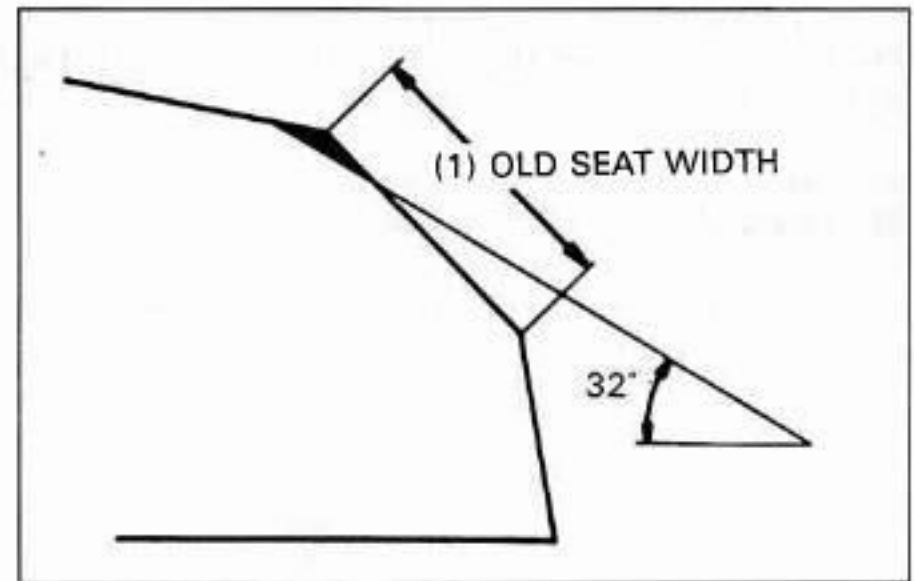


Using a 45° cutter, remove any roughness or irregularities from the seat.

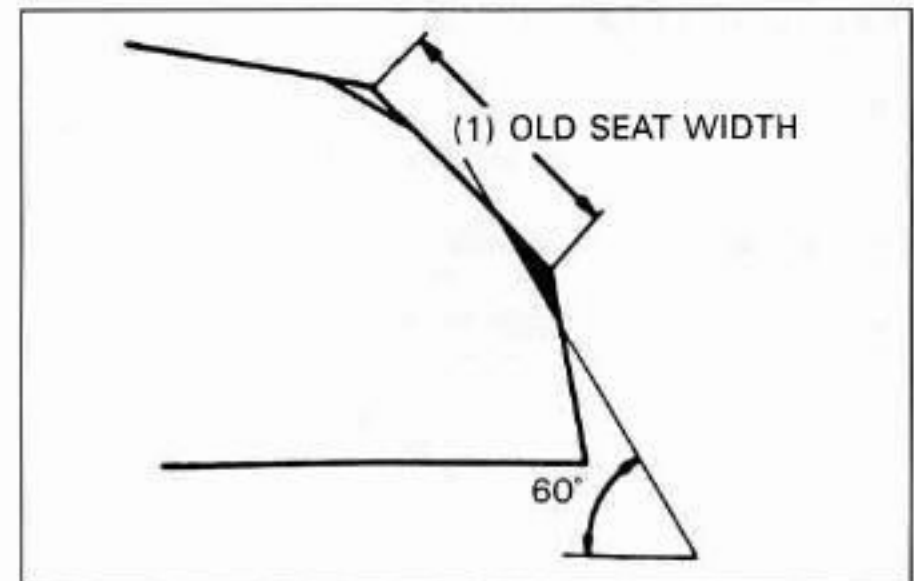


CYLINDER HEAD/VALVES

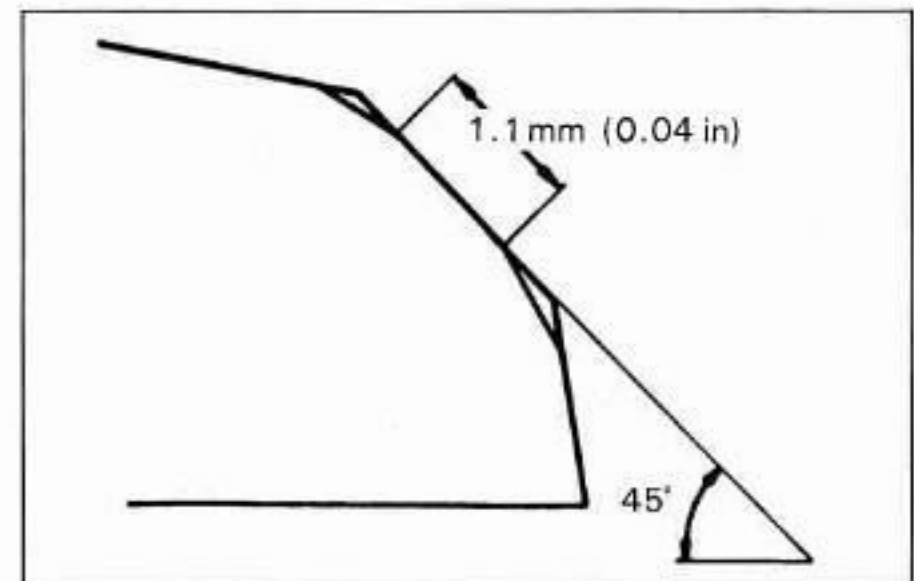
Using a 32° cutter, remove 1/4 of the existing valve seat material.



Using a 60° cutter, remove the bottom 1/4 of the old seat.



Using a 45° cutter, cut the seat to the proper width.
Make sure that all pitting and irregularities are removed.



CAUTION

- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool frequently to prevent uneven seat wear.
- Lapping compound can cause damage if it enters between the valve stem and guide.

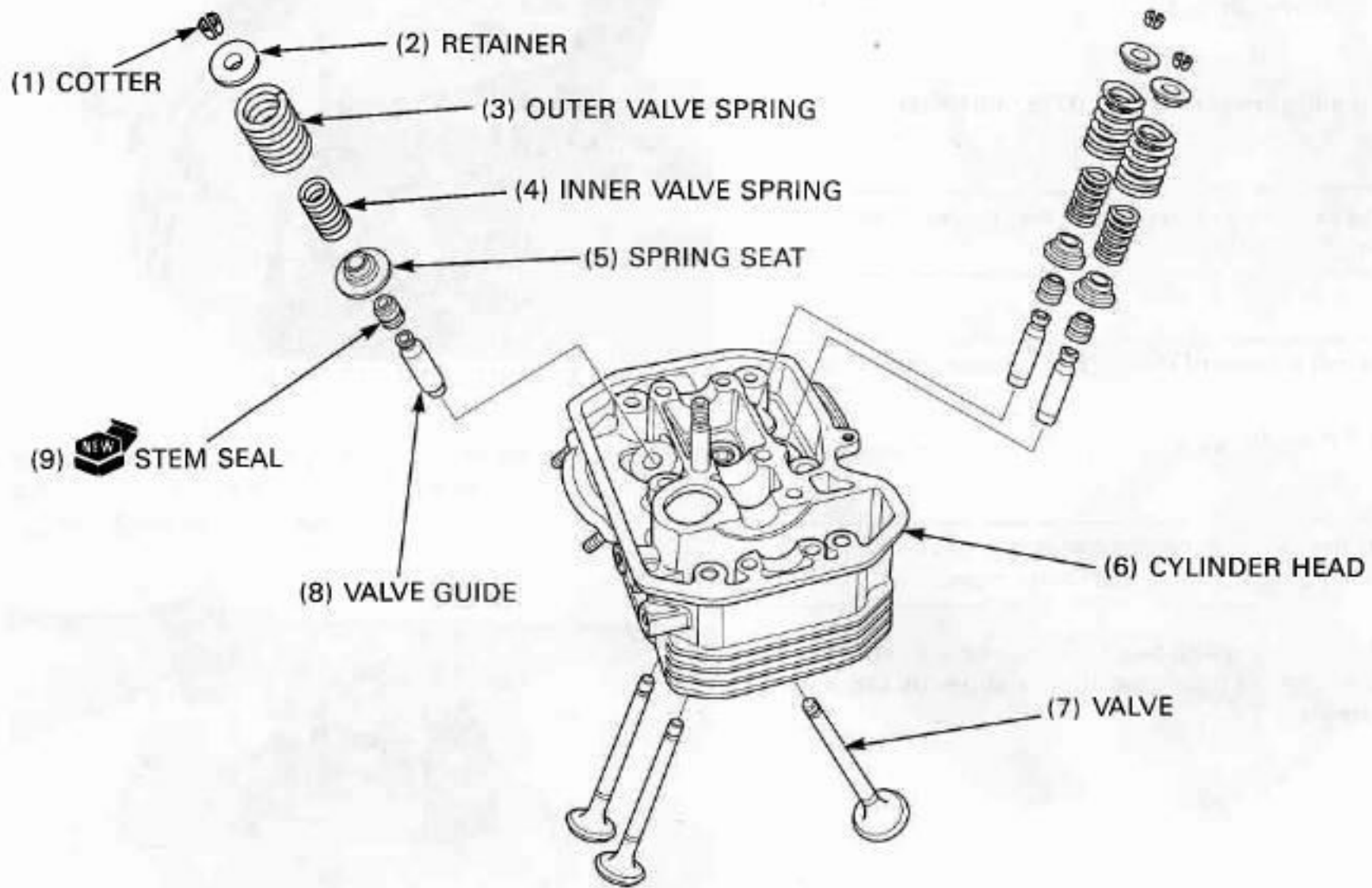
After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

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

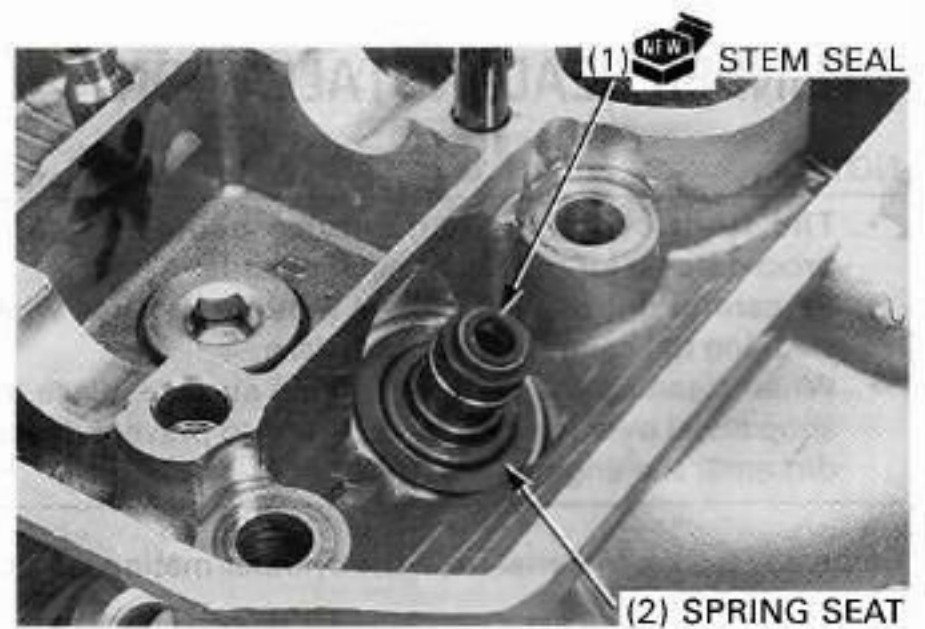
Recheck the seat contact after lapping.



CYLINDER HEAD ASSEMBLY



Install the spring seats and new stem seals.
 Lubricate each valve stems and valve guide inner surfaces
 with molybdenum oil solution.

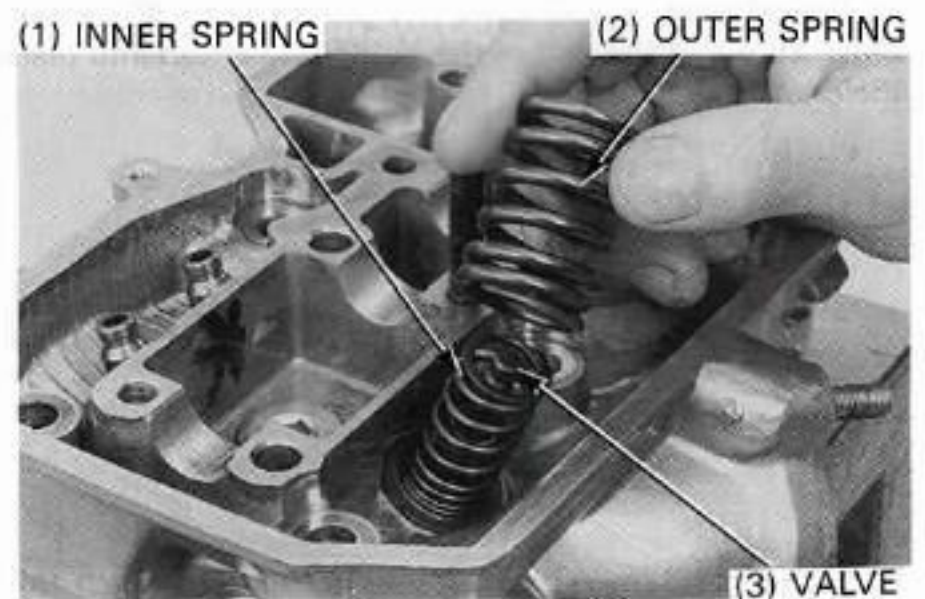


Install the valves into the valve guides.

NOTE

- To avoid damage to the stem seal, turn the valve slowly when valve installing.

Install the inner, outer valve springs with tightly wound coils
 side facing the combustion chamber.



CYLINDER HEAD/VALVES

Install the retainers.
Install the valve spring compressor onto the valve and compress the valve springs.

TOOL:

Valve spring compressor 07757-0010000

CAUTION

- *Compressing the valve springs more than necessary will cause loss of valve spring tension.*

NOTE

- To ease installation of the cotters, grease them first.

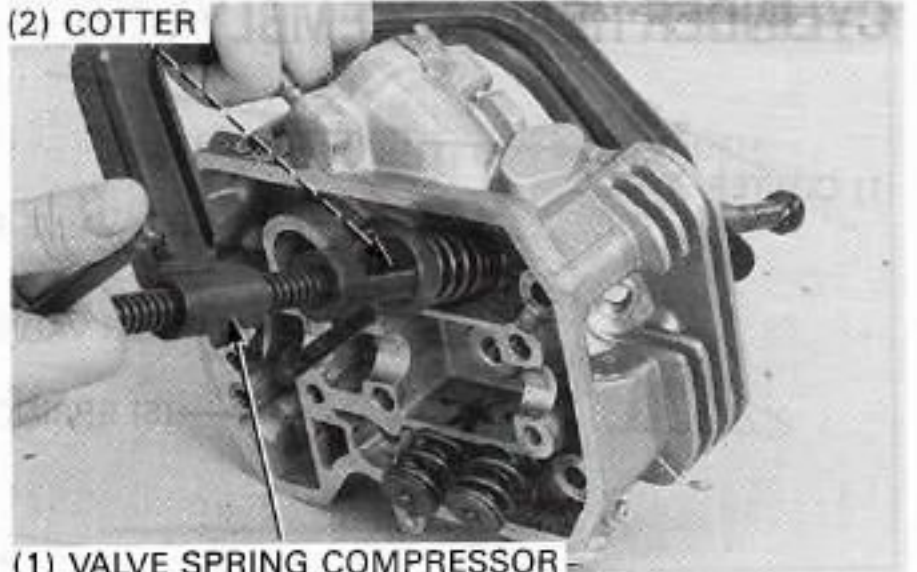
Install the valve cotters.

NOTE

- Support the cylinder head so that the valve heads will not contact anything that causes damage.

Set the cotters firmly using two soft hammers as shown. Hold one hammer on the valve stem and gently tap it with the other hammer.

(2) COTTER



(1) VALVE SPRING COMPRESSOR



CYLINDER HEAD INSTALLATION

NOTE

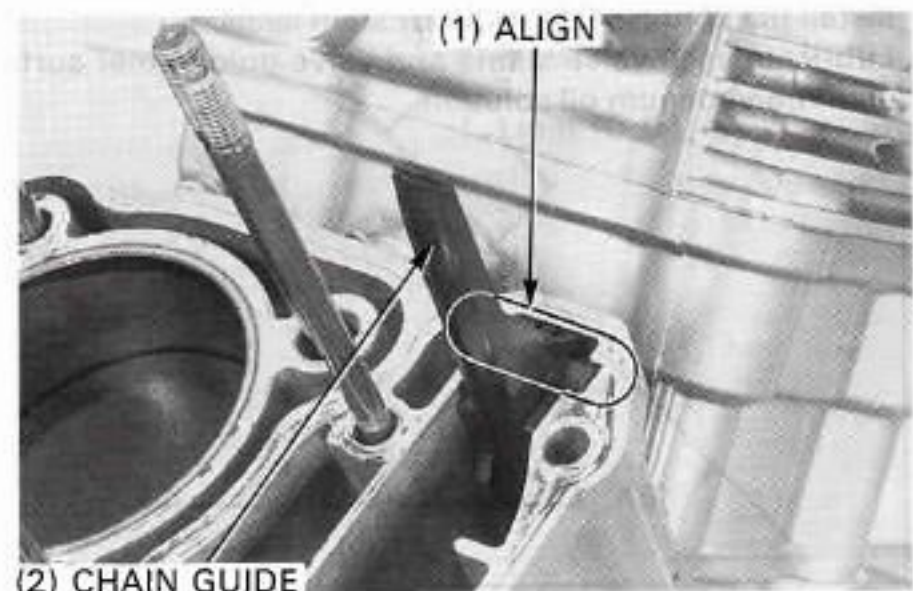
- The front cylinder head service using the same procedure as for the rear cylinder head.
- Be careful not to damage the mating surfaces when cleaning the cylinder mating surface.
- When cleaning the cylinder mating surface, place the shop towel over the cylinder opening to prevent dust or dirt enter the engine.

Clean any gasket material from the cylinder mating surfaces.

Install the cam chain guide aligning its tab with the groove on the cylinder.

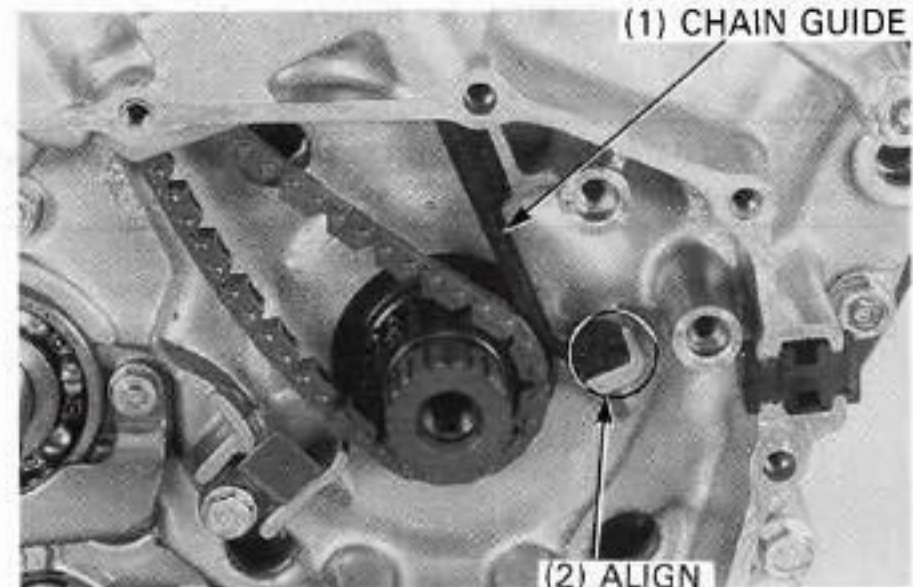
Make sure that the end of the guide is inserted into place in the crankcase.

(1) ALIGN



(2) CHAIN GUIDE

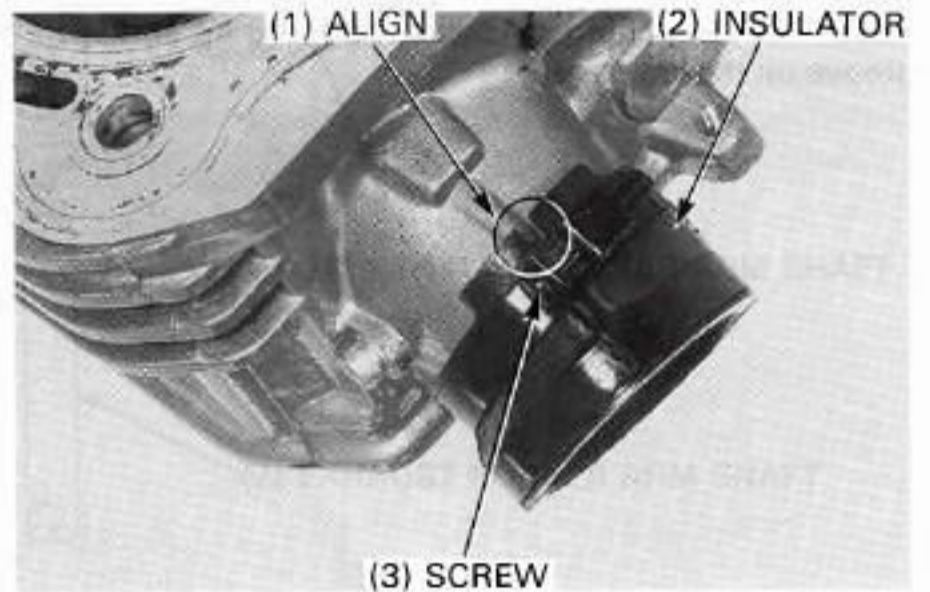
(1) CHAIN GUIDE



Install the dowel pins and new gasket.



Install the insulator, aligning the boss on the cylinder head with the slot in the insulator as shown. Tighten the screw securely.

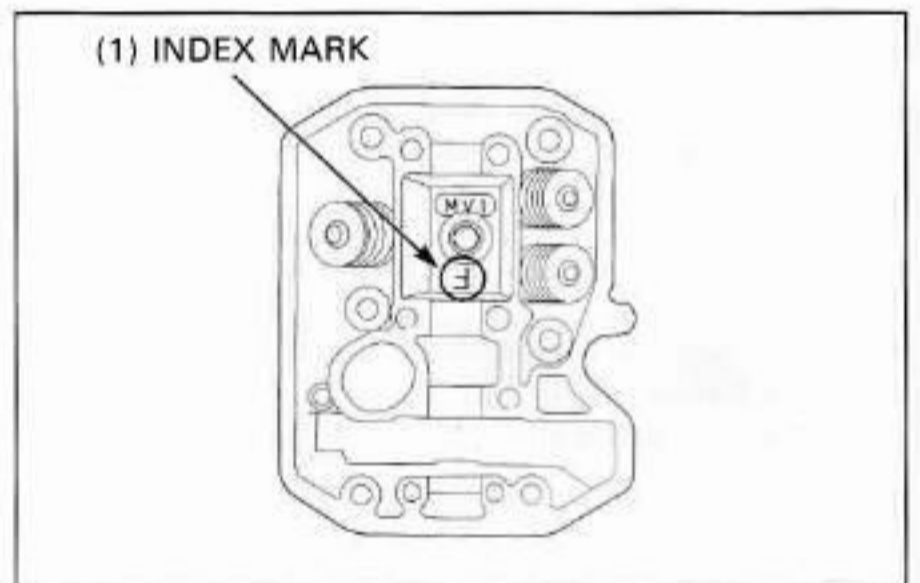


Install the cylinder head to the cylinder.

NOTE

- The cylinder heads are identified by marks on its camshaft side.
 "F": Front cylinder head
 "R": Rear cylinder head

Apply oil to the cylinder head 10 mm nut threads and flange surfaces.



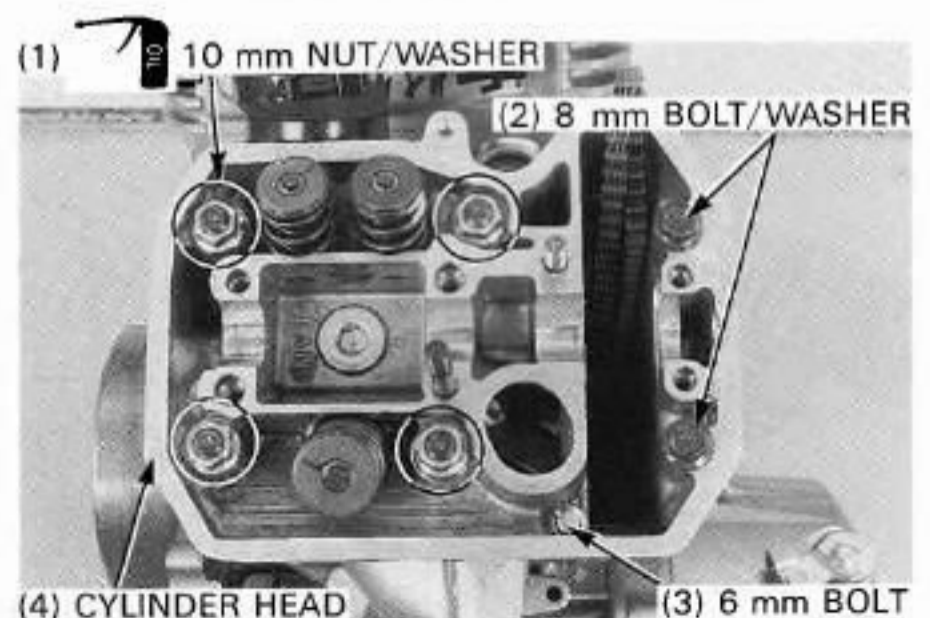
Install and tighten the cylinder head bolts and nuts to the specified torque:

TORQUE:

- 10 mm nut/washer: 47 N·m (4.8 kgf·m, 35 lbf·ft)
- 8 mm bolt/washer: 23 N·m (2.3 kgf·m, 17 lbf·ft)
- 6 mm bolt: 12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE

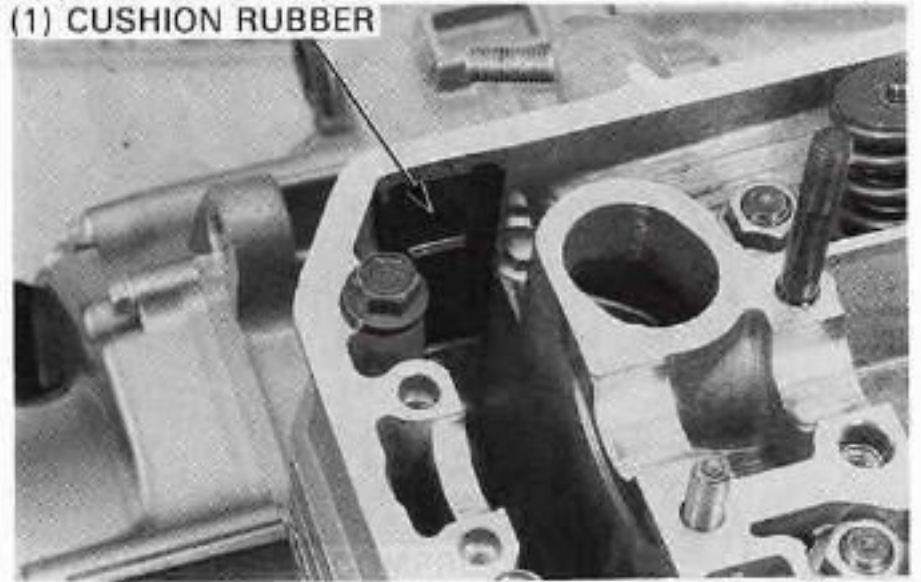
- Tighten all to hand-tight, then torque big fasteners before little fasteners.
- Tighten the bolts and nuts in a crisscross pattern in several times.



CYLINDER HEAD/VALVES

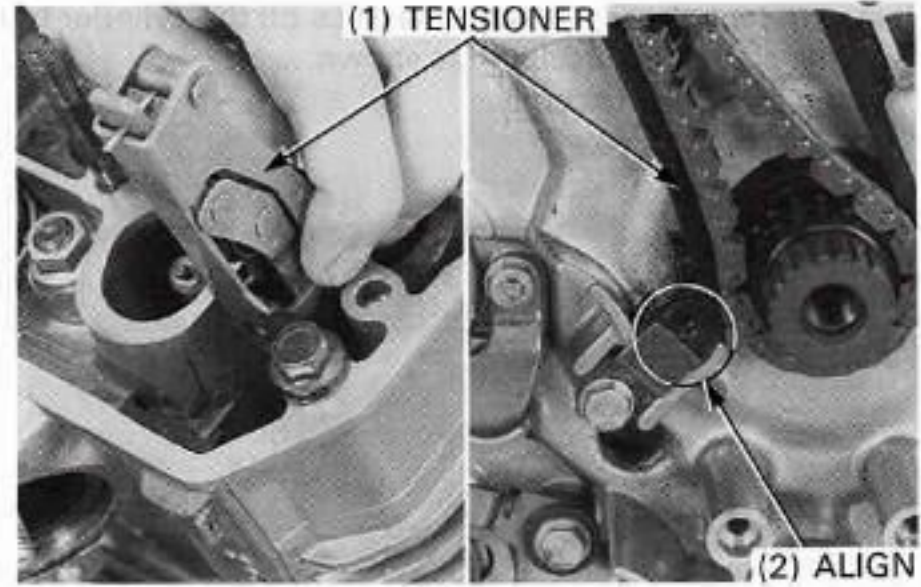
Install the cushion rubber.

(1) CUSHION RUBBER



Install the cam chain tensioner aligning its end with the groove on the crankcase.

(1) TENSIONER

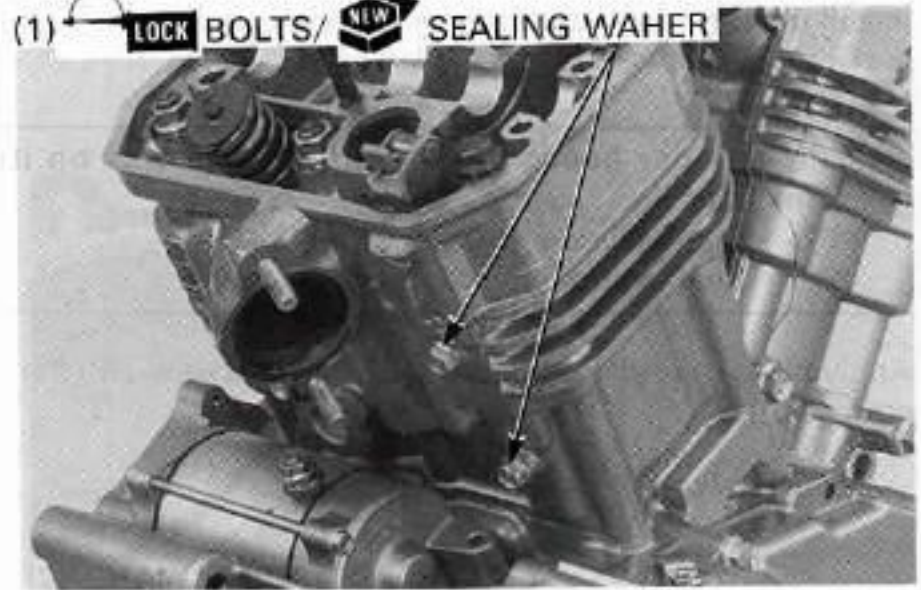


Install the new sealing washers.
Clean and apply a locking agent to the cam chain tensioner bolt threads.
Install and tighten the cam chain tensioner mounting bolts to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

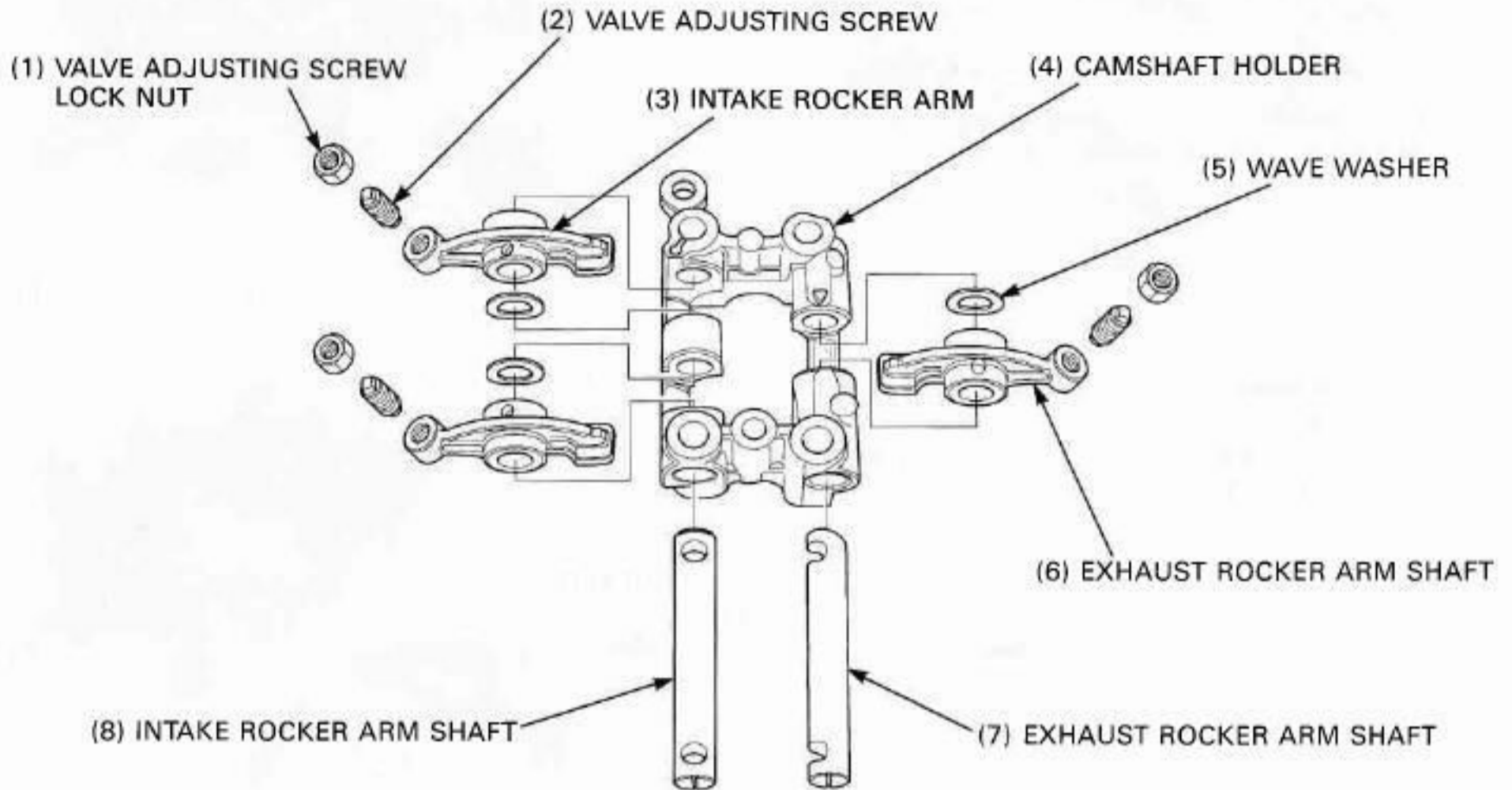
Install the engine to the frame (front cylinder only/Section 7).
Install the camshaft (page 10-25).
Install the cylinder head cover (page 10-32).

(1) LOCK BOLTS/ NEW SEALING WAHER



CAMSHAFT INSTALLATION

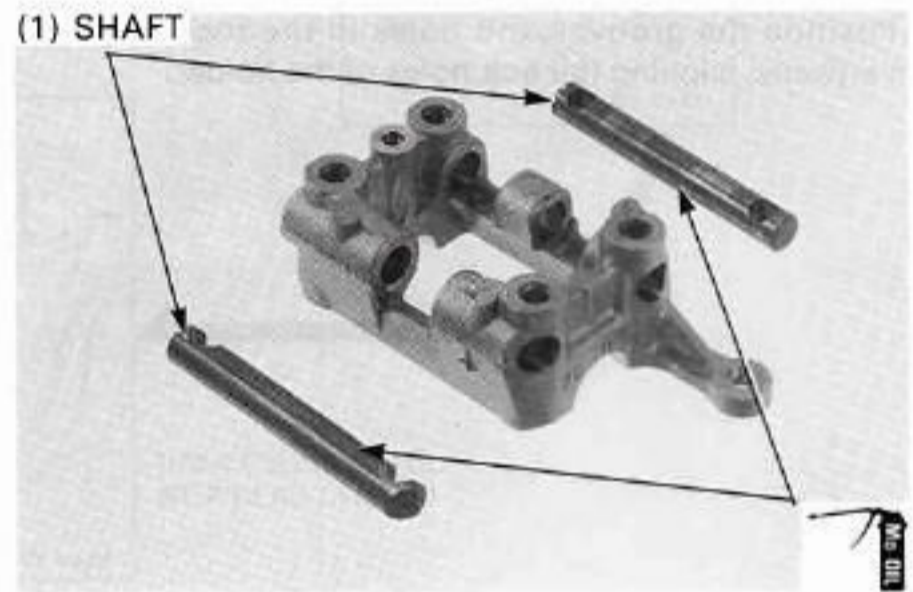
CAMSHAFT HOLDER ASSEMBLY



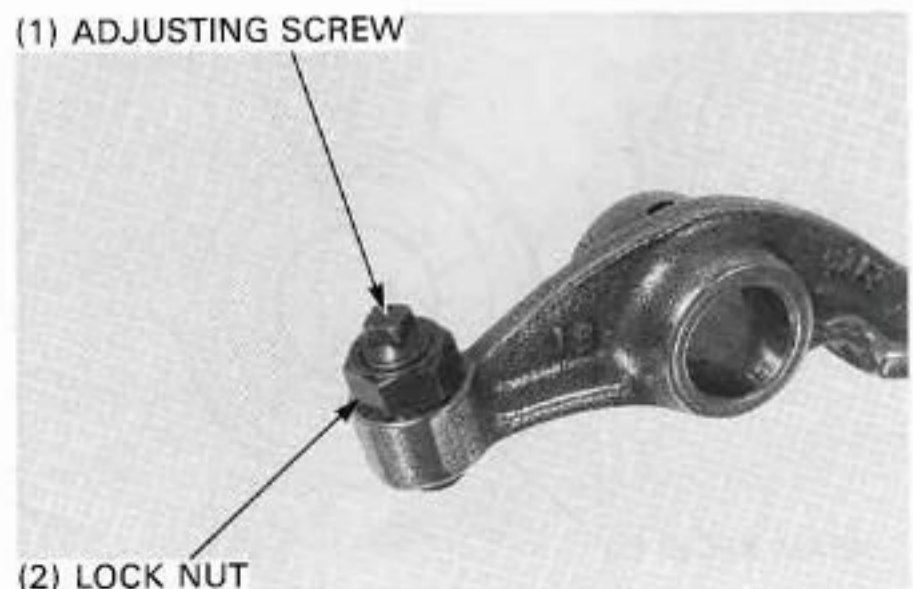
NOTE

- Camshaft lubricating oil is fed through oil passages in the cylinder head and camshaft holder. Clean the oil passages before assembling the cylinder head and camshaft holder.

Lubricate each rocker arm shaft outer sliding surfaces with molybdenum oil solution.



Install the valve adjusting screw and lock nut.



CYLINDER HEAD/VALVES

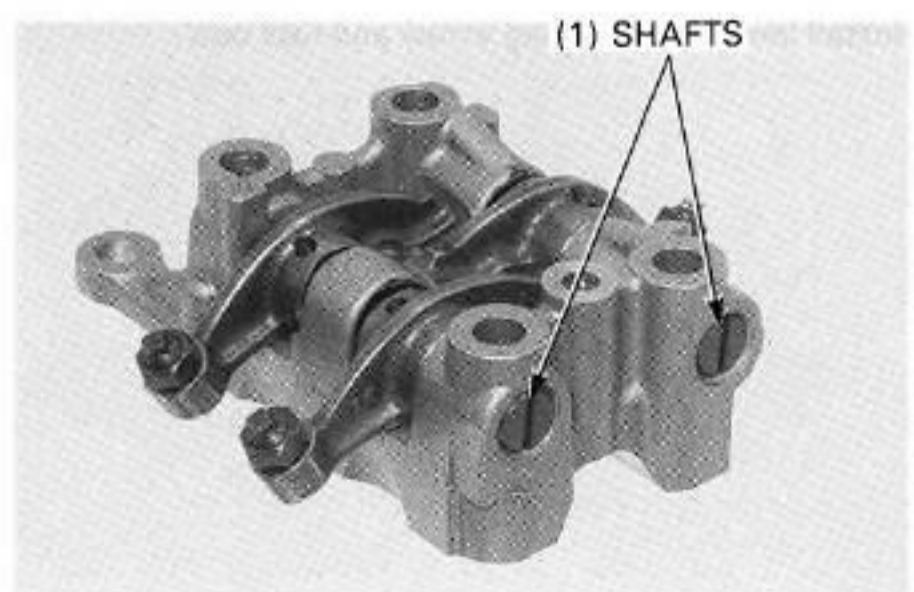
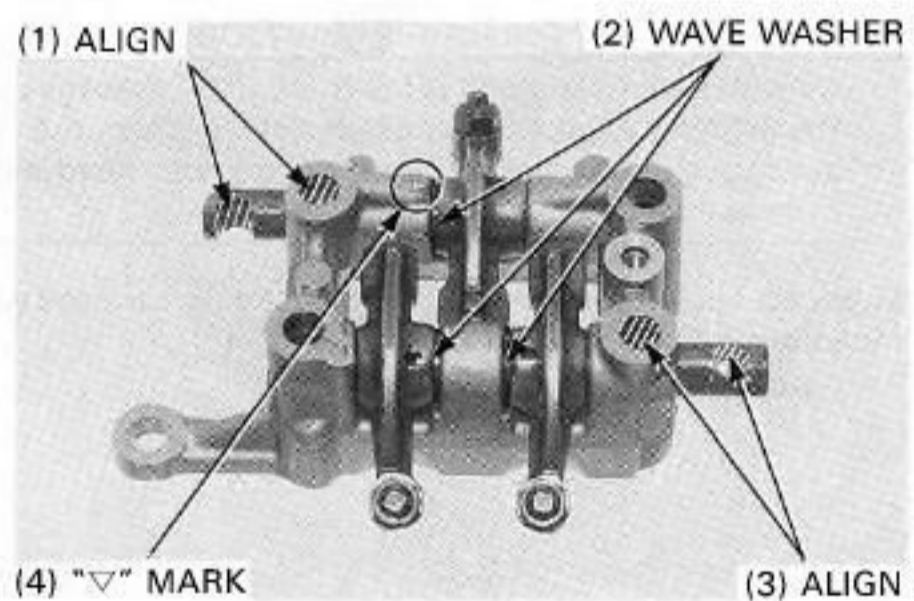
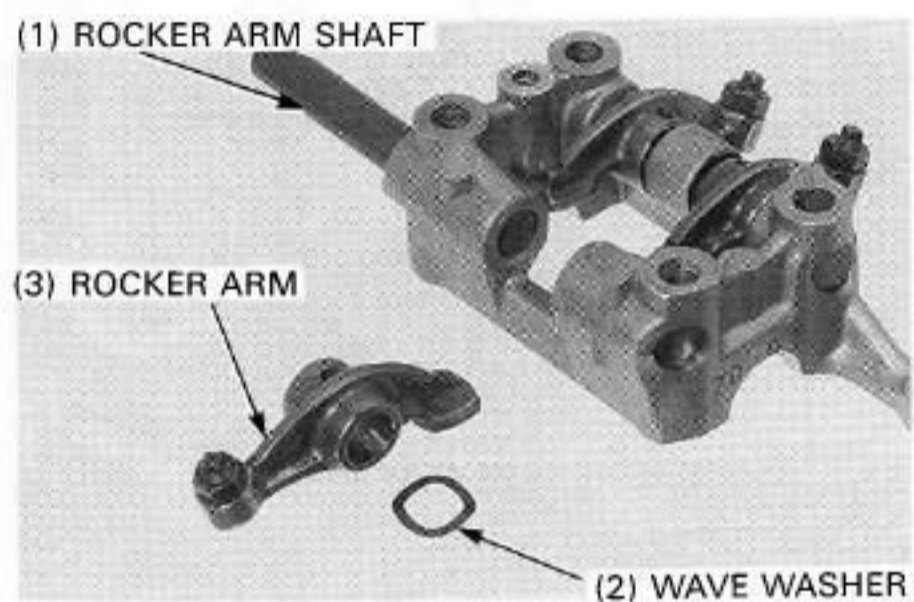
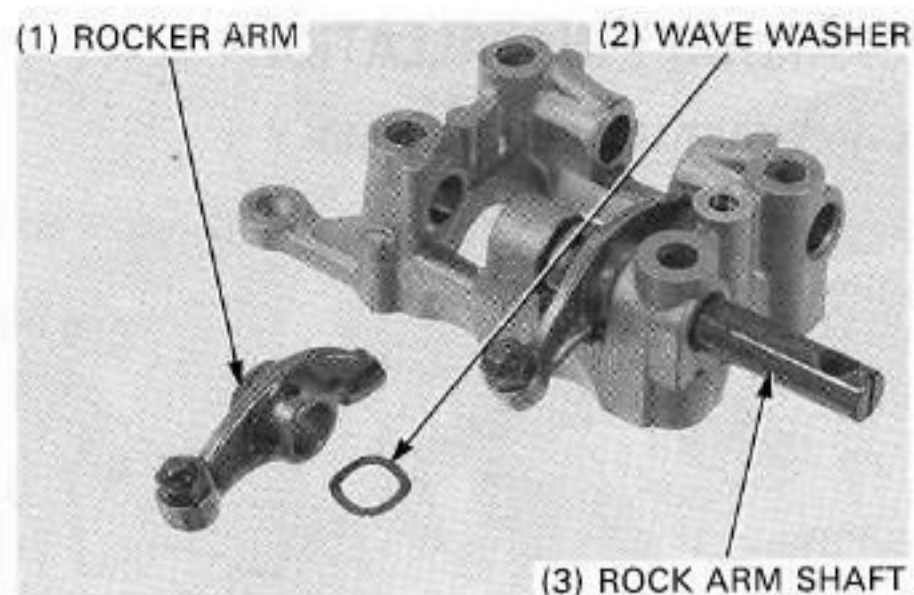
NOTE

- The exhaust rocker arm has larger slipper face than the intake rocker arm.
- The intake rocker arm shaft has two holes on each end.
- The exhaust rocker arm shaft has two grooves on each end.

Install the wave washer, 12 mm, intake rocker arm and intake rocker arm shaft to the camshaft holder.

Install the wave washer, 12 mm to the "▽" mark side on the camshaft holder.
Install the exhaust rocker arm and exhaust rocker arm shaft to the camshaft holder.

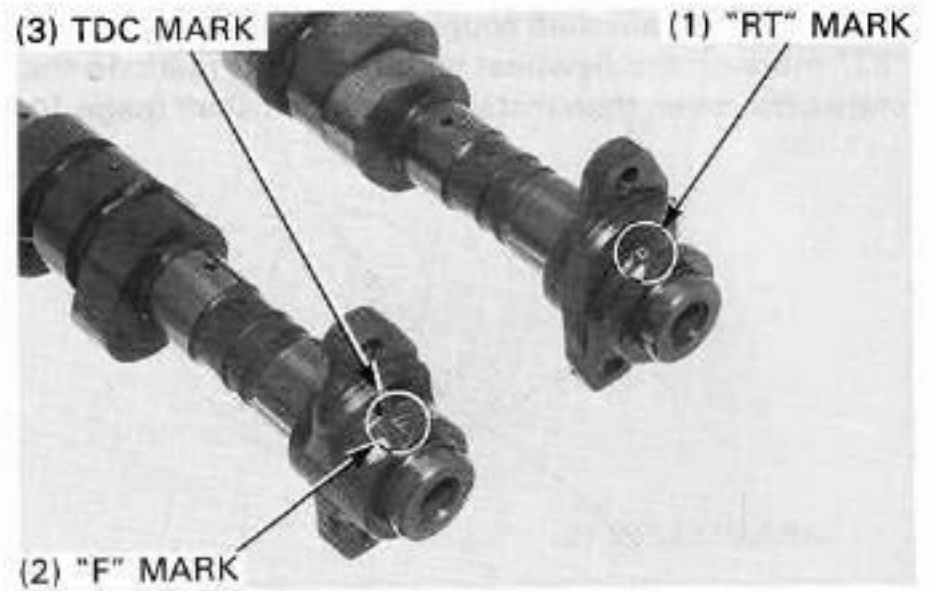
Position the grooves and holes in the rocker arm shafts vertically, aligning the bolt holes of the holder.



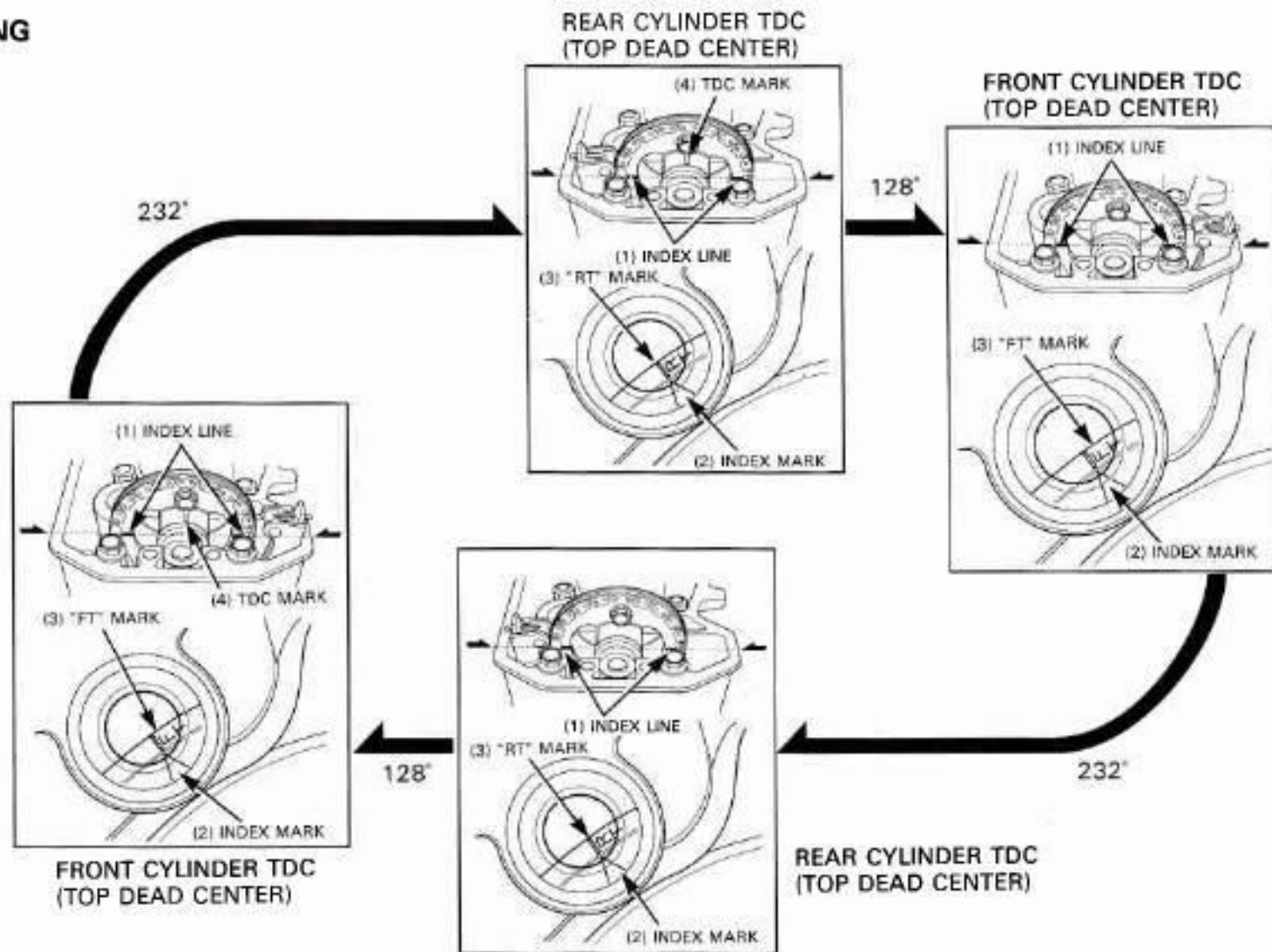
CAMSHAFT INSTALLATION

NOTE

- The camshafts are identified by marks on the their flanges:
 "F": Front cylinder camshaft
 "R": Rear cylinder camshaft
 "Index notch": TDC (Top Dead Center) mark
- If both (front and rear) camshaft is removed, install the front cylinder camshaft first, then install the rear cylinder camshaft.
- If the rear cylinder head was not serviced, remove the rear cylinder head cover to check the cam shaft position.
- If the front cylinder head was not serviced, remove the front cylinder head cover to check the cam shaft position.

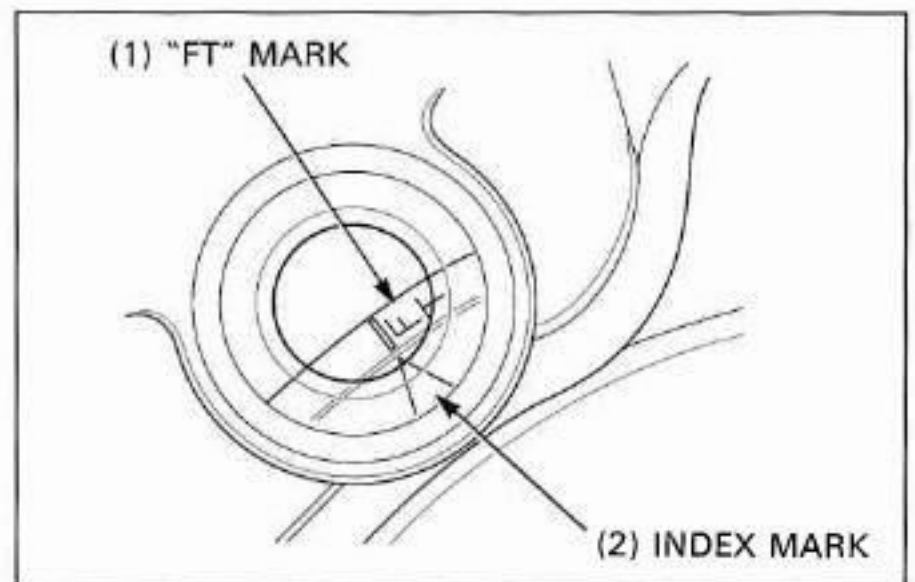


VALVE TIMING



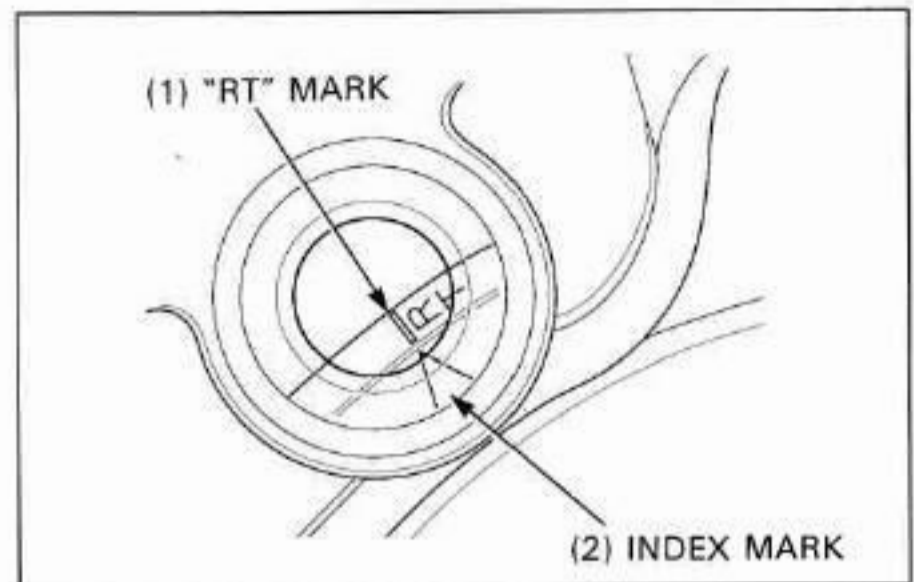
BOTH CYLINDER CAMSHAFT SERVICE

Remove the timing hole cap.
 Turn the crankshaft counterclockwise and align the "FT" mark on the flywheel with the index mark on the left crankcase cover, then check the front cylinder piston is "TDC (Top Dead Center)".
 Install the front cylinder camshaft (page 10-29).



CYLINDER HEAD/VALVES

Then turn the crankshaft counterclockwise 232° and align the "RT" mark on the flywheel with the index mark on the left crankcase cover, then install the rear camshaft (page 10-29).



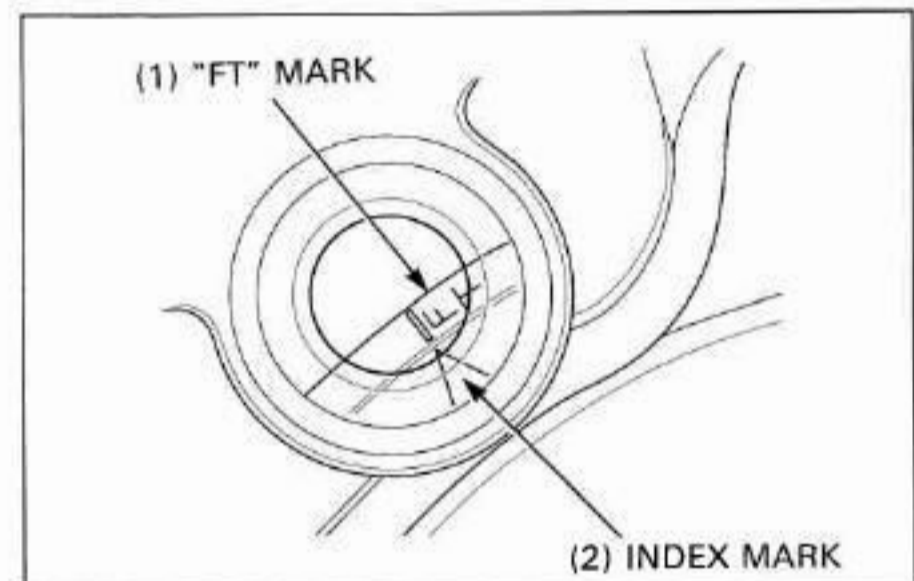
REAR CYLINDER CAMSHAFT SERVICE ONLY (FRONT CYLINDER CAMSHAFT WAS NOT SERVICED)

If the front cylinder head was not serviced, remove the front cylinder head cover (page 10-5) and check the camshaft position as follows:

Remove the front cylinder head camshaft end holder (page 10-6).

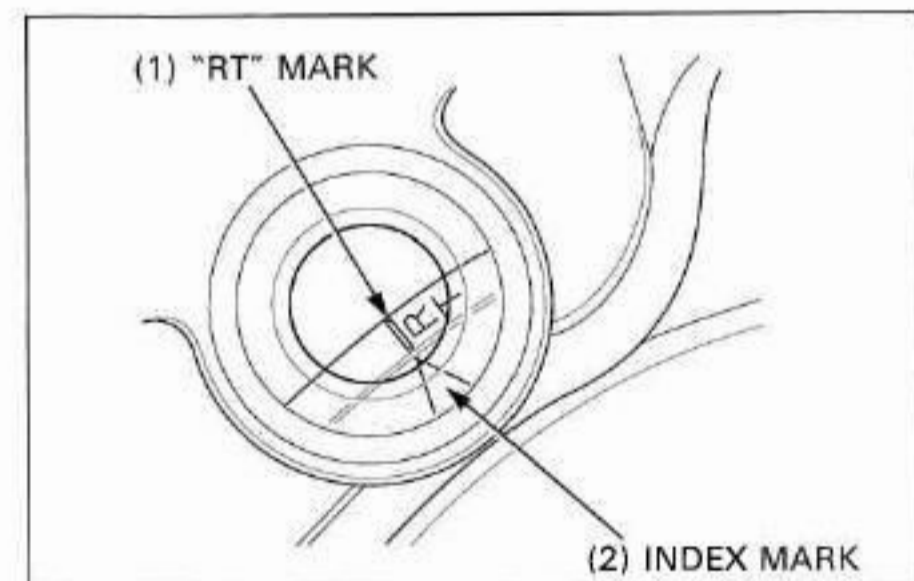
Remove the timing hole cap.

Turn the crankshaft counterclockwise and align the "FT" mark on the flywheel with the index mark on the left crankcase cover, then check that the camshaft "TDC (Top Dead Center)" mark is facing up.



If the "TDC (Top Dead Center)" mark is facing up, turn the crankshaft counterclockwise 232° and align the "RT" mark on the flywheel with the index mark on the left crankcase cover, then install the rear camshaft (page 10-29).

If the "TDC (Top Dead Center)" mark is facing down, turn the crankshaft counterclockwise 592° ($360^{\circ} + 232^{\circ}$) and align the "RT" mark on the flywheel with the index mark on the left crankcase cover, then install the rear camshaft (page 10-29).



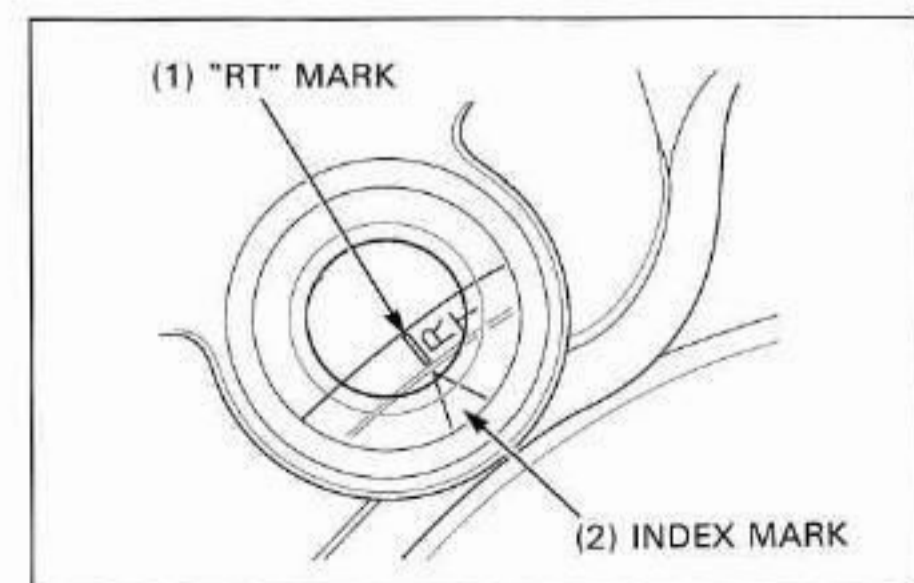
FRONT CYLINDER CAMSHAFT SERVICE ONLY (REAR CYLINDER CAMSHAFT WAS NOT SERVICED)

If the rear cylinder head was not serviced, remove the rear cylinder head cover (page 10-6) and check the camshaft position as follows:

Remove the rear cylinder head camshaft end holder (page 10-6).

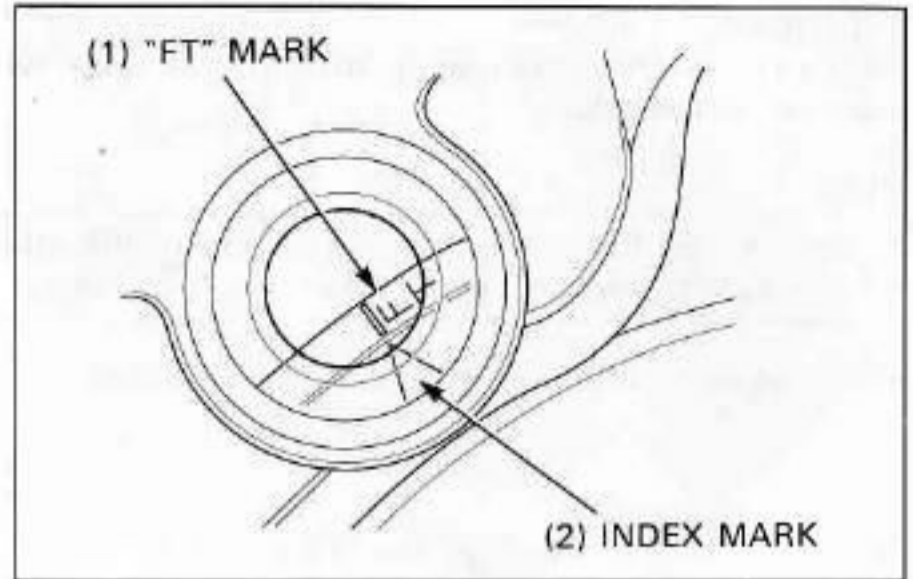
Remove the timing hole cap.

Turn the crankshaft counterclockwise and align the "RT" mark on the flywheel with the index mark on the left crankcase cover, then check that the camshaft "TDC (Top Dead Center)" mark is facing up.



If the "TDC (Top Dead Center)" mark is facing up, turn the crankshaft counterclockwise 488° (360°+128°) and align the "FT" mark on the flywheel with the index mark on the left crankcase cover, then install the front camshaft (page 10-29).

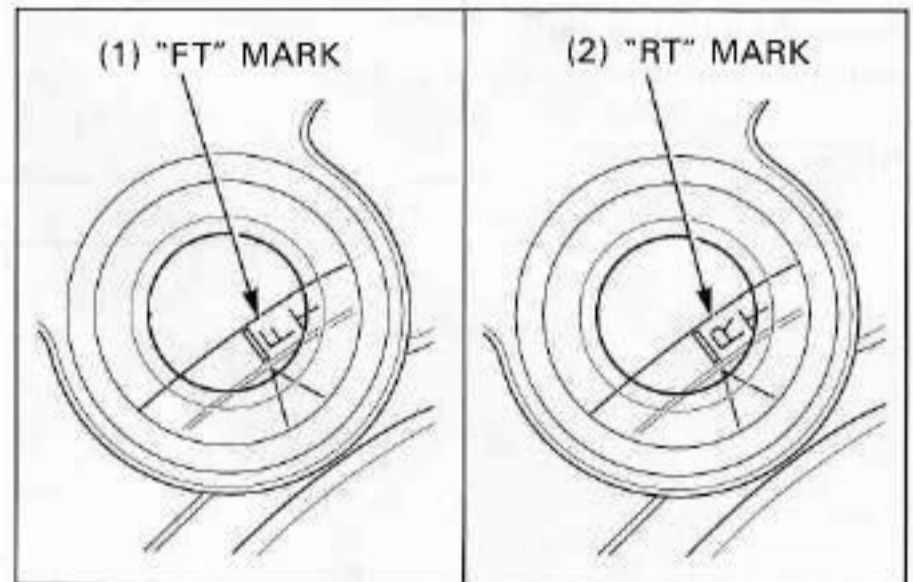
If the "TDC (Top Dead Center)" mark is facing down, turn the crankshaft counterclockwise 128° and align the "FT" mark on the flywheel with the index mark on the left crankcase cover, then install the front camshaft (page 10-29).



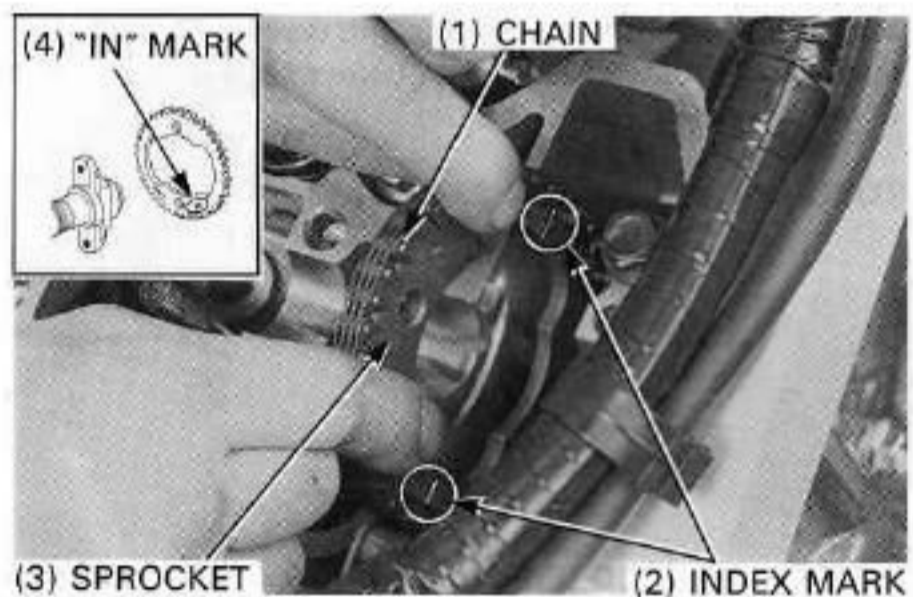
CAMSHAFT INSTALLATION

Remove the timing hole cap.

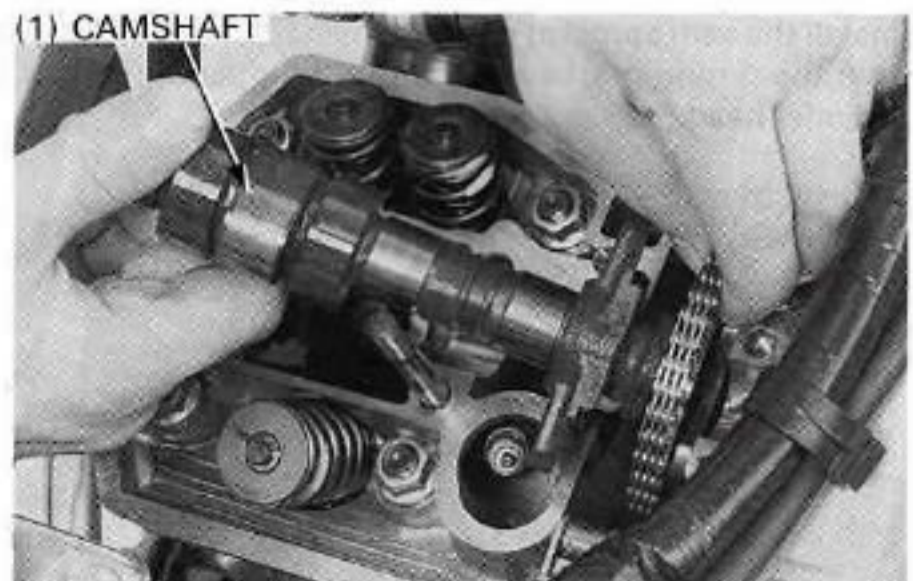
Turn the crankshaft counterclockwise and align the "RT" mark (front cylinder: "FT" mark) on the flywheel with the index mark on the left crankcase cover.



Install the cam sprocket to the cam chain with the "IN" mark facing the inside and align the timing marks (index line) on the cam sprocket and the upper surface of the cylinder head.



Install the camshaft through the cam chain and cam sprocket with the camshaft "TDC" mark is facing up.



NOTE

- The camshafts are identified by marks on the their flanges:
 "F": Front cylinder camshaft
 "R": Rear cylinder camshaft
 "Index notch": TDC (Top Dead Center) mark

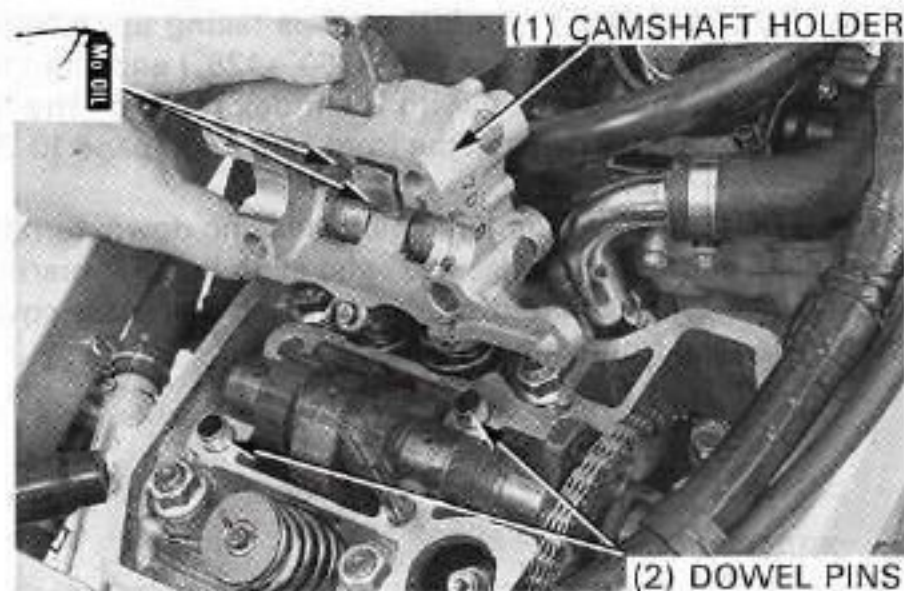
CYLINDER HEAD/VALVES

Install the dowel pins.
Lubricate each rocker arm slipper surfaces with molybdenum oil solution.

NOTE

- Before camshaft holder installation, loosen the valve adjusting screw and lock nut fully.

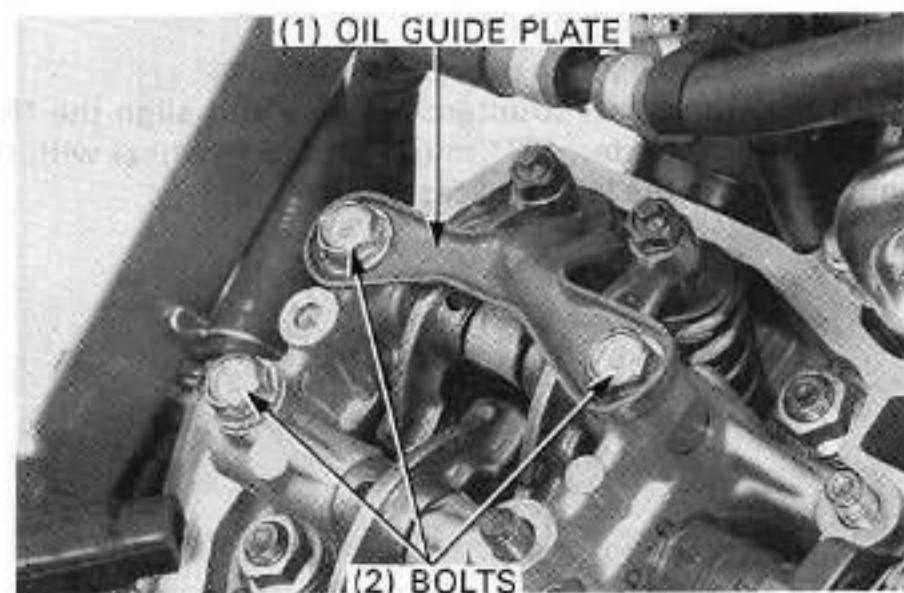
Install the camshaft holder assembly.



Install the oil guide plate.
Install the camshaft holder bolts (8 mm).

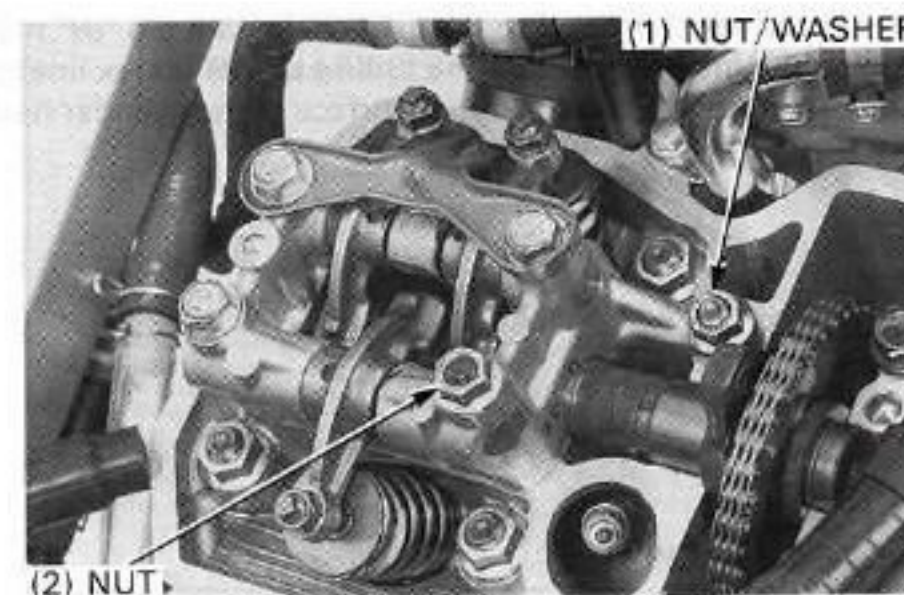
NOTE

- Do not tighten the camshaft holder bolts yet.

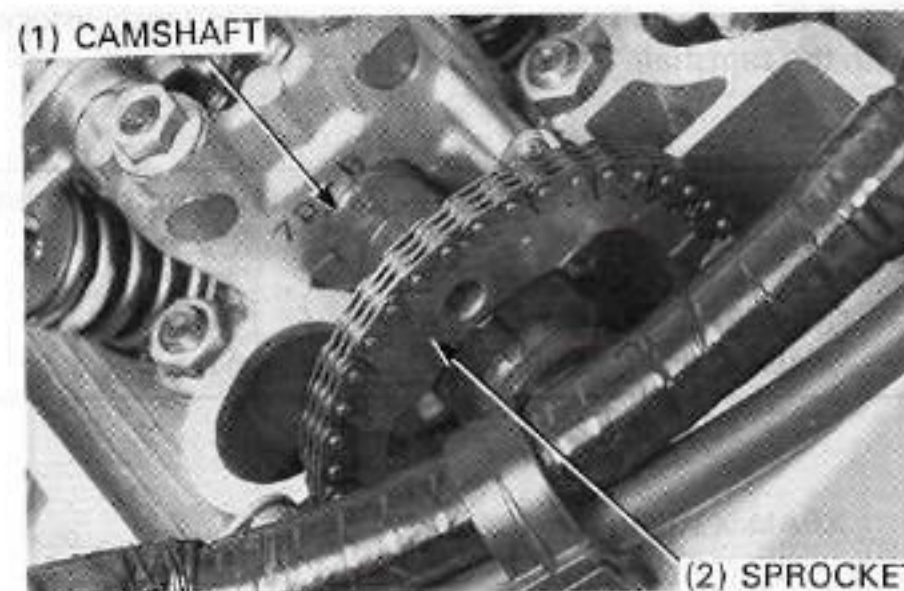


Install the camshaft holder nuts and washer (8 mm).
Install and tighten the camshaft holder bolts (8 mm) and nuts (8 mm) to the specified torque.

TORQUE: bolt (8 mm): 23 N·m (2.3 kgf·m, 17 lbf·ft)
nut (8 mm): 23 N·m (2.3 kgf·m, 17 lbf·ft)



Install the cam sprocket on the camshaft flange and recheck that the timing marks align with the upper surface of the cylinder head.



Clean and apply a locking agent to the cam sprocket bolt threads.

NOTE

- Be careful not to let the cam sprocket bolts fall into the crankcase.

Align the cam sprocket bolt holes in the cam sprocket and camshaft.
Temporarily install the cam sprocket bolt.
Turn the crankshaft counterclockwise 360° and tighten other sprocket bolt to the specified torque.

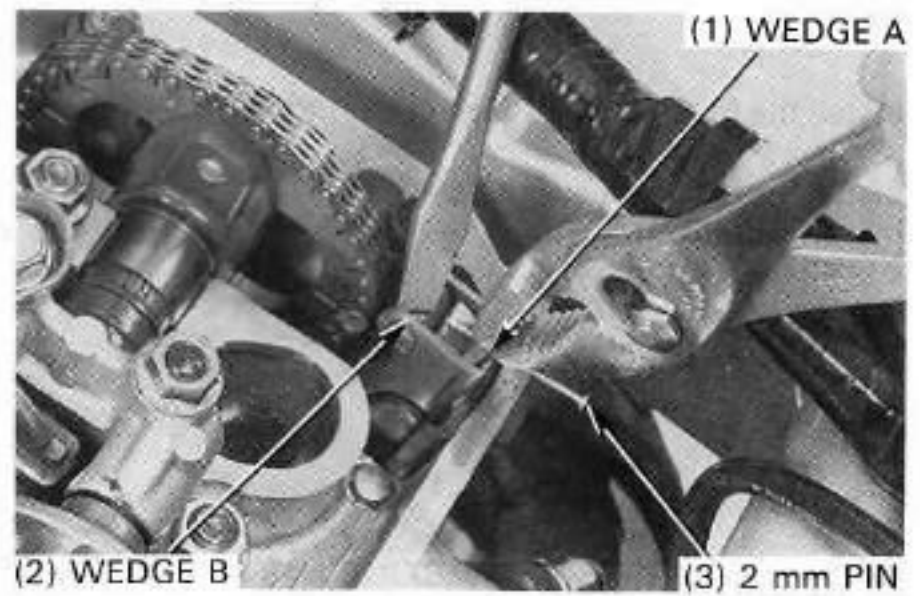
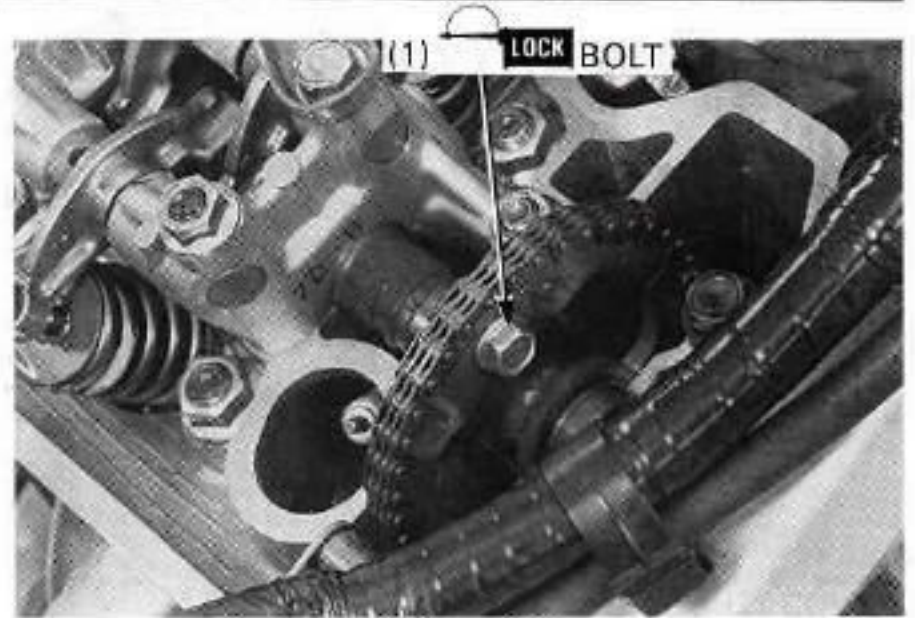
TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Turn the crankshaft counterclockwise 360° and tighten other sprocket bolt to the specified torque.

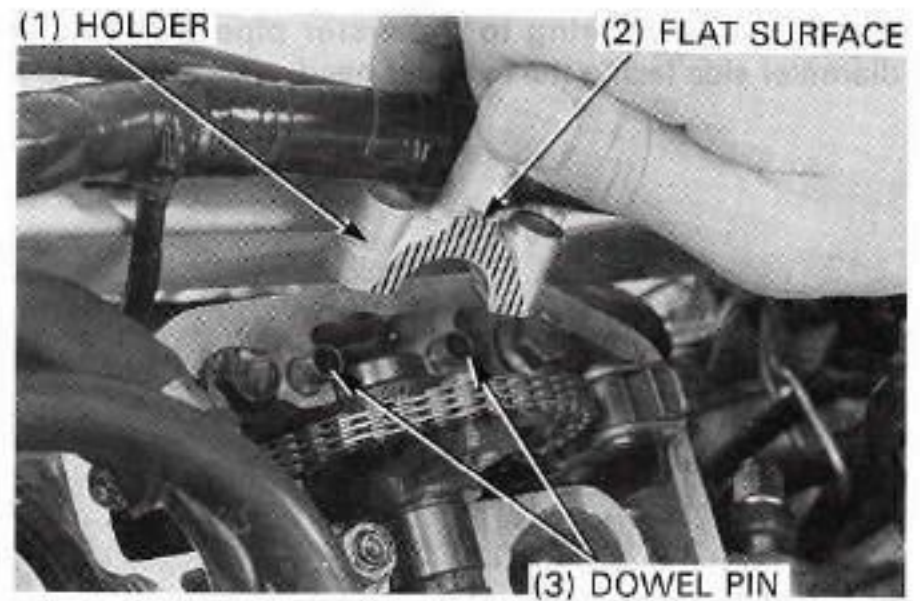
Remove the 2 mm pin holding cam chain tensioner wedge A.

NOTE

- Be careful not to let the 2 mm pin fall into the crankcase.
- Do not forget to remove the 2 mm pin before installing the cylinder head cover.



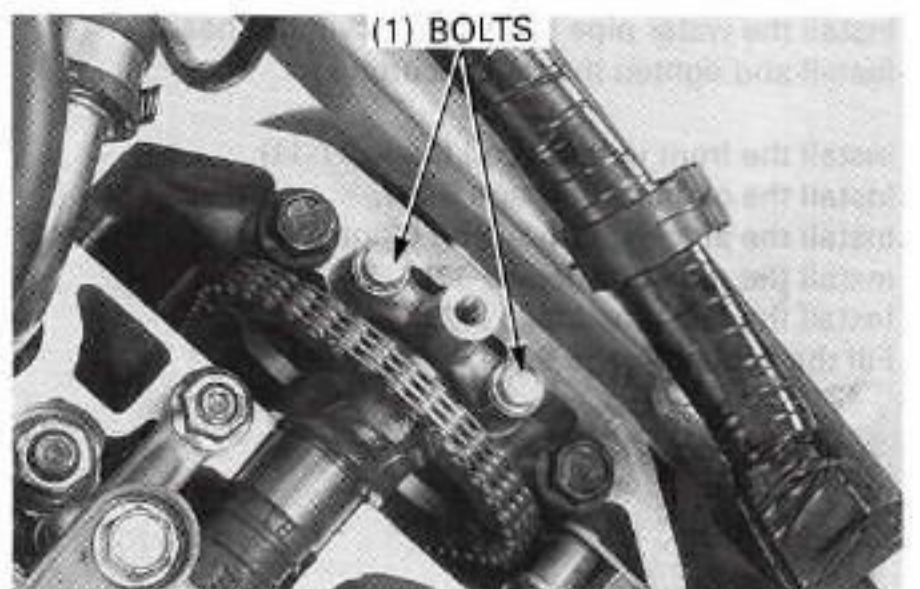
Install the dowel pins.
Install the camshaft end holder with it's flat surface on the holder facing in.



Install and tighten the camshaft end holder bolts to the specified torque.

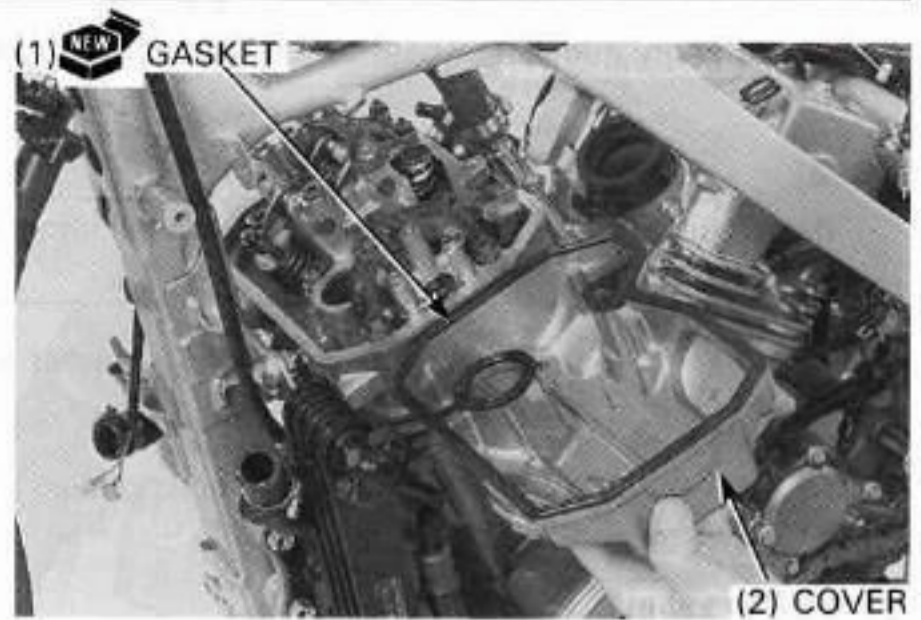
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Adjust the valve clearance (page 3-9).



CYLINDER HEAD COVER INSTALLATION

Fill the oil pockets in the head with the engine oil.
Clean the gasket groove of the cylinder head cover.
Apply Honda bond A or equivalent to the gasket groove of the cylinder head cover, then install the gasket into the groove.

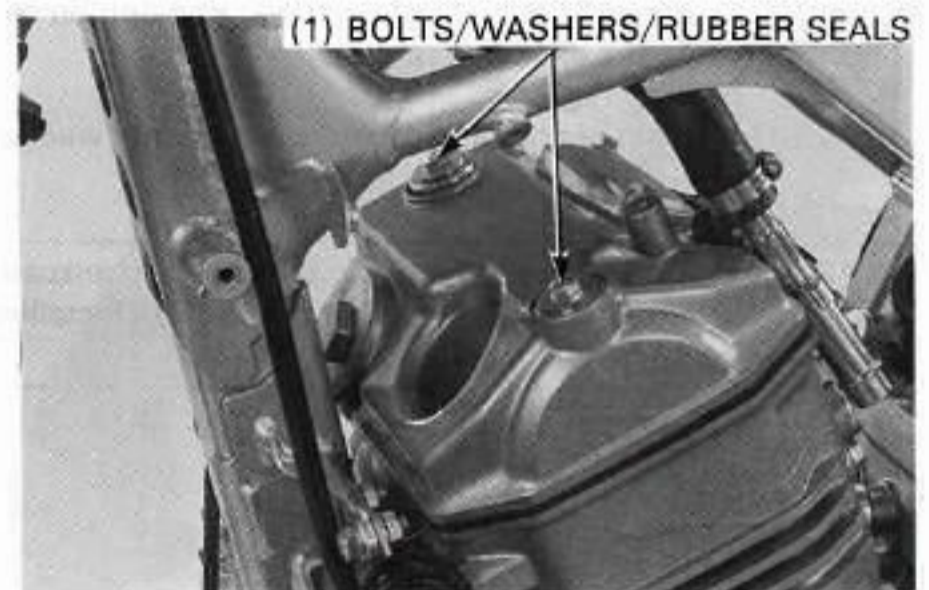


FRONT

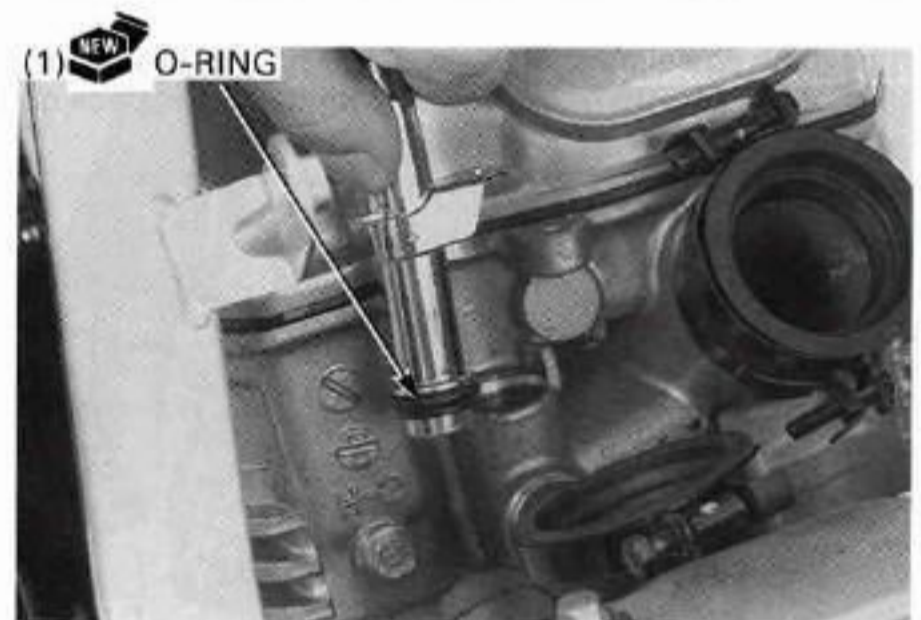
Install the front cylinder head cover to the front cylinder.

Install the rubber seals and washers.
Install and tighten the cylinder head cover bolts to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

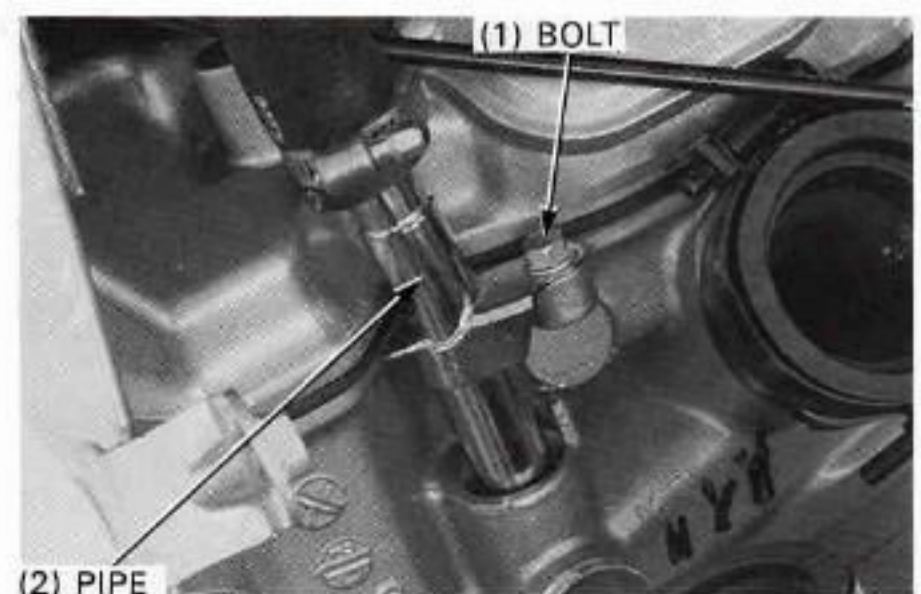


Install the new O-ring to the water pipe with the small diameter side facing the cylinder head.



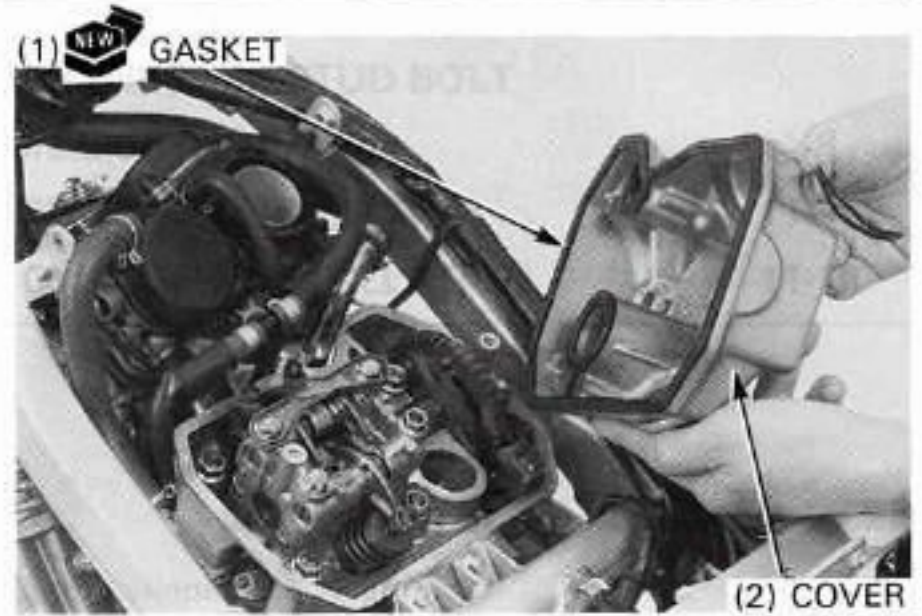
Install the water pipe to the front cylinder head.
Install and tighten the bolt securely.

Install the front ignition coil (page 17-11)
Install the carburetor (page 5-21).
Install the air cleaner housing (page 5-4).
Install the radiator (page 6-17).
Install the fuel tank (page 2-23).
Fill the coolant (page 6-6).



REAR

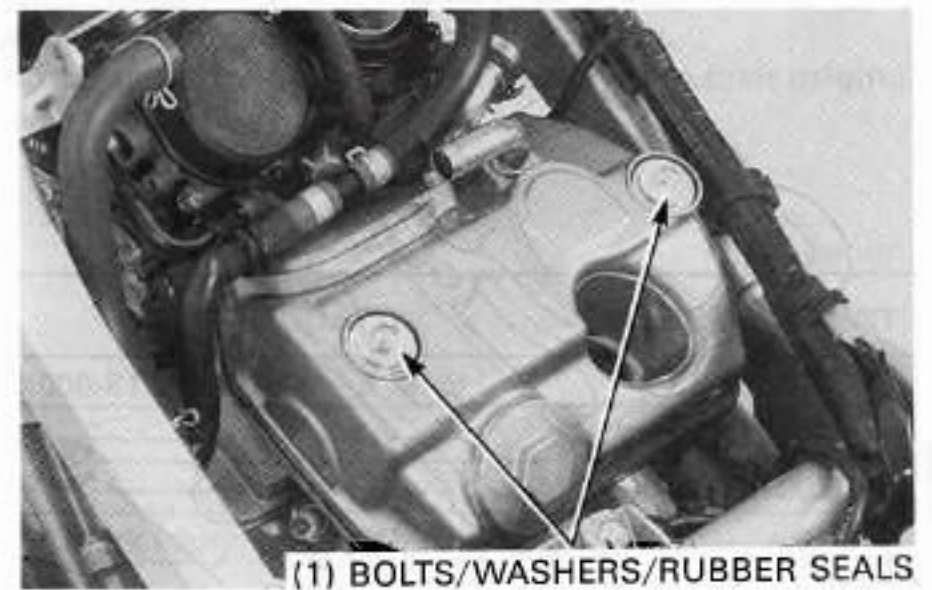
Install the rear cylinder head cover to the rear cylinder.

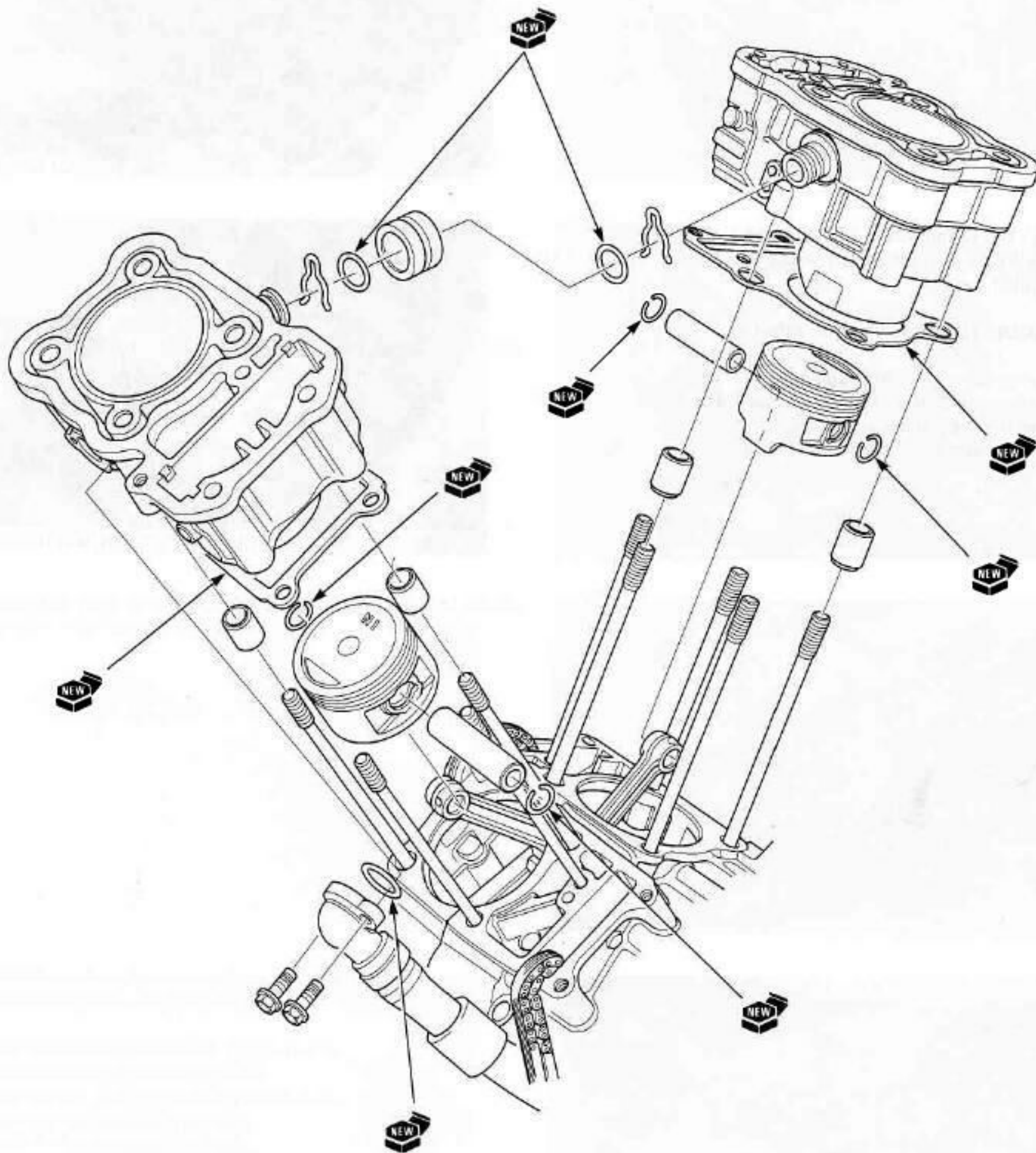


Install the rubber seals and washers.
Install and tighten the cylinder head cover bolts to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Connect the spark plug caps (page 17-11).
Install the air cleaner housing (page 5-4).
Install the fuel tank (page 2-23).
Fill the coolant (page 6-6).





11. CYLINDER/PISTON

| | | | |
|---------------------|------|-----------------------|-------|
| SERVICE INFORMATION | 11-1 | CRANKCASE STUD BOLT | |
| TROUBLESHOOTING | 11-2 | INSPECTION | 11-8 |
| CYLINDER REMOVAL | 11-3 | PISTON INSTALLATION | 11-8 |
| PISTON REMOVAL | 11-5 | CYLINDER INSTALLATION | 11-10 |

SERVICE INFORMATION

GENERAL

- The engine must be removed from the frame before servicing the cylinder and piston.
- Take care not to damage the cylinder wall and piston.
- Be careful not to damage the mating surfaces by using a screwdriver when disassembling the cylinder.
- Clean all disassembled parts with clean solvent and dry them using compressed air before inspection.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.

SPECIFICATIONS

Unit:mm(in)

| ITEM | STANDARD | SERVICE LIMIT |
|--|---|-----------------------------|
| Cylinder I.D. | 81.000-81.015(3.1890 – 3.1896) | 81.15 (3.195) |
| Cylinder out of round | ————— | 0.08 (0.003) |
| Cylinder warpage | ————— | 0.05 (0.002) |
| Piston mark direction | "IN" mark facing toward the intake side | ————— |
| Piston O.D. | 80.970 – 80.990 (3.1878 – 3.1886) | 80.85 (3.183) |
| Piston O.D.measurement point | 10mm (0.4 in) from the bottom | ————— |
| Piston pin hole I.D. | 20.002 – 20.008 (0.7875 – 0.7877) | 20.03 (0.789) |
| Cylinder-to-piston clearance | 0.010 – 0.045 (0.0004 – 0.0018) | 0.15 (0.006) |
| Piston pin O.D. | 19.994 – 20.000 (0.7872 – 0.7874) | 19.98 (0.787) |
| Piston-to-piston pin clearance | 0.002 – 0.014 (0.0001 – 0.0006) | 0.04 (0.002) |
| Piston ring-to-ring groove clearance | 0.015 – 0.045 (0.0006 – 0.0018) | 0.08 (0.003) |
| Connecting rod-to-piston pin clearance | 0.016 – 0.040 (0.0006 – 0.0016) | 0.06 (0.0024) |
| Ring end gap | Top | 0.20 – 0.35 (0.008 – 0.014) |
| | Second | 0.35 – 0.50 (0.014 – 0.020) |
| Ring mark | Top | " R " |
| | Second | " • " |

11

TROUBLESHOOTING

Compression too low, hard starting or poor performance at low speed

- Leaking cylinder head gasket
- Worn, stuck or broken piston rings
- Worn or damaged cylinder and piston
- Loose spark plug

Compression too high, over heating or knocking

- Excessive carbon build-up in cylinder head or on top of piston

Abnormal noise

- Worn cylinder and piston
- Worn piston pin or piston pin hole
- Worn connecting rod small end

Excessive smoke

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

CYLINDER REMOVAL

NOTE

- The front cylinder service using the same procedure as for the rear cylinder.

Remove the cylinder head (page 10-13).

Remove the joint collar clips.

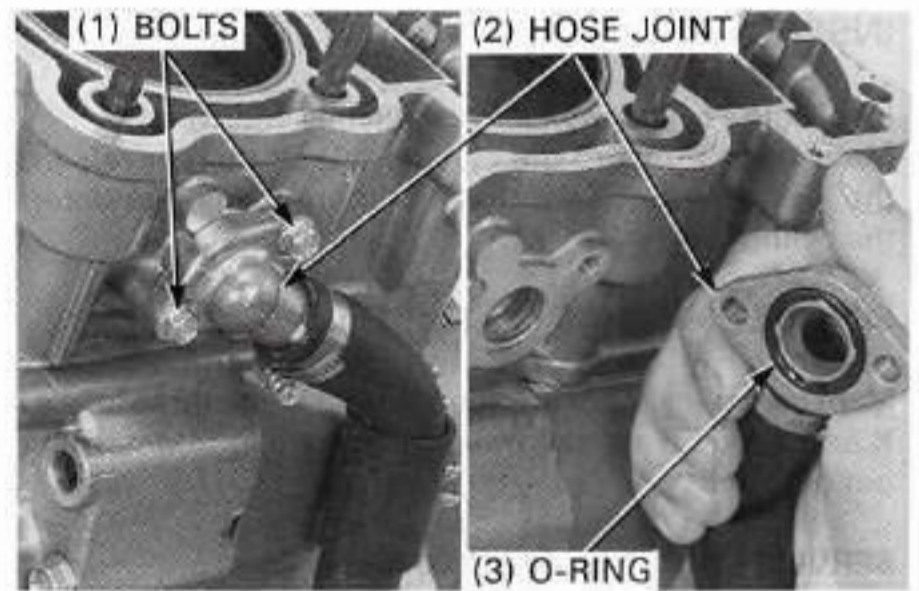
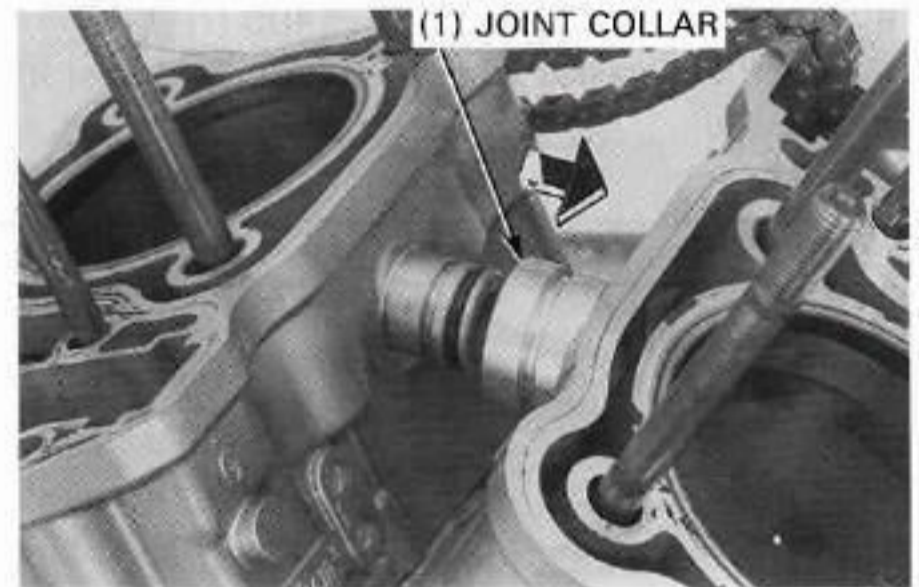
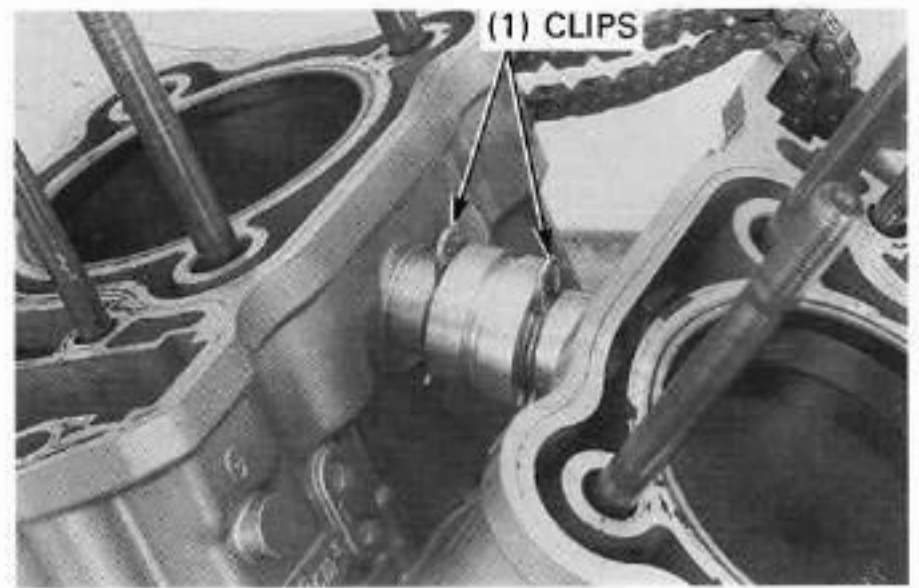
Slide the cylinder joint collar toward either the front or rear cylinder.

Remove the bolts, water hose joint and O-ring (front cylinder only).

Remove the cylinder.

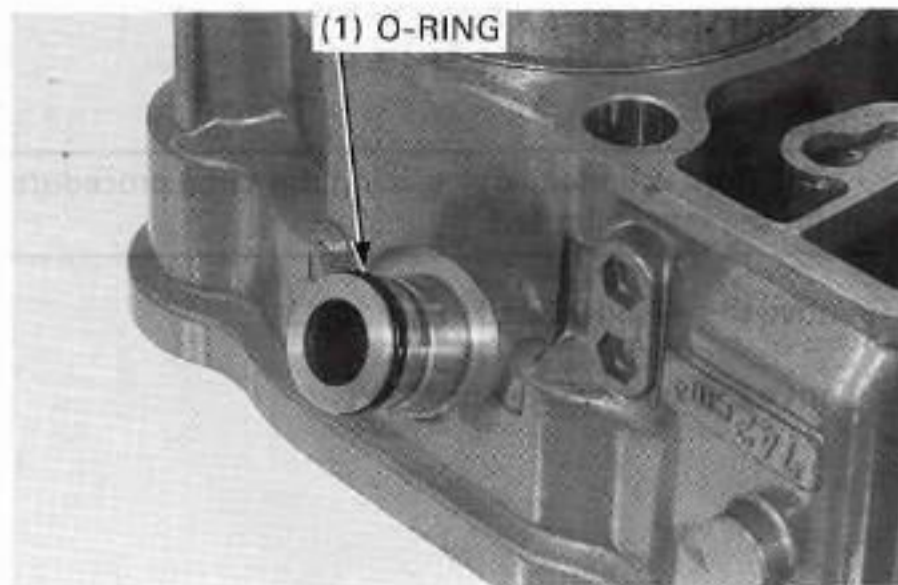
NOTE

- Attach a piece of mechanic's wire to the cam chain to prevent it from being dropped into the crankcase.
- Be careful not to damage the mating surfaces by using a screwdriver when disassembling the cylinder.



CYLINDER/PISTON

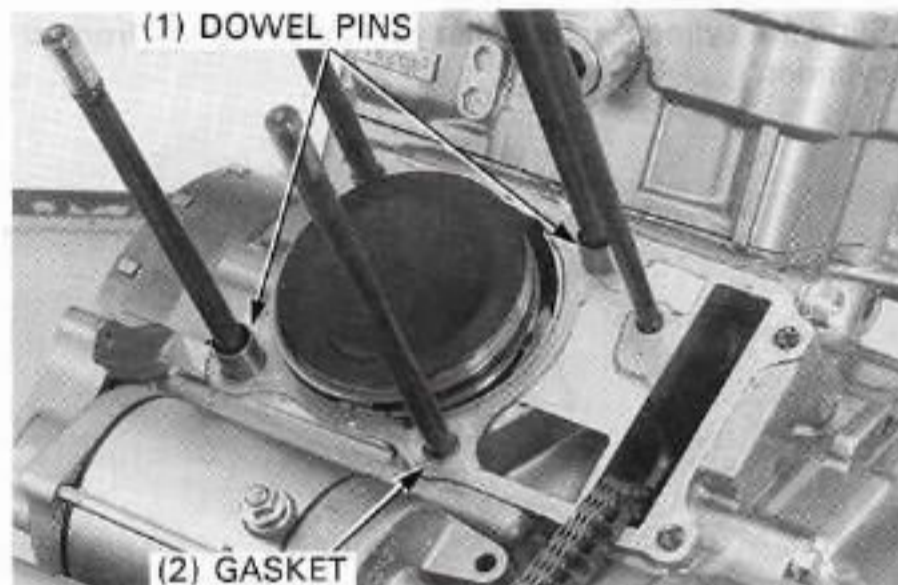
Remove the O-ring.



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

NOTE

- Be careful not to damage the gasket surface.



INSPECTION

Inspect the cylinder wall for scratches and wear.
Measure and record the cylinder I.D. at three levels in both the X and Y axes. Take the maximum reading to determine the cylinder wear.

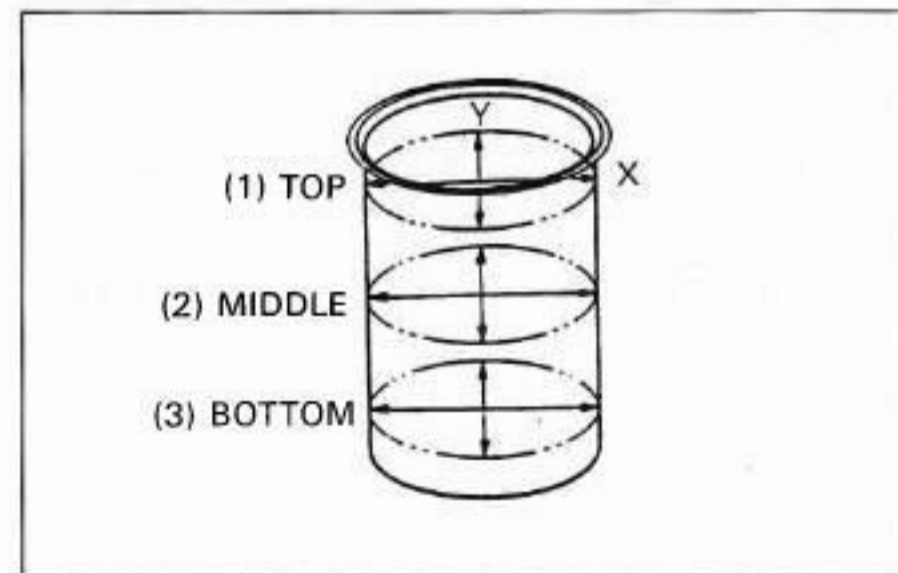
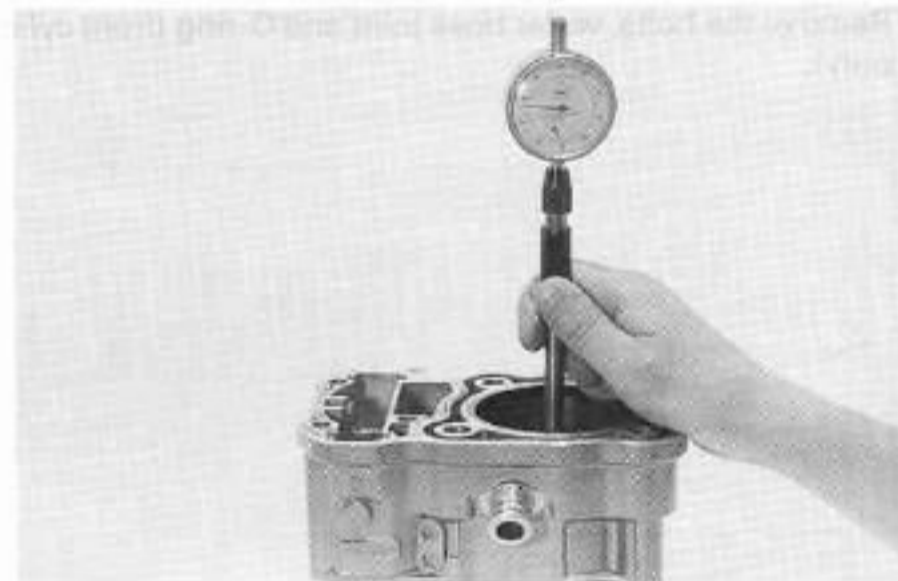
SERVICE LIMIT: 81.15 mm (3.195 in)

Measure the cylinder for out of round at the three levels in an X and Y axis. Take the maximum reading to determine the out of round.

SERVICE LIMIT: 0.08 mm (0.003 in)

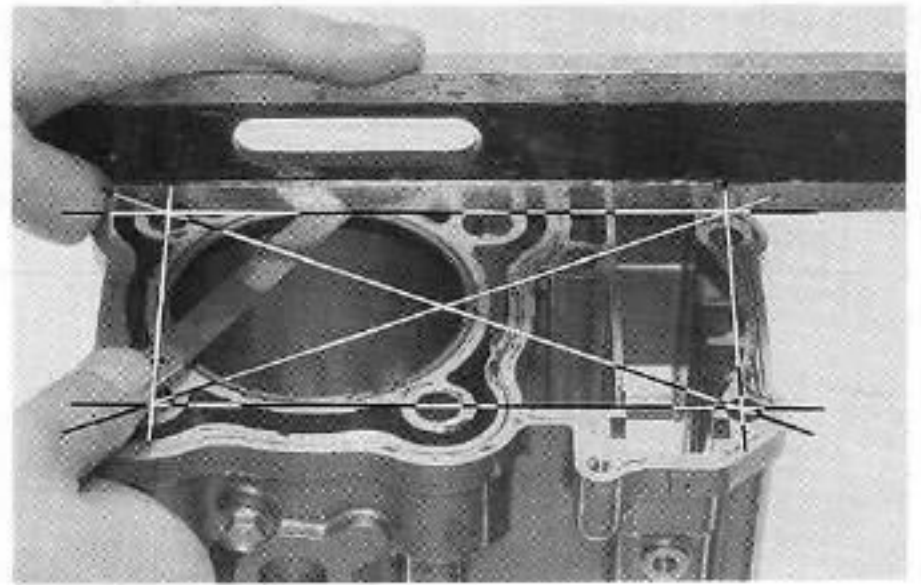
Measure the cylinder for taper at three levels in an X and Y axis. Take the maximum reading to determine the taper.

SERVICE LIMIT: 0.05 mm (0.002 in)



Check the cylinder for warpage by placing a straight edge and a feeler gauge.

SERVICE LIMIT: 0.05 mm (0.002 in)

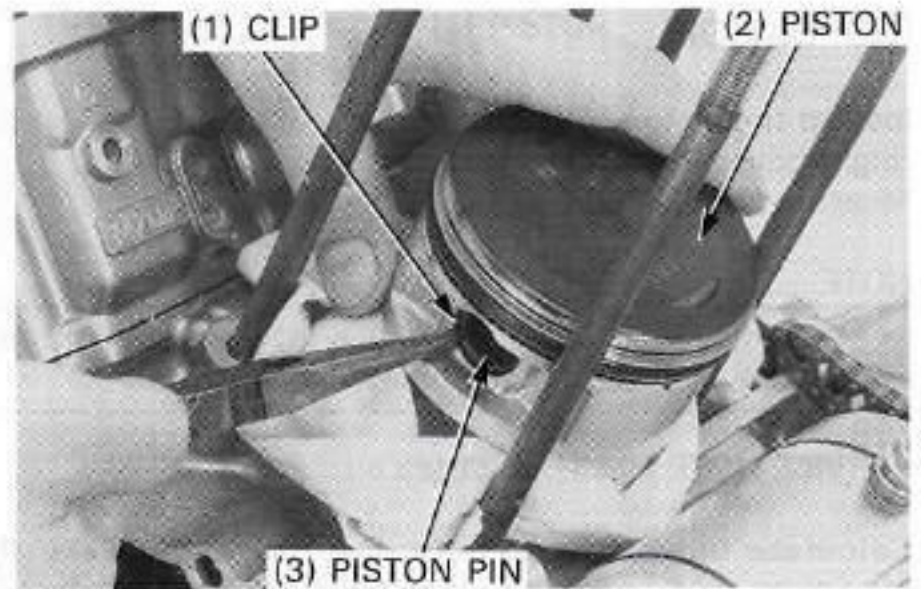


PISTON REMOVAL

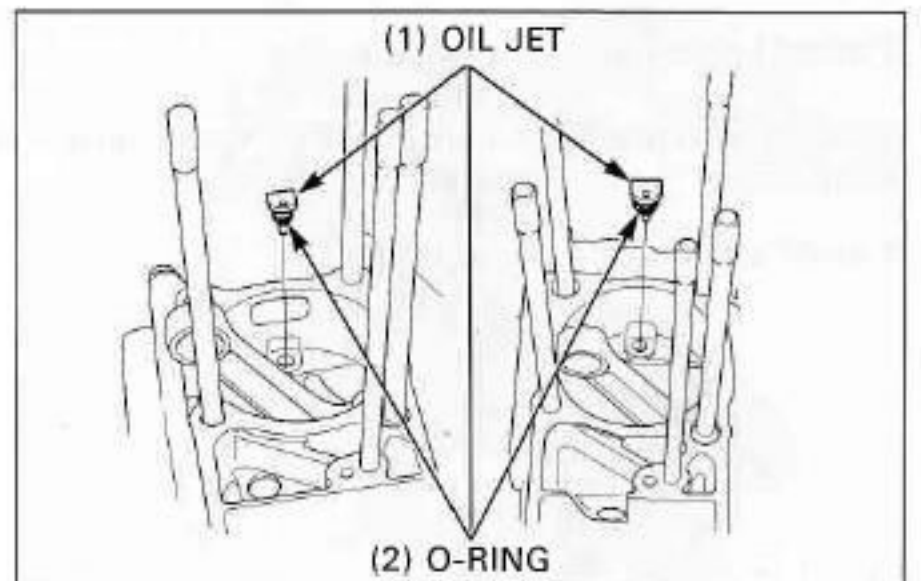
NOTE

- Place a shop towel over the crankcase opening to prevent piston pin clips from falling into the crankcase.
- The rear piston service using the same procedure as for the front piston.

Remove the piston pin clip, piston pin and piston.



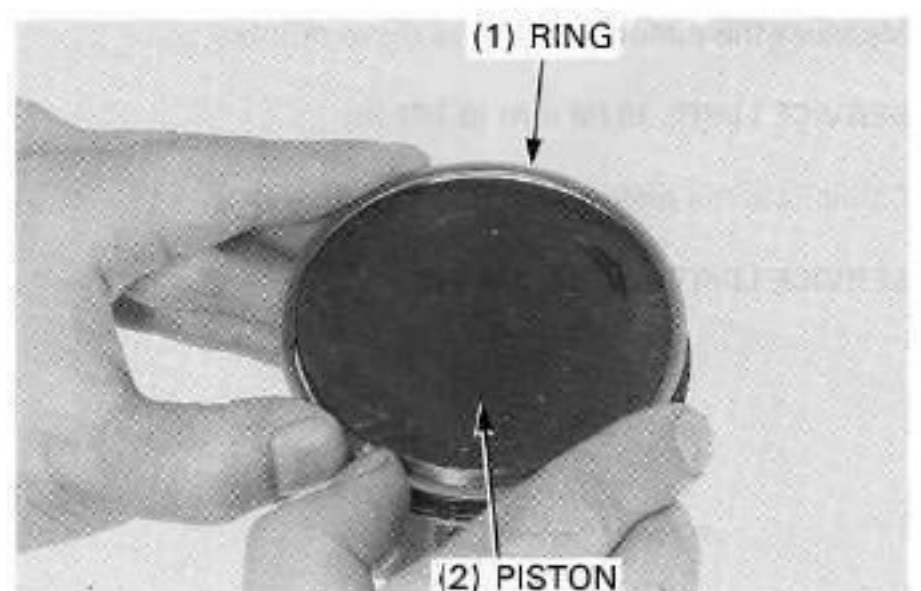
Remove the oil jet and O-ring.



Spread each piston ring and remove it by lifting it up at a point just opposite the gap.

CAUTION

- Do not the piston ring by spreading the ends too far.
- Be careful not to damage the piston when the piston ring removal.



CYLINDER/PISTON

Clean carbon deposits from the piston.

NOTE

- Clean carbon deposits from the piston ring grooves with a ring that will be discarded. Never use the wire brush; it will scratch the groove.

INSPECTION

Inspect the piston for cracks or other damage. Inspect the ring grooves for excessive wear and carbon build-up. Measure each piston O.D..

NOTE

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

SERVICE LIMIT: 80.85 mm (3.183 in)

Calculate the piston-to-cylinder clearance. Take the maximum reading to determine the clearance (Cylinder I.D.: 11-4).

SERVICE LIMIT: 0.15 mm (0.006 in)

Measure each piston pin hole I.D. in an X and Y axis. Take the maximum reading to determine I.D..

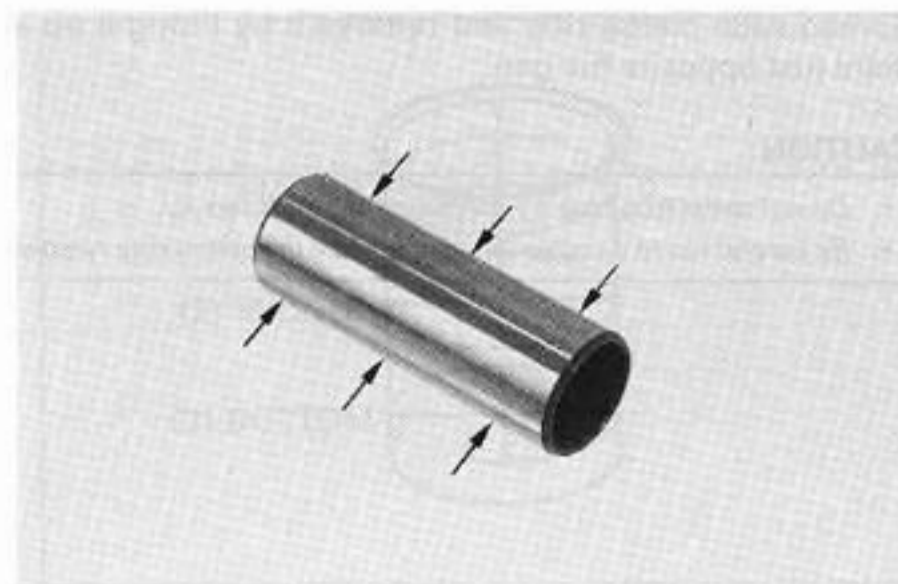
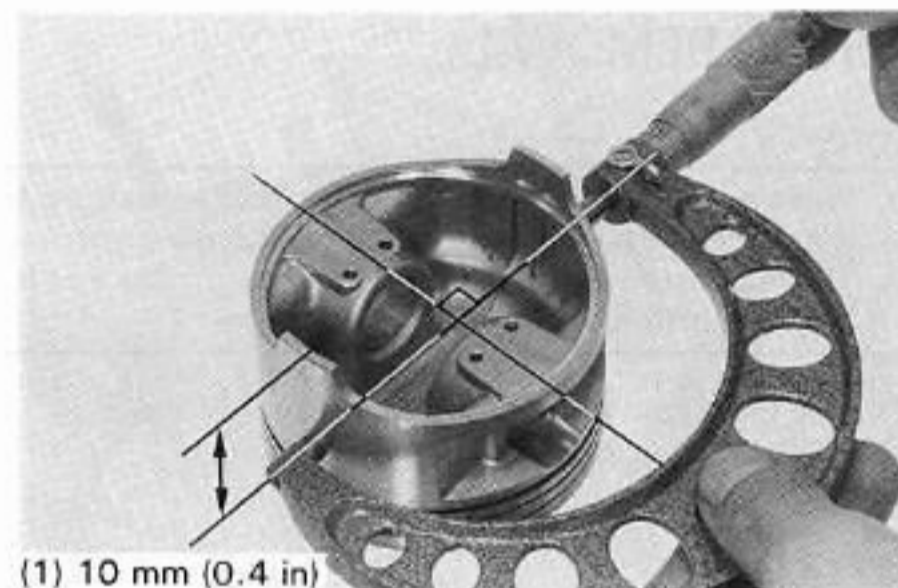
SERVICE LIMIT: 20.03 mm (0.789 in)

Measure the piston pin O.D. at three points.

SERVICE LIMIT: 19.98 mm (0.787 in)

Calculate the piston-to-piston pin clearance.

SERVICE LIMIT: 0.04 mm (0.002 in)



Measure the connecting rod small end I.D.

SERVICE LIMIT: 20.05 mm (0.789 in)

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

SERVICE LIMIT: 0.06 mm (0.0024 in)



Inspect the piston ring, and replace them if they are worn.

NOTE

- Always replace the piston rings as a set.

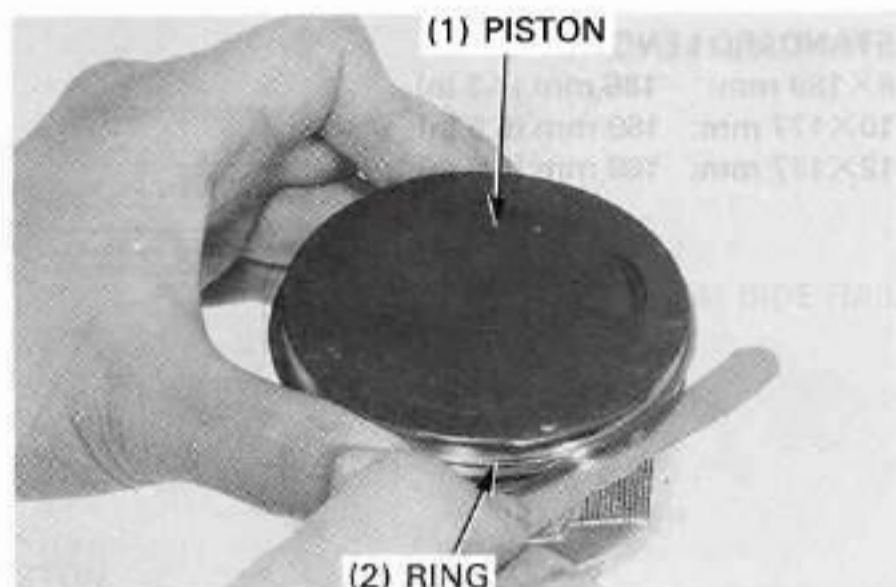
Reinstall the piston rings (page 11-8) into the piston grooves.

Push in the ring until the outer surface of the piston ring is nearly flush with the piston and measure the clearance using a feeler gauge.

SERVICE LIMIT:

Top: 0.08 mm (0.003 in)

Second: 0.08 mm (0.003 in)

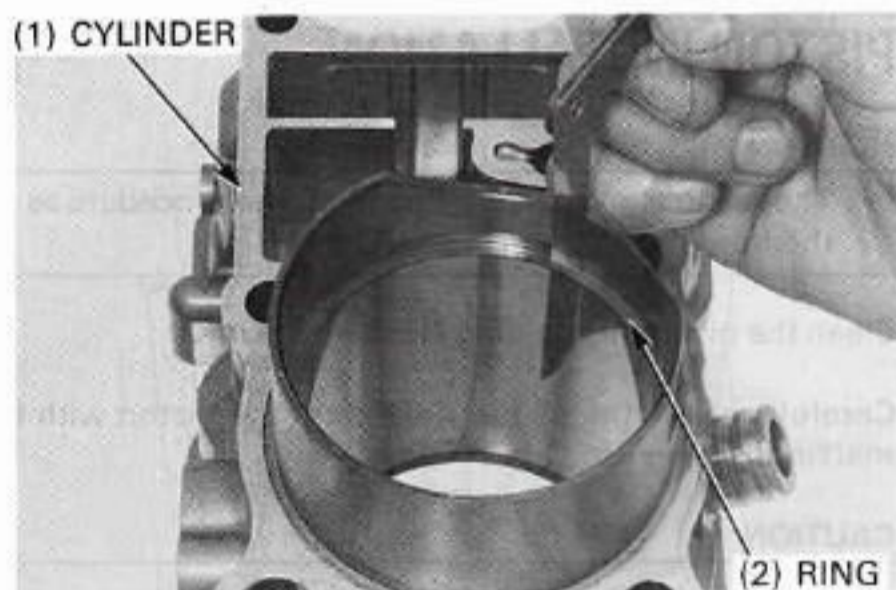


Using a piston, push the ring securely into the cylinder and measure the end gap using a feeler gauge.

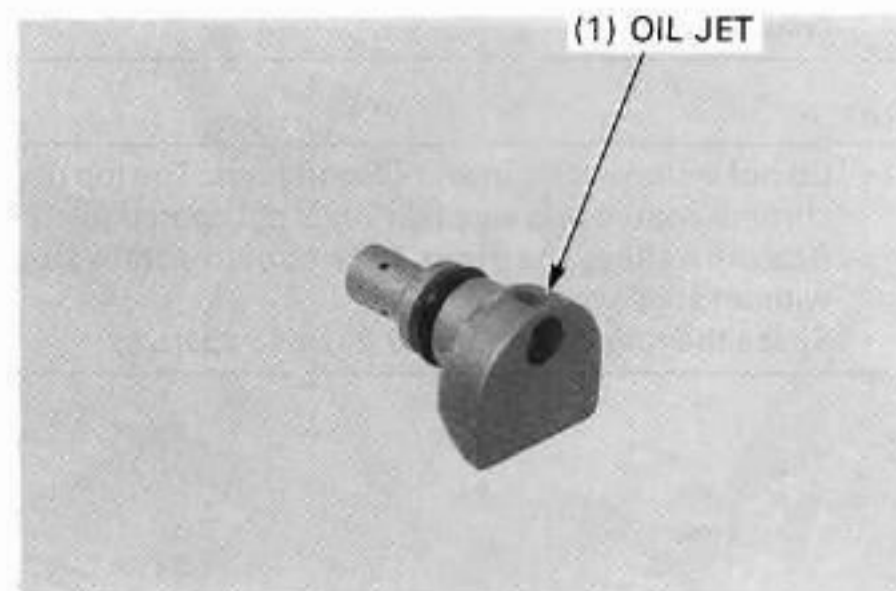
SERVICE LIMIT:

Top: 0.7 mm (0.03 in)

Second: 0.7 mm (0.03 in)



Check the oil jet for clogging.



CRANKCASE STUD BOLT INSPECTION

Check the stud bolts for loose.

If the stud bolts are loose, remove the stud bolts and apply engine oil to the threads and tighten the stud bolt securely or replace the stud bolt and apply engine oil to the new stud bolt threads and tighten the stud bolt securely.

NOTE

- Install the stud bolts with its tab side facing to the cylinder head side.

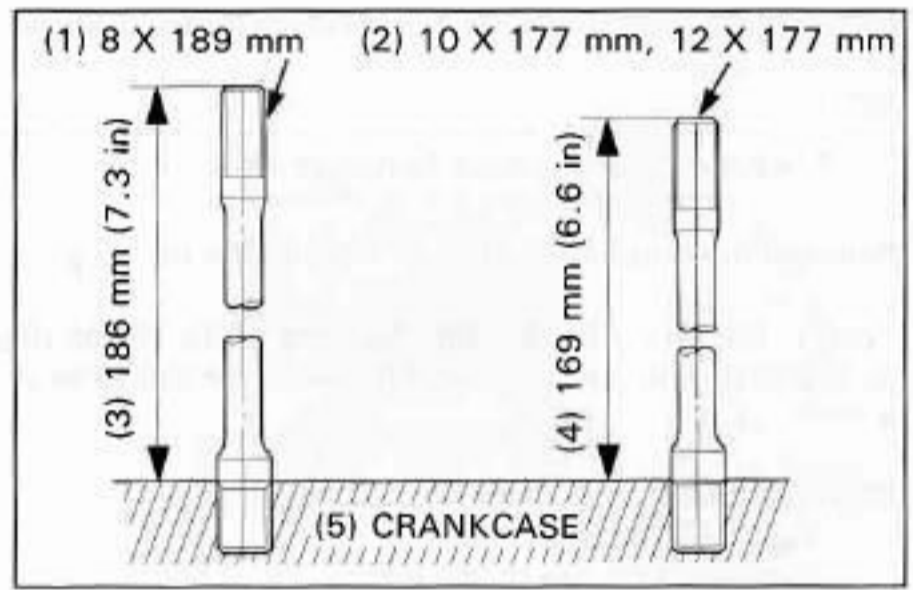
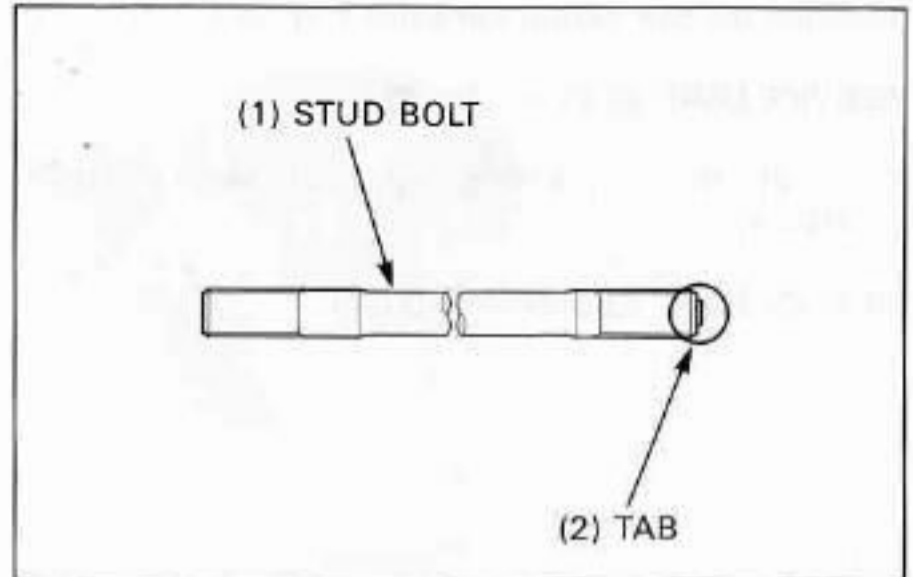
After installing, be sure to measure the length from the top of each stud to crankcase surface.

STANDARD LENGTH

8×189 mm: 186 mm (7.3 in)

10×177 mm: 169 mm (6.6 in)

12×177 mm: 169 mm (6.6 in)



PISTON INSTALLATION

NOTE

- The rear piston service using the same procedure as for the front piston.

Clean the piston heads, ring lands and skirts.

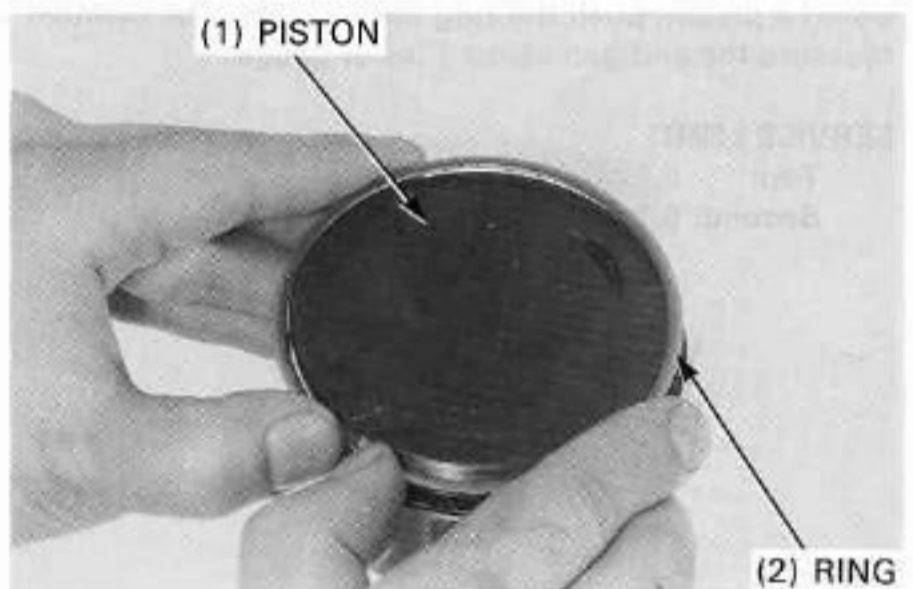
Carefully install the piston rings onto the piston with their markings facing up.

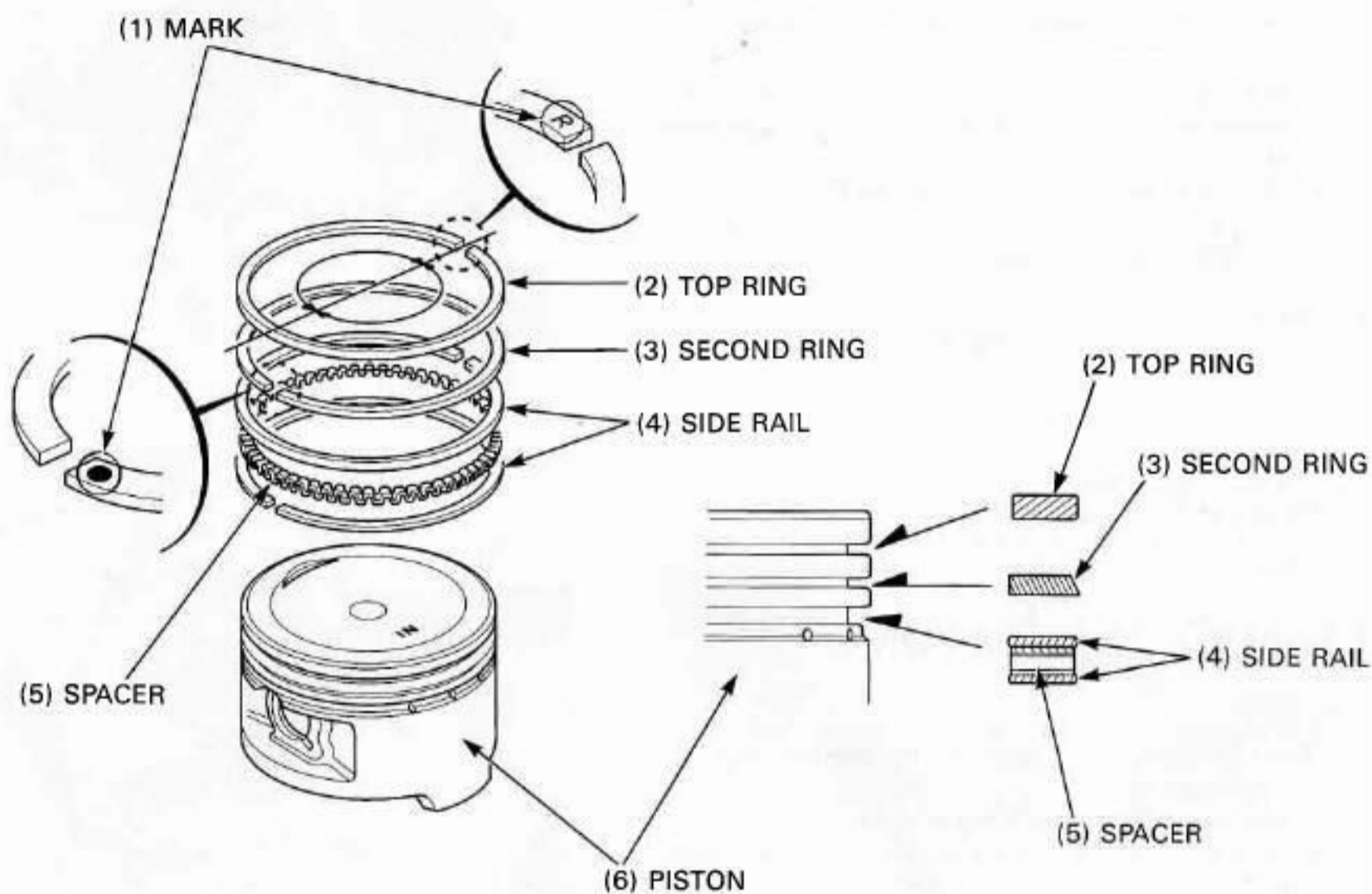
CAUTION

- Do not the piston ring by spreading the ends too far.
- Be careful not to damage the piston when the piston ring installation.

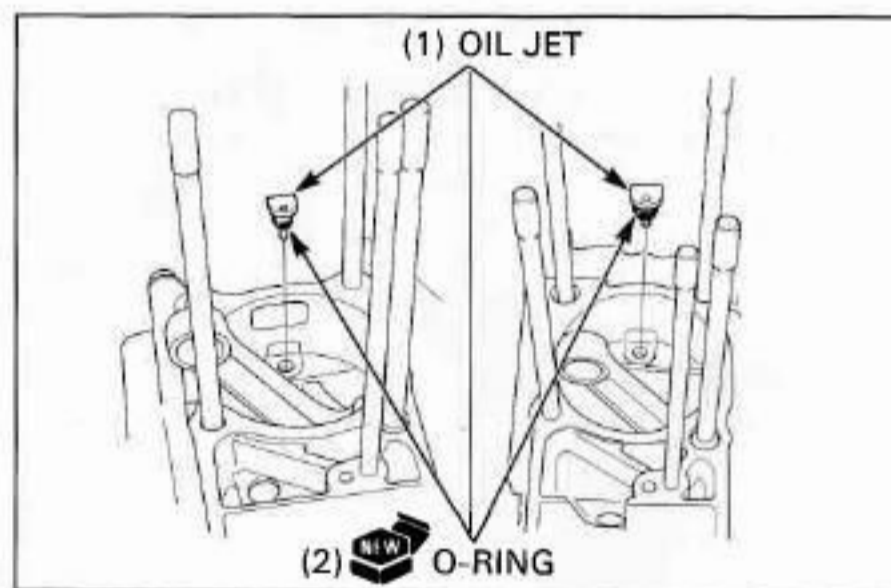
NOTE

- Do not confuse the top and second rings: The top ring is chrome-coated and second ring is not coated (black).
- After installing the rings they should rotate freely, without sticking.
- Space the ring end gaps 180 degrees apart.





Apply engine oil to the new O-ring and install it to the oil jet. Install the oil jet to the crankcase securely.



NOTE

- When cleaning the cylinder mating surface, place a shop towel over the cylinder opening to prevent dust or dirt enter the engine.

Clean any gasket material from the cylinder mating surfaces of the crankcase.



CYLINDER/PISTON

NOTE

- Place the shop towel over the crankcase opening to prevent piston pin clips from falling into the crankcase.

Apply molybdenum solution to the piston pin outer surfaces. Apply engine oil to the connecting rod small end and piston pin hole.

Install the piston with its "IN" mark facing the intake side.

Install the piston pin.

Install the new piston pin clips.

CAUTION

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

NOTE

- Set the piston pin clip in the groove properly.
- Do not align the clip's end gap with the piston cutout.

CYLINDER INSTALLATION

NOTE

- The front cylinder service using the same procedure as for the rear cylinder.
- When cleaning the cylinder mating surface, place a shop towel over the cylinder opening to prevent dust or dirt enter the engine.

Install the dowel pins and new gasket.

Apply coolant to the new O-ring and install it to the water joint of the cylinder.

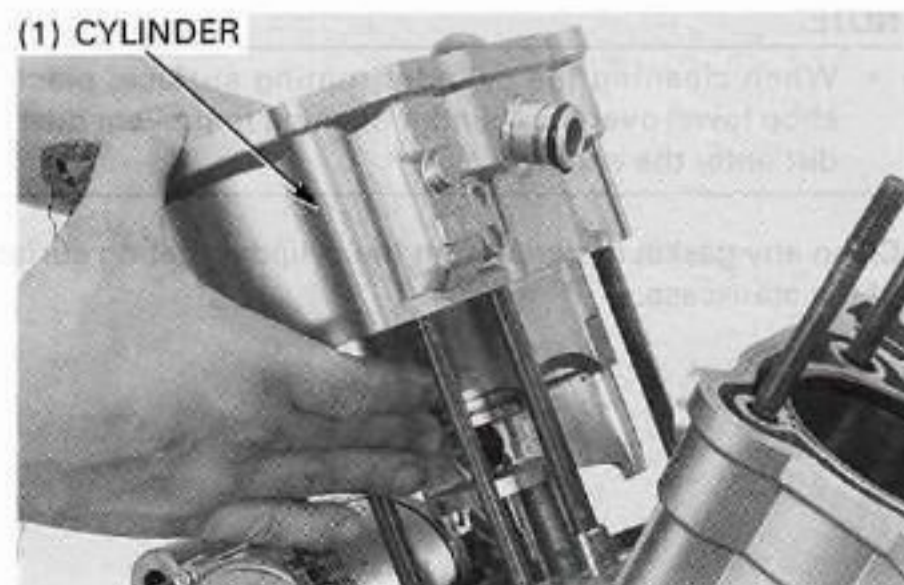
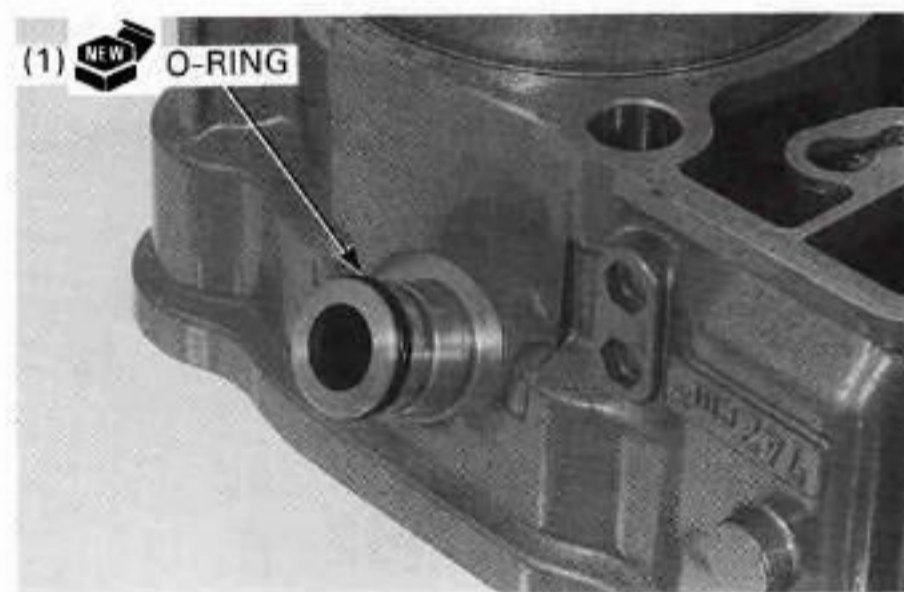
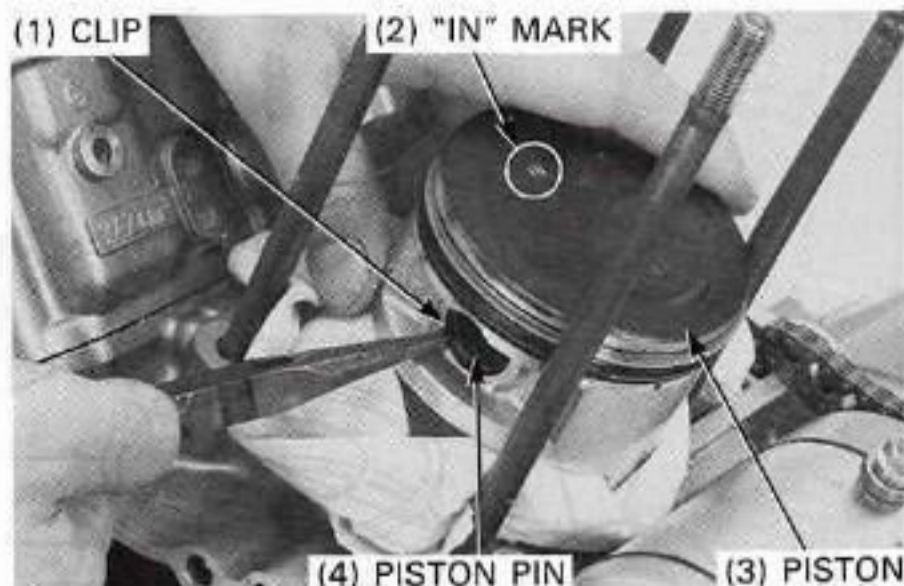
Apply engine oil to the cylinder wall and piston outer surfaces and piston rings.

CAUTION

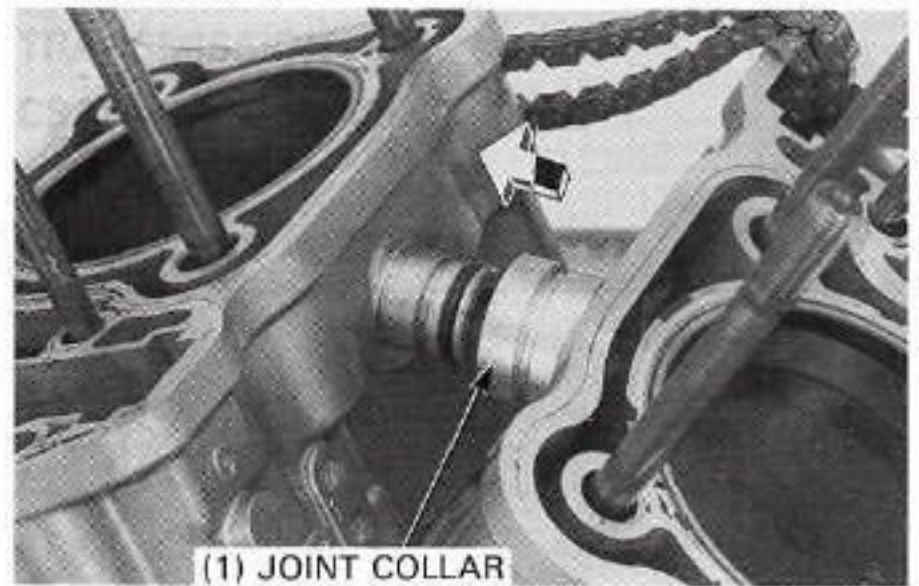
- Be careful not to damage the piston rings and cylinder walls.

Route the cam chain through the cylinder.

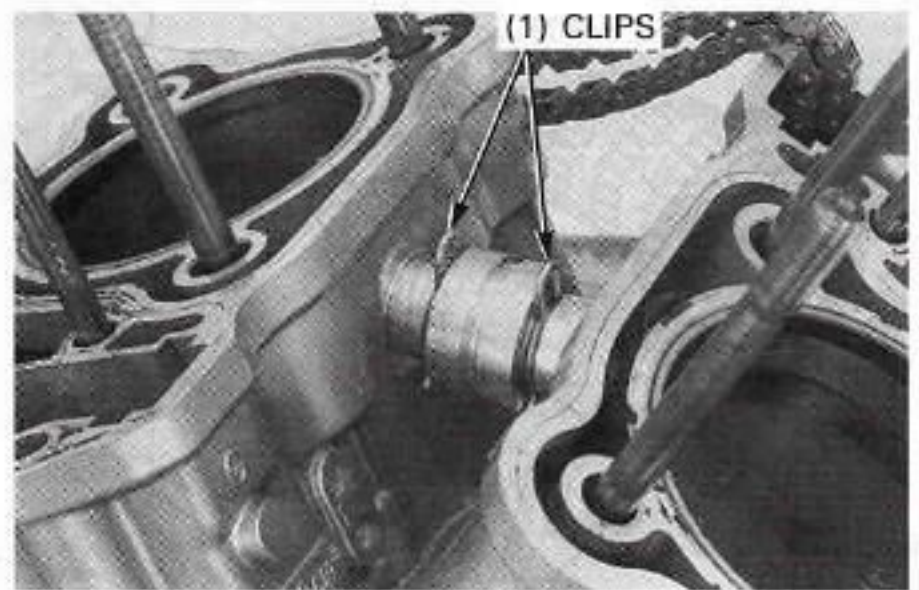
Install the cylinder over the piston rings by hand while compressing the piston rings.



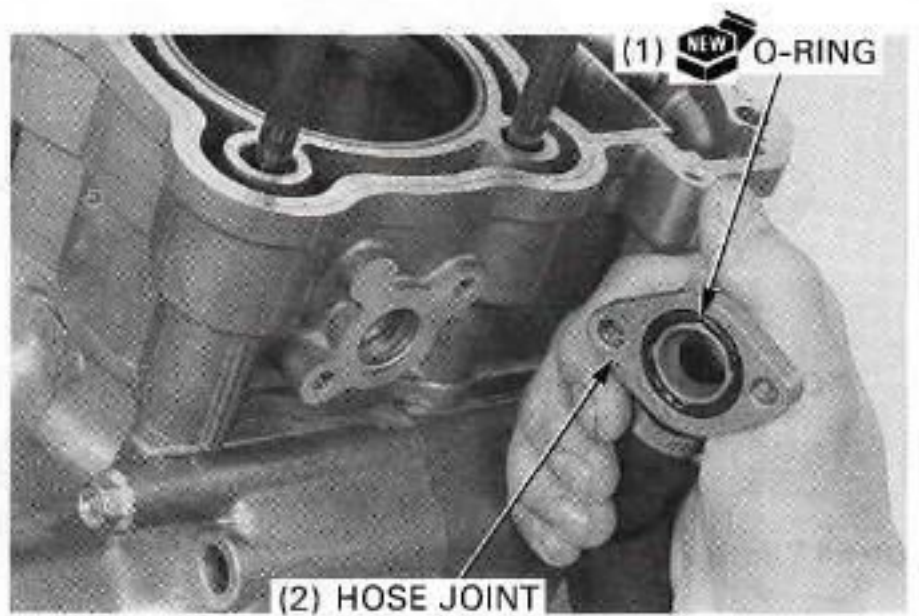
Slide the cylinder joint collar to the its original position.



Install the joint collar clips to the groove on the water joint of the cylinder.

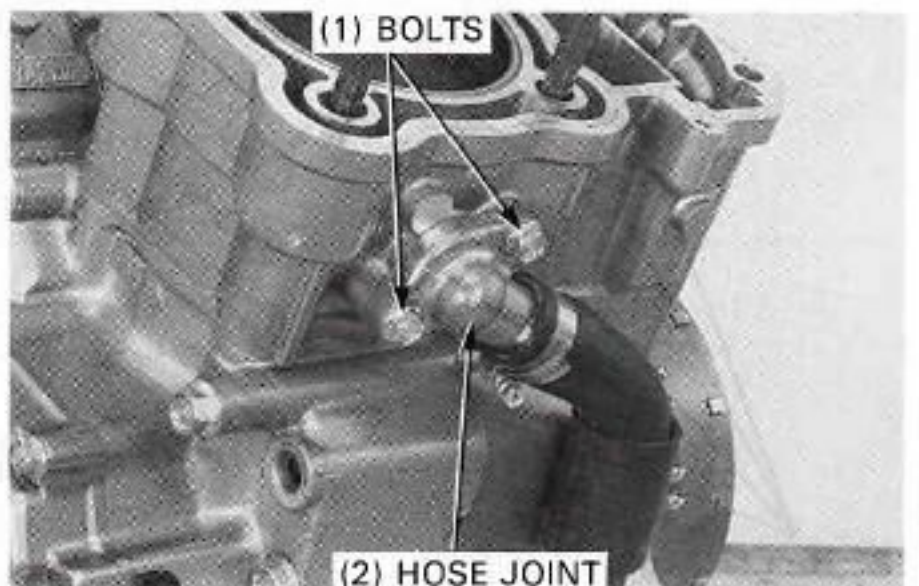


Apply coolant to the new O-ring and install it to the groove on the water hose joint of the front cylinder (front cylinder only).

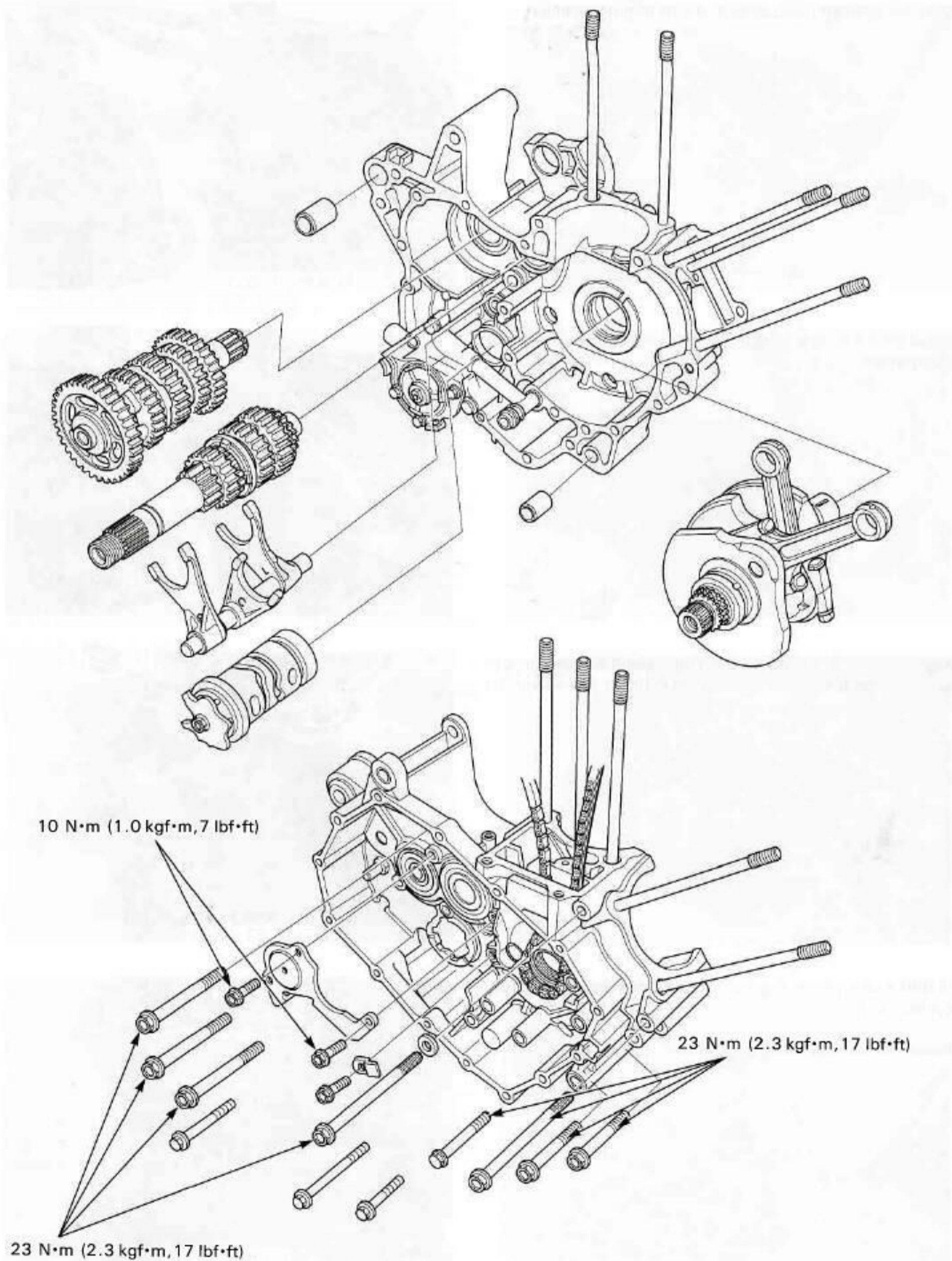


Install and tighten the hose joint bolts securely (front cylinder only).

Install the cylinder head (page 10-22).

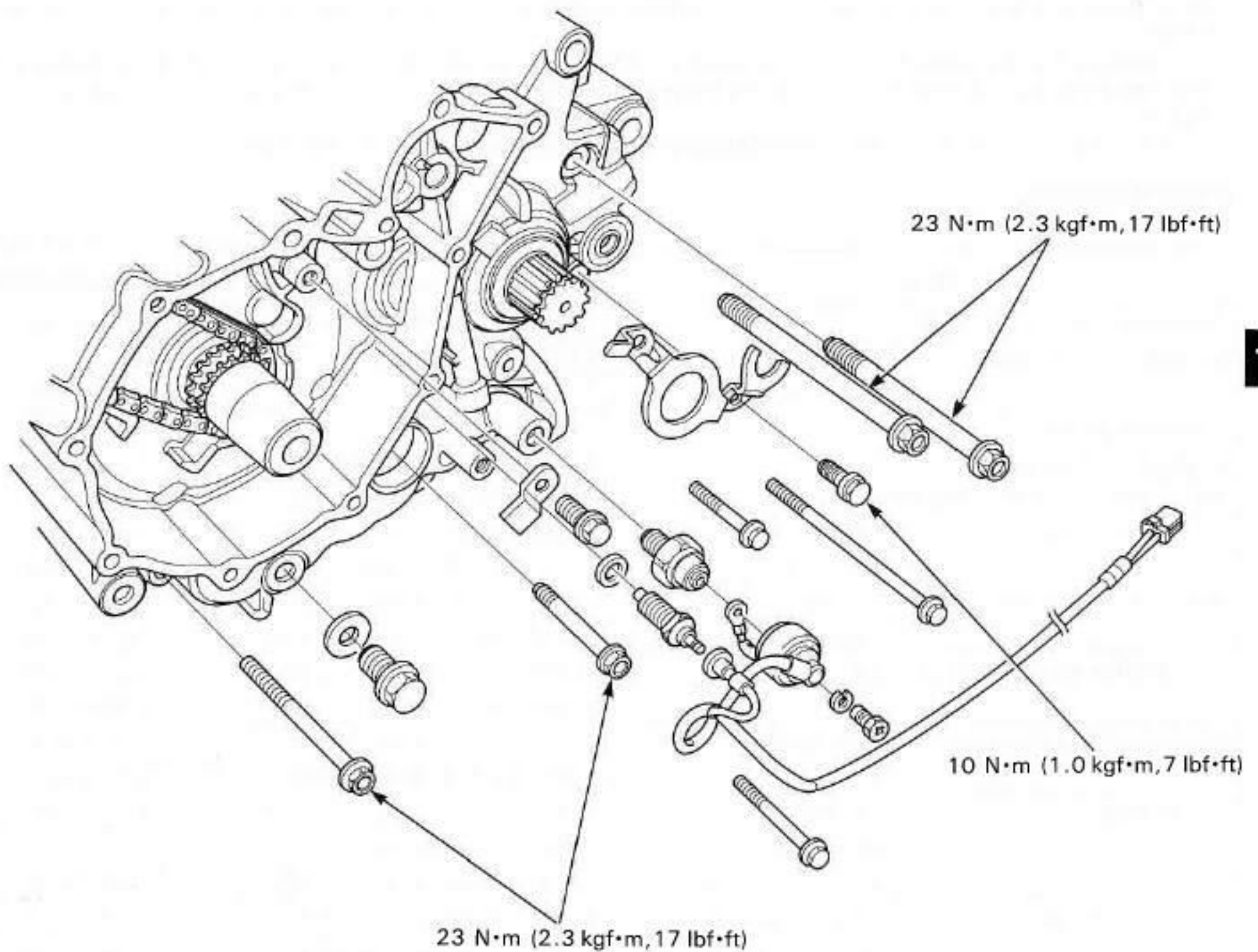


CRANKSHAFT/TRANSMISSION



12. CRANKSHAFT/TRANSMISSION

| | | | |
|---------------------------|------|--------------------|-------|
| SERVICE INFORMATION | 12-2 | TRANSMISSION | 12-14 |
| TROUBLESHOOTING | 12-3 | CRANKCASE BEARING | |
| CRANKCASE SEPARATION | 12-4 | REPLACEMENT | 12-21 |
| CRANKSHAFT/CONNECTING ROD | 12-6 | CRANKCASE ASSEMBLY | 12-23 |



SERVICE INFORMATION

GENERAL

- The crankcase halves must be separated to service the crankshaft, connecting rod and transmission (including the shift fork and shift drum). To service these parts, the engine must be removed from the engine (Section 7).
- The following parts must be removed before separating the crankcase:
 - Oil distributor (Section 4)
 - Water pump (Section 6)
 - Cylinder head (Section 10)
 - Cylinder, piston (Section 11)
 - Clutch, gearshift linkage and primary drive gear (Section 8)
 - Alternator, flywheel (Section 9)
 - Starter motor (Section 18)
 - Neutral switch, oil pressure switch (Section 19)
- Be careful not to damage the crankcase mating surface.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Connecting rod and crankshaft bearing inserts are select fitted and are identified by color code. Select the replacement bearings using the selection tables. After installing new bearings, recheck them with plastigauge to verify correct clearance.
- Clean and apply sealant to the crankcase mating surfaces. Wipe off excess sealant thoroughly.

SPECIFICATIONS

Unit:mm(in)

| ITEM | | STANDARD | SERVICE LIMIT |
|-----------------------------------|----------------------------|-----------------------------------|---------------|
| Connecting rod small end I.D. | | 20.016 – 20.034 (0.7880 – 0.7887) | 20.05 (0.789) |
| Connecting rod big end | side clearance | 0.15 – 0.30 (0.006-0.012) | ———— |
| | radial clearance | ———— | 0.03 (0.001) |
| Crankshaft runout | | ———— | 0.03 (0.001) |
| Crank pin oil clearance | | 0.028 – 0.052 (0.0011 – 0.0020) | 0.10 (0.004) |
| Main journal oil clearance 50 dia | | 0.025 – 0.041 (0.0010 – 0.0016) | 0.10 (0.004) |
| Transmission gear I.D. | M3,M5 | 28.000 – 28.021 (1.1024 – 1.1032) | 28.04 (1.104) |
| | C1,C2,C4 | 31.000 – 31.025 (1.2205 – 1.2215) | 31.05 (1.222) |
| Transmission gear bushing O.D. | M3,M5 | 27.959 – 27.980 (1.1007 – 1.1016) | 27.94 (1.100) |
| | C1,C2,C4 | 30.950 – 30.975 (1.2185 – 1.2195) | 30.93 (1.218) |
| Transmission gear bushing I.D. | M3 | 25.000 – 25.021 (0.9843 – 0.9851) | 25.04 (0.986) |
| | C2 | 27.995 – 28.016 (1.1021 – 1.1030) | 28.04 (1.104) |
| Gear-to-bushing clearance | M3,M5 gear | 0.020 – 0.062 (0.0008 – 0.0024) | 0.10 (0.004) |
| | C1,C2,C4 gear | 0.025 – 0.075 (0.0010 – 0.0030) | 0.11 (0.004) |
| Mainshaft O.D. | M3 gear bushing | 24.972 – 24.993 (0.9831 – 0.9840) | 24.95 (0.982) |
| | At left crankcase journal | 19.980 – 19.993 (0.7866 – 0.7871) | 19.96 (0.786) |
| | At right crankcase journal | 24.980 – 24.993 (0.9835 – 0.9840) | 24.90 (0.983) |
| Countershaft O.D. | C2 gear bushing | 27.967 – 27.980 (1.1011 – 1.1016) | 27.95 (1.100) |
| | At left crankcase journal | 27.972 – 27.990 (1.1013 – 1.1020) | 27.95 (1.100) |
| | At right crankcase journal | 19.980 – 19.990 (0.7866 – 0.7871) | 19.96 (0.786) |

Unit:mm(in)

| ITEM | | STANDARD | SERVICE LIMIT |
|---------------------------------|----|-----------------------------------|---------------|
| Gear bushing-to-shaft clearance | M3 | 0.007 – 0.049 (0.0003 – 0.0019) | 0.08 (0.003) |
| | C2 | 0.015 – 0.049 (0.0006 – 0.0019) | 0.08 (0.003) |
| Shift fork claw thickness | | 5.93 – 6.300 (0.233 – 0.236) | 5.9 (0.23) |
| Shift fork I.D. | | 13.000 – 13.021 (0.5118 – 0.5126) | 13.04 (0.513) |
| Shift fork shaft O.D. | | 12.966 – 12.984 (0.5105 – 0.5112) | 12.95 (0.510) |

TORQUE VALUES

| | | |
|-------------------------------------|-------------------------------|---|
| Mainshaft bearing set plate bolt | 10 N•m (1.0 kgf•m, 7 lbf•ft) | Apply a locking agent to the threads |
| Countershaft bearing set plate bolt | 10 N•m (1.0 kgf•m, 7 lbf•ft) | Apply a locking agent to the threads |
| Crankcase bolt | 23 N•m (2.3 kgf•m, 17 lbf•ft) | |
| Connecting rod bearing cap nut | 42 N•m (4.3 kgf•m, 31 lbf•ft) | Apply oil to the threads and flange surface |
| Neutral switch | 12 N•m (1.2 kgf•m, 9 lbf•ft) | Apply sealant to the threads |

TOOLS

| | |
|--------------------------------------|---------------|
| Bearing remover set | 07936-3710001 |
| - Bearing remover head | 07936-3710600 |
| - Remover handle | 07936-3710100 |
| - Remover sliding weight | 07741-0010201 |
| Mainshaft bearing remover attachment | 07946-ME90101 |
| Mainshaft bearing driver attachment | 07946-ME90200 |
| Driver attachment, 42 X 47 mm | 07746-0010300 |
| Driver attachment, 52 X 55 mm | 07746-0010400 |
| Driver attachment, 62 X 68 mm | 07746-0010500 |
| Pilot, 20 mm | 07746-0040500 |
| Pilot, 25 mm | 07746-0040600 |
| Pilot, 28 mm | 07746-0041100 |
| Driver | 07749-0010000 |
| Universal bearing puller | 07631-0010000 |
| Inner driver, 25 mm | 07746-0030200 |

TROUBLESHOOTING

Excessive noise

- Worn connecting rod big end bearing
- Bent connecting rod
- Worn crankshaft main bearing
- Worn transmission gear

Transmission jumps out of gear

- Worn gear dogs or slots
- Bent fork shaft
- Broken shift drum stopper
- Worn or bent shift forks
- Broken shift linkage return spring

Hard to shift

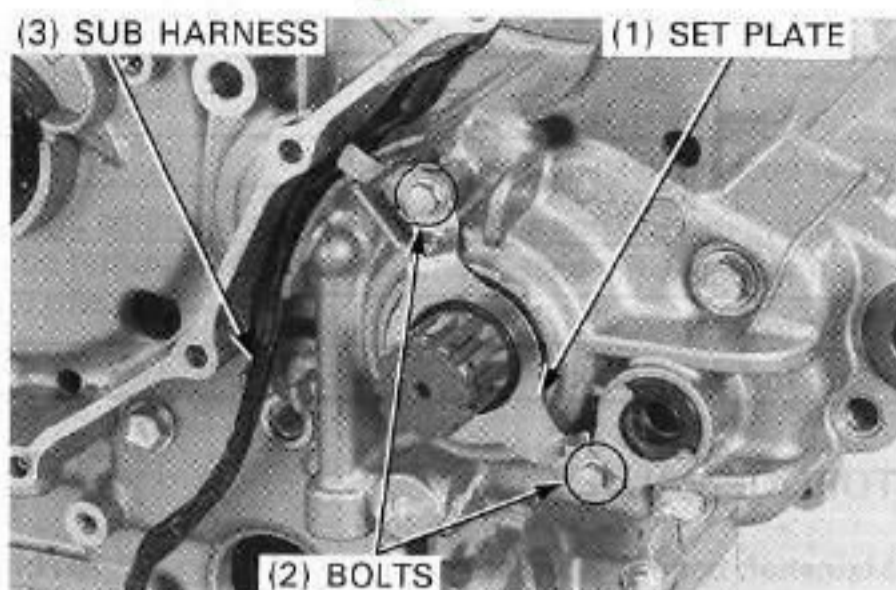
- Improper clutch adjustment
- Improper clutch operation
- Bent shift fork
- Bent shift fork shaft
- Bent shift spindle
- Damaged shift drum cam grooves
- Incorrect transmission oil weight

CRANKCASE SEPARATION

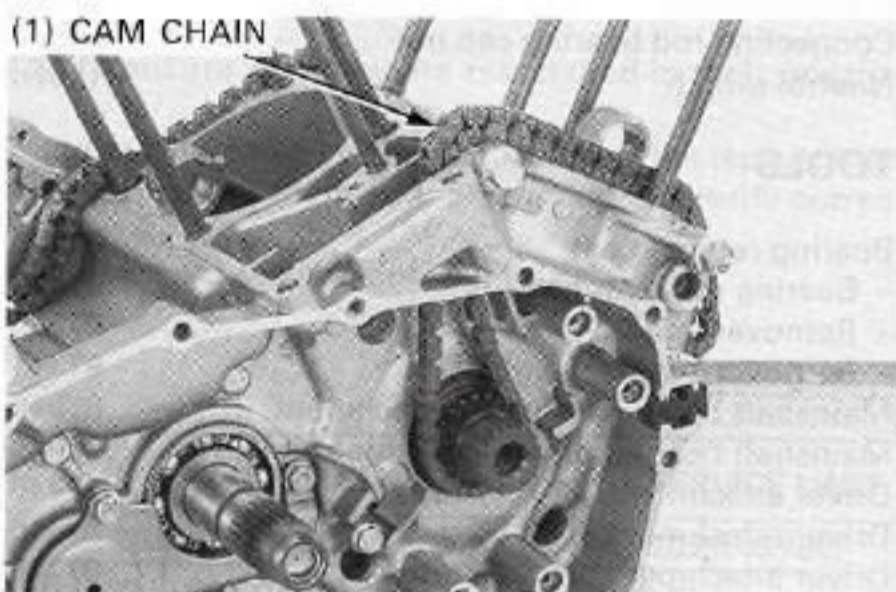
Remove the engine from the frame (Section 7).

Refer to Service Information (page 12-2) for removal of necessary parts before disassembling the crankcase.

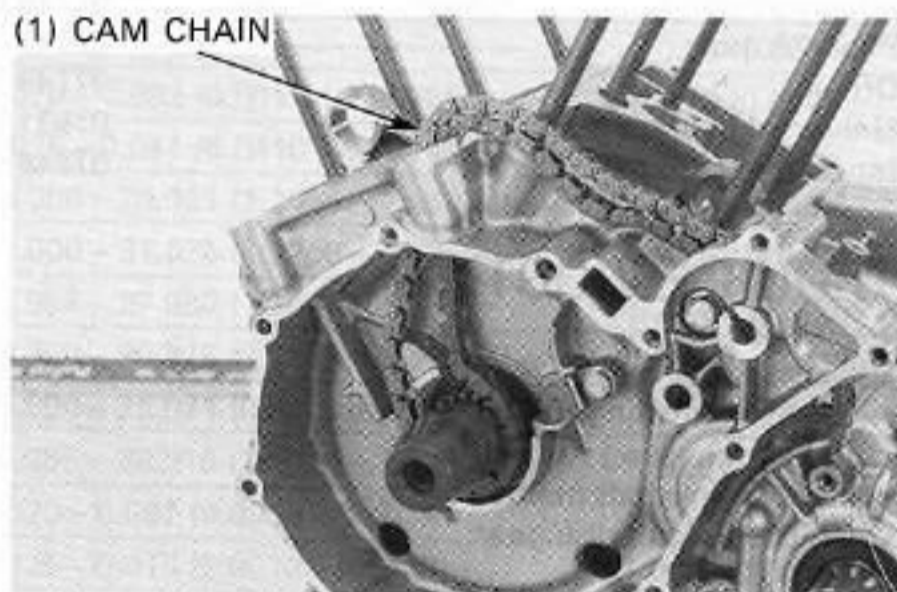
Remove the bolts and countershaft bearing set plate.
Remove the engine sub harness.



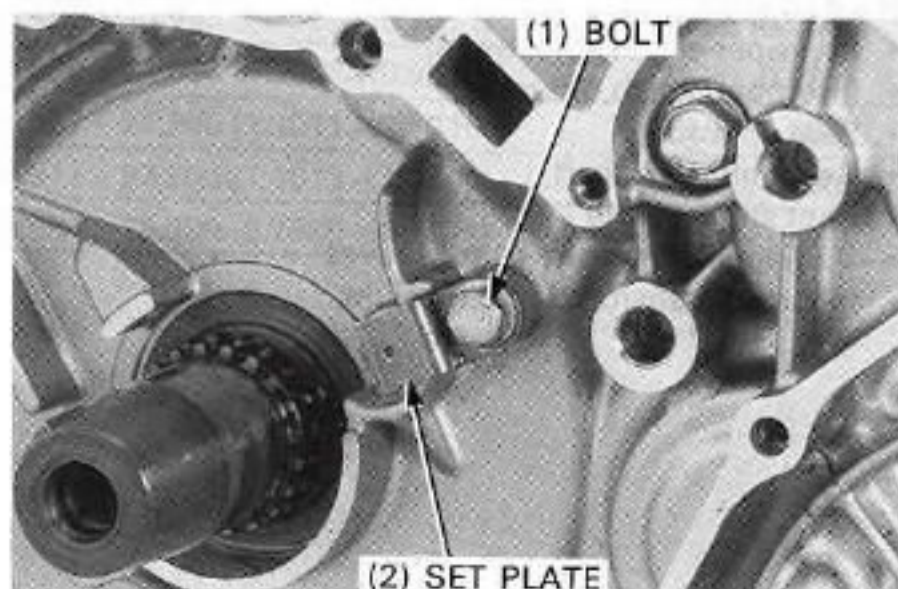
Remove the front cam chain.



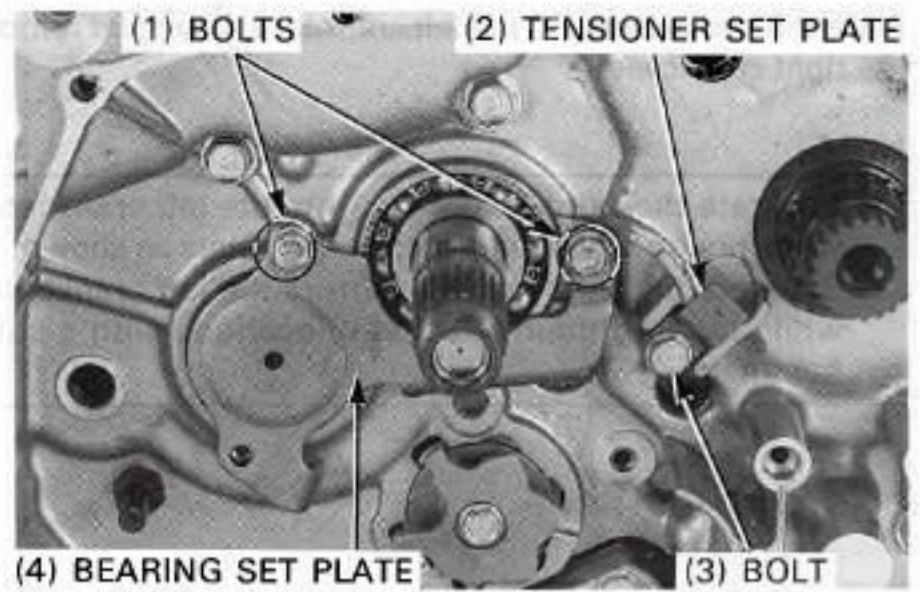
Remove the rear cam chain.



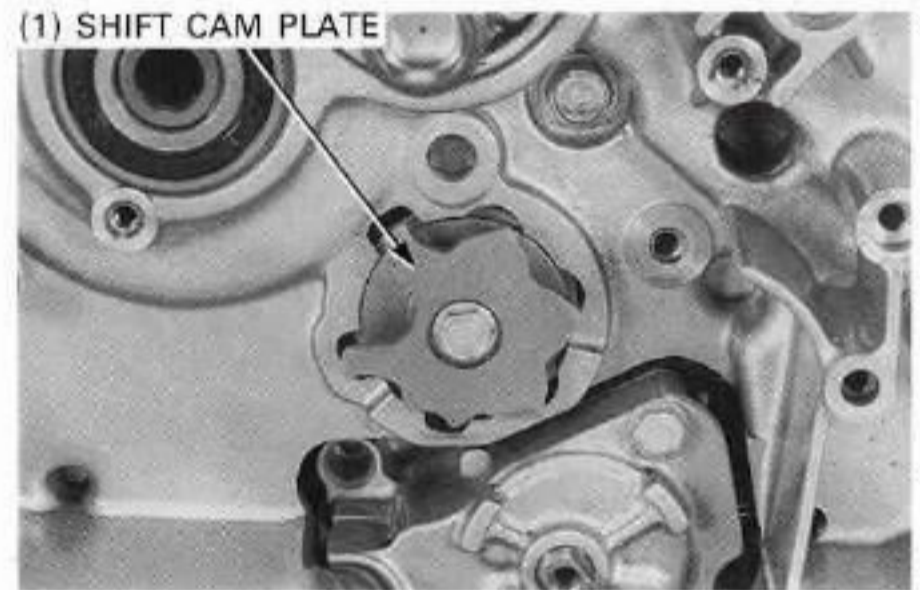
Remove the bolt and rear cylinder cam chain tensioner set plate.



Remove the bolt and front cylinder cam chain tensioner set plate.
Remove the mainshaft bearing set plate bolt and mainshaft bearing set plate.



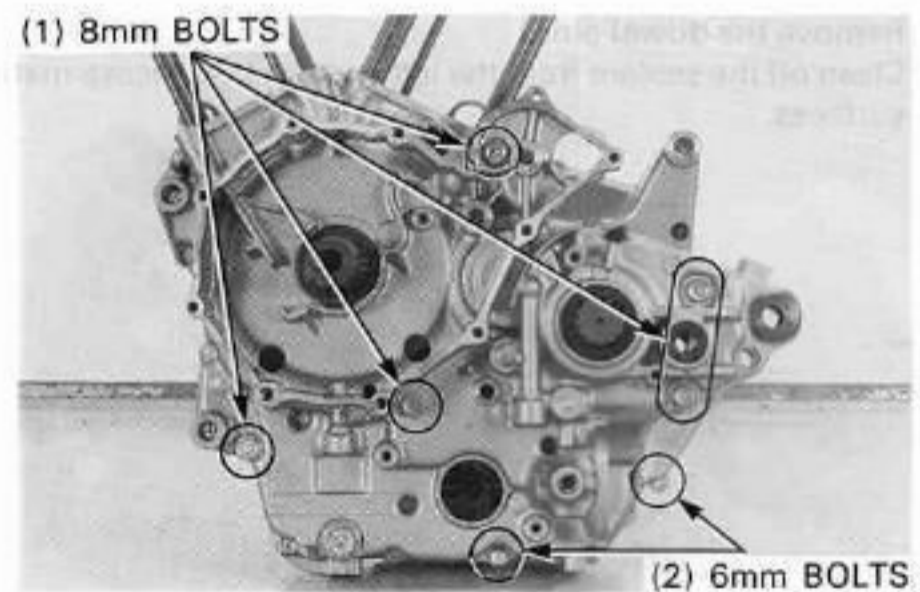
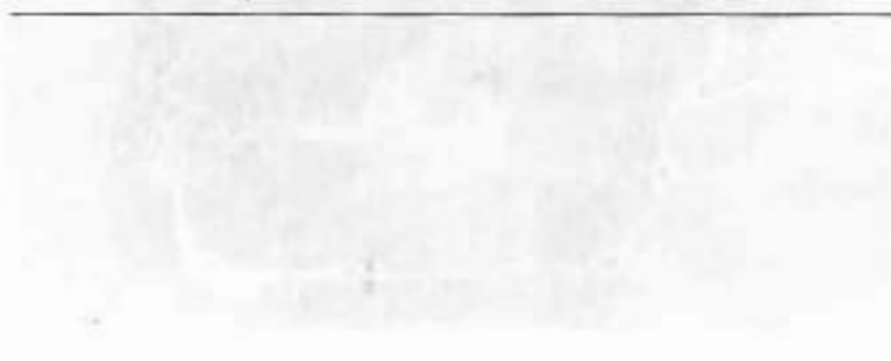
Turn the shift drum until shift cam plate as shown.



Remove the left crankcase bolts.

