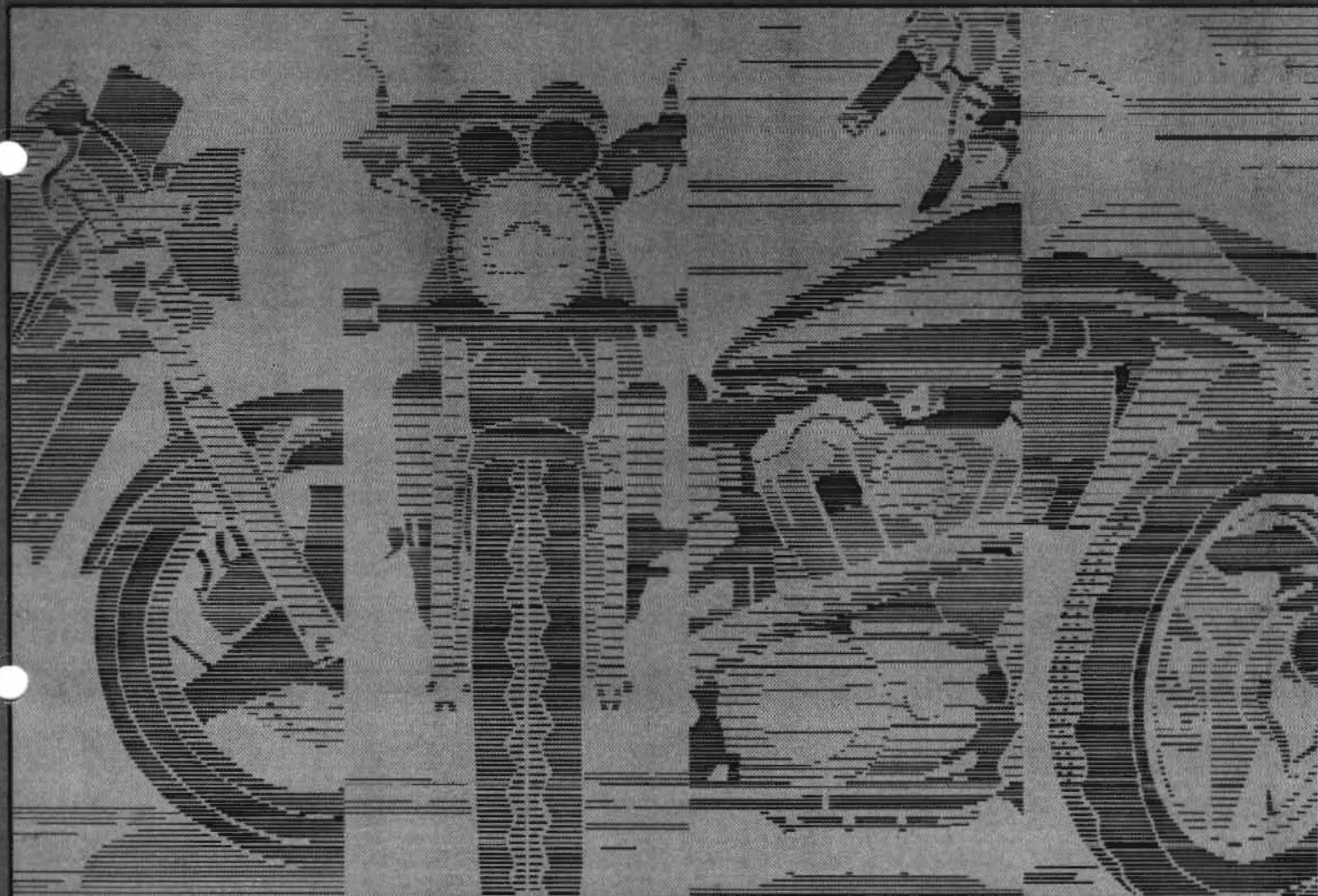


# HONDA

## SERVICE MANUAL



**89**  
**CB400F**  
**CB-1**

## INTRODUCTION

This service manual describes the service procedures for the CB400F.

This Model Specific Manual includes every service procedure that is of a specific nature to this particular model. Basic service procedures that are common to other Honda Motorcycles/Motor Scooters Common Service Manual. This Model Specific Service Manual should be used together with the Common Service Manual in order to provide complete service information on all aspects of this motorcycle.

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

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.

While section 4 through 18 describe parts of the motorcycle, grouped according to locations.

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

Most sections describe the service procedure through a system illustration. Refer to the next page for details on how to use this manual.

If you don't know the source of the trouble, go to section 19, TROUBLESHOOTING.

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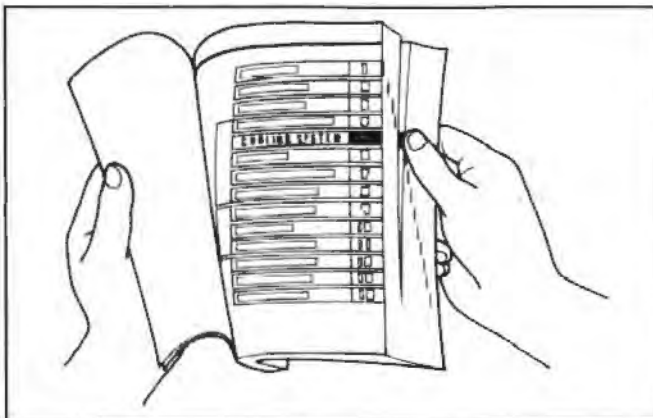
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# HOW TO USE THIS MANUAL

## FINDING INFORMATION YOU NEED

- This manual is divided into sections which cover each of the major components of the motorcycle. To quickly find the section you are interested in, the first page of each section is marked with a black tab that lines up with one of the thumb index tabs before this page. The first page of each section lists the table of contents within the section. Read the service information and troubleshooting related to the section before you begin working.
- An index of the entire book is provided in the last chapter to directly locate the information you need.



## NOTE ON THE EXPLANATION METHOD OF THIS MANUAL















- The removal and installation of parts are for the most part illustrated by large and clear illustrations that should provide the reader with visual aid in understanding the major point for servicing.
- The system illustrations are augmented by callouts whose numbers or letters indicate the order in which the parts should be removed or installed.
- The sequence of steps represented numerically are differentiated from the ones represented alphabetically to notify the reader that they must perform these steps separately.
- For example, if the steps prior and up to camshaft removal are performed with the engine installed, but the subsequent steps like cylinder head removal require engine removal, the callouts are grouped in numerical and alphabetical orders.
- The illustrations may contain symbol marks to indicate necessary service procedures and precautions that need to be taken. Refer to the next page for the meaning of each symbol mark.
- Also in the illustration is a chart that lists information such as the order in which the part is removed/installed, the name of the part, and some extra notes that may be needed.
- Step by step instructions are provided to supplement the illustrations when detailed explanation of the procedure is necessary or illustrations alone would not suffice.
- Service procedures required before or after the procedure described on that particular page, or inspection/adjustment procedures required following the installation of parts, are described under the title Requisite Service.
- Standard workshop procedures and knowledge covered in the Common Service Manual are abbreviated in this manual.

| Symbol mark   | System illustration  | Detailed description of the procedure  |
|---|--|--|
| <p><b>Symbol mark</b></p> <p><b>Step sequence (numerals or alphabets)</b></p> | <p><b>System illustration</b></p> <p><b>CYLINDER HEAD REMOVAL/INSTALLATION</b></p> <p><b>REQUISITE SERVICE</b></p> <p>Remove the timing chain (page 8-7).</p> <p><b>REMOVAL ORDER</b></p> <ol style="list-style-type: none"> <li>Cylinder head support bar</li> <li>Cylinder head mounting bolt</li> <li>Cylinder head</li> <li>Washer</li> <li>Washer</li> <li>Washer</li> <li>Washer</li> <li>Washer</li> <li>Washer</li> <li>Washer</li> <li>Washer</li> </ol> <p><b>REMARKS</b></p> <p>1) Tighten the timing chain (page 8-7).</p> <p>2) Tighten the timing chain (page 8-7).</p> <p>3) Tighten the timing chain (page 8-7).</p> <p>4) Tighten the timing chain (page 8-7).</p> <p>5) Tighten the timing chain (page 8-7).</p> <p>6) Tighten the timing chain (page 8-7).</p> <p>7) Tighten the timing chain (page 8-7).</p> <p>8) Tighten the timing chain (page 8-7).</p> <p>9) Tighten the timing chain (page 8-7).</p> <p>10) Tighten the timing chain (page 8-7).</p> <p>11) Tighten the timing chain (page 8-7).</p> | <p><b>Detailed description of the procedure</b></p> <p><b>CAMSHAFT IDLE GEAR CASE INSTALLATION</b></p> <p>Insert the camshaft idle gear case (mark and project).</p> <p><b>NOTE</b></p> <p>Remove the camshaft idle gear case (mark and project).</p> <p>While rotating the idle gear lightly, set the gap each side. The gear case should be fitted so slightly than the cylinder.</p> <p>Insert a new timing adjuster and mounting bolt. Tighten them to a specified torque.</p> <p><b>CYLINDER HEAD MOUNTING INSTALLATION</b></p> <p>Insert the cylinder head mounting bolt as shown. Do not tighten more yet.</p> <p>Insert the cylinder head mounting bolts. Tighten the cylinder head mounting bolts to a specified torque.</p> <p><b>REMARKS</b></p> <p>1) Tighten the timing chain (page 8-7).</p> <p>2) Tighten the timing chain (page 8-7).</p> <p>3) Tighten the timing chain (page 8-7).</p> <p>4) Tighten the timing chain (page 8-7).</p> <p>5) Tighten the timing chain (page 8-7).</p> <p>6) Tighten the timing chain (page 8-7).</p> <p>7) Tighten the timing chain (page 8-7).</p> <p>8) Tighten the timing chain (page 8-7).</p> <p>9) Tighten the timing chain (page 8-7).</p> <p>10) Tighten the timing chain (page 8-7).</p> <p>11) Tighten the timing chain (page 8-7).</p> |
| <p><b>Part name</b></p>   | <p><b>Number of parts</b></p>  | <p><b>Extra notes or precaution related to the service procedure</b></p>   |



## 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 of the symbols.

|  |  |
|--|--|
|                   | Replace the part(s) with new one(s) before assembly.   |
|                   | Use special tool   |
|                   | Use optional tool. These tools are obtained as you order parts.  |
| <br>10 (1.0, 7.2) | Torque specification. 10 N·m (1.0 kg·m, 7.2 ft·lb)   |
|                   | Use recommended engine oil, unless otherwise specified.  |
|                   | Use molybdenum oil solution (mixture of the engine oil and molybdenum grease with the ratio 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)<br>Example: Molykote® BF-2 plus manufactured by Dow Corning, U.S.A.<br>Multi-purpose M-2 manufactured by Mitsubishi Oil Japan  |
|                 | Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent)<br>Example: Molykote® G-n Paste manufactured by Dow Corning, U.S.A.<br>Honda Moly 45 (U.S.A. only)<br>Rocol ASP manufactured by Rocol Limited, U.K.<br>Rocol Paste manufactured by Sumico Lubricant, Japan |
|                 | Use silicone grease  |
|                 | Apply a locking agent. Use the agent of the middle strength, unless otherwise specified.   |
|                 | Apply sealant  |
|                 | Use brake fluid, DOT 3 or DOT 4. Use the recommended brake fluid, unless otherwise specified.  |
|                 | Use Fork or Suspension Fluid.  |



# 1. GENERAL INFORMATION

1

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## 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 from 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 (or transmission oil in two-strokes) 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. Use an OSHA-approved vacuum cleaner or alternate method approved by OSHA, designed to minimize the hazard caused by airborne asbestos fibers.

#### ⚠ 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 OF CHILDREN.

## GENERAL INFORMATION

### Coolant

Under some conditions, the ethylene glycol in engine coolant is combustible and its flame is not visible. If the ethylene glycol does 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.**
- Do not remove the radiator cap when the engine is hot. The coolant is under pressure and could scald you.
- Keep hands and clothing away from the cooling fan, as it starts automatically.

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, always store coolant in a safe place, away from the reach of children.

### Nitrogen Pressure

For shock absorbers 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. Dispose of the oil in a manner acceptable to the Environmental Protection Agency (EPA).

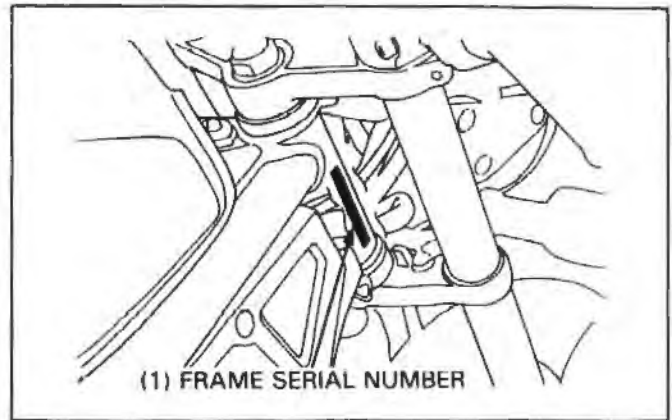
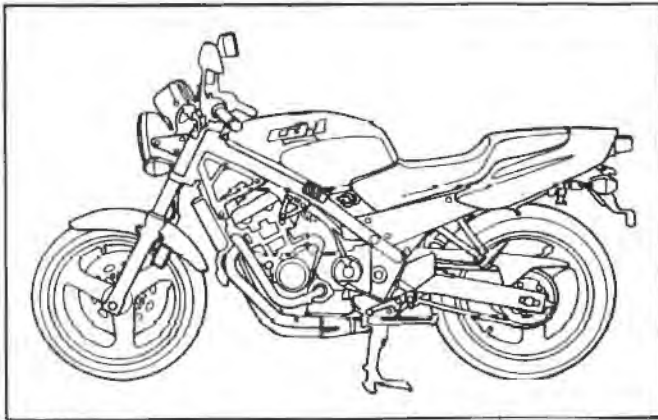
Before disposal of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve stem from the shock absorber.

### Battery Hydrogen Gas & Electrolyte

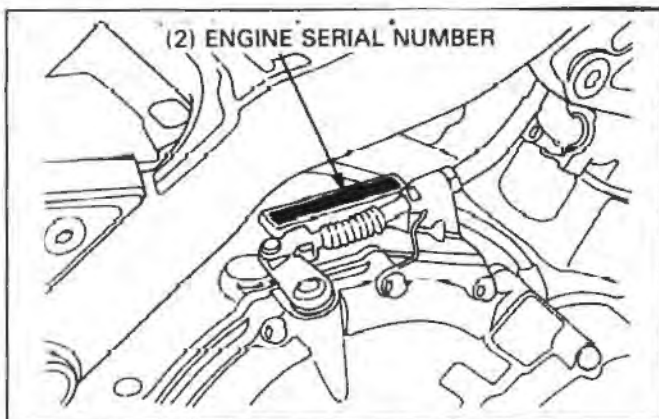
#### ▲ WARNING

- 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 a 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.
- 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.**

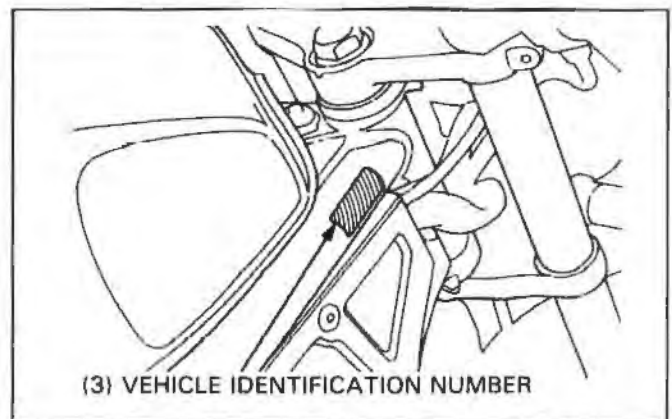
## MODEL IDENTIFICATION



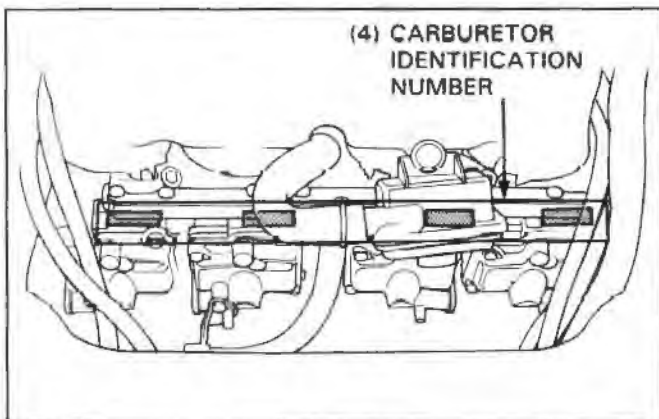
The frame serial number is stamped on the right side of the steering head.



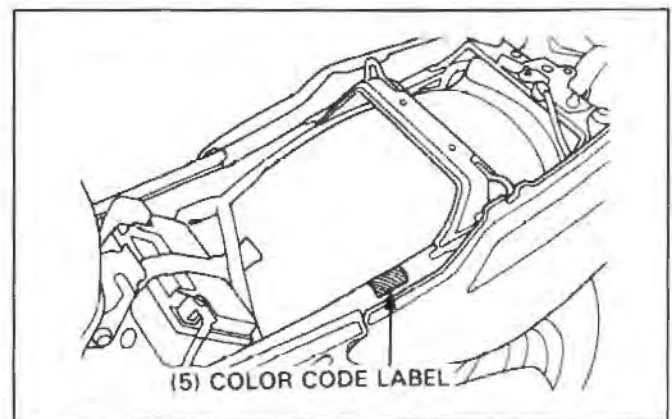
The engine serial number is stamped on the right side of the crankcase.



The Vehicle Identification Number (VIN) is located on the safety certification label on the right side of the frame tube.



The carburetor identification number is on the rear side of each carburetor.

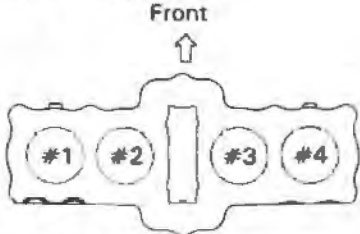


The color code label is attached on the left frame tube under the seat. When ordering a color coded part, always specify its designated color code.



## GENERAL INFORMATION

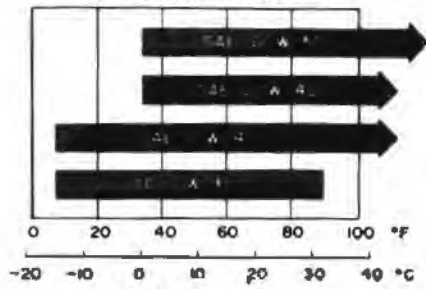
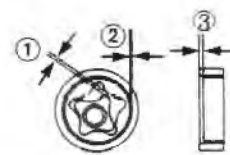
## SPECIFICATIONS

| General                    |  |   |
|----------------------------|--|---|
|                            | ITEM   | SPECIFICATIONS                          |
| DIMENSIONS                 | Overall length   | 2,035 mm (80.1 in)                      |
|                            | Overall width  | 705 mm (27.8 in)                        |
|                            | Overall height   | 1,025 mm (40.4 in)                      |
|                            | Wheel base   | 1,370 mm (53.9 in)                      |
|                            | Seat height  | 775 mm (30.5 in)                        |
|                            | Foot peg height  | 335 mm (13.2 in)                        |
|                            | Ground clearance   | 130 mm (5.1 in)                         |
|                            | Dry weight   | 170 kg (375 lbs)                        |
|                            | Curb weight  | 183 kg (403 lbs)                        |
|                            | Maximum weight capacity  | 157 kg (347 lbs)                        |
| FRAME                      | Frame type   | Diamond                                 |
|                            | Front suspension   | Telescopic fork                         |
|                            | Front wheel travel   | 130 mm (5.1 in)                         |
|                            | Rear suspension  | Swingarm                                |
|                            | Rear wheel travel  | 110 mm (4.3 in)                         |
|                            | Rear damper  | Gas-filled damper                       |
|                            | Front tire size  | 110/70-17 54H                           |
|                            | Rear tire size   | 140/70-17 66H                           |
|                            | Tire brand (Bridgestone) Front/Rear  | G547/G548                               |
|                            | Tire brand (Dunlop) Front/Rear   | K505F/K505                              |
|                            | Tire brand (Yokohama) Front/Rear   | —                                       |
|                            | Tire brand (IRC) Front/Rear  | —                                       |
|                            | Front brake  | Hydraulic disc brake                    |
|                            | Rear brake   | Hydraulic disc brake                    |
|                            | Caster angle   | 25°30'                                  |
| Trail length               | 99 mm (3.9 in)   |   |
| Fuel tank capacity         | 11.5 lit (3.04 US gal, 2.53 imp gal)   |   |
| Fuel tank reserve capacity | 3.5 lit (0.92 US gal, 0.77 imp gal)  |   |
| ENGINE                     | Bore and stroke  | 55.0 x 42.0 mm (2.17 x 1.65 in)         |
|                            | Displacement   | 399 cm <sup>3</sup> (24.3 cu in)        |
|                            | Compression ratio  | 11.6 : 1                                |
|                            | Valve train  | Gear driven DOHC, 4 valves per cylinder |
|                            | Intake valve opens at 1 mm lift  | 5° ATDC                                 |
|                            | Intake valve close at 1 mm lift  | 33° ABDC                                |
|                            | Exhaust valve opens at 1 mm lift   | 33° BBDC, 38° BBDC (California)         |
|                            | Exhaust valve close at 1 mm lift   | 5° BTDC, 10° BTDC (California)          |
|                            | Lubrication system   | Forced pressure and wet sump            |
|                            | Oil pump type  | Trochoid-type                           |
|                            | Cooling system   | Liquid cooling system with cooling fan  |
|                            | Air filtration   | Paper filter                            |
|                            | Crankshaft type  | Unit-type, 6 main journals              |
|                            | Engine weight (dry)  | 57 kg (126 lbs)                         |
| Firing order               | 1-2-4-3  |   |
| Cylinder arrangement       | Vertical 30° in line four  |   |
|                            | <p style="text-align: center;">Front<br/>↑</p>  |   |

| General (Cont'd) |   |  |
|------------------|---|--|
|                  | ITEM  | SPECIFICATIONS   |
| CARBURETOR       | Carburetor type<br>Throttle bore  | VG06<br>32.5 mm (1.28 in)  |
| DRIVE TRAIN      | Clutch system<br>Clutch operation system<br>Transmission<br>Primary reduction<br>Secondary reduction<br>Third reduction<br>Final reduction<br>Gear ratio 1st<br>Gear ratio 2nd<br>Gear ratio 3rd<br>Gear ratio 4th<br>Gear ratio 5th<br>Gear ratio 6th<br>Gear ratio reverse<br>Gearshift pattern | Wet, multi-plate<br>Mechanical type<br>6-speed constant-mesh<br>2.181 (96/44)<br>—<br>2.733 (41/15)<br>3.307 (43/13)<br>2.352 (40/17)<br>1.875 (30/16)<br>1.590 (35/22)<br>1.434 (33/23)<br>1.333 (32/24)<br>—<br>Left foot operated return system 1-N-2-3-4-5-6 |
| ELECTRICAL       | Ignition system<br>Starting system<br>Charging system<br>Regulator/rectifier type<br>Lighting system<br>AC regulator type   | Full transistor ignition<br>Starter motor<br>Triple phase output alternator<br>SCR shorted/triple phase full-wave rectification<br>Battery<br>—  |

**GENERAL INFORMATION**

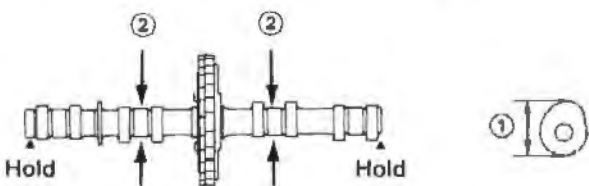
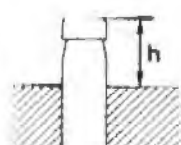
Unit: mm (in)

| Lubrication   | Item  | Standard   | Service limit |
|---|---|--|---------------|
| Engine oil capacity at draining<br>at disassembly<br>at oil filter change |   | 2.9 ℓ (3.06 US qt, 2.55 Imp qt)  | —             |
|   |   | 3.5 ℓ (3.70 US qt, 3.08 Imp qt)  | —             |
| Recommended engine oil  |   | 3.1 ℓ (3.28 US qt, 2.73 Imp qt)  | —             |
|   | <b>OIL VISCOSITIES</b>  | HONDA 4-stroke oil or equivalent.<br>API service classification SE or SF.  | —             |
|   |  | The viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range. |               |
|   | Oil pressure at oil pressure switch   | 490 kPa (5 kg/cm <sup>2</sup> , 71 psi)  | —             |
|   | Oil pump roter tip clearance ①  | 0.10 (0.004)   | 0.15 (0.006)  |
|   | body clearance ②  | 0.15–0.22 (0.006–0.009)  | 0.35 (0.014)  |
|   | end clearance ③   | 0.02–0.07 (0.001–0.003)  | 0.10 (0.004)  |
|   |  |  |               |

| Fuel system | Item   | Standard                           | Service limit |
|-------------|--|------------------------------------|---------------|
|             | Carburetor identification number                 | VG06B                              | —             |
|             | (California)                                     | VG06C                              | —             |
|             | Main jet   | #105                               | —             |
|             | (High altitude)                                  | —                                  | —             |
|             | (2, 3)   | —                                  | —             |
|             | (1, 4)   | —                                  | —             |
|             | (Front)  | —                                  | —             |
|             | (Rear)   | —                                  | —             |
|             | Slow jet   | #35                                | —             |
|             | Jet needle crip position                         | —                                  | —             |
|             | Pilot screw initial opening                      | 2-1/4 turns out                    | —             |
|             | (California)                                     | 2-1/2 turns out                    | —             |
|             | Pilot screw adjustment final opening             | 1 turn out                         | —             |
|             | Pilot screw high altitude adjustment             | 1/2 turn in from initial opening   | —             |
|             | Air screw initial opening                        | —                                  | —             |
|             | (California)                                     | —                                  | —             |
|             | Air screw high altitude adjustment               | —                                  | —             |
|             | Float level                                      | 8.0 (0.31)                         | —             |
|             | Carburetor vacuum difference                     | Within 30 mmHg (1.2 inHg)          | —             |
|             | Base carburetor (For carburetor synchronization) | No. 2 carburetor                   | —             |
|             | Idle speed                                       | 1,300 ± 100 rpm                    | —             |
|             | (California)                                     | 1,400 ± 100 rpm                    | —             |
|             | Throttle grip free play                          | 2–6 (0.08–0.24)                    | —             |
|             | Accelerator pump clearance                       | —                                  | —             |
|             | Secondary air supply system                      | Reed valves are built into the ASV | —             |
|             | Air injection control valve vacuum pressure      | 360 mmHg (14.2 inHg)               | —             |



## GENERAL INFORMATION

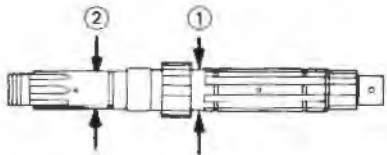
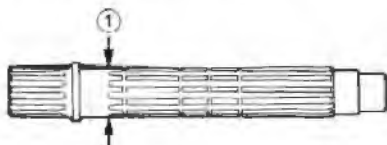
| Cylinder head  |   | Unit: mm (in)   |  |
|--|---|-----------------|--|
| Item   | Standard  | Service limit   |  |
| Cylinder compression   | 1,280–1,320 kPa (12.8–13.2 kg/cm <sup>2</sup> ,<br>182–188 psi)/400 rpm | —               |  |
| Cylinder compression difference  | Within 30 mmHg (1.2 inHg) of each other                                 | —               |  |
| Valve clearance IN<br>(cold)   | 0.12–0.18 (0.005–0.007)   | —               |  |
| EX   | 0.17–0.23 (0.007–0.009)   | —               |  |
| Cylinder head warpage  | —   | 0.1 (0.004)     |  |
| Cam lobe height ① IN   | 33.070–33.230 (1.3020–1.3083)   | 33.02 (1.300)   |  |
| IN (California model)  | —   | —               |  |
| EX   | 33.120–33.280 (1.3039–1.3102)   | 33.07 (1.302)   |  |
| EX (California model)  | —   | —               |  |
| Camshaft runout ②  | —   | 0.05 (0.002)    |  |
| Camshaft oil clearance   | 0.020–0.062 (0.0008–0.0024)   | 0.10 (0.004)    |  |
|   |   |                 |  |
| Camshaft journal O.D.  | 22.959–22.980 (0.9039–0.9047)   | 22.965 (0.9041) |  |
| Camshaft holder I.D.   | —   | —               |  |
| Valve stem O.D. IN   | 3.775–3.790 (0.1486–0.1492)   | 3.70 (0.146)    |  |
| EX   | 3.755–3.770 (0.1478–0.1484)   | 3.69 (0.145)    |  |
| Valve guide I.D. IN  | 3.800–3.812 (0.1496–0.1253)   | 3.89 (0.153)    |  |
| EX   | 3.800–3.812 (0.1496–0.1253)   | 3.89 (0.153)    |  |
| Stem-to-guide clearance IN   | —   | 0.04 (0.002)    |  |
| EX   | —   | 0.05 (0.002)    |  |
| Valve guide projection above cylinder head (h) IN  | 13.37–13.77 (0.526–0.542)   | —               |  |
| EX   | 11.52–11.92 (0.454–0.469)   | —               |  |
|  <p>Before guide installation:</p> <ol style="list-style-type: none"> <li>1. Chill the valve guides in the freezer section of a refrigerator for about an hour.</li> <li>2. Heat the cylinder head to 100–150°C (212–300°F).</li> </ol> |   |                 |  |
| Valve seat width   | 0.9–1.1 (0.035–0.043)   | 1.5 (0.06)      |  |
| Valve spring free length IN  | 39.40 (1.551)   | 38.6 (1.52)     |  |
| EX   | 39.40 (1.551)   | 38.6 (1.52)     |  |
| inner IN   | —   | —               |  |
| inner EX   | —   | —               |  |
| outer IN   | —   | —               |  |
| outer EX   | —   | —               |  |
| Rocker arm I.D. IN   | —   | —               |  |
| EX   | —   | —               |  |
| Rocker arm shaft O.D. IN   | —   | —               |  |
| EX   | —   | —               |  |
| Rocker arm-to-rocker arm shaft clearance   | —   | —               |  |
| Valve lifter O.D.  | —   | —               |  |
| Valve lifter bore I.D.   | —   | —               |  |
| Hydraulic lash adjuster assist spring free length  | —   | —               |  |
| Hydraulic lash adjuster compression stroke with kerosene   | —   | —               |  |

## GENERAL INFORMATION

| Cylinder/piston   |  | Unit: mm (in) |  |
|---|--|---------------|--|
| Item  | Standard                                 | Service limit |  |
| Cylinder I.D.   | 55.000–55.010 (2.1654–2.1657)            | 55.10 (2.169) |  |
| Cylinder out of round                                     | —  | 0.10 (0.004)  |  |
| Cylinder taper  | —  | 0.10 (0.004)  |  |
| Cylinder warp   | —  | 0.10 (0.004)  |  |
| Piston mark direction                                     | With "IN" mark facing to the intake side | —             |  |
| Piston O.D. (D)   | 54.960–54.990 (2.1638–2.1650)            | 54.90 (2.161) |  |
| Piston O.D. measurement point (H)                         | 10 (0.4)                                 | —             |  |
| Piston pin hole I.D. (d)                                  | 14.002–14.008 (0.5513–0.5515)            | 14.05 (0.553) |  |
|   |  |               |  |
| Cylinder-to-piston clearance                              | —  | 0.10 (0.004)  |  |
| Piston pin O.D.   | 13.994–14.000 (0.5509–0.5512)            | 13.98 (0.550) |  |
| Piston-to-piston pin clearance                            | 0.002–0.014 (0.0001–0.0006)              | 0.04 (0.002)  |  |
| Connecting rod-to-piston pin clearance                    | 0.016–0.040 (0.0006–0.0016)              | 0.06 (0.002)  |  |
| Top ring-to-ring groove clearance                         | 0.015–0.050 (0.0006–0.0020)              | 0.08 (0.003)  |  |
| Second ring-to-ring groove clearance                      | 0.015–0.050 (0.0006–0.0020)              | 0.08 (0.003)  |  |
| Top ring end gap  | 0.18–0.28 (0.007–0.011)                  | 0.5 (0.02)    |  |
| Second ring end gap                                       | 0.18–0.33 (0.007–0.013)                  | 0.5 (0.02)    |  |
| Oil ring (side rail) end gap                              | 0.2–0.7 (0.01–0.03)                      | 1.1 (0.04)    |  |
| Top ring mark   | Install with the marked side up          | —             |  |
| Second ring mark  | Install with the marked side up          | —             |  |
| <b>Crankshaft</b>   |  |               |  |
| Connecting rod small end I.D.                             | 14.016–14.034 (0.5518–0.5525)            | 14.07 (0.554) |  |
| Connecting rod big end side clearance<br>radial clearance | 0.05–0.20 (0.002–0.008)                  | 0.30 (0.012)  |  |
| Crankshaft runout ①                                       | —  | 0.05 (0.002)  |  |
|   |  |               |  |
| Crankpin oil clearance                                    | 0.020–0.052 (0.0008–0.0020)              | 0.06 (0.002)  |  |
| Crankpin bearing selection                                | See page 10-7                            | —             |  |
| Main journal oil clearance                                | 0.022–0.046 (0.0009–0.0018)              | 0.05 (0.002)  |  |
| Main journal bearing selection                            | See page 10-6                            | —             |  |
| <b>Kickstarter</b>  |  |               |  |
| Kickstarter pinion gear I.D.                              | —  | —             |  |
| Kickstarter spindle O.D.                                  | —  | —             |  |
| Kickstarter idle gear I.D.                                | —  | —             |  |
| Countershaft O.D. at kickstarter idle gear                | —  | —             |  |
| Kickstarter idle gear bushing O.D.<br>I.D.                | —  | —             |  |

## GENERAL INFORMATION

Unit: mm (in)

| Transmission  | Item  | Standard                          | Service limit |
|---|---|-----------------------------------|---------------|
| Transmission gear I.D.  | M5  | 25.000 - 25.021 (0.9843 - 0.9851) | 25.05 (0.986) |
|   | M6  | 25.000 - 25.021 (0.9843 - 0.9851) | 25.05 (0.986) |
|   | C2  | 28.000 - 28.021 (1.1024 - 1.1032) | 28.05 (1.104) |
|   | C3  | 28.000 - 28.021 (1.1024 - 1.1032) | 28.05 (1.104) |
|   | C4  | 28.000 - 28.021 (1.1024 - 1.1032) | 28.05 (1.104) |
| Transmission gear bushing O.D.  | M5  | 24.959 - 24.980 (0.9826 - 0.9835) | 24.92 (0.981) |
|   | M6  | 24.959 - 24.980 (0.9826 - 0.9835) | 24.92 (0.981) |
|   | C2  | 27.959 - 27.980 (1.1007 - 1.1016) | 27.92 (1.099) |
|   | C3  | 27.959 - 27.980 (1.1007 - 1.1016) | 27.92 (1.099) |
|   | C4  | 27.959 - 27.980 (1.1007 - 1.1016) | 27.92 (1.099) |
| Transmission gear busing I.D.   | M5  | 21.985 - 22.006 (0.8655 - 0.8664) | 22.07 (0.869) |
|   | C2  | 24.985 - 25.006 (0.9837 - 0.9845) | 25.07 (0.987) |
| Gear-to-bushing clearance   | at M5 gear  | 0.020 - 0.062 (0.0008 - 0.0024)   | 0.10 (0.004)  |
|   | at M6 gear  | 0.020 - 0.062 (0.0008 - 0.0024)   | 0.10 (0.004)  |
|   | at C2 gear  | 0.020 - 0.062 (0.0008 - 0.0024)   | 0.10 (0.004)  |
|   | at C3 gear  | 0.020 - 0.062 (0.0008 - 0.0024)   | 0.10 (0.004)  |
|   | at C4 gear  | 0.020 - 0.062 (0.0008 - 0.0024)   | 0.10 (0.004)  |
| Mainshaft O.D.  | at M5 gear bushing ①  | 21.959 - 21.980 (0.8645 - 0.8654) | 21.93 (0.863) |
|   | at clutch outer guide ②   | 21.967 - 21.980 (0.8648 - 0.8654) | 21.93 (0.863) |
|  |   |                                   |               |
| Countershaft O.D. at C2 gear bushing ①  |   | 24.967 - 24.980 (0.9830 - 0.9835) | 24.93 (0.981) |
|   |  |                                   |               |
| Gear-to-shaft clearance   |   |                                   |               |
| Gear bushing-to-shaft clearance at M5 gear  |   | 0.020 - 0.062 (0.0008 - 0.0024)   | 0.10 (0.004)  |
| at C2 gear  |   | 0.005 - 0.039 (0.0002 - 0.0015)   | 0.06 (0.002)  |
| Shift fork claw thickness L   | C   | 5.93 - 6.00 (0.233 - 0.236)       | 5.60 (0.220)  |
|   | R   | 5.93 - 6.00 (0.233 - 0.236)       | 5.60 (0.220)  |
|   |   | 5.93 - 6.00 (0.233 - 0.236)       | 5.60 (0.220)  |
| Shift fork I.D.   | L   | 12.000 - 12.018 (0.4724 - 0.4731) | 12.06 (0.475) |
|   | C   | 12.000 - 12.018 (0.4724 - 0.4731) | 12.06 (0.475) |
|   | R   | 12.000 - 12.018 (0.4724 - 0.4731) | 12.06 (0.475) |
| Shift fork shaft O.D.   |   | 11.969 - 11.980 (0.4712 - 0.4717) | 11.90 (0.469) |



## GENERAL INFORMATION

Unit: mm (in)

| Clutch system | Item  | Standard                      | Service limit |
|---------------|---|-------------------------------|---------------|
|               | Clutch lever free play                        | 10–20 (0.4–0.8)               | —             |
|               | Recommended clutch fluid                      | —                             | —             |
|               | Clutch master cylinder I.D.                   | —                             | —             |
|               | Clutch master piston O.D.                     | —                             | —             |
|               | Clutch outer I.D.                             | 37.005–37.030 (1.4569–1.4579) | 37.08 (1.460) |
|               | Clutch outer guide O.D.                       | 29.994–30.007 (1.1809–1.1814) | 29.95 (1.179) |
|               | I.D.  | 21.980–22.007 (0.8654–0.8664) | 22.05 (0.868) |
|               | Mainshaft O.D. at clutch outer guide          | 21.967–21.980 (0.8648–0.8654) | 21.93 (0.863) |
|               | Oil pump drive sprocket I.D.                  | 30.025–30.075 (1.1821–1.1841) | 30.13 (1.186) |
|               | Clutch spring free height                     | —                             | —             |
|               | Clutch spring free length                     | 37.5 (1.48)                   | 36.0 (1.42)   |
|               | Clutch disc thickness A                       | 3.22–3.38 (0.127–0.133)       | 2.9 (0.11)    |
|               | B   | 3.22–3.38 (0.127–0.133)       | 2.9 (0.11)    |
|               | C   | 3.42–3.58 (0.135–0.141)       | 3.1 (0.12)    |
|               | Clutch plate warpage                          | —                             | 0.3 (0.01)    |
|               | Centrifugal clutch drum I.D.                  | —                             | —             |
|               | bushing O.D.                                  | —                             | —             |
|               | Centrifugal clutch center guide I.D.          | —                             | —             |
|               | O.D.  | —                             | —             |
|               | Centrifugal clutch center guide collar height | —                             | —             |
|               | Centrifugal clutch weight lining thickness    | —                             | —             |
|               | Centrifugal clutch spring free length         | —                             | —             |
|               | Clutch lining thickness                       | —                             | —             |
|               | Crankshaft O.D. at clutch center              | —                             | —             |

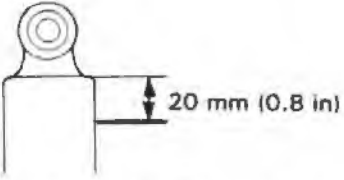
| Cooling system | Item                                   | Standard  | Service limit |
|----------------|--|---|---------------|
|                | Coolant capacity (Radiator and engine) | 1.5 l (0.40 US gal, 0.33 Imp gal)                     | —             |
|                | (Reserve tank)                         | 0.3 l (0.08 US gal, 0.07 Imp gal)                     | —             |
|                | Radiator cap relief pressure           | 93–123 kPa (0.95–1.25 kg/cm <sup>2</sup> , 14–18 psi) | —             |
|                | Thermostat begins to open              | 80–84°C (176–183°F)                                   | —             |
|                | Thermostat fully open                  | 95°C (203°F)  | —             |
|                | Thermostat valve lift                  | 8.0 (0.315) min.                                      | —             |

| Drive train | Item   | Standard | Service limit |
|-------------|--|----------|---------------|
|             | Recommended final drive oil                  | —        | —             |
|             | Final drive gear oil capacity at disassembly | —        | —             |
|             | at draining                                  | —        | —             |
|             | Final drive gear backlash                    | —        | —             |
|             | Ring gear-to-stop pin clearance (A)          | —        | —             |
|             | Stop pin shim                                | —        | —             |
|             | Ring gear spacer                             | —        | —             |
|             | Pinion spacer                                | —        | —             |
|             | Output gear backlash                         | —        | —             |
|             | Output gear I.D.                             | —        | —             |
|             | Output gear bushing O.D.                     | —        | —             |
|             | I.D.   | —        | —             |
|             | Output drive shaft O.D.                      | —        | —             |
|             | Output gear damper spring free length        | —        | —             |
|             | Output shaft adjustment shim                 | —        | —             |
|             | Countershaft drive shaft adjustment shim     | —        | —             |

## GENERAL INFORMATION

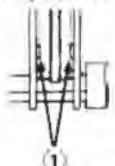
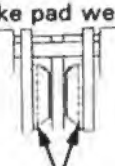
|              |   | Unit: mm (in)                              |               |
|--------------|---|--|---------------|
| Wheels/tires | Item  | Standard                                   | Service limit |
|              | Minimum tire tread depth (FR)                   | —  | 1.5 (0.06)    |
|              | (RR)  | —  | 2.0 (0.08)    |
|              | Cold tire pressure Up to 90kg (200lb) load (FR) | 225 kPa (2.25 kg/cm <sup>2</sup> , 33 psi) | —             |
|              | Up to 90kg (200lb) load (RR)                    | 225 kPa (2.25 kg/cm <sup>2</sup> , 33 psi) | —             |
|              | Up to maximum weight capacity (FR)              | 225 kPa (2.25 kg/cm <sup>2</sup> , 33 psi) | —             |
|              | Up to maximum weight capacity (RR)              | 250 kPa (2.50 kg/cm <sup>2</sup> , 36 psi) | —             |
|              | Front and rear axle runout                      | —  | 0.2 (0.01)    |
|              | Front and rear wheel rim runout (Radial)        | —  | 2.0 (0.08)    |
|              | (Axial)   | —  | 2.0 (0.08)    |
|              | Front wheel hub-to-rim distance                 | —  | —             |
|              | Front wheel hub standard surface                | —  | —             |
|              | Rear wheel hub-to-rim distance                  | —  | —             |
|              | Rear wheel hub standard surface                 | —  | —             |
|              | Wheel balance weight Front/Rear                 | —  | 60 g (2.1 oz) |
|              | Drive chain slack                               | 15–25 (5/8–1)                              | —             |
|              | Drive chain size/link (DID)                     | DID525V8/104                               | —             |
|              | (RK)  | RK525SM4/104                               | —             |

| Front suspension |                           |   |            |
|------------------|---------------------------|---|------------|
|                  | Fork spring free length   | 324.5 (12.78)                           | 318 (12.5) |
|                  | Fork spring free length A | —                                       | —          |
|                  | B                         | —                                       | —          |
|                  | Fork spring direction     | With tightly wound coil end facing down | —          |
|                  | Fork tube runout          | —                                       | 0.2 (0.01) |
|                  | Recommended fork oil      | Fork Fluid                              | —          |
|                  | Fork oil level            | 95 (3.7)                                | —          |
|                  | Fork oil level (R)        | —                                       | —          |
|                  | (L)                       | —                                       | —          |
|                  | Fork oil capacity         | 510 cc (17.2 US oz, 17.9 imp oz)        | —          |
|                  | Fork oil capacity (R)     | —                                       | —          |
|                  | (L)                       | —                                       | —          |
|                  | Fork air pressure         | —                                       | —          |
|                  | Steering bearing preload  | 1.0–1.6 kg                              | —          |

| Rear suspension |   |                                       |           |
|-----------------|---|---------------------------------------|-----------|
|                 | Shock absorber spring free length   | 178.0 (7.01)                          | 174 (6.9) |
|                 | Shock absorber spring free length (A)   | —                                     | —         |
|                 | (B)   | —                                     | —         |
|                 | Damper gas pressure   | —                                     | —         |
|                 | Damper compressed gas   | —                                     | —         |
|                 | Damper rod compressed force at 10 mm (0.4 in) compressed                            | —                                     | —         |
|                 | Damper drilling point   | —                                     | —         |
|                 |  |                                       |           |
|                 | Shock absorber spring installed length (Standard)                                   | Adjuster position III                 | —         |
|                 | (Adjustable range)  | Position I–VII                        | —         |
|                 | Shock absorber spring direction   | With the taper end facing to adjuster | —         |
|                 | Recommended shock absorber oil  | —                                     | —         |
|                 | Shock absorber oil capacity   | —                                     | —         |
|                 | air pressure  | —                                     | —         |

## GENERAL INFORMATION

Unit: mm (in)

| Brakes   |  | Standard                      | Service limit   |
|--|--|-------------------------------|-----------------|
| Item   |  |                               |                 |
| Front brake fluid  |  | DOT4                          | —               |
| brake lever free play  |  | —                             | —               |
| brake pad wear indicator   |  | —                             | to the groove ① |
|   |  |                               |                 |
| brake disc thickness   |  | 5.6–6.0 (0.22–0.24)           | 5.0 (0.20)      |
| brake disc runout  |  | —                             | 0.4 (0.02)      |
| master cylinder I.D.   |  | 11.000–11.043 (0.4331–0.4348) | 11.055 (0.4352) |
| master piston O.D.   |  | 10.957–10.984 (0.4314–0.4324) | 10.945 (0.4309) |
| caliper cylinder I.D.  |  | 27.000–27.050 (1.0630–1.0650) | 27.06 (1.065)   |
| caliper cylinder I.D. (Upper)  |  | —                             | —               |
| (Lower)  |  | —                             | —               |
| caliper piston O.D.  |  | 26.918–26.968 (1.0598–1.0617) | 26.91 (1.059)   |
| caliper piston O.D. (Upper)  |  | —                             | —               |
| (Lower)  |  | —                             | —               |
| brake drum I.D.  |  | —                             | —               |
| brake lining thickness   |  | —                             | —               |
| Rear brake fluid   |  | DOT4                          | —               |
| brake pedal height   |  | —                             | —               |
| brake pedal free play  |  | —                             | —               |
| brake pad wear indicator   |  | —                             | to the step ②   |
|  |  |                               |                 |
| brake disc thickness   |  | 4.8–5.2 (0.19–0.20)           | 4.0 (0.16)      |
| runout   |  | —                             | 0.4 (0.02)      |
| master cylinder I.D.   |  | 14.000–14.043 (0.5512–0.5529) | 14.06 (0.554)   |
| master piston O.D.   |  | 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.  |  | 38.098–38.148 (1.4999–1.5019) | 38.09 (1.500)   |
| brake drum I.D.  |  | —                             | —               |
| brake lining thickness   |  | —                             | —               |

## Battery/charging system

|   |                                |   |
|---|--------------------------------|---|
| Alternator charging coil resistance (At 20°C/68°F)  | 0.1–0.5 Ω                      | — |
| Regulator/rectifier regulated voltage/ampere        | 14.0–16.0 V/0–8 A at 5,000 rpm | — |
| Battery capacity                                    | 12 V–8 AH                      | — |
| Battery specific gravity (Fully charging)           | —                              | — |
| (Needs charging)                                    | —                              | — |
| Battery charging rate (Normal)                      | 0.8 A (5–10 hours)             | — |
| (Quick)   | 4 A (1 hour)                   | — |
| Battery voltage (Fully charged 20°C/68°F)           | Over 12.8 V                    | — |
| (Needs charging 20°C/68°F)                          | Below 12.5 V                   | — |
| Alternator lighting coil resistance (At 20°C/68°F)  | —                              | — |
| AC regulator regulated voltage (With analogue type) | —                              | — |
| (With digital type)                                 | —                              | — |

## Starting system

|                                    |                               |               |
|------------------------------------|-------------------------------|---------------|
| Starter driven gear O.D.           | 42.175–42.200 (1.6604–1.6614) | 42.12 (1.658) |
| Starter clutch outer I.D.          | —                             | —             |
| Starter motor brush spring tension | 920 ± 140 g (32.4 ± 4.9 oz)   | —             |
| brush length                       | 12.5 (0.49)                   | 8.5 (0.33)    |



## GENERAL INFORMATION

| Ignition system                                   |                      | Standard                              | Service limit |
|---|----------------------|---------------------------------------|---------------|
| Item  |                      |                                       |               |
| Spark plug (Standard NGK)                         |                      | CR8EH-9                               | —             |
| (Standard ND)                                     |                      | U24FER9                               | —             |
| (For cold climate/below 5°C/41°F NGK)             |                      | —                                     | —             |
| (For cold climate/below 5°C/41°F ND)              |                      | —                                     | —             |
| (For extended high speed riding NGK)              |                      | CR9EH-9                               | —             |
| (For extended high speed riding ND)               |                      | U27FER9                               | —             |
| Spark plug gap                                    |                      | 0.8—0.9 (0.031—0.035)                 | —             |
| Ignition timing "F" mark                          |                      | 16° BTDC at idle                      | —             |
| Advance start                                     |                      | 1,700 rpm                             | —             |
| stop  |                      | —                                     | —             |
| Full advance                                      |                      | —                                     | —             |
| Alternator exciter coil resistance (At 20°C/68°F) |                      | —                                     | —             |
| Ignition coil resistance (Primary: at 20°C/68°F)  |                      | 2—4 Ω                                 | —             |
| (Secondary with plug cap)                         |                      | 23—27 kΩ                              | —             |
| (Secondary without plug wire)                     |                      | 13—17 kΩ                              | —             |
| Pulse generator resistance (At 20°C/68°F)         |                      | 340—420 Ω                             | —             |
| <b>Lights/meters/switches</b>                     |                      |                                       |               |
| Main fuse   |                      | 30 A                                  | —             |
| Fuse  |                      | 10 A x 4                              | —             |
| Headlight (high/low beam)                         |                      | 12 V 60/55 W                          | —             |
| Tail/brakelight                                   |                      | 12 V 3/32 CP                          | —             |
| License light                                     |                      | —                                     | —             |
| Position light bulb                               |                      | —                                     | —             |
| Front turn signal/running light                   |                      | —                                     | —             |
| Front turn signal light                           |                      | 12 V 32 CP x 2                        | —             |
| Rear turn signal light                            |                      | 12 V 32 CP x 2                        | —             |
| Instrument lights                                 |                      | 12 V 1.7 W x 3                        | —             |
| Oil pressure warning indicator                    |                      | 12 V 1.7 W                            | —             |
| Tail/brakelight warning indicator                 |                      | —                                     | —             |
| Side stand indicator                              |                      | 12 V 1.7 W                            | —             |
| Low fuel indicator                                |                      | —                                     | —             |
| Coolant temperature indicator                     |                      | —                                     | —             |
| Oil temperature indicator                         |                      | —                                     | —             |
| High beam indicator                               |                      | 12 V 1.7 W                            | —             |
| Turn signal indicator                             |                      | 12 V 1.7 W                            | —             |
| Neutral indicator                                 |                      | 12 V 1.7 W                            | —             |
| Reverse indicator                                 |                      | —                                     | —             |
| Overdrive indicator                               |                      | —                                     | —             |
| Oil temperature sensor resistance                 |                      | —                                     | —             |
| Fuel unit resistance (at full level)              |                      | —                                     | —             |
| (at low level)                                    |                      | —                                     | —             |
| Fuel pump flow capacity (min./minute)             |                      | 660 cc (22.3 US oz, 23.2 Imp oz) min. | —             |
| Coolant temperature sensor resistance             | 80°C (176°F)         | 47—57 Ω                               | —             |
|   | 120°C (248°F)        | 14—18 Ω                               | —             |
| Fan motor switch                                  | Starts to close (ON) | 98—102°C (208—216°F)                  | —             |
|   | Stops to open (OFF)  | 93—97°C (199—207°F)                   | —             |

**GENERAL INFORMATION****TORQUE VALUES****STANDARD TORQUE VALUES**

| Item               | Torque<br>N·m (kg-m, ft-lb) | Item                                  | Torque<br>N·m (kg-m, ft-lb) |
|--------------------|-----------------------------|---------------------------------------|-----------------------------|
| 5 mm bolt and nut  | 5 (0.5, 3.5)                | 5 mm screw                            | 4 (0.4, 3)                  |
| 6 mm bolt and nut  | 10 (1.0, 7)                 | 6 mm screw                            | 9 (0.9, 7)                  |
| 8 mm bolt and nut  | 22 (2.2, 16)                | 6 mm flange bolt (8 mm head)          | 9 (0.9, 7)                  |
| 10 mm bolt and nut | 35 (3.5, 25)                | 6 mm flange bolt (10 mm head) and nut | 12 (1.2, 9)                 |
| 12 mm bolt and nut | 55 (5.5, 40)                | 8 mm flange bolt and nut              | 27 (2.7, 20)                |
|                    |                             | 10 mm flange bolt and nut             | 40 (4.0, 29)                |

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

**NOTES:**

1. Apply a locking agent to the threads.
2. Apply sealant to the threads.
3. Stake.
4. Apply silicone grease to the sliding surface.

**ENGINE**

| Item                                      | Q'ty | Thread<br>dia (mm) | Torque |      |       | Remarks |
|---|------|--------------------|--------|------|-------|---------|
|   |      |                    | N·m    | kg m | ft-lb |         |
| <b>Lubrication:</b>                       |      |                    |        |      |       |         |
| Oil pump driven sprocket bolt             | 1    | 6                  | 15     | 1.5  | 11    | NOTE 1  |
| Oil pressure switch                       | 1    | —                  | 12     | 1.2  | 9     | NOTE 2  |
| Oil drain bolt                            | 1    | 12                 | 35     | 3.5  | 25    |         |
| Oil filter boss                           | 1    | 20                 | 18     | 1.8  | 13    |         |
| Oil filter                                | 1    | 20                 | 10     | 1.0  | 7     |         |
| <b>Cylinder head/cylinder/piston:</b>     |      |                    |        |      |       |         |
| Cylinder head cover bolt                  | 8    | 6                  | 10     | 1.0  | 7     |         |
| Camshaft holder bolt                      | 16   | 6                  | 12     | 1.2  | 9     |         |
| Cylinder head cover breather plate bolt   | 2    | 6                  | 12     | 1.2  | 9     | NOTE 1  |
| Cylinder head special nut                 | 12   | 8                  | 30     | 3.0  | 22    |         |
| Cylinder head mounting bolt               | 2    | 6                  | 12     | 1.2  | 9     |         |
| Cylinder mounting bolt                    | 1    | 6                  | 10     | 1.0  | 7     |         |
| Cylinder stud bolt                        | 12   | 8                  | 26     | 2.6  | 19    |         |
| Spark plug                                | 4    | 10                 | 11     | 1.1  | 8     |         |
| <b>Clutch/gearshift linkage:</b>          |      |                    |        |      |       |         |
| Crankshaft hole cap                       | 1    | 30                 | 7      | 0.7  | 5     |         |
| Timing hole cap                           | 1    | 14                 | 10     | 1.0  | 7     |         |
| Clutch center lock nut                    | 1    | 20                 | 85     | 8.5  | 61    | NOTE 3  |
| Gearshift spindle return spring pin       | 1    | 8                  | 23     | 2.3  | 17    |         |
| <b>Crankcase/crankshaft/transmission:</b> |      |                    |        |      |       |         |
| Connecting rod nut                        | 8    | 7                  | 24     | 2.4  | 17    |         |
| Crankcase bolt (8 mm)                     | 12   | 8                  | 24     | 2.4  | 17    |         |
| (8 mm x 65)                               | 1    | 8                  | 27     | 2.7  | 20    |         |
| (6 mm)                                    | 19   | 6                  | 12     | 1.2  | 9     |         |
| Sealing bolt (lower crankcase)            | 1    | 20                 | 30     | 3.0  | 22    |         |
| Special bolt (lower crankcase)            | 1    | 14                 | 25     | 2.5  | 18    | NOTE 2  |
| Neutral switch                            | 1    | 10                 | 18     | 1.8  | 13    | NOTE 2  |
| Drive sprocket bolt                       | 1    | 10                 | 55     | 5.5  | 40    |         |
| <b>Alternator:</b>                        |      |                    |        |      |       |         |
| Flywheel bolt                             | 1    | 10                 | 85     | 8.5  | 61    |         |
| <b>Starter clutch:</b>                    |      |                    |        |      |       |         |
| Starter clutch bolt                       | 1    | 10                 | 85     | 8.5  | 61    |         |

## FRAME

| Item   | Q'ty | Thread<br>dia (mm) | Torque |      |       | Remarks   |
|--|------|--------------------|--------|------|-------|-----------|
|  |      |                    | N-m    | kg-m | ft-lb |           |
| <b>Frame/exhaust system:</b>                 |      |                    |        |      |       |           |
| Exhaust pipe joint nut                       | 8    | 6                  | 12     | 1.2  | 9     |           |
| Muffler mounting bolt                        | 2    | 8                  | 22     | 2.2  | 16    |           |
| Side stand pivot bolt                        | 1    | 10                 | 10     | 1.0  | 7     |           |
| Side stand pivot lock nut                    | 1    | 10                 | 27     | 2.7  | 20    |           |
| Side stand switch mounting bolt              | 1    | 6                  | 30     | 3.0  | 22    |           |
| Gearshift pedal joint bolt                   | 1    | 6                  | 12     | 1.2  | 9     |           |
| Gearshift pedal mounting bolt                | 1    | 8                  | 27     | 2.7  | 20    | NOTE 1    |
| Footpeg stay bolt                            | 4    | 8                  | 27     | 2.7  | 20    |           |
| <b>Cooling system:</b>                       |      |                    |        |      |       |           |
| Temperature sensor                           | 1    | —                  | 10     | 1.0  | 7     | NOTE 2    |
| Fan motor switch                             | 1    | 16                 | 18     | 1.8  | 13    | NOTE 2    |
| <b>Fuel system:</b>                          |      |                    |        |      |       |           |
| Fuel valve nut                               | 1    | 22                 | 23     | 2.3  | 17    |           |
| Fuel tank cap mounting bolt                  | 3    | 4                  | 3      | 0.3  | 2     |           |
| <b>Engine mount:</b>                         |      |                    |        |      |       |           |
| Engine mount nut (front)                     | 2    | 10                 | 40     | 4.0  | 29    |           |
| Engine mount nut (rear/upper)                | 1    | 10                 | 50     | 5.0  | 36    |           |
| Engine mount nut (rear/lower)                | 1    | 10                 | 50     | 5.0  | 36    |           |
| Adjusting bolt                               | 1    | 20                 | 15     | 1.5  | 11    |           |
| Adjusting bolt lock nut                      | 1    | 20                 | 65     | 6.5  | 47    |           |
| Engine sub frame nut                         | 4    | 10                 | 45     | 4.5  | 33    |           |
| Engine bracket bolt                          | 6    | 10                 | 40     | 4.0  | 29    |           |
| <b>Front:</b>                                |      |                    |        |      |       |           |
| Handlebar pinch bolt                         | 2    | 8                  | 27     | 2.7  | 20    |           |
| Handlebar weight screw                       | 2    | 6                  | 10     | 1.0  | 7     | NOTE 1    |
| Axle bolt                                    | 1    | 14                 | 60     | 6.0  | 43    |           |
| Axle pinch bolt                              | 4    | 8                  | 22     | 2.2  | 16    |           |
| Fork pinch bolt (upper)                      | 2    | 7                  | 11     | 1.1  | 8     |           |
| Fork pinch bolt (lower)                      | 2    | 10                 | 50     | 5.0  | 36    |           |
| Fork oap bolt                                | 2    | 37                 | 23     | 2.3  | 17    |           |
| Fork socket bolt                             | 2    | 6                  | 20     | 2.0  | 14    | NOTE 1    |
| Steering stem nut                            | 1    | 24                 | 105    | 10.5 | 76    |           |
| Steering head bearing adjustment nut         | 1    | 26                 | 25     | 2.5  | 18    |           |
| Ignition switch mounting bolt                | 2    | 8                  | 25     | 2.5  | 18    | NOTE 1    |
| <b>Rear:</b>                                 |      |                    |        |      |       |           |
| Axle nut                                     | 1    | 16                 | 90     | 9.0  | 65    |           |
| Drive sprocket nut                           | 5    | 10                 | 65     | 6.5  | 47    |           |
| Shock absorber mounting nut (upper)          | 1    | 10                 | 45     | 4.5  | 33    |           |
| Shock absorber mounting nut (lower)          | 1    | 10                 | 45     | 4.5  | 33    |           |
| Shock absorber lower joint lock nut          | 1    | 14                 | 68     | 6.8  | 49    | NOTE 1    |
| Swingarm pivot nut                           | 1    | 14                 | 110    | 11.0 | 80    |           |
| <b>Brake:</b>                                |      |                    |        |      |       |           |
| Front caliper pad pin plug                   | 1    | 10                 | 2.5    | 0.25 | 1.8   |           |
| pad pin                                      | 1    | 10                 | 18     | 1.8  | 13    |           |
| bracket bolt                                 | 2    | 8                  | 27     | 2.7  | 20    |           |
| pin bolt                                     | 1    | —                  | 23     | 2.3  | 17    | NOTE 1, 4 |
| bracket pin bolt                             | 1    | —                  | 13     | 1.3  | 9     | NOTE 1, 4 |
| Front master cylinder reservoir cover screw  | 2    | 4                  | 6      | 0.6  | 4     |           |
| Front brake disc bolt                        | 6    | 8                  | 30     | 3.0  | 22    |           |
| Rear caliper pad pin plug                    | 1    | 10                 | 2.5    | 0.25 | 1.8   |           |
| pad pin                                      | 1    | 10                 | 18     | 1.8  | 13    |           |
| mounting bolt                                | 1    | 8                  | 23     | 2.3  | 17    |           |
| pin bolt                                     | 1    | —                  | 23     | 2.3  | 17    | NOTE 1, 4 |
| Rear master cylinder push rod joint lock nut | 1    | —                  | 17     | 1.7  | 12    |           |
| Rear brake disc bolt                         | 4    | 8                  | 40     | 4.0  | 29    |           |
| Brake hose bolt                              | 4    | 10                 | 35     | 3.5  | 25    |           |

## GENERAL INFORMATION

## TOOLS

- The tools for the ball bearing removal and installation are not contained in this list. Refer to section 1, Ball Bearing Replacement, of the Common Service Manual.
- The newly designed tools are indicated with \* mark in the list.

| Description  | Tool number            | Alternative tool                                     | Ref. section(s) |
|--|------------------------|--|-----------------|
| Oil filter wrench                                  | 07HAA-PJ70100          |  | 3               |
| Vacuum gauge                                       | 07404-0030000          |  | 3               |
| Oil pressure gauge                                 | 07506-3000000          | ] or equivalent commercially available in U.S.A.     | 4               |
| Oil pressure gauge attachment                      | 07510-4220100          |  | 4               |
| Rotor holder                                       | 07725-0040000          |  | 4, 14, 16       |
| Antifreeze tester                                  | Commercially available |  | 5               |
| Cooling system tester                              | Commercially available |  | 5               |
| Float level gauge                                  | 07401-0010000          |  | 6               |
| Vacuum pump  | ST-AH-260-MC7          | -U.S.A. only   | 6               |
| Pressure pump                                      | ST-AH-255-MC7          | -U.S.A. only   | 6               |
| * Valve guide driver (guide removal/ installation) | 07JMD-KY20100          |  | 8               |
| * Valve bucket hole protector                      | 07JMG-KY20100          |  | 8               |
| Valve spring compressor                            | 07757-0010000          |  | 8               |
| * Valve spring compressor attachment               | 07JME-KY20100          |  | 8               |
| * Valve guide reamer, 3.8 mm                       | 07JMH-KY20100          | -07JMH-KY2010A (U.S.A. only)                         | 8               |
| Valve seat cutter, 22 mm (45° IN, EX)              | 07780-0010701          | ] or equivalent commercially available in U.S.A.     | 8               |
| Valve flat cutter, 22 mm (32° IN)                  | 07780-0012601          |  | 8               |
| Valve flat cutter, 21.5 mm (32° EX)                | 07780-0012800          |  | 8               |
| Valve interior cutter, 22 mm (60° IN, EX)          | 07780-0014202          |  | 8               |
| * Cutter holder                                    | 07JMH-KY20200          |  | 8               |
| Piston ring compressor                             | 07954-2500000          | -07954-2350000                                       | 8               |
| Piston base  | 07958-4130000          | -07958-2500001 (U.S.A. only)                         | 8               |
| Compression gauge                                  | 07305-0010000          | ] or equivalent commercially available in U.S.A.     | 8               |
| * Compression gauge attachment                     | 07JMJ-KY20100          |  | 8               |
| * Clutch cover holder                              | 07GMB-KT80100          | -Not available in U.S.A. 07HGB-001000A (U.S.A. only) | 9               |



(Cont'd)

| Description                          | Tool number                              | Alternative tool  | Ref. section(s)   |
|--------------------------------------|--|---|-------------------|
| Bearing remover head, 20 mm          | 07746-0050600                            |   | 11                |
| Bearing remover shaft                | 07746-0050100                            |   | 11                |
| Driver                               | 07749-0010000                            |   | 11, 12            |
| Attachment, 42 x 47 mm               | 07746-0010300                            |   | 11, 12            |
| Attachment, 52 x 55 mm               | 07746-0010400                            |   | 11                |
| Pilot, 20 mm                         | 07746-0040500                            |   | 11, 12            |
| Fork seal driver                     | 07947-KA50100                            |   | 11                |
| Fork seal driver attachment          | 07947-KF00100                            |   | 11                |
| Lock nut wrench, 30 x 32 mm          | 07716-0020400                            |   | 11                |
| Steering stem socket                 | 07916-3710100                            |   | 11                |
| Ball race remover                    | 07953-MJ10000                            | Attachment (07953-MJ1000A), Driver (07949-3710001) and Attachment, 37 x 40 mm (07746-0010200) | 11                |
| -attachment                          | 07953-MJ10100                            |   | (11)              |
| -driver                              | 07953-MJ10200                            |   | (11)              |
| Bearing race remover                 | 07946-3710500                            |   | 11                |
| Driver                               | 07949-3710001                            |   | 11                |
| Attachment, 37 x 40 mm               | 07746-0010200                            |   | 11                |
| Steering stem driver                 | 07946-MB00000                            |   | 11                |
| Bearing remover head, 17 mm          | 07746-0050500                            |   | 12                |
| Attachment, 24 x 26 mm               | 07746-0010700                            |   | 12                |
| Pilot, 17 mm                         | 07746-0040400                            |   | 12                |
| Pilot, 22 mm                         | 07746-0041000                            |   | 12                |
| Shock absorber compressor            | 07GME-0010000                            | -Not available in U.S.A.<br>07959-3290001   | 12                |
| -screw assembly                      | 07GME-0010100                            |   | (12)              |
| Shock absorber compressor attachment | 07959-MB10000                            |   | 12                |
| *Driver pin                          | 07GMD-KT80100                            | -Not available in U.S.A.<br>Pilot, 22 mm (07746-0041000) and Driver (07749-0010000)           | 12                |
| Driver shaft                         | 07946-MJ00100                            | -Not available in U.S.A.<br>Driver (07949-3710001)  | 12                |
| *Needle bearing remover attachment   | 07GMD-KT70200                            | -Not available in U.S.A.<br>Bushing remover (M967X-038-XXXXX)                                 | 12                |
| Attachment, 28 x 30 mm               | 07946-1870100                            |   | 12                |
| Attachment, 32 x 35 mm               | 07746-0010100                            |   | 12                |
| Pilot, 15 mm                         | 07746-0040300                            |   | 12                |
| Snap ring pliers                     | 07914-3230001                            |   | 12, 13            |
| Rotor puller                         | 07733-0020001                            | -07933-2160000<br>(U.S.A. only)   | 14                |
| Christie battery charger             | MC1012/2                                 |   | 14                |
| Battery tester                       | BM-21U                                   |   | 14                |
| Digital multitester (KOWA)           | 07411-0020000                            | -KS-AHM-32-003<br>(U.S.A. only)   | 14, 15, 16,<br>17 |
| Analogue tester                      | 07308-0020001 (SANWA)<br>or TH-5H (KOWA) |   | 14, 15, 16,<br>17 |
| Torx bit (T40)                       | 07703-0010100                            | -or equivalent commercially available in U.S.A.   | 17                |



## GENERAL INFORMATION

## LUBRICATION AND SEAL POINTS

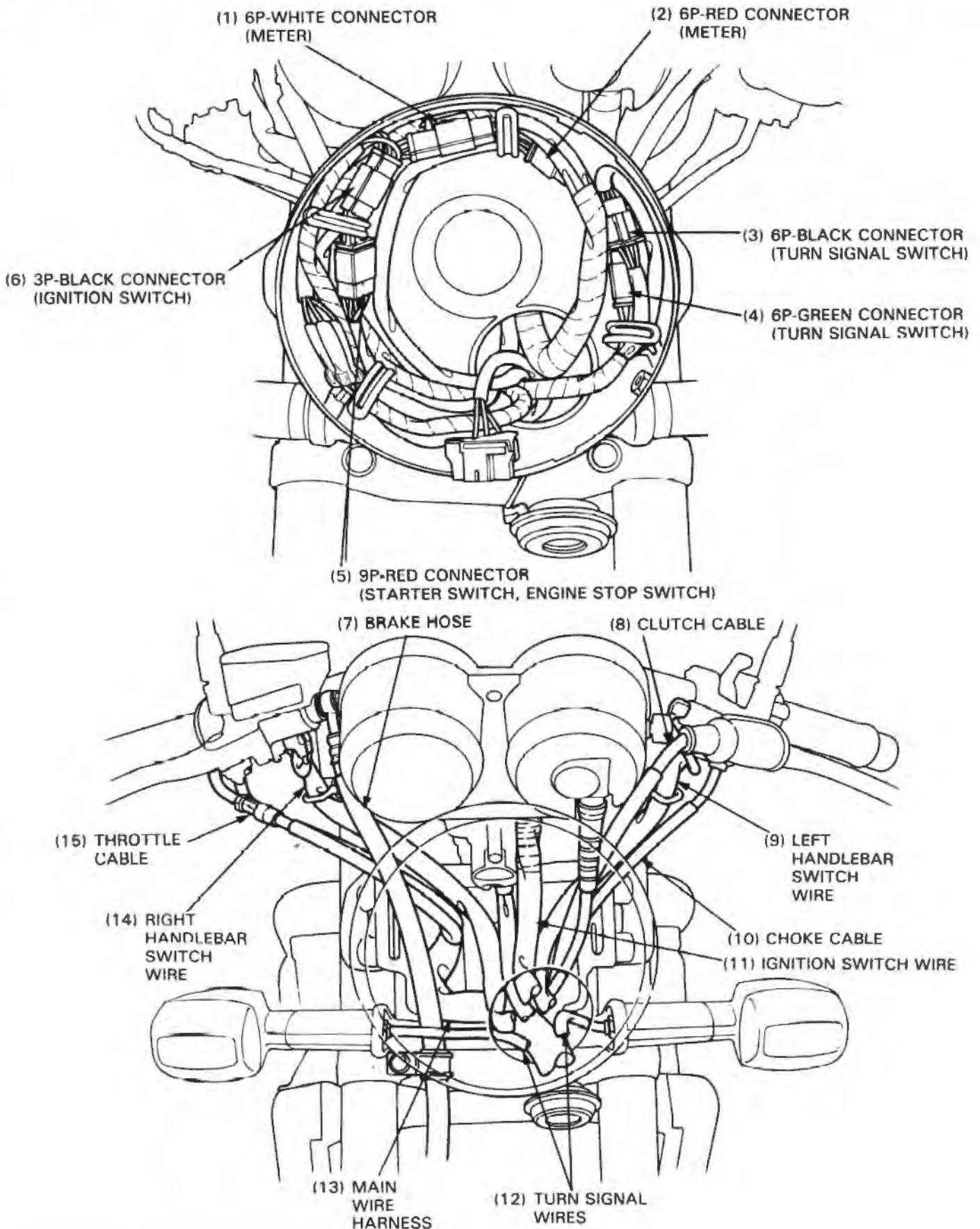
## ENGINE

| Point   | Material   | Remarks   |
|---|--|---|
| <ul style="list-style-type: none"> <li>• Intake and Exhaust valve stem sliding surface</li> <li>• Camshaft journal</li> <li>• Connecting rod small end-piston pin sliding surface</li> <li>• Transmission gear shifter groove</li> <li>• Crankshaft main journal bearing sliding surface</li> <li>• Connecting rod bearing sliding surface</li> </ul> | Molybdenum solution (mixture of the engine oil and molybdenum disulfide grease with the ratio 1 : 1) |   |
| <ul style="list-style-type: none"> <li>• Upper crankcase mating surface</li> </ul>  | Liquid sealant   | Do not apply sealant to the oil passages and near the main journal bearings |
| <ul style="list-style-type: none"> <li>• Oil pressure switch</li> <li>• Fan motor switch</li> <li>• Thermo sensor</li> <li>• Neutral switch</li> </ul>  | Sealant  | Do not apply sealant to the oil pressure switch thread head as shown.       |
| <ul style="list-style-type: none"> <li>• Gear teeth</li> <li>• Shaft journals</li> <li>• Sliding surface</li> </ul>   | Engine oil   |   |

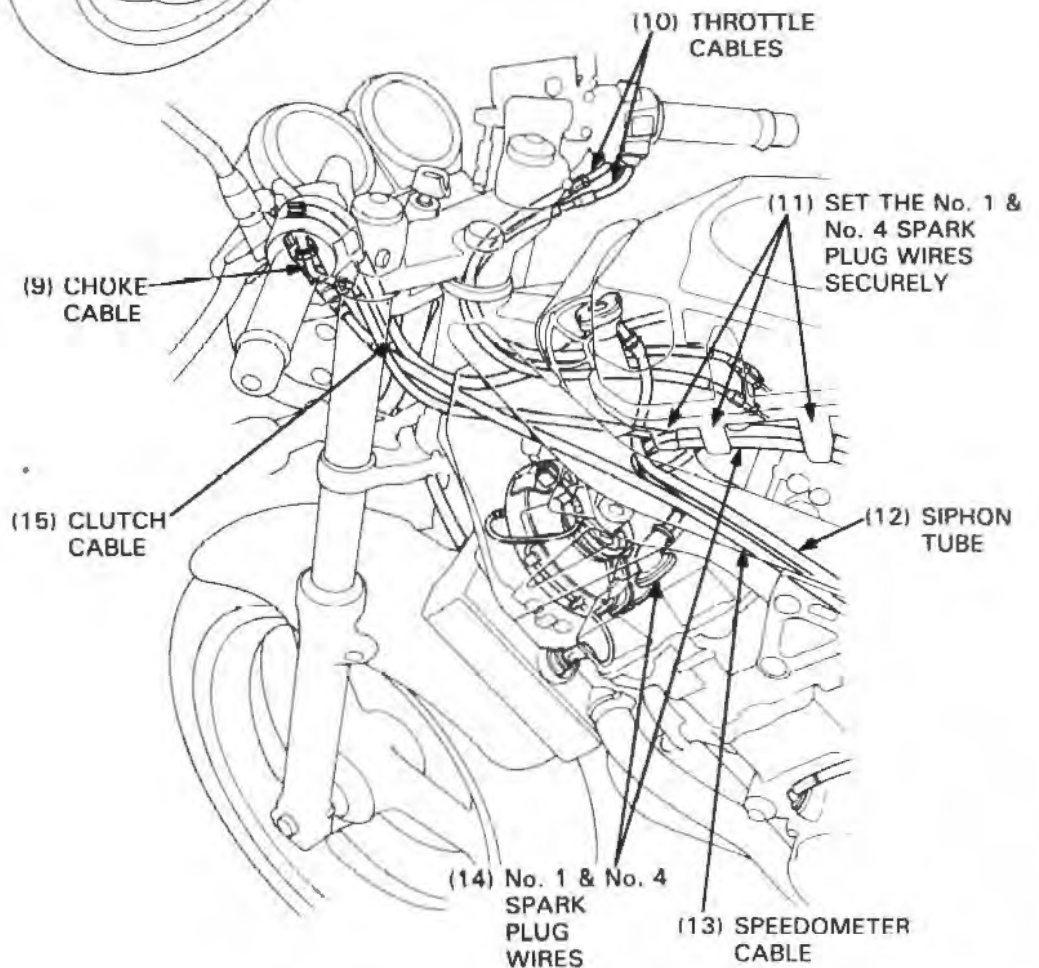
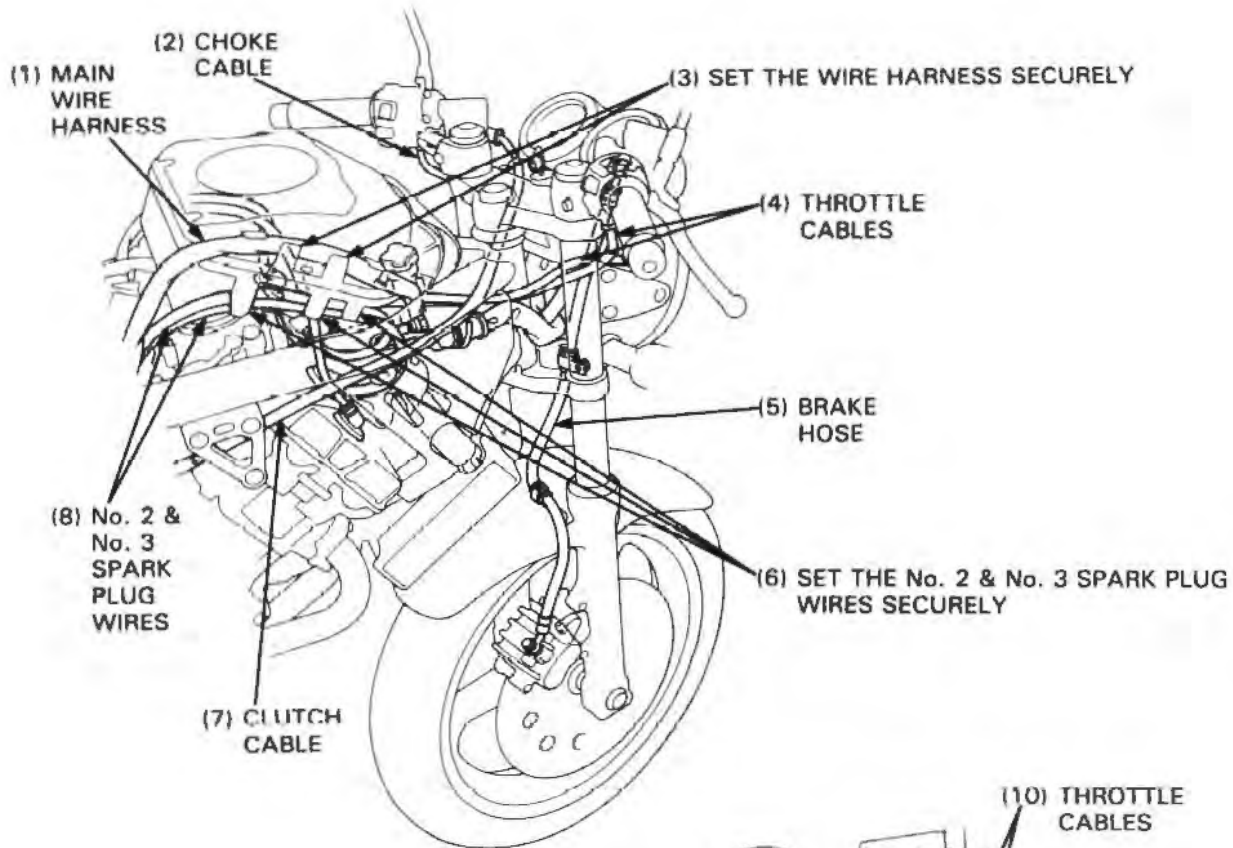
## FRAME

