

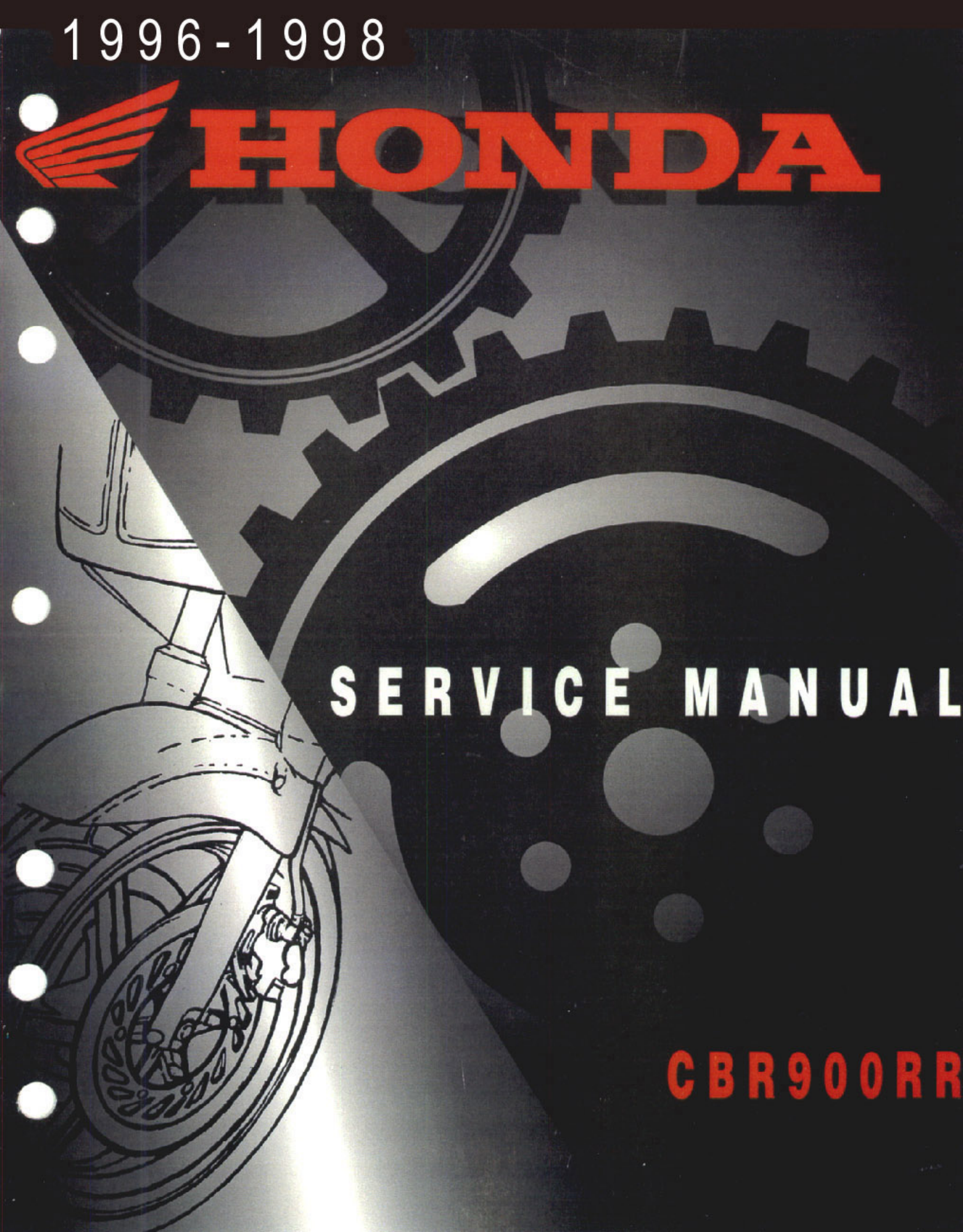
1996-1998



# HONDA

SERVICE MANUAL

CBR900RR



## HOW TO USE THIS MANUAL

This service manual describes the service procedures for the CBR900RR.

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 California Air Resources Board.

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

Sections 1 and 3 apply to the whole motorcycle. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections. Section 4 through 19 describe parts of the motorcycle, grouped according to location.

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

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












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

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# 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.

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

|                      |      |  |      |
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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 has been running. Wear insulated gloves or wait until the engine and exhaust system have cooled before handling these parts.*

### USED ENGINE OIL

#### ▲ WARNING

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

### BRAKE DUST

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

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### BATTERY HYDROGEN GAS & ELECTROLYTE

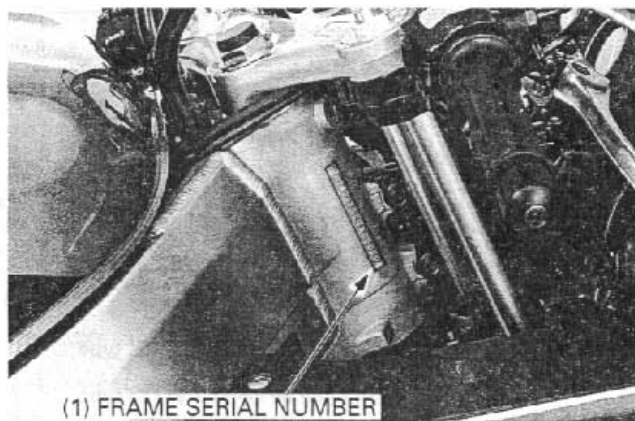
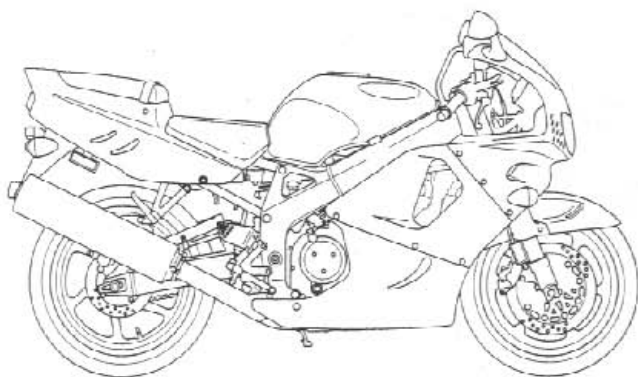
#### **▲ WARNING**

- *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 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.*
- 

## SERVICE RULES

1. Use genuine HONDA or HONDA-recommended parts and lubricants or their equivalents. Parts that don't meet HONDA's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as show on pages 1-21 through 1-31, Cable and Harness Routing.

## MODEL IDENTIFICATION



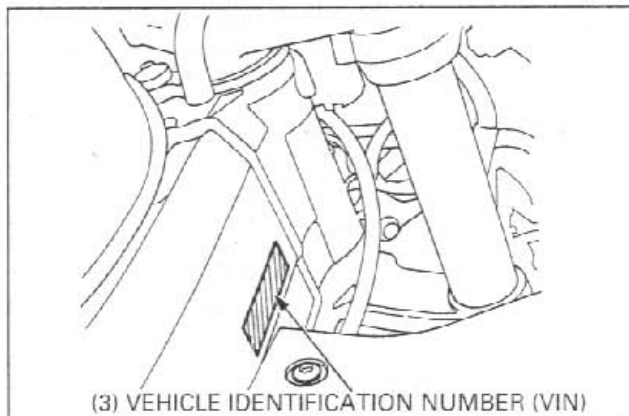
(1) FRAME SERIAL NUMBER

- (1) The frame serial number is stamped on the right side of the steering head.



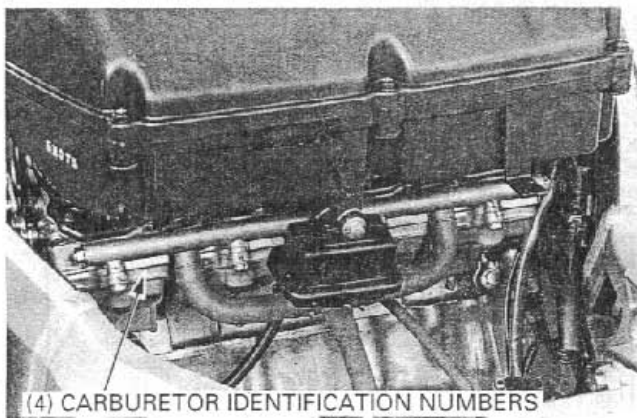
(2) ENGINE SERIAL NUMBER

- (2) The engine serial number is stamped on the right side of the upper crankcase.



(3) VEHICLE IDENTIFICATION NUMBER (VIN)

- (3) The Vehicle Identification Number (VIN) is located on right side of the frame near the steering head on the Safety Certification Label.



(4) CARBURETOR IDENTIFICATION NUMBERS

- (4) The carburetor identification numbers are stamped on the intake side of the carburetor body as shown.



(5) COLOR LABEL

- (5) The color label is attached as shown. When ordering color-coded parts, always specify the designated color code.

GENERAL INFORMATION

SPECIFICATIONS

| GENERAL                    |  |  |  |                     |                                     |
|----------------------------|--|--|--|---------------------|-------------------------------------|
|                            | ITEM                                   | SPECIFICATIONS   |  |                     |                                     |
| DIMENSIONS                 | Overall length                         | 2,055 mm (80.9 in)   |  |                     |                                     |
|                            | Overall width                          | '96 - '97: 675 mm (26.6 in)<br>After '97: 685 mm (26.9 in)   |  |                     |                                     |
|                            | Overall height                         | '96 - '97: 1,130 mm (44.5 in)<br>After '97: 1,135 mm (44.7 in)   |  |                     |                                     |
|                            | Wheelbase                              | 1,400 mm (55.1 in)   |  |                     |                                     |
|                            | Seat height                            | 810 mm (31.9 in)   |  |                     |                                     |
|                            | Footpeg height                         | '96 - '97: 380 mm (15.0 in)<br>After '97: 383 mm (15.1 in)   |  |                     |                                     |
|                            | Ground clearance                       | 140 mm (5.5 in)  |  |                     |                                     |
|                            | Dry weight                             |  |  |                     |                                     |
|                            |  | '96 - '97: 49 states/Canada type 183 kg (403 lbs)<br>California type 186 kg (410 lbs)<br>After '97: 49 states/Canada type 180 kg (397 lbs)<br>California type 183 kg (403 lbs)             |  |                     |                                     |
|                            | Curb weight                            |  |  |                     |                                     |
|                            |  | '96 - '97: 49 states/Canada type 205 kg (454 lbs)<br>California type 208 kg (459 lbs)<br>After '97: 49 states/Canada type 203 kg (448 lbs)<br>California type 206 kg (454 lbs)             |  |                     |                                     |
|                            | Maximum weight capacity                |  |  |                     |                                     |
|                            |  | '96 - '97: 49 states/Canada type 160 kg (353 lbs)<br>California type 160 kg (353 lbs)<br>After '97: 49 states/California type 160 kg (353 lbs)<br>Canada type 164 kg (352 lbs)             |  |                     |                                     |
|                            | FRAME                                  | Frame type   | Diamond  |                     |                                     |
|                            |  | Front suspension   | Telescopic fork                                  |                     |                                     |
|                            |  | Front wheel travel   | 110 mm (4.3 in)                                  |                     |                                     |
|                            |  | Rear suspension  | Swingarm   |                     |                                     |
|                            |  | Rear wheel travel  | 125 mm (4.9 in)                                  |                     |                                     |
| Rear damper                |  | Nitrogen gas-filled damper, with reserve tank  |  |                     |                                     |
| Front tire size            |  | '96 - '97: 130/70 ZR 16<br>After '97: 130/70 ZR 16 (61 W)  |  |                     |                                     |
| Rear tire size             |  | '96 - '97: 180/55 ZR 17<br>After '97: 180/55 ZR 17 (73 W)  |  |                     |                                     |
| Tire brand                 |  |  |  |                     |                                     |
|                            |  | Bridgestone<br>Michelin  |  |                     |                                     |
| Front brake                |  | Hydraulic double disc brake  |  |                     |                                     |
| Rear brake                 |  | Hydraulic single disc brake  |  |                     |                                     |
| Caster angle               |  | 24°  |  |                     |                                     |
| Trail length               |  | '96 - '97: 90 mm (3.5 in)<br>After '97: 95 mm (3.7 in)   |  |                     |                                     |
| Fuel tank capacity         | 18.0 liter (4.76 US gal, 3.96 Imp gal) |  |  |                     |                                     |
| Fuel tank reserve capacity | 3.5 liter (0.92 US gal, 0.77 Imp gal)  |  |  |                     |                                     |
| ENGINE                     | Bore and stroke                        | 71.0 x 58.0 mm (2.80 x 2.28 in)  |  |                     |                                     |
|                            | Displacement                           | 919 cm <sup>3</sup> (56.1 cu-in)   |  |                     |                                     |
|                            | Compression ratio                      | 11.0 : 1   |  |                     |                                     |
|                            | Valve train                            | Chain drive and DOHC   |  |                     |                                     |
|                            | Intake valve                           | opens 15° BTDC<br>closes 35° ABDC  | at 1 mm (0.04 in) lift<br>After '97              | 0° BTDC<br>37° ABDC | at 1 mm (0.04 in) lift<br>After '97 |
|                            | Exhaust valve                          | opens 39° BBDC<br>closes 11° ATDC  | 49 states/Canada type<br>and '96 - '97 all types | 40° BBDC<br>0° ATDC | California type                     |
|                            | Lubrication system                     | Forced pressure and wet sump   |  |                     |                                     |
|                            | Oil pump type                          | Trochoid   |  |                     |                                     |
|                            | Cooling system                         | Liquid-cooled  |  |                     |                                     |
|                            | Air filtration                         | Paper filter   |  |                     |                                     |
|                            | Crankshaft type                        | Unit type  |  |                     |                                     |
|                            | Engine dry weight                      |  |  |                     |                                     |
|                            |  | '96 - '97: 49 states/Canada type 66.9 kg (147.5 lbs)<br>California type 68.2 kg (150.4 lbs)<br>After '97: 49 states/Canada type 66.3 kg (146.2 lbs)<br>California type 67.6 kg (149.1 lbs) |  |                     |                                     |
|                            | Cylinder arrangement                   | Four cylinder, inline  |  |                     |                                     |

| GENERAL (Cont'd) |   |  |
|------------------|---|--|
| ITEM             |   | SPECIFICATIONS   |
| CARBURETOR       | Carburetor type<br>Throttle bore  | CV (Constant Velocity) type, with flat valve<br>38 mm (1.5 in)   |
| DRIVE TRAIN      | Clutch system<br>Clutch operation system<br>Transmission<br>Primary reduction<br>Final reduction<br>Gear ratio<br>1st<br>2nd<br>3rd<br>4th<br>5th<br>6th<br><br>Gearshift pattern | Multi-plate, wet<br>Mechanical type<br>Constant mesh, 6-speed<br>1.520 (76/50)<br>2.687 (43/16)<br>2.727 (30/11) }<br>1.933 (29/15) } '96 - '97:<br>1.600 (24/15) }<br>1.400 (28/20) }<br>1.263 (24/19) }<br>1.167 (21/18) }<br>2.769 (36/13) }<br>2.000 (26/13) }<br>1.600 (24/15) } After '97:<br>1.368 (26/19) }<br>1.227 (27/22) }<br>1.130 (26/23) }<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<br>Lighting system   | Full transistor digital ignition<br>Electric starter motor<br>Triple phase output alternator<br>SCR shorted/triple phase, full wave rectification<br>Battery   |



## GENERAL INFORMATION

Unit: mm (in)

| LUBRICATION SYSTEM                  |                      | STANDARD   | SERVICE LIMIT |
|-------------------------------------|----------------------|--|---------------|
| ITEM                                |                      |  |               |
| Engine oil capacity                 | At draining          | 3.5 liter (3.7 US qt, 3.1 Imp qt)  | —             |
|                                     | At disassembly       | 4.4 liter (4.6 US qt, 3.9 Imp qt)  | —             |
|                                     | At oil filter change | 3.6 liter (3.8 US qt, 3.2 Imp qt)  | —             |
| Recommended engine oil              |                      | HONDA 4-stroke oil or equivalent motor oil<br>API service classification SE, SF or SG<br>Viscosity: SAE 10W - 40 | —             |
| Oil pressure at oil pressure switch |                      | 490 kPa (5.0 kgf/cm <sup>2</sup> , 71 psi) at 6,000 rpm (min <sup>-1</sup> )/(80°C/176°F)                        | —             |
| Oil pump rotor                      | Tip clearance        | 0.15 - 0.22 (0.006 - 0.009)  | 0.20 (0.008)  |
|                                     | Body clearance       | 0.15 - 0.22 (0.006 - 0.009)  | 0.35 (0.014)  |
|                                     | Side clearance       | 0.02 - 0.07 (0.001 - 0.003)  | 0.10 (0.004)  |

| FUEL SYSTEM                      |                        |                               | SPECIFICATIONS                |
|----------------------------------|------------------------|-------------------------------|-------------------------------|
| ITEM                             |                        |                               |                               |
| Carburetor identification number | 49 states type         | '96 - '97:                    | VP88B                         |
|                                  |                        | After '97:                    | VP8CP                         |
|                                  | California type        | '96 - '97:                    | VP89A                         |
|                                  |                        | After '97:                    | VP8DA                         |
|                                  | Canada type            | '96:                          | VP88A                         |
|                                  |                        | '97:                          | VP88B                         |
| After '97:                       |                        | VP8CB                         |                               |
| Main jet                         | 49 states type         | '96 - '97:                    | #115 (See page 5-11)          |
|                                  |                        | After '97:                    | #120                          |
|                                  | California type        | '96 - '97:                    | #115                          |
|                                  |                        | After '97:                    | #120                          |
|                                  | Canada type            | '96:                          | #115                          |
|                                  |                        | '97:                          | No. 1, 4: #115/No. 2, 3: #118 |
| After '97:                       |                        | #120                          |                               |
| Slow jet                         |                        |                               | #40                           |
| Jet needle number                | 49 states type         | '96 - '97:                    | No. 1, 4: J5FB/No. 2, 3: J5FA |
|                                  |                        | After '97:                    | No. 1, 4: J5FH/No. 2, 3: J5DD |
|                                  | California type        | '96 - '97:                    | No. 1, 4: J5FB/No. 2, 3: J5FA |
|                                  |                        | After '97:                    | No. 1, 4: J5FA/No. 2, 3: J5FC |
|                                  | Canada type            | '96:                          | No. 1, 4: J5FZ/No. 2, 3: J5FY |
|                                  |                        | '97:                          | No. 1, 4: J5FB/No. 2, 3: J5FA |
| After '97:                       |                        | No. 1, 4: J5FH/No. 2, 3: J5DD |                               |
| Pilot screw initial opening      | '96 - '97:             |                               | 3 turns out                   |
|                                  | Except California type | After '97:                    | 1 - 5/8 turns out             |
|                                  | California type        |                               | 2 turns out                   |
| Float level                      |                        |                               | 13.7 mm (0.54 in)             |
| Idle speed                       | Except California type |                               | 1,100 ± 100 rpm               |
|                                  | California type        |                               | 1,200 ± 100 rpm               |
| Throttle grip free play          |                        |                               | 2 - 6 mm (1/12 - 1/4 in)      |

## COOLING SYSTEM

| ITEM                         |                     | SPECIFICATIONS |   |
|------------------------------|---------------------|----------------|---|
| Coolant capacity             | Radiator and engine | '96 - '97:     | 2.77 liter (2.93 US qt, 2.44 Imp qt)                        |
|                              |                     | After '97:     | 2.64 liter (2.79 US qt, 2.32 Imp qt)                        |
|                              | Reserve tank        | '96 - '97:     | 0.45 liter (0.476 US qt, 0.396 Imp qt)                      |
|                              |                     | After '97:     | 0.35 liter (0.370 US qt, 0.310 Imp qt)                      |
| Radiator cap relief pressure |                     | '96 - '97:     | 108 - 137 kPa (1.1 - 1.4 kgf/cm <sup>2</sup> , 16 - 20 psi) |
|                              |                     | After '97:     | 107.9 kPa (1.1 kgf/cm <sup>2</sup> , 16 psi)                |
| Thermostat                   | Begin to open       |                | 80 - 84°C (176 - 183°F)                                     |
|                              | Fully open          |                | 95°C (203°F)  |
|                              | Valve lift          |                | 8 mm (0.3 in) minimum                                       |

Unit: mm (in)

## CYLINDER HEAD/VALVES

| ITEM                     |  |                               | STANDARD  | SERVICE LIMIT                     |               |
|--------------------------|--|-------------------------------|---|-----------------------------------|---------------|
| Cylinder compression     | '96 - '97:                                 |                               | 1,177 kPa (12.0 kgf/cm <sup>2</sup> , 171 psi) at 500 - 600 rpm | —                                 |               |
|                          | After '97:                                 |                               | 1.2 kPa (13.0 kgf/cm <sup>2</sup> , 185 psi) at 350 rpm         | —                                 |               |
| Cylinder head warpage    |  |                               | —   | 0.10 (0.004)                      |               |
| Valve, valve guide       | Valve clearance                            | IN                            | 0.13 - 0.19 (0.005 - 0.007)                                     | —                                 |               |
|                          |  | '96 - '97:                    | EX  | 0.19 - 0.25 (0.007 - 0.010)       | —             |
|                          |  | After '97:                    | EX  | 0.22 - 0.28 (0.009 - 0.011)       | —             |
|                          | Valve stem O.D.                            | IN                            | 4.475 - 4.490 (0.1762 - 0.1768)                                 | 4.465 (0.1758)                    |               |
|                          |  | EX                            | 4.465 - 4.480 (0.1758 - 0.1764)                                 | 4.455 (0.1754)                    |               |
|                          | Valve guide I.D.                           | IN                            | 4.500 - 4.512 (0.1772 - 0.1776)                                 | 4.540 (0.1787)                    |               |
|                          |  | EX                            | 4.500 - 4.512 (0.1772 - 0.1776)                                 | 4.540 (0.1787)                    |               |
|                          | Stem-to-guide clearance                    | IN                            | 0.010 - 0.037 (0.0004 - 0.0015)                                 | —                                 |               |
|                          |  | EX                            | 0.020 - 0.047 (0.0008 - 0.0019)                                 | —                                 |               |
|                          | Valve guide projection above cylinder head | IN                            | 14.60 - 14.80 (0.575 - 0.583)                                   | —                                 |               |
| EX                       |  | 14.80 - 15.00 (0.583 - 0.591) | —   |                                   |               |
| Valve seat width         |  | IN/EX                         | 0.90 - 1.10 (0.035 - 0.043)                                     | 1.5 (0.06)                        |               |
| Valve spring free length | Inner                                      |                               | IN/EX   | 35.77 (1.408)                     | 34.07 (1.341) |
|                          | Outer                                      |                               | IN/EX   | 39.69 (1.563)                     | 37.79 (1.488) |
| Valve lifter             | Valve lifter O.D.                          |                               | IN/EX   | 25.978 - 25.993 (1.0228 - 1.0233) | 25.97 (1.022) |
|                          | Valve lifter bore I.D.                     |                               | IN/EX   | 26.010 - 26.026 (1.0240 - 1.0246) | 26.04 (1.025) |
| Camshaft                 | Cam lobe height                            | Except California type        | IN  | 36.040 - 36.280 (1.4189 - 1.4283) | 36.01 (1.418) |
|                          |  |                               | EX  | 35.800 - 36.040 (1.4094 - 1.4189) | 35.77 (1.408) |
|                          |  | California type               | IN  | 34.940 - 35.180 (1.3756 - 1.3850) | 34.91 (1.374) |
|                          |  |                               | EX  | 35.100 - 35.340 (1.3819 - 1.3913) | 35.07 (1.381) |
|                          | Runout                                     |                               |   | —                                 | 0.05 (0.002)  |
| Oil clearance            |  |                               | 0.020 - 0.062 (0.0008 - 0.0024)                                 | 0.10 (0.004)                      |               |

**GENERAL INFORMATION**

Unit: mm (in)

| <b>CLUTCH/GEARSHIFT LINKAGE</b>      |                 |                |                                       |                 |
|--------------------------------------|-----------------|----------------|---------------------------------------|-----------------|
| ITEM                                 |                 |                | STANDARD                              | SERVICE LIMIT   |
| Clutch lever free play               |                 |                | 10 - 20 (3/8 - 3/4)                   | —               |
| Clutch spring free length            |                 | '96 - '97:     | 50.2 (1.98)                           | 49.2 (1.93)     |
|                                      |                 | After '97:     | 48.8 (1.92)                           | 47.0 (1.85)     |
| Clutch disc thickness                |                 | '96 - '97:     | 2.62 - 2.78 (0.103 - 0.109)           | 2.3 (0.09)      |
|                                      |                 | After '97:     | 2.92 - 3.08 (0.11 - 0.12)             | 2.6 (0.102)     |
| Clutch plate warpage                 |                 |                | —                                     | 0.30 (0.012)    |
| Clutch outer guide                   |                 | I.D.           | 24.9935 - 25.0035 (0.98399 - 0.98451) | 25.016 (0.9849) |
|                                      |                 | O.D.           | 34.975 - 34.991 (1.3770 - 1.3776)     | 34.965 (1.3766) |
| Mainshaft O.D. at clutch outer guide |                 |                | 24.980 - 24.993 (0.9835 - 0.9840)     | 24.96 (0.983)   |
| Shift fork,<br>fork shaft            | Fork            | I.D.           | 12.000 - 12.021 (0.4724 - 0.4733)     | 12.03 (0.474)   |
|                                      |                 | Claw thickness | 5.93 - 6.00 (0.233 - 0.236)           | 5.9 (0.23)      |
|                                      | Fork shaft O.D. |                | 11.957 - 11.968 (0.4707 - 0.4712)     | 11.95 (0.470)   |

Unit: mm (in)

| <b>ALTERNATOR/STARTER CLUTCH</b> |  |  |                                   |                 |
|----------------------------------|--|--|-----------------------------------|-----------------|
| ITEM                             |  |  | STANDARD                          | SERVICE LIMIT   |
| Starter driven gear boss O.D.    |  |  | 51.699 - 51.718 (2.0354 - 2.0361) | 51.684 (2.0348) |

Unit: mm (in)

| <b>CRANKCASE/PISTON/CYLINDER</b>       |   |                         |   |               |
|--|---|-------------------------|---|---------------|
| ITEM                                   |   |                         | STANDARD                                | SERVICE LIMIT |
| Cylinder                               | I.D.                                    |                         | 71.000 - 71.015 (2.7953 - 2.7963)       | 71.10 (2.795) |
|  | Out of round                            |                         | —                                       | 0.10 (0.004)  |
|  | Taper                                   |                         | —                                       | 0.10 (0.004)  |
|  | Warpage                                 |                         | —                                       | 0.05 (0.002)  |
| Piston, piston<br>rings                | Piston mark direction                   |                         | "IN" mark facing toward the intake side | —             |
|  | Piston O.D.                             |                         | 70.965 - 70.985 (2.7939 - 2.7947)       | 70.90 (2.791) |
|  | Piston O.D. measurement point           |                         | 15 mm (0.6 in) from bottom of skirt     | —             |
|  | Piston pin bore I.D.                    |                         | 17.002 - 17.008 (0.6694 - 0.6696)       | 17.03 (0.670) |
|  | Piston pin O.D.                         |                         | 16.993 - 17.000 (0.6690 - 0.6693)       | 16.98 (0.669) |
|  | Piston-to-piston pin clearance          |                         | 0.002 - 0.015 (0.0001 - 0.0006)         | —             |
|  | Piston ring-to-ring<br>groove clearance | Top                     | 0.030 - 0.065 (0.0012 - 0.0026)         | 0.08 (0.003)  |
|  |   | Second                  | 0.015 - 0.045 (0.0006 - 0.0018)         | 0.07 (0.003)  |
|  | Piston ring end gap                     | Top                     | 0.28 - 0.38 (0.011 - 0.015)             | 0.5 (0.02)    |
|  |   | Second                  | 0.40 - 0.55 (0.016 - 0.022)             | 0.7 (0.03)    |
| Oil (side rail)                        |   | 0.2 - 0.7 (0.01 - 0.03) | 0.9 (0.04)                              |               |
| Cylinder-to-piston clearance           |   |                         | 0.015 - 0.050 (0.0006 - 0.0020)         | —             |
| Connecting rod small end I.D.          |   |                         | 17.016 - 17.034 (0.6699 - 0.6706)       | 17.04 (0.671) |
| Connecting rod-to-piston pin clearance |   |                         | 0.016 - 0.041 (0.0006 - 0.0016)         | —             |
| Crankpin oil clearance                 |   |                         | 0.030 - 0.052 (0.0012 - 0.0020)         | 0.06 (0.002)  |

Unit: mm (in)

## CRANKSHAFT/TRANSMISSION

| ITEM         |                            | STANDARD                        | SERVICE LIMIT                     |               |
|--------------|----------------------------|---------------------------------|-----------------------------------|---------------|
| Crankshaft   | Side clearance             | 0.05 – 0.20 (0.002 – 0.008)     | 0.30 (0.012)                      |               |
|              | Runout                     | —                               | 0.30 (0.012)                      |               |
|              | Main journal oil clearance | 0.017 – 0.035 (0.0007 – 0.0014) | 0.05 (0.002)                      |               |
| Transmission | Gear I.D.                  | M5, 6                           | 28.000 – 28.021 (1.1024 – 1.1032) | 28.04 (1.104) |
|              |                            | C1                              | 24.000 – 24.021 (0.9449 – 0.9457) | 24.04 (0.946) |
|              |                            | C2, 3, 4                        | 31.000 – 31.025 (1.2205 – 1.2215) | 31.04 (1.222) |
|              | Bushing O.D.               | M5, 6                           | 27.959 – 27.980 (1.1007 – 1.1016) | 27.94 (1.100) |
|              |                            | C2                              | 30.955 – 30.980 (1.2187 – 1.2197) | 30.93 (1.218) |
|              |                            | C3, 4                           | 30.950 – 30.975 (1.2185 – 1.2195) | 30.93 (1.218) |
|              | Bushing I.D.               | M5                              | 24.985 – 25.006 (0.9837 – 0.9845) | 25.02 (0.985) |
|              |                            | C2                              | 27.985 – 28.006 (1.1018 – 1.1026) | 28.02 (1.103) |
|              | Gear-to-bushing clearance  | M5, 6                           | 0.020 – 0.062 (0.0008 – 0.0024)   | 0.10 (0.004)  |
|              |                            | C2                              | 0.020 – 0.070 (0.0008 – 0.0028)   | 0.11 (0.004)  |
|              |                            | C3, 4                           | 0.025 – 0.075 (0.0010 – 0.0030)   | 0.11 (0.004)  |
|              | Mainshaft O.D.             | M5                              | 24.967 – 24.980 (0.9830 – 0.9835) | 24.96 (0.983) |
|              |                            | Clutch outer guide              | 24.980 – 24.993 (0.9835 – 0.9840) | 24.96 (0.983) |
|              | Countershaft O.D.          | C2                              | 27.967 – 27.980 (1.1011 – 1.1016) | 27.96 (1.101) |
|              | Bushing-to-shaft clearance | M5                              | 0.005 – 0.039 (0.0002 – 0.0015)   | 0.08 (0.003)  |
| C2           |                            | 0.005 – 0.039 (0.0002 – 0.0015) | 0.08 (0.003)                      |               |

**GENERAL INFORMATION**

| <b>FRONT WHEEL/SUSPENSION/STEERING</b> |                               |   |   | Unit: mm (in)        |              |
|--|-------------------------------|---|---|----------------------|--------------|
| <b>ITEM</b>                            |                               | <b>STANDARD</b>                             |   | <b>SERVICE LIMIT</b> |              |
| Minimum tire tread depth               |                               | —   |   | 1.5 (0.06)           |              |
| Cold tire pressure                     | Up to 90 kg (200 lb) load     | 250 kPa (2.50 kgf/cm <sup>2</sup> , 36 psi) |   | —                    |              |
|  | Up to maximum weight capacity | 250 kPa (2.50 kgf/cm <sup>2</sup> , 36 psi) |   | —                    |              |
| Axle runout                            |                               | —   |   | 0.20 (0.008)         |              |
| Wheel rim runout                       | Radial                        | —   |   | 2.0 (0.08)           |              |
|  | Axial                         | —   |   | 2.0 (0.08)           |              |
| Fork                                   | Spring free length            | '96 - '97:                                  | 248.2 (9.77)  | 243.2 (9.57)         |              |
|  |                               | After '97:                                  | 250.2 (9.85)  | 245.2 (9.65)         |              |
|  | Spring direction              |   | With the tapered end facing down                                  |                      | —            |
|  | Tube runout                   |   | —   |                      | 0.20 (0.008) |
|  | Recommended fork fluid        |   | Pro-Honda Suspension Fluid SS-8                                   |                      | —            |
|  | Fluid level                   |   | 114 ± 4 (4.5 ± 0.2)   |                      | —            |
|  | Fluid capacity                | '96 - '97:                                  | 561 ± 2.5 cm <sup>3</sup> (19.0 ± 0.02 US oz, 19.7 ± 0.09 Imp oz) |                      | —            |
|  |                               | After '97:                                  | 540 ± 2.5 cm <sup>3</sup> (18.3 ± 0.02 US oz, 19.0 ± 0.09 Imp oz) |                      | —            |
|  | Pre-load adjuster setting     |   | 12 mm (0.5 in) from top of fork cap                               |                      | —            |
|  | Rebound adjuster setting      |   | 1 turn from full hard   |                      | —            |
| Compression adjuster setting           | '96 - '97:                    | 1 turn from full hard                       |   | —                    |              |
|  | After '97:                    | 1.5 turn from full hard                     |   | —                    |              |
| Steering head bearing preload          |                               | 1.0 - 1.5 kgf (2.2 - 3.3 lbf)               |   | —                    |              |

| <b>REAR WHEEL/SUSPENSION</b> |                               |   |                                | Unit: mm (in)        |   |
|------------------------------|-------------------------------|---|--------------------------------|----------------------|---|
| <b>ITEM</b>                  |                               | <b>STANDARD</b>                             |                                | <b>SERVICE LIMIT</b> |   |
| Minimum tire tread depth     |                               | —   |                                | 2.0 (0.08)           |   |
| Cold tire pressure           | Up to 90 kg (200 lb) load     | 290 kPa (2.90 kgf/cm <sup>2</sup> , 42 psi) |                                | —                    |   |
|                              | Up to maximum weight capacity | 290 kPa (2.90 kgf/cm <sup>2</sup> , 42 psi) |                                | —                    |   |
| Axle runout                  |                               | —   |                                | 0.20 (0.008)         |   |
| Wheel rim runout             | Radial                        | —   |                                | 2.0 (0.08)           |   |
|                              | Axial                         | —   |                                | 2.0 (0.08)           |   |
| Shock absorber               | Spring free length            | '96 - '97:                                  | 172.6 (6.80)                   | 169.1 (6.66)         |   |
|                              |                               | After '97:                                  | 167.7 (6.60)                   | 164.3 (6.47)         |   |
|                              | Spring direction              |   | With the tapered end facing up |                      | — |
|                              | Pre-load adjuster setting     | '96 - '97:                                  | 2nd position                   |                      | — |
|                              |                               | After '97:                                  | 3rd position                   |                      | — |
|                              | Rebound adjuster setting      |   | 1 turn from full hard          |                      | — |
| Compression adjuster setting |                               | 1 turn from full hard                       |                                | —                    |   |
| Drive chain                  | Size/link                     | DID   | DID525HV GC&B - 120ZB          |                      | — |
|                              |                               | RK  | RKGB525ROZ1 - 120LJF           |                      | — |
|                              | Slack                         | 20 - 30 (1.2 - 1.6)                         |                                | 50 (1.97)            |   |

Unit: mm (in)

| HYDRAULIC BRAKE |                       |            |                                   | STANDARD                          | SERVICE LIMIT   |
|-----------------|-----------------------|------------|-----------------------------------|-----------------------------------|-----------------|
| ITEM            |                       |            |                                   |                                   |                 |
| Front           | Specified brake fluid |            | DOT 4                             |                                   | —               |
|                 | Brake disc thickness  |            | 4.5 (0.18)                        |                                   | 3.5 (0.14)      |
|                 | Brake disc runout     |            | —                                 |                                   | 0.30 (0.012)    |
|                 | Master cylinder I.D.  | '96 - '97: |                                   | 14.000 - 14.043 (0.5512 - 0.5529) | 14.055 (0.5533) |
|                 |                       | After '97: |                                   | 15.870 - 15.913 (0.6248 - 0.6265) | 15.925 (0.627)  |
|                 | Master piston O.D.    | '96 - '97: |                                   | 13.957 - 13.984 (0.5495 - 0.5506) | 13.945 (0.5490) |
|                 |                       | After '97: |                                   | 15.827 - 15.854 (0.6231 - 0.6242) | 15.815 (0.623)  |
|                 | Caliper cylinder I.D. | A          | '96 - '97:                        | 30.230 - 30.280 (1.1902 - 1.1921) | 30.29 (1.193)   |
|                 |                       |            | After '97:                        | 32.03 - 32.08 (1.261 - 1.263)     | —               |
|                 |                       | B          | '96 - '97:                        | 27.000 - 27.050 (1.0630 - 1.0650) | 27.06 (1.065)   |
|                 |                       |            | After '97:                        | 33.96 - 34.01 (1.337 - 1.339)     | —               |
|                 | Caliper piston O.D.   | A          | '96 - '97:                        | 30.148 - 30.198 (1.1869 - 1.1889) | 30.140 (1.1866) |
| After '97:      |                       |            | 31.965 - 31.998 (1.2585 - 1.2598) | —                                 |                 |
| B               |                       | '96 - '97: | 26.935 - 26.968 (1.0604 - 1.0617) | 26.927 (1.0610)                   |                 |
|                 |                       | After '97: | 33.895 - 33.928 (1.3344 - 1.3357) | —                                 |                 |
| Rear            | Specified brake fluid |            | DOT 4                             |                                   | —               |
|                 | Brake disc thickness  |            | 5.0 (0.20)                        |                                   | 4.0 (0.16)      |
|                 | Brake disc runout     |            | —                                 |                                   | 0.30 (0.012)    |
|                 | Master cylinder I.D.  |            | 15.870 - 15.913 (0.6248 - 0.6265) |                                   | 15.925 (0.6270) |
|                 | Master piston O.D.    |            | 15.827 - 15.854 (0.6231 - 0.6242) |                                   | 15.815 (0.6226) |
|                 | Caliper cylinder I.D. |            | 38.18 - 38.23 (1.503 - 1.505)     |                                   | 38.24 (1.506)   |
|                 | Caliper piston O.D.   |            | 38.115 - 38.148 (1.5006 - 1.5019) |                                   | 38.107 (1.5003) |

| BATTERY/CHARGING SYSTEM               |                                      |                |                         | SPECIFICATIONS |
|---------------------------------------|--------------------------------------|----------------|-------------------------|----------------|
| ITEM                                  |                                      |                |                         |                |
| Battery                               | Capacity                             |                | 12V - 8 Ah              |                |
|                                       | Current leakage                      |                | 0.1 mA max.             |                |
|                                       | Voltage (20°C/68°F)                  | Fully charged  |                         | 13.0 - 13.2 V  |
|                                       |                                      | Needs charging |                         | Below 12.3 V   |
|                                       | Charging current                     | Normal         |                         | 0.9 A/5 - 10 h |
| Quick                                 |                                      | 4.0 A/0.5 h    |                         |                |
| Alternator                            | Capacity                             |                | 384 W/5,000 rpm         |                |
|                                       | Charging coil resistance (20°C/68°F) |                | 0.1 - 0.3 Ω             |                |
| Regulator/rectifier regulated voltage |                                      |                | 13.5 - 15.5 V/5,000 rpm |                |

## GENERAL INFORMATION

### IGNITION SYSTEM

| ITEM                                  |          | SPECIFICATIONS                    |          |
|---------------------------------------|----------|-----------------------------------|----------|
| Spark plug                            |          | NGK                               | DENSO    |
|                                       | Standard | CR9EH 9                           | U27FER 9 |
|                                       | Optional | CR8EH 9                           | U24FER 9 |
| Spark plug gap                        |          | 0.80 – 0.90 mm (0.031 – 0.035 in) |          |
| Ignition coil peak voltage            |          | 100 V minimum                     |          |
| Ignition pulse generator peak voltage |          | 0.7 V minimum                     |          |
| Ignition timing                       | "F" mark | 10° BTDC at idle                  |          |

Unit: mm (in)

### ELECTRIC STARTER

| ITEM                       | STANDARD                  | SERVICE LIMIT |
|----------------------------|---------------------------|---------------|
| Starter motor brush length | 12.0 – 13.0 (0.47 – 0.51) | 4.5 (0.18)    |

### LIGHTS/METERS/SWITCHES

| ITEM  |                                 | SPECIFICATIONS           |                  |
|---|---------------------------------|--------------------------|------------------|
| Bulbs   | Headlight (High/low beam)       | 12 V – 45/45 W x 2       |                  |
|   | Position light                  | 12 V – 5 W               |                  |
|   | Brake/tail light                | 12 V – 32/3 cp           |                  |
|   | Front turn signal/running light | 12 V – 32/3 cp           |                  |
|   | Rear turn signal light          | 12 V – 32 cp             |                  |
|   | License light                   | 12 V – 4 cp              |                  |
|   | Instrument light                | '96 – '97:               | 12 V – 1.7 W x 3 |
|   |                                 | After '97:               | 1.1 W x 2        |
|   | Turn signal indicator           | '96 – '97:               | 12 V – 1.7 W x 2 |
|   |                                 | After '97:               | 12 V – 1.1 W x 2 |
|   | High beam indicator             | '96 – '97:               | 12 V – 1.7 W     |
|   |                                 | After '97:               | 12 V – 1.1 W     |
|   | Neutral indicator               | '96 – '97:               | 12 V – 1.7 W     |
|   |                                 | After '97:               | 12 V – 1.1 W     |
|   | Oil pressure indicator          | '96 – '97:               | 12 V – 1.7 W     |
| After '97:  |                                 | 12 V – 1.1 W             |                  |
| Side stand indicator                              | '96 – '97:                      | 12 V – 1.7 W             |                  |
| Coolant temperature gauge light                   | After '97:                      | 12 V – 1.1 W             |                  |
| Fuse  | Main fuse                       | 30 A                     |                  |
|   | Sub fuse                        | 10 A x 4, 20 A x 1       |                  |
| Fan motor switch                                  | Start to close (ON)             | 98 – 102°C (208 – 216°F) |                  |
|   | Stop to open -                  | 93 – 97°C (199 – 207°F)  |                  |
| Coolant temperature sensor resistance (20°C/68°F) |                                 | 45 – 60 Ω                |                  |

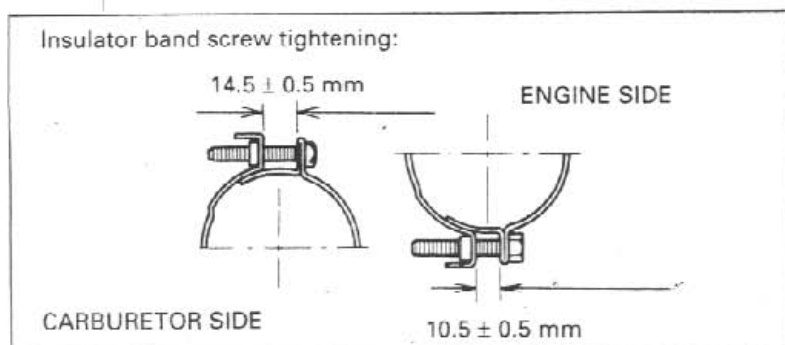
## TORQUE VALUES

| FASTENER TYPE          | TORQUE<br>N·m (kgf·m, lbfft) | FASTENER TYPE                         | TORQUE<br>N·m (kgf·m, lbfft) |
|------------------------|------------------------------|---------------------------------------|------------------------------|
| 5 mm hex bolt and nut  | 5 (0.5, 3.6)                 | 5 mm screw                            | 4 (0.4, 2.9)                 |
| 6 mm hex bolt and nut  | 10 (1.0, 7)                  | 6 mm screw and flange bolt (SH type)  | 9 (0.9, 6.5)                 |
| 8 mm hex bolt and nut  | 22 (2.2, 16)                 | 6 mm flange bolt (8 mm head)          | 9 (0.9, 6.5)                 |
| 10 mm hex bolt and nut | 34 (3.5, 25)                 | 6 mm flange bolt (10 mm head) and nut | 12 (1.2, 9)                  |
| 12 mm hex bolt and nut | 54 (5.5, 40)                 | 8 mm flange bolt and nut              | 26 (2.7, 20)                 |
|                        |                              | 10 mm flange bolt and nut             | 39 (4.0, 29)                 |

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

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

| ENGINE              | ITEM                       | Q'TY                            | THREAD DIA.<br>(mm)  | TORQUE<br>N·m (kgf·m, lbfft) | REMARKS         |               |
|---------------------|----------------------------|---------------------------------|----------------------|------------------------------|-----------------|---------------|
| <b>MAINTENANCE:</b> | Crankshaft hole cap        | 1                               | 45                   | 18 (1.8, 13)                 | NOTE 4          |               |
|                     | Spark plug                 | 4                               | 10                   | 12 (1.2, 8.7)                |                 |               |
|                     | <b>LUBRICATION SYSTEM:</b> | Oil drain bolt                  | 1                    | 12                           | 29 (3.0, 22)    |               |
|                     |                            | Oil filter cartridge            | 1                    | 20                           | 10 (1.0, 7.2)   | NOTE 6, 7     |
|                     |                            | Oil pump driven sprocket bolt   | 1                    | 6                            | 15 (1.5, 11)    | NOTE 2        |
|                     |                            | Oil cooler boss                 | 1                    | 20                           | 64 (6.5, 47)    | NOTE 2        |
|                     |                            | <b>COOLING SYSTEM:</b>          | Water pump coverbolt | 3                            | 6               | 13 (1.3, 9.4) |
|                     | Coolant temperature sensor |                                 | 1                    | PT1/8                        | 10 (1.0, 7.2)   | NOTE 1        |
|                     | <b>FUEL SYSTEM:</b>        | Carburetor assembly bolt, 5 mm  | 1                    | 5                            | 5 (0.5, 4)      |               |
|                     |                            | 6 mm                            | 1                    | 6                            | 10 (1.0, 7.2)   |               |
|                     |                            | Vacuum plug for synchronization | 3                    | 5                            | 3.0 (0.30, 2.2) |               |
|                     |                            | Boost joint for fuel valve      | 1                    | 5                            | 2.5 (0.25, 1.8) |               |
|                     |                            | Carburetor insulator band screw | 8                    | 5                            |                 | See below     |
|                     |                            |                                 |                      |                              |                 |               |





**GENERAL INFORMATION**

| <b>ENGINE (Cont'd)</b>                      |    | <b>Q'TY</b> | <b>THREAD DIA.<br/>(mm)</b> | <b>TORQUE<br/>N-m (kgf-m, lbf-ft)</b> | <b>REMARKS</b> |
|---|----|-------------|-----------------------------|---------------------------------------|----------------|
| <b>ENGINE MOUNTING:</b>                     |    |             |                             |                                       |                |
| Drive sprocket bolt                         | 1  | 10          | 54 (5.5, 40)                |                                       |                |
| <b>CYLINDER HEAD/VALVES:</b>                |    |             |                             |                                       |                |
| Breather plate flange bolt                  | 3  | 6           | 12 (1.2, 8.7)               |                                       | NOTE 2         |
| Cylinder head stud bolt                     | 8  | 8           | 25 (2.6, 19)                |                                       |                |
| Cylinder head cover special bolt            | 6  | 6           | 10 (1.0, 7.2)               |                                       |                |
| Camshaft holder flange bolt                 | 10 | 6           | 12 (1.2, 8.7)               |                                       |                |
| Cylinder head socket bolt                   | 10 | 9           | 48 (4.8, 35)                |                                       | NOTE 6         |
| Cam sprocket bolt                           | 4  | 7           | 20 (2.0, 14)                |                                       | NOTE 2         |
| Cam chain tensioner lifter mounting bolt    | 2  | 6           | 12 (1.2, 8.7)               |                                       |                |
| Air bleed tube joint                        | 1  | 10          | 25 (2.5, 18)                |                                       |                |
| <b>CLUTCH/GEARSHIFT LINKAGE:</b>            |    |             |                             |                                       |                |
| Right crankcase cover SH bolt               | 7  | 6           | 12 (1.2, 8.7)               |                                       |                |
| Clutch center lock nut                      | 1  | 22          | 128 (13.1, 94.8)            |                                       | NOTE 5, 6      |
| Gearshift pedal spring stopper              | 1  | 8           | 22 (2.2, 16)                |                                       |                |
| Shift drum center bolt                      | 1  | 8           | 23 (2.3, 17)                |                                       | NOTE 2         |
| Shift drum bearing set plate bolt           | 2  | 6           | 12 (1.2, 8.7)               |                                       | NOTE 2         |
| <b>ALTERNATOR/STARTER CLUTCH:</b>           |    |             |                             |                                       |                |
| Left crankcase cover SH bolt                | 10 | 6           | 12 (1.2, 8.7)               |                                       |                |
| Flywheel flange bolt                        | 1  | 10          | 93 (9.5, 69)                |                                       | NOTE 6         |
| Stator mounting socket bolt                 | 4  | 6           | 12 (1.2, 8.7)               |                                       |                |
| Starter one-way clutch socket bolt          | 6  | 6           | 16 (1.6, 12)                |                                       | NOTE 2         |
| <b>CRANKCASE/PISTON/CYLINDER:</b>           |    |             |                             |                                       |                |
| Crankcase bolt, 10 mm                       | 1  | 10          | 39 (4.0, 29)                |                                       |                |
| 9 mm  | 10 | 9           | 35 (3.6, 26)                |                                       | NOTE 6         |
| 8 mm  | 2  | 8           | 24 (2.4, 17)                |                                       |                |
| 6 mm  | 18 | 6           | 12 (1.2, 8.7)               |                                       |                |
| Connecting rod nut                          | 8  | 8           | 34 (3.5, 25)                |                                       | NOTE 6         |
| Lower crankcase sealing bolt, 20 mm         | 1  | 20          | 29 (3.0, 22)                |                                       | NOTE 2         |
| 18 mm                                       | 1  | 18          | 44 (4.5, 33)                |                                       | NOTE 2         |
| <b>CRANKSHAFT/TRANSMISSION:</b>             |    |             |                             |                                       |                |
| Mainshaft bearing set plate bolt            | 2  | 6           | 12 (1.2, 8.7)               |                                       | NOTE 2         |
| <b>IGNITION SYSTEM:</b>                     |    |             |                             |                                       |                |
| Ignition pulse generator cover SH bolt      | 8  | 6           | 12 (1.2, 8.7)               |                                       | NOTE 1         |
| Ignition pulse generator rotor special bolt | 1  | 10          | 59 (6.0, 43)                |                                       |                |
| <b>LIGHTS/METERS/SWITCHES:</b>              |    |             |                             |                                       |                |
| Neutral switch                              | 1  | 10          | 12 (1.2, 8.7)               |                                       |                |
| Oil pressure switch                         | 1  | PT1/8       | 12 (1.2, 8.7)               |                                       | NOTE 1         |

| FRAME                                    |            | Q'TY | THREAD DIA.<br>(mm) | TORQUE<br>N·m (kgf·m, lbf·ft) | REMARKS        |
|--|------------|------|---------------------|-------------------------------|----------------|
| <b>FRAME/BODY PANELS/EXHAUST SYSTEM:</b> |            |      |                     |                               |                |
| Upper cowl stay mounting bolt            |            | 2    | 8                   | 26 (2.7, 20)                  |                |
| Front fender mounting bolt               |            | 8    | 6                   | 5 (0.5, 3.6)                  |                |
| Exhaust pipe joint nut                   |            | 8    | 7                   | 12 (1.2, 8.7)                 |                |
| Muffler mounting bolt/nut                |            | 2    | 8                   | 25 (2.6, 19)                  |                |
| Step holder mounting bolt                |            | 4    | 8                   | 26 (2.7, 20)                  |                |
| Footpeg mounting bolt                    |            | 1    | 10                  | 44 (4.5, 33)                  | NOTE 9         |
| Bank sensor                              |            | 2    | 8                   | 10 (1.0, 7.2)                 |                |
| Handlebar weight screw                   |            | 2    | 6                   | 10 (1.0, 7.2)                 |                |
| <b>FUEL SYSTEM:</b>                      |            |      |                     |                               |                |
| Fuel valve                               |            | 1    | 22                  | 34 (3.5, 25)                  |                |
| Sub-air cleaner mounting bolt            |            | 1    | 6                   | 7 (0.7, 5.1)                  |                |
| <b>COOLING SYSTEM:</b>                   |            |      |                     |                               |                |
| Fan motor nut                            |            | 1    | 5                   | 2.5 (0.25, 1.8)               | NOTE 2         |
| Fan motor switch                         |            | 1    | PT1/8               | 18 (1.8, 13)                  | NOTE 1         |
| <b>ENGINE MOUNTING:</b>                  |            |      |                     |                               |                |
| Left engine hanger bolt                  |            | 2    | 10                  | 39 (4.0, 29)                  |                |
| Right engine hanger bolt                 |            | 1    | 10                  | 44 (4.5, 33)                  |                |
| Engine hanger nut (Rear/upper)           |            | 1    | 10                  | 39 (4.0, 29)                  |                |
| (Rear/lower)                             |            | 1    | 10                  | 39 (4.0, 29)                  |                |
| Engine hanger adjusting bolt             |            | 1    | 22                  | 11 (1.1, 8)                   |                |
| Engine hanger adjusting bolt lock nut    |            | 1    | 22                  | 54 (5.5, 40)                  |                |
| Engine hanger plate bolt                 |            | 4    | 8                   | 26 (2.7, 20)                  |                |
| <b>FRONT WHEEL/SUSPENSION/STEERING:</b>  |            |      |                     |                               |                |
| Steering stem nut                        |            | 1    | 24                  | 103 (10.5, 76)                | See page 13-28 |
| Top thread A                             |            | 1    | 26                  | —                             |                |
| Top thread B                             |            | 1    | 26                  | —                             |                |
| Fork top bridge pinch bolt               | '96 - '97: | 2    | 8                   | 23 (2.3, 17)                  |                |
|  | After '97: | 2    | 8                   | 22 (2.2, 16)                  |                |
| Fork bottom bridge pinch bolt            | '96 - '97: | 2    | 10                  | 49 (5.0, 36)                  |                |
|  | After '97: | 4    | 8                   | 27 (2.8, 20)                  |                |
| Front axle bolt                          |            | 1    | 14                  | 59 (6.0, 43)                  |                |
| Front axle holder bolt                   |            | 4    | 8                   | 22 (2.2, 16)                  |                |
| Front brake disc mounting bolt           |            | 12   | 6                   | 20 (2.0, 14)                  | NOTE 9         |
| Fork cap                                 | '96 - '97: | 2    | 42                  | 23 (2.3, 17)                  |                |
|  | After '97: | 2    | 42                  | 22 (2.2, 16)                  |                |
| Fork socket bolt                         | '96 - '97: | 2    | 8                   | 20 (2.0, 14)                  | NOTE 2         |
|  | After '97: | 2    | 10                  | 34 (3.5, 25)                  |                |
| <b>REAR WHEEL/SUSPENSION:</b>            |            |      |                     |                               |                |
| Rear axle nut                            |            | 1    | 18                  | 93 (9.5, 69)                  |                |
| Rear brake disc mounting bolt            |            | 4    | 8                   | 42 (4.3, 31)                  | NOTE 9         |
| Driven sprocket nut                      |            | 5    | 12                  | 108 (11.0, 80)                | NOTE 8         |
| Rear shock absorber upper mounting nut   |            | 1    | 10                  | 44 (4.5, 33)                  | NOTE 8         |
| Shock arm plate nut                      |            | 2    | 10                  | 44 (4.5, 33)                  | NOTE 8         |
| Shock link nut                           |            | 2    | 10                  | 44 (4.5, 33)                  | NOTE 8         |
| Swingarm pivot adjusting bolt            |            | 1    | 30                  | 15 (1.5, 11)                  | See page 14-22 |
| Swingarm pivot lock nut                  |            | 1    | 30                  | 64 (6.5, 47)                  |                |
| Swingarm pivot nut                       |            | 1    | 18                  | 93 (9.5, 69)                  | NOTE 8         |
| Drive chain slider bolt                  |            | 2    | 6                   | 9 (0.9, 6.5)                  |                |

**GENERAL INFORMATION**

| FRAME (Cont'd)                         |            | Q'TY | THREAD DIA.<br>(mm) | TORQUE<br>N-m (kgf-m, lbfft) | REMARKS |
|--|------------|------|---------------------|------------------------------|---------|
| <b>HYDRAULIC BRAKE:</b>                |            |      |                     |                              |         |
| Front brake caliper mounting bolt      |            | 4    | 8                   | 30 (3.1, 22)                 | NOTE 9  |
| Front brake pipe mounting bolt         |            | 2    | 10                  | 17 (1.7, 12)                 |         |
| Front brake caliper assembly torx bolt | '96 - '97: | 8    | 8                   | 32 (3.3, 24)                 | NOTE 2  |
|  | After '97: | 8    | 8                   | 23 (2.3, 17)                 | NOTE 9  |
| Front oil cup mounting nut             |            | 1    | 6                   | 6 (0.6, 4.3)                 |         |
| Brake lever pivot bolt                 |            | 1    | 6                   | 1 (0.1, 0.7)                 |         |
| Brake lever pivot nut                  |            | 1    | 6                   | 6 (0.6, 4.3)                 |         |
| Brake hose oil bolt                    |            | 5    | 10                  | 34 (3.5, 25)                 |         |
| Pad pin                                | '96 - '97: | 3    | 10                  | 18 (1.8, 13)                 |         |
|  | After '97: | 5    | 10                  | 18 (1.8, 13)                 |         |
| Pad pin plug                           | '96 - '97: | 3    | 10                  | 2.5 (0.25, 1.8)              |         |
|  | After '97: | 1    | 10                  | 2.4 (0.24, 1.7)              |         |
| Brake caliper bleeder                  |            | 3    | 8                   | 6 (0.6, 4.3)                 |         |
| Rear brake hose guide bolt             |            | 1    | 6                   | 12 (1.2, 9)                  |         |
| Rear master cylinder joint nut         |            | 1    | 8                   | 18 (1.8, 13)                 |         |
| Rear master cylinder hose joint screw  |            | 1    | 4                   | 1.5 (0.15, 1.1)              |         |
| Rear brake caliper pin bolt            |            | 1    | 12                  | 27 (2.8, 20)                 |         |
| Rear brake caliper bolt                | '96 - '97: | 1    | 8                   | 23 (2.3, 17)                 |         |
|  | After '97: | 1    | 8                   | 22 (2.2, 16)                 |         |
| Rear caliper clamp bolt                |            | 1    | 6                   | 9 (0.9, 6.5)                 | NOTE 9  |
| <b>LIGHTS/METERS/SWITCHES:</b>         |            |      |                     |                              |         |
| Side stand mounting bolt               |            | 1    | 10                  | 10 (1.0, 7)                  |         |
| Side stand lock nut                    |            | 1    | 10                  | 29 (3.0, 22)                 |         |
| Side stand switch mounting bolt        |            | 1    | 6                   | 10 (1.0, 7)                  | NOTE 9  |
| Side stand bracket bolt                |            | 2    | 10                  | 44 (4.5, 33)                 | NOTE 9  |
| Ignition switch mounting bolt          |            | 2    | 8                   | 25 (2.5, 18)                 | NOTE 2  |

## TOOLS

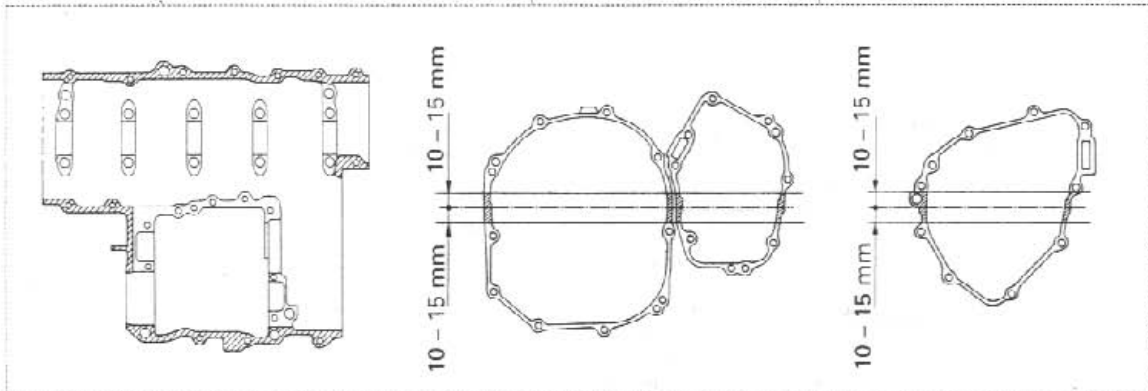
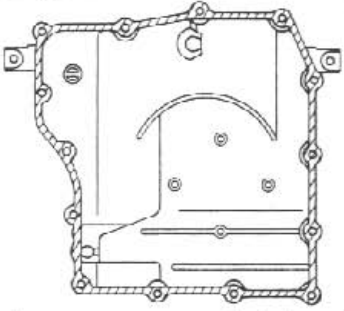
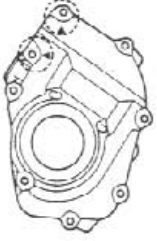
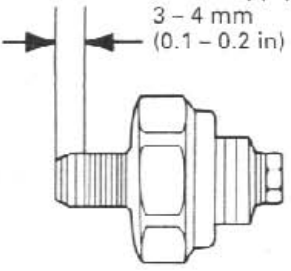
- NOTES: 1. Equivalent commercially available in U.S.A..  
 2. Not available in U.S.A..  
 3. Alternative tool.  
 4. Newly provided tool.

| DESCRIPTION                        | TOOL NUMBER     | REMARKS   | REF. SEC.      |
|------------------------------------|-----------------|---|----------------|
| Carburetor float level gauge       | 07401 - 0010000 |   | 5              |
| Oil pressure gauge attachment      | 07406 - 0030000 | NOTE 1  | 4              |
| Oil pressure gauge                 | 07506 - 3000000 | NOTE 1  | 4              |
| Clutch center holder               | 07724 - 0050002 | NOTE 1  | 9              |
| Flywheel holder                    | 07725 - 0040000 | NOTE 1  | 10             |
| Rotor puller                       | 07733 - 0020001 | NOTE 3:<br>07933 - 3950000                                  | 10             |
| Adjustable valve guide driver      | 07743 - 0020000 | NOTE 2  | 8              |
| Attachment, 37 x 40 mm             | 07746 - 0010200 |   | 9, 14          |
| Attachment, 42 x 47 mm             | 07746 - 0010300 |   | 9, 13, 14      |
| Attachment, 52 x 55 mm             | 07746 - 0010400 |   | 14             |
| Attachment, 24 x 26 mm             | 07746 - 0010700 |   | 14             |
| Driver B                           | 07746 - 0030100 |   | 12             |
| Inner driver, 25 mm                | 07746 - 0030200 |   | 12             |
| Pilot, 17 mm                       | 07746 - 0040400 |   | 14             |
| Pilot, 20 mm                       | 07746 - 0040500 |   | 13, 14         |
| Pilot, 35 mm                       | 07746 - 0040800 |   | 9              |
| Pilot, 28 mm                       | 07746 - 0041100 |   | 14             |
| Bearing remover shaft              | 07746 - 0050100 |   | 13, 14         |
| Bearing remover head, 20 mm        | 07746 - 0050600 |   | 13, 14         |
| Driver                             | 07749 - 0010000 |   | 9, 13, 14      |
| Valve spring compressor            | 07757 - 0010000 |   | 8              |
| Valve seat cutter                  |                 | NOTE 1  | 8              |
| Seat cutter, 27.5 mm (45° IN/EX)   | 07780 - 0010200 |   |                |
| Flat cutter, 30 mm (32° IN)        | 07780 - 0012200 |   |                |
| Flat cutter, 27 mm (32° EX)        | 07780 - 0013300 |   |                |
| Inferior cutter, 30 mm (60° IN/EX) | 07780 - 0014000 |   |                |
| Cutter holder, 4.5 mm              | 07781 - 0010600 |   |                |
| Pilot screw wrench                 | 07908 - 4220201 | 07908 - 4730001<br>(Except California type)                 | 5              |
| Pivot adjusting wrench             | 07908 - 4690003 |   | 14             |
| Snap ring pliers                   | 07914 - SA50001 | NOTE 2:<br>07914 - 3230001                                  | 15             |
| Steering stem socket               | 07916 - 3710101 | NOTE 2:<br>07916 - 3710100                                  | 13             |
| Bearing remover set                | 07936 - 3710001 |   | 14             |
| — Remover handle                   | 07936 - 3710100 |   |                |
| — Remover head, 20 mm              | 07936 - 3710600 |   |                |
| — Remover weight                   | 07741 - 0010201 | NOTE 2:<br>07936 - 3710200<br>07936 - 371020A (U.S.A. only) |                |
| Ball race remover set              | 07946 - KM90001 | NOTE 2:   | See page 13-27 |
| — Driver attachment, A             | 07946 - KM90100 |   |                |
| — Driver attachment, B             | 07946 - KM90200 |   |                |
| — Driver shaft assembly            | 07946 - KM90300 |   |                |
| — Bearing remover, A               | 07946 - KM90401 |   |                |
| — Bearing remover, B               | 07946 - KM90500 |   |                |
| — Assembly base                    | 07946 - KM90600 |   |                |

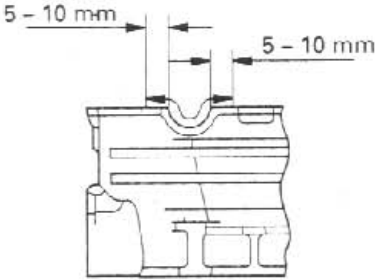
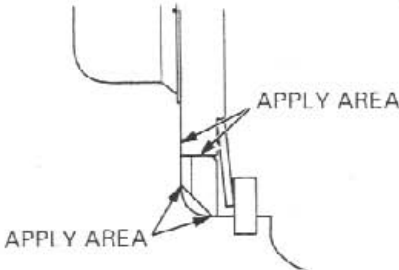
## GENERAL INFORMATION

| DESCRIPTION                          | TOOL NUMBER     | REMARKS  | REF. SEC.      |
|--------------------------------------|-----------------|--|----------------|
| Steering stem driver                 | 07946 - MB00000 |  | 13             |
| Driver shaft                         | 07946 - MJ00100 | NOTE 2   | 14             |
| Valve spring compressor attachment   | 07959 - KM30101 |  | 8              |
| Driver shaft                         | 07964 - MB00200 |  | 12             |
| Pin driver                           | 07GMD - KT80100 | NOTE 2   | 14             |
| Shock absorber compressor            | 07GME - 0010000 |  | 14             |
| Inspection adaptor                   | 07GMJ - ML80100 | NOTE 2   | 17             |
| Oil filter wrench                    | 07HAA - PJ70100 |  | 4              |
| Peak voltage adaptor                 | 07HGJ - 0020100 | NOTE 2   | 17             |
| Lock nut wrench                      | 07HMA - MR70200 | NOTE 3:<br>07VMA - MAT0100<br>(Except U.S.A.)<br>07VMA - MAT010A (U.S.A.only)                | 7              |
| Needle bearing remover               | 07HMC - MR70100 | NOTE 2   | 14             |
| Valve guide driver, 4.5 mm           | 07HMD - ML00101 |  | 8              |
| Tappet hole protector                | 07HMG - MR70002 | NOTE 2   | 8              |
| Valve guide reamer, 4.5 mm           | 07HMH - ML00101 | NOTE 3:<br>07HMH - ML0010A   | 8              |
| Drive chain tool set                 | 07HMH - MR10103 | NOTE 3:<br>07HMH - MR1010B (U.S.A.<br>only)  | 3              |
| Pilot screw wrench                   | 07KMA - MN90100 | 07KMA - MS60101 with<br>07PMA - MZ20110<br>(California type)<br>07KMA - MV9010A (U.S.A.only) | 5              |
| Fork seal driver, 45 mm              | 07KMD - KZ30100 | NOTE 2:<br>07KMD - KZ3010A   | 13             |
| Needle bearing remover set           | 07LMC - KV30100 | NOTE 4   | 14             |
| Shock absorber compressor attachment | 07NME - MY70100 | NOTE 2   | 14             |
| Compression gauge attachment         | 07RMJ - MY50100 | NOTE 1   | 8              |
| Analog tester (SANWA)                | SP - 15D        | NOTE 1   | 16, 17, 18, 19 |
| Analog tester (KOWA)                 | TH - 5H         | NOTE 1   | 16, 17, 18, 19 |

# LUBRICATION & SEAL POINTS

| ENGINE   | LOCATION   | MATERIAL  | REMARKS |
|--|--|---|---------|
| <p>Crankcase mating surface</p>    | <p>Liquid sealant<br/>(Three Bond 1207B or equivalent)</p> |   |         |
| <p>Oil pan mating surface</p>  <p>Ignition pulse generator cover bolt threads (marked "Δ")</p>  <p>Oil pressure switch threads</p> <p>Do not apply to the thread head.<br/>3 - 4 mm<br/>(0.1 - 0.2 in)</p>  <p>Thermo unit threads</p> |  | <p>Coating width: <math>6.5 \pm 1</math> mm</p> |         |

# GENERAL INFORMATION

| ENGINE (Cont'd)<br>LOCATION   | MATERIAL   | REMARKS |
|---|--|---------|
| Cylinder head semi-circular cut-out<br>  | Sealant  |         |
| Cylinder head bolt threads and seating surface<br>Camshaft lobes/journals<br>Valve lifter outer sliding surface<br>Valve stem (valve guide sliding surface)<br>Connecting rod small end<br>Piston pin sliding surface<br>Main journal bearing surface<br>Connecting rod bearing surface<br>Crankshaft journals<br>M3/4, C5, C6 shifter gear (shift fork grooves)<br>10 x 44 mm pin outer surface<br>Primary drive gear and sub gear sliding surface<br>   | Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease) |         |
| Clutch outer needle bearing   |  |         |
| Piston ring sliding area<br>Main journal 9 mm bolt threads and seating surface (after removing anti-rust oil additive)<br>Cylinder head special bolt (after removing anti-rust oil additive)<br>Oil strainer packing<br>Oil cooler center bolt threads and seating surface<br>Oil filter cartridge threads and O-ring<br>Flywheel bolt threads and seating surface<br>Starter one-way clutch sliding surface<br>Connecting rod nut threads<br>Clutch center lock nut threads<br>Clutch disc surface<br>Each gear teeth and rotating surface<br>Each bearing<br>Each O-ring<br>Other rotating area and sliding surface | Engine oil   |         |
| Crankshaft hole cap threads<br>Each oil seal lips   | Multi-purpose grease   |         |

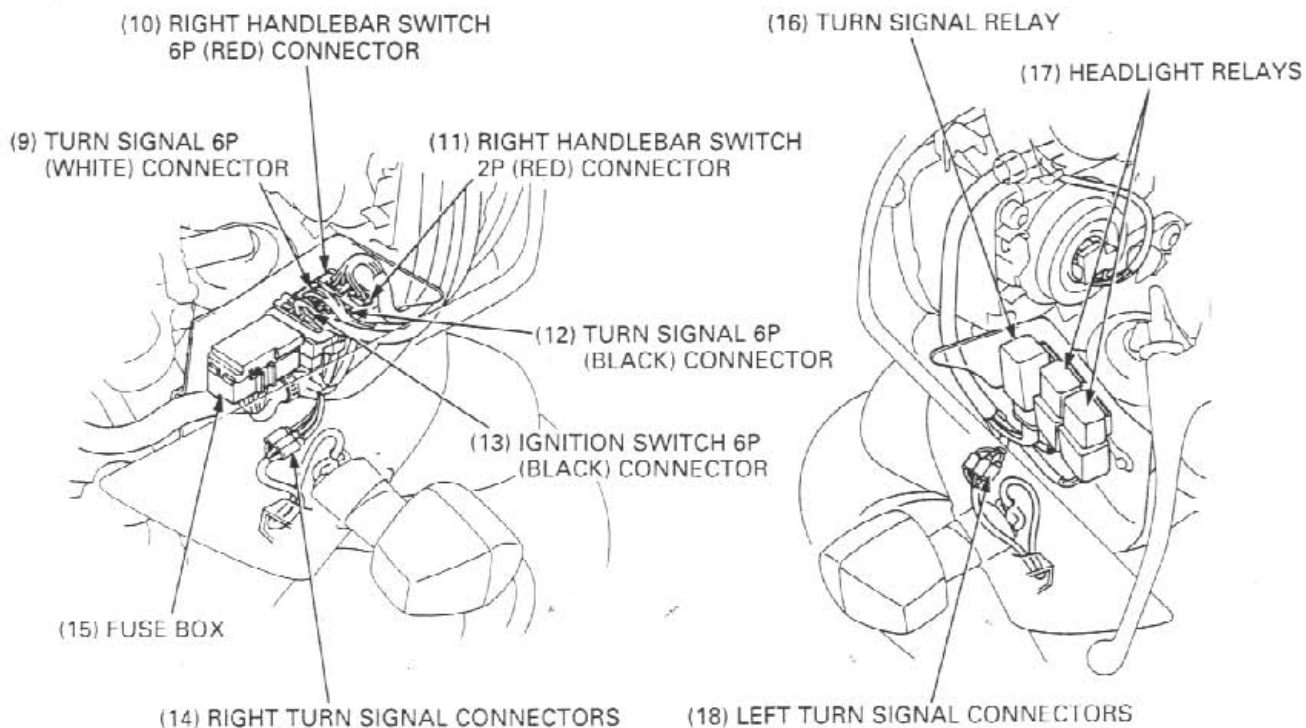
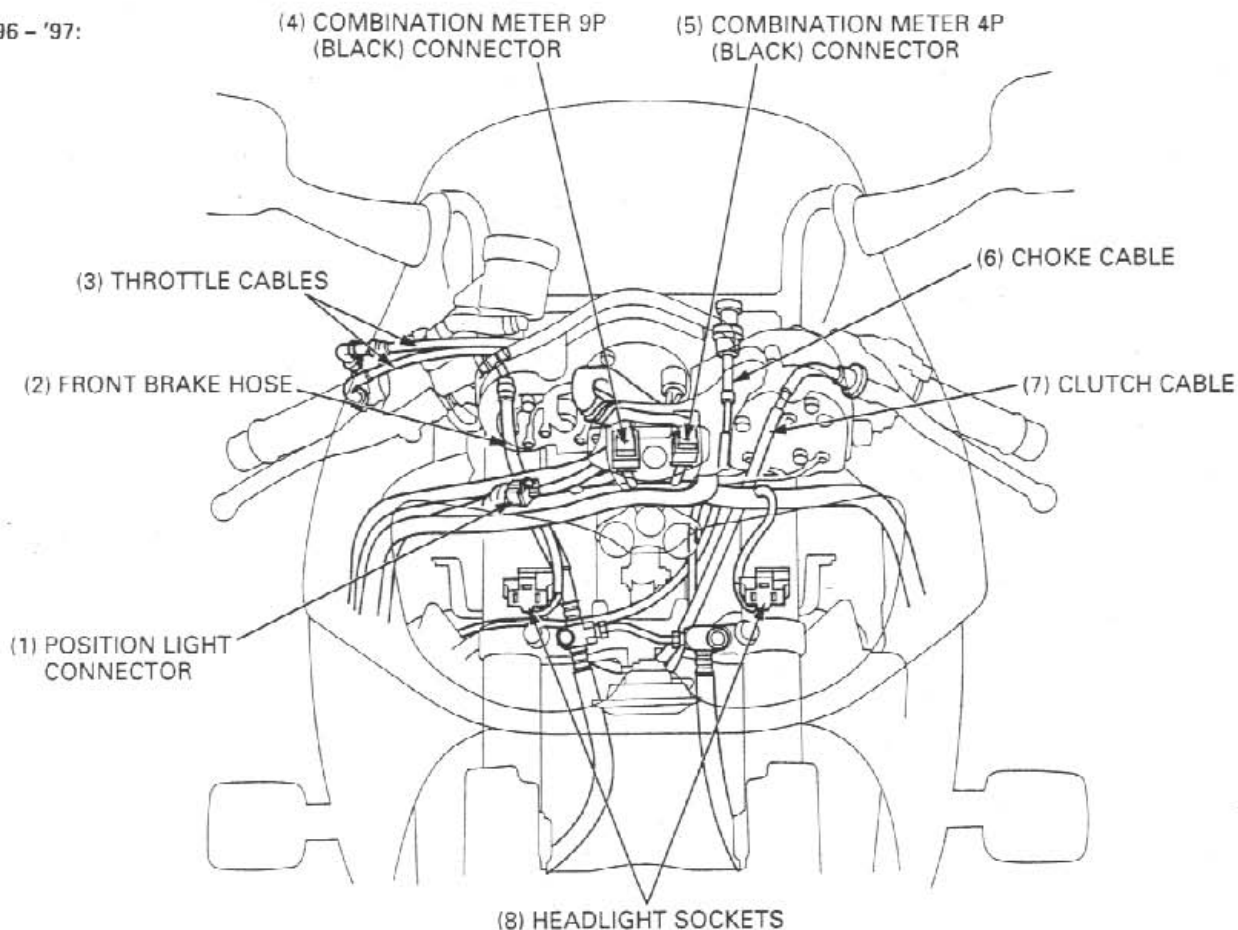
| ENGINE (Cont'd)  |               |                           |
|--|---------------|---------------------------|
| LOCATION   | MATERIAL      | REMARKS                   |
| Cylinder head sealing bolt threads<br>Cylinder head cover breather joint threads<br>Lower crankcase sealing bolt threads<br>Starter one-way clutch outer bolt threads<br>Oil pump driven sprocket bolt threads<br>Shift drum set plate bolt threads<br>Shift drum center bolt threads<br>Mainshaft bearing set plate bolt threads<br>Cam sprocket bolt threads<br>Cylinder head cover breather plate bolt threads<br>Air suction valve tightening bolt threads | Locking agent | Coating width: 6.5 + 1 mm |

| FRAME  |  |         |
|--|--|---------|
| LOCATION   | MATERIAL   | REMARKS |
| Steering head bearing sliding surface<br>Steering head dust seal lips<br>Swingarm pivot bearing and dust seal lips<br>Wheel dust seal lips<br>Rear wheel side collar inner surface<br>Shock absorber needle bearing and dust seal lips<br>Shock link needle bearing and dust seal lips<br>Footpeg sliding area<br>Passenger footpeg sliding area<br>Rear brake pedal pivot sliding area<br>Throttle pipe sliding area<br>Clutch lever pivot<br>Pillion seat catch hook<br>Pillion seat pivot<br>Gearshift pedal link pivot<br>Gearshift pedal link tie-rod ball joints<br>Side stand pivot surface | Multi-purpose grease                                       |         |
| Throttle pipe cable end area   | Molybdenum disulfide grease                                |         |
| Shock absorber spring adjuster cam surface   | Molybdenum paste   |         |
| Steering stem top threads<br>Driven sprocket nut threads and seating surface<br>Throttle cable casing inner<br>Choke cable casing inner<br>Clutch cable casing inner<br>Brake pipe joint threads   | Engine oil   |         |
| Brake master cylinder cups<br>Brake caliper piston seals   | DOT 4 brake fluid  |         |
| Brake caliper dust seals<br>Front brake lever pivot and piston tips<br>Rear master cylinder boot inside and push rod tips<br>Brake caliper slide pin surface   | Silicone grease  |         |
| Front brake caliper assembly torx bolt threads<br>Fork socket bolt threads   | Locking agent  |         |
| Handle grip rubber inside  | Honda Bond A or<br>Honda Hand Grip<br>Cement (U.S.A. only) |         |
| Fork cap O-ring<br>Fork oil seal lips  | Pro-Honda Suspension<br>Fluid SS-8                         |         |