NOTE

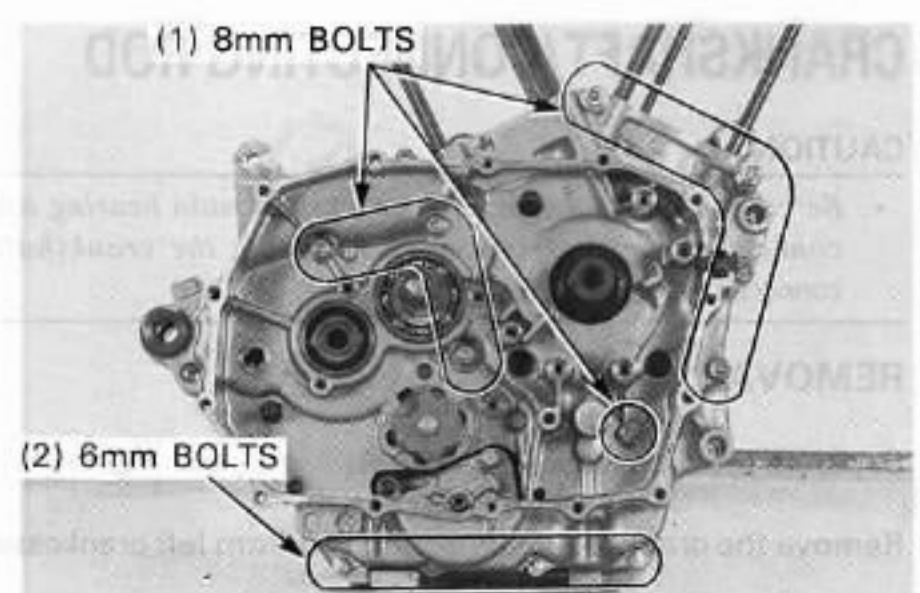
- Loosen the 6 mm bolts first, then 8 mm bolts.
- Loosen the left crankcase bolts in a crisscross pattern in several steps.



Remove the right crankcase bolts.

NOTE

- Loosen the 6 mm bolts first, then 8 mm bolts.
- Loosen the right crankcase bolts in a crisscross pattern in several steps.

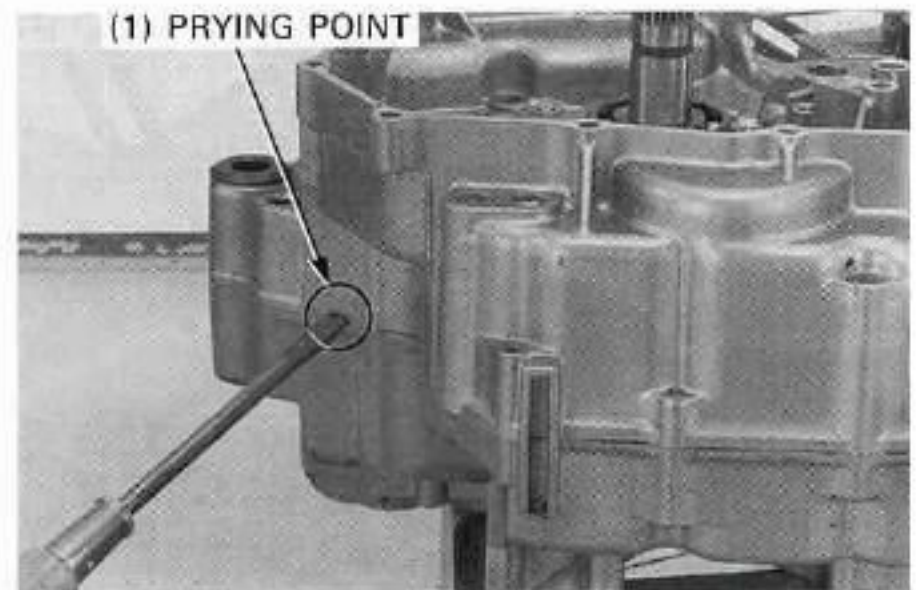
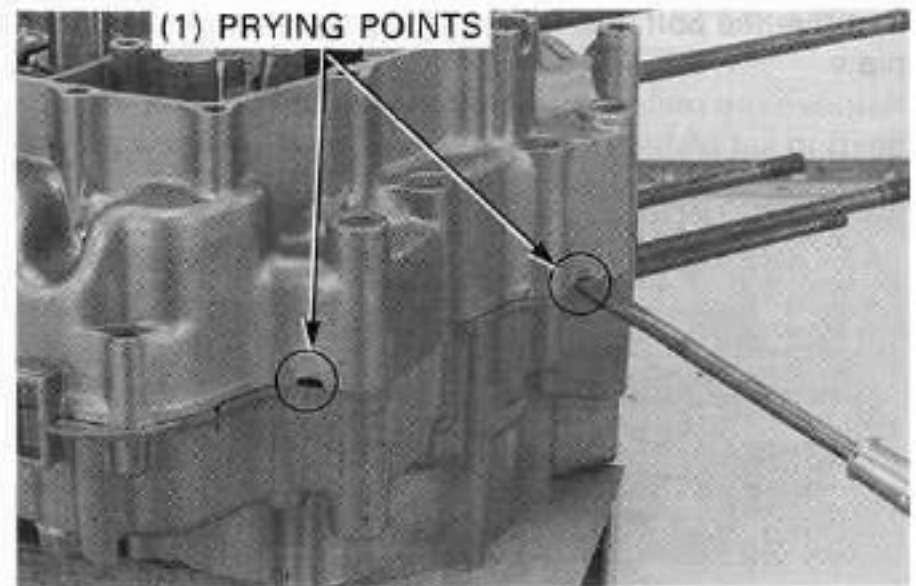


CRANKSHAFT/TRANSMISSION

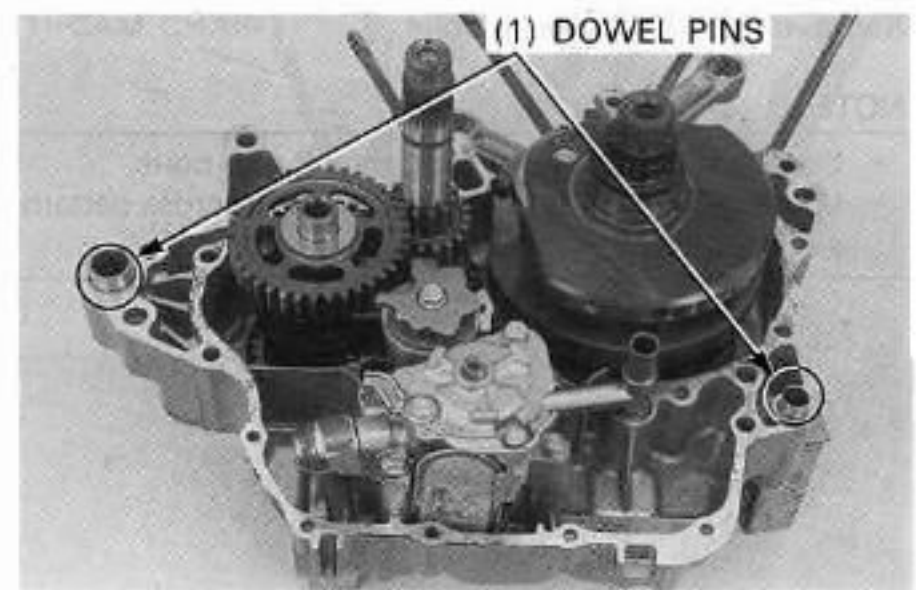
Place the crankcase with the left crankcase down and remove the right crankcase.

NOTE

- Separate the right crankcase from the left crankcase while prying where indicated at the points as shown.
- Separate the right crankcase from the left crankcase while tapping them at several locations with a soft hammer.



Remove the dowel pins.
Clean off the sealant from the left and right crankcase mating surfaces.



CRANKSHAFT/CONNECTING ROD

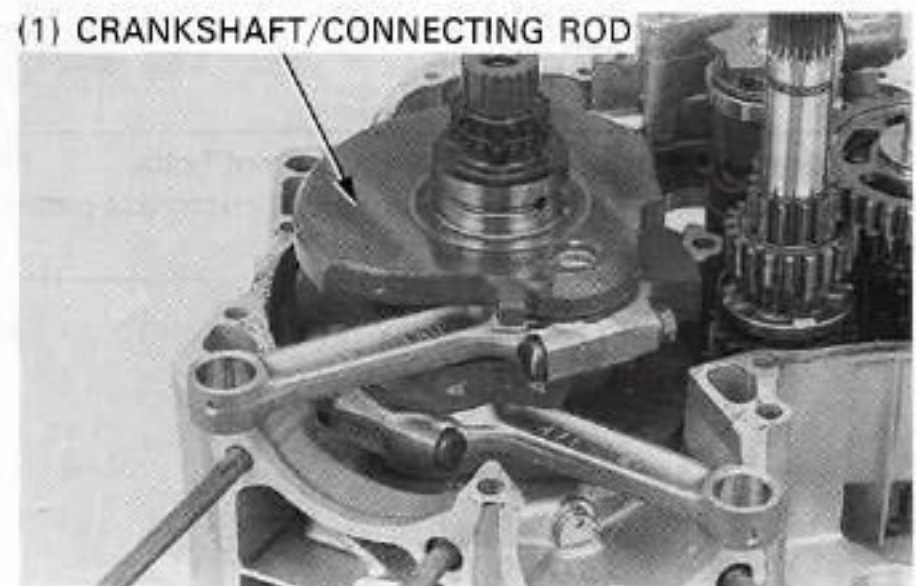
CAUTION

- *Be careful not to damage the crankshaft main bearing and connecting rod bearing while servicing the crankshaft/ connecting rod.*

REMOVAL

Separate the crankcase (page 12-4).

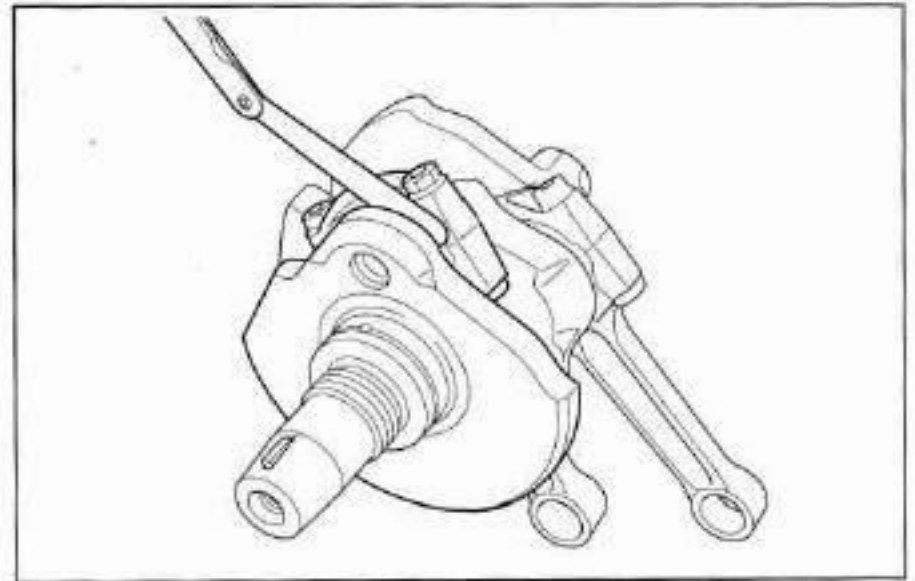
Remove the crankshaft/connecting rod from left crankcase.



Inspect the connecting rod big end side clearance before connecting rod removal.

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

STANDARD: 0.15-0.30 mm (0.006-0.012 in)



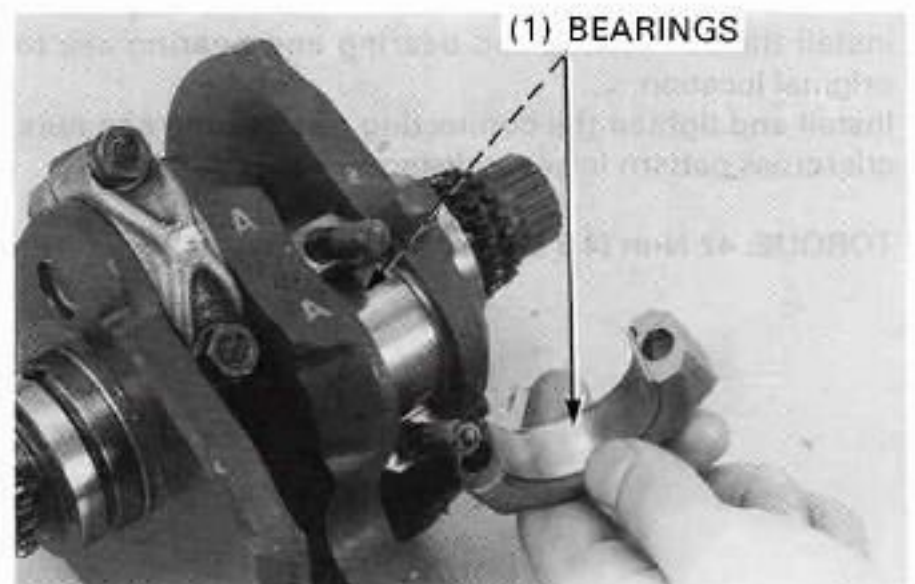
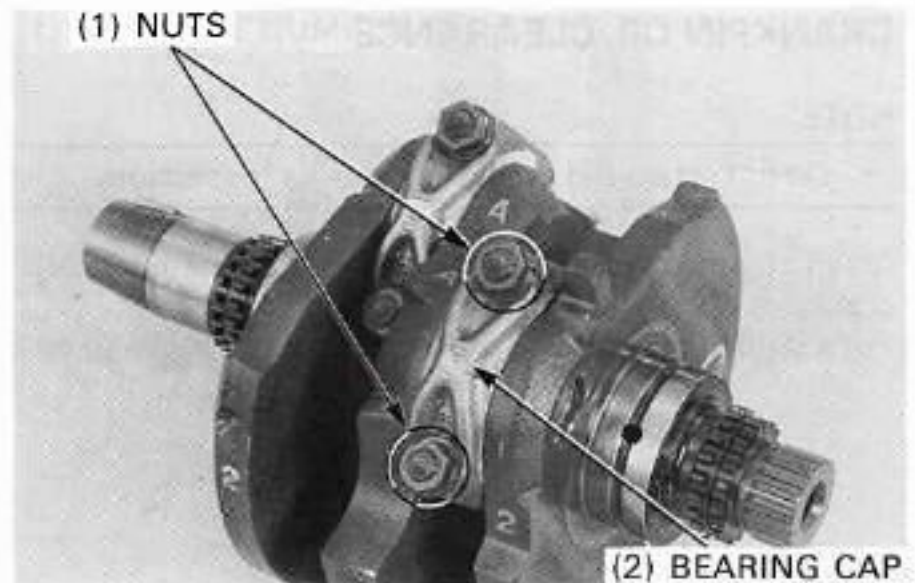
Remove the connecting rod bearing cap nuts, bearing cap and connecting rod.

NOTE

- Tap the side of the cap lightly if the bearing cap is hard to remove.

Mark the bearing caps, bearings and connecting rod as you remove them to indicate the correct cylinder and position on the crankpins for reassembly.

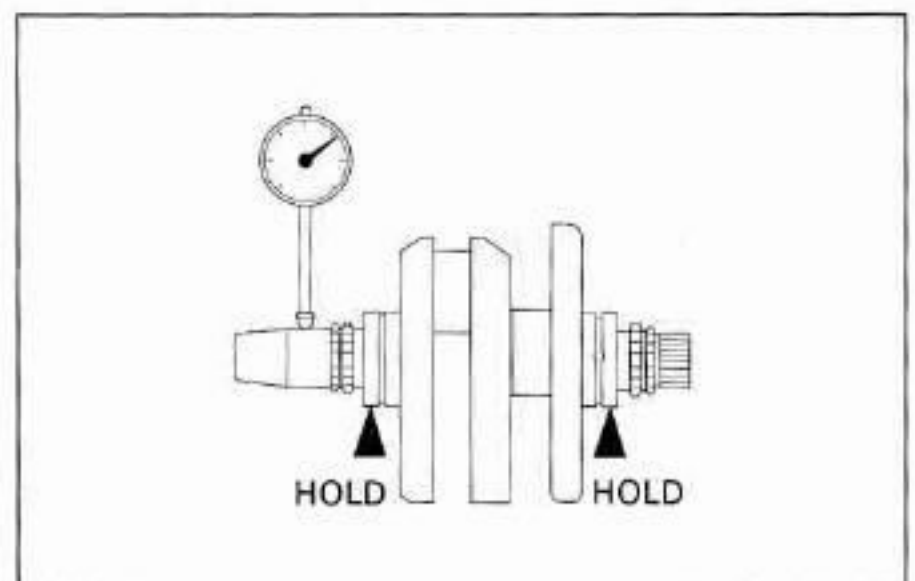
Connecting rod small end inspection (page 11-7)



CRANKSHAFT INSPECTION

Place the crankshaft on a stand or V-blocks.
Set the indicator on the main journal.
Rotate the crankshaft two revolutions and read the runout.

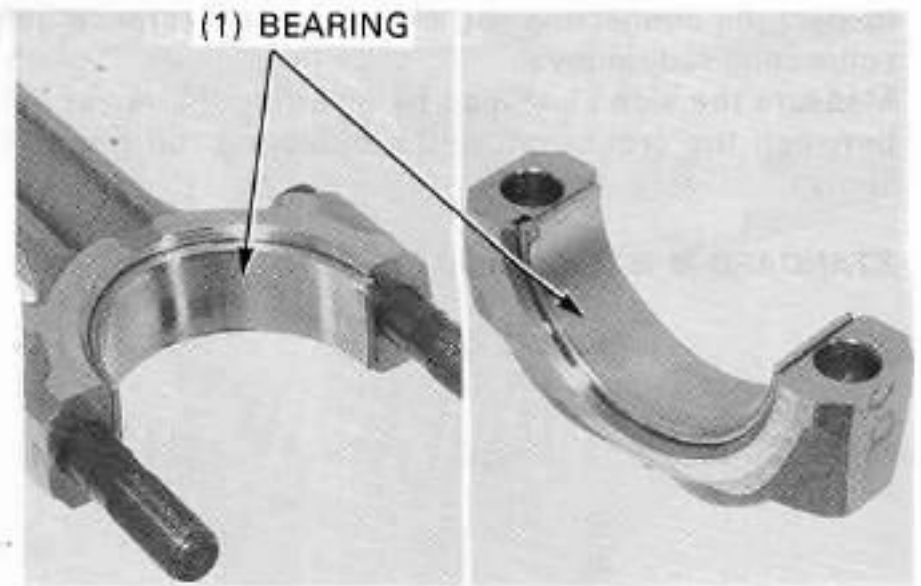
SERVICE LIMIT: 0.03 mm (0.001 in)



CRANKSHAFT/TRANSMISSION

CONNECTING ROD BEARING INSPECTION

Inspect the bearing inserts for unusual wear, damage or peeling and replace if necessary.

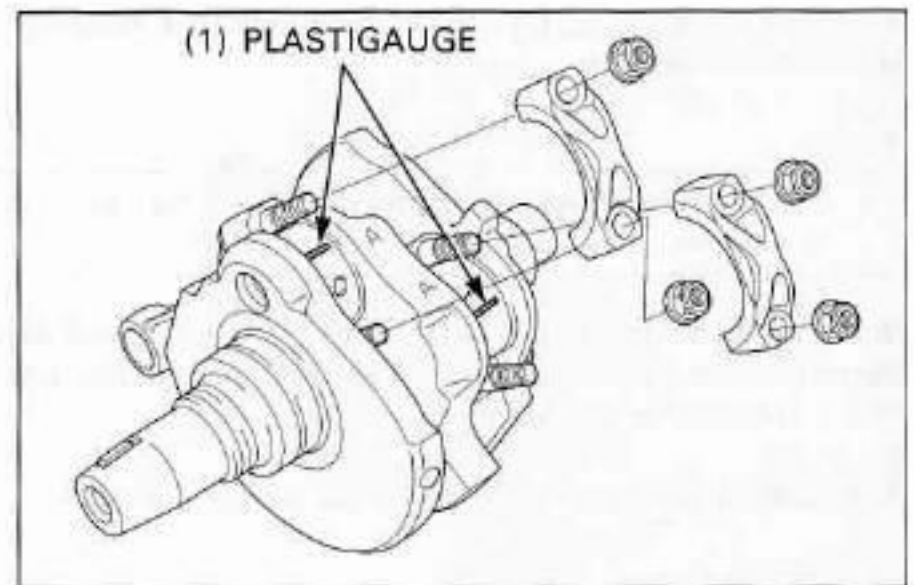


CRANKPIN OIL CLEARANCE

NOTE

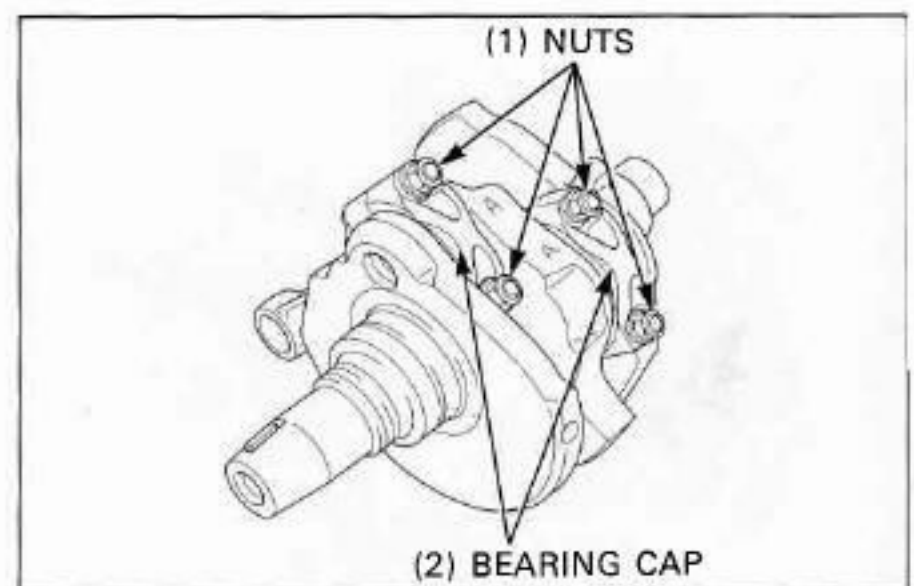
- Do not rotate the crankshaft during inspection.

Clean off any oil from the connecting rod bearing inserts and crankpin.
Put a strip of plastigauge on each crank pin avoiding oil hole.



Install the connecting rod bearing and bearing cap to the original location.
Install and tighten the connecting rod bearing cap nuts in a crisscross pattern in several steps.

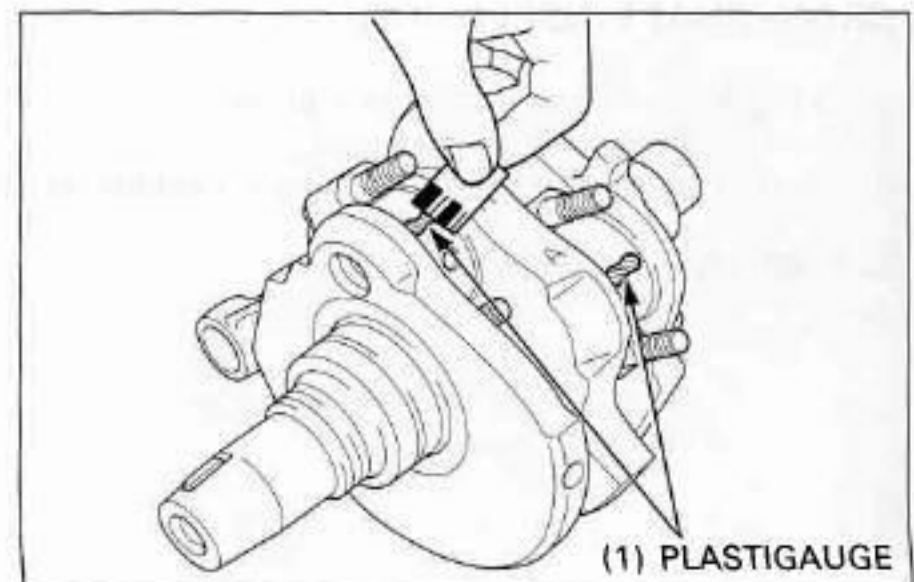
TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)



Remove the connecting rod bearing cap nuts, bearing cap and bearing.
Measure the compressed plastigauge at its widest point on each crank pin to determine the oil clearance.

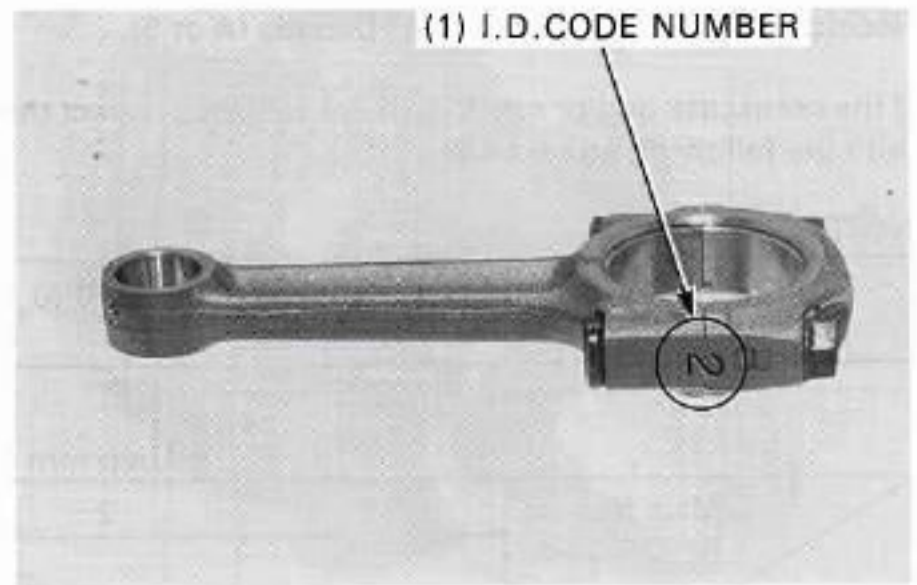
SERVICE LIMIT: 0.10 mm (0.004 in)

If the clearance exceeds the service limit, select the correct replacement bearings as follows.

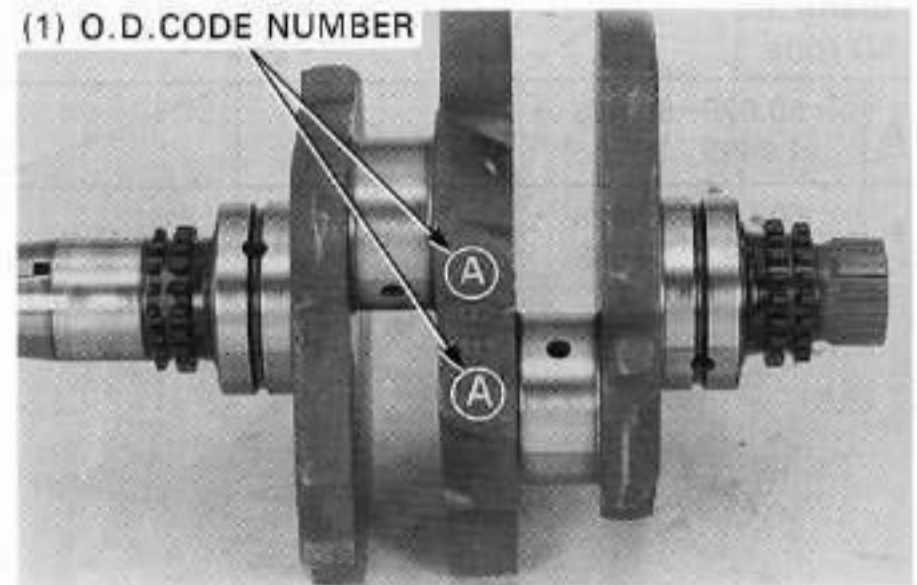


CONNECTING ROD BEARING SELECTION

Record the connecting rod I.D. code number (1 or 2) or measure the I.D. with the bearing cap installed with out beating insert.



Record the corresponding crankpin O.D. code letter (A, or B) or measure the crankpin O.D.. Cross-reference the crankpin and rod codes to determine the replacement bearing color.



Unit: mm (in)

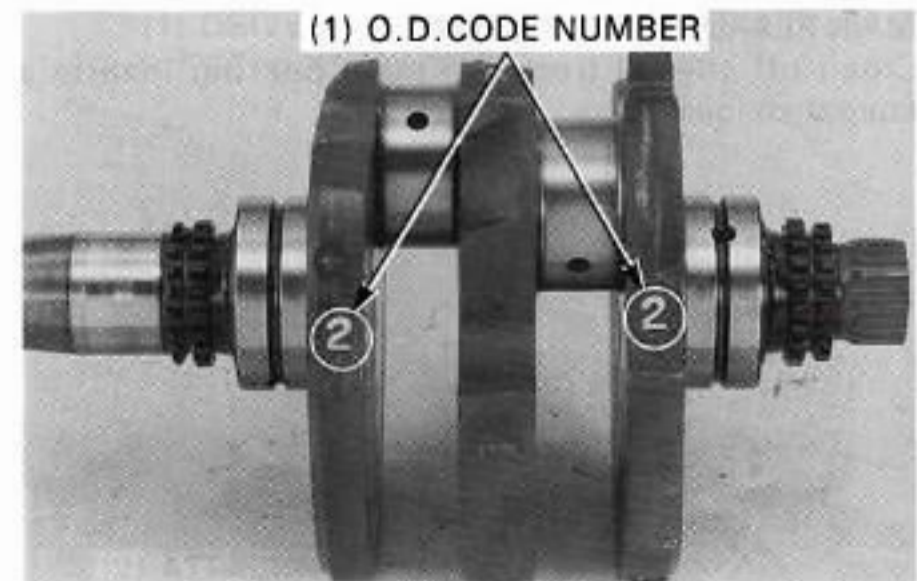
| Connecting rod O.D. code | | A | B |
|-----------------------------|---|--------------------------------------|--------------------------------------|
| | | 42.982 - 42.990 (1.6922 - 1.6925) | 42.974 - 42.982 (1.6919 - 1.6922) |
| Crankpin I.D. code | 1 | F (Pink) | E (Yellow) |
| | 2 | E (Yellow) | D (Green) |

Bearing thickness:
 D(Green): Thick
 E(Yellow): \updownarrow
 F(Pink): Thin

CRANKSHAFT/CRANKCASE SELECTION

Crankcase and crankshaft are select fitted.

Record the main journal O.D. code number (1 or 2).



CRANKSHAFT/TRANSMISSION

Record the main journal bearing I.D. code (A or B).

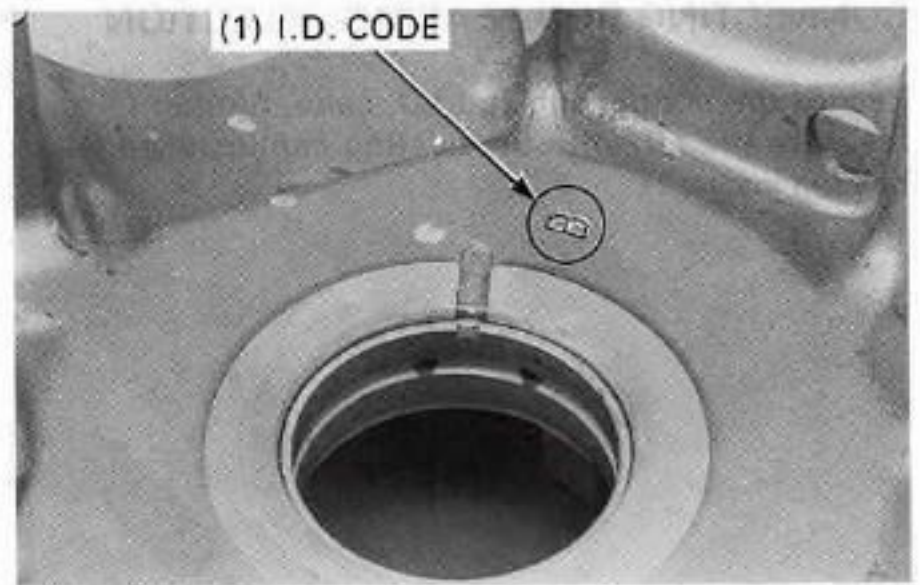
If the crankcase and/or crankshaft are replaced, select them with the following fitting table.

NOTE

- The "○" mark in the table indicates that mating is possible in the crossed codes.

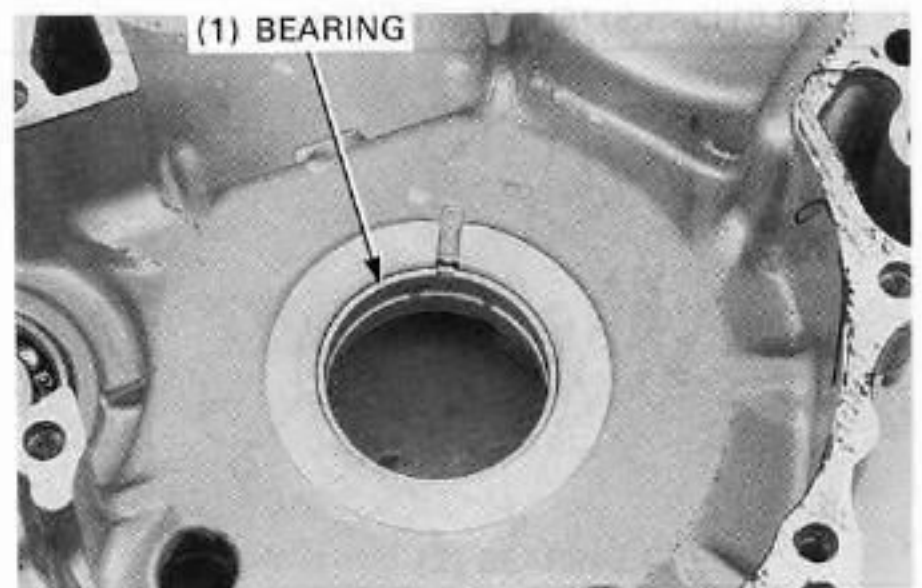
Unit: mm (in)

| Main journal O.D.code | | 1 | 2 |
|--------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| | | 49.992 - 50.000 (1.9682 - 1.9685) | 49.984 - 49.992 (1.9679 - 1.9682) |
| Crankcase I.D.code | A | ○ | / |
| | B | / | ○ |
| A | 50.025 - 50.033 (1.9695 - 1.9698) | ○ | / |
| B | 50.017 - 50.025 (1.9692 - 1.9695) | / | ○ |



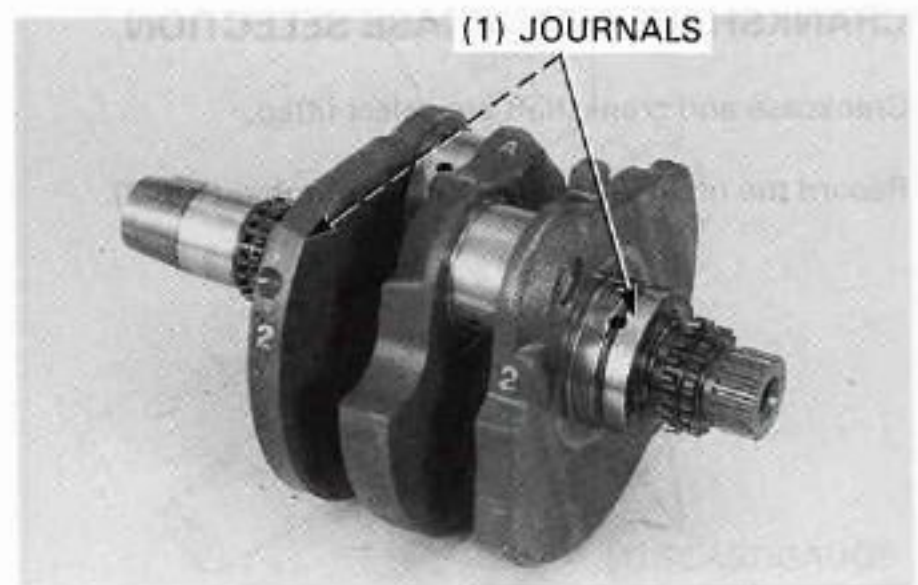
MAIN BEARING INSPECTION

Inspect the bearing inserts for unusual wear, damage or peeling and replace if necessary.



MAIN BEARING OIL CLEARANCE

Clean off any oil from the main bearing inserts and crankshaft journals.



Measure and record the crankshaft main journal O.D..

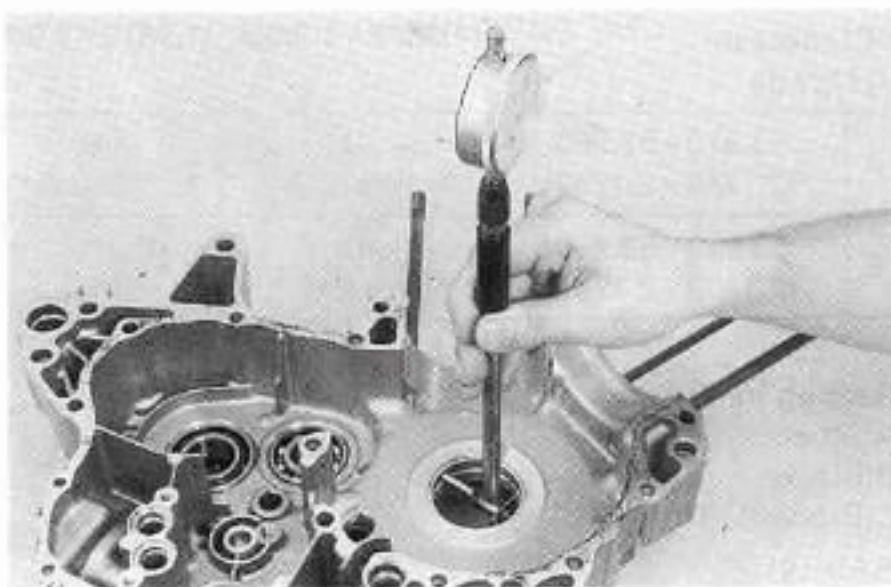


Measure and record the main bearing I.D..

Calculate the oil clearance by subtracting the journal O.D. from bearing I.D..

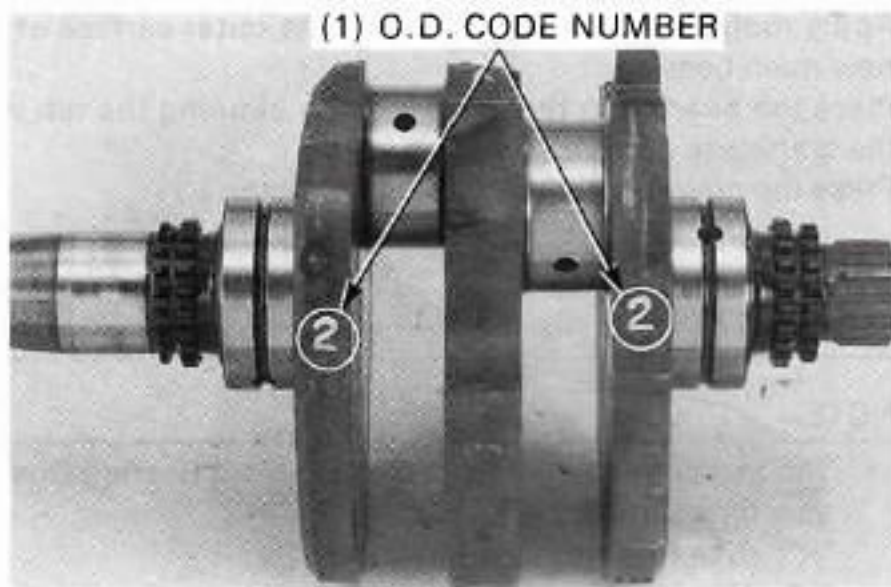
SERVICE LIMIT: 0.10 mm (0.004 in)

Replace the bearing if the service limit is exceeded. Select the replacement bearing (see below).



MAIN BEARING SELECTION

Record the main journal O.D. code number (1 or 2).



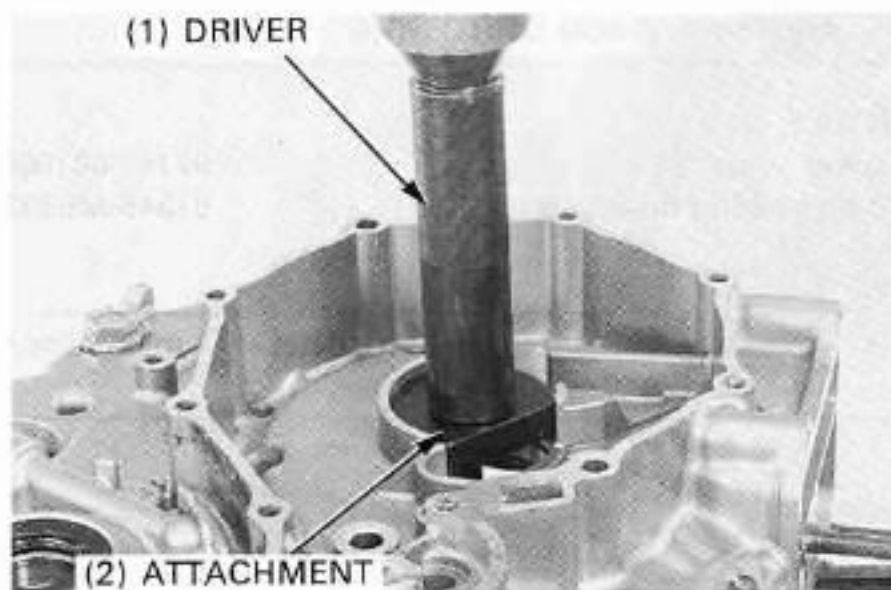
Press out the main bearing using the special tools and hydraulic press.

CAUTION

- *When removing bearings, always use a hydraulic press and special tools to prevent crankcase damage.*

TOOLS:

Driver 07749-001000
 Main bearing remover attachment 07946-ME90101



CRANKSHAFT/TRANSMISSION

Measure and record the crankcase I.D..

Cross-reference the crankcase and main journal codes to determine the replacement bearing color.

Unit: mm (in)

| Main journal O.D.code | | 1 | 2 |
|--------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| | | 49.992 - 50.000 (1.9682 - 1.9685) | 49.984 - 49.992 (1.9679 - 1.9682) |
| Crankcase I.D.code | A | C (Brown) | B (Black) |
| | B | B (Black) | A (Blue) |
| | 53.970 - 53.980 (2.1248 - 2.1252) | | |
| | 53.980 - 53.990 (2.1252 - 2.1256) | | |

Bearing thickness:

A(Blue): Thick
 B(Black): ↑
 C(Brown): ↓
 C(Brown): Thin

Apply molybdenum disulfide oil to the outer surface of the new main bearing.
 Place the bearing in the crankcase by aligning the tab with the crankcase groove.
 Press the main bearing into the crankcase.

CAUTION

- Be careful not to damage the bearing.

NOTE

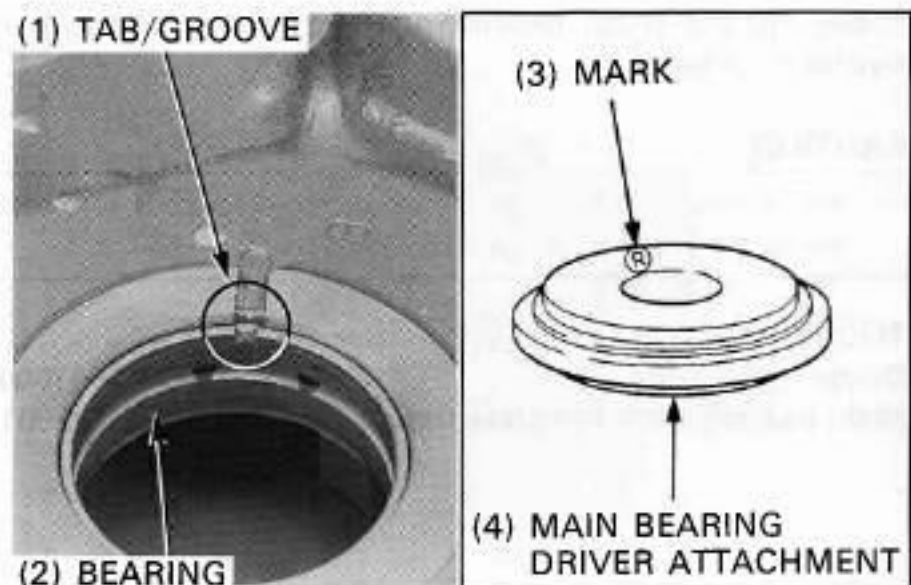
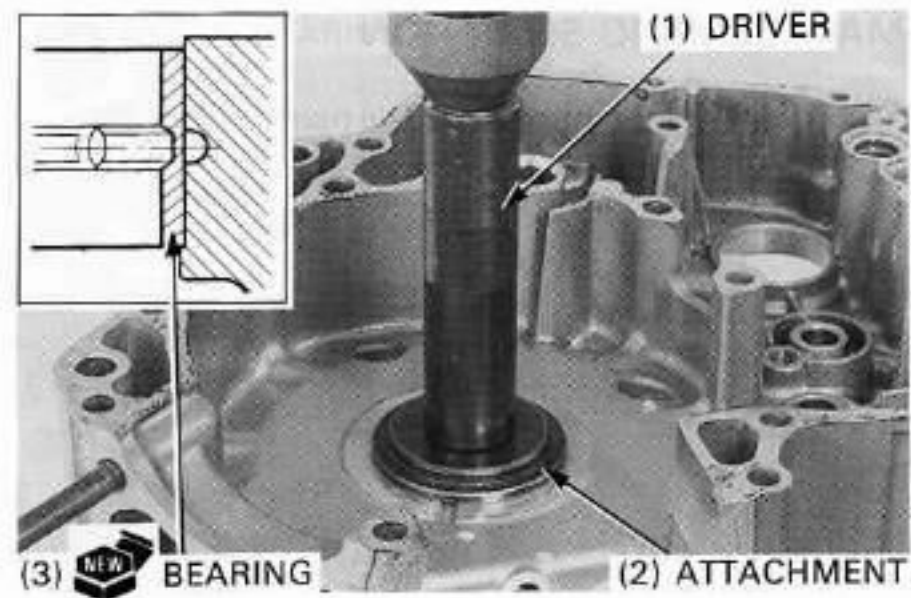
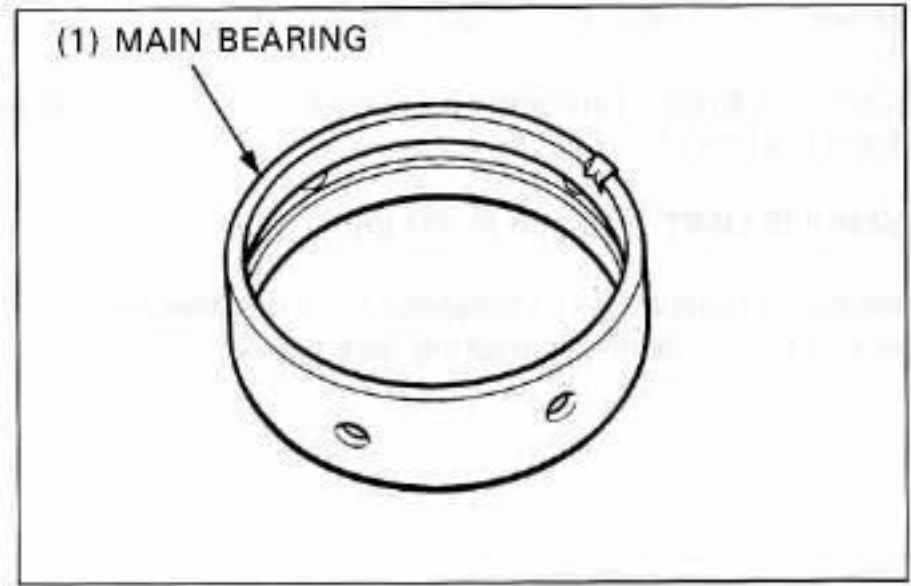
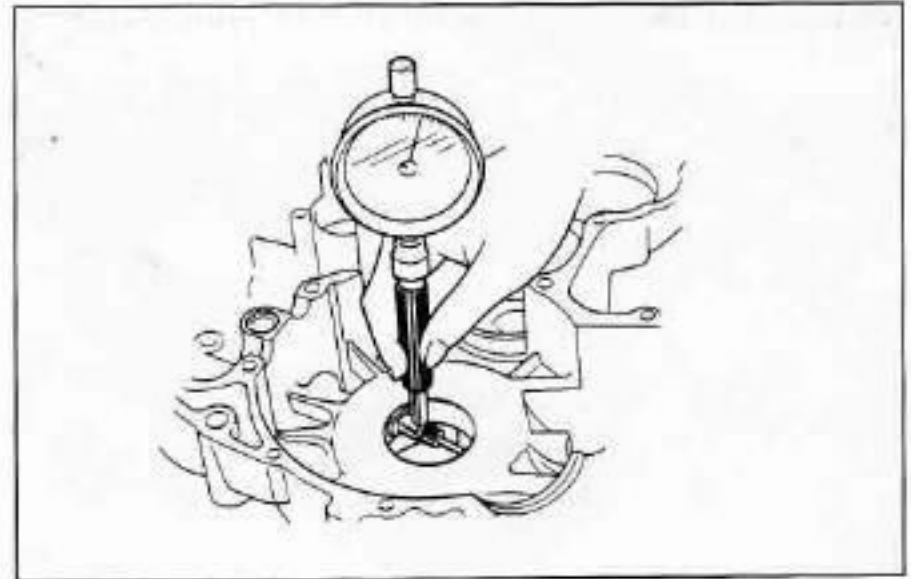
- The marks on the both sides of the Main Bearing Driver attachment mean.
 "R": Use for right side bearing
 "L": Use for left side bearing
- At installation, align the bearing oil hole with the crankcase oil hole.

TOOLS:

Driver **07749-0010000**
 Main bearing driver attachment **07946-ME90200**

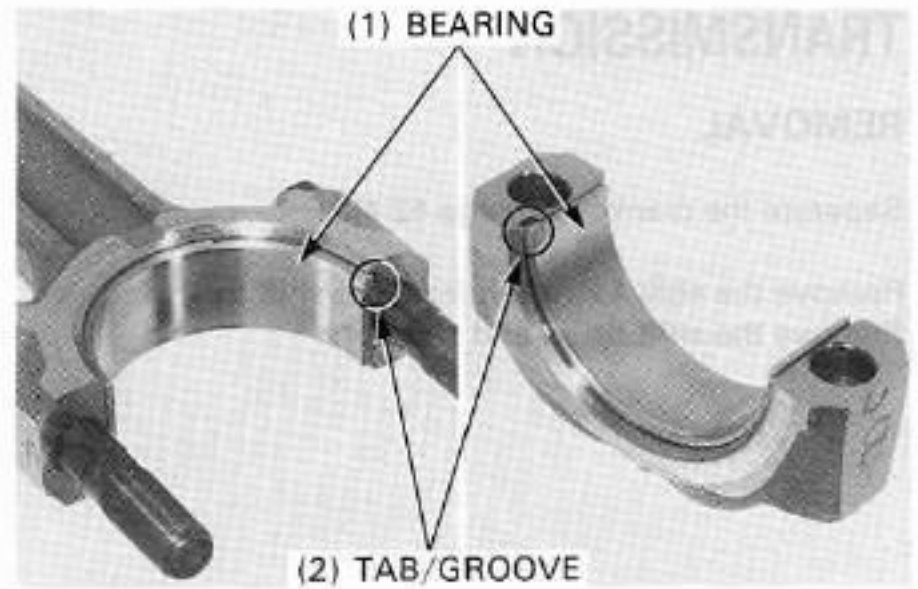
NOTE

- If the main bearing is replaced, delete the main bearing I.D. code letter on the crankcase.



INSTALLATION

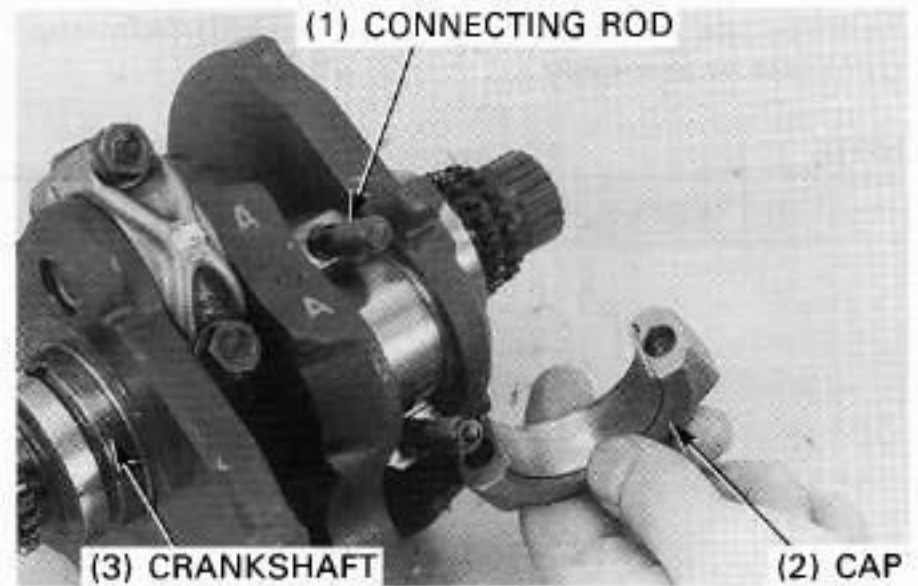
Clean off any oil from the main bearing inserts and connecting rod bearing cap.
Install the main bearing to the connecting rod and bearing cap aligning the tab on the bearing with the groove on the connecting rod and bearing cap.



Install the connecting rods and bearing caps on the crankpin. Be sure the each part is installed in its original position.

NOTE

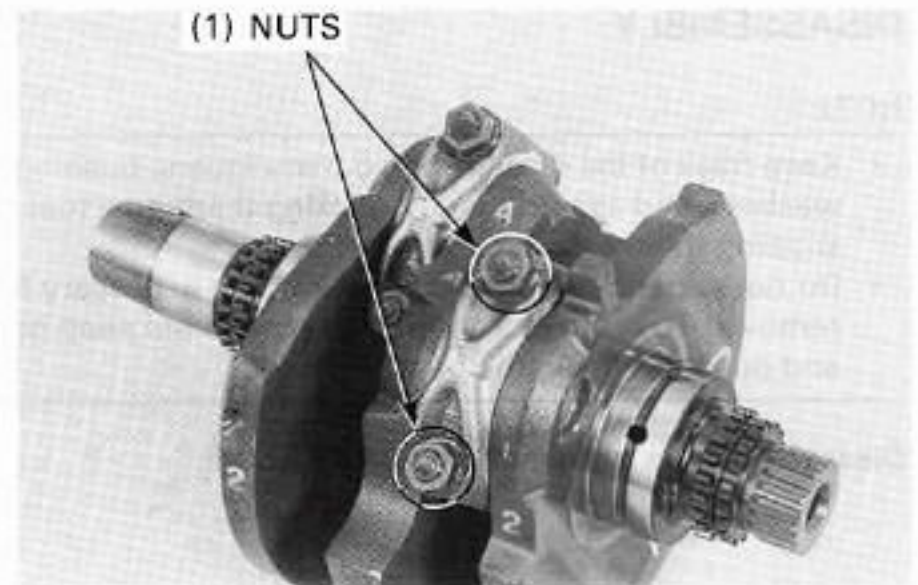
- Align the I.D. code on the bearing cap and connecting rod.



Apply oil to the connecting rod bearing cap nut threads and flange surface.
Install and tighten the connecting rod bearing cap nuts to the specified torque in several steps.

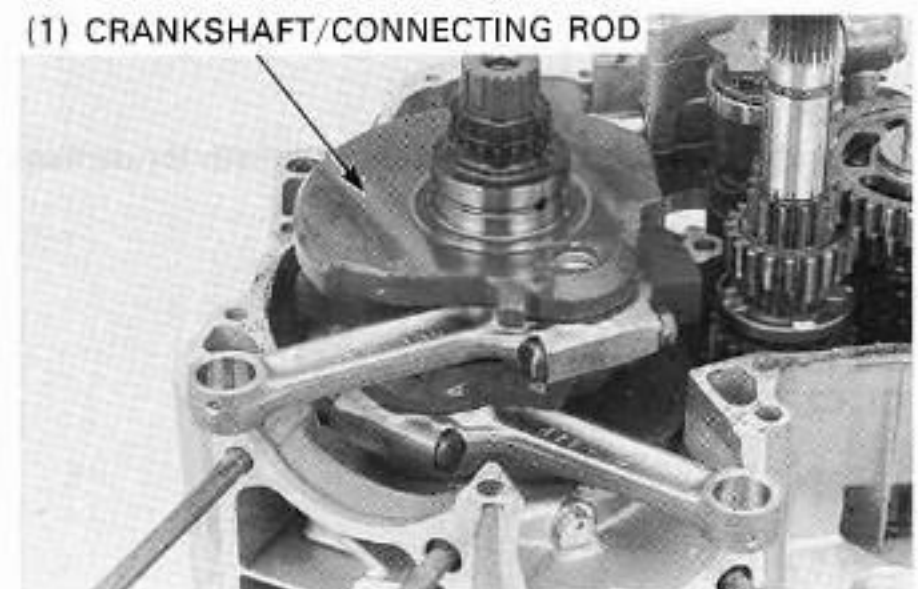
TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

After tightening, check the connecting rods move freely without binding.



Apply molybdenum disulfide oil to the main bearing sliding surfaces and install the crankshaft to the left crankcase.

Assemble the crankcase (page 12-23).



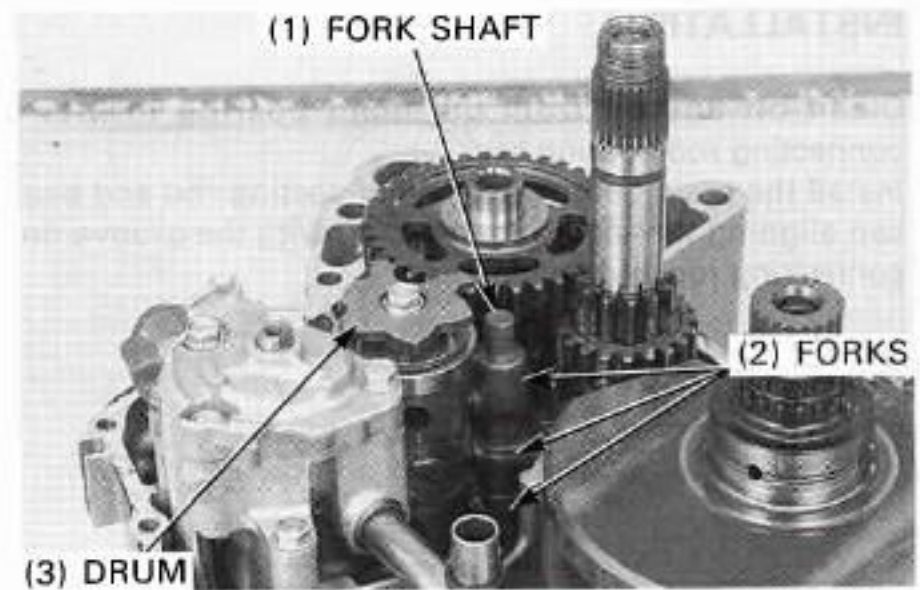
CRANKSHAFT/TRANSMISSION

TRANSMISSION

REMOVAL

Separate the crankcase (page 12-4).

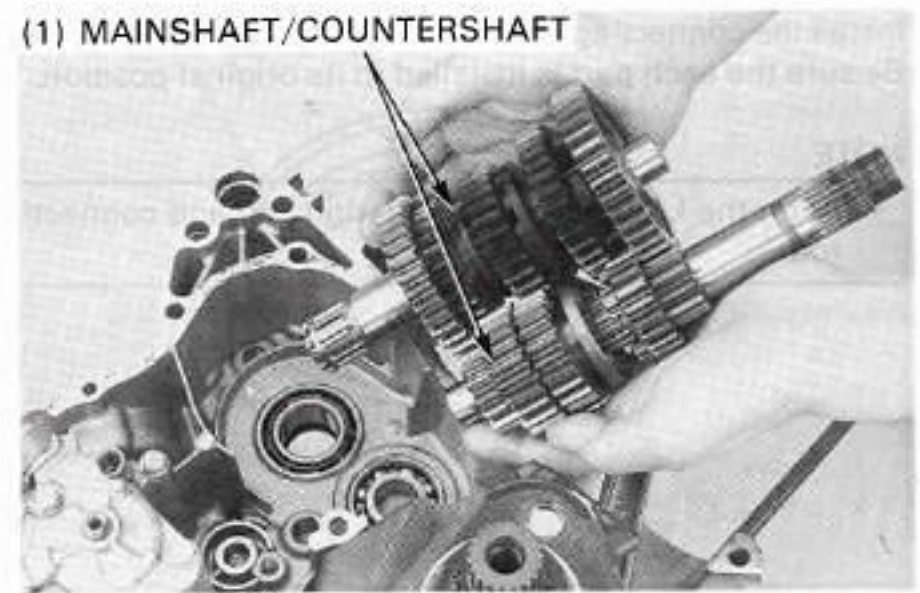
Remove the shift fork shaft from the shift fork.
Remove the shift drum and shift fork.



Remove the mainshaft and countershaft from the left crankcase as assembly.

NOTE

- Do not forget to install the transmission end washer.

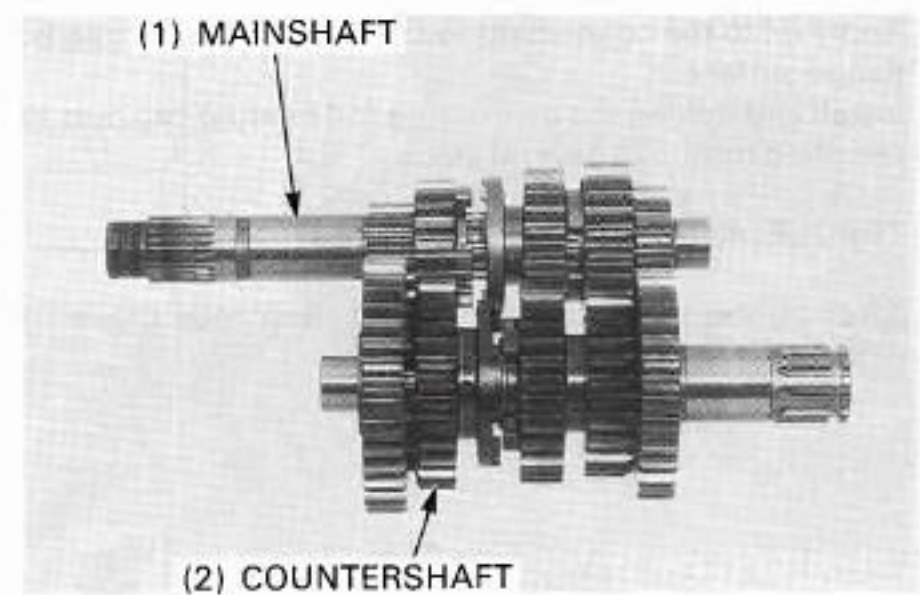


DISASSEMBLY

NOTE

- Keep track of the disassembled parts (gears, bushings, washers, and snap rings) by stacking them on a tool or slipping them onto a piece of wire.
- Do not expand the snap ring more than necessary for removal. To remove a snap ring, expand the snap ring and pull it off using the gear behind it.

Disassemble the mainshaft and countershaft.



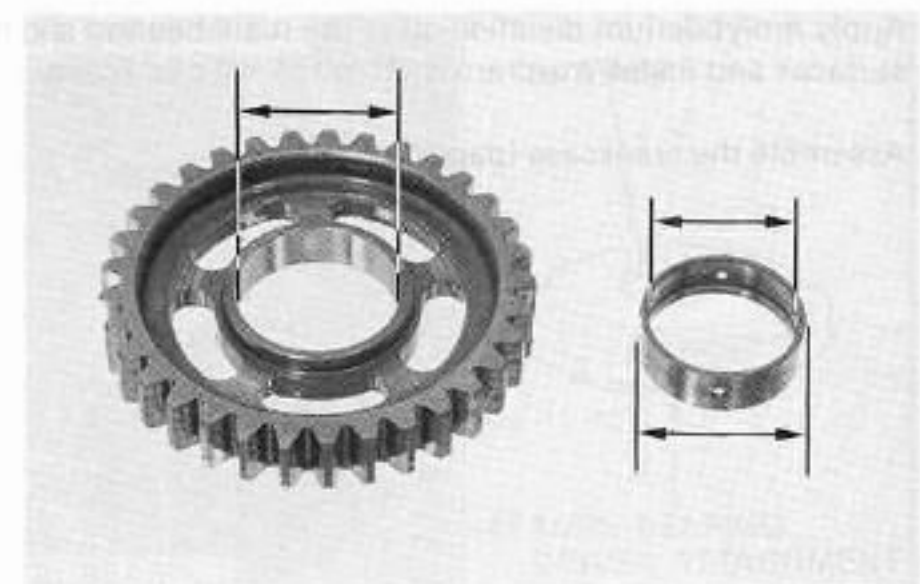
INSPECTION

GEAR

Check the gear dogs, dog holders and teeth for damage or excessive wear.
Measure the I.D. of each gear.

SERVICE LIMITS:

M3, M5: 28.04 mm (1.104 in)
C1, C2, C4: 31.05 mm (1.222 in)



BUSHING

Check the bushings for damage or excessive wear.
Measure the O.D. of each bushing.

SERVICE LIMITS:

- M3, M5:** 27.94 mm (1.100 in)
- C1, C2, C4:** 30.93 mm (1.218 in)

Measure the I.D. of each bushing.

SERVICE LIMITS:

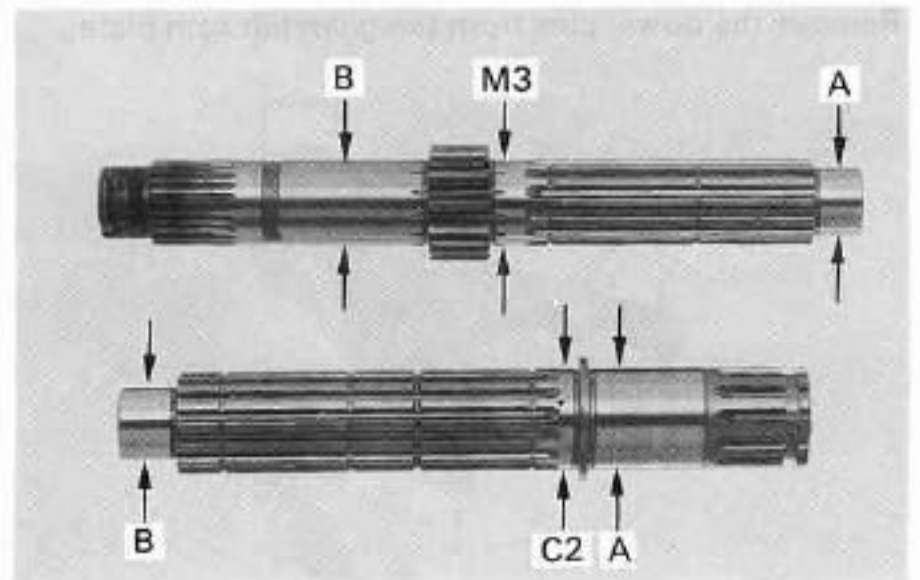
- M3:** 25.04 mm (0.986 in)
- C2:** 28.04 mm (1.104 in)

MAINSHAFT/COUNTERSHAFT

Check the spline grooves and sliding surfaces for damage or abnormal wear.
Measure the O.D. of the mainshaft and countershaft at the gear and bushing sliding areas.

SERVICE LIMITS:

- Mainshaft: M3 gear bushing:** 24.95 mm (0.982 in)
- Case journal A:** 19.96 mm (0.786 in)
- Case journal B:** 24.90 mm (0.983 in)
- Countershaft: C2 gear bushing:** 27.95 mm (1.100 in)
- Case journal A:** 27.95 mm (1.100 in)
- Case journal B:** 19.96 mm (0.786 in)



Calculate the clearance by subtracting mainshaft/ countershaft O.D. from gear bushing I.D..

SERVICE LIMITS:

- M3:** 0.08 mm (0.003 in)
- C2:** 0.08 mm (0.003 in)

Calculate the clearance by subtracting gear bushing O.D. from gear I.D..

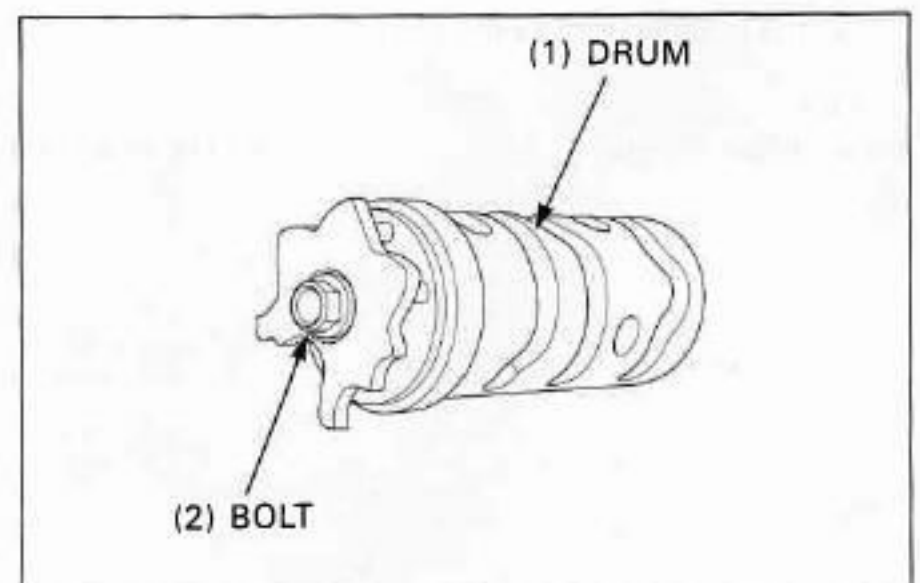
SERVICE LIMITS:

- M3, M5:** 0.10 mm (0.004 in)
- C1, C2, C4:** 0.11 mm (0.004 in)

SHIFT DRUM/SHIFT DRUM BEARING

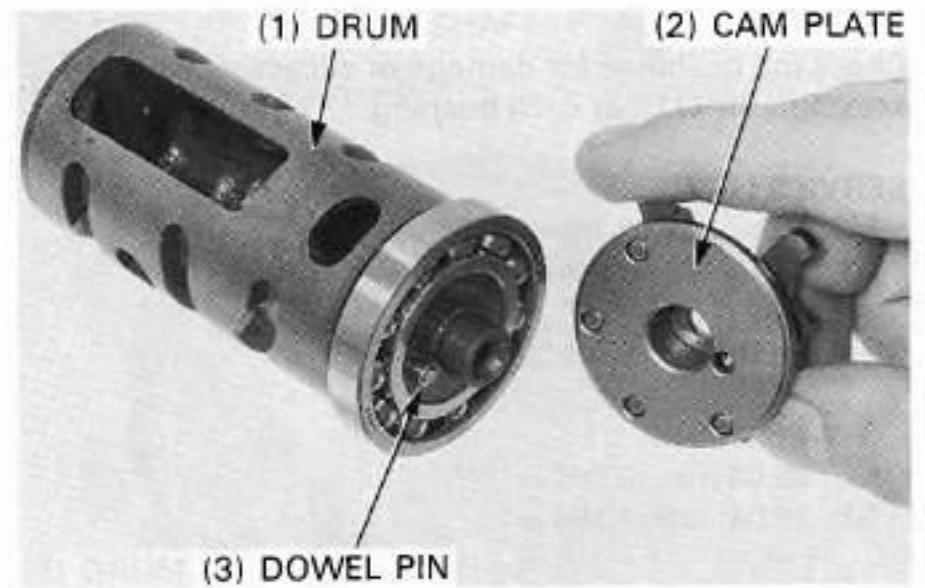
Inspect the shift drum for scoring, scratches or evidence of insufficient lubrication.
Check the shift drum grooves for abnormal wear or damage.

If the it will be replaced, disassemble the shift drum as follows.

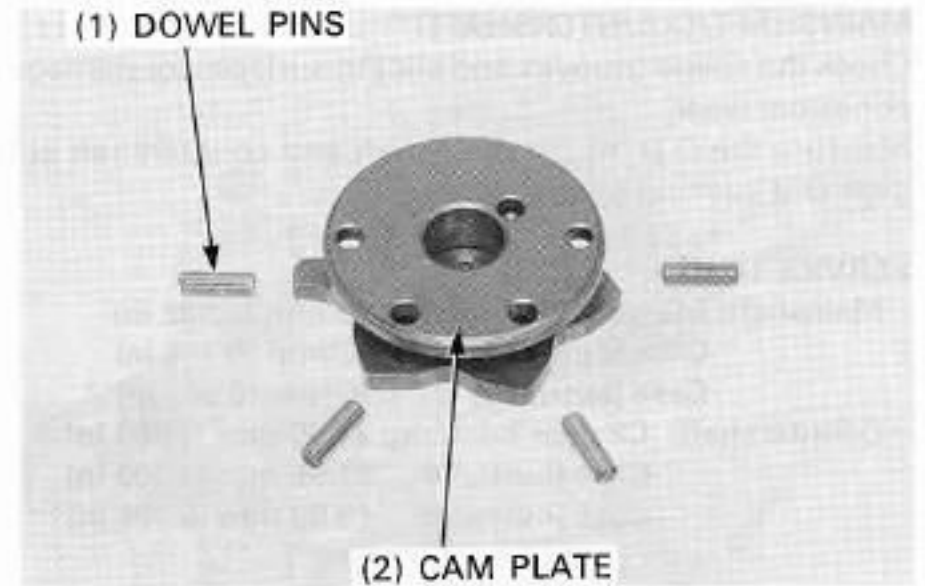


CRANKSHAFT/TRANSMISSION

Remove the bolt and gearshift cam plate.
Remove the dowel pin.



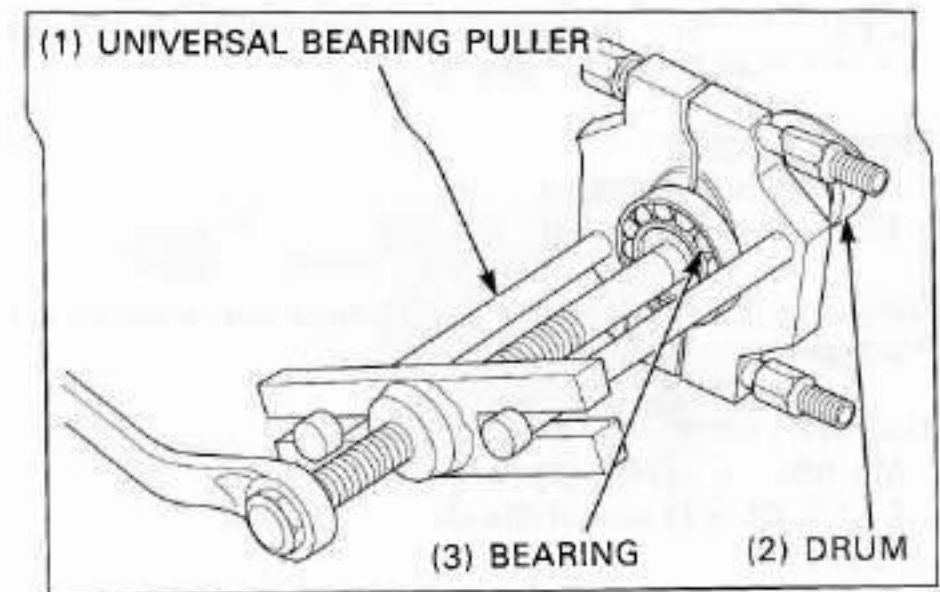
Remove the dowel pins from the gearshift cam plate.



Replace the bearing if the races do not turn smoothly and quietly.

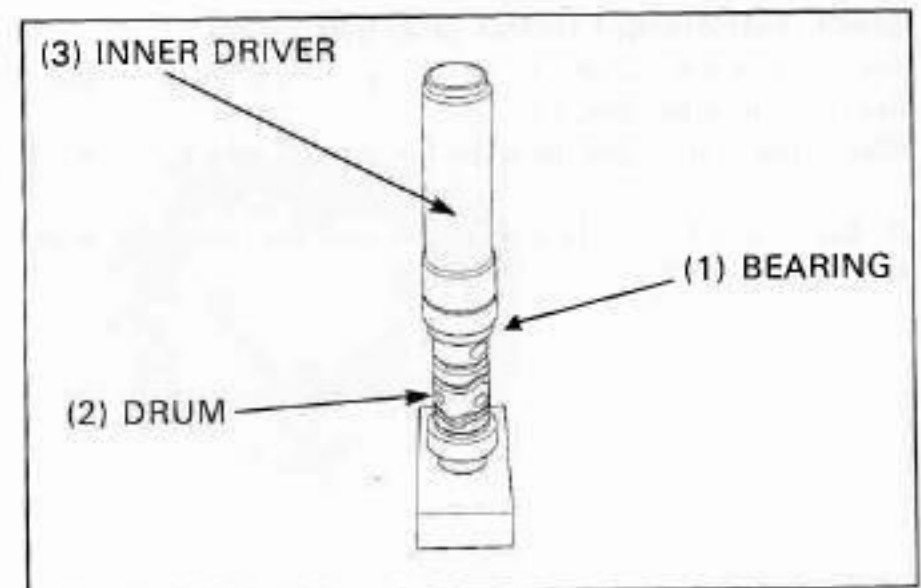
Remove the bearing using the bearing puller.

TOOL:
Universal bearing puller 07631-0010000



Press the new bearing to the shift drum.

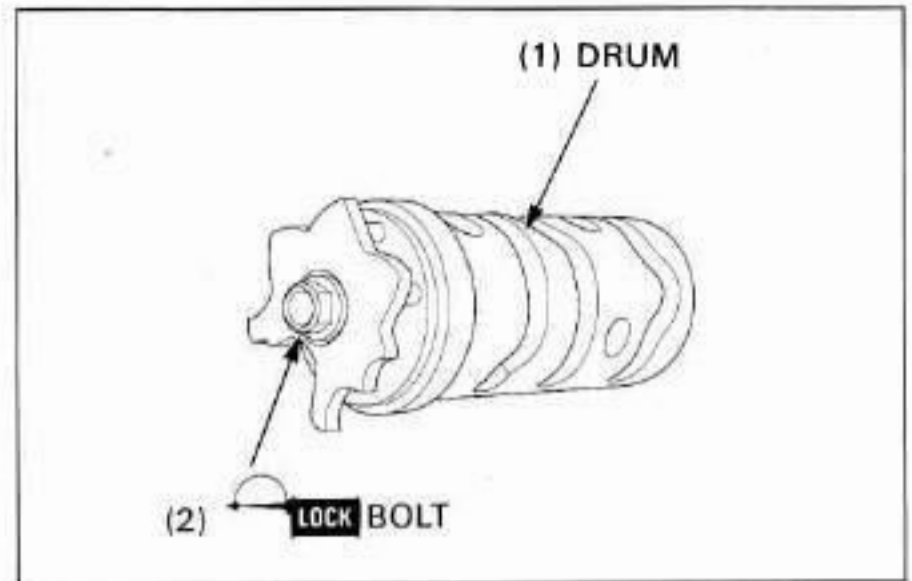
TOOL:
Inner driver, 25 mm 07746-0030200



Installation is in the reverse order of removal.

NOTE

- Install the dowel pin into the shift drum.
- Install the gearshift cam plate aligning the hole on the cam plate with the dowel pin.
- Apply a locking agent to the bolt threads and tighten it securely.

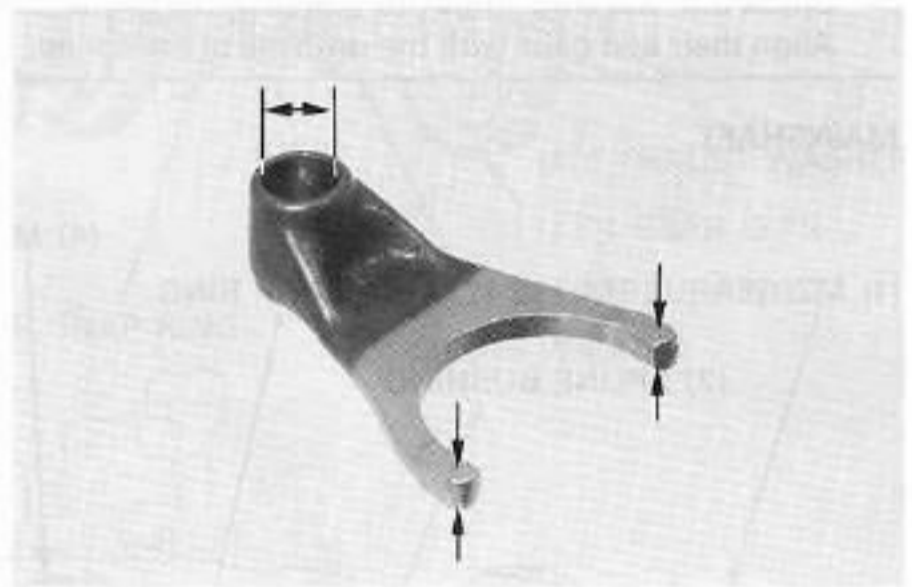
**SHIFT FORK, SHIFT FORK SHAFT**

Check for abnormal wear or deformation.
Measure the shift fork I.D. and claw thickness.

SERVICE LIMITS:

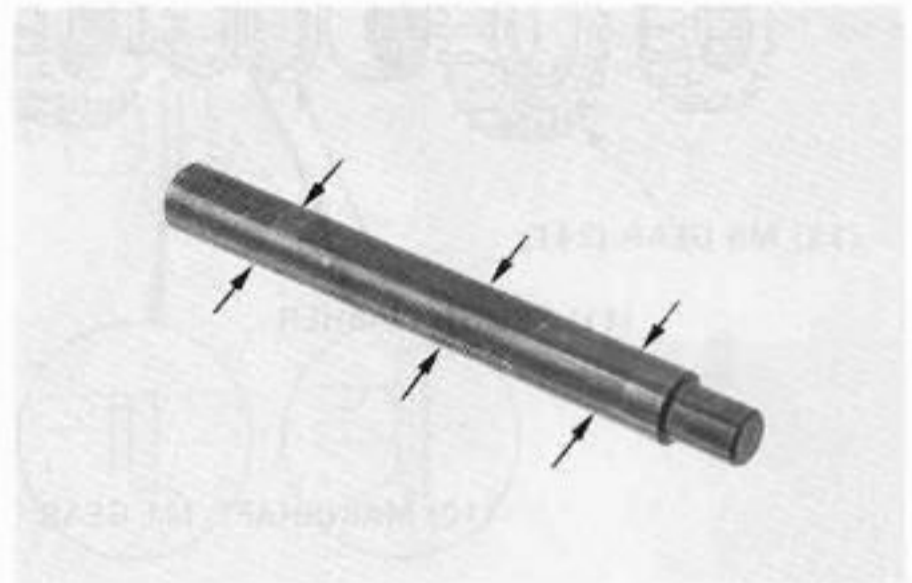
I.D.: 13.04 mm (0.513 in)

Claw thickness: 5.9 mm (0.23 in)



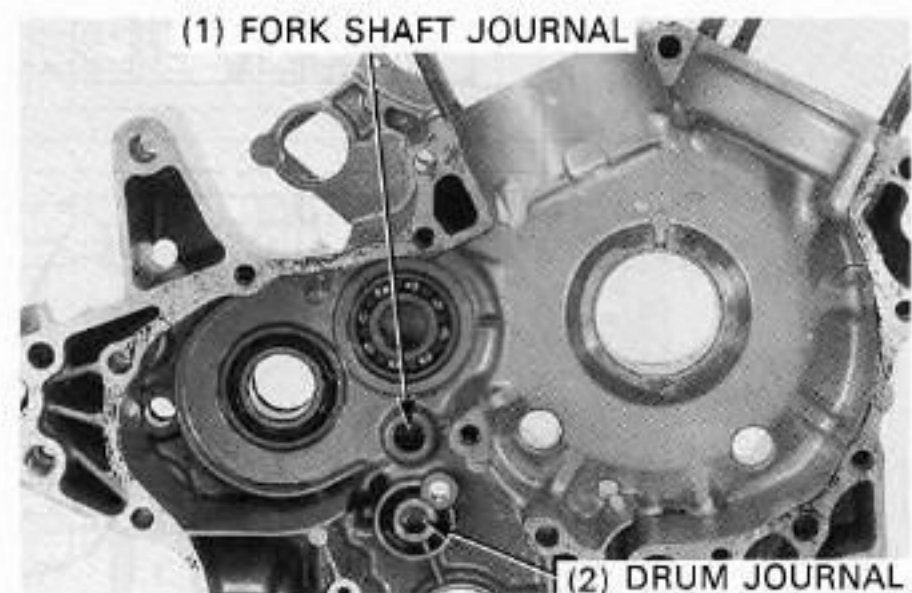
Check for abnormal wear, damage or straightens.
Measure the shift fork O.D..

SERVICE LIMIT: 12.95 mm (0.510 in)

**SHIFT DRUM JOURNAL, SHIFT FORK SHAFT JOURNAL**

Check the right and left crankcase shift fork journal for wear or damage.

Check the left crankcase shift drum journal for wear or damage.



CRANKSHAFT/TRANSMISSION

ASSEMBLY

Clean all parts in solvent.

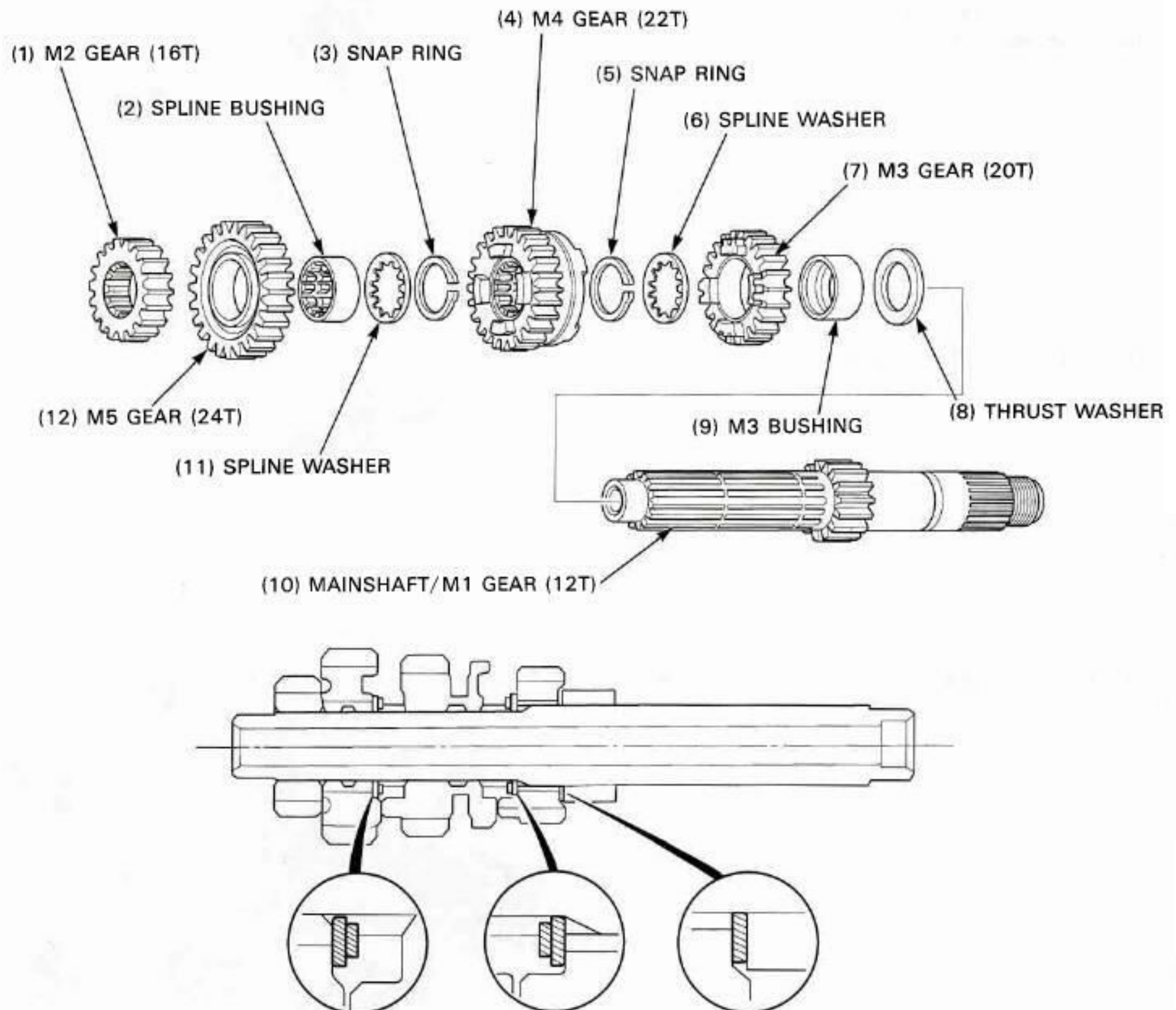
Apply molybdenum oil solution to the gear and bushing sliding surface and shift fork grooves to ensure initial lubrication.

Assemble all parts into their original positions.

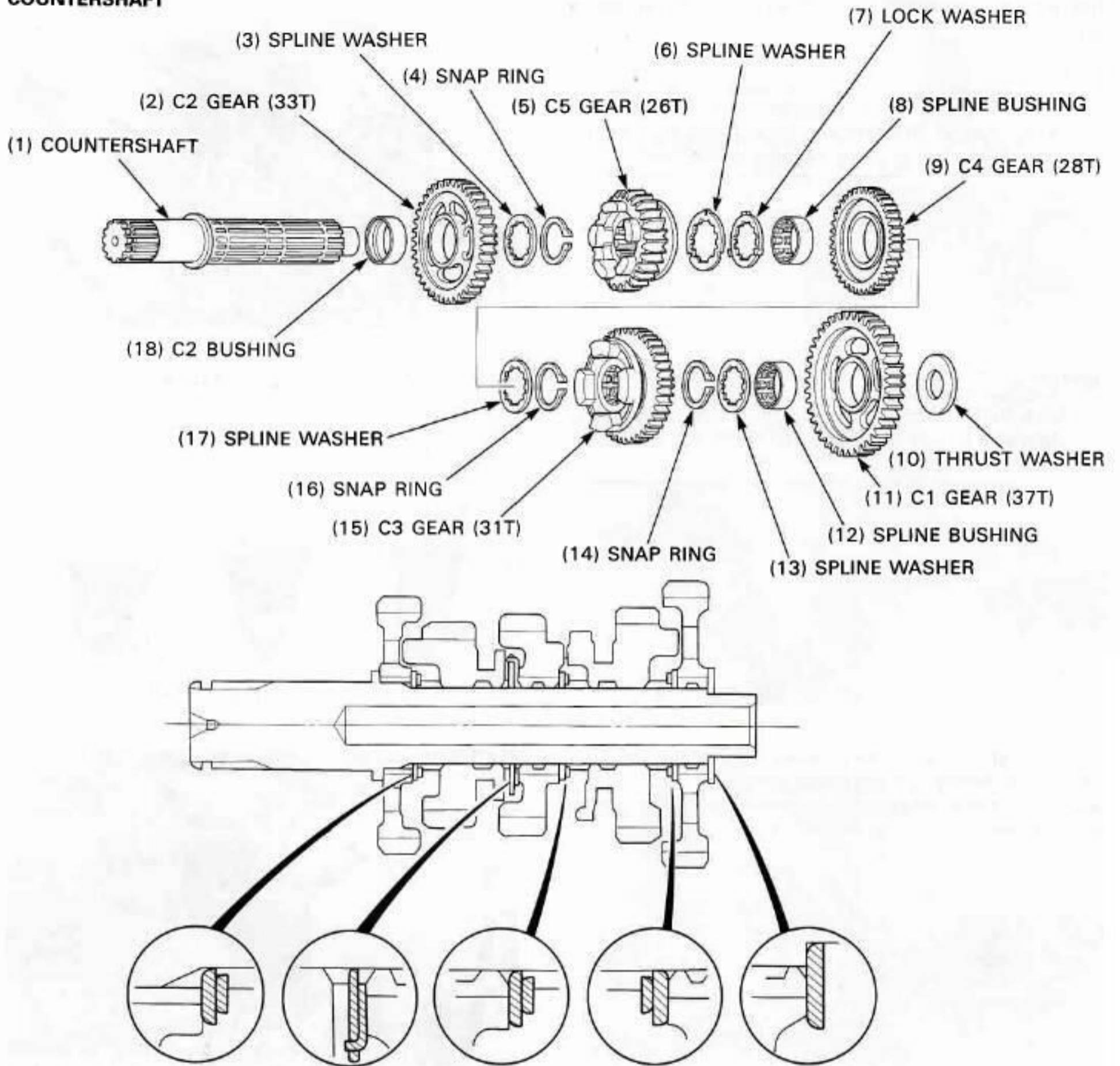
NOTE

- Check the gears for freedom of movement or rotation on the shaft.
- Install the washers and snap rings with the chamfered edges facing the thrust load side.
- Do not reuse worn snap rings which could easily spin in the grooves.
- Check that the snap rings are seated in the grooves. Align their end gaps with the grooves of the spline.

MAINSHAFT



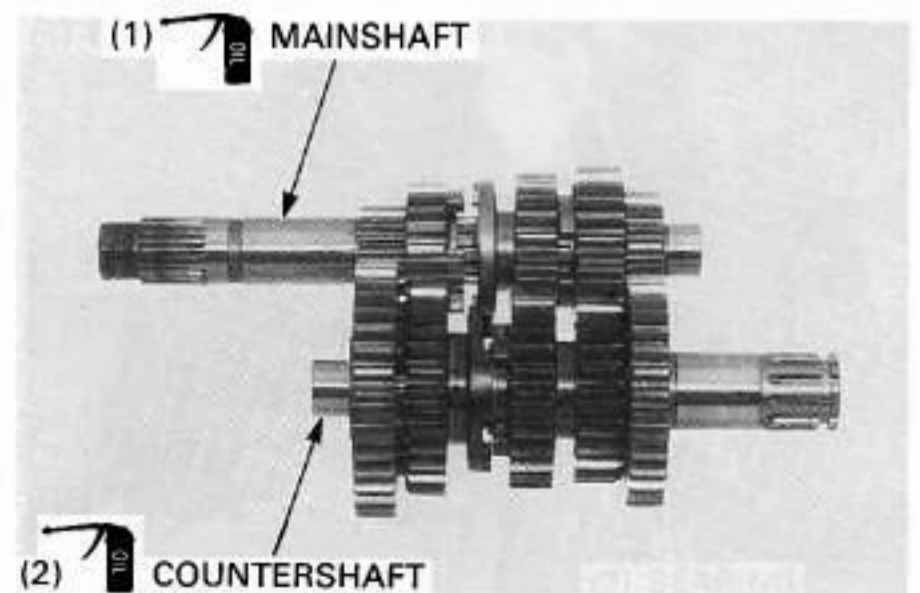
COUNTERSHAFT



INSTALLATION

Apply engine oil to the following parts.

- Mainshaft
- Countershaft
- Each gear
- Mainshaft bearing
- Countershaft bearing
- Shift drum bearing

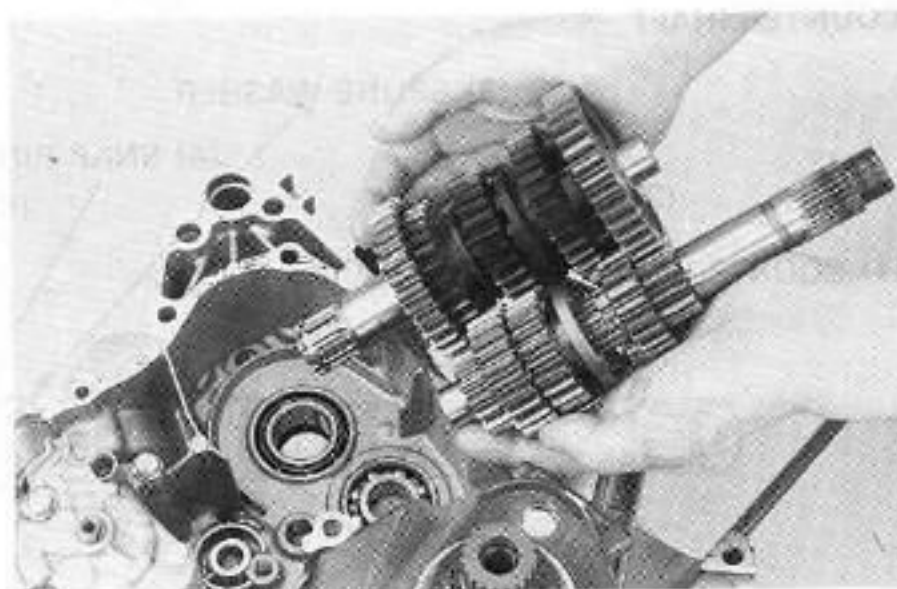


CRANKSHAFT/TRANSMISSION

Install the mainshaft and countershaft to the left crankcase as an assembly.

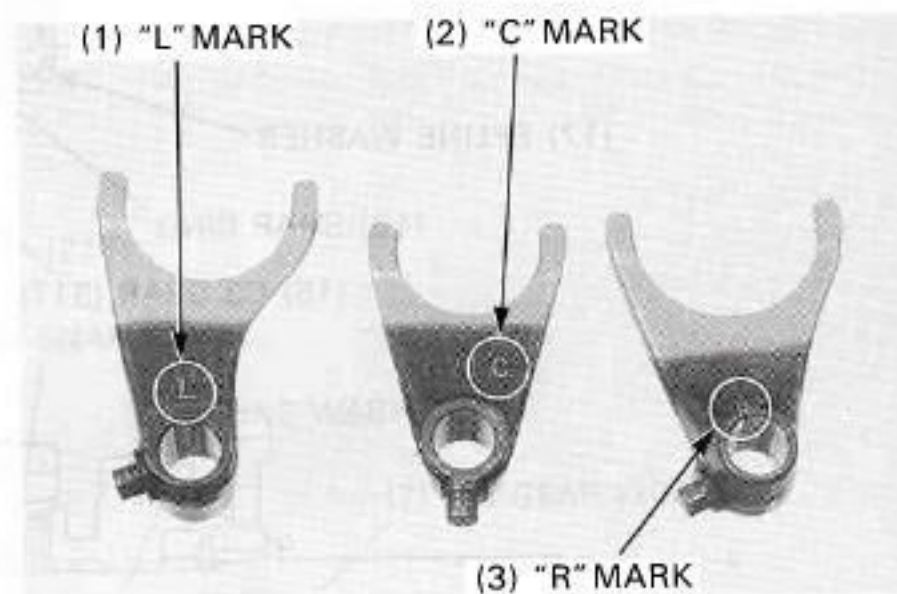
NOTE

- Do not forget to install the transmission end washer.
- When mainshaft and countershaft installation, be careful not to damage the countershaft oil seal.

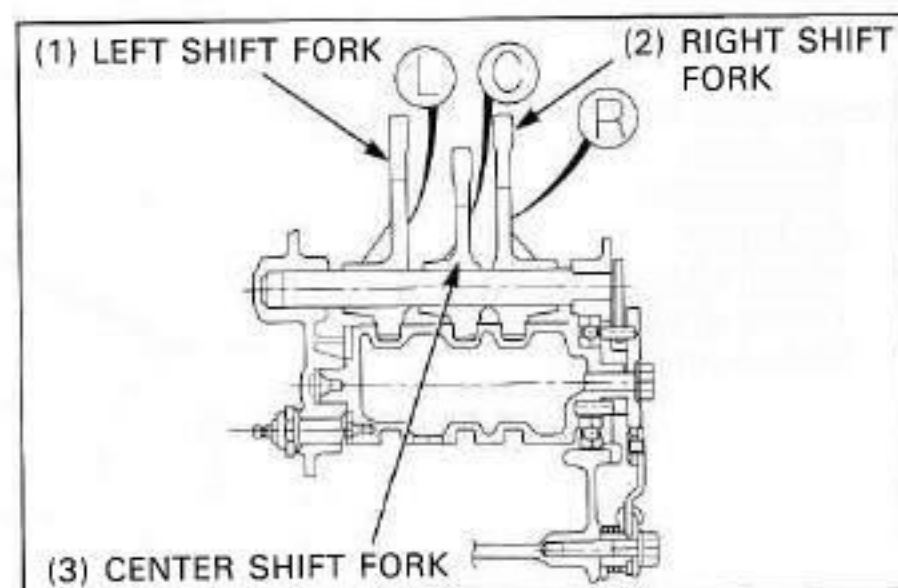
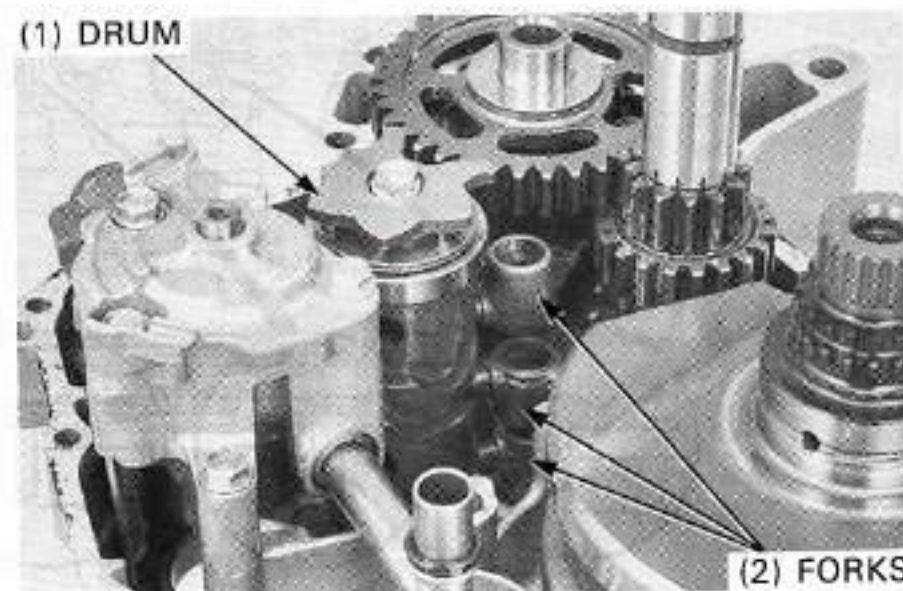


NOTE

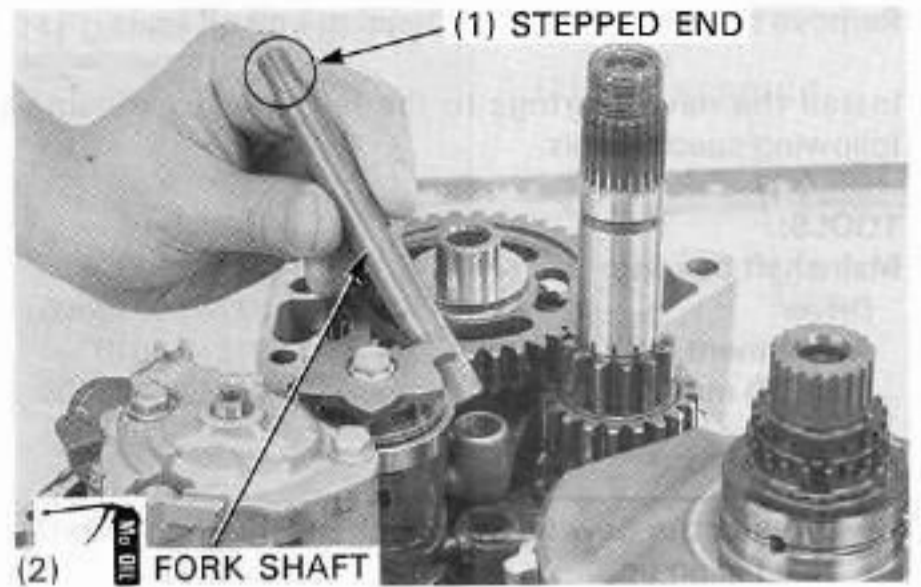
- Each shift fork has an identification mark; "R" is for the right shift fork, "L" is for the left shift fork and "C" is for the center shift fork.



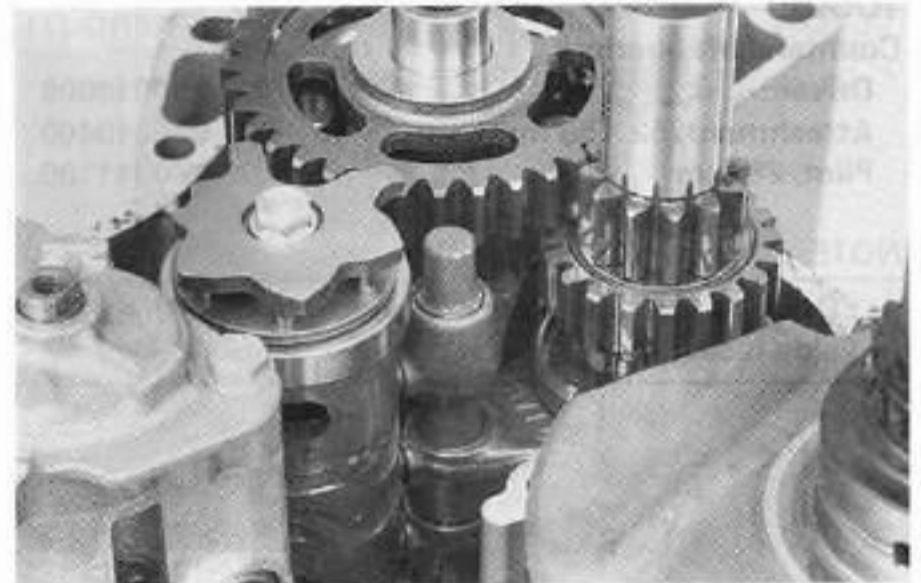
Install the shift forks to the grooves of the shifter gear with their marks facing up (right crankcase side).
Install the shift drum aligning the guide pins on the shift fork with the guide grooves of the shift drum.



Apply molybdenum oil solution to the shift fork shaft.
Install the shift fork shaft with its stepped end side facing up (right crankcase side).



After installing, check for smooth transmission operation.
Assemble the crankcase (page 12-23).



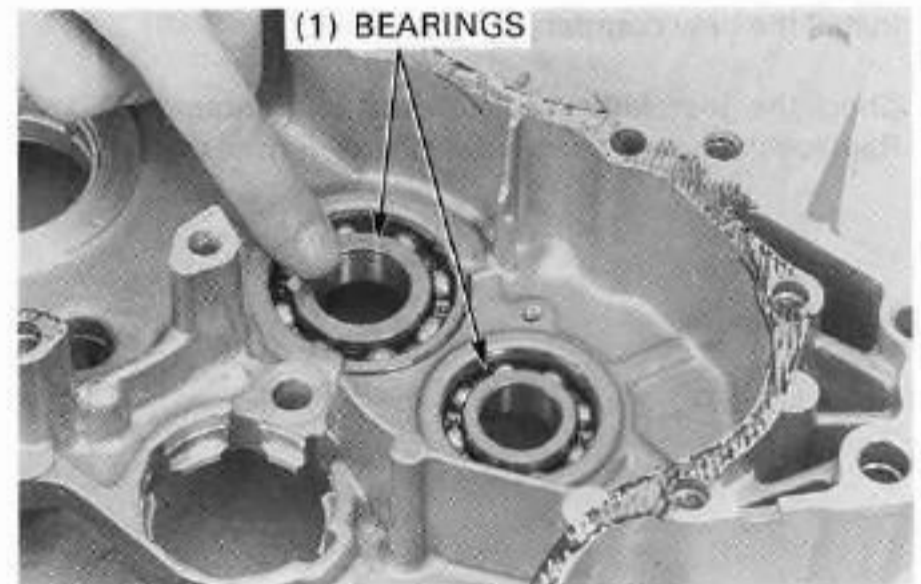
CRANKCASE BEARING REPLACEMENT

Remove the followings:

- Crankshaft (page 12-6).
- Transmission (page 12-14).
- Oil pump (page 4-4).

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.

Replace the bearings if the races does not turn smoothly and quietly, or if they fit loosely in the crankcase.



LEFT CRANKCASE BEARING REPLACEMENT

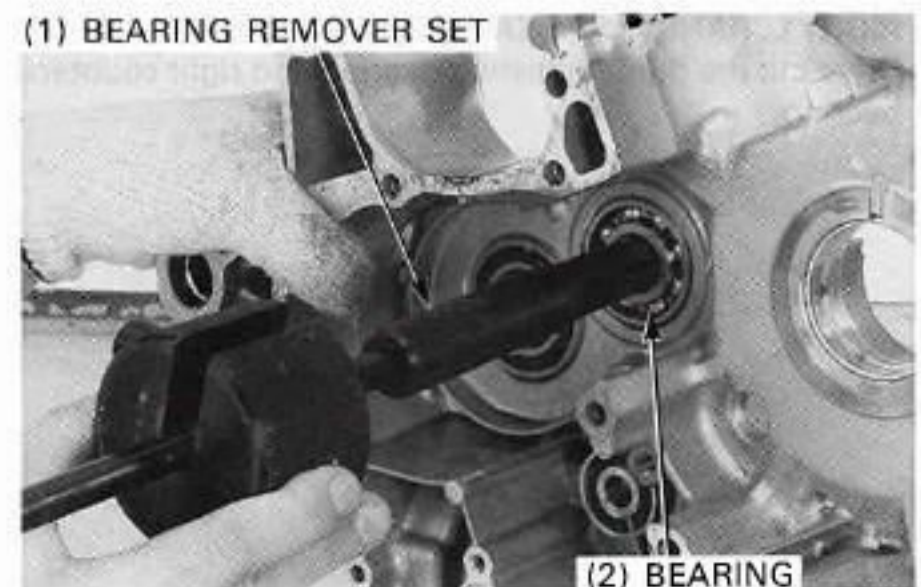
NOTE

- The oil pump must be removed before replacing the crankcase bearing.

Remove the left mainshaft bearing using the special tools.

TOOLS:

- | | |
|--------------------------|---------------|
| Bearing remover set | 07936-3710001 |
| — Remover handle | 07936-3710100 |
| — Bearing remover head | 07936-3710600 |
| — Remover sliding weight | 07741-0010201 |



CRANKSHAFT/TRANSMISSION

Remove the left countershaft bearing and oil seal.

Install the new bearings to the left crankcase using the following special tools.

TOOLS:

Mainshaft bearing:

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


NOTE

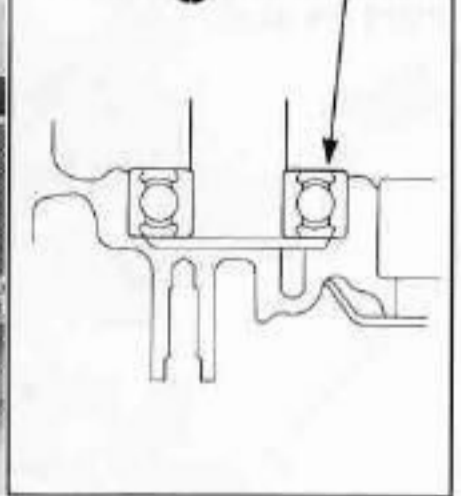
- Drive in the new bearings squarely with the marking side facing up.

(1) DRIVER



(3) ATTACHMENT

(2)  BEARING



TOOLS:

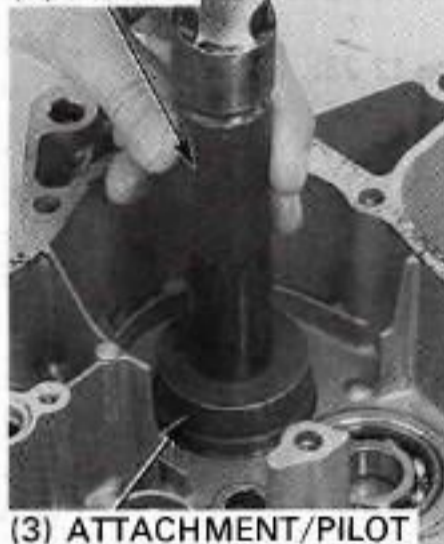
Countershaft bearing:

| | |
|----------------------|---------------|
| Driver | 07749-0010000 |
| Attachment, 52×55 mm | 07746-0010400 |
| Pilot, 28 mm | 07746-0041100 |


NOTE

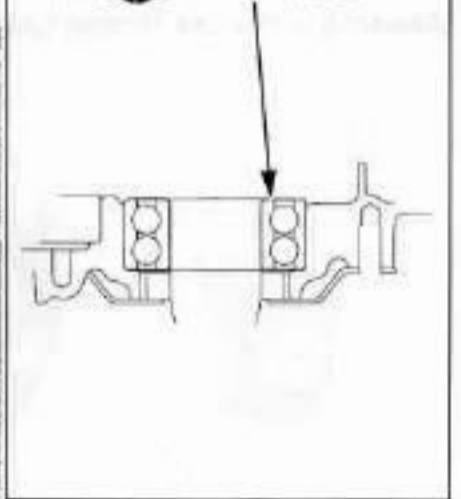
- Drive in the new bearings squarely with the marking side facing up.

(1) DRIVER



(3) ATTACHMENT/PILOT

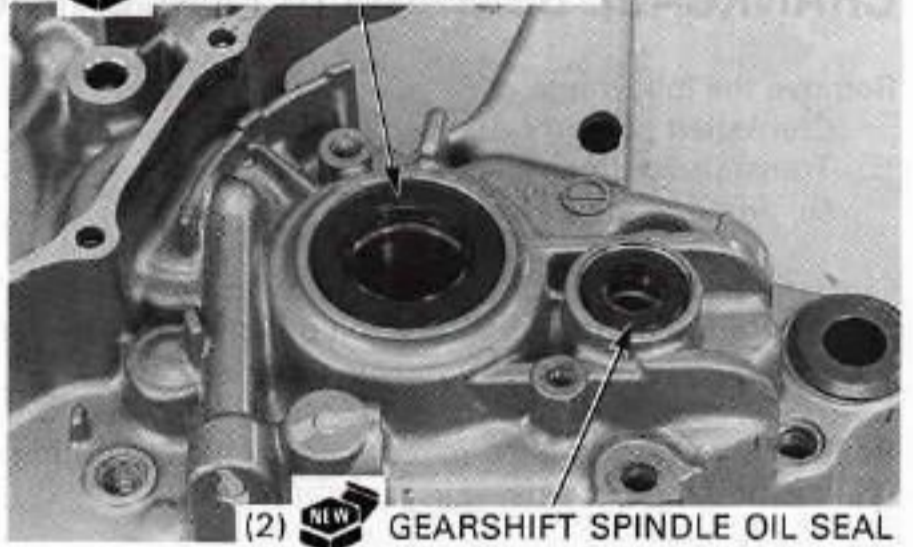
(2)  BEARING




Install the new countershaft oil seal.

Check the gearshift spindle oil seal for damage.
Replace the gearshift spindle oil seal if necessary.

(1)  COUNTERSHAFT OIL SEAL



(2)  GEARSHIFT SPINDLE OIL SEAL

RIGHT LCRANKCASE BEARING REPLACEMENT

Drive out the right mainshaft bearing and right countershaft bearing.

(1) MAINSHAFT BEARING



(2) COUNTERSHAFT BEARING

Install the new bearings to the right crankcase using the following special tools.

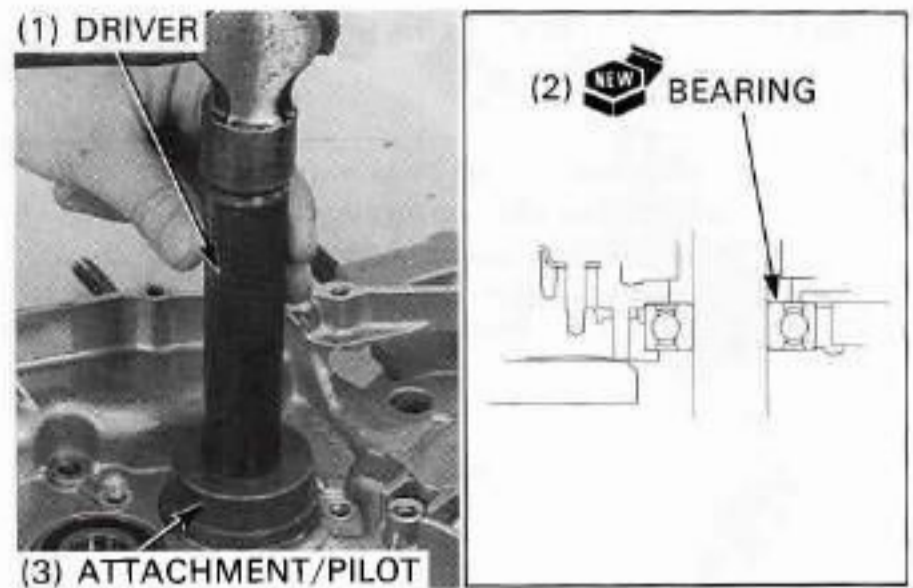
TOOLS:

Mainshaft bearing:

| | |
|----------------------|---------------|
| Driver | 07749-0010000 |
| Attachment, 62×68 mm | 07746-0010500 |
| Pilot, 25 mm | 07746-0040600 |

NOTE

- Drive in the new bearings squarely with the marking side facing up.



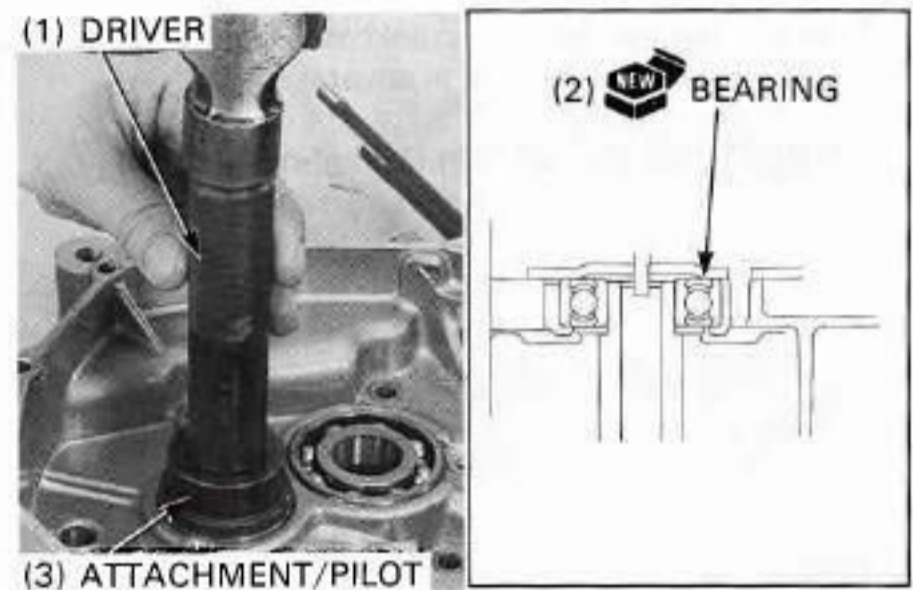
TOOLS:

Countershaft bearing:

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

NOTE

- Drive in the new bearings squarely with the marking side facing up.



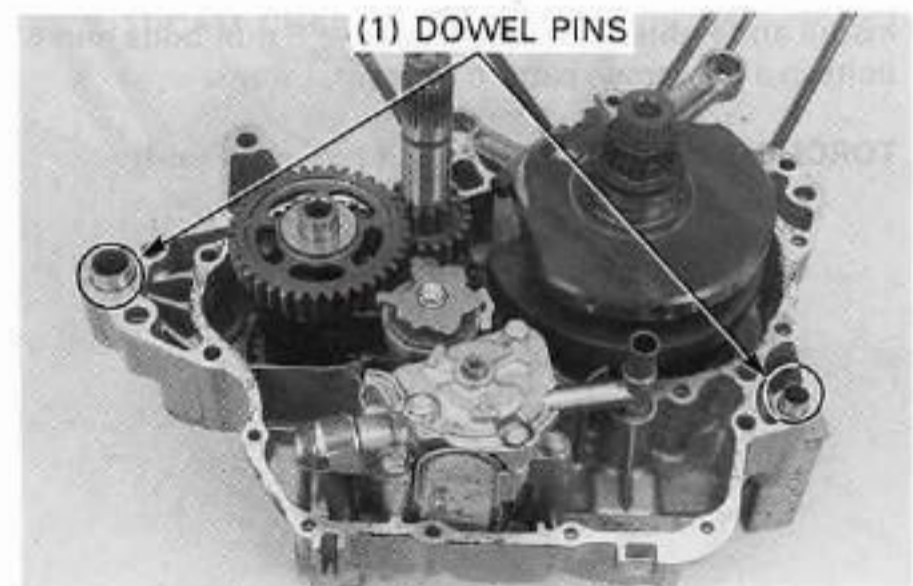
CRANKCASE ASSEMBLY

Clean the right and left crankcase mating surface thoroughly, being careful not to damage them.

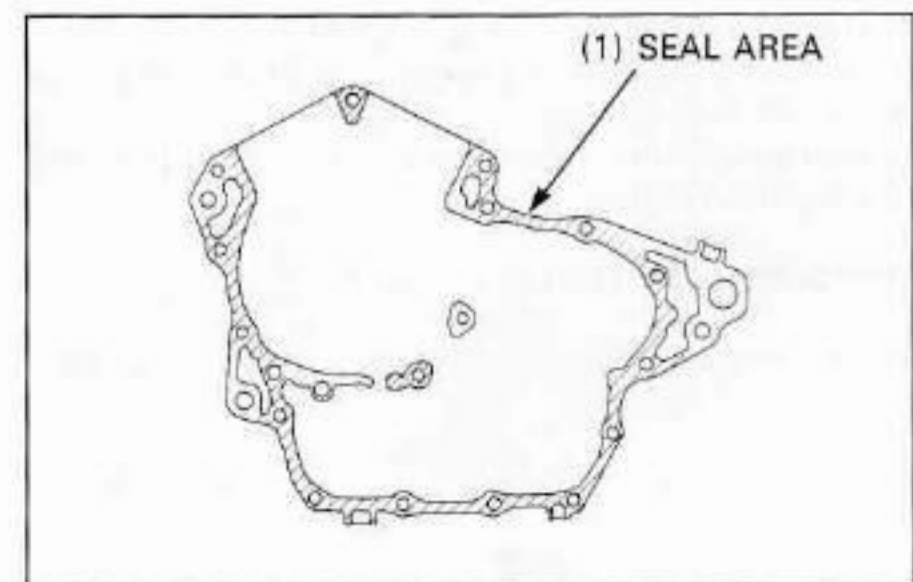
Install the followings:

- Crankshaft (page 12-13)
- Transmission (page 12-19)
- Oil pump (page 4-9)

Install the dowel pins.



Apply a light but thorough coating of sealant to all crankcase mating surfaces except the oil passage area.

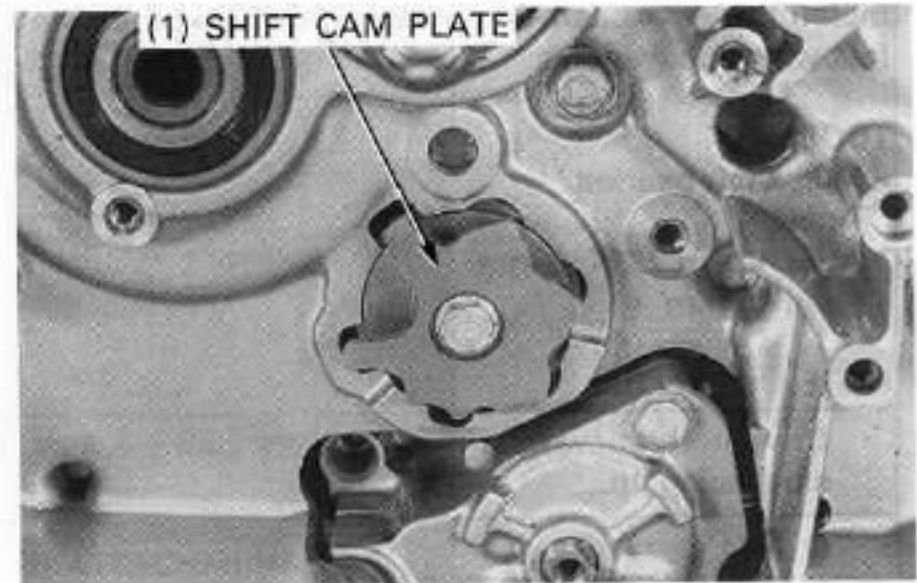


CRANKSHAFT/TRANSMISSION

Install the right crankcase to the left crankcase.

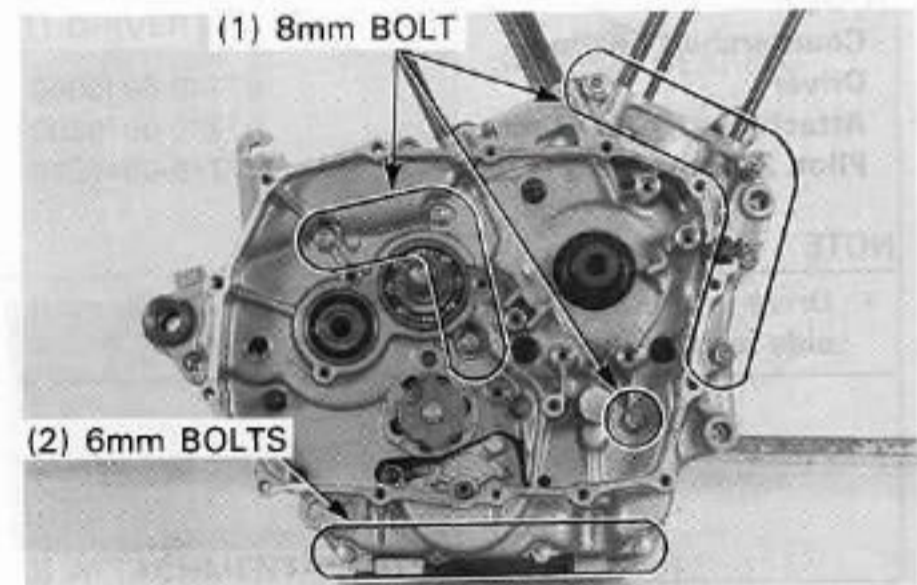
CAUTION

- Turn the shift drum until shift cam plate as shown.
- Do not force crankcase halves together; if there is excessive force required, something is wrong. Remove the right crankcase and check for misaligned parts.



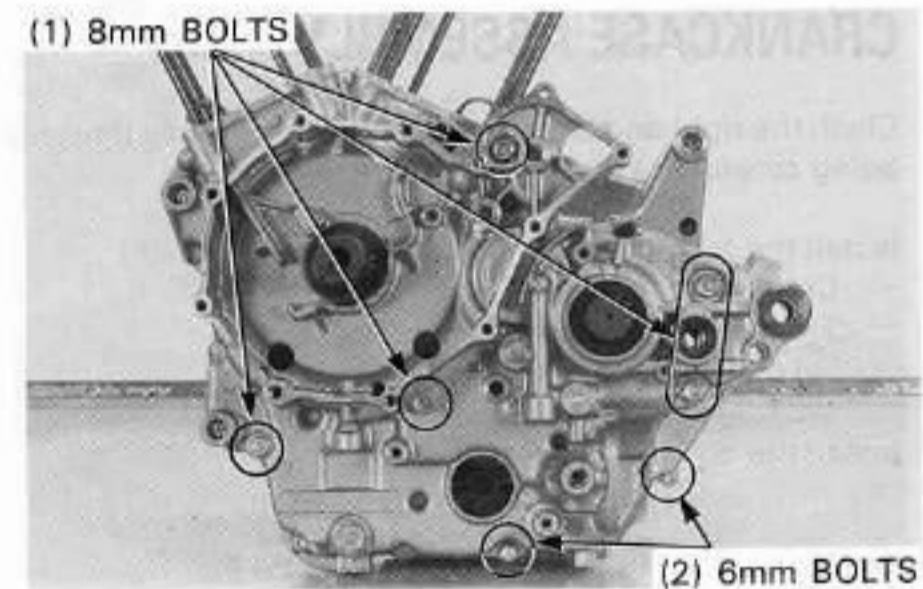
Install and tighten the right crankcase 8 mm bolts and 6 mm bolts in a crisscross pattern in several steps.

TORQUE: 8 mm bolt: 23 N·m (2.3 kgf·m, 17 lbf·ft)



Install and tighten the left crankcase 8 mm bolts and 6 mm bolts in a crisscross pattern in several steps.

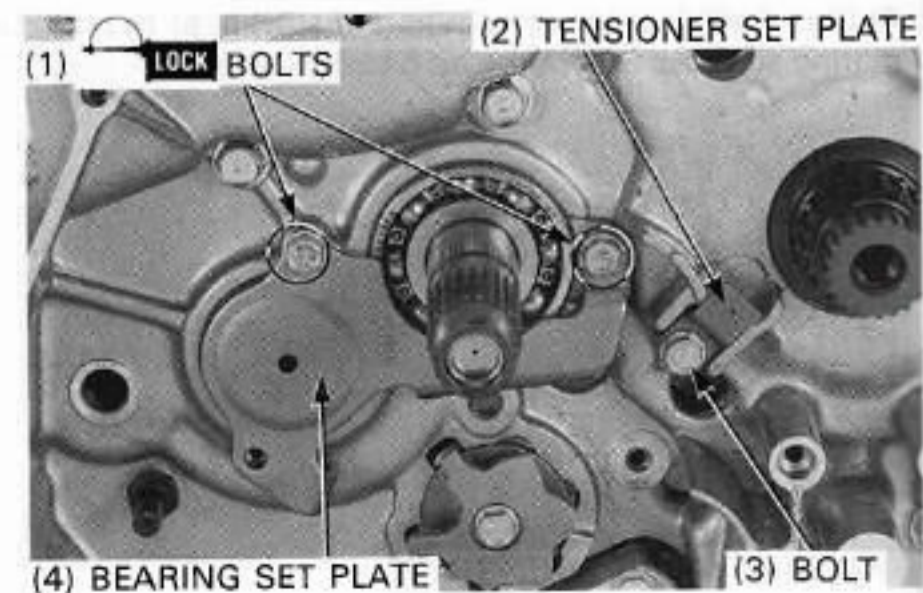
TORQUE: 8 mm bolt: 23 N·m (2.3 kgf·m, 17 lbf·ft)



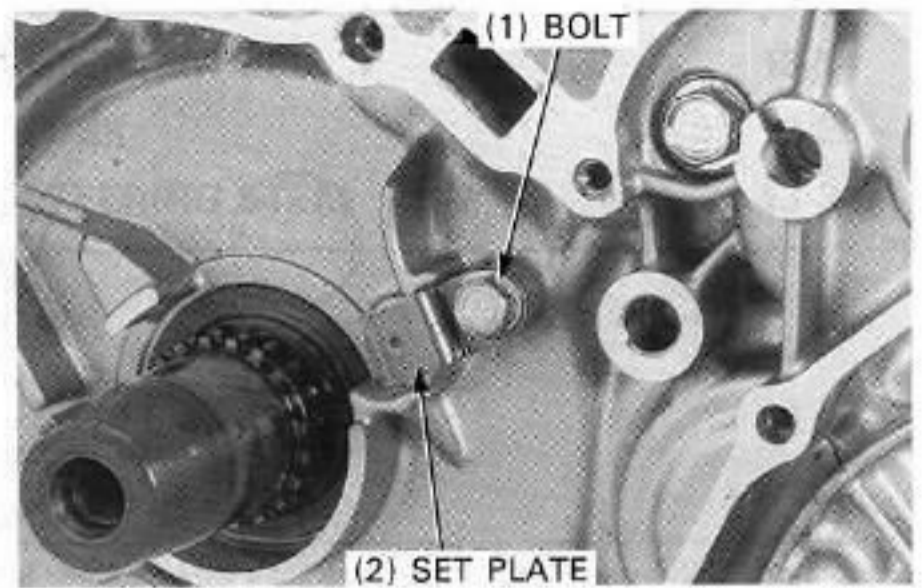
Install the mainshaft bearing set plate.
Clean and apply a locking agent to the mainshaft bearing set plate bolt threads.
Install and tighten the mainshaft bearing set plate bolts to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

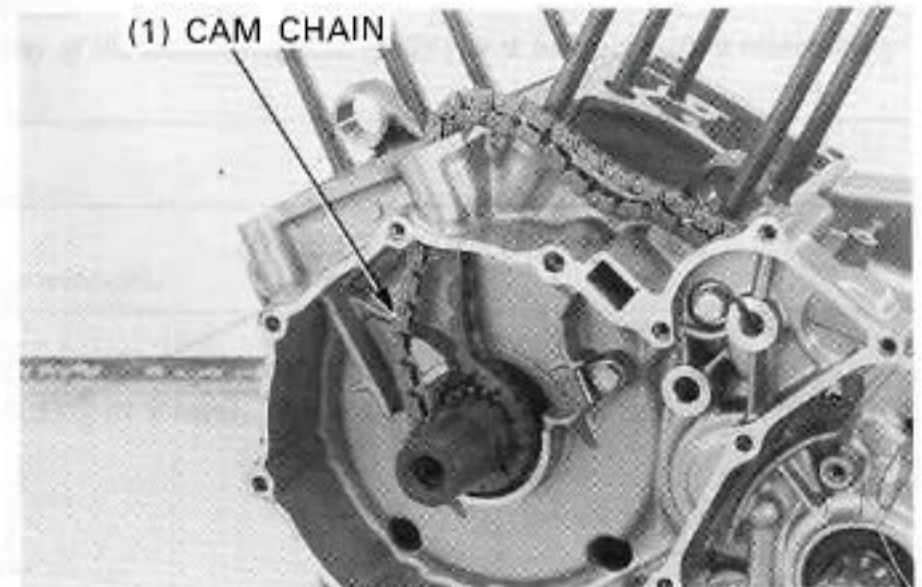
Install the front cam chain tensioner set plate and bolt.



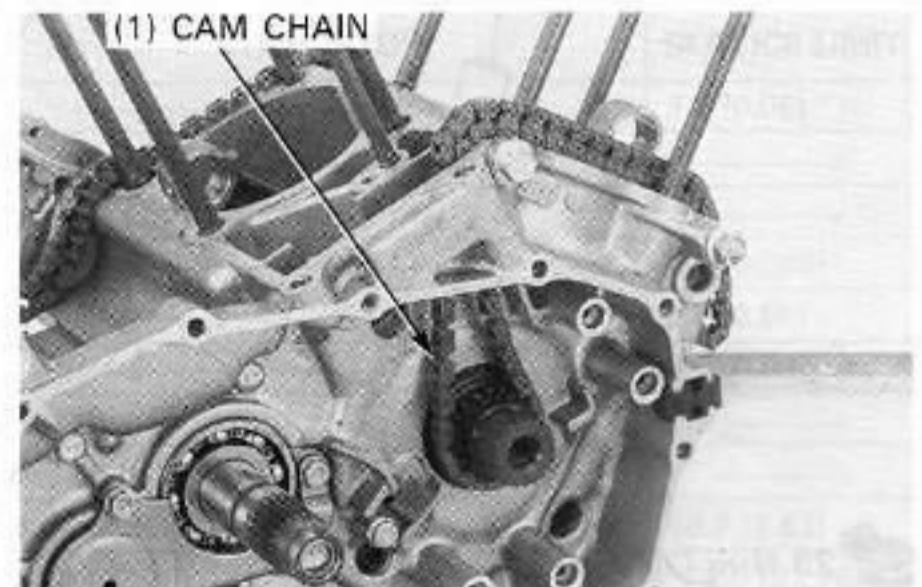
Install the rear cam chain tensioner set plate and bolt.



Install the front cam chain into the crankshaft tooth.



Install the rear cam chain into the crankshaft tooth.



Install the engine sub harness.

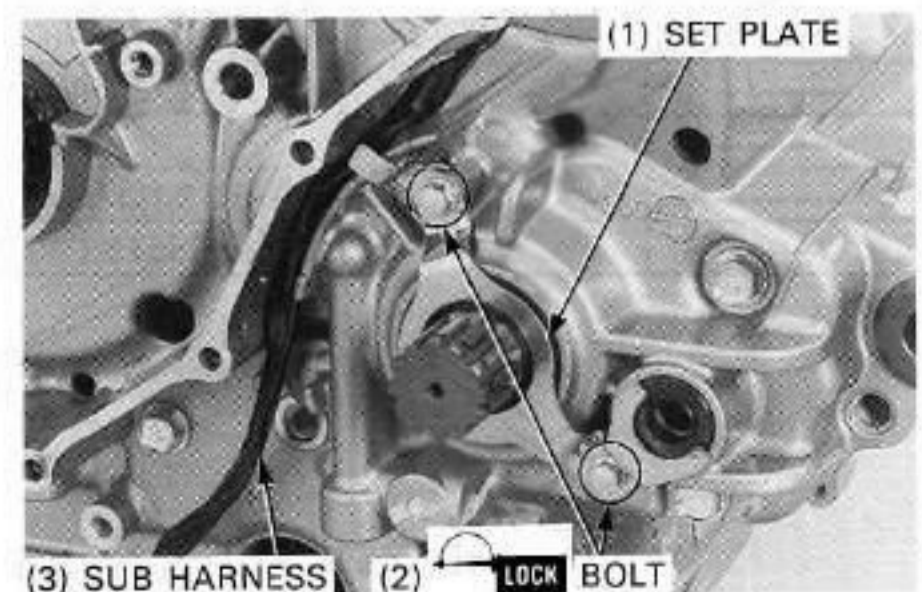
NOTE

- Route the engine sub harness correctly (page 1-22).

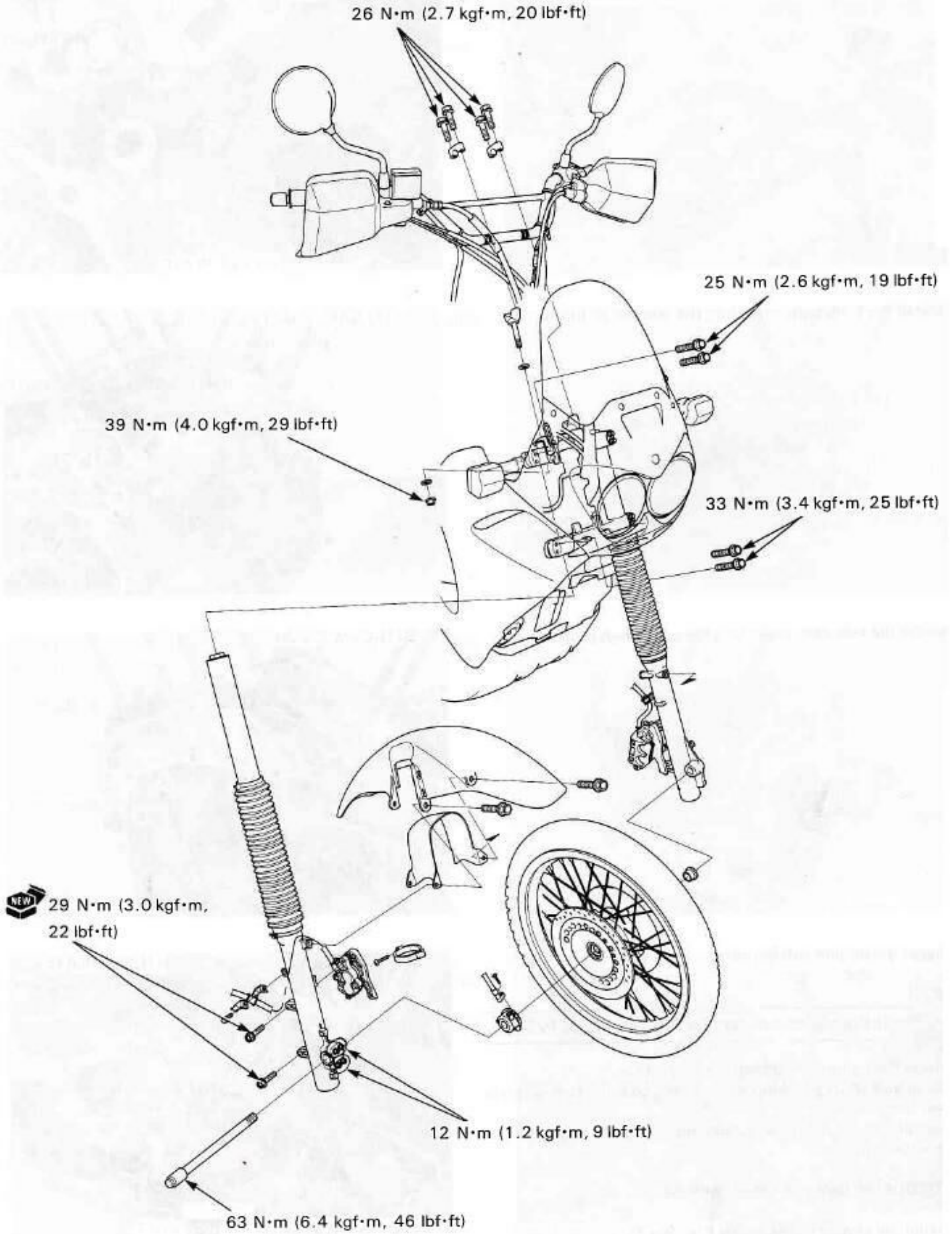
Install the countershaft bearing set plate.
Clean and apply a locking agent to the countershaft set plate bolt threads.
Install the countershaft bearing set plate bolts to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the engine to the frame (Section 7).



FRONT WHEEL/SUSPENSION/STEERING



13. FRONT WHEEL/SUSPENSION/STEERING

| | | | |
|---------------------|------|---------------|-------|
| SERVICE INFORMATION | 13-1 | FRONT WHEEL | 13-14 |
| TROUBLESHOOTING | 13-2 | FORK | 13-23 |
| HANDLEBAR | 13-3 | STEERING STEM | 13-34 |

SERVICE INFORMATION

GENERAL

⚠ WARNING

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean contaminated disc with a high quality brake degreasing agent.
- Riding on damaged rims or spokes impairs safe operation of the vehicle.
- Wheel balance directly affects the stability, handling and overall safety of the motorcycle. Carefully check balance before reinstalling the wheel.

CAUTION

- Do not jack up the motorcycle using oil filter.
- To avoid damaging the rim when using the tire lever, always use rim protectors.

- When servicing the front wheel, support the motorcycle securely with a jack or other support under the engine.
- Do not operate the brake lever after removing the caliper and front wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.
- Refer to Section 15 for brake system information.

SPECIFICATIONS

| ITEM | | STANDARD | SERVICE LIMIT |
|-----------------------------------|----------------------|--|---------------|
| Minimum tire tread depth | | _____ | 1.5 (0.06) |
| Cold tire pressure | Driver only | 200 kPa (2.00 kgf/cm ² , 29 psi) | _____ |
| | Driver and passenger | 200 kPa (2.00 kgf/cm ² , 29 psi) | _____ |
| Front axle runout | | _____ | 0.2 (0.008) |
| Front wheel rim runout | Radial | _____ | 2.0 (0.08) |
| | Axial | _____ | 2.0 (0.08) |
| Front wheel hub-to-rim distance | | 26 (1.0) | _____ |
| Wheel balance weight | | Max 60 g | _____ |
| Fork spring free length | A | 68.3 (2.68) | 66.9 (2.63) |
| | B | 564.1 (22.20) | 552.8 (21.76) |
| Fork spring B installed direction | | Taper would coil facing down | _____ |
| Fork tube runout | | _____ | 0.20 (0.008) |
| Recommended fork oil | | Fork fluid | _____ |
| Fork oil level | | 106 (4.1) | _____ |
| Fork oil capacity | | 648cm ³ (21.9 US oz, 22.7 Imp oz) | _____ |
| Steering bearing preload | | 1.1 – 1.6 kgf (2.43 – 3.53 lbf) | _____ |

Unit:mm(in)

13

FRONT WHEEL/SUSPENSION/STEERING

TORQUE VALUES

| | |
|--------------------------------|--|
| Front axle | 63 N•m (6.4 kgf•m, 46 lbf•ft) |
| Front axle holder nut | 12 N•m (1.2 kgf•m, 9 lbf•ft) |
| Front brake disc mounting bolt | 42 N•m (4.3 kgf•m, 31 lbf•ft) ALOC bolt |
| Steering stem nut | 126 N•m (12.8 kgf•m, 93 lbf•ft) |
| Steering top thread | 11 N•m (1.1 kgf•m, 8 lbf•ft) |
| Handlebar upper holder bolt | 26 N•m (2.7 kgf•m, 20 lbf•ft) |
| Handlebar lower holder nut | 39 N•m (4.0 kgf•m, 29 lbf•ft) |
| Choke lever pivot bolt | 9 N•m (0.9 kgf•m, 6.5 lbf•ft) |
| Throttle housing cover screw | 4.2 N•m (0.43 kgf•m, 3.1 lbf•ft) |
| Fork top bridge pinch bolt | 25 N•m (2.6 kgf•m, 19 lbf•ft) |
| Fork bottom bridge pinch bolt | 33 N•m (3.4 kgf•m, 25 lbf•ft) |
| Fork cap | 22 N•m (2.2 kgf•m, 16 lbf•ft) |
| Fork socket bolt | 20 N•m (2.0 kgf•m, 14 lbf•ft) Apply a locking agent to the threads |
| Front caliper mounting bolt | 29 N•m (3.0 kgf•m, 22 lbf•ft) ALOC bolt |

TOOLS

| | |
|-----------------------------|---------------|
| Steering stem socket wrench | 07916-KA50100 |
| Steering stem driver | 07946-4300101 |
| Oil seal driver attachment | 07947-KA40200 |
| Slider weight | 07947-KA50100 |
| Ball race driver | 07953-MJ10000 |
| – Driver attachment | 07953-MJ10100 |
| – Driver handle | 07953-MJ10200 |
| Spanner C, 5.8 X 6.1 mm | 07701-0020300 |
| Bearing remover shaft | 07746-0050100 |
| Bearing remover head, 17 mm | 07746-0050500 |
| Attachmeht, 37 X 40 mm | 07746-0010200 |
| Attachmeht, 42 X 47 mm | 07746-0010300 |
| Pilot, 17 mm | 07746-0040400 |
| Driver | 07749-0010000 |

TROUBLESHOOTING

Hard steering

- Steering top thread too tight
- Faulty steering head bearings
- Damaged steering head bearings
- Faulty tire
- Insufficient tire pressure

Steers to one side or does not track straight

- Bent fork
- Faulty steering head bearings
- Damaged steering head bearings
- Unevenly adjusted right and left forks
- Bent frame
- Worn wheel bearings
- Bent front axle
- Worn swingarm pivot component

Front Wheel wobbling

- Bent rim
- Worn wheel bearings
- Faulty tire
- Unbalanced tire and wheel

Soft suspension

- Weak fork spring
- Low fluid level in fork
- Insufficient fluid in fork
- Low tire pressure

Hard suspension

- High tire pressure
- Bent fork
- High fluid level in fork
- Incorrect fluid weight
- Clogged fluid passage

Front suspension noisy

- Loose fork fasteners
- Insufficient fluid in fork

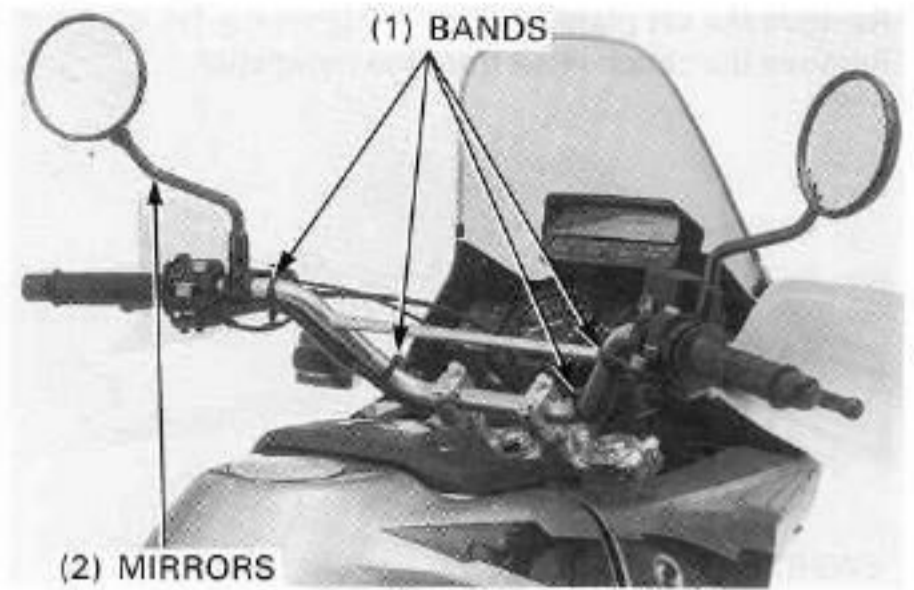
Wheel turns hard

- Faulty wheel bearings
- Bent front axle
- Brake drug
- Faulty speedometer gear

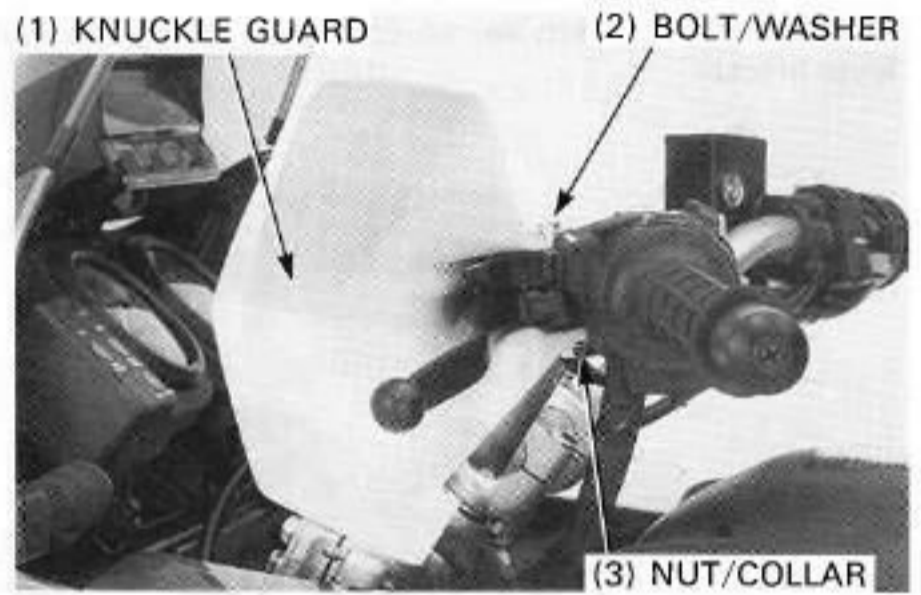
HANDLEBAR

REMOVAL

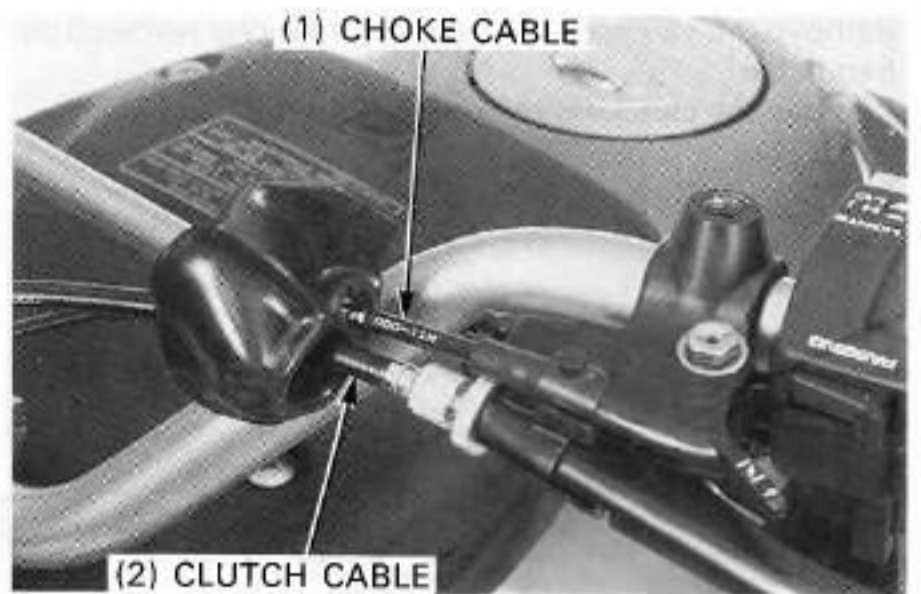
Remove the wire bands and rear view mirrors.



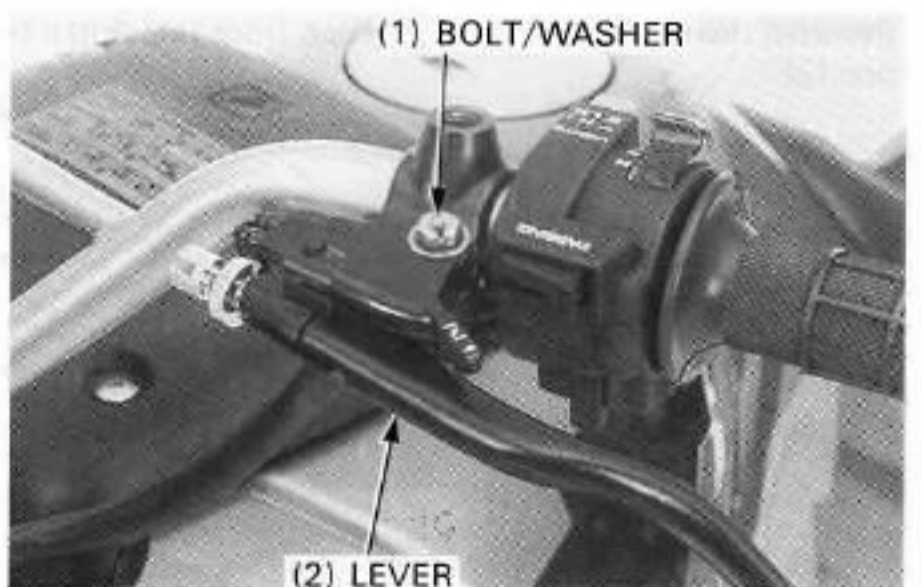
Remove the bolt and washer.
Remove the choke lever pivot nut and collar.
Remove the knuckle guard from the clutch lever bracket.



Disconnect the clutch cable and choke cable from the clutch lever and choke lever.

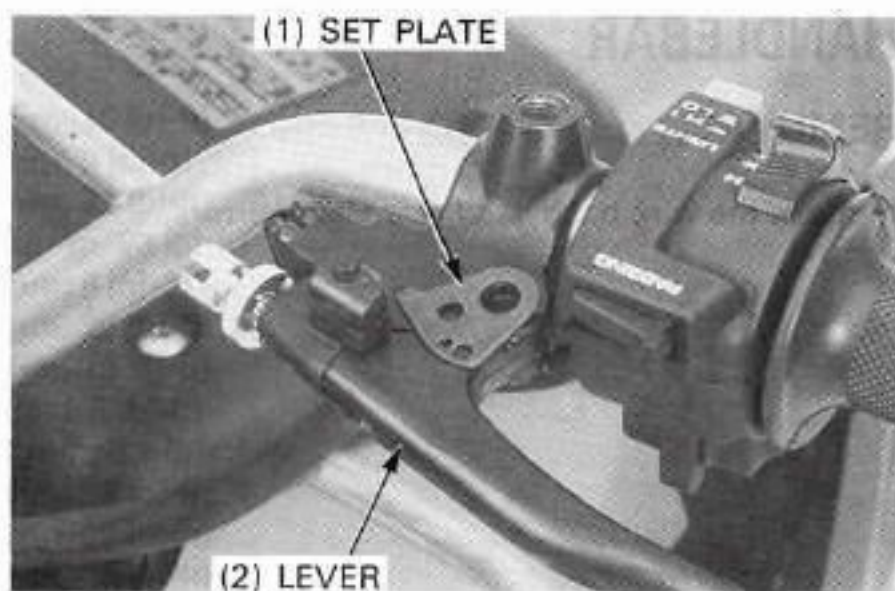


Remove the choke lever pivot bolt and washer.
Remove the choke lever.

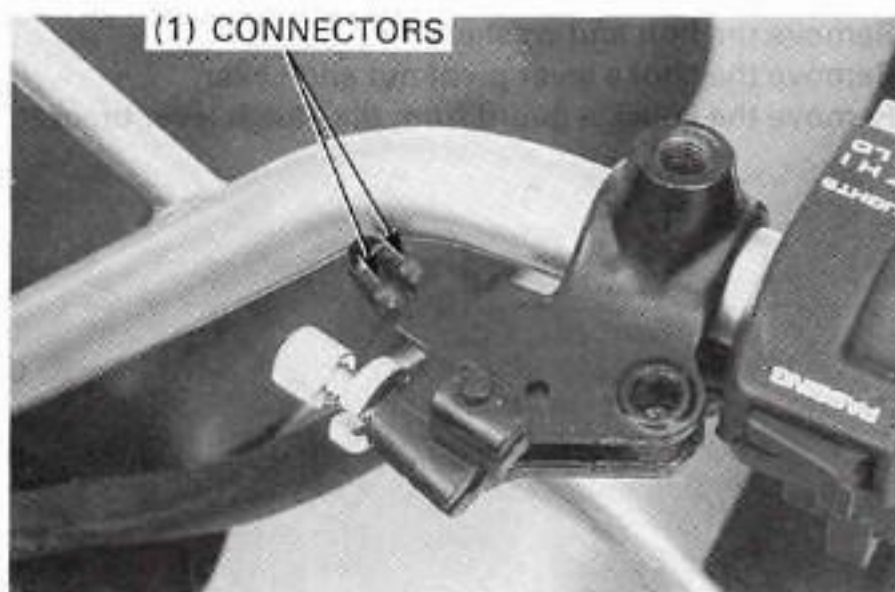


FRONT WHEEL/SUSPENSION/STEERING

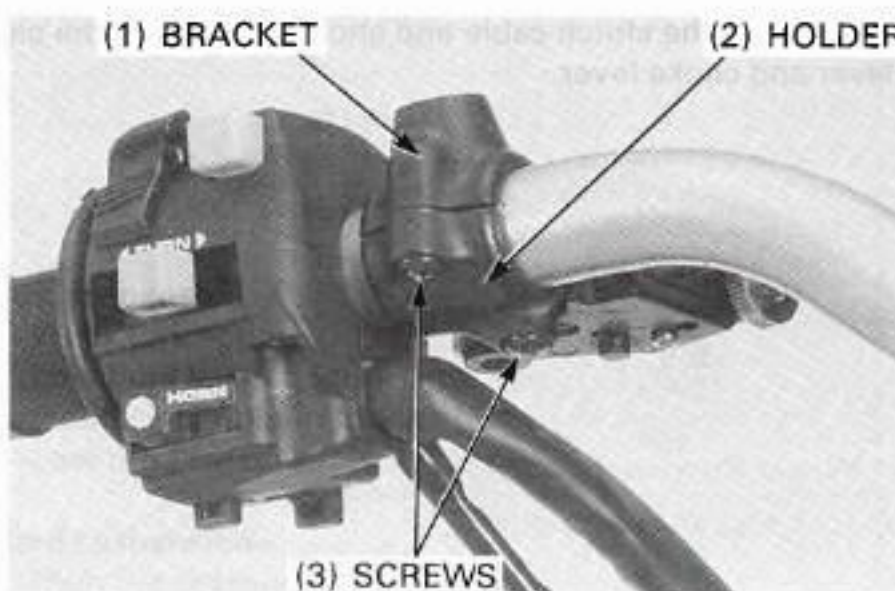
Remove the set plate.
Remove the clutch lever from the handlebar.



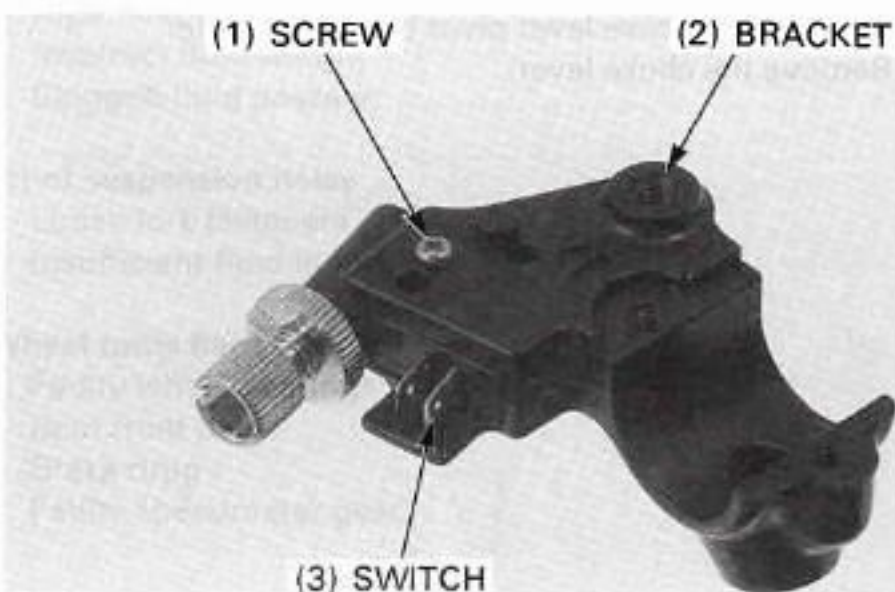
Disconnect the clutch switch connectors from the clutch lever bracket.



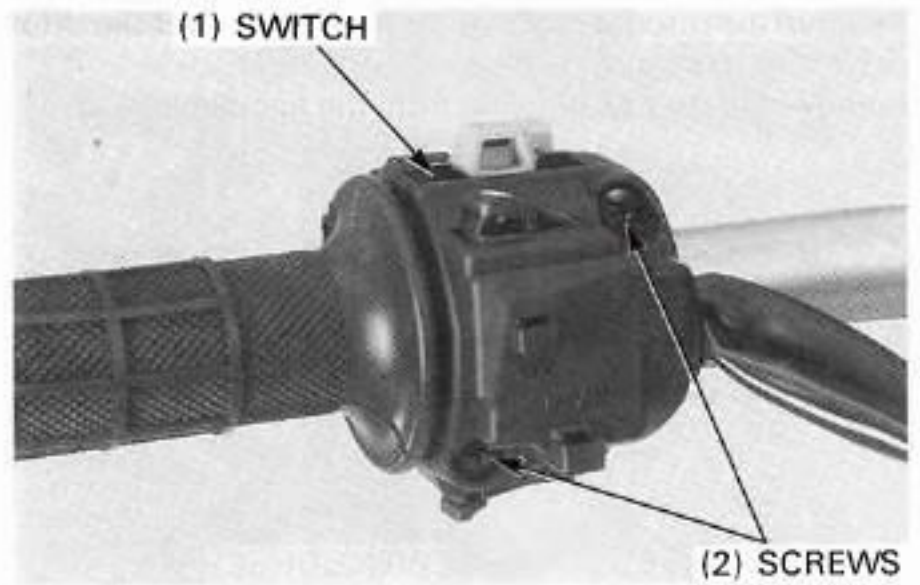
Remove the screws and clutch lever bracket holder from the handlebar.
Remove the clutch lever bracket from the handlebar.



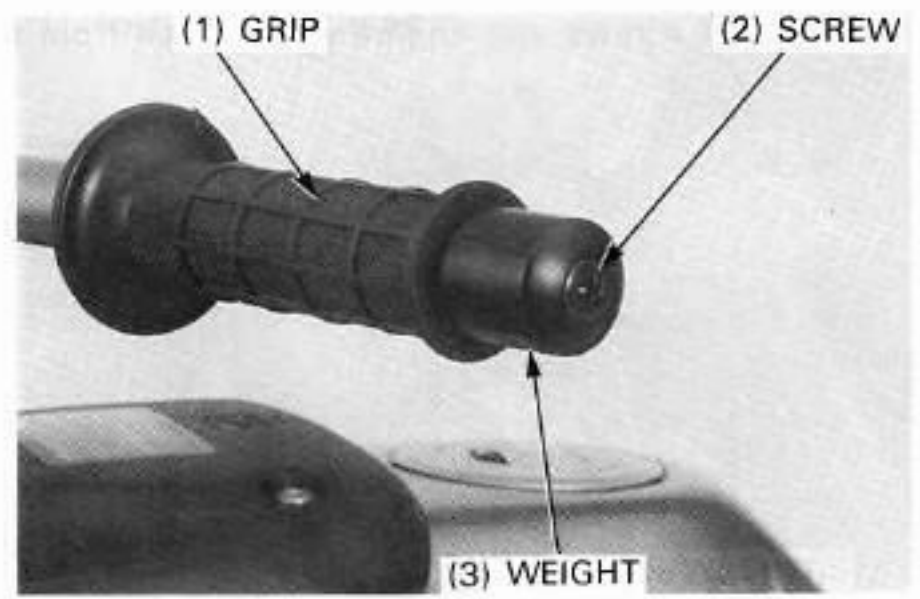
Remove the screw and clutch switch from the clutch lever bracket.



Remove the screws and left handlebar switch from the handlebar.



Remove the screw, handlebar weight and left handlebar grip from the handlebar.



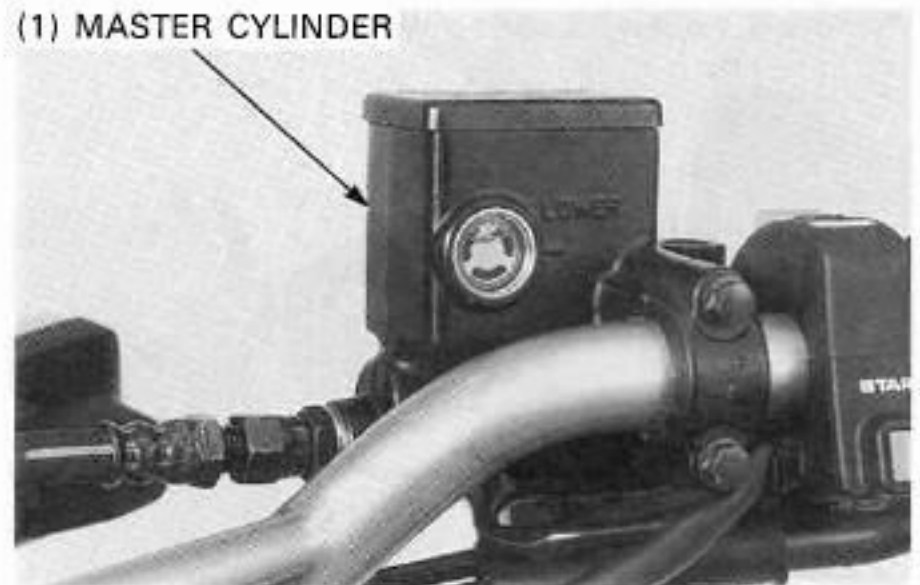
Remove the master cylinder from the handlebar (page 15-11).

CAUTION

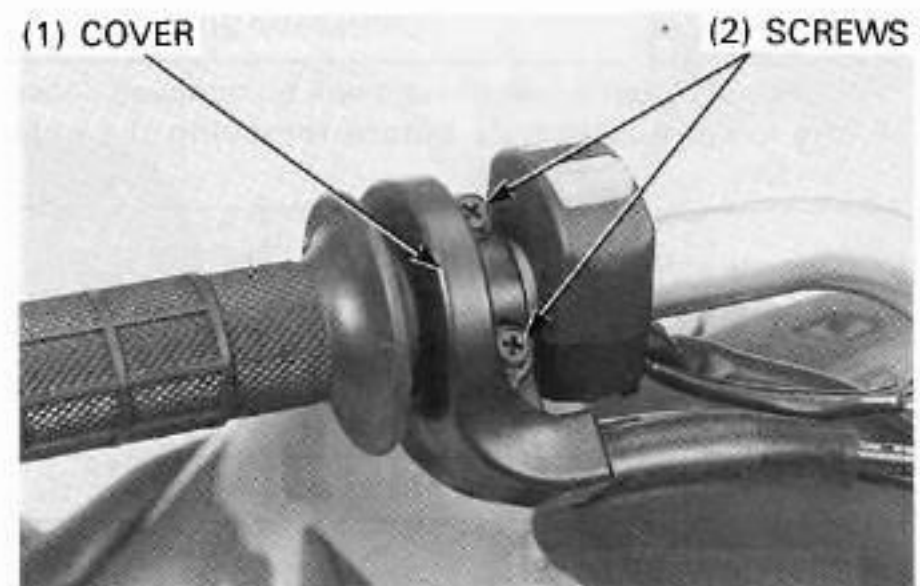
- Do not disconnect the hydraulic line.

NOTE

- Keep the master cylinder upright to prevent air from entering the hydraulic system.

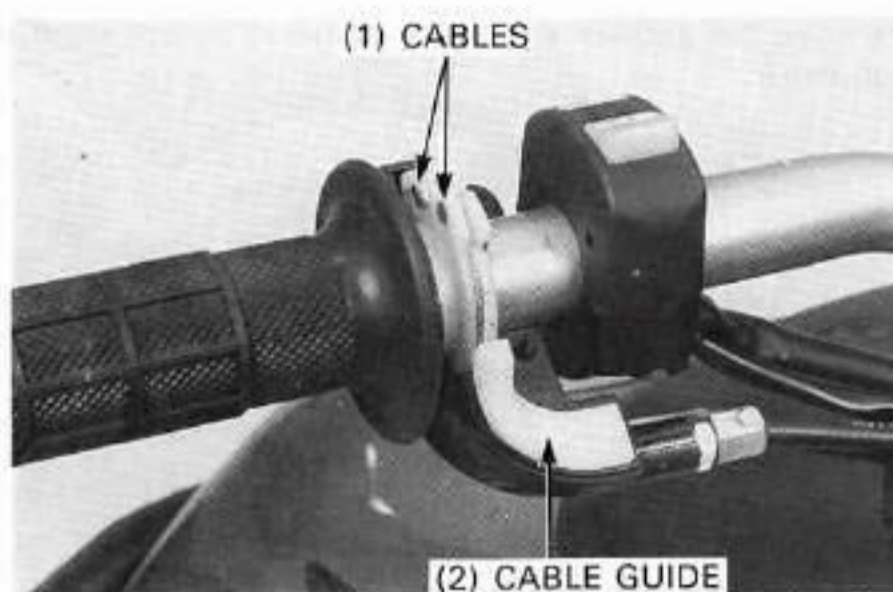


Remove the screws and throttle housing cover from the handlebar.



FRONT WHEEL/SUSPENSION/STEERING

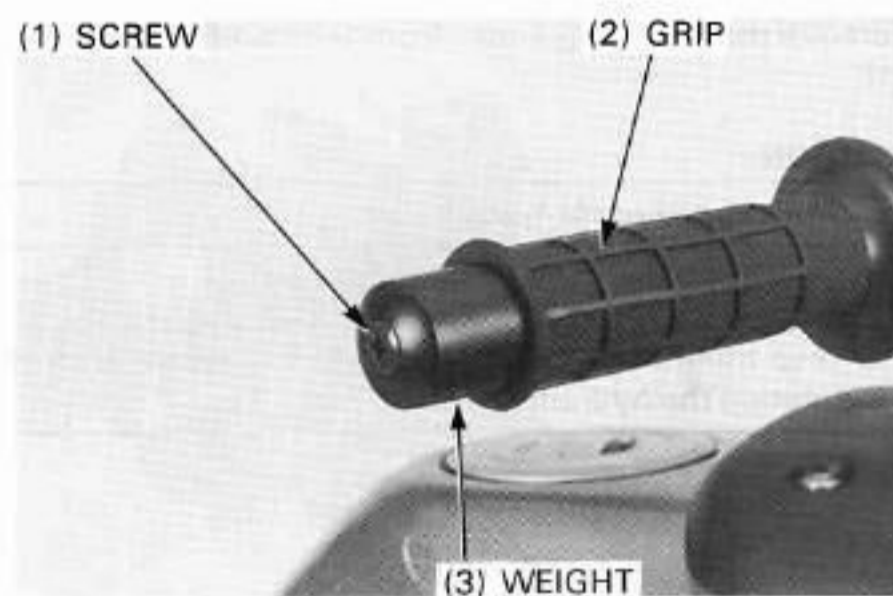
Remove the throttle cable guide and disconnect the throttle cables from the throttle pipe.
Remove the throttle housing from the handlebar.



Remove the screws and engine stop switch from the handlebar.



Remove the screw, handlebar weight and throttle grip from the handlebar.



NOTE

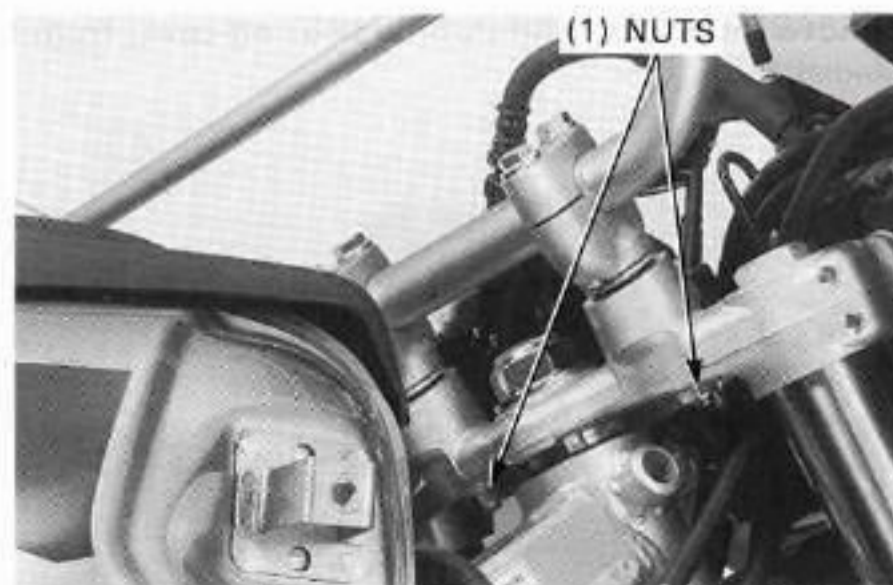
- If the handlebar lower holders will be removed, loosen the lower holder nuts before removing the upper holders.

Remove the side cowl (page 2-2).

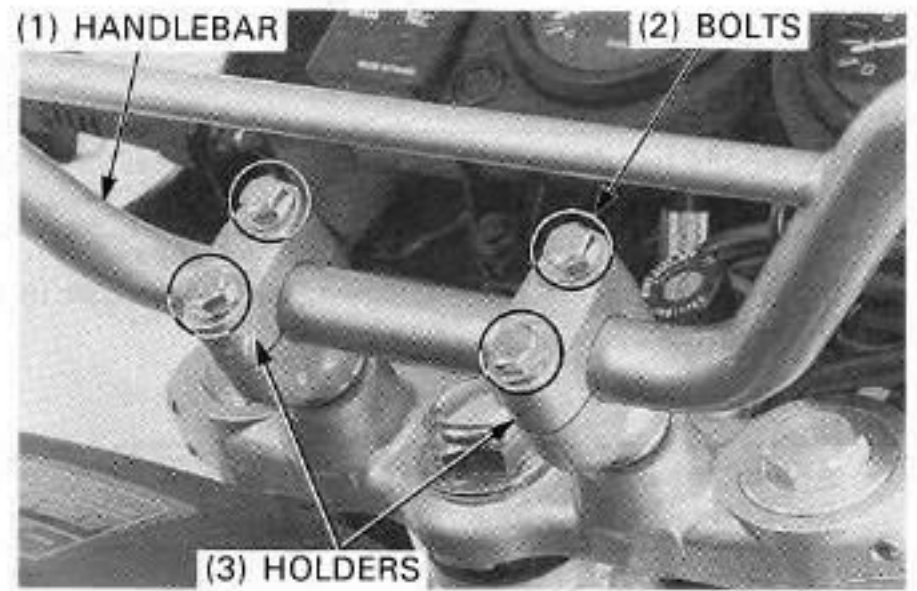
Loosen the handlebar lower holder nuts.

NOTE

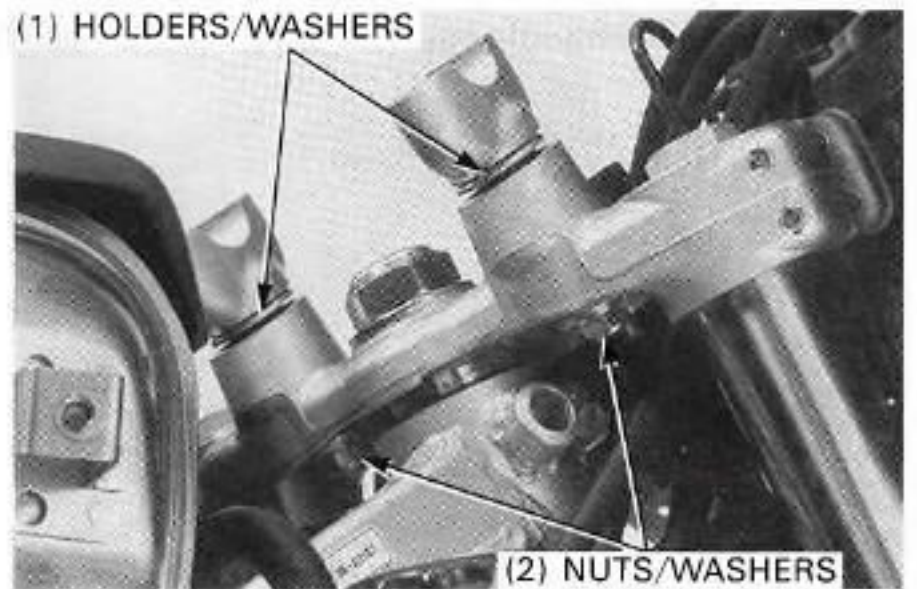
- Do not remove the lower holder nuts yet.



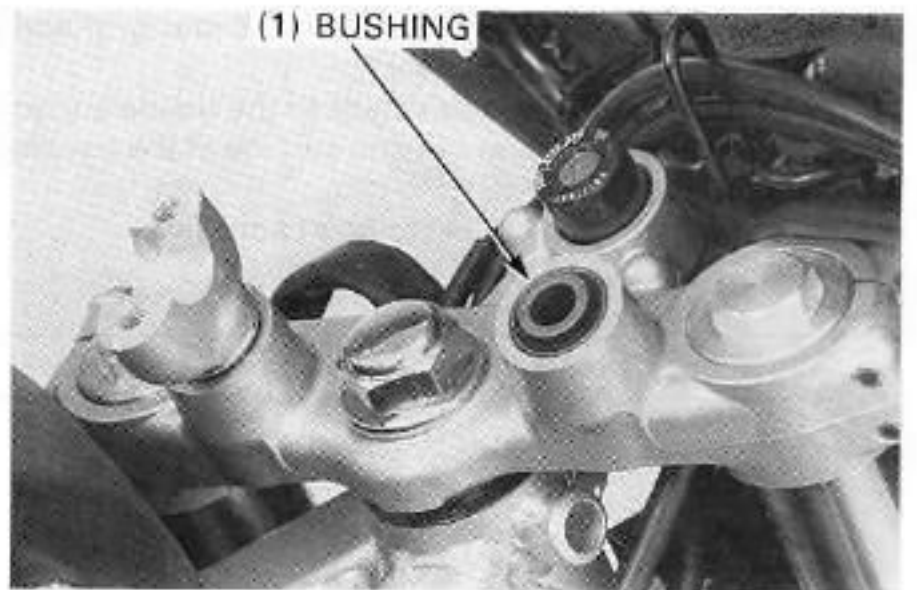
Remove the handlebar upper holder bolts and handlebar upper holders.
Remove the handlebar.



Remove the handlebar lower holder nuts/washers and handlebar lower holders/washers.



Check the bushing for wear or damage.
Replace the bushing if necessary.

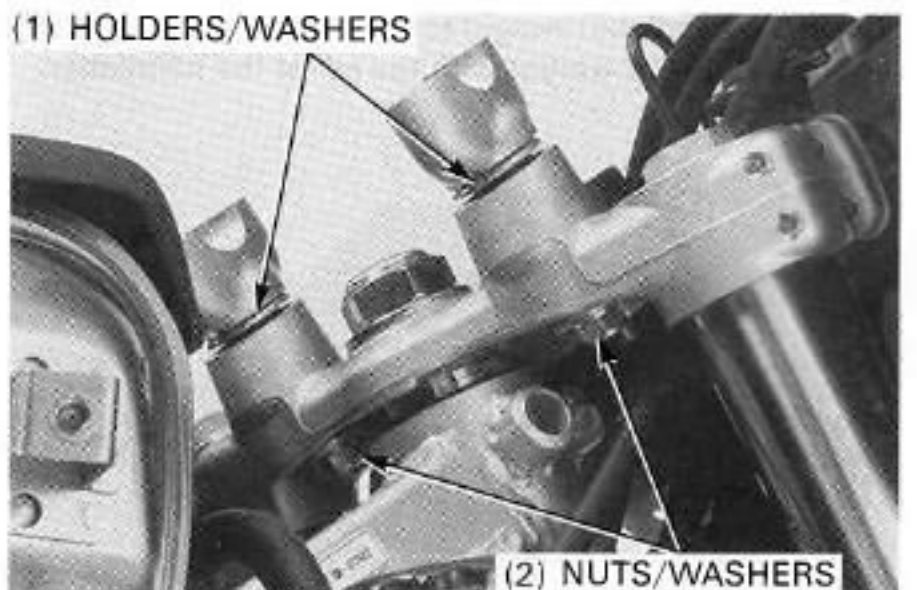


INSTALLATION

Install the handlebar lower holders/washers and handlebar lower holder nuts/washers.

NOTE

- Do not tighten the lower holder nuts yet.



FRONT WHEEL/SUSPENSION/STEERING

Install the handlebar and handlebar upper holders.

NOTE

- Install the handlebar upper holder with its punch mark facing forward.

Install and tighten the handlebar upper holder bolt to the specified torque.

NOTE

- At handlebar upper holder bolts installation, tighten the forward bolts first, then tighten the rear bolts.

Torque: 26 N·m (2.7 kgf·m, 20 lbf·ft)

Tighten the handlebar lower holder nuts to the specified torque.

Torque: 39 N·m (4.0 kgf·m, 29 lbf·ft)

Clean the inside surface of the left handlebar grip and the outside surface of the handlebar.

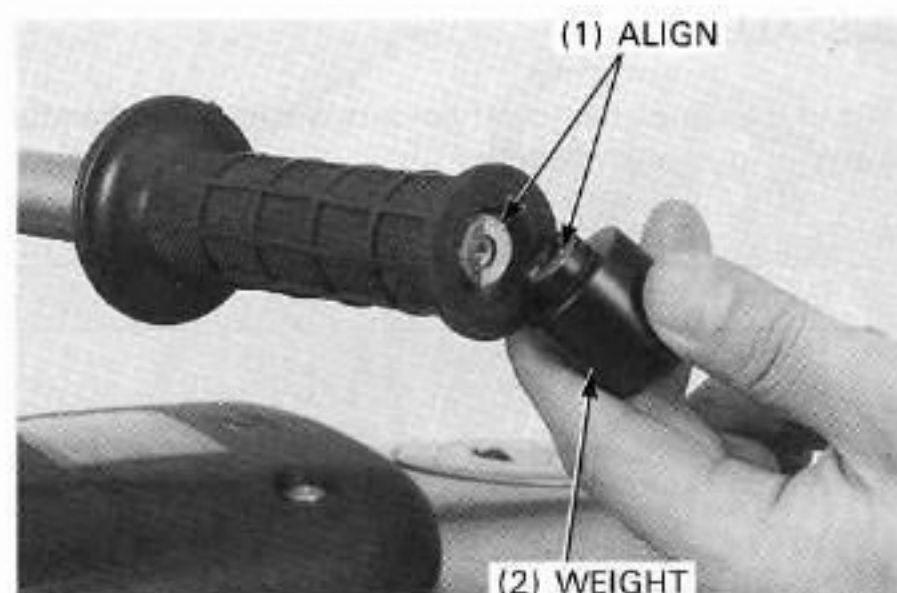
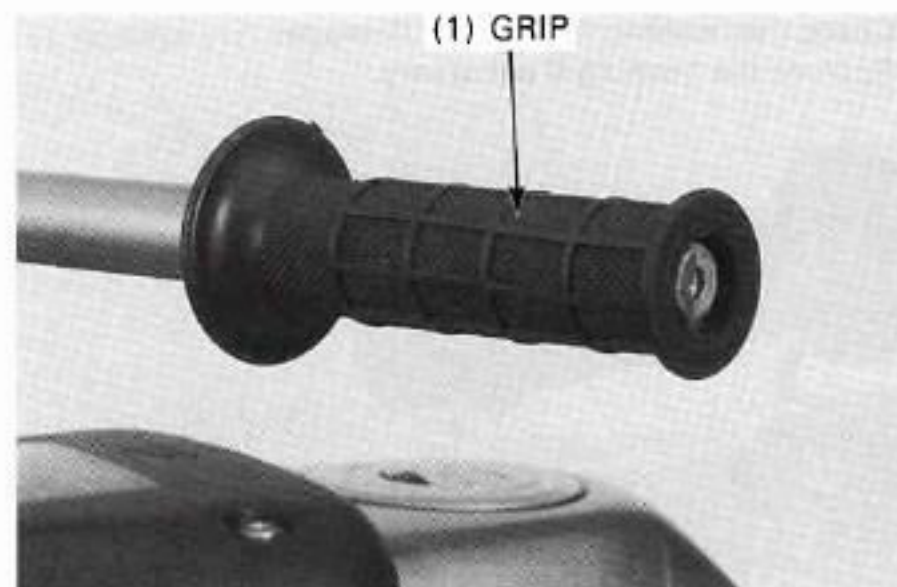
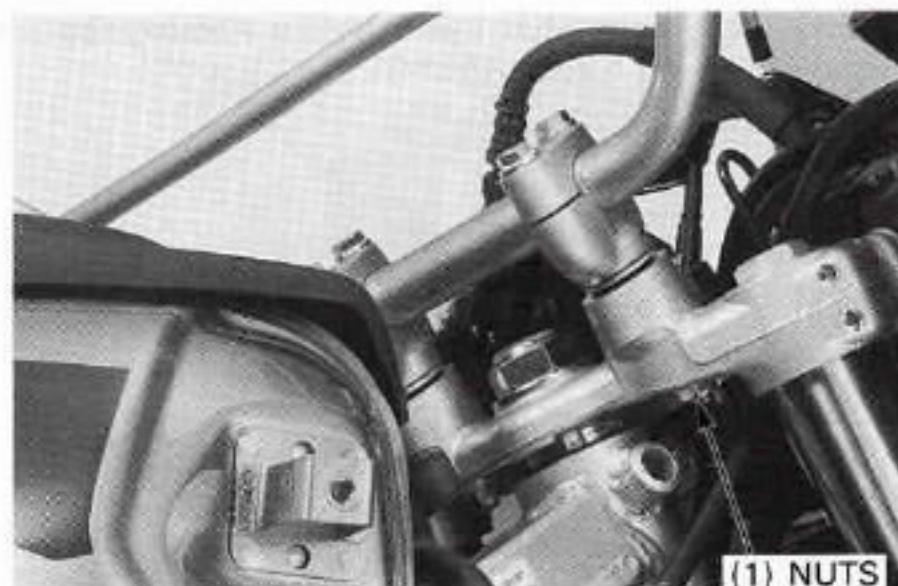
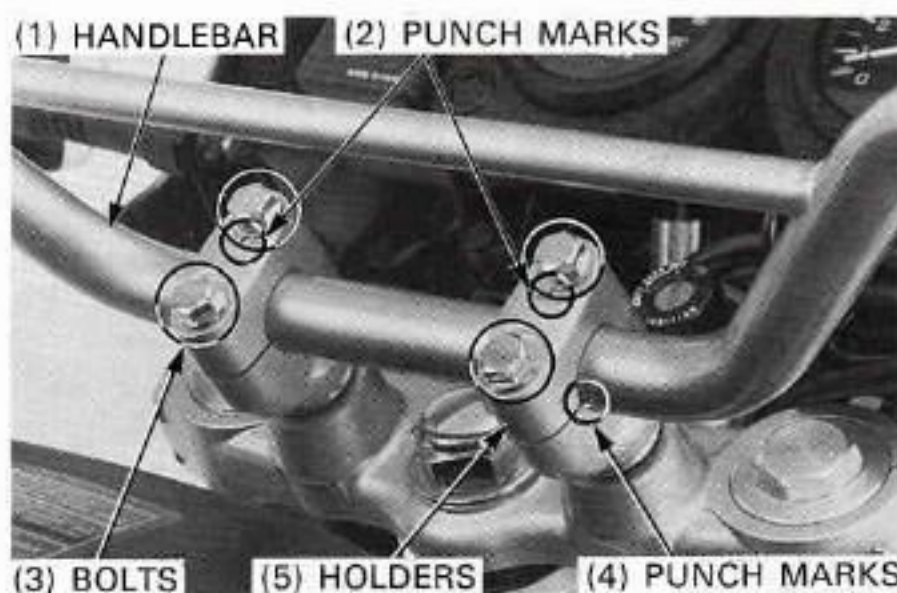
Apply Honda Bond A or equivalent to the inside surface of the left handlebar grip and outside surface of the handlebar. Wait 3-5 minutes and install the grip.

Rotate the grip for even application of adhesive.