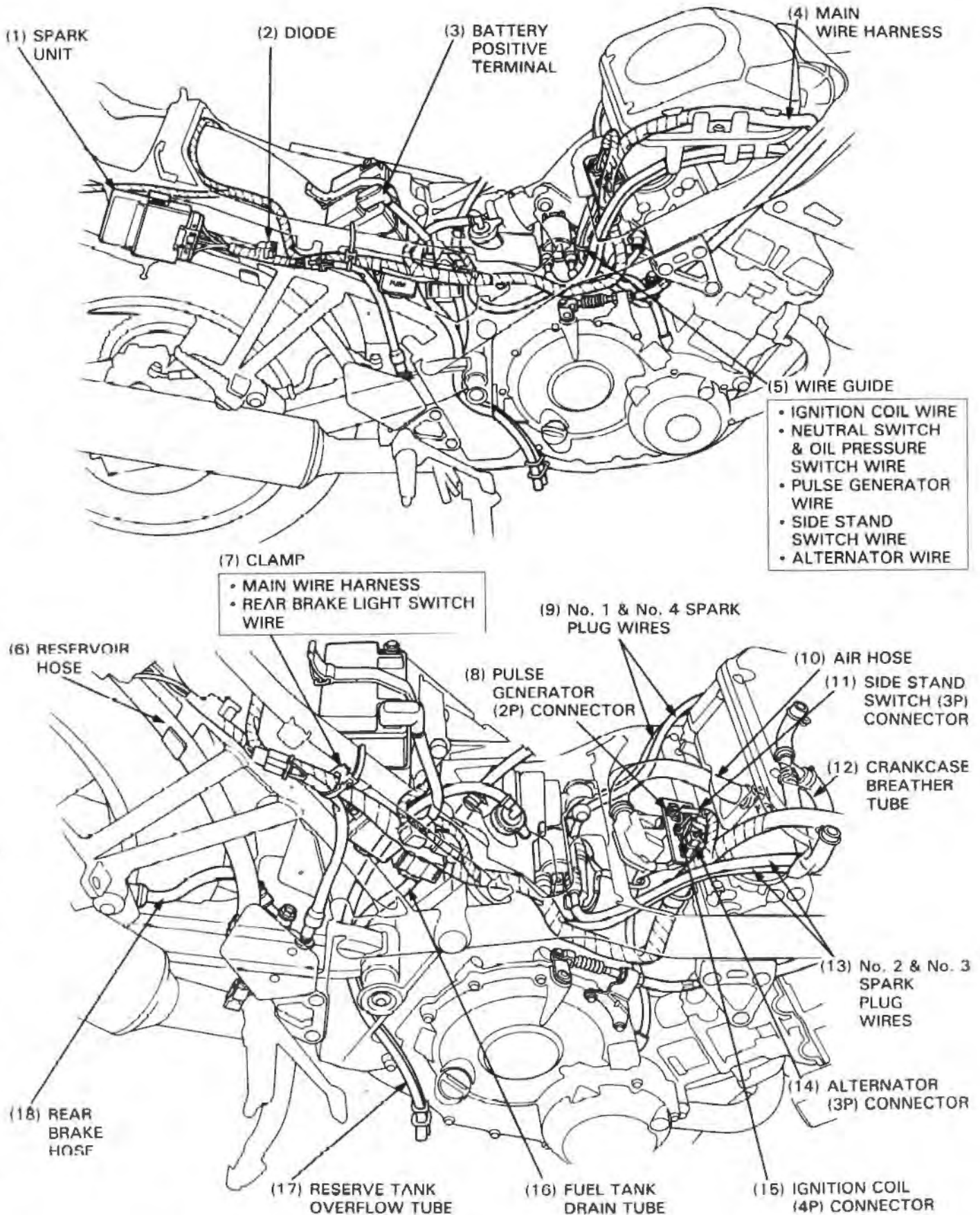
| Point  | Material   | Remarks |
|--|--|---------|
| <ul style="list-style-type: none"> <li>• Center stand pivot</li> <li>• Side stand pivot</li> <li>• Brake pedal pivot</li> <li>• Gearshift pedal pivot</li> <li>• Steering head bearings</li> <li>• Dust seal lips</li> <li>• Clutch lever pivot</li> <li>• Throttle cable ends</li> <li>• Swingarm pivot bearings</li> <li>• Seat locking tab</li> <li>• Rear wheel driven flange bearing</li> <li>• Wheel bearings</li> <li>• Speedometer gear</li> </ul> | Multipurpose grease  |         |
| <ul style="list-style-type: none"> <li>• Brake caliper seals</li> <li>• Caliper-piston sliding surface</li> <li>• Master cylinder piston cups</li> <li>• Master cylinder piston sliding surface</li> </ul>   | DOT 4 Brake fluid  |         |
| <ul style="list-style-type: none"> <li>• Brake caliper pivots</li> <li>• Brake caliper pivot boots</li> <li>• Rear brake master cylinder push rod head</li> </ul>  | Silicone grease  |         |
| <ul style="list-style-type: none"> <li>• Speedometer cable</li> <li>• Throttle cable</li> <li>• Choke cable</li> <li>• Clutch cable</li> </ul>   | Light weight oil   |         |
| <ul style="list-style-type: none"> <li>• Handlebar grip inside surface</li> </ul>  | Honda Bond A or<br>Honda Hand Grip Cement<br>(U.S.A. only) |         |

# CABLE AND HARNESS ROUTING



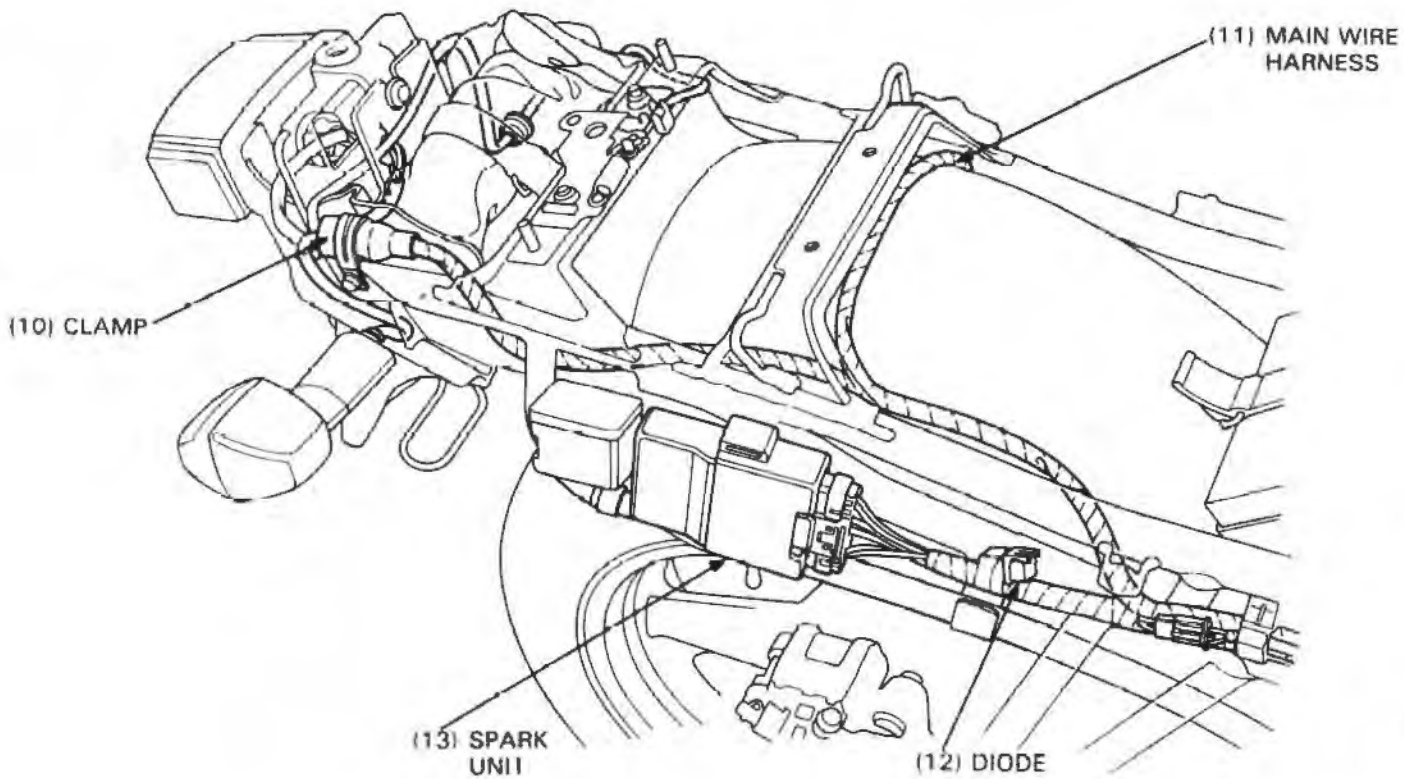
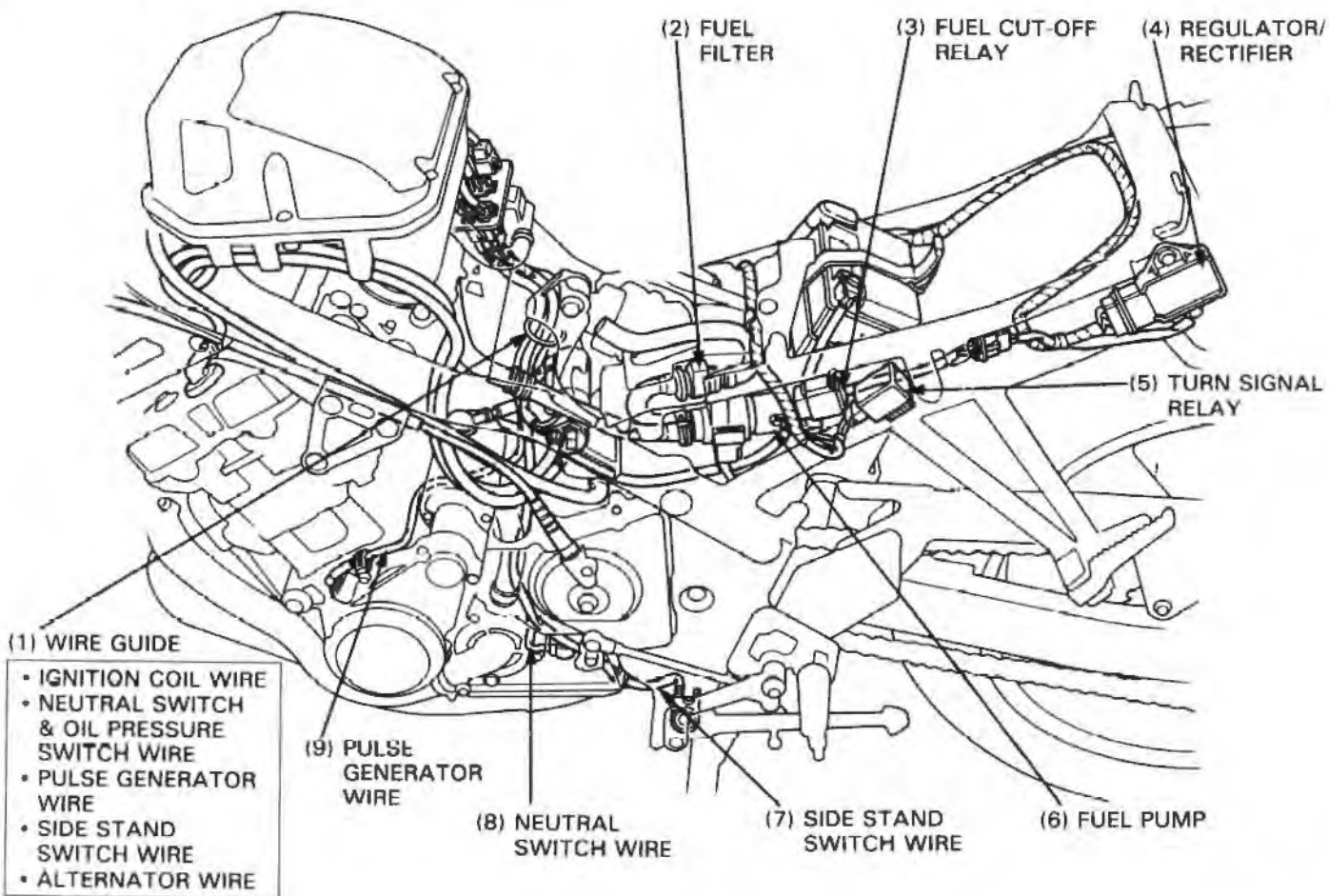
**GENERAL INFORMATION**





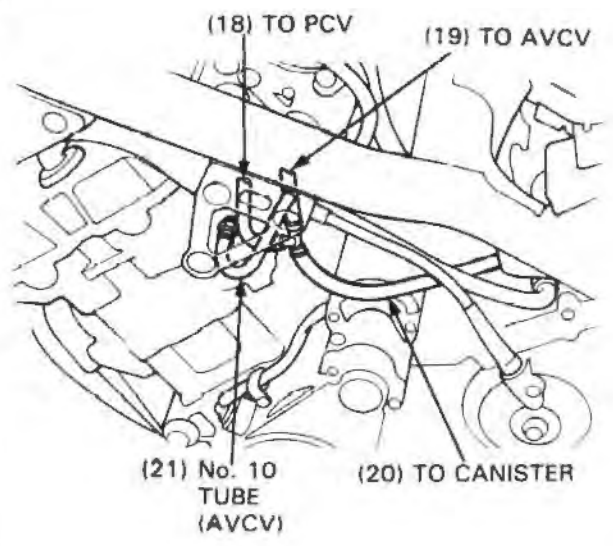
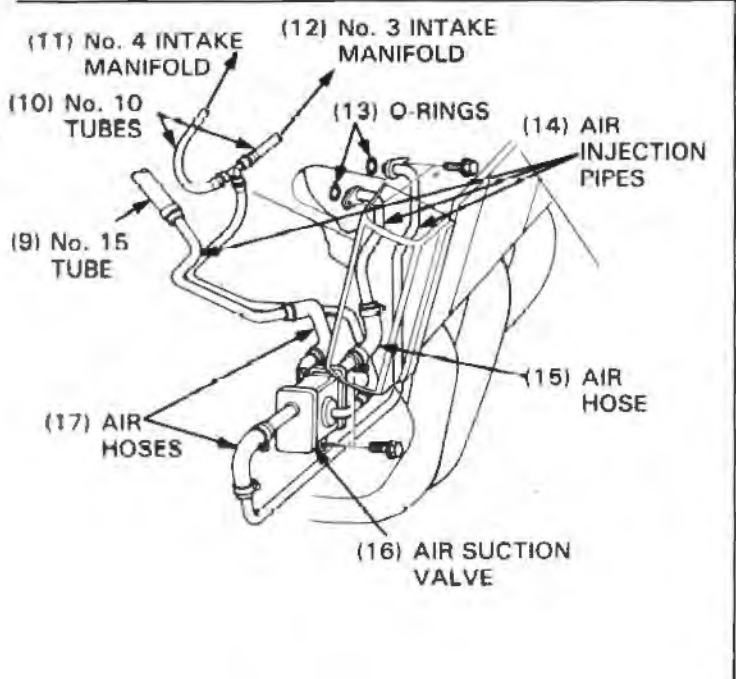
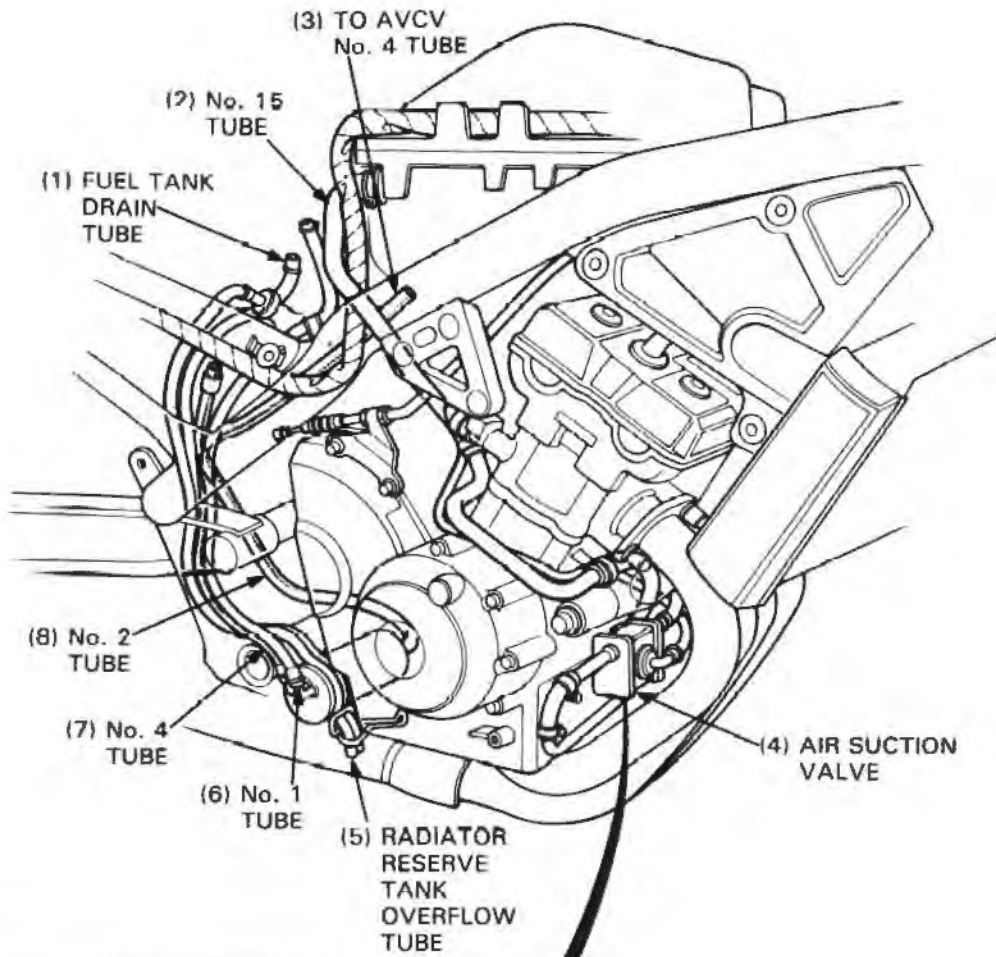


**GENERAL INFORMATION**

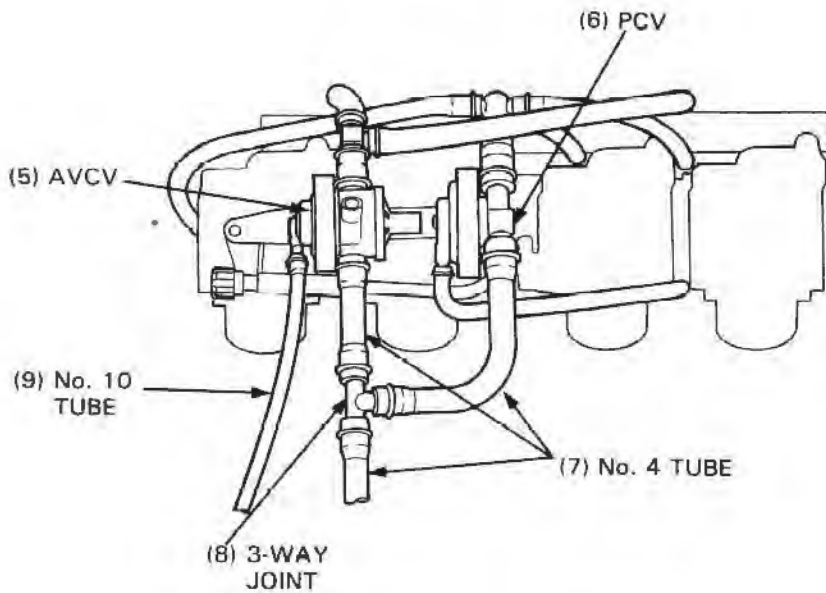
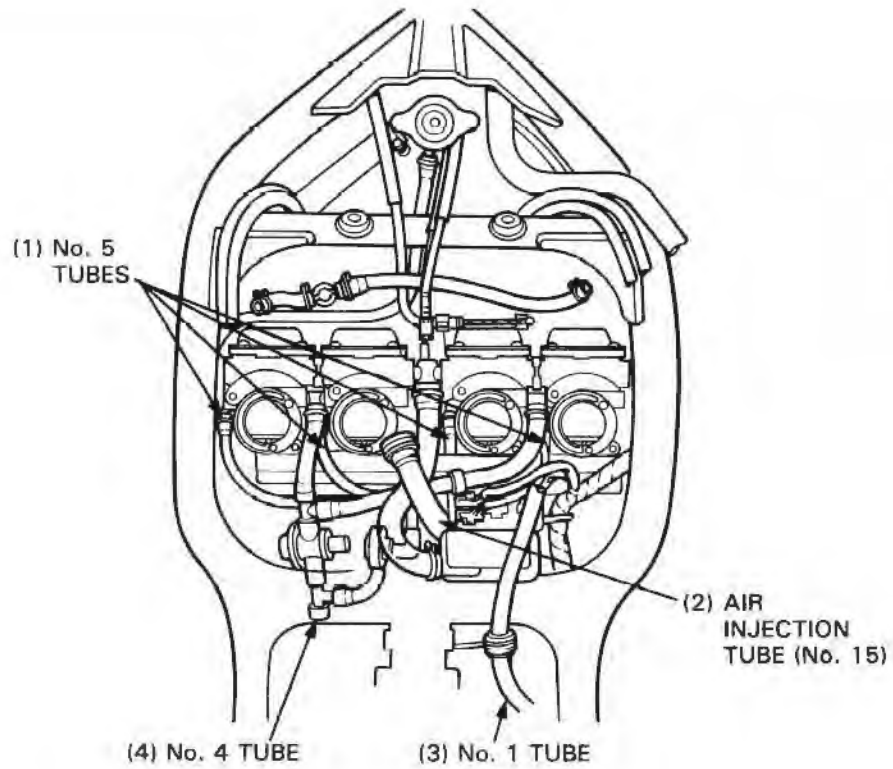




• California Model Only



**GENERAL INFORMATION**



## EMISSION CONTROL SYSTEMS

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

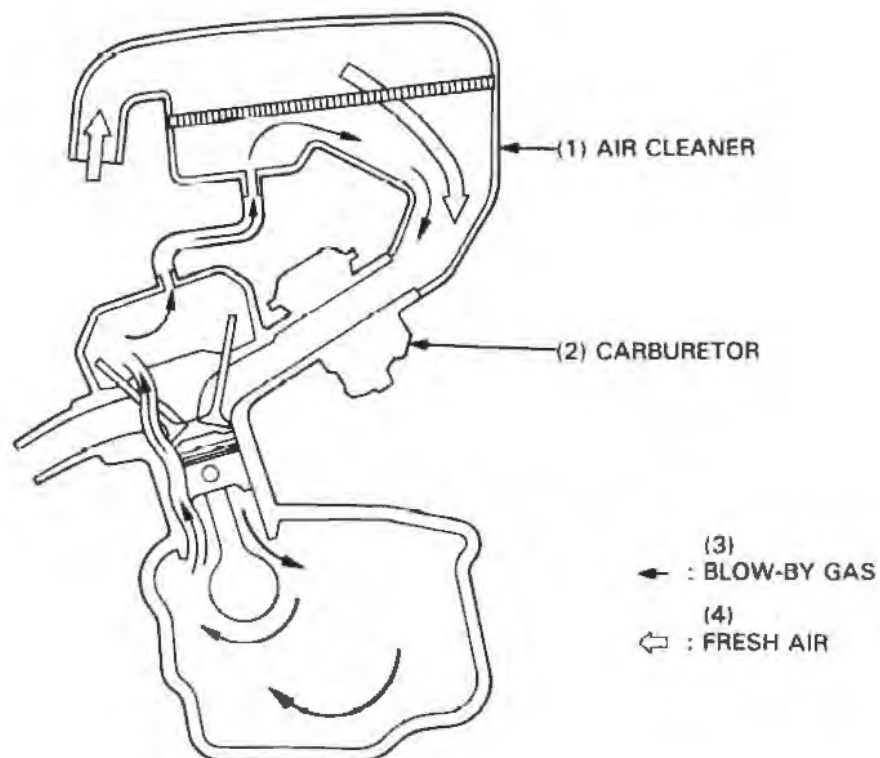
### SOURCE OF EMISSIONS

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

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

### CRANKCASE EMISSION CONTROL SYSTEM

The crankcase emission control system routes crankcase emissions through the air cleaner and into the combustion chamber. Condensed crankcase vapors are accumulated in an air/oil separator and drain tube which must be emptied periodically. Refer to the Maintenance Schedule (page 3-4). The drain tube needs to be checked for oil accumulation more frequently if the machine has been ridden mostly at high speeds or in rain.



**GENERAL INFORMATION****EXHAUST EMISSION CONTROL SYSTEM (SECONDARY AIR SUPPLY SYSTEM)****(Except California model)**

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

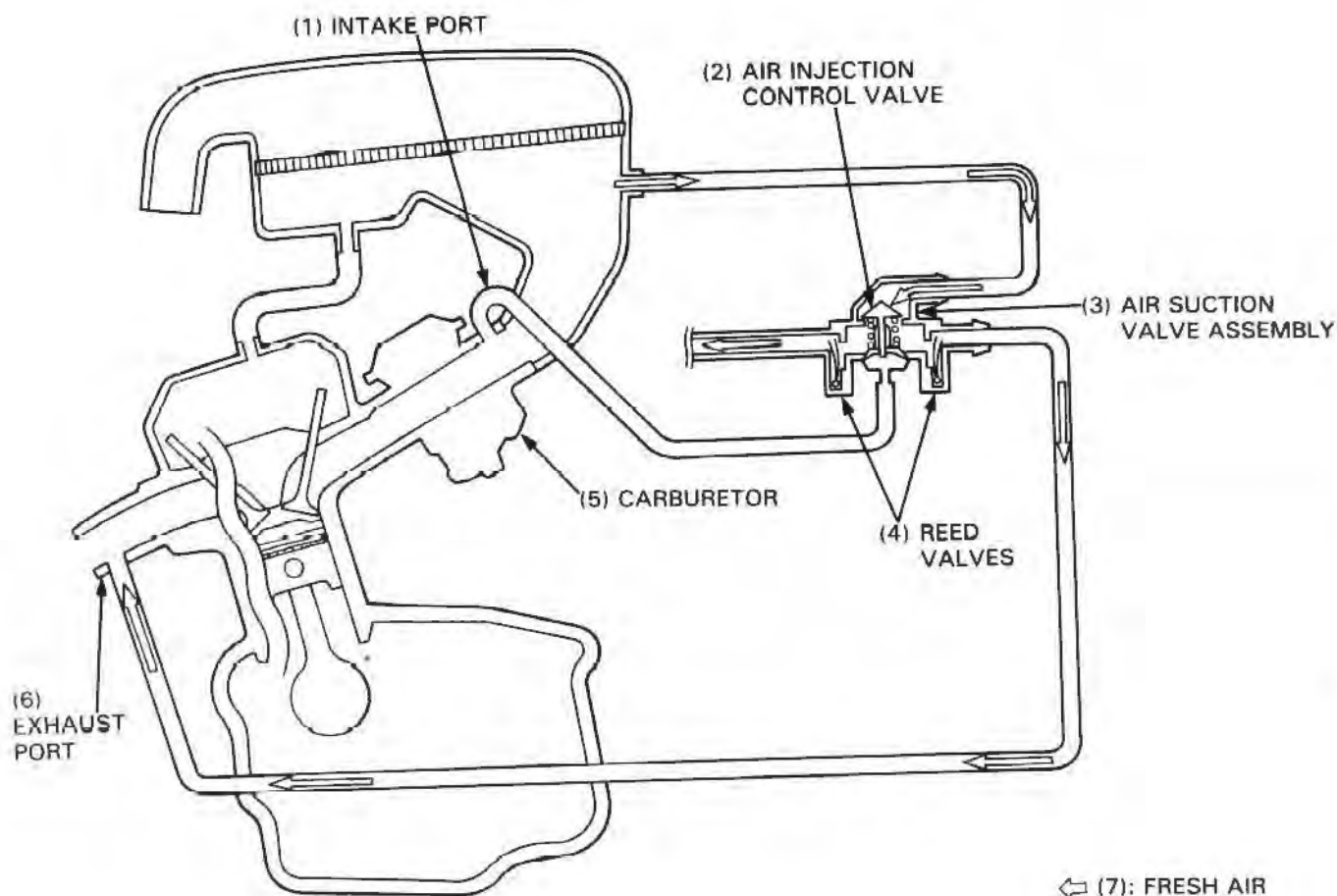
**(California model)**

The exhaust emission control system consists of a secondary air supply system which introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port whenever there is a negative pressure pulse in the exhaust system. This charge of fresh air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water vapor.

This model has the air suction valve; it consists of reed valves built into the air injection control valve.

A reed valve prevents reverse air flow through the system. The air injection control valve reacts to high intake manifold vacuum and will cut off the supply of fresh air during engine deceleration, thereby preventing afterburn in the exhaust system.

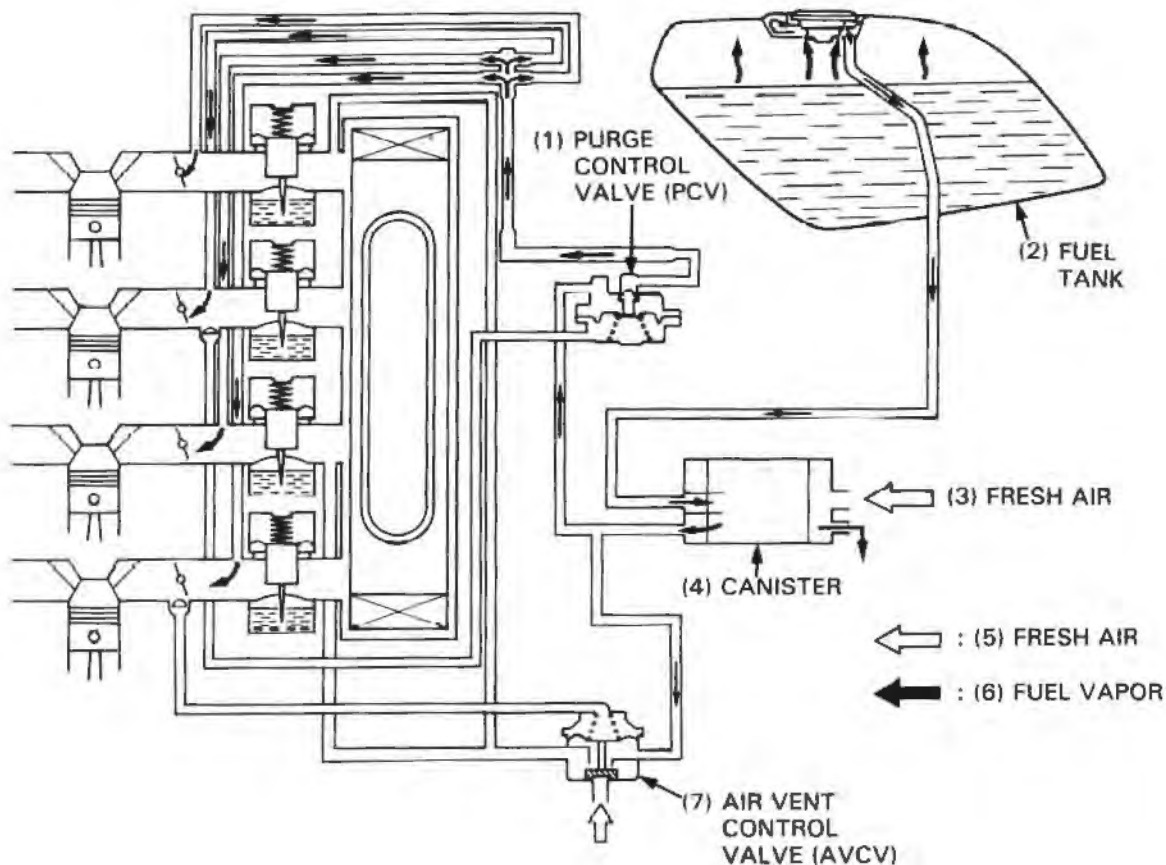
No adjustments to the secondary air supply system should be made, although periodic inspection of the components is recommended.



**EVAPORATIVE EMISSION CONTROL SYSTEM (California model only)**

This vehicle complies with the California Air Resources Board requirements for evaporative emission regulations.

Fuel vapor from the fuel tank and carburetors is routed into the charcoal canister where it is absorbed and stored while the engine is stopped. When the engine is running and the purge control diaphragm valve is open fuel vapor in the charcoal canister is drawn into the engine through the carburetor. At the same time, the air vent control valve is open and air is drawn into the carburetor through the valve.

**NOISE EMISSION CONTROL SYSTEM**

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

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

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

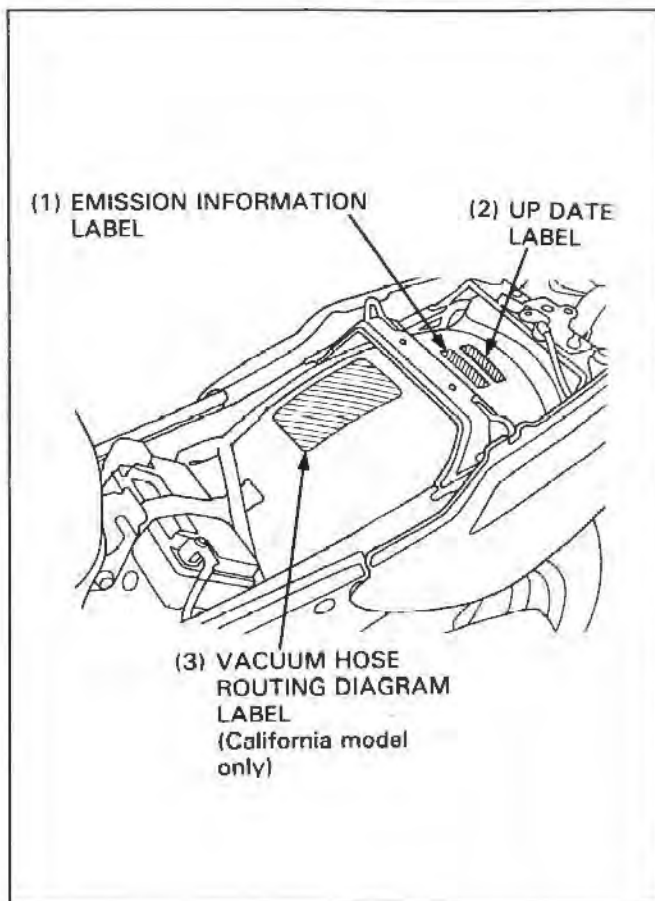


**GENERAL INFORMATION****EMISSION CONTROL  
INFORMATION LABELS  
(U.S.A. Only)**

An Emission Information Label is located on the rear fender as shown. The seat must be removed to read it. It gives basic tune-up specifications.

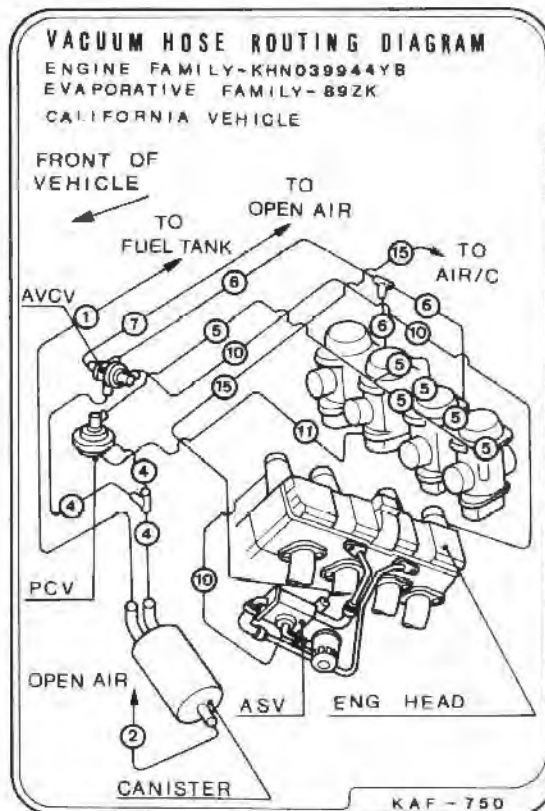
**VEHICLE EMISSION CONTROL INFORMATION  
UPDATE LABEL**

After making a high altitude carburetor adjustment, attach an update label on the rear fender as shown.

**VACUUM HOSE ROUTING DIAGRAM LABEL  
(California model only)**

The Vacuum Hose Routing Diagram Label is on the rear fender as shown. The seat must be removed to read it.

Route the vacuum hoses as shown on this label.



## 2. FRAME/BODY PANELS/EXHAUST SYSTEM

2

|                                       |     |   |     |
|---------------------------------------|-----|---|-----|
| SERVICE INFORMATION                   | 2-1 | SIDE COVER REMOVAL/INSTALLATION         | 2-3 |
| TROUBLESHOOTING                       | 2-1 | EXHAUST SYSTEM REMOVAL/<br>INSTALLATION | 2-3 |
| SEAT REMOVAL/INSTALLATION             | 2-2 | FUEL TANK REMOVAL/INSTALLATION          | 2-4 |
| REAR FAIRING REMOVAL/<br>INSTALLATION | 2-2 |   |     |

### SERVICE INFORMATION

- When removing a cover, be careful not to damage any tab or groove.

#### ⚠ WARNING

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

#### NOTE

- Replace the exhaust pipe gaskets if the exhaust system is removed.
- Tighten the exhaust pipe joint nuts first, then the mounting bolts.
- Although it is possible to weld some cracked frames and straighten some frames that are slightly bent it is best to replace the frame with a new one when it is damaged.
- Generally speaking, plastic body panels cannot be repaired and therefore must be replaced.
- It is possible that a front end collision will bend the steering head of the frame, but not the fork, wheel or even the axle.

### TROUBLESHOOTING

- Failure of the front suspension, steering or rear suspension may damage the frame enough to require replacement.
- Refer to the section 18 of the Common Service Manual for front suspension and steering inspections.
- Refer to the section 19 of the Common Service Manual for rear suspension inspection.

#### Abnormal engine vibration

- Cracked or damaged engine mounts
- Cracked, damaged or bent welded portions
- Bent or damaged frame
- Engine problems

#### Abnormal noise when riding (banging or cracking)

- Damaged or bent engine mounts
- Damaged welded points
- Damaged or bent frame

#### Steers to one side when under acceleration or deceleration

- Bent frame
- Bent fork
- Bent swingarm

**FRAME/BODY PANELS/EXHAUST SYSTEM****SEAT REMOVAL/INSTALLATION**

Insert the ignition key into the seat lock/helmet holder and turn the key clockwise and push down the lever; release the seat locking.

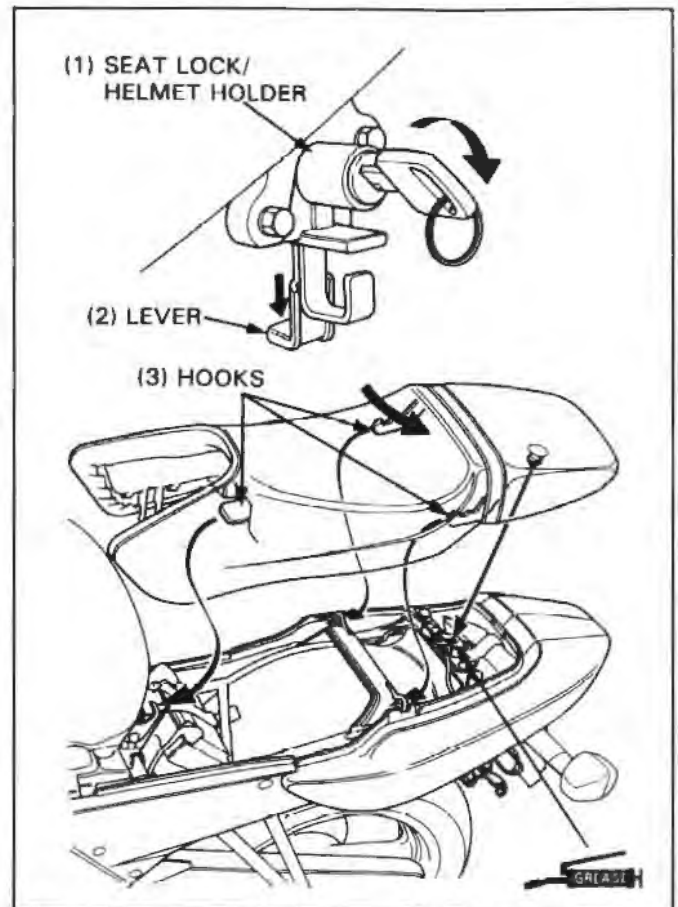
Pushing the seat as shown, remove the seat rearward.

Align the seat hooks with the frame hooks and push the seat forward.

Press the rear of the seat down and lock the seat securely.

**CAUTION**

- Apply grease to the seat locking.
- Be careful not to pinch the wire harness between the seat and the frame.

**REAR FAIRING REMOVAL/  
INSTALLATION**

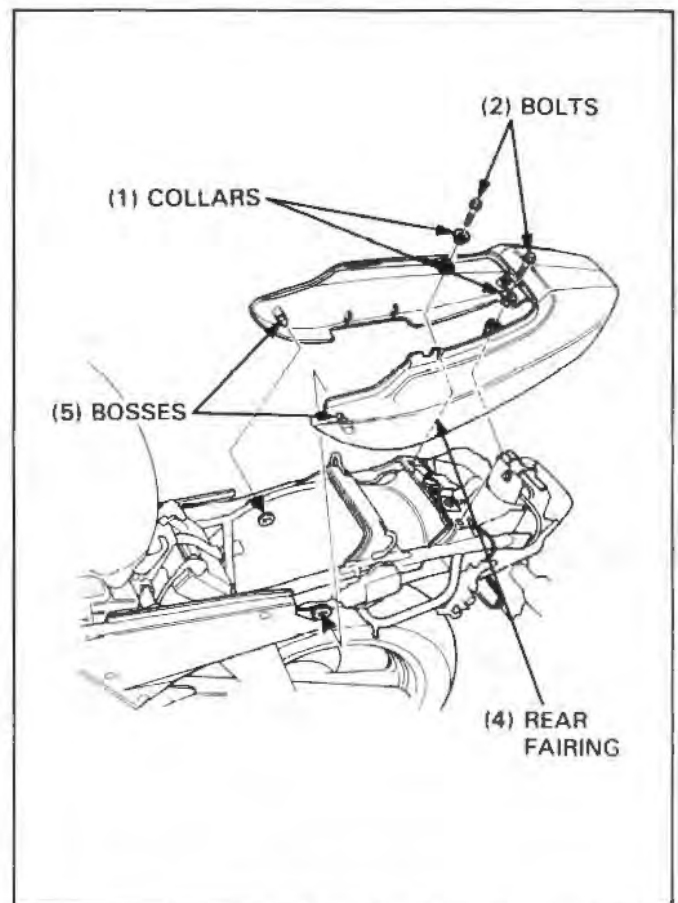
Remove the seat (above).

Remove the bolts and collars.

Release the fairing front bosses from the grommets.

Remove the rear fairing rearward.

Install the rear fairing in the reverse order of removal.



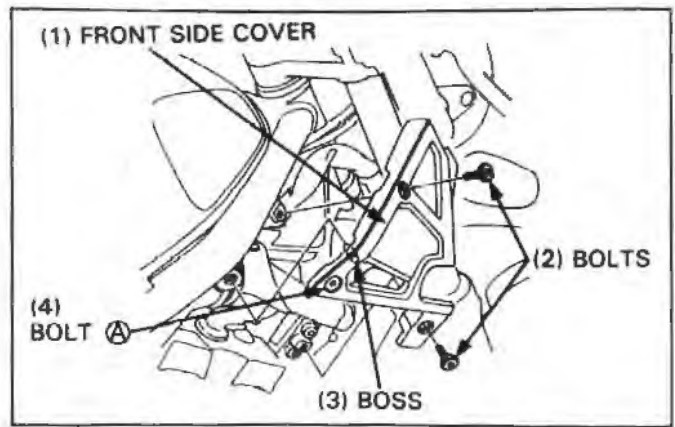
## SIDE COVER REMOVAL/ INSTALLATION

### FRONT SIDE COVER

Remove the bolts.  
Release the boss from the frame grummet and remove the front side cover.  
Install the side cover in the reverse order of removal.

#### NOTE

- It is not necessary to remove the bolt  as shown.



### REAR SIDE COVER

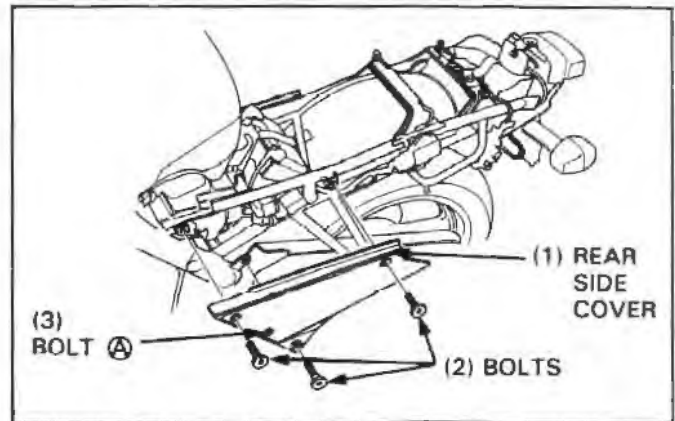
Remove the following:  
seat (page 2-2).  
Release the rear fairing front bosses from the grommets (page 2-2).

Remove the bolts and rear side cover.

Install the side cover in the reverse order of removal.

#### NOTE

- It is not necessary to remove the bolt  as shown.



## EXHAUST SYSTEM REMOVAL/ INSTALLATION

Remove the radiator lower mounting bolts and loosen the upper mounting bolt/nut (page 5-5). Swing the radiator forward.

Remove the following:

- exhaust pipe joint nuts.
- muffler mounting bolts and exhaust pipe/muffler.
- gaskets.

#### NOTE

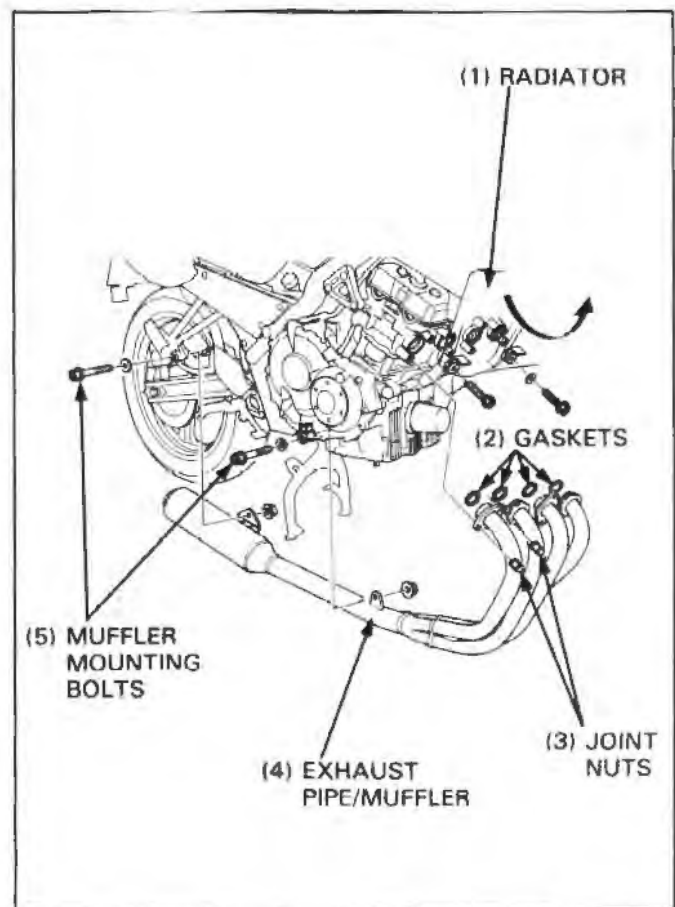
- Replace the exhaust pipe gaskets if the exhaust system is removed.

Install new gaskets and exhaust pipe/muffler.  
Tighten the exhaust pipe joint nuts first.

**TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)**

Then tighten the muffler mounting bolts.

**TORQUE: 22 N·m (2.2 kg-m, 16 ft-lb)**



## FRAME/BODY PANELS/EXHAUST SYSTEM

FUEL TANK REMOVAL/  
INSTALLATION**▲ WARNING**

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

Remove the seat (page 2-2).

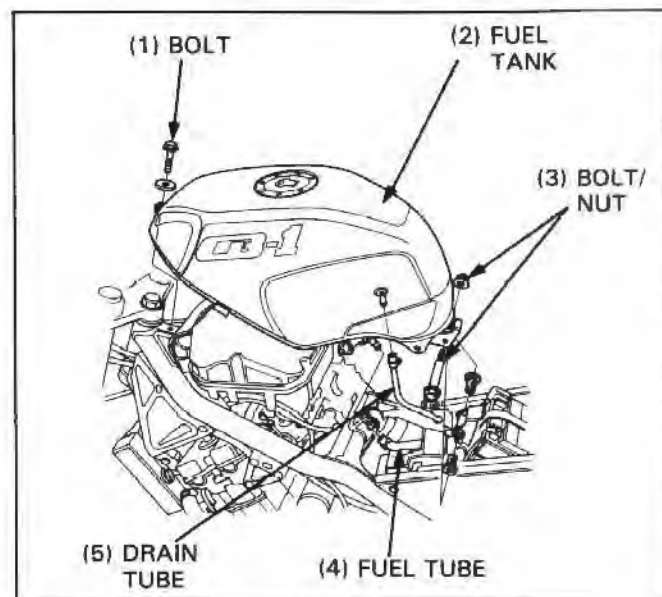
Turn the fuel valve OFF.

Remove the fuel tank mounting bolts and lift the tank up. Disconnect the tubes, and remove the fuel tank.

Install the fuel tank in the reverse order of removal.

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

Install the seat (page 2-2).





## 3. MAINTENANCE

|                      |     |                            |     |
|----------------------|-----|----------------------------|-----|
| SERVICE INFORMATION  | 3-1 | SPARK PLUG                 | 3-5 |
| SERVICE ACCESS GUIDE | 3-2 | VALVE CLEARANCE            | 3-5 |
| MAINTENANCE SCHEDULE | 3-4 | CARBURETOR SYNCHRONIZATION | 3-8 |
| AIR CLEANER          | 3-5 | SIDE STAND                 | 3-8 |

### SERVICE INFORMATION

- Refer to the Common Service Manual for items not included in this manual.
- Refer to the specifications (Section 1) for maintenance service data.

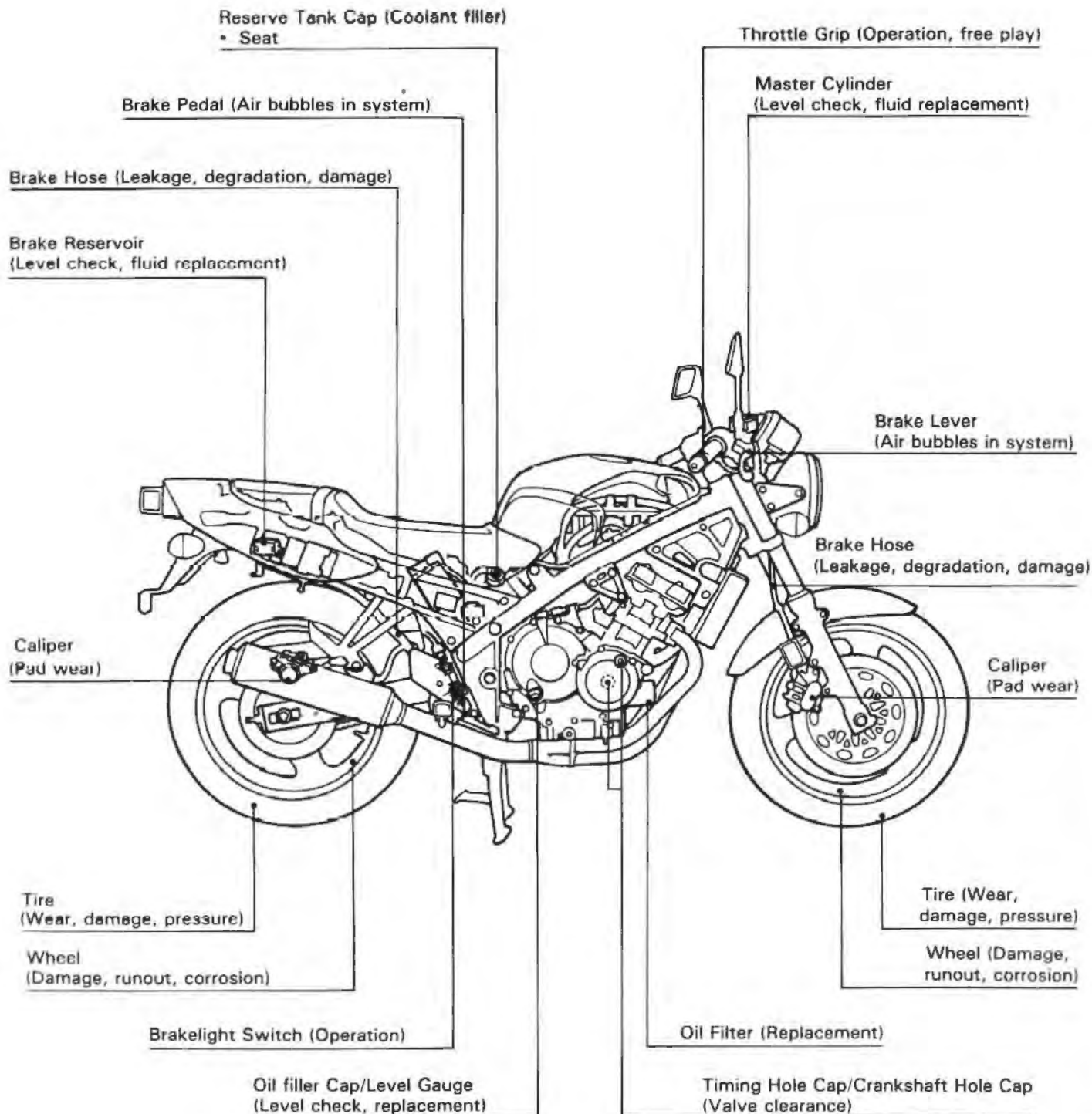
## MAINTENANCE

### SERVICE ACCESS GUIDE

- The following shows the locations of the maintenance items listed below and the parts required to be removed for that maintenance service. Refer to the Common Service Manual for items not instructed in this manual.
- Refer to section 2 (Frame/Body panels/Exhaust system), the parts required to be removed for service.

For example: AIR CLEANER (Contamination, clogging, replacement) ——— maintenance parts (service item)

- Fuel tank ——— parts required to be removed for service



Air Cleaner  
(Contamination, clogging, replacement page 3-5)  
• Fuel tank

Synchronization Adjusting Screw  
(Carburetor synchronization page 3-8)  
• Fuel tank

Carburetor Choke (Operation)

PCV and AICV (Damage, faulty hose page 6-13)

Clutch lever (Free play)

Reserve Tank (Coolant level)

Headlight (Aim)

Steering Head Bearings (Damage)

Valve Clearance  
(page 3-5)

Suspension  
(Loose, wear, damage)

Suspension  
(Loose, wear, damage)

Drive Chain  
(Free play, lubrication, replacement)

ASV (Damage, faulty hose page 6-13)

Side Stand (page 3-8)

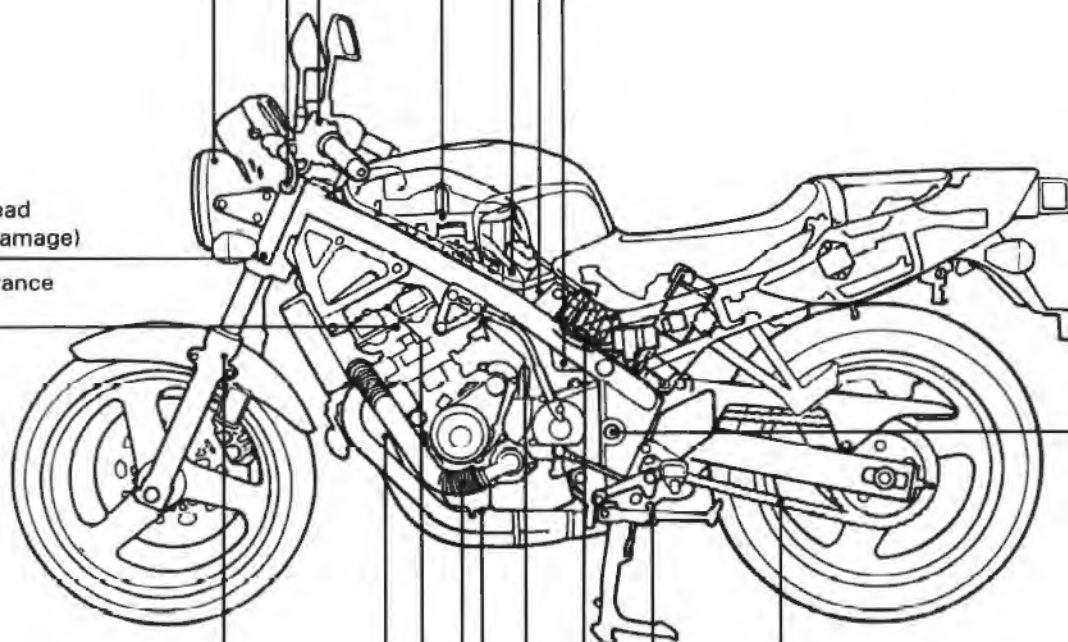
Spark Plug (Wear, damage, coloration)  
• Front side cover

Fuel Filter (clogging)  
Fuel Line (Damage, leakage)

Radiator Hose (Leakage, degradation, damage)

Engine Oil Drain Bolt (Oil replacement)

Throttle Stop Screw (Idle speed)



## MAINTENANCE

## 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, L: Lubricate

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

| ITEM                       | FREQUENCY                             | WHICHEVER COMES FIRST<br>→<br>↓<br>NOTE | ODOMETER READING (NOTE 1)    |     |   |    |    |    |        |            | Refer to page |
|----------------------------|---------------------------------------|---|------------------------------|-----|---|----|----|----|--------|------------|---------------|
|                            |                                       |   | x 1000 km                    | 1   | 6 | 12 | 18 | 24 | 30     | 36         |               |
|                            |                                       |   | x 1000 mi                    | 0.6 | 4 | 8  | 12 | 16 | 20     | 24         |               |
| EMISSION RELATED ITEMS     | * FUEL LINE                           |   |                              |     | I |    | I  |    | I      | NOTE 5     |               |
|                            | * THROTTLE OPERATION                  |   |                              |     | I |    | I  |    | I      | NOTE 5     |               |
|                            | * CARBURETOR CHOKE                    |   |                              |     | I |    | I  |    | I      | NOTE 5     |               |
|                            | AIR CLEANER                           | NOTE 2                                  |                              |     |   | R  |    |    | R      | 3-5        |               |
|                            | SPARK PLUG                            |   |                              | R   | R | R  | R  | R  | R      | 3-5/NOTE 5 |               |
|                            | * VALVE CLEARANCE                     |   | I                            |     |   |    | I  |    |        | 3-5        |               |
|                            | ENGINE OIL                            |   | R                            |     | R |    | R  |    | R      | NOTE 5     |               |
|                            | ENGINE OIL FILTER                     |   | R                            |     | R |    | R  |    | R      | NOTE 5     |               |
|                            | * CARBURETOR SYNCHRONIZATION          |   |                              |     | I |    | I  |    | I      | 3-8/NOTE 5 |               |
|                            | * CARBURETOR IDLE SPEED               |   | I                            | I   | I | I  | I  | I  | I      | NOTE 5     |               |
|                            | RADIATOR COOLANT                      | NOTE 3                                  |                              |     | I |    | I  |    | R      | NOTE 5     |               |
|                            | * COOLING SYSTEM                      |   |                              |     | I |    | I  |    | I      | NOTE 5     |               |
|                            | * SECONDARY AIR SUPPLY SYSTEM         | NOTE 4                                  |                              |     | I |    | I  |    | I      | NOTE 5     |               |
|                            | * EVAPORATIVE EMISSION CONTROL SYSTEM | NOTE 4                                  |                              |     |   | I  |    | I  |        | NOTE 5     |               |
| NON-EMISSION RELATED ITEMS | DRIVE CHAIN                           |   | I, L EVERY 500 mi (1,000 km) |     |   |    |    |    |        |            | NOTE 5        |
|                            | BRAKE FLUID                           | NOTE 3                                  |                              | I   | I | R  | I  | I  | R      | NOTE 5     |               |
|                            | BRAKE PAD WEAR                        |   |                              | I   | I | I  | I  | I  | I      | NOTE 5     |               |
|                            | BRAKE SYSTEM                          |   |                              | I   |   | I  |    | I  |        | NOTE 5     |               |
|                            | * BRAKE LIGHT SWITCH                  |   |                              |     | I |    | I  |    | I      | NOTE 5     |               |
|                            | * HEADLIGHT AIM                       |   |                              |     | I |    |    |    | I      | NOTE 5     |               |
|                            | CLUTCH SYSTEM                         |   |                              | I   | I | I  | I  | I  | I      | NOTE 5     |               |
|                            | SIDE STAND                            |   |                              |     | I |    | I  |    | I      | 3-8        |               |
|                            | * SUSPENSION                          |   |                              |     | I |    | I  |    | I      | NOTE 5     |               |
|                            | * NUTS, BOLTS, FASTENERS              |   |                              | I   |   | I  |    | I  |        | NOTE 5     |               |
| ** WHEELS/TIRES            |                                       |   |                              | I   |   | I  |    | I  | NOTE 5 |            |               |
| ** STEERING HEAD BEARINGS  |                                       |   | I                            |     | I |    | I  |    | NOTE 5 |            |               |

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

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

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. Californian type only.

5. Refer to the Common Service Manual.

## AIR CLEANER

Remove the following:

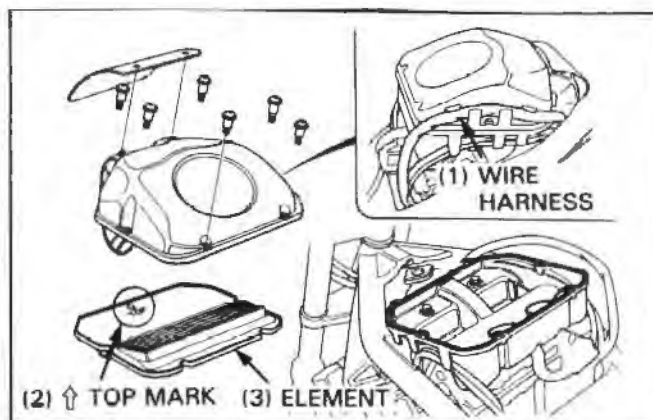
- fuel tank (page 2-4).
- air cleaner case cover (page 6-3).

Discard the air cleaner element in accordance with the main maintenance schedule.

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

Install the air cleaner element with the ↑ mark forward and the TOP mark facing up.

Install the wire harness into the wire harness clamp on the cover securely.



## SPARK PLUG

### NOTE

- For detailed instructions, refer to section 2 of the Common Service Manual. Instruction for removal/installation of only the No. 2 and No. 3 spark plugs is given here. No. 1 and No. 2 plug can be removed easily only to remove the front side cover.

Remove the front side covers (page 2-3).

The spark plug wrench is included in the tool kit.

Insert the plug wrench between the heat guard plate and cylinder head cover as shown, and set the wrench onto the spark plug.

Turn the plug wrench and remove the spark plug.

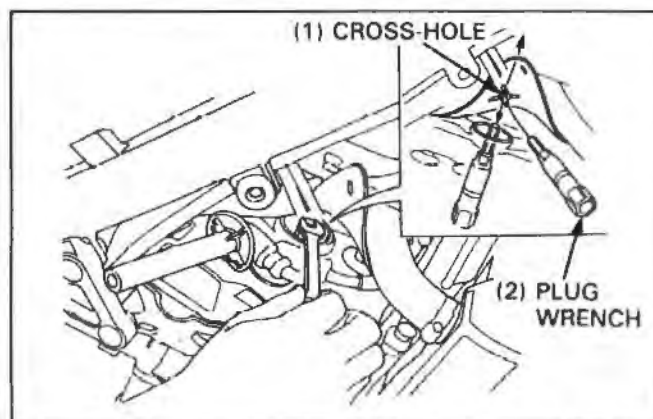
Then lift up the wrench with the plug, through the heat guard cross-hole.

Pull the wrench out of the cylinder head.

Remove the spark plug from the wrench.

Install a new spark plug into the cylinder in the reverse order of removal.

Tighten the spark plug 1/2 turn with an open end wrench to compress the plug sealing washer.



## VALVE CLEARANCE

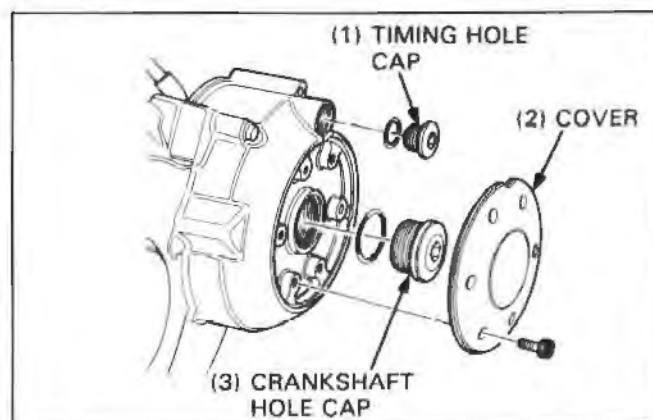
### INSPECTION

### NOTE

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

Remove the following:

- timing hole cap (page 9-2).
- crankshaft hole cap cover (page 9-2).
- crankshaft hole cap (page 9-2).
- air cleaner case (page 6-3).

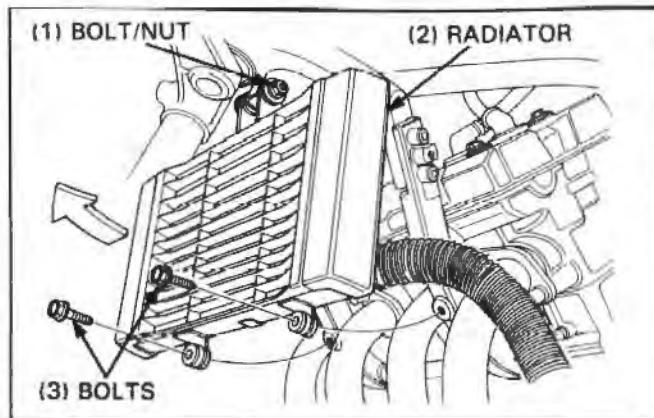




**MAINTENANCE**

Remove the radiator lower mounting bolts and loosen the upper mounting bolt/nut.  
Swing the radiator forward.

Remove the cylinder head cover (page 8-2).

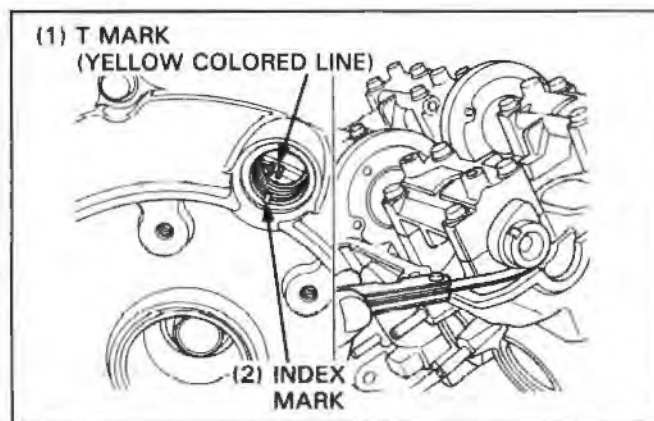


Rotate the crankshaft clockwise.

Align the T mark (Yellow colored line) on the flywheel with the index mark on the right crankcase cover. Each timing mark (EX and IN) on the camshaft gears should be aligned with the cylinder head upper surface.

If each timing mark is facing outside, No. 4 cylinder piston is at TDC (Top Dead Center) on the compression stroke, go to Step 1.

If each timing mark is facing inside, No. 1 cylinder piston is at TDC (Top Dead Center) on the compression stroke, go to Step 2.



Step 1:

Insert the feeler gauge between the cam lobe and valve bucket.

Measure the valve clearance as follow:

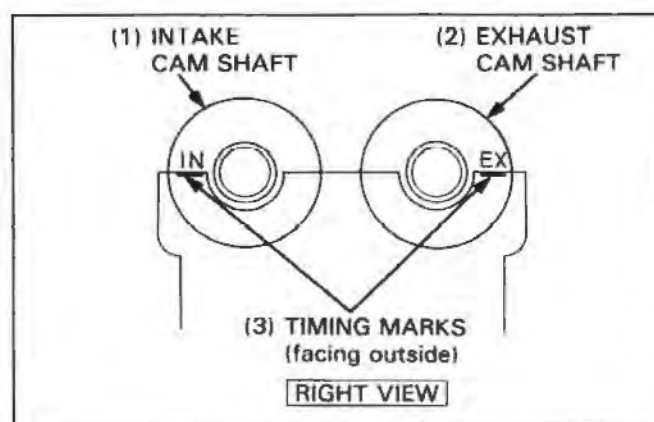
- No. 2 (IN)
- No. 3 (EX)
- No. 4 (IN/EX)

Step 2:

Insert the feeler gauge between the cam lobe and valve bucket.

Measure the valve clearance as follow:

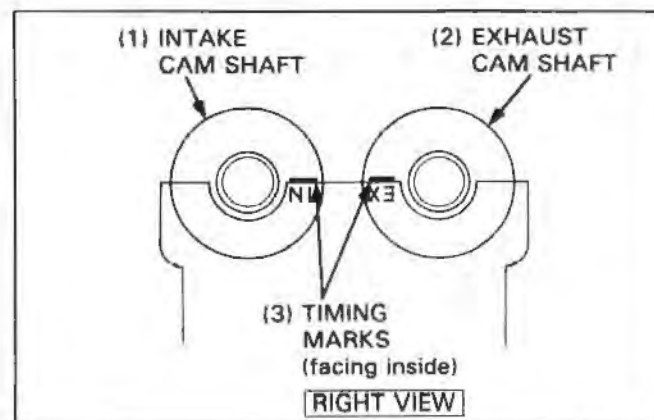
- No. 1 (IN/EX)
- No. 2 (EX)
- No. 3 (IN)

**VALVE CLEARANCES:**

IN: 0.12–0.18 mm (0.005–0.007 in)

EX: 0.17–0.23 mm (0.007–0.009 in)

Rotate the crankshaft 360 degrees and align the T mark with the index mark again and go to Step 2 or 1 to check other valve clearances.



## SHIM SELECTION

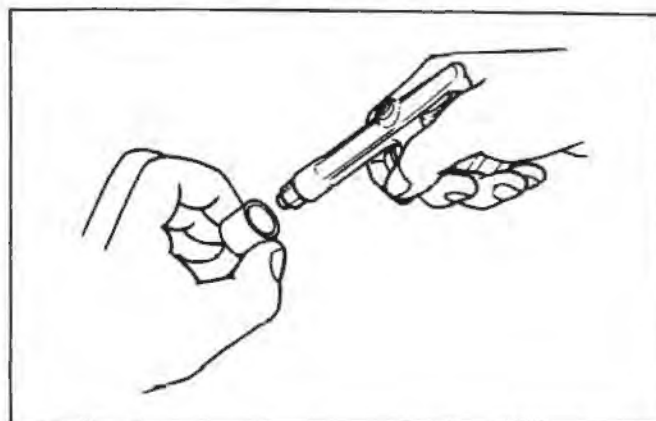
If the clearance is not correct:

Remove the camshafts (page 8-2).

Remove the valve buckets and shims (page 8-6).

### NOTE

- Do not allow shims to fall into the crankcase. The shim(s) may occasionally stick to the bucket.
- Mark the positions of all buckets and shims to ensure correct reassembly.
- It is easy to remove the valve bucket with a valve lapping tool or magnet.
- Remove the shims with tweezers or a magnet.

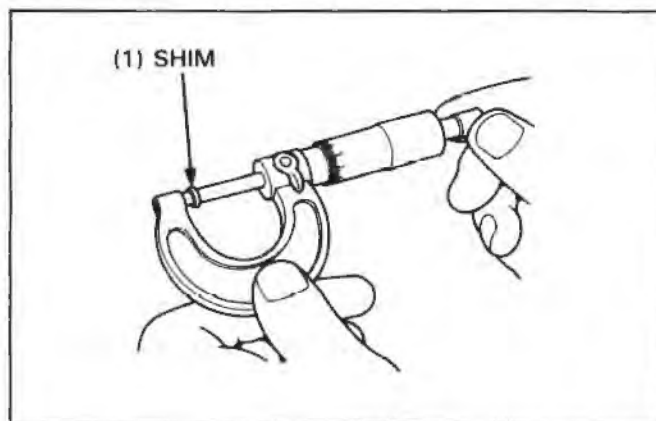


Clean the valve buckets with compressed air.

Measure the shim thickness with a micrometer and record it.

### NOTE

- Sixty-five different shims are available in thickness intervals of 0.025 mm. The thinnest is 1.200 mm the thickest is 2.800 mm.



To confirm your shim choice, you may use the following formula:

$$a = (b - c) + d$$

**a:** new shim thickness

**b:** recorded valve clearance

**c:** specified valve clearance (IN: 0.15 mm EX: 0.20 mm)

**d:** old shim thickness

**example:**

**b:** recorded valve clearance: 0.18 mm

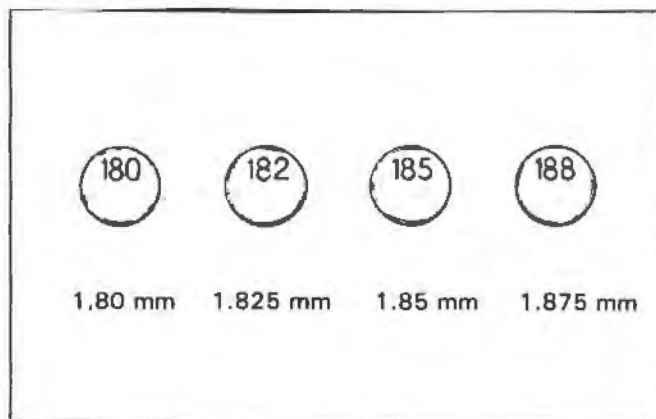
**d:** old shim thickness: 1.850 mm

**c:** specified valve clearance: 0.15 mm

$$a = (0.18 - 0.15) + 1.850$$

$$a = 1.880$$

**now shim thickness – 1.875 mm**



### NOTE

- If the required thickness of the new shim is more than 2.800 mm, the valve seat is probably heavily carboned. Reface the seat, recheck valve clearance and reselect the shim.

## MAINTENANCE

## CARBURETOR SYNCHRONIZATION

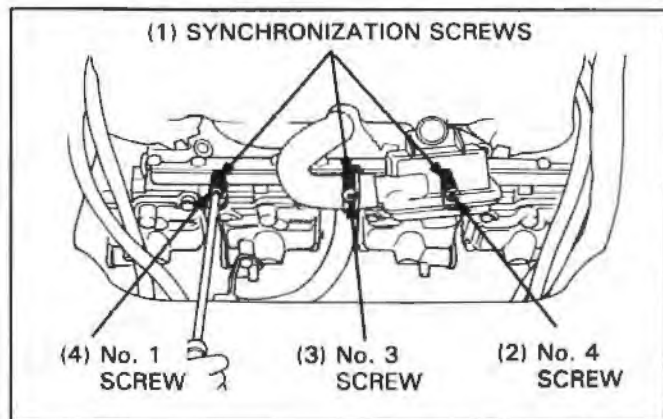
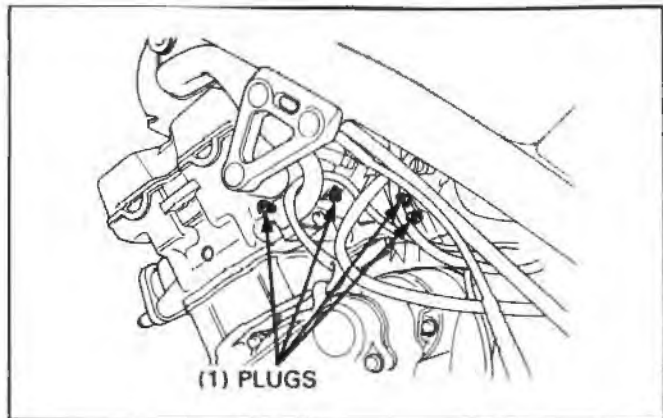
## NOTE

- For detailed instructions, refer to section 2 of the Common Service Manual. The information here only indicates locations of the plugs for the adapters and the synchronization adjusting screws. Before inspection, remove the fuel tank mounting bolts (page 2-4) and move the tank rearward with the fuel tube connected.

## CARBURETOR VACUUM DIFFERENCE:

Within 30 mmHg (1.2 inHg)

BASE CARBURETOR: No. 2 CARBURETOR



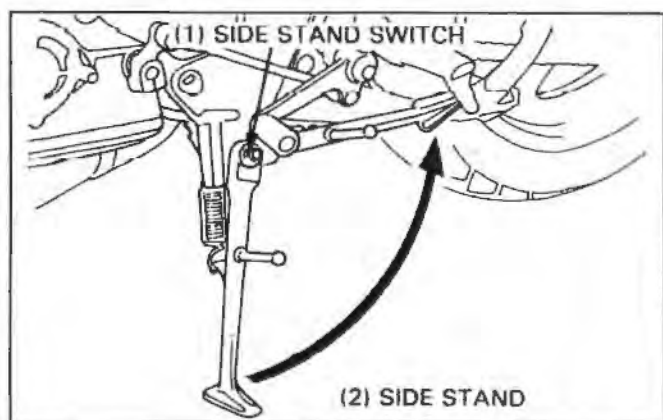
## SIDE STAND

Check the side stand ignition cut-off system:

- Place the motorcycle on its center stand 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 full 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 15).

Check the side stand switch mounting bolts for looseness.



# 4. LUBRICATION SYSTEM

|                                   |            |                                      |            |
|-----------------------------------|------------|--------------------------------------|------------|
| <b>SERVICE INFORMATION</b>        | <b>4-1</b> | <b>OIL PUMP REMOVAL/INSTALLATION</b> | <b>4-3</b> |
| <b>TROUBLESHOOTING</b>            | <b>4-1</b> | <b>OIL PUMP DISASSEMBLY/ASSEMBLY</b> | <b>4-4</b> |
| <b>LUBRICATION SYSTEM DIAGRAM</b> | <b>4-2</b> |                                      |            |

## SERVICE INFORMATION

4

### ▲ WARNING

- **Used engine oil (or transmission oil in two-strokes) 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 oil pump can be serviced with the engine installed in the frame.
- Replace the oil pump as an assembly.
- For oil pressure check, refer to section 4 of the Common Service Manual; for the switch location, see page 17-2 of this manual.
- For oil pressure warning light inspection, refer to section 25 of the Common Service Manual.
- When removing and installing the oil pump use care not to allow dust or dirt to enter the engine.
- After the oil pump has been installed, check that there are no oil leaks and that oil pressure is correct.