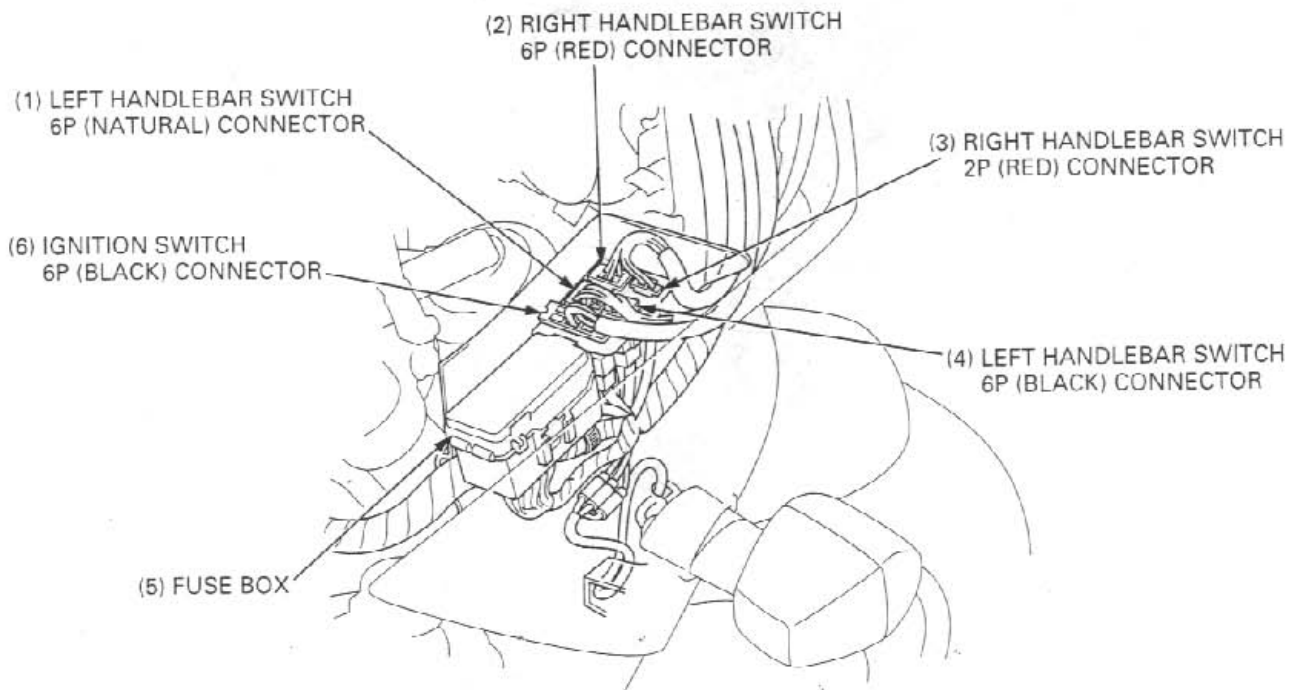
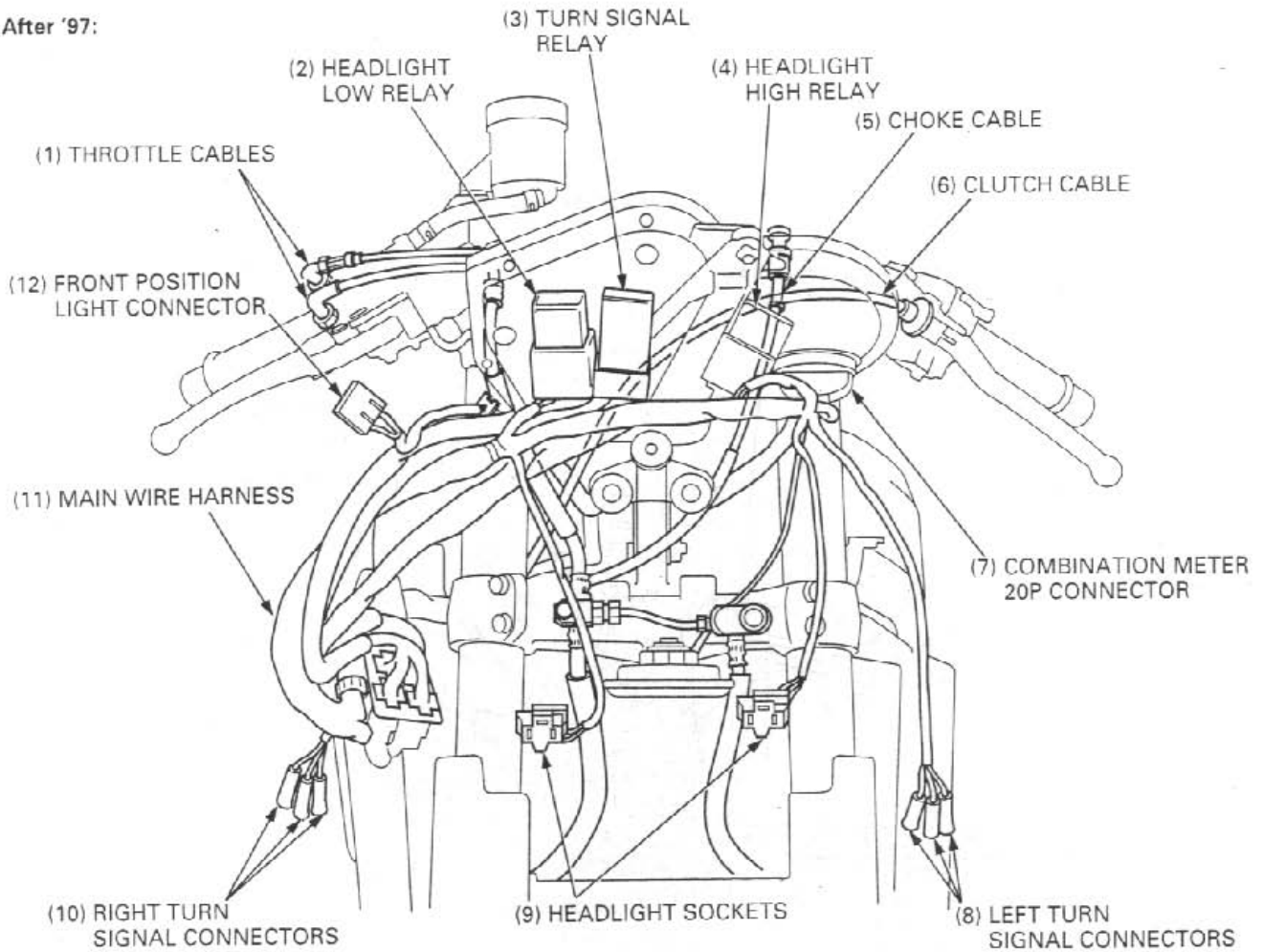


# CABLE & HARNESS ROUTING

'96 - '97:

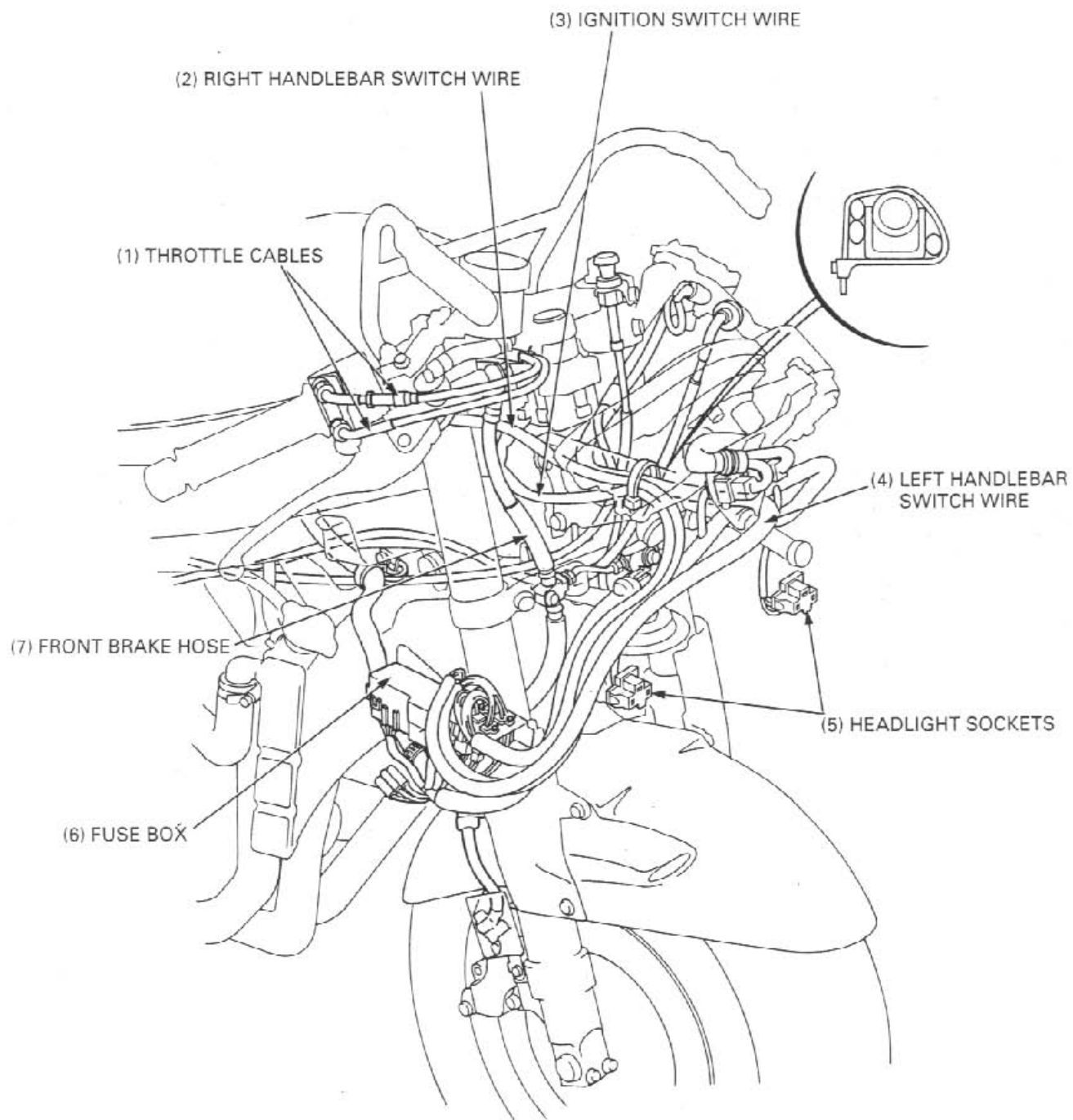


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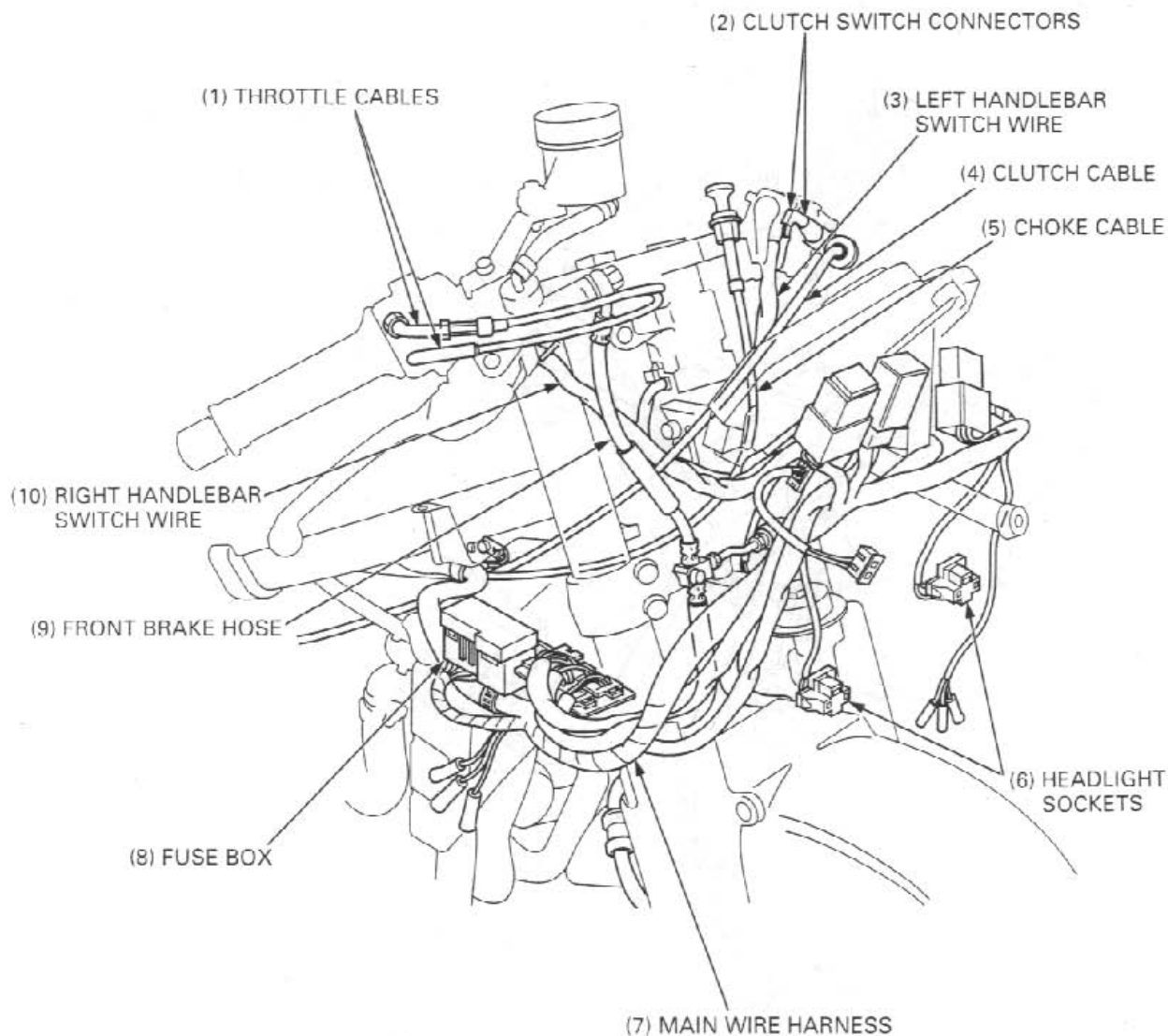


# GENERAL INFORMATION

'96 - '97:



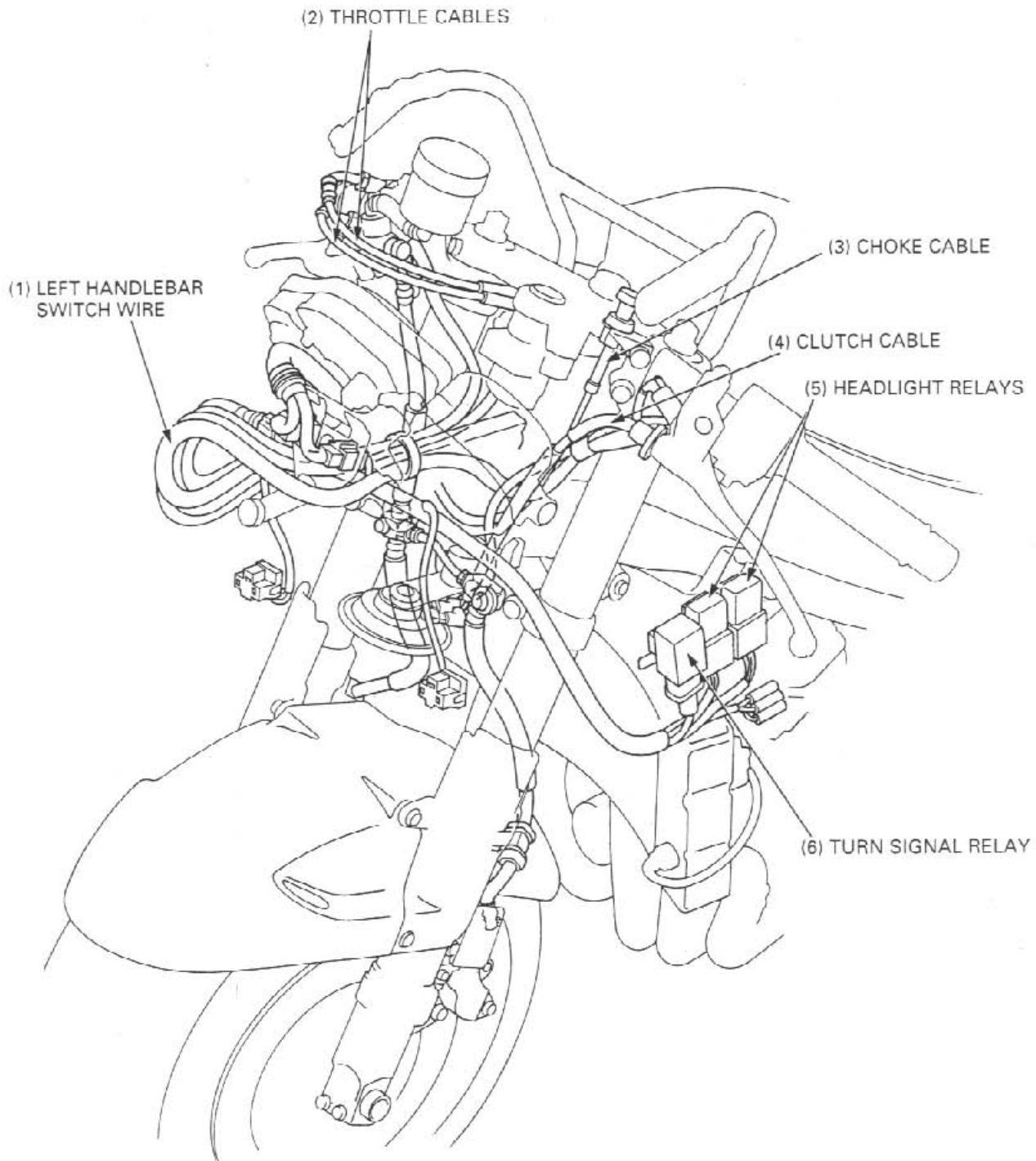
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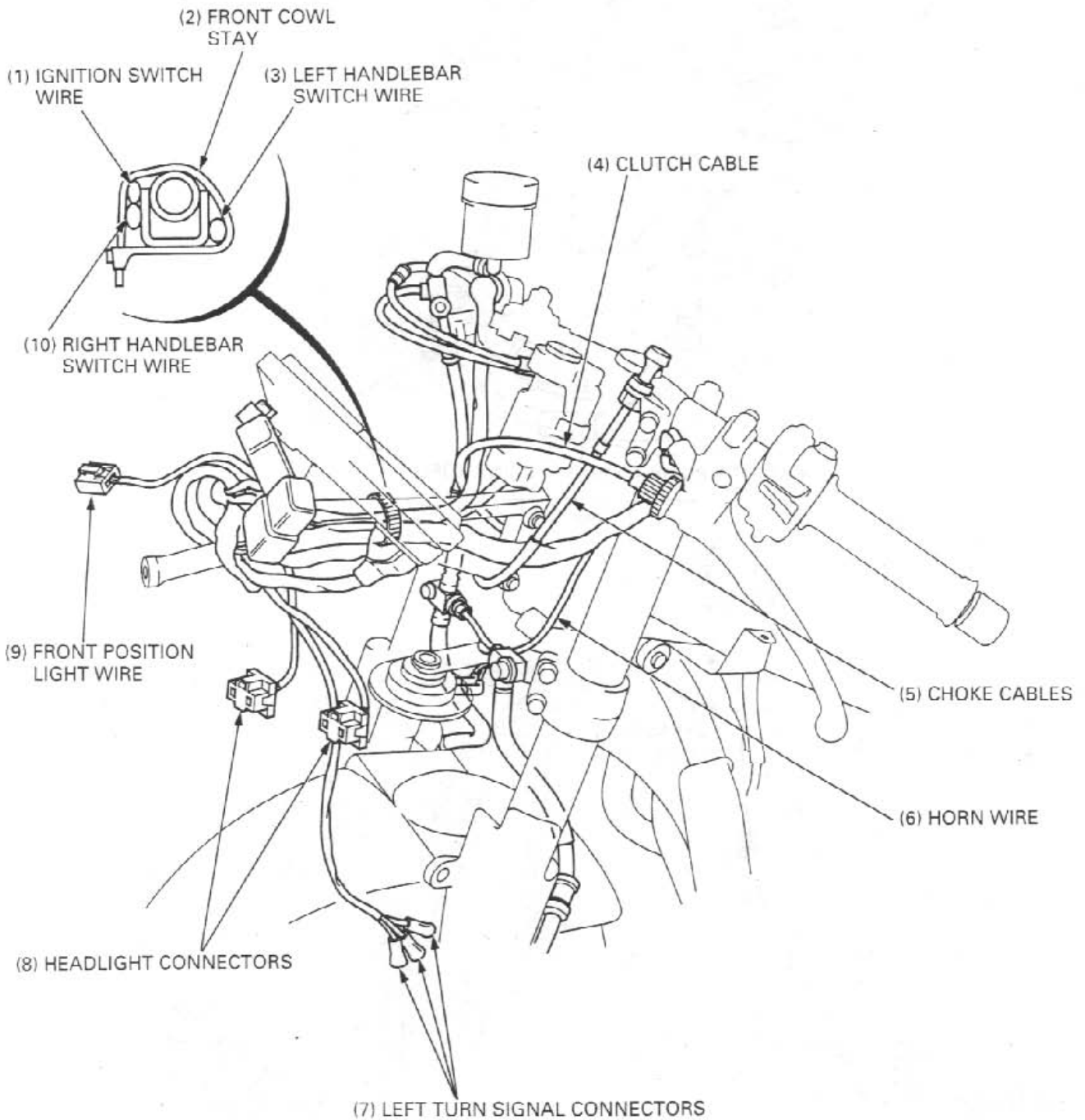
## GENERAL INFORMATION

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'96 - '97:

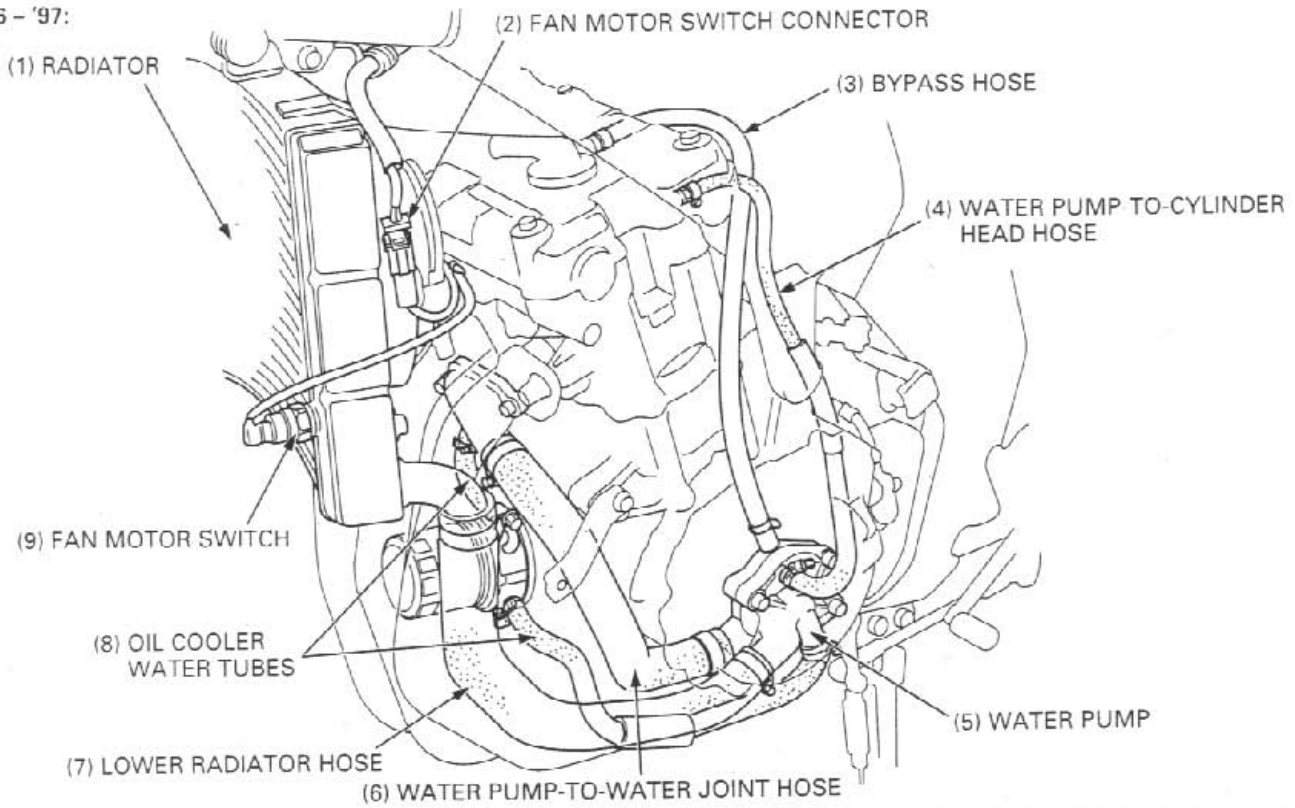


After '97:



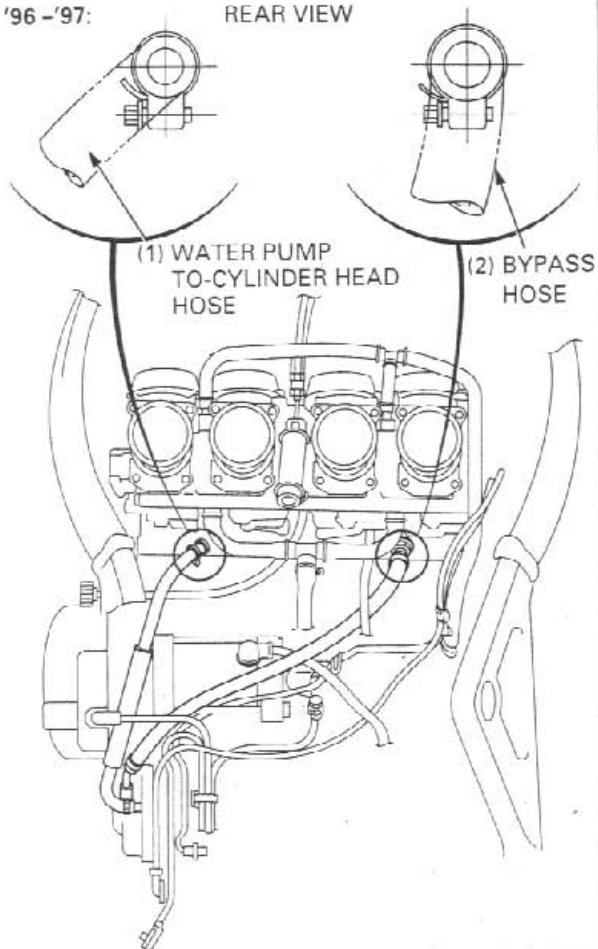
# GENERAL INFORMATION

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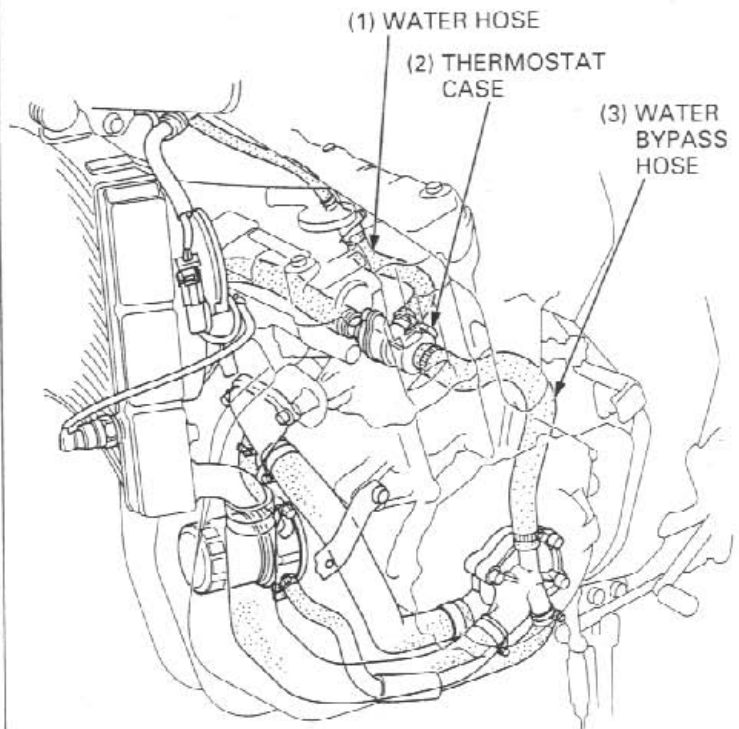


'96 - '97:

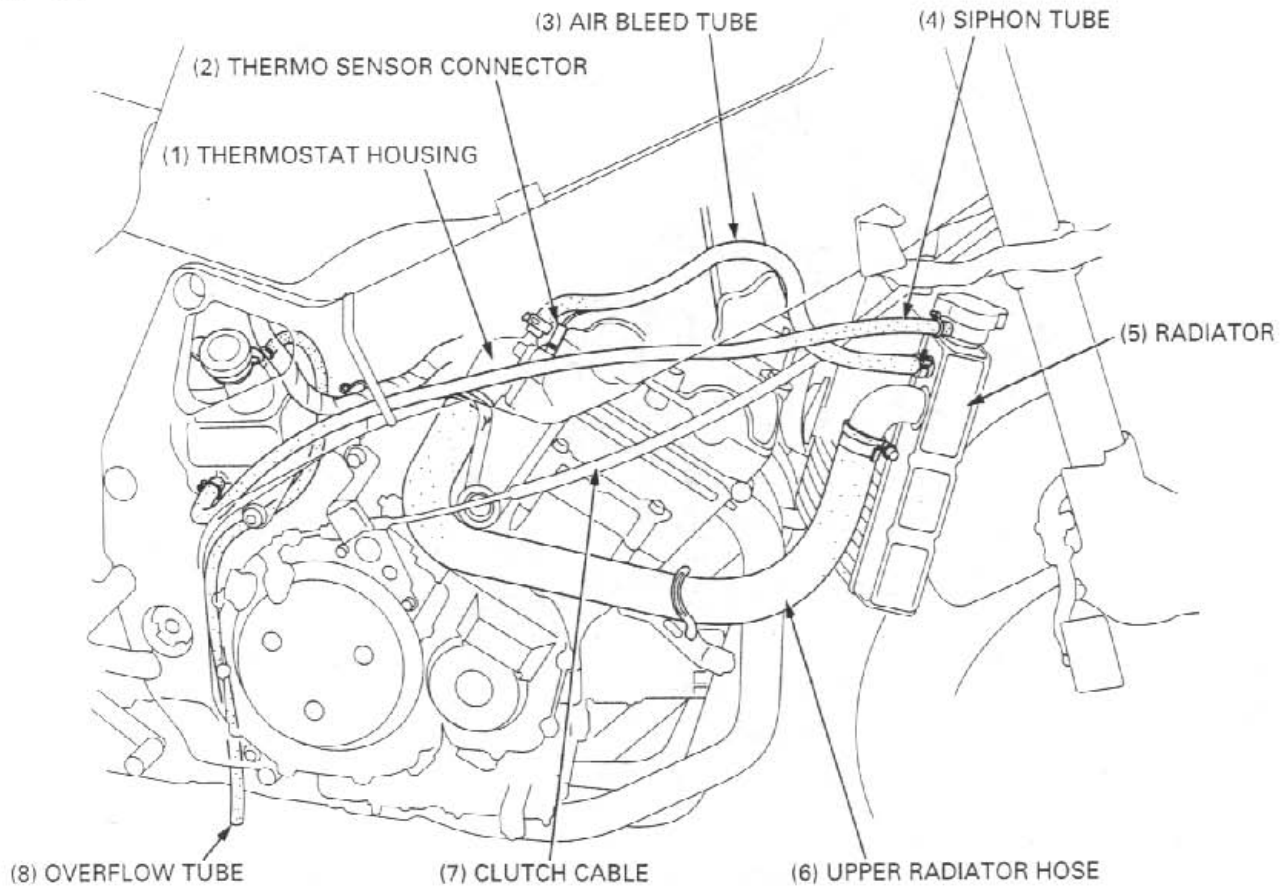
REAR VIEW



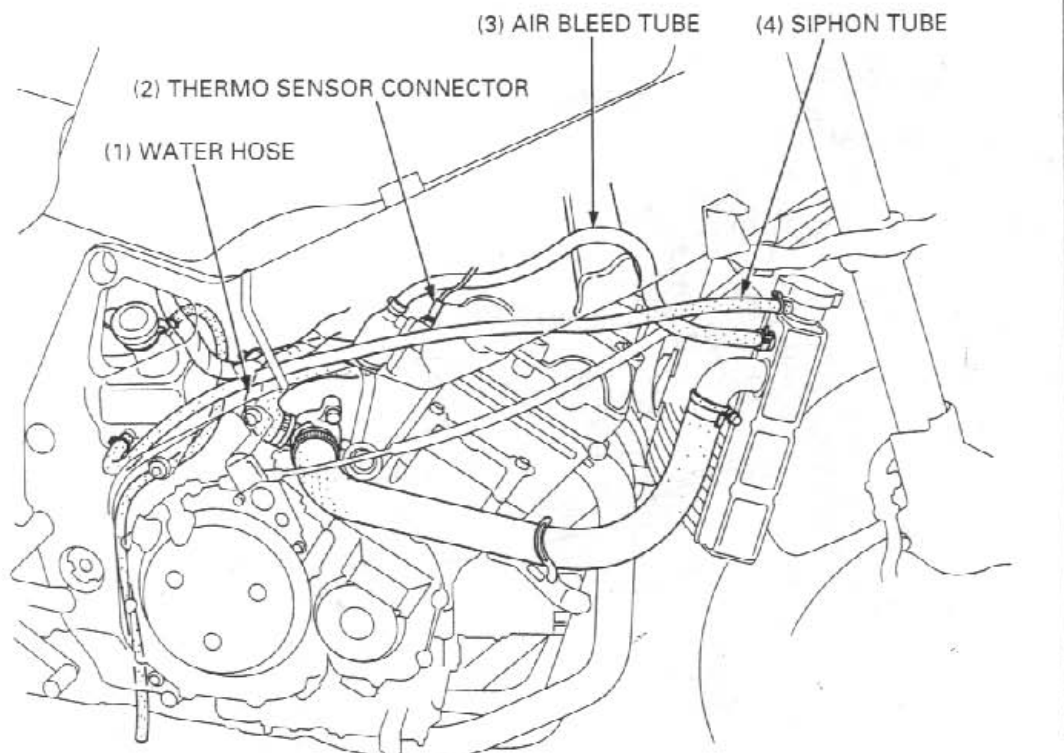
After '97:



'96 - '97:



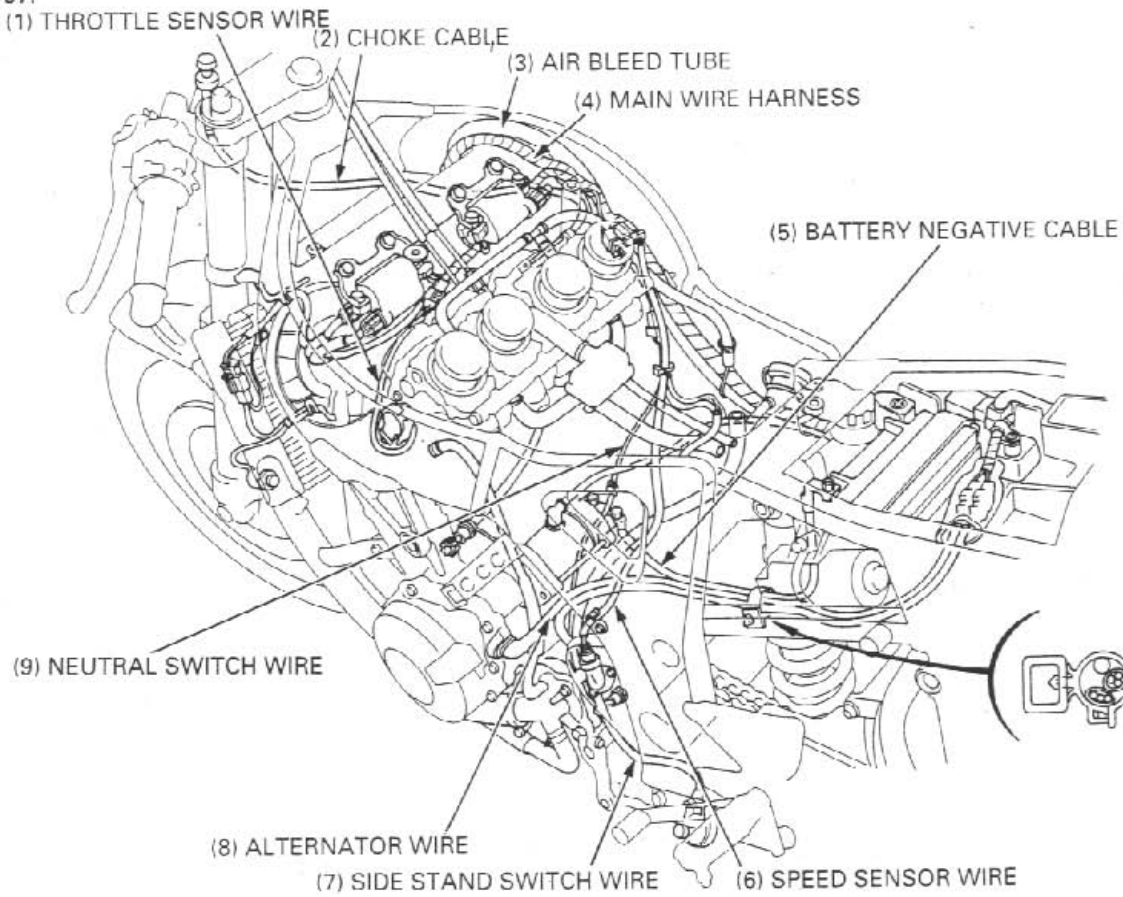
After '97:



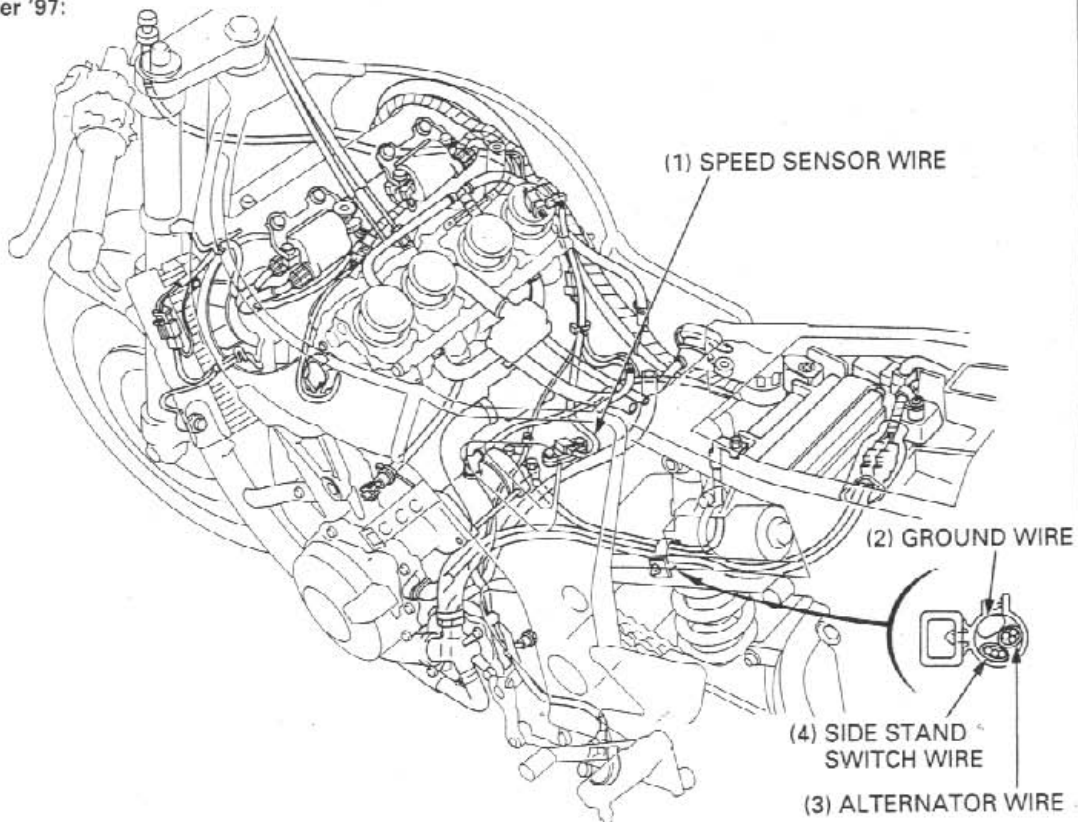


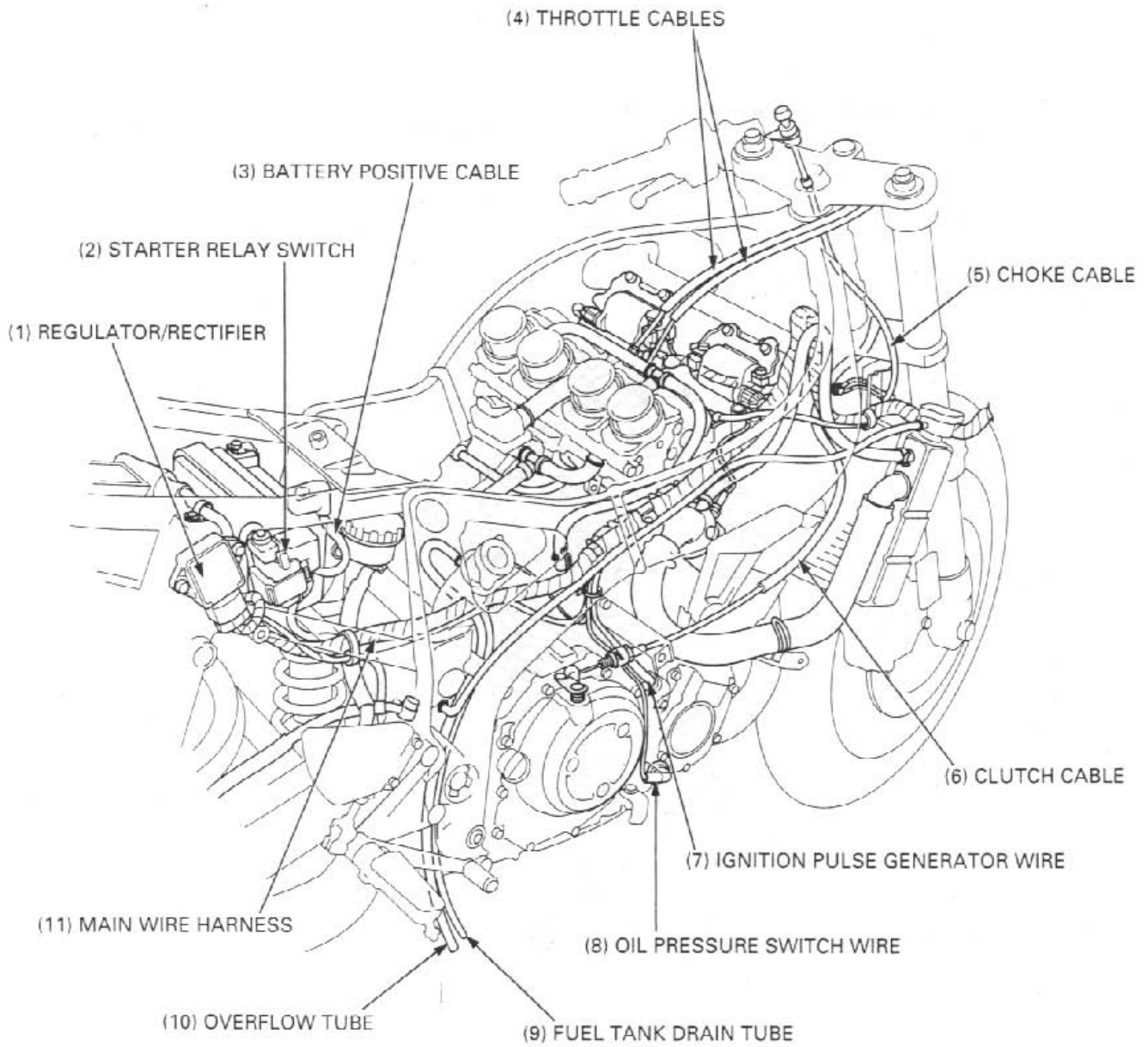
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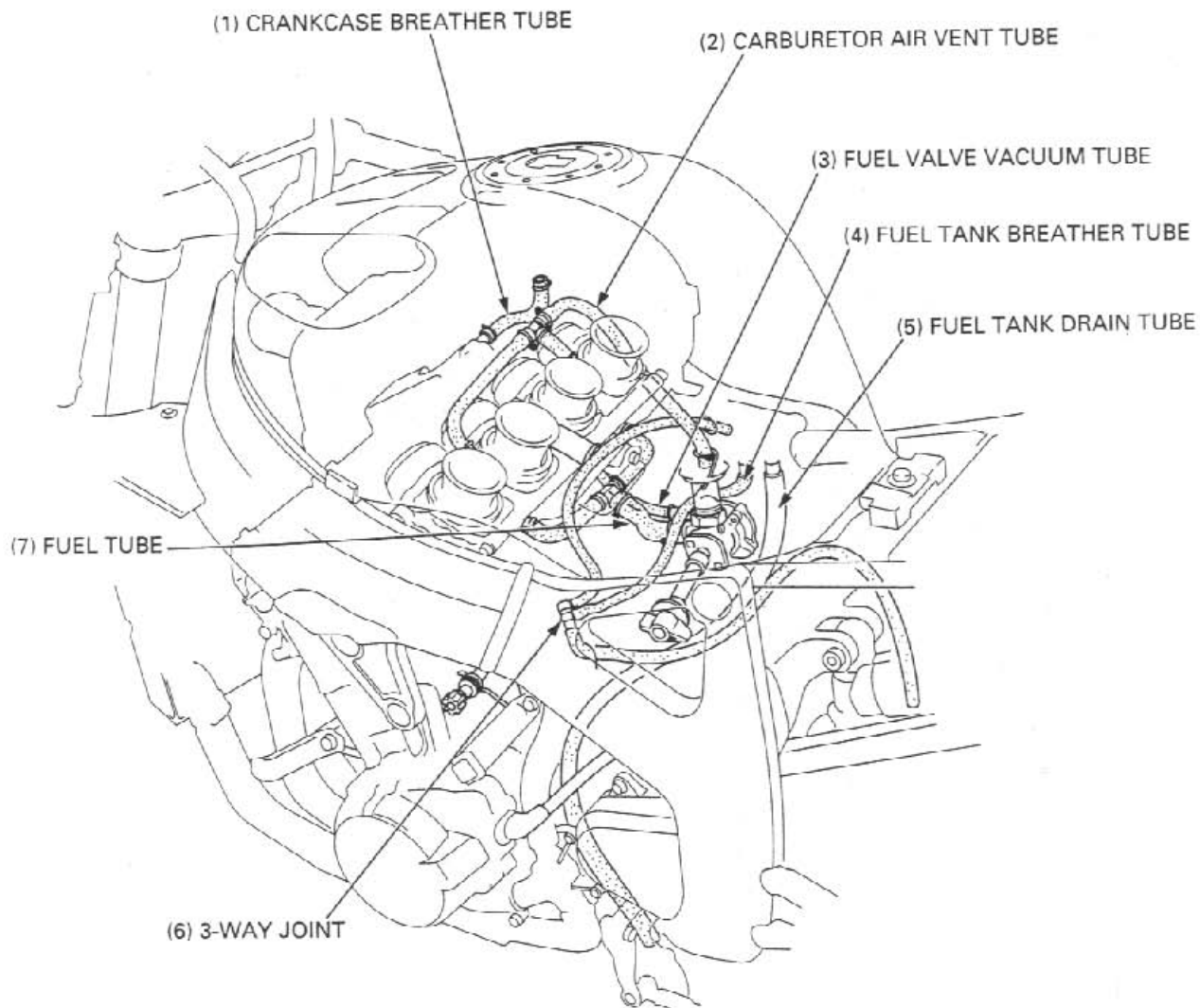
'96 - '97:



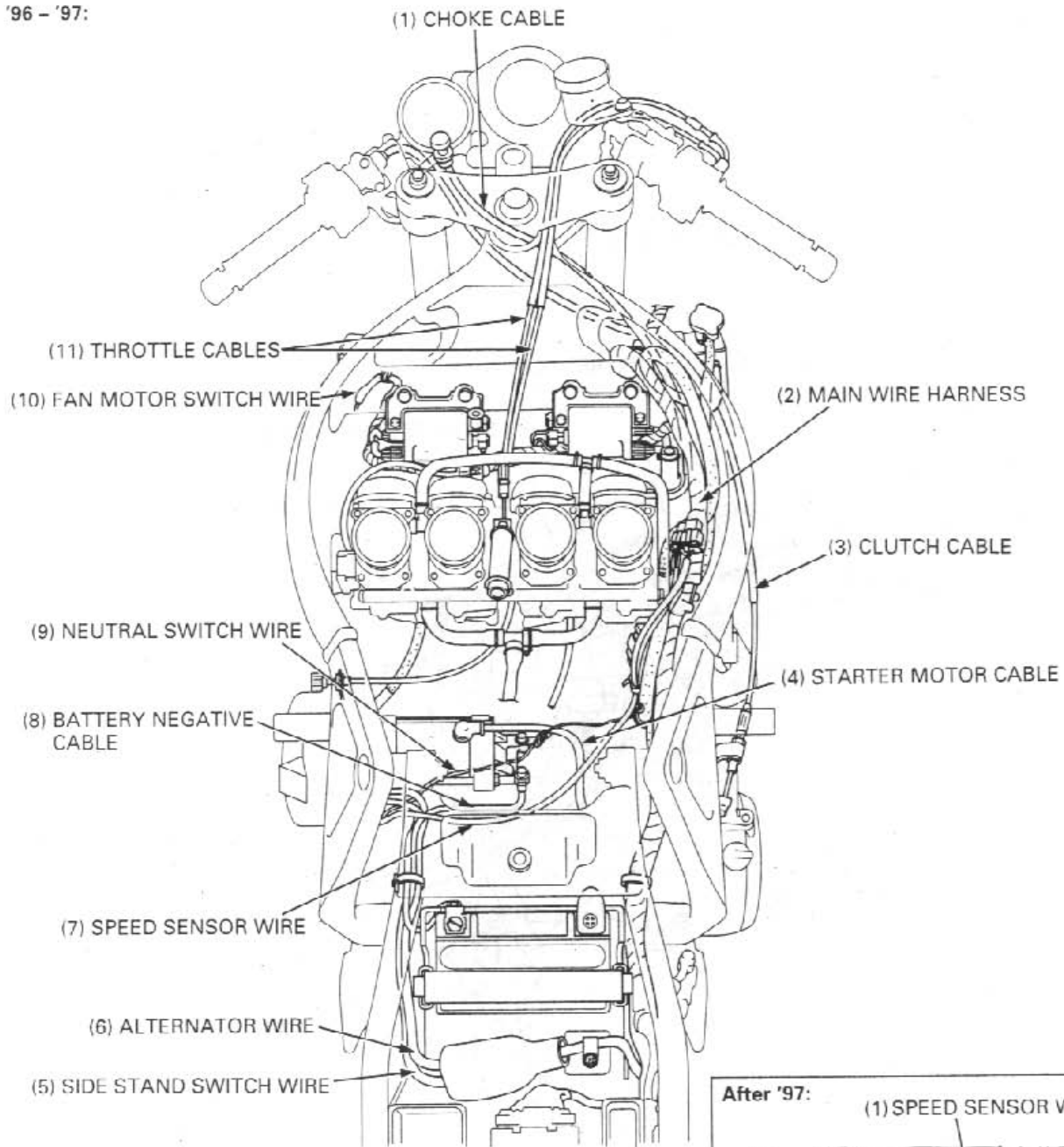
After '97:



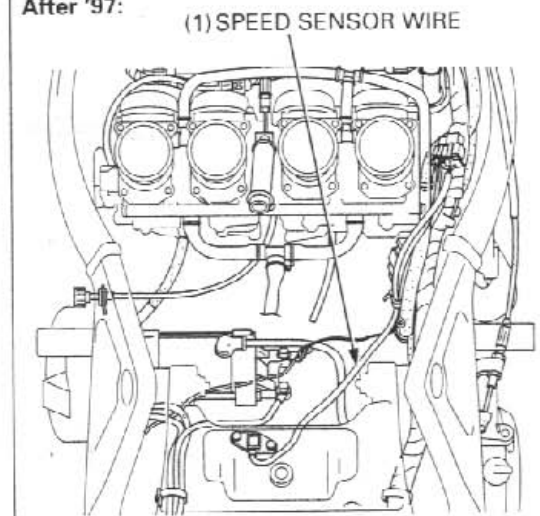


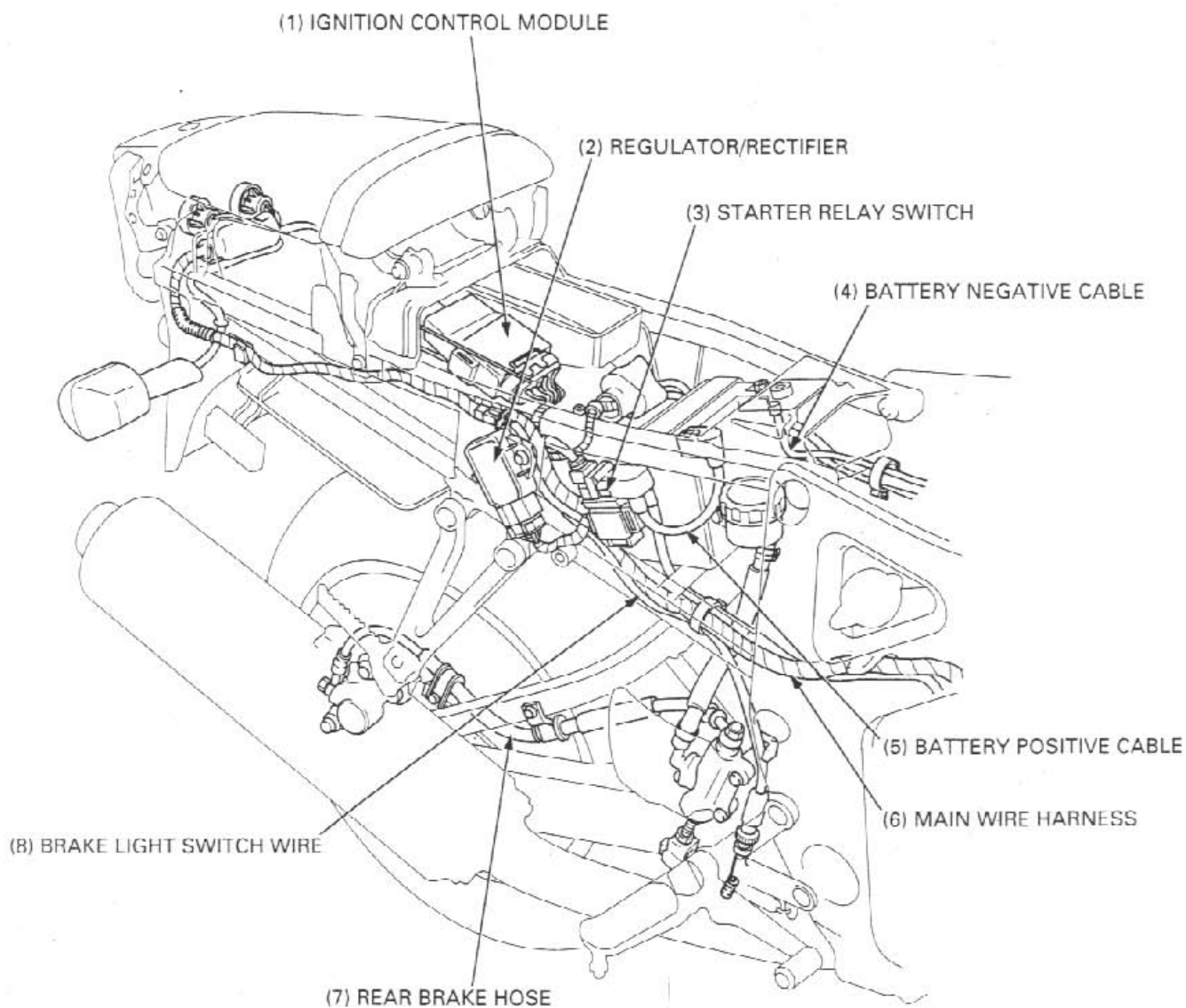


'96 - '97:

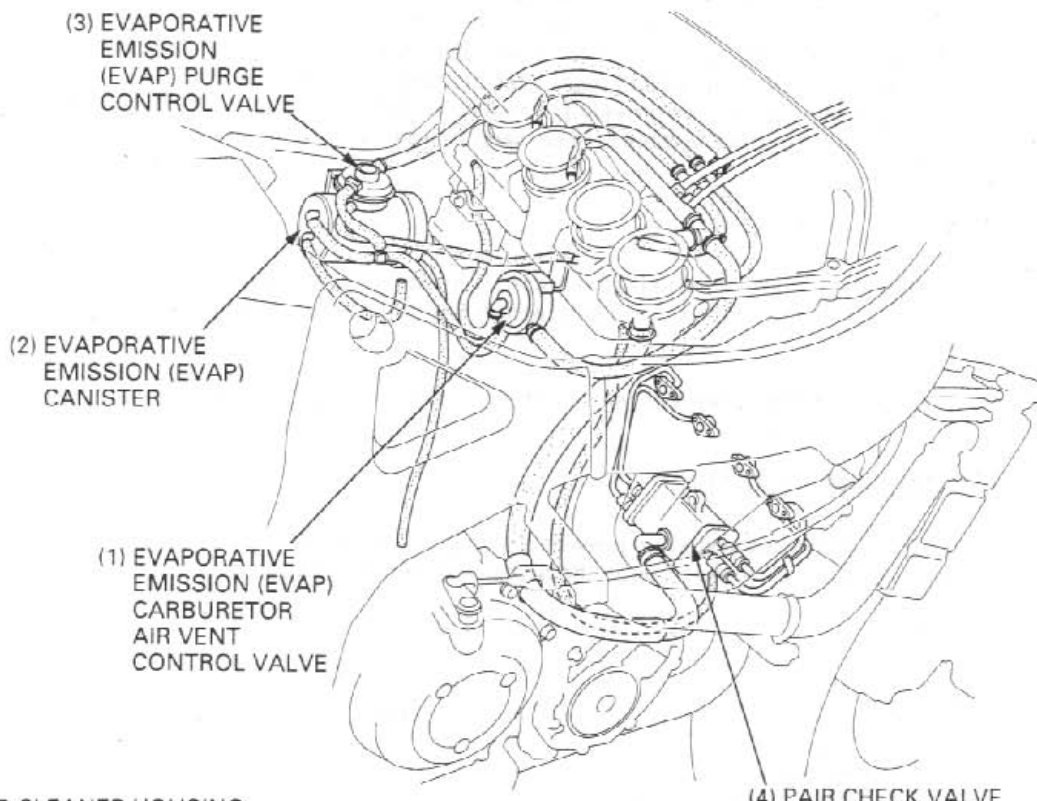


After '97:





SECONDARY AIR SUPPLY SYSTEM ROUTING (CALIFORNIA TYPE ONLY)

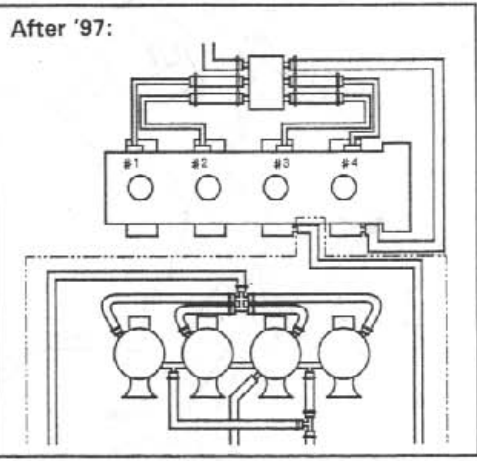


'96 - '97:

(5) AIR CLEANER HOUSING

(4) PAIR CHECK VALVE

(6) CYLINDER HEAD



(7) CARBURETOR

(8) FUEL TANK

(3) EVAP PURGE CONTROL VALVE

(2) EVAP CANISTER

(1) EVAP CAV CONTROL VALVE

## **EMISSION CONTROL SYSTEMS (U.S.A. ONLY)**

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 Limited Warranty for Honda Motorcycle Emission Control Systems is necessary in order to keep the emissions system warranty in effect.

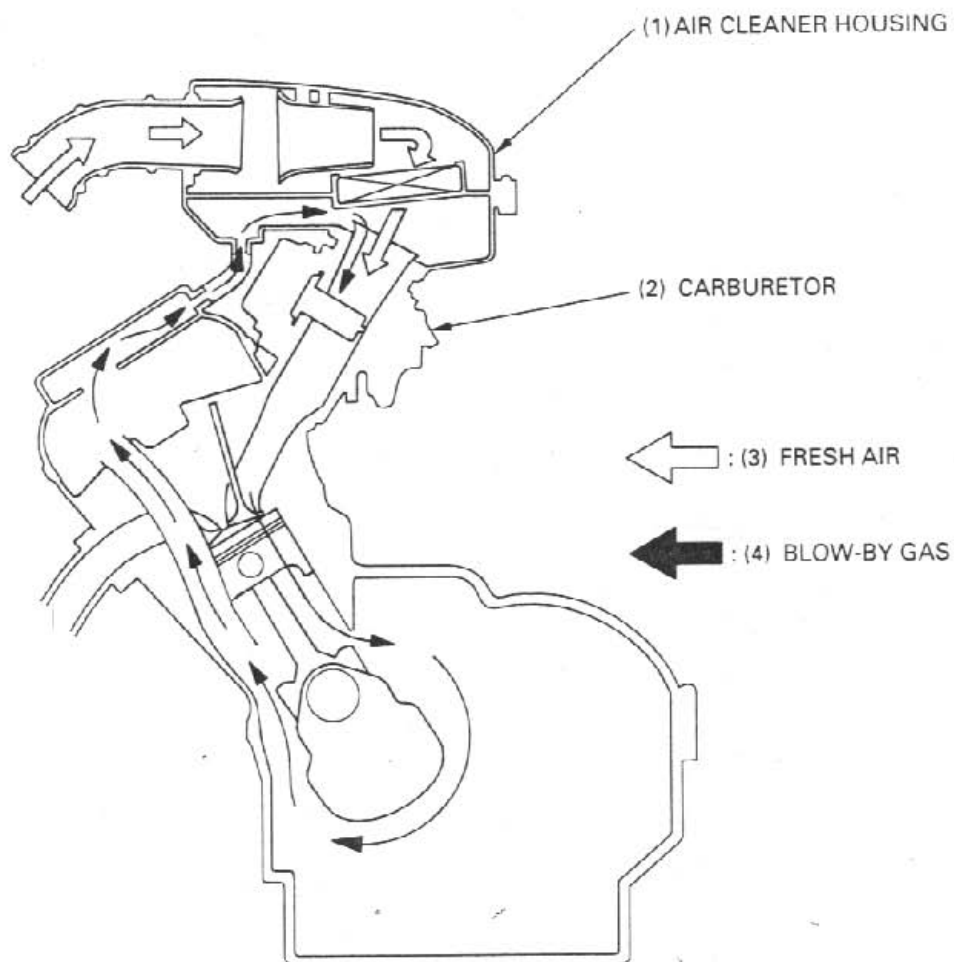
### **SOURCE OF EMISSIONS**

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

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

### **CRANKCASE EMISSION CONTROL SYSTEM**

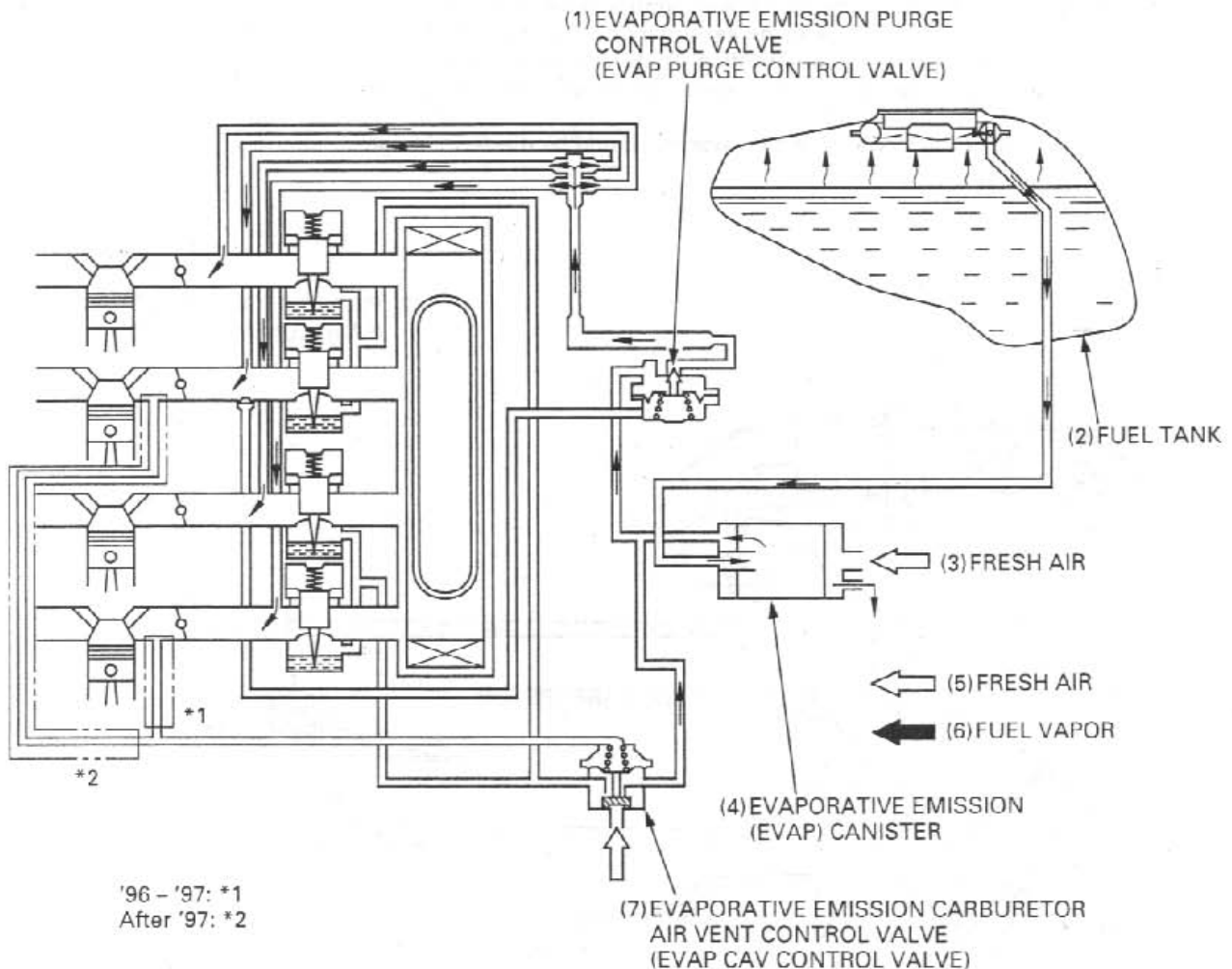
The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere. Blow-by gas is returned to the combustion chamber through the air cleaner and carburetor.



## EVAPORATIVE EMISSION CONTROL SYSTEM (CALIFORNIA TYPE ONLY)

This model complies with California Air Resources Board evaporative emission requirements.

Fuel vapor from the fuel tank and carburetors is routed into the evaporative emission (EVAP) canister where it is absorbed and stored while the engine is stopped. When the engine is running and the evaporative emission (EVAP) purge control valve is open, fuel vapor in the EVAP canister is drawn into the engine through the carburetor. At the same time, the EVAP carburetor air vent (CAV) 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; (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 of 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

### EXHAUST EMISSION CONTROL SYSTEM (PULSE SECONDARY AIR INJECTION SYSTEM)

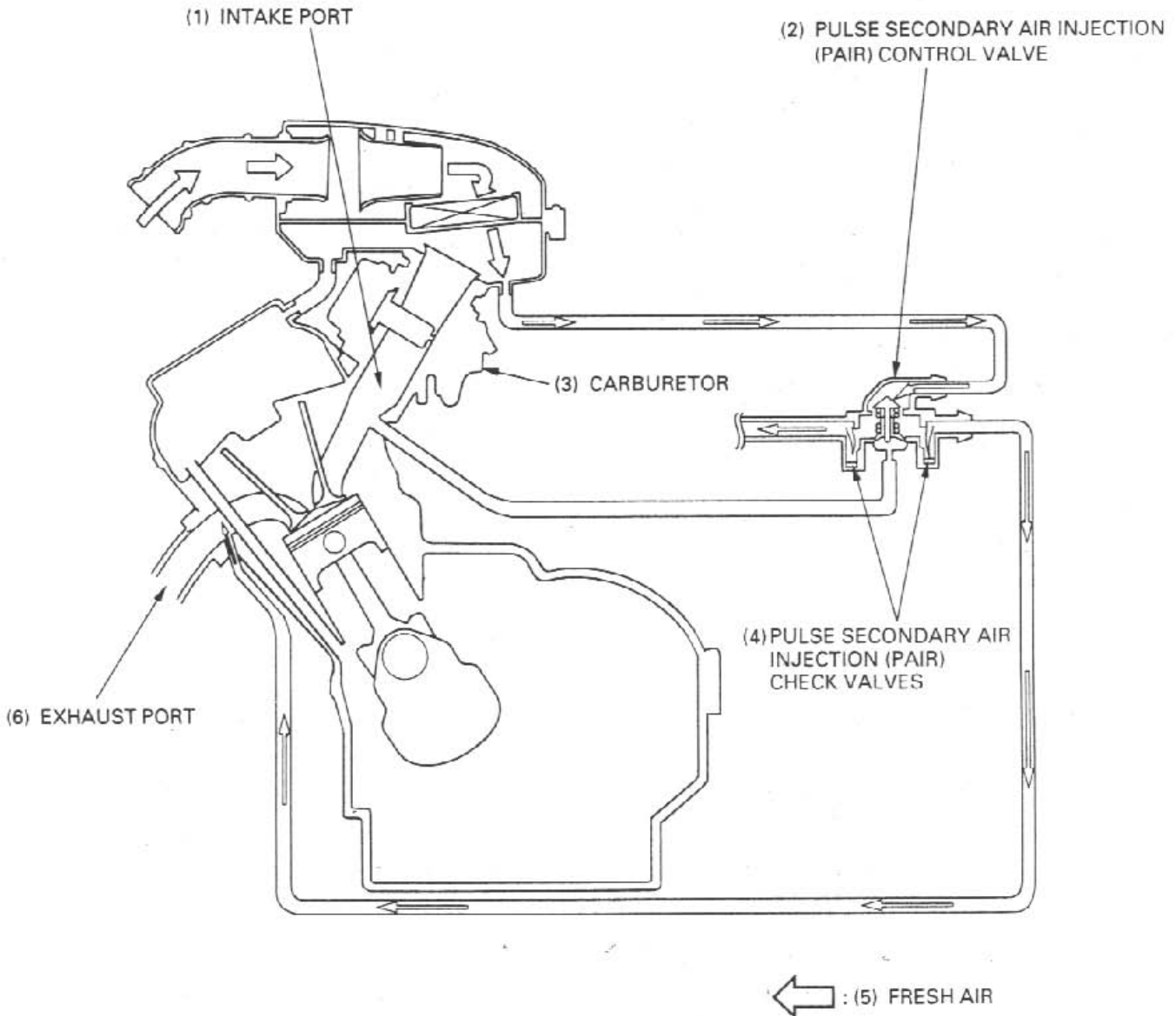
The exhaust emission control system incorporates a lean carburetor setting and no adjustment should be made except idle speed by using the throttle stop screw.