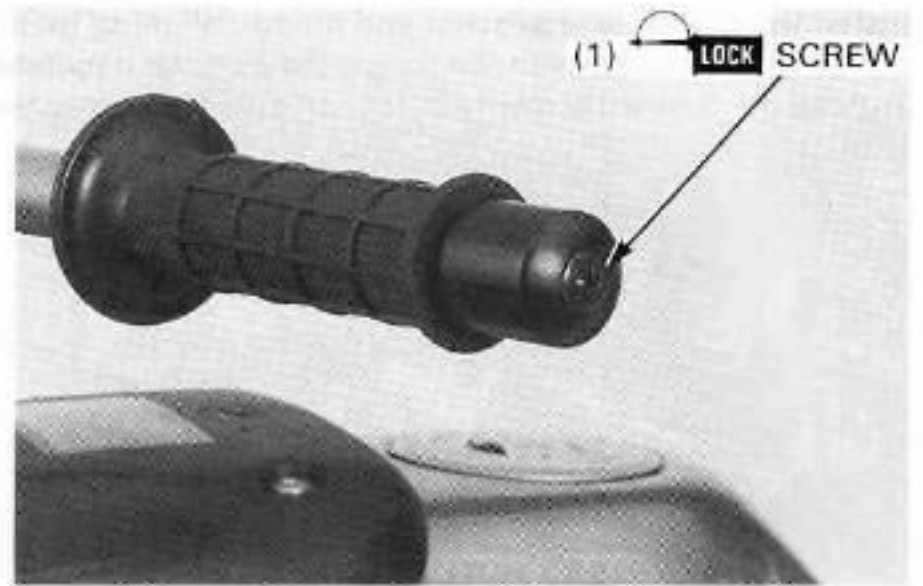
NOTE

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

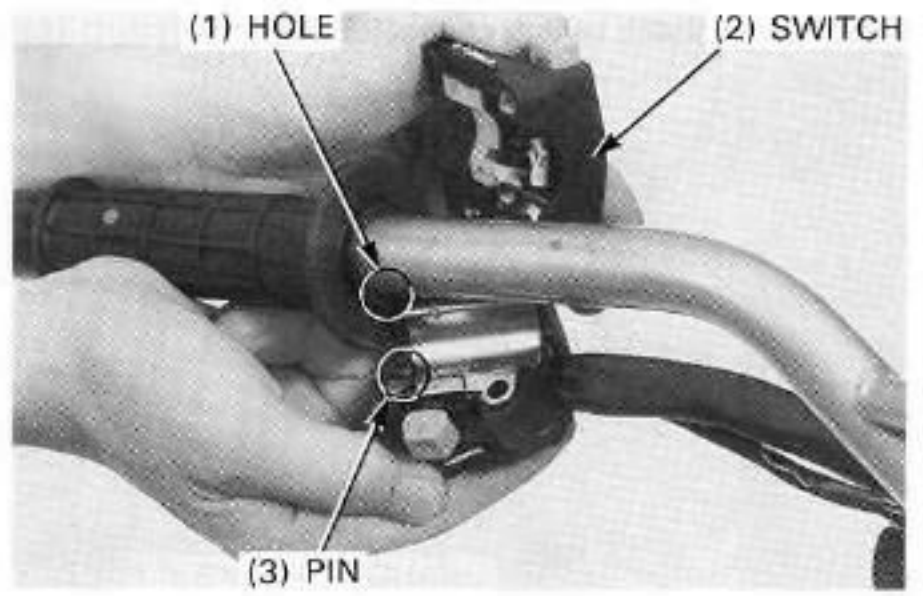
Install the handlebar weight to the handlebar aligning the tab on the handlebar weight with the slit of the handlebar.



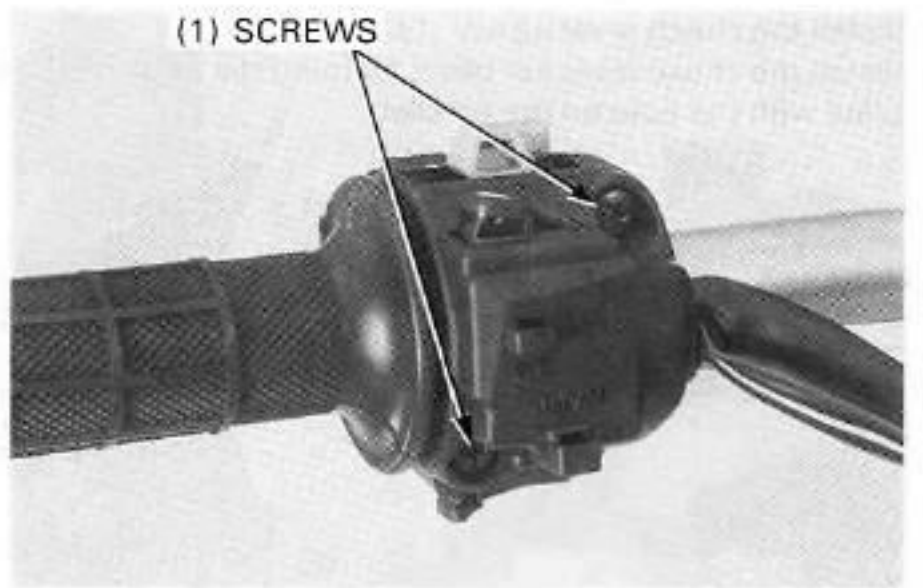
Clean and apply a locking agent to the threads and tighten the screw securely.



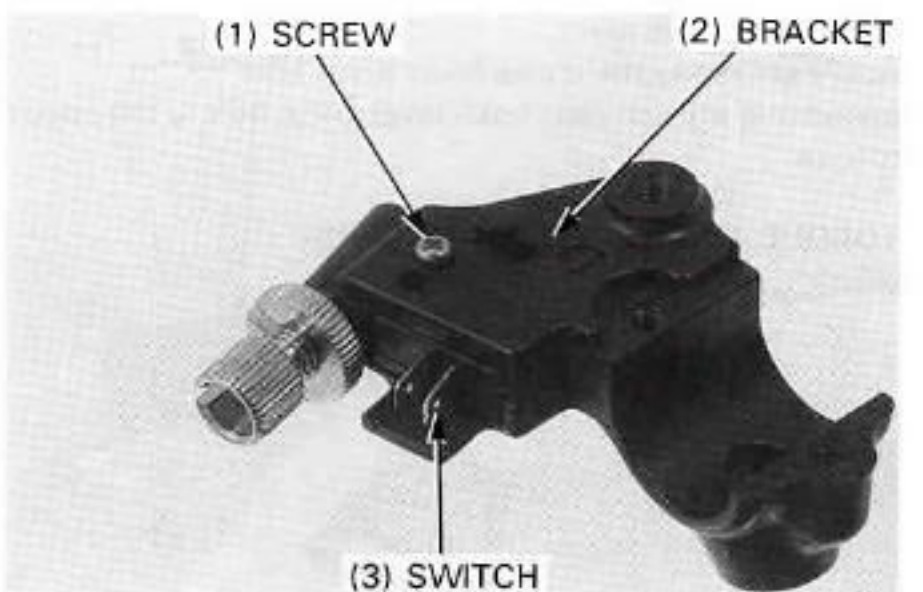
Install the left handle switch, aligning the pin on the housing with the hole in the handlebar.



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

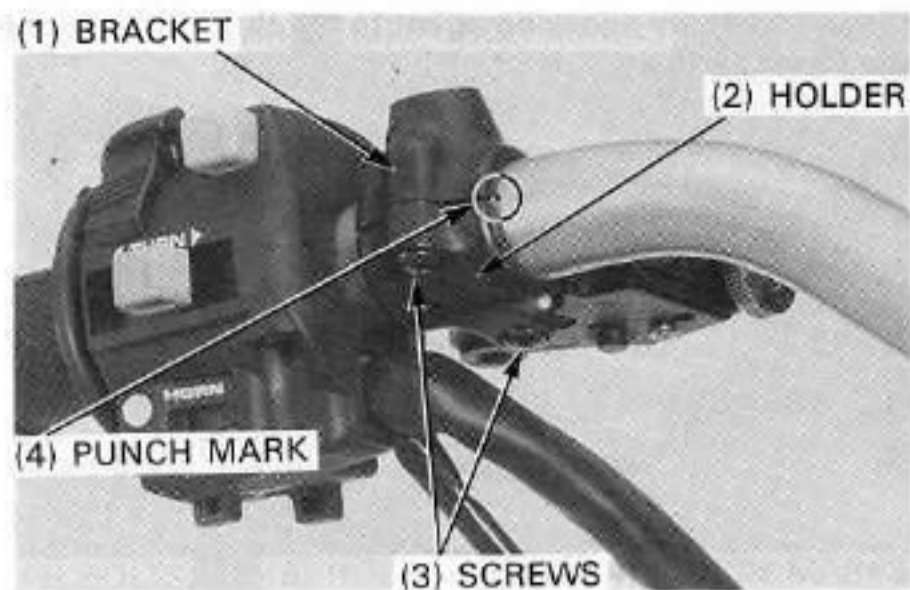


Install the clutch switch to the clutch lever bracket. Install and tighten the screw securely.

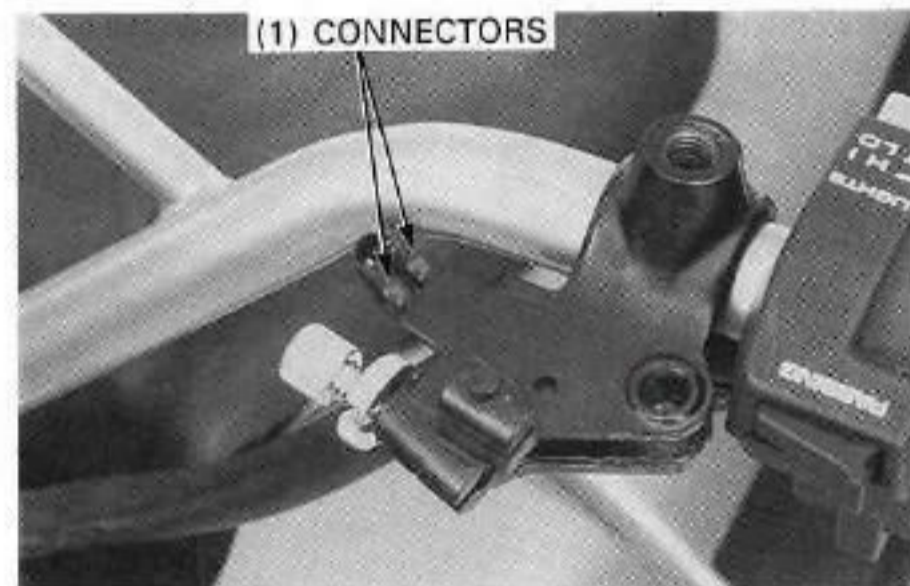


FRONT WHEEL/SUSPENSION/STEERING

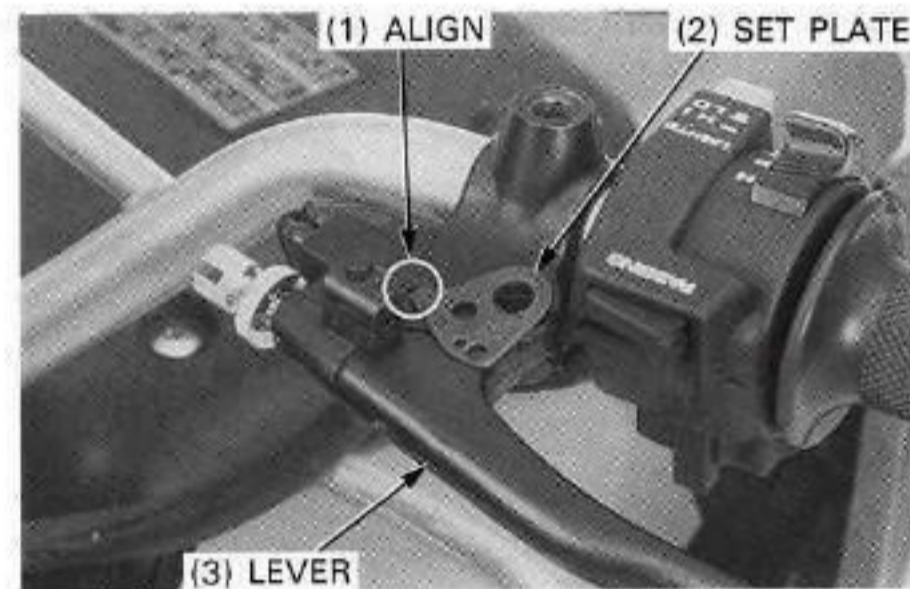
Install the clutch lever bracket and holder, aligning mating surface of the holder with the punch mark on the handlebar. Tighten the forward screw first, then tighten the rear screw.



Connect the clutch switch connectors.

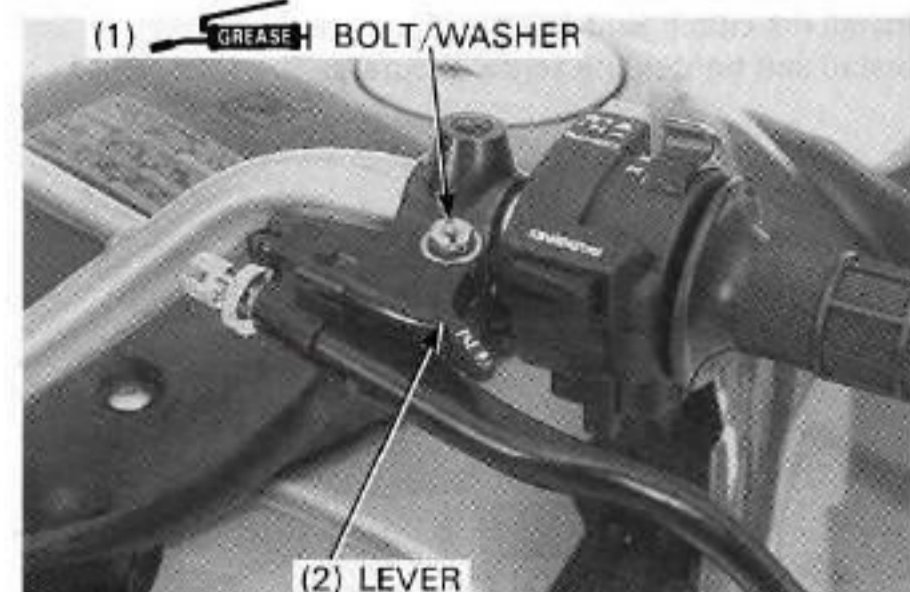


Install the clutch lever.
Install the choke lever set plate, aligning the hook on the set plate with the hole on the bracket.

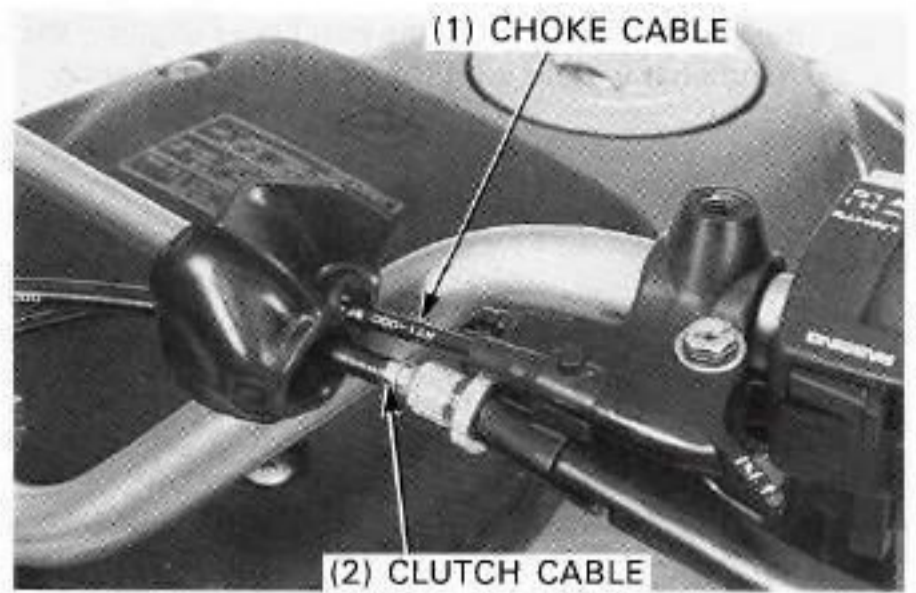


Install the choke lever.
Apply grease to the choke lever pivot bolt.
Install and tighten the choke lever pivot bolt to the specified torque.

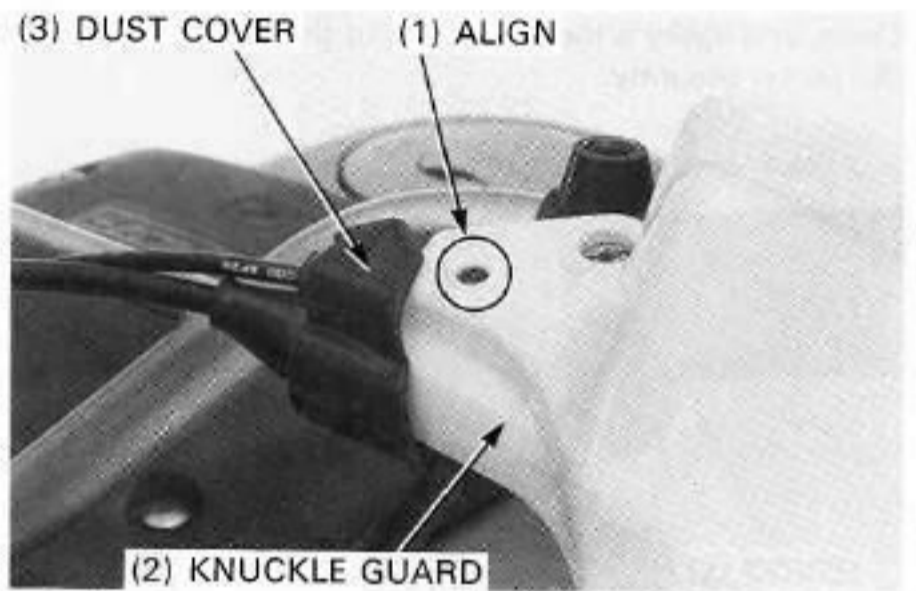
TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)



Connect the clutch cable and choke cable to the clutch lever and choke lever.



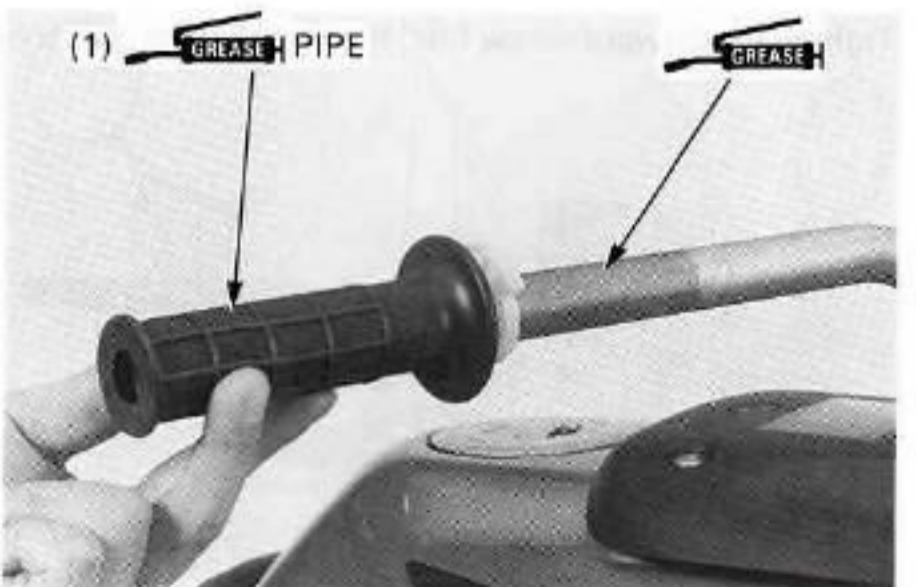
Install the knuckle guard, aligning the hole on the knuckle guard to the tab on the clutch lever bracket. Install the dust cover over the knuckle guard.



Install the collar and choke lever pivot nut securely. Install the washer and bolt securely.

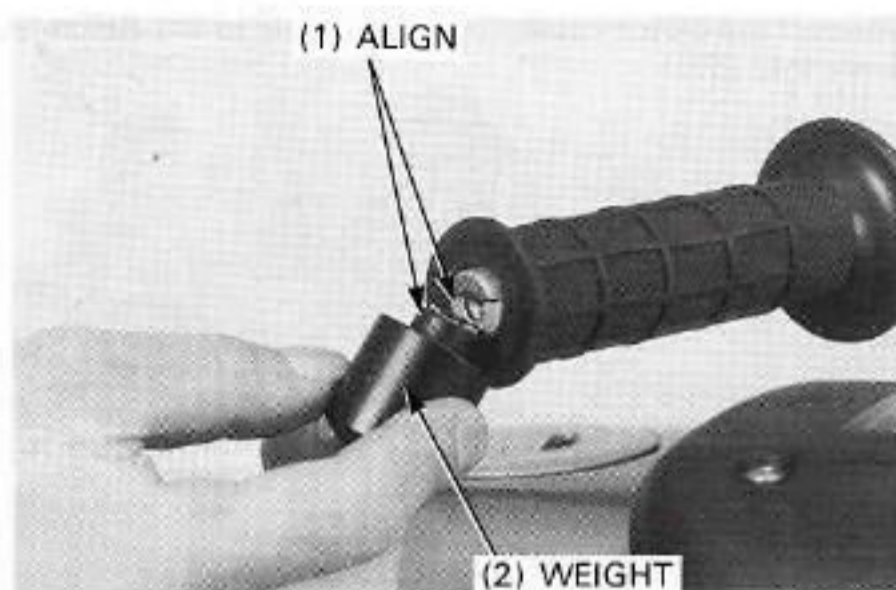


Apply grease to the throttle pipe inner surface and handlebar sliding outer surface. Install the throttle pipe.

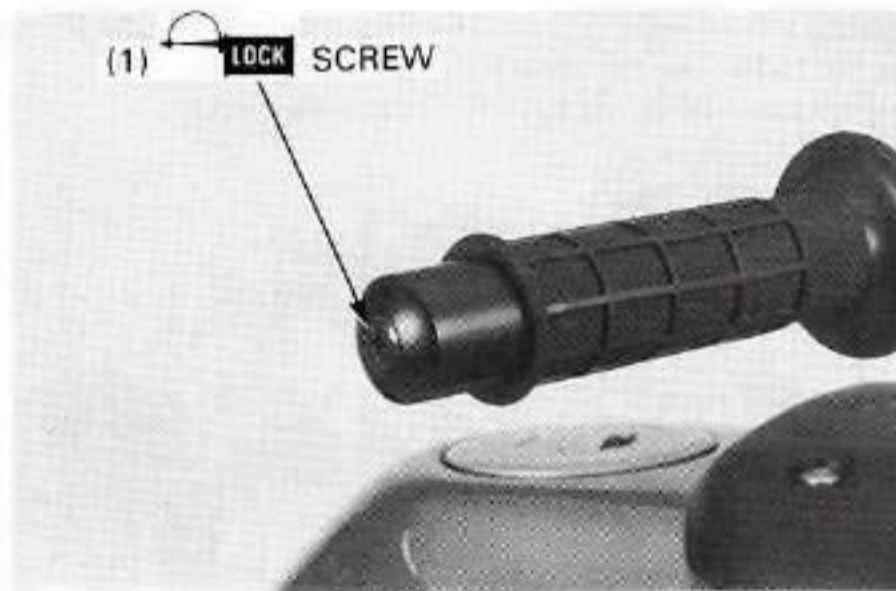


FRONT WHEEL/SUSPENSION/STEERING

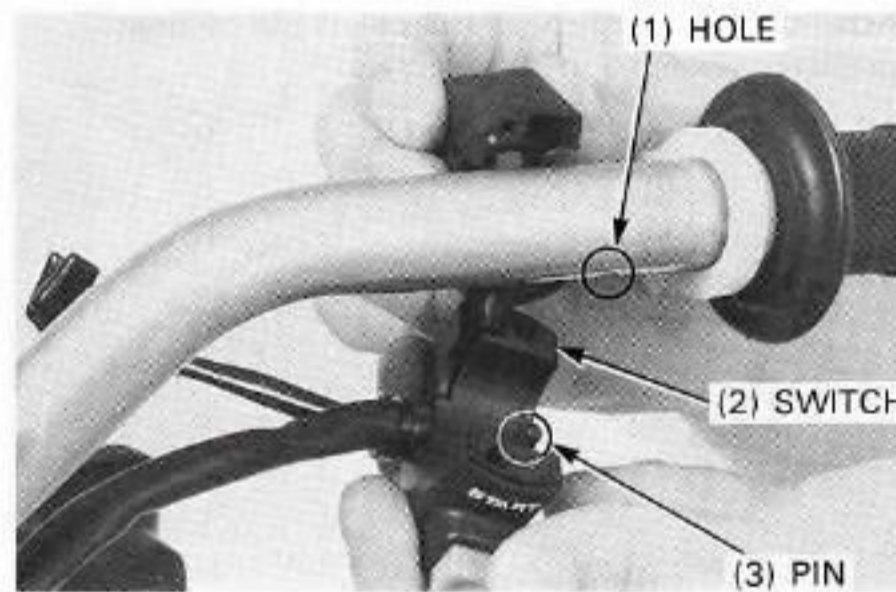
Install the handlebar weight to the handlebar aligning the tab on the handlebar weight with the slit of the handlebar.



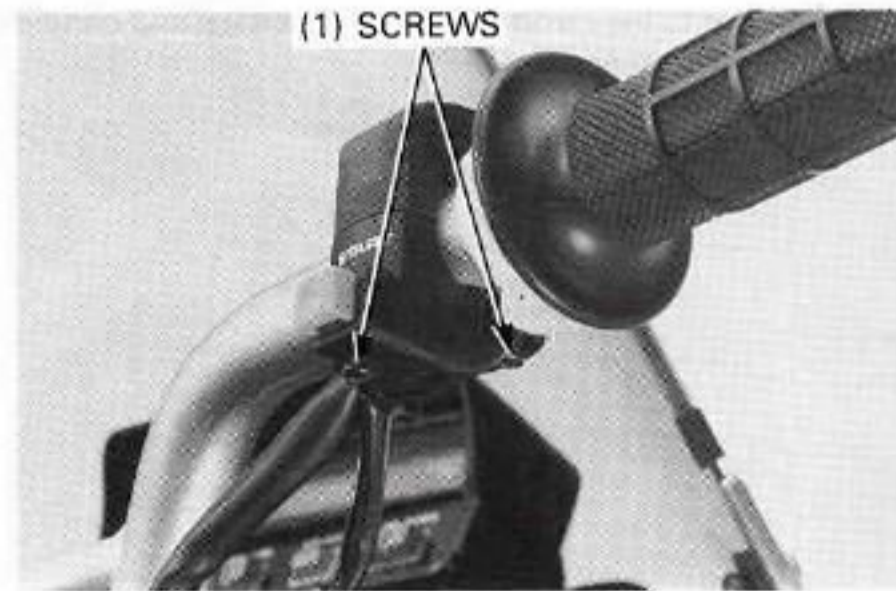
Clean and apply a locking agent to the threads and tighten the screw securely.



Install the engine stop switch, aligning the pin on the housing with the hole in the handlebar.

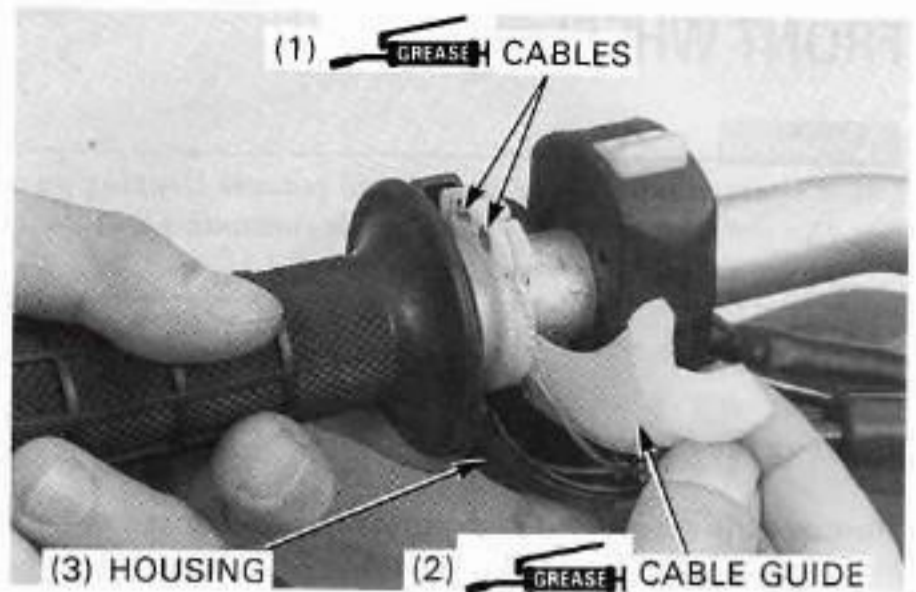


Tighten the forward screw first, then tighten the rear screw.

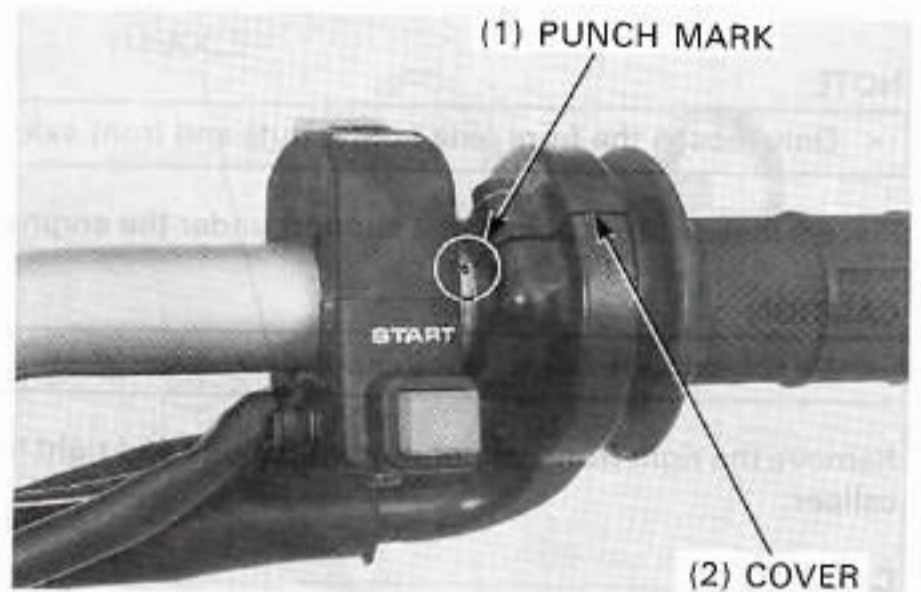


Apply grease to the throttle cable ends and connect them to the throttle grip.

Apply grease the throttle cable guide sliding surface.
Install the throttle cable guide to the throttle housing.



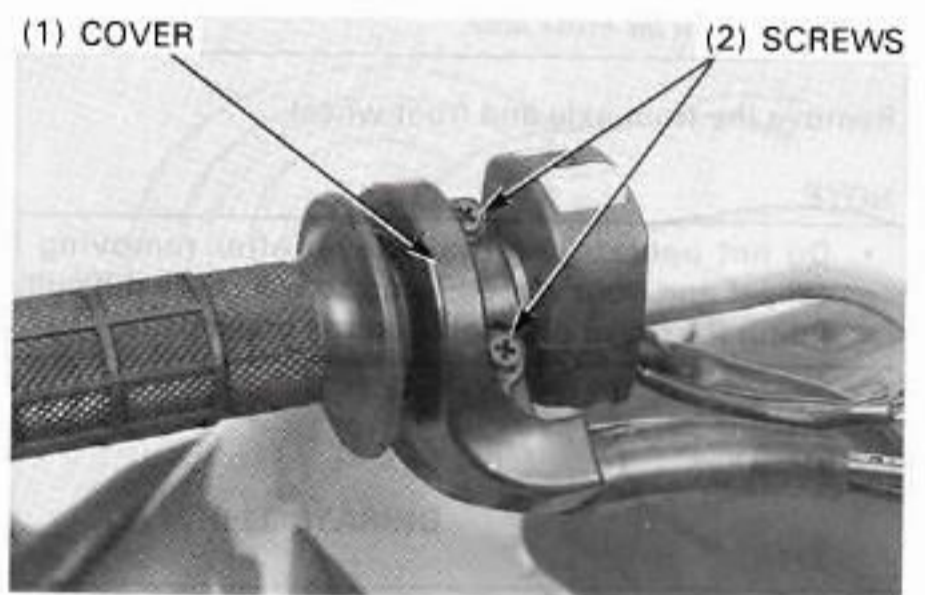
Install the throttle housing to the handlebar.
Install the throttle housing cover to the throttle housing aligning its mating surface with the punch mark on the handlebar.



Install and tighten the throttle housing cover screws to the specified torque.

TORQUE: 4.2 N·m (0.43 kgf·m, 3.1 lbf·ft)

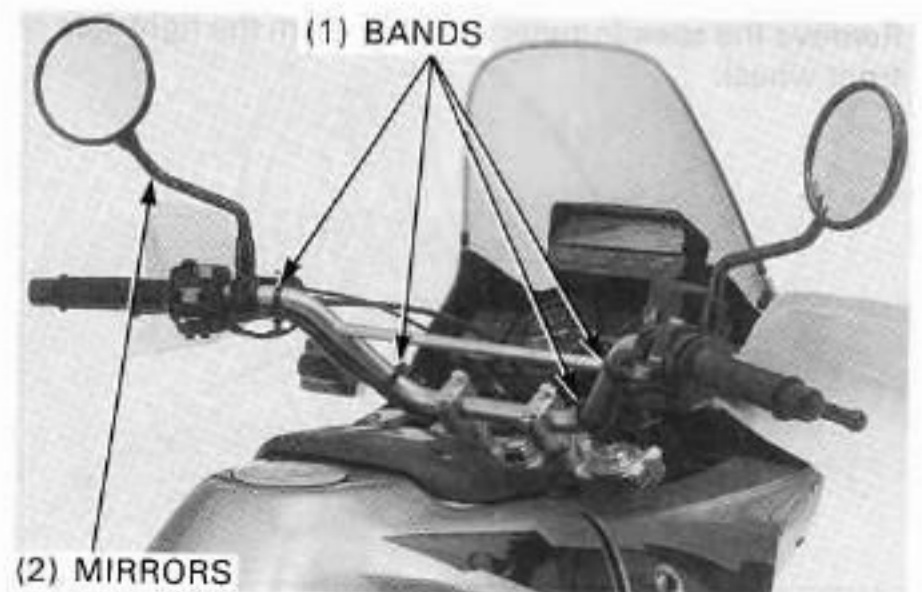
Install the master cylinder (page 15-17).



Install the wire bands and rear view mirrors.

NOTE

- Route the cables, wires and harness properly (page 1-22).



FRONT WHEEL

⚠ WARNING

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean contaminated disc with a high quality brake degreasing agent.

REMOVAL

Remove the fork cover (page 2-4).

Remove the screw and disconnect the speedometer cable.

Loosen the front axle holder nuts.

Loosen the front axle.

NOTE

- Only loosen the front axle holder nuts and front axle.

Place a jack or other adjustable support under the engine.

CAUTION

- Do not jack up the motorcycle using oil filter.

Remove the right front caliper mounting bolts and right front caliper.

CAUTION

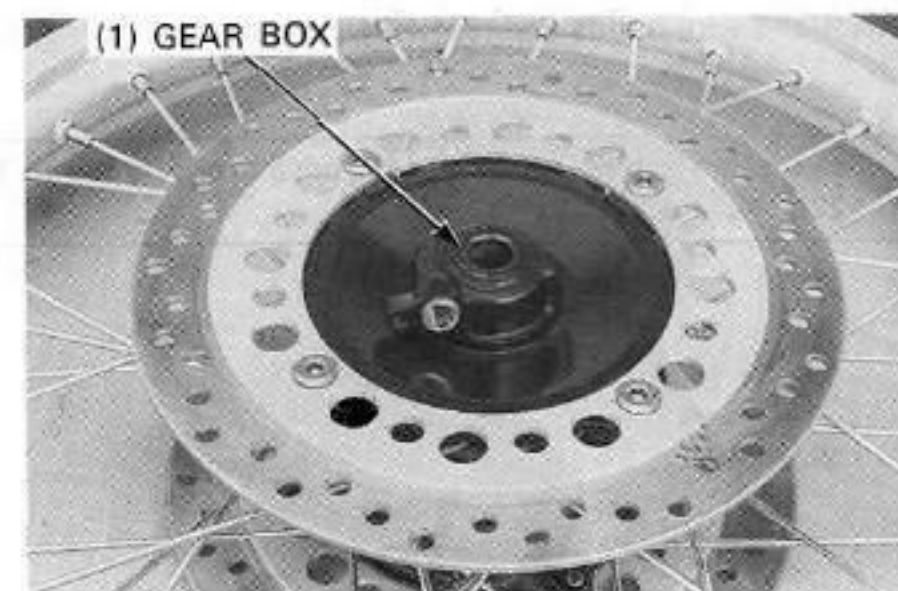
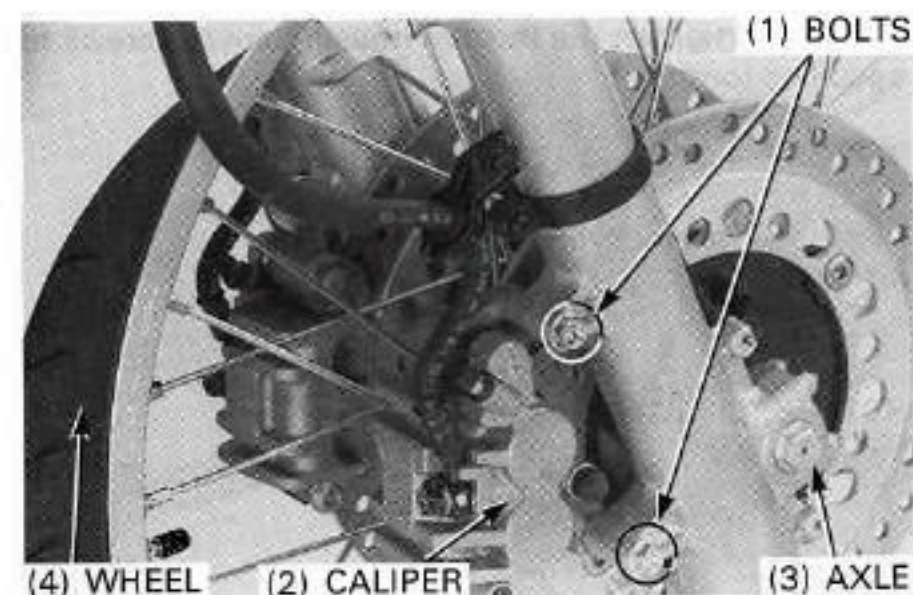
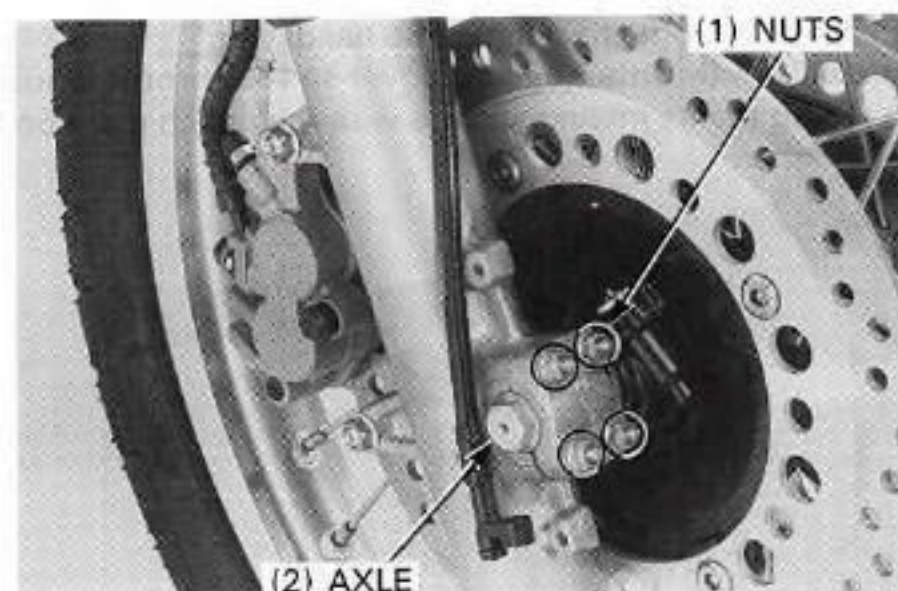
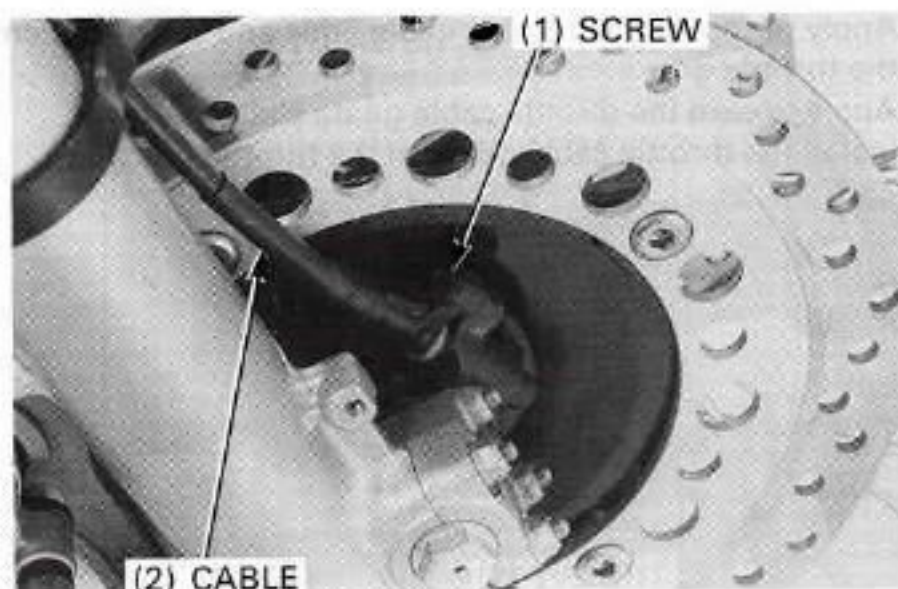
- Do not suspend the brake caliper from the brake hose.
Do not twist the brake hose.

Remove the front axle and front wheel.

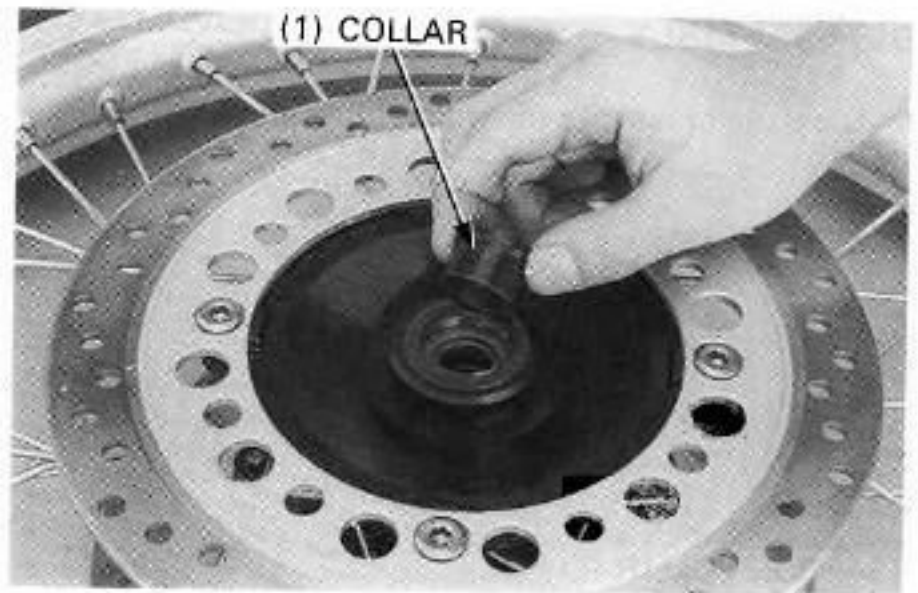
NOTE

- Do not operate the brake lever after removing the caliper and front wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.

Remove the speedometer gear box from the right side of the front wheel.



Remove the side collar from the left side of the front wheel.

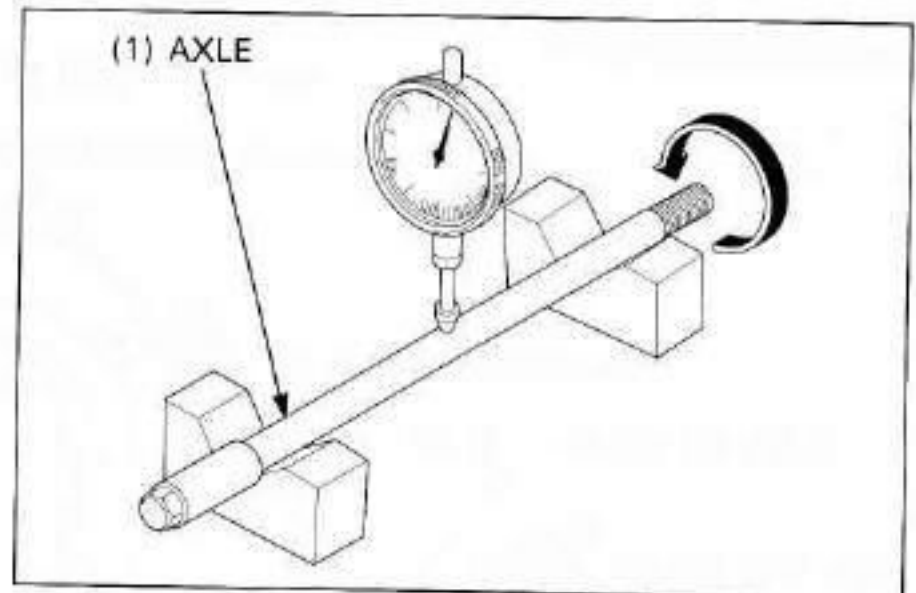


INSPECTION

AXLE

Set the front axle in V-blocks and measure the runout. Turn the front axle and measure the runout using a dial indicator. Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.2mm (0.008 in)



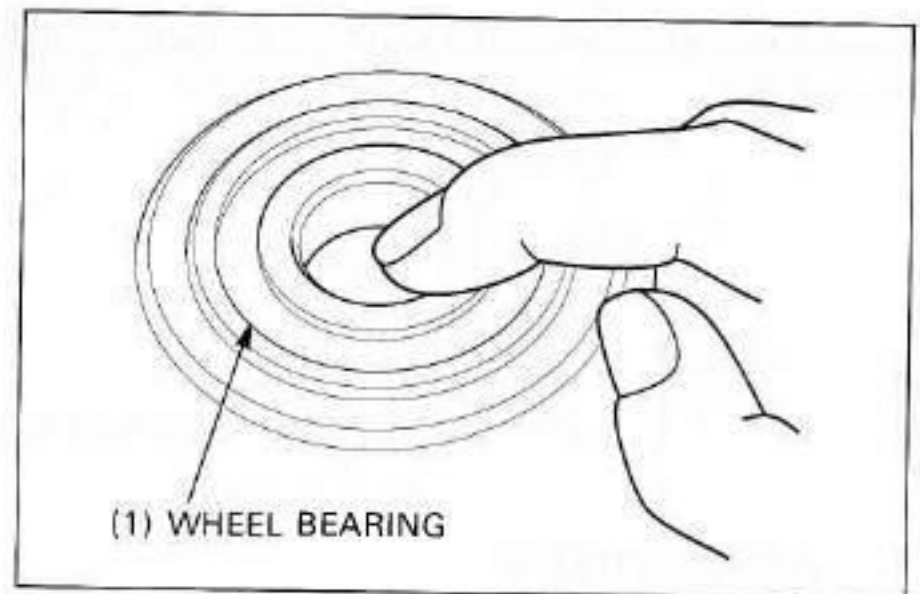
WHEEL BEARING

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 hub.

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

NOTE

- Replace the wheel bearings in pairs.



WHEEL RIM

Check the rim runout by placing the wheel in a truing stand. Spin the wheel slowly and read the runout using a dial indicator.

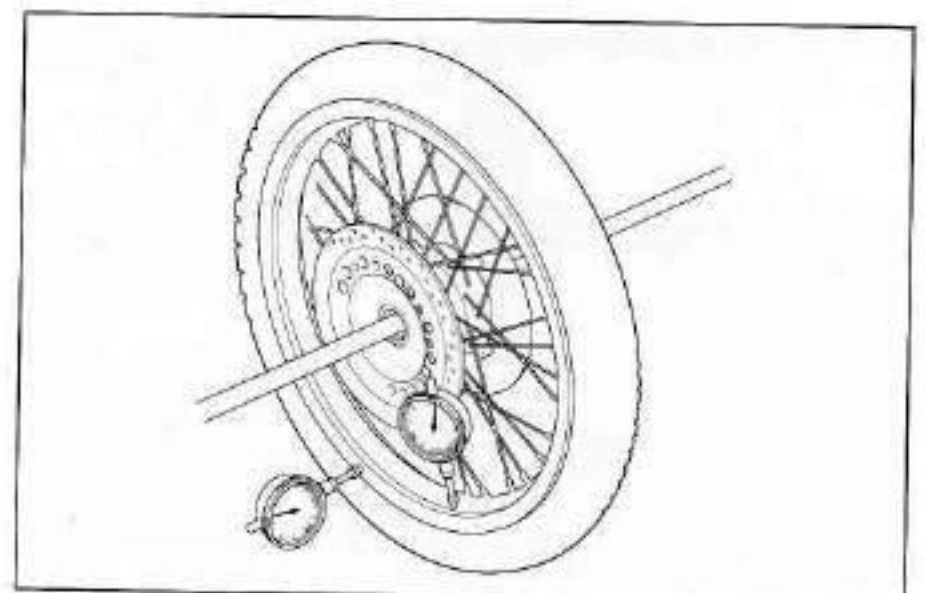
Actual runout is 1/2 the total indicator reading.

SERVICE LIMITS:

Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)

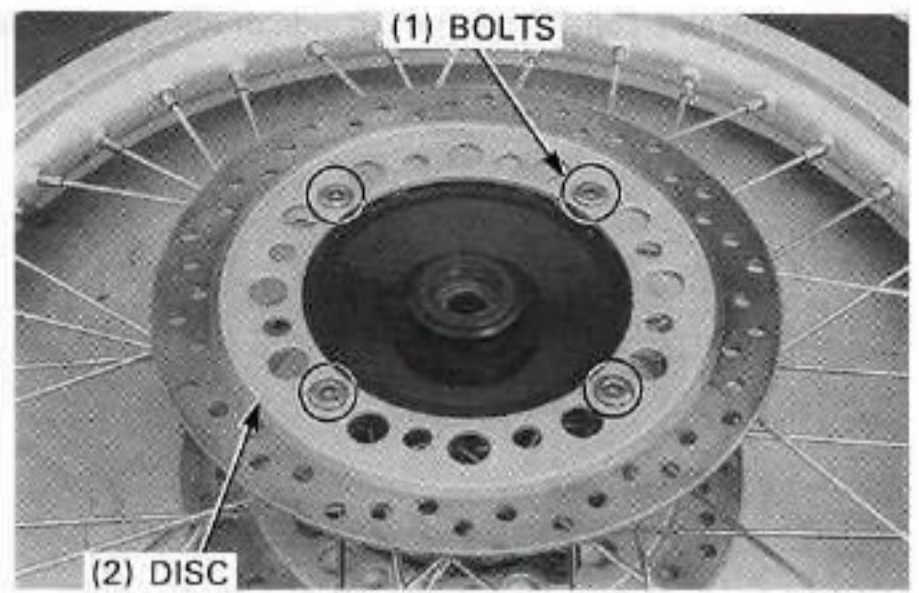
Check the spokes for loose or damage.



FRONT WHEEL/SUSPENSION/STEERING

DISASSEMBLY

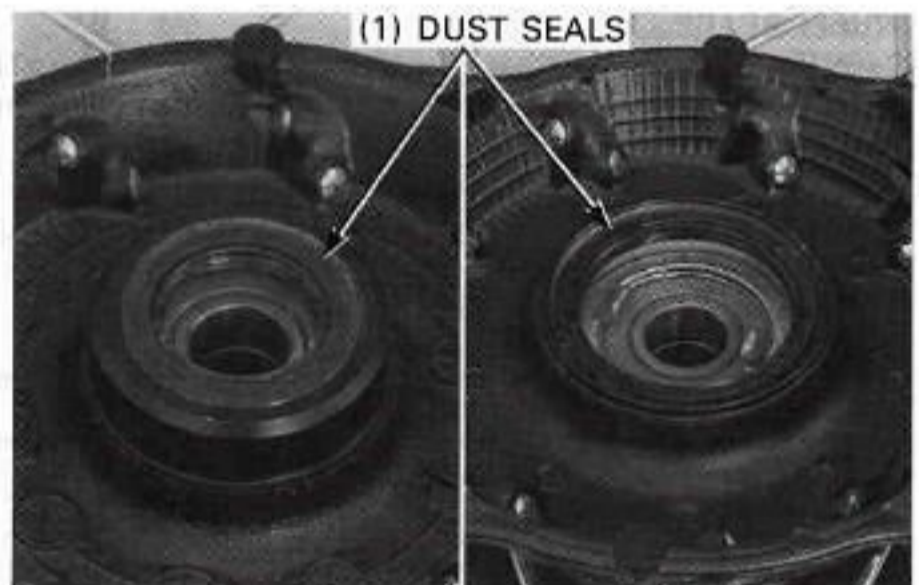
Remove the brake disc mounting bolts and brake discs.



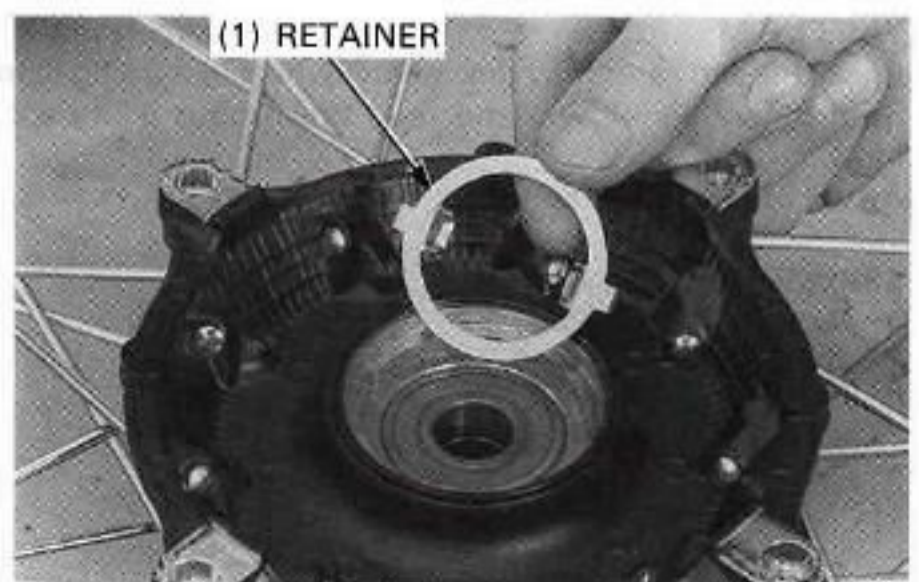
Remove the hub covers.



Remove the right and left dust seal from the each side of the front wheel.



Remove the speedometer gear retainer.



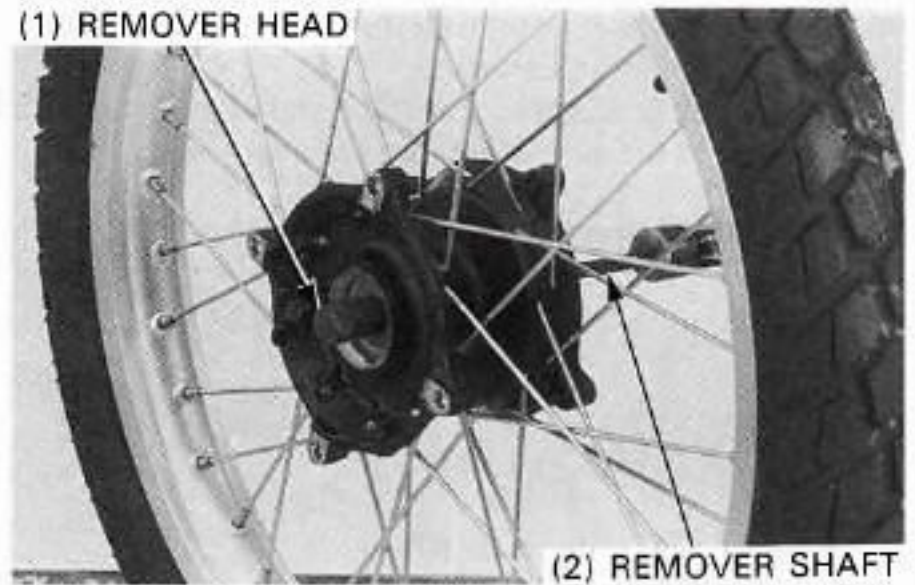
Install the bearing remover head into the bearing.
 From opposite side install the bearing remover shaft and drive the bearing out of the wheel hub.
 Remove the distance collar and drive out the other bearing.

TOOLS:

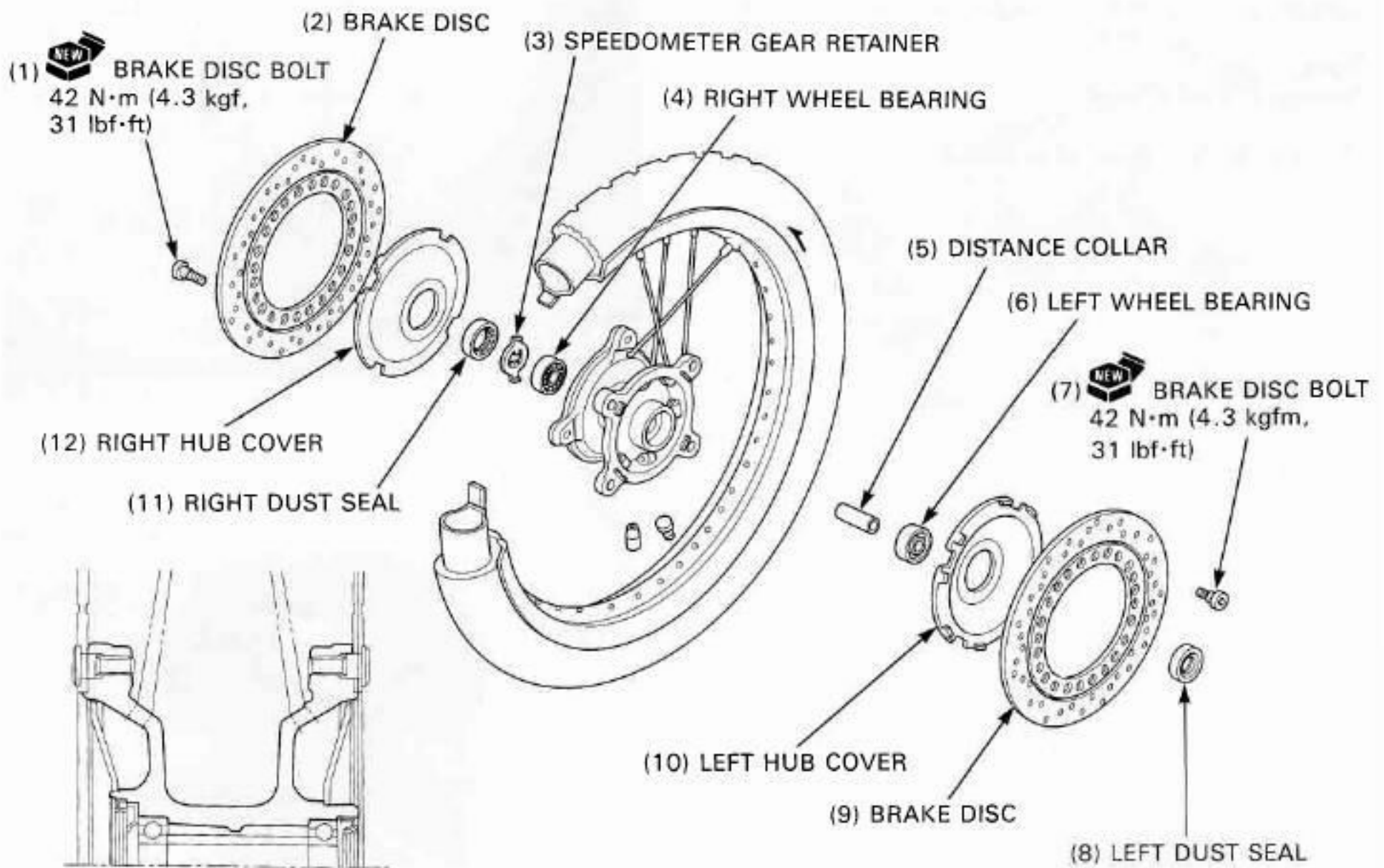
Bearing remover shaft 07746-0050100
Bearing remover head, 17 mm 07746-0050500

NOTE

- Replace the wheel bearings in pairs. Do not re-use old bearings.



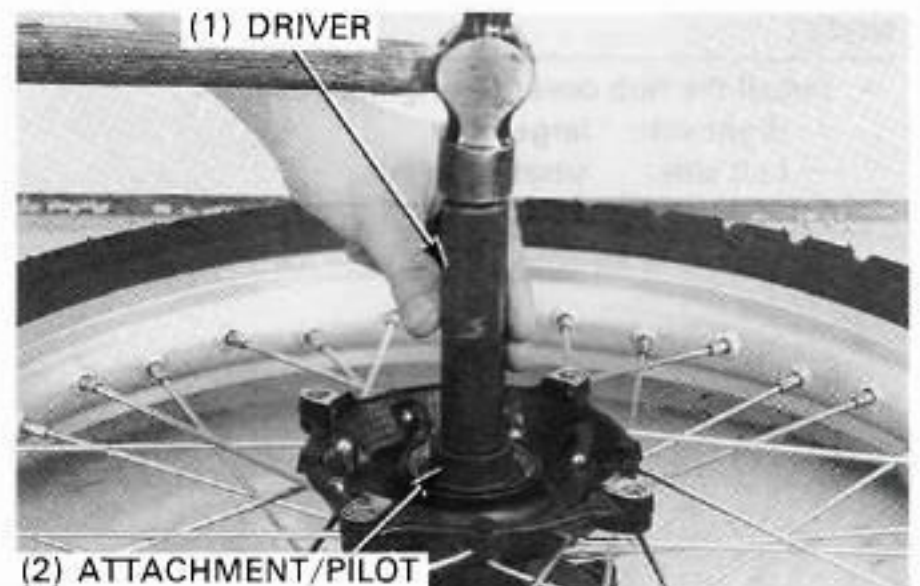
ASSEMBLY



Drive in a new right bearing (6203 UU) squarely with the marking side facing up until it is fully seated.
 Install the distance collar.
 Drive in a new left bearing (6203 UU) squarely with the marking side facing up until it is fully seated.

TOOLS:

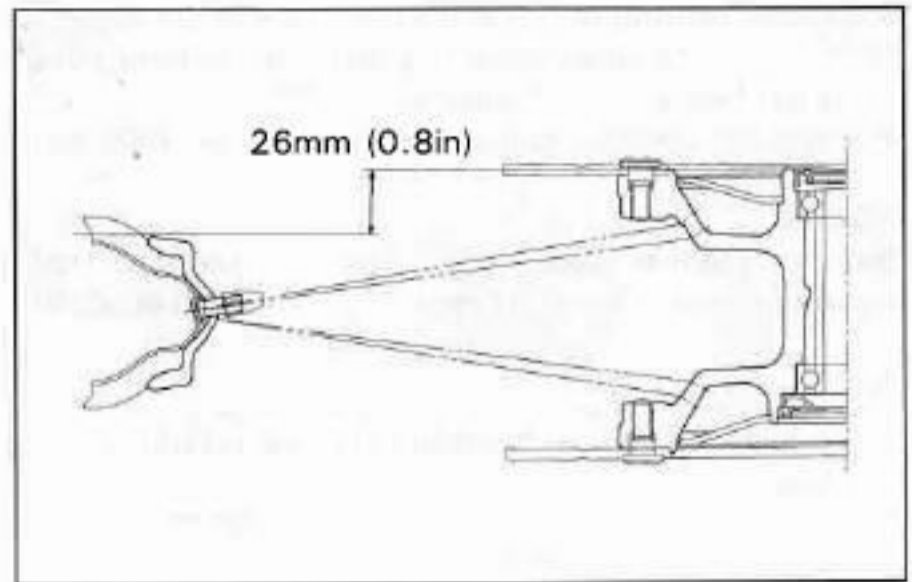
Driver 07749-0010000
Attachment, 37×40 mm 07746-0010200
Pilot, 17 mm 07746-0040400



FRONT WHEEL/SUSPENSION/STEERING

Assemble the wheel as follows if wheel is disassembled.
Clean the spoke nipple threads.
Adjust the hub position so that the distance from the hub left end surface to the side of rim is as shown.

STANDARD: 26 mm (1.0 in)



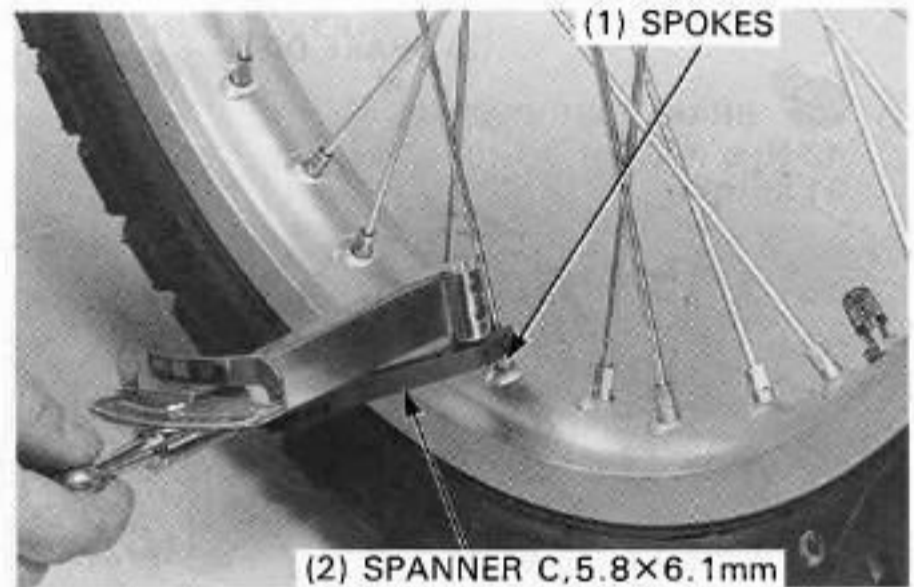
Torque the spokes in 2 or 3 progressive steps.

TOOL:

Spanner C, 5.8×6.1 mm

07701-0020300

TORQUE: 3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)

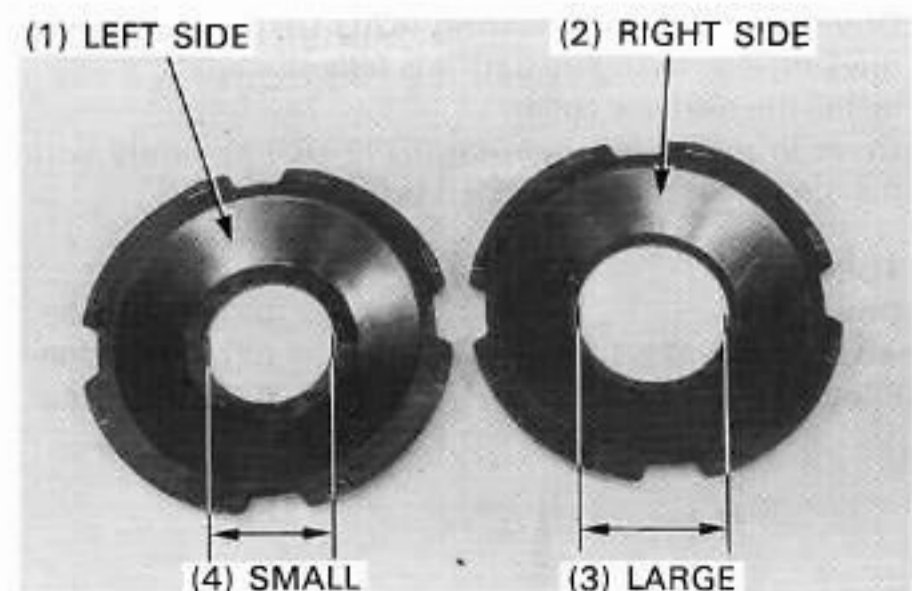


Install the hub covers.



NOTE

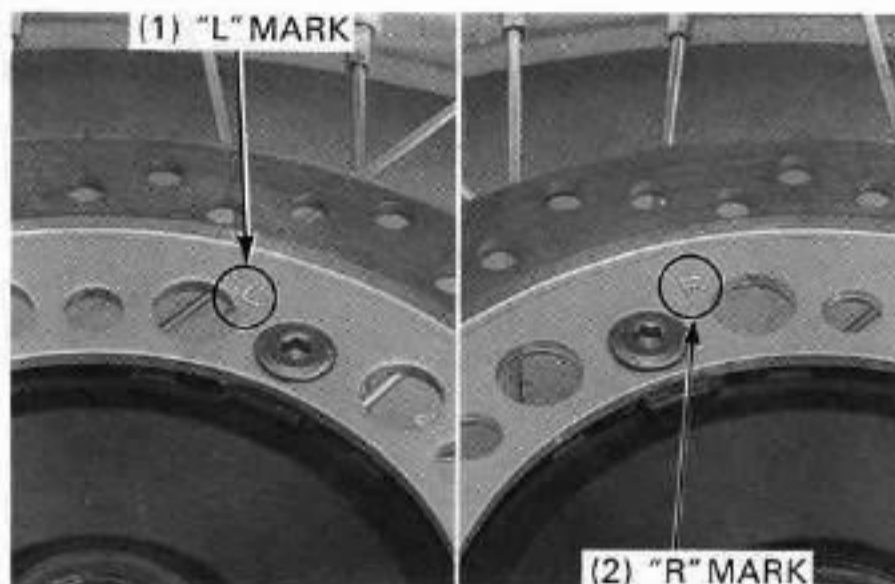
- Install the hub cover to original position.
 - Right side: large hole
 - Left side: small hole



Install the brake disc with the marked side facing out.

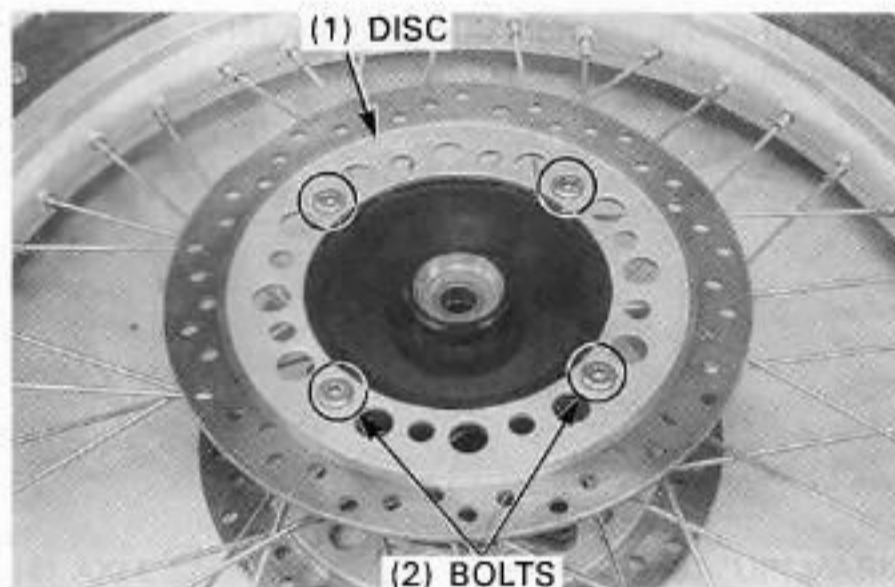
NOTE

- Right brake disc has "R" mark on the marked side.
- Left brake disc has "L" mark on the marked side.



Install and tighten the new brake disc bolts to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)



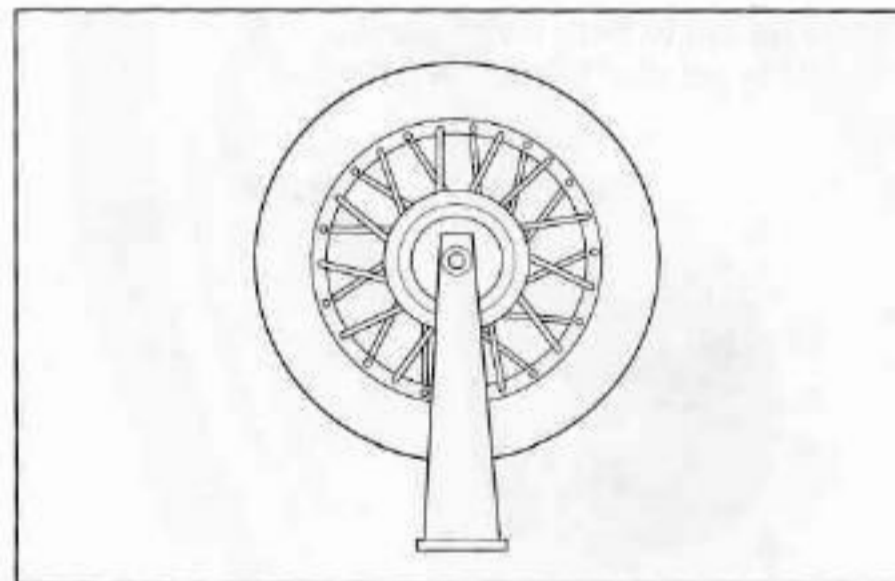
WHEEL BALANCE

⚠ WARNING

- *Wheel balance directly affects the stability, handling and overall safety of the motorcycle. Carefully check balance before reinstalling the wheel.*

NOTE

- The wheel balance must be checked when the tire is remounted.
- For optimum balance, the tire balance mark (a paint dot on the side wall) must be located next to the valve stem.
Remount the tire if necessary.



Mount the wheel, tire and brake disc assembly on an inspection stand.

Spin the wheel, allow it to stop, and mark the lowest (heaviest) part of the wheel with chalk.

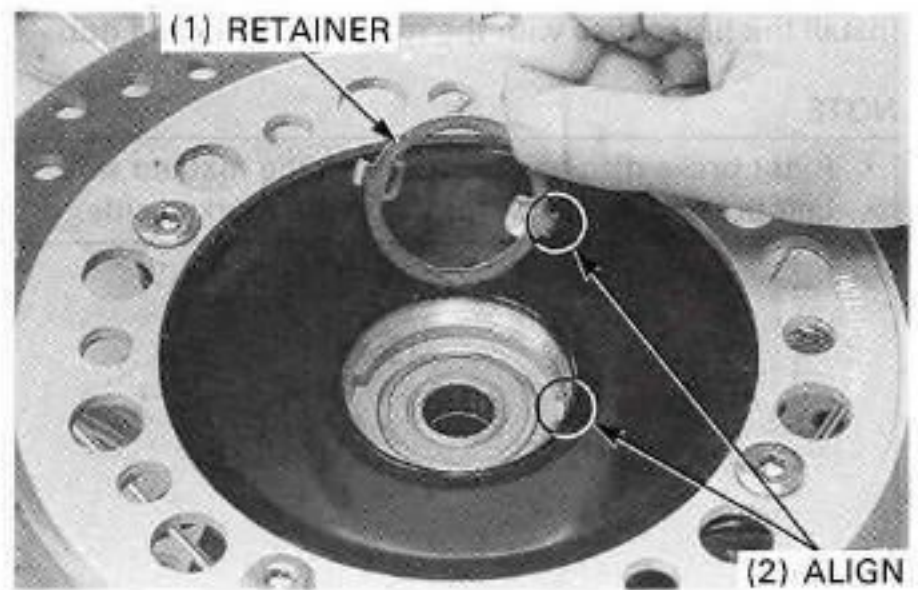
Do this two or three times to verify the heaviest area. If the wheel is balanced, it will not stop consistently in the same position.

To balance the wheel, install balance weights on the lightest side of rim, the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun.

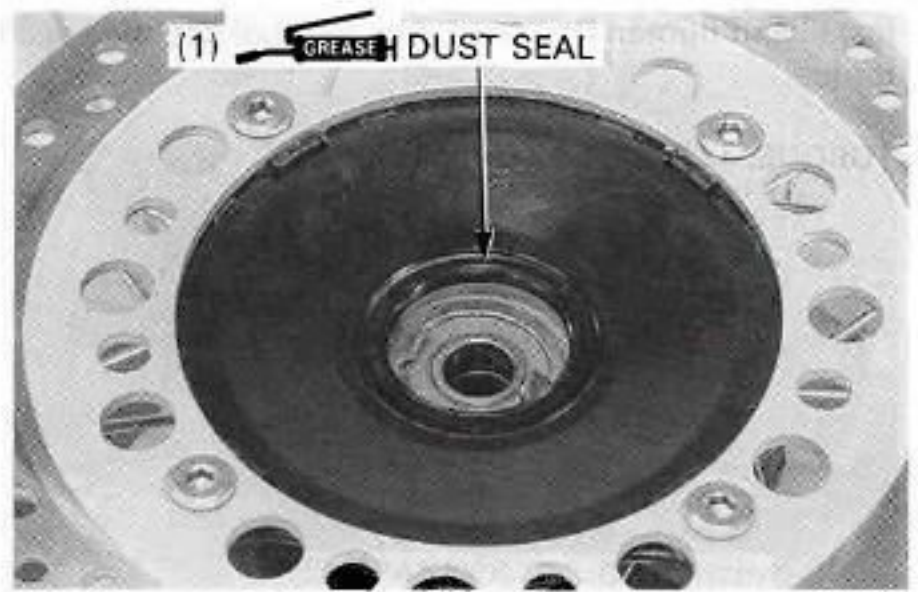
Do not add more than 60 grams (2.1 oz) to the front wheel.

FRONT WHEEL/SUSPENSION/STEERING

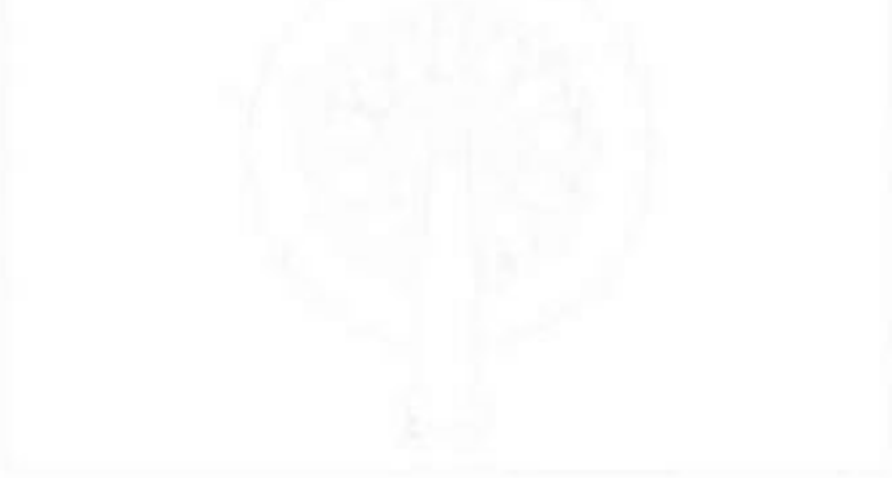
Install the speedometer gear retainer to the wheel hub aligning the tangs on the retainer with the slots on the hub.



Apply grease to the right dust seal lip. Install the right dust seal to the right wheel.



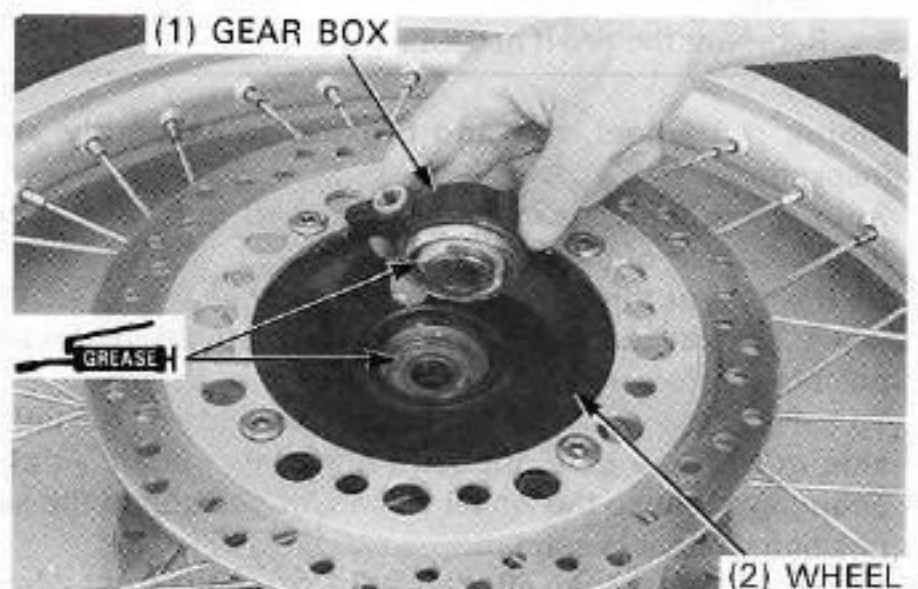
Apply grease to the left dust seal lip. Install the left dust seal to the left wheel.



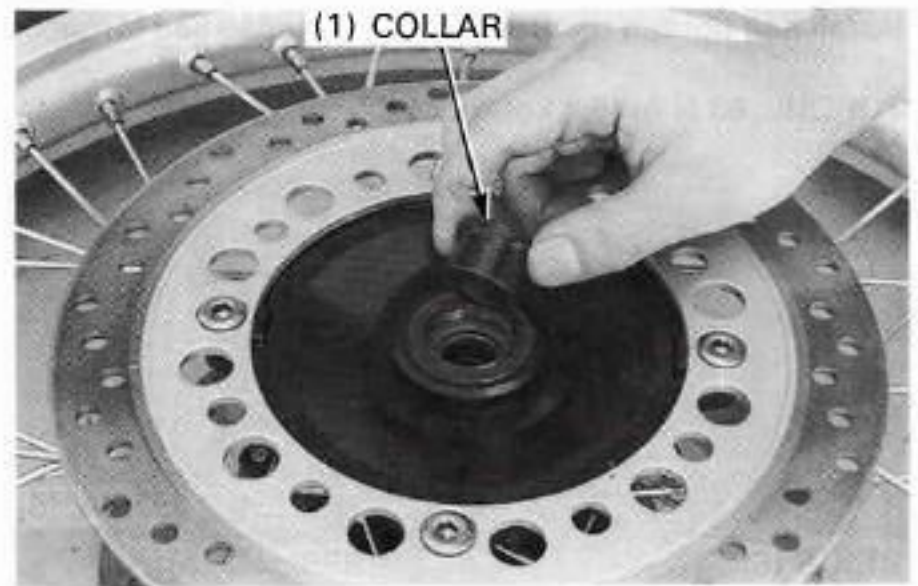
INSTALLATION

Apply grease to the inside of the speedometer gear box, and install the washer and speedometer gear.

Install the speedometer gear box into the right wheel.



Install the side collar into the left wheel.

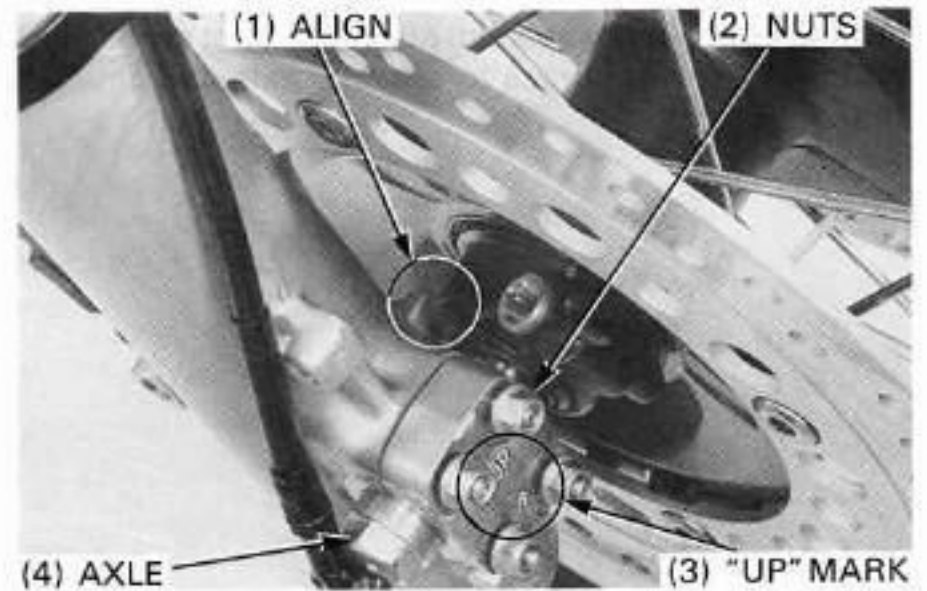


Install the front wheel between the fork legs so that the brake disc is positioned between the pads, being careful not to damage the pads.

NOTE

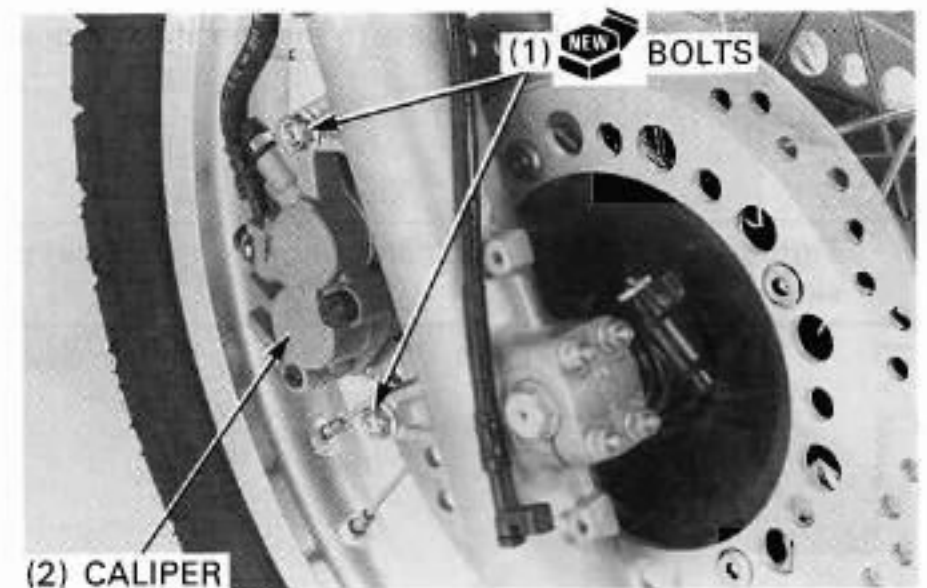
- If removed the axle holder, install it with "UP" mark facing up.

Apply thin coat of grease to the front axle.
Install the front axle.
Position the lug on the speedometer gear box against the back of stopper on the fork leg.

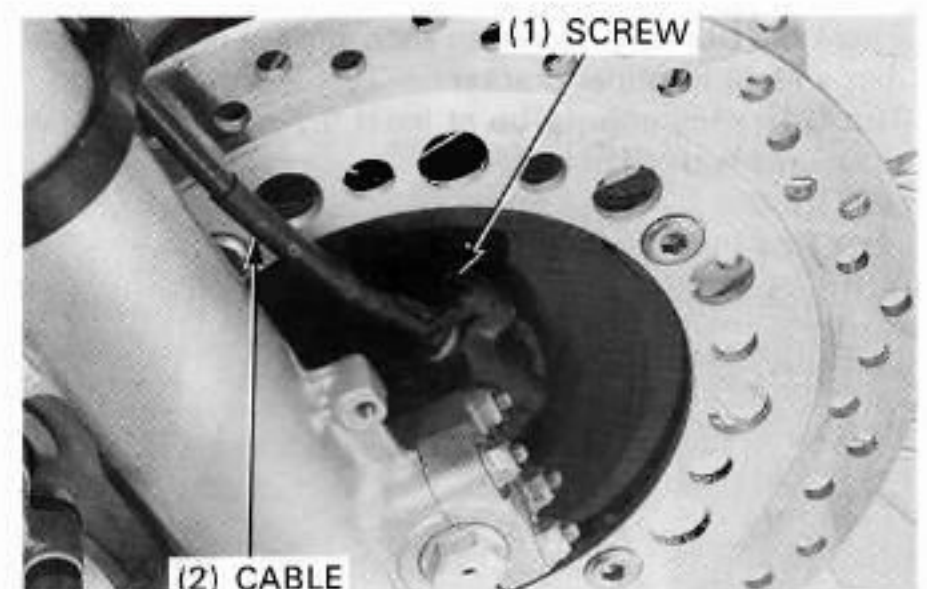


Install the right front caliper.
Install and tighten the new right front caliper mounting bolts to the specified torque.

TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)



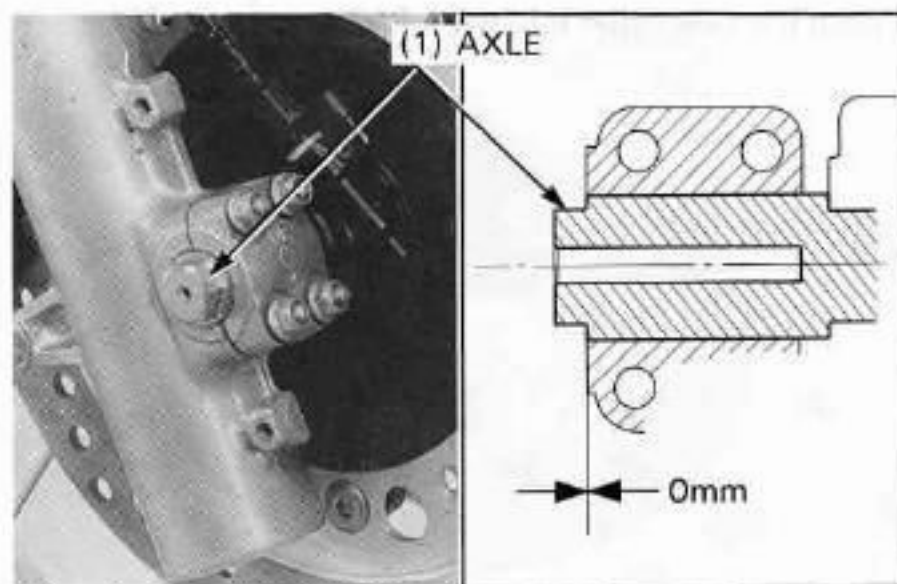
Connect the speedometer cable.
Install and tighten the screw securely.



FRONT WHEEL/SUSPENSION/STEERING

Install and tighten the front axle to the specified torque.

TORQUE: 63 N·m (6.4 kgf·m, 46 lbf·ft)



With the front brake applied, pump the front suspension up and down several times to seat the axle and check front brake operation.

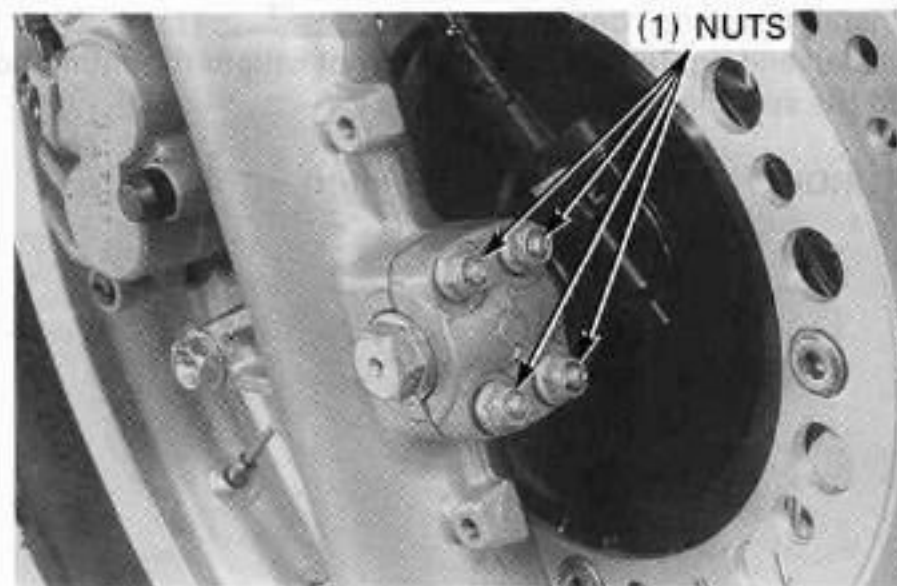


Tighten the front axle holder nuts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

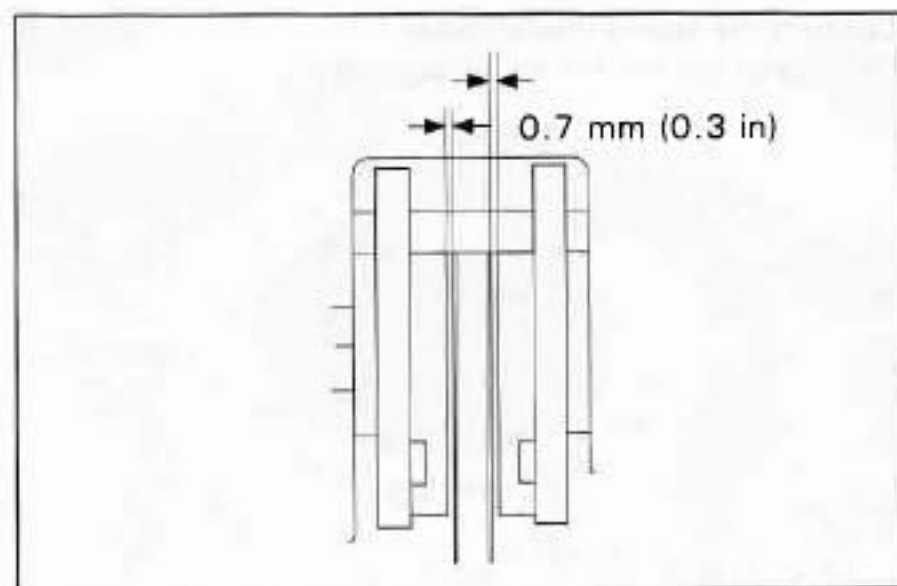
NOTE

- Tighten the front axle holder nuts with start the upper side.



Check the clearance between each surface of the right brake disc and right caliper bracket. The clearance should be at least 0.7 mm (0.03 in) when measured with a feeler gauge.

Install the fork cover (page 2-5).



FORK

REMOVAL

Remove the bolt and brake hose clamp from the fork leg.
Remove the right front caliper mounting bolts and right front caliper.

CAUTION

- Do not suspend the brake caliper from the brake hose.
Do not twist the brake hose.

Remove the front fender (page 2-4).
Remove the front wheel (page 13-14).

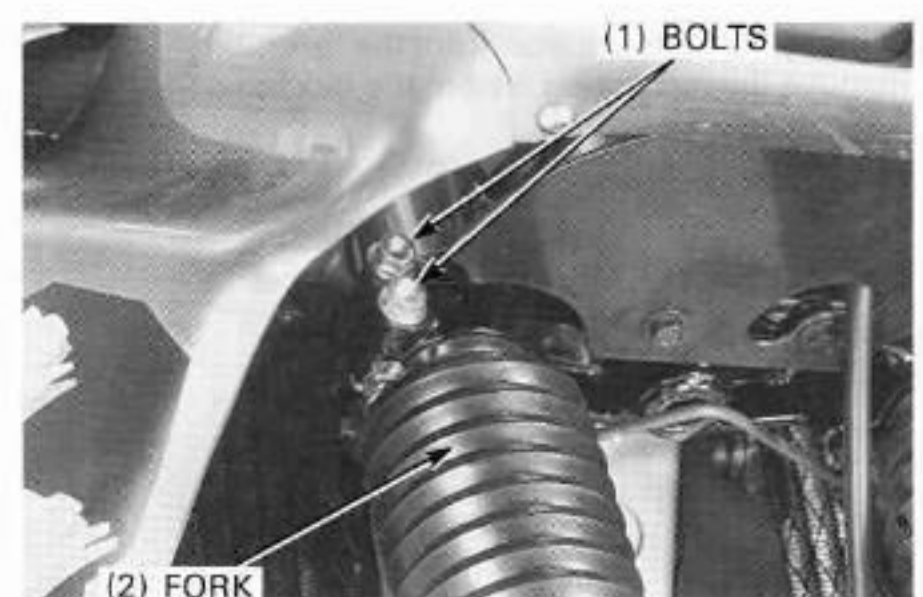
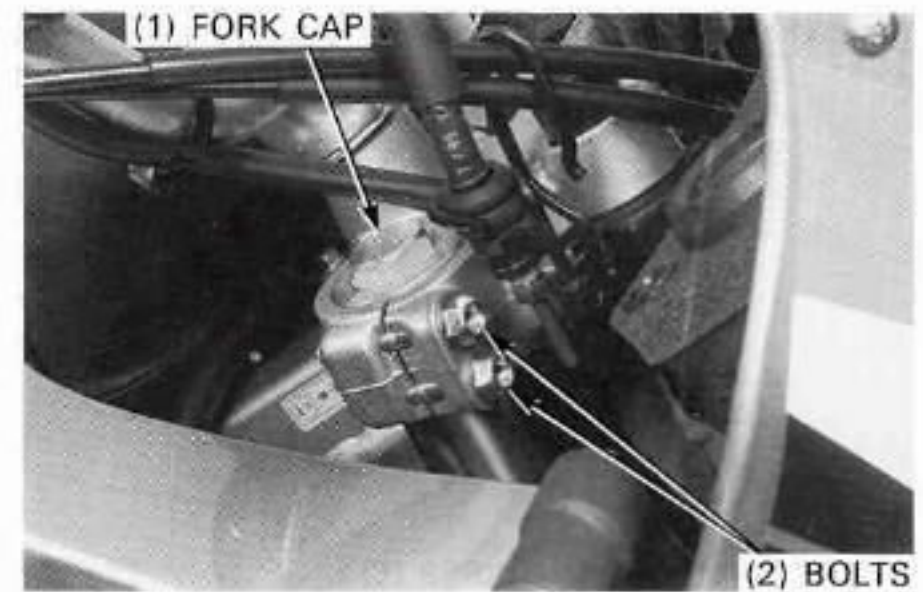
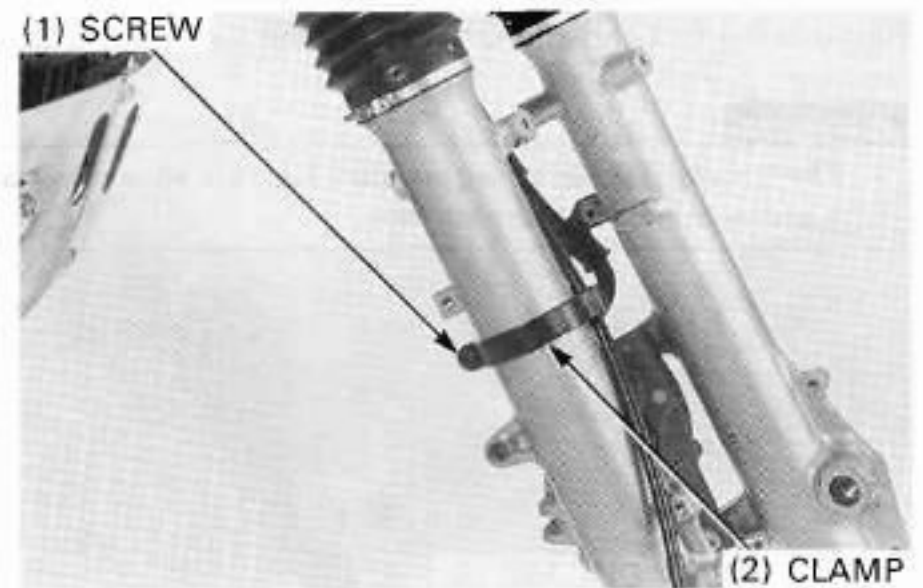
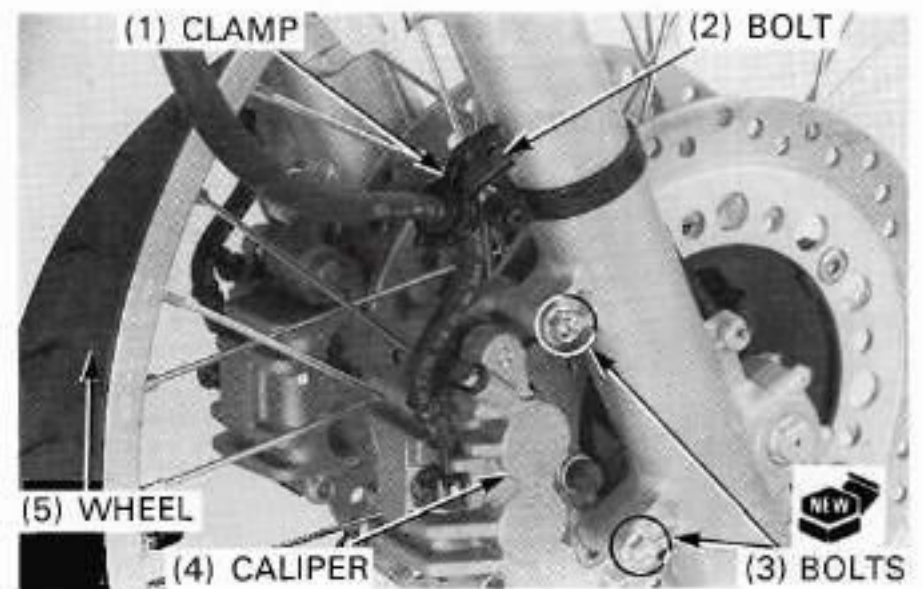
NOTE

- Do not operate the front brake lever after removing the caliper and front wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.

Remove the screw and speedometer cable clamp (right side only).

Loosen the fork top bridge pinch bolts.
When the fork is ready to be disassembled, loosen the fork cap, but do not remove it.

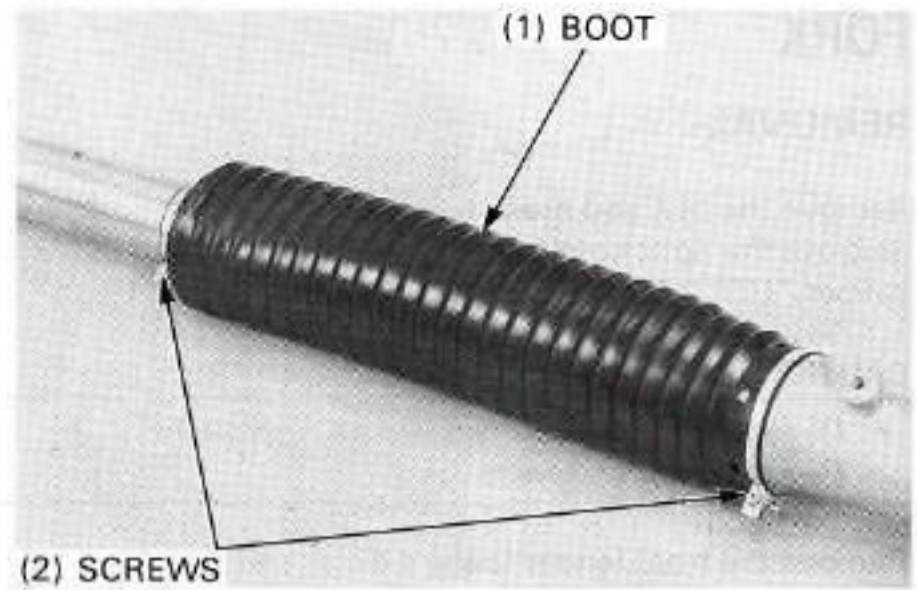
Loosen the fork bottom bridge pinch bolts while holding the fork.
Remove the fork from the top bridge and steering stem.



FRONT WHEEL/SUSPENSION/STEERING

DISASSEMBLY

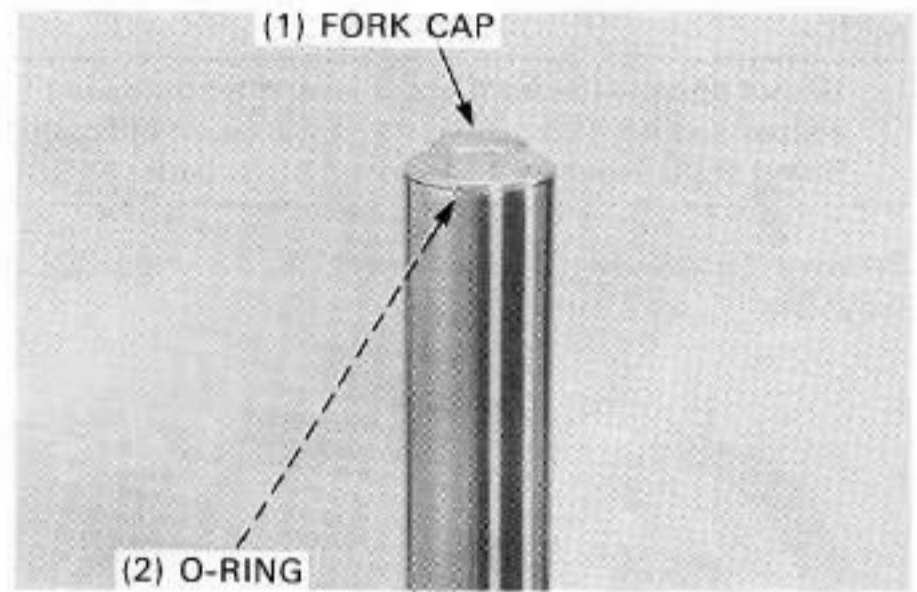
Loosen the band screws and remove the fork boot.



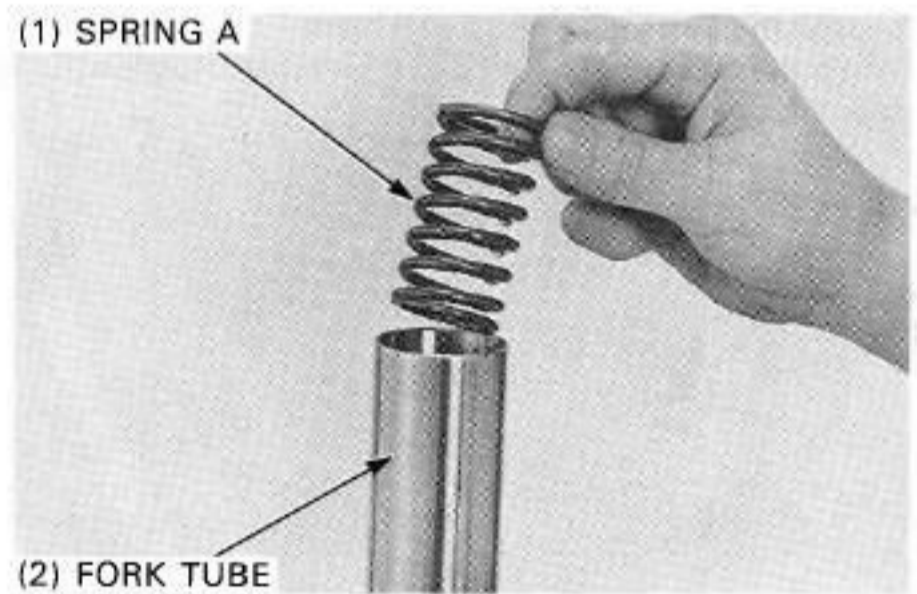
Remove the fork cap and O-ring from the fork tube.

⚠ WARNING

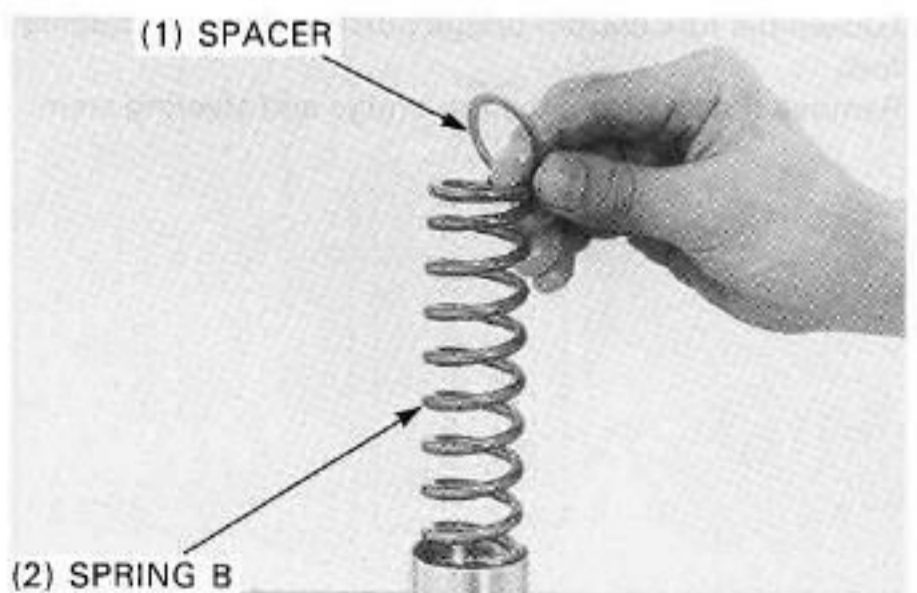
- *The fork cap is under spring pressure. Use care when removing it and wear eye and face protection.*



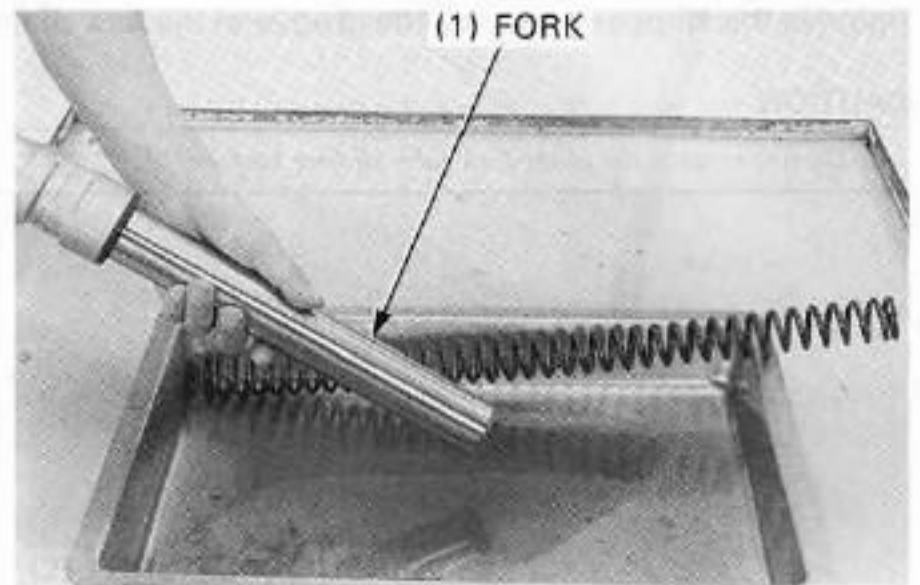
Remove the fork spring A from the fork tube.



Remove the spring spacer from the fork tube.
Remove the fork spring B from the fork tube.



Pour out the fork oil from the fork leg by pumping the fork 8-10 times.



CAUTION

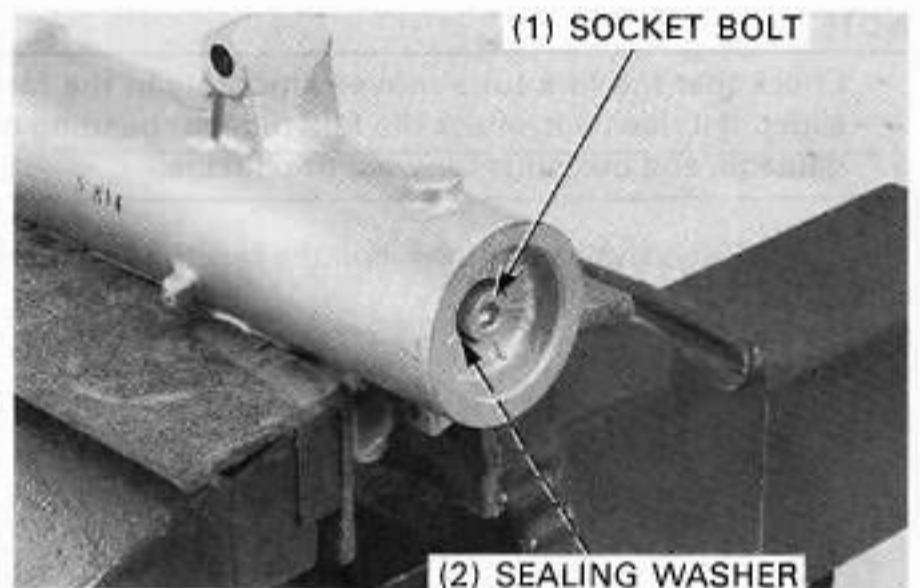
- Do not over tighten the bracket.

Hold the axle holder of the fork slider in a vise with a piece of wood or soft jaws to avoid damage.

Loosen and remove the fork socket bolt and sealing washer from the fork slider.

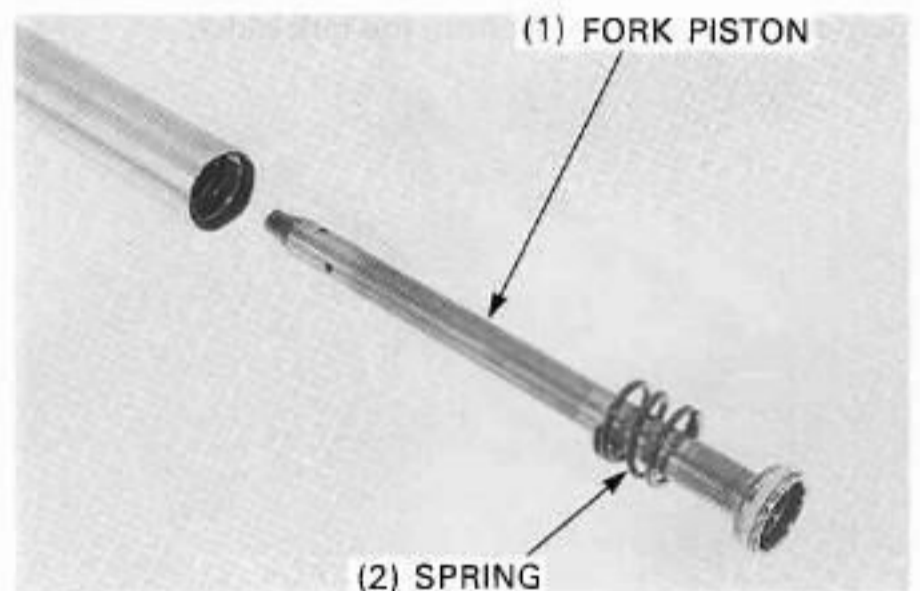
If the fork piston turns with the socket bolt, temporarily install the fork spring A, B, spring spacer and fork cap.

Remove the fork piston and rebound spring.

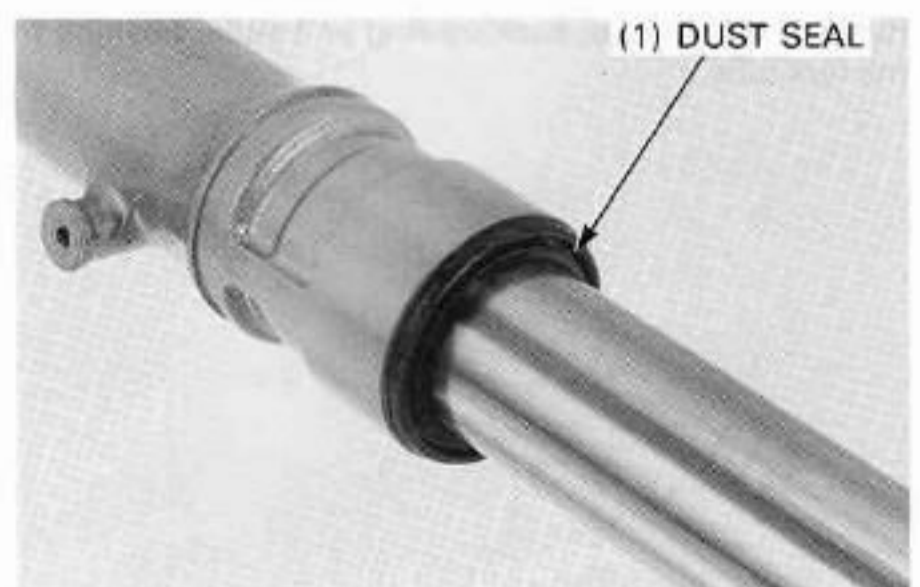


NOTE

- Do not remove the fork piston ring, unless it is necessary to replace with a new one.



Remove the dust seal.

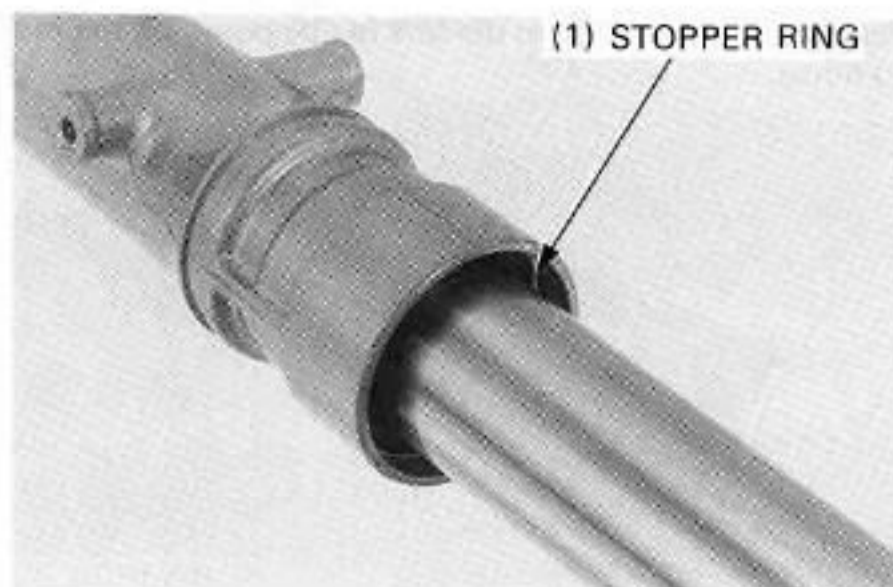


FRONT WHEEL/SUSPENSION/STEERING

Remove the stopper ring from the groove of the fork slider.

CAUTION

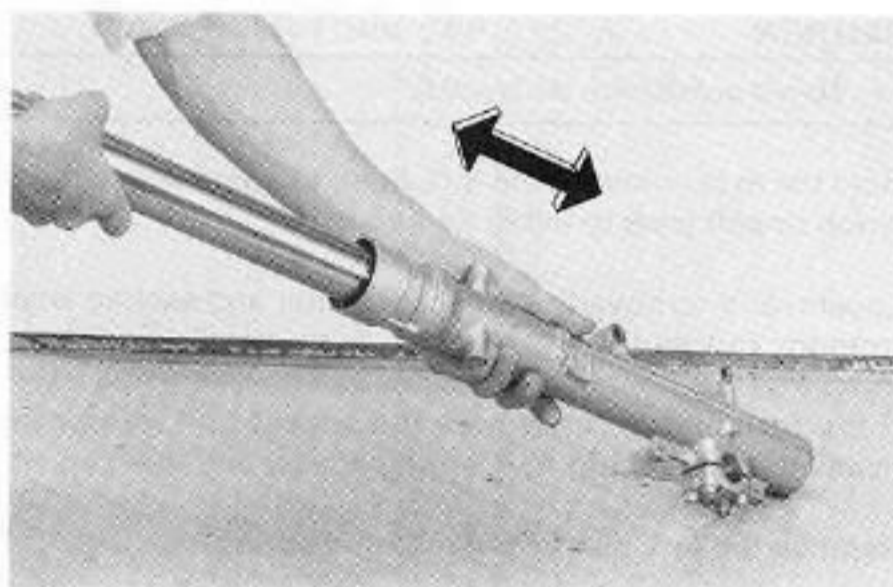
- Do not scratch the inner fork tube sliding surface.



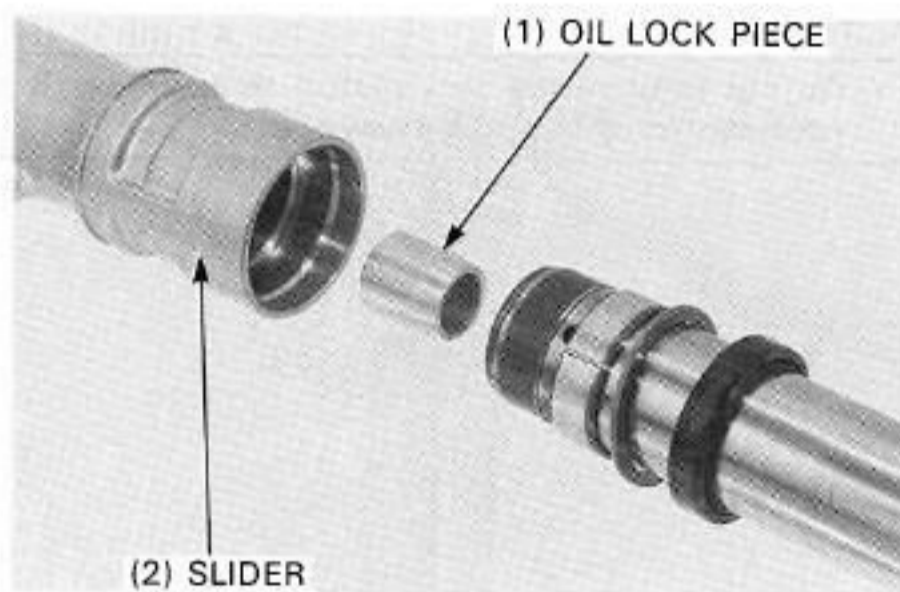
NOTE

- Check that the fork tube moves smoothly in the fork slider. If it does not, check the fork tube for bending or damage, and bushings for wear or damage.

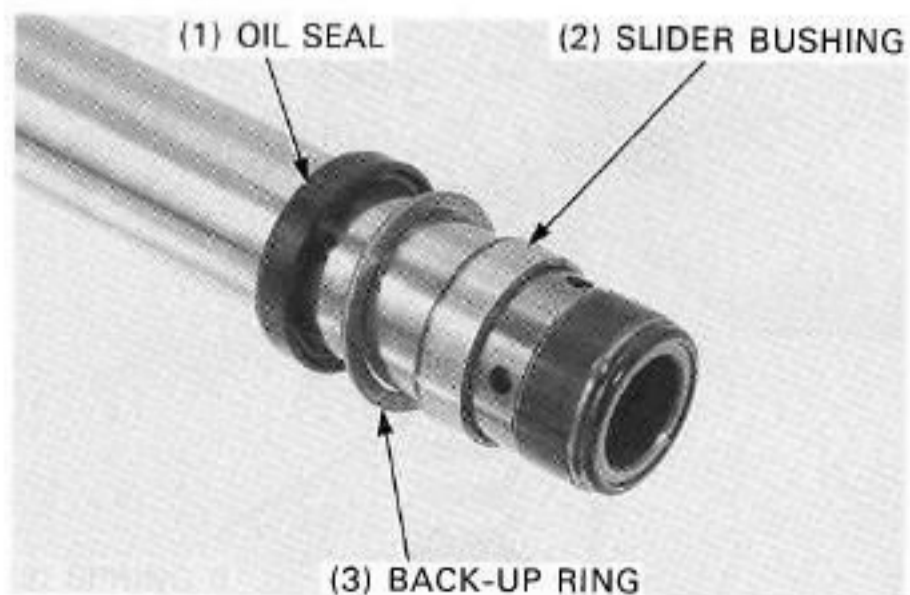
Using quick successive motions, pull the fork tube out of the fork slider.



Remove the oil lock piece from the fork slider.



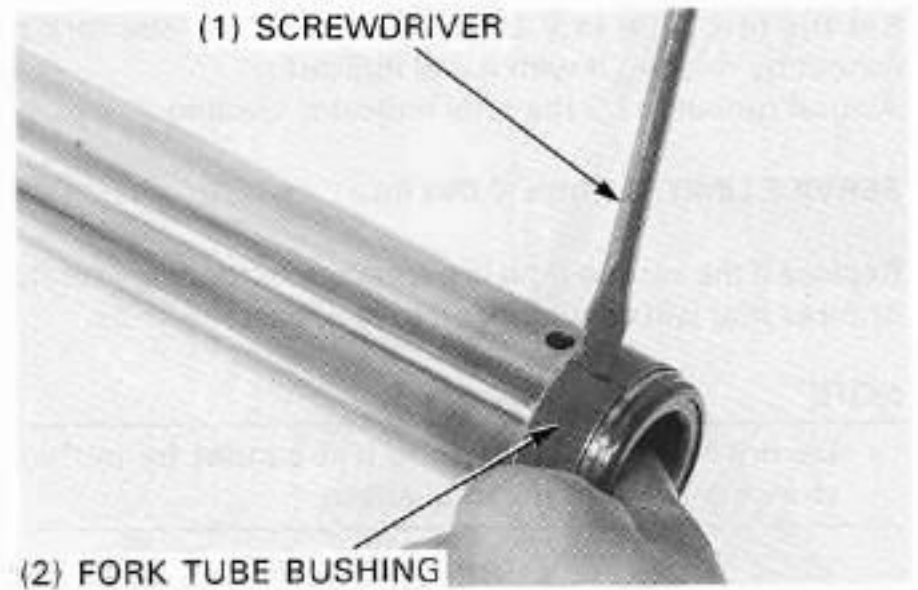
Remove the oil seal, back-up ring and slider bushing from the fork tube.



NOTE

- Do not remove the fork tube bushing unless it is necessary to replace it with a new one.

Carefully remove the fork tube bushing by prying the slot with a screwdriver until the bushing can be pulled off by hand.



INSPECTION

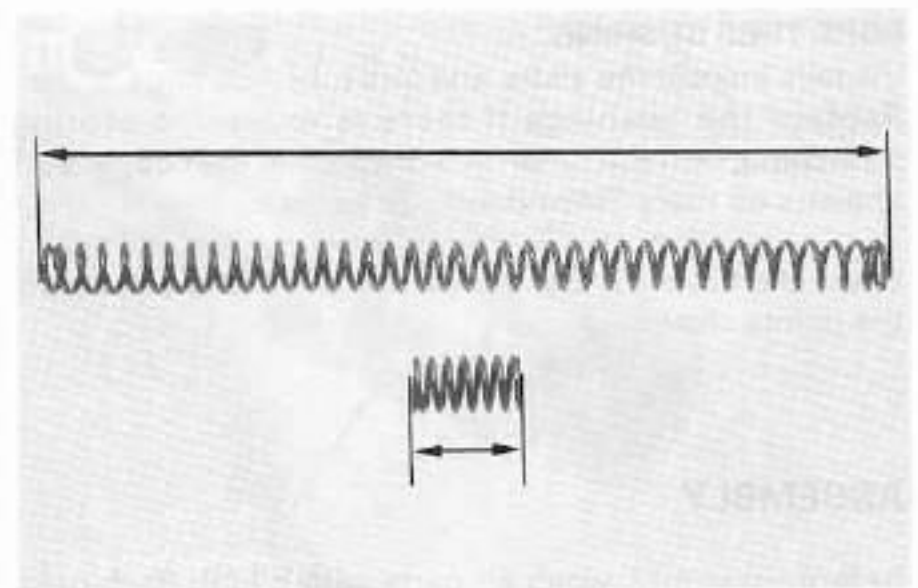
FORK SPRING

Measure the fork spring free length by placing the spring on a flat surface.

SERVICE LIMITS:

Fork spring A: 66.9 mm (2.63 in)

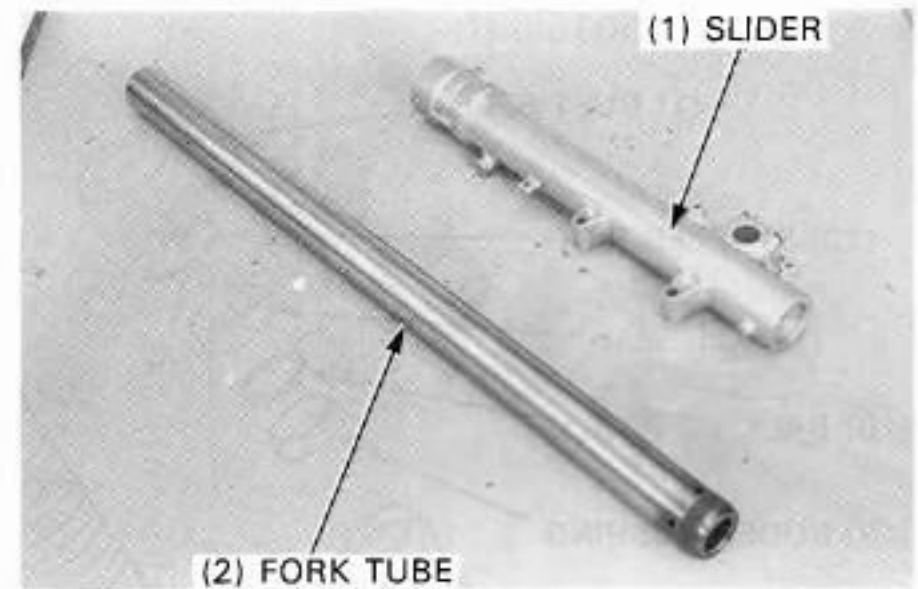
Fork spring B: 552.8 mm (21.76 in)



FORK TUBE/SLIDER/FORK PISTON

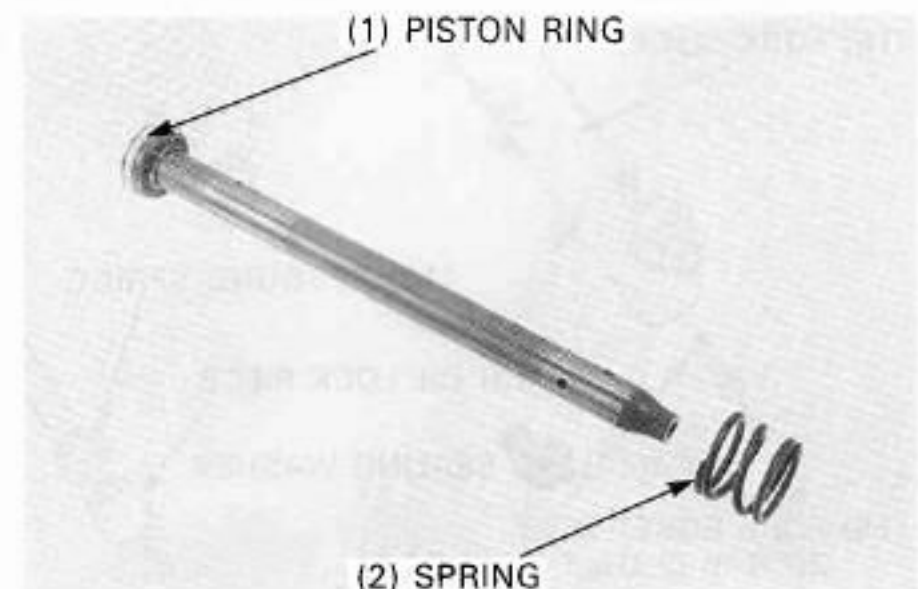
Check the fork tube, slider and fork piston for score marks, and excessive or abnormal wear.

Replace the component if necessary.



Check the fork piston ring for wear or damage.
Check the rebound spring for fatigue or damage.

Replace the component if necessary.



FRONT WHEEL/SUSPENSION/STEERING

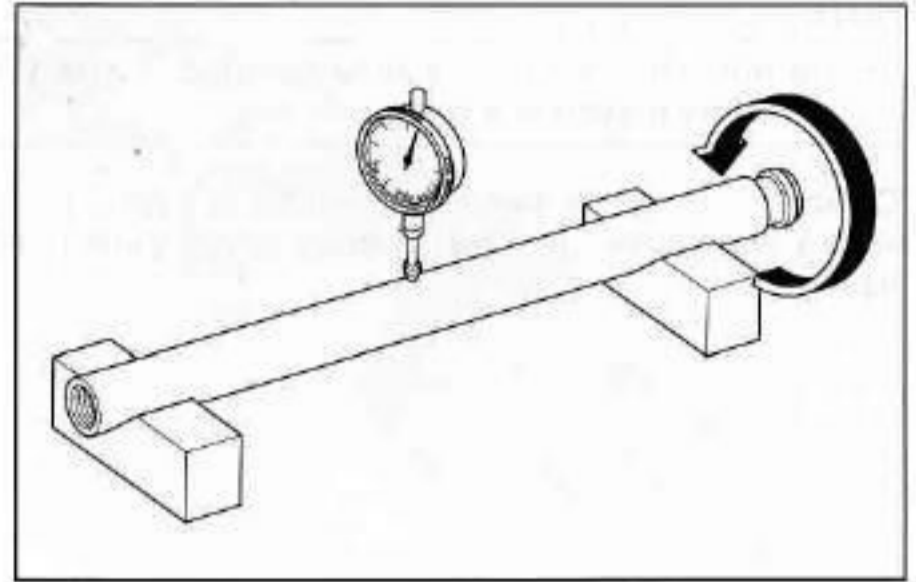
Set the fork tube in V-blocks and measure the fork tube runout by rotating it with a dial indicator.
Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.2 mm (0.008 in)

Replace if the service limit is exceeded, or there are scratches or nicks that will allow fork oil to leak past the seals.

NOTE

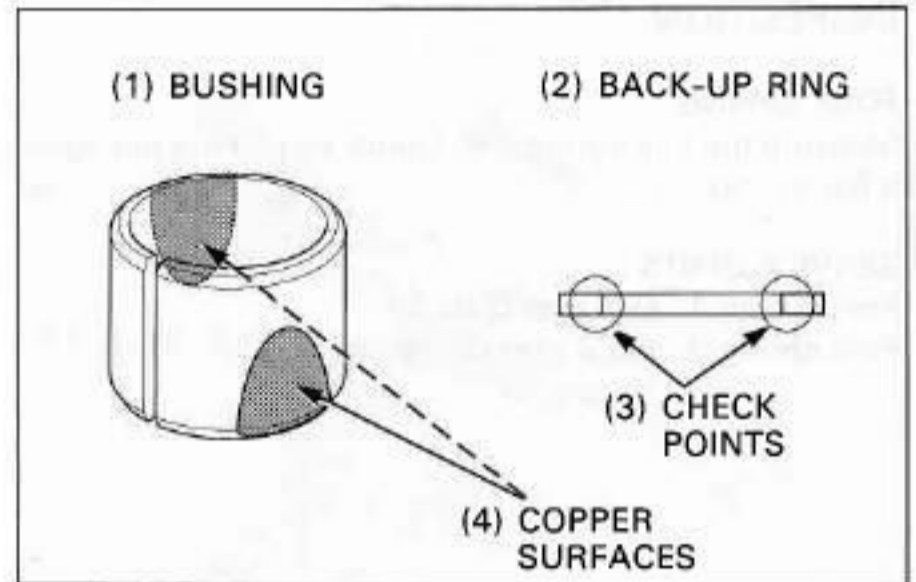
- Do not reuse the fork tube if it cannot be perfectly straightened with minimal effort.



FORK TUBE BUSHING

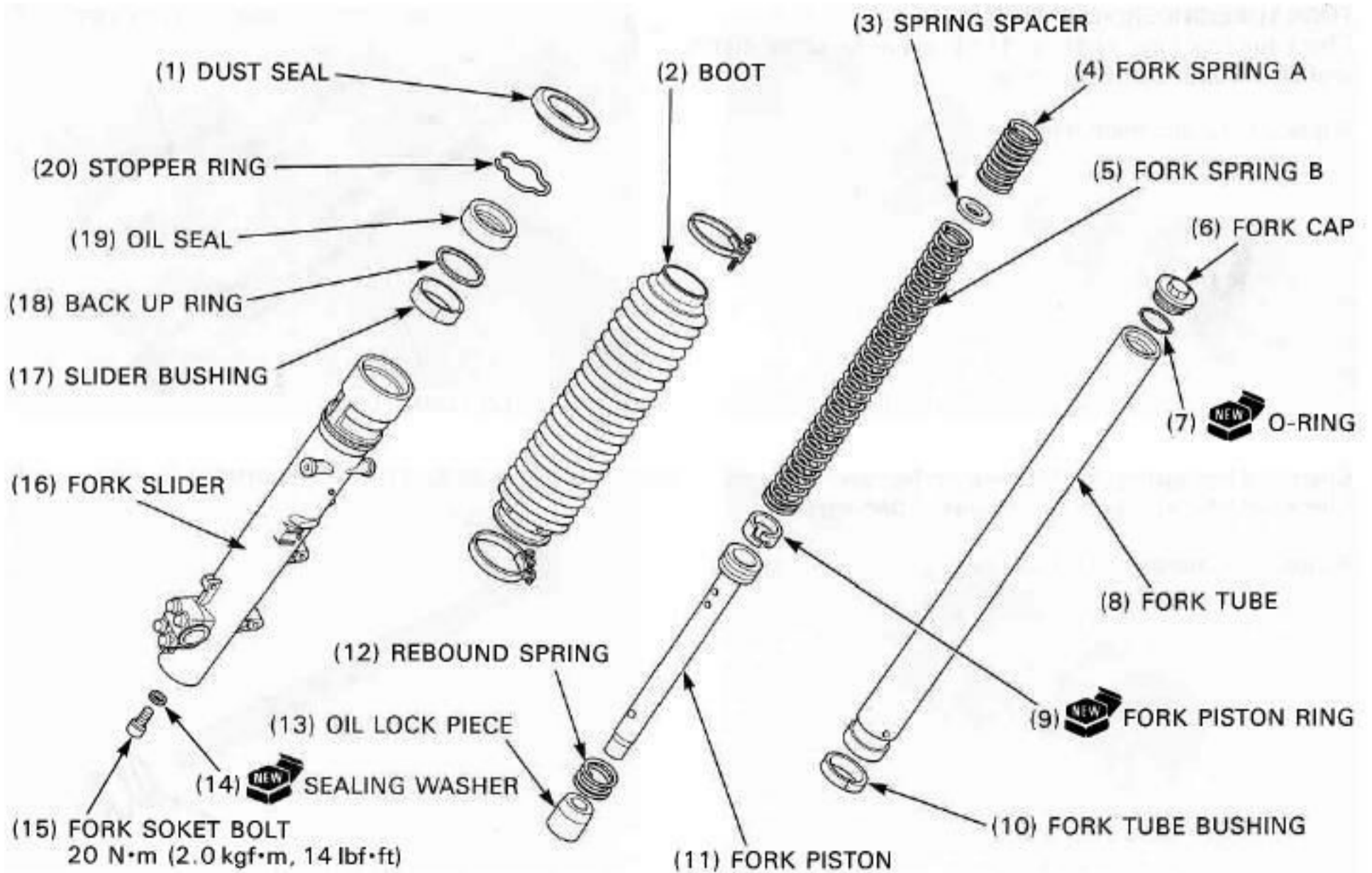
Visually inspect the slider and fork tube bushings. Replace the bushings if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more 3/4 of the entire surface.

Check the back-up ring; replace it if there is any distortion at the points shown.



ASSEMBLY

Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them off completely.



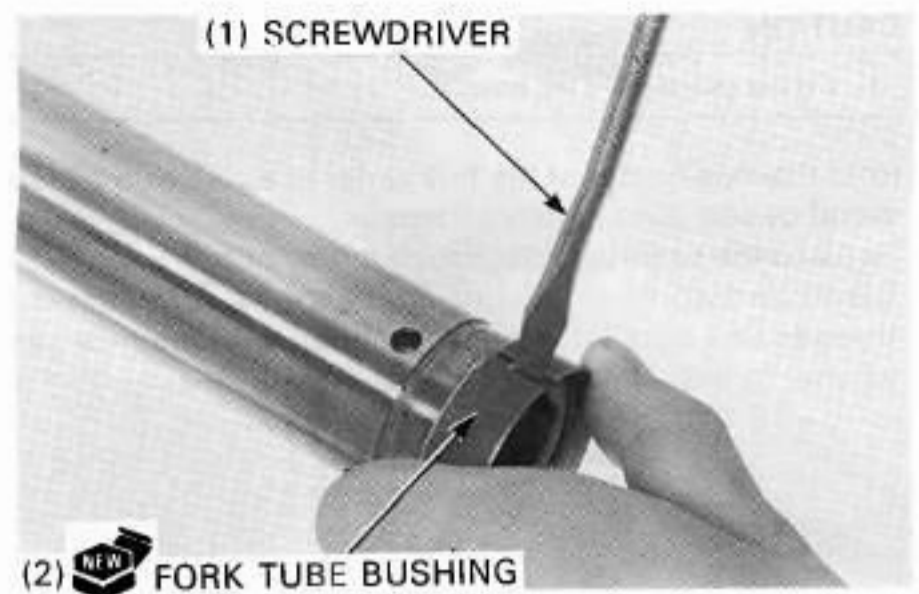
Install a new fork tube bushing if the tube bushing has been removed.

CAUTION

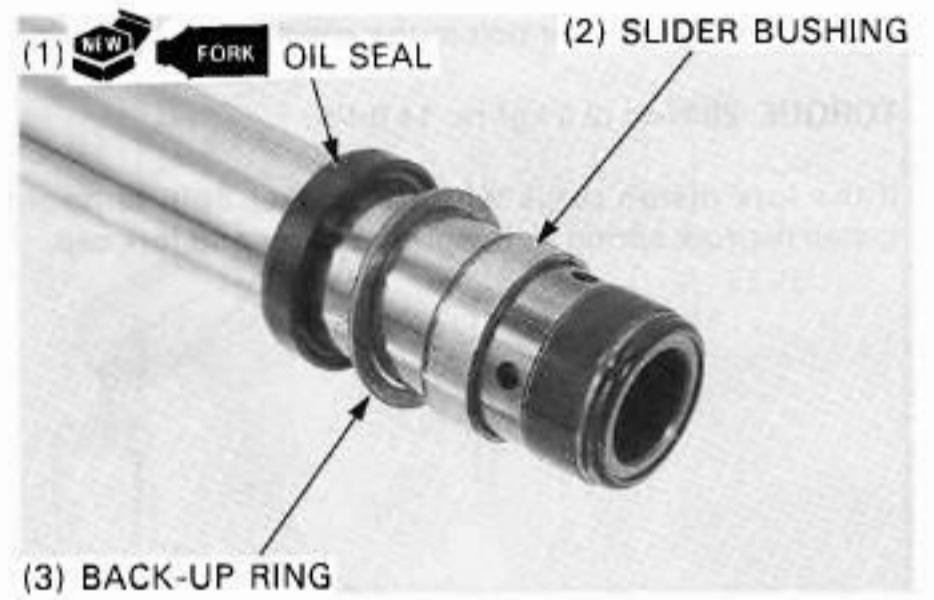
- *Be careful not to damage the fork tube bushing coating.*
- *Do not open the fork tube bushing more than necessary.*

NOTE

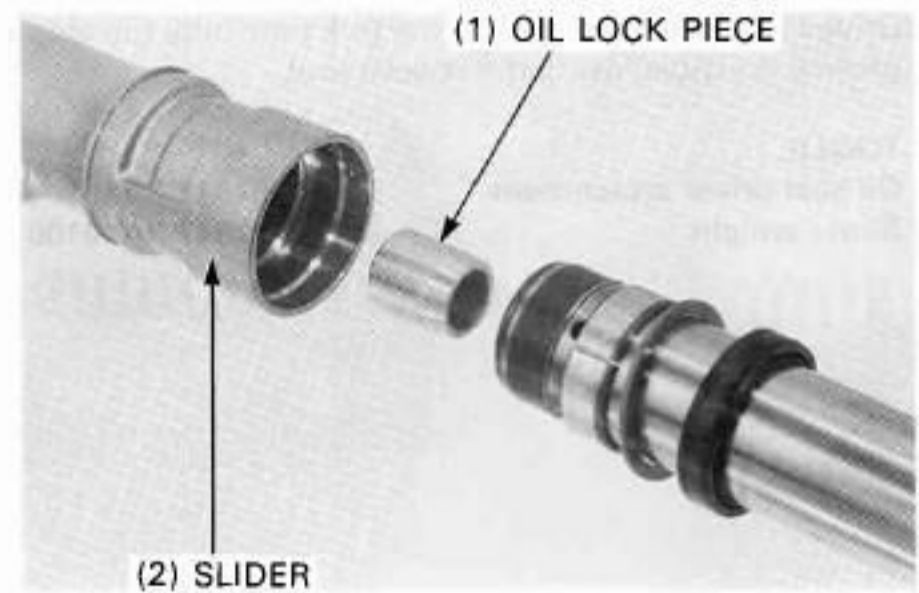
- Remove the burrs from the bushing mating surface, being careful not to peel off the coating.



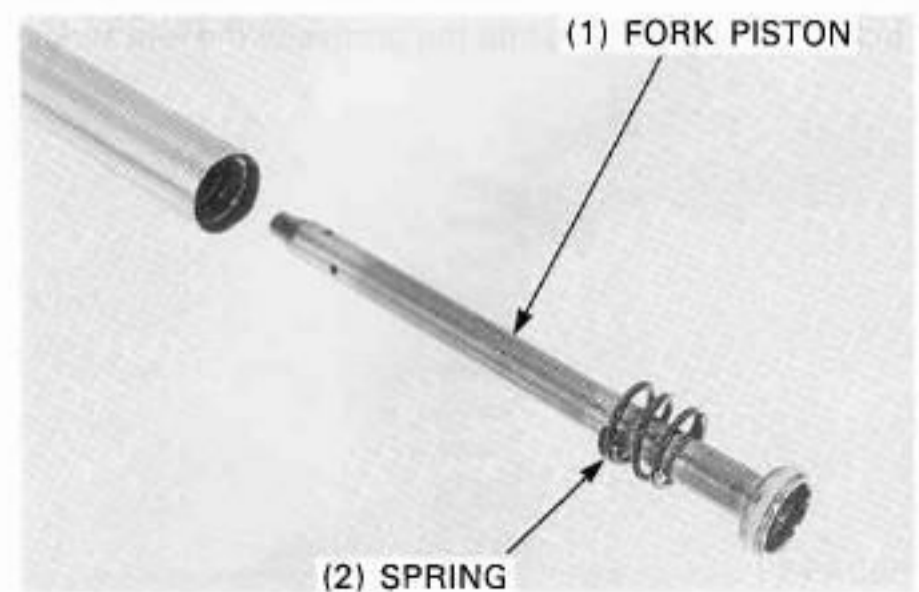
Install the slider bushing and back-up ring to the fork tube. Apply fork oil to the new oil seal lip. Install the new oil seal to the fork tube with it marking side facing up.



Install the oil lock piece onto the fork piston end. Coat the fork tube bushing with the fork oil and install the fork tube into the fork slider.



Install the rebound spring to the fork piston. Install the fork piston into the fork tube.

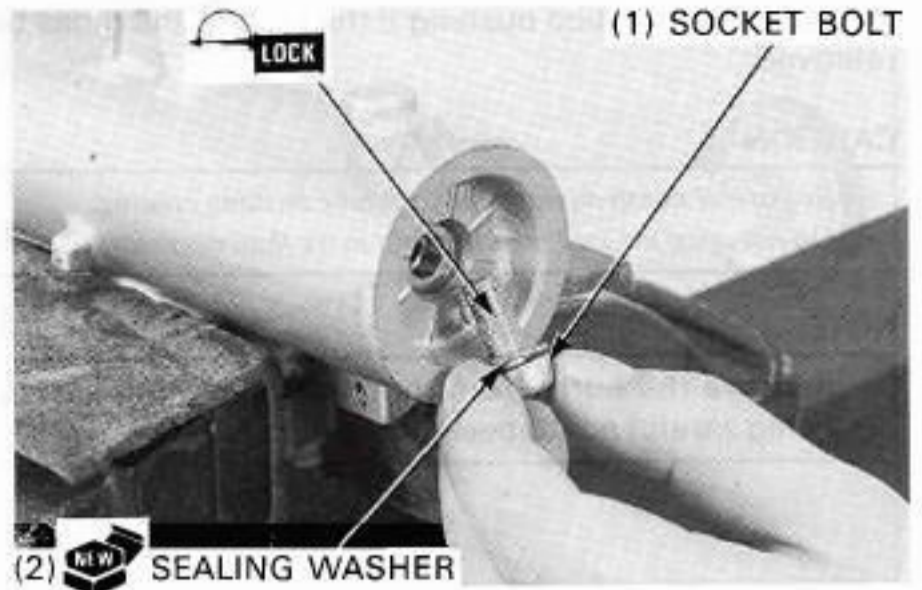


FRONT WHEEL/SUSPENSION/STEERING

CAUTION

- Do not overtighten the bracket.

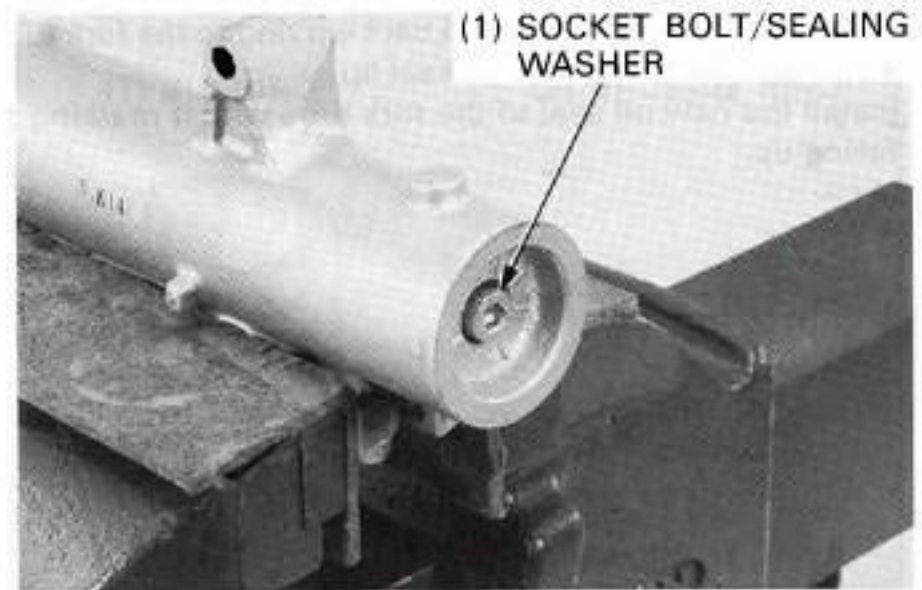
Hold the axle holder of the fork slider in a vise with a piece of wood or soft jaws to avoid damage.
 Replace the sealing washer with a new one.
 Clean and apply a locking agent to the fork socket bolt threads and install the fork socket bolt with the new sealing washer into the fork piston.



Tighten the fork socket bolt to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)

If the fork piston turns with the socket bolt, temporarily install the fork spring A, B, spring spacer and fork cap.

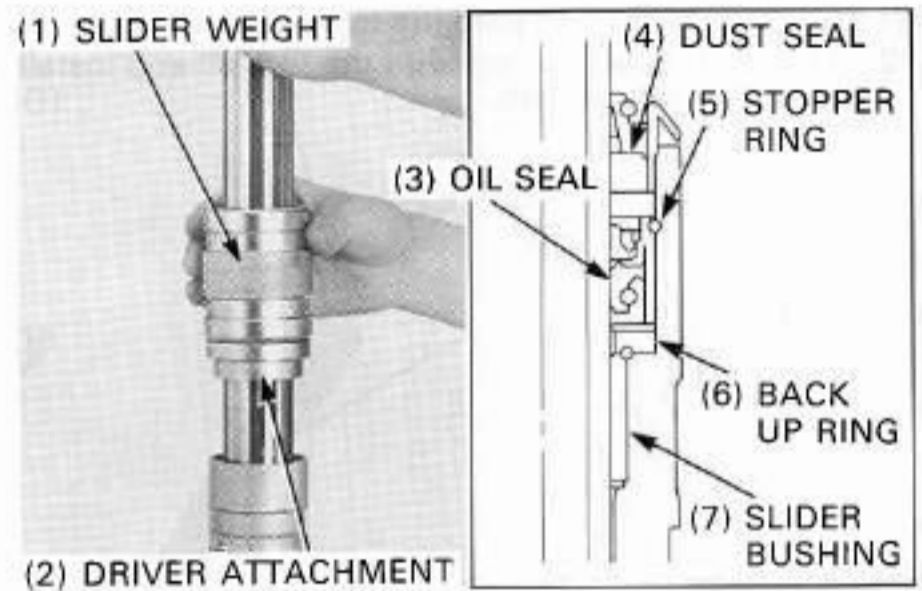


Drive in the new oil seal into the fork tube until the stop ring groove is visible, using the special tool.

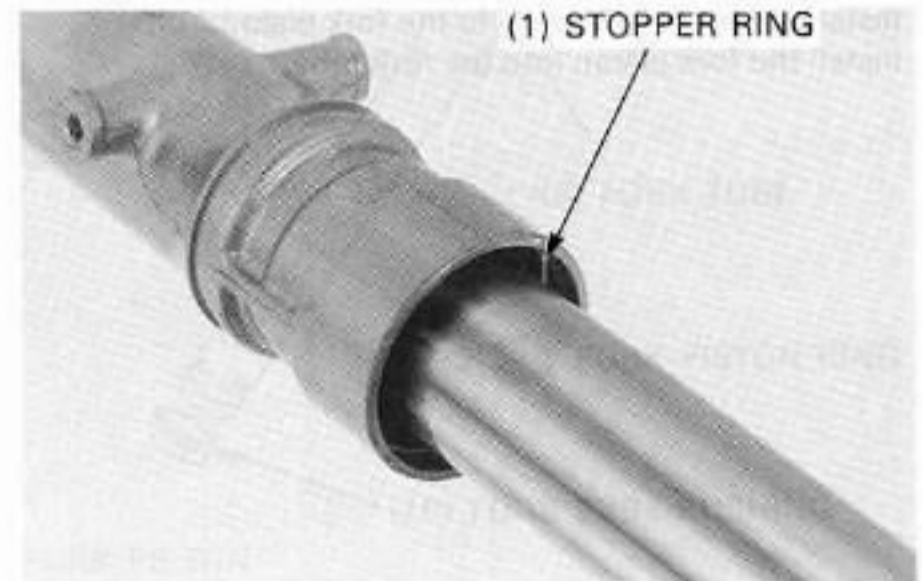
TOOLS:

Oil seal driver attachment
 Slider weight

07947-KA40200
 07947-KA50100



Install the stopper ring into the groove in the fork slider.



Apply fork oil to the lip of a new dust seal and install the dust seal.



Pour half the required amount of the recommended fork oil in the fork tube.

RECOMMENDED FORK OIL: Fork fluid
OIL CAPACITY: 648 cm³ (21.9 US oz, 22.7 Imp oz)

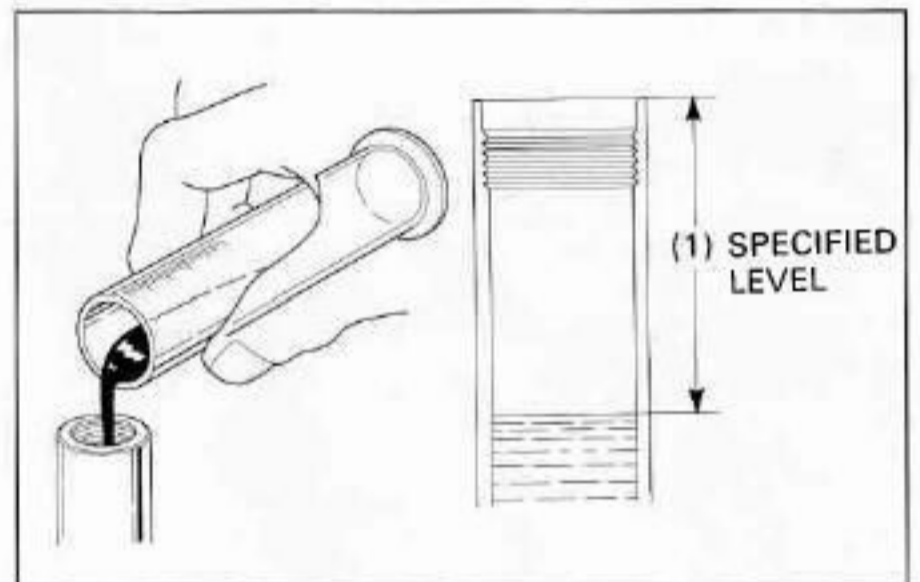
Slowly pump the fork tube several times to remove trapped air.

Pour additional oil up to the specified capacity and repeat the above step.

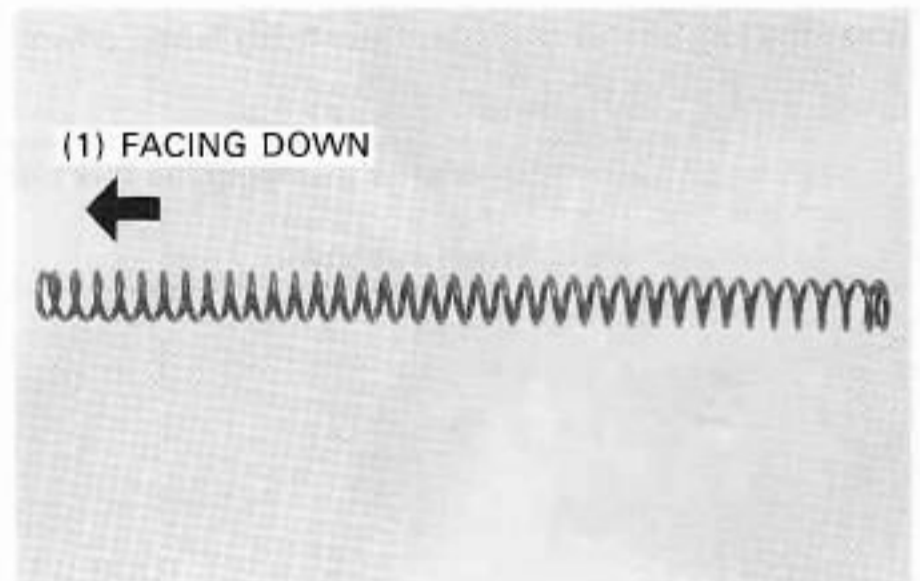
Compress the fork leg fully.

Measure the oil level from the top of the fork tube.

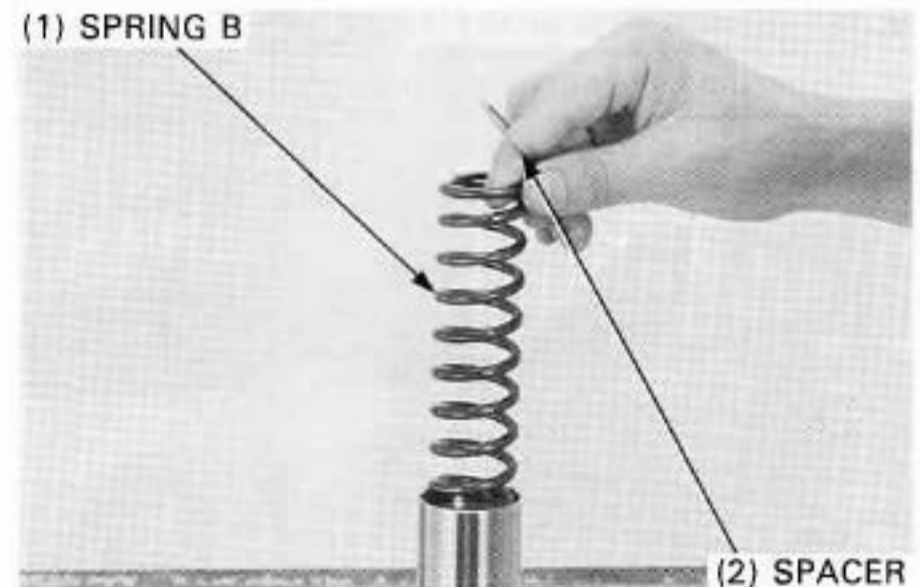
OIL LEVEL: 106 mm (4.1 in)



Pull the fork tube and install the fork spring B with the tightly wound end facing down.

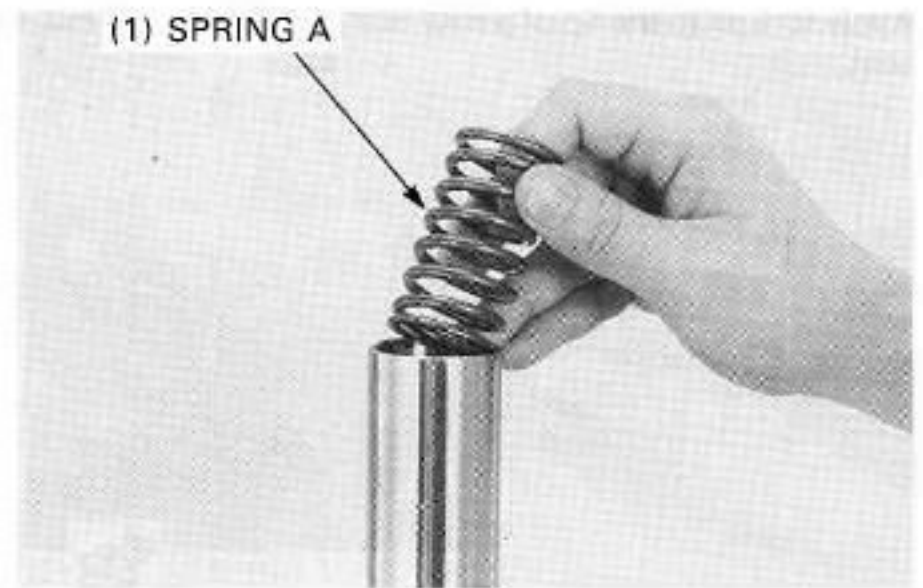


Install the spring spacer.



FRONT WHEEL/SUSPENSION/STEERING

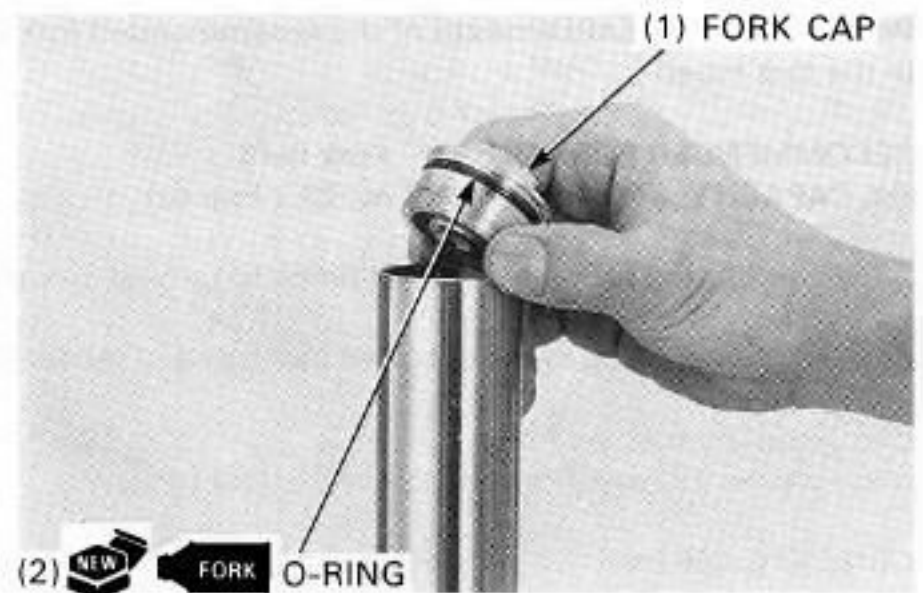
Install the fork spring A.



Apply fork oil to the new O-ring and install the new O-ring to the fork cap.
Install the fork cap into the fork tube.

NOTE

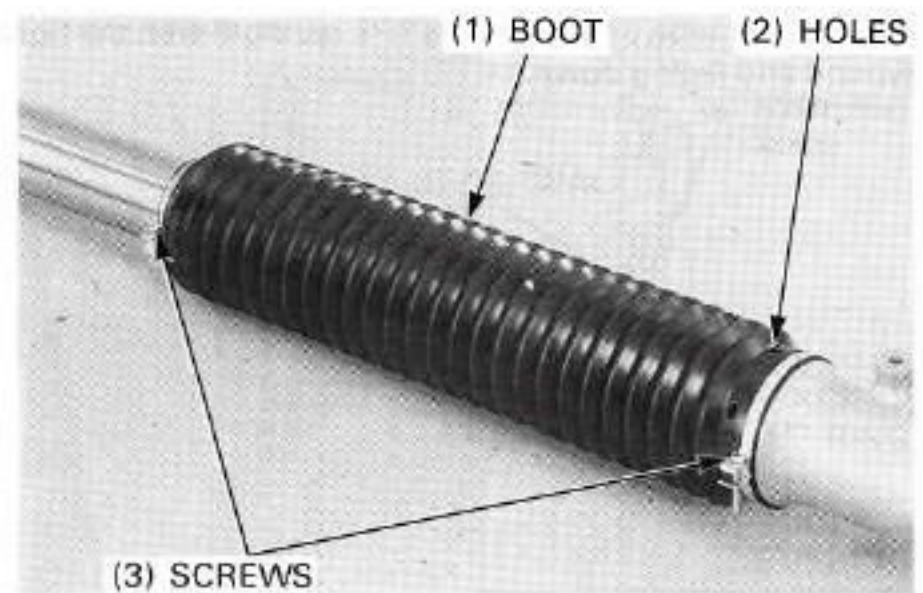
- Tighten the fork cap after installing the fork tube into the fork bridge.



Install the fork boot with the breather holes facing down.

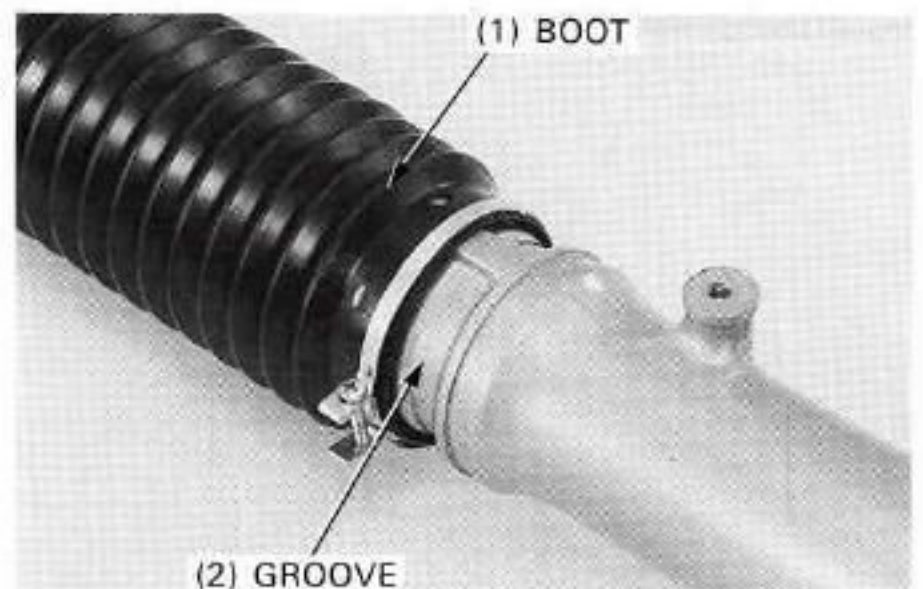
NOTE

- Tighten the band screws after installing the fork tube into the fork bridge.
- The band screws direction as shown.



NOTE

- Install the fork boot to the slider groove securely.



INSTALLATION

Install the fork into the bottom and top bridge.

Align the top of fork tube with the upper surface of the top bridge.

Tighten the bottom bridge pinch bolts to the specified torque.

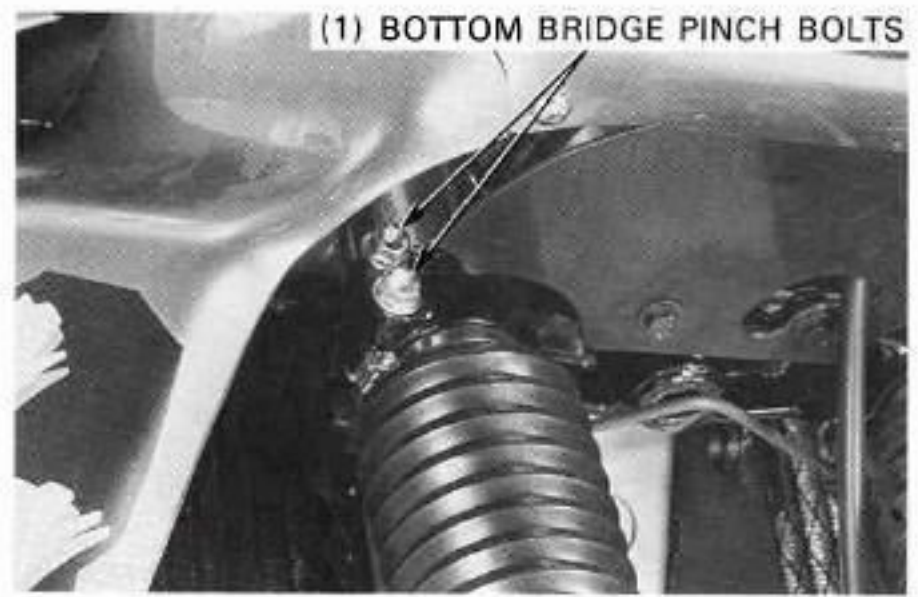
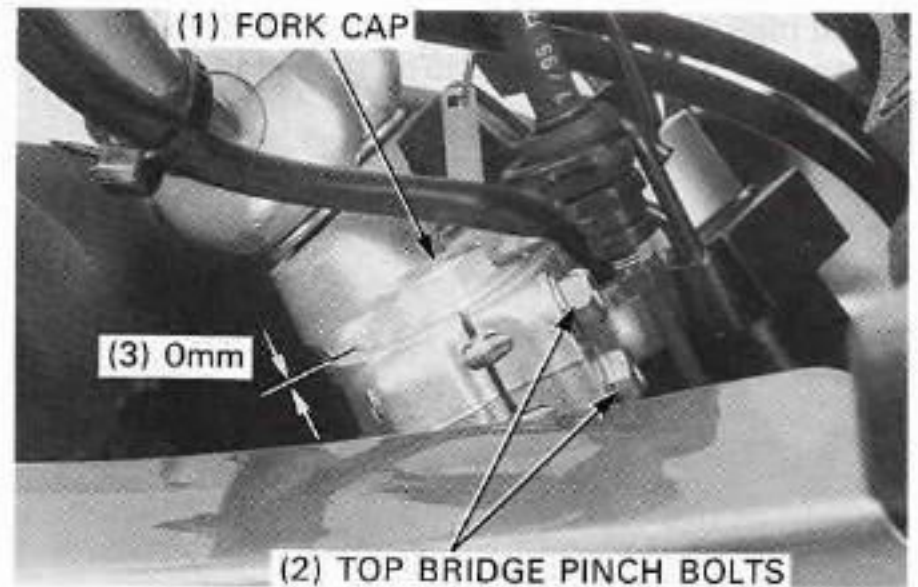
TORQUE: 33 N·m (3.4 kgf·m, 25 lbf·ft)

Tighten the fork cap to the specified torque.

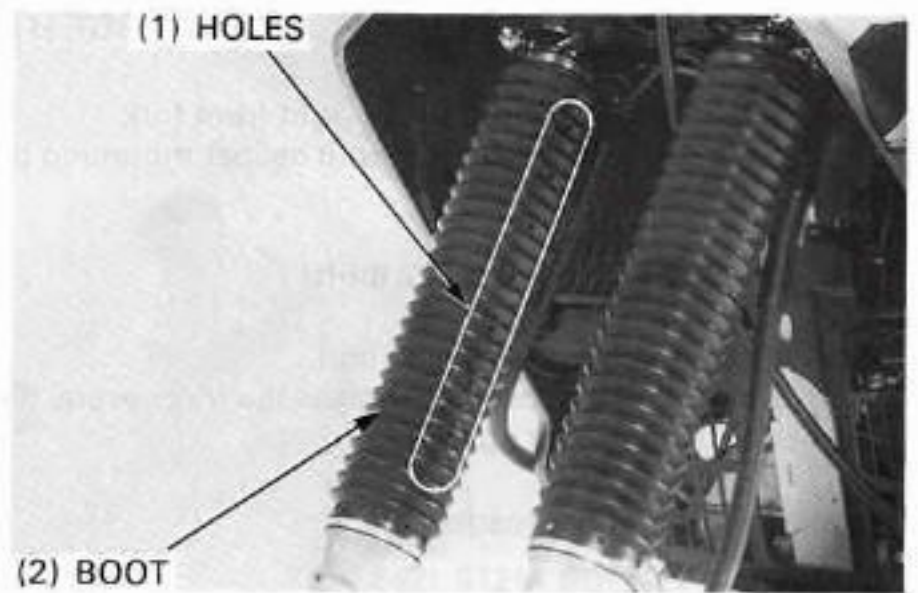
TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Tighten the top bridge pinch bolts to the specified torque.

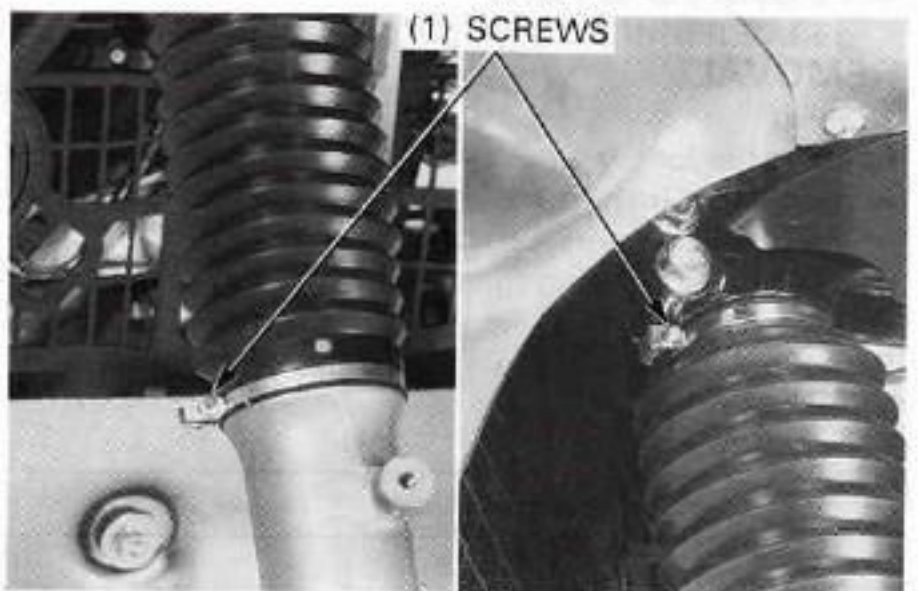
TORQUE: 25 N·m (2.6 kgf·m, 19 lbf·ft)



Turn the fork boot with its breather holes facing in.

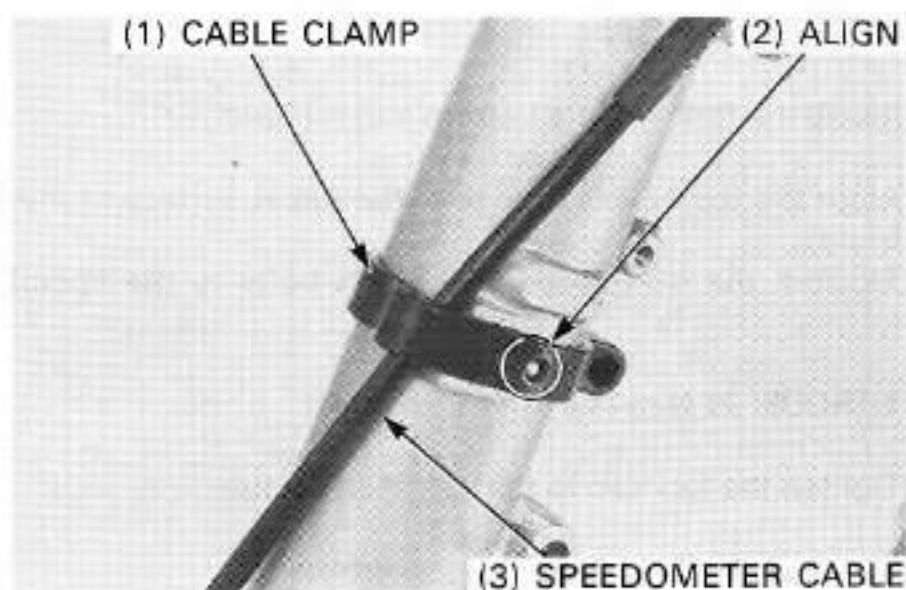


Push the fork boot up until it just touch to the steering stem. Tighten the band screws securely.

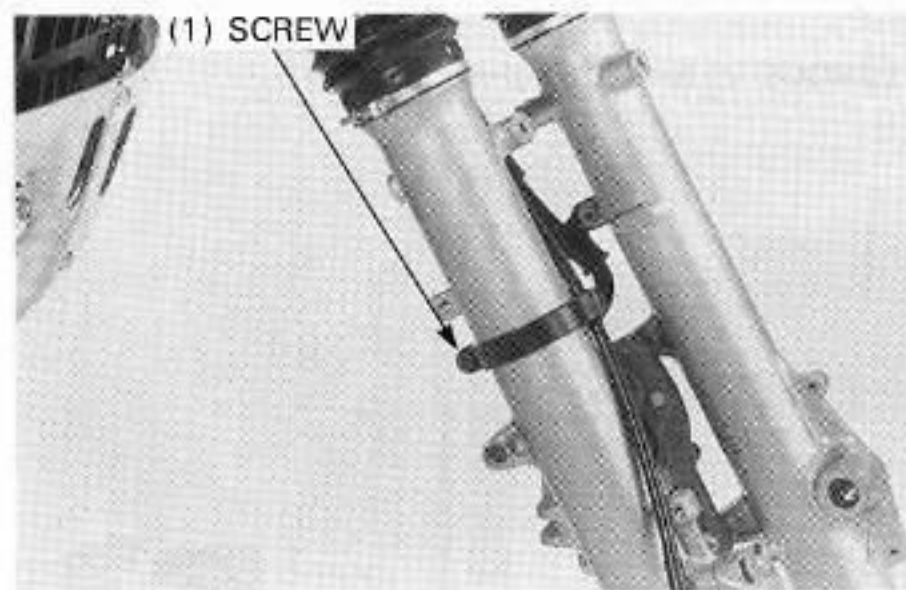


FRONT WHEEL/SUSPENSION/STEERING

Install the speedometer cable and cable clamp, aligning the hole on the clamp with the tab on the right fork.



Install and tighten the screw securely.



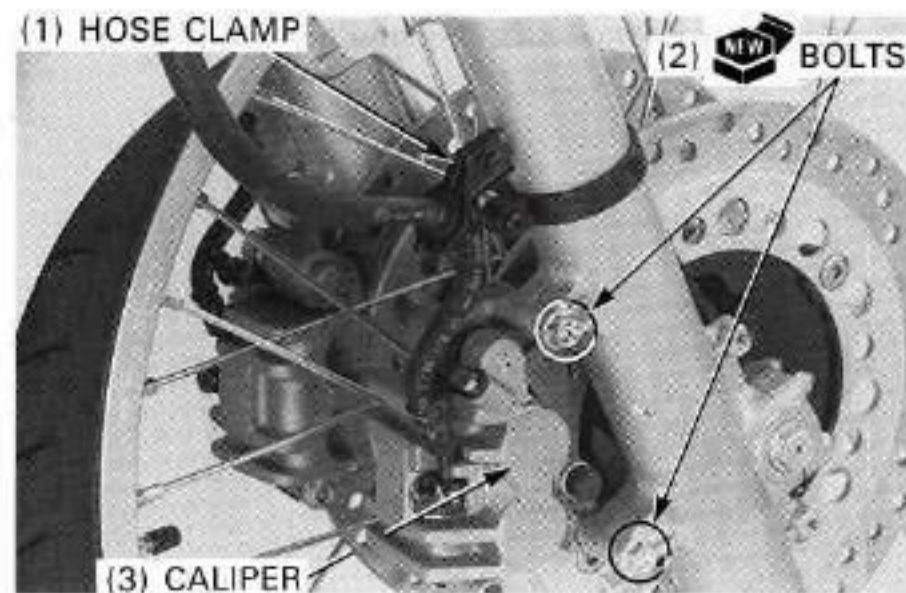
Install the front wheel (page 13-20).

Install the right front caliper to the right front fork.
Install and tighten the new right front caliper mounting bolts to the specified torque.

TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)

Install the brake hose clamp and bolt.
With the front brake applied, compress the fork several times to check for proper fork operation.

Install the front fender (page 2-4).



STEERING STEM

REMOVAL

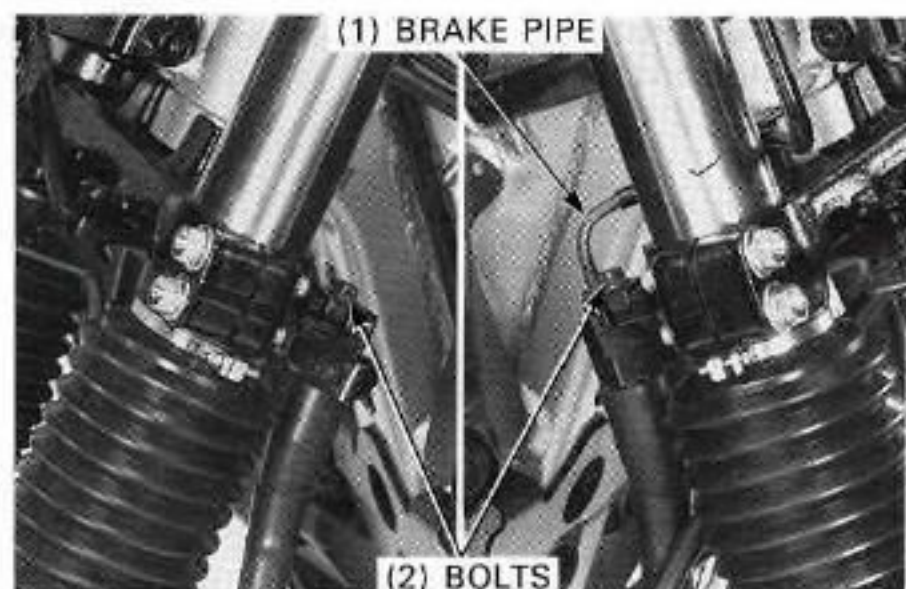
Remove the followings:

- Handlebar (page 13-3)
- Front wheel (page 13-14)
- Air cleaner housing (page 5-4)

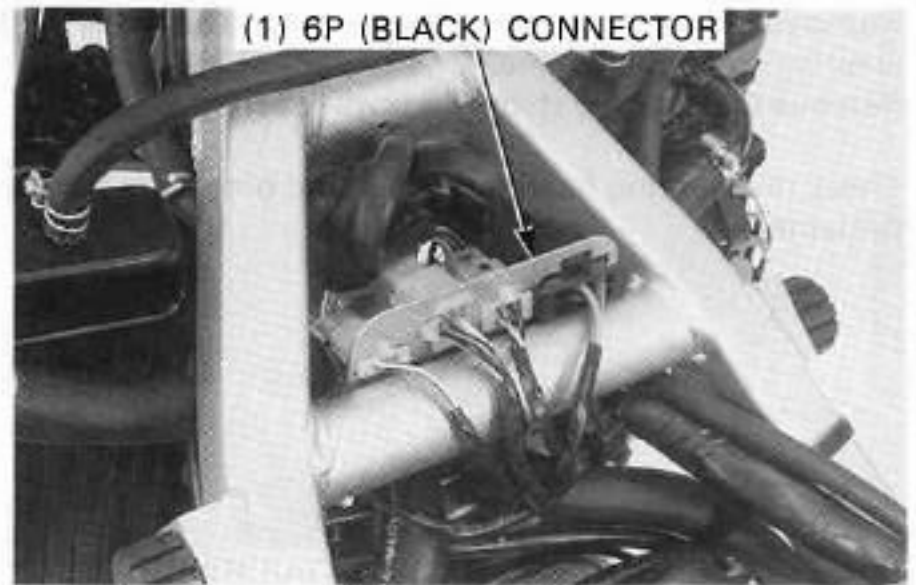
Remove the brake pipe joint bolts and brake pipe.

CAUTION

- Do not bend the brake metal line.



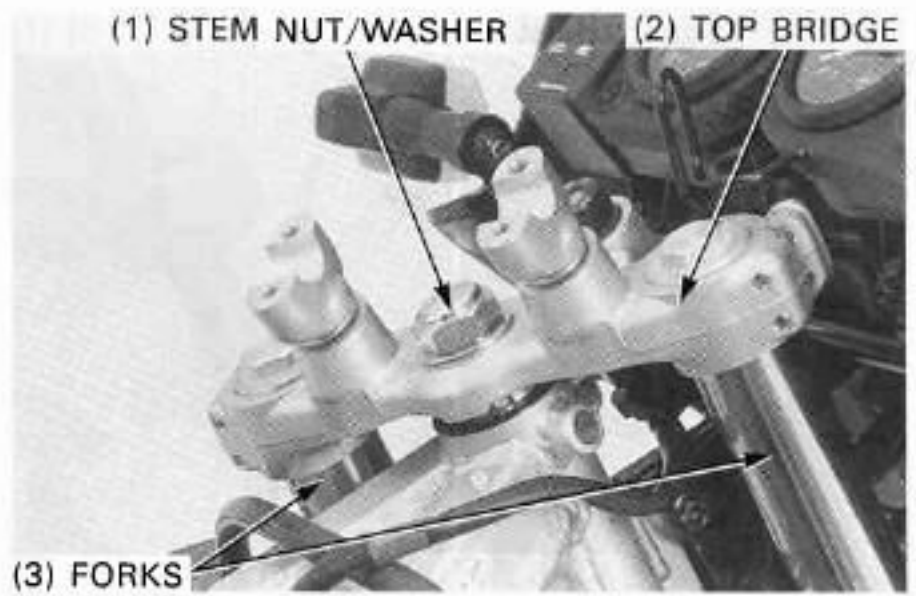
Disconnect the ignition switch 6P (black) connector.



Remove the steering stem nut and washer.

Remove the forks (page 13-23).

Remove the top bridge.

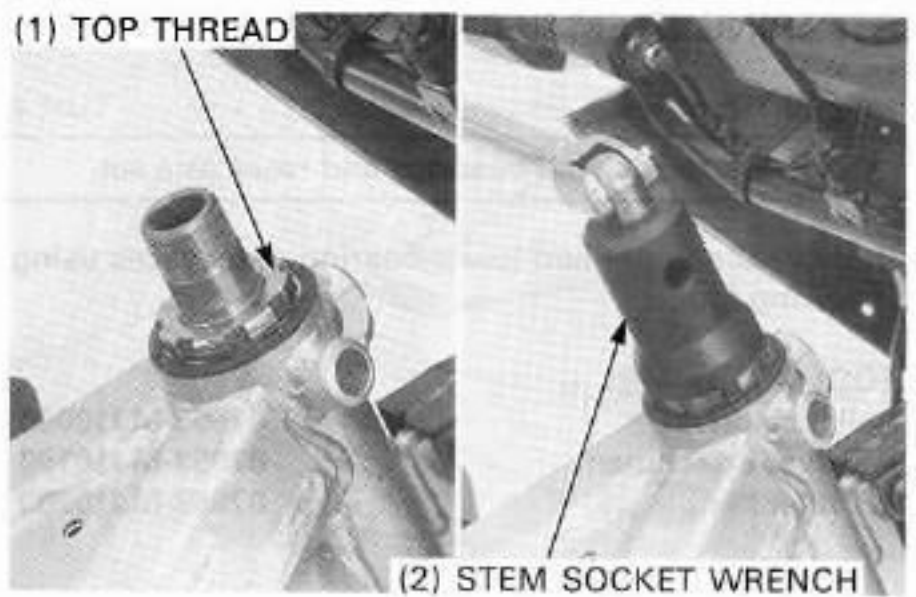


Remove the steering top thread using following tool.

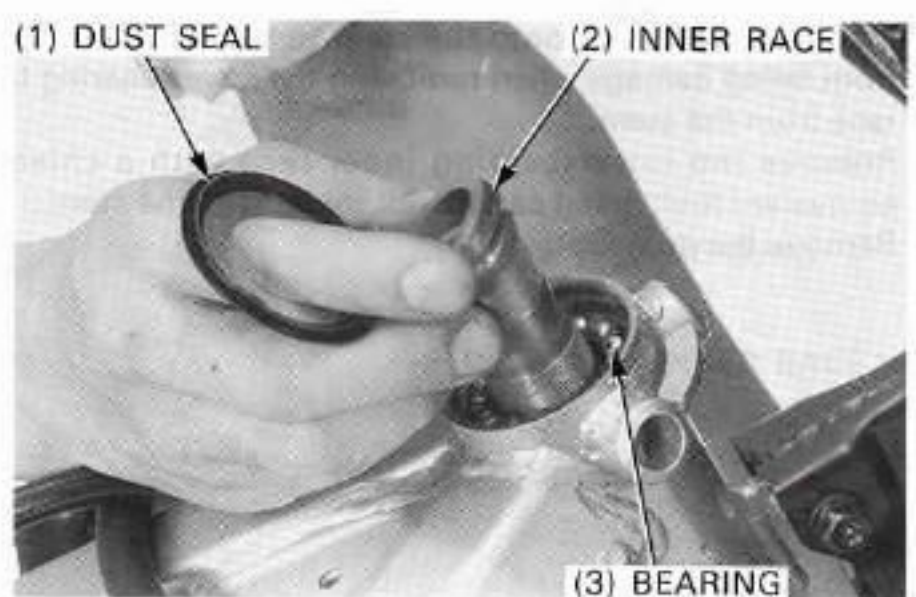
TOOL:

Steering stem socket wrench

07916-KA50100



Remove the dust seal, upper bearing inner race and upper bearing.