## TROUBLESHOOTING

### Oil level low

- Oil consumption
- External oil leaks
- 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 cylinder head gasket

### High oil pressure

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

### Low oil pressure

- Pressure relief valve stuck open
- Oil pump worn or damaged
- Internal oil leaks
- Incorrect oil being used
- Low oil level

### No oil pressure

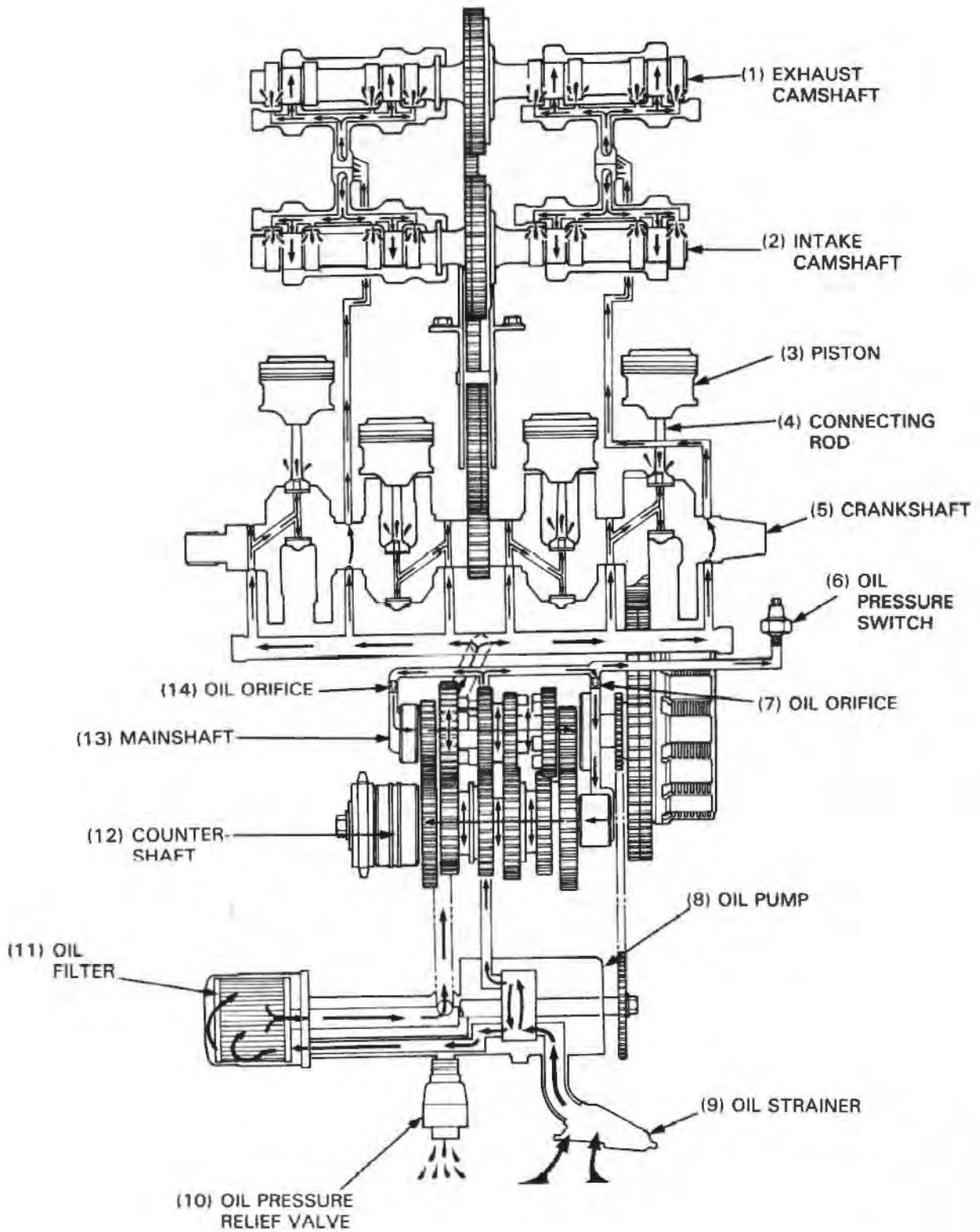
- Oil level too low
- Oil pump drive chain or oil pump drive/driven sprocket
- Oil pump damaged (pump shaft)
- Internal oil leaks

### Oil pressure warning light does not work well

- Refer to section 25 of the Common Service Manual

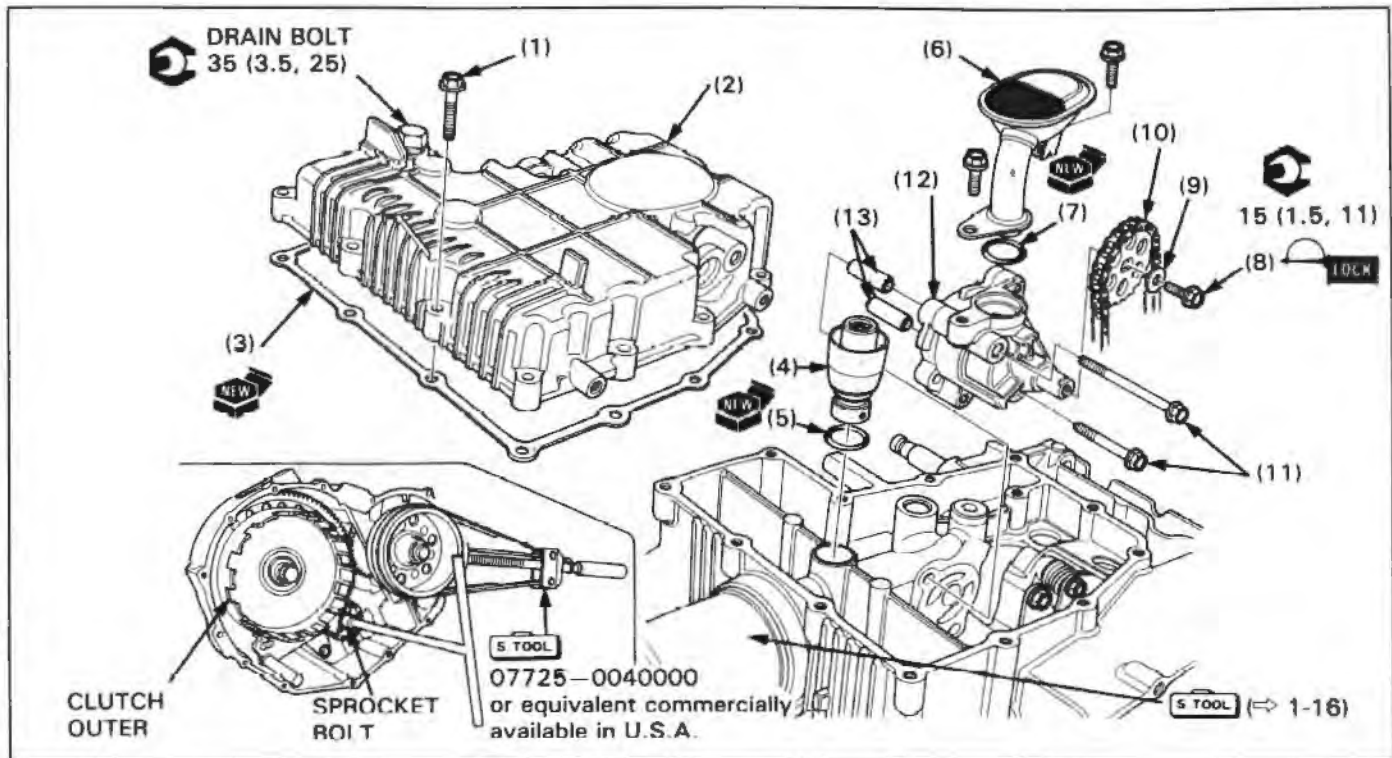
LUBRICATION SYSTEM

LUBRICATION SYSTEM DIAGRAM





## OIL PUMP REMOVAL/INSTALLATION



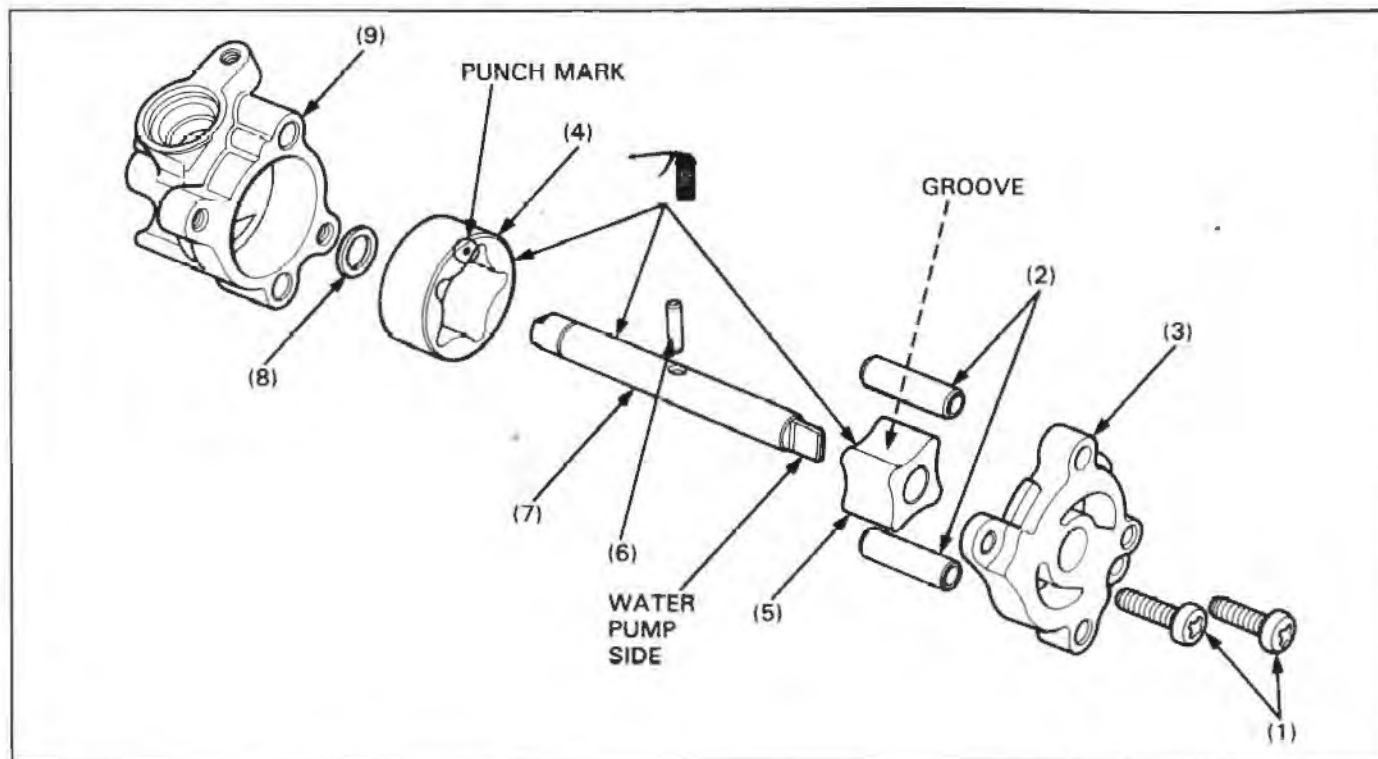
## REQUISITE SERVICE

- Engine oil draining (location: page 3-3, step: section 2 of the Common Service Manual)
- Exhaust system removal/installation (page 2-3)
- Clutch disassembly (page 9-4)/assembly (page 9-8)

| PROCEDURE                         | Q'ty | REMARKS   |
|-----------------------------------|------|---|
| <b>REMOVAL ORDER</b>              |      |   |
| (1) Oil pan bolt                  | 12   | • Installation is in the reverse order of removal.<br>At installation, tighten the bolts in a gradual, crisscross pattern.  |
| (2) Oil pan                       | 1    |   |
| (3) Gasket                        | 1    |   |
| (4) Relief valve                  | 1    |   |
| (5) O-ring                        | 1    |   |
| (6) Oil strainer                  | 1    | Clean with the non-flammable solvent.   |
| (7) O-ring                        | 1    |   |
| (8) Oil pump driven sprocket bolt | 1    | <b>NOTE:</b><br>• Install the clutch outer onto the mainshaft temporarily (page 9-8), hold the flywheel with the rotor holder and remove (or torque) the bolt.<br>• Apply a locking agent to the tip of the threads (approx. 6 mm/0.2 in) |
| (9) Washer                        | 1    |   |
| (10) Oil pump driven sprocket     | 1    | At installation, install with the grooves facing inside.  |
| (11) Oil pump mounting bolt       | 2    |   |
| (12) Oil pump                     | 1    |   |
| (13) Dowel pin                    | 2    |   |

## LUBRICATION SYSTEM

## OIL PUMP DISASSEMBLY/ASSEMBLY



## NOTE

- Before installing them, clean all removed parts thoroughly with clean engine oil.
- Refer to section 4 of the Common Service Manual for inspection information.
- Refer to page 1-6 for specification.

## REQUISITE SERVICE

- Oil pump removal/installation (page 4-3)

|     | PROCEDURE                      | Q'ty | REMARKS   |
|-----|--------------------------------|------|---|
|     | DISASSEMBLY ORDER              |      |   |
| (1) | Oil pump cover attaching screw | 2    | • Assembly is in the reverse order of disassembly.<br>NOTE:<br>• Install the dowel pins, then tighten the screws. |
| (2) | Dowel pin                      | 2    |   |
| (3) | Oil pump cover                 | 1    |   |
| (4) | Outer rotor                    | 1    | Install with its punch mark facing the cover.   |
| (5) | Inner rotor                    | 1    | Install the rotor, aligning its groove with the drive pin.  |
| (6) | Drive pin                      | 1    |   |
| (7) | Pump shaft                     | 1    | Install with the tab side facing the cover (water pump side).   |
| (8) | Washer                         | 1    |   |
| (9) | Oil pump body                  | 1    |   |

# 5. COOLING SYSTEM

|                                       |     |                                     |     |
|---------------------------------------|-----|-------------------------------------|-----|
| SERVICE INFORMATION                   | 5-1 | THERMOSTAT REMOVAL/<br>INSTALLATION | 5-4 |
| TROUBLESHOOTING                       | 5-1 | RADIATOR REMOVAL/INSTALLATION       | 5-5 |
| SYSTEM FLOW PATTERN                   | 5-2 | RADIATOR DISASSEMBLY/ ASSEMBLY      | 5-6 |
| COOLANT DRAINING                      | 5-3 | WATER PUMP DISASSEMBLY/<br>ASSEMBLY | 5-7 |
| RESERVE TANK REMOVAL/<br>INSTALLATION | 5-3 |                                     |     |

## SERVICE INFORMATION

### ▲ 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

- Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system service can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- For coolant replacement, refer to section 5 of the Common Service Manual; in this manual, only the coolant draining procedure is described.
- After servicing the system, check for leaks with a cooling system tester.
- For fan motor switch and thermo sensor inspections, refer to section 25 of the Common Service Manual; for the switch and sensor locations, see page 17-2 of this manual.

## TROUBLESHOOTING

### Engine temperature too high

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

### Engine temperature too low

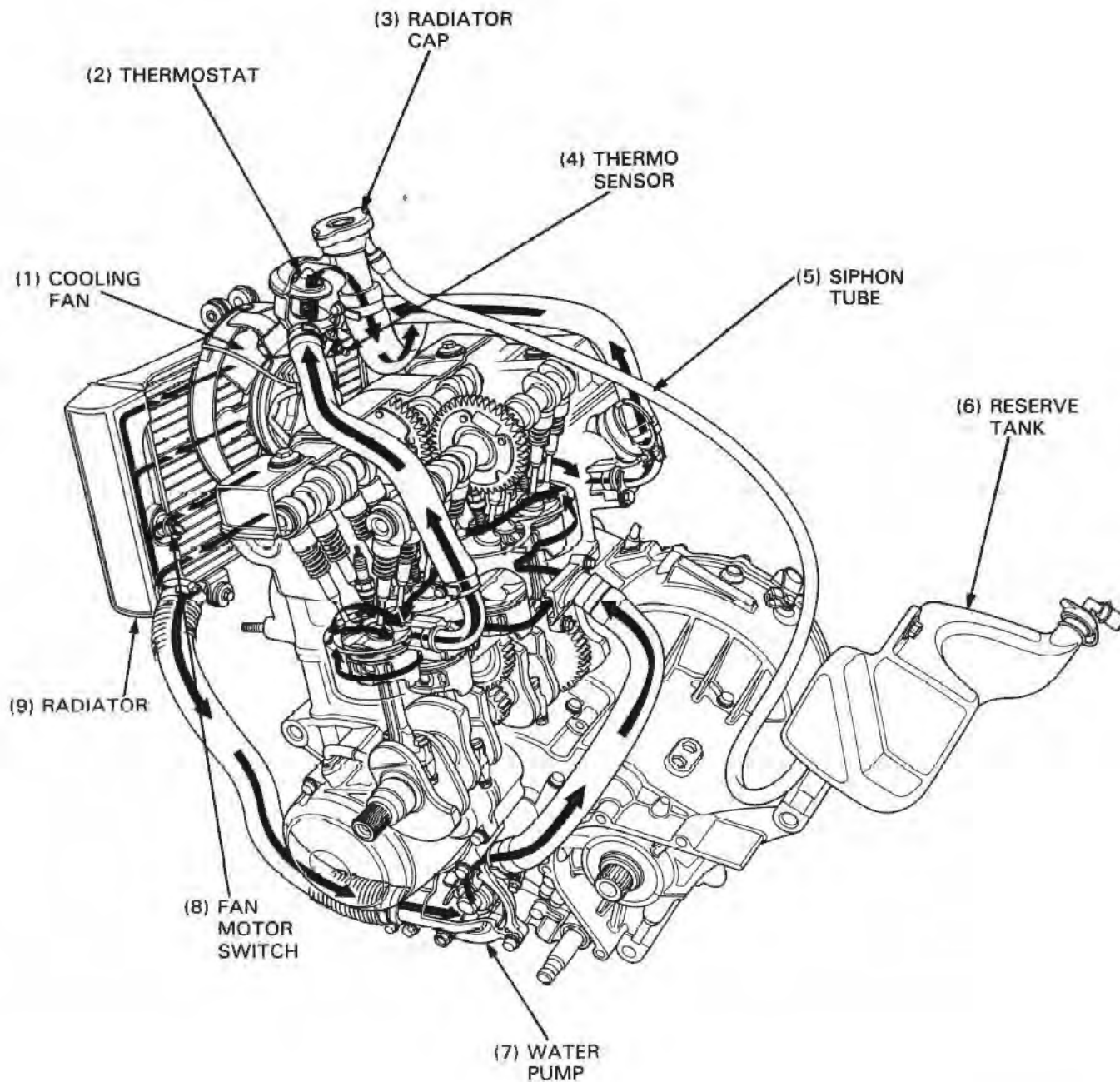
- Faulty temperature gauge or thermo sensor
- Thermostat stuck open
- Faulty fan motor switch

### Coolant leaks

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

# COOLING SYSTEM

## SYSTEM FLOW PATTERN



## COOLANT DRAINING

### NOTE

- For coolant replacement, refer to section 5 of the Common Service Manual.

### CAUTION

- Wait until the engine is cool before servicing the cooling system. Removing the radiator cap while the engine is hot and the coolant is under pressure may cause serious scalding.

To drain the coolant, remove the following:

- fuel tank (page 2-4).
- heat rubber and radiator cap.
- water pump drain bolt and sealing washer.

Remove the cylinder drain bolts and sealing washers and drain the coolant completely from the system.

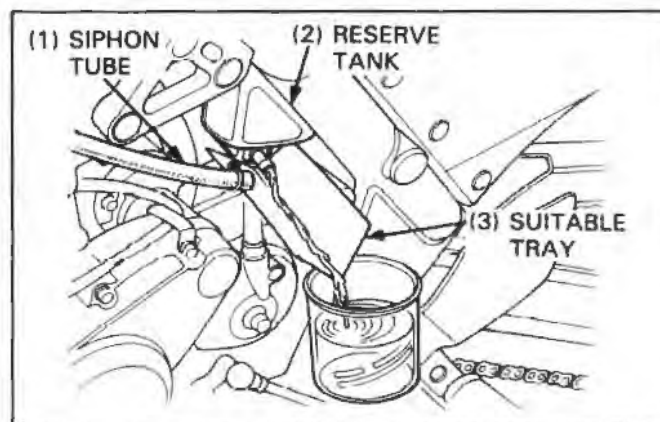
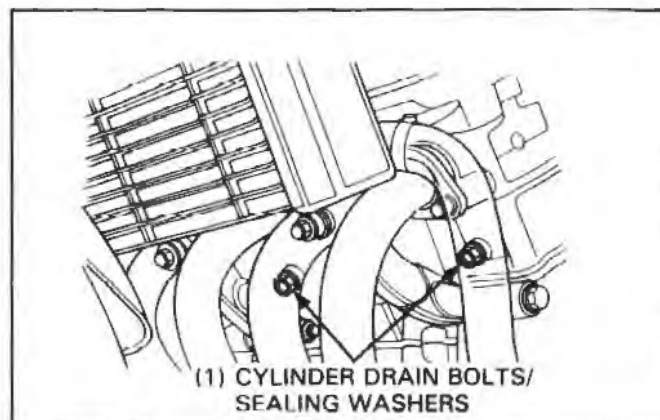
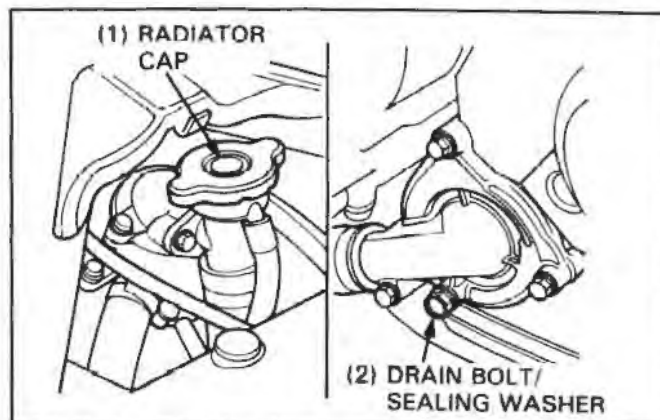
### NOTE

- California model has the only left drain bolt.

Place a suitable tray under the siphon tube joint of the reserve tank and disconnect the siphon tube from the reserve tank.

Drain the coolant from the reserve tank.

Install the water pump drain bolt and cylinder drain bolts with new sealing washers, and connect the siphon tube to the reserve tank.



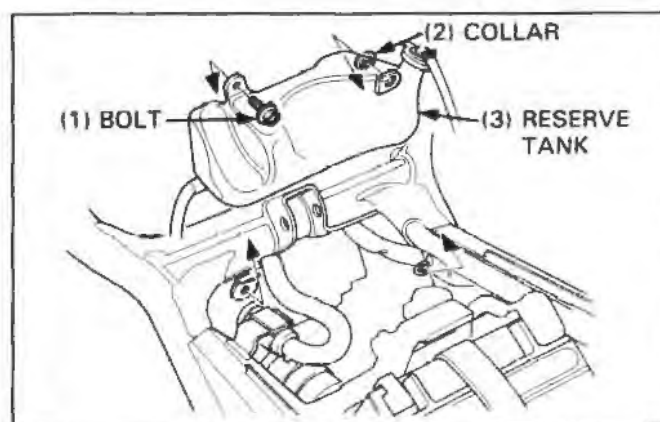
## RESERVE TANK REMOVAL/ INSTALLATION

Drain the coolant from the reserve tank (see above).

Remove the following:

- shock absorber (page 12-4).
- reserve tank mounting bolt.
- collar and reserve tank.

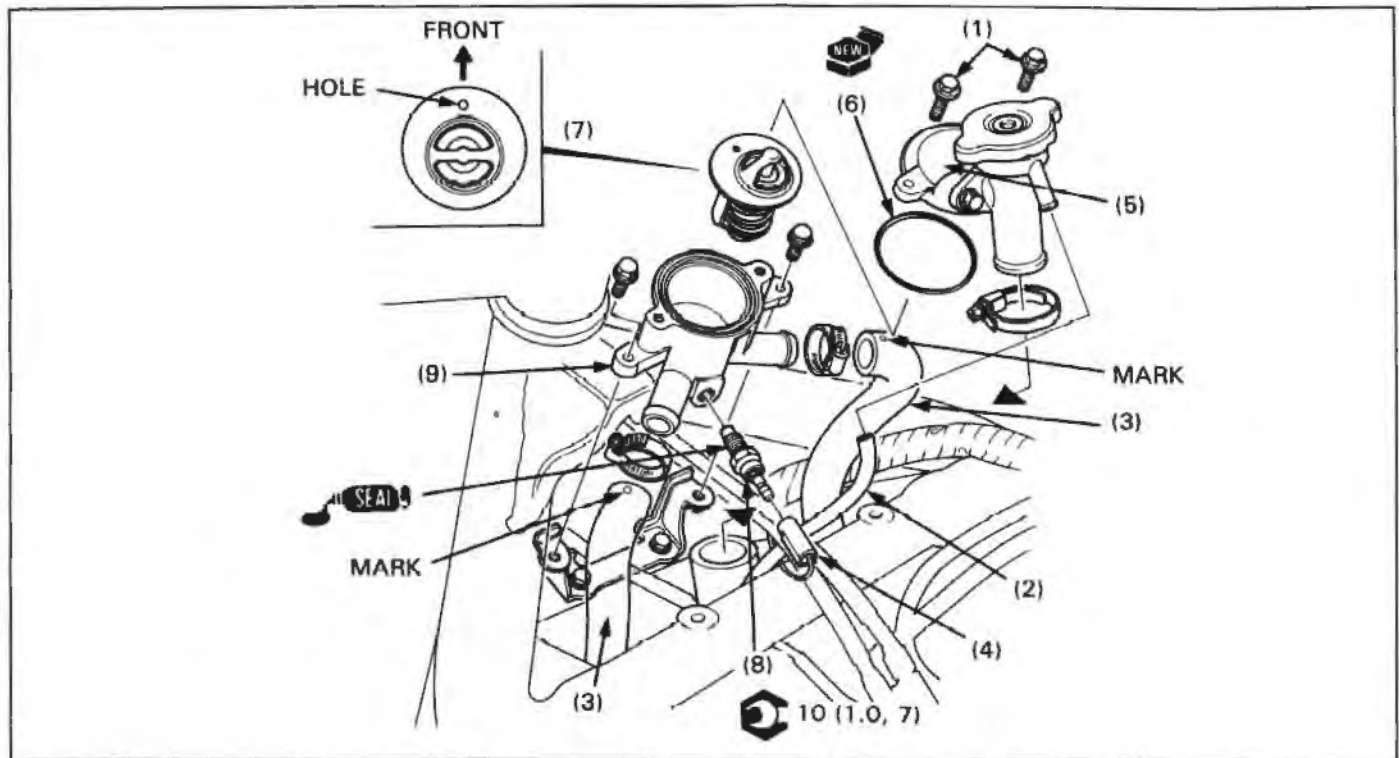
Install the reserve tank in the reverse order of removal.





## COOLING SYSTEM

## THERMOSTAT REMOVAL/INSTALLATION

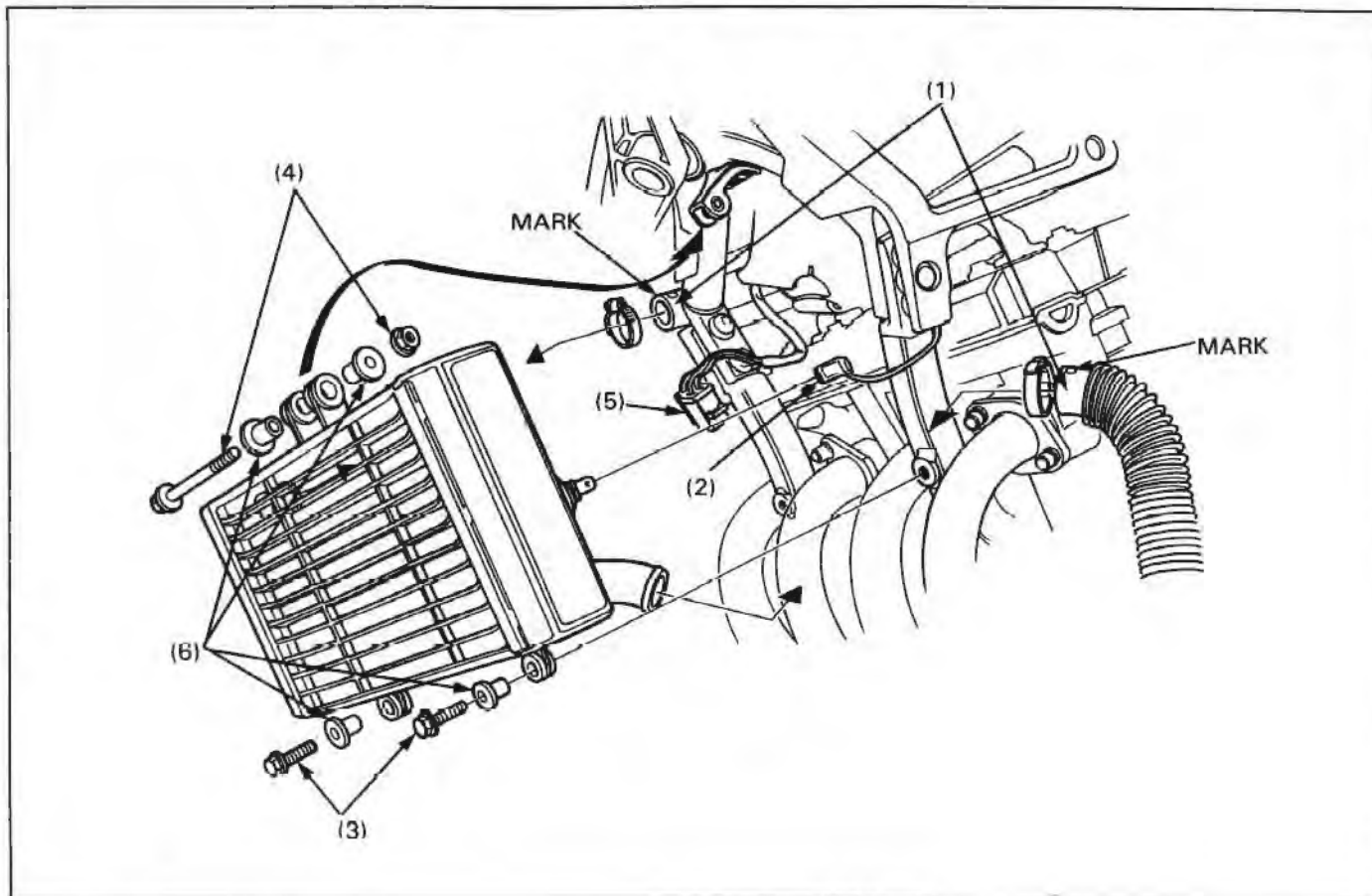


## REQUISITE SERVICE

- Fuel tank removal/installation (page 2-4)
- Coolant draining (page 5-3)
- Coolant refill (section 5 of the Common Service Manual)
- Air cleaner case removal/installation (page 6-3)

| PROCEDURE                          | Q'ty | REMARKS   |
|------------------------------------|------|---|
| REMOVAL ORDER                      |      | • Installation is in the reverse order of removal.  |
| (1) Thermostat cover mounting bolt | 2    |   |
| (2) Siphon tube                    | 1    |   |
| (3) Radiator hose                  | 2    | Install them with "O" marks facing up.              |
| (4) Thermo sensor connector        | 1    |   |
| (5) Thermostat cover               | 1    |   |
| (6) O-ring                         | 1    |   |
| (7) Thermostat                     | 1    | Install the thermostat with its hole side forwards. |
| (8) Thermo sensor                  | 1    | At installation, apply sealant to the threads.      |
| (9) Thermostat housing             | 1    |   |

## RADIATOR REMOVAL/INSTALLATION



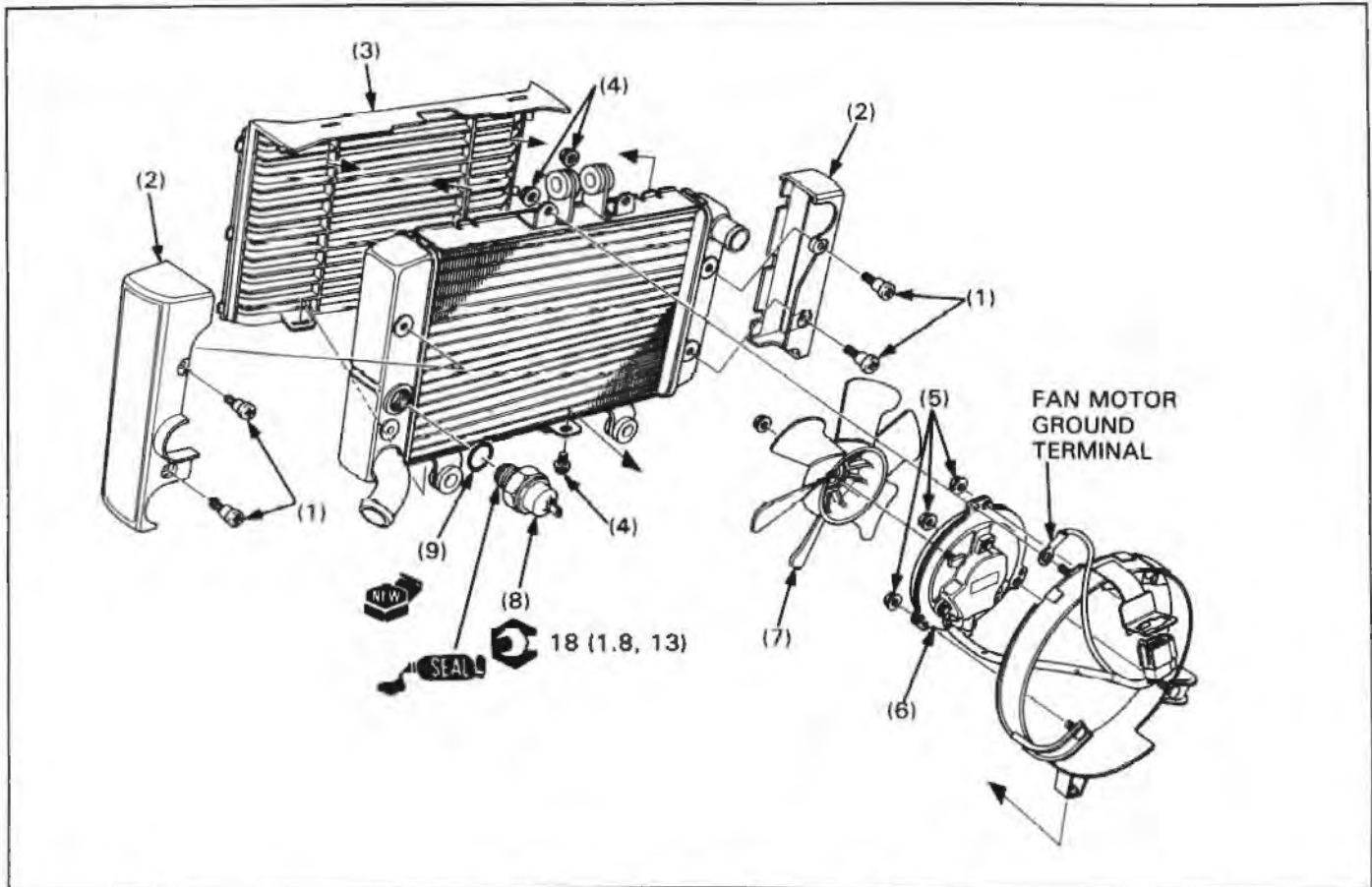
## REQUISITE SERVICE

- Coolant draining (page 5-3)
- Coolant refill (section 5 of the Common Service Manual)

| PROCEDURE     |                                  | Q'ty | REMARKS  |
|---------------|----------------------------------|------|--|
| REMOVAL ORDER |                                  |      | • Installation is in the reverse order of removal.<br>Install them with "O" marks facing up. |
| (1)           | Radiator hose                    | 2    |  |
| (2)           | Fan motor switch connector       | 1    |  |
| (3)           | Radiator lower mounting bolt     | 2    |  |
| (4)           | Radiator upper mounting bolt/nut | 1/1  |  |
| (5)           | Fan motor connector              | 1    |  |
| (6)           | Collar                           | 4    |  |

## COOLING SYSTEM

## RADIATOR DISASSEMBLY/ASSEMBLY

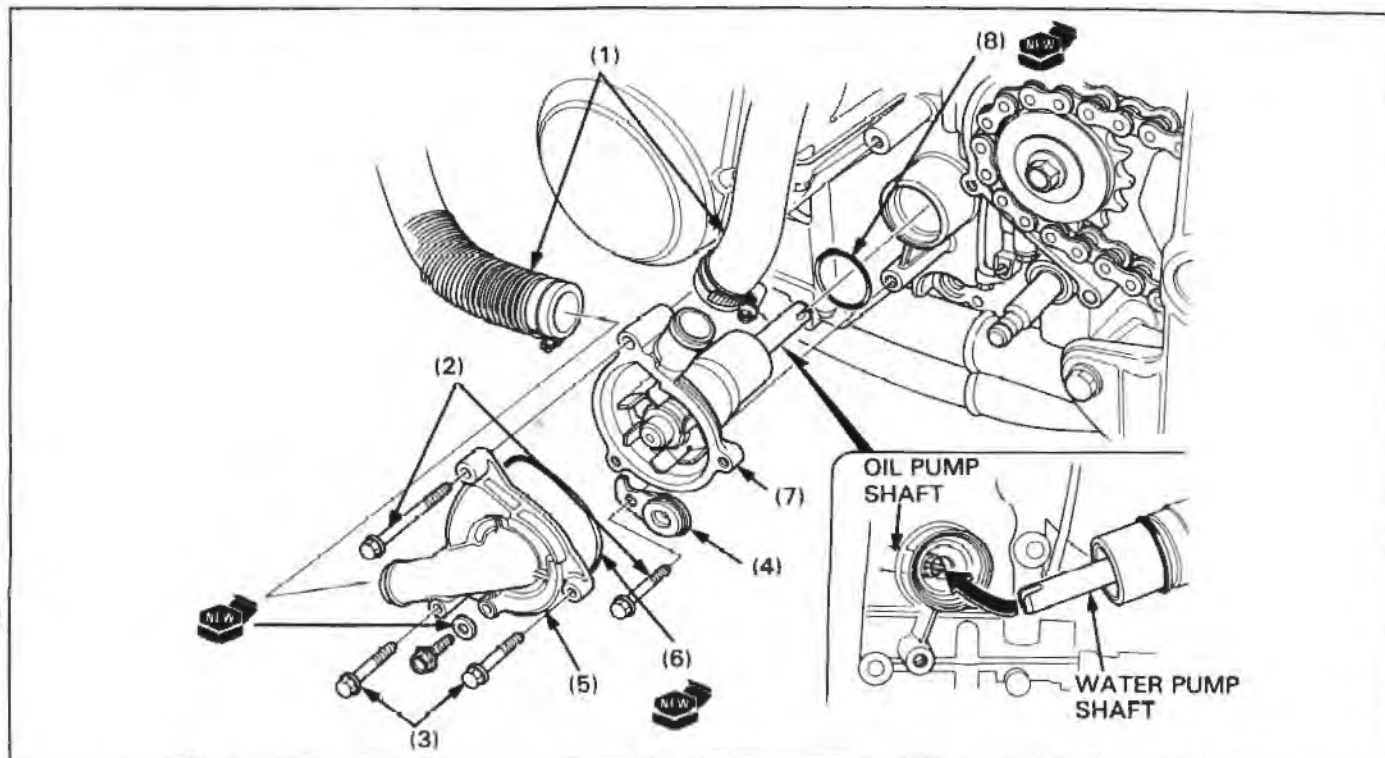


## REQUISITE SERVICE

- Radiator removal/installation (page 5-5)

| PROCEDURE                              | Q'ty | REMARKS  |
|--|------|--|
| DISASSEMBLY ORDER                      |      | • Assembly is in the reverse order of disassembly.                             |
| (11) Radiator shroud attaching screw   | 4    |  |
| (2) Left and right radiator shroud     | 2    | At installation, align the grille tabs with the shroud grooves.                |
| (3) Radiator grille                    | 1    | At installation, align four grille grooves with the radiator lugs.             |
| (4) Fan motor shroud mounting bolt/nut | 1/2  | At installation, install the fan motor ground wire terminal properly as shown. |
| (5) Fan motor mounting nut             | 3    |  |
| (6) Fan motor                          | 1    | Install the fan motor, with the motor wireharness facing down.                 |
| (7) Cooling fan                        | 1    | At installation, align the fan groove with the motor shaft.                    |
| (8) Fan motor switch                   | 1    | At installation, apply sealant to the threads.<br><b>CAUTION:</b>              |
| (9) O-ring                             | 1    | • Do not over-tighten the fan motor switch, or the radiator may be damaged.    |

## WATER PUMP DISASSEMBLY/ASSEMBLY



## NOTE

- If the mechanical seal is damaged, the water pump must be replaced as an assembly.

## REQUISITE SERVICE

- Coolant draining (page 5-3)
- Engine oil draining (drain bolt location: page 3-3, step: section 2 of the Common Service Manual)
- Coolant refill (section 5 of the Common Service Manual)
- Gearshift spindle joint removal/installation (page 9-6)
- Water pump side cover removal/installation (page 7-2)

| PROCEDURE                      | Q'ty | REMARKS   |
|--------------------------------|------|---|
| <b>DISASSEMBLY ORDER</b>       |      | • Assembly is in the reverse order of disassembly.  |
| (1) Radiator hose              | 2    | <b>NOTE:</b><br>• Before removing bolts, loosen the pump cover bolts(3).<br><br>At installation, align the pump shaft slot with the oil pump shaft. |
| (2) Water pump mounting bolt   | 2    |   |
| (3) Water pump cover bolt      | 2    |   |
| (4) Water pump side cover stay | 1    |   |
| (5) Water pump cover           | 1    |   |
| (6) O-ring                     | 1    |   |
| (7) Water pump body            | 1    |   |
| (8) O-ring                     | 1    |   |

# 6. FUEL SYSTEM

|   |     |   |      |
|---|-----|---|------|
| SERVICE INFORMATION                       | 6-1 | CARBURETOR DISASSEMBLY/<br>ASSEMBLY                 | 6-8  |
| TROUBLESHOOTING                           | 6-2 | CARBURETOR COMBINATION                              | 6-10 |
| AIR CLEANER CASE REMOVAL/<br>INSTALLATION | 6-3 | FUEL PUMP/FILTER                                    | 6-13 |
| CARBURETOR REMOVAL/<br>INSTALLATION       | 6-4 | EMISSION CONTROL SYSTEMS<br>(California Model Only) | 6-13 |
| CARBURETOR SEPARATION                     | 6-6 |   |      |

## SERVICE INFORMATION

### ▲ WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause fire or explosion.
- Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.

### CAUTION

- To prevent damage, be sure to remove the diaphragms before cleaning air and fuel passages with compressed air. The diaphragms might be damaged.

### NOTE

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

- When disassembling fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- Before removing the carburetors, place a suitable container under the carburetor drain tube, loosen the drain bolts and drain the carburetors.
- After removing the carburetors, cover the intake port of the engine with a shop towel or cover it with pieces of tape to prevent any foreign material from dropping into the engine.
- The vacuum chamber and float chamber can be serviced with the carburetors assembled.
- For fuel tank removal/installation, see page 2-4.
- California Model Only:  
All hoses used in the secondary air supply and evaporative emission control systems are numbered for identification. When connecting one of these hoses, compare the hose number with the Vacuum Hose Routing Diagram Label, page 1-29, and carburetor tubes, page 6-12.



**FUEL SYSTEM****TROUBLESHOOTING****Engine won't start**

- No fuel to carburetors
  - fuel strainer clogged
  - fuel tube clogged
  - float valve stuck
  - float level misadjusted
  - fuel tank cap breather hole clogged
  - fuel pump malfunction
- Too much fuel getting to the engine
  - air cleaner clogged
  - flooded carburetors
- Intake air leak
- Fuel contaminated/deteriorated
- Slow circuit or bystarter circuit clogged
- Ignition malfunction

**Engine stalls, hard to start, rough idling**

- Fuel line restricted
- Ignition malfunction
- Fuel mixture too lean/rich
- Fuel contaminated/deteriorated
- Intake air leak
- Idle speed misadjusted
- Fuel pump malfunction
- Pilot screw misadjusted
- Slow circuit or bystarter circuit clogged
- Float level misadjusted
- Fuel tank breather tube clogged
- Emission control system malfunction (California Model Only)
  - air vent control valve (AVCV) faulty
  - purge control valve (PCV) faulty
  - loose, disconnected or deteriorated hoses of the emission control system

**Afterburn on deceleration**

- Lean mixture in slow circuit
- Emission control system malfunction (California Model Only)
  - secondary air supply system faulty
  - loose, disconnected or deteriorated hoses of the emission control system

**Backfiring or misfiring during acceleration**

- Ignition system faulty
- Fuel mixture too lean

**Poor performance (driveability) and poor fuel economy**

- Fuel system clogged
- Ignition malfunction
- Emission control system malfunction (California Model Only)
  - air vent control valve (AVCV) faulty
  - loose, disconnected or deteriorated hoses of the emission control system

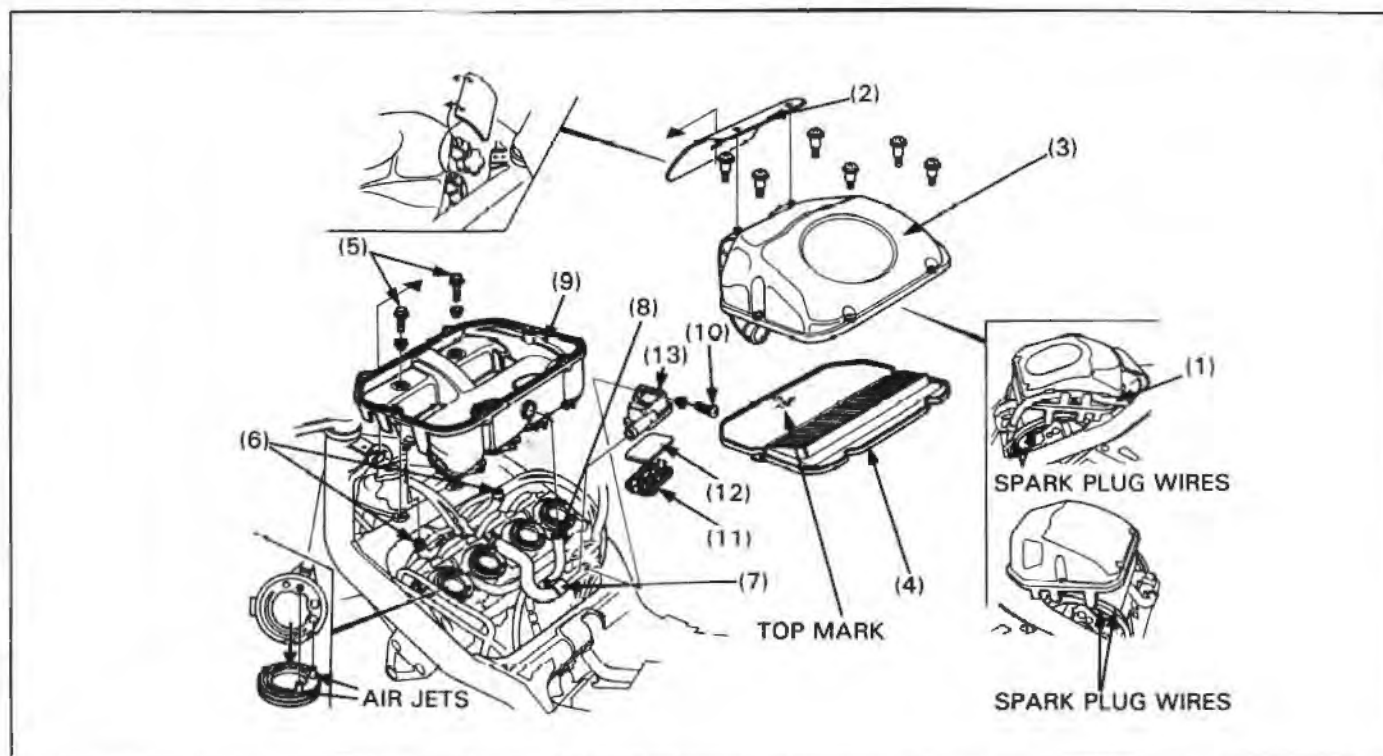
**Lean mixture**

- Fuel jets clogged
- Float valve faulty
- Float level too low
- Fuel line restricted
- Carburetor air vent hole (or tube) clogged
- California Model Only: air vent control valve (AVCV) faulty
- Intake air leak
- Fuel pump malfunction
- Vacuum piston faulty
- Throttle valve faulty

**Rich mixture**

- Bystarter valve in ON position
- Float valve faulty
- Float level too high
- Air jets clogged
- Air cleaner element contaminated
- Flooded carburetors

## AIR CLEANER CASE REMOVAL/INSTALLATION



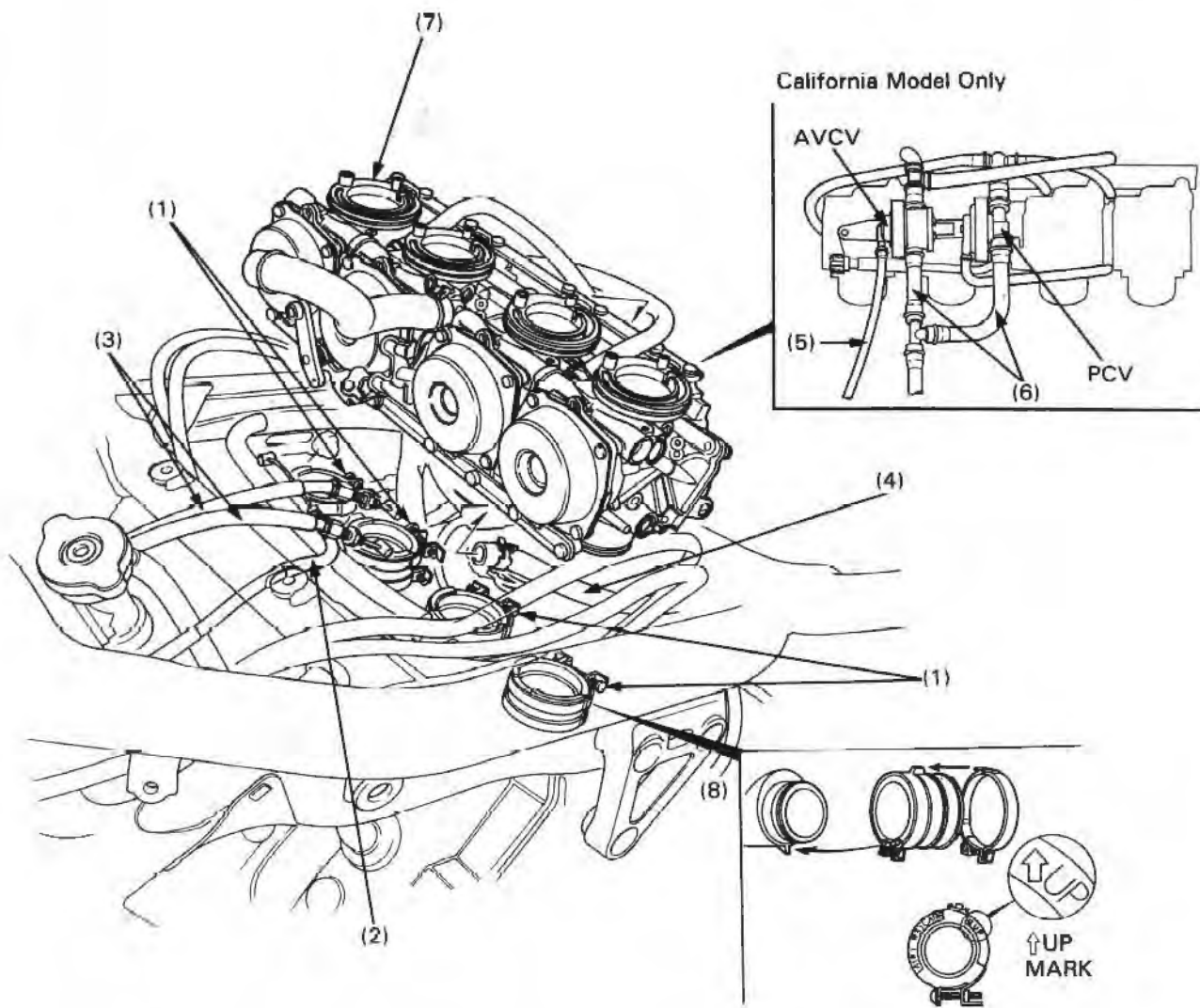
## REQUISITE SERVICE

- Fuel tank removal/installation (page 2-4)

| PROCEDURE  |                              | Q'ty | REMARKS   |
|--|------------------------------|------|---|
| <b>AIR CLEANER CASE REMOVAL ORDER</b>                                  |                              |      |   |
| (1)  | Main wire harness            | 1    | <ul style="list-style-type: none"> <li>• Installation is in the reverse order of removal.</li> <li>Install it into the wire harness clamp of the case cover.</li> </ul>                   |
| (2)  | Heat guard plate             | 1    |   |
| (3)  | Air cleaner case cover       | 1    |   |
| (4)  | Air cleaner element          | 1    |   |
| (5)  | Air cleaner case bolt/collar | 2/2  | <ul style="list-style-type: none"> <li>Install it with the ↑ mark forwards and with the TOP mark facing up.</li> </ul>  |
| (6)  | Crankcase breather tube      | 2    |   |
| (7)  | Air hose                     | 1    |   |
| (8)  | Air injection tube (No. 15)  | 1    |   |
| (9)  | Air cleaner case             | 1    |   |
| <b>SUB AIR CLEANER CASE REMOVAL ORDER</b><br>(Except California Model) |                              |      | <ul style="list-style-type: none"> <li>• Installation is in the reverse order of removal.</li> </ul>  |
| (10)   | Attaching screw              | 1    |   |
| (11)   | Sub air cleaner case cover   | 1    |   |
| (12)   | Sub air cleaner element      | 1    |   |
| (13)   | Sub air cleaner case         | 1    | <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• For element cleaning, refer to section 2 (AIR CLEANER: Oiled Urethane Foam Element) of the Common Service Manual.</li> </ul> |

FUEL SYSTEM

CARBURETOR REMOVAL/INSTALLATION



**▲ WARNING**

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

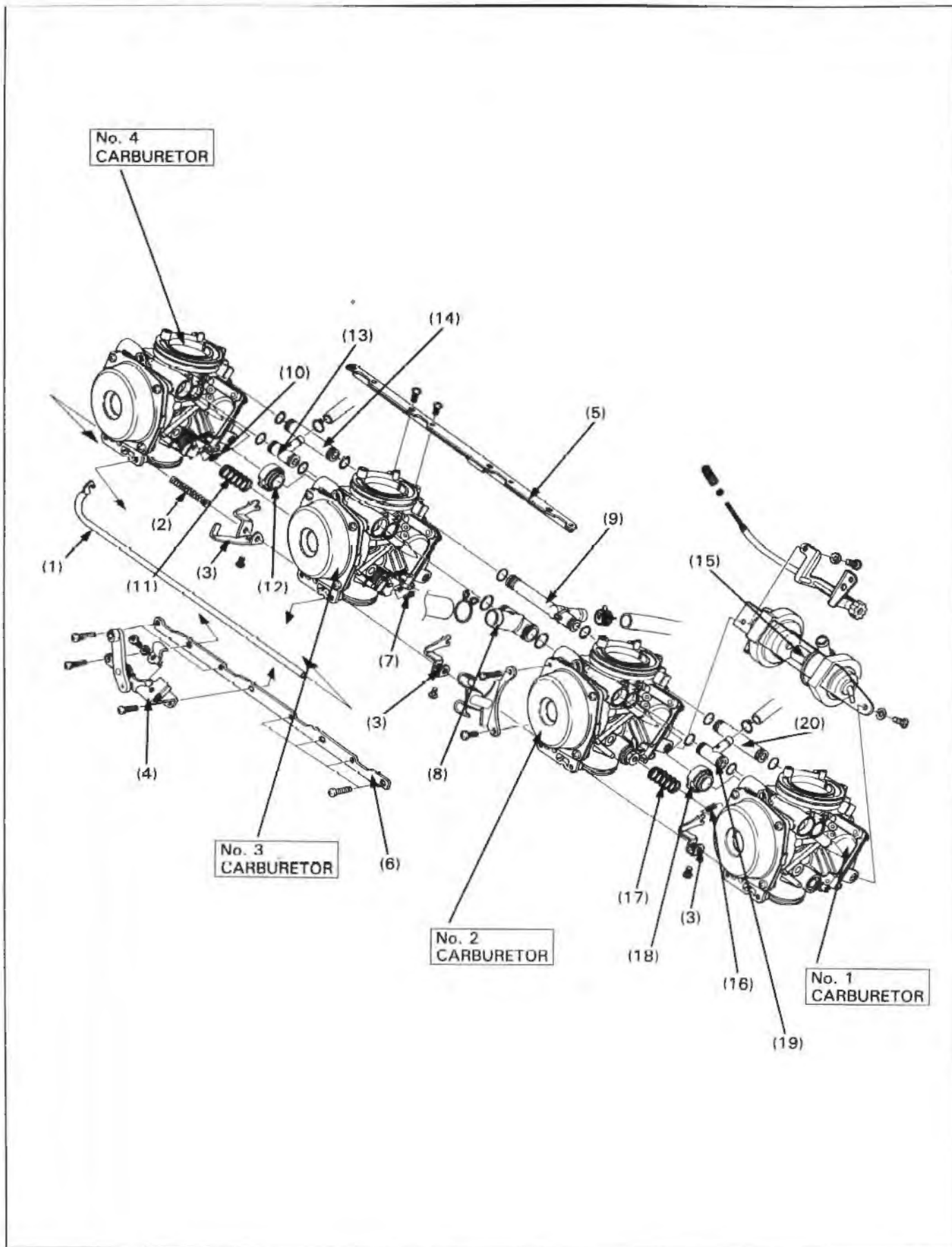
**REQUISITE SERVICE**

- Fuel tank removal/installation (page 2-4)
- Air cleaner case removal/installation (page 6-3)
- Carburetors draining

| PROCEDURE |                                     | Q'ty | REMARKS   |
|-----------|-------------------------------------|------|---|
|           | <b>REMOVAL ORDER</b>                |      | • Installation is in the reverse order of removal.  |
| (1)       | Insulator band                      | 4    | Only loosen the screws.   |
| (2)       | Choke cable                         | 1    |   |
| (3)       | Throttle cable                      | 2    |   |
| (4)       | Fuel tube                           | 1    |   |
| (5)       | No. 10 vacuum tube (from the AVCV)* | 1    | California Model Only   |
| (6)       | No. 4 tube (from the AVCV and PCV)  | 2    | California Model Only   |
| (7)       | Carburetors                         | 1    |   |
| (8)       | Insulator                           | 4    | Each insulator has the identification number as shown. At installation, align the insulator groove with the engine lug, with the ↑ UP mark facing upwards (carbretor side). |

# FUEL SYSTEM

## CARBURETOR SEPARATION





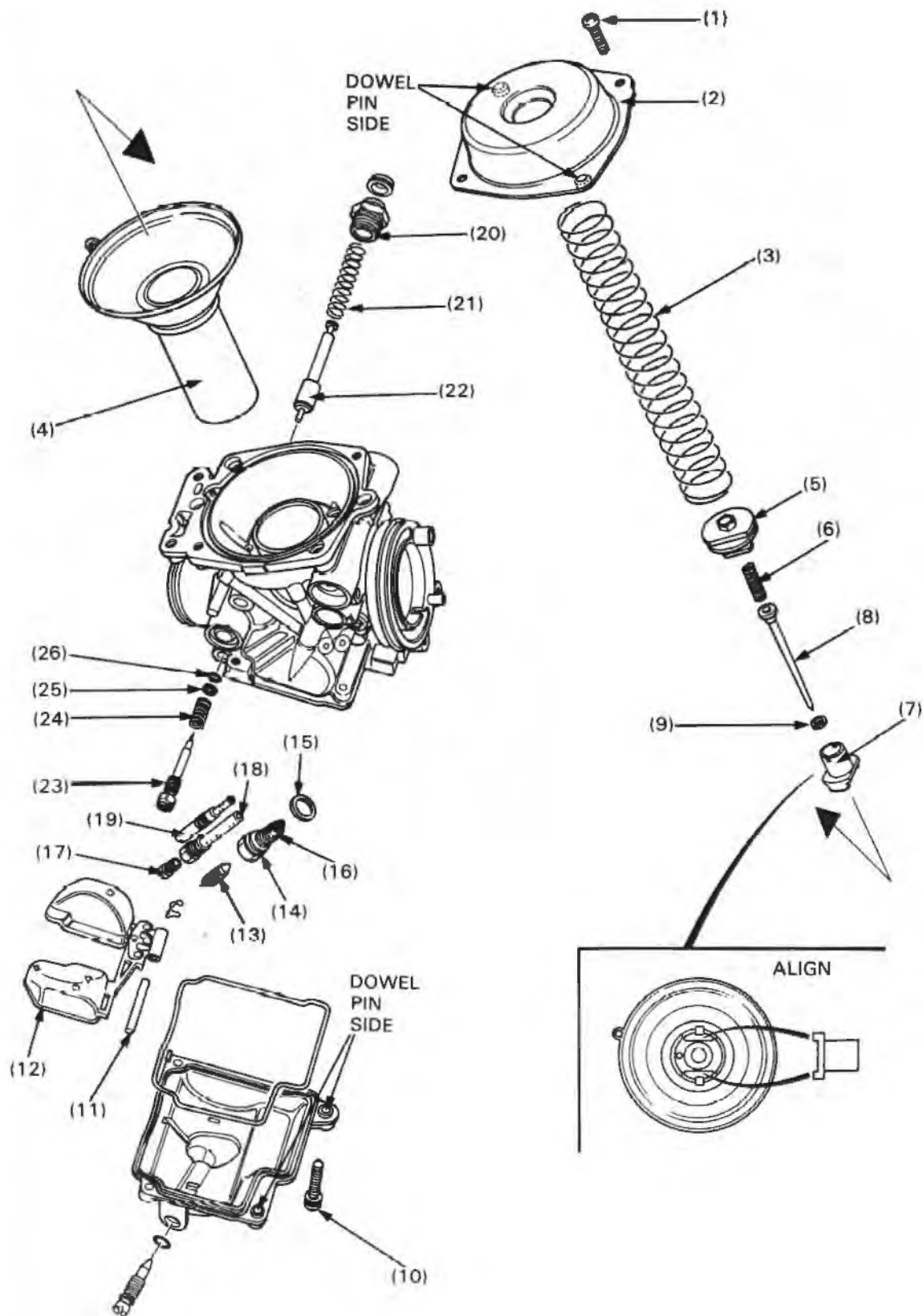
## REQUISITE SERVICE

- Fuel tank removal (page 2-4)
- Air cleaner case removal (page 6-3)
- Carburetor removal (page 6-4)
- California Model Only: AVCV and PCV tubes removal from carburetors

| PROCEDURE |  | Q'ty | REMARKS               |
|-----------|--|------|-----------------------|
|           | <b>Separate No. 3/No. 4 carb. from No. 1/<br/>No. 2 carb..</b> |      |                       |
| (1)       | Bystarter arm shaft  | 1    |                       |
| (2)       | Spring   | 1    |                       |
| (3)       | Bystarter arm  | 3    |                       |
| (4)       | Choke cable holder   | 1    |                       |
| (5)       | Rear bracket   | 1    |                       |
| (6)       | Front bracket  | 1    |                       |
| (7)       | No. 3 carb. synchronization spring                             | 1    |                       |
| (8)       | Air joint pipe (3-way)/O-ring                                  | 1/2  |                       |
| (9)       | Fuel joint pipe (3-way)/O-ring                                 | 1/2  |                       |
|           | <b>Separate No. 3 carb. from No. 4 carb..</b>                  |      |                       |
| (10)      | No. 4 carb. synchronization spring                             | 1    |                       |
| (11)      | Thrust spring  | 1    |                       |
| (12)      | Air joint pipe (rubber)  | 1    |                       |
| (13)      | Air vent pipe/O-ring   | 1/2  |                       |
| (14)      | Fuel joint pipe (2-way)/O-ring                                 | 1/2  |                       |
|           | <b>Separate No. 1 carb. from No. 2 carb..</b>                  |      |                       |
| (15)      | AVCV and PCV as an assembly                                    | 1    | California Model Only |
| (16)      | No. 1 carb. synchronization spring                             | 1    |                       |
| (17)      | Thrust spring  | 1    |                       |
| (18)      | Air joint pipe (rubber)  | 1    |                       |
| (19)      | Air vent pipe/O-ring   | 1/2  |                       |
| (20)      | Fuel joint pipe (2-way)/O-ring                                 | 1/2  |                       |

## FUEL SYSTEM

## CARBURETOR DISASSEMBLY/ASSEMBLY



## NOTE

- The vacuum chamber and float chamber can be serviced with the carburetors assembled.
- The pilot screws are factory pre-set and should not be removed unless the carburetors are overhauled. Turn each pilot screw in and carefully count the number of turns before it seats lightly. Make a note of this to use as a reference when reinstalling the pilot screws. If new pilot screws are installed, turn pilot screws out to the initial opening (page 1-6).

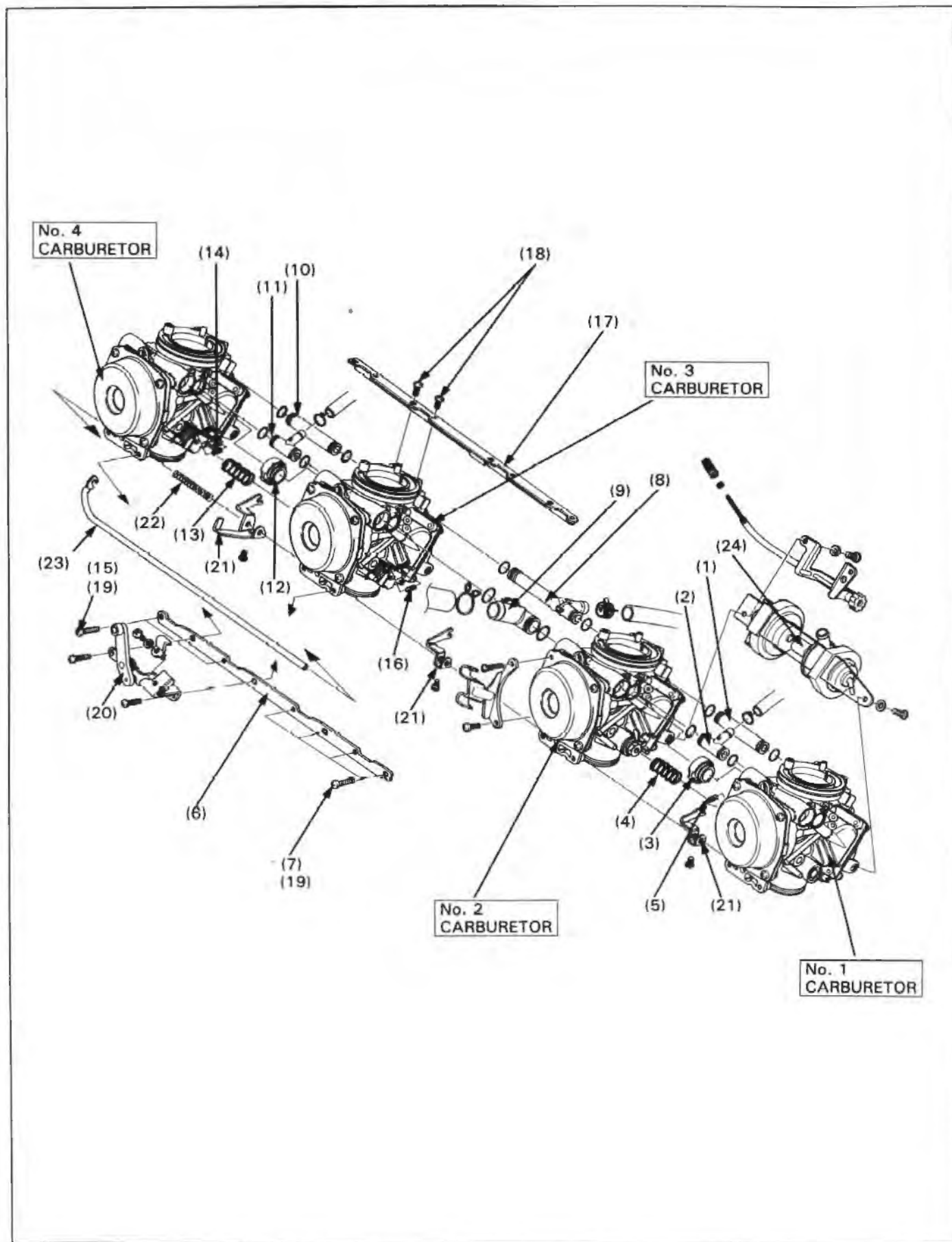
## REQUISITE SERVICE

- Fuel tank removal/installation (page 2-4)
- Air cleaner case removal/installation (page 6-3)
- Carburetor removal/installation (page 6-4)
- Carburetor separation (page 6-6)/combination (page 6-10)
- Carburetor synchronization (page 3-8)

| PROCEDURE                |                             | Q'ty | REMARKS   |
|--------------------------|-----------------------------|------|---|
| <b>DISASSEMBLY ORDER</b> |                             |      | • Assembly is in the reverse order of disassembly.  |
| <b>Vacuum Chamber</b>    |                             |      |   |
| (1)                      | Vacuum chamber cover screws | 4    | At installation, first tighten the two screws on the dowel pin side.  |
| (2)                      | Vacuum chamber cover        | 1    |   |
| (3)                      | Spring                      | 1    |   |
| (4)                      | Diaphragm/vacuum piston     | 1    |   |
| (5)                      | Jet needle holder           | 1    | Turn the holder 90° counterclockwise while pushing it in and remove it.   |
| (6)                      | Spring                      | 1    |   |
| (7)                      | Spring holder               | 1    | At installation, align holder claws with piston grooves.  |
| (8)                      | Jet needle                  | 1    |   |
| (9)                      | Washer                      | 1    |   |
| <b>Float Chamber</b>     |                             |      |   |
| (10)                     | Float chamber cover screws  | 4    | At installation, first tighten the two screws on the dowel pin side.  |
| (11)                     | Float pin                   | 1    | NOTE:<br>• For removal of the No. 1 (or No. 3) carburetor float pin with the carburetors assembled, first remove the No. 2 (or No. 4) carburetor float chamber. |
| (12)                     | Float                       | 1    | For float level inspection, refer to the section 8 of the Common Service Manual.  |
| (13)                     | Float valve                 | 1    |   |
| (14)                     | Valve seat                  | 1    |   |
| (15)                     | Sealing washer              | 1    |   |
| (16)                     | Fuel filter                 | 1    |   |
| (17)                     | Main jet                    | 1    |   |
| (18)                     | Needle jet                  | 1    |   |
| (19)                     | Slow jet                    | 1    |   |
| <b>Bystarter Valve</b>   |                             |      |   |
| (20)                     | Valve nut                   | 1    |   |
| (21)                     | Spring                      | 1    |   |
| (22)                     | Bystarter valve             | 1    |   |
| <b>Pilot Screw</b>       |                             |      |   |
| (23)                     | Pilot screw                 | 1    | Canada model: No. 1 and No. 4 carburetor pilot screws are shorter than those for No. 2 and No. 3.   |
| (24)                     | Spring                      | 1    |   |
| (25)                     | Washer                      | 1    |   |
| (26)                     | O-ring                      | 1    |   |

**FUEL SYSTEM**

**CARBURETOR COMBINATION**



## REQUISITE SERVICE

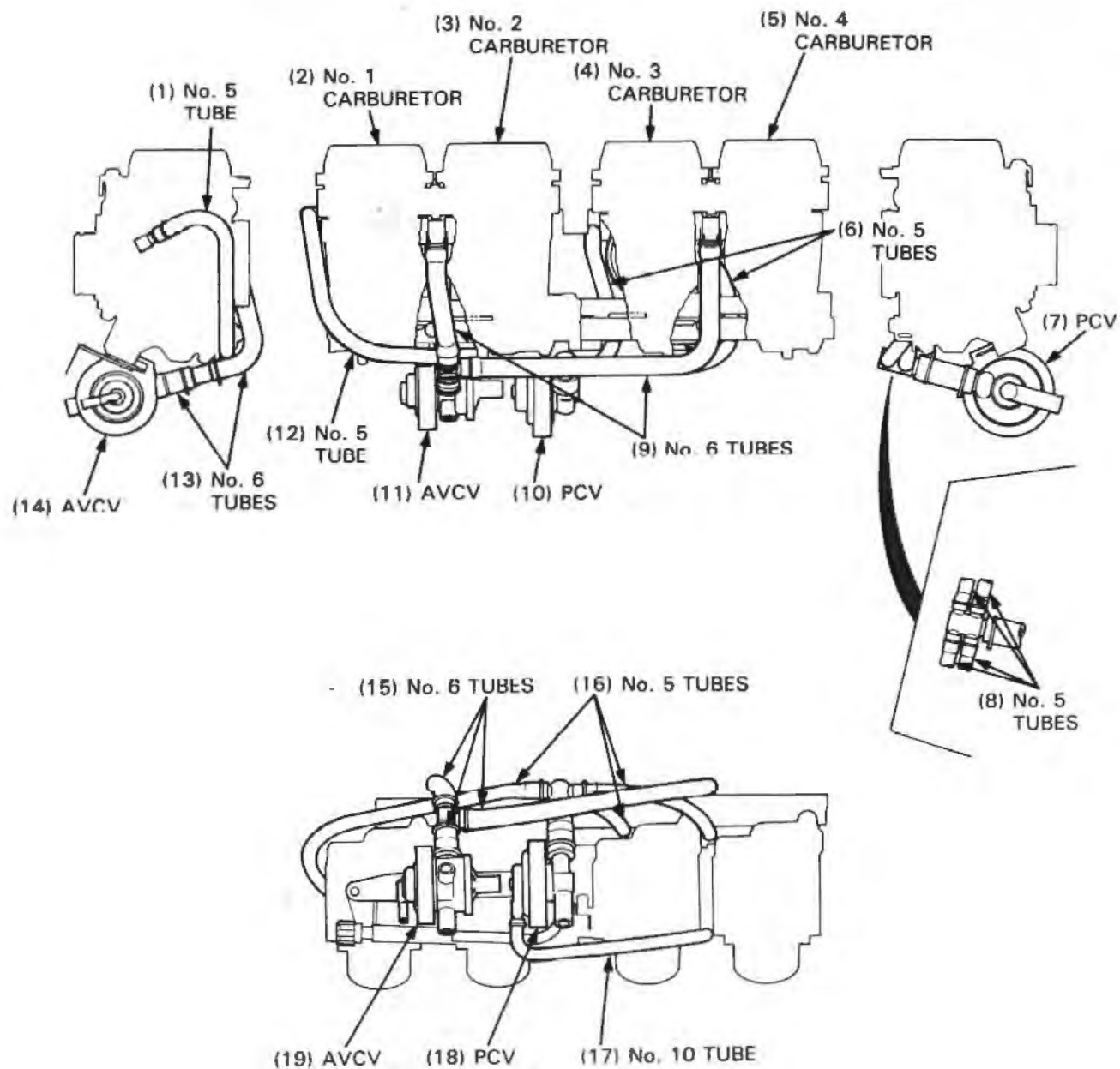
- Carburetor assembly (page 6-8)

| PROCEDURE   |                                    | Q'ty | REMARKS  |
|---|------------------------------------|------|--|
| <b>Assemble No. 1 carb. with No. 2 carb..</b>             |                                    |      | No. 2 carburetor is the base carburetor.   |
| (1)   | Fuel joint pipe (2-way)/O-ring     | 1/2  |  |
| (2)   | Air vent pipe (3-way)/O-ring       | 1/2  |  |
| (3)   | Air joint pipe (rubber)            | 1    |  |
| (4)   | Thrust spring                      | 1    |  |
| (5)   | No. 1 carb. synchronization spring | 1    |  |
| (6)   | Front bracket                      | 1    |  |
| (7)   | Front bracket screw                | 4    | The shorter. Do not tighten screws yet.  |
| (8)   | Fuel joint pipe (3-way)/O-ring     | 1/2  | Onto the No. 2 carburetor.   |
| (9)   | Air joint pipe (3-way)/O-ring      | 1/2  | Onto the No. 2 carburetor.   |
| <b>Assemble No. 3 carb. with No. 4 carb..</b>             |                                    |      |  |
| (10)  | Fuel joint pipe (2-way)/O-ring     | 1/2  |  |
| (11)  | Air vent pipe (3-way)/O-ring       | 1/2  |  |
| (12)  | Air joint pipe (rubber)            | 1    |  |
| (13)  | Thrust spring                      | 1    |  |
| (14)  | No. 4 carb. synchronization spring | 1    |  |
| (15)  | Front bracket screw                | 2    | The shorter. Do not tighten screws yet. Do not install two screws of the front bracket/choke cable holder yet. |
| <b>Assemble No. 1/No. 2 carb. with No. 3/No. 4 carb..</b> |                                    |      |  |
| (16)  | No. 3 carb. synchronization spring | 1    |  |
| (17)  | Rear bracket                       | 1    |  |
| (18)  | Rear bracket screw                 | 8    | Tighten them.  |
| (19)  | Front bracket screw                | 6    | Tighten them.  |
| (20)  | Choke cable holder                 | 1    | Use two longer front bracket screws.   |
| (21)  | Bystarter arm                      | 3    |  |
| (22)  | Spring                             | 1    |  |
| (23)  | Bystarter arm shaft                | 1    |  |
| (24)  | AVCV and PCV as an assembly        | 1    | California Model Only  |
| (25)  | AVCV and PCV tube                  | —    | California Model Only: page 6-12   |



**FUEL SYSTEM**

**CALIFORNIA MODEL ONLY:  
AVCV AND PCV TUBES ROUTING**

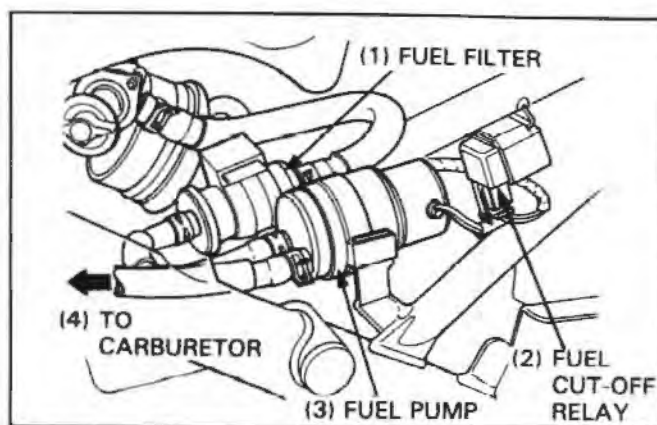


## FUEL PUMP/FILTER

Turn the fuel valve OFF.  
 Remove the rear-left side cover (page 2-3).  
 Remove the fuel pump and fuel filter to the left.  
 Install the fuel filter and pump in the reverse order of removal.

### NOTE

- Fuel filter orientation as shown.



## EMISSION CONTROL SYSTEMS (California Model Only)

### EVAPORATIVE EMISSION CONTROL SYSTEM

#### PURGE CONTROL VALVE (PCV) AND AIR VENT CONTROL VALVE (AVCV) REMOVAL

Remove the following:

- fuel tank (page 2-4)
- air cleaner case (page 6-3)
- carburetors (page 6-4)

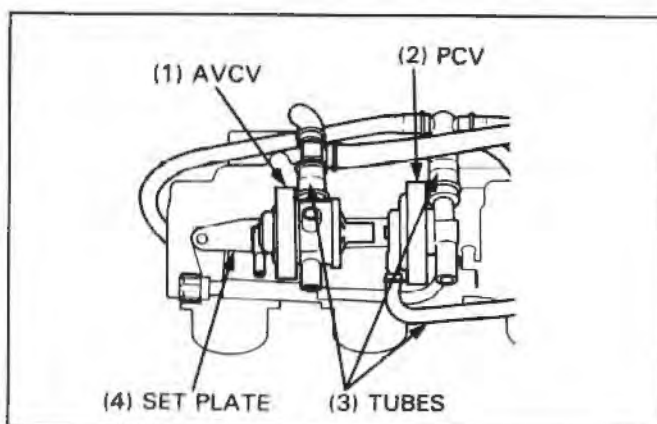
Disconnect the tubes from PCV and AVCV, and remove the set plate from the No. 1 carburetor float chamber cover. Remove the PCV and AVCV.

Inspect the PCV and AVCV (refer to section 7 of the Common Service Manual).

Install the PCV and AVCV in the reverse order of removal.

### NOTE

- For PCV and AVCV tubes routing, see previous page.



## FUEL SYSTEM

### SECONDARY AIR SUPPLY SYSTEM

#### NOTE

- The ASV has reed valves built into the AICV.

Remove the fuel tank (page 2-4).

Disconnect the air injection tube (No. 15 tube) from the air cleaner case.

Disconnect the vacuum tube (No. 10 tube) from the ASV.  
Install the plug onto the No. 10 vacuum tube and connect the vacuum pump to the ASV.

Perform the secondary air supply system (refer to section 7 of the Common Service Manual).

**SPECIFIED VACUUM: 360 mmHg (14.2 inHg)**

#### AIR SUCTION VALVE (ASV) REMOVAL

Remove two bolts and air suction valve as an assembly.