#### (CALIFORNIA ONLY)

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 pulse secondary air injection (PAIR) control valve; it consists of check valves built into the pulse secondary air injection (PAIR) control valve. A pulse secondary air injection (PAIR) check valve prevents reverse air flow through the system. The pulse secondary air injection (PAIR) 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.

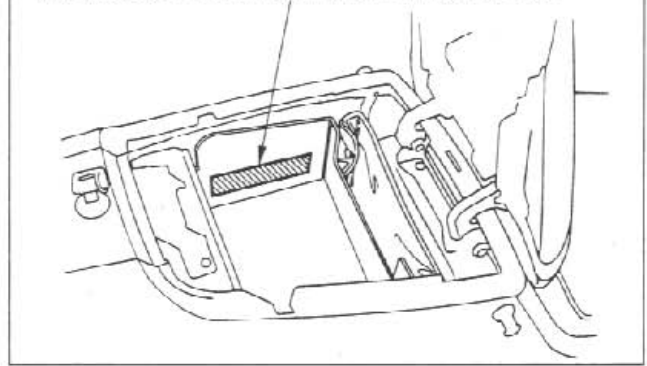
No adjustment to the pulse secondary air injection system should be made, although periodic inspection of the components is recommended.



## EMISSION CONTROL INFORMATION LABELS (U.S.A. ONLY)

An Emission Control Information Label is located on the side wall of the storage compartment as shown. The passenger seat must be opened to read it. It provides base tune-up specifications.

(1) EMISSION CONTROL INFORMATION LABEL



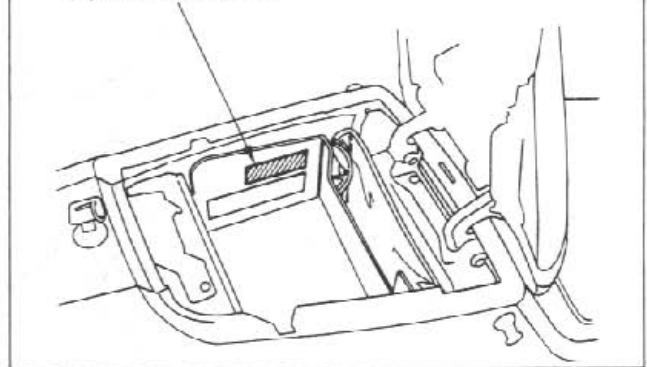
## VEHICLE EMISSION CONTROL INFORMATION UPDATE LABEL

After making a high altitude carburetor adjustment, attach an update label on the side wall of the storage compartment as shown.

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

When readjusting the carburetors back to the low altitude specifications, be sure to remove this update label.

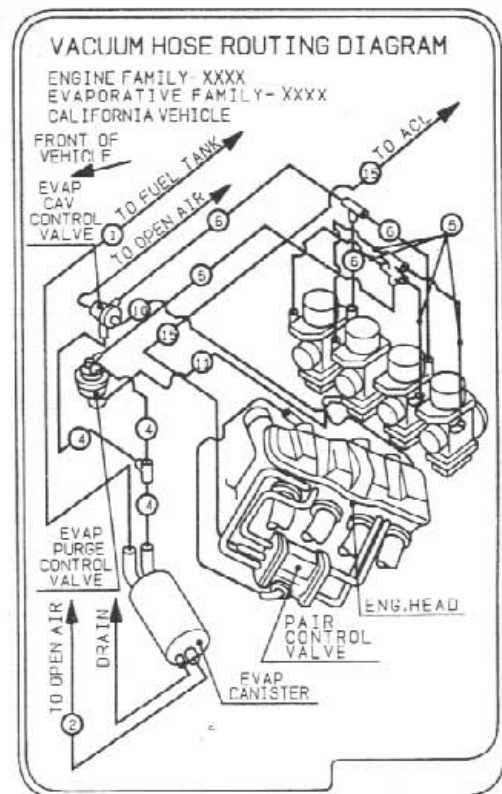
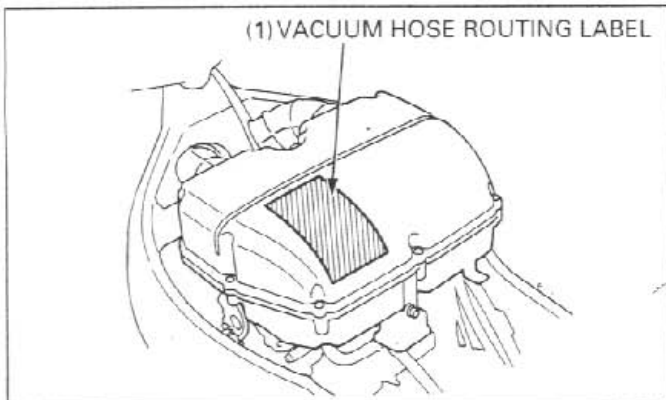
(1) UPDATE LABEL



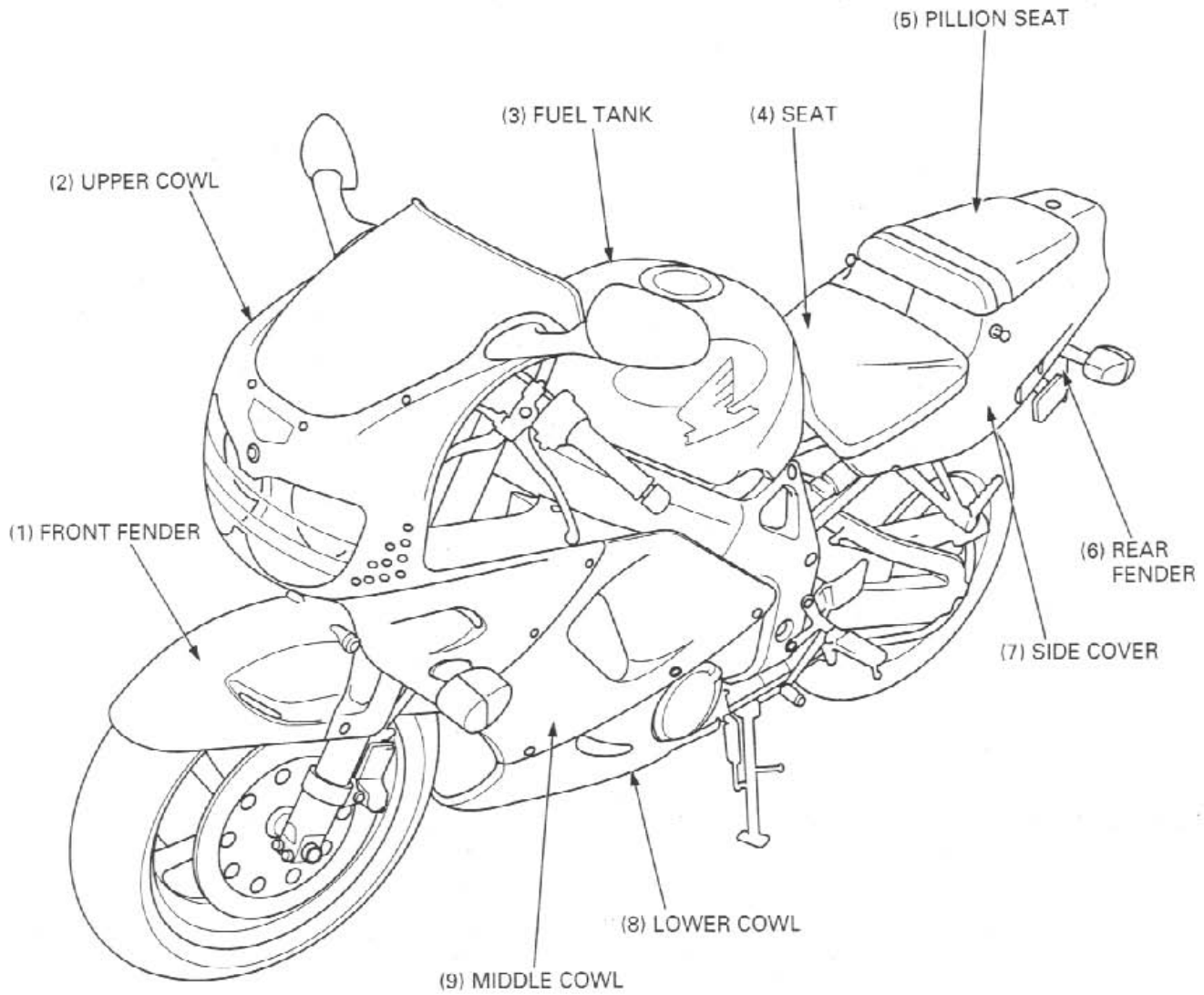
## VACUUM HOSE ROUTING DIAGRAM LABEL (CALIFORNIA TYPE ONLY)

The Vacuum Hose Routing Diagram Label is on the air cleaner housing cover as shown. The fuel tank must be removed to read it. Refer to page 2-2 for fuel tank removal.

(1) VACUUM HOSE ROUTING LABEL



## BODY PANEL LOCATIONS



|                         |     |                      |      |
|-------------------------|-----|----------------------|------|
| BODY PANEL LOCATIONS    | 2-0 | UPPER COWL           | 2-7  |
| SERVICE INFORMATION     | 2-1 | FRONT FENDER         | 2-13 |
| TROUBLESHOOTING         | 2-1 | REAR FENDER          | 2-14 |
| SEAT/FUEL TANK          | 2-2 | SEAT RAIL            | 2-15 |
| PILLION SEAT/SIDE COVER | 2-3 | MUFFLER/EXHAUST PIPE | 2-16 |
| MIDDLE/LOWER COWL       | 2-6 |                      |      |

## SERVICE INFORMATION

### GENERAL

#### ▲ WARNING

- Gasoline is extremely flammable and is explosive under certain condition. **KEEP OUT OF REACH OF CHILDREN.**
  - Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.
- 
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
  - This section covers removal and installation of the body panels, fuel tank and exhaust system.
  - Always replace the exhaust pipe gaskets after removing the exhaust pipe from the engine.
  - When installing the exhaust system, loosely install all of the exhaust pipe fasteners. Always tighten the exhaust clamps first, then tighten the mounting fasteners. If you tighten the mounting fasteners first, the exhaust pipe may not seat properly.
  - Always inspect the exhaust system for leaks after installation.

### TORQUE VALUES

|                               |                               |           |
|-------------------------------|-------------------------------|-----------|
| Upper cowl stay mounting bolt | 26 N·m (2.7 kgf·m, 20 lbf·ft) |           |
| Front fender mounting bolt    | 5 N·m (0.5 kgf·m, 3.6 lbf·ft) |           |
| Exhaust pipe joint nut        | 12 N·m (1.2 kgf·m, 9 lbf·ft)  |           |
| Muffler mounting bolt/nut     | 25 N·m (2.6 kgf·m, 19 lbf·ft) |           |
| Step holder mounting bolt     | 26 N·m (2.7 kgf·m, 20 lbf·ft) |           |
| Footpeg mounting bolt         | 44 N·m (4.5 kgf·m, 33 lbf·ft) | ALOC bolt |
| Bank sensor                   | 10 N·m (1.0 kgf·m, 7 lbf·ft)  |           |
| Side stand bracket bolt       | 44 N·m (4.5 kgf·m, 33 lbf·ft) | ALOC bolt |

## TROUBLESHOOTING

### Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

### Poor performance

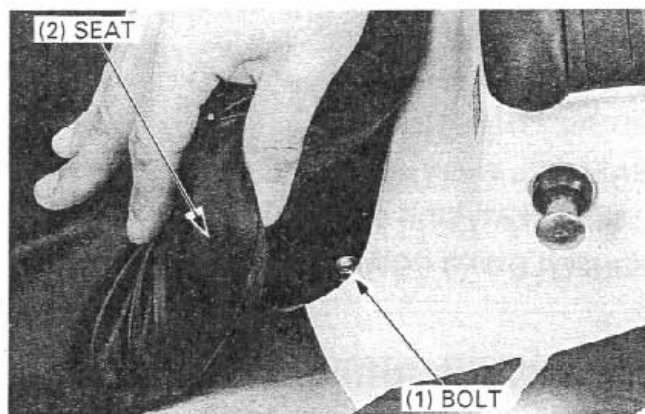
- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

## SEAT/FUEL TANK

### REMOVAL

Remove the two seat mounting bolts behind the seat.

Slide the seat back and then off.



#### ⚠ WARNING

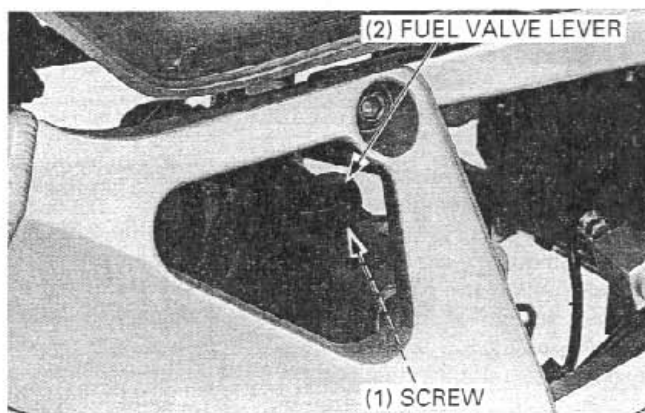
- Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.

#### NOTE

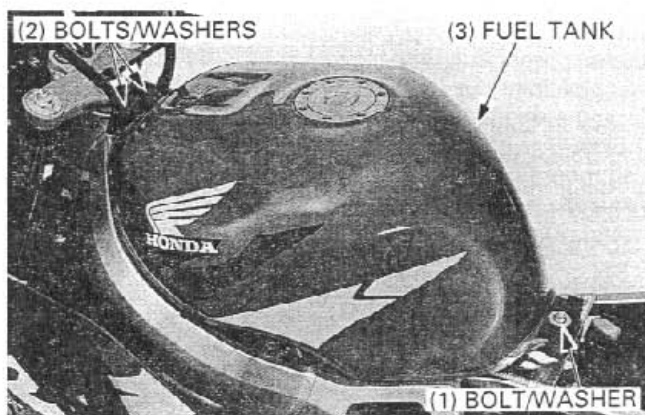
- Before disconnecting the fuel tube, turn the fuel valve lever OFF.

Turn the fuel valve OFF.

Remove the screw and fuel valve lever.

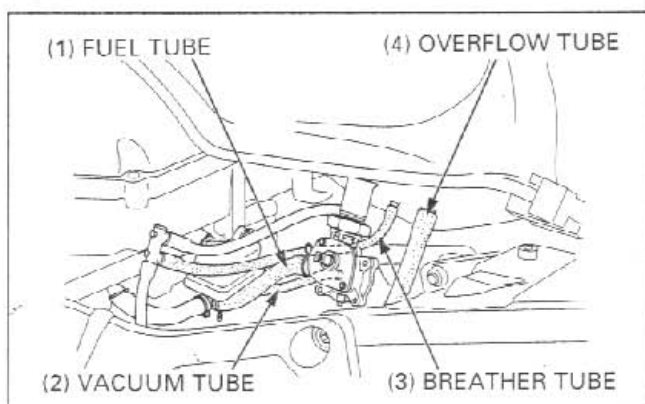


Remove the fuel tank rear mounting bolt, washer and collar.  
Remove the fuel tank front mounting bolts and washers.

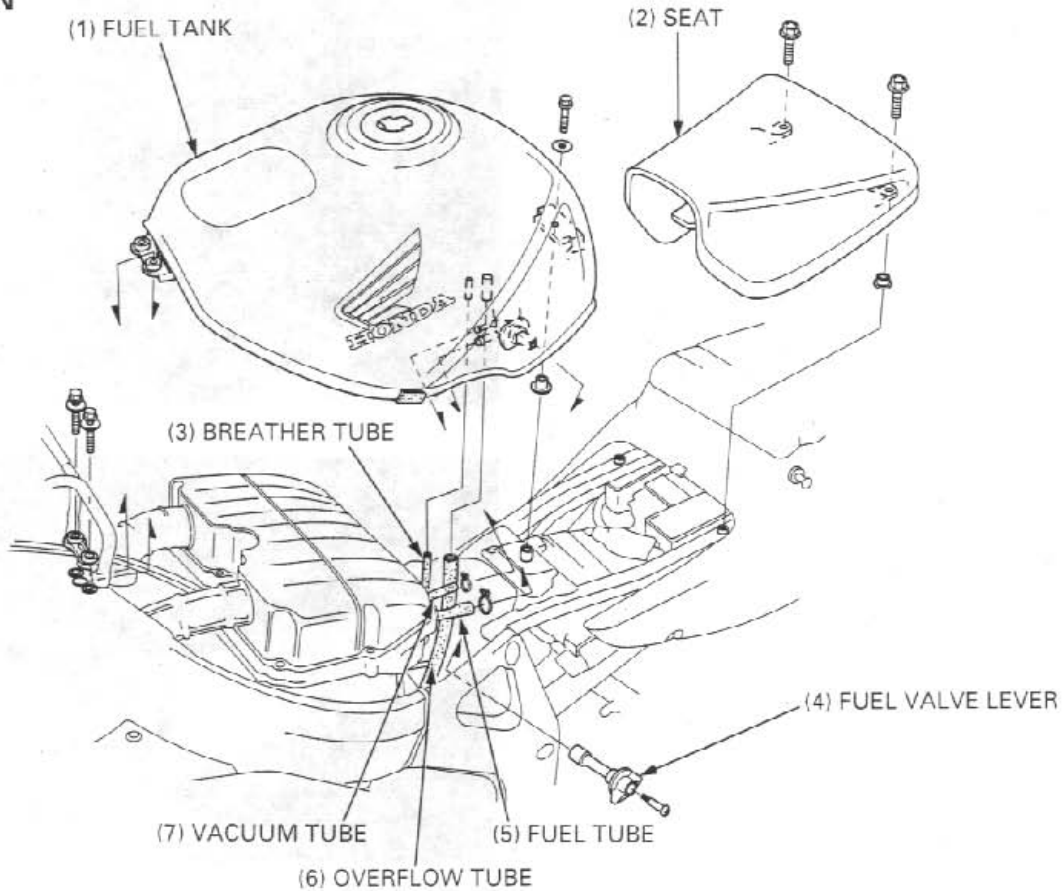


Disconnect the fuel tube and vacuum tube from the fuel valve.

Disconnect the breather tube and overflow tube from the fuel tank, then remove the fuel tank.



**INSTALLATION**

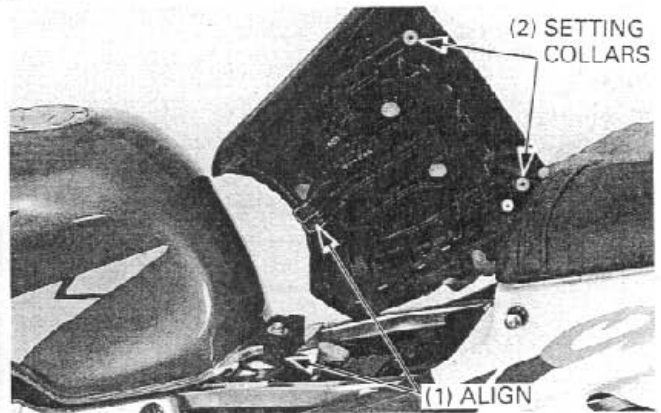


Installation is in the reverse order of removal.

**NOTE**

- Make sure the seat setting collars are in place.
- After fuel tank installation, turn the fuel valve ON and make sure there is no fuel leaks.

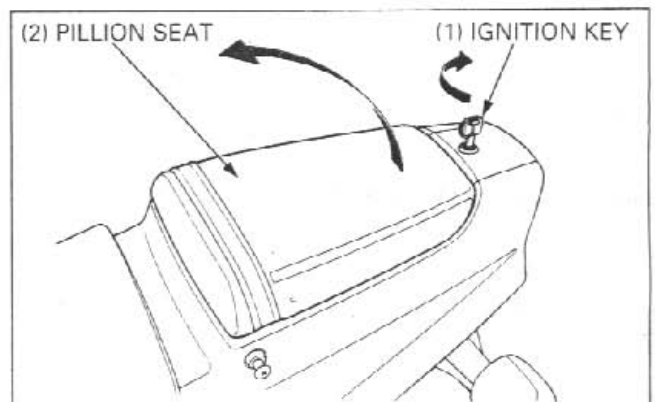
Align the seat hook with the frame bracket and install the seat.  
Install and tighten the seat mounting bolts.



**PILLION SEAT/SIDE COVER**

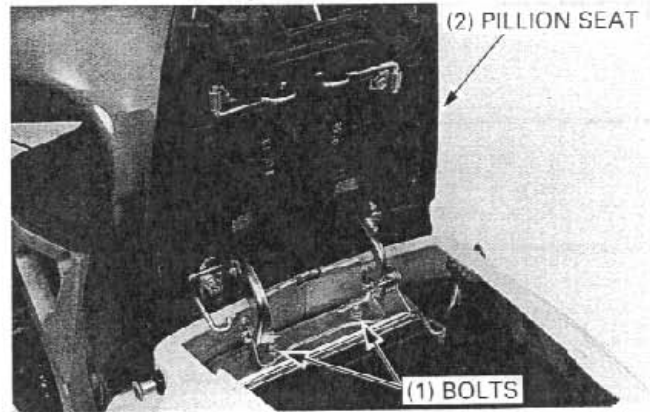
**REMOVAL**

Open the pillion seat using the ignition key.

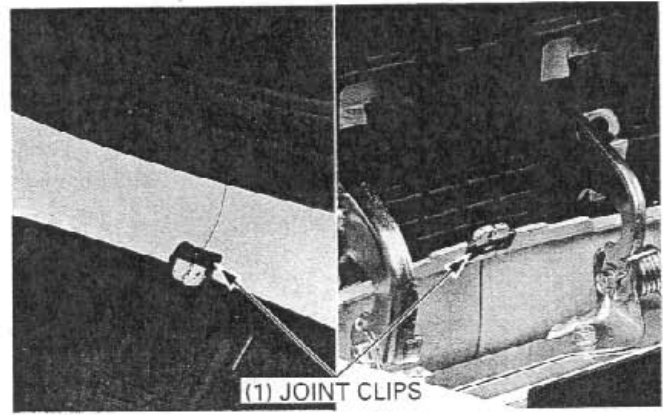


## FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the two mounting bolts, nuts and pillion seat assembly.

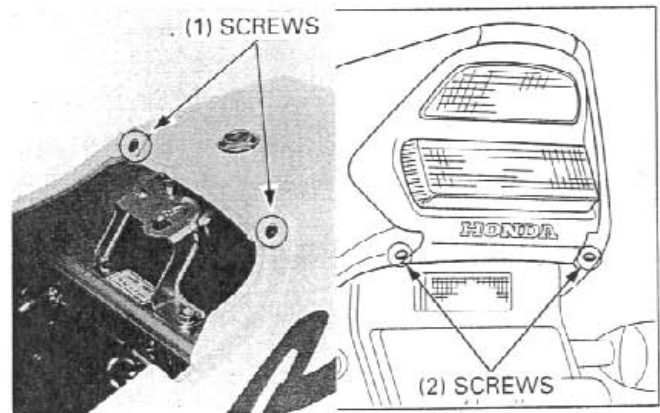


Remove the two joint clips.



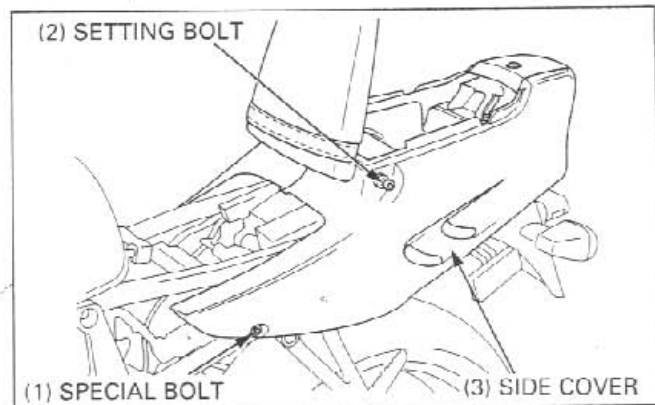
Remove the following:

— Screws

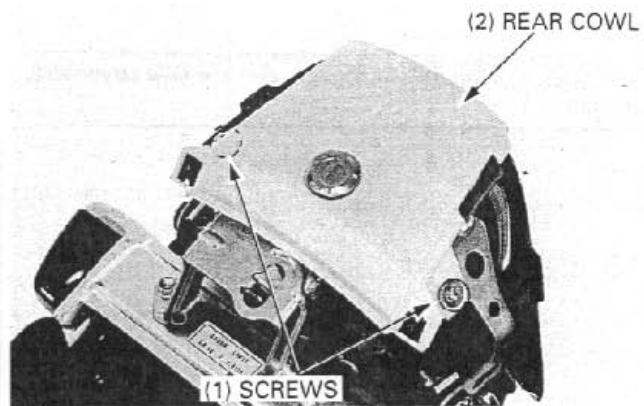


- Special bolt
- Side cover setting bolt
- Setting collar
- Setting spacer

Separate and remove the side cover.

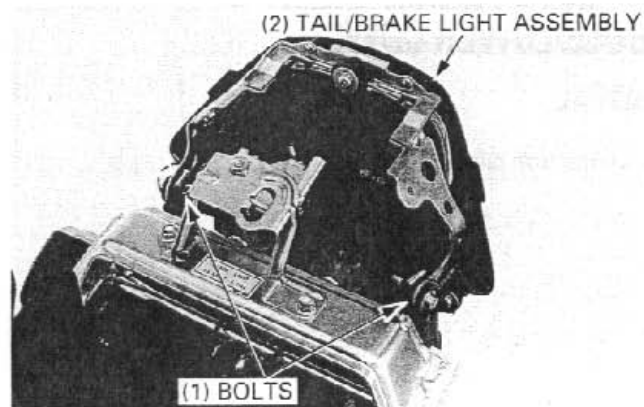


Remove the screws and rear cowl.



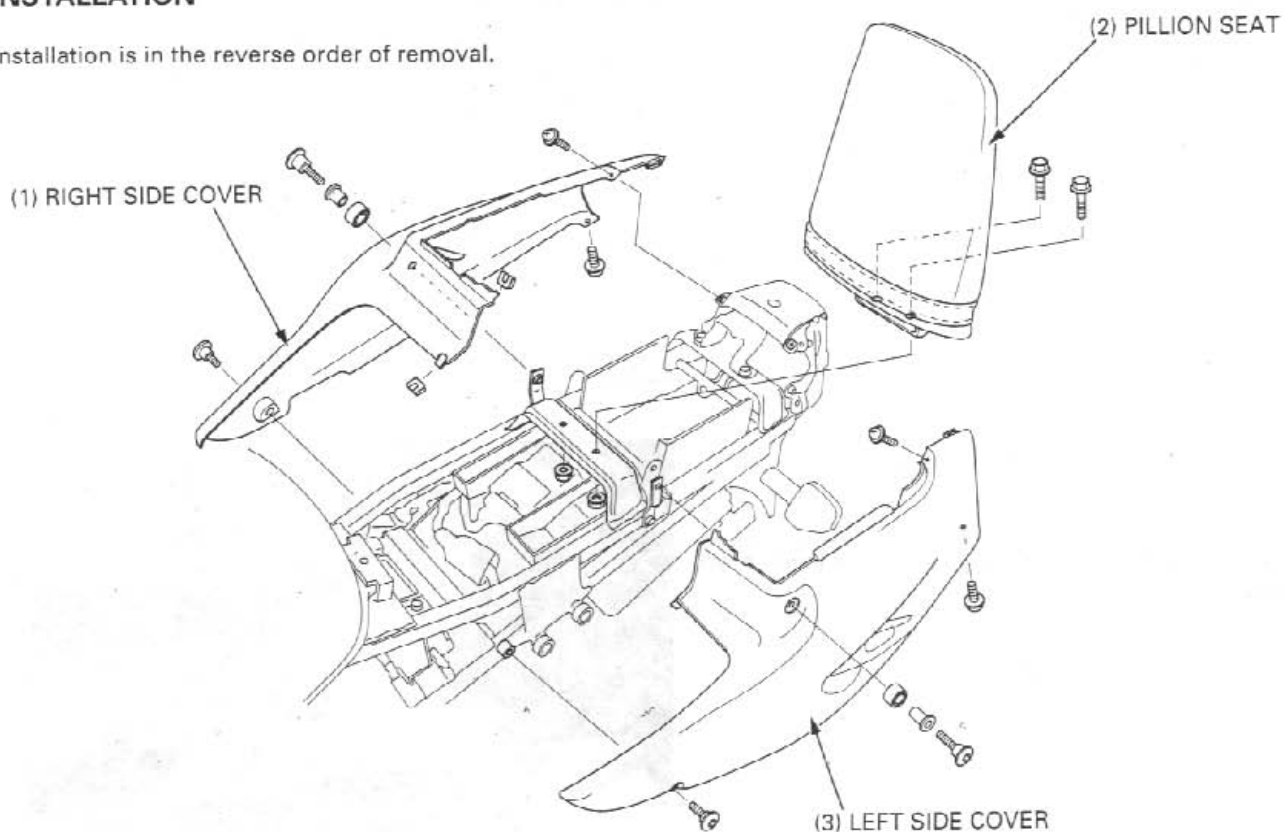
Remove the two bolts and remove the tail/brake light assembly from the rear fender.

Disconnect the tail/brake light 3P (Natural) connector and remove the tail/brake light assembly.



## INSTALLATION

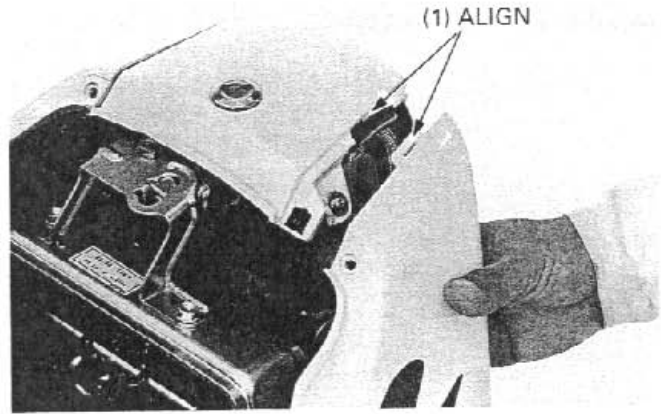
Installation is in the reverse order of removal.





### NOTE

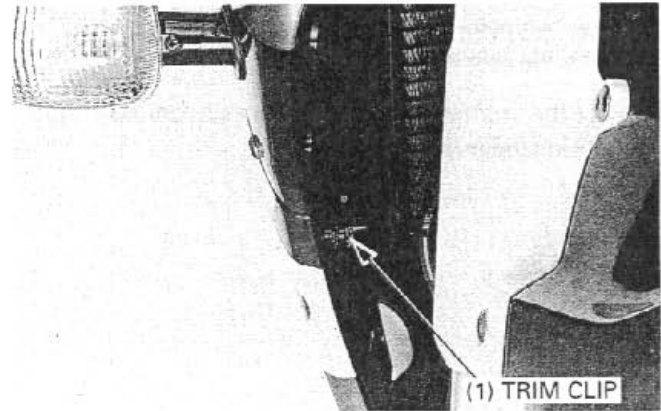
- At installation, align the hooks between the side cover and rear cowl.



## MIDDLE/LOWER COWL

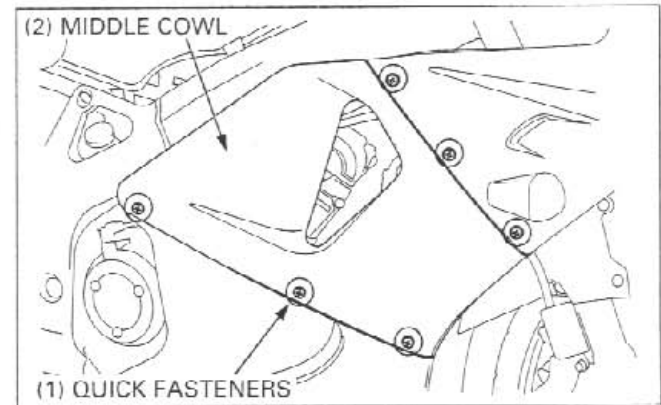
### REMOVAL

Remove the trim clip.



Turn the quick fasteners counterclockwise and release the fasteners.

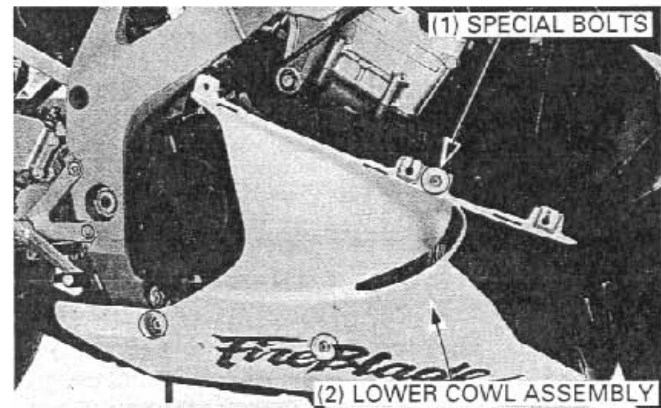
Remove the middle cowl.



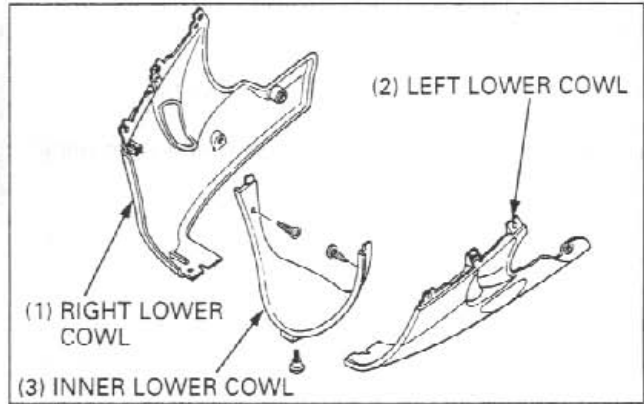
Remove the six special bolts and lower cowl.

### NOTE

- During removal and installation, support the lower cowl securely.



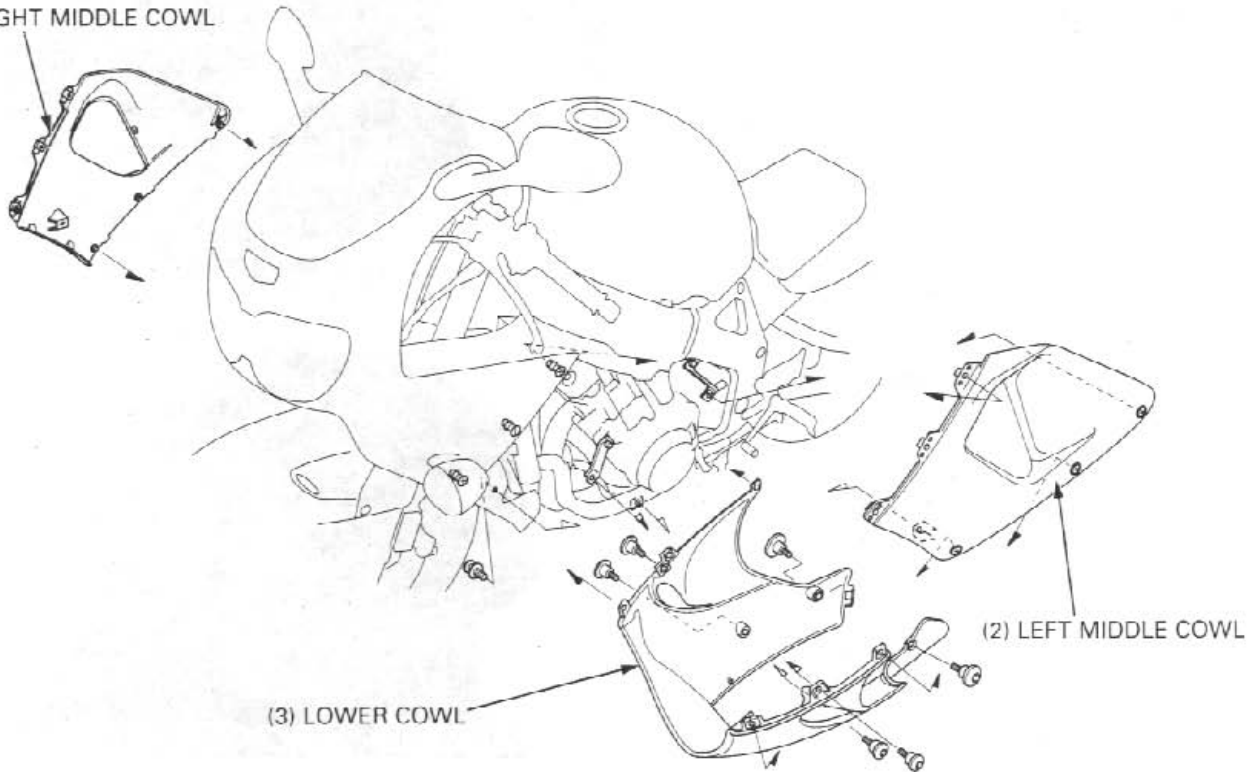
Remove the screws and special bolt, then separate the lower cowl.



## INSTALLATION

Installation is in the reverse order of removal.

(1) RIGHT MIDDLE COWL



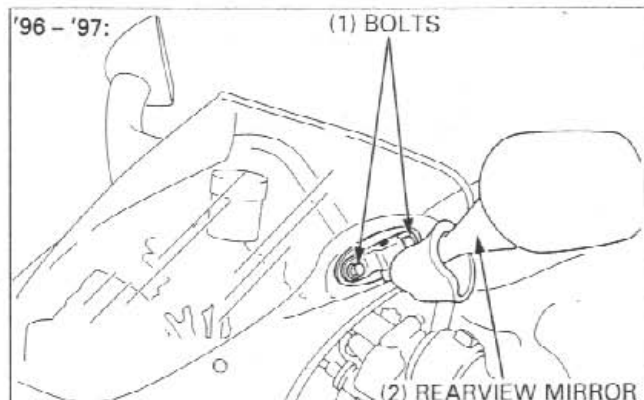
## UPPER COWL

### REARVIEW MIRROR REMOVAL

Remove the rearview mirror pivot boot ('96 - '97).

Remove the following:

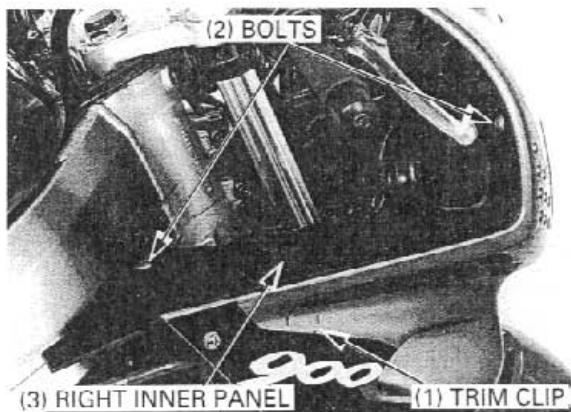
- SH bolts/nuts ('96 - '97:)
- Bolts/nuts (After '97:)
- Rearview mirror
- Mirror plate ('96 - '97:)
- Rubber cushion ('96 - '97:)



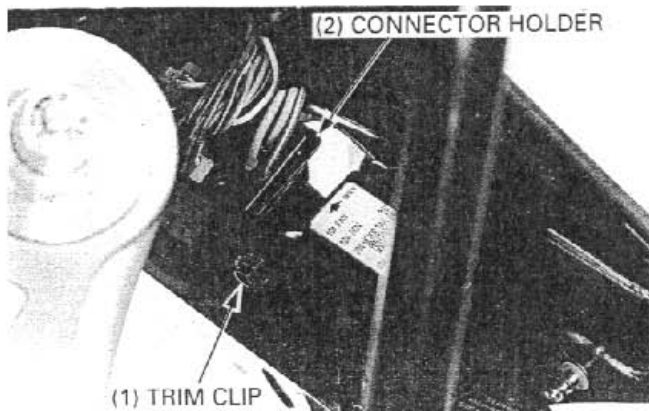
**UPPER COWL REMOVAL**

Remove the right and left middle cowls (page 2-6).

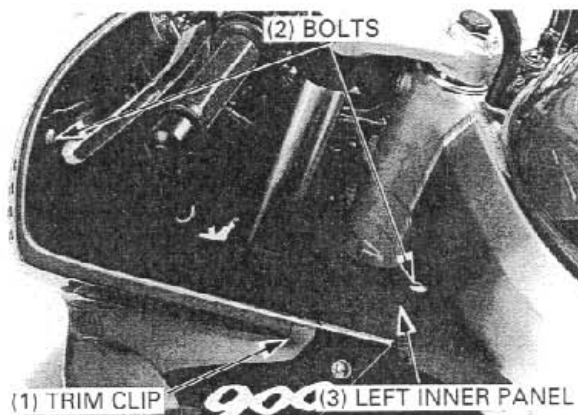
Remove the trim clip, special bolts, collar and right upper cowl inner panel.



Remove the trim clip and release the connector holder from the upper cowl.  
Disconnect the right turn signal connectors.

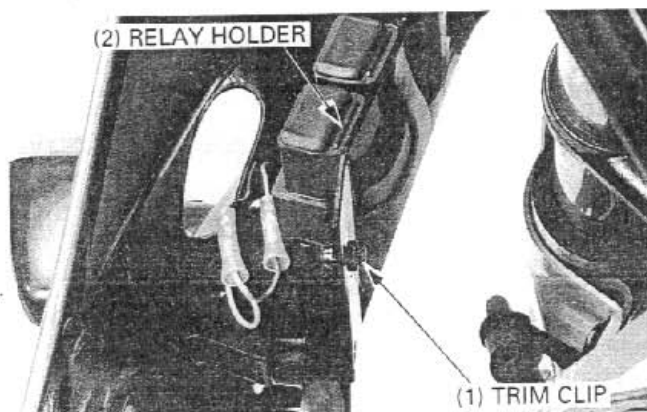


Remove the trim clip, special bolts, collar and left upper cowl inner panel.



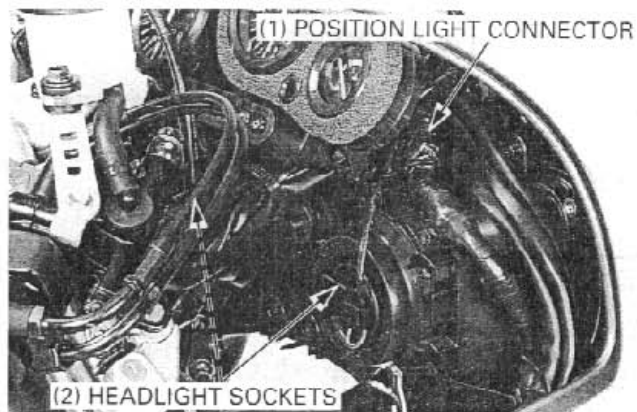
Remove the trim clip and release the relay holder bracket ('96 - '97:) from the upper cowl.

Disconnect the left turn signal connectors.



Disconnect the position light connector.

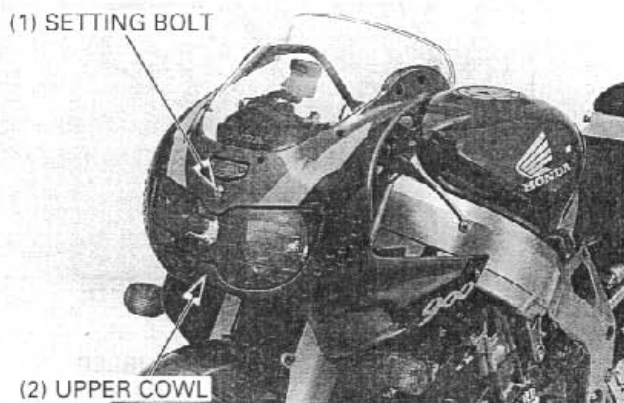
Release the retaining tabs and remove the headlight sockets.



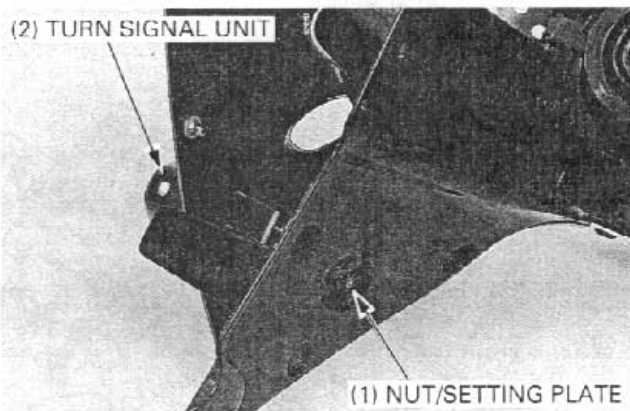
Remove the setting bolt and remove the upper cowl forward.

NOTE

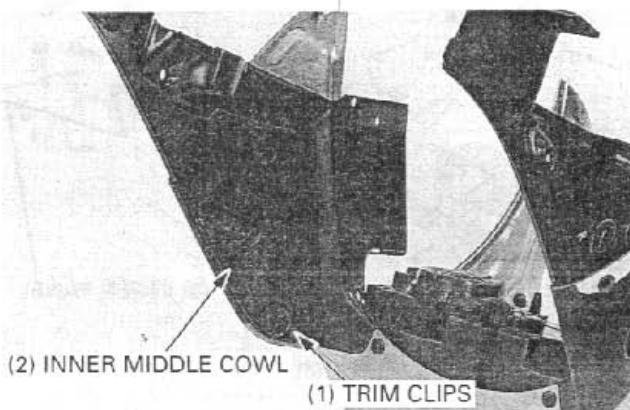
- Refer to page 19-5 for headlight unit removal/installation.



Remove the nut, setting plate and turn signal unit.



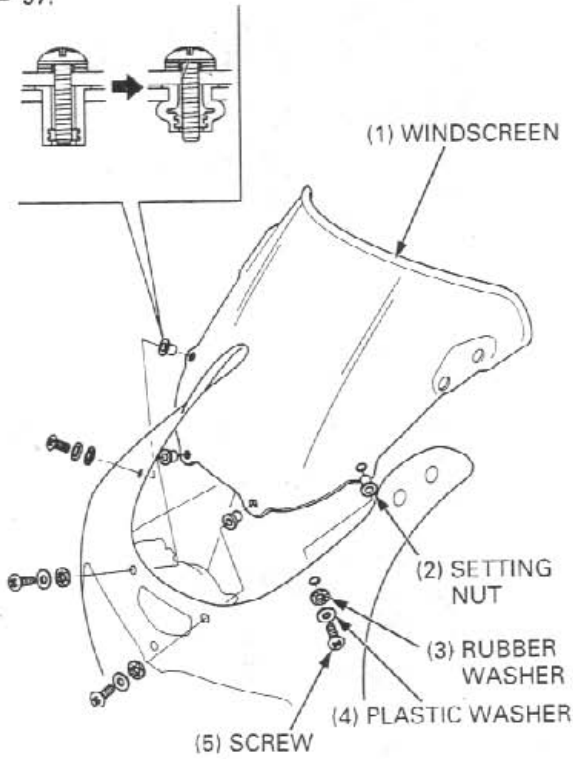
Remove the trim clips and inner middle cowl.



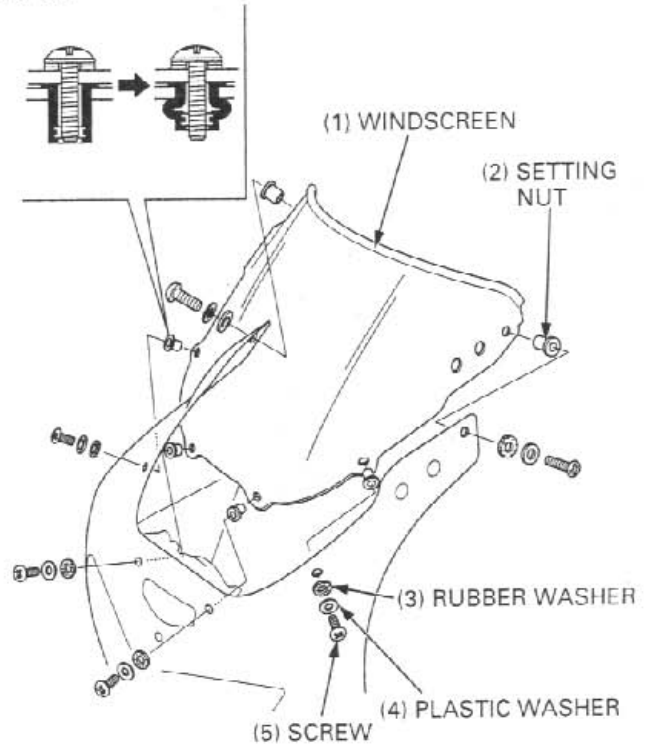
WINDSCREEN REPLACEMENT

Remove the screws, plastic washers and rubber washers.  
Remove the windscreen and setting nuts.

'96 - '97:

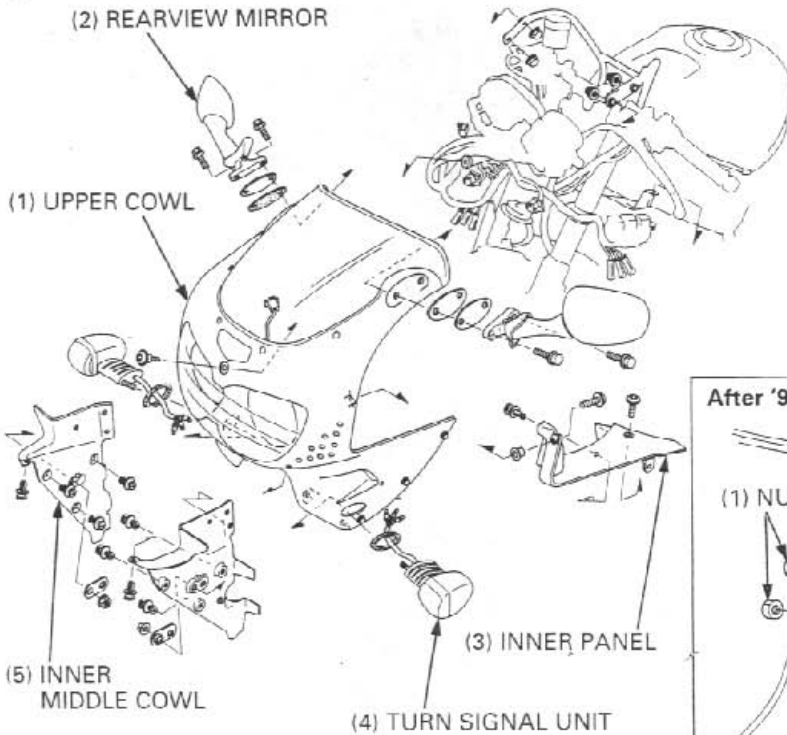


After '97:

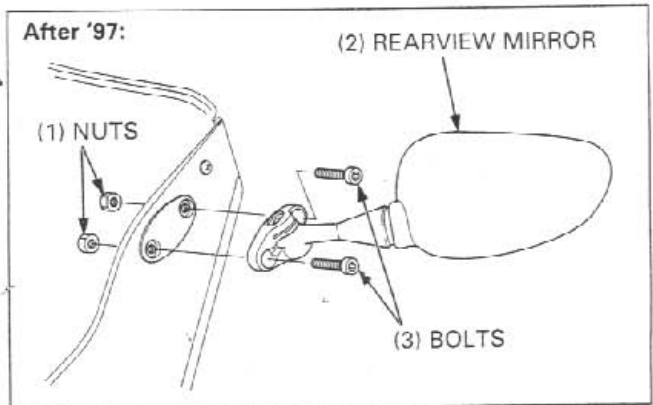


INSTALLATION

'96 - '97:

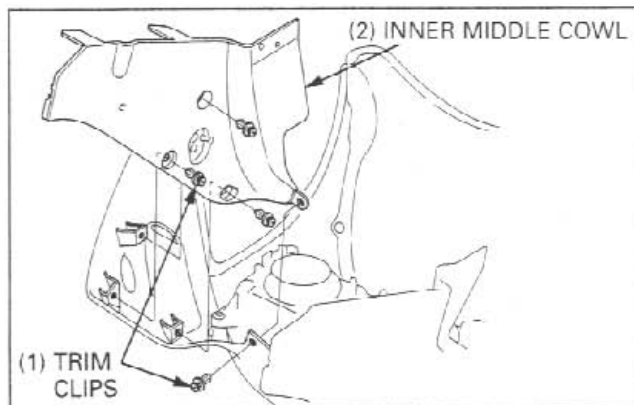


After '97:

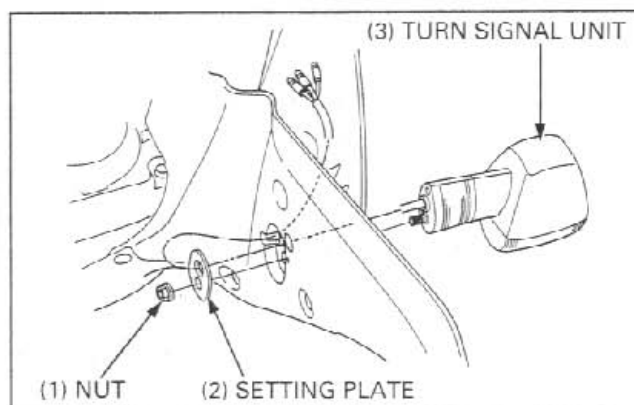


## UPPER COWL INSTALLATION

Install the inner middle cowl and secure it with the trim clips.



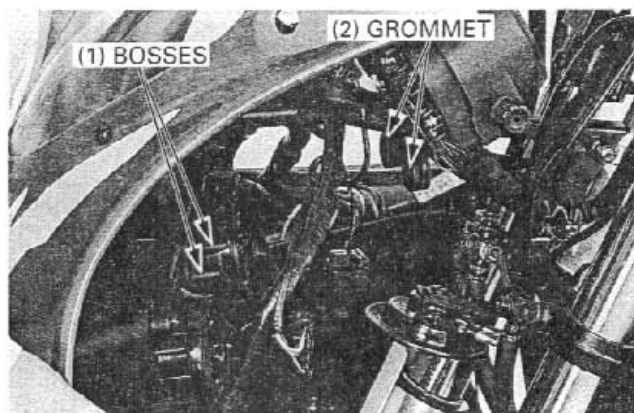
Install the turn signal unit, set plate and nut. Route the turn signal wire into the inner middle cowl as shown.



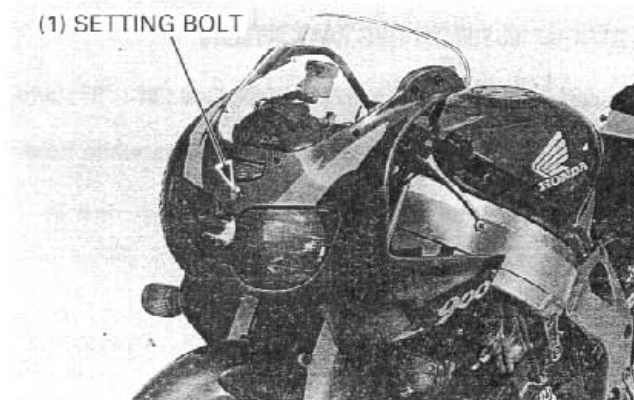
Install the upper cowl, aligning the bosses on the headlight unit with the rubber grommets on the upper cowl stay.

### NOTE

- Route the wire harness into the upper cowl properly (page 1-21).
- Be careful not to pinch the position light wire between the upper cowl and cowl stay.



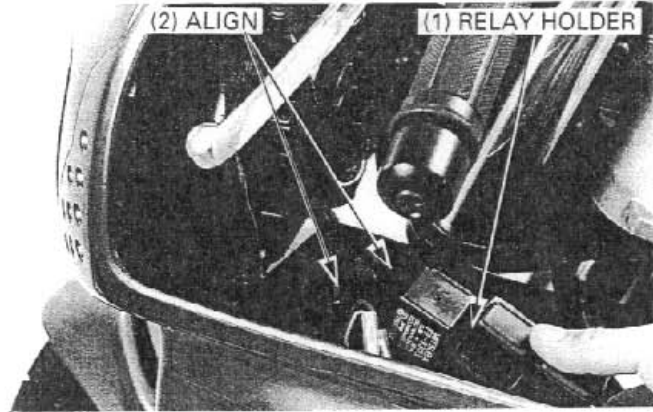
Install and tighten the setting bolt.



## FRAME/BODY PANELS/EXHAUST SYSTEM

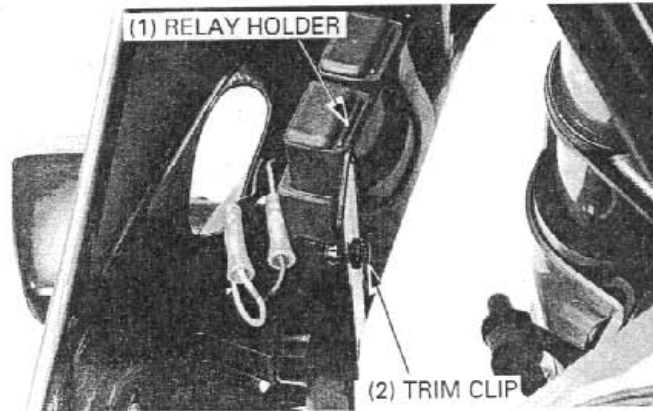
Connect the turn signal connectors.

Install the relay holder aligning its boss with the groove in the inner middle cowl as shown ('96 - '97:).



Secure the holder with the trim clip.

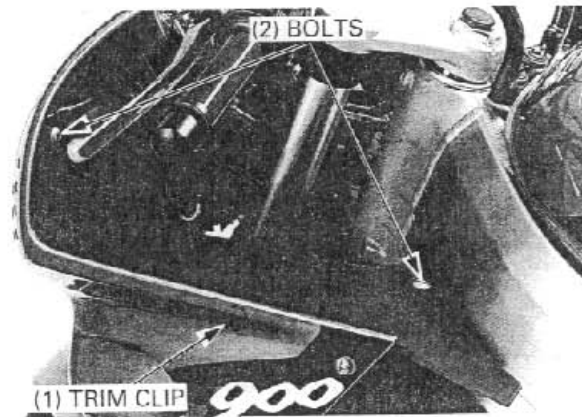
Install the relay holder using the same procedure.



Install the upper cowl inner panel and secure it with the trim clip.  
Install and tighten the special bolts.

### NOTE

- Before installation, install the collar onto the inner panel.

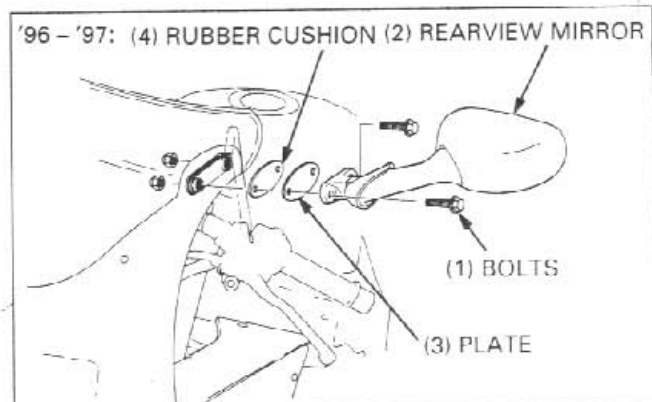


## REARVIEW MIRROR INSTALLATION

Set the rubber cushion ('96 - '97), mirror plate ('96 - '97:) and rearview mirror.

Install the bolts and nuts, then tighten the nuts while holding the bolts.

Install the rubber boot securely ('96 - '97:).

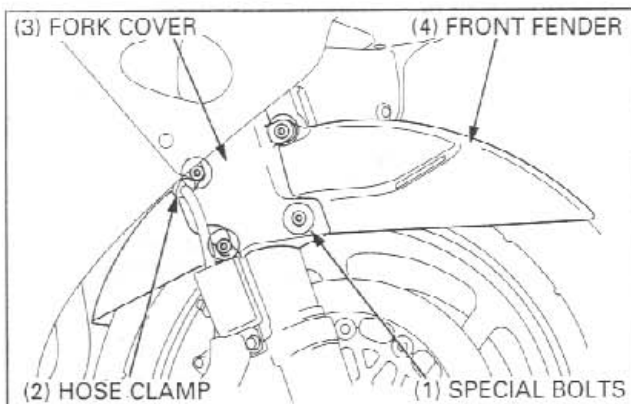


## FRONT FENDER

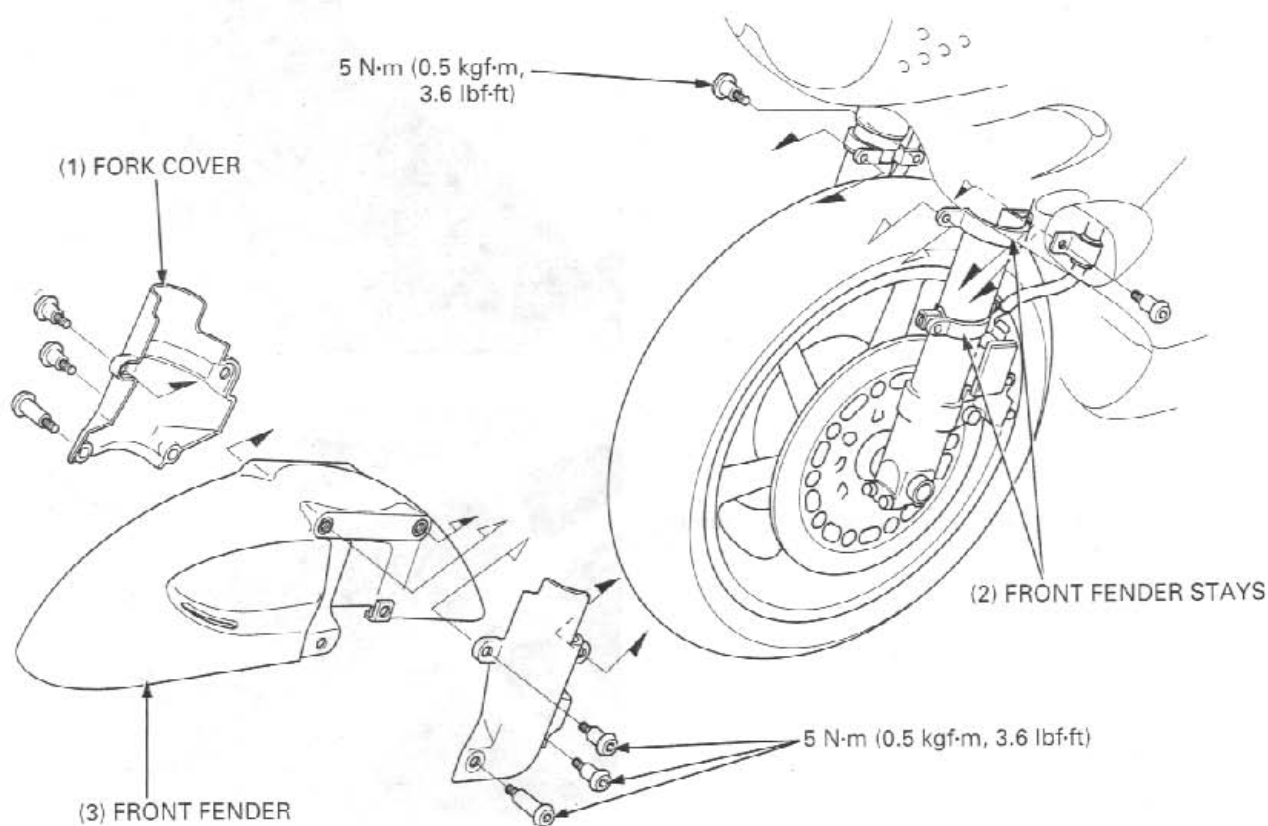
### REMOVAL

Remove the special bolts, brake hose clamps and fork covers.

Remove the front fender forward.



### INSTALLATION



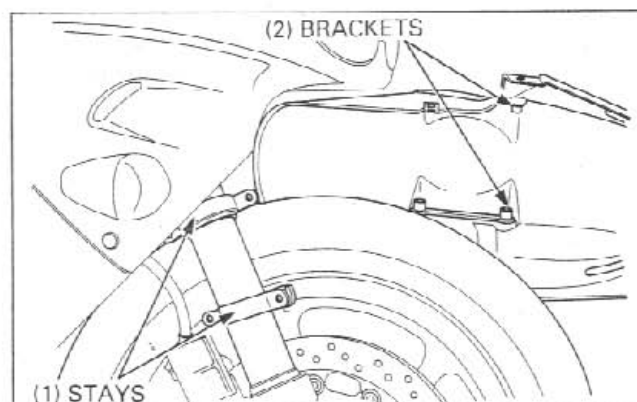
Installation is in the reverse order of removal.

#### NOTE

- Install the front fender stays and brackets as shown.
- Install the long bolts into the front lower side.

#### TORQUE:

Front fender mounting bolt: 5 N·m (0.5 kgf·m, 3.6 lbf·ft)



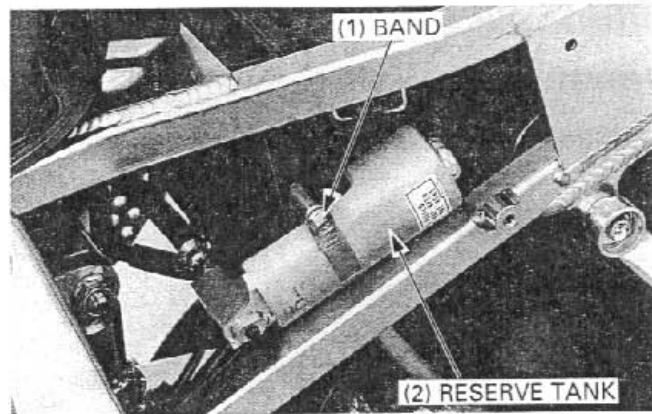


## REAR FENDER

### REMOVAL

Remove the side cover (page 2-3).  
Remove the battery (page 16-5).

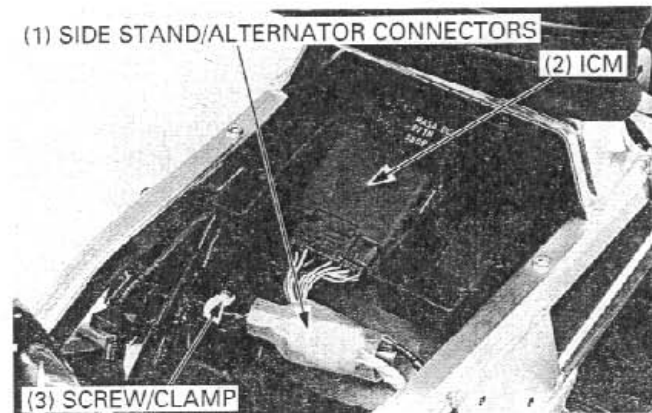
Remove the rear shock absorber reserve tank band.  
Remove the reserve tank from the rear fender groove.



Disconnect the following:

- Side stand switch connector
- Alternator connector

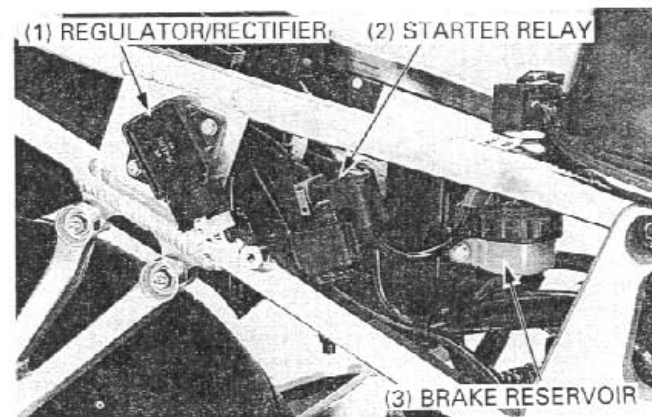
Remove the ICM (ignition control module).  
Remove the wire harness clamp screw.



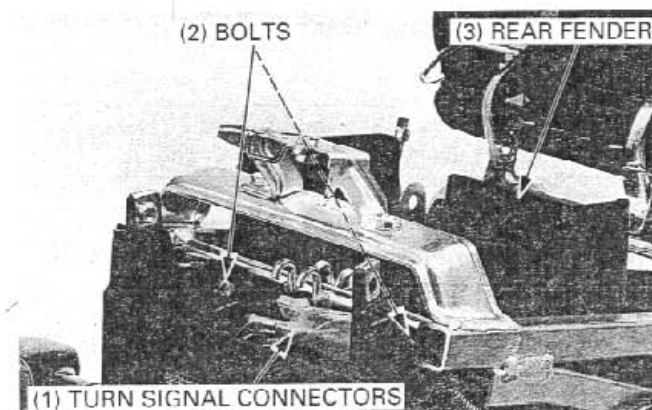
Remove the bolts, nuts and regulator/rectifier.  
Disconnect the regulator/rectifier connector.

Remove the starter relay switch and release the wire harness from the rear fender.

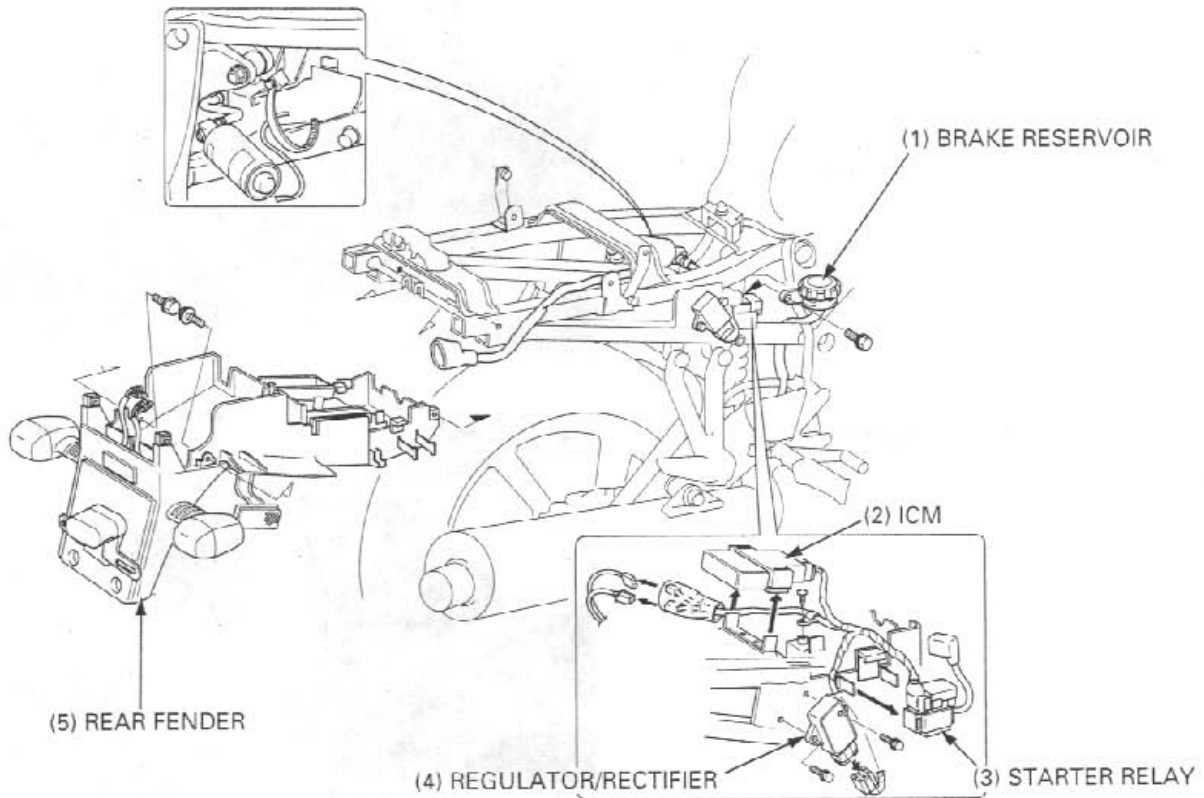
Remove the bolt and rear brake reservoir.



Disconnect the turn signal and license light connectors.  
Remove the rear fender mounting bolts and rear fender.



INSTALLATION



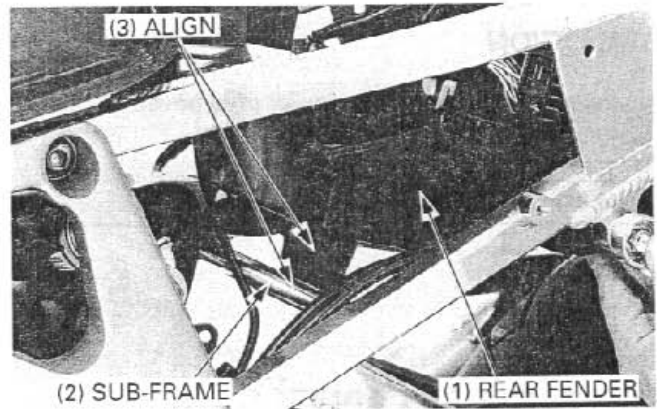
Install the rear fender into the seat rail, while aligning the front groove of the rear fender with the sub-frame.

NOTE

- While installing the rear fender, route the wire harness properly (page 1-21).

Install and tighten the rear fender mounting bolts.

Install the removed parts in the reverse order of removal.

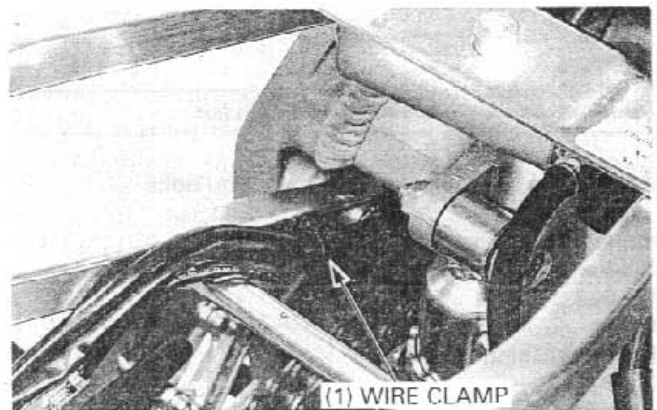


SEAT RAIL

REMOVAL

Remove the rear fender (page 2-14).

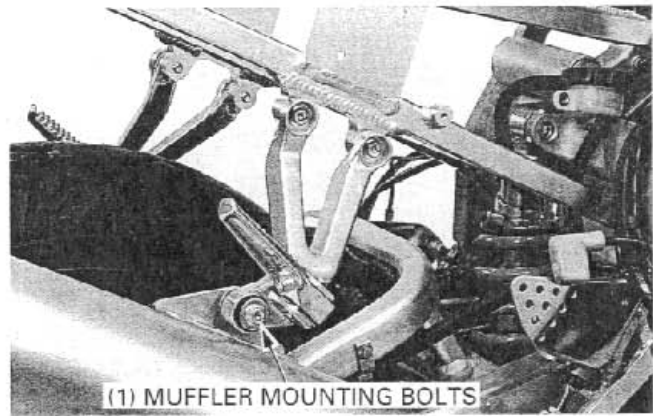
Release the harness wire clamp.



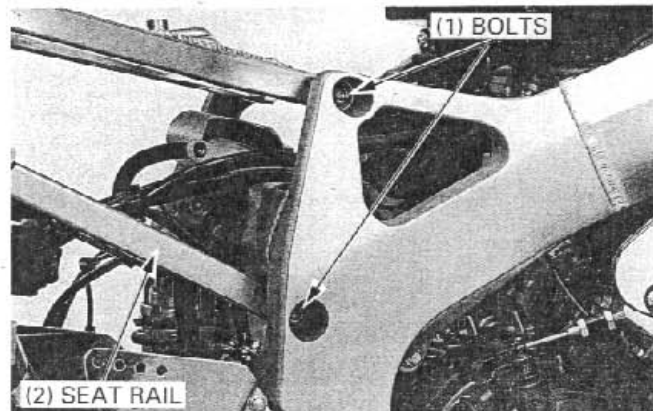
## FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the following:

- Muffler mounting bolt/nut
- Plain washer
- Collar



Remove the seat rail mounting bolts, nuts and seat rail.