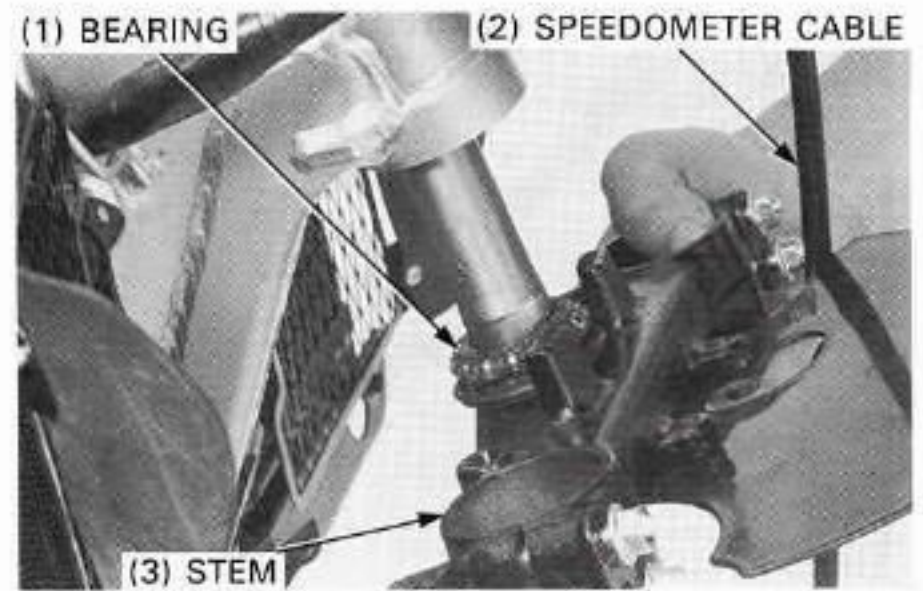


FRONT WHEEL/SUSPENSION/STEERING

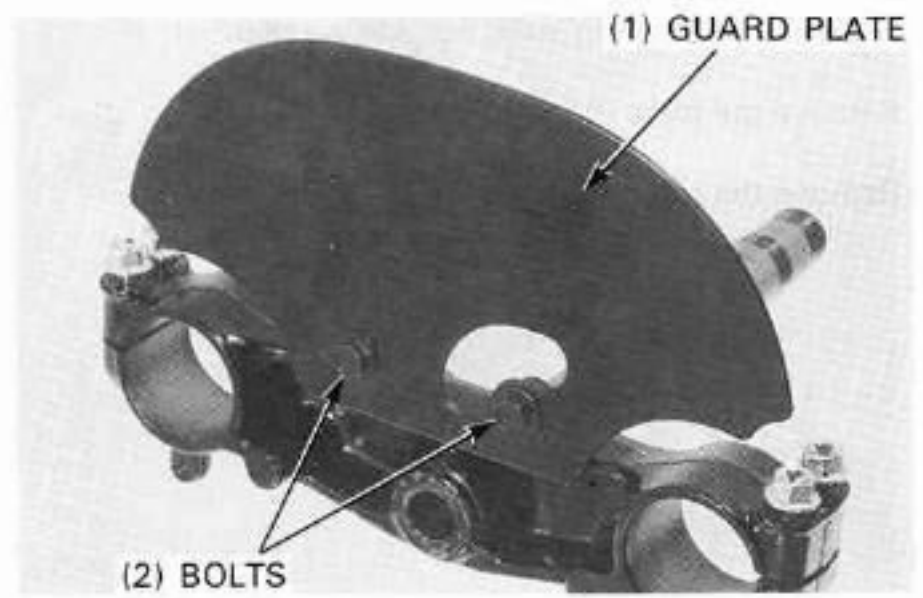
Remove the speedometer cable from the hole on the steering stem guard plate.

Remove the steering stem and lower bearing.

Check the steering bearings, inner and outer races for wear or damage.



Remove the bolts and steering stem guard plate.



STEERING STEM BEARING REPLACEMENT

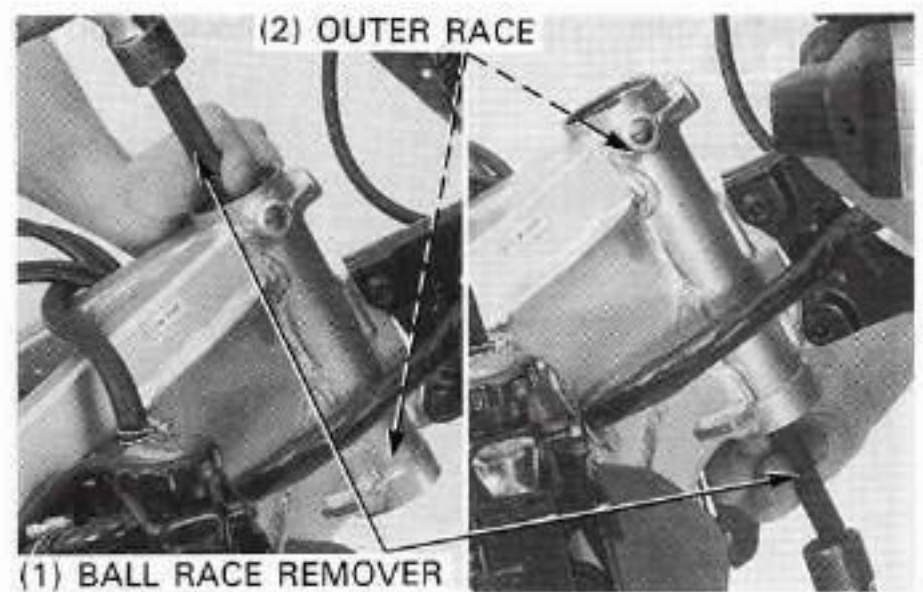
NOTE

- Always replace the bearings and races as a set.

Remove the upper and lower bearing outer races using the following tool.

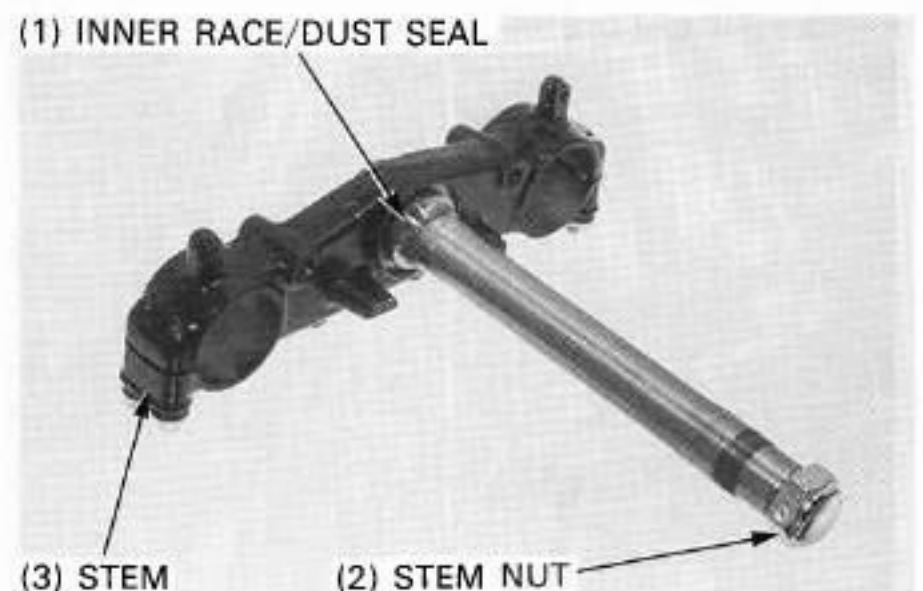
TOOL:

| | |
|--------------------|---------------|
| Ball race driver | 07953-MJ10000 |
| - Driver attachmen | 07953-MJ10100 |
| - Driver handle | 07953-MJ10200 |



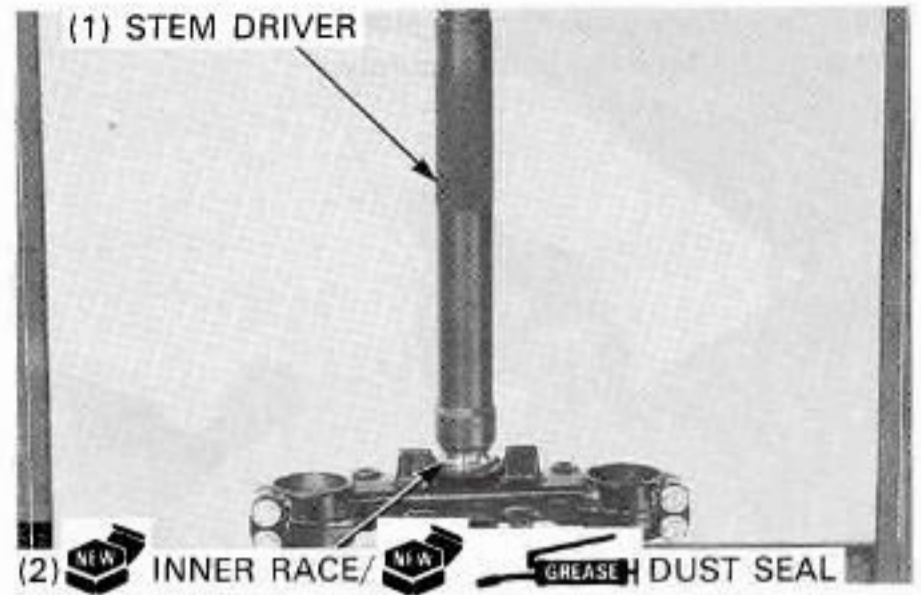
Install the stem nut onto the stem to prevent the threads from being damage when removing the lower bearing inner race from the stem.

Remove the lower bearing inner race with a chisel or equivalent tool, being careful not to damage the stem. Remove the dust seal.



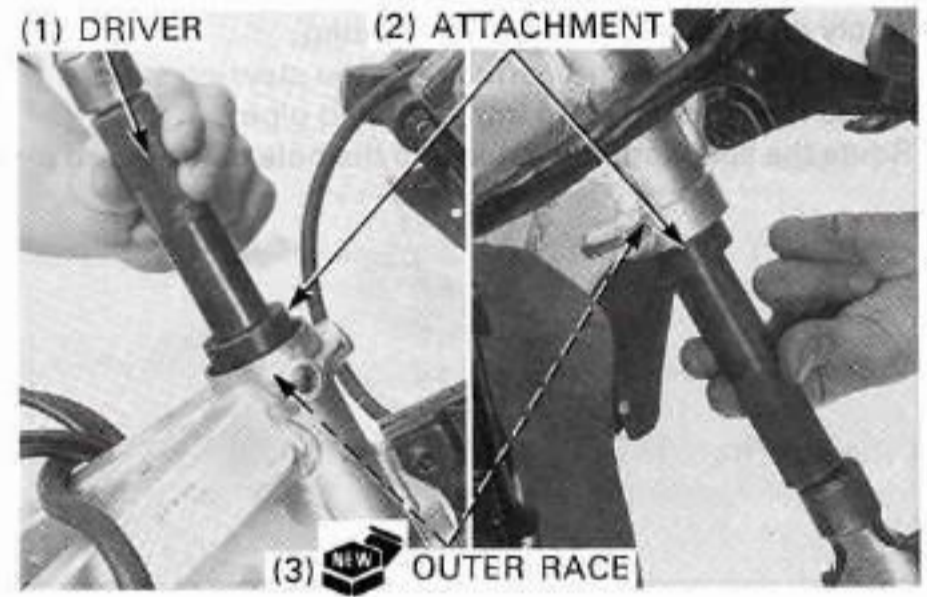
Apply grease to the new dust seal lip and install it to the steering stem.
Install the new lower bearing inner race using the following tool and hydraulic press.

TOOL:
Steering stem driver **07946-4300101**

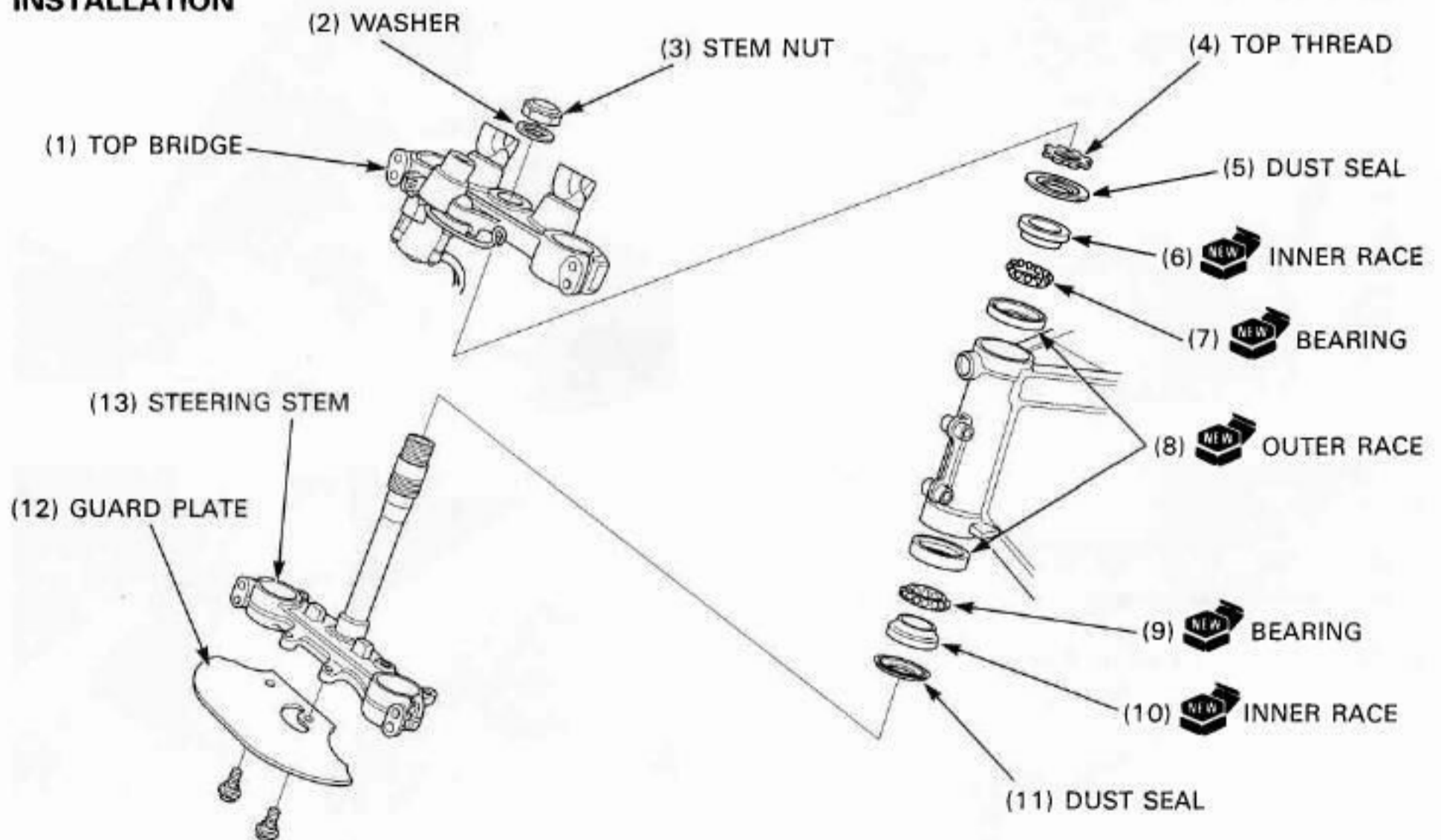


Drive the new upper and lower bearing outer race into the head pipe using the following tools.

TOOLS:
Driver **07749-0010000**
Driver attachment, 42×47 mm **07746-0010300**

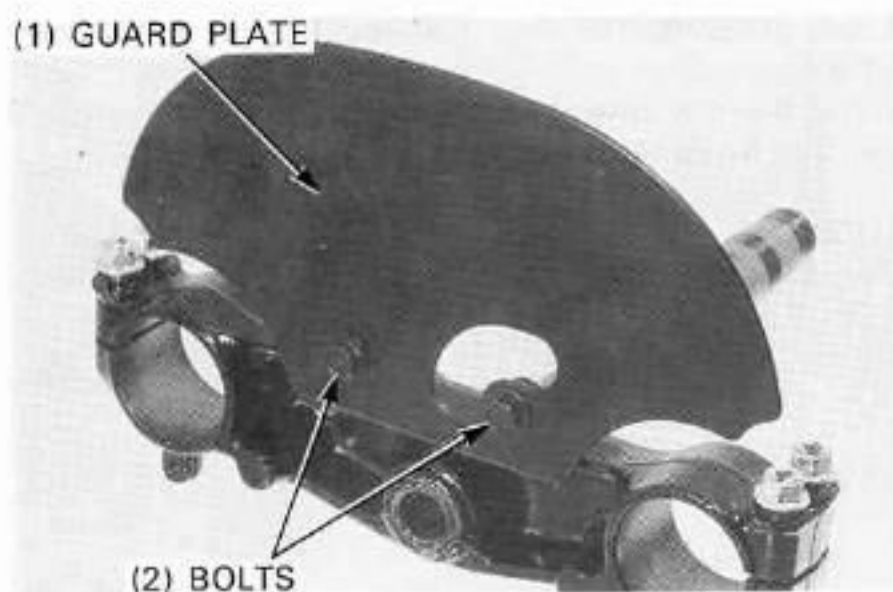


INSTALLATION

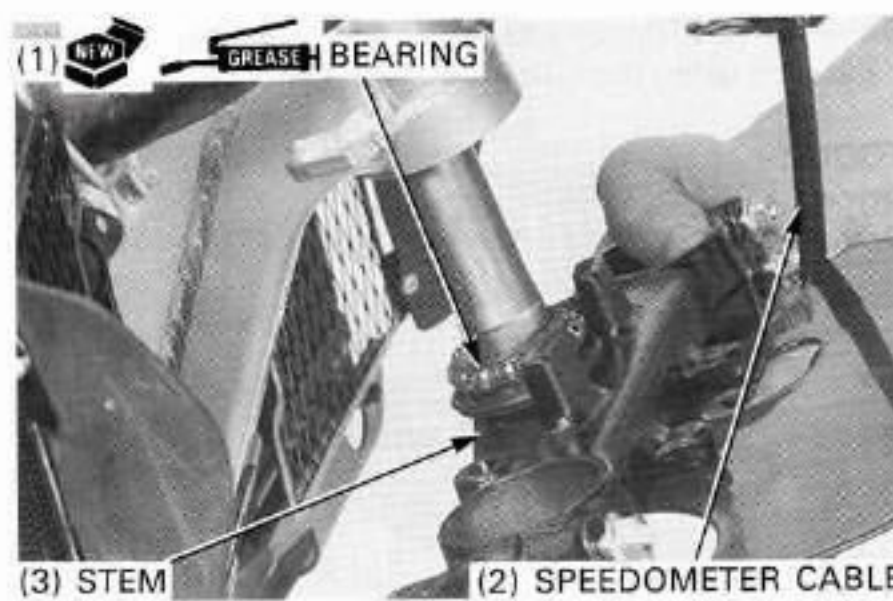


FRONT WHEEL/SUSPENSION/STEERING

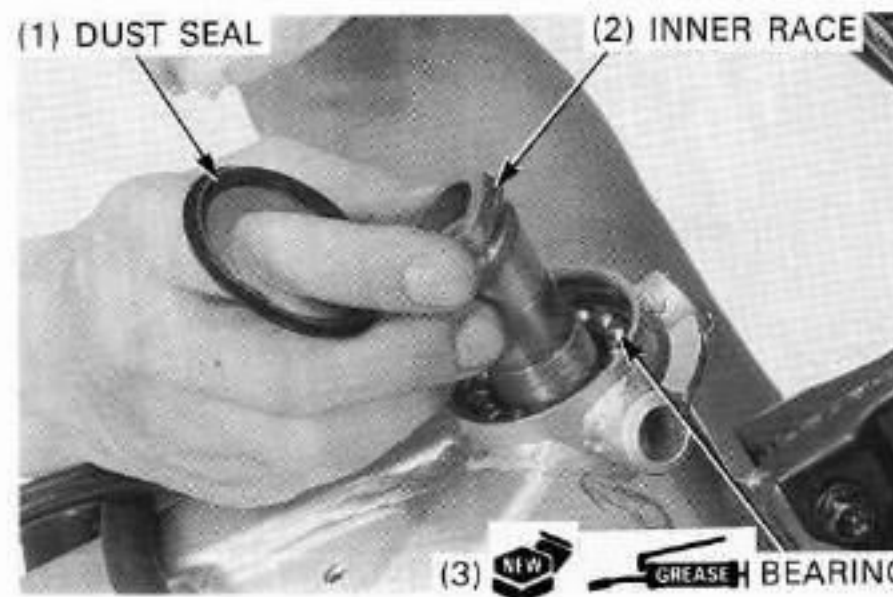
Install the steering stem guard plate.
Install and tighten the bolts securely.



Apply grease to the new lower bearing.
Install the new lower bearing onto the steering stem.
Install the steering stem into the head pipe.
Route the speedometer cable into the hole of the guard plate.



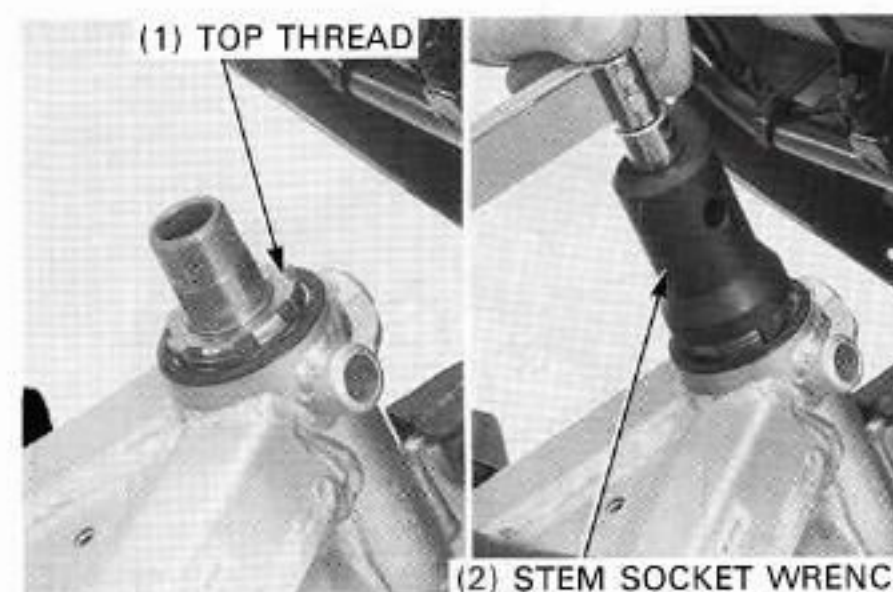
Apply grease to the new upper bearing and the new dust seal lip.
Install the upper bearing, upper bearing inner race and dust seal.



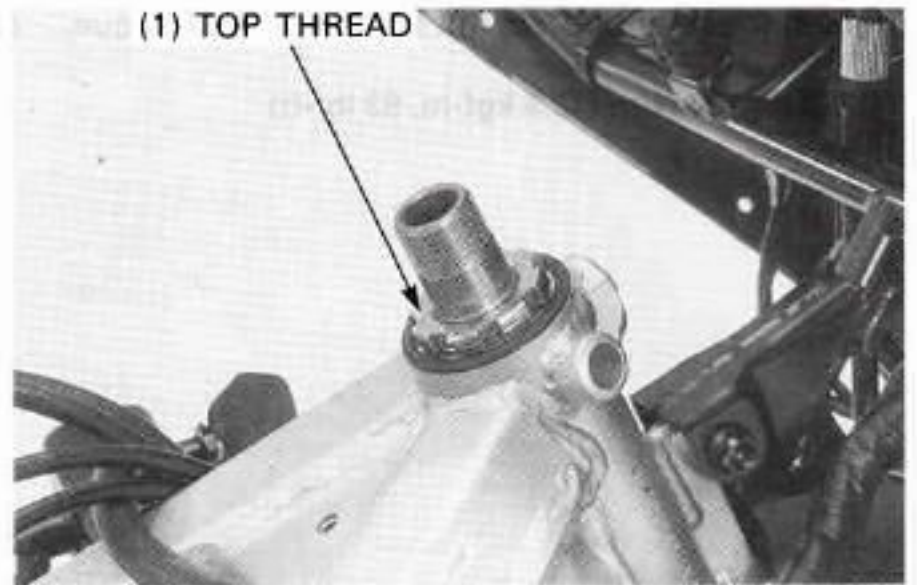
Install the steering top thread and tighten it to the specified torque.

TOOL:
Steering stem socket wrench 07916-KA50100

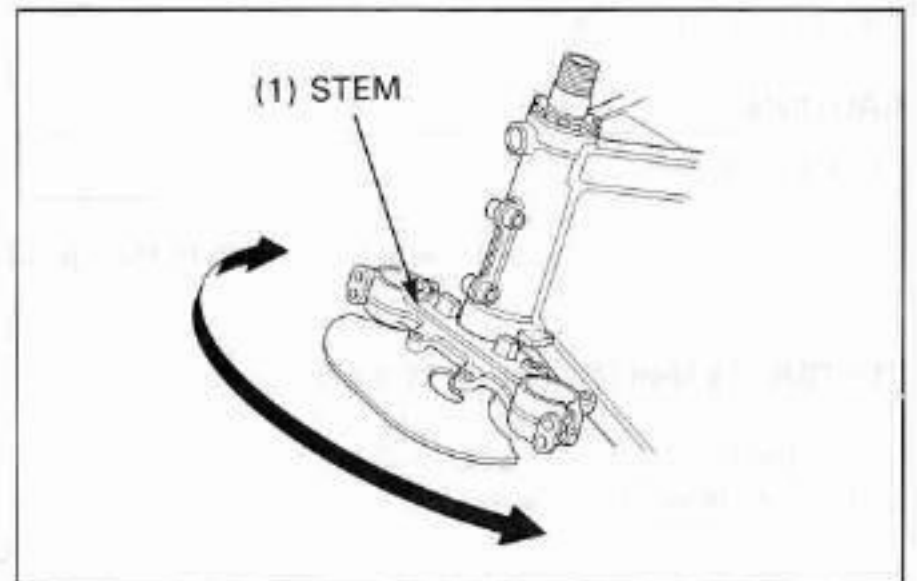
TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)



Loosen the steering top thread and retighten the steering top thread to the specified torque.



Turn the steering stem right and left, lock-to-lock at least five times to seat bearings.
Make sure that the steering stem moves smoothly, without play or binding.

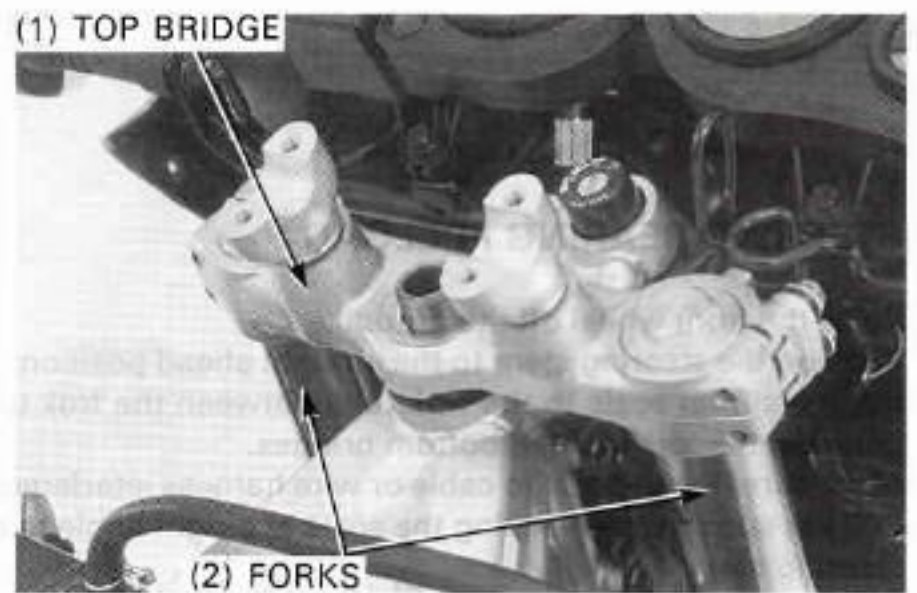


Tighten the steering top thread to the specified torque.

TOOL:
Steering stem socket wrench 07916-KA50100

TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)

Install the top bridge.
Install the forks (page 13-33).



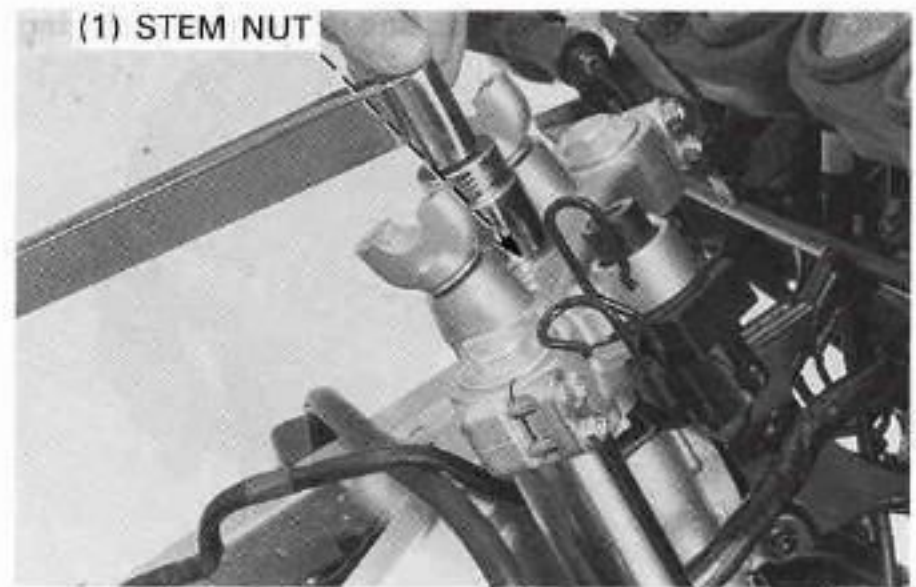
Install the washer and steering stem nut.



FRONT WHEEL/SUSPENSION/STEERING

Tighten the steering stem nut to the specified torque.

TORQUE: 126 N·m (12.8 kgf·m, 93 lbf·ft)



Install the brake pipe.

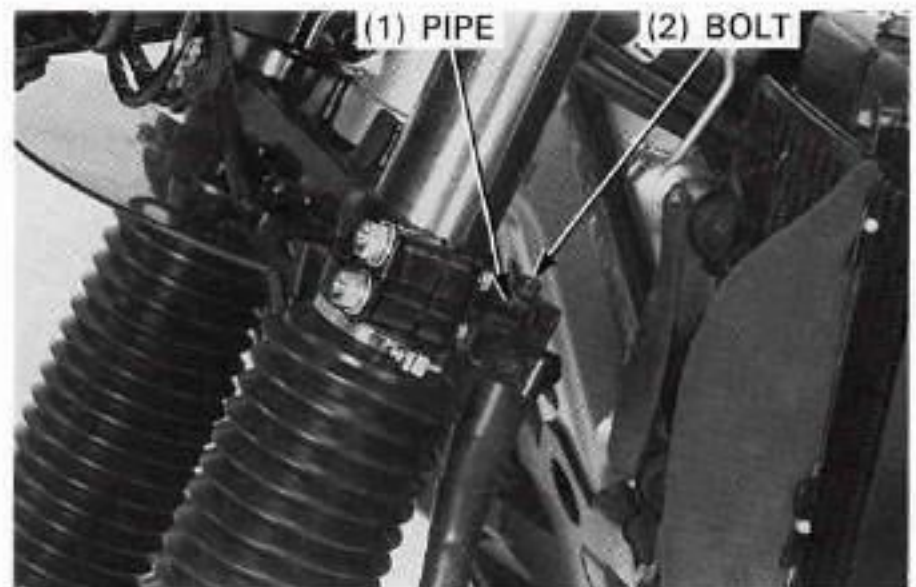
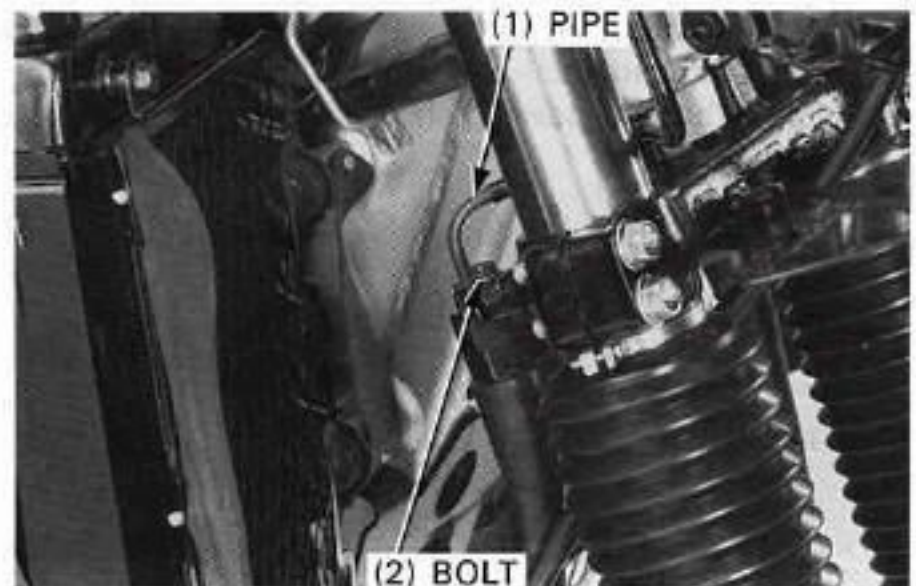
CAUTION

- Do not bend the brake metal line.

Install and tighten the brake pipe joint bolts to the specified torque.

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)

Install the front wheel (page 13-20).
Install the handlebar (page 13-7).



STEERING BEARING PRELOAD

Raise the front wheel off the ground.
Position the steering stem to the straight ahead position.
Hook a spring scale to the fork tube between the fork tube between the fork top and bottom bridges.
Make sure that there is no cable or wire harness interference.
Pull the spring scale keeping the scale at a right angle to the steering stem.
Read the scale at the point where the steering stem just starts to move.

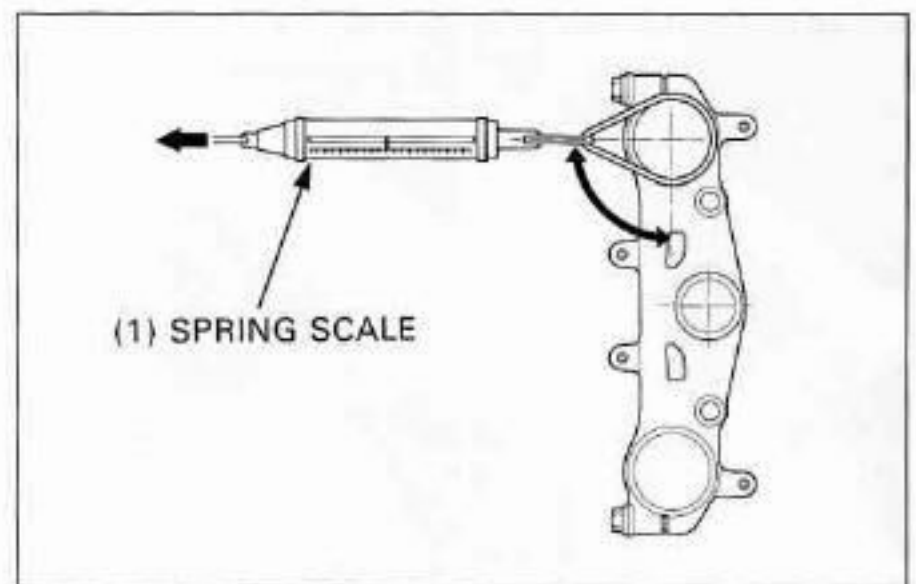
STEERING BEARING PRELOAD:
1.1-1.6 kgf (2.43-3.53 lbf)

If the readings do not fall within the limits, read just the steering top thread.

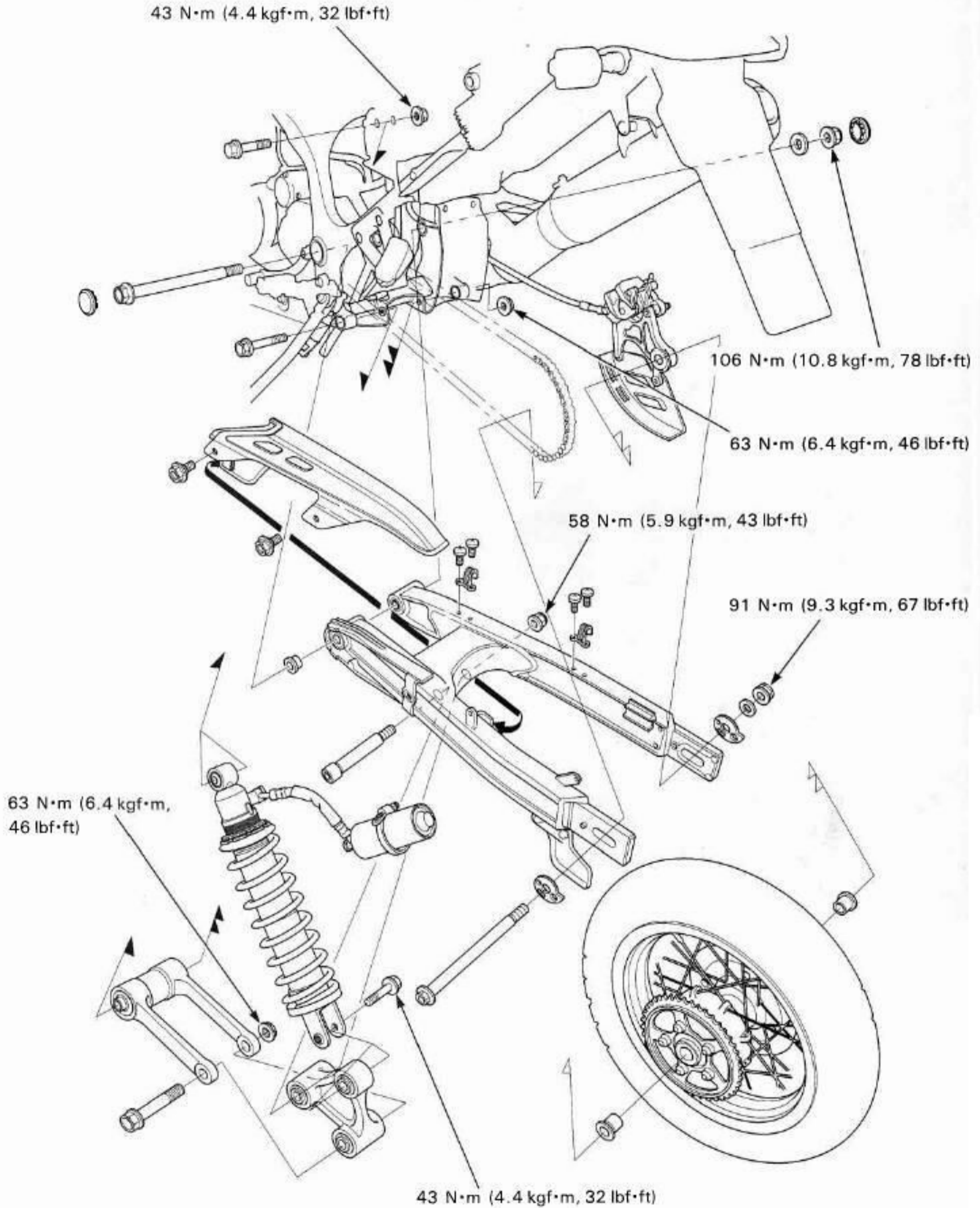
Install the removed parts in the reverse order of removal.

NOTE

- Route the cables and wire harnesses properly (page 1-22).



REAR WHEEL/SUSPENSION



14. REAR WHEEL/SUSPENSION

| | | | |
|---------------------|------|--------------------|-------|
| SERVICE INFORMATION | 14-1 | SHOCK ABSORBER | 14-13 |
| TROUBLESHOOTING | 14-3 | SUSPENSION LINKAGE | 14-16 |
| REAR WHEEL | 14-4 | SWINGARM | 14-20 |

SERVICE INFORMATION

GENERAL

⚠ WARNING

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean contaminated disc with a high quality brake degreasing agent.
- The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the gas containing shock absorber.
- Before disposal of the gas containing shock absorber, release the nitrogen gas (see page 14-5).

CAUTION

- To avoid damaging the rim when using the tire lever, always use rim protectors.
- When servicing the rear wheel, suspension linkage, swingarm or shock absorber, support the motorcycle using a safety stand or hoist.
- Do not operate the brake pedal after removing the caliper and rear wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.
- Use only genuine Honda replacement bolts and nuts for all suspension pivot and mounting points.
- Refer to Section 15 for brake system information.

SPECIFICATIONS

Unit: mm (in)

| ITEM | | STANDARD | SERVICE LIMIT |
|-----------------------------------|----------------------|--|---------------|
| Minimum tire tread depth | | _____ | 2.0 (0.08) |
| Cold tire pressure | Driver only | 200 kPa (2.00 kgf/cm ² , 29 psi) | _____ |
| | Driver and passenger | 250 kPa (2.50 kgf/cm ² , 36 psi) | _____ |
| Rear axle runout | | _____ | 0.2 (0.008) |
| Rear wheel rim runout | Radial | _____ | 2.0 (0.08) |
| | Axial | _____ | 2.0 (0.08) |
| Rear wheel hub-to-rim distance | | 22 (0.86) | _____ |
| Wheel balance weight | | Max 60 g | _____ |
| Drive chain slack | | 35 – 45 (1.4 – 1.8) | _____ |
| Drive chain link | Except AR type | 124LE with O-ring | _____ |
| | AR type | 122LE with O-ring | _____ |
| Drive chain size | DID | 525V8 | _____ |
| | RK | 525SM5 | _____ |
| Shock absorber spring free length | | 245.5 (9.66) | 240.6 (9.47) |
| Damper/reservoir gas pressure | | 1,569 kPa (16 kgf/cm ² , 228 psi) | _____ |

REAR WHEEL/SUSPENSION

Unit:mm(in)

| ITEM | STANDARD | SERVICE LIMIT |
|--|----------------------|---------------|
| Pressurize gas material | Nitrogen | ———— |
| Damper rod compressed force at 10 mm (0.4 in) compressed | 27 kg | ———— |
| Damper/reservoir gas release drilling point | Reservoir cap center | ———— |
| Shock absorber spring install length (Standard) | 242.7 (9.55) | ———— |

TORQUE VALUES

| | | |
|------------------------------------|---------------------------------|---|
| Rear axle nut | 91 N•m (9.3 kgf•m, 67 lbf•ft) | U-nut |
| Rear brake disc mounting bolt | 42 N•m (4.3 kgf•m, 31 lbf•ft) | ALOC bolt |
| Driven sprocket nut | 96 N•m (9.8 kgf•m, 71 lbf•ft) | Apply oil to the threads and flange surface |
| Swingarm pivot nut | 106 N•m (10.8 kgf•m, 78 lbf•ft) | U-nut |
| Shock absorber upper mounting nut | 43 N•m (4.4 kgf•m, 32 lbf•ft) | U-nut |
| Shock absorber lower mounting bolt | 43 N•m (4.4 kgf•m, 32 lbf•ft) | |
| Shock arm nut (swingarm side) | 58 N•m (5.9 kgf•m, 43 lbf•ft) | U-nut |
| (shock link side) | 63 N•m (6.4 kgf•m, 46 lbf•ft) | U-nut |
| Shock link nut | 63 N•m (6.4 kgf•m, 46 lbf•ft) | U-nut |

TOOLS

| | |
|-----------------------------|---------------|
| Needle bearing remover | 07946-KA50000 |
| Pin driver | 07GMD-KT80100 |
| Spanner C, 5.8 X 6.1 mm | 07701-0020300 |
| Bearing remover shaft | 07746-0050100 |
| Bearing remover head, 17 mm | 07746-0050500 |
| Attachment, 24 X 26 mm | 07746-0010700 |
| Attachment, 32 X 35 mm | 07746-0010100 |
| Attachment, 37 X 40 mm | 07746-0010200 |
| Attachment, 42 X 47 mm | 07746-0010300 |
| Pilot, 15 mm | 07746-0040300 |
| Pilot, 17 mm | 07746-0040400 |
| Pilot, 20 mm | 07746-0040500 |
| Driver | 07749-0010000 |

TROUBLESHOOTING

Rear wheel wobbles

- Bent rim
- Worn rear wheel bearings
- Faulty tire
- Unbalanced tire or wheel
- Low tire pressure
- Faulty swingarm pivot bearings

Wheel turns hard

- Faulty wheel bearings
- Bent rear axle
- Brake drag

Rear suspension noisy

- Faulty rear shock absorber
- Worn or damaged suspension linkage pivot bearings
- Loose fasteners

Soft suspension

- Weak spring
- Incorrect damper adjustment
- Incorrect spring install length
- Oil and gas leakage from damper unit
- Low tire pressure

Hard suspension

- Bent damper rod
- High tire pressure
- Incorrect damper adjustment
- Incorrect spring install length
- Damaged swingarm pivot bearing
- Damaged linkage pivot bearings

REAR WHEEL/SUSPENSION

REAR WHEEL

⚠ WARNING

- *A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean contaminated disc with a high quality brake degreasing agent.*

REMOVAL

Loosen the rear axle.
Raise the rear wheel off the ground using a safty stand or hoist.

CAUTION

- *Do not support the motorcycle using oil filter.*

Turn the left and right eccentric adjuster and loose the drive chain.

Move the rear wheel forward, and derail the drive chain from the driven sprocket.
Remove the rear axle nut, washer and right eccentric adjuster.

Remove the rear axle and left eccentric adjuster.
Remove the rear wheel.

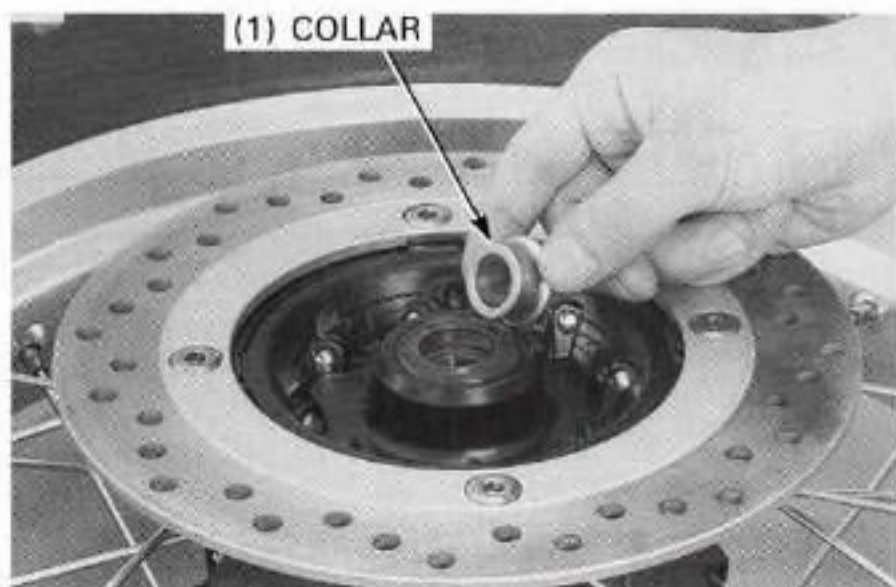
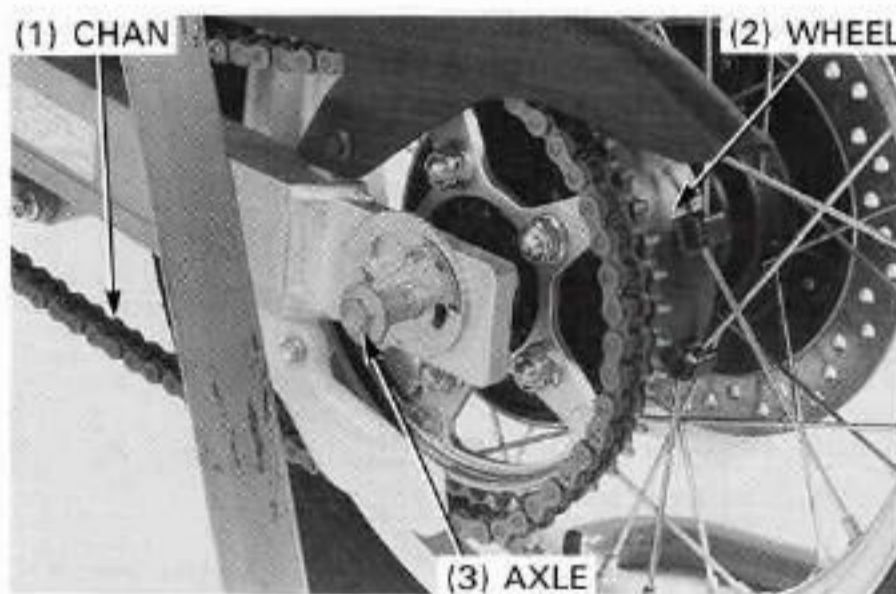
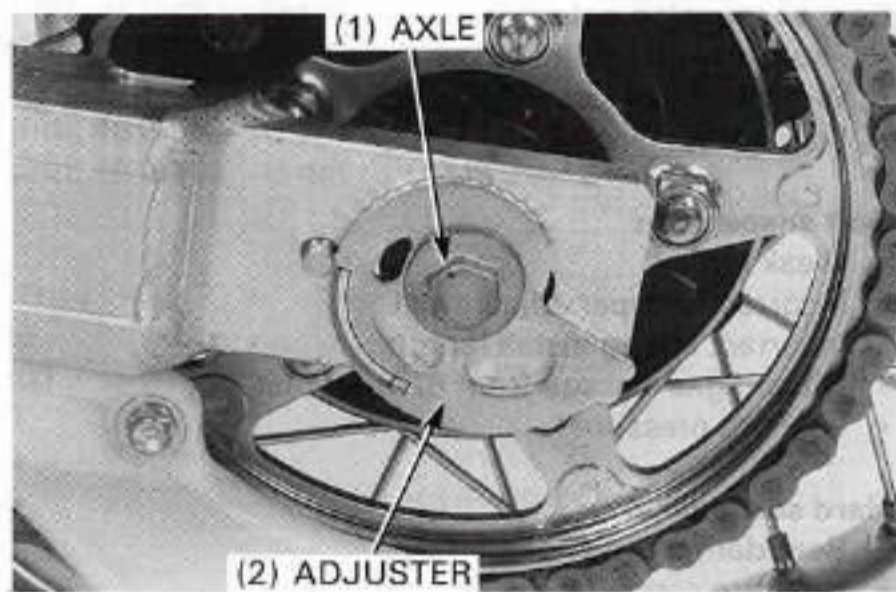
CAUTION

- *Do not suspend the brake caliper from the brake hose.
Do not twist the brake hose.*

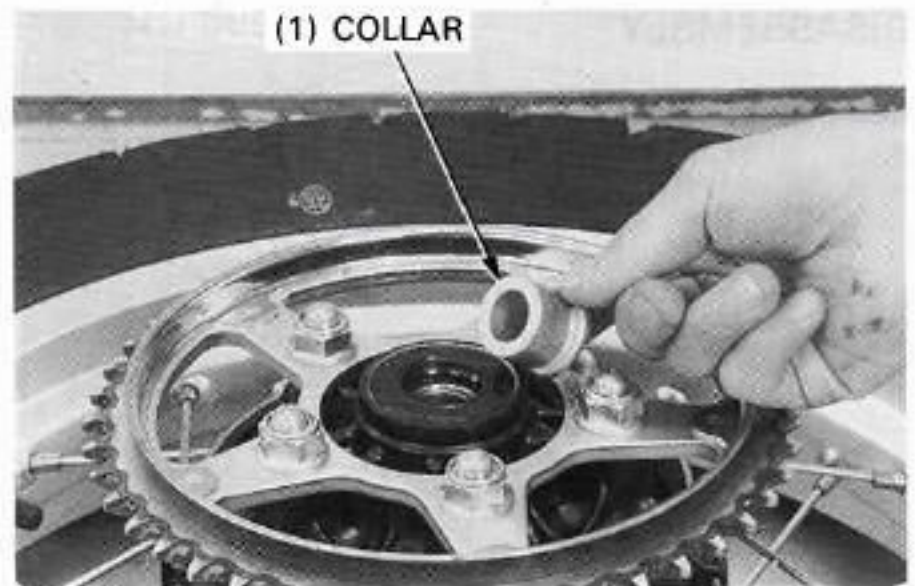
NOTE

- *Do not operate the brake pedal after removing the caliper and rear wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.*

Remove the right side collar from the right side of the rear wheel.



Remove the left side collar from the left side of the rear wheel.



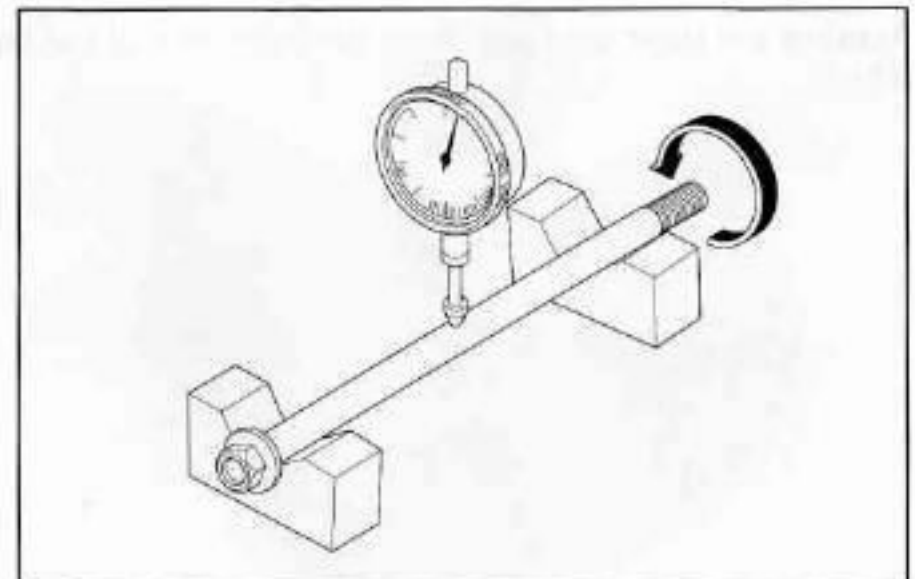
INSPECTION

AXLE

Set the front axle in V-blocks and measure the runout. Turn the rear axle and measure the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.2 mm (0.008 in)



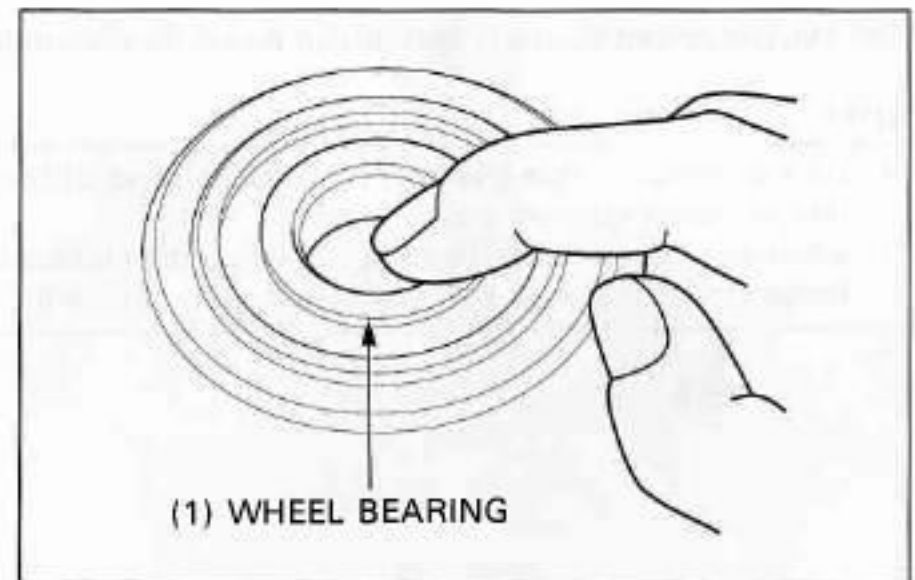
WHEEL BEARING

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 hub.

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

NOTE

- Replace the wheel bearings in pairs.



WHEEL RIM

Check the rim runout by placing the wheel in a turning stand. Spin the wheel slowly and read the runout using a dial indicator.

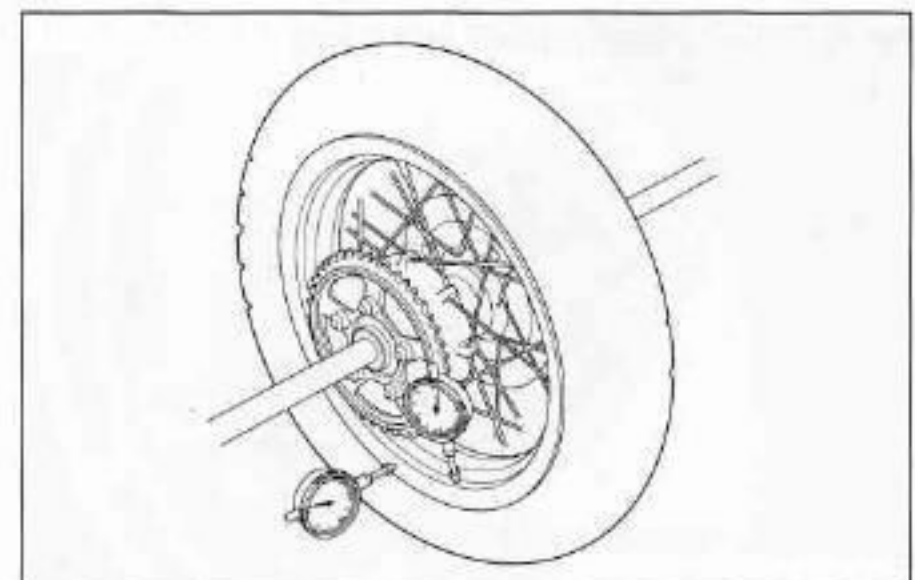
Actual runout is 1/2 the total indicator reading.

SERVICE LIMITS:

Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)

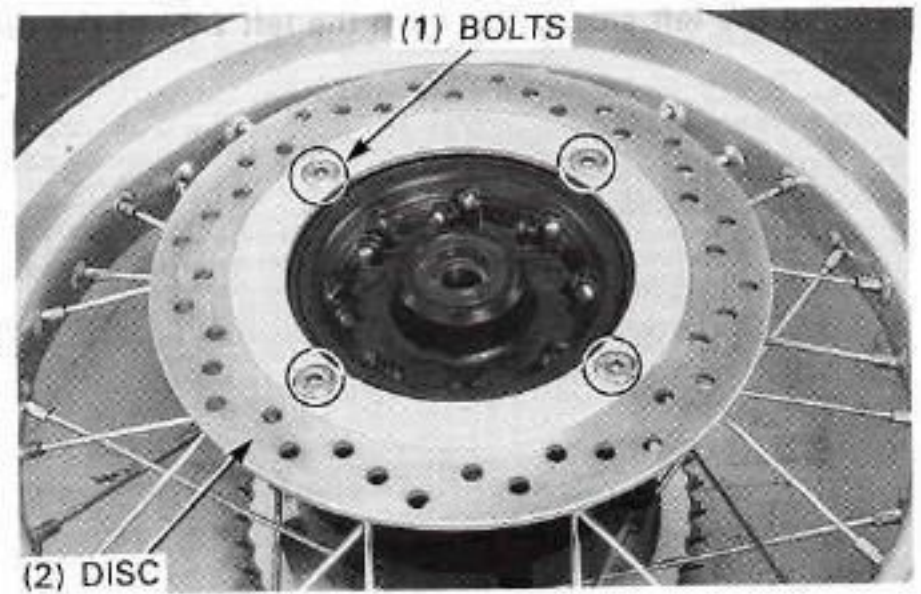
Check the spokes for loose or damage.



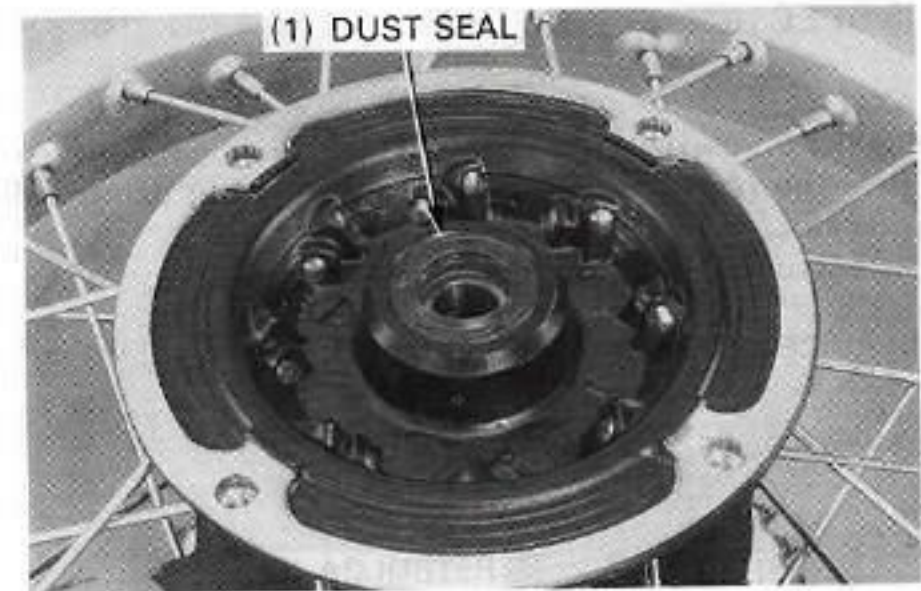
REAR WHEEL/SUSPENSION

DISASSEMBLY

Remove the rear brake disc mounting bolts and rear brake disc.



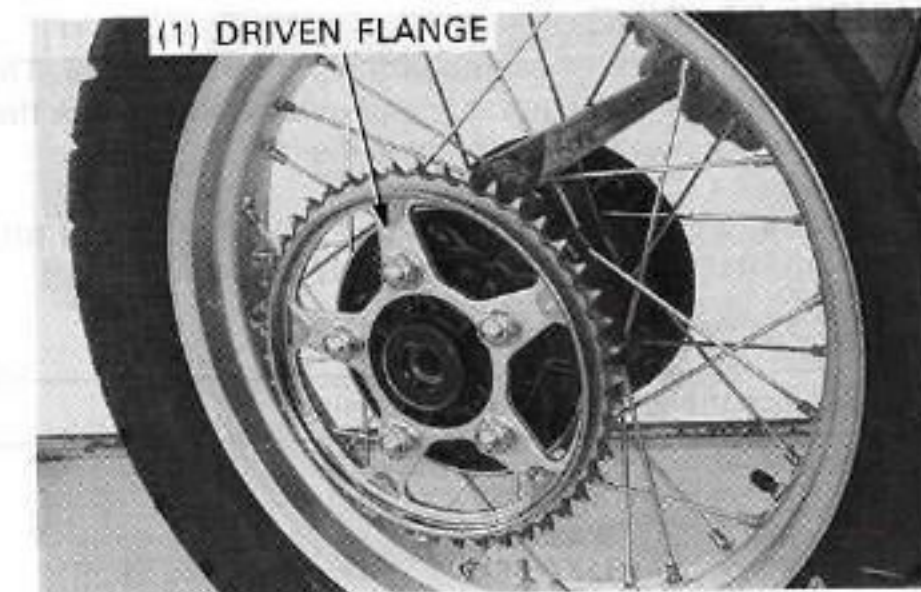
Remove the right dust seal from the right side of the rear wheel.



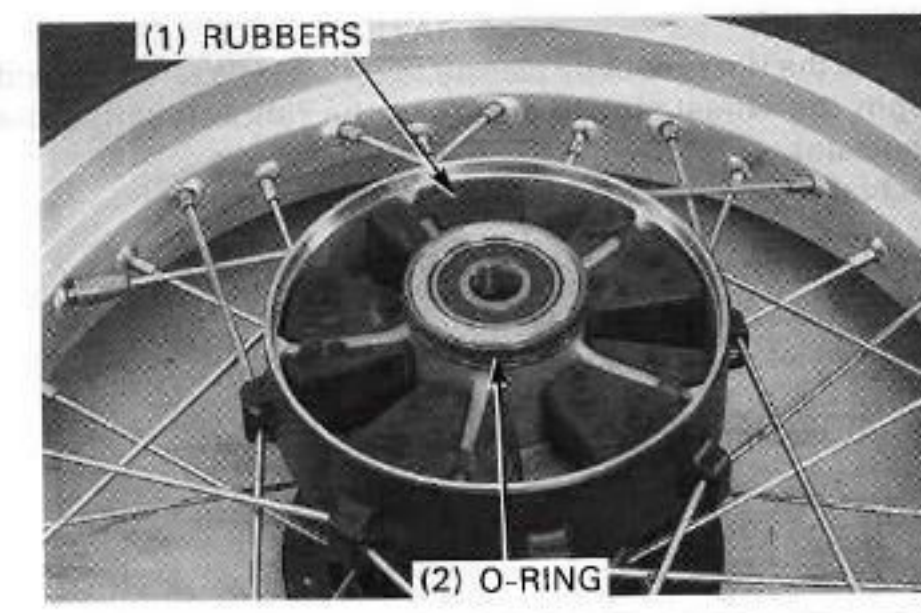
Remove the driven sprocket and driven flange as assembly.

NOTE

- Do not disassemble the driven sprocket and driven flange unless replacement.
- When the driven flange bearing is ready to be replaced, loosen the driven sprocket nuts, but do not remove it.

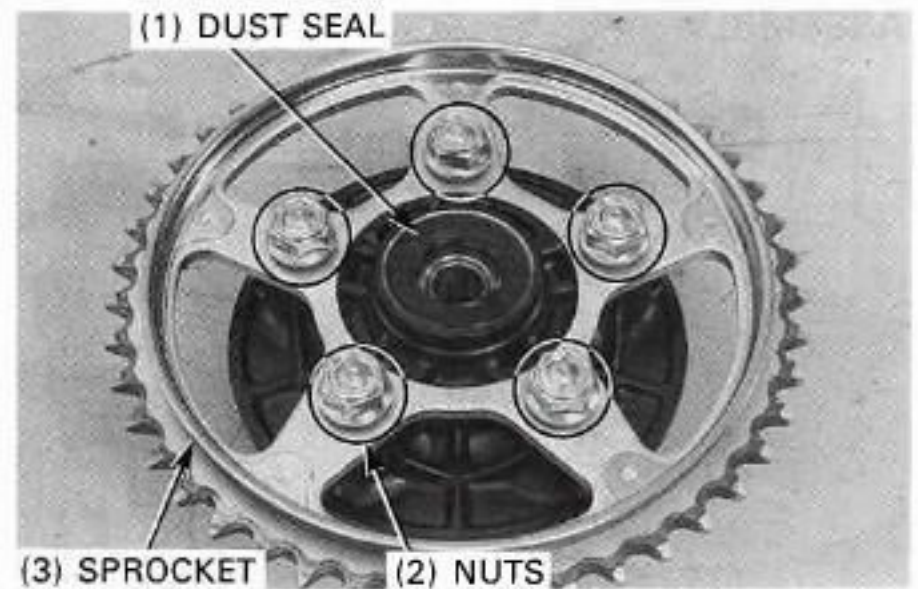


Remove the damper rubbers and O-ring.

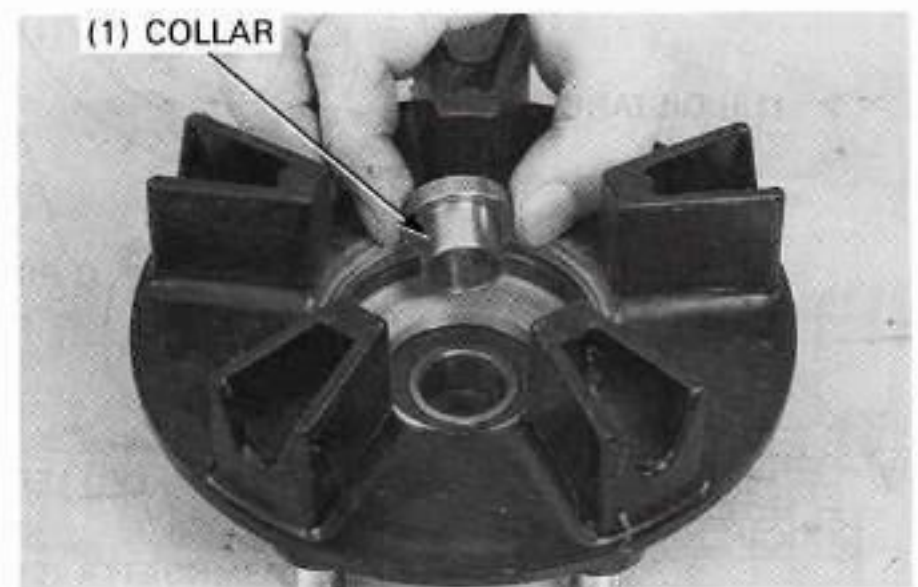


DRIVEN FLANGE BEARING REMOVAL

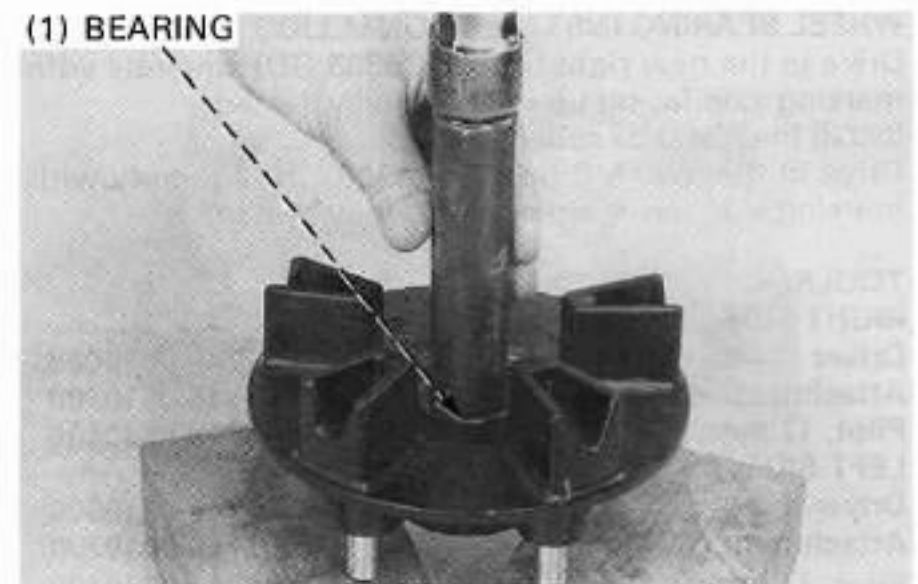
Remove the left dust seal.
Remove the driven sprocket nuts and driven sprocket.



Remove the driven flange distance collar.



Remove the driven flange bearing from the driven flange.



WHEEL BEARING REMOVAL

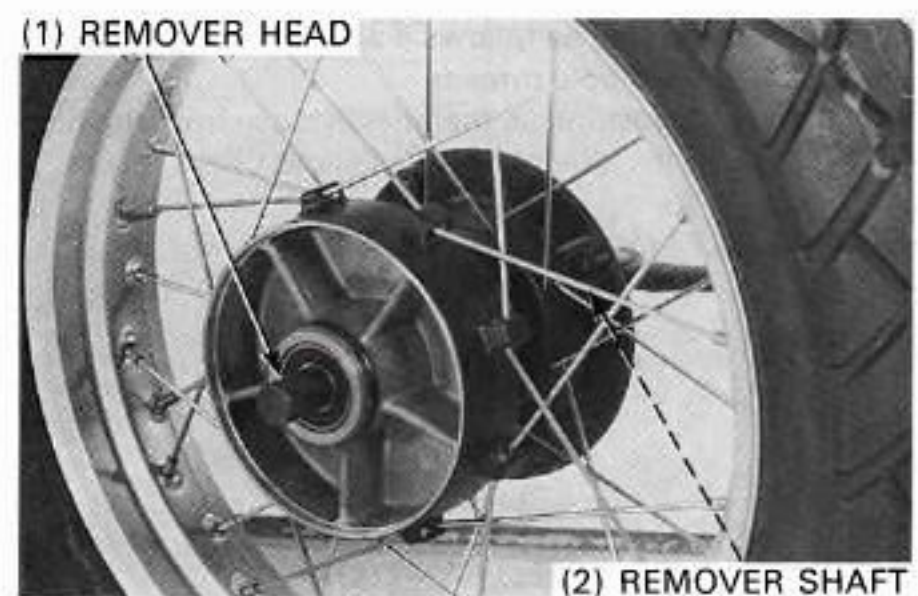
Install the bearing remover head into the bearing.
From opposite side install the bearing remover shaft and drive the bearing out of the wheel hub.
Remove the distance collar and drive out the other bearing.

TOOLS:

| | |
|-----------------------------|---------------|
| Bearing remover shaft | 07746-0050100 |
| Bearing remover head, 17 mm | 07746-0050500 |

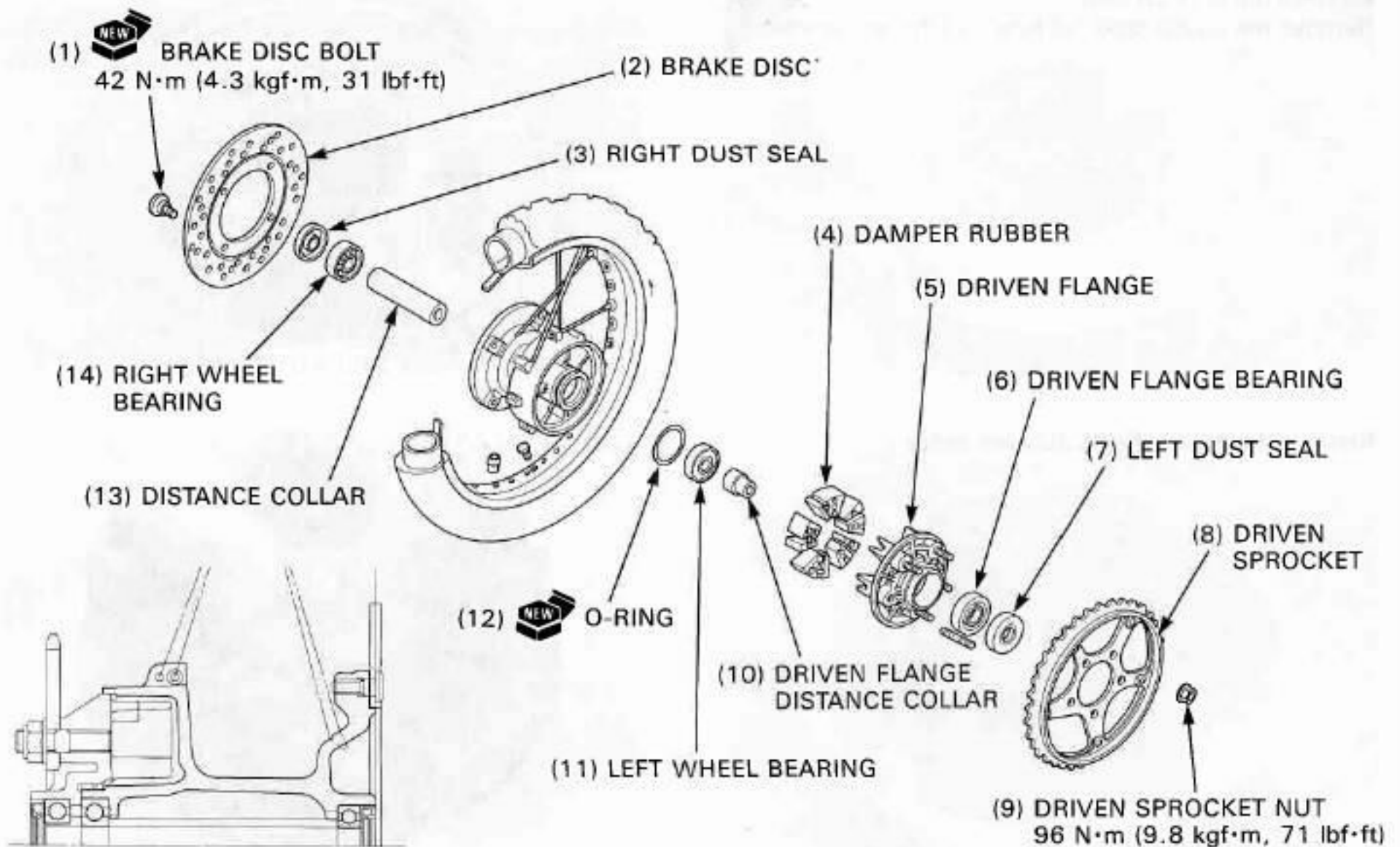
NOTE

- Once the bearings are removed, they must be replaced with new ones.



REAR WHEEL/SUSPENSION

ASSEMBLY



WHEEL BEARING INSTALLATION

Drive in the new right bearing (6303 UU) squarely with the marking side facing up until it is fully seated.

Install the distance collar.

Drive in the new left bearing (6203 UU) squarely with the marking side facing up until it is fully seated.

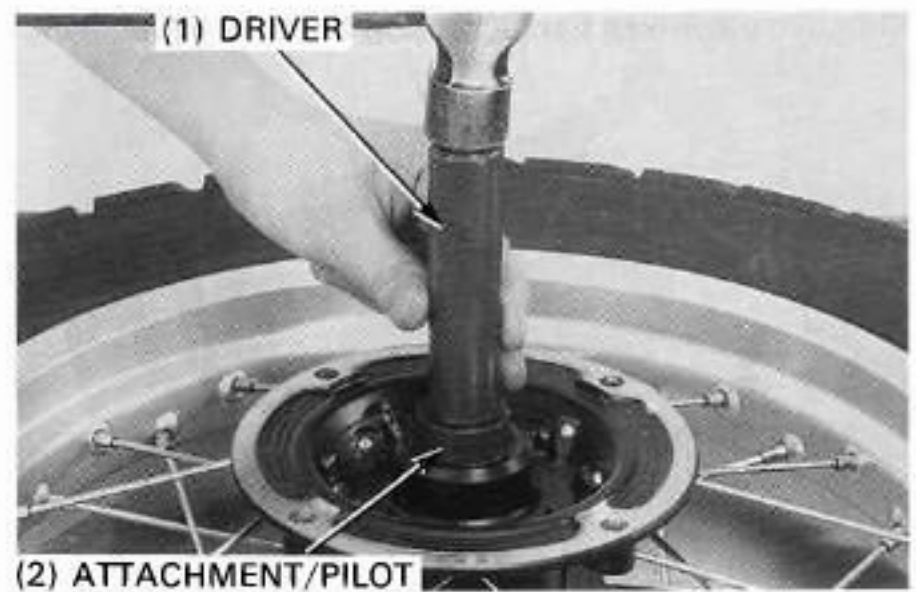
TOOLS:

RIGHT SIDE:

Driver 07749-0010000
Attachment, 42×47 mm 07746-0010300
Pilot, 17 mm 07746-0040400

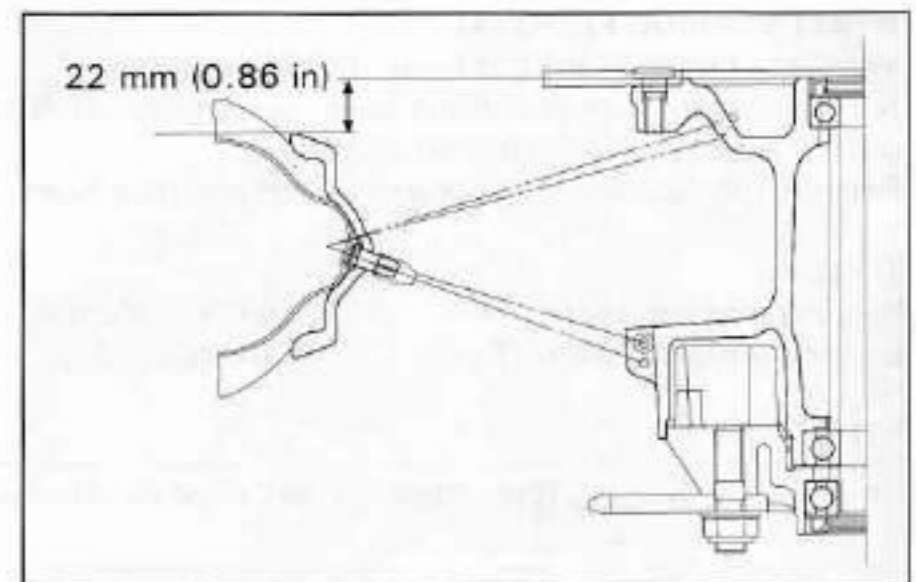
LEFT SIDE:

Driver 07749-0010000
Attachment, 37×40 mm 07746-0010200
Pilot, 17 mm 07746-0040400



Assemble the wheel as follows if wheel is disassembled.
Clean the spoke nipple threads.
Adjust the hub position so that the distance from the hub left end surface to the side of rim is as shown.

STANDARD: 22 mm (0.86 in)

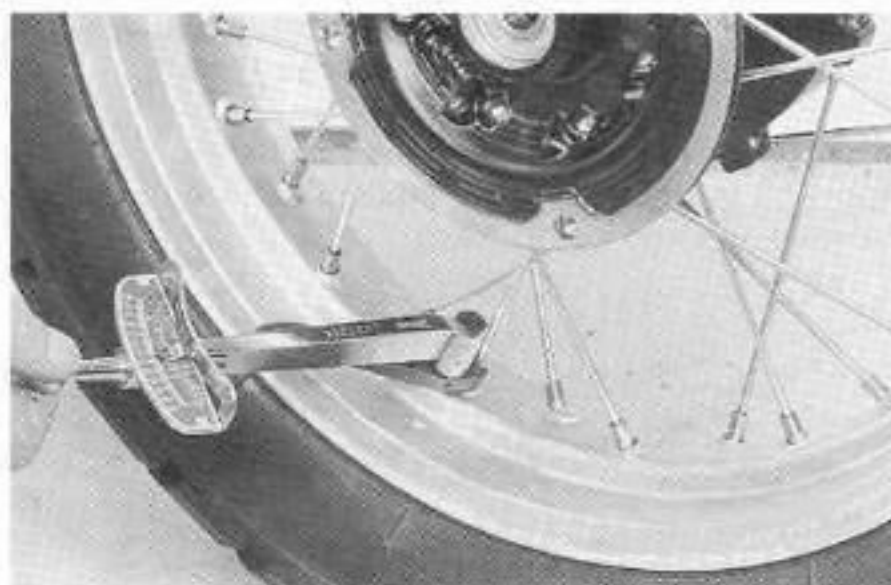


Torque the spokes in 2 or 3 progressive steps.

TOOL:

Spanner C, 5.8×6.1 mm 07701-0020300

TORQUE: 3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)



DRIVEN FLANGE BEARING INSTALLATION

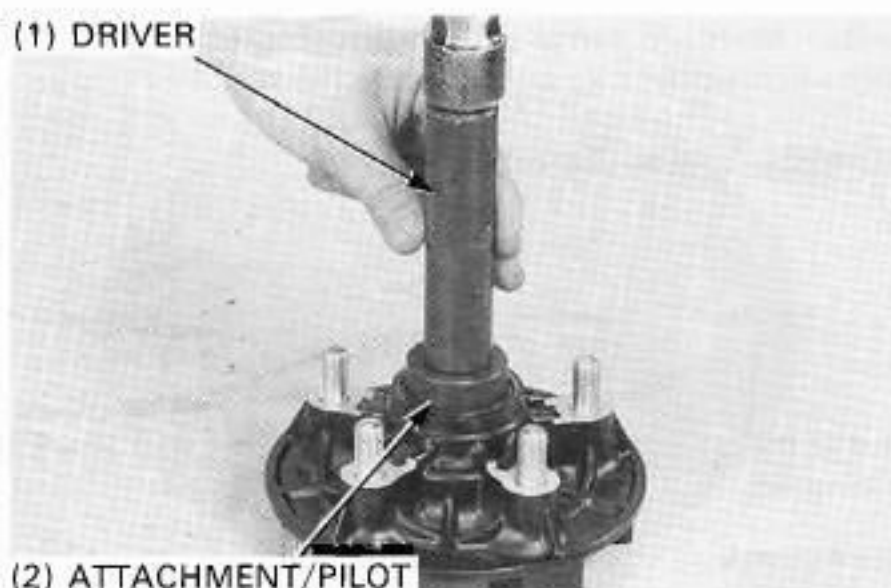
Drive in the driven flange bearing (6204 UU) squarely with the marked side facing down until it is fully seated.

TOOLS:

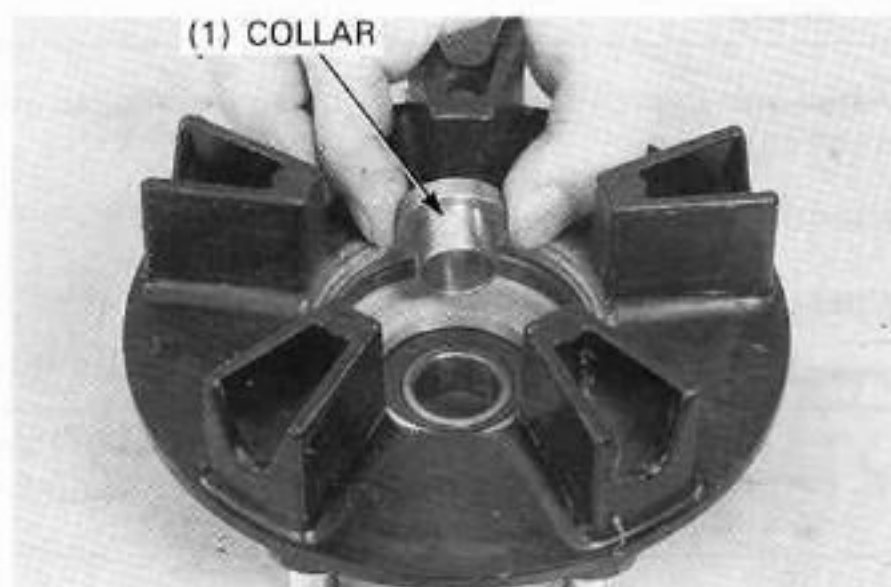
Driver 07749-0010000

Attachment, 42×47 mm 07746-0010300

Pilot, 20 mm 07746-0040500



Install the driven flange distance collar.

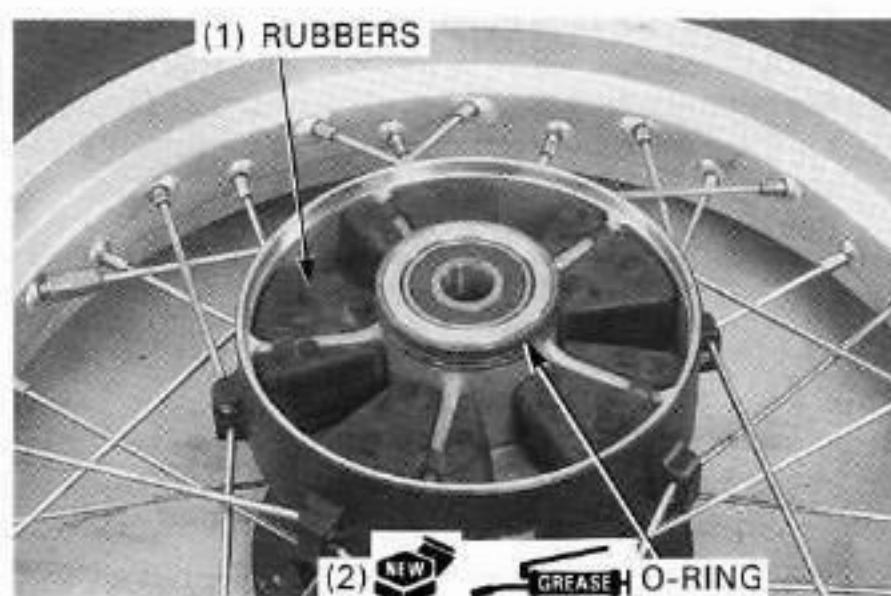


Check the damper rubber for wear or damage. Replace if necessary.

NOTE

- Replace the damper rubber as a set.

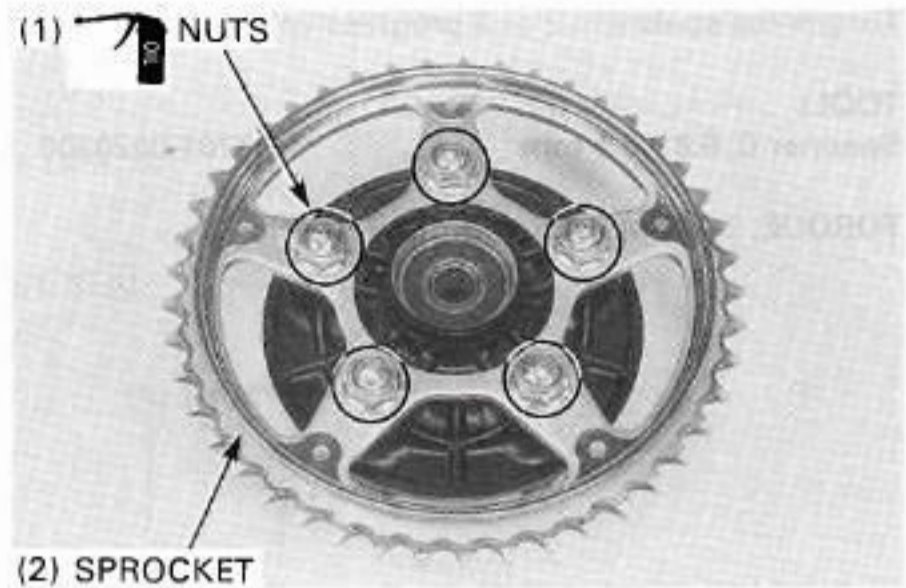
Install the damper rubbers to the wheel hub. Apply grease to the new O-ring and install it to the groove on the wheel hub.



REAR WHEEL/SUSPENSION

If the driven sprocket is removed from the driven flange, install the driven sprocket as followings.

Install the driven sprocket to the driven flange.
Apply oil to the threads and flange surface of the driven sprocket nuts and install them.



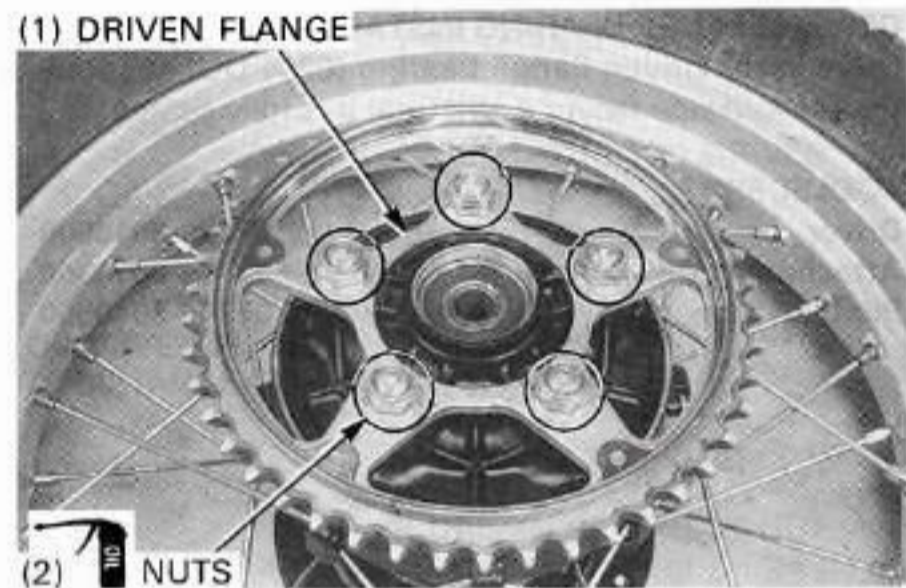
Install the driven flange and driven sprocket as assembly.
Tighten the driven sprocket nuts to the specified torque.

TORQUE: 96 N·m (9.8 kgf·m, 71 lbf·ft)

Install the rear brake disc with the "MIN. TH 4 mm" mark side facing up.

⚠ WARNING

- Do not get grease on the brake disc or stopping power will be reduced.



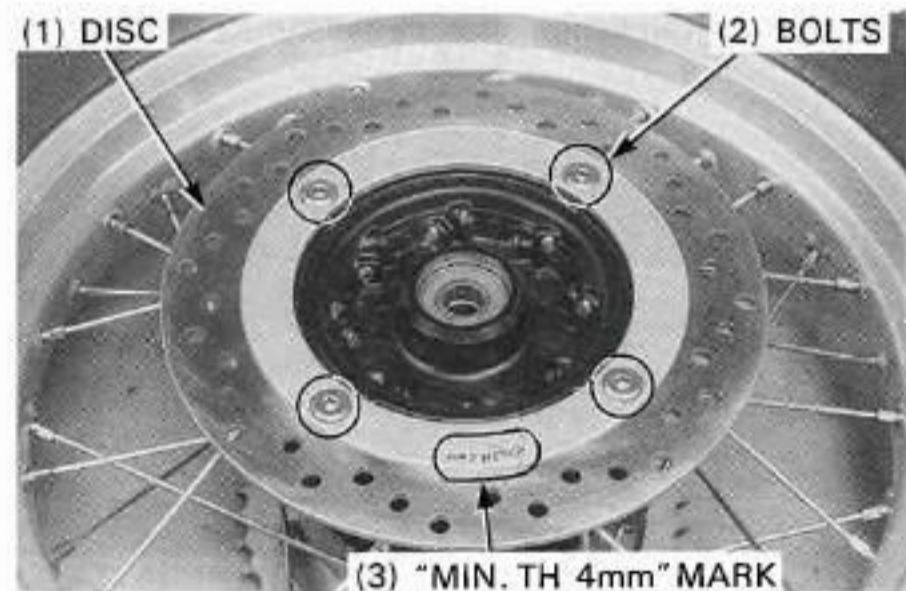
Install and tighten the new rear brake disc bolts to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

WHEEL BALANCE

⚠ WARNING

- Wheel balance directly affects the stability, handling and overall safety of the motorcycle. Carefully check balance before reinstalling the wheel.



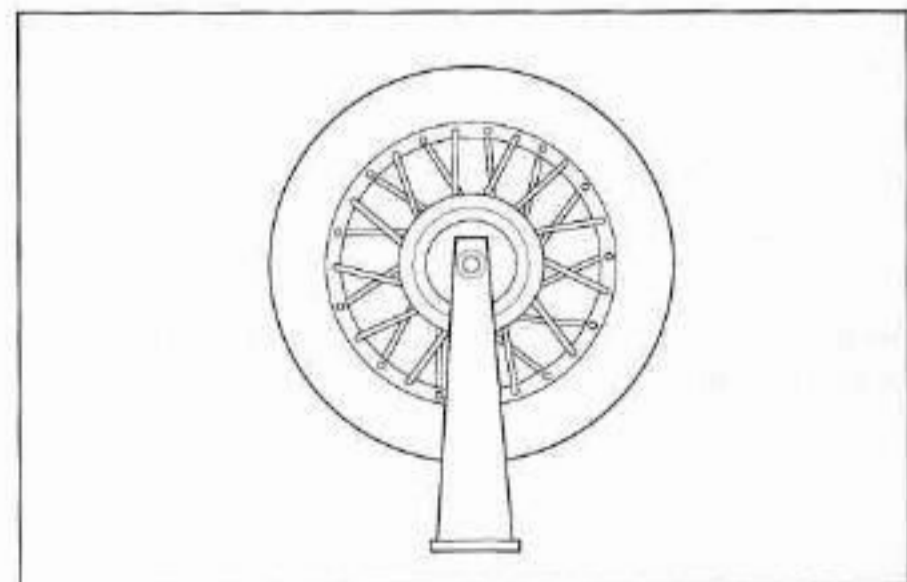
NOTE

- The wheel balance must be checked when the tire is remounted.
- For optimum balance, the tire balance mark (a paint dot on the side wall) must be located next to the valve stem.
Remount the tire if necessary.

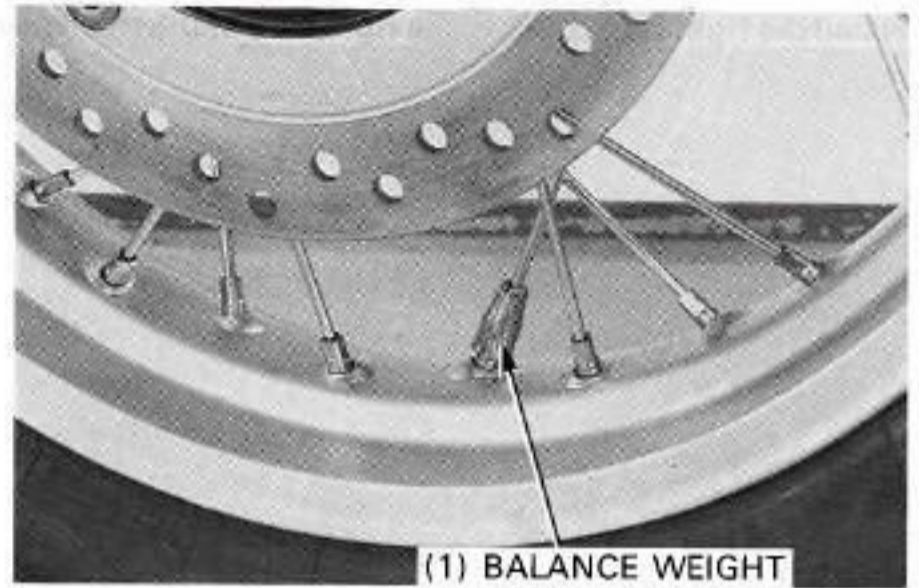
Mount the wheel, tire and brake disc assembly on an inspection stand.

Spin the wheel, allow it to stop, and mark the lowest (heaviest) part of the wheel with chalk.

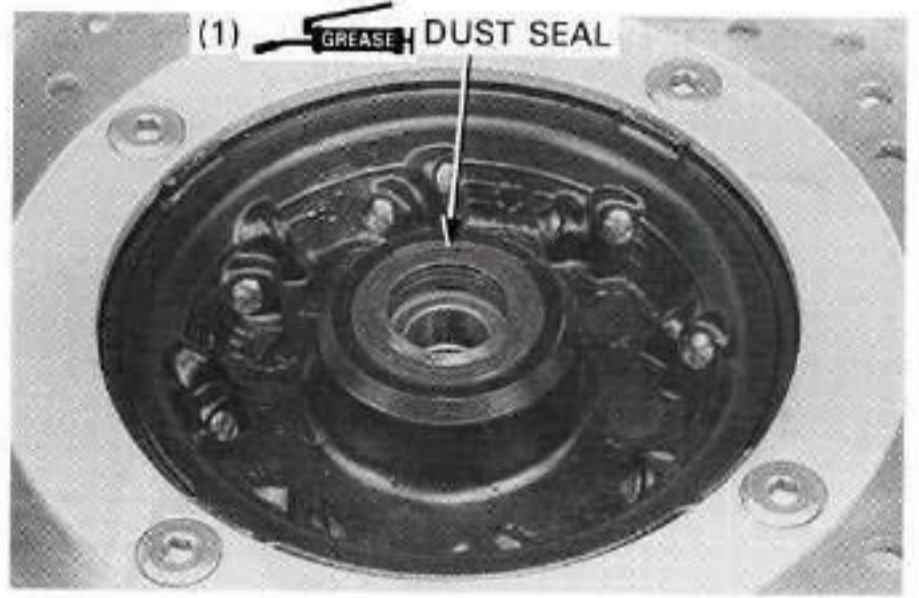
Do this two or three times to verify the heaviest area. If the wheel is balanced, it will not stop consistently in the same position.



To balance the wheel, install balance weights on the lightest side of rim, the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun.
Do not add more than 60 grams (2.1 oz) to the rear wheel.



Apply grease to the right dust seal lip.
Install the right dust seal to the right side of the rear wheel.

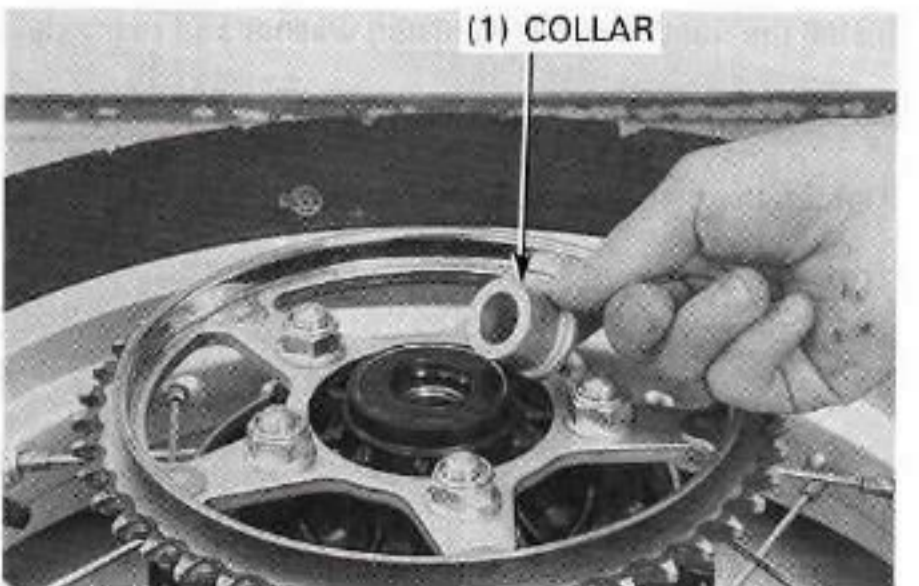


Apply grease to the left dust seal lip.
Install the left dust seal to the left side of the rear wheel.



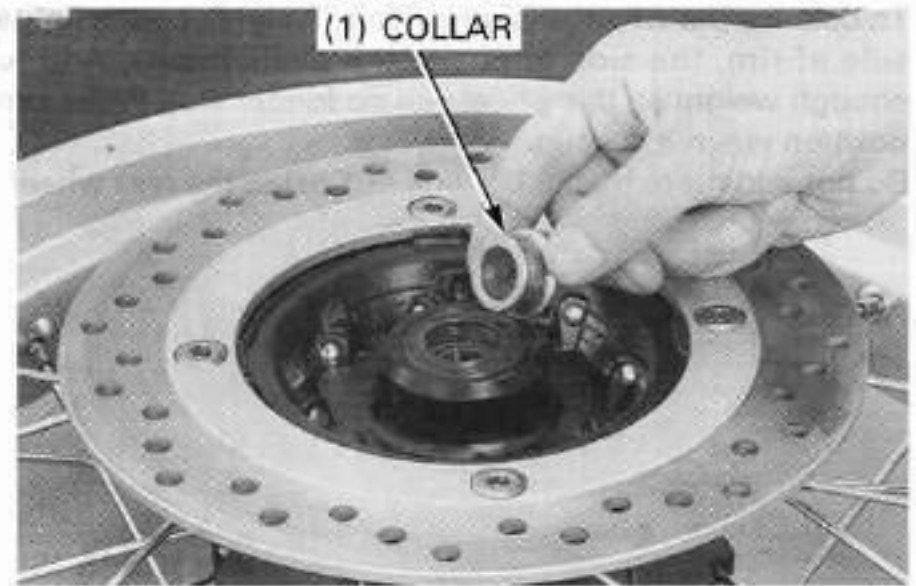
INSTALLATION

Install the left side collar to the left side of the rear wheel.

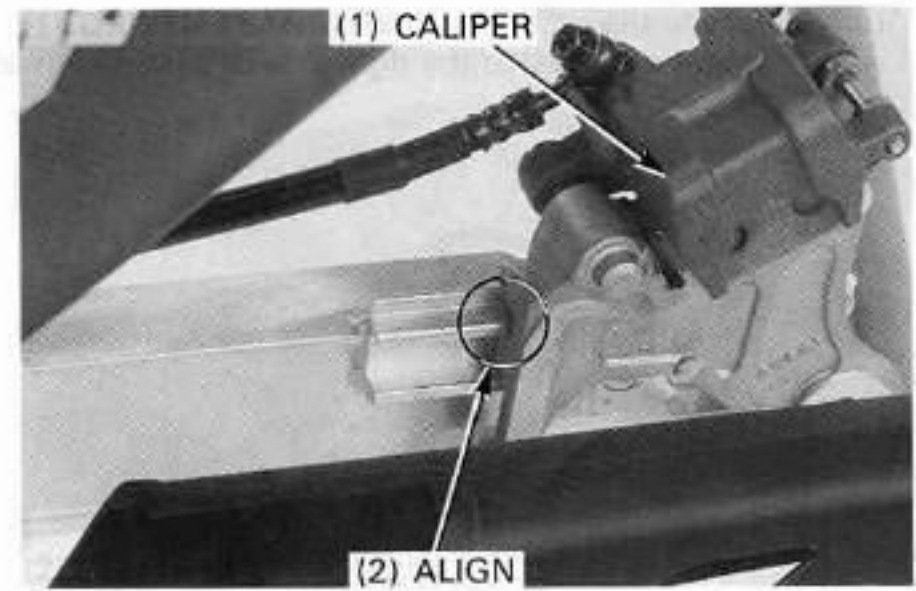


REAR WHEEL/SUSPENSION

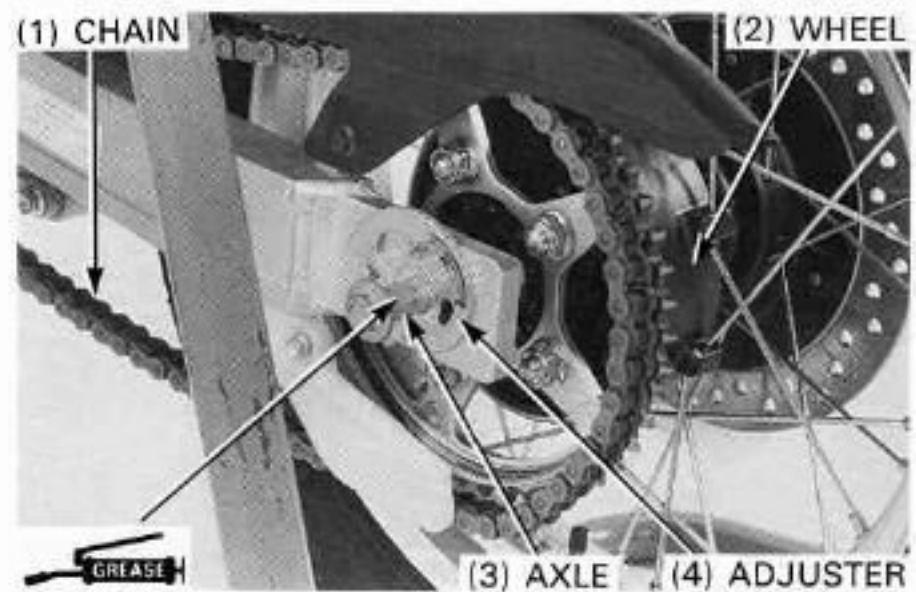
Install the right side collar to the right side of the rear wheel.



Align the rear caliper bracket with the slide rail on the swingarm.



Install the rear wheel so that the brake disc is positioned between the pads, being careful not to damage the pads. Apply thin coat of grease to the rear axle. Install the rear axle and left eccentric adjuster. Install the drive chain over the driven sprocket.

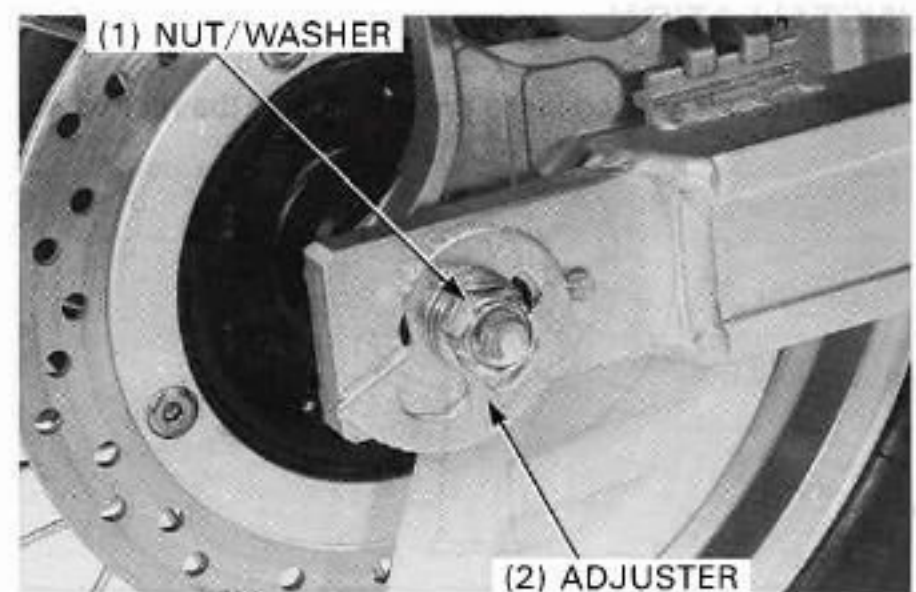


Install the right eccentric adjuster, washer and rear axle nut.

Adjust the drive chain slack (page 3-18) .

Tighten the rear axle nut to the specified torque.

TORQUE: 91 N·m (9.3 kgf·m, 67 lbf·ft)



SHOCK ABSORBER

⚠ WARNING

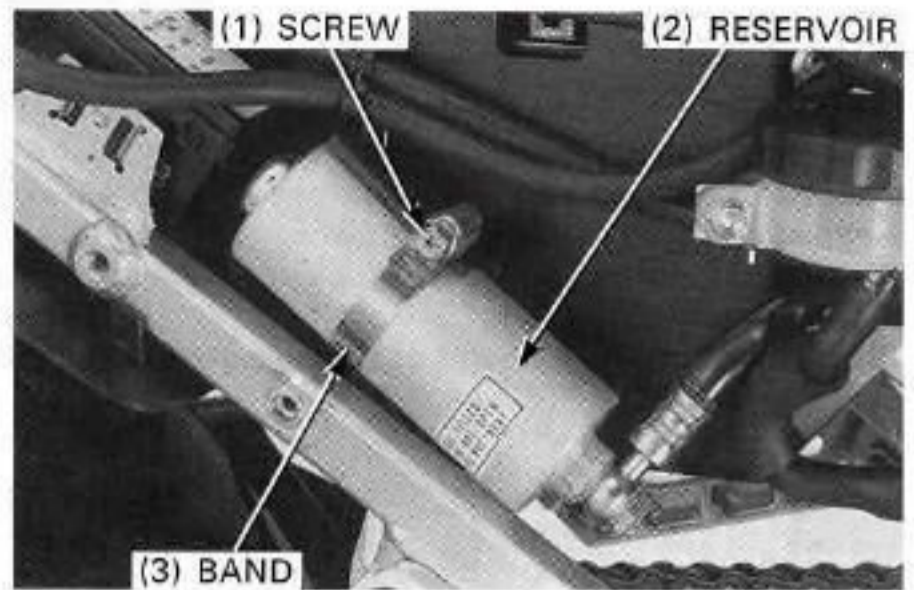
- *The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the gas containing shock absorber.*

REMOVAL

Raise the rear wheel off the ground using a safety stand or hoist.

CAUTION

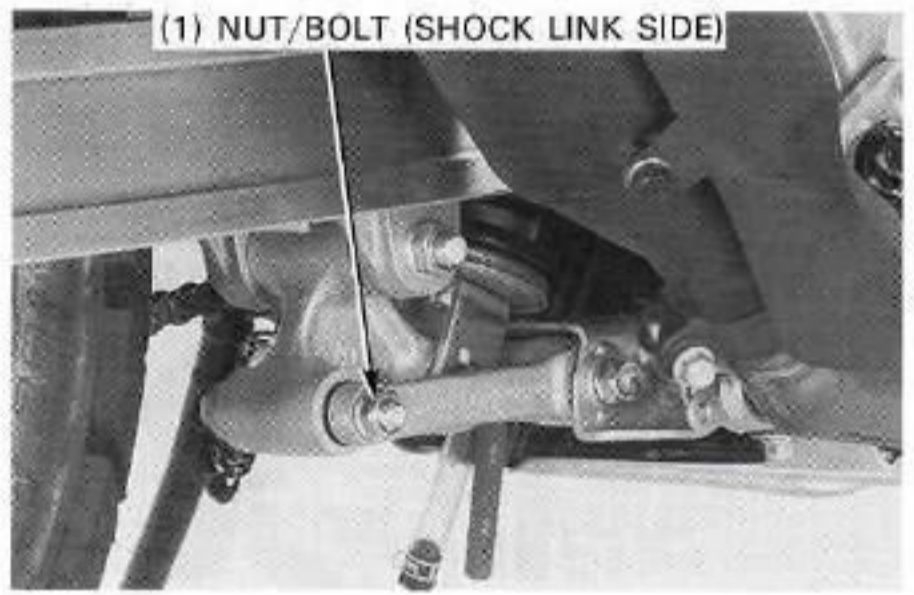
- *Do not jack up the motorcycle using oil filter.*



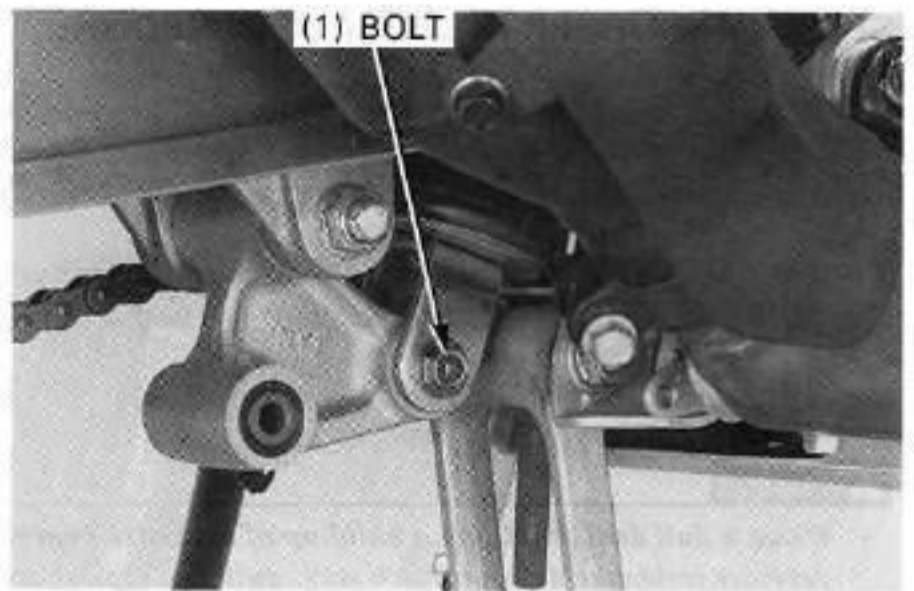
Remove the side cover (page 2-7) .

Loosen the screw and shock absorber reservoir band.
Remove the shock absorber reservoir.

Remove the shock arm nut/bolt (shock link side) .



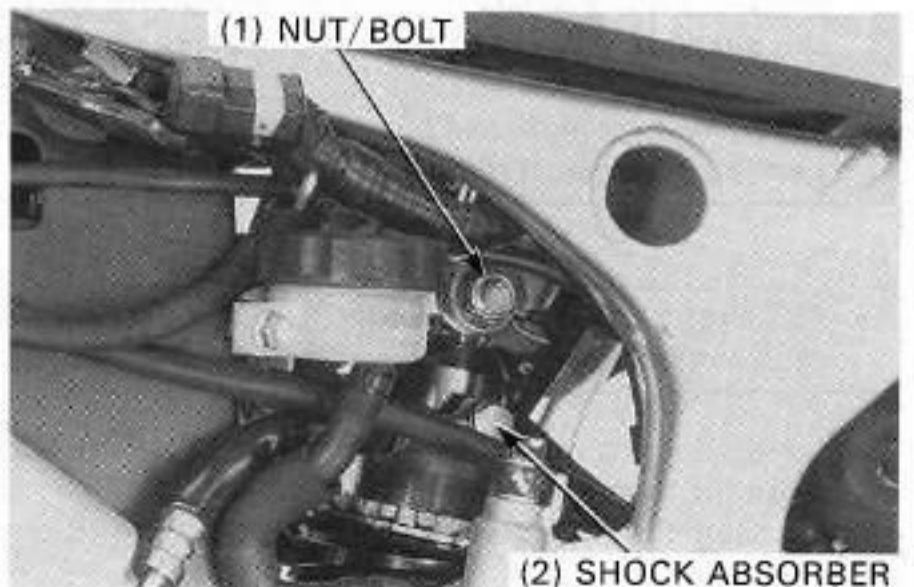
Remove the shock absorber lower mounting bolt.



Remove the shock absorber upper mounting nut/bolt.
Remove the shock absorber out of the frame from the right.

⚠ WARNING

- *Do not try to disassemble the shock absorber or more.*



REAR WHEEL/SUSPENSION

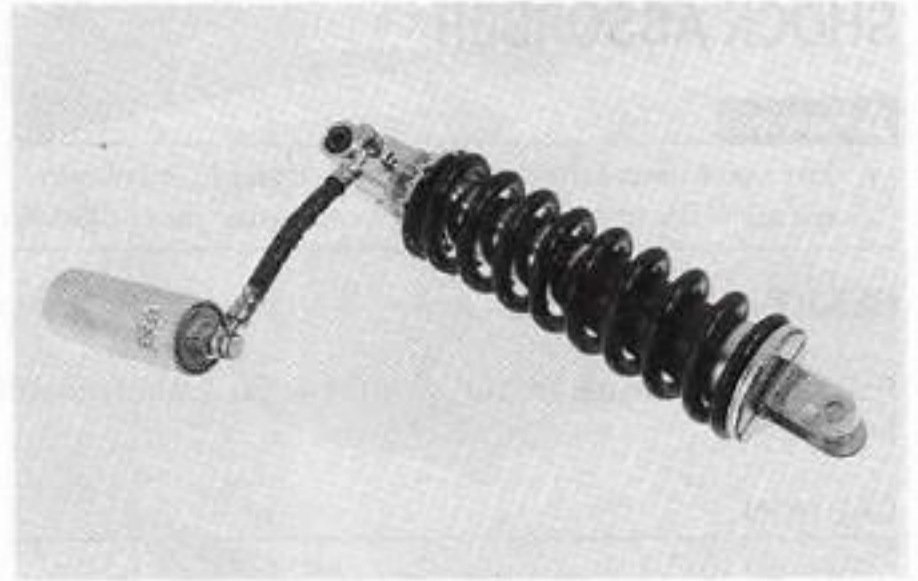
INSPECTION

Check the damper unit for deformation or oil leakage and replace if necessary.

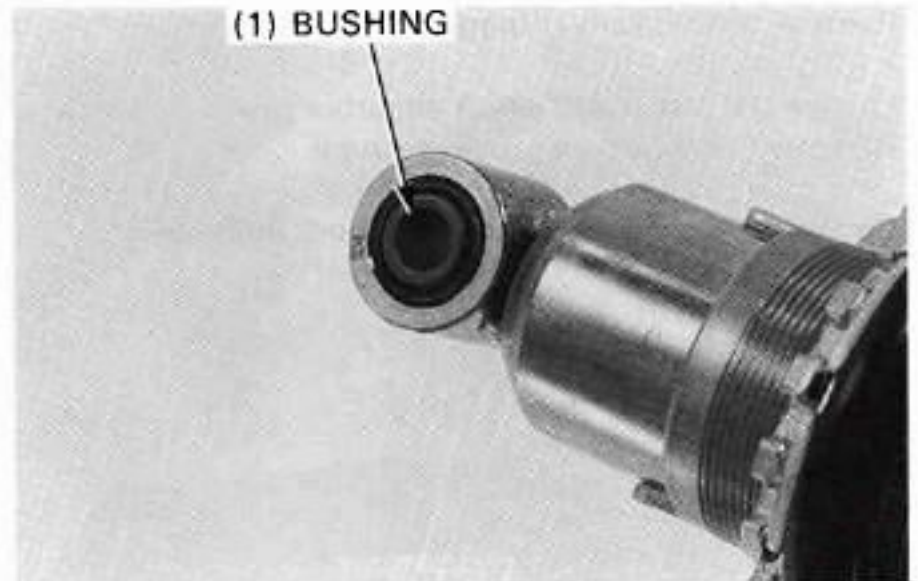
Check the damper rod for straightness. Also check for stepped wear and replace if necessary.

Check the stopper rubber for fatigue or damage and replace if necessary.

Check the hose for damage or oil leakage and replace if necessary.



Check the bushing for wear or damage and replace if necessary.



SHOCK ABSORBER DISPOSAL PROCEDURE

Center punch the reservoir tank to mark the drilling point.

Place the reservoir tank inside a plastic bag and it upright in a vise.

Through the open end of the bag, insert a drill motor with a sharp 2-3 mm (5/64-1/8 in) drill bit. Warp the bag around the drill and hold it closed.

Use a sharp drill bit to minimize heat buildup.

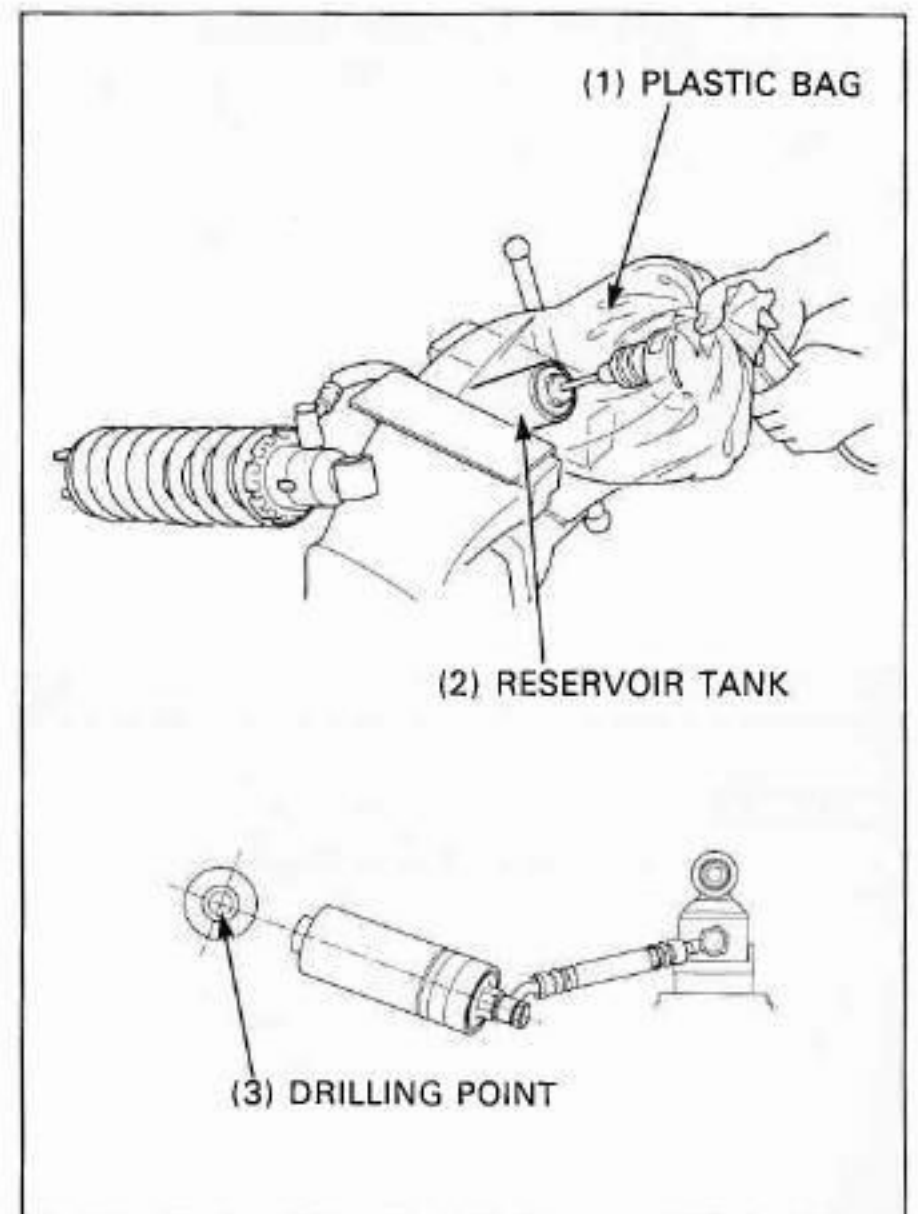
⚠ WARNING

- *Using a dull drill bit allows a build-up of excessive heat and pressure inside the damper which may cause an explosion.*
- *The shock absorber contains nitrogen gas and oil under high pressure. Drilling farther into the damper case than specified can puncture the oil chamber. Oil escaping under high pressure may cause serious injury.*
- *Always wear eye protection to avoid getting metal shaving in your eyes when gas pressure is released.*

NOTE

- The plastic bag is only intended to shield you from the escaping gas.

Briefly run the drill motor inside the bag; this will inflate the bag with air from the motor and help keep the bag from getting caught in the bit when you start.

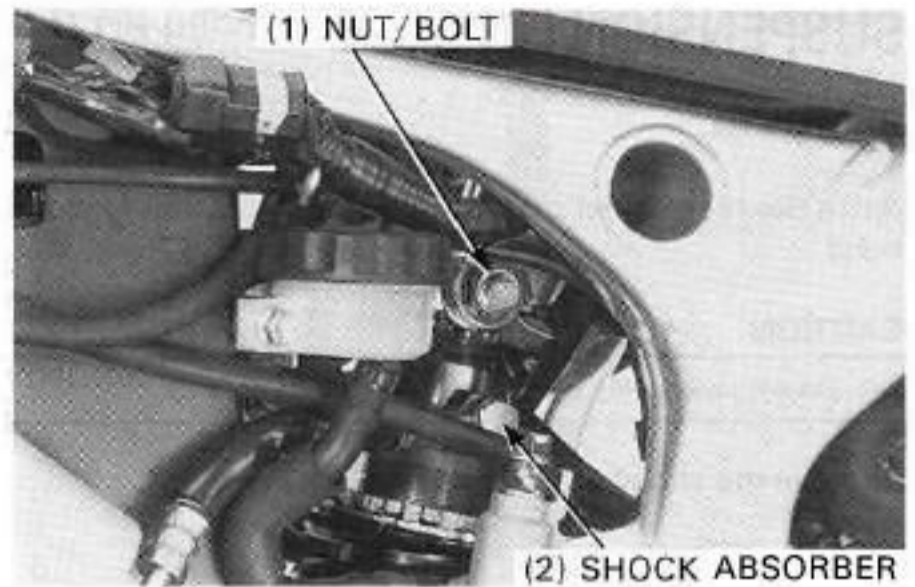


INSTALLATION

Install the shock absorber to the frame from the right side of the frame.

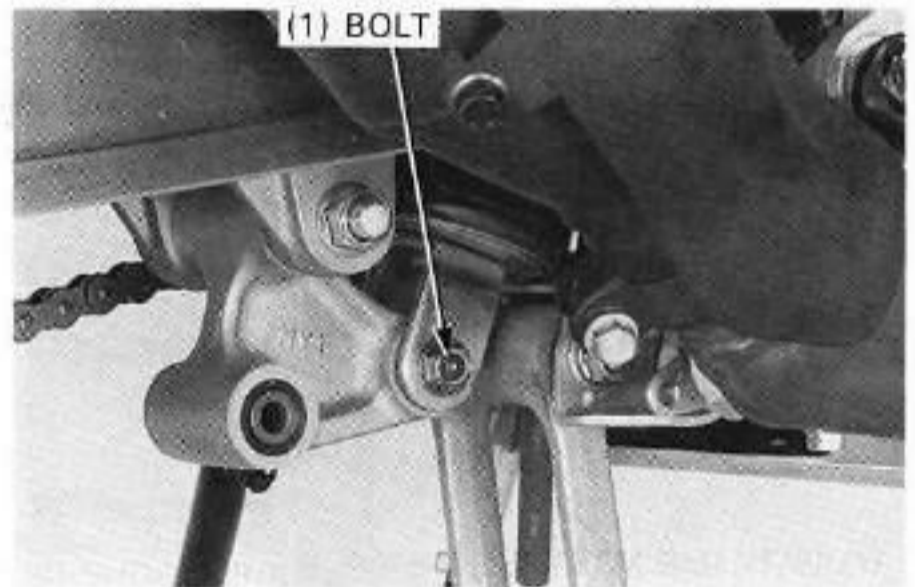
Install the shock absorber upper mounting bolt/nut and tighten the upper mounting nut to the specified torque.

TORQUE: 43 N·m (4.4 kgf·m, 32 lbf·ft)



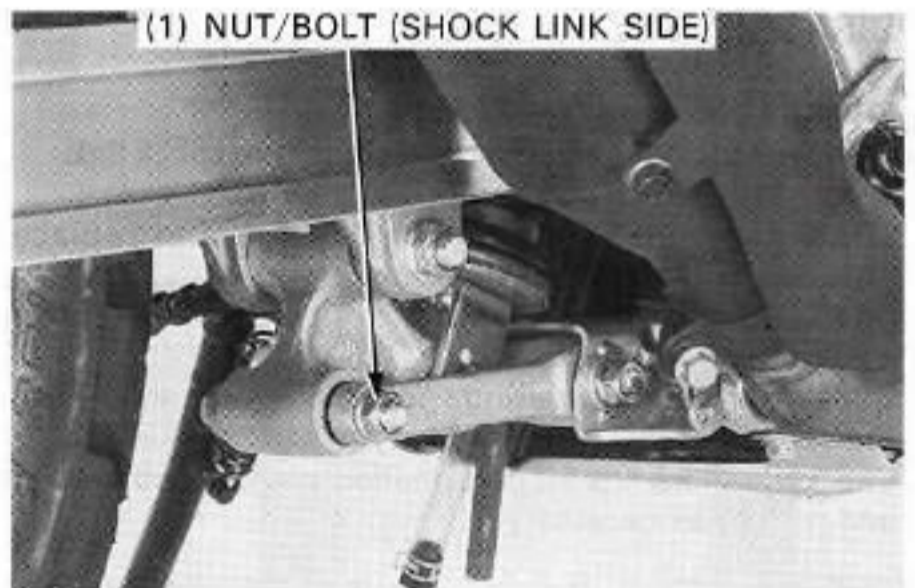
Install the shock absorber lower mounting bolt and tighten the lower mounting bolt to the specified torque.

TORQUE: 43 N·m (4.4 kgf·m, 32 lbf·ft)

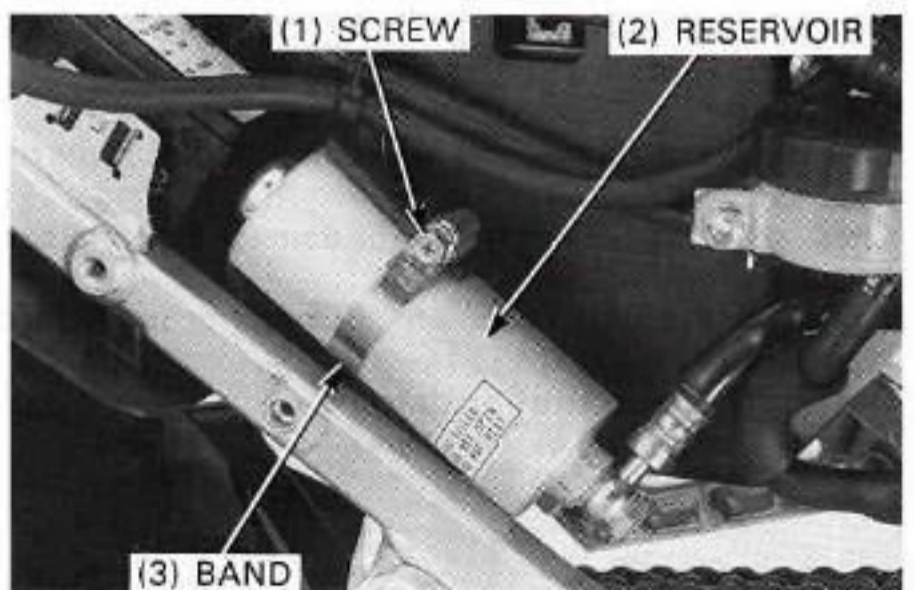


Install the shock arm bolt/nut (shock link side) and tighten shock arm nut to the specified torque.

TORQUE: 63 N·m (6.4 kgf·m, 46 lbf·ft)



Install the shock absorber reservoir and reservoir band. Tighten the band screw securely.



REAR WHEEL/SUSPENSION

SUSPENSION LINKAGE

REMOVAL

Raise the rear wheel off the ground using a safety stand or hoist.

CAUTION

- Do not jack up the motorcycle using oil filter.

Remove the shock arm nut/bolt (shock link side) .

Remove the shock absorber lower mounting bolt.
Remove the shock link nut/bolt and shock link.
Remove the shock arm nut/bolt (swingarm side) and shock arm.

DISASSEMBLY

SHOCK LINK

Remove the collar and dust seals from the shock link.

Check the collar for wear or damage and replace as necessary.

Check the dust seals for wear or damage and replace as necessary.

Check the needle bearings for damage or loose fit and replace as necessary (page 14 -17) .

Check the shock link for deformation, cracks or other damage and replace as necessary.

SHOCK ARM

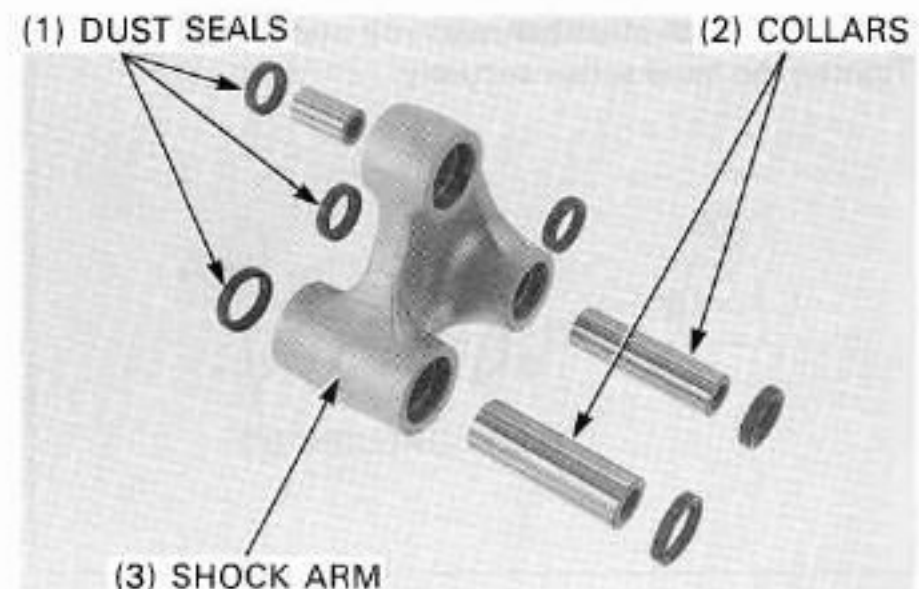
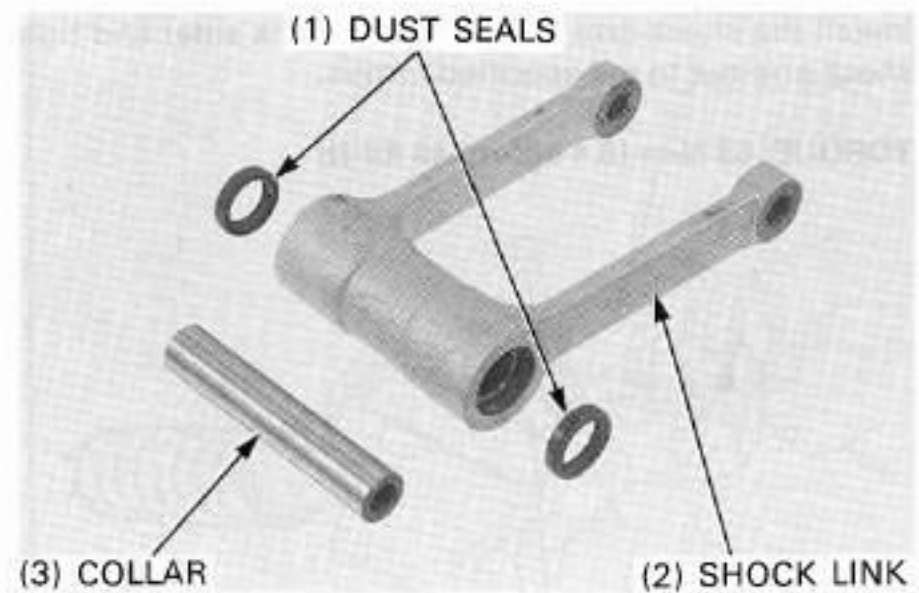
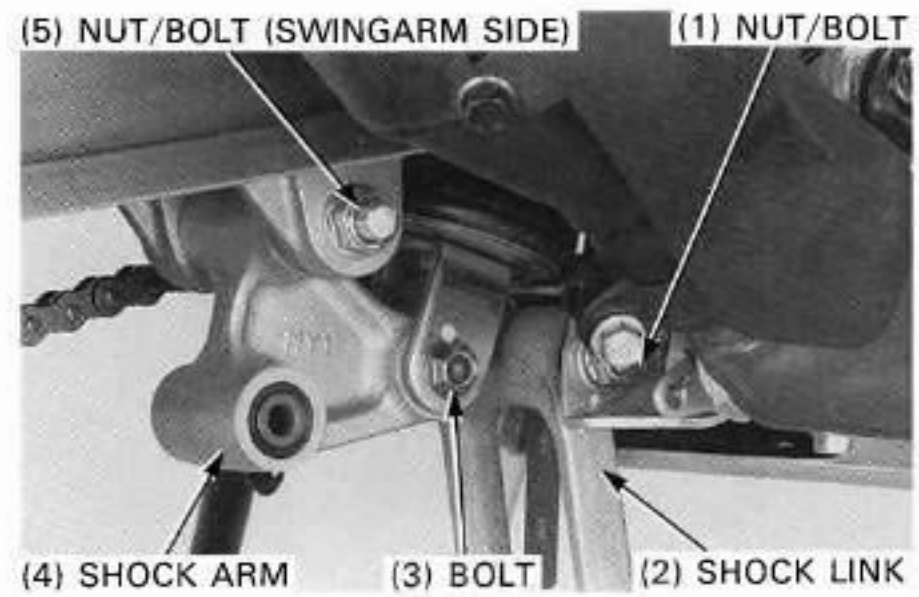
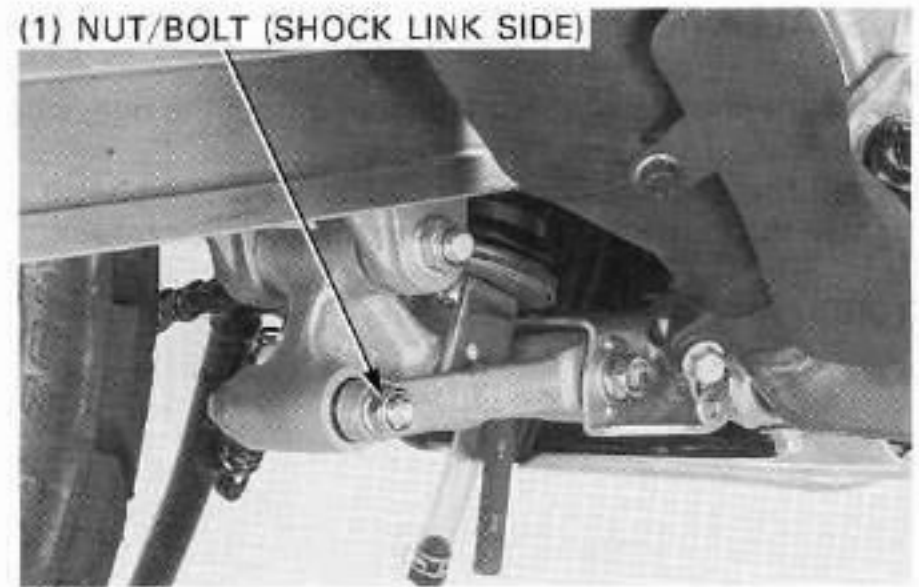
Remove the collars and dust seals from the shock arm.

Check the collars for wear or damage and replace as necessary.

Check the dust seals for wear or damage and replace as necessary.

Check the needle bearings for damage or loose fit and replace as necessary (page 14 -17) .

Check the shock arm for deformation, cracks or other damage and replace as necessary.



NEEDLE BEARING REPLACEMENT

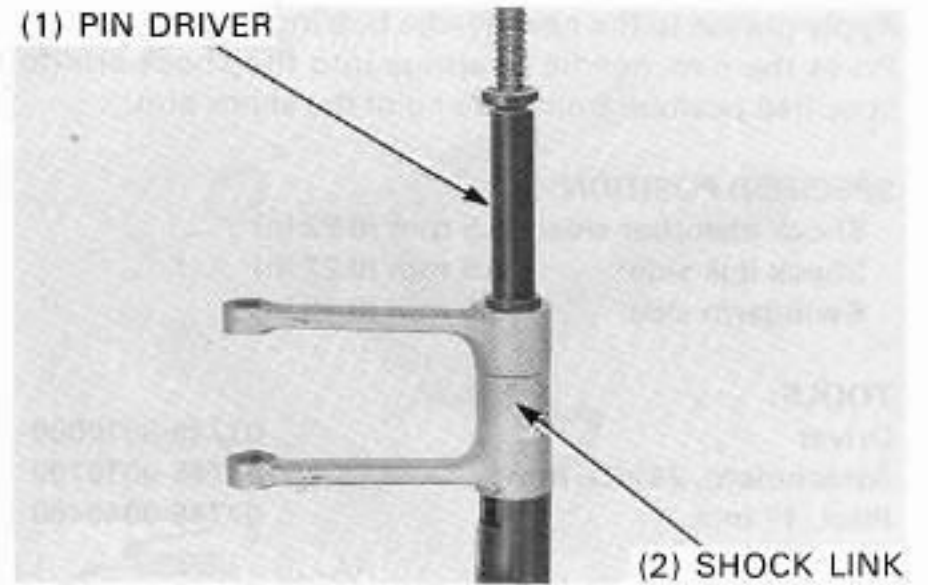
SHOCK LINK

Press the needle bearing out of the shock link.

TOOL:

Pin driver

07GMD -KT80100



Apply grease to the new needle bearings.

Press the new needle bearings into the shock link so that the needle bearing outer surface is 5.5 mm (0.22 in) below the outer edge of the shock link pivot bearing cavity.

TOOLS:

Driver

07749 -0010000

Attachment, 24 X 26 mm

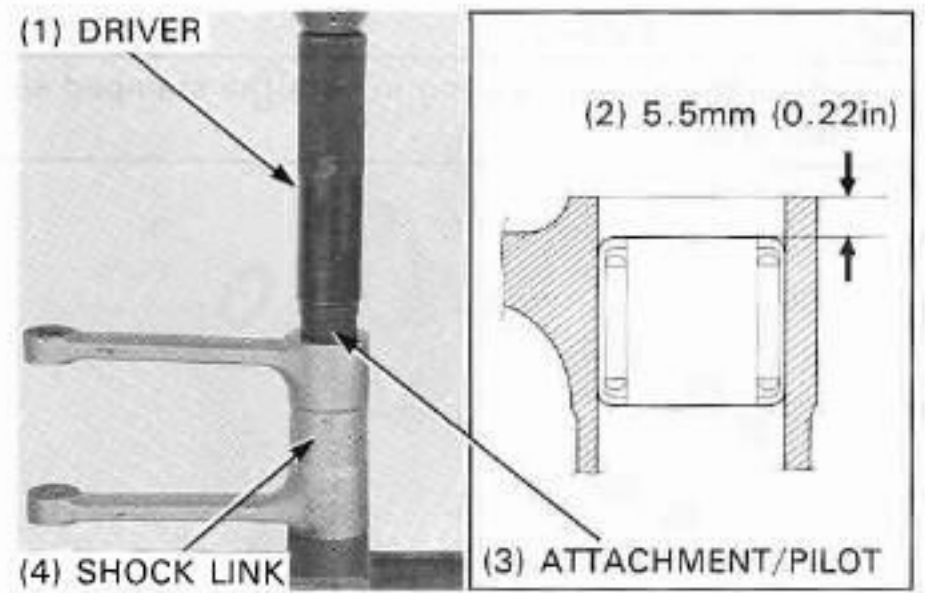
07746 -0010700

Pilot, 17 mm

07746 -0040400

NOTE

- Press the needle bearing in with the stamped side facing out.



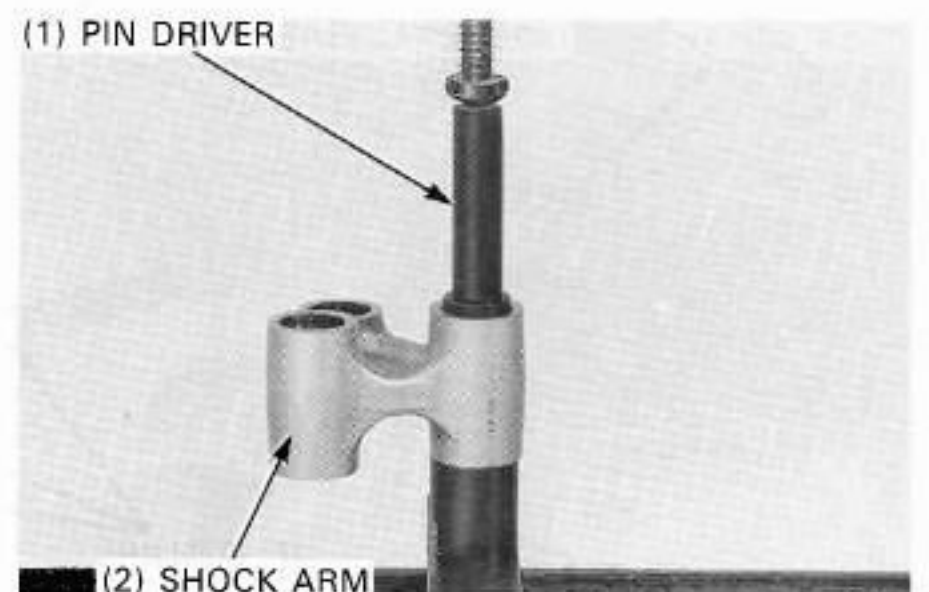
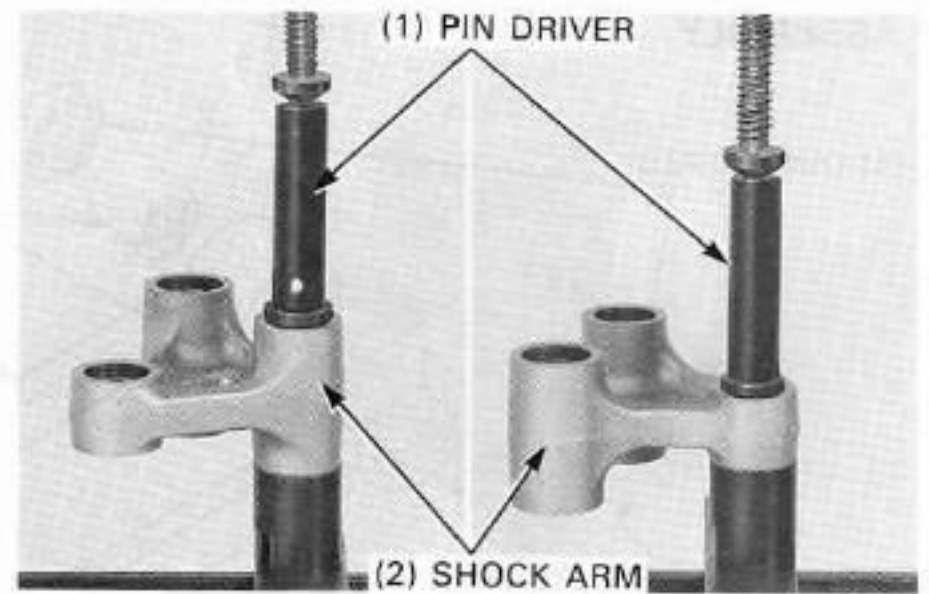
SHOCK ARM

Press the needle bearing out of the shock arm.

TOOL:

Pin driver

07GMD -KT80100



REAR WHEEL/SUSPENSION

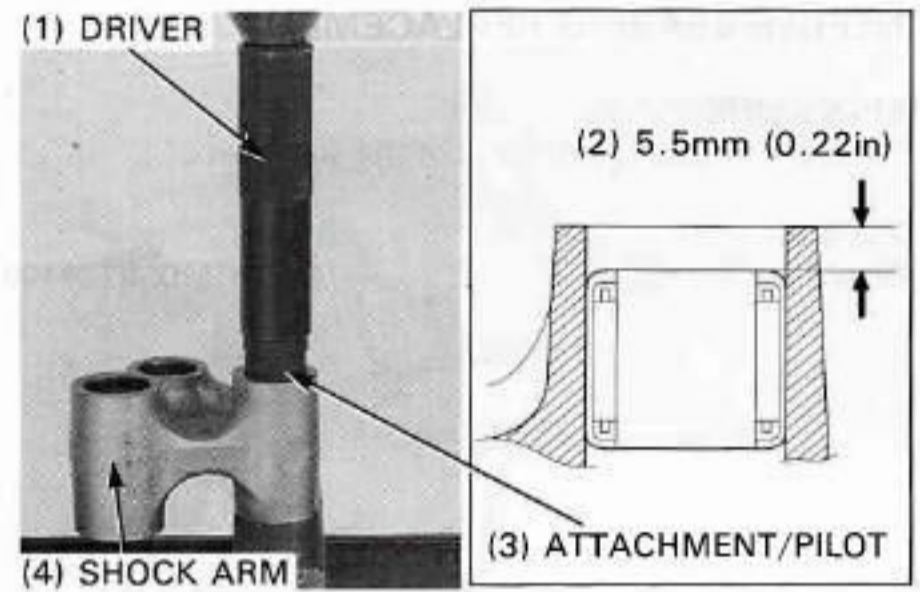
Apply grease to the new needle bearings.
Press the new needle bearings into the shock arm to the specified position from the end of the shock arm.

SPECIFIED POSITION:

Shock absorber side: 5.5 mm (0.22 in)
Shock link side: 5.5 mm (0.22 in)
Swingarm side: 5.0 mm (0.19 in)

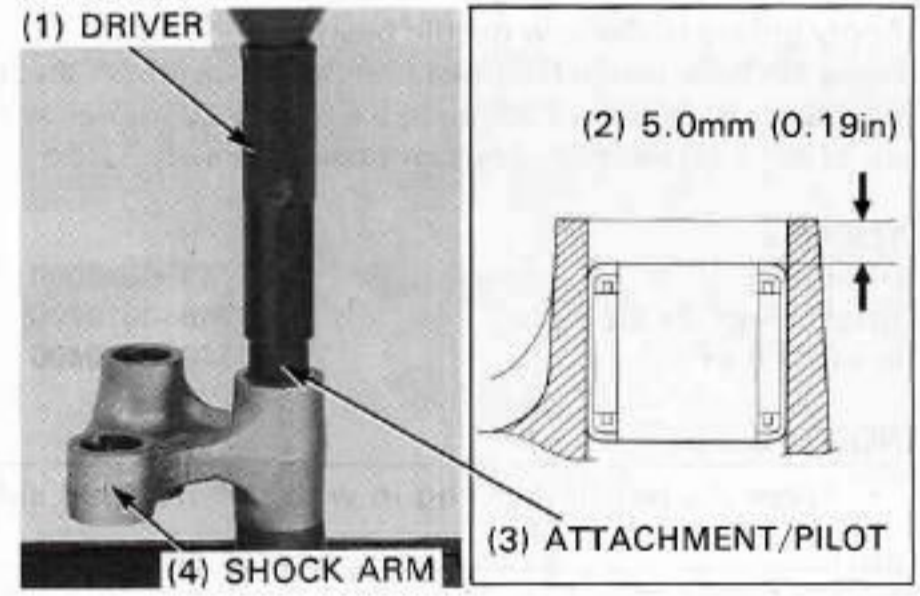
TOOLS:

| | |
|----------------------|---------------|
| Driver | 07749-0010000 |
| Attachment, 24×26 mm | 07746-0010700 |
| Pilot, 17 mm | 07746-0040400 |

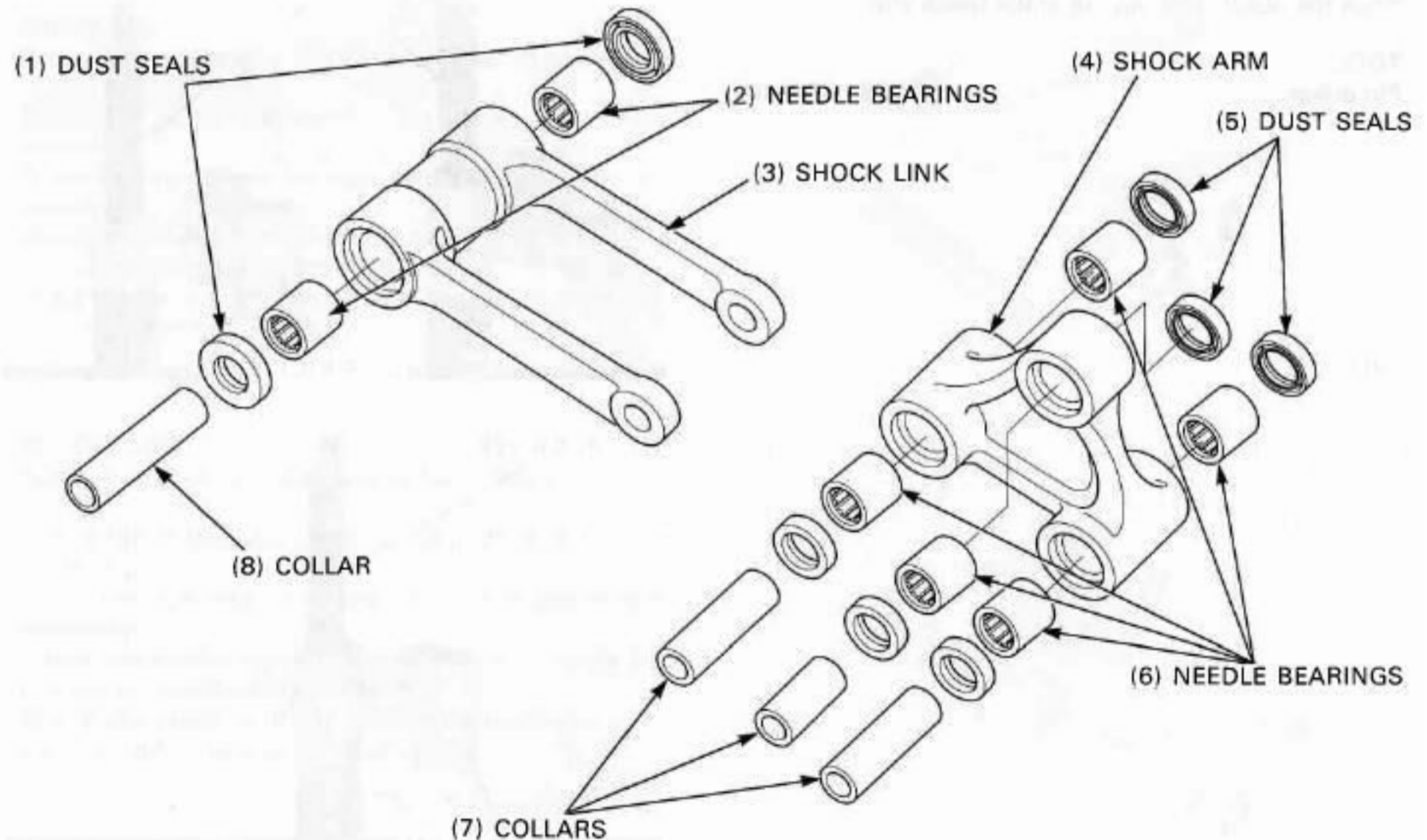


NOTE

- Press the needle bearing in with the stamped side facing out.

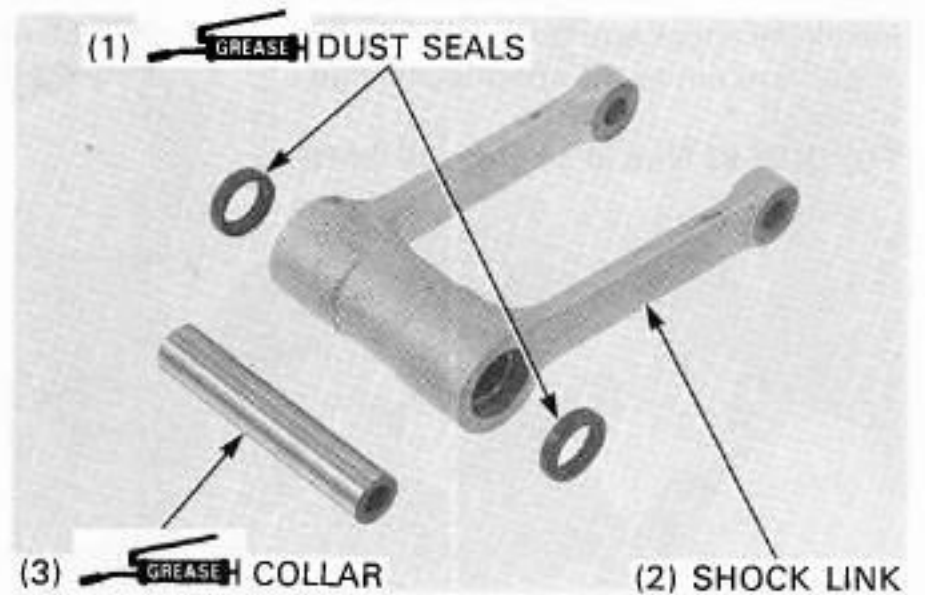


ASSEMBLY



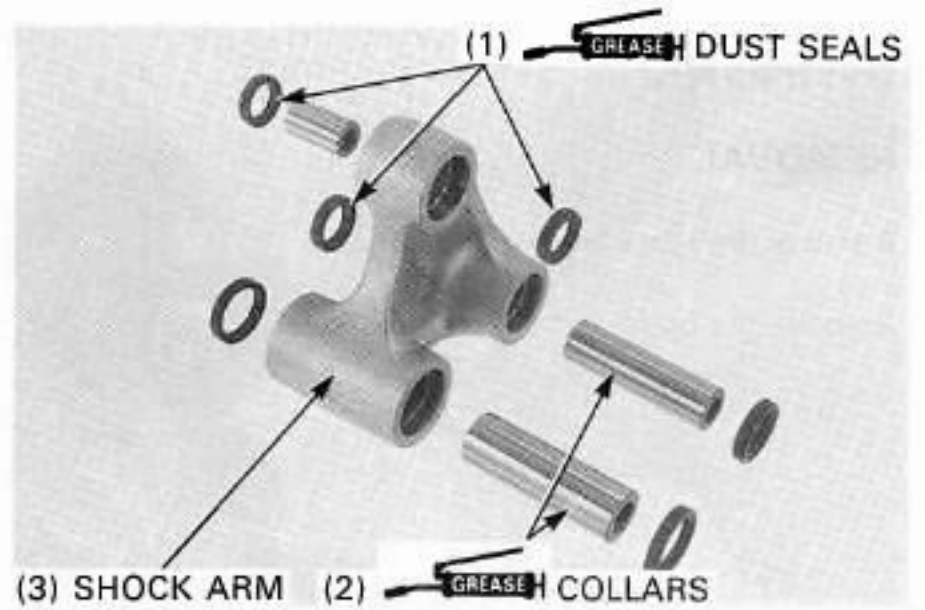
SHOCK LINK

Apply grease to the collar and dust seal lips.
Install the collar and dust seals to the shock link.



SHOCK ARM

Apply grease to the collars and dust seal lips.
Install the collars and dust seals to the shock arm.



INSTALLATION

Install the shock arm with its "⇄ FRONT" mark facing forward.

Install the shock arm bolt/nut (swingarm side) and tighten the shock arm nut to the specified torque.

TORQUE: 58 N·m (5.9 kgf·m, 43 lbf·ft)

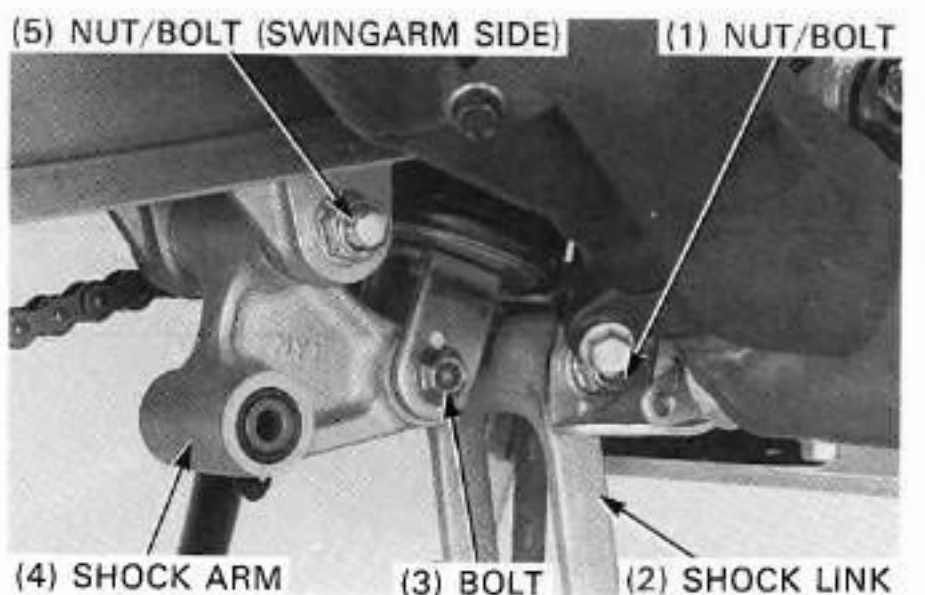
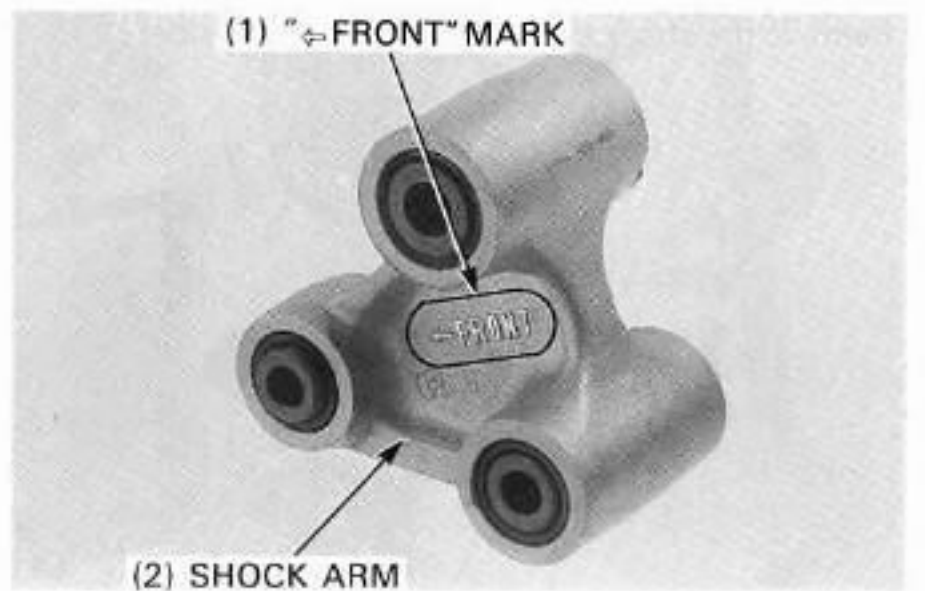
Install the shock link.

Install the shock link bolt/nut and tighten the shock link nut to the specified torque.

TORQUE: 63 N·m (6.4 kgf·m, 46 lbf·ft)

Install the shock absorber lower mounting bolt and tighten the lower mounting bolt to the specified torque.

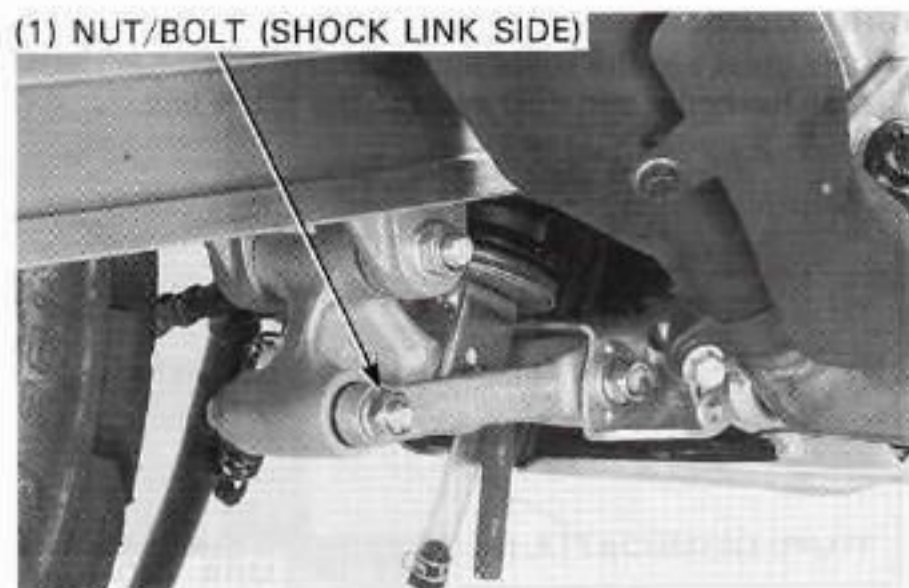
TORQUE: 43 N·m (4.4 kgf·m, 32 lbf·ft)



REAR WHEEL/SUSPENSION

Install the shock arm bolt/nut (shock link side) and tighten the shock arm nut to the specified torque.

TORQUE: 63 N·m (6.4 kgf·m, 46 lbf·ft)

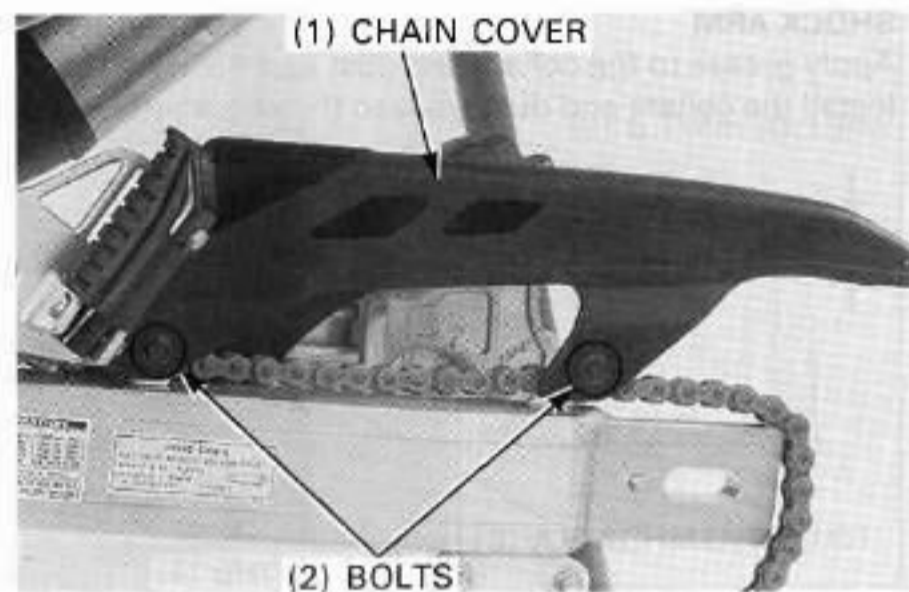


SWINGARM

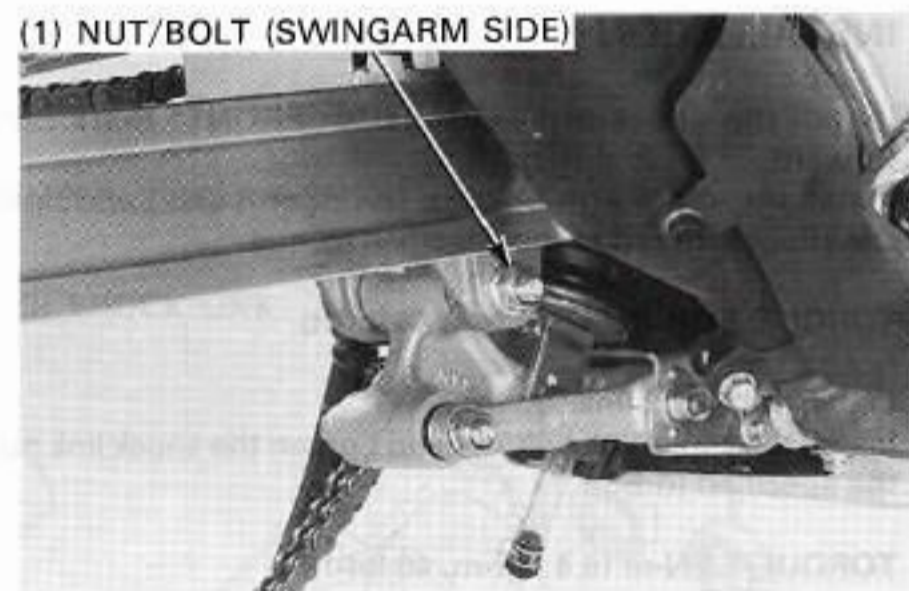
REMOVAL

Remove the rear wheel (page 14 -4) .

Remove the bolts and drive chain cover.



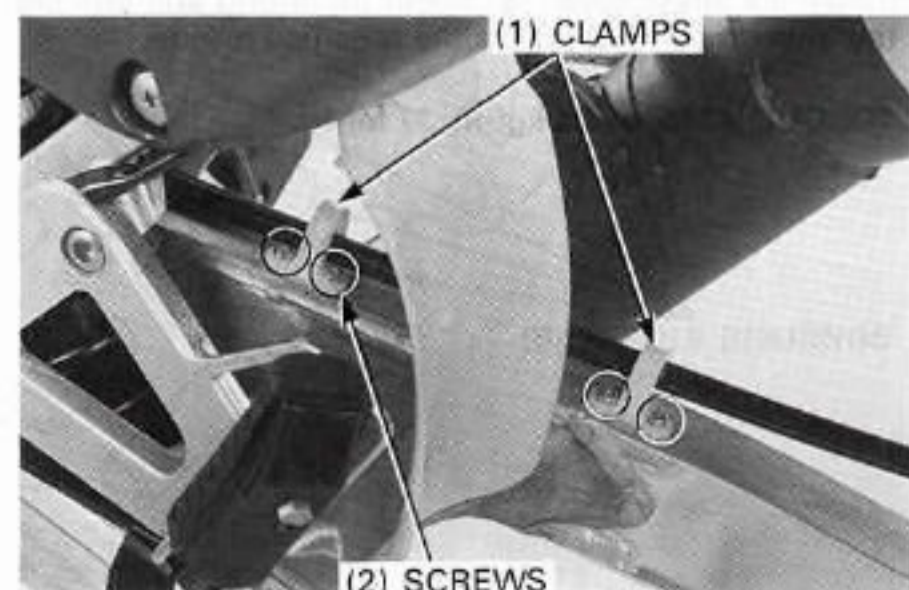
Remove the shock arm nut/bolt (swingarm side) .



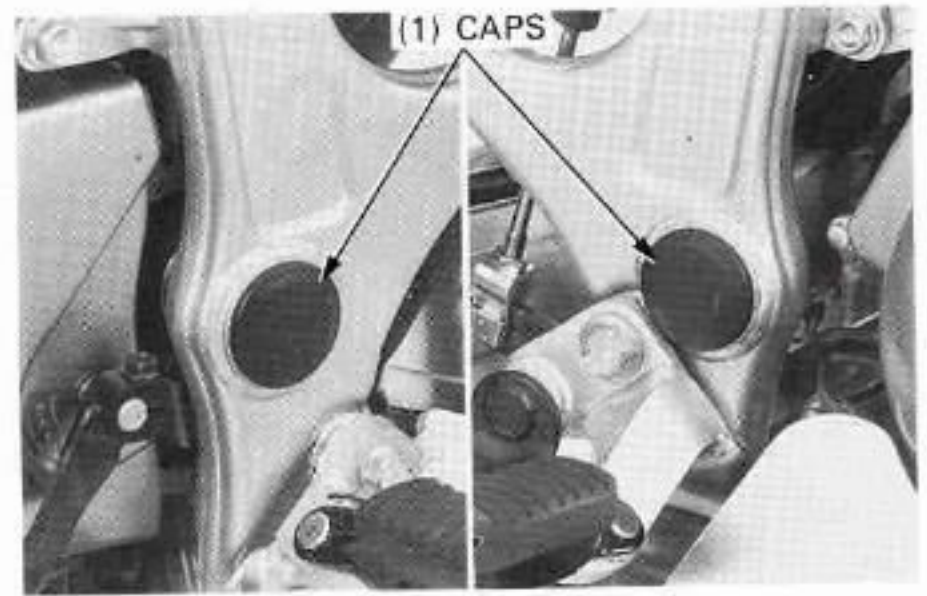
Remove the screws and brake hose clamps.
Derail the rear caliper bracket from the slide rail on the swingarm.

CAUTION

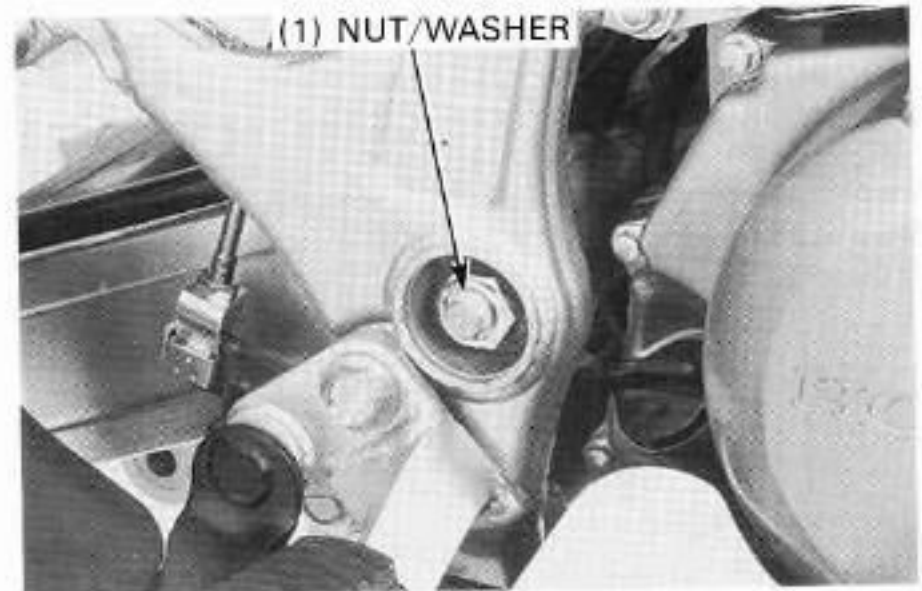
- Do not suspend the brake caliper from the brake hose.
- Do not twist the brake hose.



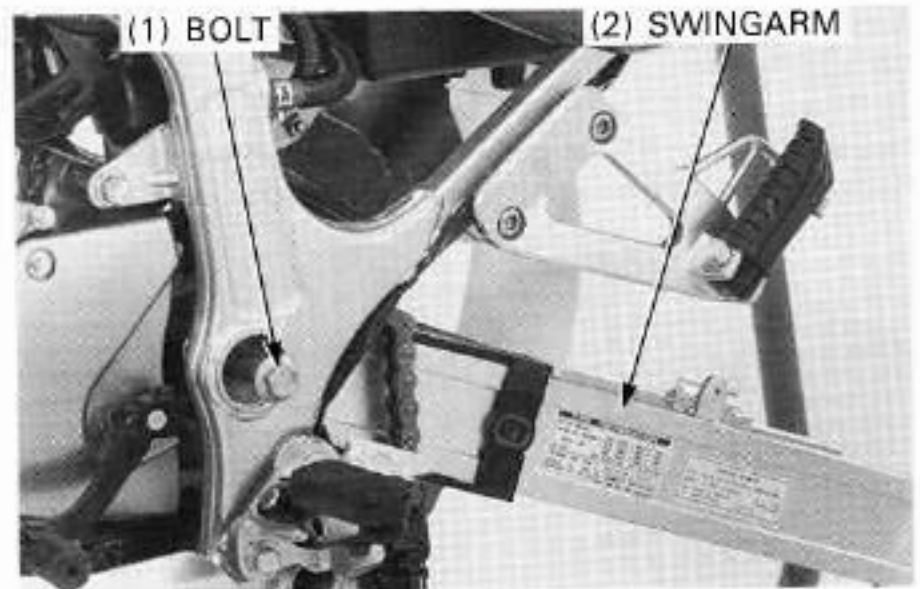
Remove the swingarm pivot caps.



Remove the swingarm pivot nut/washer.

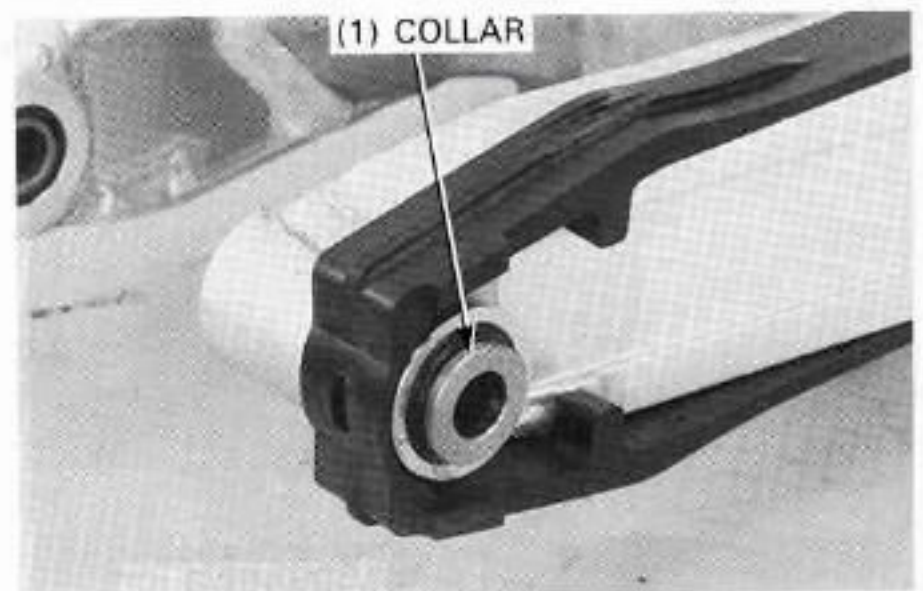


Remove the swingarm pivot bolt and swingarm.



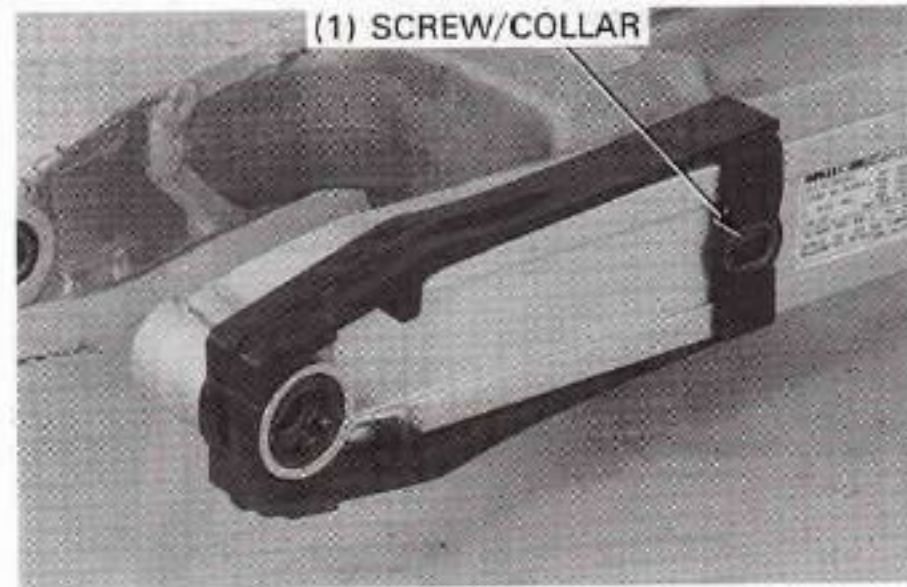
DISASSEMBLY

Remove the swingarm pivot collar.



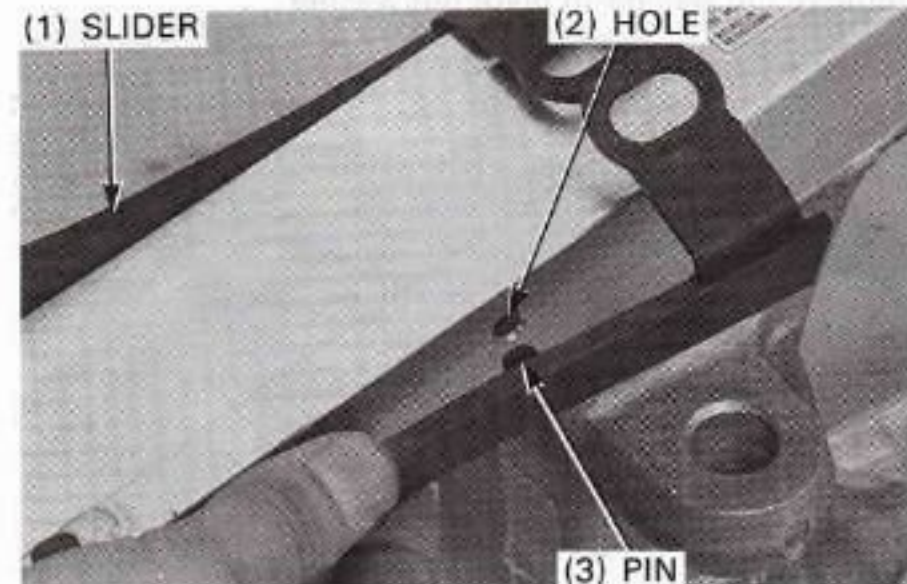
REAR WHEEL/SUSPENSION

Remove the drive chain slider screw and collar.



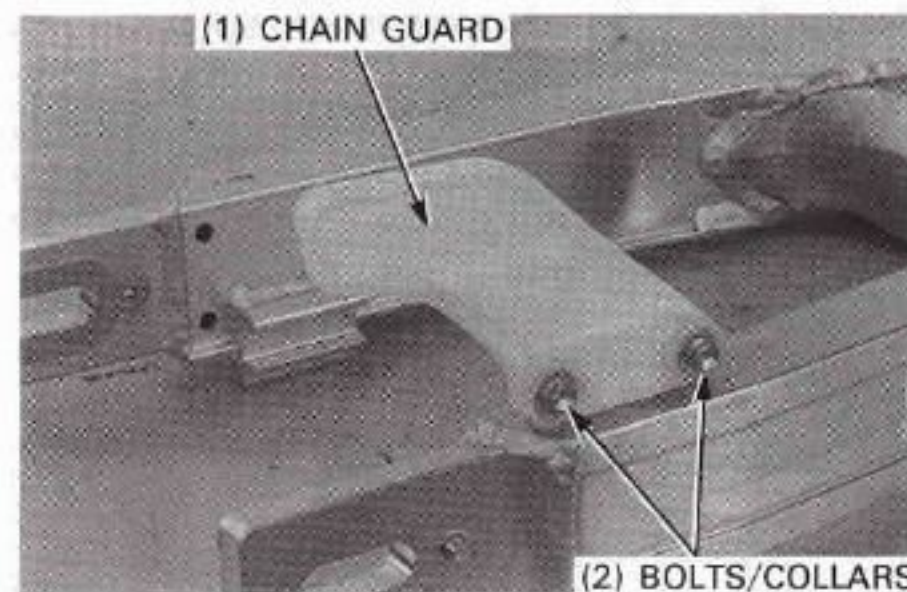
Remove the pin on the chain slider from the hole on the swingarm and remove the drive chain slider from the swingarm.

Inspect the drive chain slider for excessive wear. Replace the drive chain slider if it is worn to the wear indicator.

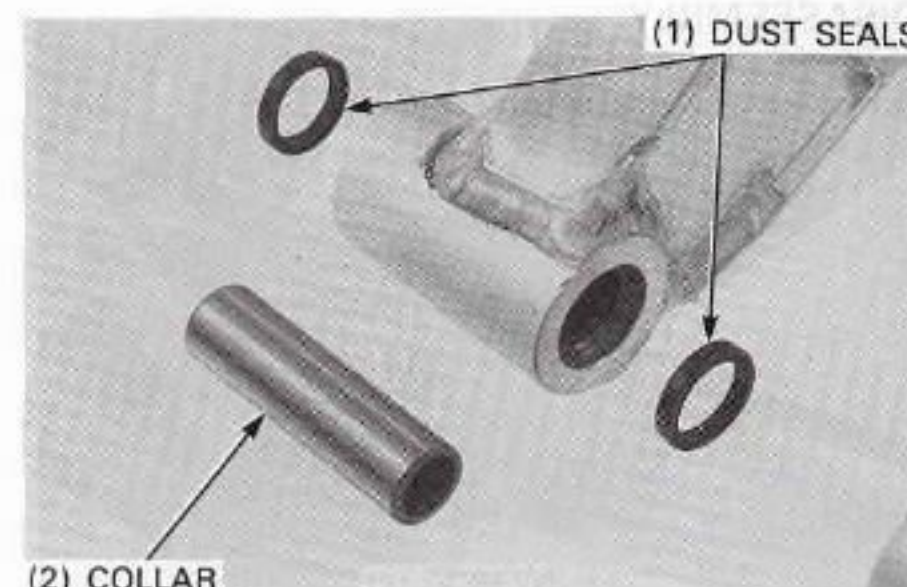


Remove the bolts, collars and drive chain guard from the swingarm.

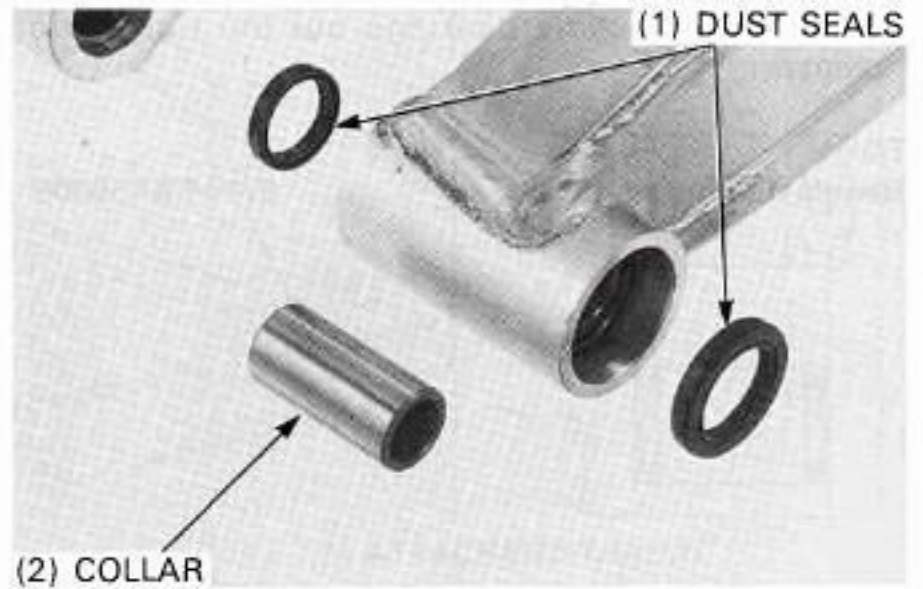
Inspect the drive chain guard for excessive wear. Replace the drive chain guard if it is worn.



Remove the right pivot collar, dust seals and needle bearings (page 14 -23) .

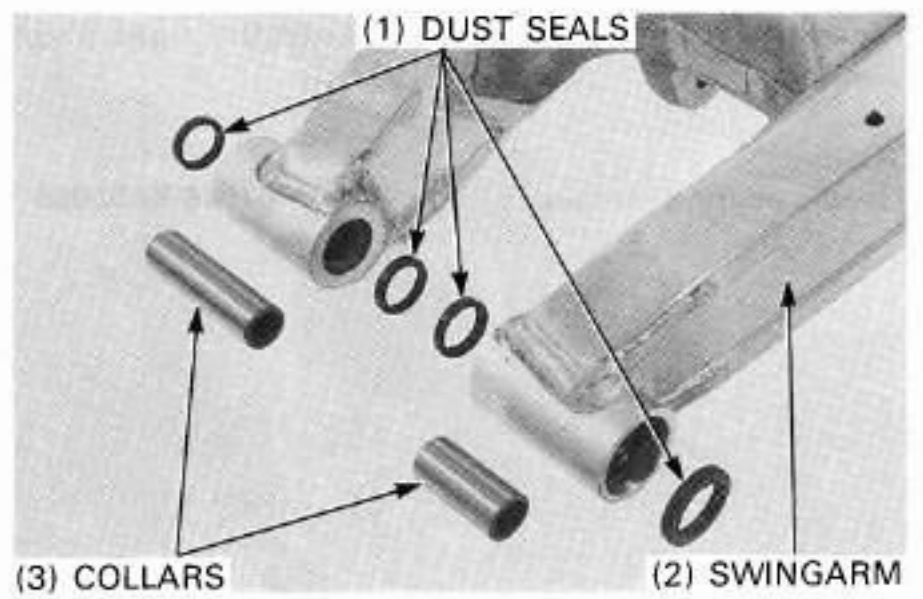


Remove the left pivot collar, dust seals, needle bearing, snap ring and ball bearings (page 14 -23) .