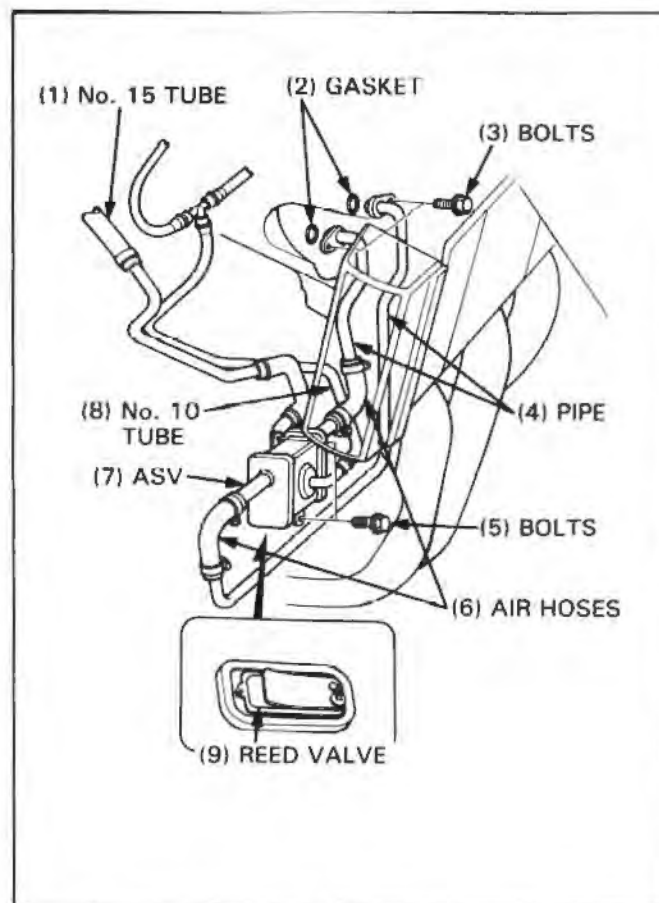
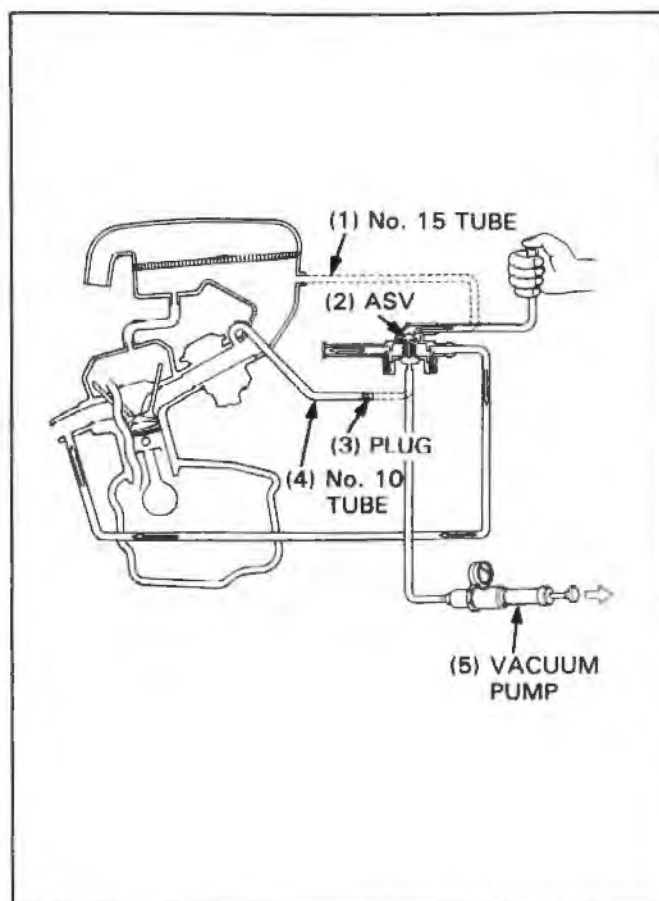
Disconnect the following from the ASV.

- No. 10 vacuum tube.
- No. 15 air injection tube.
- air supply hoses.

Remove bolts, air injection pipes and gaskets.

Remove the reed valve covers and reed valves.

Install the air suction valve in the reverse order of removal.



# 7. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

7-1 ENGINE REMOVAL/INSTALLATION

7-2

## SERVICE INFORMATION

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

### CAUTION

- Do not jack up the motorcycle using the oil filter.

- The following components can be serviced with the engine installed in the frame:

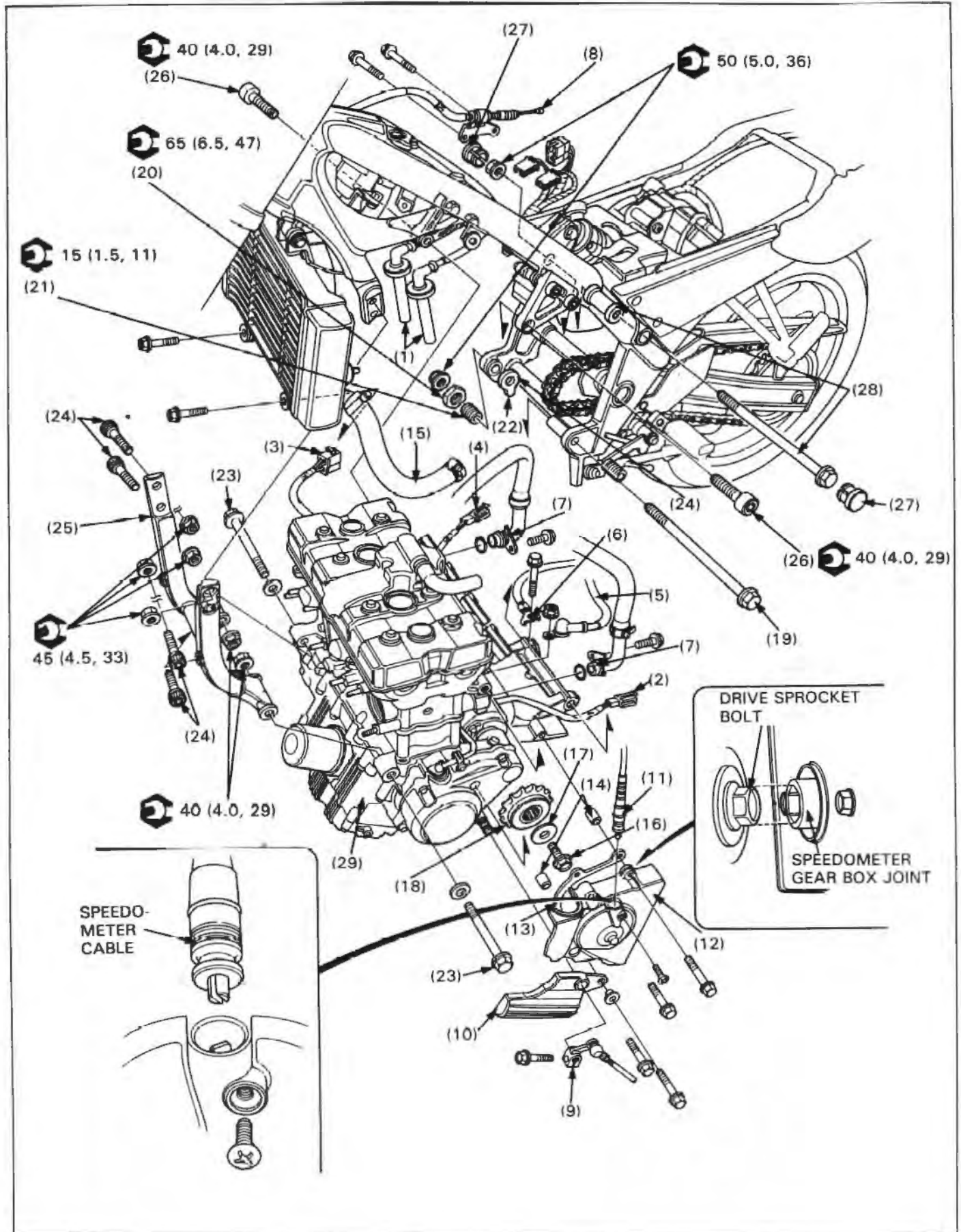
- alternator (Section 14)
- camshaft (Section 8)
- carburetors (Section 6)
- clutch (Section 9)
- gearshift linkage (Section 9)
- oil pump (Section 4)
- pulse generator (Section 15)
- starter clutch (Section 16)
- starter motor (Section 16)
- water pump (Section 5)

- The following components require engine removal for service:

- connecting rod (Section 10)
- crankshaft (Section 10)
- cylinder (Section 8)
- cylinder head (Section 8)
- piston (Section 8)
- transmission (Section 10)

**ENGINE REMOVAL/INSTALLATION**

**ENGINE REMOVAL/INSTALLATION**





**ENGINE REMOVAL/INSTALLATION****NOTE**

- Turn the ignition switch OFF and disconnect the battery ground (-) cable.

**CAUTION**

- Do not jack up the motorcycle using the oil filter.

**REQUISITE SERVICE**

- Exhaust system removal/installation (page 2-3)
- Fuel tank removal/installation (page 2-4)
- Air cleaner case removal/installation (page 6-3)
- Carburetor removal/installation (page 6-4)
- Coolant draining (page 5-3)
- Engine oil draining (location: page 3-3, step: section 2 of the Common Service Manual)
- Remove the radiator lower mounting bolts and loosen the upper mounting bolt/nut (page 5-5). Swing the radiator forward.
- Coolant refill (section 5 of the Common Service Manual)

| PROCEDURE  | Q'ty | REMARKS  |
|--|------|--|
| <b>REMOVAL ORDER</b>   |      | • Installation is in the reverse order of removal.   |
| (1) Spark plug cap   | 4    |  |
| (2) Pulse generator 2P mini (blue) connector                     | 1    |  |
| (3) Alternator 3P (black) connector                              | 1    |  |
| (4) Neutral switch/oil pressure switch 2P mini (black) connector | 1    |  |
| (5) Starter motor cable  | 1    |  |
| (6) Engine ground cable  | 1    | On the starter motor   |
| (7) Water hose joint/U-ring                                      | 2/2  |  |
| (8) Clutch cable   | 1    |  |
| (9) Gearshift spindle joint                                      | 1    | At installation, align the punch marks on the joint and spindle.   |
| (10) Water pump side cover                                       | 1    |  |
| (11) Speedometer cable   | 1    |  |
| (12) Drive sprocket cover  | 1    | <b>CAUTION:</b><br>• Make sure the drive sprocket bolt is aligned with the speedometer gear box joint securely as shown.   |
| (13) Drive chain guide   | 1    |  |
| (14) Dowel pin   | 2    |  |
| (15) Water hose  | 1    |  |
| (16) Drive sprocket bolt   | 1    | <b>NOTE:</b><br>• Hold the motorcycle on its side stand and shift the transmission in 6th gear. With the brake pedal applied, remove (or install) the drive sprocket bolt. |
| (17) Washer  | 1    |  |
| (18) Drive sprocket  | 1    | Loosen the drive chain.  |
| (19) Engine mount bolt (rear/lower)                              | 1    |  |
| (20) Adjusting bolt lock nut                                     | 1    |  |
| (21) Adjusting bolt  | 1    |  |
| (22) Special washer  | 1    | With its tab facing down.  |
| (23) Engine mount bolt (Front)/washer                            | 2/2  |  |
| (24) Engine sub frame bolt                                       | 4    |  |
| (25) Engine sub frame  | 1    |  |
| (26) Engine bracket bolt   | 2    | Only remove the left/lower and right/lower bolts.  |
| (27) Bolt cap  | 2    |  |
| (28) Engine mount bolt (rear/upper)/collar                       | 1/1  | Install the collar on the left side.<br>Move the engine out of the frame to the left.  |
| (29) Engine assembly   | 1    | <b>CAUTION:</b><br>• Carefully align mounting points with the jack to prevent damage to mounting bolt threads, wire harness and cables.                                    |

# 8. CYLINDER HEAD/CYLINDER/PISTON

|  |            |  |            |
|--|------------|--|------------|
| <b>SERVICE INFORMATION</b>                     | <b>8-1</b> | <b>CYLINDER HEAD DISASSEMBLY/<br/>ASSEMBLY</b>   | <b>8-6</b> |
| <b>TROUBLESHOOTING</b>                         | <b>8-1</b> | <b>CYLINDER/PISTON REMOVAL/<br/>INSTALLATION</b> | <b>8-8</b> |
| <b>CAMSHAFT REMOVAL/INSTALLATION</b>           | <b>8-2</b> |  |            |
| <b>CYLINDER HEAD REMOVAL/<br/>INSTALLATION</b> | <b>8-4</b> |  |            |

## SERVICE INFORMATION

- Camshaft service can be done with the engine in the frame.
- Camshaft lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling the cylinder head. Fill the cylinder head oil pockets with the clean engine oil of the proper type and viscosity.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Before reassembly, lubricate the camshaft journals and cam lobes with a molybdenum oil solution.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their proper locations.
- Be careful not to damage the mating surfaces by using a screwdriver when removing the cylinder. Do not strike the cylinder too hard during disassembly, even with a rubber or plastic mallet, to prevent the possibility of damage to the cylinder fins.
- Take care not to damage the cylinder walls and pistons.
- Store the valve and piston components in the same order they were installed so they can be reinstalled in the original positions.

## TROUBLESHOOTING

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

If performance is poor at low speeds, check for white smoke in the crankcase breather tube. If the tube is smokey, check for seized piston rings.

### NOTE

- For cylinder compression and leak-down test procedures, refer to section 3 of the Common Service Manual.

#### Rough idle

- Low cylinder compression

#### Low compression

- Incorrect valve shim adjustment (page 3-5)
- Burned or bent valves
- Incorrect valve timing
- Broken valve spring
- Uneven valve seating
- Leaking or damaged head gasket
- Warped or cracked cylinder head
- Loose spark plug
- Worn, stuck or broken piston rings
- Worn or damaged cylinder and piston

#### Compression too high

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

#### Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Worn cylinder, piston or piston rings
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

#### Excessive noise

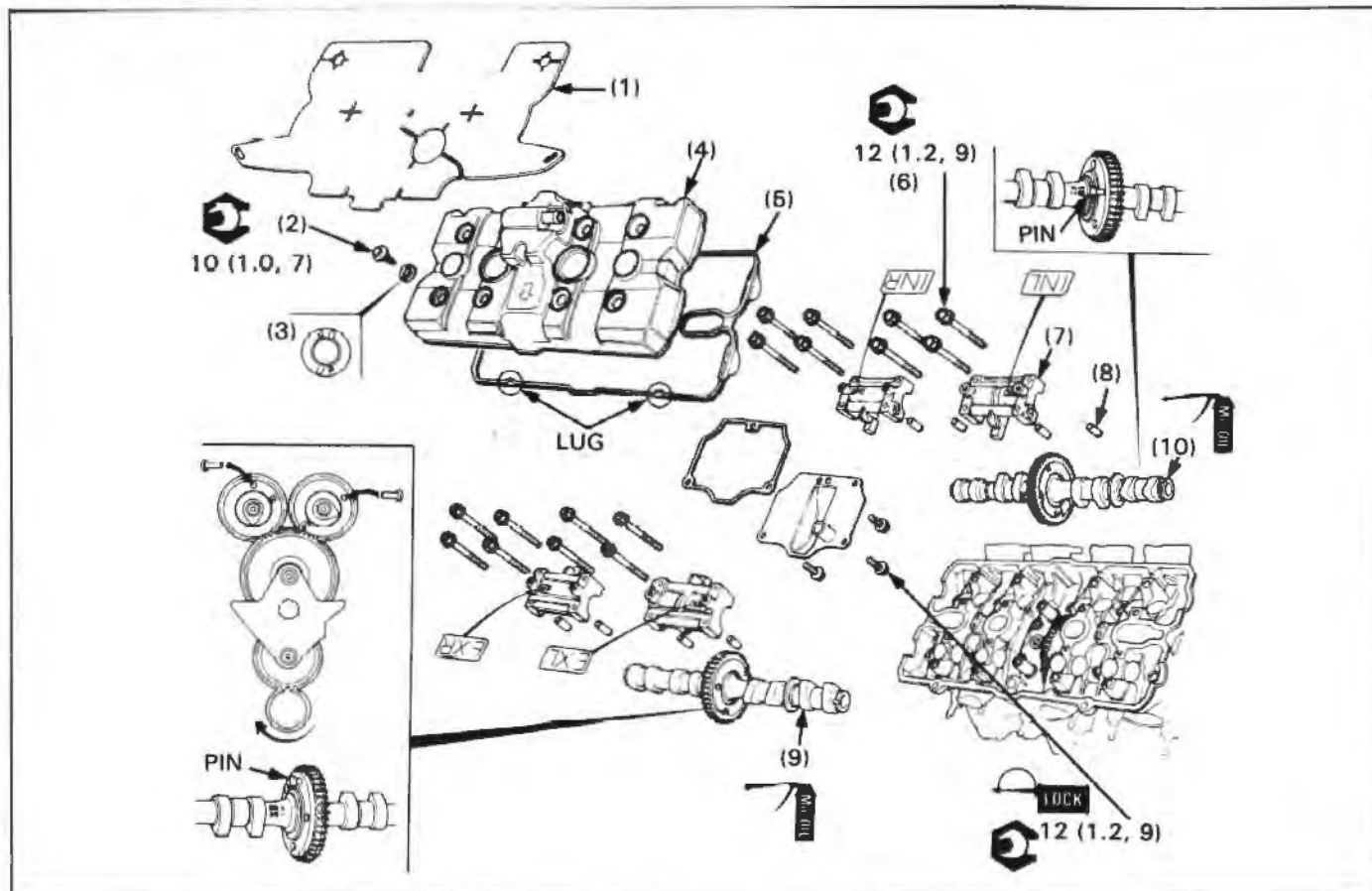
- Incorrect valve shim adjustment (page 3-5)
- Sticking valve or broken valve spring
- Damaged or worn camshaft
- Damaged camshaft drive gear

#### Abnormal noise (piston)

- Worn cylinder and piston
- Worn piston pin or piston pin hole
- Worn connecting rod big end bearing

## CYLINDER HEAD/CYLINDER/PISTON

## CAMSHAFT REMOVAL/INSTALLATION



## REQUISITE SERVICE

- Fuel tank removal/installation (page 2-4)
- Air cleaner case removal/installation (page 6-3)
- Remove the radiator lower mounting bolts and loosen the upper mounting bolt/nut (page 5-5). Swing the radiator forward.

| PROCEDURE                    | Q'ty | REMARKS  |
|------------------------------|------|--|
| REMOVAL ORDER                |      | • Installation is in the reverse order of removal.   |
| (1) Heat guard plate         | 1    |  |
| (2) Cylinder head cover bolt | 8    | At installation, tighten the bolts in a gradual, crisscross pattern.   |
| (3) Washer                   | 8    | Install them with the "UP" mark facing up.   |
| (4) Cylinder head cover      | 1    | Install with the "←" mark forward.   |
| (5) Gasket                   | 1    | NOTE:<br>• Apply Three Bond 1521 or equivalent to the head cover and install the gasket onto the cover with tabs facing forward.   |
| (6) Camshaft holder bolt     | 16   | NOTE:<br>• Before removing bolts, turn the flywheel clockwise and insert suitable pins into the cam gear holes to ease the installation of camshaft serrated gears. Take care not to drop pins into the crankcase and that the pins do not interfere with the cylinder head. |
| (7) Camshaft holder          | 4    | Camshaft installation (page 8-3)   |
| (8) Dowel pin                | 8    |  |
| (9) Exhaust (EX) camshaft    | 1    |  |
| (10) Intake (IN) camshaft    | 1    |  |

## CYLINDER HEAD/CYLINDER/PISTON

## CAMSHAFT INSTALLATION

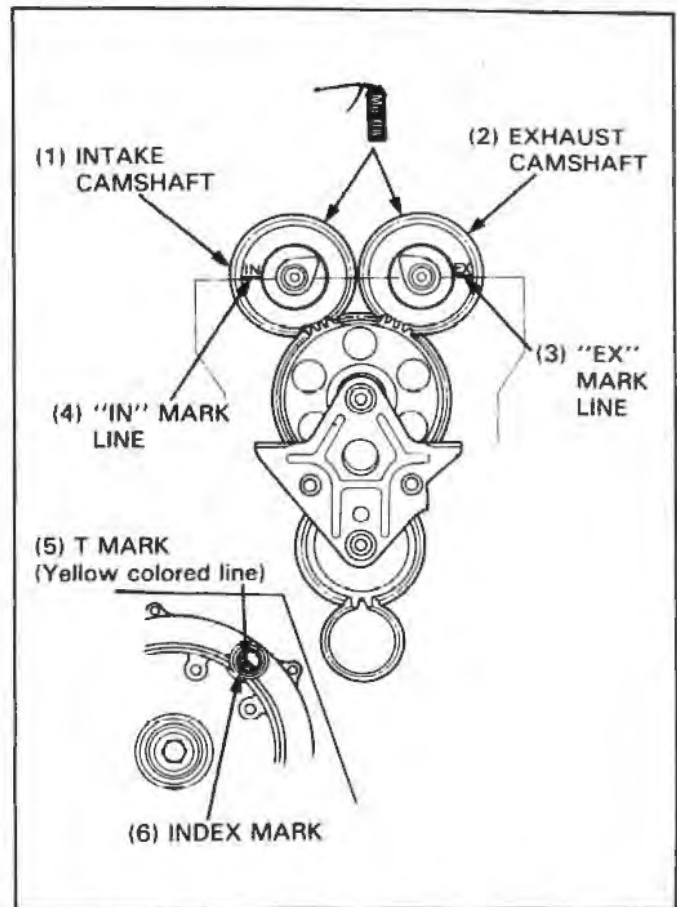
Remove the following:

- crankshaft hole cap cover (page 9-2).
- crankshaft hole cap (page 9-2).
- timing mark hole cap (page 9-2).

Rotate the crankshaft clockwise and align the flywheel "T" mark (Yellow colored line) with the cover index mark. Lubricate the camshaft journals and cam lobes with a molybdenum oil solution.

Lay the EX marked (Exhaust) camshaft onto the cylinder head with EX mark line as shown and lay the IN marked (Intake) camshaft with IN mark line as shown.

In this position, the No. 4 piston is at TDC on the compression stroke.



Install the dowel pins onto the camshaft holders and install the camshaft holders in their original positions.

## NOTE

- Each holder has identification marks.
- |                                |                                 |
|--------------------------------|---------------------------------|
| EXL: Exhaust camshaft-<br>Left | EXR: Exhaust camshaft-<br>Right |
| INL: Intake camshaft-<br>Left  | INR: Intake camshaft-<br>Right  |

Tighten the camshaft holder bolts in a gradual, crisscross pattern.

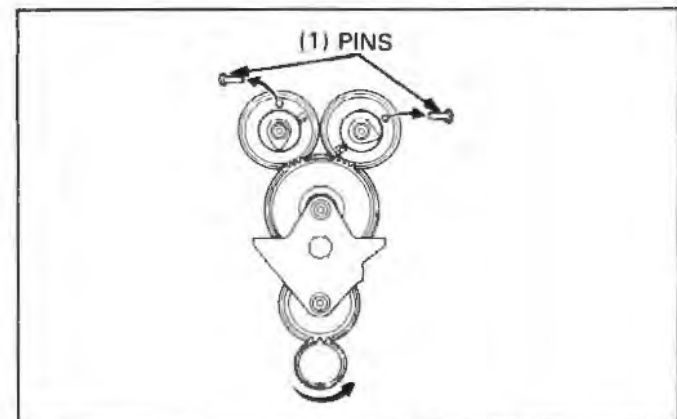
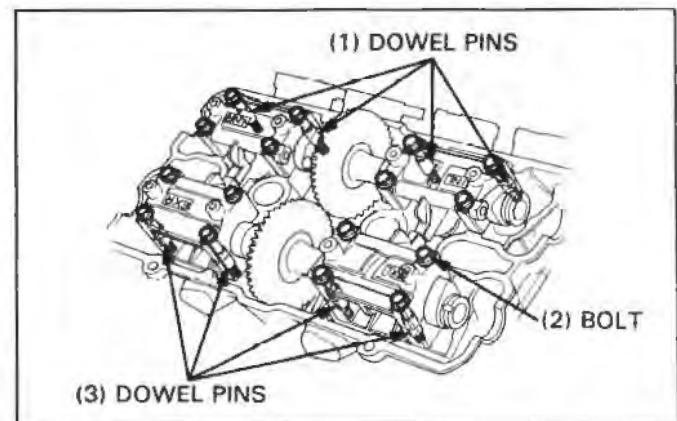
**TORQUE: 12 N·m (1.2 kg·m, 9 ft·lb)**

Turn the crankshaft counterclockwise so as not to interfere the camshaft serrated gear holder pins with the cylinder head. Remove the holder pins from each camshaft gear.

## NOTE

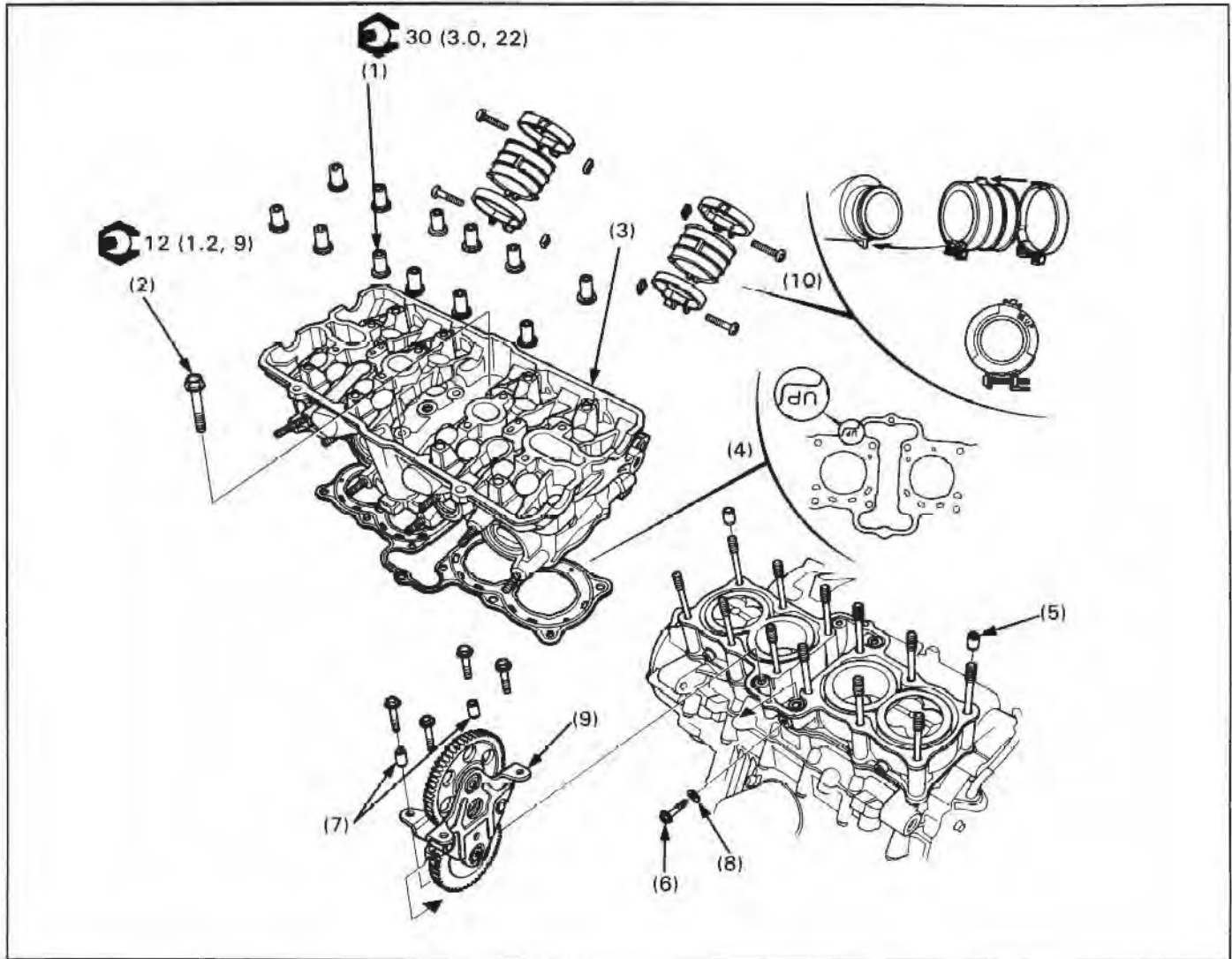
- Take care not to drop the pins into the crankcase.

Recheck the valve timing.



**CYLINDER HEAD/CYLINDER/PISTON**

**CYLINDER HEAD REMOVAL/INSTALLATION**



**REQUISITE SERVICE**

- Engine removal/installation (page 7-2)
- Camshaft removal/installation (page 8-2)

| PROCEDURE                             | Q'ty | REMARKS   |
|---------------------------------------|------|---|
| <b>REMOVAL ORDER</b>                  |      |   |
| (1) Cylinder head special nut         | 12   | • Installation is in the reverse order of removal.<br>Installation (page 8-5)   |
| (2) Cylinder head mounting bolt       | 2    |   |
| (3) Cylinder head assembly            | 1    | Install with the UP mark facing up and rearward.  |
| (4) Gasket                            | 1    |   |
| (5) Dowel pin                         | 2    | Installation (page 8-5)   |
| (6) Camshaft idle gear case bolt      | 5    |   |
| (7) Camshaft idle gear case dowel pin | 2    | At installation, align the insulator groove with the engine lug, with the ↑ UP mark facing upwards (carburetor side). |
| (8) Sealing washer                    | 1    |   |
| (9) Camshaft idle gear case           | 1    |   |
| (10) Carburetor insulator             | 4    |   |



## CYLINDER HEAD/CYLINDER/PISTON

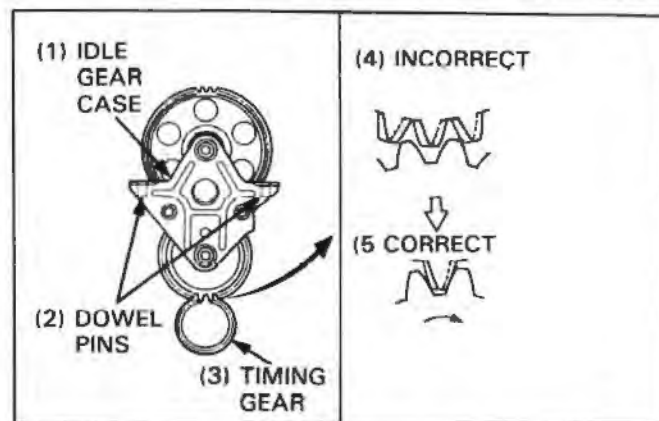
## CAMSHAFT IDLE GEAR CASE INSTALLATION

Install the camshaft idle gear case dowel pins properly.

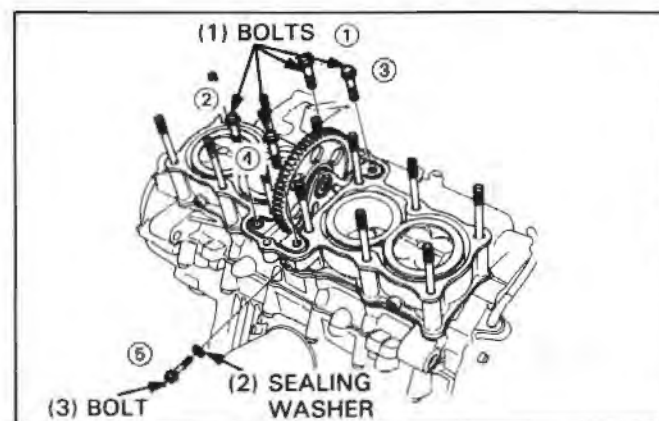
## NOTE

- Without the dowel pins installed properly, the camshaft idle gear may not be able to be installed onto the crankshaft timing gear.

Install the camshaft idle gear case onto the cylinder. While moving the idle gear lightly with the gear case held, the gear case should be lifted up slightly from the cylinder.

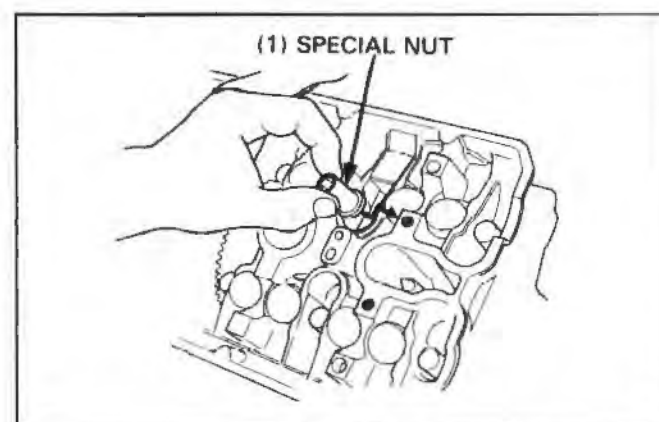


Install a new sealing washer and mounting bolts. Tighten bolts in a gradual, as shown.



## CYLINDER HEAD NUT/BOLT INSTALLATION

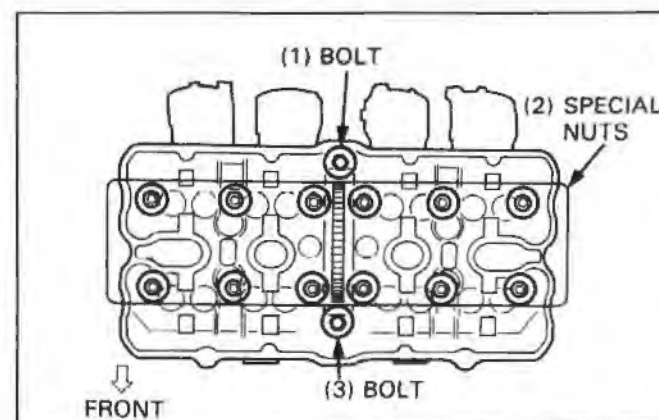
Install the cylinder head special nuts as shown. Do not tighten them yet.



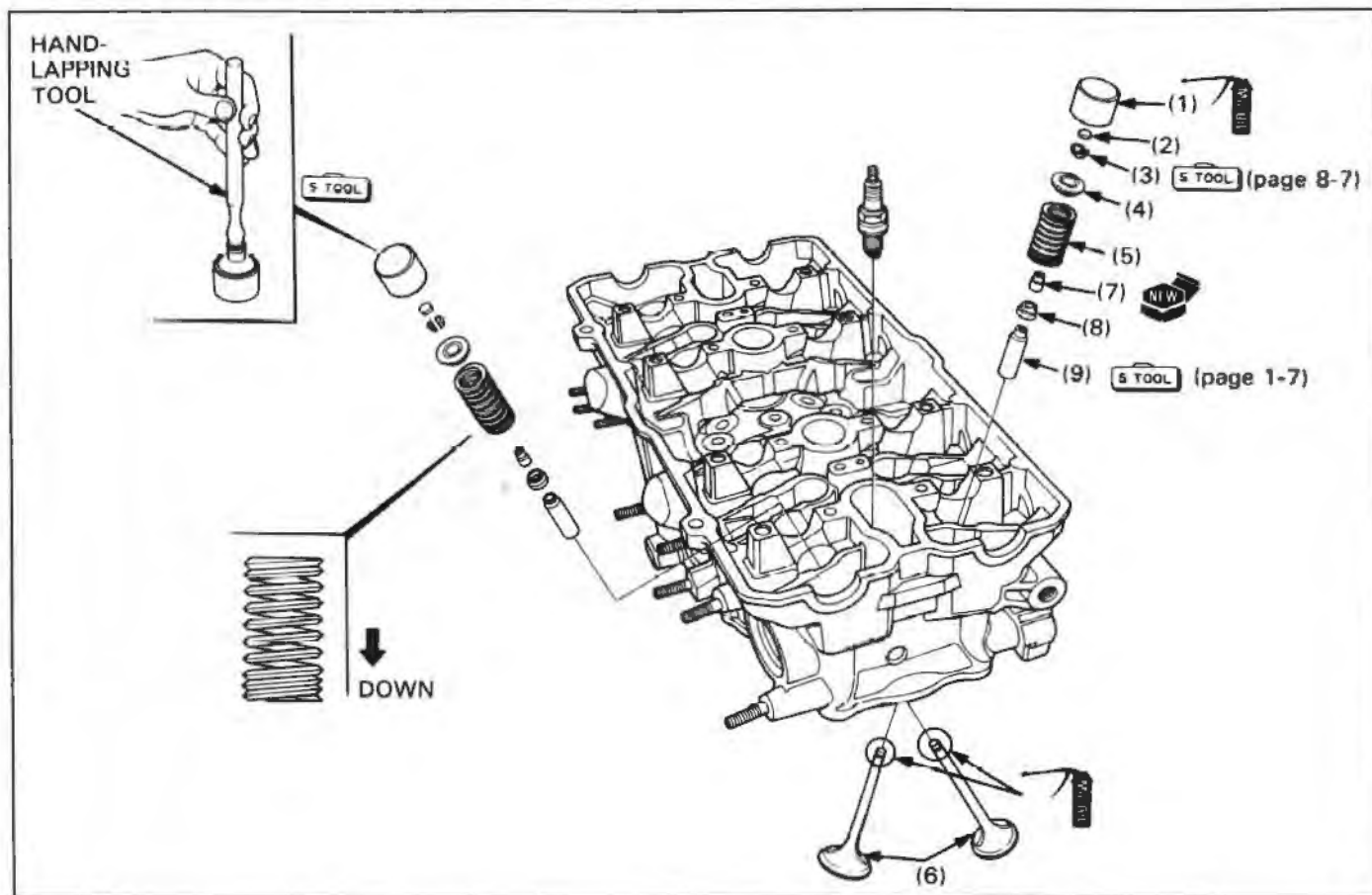
Install the cylinder head mounting bolts. Tighten the special nuts and mounting bolts in a gradual, crisscross pattern.

## TORQUE:

- Special nut: 30 N·m (3.0 kg-m, 22 ft-lb)  
Mounting bolt: 12 N·m (1.2 kg-m, 9 ft-lb)



# CYLINDER HEAD DISASSEMBLY/ASSEMBLY



**NOTE**

- Store the valve components in the same order they were installed so they can be reinstalled in the original positions.
- Refer to section 9 of the Common Service Manual for valve guide inspection/replacement.

**REQUISITE SERVICE**

- Engine removal/installation (page 7-2)
- Camshaft removal/installation (page 8-2)
- Cylinder head removal/installation (page 8-4)

| PROCEDURE                             | Q'ty | REMARKS  |
|---------------------------------------|------|--|
| (1) DISASSEMBLY ORDER<br>Valve bucket | 16   | • Assembly is in the reverse order of disassembly.<br>NOTE:<br>• Remove using a handlapping tool. Do not damage the cylinder head -bucket sliding surface. |
| (2) Valve shim                        | 16   |  |
| (3) Valve cotter                      | 32   | Removal/Installation (page 8-7)  |
| (4) Retainer                          | 16   |  |
| (5) Valve spring                      | 16   | Install them with the narrow pitch end facing down.  |
| (6) Valve                             | 16   |  |
| (7) Stem seal                         | 16   |  |
| (8) Spring seat                       | 16   |  |
| (9) Valve guide                       | 16   | Be sure to duplicate the proper valve guide installed length (page 1-7)  |

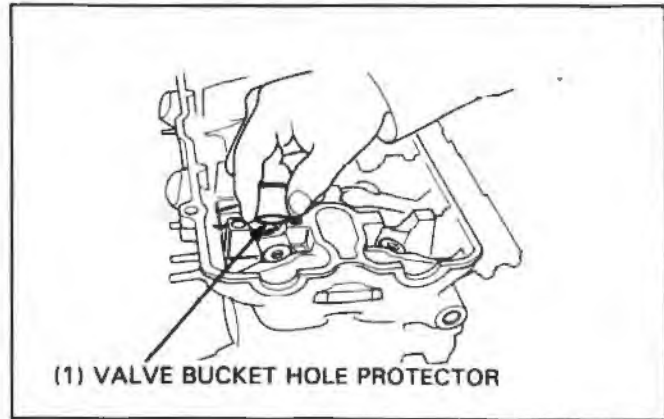
**VALVE COTTERS REMOVAL/INSTALLATION**

Remove the valve buckets and shims.  
Install the cylinder head protector into the cylinder head-bucket sliding surface.

**S TOOL**

**VALVE BUCKET HOLE PROTECTOR**

**07JMG-KY20100**



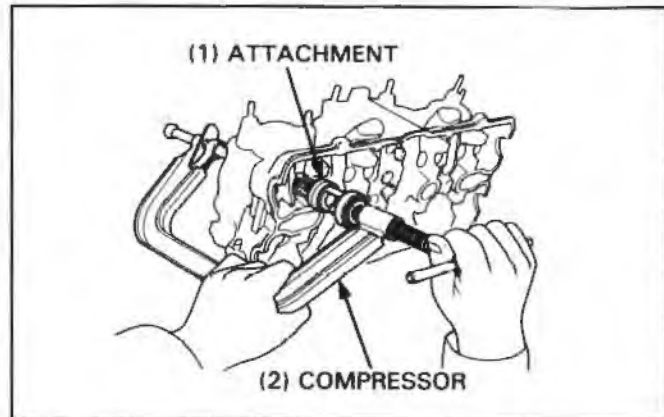
Install the valve spring compressor onto the valve and compress the valve spring.  
Remove (or install) the valve cotters.

**S TOOL**

**VALVE SPRING COMPRESSOR ATTACHMENT**

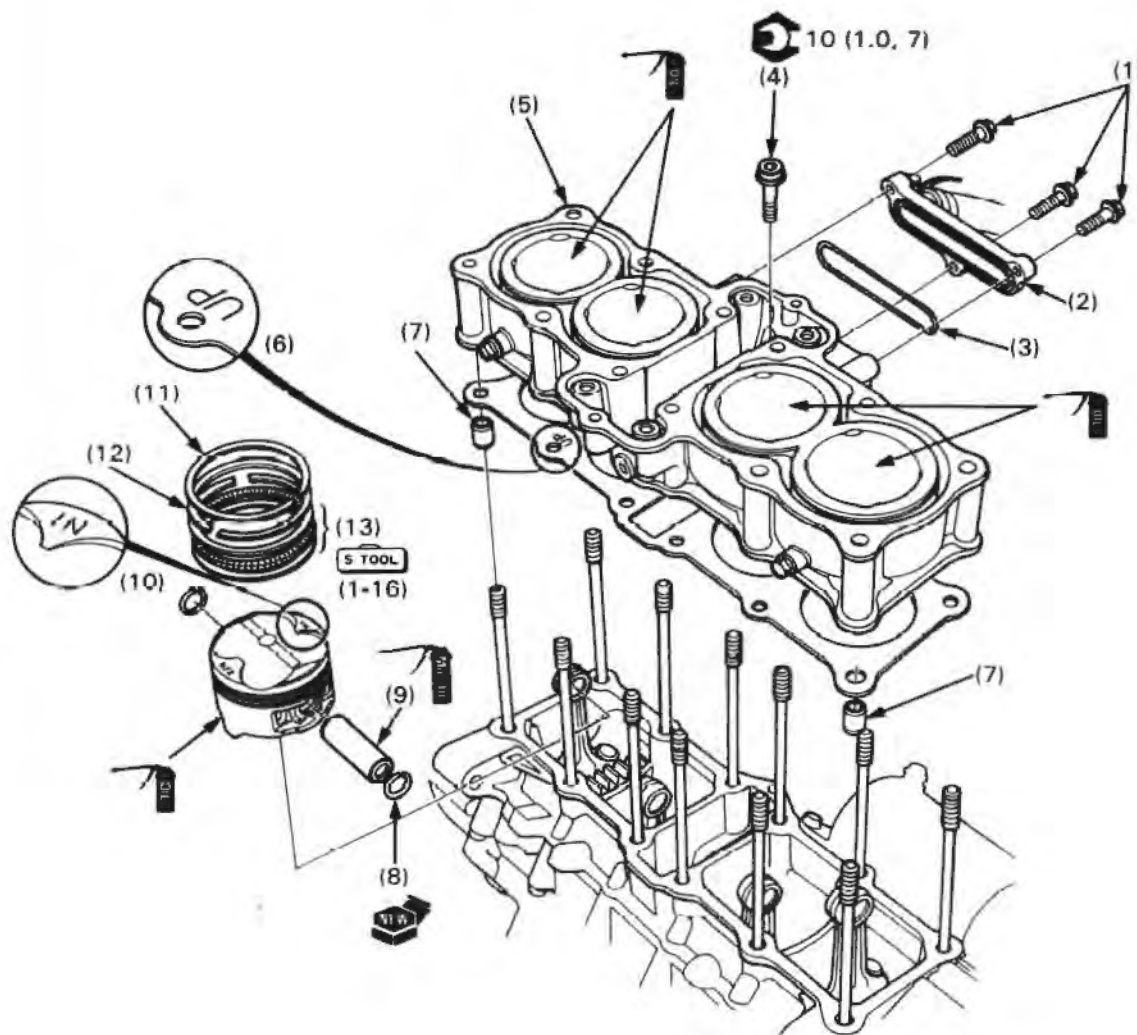
**07JME-KY20100**

**VALVE SPRING COMPRESSOR** **07757-0010000**



**CYLINDER HEAD/CYLINDER/PISTON**

**CYLINDER/PISTON REMOVAL/INSTALLATION**



**NOTE**

- Refer to section 10 of the Common Service Manual for piston and piston ring inspection.

**REQUISITE SERVICE**

- Engine removal/installation (page 7-2)
- Camshaft removal/installation (page 8-2)
- Cylinder head removal/installation (page 8-4)

| PROCEDURE |   | Q'ty | REMARKS  |
|-----------|---|------|--|
|           | <b>REMOVAL ORDER</b>                        |      | • Installation is in the reverse order of removal.   |
| (1)       | Water joint bolt                            | 3    |  |
| (2)       | Water joint                                 | 1    |  |
| (3)       | O-ring                                      | 1    |  |
| (4)       | Cylinder mounting bolt                      | 1    |  |
| (5)       | Cylinder                                    | 1    |  |
| (6)       | Gasket                                      | 1    | Install with the UP mark facing up and forward.  |
| (7)       | Dowel pin                                   | 2    |  |
| (8)       | Piston pin clip                             | 8    |  |
| (9)       | Piston pin                                  | 4    |  |
| (10)      | Piston                                      | 4    | Install them with the IN mark facing to the intake side.   |
| (11)      | Piston top ring                             | 4    | • Install the top and second rings with the markings facing up.<br>• Space the ring end gaps 120° apart.<br>• Space the side rail gaps 20 mm (0.8 in) or more apart. |
| (12)      | Piston second ring                          | 4    |  |
| (13)      | Piston oil ring set (side rails and spacer) | 4    |  |



# 9. CLUTCH/GEARSHIFT LINKAGE

|  |            |  |            |
|--|------------|--|------------|
| <b>SERVICE INFORMATION</b>                             | <b>9-1</b> | <b>CLUTCH REMOVAL</b>                              | <b>9-4</b> |
| <b>TROUBLESHOOTING</b>                                 | <b>9-1</b> | <b>GEARSHIFT LINKAGE REMOVAL/<br/>INSTALLATION</b> | <b>9-6</b> |
| <b>RIGHT CRANKCASE COVER REMOVAL/<br/>INSTALLATION</b> | <b>9-2</b> | <b>CLUTCH INSTALLATION</b>                         | <b>9-8</b> |

## SERVICE INFORMATION

- Clutch and gearshift linkage maintenance can be done with the engine in the frame.
- Engine oil viscosity and level have an effect on clutch operation. When the clutch does not disengage or the vehicle creeps with clutch disengaged, inspect the engine oil and oil level before servicing the clutch system.
- Clean any gasket off the crankcase cover-crankcase mating surface.
- Do not damage the cover-case mating surface.
- Never allow foreign materials to get into the engine.
- If the shift forks, drum and transmission require servicing, remove the engine and separate the crankcase (Section 10).
- If it is no longer clear which bolt belongs in which hole, insert all bolts in the holes and check the exposed length; each should be exposed the same amount.

## TROUBLESHOOTING

### Clutch lever too hard

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

### Clutch will not disengage or motorcycle creeps with clutch disengaged

- Too much clutch lever free play
- Warped plate(s)
- Oil level too high, improper oil viscosity or oil additive used

### Clutch slips

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

### Hard to shift

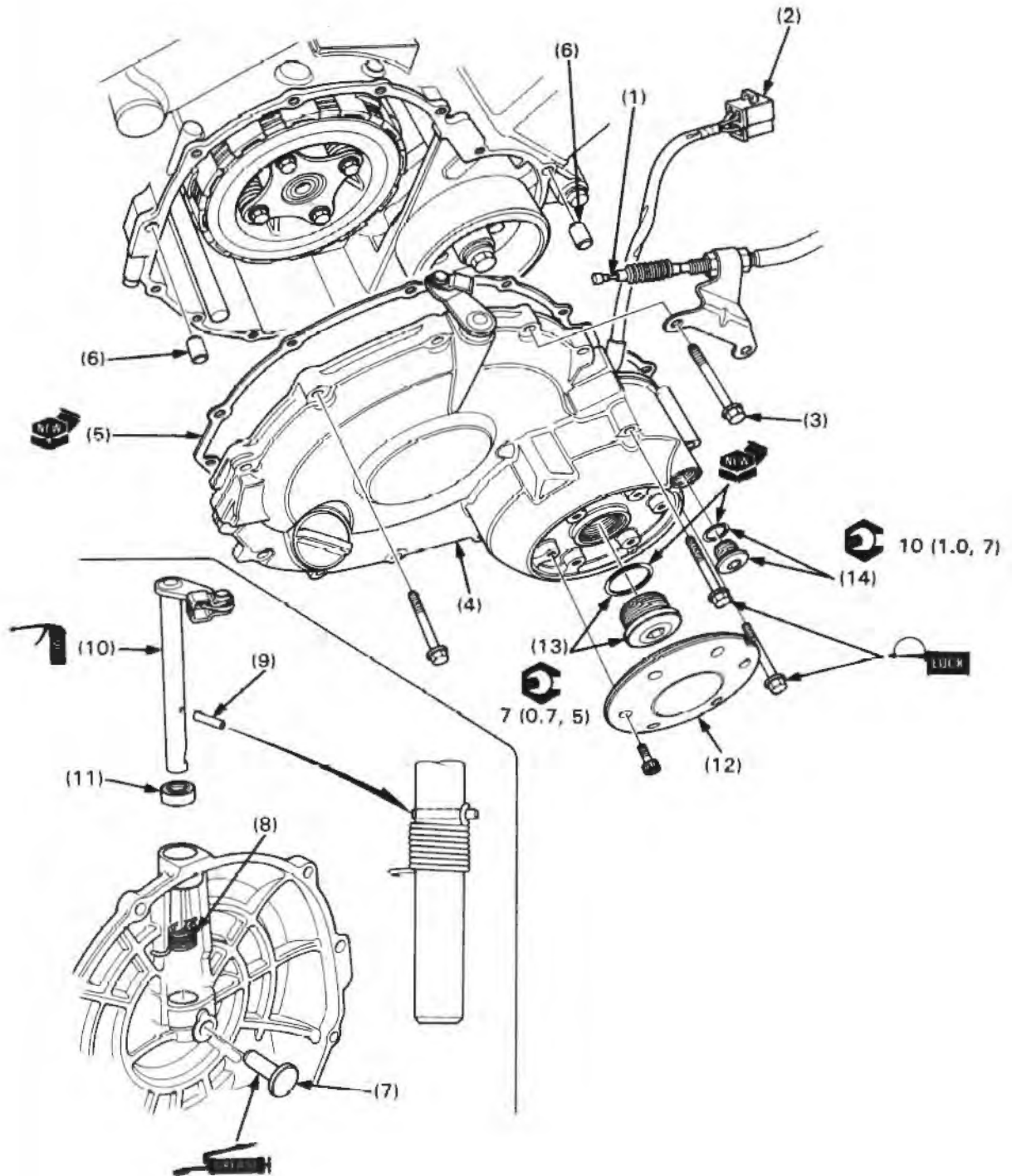
- Misadjusted clutch cable
- Damaged or bent shift fork
- Bent shift fork shaft
- Worn gear dogs
- Incorrect engine oil viscosity
- Incorrect gearshift linkage guide plate installation

### Jumps out of gear

- Damaged or bent shift fork
- Bent shift fork shaft
- Damaged stopper arm
- Worn gear engagement dogs or slots
- Damaged shift drum cam grooves

**CLUTCH/GEARSHIFT LINKAGE**

**RIGHT CRANKCASE COVER REMOVAL/INSTALLATION**



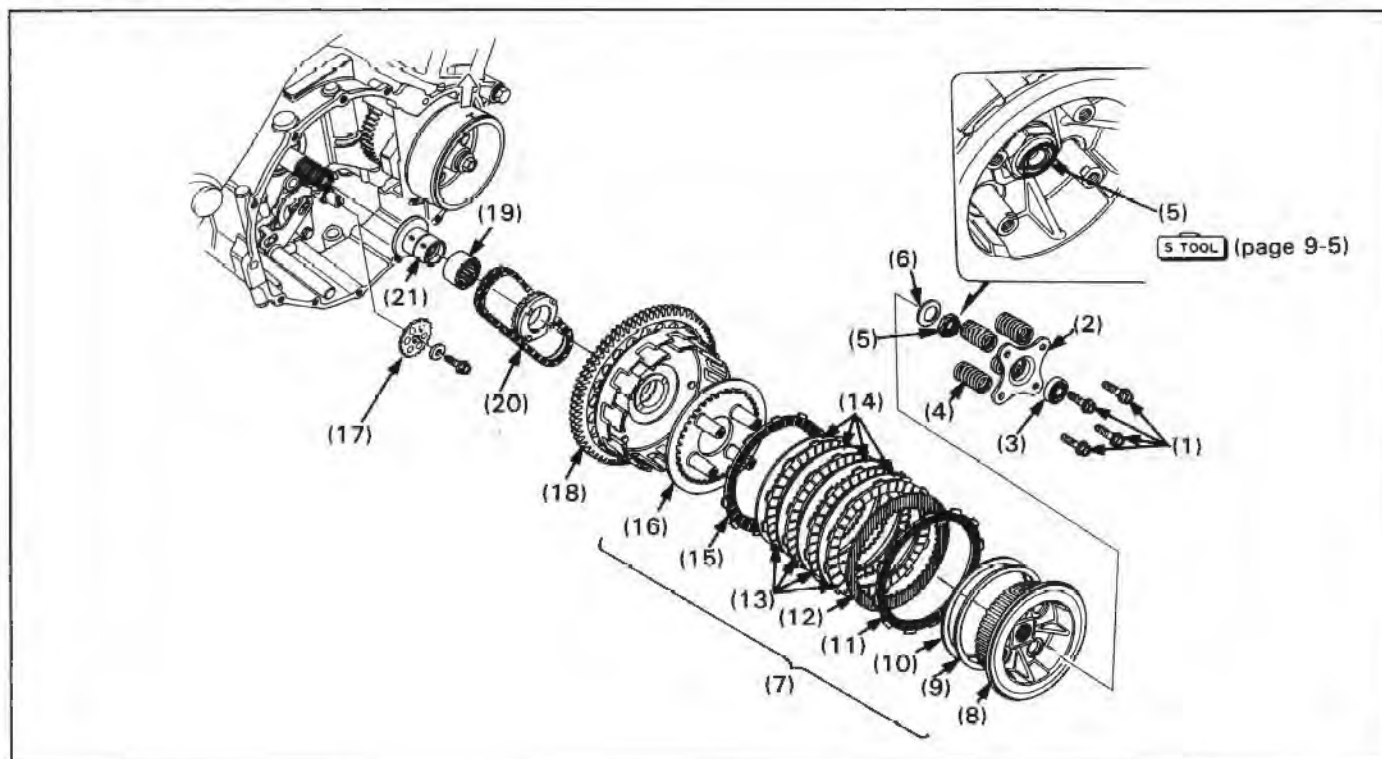
**REQUISITE SERVICE**

- Engine oil draining (drain bolt location: page 3-3, step: section 2 of the Common Service Manual)

| PROCEDURE            |                             | Q'ty | REMARKS   |
|----------------------|-----------------------------|------|---|
| <b>REMOVAL ORDER</b> |                             |      | • Installation is in the reverse order of removal.  |
| (1)                  | Clutch cable                | 1    | <b>NOTE:</b><br>• At installation, apply a locking agent to the two bolt threads.<br>Disconnect (or connect) the Alternator 3P connector. |
| (2)                  | Alternator wire connector   | 1    |   |
| (3)                  | Right crankcase cover bolt  | 14   |   |
| (4)                  | Right crankcase cover       | 1    |   |
| (5)                  | Gasket                      | 1    |   |
| (6)                  | Dowel pin                   | 2    |   |
| (7)                  | Clutch lifter pin           | 1    | <b>NOTE:</b><br>• Drive in a new spring pin using a pin driver until the pin does not interfere with the lifter arm as shown.             |
| (8)                  | Return spring               | 1    |   |
| (9)                  | Spring pin                  | 1    |   |
| (10)                 | Clutch lifter arm           | 1    |   |
| (11)                 | Oil seal                    | 1    |   |
| (12)                 | Crankshaft hole cap cover   | 1    |   |
| (13)                 | Crankshaft hole cap/O-ring  | 1/1  |   |
| (14)                 | Timing mark hole cap/O-ring | 1/1  |   |

## CLUTCH/GEARSHIFT LINKAGE

## CLUTCH REMOVAL



## REQUISITE SERVICE

- Right crankcase cover removal (page 9-2)

| PROCEDURE |                                     | Q'ty | REMARKS   |                    |
|-----------|-------------------------------------|------|---|--------------------|
| (1)       | Clutch lifter plate bolt            | 4    | Remove them in a gradual, crisscross pattern.   |                    |
| (2)       | Clutch lifter plate                 | 1    |   |                    |
| (3)       | Clutch lifter plate bearing         | 1    |   |                    |
| (4)       | Clutch spring                       | 4    |   |                    |
| (5)       | Clutch center lock nut              | 1    |   | Removal (page 9-5) |
| (6)       | Lock washer                         | 1    |   |                    |
| (7)       | Clutch assembly                     | —    | Refer to page 1-10 for specification.   |                    |
| (8)       | — clutch center                     | 1    | Larger I.D. disc/Color: black<br>Color: gray<br>Smaller I.D. disc<br>Color: silver<br>Smaller I.D. disc/Color: black<br>Refer to section 11 of the Common Service Manual for inspection information.          |                    |
| (9)       | — spring seat                       | 1    |   |                    |
| (10)      | — judder spring                     | 1    |   |                    |
| (11)      | — clutch friction disc C            | 1    |   |                    |
| (12)      | — clutch plate B                    | 1    |   |                    |
| (13)      | — clutch friction disc B            | 4    |   |                    |
| (14)      | — clutch plate A                    | 4    |   |                    |
| (15)      | — clutch friction disc A            | 1    |   |                    |
| (16)      | — pressure plate                    | 1    |   |                    |
| (17)      | Oil pump driven sprocket            | 1    |   | Removal (page 4-3) |
| (18)      | Clutch outer                        | 1    | NOTE:<br>• Turn the crankshaft clockwise and face the flywheel "T" mark up so as not to interfere the primary driven gear with the crank weight.<br>• Do not still remove the needle bearing and outer guide. |                    |
| (19)      | Needle bearing                      | 1    |   |                    |
| (20)      | Oil pump drive sprocket/drive chain | 1/1  |   |                    |
| (21)      | Clutch outer guide                  | 1    |   |                    |

**CLUTCH/GEARSHIFT LINKAGE****CLUTCH CENTER LOCK NUT REMOVAL**

If you have the universal type of the clutch center holder, you will be able to use it.

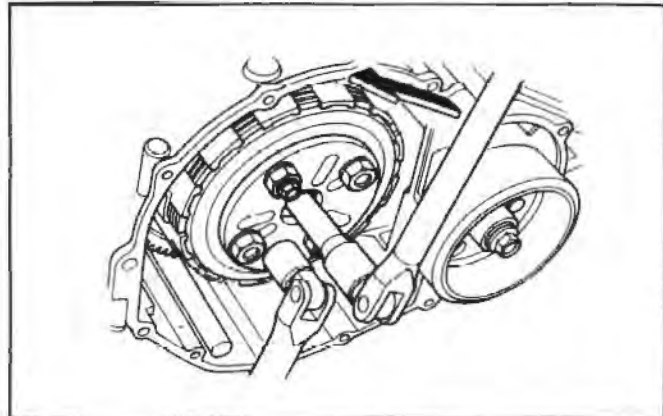
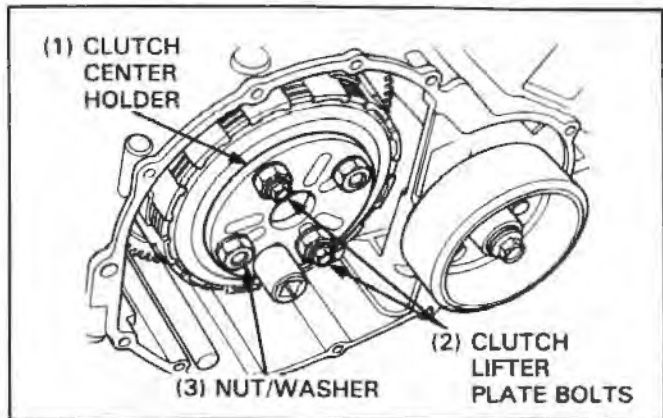
Unstake the nut.

Set the clutch center holder to the pressure plate bosses and loosely install the nuts.

**CLUTCH CENTER HOLDER**      **07HGB-001000A**  
(U.S.A. only)

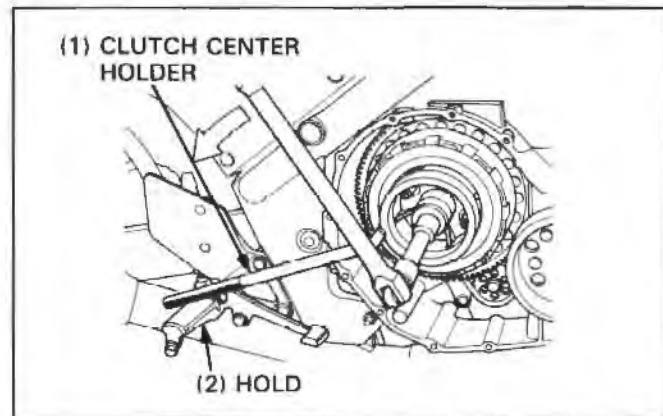
Temporarily remove the tool and tighten nuts; then reinstall the clutch center holder onto the bosses. Use at least two clutch lifter plate bolts to secure the tool to the clutch.

Hold the clutch center holder and remove the lock nut as shown.



If you do not have the above holder, use the below holder. Unstake the nut. Remove the clutch center lock nut as shown.

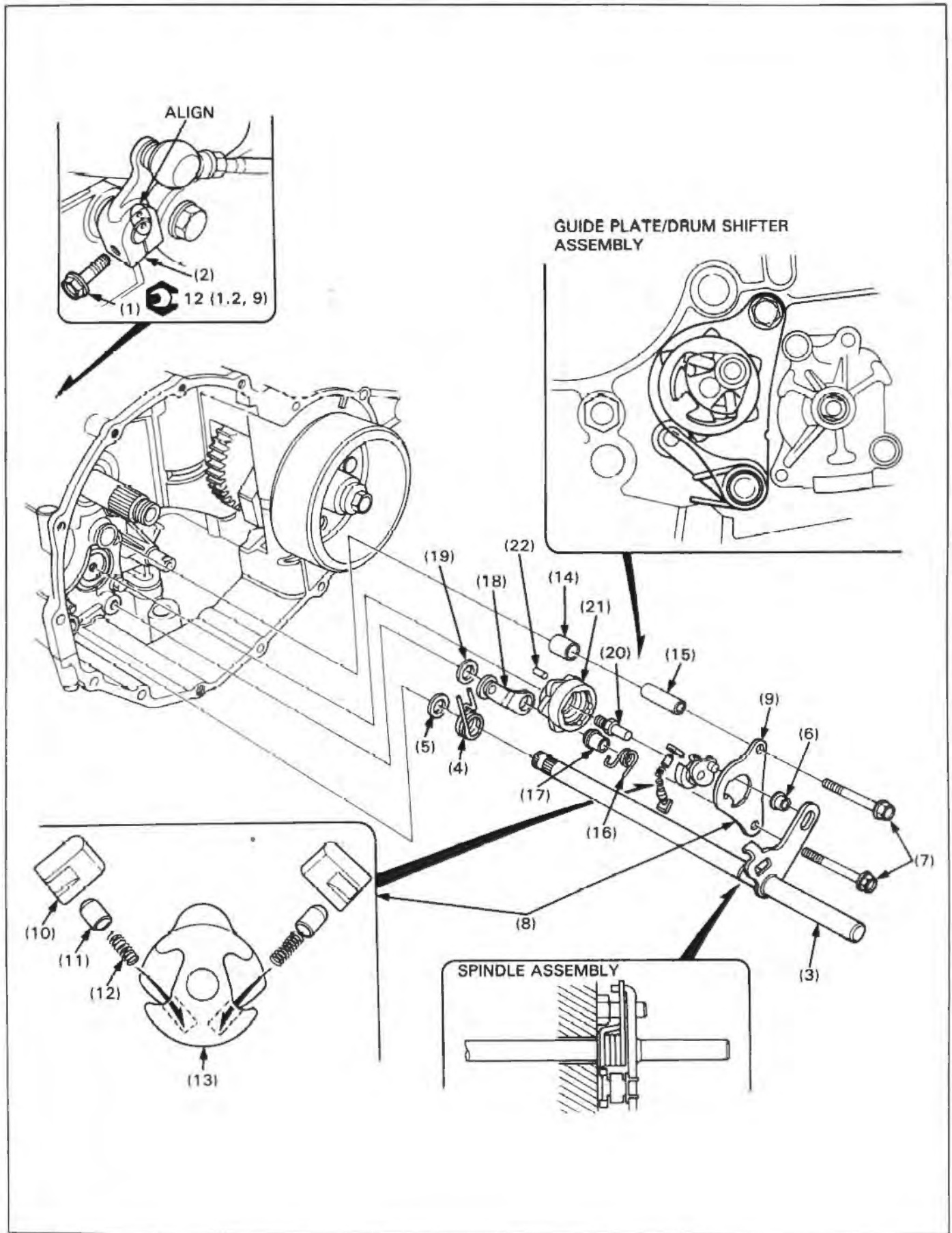
**CLUTCH CENTER HOLDER**      **07GMB-KT80100**  
(Not available in U.S.A.)





### CLUTCH/GEARSHIFT LINKAGE

## GEARSHIFT LINKAGE REMOVAL/INSTALLATION



**CLUTCH/GEARSHIFT LINKAGE**

## NOTE

- Make sure the gearshift linkage can be operated properly after assembly.

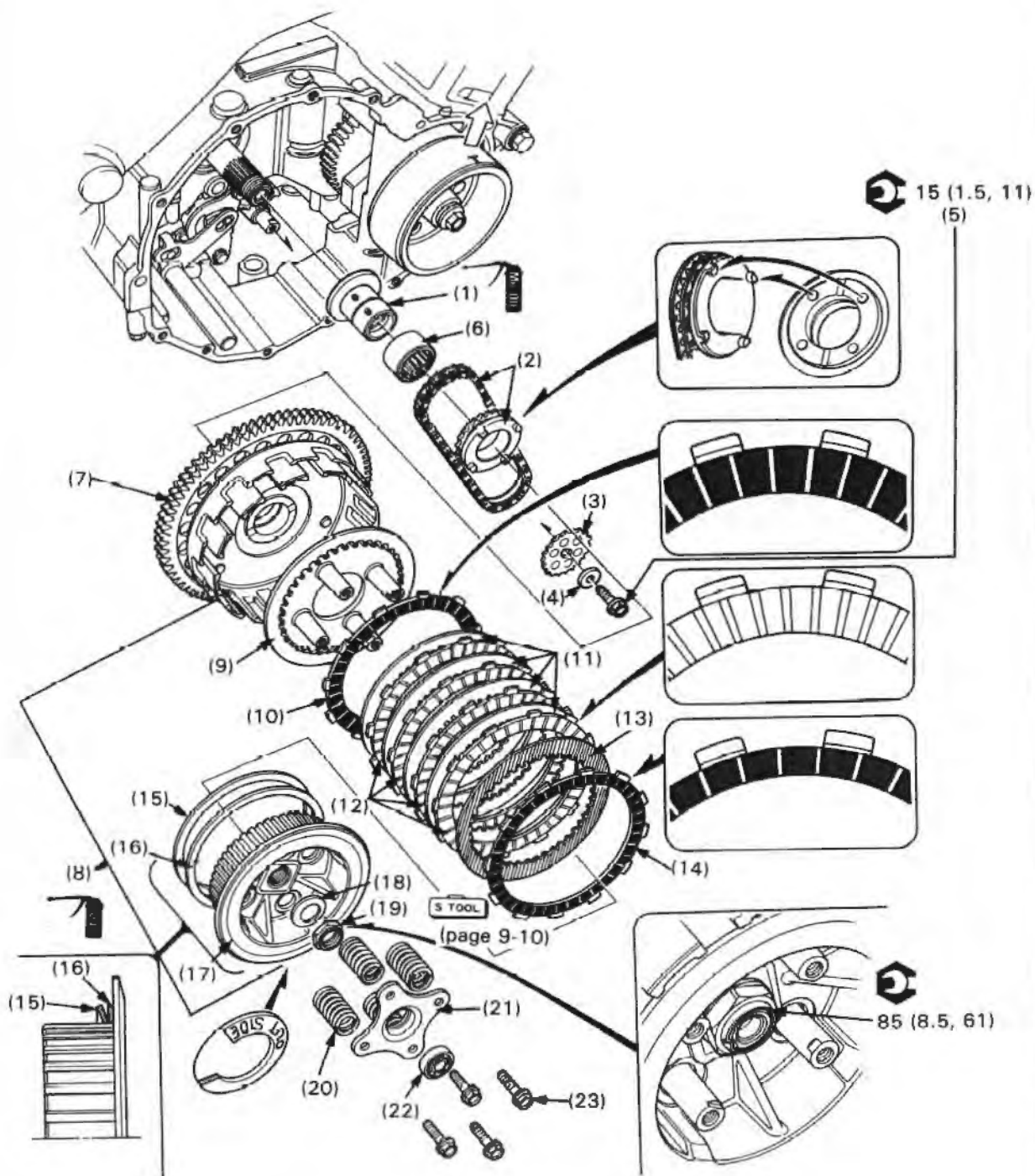
**REQUISITE SERVICE**

- Right crankcase cover removal/installation (page 9-2)
- Clutch removal/installation (page 9-4, 9-8)

| PROCEDURE            |                                   | Q'ty | REMARKS  |
|----------------------|-----------------------------------|------|--|
| <b>REMOVAL ORDER</b> |                                   |      | • Installation is in the reverse order of removal.   |
| (1)                  | Gearshift spindle joint bolt      | 1    | At installation, align the punch marks on the joint and spindle.   |
| (2)                  | Gearshift spindle joint           | 1    |  |
| (3)                  | Gearshift spindle                 | 1    |  |
| (4)                  | Spindle return spring             | 1    |  |
| (5)                  | Washer                            | 1    |  |
| (6)                  | Shifter collar                    | 1    | Assembly: as illustrated<br>Install onto dowel pins properly, or shift to hard.<br>Pawl orientation as shown.                                |
| (7)                  | Guide plate mounting bolt         | 2    |  |
| (8)                  | Guide plate/drum shifter assembly | —    |  |
| (9)                  | — guide plate                     | 1    |  |
| (10)                 | — ratchet pawl                    | 2    |  |
| (11)                 | — plunger                         | 2    |  |
| (12)                 | — spring                          | 2    |  |
| (13)                 | — drum shifter                    | 1    |  |
| (14)                 | Collar                            | 1    |  |
| (15)                 | Dowel pin                         | 1    |  |
| (16)                 | Stopper arm spring                | 1    | At installation, torque after applying a locking agent to bolt threads.<br>At installation, align the drum center groove with the dowel pin. |
| (17)                 | Spring collar                     | 1    |  |
| (18)                 | Stopper arm                       | 1    |  |
| (19)                 | Washer                            | 1    |  |
| (20)                 | Shift drum center bolt            | 1    |  |
| (21)                 | Shift drum center                 | 1    |  |
| (22)                 | Dowel pin                         | 1    |  |

# CLUTCH/GEARSHIFT LINKAGE

## CLUTCH INSTALLATION



## REQUISITE SERVICE

• Gearshift linkage installation (page 9-6)

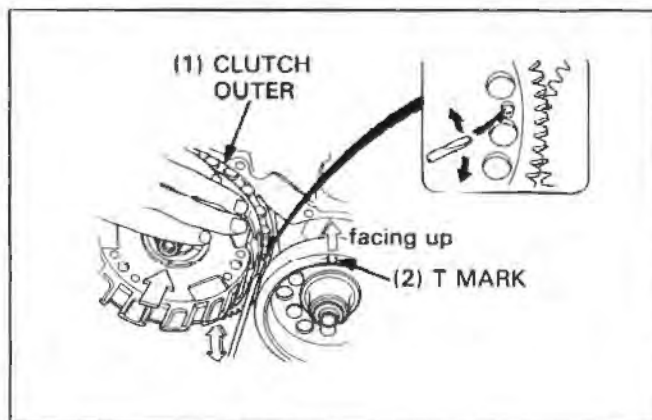
• Right crankcase cover installation (page 9-2)

| PROCEDURE                               | Q'ty | REMARKS   |
|---|------|---|
| (1) Clutch outer guide                  | 1    | At installation, install with the grooves facing inside.<br><br>Apply a locking agent to the threads. Installation (page 4-3).<br><br>Installation (see below)                    |
| (2) Oil pump drive sprocket/drive chain | 1/1  |   |
| (3) Oil pump driven sprocket            | 1    |   |
| (4) Washer                              | 1    |   |
| (5) Oil pump drive sprocket bolt        | 1    |   |
| (6) Needle bearing                      | 1    |   |
| (7) Clutch outer                        | 1    |   |
| (8) Clutch assembly                     | —    | Smaller I.D. disc/Color: black<br>Color: silver<br>Smaller I.D. disc<br>Color: gray<br>Larger I.D. disc/Color: black<br>Face the dished side of the judder spring to the outside. |
| (9) — pressure plate                    | 1    |   |
| (10) — clutch friction disc A           | 1    |   |
| (11) — clutch plate A                   | 4    |   |
| (12) — clutch friction disc B           | 4    |   |
| (13) — clutch plate B                   | 1    |   |
| (14) — clutch friction disc C           | 1    |   |
| (15) — judder spring                    | 1    |   |
| (16) — spring seat                      | 1    |   |
| (17) — clutch center                    | 1    |   |
| (18) Lock washer                        | 1    | With the OUTSIDE mark facing up.<br>Installation (page 9-10)  |
| (19) Clutch center lock nut             | 1    |   |
| (20) Clutch spring                      | 4    | Install it with the marked side facing out.<br>Install them in a gradual, crisscross pattern.   |
| (21) Clutch lifter plate                | 1    |   |
| (22) Clutch lifter plate bearing        | 1    |   |
| (23) Clutch lifter plate bolt           | 4    |   |

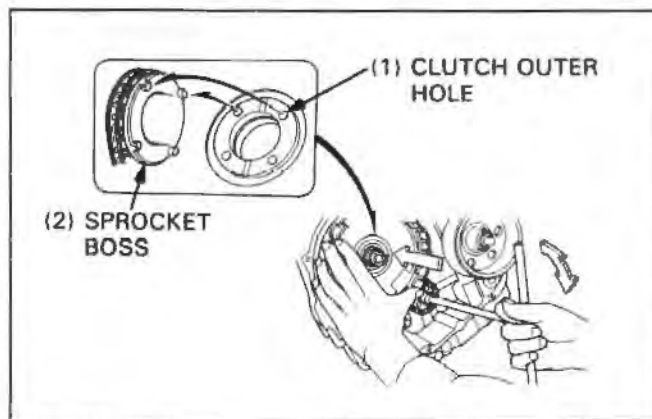
## CLUTCH OUTER INSTALLATION

Turn the crankshaft clockwise and face the flywheel "T" mark up so that the primary driven gear does not interfere with the crank weight.

Align the serrated tooth of the primary driven gear with the drive gear teeth, as shown, and temporarily install the clutch outer onto the mainshaft.



While holding the clutch outer and pushing in on it lightly, rotate the oil pump driven sprocket bolt. Install the clutch outer properly, aligning the clutch outer holes with the oil pump drive sprocket bosses.



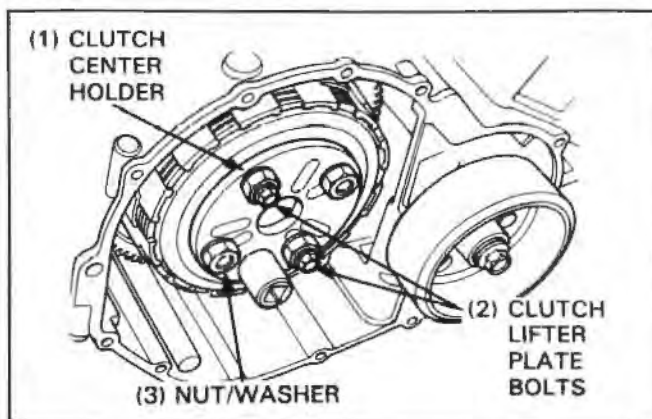
**CLUTCH/GEARSHIFT LINKAGE****CLUTCH CENTER LOCK NUT INSTALLATION**

If you have the universal type of the clutch center holder, you will be able to use it.

Position the tools as shown and use at least two clutch lifter plate bolts to secure the tool to the clutch.

**S TOOL**

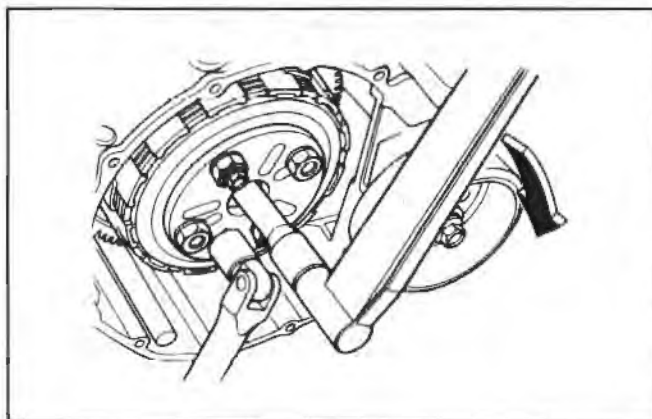
**CLUTCH CENTER HOLDER**      **07HGB-001000A**  
(U.S.A. only)



Hold the clutch center holder and torque the clutch center lock nut as shown.

**TORQUE: 85 N·m (8.5 kg-m, 61 ft-lb)**

Stake the lock nut onto the mainshaft.



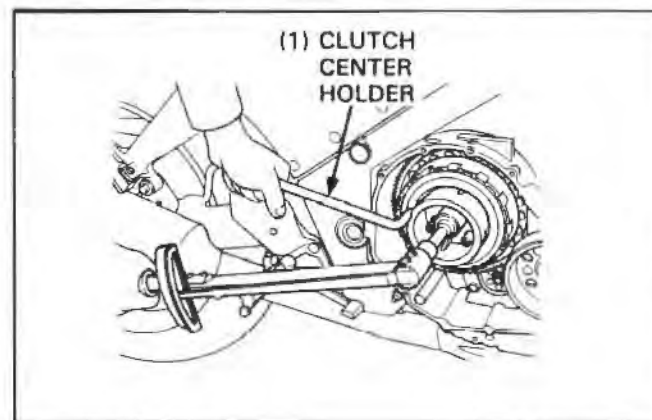
If you do not have the above holder, use the below holder. Hold the clutch center as shown and torque the clutch center lock nut.

**S TOOL**

**CLUTCH CENTER HOLDER**      **07GMB-KT80100**  
(Not available in U.S.A.)

**TORQUE: 85 N·m (8.5 kg-m, 61 ft-lb)**

Stake the lock nut onto the mainshaft.





# 10. CRANKSHAFT/TRANSMISSION

|   |      |                                       |       |
|---|------|---------------------------------------|-------|
| SERVICE INFORMATION                               | 10-1 | TRANSMISSION REMOVAL/<br>INSTALLATION | 10-8  |
| TROUBLESHOOTING                                   | 10-1 |                                       |       |
| CRANKCASE SEPARATION                              | 10-2 | TRANSMISSION DISASSEMBLY/<br>ASSEMBLY | 10-10 |
| CRANKSHAFT/CONNECTING ROD<br>REMOVAL/INSTALLATION | 10-4 | CRANKCASE INSTALLATION                | 10-12 |
| CRANKSHAFT BEARING<br>REPLACEMENT                 | 10-6 |                                       |       |

## SERVICE INFORMATION

- Remove the engine and separate the crankcase to inspect the crankshaft, connecting rod and transmission.
- Service Points

| Service Item   | Removed Components   |
|----------------|--|
| Connecting rod | <ul style="list-style-type: none"> <li>• Cylinder head (page 8-4)</li> <li>• Cylinder/Piston (page 8-8)</li> <li>• Crankcase separation (page 10-2)</li> </ul>   |
| Crankshaft     | <ul style="list-style-type: none"> <li>• Starter clutch (page 16-8)</li> <li>• Flywheel (page 14-7)</li> <li>• Crankcase separation (page 10-2)</li> <li>• Connecting rod bearing cap (page 10-4)</li> </ul> |
| Transmission   | <ul style="list-style-type: none"> <li>• Crankcase separation (page 10-2)</li> <li>• Gearshift linkage (page 9-6)</li> </ul>   |

10

- Prior to assembling the crankcase halves, apply a sealant to their mating surface. Wipe off excess sealant thoroughly.
- Mark and store the bearing inserts to be sure of their correct locations for reassembly. If the inserts are improperly installed they will block the oil holes, causing insufficient lubrication and eventual engine seizure.
- If it is no longer clear which bolt belongs in which hole, insert all bolts in the holes and check the exposed lengths; each should be exposed the same amount.