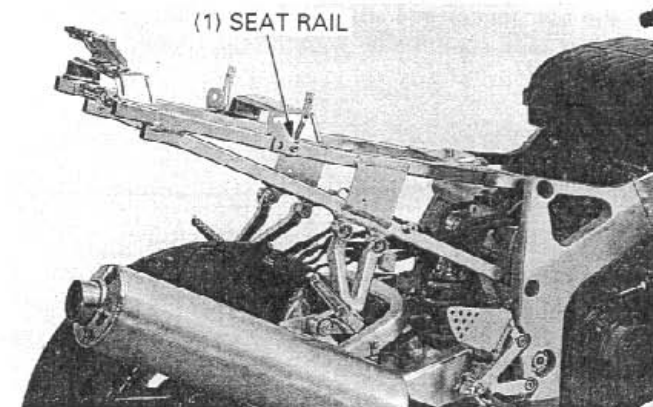


## INSTALLATION

Install the seat rail in the reverse order of removal.

### NOTE

- Route the wire harness properly and clamp it.



## MUFFLER/EXHAUST PIPE

### REMOVAL

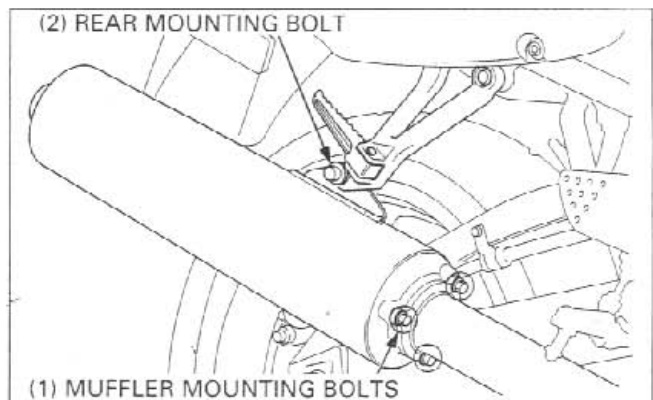
#### ▲ WARNING

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

Remove the exhaust pipe/muffler mounting bolts.

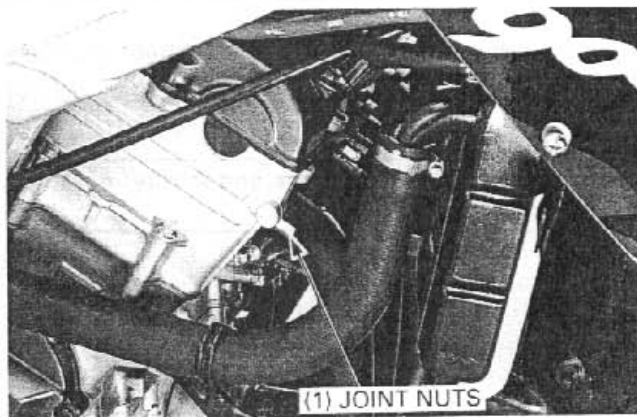
Remove the following:

- Muffler mounting bolt/nut
- Washer
- Collar
- Rubber bushing
- Muffler
- Muffler gasket



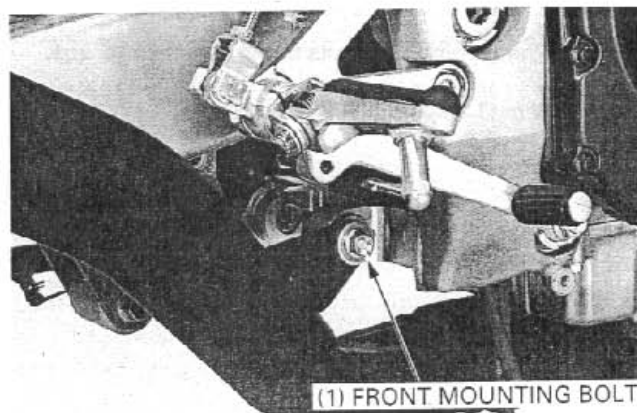
Remove the middle/lower cowl (page 2-6).

Remove the exhaust pipe joint nuts.

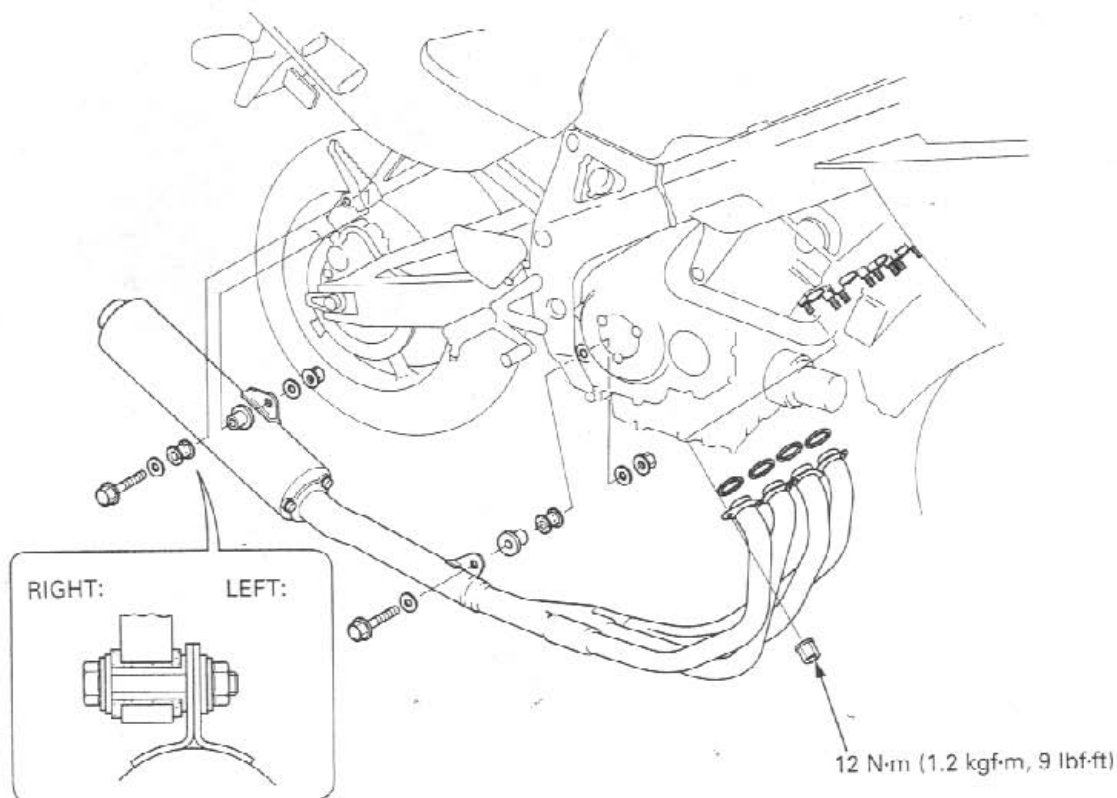


Remove the following:

- Exhaust pipe mounting bolt/nut
- Washer
- Collar
- Rubber bushing
- Exhaust pipe
- Exhaust pipe gaskets



**INSTALLATION**

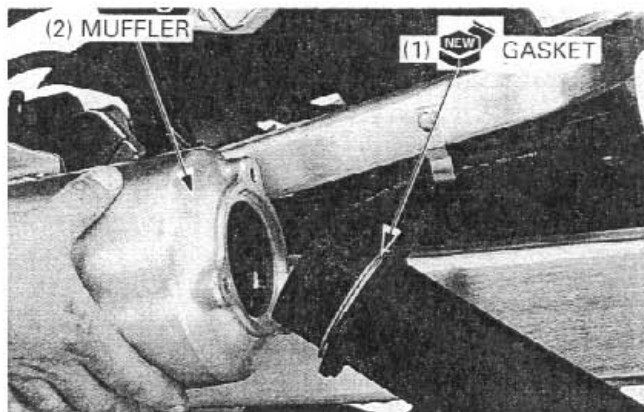


## FRAME/BODY PANELS/EXHAUST SYSTEM

Install the exhaust pipe and muffler, and temporarily tighten the all mounting bolts and nuts.

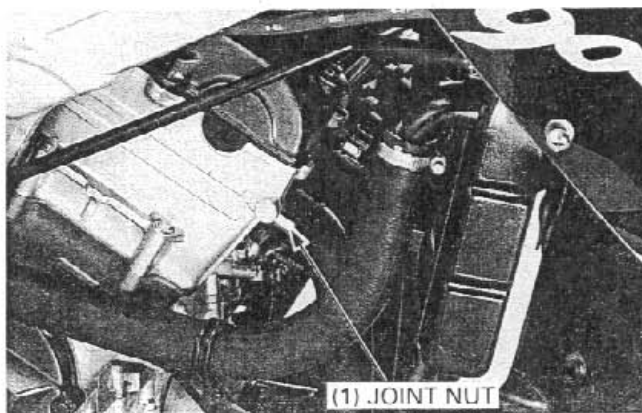
### NOTE

- Always replace the exhaust pipe and muffler gaskets with new ones.



Tighten the exhaust pipe joint nuts to the specified torque.

**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

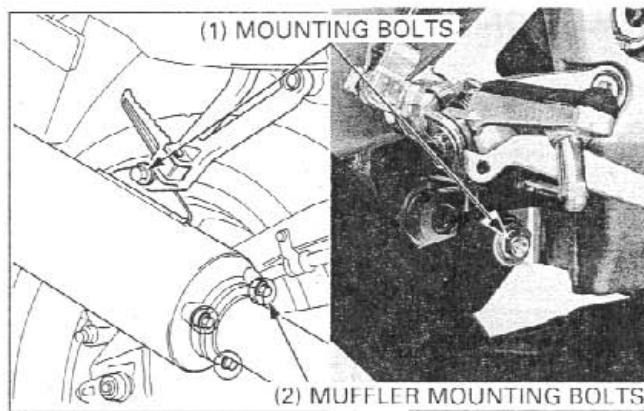


Tighten the muffler/exhaust pipe mounting bolts.

Tighten the muffler/exhaust pipe mounting nut to the specified torque.

**TORQUE: 25 N·m (2.6 kgf·m, 19 lbf·ft)**

Install the middle/lower cowl (page 2-6).



|  |      |  |      |
|--|------|--|------|
| SERVICE INFORMATION                                | 3-1  | EVAPORATIVE EMISSION CONTROL SYSTEM (CALIFORNIA TYPE ONLY) | 3-17 |
| MAINTENANCE SCHEDULE                               | 3-3  | DRIVE CHAIN  | 3-17 |
| FUEL LINE  | 3-4  | BRAKE FLUID  | 3-21 |
| THROTTLE OPERATION                                 | 3-4  | BRAKE PAD WEAR   | 3-22 |
| CARBURETOR CHOKE                                   | 3-5  | BRAKE SYSTEM   | 3-22 |
| AIR CLEANER  | 3-5  | BRAKE LIGHT SWITCH   | 3-23 |
| SPARK PLUG   | 3-5  | HEADLIGHT AIM  | 3-23 |
| VALVE CLEARANCE                                    | 3-7  | CLUTCH SYSTEM  | 3-24 |
| ENGINE OIL/OIL FILTER                              | 3-11 | SIDE STAND   | 3-25 |
| CARBURETOR SYNCHRONIZATION                         | 3-13 | SUSPENSION   | 3-25 |
| ENGINE IDLE SPEED                                  | 3-15 | NUTS, BOLTS, FASTENERS                                     | 3-27 |
| RADIATOR COOLANT                                   | 3-15 | WHEELS/TIRES   | 3-28 |
| COOLING SYSTEM                                     | 3-16 | STEERING HEAD BEARINGS                                     | 3-28 |
| SECONDARY AIR SUPPLY SYSTEM (CALIFORNIA TYPE ONLY) | 3-16 |  |      |

## SERVICE INFORMATION

### GENERAL

#### ▲ 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 the gasoline is stored can cause a fire or explosion.
  - If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death.
- 
- Place the motorcycle on a level ground before starting any work.

### SPECIFICATIONS

| ITEM                    |          | SPECIFICATIONS                    |                                   |
|-------------------------|----------|-----------------------------------|-----------------------------------|
| Throttle grip free play |          | 2 - 6 mm (1/12 - 1/4 in)          |                                   |
| Spark plug              |          | NGK                               | NIPPONDENSO                       |
|                         | Standard | CR9EH 9                           | U27FER 9                          |
|                         | Optional | CR8EH 9                           | U24FER 9                          |
| Spark plug gap          |          | 0.80 - 0.90 mm (0.031 - 0.035 in) |                                   |
| Valve clearance         | IN       | 0.13 - 0.19 mm (0.005 - 0.007 in) |                                   |
|                         | EX       | '96 - '97:                        | 0.19 - 0.25 mm (0.007 - 0.010 in) |
|                         |          | After '97:                        | 0.22 - 0.28 mm (0.009 - 0.011 in) |

## MAINTENANCE

| ITEM                     |                               | SPECIFICATIONS   |   |
|--------------------------|-------------------------------|--|---|
| Engine oil capacity      | At draining                   | 3.5 liter (3.7 US qt, 3.0 Imp qt)  |   |
|                          | At disassembly                | 4.4 liter (4.6 US qt, 3.9 Imp qt)  |   |
|                          | At oil filter change          | 3.6 liter (3.8 US qt, 3.2 Imp qt)  |   |
| Recommended engine oil   |                               | HONDA GN4 4-stroke oil or equivalent motor oil<br>API service classification SF or SG<br>Viscosity: SAE 10W - 40 |   |
| Engine idle speed        | Except California type        | 1,100 ± 100 rpm  |   |
|                          | California type               | 1,200 ± 100 rpm  |   |
| Drive chain slack        |                               | 30 - 40 mm (1-1/8 - 1-1/2 in)  |   |
| Recommended brake fluid  |                               | DOT 4  |   |
| Clutch lever free play   |                               | 10 - 20 mm (3/8 - 3/4 in)  |   |
| Tire size                | '96 - '97:                    | Front  | 130/70 - ZR16                               |
|                          |                               | Rear   | 180/55 - ZR17                               |
|                          | After '97:                    | Front  | 130/70 - ZR16 (61 W)                        |
|                          |                               | Rear   | 180/55 - ZR17 (73 W)                        |
| Tire brand               | Bridgestone                   | Front  | BT56F RADIAL                                |
|                          |                               | Rear   | BT56R RADIAL G                              |
|                          | Michelin                      | Front  | TX15  |
|                          |                               | Rear   | TX25  |
| Tire air pressure        | Up to 90 kg (200 lb) load     | Front  | 250 kPa (2.50 kgf/cm <sup>2</sup> , 36 psi) |
|                          |                               | Rear   | 290 kPa (2.90 kgf/cm <sup>2</sup> , 42 psi) |
|                          | Up to maximum weight capacity | Front  | 250 kPa (2.50 kgf/cm <sup>2</sup> , 36 psi) |
|                          |                               | Rear   | 290 kPa (2.90 kgf/cm <sup>2</sup> , 42 psi) |
| Tire minimum tread depth | Front                         | 1.5 mm (0.06 in)   |   |
|                          | Rear                          | 2.0 mm (0.08 in)   |   |

## TORQUE VALUES

|                                 |                                  |
|---------------------------------|----------------------------------|
| Crankshaft hole cap             | 18 N·m (1.8 kgf·m, 13 lbf·ft)    |
| Spark plug                      | 12 N·m (1.2 kgf·m, 9 lbf·ft)     |
| Oil drain bolt                  | 29 N·m (3.0 kgf·m, 22 lbf·ft)    |
| Oil filter cartridge            | 10 N·m (1.0 kgf·m, 7 lbf·ft)     |
| Vacuum plug for synchronization | 3.0 N·m (0.30 kgf·m, 2.2 lbf·ft) |
| Rear axle nut                   | 93 N·m (9.5 kgf·m, 69 lbf·ft)    |

## TOOLS

|                      |  |
|----------------------|--|
| Oil filter wrench    | 07HAA - PJ70100  |
| Drive chain tool set | 07HMH - MR10103 or 07HMH - MR1010B (U.S.A. only)                   |
| Vacuum gauge set     | 07LMJ - 001000A (U.S.A. only) or M937B - 021 - XXXXX (U.S.A. only) |

# MAINTENANCE SCHEDULE

Perform the Pre-ride inspection described in the Owner's Manual at each scheduled maintenance period.  
 I: Inspect and Clean, Adjust, Lubricate or Replace if necessary. C: Clean. R: Replace. A: Adjust. 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.

| ITEMS                      | FREQUENCY                             | NOTE<br>↓ | ODOMETER READING (NOTE 1)  |     |   |    |    |    |    |    | REFER TO PAGE |      |
|----------------------------|---------------------------------------|-----------|----------------------------|-----|---|----|----|----|----|----|---------------|------|
|                            |                                       |           | X1,000 mi                  | 0.6 | 4 | 8  | 12 | 16 | 20 | 24 |               |      |
|                            |                                       |           | X1,000 km                  | 1   | 6 | 12 | 18 | 24 | 30 | 36 |               |      |
| EMISSION RELATED ITEMS     | * FUEL LINE                           |           |                            |     |   | I  |    |    | I  |    | I             | 3-4  |
|                            | * THROTTLE OPERATION                  |           |                            |     |   | I  |    |    | I  |    | I             | 3-4  |
|                            | * CARBURETOR CHOKE                    |           |                            |     |   | I  |    |    | I  |    | I             | 3-5  |
|                            | * AIR CLEANER                         | NOTE 2    |                            |     |   |    | R  |    |    |    | R             | 3-5  |
|                            | SPARK PLUG                            |           |                            |     | I | R  | I  | R  | I  | R  |               | 3-5  |
|                            | * VALVE CLEARANCE                     |           |                            |     |   |    |    |    | I  |    |               | 3-7  |
|                            | ENGINE OIL                            |           |                            |     |   | R  |    | R  |    | R  |               | 3-11 |
|                            | ENGINE OIL FILTER                     |           |                            |     |   | R  |    | R  |    | R  |               | 3-11 |
|                            | * CARBURETOR SYNCHRONIZATION          |           |                            |     |   | I  |    | I  |    | I  |               | 3-13 |
|                            | * ENGINE IDLE SPEED                   |           |                            |     | I | I  | I  | I  | I  | I  |               | 3-15 |
|                            | RADIATOR COOLANT                      | NOTE 3    |                            |     |   |    | I  |    | I  |    | R             | 3-15 |
|                            | * COOLING SYSTEM                      |           |                            |     |   |    | I  |    | I  |    | I             | 3-16 |
|                            | * SECONDARY AIR SUPPLY SYSTEM         | NOTE 4    |                            |     |   |    | I  |    | I  |    | I             | 3-16 |
|                            | * EVAPORATIVE EMISSION CONTROL SYSTEM | NOTE 4    |                            |     |   |    |    |    | I  |    | I             | 3-17 |
| NON-EMISSION RELATED ITEMS | DRIVE CHAIN                           |           | EVERY 500 mi (800 km) I, L |     |   |    |    |    |    |    | 3-17          |      |
|                            | BRAKE FLUID                           | NOTE 3    |                            |     | I | I  | R  | I  | I  | R  |               | 3-21 |
|                            | BRAKE PAD WEAR                        |           |                            |     | I | I  | I  | I  | I  | I  |               | 3-22 |
|                            | BRAKE SYSTEM                          |           |                            |     | I |    |    | I  |    | I  |               | 3-22 |
|                            | * BRAKE LIGHT SWITCH                  |           |                            |     |   | I  |    | I  |    | I  |               | 3-23 |
|                            | * HEADLIGHT AIM                       |           |                            |     |   | I  |    | I  |    | I  |               | 3-23 |
|                            | CLUTCH SYSTEM                         |           |                            |     | I | I  | I  | I  | I  | I  |               | 3-24 |
|                            | SIDE STAND                            |           |                            |     |   | I  |    | I  |    | I  |               | 3-25 |
|                            | * SUSPENSION                          |           |                            |     |   | I  |    | I  |    | I  |               | 3-25 |
|                            | * NUTS, BOLTS, FASTENERS              |           |                            |     | I |    | I  |    | I  |    | I             | 3-27 |
| ** WHEELS/TIRES            |                                       |           |                            |     | I |    | I  |    | I  |    | 3-28          |      |
| ** STEERING HEAD BEARINGS  |                                       |           |                            | I   |   | I  |    | I  |    | I  | 3-28          |      |

- \* 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 reading, 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. California type only.

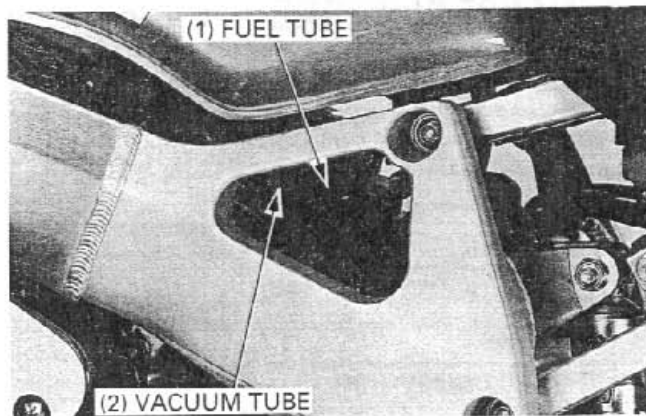


## MAINTENANCE

### FUEL LINE

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

Also check the fuel valve vacuum tube for damage.  
Replace the vacuum if necessary.



### THROTTLE OPERATION

Check for smooth throttle grip full opening and automatic full closing in all steering positions.  
Check the throttle cables and replace them if they are deteriorated, kinked or damaged.

If throttle operation is not smooth, lubricate the throttle cables.

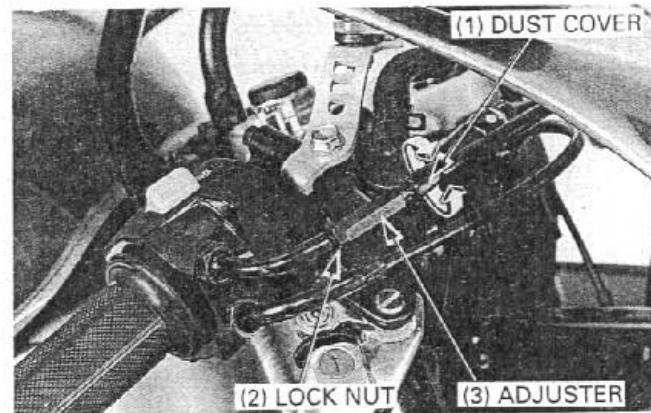
Measure the free play at the throttle grip flange.

**FREE PLAY: 2 – 6 mm (1/12 – 1/4 in)**



Throttle grip free play can be adjusted at either end of the throttle cable.

Minor adjustments are made with the upper adjuster.  
Remove the dust cover from the adjuster.  
Adjust the free play by loosening the lock nut and turning the adjuster.



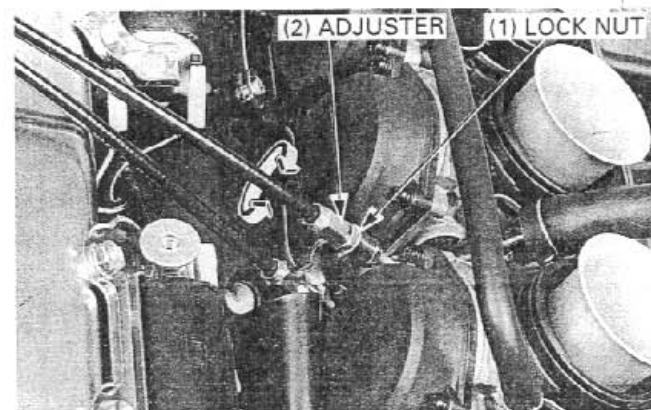
Major adjustments are made with the lower adjuster.

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

Adjust the free play loosening the lock nut and turn the adjuster.

After adjustment, tighten the lock nut securely.

Recheck the throttle operation.  
Replace any damaged parts, if necessary.

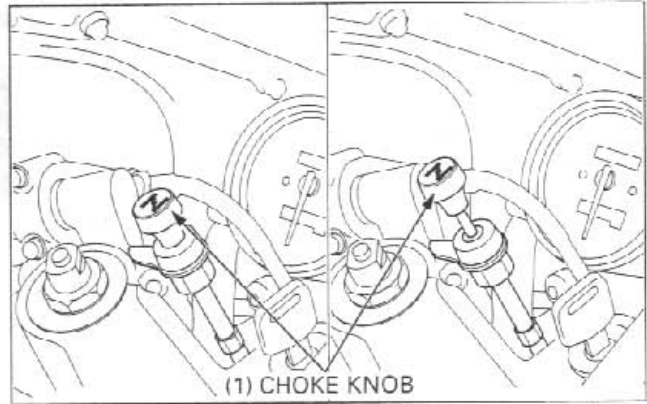


## CARBURETOR CHOKE

The choke system uses a fuel enrichment circuit controlled by a starting enrichment (SE) valve. The SE valve opens the enrichment circuit via a cable when the choke knob on the top bridge is pulled up.

Check for smooth choke knob operation and lubricate the choke cable if required.

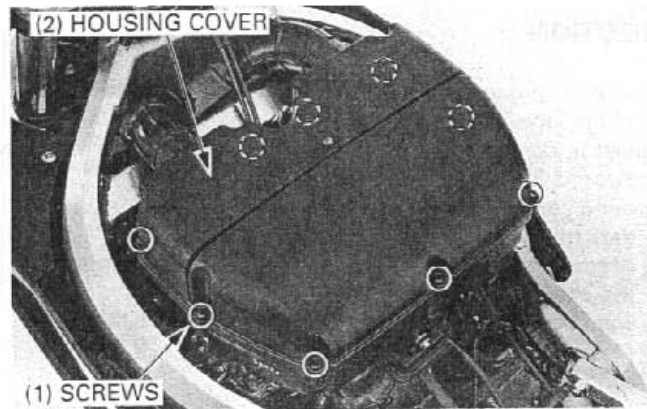
Inspect the cable for cracks which could allow moisture to enter.  
Replace the cable if necessary.



## AIR CLEANER

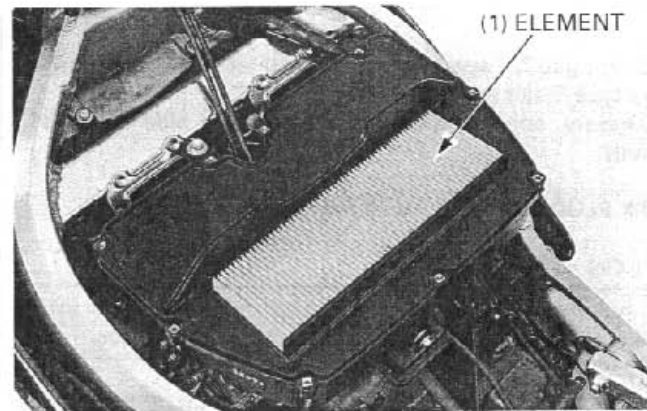
Remove the fuel tank (page 2-2).

Remove the nine screws and air cleaner housing cover.



Remove and discard the air cleaner element in accordance with the maintenance schedule. Also replace the air cleaner element any time it is excessively dirty or damaged.

Install the removed parts in the reverse order of removal.



## SPARK PLUG

Remove the middle cowl (page 2-6).

Disconnect the spark plug caps.

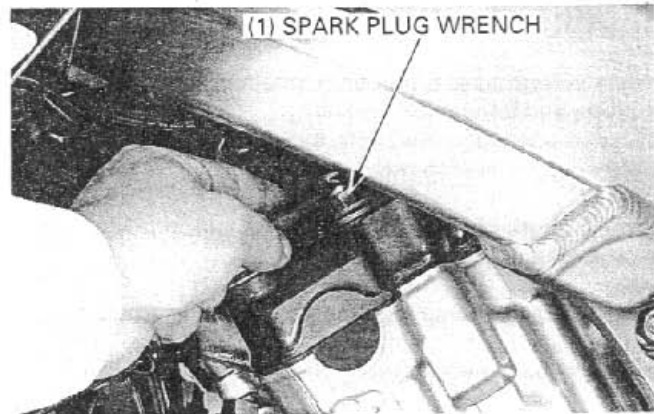
### NOTE

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



## MAINTENANCE

Remove the spark plug using a spark plug wrench. Inspect or replace as described in the maintenance schedule.



## INSPECTION

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

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

## REUSING A SPARK PLUG

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

Check the gap between the center and side electrodes with a wire-type feeler gauge.

If necessary, adjust the gap by bending the side electrode carefully.

**SPARK PLUG GAP: 0.80 – 0.90 mm (0.031 – 0.035 in)**

## CAUTION

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

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

**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

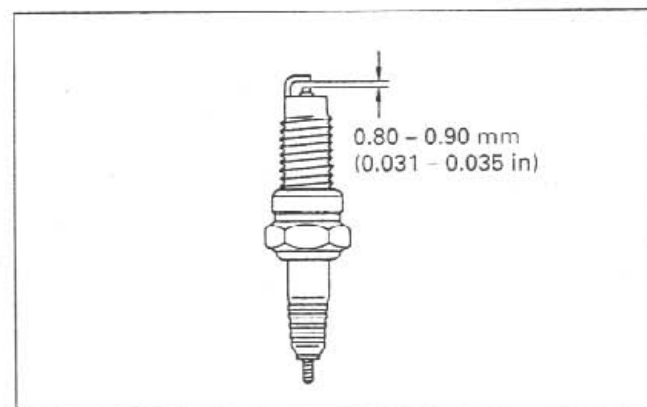
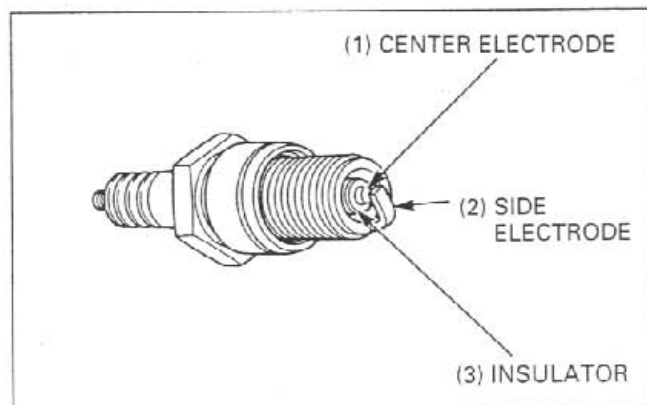
## REPLACING A SPARK PLUG

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

## CAUTION

- *Do not overtighten the spark plug.*

Install and hand tighten the new spark plug, then tighten it about 1/2 of a turn after the sealing washer contacts the seat of the plug hole.



# VALVE CLEARANCE

## INSPECTION

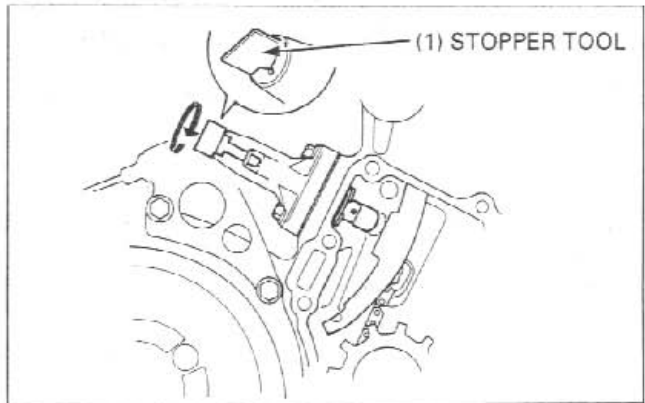
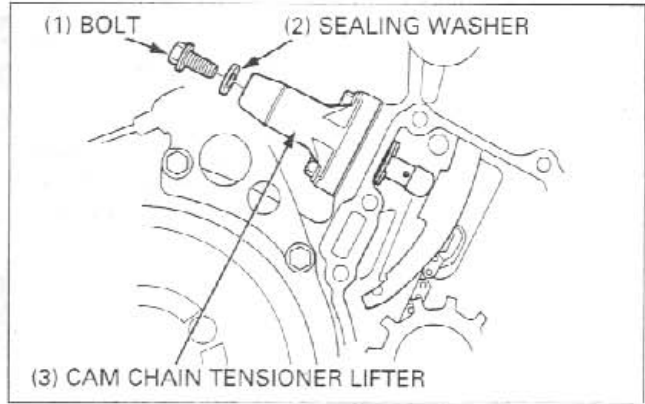
### NOTE

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

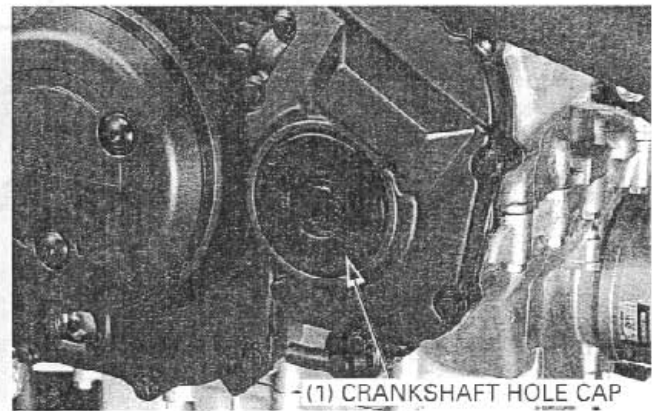
Remove the middle/lower cowl (page 2-6).  
Remove the cylinder head cover (page 8-4).

Remove the cam chain tensioner lifter sealing bolt and washer.

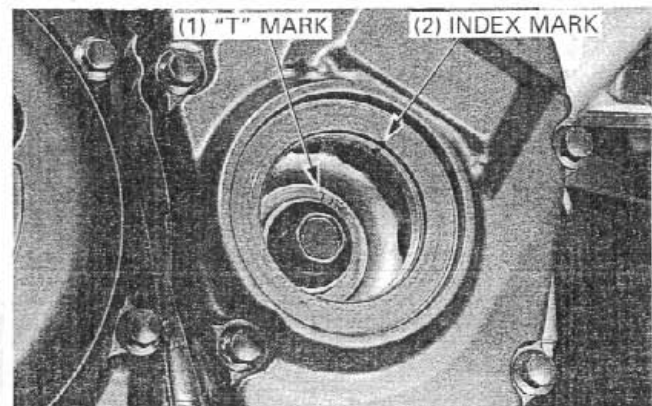
Turn the cam chain tensioner lifter shaft fully and secure it using the stopper tool (See page 8-6).



Remove the crankshaft hole cap and O-ring.



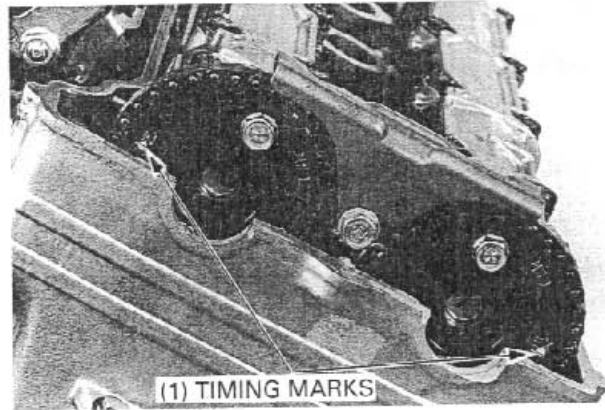
Turn the crankshaft clockwise, align the "T" mark on the ignition pulse generator rotor with the index mark on the ignition pulse generator rotor cover.



## MAINTENANCE

The timing marks ("IN" and "EX") on the cam sprockets must be flush with the cylinder head surface and facing outward as shown.

If the timing marks on the cam sprocket facing inward, turn the crankshaft clockwise one full turn (360°) and realign the timing marks with the cylinder head surface so they are facing outward.



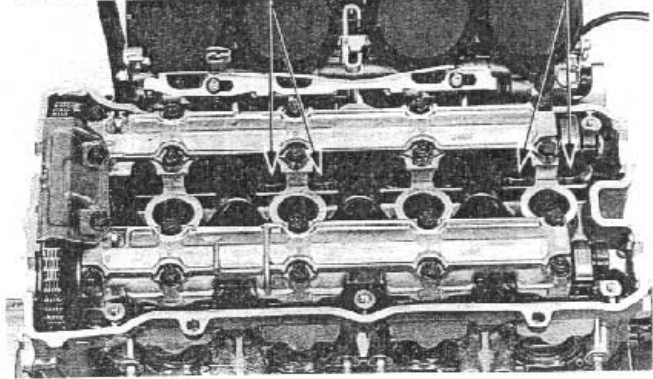
Insert the feeler gauge between the valve lifter and the cam lobe. Check the valve clearance for the No. 1 and No. 3 cylinder intake valves using a feeler gauge.

**VALVE CLEARANCE: IN: 0.13 – 0.19 mm (0.005 – 0.007 in)**

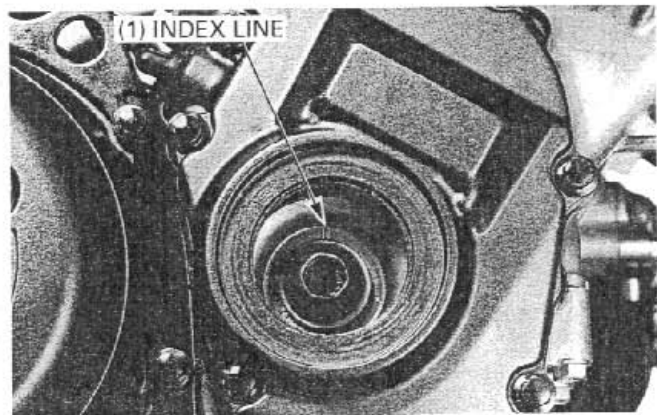
### NOTE

- Record the clearance for each valve for reference in shim selection if adjustment is required.

(2) No. 3 INTAKE VALVES (1) No. 1 INTAKE VALVES



Turn the crankshaft clockwise 1/2 turn (180°), align the index line on the ignition pulse generator rotor so that it is facing up as shown.



Check the valve clearance for the No. 2 and No. 4 cylinder exhaust valves using a feeler gauge.

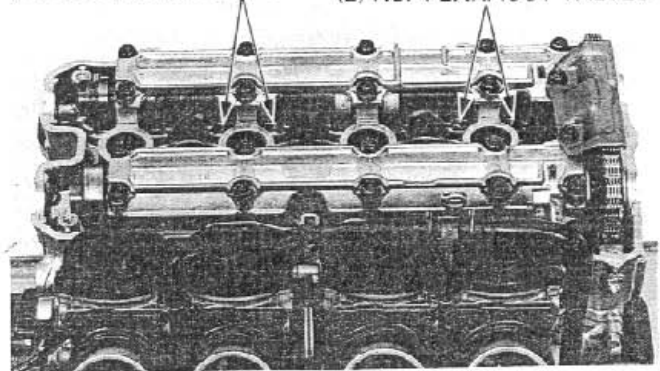
### VALVE CLEARANCE:

**EX: 0.19 – 0.25 mm (0.007 – 0.010 in) '96 – '97:  
0.22 – 0.28 mm (0.009 – 0.011 in) After '97:**

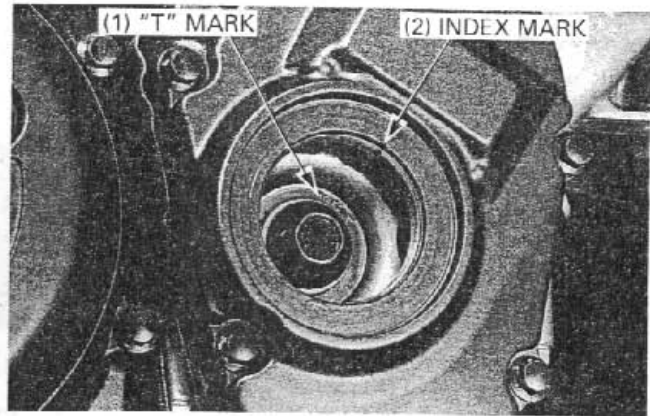
### NOTE

- Record the clearance for each valve for reference in shim selection if adjustment is required.

(1) No. 2 EXHAUST VALVES (2) No. 4 EXHAUST VALVES



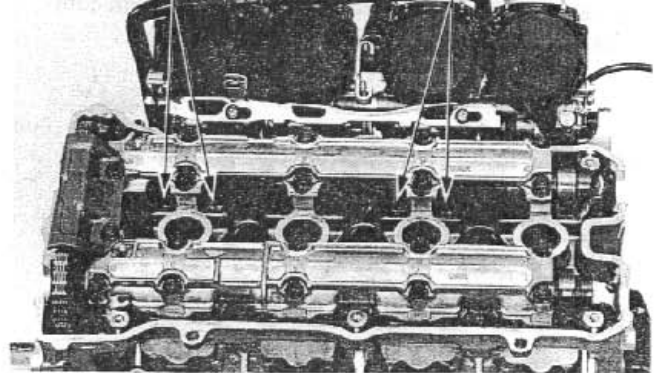
Turn the crankshaft clockwise 1/2 turn (180°), align the "T" mark on the ignition pulse generator rotor with the index mark on the ignition pulse generator rotor cover.



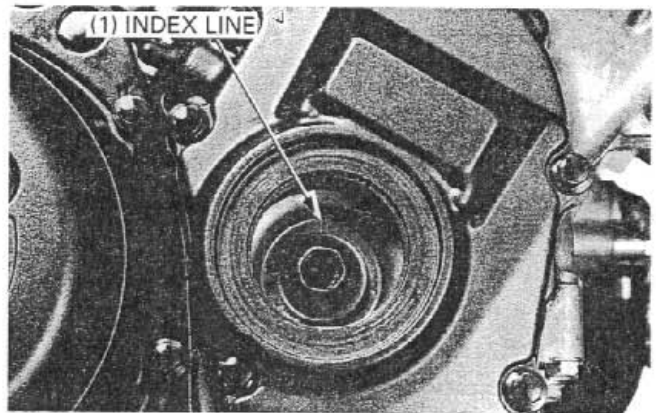
Check the valve clearance for the No. 2 and No. 4 cylinder intake valves using feeler gauge.

**VALVE CLEARANCE: IN: 0.13 – 0.19 mm (0.005 – 0.007 in)**

(2) No. 4 INTAKE VALVES (1) No. 2 INTAKE VALVES



Turn the crankshaft clockwise 1/2 turn (180°), align the index line on the ignition pulse generator rotor facing up as shown.

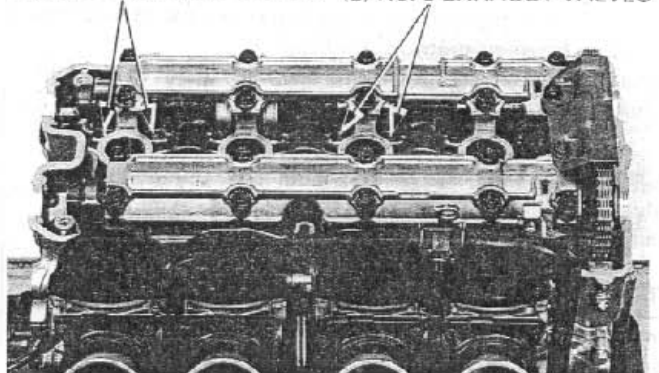


Check the valve clearance for the No. 1 and No. 3 cylinder exhaust valves using a feeler gauge.

**VALVE CLEARANCE:**

**EX: 0.19 – 0.25 mm (0.007 – 0.010 in) '96 – '97:  
0.22 – 0.28 mm (0.009 – 0.011 in) After '97:**

(1) No. 1 EXHAUST VALVES (2) No. 3 EXHAUST VALVES



## MAINTENANCE

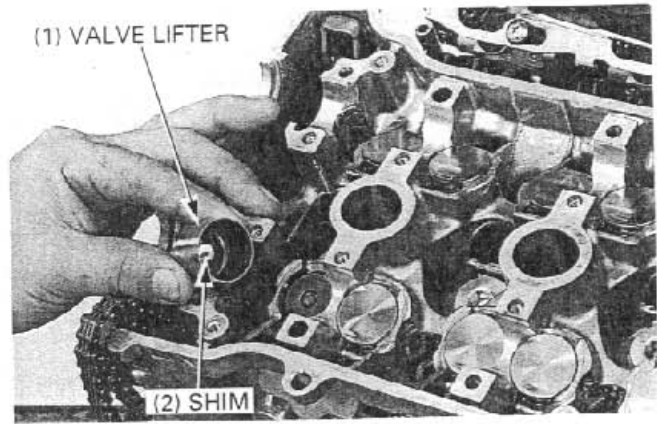
### ADJUSTMENT

Remove the camshaft (page 8-5).  
Remove the valve lifters and shims.

#### NOTE

- Shim may stick to the inside of the valve lifter. Do not allow the shims to fall into the crankcase.
- Mark all valve lifters and shims to ensure correct reassembly in their original locations.
- The valve lifter can be easily removed with a valve lapping tool or magnet.
- The shims can be easily removed with a tweezers or magnet.

Clean the valve shim contact area in the valve lifter with compressed air.



Measure the shim thickness and record it.

#### NOTE

- Sixty-five different thickness shims are available from the thinnest (1.200 mm thickness) shim to the thickest (2.800 mm thickness shim) in intervals of 0.025 mm.

Calculate the new shim thickness using the equation below.

$$A = (B - C) + D$$

- A: New shim thickness
- B: Recorded valve clearance
- C: Specified valve clearance
- D: Old shim thickness

#### NOTE

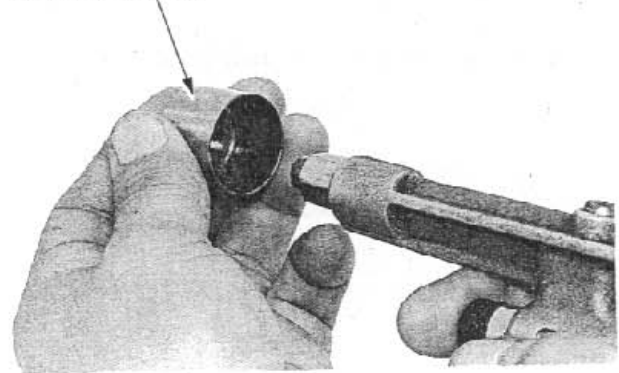
- Make sure of the correct shim thickness by measuring the shim by micrometer.
- Reface the valve seat if carbon deposits result in a calculated dimension of over 2.800 mm.

Install the newly selected shim on the valve retainer.  
Apply molybdenum disulfide oil to the valve lifters.  
Install the valve lifters into the valve lifter holes.

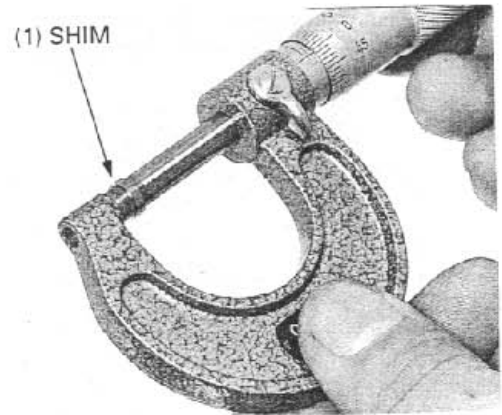
#### NOTE

- Install the shims and valve lifters in their original locations.

(1) VALVE LIFTER



(1) SHIM



1.80 mm



1.825 mm



1.85 mm

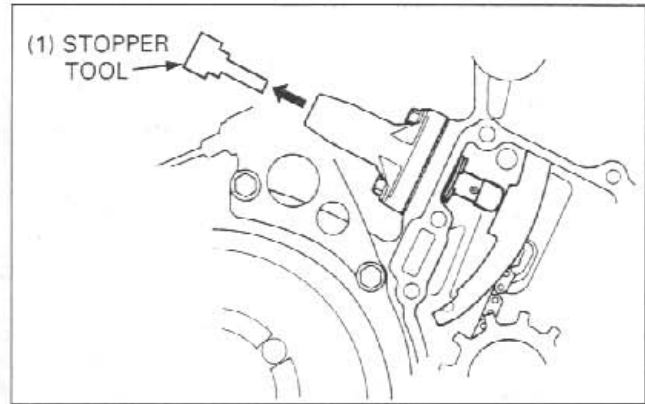


1.875 mm

Install the camshaft (page 8-20).

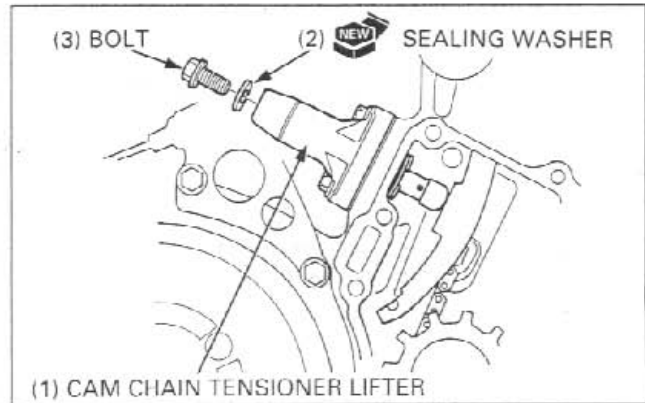
Rotate the camshafts by rotating the crankshaft clockwise several times.  
Recheck the valve clearance.

Remove the stopper tool.



Install the new sealing washer and cam chain tensioner sealing bolt.  
Tighten the bolt securely.

Install the removed parts in the reverse order of removal.



## ENGINE OIL/OIL FILTER

### OIL LEVEL INSPECTION

Place the motorcycle on level ground.  
Check the oil level through the inspection window.

If the oil level is below or near the lower level line, remove the oil filler cap and add the recommended oil up to the upper level.

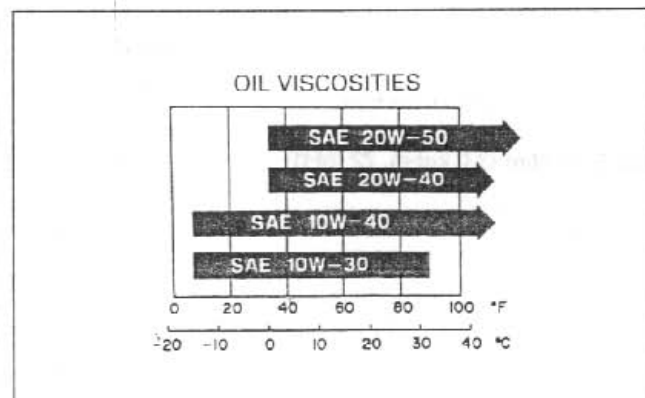
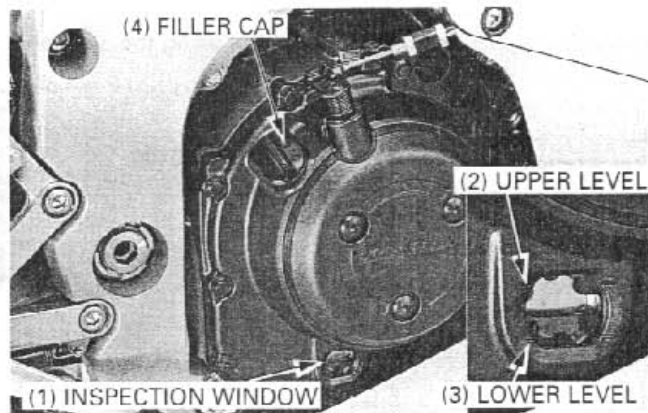
#### RECOMMENDED ENGINE OIL:

**HONDA GN4 4-stroke oil or equivalent motor oil**  
**API service classification: SF or SG**  
**Viscosity: 10W - 40**

#### NOTE

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

Reinstall the filler cap.





## MAINTENANCE

### ENGINE OIL & FILTER CHANGE

#### ▲ WARNING

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

Warm up the engine.

#### NOTE

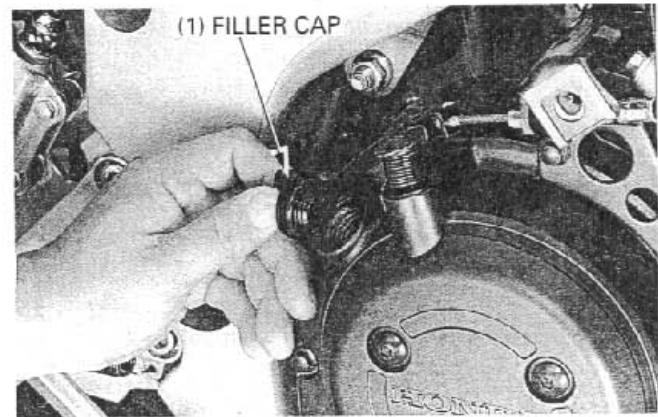
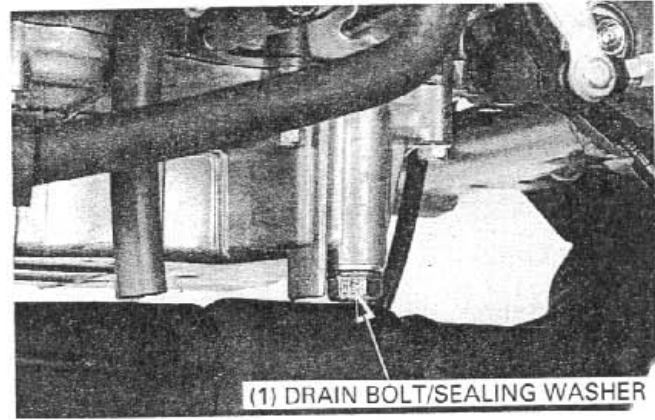
- Change the engine oil with the engine warm and the motorcycle on level ground to assure complete draining.

Remove the lower cowl (page 2-6).

Stop the engine and remove the oil filler cap and drain bolt. Drain the oil completely.

#### CAUTION

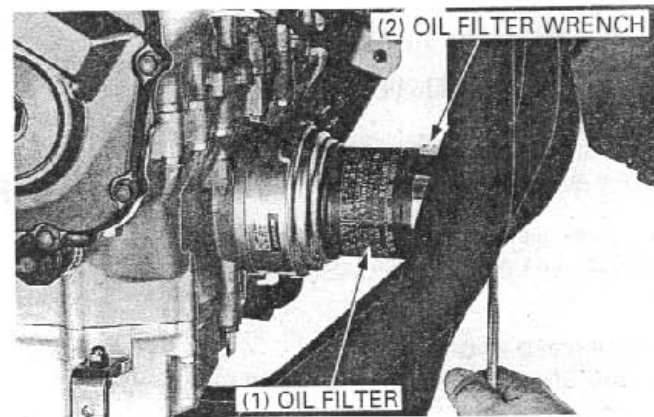
- *Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.*



Remove and discard the oil filter cartridge using the special tool.

**TOOL:**  
Oil filter wrench

07HAA - PJ70100

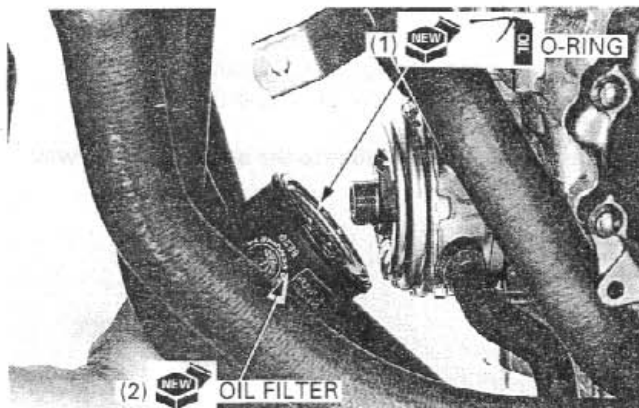


Check that the sealing washer on the drain bolt is in good condition, and replace if necessary. Install and tighten the drain bolt.

**TORQUE:** 29 N·m (3.0 kgf·m, 22 lbf·ft)



Apply oil to the new oil filter O ring.



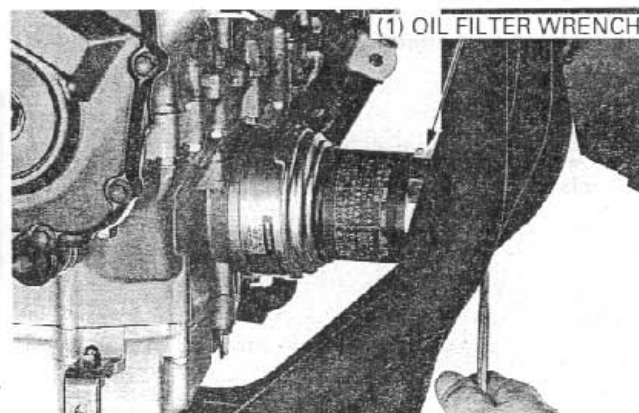
Install the new oil filter and tighten it to the specified torque.

**TOOL:**

Oil filter wrench

07HAA - PJ70100

**TORQUE:** 10 N-m (1.0 kgf-m, 7 lbf-ft)



Fill the crankcase with recommended engine oil.

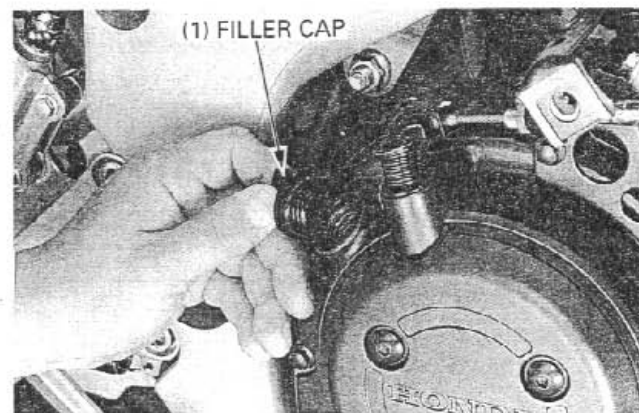
**OIL CAPACITY:**

3.5 liter (3.7 US qt, 3.0 Imp qt) at draining

3.6 liter (3.8 US qt, 3.2 Imp qt) at oil filter change

Install the oil filler cap.

Start the engine and let it idle for 2 to 3 minutes. Stop the engine and check that the oil level is at the upper level line in the inspection window. Make sure there are no oil leaks.



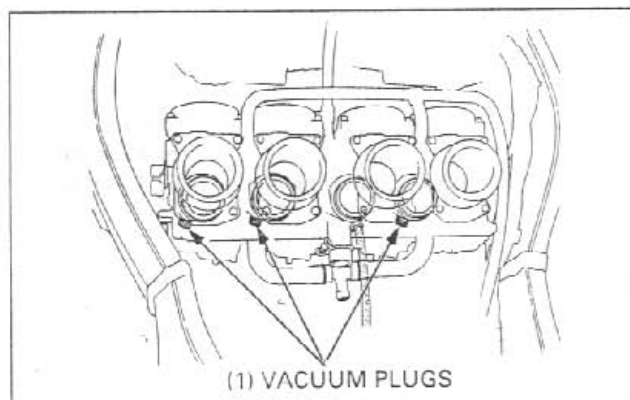
## CARBURETOR SYNCHRONIZATION

**NOTE**

- Synchronize the carburetors with the engine at normal operating temperature, the transmission in neutral and the motorcycle supported securely on a level surface.

Remove the fuel tank and middle cowl (Section 2).

Remove the vacuum plugs from the engine intake ports.



## MAINTENANCE

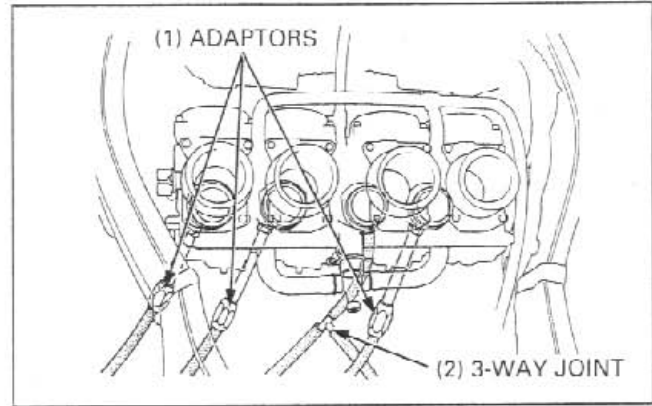
Screw the adaptors in the intake ports.  
Install the 3-way joint to the fuel valve vacuum tube.  
Connect the fuel tube and vacuum tube to the fuel tank.

Connect the vacuum gauge tubes to the adaptors and 3-way joint.

### TOOL:

Vacuum gauge set

07LMJ - 001000A  
(U.S.A. only) or  
M937B - 021 - XXXXX  
(U.S.A. only)



Start the engine and adjust the idle speed by turning the throttle stop screw.

### IDLE SPEED:

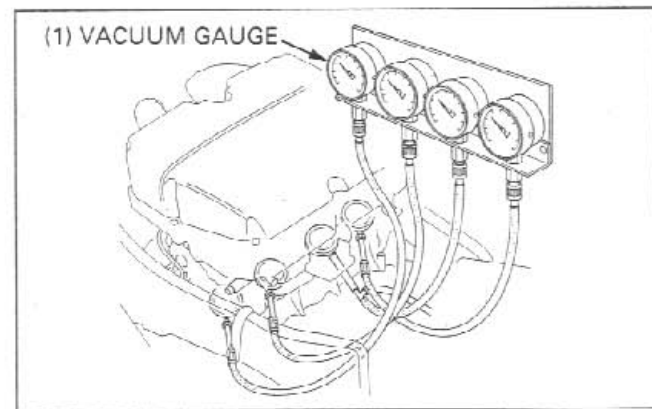
Except California type:  $1,100 \pm 100$  rpm  
California type:  $1,200 \pm 100$  rpm



Check that each carburetor intake vacuum pressure is within 20 mm (0.8 in) Hg of the base carburetor.

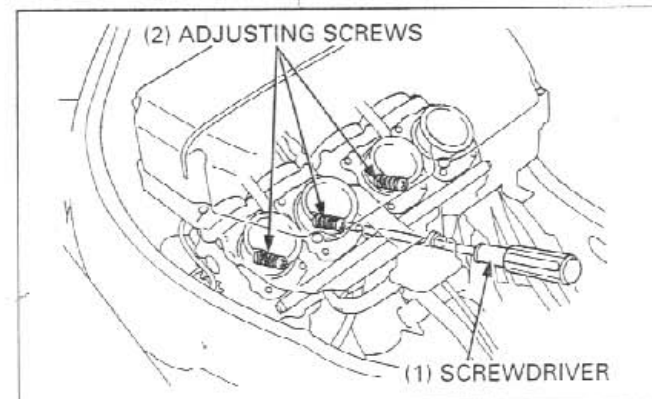
### NOTE

- The No. 3 carburetor cannot be adjusted; it is the base carburetor.
- The No. 3 cylinder intake vacuum pressure is the base vacuum pressure.



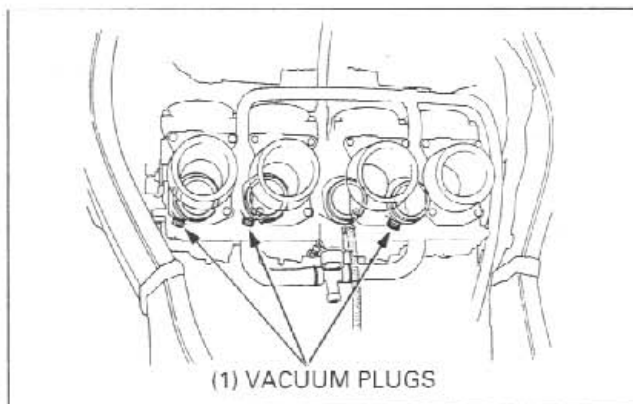
Synchronize to specification by turning the adjusting screw with the phillips screwdriver as shown.

Recheck the idle speed and each cylinder intake vacuum pressure so it is within 20 mm (0.8 in) Hg of the base carburetor reading after snapping the throttle grip 3 - 4 times.



Remove the vacuum gauge tubes.

Install the vacuum plugs into the intake ports, and tighten them securely.



## ENGINE IDLE SPEED

### ⚠ WARNING

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

### NOTE

- Inspect and adjust the idle speed after all other engine maintenance items have been performed and are within specifications.
- The engine must be warm for accurate idle speed inspection and adjustment.



Warm up the engine for about ten minutes.

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

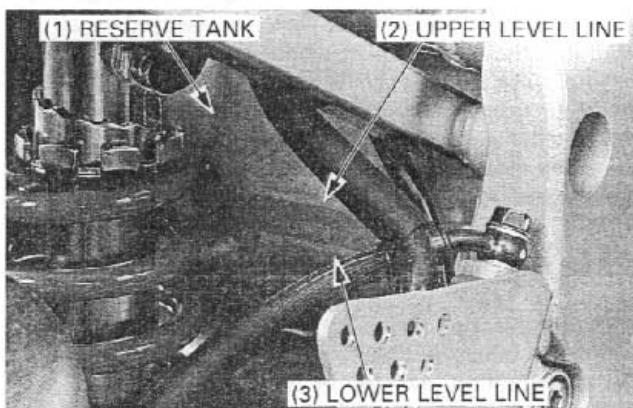
### IDLE SPEED:

Except California type:  $1,100 \pm 100$  rpm

California type:  $1,200 \pm 100$  rpm

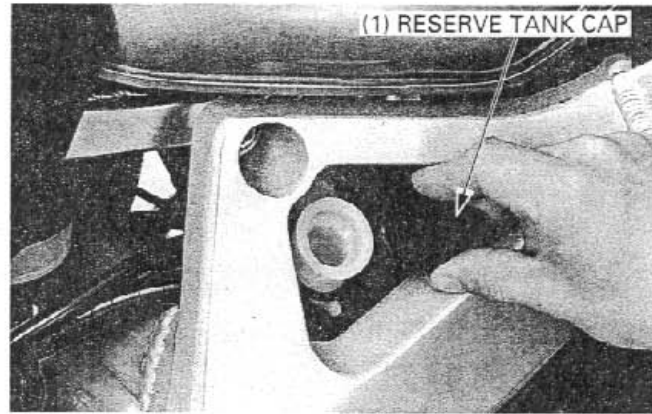
## RADIATOR COOLANT

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



## MAINTENANCE

If necessary remove the reserve tank cap and fill to the "UPPER" level line with 50/50 mixture of distilled water and antifreeze.  
Reinstall the cap.



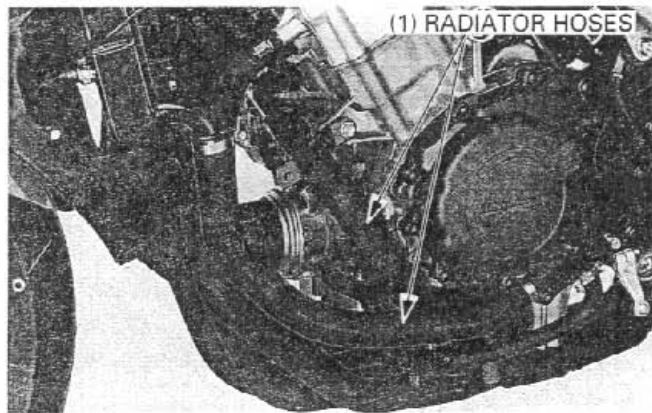
## COOLING SYSTEM

Remove the middle and lower cowl (page 2-6).

Check the radiator air passages for clogging or damage. Straighten bend fins, and remove insects, mud or other obstructions with compressed air or low water pressure. Replace the radiator if the air flow is restricted over more than 20% of the radiating surface.



Inspect the radiator hoses for cracks or deterioration, and replace if necessary.  
Check the tightness of all hose clamps and fasteners.



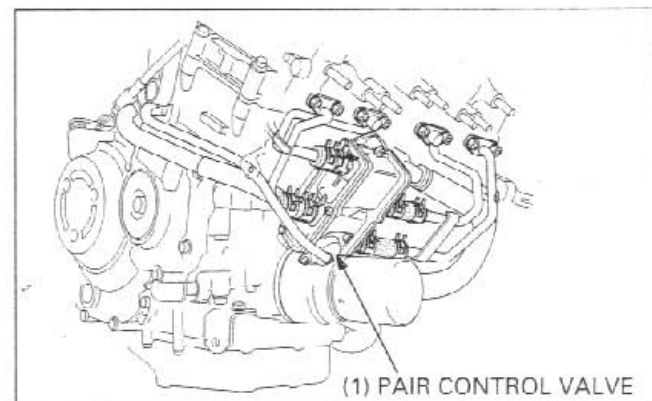
## SECONDARY AIR SUPPLY SYSTEM (CALIFORNIA TYPE ONLY)

### NOTE

- The secondary air supply system introduces filtered air into exhaust gases in the exhaust port. The secondary air is drawn into the exhaust port whenever there is negative pressure pulse in the exhaust system. This charged secondary air promotes burning of the unburned exhaust gases and converts considerable amounts of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water.

Remove the fuel tank and lower cowl (Section 2).

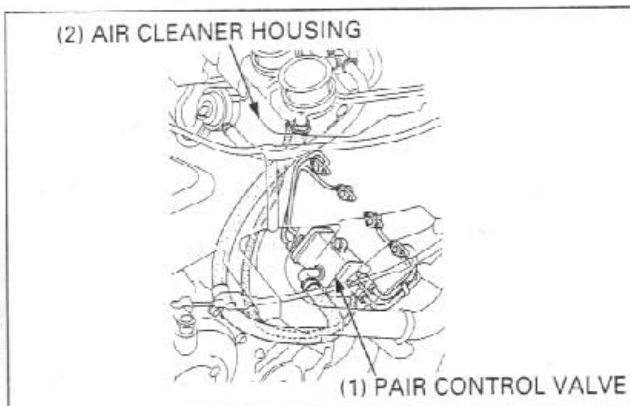
Check the air injection hoses and pipes between the pulse secondary air injection (PAIR) control valve and exhaust port for deterioration, damage or loose connections. Make sure that the hoses are not cracked.



NOTE

- If the hoses show any signs of heat damage, inspect the PAIR check valve in the PAIR control valve for damage.

Check the air suction hose between the air filter, air chamber and PAIR control valve for deterioration, damage or loose connections. Make sure that the hoses are not kinked, pinched or cracked.

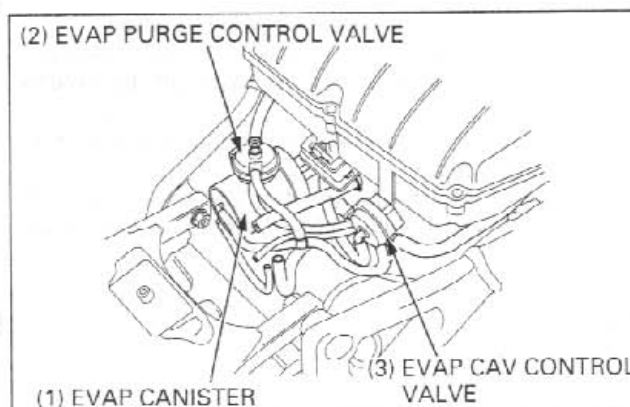


## EVAPORATIVE EMISSION CONTROL SYSTEM (CALIFORNIA TYPE ONLY)

Check the tube between the fuel tank, EVAP canister, EVAP purge control valve and carburetor for deterioration, damage or loose connection.

Check the EVAP canister for cracks or other damage.

Refer to the Vacuum Hose Routing Diagram Label and Cable & Harness Routing (page 1-25) for tube connections.



## DRIVE CHAIN

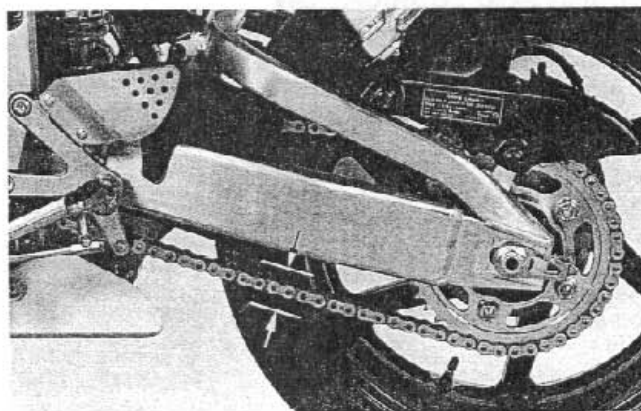
### DRIVE CHAIN SLACK INSPECTION

**▲ WARNING**

- *Never inspect and adjust the drive chain while the engine is running.*

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

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



**CHAIN SLACK: 30 – 40 mm (1-1/8 – 1-1/2 in)**

**CAUTION**

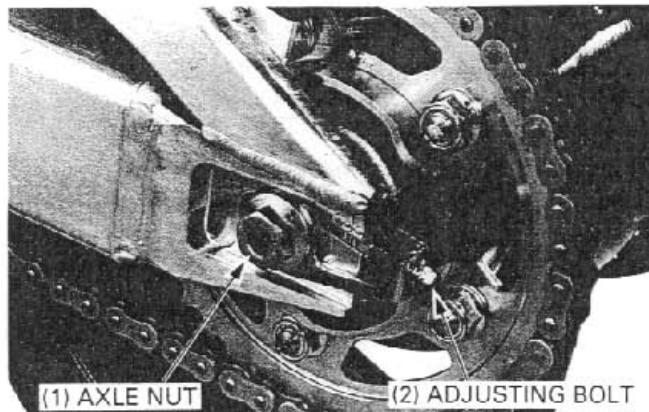
- *Excessive chain slack, 40 mm (1-1/2 in) or more, may damage the frame.*

Lubricate the drive chain with Pro Honda chain lube designed specifically for use with O-ring chains. Wipe off the excess chain lube.

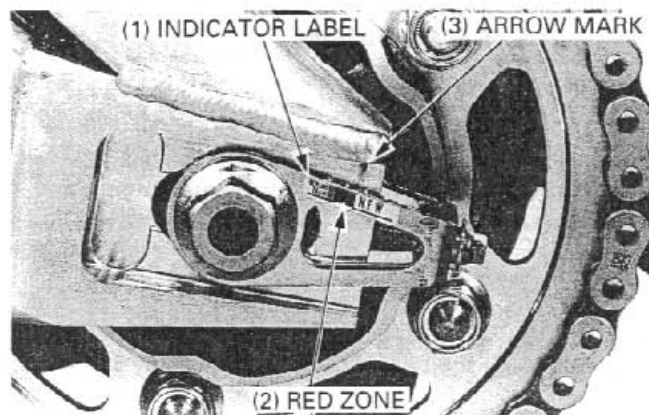
## ADJUSTMENT

Loosen the rear axle nut.  
Turn both adjusting bolts until the correct drive chain slack is obtained.  
Make sure the index marks on the both adjusters are aligned with the rear end of the swingarm.  
Tighten the rear axle nut to the specified torque.

**TORQUE: 93 N·m (9.5 kgf·m, 69 lbf·ft)**



Recheck the drive chain slack and free wheel rotation.  
Lubricate the drive chain with Pro Honda Chain Lube designed specifically for use with O-ring chains. Wipe off the excess chain lube.  
Check the drive chain wear indicator label attached on the left drive chain adjuster.  
If the red zone on the label aligns with the arrow mark on the swingarm, replace the drive chain with a new one (page 3-19).

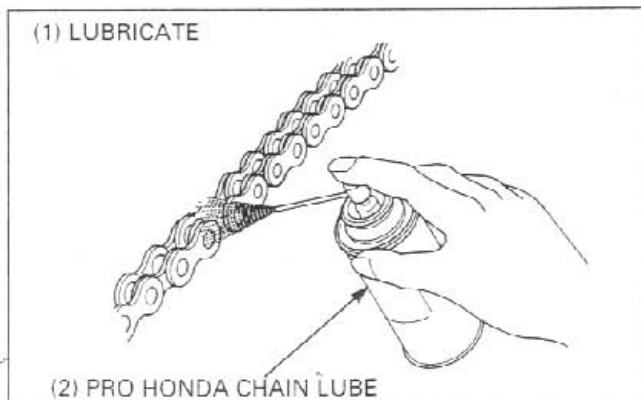
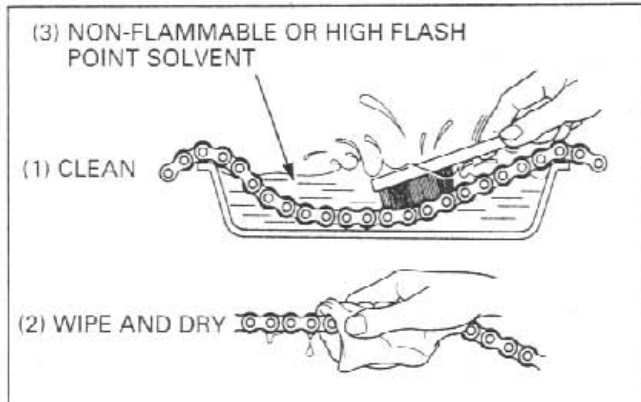


## CLEANING AND LUBRICATION

Clean the chain with a soft brush using a non-flammable or high flash point solvent and wipe it dry.  
Be sure the chain has dried completely before lubricating.