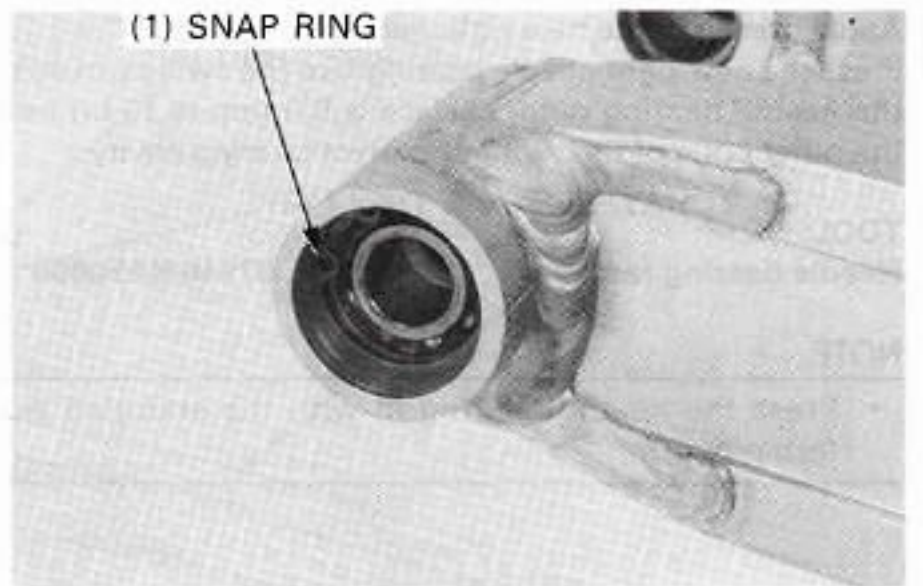
INSPECTION

Check the pivot collar for wear or damage and replace as necessary.
Check the dust seals for wear or damage and replace as necessary.
Check the needle bearings and ball bearings for damage or loose fit and replace as necessary.
Check the swingarm for deformation, cracks or other damage and replace as necessary.



BEARING REPLACEMENT

Remove the snap ring from the left pivot of the swingarm.

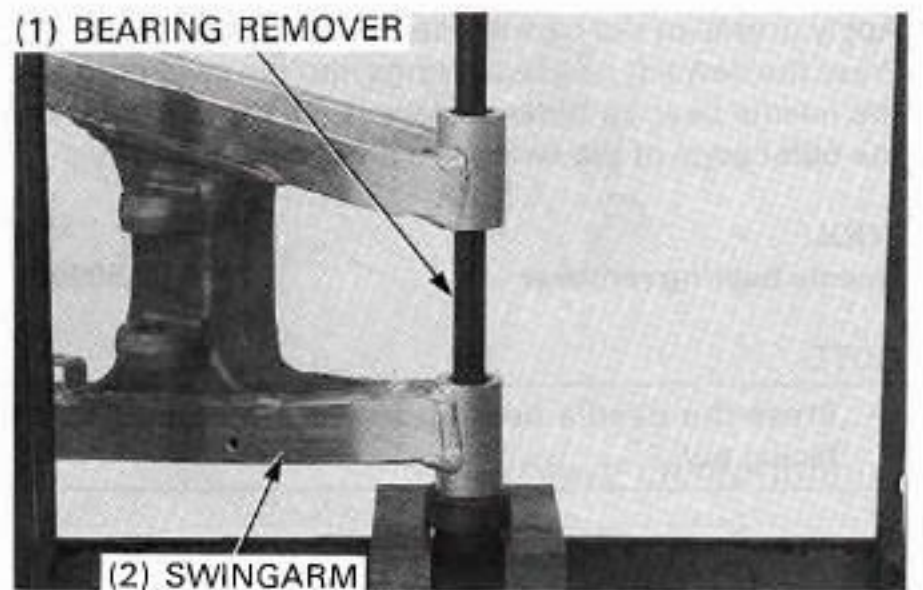


Press the left ball bearings out the left pivot of swingarm.

TOOL:

Needle bearing remover

07946-KA50000



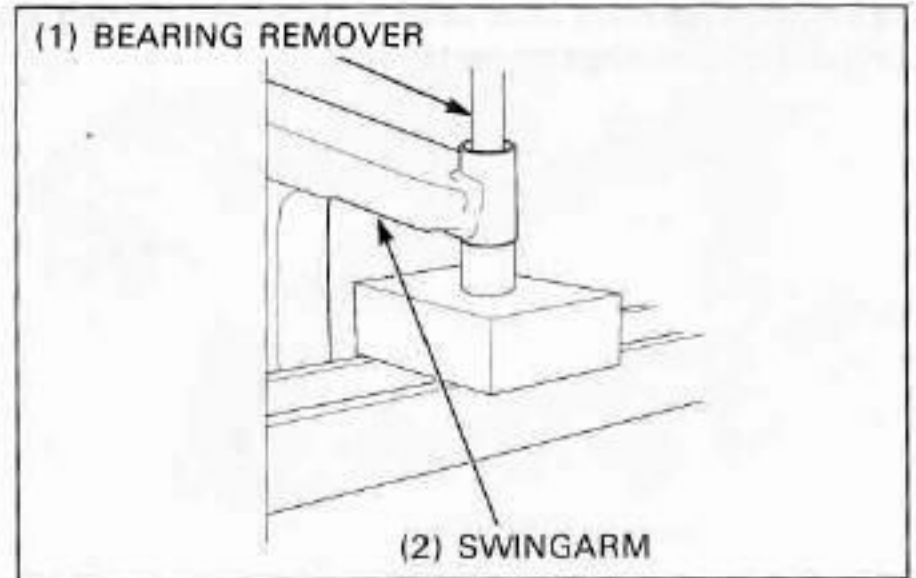
REAR WHEEL/SUSPENSION

Press the left needle bearings out the right pivot of swingarm.

TOOL:

Needle bearing remover

07946-KA50000

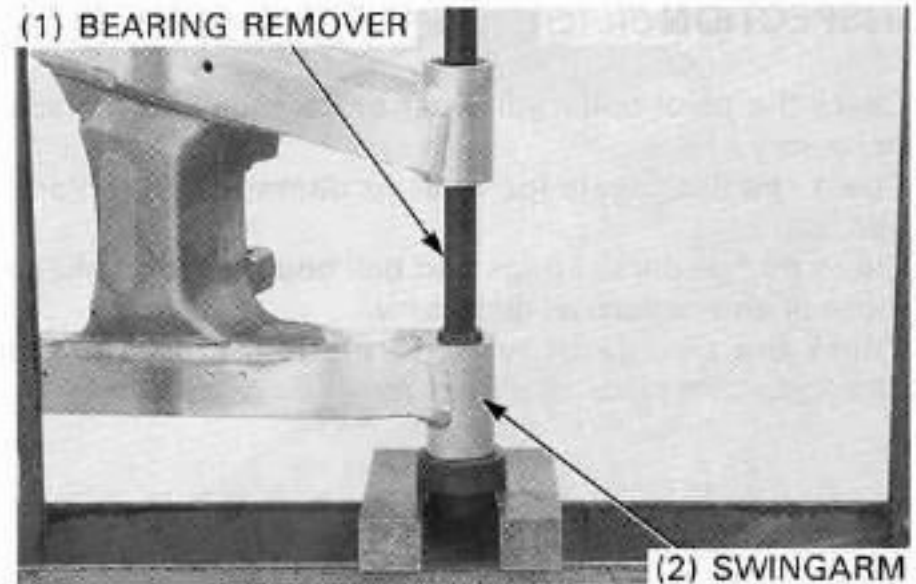


Press the right needle bearings out the right pivot of swingarm.

TOOL:

Needle bearing remover

07946-KA50000



Apply grease to the new right needle bearings.
Press the new right needle bearing into the swingarm so that the needle bearing outer surface is 5.0 mm (0.19 in) below the outer edge of the swingarm pivot bearing cavity.

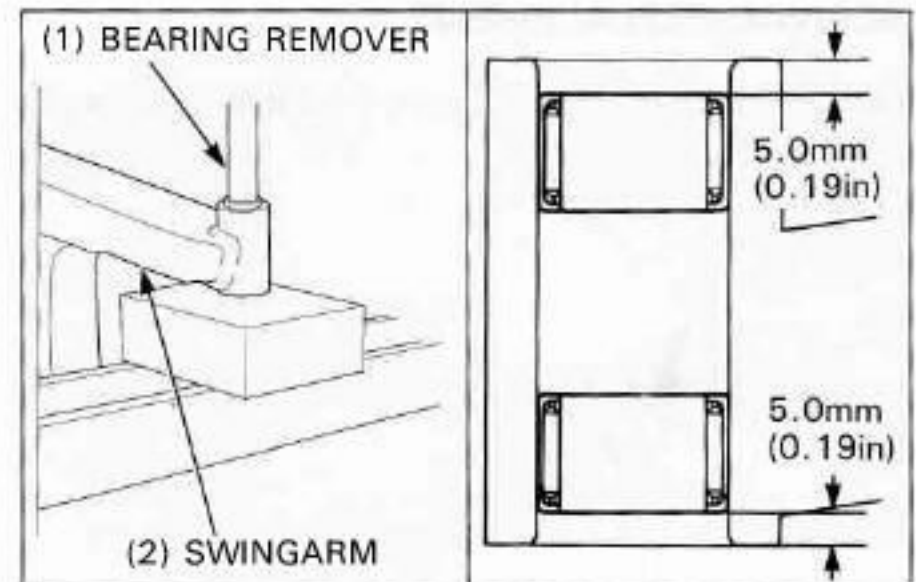
TOOL:

Needle bearing remover

07946-KA50000

NOTE

- Press the needle bearing in with the stamped side facing out.



Apply grease to the new left needle bearings.
Press the new left needle bearings into the swingarm so that the needle bearing outer surface is 5.0 mm (0.19 in) below the outer edge of the swingarm pivot bearing cavity.

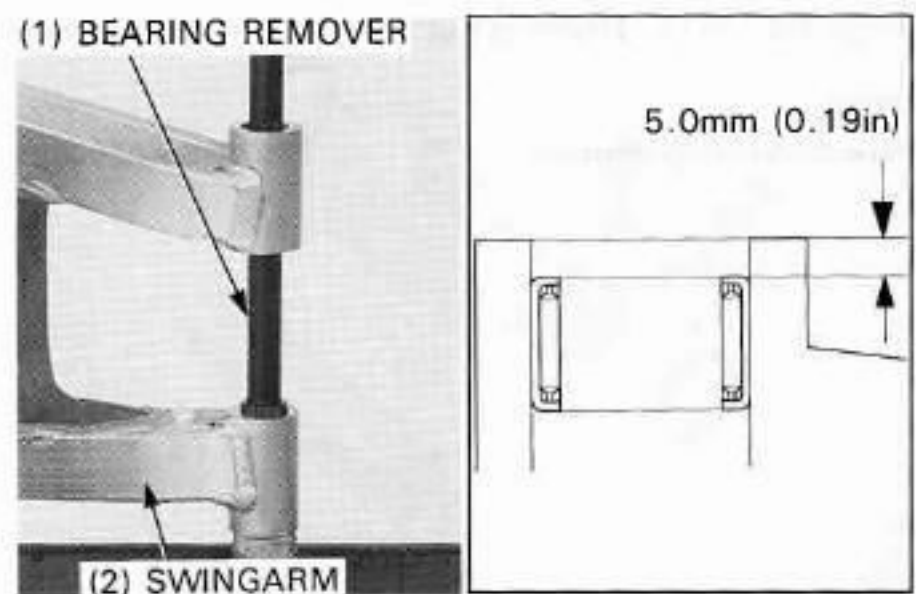
TOOL:

Needle bearing remover

07946-KA50000

NOTE

- Press the needle bearing in with the stamped side facing out.



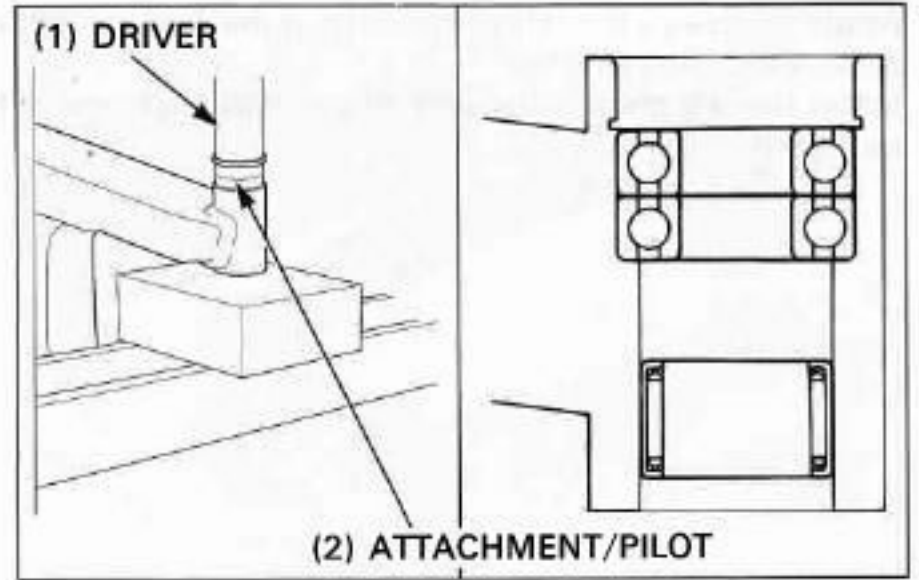
Apply grease to the new ball bearings.
Press the new right ball bearings into the left pivot of the swingarm one at a time until they are fully seated.

NOTE

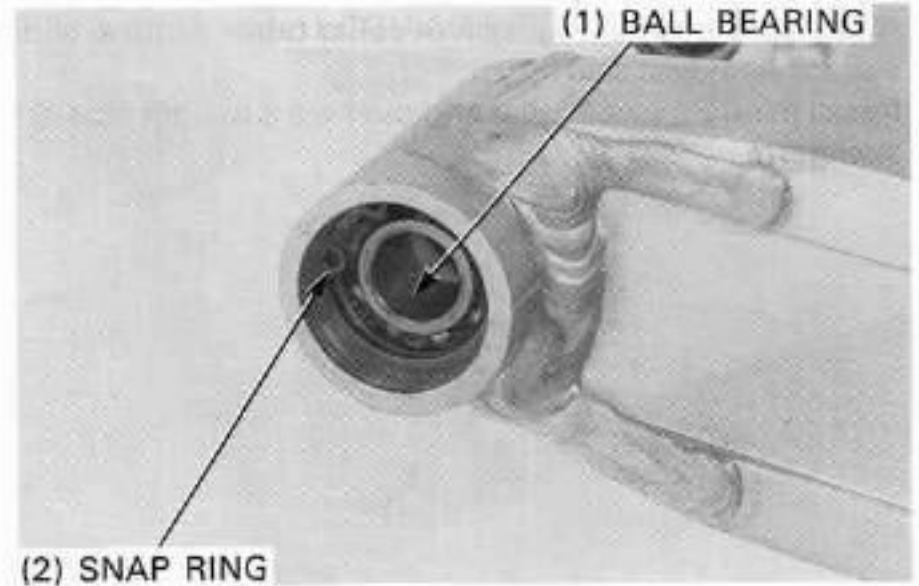
- Install the ball bearings with the stamped side facing out.

TOOLS:

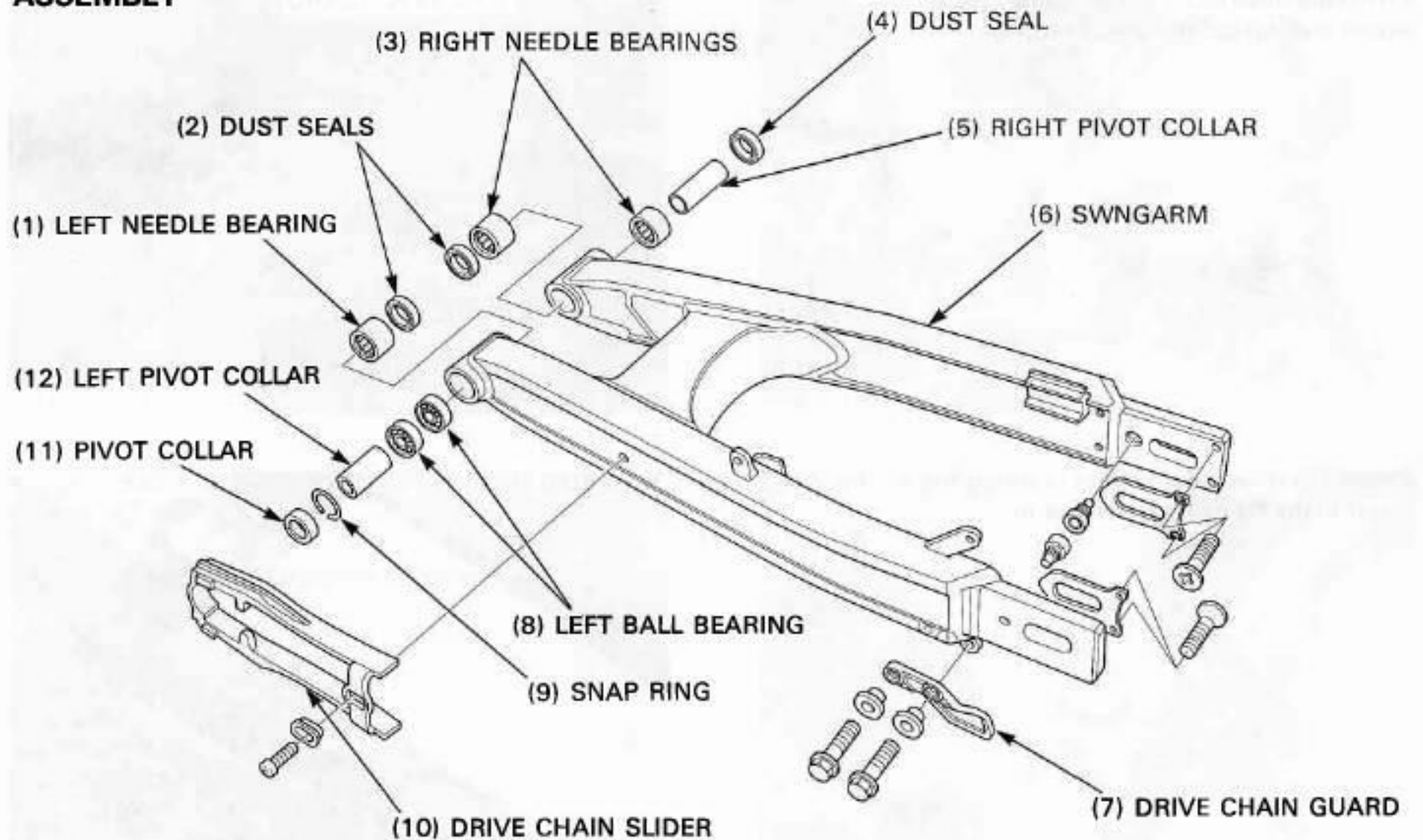
- | | |
|-----------------------------|----------------------|
| Driver | 07749-0010000 |
| Attachment, 32×35 mm | 07746-0010100 |
| Pilot, 15 mm | 07746-0040300 |



Install the snap ring to the right pivot groove of the swingarm.

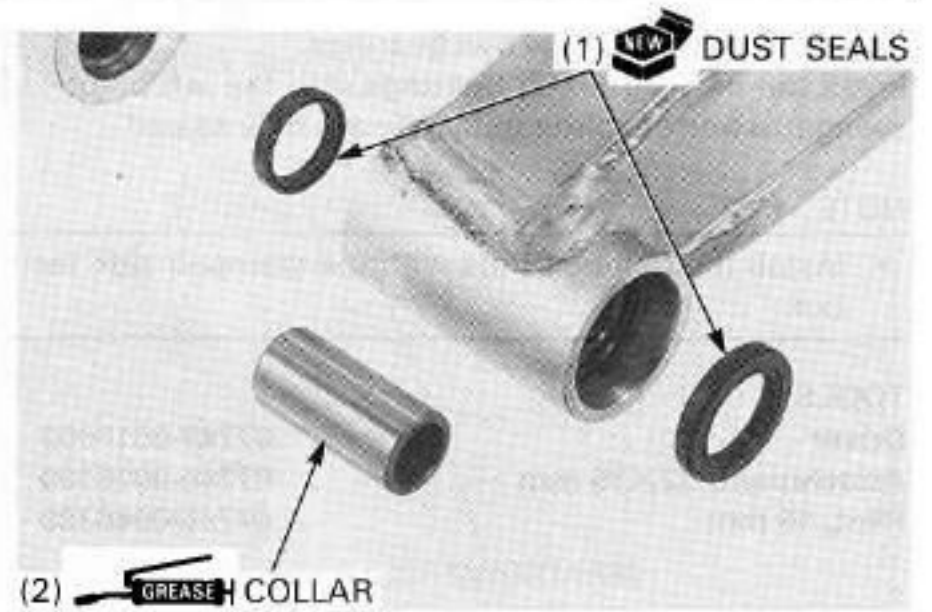


ASSEMBLY

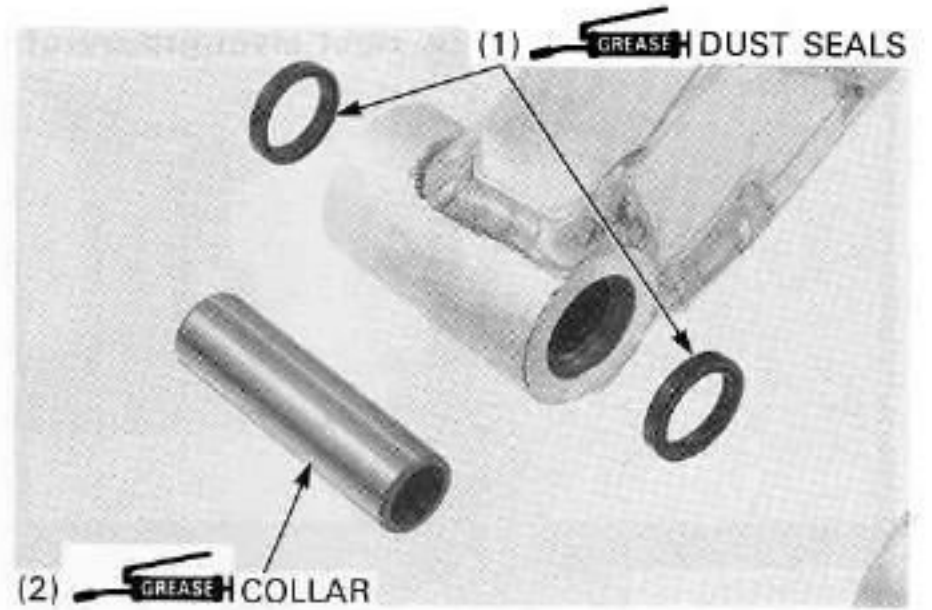


REAR WHEEL/SUSPENSION

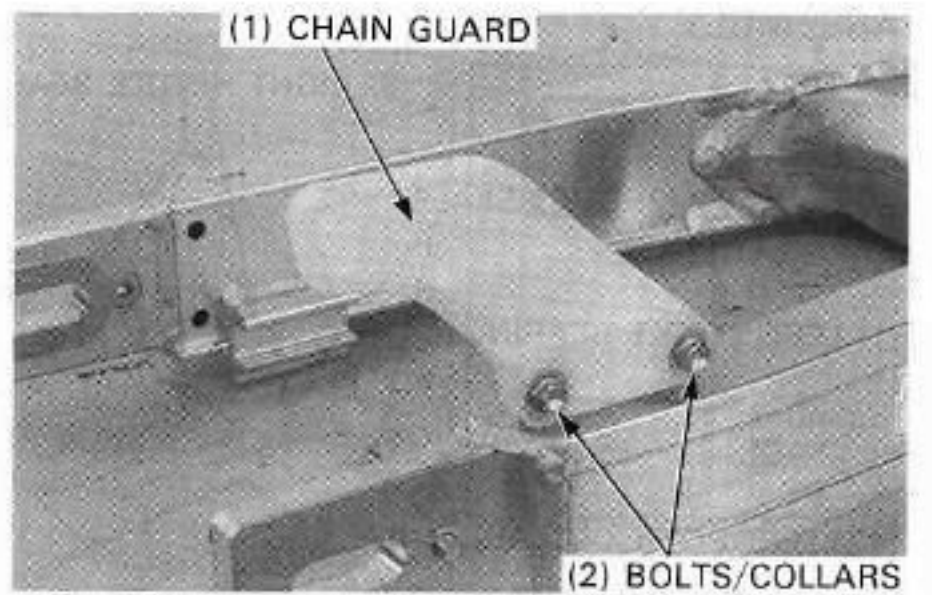
Apply grease to the left pivot collar outer surface, sliding surface and dust seal lip.
Install the left pivot collar and dust seals to left side of the swingarm.



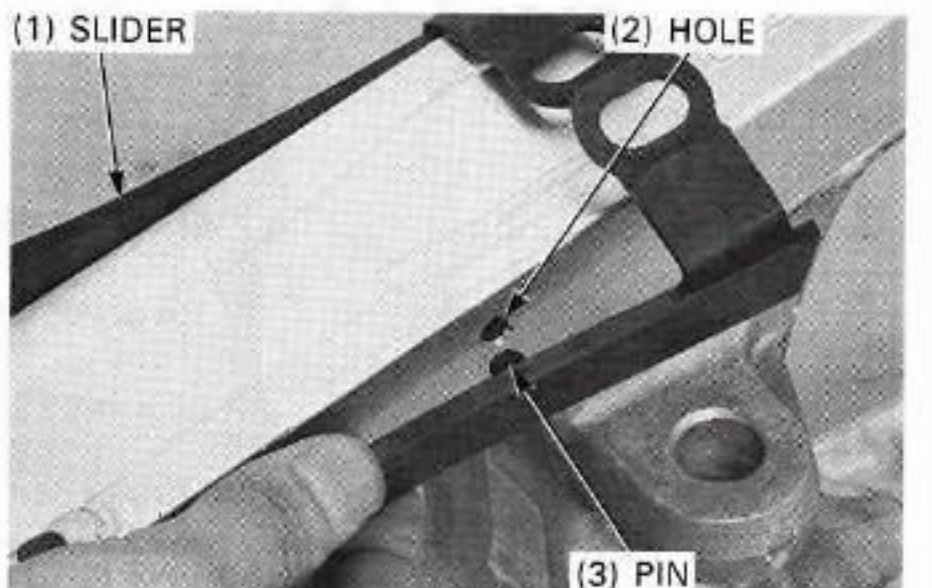
Apply grease to the right pivot collar outer surface, sliding surface and dust seal lip.
Install the right pivot collar and dust seals to right side of the swingarm.



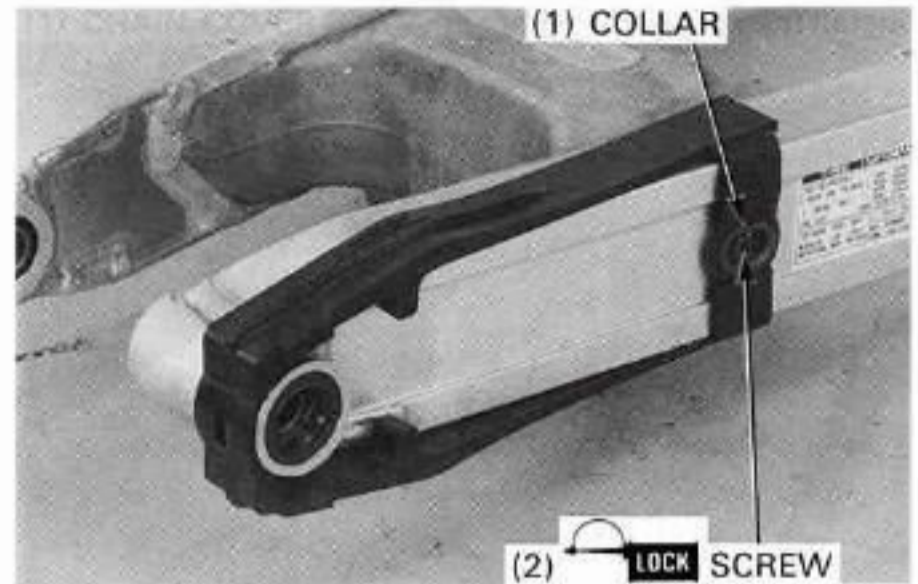
Install the drive chain guard, collar.
Install and tighten the bolts securely.



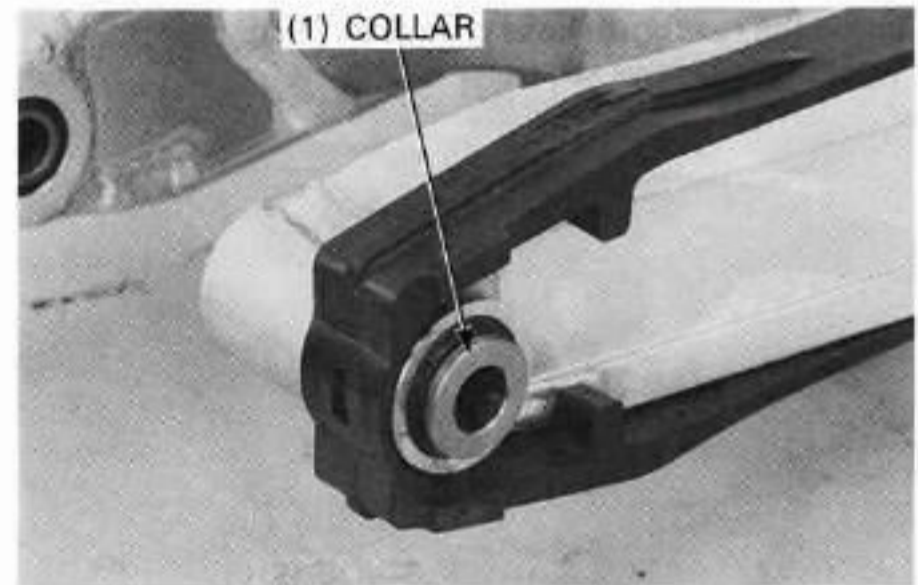
Install the drive chain slider aligning the pin on the chain slider to the hole on the swingarm.



Clean and apply a locking agent to the drive chain slider screw threads.
Install the collar and drive chain slider screw.
Tighten the drive chain slider screw securely.



Install the swingarm pivot collar.

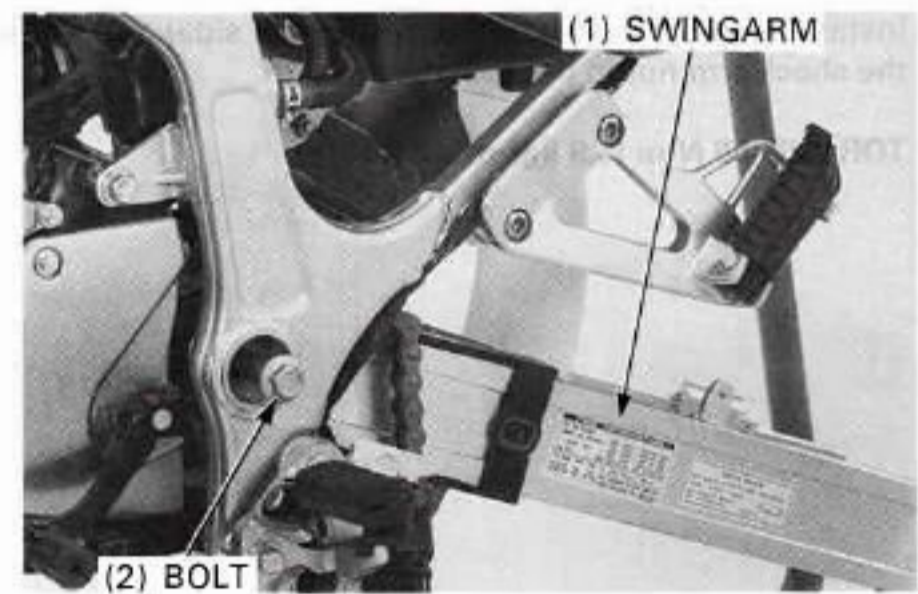


INSTALLATION

NOTE

- Route the tubes and wires properly (page 1 -22) .

Install the swingarm.
Apply thin coat of grease to the swingarm pivot bolt.
Install the swingarm pivot bolt.



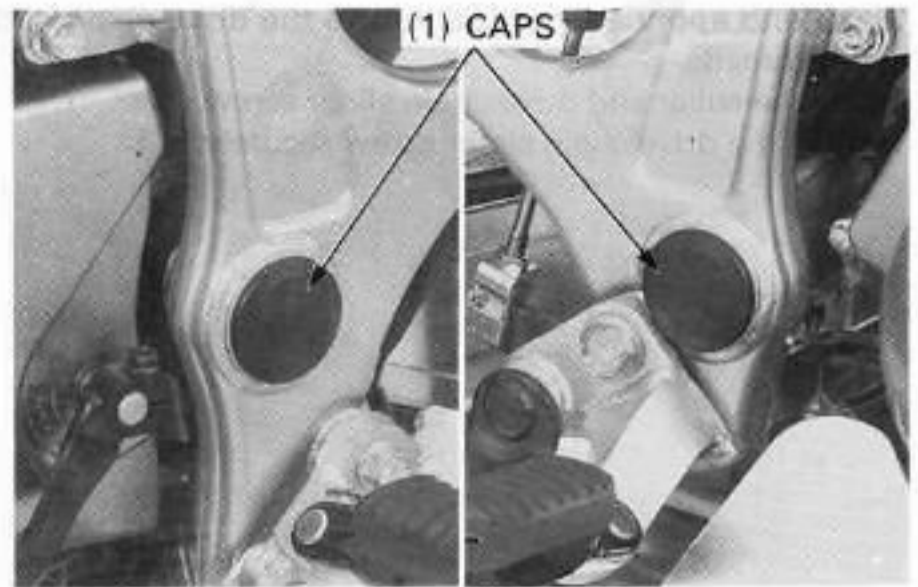
Install and tighten the swingarm pivot nut to the specified torque.

TORQUE: 106 N·m (10.8 kgf·m, 78 lbf·ft)

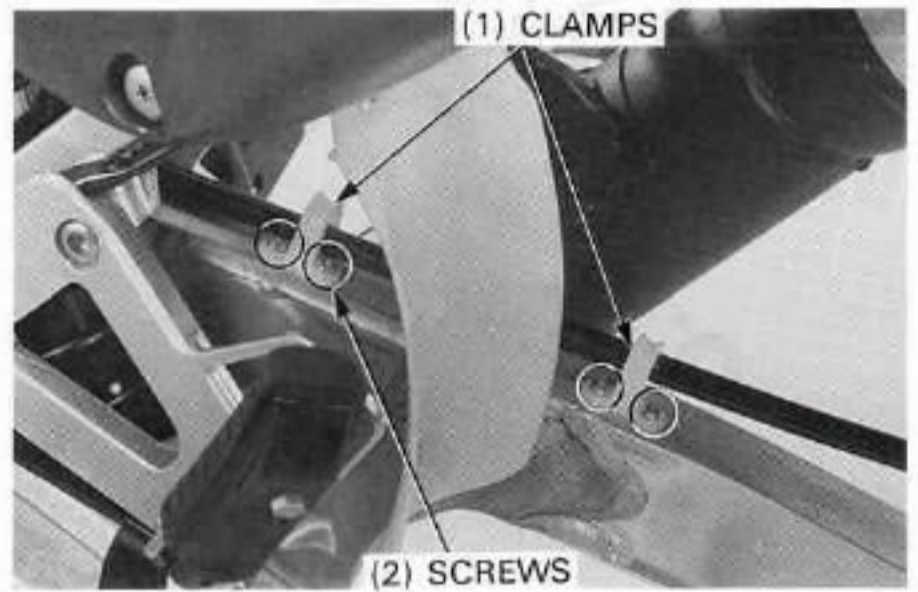
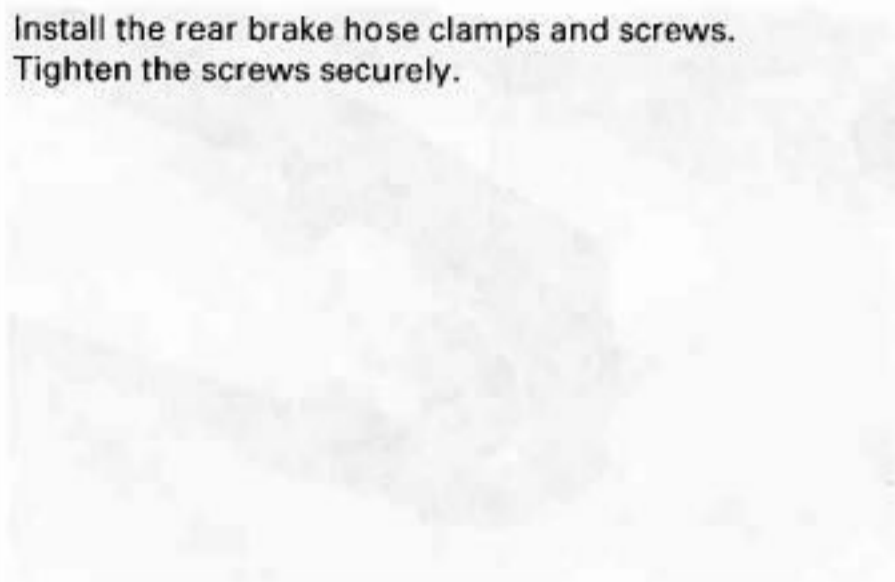


REAR WHEEL/SUSPENSION

Install the swingarm pivot caps.

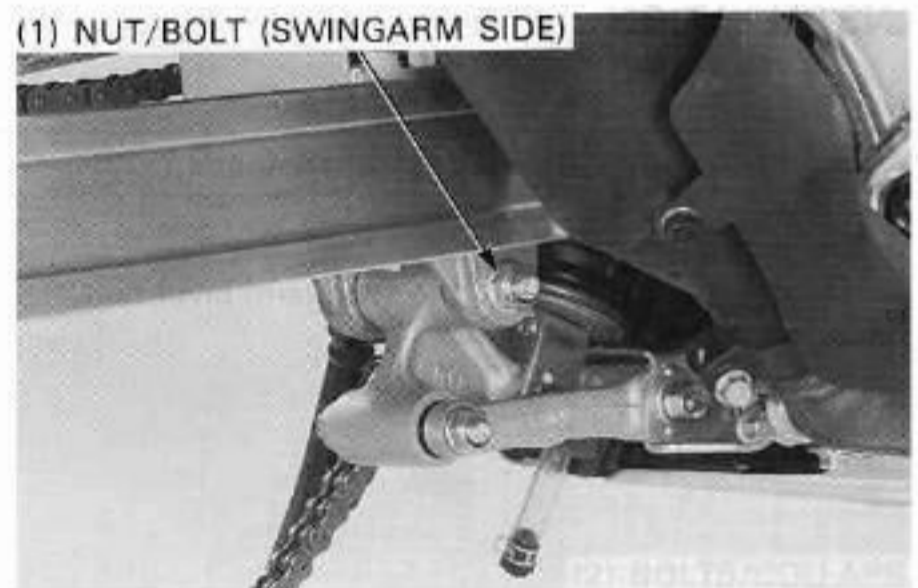
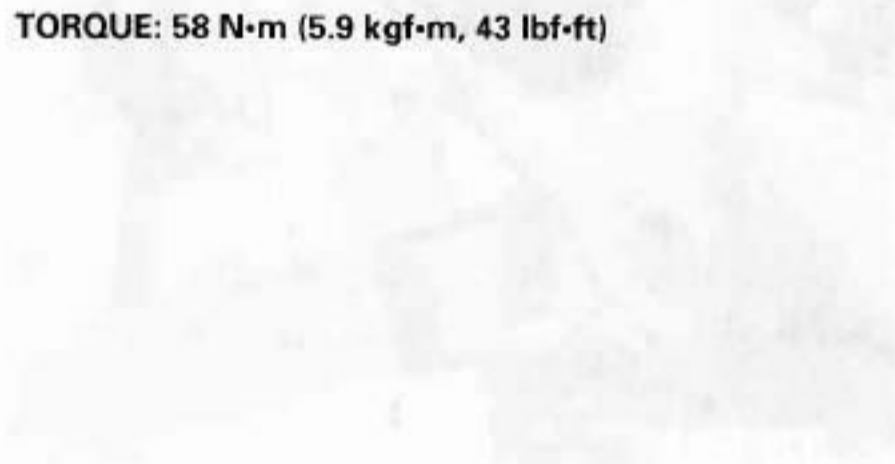


Install the rear brake hose clamps and screws.
Tighten the screws securely.

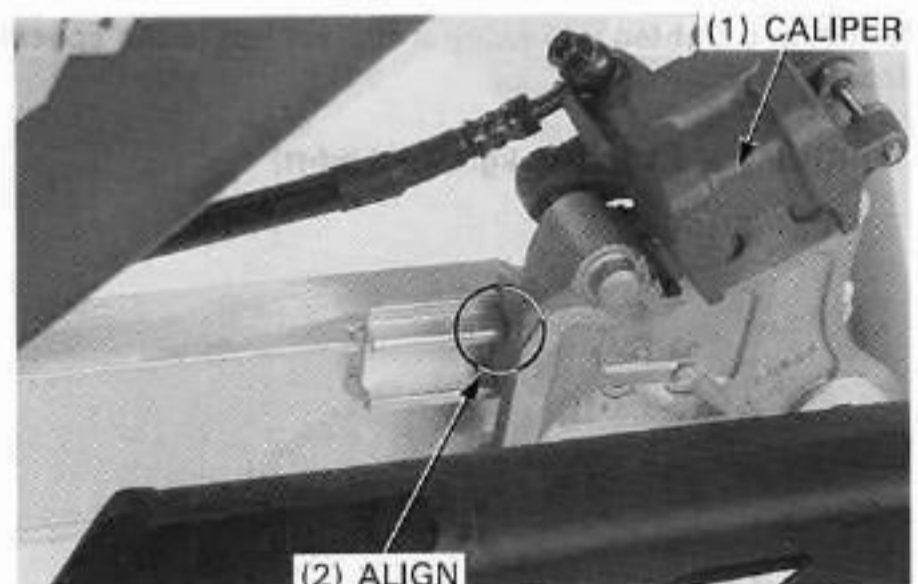
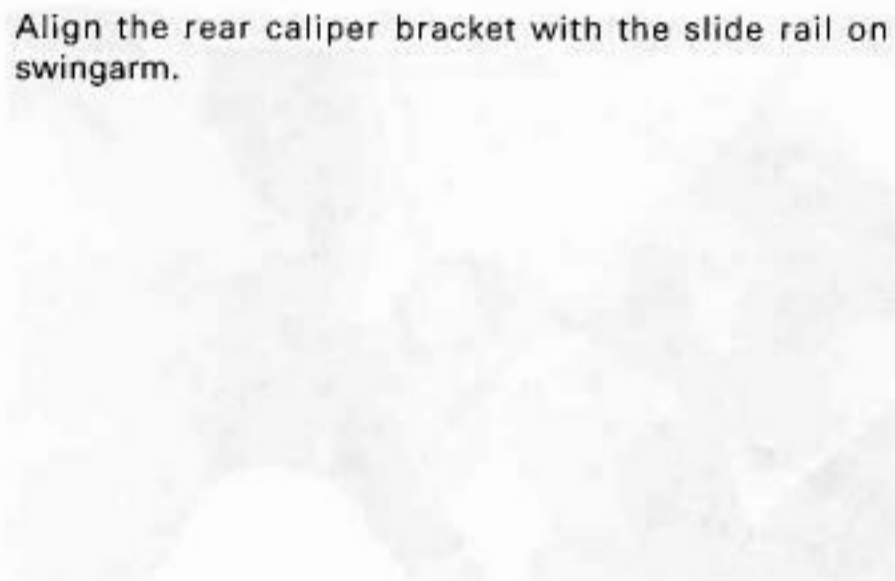


Install the shock arm bolt/nut (swingarm side) and tighten
the shock arm nut to the specified torque.

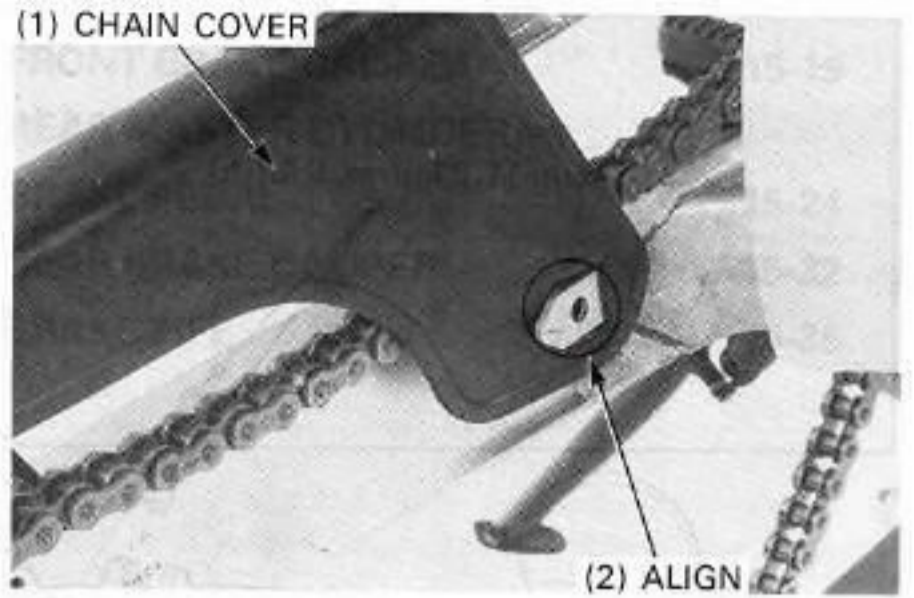
TORQUE: 58 N·m (5.9 kgf·m, 43 lbf·ft)



Align the rear caliper bracket with the slide rail on the
swingarm.

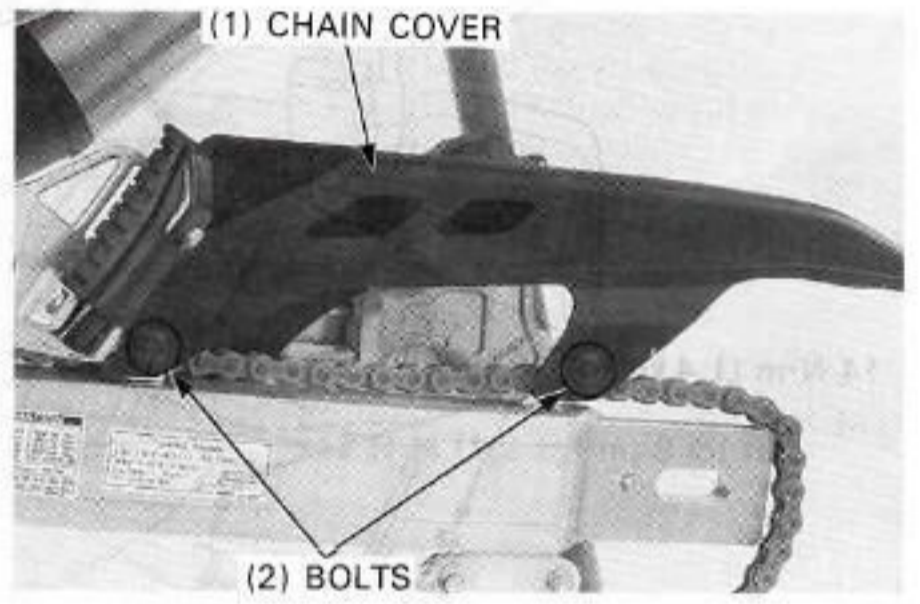


Install the drive chain cover aligning the its groove with the tab on the swingarm.

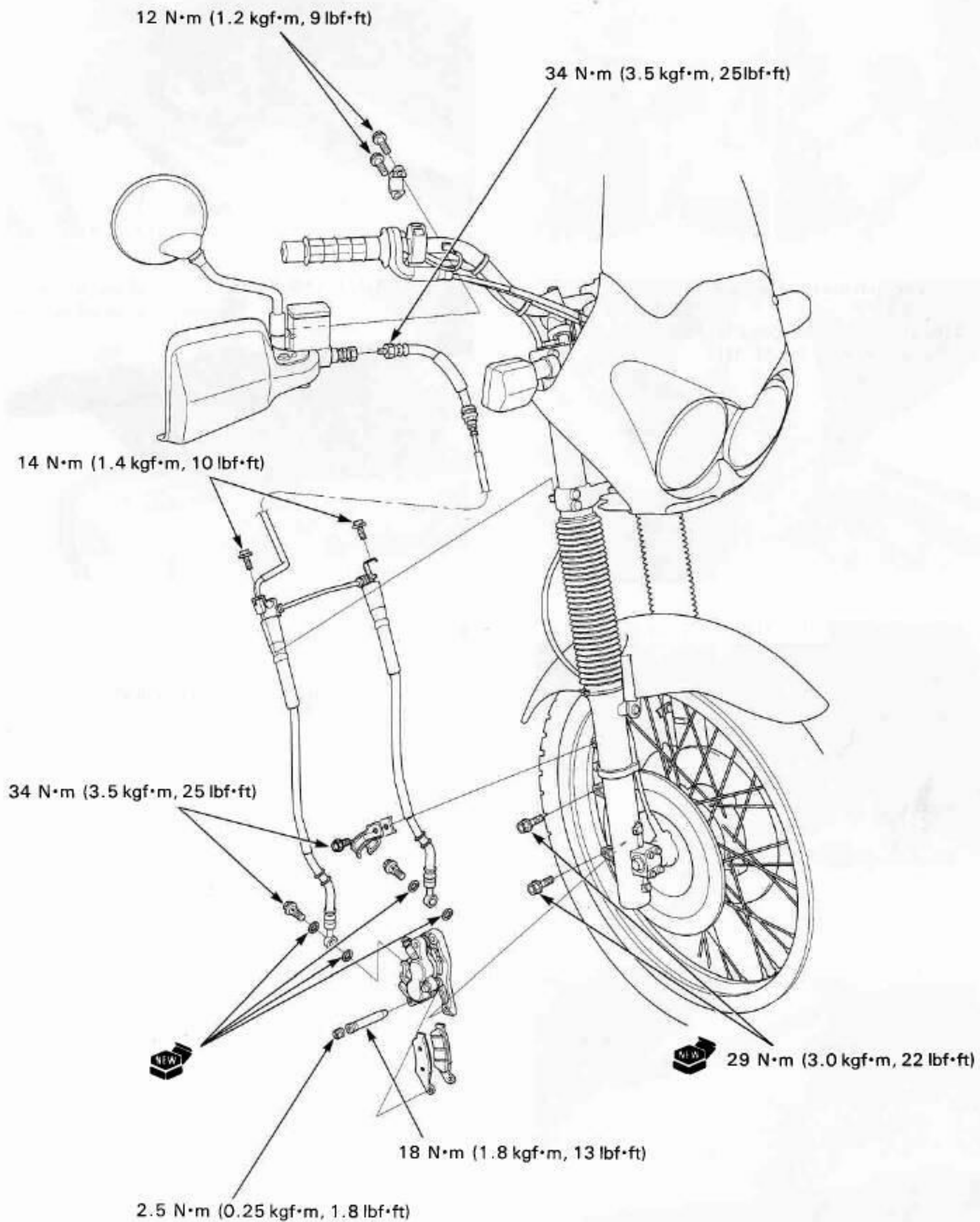


Install and tighten the bolts securely.

Install the shock absorber (page 14 -15) .
Install the rear wheel (page 14 -11) .



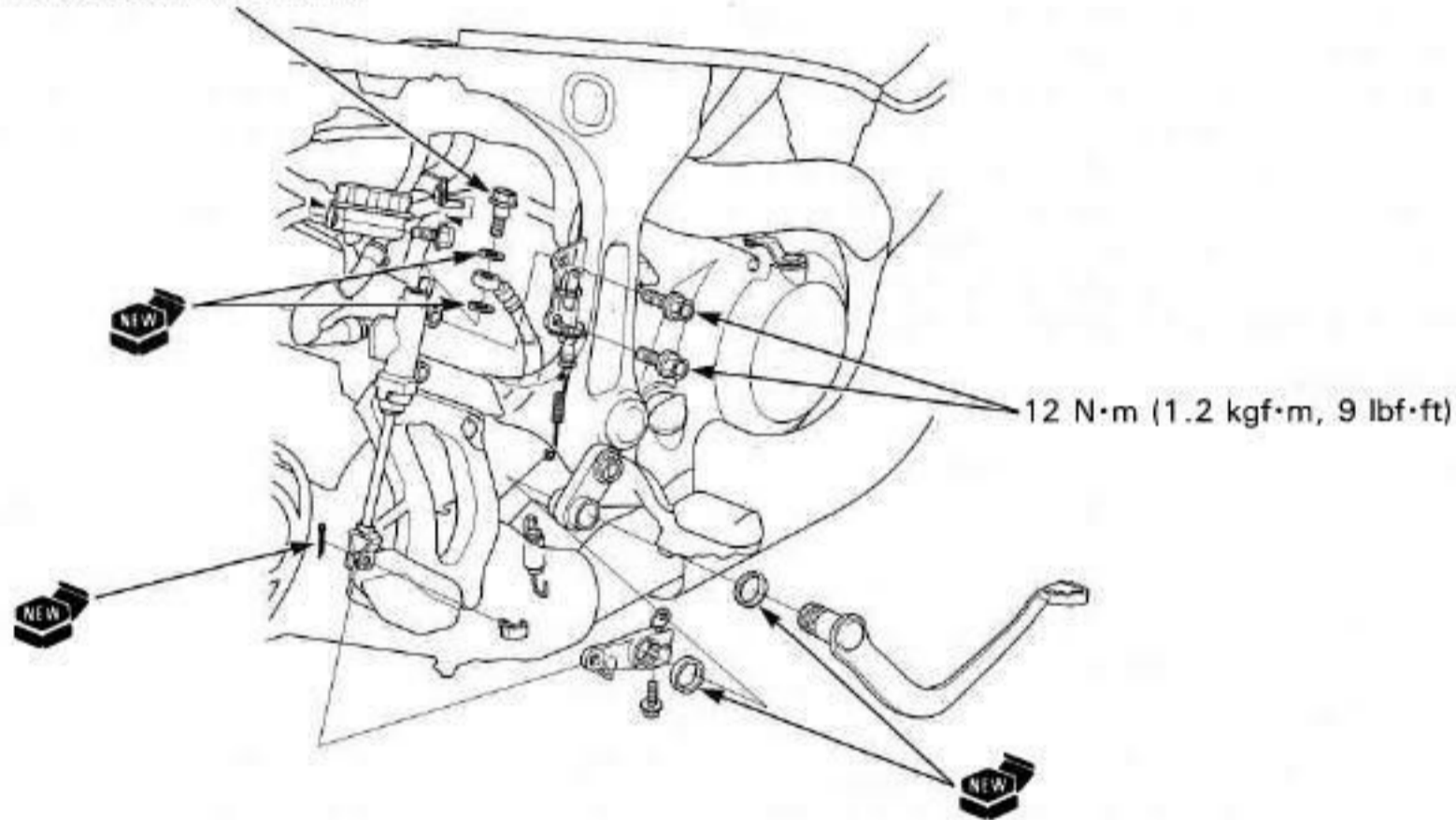
HYDRAULIC BRAKE



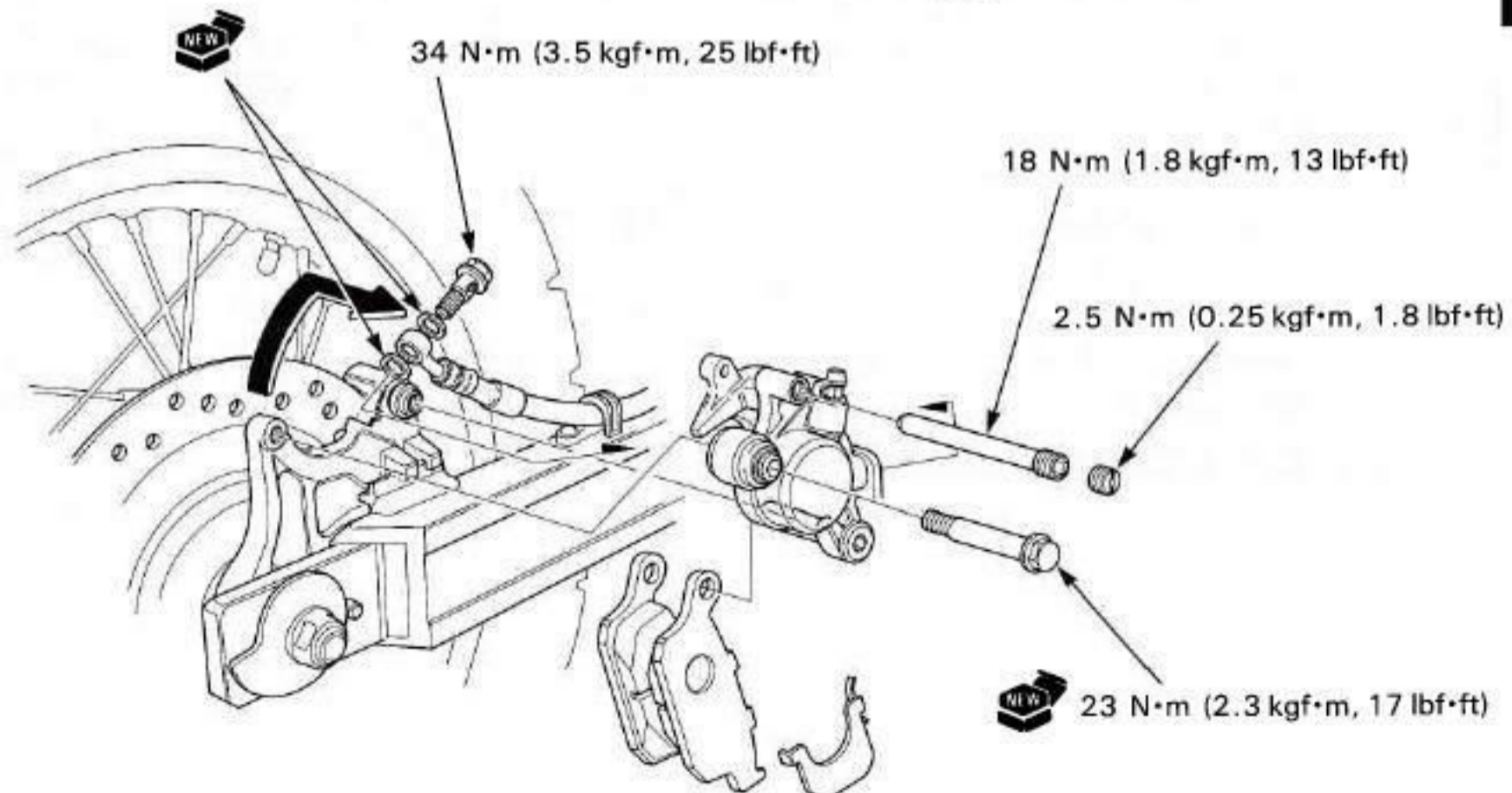
15. HYDRAULIC BRAKE

| | | | |
|--|-------|--------------------------------------|-------|
| SERVICE INFORMATION | 15-2 | FRONT BRAKE CALIPER | 15-19 |
| TROUBLESHOOTING | 15-3 | REAR MASTER CYLINDER/ BRAKE PEDAL | 15-24 |
| BRAKE FLUID REPLACEMENT/ AIR BLEEDING | 15-4 | REAR BRAKE CALIPER | 15-32 |
| BRAKE PAD/DISC | 15-6 | BRAKE PIPE | 15-36 |
| FRONT MASTER CYLINDER | 15-11 | | |

34 N·m (3.5 kgf·m, 25 lbf·ft)



15



HYDRAULIC BRAKE

SERVICE INFORMATION

GENERAL

⚠ WARNING

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean contaminated disc with a high quality brake degreasing agent.

CAUTION

- Support the brake caliper with a piece of wire so that it does not hang from the brake hose. Do not twist the brake hose.
 - Reusing drained fluids can impair braking efficiency.
 - Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag or shop towel over these parts whenever the system is serviced.
-
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.
 - Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid as they may not be compatible.
 - Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap: make sure the front reservoir is horizontal first.
 - Do not reuse the sealing washers. Replace with new ones.
 - Once the hydraulic system has been operated, or if the brake feel spongy, the system must be bled.
 - Always check brake operation before riding the motorcycle.
 - Always replace the brake pads in pairs to ensure even disc pressure.
 - Always check brake operation before riding the motorcycle.

SPECIFICATIONS

Unit:mm(in)

| ITEM | | STANDARD | SERVICE LIMIT |
|-------|--|-----------------------------------|---------------|
| Front | Brake fluid | DOT 4 | ———— |
| | Brake pad wear indicator | ———— | 1.0 (0.04) |
| | Brake disc thickness | 4.0 (0.16) | 3.5 (0.14) |
| | Brake disc runout | ———— | 0.30 (0.14) |
| | Master cylinder I.D. | 12.700 – 12.743 (0.5000 – 0.5017) | 12.75 (0.502) |
| | Master piston O.D.on secondary cup side | 12.657 – 12.684 (0.4983 – 0.4994) | 12.64 (0.498) |
| | Caliper cylinder I.D. | 27.000 – 27.050 (1.0630 – 1.0650) | 27.06 (1.065) |
| | Caliper piston O.D. | 26.968 – 26.935 (1.0617 – 1.0604) | 26.92 (1.060) |
| Rear | Brake fluid | DOT 4 | ———— |
| | Brake pad wear indicator | ———— | 1.0 (0.04) |
| | Brake disc thickness | 5.0 (0.20) | 4.0 (0.15) |
| | Brake disc runout | ———— | 0.30 (0.14) |
| | Master cylinder I.D. | 14.000 – 14.043 (0.5512 – 0.5529) | 14.05 (0.553) |
| | Master piston O.D. on secondary cup side | 13.957 – 13.984 (0.5495 – 0.5506) | 13.95 (0.549) |
| | Caliper cylinder I.D. | 38.180 – 38.230 (1.5031 – 1.5051) | 38.24 (1.506) |
| | Caliper piston O.D | 38.115 – 38.148 (1.5006 – 1.5019) | 38.11 (1.500) |

TORQUE VALUES

| | | |
|--|----------------------------------|--------------------------------------|
| Front caliper mounting bolt | 29 N•m (3.0 kgf•m, 22 lbf•ft) | ALOC bolt |
| Front brake hose joint: | | |
| Hose nut (hose-to-joint) | 17 N•m (1.7 kgf•m, 12 lbf•ft) | |
| Master cylinder joint (master cylinder side) | 34 N•m (3.5 kgf•m, 25 lbf•ft) | |
| Rear caliper mounting bolt | 23 N•m (2.3 kgf•m, 17 lbf•ft) | ALOC bolt |
| Reservoir hose joint screw | 1.5 N•m (0.15 kgf•m, 1.1 lbf•ft) | Apply a locking agent to the threads |
| Rear master cylinder push rod lock nut | 18 N•m (1.8 kgf•m, 13 lbf•ft) | |
| Brake hose oil bolt | 34 N•m (3.5 kgf•m, 25 lbf•ft) | |
| Brake pipe joint bolt | 14 N•m (1.4 kgf•m, 10 lbf•ft) | |
| Front master cylinder holder bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) | |
| Rear master cylinder mounting bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) | |
| Bleed valve | 6 N•m (0.6 kgf•m, 4.3 lbf•ft) | |
| Pad pin | 18 N•m (1.8 kgf•m, 13 lbf•ft) | |
| Pad pin plug | 2.5 N•m (0.25 kgf•m, 1.8 lbf•ft) | |
| Front caliper bracket pin bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) | |
| Front caliper pin bolt | 22 N•m (2.2 kgf•m, 16 lbf•ft) | |
| Rear caliper pin bolt | 27 N•m (2.8 kgf•m, 20 lbf•ft) | |

TOOLS

| | |
|------------------|---------------|
| Snap ring pliers | 07914-3230001 |
|------------------|---------------|

TROUBLESHOOTING

Brake lever/pedal soft or spongy

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

Brake lever/pedal hard

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

Brakes drag

- Contaminated brake disc/pad
- Warped/deformed brake disc
- Caliper not sliding properly
- Misaligned wheel

HYDRAULIC BRAKE

BRAKE FLUID REPLACEMENT/AIR BLEEDING

⚠ WARNING

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean contaminated disc with a high quality brake degreasing agent.

CAUTION

- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.
- Use only DOT 4 brake fluid from a sealed container.
- Do not mix different types of fluid. They are not compatible.

BRAKE FLUID DRAINING

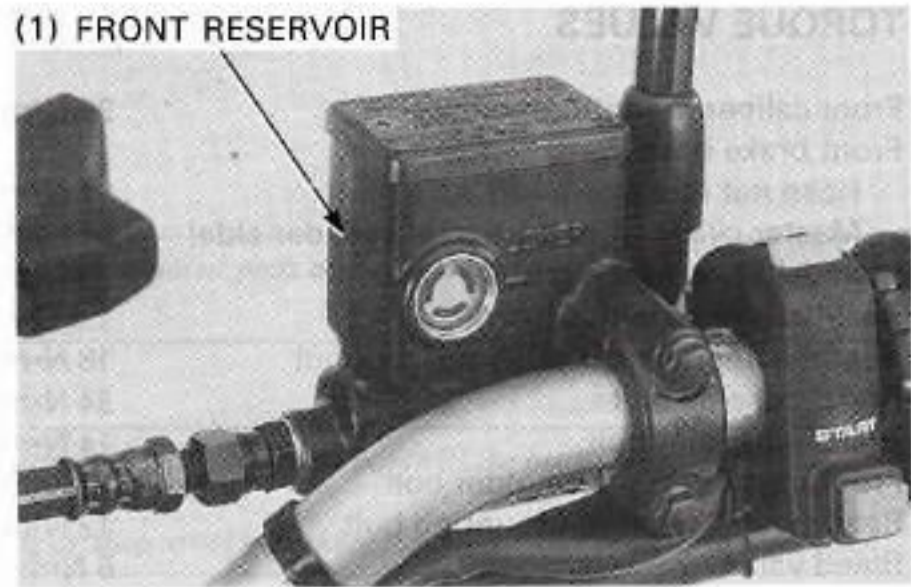
For the front brake, turn the handlebar to the left until the reservoir is level. Remove the screws, reservoir cover, set plate and diaphragm.

For rear brake, remove the side cover (page 2- 7). Remove the bolt, reservoir cap, set plate and diaphragm.

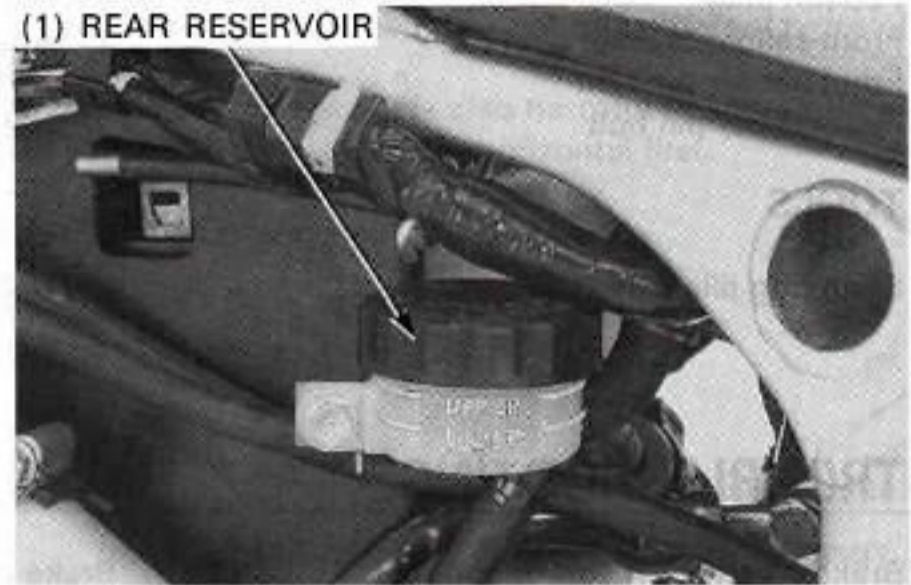
Connect the bleed tube to the bleed valve.

Loosen the bleed valve and pump the brake lever or pedal until no more fluid flows out of the bleed valve.

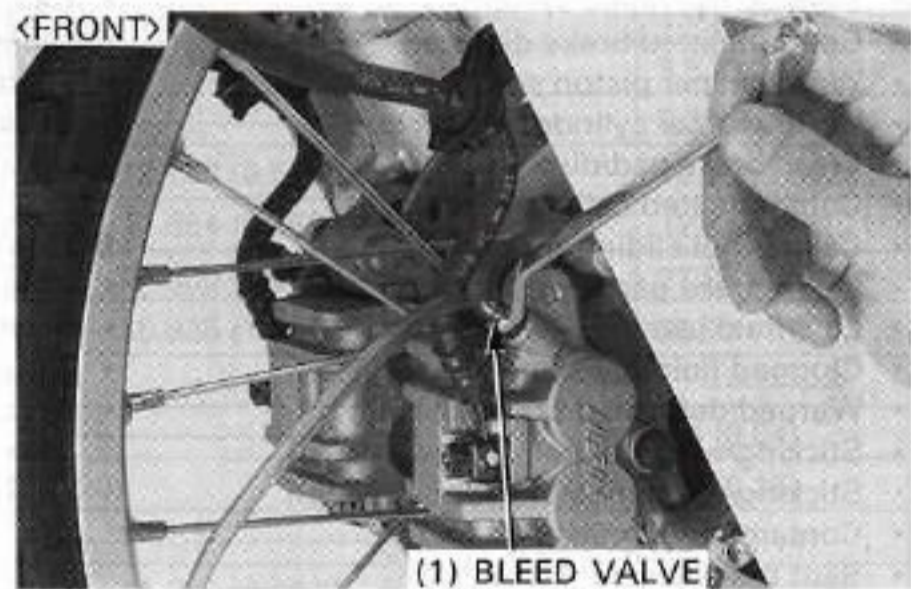
(1) FRONT RESERVOIR



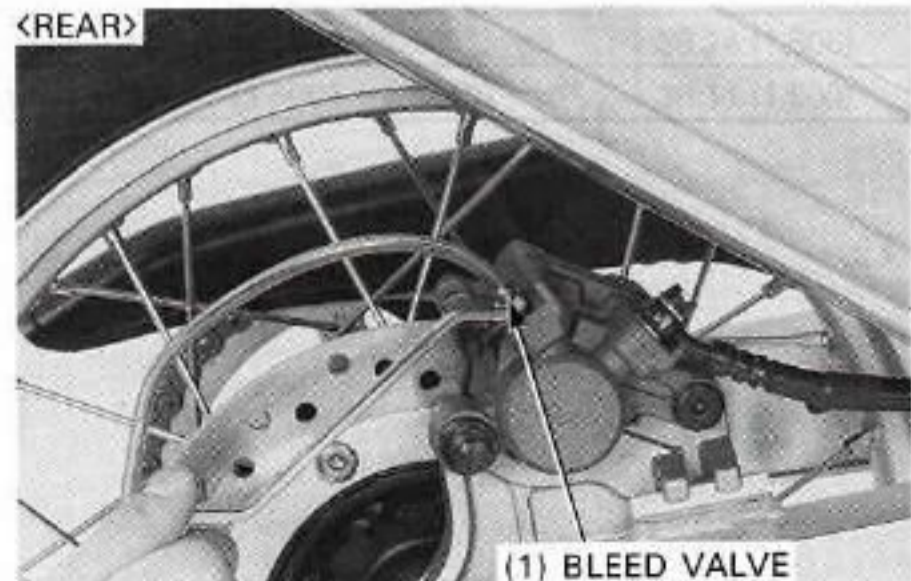
(1) REAR RESERVOIR



<FRONT>

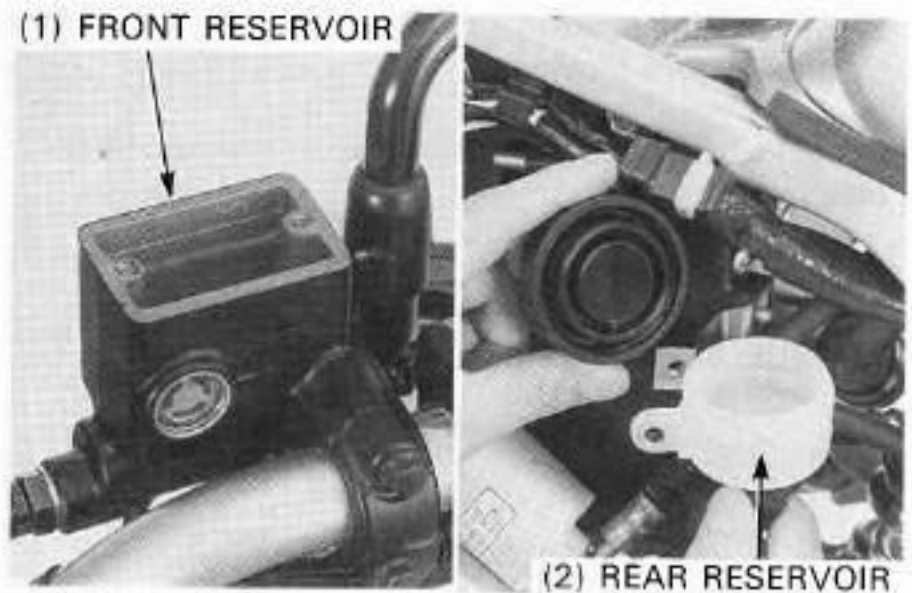


<REAR>



BRAKE FLUID FILLING/BLEEDING

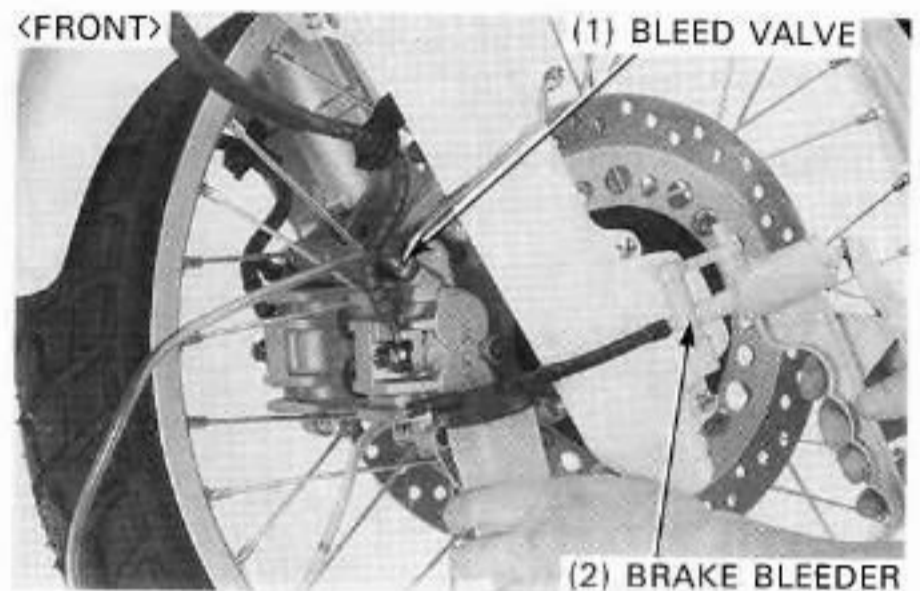
Close the bleed valve.
Fill the reservoir with DOT 4 brake fluid from a sealed container.



Connect a commercially available brake bleeder to the bleed valve.
Pump the brake bleeder and loosen the bleed valve.
Add brake fluid when the fluid level in the reservoir is low.

NOTE

- Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

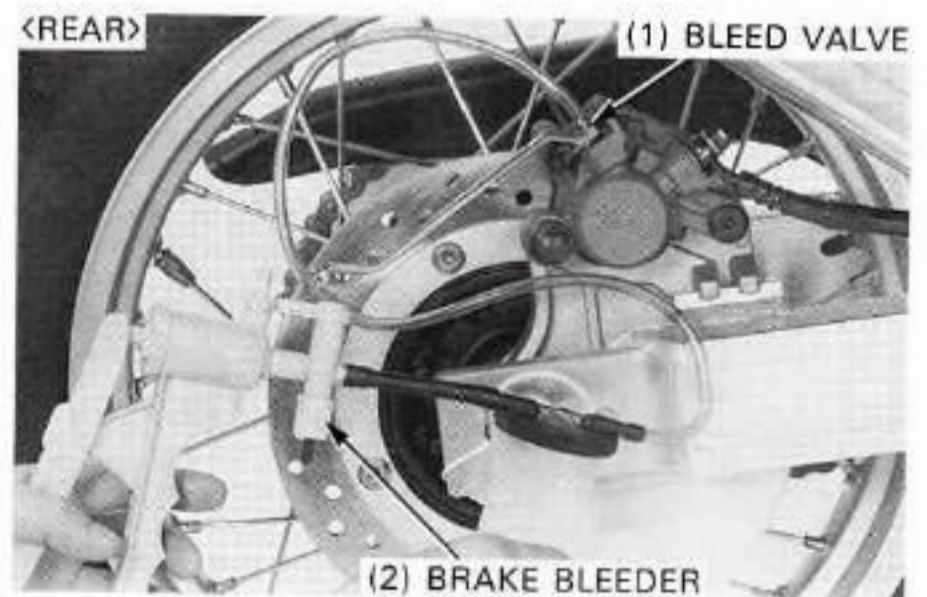


Repeat the above procedures until air bubbles do not appear in the plastic hose.

NOTE

- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Close the bleed valve and operate the brake lever or pedal. If it still feels spongy, bleed the system again.



If a brake bleeder is not available, use the following procedure:

Pump up the system pressure with the brake lever or pedal until lever or pedal resistance is felt.

Connect a bleed hose to the bleed valve and bleed the system as follows:

1. Squeeze the brake lever or depress the brake pedal. Open the bleed valve 1/2 turn and close it.

NOTE

- Do not release the brake lever until the bleed valve has been closed.



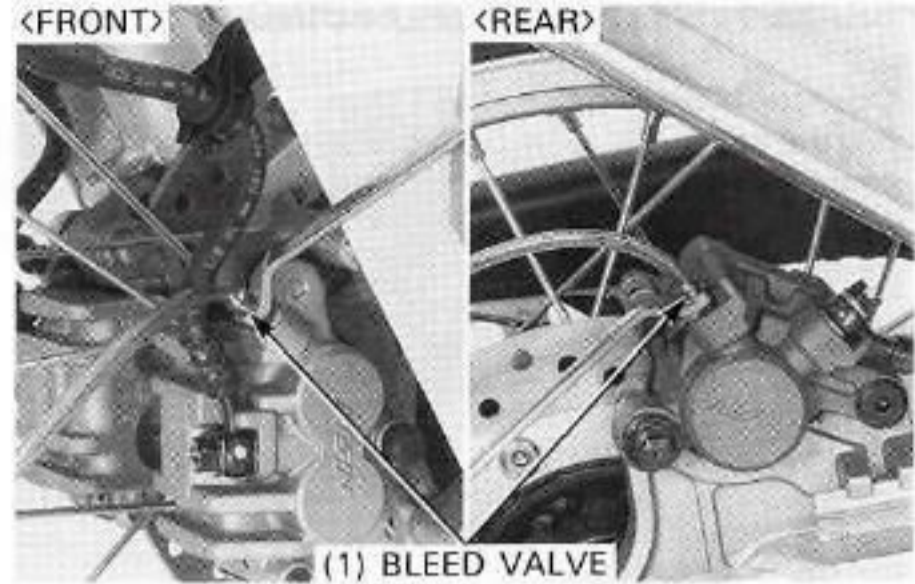
HYDRAULIC BRAKE

2. Release the brake lever slowly and wait several seconds after it stops moving.

Repeat steps 1 and 2 until air bubbles do not appear in the bleed valve.

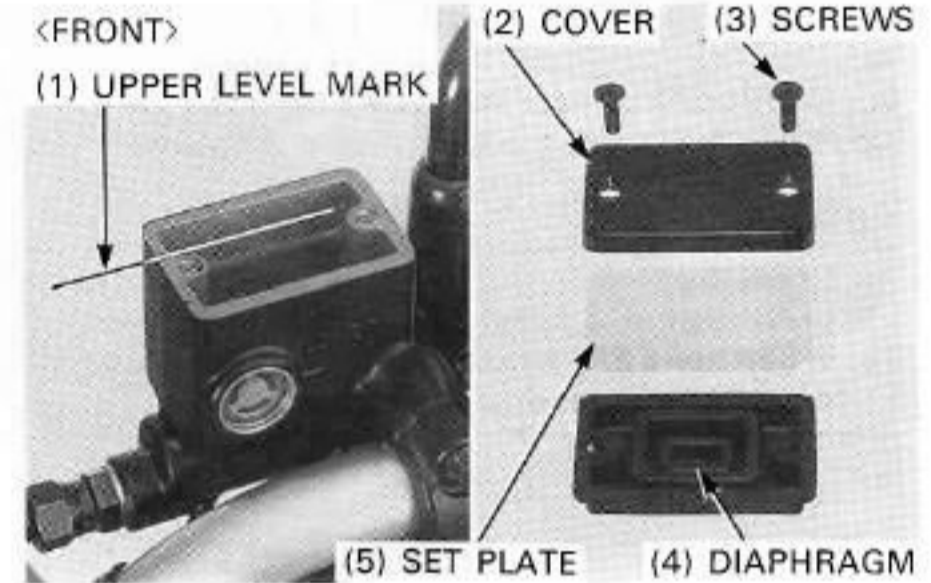
Tighten the bleed valve

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

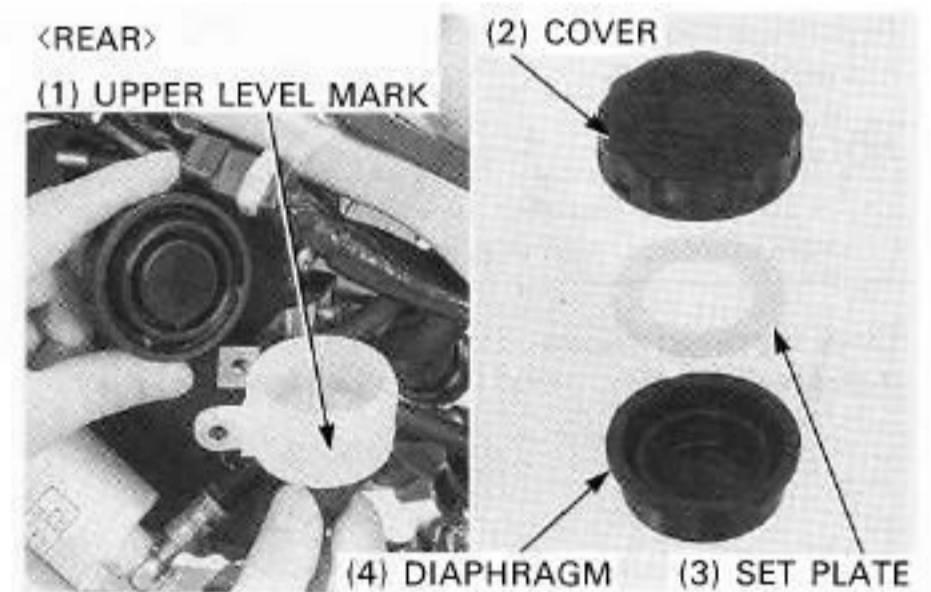


Fill the reservoir to the upper level mark with DOT 4 brake fluid from a sealed container.

For front brake, install the diaphragm, set plate and reservoir cover. Tighten the screws securely.



For rear brake, install the diaphragm, set plate and reservoir cover.



BRAKE PAD/DISK

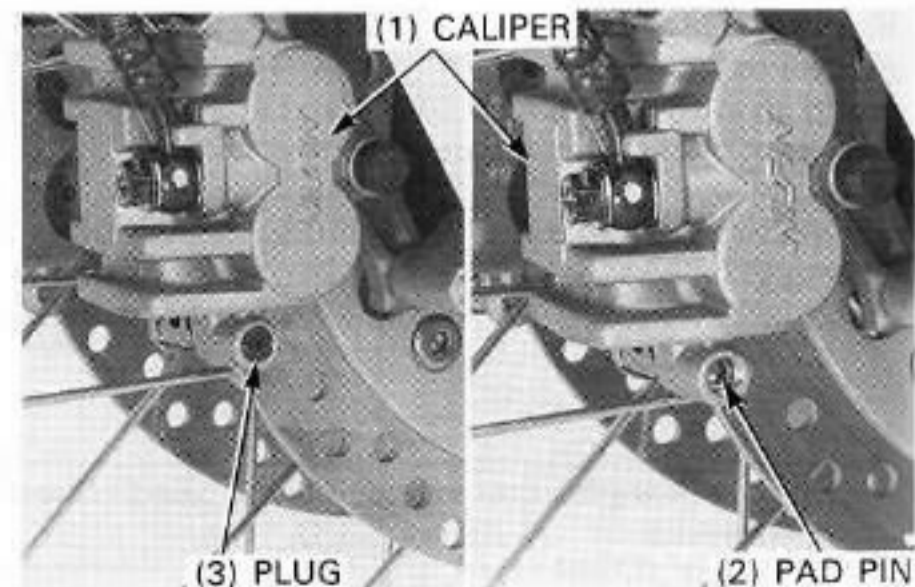
FRONT BRAKE PAD REPLACEMENT

NOTE

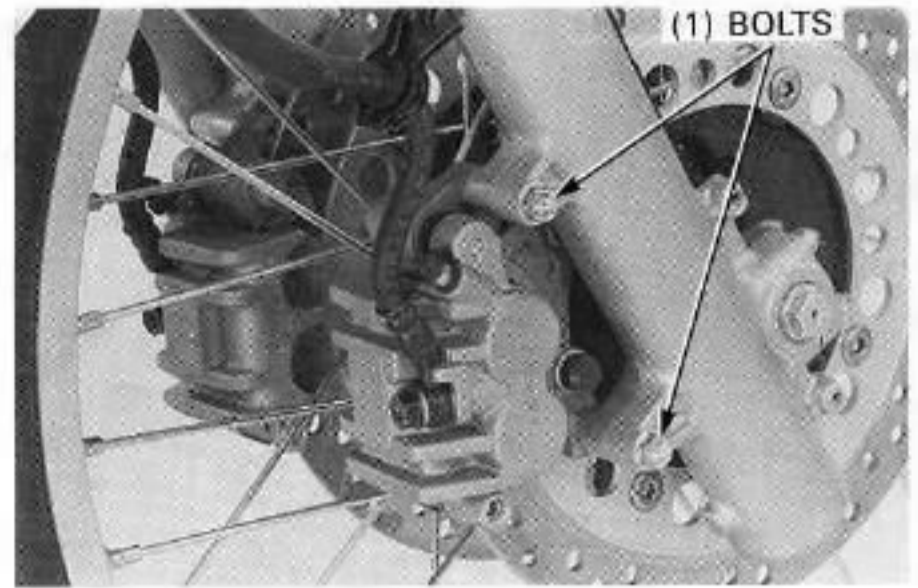
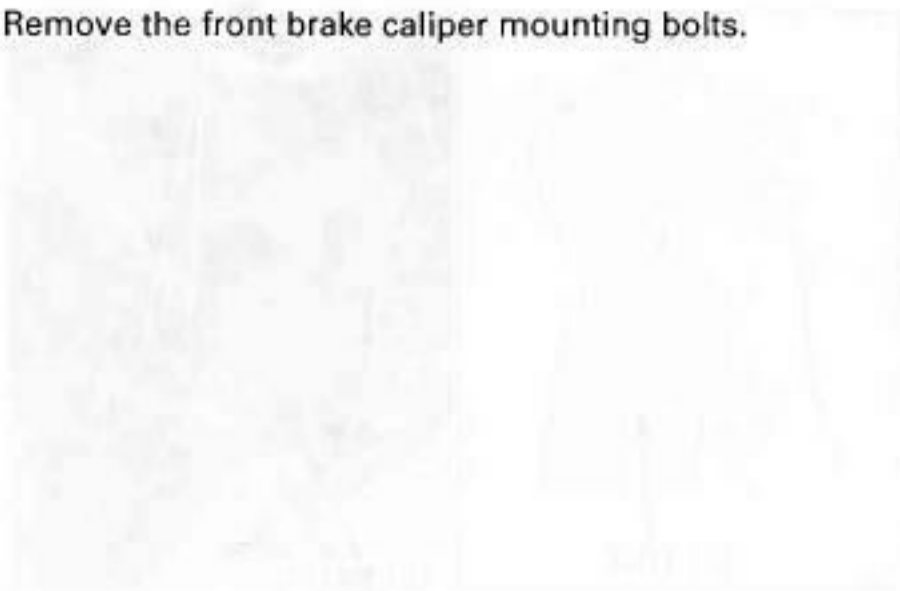
- Always replace the brake pads in pairs to ensure even disc pressure.

Remove the pad pin plug and loosen the pad pin.

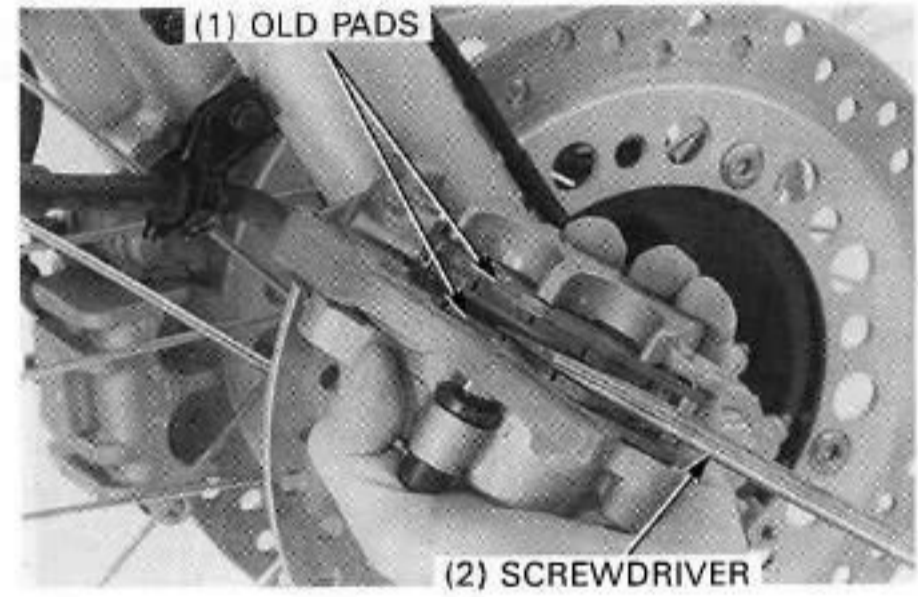
Remove the fork cover (page 2- 4).



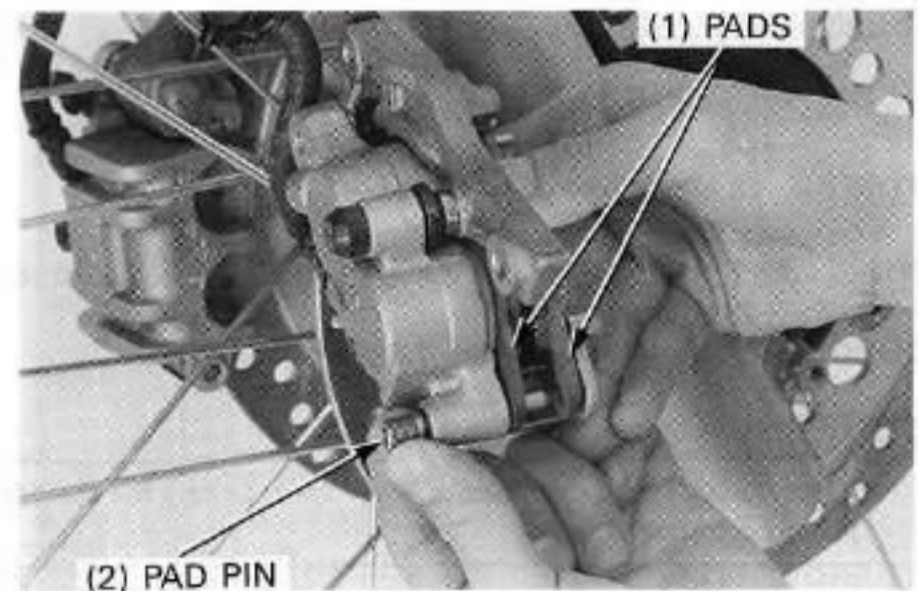
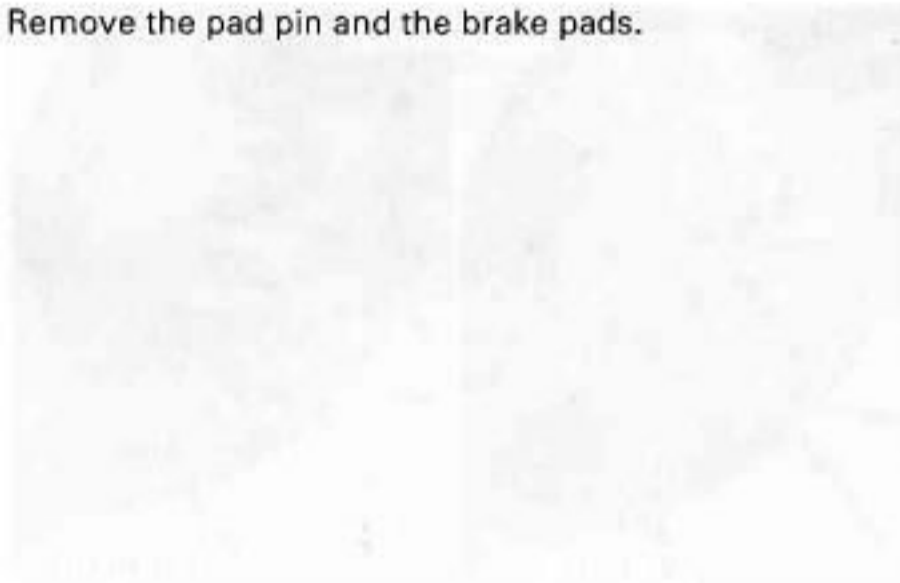
Remove the front brake caliper mounting bolts.



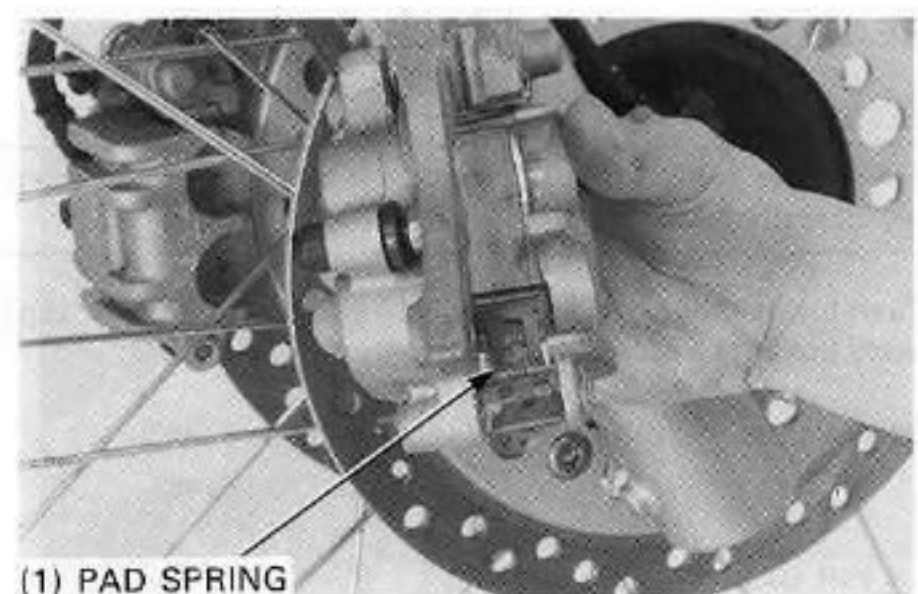
Pry one old pad against the caliper with a screwdriver to push the pistons into the caliper.



Remove the pad pin and the brake pads.



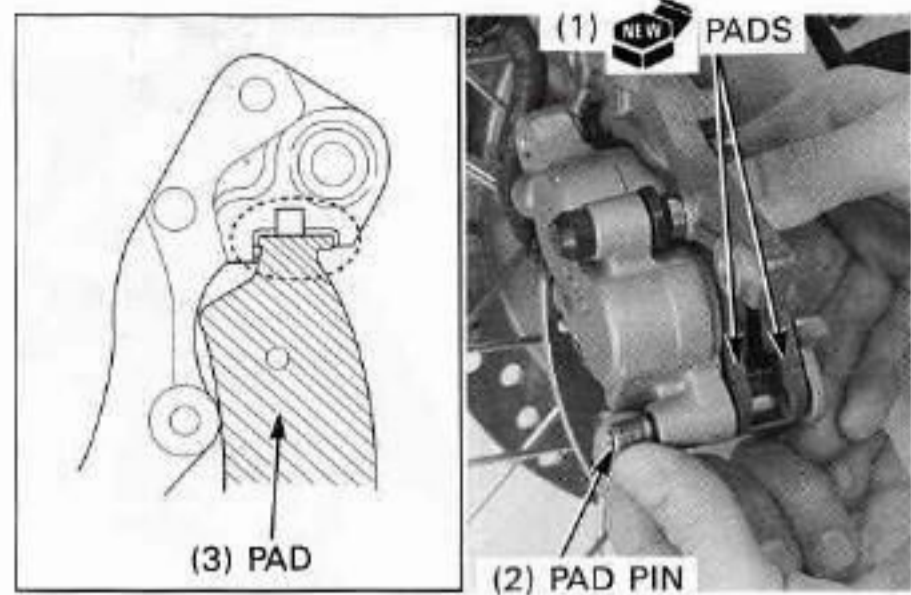
Clean the inside of the caliper especially around the caliper piston.
Make sure that the pad spring is installed in position.



HYDRAULIC BRAKE

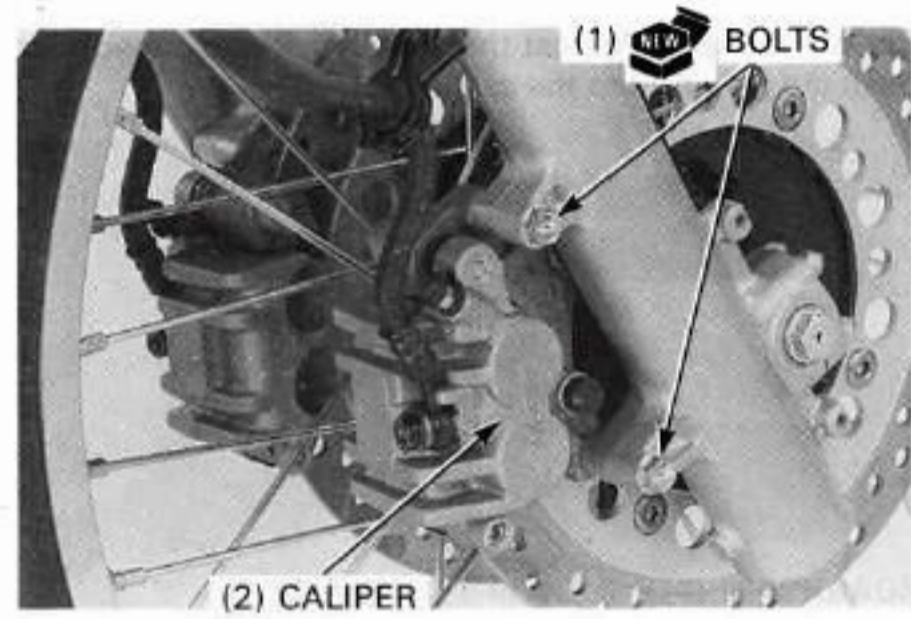
Install new pads so that their ends rest on the pad retainer on the bracket properly.

Install the pad pin by pushing the pads against the pad spring to align the pad pin holes in the pads and caliper.



Install the front brake caliper to the front fork.
Install and tighten the new front caliper mounting bolts to the specified torque.

TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)



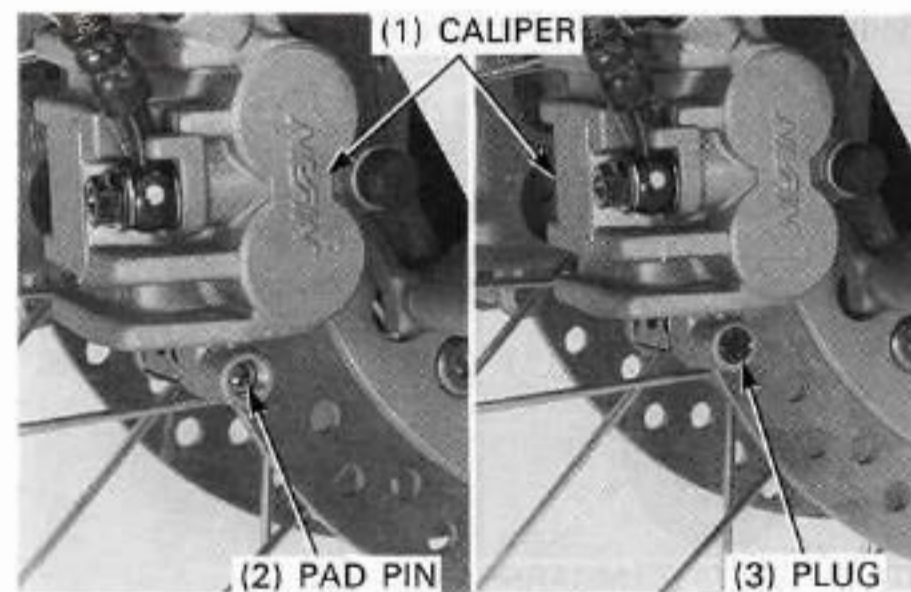
Install the fork cover (page 2- 5).

Tighten the pad pin to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Install and tighten the pad pin plug to the specified torque.

TORQUE: 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)



⚠ WARNING

- After replacement, operate the brake lever to seat the caliper pistons against the pads.

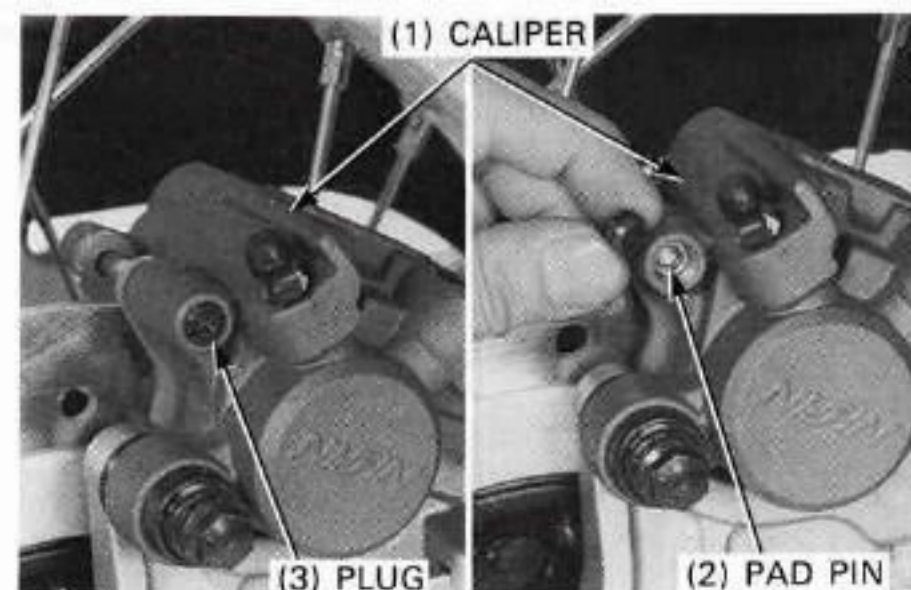
REAR BRAKE PAD REPLACEMENT

NOTE

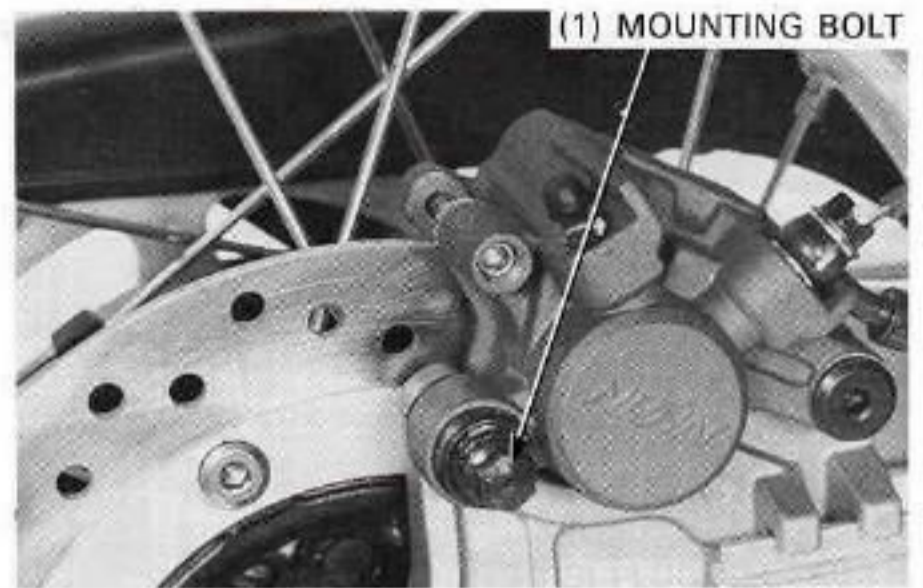
- Always replace the brake pads in pairs to ensure even disc pressure.

Push the caliper pistons all the way in by pushing the caliper body inward to provide clearance for the new pads.

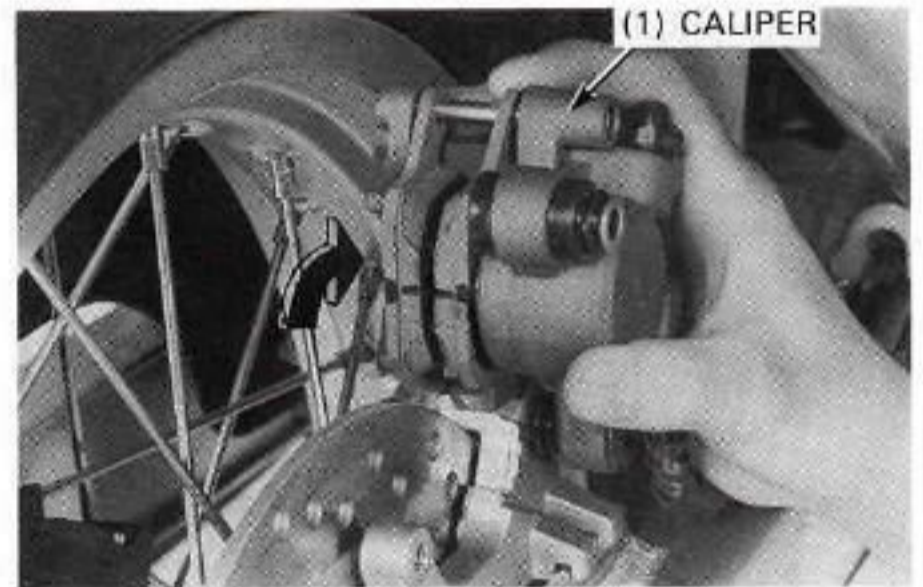
Remove the pad pin plug and loosen the pad pin.



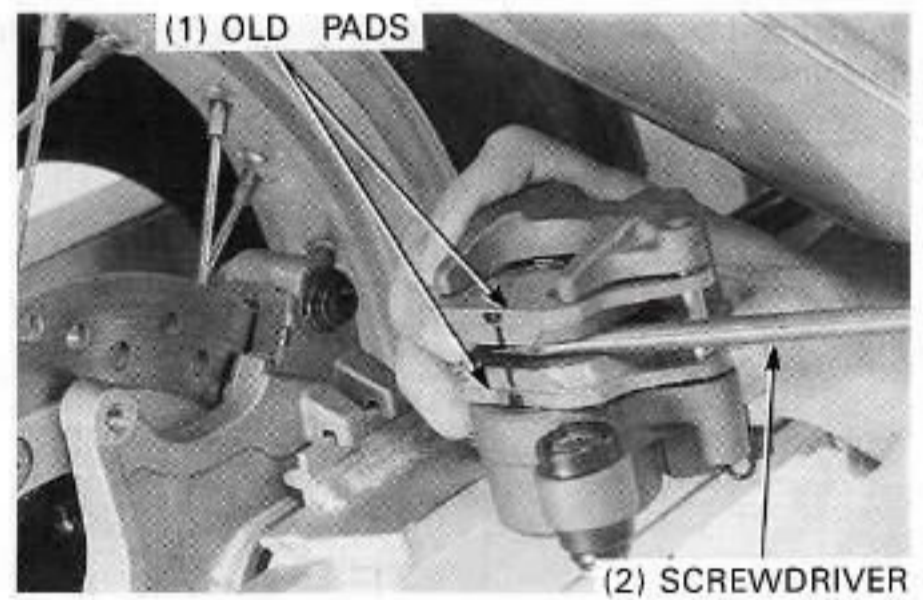
Remove the rear caliper mounting bolt.



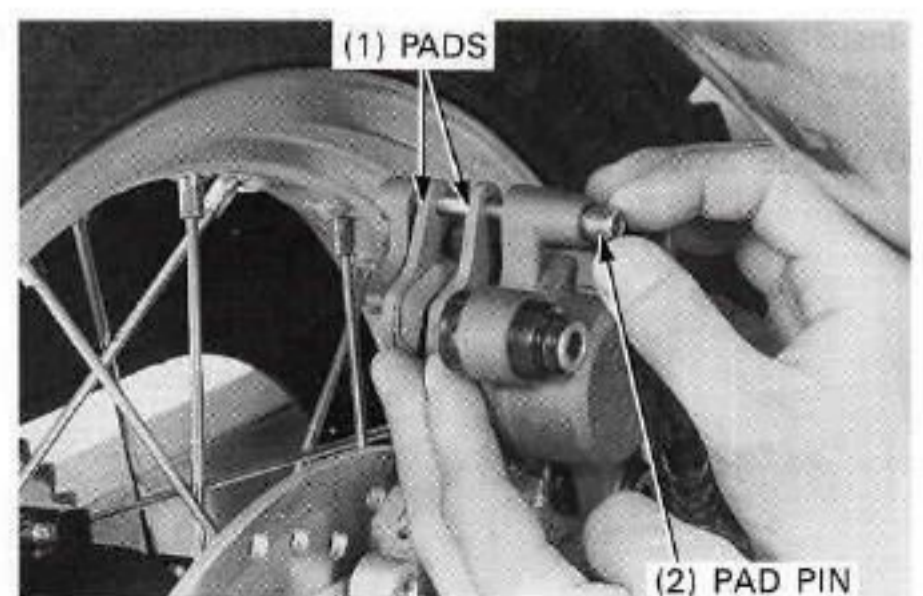
Swing the rear caliper upward and remove the rear caliper.



Pry one old pad against the caliper with a screwdriver to push the pistons into the caliper.

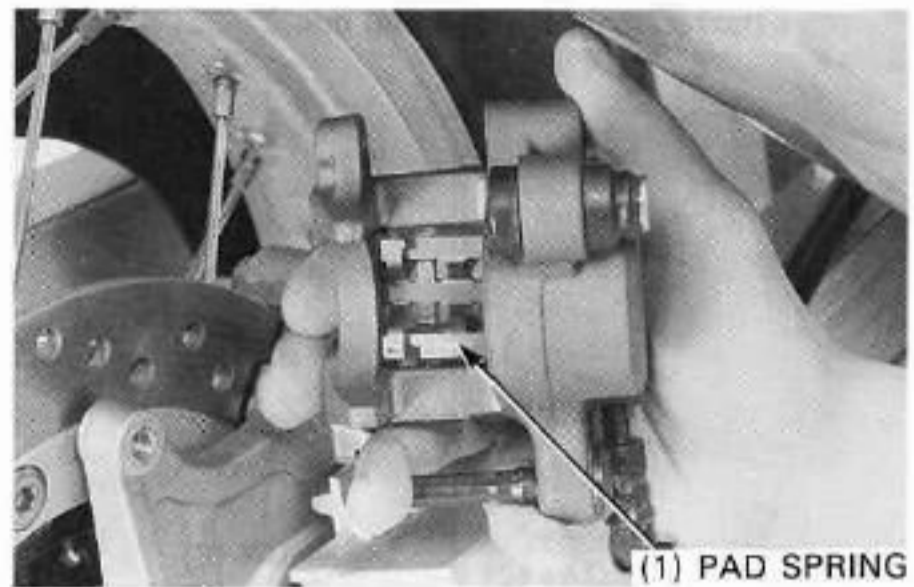


Remove the pad pin and the brake pads.

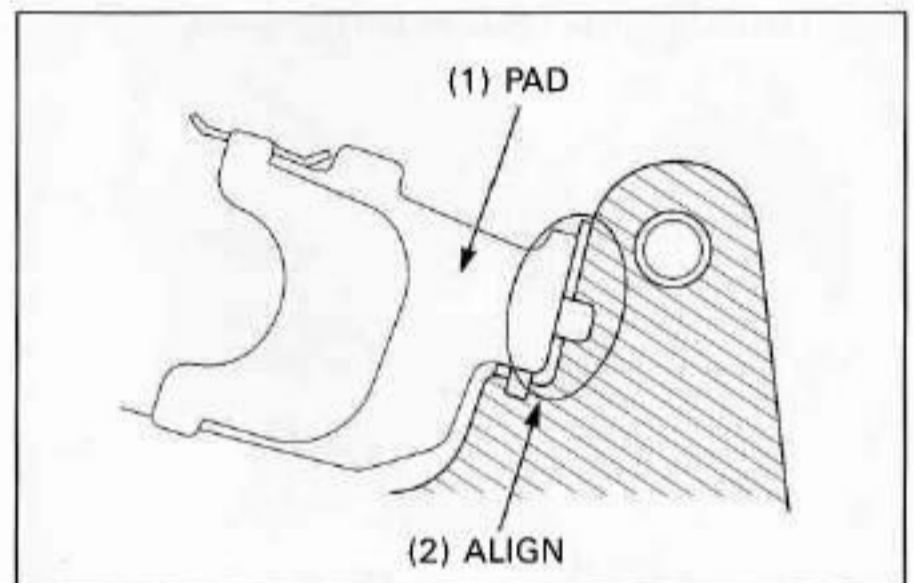


HYDRAULIC BRAKE

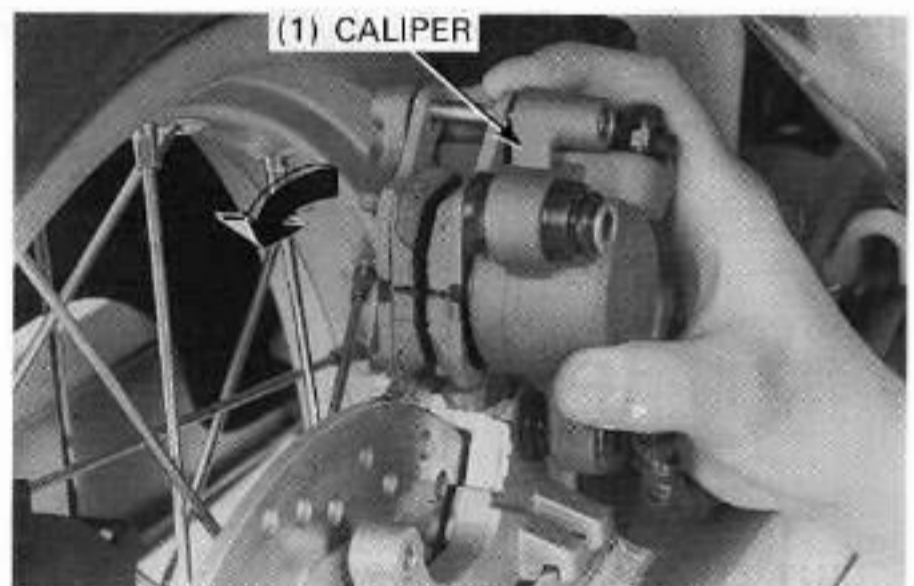
Clean the inside of the caliper especially around the caliper piston.
Make sure that the pad spring is installed in position.



Install new pads so that their ends rest on the pad retainer on the bracket properly.
Install the pad pin.

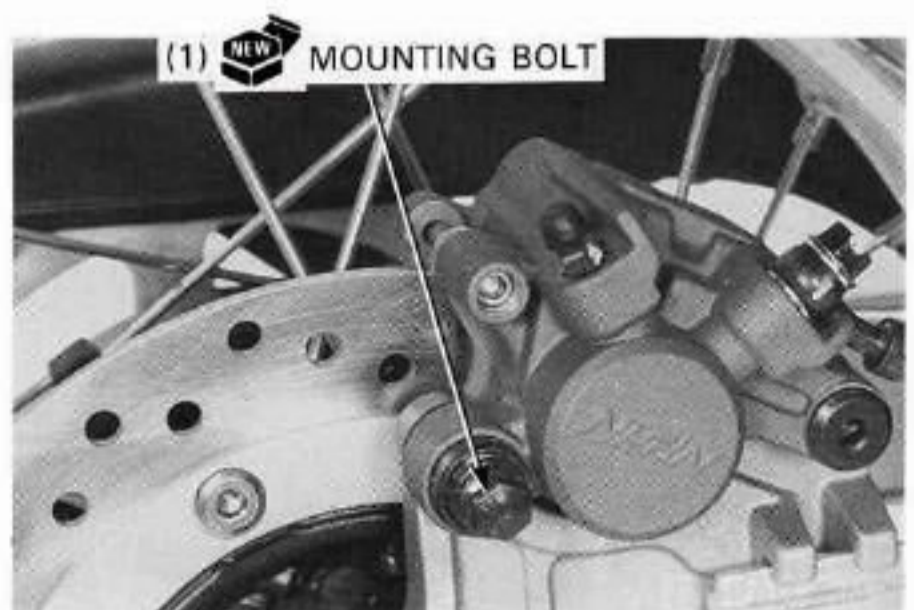


Install and lower the caliper and install the pad pin while pushing the pads against the spring.



Install and tighten the new rear caliper mounting bolt to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



Tighten the pad pin to the specified torque.

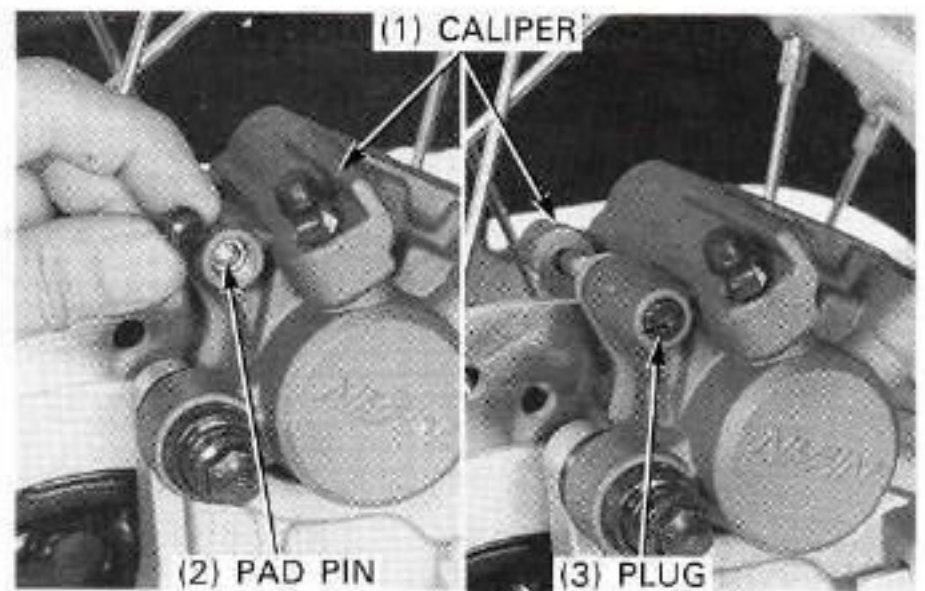
TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Install and tighten the pad pin plug to the specified torque.

TORQUE: 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)

⚠ WARNING

- *After the replacement, operate the brake pedal to seat the caliper piston against the pad.*



BRAKE DISC INSPECTION

Visually inspect the disc for damage or cracks.

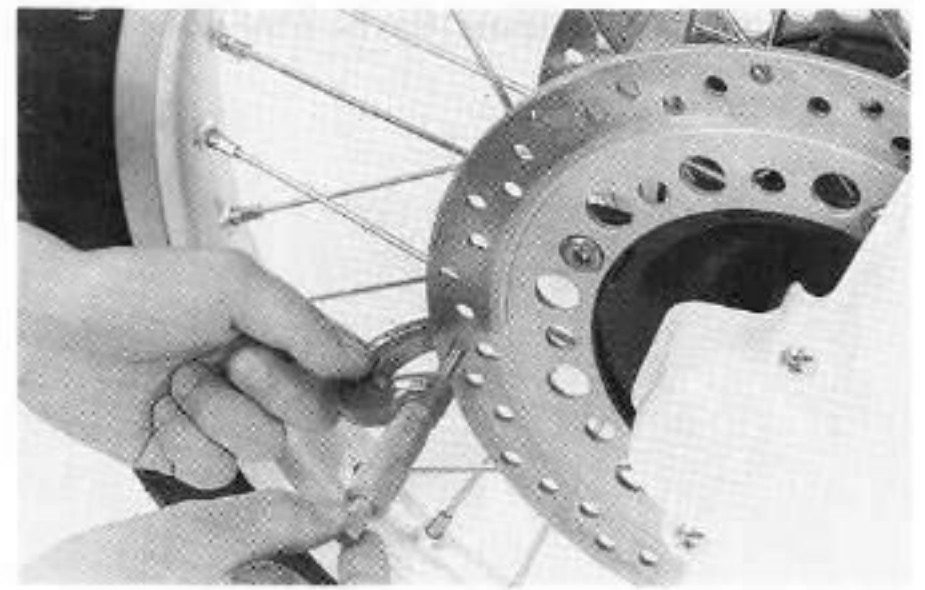
Measure the brake disc thickness at several points.

SERVICE LIMITS:

Front: 3.5 mm (0.14 in)

Rear: 4.0 mm (0.15 in)

Replace the brake disc if the smallest measurement is less than the service limit.

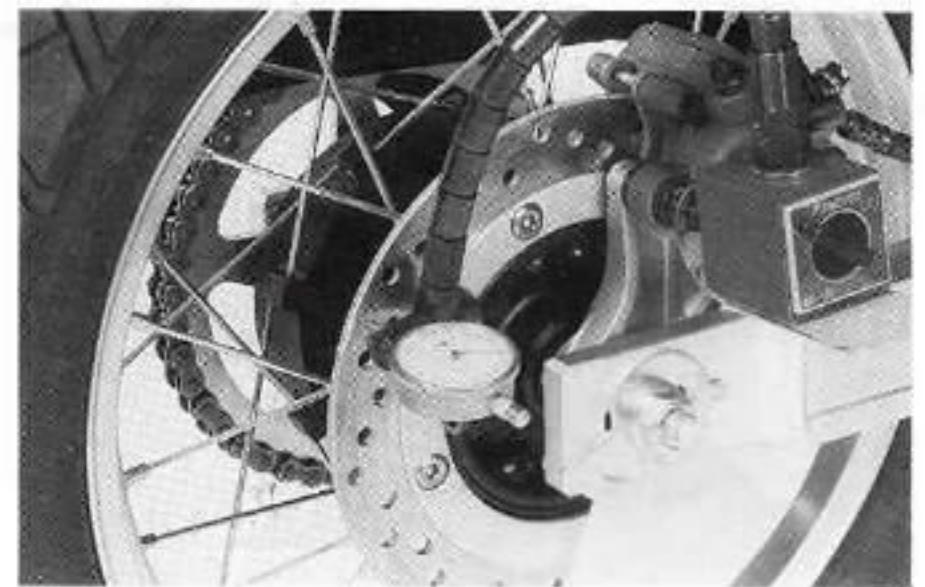


Check the brake disc for warpage.

SERVICE LIMIT: 0.30 mm (0.014 in)

Check the wheel bearings for excessive play, if the warpage exceeds the service limit.

Replace the brake disc if the wheel bearings are normal.



FRONT MASTER CYLINDER

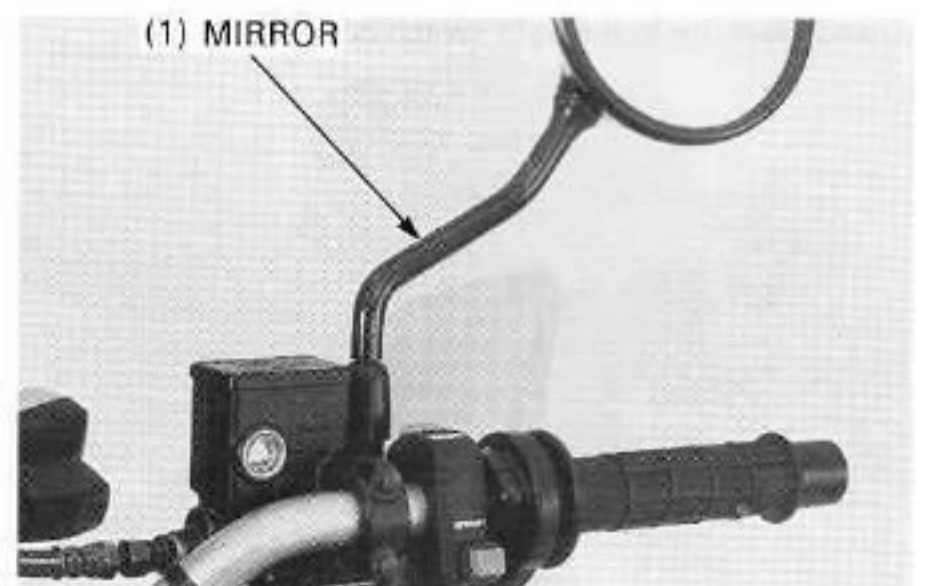
CAUTION

- *Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag or shop towel over these parts whenever the system is serviced.*
- *When removing the oil hose, cover the end of the hose to prevent contamination.*

REMOVAL

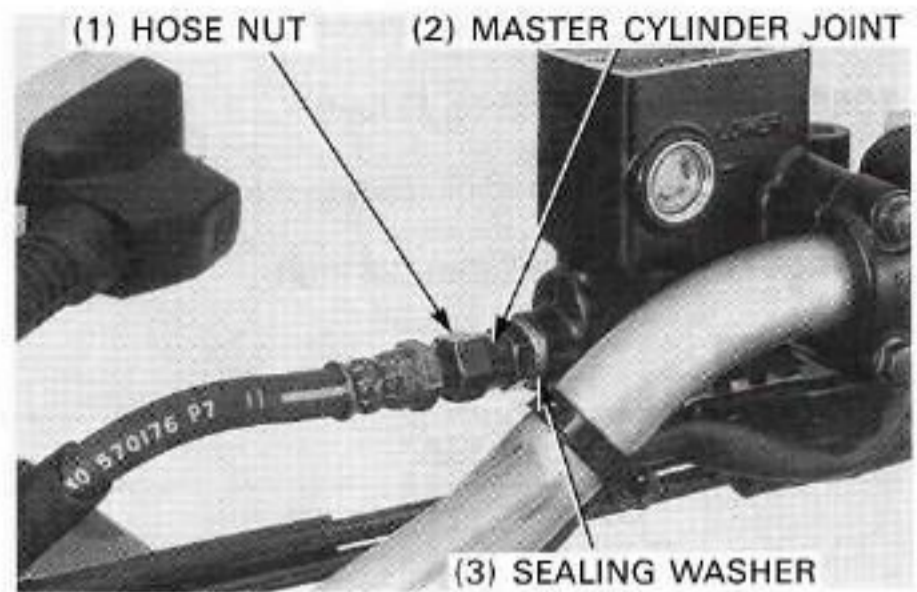
Drain the brake fluid (page 15- 4).

Remove the right rear view mirror (page 13- 3).

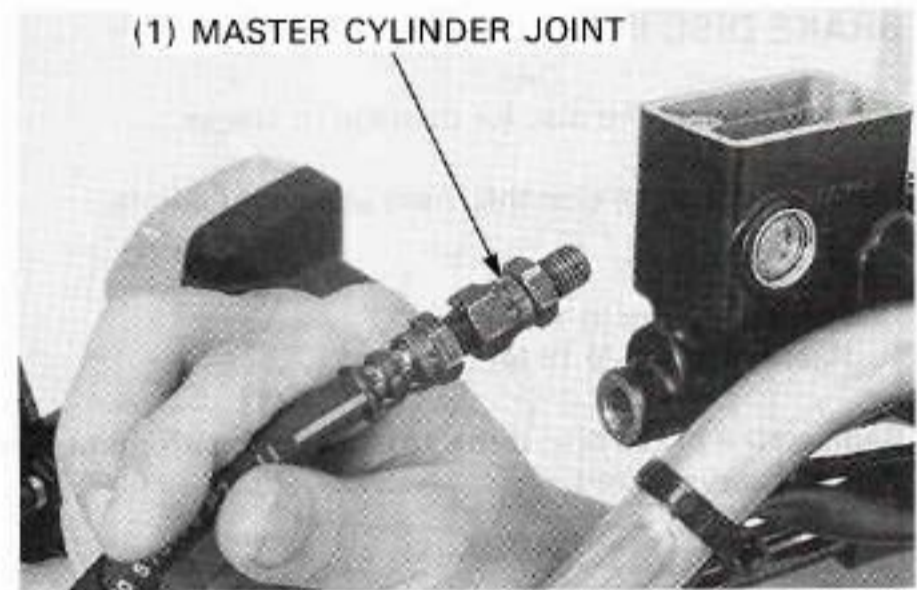


HYDRAULIC BRAKE

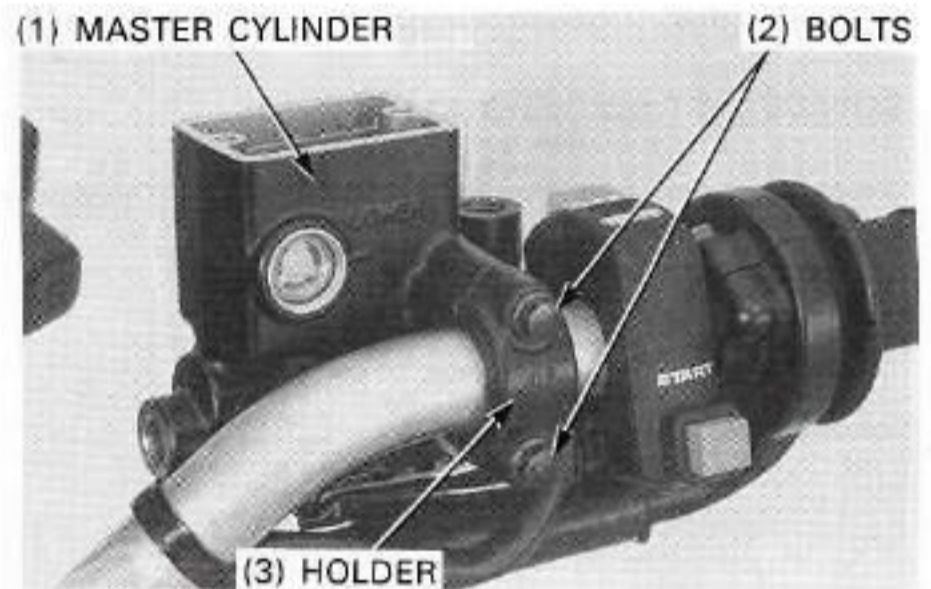
Hold the brake hose nut, then loosen the master cylinder joint from the master cylinder. Remove the sealing washer.



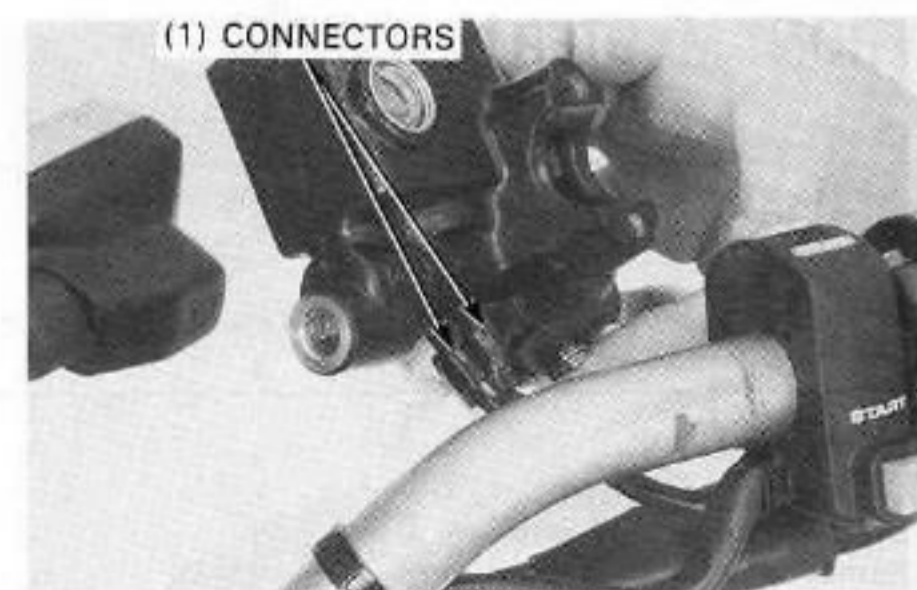
Remove the master cylinder joint from the brake hose.



Remove the front master cylinder holder bolts, holder and master cylinder.

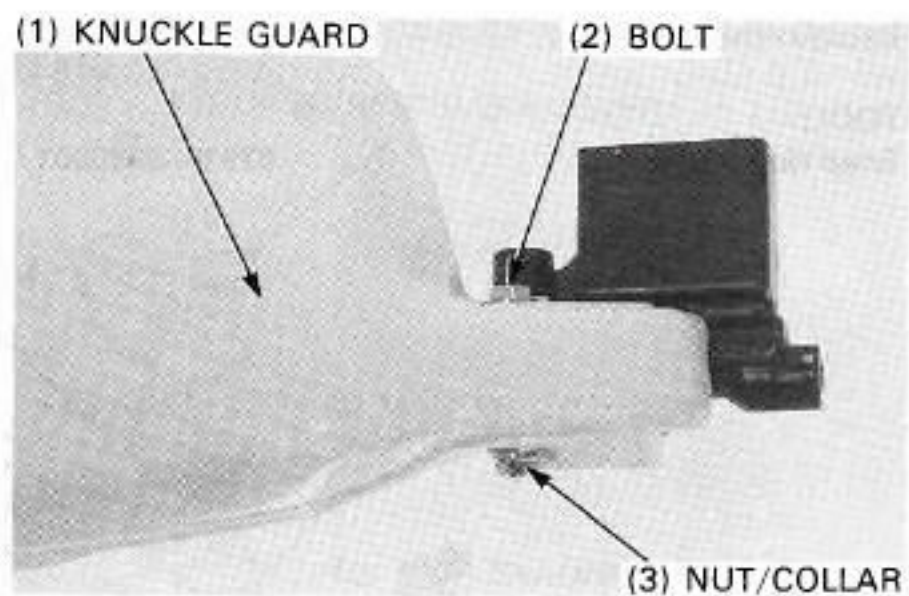


Disconnect the brake light switch connectors.

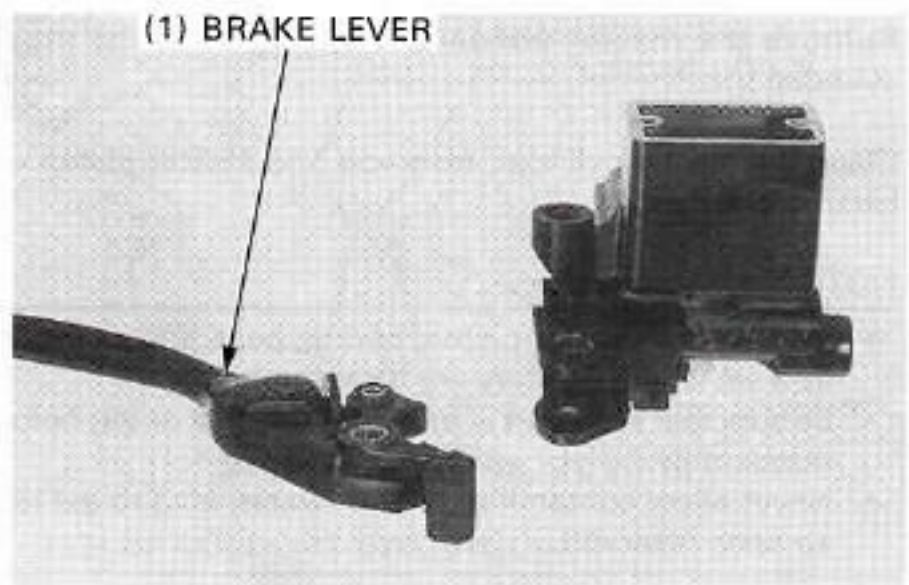


DISASSEMBLY

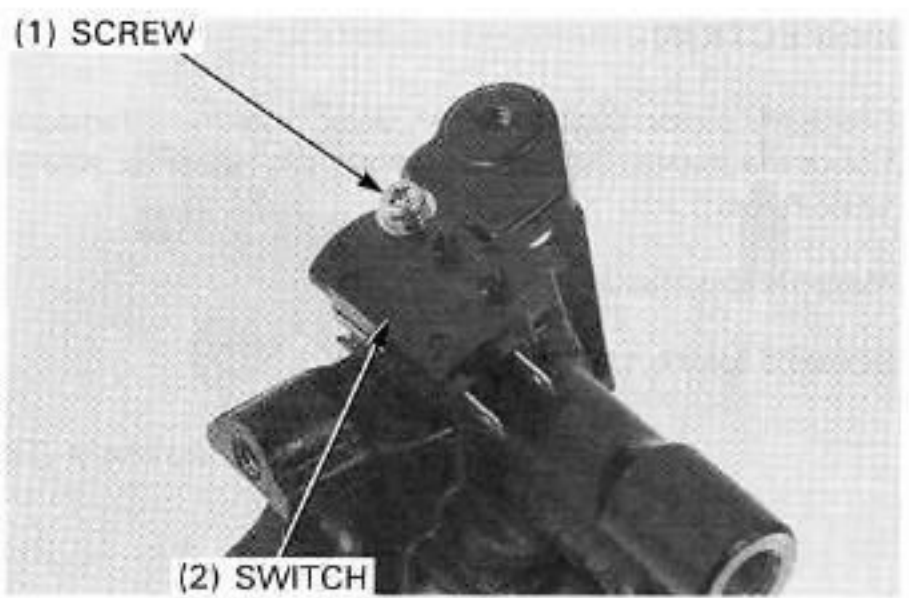
Remove the brake lever pivot nut, collar and bolt.
Remove the knuckle guard.



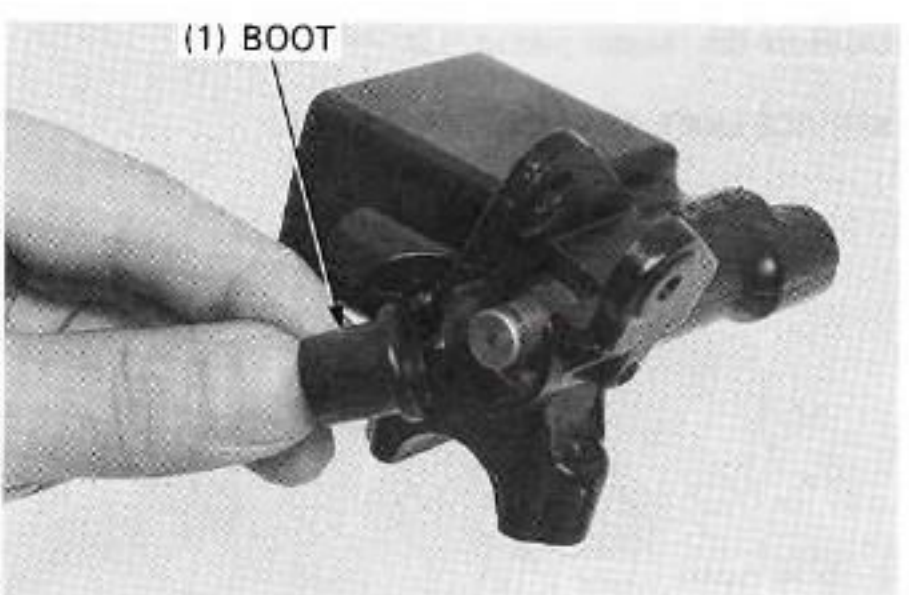
Remove the brake lever assembly.



Remove the screw and brake light switch.



Remove the boot from the master cylinder and master piston.



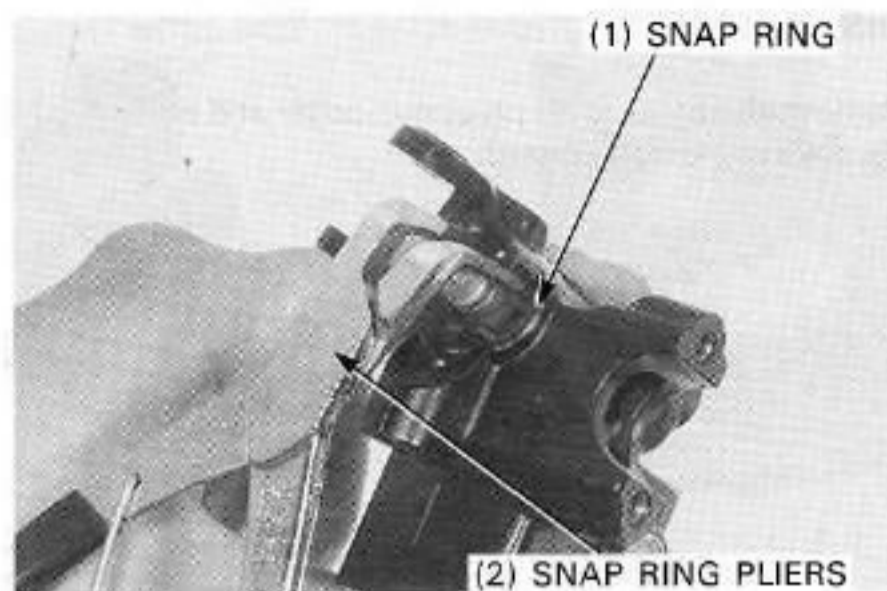
HYDRAULIC BRAKE

Remove the snap ring.

TOOL:

Snap ring pliers

07914- 3230001

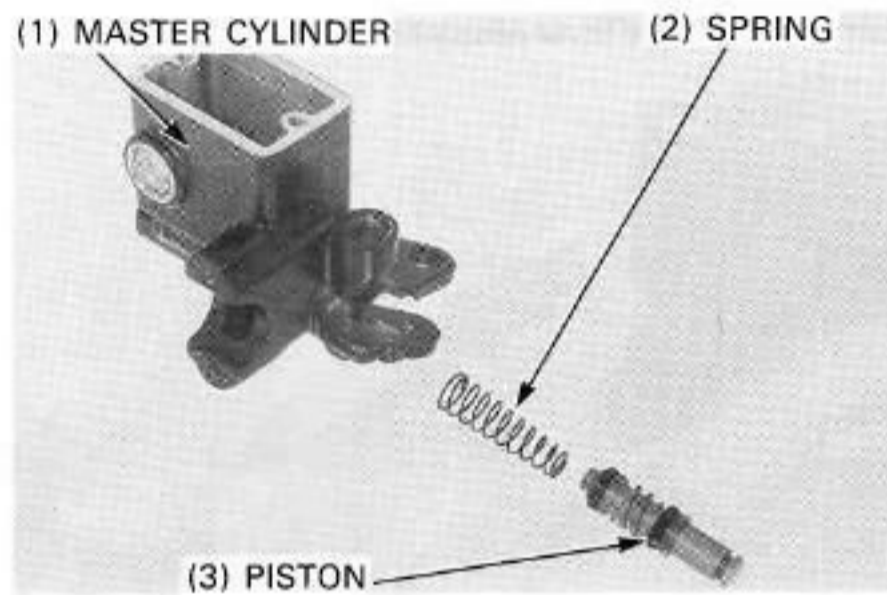


Remove the master piston and spring from the master cylinder.

Clean the master cylinder, reservoir and master piston with clean brake fluid.

NOTE

- Replace the master piston, spring, cups and snap ring as a set whenever they are disassembled.
- Be sure that each part is free from the dust or dirt before reassembly.
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.

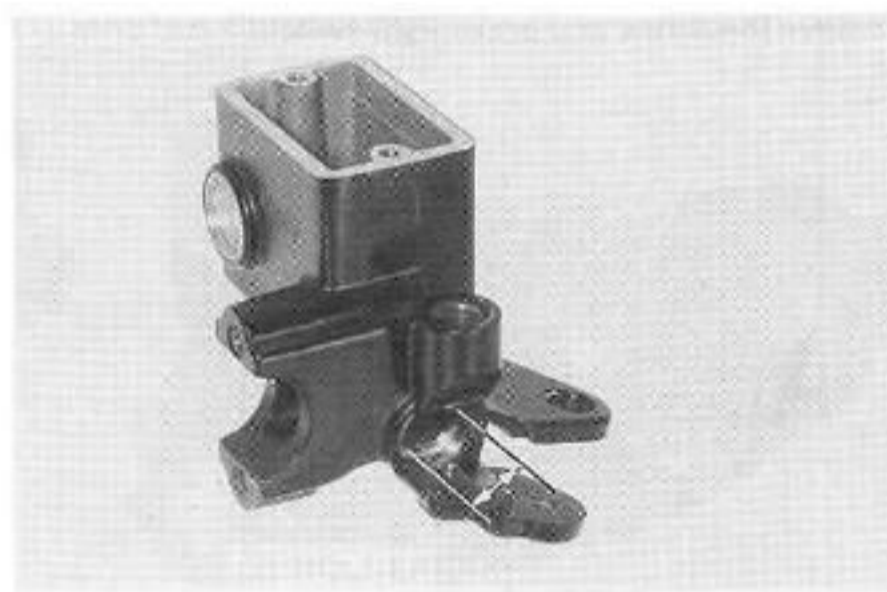


INSPECTION

Check the piston cups for wear, deterioration or damage. Check the master cylinder and piston for scoring, scratches or damage.

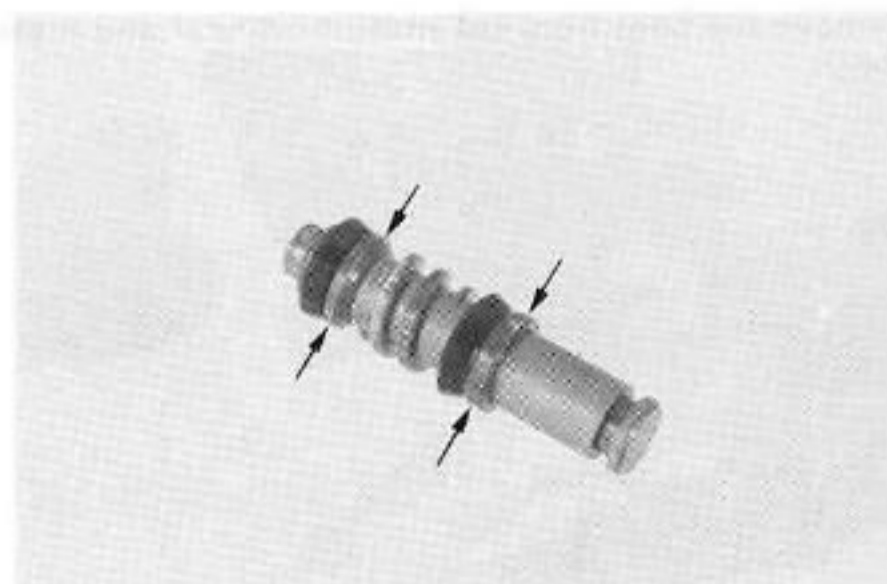
Measure the master cylinder I.D.

SERVICE LIMIT: 12.75 mm (0.502 in)

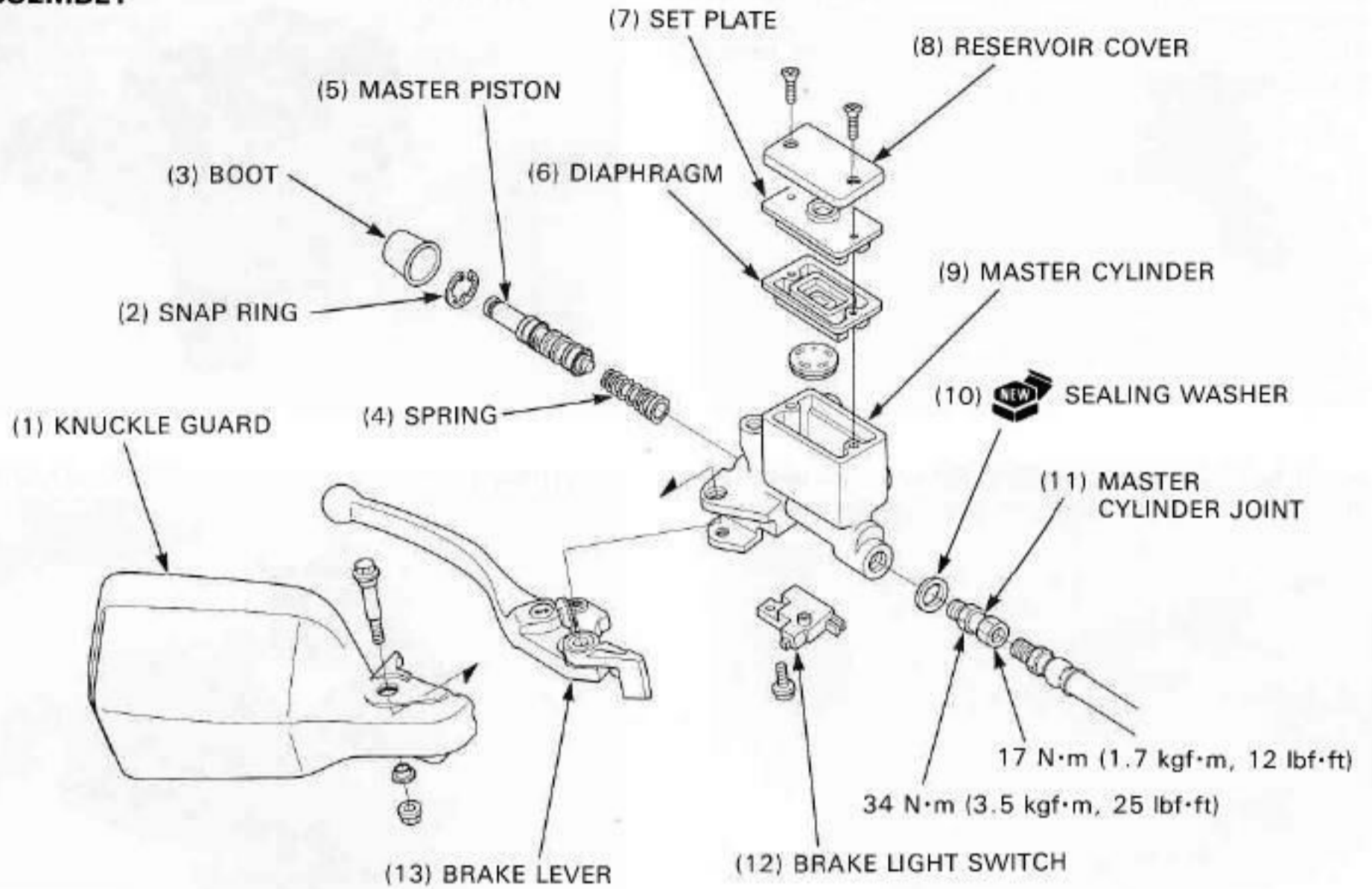


Measure the master piston O.D.

SERVICE LIMIT: 12.64 mm (0.498 in)



ASSEMBLY



NOTE

- Replace the master piston, spring, cups and snap ring as a set.
- Replace the boot if it is wear, deterioration or damage.
- Apply silicone grease to the boot inner surface.
- Be sure that each part is free from the dust or dirt before reassembly.

Coat the master piston and piston cups with clean DOT 4 brake fluid.

Install the spring onto the master piston end.

Install the master piston/spring into the master cylinder.

CAUTION

- Do not allow the piston cup lips to turn inside out.

Install the snap ring into the groove in the master cylinder.

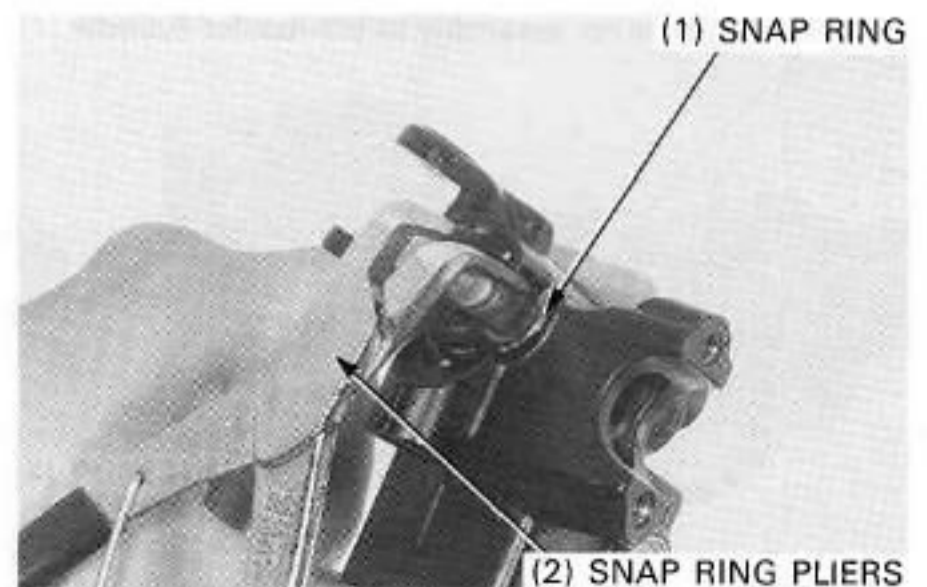
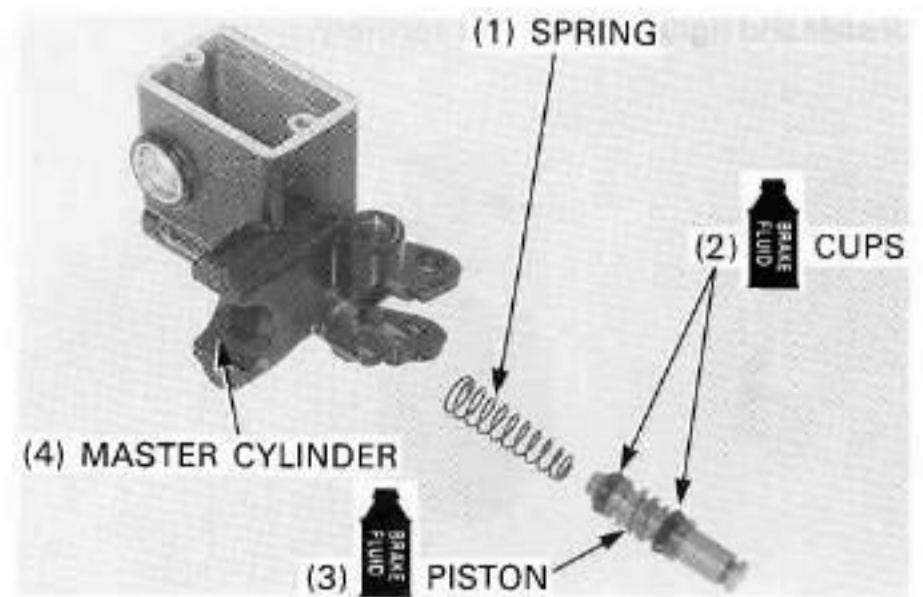
TOOL:

Snap ring pliers

07914- 3230001

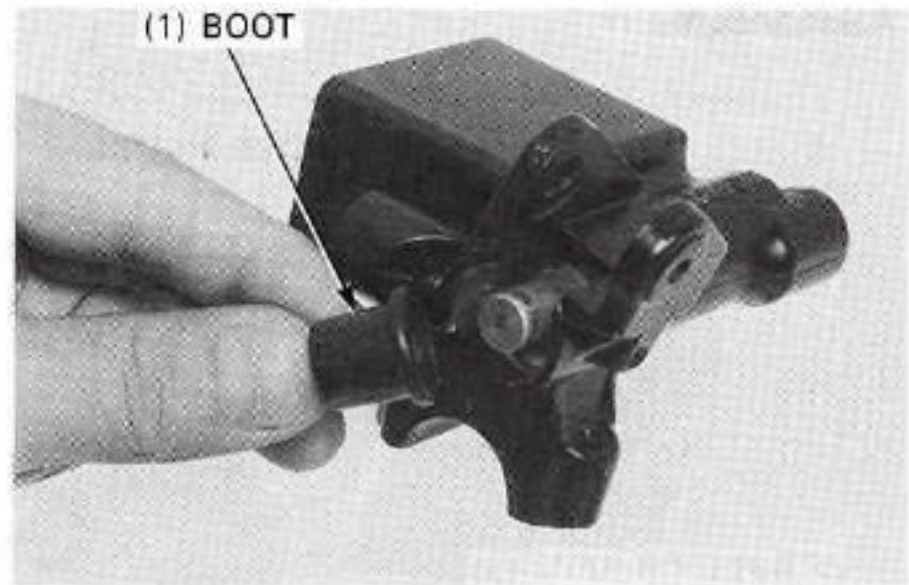
CAUTION

- Be certain the snap ring is firmly seated in the groove.

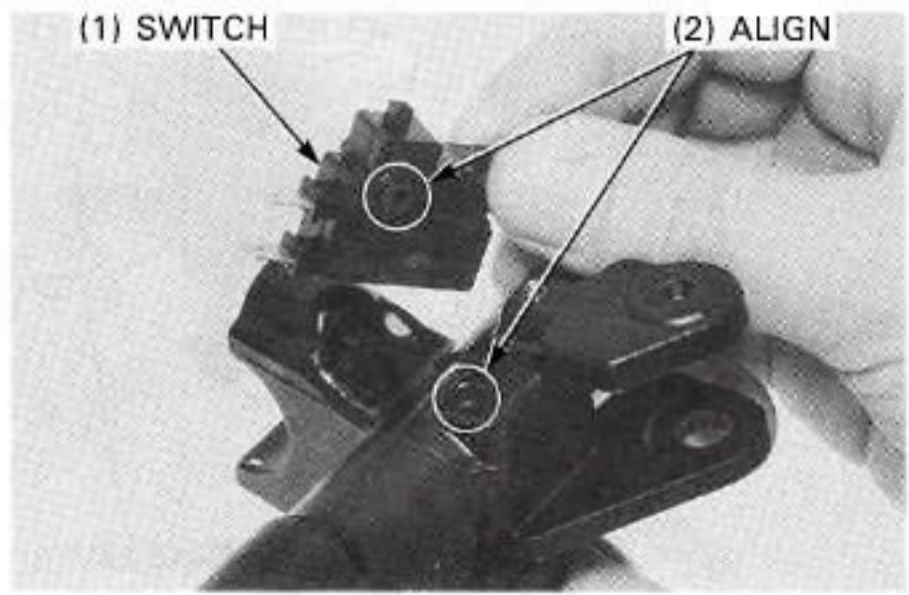


HYDRAULIC BRAKE

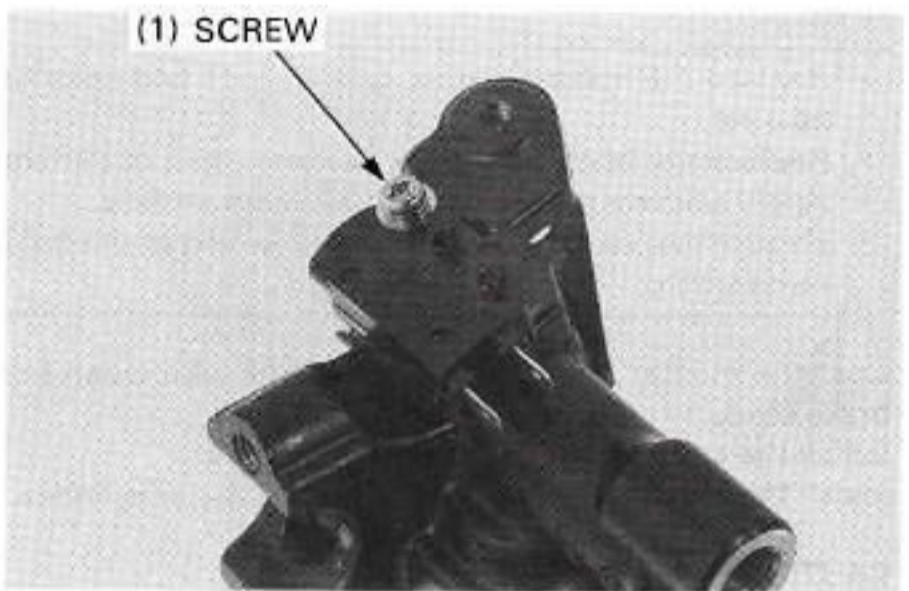
Install the boot into the master cylinder and the groove in the master piston.
Apply silicone grease to the brake lever contacting surface of the master cylinder.



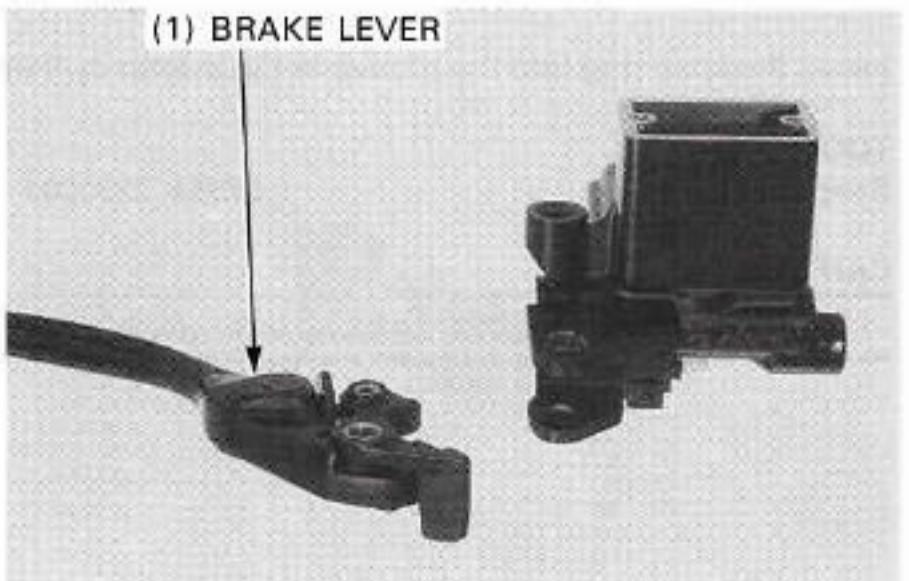
Install the brake light switch to the master cylinder aligning the brake light switch tab and master cylinder groove.



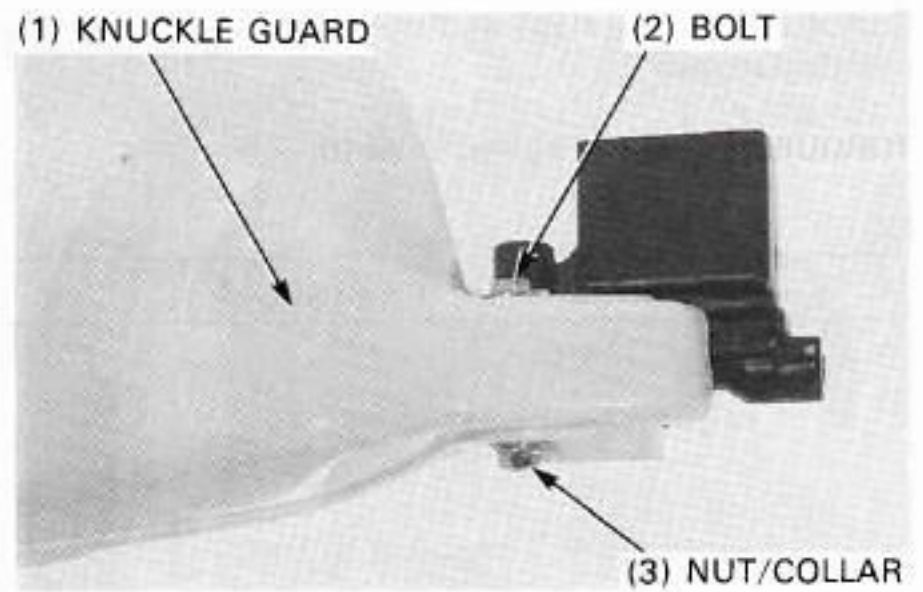
Install and tighten the screw securely.



Install the brake lever assembly to the master cylinder.

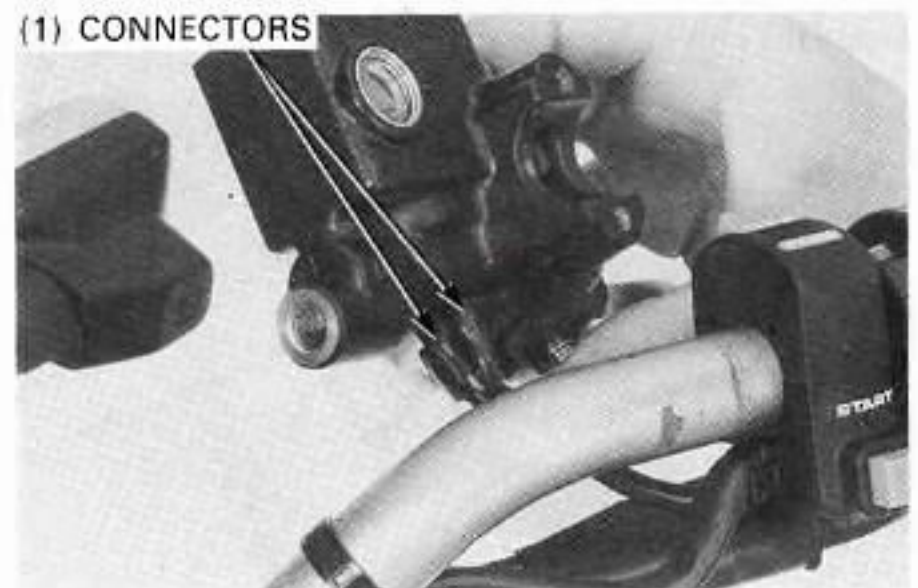


Install the knuckle guard.
 Apply grease to the brake lever pivot bolt.
 Install the brake lever pivot bolt, collar and nut.

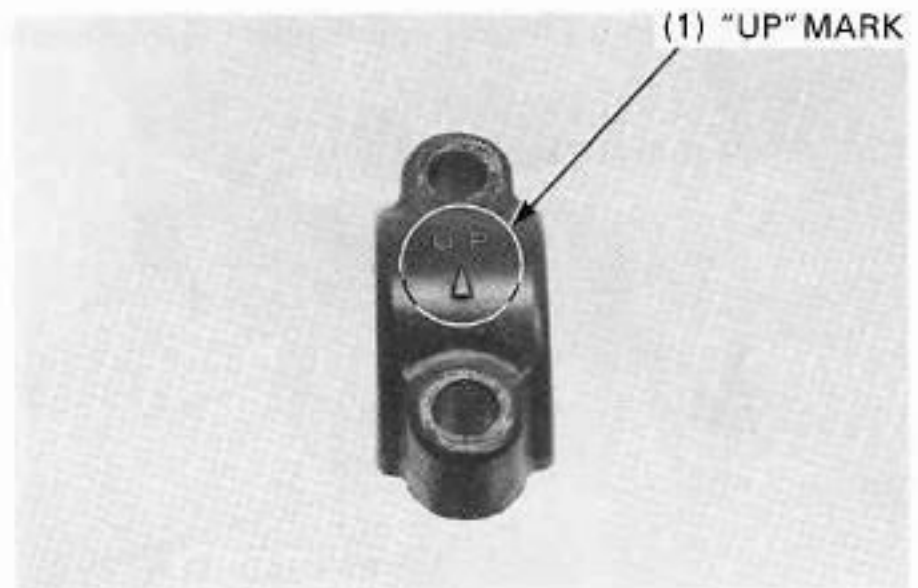


INSTALLATION

Connect the brake light switch connectors.

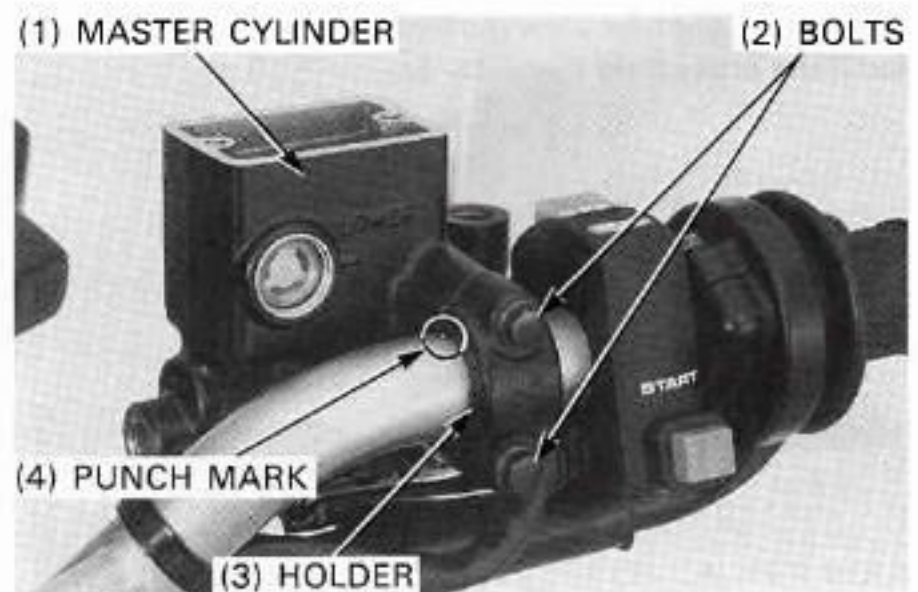


Install the master cylinder and the master cylinder holder with the "UP" mark facing up.



Align the end of the master cylinder with the punch mark on the handlebar.
 Install the front master cylinder bolts and tighten the upper bolt first, then tighten the lower bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



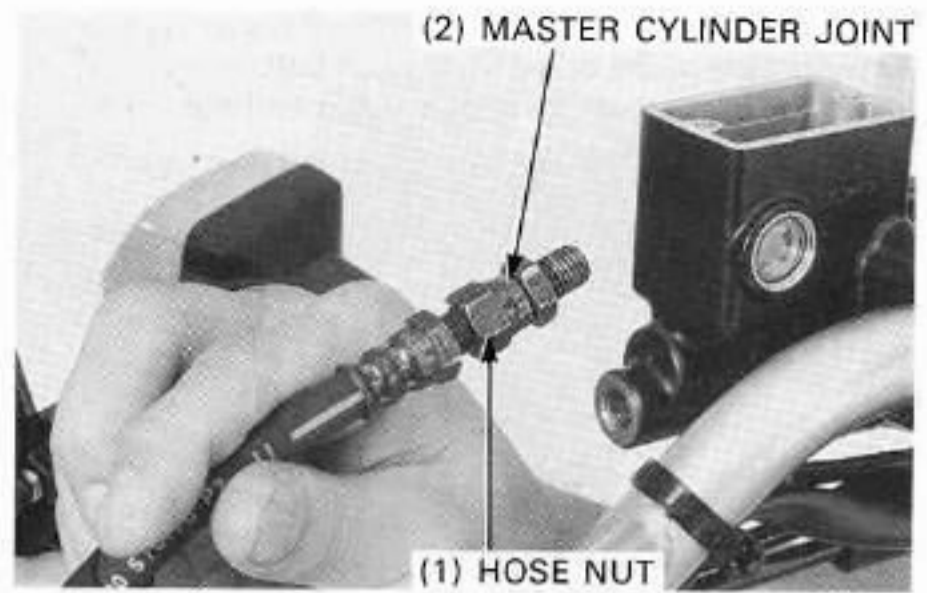
HYDRAULIC BRAKE

Connect the brake hose and tighten the hose nut to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 12 lbf·ft)

NOTE

- Be careful not to twist the brake hose.

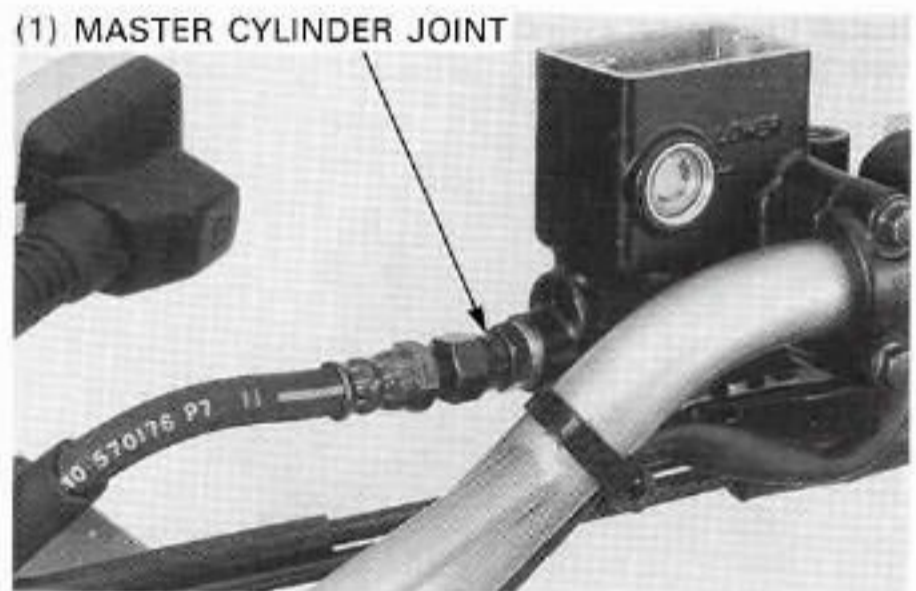


Install the new sealing washer.

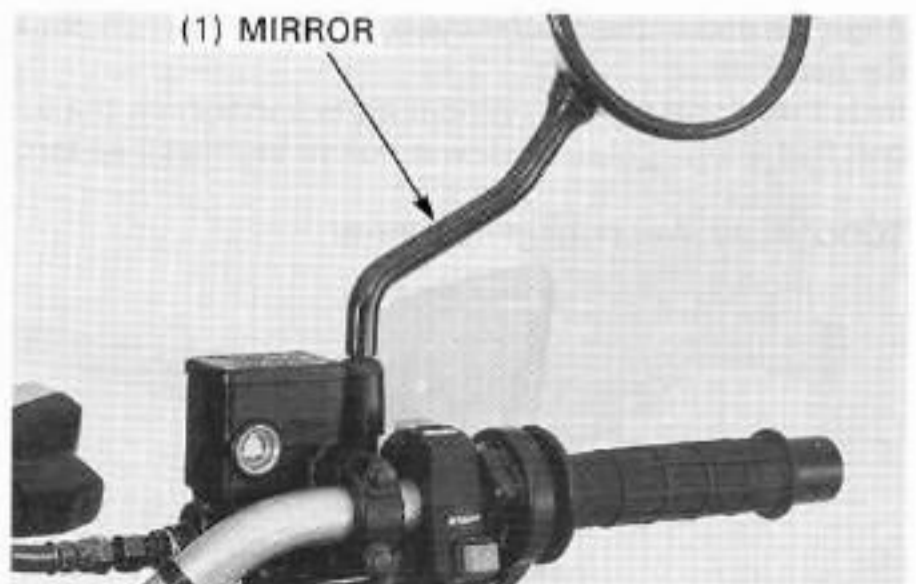


Install and tighten the master cylinder joint to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



Install the right rear view mirror (page 13- 13).
Refill the brake fluid (page 15- 5).



FRONT BRAKE CALIPER

CAUTION

- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag or shop towel over these parts whenever the system is serviced.
- When removing the oil hose bolt, cover the end of the hose to prevent contamination.

REMOVAL

Drain the brake fluid (page 15- 4).
Remove the fork cover (page 2- 4).

Remove the bolt and brake hose clamp.

Remove the brake hose oil bolt and sealing washers and disconnect the brake hose from the front brake caliper.

Remove the front brake caliper mounting bolts and front brake caliper.

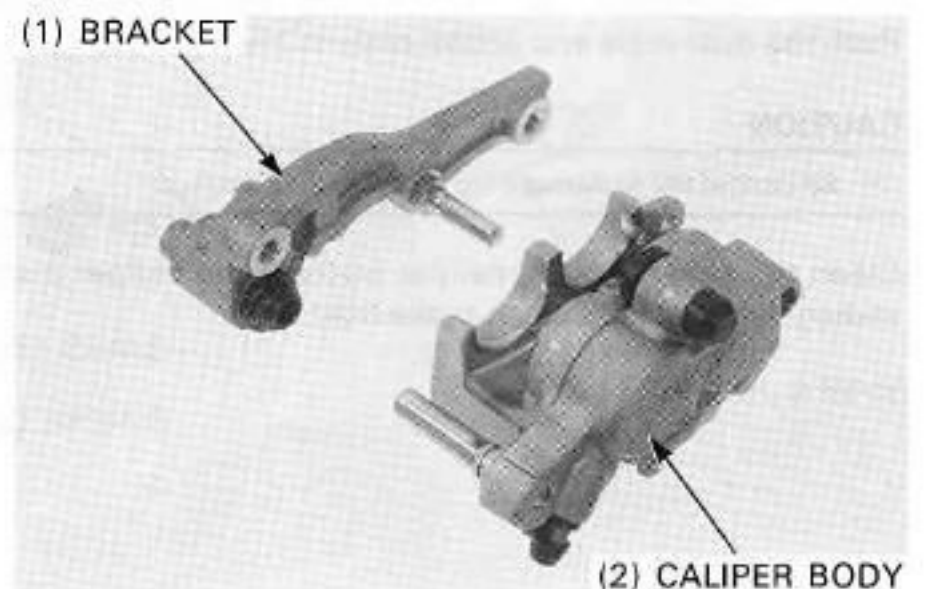
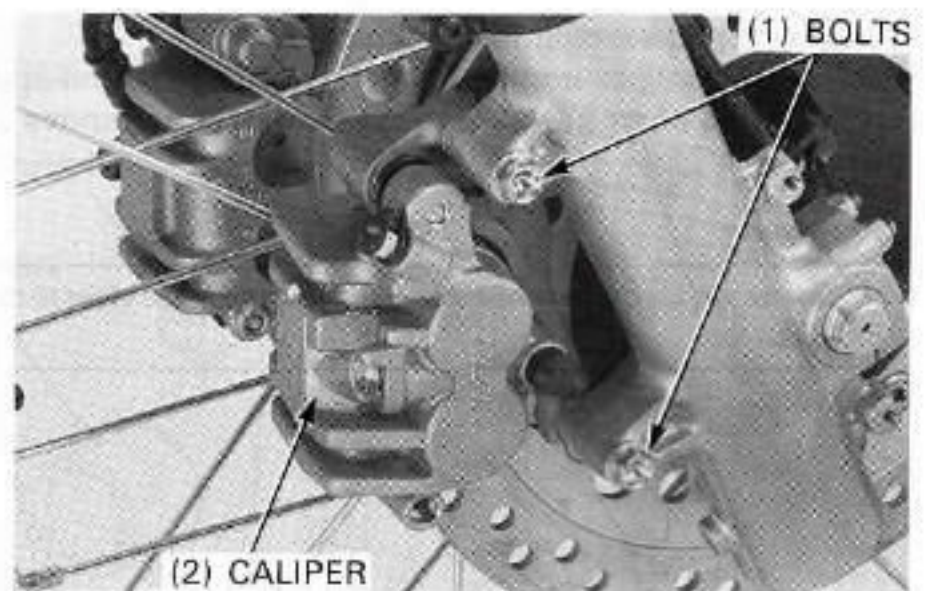
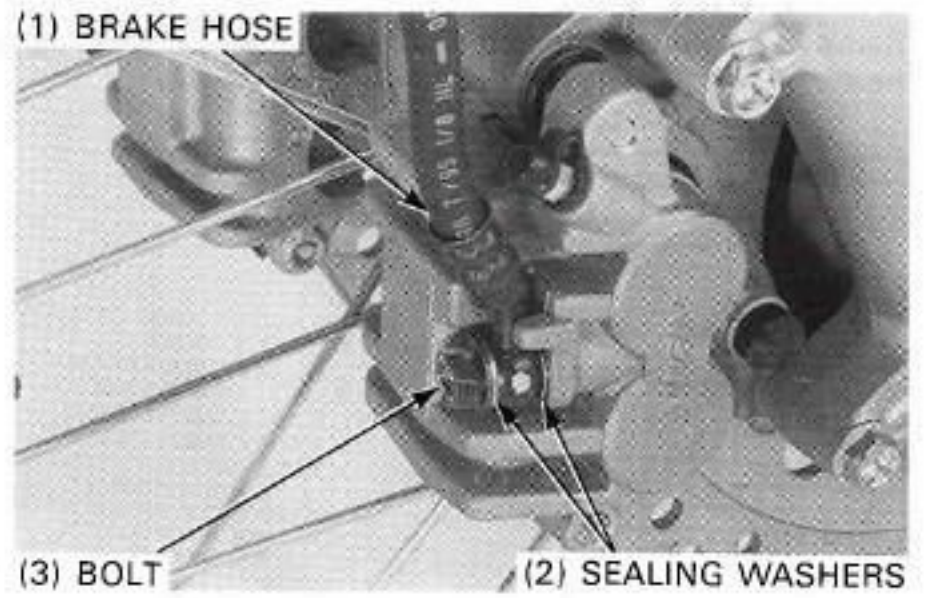
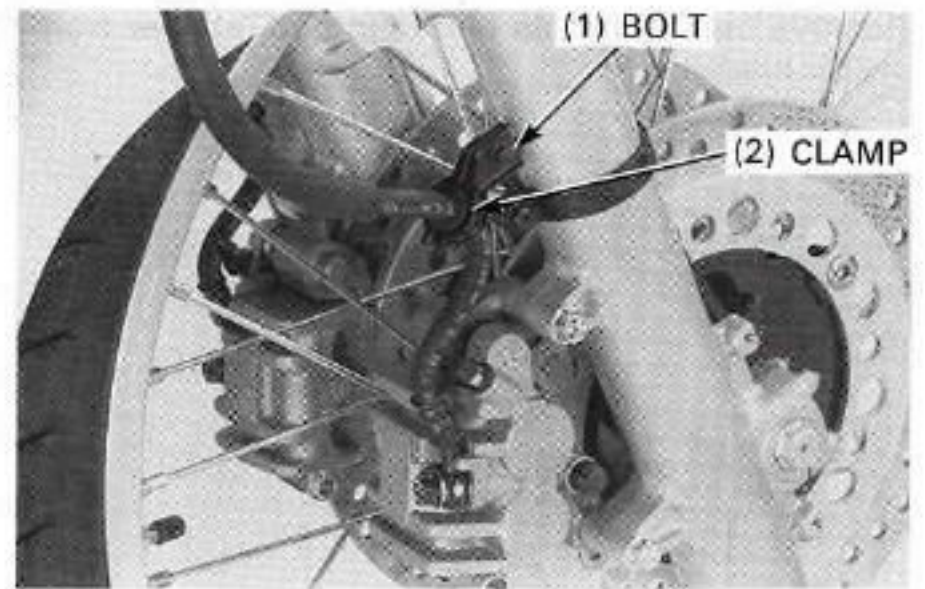
Remove the brake pad (page 15- 6).

DISASSEMBLY

NOTE

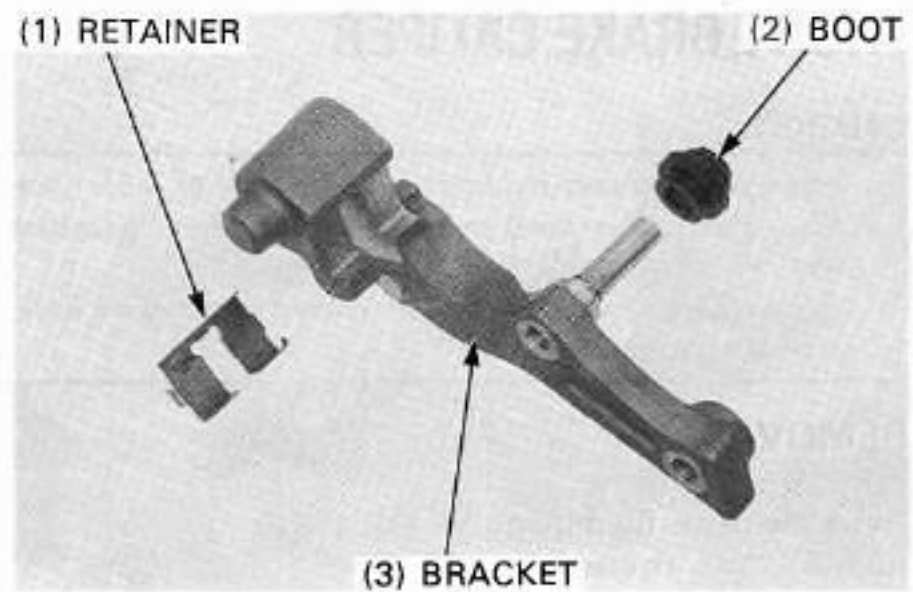
- Do not remove the caliper and bracket pins unless replacement.

Remove the caliper bracket from the caliper body.

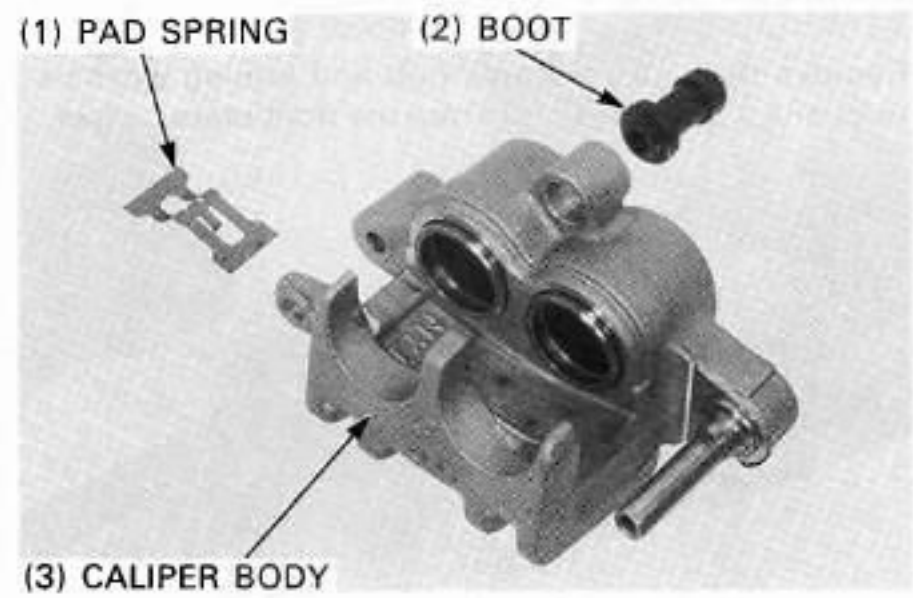


HYDRAULIC BRAKE

Remove the caliper pin boot and pad retainer from the caliper bracket.



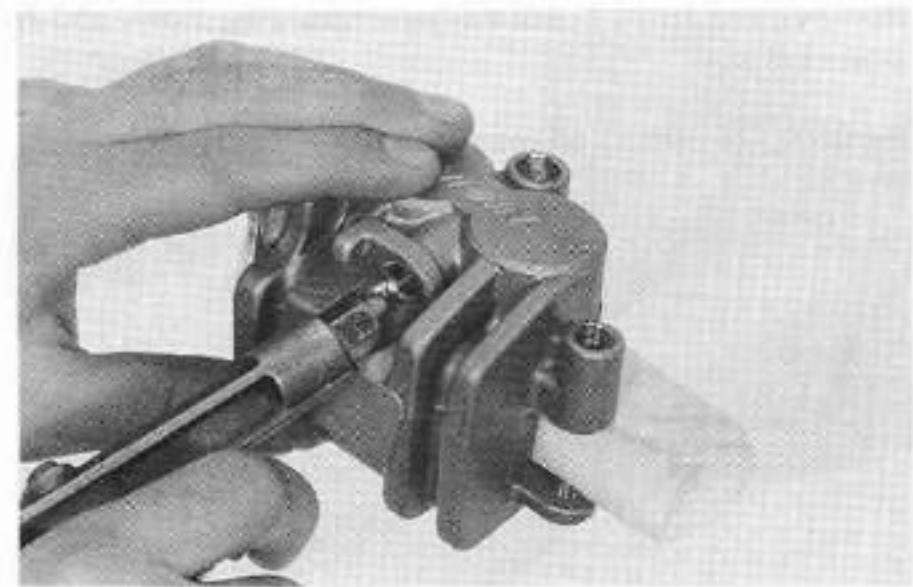
Remove the pad spring and bracket pin boot from the caliper body.



Place a shop towel over the pistons.
Position the caliper body with the pistons down and apply small squirts of air pressure to the fluid inlet to remove the pistons.

⚠ WARNING

- Do not use high pressure air or bring the nozzle too close to the inlet.