## TROUBLESHOOTING

### Excessive noise

- Worn connecting rod bearings
- Bent connecting rod
- Worn crankshaft main bearing

### Hard to shift

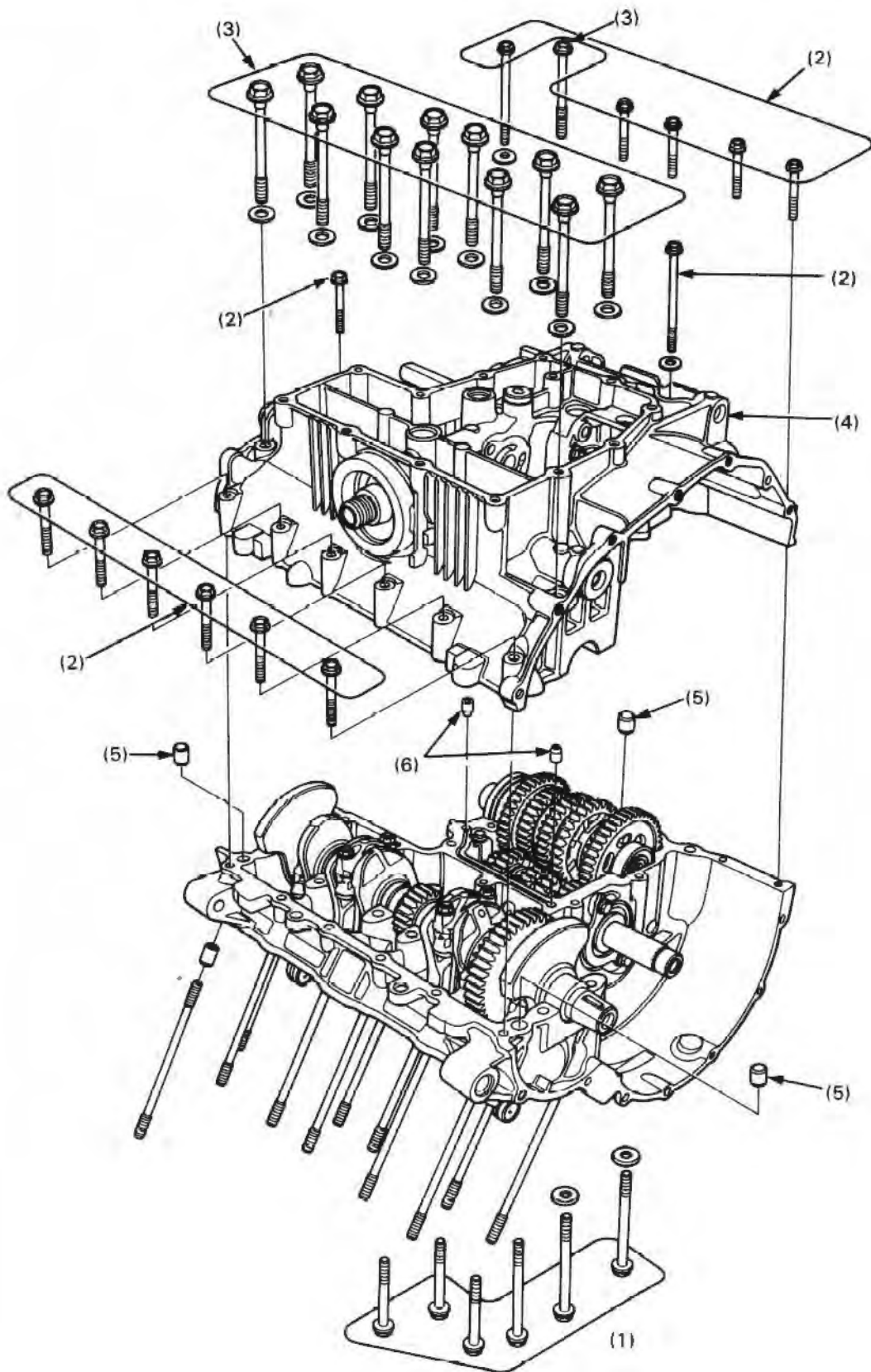
- Improper clutch operation
- Incorrect engine oil viscosity
- Incorrect clutch adjustment
- Bent shift forks
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum cam grooves
- Bent shift spindle

### Transmission jumps out of gear

- Worn gear engagement dogs or slots
- Bent shift fork shaft
- Damaged shift drum stopper arm
- Damaged or bent shift fork
- Broken shift linkage return spring
- Damaged shift drum cam grooves

### CRANKSHAFT/TRANSMISSION

## CRANKCASE SEPARATION



**REQUISITE SERVICE**

- Engine (page 7-2)
- Clutch/oil pump drive chain (page 9-4)
- Left crankcase cover (page 16-8)
- Starter motor (page 16-5)
- Oil pan (page 4-3)

| PROCEDURE |                             | Q'ty | REMARKS  |
|-----------|-----------------------------|------|--|
| (1)       | Upper crankcase bolt (6 mm) | 6    | Bolts (2 psc/marked $\Delta$ on the crankcase) have sealing washers. |
| (2)       | Lower crankcase bolt (6 mm) | 13   | Bolts (2 psc/marked $\Delta$ on the crankcase) have sealing washers. |
| (3)       | Lower crankcase bolt (8 mm) | 13   | Bolts (12 psc) have sealing washers.                                 |
| (4)       | Lower crankcase             | 1    |  |
| (5)       | Dowel pin                   | 3    |  |
| (6)       | Oil orifice                 | 2    |  |

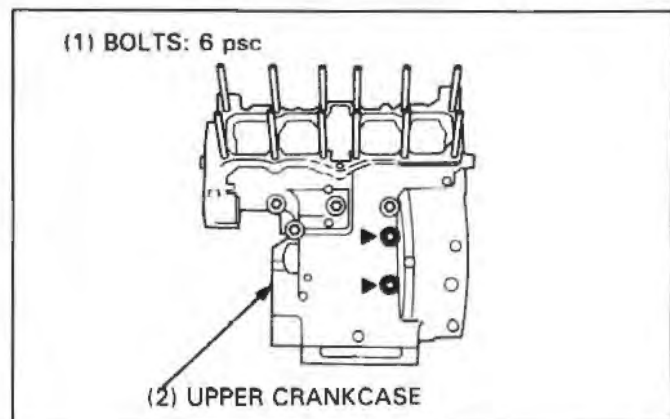
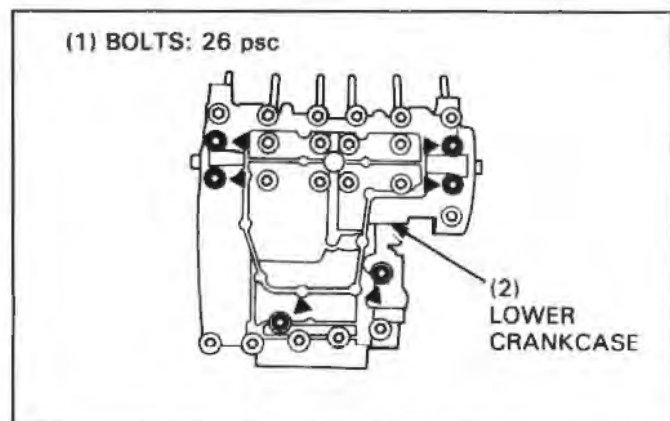
**CRANKCASE BOLTS LOCATION**

Loosen all bolts in a gradual, crisscross pattern.

Bolts location: as shown

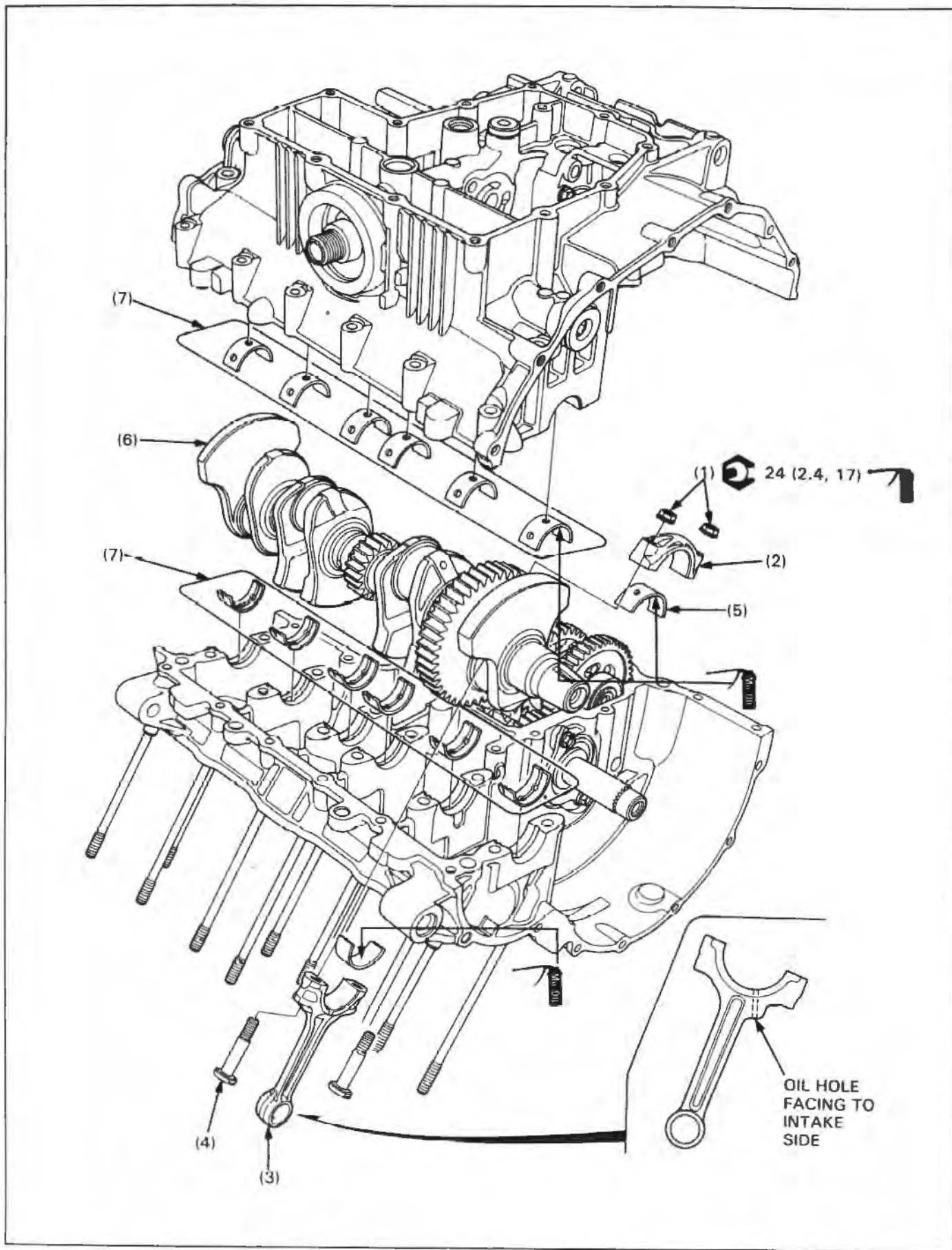
$\blacktriangle$ : bolt with a sealing washer

Clean any liquid sealant off the crankcase mating surface.



**CRANKSHAFT/TRANSMISSION**

**CRANKSHAFT/CONNECTING ROD REMOVAL/INSTALLATION**



**CRANKSHAFT/TRANSMISSION****NOTE**

- Determine the replacement bearing color code according to the main bearing selection table (page 10-6) or the connecting rod bearing selection table (page 10-7).
- Mark and store the bearing inserts to be sure of their correct locations for reassembly.
- At installation, apply molybdenum solution to the main journal bearing and connecting rod bearing surface.
- Refer to page 1-8 for crankshaft and rod specification.
- Refer to section 14 of the Common Service Manual for bearing inspection.

**REQUISITE SERVICE**

- Refer to Service Information (page 10-1)

| PROCEDURE                 |                                 | Q'ty | REMARKS   |
|---------------------------|---------------------------------|------|---|
| <b>REMOVAL ORDER</b>      |                                 |      |   |
| (1)                       | Connecting rod bearing cap nut  | 8    |   |
| (2)                       | Bearing cap                     | 4    |   |
| (3)                       | Connecting rod                  | 4    |   |
| (4)                       | Connecting rod bolt             | 8    | Do not remove them without necessary.   |
| (5)                       | Connecting rod bearing          | 8    | Wipe all oil from the bearing seating areas.  |
| (6)                       | Crankshaft                      | 1    |   |
| (7)                       | Crankshaft main journal bearing | 12   | Wipe all oil from the bearing seating areas.  |
| <b>INSTALLATION ORDER</b> |                                 |      |   |
| (7)                       | Crankshaft main journal bearing | 12   | The bearing tabs should be aligned with the grooves in the crankcases.                            |
| (6)                       | Crankshaft                      | 1    | Install it onto the upper crankcase with the flywheel side facing to the clutch side.             |
| (5)                       | Connecting rod bearing          | 8    | <b>NOTE:</b><br>• The bearing oil hole should be aligned with the oil hole in the connecting rod. |
| (4)                       | Connecting rod bolt             | 8    |   |
| (3)                       | Connecting rod                  | 4    | <b>NOTE:</b><br>• Face the oil holes to the intake side.  |
| (2)                       | Bearing cap                     | 4    | Install them with the code letters read properly.   |
| (1)                       | Connecting rod bearing cap nut  | 8    | Apply oil to the nut threads and torque them in gradual, crisscross pattern.                      |

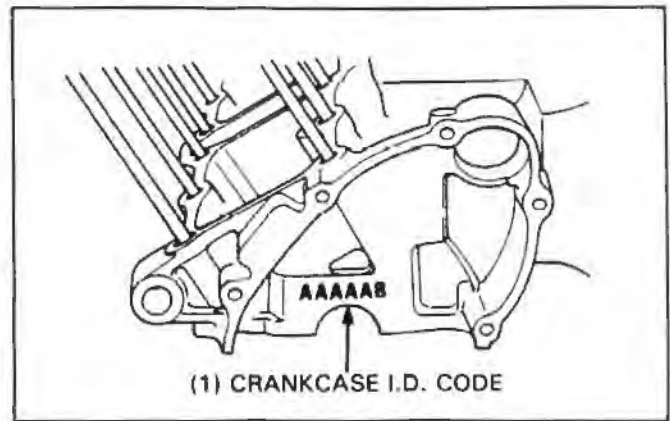


**CRANKSHAFT/TRANSMISSION****CRANKSHAFT BEARING REPLACEMENT****MAIN JOURNAL BEARING SELECTION**

Record the crankcase I.D. code letters from the pad on the left side of the crankcase.

**NOTE**

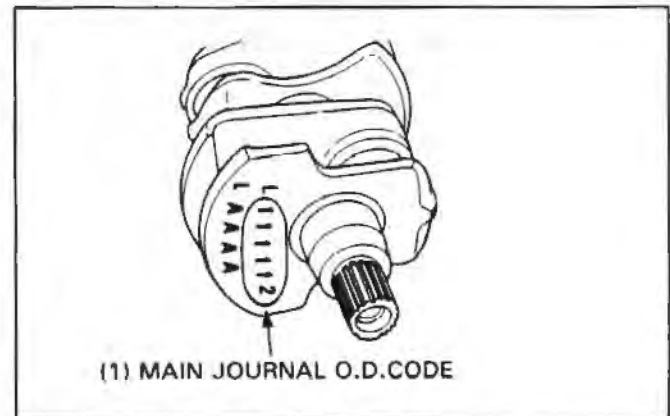
- Letters (A, B or C) on the upper crankcase are the codes for the main journal I.D.s from the left.



Record the corresponding main journal O.D. code numbers from the crank weight.

**NOTE**

- Numbers (1 or 2) on the crank weight are the codes for the main journal O.D.s from the left.



Cross reference the case and journal codes to determine the replacement bearing color code.

| Crankcase I.D. code    |                                       | A                                   | B                                   | C                                   |
|------------------------|---------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
|                        |                                       | 33.000–33.008 mm (1.2992–1.2995 in) | 33.009–33.016 mm (1.2996–1.2998 in) | 33.017–33.024 mm (1.2999–1.3002 in) |
| Main journal O.D. code | 1 29.992–30.000 mm (1.1808–1.1811 in) | Pink                                | Yellow                              | Green                               |
|                        | 2 29.984–29.992 mm (1.1805–1.1808 in) | Yellow                              | Green                               | Brown                               |

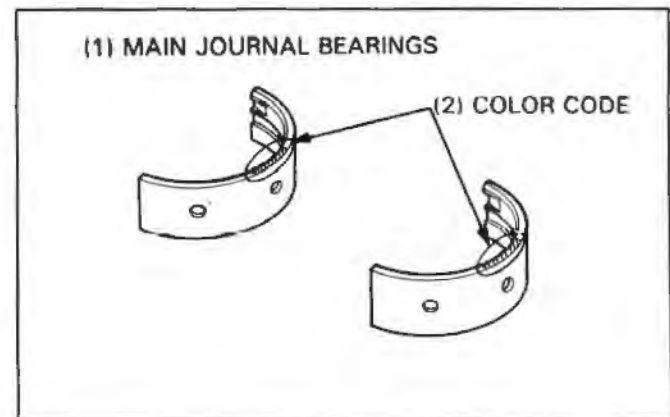
**Bearing thickness**

Brown: Thick

Green: ↑

Yellow: ↓

Pink: Thin

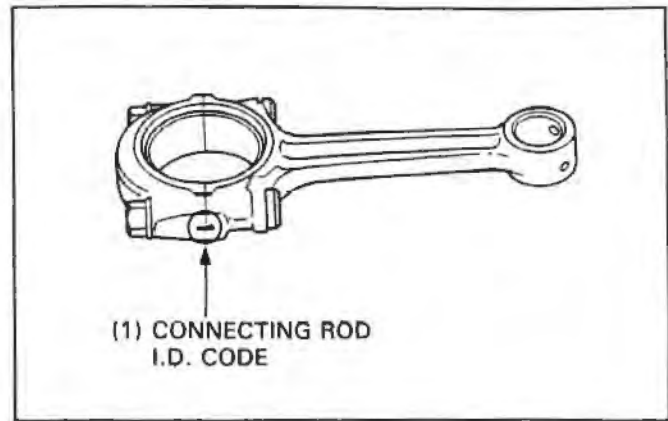


## CONNECTING ROD BEARING SELECTION

Record the connecting rod I.D. code numbers on the rod.

## NOTE

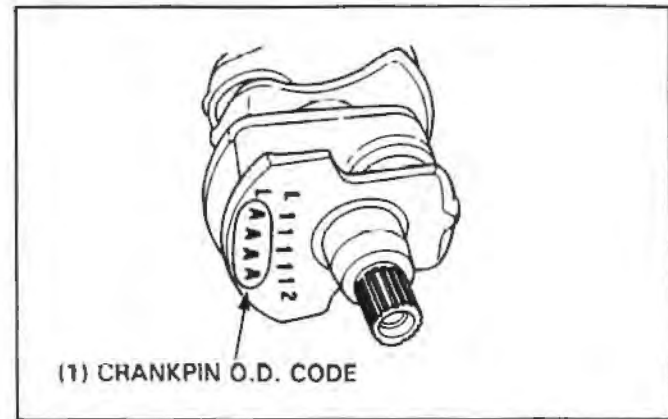
- Numbers (1 or 2) on the connecting rod are the codes for the connecting rod I.D.s.



Record the crankpin O.D. code letters from the crank weight.

## NOTE

- Letters (A or B) on the upper crankcase are the codes for the crankpin O.D.s from the left.



Cross reference the crankpin and rod codes to determine the replacement bearing color code.

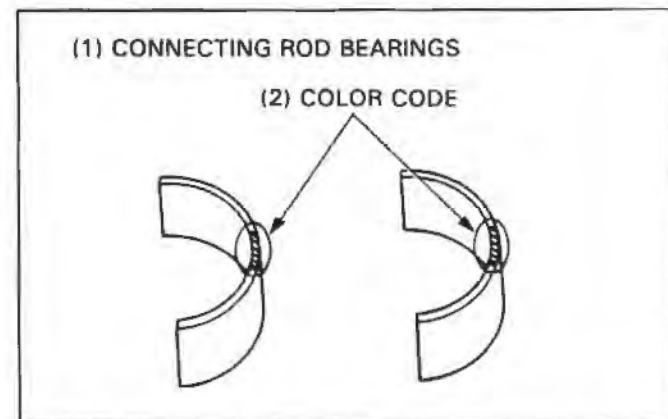
| Connecting rod I.D. code \ Crankpin O.D. code |                                     | 1                                   | 2                                   |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
|   |                                     | 32.992–33.000 mm (1.2989–1.2992 in) | 33.001–33.008 mm (1.2992–1.2995 in) |
| A   | 29.992–30.000 mm (1.1808–1.1811 in) | Yellow                              | Green                               |
| B   | 29.984–29.991 mm (1.1805–1.1807 in) | Green                               | Brown                               |

## Bearing thickness

Brown: Thin

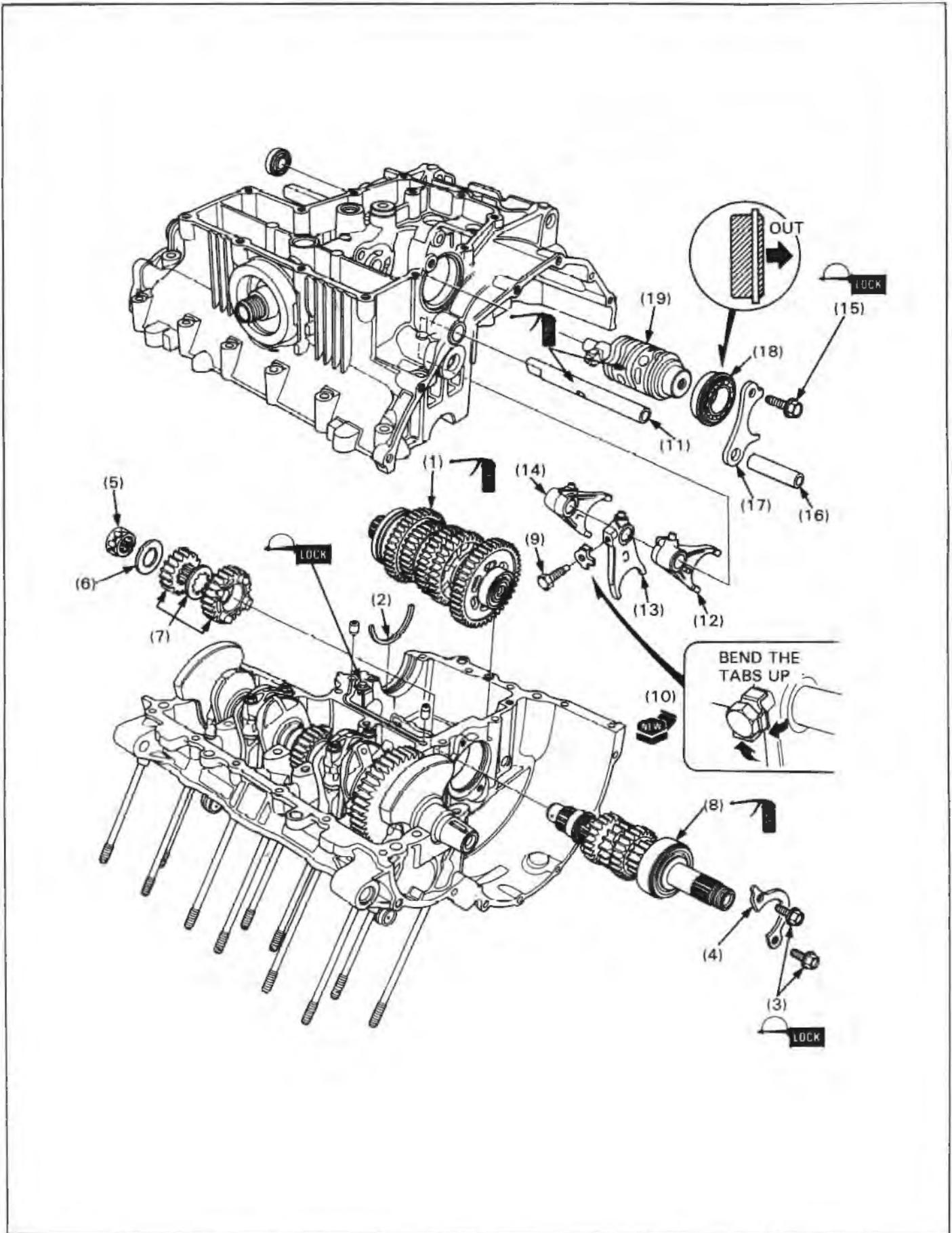
Black:  $\updownarrow$

Blue: Thick



**CRANKSHAFT/TRANSMISSION**

**TRANSMISSION REMOVAL/INSTALLATION**



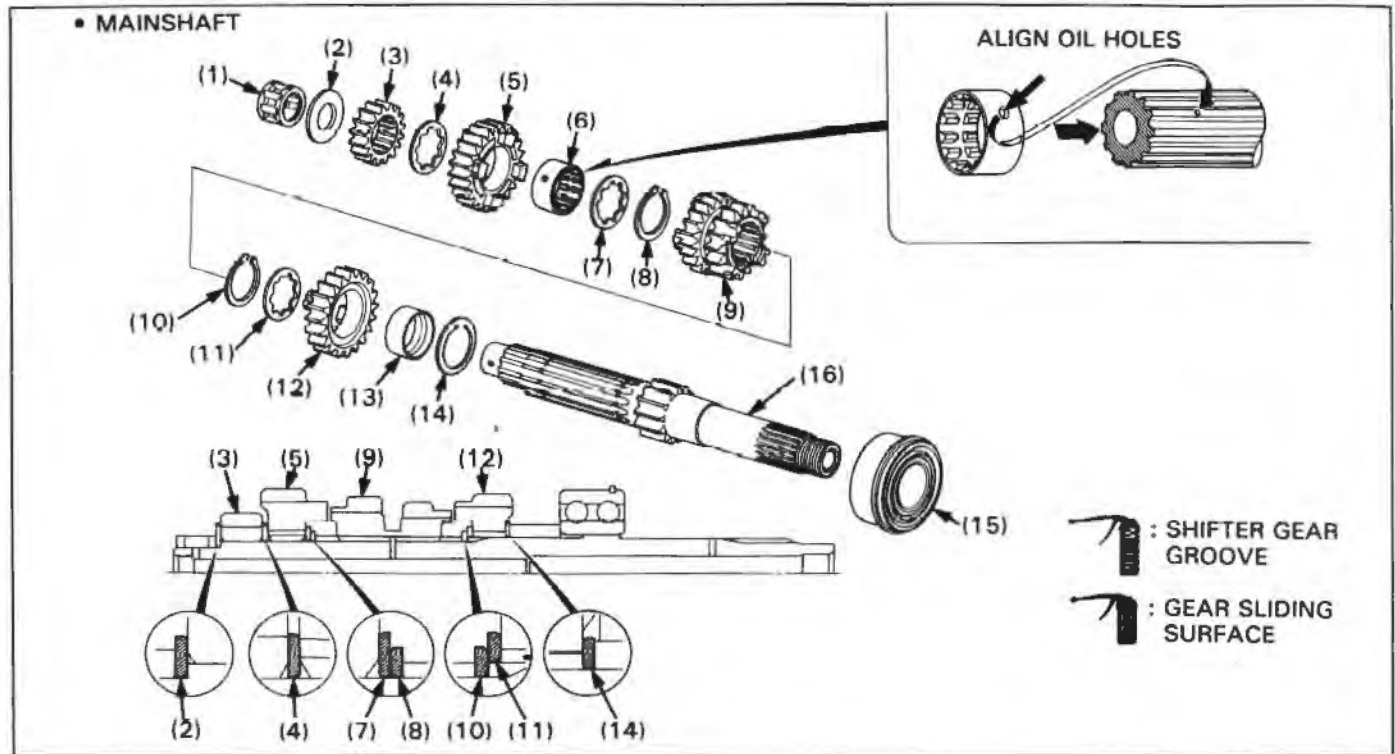
**REQUISITE SERVICE**

- Refer to Service Information (page 10-1)

| PROCEDURE            |   | Q'ty | REMARKS  |
|----------------------|---|------|--|
| <b>REMOVAL ORDER</b> |   |      |  |
| (1)                  | Countershaft assembly                   | 1    | • Installation is in the reverse order of removal.<br>At installation, align the bearing groove with the set ring and align the oil seal with the case groove. |
| (2)                  | Countershaft bearing set ring           | 1    |  |
| (3)                  | Mainshaft bearing set plate bolt        | 2    |  |
| (4)                  | Mainshaft bearing set plate             | 1    |  |
| (5)                  | Needle bearing                          | 1    |  |
| (6)                  | Washer                                  | 1    |  |
| (7)                  | Mainshaft M2 gear/spline washer/M6 gear | —    |  |
| (8)                  | Mainshaft assembly                      | 1    | Remove after bending down the lock washer tab. Install and bend new lock washer tabs as shown.   |
| (9)                  | Center shift fork bolt                  | 1    |  |
| (10)                 | Lock washer                             | 1    | Install a new lock washer.   |
| (11)                 | Shift fork shaft                        | 1    | At installation, face the shaft flattened surface side forward the drive sprocket.   |
| (12)                 | Right shift fork                        | 1    | Install them with the identification marks (R: Right, C: Center, L: Left) facing forward the clutch side.  |
| (13)                 | Center shift fork                       | 1    |  |
| (14)                 | Left shift fork                         | 1    |  |
| (15)                 | Shift drum bearing set plate bolt       | 1    | Install with the bearing stopper near the outside.   |
| (16)                 | Dowel pin                               | 1    |  |
| (17)                 | Shift drum bearing set plate            | 1    |  |
| (18)                 | Shift drum bearing                      | 1    |  |
| (19)                 | Shift drum                              | 1    |  |

## CRANKSHAFT/TRANSMISSION

## TRANSMISSION DISASSEMBLY/ASSEMBLY



## NOTE

- Apply molybdenum solution to the shifter gear grooves. Apply oil to all sliding surface of the mainshaft, countershaft and bushings.
- Install the thrust washers and snap rings with the chamfered edge facing to the thrust load side.
- Refer to section 13 of the Common Service Manual for inspection information.

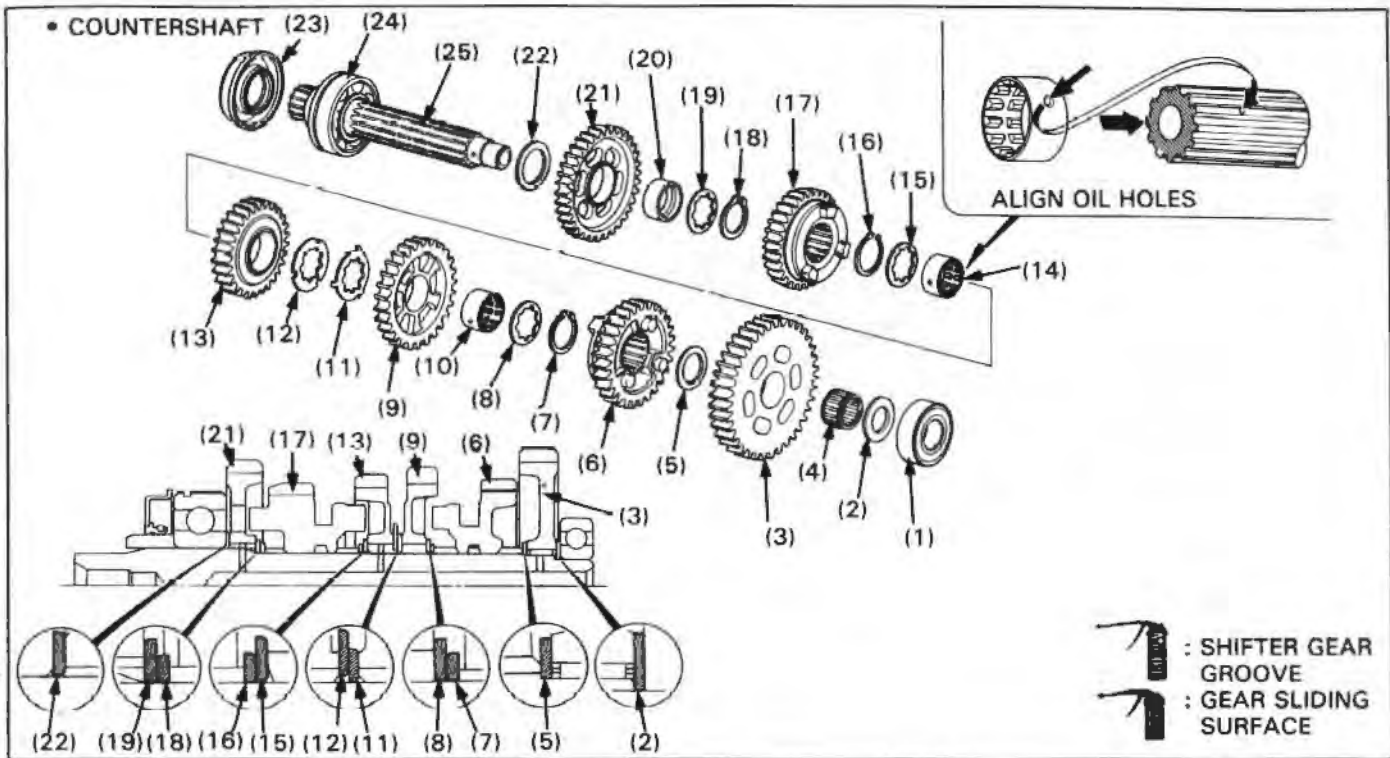
## REQUISITE SERVICE

- Transmission removal/installation (page 10-8)

| PROCEDURE                          | Q'ty | REMARKS   |
|------------------------------------|------|---|
| MAINSHAFT DISASSEMBLY ORDER        |      | • Assembly is in the reverse order of disassembly.    |
| (1) Needle bearing                 | 1    |   |
| (2) Thrust washer                  | 1    |   |
| (3) M2 gear (17T)                  | 1    |   |
| (4) Spline washer                  | 1    |   |
| (5) M6 gear (24T)                  | 1    |   |
| (6) M6 spline bushing              | 1    | Align the oil holes of the bushing and mainshaft.     |
| (7) Spline washer                  | 1    |   |
| (8) Snap ring                      | 1    |   |
| (9) M3 (16T)/M4 (22T) shifter gear | 1    |   |
| (10) Snap ring                     | 1    |   |
| (11) Spline washer                 | 1    |   |
| (12) M5 gear (23T)                 | 1    |   |
| (13) M5 bushing                    | 1    |   |
| (14) Thrust washer                 | 1    |   |
| (15) Mainshaft bearing             | 1    | Install it with the bearing stopper near the outside. |
| (16) Mainshaft (M1 gear/13T)       | 1    |   |



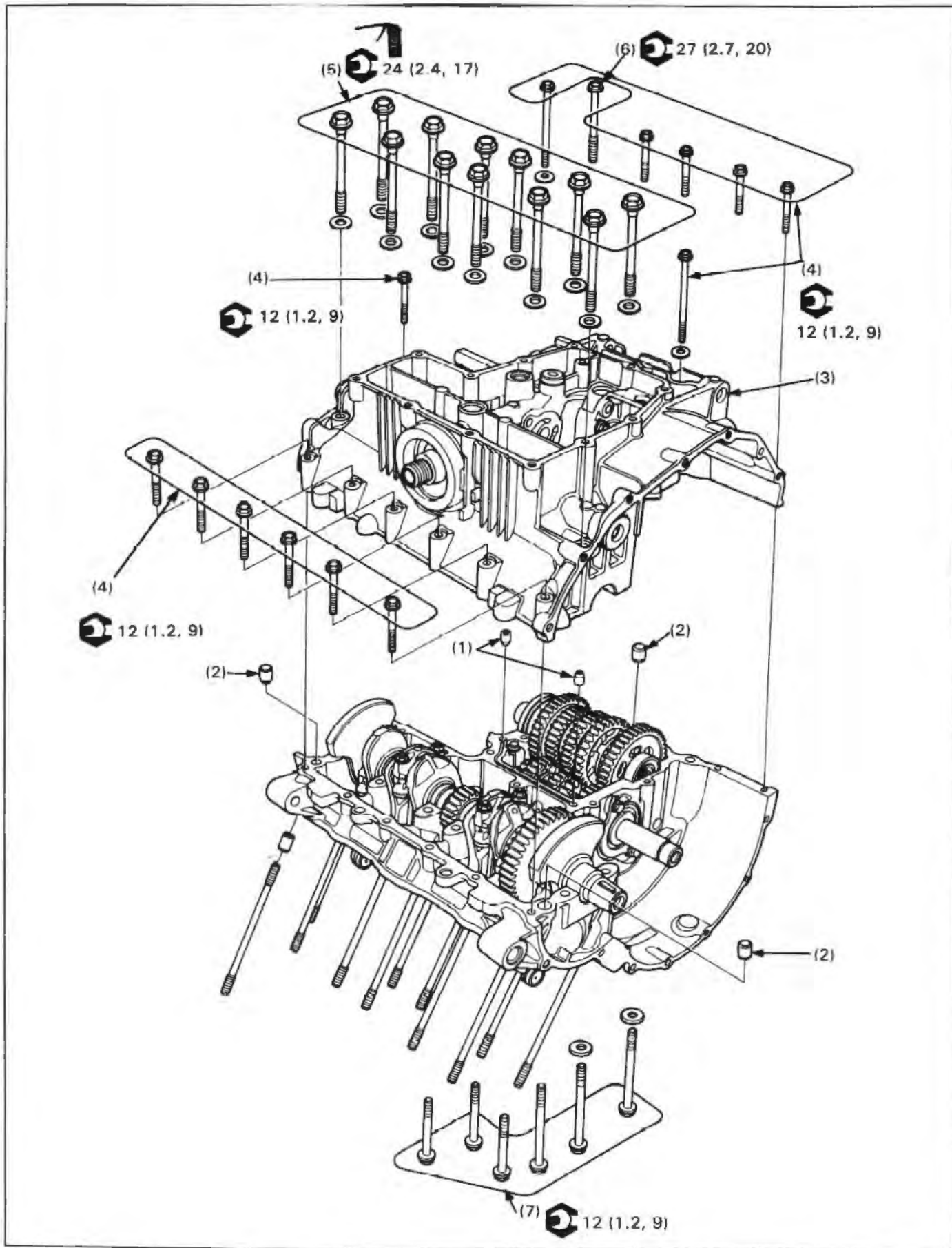
## CRANKSHAFT/TRANSMISSION



| PROCEDURE                             | Q'ty | REMARKS  |
|---------------------------------------|------|--|
| <b>COUNTERSHAFT DISASSEMBLY ORDER</b> |      |  |
| (1) Bearing                           | 1    | • Assembly is in the reverse order of disassembly.<br>Install with the sealed side facing outside. |
| (2) Thrust washer                     | 1    |  |
| (3) C1 gear (43T)                     | 1    |  |
| (4) Needle bearing                    | 1    |  |
| (5) Thrust washer                     | 1    |  |
| (6) C5 shifter gear (33T)             | 1    |  |
| (7) Snap ring                         | 1    |  |
| (8) Spline washer                     | 1    |  |
| (9) C3 gear (30T)                     | 1    |  |
| (10) C3 spline bushing                | 1    | Align the oil holes of the bushing and countershaft.   |
| (11) Lock washer                      | 1    |  |
| (12) Spline washer                    | 1    |  |
| (13) C4 gear (35T)                    | 1    |  |
| (14) C4 spline bushing                | 1    | Align the oil holes of the bushing and countershaft.   |
| (15) Spline washer                    | 1    |  |
| (16) Snap ring                        | 1    |  |
| (17) C6 shifter gear (32T)            | 1    |  |
| (18) Snap ring                        | 1    |  |
| (19) Spline washer                    | 1    |  |
| (20) C2 bushing                       | 1    |  |
| (21) C2 gear (40T)                    | 1    |  |
| (22) Thrust washer                    | 1    |  |
| (23) Oil seal                         | 1    |  |
| (24) Bearing                          | 1    | Install with the bearing stopper near the outside.   |
| (25) Countershaft                     | 1    |  |

### CRANKSHAFT/TRANSMISSION

## CRANKCASE INSTALLATION



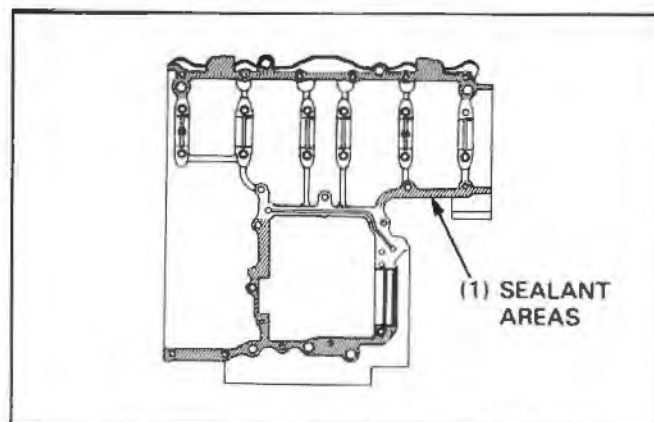
**CRANKSHAFT/TRANSMISSION****REQUISITE SERVICE**

- Crankshaft/connecting rod installation (page 10-4)
- Transmission installation (page 10-8)

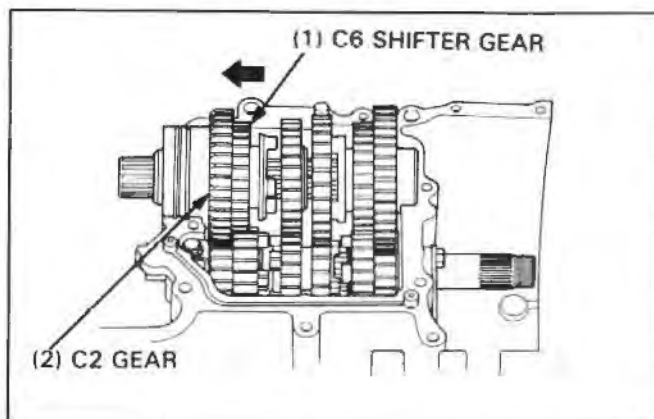
| PROCEDURE |                                  | Q'ty | REMARKS                            |
|-----------|----------------------------------|------|------------------------------------|
| (1)       | Oil orifice                      | 2    | Crankcase installation (see below) |
| (2)       | Dowel pin                        | 3    |                                    |
| (3)       | Lower crankcase                  | 1    |                                    |
| (4)       | Lower crankcase bolt (6 mm)      | 13   |                                    |
| (5)       | Lower crankcase bolt (8 mm)      | 12   |                                    |
| (6)       | Lower crankcase bolt (8 mm x 65) | 1    |                                    |
| (7)       | Upper crankcase bolt (6 mm)      | 6    |                                    |

**CRANKCASE INSTALLATION**

Apply a light but thorough coating of sealant to the upper crankcase mating surface except to the main bearing journal bolt mating areas and the oil passage area as shown.



Set the mainshaft and countershaft into neutral position first, then slide the C6 shifter gear onto the C2 gear (2nd gear position) as shown, to ease upper crankcase installation.



**CRANKSHAFT/TRANSMISSION**

Set the shift drum in the 2nd gear position as shown.

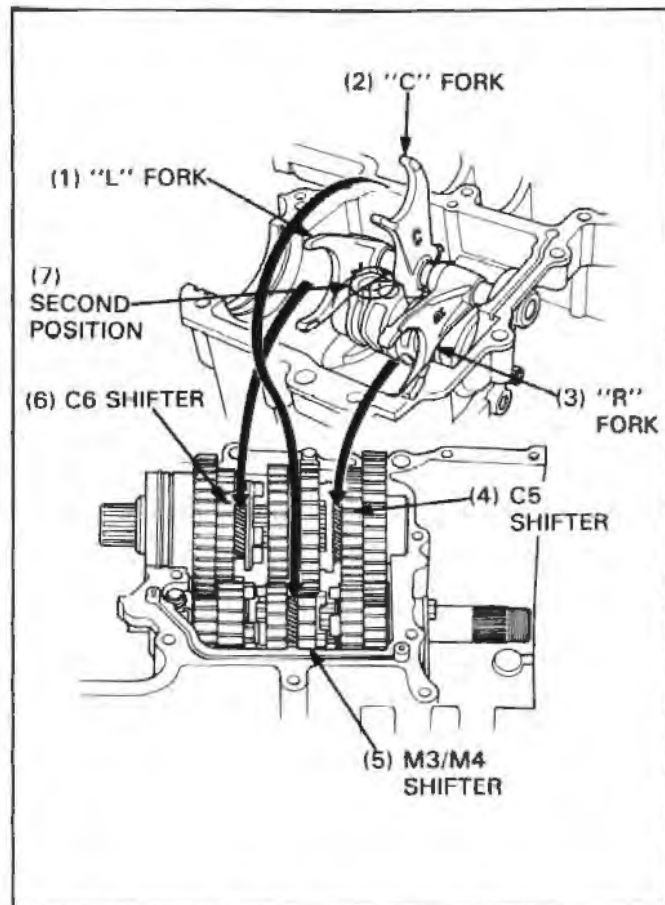
**NOTE**

- The shifter-pin of the left shift fork (marked "L") should be located as shown.

Align the left shift fork (marked "L") with the C6 shifter gear, and the right shift fork (marked "R") with the C5 shifter gear first, then lowering the lower crankcase, align the center shift fork (marked "C") with the M3/M4 shifter gear.

Assemble the crankcases.

Make sure each crankcase is assembled securely.



Install the crankcase bolts and sealing washers as shown.

**NOTE**

- Four 6 mm bolts (marked  $\Delta$  on the crankcase) have sealing washers.
- Twelve 8 mm bolts (for the crankshaft main journals) have sealing washers.
- Four 8 mm bolts (marked  $\Delta$  on the crankcase, (9), (10), (11) and (12)) is black in color.

Tighten all crankcase bolts in a gradual, crisscross pattern, beginning with larger diameter bolts first as shown.

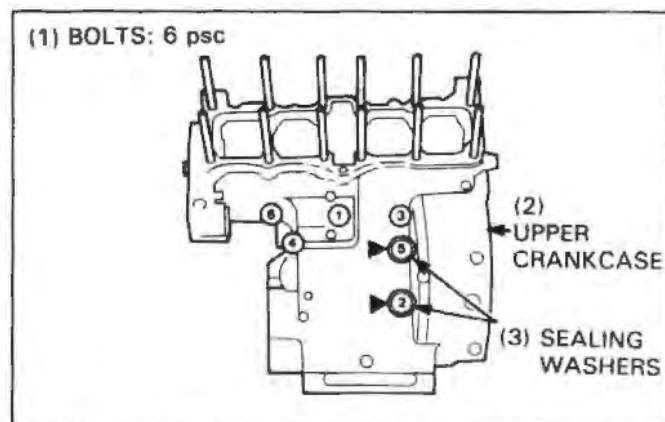
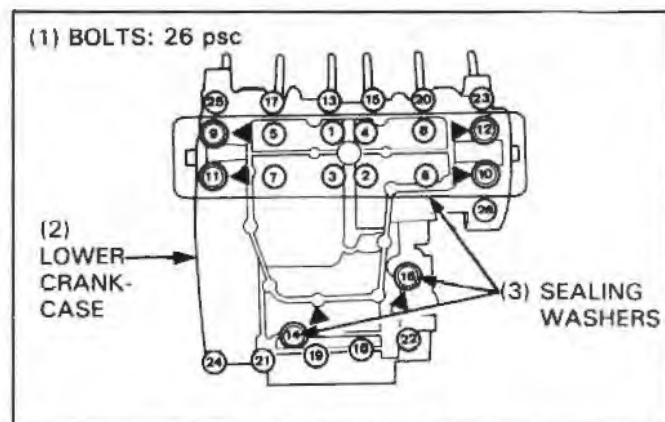
**TORQUE:**

8 mm crankcase bolt: 24 N·m (2.4 kg-m, 17 ft-lb)

8 mm x 65 crankcase bolt (2):

27 N·m (2.7 kg-m, 20 ft-lb)

6 mm crankcase bolt: 12 N·m (1.2 kg-m, 9 ft-lb)



# 11. FRONT WHEEL/SUSPENSION/STEERING

|  |      |  |       |
|--|------|--|-------|
| SERVICE INFORMATION                      | 11-1 | FRONT WHEEL DISASSEMBLY/<br>ASSEMBLY   | 11-5  |
| TROUBLESHOOTING                          | 11-1 | FORK REMOVAL/INSTALLATION              | 11-6  |
| RIGHT HANDLEBAR REMOVAL/<br>INSTALLATION | 11-2 | FORK DISASSEMBLY                       | 11-8  |
| LEFT HANDLEBAR REMOVAL/<br>INSTALLATION  | 11-3 | FORK ASSEMBLY                          | 11-10 |
| FRONT WHEEL REMOVAL/<br>INSTALLATION     | 11-4 | STEERING STEM REMOVAL/<br>INSTALLATION | 11-12 |

## SERVICE INFORMATION

### ▲ WARNING

- Riding on damaged rims impairs safe operation of the vehicle.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.

- Refer to the section 13 for brake system information.
- Refer to the section 17 for light, meter and switch information.
- Tubeless tire removal, repair, and remounting procedures are covered in the section 16 of the Common Service Manual.
- If the motorcycle has been involved in an accident, inspect the frame very carefully at the steering head and at the engine mounts.  
These are the areas most likely to suffer damage. It is possible to bend the frame steering head without bending the fork tubes or even the front axle.
- For wheel, fork or steering stem removal, a jack or other support is required to support the motorcycle. Do not use the oil filter as a jack point.

11

## TROUBLESHOOTING

### Hard steering

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

### Steers to one side or does not track straight

- Bent fork
- Bent front axle: wheel installed incorrectly
- Faulty steering head bearings
- Bent frame
- Worn wheel bearing
- Worn swingarm pivot

### Front wheel wobbling

- Bent rim
- Worn front wheel bearings
- Faulty tire
- Unbalanced tire and wheel

### Wheel turns hard

- Faulty wheel bearing
- Brake drag (page 13-1)
- Bent front axle

### Soft suspension

- Weak fork spring
- Insufficient fluid in fork
- Low fluid level in fork
- Low tire pressure

### Hard suspension

- Incorrect fluid weight
- Bent fork tubes
- Clogged fork fluid passage
- High tire pressure

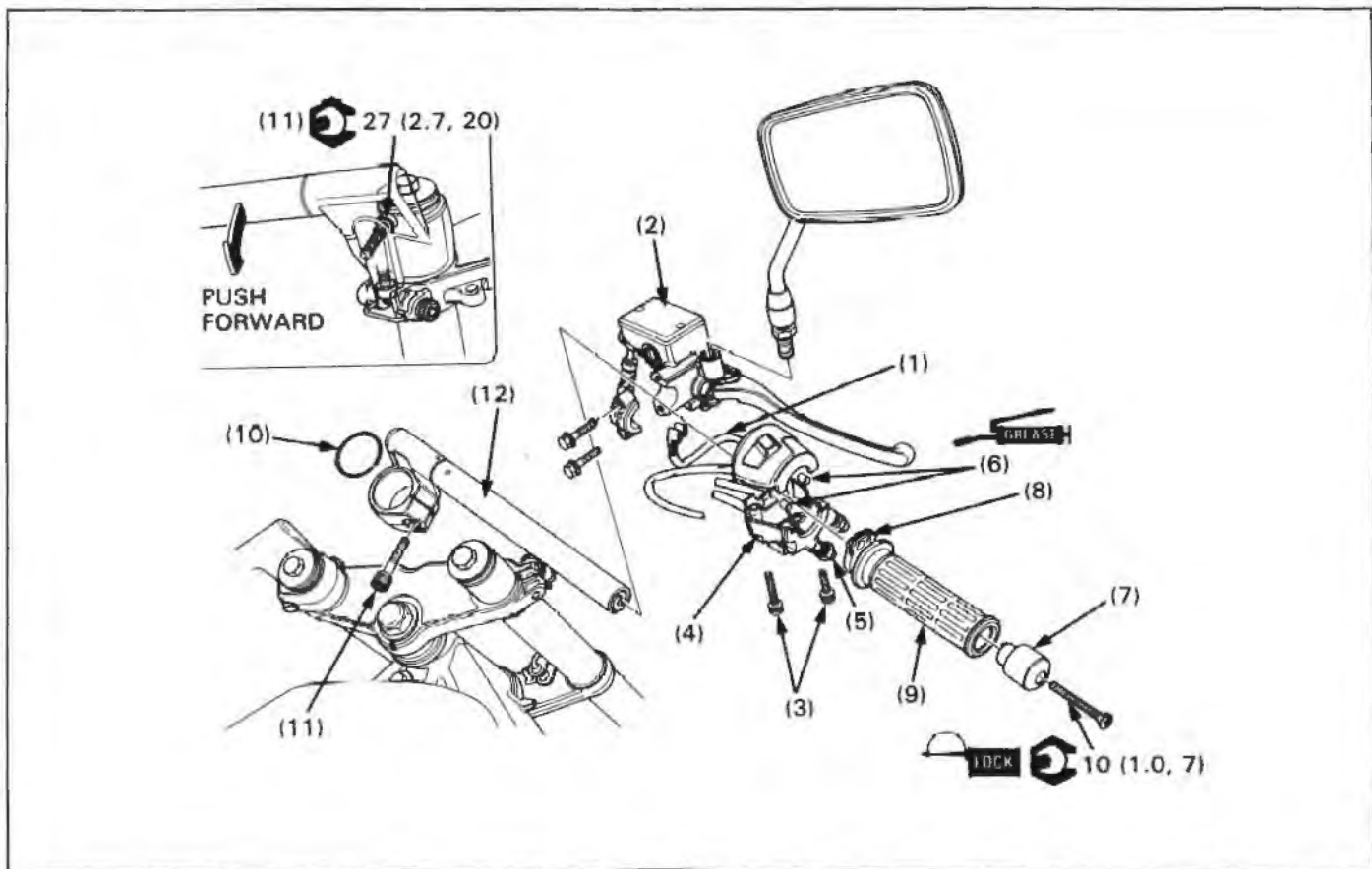
### Front suspension noisy

- Insufficient fluid in fork
- Loose fork fasteners



## FRONT WHEEL/SUSPENSION/STEERING

## RIGHT HANDLEBAR REMOVAL/INSTALLATION

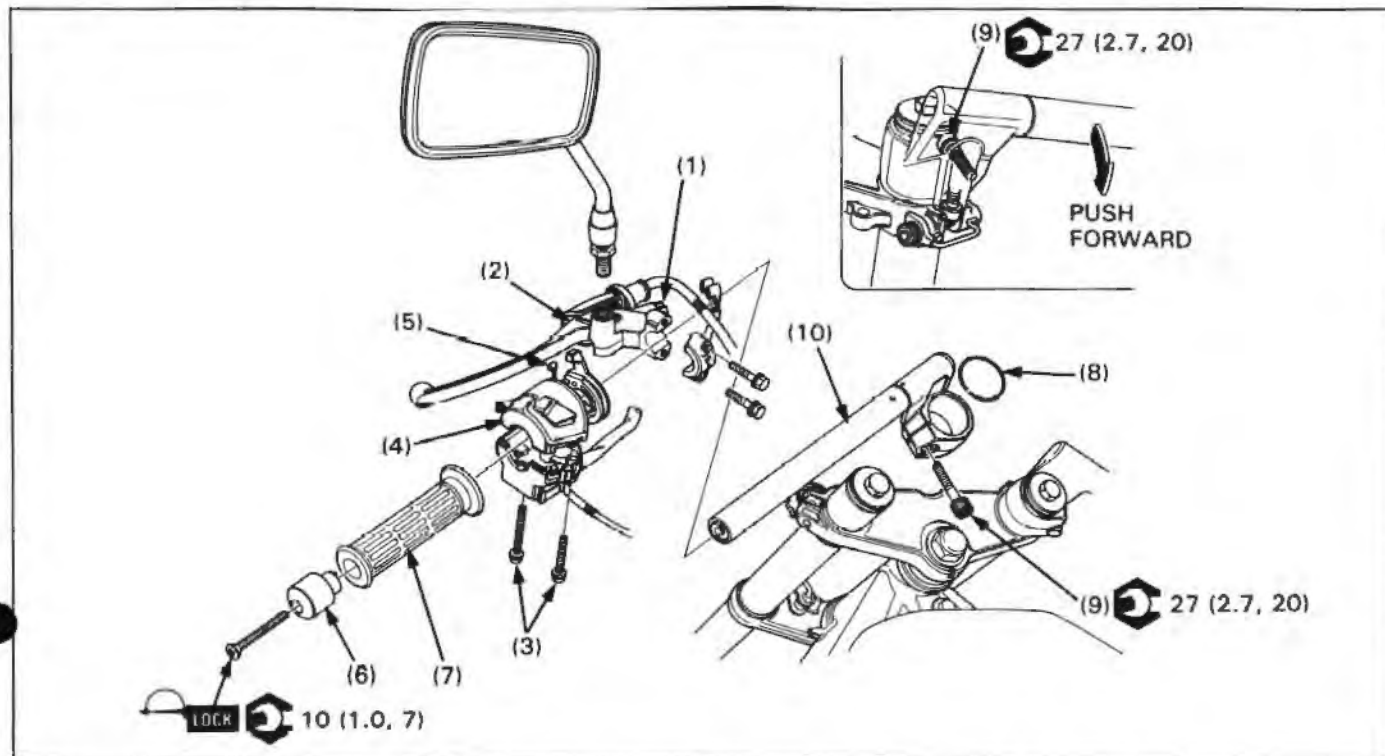


## NOTE

- Using wires, hang the front brake master cylinder at least as high as the position it was originally installed at to prevent air from getting into the master cylinder. Do not twist the brake hose.
- Route the cables and wire harnesses properly (page 1-19).
- Adjust the throttle cable after installation.

| PROCEDURE            |                                      | Qty | INSTALLATION REMARKS  |
|----------------------|--------------------------------------|-----|---|
| <b>REMOVAL ORDER</b> |                                      |     | • Installation is in the reverse order of removal.  |
| (1)                  | Front brakelight switch connector    | 2   | Align the holder end with the punch mark on the handlebar and face the holder UP mark upward. Tighten the upper bolt first, then the lower bolt.<br>Tighten the front screw first, then the rear screw.<br><br>Don't bend or distort the cables.<br>Align its boss with the inner weight.<br><br>Apply Honda Bond A or Honda Hand Grip Cement (U.S.A. only) to the inside surface of the grip.<br>Install into the fork groove properly.<br>Tighten with the handlebar pushing forward.<br>Align the handlebar boss with the top bridge slot. |
| (2)                  | Master cylinder                      | 1   |   |
| (3)                  | Right handlebar switch housing screw | 2   |   |
| (4)                  | Right handlebar switch housing       | 1   |   |
| (5)                  | Throttle cable nut                   | 1   |   |
| (6)                  | Throttle cable                       | 2   |   |
| (7)                  | Handlebar weight                     | 1   |   |
| (8)                  | Throttle pipe                        | 1   |   |
| (9)                  | Throttle grip                        | 1   |   |
| (10)                 | Stop ring                            | 1   |   |
| (11)                 | Handlebar pinch bolt                 | 1   |   |
| (12)                 | Right handlebar                      | 1   |   |

## LEFT HANDLEBAR REMOVAL/INSTALLATION



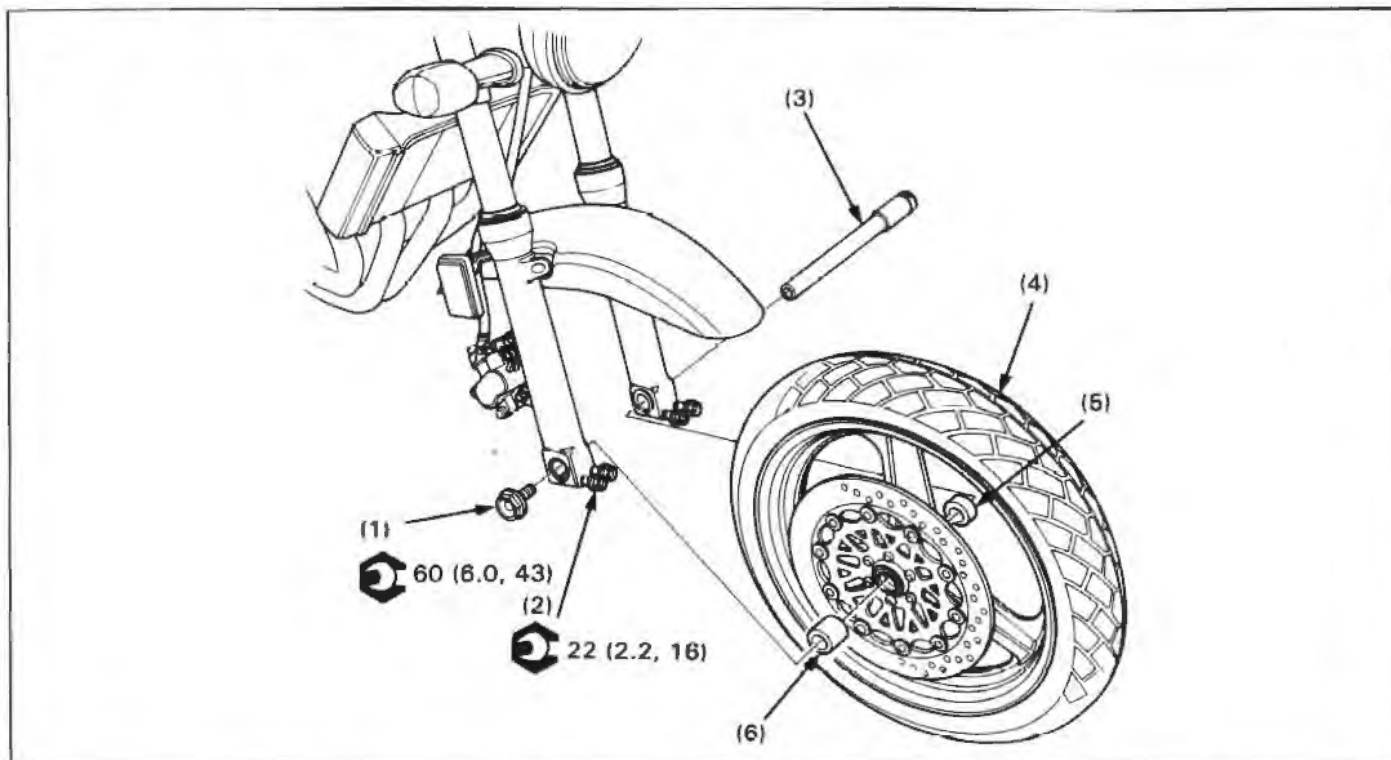
## NOTE

- Route the cables and wire harnesses properly (page 1-18).
- Adjust the clutch cable after installation.

| PROCEDURE     |                                     | Q'ty | INSTALLATION REMARKS   |
|---------------|-------------------------------------|------|--|
| REMOVAL ORDER |                                     |      | • Installation is in the reverse order of removal.   |
| (1)           | Clutch switch connector             | 2    |  |
| (2)           | Clutch lever assembly               | 1    | Align the holder end with the punch mark on the handlebar and face the holder UP mark upward. Tighten the upper bolt first, then the lower bolt. |
| (3)           | Left handlebar switch housing screw | 2    | Tighten the front screw first, then the rear screw.  |
| (4)           | Left handlebar switch housing       | 1    |  |
| (5)           | Choke cable                         | 1    |  |
| (6)           | Handlebar weight                    | 1    | Align its boss with the inner weight.  |
| (7)           | Handle grip                         | 1    | Apply Honda Bond A or Honda Hand Grip Cement (U.S.A. only) to the inside surface of the grip.  |
| (8)           | Stop ring                           | 1    | Install into the fork groove properly.   |
| (9)           | Handlebar pinch bolt                | 1    | Tighten with the handlebar pushing forward.  |
| (10)          | Left handlebar                      | 1    | Align the handlebar boss with the top bridge slot.   |

## FRONT WHEEL/SUSPENSION/STEERING

## FRONT WHEEL REMOVAL/INSTALLATION



## ⚠ WARNING

- A contaminated brake disc or pad reduced stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.

## CAUTION

- Do not use the oil filter as a jack point.

## NOTE

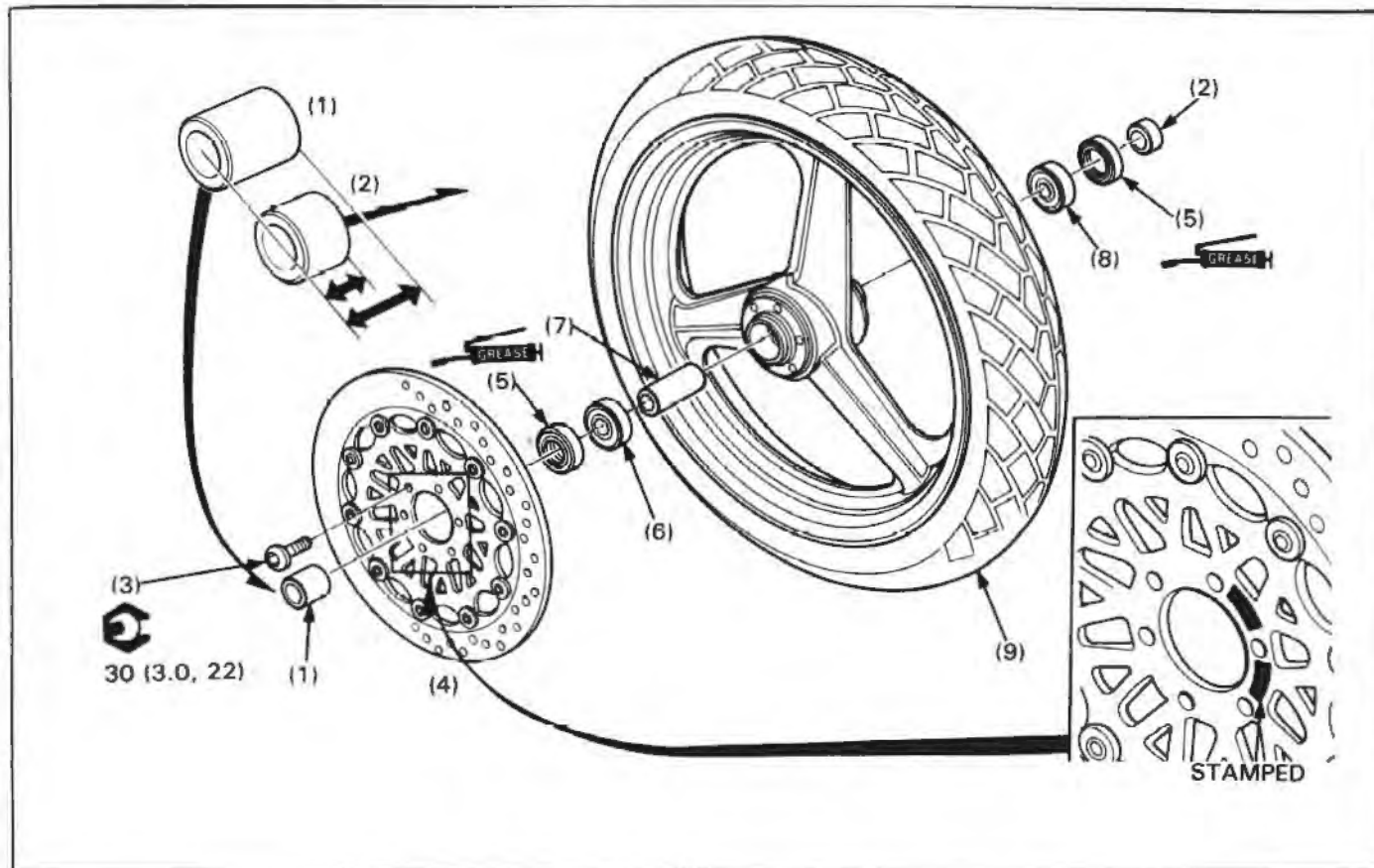
- Do not depress the brake lever when the caliper is removed, or it will be difficult to refit the disc between the brake pads.

## REQUISITE SERVICE

- Raise the front wheel off the ground by placing a jack or other support under the engine.

| PROCEDURE |                      | Q'ty | REMARKS  |
|-----------|----------------------|------|--|
|           | REMOVAL ORDER        |      | • Installation is in the reverse order of removal. |
| (1)       | Axle bolt            | 1    |  |
| (2)       | Axle pinch bolt      | 4    | Only loosen the bolts.                             |
| (3)       | Axle shaft           | 1    |  |
| (4)       | Front wheel assembly | 1    |  |
| (5)       | Left side collar     | 1    | Shorter one  |
| (6)       | Right side collar    | 1    | Longer one   |

## FRONT WHEEL DISASSEMBLY/ASSEMBLY



## ⚠ WARNING

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.

## NOTE

- Always replace wheel bearings as a set.
- For wheel bearing replacement, refer to the section 1 of the Common Service Manual.

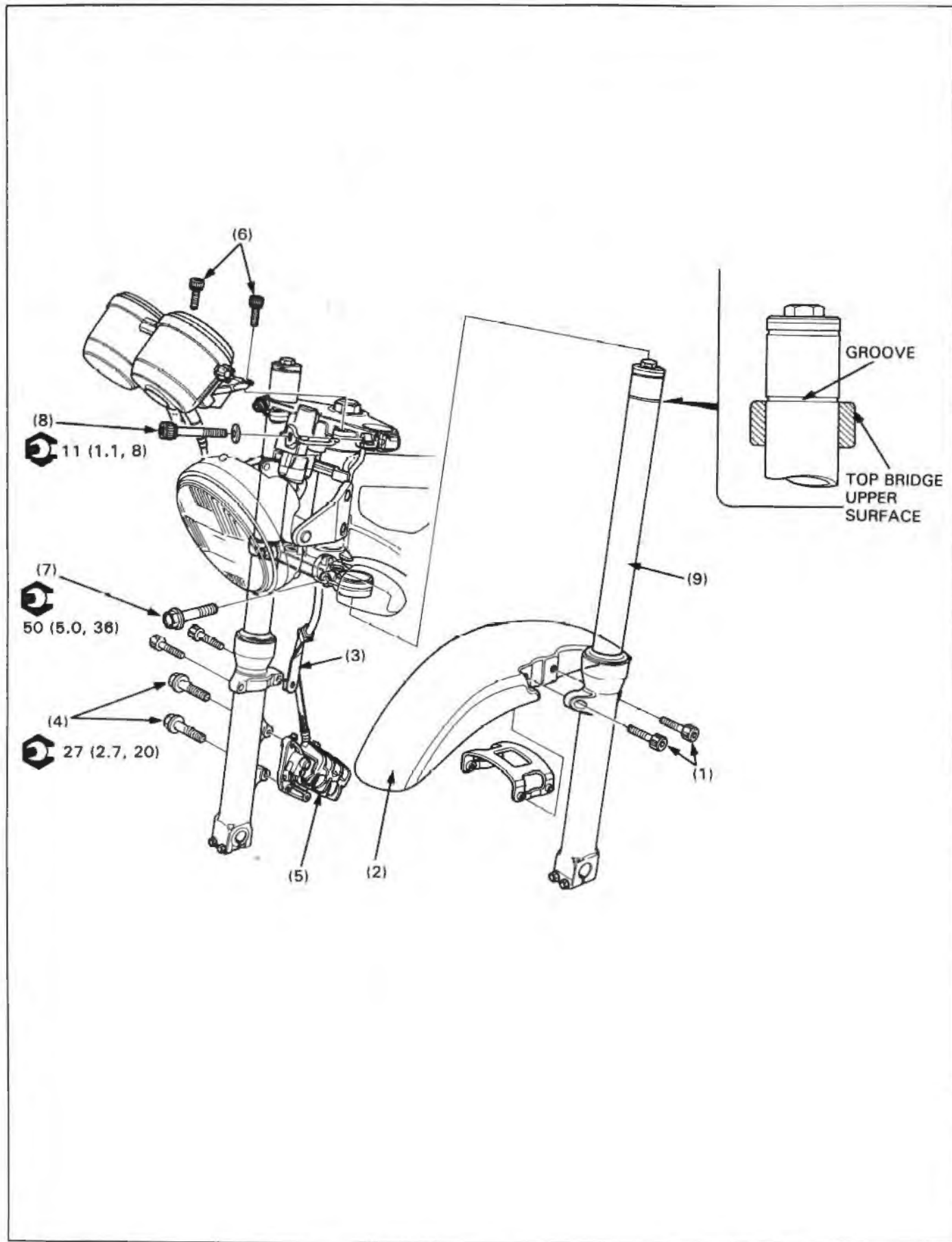
## REQUISITE SERVICE

- Front wheel removal/installation (page 11-4)

| PROCEDURE                         | Q'ty | ASSEMBLY REMARKS   |
|-----------------------------------|------|--|
| DISASSEMBLY ORDER                 |      | • Assembly is in the reverse order of disassembly.                                   |
| (1) Right side collar             | 1    | Longer collar  |
| (2) Left side collar              | 1    | Shorter collar   |
| (3) Brake disc bolt               | 6    | Wipe off all the grease on the bolt surface.   |
| (4) Brake disc                    | 1    | Install with the stamped side outward as shown.                                      |
| (5) Dust seal                     | 2    | Apply grease to the dust seal lips and install them with the lip side facing inside. |
| (6) Right wheel bearing (6004 UU) | 1    |  |
| (7) Distance collar               | 1    |  |
| (8) Left wheel bearing (6004 UU)  | 1    | NOTE:<br>• Drive in the left side bearing first, then the right side bearing.        |
| (9) Front wheel/tire              | 1/1  |  |

**FRONT WHEEL/SUSPENSION/STEERING**

**FORK REMOVAL/INSTALLATION**





**FRONT WHEEL/SUSPENSION/STEERING****CAUTION**

- Support the removed caliper with a piece of wire so that it does not hang from the brake hose. Do not twist the brake hose.

**NOTE**

- Do not depress the brake lever when the caliper is removed, or it will be difficult to refit the disc between the brake pads.
- Before removing the fork, loosen the fork cap bolt; but still do not remove it.

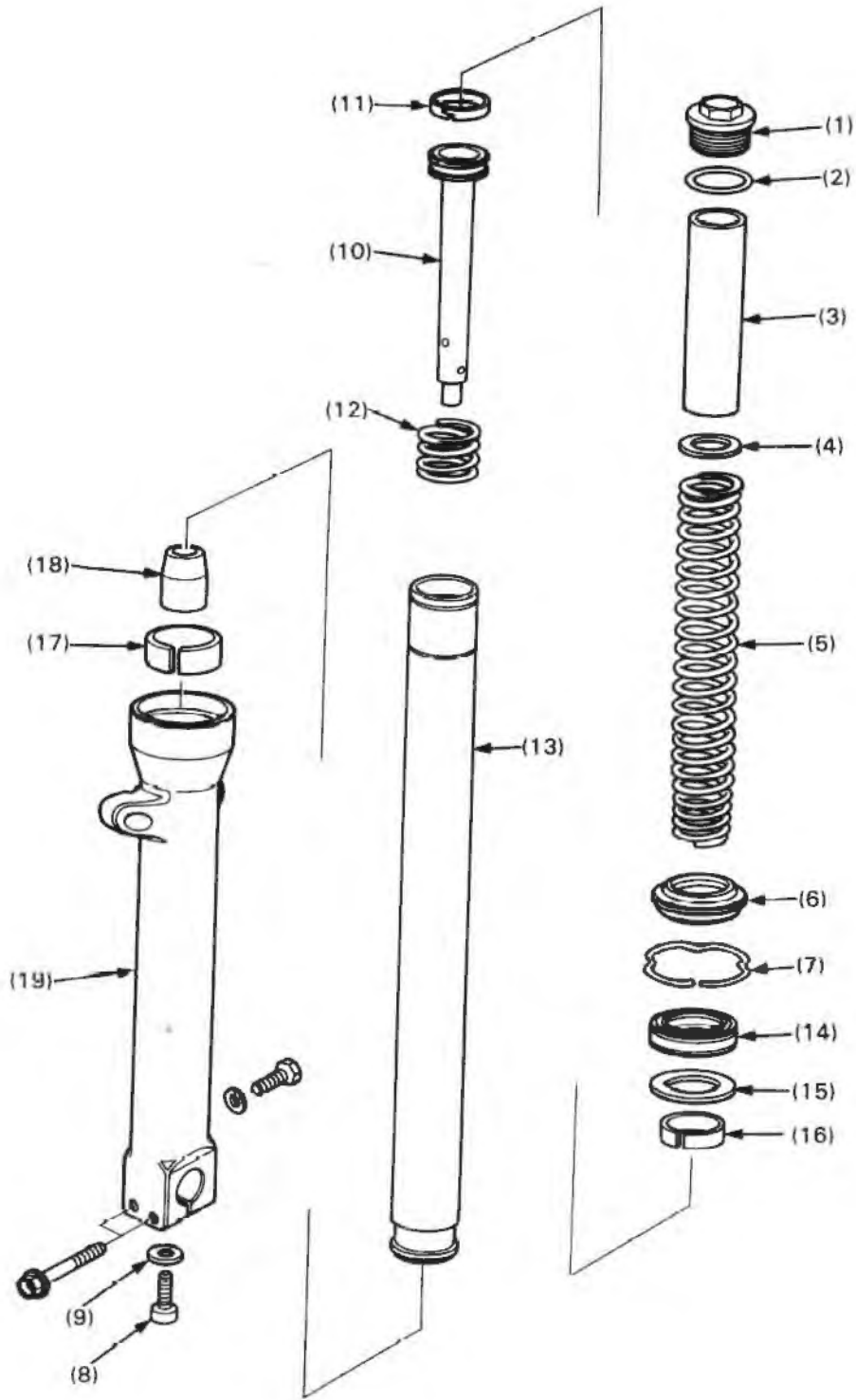
**REQUISITE SERVICE**

- Right handlebar removal/installation (page 11-2)
- Left handlebar removal installation (page 11-3)
- Front wheel removal/installation (page 11-4)

| PROCEDURE |                         | Q'ty | REMARKS   |
|-----------|-------------------------|------|---|
|           | REMOVAL ORDER           |      | • Installation is in the reverse order of removal.                          |
| (1)       | Front fender bolt       | 4    |   |
| (2)       | Front fender            | 1    |   |
| (3)       | Brake hose clamp        | 1    | Install it with the front fender as shown.                                  |
| (4)       | Caliper bracket bolt    | 2    |   |
| (5)       | Caliper assembly        | 1    |   |
| (6)       | Meter mounting bolt     | 2    | Move the meter assembly forward.  |
| (7)       | Fork pinch bolt (lower) | 2    | Only loosen the bolts.  |
| (8)       | Fork pinch bolt (upper) | 2    | Only loosen the bolts.  |
|           |                         |      | NOTE:   |
|           |                         |      | • Be careful not to let the fork leg drop when loosening the pinch bolt.    |
| (9)       | Fork assembly           | 2    | At installation, align the fork grooves with the top bridge upper surfaces. |

# FRONT WHEEL/SUSPENSION/STEERING

## FORK DISASSEMBLY



## FRONT WHEEL/SUSPENSION/STEERING

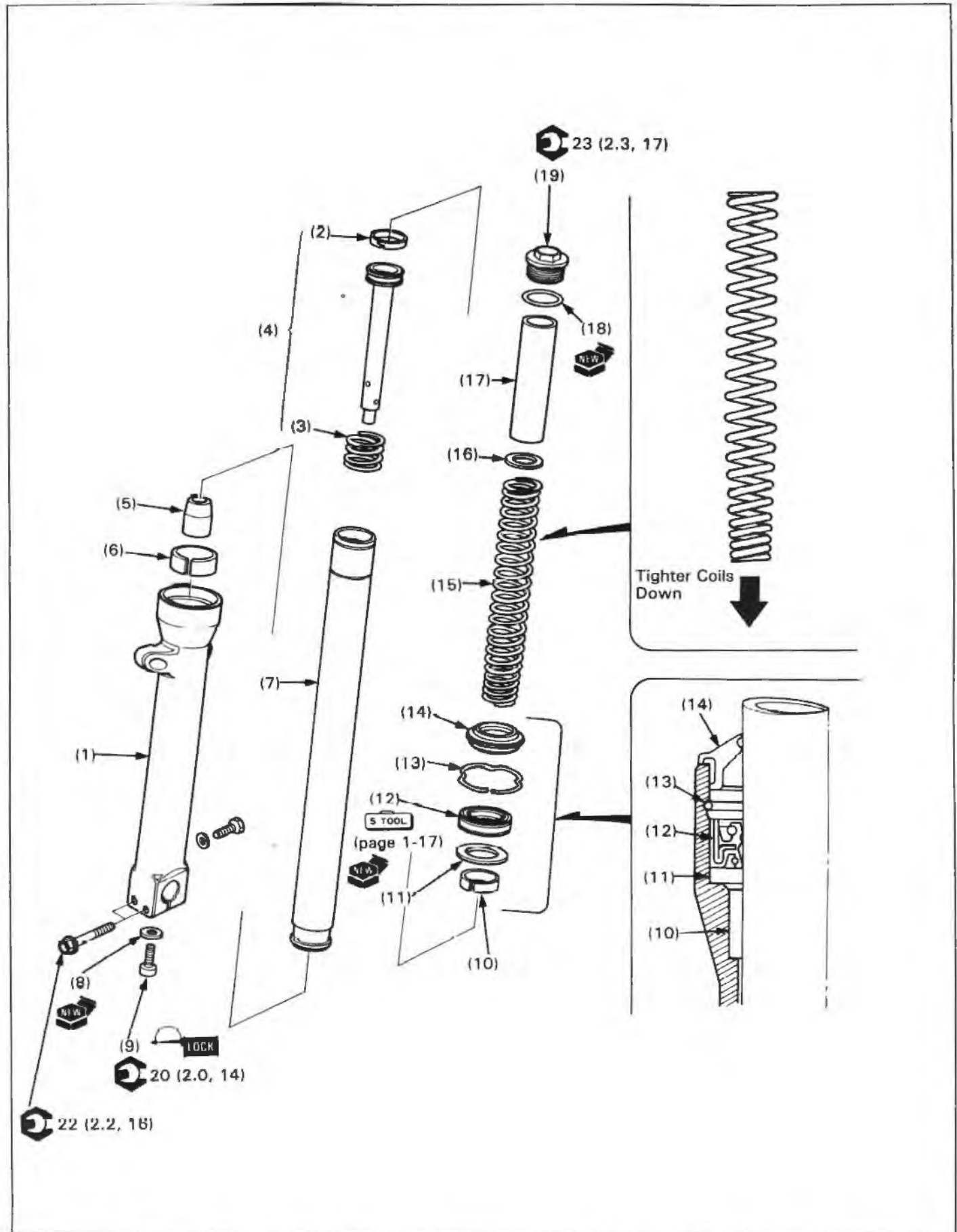
## REQUISITE SERVICE

- Fork removal (page 11-6)

| PROCEDURE |                   | Q'ty | REMARKS  |
|-----------|-------------------|------|--|
| (1)       | Fork cap bolt     | 1    | <p><b>▲ WARNING</b></p> <ul style="list-style-type: none"> <li>• The fork cap bolt is under high pressure. Use care when loosening the bolt.</li> </ul>                            |
| (2)       | O-ring            | 1    |  |
| (3)       | Spacer            | 1    |  |
| (4)       | Spring seat       | 1    |  |
| (5)       | Fork spring       | 1    | After removing, pour out any remaining fork oil.   |
| (6)       | Dust seal         | 1    | When removing them, do not damage the fork tube.   |
| (7)       | Stopper ring      | 1    |  |
| (8)       | Fork socket bolt  | 1    | <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Temporarily install the spring and fork cap bolt if difficulty is encountered in removing the socket bolt.</li> </ul> |
| (9)       | Sealing washer    | 1    |  |
| (10)      | Fork piston       | 1    |  |
| (11)      | Fork piston ring  | 1    | <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Do not remove it unless it is necessary to replace.</li> </ul>  |
| (12)      | Rebound spring    | 1    |  |
| (13)      | Fork tube         | 1    |  |
| (14)      | Oil seal          | 1    |  |
| (15)      | Back up ring      | 1    |  |
| (16)      | Slider bushing    | 1    |  |
| (17)      | Fork tube bushing | 1    | <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Do not remove it unless it is necessary to replace.</li> </ul>  |
| (18)      | Oil lock piece    | 1    |  |
| (19)      | Fork slider       | 1    |  |

**FRONT WHEEL/SUSPENSION/STEERING**

**FORK ASSEMBLY**



## FRONT WHEEL/SUSPENSION/STEERING

## NOTE

- Clean all disassembled parts.