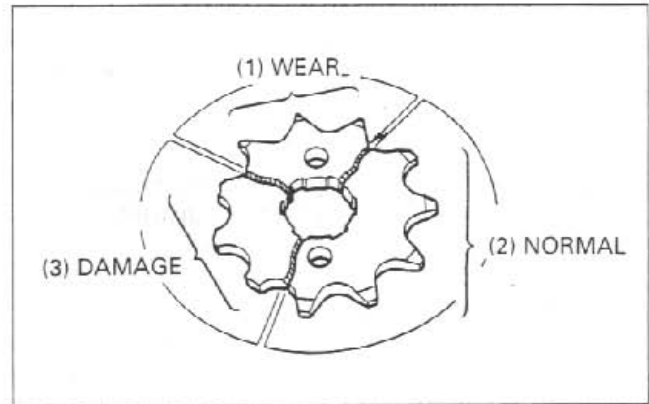
Inspect the drive chain for possible damage or wear.  
Replace any chain that has damaged rollers, loose fitting links, or otherwise appears unserviceable.  
Installing a new chain on badly worn sprockets will cause the new chain to wear quickly.  
Inspect and replace sprocket as necessary.

Lubricate the drive chain with Pro Honda Chain Lube designed specifically for use on O-ring chains.  
Wipe off the excess chain lube.

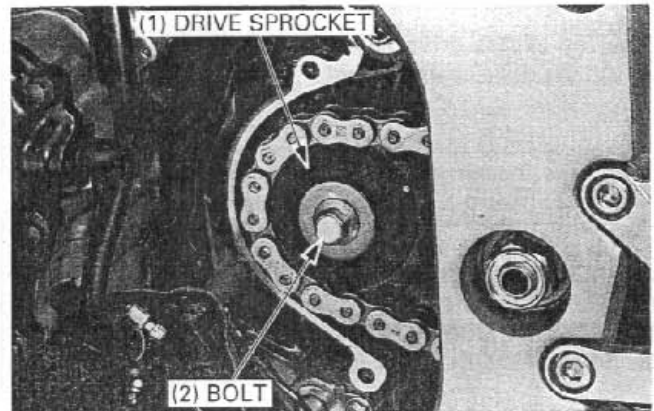


## SPROCKETS INSPECTION

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



Check the attaching bolts and nuts on the drive and driven sprockets.  
 If any are loose, torque them to the proper specifications.



## REPLACEMENT

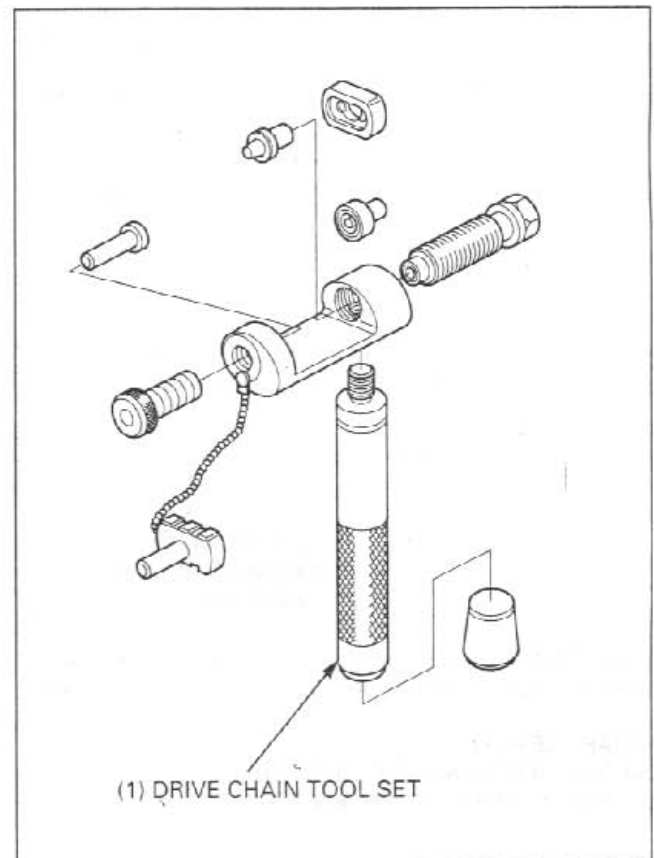
This motorcycle uses a drive chain with a staked master link.

Loosen the drive chain (page 3-17).  
 Assemble the special tool as shown.

**TOOL:**  
 Drive chain tool set  
 07HMH – MR10103 or  
 07HMH – MR1010B  
 (U.S.A. only)

### NOTE

- When using the special tool, follow the manufacturer's instruction.





## MAINTENANCE

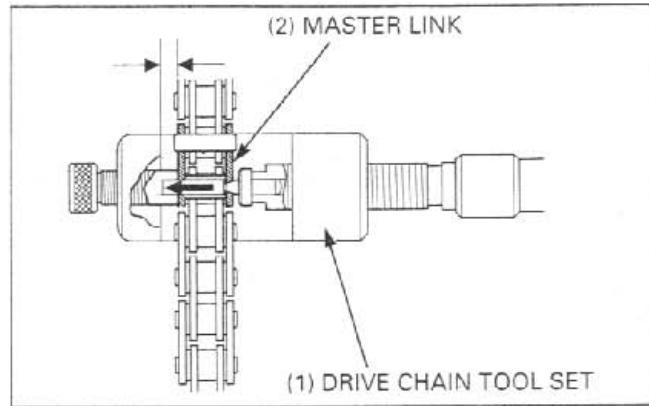
Locate the crimped pin ends of the master link from the outside of the chain, and remove the link with the drive chain tool set.

### TOOL:

Drive chain tool set

07HMH – MR10103 or  
07HMH – MR1010B  
(U.S.A. only)

Remove the drive chain.



Remove the excess drive chain links from the new drive chain with the drive chain tool set.

### NOTE

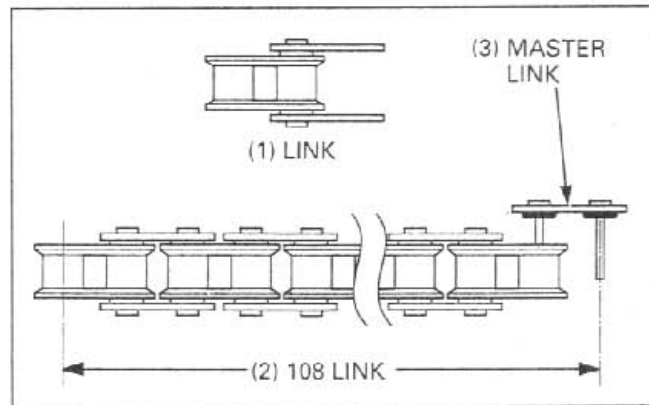
- Include the master link when you count the drive chain links.

STANDARD LINKS: 120 links

REPLACEMENT CHAIN:

DID: DID525HV GC&B – 120ZB

RK: RKGB525ROZ1 – 120LJF



### CAUTION

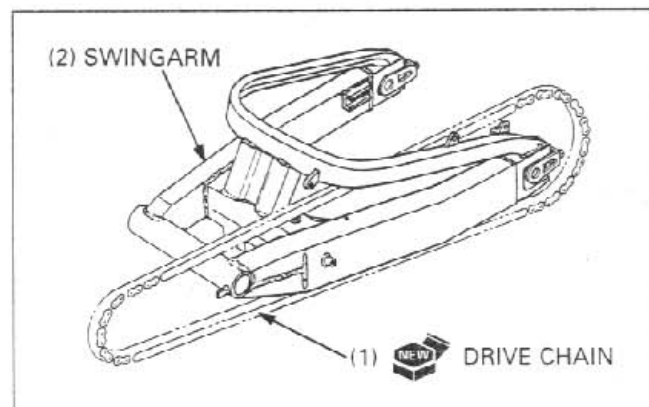
- Never reuse the old drive chain, master link, master link plate and O-rings

Install the new drive chain into the swingarm as shown.

Assemble the new master link, O-rings and plate.

### CAUTION

- Insert the master link from the inside of the drive chain, and install the plate with the identification mark facing the outside.



Assemble and set the drive chain tool set.

### TOOL:

Drive chain tool set

07HMH – MR10103 or  
07HMH – MR1010B  
(U.S.A. only)

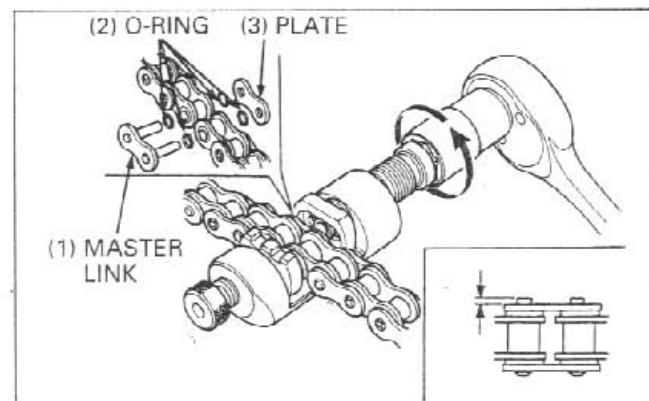
Make sure that the master link pins are installed properly. Measure the master link pin length projected from the plate.

STANDARD LENGTH:

DID: 1.15 – 1.55 mm (0.045 – 0.061 in)

RK: 1.20 – 1.40 mm (0.047 – 0.055 in)

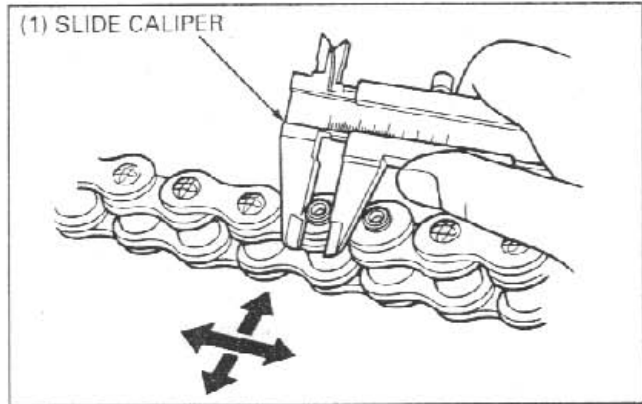
Stake the master link pins.



Make sure that the pins are staked properly by measuring the diameter of the staked area using a slide caliper.

**DIAMETER OF THE STAKED AREA:**

- DID: 5.5 – 5.8 mm (0.22 – 0.23 in)
- RK: 5.49 – 5.94 mm (0.216 – 0.233 in)



After staking, check the staked area of the master link for cracks. If there is any cracking, replace the master link, O-rings and plate.

**CAUTION**

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

**BRAKE FLUID**

**CAUTION**

- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

**NOTE**

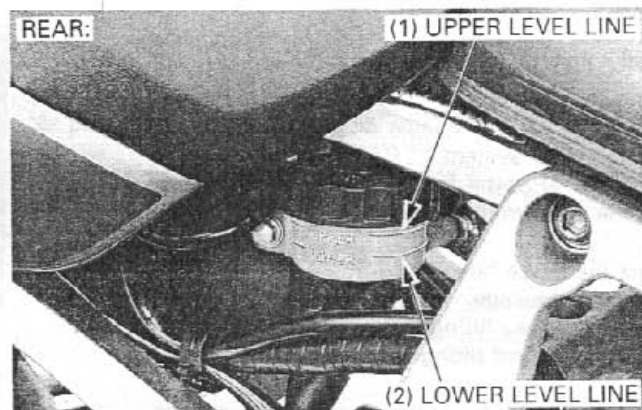
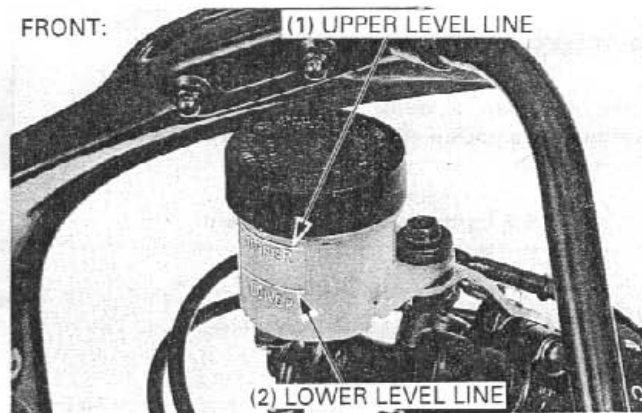
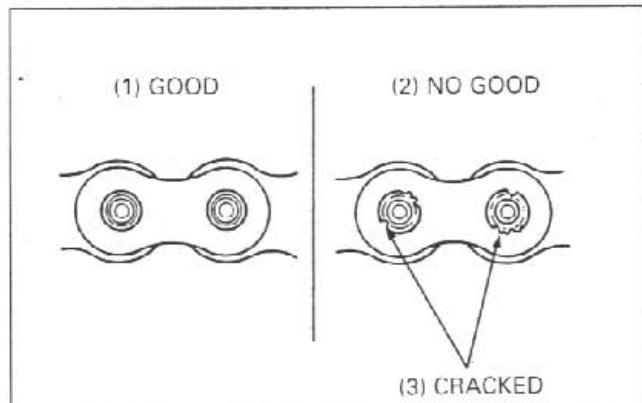
- When the fluid level is low, check the brake pads for wear (see next page). A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper piston is pushed out, and this accounts for a low reservoir level. If the brake pads are not worn and the fluid level is low, check entire system for leaks (see next page).

**FRONT BRAKE**

Turn the handlebar to the left so that the reservoir is level and check the front brake reservoir level through the sight glass. If the level is near the lower level line, check the brake pad wear (see next page).

**REAR BRAKE**

Place the motorcycle on a level surface, and support it upright position. Check the rear brake fluid reservoir level. If the level is near the lower level line, check the brake pad wear (see next page).



## MAINTENANCE

### BRAKE PAD WEAR

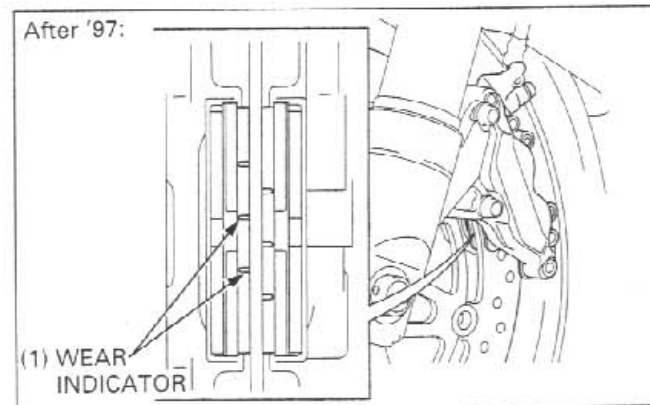
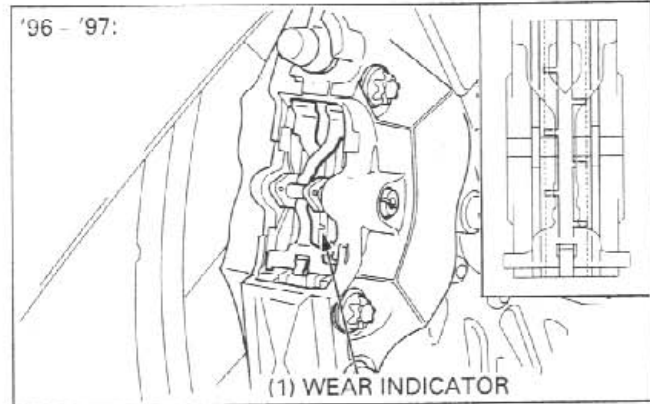
#### FRONT BRAKE PADS

Remove the brake pad covers ('96 - '97:).

Check the brake pad for wear.

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

Refer to page 15-5, 6 for brake pad replacement.

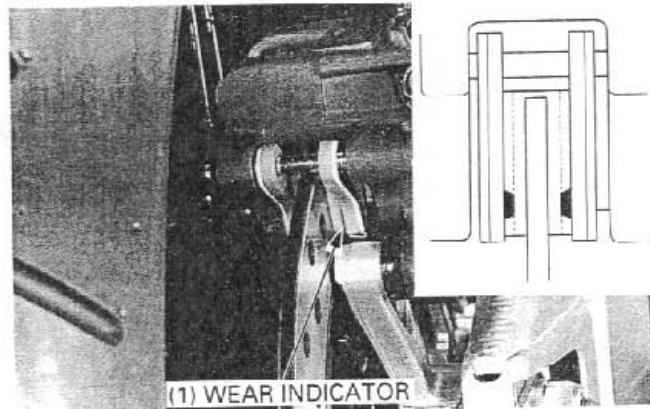


#### REAR BRAKE PADS

Check the brake pad for wear.

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

Refer to page 15-8 for brake pad replacement.



### BRAKE SYSTEM

#### INSPECTION

Firmly apply the brake lever or pedal, and check that no air has entered the system.

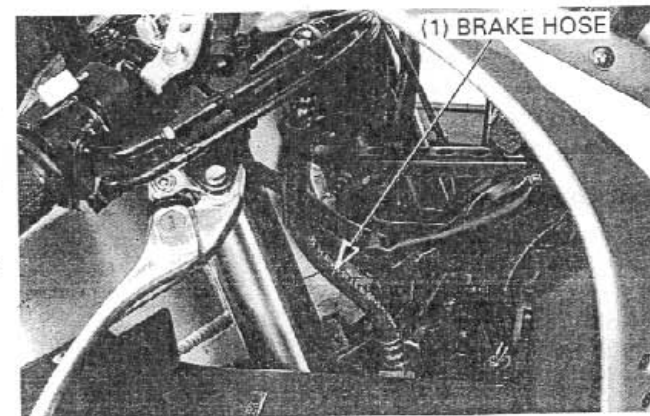
If the lever or pedal feels soft or spongy when operated, bleed the air from the system.

Inspect the brake hose and fittings for deterioration, cracks and signs of leakage.

Tighten any loose fittings.

Replace hoses and fittings as required.

Refer to page 15-3 for brake bleeding procedures.



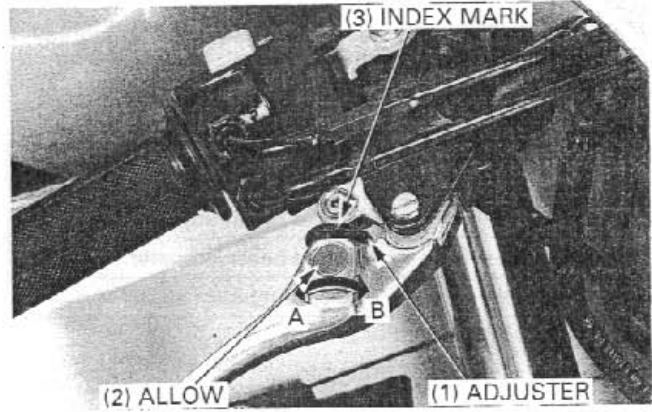
## BRAKE LEVER ADJUSTMENT

The distance between the top of the brake lever and the grip can be adjusted by turning the adjuster.

- DIRECTION A:** Brake lever further away from the grip  
**DIRECTION B:** Brake lever closer to the grip

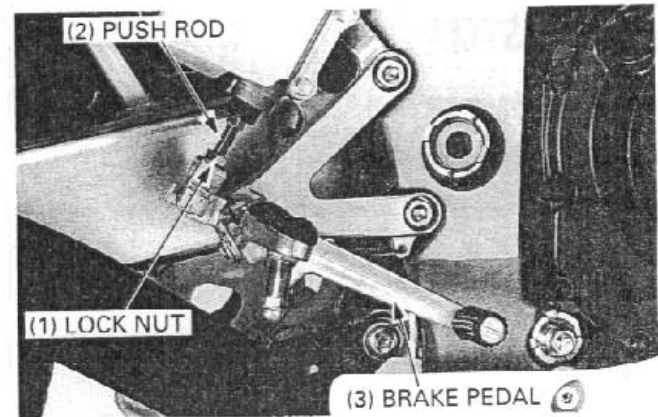
### CAUTION

- Align the allowance on the brake lever with the index mark on the adjuster.



## BRAKE PEDAL HEIGHT ADJUSTMENT

Loosen the lock nut and turn the push rod until the correct pedal height is obtained.

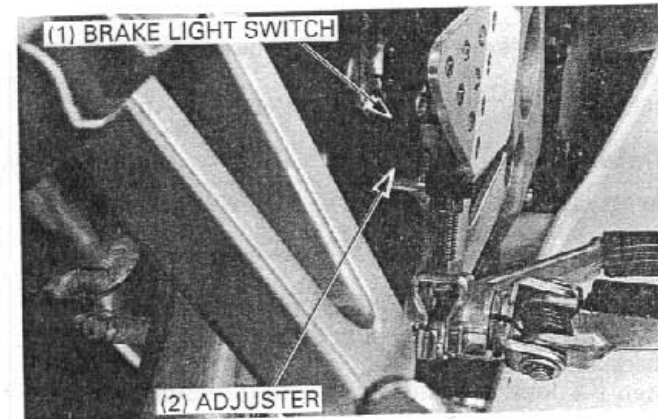


## BRAKE LIGHT SWITCH

### NOTE

- The front brake light switch does not require adjustment.

Adjust the brake light switch so that the brake light comes on just prior to the brake actually being engaged. If the light fails to come on, adjust the switch so that the light comes on at the proper time. Hold the switch body and turn the adjuster. Do not turn the switch body.



## HEADLIGHT AIM

### ⚠ WARNING

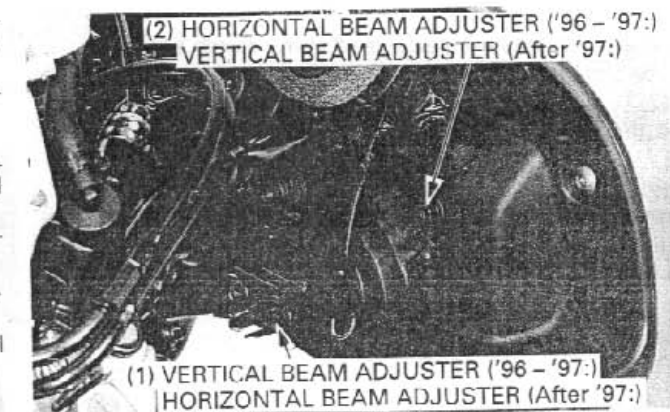
- An improperly adjusted headlight may blind on-coming drivers, or it may fail to light the road for a safe distance.

### NOTE

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

Place the motorcycle on a level surface.

Adjust the headlight beam vertically by turning the vertical beam adjusting screws. A clockwise rotation moves the beam up.

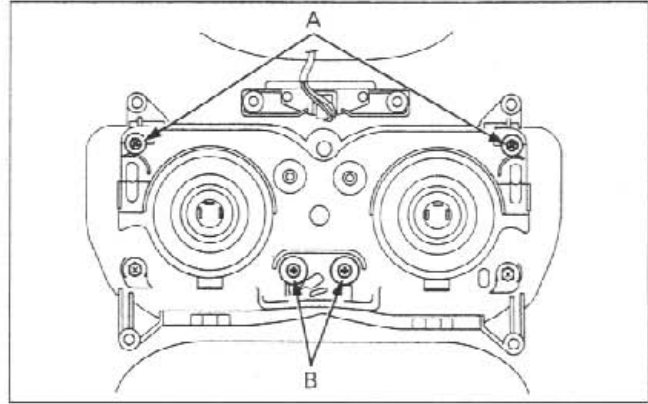


## MAINTENANCE

Horizontal beam adjustments are made using the horizontal beam adjusting screws.

A clockwise rotation moves the beam toward the right side of the rider.

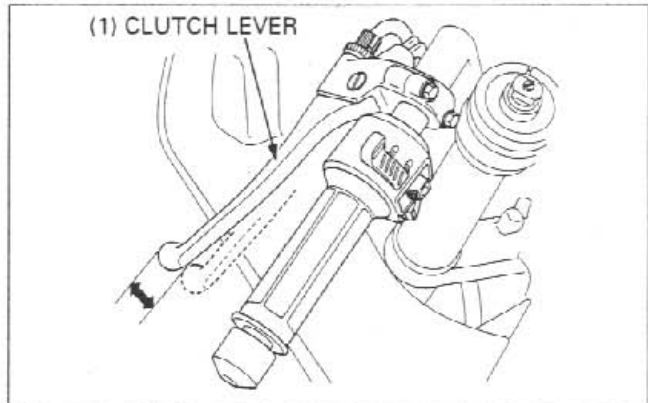
|   |            |                          |
|---|------------|--------------------------|
| A | '96 - '97: | Horizontal beam adjuster |
|   | After '97: | Vertical beam adjuster   |
| B | '96 - '97: | Vertical beam adjuster   |
|   | After '97: | Horizontal beam adjuster |



## CLUTCH SYSTEM

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

**FREE PLAY: 10 - 20 mm (3/8 - 3/4 in)**

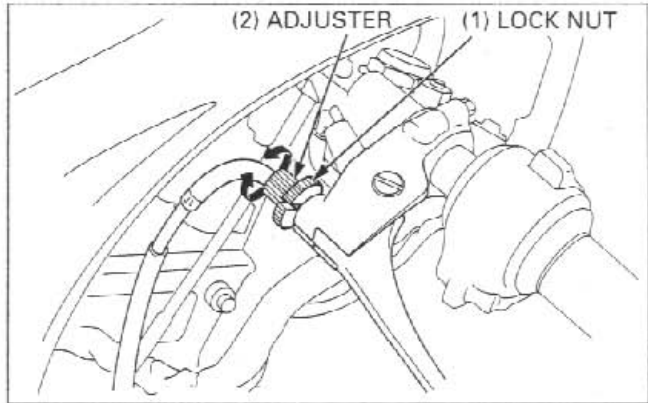


Minor adjustments are made using the upper adjuster at the clutch lever.

Loosen the lock nut and turn the adjuster.

### CAUTION

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



If the adjuster is threaded out near its limit and the correct free play cannot be obtained, turn the adjuster all the way in and back out one turn.

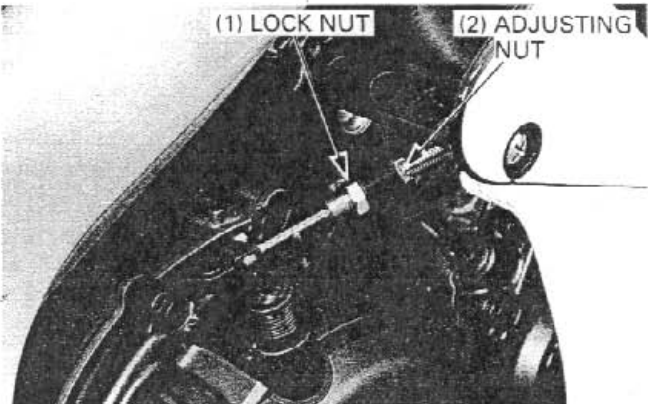
Tighten the lock nut and make a major adjustment as described below.

Major adjustments are performed at the clutch arm.

Loosen the lock nut and turn the adjusting nut to adjust free play.

Hold the adjusting nut securely while tightening the lock nut.

If proper free play cannot be obtained, or the clutch slips during the test ride, disassemble and inspect the clutch (see section 9).



## SIDE STAND

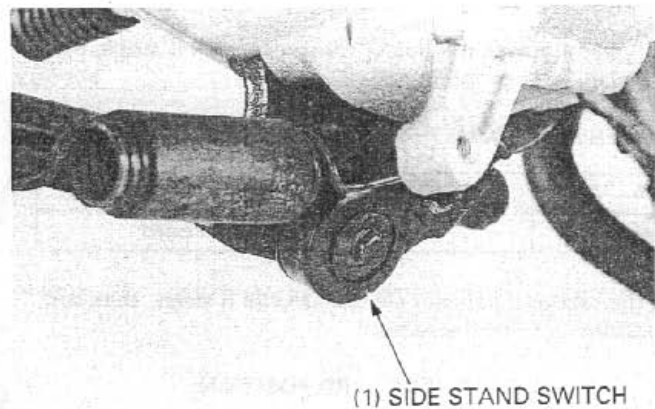
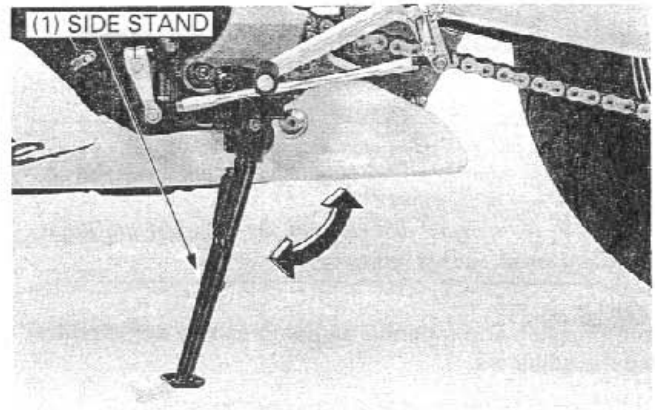
Support the motorcycle on a level surface.

Check the side stand spring for damage or loss of tension. Check the side stand assembly for freedom of movement and lubricate the side stand pivot if necessary.

Check the side stand ignition cut-off system:

- Sit astride the motorcycle and raise the side stand.
- Start the engine with the transmission in neutral, then shift the transmission into gear, while squeezing the clutch lever.
- Fully lower the side stand.
- The engine should stop as the side stand is lowered.

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



## SUSPENSION

### ⚠ WARNING

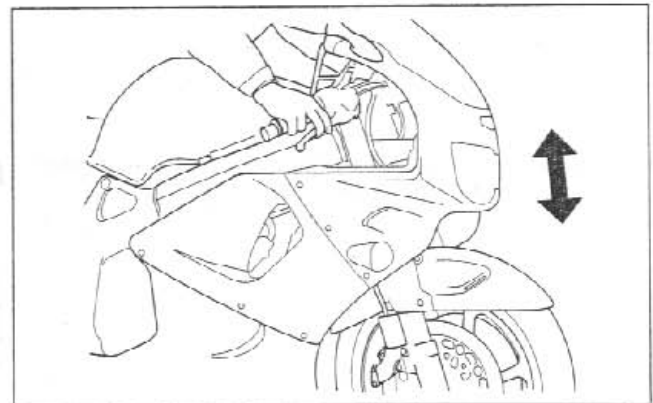
- *Loose, worn or damaged suspension parts impair motorcycle stability and control. Repair or replace any damaged components before riding. Riding a motorcycle with faulty suspension increases your risk of an accident and possible injury.*

### FRONT SUSPENSION INSPECTION

Check the action of the forks by operating the front brakes and compressing the front suspension several times. Check the entire assembly for signs of leaks, damage or loose fasteners.

Replace damaged components which cannot be repaired. Tighten all nuts and bolts.

Refer to section 13 for fork service.



### FRONT SUSPENSION ADJUSTMENT

#### NOTE

- To adjust both sides equally, set the right and left damping adjusters to the same position.

#### SPRING PRE-LOAD ADJUSTER

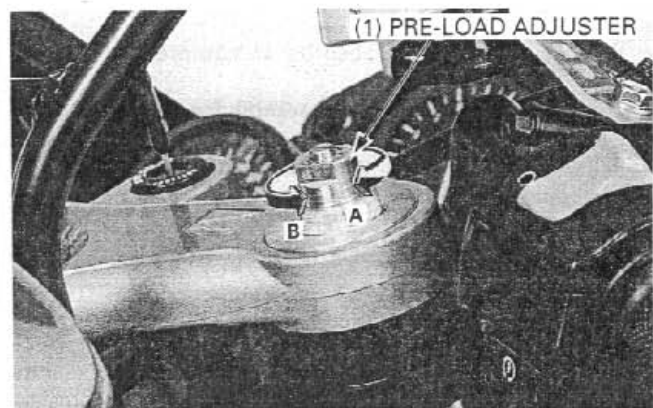
Spring pre-load can be adjusted by turning the adjuster.

**DIRECTION A:** Increase the spring pre-load

**DIRECTION B:** Decrease the spring pre-load

**PRE-LOAD ADJUSTER STANDARD POSITION:**

12 mm (0.5 in) from top of fork cap



## MAINTENANCE

### COMPRESSION AND REBOUND DAMPING ADJUSTERS

#### CAUTION

- Always start on full hard when adjusting the damping.
- Do not turn the adjuster screws more than the given positions or the adjusters may be damaged.
- Be sure that the rebound and compression adjusters are firmly located in a detent, and not between positions.

The compression and rebound damping can be adjusted by turning the adjusters.

**DIRECTION H: Increase the damping force**  
**DIRECTION S: Decrease the damping force**

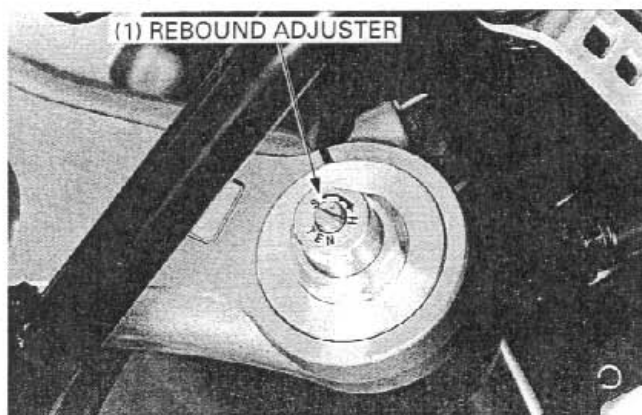
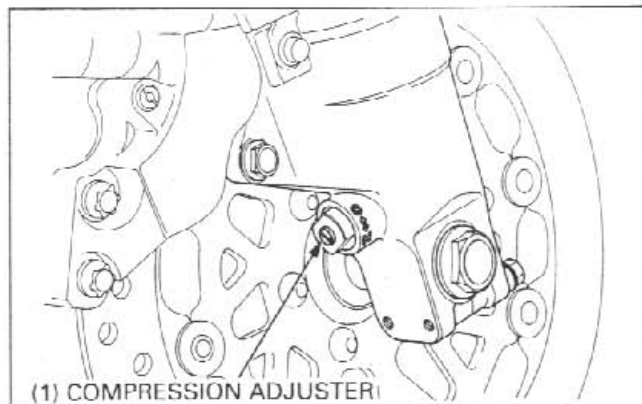
Turn the compression adjuster clockwise until it stops, then turn the adjuster counterclockwise.

#### COMPRESSION ADJUSTER STANDARD POSITION:

|            |                             |
|------------|-----------------------------|
| '96 - '97: | 1 turn out from full hard   |
| After '97: | 1.5 turn out from full hard |

Turn the rebound adjuster clockwise until it stops, then turn the adjuster counterclockwise.

**REBOUND ADJUSTER STANDARD POSITION:**  
1 turn out from full hard

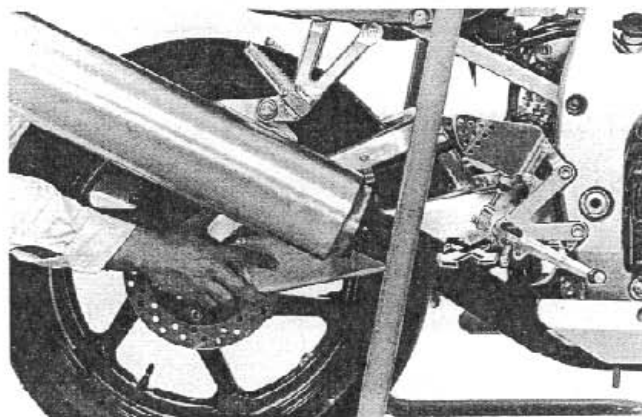


### REAR SUSPENSION INSPECTION

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

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

Replace the bearings if any looseness is noted.

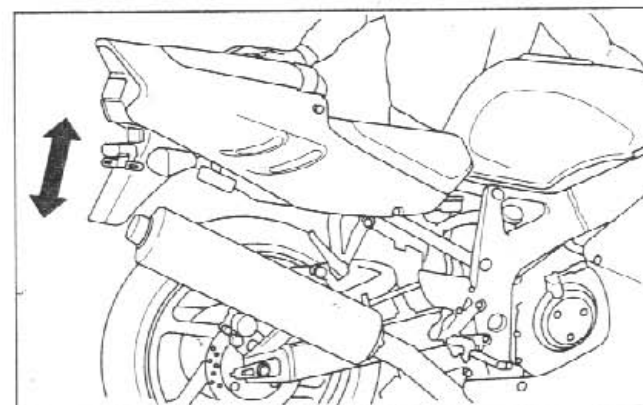


Check the action of the shock absorber by compressing it several times.

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

Replace damaged components which cannot be repaired. Tighten all nuts and bolts.

Refer to section 14 for shock absorber service.



## REAR SUSPENSION ADJUSTMENT

### SPRING PRE-LOAD ADJUSTER

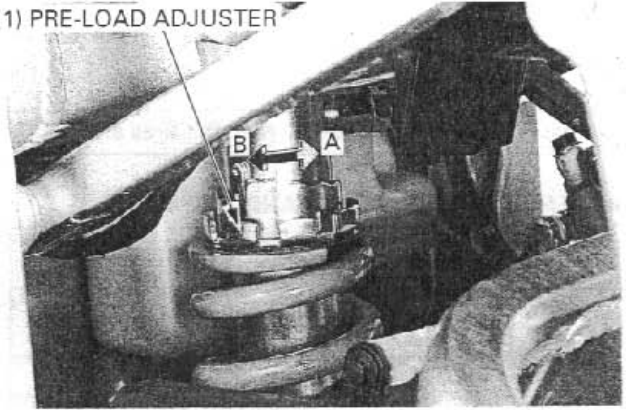
Spring pre-load can be adjusted by turning the adjuster using a pin spanner.

**DIRECTION A:** Increase the spring pre-load  
**DIRECTION B:** Decrease the spring pre-load

### PRE-LOAD ADJUSTER STANDARD POSITION:

2nd groove on the adjuster: '96 - '97  
 3rd groove on the adjuster: After '97

(1) PRE-LOAD ADJUSTER



## COMPRESSION AND REBOUND DAMPING ADJUSTERS

### CAUTION

- Always start on full hard when adjusting the damping.
- Do not turn the adjuster screws more than the given positions or the adjusters may be damaged.

The compression and rebound damping can be adjusted by turning the adjusters.

**DIRECTION H:** Increase the damping force  
**DIRECTION S:** Decrease the damping force

Turn the compression adjuster clockwise until it stops, then turn the adjuster counterclockwise.

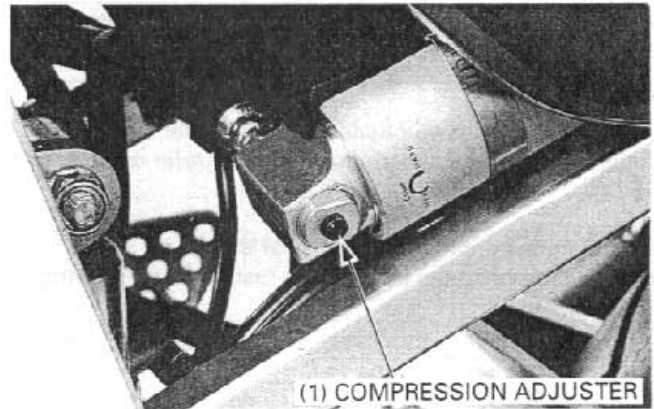
### COMPRESSION ADJUSTER STANDARD POSITION:

1 turn out from full hard

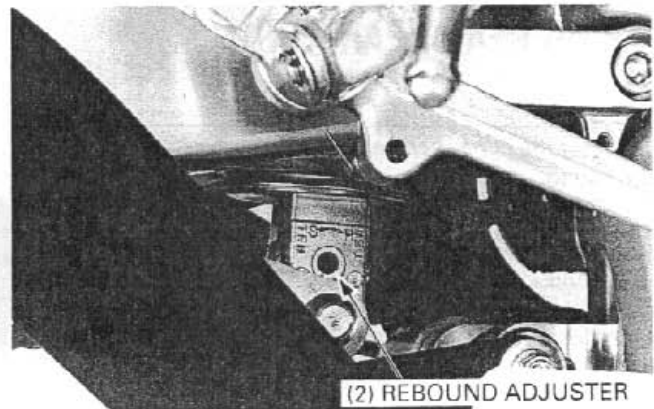
Turn the rebound adjuster clockwise until it stops, then turn the adjuster counterclockwise.

### REBOUND ADJUSTER STANDARD POSITION:

1 turn out from full hard



(1) COMPRESSION ADJUSTER



(2) REBOUND ADJUSTER

## NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-13).

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



## WHEELS/TIRES

NOTE

- Tire pressure should be checked when the tires are COLD.

RECOMMENDED TIRE PRESSURE AND TIRE SIZE:

|  |             | FRONT                   | REAR                    |
|--|-------------|-------------------------|-------------------------|
| Tire pressure<br>kPa (kgf/cm <sup>2</sup> , psi) |             | 250 (2.50, 36)          | 290 (2.90, 42)          |
| Tire size  | '96 - '97:  | 130/70 - ZR16           | 180/55 - ZR17           |
|  | After '97:  | 130/70 - ZR16<br>(61 W) | 180/55 - ZR17<br>(73 W) |
| Tire brand                                       | Bridgestone | BT56F RADIAL            | BT56R RADIAL G          |
|  | Michelin    | TX15                    | TX25                    |

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

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

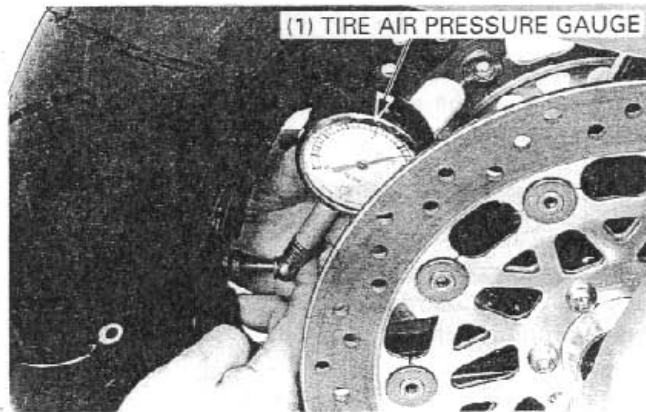
- MINIMUM TREAD DEPTH:**  
**FRONT:** 1.5 mm (0.06 in)  
**REAR:** 2.0 mm (0.08 in)

## STEERING HEAD BEARINGS

NOTE

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

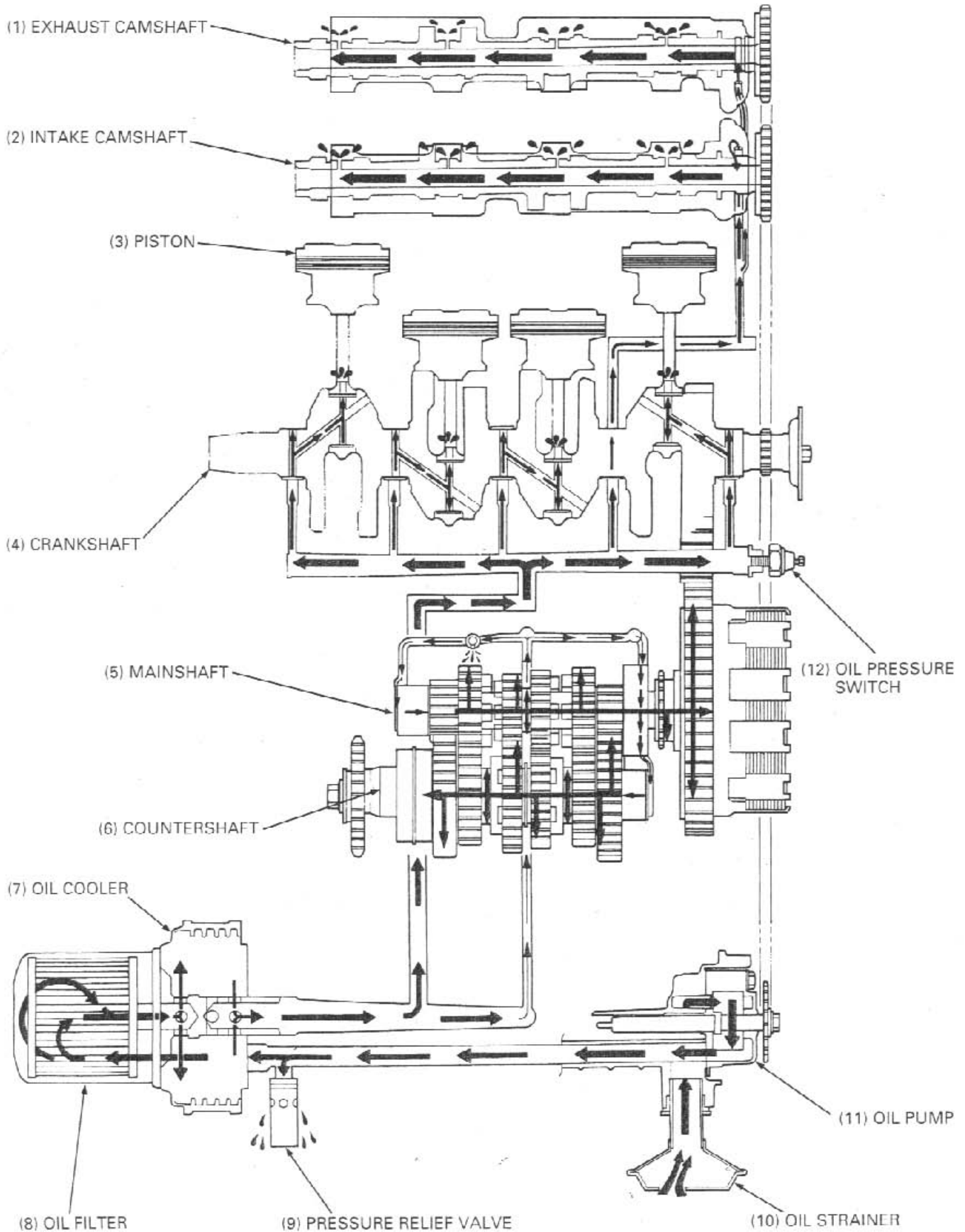
Support the motorcycle securely and raise the front wheel off the ground. Check that the handlebar moves freely from side to side. If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (Section 13).



---

MEMO

# LUBRICATION SYSTEM DIAGRAM



|                            |     |                                    |      |
|----------------------------|-----|------------------------------------|------|
| LUBRICATION SYSTEM DIAGRAM | 4-0 | OIL STRAINER/PRESSURE RELIEF VALVE | 4-4  |
| SERVICE INFORMATION        | 4-1 | OIL PUMP                           | 4-6  |
| TROUBLESHOOTING            | 4-2 | OIL COOLER                         | 4-10 |
| OIL PRESSURE INSPECTION    | 4-3 |                                    |      |

## SERVICE INFORMATION

### GENERAL

#### ▲ WARNING

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

- The oil pump can be serviced with the engine installed in the frame.
- The service procedures in this section must be performed with the engine oil drained.
- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the oil pump has been installed, check that there are no oil leaks and that oil pressure is correct.

### SPECIFICATIONS

Unit: mm (in)

| ITEM                                |                      | STANDARD   | SERVICE LIMIT |
|-------------------------------------|----------------------|--|---------------|
| Engine oil capacity                 | At draining          | 3.5 liter (3.7 US qt, 3.1 Imp qt)  | —             |
|                                     | At disassembly       | 4.4 liter (4.6 US qt, 3.9 Imp qt)  | —             |
|                                     | At oil filter change | 3.6 liter (3.8 US qt, 3.2 Imp qt)  | —             |
| Recommended engine oil              |                      | Honda GN4 4-stroke oil or equivalent motor oil<br>API service classification SF or SG<br>Viscosity: SAE 10W - 40 | —             |
| Oil pressure at oil pressure switch |                      | 490 kPa (5.0 kgf/cm <sup>2</sup> , 71 psi) at 6,000 rpm/(80°C/176°F)   | —             |
| Oil pump rotor                      | Tip clearance        | 0.15 - 0.22 (0.006 - 0.009)  | 0.20 (0.008)  |
|                                     | Body clearance       | 0.15 - 0.22 (0.006 - 0.009)  | 0.35 (0.014)  |
|                                     | Side clearance       | 0.02 - 0.07 (0.001 - 0.003)  | 0.10 (0.004)  |

### TORQUE VALUES

|                               |                               |                                      |
|-------------------------------|-------------------------------|--------------------------------------|
| Oil drain bolt                | 29 N·m (3.0 kgf·m, 22 lbf·ft) |                                      |
| Oil filter cartridge          | 10 N·m (1.0 kgf·m, 7 lbf·ft)  | Apply oil to the new O-ring          |
| Oil pump driven sprocket bolt | 15 N·m (1.5 kgf·m, 11 lbf·ft) | Apply a locking agent to the threads |
| Oil cooler boss               | 64 N·m (6.5 kgf·m, 47 lbf·ft) | Apply a locking agent to the threads |
| Oil pressure switch           | 12 N·m (1.2 kgf·m, 9 lbf·ft)  | Apply sealant to the threads         |

### TOOLS

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

— Equivalent commercially available in U.S.A.

## TROUBLESHOOTING

### Engine oil level too low

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

### Low or no oil pressure

- Clogged oil orifice
- Incorrect oil being used

### No oil pressure

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

### Low oil pressure

- Clogged oil strainer screen
- Oil pump worn or damaged
- Internal oil leak
- Incorrect oil being used
- Low oil level

### High oil pressure

- Plugged oil filter, gallery, or metering orifice
- Incorrect oil being used

## OIL PRESSURE INSPECTION

### NOTE

- If the oil pressure indicator light remains on a few seconds, check the indicator system before checking the oil pressure.

Check the oil level (page 3-11).

Warm up the engine to normal operating temperature (approximately 80°C/176°F).  
Stop the engine and disconnect the oil pressure switch wire connector from the switch.

Remove the oil pressure switch and connect an oil pressure gauge and attachment to the switch hole.

### TOOLS:

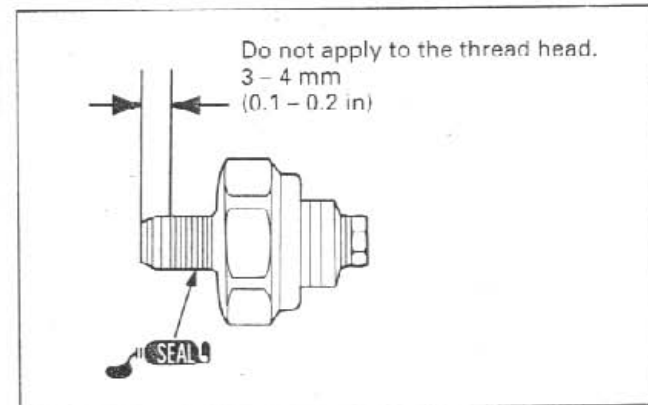
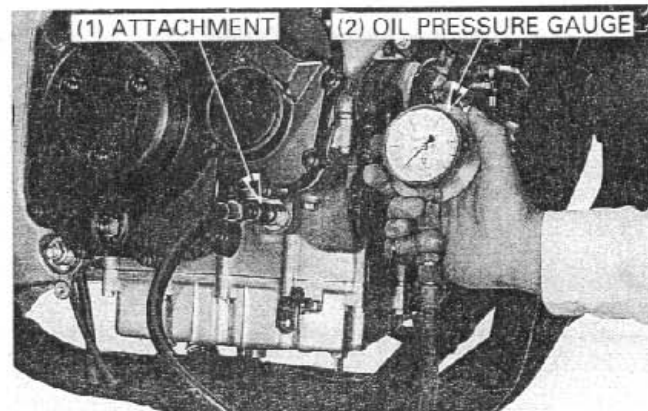
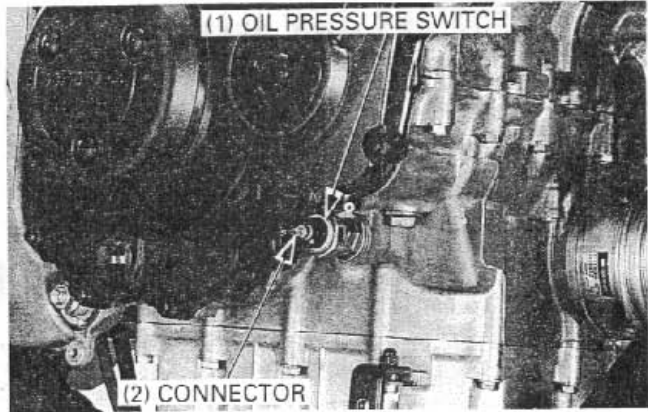
|                               |  |
|-------------------------------|--|
| Oil pressure gauge            | 07506 - 3000000<br>(Equivalent commercially available in U.S.A.) |
| Oil pressure gauge attachment | 07510 - 4220100<br>(Equivalent commercially available in U.S.A.) |

Start the engine and increase the rpm to 6,000 rpm and read the oil pressure.

### OIL PRESSURE:

490 kPa (5.0 kgf/cm<sup>2</sup>, 71 psi) at 6,000 rpm/(80°C/176°F)

Stop the engine and remove the tools.  
Apply sealant to the threads of the oil pressure switch.



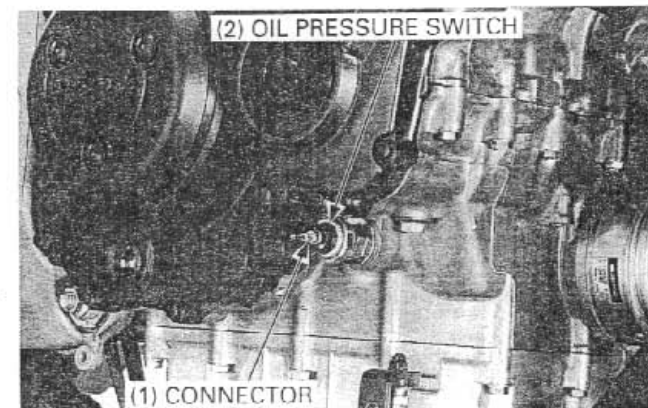
Install and tighten it to the specified torque.

**TORQUE:** 12 N·m (1.2 kgf·m, 9 lbf·ft)

### CAUTION

- To prevent crankcase damage, do not overtighten the switch.

Connect the oil pressure switch connector.



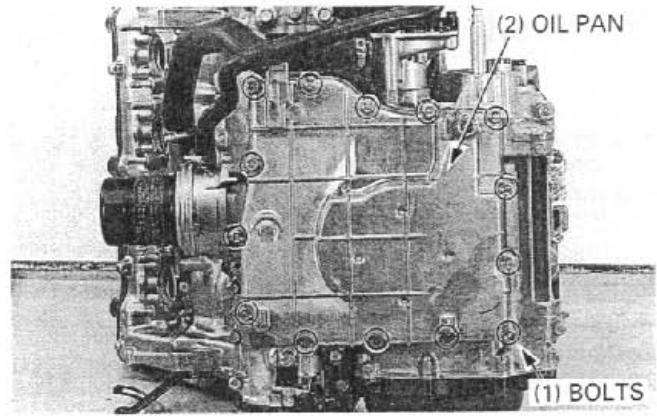
# OIL STRAINER/PRESSURE RELIEF VALVE

## REMOVAL

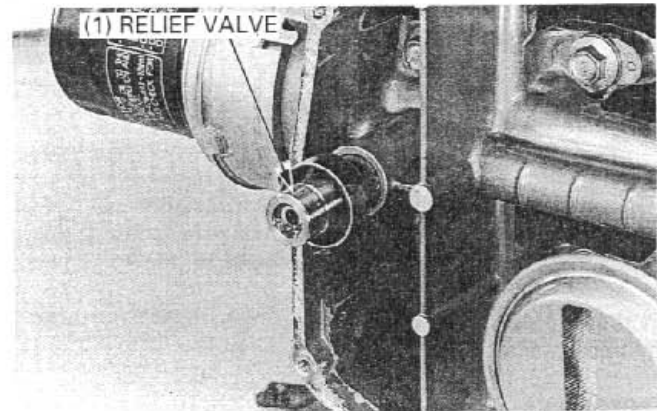
Drain the engine oil (page 3-12).

Remove the exhaust pipe (page 2-16).

Remove the oil pan flange bolts and oil pan.

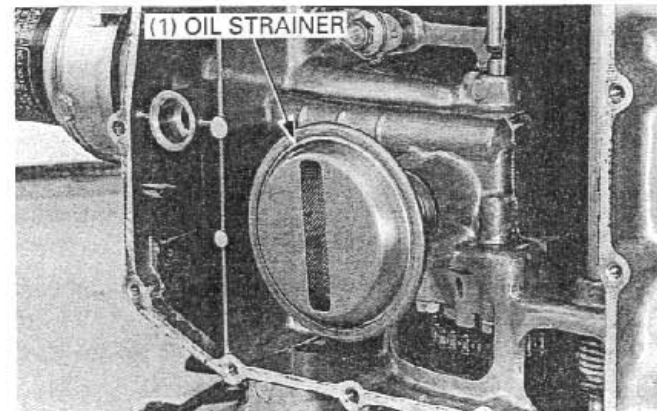


Remove the pressure relief valve and O-ring.



Remove the oil strainer and gasket.

Clean the oil strainer screen.



## INSPECTION

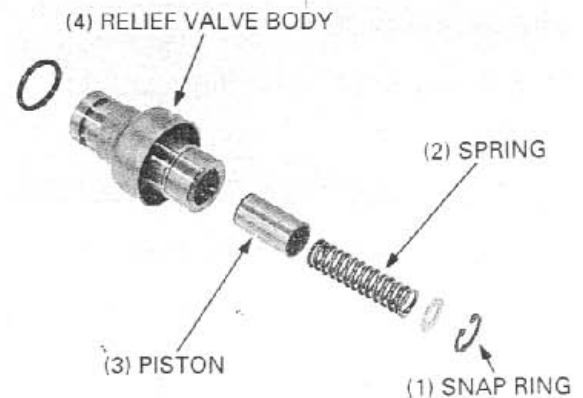
Check the operation of the pressure relief valve by pushing on the piston.

Disassemble the relief valve by removing the snap ring.

Inspect the piston for wear, sticking or damage.

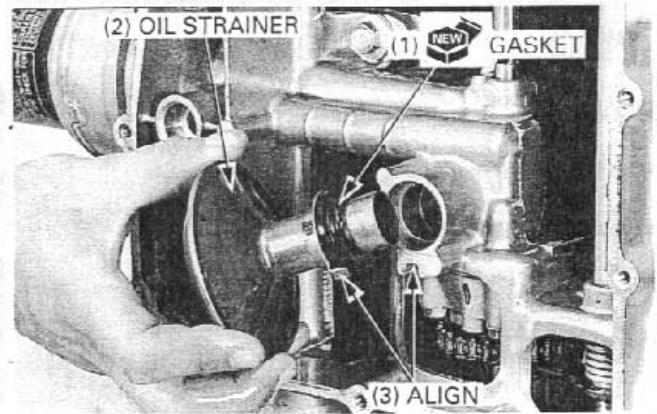
Inspect the spring for weakness or damage.

Assemble the relief valve in the reverse order of disassembly.

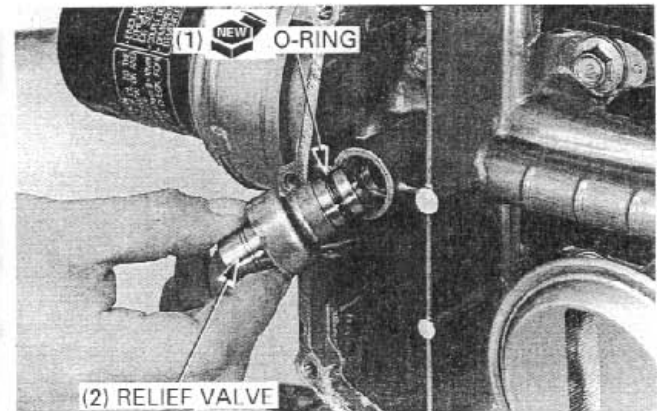


## INSTALLATION

Apply oil to the new gasket and install it onto the oil strainer. Install the oil strainer into the crankcase while aligning its boss with the groove in the crankcase.



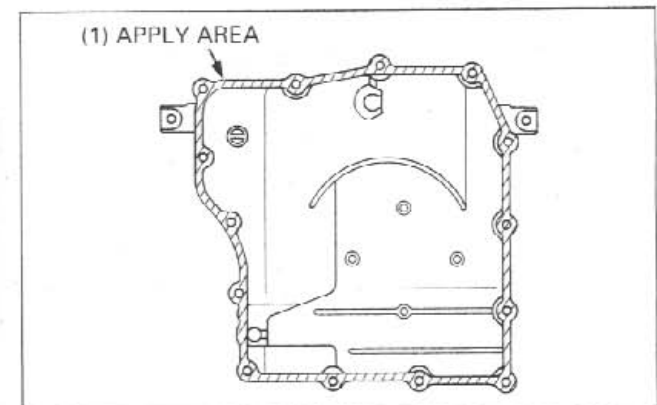
Apply oil to the new O-ring and install it onto the relief valve. Install the relief valve into the crankcase.



Clean the oil pan mating surface thoroughly. Apply Three Bond 1207B or an equivalent to the mating surface.

### CAUTION

- Do not apply sealant more than necessary.

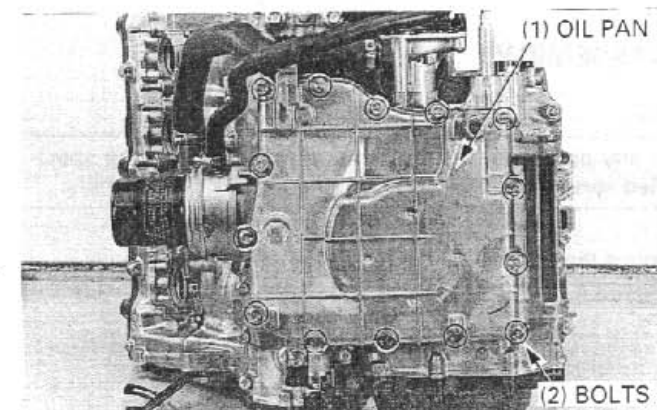


Install the oil pan and tighten the flange bolts in a crisscross pattern in 2 – 3 steps.

Install the exhaust pipe (page 2-17).  
Fill the crankcase with recommended oil (page 3-13).

### NOTE

- After installation, check that there are no oil leaks.



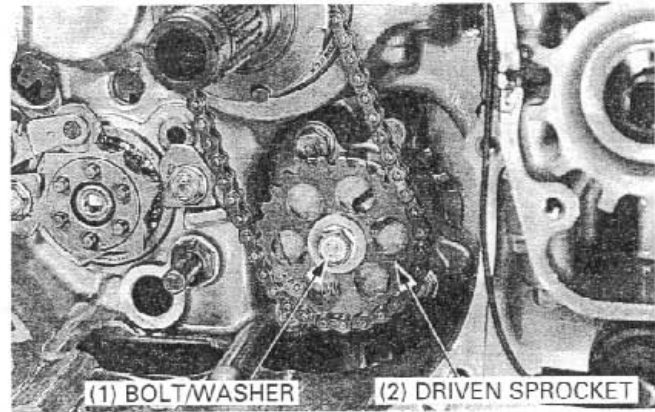


# OIL PUMP

## REMOVAL

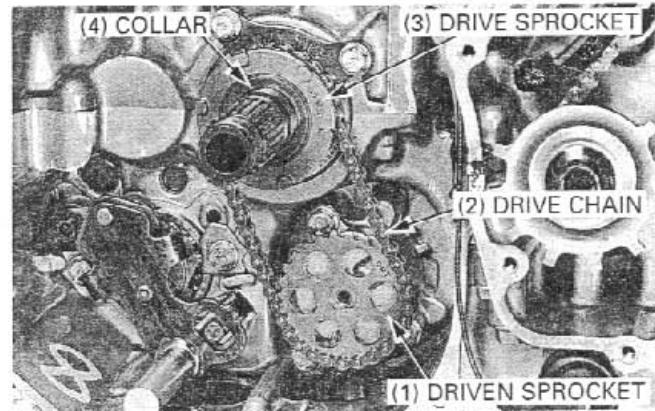
Remove the clutch assembly (page 9-4).

Remove the oil pump driven sprocket bolt/washer.

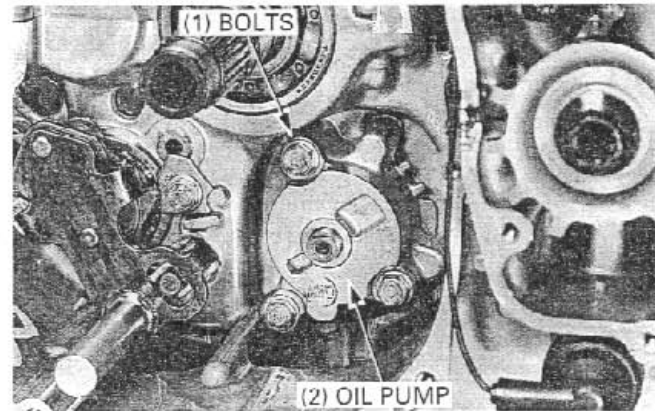


Remove the following:

- Oil pump driven sprocket
- Oil pump drive chain
- Oil pump drive sprocket
- Drive sprocket collar



Remove the flange bolts and oil pump assembly.

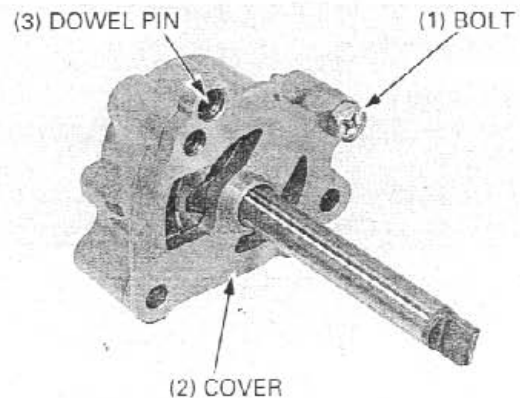


## DISASSEMBLY

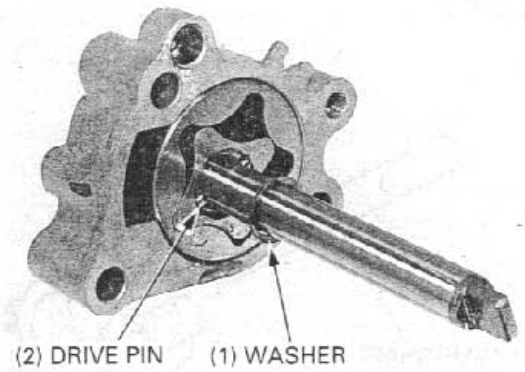
### NOTE

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

Remove the bolt, oil pump cover and dowel pin.



Remove the thrust washer and drive pin.  
Disassemble the oil pump.

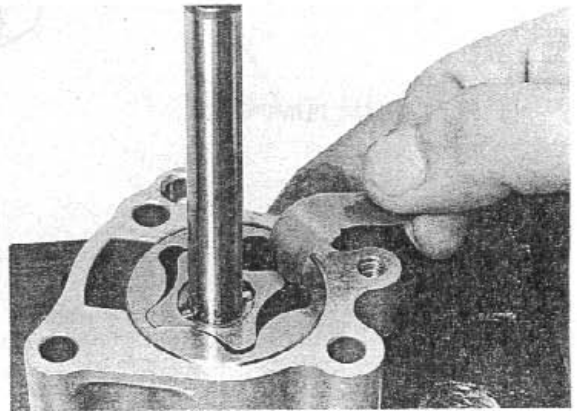


## INSPECTION

Temporarily install the oil pump shaft.  
Install the outer and inner rotors into the oil pump body.

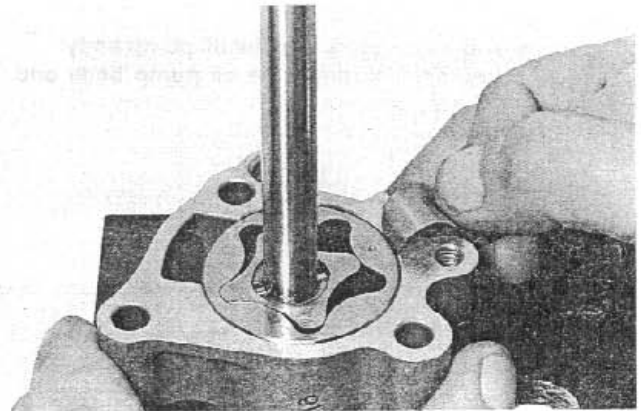
Measure the tip clearance.

**SERVICE LIMIT: 0.20 mm (0.008 in)**



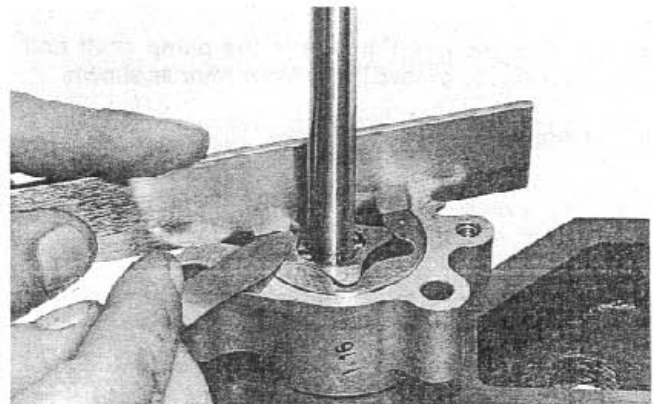
Measure the pump body clearance.

**SERVICE LIMIT: 0.35 mm (0.014 in)**

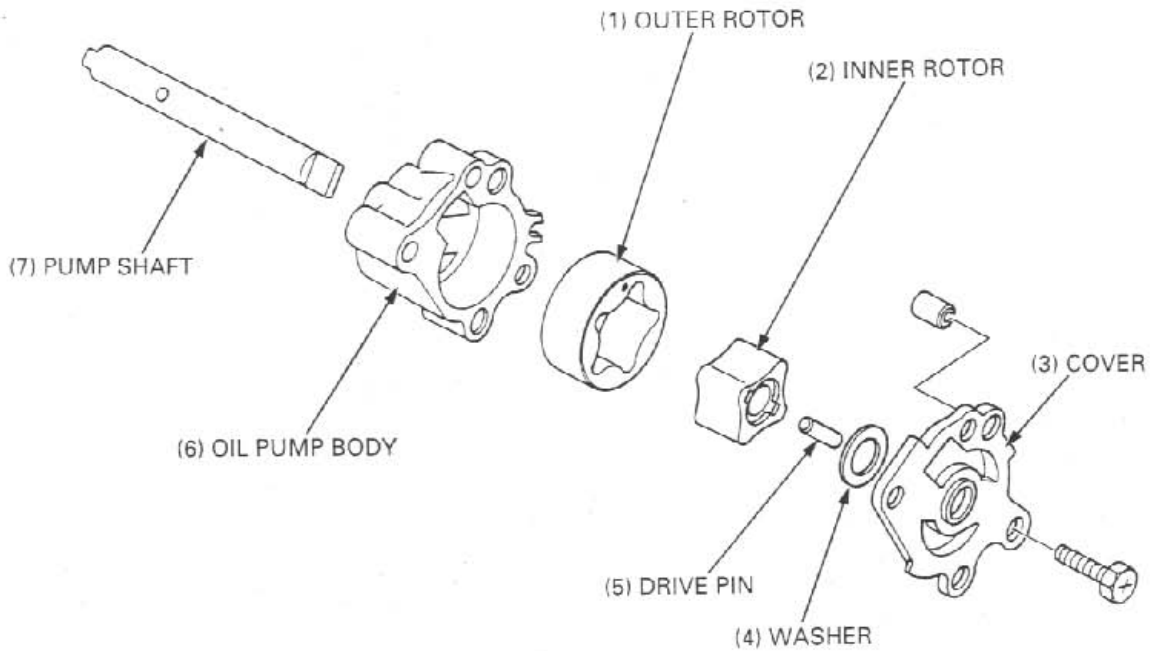


Measure the side clearance using a straight edge and feeler gauge.

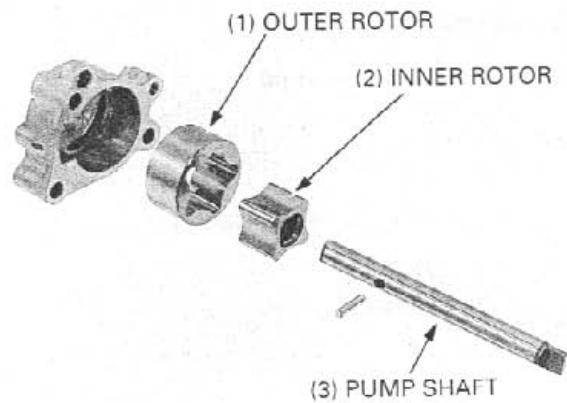
**SERVICE LIMIT: 0.10 mm (0.004 in)**



ASSEMBLY

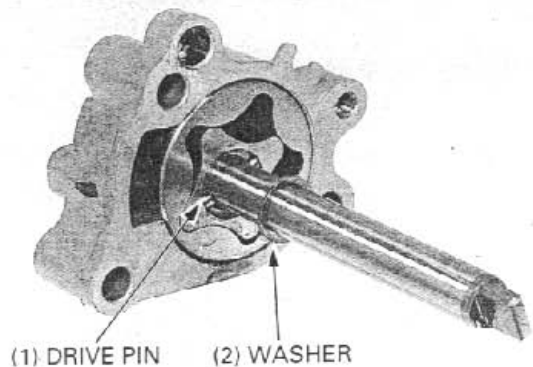


Install the outer and inner rotors into the oil pump body.  
Install the oil pump shaft through the oil pump body and inner rotor.

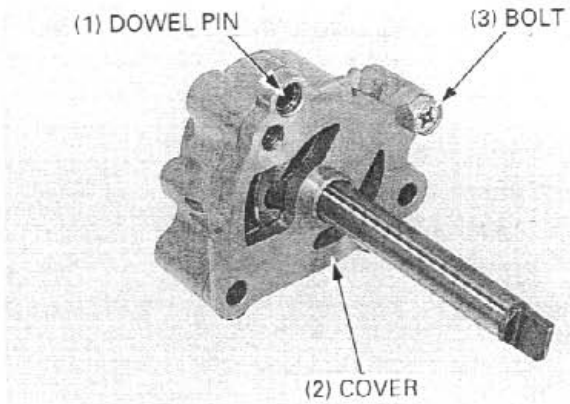


Install the drive pin into the hole in the pump shaft and align the pin with the groove in the inner rotor as shown.

Install the thrust washer.

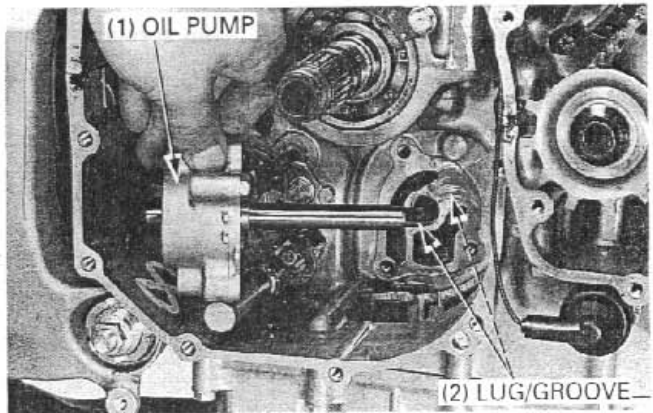


Install the dowel pin and oil pump cover, then tighten the cover bolt securely.