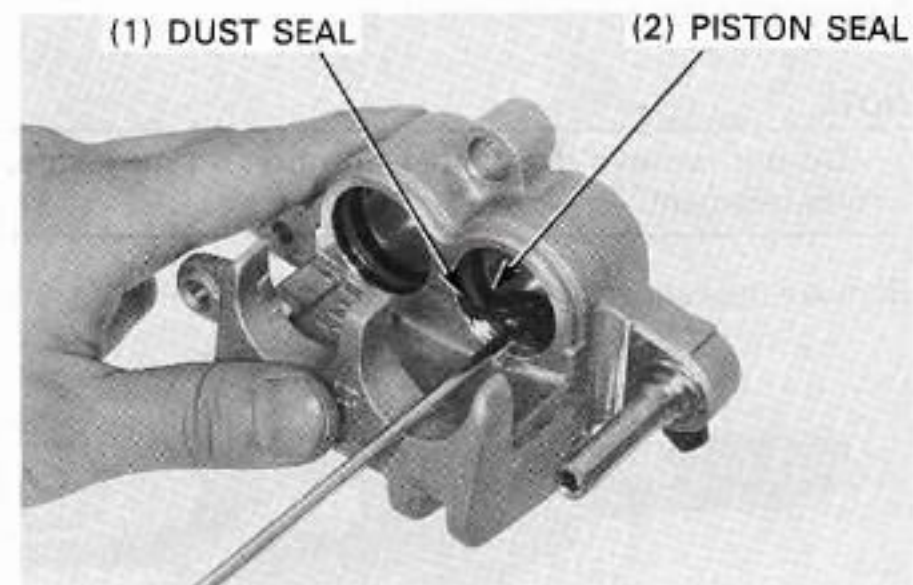


Push the dust seals and piston seals in and lift them out.

CAUTION

- Be careful not to damage the piston sliding surface.

Clean the seal grooves, caliper pistons and caliper piston sliding surfaces with clean brake fluid.

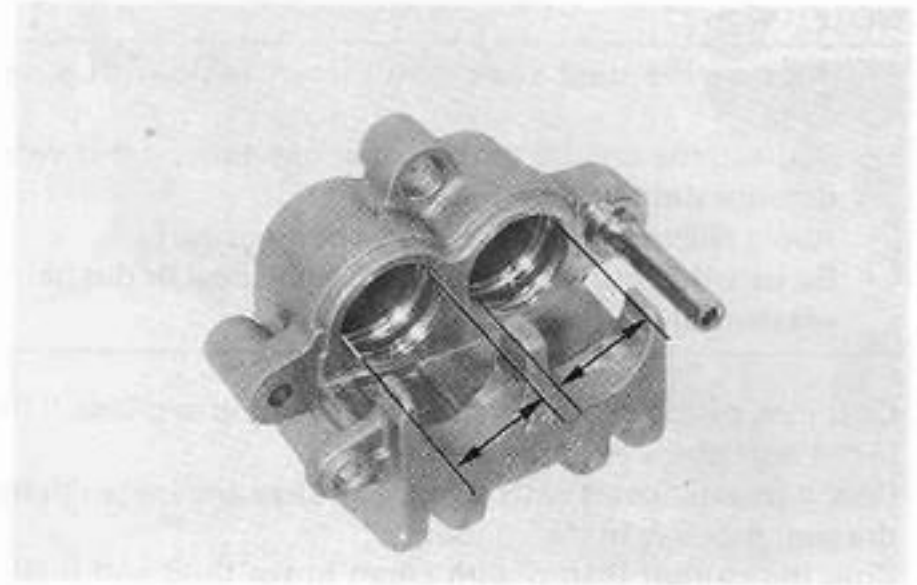


INSPECTION

Check the caliper cylinder and pistons for scoring, scratches or damage.

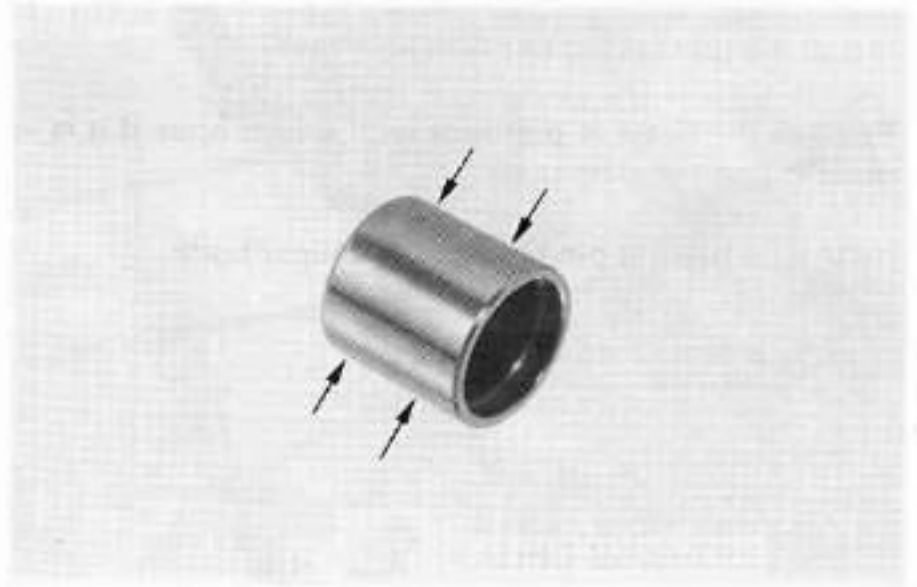
Measure the caliper cylinder I.D.

SERVICE LIMIT: 27.06 mm (1.065 in)

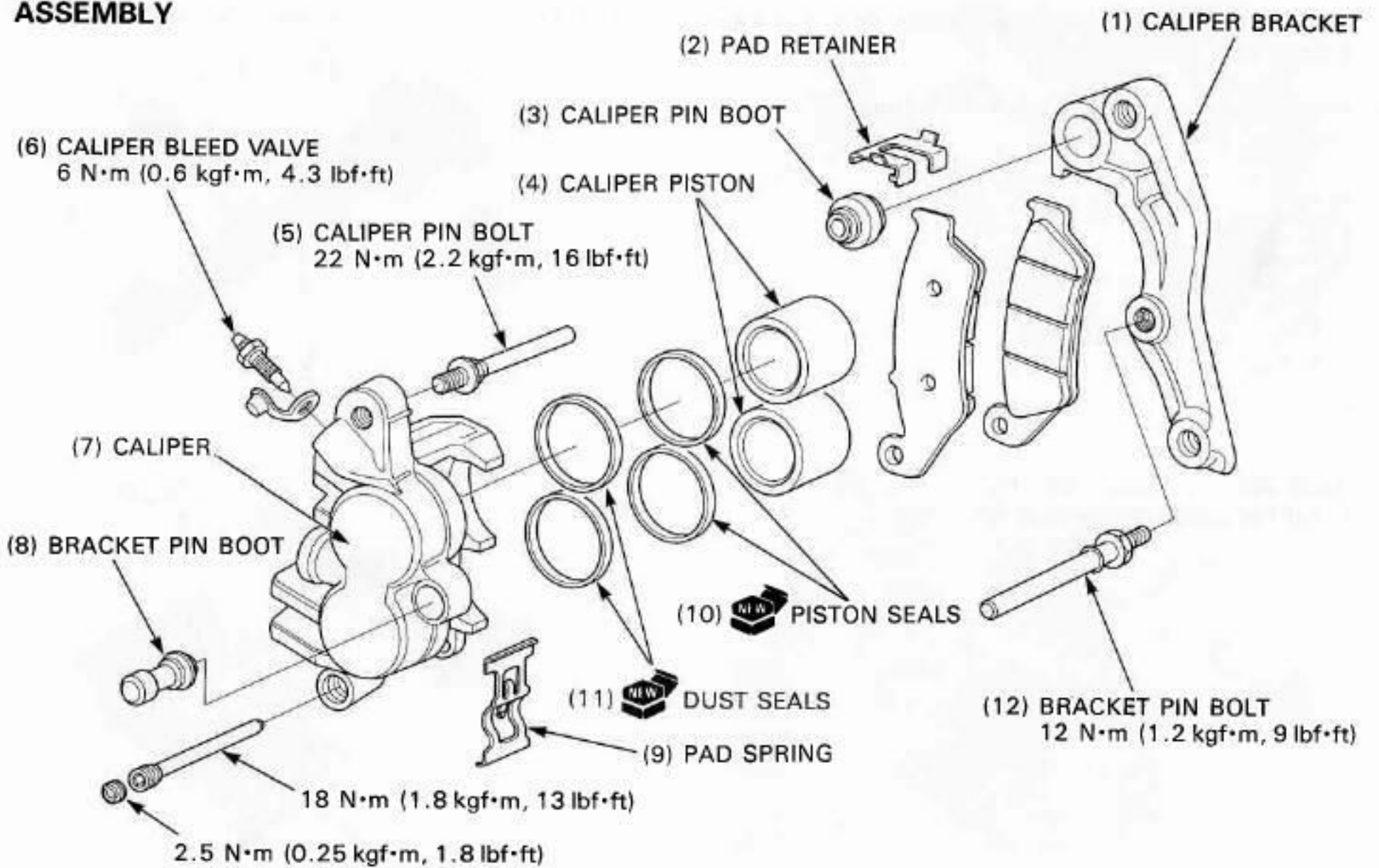


Measure the caliper piston O.D.

SERVICE LIMIT: 26.92 mm (1.060 in)



ASSEMBLY



HYDRAULIC BRAKE

NOTE

- Replace the dust seals and piston seals with a new ones.
- Replace the caliper and bracket pin boots if it is wear, deterioration or damage.
- Apply silicone grease to the boot inner surface.
- Be sure that each part is free from the dust or dirt before reassembly.

Coat new piston seals with clean brake fluid and install them in the seal grooves in the caliper.

Coat new dust seals with silicone grease and install them in the seal grooves in the caliper.

Coat the caliper piston with clean brake fluid and install it into the caliper cylinder with the opening toward the pads.

Install the pad spring to the caliper body.

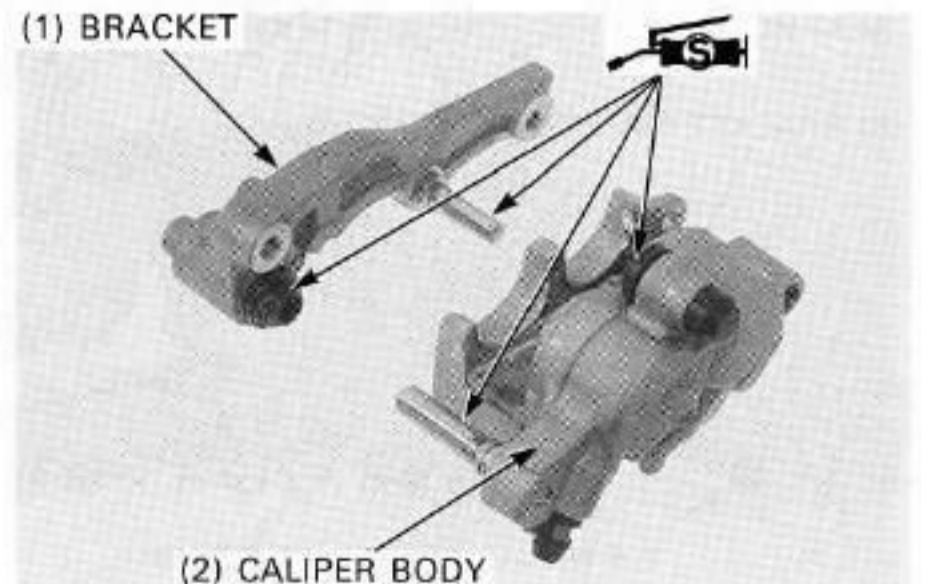
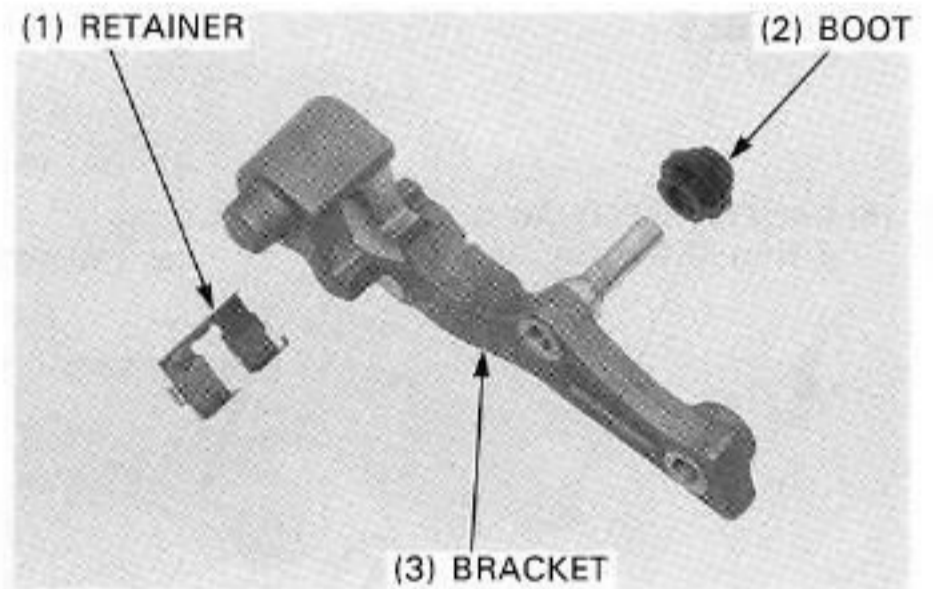
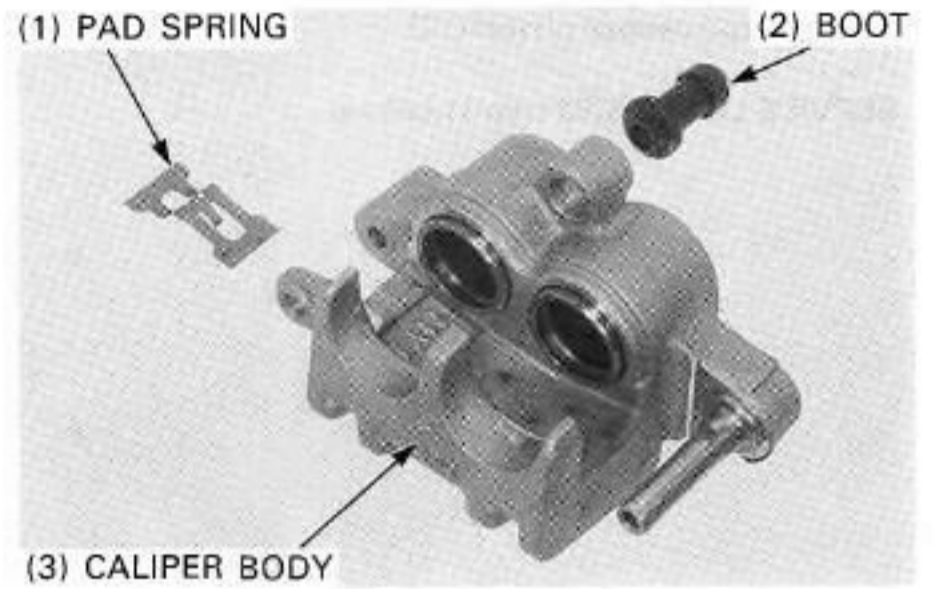
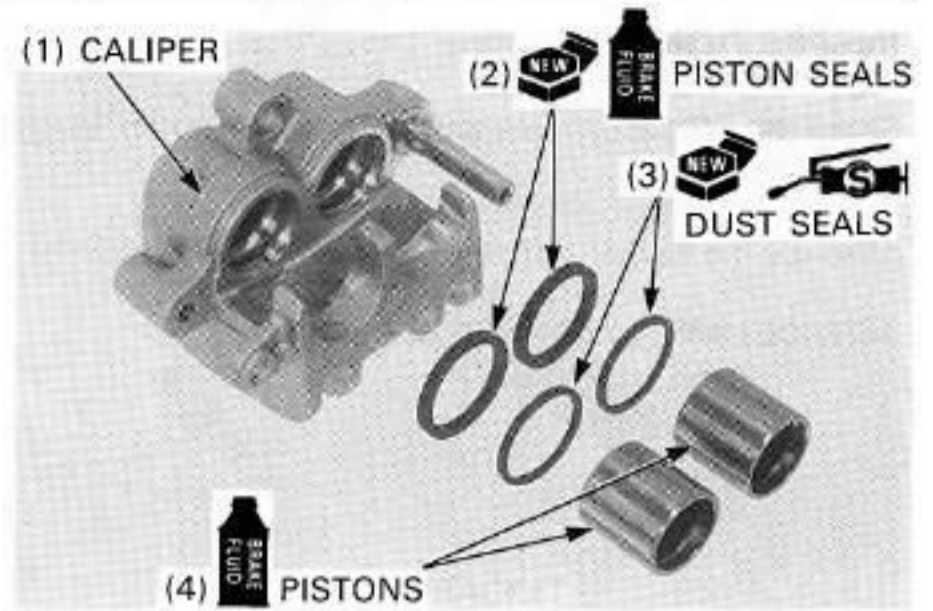
Replace the bracket pin boot with a new ones if it is wear, deterioration or damage.

Install the bracket pin boot to the caliper body.

Replace the caliper pin boot with a new ones if it is wear, deterioration or damage.

Install the caliper pin boot and pad retainer to the caliper bracket.

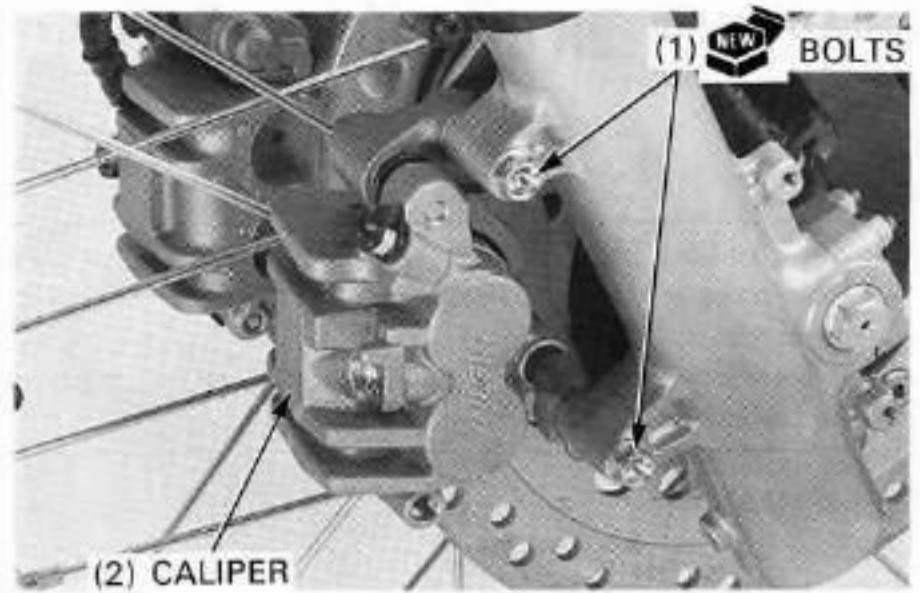
Apply silicone grease to the caliper and bracket pins.
Install the caliper bracket over the caliper.



INSTALLATION

Install the front brake caliper to the front fork.
Install and tighten the new front caliper mounting bolts to the specified torque.

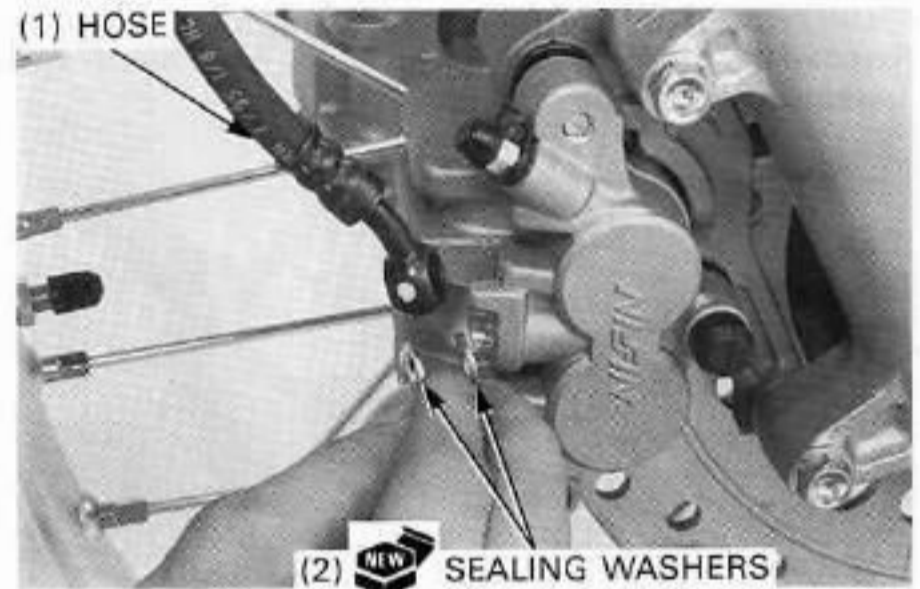
TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)



Connect the brake hose to the brake caliper with new sealing washers.

NOTE

- Be careful not to twist the brake hose.



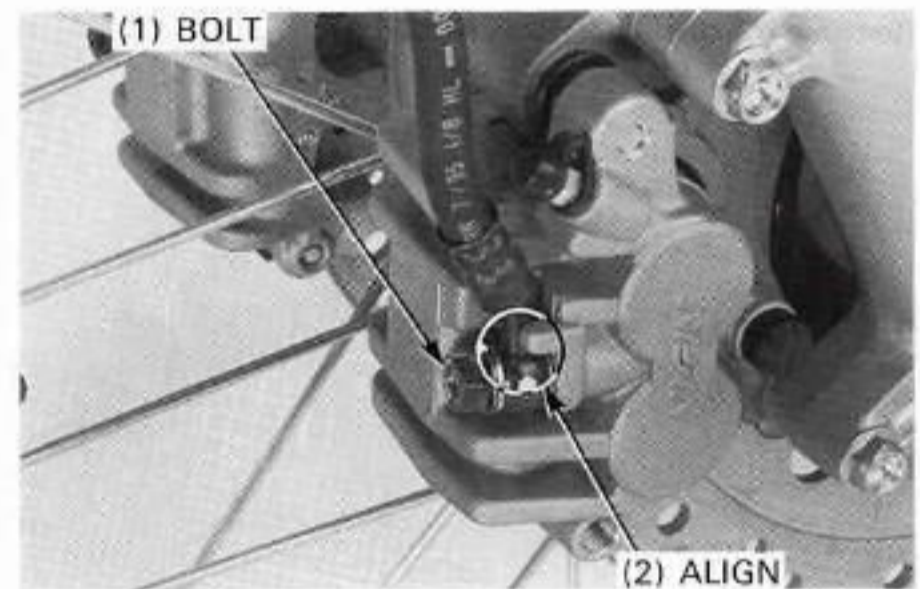
Install the brake pad (page 15-8).

Install and tighten the brake hose oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

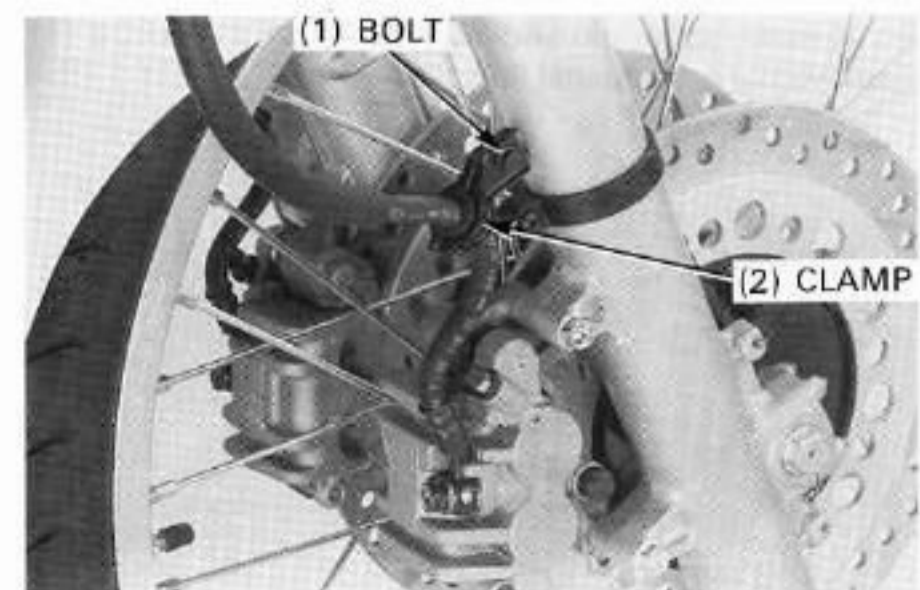
NOTE

- While tightening the brake hose oil bolt, align the brake hose end with the stopper.



Install the brake hose clamp and tighten the bolt securely.

Install the fork cover (page 2-5).
Refill the brake fluid (page 15-5).



HYDRAULIC BRAKE

REAR MASTER CYLINDER/BRAKE PEDAL

CAUTION

- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag or shop towel over these parts whenever the system is serviced.
- When removing the oil hose, cover the end of the hose to prevent contamination.

REMOVAL

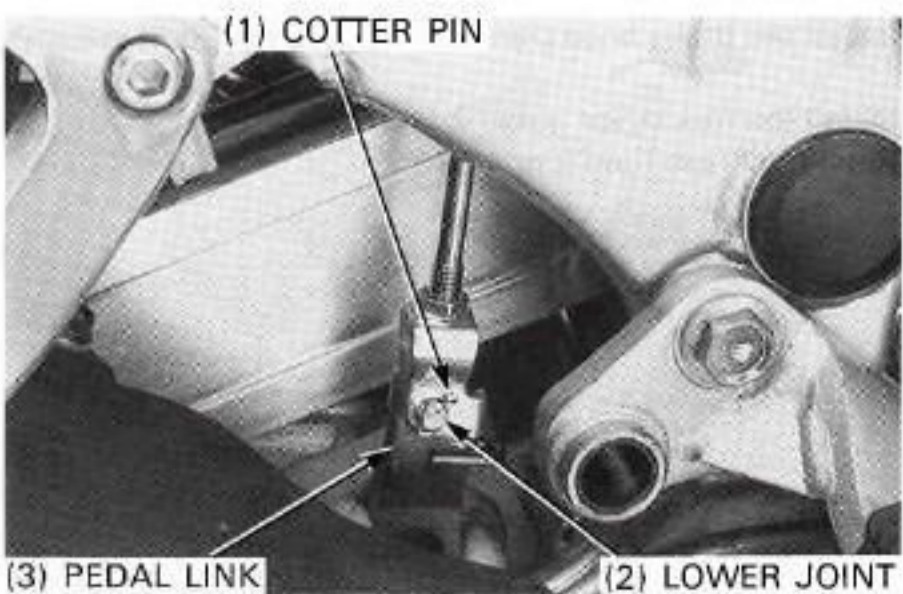
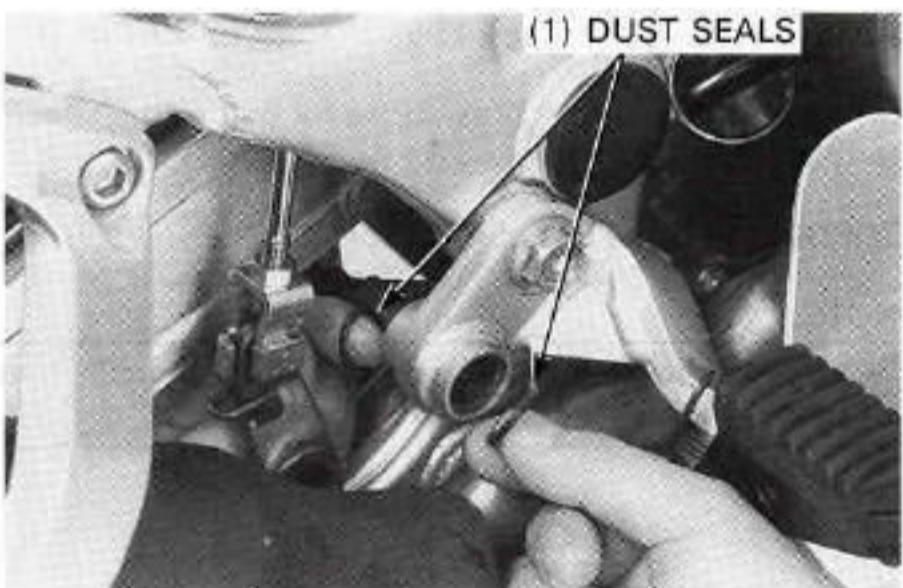
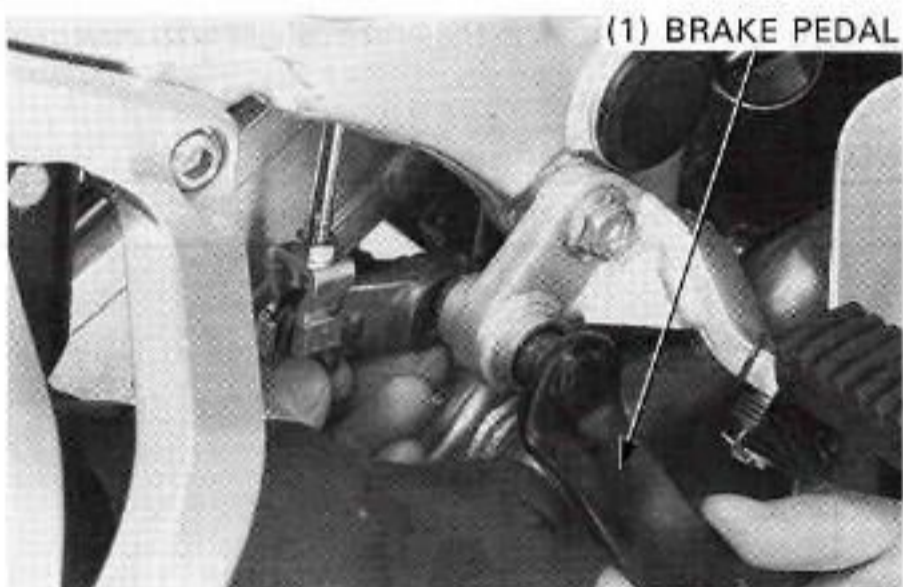
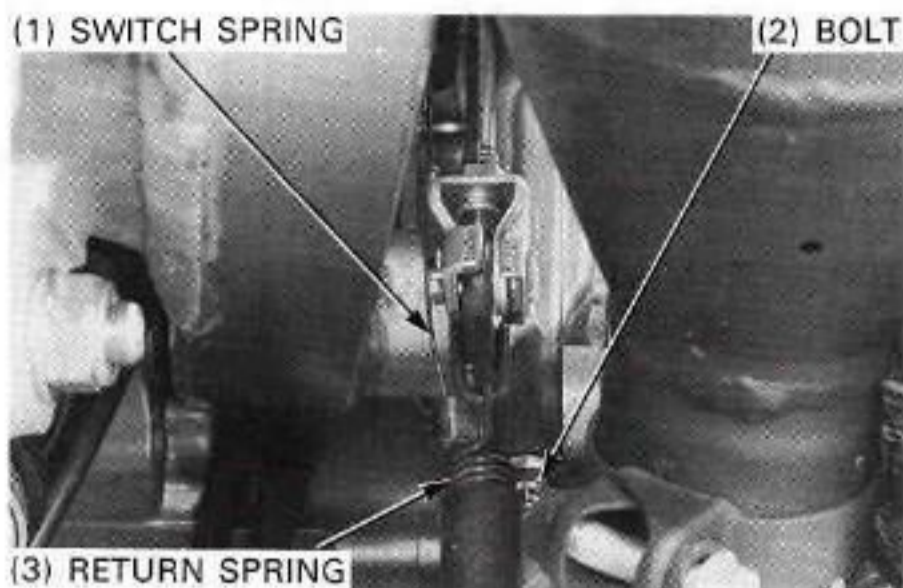
Remove the side cover (page 2-7).
Drain the brake fluid (page 15-4).

Remove the brake pedal link bolt, brake light switch spring and brake pedal return spring.

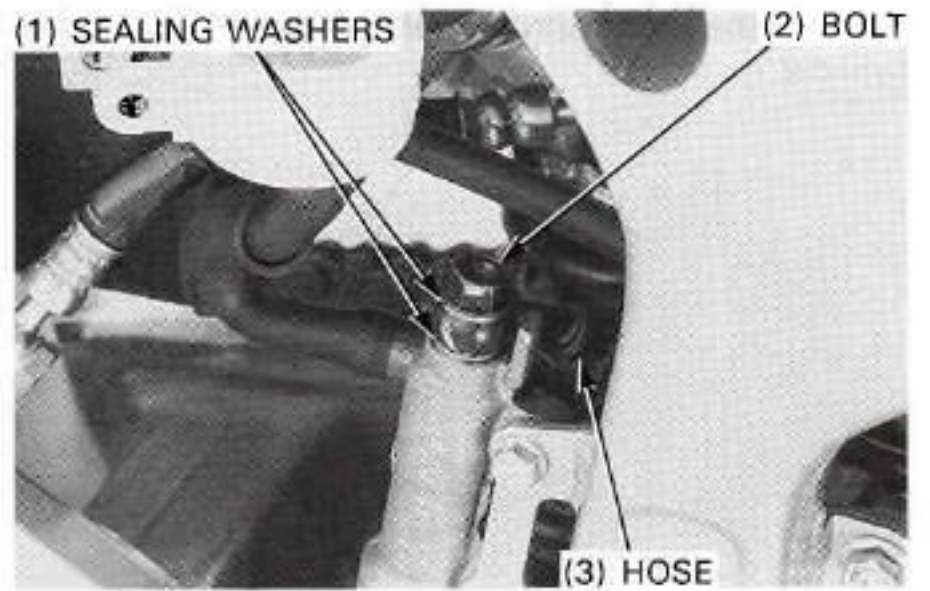
Remove the brake pedal.

Remove the dust seals.

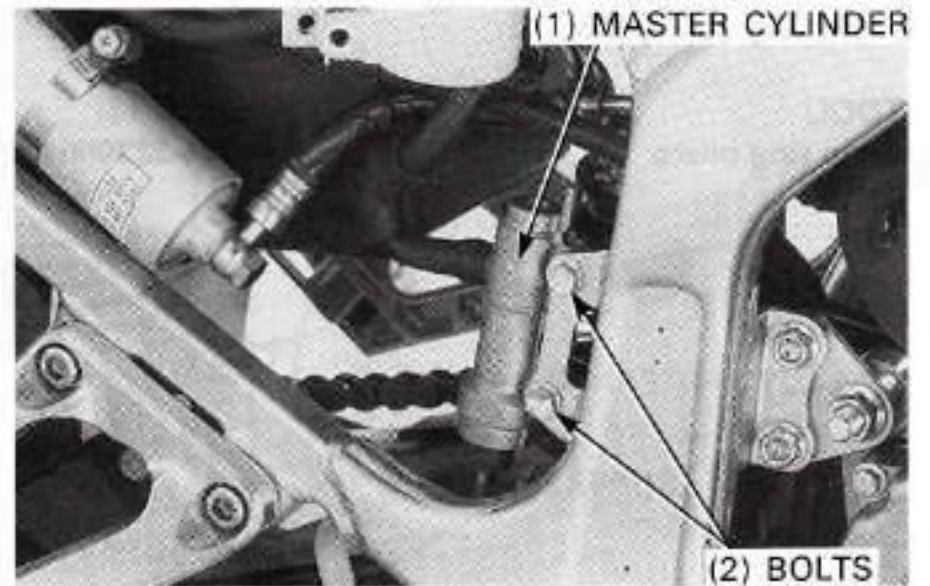
Remove the cotter pin and lower joint.
Remove the brake pedal link.



Remove the brake hose oil bolt and sealing washers. Disconnect the brake hose from the master cylinder.

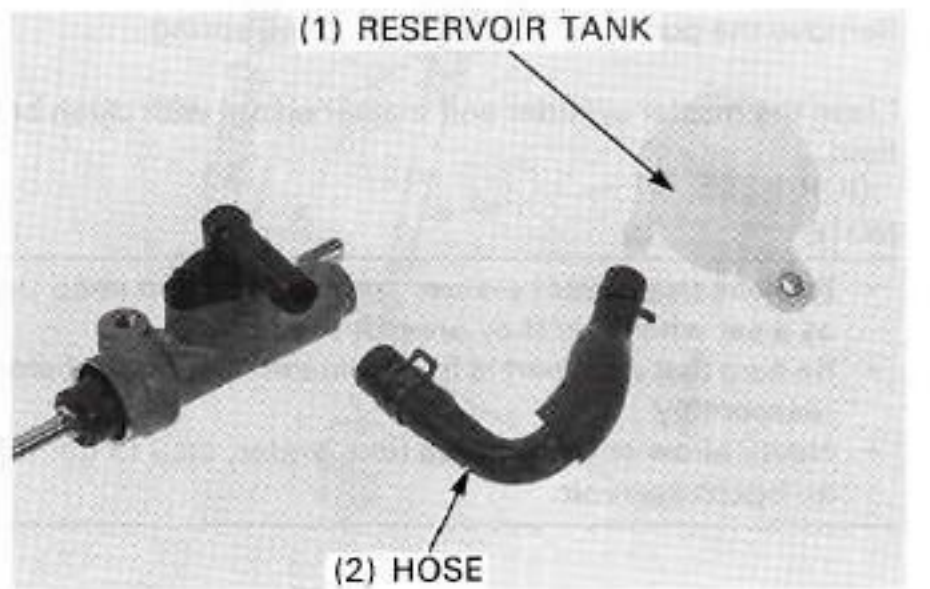


Remove the rear master cylinder mounting bolts and rear master cylinder.

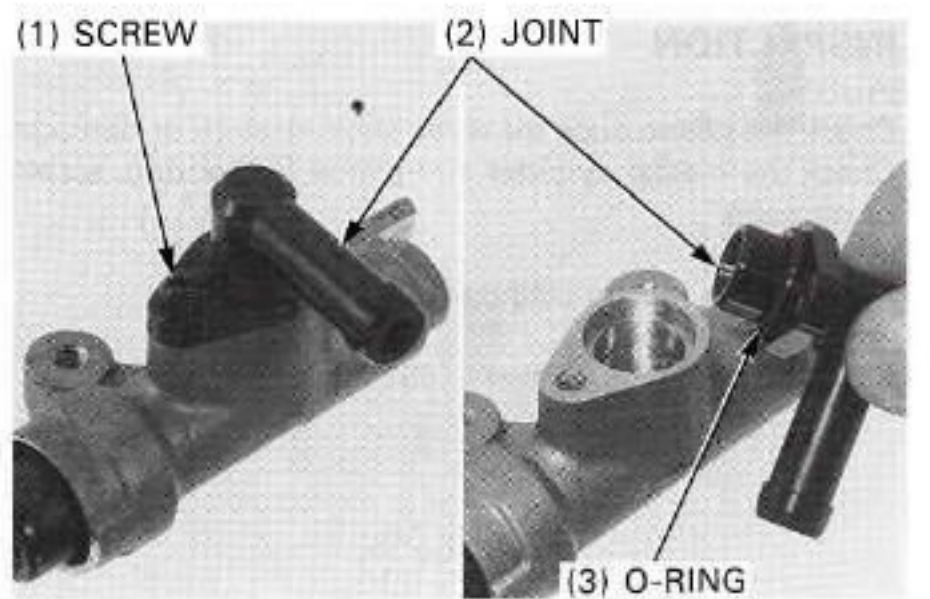


DISASSEMBLY

Disconnect the reservoir hose and reservoir tank.

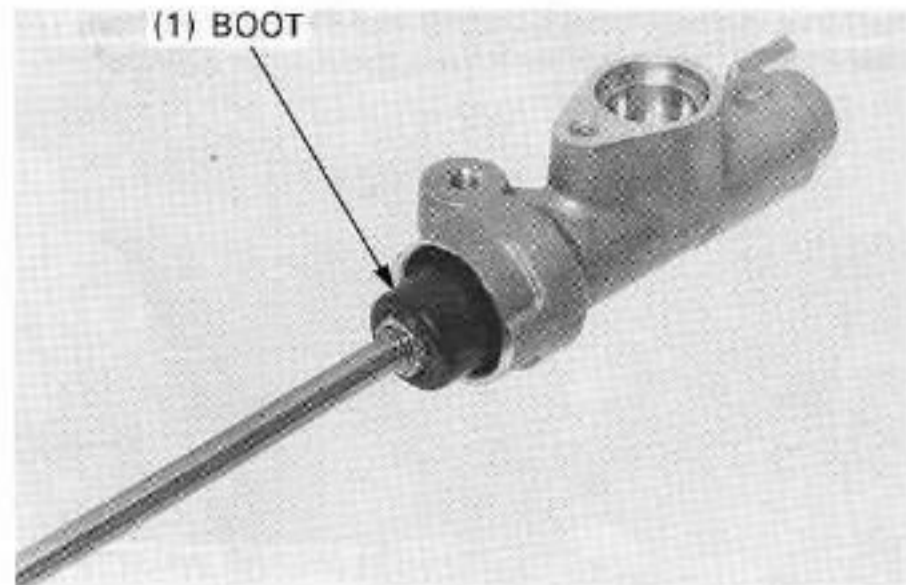


Remove the screw, reservoir hose joint and O-ring.



HYDRAULIC BRAKE

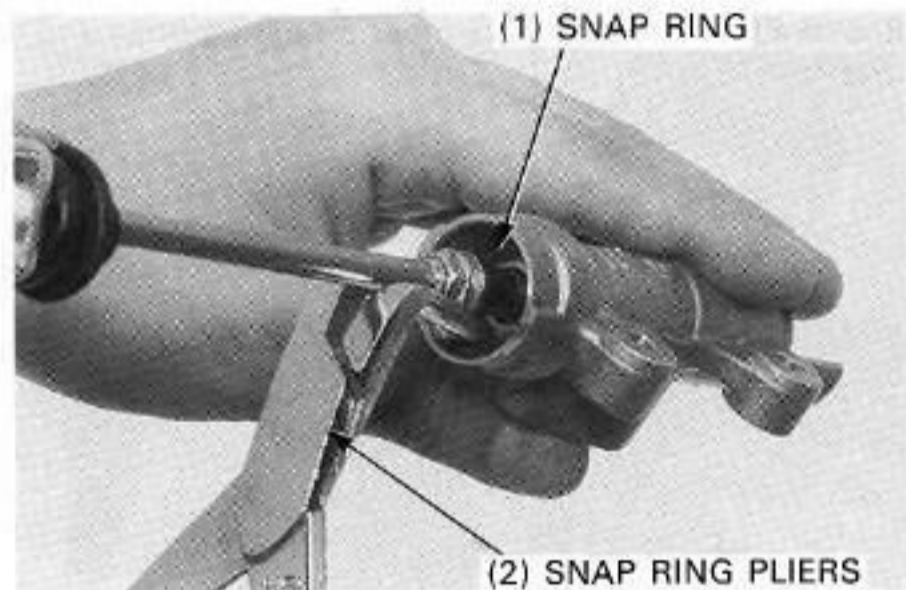
Remove the boot from the push rod groove and master cylinder.



Remove the snap ring.

TOOL:
Snap ring pliers

07914-3230001

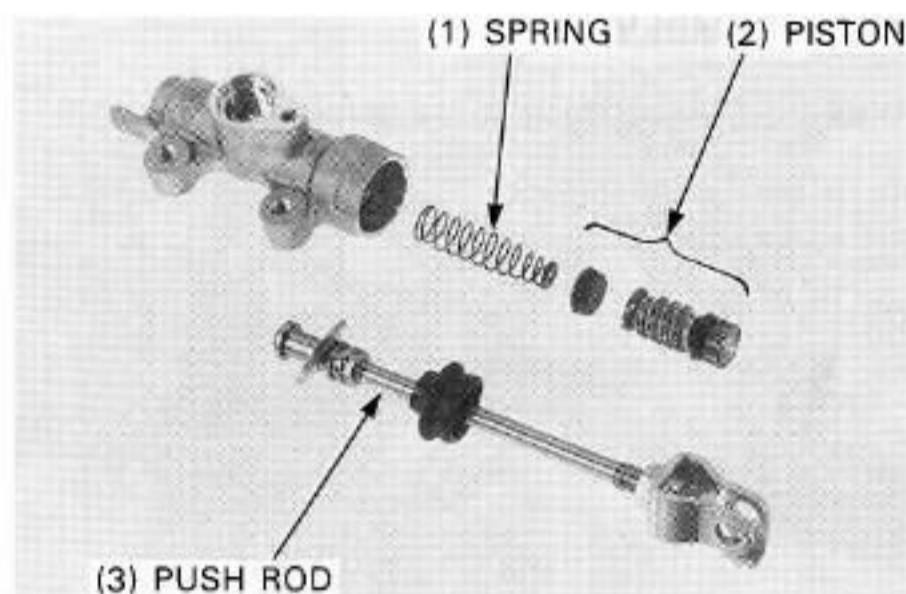


Remove the push rod, master piston and spring.

Clean the master cylinder and master piston with clean brake fluid.

NOTE

- Replace the master piston, spring, cups and snap ring as a set whenever they are disassembled.
- Be sure that each part is free from the dust or dirt before reassembly.
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.

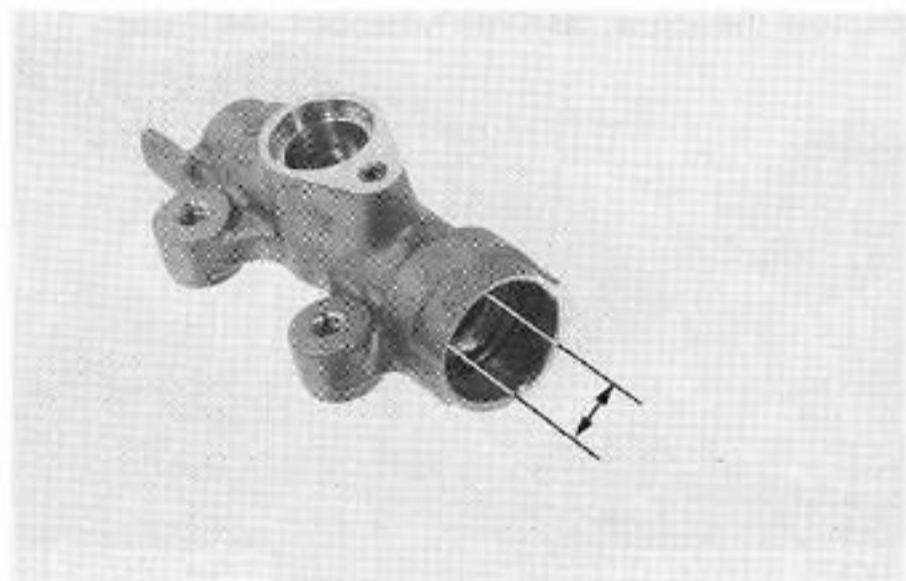


INSPECTION

Check the piston cups for wear, deterioration or damage. Check the master cylinder and piston for scoring, scratches or damage.

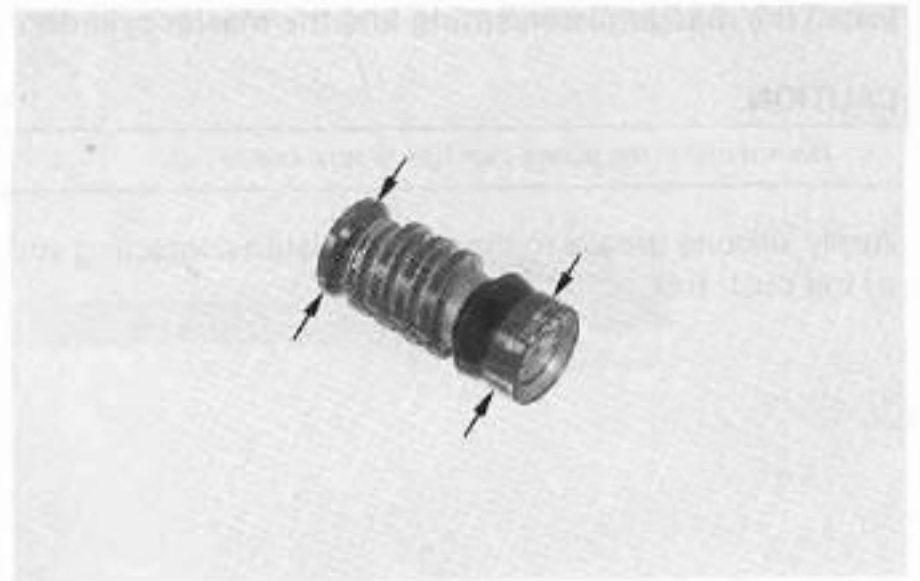
Measure the master cylinder I.D.

SERVICE LIMIT: 14.05 mm (0.553 in)

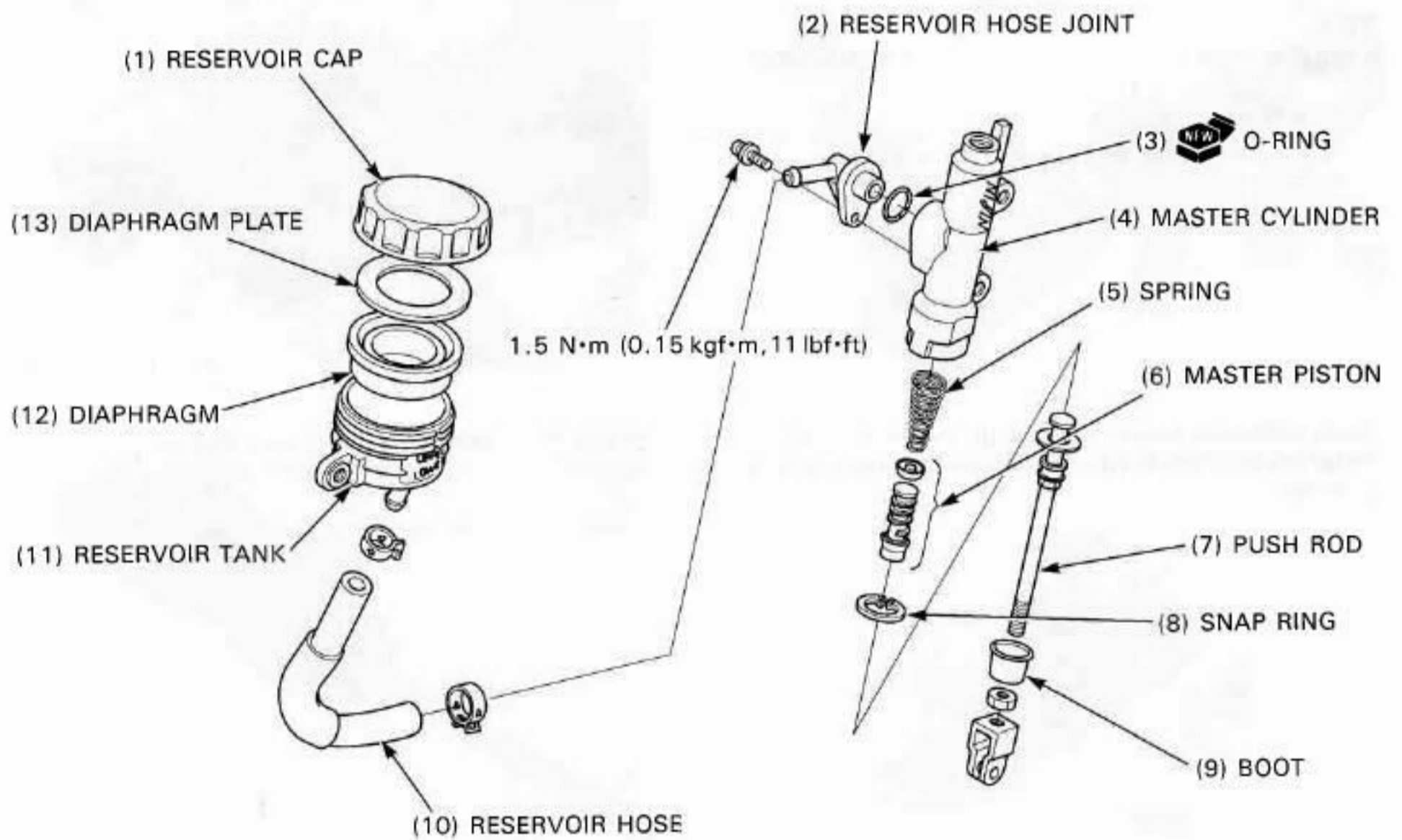


Measure the master piston O.D.

SERVICE LIMIT: 13.95 mm (0.549 in)



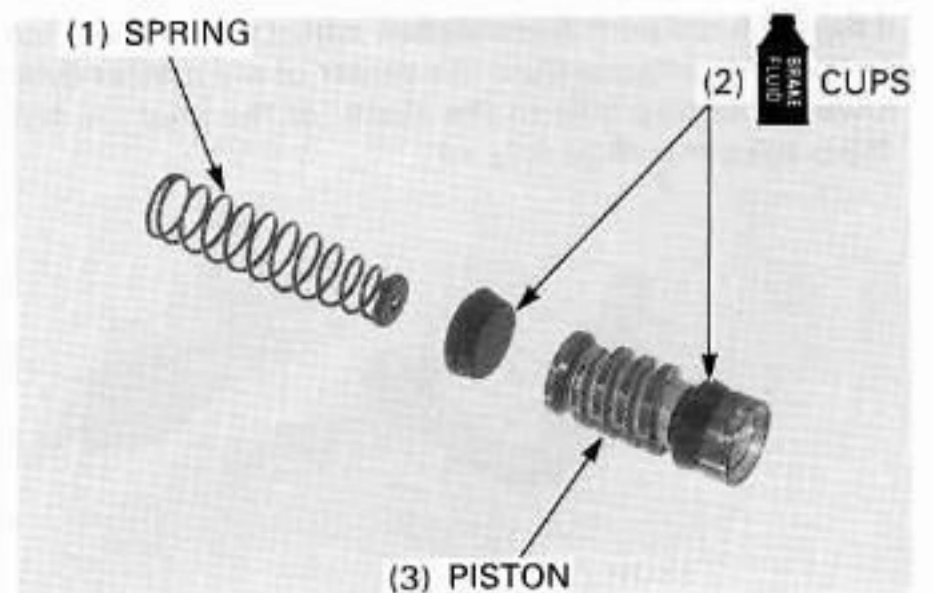
ASSEMBLY



NOTE

- Replace the master piston, spring, cups and snap ring as a set.
- Replace the boot if it is wear, deterioration or damage.
- Apply silicone grease to the boot inner surface.
- Be sure that each part is free from the dust or dirt before reassembly.

Coat the master piston and piston cups with clean DOT 4 brake fluid.
 Install the spring onto the master piston end.



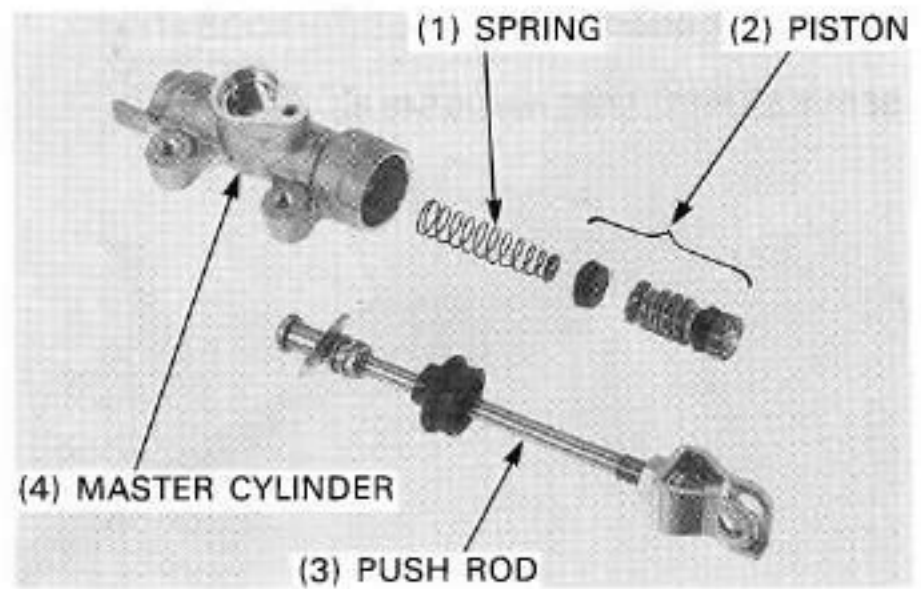
HYDRAULIC BRAKE

Install the master piston/spring into the master cylinder.

CAUTION

- Do not allow the piston cup lips to turn inside out.

Apply silicone grease to the master piston contacting surface of the push rod.



Install the snap ring into the groove in the master cylinder.

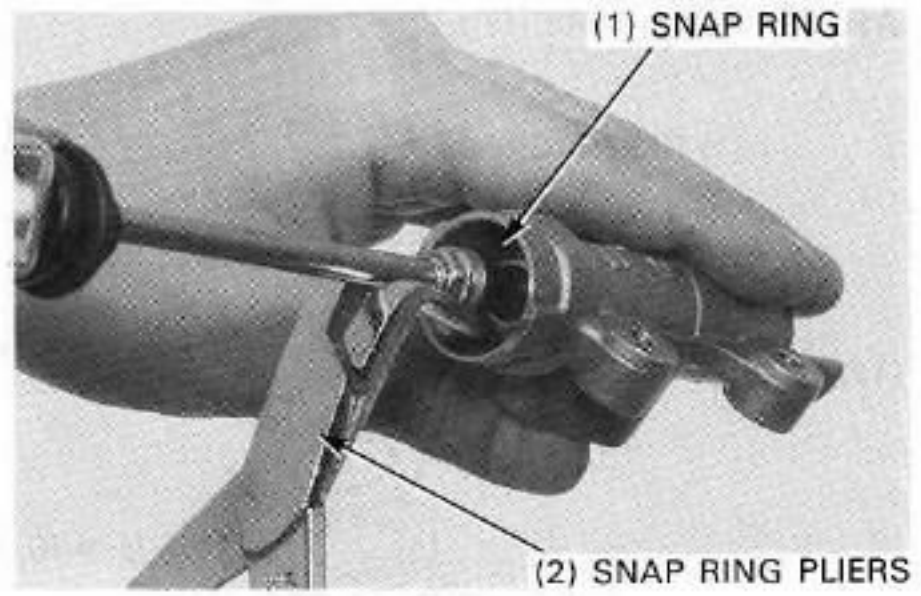
TOOL:

Snap ring pliers

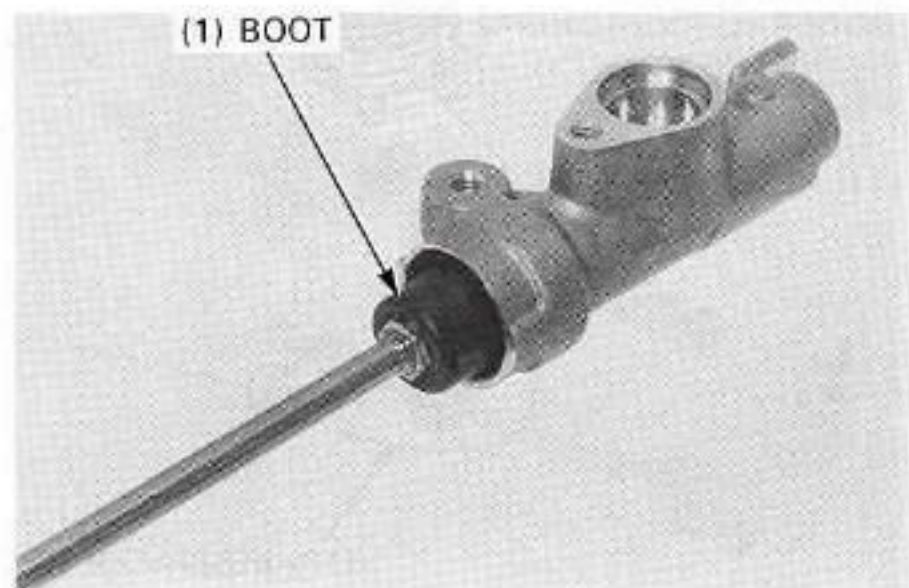
07914-3230001

CAUTION

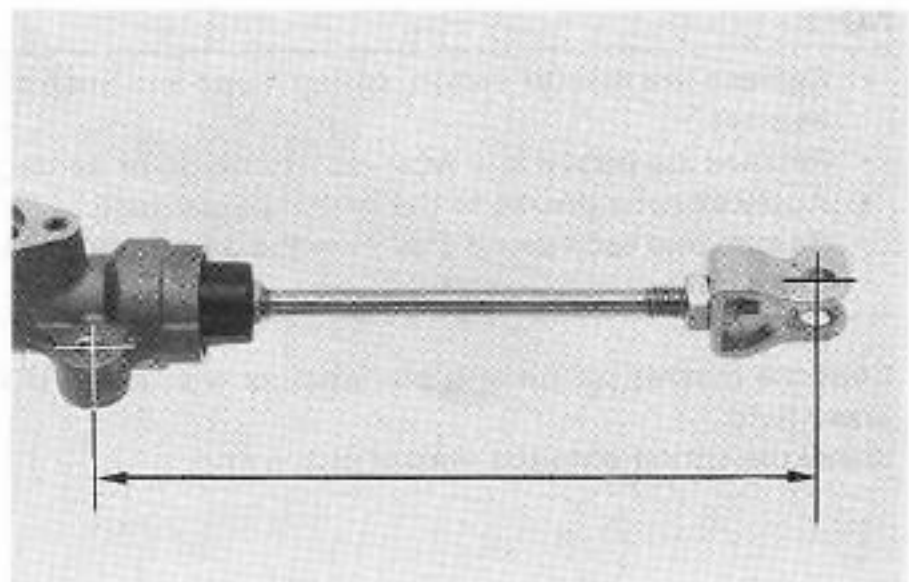
- Be certain the snap ring is firmly seated in the groove.



Apply silicone grease to the boot groove in the push rod. Install the boot into the master cylinder and the groove in the push rod.

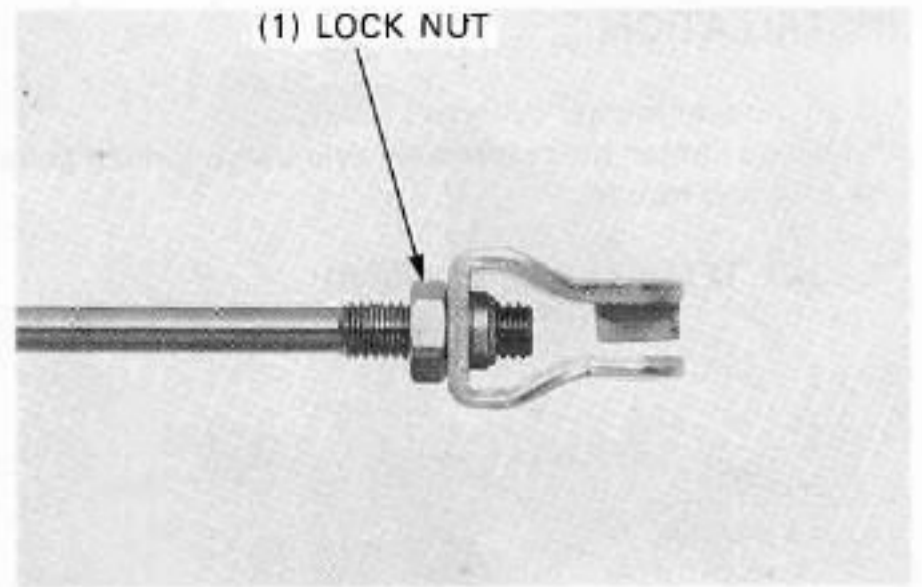


If the push rod joint is reinstalled, adjust the push rod length so that the distance from the center of the master cylinder lower mounting hole to the center of the joint pin hole is 153.5-155.5 mm (6.04-6.12 in).

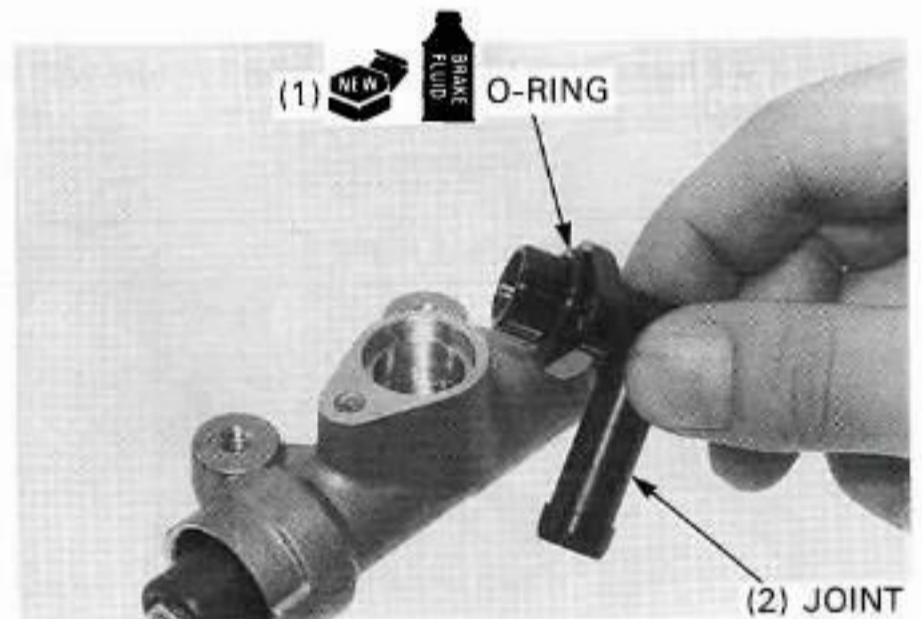


After adjustment, tighten the lock nut.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

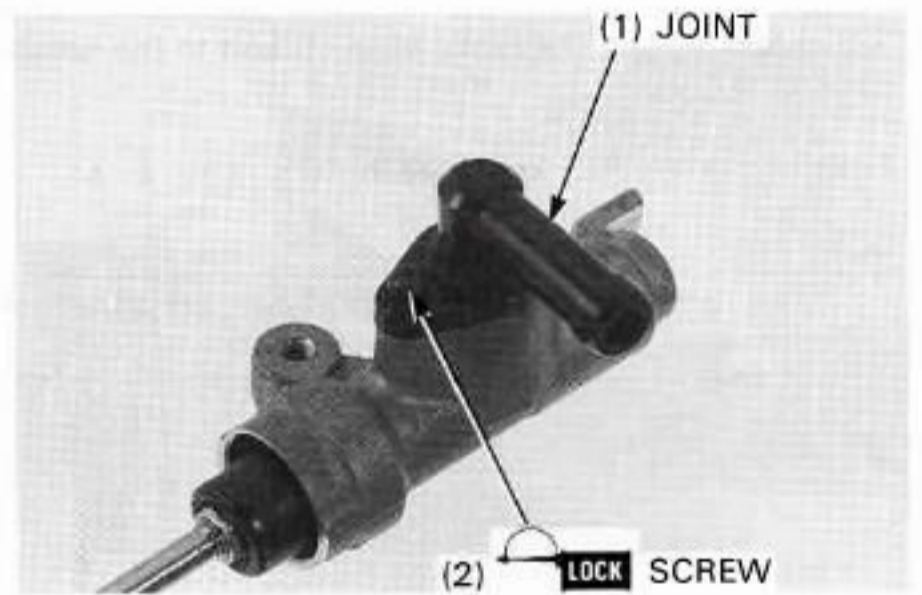


Coat the new O-ring with clean brake fluid and install it onto the reservoir hose joint.

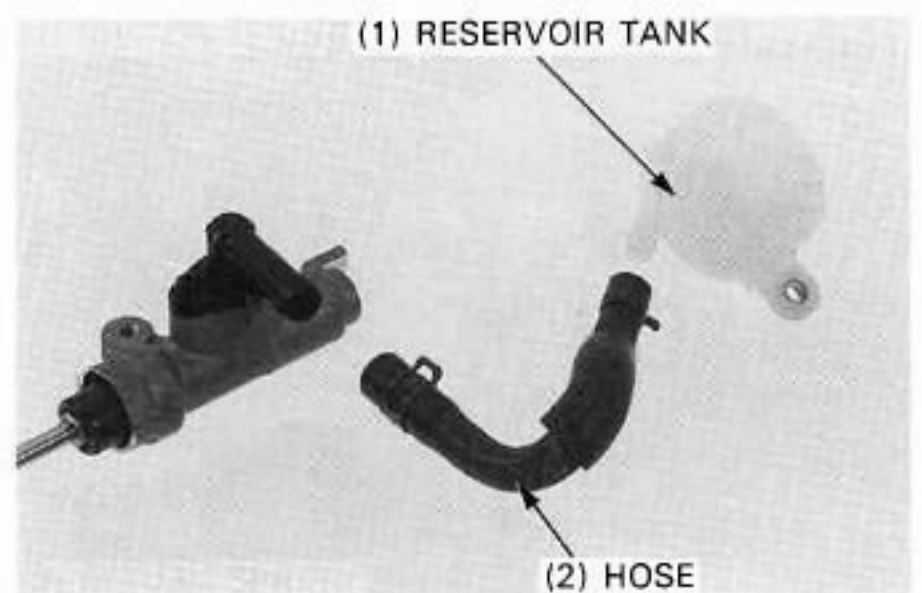


Install the reservoir hose joint to the rear master cylinder. Clean and apply a locking agent to the reservoir hose joint screw threads. Install and tighten the screw to the specified torque.

TORQUE: 1.5 N·m (0.15 kgf·m, 11 lbf·ft)



Connect the reservoir hose and reservoir tank.

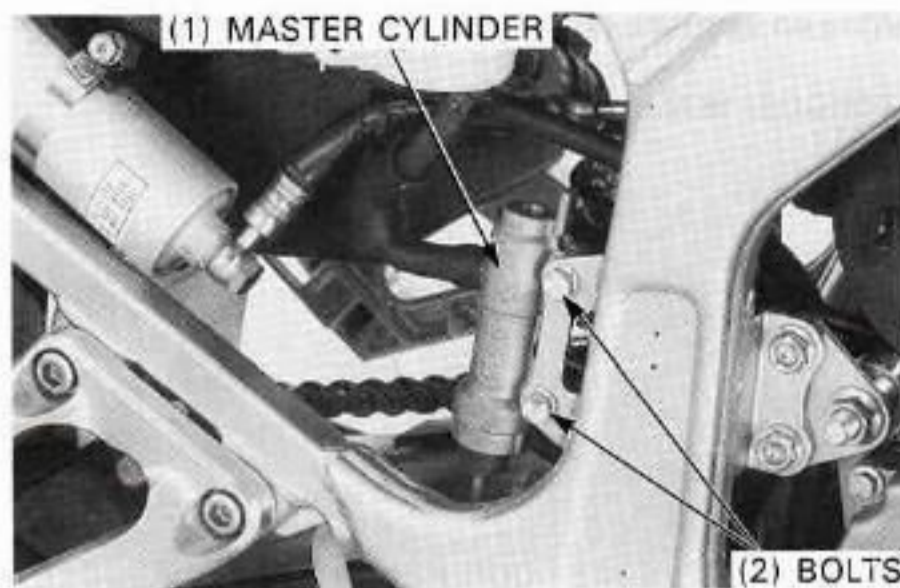


HYDRAULIC BRAKE

INSTALLATION

Install the rear master cylinder.
Install and tighten the rear master cylinder mounting bolts to the specified torque.

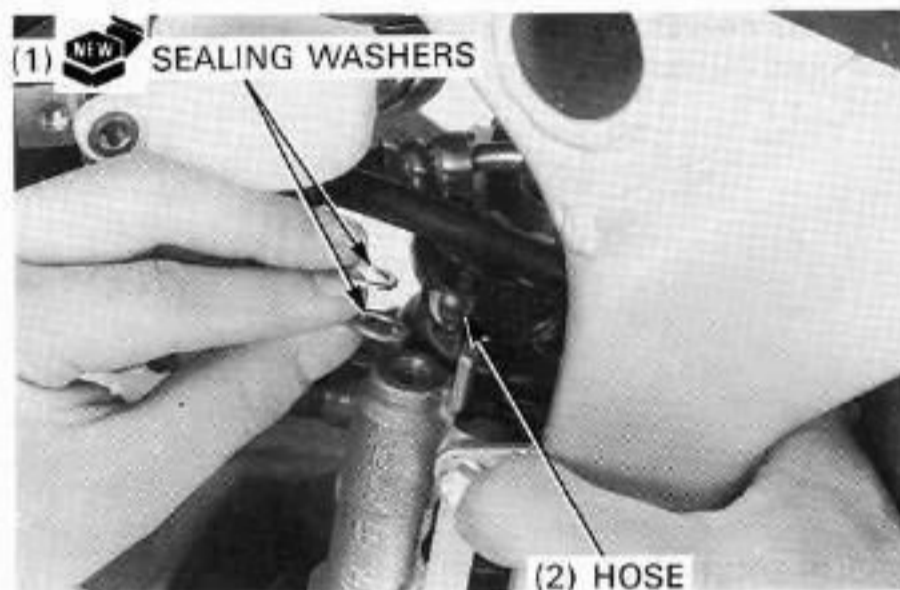
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Connect the brake hose to the rear master cylinder with new sealing washers.

NOTE

- Be careful not to twist the brake hose.

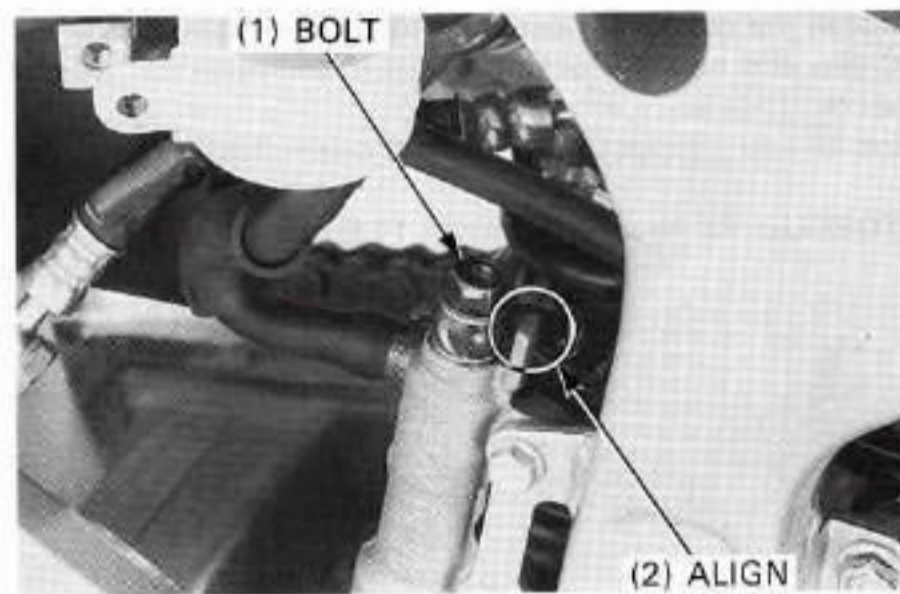


Install and tighten the brake hose oil bolt to the specified torque.

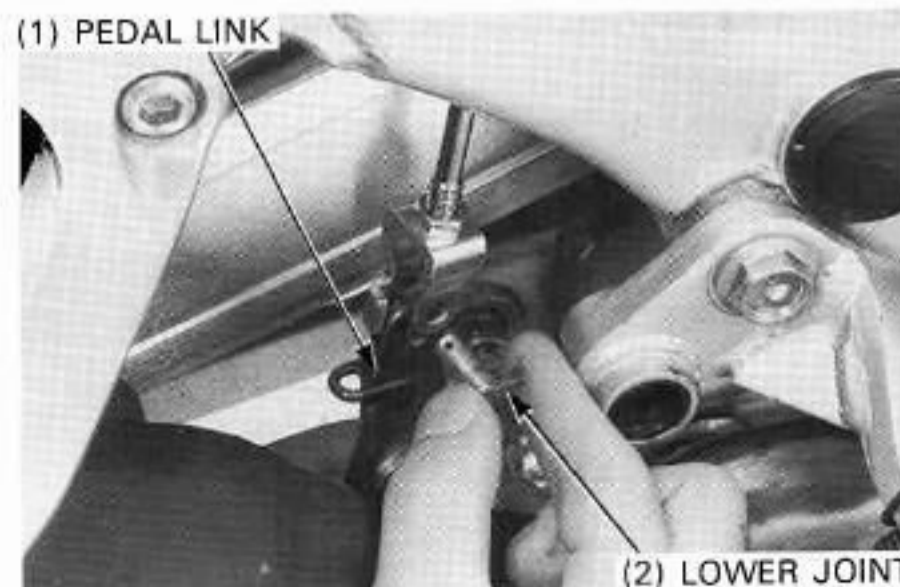
TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

NOTE

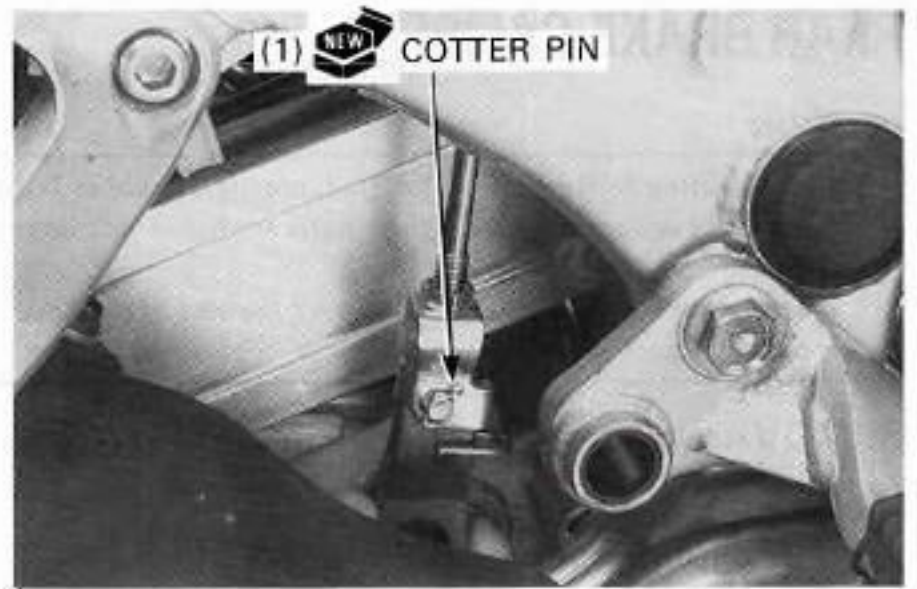
- While tightening the brake hose oil bolt, press the brake hose end against the stopper.



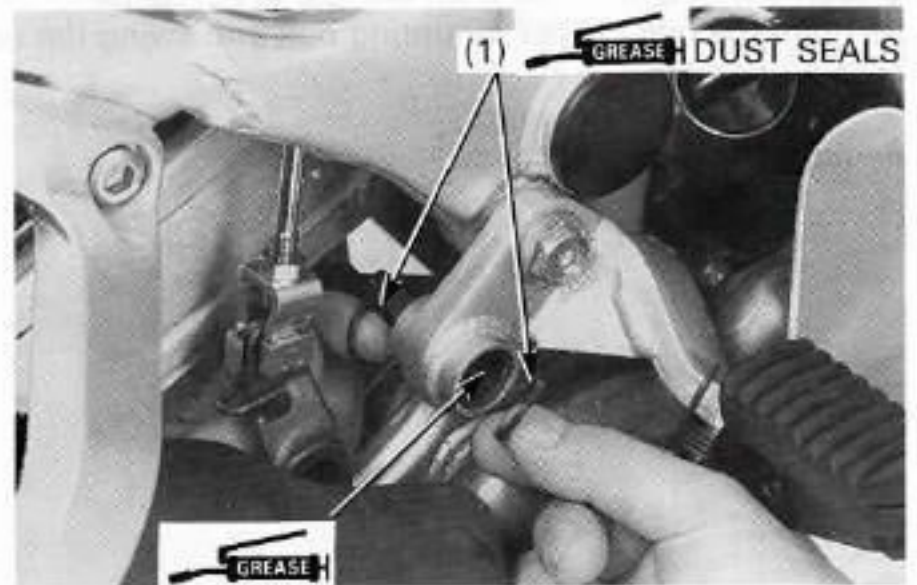
Install the brake pedal link and lower joint.



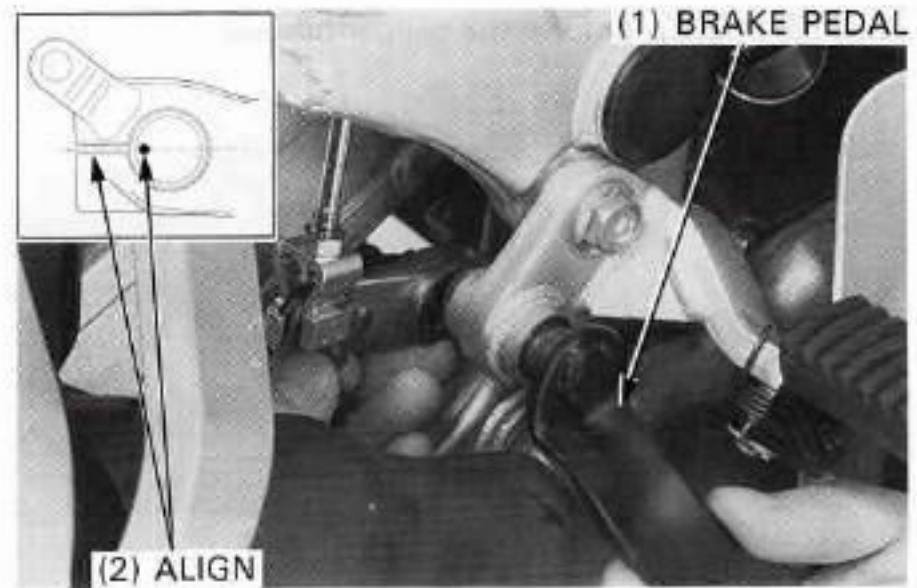
Install the new cotter pin.



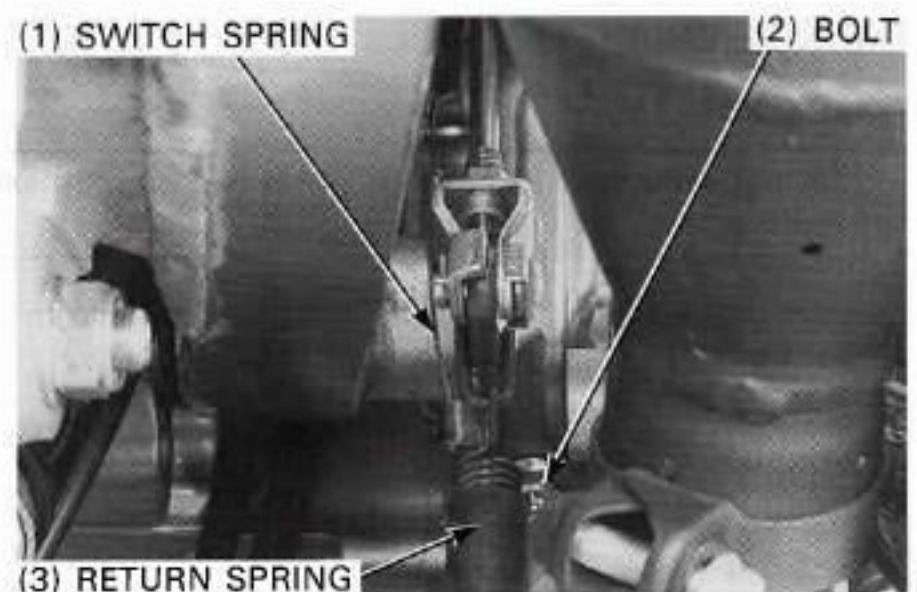
Apply grease to the brake pedal pivot surface.
Apply grease to the dust seal lips and install the dust seals with the lip side facing to the frame.



Apply grease to the brake pedal pivot and install the brake pedal to the frame.
Install the brake pedal link aligning the slit with the punch mark on the brake pedal.



Install and tighten the brake pedal link pinch bolt securely.
Install the brake light switch return spring and brake pedal return spring.



Refill the brake fluid and bleed the rear hydraulic system (page 15-5).

HYDRAULIC BRAKE

REAR BRAKE CALIPER

CAUTION

- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag or shop towel over these parts whenever the system is serviced.
- When removing the oil hose bolt, cover the end of the hose to prevent contamination.

REMOVAL

Drain the brake fluid (page 15-4).

Remove the brake hose bolt and sealing washers. Disconnect the brake hose from the rear brake caliper. Remove the rear caliper mounting bolt and swing the rear caliper upward.

Remove the brake pad (page 15-8).

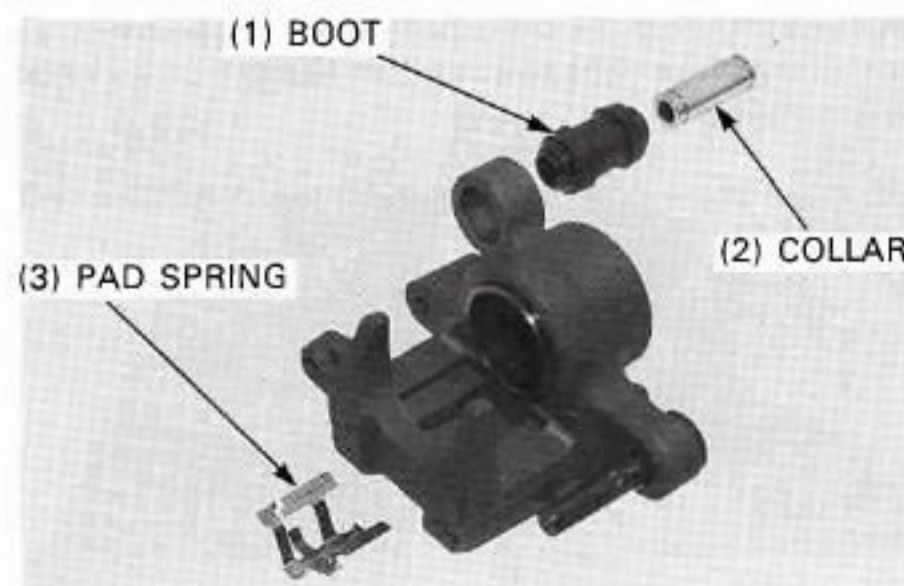
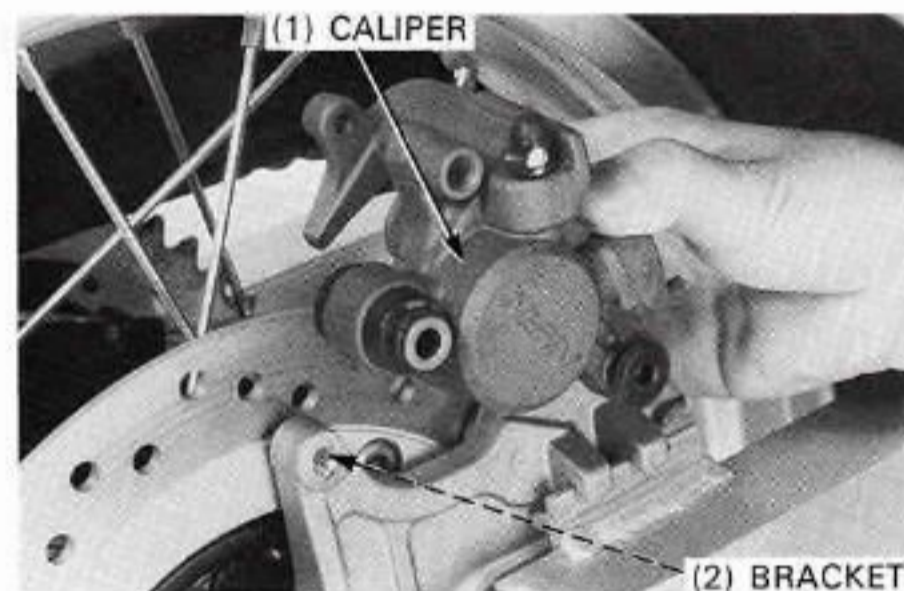
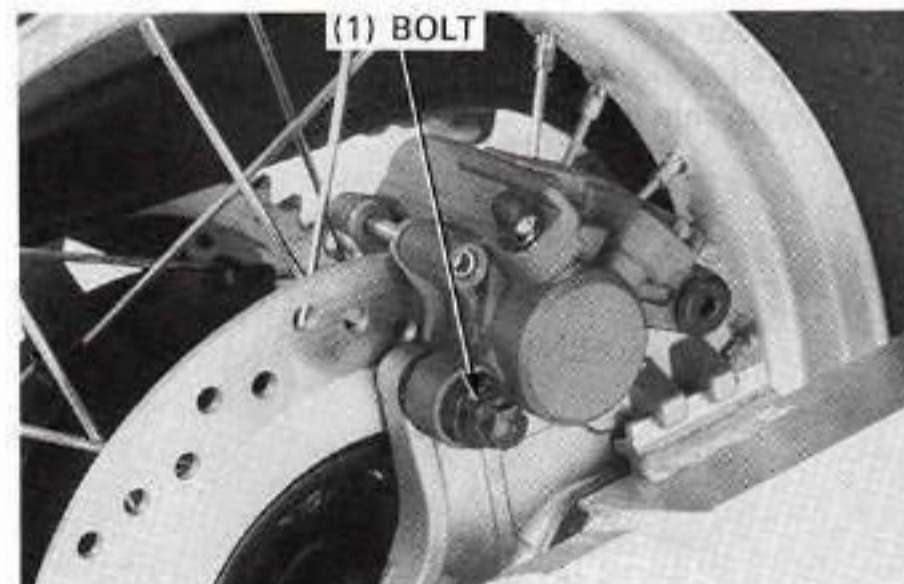
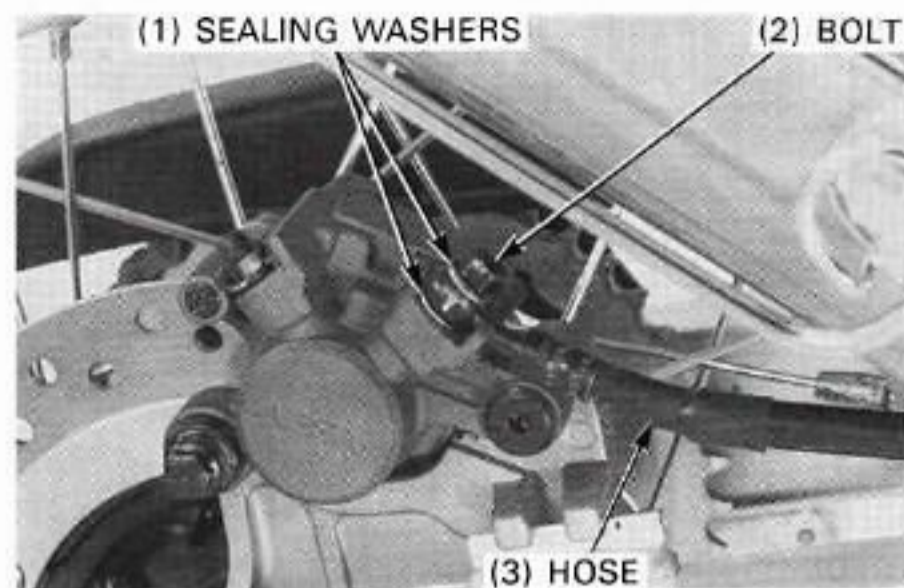
Remove the caliper from the caliper bracket.

DISASSEMBLY

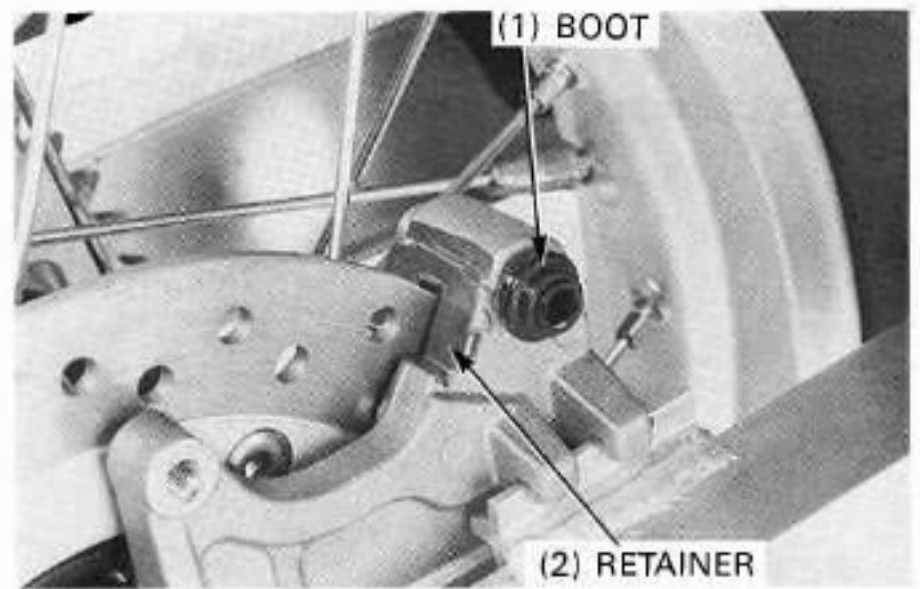
NOTE

- Do not remove the caliper and bracket pins unless replacement.

Remove the pad spring, collar and bracket pin boot from the caliper body.



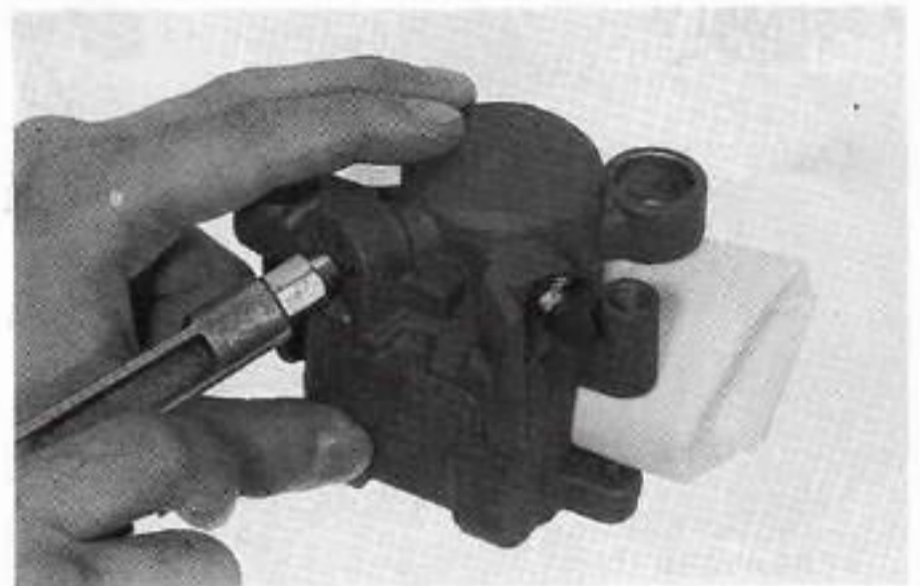
Remove the pad retainer and caliper pin boot from the caliper bracket.



Place a shop towel over the piston.
Position the caliper body with the piston down and apply small squirts of air pressure to the fluid inlet to remove the piston.

⚠ WARNING

- Do not use high pressure air or bring the nozzle too close to the inlet.

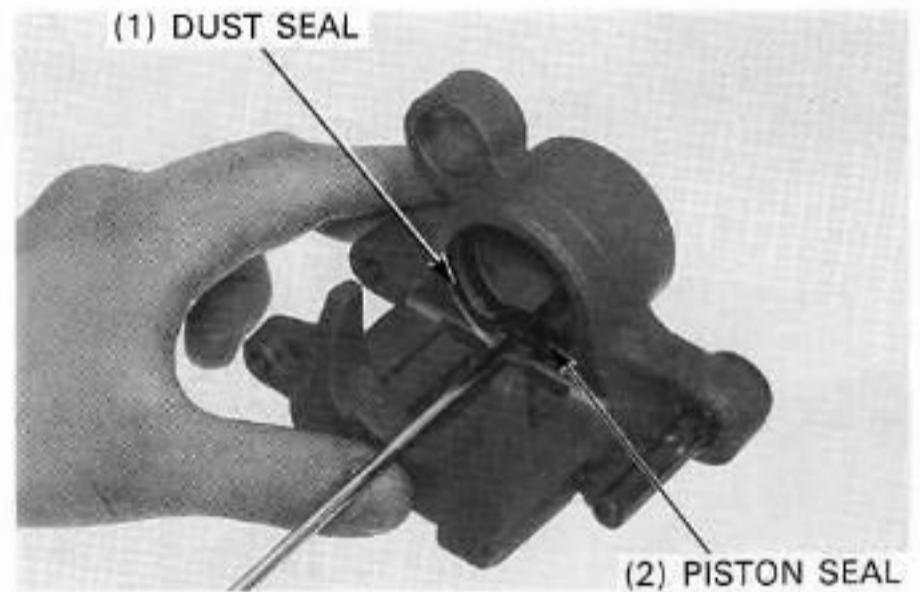


Push the dust seal and piston seal in and lift them out.

CAUTION

- Be careful not to damage the piston sliding surface.

Clean the seal grooves, caliper piston and caliper piston sliding surfaces with clean brake fluid.

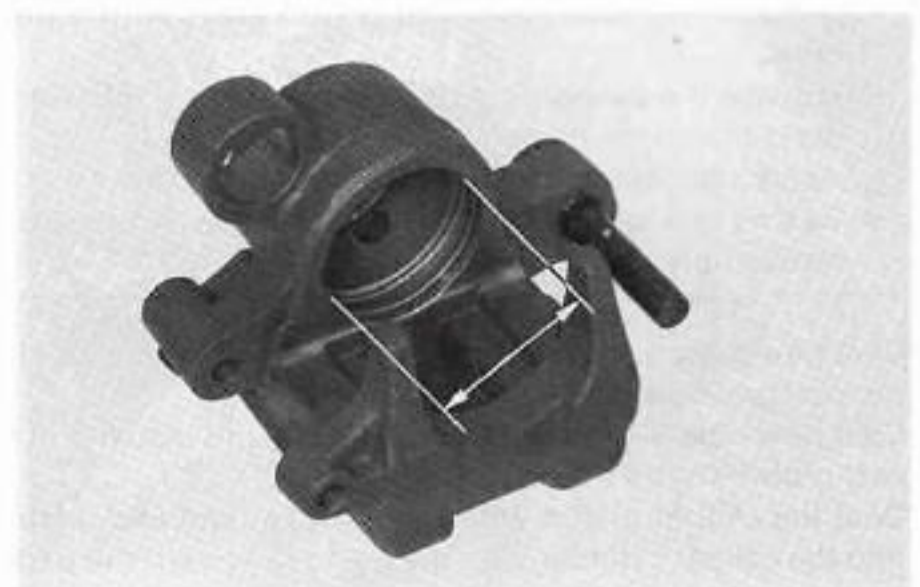


INSPECTION

Check the caliper cylinder and pistons for scoring, scratches or damage.

Measure the caliper cylinder I.D.

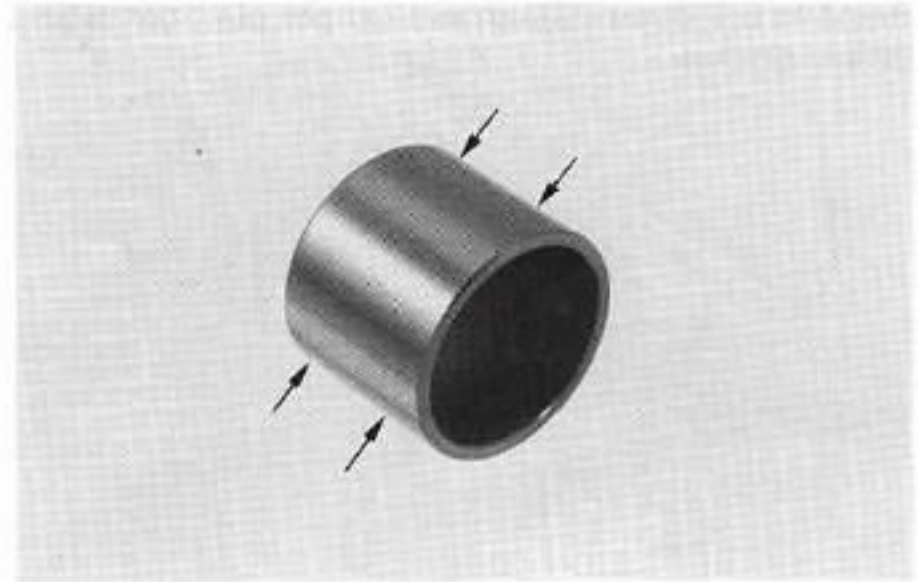
SERVICE LIMIT: 38.24 mm (1.506 in)



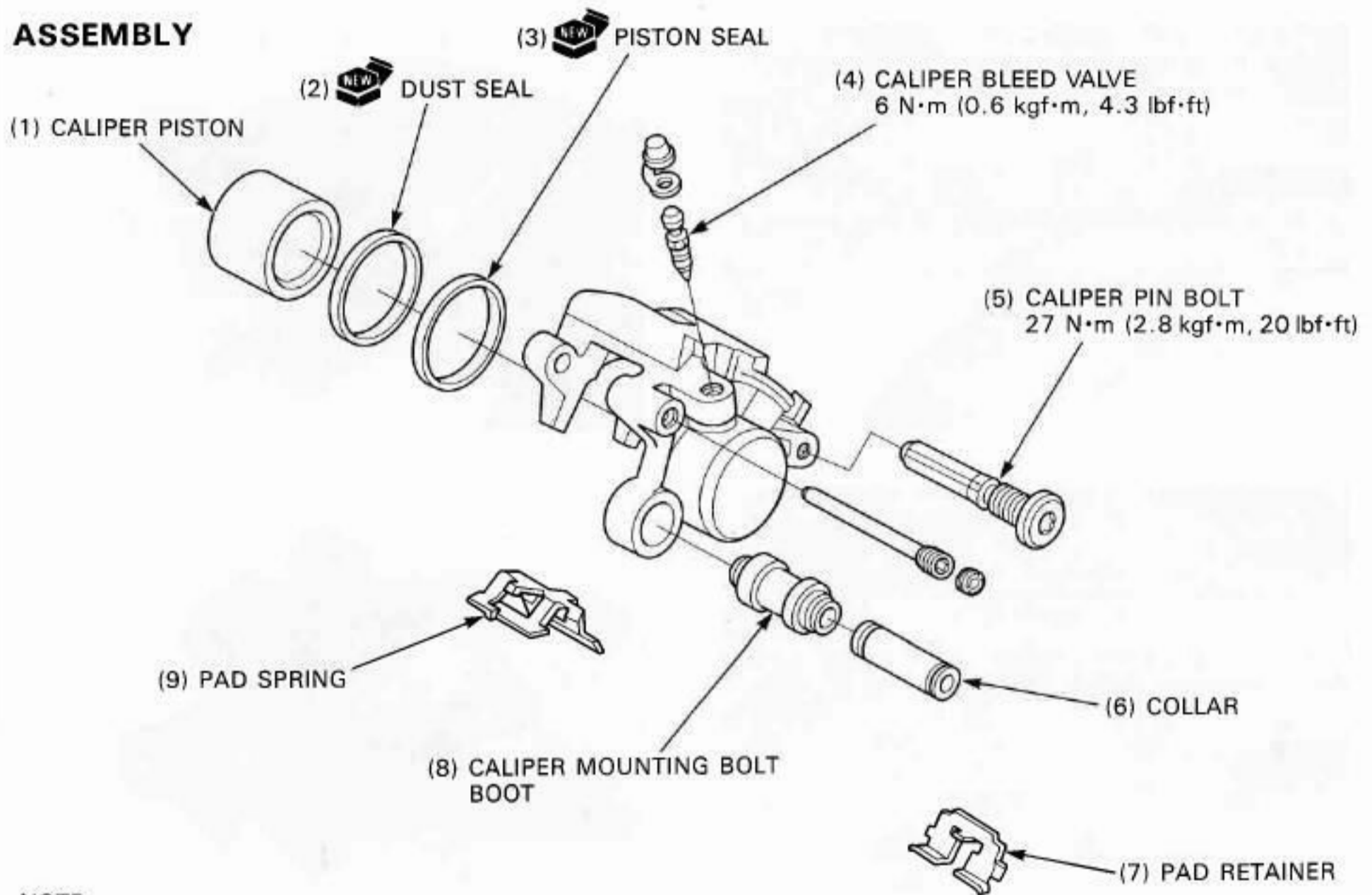
HYDRAULIC BRAKE

Measure the caliper piston O.D.

SERVICE LIMIT: 38.11 mm (1.500 in)



ASSEMBLY



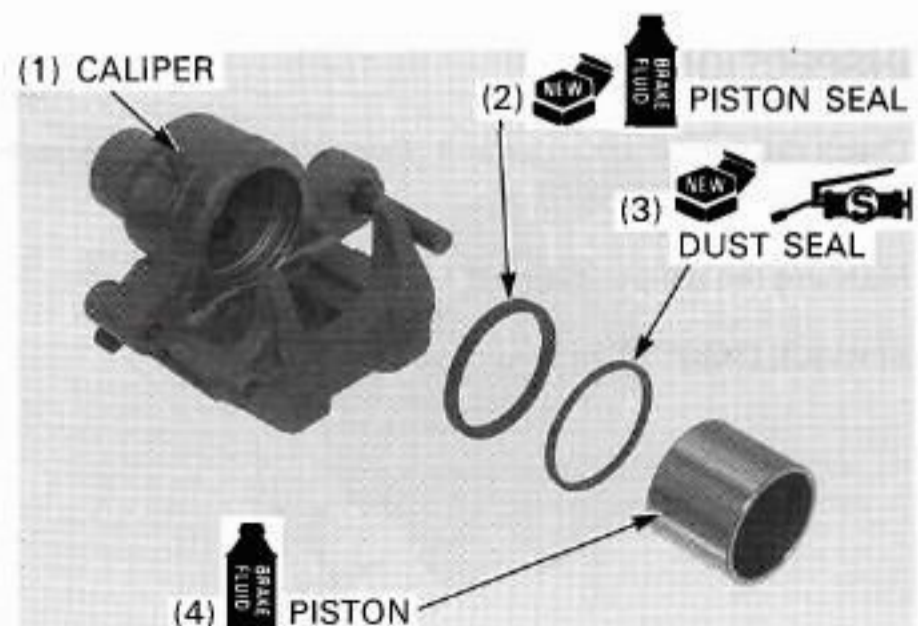
NOTE

- Replace the dust seals and piston seals with a new ones.
- Replace the caliper and bracket pin boots if it is wear, deterioration or damage.
- Apply silicone grease to the boot inner surface.
- Be sure that each part is free from the dust or dirt before reassembly.

Coat new piston seal with clean brake fluid and install it in the seal groove in the caliper.

Coat new dust seal with silicone grease and install it in the seal groove in the caliper.

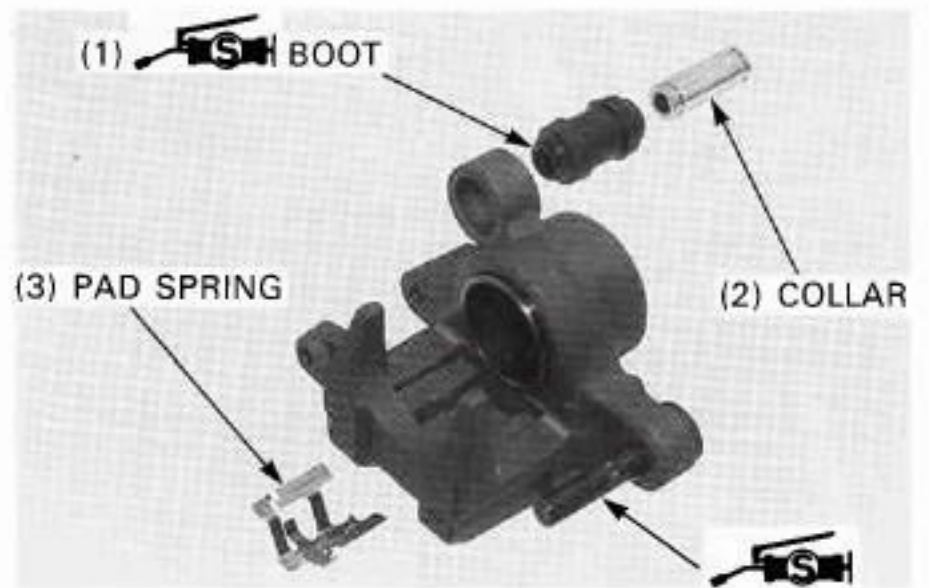
Coat the caliper piston with clean brake fluid and install it into the caliper cylinder with the opening toward the pads.



Replace the caliper mounting bolt boot with a new ones if it is wear, deterioration or damage.

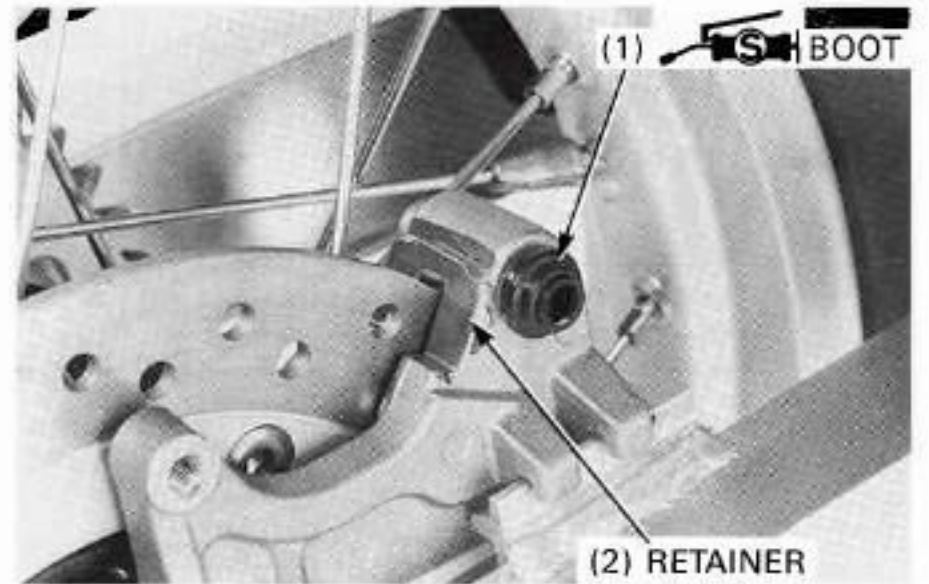
Apply silicone grease to the inside of the caliper mounting bolt boot.
Install the caliper mounting bolt boot and collar to the caliper body.

Install the pad spring to the caliper body.



Replace the caliper pin boot with a new ones if it is wear, deterioration or damage.

Apply silicone grease to the inside of the caliper pin boot.
Install the caliper pin boot and pad retainer to the caliper bracket.

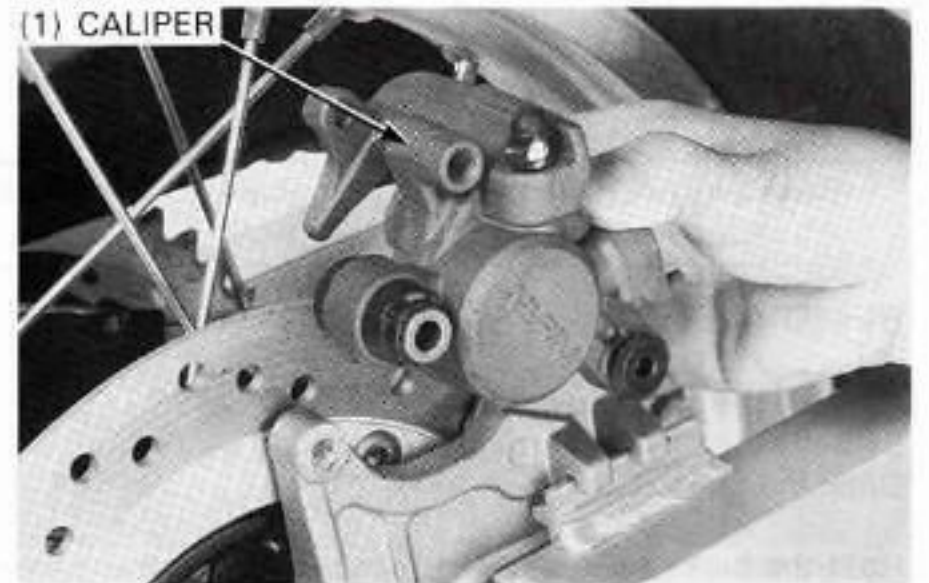


INSTALLATION

Apply silicone grease to the caliper pin and bracket pin bolt sliding surfaces.

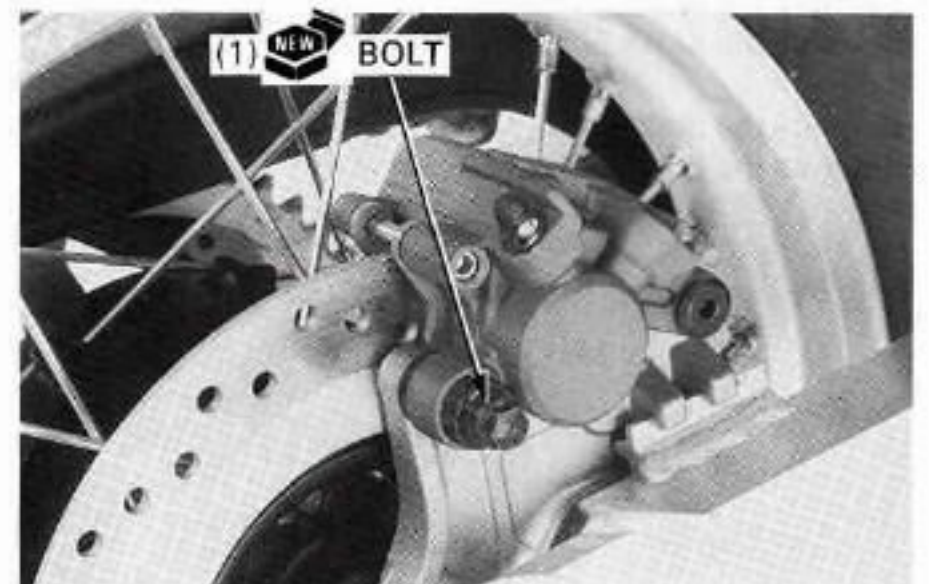
Install the rear brake caliper to the caliper bracket.

Install the brake pad (page 15-9).



Install and tighten the new rear caliper mounting bolt to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

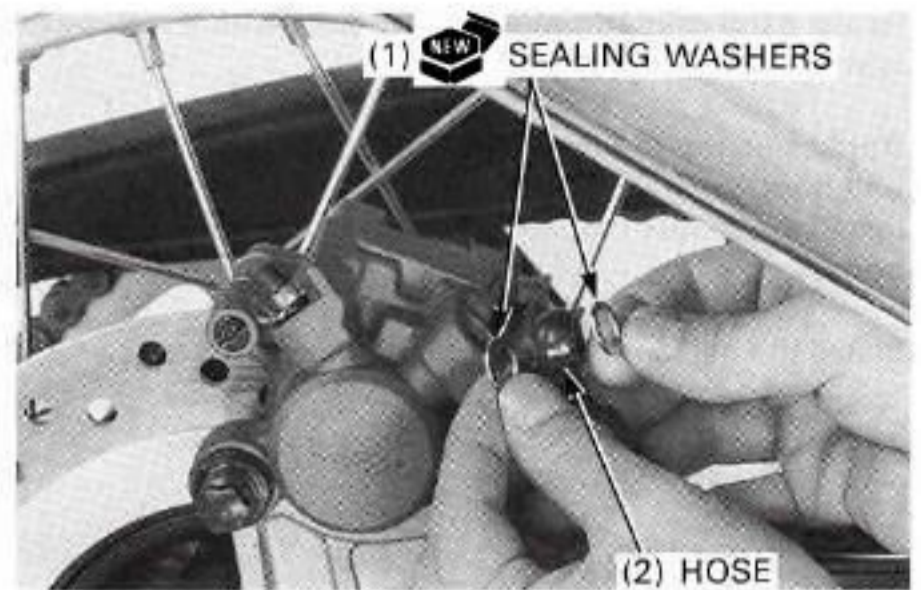


HYDRAULIC BRAKE

Connect the brake hose to the rear master cylinder with new sealing washers.

NOTE

- Be careful not to twist the brake hose.



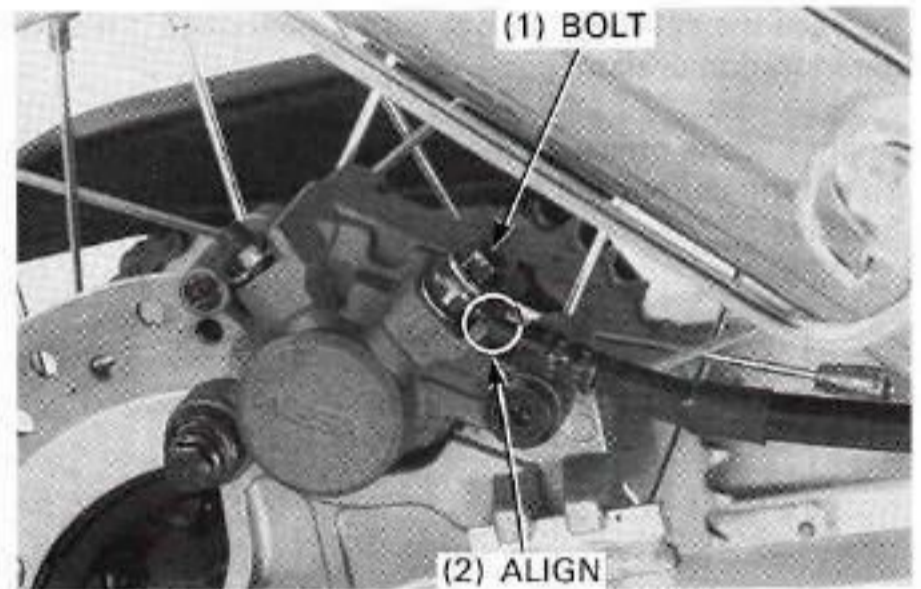
Install and tighten the brake hose oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

NOTE

- While tightening the brake hose oil bolt, align the brake hose end with the stopper.

Refill the brake fluid and bleed the rear hydraulic system (page 15-5).



BRAKE PIPE

NOTE

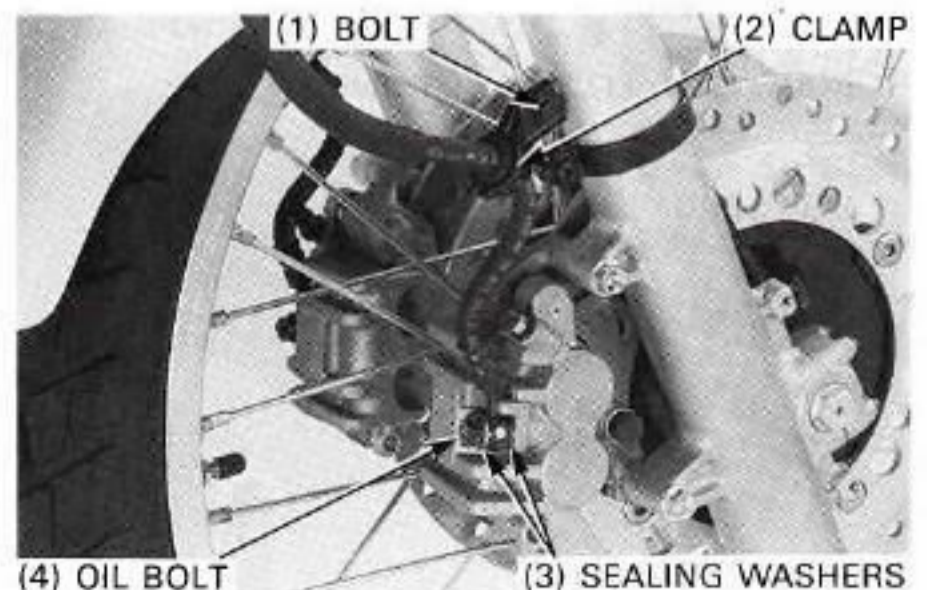
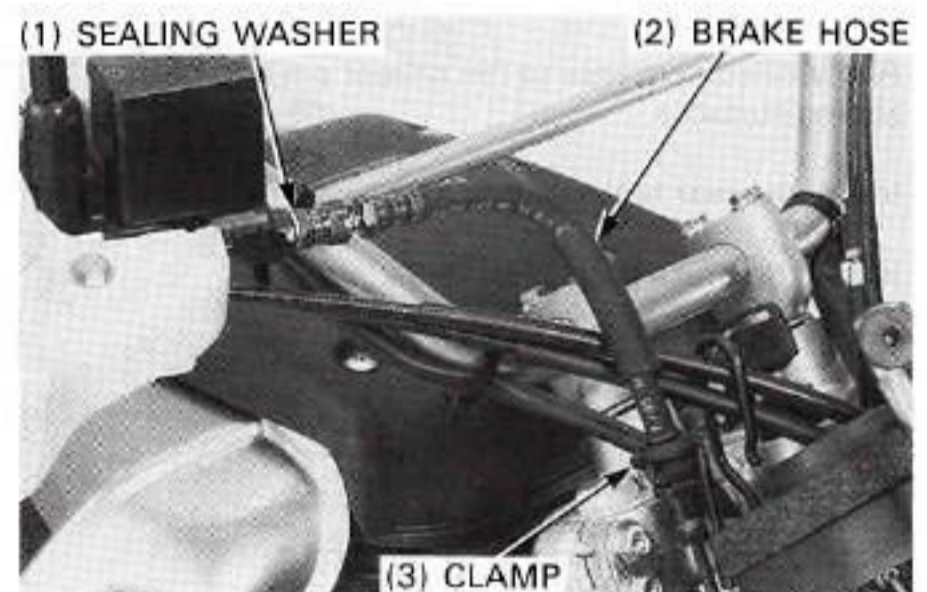
- Be careful not to damage the brake pipe when removal/installation.

REMOVAL

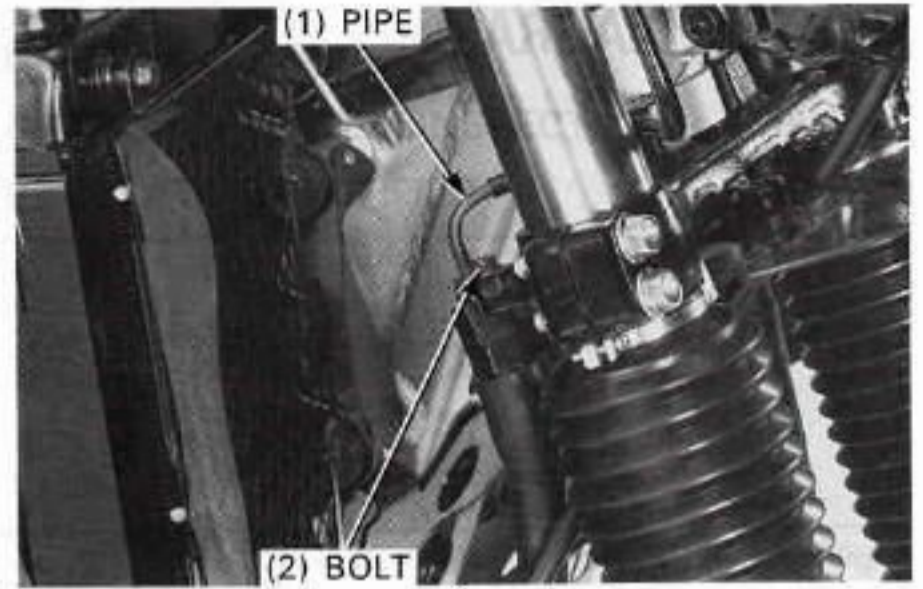
Remove the upper cowl (page 2-2).
Remove the fork cover (page 2-4).
Drain the brake fluid (page 15-4).

Hold the brake hose nut, then loosen the master cylinder joint and disconnect the brake hose.
Remove the sealing washer.
Remove the brake hose from the clamp.

Remove the brake hose oil bolts and sealing washers.
Remove the bolts and hose clamps.



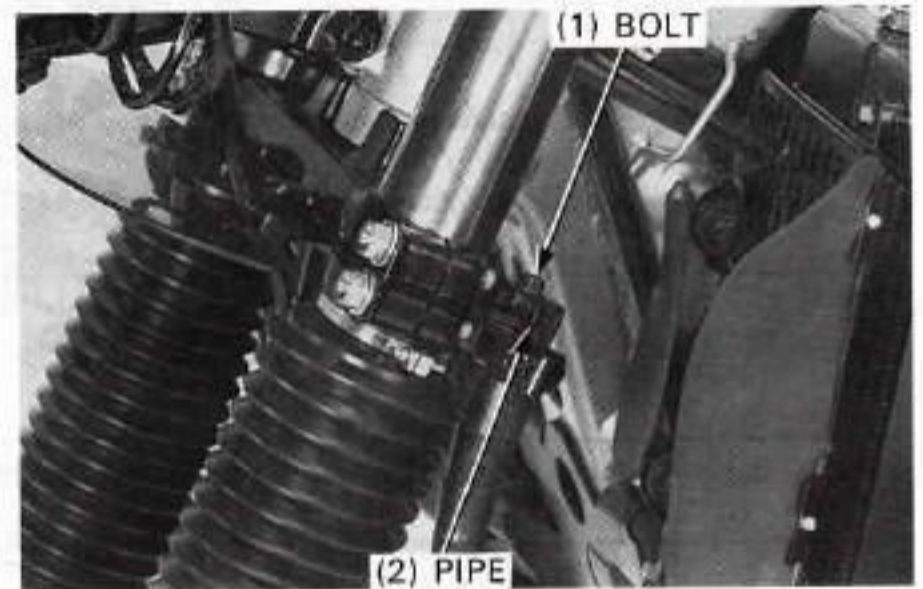
Remove the brake pipe joint bolts and brake pipe.



INSTALLATION

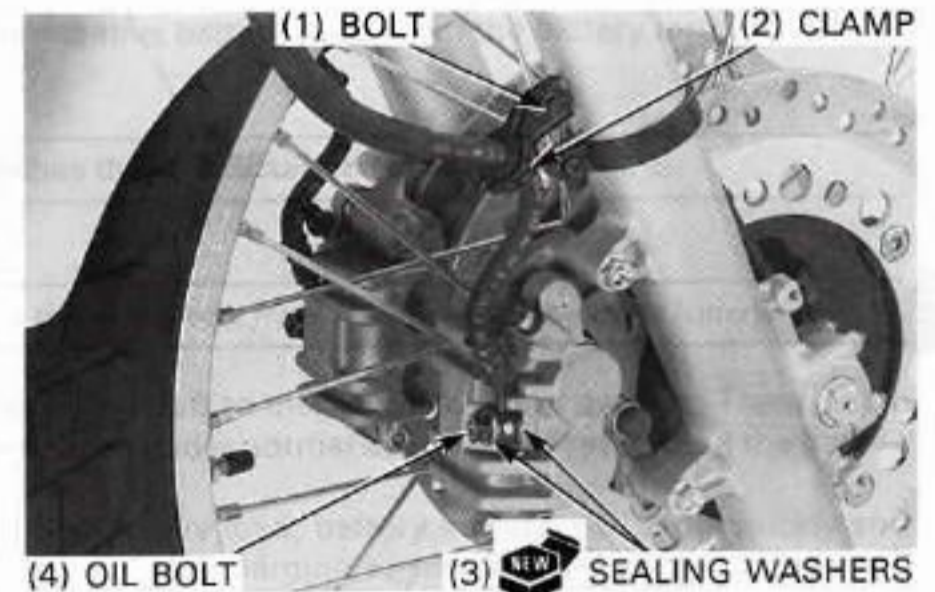
Install the brake pipe and brake pipe joint bolts.
Tighten the brake pipe joint bolts to the specified torque.

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)



Install the new sealing washers.
Install and tighten the brake hose oil bolts to the specified torque.

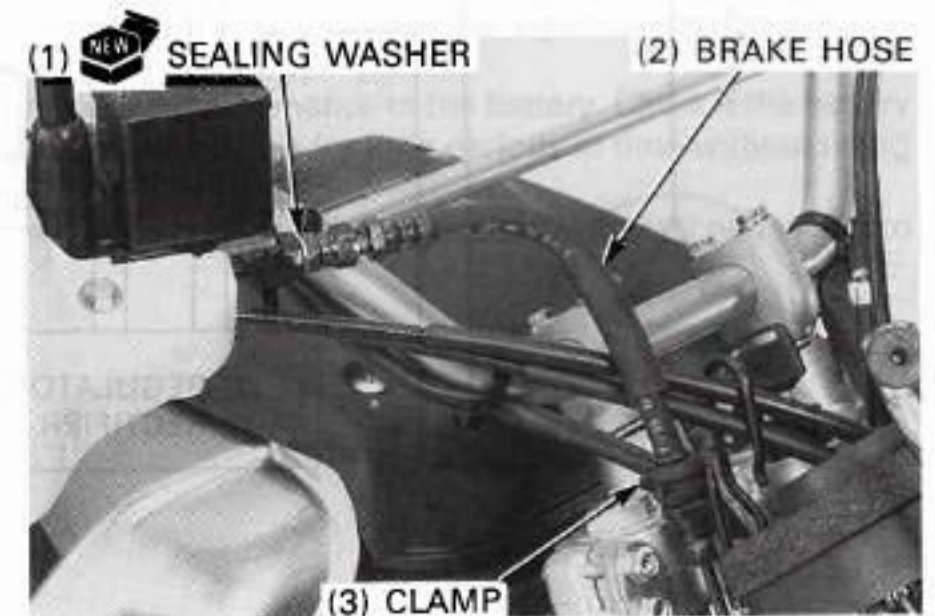
TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



Install the brake hose to the clamp.
Install the new sealing washer and connect the brake hose.
Hold the brake hose nut, then install and tighten the master cylinder joint to the specified torque.

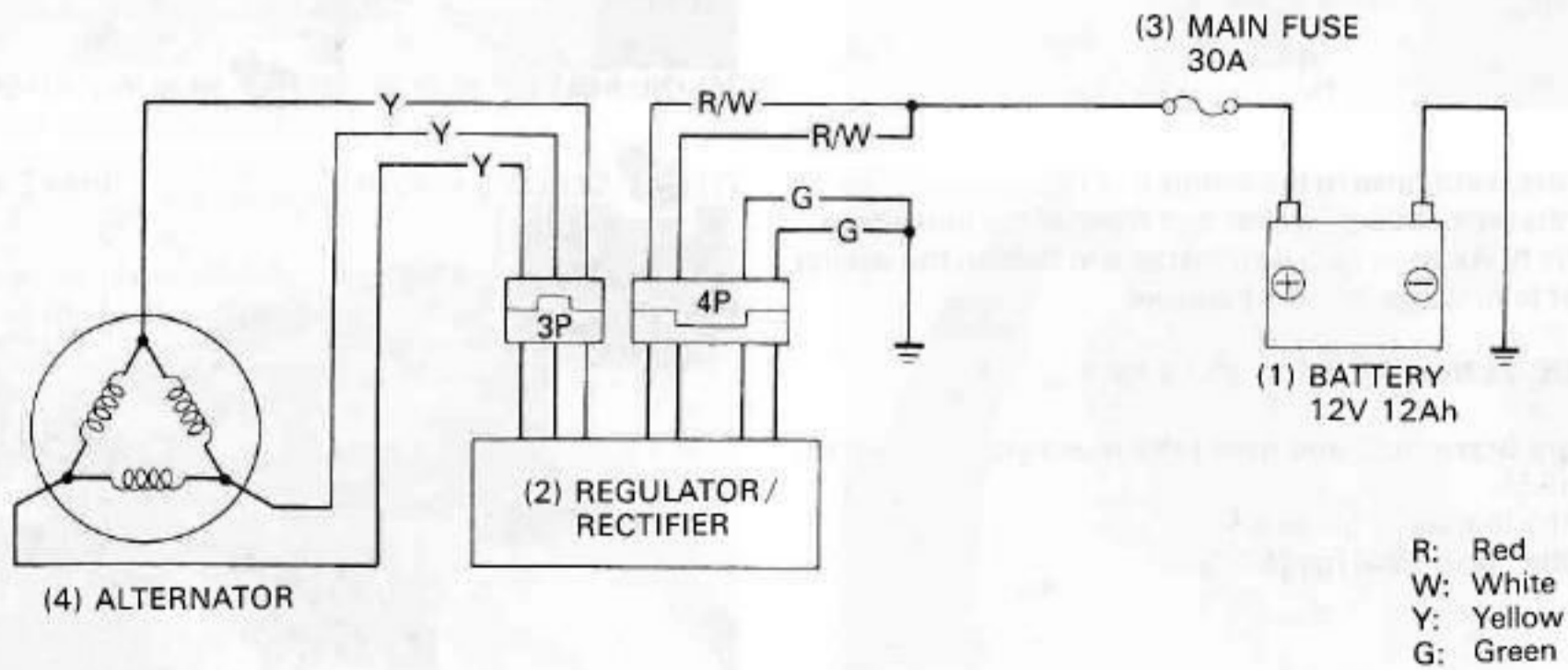
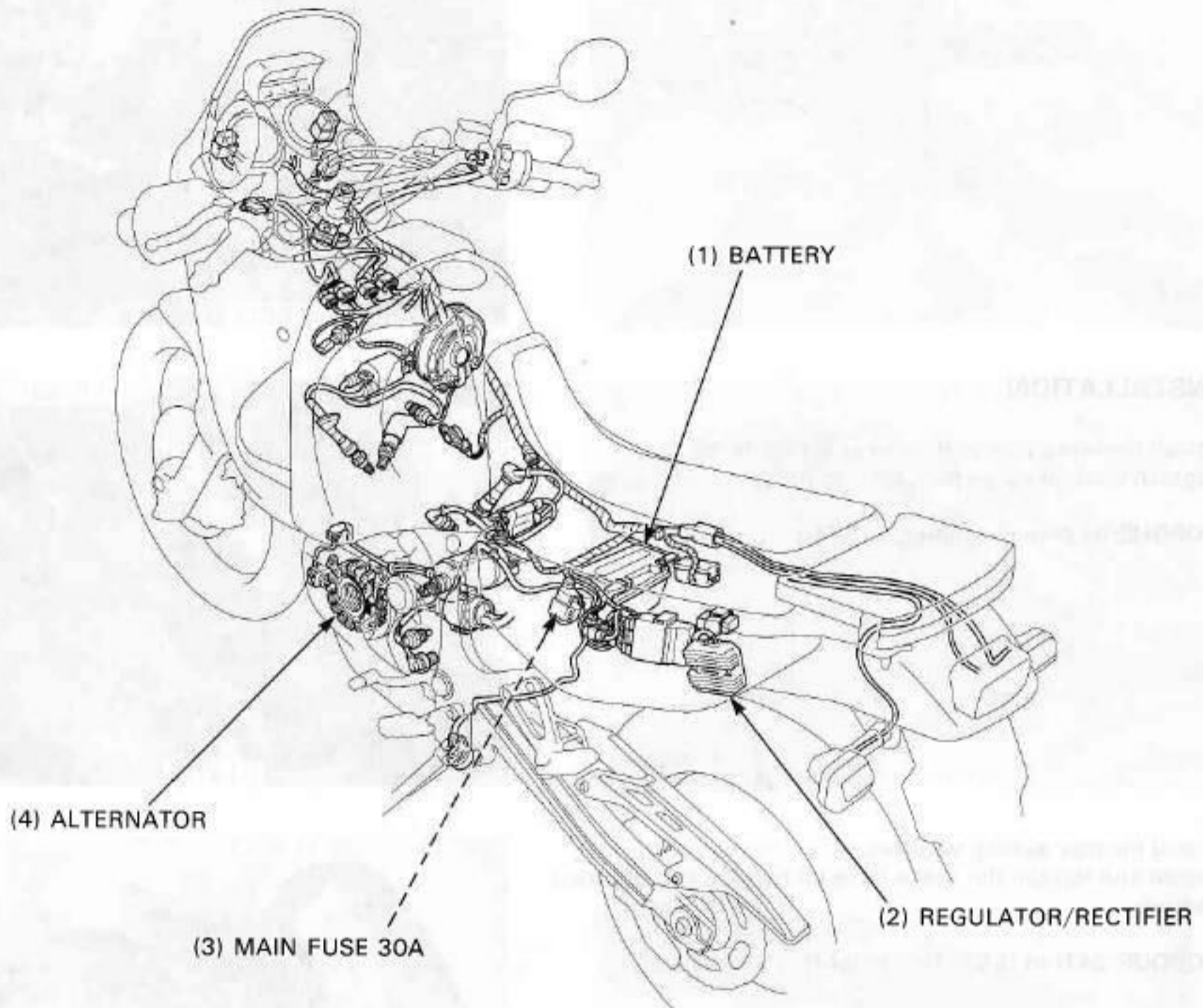
TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Refill the brake fluid and bleed the rear hydraulic system (page 15-5).
Install the fork cover (page 2-5).
Install the upper cowl (page 2-3).



BATTERY/CHARGING SYSTEM

SYSTEM DIAGRAM



16. BATTERY/CHARGING SYSTEM

| | | | |
|---------------------|------|----------------------------|------|
| SYSTEM DIAGRAM | 16-0 | BATTERY | 16-5 |
| SERVICE INFORMATION | 16-1 | CHARGING SYSTEM INSPECTION | 16-6 |
| TROUBLESHOOTING | 16-3 | REGULATOR/RECTIFIER | 16-8 |

SERVICE INFORMATION

GENERAL

⚠ WARNING

- *The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging or using the battery in an enclosed space.*
 - *The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.*
 - *If electrolyte gets on your skin, flush with water.*
 - *If electrolyte gets on your eyes, flush with water for at least 15 minutes and call a physician immediately.*
 - *Electrolyte is poisonous.*
 - *If swallowed, drink large quantities of water or milk and follow with milk of magnesia or vegetable oil and call a physician.*
 - **KEEP OUT OF REACH OF CHILDREN.**
-
- Always turn off the ignition switch before disconnecting any electrical component.

CAUTION

- *Some electrical components may be damaged if terminals or connectors are connected or disconnect while the ignition switch is ON and a current is present*
-
- For extended storage, remove the battery, give it a full charge and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
 - For battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.

NOTE

- The maintenance-free battery must be replaced when it reaches the end of its service life.

CAUTION

- *The battery sealing caps should not be removed. Attempting to remove the sealing caps from the cells may damage the battery.*
-
- The battery can be damaged if overcharged or undercharged, or if left to discharge for long periods. These same conditions contribute to shortening the life-span of the battery. Even under normal use, the performance of the battery deteriorates after 2-3 years.
 - Battery voltage may recover after battery charging, but under a heavy load, battery voltage will drop quickly and eventually the battery will be completely discharged. For this reason, the charging system is often suspected to be the problem. Battery overcharge often results in problems in the battery itself, which may appear to be an overcharge symptom. If one of the battery cells is shorted and the battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level drops quickly.
 - Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under a heavy load, such as having the headlight and taillight ON for long periods of time without riding the motorcycle.
 - The battery will self-discharge when the motorcycle is not use. For this reason, charge the battery every two weeks to prevent sulfation from forming.

BATTERY/CHARGING SYSTEM

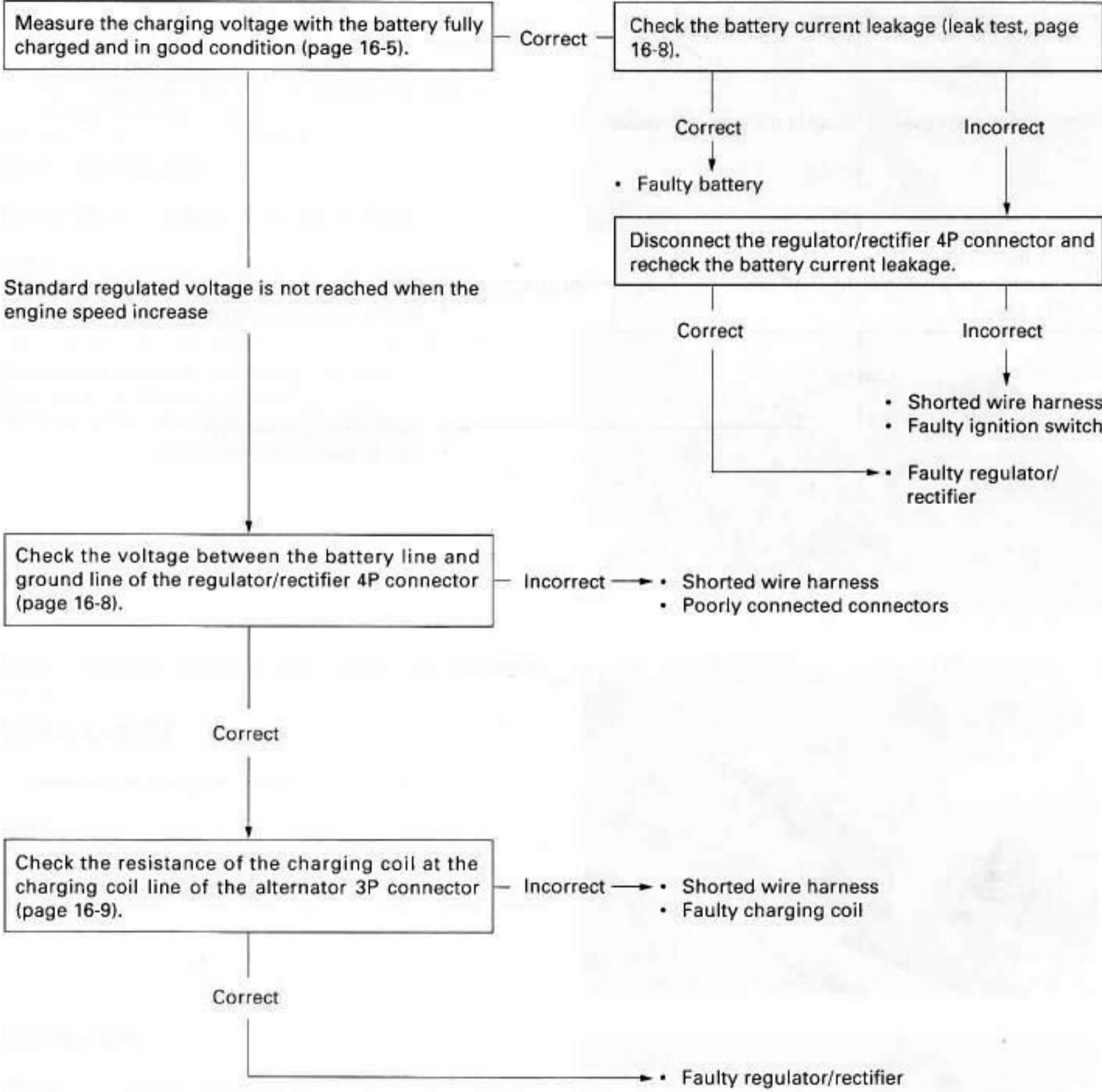
- Filling a new battery with electrolyte will produce some voltage, but in order to achieve maximum performance, always charge the battery. Also, the battery life is lengthened when it is initial-charged.
- When checking the charge system, always follow the steps in the troubleshooting flow chart (page 16-3).
- Alternator servicing may be done with the engine in the frame.
- If you disconnect the battery terminal, all memories of the trip meter are erased.

SPECIFICATIONS

| ITEM | | SPECIFICATIONS |
|---|--------|---|
| Alternator rated output | | 360 W/5,000 min ⁻¹ (rpm) |
| Alternator charging coil resistance (At 20 °C/68 °F) | | 0.1 – 1.0 Ω |
| Regulator/rectifier: regulated voltage (At 20 °C/68 °F) | | 14 – 15 V min. at 5,000 min ⁻¹ (rpm) |
| Current leakage | | 1 mA maximum |
| Battery capacity | | 12 V – 12 Ah |
| Battery type | | MF (YTX14-BS) |
| Battery charging rate | Normal | 1.4 A/5 – 10 h |
| | Quick | 6.0 A/1 h |

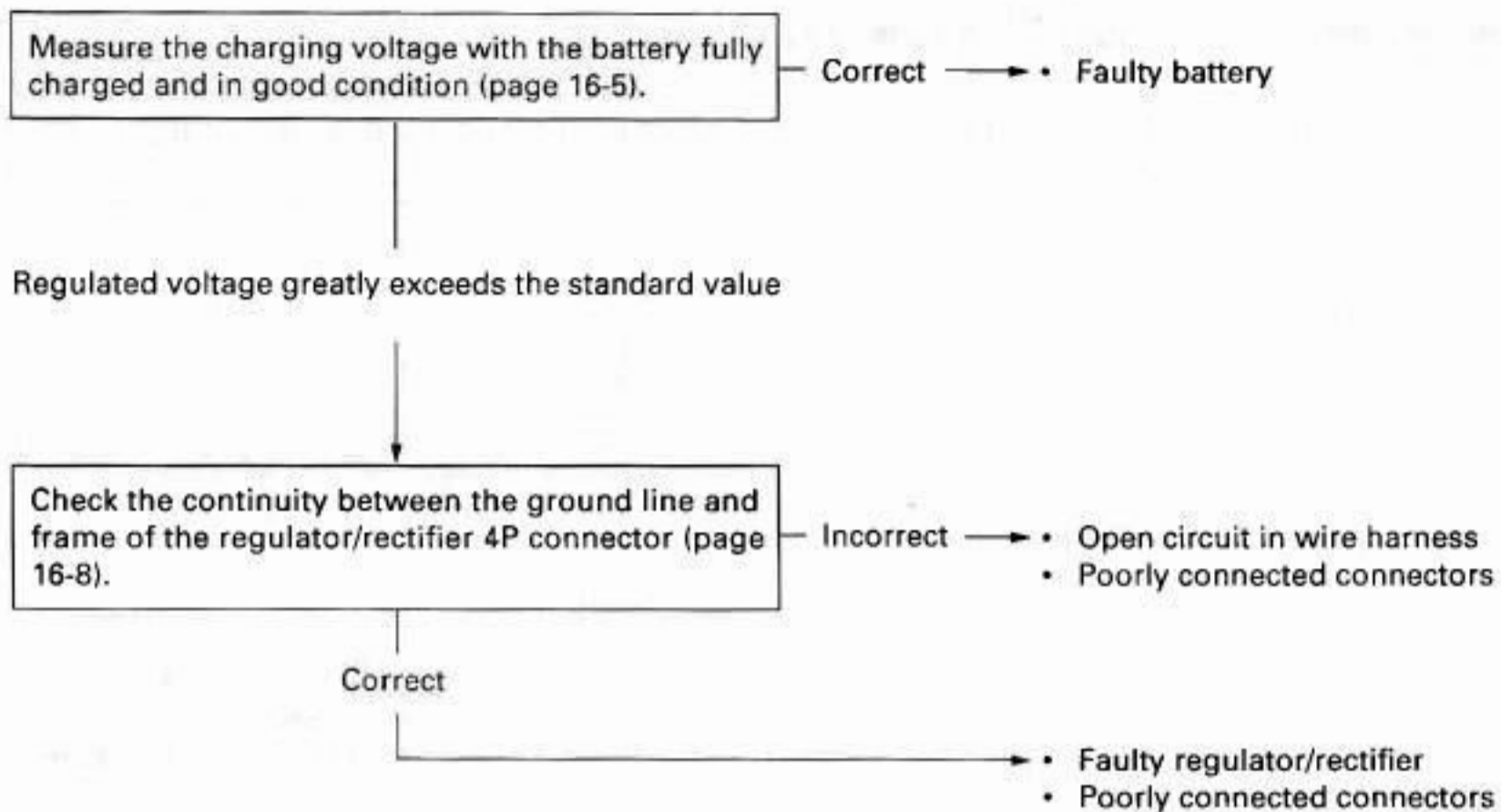
TROUBLESHOOTING

BATTERY UNDERCHARGING (VOLTAGE NOT RAISED TO REGULATED VOLTAGE).



BATTERY/CHARGING SYSTEM

BATTERY OVERCHARGING (REGULATED VOLTAGE TOO HIGH).



BATTERY

REMOVAL

NOTE

- Always turn the ignition switch OFF before removing or installing the battery.
- If you disconnect the battery terminal, all memories of the trip meter are erased.

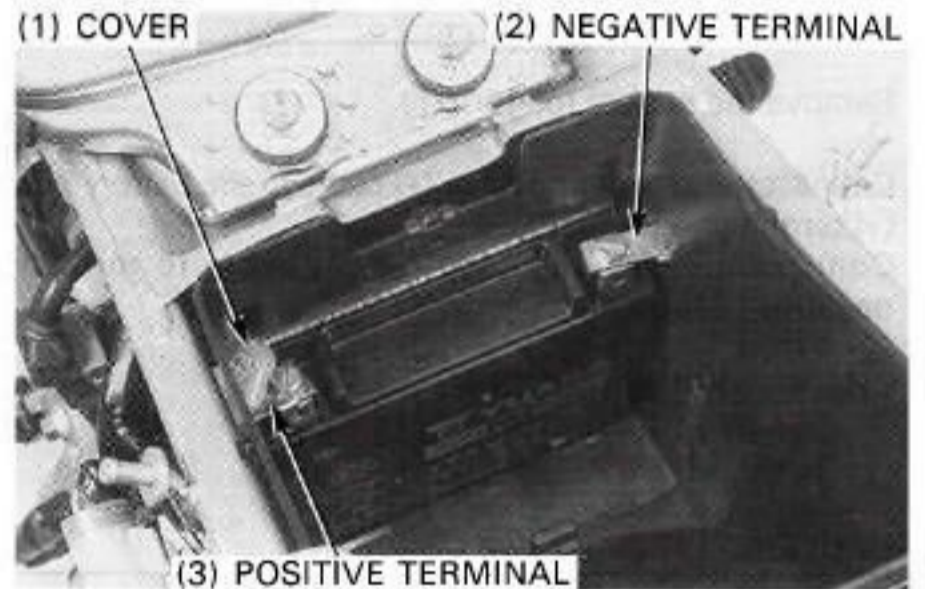
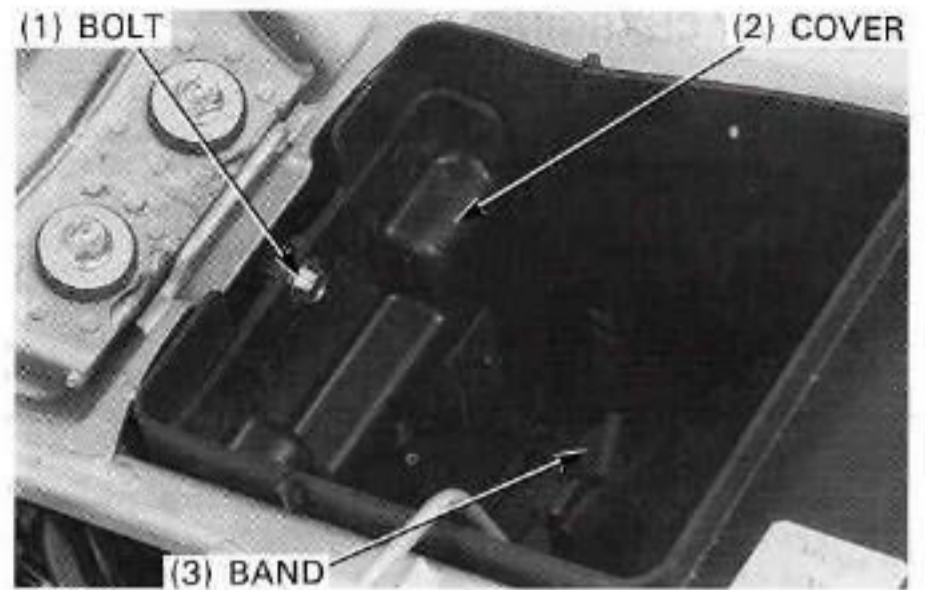
Remove the seat (page 2-7).

Remove the bolt, battery cover and tool band.

NOTE

- Disconnect the battery negative cable first, then positive cable from the battery.

Remove the bolt and battery negative cable.
Remove the positive cable cover.
Remove the bolt and battery positive cable.



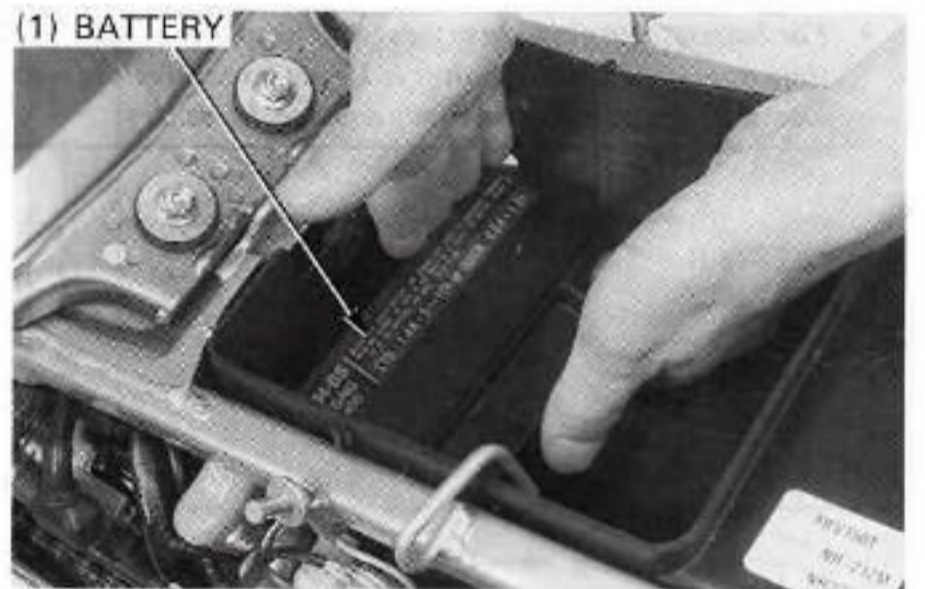
Slide the battery rearward, then remove the battery as shown.

INSTALLATION

Installation is in the reverse order of removal.

NOTE

- Apply clean grease to the battery terminals.
- Pull the cover over the positive terminal.



INSPECTION

Measure the battery voltage using a commercially available digital multimeter.

Voltage: Fully charged: 12.8 V
Under charged: Below 12.3 V



BATTERY/CHARGING SYSTEM

BATTERY CHARGING

⚠ WARNING

- *The battery gives off explosive gases; keep sparks, flames, and cigarettes away. Provide adequate ventilation when charging.*
- *The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.*
 - *If electrolyte gets on your skin, flush with water.*
 - *If electrolyte gets on your eyes, flush with water for at least 15 minutes and call a physician.*
- *Electrolyte is poisonous. If swallowed, drink large quantities of water or milk and follow with milk of magnesia or vegetable oil and call a physician.*
- *Turn power ON/OFF at the charger, not at the battery terminals.*

Remove the battery (page 16-5).

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

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

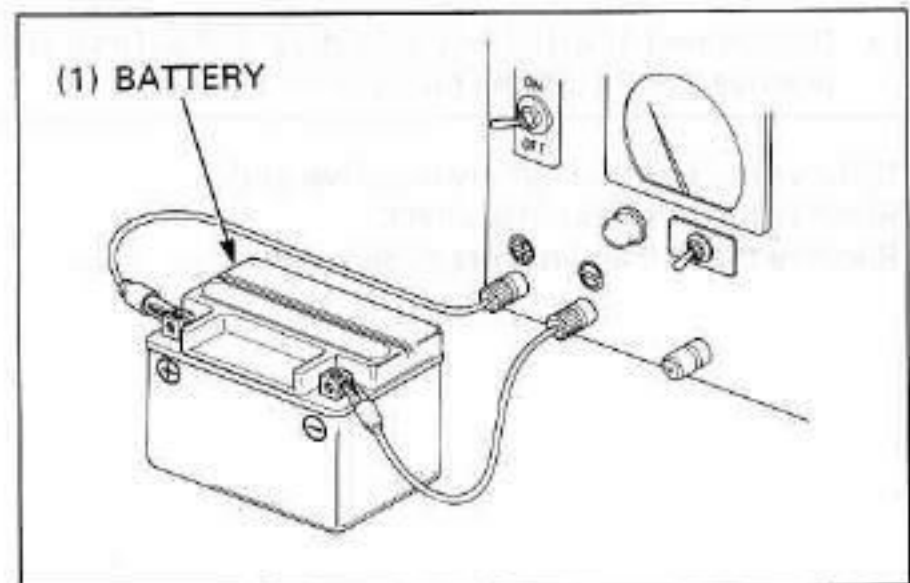
CHARGING CURRENT/TIME

Standard: 1.4 A/5-10 h

Quick: 6.0 A/1 h

CAUTION

- *Quick-charging should only be done in an emergency; slow charging is preferred.*
- *For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.*



CHARGING SYSTEM INSPECTION

NOTE

- *Measuring circuits with a large capacity that exceeds the capacity of the tester may cause damage to the tester. Before starting each test, set the tester at the high capacity range first, then gradually down to low capacity ranges in order to ensure that you have the correct range and do not damage the tester.*
- *When measuring small capacity circuits, keep the ignition switch off. If the switch is suddenly turned on during a test, the tester fuse may blow.*

REGULATED VOLTAGE INSPECTION

⚠ WARNING

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

Remove the battery (page 16-5) and install the fully charged battery.

Start the engine and warm it up to the operating temperature; stop the engine.

Connect the multimeter between the positive and negative terminals of the battery.

CAUTION

- *To prevent short, make absolutely certain which are the positive and negative terminals or cable.*
- *Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.*

With the headlight ON (Lo beam) , restart the engine. Measure the voltage on the multimeter when the engine runs at 5,000 min⁻¹ (rpm).

Regulated voltage: 14.0-15.0 V/5,000 min⁻¹ (rpm)

The battery is normal if the voltage reads the regulated voltage on the tester.

NOTE

- The speed at which voltage starts to rise cannot be checked as it varies with the temperature and loads of the generator.

A frequently discharged battery is an indication that it is deteriorated even if it proves normal in the regulated voltage inspection.

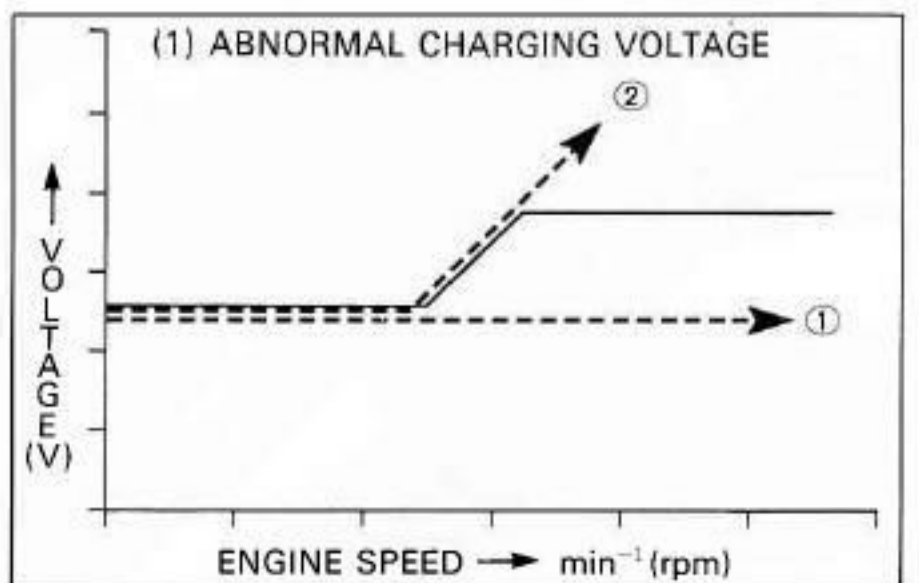
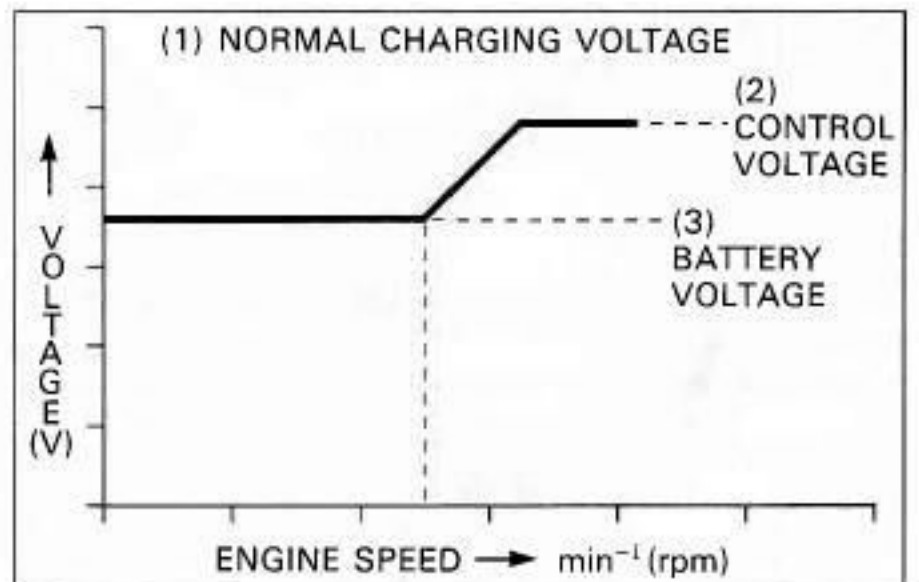
The charging circuit may be abnormal if any of the following symptoms is encountered:

1. Voltage not raised to regulated voltage (page 16-3)

- Open or shorted circuit in the charging system wire harness or poorly connected connector
- Open or shorted of the alternator
- Faulty regulator/rectifier

2. Regulated voltage too high (page 16-4)

- Poorly grounded voltage regulator/rectifier
- Faulty battery
- Faulty regulator/rectifier



BATTERY/CHARGING SYSTEM

CURRENT LEAKAGE TEST

Remove the battery cover (page 16-5).

Turn the ignition switch OFF, and disconnect the ground (-) cable from the battery.

Connect the ammeter (+) probe to the battery ground cable and the ammeter (-) probe to the battery (-) terminal. With the ignition switch off, check for current leakage.

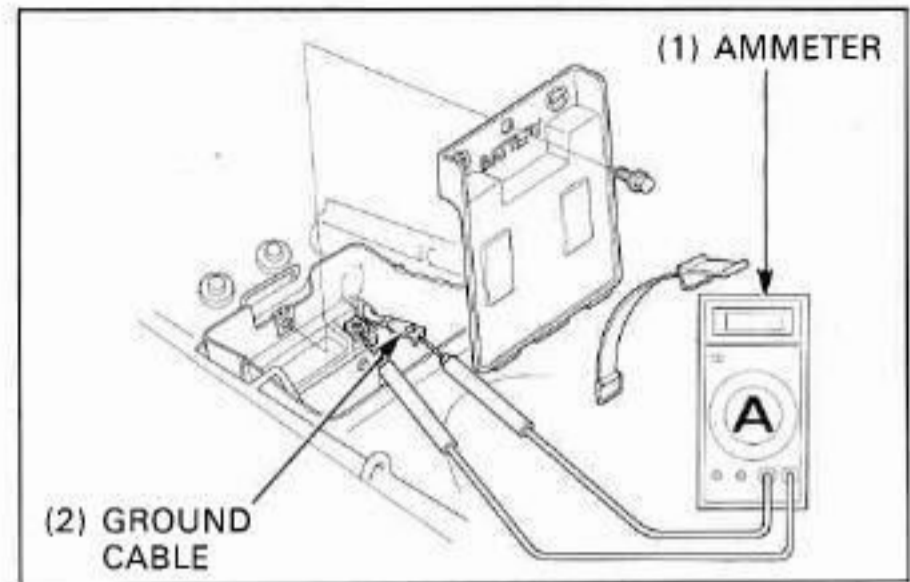
NOTE

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

SPECIFIED CURRENT LEAKAGE: 1 mA max.

If current leakage exceeds the specified value, a shorted circuit is likely.

Locate the short by disconnecting connections one by one and measuring the current.



REGULATOR/RECTIFIER

WIRE HARNESS INSPECTION

Remove the side cover (page 2-7).

Disconnect the regulator/rectifier 4P and alternator 3P connectors.

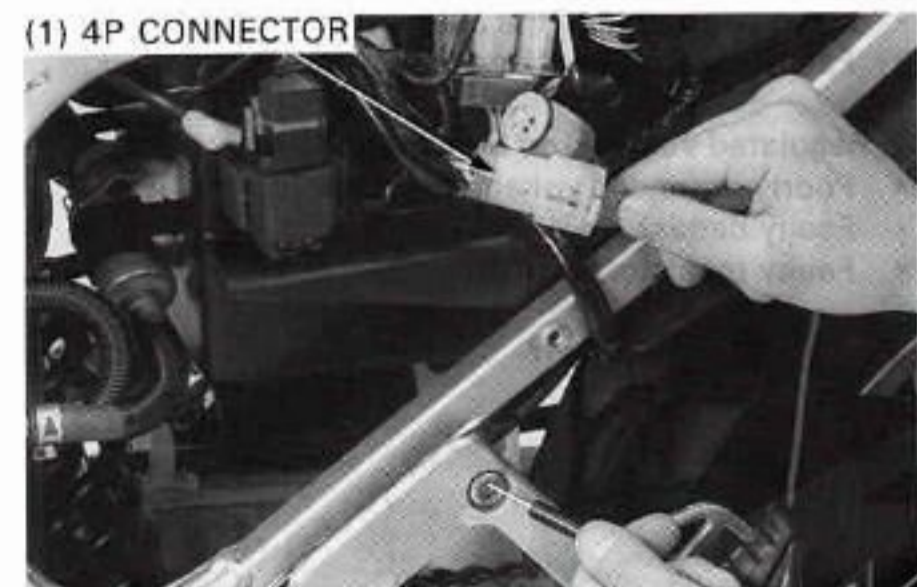
Check the connectors for loose or corroded terminals.

BATTERY LINE

Make sure the battery voltage between Red/White (+) and Green (-).

If there are no voltage, measure the followings:

| Item | Terminals | Specification |
|-----------------------|------------------------------|---------------------------------|
| Battery charging line | Red/White (+) and ground (-) | Battery voltage should register |
| Ground line | Green and ground | Continuity exists |



CHARGING LINE

NOTE

- It is not necessary to remove the stator coil to complete this test.

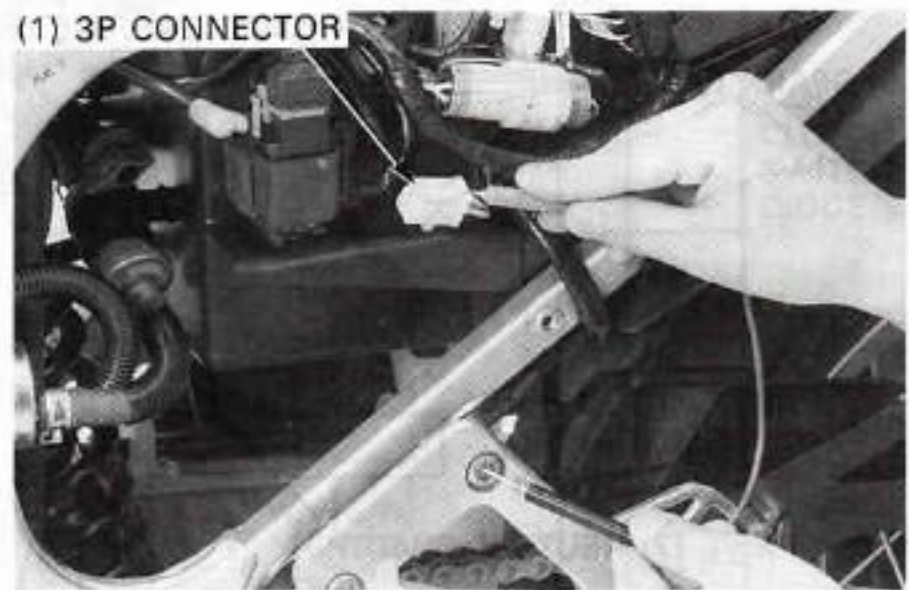
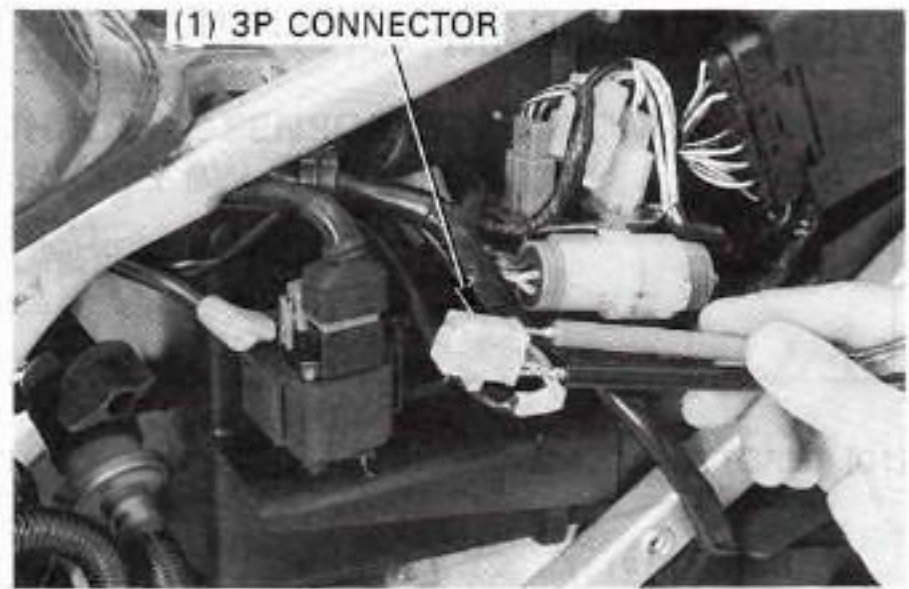
Measure the resistance between the connector terminals and ground.

CONNECTION: Yellow and Yellow
STANDARD: 0.1-1.0 Ω (20° C/68° F)

If the charging coil reading is out of specification, replace the stator (page 9-2).

Check for continuity between the connector terminals and ground. There should be no continuity.

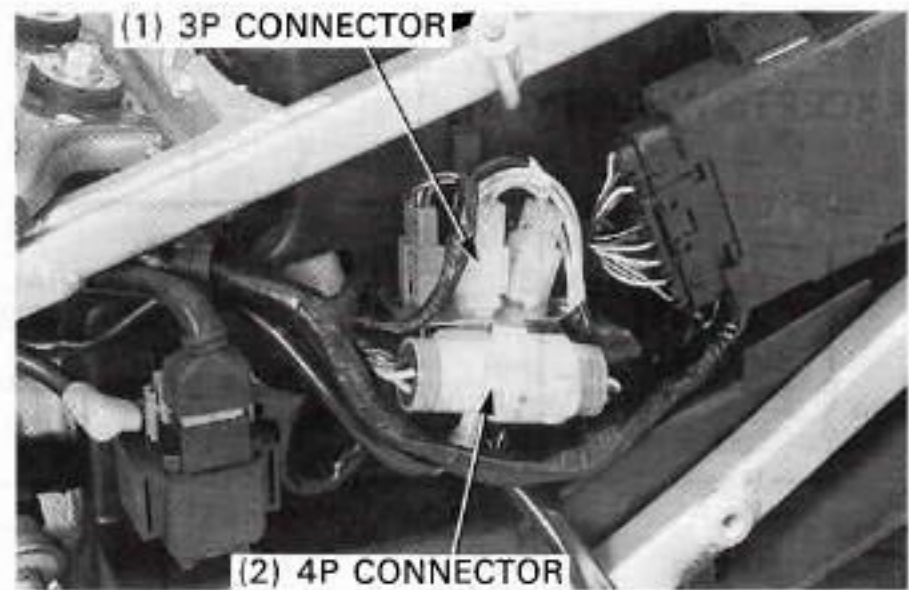
If there is continuity between the connector and ground, replace the stator (page 9-2).



REMOVAL/INSTALLATION

Remove the left side cover (page 2-7).

Disconnect the regulator/rectifier 4P and alternator 3P connectors.

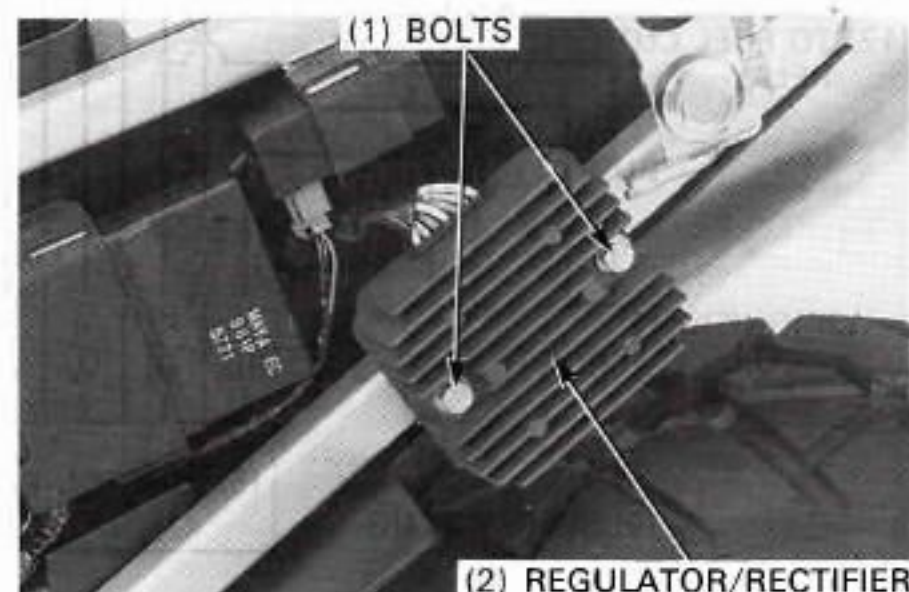


Remove the bolts and regulator/rectifier unit.

Installation is in the reverse order of removal.

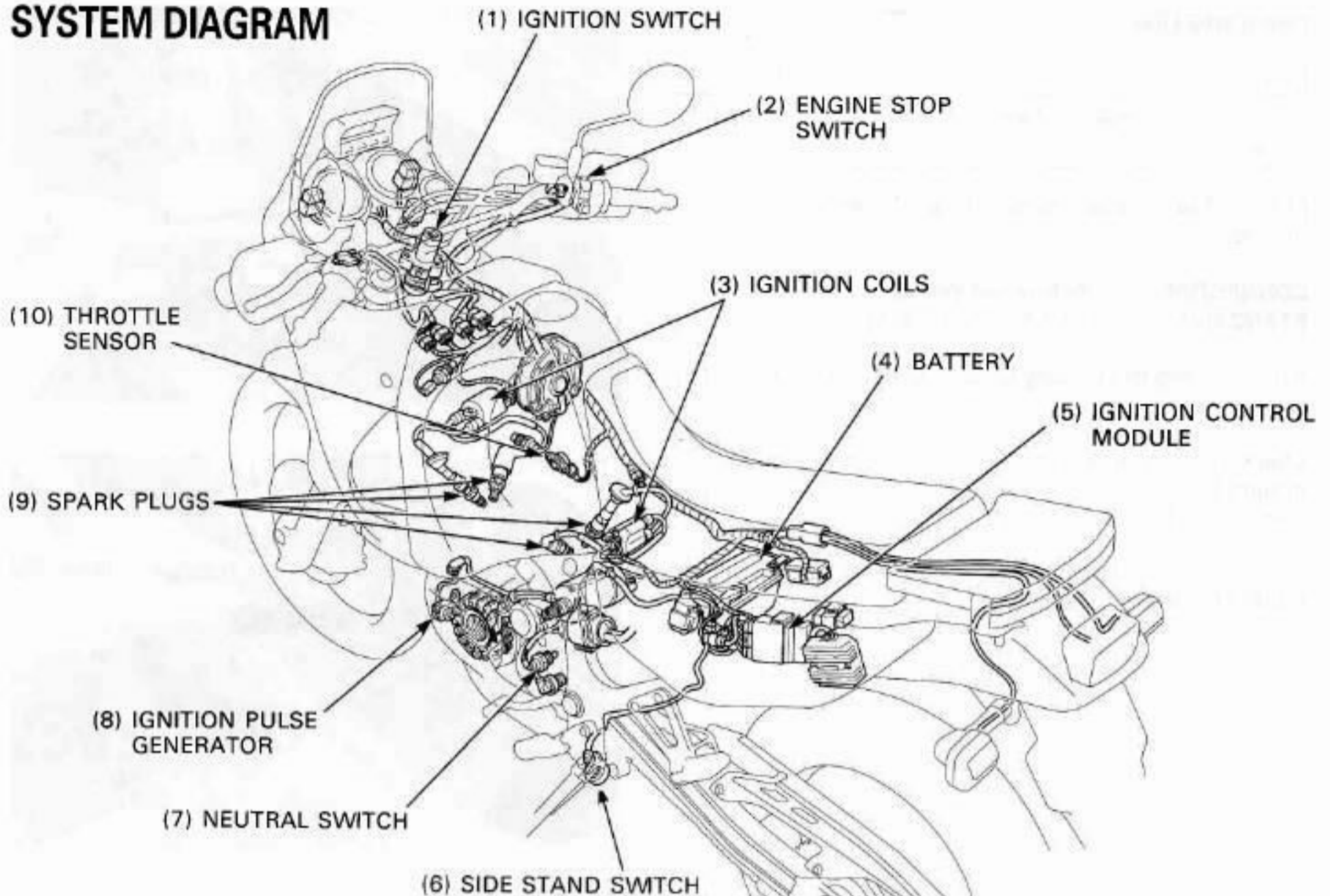
NOTE

- Route the wire harness properly (page 1-22).

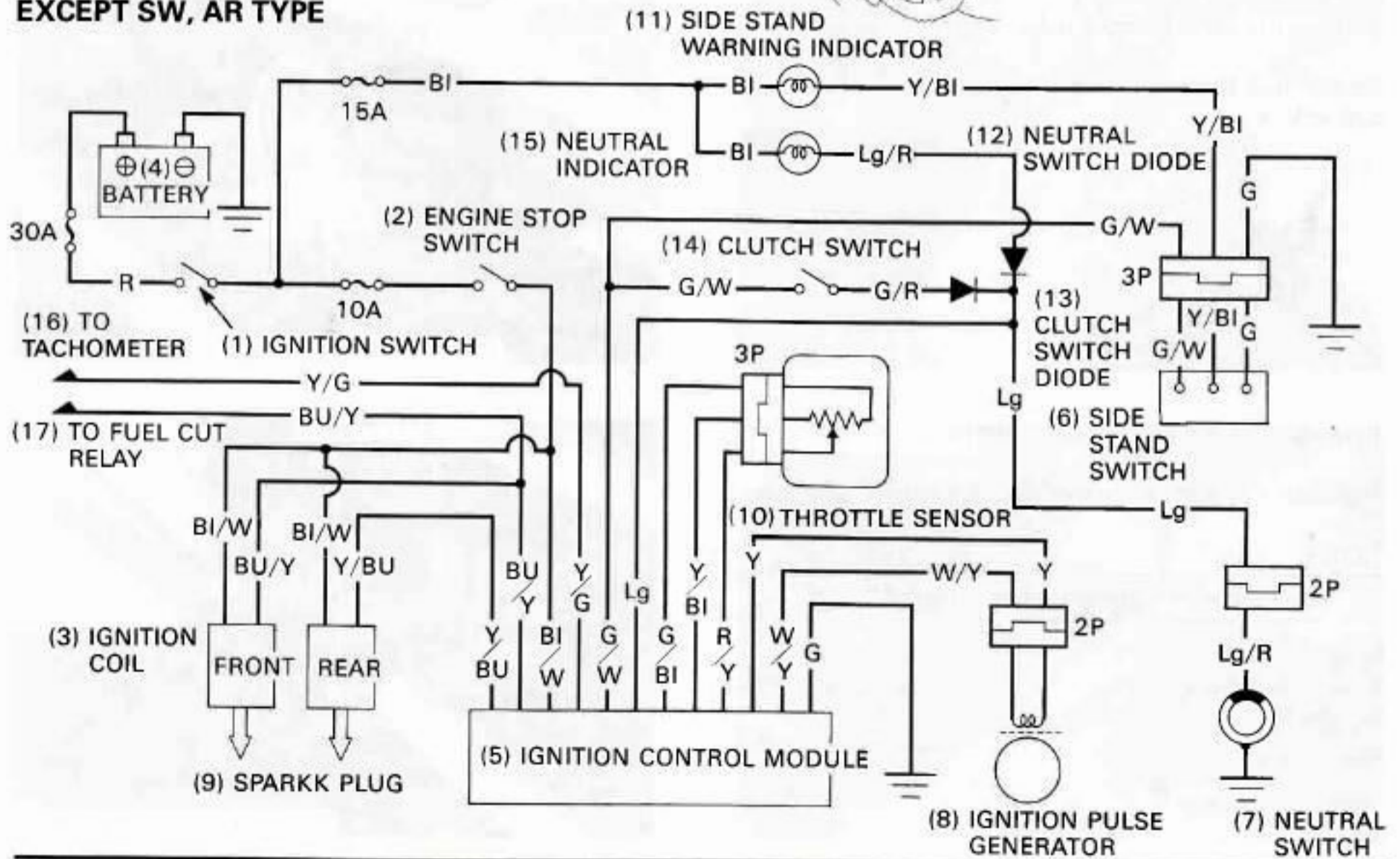


IGNITION SYSTEM

SYSTEM DIAGRAM



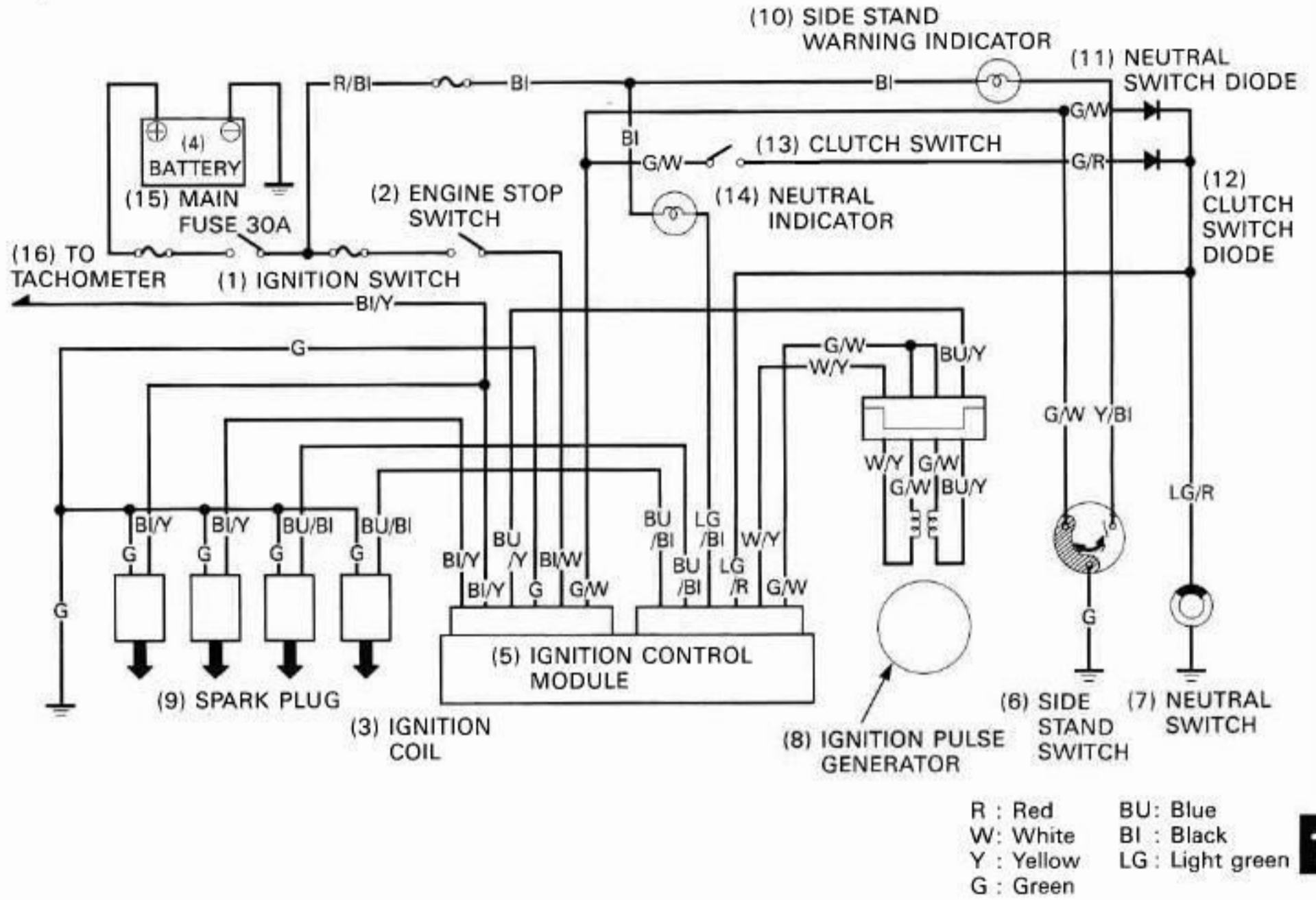
EXCEPT SW, AR TYPE



17.IGNITION SYSTEM

| | | | |
|----------------------------|-------|---|-------|
| SYSTEM DIAGRAM | 17-0 | IGNITION COIL | 17-11 |
| SERVICE INFORMATION | 17-2 | THROTTLE SENSOR INSPECTION (EXCEPT SW, AR TYPE ONLY) | 17-12 |
| TROUBLESHOOTING | 17-3 | IGNITION TIMING | 17-14 |
| IGNITION SYSTEM INSPECTION | 17-5 | | |
| IGNITION PULSE GENERATOR | 17-10 | | |

SW, AR TYPE



IGNITION SYSTEM

SERVICE INFORMATION

GENERAL

⚠ WARNING

- *If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of the consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.*

CAUTION

- *Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and a current is present.*
- When checking the ignition system, always follow the steps in the troubleshooting (page 17-3).
- Ignition timing cannot be adjusted since the Ignition Control Module (ICM) is non-adjustable. If ignition timing is incorrect, check the system components and replace any faulty parts.
- The ICM may be damaged if dropped. Also, if the connector is disconnected when current is flowing, the resulting excessive voltage may damage the unit. Always turn off the ignition switch before servicing.
- A faulty ignition system is often related to poorly connected or corroded connectors. Check those connections before proceeding. Make sure the battery is adequately charged. Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plugs.
- Use spark plugs of the correct heat range. Using a spark plug of an incorrect heat range can damage the engine.
- For neutral switch and side stand switch inspection and removal/installation see section 19.
- For engine stop switch and ignition switch inspection and removal/installation see section 13, 19.

SPECIFICATIONS

| ITEM | | SPECIFICATIONS | |
|---------------------------------------|--|--|-----------|
| Spark plug | Standard | NGK | DPR8EA-9 |
| | | NIPPONDENSO | X24EPR-U9 |
| | For cold climate/below (5 °C/41 °F) | NGK | DPR7EA-9 |
| | | NIPPONDENSO | X22EPR-U9 |
| For extended high speed riding | NGK | DPR9EA-9 | |
| | NIPPONDENSO | X27EPR-U9 | |
| Ignition timing " F " mark | | BTDC 10°/1,200 ± 200 min ⁻¹ (rpm) | |
| Advance | Start | 1,700 ± 200 min ⁻¹ (rpm) | |
| | Stop | 4,500 ± 200 min ⁻¹ (rpm) | |
| Full advance | | BTDC 28° | |
| Ignition cut-out revolution | | 8,800 ± 200 min ⁻¹ (rpm) | |
| Ignition coil Peak voltage | | 100 V minimum | |
| Ignition pulse generator peak voltage | | 0.7 V minimum | |

TORQUE VALUES

| | | |
|-------------------------------------|------------------------------|--|
| Timing hole cap | 10 N•m (1.0 kgf•m, 7 lbf•ft) | Apply molybdenum disulfide oil to the threads Apply oil to the O-ring |
| Ignition pulse generator cover bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) | Apply molybdenum disulfide oil to the threads |
| Ignition pulse generator bolt | 12 N•m (1.2 kgf•m, 9 lbf•ft) | Apply a locking agent to the threads |

TOOLS

Peak voltage adaptor
Imrie diagnostic tester (model 625)

07HGJ-020100

TROUBLESHOOTING

- Inspect the following before diagnosing the system.
 - Faulty spark plug
 - Loose spark plug cap or spark plug wire connections
 - Water got into the spark plug cap (Leaking to the ignition coil secondary voltage)
- If there is no spark at either cylinders, temporarily exchange the ignition coil with the other good one and perform the spark test. If there is a spark, the exchanged ignition coil is faulty.
- Initial voltage" of the ignition primary coil is the battery voltage with the ignition switch ON and engine stop switch at RUN (The engine is not cranked by the starter motor).