## REQUISITE SERVICE

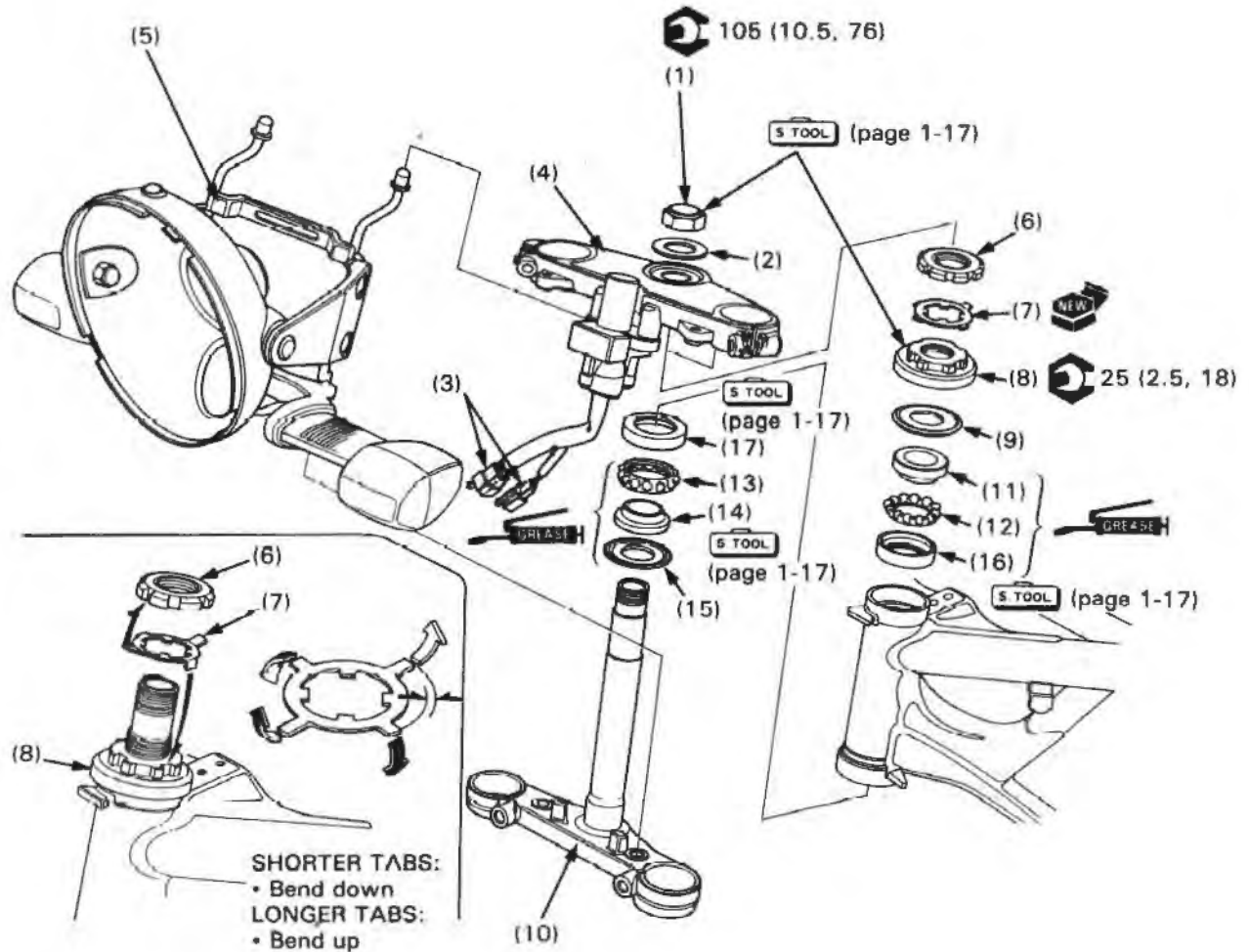
- Fork installation (page 11-6)

| PROCEDURE |                      | Q'ty | REMARKS  |
|-----------|----------------------|------|--|
| (1)       | Fork slider          | 1    |  |
| (2)       | Fork piston ring     | 1    | Replace with a new one if it was removed from the piston.  |
| (3)       | Rebound spring       | 1    |  |
| (4)       | Fork piston assembly | 1    | Insert into the fork tube (10).  |
| (5)       | Oil lock piece       | 1    | Install onto the piston (4).   |
| (6)       | Fork tube bushing    | 1    | Replace with a new one if it was removed from the fork tube.   |
| (7)       | Fork tube            | 1    |  |
| (8)       | Sealing washer       | 1    |  |
| (9)       | Fork socket bolt     | 1    | NOTE:<br>• Temporarily install the fork spring and fork cap bolt so that the piston is held in place when the socket bolt is tightened.  |
| (10)      | Slider bushing       | 1    |  |
| (11)      | Back up ring         | 1    |  |
| (12)      | Oil seal             | 1    | NOTE:<br>• Wrap vinyl tape around the fork tube top end to avoid damaging the oil seal during the oil seal installation.<br>• Drive in it securely, using fork seal driver (07947-KA50100) and attachment (07947-KF00100). |
| (13)      | Stopper ring         | 1    | Install into the slider groove securely.   |
| (14)      | Dust seal            | 1    | NOTE:<br>• After installing it, compress the fork tube fully and pour the specified amount of fork fluid (page 1-11) into the fork tube.   |
| (15)      | Fork spring          | 1    | NOTE:<br>• Wipe oil off the spring thoroughly using a clean lint free cloth and install with tightly wound coil end facing down.   |
| (16)      | Spring seat          | 1    |  |
| (17)      | Spacer               | 1    |  |
| (18)      | O-ring               | 1    |  |
| (19)      | Fork cap bolt        | 1    | Tighten lightly, being careful not to cross-thread the bolt; after installing the fork into the steering stem, torque the bolt.  |



**FRONT WHEEL/SUSPENSION/STEERING**

**STEERING STEM REMOVAL/INSTALLATION**



## FRONT WHEEL/SUSPENSION/STEERING

## NOTE

- Bearings should always be replaced as a set- inner and outer races.
- Remove the fork, after loosening the steering stem nut.
- Check the steering head bearing preload (page 1-11) after torquing the stem nut.

## REQUISITE SERVICE

- Front wheel removal/installation (page 11-4)
- Fork removal/installation (page 11-6)

| PROCEDURE                                | Q'ty | REMARKS  |
|--|------|--|
| <b>REMOVAL ORDER</b>                     |      |  |
| (1) Steering stem nut                    | 1    | After removing, remove the fork.   |
| (2) Washer                               | 1    |  |
| (3) Ignition switch connector            | 2    | Disconnect inside the headlight case (page 1-19).  |
| (4) Top bridge                           | 1    |  |
| (5) Headlight/Stay assembly              | 1    | Support with a piece of wire so that they do not hang from the cables or wire harnesses.   |
| (6) Lock nut                             | 1    | NOTE:<br>• Remove, after straightening the lock washer tabs.   |
| (7) Lock washer                          | 1    |  |
| (8) Steering head bearing adjustment nut | 1    |  |
| (9) Dust seal                            | 1    |  |
| (10) Steering stem                       | 1    |  |
| (11) Upper inner race                    | 1    |  |
| (12) Upper bearing                       | 1    |  |
| (13) Lower bearing                       | 1    |  |
| (14) Lower inner race                    | 1    | Replace if they were removed.  |
| (15) Dust seal                           | 1    | • Use race remover attachment (07953-MJ1000A) with driver (07949-3710001) and attachment, 37 x 40 mm (07746-0010200) for upper outer race removal. |
| (16) Upper outer race                    | 1    |  |
| (17) Lower outer race                    | 1    | • Use race remover (07946-3710500) with driver (07949-3710001) and attachment, 37 x 40 mm (07746-0010200) for lower outer race removal.            |
| <b>INSTALLATION ORDER</b>                |      |  |
| (17) Lower outer race                    | 1    | Replace as a set, if necessary.  |
| (16) Upper outer race                    | 1    | • Use attachment, 52 x 55 mm (07746-0010400) and driver (07749-0010000) for lower outer race installation.   |
| (15) Dust seal                           | 1    |  |
| (14) Lower inner race                    | 1    | • Use attachment, 42 x 47 mm (07746-0010300) and driver (07749-0010000) for upper outer race installation.   |
| (13) Lower bearing                       | 1    |  |
| (12) Upper bearing                       | 1    |  |
| (11) Upper inner race                    | 1    | • Use steering stem driver (07946-MB00000) for lower inner race installation.  |
| (10) Steering stem                       | 1    |  |
| (9) Dust seal                            | 1    |  |
| (8) Steering head bearing adjustment nut | 1    | Installation: refer to section 18 of the Common Service Manual (Retainer-Type Ball Bearings).  |
| (7) Lock washer                          | 1    |  |
| (6) Lock nut                             | 1    |  |
| (5) Headlight Stay assembly              | 1    |  |
| (4) Top bridge                           | 1    |  |
| (3) Ignition switch connector            | 2    | Connect them (page 1-19).  |
| (2) Washer                               | 1    |  |
| (1) Steering stem nut                    | 1    | Temporarily install fork and torque the nut.   |

# 12. REAR WHEEL/SUSPENSION

|   |             |   |             |
|---|-------------|---|-------------|
| <b>SERVICE INFORMATION</b>                      | <b>12-1</b> | <b>SHOCK ABSORBER DISASSEMBLY/<br/>ASSEMBLY</b> | <b>12-5</b> |
| <b>TROUBLESHOOTING</b>                          | <b>12-1</b> | <b>SWINGARM REMOVAL/<br/>INSTALLATION</b>       | <b>12-7</b> |
| <b>REAR WHEEL REMOVAL/<br/>INSTALLATION</b>     | <b>12-2</b> | <b>SWINGARM DISASSEMBLY/<br/>ASSEMBLY</b>       | <b>12-8</b> |
| <b>REAR WHEEL DISASSEMBLY/<br/>ASSEMBLY</b>     | <b>12-3</b> |   |             |
| <b>SHOCK ABSORBER REMOVAL/<br/>INSTALLATION</b> | <b>12-4</b> |   |             |

## SERVICE INFORMATION

### ⚠ WARNING

- The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock absorber.
- Before disposal of the shock absorber, release the nitrogen (Step: section 19 of the Common Service Manual; Drilling point: page 1-11)
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.
- Riding on damaged rims impairs safe operation of the vehicle.

12

- Refer to the section 13 for brake system information.
- Tubeless tire removal, repair, and remounting procedures are covered in the section 16 of the Common Service Manual.

## TROUBLESHOOTING

### Rear wheel wobbling

- Bent rim
- Worn rear wheel bearings
- Faulty tire
- Unbalanced tire and wheel
- Low tire pressure
- Faulty swingarm pivot bearing(s)

### Wheel turns hard

- Faulty wheel bearing(s)
- Brake drag (page 13-1)
- Bent rear axle

### Soft suspension

- Weak spring
- Incorrect suspension adjustment
- Oil leakage from damper unit
- Low tire pressure

### Hard suspension

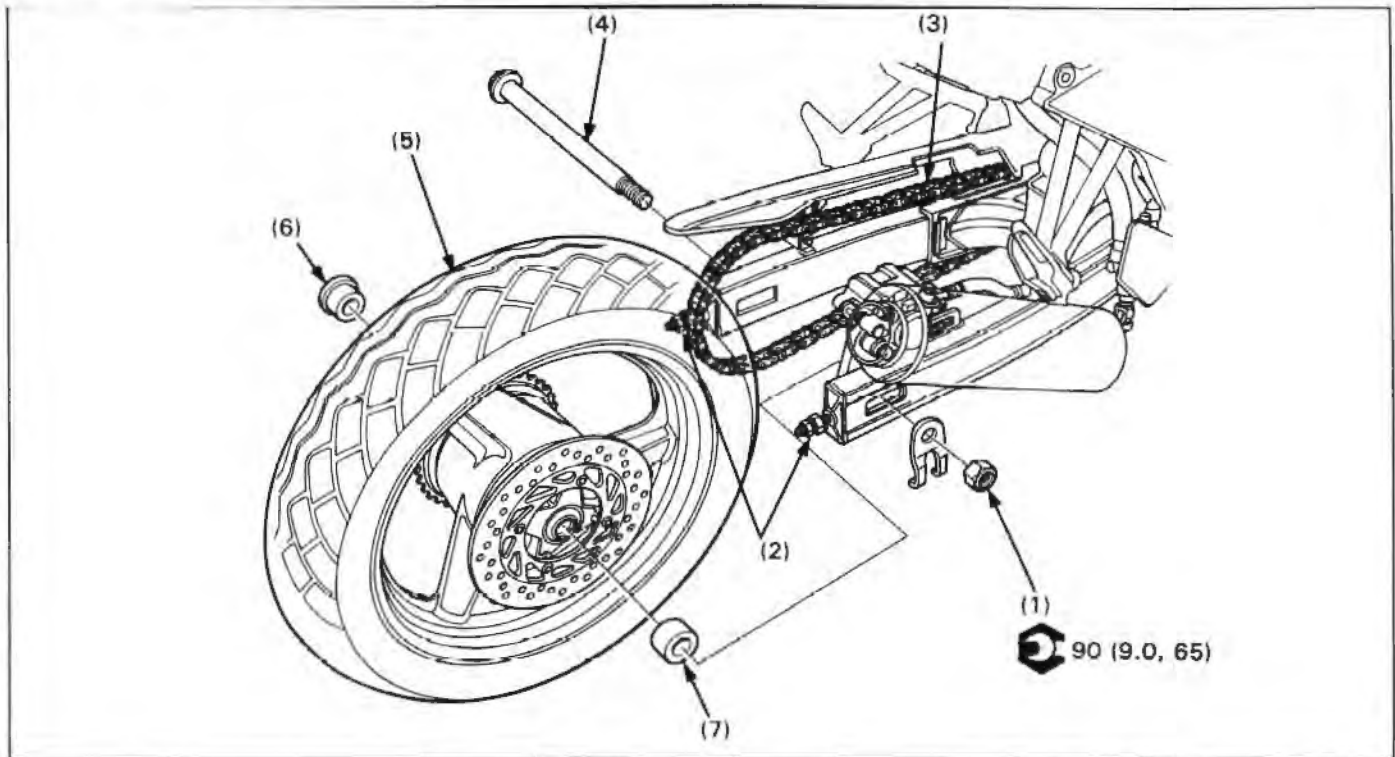
- Damaged shock absorber upper or lower bearings
- Incorrect suspension adjustment
- Bent damper rod
- Damaged swingarm pivot bearing
- High tire pressure

### Rear suspension noisy

- Loose fasteners

## REAR WHEEL/SUSPENSION

## REAR WHEEL REMOVAL/INSTALLATION



## ⚠ WARNING

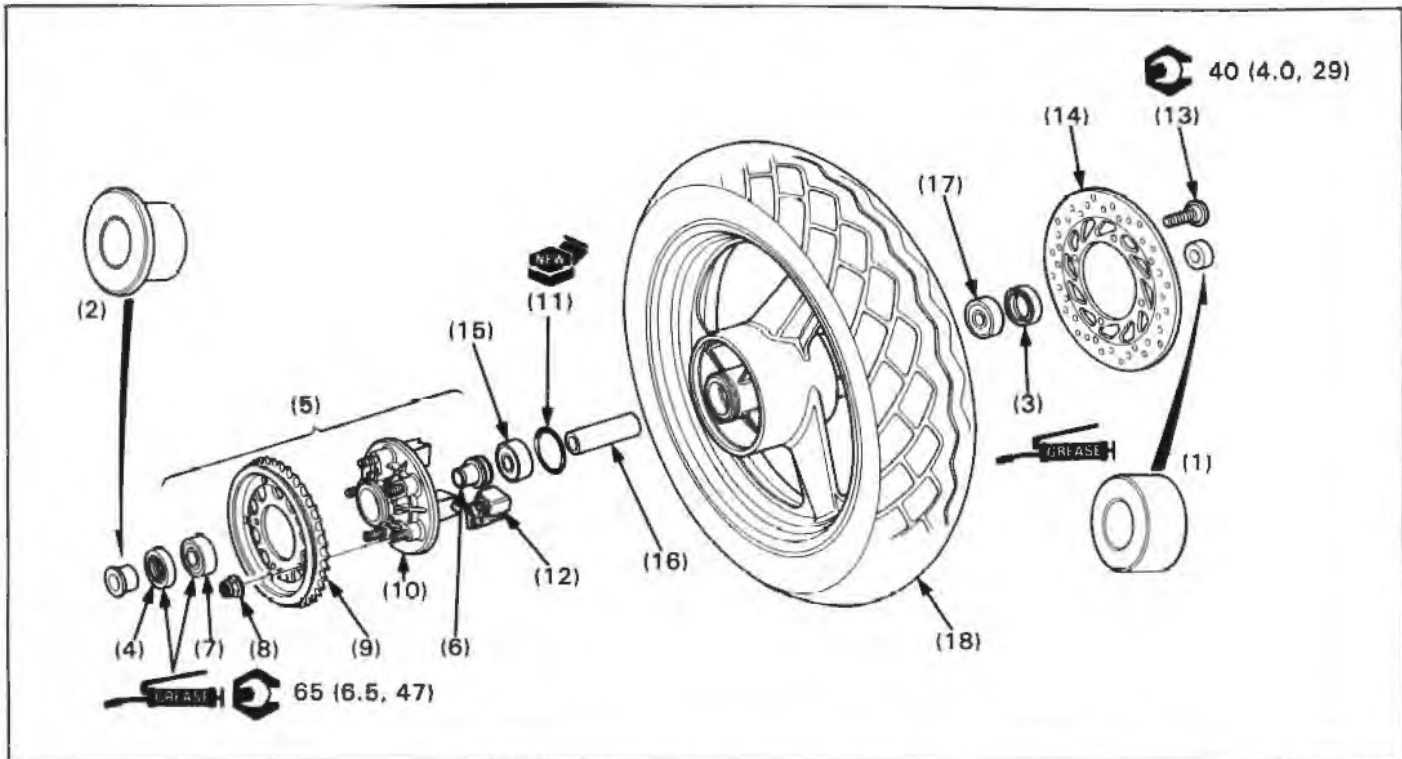
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.

## NOTE

- Put the motorcycle on its center stand.
- Do not depress the brake pedal when the caliper is removed, or it will be difficult to refit the disc between the brake pads.
- Support the removed caliper with a piece of wire so that it does not hang from the brake hose. Do not twist the brake hose.
- Adjust the drive chain free play adjustment after installing the wheel.

| PROCEDURE     |                           | Q'ty | REMARKS  |
|---------------|---------------------------|------|--|
| REMOVAL ORDER |                           |      | • Installation is in the reverse order of removal.                                   |
| (1)           | Rear axle nut             | 1    |  |
| (2)           | Drive chain adjusting nut | 2    | Loosen the lock nuts and loosen the adjusting nut fully.                             |
| (3)           | Drive chain               | 1    | Move the rear wheel forward, and disengage the drive chain from the driven sprocket. |
| (4)           | Rear axle                 | 1    |  |
| (5)           | Rear wheel assembly       | 1    |  |
| (6)           | Left side collar          |      |  |
| (7)           | Right side collar         |      |  |

## REAR WHEEL DISASSEMBLY/ASSEMBLY



**⚠ WARNING**

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.

**NOTE**

- For driven sprocket removal, loosen the sprocket nuts with the driven flange installed into the wheel hub.
- Replace wheel bearings as a set.
- For wheel bearing replacement, refer to the section 1 of the Common Service Manual.

**REQUISITE SERVICE**

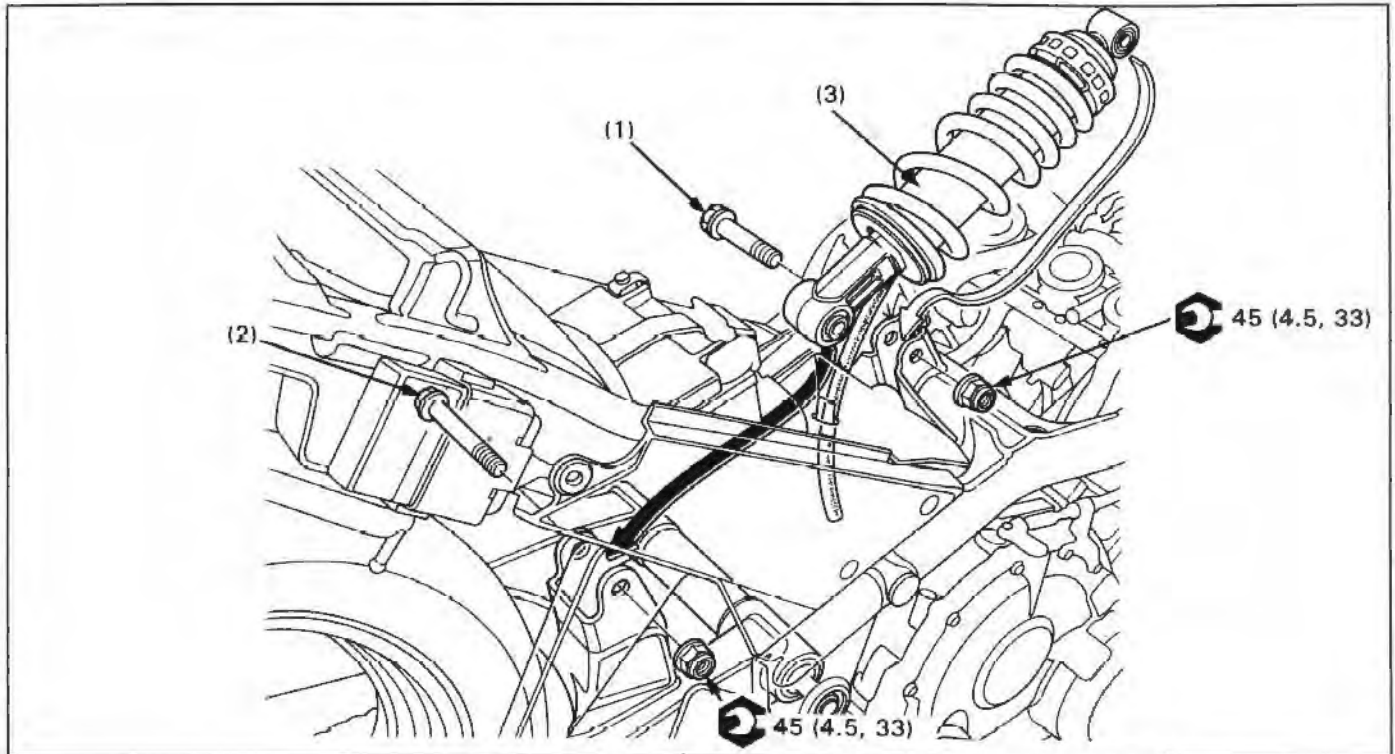
- Rear wheel removal/installation (page 12-2)

| PROCEDURE                            | Q'ty | ASSEMBLY REMARKS   |
|--------------------------------------|------|--|
| DISASSEMBLY ORDER                    |      | • Assembly is in the reverse order of disassembly.                                   |
| (1) Right side collar                | 1    |  |
| (2) Left side collar                 | 1    |  |
| (3) Right dust seal                  | 1    | Apply grease to the dust seal lips and install them with the lip side facing inside. |
| (4) Left dust seal                   | 1    |  |
| (5) Driven flange assembly           | 1    | Install with the sealed side facing out.   |
| (6) — driven flange collar           | 1    |  |
| (7) — driven flange bearing (6204 U) | 1    |  |
| (8) — driven sprocket nut            | 5    |  |
| (9) — driven sprocket                | 1    |  |
| (10) — driven flange                 | 1    |  |
| (11) O-ring                          | 1    | NOTE:<br>• Drive in the right side bearing first, then the left side bearing.        |
| (12) Rear wheel damper               | 4    |  |
| (13) Brake disc bolt                 | 4    |  |
| (14) Brake disc                      | 1    |  |
| (15) Left wheel bearing (6303 UU)    | 1    |  |
| (16) Distance collar                 | 1    |  |
| (17) Right wheel bearing (6303 UU)   | 1    |  |
| (18) Rear wheel/tire                 | 1/1  |  |



## REAR WHEEL/SUSPENSION

## SHOCK ABSORBER REMOVAL/INSTALLATION



## NOTE

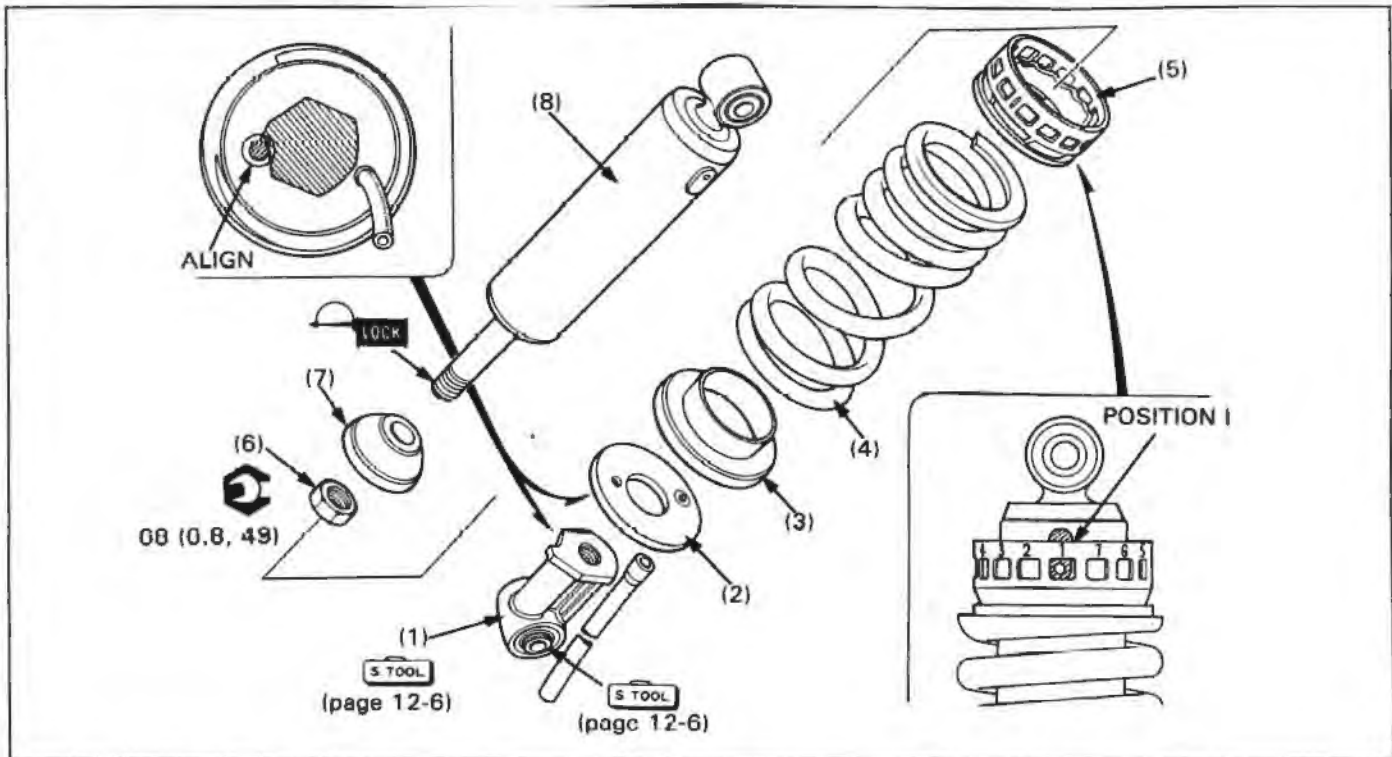
- Put the motorcycle on its center stand.
- Before removing the shock absorber for disassembly, adjust the shock absorber to position I (for lightest loads) before removing the shock absorber from the frame.

## REQUISITE SERVICE

- Fuel tank removal/installation (page 2-4)

| PROCEDURE                                | Q'ty | REMARKS  |
|--|------|--|
| REMOVAL ORDER                            |      | • Installation is in the reverse order of removal. |
| (1) Shock absorber mounting bolt (upper) | 1    | At installation, install them from the left side.  |
| (2) Shock absorber mounting bolt (lower) | 1    |  |
| (3) Shock absorber assembly              | 1    |  |
|  |      | NOTE:  |
|  |      | • Remove it upwards from the frame.                |
|  |      | • Install with the drain tube forward.             |

## SHOCK ABSORBER DISASSEMBLY/ASSEMBLY



## ▲ WARNING

- The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock absorber.
- Before disposal of the shock absorber, release the nitrogen  
(Step: section 19 of the Common Service Manual; Drilling point: page 1-11)

## NOTE

- Adjust the shock absorber to position I (for lightest loads) before removing the shock absorber from the frame.
- For lower joint needle bearing replacement, see next page.

## REQUISITE SERVICE

- Shock absorber removal/installation (page 12-4)

| PROCEDURE |                                  | Q'ty | REMARKS  |
|-----------|----------------------------------|------|--|
| (1)       | DISASSEMBLY ORDER<br>Lower joint | 1    | • Assembly is in the reverse order of disassembly.<br>NOTE:<br>• Removal/Installation (page 12-6)<br>• At installation, align the lower joint with the seat stopper pin. |
| (2)       | Seat stopper                     | 1    |  |
| (3)       | Spring seat                      | 1    |  |
| (4)       | Spring                           | 1    | Install with the taper end facing to the adjuster.   |
| (5)       | Adjuster                         | 1    |  |
| (6)       | Lower joint lock nut             | 1    |  |
| (7)       | Damper rubber                    | 1    |  |
| (8)       | Damper                           | 1    |  |

## REAR WHEEL/SUSPENSION

### LOWER JOINT REMOVAL/INSTALLATION

Install the shock absorber compressor and attachment on the rear shock absorber as shown.

**S TOOL**

**SHOCK ABSORBER COMPRESSOR** 07GME-0010000

(Not available in  
U.S.A.) or

07959-3290001

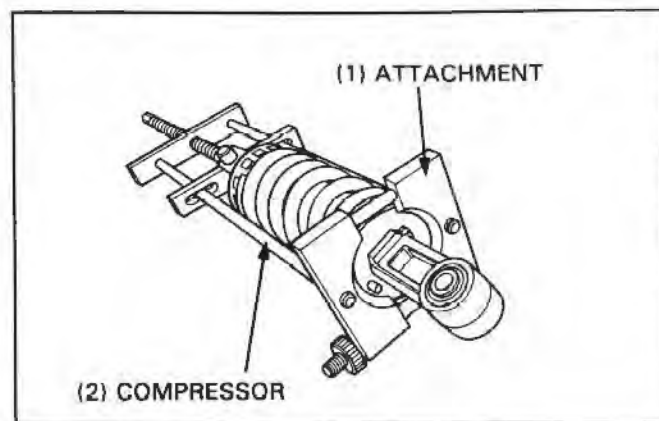
07GME-0010100

— screw assembly

**ATTACHMENT**

07959-MB10000

Turn the compressor handle and slowly compress the spring.



Hold the lower joint and loosen the lock nut (turn the nut clockwise).

Remove the lower joint and clean off any locking agent from the threads.

**Installation:**

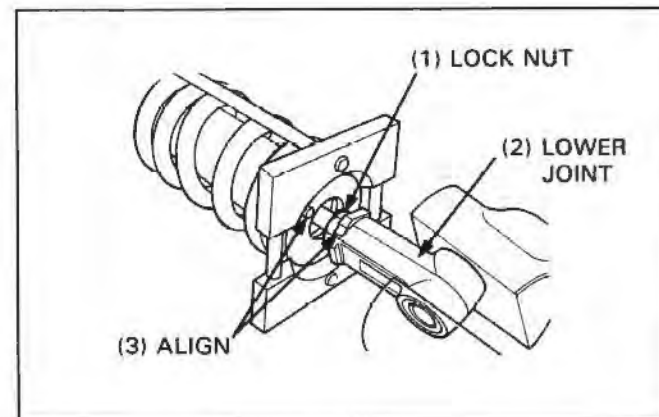
Apply a locking agent to the damper threads.

Install the lower joint securely onto the damper rod.

Hold the lower joint and torque the lock nut.

**TORQUE: 68 N·m (6.8 kg-m, 49 ft-lb)**

Make sure the Lower joint is aligned with the seat stopper pin and remove the compressor.



### LOWER JOINTS NEEDLE BEARING REPLACEMENT

Remove the dust seals.

Hold the joint with a suitable tool.

Press the needle bearing out of the joint.

**S TOOL**

**DRIVER PIN**

07GMD-KT80100

(Not available  
in U.S.A.)

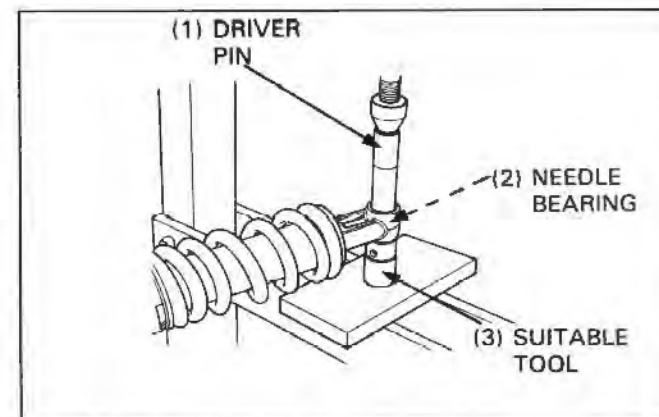
or

**PILOT, 22 mm**

07746-0041000

**DRIVER**

07749-0010000



Pack a new bearing with grease.

Press the bearing into the joint until the bearing surface flushes with the joint surface as shown.

**S TOOL**

**DRIVER**

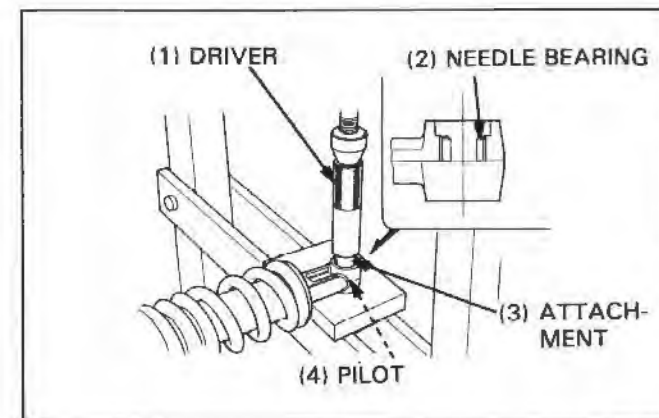
07749-0010000

**ATTACHMENT, 24 x 26 mm**

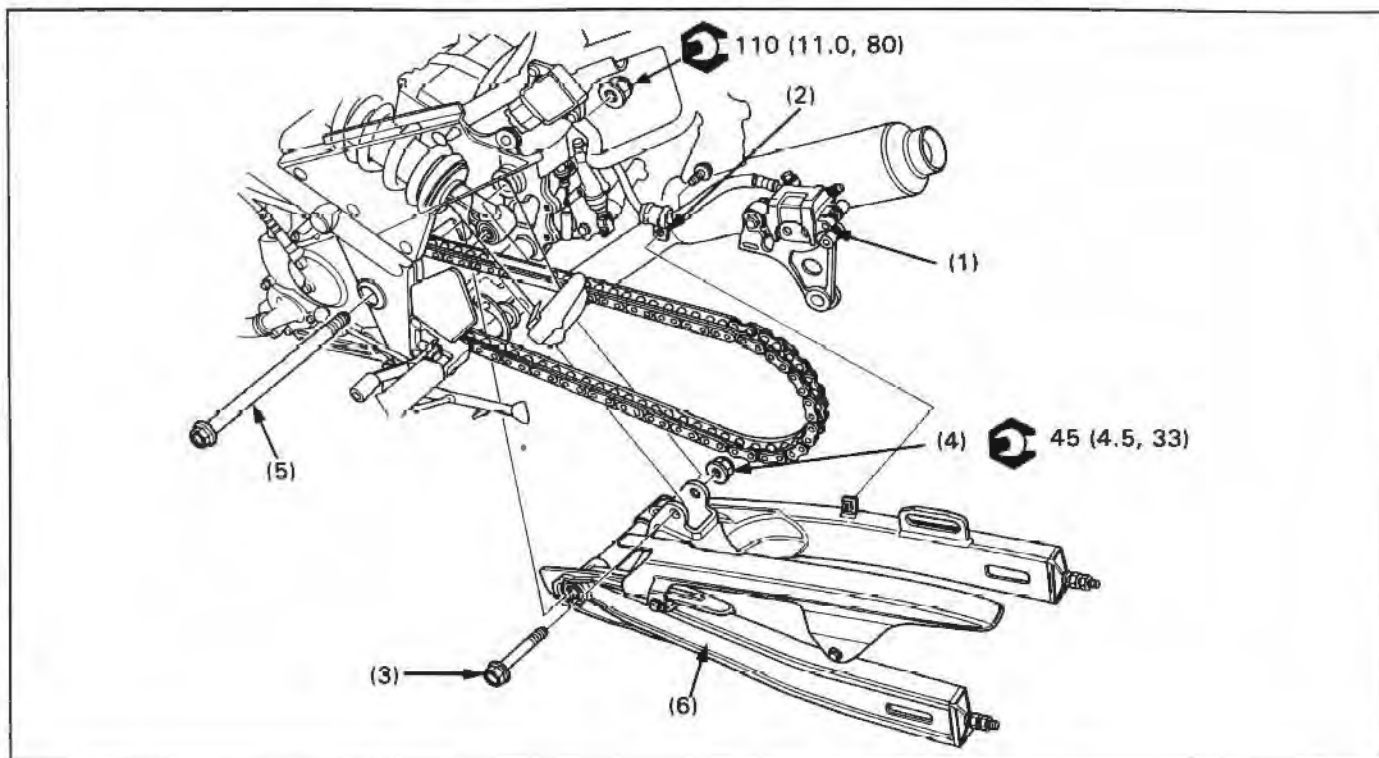
07746-0010700

**PILOT, 17 mm**

07746-0040400



## SWINGARM REMOVAL/INSTALLATION



### NOTE

- Put the motorcycle on its center stand.
- Do not depress the brake pedal when the caliper is removed, or it will be difficult to refit the disc between the brake pads.
- Support the removed caliper with a piece of wire so that it does not hang from the brake hose. Do not twist the brake hose.
- If necessary, loosen the rear engine mounting nut near the swingarm pivot to ease the swingarm removal/installation.

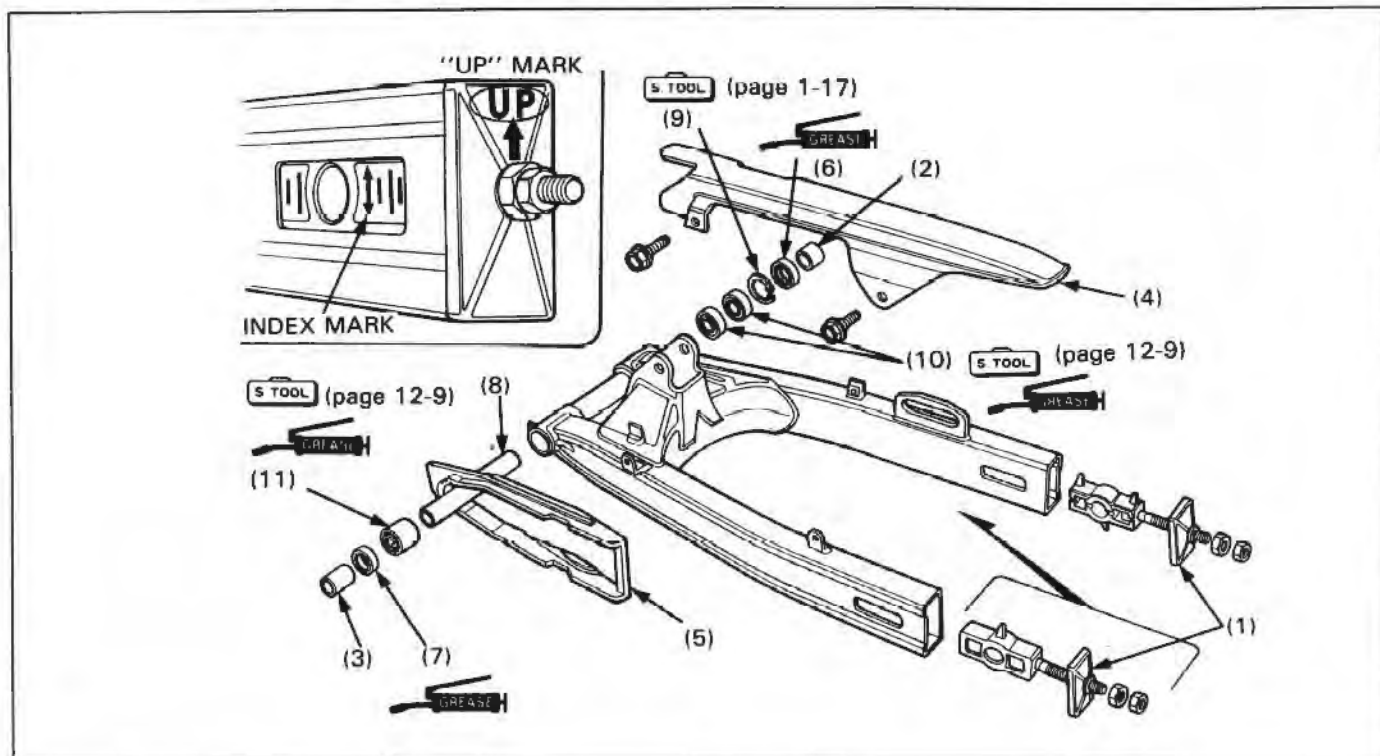
### REQUISITE SERVICE

- Rear wheel removal/installation (page 12-2)

| PROCEDURE                              | Q'ty | REMARKS  |
|--|------|--|
| REMOVAL ORDER                          |      | • Installation is in the reverse order of removal. |
| (1) Rear brake caliper                 | 1    |  |
| (2) Brake hose clamp                   | 1    |  |
| (3) Shock absorber lower mounting bolt | 1    |  |
| (4) Swingarm pivot nut                 | 1    |  |
| (5) Swingarm pivot shaft               | 1    |  |
| (6) Swingarm assembly                  | 1    |  |

## REAR WHEEL/SUSPENSION

## SWINGARM DISASSEMBLY/ASSEMBLY



## NOTE

- For pivot bearing replacement, see next page.

## REQUISITE SERVICE

- Rear wheel removal/installation (page 12-2)
- Swingarm removal/installation (page 12-7)

| PROCEDURE                | Q'ty | ASSEMBLY REMARKS   |
|--------------------------|------|--|
| (1) DISASSEMBLY ORDER    |      |  |
| (1) Drive chain adjuster | 2    | • Assembly is in the reverse order of disassembly.<br>Install them with the UP mark facing up and the index mark facing out. |
| (2) Right pivot collar   | 1    |  |
| (3) Left pivot collar    | 1    |  |
| (4) Drive chain cover    | 1    |  |
| (5) Drive chain slider   | 1    |  |
| (6) Right dust seal      | 1    | Apply grease to the lip.   |
| (7) Left dust seal       | 1    |  |
| (8) Distance collar      | 1    |  |
| (9) Snap ring            | 1    | Install it into the groove securely.   |
| (10) Ball bearing        | 2    | Replacement (page 12-9)  |
| (11) Needle bearing      | 1    |  |



## SWINGARM PIVOT BEARING REPLACEMENT

Press the right pivot bearings (ball bearings) out of the swingarm.

**S TOOL**

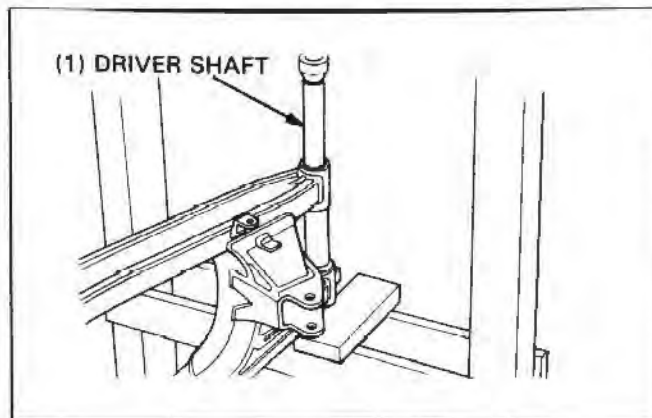
**DRIVER SHAFT**

**07946-MJ00100**  
(Not available in U.S.A.)

or

**DRIVER**

**07949-3710001**



Set the needle bearing remover onto the left pivot bearing (needle bearing) as shown.  
Press the bearing out of the swingarm.

**S TOOL**

**NEEDLE BEARING REMOVER ATTACHMENT**

**07GMD-KT70200** (Not available  
**07946-MJ00100** in U.S.A.)

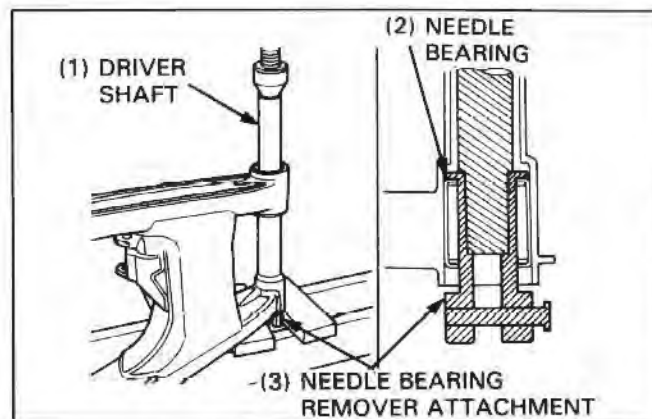
**DRIVER SHAFT**

or

**BUSHING REMOVER M967X-038-XXXXX**

**DRIVER**

**07949-3710001**



Press the needle bearing into the swingarm with the marked side facing out.

### NOTE

- The bearing surface should flush with the pivot inside surface as shown.

**S TOOL**

**DRIVER**

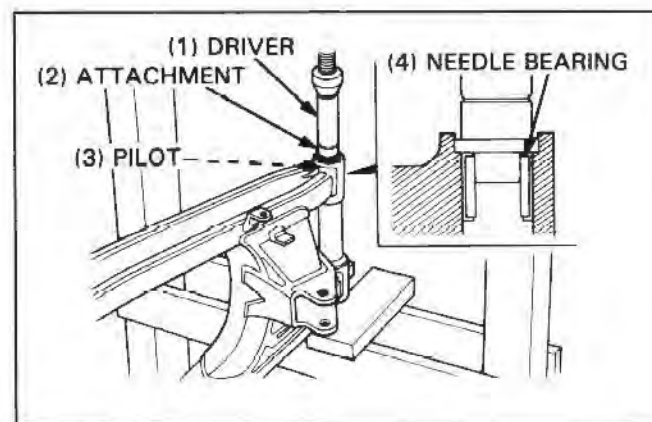
**07749-0010000**

**ATTACHMENT, 28 x 30 mm**

**07946-1870100**

**PILOT, 22 mm**

**07746-0041000**



Press one ball bearing (inner bearing) into the swingarm first, then press in another on top of it (outer bearing).

**S TOOL**

**DRIVER**

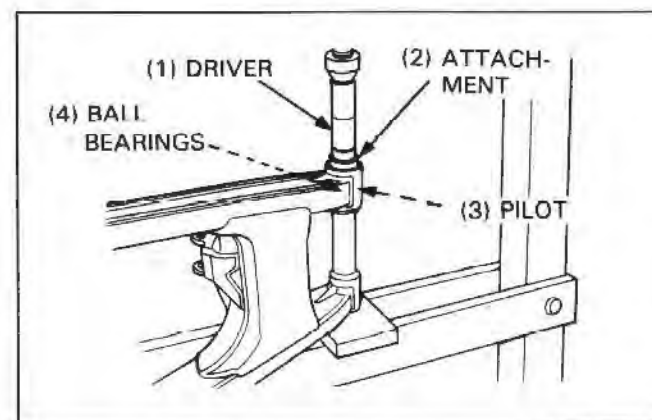
**07749-0010000**

**ATTACHMENT, 32 x 35 mm**

**07746-0010100**

**PILOT, 15 mm**

**07746-0040300**



# 13. BRAKES

|  |      |   |       |
|--|------|---|-------|
| SERVICE INFORMATION                          | 13-1 | FRONT MASTER CYLINDER<br>REMOVAL/INSTALLATION | 13-8  |
| TROUBLESHOOTING                              | 13-1 | REAR MASTER CYLINDER<br>REMOVAL/INSTALLATION  | 13-9  |
| FRONT BRAKE PAD REPLACEMENT                  | 13-2 | FRONT MASTER CYLINDER<br>DISASSEMBLY/ASSEMBLY | 13-10 |
| REAR BRAKE PAD REPLACEMENT                   | 13-3 | REAR MASTER CYLINDER<br>DISASSEMBLY/ASSEMBLY  | 13-11 |
| FRONT BRAKE CALIPER REMOVAL/<br>INSTALLATION | 13-4 | BRAKE PEDAL REMOVAL/<br>INSTALLATION          | 13-12 |
| REAR BRAKE CALIPER REMOVAL/<br>INSTALLATION  | 13-5 |   |       |
| FRONT BRAKE CALIPER<br>DISASSEMBLY/ASSEMBLY  | 13-6 |   |       |
| REAR BRAKE CALIPER DISASSEMBLY/<br>ASSEMBLY  | 13-7 |   |       |

## SERVICE INFORMATION

### ⚠ WARNING

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.

- Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be very careful whenever you remove the reservoir cap: make sure the front reservoir is horizontal first.
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brakes feel spongy, the system must be bled.
- 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.
- Always check brake operation before riding the motorcycle.

## TROUBLESHOOTING

### Brake lever/pedal soft or spongy

- Air bubbles in the hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master cylinder piston cups
- Worn brake pad
- 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
- Worn brake disc
- Contaminated master cylinder
- Bent brake lever/pedal

### Brake lever/pedal hard

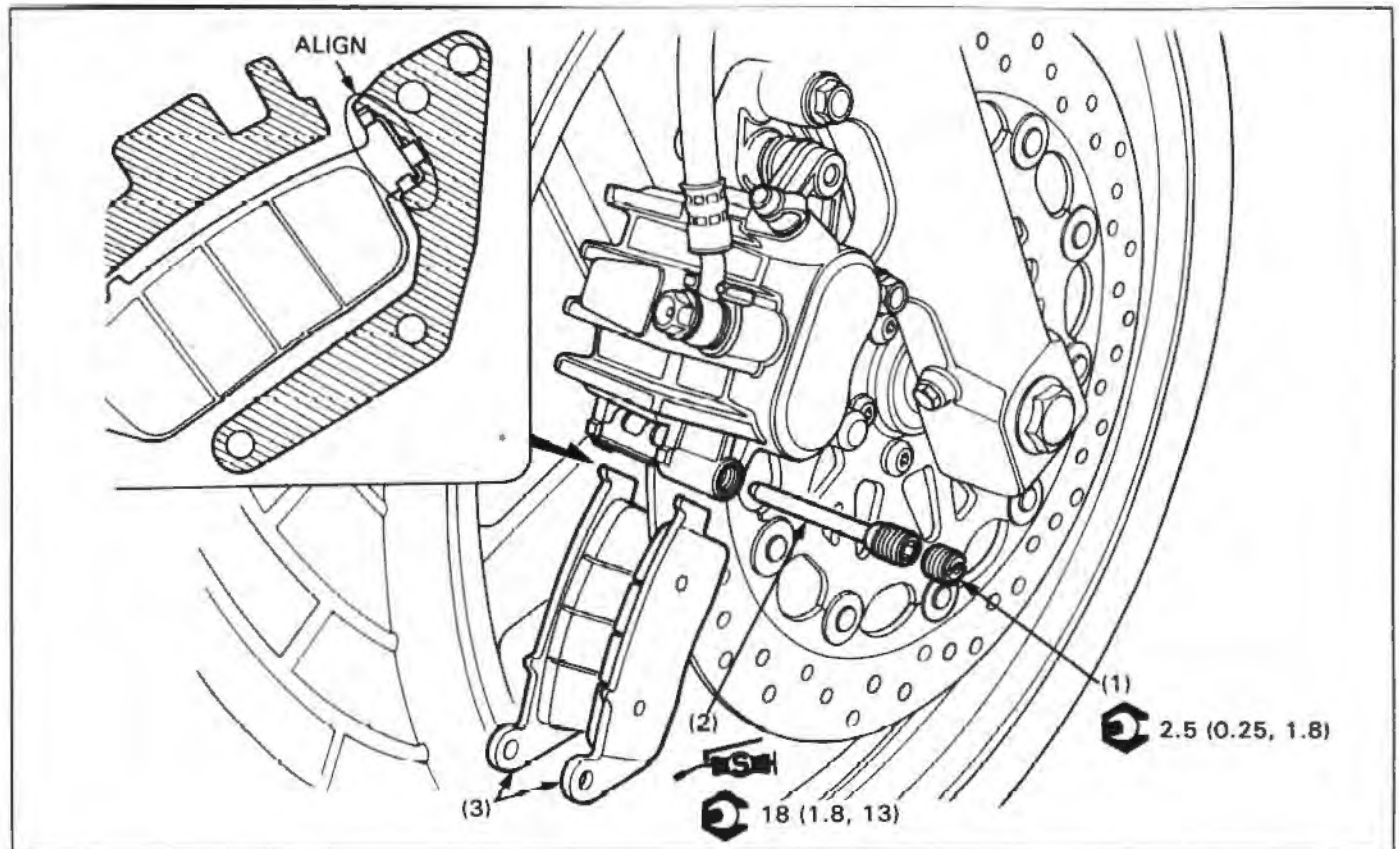
- Clogged/restricted brake system
- Sticking/worn caliper piston
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever/pedal

### Brakes drag

- Contaminated brake pad/disc
- Misaligned wheel
- Worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly

## BRAKES

## FRONT BRAKE PAD REPLACEMENT



## ▲ WARNING

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.
- After replacement, operate the brake lever to seat the caliper pistons against the pads.

## NOTE

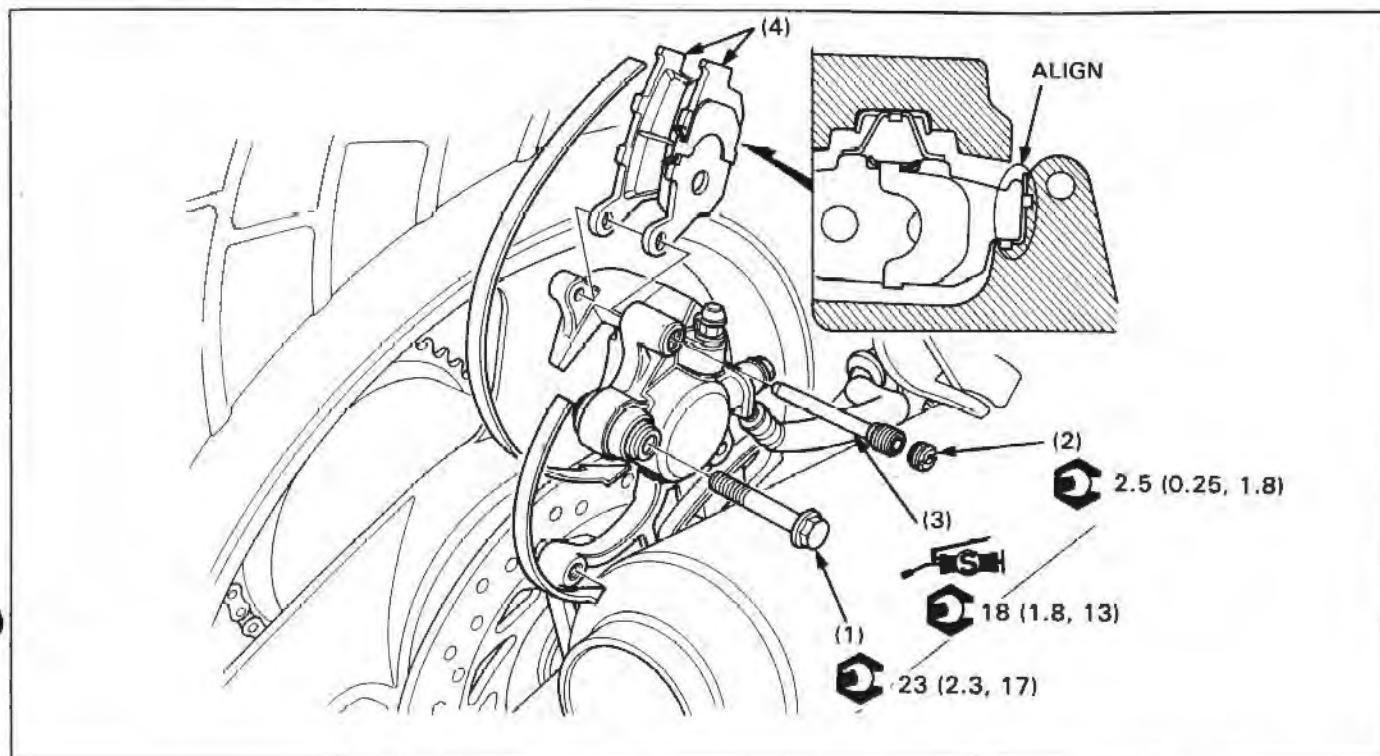
- Do not depress the brake lever when the caliper is removed, or it will be difficult to refit the disc between the brake pads.
- Replace brake pads as a set.
- Apply a thin of silicone grease onto the pad pin so as not to rust it.

## REQUISITE SERVICE

- Pushing the caliper against the disc, push the caliper pistons all the way in to allow the installation of new brake pads.

| PROCEDURE     |              | Q'ty | INSTALLATION REMARKS                                     |
|---------------|--------------|------|--|
| REMOVAL ORDER |              |      | • Installation is in the reverse order of removal.       |
| (1)           | Pad pin plug | 1    |  |
| (2)           | Pad pin      | 1    | Insert the pin, pushing the pads against the pad spring. |
| (3)           | Brake pad    | 2    | Align the pad lug with the pad retainer as shown.        |

## REAR BRAKE PAD REPLACEMENT



## ⚠ WARNING

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.
- After replacement, operate the brake pedal to seat the caliper pistons against the pads.

## NOTE

- Do not depress the brake pedal when the caliper is removed, or it will be difficult to refit the disc between the brake pads.
- Replace brake pads as a set.
- Apply a thin coating of silicone grease onto the pad pins to prevent rust and allow easy pad movement.

## REQUISITE SERVICE

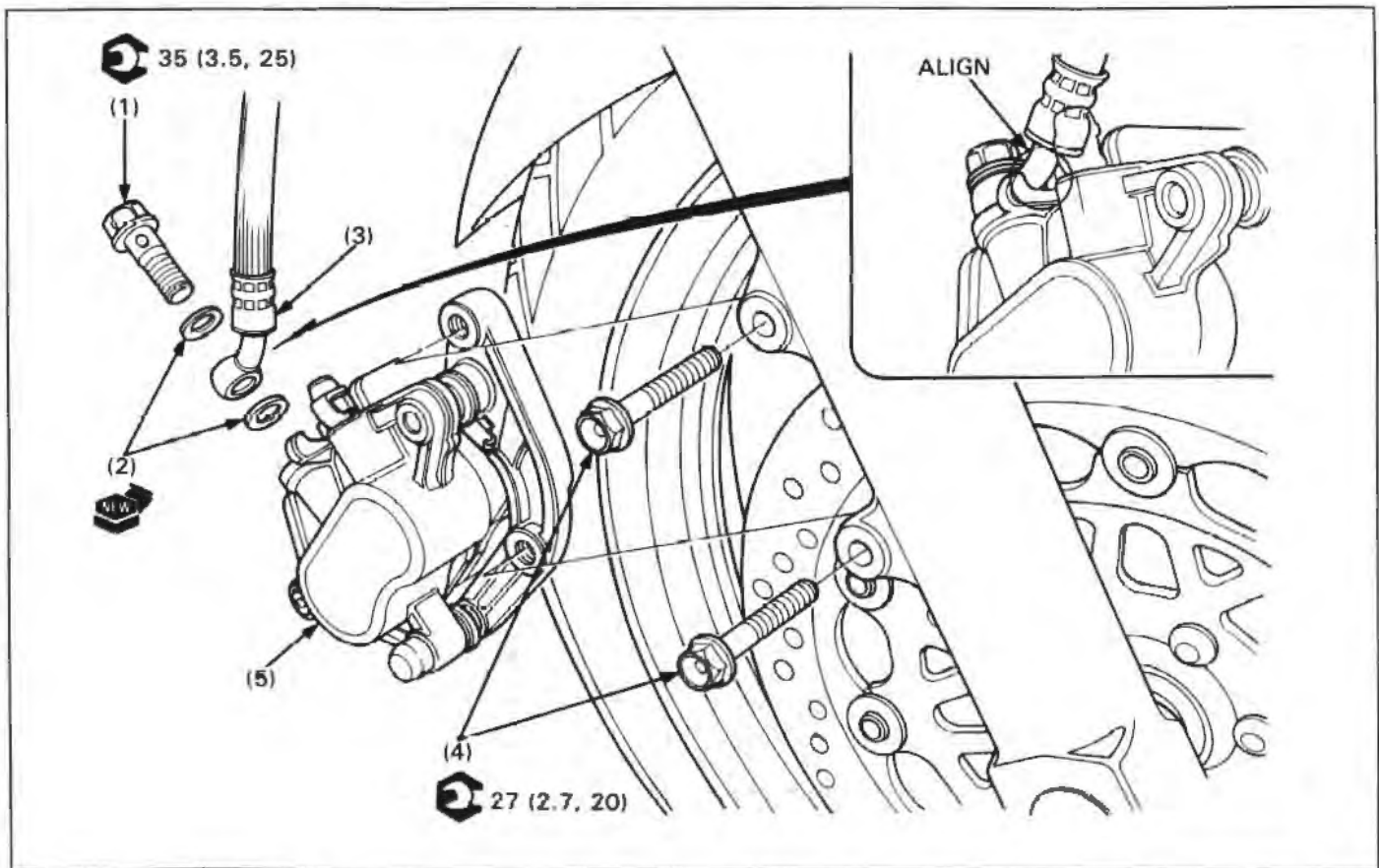
- Pushing the caliper against the disc, push the caliper piston all the way in to allow the installation of new brake pads.

| PROCEDURE                 |                       | Q'ty | REMARKS  |
|---------------------------|-----------------------|------|--|
| <b>REMOVAL ORDER</b>      |                       |      |  |
| (1)                       | Caliper mounting bolt | 1    | Remove the bolt and swing the caliper upward.  |
| (2)                       | Pad pin plug          | 1    |  |
| (3)                       | Pad pin               | 1    |  |
| (4)                       | Brake pad             | 2    |  |
| <b>INSTALLATION ORDER</b> |                       |      |  |
| (1)                       | Brake pad             | 2    | Align the pad lug with the pad retainer as shown. Insert the pin, pushing the pads against the pad spring. |
| (2)                       | Pad pin               | 1    |  |
| (3)                       | Pad pin plug          | 1    |  |
| (4)                       | Caliper mounting bolt | 1    |  |



## BRAKES

## FRONT BRAKE CALIPER REMOVAL/INSTALLATION



## ▲ WARNING

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.

## NOTE

- If you remove the caliper pistons, remove the caliper bracket bolts (4) before disconnecting the brake hose (3); and place a pan under the caliper to catch the draining fluid and squeeze the brake lever slowly to push out the pistons.

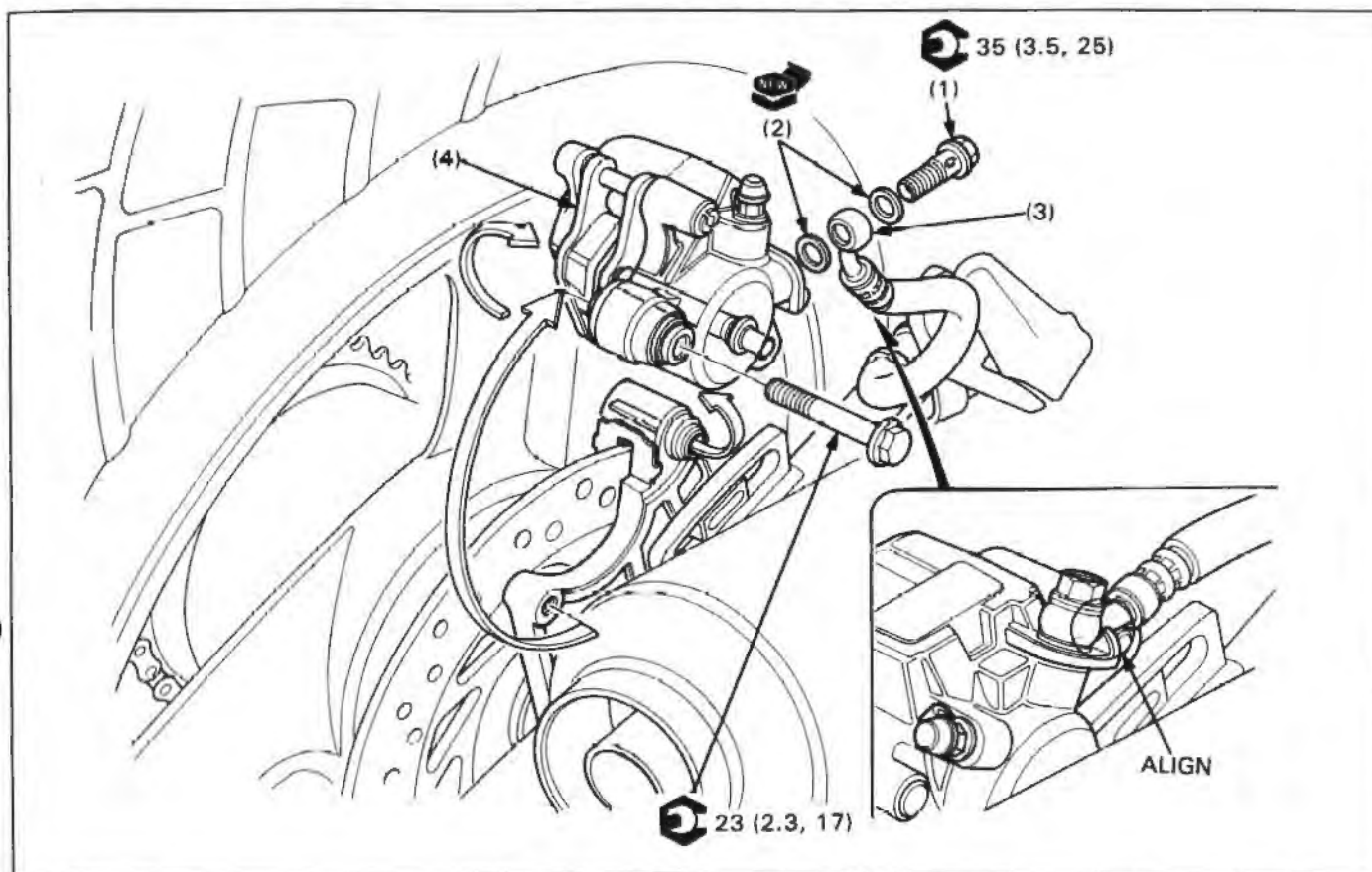
## REQUISITE SERVICE

- Brake pad removal/installation (page 13-2)
- Brake fluid replacement/air bleeding (section 17 of the Common Service Manual)

| PROCEDURE                        | Q'ty | REMARKS   |
|----------------------------------|------|---|
| REMOVAL ORDER                    |      | • Installation is in the reverse order of removal.                                      |
| (1) Brake hose bolt              | 1    |   |
| (2) Sealing washer               | 2    |   |
| (3) Brake hose                   | 1    | At installation, press the hose end against the stopper while tightening the hose bolt. |
| (4) Caliper bracket bolt         | 2    |   |
| (5) Front brake caliper assembly | 1    |   |



## REAR BRAKE CALIPER REMOVAL/INSTALLATION



**▲ WARNING**

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.

## NOTE

- Before disconnecting the brake hose (1), place a pan under the caliper to catch the draining fluid and squeeze the brake lever slowly to push out the piston.

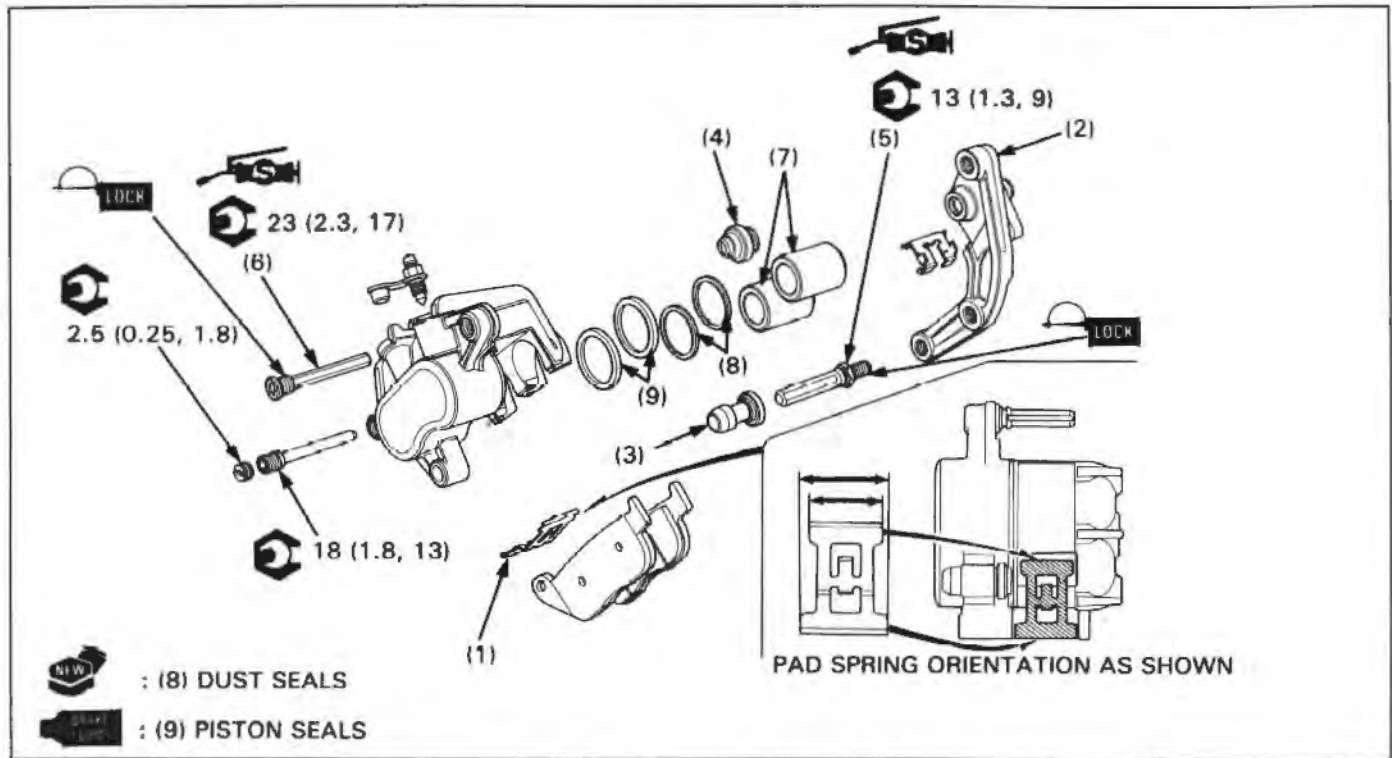
## REQUISITE SERVICE

- Brake pad removal/installation (page 13-3)
- Brake fluid replacement/air bleeding (section 17 of the Common Service Manual)

| PROCEDURE |                                  | Q'ty | REMARKS   |
|-----------|----------------------------------|------|---|
| (1)       | REMOVAL ORDER<br>Brake hose bolt | 1    | <ul style="list-style-type: none"> <li>• Installation is in the reverse order of removal. Temporarily install the caliper onto the bracket.</li> <li>At installation, press the hose end against the stopper while tightening the hose bolt.</li> </ul> |
| (2)       | Sealing washer                   | 2    |   |
| (3)       | Brake hose                       | 1    |   |
| (4)       | Rear brake caliper assembly      | 1    |   |

**BRAKES**

**FRONT BRAKE CALIPER DISASSEMBLY/ASSEMBLY**



**WARNING**

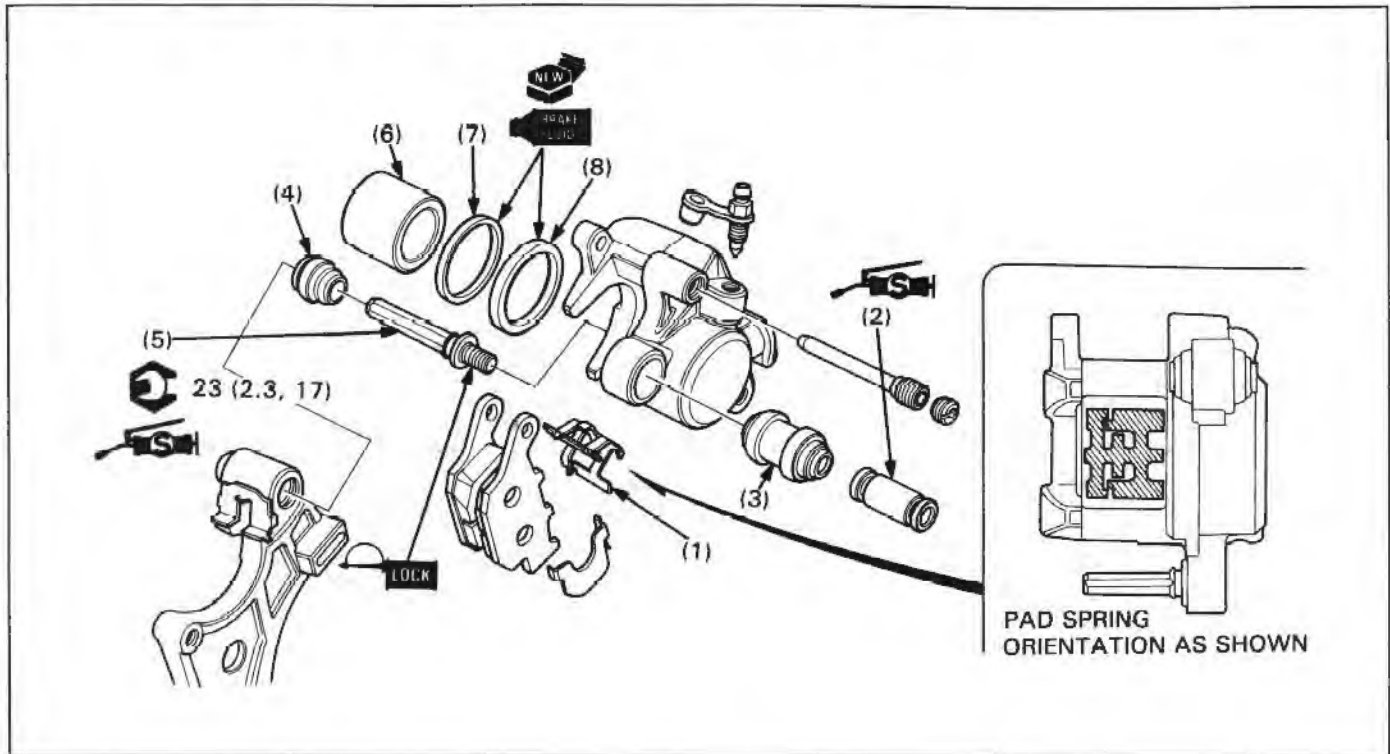
Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.

**REQUISITE SERVICE**

- Front brake pad removal/installation (page 13-2)
- Brake fluid replacement/air bleeding (section 17 of the Common Service Manual)
- Front brake caliper removal/installation (page 13-4)

| PROCEDURE                 | Q'ty | REMARKS   |
|---------------------------|------|---|
| (1) Pad spring            | 1    | • Assembly is in the reverse order of disassembly. Note the spring direction as shown.<br><br>• Install into the bracket groove securely.<br>• Apply a locking agent to the threads and torque it. Apply silicone grease to the pin.<br>• Install them with the concaved side away from the pad.<br><b>CAUTION:</b><br>• Be careful not to damage the piston sliding surface when removing seals. |
| (2) Caliper bracket       | 1    |   |
| (3) Bracket pin bolt boot | 1    |   |
| (4) Caliper pin bolt boot | 1    |   |
| (5) Bracket pin bolt      | 1    |   |
| (6) Caliper pin bolt      | 1    |   |
| (7) Caliper piston        | 2    |   |
| (8) Dust seal             | 2    |   |
| (9) Piston seal           | 2    |   |

## REAR BRAKE CALIPER DISASSEMBLY/ASSEMBLY



### WARNING

- Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or alternate method approved by OSAH designed to minimize the hazard caused by airborne asbestos fibers.