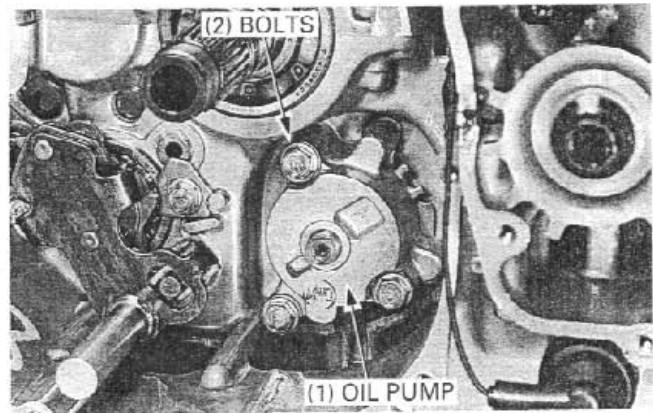


### INSTALLATION

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



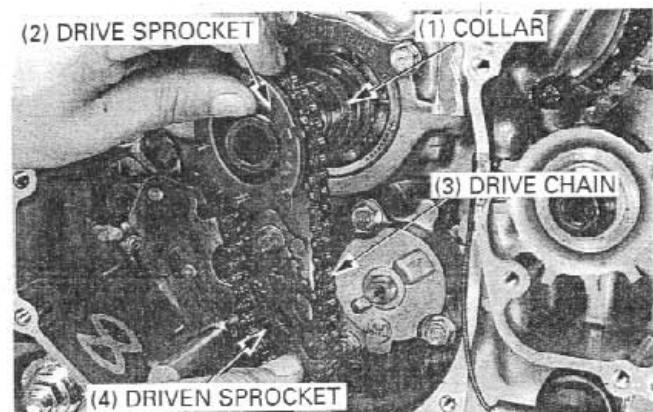
Install and tighten the three flange bolt securely.



Apply oil to the oil pump drive sprocket collar, drive sprocket and drive chain.

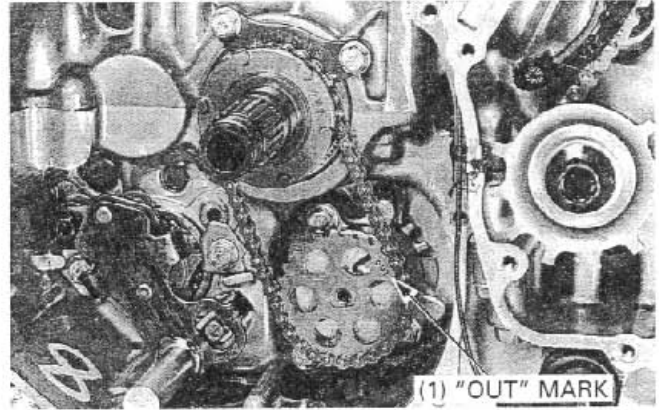
Install the following:

- Drive sprocket collar
- Oil pump drive sprocket
- Oil pump drive chain
- Oil pump driven sprocket



## LUBRICATION SYSTEM

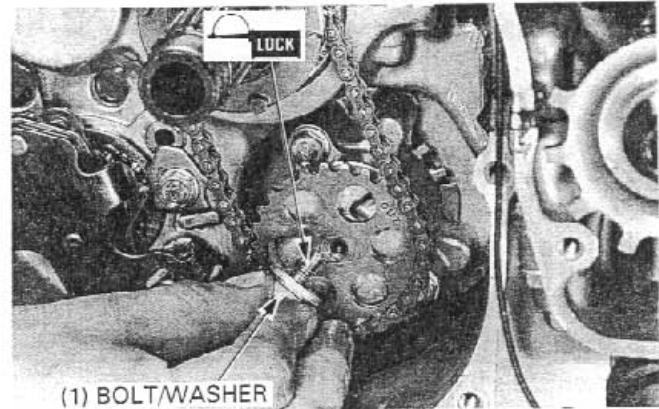
Install the oil pump driven sprocket with its "OUT" mark facing outward.



Apply a locking agent to the oil pump driven sprocket bolt threads.  
Install and tighten the driven sprocket bolt/washer to the specified torque.

**TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)**

Install the clutch assembly (page 9-8).

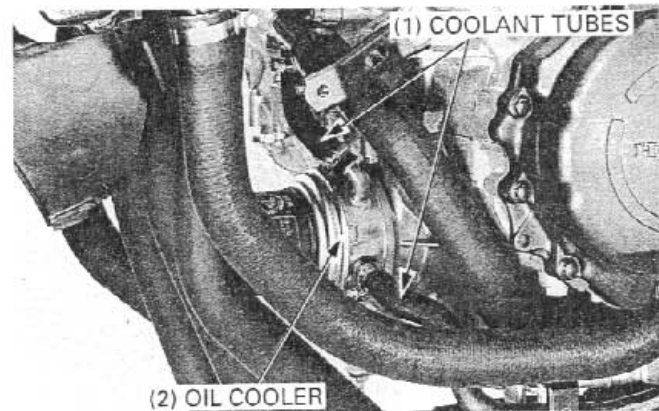


## OIL COOLER

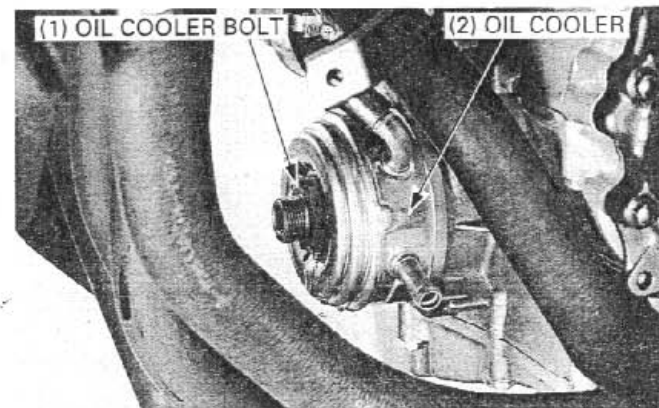
### REMOVAL

Drain the engine oil (page 3-12).  
Remove the oil filter cartridge (page 3-12).  
Drain the coolant (page 6-4).

Disconnect the coolant tubes from the oil cooler.

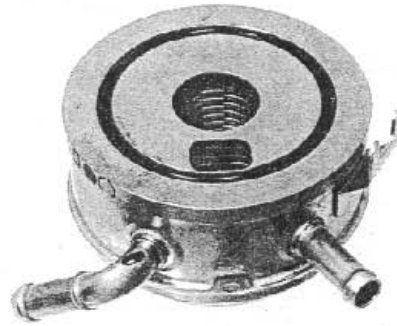


Remove the oil cooler bolt.  
Remove the oil cooler and O-ring.

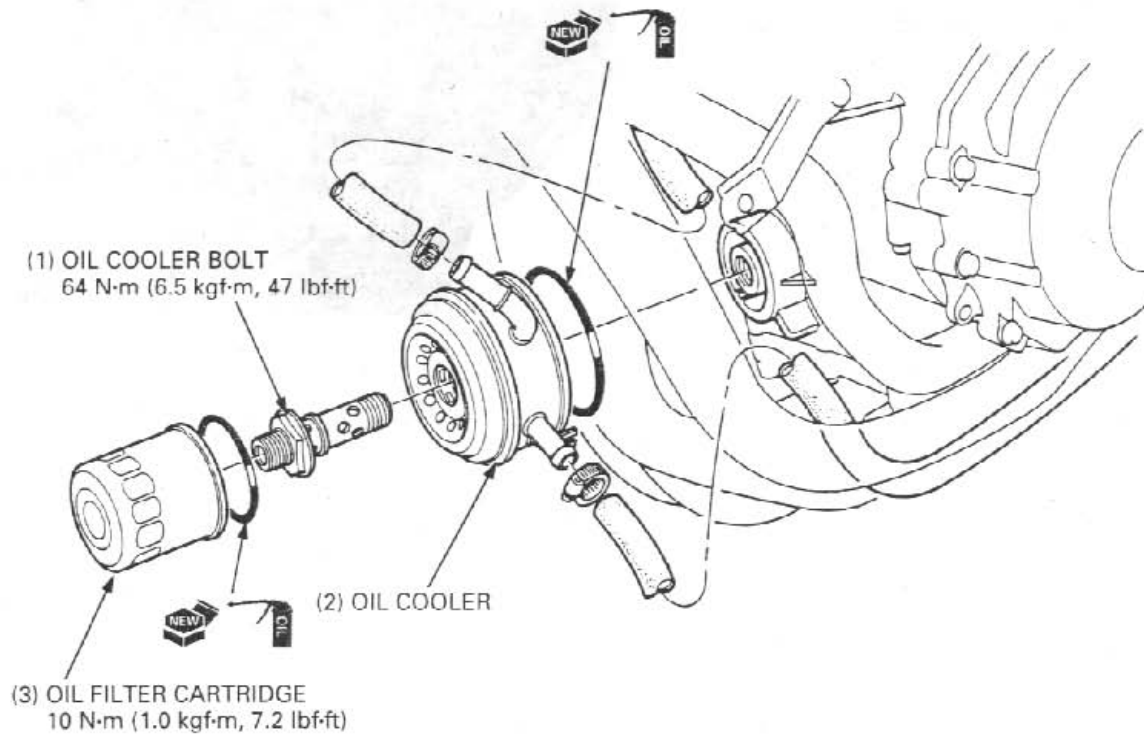


## INSPECTION

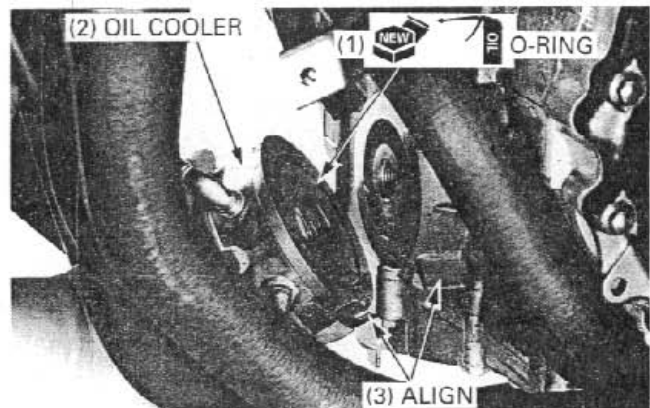
Check the oil cooler for leakage or damage.



## INSTALLATION



Apply oil to the new O-ring and install it onto the oil cooler. Install the oil cooler, aligning its guide groove with the boss on the crankcase.

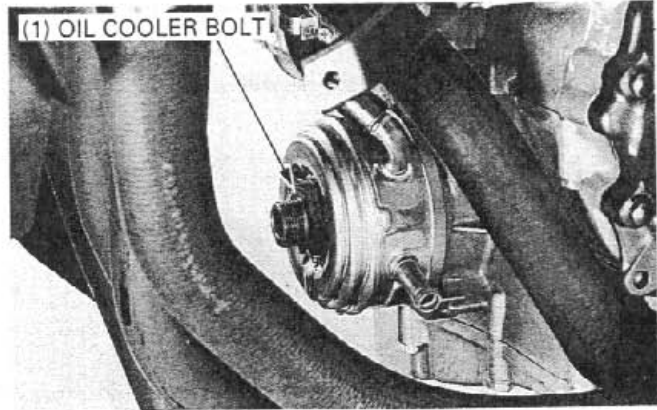


## LUBRICATION SYSTEM

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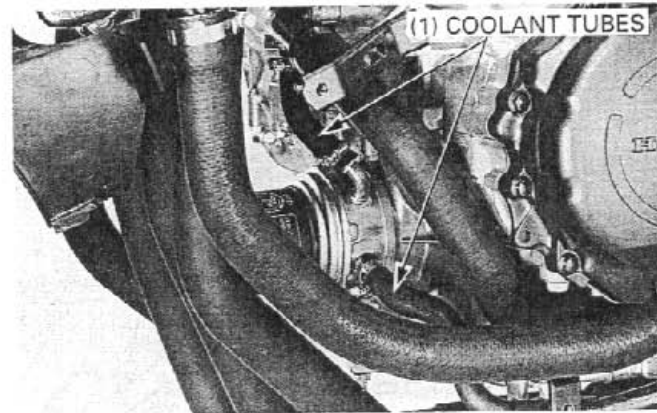
Apply a locking agent to the oil cooler bolt threads.  
Install and tighten the oil cooler bolt to the specified torque.

**TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)**



Connect the coolant tubes and secure them with the clamps.

Install the oil filter cartridge (page 3-13).  
Fill the crankcase with recommended engine oil (page 3-13).  
Fill the cooling system (page 6-4).

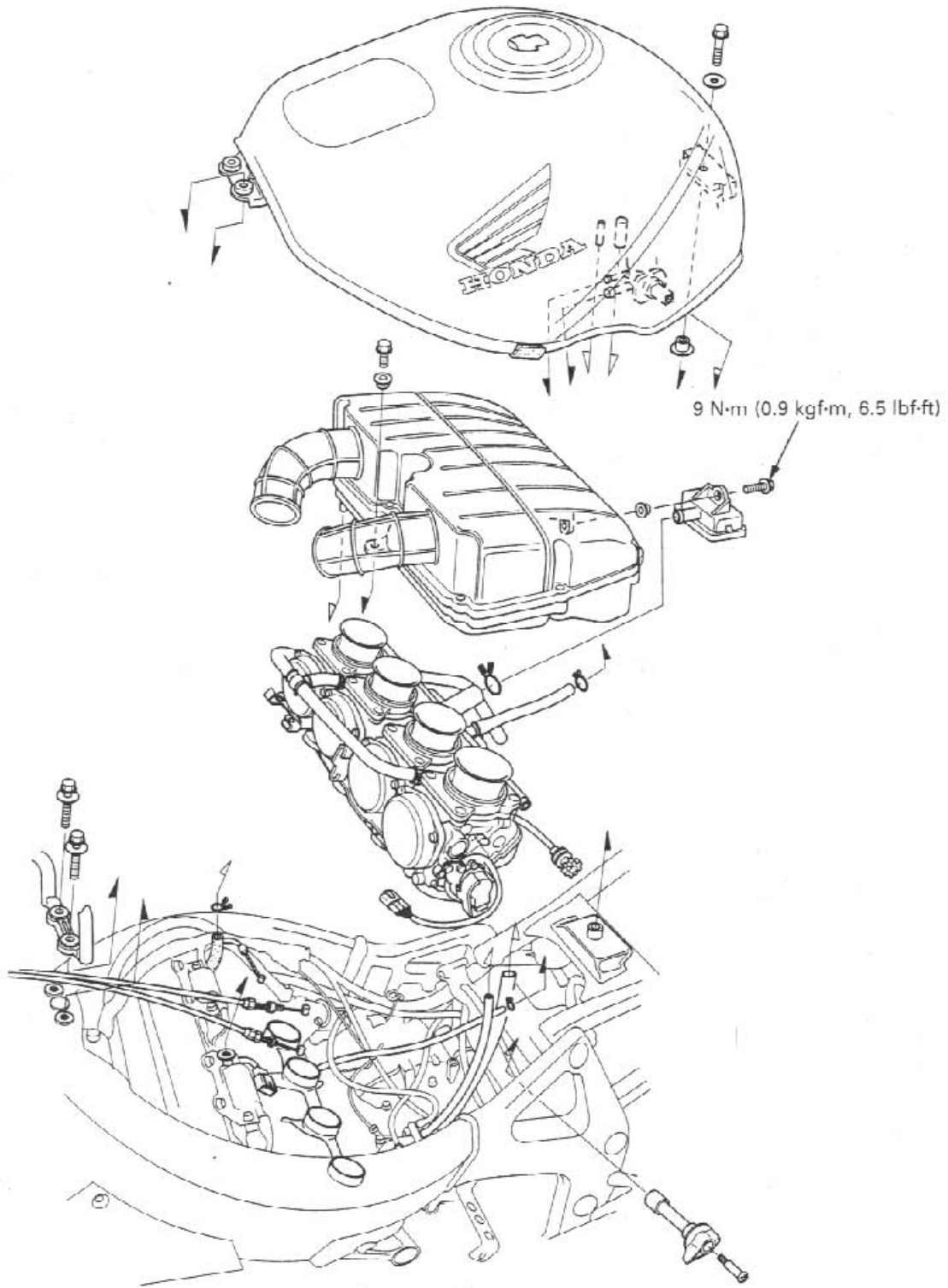


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MEMO

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|                        |      |  |      |
|------------------------|------|--|------|
| SERVICE INFORMATION    | 5-1  | CARBURETOR INSTALLATION                            | 5-19 |
| TROUBLESHOOTING        | 5-3  | PILOT SCREW ADJUSTMENT                             | 5-20 |
| AIR CLEANER HOUSING    | 5-4  | HIGH ALTITUDE ADJUSTMENT (U.S.A. ONLY)             | 5-21 |
| CARBURETOR REMOVAL     | 5-5  | SECONDARY AIR SUPPLY SYSTEM (CALIFORNIA TYPE ONLY) | 5-22 |
| CARBURETOR SEPARATION  | 5-6  | FUEL VALVE   | 5-23 |
| CARBURETOR DISASSEMBLY | 5-7  |  |      |
| CARBURETOR ASSEMBLY    | 5-11 |  |      |
| CARBURETOR COMBINATION | 5-15 |  |      |

## SERVICE INFORMATION

### GENERAL

#### ⚠ WARNING

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

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.

#### CAUTION

- Be sure to remove the diaphragms before cleaning air and fuel passages with compressed air. The diaphragms might be damaged.
- Refer to section 2 for fuel tank removal and installation.
- When disassembling fuel system parts, note the location of the O-rings. Replace them with new ones on reassembly.
- Before disassembling the carburetor, place the suitable container under the carburetor drain tube, loosen the bolt and drain the carburetor.
- After removing the carburetor, wrap the intake ports of the engine with a shop towel or cover it with a piece 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.

#### NOTE

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

## FUEL SYSTEM

### SPECIFICATIONS

| ITEM                             |                        | SPECIFICATIONS                |                               |
|----------------------------------|------------------------|-------------------------------|-------------------------------|
| Carburetor identification number | 49 states type         | '96 - '97:                    | VP88B                         |
|                                  |                        | After '97:                    | VP8CP                         |
|                                  | California type        | '96 - '97:                    | VP89A                         |
|                                  |                        | After '97:                    | VP8DA                         |
|                                  | Canada type            | '96:                          | VP88A                         |
|                                  |                        | '97:                          | VP88B                         |
| After '97:                       |                        | VP8CB                         |                               |
| Main jet                         | 49 states type         | '96 - '97:                    | #115 (See page 5-11)          |
|                                  |                        | After '97:                    | #120                          |
|                                  | California type        | '96 - '97:                    | #115                          |
|                                  |                        | After '97:                    | #120                          |
|                                  | Canada type            | '96:                          | #115                          |
|                                  |                        | '97:                          | No. 1, 4: #115/No. 2, 3: #118 |
| After '97:                       |                        | #120                          |                               |
| Slow jet                         |                        |                               | #40                           |
| Jet needle number                | 49 states type         | '96 - '97:                    | No. 1, 4: J5FB/No. 2, 3: J5FA |
|                                  |                        | After '97:                    | No. 1, 4: J5FH/No. 2, 3: J5DD |
|                                  | California type        | '96 - '97:                    | No. 1, 4: J5FB/No. 2, 3: J5FA |
|                                  |                        | After '97:                    | No. 1, 4: J5FA/No. 2, 3: J5FC |
|                                  | Canada type            | '96:                          | No. 1, 4: J5FZ/No. 2, 3: J5FY |
|                                  |                        | '97:                          | No. 1, 4: J5FB/No. 2, 3: J5FA |
| After '97:                       |                        | No. 1, 4: J5FH/No. 2, 3: J5DD |                               |
| Pilot screw initial opening      | '96 - '97:             |                               | 3 turns out                   |
|                                  | Except California type | After '97:                    | 1 - 5/8 turns out             |
|                                  | California type        |                               | 2 turns out                   |
| Float level                      |                        |                               | 13.7 mm (0.54 in)             |
| Idle speed                       | Except California type |                               | 1,100 ± 100 rpm               |
|                                  | California type        |                               | 1,200 ± 100 rpm               |
| Throttle grip free play          |                        |                               | 2 - 6 mm (1/12 - 1/4 in)      |

### TORQUE VALUES

|                                 |                                  |
|---------------------------------|----------------------------------|
| Carburetor assembly bolt, 5 mm  | 5 N·m (0.5 kgf·m, 3.6 lbf·ft)    |
| 6 mm                            | 10 N·m (1.0 kgf·m, 7 lbf·ft)     |
| Vacuum plug for synchronization | 3.0 N·m (0.30 kgf·m, 2.2 lbf·ft) |
| Boost joint for fuel auto valve | 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft) |
| Fuel valve                      | 34 N·m (3.5 kgf·m, 25 lbf·ft)    |
| Sub-air cleaner mounting bolt   | 7 N·m (0.7 kgf·m, 5.1 lbf·ft)    |

### TOOLS

|                                      |                 |   |
|--------------------------------------|-----------------|---|
| Carburetor float level gauge         | 07401 - 0010000 |   |
| Pilot screw wrench (California type) | 07KMA - MN90100 | or 07KMA - MS60101 with 07PHA - MZ20110 (California only) |
|                                      |                 | or 07KMA - MV9010A (U.S.A. only)                          |
| (Except California type)             | 07908 - 4220201 | or 07908 - 4730001 (Except California type)               |

## TROUBLESHOOTING

### Engine won't start

- Too much fuel getting to the engine
  - Air cleaner clogged
  - Flooded carburetors
- Intake air leak
- Fuel contaminated/deteriorated
- No fuel to carburetor
  - Fuel strainer clogged
  - Fuel tube clogged
  - Fuel valve vacuum tube clogged
  - Disconnected fuel valve vacuum tube
  - Float level misadjusted
  - Fuel tank breather tube clogged

### Lean mixture

- Fuel jets clogged
- Float valve faulty
- Float level too low
- Fuel line restricted
- Carburetor air vent tube clogged
- Intake air leak
- Throttle valve faulty
- Vacuum piston faulty

### Rich mixture

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

### Engine stall, hard to start, rough idling

- Fuel line restricted
- Ignition malfunction
- Fuel mixture too lean/rich
- Fuel contaminated/deteriorated
- Intake air leak
- Idle speed misadjusted
- Float level misadjusted
- Fuel tank breather tube clogged
- Pilot screw misadjusted
- Slow circuit or starting enrichment circuit clogged
- Emission control system malfunction (California type)

### Afterburn when engine braking is used

- Lean mixture in slow circuit
- Air cut-off valve malfunction
- Emission control system is malfunction
  - Secondary air supply system faulty
  - Loose, disconnected or deteriorated hoses of the emission control system

### Backfiring or misfiring during acceleration

- Ignition system malfunction
- Fuel mixture too lean

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

- Fuel system clogged
- Ignition system malfunction
- Emission control system malfunction
  - Secondary air supply system faulty
  - Loose, disconnected or deteriorated hoses of the emission control system

## AIR CLEANER HOUSING

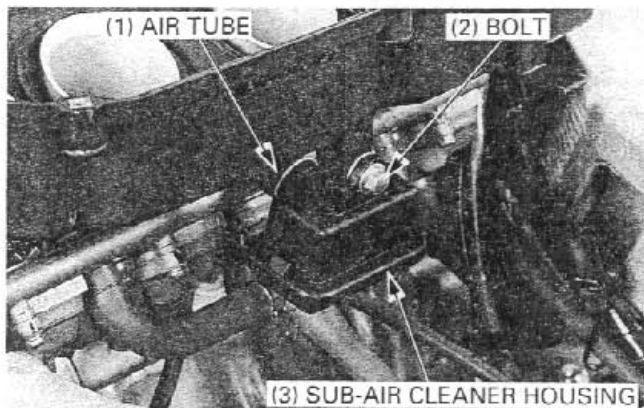
### REMOVAL

#### NOTE

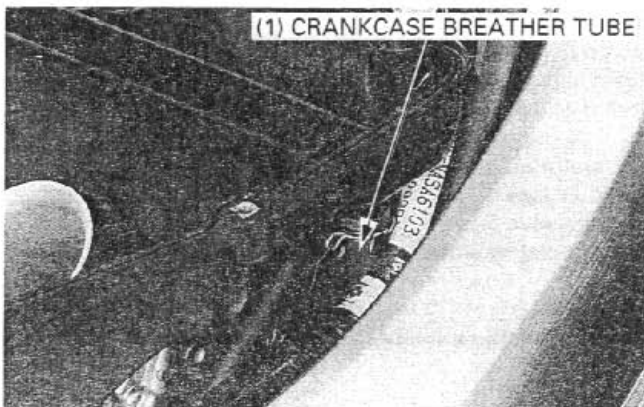
- Refer to page 3-5 for air cleaner element replacement.

Remove the fuel tank (page 2-2).

Disconnect the sub-air cleaner housing air tube.  
Remove the bolt and sub-air cleaner housing.

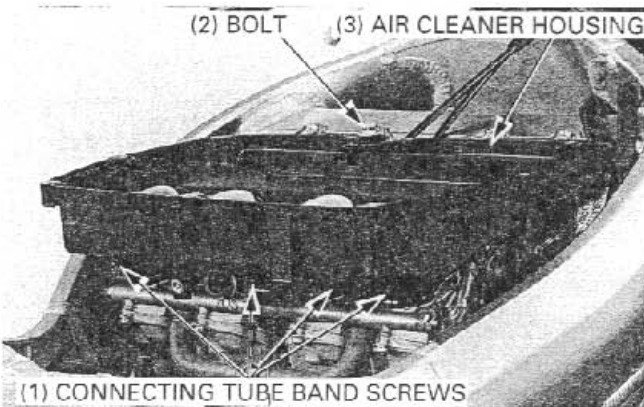


Disconnect the crankcase breather tube from the air cleaner housing.



Loosen the carburetor connecting tube band screws.

Remove the bolt and air cleaner housing.  
Remove the collar.



### INSTALLATION

Install the air cleaner housing in the reverse order of removal.



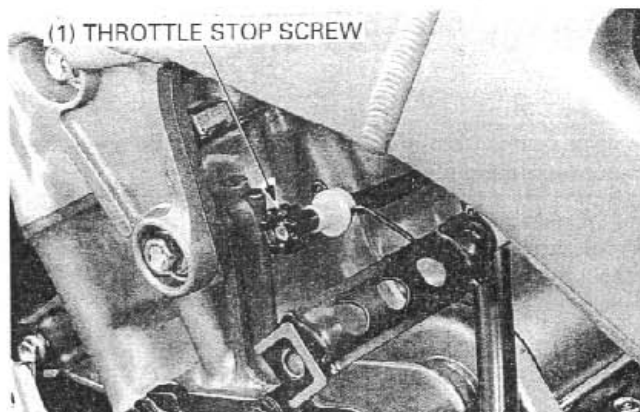
## CARBURETOR REMOVAL

### ▲ WARNING

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

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

Remove the throttle stop screw from the bracket.

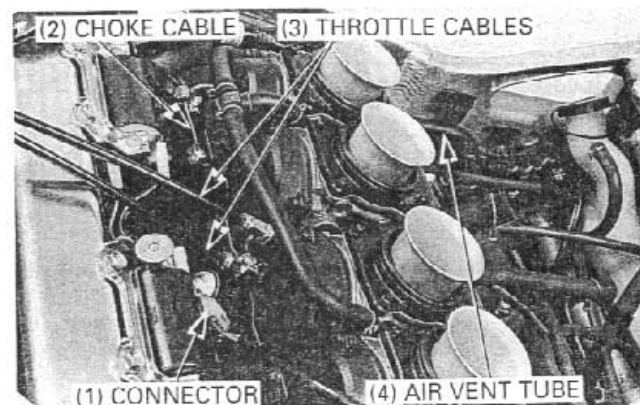


Disconnect the throttle sensor connector.

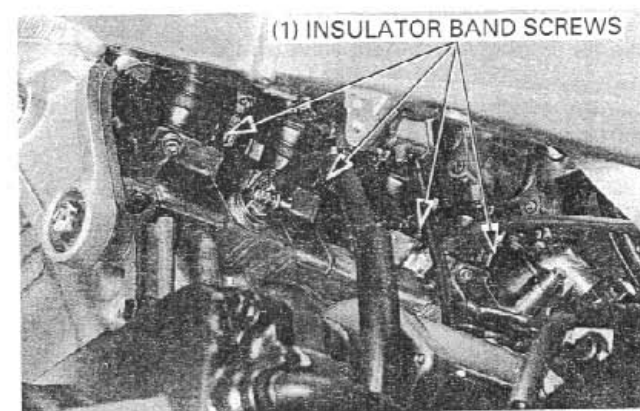
Loosen the screw and disconnect the choke cable from the carburetor.

Remove the throttle cables from the cable holder and disconnect the throttle cables from the throttle drum.

Remove the air vent tube from the guide.

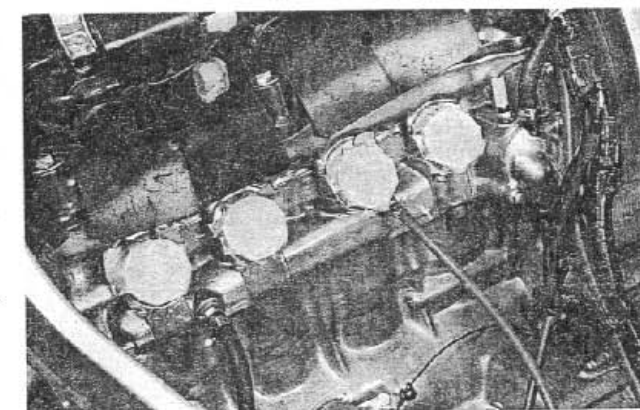


Loosen the engine side insulator band screws and remove the carburetor assembly.



### NOTE

- After removing the carburetor assembly, do not place it up side down or the air intake might be deformed.
- Seal the cylinder head intake ports with a shop towel or cover it with piece of tape to prevent any foreign material from dropping into the engine.



## CARBURETOR SEPARATION

NOTE

- The vacuum chamber and float chamber can be serviced without separating the carburetors.

Loosen the screws and remove the insulators. Disconnect the fuel tubes from the fuel joint. Disconnect the air vent tubes and sub-air cleaner tube.

NOTE

- It is not necessary to remove the throttle sensor from the carburetor body.

If necessary, remove the screws and throttle sensor from the carburetor body.

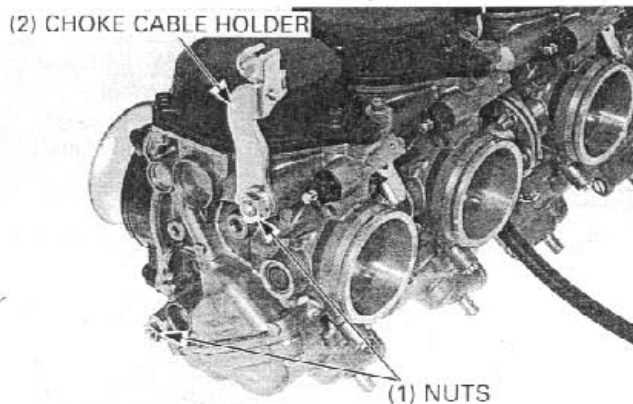
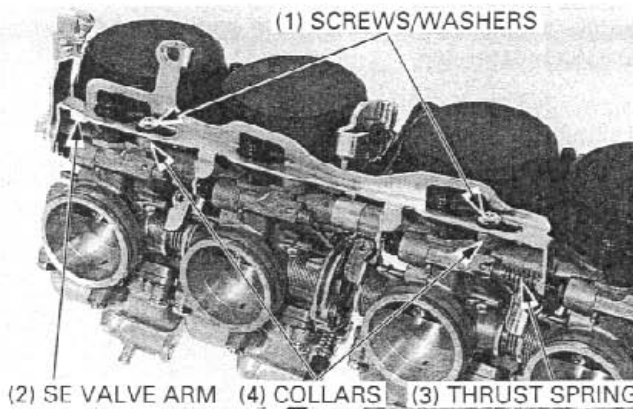
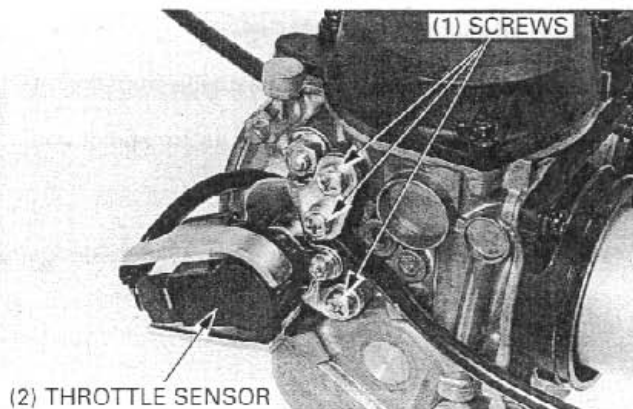
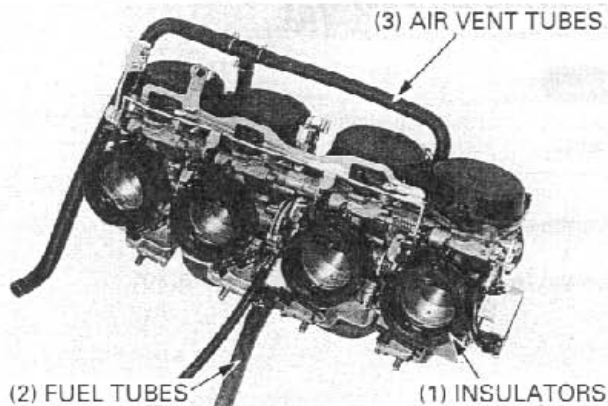
Remove the starting enrichment valve arm screws and washers. Remove the starting enrichment valve arm, thrust spring and plastic collars.

Loosen and remove the carburetor connecting nuts.

NOTE

- Loosen the nuts gradually and alternately.

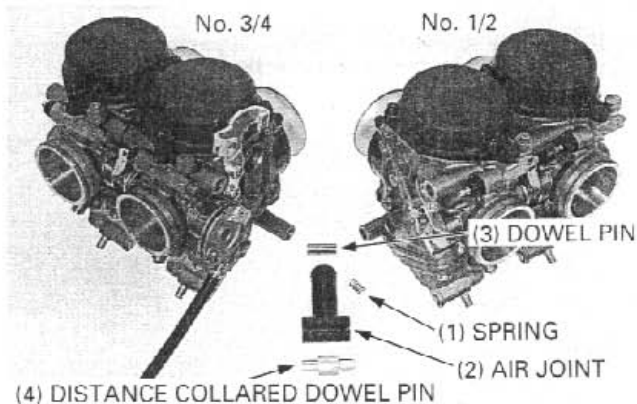
Remove the choke cable holder.



Separate the No. 3/4 carburetors from the No. 1/2 carburetors.

Remove the following:

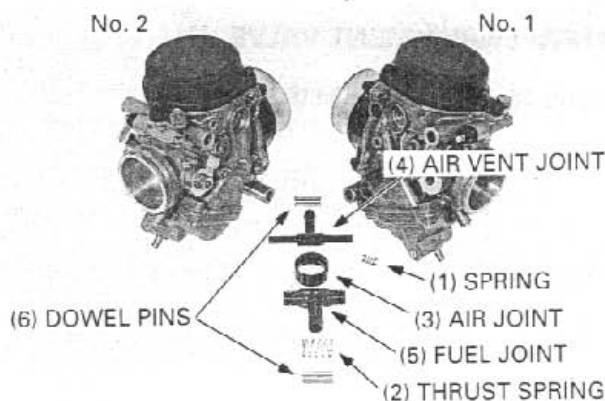
- No. 2 carburetor synchronization spring
- 3-way air joint pipe/O-rings
- Dowel pin (5 mm bolt side)
- Distance collared dowel pin (6 mm bolt side)



Separate the No. 1 carburetor from the No. 2 carburetor.

Remove the following:

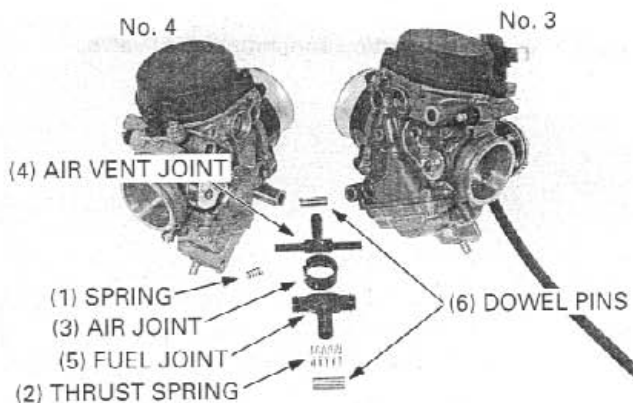
- No. 1 carburetor synchronization spring
- Thrust spring
- Air joint rubber pipe
- Air vent joint pipe/O-rings
- 3-way fuel joint pipe/O-rings
- Dowel pin (5 mm bolt side)
- Dowel pin (6 mm bolt side)



Separate the No. 3 carburetor from the No. 4 carburetor.

Remove the following:

- No. 4 carburetor synchronization spring
- Thrust spring
- Air joint rubber pipe
- Air vent joint pipe/O-rings
- 3-way fuel joint pipe/O-rings
- Dowel pin (5 mm bolt side)
- Dowel pin (6 mm bolt side)



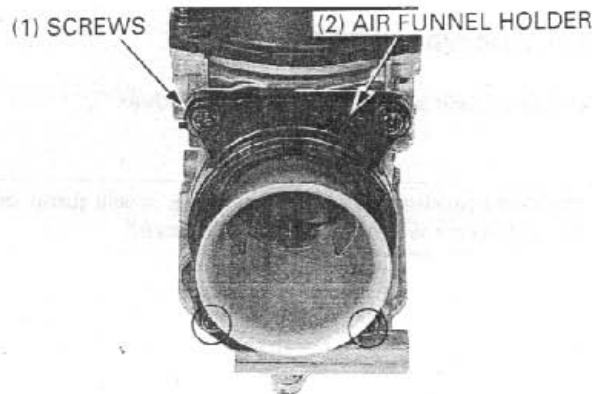
## CARBURETOR DISASSEMBLY

### NOTE

- Note the location of each carburetor part so they can be replaced in their original locations.

### AIR FUNNEL

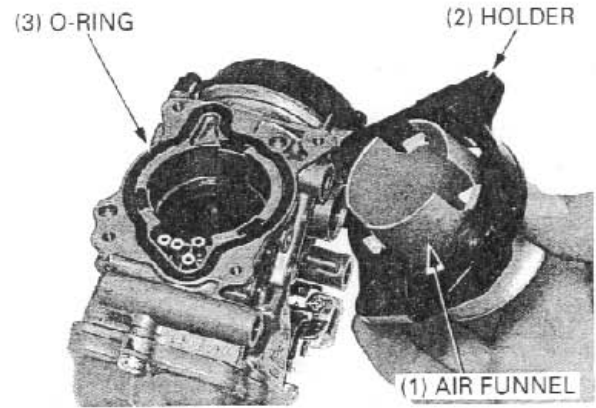
Remove the screws and air funnel holder.





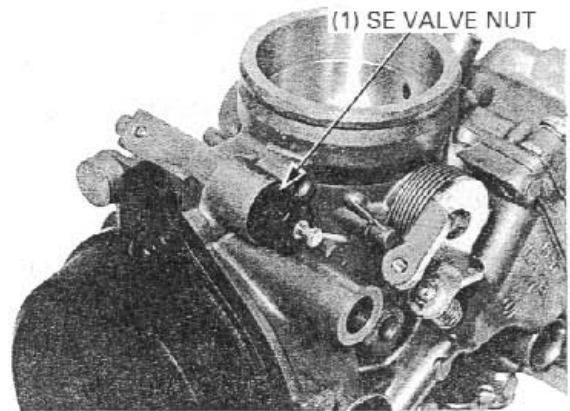
## FUEL SYSTEM

Remove the air funnel from the holder.  
Remove the O-ring from the carburetor body.

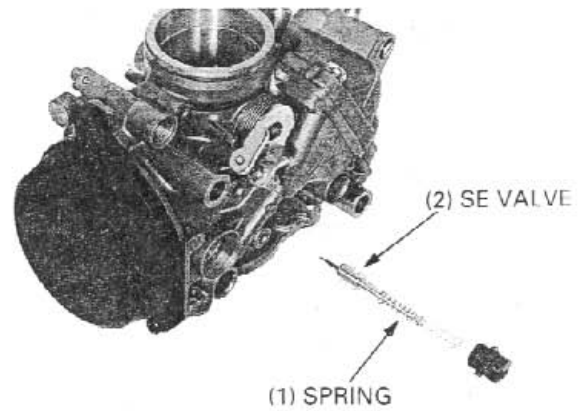


## STARTING ENRICHMENT VALVE

Remove the starting enrichment (SE) valve nut.



Remove the spring and starting enrichment (SE) valve.

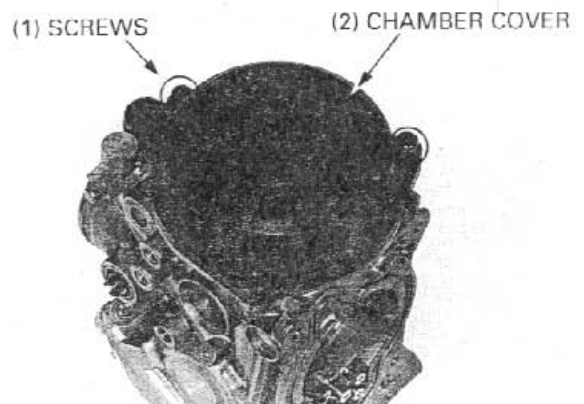


## DIAPHRAGM/VACUUM PISTON

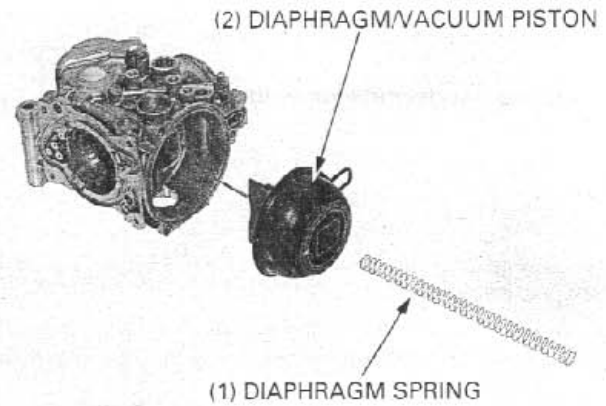
Remove the screws and vacuum chamber cover.

### NOTE

- As the compression spring is very long, it will jump out of the carburetor when the cover is removed.



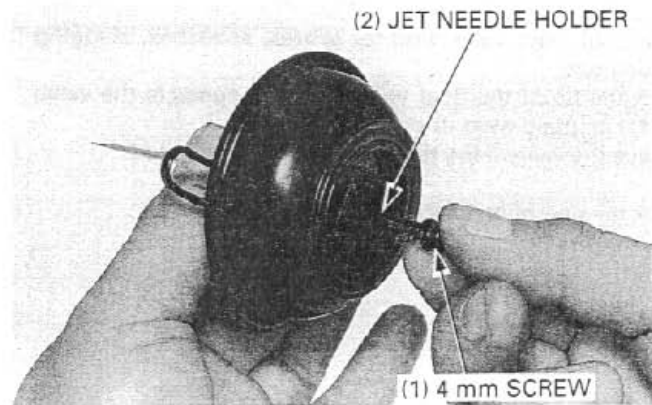
Remove the diaphragm spring and diaphragm/vacuum piston from the carburetor body.



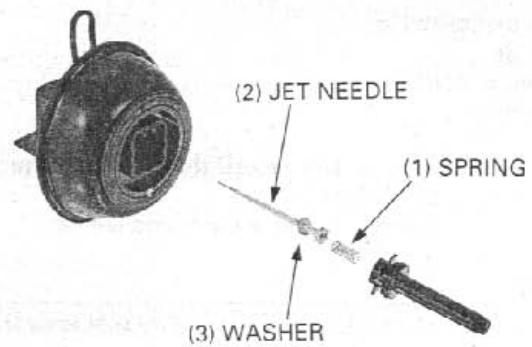
Temporarily install a 4 mm screw (example: vacuum chamber screw) into the jet needle holder. Pull the screw and remove the jet needle holder.

**CAUTION**

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

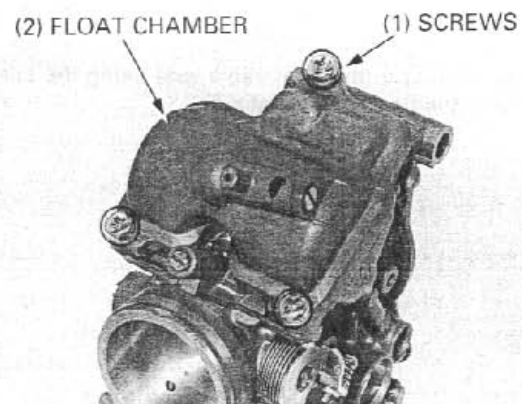


Remove the spring, jet needle and washer from the vacuum piston.



**FLOAT AND JETS**

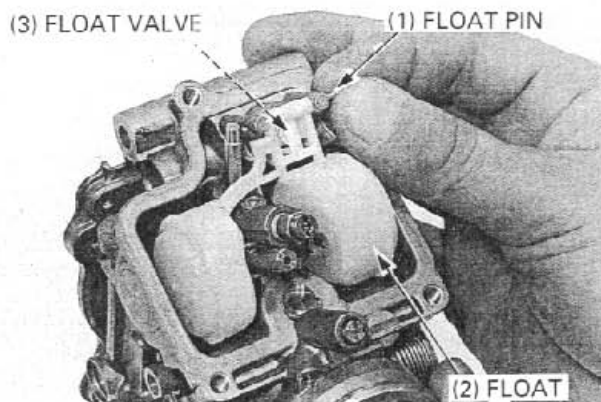
Remove the screws and float chamber.



## FUEL SYSTEM

Remove the float pin, float and float valve.

Inspect the float for deformation or damage.

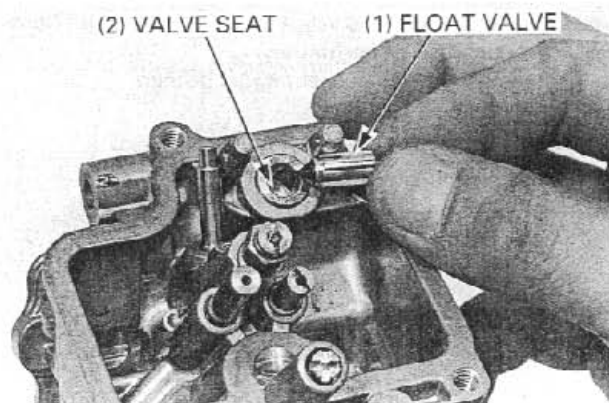


Inspect the float valve seat for scores, scratches, clogging and damage.

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

Replace the valve if the tip is worn or contaminated.

Check the operation of the float valve.



Remove the following:

- Main jet
- Needle jet holder
- Slow jet

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

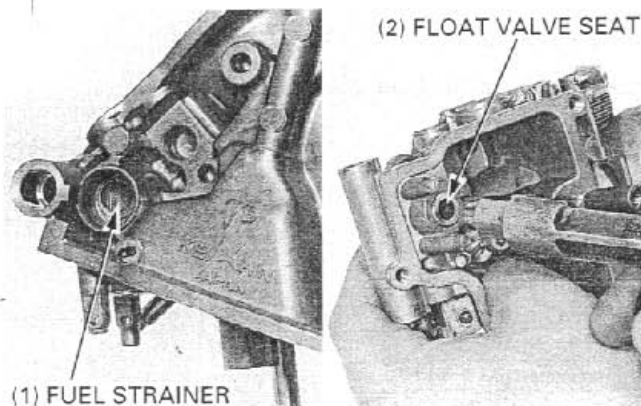
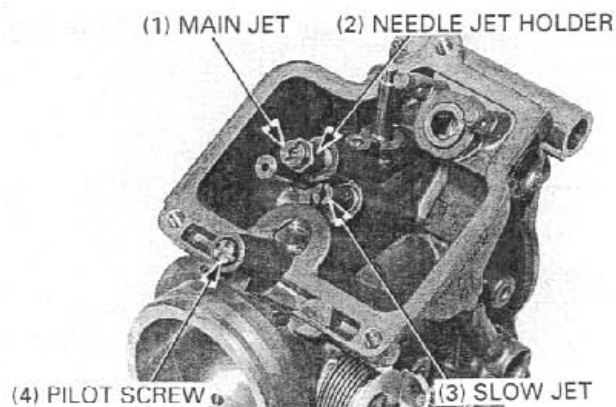
Remove the pilot screw, spring, washer and O-ring.

### CAUTION

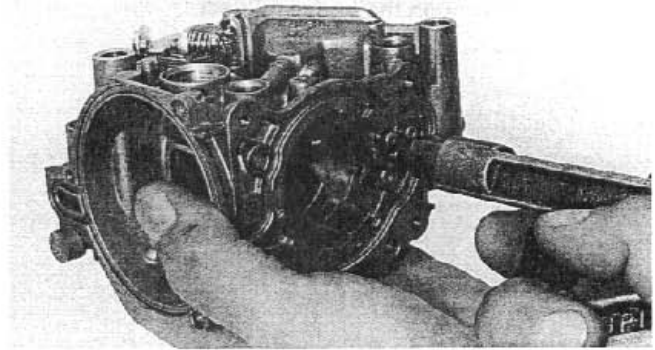
- *Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.*

Inspect each jet for wear or damage and replace if necessary.

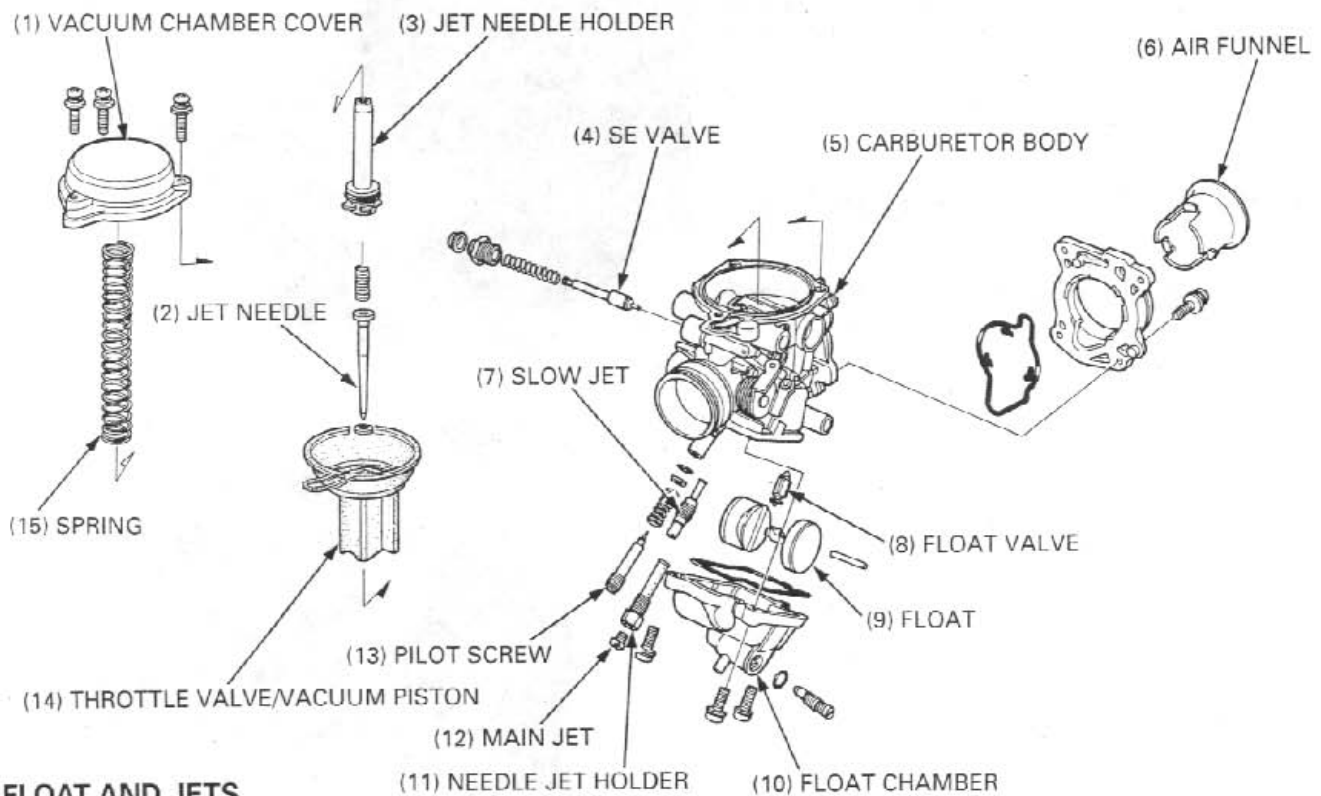
Clean the fuel strainer in the float valve seat using the compressed air from the float valve seat side.



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



## CARBURETOR ASSEMBLY



### FLOAT AND JETS

Install the following:

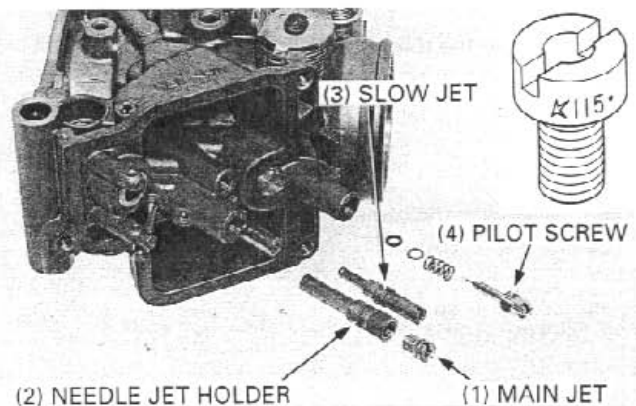
- Slow jet
- Needle jet holder
- Main jet

### CAUTION

- *Except Canada type: Install the punch marked main jets into the No. 2 and No. 3 carburetors.*
- *Handle all jets with care. They can easily be scored or scratched.*

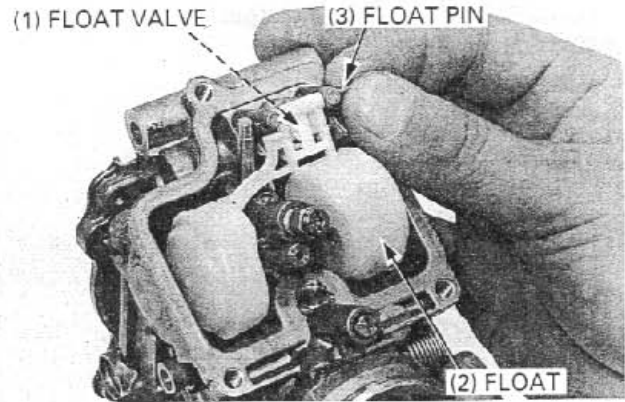
Install the pilot screw and return it to its original position as noted during removal.

Perform the pilot screw adjustment procedure if a new pilot screw is installed (page 5-20).



## FUEL SYSTEM

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



### FLOAT LEVEL INSPECTION

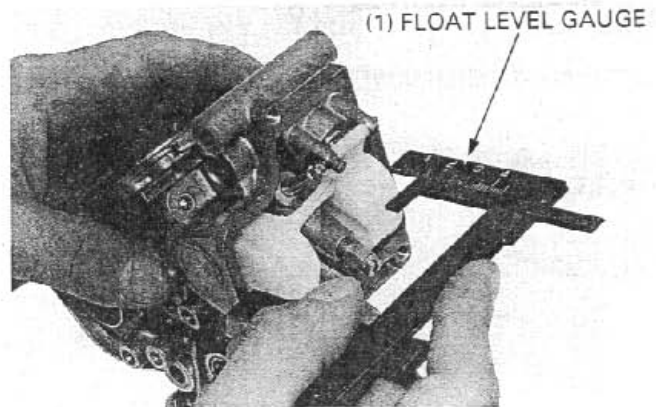
With the float valve seated and the float arm just touching the valve, measure the float level with the special tool as shown.

**FLOAT LEVEL: 13.7 mm (0.54 in)**

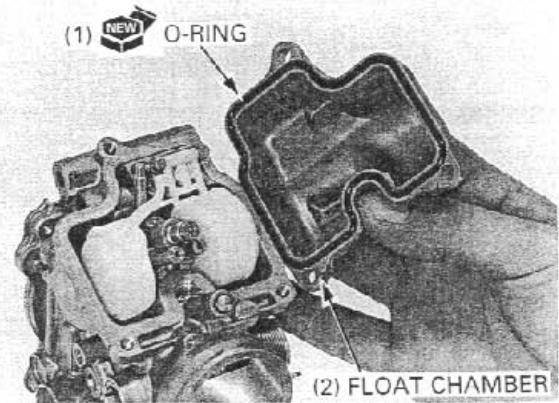
#### TOOL:

Carburetor float level gauge 07401 - 0010000

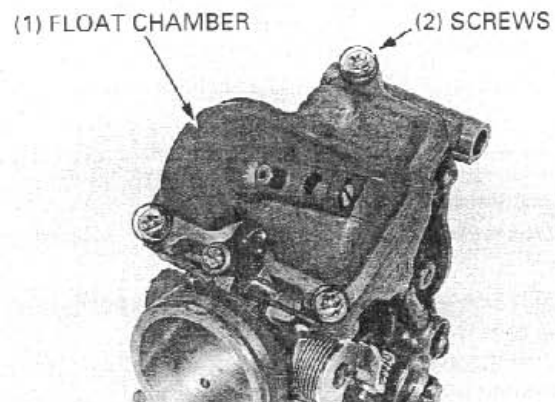
The float cannot be adjusted.  
Replace the float assembly if the float level is out of specification.



Install a new O-ring in the float chamber.  
Install the float chamber.



Install and tighten the three float chamber screws.

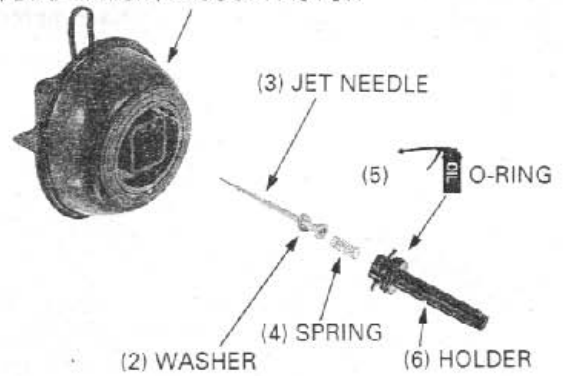


### DIAPHRAGM/VACUUM PISTON

Check the condition of the O-ring on the jet needle holder, replace if necessary. Apply oil to the O-ring.

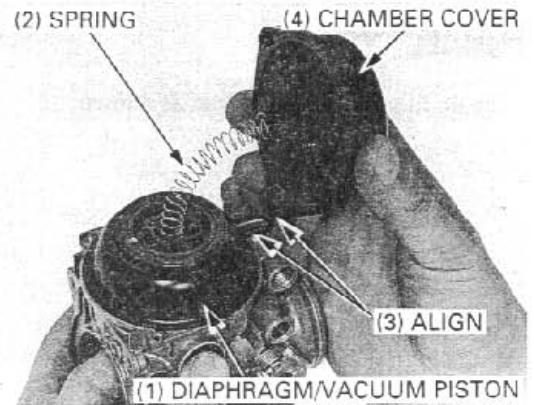
Install the washer, jet needle, spring into the vacuum piston. Press the jet needle holder into the vacuum piston until you feel a click indicating that the O-ring is seated into the groove in the vacuum piston.

(1) DIAPHRAGM/VACUUM PISTON



Install the diaphragm/vacuum piston in the carburetor body, aligning the diaphragm tab with the groove of the carburetor body. Hold the vacuum piston almost full open so the diaphragm is not pinched by the chamber cover.

Install the chamber cover with the spring, being careful not to damage the spring.

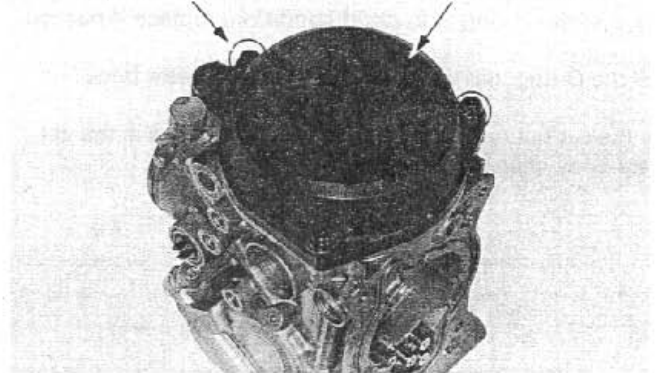


Install and tighten the vacuum chamber cover screws.

#### CAUTION

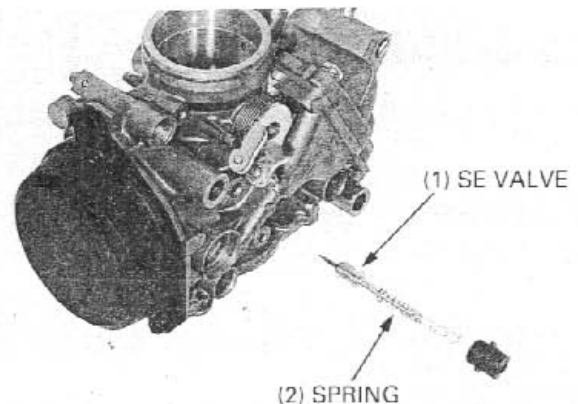
- Do not pinch the diaphragm under the chamber cover.

(2) SCREWS (1) CHAMBER COVER



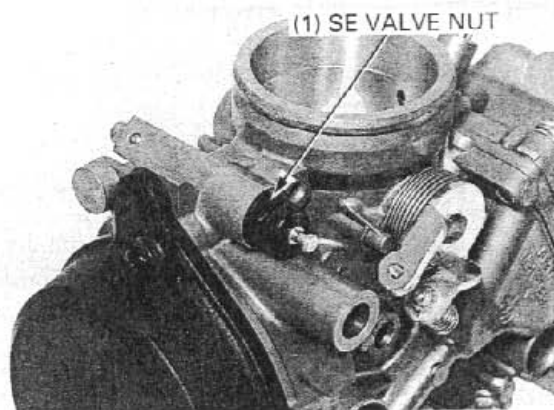
### STARTING ENRICHMENT VALVE

Install the starting enrichment (SE) valve and spring.



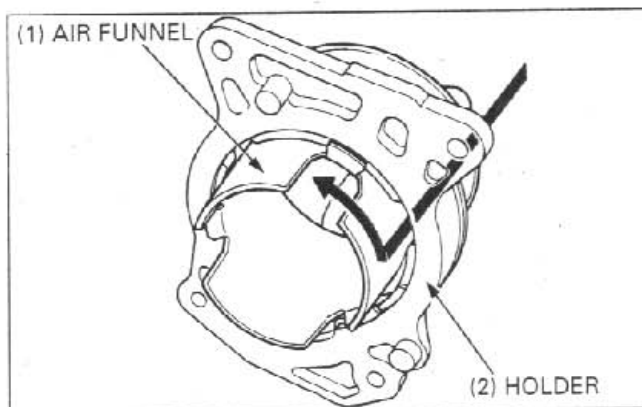
## FUEL SYSTEM

Install the starting enrichment (SE) valve nut and tighten it securely.



## AIR FUNNEL

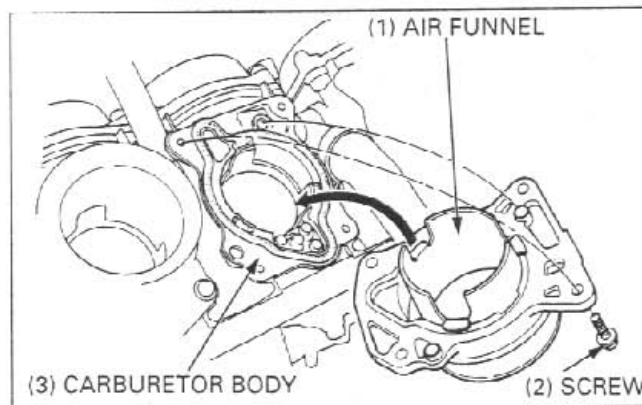
Install the air funnel into the holder as shown.



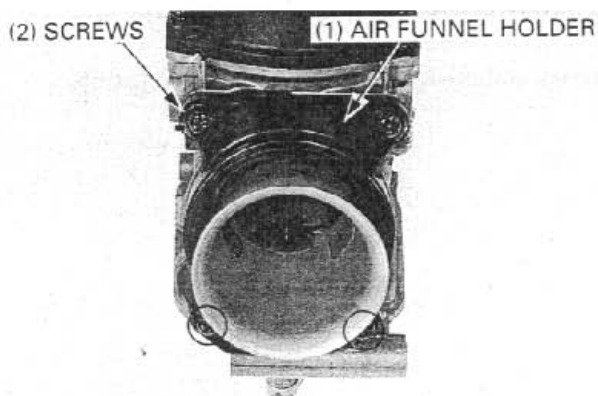
Check that the O-ring is in good condition, replace if necessary.

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

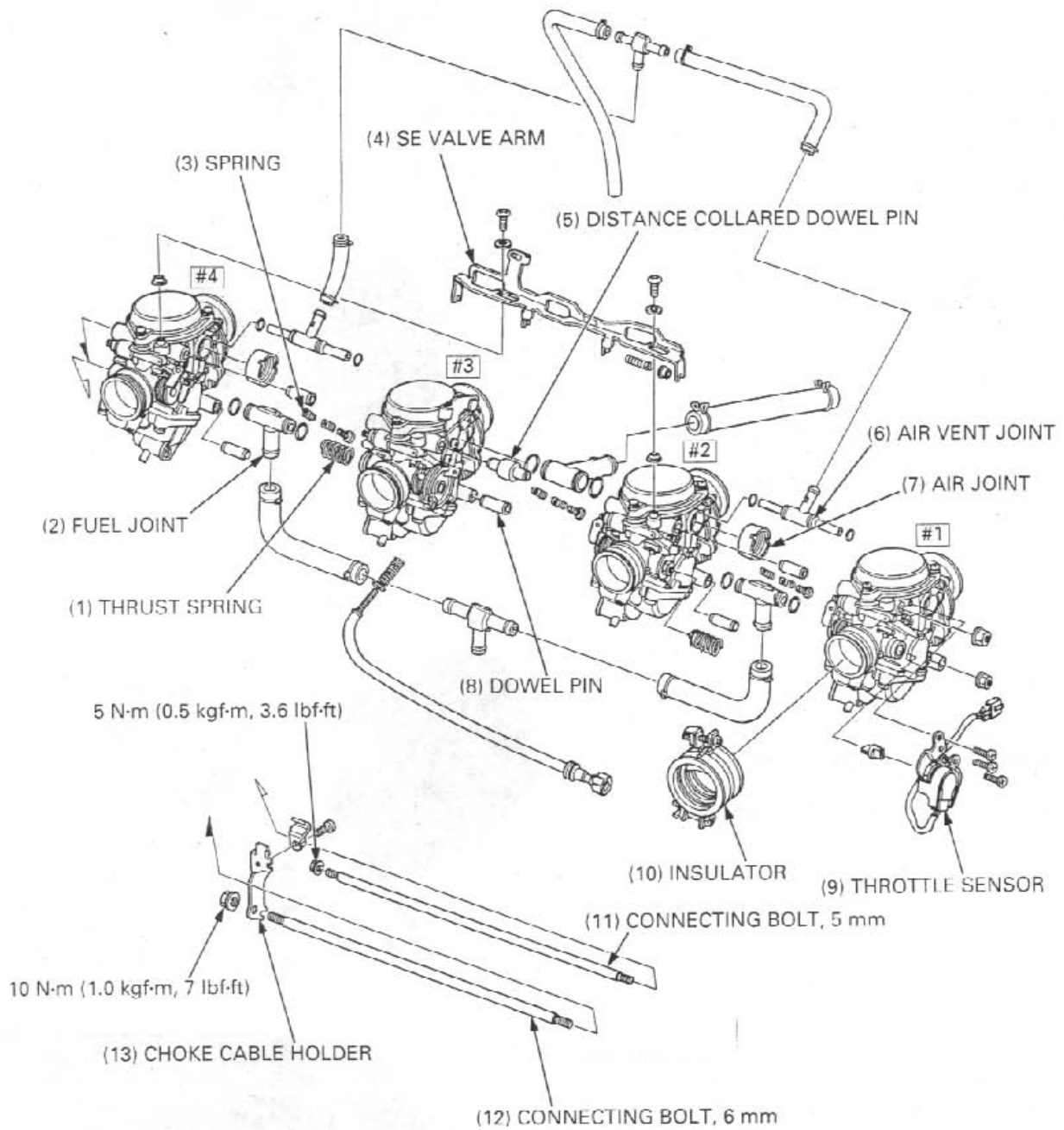
Align the cut-out on the air funnel with the groove in the carburetor body, then install the air funnel/holder.



Install and tighten the holder screws.



# CARBURETOR COMBINATION





## FUEL SYSTEM

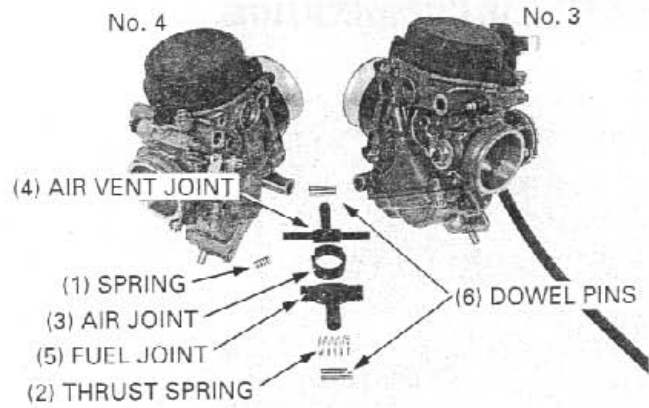
### NOTE

- Always replace the O-ring with new ones.

#### Install the following:

- Dowel pin (5 mm bolt side)
- Dowel pin (6 mm bolt side)
- 3-way fuel joint pipe/new O-rings
- Air vent joint pipe/new O-rings
- Air joint rubber pipe
- Thrust spring
- No. 4 carburetor synchronization spring

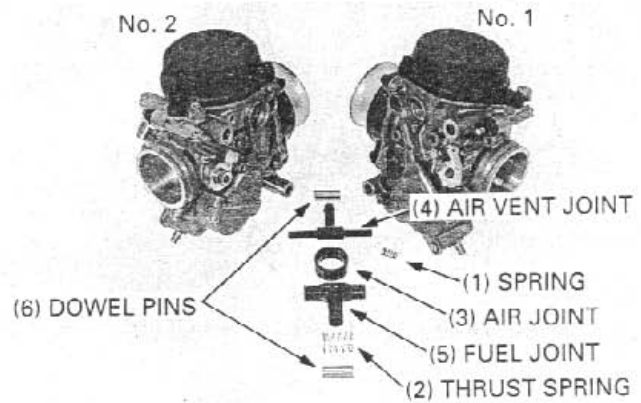
Assemble the No. 3 and the No. 4 carburetors.



#### Install the following:

- Dowel pin (5 mm bolt side)
- Dowel pin (6 mm bolt side)
- 3-way fuel joint pipe/new O-rings
- Air vent joint pipe/new O-rings
- Air joint rubber pipe
- Thrust spring
- No. 1 carburetor synchronization spring

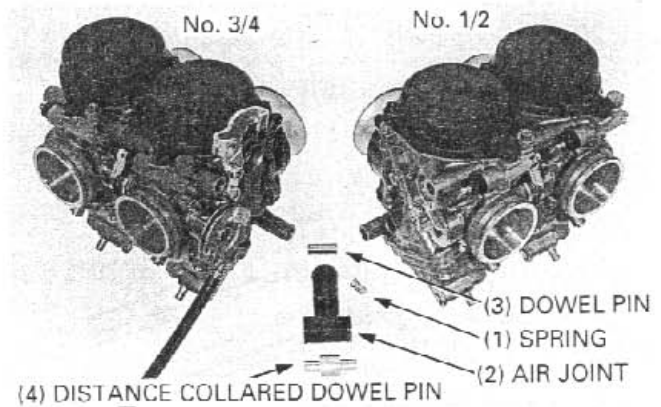
Assemble the No. 1 and the No. 2 carburetors.



#### Install the following:

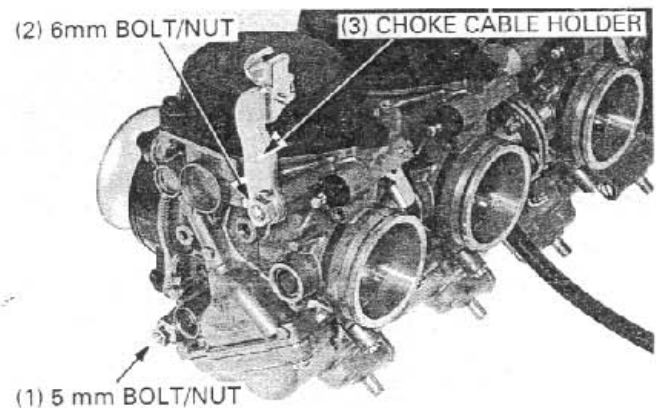
- Dowel pin (5 mm bolt side)
- Distance collared dowel pin (6 mm bolt side)
- 3-way air joint pipe/O-rings
- No. 2 carburetor synchronization spring

Assemble the No. 3/4 and the No. 1/2 carburetors.



Install the 5 mm and 6 mm carburetor connecting bolts through the carburetors.

Set the choke cable holder and install the nuts, but do not tighten them yet.



NOTE

- Before tightening the carburetor connecting nuts, check there is no clearance between each of the carburetor joints.

Tighten the each connecting nuts gradually and alternately, be sure the bolt thread projections are equal height.

Hold the nut and tighten the nut on other side to the specified torque.

**TORQUE: 5 mm nut: 5 N·m (0.5 kgf·m, 3.6 lbf·ft)**

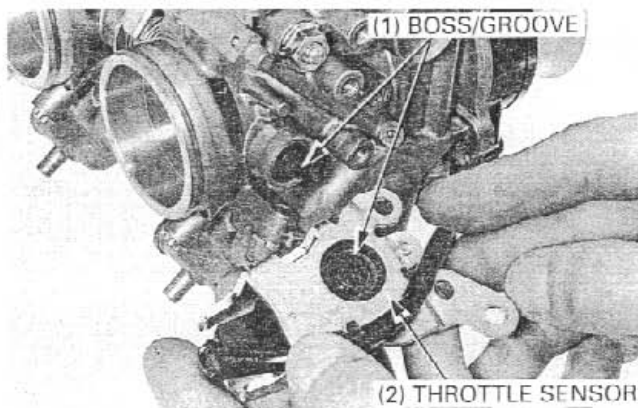
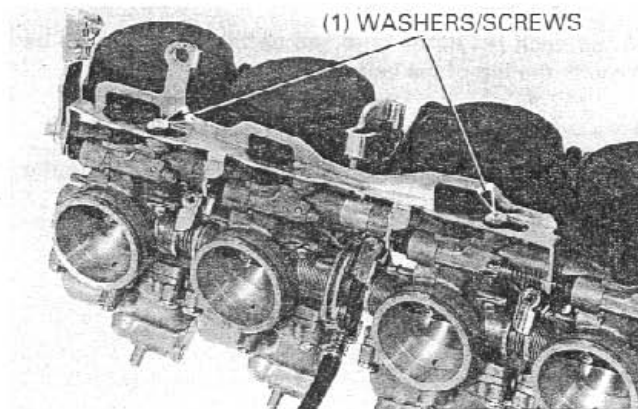
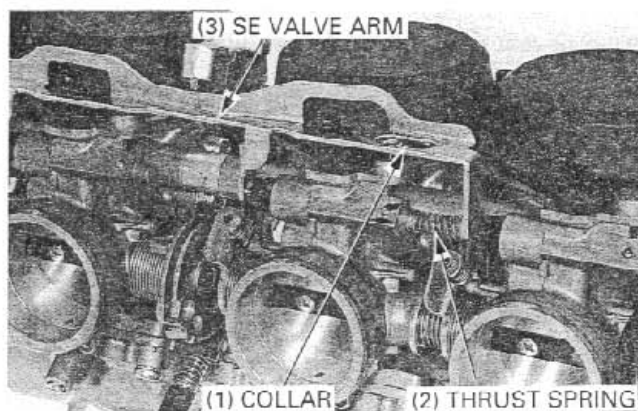
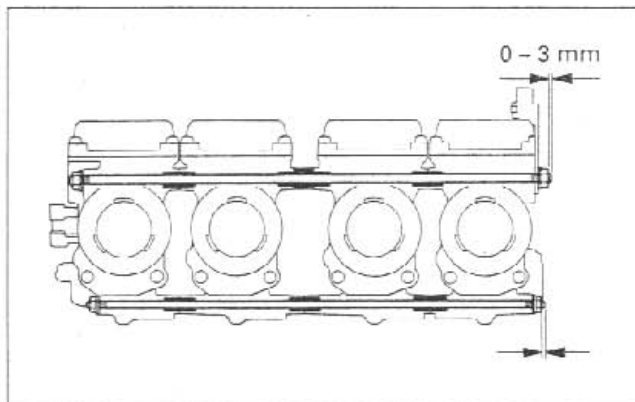
**6 mm nut: 10 N·m (1.0 kgf·m, 7 lbf·ft)**

Install the plastic collars onto the No. 2 and No. 4 carburetor bodies.