NO SPARK AT ALL SPARK PLUGS (AR, SW TYPE)

| Unusual condition | | Probable cause (Check in numerical order) |
|-------------------------------|--|---|
| Ignition coil primary voltage | Low peak voltage | 1. Incorrect peak voltage adaptor connections 2. Multimeter impedance is too low; below 10 MΩ/DCV 3. Cranking speed is too slow (battery is under charged) 4. The sample timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the specifications at least once) 5. Poorly connected connectors or an open circuit in ignition system 6. Faulty side stand switch or neutral switch 7. Faulty ignition coil 8. Faulty ignition control module (ICM) (in cases when above No. 1-7 are normal) |
| | No peak voltage | 1. Incorrect peak voltage adaptor connections 2. Battery is undercharged (Voltage drops largely when the engine is started) 3. Faulty ignition switch or engine stop switch 4. No voltage at the power source wire between BI/W (+) and ground (-) of the ICM, or loose or poorly connected ICM connectors 5. Poor connection or open circuit in G wire of the ICM 6. Faulty side stand switch or neutral switch 7. Faulty peak voltage adaptor 8. Faulty ignition pulse generator 9. Faulty ICM (in cases when above No. 1-8 are normal) |
| | Peak voltage is normal, but no spark jumps at plug | 1. Faulty spark plug or leaking ignition coil secondary current ampere 2. Faulty ignition coils |
| Ignition pulse generator | Low peak voltage | 1. Multimeter impedance is too low; below 10 MΩ/DCV 2. Cranking speed is too slow (battery is under charged) 3. The sample timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the specifications at least once) 4. Faulty ignition pulse generator (in cases when above No. 1-3 are normal) |
| | No peak voltage | 1. Faulty peak voltage adaptor 2. Faulty ignition pulse generator |

IGNITION SYSTEM

NO SPARK AT ALL SPARK PLUGS (EXCEPT AR, SW TYPE)

| Unusual condition | | Probable cause (Check in numerical order) |
|-------------------------------|---|--|
| Ignition coil primary voltage | No initial voltage with the ignition switch ON and engine stop switch at RUN (Other electrical components are normal) | <ol style="list-style-type: none"> 1. Faulty engine stop switch 2. Open circuit in BI/W wire between the engine stop switch and ignition coil 3. Loose or poor connection of the ignition coil primary wire terminal, or open circuit in primary coil (Check at the ignition control module connector) 4. Faulty ignition control module (ICM) , in case when the initial voltage is normal with the ICM 12P connector disconnected |
| | Initial voltage is normal, but it drops by 2-4 volts while cranking the engine | <ol style="list-style-type: none"> 1. Incorrect peak voltage adaptor connections 2. Battery is undercharged (Voltage drops largely when the engine is started) 3. No voltage at the power source wire between BI/W (+) and ground (-) of the ICM, or loose or poorly connected ICM 12P connectors 4. Poor connection or open circuit in G wire of the ignition control module (ICM) 5. Loose or poor connections, or open circuit in BI/W, Bu/Y and Y/Bu wires between the ignition coil and ICM 6. Short circuit in ignition primary coil 7. Faulty side stand switch or neutral switch 8. Open circuit or loose connection in No. 7 related circuit wires <ul style="list-style-type: none"> • Side stand switch line: G/W and G wire • Neutral switch line: Lg and Lg/R wire 9. Faulty ICM (in cases when above No. 1-8 are normal) |
| | Initial voltage is normal, but no peak voltage exists while cranking the engine | <ol style="list-style-type: none"> 1. Incorrect peak voltage adaptor connections 2. Faulty peak voltage adaptor 3. Faulty ICM (in cases when above No. 1-2 are normal) |
| | Initial voltage is normal, but peak voltage lower than the standard value | <ol style="list-style-type: none"> 1. Multimeter impedance is too low; below 10 MΩ/DCV 2. Cranking speed is too slow (battery is under charged) 3. The sample timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the specifications at least once) 4. Faulty ignition coil 5. Faulty ICM (in cases when above No. 1-4 are normal, but no spark jumps at plug) |
| | Initial voltage and peak voltage are normal, but no spark jumps at plug | <ol style="list-style-type: none"> 1. Faulty spark plug or leaking ignition coil secondary current ampere 2. Faulty ignition coils |
| Ignition pulse generator | Peak voltage is lower than the standard value | <ol style="list-style-type: none"> 1. Multimeter impedance is too low; below 10 MΩ/DCV 2. Cranking speed is too slow (battery is under charged) 3. The sample timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the specifications at least once) 4. Faulty ignition pulse generator (in cases when above No. 1-3 are normal) |
| | No peak voltage | <ol style="list-style-type: none"> 1. Faulty peak voltage adaptor 2. Faulty ignition pulse generator |

IGNITION SYSTEM INSPECTION

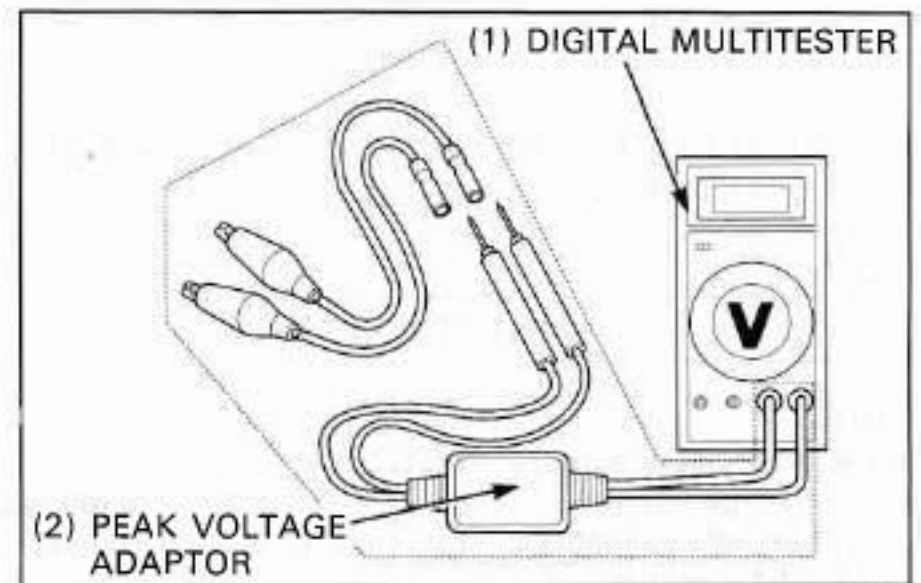
NOTE

- If there is no spark at either plug, check all connections for loose or poor contact before measuring each peak voltage.
- Use the recommended digital multimeter or commercially available digital multimeter with an impedance of 10 M Ω /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If using an Imrie diagnostic tester (model 625), follow the manufacturer's operating instructions.

Connect the peak voltage adaptor to the digital multimeter, or use the Imrie diagnostic tester.

TOOLS:

Imrie diagnostic tester (model 652) or
 Peak voltage adaptor 07HGJ-0020100 with
 Commercially available digital multimeter (impedance 10M
 Ω /DCV minimum)



IGNITION PRIMARY VOLTAGE INSPECTION

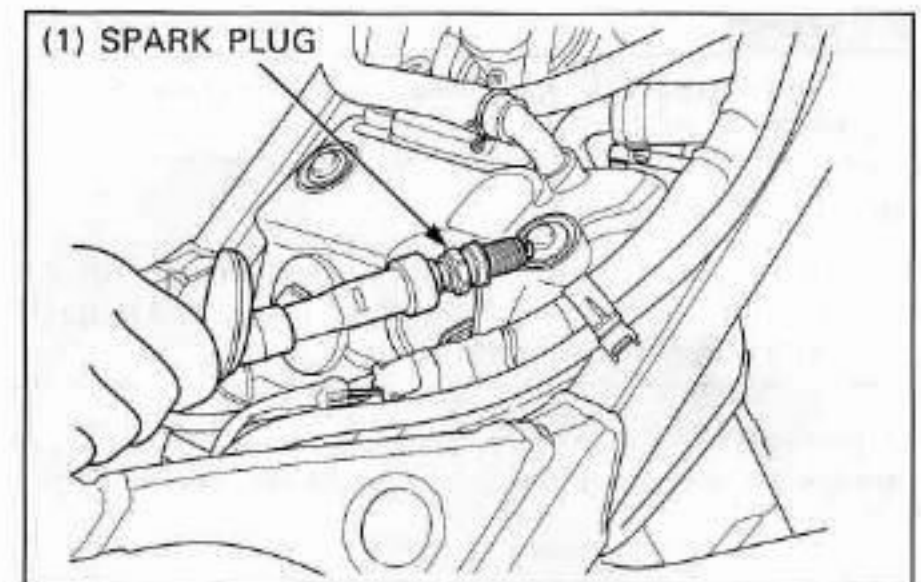
NOTE

- Check all system connection before the inspection. If the system is disconnected, an incorrect peak voltage will register.
- Check cylinder compression at each cylinder and check that the spark plugs are installed correctly in each cylinder.

Support the motorcycle using the side stand.

Disconnect the spark plug caps from the spark plugs on the cylinder head (page 17-11).

Connect a good known spark plug to each spark plug cap and ground the spark plugs to the cylinder as done in a spark test.



IGNITION SYSTEM

EXCEPT SW, AR TYPE:

Remove the fuel tank (page 2-20).

Connect the peak voltage adaptor or Imrie tester to the ignition coil primary terminal.

NOTE

- Do not disconnect the ignition coil primary wires.

TOOLS:

Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100 with
Commercially available digital multimeter (impedance
10M Ω /DCV minimum)

CONNECTION:

Front cylinder: Blue/Yellow (+) - Body ground (-)
Rear cylinder: Yellow/Blue (+) - Body ground (-)

Turn the ignition switch "ON" and engine stop switch to "RUN".

Check for initial battery voltage.

If battery voltage is not present, follow the checks described in the troubleshooting on page 17-4.

Shift the transmission into neutral.

Crank the engine with the starter motor and read each ignition coil primary voltage.

PEAK VOLTAGE: 100 V minimum

⚠ WARNING

- Avoid touching the spark plugs and tester probes to prevent electric shock.

NOTE

- Although measured values are different for each ignition coil, they are normal as long as the voltage is higher than the standard value.

If the peak voltage is lower than the standard value, follow the checks described in the troubleshooting on page 17-4.

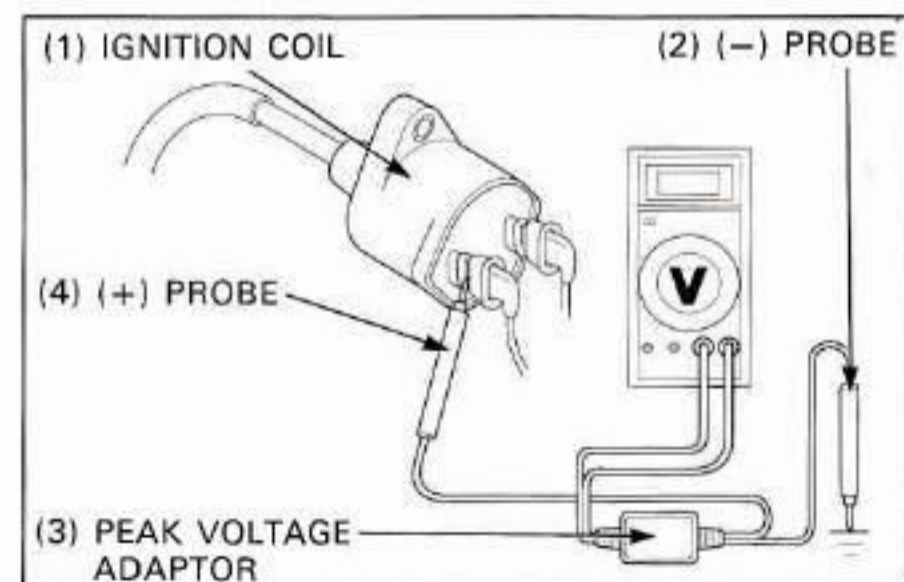
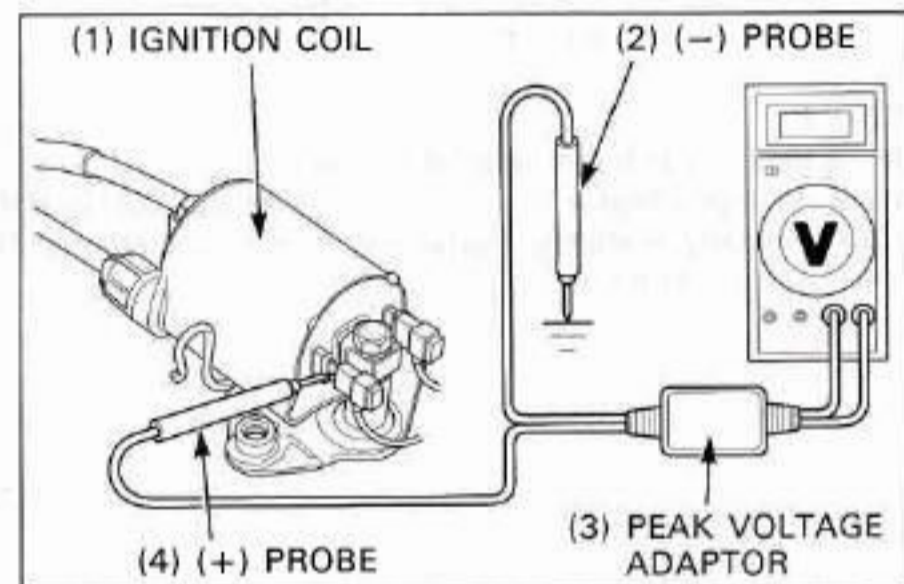
SW, AR TYPE:

Remove the fuel tank (page 2-20).

Connect the peak voltage adaptor of Imrie tester to the ignition coil primary terminal.

NOTE

- Do not disconnect the ignition coil primary wires.



TOOLS:

Imrie diagnostic tester (model 625) or
 Peak voltage adaptor 07HGJ-0020100 With
 Commercially available digital multimeter (impedance
 10M Ω /DCV minimum)

CONNECTION:

Front cylinder: Black/Yellow (+) - Body ground (-)
 Rear cylinder: Blue/Black (+) - Body ground (-)

Turn the ignition switch "ON" and engine stop switch to "RUN".

Shift the transmission into neutral.

Crank the engine with the starter motor and read each ignition coil primary voltage.

PEAK VOLTAGE: 100 V minimum

⚠ WARNING

- Avoid touching the spark plugs and tester probes to prevent electric shock.

NOTE

- Although measured values are different for each ignition coil, they are normal as long as the voltage is higher than the standard value.

If the peak voltage is lower than the standard value, follow the checks described in the troubleshooting on page 17-3.

IGNITION PULSE GENERATOR PEAK VOLTAGE INSPECTION

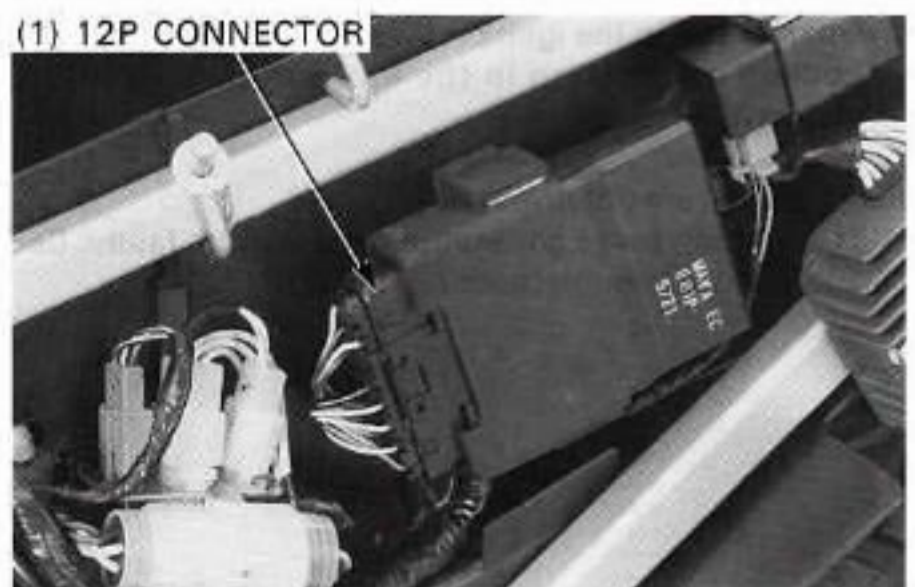
Remove the left side cover (page 2-7).

NOTE

- Check all system connection before the inspection. If the system is disconnected, an incorrect peak voltage will register.
- Check cylinder compression at each cylinder and check that the spark plugs are installed correctly in each cylinder.

EXCEPT SW, AR TYPE:

Disconnect the ignition control module (ICM) 12P connector.



IGNITION SYSTEM

Connect the peak voltage adaptor to the 12P connector wire harness side.

TOOLS:

Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100 with
Commercially available digital multimeter (impedance
10M Ω /DCV minimum)

CONNECTION: White/Yellow (+) - Yellow (-)

Turn the ignition switch "ON" and engine stop switch to "RUN".

Shift the transmission into neutral.

Crank the engine with the starter motor and read the ignition pulse generator peak voltage.

PEAK VOLTAGE: 0.7 V minimum

⚠ WARNING

- Avoid touching the spark plugs and tester probes to prevent electric shock.

If the peak voltage is lower than standard value, perform the following procedure.

Disconnect the ignition pulse generator 2P connector.
Turn the ignition switch "ON" and engine stop switch to "RUN".

Shift the transmission into neutral.

Crank the engine with the starter motor and measure the peak voltage at the 2P connector ignition pulse generator side and record it.

CONNECTION: White / Yellow (+) - Yellow (-)

PEAK VOLTAGE: 0.7 V minimum

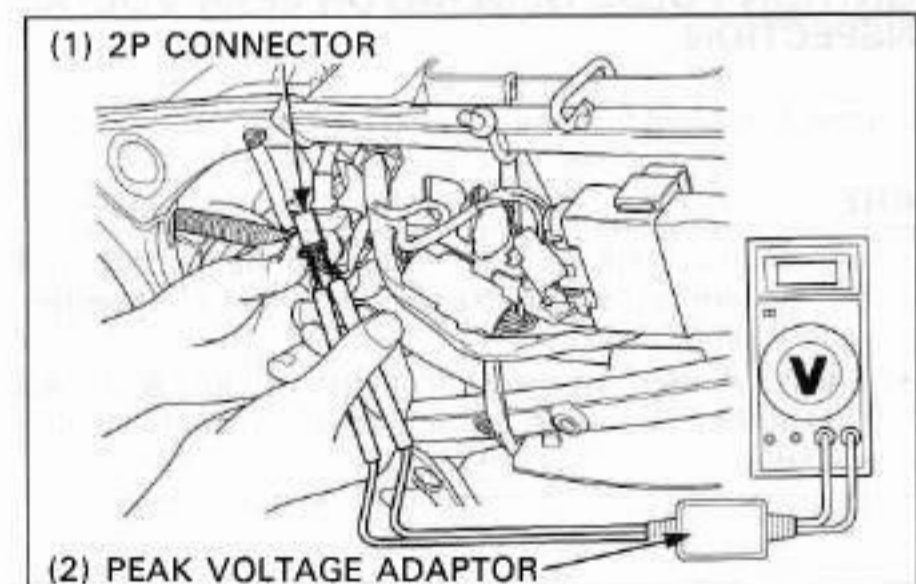
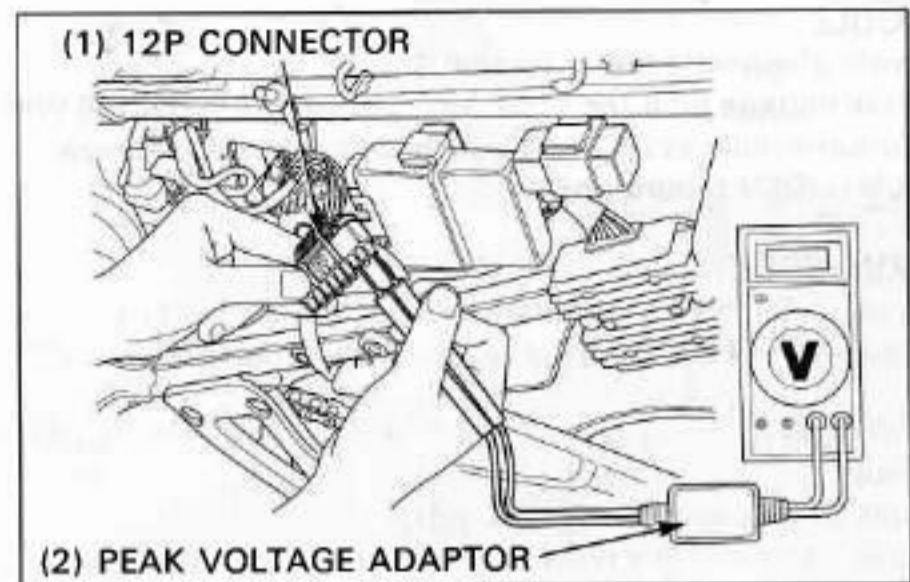
Compare their values at the ignition control module (ICM) 12P connector and the ignition pulse generator 2P connector.

If the value at the ignition pulse generator is normal, but abnormal at the ICM:

- Open circuit in the ignition pulse generator wires
- Loosen connection in the ignition pulse generator connector

If both values are abnormal:

- The ignition pulse generator is likely to be faulty. Check and perform troubleshooting on page 17-3.



SW, AR TYPE:

Disconnect the ignition control module (ICM) 4P connector. Connect the peak voltage adaptor to the 4P connector wire harness side.

TOOLS:

Imrie diagnostic tester (model 625) or
 Peak voltage adaptor 07HGJ-0020100 With
 Commercially available digital multimeter (impedance 10M
 Ω /DCV minimum)

CONNECTION:

Front cylinder: Blue/Yellow (+) - Green/White (-)
 Rear cylinder: White/Yellow (+) - Green/White (-)

Turn the ignition switch "ON" and engine stop switch to "RUN".
 Shift the transmission into neutral.
 Crank the engine with the starter motor and read the ignition pulse generator peak voltage.

PEAK VOLTAGE: 0.7 V minimum

⚠ WARNING

- Avoid touching the spark plugs and tester probes to prevent electric shock.

If the peak voltage is lower than standard value, perform the following procedure.

Disconnect the ignition pulse generator 2P connector. Turn the ignition switch "ON" and engine stop switch to "RUN".
 Shift the transmission into neutral.
 Crank the engine with the starter motor and measure the peak voltage at the 2P connector ignition pulse generator side and record it.

CONNECTION:

Front cylinder: Blue/Yellow (+) - Green/White (-)
 Rear cylinder: White/Yellow (+) - Green/White (-)
PEAK VOLTAGE: 0.7 V minimum

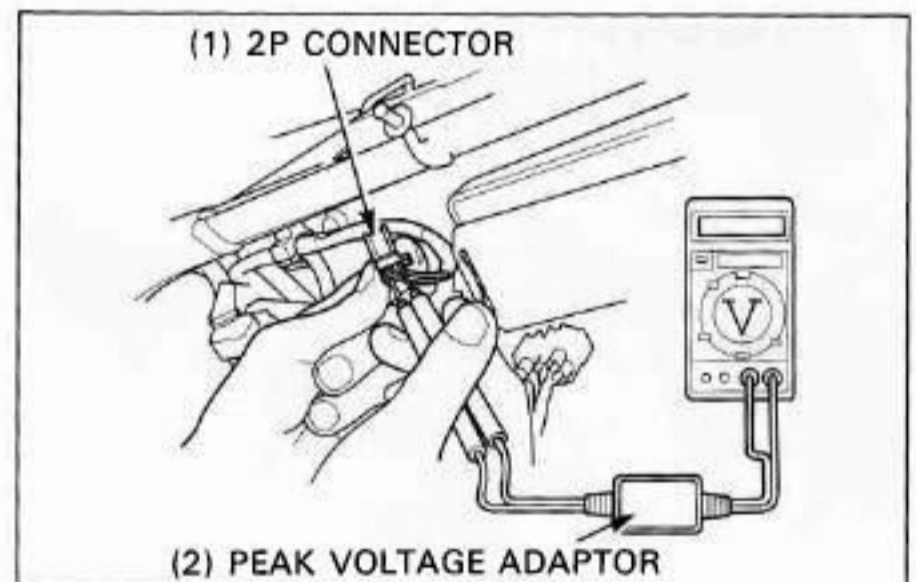
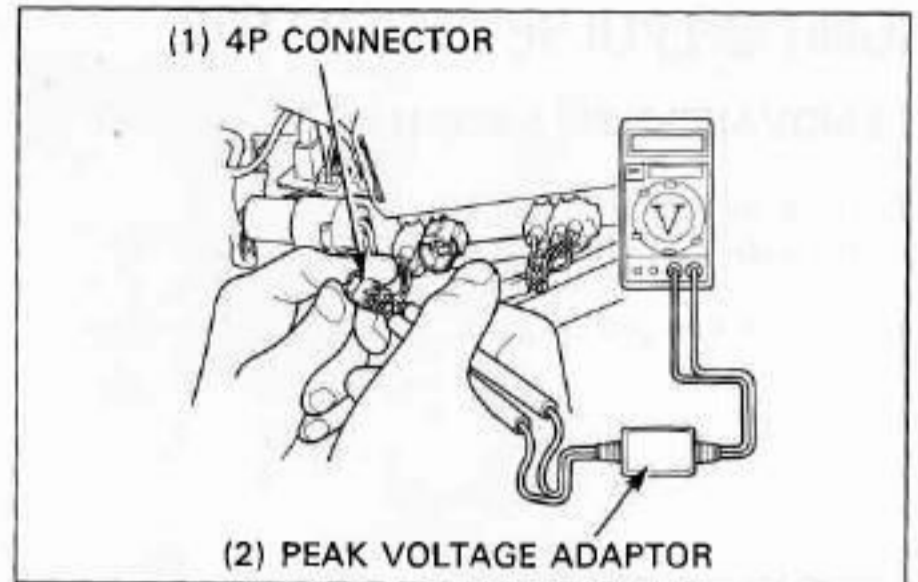
Compare their values at the ICM 4P connector and the ignition pulse generator 2P connector.

If the value at the ignition pulse generator is normal, but abnormal at the ICM:

- Open circuit in the ignition pulse generator wires
- Loosen connection in the ignition pulse generator connector

If both values are abnormal:

- The ignition pulse generator is likely to be faulty. Check and perform troubleshooting on page 17-3.



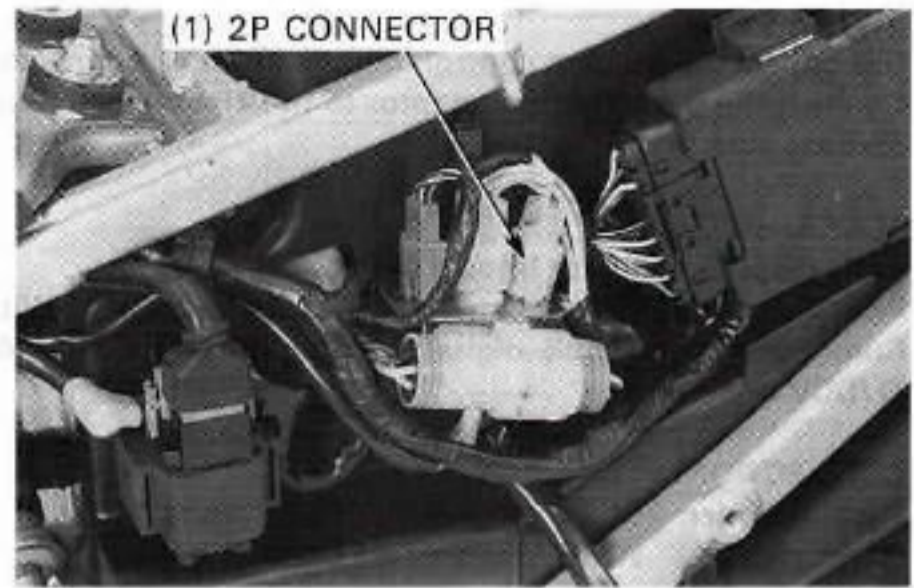
IGNITION SYSTEM

IGNITION PULSE GENERATOR

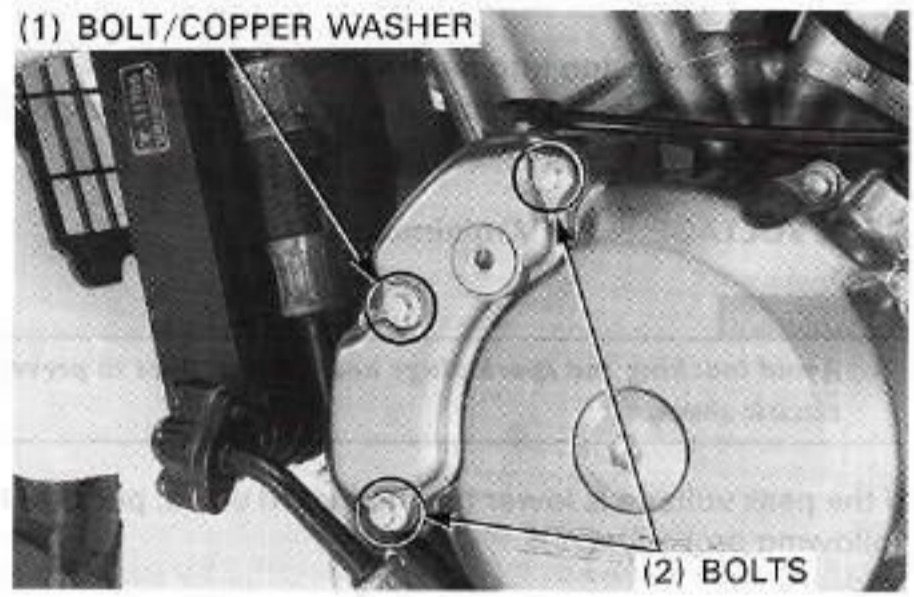
REMOVAL/INSTALLATION

Remove the skid plate (page 2-7).
Remove the left side cover (page 2-7).

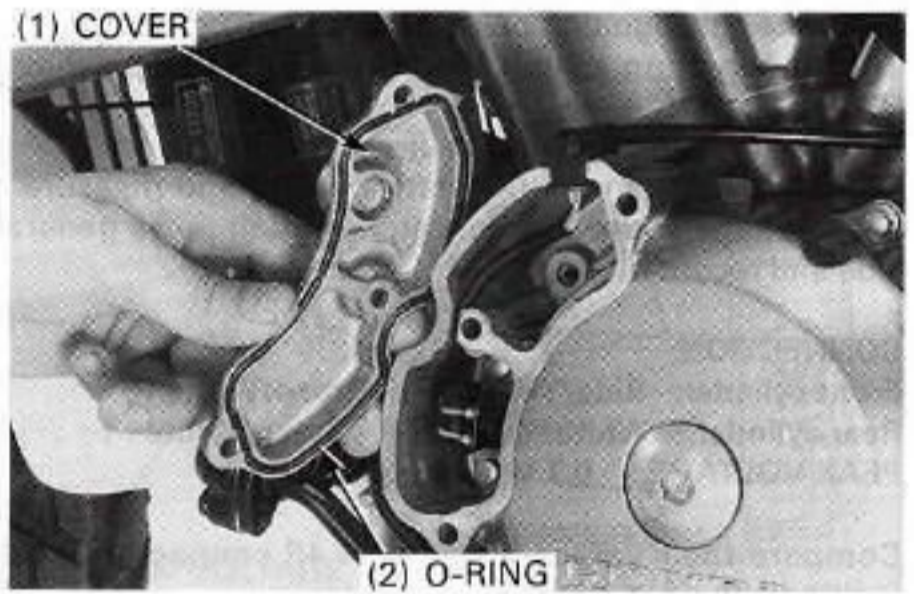
Disconnect the ignition pulse generator 2P connector.



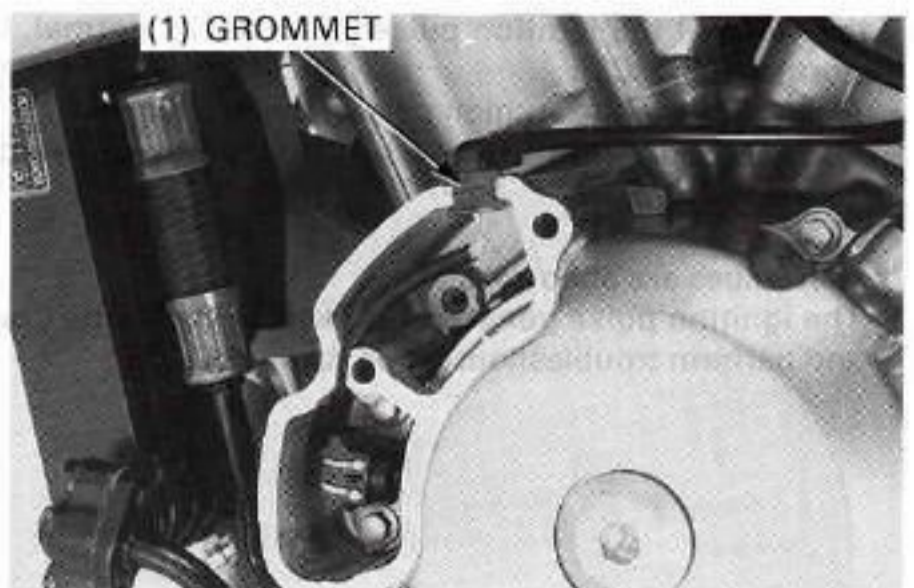
Remove the ignition pulse generator cover bolts and copper washer.



Remove the pulse generator cover and O-ring.



Remove the wire grommet from the groove on the left crankcase cover.



Remove the bolts and ignition pulse generator.

Clean and apply a locking agent to the ignition pulse generator bolt threads.

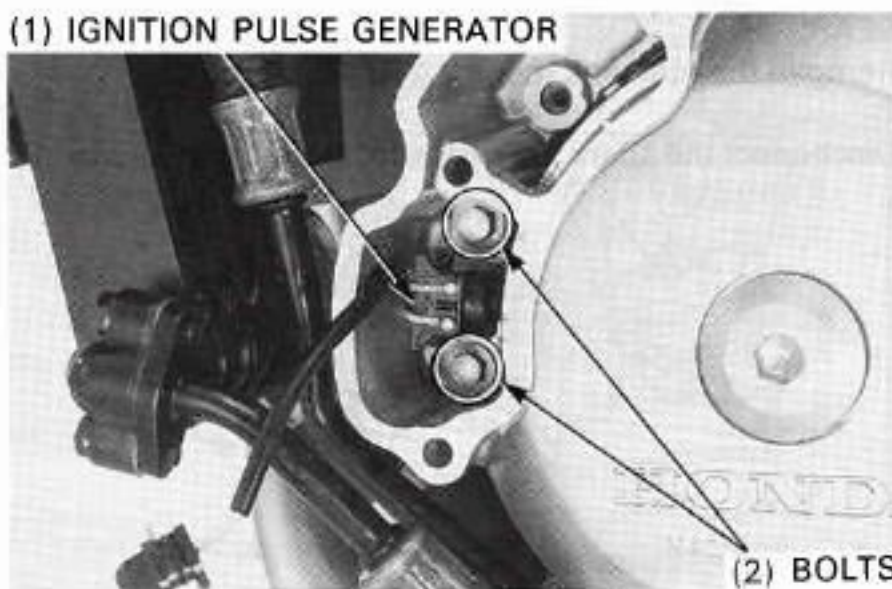
Install the ignition pulse generator and tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Installation is in the reverse order of removal.

NOTE

- At installation, apply sealant to the wire grommet and install it into the groove on the left crankcase cover.
- Route the wire harness properly (page 1-22).

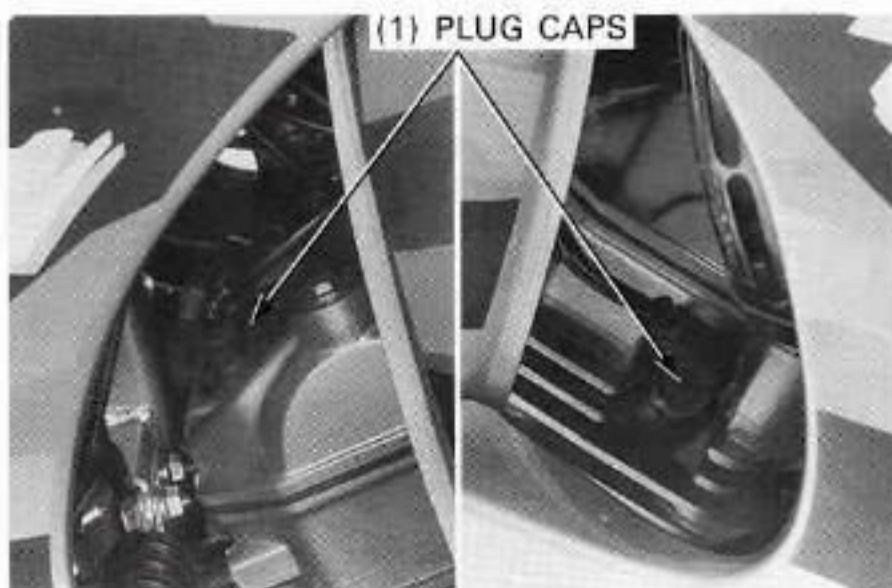


IGNITION COIL

REMOVAL/INSTALLATION

FRONT:

Disconnect the spark plug cap from the spark plug.



Remove the side cowl (page 2-2).

Disconnect the ignition coil primary wires from the terminals.

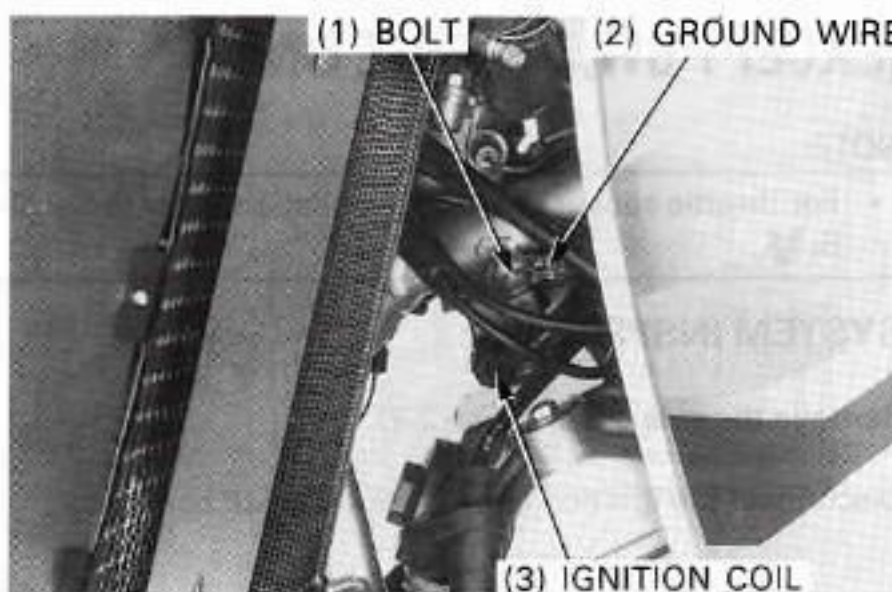
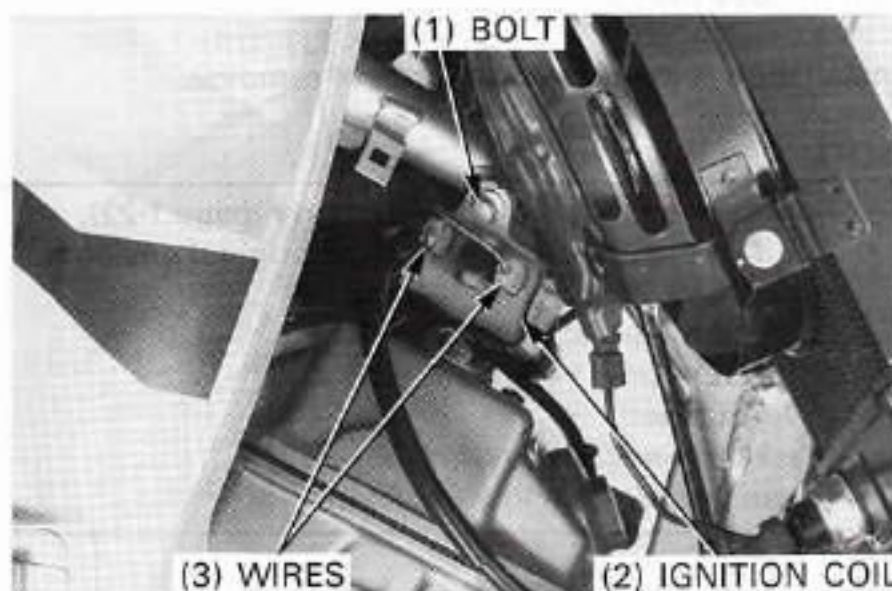
Remove the bolts and ground wire eyelet.

Remove the ignition coil.

Installation is in the reverse order of removal.

NOTE

- Route the spark plug wires properly (page 1-22).
- Connect the primary wires to the original position.
 Except SW, AR type:
 Black terminal: Black/White wire
 Green terminal: Blue/Yellow wire
 SW, AR type:
 Black terminal: Black/Yellow wire
 Green terminal: Green wire

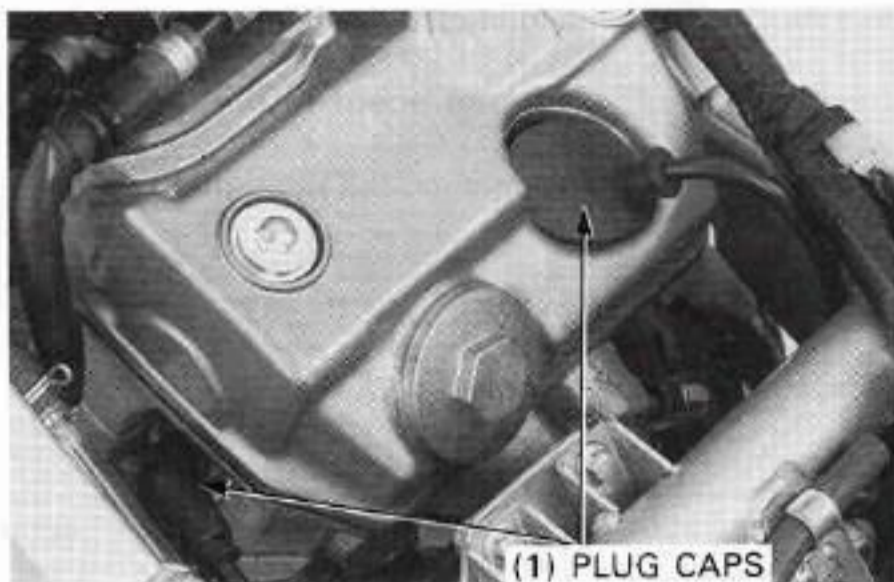


IGNITION SYSTEM

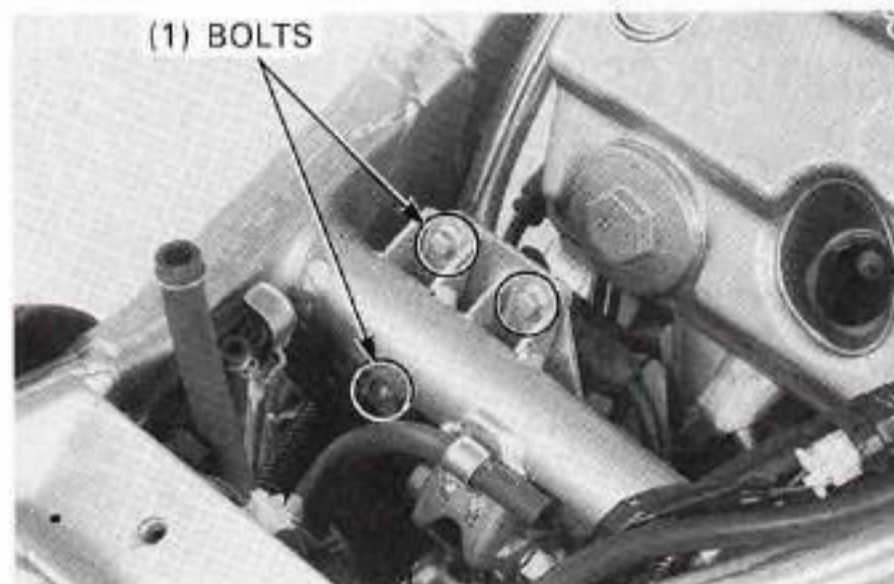
REAR:

Remove the fuel tank (page 2-20).

Disconnect the spark plug caps from the spark plugs.



Remove the bolts.

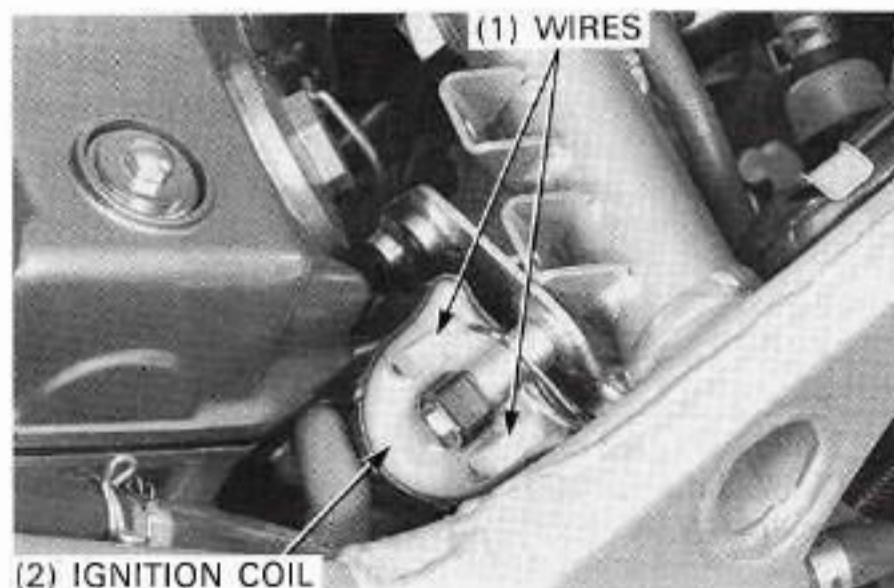


Disconnect the ignition coil primary wires from the terminals and remove the ignition coil.

Installation is in the reverse order of removal.

NOTE

- Route the spark plug wires properly (page 1-22).
- Connect the primary wires to the original position.
Except SW, AR type:
Black terminal: Black/White wire
Green terminal: Yellow/Blue wire
SW, AR type:
Black terminal: Black/White wire
Green terminal: Yellow/Blue wire



THROTTLE SENSOR INSPECTION (EXCEPT SW, AR TYPE ONLY)

NOTE

- For throttle sensor removal/installation, refer to Section 5.

SYSTEM INSPECTION

Remove the side cover (page 2-7).

Disconnect the ignition control module 12P connector,



Check the connector for loose or corroded terminals.

Measure the resistance between the Green/Black and Yellow/Black terminals.

STANDARD: 4–6k Ω (20 °C/68 °F)

Measure the resistance between the Yellow/Black and Red/Yellow terminals when the throttle is opened.

STANDARD:

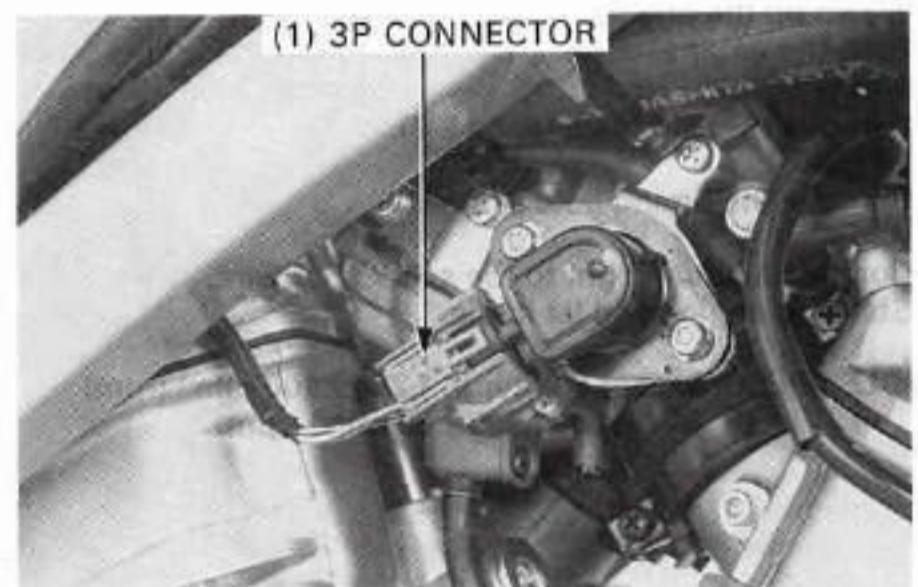
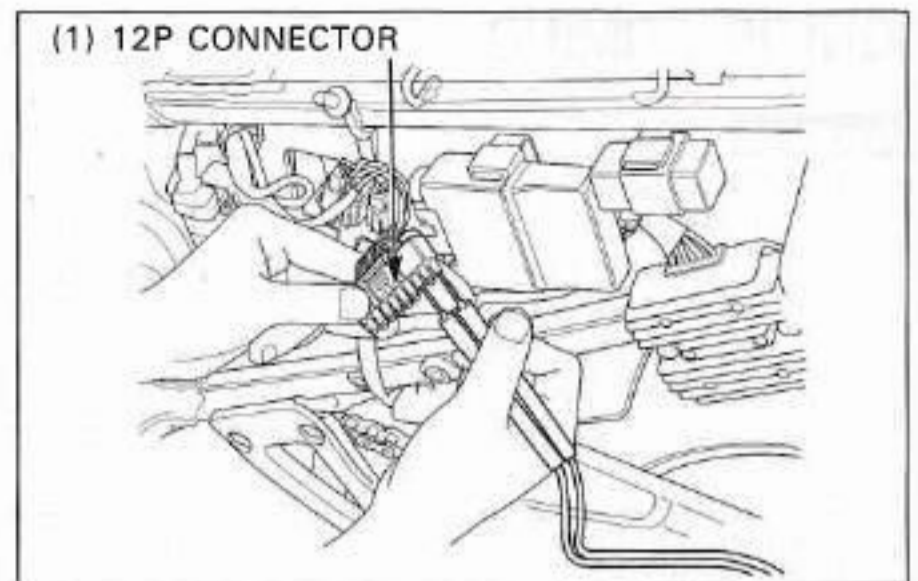
Open the throttle: increase resistance

Close the throttle: decrease resistance

If the measurement is out of specified range, perform the following procedures:

Remove the fuel tank (page 2-20).

Disconnect the throttle sensor 3P connector.
Check the connector for loose or corroded terminals.



Measure the resistance between the Green/Black and Yellow/Black terminals.

STANDARD: 4–6k Ω (20 °C/68 °F)

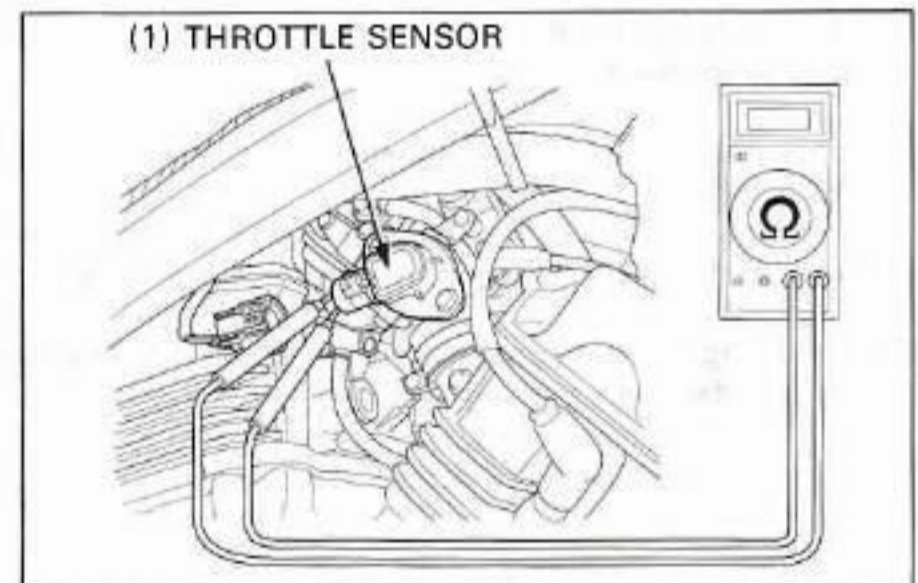
Measure the resistance between the Yellow/Black and Red/Yellow terminals when the throttle is opened.

STANDARD:

Open the throttle: increase resistance

Close the throttle: decrease resistance

If the values at the throttle sensor 3P connector is abnormal, replace the throttle sensor (page 5-17).



INPUT VOLTAGE INSPECTION

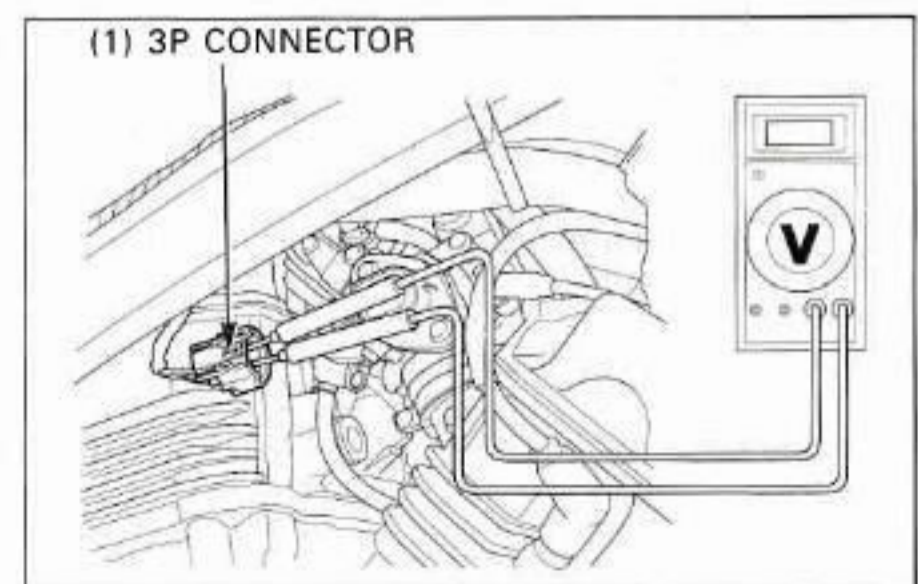
Turn the ignition switch ON.
Measure the input voltage between the throttle sensor 3P connector wire harness side.

CONNECTION: Green/Black (+)- Yellow/Black (-)

STANDARD: 4.7–5.3 V

If the measurement is out of the specification, check the following:

- Loose connection ignition control module 12P connector.
- An open circuit in wire harness.



IGNITION SYSTEM

IGNITION TIMING

⚠ WARNING

- If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of the consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

NOTE

- Read the manufacturer's operating instructions for the timing light.

Warm up the engine.
Stop the engine.

Remove the skid plate (page 2-7).

Remove the timing hole cap.

Connect a timing light to the spark plug wire.
Start the engine and let it idle.

IDLE SPEED: Except SW type: $1,200 \pm 100 \text{ min}^{-1}$ (rpm)
SW type: $1,200 \pm 50 \text{ min}^{-1}$ (rpm)

The timing is correct if the "F" mark on the flywheel aligns with the index mark on the left crankcase cover.

Increase the engine speed by rotating the throttle stop control knob.

The timing is correct if the advance marks on the flywheel aligns with the index mark on the left crankcase cover.

Stop the engine and connect the timing light to the front (No.2) cylinder spark plug wire.

Recheck the ignition timing at the front cylinder.

Coat the new O-ring with engine oil and install it in the timing hole cap groove.

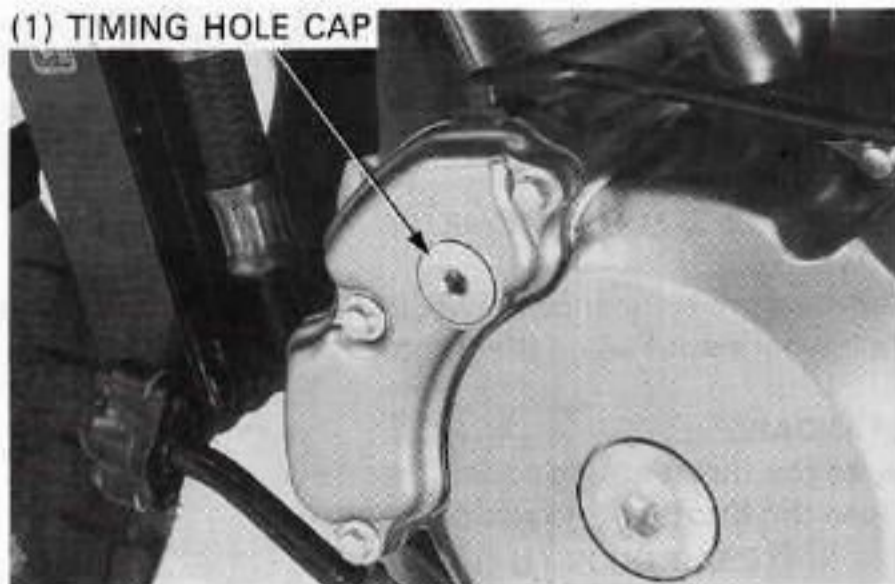
Apply molybdenum disulfide oil to the timing hole cap threads and flange surface.

Install and tighten the timing hole cap to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the skid plate (page 2-7).

(1) TIMING HOLE CAP

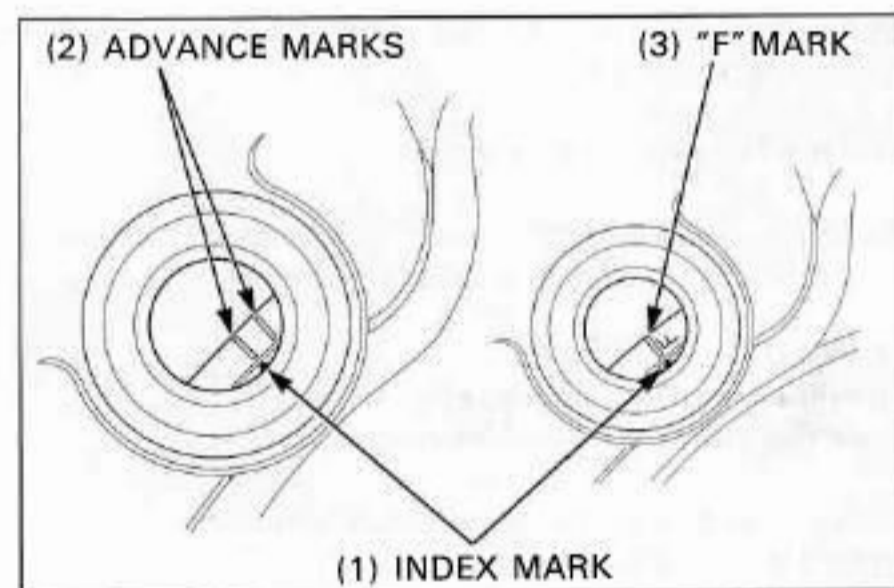


(1) TIMING LIGHT

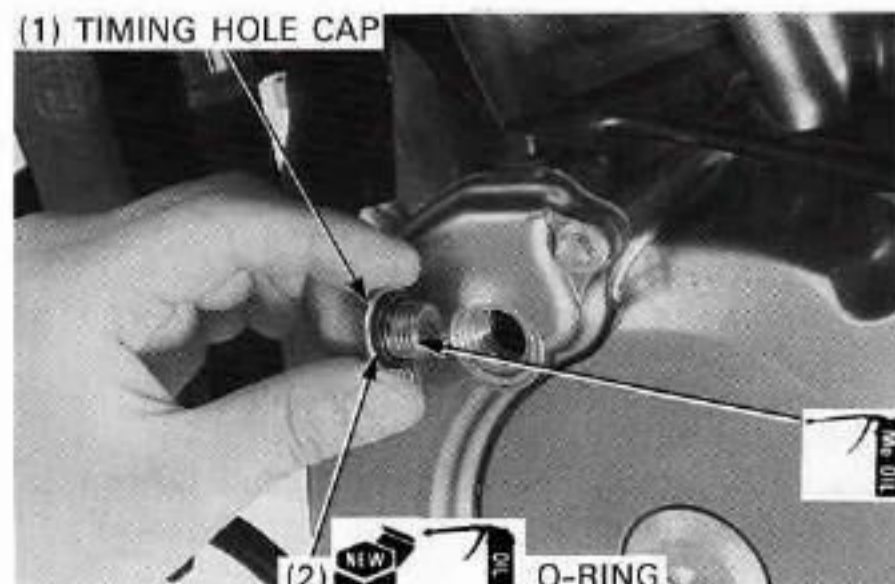


(2) ADVANCE MARKS

(3) "F" MARK



(1) TIMING HOLE CAP



(2) NEW

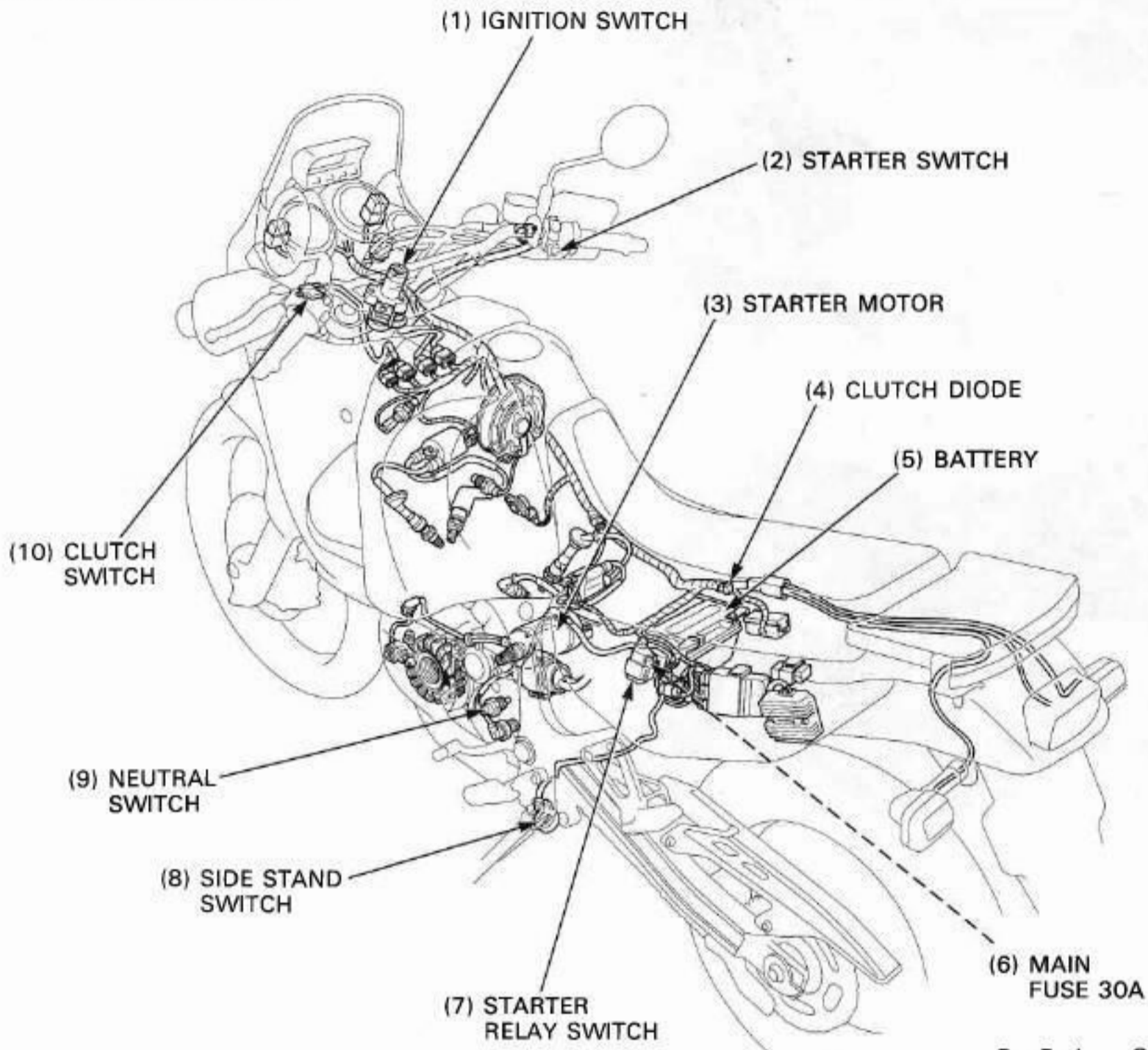
O-RING

MEMO

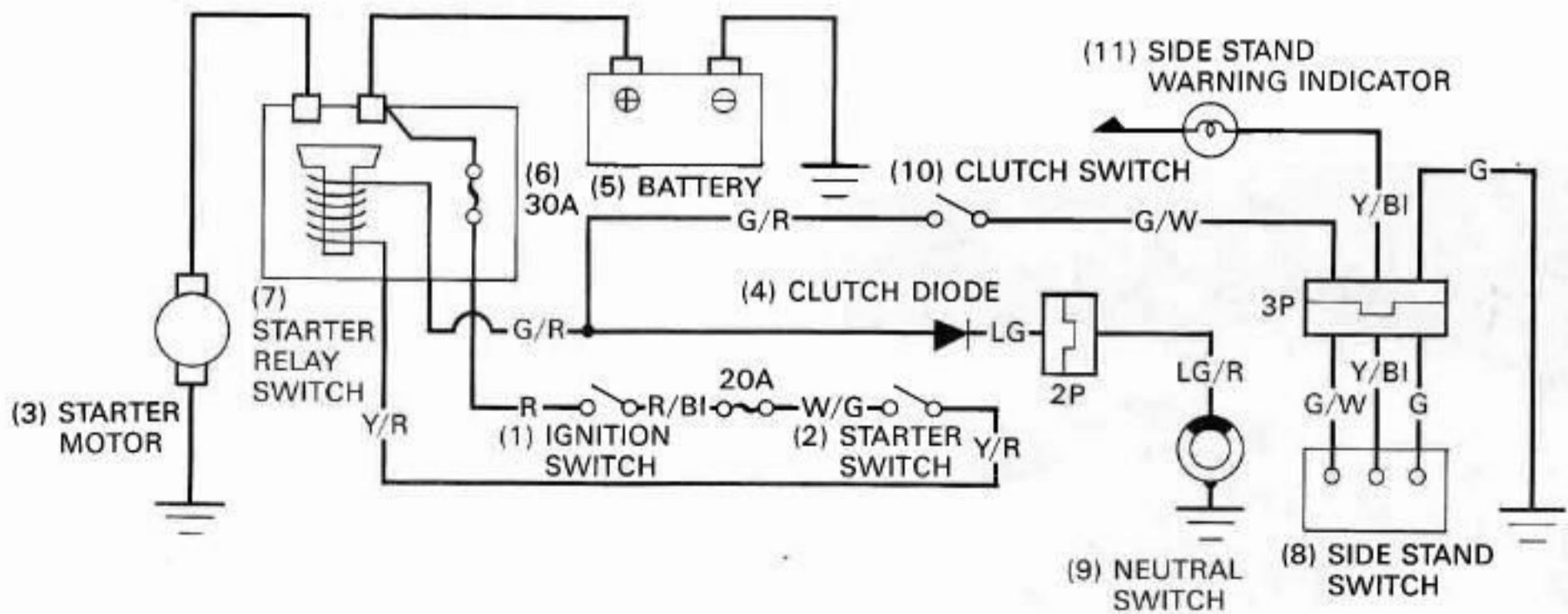
[Faint, illegible text, likely bleed-through from the reverse side of the page]



SYSTEM DIAGRAM



R : Red G : Green
 W : White BI : Black
 Y : Yellow LG: Light green



18. ELECTRIC STARTER

| | | | |
|---------------------|------|----------------------|-------|
| SYSTEM DIAGRAM | 18-0 | STARTER MOTOR | 18-4 |
| SERVICE INFORMATION | 18-1 | STARTER RELAY SWITCH | 18-14 |
| TROUBLESHOOTING | 18-2 | CLUTCH DIODE | 18-16 |

SERVICE INFORMATION

GENERAL

▲ WARNING

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

- When checking the starter system, always follow the steps in the troubleshooting flow chart (page 18-2).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- If current continues to flow kept flowing through the starter motor while the engine is not cranking over, the starter motor may be damaged.
- Always turn of the ignition switch before disconnecting any electrical components.
- For following components inspections, refer to the following pages; for the parts locations, see page 18-0 of this manual.
 - Side stand switch (Section 19)
 - Neutral switch (Section 19)
 - Ignition switch (Section 19)
 - Starter switch (Section 19)
 - Clutch switch (Section 19)

SPECIFICATION

Unit:mm(in)

| ITEM | STANDARD | SERVICE LIMIT |
|----------------------------|----------|---------------|
| Starter motor brush length | 10 (0.4) | 6.5 (0.26) |

TORQUE VALUES

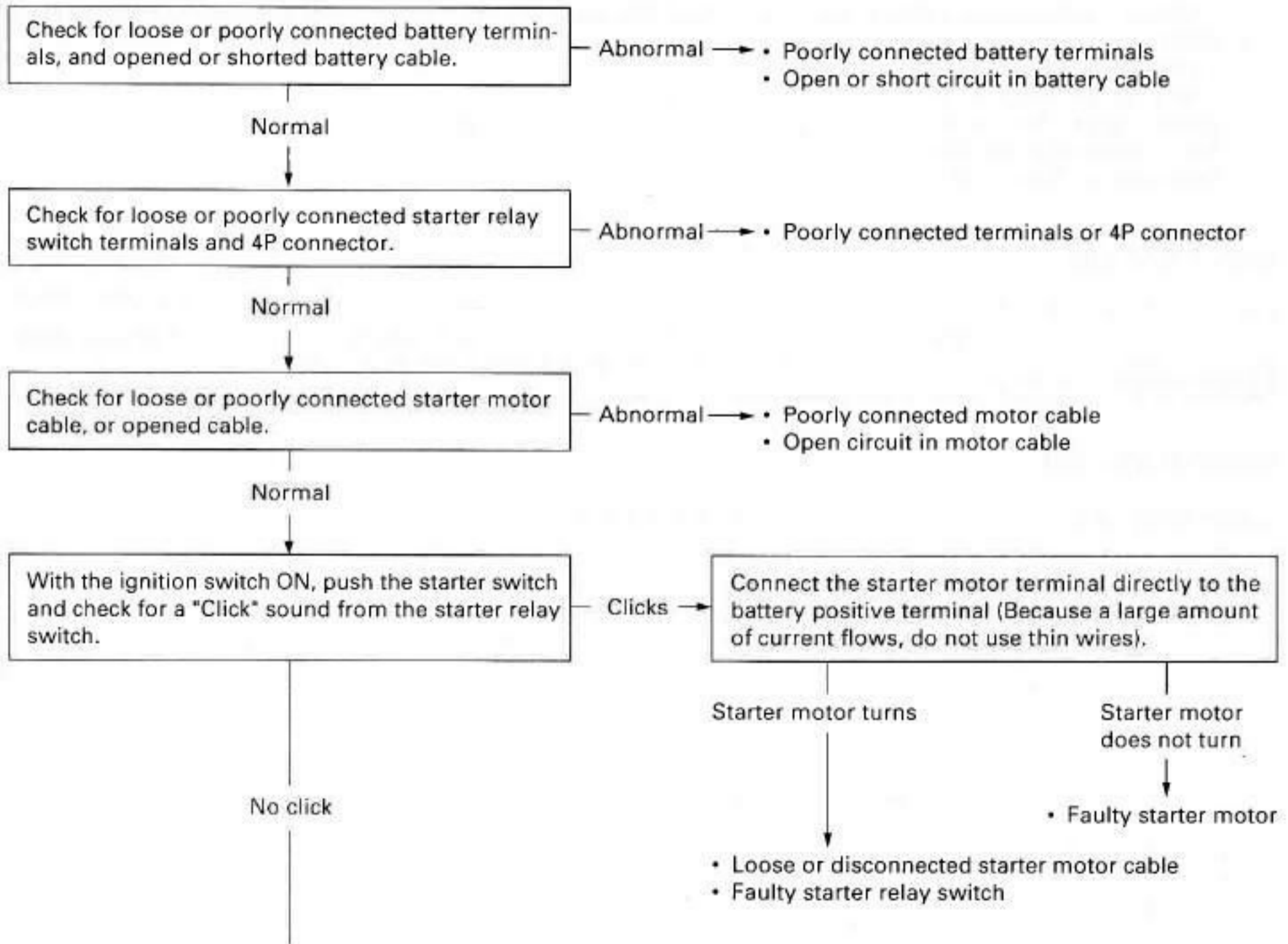
Starter motor cable nut 10 N•m (1.0 kgf•m, 7 lbf•ft)

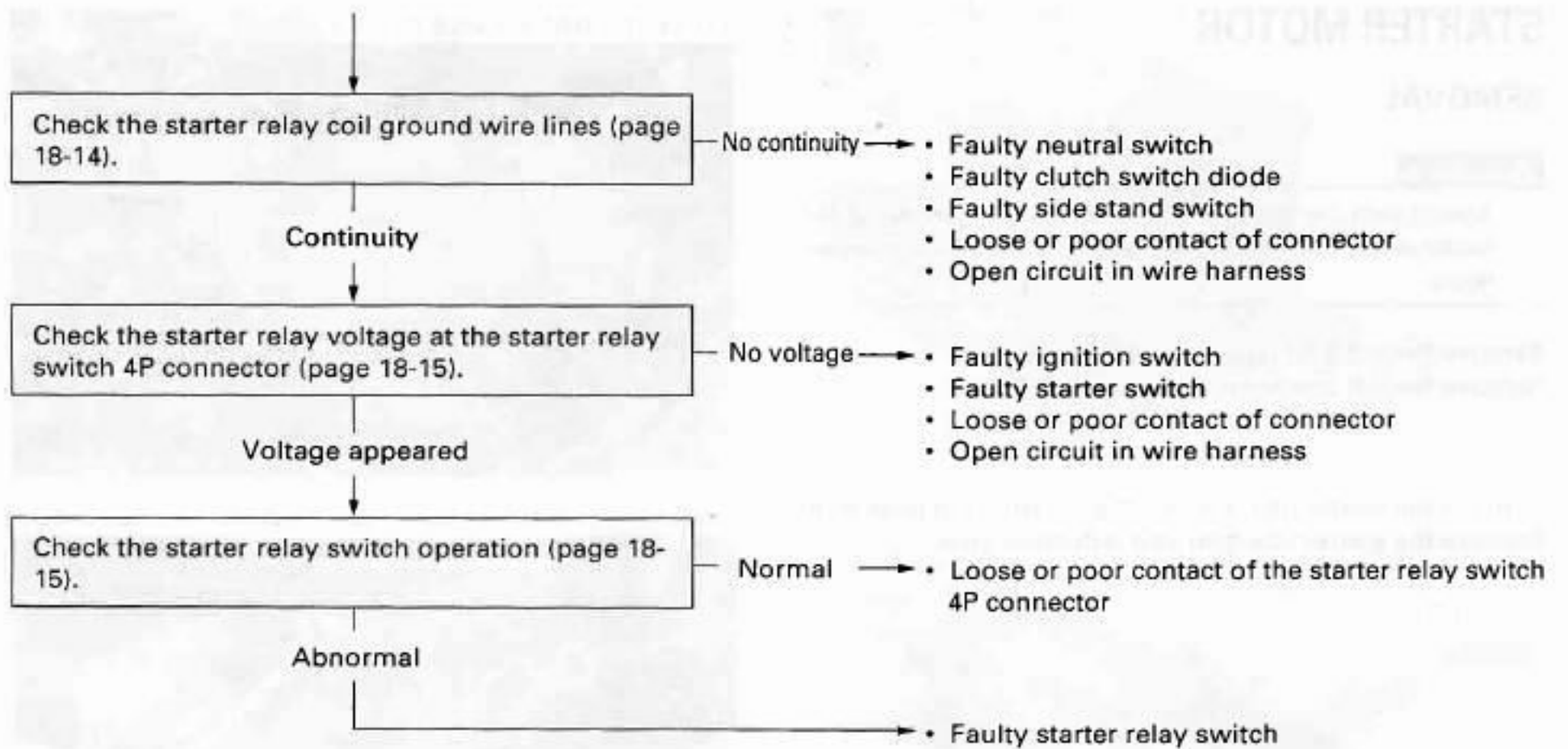
TROUBLESHOOTING

- Check for the following before troubleshooting the system.
 - Blown main fuse (30A) or sub fuse (20A).
 - Loose battery and starter motor cable.
 - Discharged battery.
- The starter motor should turn when the transmission is in neutral.
- The starter motor should turn when transmission is in any gear as indicated the chart below.

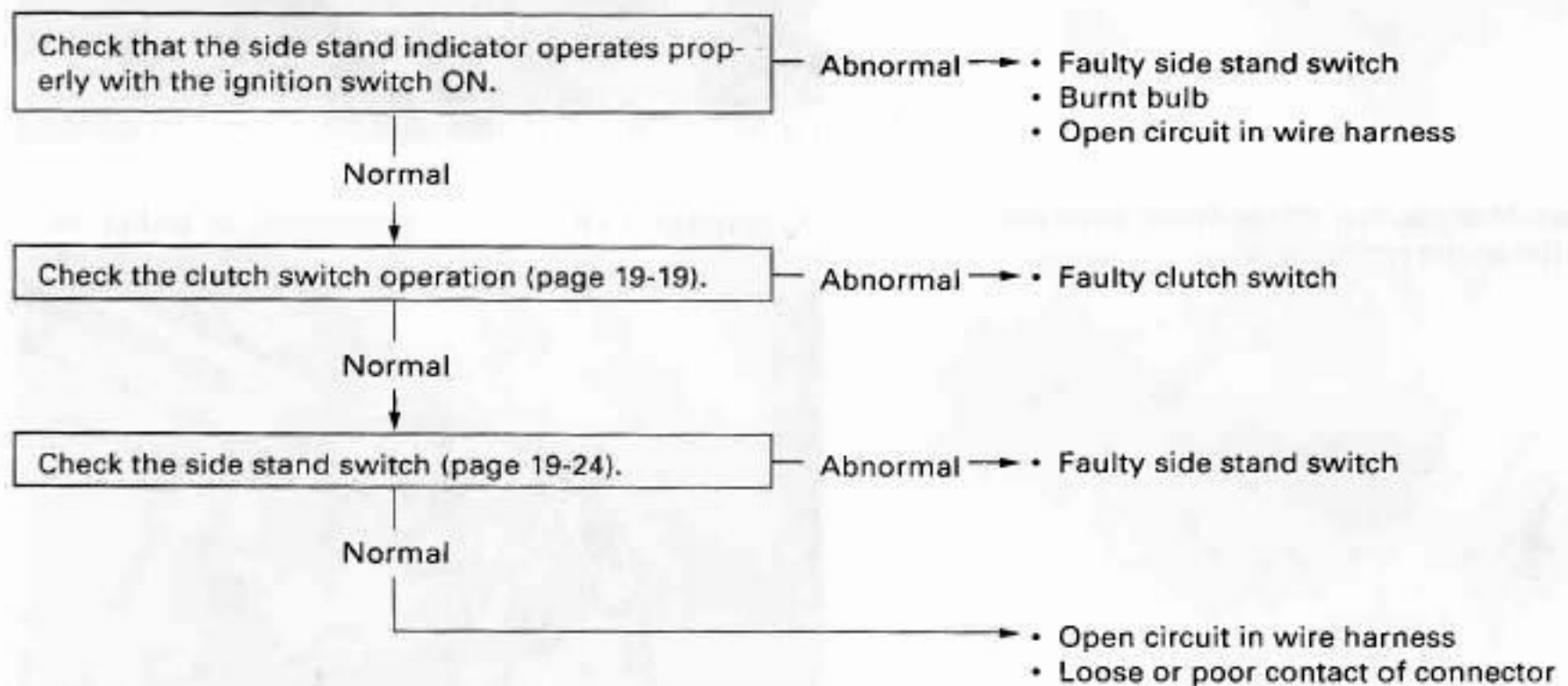
| Gear Position | Side Stand | Clutch Lever | Starter Motor |
|---------------|------------|--------------|---------------|
| Any Gear | Up | Pulled in | Turn |
| | | Released | Does not turn |
| | Down | Pulled in | Does not turn |
| | | Released | Does not turn |

Starter motor will not turn





The starter motor turns when the transmission is in neutral, but does not turn with the transmission in any position except neutral. The side stand is up and the clutch lever is pulled in.



Starter motor turns slowly

- Poorly connected battery terminal cable
- Poorly connected starter motor cable
- Faulty starter motor
- Wear or damage starter motor brush

Starter relay switch "clicks", but engine does not turn over

- Crankshaft does not turn due to engine problem
- Faulty starter reduction gear
- Faulty starter idle gear

Starter motor turns, but engine does not turn

- Starter motor is running backwards
 - Case assembled improperly
 - Terminals connected improperly
- Faulty starter clutch

ELECTRIC STARTER

STARTER MOTOR

REMOVAL

⚠ WARNING

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

Remove the exhaust pipe (page 2-12).
Remove the left crankcase cover (page 9-2).

Remove the starter idle gear shaft and reduction gear shaft.
Remove the starter idle gear and reduction gear.

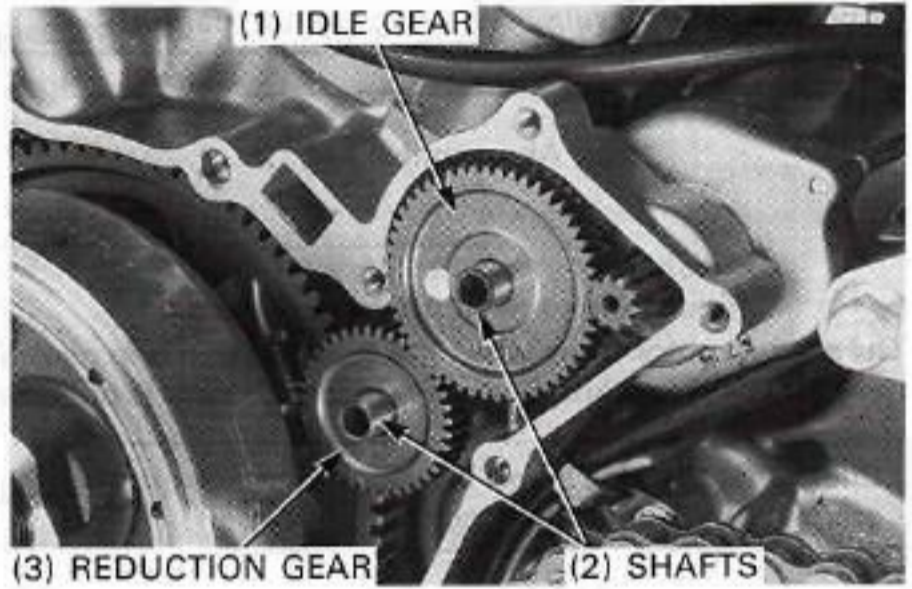
Remove the rubber cap and starter motor cable nut.
Disconnect the starter motor cable.

Remove the bolts and ground cable.
Remove the starter motor.

(1) LEFT CRANK CASE COVER



(1) IDLE GEAR

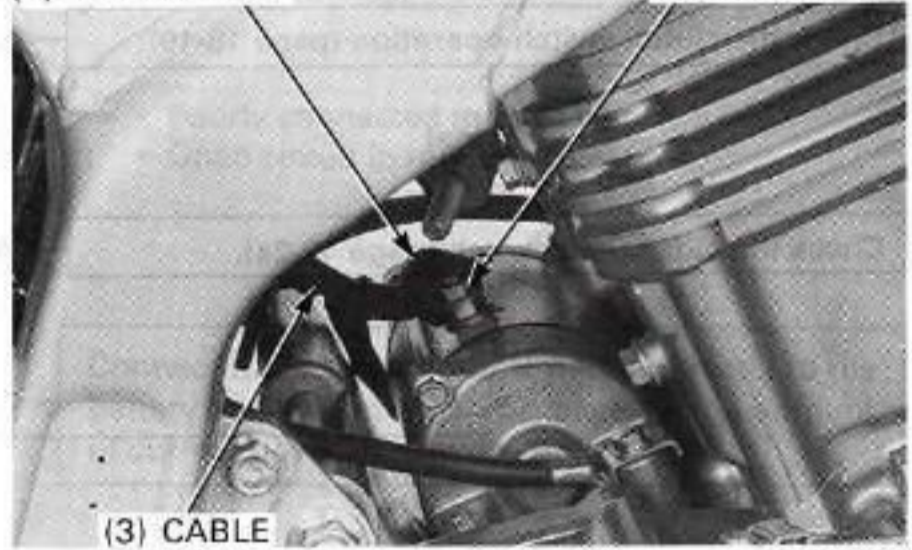


(3) REDUCTION GEAR

(2) SHAFTS

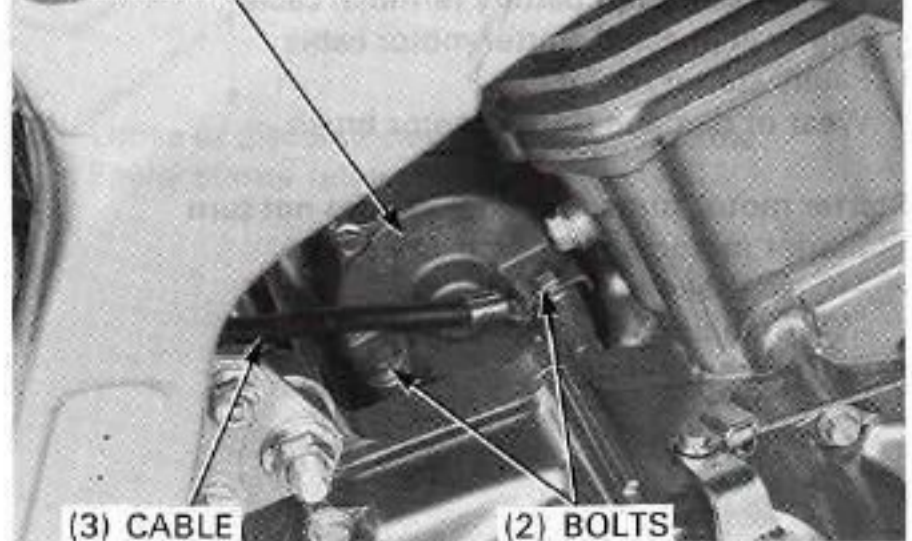
(1) RUBBER CAP

(2) CABLE NUT



(3) CABLE

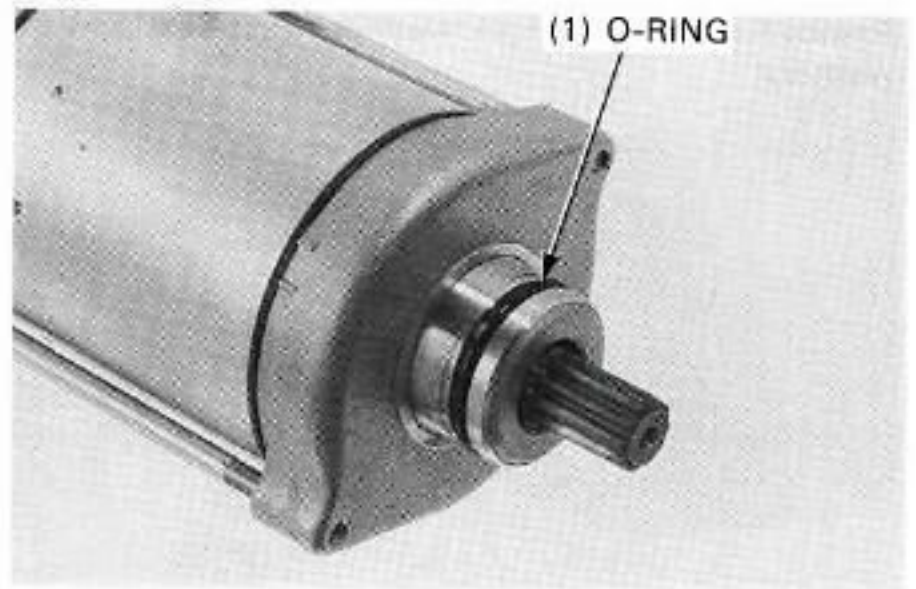
(1) STARTER MOTOR



(3) CABLE

(2) BOLTS

Remove the O-ring.

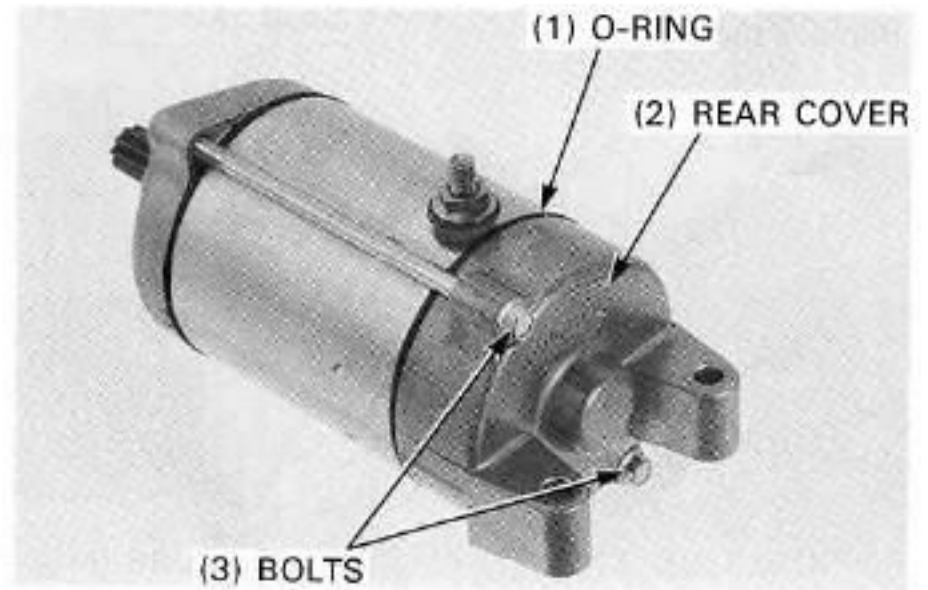


DISASSEMBLY

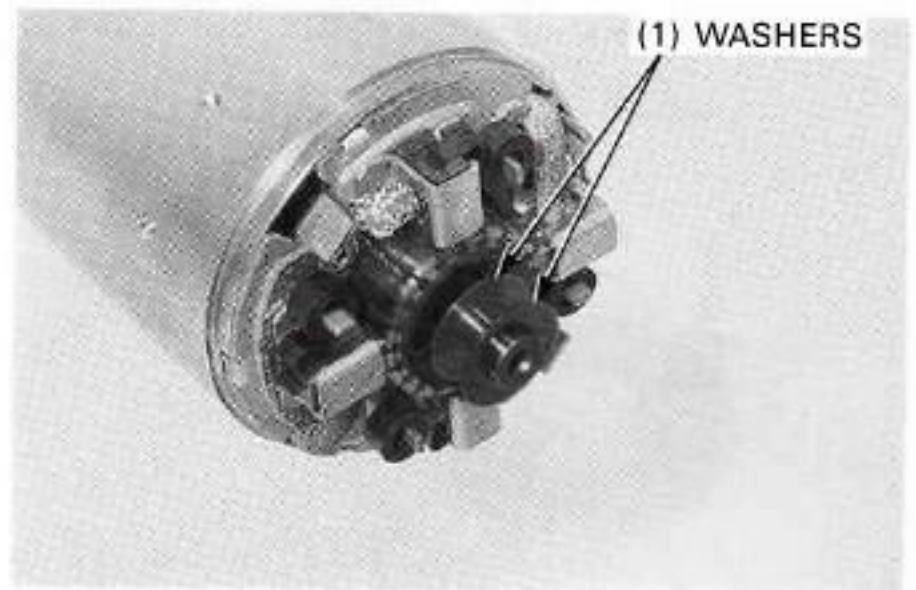
NOTE

- Record the location and number of shims and washers.

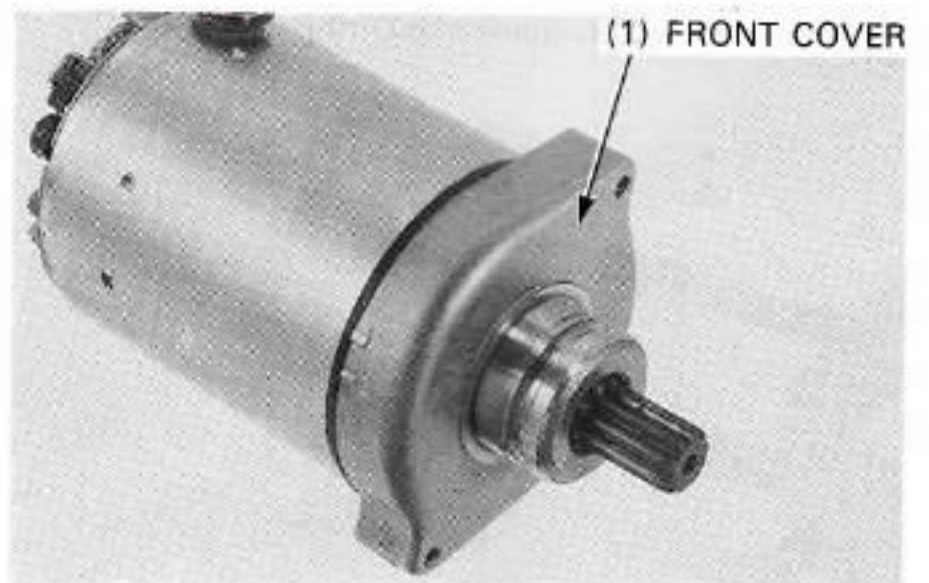
Remove the bolts, rear cover and O-ring.



Remove the thrust washers.

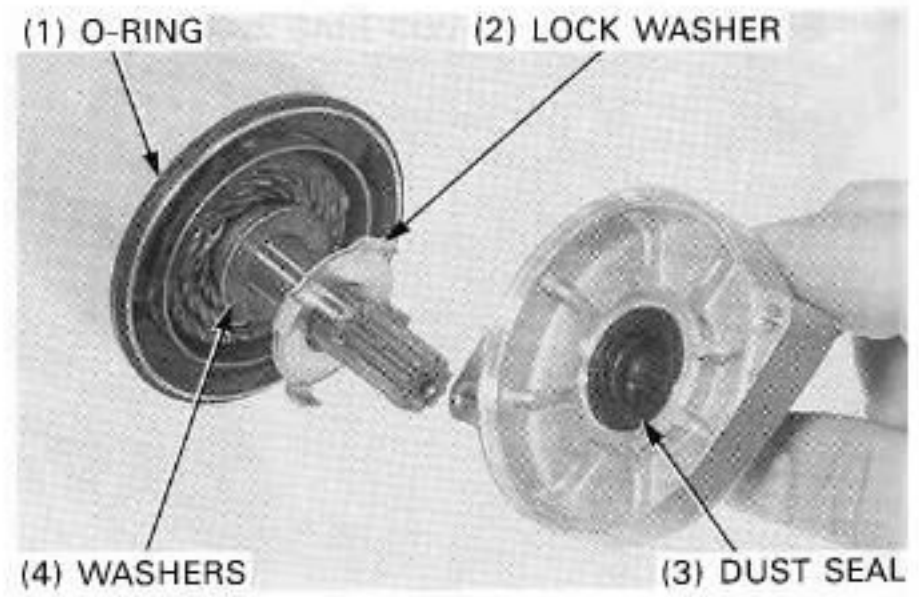


Remove the front cover.

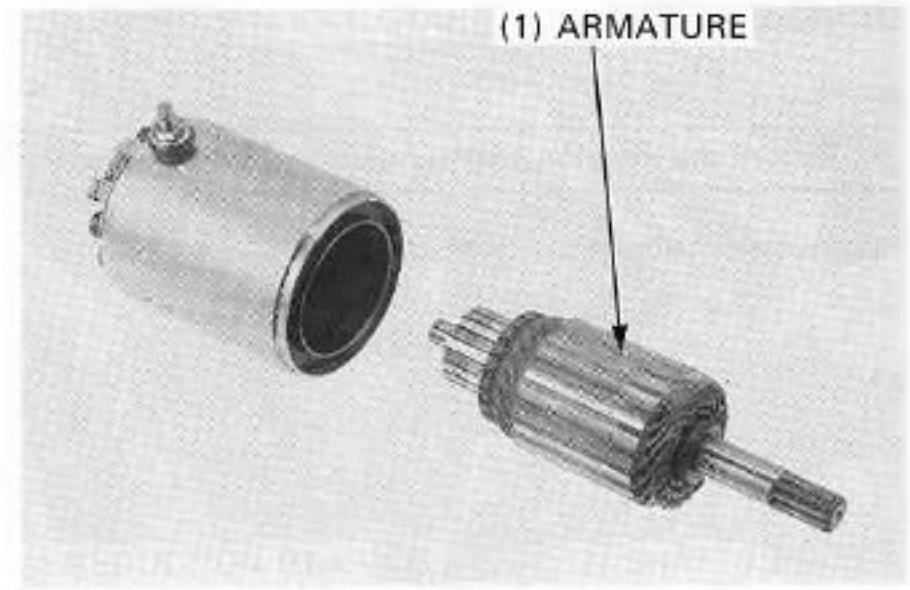


ELECTRIC STARTER

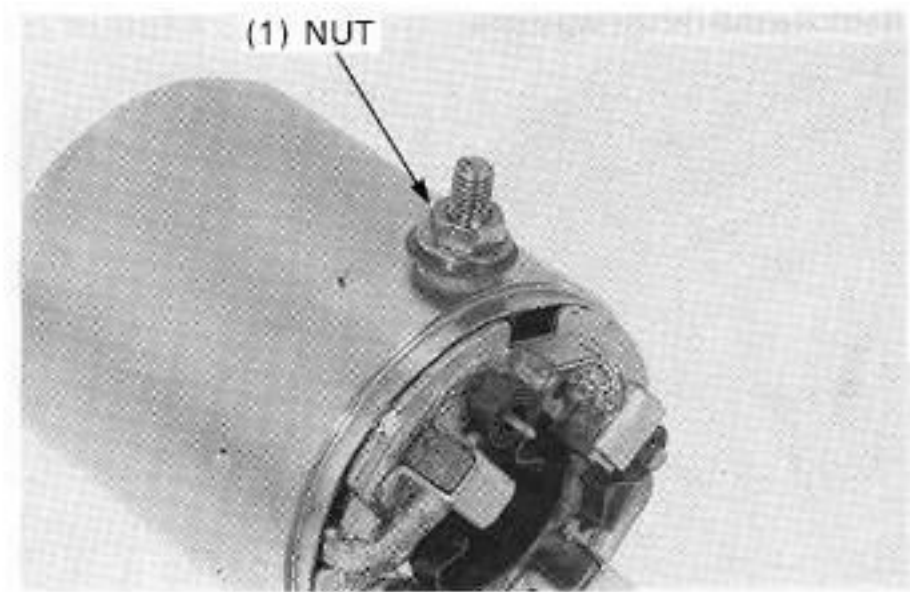
Remove the O-ring, lock washer, dust seal and thrust washers.



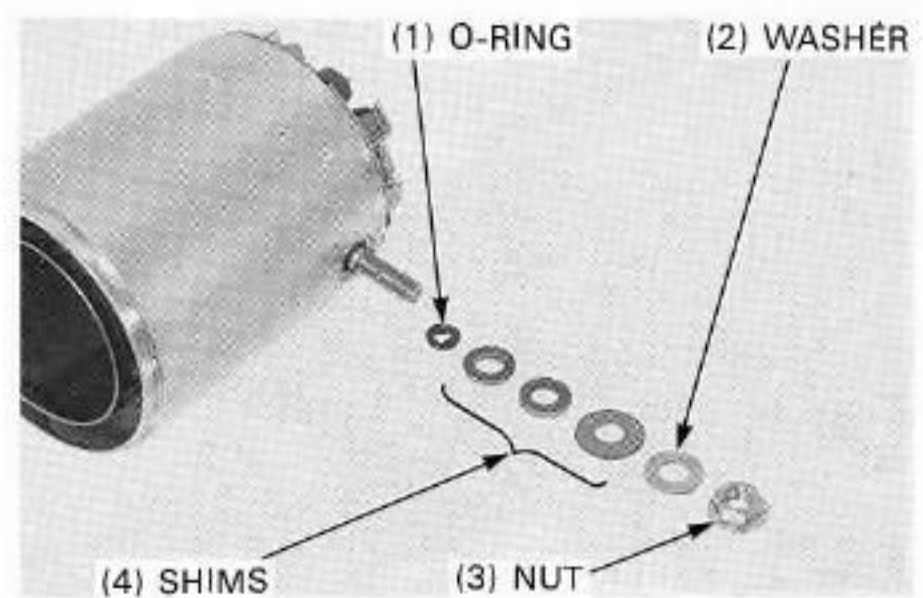
Remove the armature.



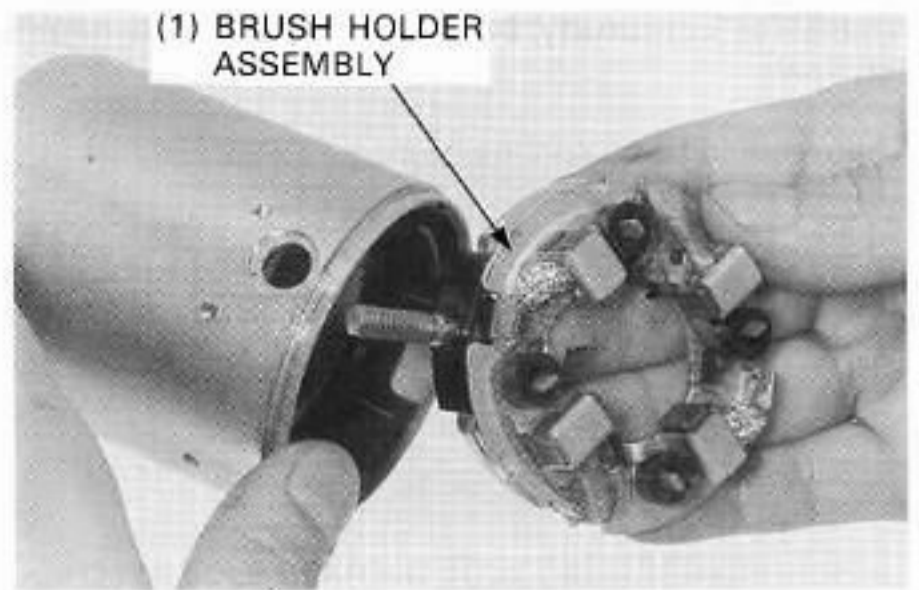
Remove the terminal nut.



Remove the washer, shims and O-ring.

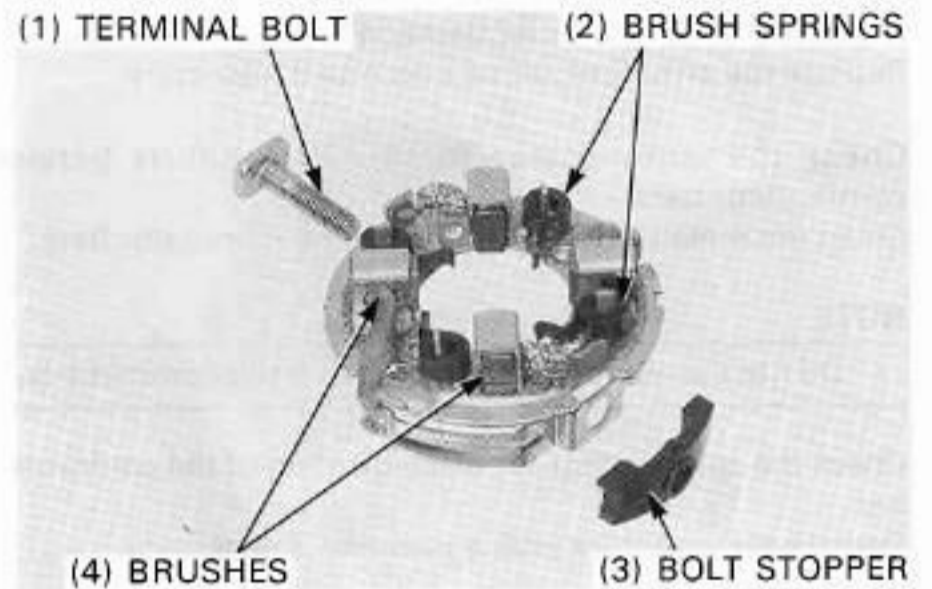


Remove the brush holder assembly.



BRUSH HOLDER DISASSEMBLY

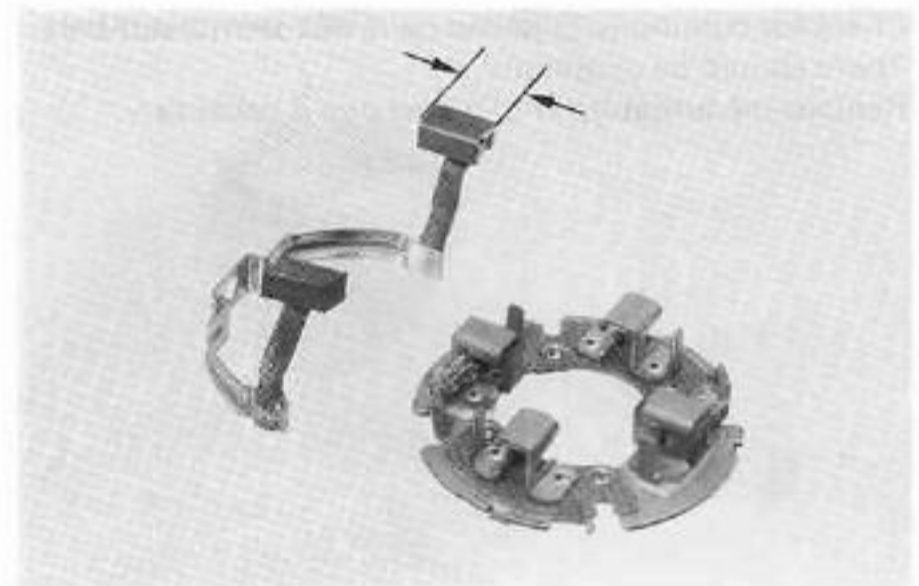
Remove the terminal bolt stopper, terminal bolt, motor brushes and brush springs.



INSPECTION

Measure the each brush length

SERVICE LIMIT: 6.5 mm (0.26 in)

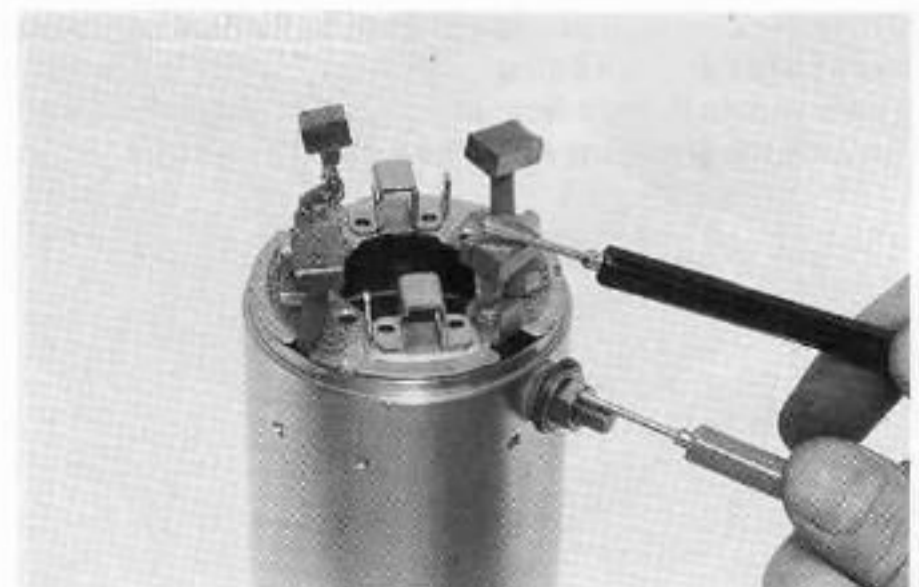


Check for continuity between starter motor terminal and positive brush.

There should be continuity.

Check for continuity between starter motor terminal and starter motor case.

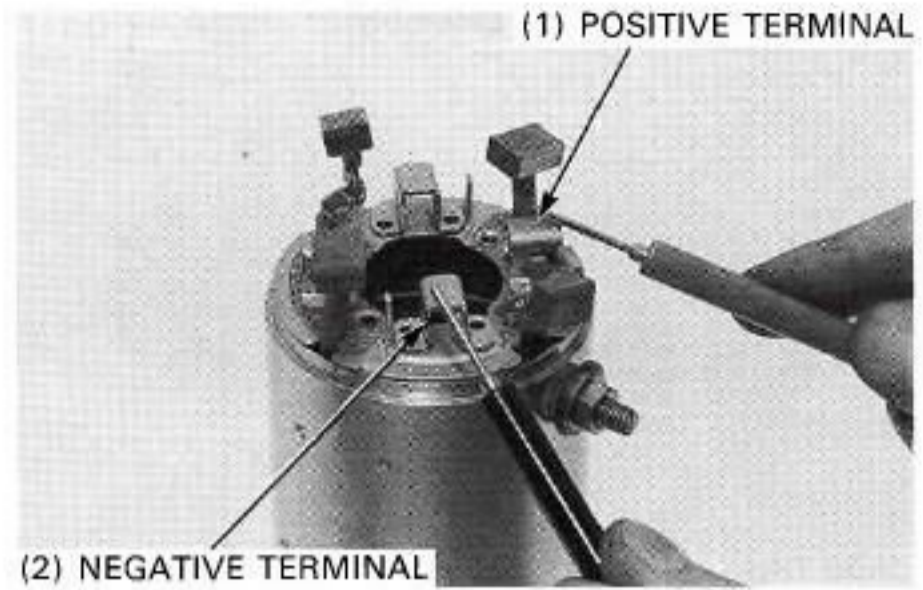
There should be no continuity.



ELECTRIC STARTER

Check for continuity between positive and negative terminals.

There should be no continuity.



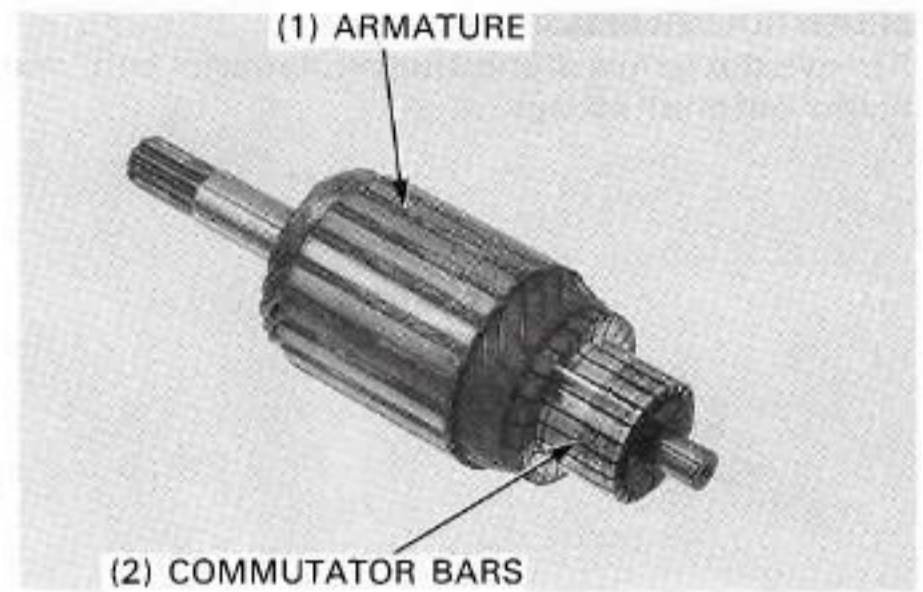
Check the commutator for damage or abnormal wear.
Replace the armature with a new one if necessary.

Check the commutator for metallic debris between commutator bars.
Clean the metallic debris off between commutator bars.

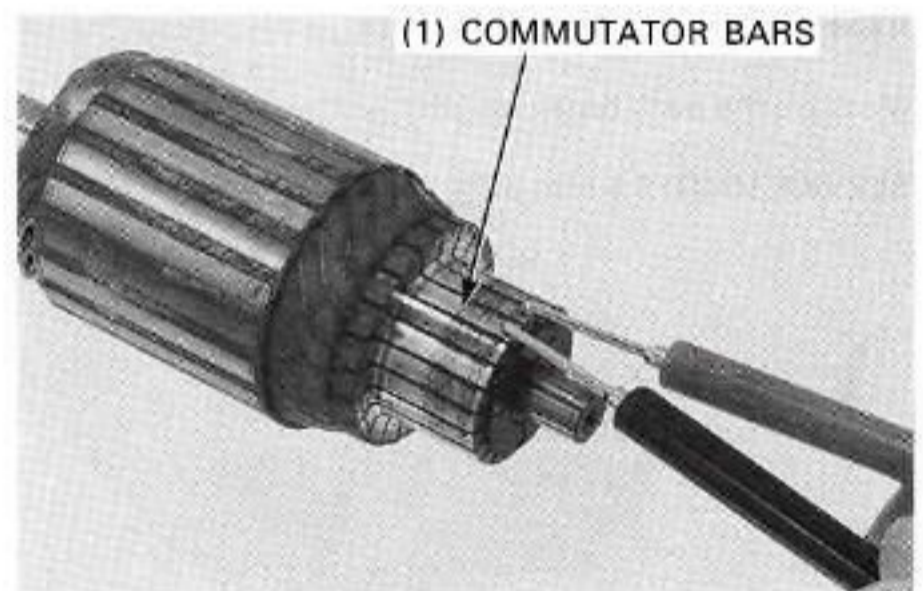
NOTE

- Do not use emery or sand paper on the commutator.

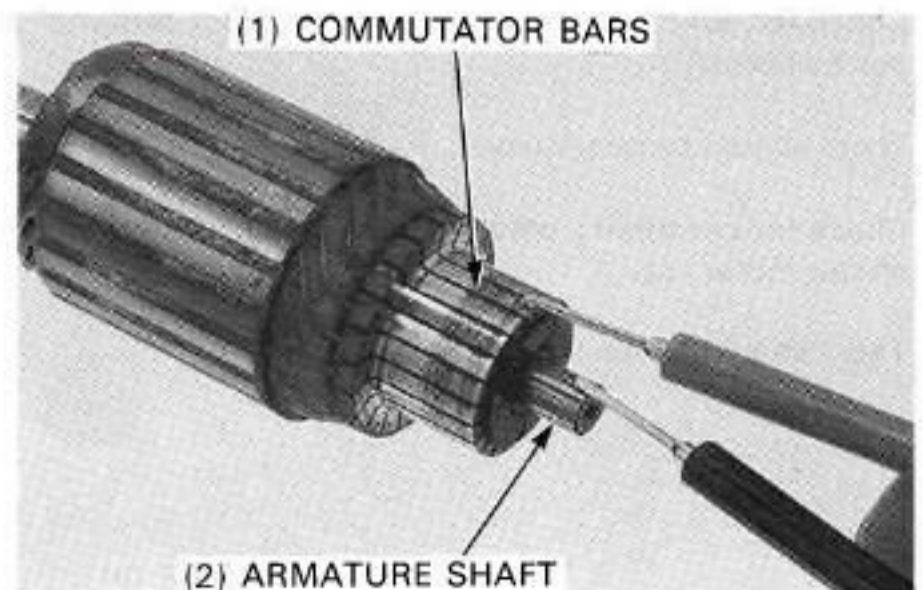
Check the commutator for discoloration of the commutator bar.
Replace the armature with a new one if necessary.



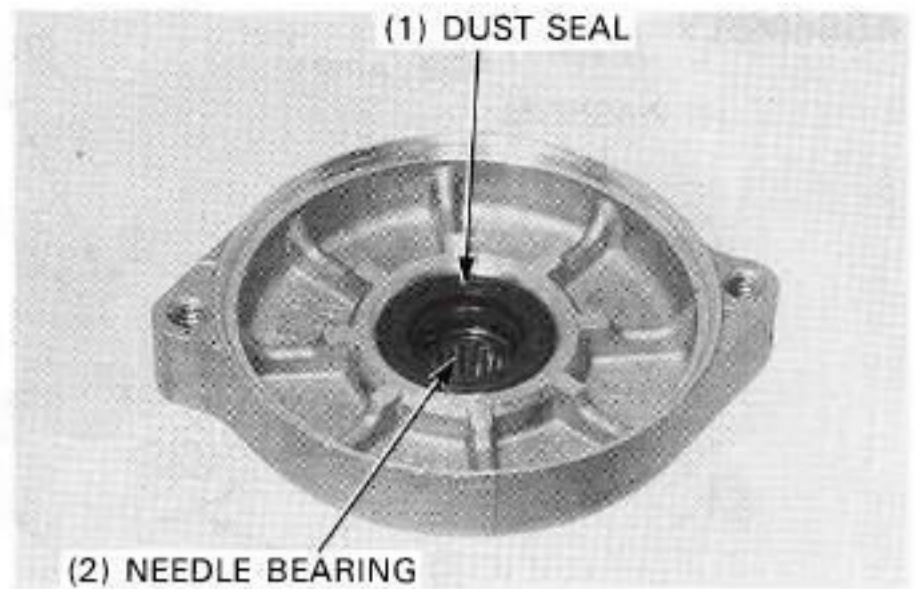
Check for continuity between pairs of commutator bars.
There should be continuity.
Replace the armature with a new one if necessary.



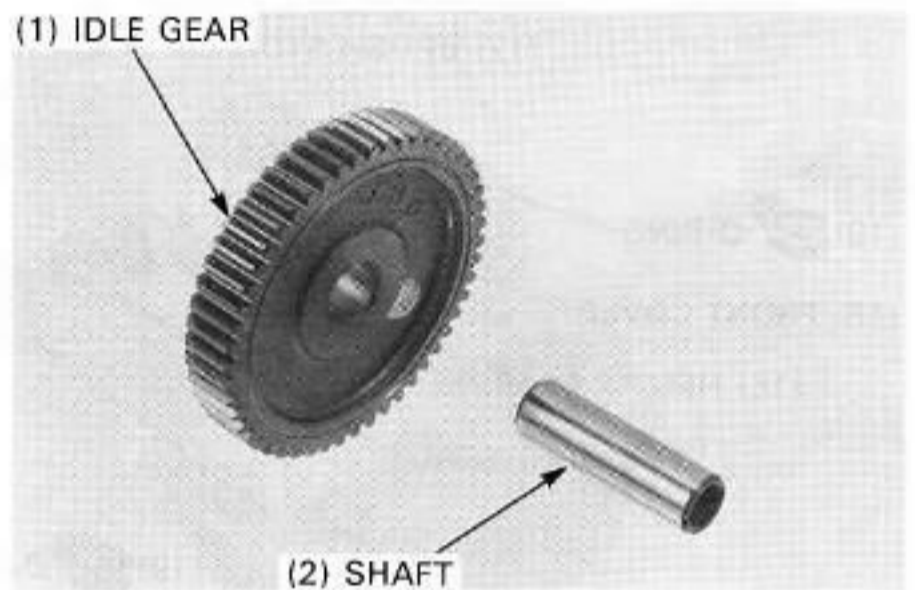
Check for continuity between each individual commutator bar and the armature shaft.
There should be no continuity.
Replace the armature with a new one if necessary.



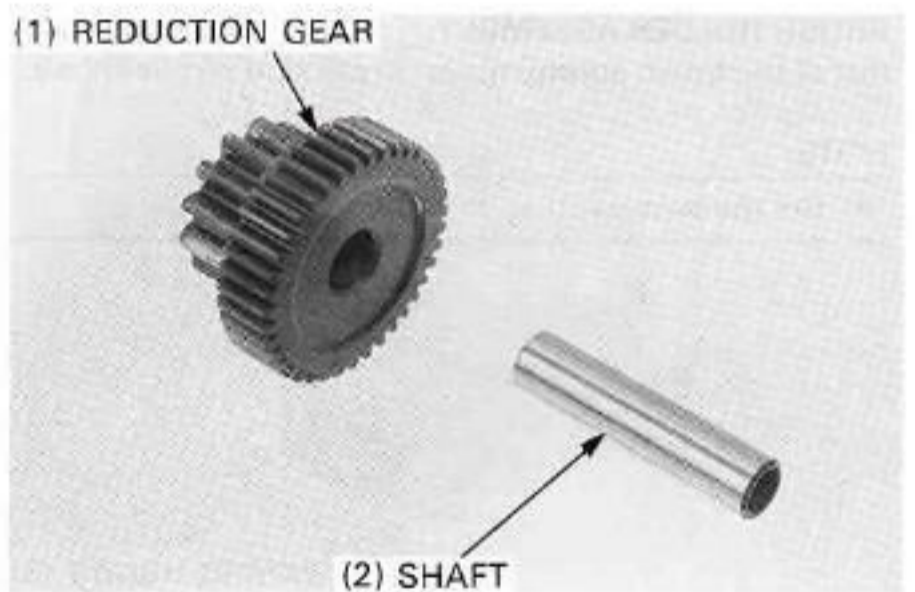
Check the dust seal and needle bearing for wear or damage.
Check the needle bearing rotates smoothly.



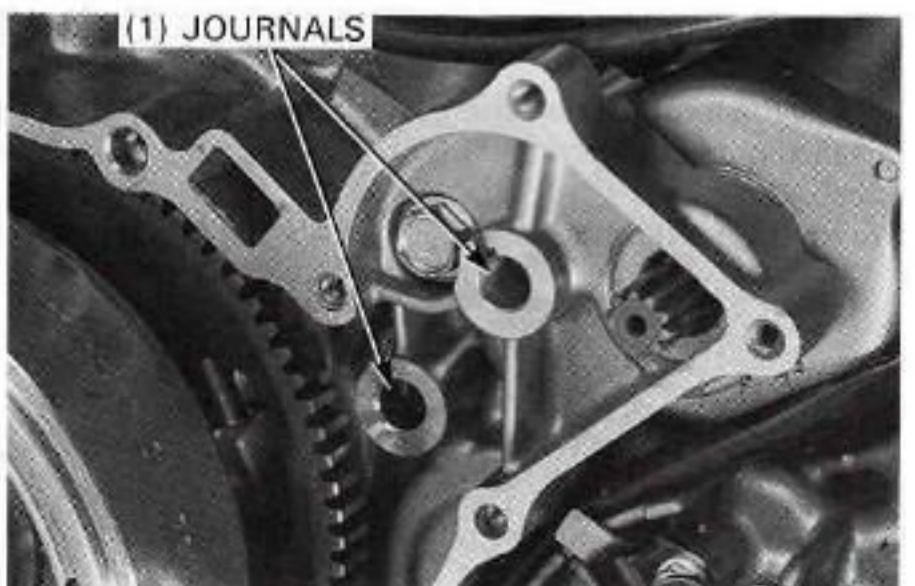
Check the starter idle gear and shaft for wear or damage.



Check the starter reduction gear and shaft for wear or damage.

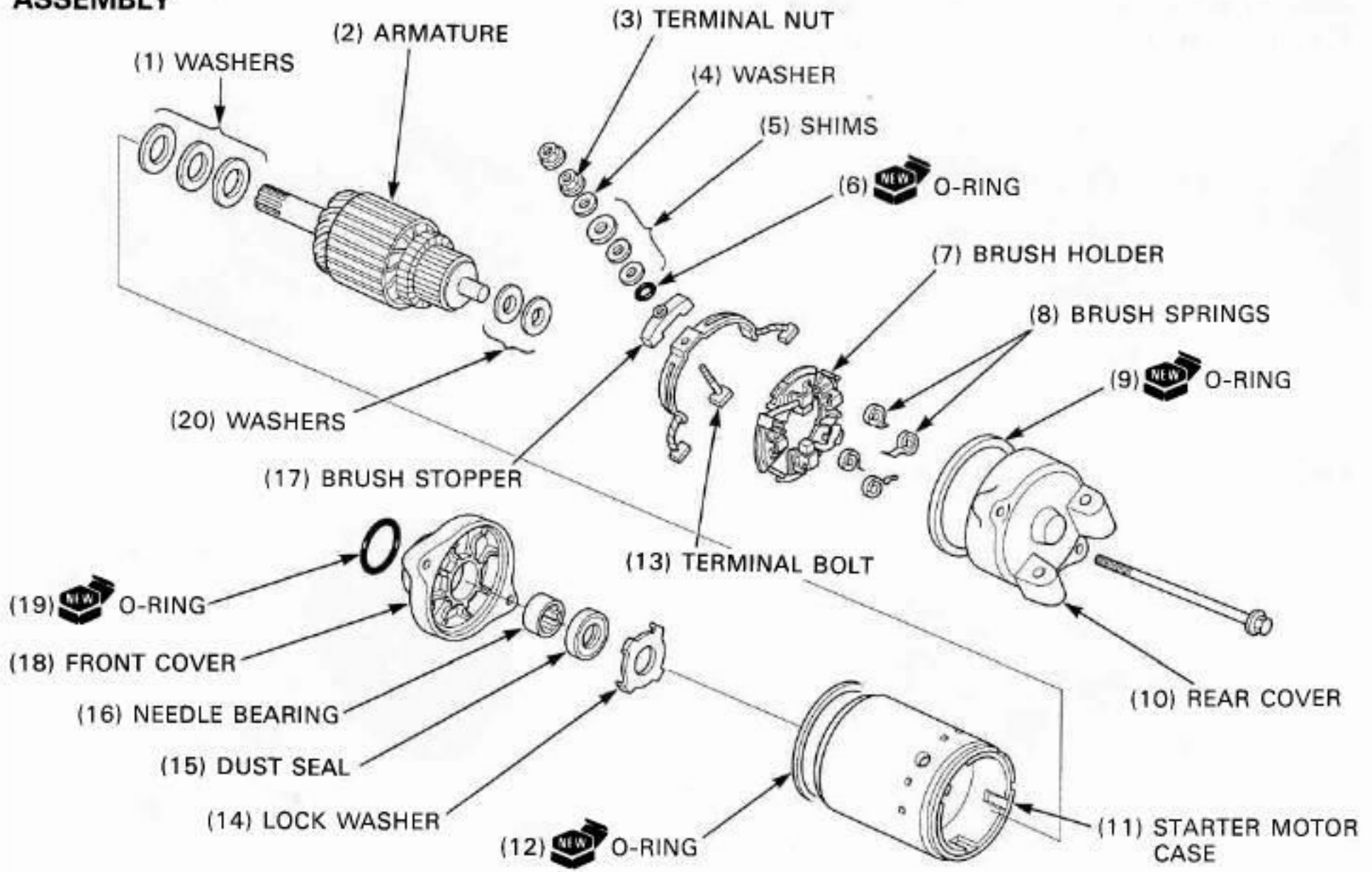


Check the starter reduction gear shaft journal and starter idle gear shaft journal for wear or damage.



ELECTRIC STARTER

ASSEMBLY

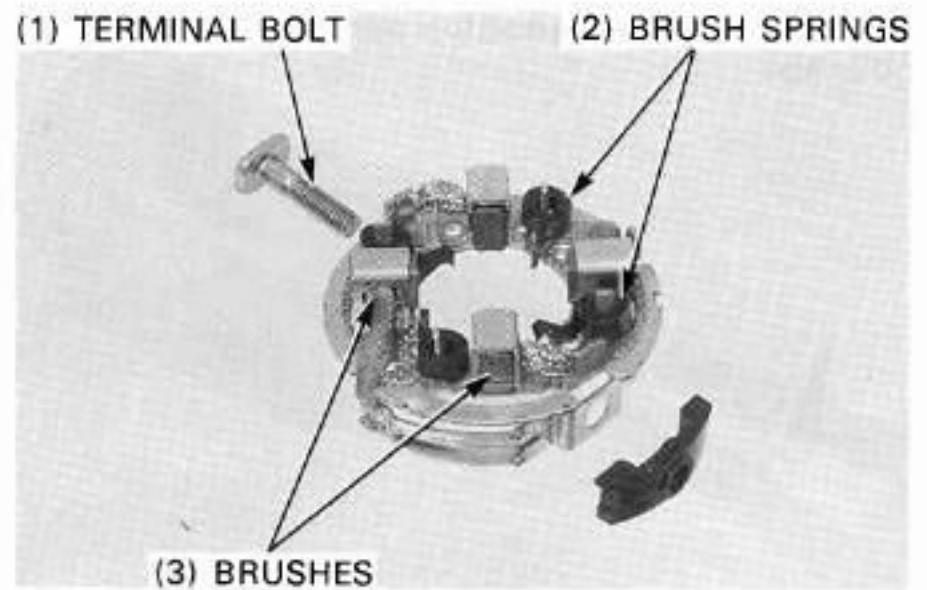


BRUSH HOLDER ASSEMBLY

Install the brush spring, motor brush and terminal bolt.

NOTE

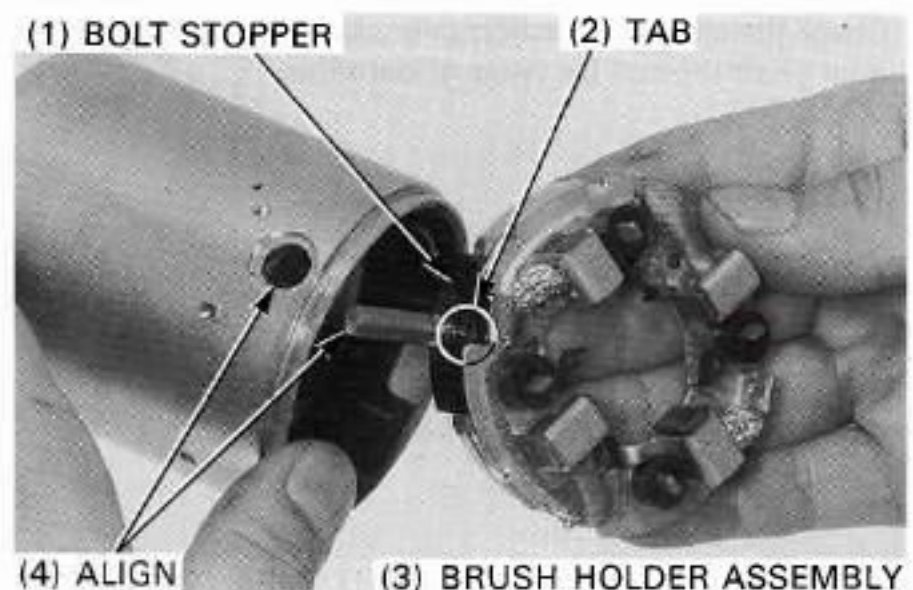
- Set the brush spring as shown.



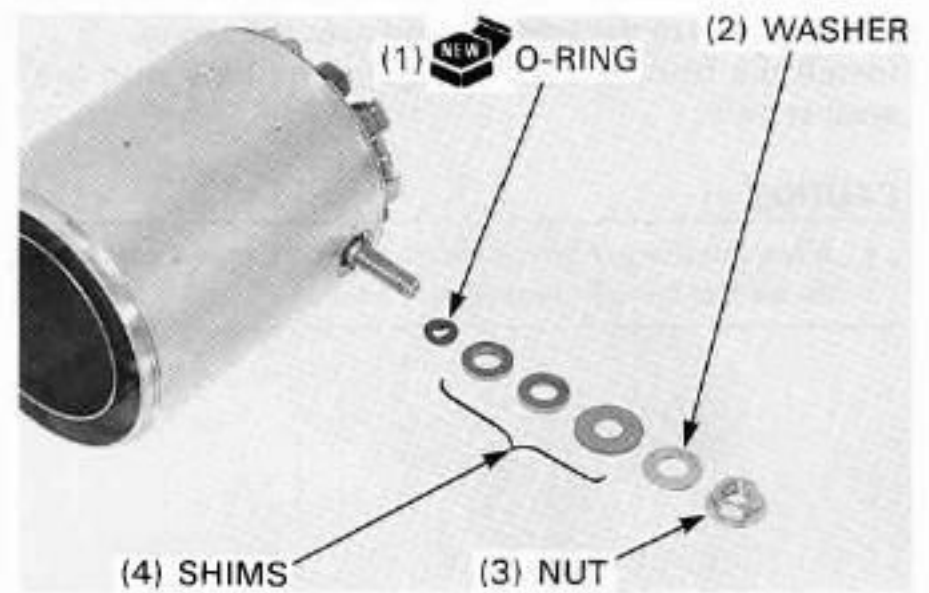
Install the terminal bolt stopper with its tab side facing to the rear cover side.

Install the terminal bolt and brush holder to the starter motor case aligning the terminal bolt and hole on the starter motor case.

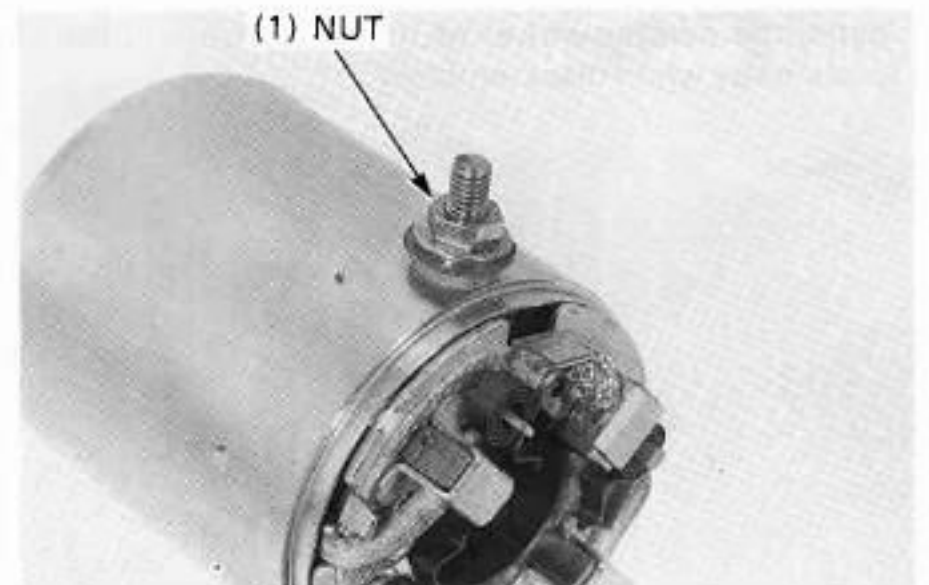
Align the starter motor case notch with the brush holder tab.



Install the new O-ring.
Install the same number of shims in the same locations as when disassembled.
Install the washer and terminal nut.



Tighten the terminal nut securely.

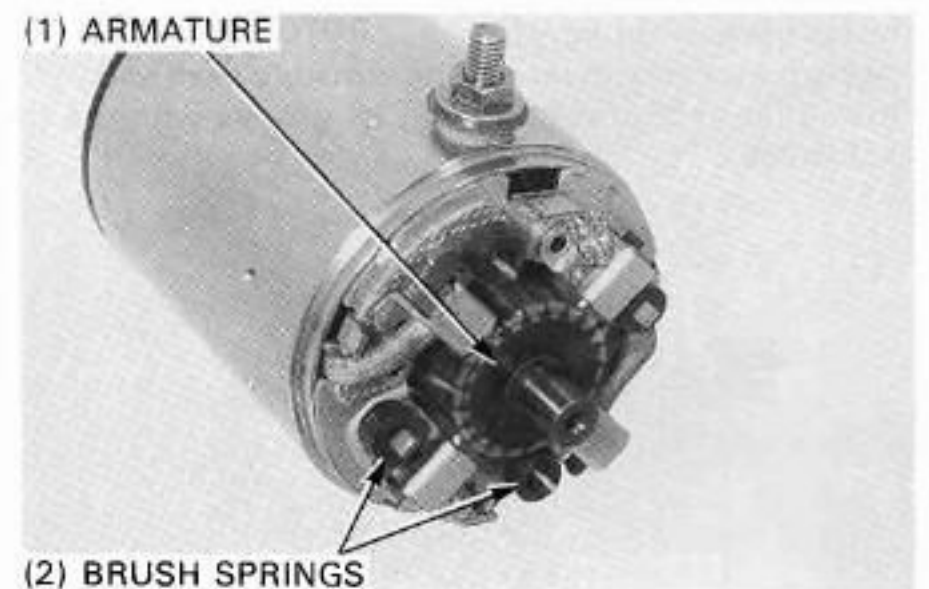


Push and hold the brush inside the brush holder, and install the armature through the brush holder.
When installing the armature into the stator motor case, hold the armature tightly to keep the magnet from pulling the armature against the stator motor case.

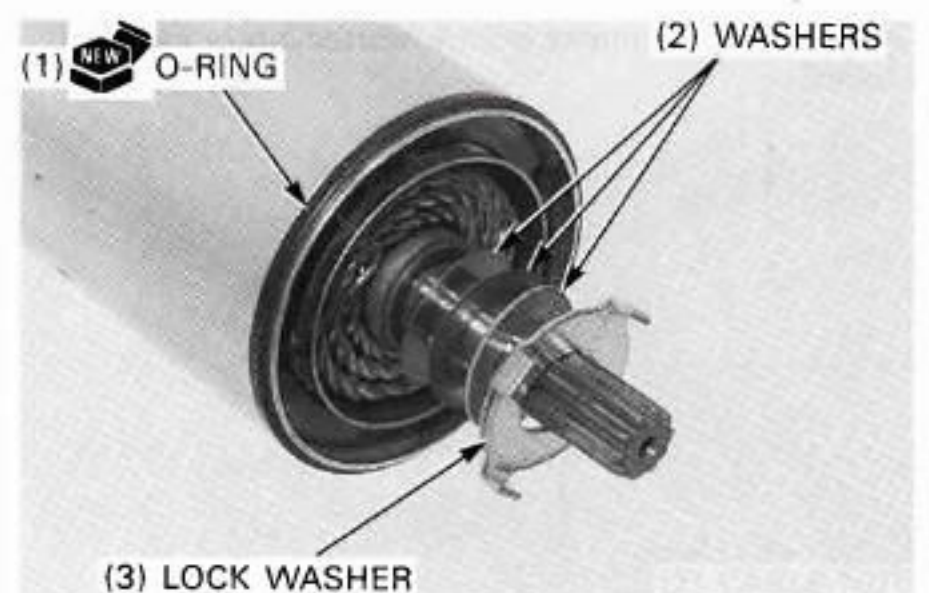
CAUTION

- *The coil may be damaged if the magnet pulls the armature against the case.*
- *The sliding surfaces of the brushes can be damaged if they are not installed properly.*

Set the brush springs.



Install the new O-ring.
Install the same number of thrust washers in the same locations as when disassembled.
Install the lock washer with tabs facing out.

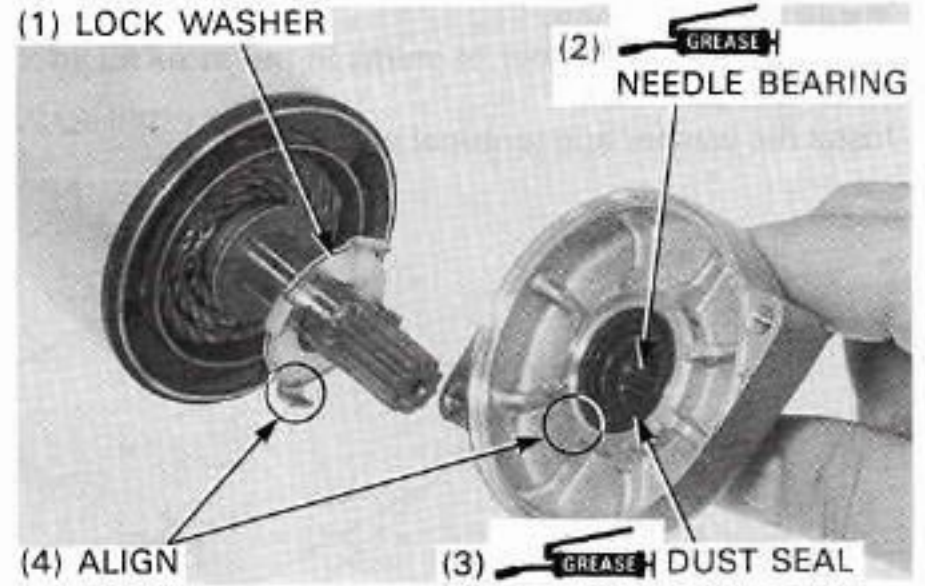


ELECTRIC STARTER

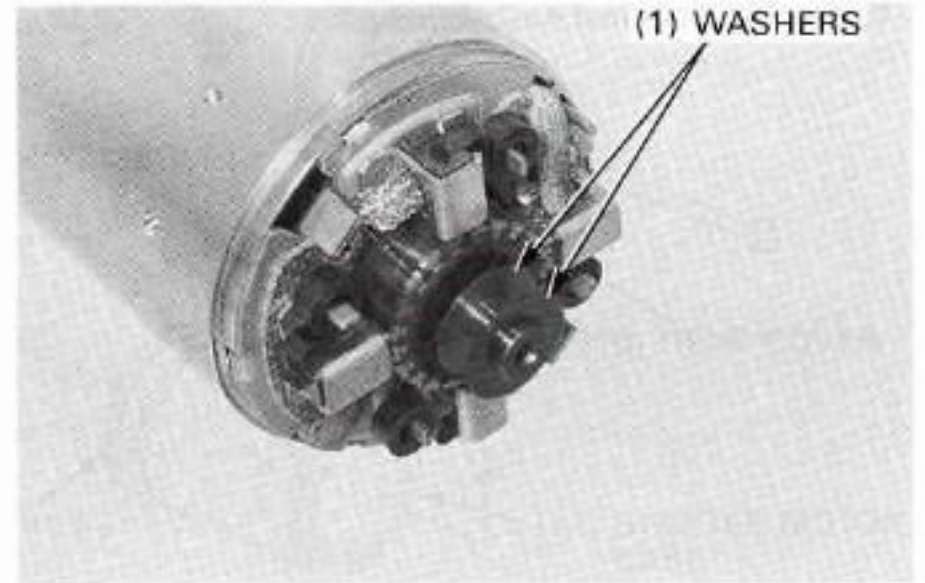
Apply grease to the seal lips and needle bearing. Install the front cover by aligning its lugs with the lock washer tabs.

CAUTION

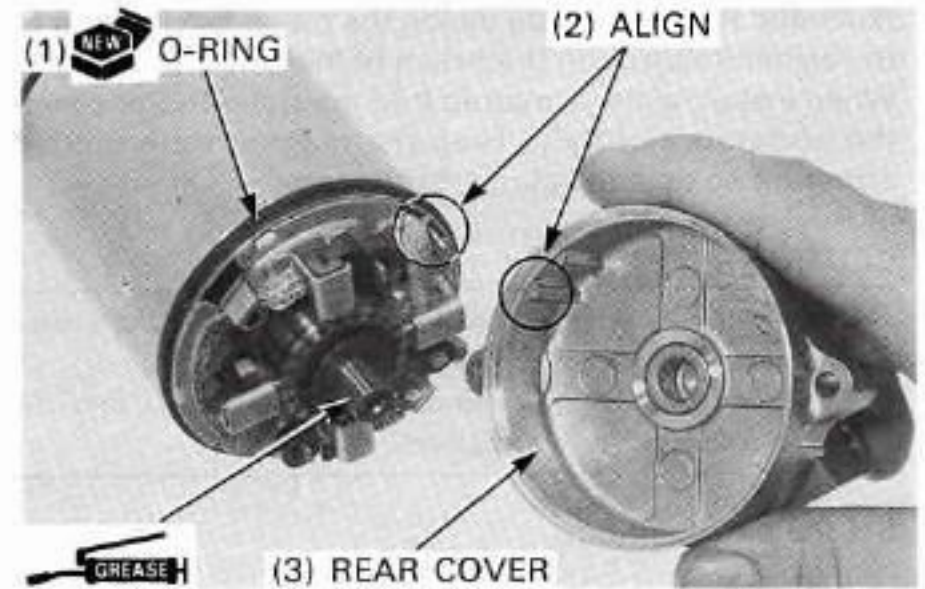
- When installing the front cover, take care to prevent damaging the oil seal lip with the armature shaft.



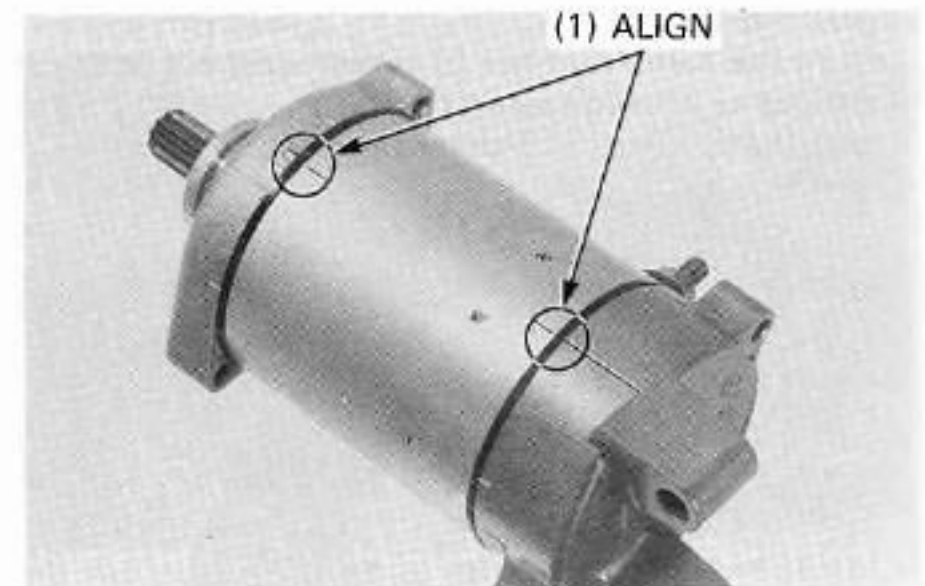
Install the same number of thrust washers in the same locations as when disassembled.



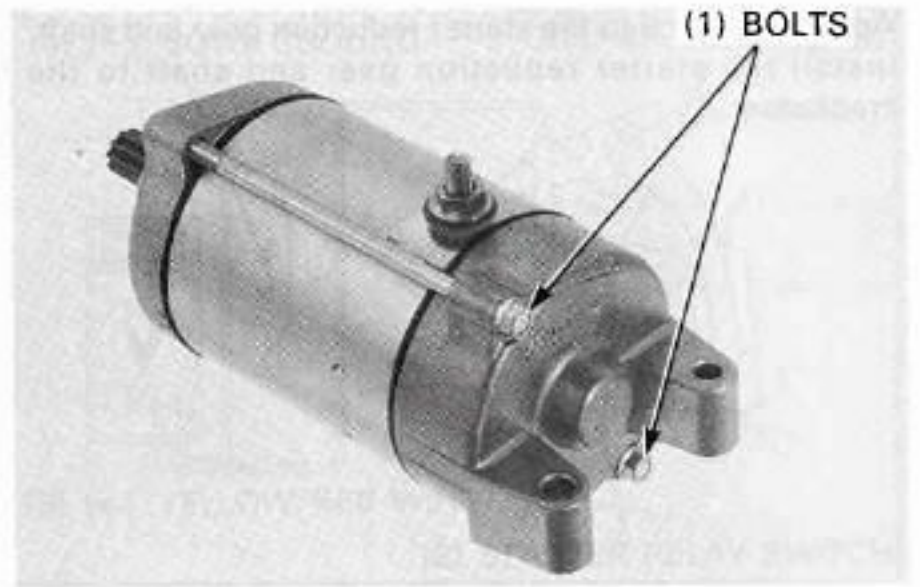
Install the new O-ring. Apply thin coat of grease to the armature shaft end. Install the rear cover aligning its groove with the brush holder tab.



Align the index marks on the starter motor case and front cover.



Install and tighten the bolts securely.

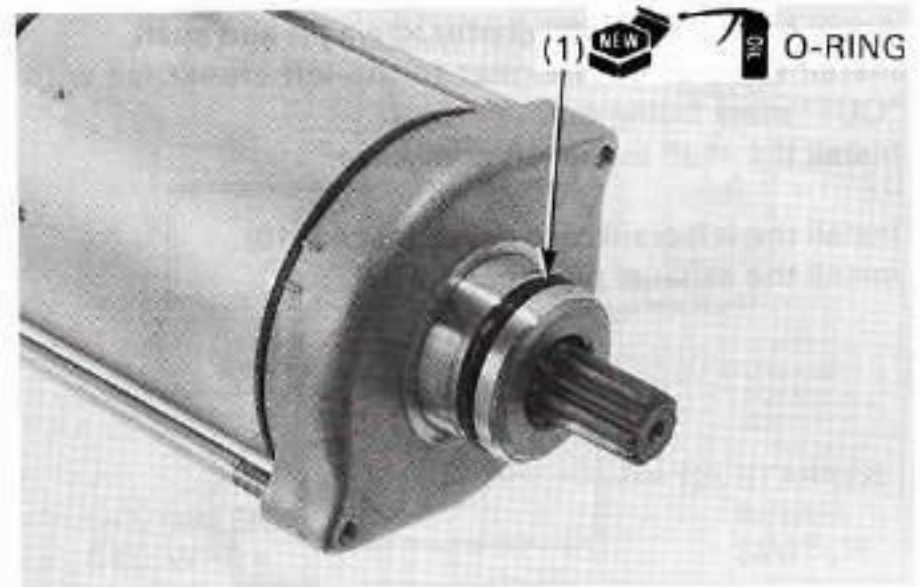


INSTALLATION

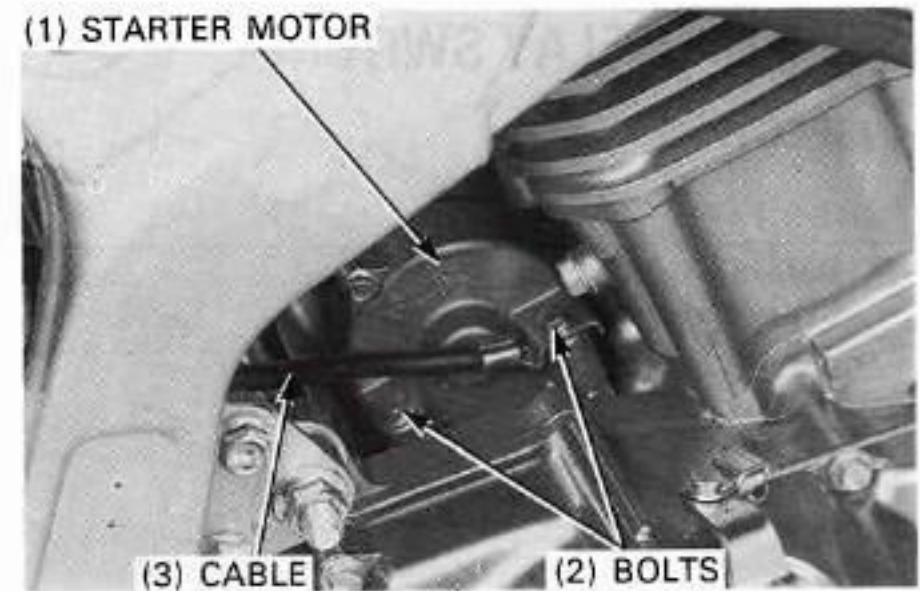
NOTE

- Route the starter motor cable and ground cable properly (page 1-22).

Apply oil to the new O-ring and install it to the starter motor groove.



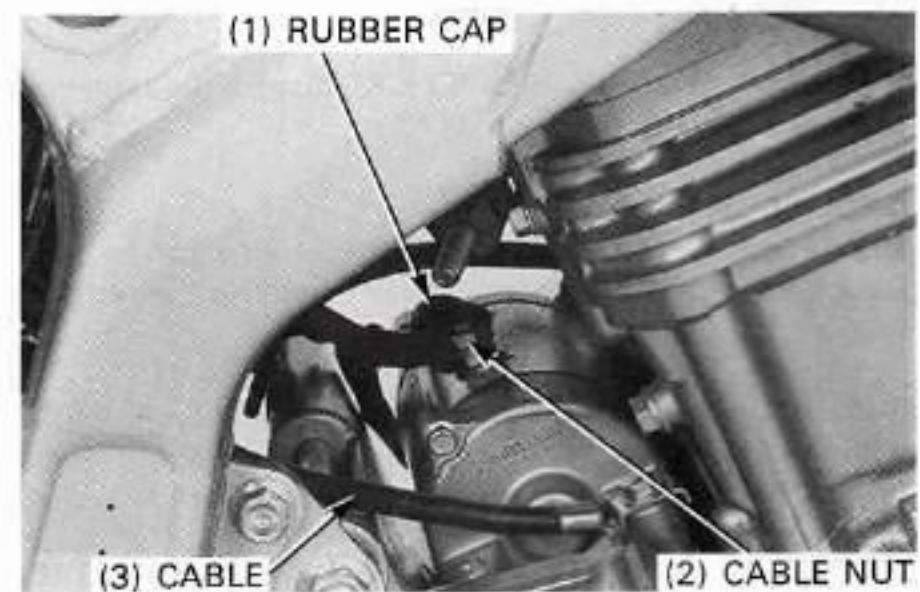
Install the starter motor onto the crankcase.
Install the ground cable.
Install and tighten the bolts securely.



Connect the starter motor cable.
Install and tighten the starter motor cable nut securely.

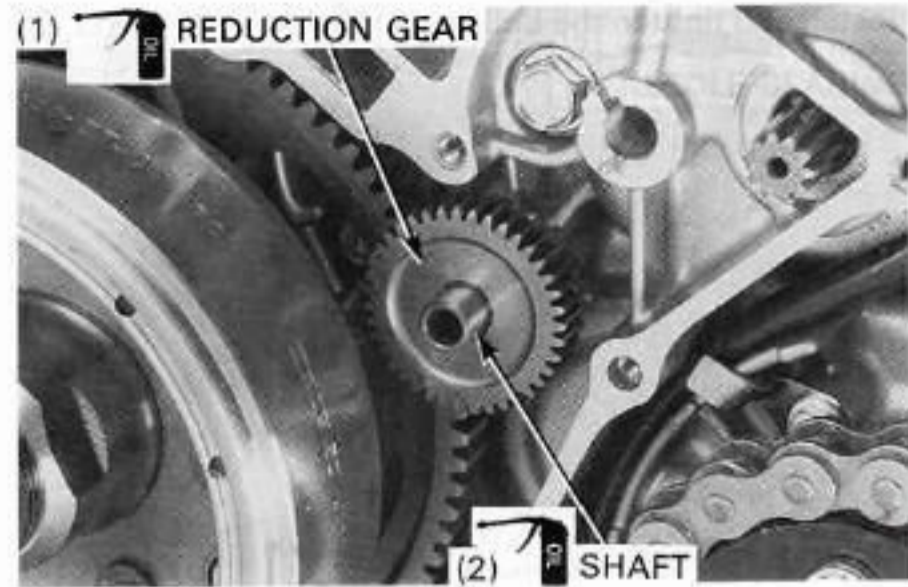
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the rubber cap securely.



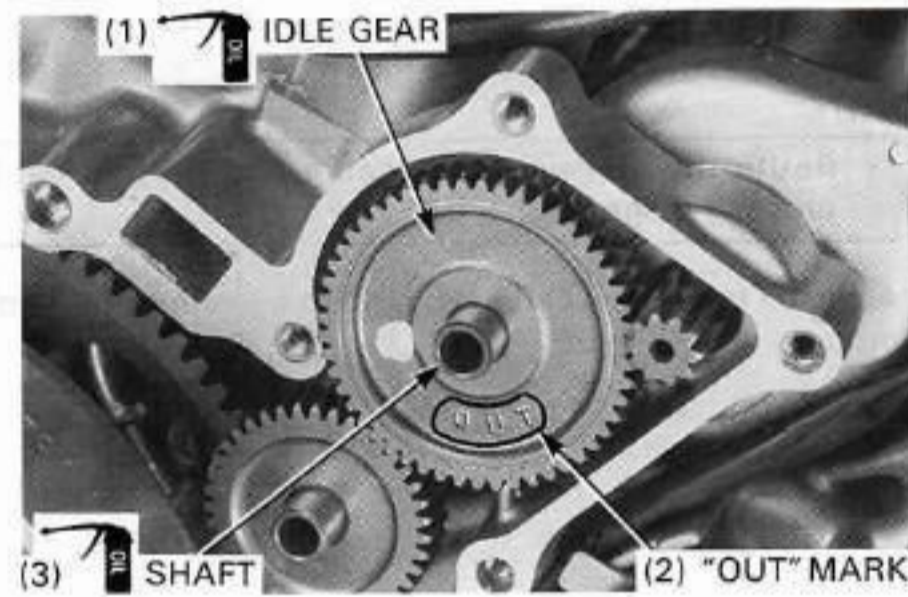
ELECTRIC STARTER

Apply engine oil to the starter reduction gear and shaft.
Install the starter reduction gear and shaft to the left crankcase.



Apply engine oil to the starter idle gear and shaft.
Install the starter idle gear to the left crankcase with the "OUT" mark facing out.
Install the shaft to the left crankcase.

Install the left crankcase cover (page 9-10).
Install the exhaust pipe (page 2-17).



STARTER RELAY SWITCH

INSPECTION

NOTE

- Before checking the starter relay switch, check for battery condition.

Remove the left side cover (page 2-7).

Shift the transmission into neutral.
Turn the ignition switch ON and engine stop switch to RUN.
Depress the starter switch button.

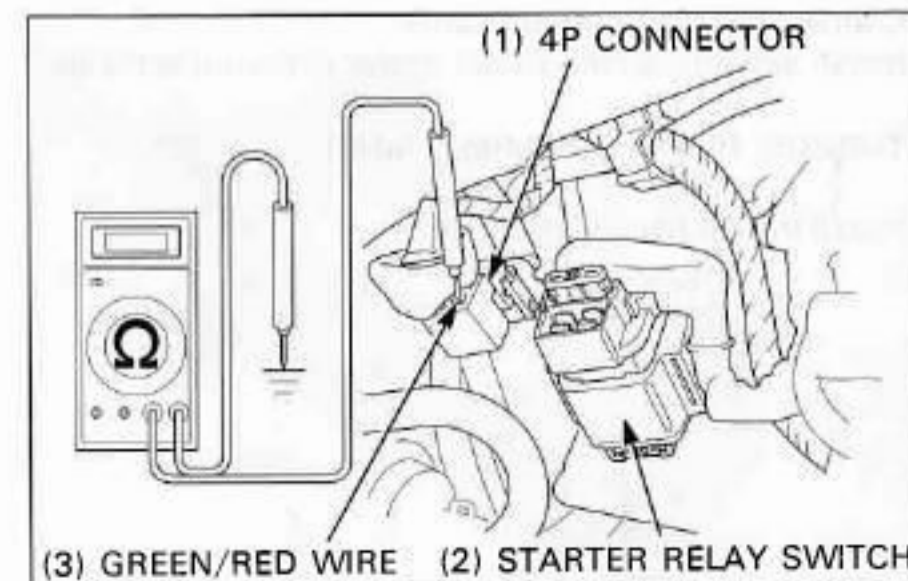
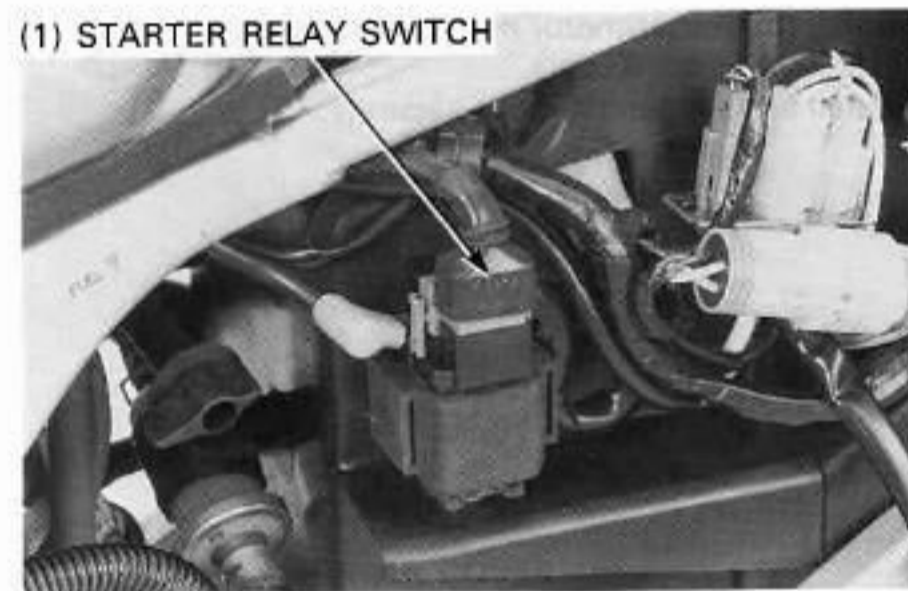
The coil is normal if the starter relay switch clicks.

If you don't hear the switch "CLICK", inspect the relay switch using the procedure below.

GROUND LINE

Disconnect the starter relay switch 4P connector.
Check for continuity between the Green/Red wire (ground line) and ground.

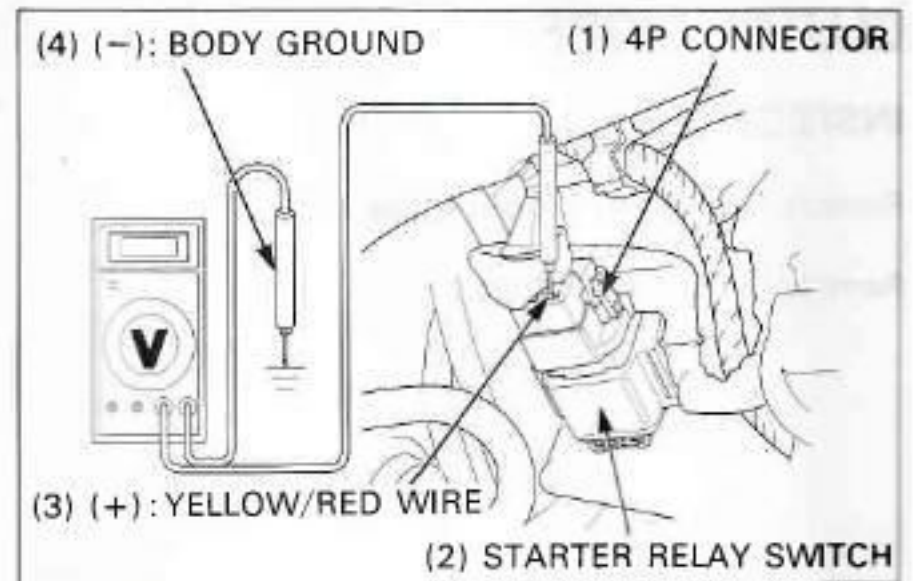
If there is continuity when the transmission is in neutral or when the clutch is disengaged and the side stand switch is up, the ground circuit is normal (In neutral, there is a slight resistance due to the diode).



STARTER RELAY VOLTAGE

Connect the starter relay switch 4P connector.
Shift the transmission into neutral.
Measure the voltage between the Yellow/Red (+) wire and ground at the starter relay switch 4P connector.

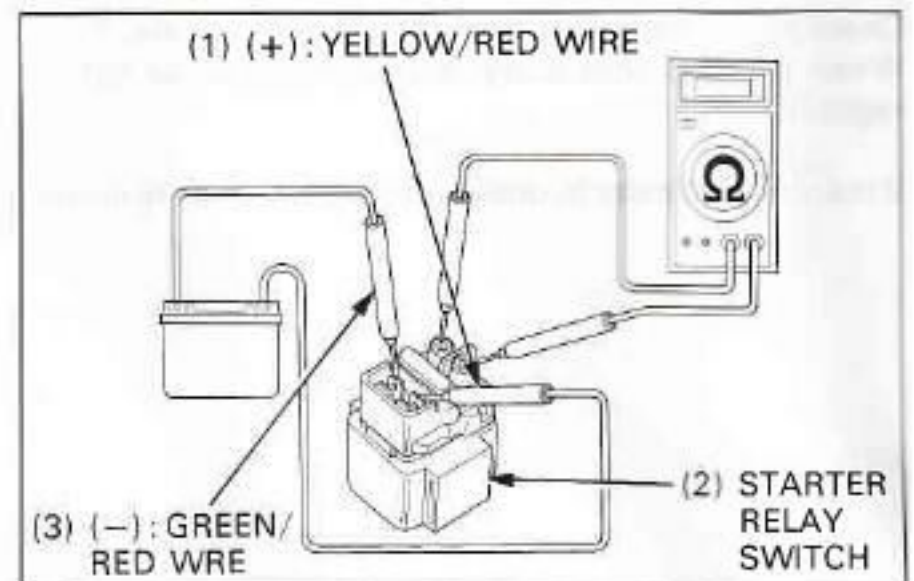
If the battery voltage appears only when the **starter switch** is pressed with the ignition switch ON, it is normal.



OPERATION CHECK

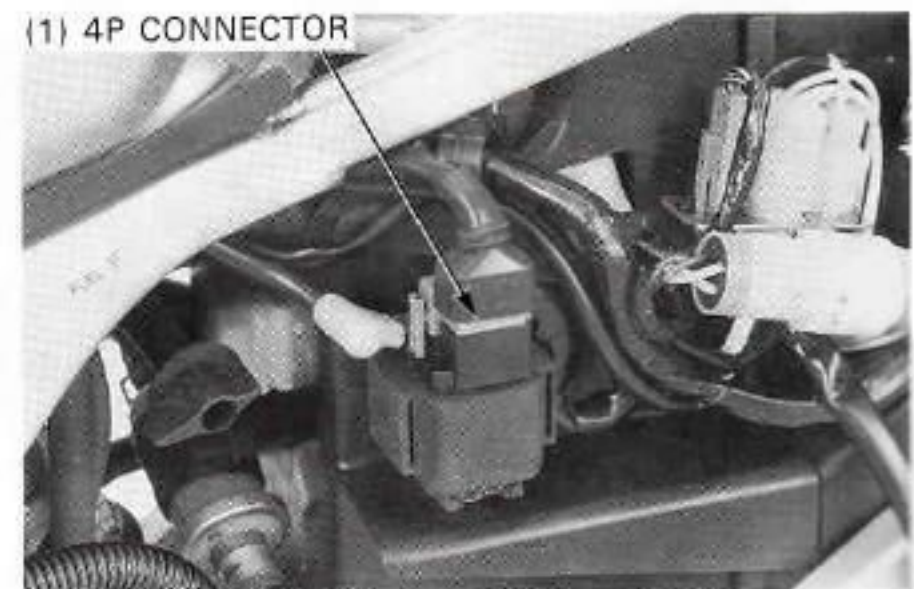
Disconnect the starter relay switch 4P connector and cables.
Connect a fully charged 12 V battery positive wire to the relay switch Yellow/Red wire terminal and negative wire to the Green/Red wire terminal.

There should be continuity between the large terminals while the battery is connected, and no continuity when the battery is disconnected.

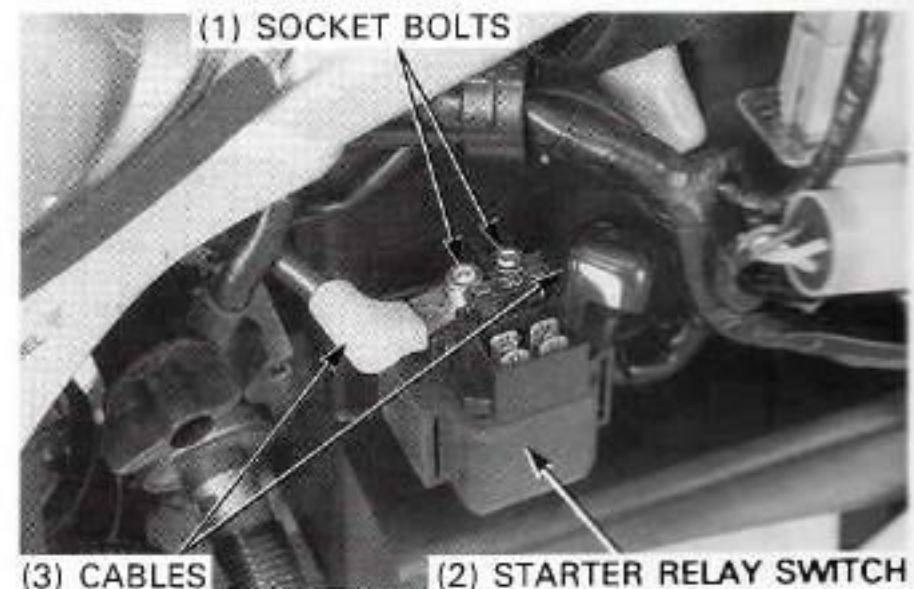


REMOVAL/INSTALLATION

Remove the left side cover (page 2-7).
Disconnect the starter relay 4P connector.



Remove the socket bolts and cables.
Remove the starter relay switch.
Installation is in the reverse order of removal.

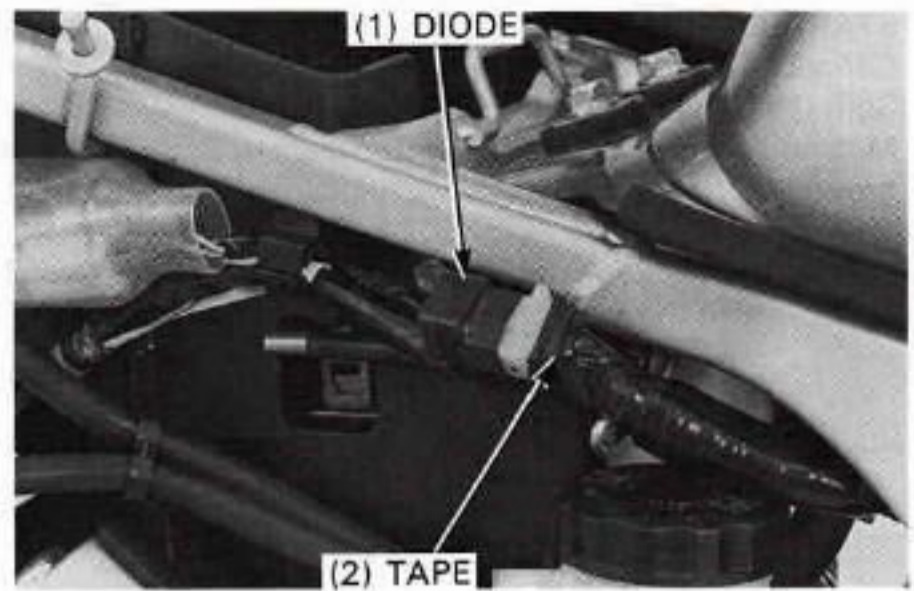


CLUTCH DIODE

INSPECTION

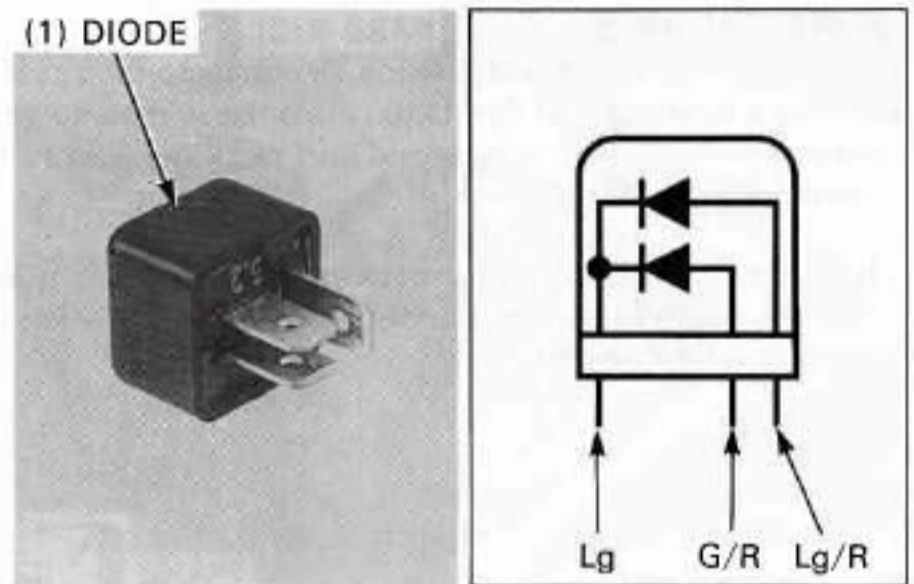
Remove the right side cover (page 2-7).

Remove the tape and diode.

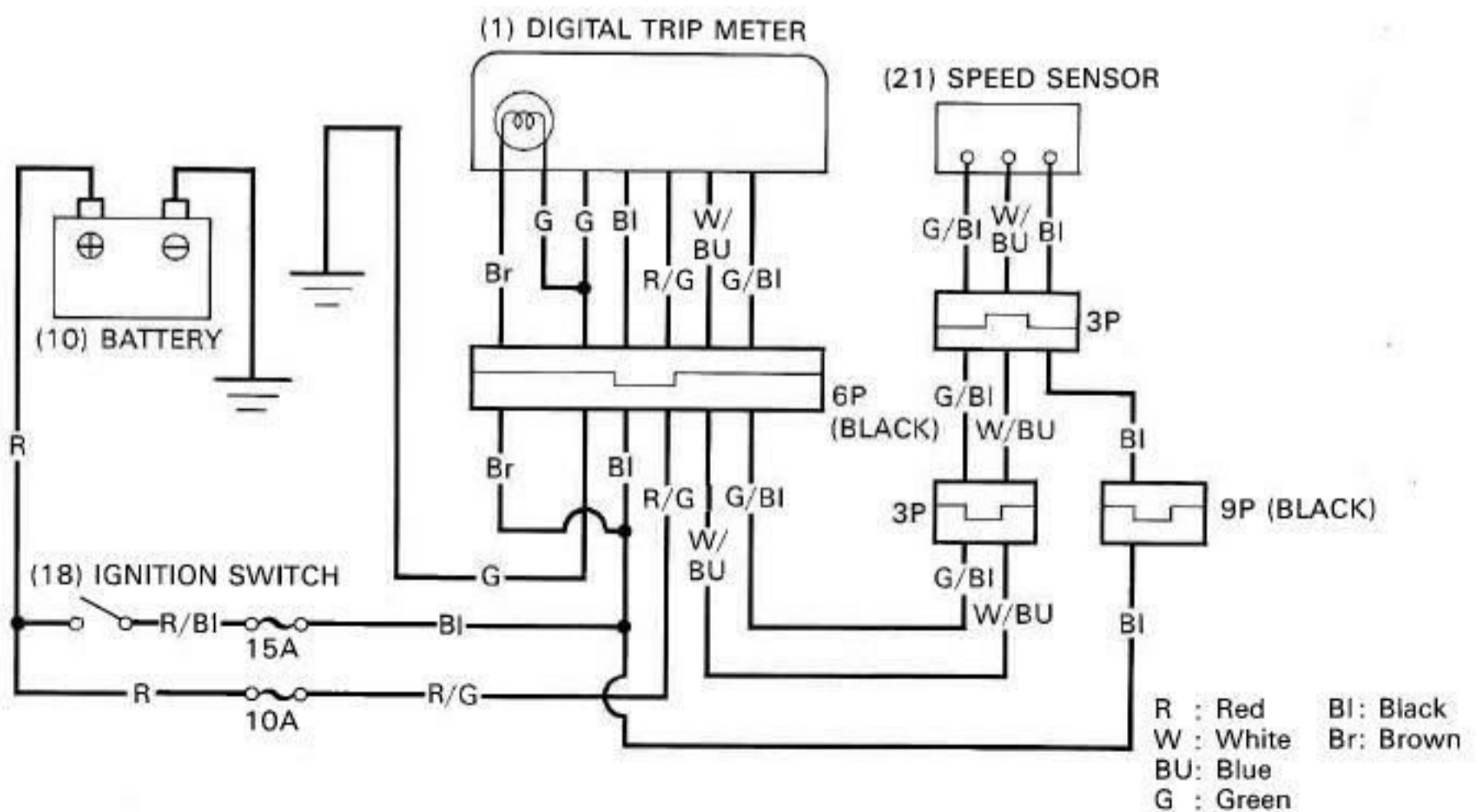
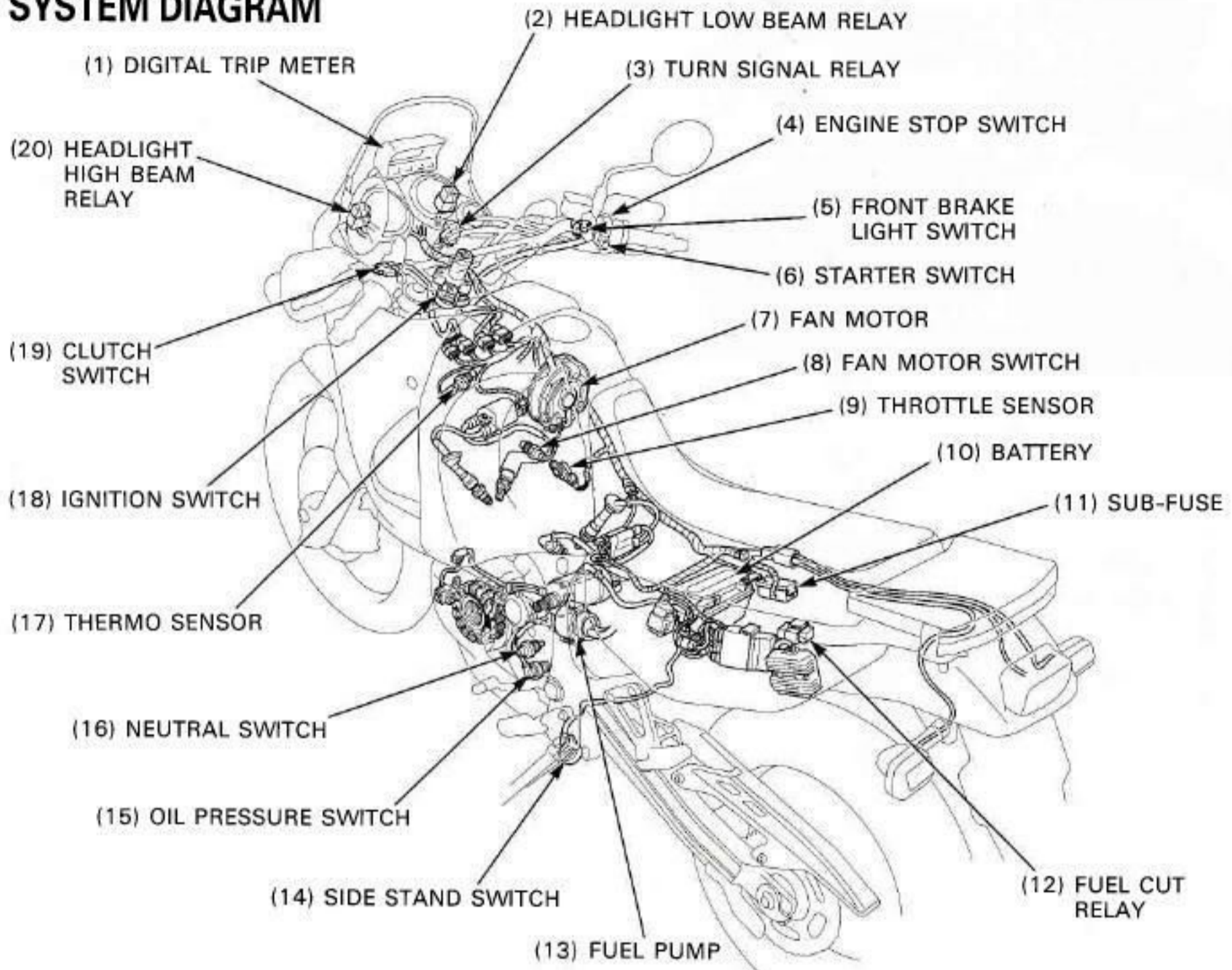


Check for continuity between the diode terminals.
When there is continuity, a small resistance value will register.

If there is continuity in one direction, the diode is normal.



SYSTEM DIAGRAM



19. LIGHTS/METERS/SWITCHES

| | | | |
|-----------------------------------|-------|--|-------|
| SYSTEM DIAGRAM | 19-0 | FRONT BRAKE LIGHT SWITCH | 19-18 |
| SERVICE INFORMATION | 19-1 | REAR BRAKE LIGHT SWITCH | 19-19 |
| TROUBLESHOOTING | 19-3 | CLUTCH SWITCH | 19-19 |
| BULB REPLACEMENT | 19-5 | HANDLEBAR SWITCH | 19-19 |
| HEADLIGHT | 19-7 | IGNITION SWITCH INSPECTION | 19-20 |
| COMBINATION METER | 19-8 | FAN MOTOR SWITCH | 19-21 |
| TACHOMETER INSPECTION | 19-13 | COOLANT TEMPERATURE, THERMO SENSOR INSPECTION | 19-22 |
| DIGITAL TRIP METER | 19-14 | HORN | 19-24 |
| OIL PRESSURE SWITCH INSPECTION | 19-16 | TURN SIGNAL RELAY | 19-24 |
| NEUTRAL SWITCH | 19-18 | SIDE STAND SWITCH | 19-24 |

SERVICE INFORMATION

GENERAL

▲ WARNING

- *A halogen headlight bulb becomes very hot while the headlight is ON, and remain hot for a while after it is turned OFF. Be sure to let it cool down before servicing.*
 - *Use an electric heating element to heat the water/coolant mixture for the thermo sensor inspection. Keep all flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.*
-
- Note the following when replacing the halogen headlight bulb.
 - Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause it to break.
 - If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
 - Be sure to install the dust cover after replacing the bulb.
 - All plastic connectors have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.
 - Always turn off the ignition switch before disconnecting any electrical component.
 - A continuity test can be made with switches installed on the motorcycle.
 - Check the battery condition before performing any inspection that requires proper battery voltage.
 - If you disconnect the battery terminal, all memories of the trip meter are erased.

LIGHTS/METERS/SWITCHES

SPECIFICATIONS

| ITEM | | SPECIFICATIONS |
|--|--------------------|--|
| Main fuse | | 30 A |
| Fuse | Except AR type | 10 AX3, 15 A X 1, 20 A X 1 |
| | AR type | 10 AX4, 15 A X 1, 20 A X 1 |
| Headlight (High/low beam) | | 12 V – 60/55 W X 2 |
| Headlight relay | | High and low beams |
| Tail/Brake light | | 12 V – 21/5 W |
| Position light | | 12V – 4 W X 2 |
| Front turn signal light | | 12V – 21 W X 2 |
| Rear turn signal light | | 12V – 21 W X 2 |
| Instruments light | Tachometer | 12 V – 1.7 W |
| | Speedometer | 12V – 1.7 W X 2 |
| | Temperature meter | 12V – 1.7 W |
| | Digital trip meter | 12V – 2 W |
| Oil pressure warning indicator | | 12V – 3 W |
| Side stand indicator | | 12V – 3 W |
| High beam indicator | | 12V – 1.7 W |
| Turn signal indicator | | 12V – 3 W |
| Neutral indicator | | 12V – 3 W |
| Fuel pump flow capacity | | Minimum 900 cm ³ (30.4 US oz, 31,6 Imp oz) per minute at 13 V |
| Thermo sensor resistance | 50 °C/122 °F | 130 – 180 Ω |
| | 100 °C/212 °F | 25 – 30 Ω |
| Fan motor switch function (Suspend 50% mixture) | OFF ⇔ ON | 98 °C/208 °F – 102 °C/216 °F |
| | ON ⇔ OFF | 93 °C/199 °F – 97 °C/207 °F |

TORQUE VALUES

| | | |
|------------------------|-------------------------------|------------------------------|
| Oil pressure switch | 12 N•m (1.2 kgf•m, 9 lbf•ft) | Apply sealant to the threads |
| Fan motor switch | 18 N•m (1.8 kgf•m, 13 lbf•ft) | Apply sealant to the threads |
| Thermo sensor | 10 N•m (1.0 kgf•m, 7 lbf•ft) | Apply sealant to the threads |
| Neutral switch | 12 N•m (1.2 kgf•m, 9 lbf•ft) | Apply sealant to the threads |
| Side stand switch bolt | 10 N•m (1.0 kgf•m, 7 lbf•ft) | ALOC bolt |

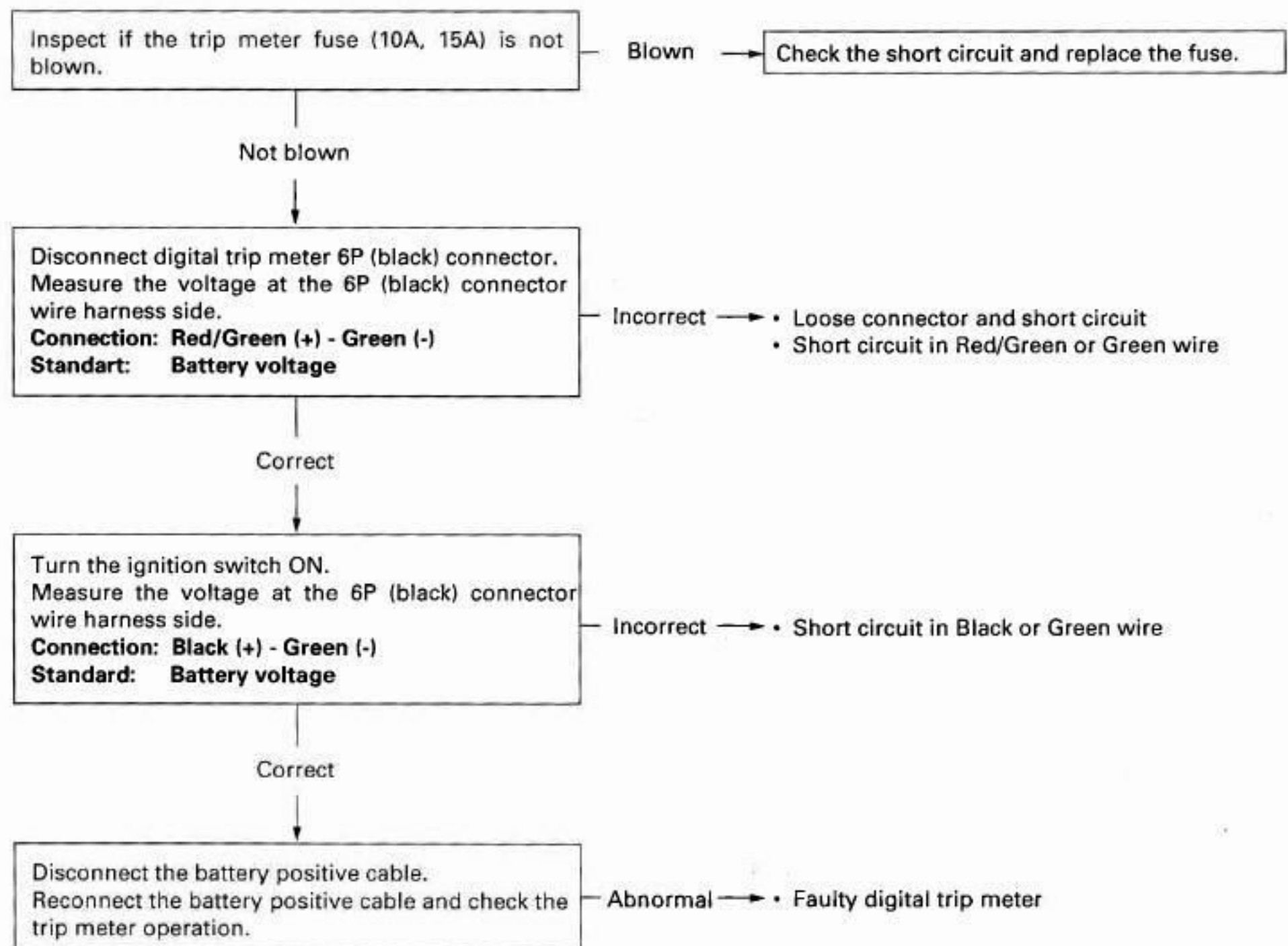
TROUBLESHOOTING

- Turn the ignition switch ON, check that all segment should be indicate all the modes about 2 or 3 minutes. If the speed sensor voltage is felt, the Liquid Crystal Display (LCD) indicated normal operation mode.
- If you disconnect the battery terminal, all memories of the trip meter are erased. Reset the trip meter (see Owner's manual).
- If the Liquid Crystal Display (LCD) is abnormal, temporarily disconnect the positive battery terminal. Turn the ignition switch ON, make sure the Liquid Crystal Display (LCD's) temporarily displays all the modes.

ALL LIQUID CRYSTAL DISPLAYS (LCD's) REMAIN OFF.

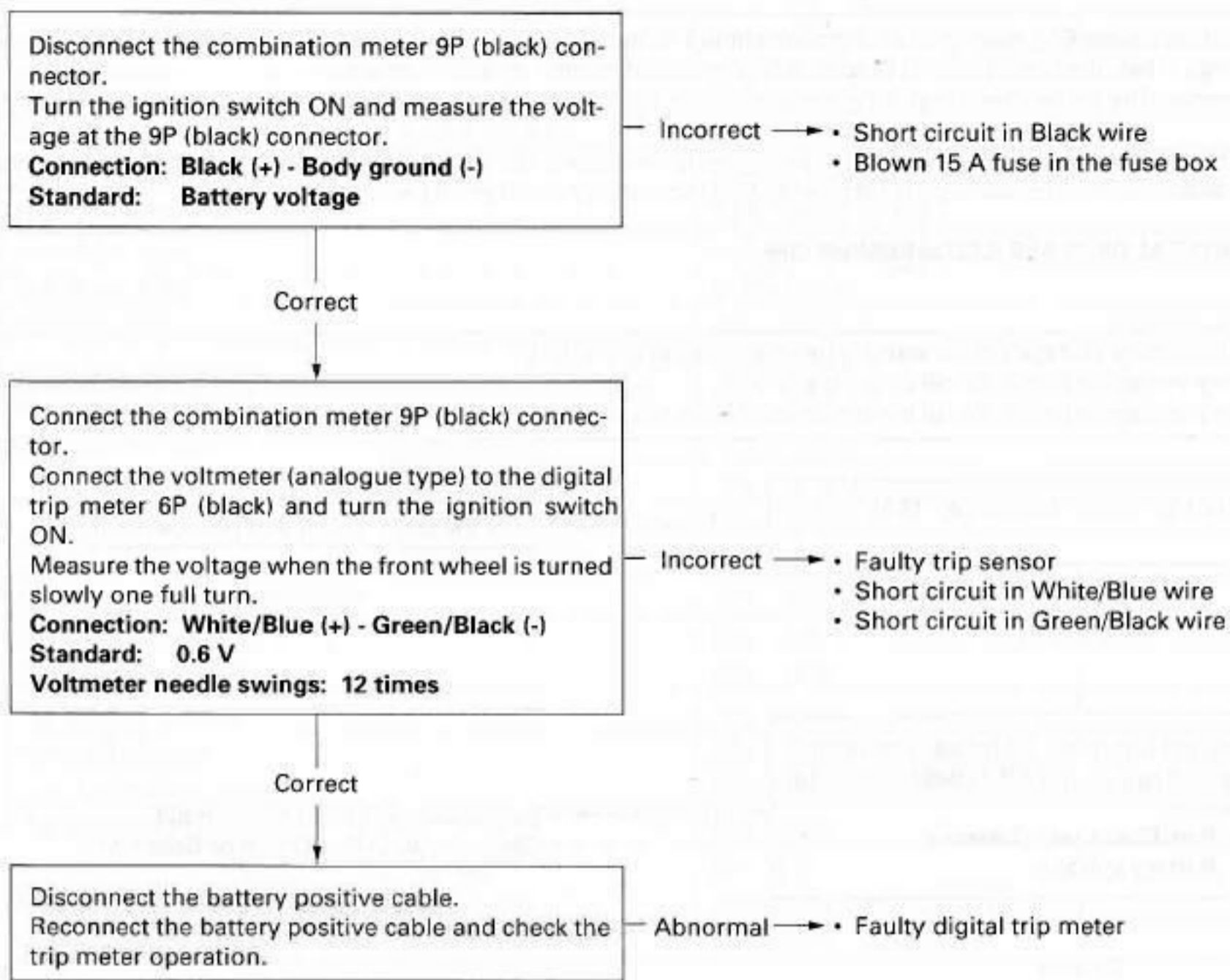
NOTE

- Measure the battery voltage before starting troubleshooting procedure.
If the battery voltage is below 7V, all LCD remain OFF.
If the battery voltage is below 3V, all trip meter memories are erased.