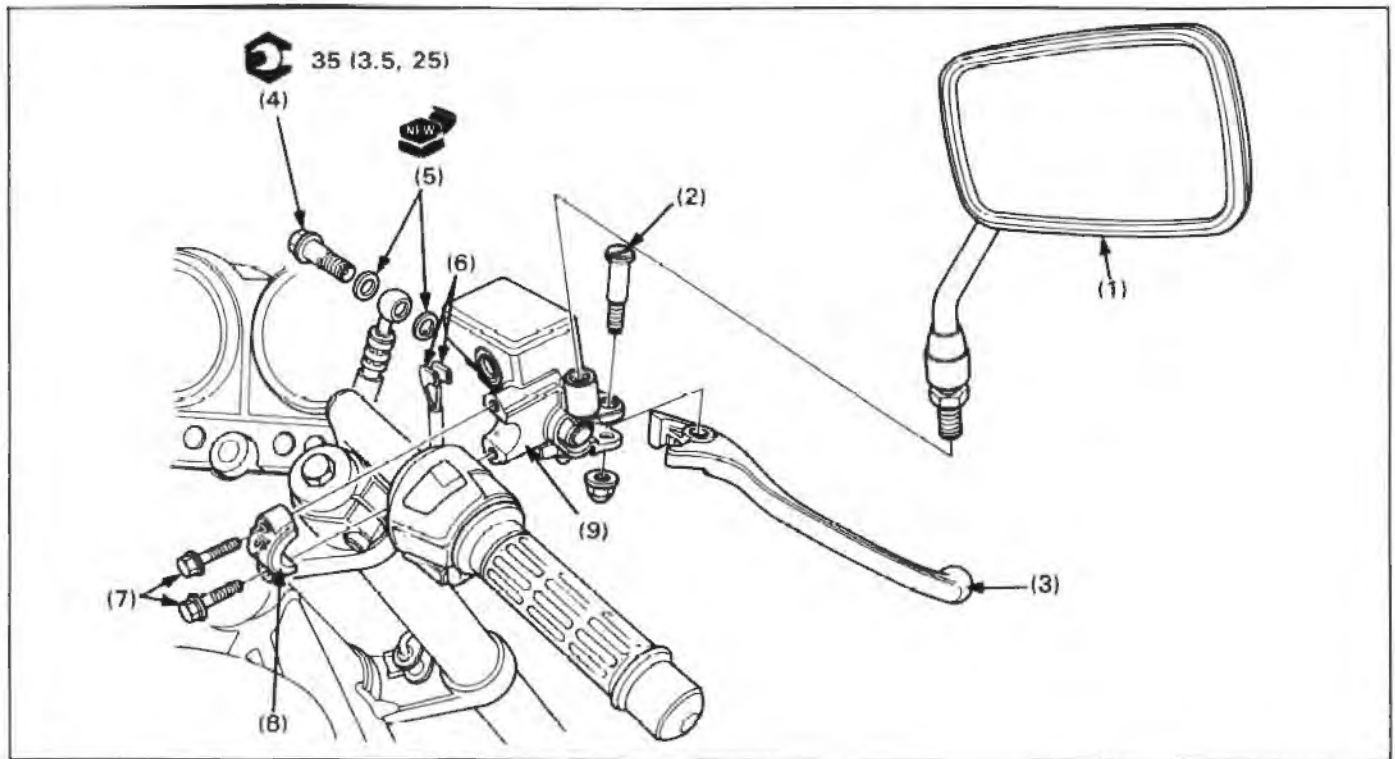
### REQUISITE SERVICE

- Rear brake pad removal/installation (page 13-3)
- Rear brake caliper removal/installation (page 13-5)
- Brake fluid replacement/air bleeding (section 17 of the Common Service Manual)

| PROCEDURE                 | Q'ty | REMARKS   |
|---------------------------|------|---|
| DISASSEMBLY ORDER         |      | • Assembly is in the reverse order of disassembly.<br>Note the spring direction as shown. |
| (1) Pad spring            | 1    | Apply silicone grease to the sliding surface.   |
| (2) Pivot collar          | 1    |   |
| (3) Pivot boot            | 1    | Install into the bracket groove securely.   |
| (4) Caliper pin bolt boot | 1    | Apply a locking agent to the threads and torque it. Apply silicone grease to the pin.     |
| (5) Caliper pin bolt      | 1    | Install it with the opening toward the pad.   |
| (6) Caliper piston        | 1    | <b>CAUTION:</b>   |
| (7) Dust seal             | 1    | • Be careful not to damage the piston sliding surface when removing seals.                |
| (8) Piston seal           | 1    |   |

## BRAKES

## FRONT MASTER CYLINDER REMOVAL/INSTALLATION

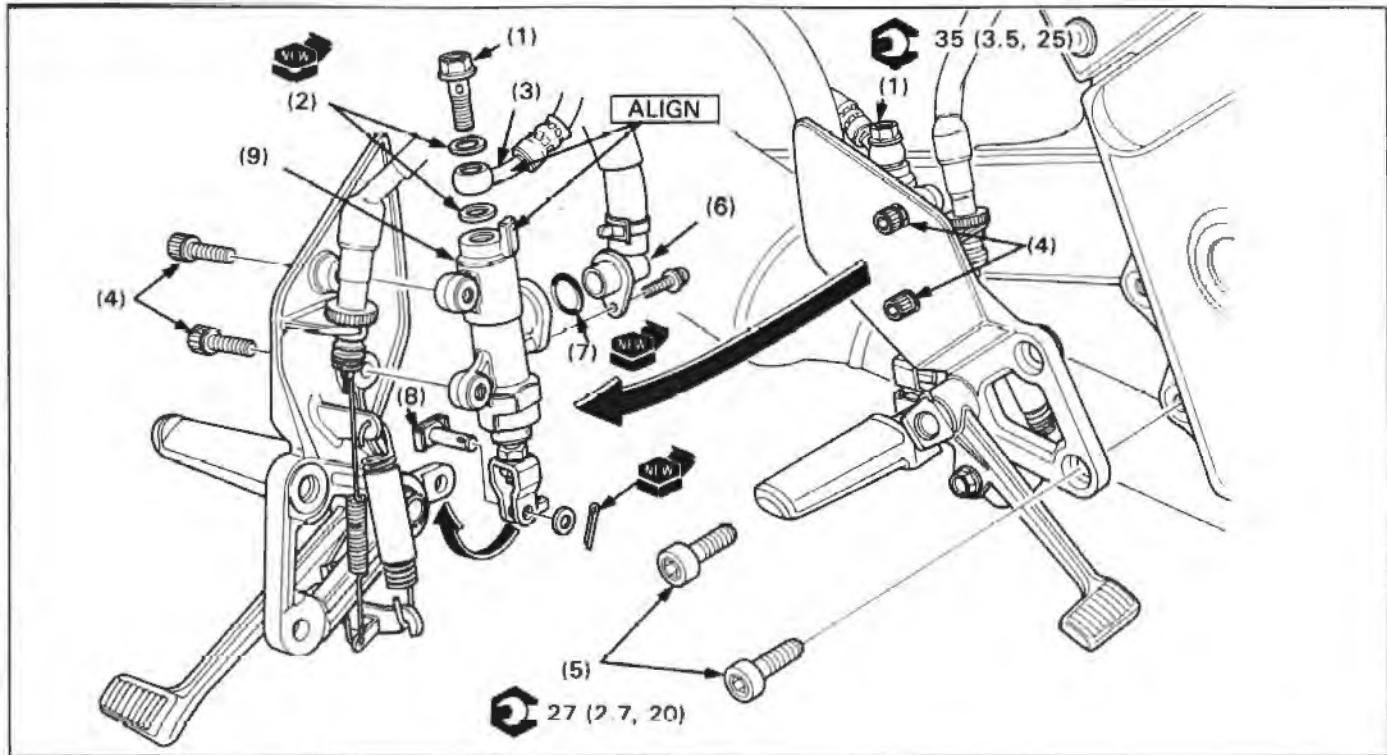


## REQUISITE SERVICE

- Air bleeding (section 17 of the Common Service Manual)

| PROCEDURE     |                                    | Q'ty | INSTALLATION REMARKS   |
|---------------|------------------------------------|------|--|
| REMOVAL ORDER |                                    |      | • Installation is in the reverse order of removal.<br><br>Tighten the upper bolt first, then the lower bolt.<br>Face the UP mark upward.<br>Align the holder end with the punch mark on the handlebar. |
| (1)           | Right rearview mirror              | 1    |  |
| (2)           | Brake lever pivot bolt             | 1    |  |
| (3)           | Brake lever                        | 1    |  |
| (4)           | Brake hose bolt                    | 1    |  |
| (5)           | Sealing washer                     | 2    |  |
| (6)           | Front brake light switch connector | 2    |  |
| (7)           | Master cylinder holder bolt        | 2    |  |
| (8)           | Master cylinder holder             | 1    |  |
| (9)           | Master cylinder assembly           | 1    |  |

## REAR MASTER CYLINDER REMOVAL/INSTALLATION



### REQUISITE SERVICE

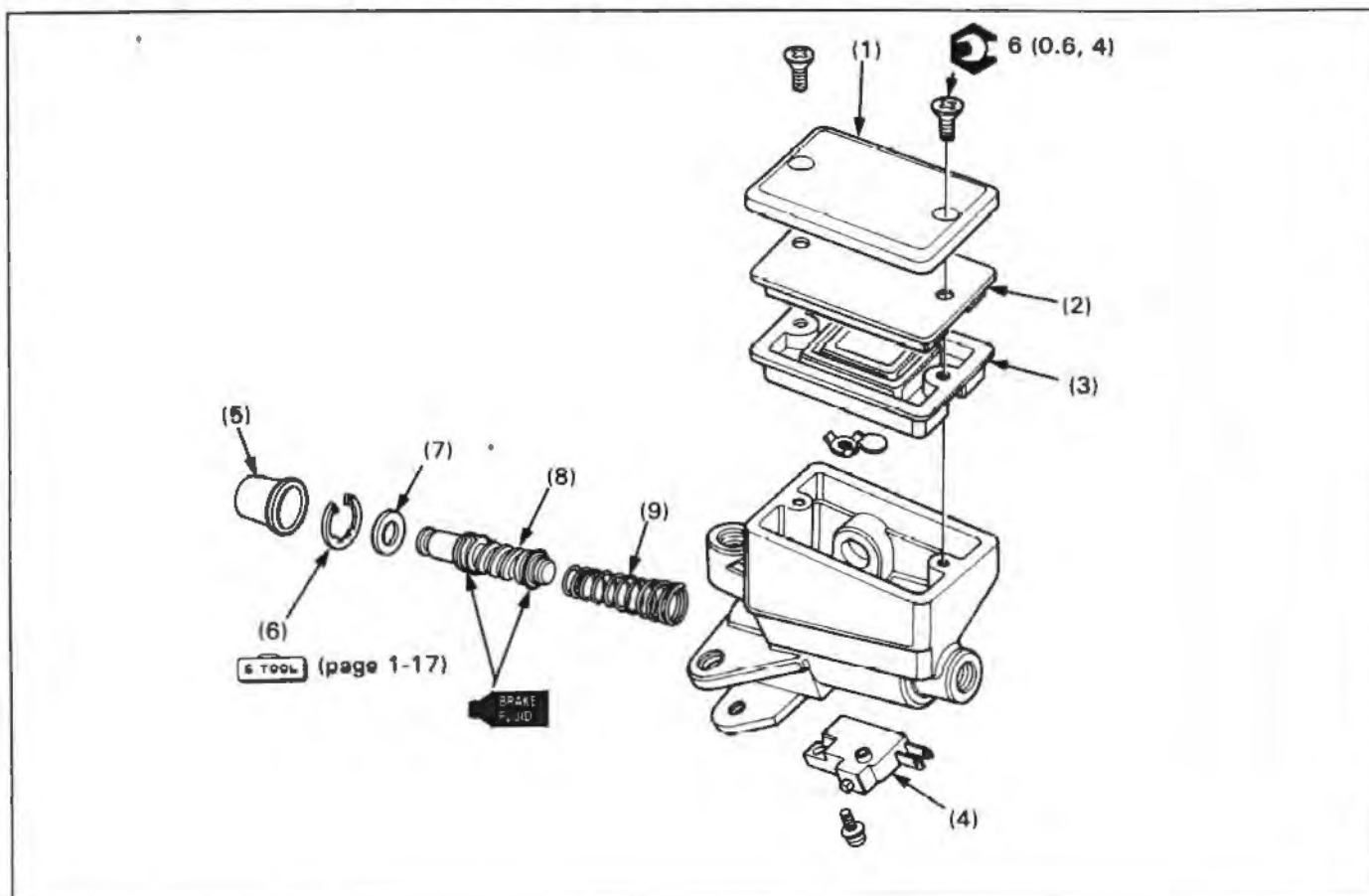
- Brake fluid replacement/air bleeding (section 17 of the Common Service Manual)

| PROCEDURE                         | Q'ty | REMARKS   |
|-----------------------------------|------|---|
| <b>REMOVAL ORDER</b>              |      | • Installation is in the reverse order of removal.      |
| (1) Brake hose bolt               | 1    |   |
| (2) Sealing washer                | 2    |   |
| (3) Brake hose                    | 1    |   |
| (4) Master cylinder mounting bolt | 2    | Only loosen the bolts.                                  |
| (5) Footpeg bracket bolt          | 2    |   |
| (6) Reservoir hose joint          | 1    |   |
| (7) O-ring                        | 1    |   |
| (8) Push rod joint                | 1    | Install it from the footpeg side with a new cotter pin. |
| (9) Master cylinder assembly      | 1    | Remove the mounting bolts (4) and master cylinder.      |



## BRAKES

## FRONT MASTER CYLINDER DISASSEMBLY/ASSEMBLY



## NOTE

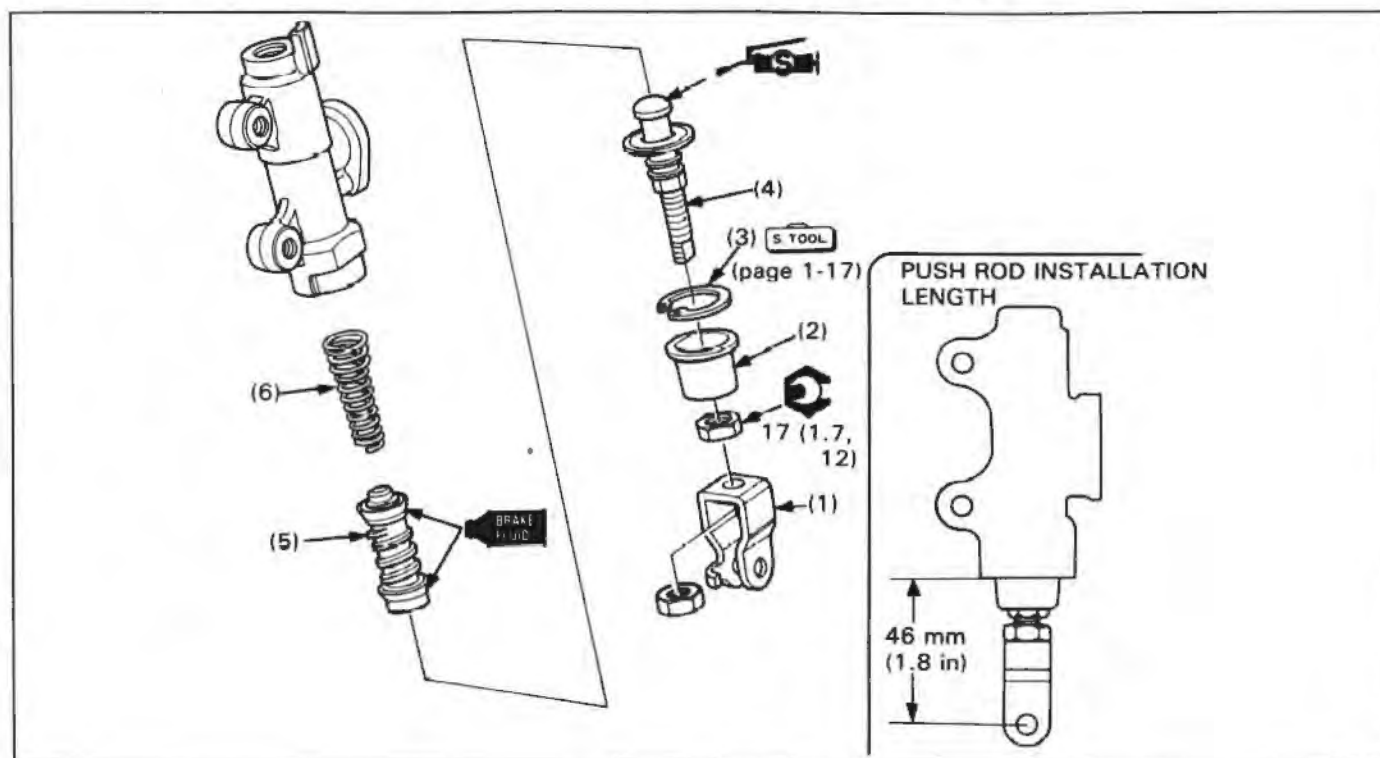
- Replace the master piston, spring, cups, stopper plate, snap ring and boot as a set.
- The master cylinder piston, cups and spring must be installed as a set.

## REQUISITE SERVICE

- Air bleeding (section 17 of the Common Service Manual)
- Front master cylinder removal/installation (page 13-8)

| PROCEDURE                   | Q'ty | ASSEMBLY REMARKS   |
|-----------------------------|------|--|
| <b>DISASSEMBLY ORDER</b>    |      | • Assembly is in the reverse order of disassembly.                           |
| (1) Reservoir cover         | 1    |  |
| (2) Diaphragm plate         | 1    |  |
| (3) Diaphragm               | 1    |  |
| (4) Front brakelight switch | 1    |  |
| (5) Boot                    | 1    |  |
| (6) Snap ring               | 1    | <b>CAUTION:</b><br>• Be certain the snap ring is fully seated in the groove. |
| (7) Stopper plate           | 1    |  |
| (8) Master piston assembly  | 1    |  |
| (9) Spring                  | 1    | Install it with its small coil end toward the piston.                        |

## REAR MASTER CYLINDER DISASSEMBLY/ASSEMBLY



## NOTE

- Replace the master piston, spring, cups, snap ring and boot as a set.
- The master cylinder piston, cups and spring must be installed as a set.

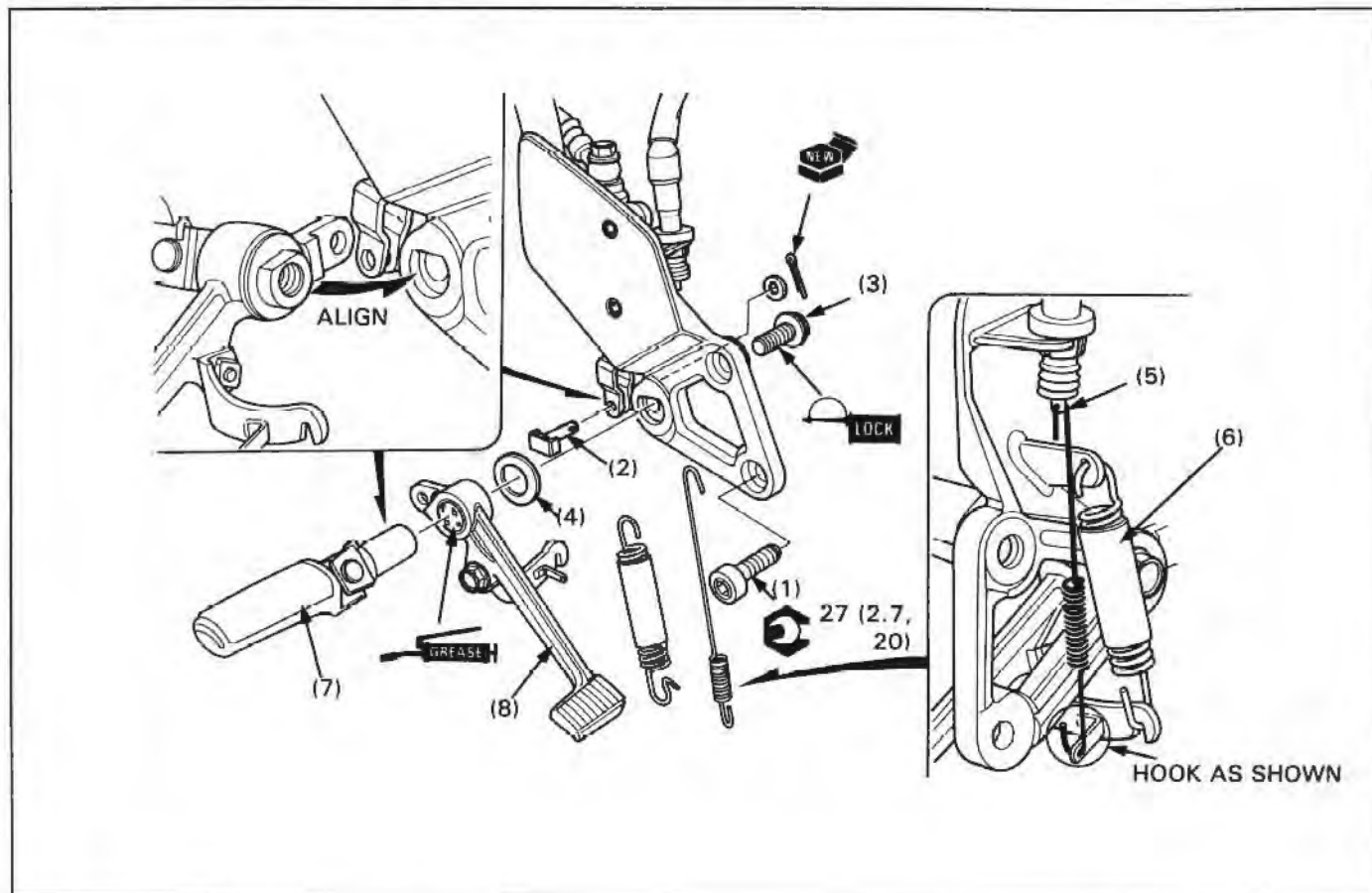
## REQUISITE SERVICE

- Brake fluid replacement/air bleeding (section 17 of the Common Service Manual)
- Rear master cylinder removal/installation (page 13-9)

| PROCEDURE                  | Q'ty | ASSEMBLY REMARKS  |
|----------------------------|------|---|
| (1) DISASSEMBLY ORDER      |      |   |
| (1) Push rod joint         | 1    | • Assembly is in the reverse order of disassembly.<br>Adjust the joint installed length as shown. Face the joint tab side as shown. |
| (2) Boot                   | 1    |   |
| (3) Snap ring              | 1    | <b>CAUTION:</b><br>• Be certain the snap ring is fully seated in the groove.  |
| (4) Push rod               | 1    | Apply silicone grease to the rod head.  |
| (5) Master piston assembly | 1    |   |
| (6) Spring                 | 1    | Install it with its small coil end toward the piston.   |

## BRAKES

## BRAKE PEDAL REMOVAL/INSTALLATION



## NOTE

- Adjust the brake pedal height after installation.

| PROCEDURE                         | Q'ty | REMARKS   |
|-----------------------------------|------|---|
| <b>REMOVAL ORDER</b>              |      | • Installation is in the reverse order of removal.      |
| (1) Footpeg stay bolt             | 2    |   |
| (2) Push rod joint                | 1    | Install it from the footpeg side with a new cotter pin. |
| (3) Footpeg mounting bolt         | 1    | Apply a locking agent to the bolt threads.              |
| (4) Wave washer                   | 1    |   |
| (5) Rear brakelight switch spring | 1    |   |
| (6) Brake pedal return spring     | 1    |   |
| (7) Right footpeg                 | 1    | Align the footpeg with the stay groove.                 |
| (8) Brake pedal                   | 1    | Apply grease to the pedal pivot.                        |

# 14. CHARGING SYSTEM/ALTERNATOR

|                     |      |                            |      |
|---------------------|------|----------------------------|------|
| SERVICE INFORMATION | 14-1 | CHARGING SYSTEM INSPECTION | 14-4 |
| SYSTEM LOCATION     | 14-2 | REGULATOR/RECTIFIER        | 14-5 |
| CIRCUIT DIAGRAM     | 14-2 | ALTERNATOR                 | 14-7 |
| TROUBLESHOOTING     | 14-3 |                            |      |

## SERVICE INFORMATION

### ▲ 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 in 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 disconnected while the ignition switch is ON and current is present.

- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry place.
- 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.

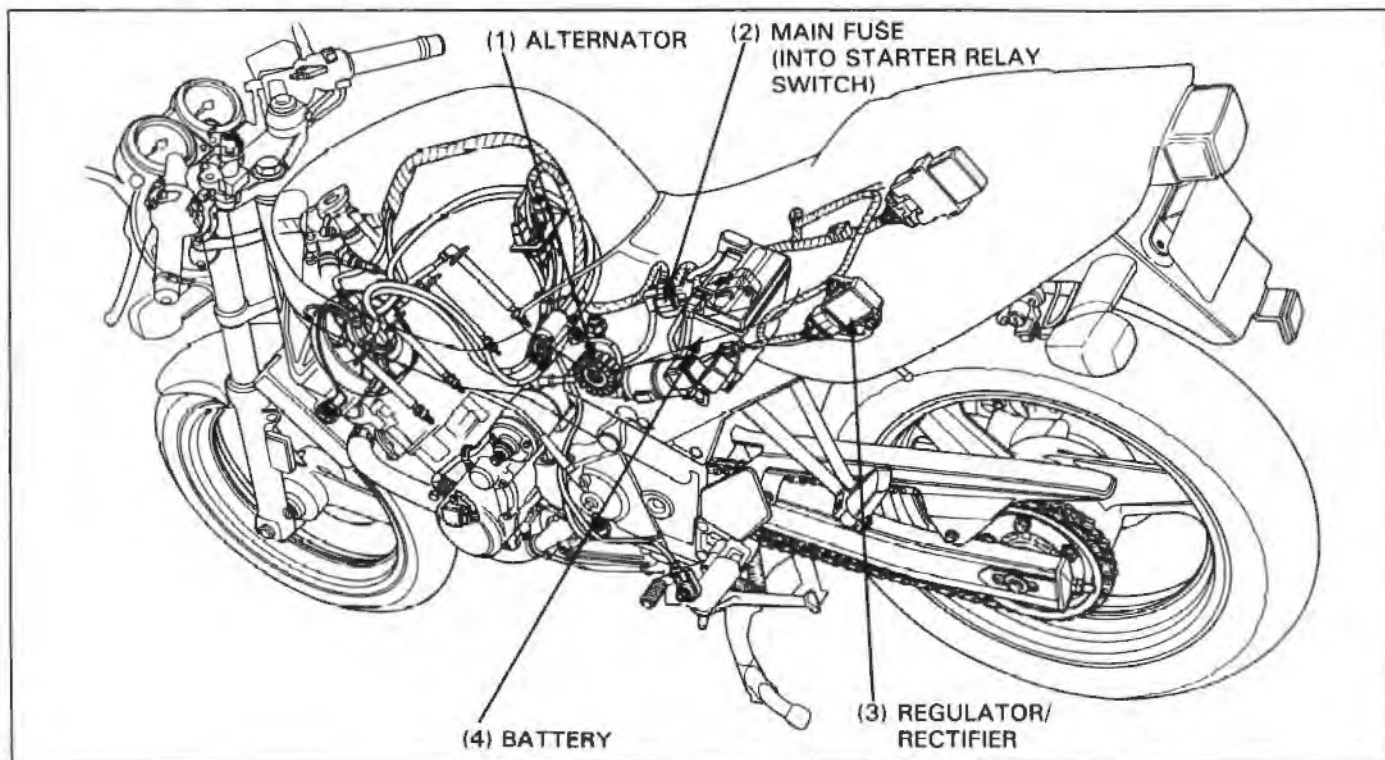
### CAUTION

- The battery caps should not be removed. Attempting to remove the sealing caps from the cells may damage the battery.

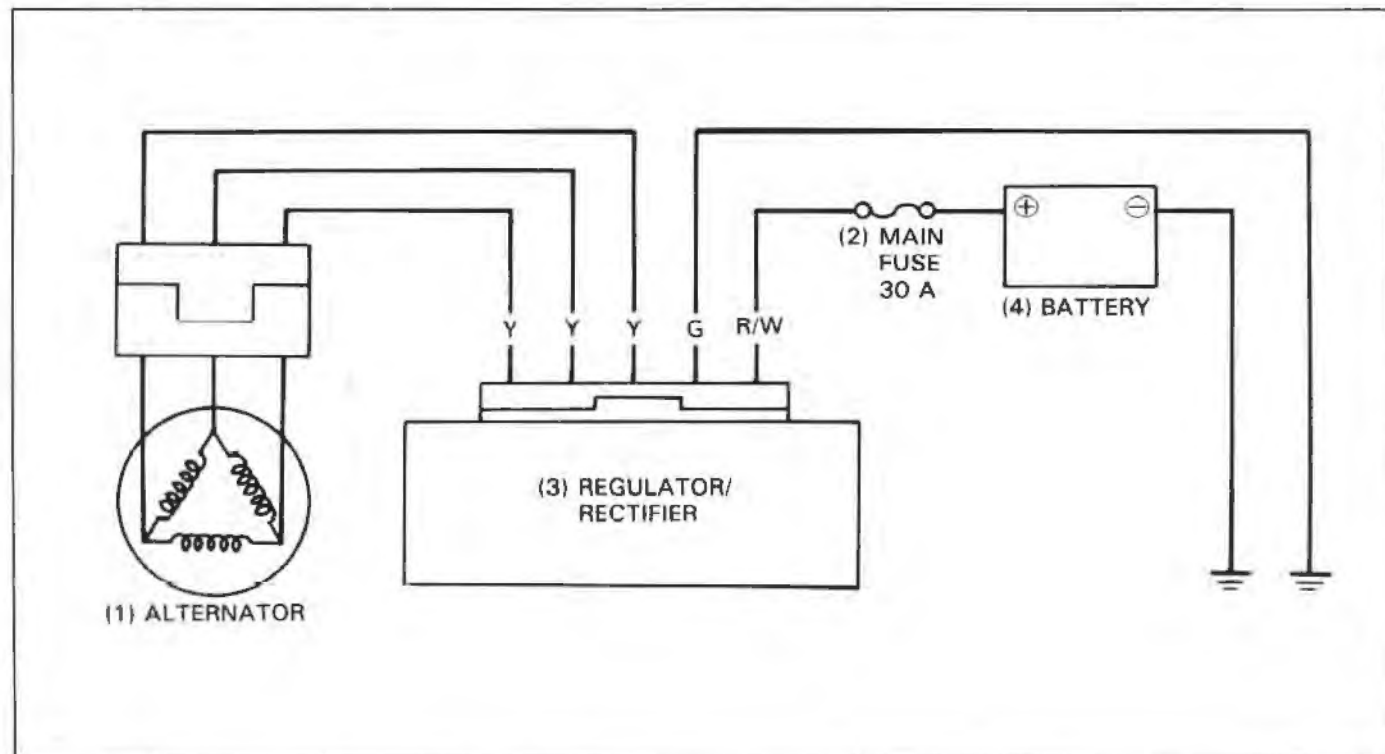
- Battery can be damaged if overcharged or undercharged, or if left to discharge for long periods. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of battery deteriorates after 2–3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected to be the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharge symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under 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 in use. For this reason, charge the battery every two weeks to prevent sulfation from forming.
- Filling a new battery with electrolyte will produce some voltage, but in order to achieve its maximum performance, always charge the battery. Also, the battery life is lengthened when it is initial-charged.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 14-3).
- For battery testing/charging, refer to section 22 of the Common Service Manual.
- For charging system location, see page 14-2.

**CHARGING SYSTEM/ALTERNATOR**

**SYSTEM LOCATION**



**CIRCUIT DIAGRAM**



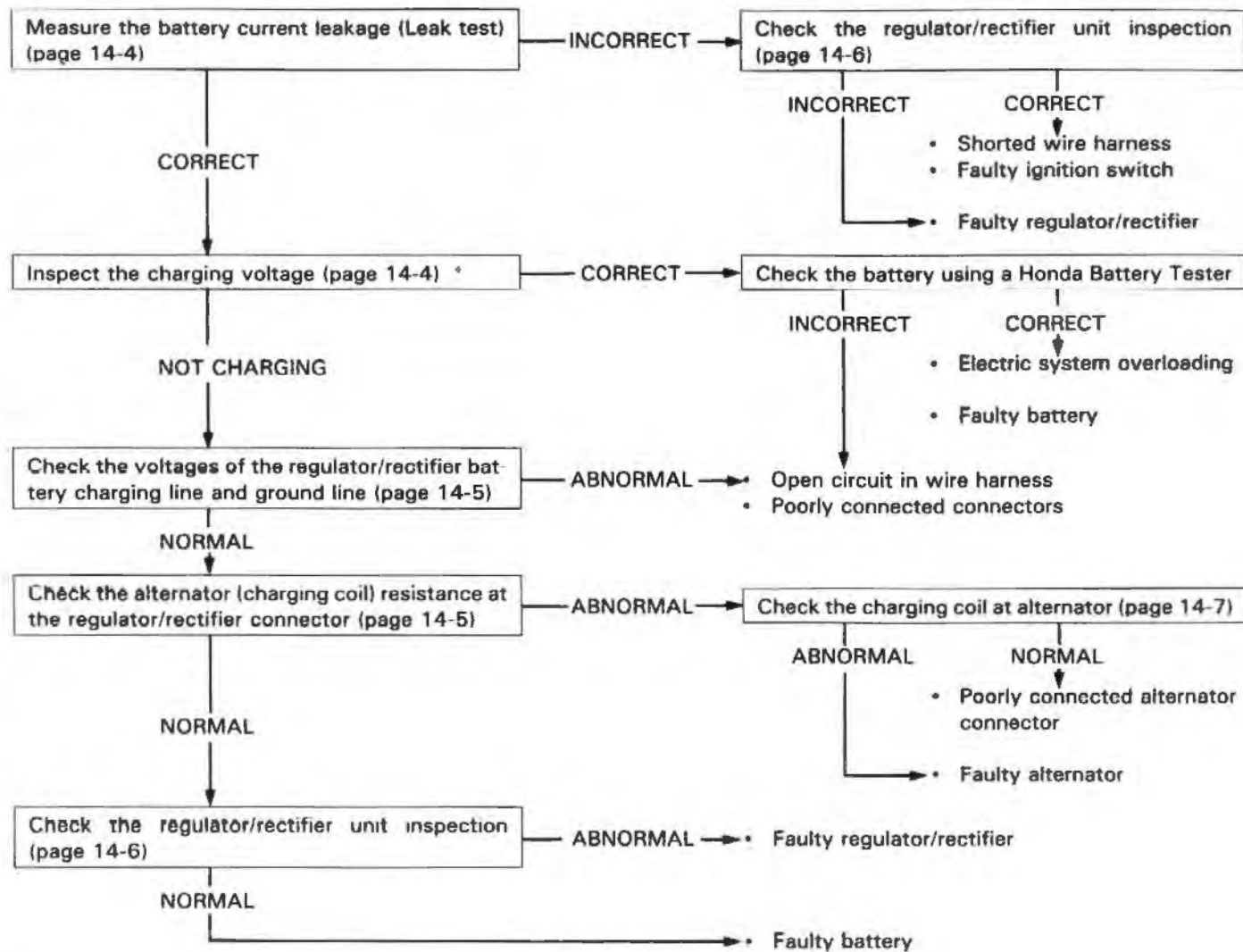


## TROUBLESHOOTING

## Battery overcharging

- Faulty regulator/rectifier

## Battery undercharging



**CHARGING SYSTEM/ALTERNATOR****CHARGING SYSTEM INSPECTION****LEAK TEST**

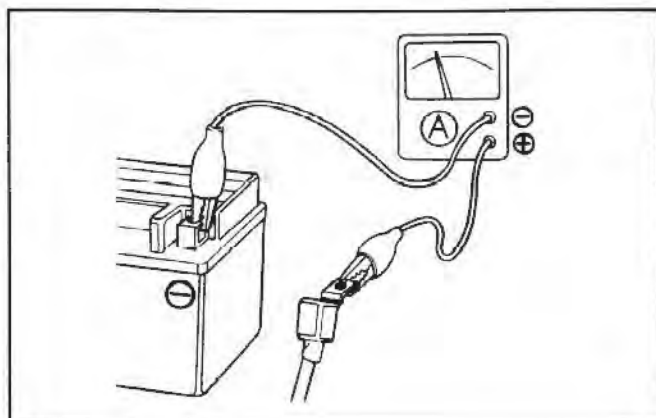
Turn off the ignition switch, and disconnect the ground (-) cable from the battery.

Connect the ammeter (+) probe to the ground cable and the ammeter (-) probe to the battery (-) terminal.

With the ignition switch off, measure the leakage current.

**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 larger than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition on. A sudden surge of current may blow out the fuse in the tester.

**SPECIFIED CURRENT LEAKAGE: 0.01 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.

**CHARGING VOLTAGE INSPECTION****NOTE**

- Before performing this test, be sure that the battery is fully charged whose voltage between its terminals is greater than 12.8 V.

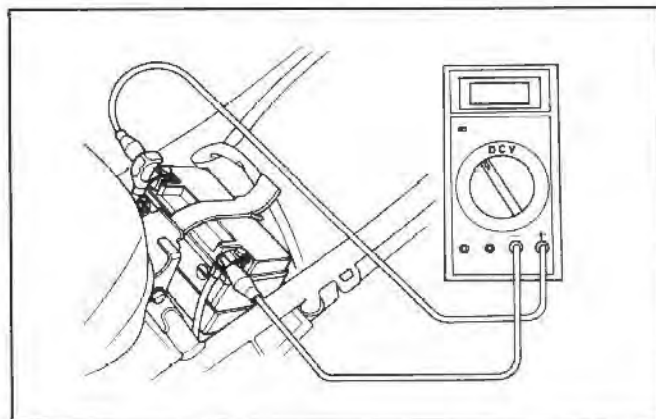
Start the engine and warm it up to operating temperature, then turn the ignition switch OFF.

Connect a multimeter between the battery terminals.



**DIGITAL MULTITESTER**

**07411-0020000 or  
KS-AHM-32-003  
(U.S.A. only)**



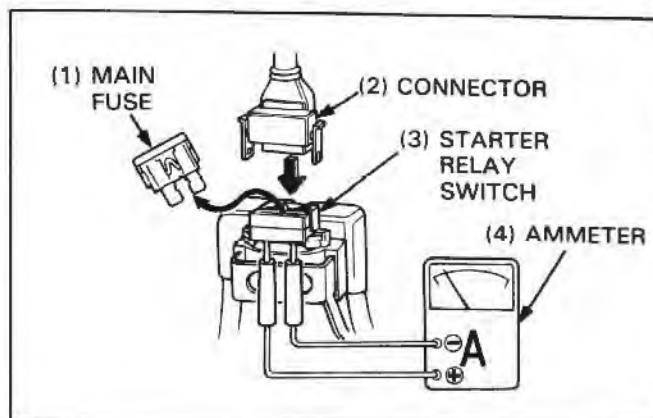
## CHARGING SYSTEM/ALTERNATOR

Disconnect the starter relay switch connector and remove the main fuse (30 A). Reconnect the connector onto the relay switch.

Connect the ammeter as shown.

### CAUTION

- Be careful not to short any tester probes.
- Although the current could be measured when the ammeter is connected between the battery positive terminal and the positive cable, a sudden surge of current to the starter motor could damage the ammeter.
- Always turn the ignition off when conducting the test. Disconnecting the ammeter or wires when current is flowing may damage the ammeter.



Start the engine and increase the engine speed gradually.

**REGULATED VOLTAGE:** 14.0–16.0 V/5,000 rpm

**CHARGING CURRENT:** 0–8 A/5,000 rpm

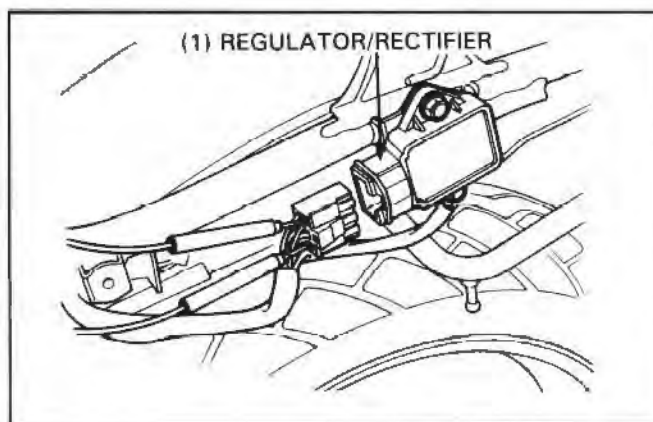
## REGULATOR/RECTIFIER

### WIRE HARNESS INSPECTION

Remove the rear fairing (page 2-2).

Disconnect the regulator/rectifier connector and measure the following between connector terminals of the wire harness side.

| Item                  | Terminals                    | Specification                    |
|-----------------------|------------------------------|----------------------------------|
| Battery charging line | Red/White (+) and ground (-) | Battery voltage should resistor. |
| Ground line           | Green and ground             | Continuity exist.                |
| Charging coil line    | Yellow and Yellow            | 0.1–0.5 $\Omega$<br>(20°C/68°F)  |



## CHARGING SYSTEM/ALTERNATOR

### UNIT INSPECTION

Remove the regulator/rectifier.

Inspect the regulator/rectifier unit by measuring the resistance between the terminals.

#### NOTE

- There are two types of the regulator/rectifier as shown. Select the proper resistance chart.
- Resistance value will not be accurate if the probes touch your finger.
- Use the following recommended multimeter. Using another manufacturer's equipment may not allow you to obtain the specified values. This is due to the characteristic of semiconductors, which have different resistance value depending on the applied voltage.

#### SPECIFIC MULTITESTER:

- 07411-0020000 (KOWA Digital type)
  - KS-AHM-32-003 (KOWA Digital type; U.S.A. only)
  - 07308-0020001 (SANWA Analogue type)
  - TH-5H (KOWA Analogue type)
- Select the following range.  
SANWA tester: x k $\Omega$   
KOWA tester: x 100  $\Omega$

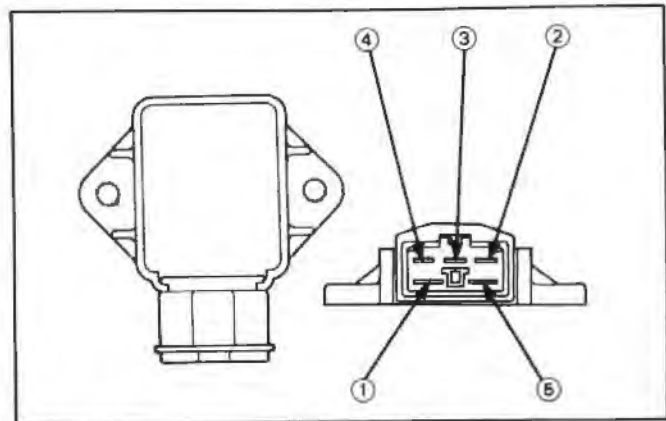
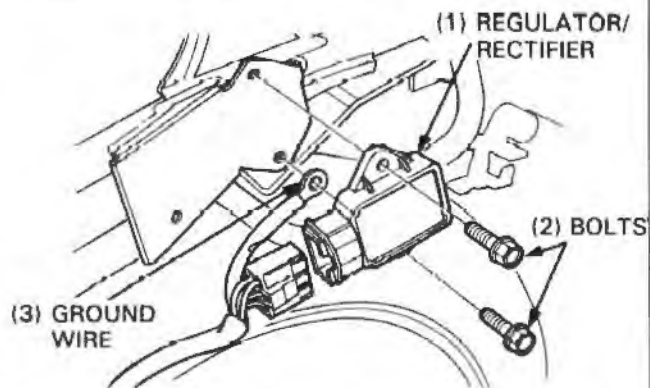
- When using the KOWA multimeter, remember that all readings should be multiplied by 100.
- An old, weak multimeter battery could cause inaccurate readings. Check the battery if the multimeter registers incorrectly.

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

Install the regulator/rectifier in the reverse order of removal.

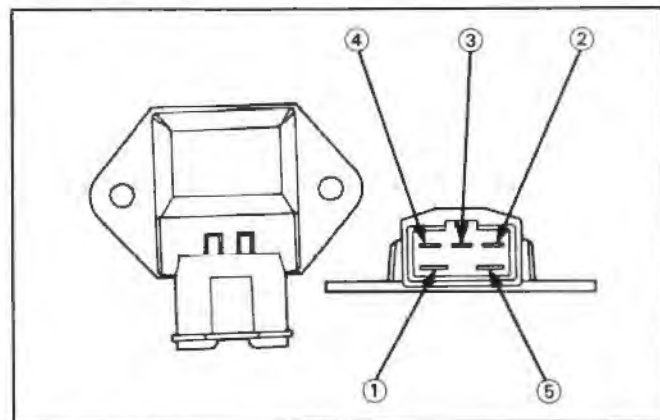
#### NOTE

- Install the ground wire onto the regulator/rectifier lower mounting bolt properly as shown.



Unit: k $\Omega$

|   | + | ①      | ②        | ③        | ④        | ⑤        |
|---|---|--------|----------|----------|----------|----------|
| - |   |        |          |          |          |          |
| ① |   |        | $\infty$ | $\infty$ | $\infty$ | $\infty$ |
| ② |   | 0.5-10 |          | 30-500   | 30-500   | 10-200   |
| ③ |   | 0.5-10 | 30-500   |          | 30-500   | 10-200   |
| ④ |   | 0.5-10 | 30-500   | 30-500   |          | 10-200   |
| ⑤ |   | 1-20   | 0.5-10   | 0.5-10   | 0.5-10   |          |



Unit: k $\Omega$

|   | + | ①      | ②        | ③        | ④        | ⑤        |
|---|---|--------|----------|----------|----------|----------|
| - |   |        |          |          |          |          |
| ① |   |        | $\infty$ | $\infty$ | $\infty$ | $\infty$ |
| ② |   | 0.5-10 |          | 30-500   | 30-500   | 10-200   |
| ③ |   | 0.5-10 | $\infty$ |          | $\infty$ | $\infty$ |
| ④ |   | 0.5-10 | $\infty$ | $\infty$ |          | $\infty$ |
| ⑤ |   | 1-20   | 0.5-10   | 0.5-10   | 0.5-10   |          |

## CHARGING SYSTEM/ALTERNATOR

## ALTERNATOR

## CHARGING COIL INSPECTION

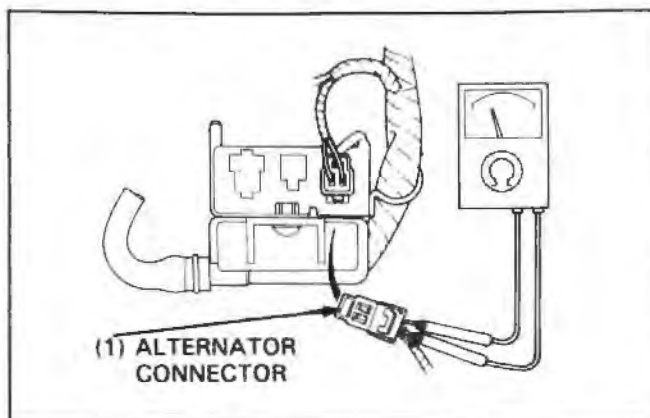
## NOTE

- It is not necessary to remove the alternator from the engine.

Disconnect the alternator 3P black connector and measure the resistance between connector terminals (Yellow and Yellow).

**STANDARD: 0.1 – 0.5  $\Omega$  (20°C/68°F)**

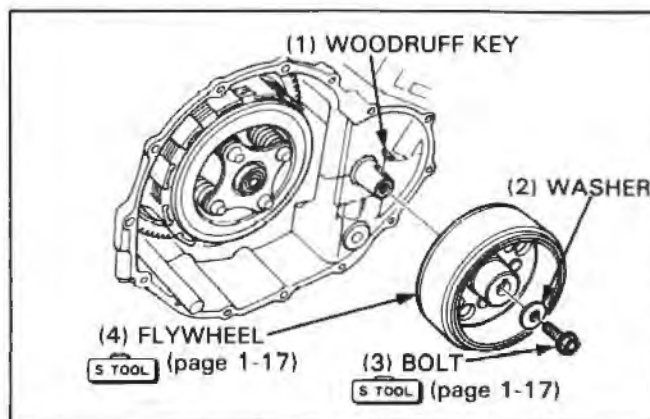
Check for continuity between the Yellow wire terminal and ground. There should be no continuity.



## STATOR COIL/FLYWHEEL REMOVAL/INSTALLATION

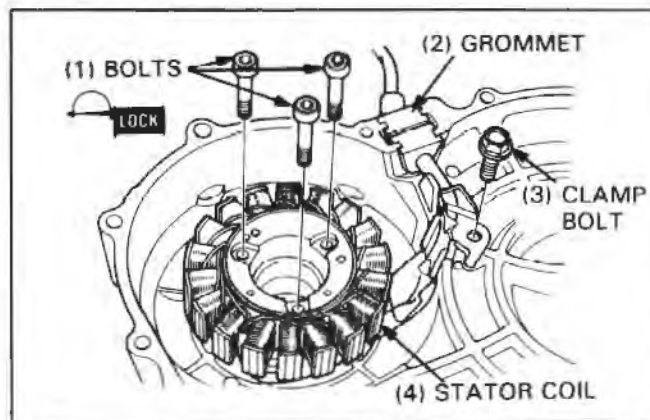
Remove the following:

- right crankcase cover (page 9-2),
- flywheel bolt,
- washer,
- flywheel,
- woodruff key.



Remove the bolt and stator wire harness clamp. Remove the bolts and stator.

Apply a locking agent to the stator mounting bolt threads. Install the stator and tighten the bolts securely. Set the wire harness grommet into the cover groove and install the clamp.



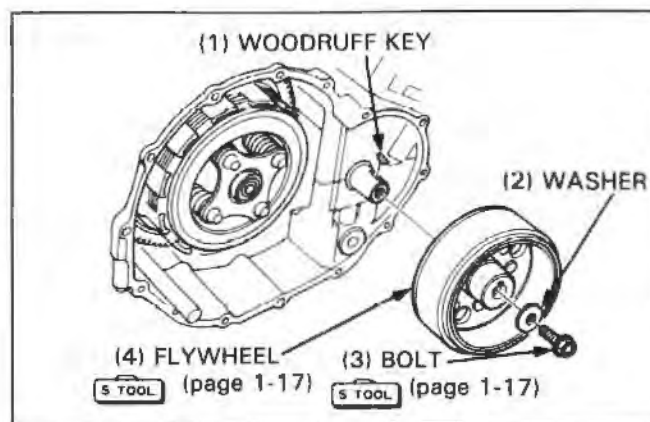
Clean any material off the crankshaft.

Install the following:

- woodruff key,
- flywheel,
- washer,
- flywheel bolt.

**TURQUE: 85 N·m (8.5 kg·m, 61 ft·lb)**

- right crankcase cover (page 9-2)





# 15. IGNITION SYSTEM

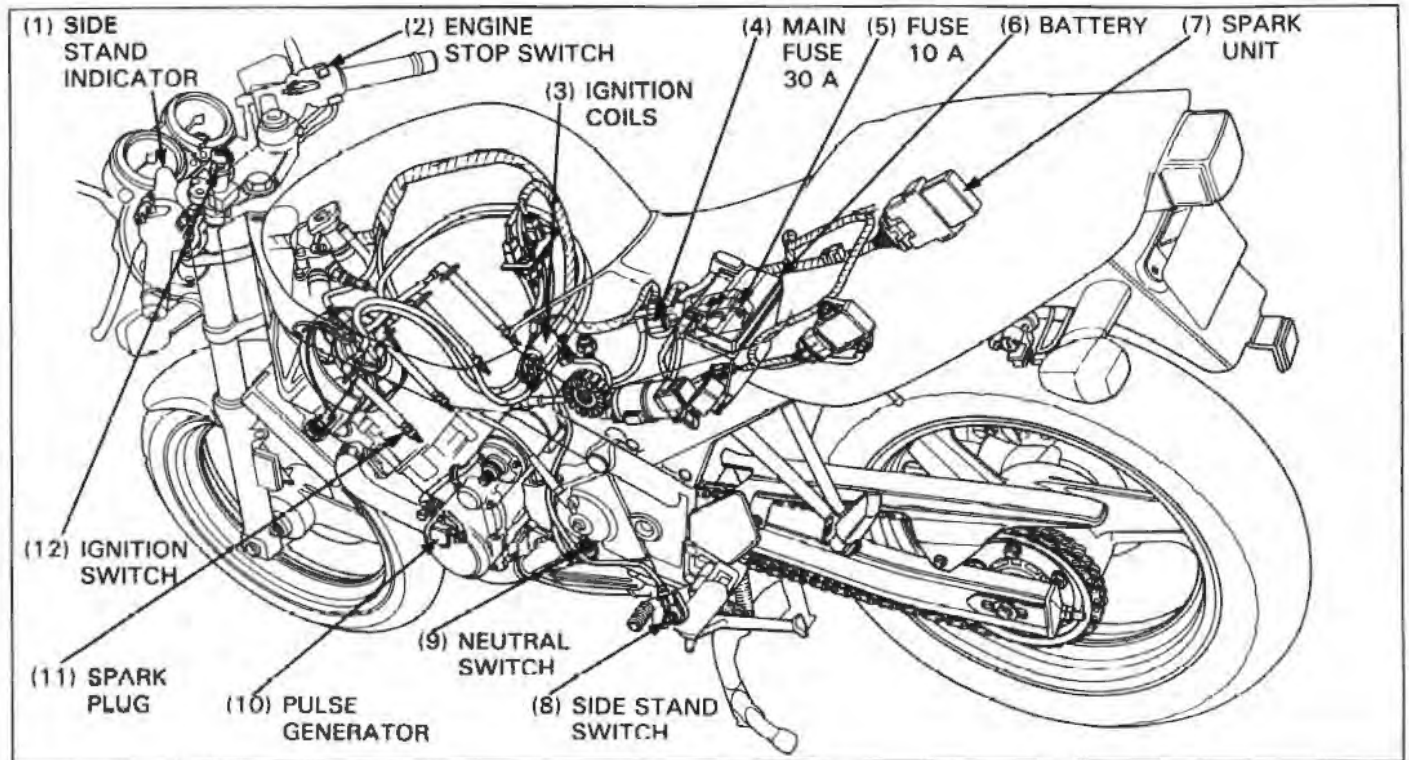
|                                   |             |                          |             |
|-----------------------------------|-------------|--------------------------|-------------|
| <b>SERVICE INFORMATION</b>        | <b>15-1</b> | <b>IGNITION COIL</b>     | <b>15-6</b> |
| <b>SYSTEM LOCATION</b>            | <b>15-2</b> | <b>PULSE GENERATOR</b>   | <b>15-8</b> |
| <b>CIRCUIT DIAGRAM</b>            | <b>15-2</b> | <b>SIDE STAND SWITCH</b> | <b>15-8</b> |
| <b>TROUBLESHOOTING</b>            | <b>15-3</b> | <b>IGNITION TIMING</b>   | <b>15-9</b> |
| <b>IGNITION SYSTEM INSPECTION</b> | <b>15-6</b> |                          |             |

## SERVICE INFORMATION

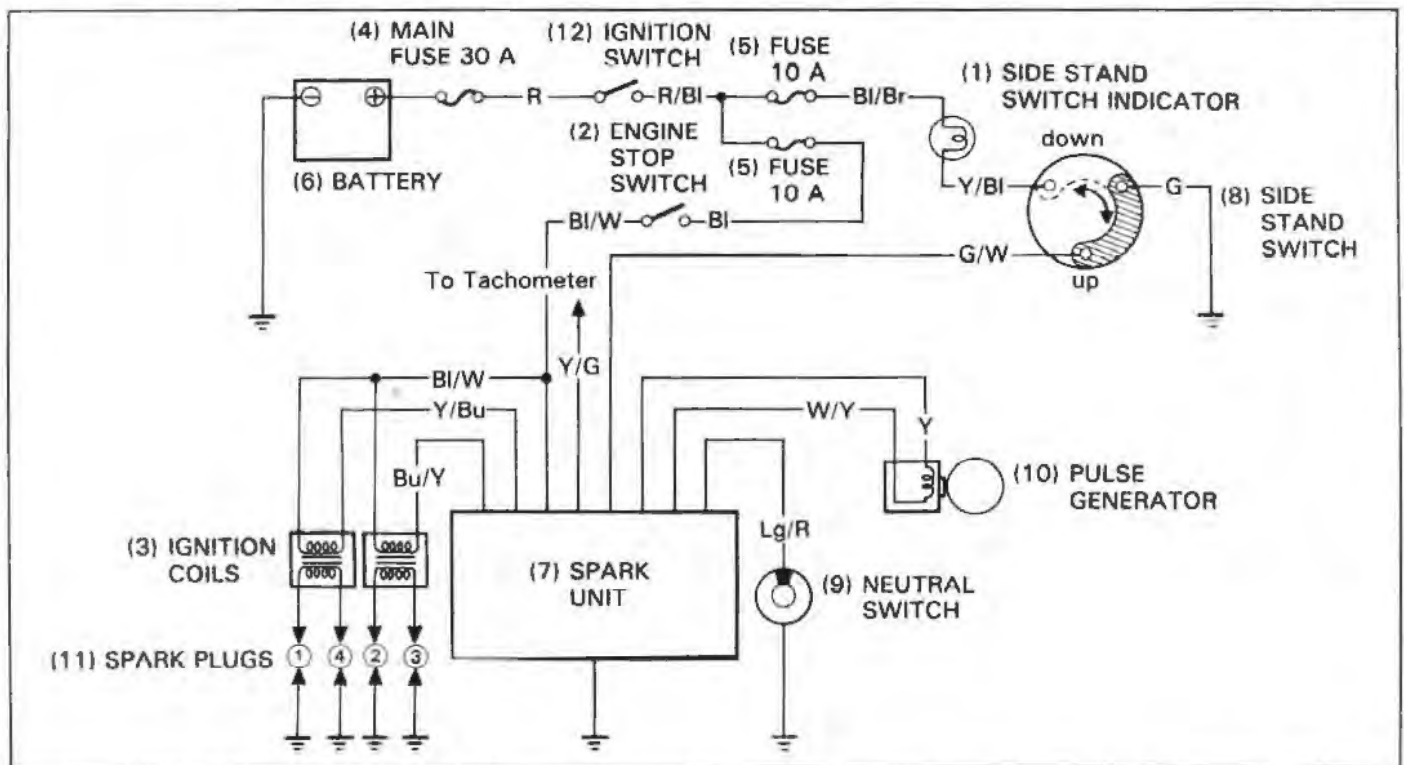
- When checking the ignition system, always follow the steps in the troubleshooting flow chart (page 15-3).
- The transistorized ignition system use an electrically controlled ignition timing system. No adjustments can be made to the ignition timing.
- A rough diagnosis can be made by identifying the cylinder whose spark timing is incorrect.
- The spark unit may be damaged if dropped. Also, if the connector is disconnected when current is flowing, the excessive voltage may damage the unit. Always turn off the ignition switch before servicing.
- A faulty ignition system is often related to poorly connected 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 spark plugs with an incorrect heat range can damage the engine. Refer to section 2 of the Common Service Manual.
- For neutral switch inspection, refer to section 25 of the Common Service Manual; for switch location, see page 15-2 of this manual (SYSTEM LOCATION).
- For the ignition switch and engine stop switch inspection, check for continuity on the continuity chart of the WIRING DIAGRAM, page 18-1. Disconnect each switch connector inside the headlight case (page 1-19) and check it.
- For side stand inhibitor system instructions, see page 15-5 "NOTE" of the troubleshooting.

**IGNITION SYSTEM**

**SYSTEM LOCATION**



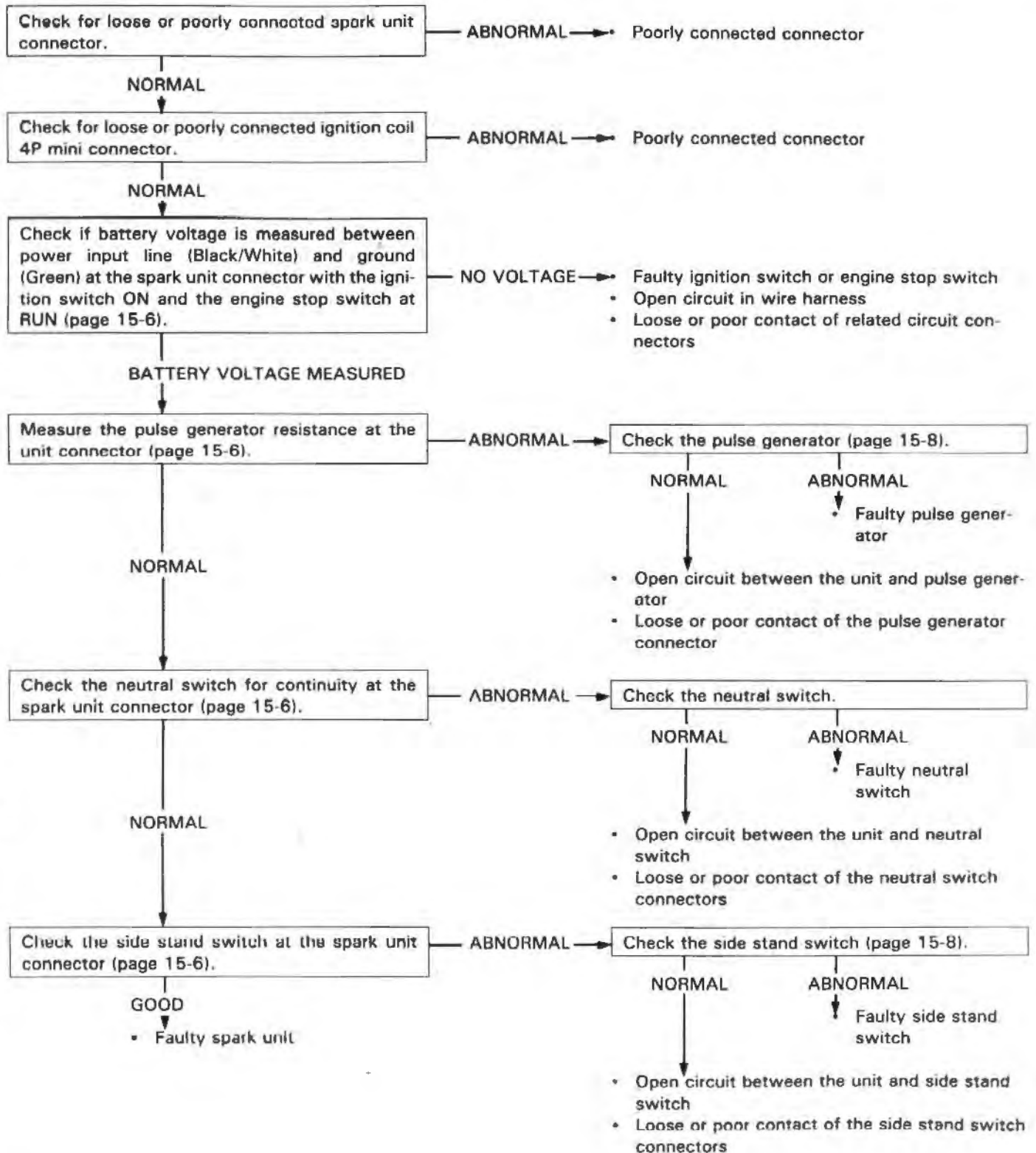
**CIRCUIT DIAGRAM**



## TROUBLESHOOTING

## No spark at all plugs (Faulty input system)

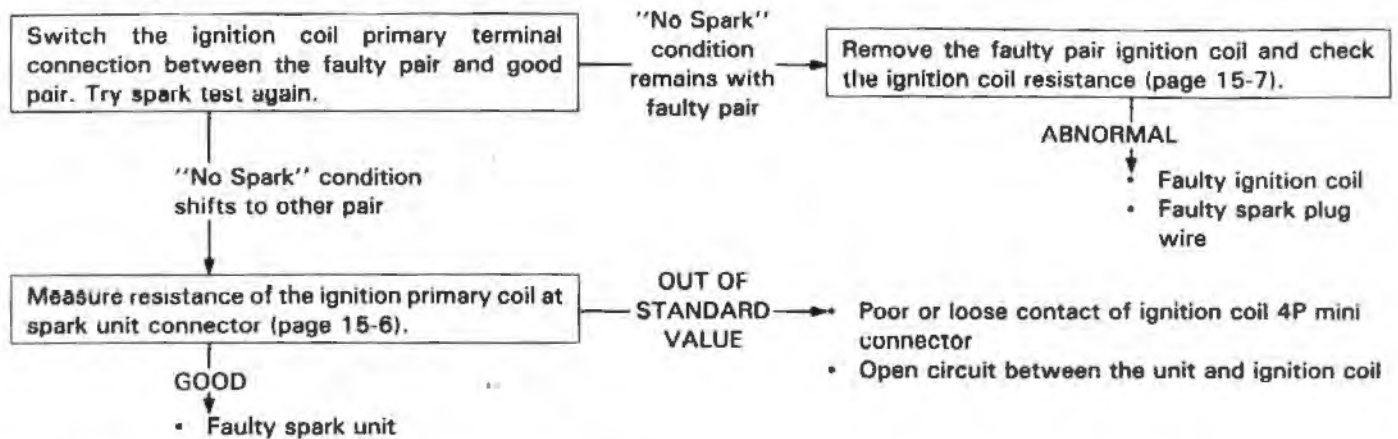
- If there is no spark at all plugs, the problem could be at the input of the ignition system (pulse generator, power input circuit of the spark unit, neutral switch, side stand switch or spark unit).



## IGNITION SYSTEM

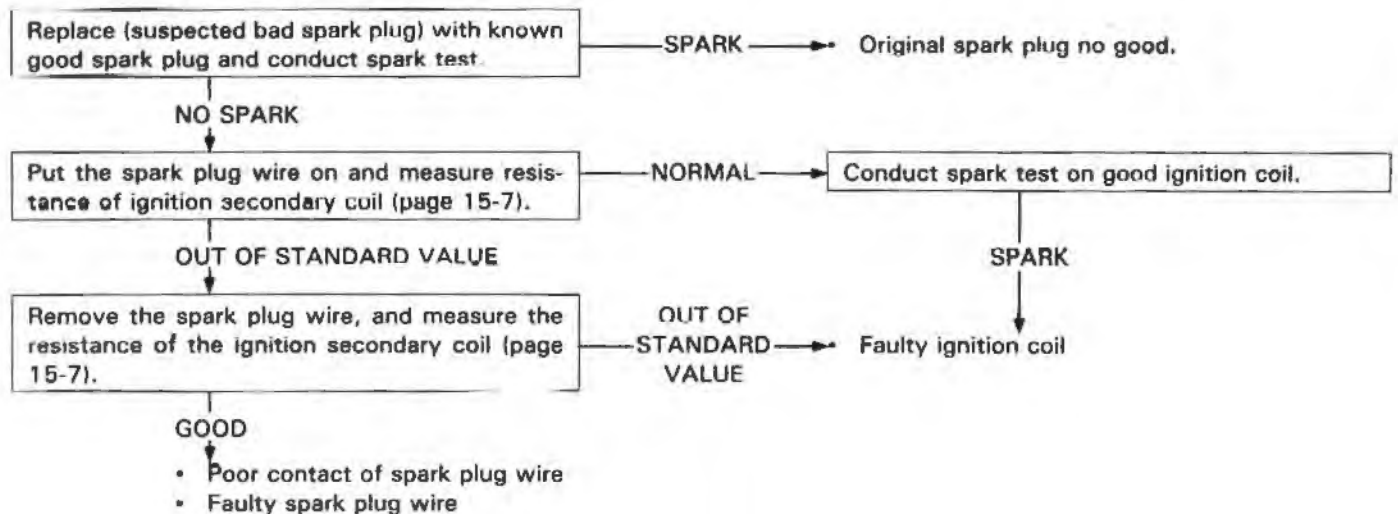
### No spark at either ignition group

- If there is no spark at either group, the problem is suspected in the primary coil side of the ignition system (ignition coil, or unit and ignition coil circuit).



### No spark at one plug (Trouble in secondary coil side)

- Faulty spark plug is most likely.

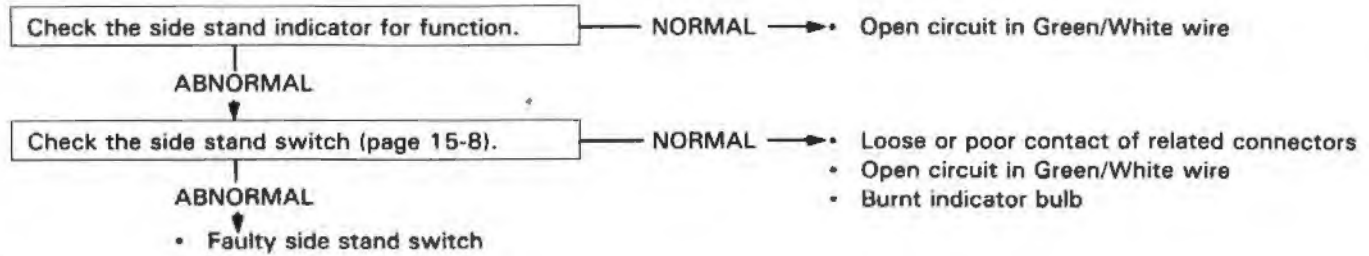


Engine starts, but side stand switch does not function at all.

NOTE

The side stand switch should function as follows:

- When the transmission is shifted into a gear from neutral with the side stand down, the ignition shuts off and the engine will stop.
- When in neutral, the neutral switch line (a) of the spark unit is connected to ground via the side stand switch. When the side stand is up, the side stand switch line (b) of the spark unit passes to ground via the side stand switch. The spark unit monitors lines (a) and (b), and provides spark only when one or both of those lines is connected to ground via the neutral switch or the side stand switch.



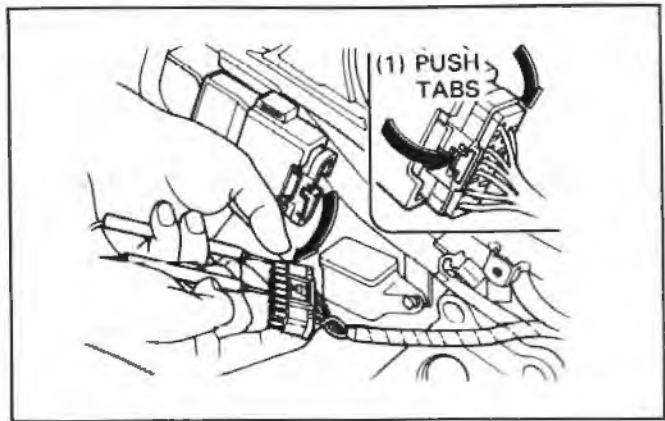


**IGNITION SYSTEM****IGNITION SYSTEM INSPECTION****CIRCUIT INSPECTION****NOTE**

- Follow the steps in the troubleshooting flow chart for servicing.

Remove the seat.

Disconnect the connector from the spark unit and conduct these tests at the connector.



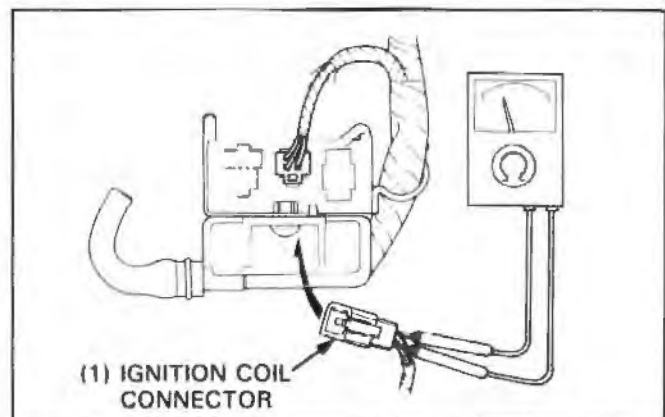
| Item                    | Terminals  | Specification  |
|-------------------------|--|--|
| Power source input line | Black/White (+) and ground (-)   | Battery voltage should resistor with the ignition switch ON and the engine stop switch at RUN. |
| Pulse generator coil    | Yellow and White/Yellow  | 340 – 420 $\Omega$ (20°C/68°F)   |
| Ignition primary coil   | No. 1 – 4: Black/White and Yellow/Blue<br>No. 2 – 3: Black/White and Blue/Yellow | 2 – 4 $\Omega$ (20°C/68°F)   |
| Neutral switch line     | Light Green/Red and ground   | Continuity into neutral<br>No continuity in any gear except neutral                            |
| Side stand switch line  | Green/White and ground   | Continuity with the side stand up<br>No continuity with the side stand down                    |
| Ground line             | Green and ground   | Continuity   |

**IGNITION COIL****INSPECTION**

Disconnect the ignition coil 4P mini connector under the fuel tank and measure the primary coil resistance between the terminals below.

- No. 1 – 4 primary coil: Black/White and Yellow/Blue
- No. 2 – 3 primary coil: Black/White and Blue/Yellow

**STANDARD: 2 – 4  $\Omega$  (20°C/68°F)**

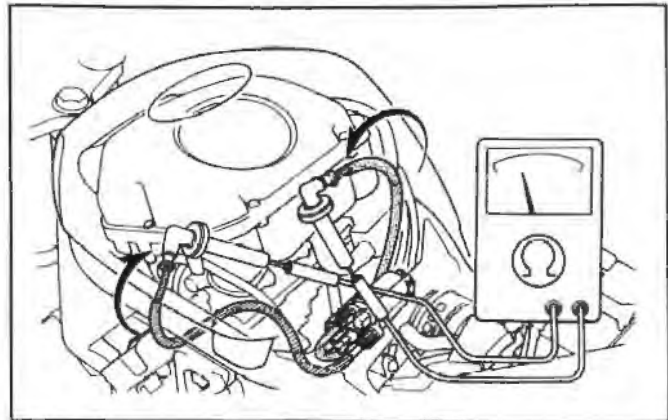


## IGNITION SYSTEM

Disconnect the spark plug caps from the spark plugs and measure the secondary coil resistance with the spark plug wire at each ignition pair:

- No. 1-4 secondary coil: between ENG 1 and ENG 4 wire
- No. 2-3 secondary coil: between ENG 2 and ENG 3 wire

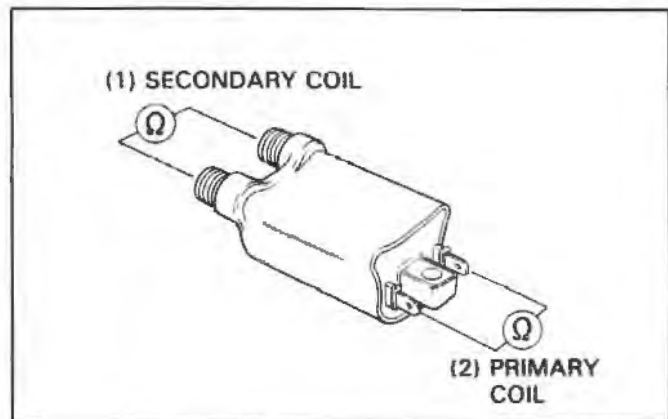
**STANDARD: 23-27 k $\Omega$  (20°C/68°F)**



Remove the ignition coil, disconnect the spark plug wires and measure the primary and secondary coil resistances as shown.

**STANDARDS:**

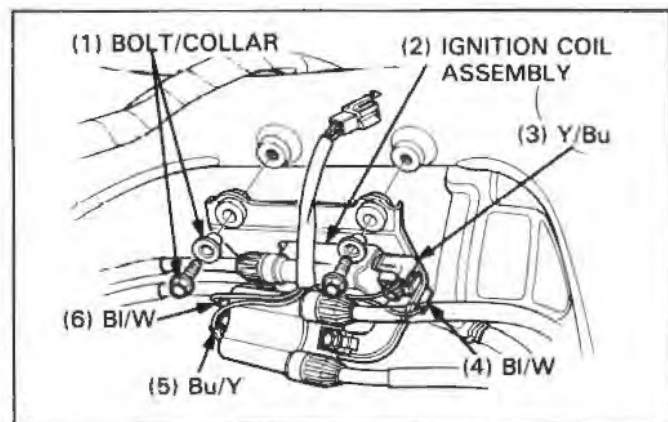
- Primary coil: 2-4  $\Omega$  (20°C/68°F)
- Secondary coil: 13-17 k $\Omega$  (20°C/68°F)



**REMOVAL/INSTALLATION**

Disconnect the ignition coil 4P mini connector under the fuel tank. Remove the bolts and collars.

Disconnect the ignition primary terminals from the coils and remove the ignition coil as an assembly.

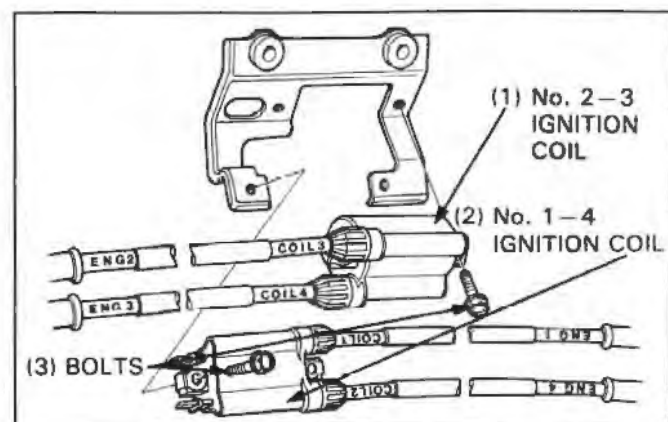


Remove bolts and No. 2-3 ignition coil first, then remove bolts and No. 1-4 ignition coil.

Install the ignition coils in the reverse order of removal.

**NOTE**

- Connect the spark plug wire properly as shown (right).
- Connect the ignition coil primary terminals properly as shown above.

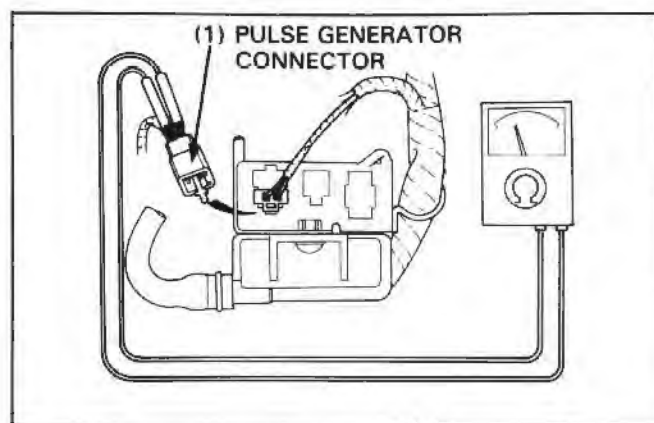


**IGNITION SYSTEM****PULSE GENERATOR****INSPECTION****NOTE**

- It is not necessary to remove the pulse generator from the engine.

Disconnect the pulse generator 2P mini blue connector under the fuel tank and measure the resistance between White/Yellow and Yellow terminals.

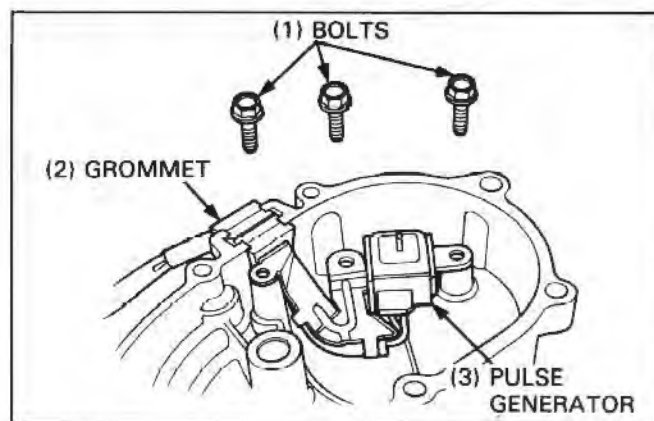
**STANDARD: 340 – 420  $\Omega$  (20°C/68°F)**

**REMOVAL/INSTALLATION**

Remove the left crankcase cover (page 16-8).  
Remove the bolts and pulse generator.

Install the pulse generator and wire clamp, and tighten the bolts securely.  
Set the wire harness grommet into the cover groove.

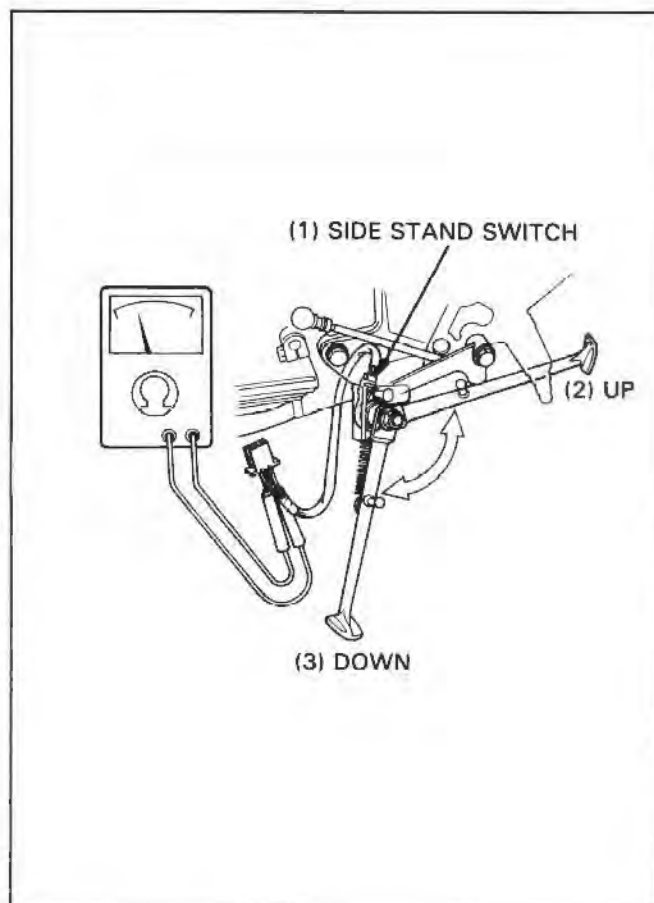
Install the left crankcase cover (page 16-8).