Set the thrust spring and install the starting enrichment valve arm aligning its ends with the starting enrichment valve heads.

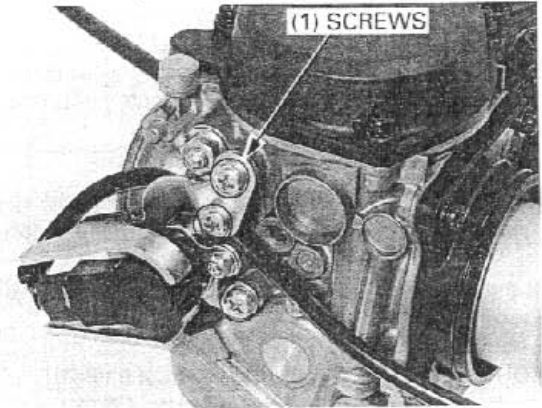
Install the plastic washers and tighten the starting enrichment valve arm screw securely.

Install the throttle sensor aligning its groove with the boss on the throttle shaft.

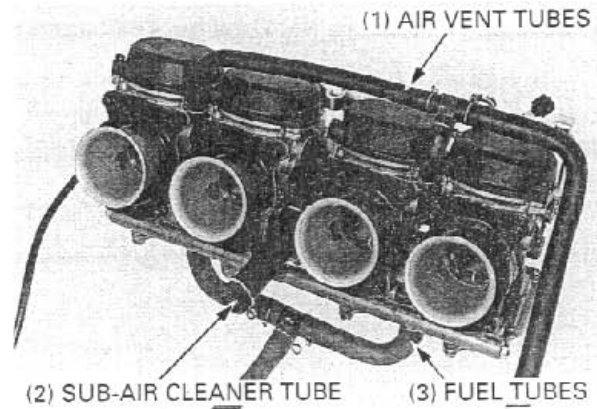


## FUEL SYSTEM

Install and tighten the throttle sensor mounting screws.



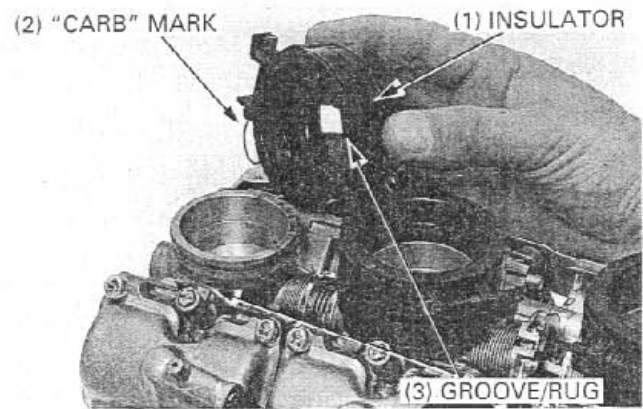
Install the air vent tube, sub-air cleaner tube and fuel tubes.



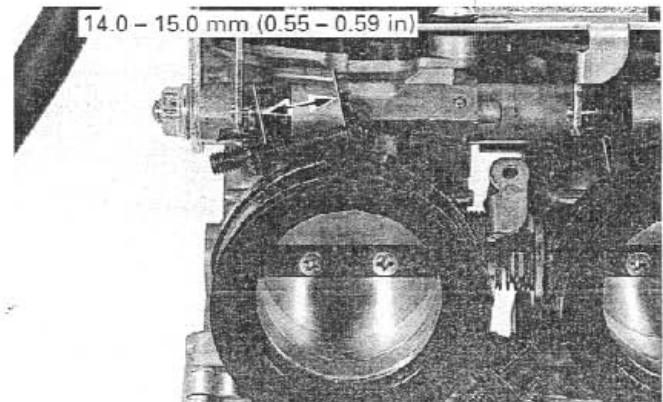
Install the each insulator onto the carburetor aligning its groove with the lug of the carburetor.

### NOTE

- Install the insulator with its "CARB" mark side facing the carburetor.



Tighten the carburetor side insulator screws so that the band ends clearance is 14.0 – 15.0 mm (0.55 – 0.59 in).

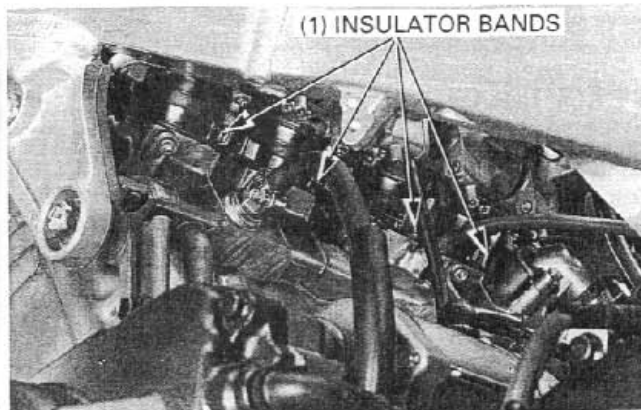


## CARBURETOR INSTALLATION

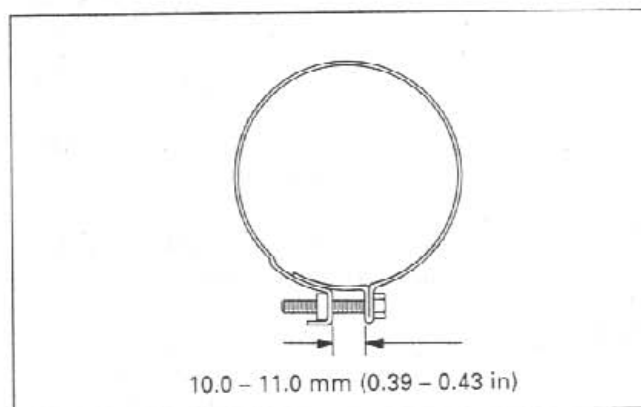
Coat the inside of the carburetor insulators with clean engine oil for ease of installation.

Install the carburetor assembly onto the cylinder head.

Adjust the insulator band angle as shown.



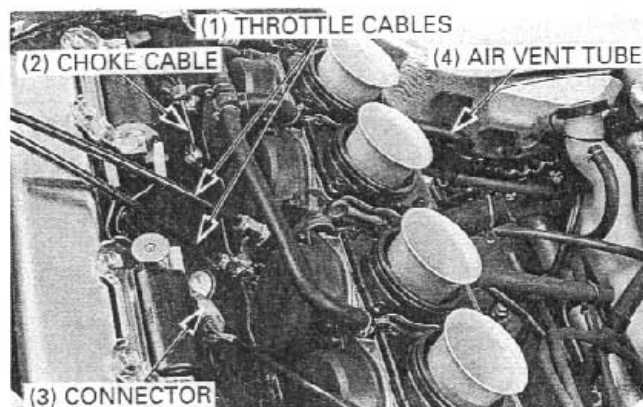
Tighten the engine side insulator screws so that the band ends clearance is 10.0 – 11.0 mm (0.39 – 0.43 in).



Connect the throttle cable ends to the throttle drum and install the throttle cables onto the cable holder. Connect the choke cable end to the starting enrichment valve arm and tighten the screw.

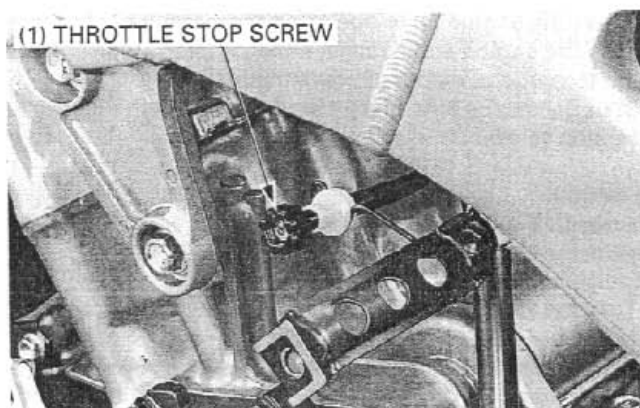
Connect the throttle sensor connector.

Install the air vent tube into the guide.



Install the throttle stop screw into the guide.

Install the removed parts in the reverse order of removal.



# PILOT SCREW ADJUSTMENT

## IDLE DROP PROCEDURE

**▲ WARNING**

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

**NOTE**

- Make sure the carburetor synchronization is within specification before pilot screw adjustment (page 3-13).
- The pilot screws are factory pre-set. Adjustment is not necessary unless the carburetors are overhauled or new pilot screws are installed.
- The engine must be warm for accurate adjustment. Ten minutes of stop-and-go riding is sufficient.
- Use a tachometer with graduations of 50 rpm or smaller that will accurately indicate 50 rpm change.

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

**CAUTION**

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

**TOOLS:**

Pilot screw wrench

Except California type

07908 - 4220201 or  
07908 - 4730001  
(Equivalent commercially available in U.S.A.)  
07KMA - MN90100 with  
07PMA - MZ20110 or  
07MMA - MV9010A  
(U.S.A. only)

California type

**INITIAL OPENING:**

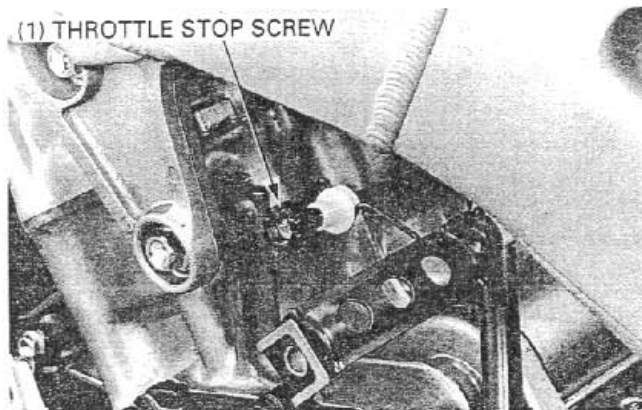
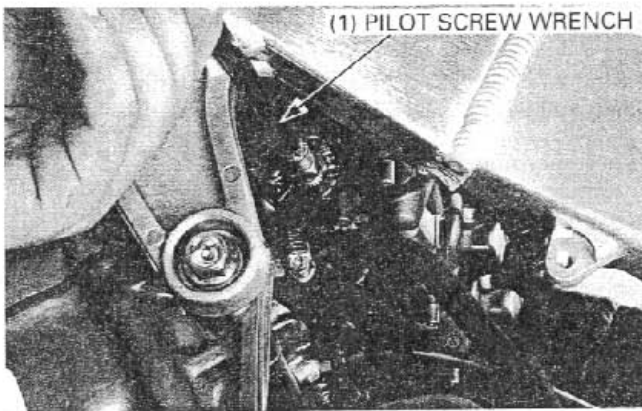
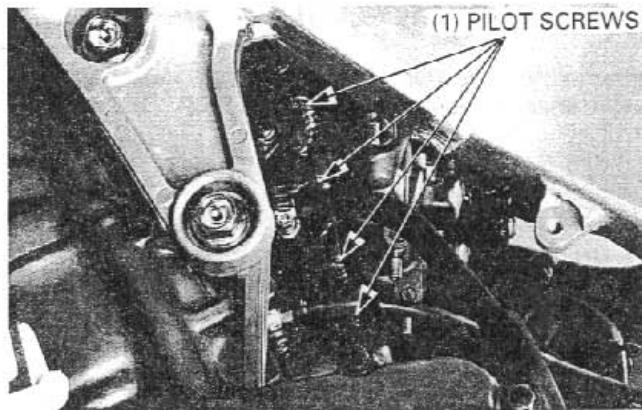
|            |                        |                   |
|------------|------------------------|-------------------|
| '96 - '97: |                        | 3 turns out       |
| After '97: | Except California type | 1 - 5/8 turns out |
|            | California type        | 2 turns out       |

2. Warm the engine up to operating temperature.
3. Stop the engine and connect a tachometer according to the tachometer manufacturer's instructions.
4. Start the engine and adjust the idle speed with the throttle stop screw.

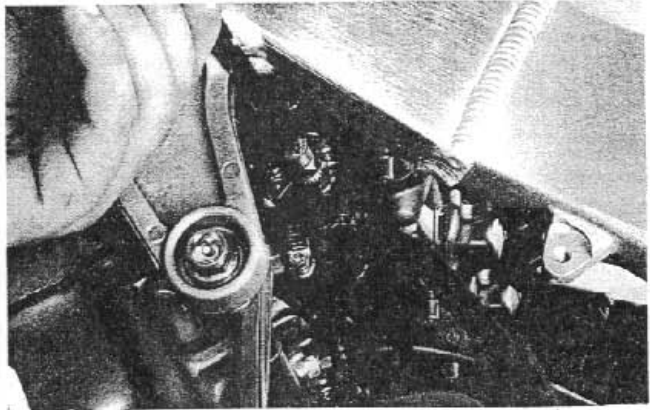
**IDLE SPEED:**

Except California type: 1,100 ± 100 rpm  
California type: 1,200 ± 100 rpm

5. Turn the No. 3 pilot screw in or out slowly to obtain the highest engine speed.
6. Perform step 5 for all the carburetor pilot screws.
7. Lightly open the throttle 2 - 3 times, adjust the idle speed with the throttle stop screw.



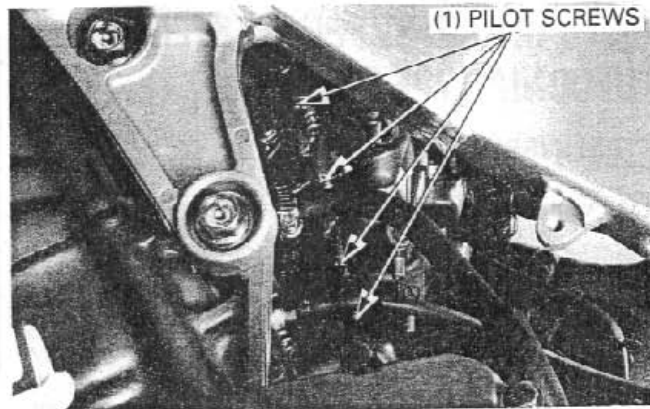
8. Turn No. 3 carburetor pilot screw in gradually until the engine speed drops 50 rpm.
9. Adjust the idle speed with the throttle stop screw.
10. Turn the No. 3 carburetor pilot screw in until the engine speed drops 50 rpm.
11. Then turn the No. 3 pilot screw counterclockwise to the final opening from the position in step 10.



**FINAL OPENING:**

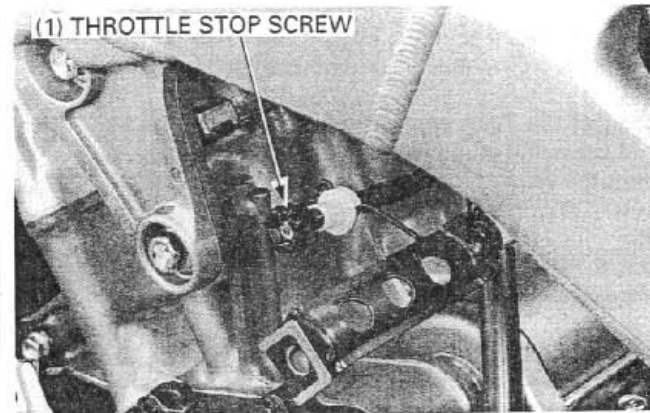
|            |                           |                   |
|------------|---------------------------|-------------------|
| '96 - '97: | 49 states type            | 3/4 turn out      |
|            | California type           | 1 - 1/4 turns out |
|            | Canada type               | 1 turn out        |
| After '97: | 49 states/California type | 3/4 turn out      |
|            | Canada type               |                   |

12. Perform steps 10 and 11 for the No. 1, 2 and 4 carburetor pilot screws.



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

When the vehicle is to be operated continuously above 2,000 m (6,500 feet), the carburetors must be readjusted as follows to improve driveability and decrease exhaust emissions. Warm up the engine to operating temperature. Stop and go riding for 10 minutes is sufficient. Turn each pilot screw clockwise 1/2 turn.



**HIGH ALTITUDE SETTING: 1/2 turn in**

Adjust the idle speed with the throttle stop screw.

**IDLE SPEED:**

- Except California type: 1,100 ± 100 rpm
- California type: 1,200 ± 100 rpm

**NOTE**

- This adjustment must be made at high altitude to ensure proper high altitude operation.

Attach a Vehicle Emission Control Information Update Label on the side wall of the storage compartment as shown in the label position illustration.

**NOTE**

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

**▲ WARNING**

- Sustained operation at an altitude lower than 1,500 m (5,000 feet) with the carburetor adjusted for high altitude may cause the engine to idle roughly and the engine stall in traffic. It may also cause engine damage due to overheating.

VEHICLE EMISSION CONTROL INFORMATION UPDATE  
- HONDA MOTOR CO., LTD



THIS VEHICLE HAS BEEN ADJUSTED TO  
IMPROVE EMISSION CONTROL PERFORMANCE  
WHEN OPERATED AT HIGH ALTITUDE.

ALTITUDE PERFORMANCE ADJUSTMENT INSTRUCTIONS  
ARE AVAILABLE AT YOUR AUTHORIZED HONDA DEALER.

## FUEL SYSTEM

When the vehicle is to be operated continuously below 1,500 m (5,000 feet), turn each pilot screw counterclockwise 1/2 turn to its original position and adjust the idle speed.

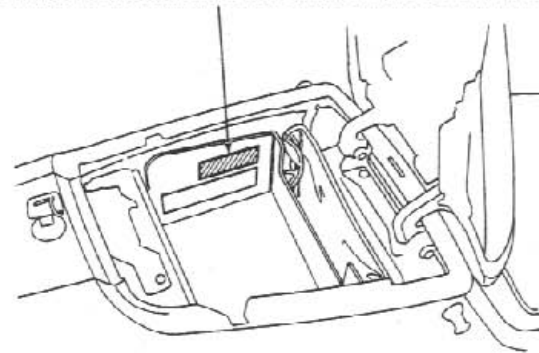
### IDLE SPEED:

Except California type: 1,100 ± 100 rpm

California type: 1,200 ± 100 rpm

Be sure to make these adjustments at low altitude. Remove the Vehicle Emission Control Information Update Label that is attached to the side wall of the storage compartment after adjusting for low altitude.

(1) EMISSION CONTROL INFORMATION UPDATE LABEL



## SECONDARY AIR SUPPLY SYSTEM (CALIFORNIA TYPE ONLY)

### SYSTEM INSPECTION

Start the engine and warm it up to normal operating temperature.

Remove the air cleaner element (page 3-5).

Check that the secondary air intake ports are clean and free carbon deposits.

If the ports are carbon fouled, check the pulse secondary air injection (PAIR) control valve.

Disconnect the air cleaner housing-to-PAIR control valve tube (No. 15) from the air cleaner housing.

Disconnect the PAIR control valve vacuum tube from the control valve and plug it to keep air from entering. Connect the vacuum pump to the PAIR control valve.

### TOOL: VACUUM PUMP

Commercially available  
in U.S.A.

Start the engine and open the throttle slightly to be certain that air is sucked in through the No. 15 vacuum tube. If the air is not drawn in, check the No. 15 tube for clogging.

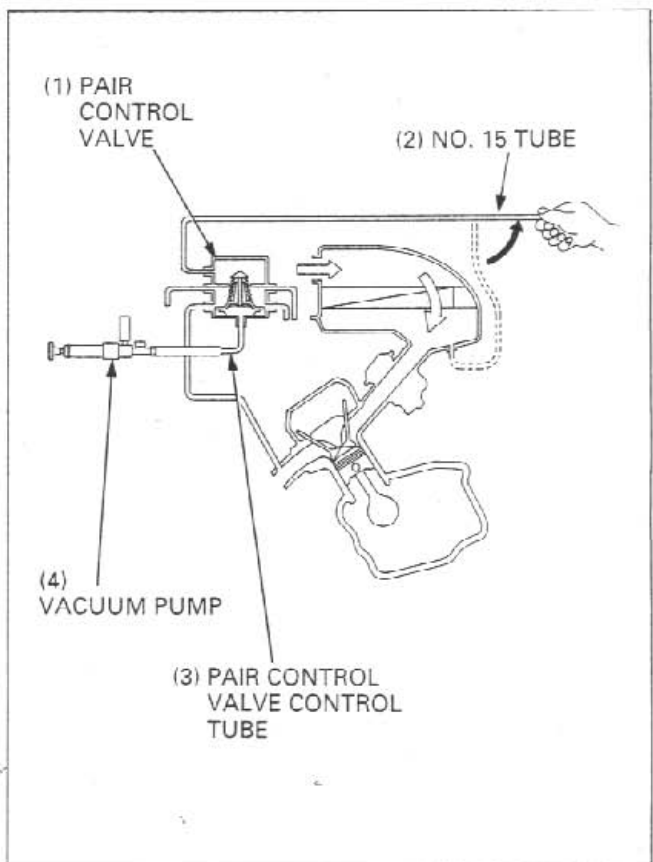
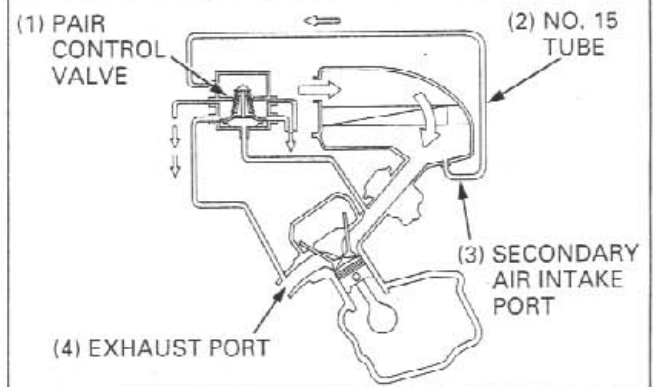
With the engine running, gradually apply vacuum to the PAIR control valve.

Check that the air intake port stops drawing air, and that the vacuum does not bleed.

### SPECIFIED VACUUM: 40 mmHg

If the air drawn in, or if the specified vacuum is not maintained, install a new PAIR control valve.

If afterburn occurs on deceleration, even when the secondary air supply system is normal, check the air cut-off valve.



# FUEL VALVE

## FUEL AUTO VALVE INSPECTION

Remove the fuel tank (page 2-2).

Connect the fuel tube to the fuel valve and place the suitable gasoline container under the fuel tube.

Turn the fuel valve on.

If the fuel comes out of the fuel tube, replace the diaphragm.

Connect a commercially available vacuum pump to the diaphragm vacuum outlet.

Fuel should flow out from the fuel tube when vacuum is applied.

If fuel flow is restricted, replace the diaphragm.

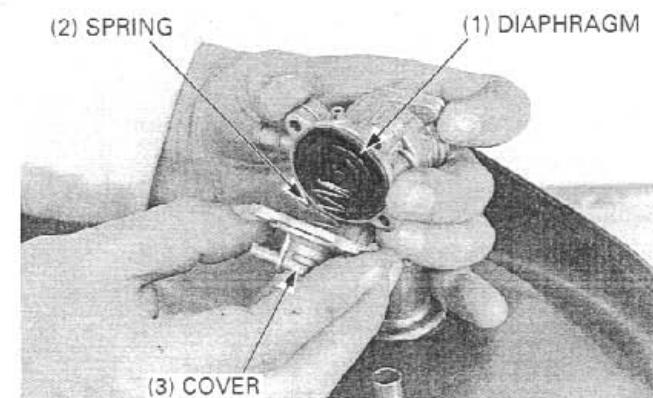
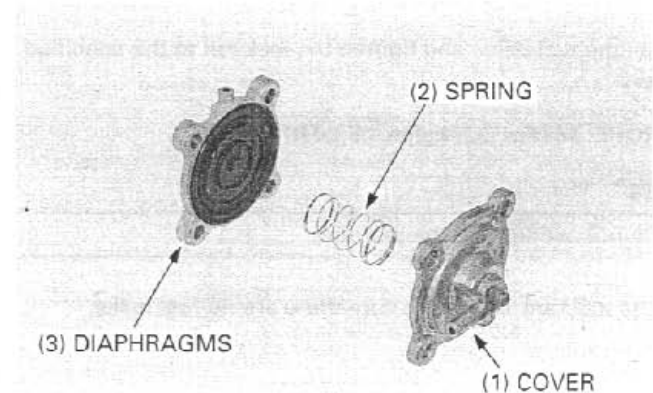
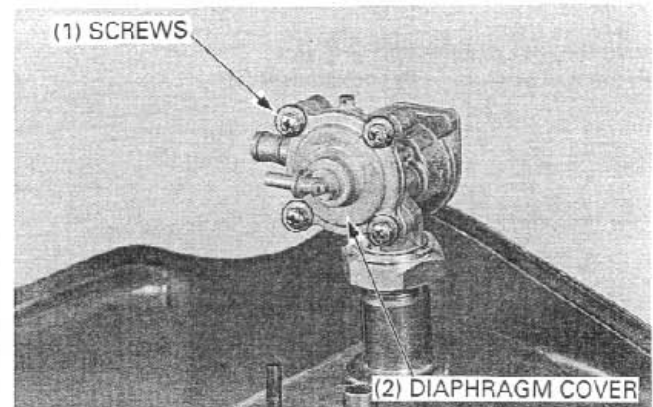
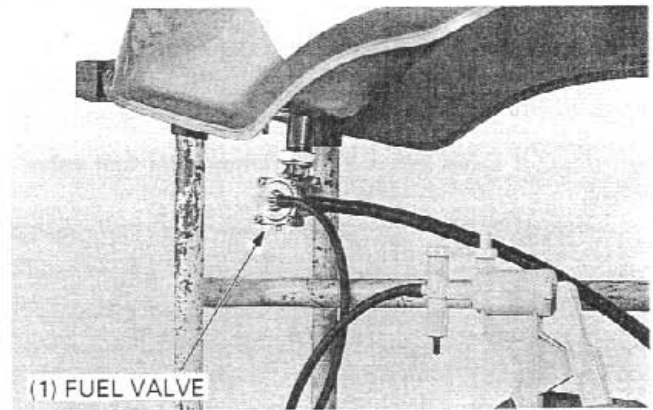
## DIAPHRAGM REPLACEMENT

Drain the fuel from the fuel tank.

Remove the four screws and diaphragm assembly.

Replace the diaphragm cover, spring, diaphragms, spacer and retainers as a set.

Install the diaphragm assembly so that the air vent pipe of the spacer and the vacuum pipe of the cover facing to the same direction as the fuel pipe of the fuel valve body.



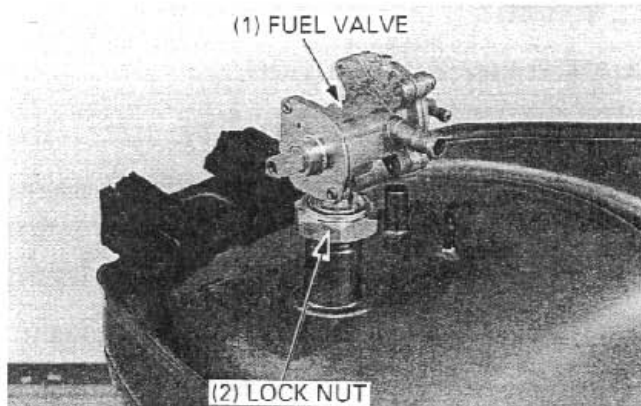


## FUEL SYSTEM

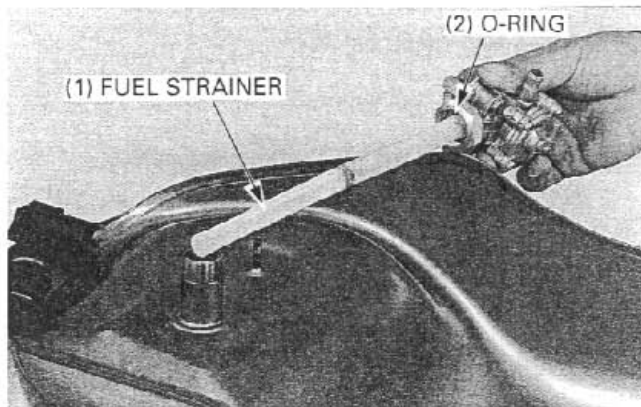
### FUEL STRAINER CLEANING

Drain the fuel from the fuel tank.

Loosen the fuel valve lock nut and remove the fuel valve assembly.



Remove the fuel strainer and O-ring.  
Clean the fuel strainer with compressed air.



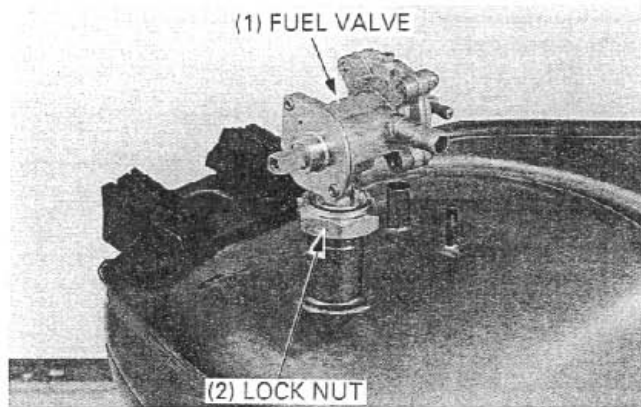
Install the fuel valve and tighten the lock nut to the specified torque.

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

#### NOTE

- Do not overtighten the lock nut.

Fill the fuel tank and make sure there are no fuel leaks.

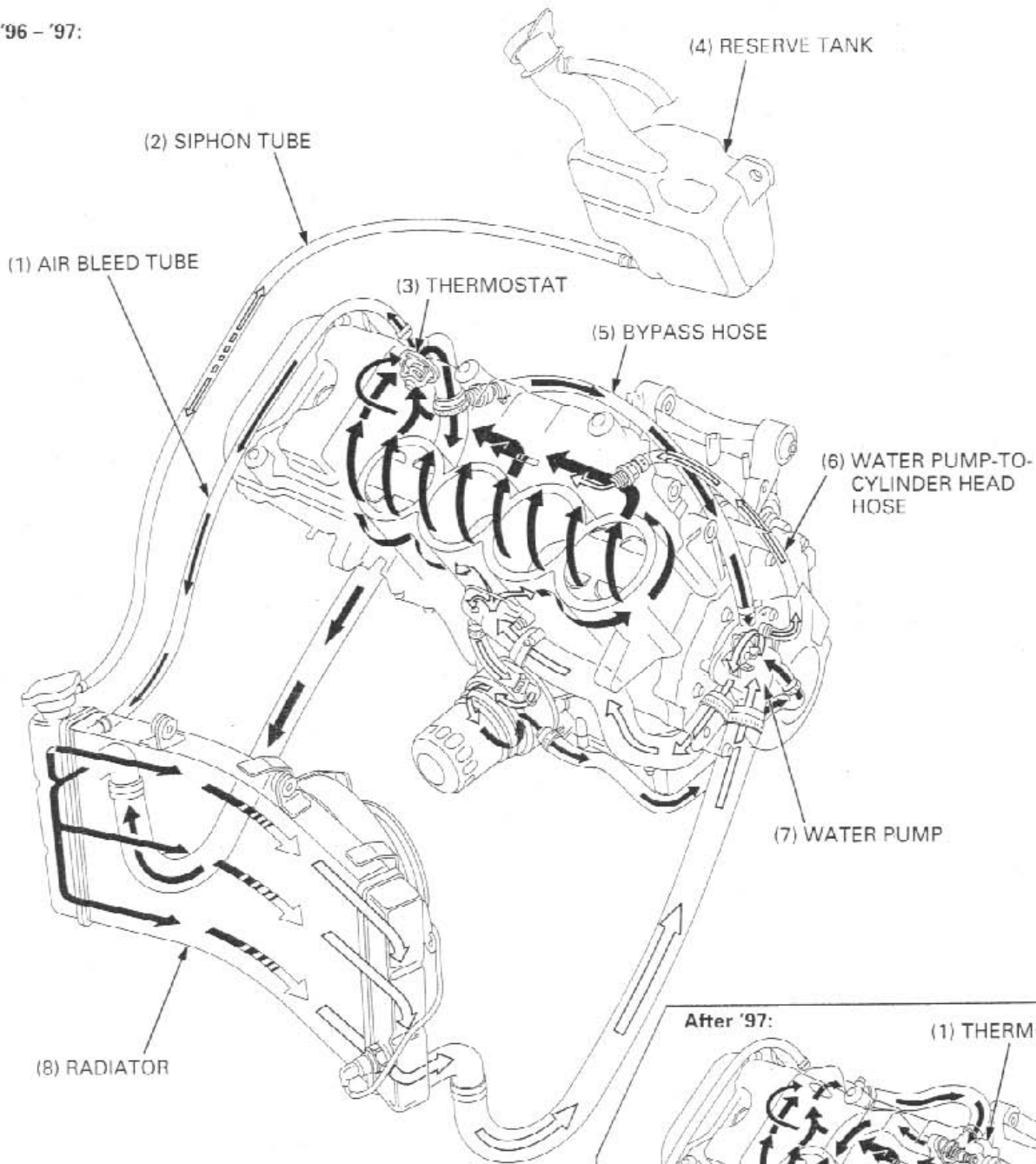


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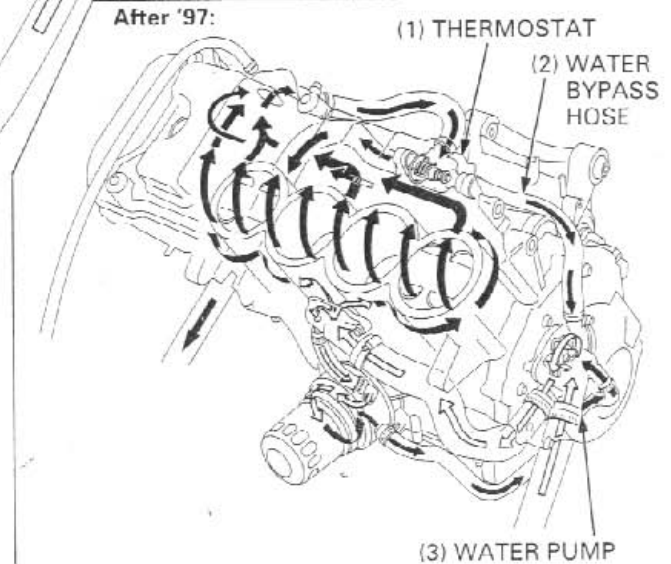
MEMO

SYSTEM FLOW PATTERN

'96 - '97:



After '97:



|                     |     |                       |      |
|---------------------|-----|-----------------------|------|
| SYSTEM FLOW PATTERN | 6-0 | THERMOSTAT            | 6-5  |
| SERVICE INFORMATION | 6-1 | RADIATOR              | 6-8  |
| TROUBLESHOOTING     | 6-2 | WATER PUMP            | 6-11 |
| SYSTEM TESTING      | 6-3 | RADIATOR RESERVE TANK | 6-14 |
| COOLANT REPLACEMENT | 6-4 |                       |      |

## SERVICE INFORMATION

### GENERAL

#### ⚠ WARNING

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

- Use only distilled water and ethylene glycol the cooling system. A 50 – 50 mixture is recommended for maximum corrosion protection. Do not use alcohol-based antifreeze.
- Add cooling system at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- Refer to section 19 for fan motor switch and coolant temperature sensor inspection.

### SPECIFICATIONS

| ITEM                         |                     | SPECIFICATIONS  |  |
|------------------------------|---------------------|---|--|
| Coolant capacity             | Radiator and engine | '96 – '97:  | 2.77 liter (2.93 US qt, 2.44 Imp qt)   |
|                              |                     | After '97:  | 2.64 liter (2.79 US qt, 2.32 Imp qt)   |
|                              | Reserve tank        | '96 – '97:  | 0.45 liter (0.476 US qt, 0.396 Imp qt) |
|                              |                     | After '97:  | 0.35 liter (0.370 US qt, 0.310 Imp qt) |
| Radiator cap relief pressure | '96 – '97:          | 108 – 137 kPa (1.1 – 1.4 kgf/cm <sup>2</sup> , 16 – 20 psi) |  |
|                              | After '97:          | 107.9 kPa (1.1 kgf/cm <sup>2</sup> , 16 psi)                |  |
| Thermostat                   | Begin to open       | 80 – 84°C (176 – 183°F)                                     |  |
|                              | Fully open          | 95°C (203°F)  |  |
|                              | Valve lift          | 8 mm (0.3 in) minimum                                       |  |

### TORQUE VALUES

|                            |                                  |                                      |
|----------------------------|----------------------------------|--------------------------------------|
| Water pump cover bolt      | 13 N·m (1.3 kgf·m, 9 lbf·ft)     |                                      |
| Coolant temperature sensor | 10 N·m (1.0 kgf·m, 7 lbf·ft)     |                                      |
| Fan motor nut              | 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft) | Apply a locking agent to the threads |
| Fan motor switch           | 18 N·m (1.8 kgf·m, 13 lbf·ft)    | Apply sealant to the threads         |

## TROUBLESHOOTING

### Engine temperature too high

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

### Engine temperature too low

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

### Coolant leak

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

## SYSTEM TESTING

### ⚠ WARNING

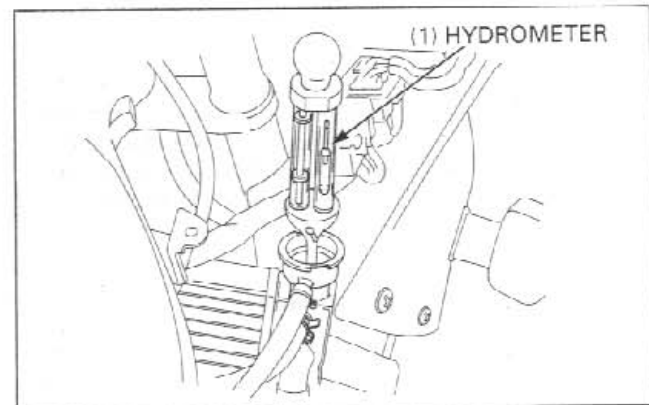
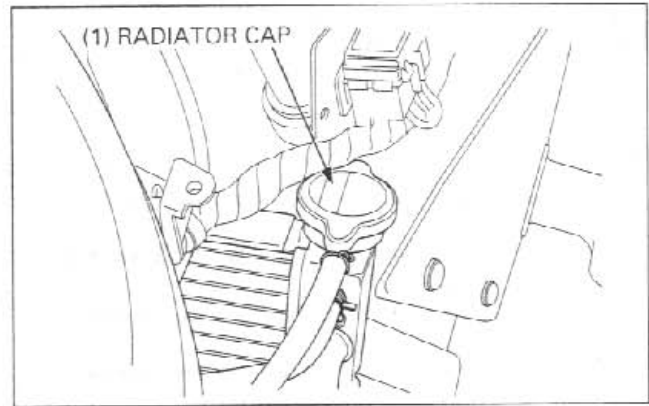
- *The engine must be cool before removing the radiator cap, or severe scalding may result.*

### COOLANT (HYDROMETER TEST)

Remove the radiator cap.

Test the coolant gravity using a hydrometer (refer to section 5 of the Common Service Manual for "Coolant gravity chart"). For maximum corrosion protection, a 50 – 50% solution of ethylene glycol and distilled water is recommended (page 6-4).

Look for contamination and replace the coolant if necessary.



### RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Remove the radiator cap (see above).

#### NOTE

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

Pressure test the radiator cap.

Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low.

It must hold specified pressure for at least 6 seconds.

#### RADIATOR CAP RELIEF PRESSURE:

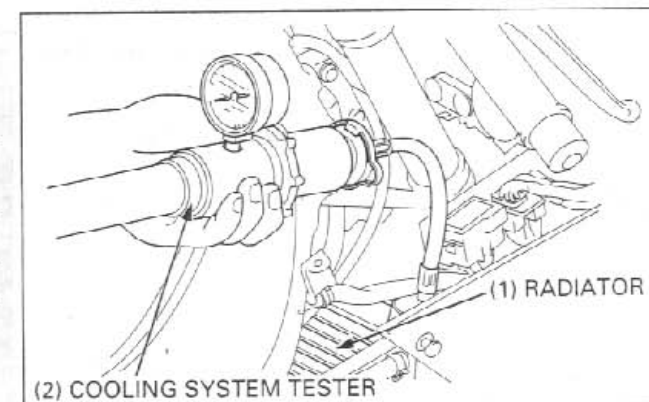
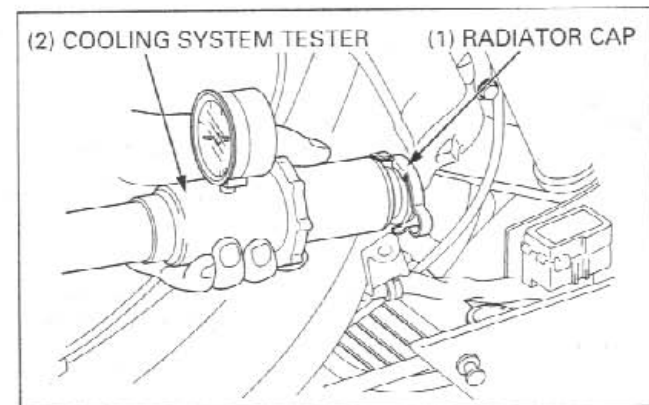
108 – 137 kPa (1.1 – 1.4 kgf/cm<sup>2</sup>, 16 – 20 psi)

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

#### CAUTION

- *Excessive pressure can damage the cooling system components. Do not exceed 137 kPa (1.4 kgf/cm<sup>2</sup>, 20 psi).*

Repair or replace components if the system will not hold specified pressure for at least 6 seconds.



## COOLANT REPLACEMENT

### PREPARATION

#### ⚠ WARNING

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

#### NOTE

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

#### RECOMMENDED MIXTURE:

50 – 50 (Distilled water and antifreeze)

### REPLACEMENT/AIR BLEEDING

#### ⚠ WARNING

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

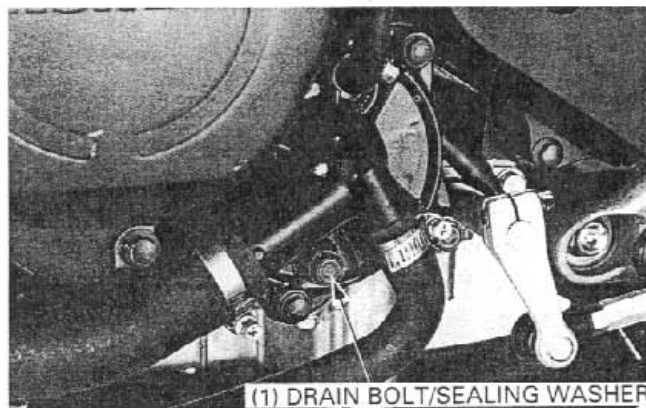
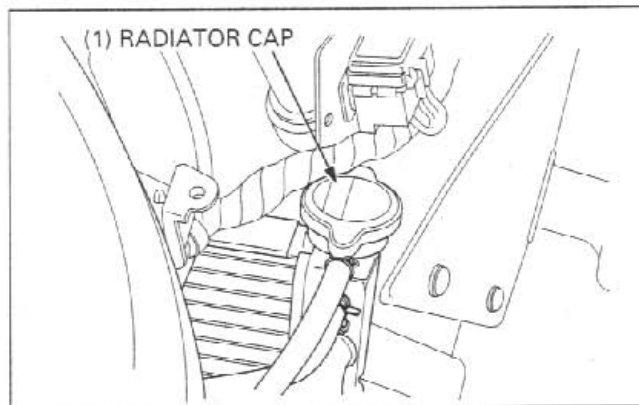
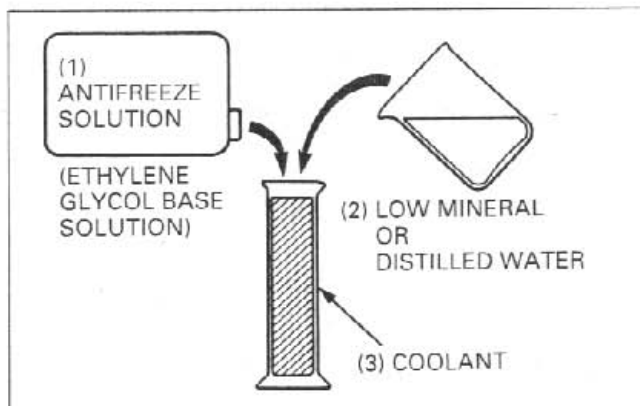
#### NOTE

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

Remove the radiator cap.

Remove the drain bolt on the water pump cover and drain the system coolant.

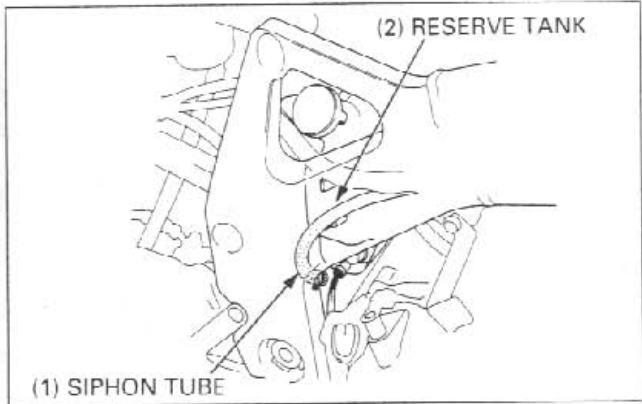
Reinstall the drain bolt with the new sealing washer.



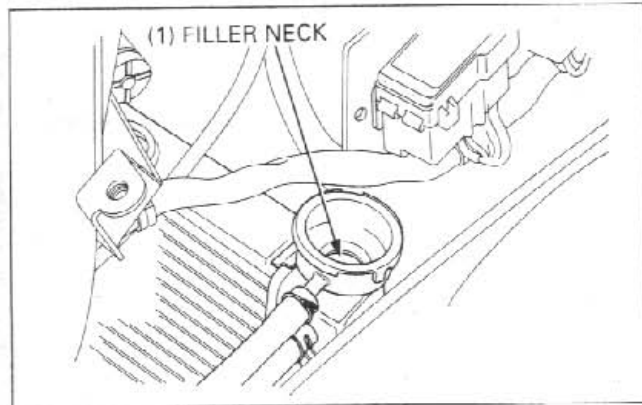
Remove the radiator reserve tank mounting bolt (page 6-12).

Disconnect the siphon tube and drain the reserve tank coolant. Empty the coolant and rinse the inside of the reserve tank with water.

Reinstall the radiator reserve tank and tighten the bolt (page 6-13).



Fill the system with the recommended coolant through the filler opening up to filler neck.



Remove the radiator reserve tank cap and fill the reserve tank to the upper level line.

Bleed air from the system as follow:

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



## THERMOSTAT

### REMOVAL

**▲ WARNING**

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

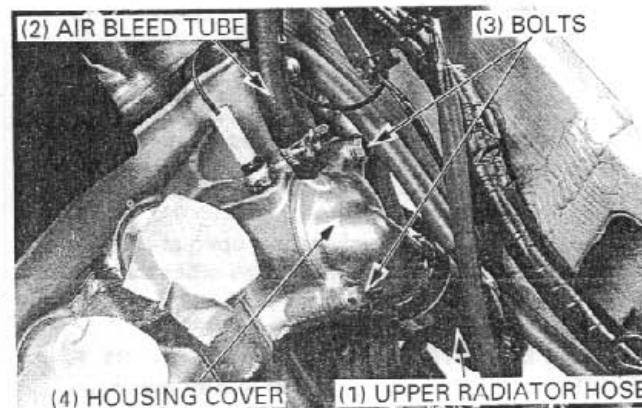
'96 – '97:

Drain the coolant (page 6-4).

Remove the carburetor (page 5-5).

Disconnect the upper radiator hose and air bleed tube from the thermostat housing.

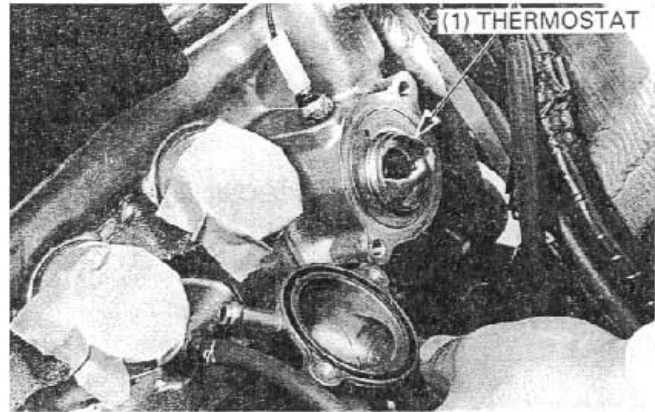
Remove the bolts and thermostat housing cover.





## COOLING SYSTEM

Remove the O-ring and thermostat.

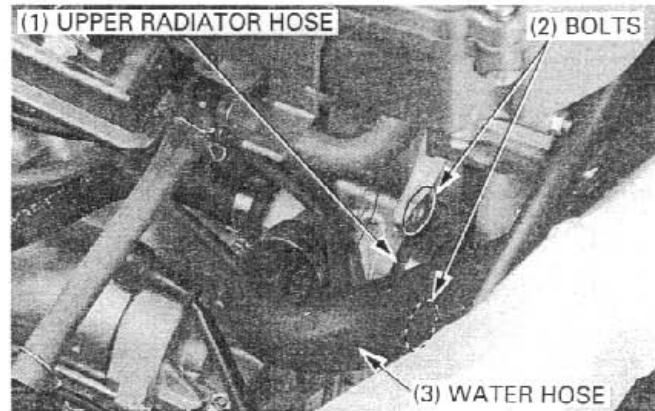


### After '97:

Drain the coolant (page 6-4).

Remove the fuel tank (page 2-2).

Disconnect the upper radiator hose from the thermostat case cover.



Remove the bolts and thermostat case cover.

Remove the O-ring and thermostat.

## INSPECTION

### ▲ WARNING

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

Visually inspect the thermostat for damage.

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

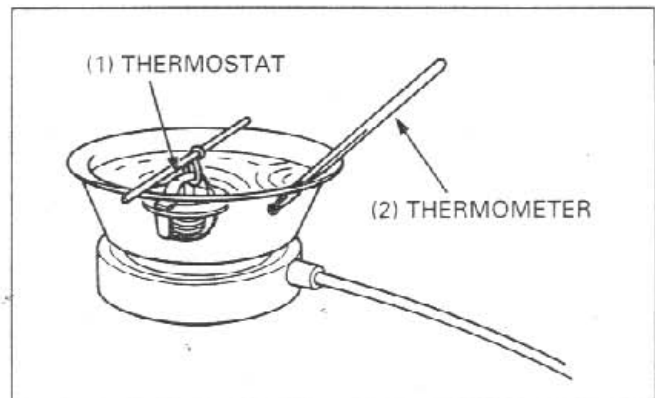
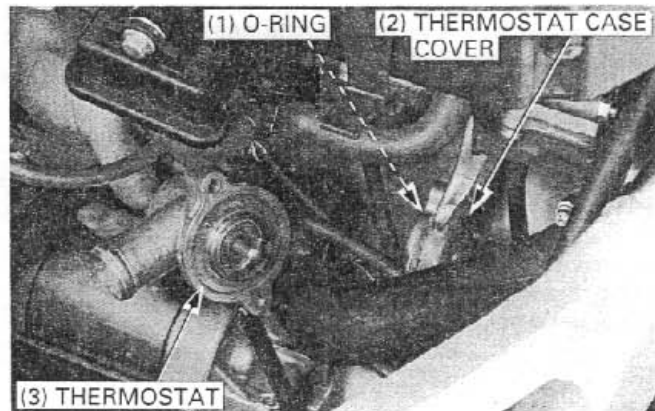
Suspend the thermostat in heated water to check its operation.

### NOTE

- Do not let the thermostat or thermometer touch the pan, or you will get false reading.

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

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

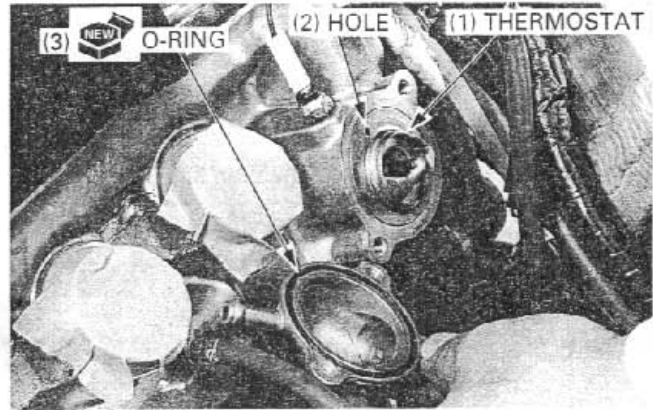


## INSTALLATION

'96 - '97:

Install the thermostat into the cylinder head with its hole facing upward.

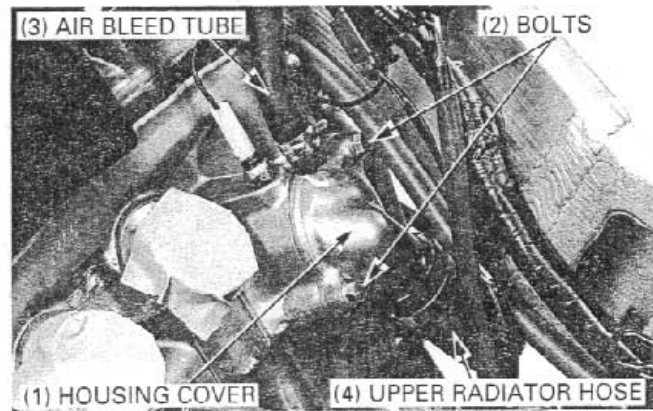
Install a new O-ring into the groove of the thermostat housing cover.



Install and tighten the housing cover bolts. Connect the radiator upper hose and air bleed tube to the housing cover.

Fill the system with recommended coolant and bleed the air (page 6-5).

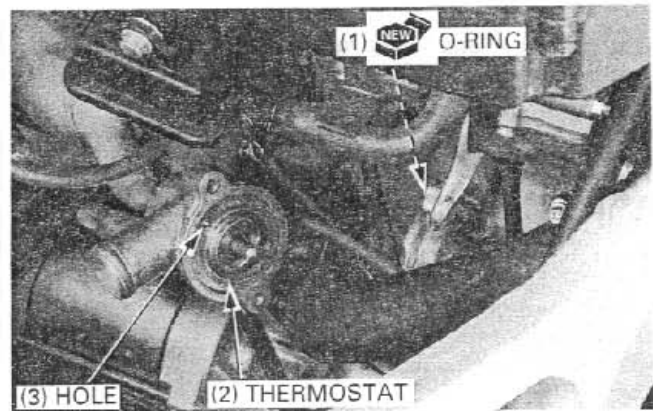
Install the carburetor (page 5-19).



After '97:

Install the thermostat into the thermostat case with its hole facing upward.

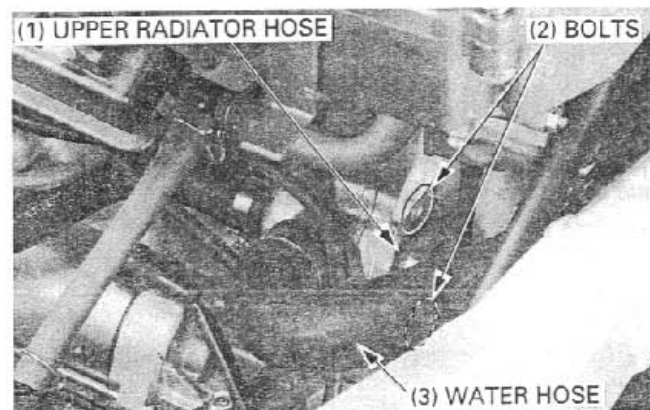
Install a new O-ring into the groove of the thermostat case cover.



Install and tighten the thermostat case cover bolts. Connect the upper radiator hose to the thermostat case cover.

Fill the system with recommended coolant and bleed the air (page 6-4).

Install the fuel tank.



# RADIATOR

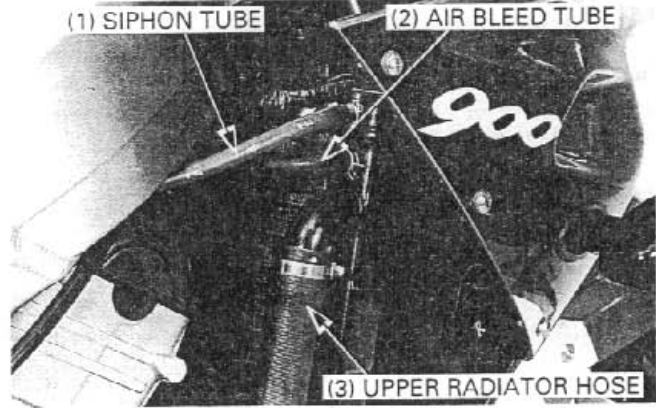
## REMOVAL

Drain the coolant (page 6-4).

Remove the middle and lower cowls (Section 2).

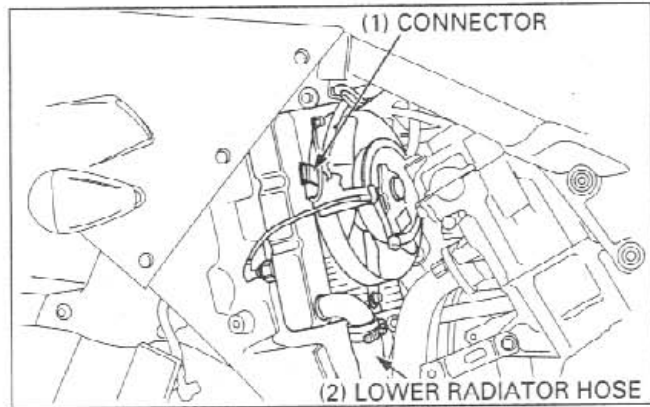
Disconnect the siphon tube and air bleed tube from the radiator.

Disconnect the upper radiator hose.



Disconnect the fan motor switch connector.

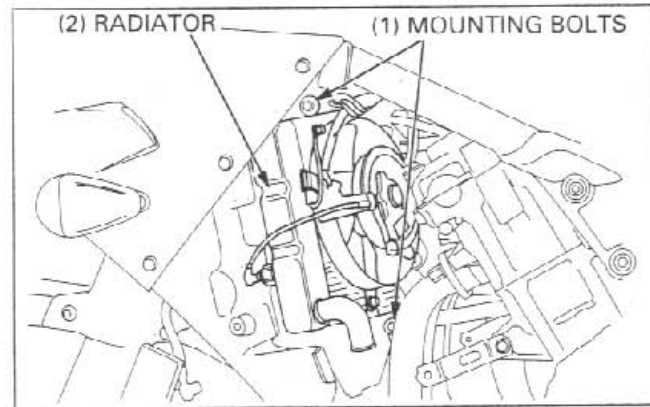
Disconnect the lower radiator hose.



Remove the upper and lower radiator mounting bolts, collars and radiator assembly.

## CAUTION

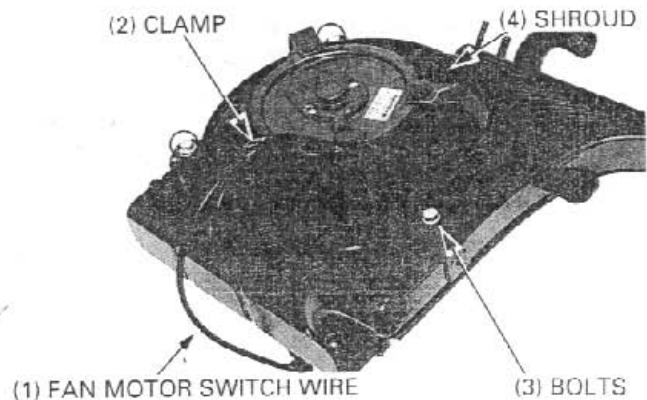
- Be careful not to damage the radiator core.



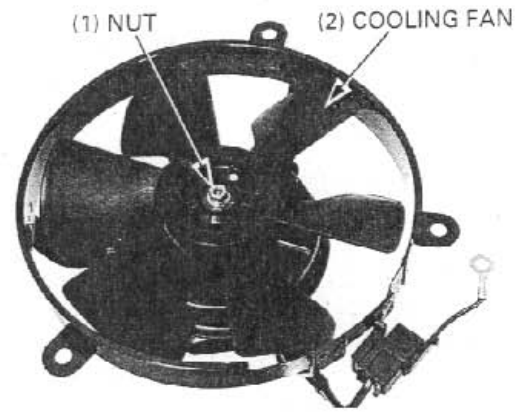
## DISASSEMBLY

Disconnect the fan motor switch connector and release the wire from the clamps.

Remove the three SH bolts, ground eyelet and fan motor/shroud assembly.

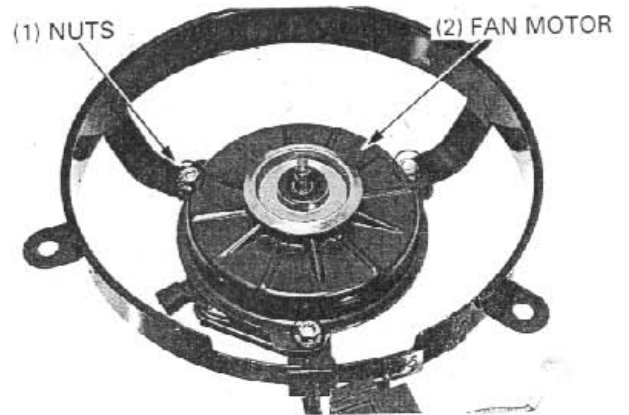


Remove the nut and cooling fan.

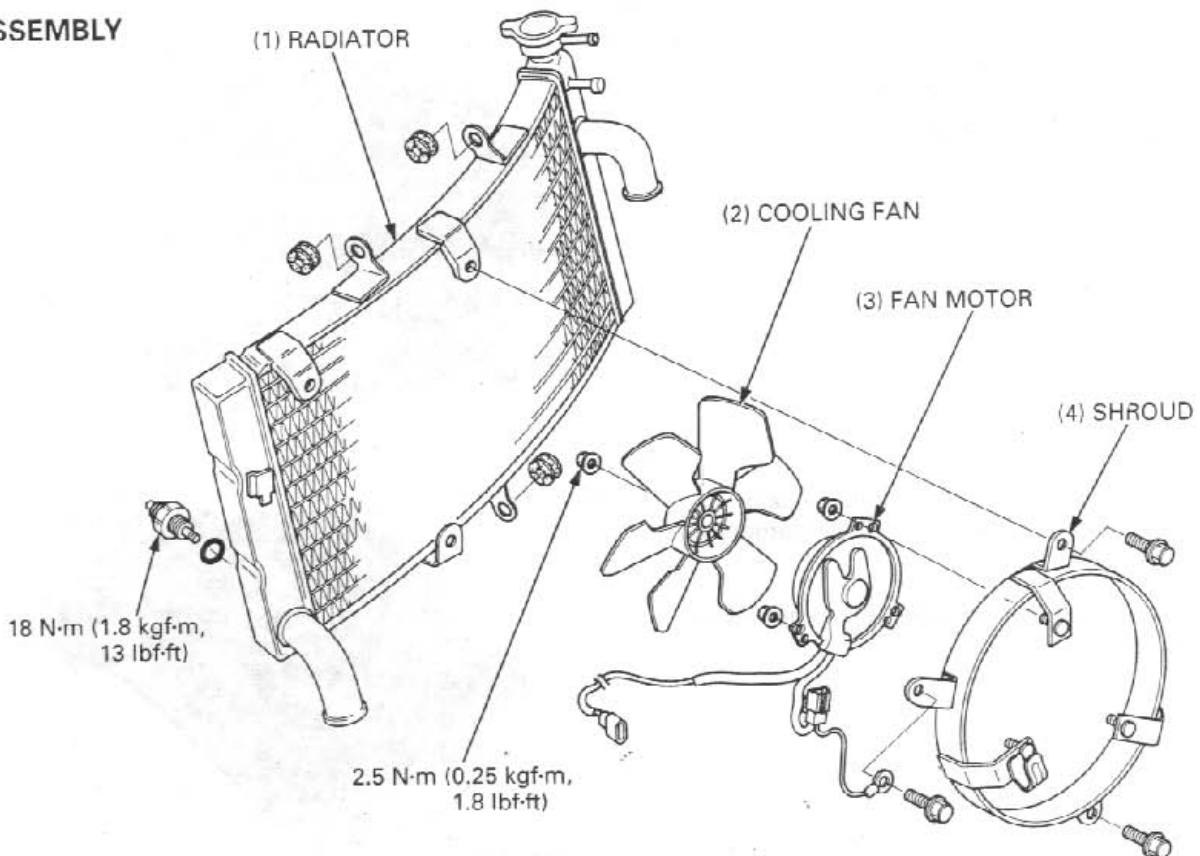


Remove the nuts and fan motor.

For fan motor switch information, refer to page 19-20.

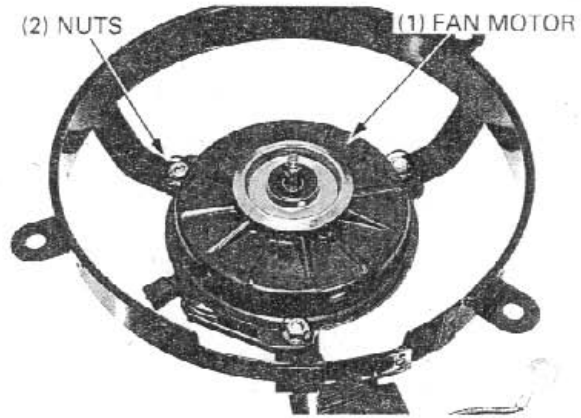


ASSEMBLY

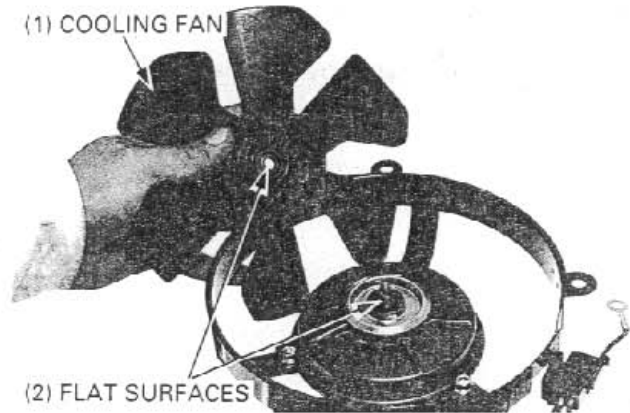


## COOLING SYSTEM

Install the fan motor onto the shroud and tighten the nuts.

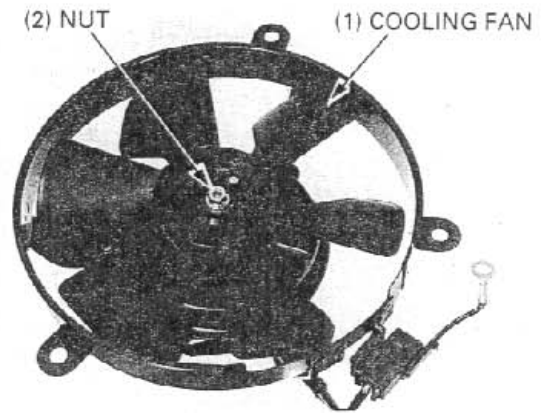


Install the cooling fan onto the fan motor shaft by aligning the flat surfaces.



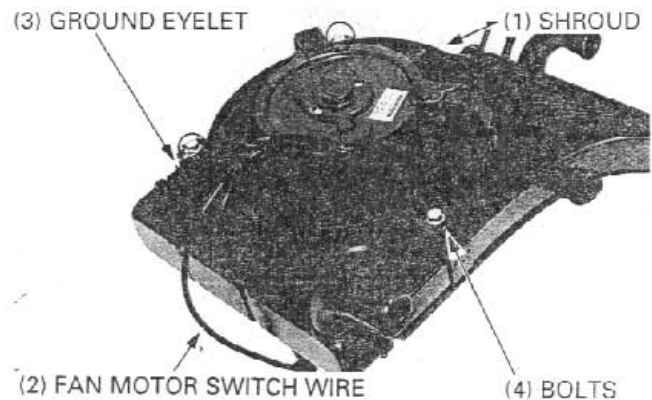
Apply a locking agent to the cooling fan nut threads. Install and tighten the nut to the specified torque.

**TORQUE: 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)**



Install the fan motor/shroud assembly onto the radiator. Route the fan motor switch cord and ground eyelet properly. Install and tighten the SH bolts.

Connect the fan motor switch wire to the fan motor switch and clamp it as shown.



## INSTALLATION

### CAUTION

- *Be careful not to damage the radiator core.*

Install the radiator, aligning its grommet with the boss on the frame.

Install the upper and lower mounting collars and bolts. Tighten the bolts securely.

Connect the fan motor connector.

Connect the lower radiator hose.

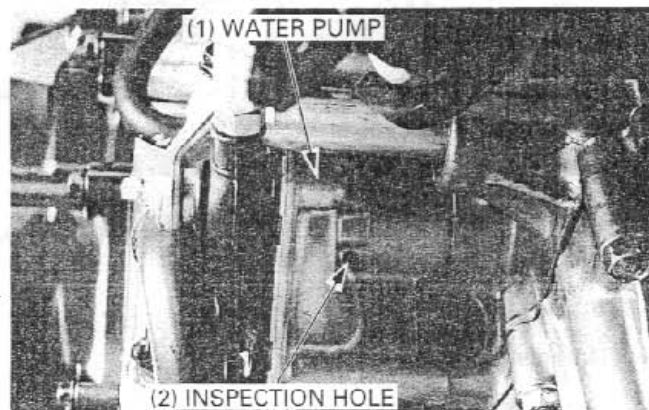
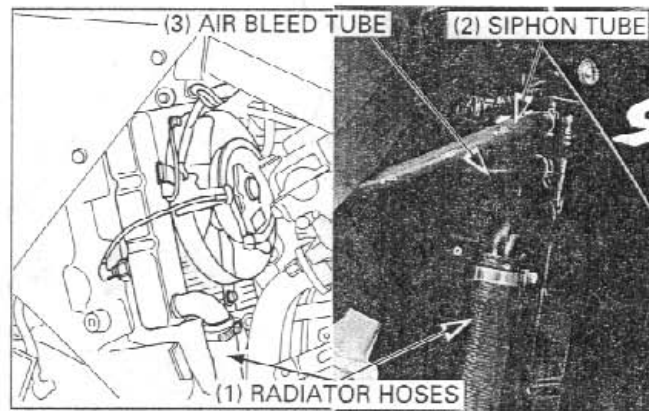
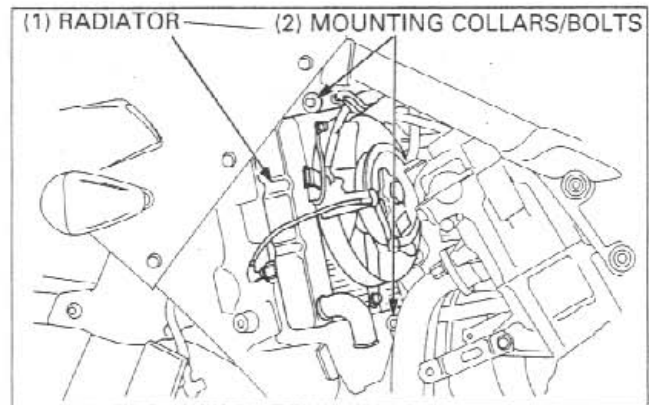
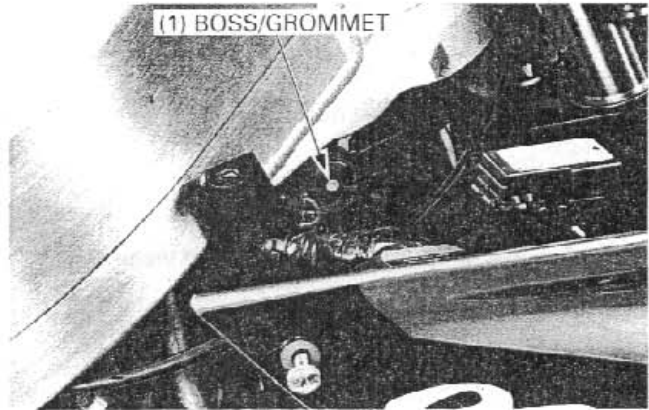
Connect the upper radiator hose.  
Connect the siphon tube and air bleed tube to the radiator.

Fill the system with recommended coolant (page 6-5).  
Install the middle and lower cowls (Section 2).

## WATER PUMP

### MECHANICAL SEAL INSPECTION

Inspect the telltale hole for signs of coolant leakage.  
If there is leakage, the mechanical seal is defective and replace the water pump as an assembly.



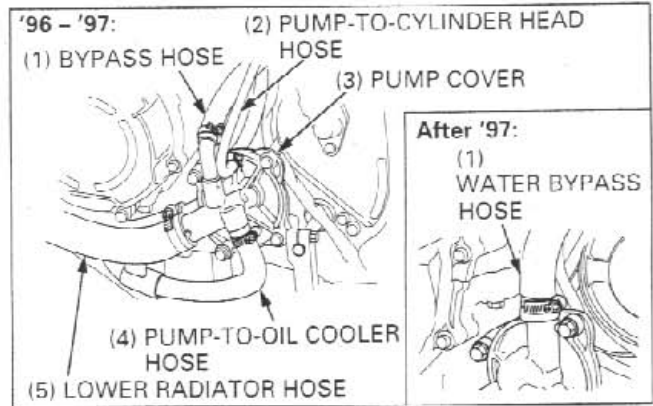
# COOLING SYSTEM

## REMOVAL

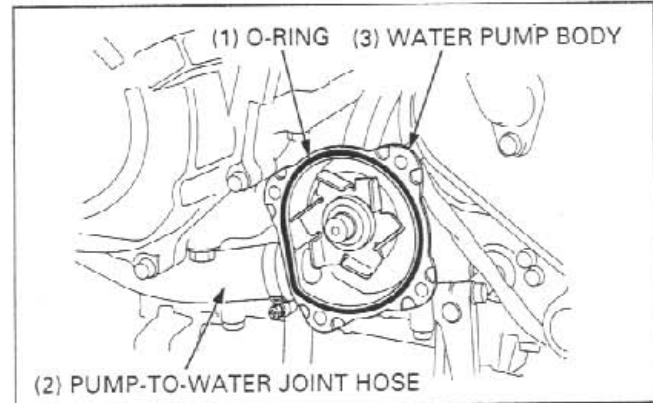
Disconnect the following:

- Water pump-to-cylinder head hose ('96 - '97:)
- Bypass hose
- Water pump-to-oil cooler hose
- Lower radiator hose

Remove the two SH bolts, two flange bolts and water pump cover.