LIGHTS/METERS/SWITCHES

TRIP METER DOES NOT COUNT.



BULB REPLACEMENT

HEADLIGHT BULB

⚠ WARNING

- A halogen headlight bulb becomes very hot while the headlight is ON, and remain hot for a while after it is turned OFF. Be sure to let it cool down before servicing.

CAUTION

- Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause it to break.
- If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
- Be sure to install the dust cover after replacing the bulb.

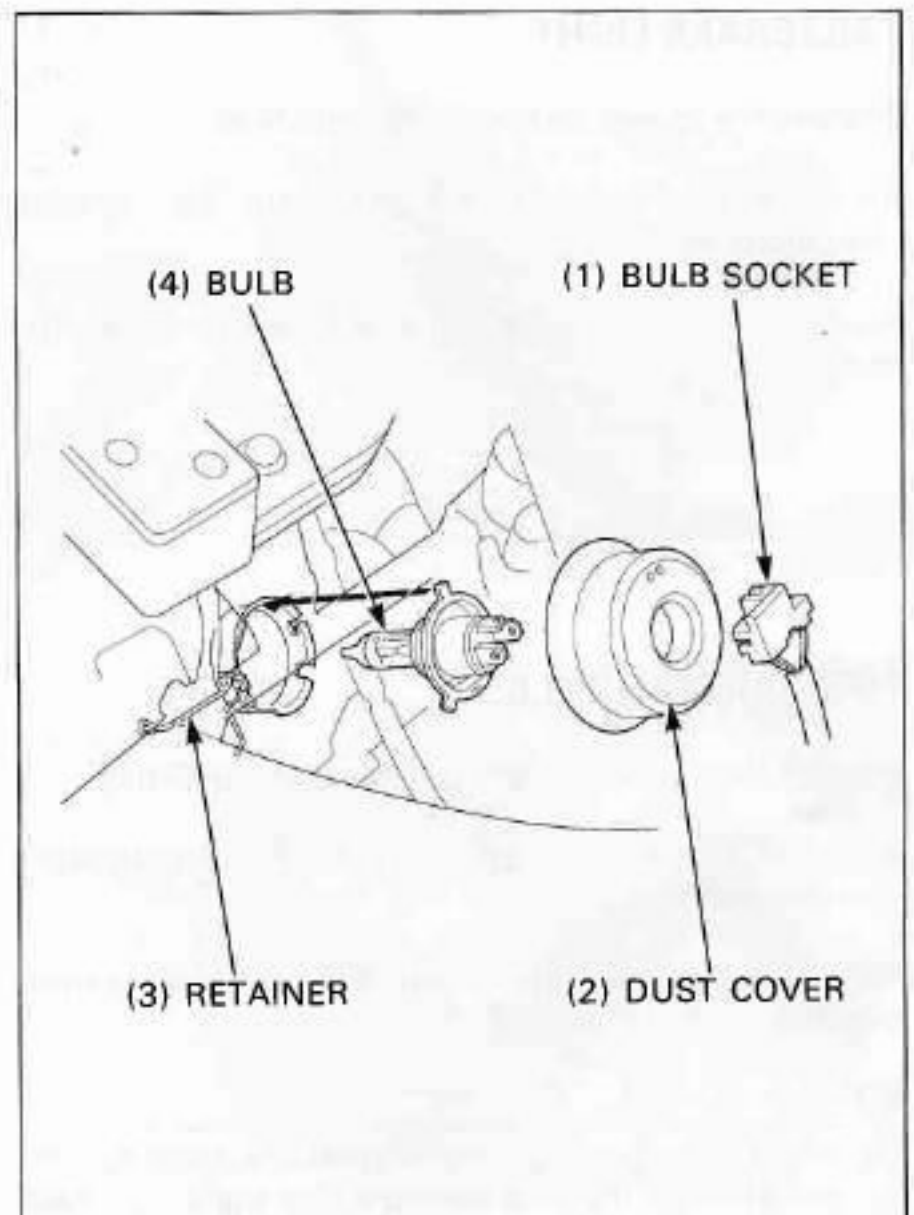
Disconnect the headlight bulb socket and remove the dust cover.

Unhook the bulb retainer and remove the headlight bulb.

Installation is in the reverse order of removal.

NOTE

- Install the dust cover with its "TOP" mark facing up.



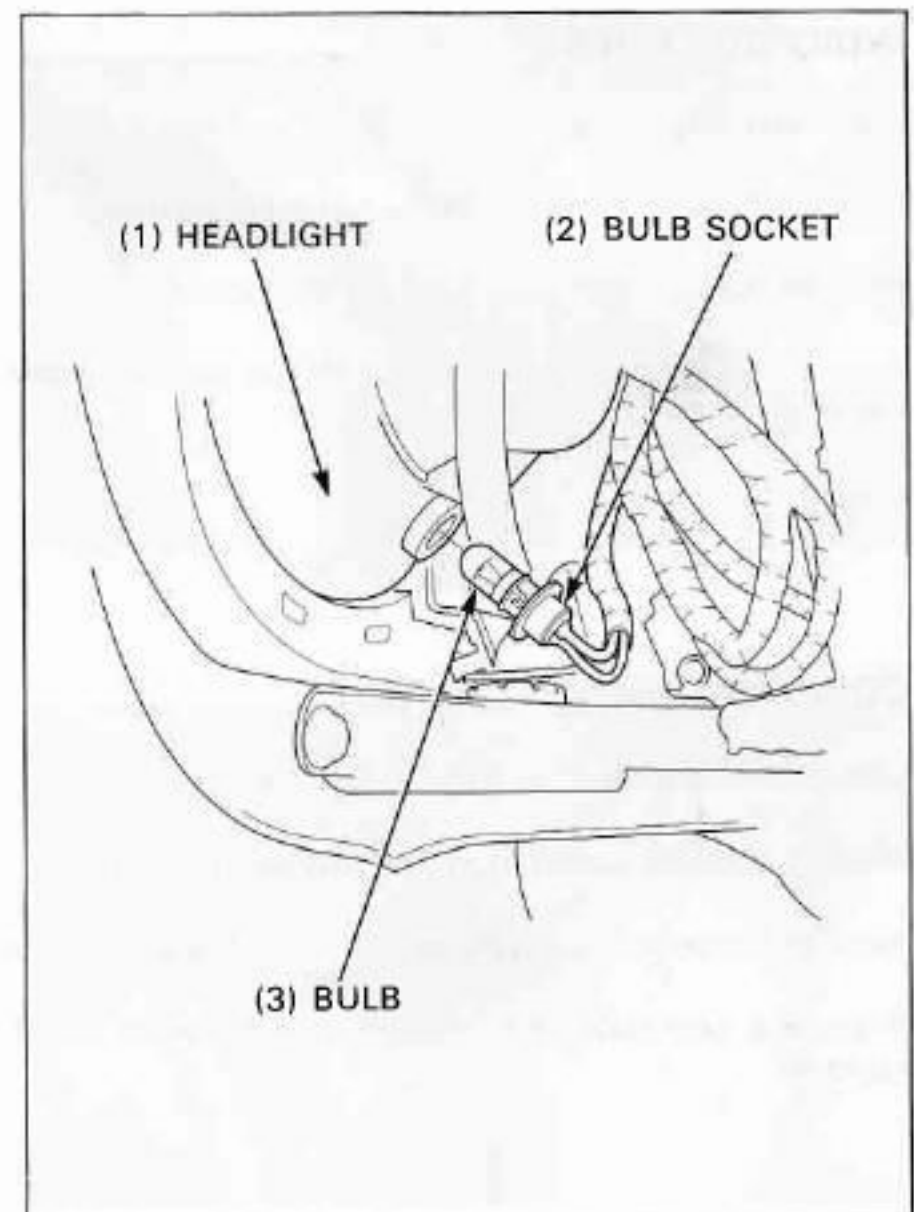
POSITION LIGHT BULB

Remove the side cowl (page 2-2).

Remove the bulb socket from the headlight.

Remove the position light bulb from the bulb socket and replace with the new ones.

Installation is in the reverse order of removal.



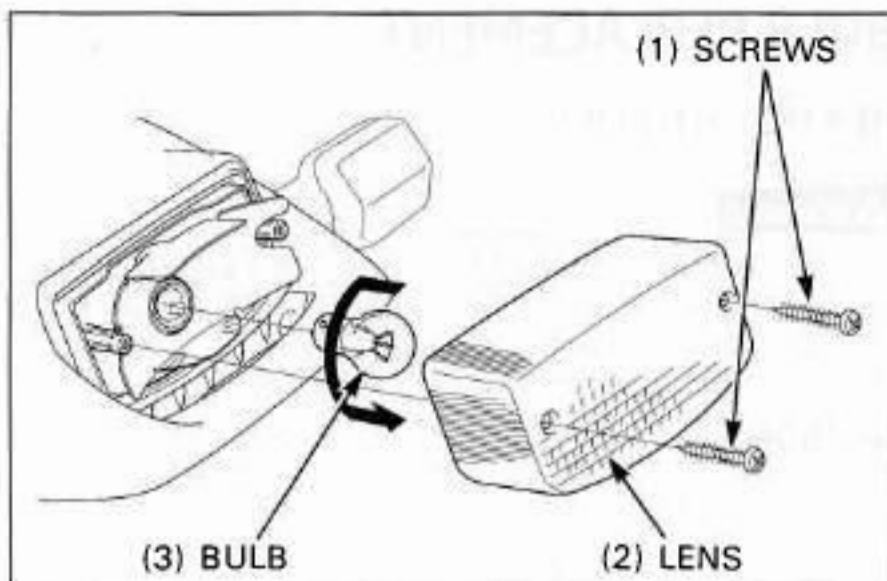
LIGHTS/METERS/SWITCHES

TAIL/BRAKE LIGHT

Remove the screws and tail/brake light lens.

Remove the tail/brake light bulb by turning it counterclockwise.

Replace a new bulb and install it in the reverse order of removal.



TURN SIGNAL BULB

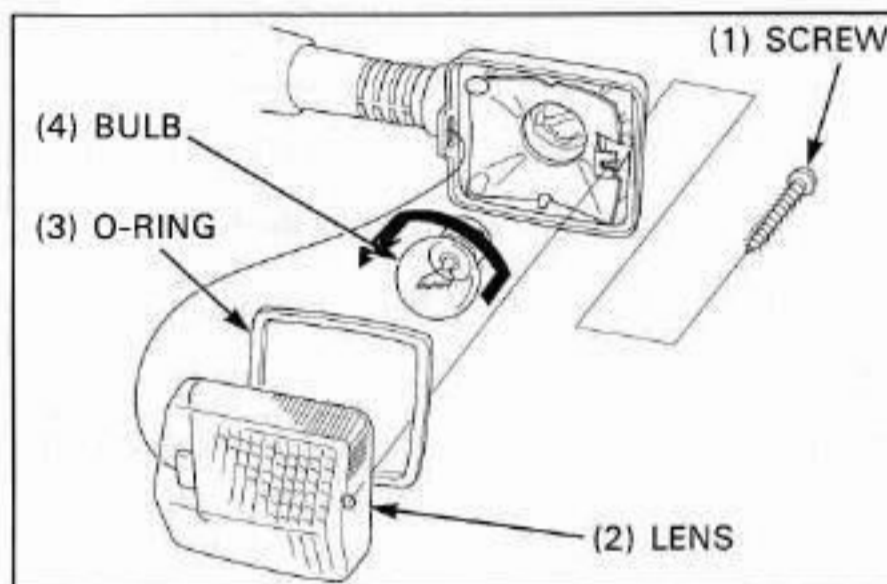
Remove the screw, turn signal light lens and O-ring.

Remove the turn signal light bulb by turning it counterclockwise.

Replace a new bulb and install it in the reverse order of removal.

NOTE

- When turn signal light lens installation, align the tab on the lens with the groove on the turn signal light case.



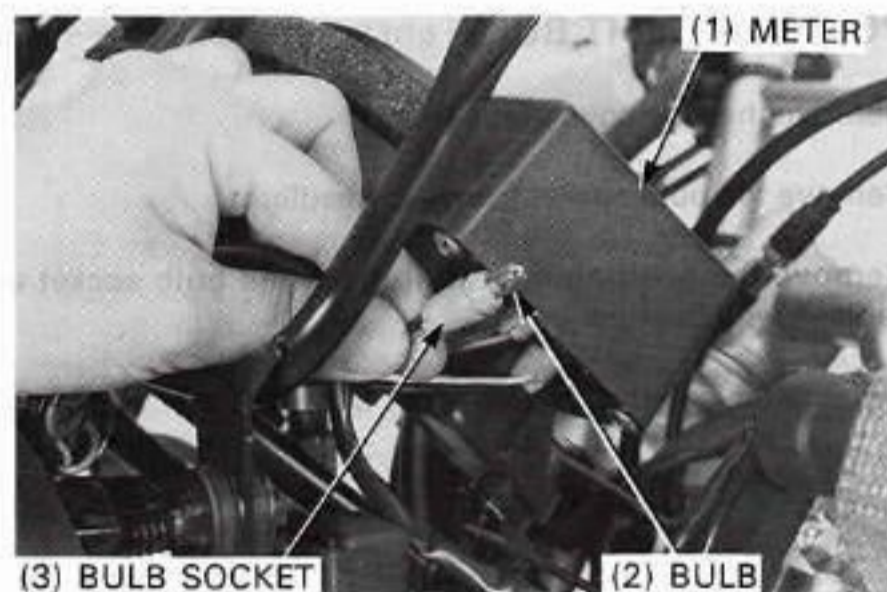
INDICATOR BULB

Remove the upper cowl (page 2-2).

Remove the bulb socket from the combination meter.

Remove the indicator bulb from the bulb socket.

Replace a new bulb and install it in the reverse order of removal.



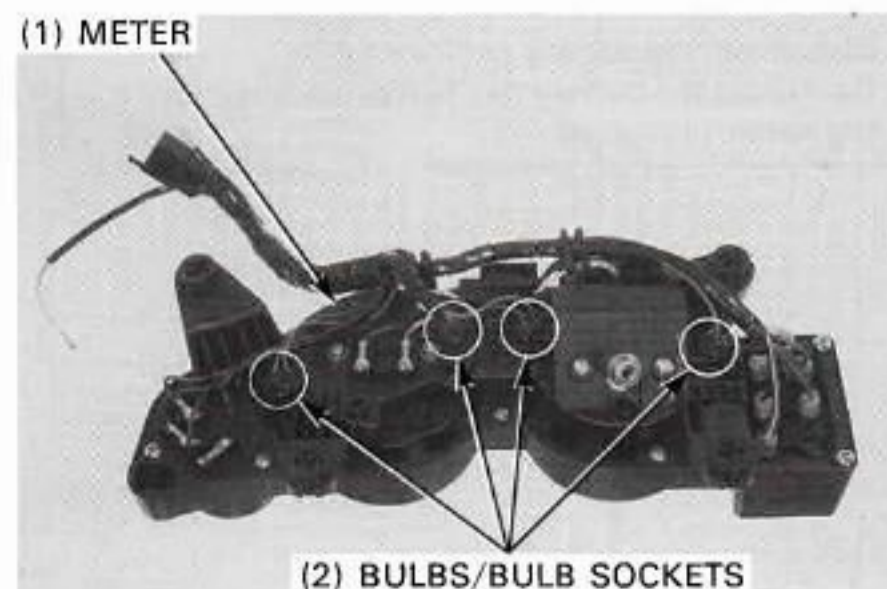
COMBINATION METER LIGHT

Remove the combination meter (page 19-8).

Remove the bulb socket from the combination meter.

Remove the combination meter bulb from the bulb socket.

Replace a new bulb and install it in the reverse order of removal.



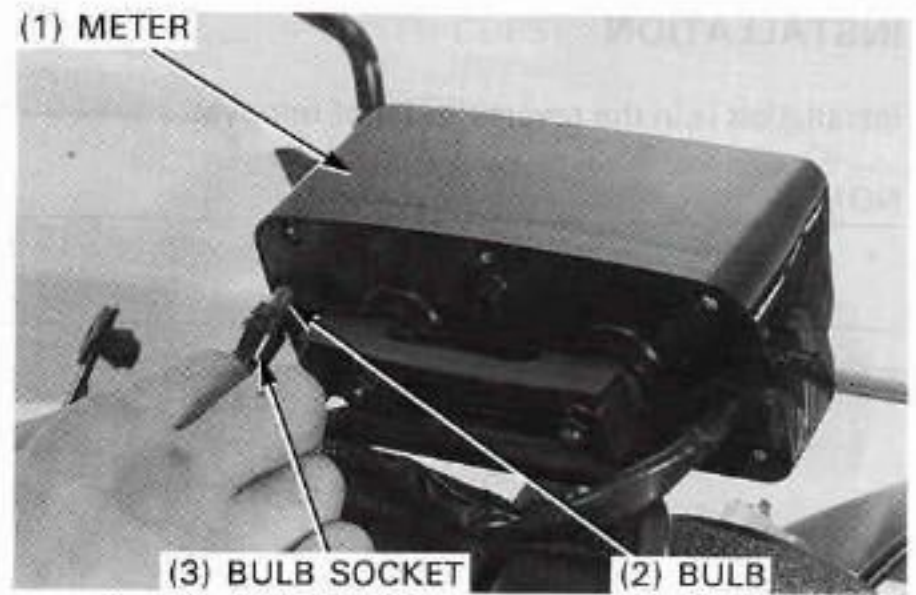
DIGITAL TRIP METER LIGHT

Remove the upper cowl (page 2-2).

Remove the bulb socket from the digital trip meter.

Remove the digital trip meter bulb from the bulb socket.

Replace a new bulb and install it in the reverse order of removal.

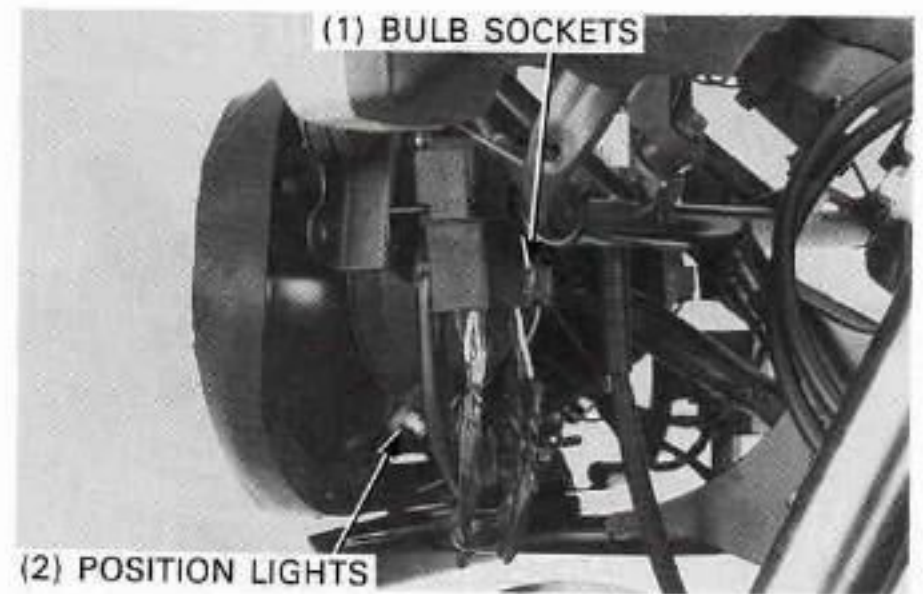


HEADLIGHT

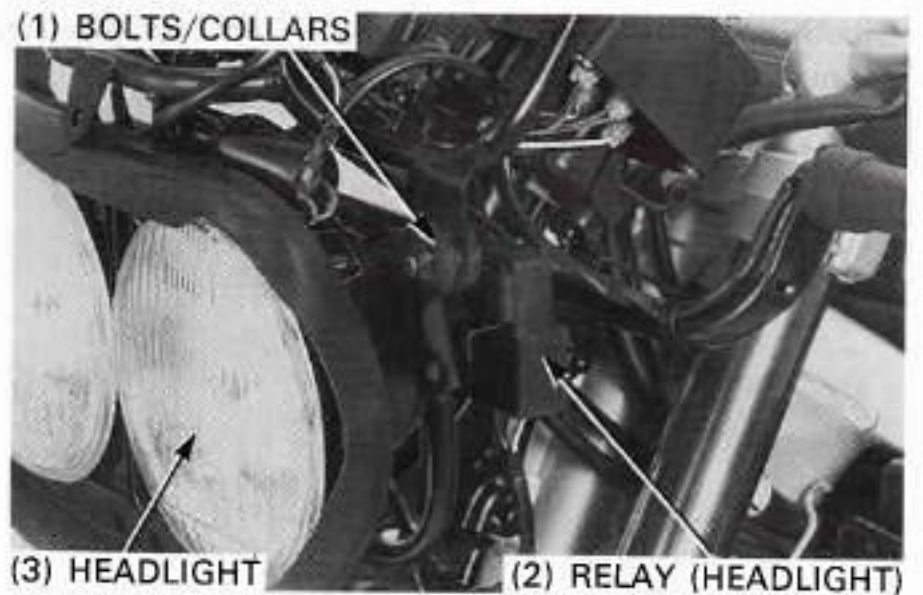
REMOVAL

Remove the upper cowl (page 2-2).

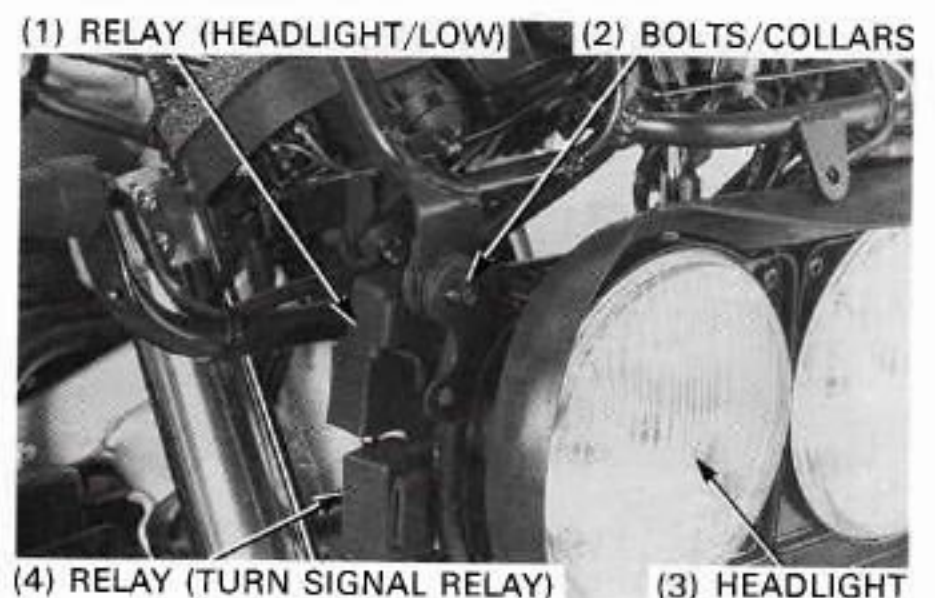
Disconnect the headlight bulb sockets and the position lights.



Remove the relay (headlight) from the left side of the headlight stay.



Remove the relays (headlight/low and turn signal) from the right side of the headlight stay.
Remove the bolts and collars and headlight.



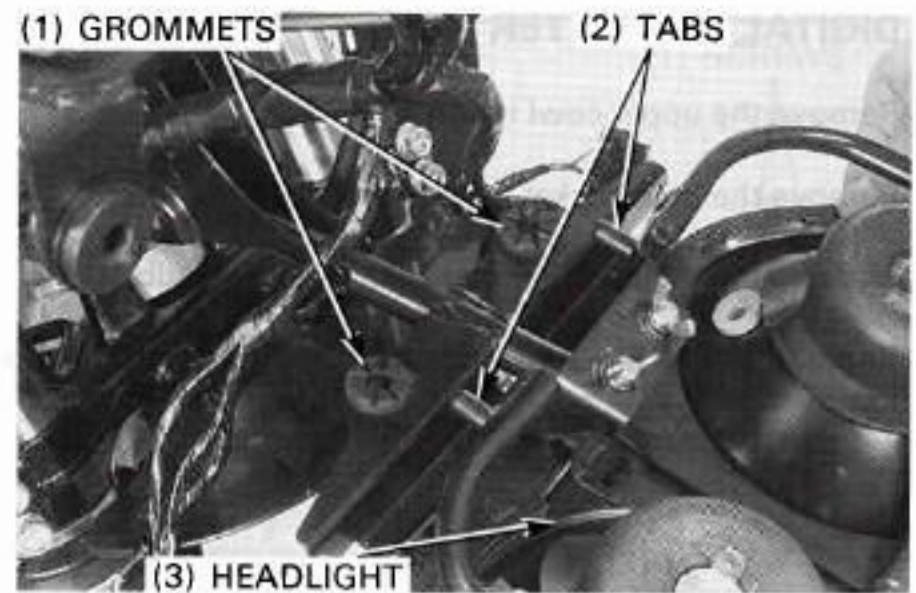
LIGHTS/METERS/SWITCHES

INSTALLATION

Installation is in the reverse order of removal.

NOTE

- At installation, align the tab on the headlight with the grommet in the frame.

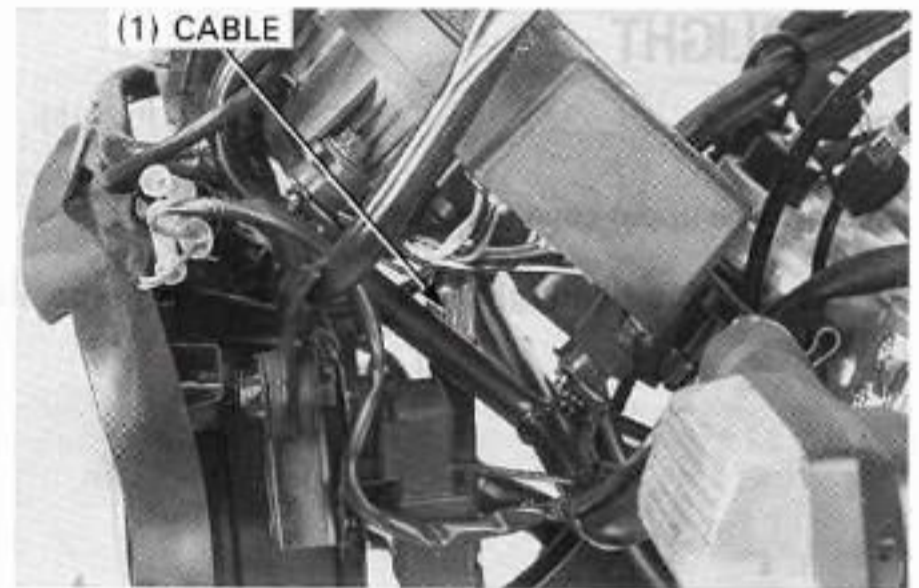


COMBINATION METER

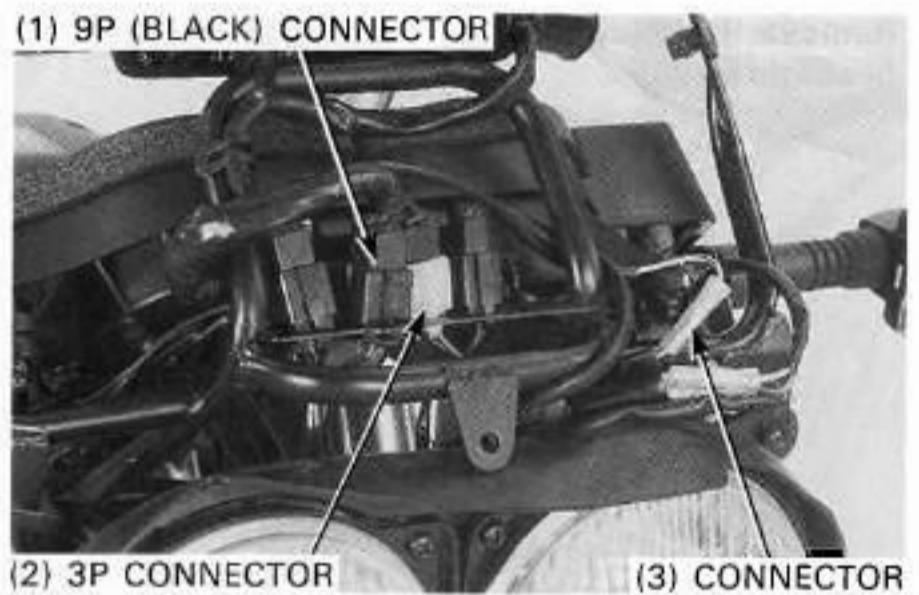
REMOVAL

Remove the upper cowl (page 2-2).

Disconnect the speedometer cable.



Disconnect the combination meter Yellow/Green wire connector, 9P (black) connector and 3P connector.

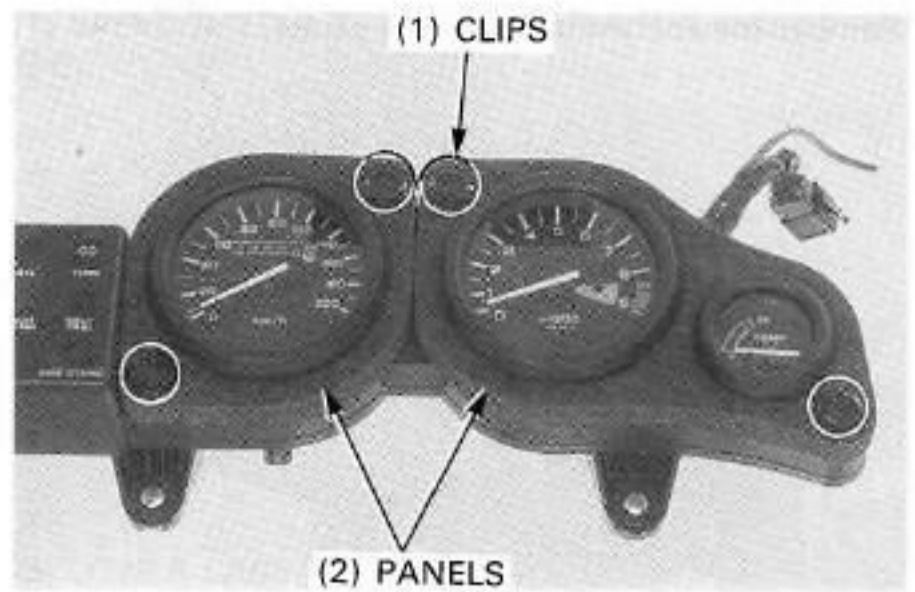


Remove the bolts and combination meter.

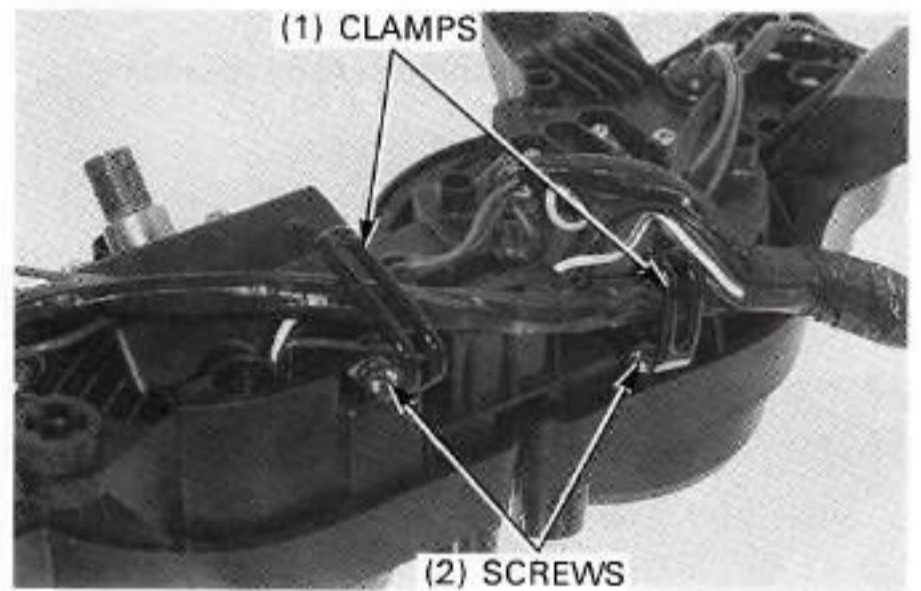


DISASSEMBLY

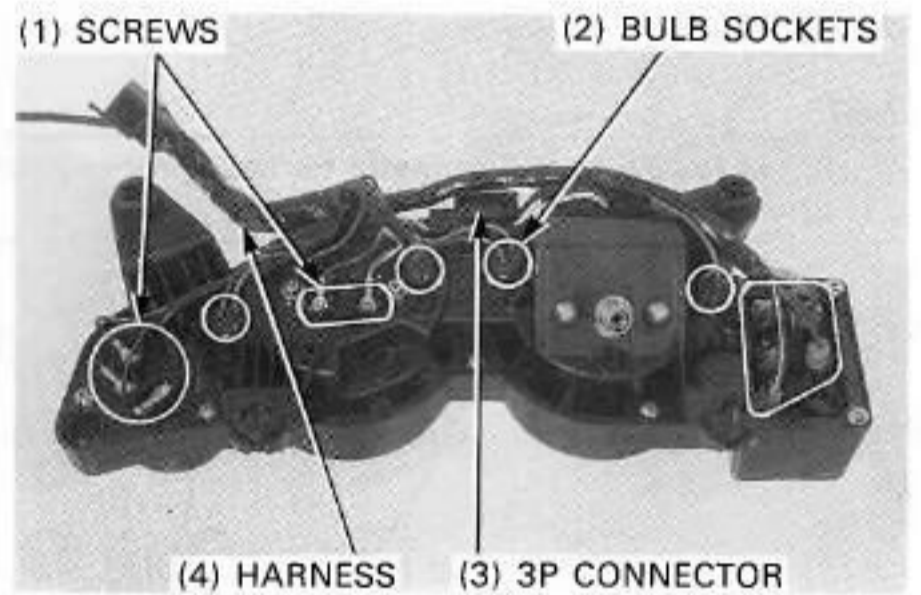
Remove the meter panel clips and meter panels.



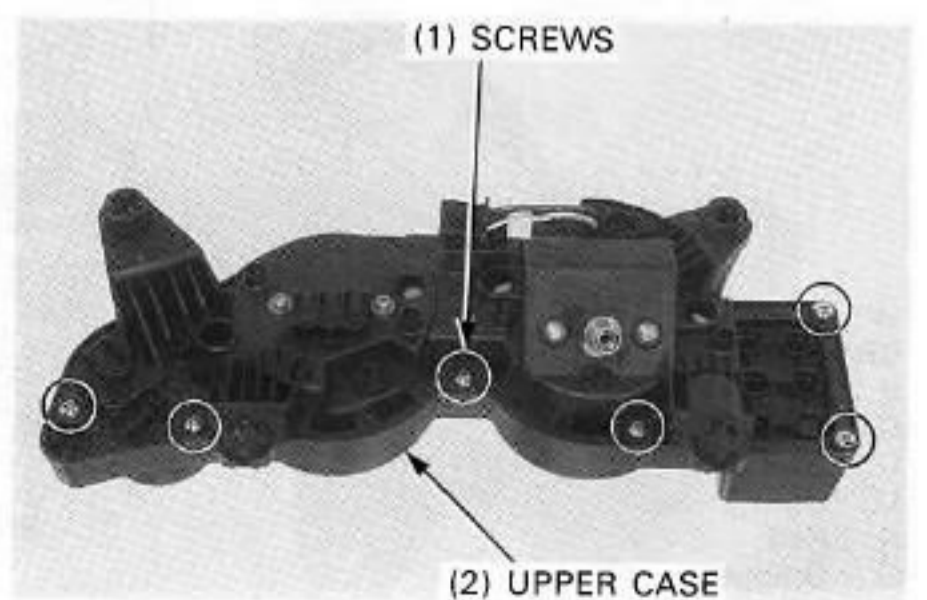
Remove the screws and clamps.



Remove the screws, bulb sockets.
Disconnect the trip sensor 3P connector.
Remove the combination meter wire harness.

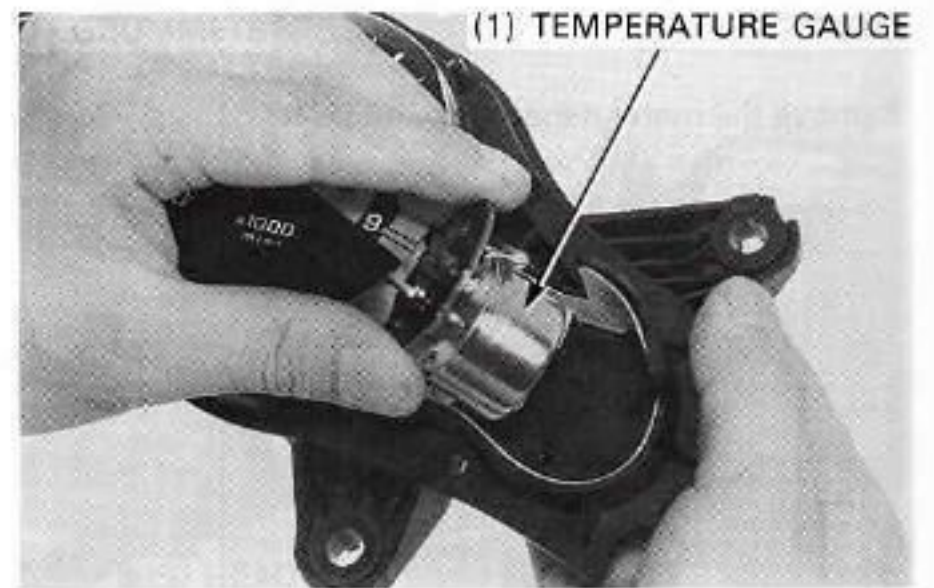


Remove the screws and upper case.

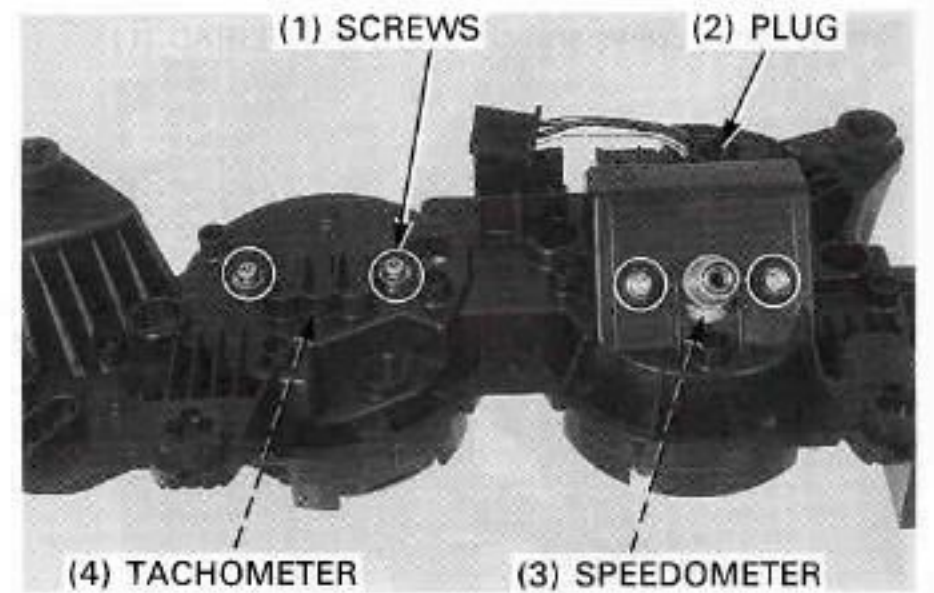


LIGHTS/METERS/SWITCHES

Remove the coolant temperature gauge.



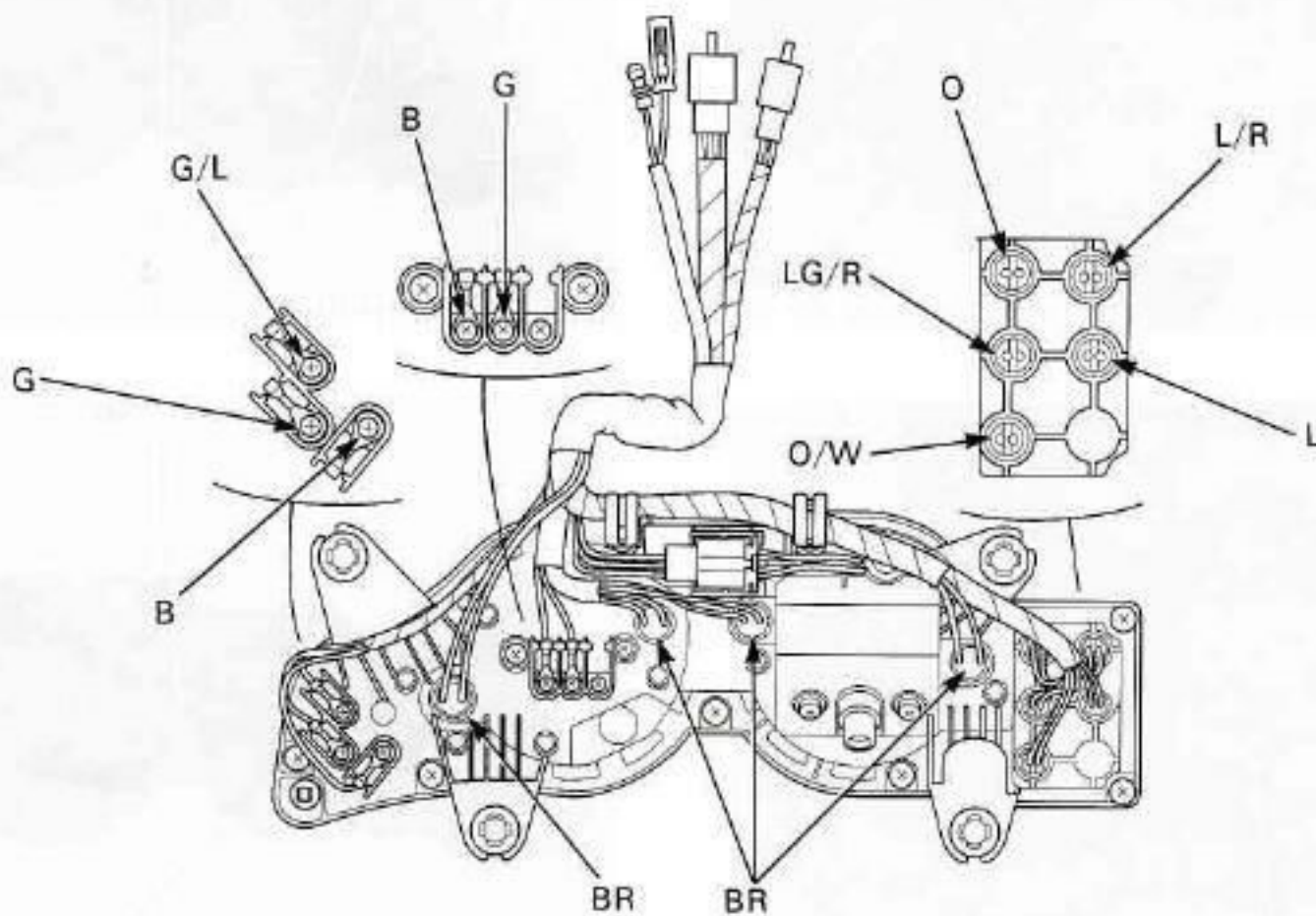
Remove the plug.
Remove the screws and tachometer and speedometer.



ASSEMBLY

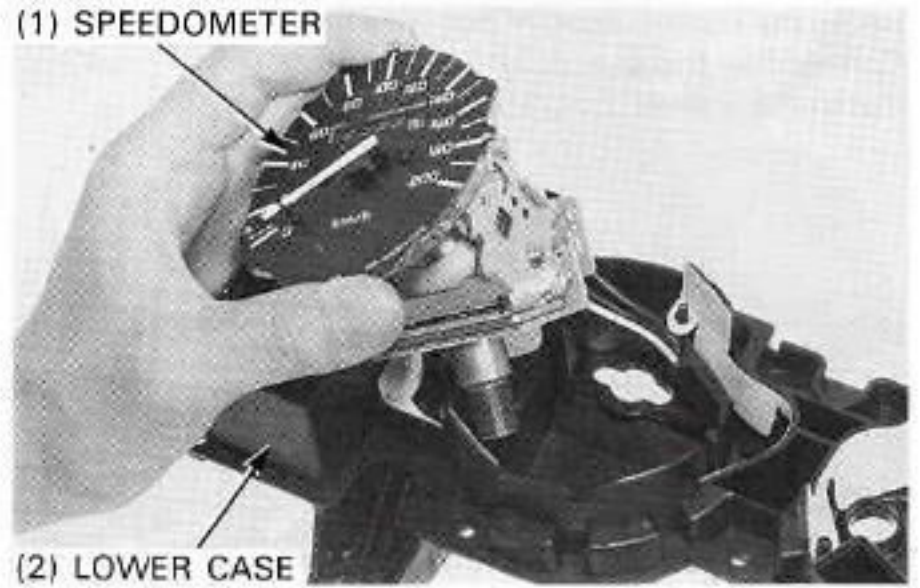
NOTE

- Route the combination meter harness properly (see below).

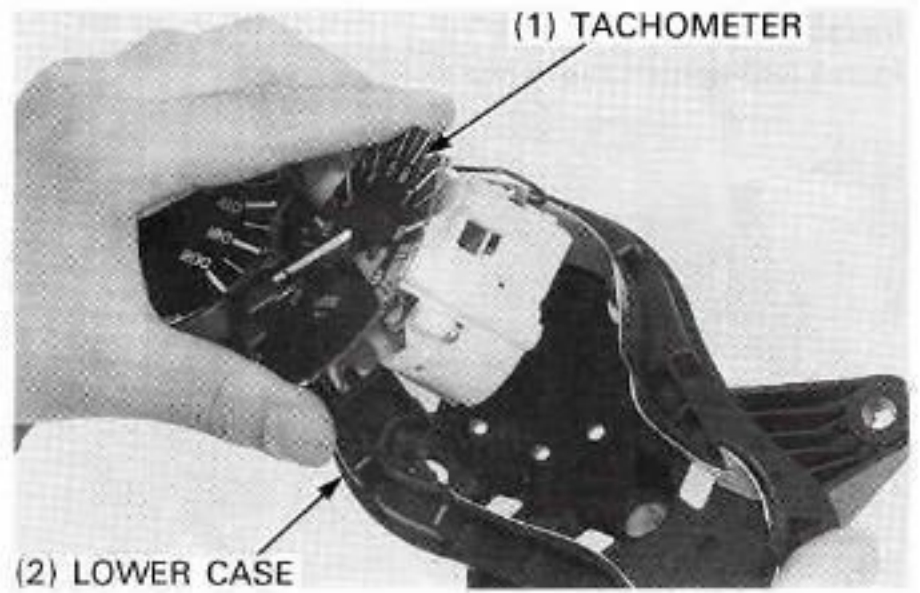


W : White
BR: Brown
B : Black
G : Green
L : Blue
LG: Light green
R : Red
O : Orange

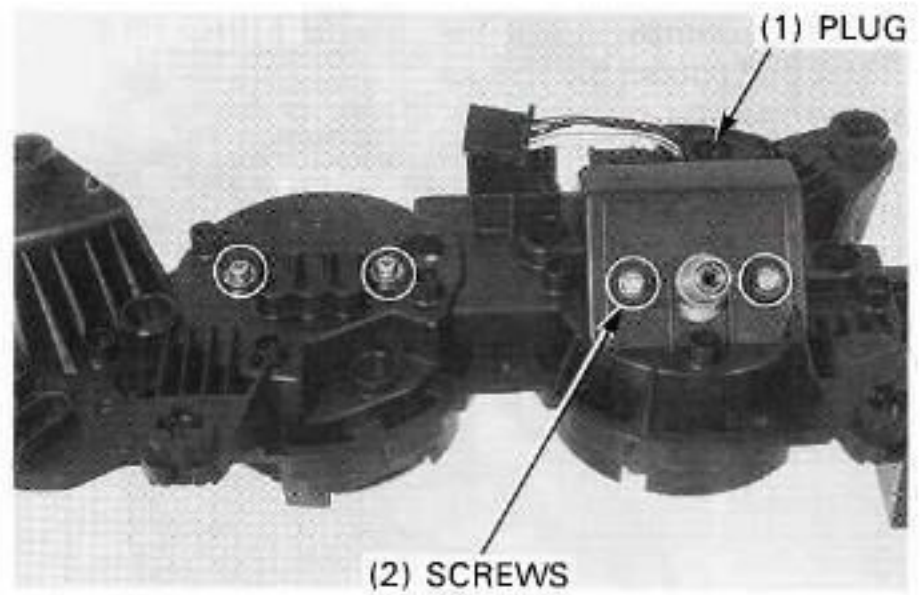
Install the speedometer to the lower case.



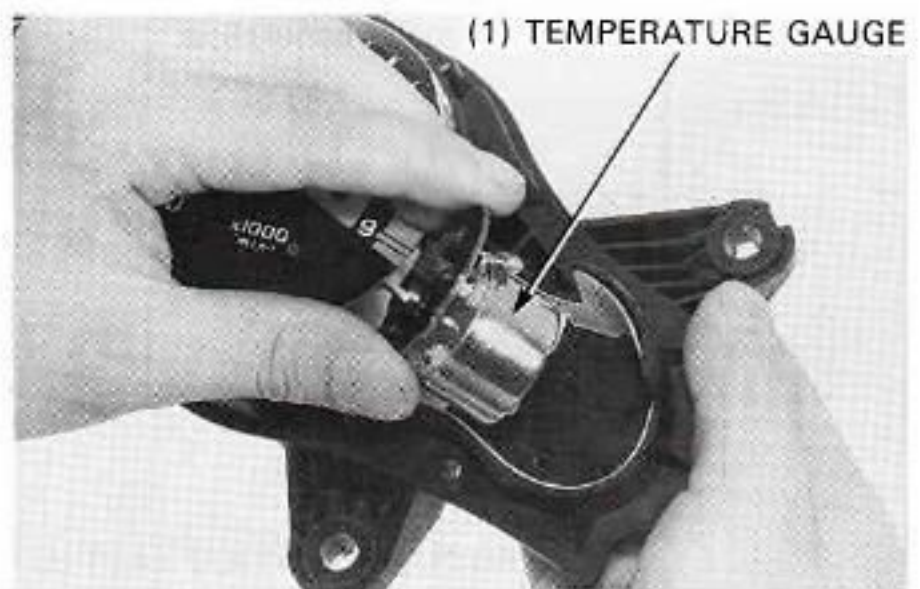
Install the tachometer to the lower case.



Install and tighten the screws.
Install the plug.

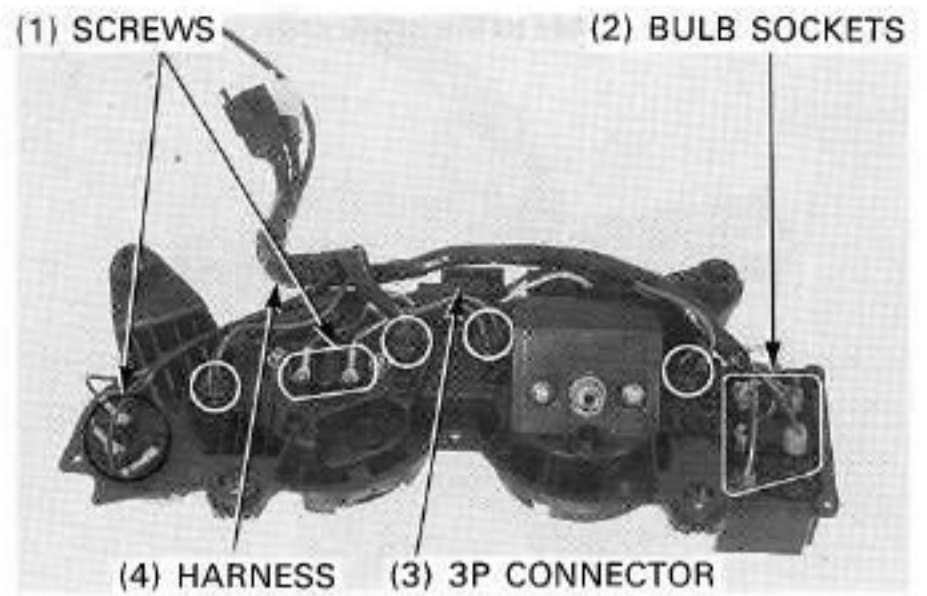


Install the coolant temperature gauge.

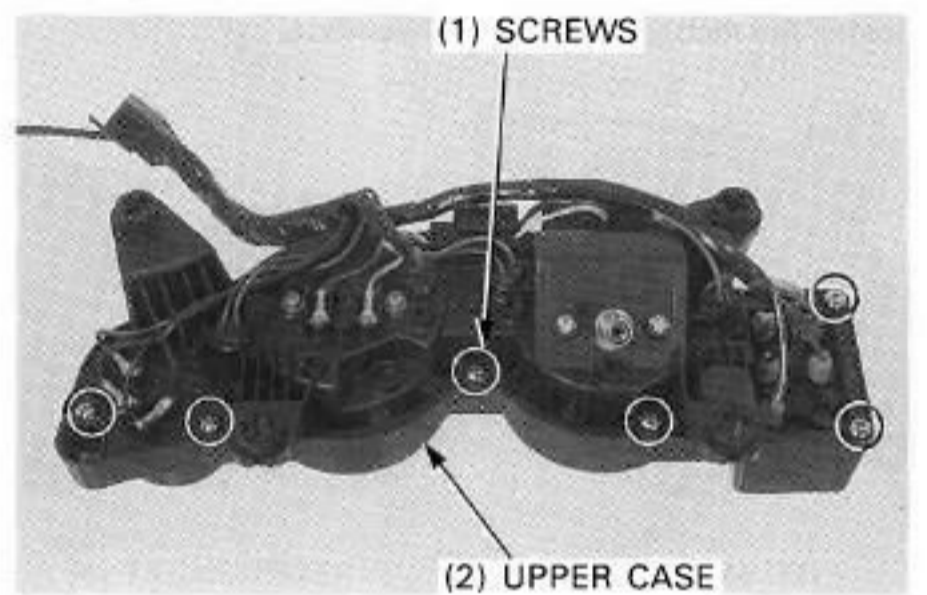


LIGHTS/METERS/SWITCHES

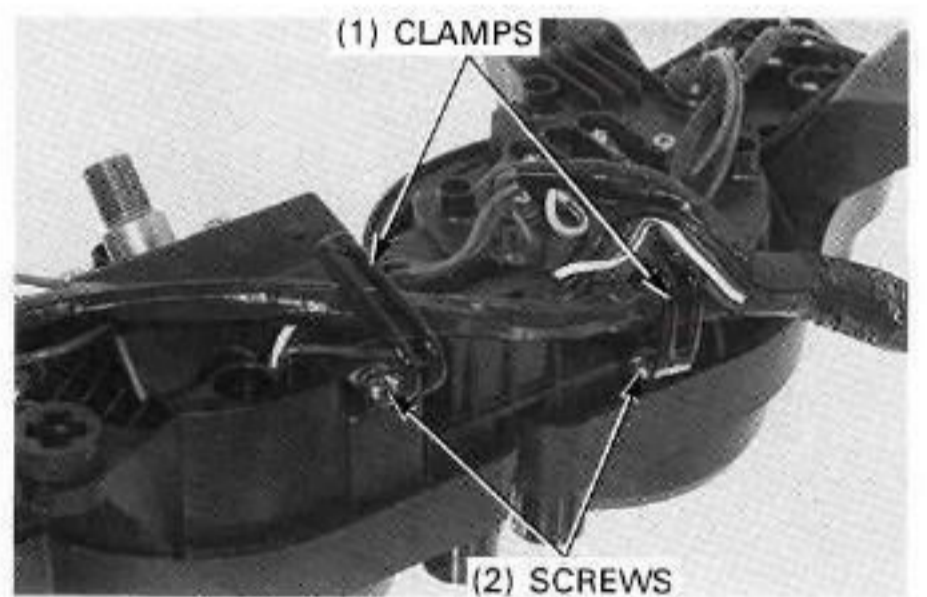
Install the combination meter wire harness.
Connect the trip sensor 3P connector.
Install the screws, bulb sockets.



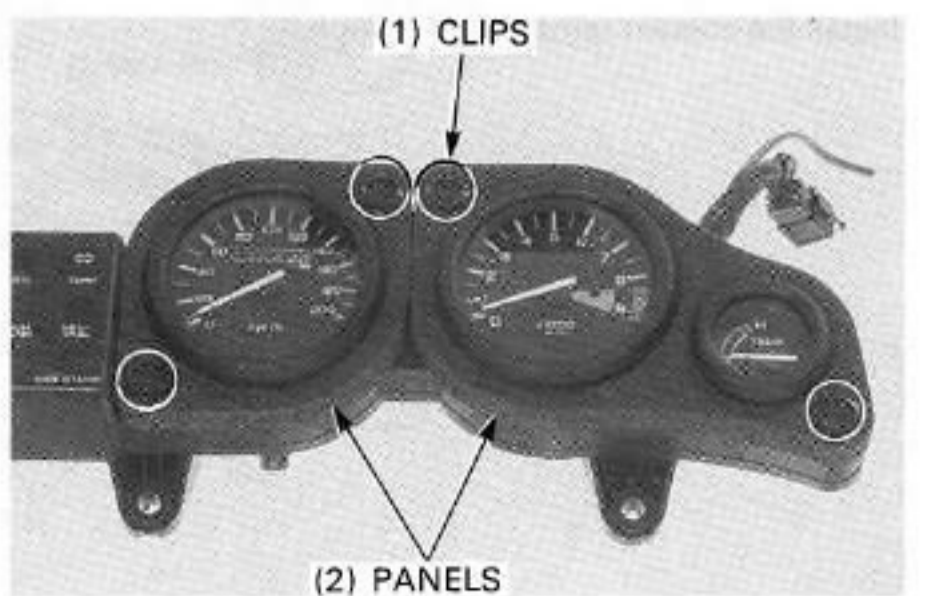
Install the upper case.
Install and tighten the screws.



Install the clamps.
Install and tighten the screws.

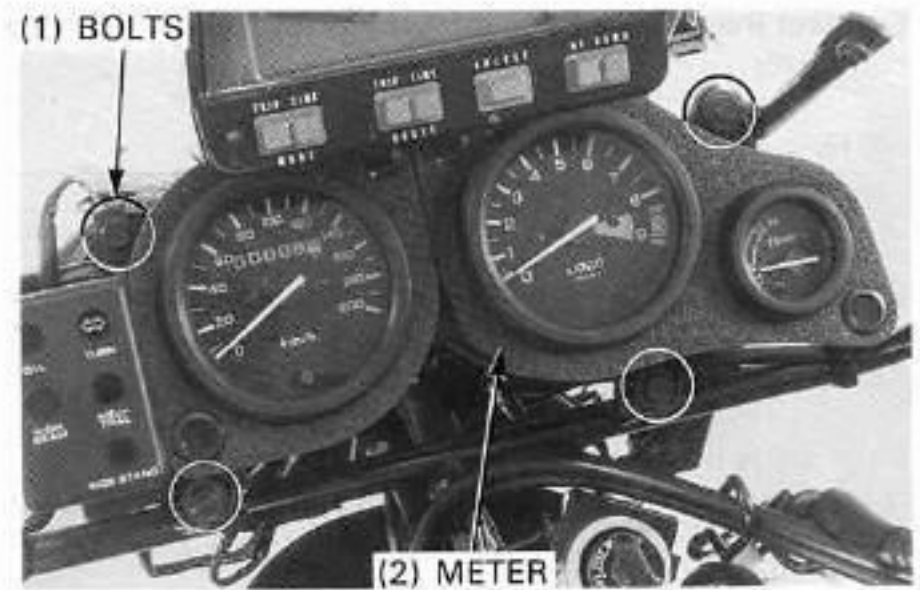


Install the meter panels and meter panel clips.

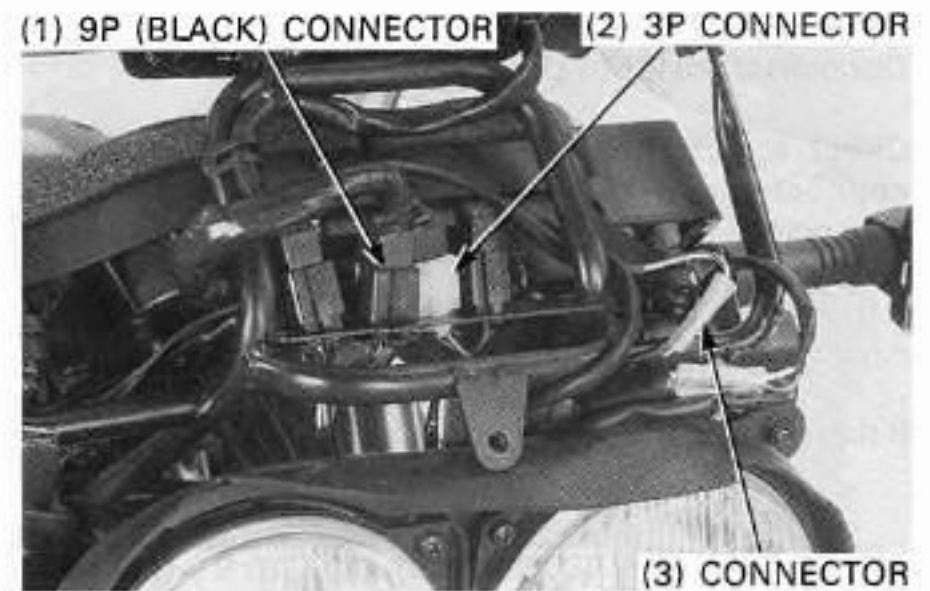


INSTALLATION

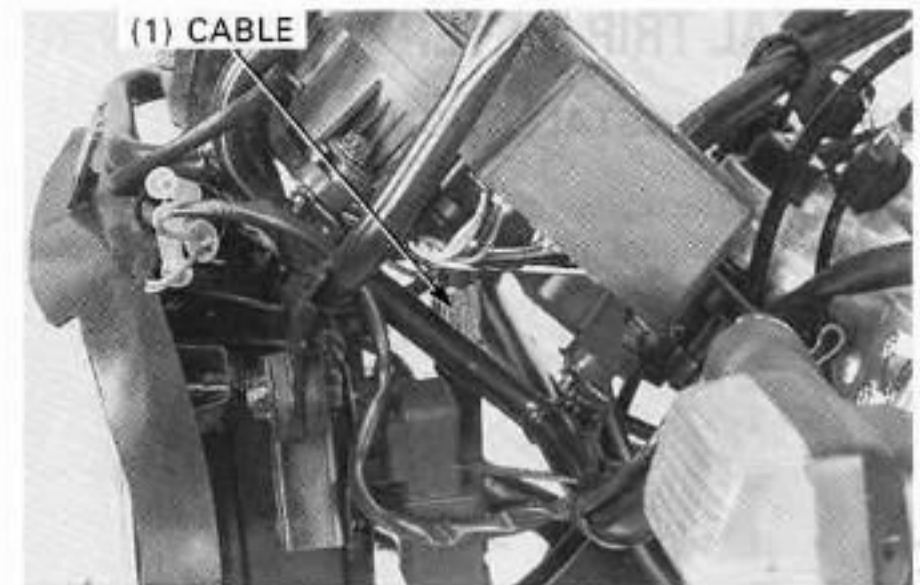
Install the combination meter.
Install and tighten the bolts securely.



Connect the combination meter Yellow/Green wire connector, 9P (black) connector and 3P connector.



Connect the speedometer cable.
Install the upper cowl (page 2-3).



TACHOMETER INSPECTION

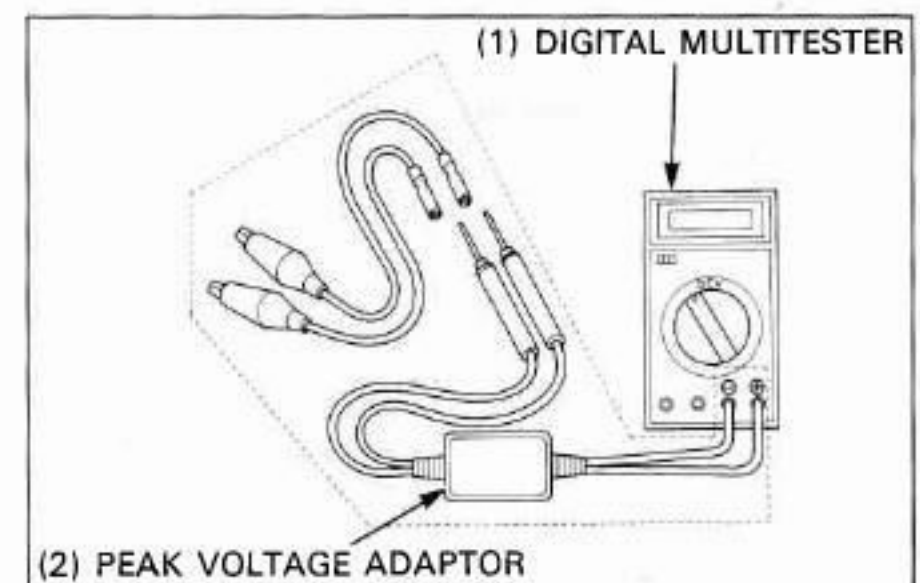
Remove the upper cowl (page 2-2).

Check for loose or poor contacts on the tachometer terminals.

Connect the peak voltage adaptor to the digital multimeter, or use the Imrie diagnostic tester (page 17-4).

TOOLS:

Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100 with
Commercially available digital multimeter (impedance 10M
Ω/DCV minimum)



LIGHTS/METERS/SWITCHES

Connect the peak voltage adaptor to the Yellow/Green wire connector.

NOTE

- Do not disconnect the Yellow/Green wire.

Start the engine and measure the tachometer input voltage.

PEAK VOLTAGE: 10.5 V minimum

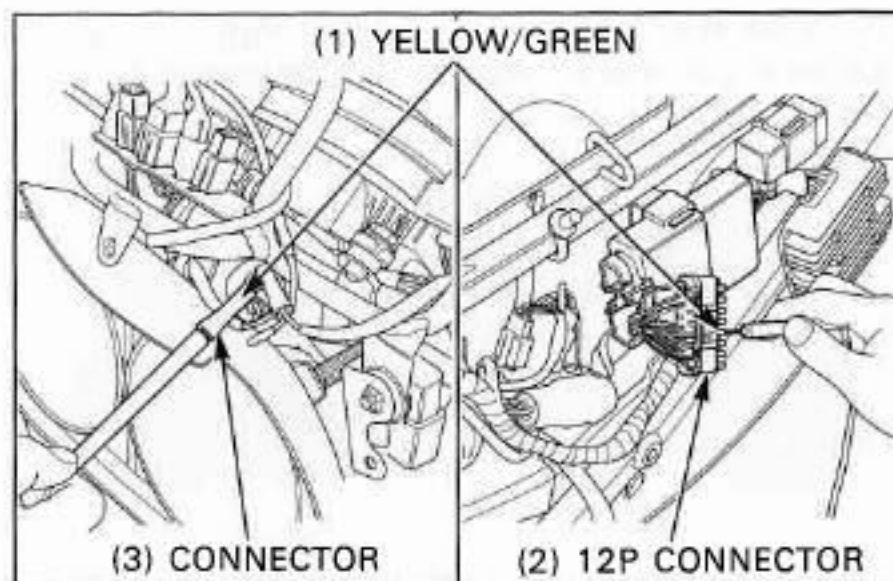
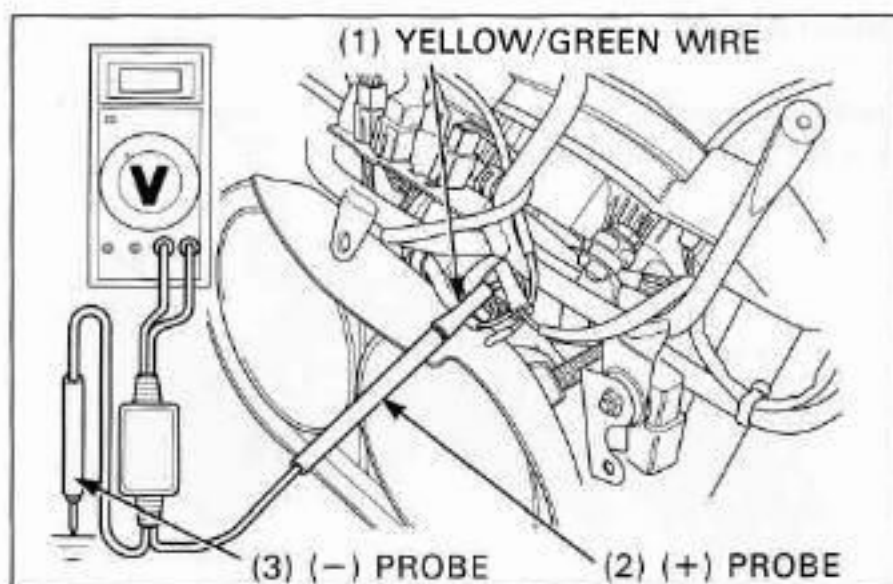
If the value is normal, replace the tachometer.
If the value is below 10.5 V, replace the ignition control module (ICM).

If the value is 0 V, perform the following procedure.
Disconnect the ICM 12P connector.

Check for continuity between the Yellow/Green wire connector and Yellow/Green terminal of the ICM 12P connector.

If there is no continuity, check the wire harness for an open circuit.

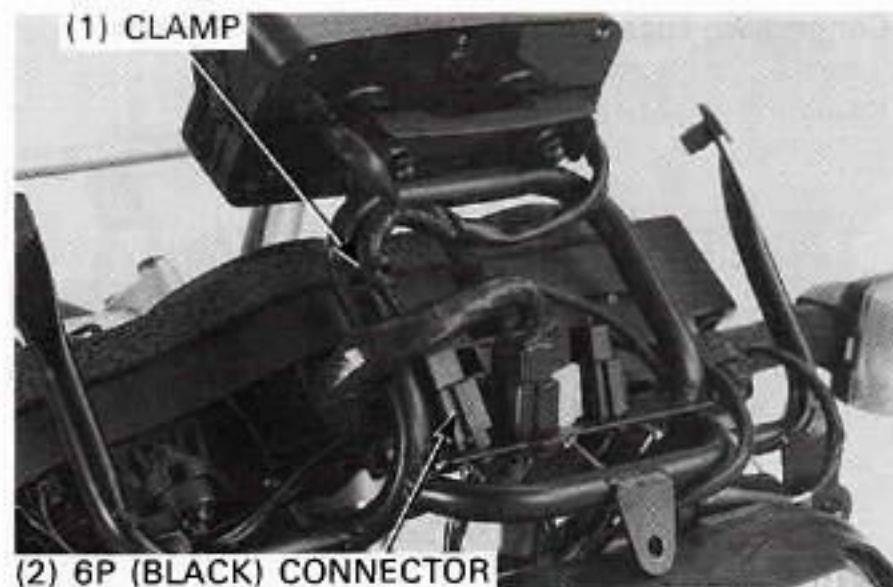
If there is no continuity, replace the ICM.



DIGITAL TRIP METER

REMOVAL/INSTALLATION

Disconnect the digital trip meter 6P (black) connector.
Remove the digital trip meter wire harness from the clamp.

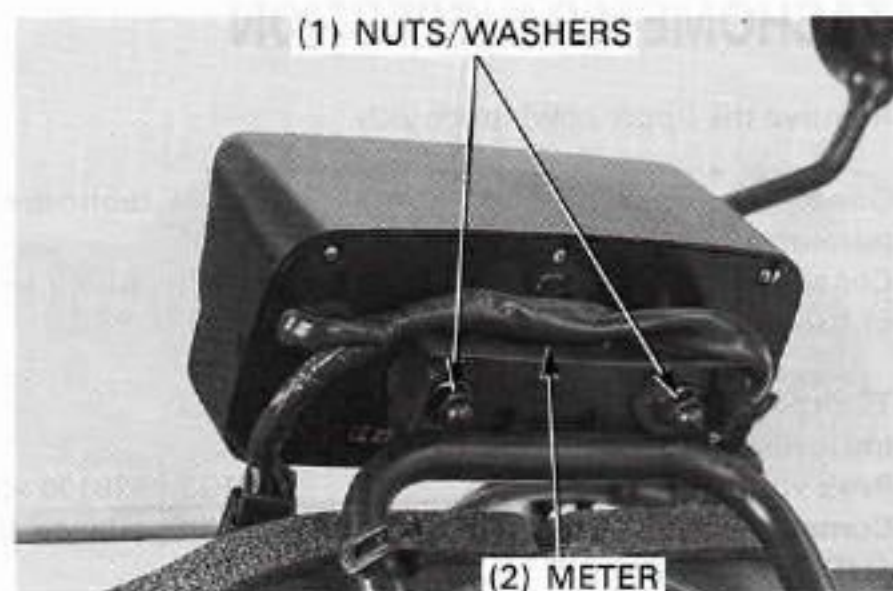


Remove the cap nuts, washers and digital trip meter.

Installation is in the reverse order of removal.

NOTE

- Route the digital trip meter wire harness properly (page 1-22).



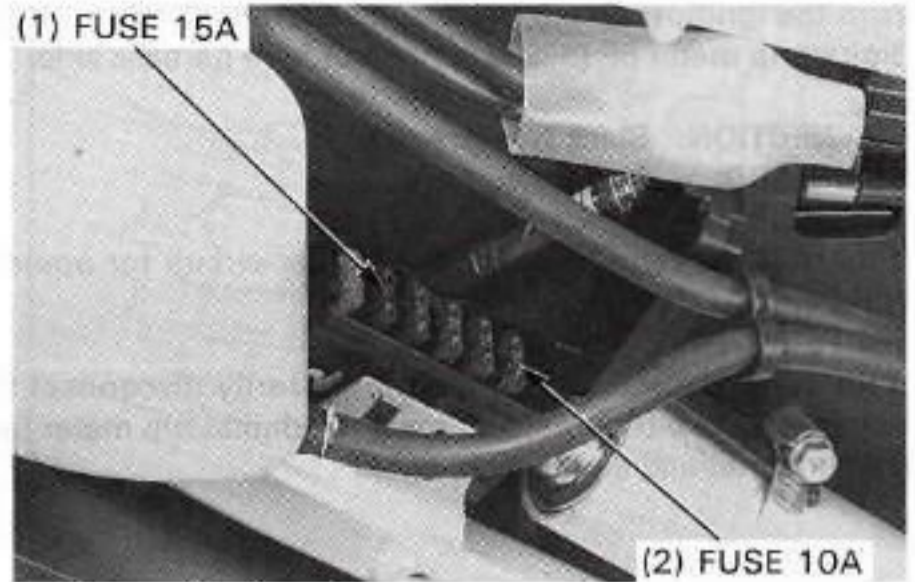
INSPECTION

NOTE

- Measure the battery voltage before starting troubleshooting procedure.
If the battery voltage below 7V, all LCD remain OFF.
If the battery voltage is below 3V, all trip meter memories are erased.

Remove the right side cover (page 2-7).

Remove the fuse box cover.
Check the sub fuse 15 A and 10 A (clock) for blown.
Replace the sub fuse 15 A and 10 A (clock) if necessary.



INPUT VOLTAGE INSPECTION (FOR CLOCK)

Remove the upper cowl (page 2-2).

Disconnect the digital trip meter 6P (black) connector.

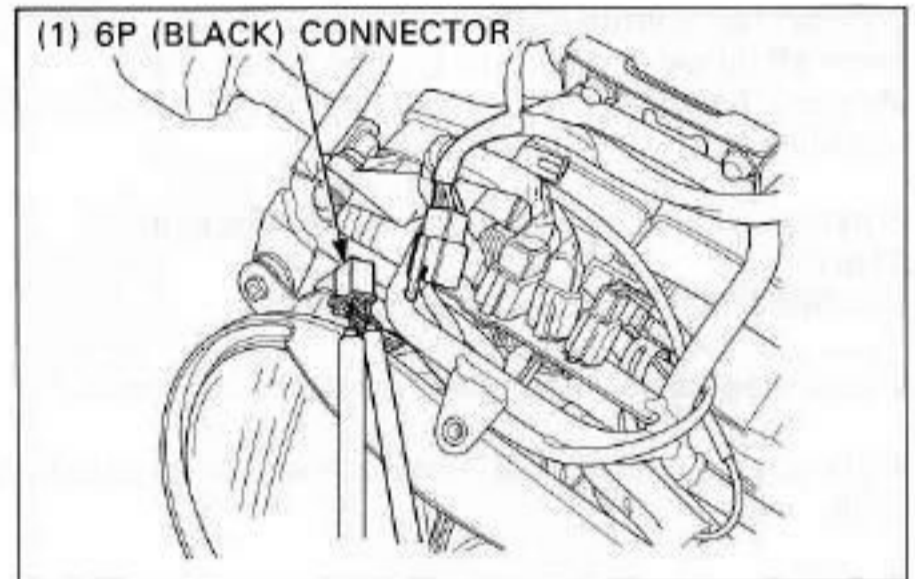


Measure the voltage at the digital trip meter 6P (black) connector wire harness side.

CONNECTION: Red (+) - Green (-)
STANDARD: Battery voltage

If there is no voltage, check the relater circuit for open or short circuit.

If the related circuit is normal, temporarily disconnect the battery positive terminal and reset the digital trip meter (see Owner's manual) and inspect again.



INPUT VOLTAGE INSPECTION (FOR TRIP METER)

Remove the upper cowl (page 2-2).

Disconnect the digital trip meter 6P (black) connector.



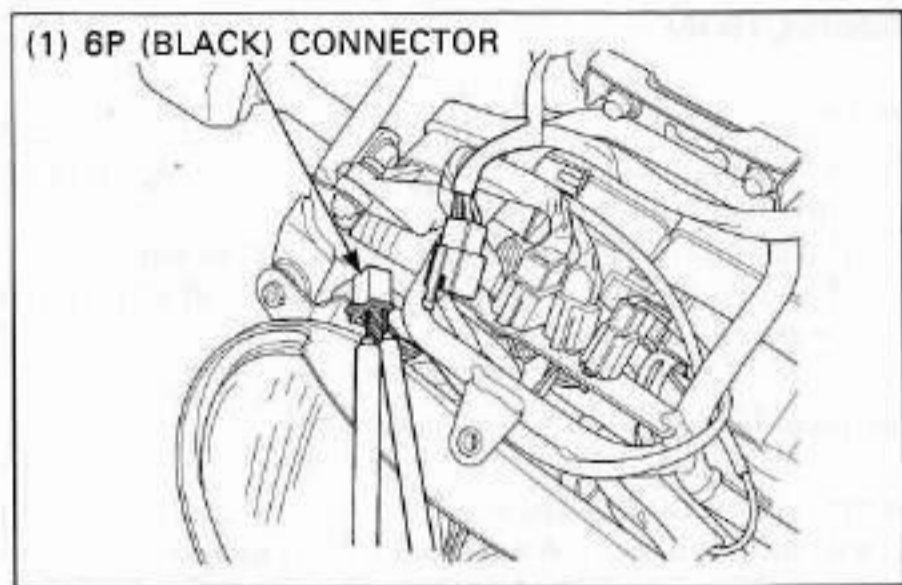
LIGHTS/METERS/SWITCHES

Turn the ignition switch ON and measure the voltage at the digital trip meter 6P (black) connector wire harness side.

CONNECTION: Black (+) - Green (-)
STANDARD: Battery voltage

If there is no voltage, check the related circuit for open or short circuit.

If the related circuit is normal, temporarily disconnect the battery positive terminal and reset the digital trip meter (see Owner's manual) and inspect again.



TRIP SENSOR CIRCUIT INSPECTION

Remove the upper cowl (page 2-2).

Disconnect the digital trip meter 6P (black) connector.

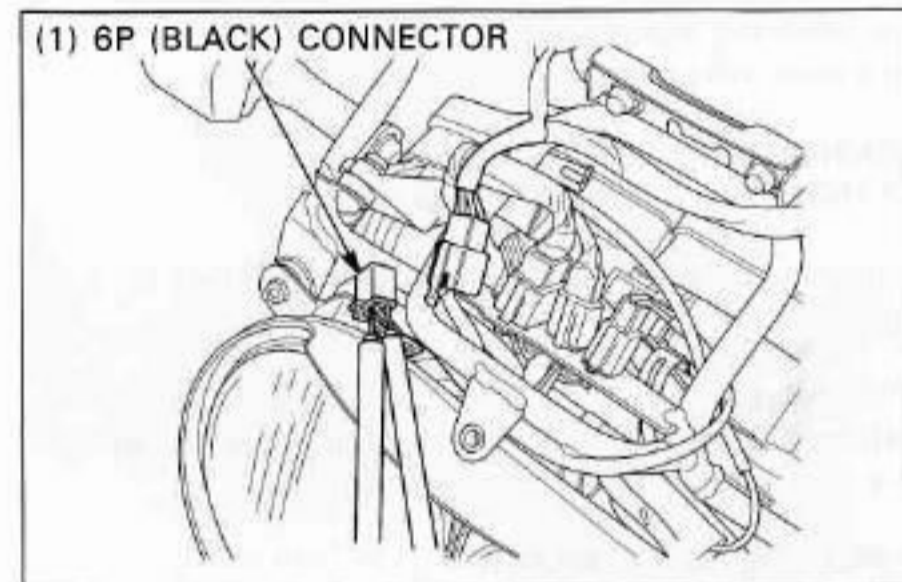


Connect the voltmeter (analogue type) to the digital trip meter 6P (black) and turn the ignition switch ON. Measure the voltage when the front wheel is turned slowly one full turn.

CONNECTION: White/Blue (+) - Green/Black (-)
STANDARD: 0.6 V
VOLTMETER NEEDLE SWINGS: 12 times

If the voltage is normal, replace the digital trip meter.

If the voltage is abnormal, replace the speedometer (page 19-8).



OIL PRESSURE SWITCH INSPECTION

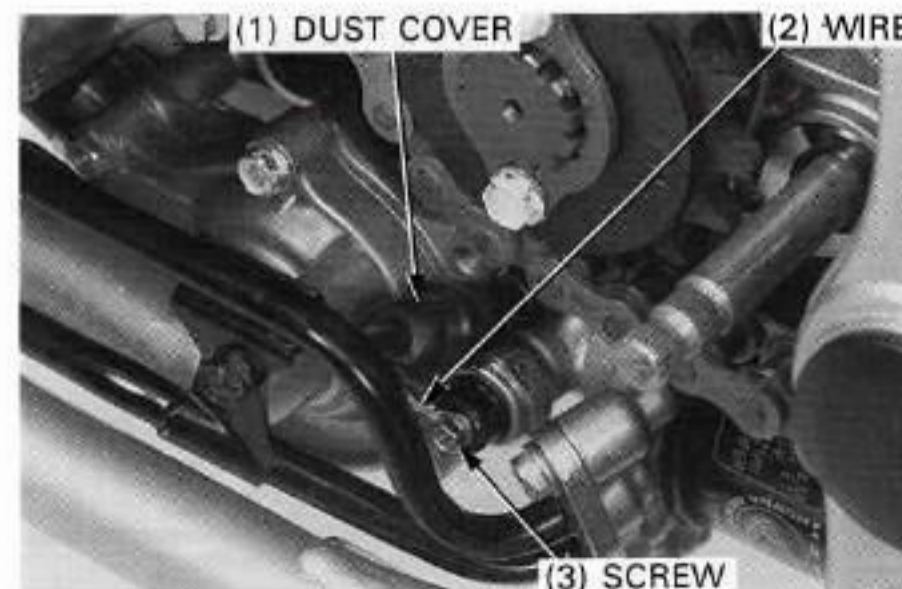
NOTE

- The oil pressure switch removal/installation is refer to page 4-3.

OIL PRESSURE INDICATOR DOES NOT COME ON WITH THE IGNITION SWITCH TURNED ON.

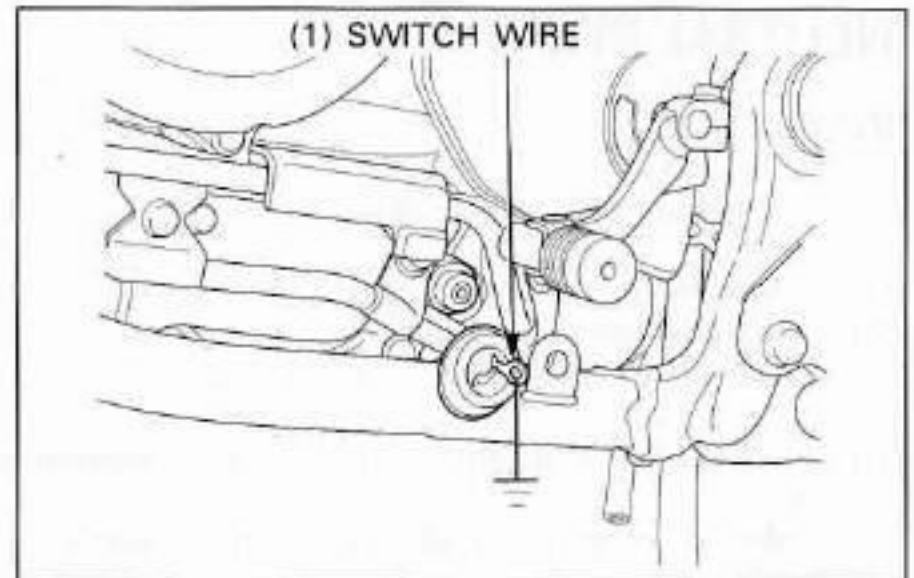
Remove the drive sprocket cover (page 7-3).

Disconnect the oil pressure switch wire from the switch by removing the terminal screw.



Short the oil pressure switch wire to ground using a jumper wire.
Turn the ignition switch ON and check the oil pressure indicator comes on.

- **Indicator comes on:**
Faulty oil pressure switch



- **Indicator does not come on:**
Remove the upper cowl (page 2-2).

Short the Blue/Red wire to ground using a jumper wire with the combination meter 9P (black) connector is connected.

Turn the ignition switch ON and check the oil level indicator comes on.

— **Indicator does not come on:**

- Open circuit in Blue/Red wire between combination meter 9P (black) connector and oil pressure switch
- Loose or poor connection of the engine sub harness 2P connector

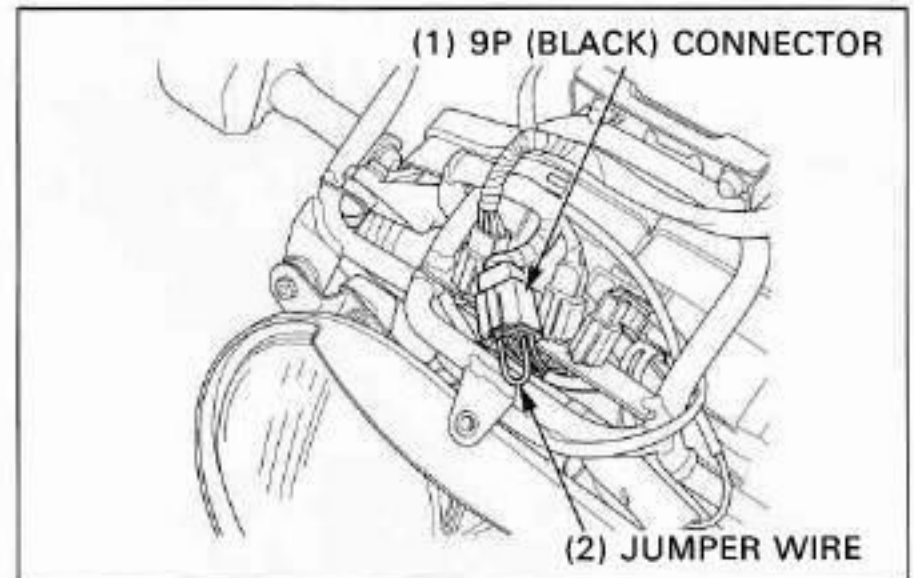
— **Indicator comes on:**

Turn the ignition switch ON and measure the voltage at the Black terminal (+) of the combination meter 9P (black) connector and body ground (-).

There should be battery voltage.

Voltage appears: Faulty oil pressure indicator

No voltage: Open circuit in Black wire between combination meter 9P (black) connector and fuse box



OIL PRESSURE INDICATOR STAYS ON WHILE THE ENGINE IS RUNNING

Remove the drive sprocket cover (page 7-3).

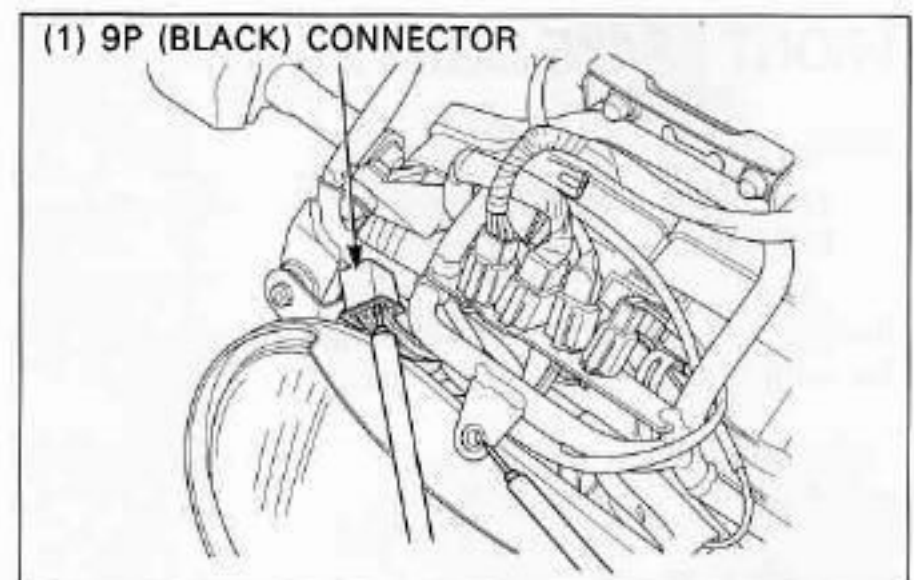
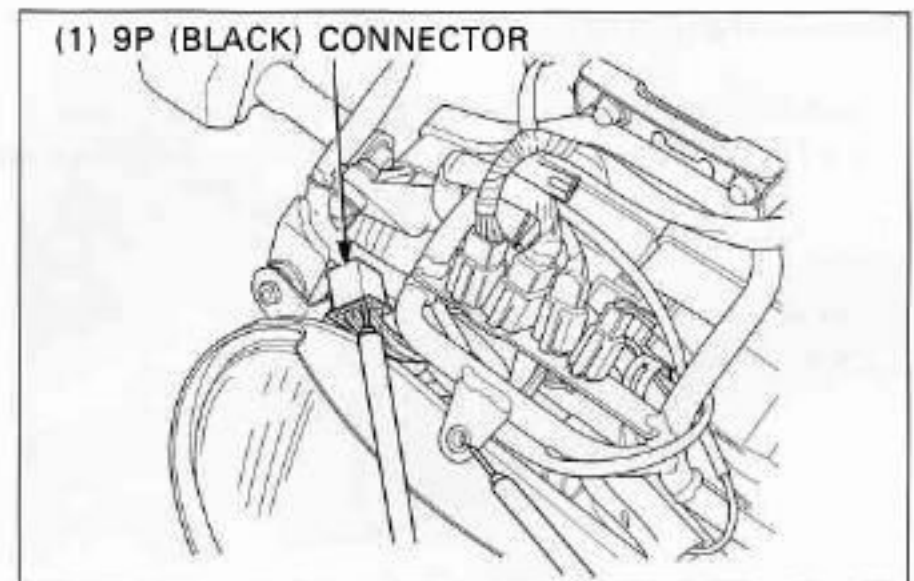
Disconnect the oil pressure switch wire from the switch by removing the terminal screw.

Remove the upper cowl (page 2-2).

Disconnect the combination meter 9P (black) connector.
Check the continuity between Blue/Red wire and ground.

Continuity: Short circuit Blue/Red wire between combination meter 9P (black) connector and oil pressure switch

No continuity: Check the oil pressure (page 4-3).
If oil pressure is normal, replace the oil pressure switch.



NEUTRAL SWITCH

INSPECTION

Remove the fuel tank (page 2-20).

Disconnect the engine sub harness 2P connector.
Shift the transmission into neutral and check for continuity between the Light Green/Red wire and ground.

There should be continuity when the transmission is in neutral.
There should be continuity when the transmission is in any other gear.

REMOVAL/INSTALLATION

Disconnect the neutral switch connector.

Remove the neutral switch.

Clean and apply sealant to the neutral switch threads.
Install and tighten the neutral switch to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the neutral switch connector.

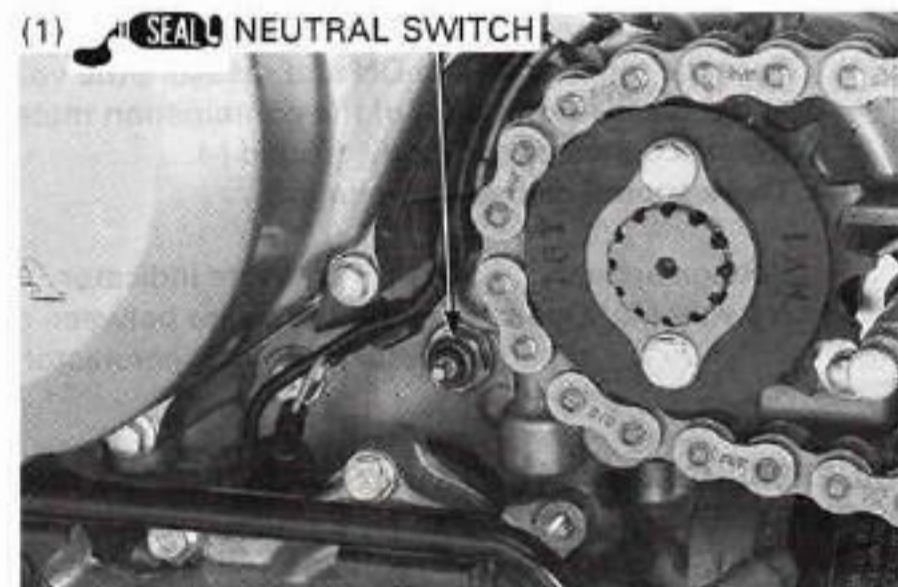
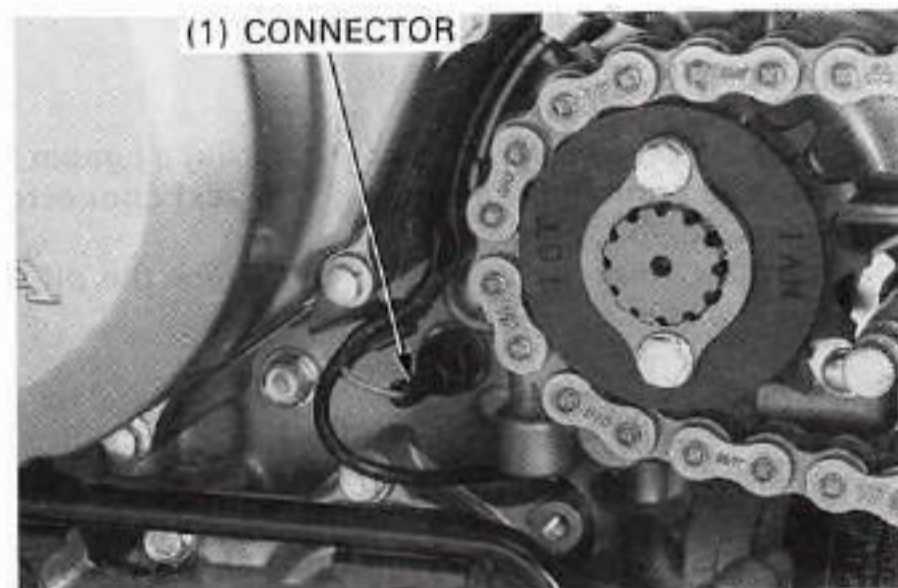
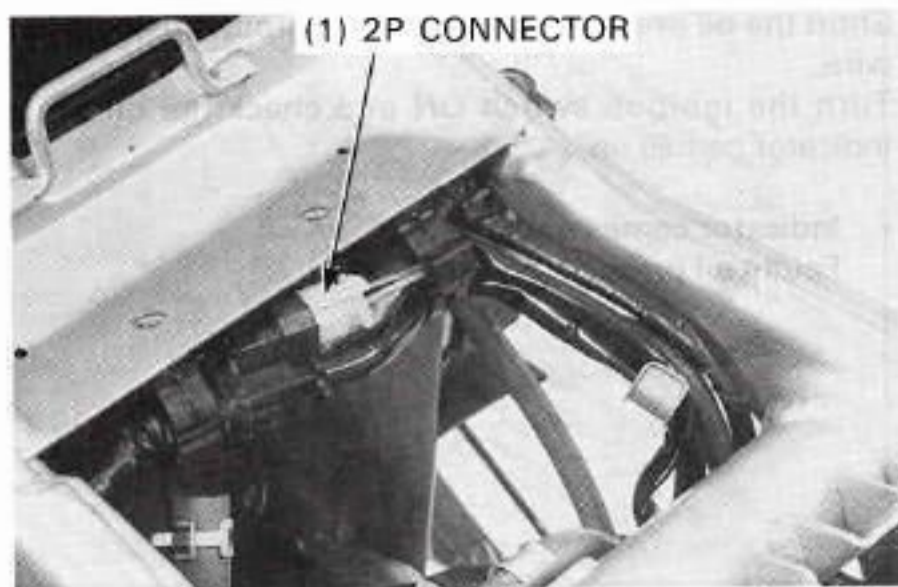
FRONT BRAKE LIGHT SWITCH

NOTE

- The front brake light switch removal/installation is refer to page 15-11.

Disconnect the front brake light switch connectors and check for continuity.

There should be continuity with the front brake applied and no continuity with it released.

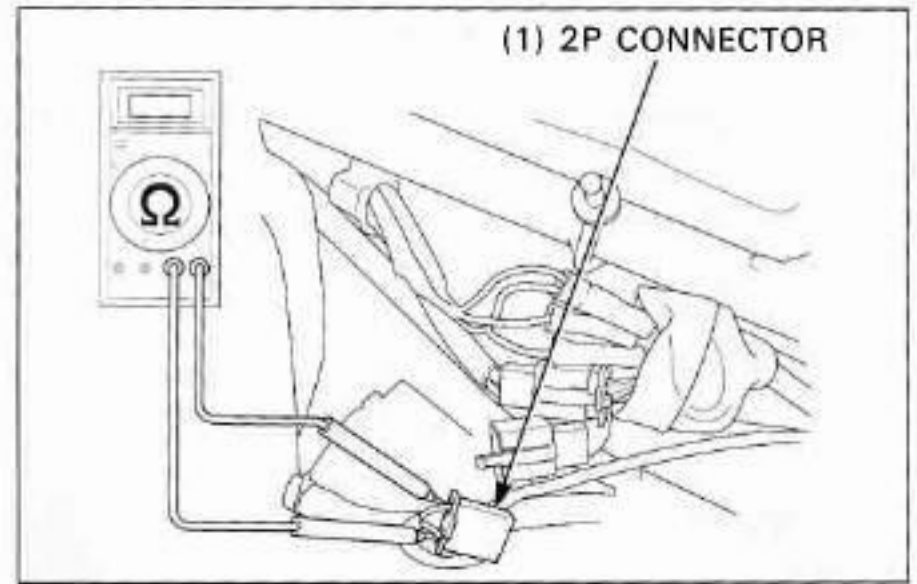


REAR BRAKE LIGHT SWITCH

Remove the right side cover (page 2-7).

Disconnect the rear brake light switch 2P connector and check for continuity at the switch side connector.

There should be continuity with the front brake applied and no continuity with it released.



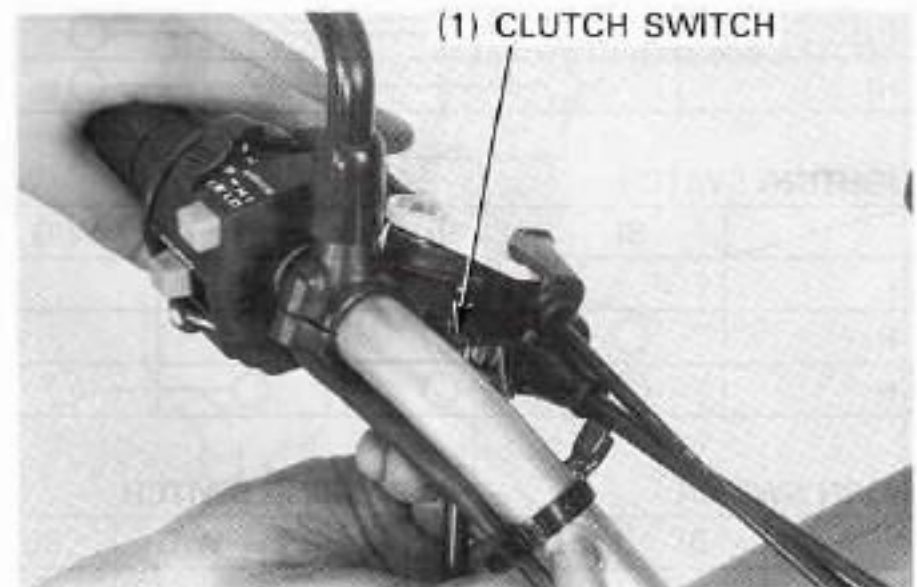
CLUTCH SWITCH

NOTE

- The clutch switch removal/installation is refer to page 13-3.

Disconnect the clutch switch connectors and check for continuity.

There should be continuity with the front brake applied and no continuity with it released.



HANDLEBAR SWITCH

NOTE

- The handlebar switches removal/installation is refer to page 13-3.

Remove the air cleaner housing (page 5-4).

Check for continuity between the terminals. Continuity should exist between the color code wire as shown in each chart.



RIGHT HANDLEBAR SWITCH

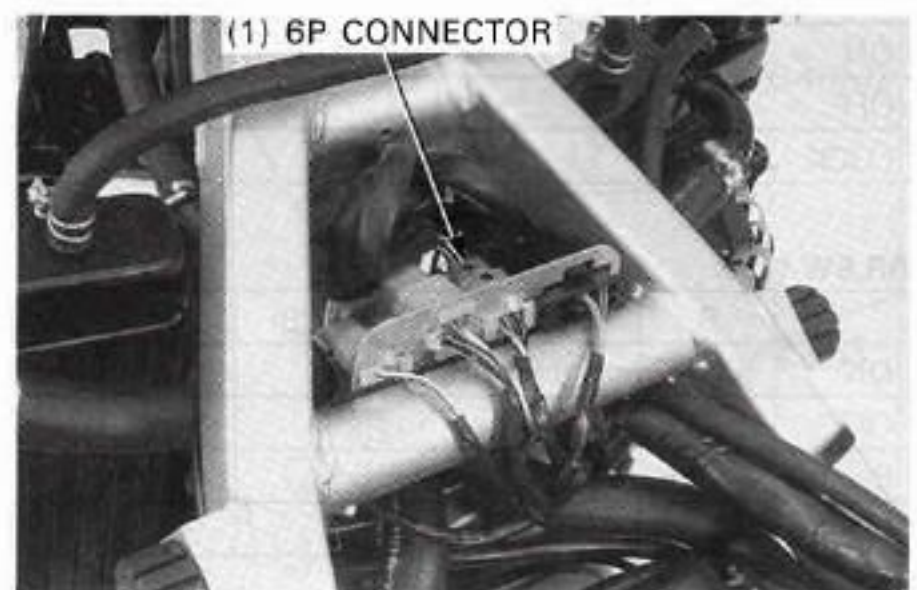
Disconnect the left handlebar 6P connector.

STARTER SWITCH

| | BI/W | Y/R |
|------|------|-----|
| Free | | |
| Push | ○ | ○ |

ENGINE STOP SWITCH

| | BI/R | BI/W |
|-----|------|------|
| Off | | |
| Run | ○ | ○ |



LIGHTS/METERS/SWITCHES

LEFT HANDLEBAR SWITCH

Disconnect the left handlebar 9P and 3P connectors.

TURN SIGNAL SWITCH

| | | | |
|---|---|----|----|
| | O | Gr | SB |
| R | | ○ | ○ |
| N | | | |
| L | ○ | ○ | |

DIMMER SWITCH

| | | | |
|-----|---|---|----|
| | — | W | Bu |
| LO | ○ | ○ | |
| (N) | ○ | ○ | ○ |
| HI | ○ | | ○ |

LIGHTING SWITCH

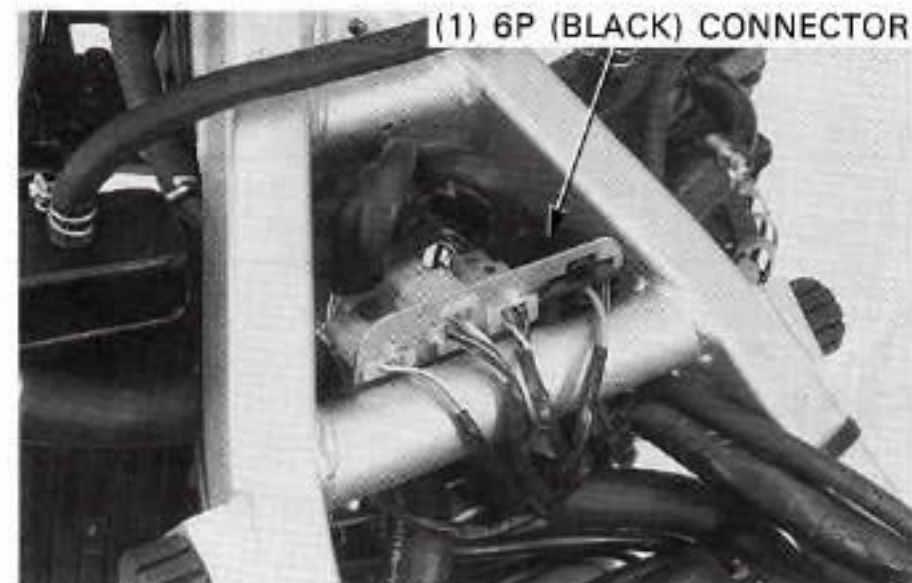
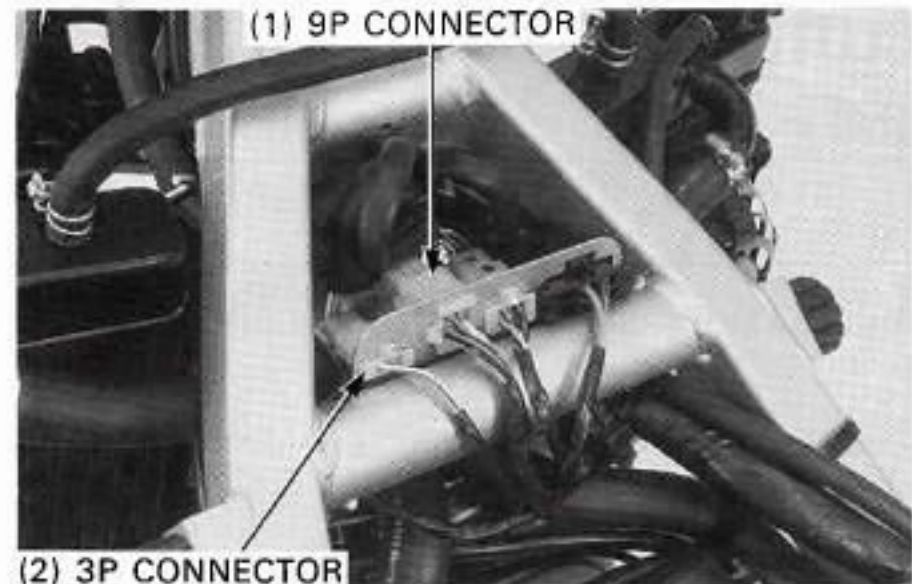
| | | | | |
|---|----|----|---|-----|
| | Bl | Br | — | W/G |
| • | | | | |
| P | ○ | ○ | | |
| H | ○ | ○ | ○ | ○ |

HORN SWITCH

| | | |
|------|----|----|
| | Bl | Lg |
| Free | | |
| Push | ○ | ○ |

PASSING SWITCH

| | | |
|------|-----|----|
| | W/G | Bu |
| Free | | |
| Push | ○ | ○ |



IGNITION SWITCH INSPECTION

Remove the air cleaner housing (page 5-4).

Disconnect the ignition switch 6P (black) connector. Check for continuity between the terminals. Continuity should exist between the color coded wire as shown in chart.

Except AR,SW type:

| | | | |
|------|---|------|------|
| | R | R/Bl | Bu/O |
| ON | ○ | ○ | ○ |
| OFF | | | |
| LOCK | | | |

AR,SW type:

| | | | | | | |
|------|---|------|------|------|----|------|
| | R | R/Bl | Bu/O | Y/Bl | Br | Br/w |
| ON | ○ | ○ | ○ | | ○ | ○ |
| OFF | | | | | | |
| P | ○ | | | ○ | | |
| LOCK | | | | | | |

FAN MOTOR SWITCH

INSPECTION

Remove the side cowl (page 2-2).

FAN MOTOR DOES NOT STOP

Turn the ignition switch OFF, disconnect the fan motor switch connector from the fan motor switch and turn the ignition switch ON again.

If the fan motor does not stop, check for a shorted wire between the fan motor and switch.

If the fan motor stops, replace the fan motor switch.

FAN MOTOR DOES NOT START

Before testing, warm up the engine to operating temperature.

Disconnect the connector from the fan motor switch and ground the connector to the body with a jumper wire. Turn the ignition switch ON and check the fan motor.

If the motor starts, check the connection at the fan motor switch terminal. If it is OK, replace the fan motor switch. If the motor does not start, check for voltage between the fan motor switch connector and ground.

- Battery voltage: Faulty fan motor
- No battery voltage:
 - Broken wire harness
 - Broken sub fuse
 - Faulty ignition switch
 - Poor connection of the connector (between the ignition switch and fuse box)

REMOVAL/INSTALLATION

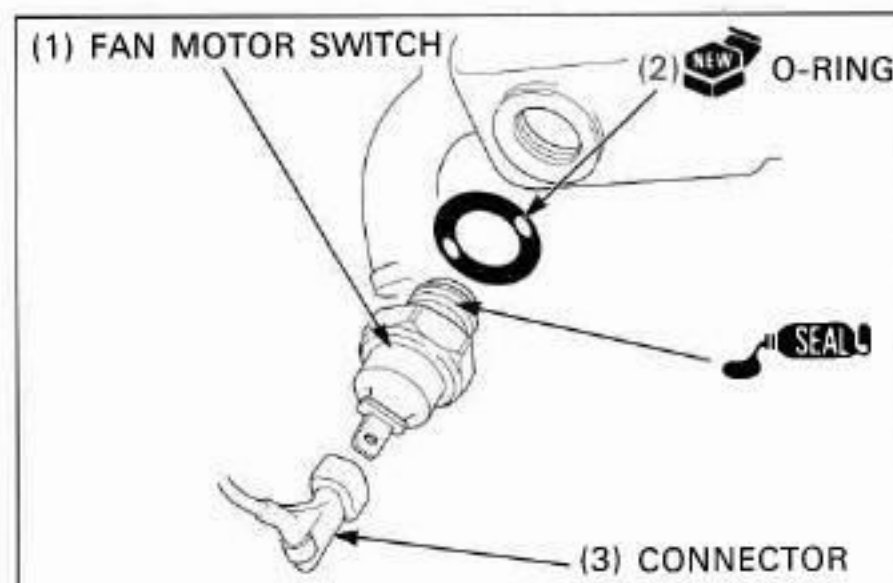
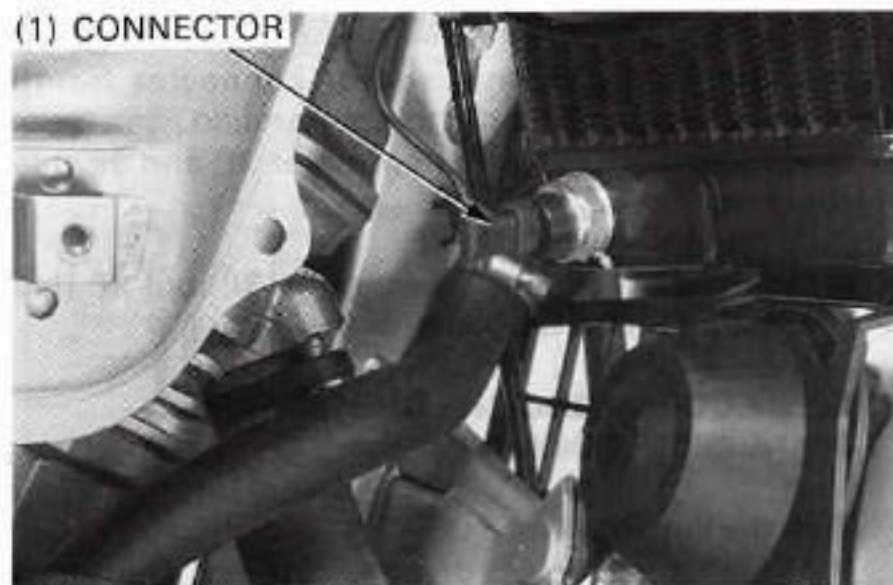
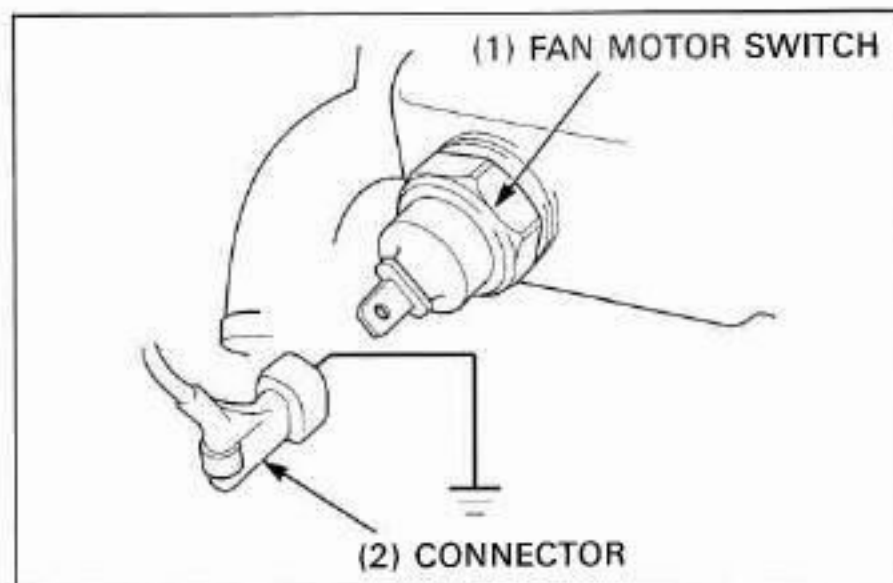
Remove the side cowl (page 2-2).
 Drain the coolant (page 6-5).

Disconnect the fan motor switch connector from the fan motor switch.

Remove the fan motor switch and O-ring from the right radiator.

Install the new O-ring.
 Clean and apply sealant to the fan motor switch threads.
 Install and tighten the fan motor switch to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



COOLANT TEMPERATURE, THERMO SENSOR INSPECTION

COOLANT TEMPERATURE GAUGE

Remove the fuel tank (page 2-20).

Disconnect the thermo sensor connector from the thermo sensor and short it to body ground.
Turn the ignition switch ON.
The coolant temperature gauge needle should move all the way to "H".

CAUTION

- Do not leave the thermo sensor wire grounded for longer than a few seconds or the temperature gauge will be damaged.

If the gauge moves, inspect the thermo sensor (page 19-23).
If the gauge does not move, check the followings.

1. Turn the ignition switch ON.
Measure the voltage between the thermo sensor connector and body ground.

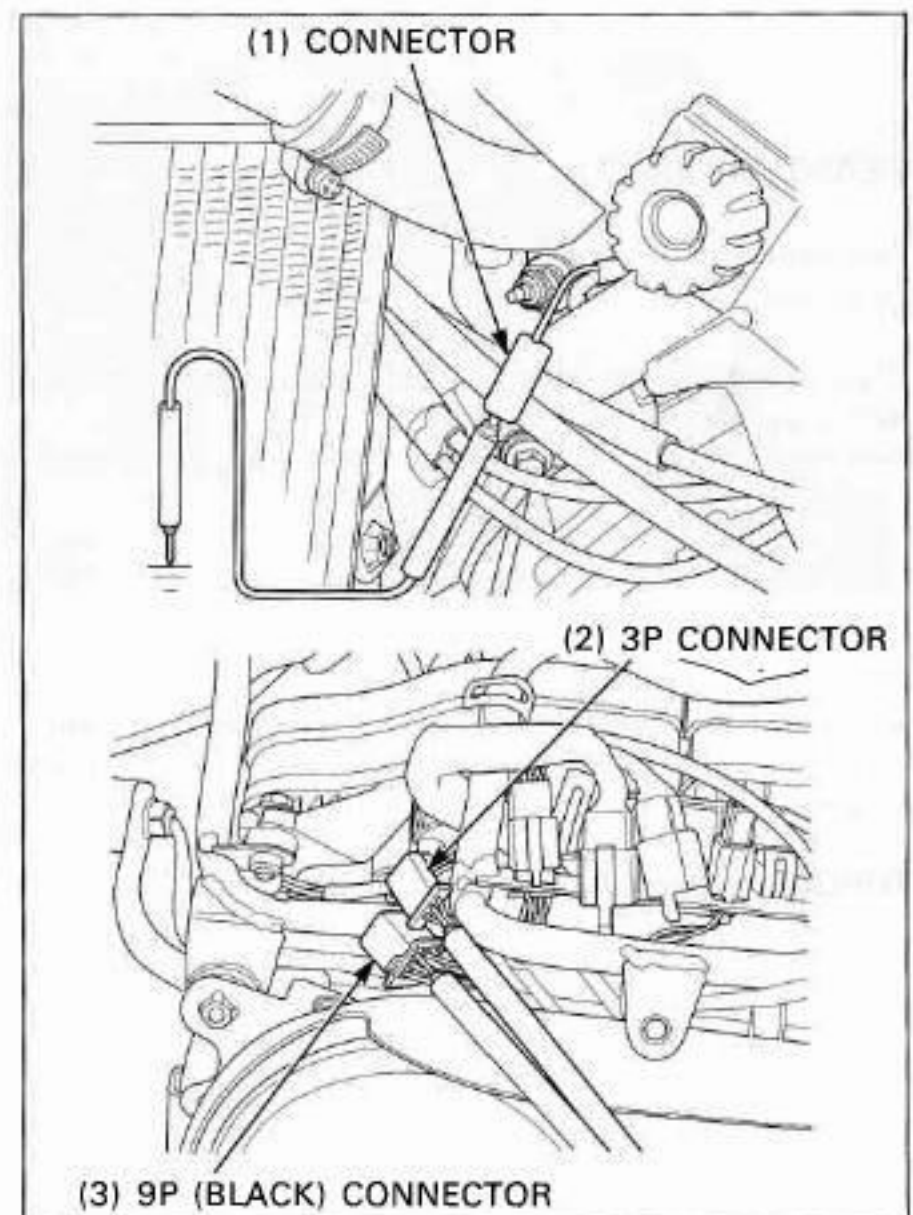
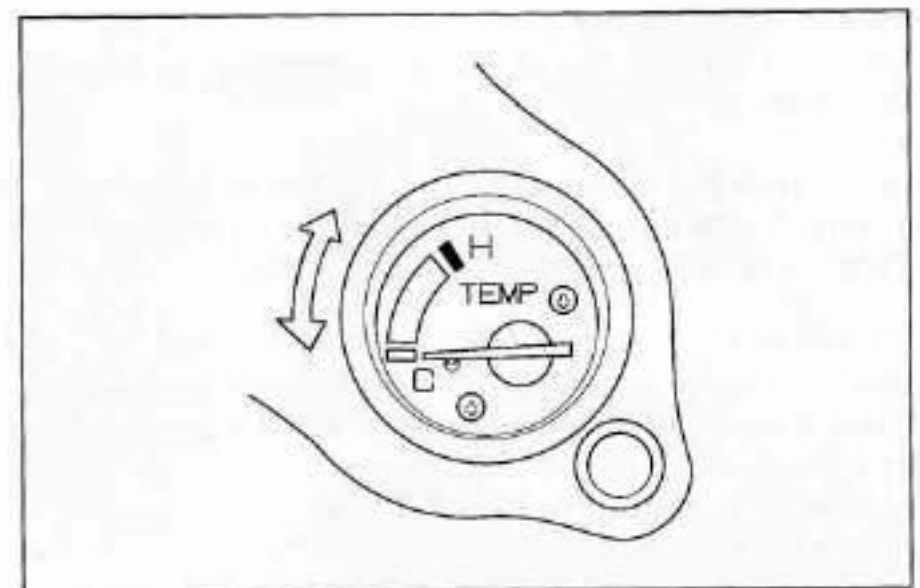
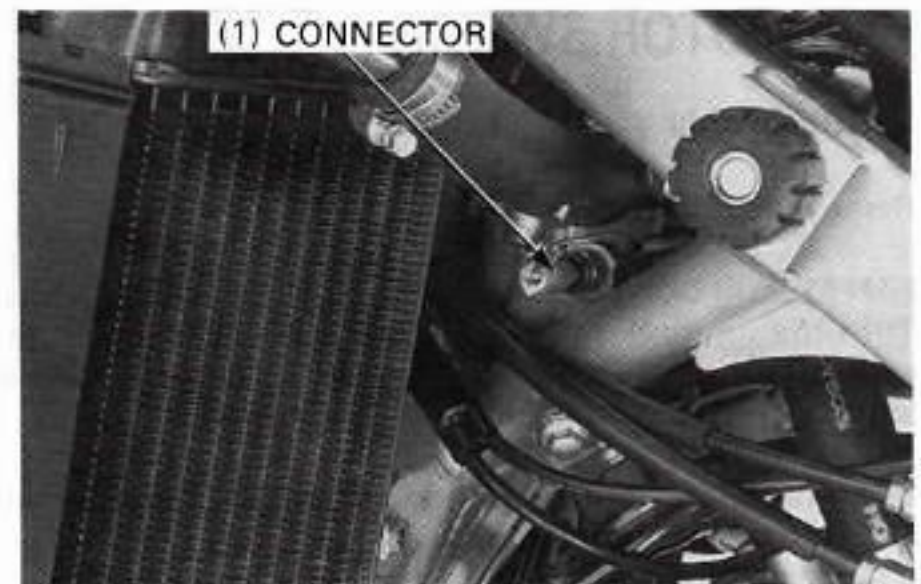
CONNECTION: Green/Blue (+) - Body ground (-)
STANDARD: Battery voltage

Turn the ignition switch OFF.
If there is battery voltage, replace the coolant temperature gauge (page 19-9).

2. Disconnect the thermo sensor connector from the thermosensor and short it to body ground.
Disconnect the combination meter 3P and 9P (black) connector
Turn the ignition switch ON.
Measure the voltage between the 3P and 9P (black) connector terminals wire harness side.

CONNECTION: Black (+) - Green/Blue (-)
STANDARD: Battery voltage

Turn the ignition switch OFF.
If there is battery voltage, replace the coolant temperature gauge (page 19-9).
If there is no voltage, check for open circuit in the Black and Green/Black wires.



THERMO SENSOR INSPECTION

⚠ WARNING

- *Wear insulated gloves and adequate eye protection.*
- *Keep flammable materials away from the electric heating element.*

NOTE

- Soak the thermo sensor in coolant up to its threads with at least a 40 mm (1.57 in) gap from the bottom of the pan to the bottom of the sensor.
- Keep the temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect readings. Do not let the thermo sensor or thermometer touch the pan.

Drain the coolant (page 6-5).
Remove the fuel tank (page 2-20).

Disconnect the thermo sensor connector.
Remove the thermo sensor.

Suspend the thermo sensor in a pan of coolant (50-50 mixture) over the electric heating element and measure the resistance through the sensor as the coolant heats up.

| | | |
|-------------|--------------|---------------|
| Temperature | 50 °C/122 °F | 100 °C/212 °F |
| Resistance | 130 - 180 Ω | 25 - 30 Ω |

Replace the sensor if it is out of specifications.

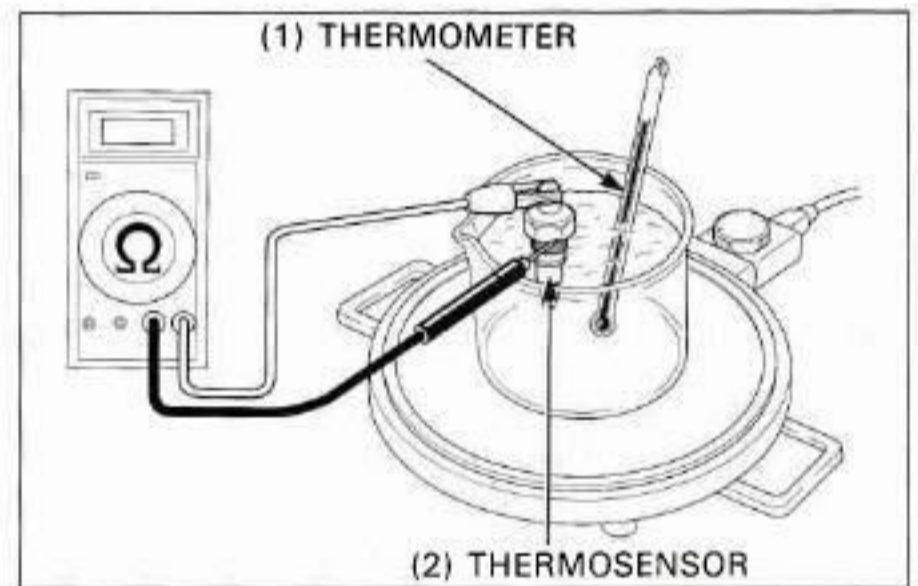
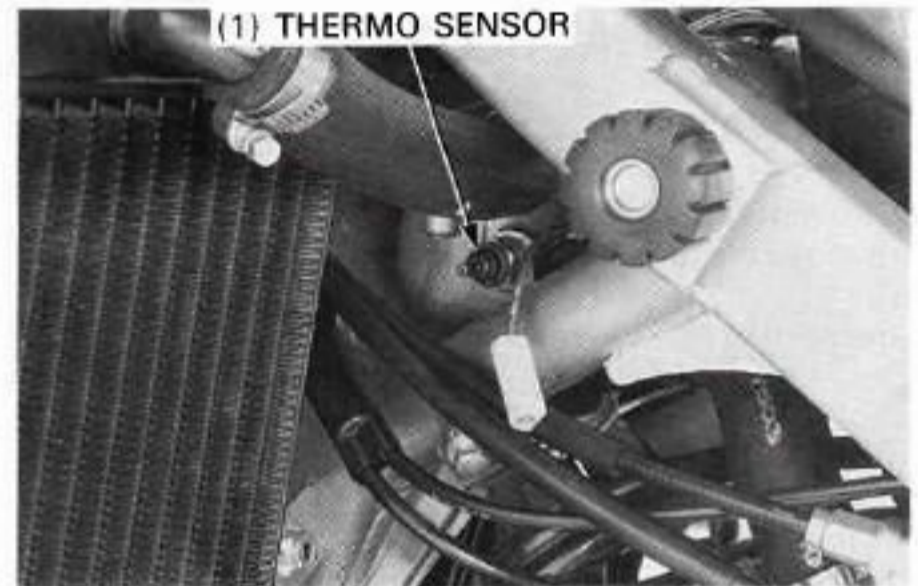
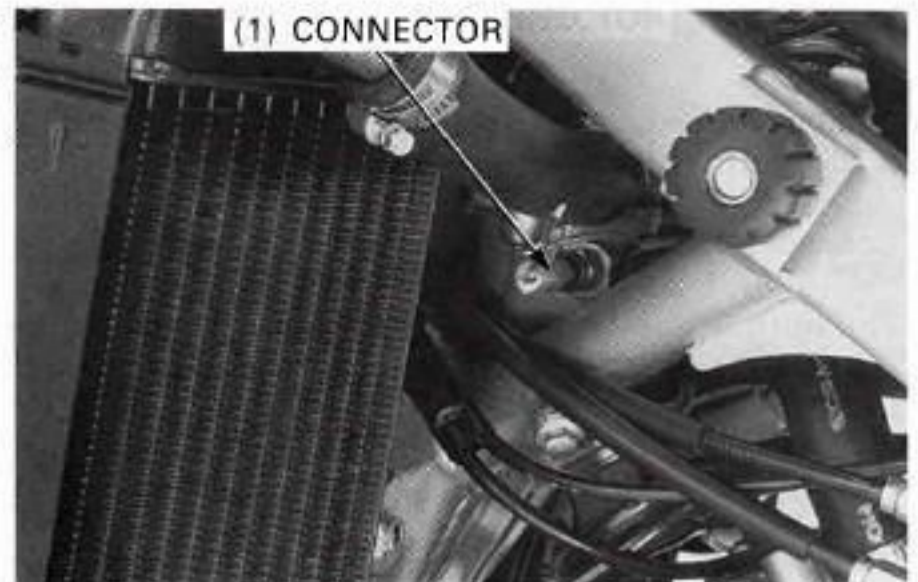
Clean and apply sealant to the thermo sensor threads. Do not apply sealant to the sensor head.

Install and tighten the thermo sensor to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Connect the thermo sensor connector.

Refill the coolant (page 6-5).
Install the fuel tank (page 2-23).

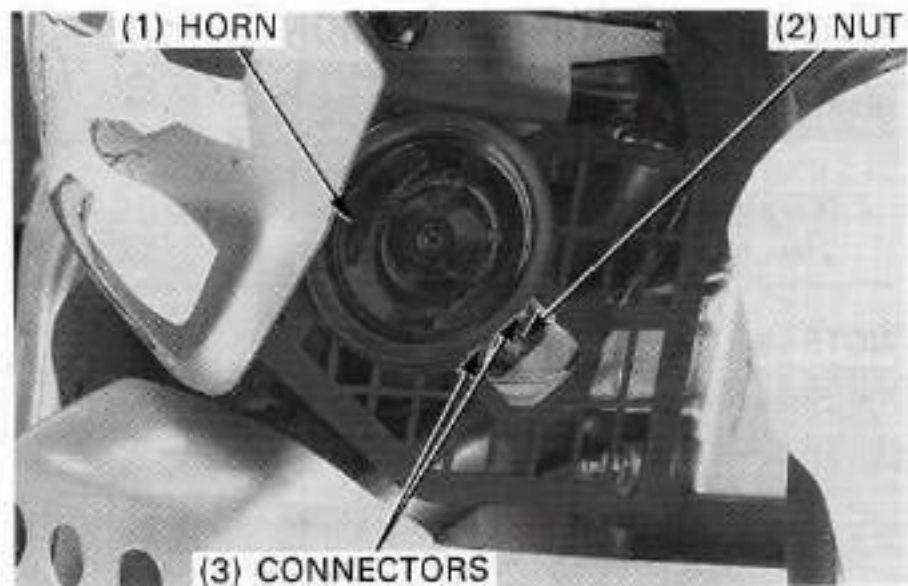


HORN

Remove the nut.
Disconnect the horn connectors and remove the horn.

Connect a 12 V battery to the horn terminals.

The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.



TURN SIGNAL RELAY

REMOVAL/INSTALLATION

Disconnect the turn signal relay 3P (black) connector.
Remove the turn signal relay.

Installation is in the reverse order of removal.

PERFORMANCE TEST

Remove the turn signal relay.
Check for turn signal circuit connection before testing.

Short the black and gray terminals of the turn signal relay connector with a jumper wire. Turn the ignition switch ON and check turn signal light by turning the switch ON.

If the light does not come on, check the turn signal switch or Open circuit in Black or Gray wire.

If the light comes on, check for continuity between Green terminal and body ground at the turn signal relay 3P (black) connector.

- No continuity: Open circuit in Green wire
- Continuity:
 - Loose or poor contact of the turn signal relay 3P (black) connector
 - Faulty turn signal relay

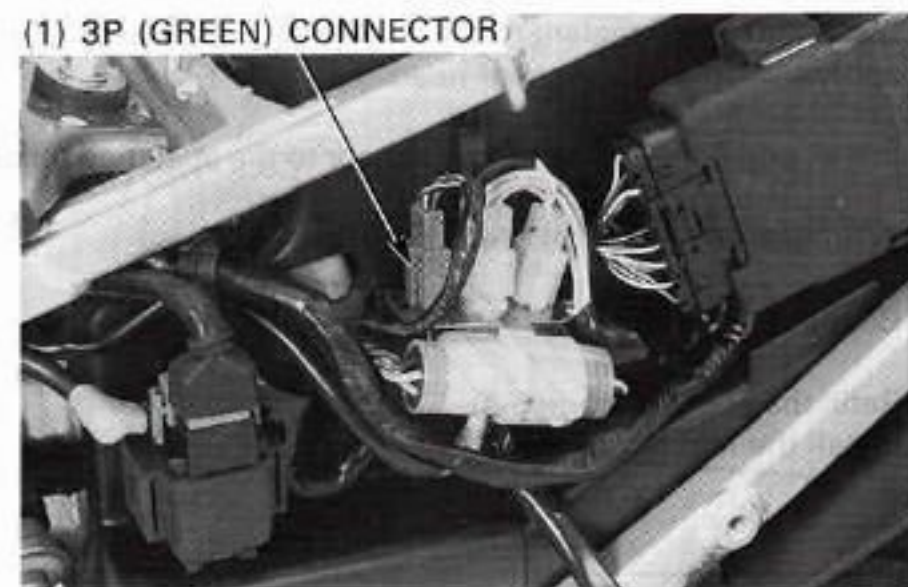


SIDE STAND

INSPECTION

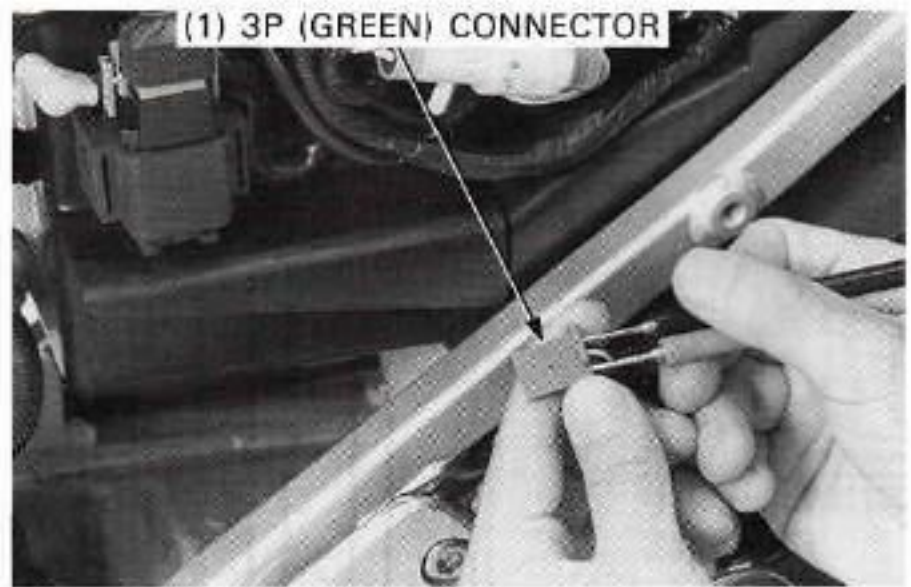
Remove the left side cover (page 2-7).

Disconnect the side stand 3P (green) connector.



Check for continuity between each of the terminals as below. There should be continuity between the ○—○ positions on the chart below.

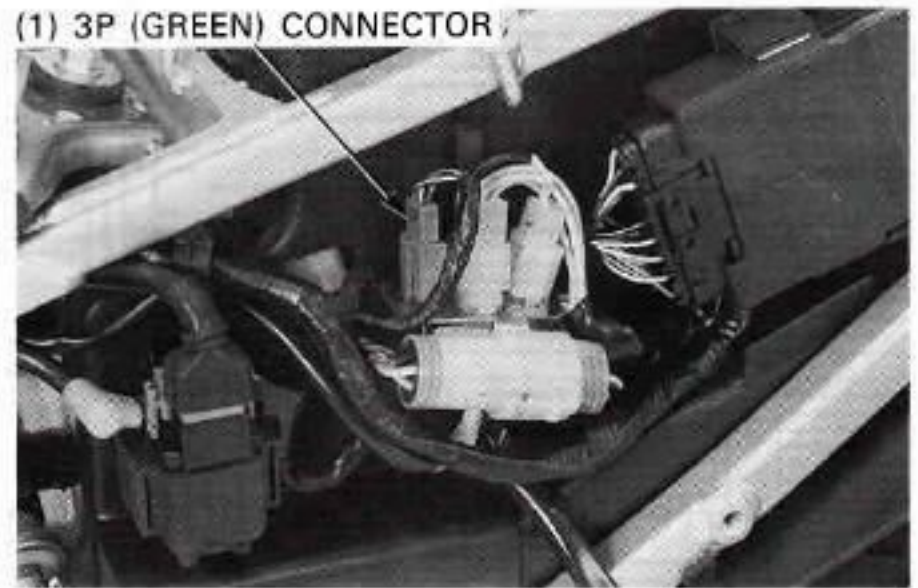
| | Green/White | Yellow/Black | Green |
|-----------------|-------------|--------------|-------|
| Side stand down | | ○—○ | ○ |
| Side stand up | ○—○ | | ○ |



REMOVAL/INSTALLATION

Remove the left side cover (page 2-7).

Disconnect the side stand 3P (green) connector.



Remove the side stand switch bolt and side stand switch.

Install the side stand switch.

NOTE

- At side stand switch installation, align the pin on the switch with the hole in the side stand.
- At side stand switch installation, align the groove on the switch with the pin on the side stand bracket.

Install and tighten the new side stand switch bolt to the specified torque.

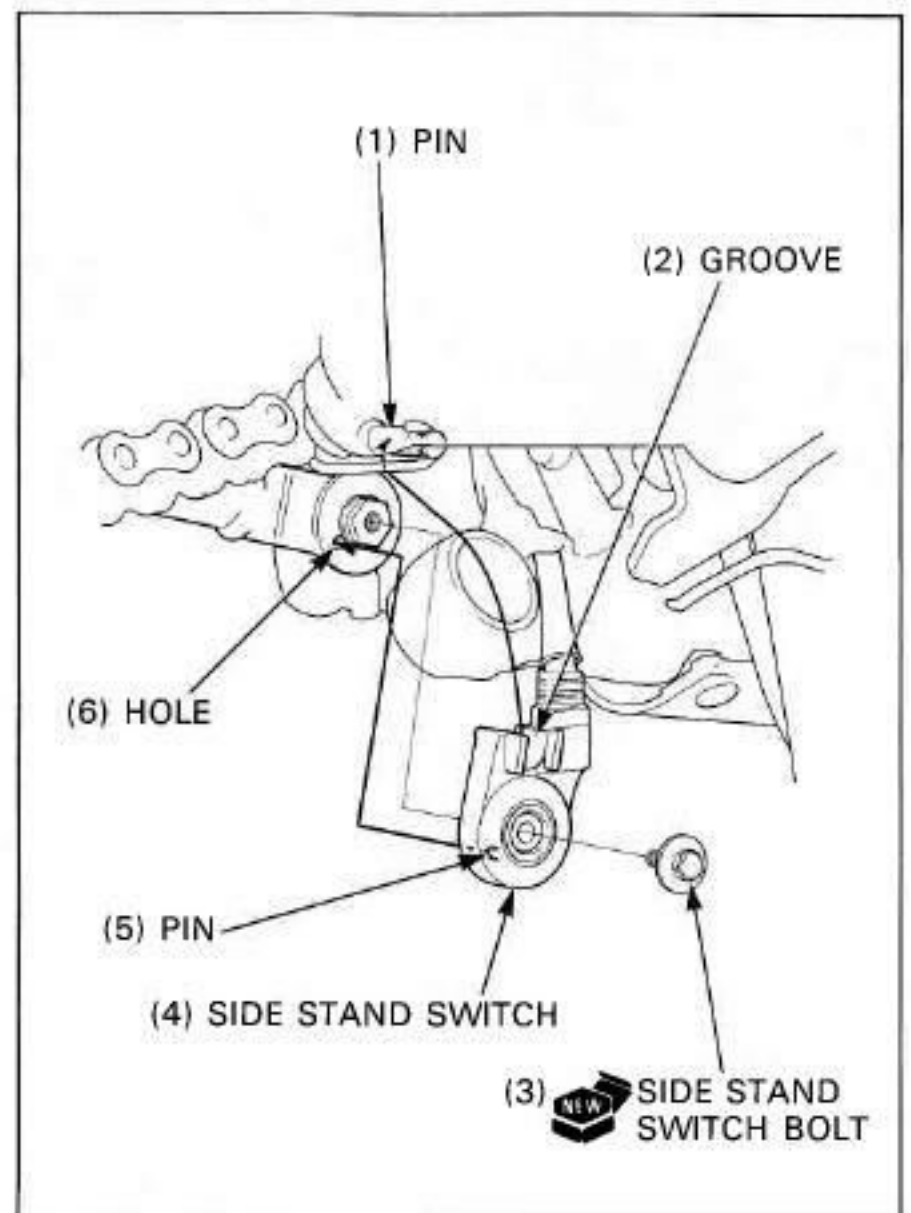
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

NOTE

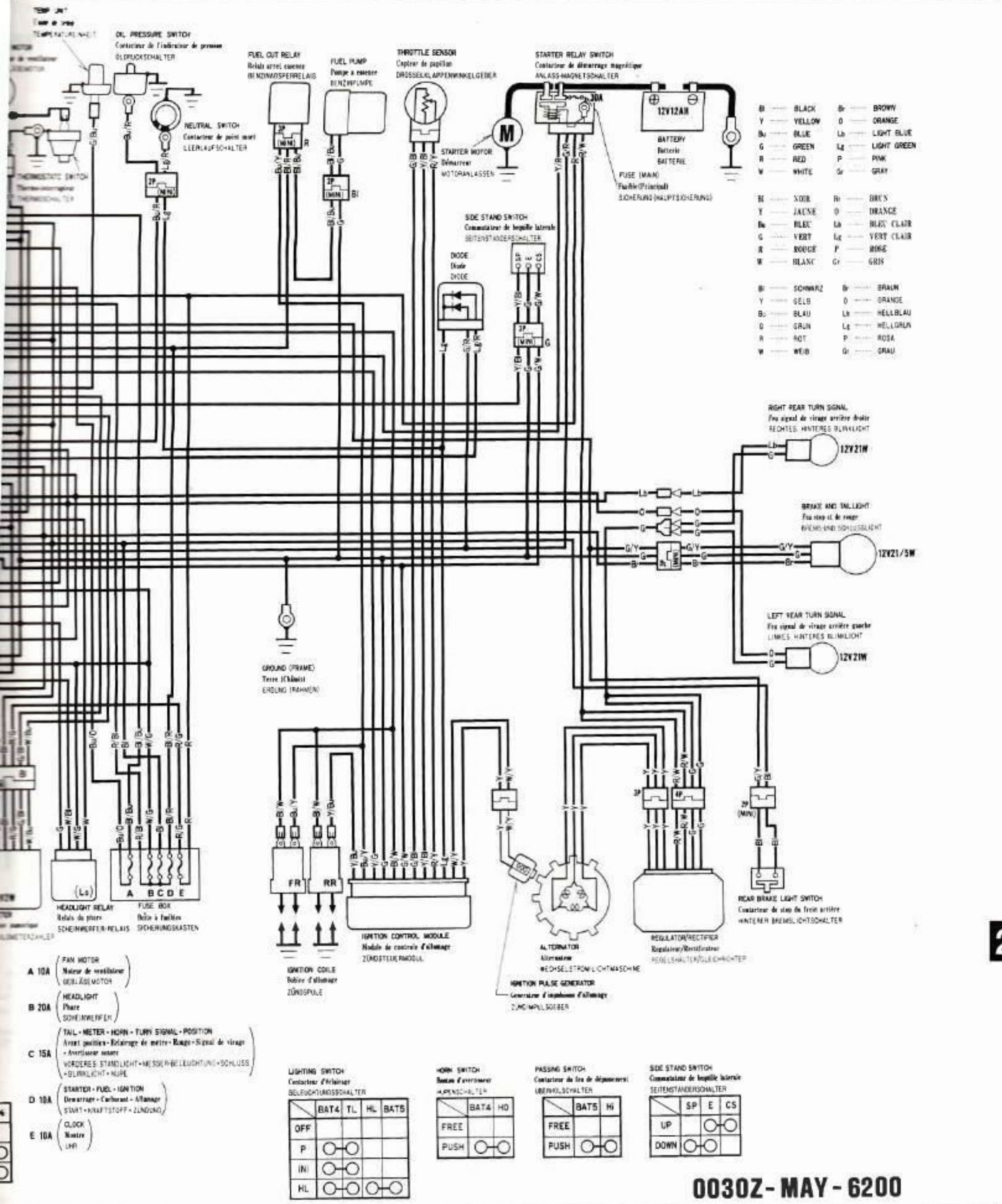
- Route the side stand switch wire properly (page 1-22).

Connect the side stand switch 3P (green) connector.

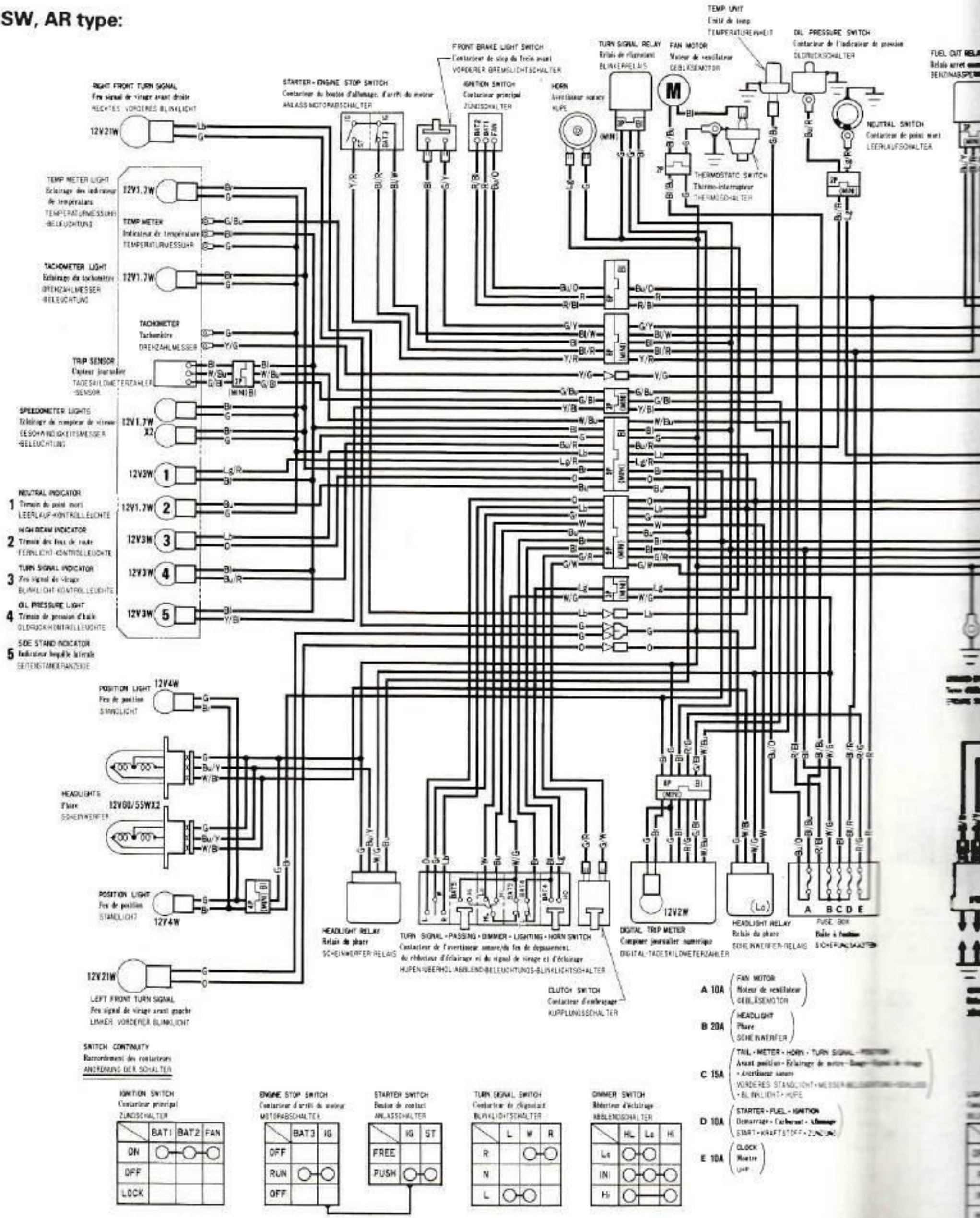
Install the left side cover (page 2-7).



20. WIRING DIAGRAMS

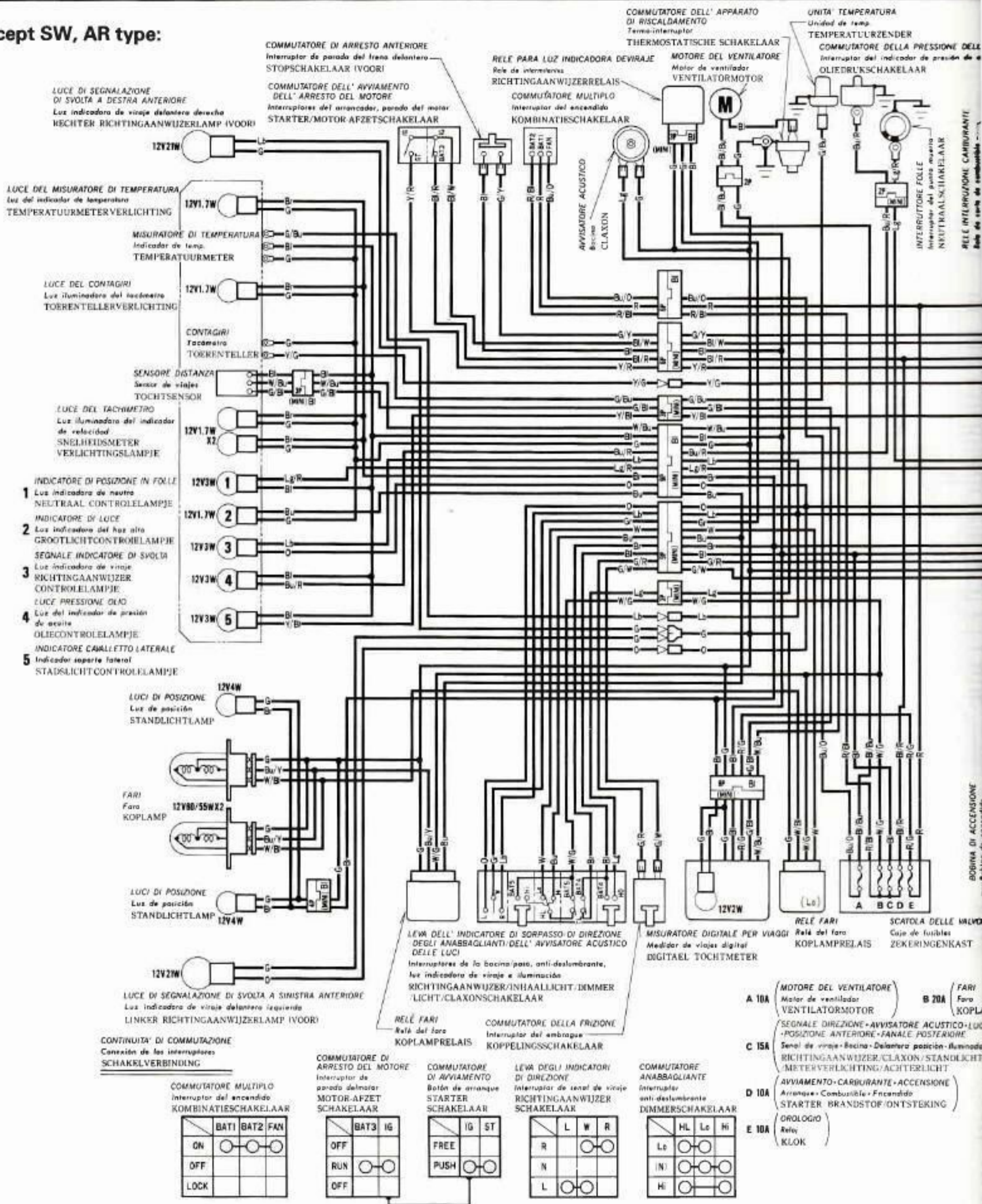


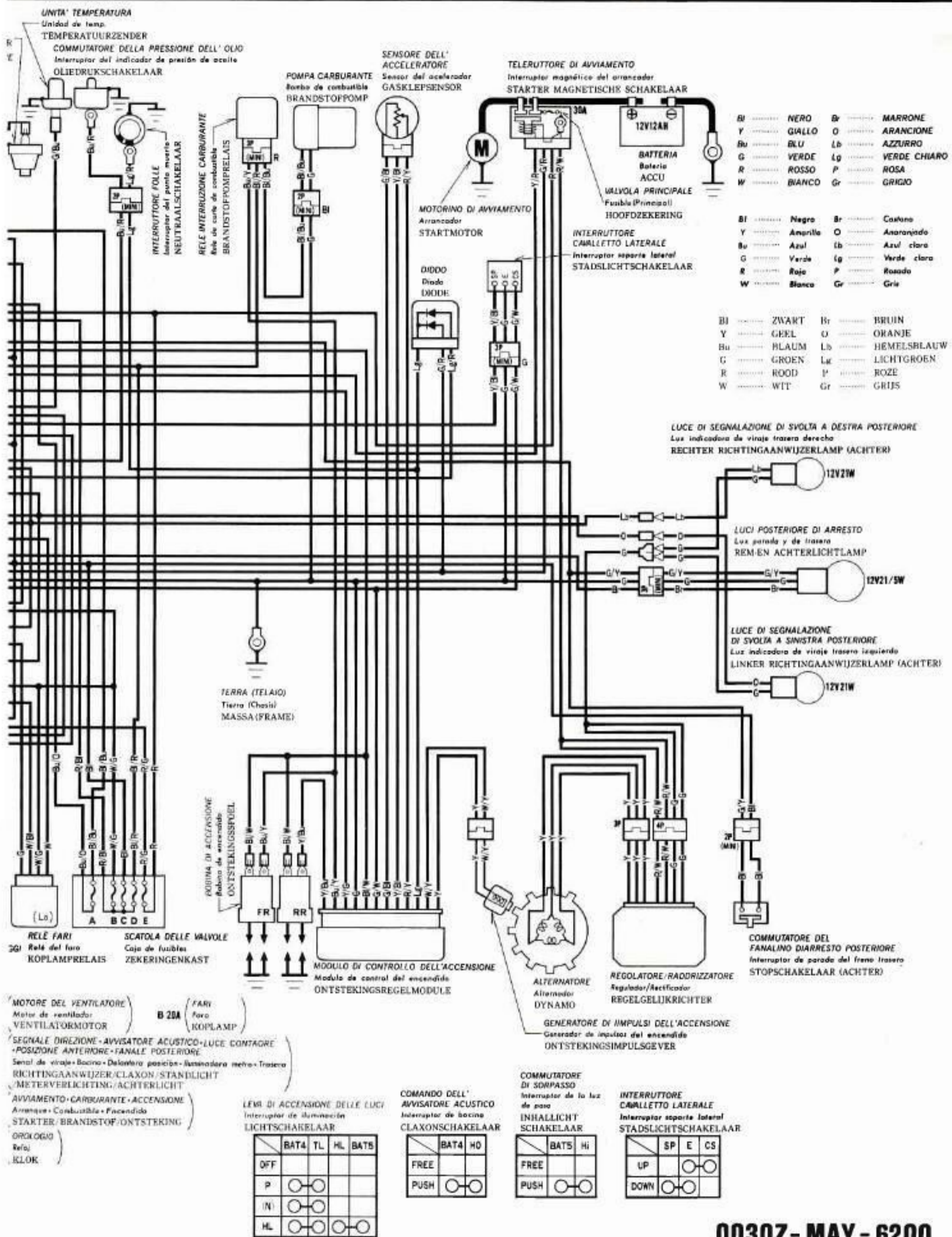
Except SW, AR type:

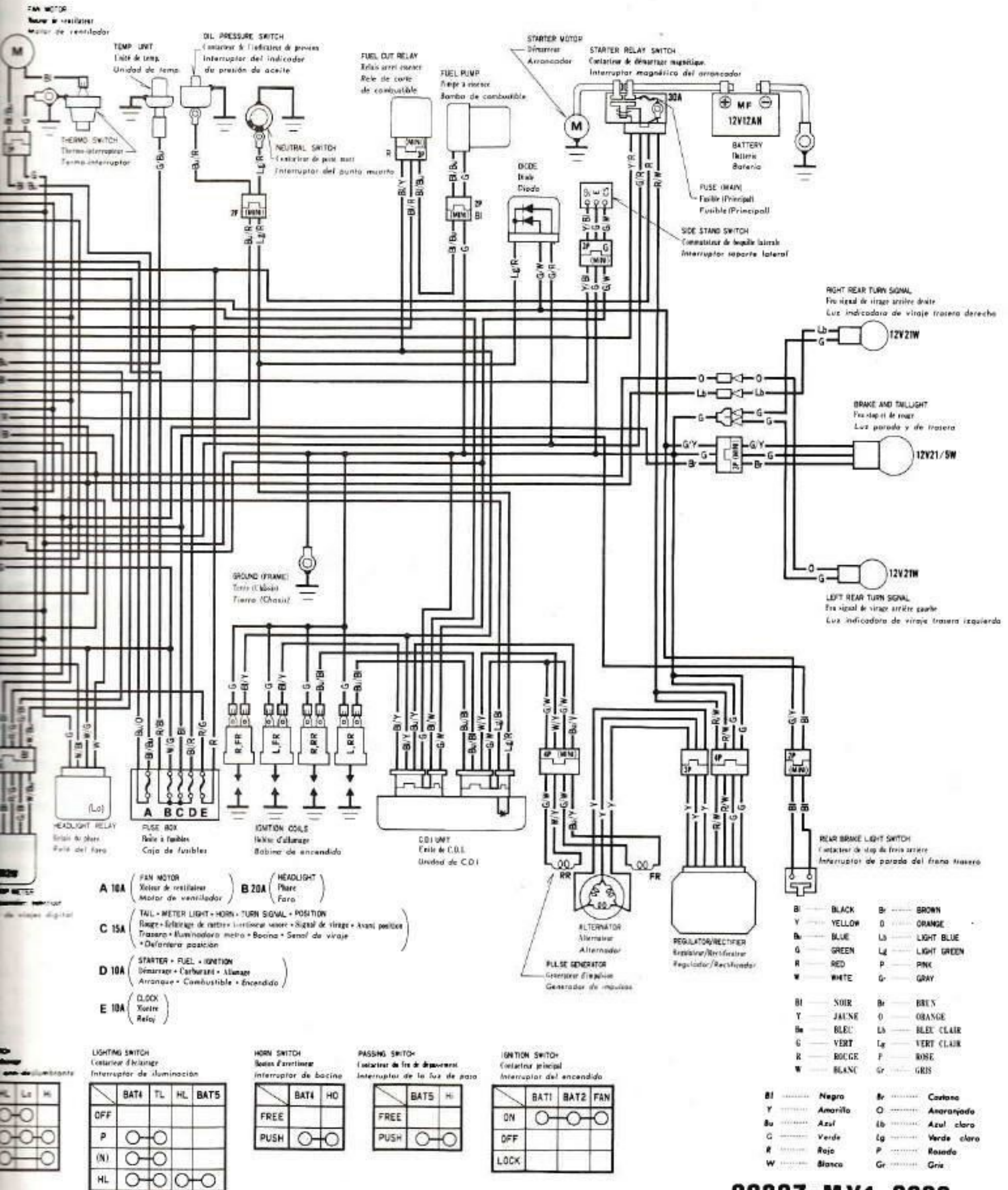


WIRING DIAGRAMS

Except SW, AR type:



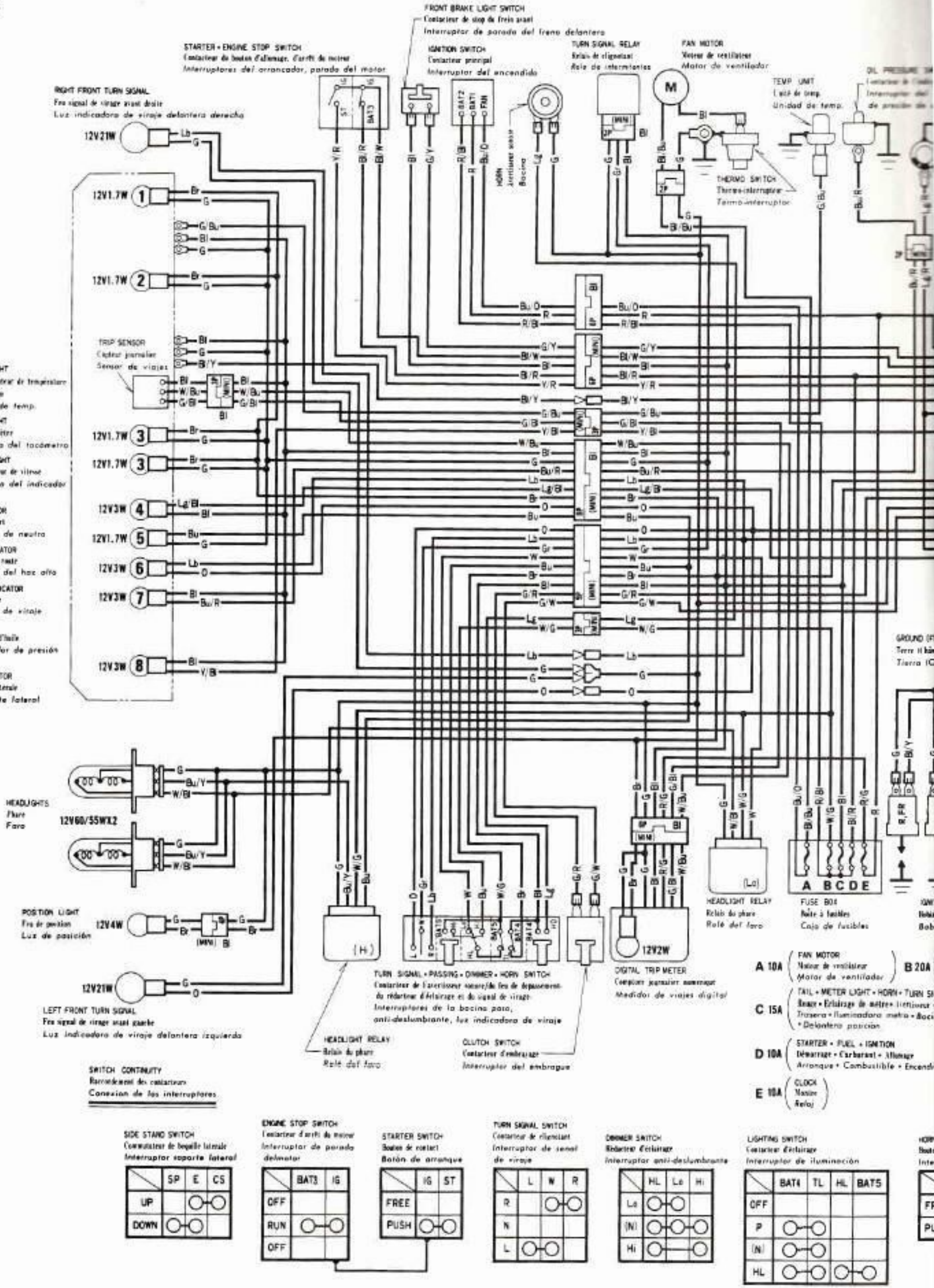




0030Z-MY1-6000

SW, AR type:

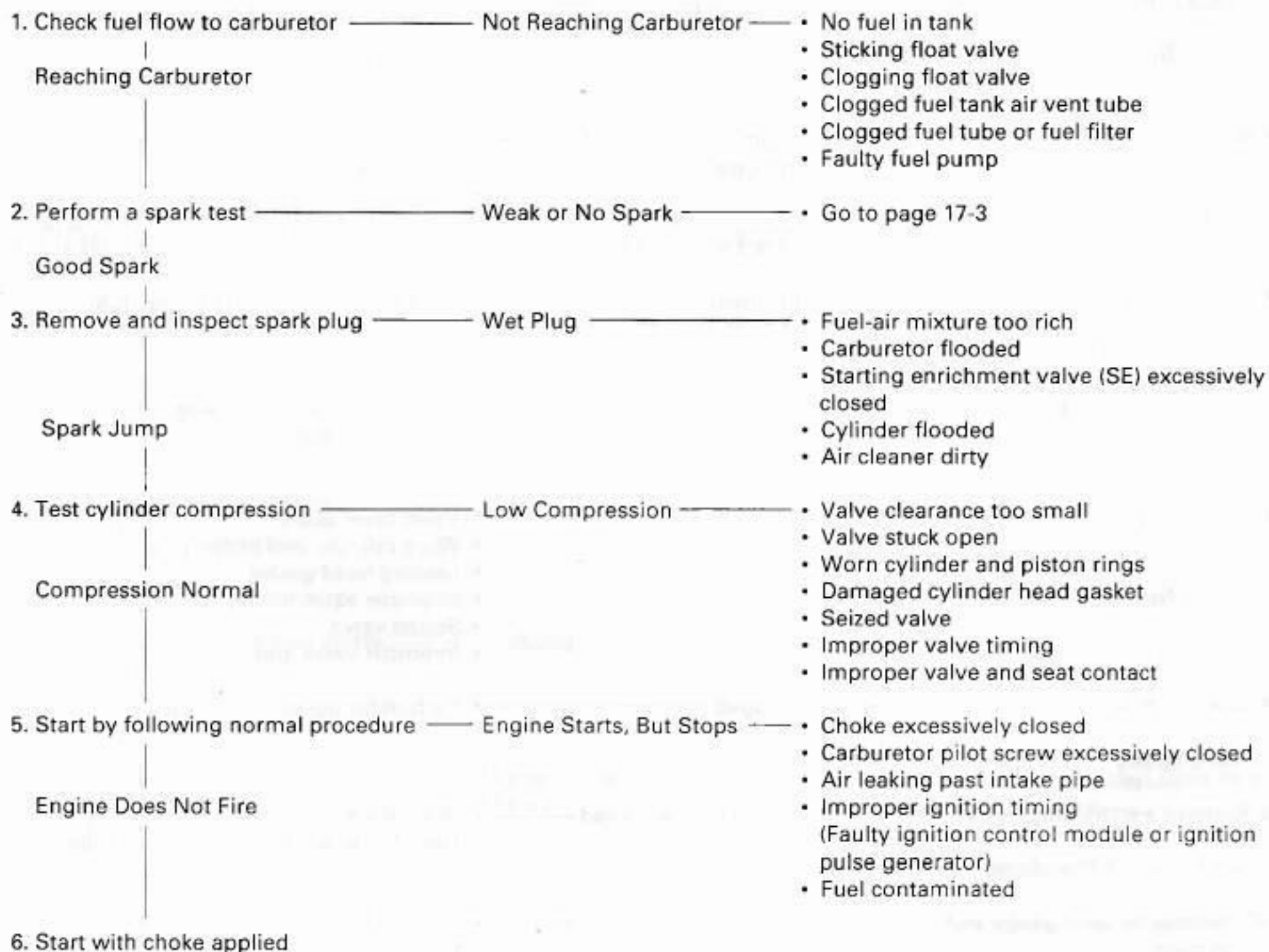
- 1 TEMP METER LIGHT
Éclairage de l'indicateur de température
Luz iluminadora del indicador de temp.
- 2 TACHOMETER LIGHT
Éclairage du tachémètre
Luz iluminadora del tacómetro
- 3 SPEEDOMETER LIGHT
Éclairage du compteur de vitesse
Luz iluminadora del indicador de velocidad
- 4 NEUTRAL INDICATOR
Témoin de point mort
Luz indicadora de neutro
- 5 HIGH BEAM INDICATOR
Témoin de feu de route
Luz indicadora del haz alto
- 6 TURN SIGNAL INDICATOR
Feu signal de virage
Luz indicadora de viraje
- 7 OIL INDICATOR
Témoin de pression d'huile
Luz del indicador de presión de aceite
- 8 SIDE STAND INDICATOR
Indicateur legalle latéral
Indicador soporte lateral



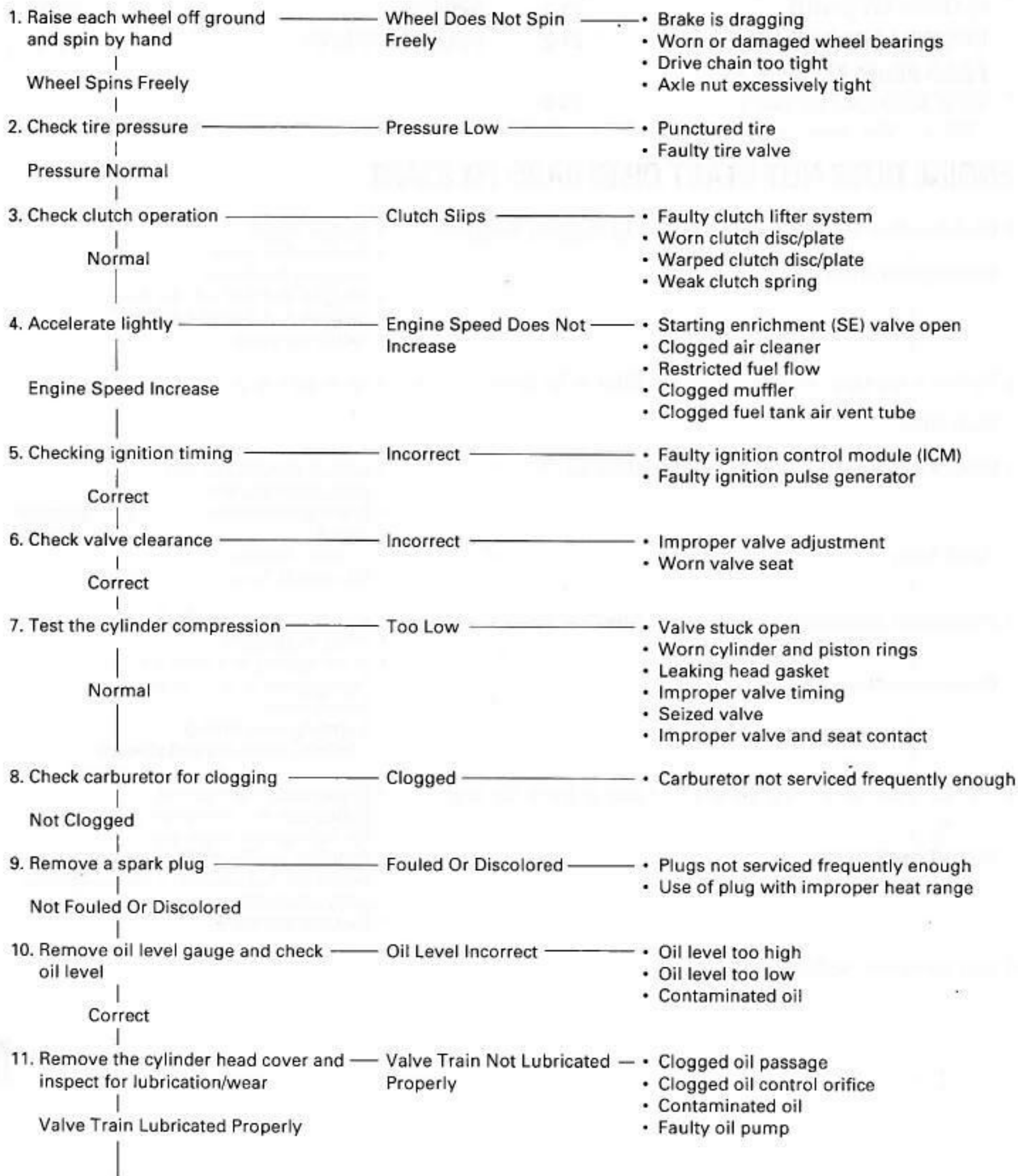
21. TROUBLESHOOTING

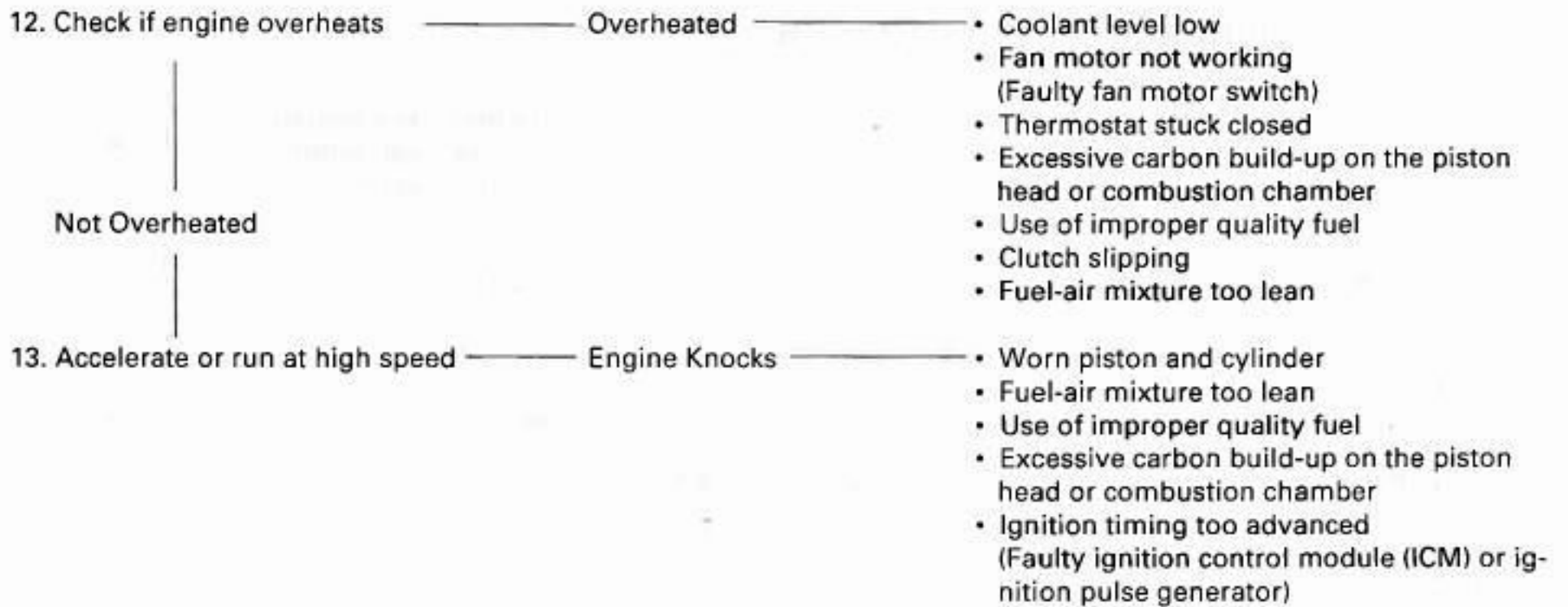
| | | | |
|---|------|---------------------------------|------|
| ENGINE DOES NOT START OR IS HARD TO START | 21-1 | POOR PERFORMANCE AT HIGH SPEEDS | 21-4 |
| ENGINE LACKS POWER | 21-2 | POOR HANDLING | 21-4 |
| POOR PERFORMANCE AT LOW AND IDLE SPEEDS | 21-3 | | |

ENGINE DOES NOT START OR IS HARD TO START

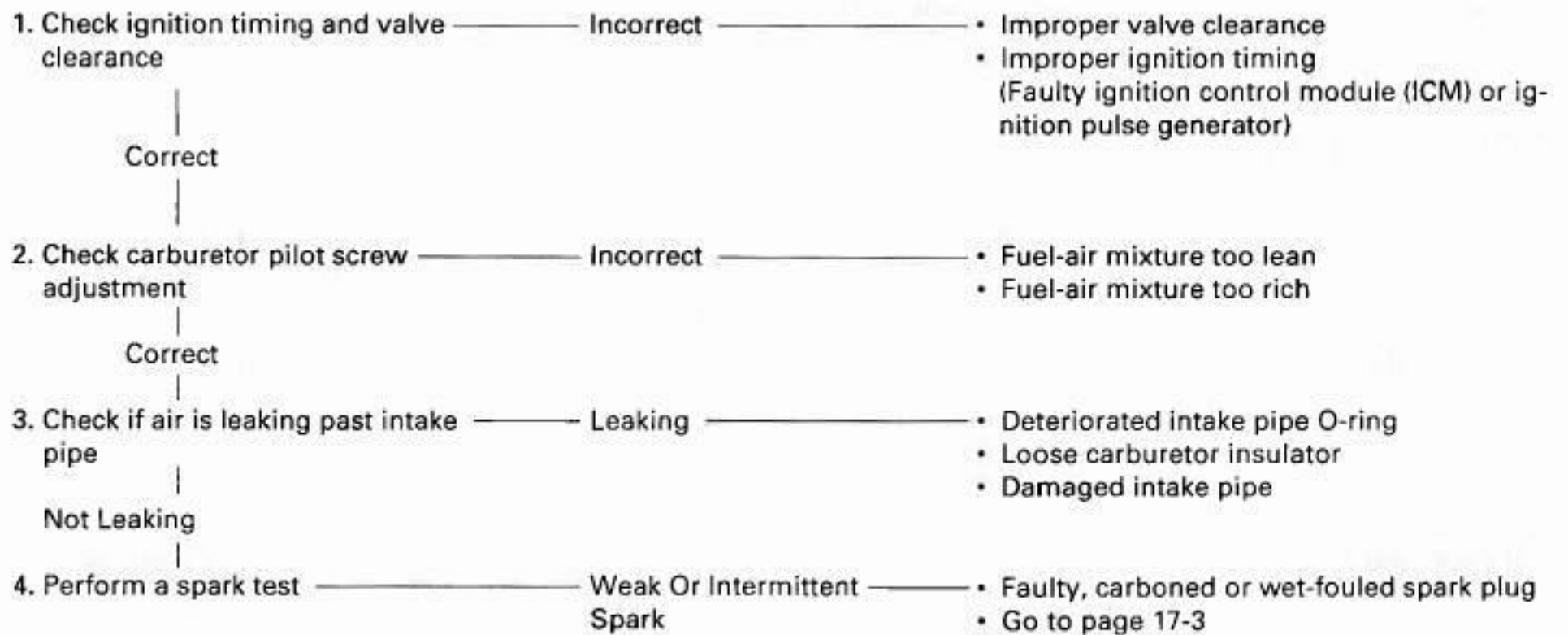


ENGINE LACKS POWER





POOR PERFORMANCE AT LOW AND IDLE SPEEDS



TROUBLESHOOTING

POOR PERFORMANCE AT HIGH SPEEDS

1. Check ignition timing and valve clearance ————— Incorrect —————
 - Improper valve clearance
 - Faulty ignition control module (ICM)
 - Faulty ignition pulse generator

Correct
2. Disconnect the fuel tube from the carburetor ————— Fuel Flow restricted —————
 - Lack of fuel in tank
 - Clogged fuel line
 - Clogged fuel tank air vent tube
 - Clogged fuel valve
 - Clogged fuel strainer

Fuel Flows Freely
3. Remove the carburetor and check for clogged jet (s) ————— Clogged —————
 - Clogged jet (s)

Not Clogged
4. Check valve timing ————— Incorrect —————
 - Cam sprocket not installed properly

Correct
5. Check valve spring ————— Damaged —————
 - Faulty valve spring

POOR HANDLING

1. If steering is heavy —————
 - Bearing top thread too tight
 - Damaged steering head bearing
 - Bent steering stem
2. If either wheel is wobbling —————
 - Excessive wheel bearing play
 - Bent rim
 - Improperly installed wheel hub or wheel
 - Damaged swingarm pivot bearing
 - Bent rim
3. If the vehicle pulls to one side —————
 - Front brake caliper dragging to one side
 - Front and rear wheels not aligned
 - Bent fork pipe (s)
 - Bent swingarm
 - Distorted frame

INDEX

| | | | |
|---|-------|---|-------|
| Air cleaner | 3-6 | Engine oil | 3-13 |
| Air cleaner housing | 5-4 | Engine oil filter | 3-14 |
| Air cut-off valve | 5-16 | Exhaust Pipe/Muffler | 2-12 |
| Air funnel | 5-15 | Fan motor switch | 19-21 |
| Battery | 16-5 | Float chamber | 5-12 |
| Brake fluid | 3-22 | Flywheel, starter clutch | 9-3 |
| Brake fluid replacement/air bleeding | 15-4 | Fork | 13-23 |
| Brake light switch | 3-24 | Fork cover and front fender | 2-4 |
| Brake pad/disc | 15-6 | Front brake caliper | 15-19 |
| Brake pad wear | 3-23 | Front brake light switch | 19-18 |
| Brake pipe | 15-36 | Front master cylinder | 15-11 |
| Brake system | 3-24 | Front wheel | 13-14 |
| Bulb replacement | 19-5 | Fuel filter | 5-27 |
| Cable & harness routing | 1-22 | Fuel line | 3-4 |
| Camshaft installation | 10-25 | Fuel pump | 5-24 |
| removal | 10-6 | Fuel tank | 2-20 |
| Carburetor body cleaning | 5-18 | Gearshift linkage | 8-13 |
| Carburetor choke | 3-5 | General safety | 1-1 |
| Carburetor combination | 5-19 | Handlebar | 13-3 |
| disassembly/assembly | 5-8 | Handlebar switch | 19-19 |
| installation | 5-21 | Headlight | 19-7 |
| separation | 5-7 | Headlight aim | 3-25 |
| removal | 5-5 | Horn | 19-24 |
| Carburetor synchronization | 3-15 | Ignition coil | 17-11 |
| Charging system inspection | 16-6 | Ignition pulse generator | 17-10 |
| Clutch diode | 18-16 | Ignition switch inspection | 19-20 |
| Clutch installation | 8-15 | Ignition system inspection | 17-5 |
| Clutch switch | 19-19 | Ignition timing | 17-14 |
| Clutch system | 3-26 | Lubrication & seal points | 1-19 |
| Clutch removal | 8-6 | Maintenance schedule | 3-3 |
| Combination meter | 19-8 | Model identification | 1-3 |
| Coolant | 6-5 | Neutral switch | 19-18 |
| Cooling system | 3-17 | Nuts, bolts, fasteners | 3-28 |
| Cooling system connecting band | 6-25 | Oil cooler | 4-11 |
| Coolant temperature, thermo sensor inspection | 19-22 | Oil distributor | 4-17 |
| Crankcase assembly | 12-23 | Oil pressure check | 4-3 |
| Crankcase bearing replacement | 12-21 | Oil pressure switch inspection | 19-16 |
| Crankcase separation | 12-4 | Oil pump | 4-4 |
| Crankcase stud bolt inspection | 11-8 | Pilot screw adjustment | 5-23 |
| Crankshaft/connecting rod | 12-6 | Piston installation | 11-8 |
| Cylinder compression | 10-4 | removal | 11-5 |
| Cylinder head cover installation | 10-32 | Poor handling | 21-4 |
| removal | 10-5 | Poor performance at high speeds | 21-4 |
| Cylinder head assembly | 10-21 | Poor performance at low and idle speeds | 21-3 |
| disassembly | 10-14 | Primary drive gear | 8-11 |
| installation | 10-22 | Radiator coolant | 3-17 |
| removal | 10-13 | Radiator/cooling fan | 6-11 |
| Cylinder installation | 11-10 | Radiator reserve tank | 6-24 |
| removal | 11-3 | Rear carrier and rear fender | 2-8 |
| Digital trip meter | 19-14 | Rear brake caliper | 15-32 |
| Drive chain | 3-18 | Rear brake light switch | 19-19 |
| Drive chain slider | 3-22 | Rear master cylinder/brake pedal | 15-24 |
| Drive sprocket installation | 7-14 | Rear wheel | 14-4 |
| removal | 7-3 | Regulator/rectifier | 16-8 |
| Engine does not start or hard to start | 21-1 | Right crankcase cover installation | 8-18 |
| Engine idle speed | 3-16 | removal | 8-6 |
| Engine installation | 7-14 | Seat and side cover | 2-7 |
| removal | 7-4 | Service information | |
| Engine lacks power | 21-2 | (Alternator/starter clutch) | 9-1 |

| | | | |
|--|-------|--------------------------------------|-------|
| (Battery/charging system) | 16-1 | (Ignition system) | 17-3 |
| (Clutch/gearshift linkage) | 8-1 | (Lubrication system) | 4-2 |
| (Cooling system) | 6-1 | (Lights/meters/switches) | 19-3 |
| (Crankshaft/transmission) | 12-2 | (Rear wheel/suspension) | 14-3 |
| (Cylinder head/valves) | 10-1 | Tools | 1-17 |
| (Cylinder/piston) | 11-1 | Torque values | 1-14 |
| (Engine removal/installation) | 7-1 | Turn signal relay | 19-24 |
| (Electric starter) | 18-0 | Vacuum chamber | 5-9 |
| (Frame/body panels/exhaust system) | 2-1 | Valve clearance | 3-9 |
| (Front wheel/suspension/steering) | 13-1 | Valve guide replacement | 10-17 |
| (Fuel system) | 5-1 | Valve seat inspection/refacing | 10-18 |
| (Hydraulic brake) | 15-2 | Water pump | 6-21 |
| (Ignition system) | 17-2 | Wheels/tires | 3-28 |
| (Lights/meters/switches) | 19-1 | Windshield screen | 2-2 |
| (Lubrication system) | 4-1 | Wiring diagram | 20-1 |
| (Maintenance) | 3-1 | | |
| (Rear wheel/suspension) | 14-1 | | |
| Service rules | 1-2 | | |
| Shock absorber | 14-13 | | |
| Side and upper cowl | 2-2 | | |
| Side stand | 3-26 | | |
| Side stand switch | 19-24 | | |
| Spark plug | 3-7 | | |
| Specifications | 1-4 | | |
| Starter motor | 18-4 | | |
| Starter relay switch | 18-14 | | |
| Stator installation | 9-9 | | |
| removal | 9-2 | | |
| Steering head bearings | 3-29 | | |
| Steering stem | 13-34 | | |
| Stone guard and skid plate | 2-5 | | |
| Suspension | 3-27 | | |
| Suspension linkage | 14-16 | | |
| Swingarm | 14-20 | | |
| System diagram | | | |
| (Battery/charging system) | 16-0 | | |
| (Electric starter) | 18-0 | | |
| (Ignition system) | 17-0 | | |
| (Lights/meters/ switches) | 19-0 | | |
| System flow pattern | 6-3 | | |
| System testing | 6-4 | | |
| Tachometer inspection | 19-13 | | |
| Thermostat | 6-7 | | |
| Throttle operation | 3-4 | | |
| Throttle sensor inspection (Except SW, AR type) | 17-12 | | |
| Throttle sensor (Except SW, AR type) | 5-17 | | |
| Transmission | 12-14 | | |
| Troubleshooting | | | |
| (Alternator/starter clutch) | 9-1 | | |
| (Battery/charging system) | 16-3 | | |
| (Clutch/gearshift linkage) | 8-2 | | |
| (Cooling system) | 6-2 | | |
| (Crankshaft/transmission) | 12-3 | | |
| (Cylinder head/valves) | 10-2 | | |
| (Cylinder/piston) | 11-2 | | |
| (Electric starter) | 18-2 | | |
| (Frame/body panels/exhaust system) | 2-1 | | |
| (Front wheel/suspension/steering) | 13-2 | | |
| (Fuel system) | 5-2 | | |
| (Hydraulic brake) | 15-3 | | |



HONDA

HONDA