**SIDE STAND SWITCH****INSPECTION**

Disconnect the side stand 3P mini green connector under the fuel tank and check for continuity between each terminals as below.

There should be continuity between the  $\bigcirc$ — $\bigcirc$  positions on the continuity chart.

|                 | Green/White             | Yellow/Black            | Green                   |
|-----------------|-------------------------|-------------------------|-------------------------|
| Side stand down |                         | $\bigcirc$ — $\bigcirc$ | $\bigcirc$ — $\bigcirc$ |
| Side stand up   | $\bigcirc$ — $\bigcirc$ |                         | $\bigcirc$ — $\bigcirc$ |



**REMOVAL/INSTALLATION**

Disconnect the side stand connector.  
Remove the water pump side cover.  
With the side stand up, remove the side stand switch mounting bolt and side stand switch.

Install the switch in the reverse order of removal.

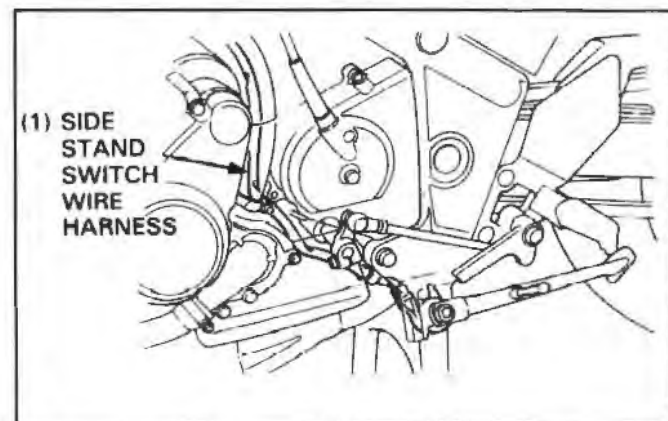
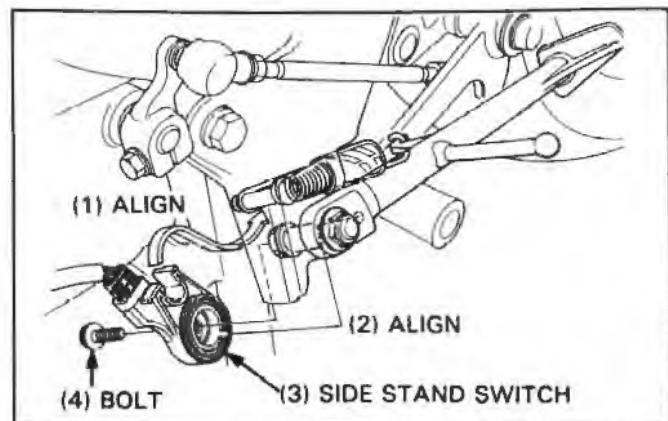
**TORQUE:**

**Side stand switch mounting bolt:**  
30 N·m (3.0 kg·m, 22 ft·lb)

**NOTE**

- Align the switch pin with the side stand hole and align the switch groove with the side stand return spring holding pin.

Route the side stand switch wire harness properly as shown.

**IGNITION TIMING**

Warm up the engine.  
Stop the engine and connect a timing light to the No. 3 cylinder spark plug wire.

**NOTE**

- Read the instructions for timing light for operating.

Remove the following:

- crankshaft hole cap cover (page 9-2).
- crankshaft hole cap (page 9-2).
- timing mark hole cap (page 9-2).

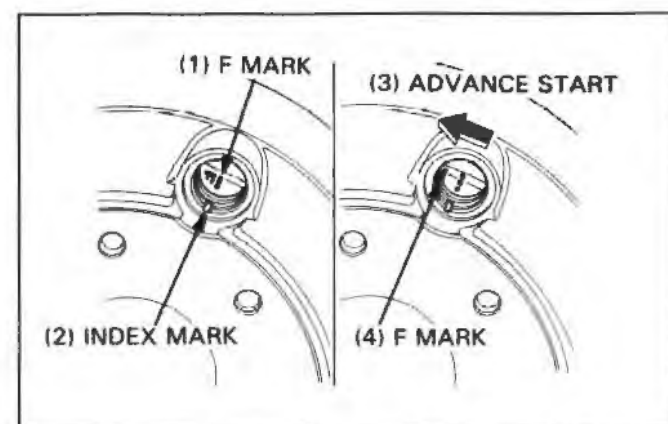
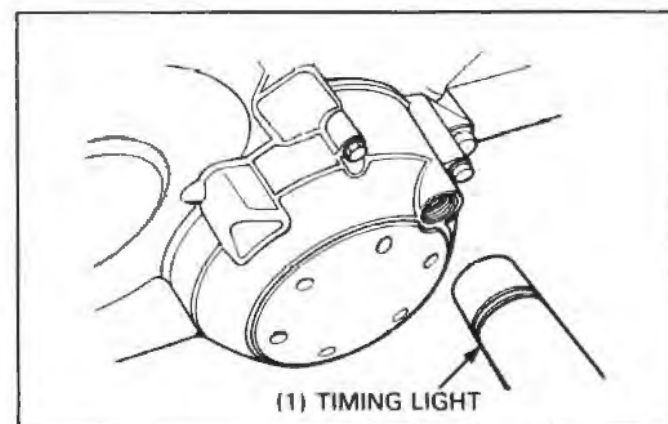
Start the engine and let it idle.

The timing is correct if the F mark aligns with the crankcase cover index mark.

**NOTE**

- If the correct timing could not be observed, connect a timing light to the No. 2 cylinder spark plug wire and recheck the ignition timing.

Increase the engine speed by rotating the throttle stop screw on the carburetor, make sure the F mark begins to move counterclockwise at approximately 1,700 rpm.



# 16. ELECTRIC STARTER/STARTER CLUTCH

|  |      |   |      |
|--|------|---|------|
| SERVICE INFORMATION                    | 16-1 | STARTER MOTOR DISASSEMBLY/<br>ASSEMBLY  | 16-6 |
| SYSTEM LOCATION                        | 16-2 |   |      |
| CIRCUIT DIAGRAM                        | 16-2 | STARTER CLUTCH REMOVAL/<br>INSTALLATION | 16-8 |
| TROUBLESHOOTING                        | 16-3 |   |      |
| STARTER MOTOR REMOVAL/<br>INSTALLATION | 16-5 |   |      |

## SERVICE INFORMATION

### ▲ WARNING

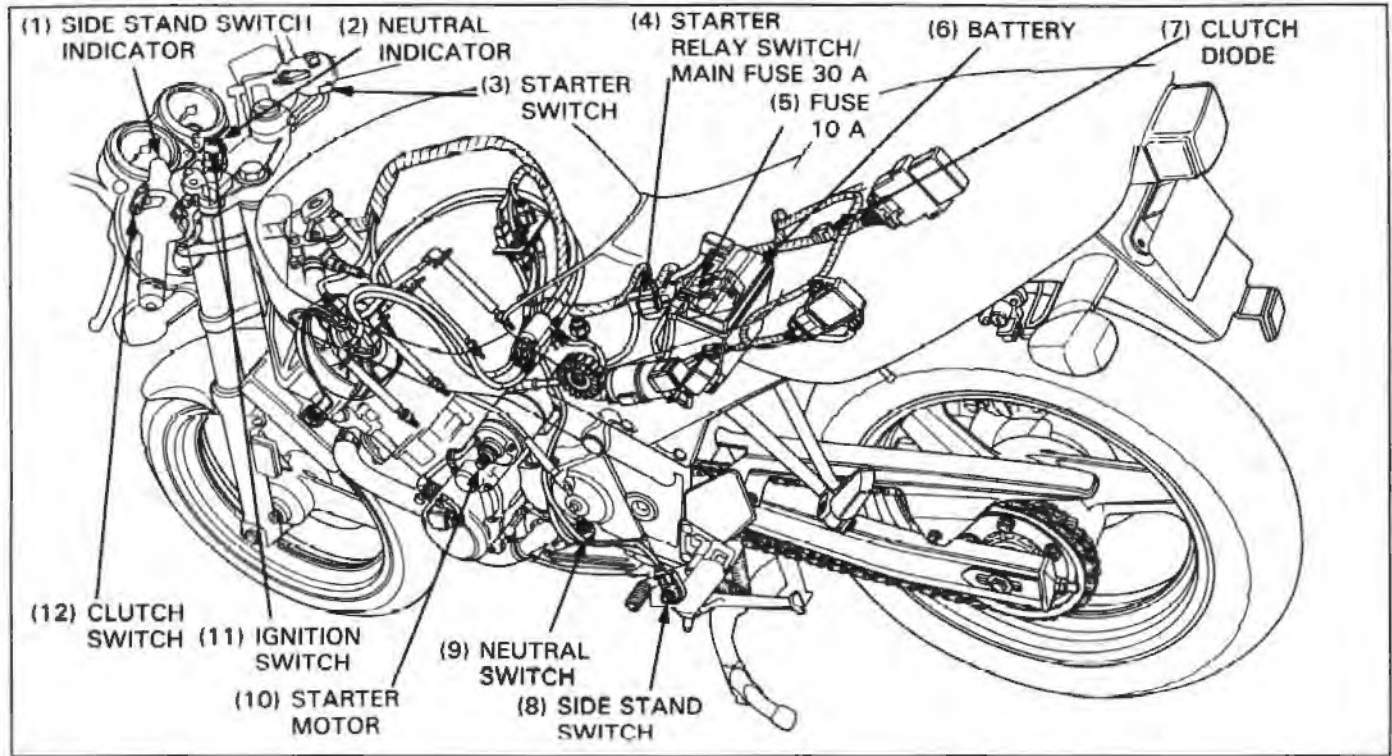
- Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.
- For the following component inspections, refer to the following pages; for the parts locations, see page 16-2 of this manual (SYSTEM LOCATION).

|                      |   |
|----------------------|---|
| Clutch switch diode  | Section 24 of the Common Service Manual.  |
| Starter motor        | Section 24 of the Common Service Manual.  |
| Starter relay switch | Section 24 of the Common Service Manual ("A" circuit type).   |
| Clutch switch        | Section 25 of the Common Service Manual.  |
| Neutral switch       | Section 25 of the Common Service Manual.  |
| Ignition switch      | Check for continuity on the continuity chart of the WIRING DIAGRAM, page 18-1.<br>Disconnect the switch connector inside the headlight case (page 1-19) and check it. |
| Side stand switch    | (page 15-8)   |

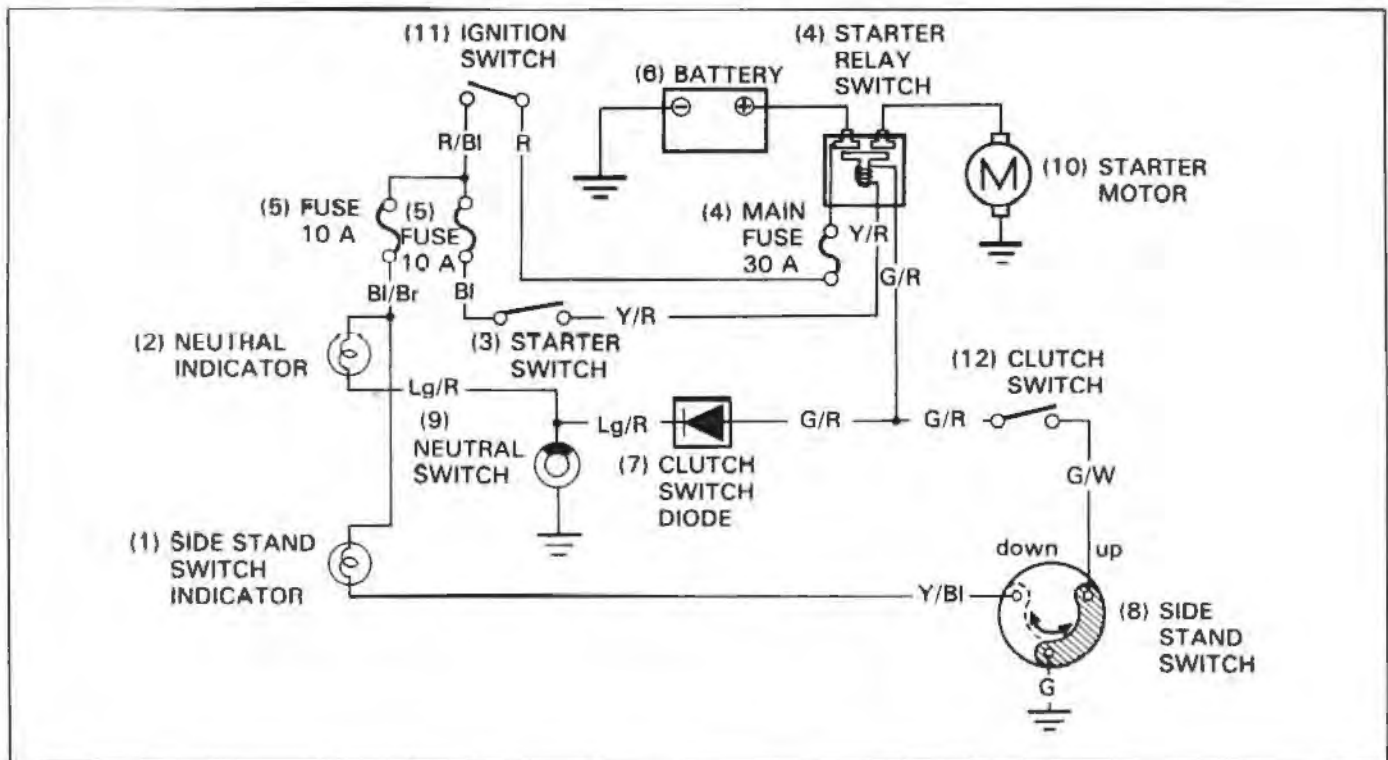


**ELECTRIC STARTER/STARTER CLUTCH**

**SYSTEM LOCATION**



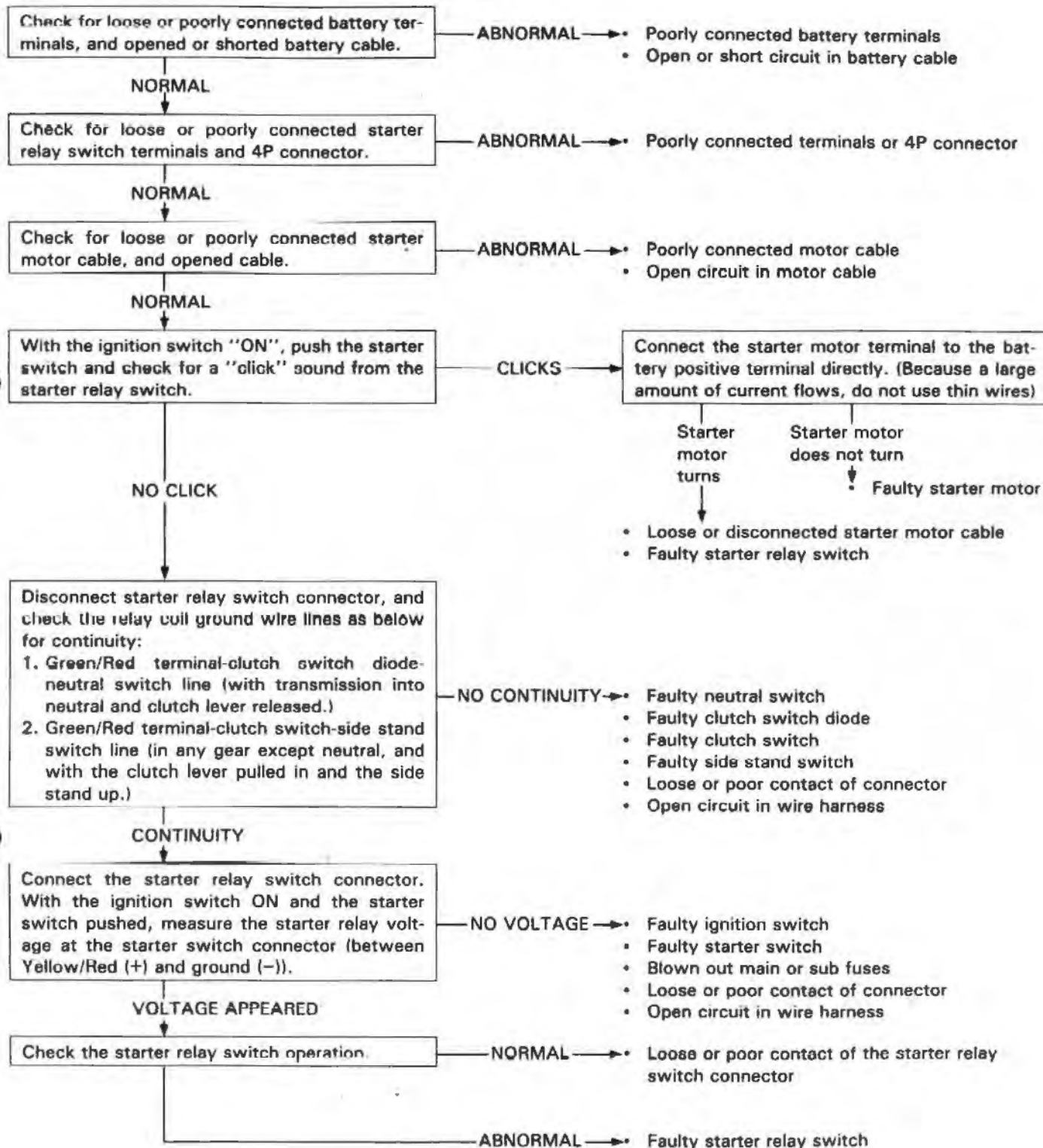
**CIRCUIT DIAGRAM**



## TROUBLESHOOTING

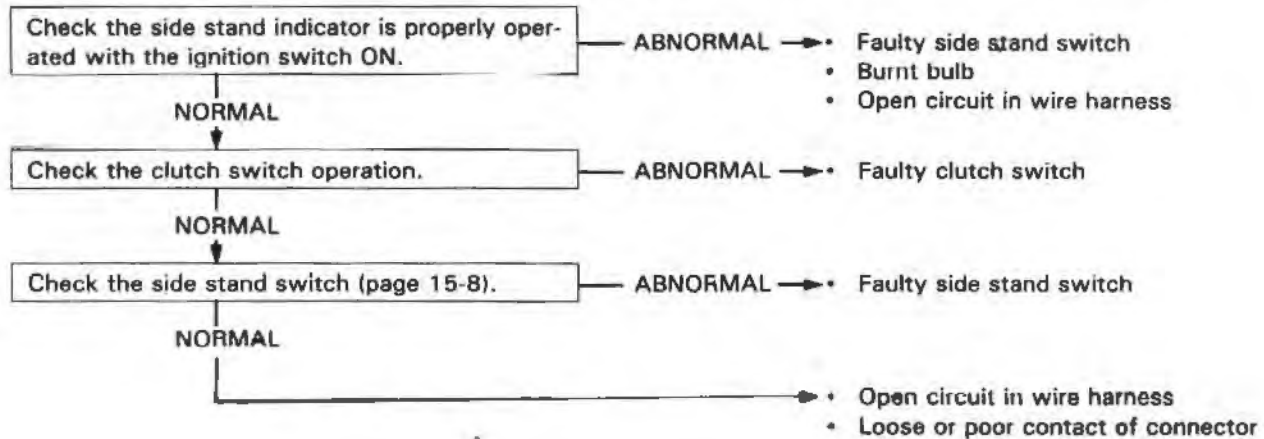
## Starter motor will not turn

- Check for a blown out main or sub fuses before servicing.
- Make sure the battery is fully charged and in good condition.



**ELECTRIC STARTER/STARTER CLUTCH**

The starter motor turns when the transmission is in neutral, but does not turn with the transmission in any position except neutral, with the side stand up and the clutch lever pulled in.

**Starter motor turns slowly**

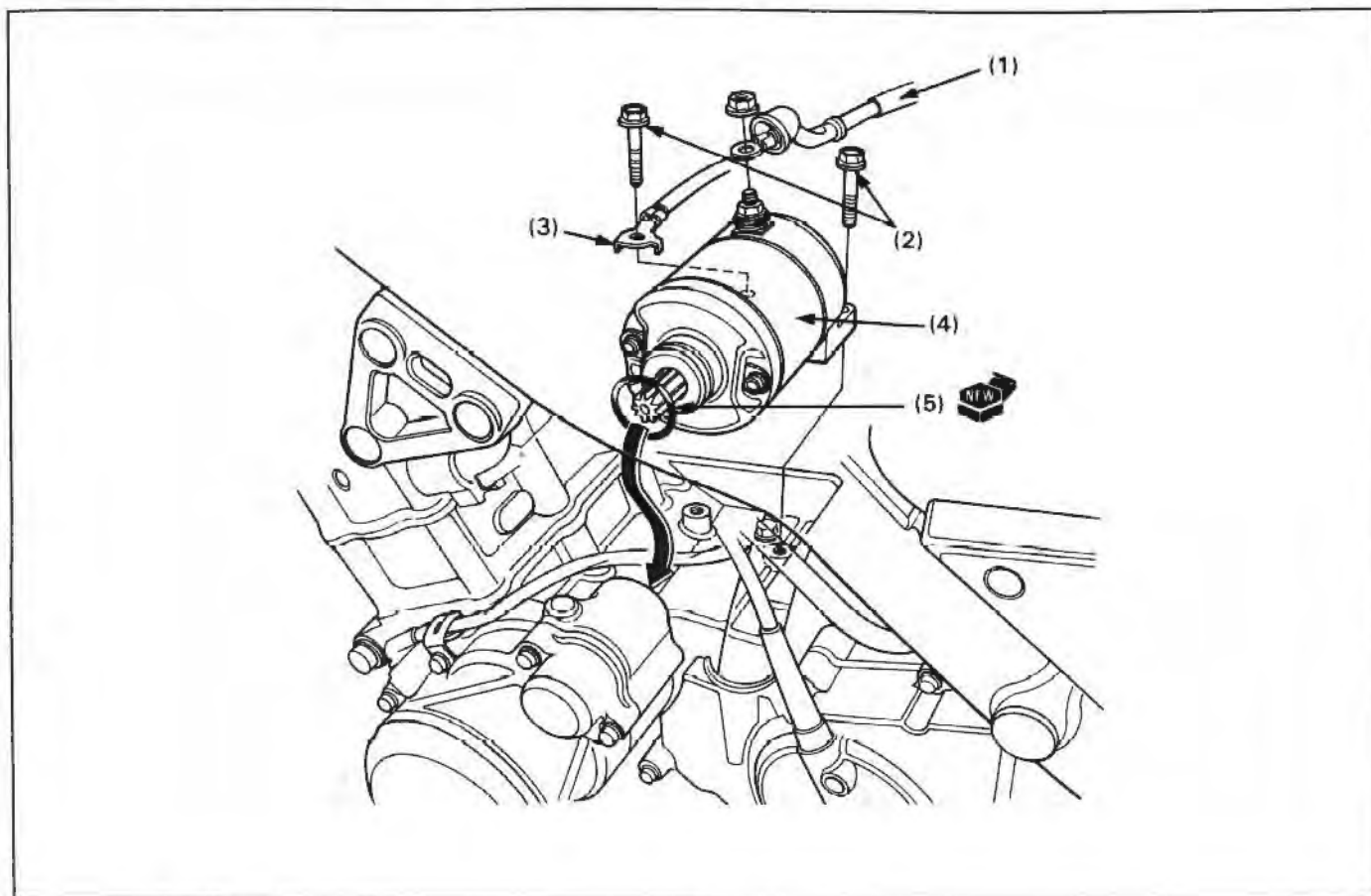
- Low specific gravity in battery (or Dead battery)
- Poorly connected battery terminal cable
- Poorly connected starter motor cable
- Faulty starter motor
- Poorly connected battery ground cable

**Starter motor turns, but engine does not turn**

- Starter motor is running backwards
  - Case assembled improperly
  - Terminals connected improperly
- Faulty starter clutch
- Damaged or faulty starter pinion
- Damaged reduction gears

**Starter relay switch "click", but engine does not turn over**

- Crankshaft does not turn due to engine problems
- Excessive reduction gear friction

**STARTER MOTOR REMOVAL/INSTALLATION****WARNING**

- Turn the ignition switch OFF.

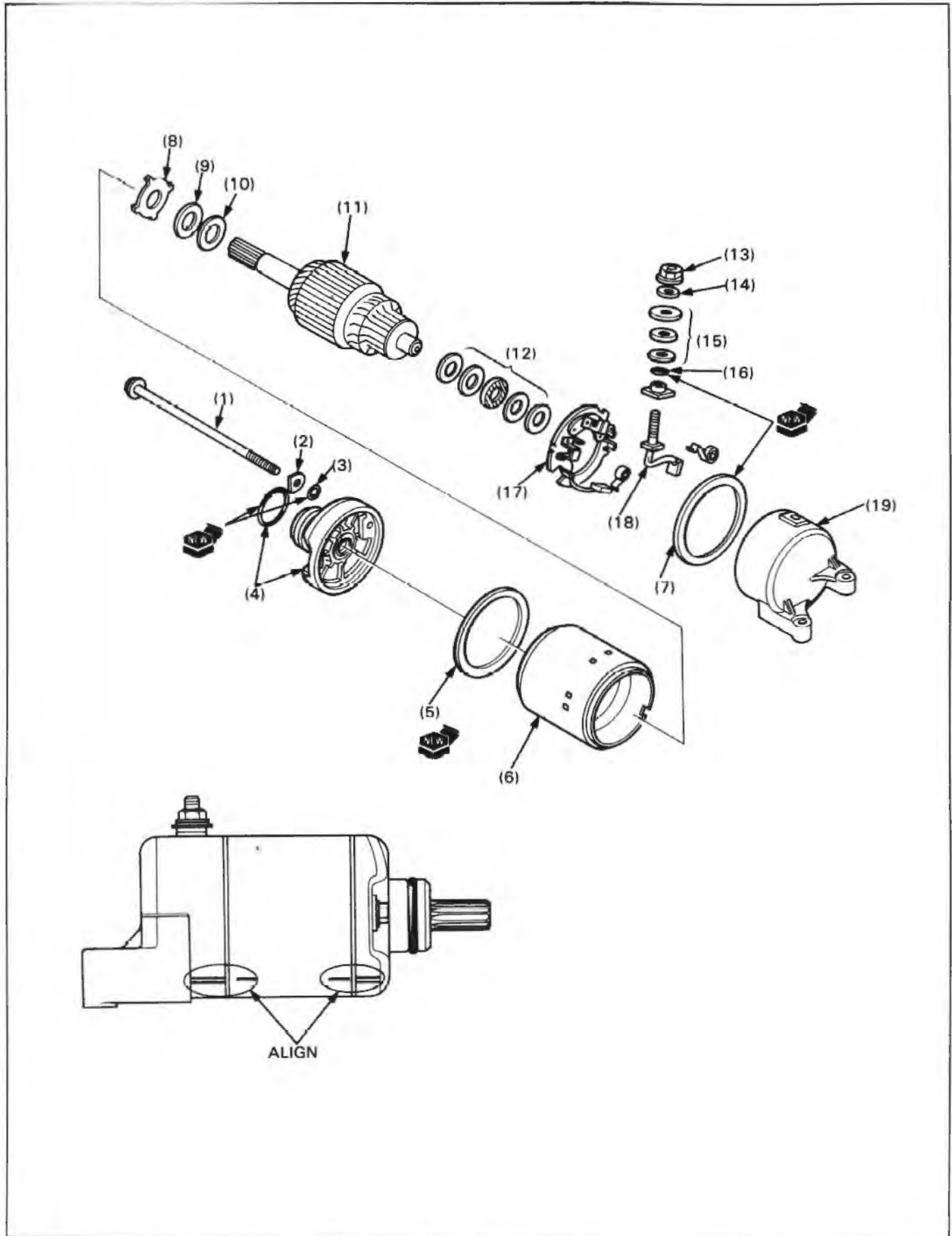
**REQUISITE SERVICE**

- Fuel tank removal/installation (page 2-4)

| PROCEDURE                       | Q'ty | REMARKS  |
|---------------------------------|------|--|
| REMOVAL ORDER                   |      | • Installation is in the reverse order of removal. |
| (1) Starter motor cable         | 1    |  |
| (2) Starter motor mounting bolt | 2    |  |
| (3) Ground cable on engine      | 1    |  |
| (4) Starter motor               | 1    |  |
| (5) O-ring                      | 1    |  |

**ELECTRIC STARTER/STARTER CLUTCH**

**STARTER MOTOR DISASSEMBLY/ASSEMBLY**





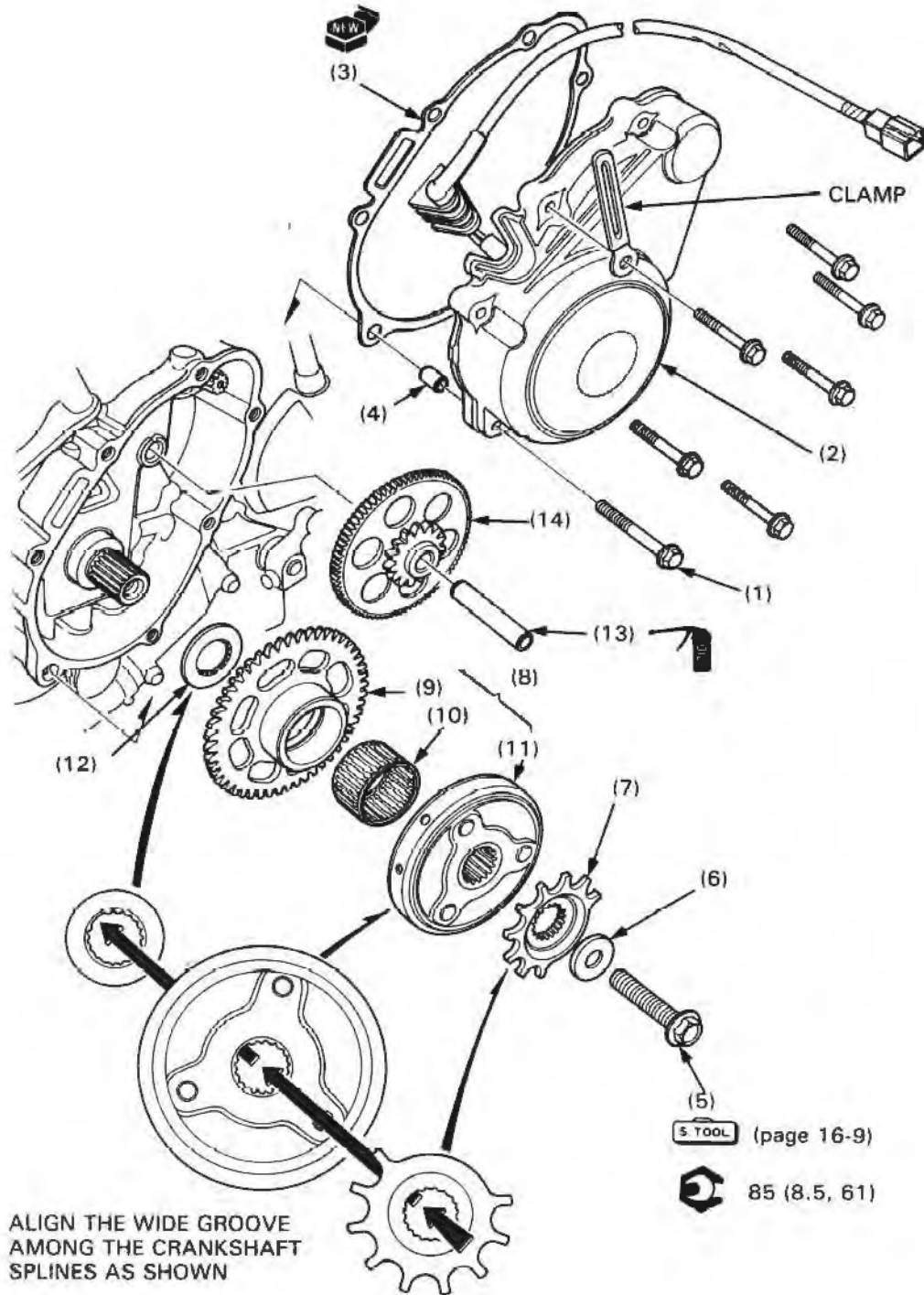
**ELECTRIC STARTER/STARTER CLUTCH****REQUISITE SERVICE**

- Starter motor removal/installation (page 16-5)

| PROCEDURE |                            | Q'ty | ASSEMBLY REMARKS   |
|-----------|----------------------------|------|--|
|           | DISASSEMBLY ORDER          |      | • Assembly is in the reverse order of disassembly.   |
| (1)       | Set screw                  | 2    |  |
| (2)       | Set plate                  | 2    |  |
| (3)       | O-ring                     | 2    |  |
| (4)       | Front cover/O-ring         | 1/1  | Align the index marks on the cover and case.   |
| (5)       | O-ring                     | 1    |  |
| (6)       | Motor case                 | 1    | NOTE:<br>• Intall with the groove side facing to the brushes.<br>• Align the index marks on the rear cover and case.   |
| (7)       | O-ring                     | 1    |  |
| (8)       | Lock washer                | 1    |  |
| (9)       | Insulated washer           | 1    |  |
| (10)      | Washer                     | 1    |  |
| (11)      | Armature                   | 1    |  |
| (12)      | Shims                      | —    | Record and store the shims in the seme order they were installed so they can be reinstalled in the original positions. |
| (13)      | Brush terminal holding nut | 1    |  |
| (14)      | Washer                     | 1    |  |
| (15)      | Insulated washer           | 3    |  |
|           | — bigger                   | (1)  |  |
|           | — smaller                  | (1)  |  |
|           | — smaller                  | (1)  |  |
| (16)      | O-ring                     | 1    |  |
| (17)      | Brush holder assembly      | 1    | Align the holder tab with the rear cover groove.   |
| (18)      | Brush and terminal         | 1    |  |
| (19)      | Rear cover                 | 1    |  |

**ELECTRIC STARTER/STARTER CLUTCH**

**STARTER CLUTCH REMOVAL/INSTALLATION**



**ELECTRIC STARTER/STARTER CLUTCH****REQUISITE SERVICE**

- Right crankcase cover removal/installation (page 9-2)

| PROCEDURE     |                           | Q'ty | REMARKS   |   |
|---------------|---------------------------|------|---|---|
| REMOVAL ORDER |                           |      | • Installation is in the reverse order of removal.<br>Install the pulse generator wire clamp properly as shown. |   |
| (1)           | Left crankcase cover bolt | 7    |   |   |
| (2)           | Left crankcase cover      | 1    |   |   |
| (3)           | Gasket                    | 1    |   |   |
| (4)           | Dowel pin                 | 1    |   |   |
| (5)           | Starter clutch bolt       | 1    |   | Removal and installation (page 16-9).       |
| (6)           | Washer                    | 1    |   | Install it with the marked side facing out. |
| (7)           | Pulse rotor               | 1    |   |   |
| (8)           | Starter clutch assembly   | —    | At installation, make sure the starter clutch roller is installed properly into the clutch housing.             |   |
| (9)           | — starter driven gear     | 1    |   |   |
| (10)          | — needle bearing          | 1    |   |   |
| (11)          | — starter clutch          | 1    |   |   |
| (12)          | Spline washer             | 1    |   |   |
| (13)          | Starter drive gear shaft  | 1    |   |   |
| (14)          | Starter drive gear        | 1    |   |   |

**STARTER CLUTCH BOLT REMOVAL/  
INSTALLATION****CAUTION**

- Do not hold the pulse rotor.

Set the rotor holder onto the flywheel.

**5 TOOL**

**ROTOR HOLDER**

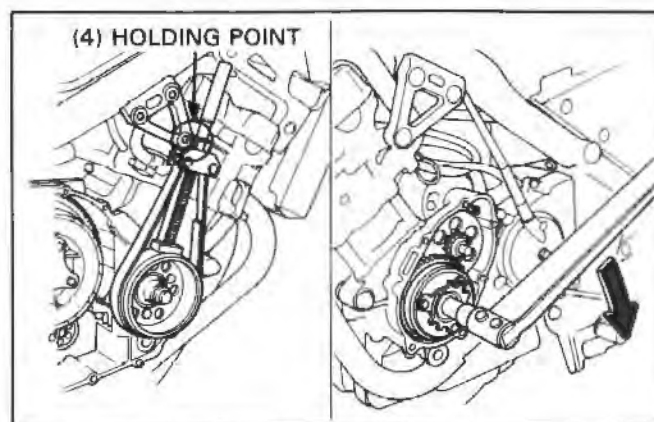
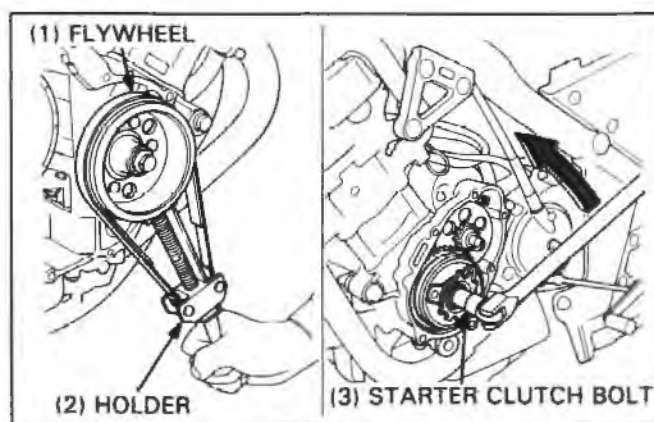
**07725-0040000** or  
equivalent commercially  
available in U.S.A.

Hold the rotor holder and remove the starter clutch bolt with a helper.

Set the rotor holder and hold it onto the engine bracket as shown.

Tighten the starter clutch bolt to the specified torque.

**TORQUE: 85 N·m (8.5 kg·m, 61 ft·lb)**



# 17. LIGHTS/METERS/SWITCHES

|                                    |      |  |      |
|------------------------------------|------|--|------|
| SERVICE INFORMATION                | 17-1 | METER REMOVAL/INSTALLATION               | 17-5 |
| SYSTEM LOCATION                    | 17-2 | METER DISASSEMBLY/ASSEMBLY               | 17-6 |
| HEADLIGHT REMOVAL/<br>INSTALLATION | 17-3 | TACHOMETER INSPECTION                    | 17-7 |
| TURN SIGNAL LIGHT                  | 17-4 | IGNITION SWITCH REMOVAL/<br>INSTALLATION | 17-7 |
| TAILLIGHT                          | 17-4 |  |      |

## SERVICE INFORMATION

### ▲ WARNING

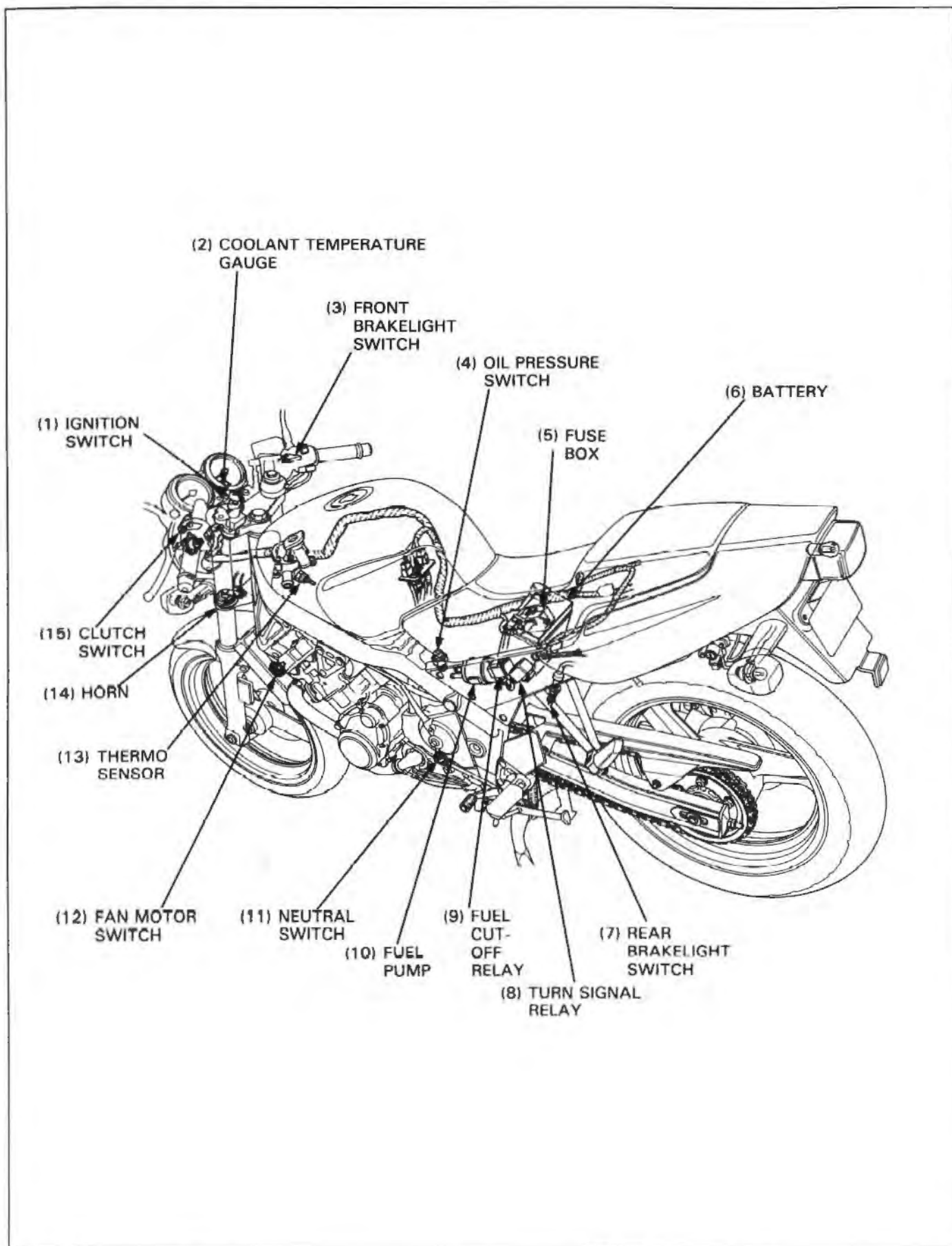
- Halogen headlight bulb becomes very hot while the headlight is ON, and remain hot for a while after it is turned OFF. Be sure to let it cool down before servicing.
- Use a flame and heated water/coolant mixture for the thermo sensor inspection. Keep all flammable materials away from the burner. Wear protective clothing, gloves and eye protection.

- Note the followings 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.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.  
For the following component locations, see page 17-2 of this manual (SYSTEM LOCATION); for inspections, refer to the applicable pages.

| Component                                   | Inspection method  | Remarks   |
|---|--|---|
| Clutch switch                               | Section 25 of the Common Service Manual  |   |
| Coolant temperature gauge/<br>Thermo sensor | Section 25 of the Common Service Manual  | Temperature gauge removal (page 17-6).<br>Thermo sensor removal (page 5-4).   |
| Fan motor switch                            | Section 25 of the Common Service Manual  | Removal (page 5-6).   |
| Front brakelight switch                     | Section 25 of the Common Service Manual  |   |
| Fuel pump/Fuel cut-off relay                | Section 25 of the Common Service Manual  | Removal (page 6-13).  |
| Horn  | Section 25 of the Common Service Manual  |   |
| Handlebar switches                          | Check for continuity on the continuity chart of the WIRING DIAGRAM, page 18-1. | Switch connectors are located inside the headlight case (page 1-19).  |
| Ignition switch                             |  |   |
| Neutral switch                              | Section 25 of the Common Service Manual  | TORQUE: 18 N·m (1.8 kg·m, 13 ft·lb)<br>Apply sealant to the threads.  |
| Oil pressure switch/warning light           | Section 25 of the Common Service Manual  | Oil pressure check: Section 4 of the Common Service Manual<br>Oil pressure switch torque:<br>12 N·m (1.2 kg·m, 9 ft·lb) |
| Rear brakelight switch                      | Section 25 of the Common Service Manual  |   |
| Turn signal lights                          | Section 25 of the Common Service Manual  | 3 terminals relay.  |

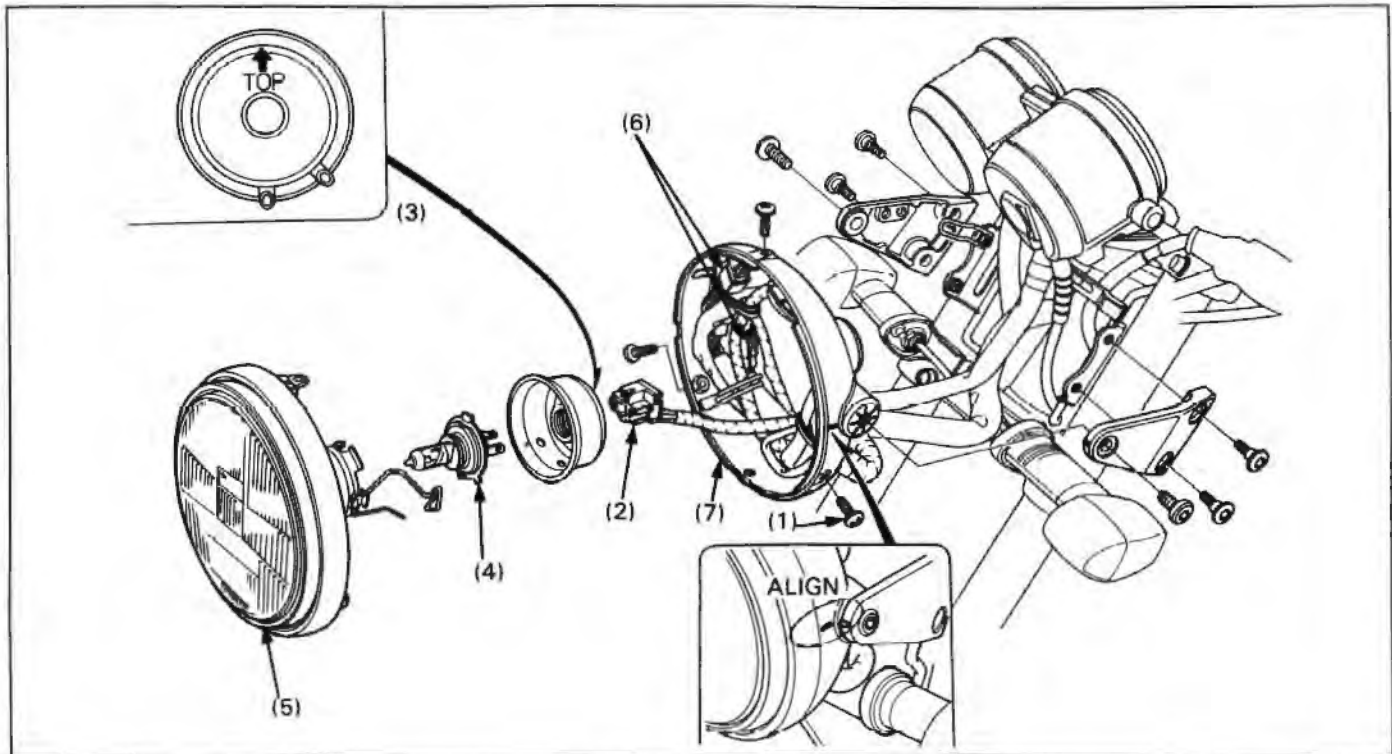
## LIGHTS/METERS/SWITCHES

## SYSTEM LOCATION





## HEADLIGHT REMOVAL/INSTALLATION



**▲ WARNING**

- 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**

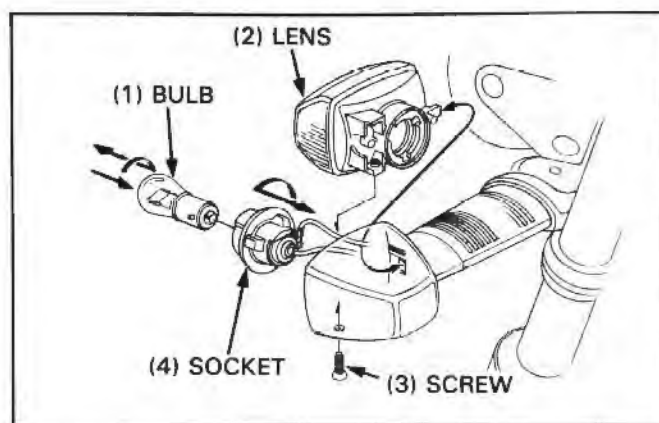
- Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause it to break.
- If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
- Be sure to install the dust cover after replacing the bulb.

| PROCEDURE                 | Q'ty | REMARKS  |
|---------------------------|------|--|
| REMOVAL ORDER             |      | • Installation is in the reverse order of removal. |
| (1) Screw                 | 3    |  |
| (2) Headlight bulb socket | 1    |  |
| (3) Dust cover            | 1    | Install it with the TOP mark facing up.            |
| (4) Headlight bulb        | 1    |  |
| (5) Headlight assembly    | 1    |  |
| (6) Connectors            | —    | Connection (page 1-19)                             |
| (7) Headlight case        | 1    | Align the index marks on the case and bracket.     |

**LIGHTS/METERS/SWITCHES****TURN SIGNAL LIGHT****BULB REPLACEMENT**

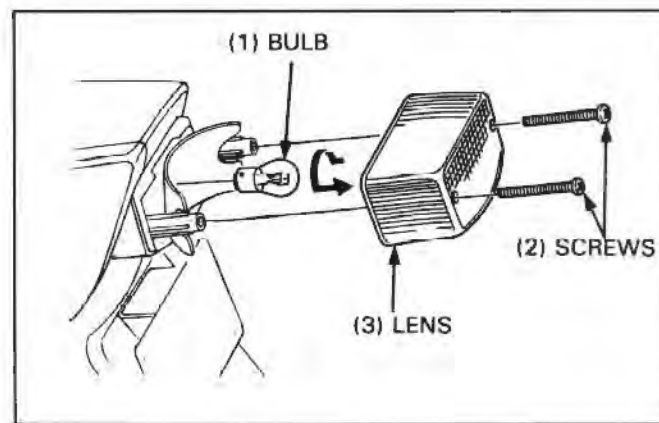
Remove the screw and lens from the turn signal case.  
Turn the bulb socket counterclockwise and remove it.  
Turn the bulb counterclockwise and remove it.

Install a new bulb in the reverse order of removal.

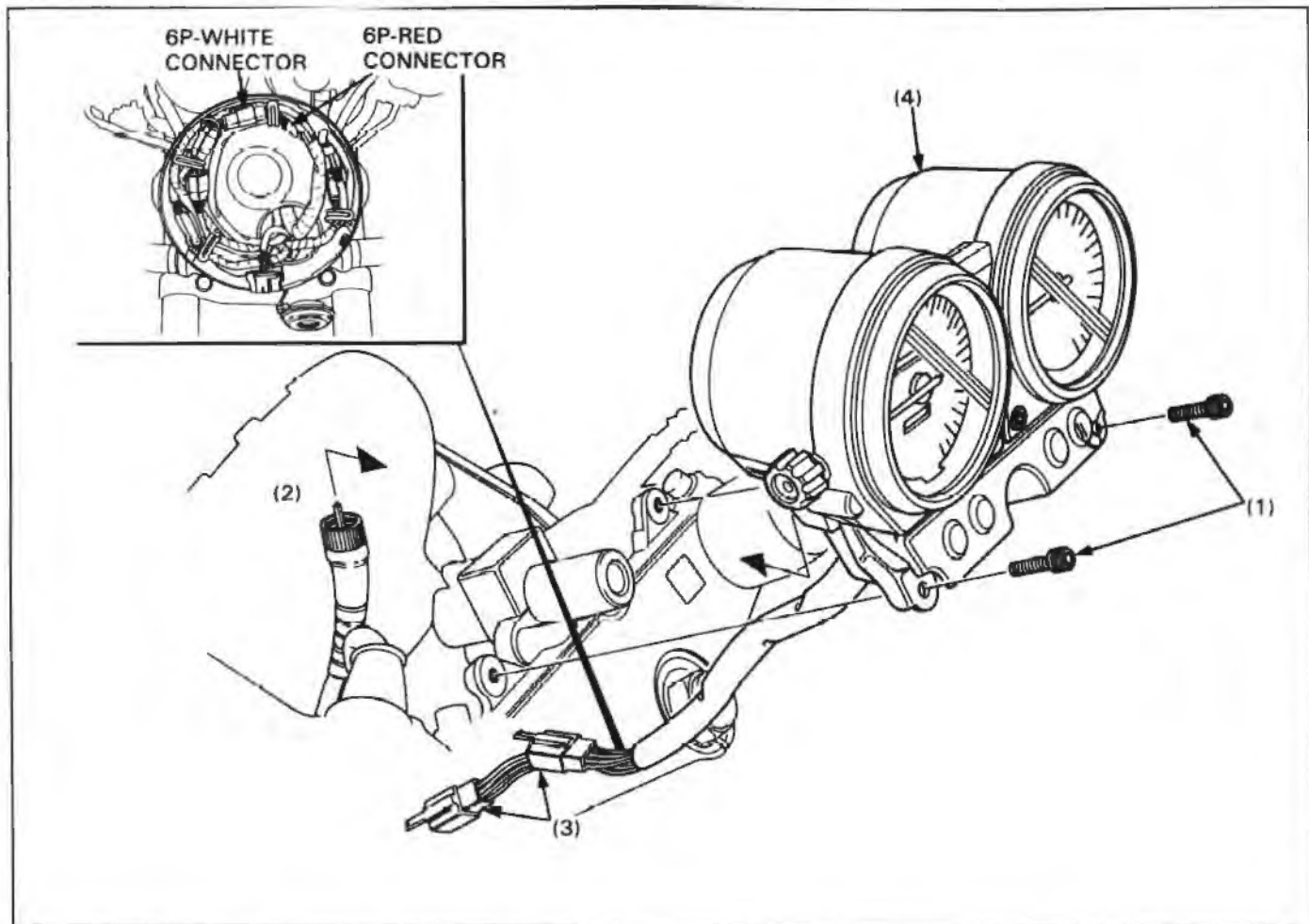
**TAILLIGHT****BULB REPLACEMENT**

Remove the screws and lens from the taillight case.  
Turn the bulb counterclockwise and remove it.

Install a new bulb in the reverse order of removal.



## METER REMOVAL/INSTALLATION



## REQUISITE SERVICE

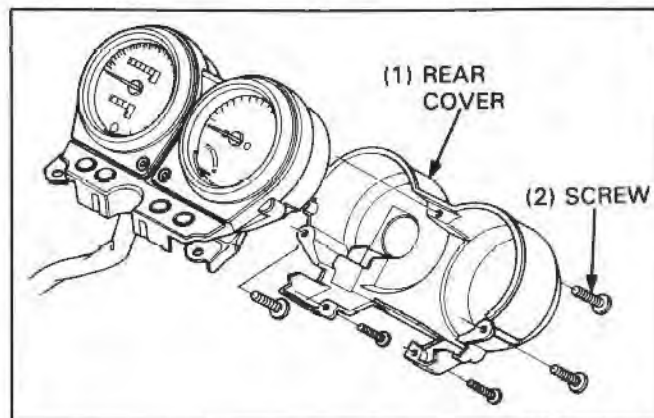
- Headlight assembly removal (page 17-3)

| PROCEDURE     |                     | Q'ty | REMARKS   |
|---------------|---------------------|------|---|
| REMOVAL ORDER |                     |      | • Installation is in the reverse order of removal.<br>6P mini White connector and 6P mini Red connector |
| (1)           | Meter mounting bolt | 2    |   |
| (2)           | Speedometer cable   | 1    |   |
| (3)           | Meter connector     | 2    |   |
| (4)           | Meter assembly      | 1    |   |

## LIGHTS/METERS/SWITCHES

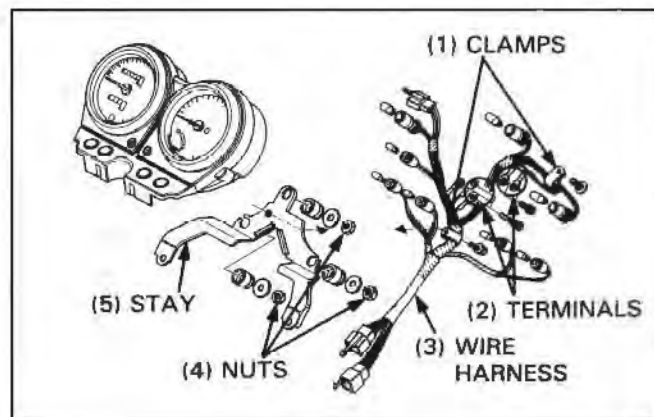
## METER DISASSEMBLY/ASSEMBLY

Remove the five screws and the meter rear cover.

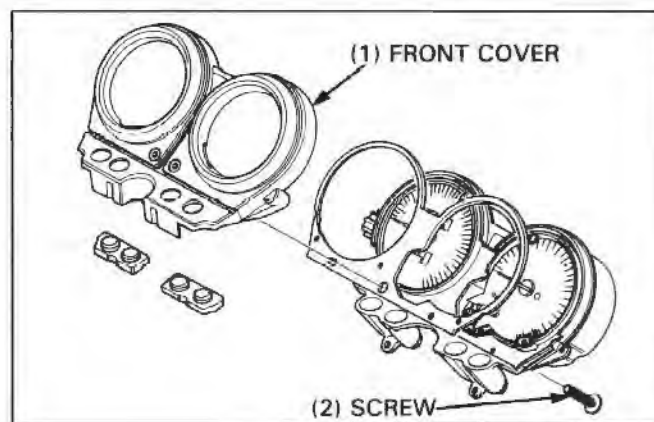


Pull all indicator bulbs out of the meter housing. Remove the wire harness clamps, and remove the nuts, washers and meter stay.

Disconnect the meter terminals, and remove the wire harness.



Remove the screw and meter front cover.



Remove the following:

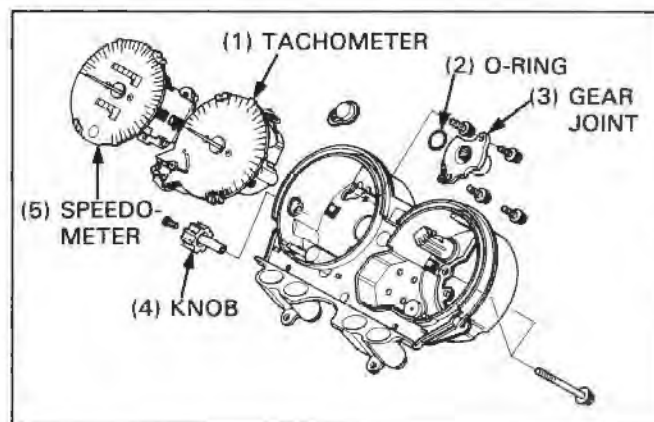
- two screws and tachometer.
- trip meter reset knob.
- four screws, speedometer gear joint and O-ring.
- speedometer.

Assemble the meter in the reverse order of disassembly.

## NOTE

- Connect the proper color wire to the meter terminals.

|                   |                  |
|-------------------|------------------|
| Y/G: Yellow/Green | G: Green         |
| B/BR: Black/Brown | G/B: Green/Black |
| G/L: Green/Blue   |                  |



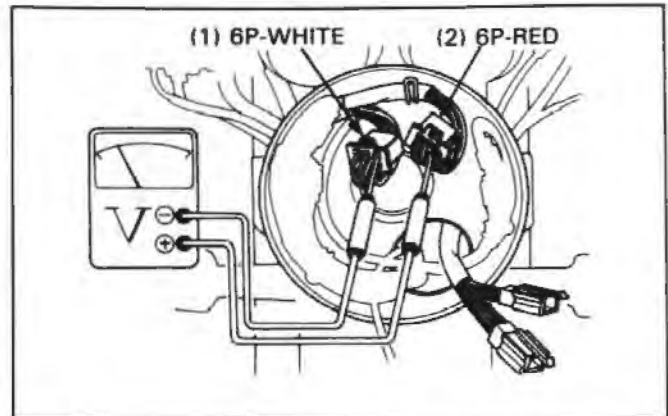
## TACHOMETER INSPECTION

Remove the headlight assembly (page 17-3), and disconnect the 6P mini Red connector and 6P mini White connector.

Connect a voltmeter across the Black/Brown (+) and Green (-) terminals of the main wire harness side.

Turn the ignition switch ON and battery voltage should register.

If there is not O.K., the electric tachometer do not catch power from the battery. Trace and repair the related wiring, sub fuse and/or connectors.



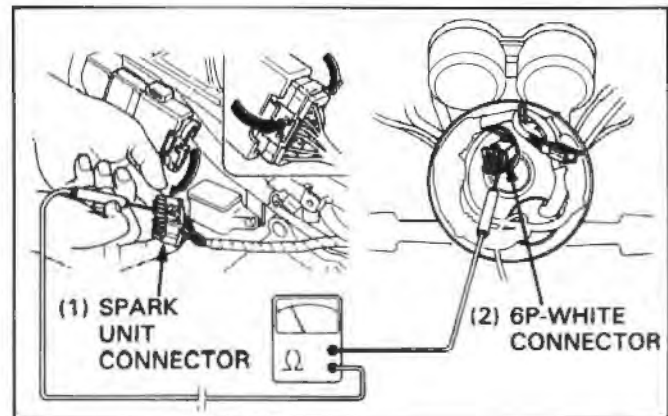
Disconnect the spark unit connector (page 15-6).

Check for continuity between the Yellow/Green wire terminals of the 6P mini White connector and spark unit connector.

Continuity exists at all times.

If there is no continuity, replace the main wire harness.

If all checks are O.K., replace the tachometer.



## IGNITION SWITCH REMOVAL/INSTALLATION

Remove the meter as an assembly (page 17-5).

Disconnect the 3P Black connector and 2P mini connector inside the headlight case.

Remove the bolts using the torx bit (T40) (07703-0010100) and ignition switch.

Remove the screws and separate the contact base from the cylinder.

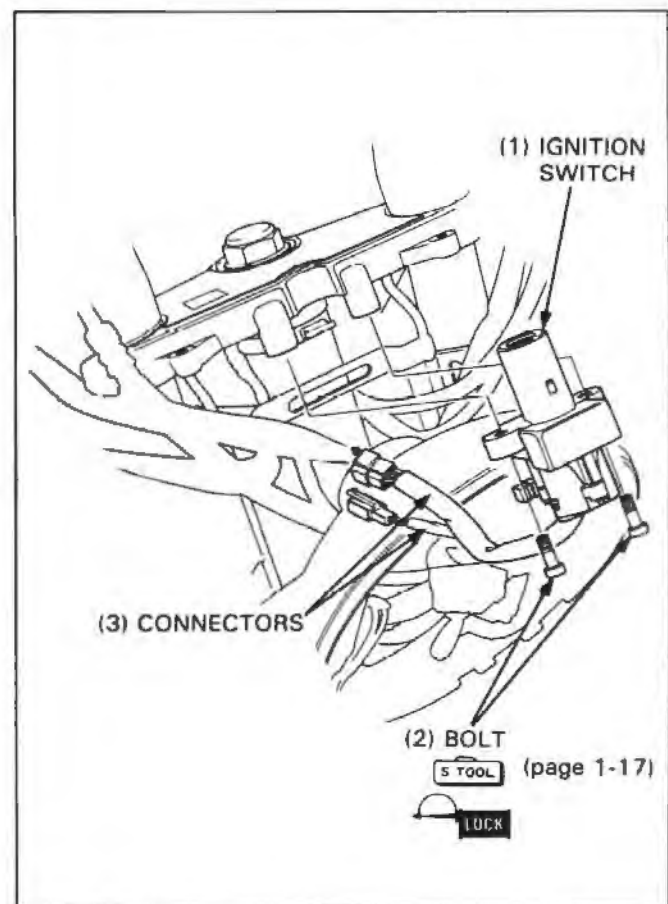
### NOTE

- You can separate the switch in all key position.

Apply a locking agent to the threads and install the ignition switch in the reverse order of removal.

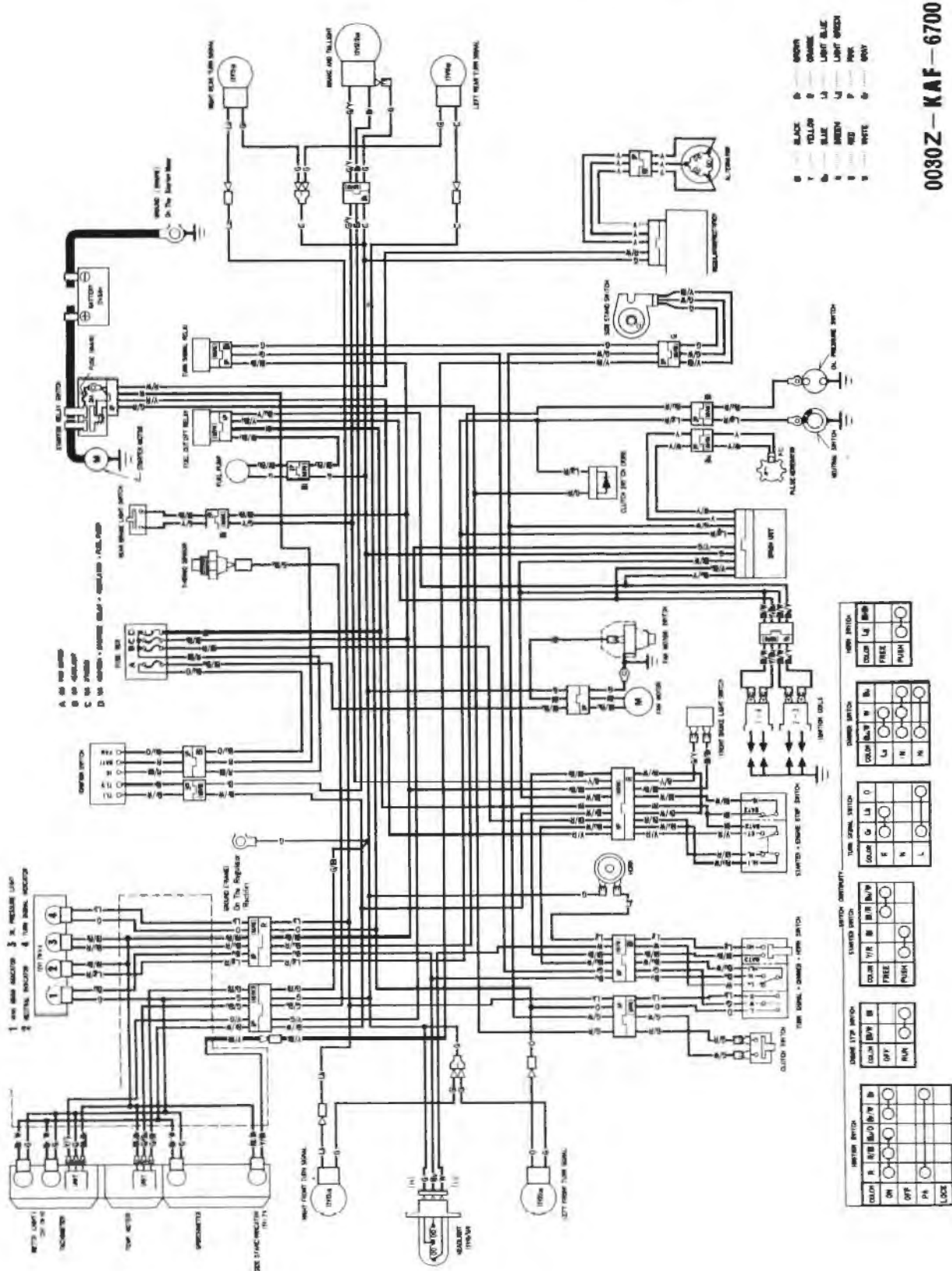
### TORQUE:

Switch mounting bolt: 25 N·m (2.5 kg·m, 18 ft·lb)





# 18. WIRING DIAGRAM

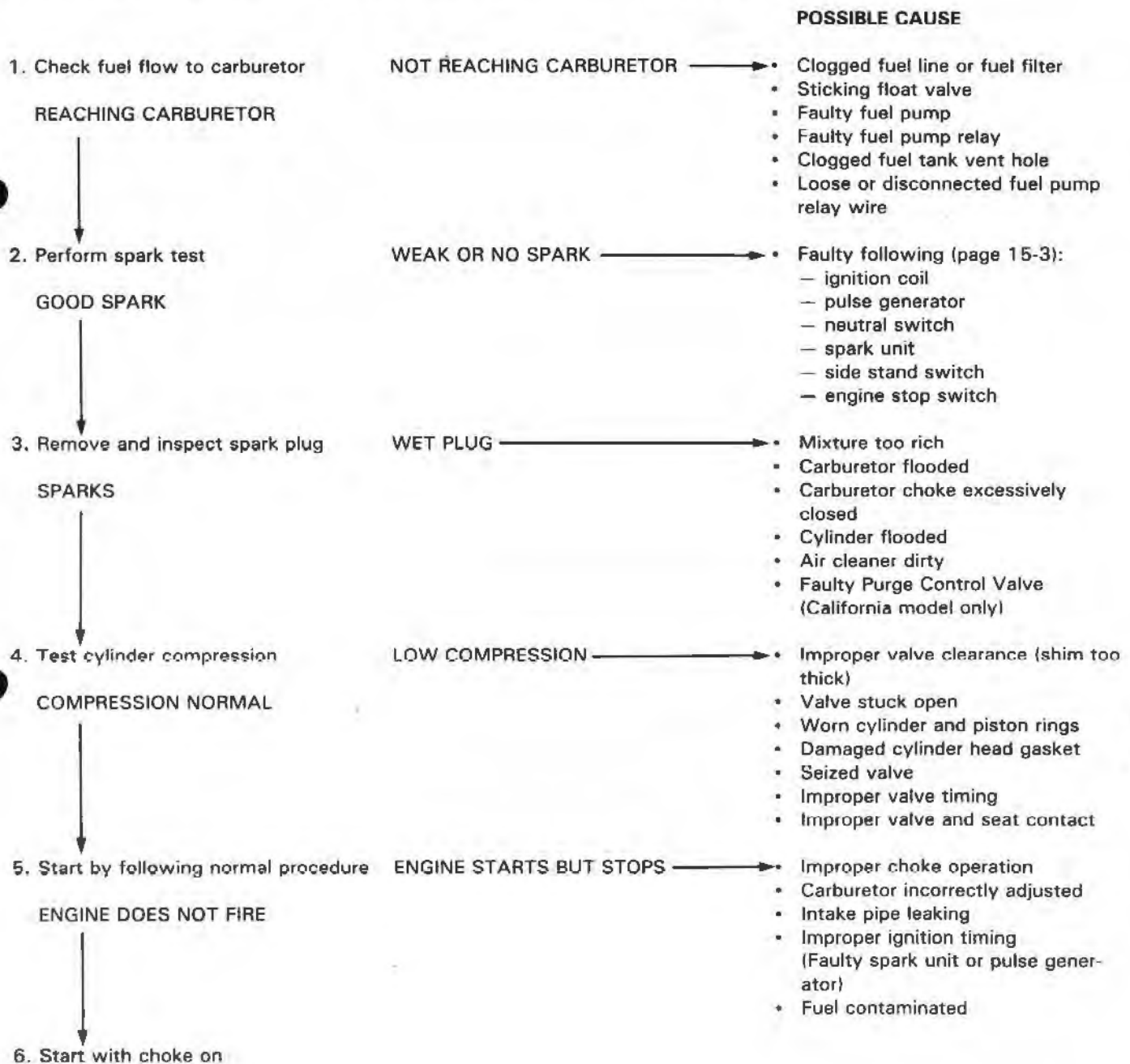


0030Z - KAF - 6700

# 19. TROUBLESHOOTING

|  |             |                                       |             |
|--|-------------|---------------------------------------|-------------|
| <b>ENGINE DOES NOT START OR IS HARD TO START</b> | <b>19-1</b> | <b>POOR PERFORMANCE AT HIGH SPEED</b> | <b>19-4</b> |
| <b>ENGINE LACKS POWER</b>                        | <b>19-2</b> | <b>POOR HANDLING</b>                  | <b>19-4</b> |
| <b>POOR PERFORMANCE AT LOW AND IDLE SPEEDS</b>   | <b>19-3</b> |                                       |             |

## ENGINE DOES NOT START OR IS HARD TO START



## TROUBLESHOOTING

## ENGINE LACKS POWER

|   | POSSIBLE CAUSE   |
|---|--|
| 1. Raise wheels off ground and spin by hand |  |
| WHEEL SPINS FREELY                          |  |
| ↓   |  |
| 2. Check tire pressure                      | WHEELS DO NOT SPIN FREELY →  |
| PRESSURE NORMAL                             | <ul style="list-style-type: none"> <li>• Brake dragging</li> <li>• Worn or damaged wheel bearings</li> <li>• Wheel bearing needs lubrication</li> <li>• Drive chain too tight</li> <li>• Axle nut excessively tight</li> </ul>   |
| ↓   |  |
| 3. Check for clutch slippage                | PRESSURE LOW →   |
| CLUTCH ENGAGED PROPERLY                     | <ul style="list-style-type: none"> <li>• Faulty tire valve</li> </ul>  |
| ↓   |  |
| 4. Accelerate lightly                       | CLUTCH SLIPS →   |
| ENGINE SPEED INCREASES                      | <ul style="list-style-type: none"> <li>• Faulty clutch lifter system</li> <li>• Worn clutch disc/plate</li> <li>• Warped clutch disc/plate</li> <li>• Weak clutch spring</li> </ul>  |
| ↓   |  |
| 5. Check ignition timing                    | ENGINE SPEED DOES NOT INCREASE →   |
| CORRECT                                     | <ul style="list-style-type: none"> <li>• Carburetor choke closed</li> <li>• Clogged air cleaner</li> <li>• Restricted fuel flow</li> <li>• Clogged muffler</li> <li>• Clogged fuel cap vent hole</li> <li>• Faulty fuel pump</li> <li>• Faulty fuel pump relay</li> <li>• Loose, broken or shorted wire or connection of pump relay</li> </ul> |
| ↓   |  |
| 6. Check valve clearance                    | INCORRECT →  |
| CORRECT                                     | <ul style="list-style-type: none"> <li>• Faulty spark unit</li> <li>• Faulty pulse generator</li> </ul>  |
| ↓   |  |
| 7. Test cylinder compression                | INCORRECT →  |
| NORMAL                                      | <ul style="list-style-type: none"> <li>• Improper valve adjustment</li> <li>• Worn valve seat</li> </ul>   |
| ↓   |  |
| 8. Check carburetor for clogging            | TOO LOW →  |
| NOT CLOGGED                                 | <ul style="list-style-type: none"> <li>• Valve stuck open</li> <li>• Worn cylinder and piston rings</li> <li>• Improper valve timing</li> <li>• Seized valve</li> <li>• Improper valve and seat contact</li> </ul>   |
| ↓   |  |
| 9. Check spark plug condition               | CLOGGED →  |
| NOT FOULED OR DISCOLORED                    | <ul style="list-style-type: none"> <li>• Carburetor not serviced frequently enough</li> </ul>  |
| ↓   |  |
| 10. Check oil level and condition           | FOULED OR DISCOLORED →   |
| CORRECT                                     | <ul style="list-style-type: none"> <li>• Plugs not serviced frequently enough</li> <li>• Spark with incorrect heat range</li> </ul>  |
| ↓   |  |
|   | INCORRECT →  |
|   | <ul style="list-style-type: none"> <li>• Oil level too high</li> <li>• Oil level too low</li> <li>• Contaminated oil</li> </ul>  |

|  |                                     | POSSIBLE CAUSE   |
|--|-------------------------------------|--|
| 11. Remove cylinder head cover and inspect lubrication | VALVE TRAIN NOT LUBRICATED PROPERLY | <ul style="list-style-type: none"> <li>• Clogged oil passage</li> <li>• Clogged oil control orifice</li> <li>• Contaminated oil</li> <li>• Faulty oil pump</li> </ul>  |
| VALVE TRAIN LUBRICATED PROPERLY                        |                                     |  |
| 12. Check for engine overheating                       | OVERHEATING                         | <ul style="list-style-type: none"> <li>• Coolant level low</li> <li>• Fan motor not working (Faulty fan motor switch)</li> <li>• Thermostat stuck closed</li> <li>• Excessive carbon build-up in combustion chamber</li> <li>• Use of poor quality fuel</li> <li>• Clutch slipping</li> <li>• Lean fuel mixture</li> </ul> |
| NOT OVERHEATING  |                                     |  |
| 13. Accelerate or run at high speed                    | ENGINE KNOCKS                       | <ul style="list-style-type: none"> <li>• Worn piston and cylinder</li> <li>• Wrong type of fuel</li> <li>• Excessive carbon build-up in combustion chamber</li> <li>• Ignition timing too advanced (Faulty spark unit)</li> <li>• Lean fuel mixture</li> </ul>   |
| ENGINE DOES NOT KNOCK                                  |                                     |  |

## POOR PERFORMANCE AT LOW AND IDLE SPEEDS

|  |                            | POSSIBLE CAUSE  |
|--|----------------------------|---|
| 1. Check ignition timing and valve clearance | INCORRECT                  | <ul style="list-style-type: none"> <li>• Improper valve clearance</li> <li>• Improper ignition timing               <ul style="list-style-type: none"> <li>— Faulty spark unit</li> <li>— Faulty pulse generator</li> </ul> </li> </ul>   |
| CORRECT                                      |                            |   |
| 2. Check carburetor pilot screw adjustment   | INCORRECT                  | See Fuel System (Section 8) of the Common Service Manual  |
| CORRECT                                      |                            |   |
| 3. Check for leaking intake pipe             | LEAKING                    | <ul style="list-style-type: none"> <li>• Loose carburetor</li> <li>• Damaged insulator</li> </ul>   |
| NO LEAKAGE                                   |                            |   |
| 4. Perform the spark test                    | WEAK OR INTERMITTENT SPARK | <ul style="list-style-type: none"> <li>• Faulty, carbon or wet fouled spark plug</li> <li>• Faulty following (page 15-3):               <ul style="list-style-type: none"> <li>— ignition coil</li> <li>— pulse generator</li> <li>— neutral switch</li> <li>— spark unit</li> <li>— side stand switch</li> <li>— engine stop switch</li> </ul> </li> </ul> |
| GOOD SPARK                                   |                            |   |

**TROUBLESHOOTING****POOR PERFORMANCE AT HIGH SPEED**

|  |                      | <b>POSSIBLE CAUSE</b>  |
|--|----------------------|--|
| 1. Check ignition timing and valve clearance     | INCORRECT            | <ul style="list-style-type: none"> <li>• Improper valve clearance</li> <li>• Improper ignition timing               <ul style="list-style-type: none"> <li>— Faulty spark unit</li> <li>— Faulty pulse generator</li> </ul> </li> </ul>  |
| CORRECT<br>↓                                     |                      |  |
| 2. Disconnect fuel line at carburetor            | FUEL FLOW RESTRICTED | <ul style="list-style-type: none"> <li>• Fuel tank empty</li> <li>• Clogged fuel line</li> <li>• Clogged fuel cap vent hole</li> <li>• Clogged fuel valve</li> <li>• Faulty fuel pump or relay</li> <li>• Clogged fuel filter</li> </ul> |
| FUEL FLOWS FREELY<br>↓                           |                      |  |
| 3. Remove carburetors and check for clogged jets | CLOGGED              | <ul style="list-style-type: none"> <li>• Clogged jets</li> </ul>   |
| NO CLOGGED JETS<br>↓                             |                      |  |
| 4. Check valve timing                            | INCORRECT            | <ul style="list-style-type: none"> <li>• Camshaft not installed properly</li> </ul>  |
| CORRECT<br>↓                                     |                      |  |
| 5. Check valve spring tension                    | WEAK                 | <ul style="list-style-type: none"> <li>• Faulty valve spring</li> </ul>  |

**POOR HANDLING** → Check tire and suspension pressure

|  | <b>POSSIBLE CAUSE</b>   |
|--|---|
| 1. If steering is heavy                | <ul style="list-style-type: none"> <li>• Steering head bearing adjustment nut too tight</li> <li>• Damaged steering head bearings</li> <li>• Bent steering stem</li> </ul>  |
| 2. If either wheel is wobbling         | <ul style="list-style-type: none"> <li>• Excessive wheel bearing play</li> <li>• Bent rim</li> <li>• Improperly installed wheel hub</li> <li>• Swingarm pivot bearing excessively worn</li> <li>• Bent frame</li> </ul> |
| 3. If the motorcycle pulls to one side | <ul style="list-style-type: none"> <li>• Incorrect drive chain adjustment</li> <li>• Front and rear wheels not aligned</li> <li>• Bent fork legs</li> <li>• Bent swingarm</li> <li>• Bent frame</li> </ul>              |



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