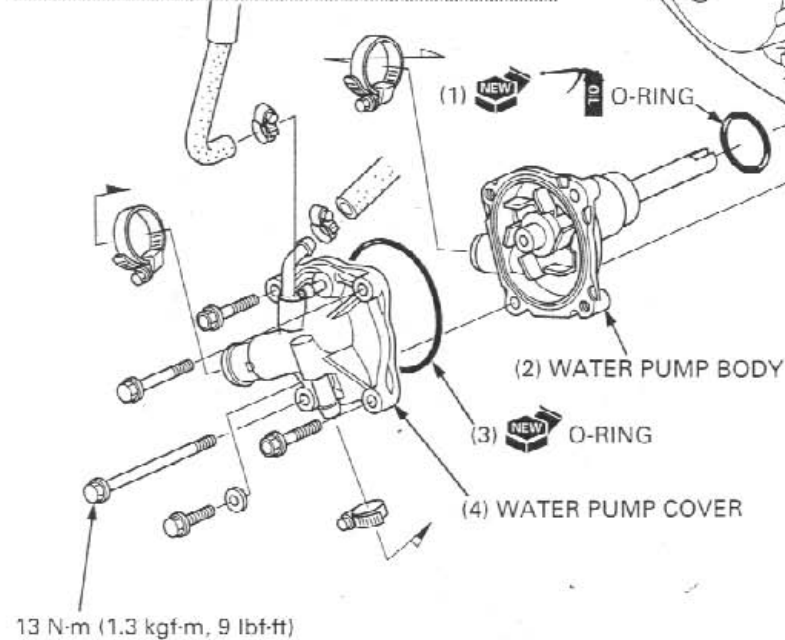
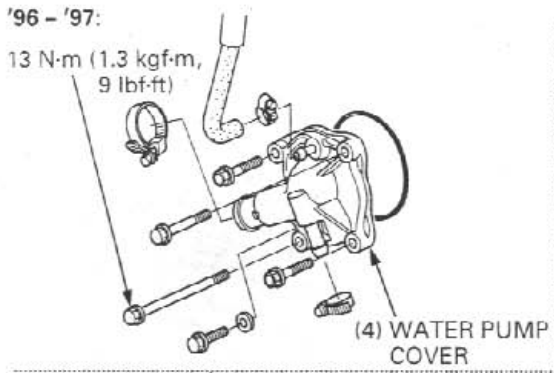
Remove the O-ring from the water pump body. Disconnect the water pump-to-water joint hose and remove the water pump body from the crankcase.



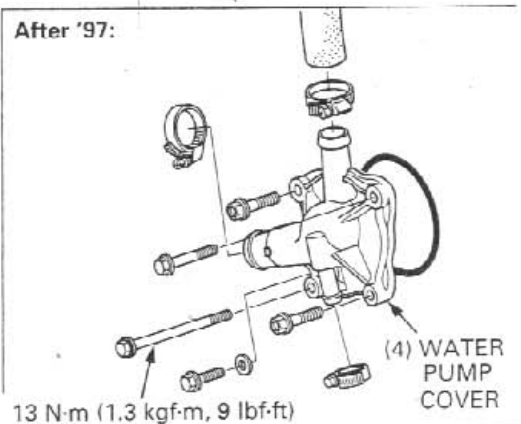
## INSTALLATION

'96 - '97:

13 N·m (1.3 kgf·m, 9 lbf·ft)

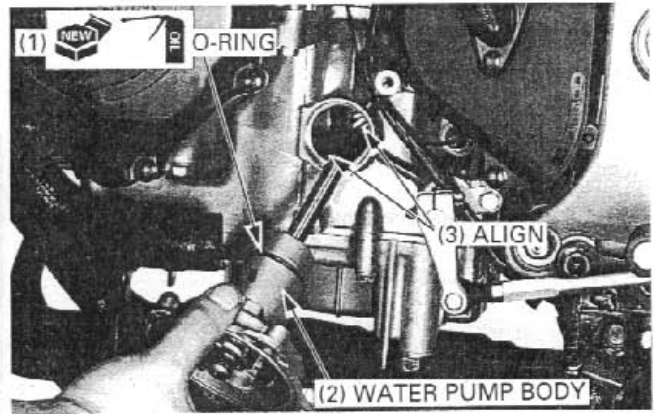


After '97:



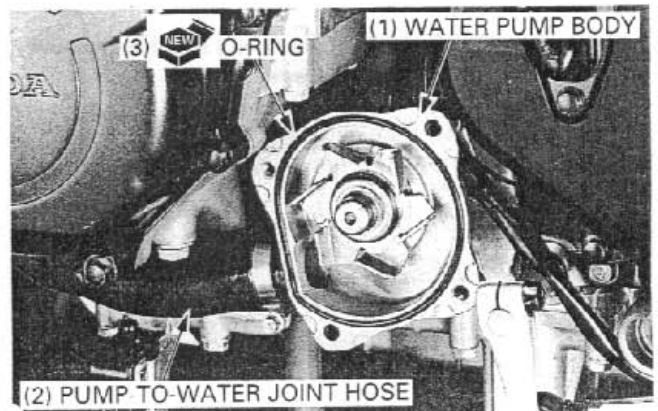
Apply engine oil to a new O-ring and install it onto the stepped portion of the water pump.

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



Connect the water pump-to-water joint hose and tighten the clamp screw. Align the mounting bolt holes in the water pump and crankcase and make sure the water pump is securely installed.

Install a new O-ring into the groove in the water pump.

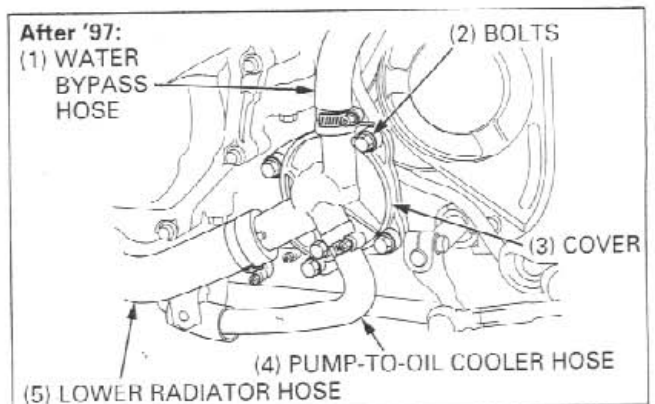
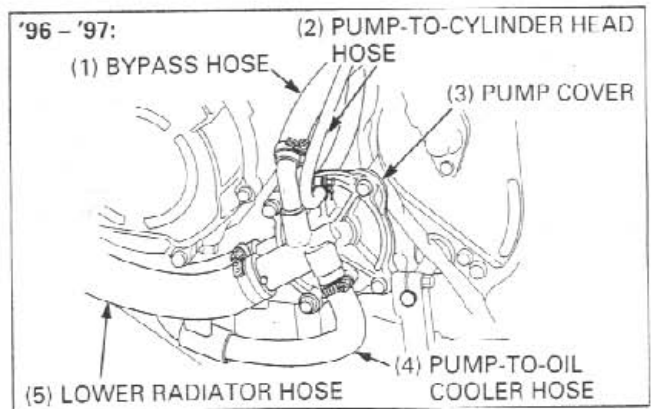


Install the water pump cover and tighten the four bolts to the specified torque.

**TORQUE: 13 N·m (1.3 kgf·m, 9 lbf·ft)**

Connect the following:

- Lower radiator hose
- Water pump-to-oil cooler hose
- Bypass hose
- Water pump-to-cylinder head hose ('96 - '97:)



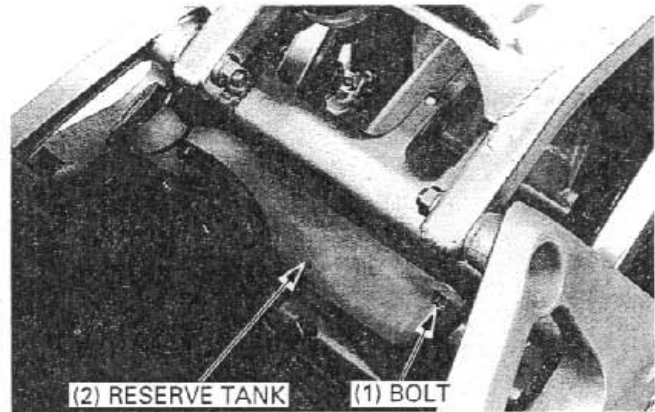


## RADIATOR RESERVE TANK

### REMOVAL

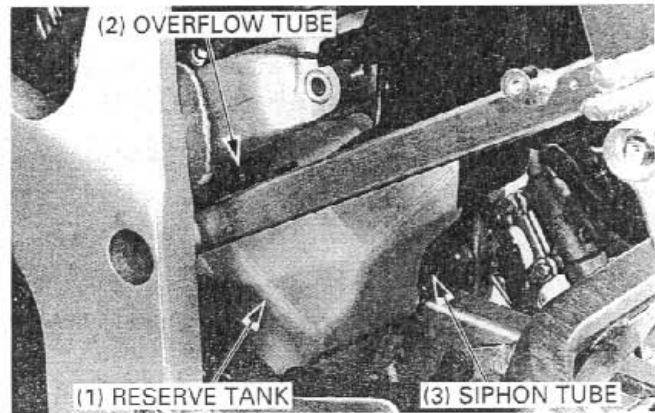
Remove the shock absorber (page 14-9).

Remove the radiator reserve tank mounting bolt.



Release the bosses from the frame hole and slit, then remove the radiator reserve tank from the frame.

Disconnect the overflow tube and siphon tube.  
Drain the coolant from the reserve tank.

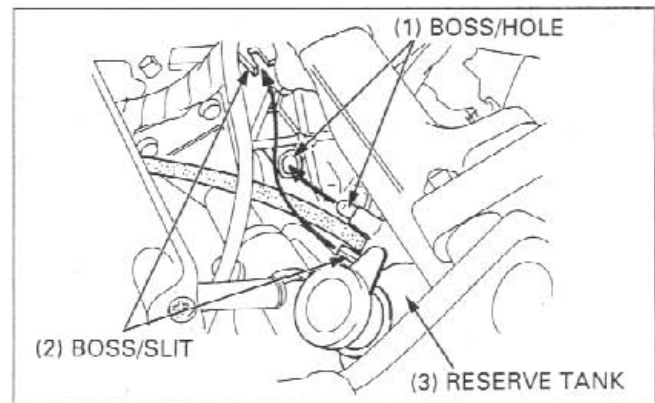


### INSTALLATION

Installation is in the reverse order of removal.

#### NOTE

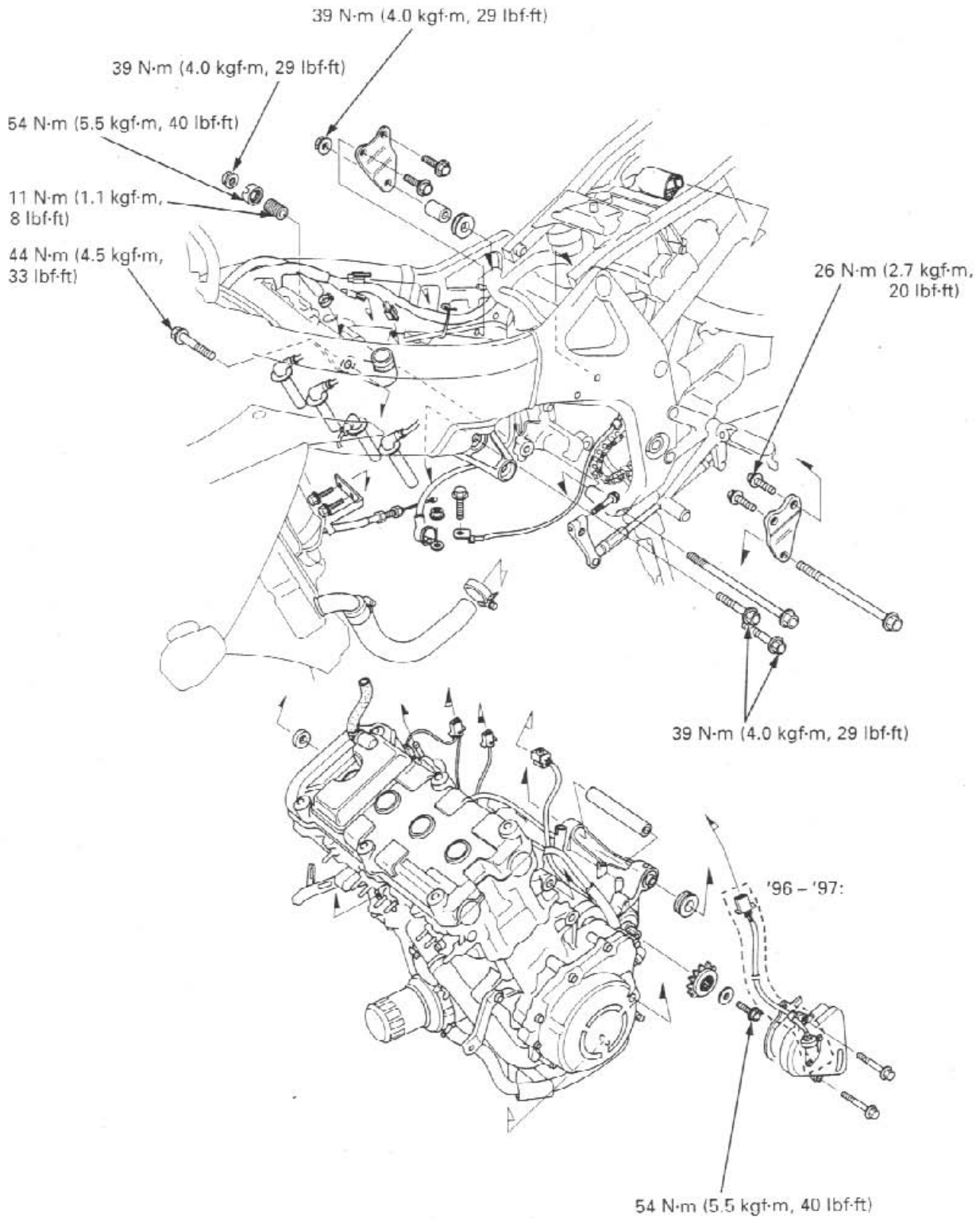
- Install the radiator reserve tank aligning its bosses with the frame hole and slit.



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MEMO

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# 7. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

7-1

ENGINE INSTALLATION

7-6

ENGINE REMOVAL

7-2

## SERVICE INFORMATION

### GENERAL

- During engine removal and installation, support the motorcycle using a safety stand or hoist.

### CAUTION

- *Do not use the oil filter as a jacking point.*

- The following components can be serviced with the engine installed in the frame.
  - Alternator (Section 10)
  - Clutch (Section 9)
  - Cylinder head/valves (Section 8)
  - Gearshift linkage (Section 9)
  - Oil cooler (Section 4)
  - Oil pump (Section 4)
  - Shift forks/shift drum (Section 9)
  - Water pump (Section 6)
- The following components require engine removal for service.
  - Crankshaft/transmission (Section 12)
  - Piston/cylinder (Section 11)

7

### SPECIFICATIONS

| ITEM                |                        | SPECIFICATIONS |                                      |
|---------------------|------------------------|----------------|--------------------------------------|
| Engine dry weight   | Except California type | '96 - '97:     | 66.9 kg (147.5 lbs)                  |
|                     |                        | After '97:     | 66.3 kg (146.2 lbs)                  |
|                     | California type        | '96 - '97:     | 68.2 kg (150.4 lbs)                  |
|                     |                        | After '97:     | 67.6 kg (149.1 lbs)                  |
| Coolant capacity    | Radiator and engine    | '96 - '97:     | 2.77 liter (2.93 US qt, 2.44 Imp qt) |
|                     |                        | After '97:     | 2.64 liter (2.79 US qt, 2.32 Imp qt) |
| Engine oil capacity | At disassembly         |                | 4.4 liter (3.8 US qt, 3.9 Imp qt)    |

### TORQUE VALUES

|                                       |                               |
|---------------------------------------|-------------------------------|
| Left engine hanger bolt               | 39 N·m (4.0 kgf·m, 29 lbf·ft) |
| Right engine hanger bolt              | 44 N·m (4.5 kgf·m, 33 lbf·ft) |
| Engine hanger nut (Rear/upper)        | 39 N·m (4.0 kgf·m, 29 lbf·ft) |
| (Rear/lower)                          | 39 N·m (4.0 kgf·m, 29 lbf·ft) |
| Engine hanger adjusting bolt          | 11 N·m (1.1 kgf·m, 8 lbf·ft)  |
| Engine hanger adjusting bolt lock nut | 54 N·m (5.5 kgf·m, 40 lbf·ft) |
| Engine hanger plate bolt              | 26 N·m (2.7 kgf·m, 20 lbf·ft) |
| Drive sprocket bolt                   | 54 N·m (5.5 kgf·m, 40 lbf·ft) |

### TOOLS

Lock nut wrench

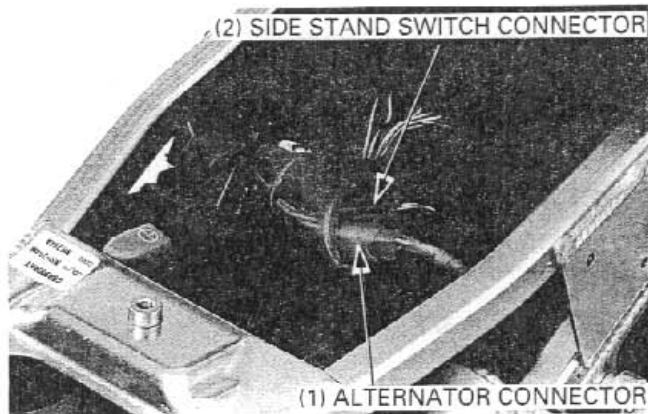
07HMA - MR70200

## ENGINE REMOVAL

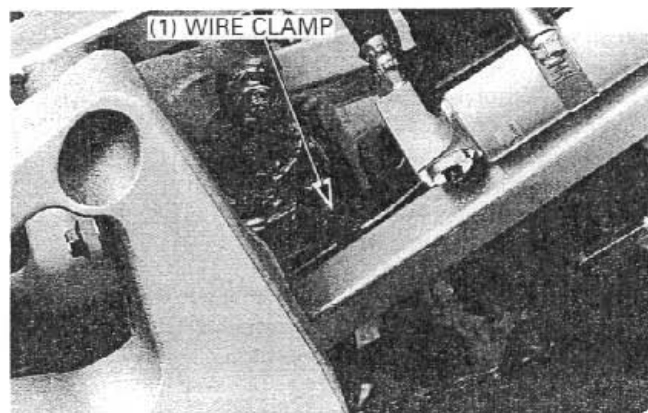
Remove the following:

- Middle and lower cowl (Section 2)
- Fuel tank (page 2-2)
- Exhaust system (page 2-12)
- Carburetor (page 5-5)

Disconnect the alternator 3P connector and side stand switch connector.



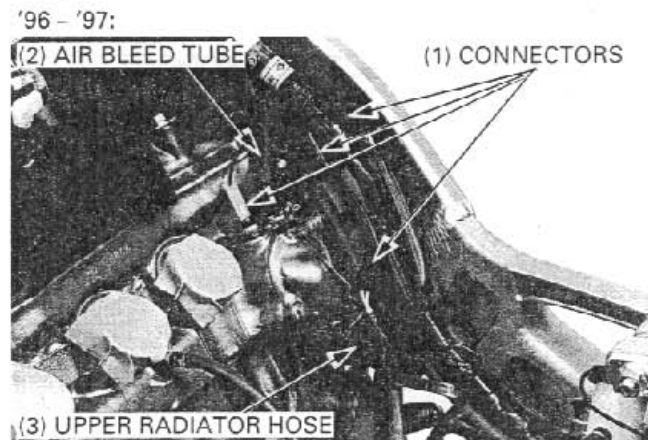
Release the alternator and side stand switch wires from the clamp.



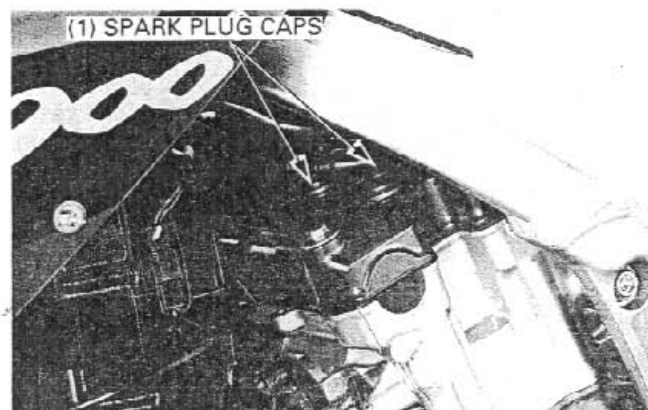
Disconnect the following connector:

- Ignition pulse generator 2P (Black) connector
- Speed sensor 3P (Black) connector
- Oil pressure switch/neutral switch/thermo sensor 3P (Black) connector

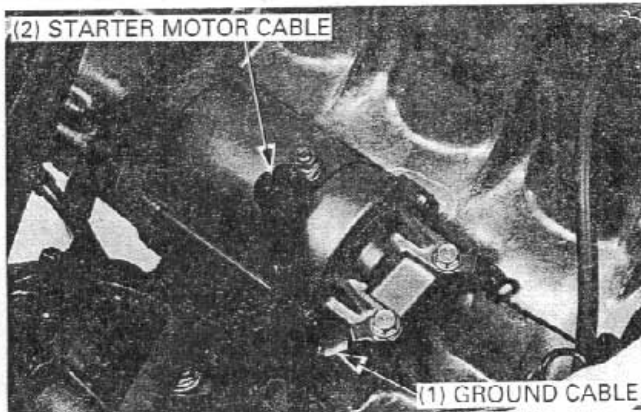
Disconnect the air bleed tube and upper radiator hose from the thermostat housing cover.



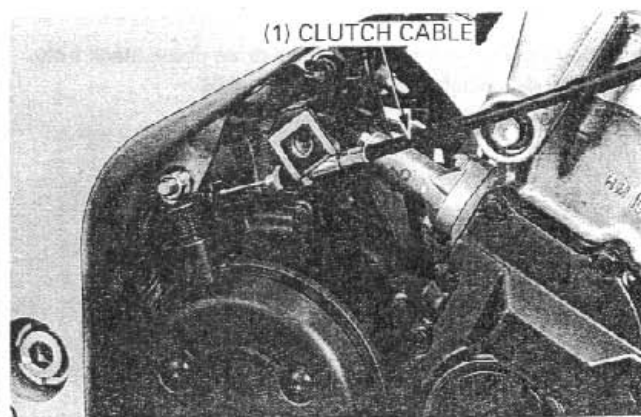
Disconnect the spark plug caps.



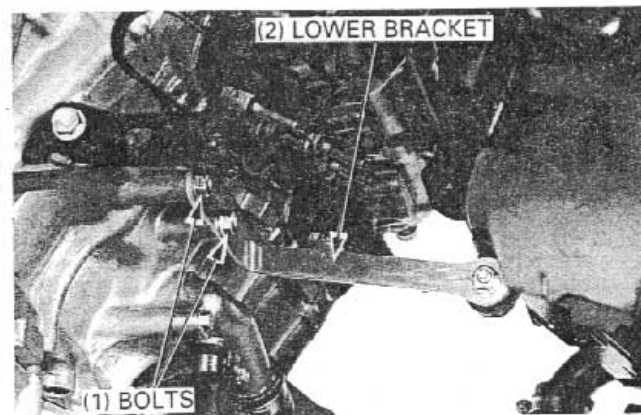
Remove the bolt and starter motor ground cable.  
Remove the nut and starter motor cable.



Remove the clutch cable from the holder and lifter arm.

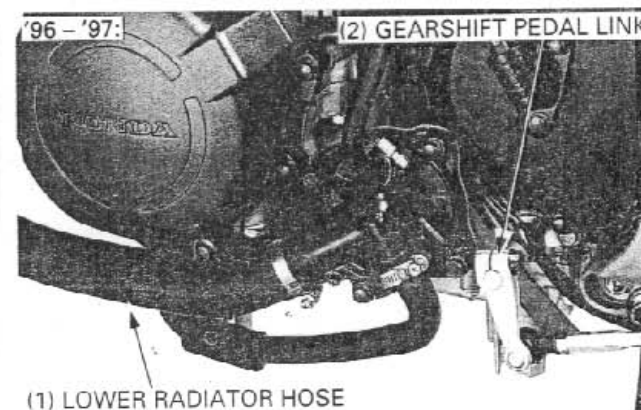


Remove the radiator lower bracket bolts.



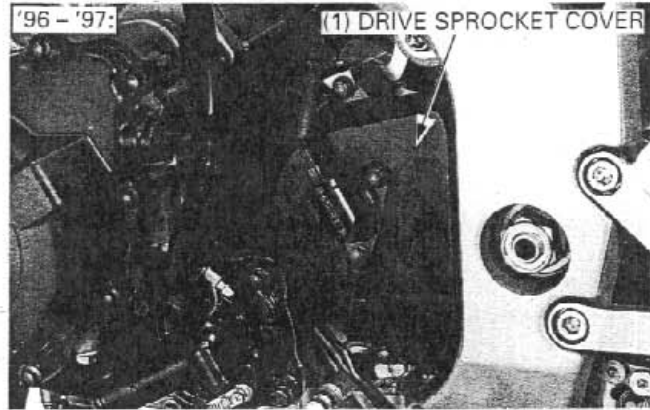
Disconnect the lower radiator hose from the water pump cover.

Remove the bolt and gearshift pedal link.

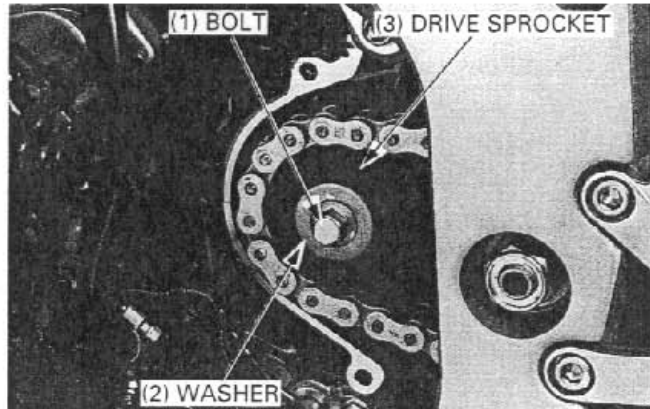


## ENGINE REMOVAL/INSTALLATION

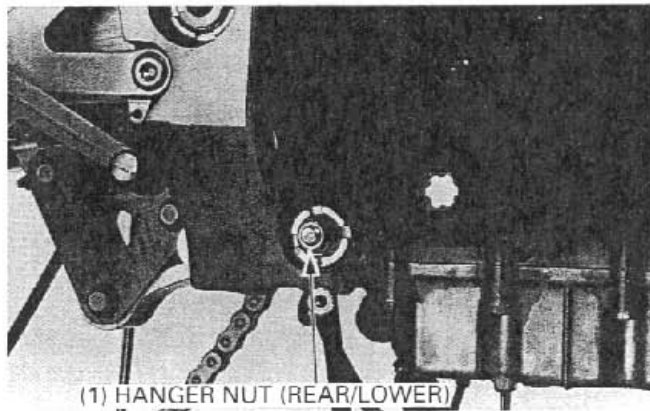
Remove the SH bolts, drive sprocket cover and guide plate.



Loosen the rear axle nut and make the drive chain slack fully. Remove the bolt, washer and drive sprocket.



Remove the rear/lower engine hanger nut.

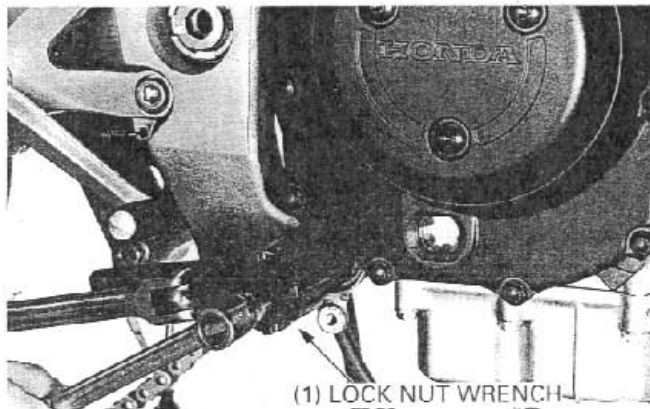


Loosen the engine hanger adjusting bolt lock nut while holding the adjusting bolt using the special tool.

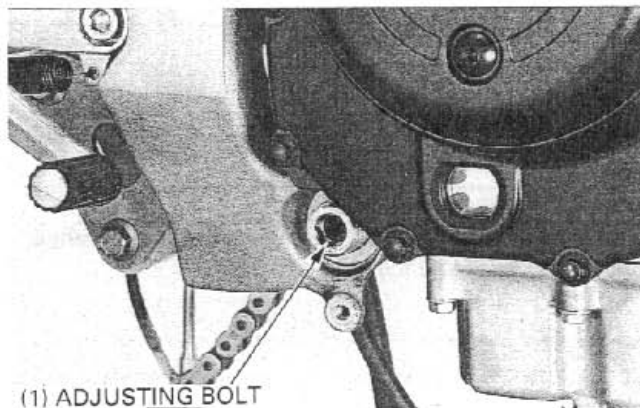
TOOL:

Lock nut wrench

07HMA - MR70200

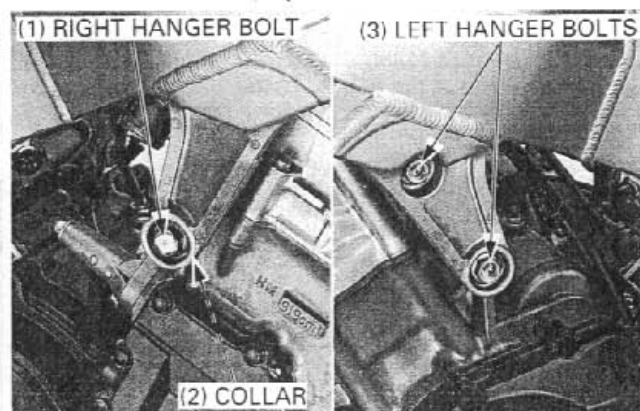


Turn the adjusting bolt counterclockwise to release the adjusting bolt from the engine.

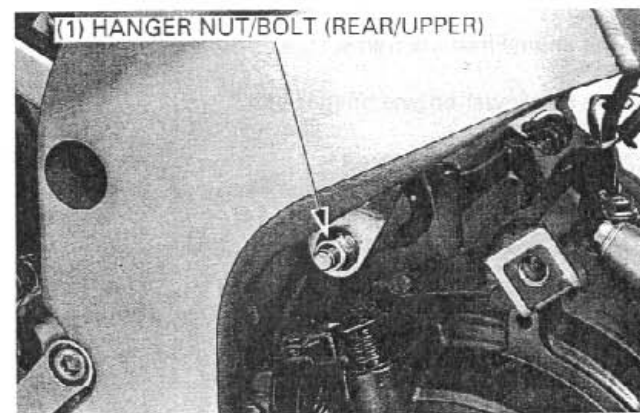


(1) ADJUSTING BOLT

Remove the right engine hanger bolt and distance collar. Remove the left engine hanger bolts.



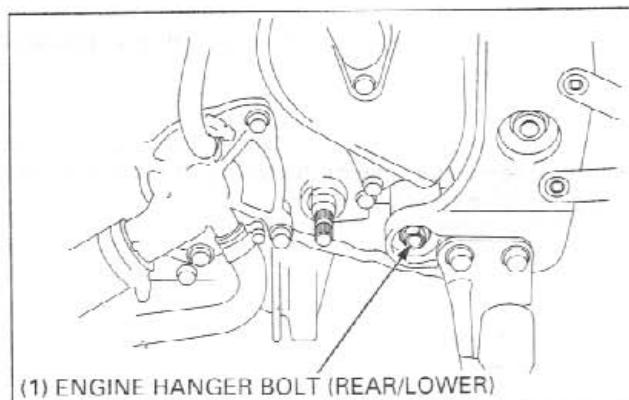
Remove the rear upper engine hanger bolt/nut, distance collars and spacer.



(1) HANGER NUT/BOLT (REAR/UPPER)

Loosen the engine hanger bracket bolts.

Remove the rear/lower engine hanger bolt, then remove the engine from the frame.



(1) ENGINE HANGER BOLT (REAR/LOWER)

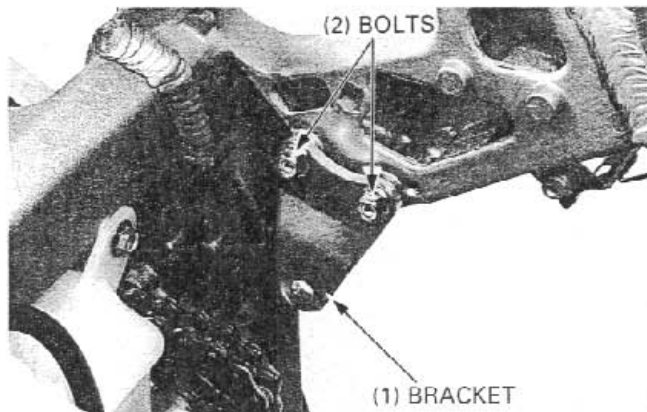


## ENGINE INSTALLATION

### CAUTION

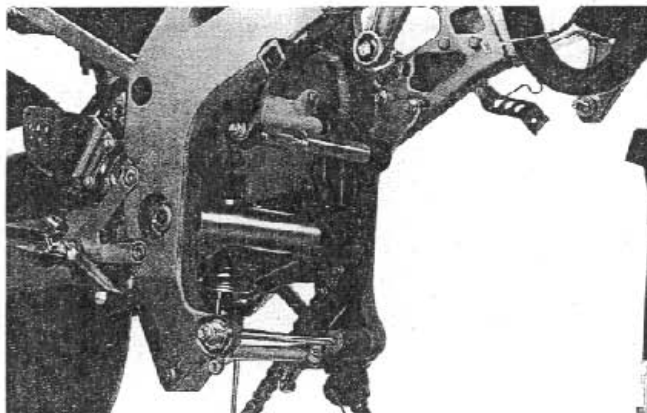
- Be sure to tighten all engine mounting fasteners to the specified torque in the specified sequence described below.

If the engine hanger plates are removed, install the hanger plates and loosely install the bolts.



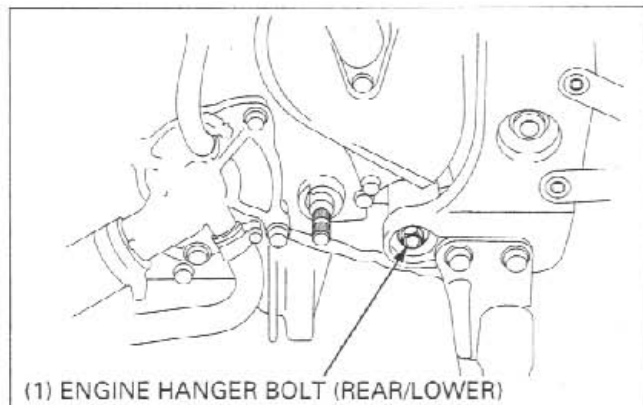
### NOTE

- Note the direction of the hanger bolts.



Install the engine into the frame.

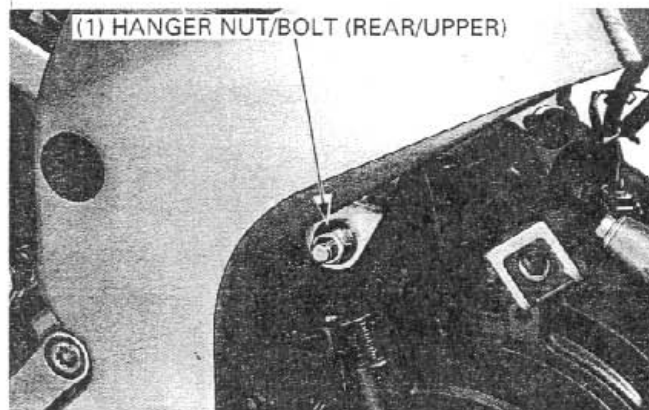
Install the rear/lower engine hanger bolt.



Install the rear/upper engine hanger bolt with the distance collars and spacers.

### NOTE

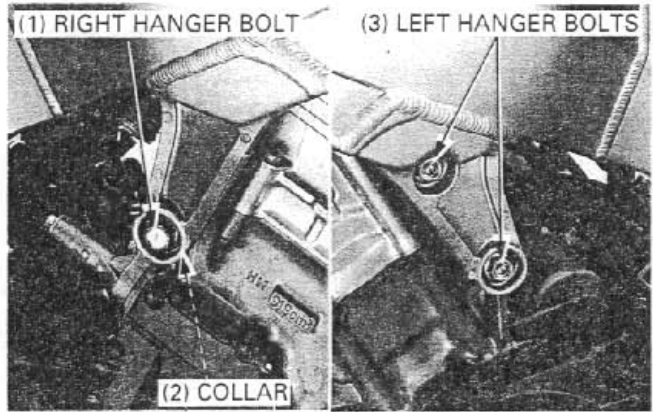
- Install the rear/lower engine hanger bolt from the left-hand side of the engine.



Install the distance collar and right engine hanger bolt.  
Install the left engine hanger bolts.

**CAUTION**

- *Install the right and left front engine hanger bolts in their proper locations. Improper installation will damage the cylinder head.*

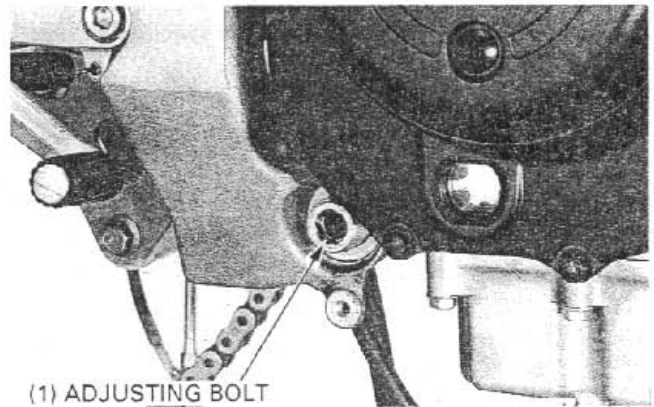


1. Tighten the engine hanger adjusting bolt to the specified torque.

**TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)**

**NOTE**

- Check that there is no clearance between the frame and the lefthand side of the engine.

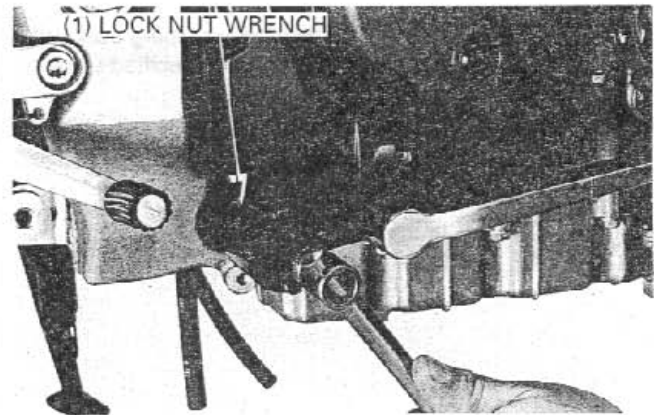


2. Hold the adjusting bolt and tighten the adjusting bolt lock nut to the specified torque using the special tool.

**TOOL:**

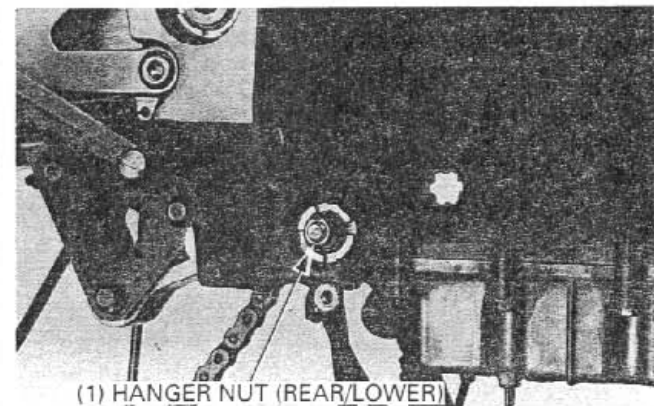
Lock nut wrench **07HMA – MR70200**

**TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)**



3. Tighten the rear/lower engine hanger nut to specified torque.

**TORQUE: 39 N·m (4.0 kgf·m, 20 lbf·ft)**



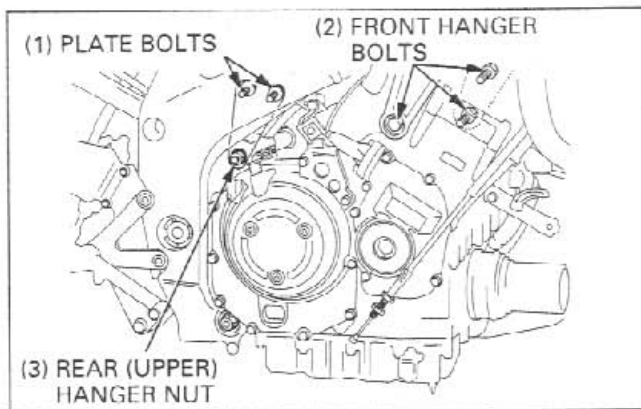
## ENGINE REMOVAL/INSTALLATION

4. Tighten the rear/upper engine hanger bolt to the specified torque.

**TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)**

5. Tighten the engine hanger plate bolt to the specified torque.

**TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)**

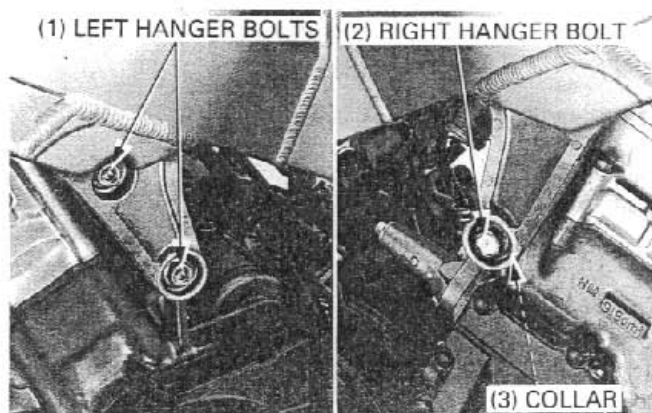


6. Tighten the front/left hanger bolts to the specified torque.

**TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)**

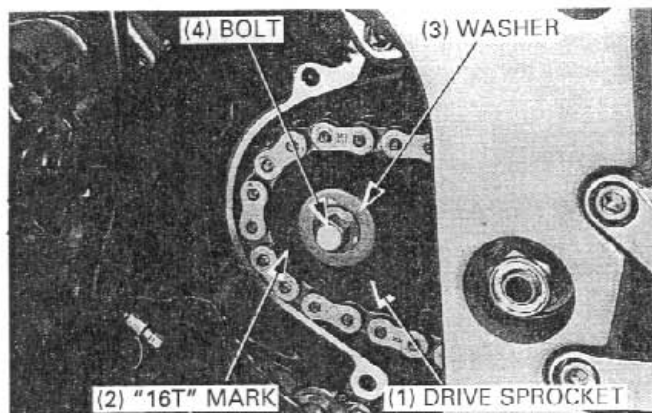
7. Tighten the front/right hanger bolt to the specified torque.

**TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)**

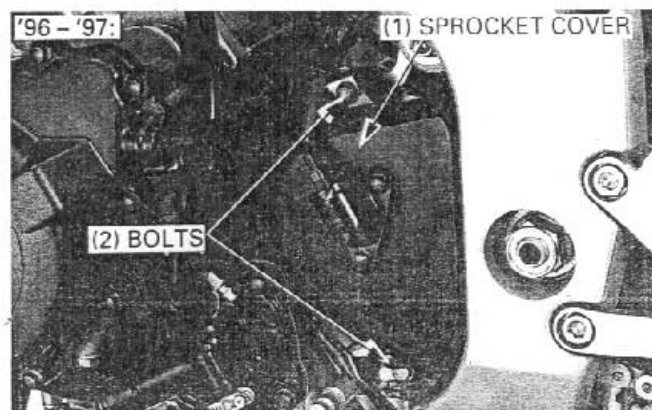


Install the drive sprocket with its "16T" mark facing outward. Install the washer and tighten the bolt to the specified torque.

**TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)**

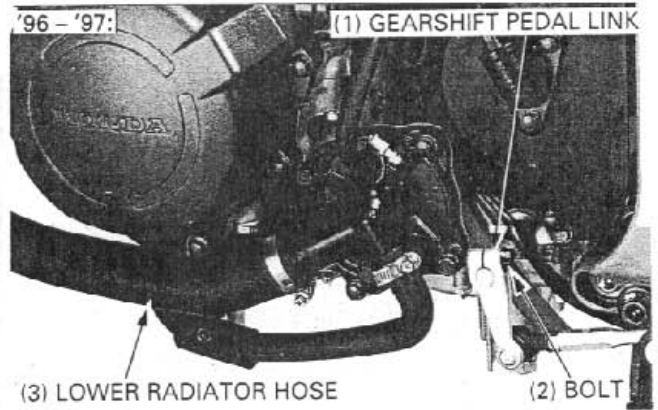


Install the guide plate and drive sprocket cover and tighten the SH bolts.

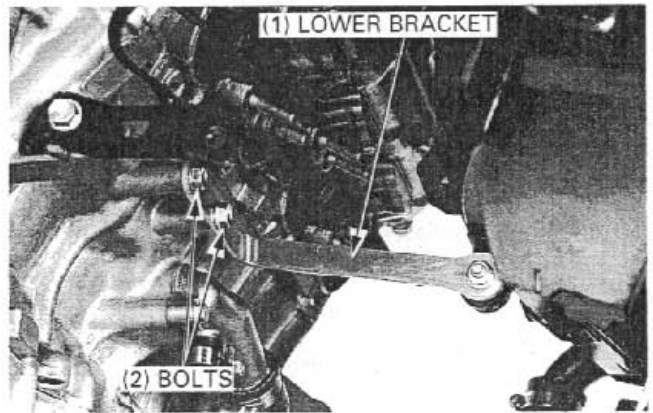


Install the gearshift pedal link aligning the punch marks. Tighten the bolt securely.

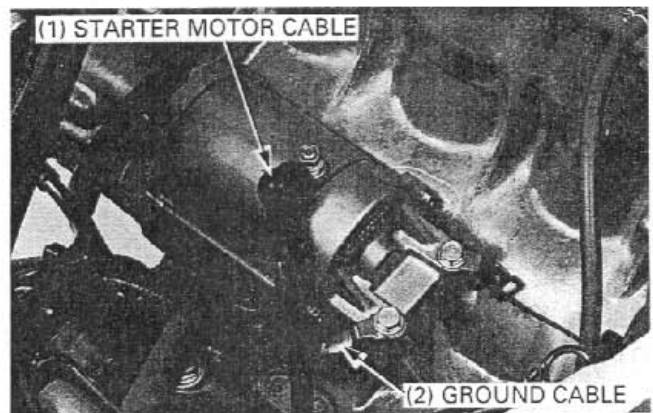
Connect the lower radiator hose and tighten the clamp screw.



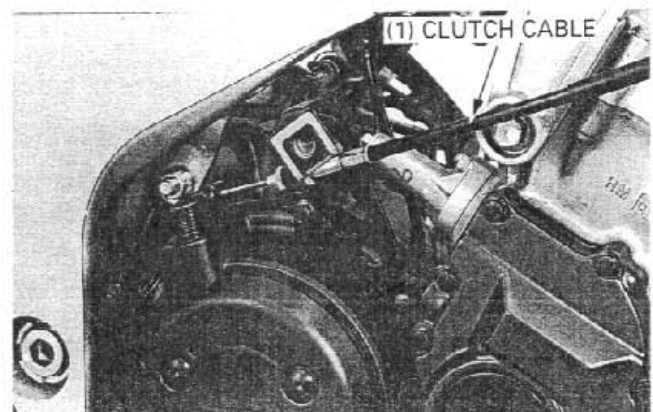
Install and tighten the radiator lower bracket bolts.



Route the starter motor cable and ground cables. Tighten the starter motor cable nut and ground cable bolt.

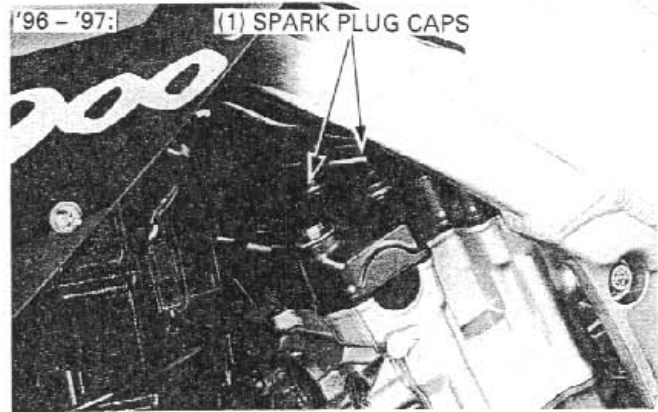


Connect the clutch cable to the clutch lifter arm.



## ENGINE REMOVAL/INSTALLATION

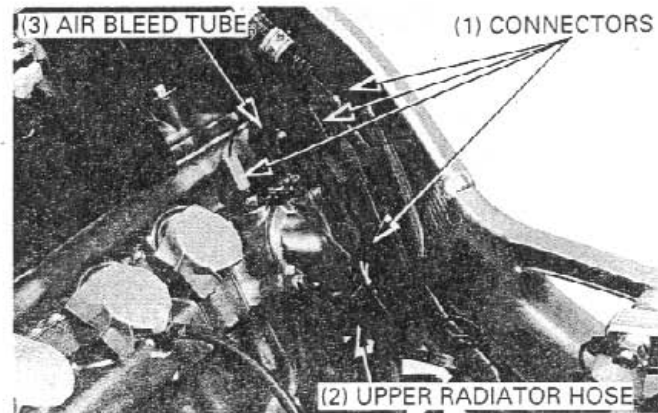
Install the spark plug caps.



Connect the following connector:

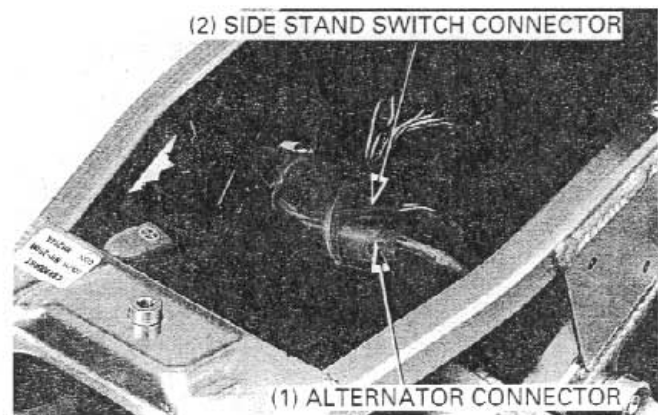
- Ignition pulse generator 2P (Black) connector
- Speed sensor 3P (Black) connector
- Oil pressure switch/neutral switch/thermo sensor 3P (Black) connector

Connect the upper radiator hose and air bleed tube to the thermostat housing cover.



Connect the alternator 3P connector and side stand switch connector.

Install the removed parts in the reverse order of removal.

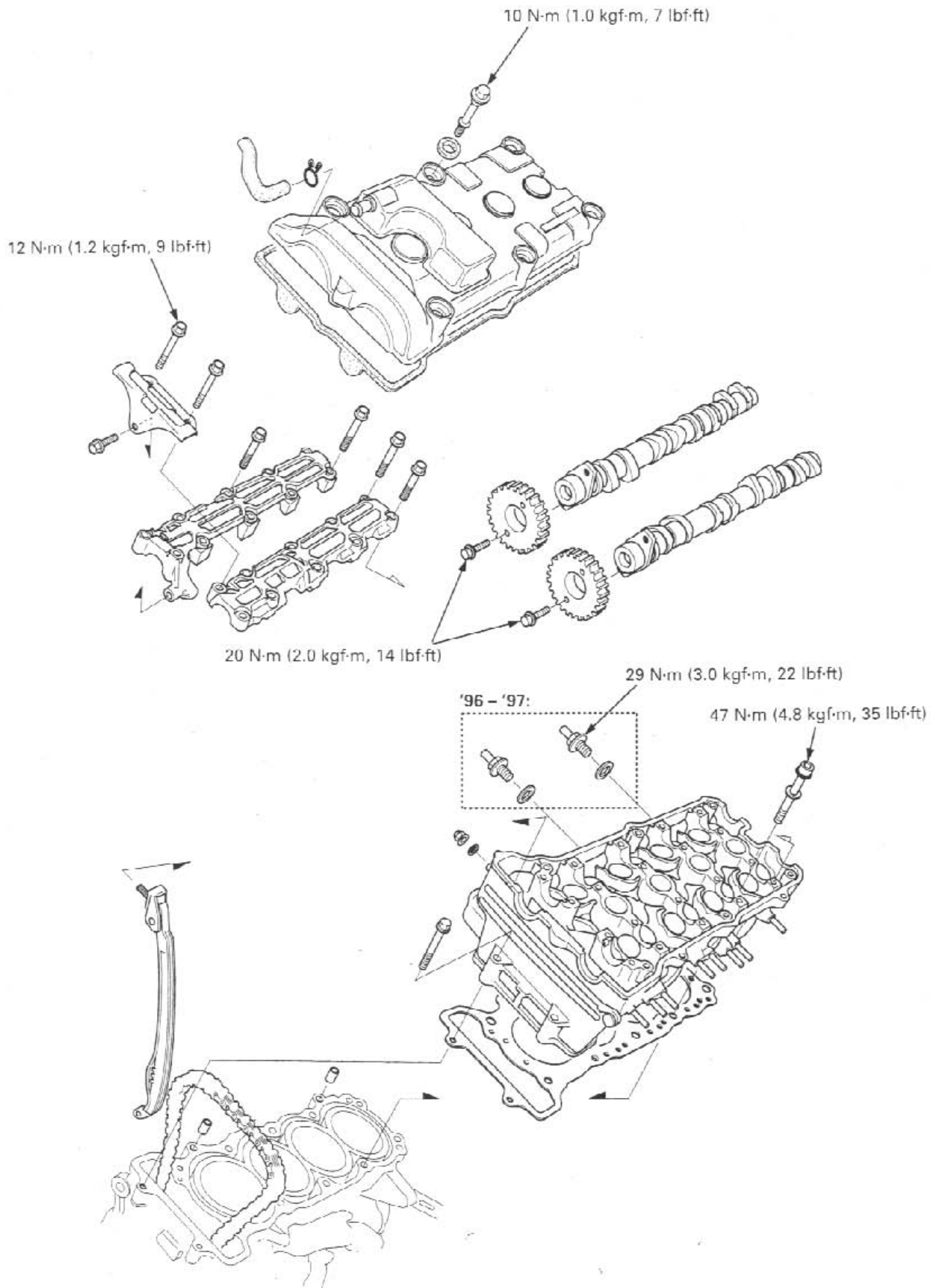


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MEMO

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# CYLINDER HEAD/VALVES



|                             |      |                                     |      |
|-----------------------------|------|-------------------------------------|------|
| SERVICE INFORMATION         | 8-1  | VALVE SEAT INSPECTION/<br>REFACING  | 8-15 |
| TROUBLESHOOTING             | 8-3  | CYLINDER HEAD ASSEMBLY              | 8-17 |
| CYLINDER COMPRESSION TEST   | 8-4  | CYLINDER HEAD INSTALLATION          | 8-19 |
| CYLINDER HEAD COVER REMOVAL | 8-4  | CAMSHAFT INSTALLATION               | 8-20 |
| CAMSHAFT REMOVAL            | 8-5  | CYLINDER HEAD COVER<br>INSTALLATION | 8-24 |
| CYLINDER HEAD REMOVAL       | 8-9  | CAM CHAIN TENSIONER LIFTER          | 8-25 |
| CYLINDER HEAD DISASSEMBLY   | 8-10 |                                     |      |
| CYLINDER HEAD INSPECTION    | 8-11 |                                     |      |
| VALVE GUIDE REPLACEMENT     | 8-14 |                                     |      |

## SERVICE INFORMATION

### GENERAL

- This section covers service of the cylinder head, valves and camshaft.
- The cylinder head, valves and camshaft services can be done with the engine installed in the frame.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling cylinder head.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.

### SPECIFICATIONS

Unit: mm (in)

| ITEM                     |  |               | STANDARD  | SERVICE LIMIT  |
|--------------------------|--|---------------|---|----------------|
| Cylinder compression     | '96 - '97:                                 |               | 1,177 kPa (12.0 kgf/cm <sup>2</sup> , 171 psi) at 500 - 600 rpm | —              |
|                          | After '97:                                 |               | 1.2 kPa (13.0 kgf/cm <sup>2</sup> , 185 psi) at 350 rpm         | —              |
| Cylinder head warpage    |  |               | —   | 0.10 (0.004)   |
| Valve, valve guide       | Valve clearance                            | IN            | 0.13 - 0.19 (0.005 - 0.007)                                     | —              |
|                          |  | '96 - '97: EX | 0.19 - 0.25 (0.007 - 0.010)                                     | —              |
|                          |  | After '97: EX | 0.22 - 0.28 (0.009 - 0.011)                                     | —              |
|                          | Valve stem O.D.                            | IN            | 4.475 - 4.490 (0.1762 - 0.1768)                                 | 4.465 (0.1758) |
|                          |  | EX            | 4.465 - 4.480 (0.1758 - 0.1764)                                 | 4.455 (0.1754) |
|                          | Valve guide I.D.                           | IN            | 4.500 - 4.512 (0.1772 - 0.1776)                                 | 4.540 (0.1787) |
|                          |  | EX            | 4.500 - 4.512 (0.1772 - 0.1776)                                 | 4.540 (0.1787) |
|                          | Stem-to-guide clearance                    | IN            | 0.010 - 0.037 (0.0004 - 0.0015)                                 | —              |
|                          |  | EX            | 0.020 - 0.047 (0.0008 - 0.0019)                                 | —              |
|                          | Valve guide projection above cylinder head | IN            | 14.60 - 14.80 (0.575 - 0.583)                                   | —              |
|                          |  | EX            | 14.80 - 15.00 (0.583 - 0.591)                                   | —              |
|                          | Valve seat width                           | IN/EX         | 0.90 - 1.10 (0.035 - 0.043)                                     | 1.5 (0.06)     |
| Valve spring free length | Inner                                      | IN/EX         | 35.77 (1.408)   | 34.07 (1.341)  |
|                          | Outer                                      | IN/EX         | 39.69 (1.563)   | 37.79 (1.488)  |
| Valve lifter             | Valve lifter O.D.                          | IN/EX         | 25.978 - 25.993 (1.0228 - 1.0233)                               | 25.97 (1.022)  |
|                          | Valve lifter bore I.D.                     | IN/EX         | 26.010 - 26.026 (1.0240 - 1.0246)                               | 26.04 (1.025)  |



## CYLINDER HEAD/VALVES

Unit: mm (in)

| ITEM          |                 |                        |                                 | STANDARD                          | SERVICE LIMIT |
|---------------|-----------------|------------------------|---------------------------------|-----------------------------------|---------------|
| Camshaft      | Cam lobe height | Except California type | IN                              | 36.040 – 36.280 (1.4189 – 1.4283) | 36.01 (1.418) |
|               |                 |                        | EX                              | 35.800 – 36.040 (1.4094 – 1.4189) | 35.77 (1.408) |
|               |                 | California type        | IN                              | 34.940 – 35.180 (1.3756 – 1.3850) | 34.91 (1.374) |
|               |                 |                        | EX                              | 35.100 – 35.340 (1.3819 – 1.3913) | 35.07 (1.381) |
|               | Runout          |                        |                                 | —                                 | 0.05 (0.002)  |
| Oil clearance |                 |                        | 0.020 – 0.062 (0.0008 – 0.0024) | 0.10 (0.004)                      |               |

## TORQUE VALUES

|  |                               |                                      |
|--|-------------------------------|--------------------------------------|
| Breather plate flange bolt               | 12 N·m (1.2 kgf·m, 9 lbf·ft)  | Apply a locking agent to the threads |
| Cylinder head stud bolt                  | 25 N·m (2.6 kgf·m, 19 lbf·ft) |                                      |
| Cylinder head cover special bolt         | 10 N·m (1.0 kgf·m, 7 lbf·ft)  |                                      |
| Camshaft holder flange bolt              | 12 N·m (1.2 kgf·m, 9 lbf·ft)  |                                      |
| Cylinder head socket bolt                | 47 N·m (4.8 kgf·m, 35 lbf·ft) | Apply oil to the threads             |
| Cam sprocket bolt                        | 20 N·m (2.0 kgf·m, 14 lbf·ft) | Apply a locking agent to the threads |
| Cam chain tensioner lifter mounting bolt | 12 N·m (1.2 kgf·m, 9 lbf·ft)  |                                      |
| Air bleed tube joint                     | 25 N·m (2.5 kgf·m, 18 lbf·ft) |                                      |

## TOOLS

|                                    |  |   |
|------------------------------------|--|---|
| Compression gauge attachment       | 07RMJ – MY50100                              | Equivalent commercially available in U.S.A. |
| Valve spring compressor            | 07757 – 0010000                              |   |
| Valve spring compressor attachment | 07959 – KM30101                              |   |
| Tappet hole protector              | 07HMG – MR70002                              |   |
| Valve guide driver                 | 07HMD – ML00101                              |   |
| Adjustable valve guide driver      | 07743 – 0020000                              | Not available in U.S.A.                     |
| Valve guide reamer, 4.5 mm         | 07HMH – ML00101                              | or 07HMH – ML0010A (U.S.A. only)            |
| Valve seat cutters                 | — these are commercially available in U.S.A. |   |
| Seat cutter, 27.5 mm (45° IN/EX)   | 07780 – 0010200                              |   |
| Flat cutter, 30 mm (32° IN)        | 07780 – 0012200                              |   |
| Flat cutter, 27 mm (32° EX)        | 07780 – 0013300                              |   |
| Interior cutter, 30 mm (60° IN/EX) | 07780 – 0014000                              |   |
| Cutter holder, 4.5 mm              | 07781 – 0010600                              |   |

## TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problem can be diagnosed by a compression test or by tracing engine noises to the top-end with a sounding rod stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather tube. If the tube is smoky, check for a seized piston ring (Section 9).

### Compression too low, hard starting or poor performance at low speed

- Valves:
  - Incorrect valve adjustment
  - Burned or bent valve
  - Incorrect valve timing
  - Broken valve spring
  - Uneven valve seating
- Cylinder head:
  - Leaking or damaged head gasket
  - Warped or cracked cylinder head
- Worn cylinder, piston or piston rings (Section 9)

### Compression too high, overheating or knocking

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

### Excessive smoke

- Cylinder head:
  - Worn valve stem or valve guide
  - Damaged stem seal
- Worn cylinder, piston or piston rings (Section 9)

### Excessive noise

- Cylinder head:
  - Incorrect valve adjustment
  - Sticking valve or broken valve spring
  - Damaged or worn camshaft
  - Loose or worn cam chain
  - Worn or damaged cam chain tensioner
  - Worn cam sprocket teeth
- Worn cylinder, piston or piston rings (Section 9)

### Rough idle

- Low cylinder compression

# CYLINDER COMPRESSION TEST

### ⚠ WARNING

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

Warm up the engine to normal operating temperature. Stop the engine and remove the all spark plug caps and remove the one spark plug at a time.

### NOTE

- To measure the cylinder compression of each cylinder, remove only one plug at a time.

Install a compression gauge.

### TOOL:

**Compression gauge attachment** 07RMJ – MY50100  
(Equivalent commercially available in U.S.A.)

Open the throttle all the way and crank the engine with the starter motor until the gauge reading stops rising. The maximum reading is usually reached within 4 – 7 seconds.

### NOTE

- To avoid discharging the battery, do not operate the starter motor for more than seven seconds.

### Compression pressure:

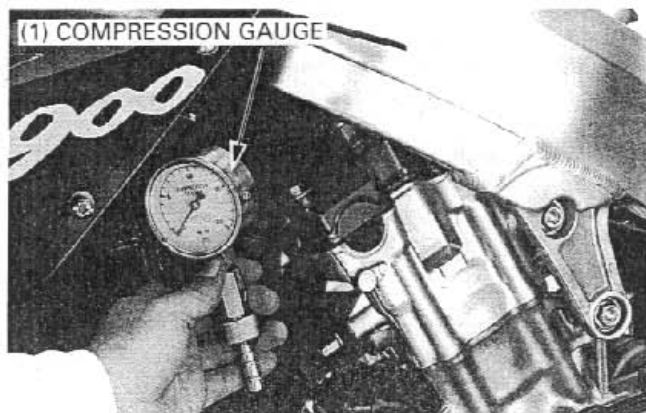
1,177 kPa (12.0 kgf/cm<sup>2</sup>, 171 psi) at 500 – 600 rpm '96 – '97:  
1.2 kPa (13.0 kgf/cm<sup>2</sup>, 185 psi) at 350 rpm After '97:

Low compression can be caused by:

- Blown cylinder head gasket
- Improper valve adjustment
- Valve leakage
- Worn piston ring or cylinder

High compression can be caused by:

- Carbon deposits in combustion chamber or on piston

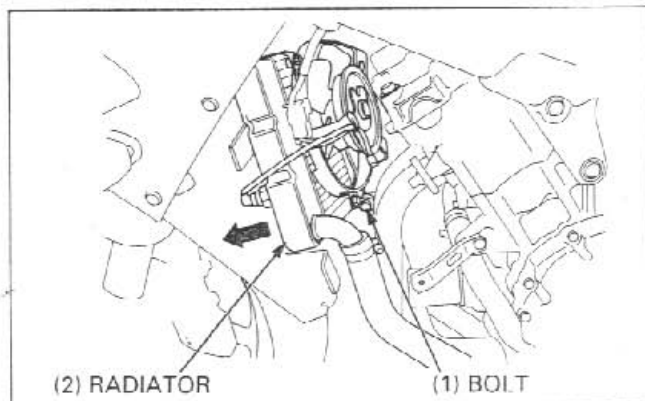


# CYLINDER HEAD COVER REMOVAL

Remove the following:

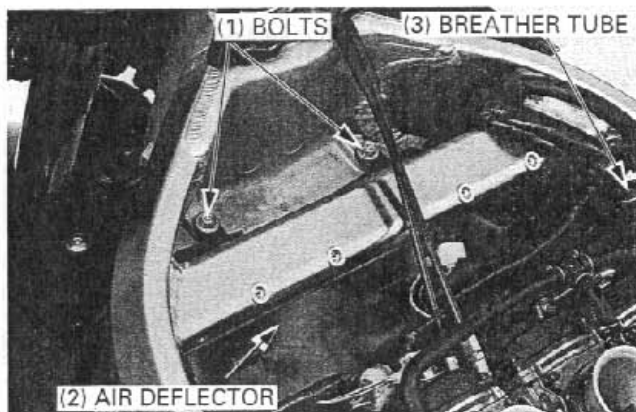
- Fuel tank (page 2-2)
- Middle/lower cowl (page 2 6)
- Air cleaner housing (page 5-4)
- Ignition coil assembly (page 17-6)

Remove the radiator lower mounting bolt and move the radiator forward.



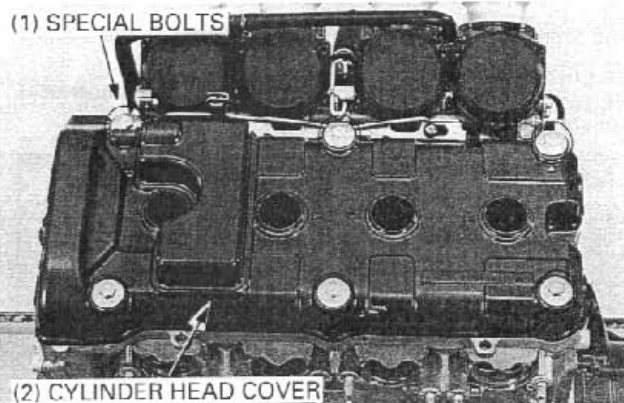
Remove the bolts and air deflector.

Disconnect the breather tube from the cylinder head cover.



Remove the following:

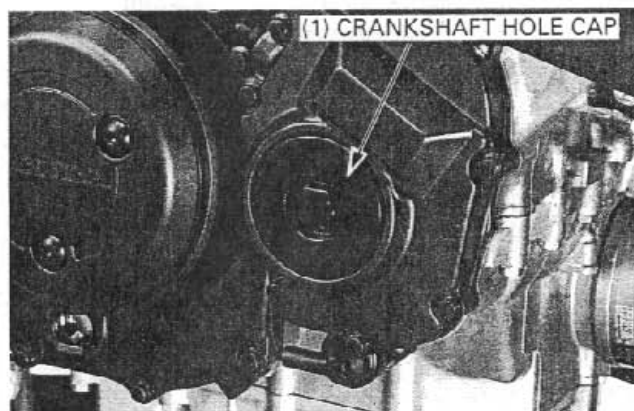
- Special bolts
- Washers
- Cylinder head cover
- Packing



## CAMSHAFT REMOVAL

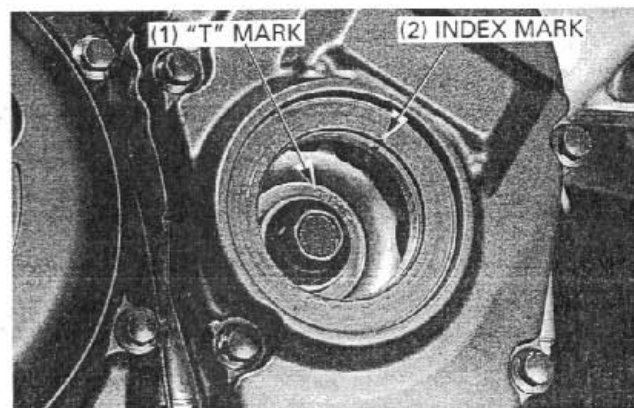
Remove the cylinder head cover (page 8-4).

Remove the crankshaft hole cap and O-ring.



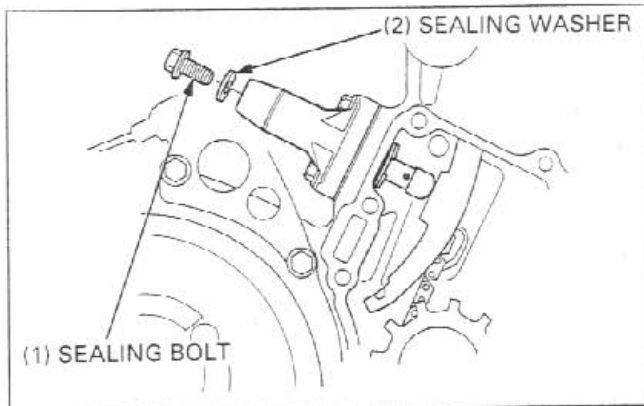
Turn the crankshaft clockwise, align the "T" mark on the ignition pulse generator rotor with the index mark on the ignition pulse generator rotor cover.

Make sure the No. 1 piston is at TDC (Top Dead Center) on the compression stroke.

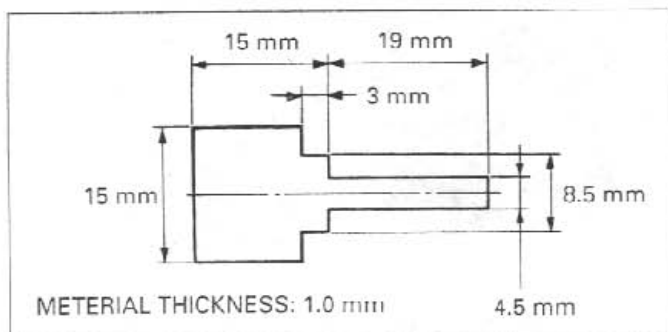
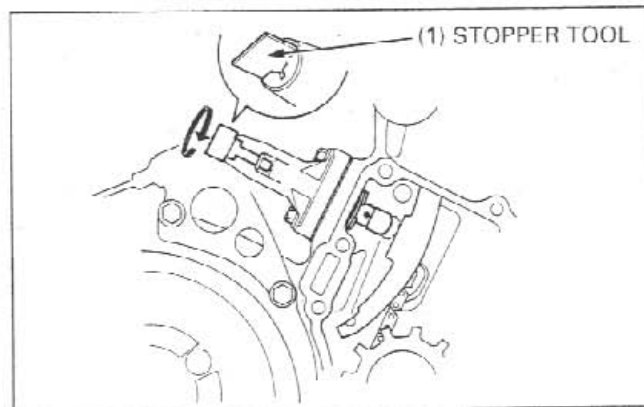


## CYLINDER HEAD/VALVES

Remove the cam chain tensioner lifter sealing bolt and sealing washer.



Turn the tensioner lifter shaft fully in (clockwise) and secure it using the stopper tool.  
This tool can easily be made from a thin (1 mm thickness) piece of steel.



If you plan to replace the camshaft and/or cam sprocket, loosen the cam sprocket bolts as follow:

### NOTE

- It is not necessary to remove the cam sprocket from the camshaft except when replacing the camshaft and/or cam sprocket.

— Remove the cam sprocket bolt from intake and exhaust camshafts.

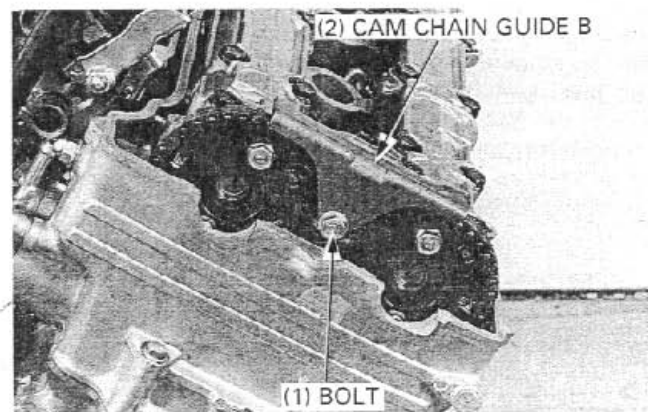
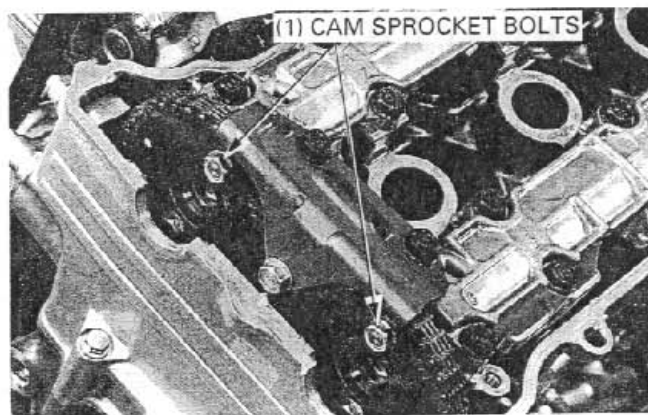
### NOTE

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

— Turn the crankshaft one full turn (360°), remove the other cam sprocket bolt from the camshafts.

— Remove the cam sprocket from the camshaft.

Remove the cam chain guide B bolt.



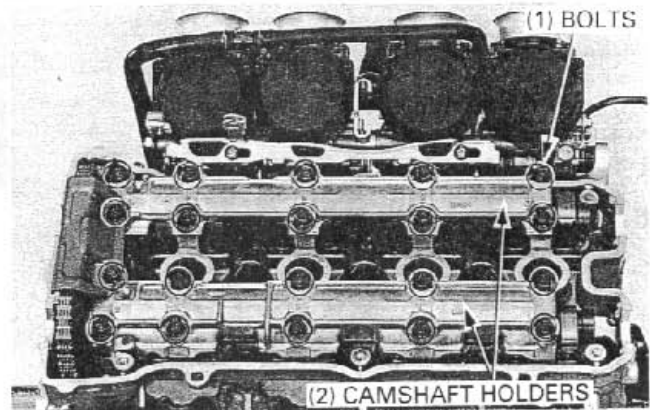
Loosen and remove the camshaft holder bolts, then remove the cam chain guide B, camshaft holders and camshafts.

### CAUTION

- From outside to inside, loosen the bolts in a crisscross pattern in several steps or the camshaft holder might break.

### NOTE

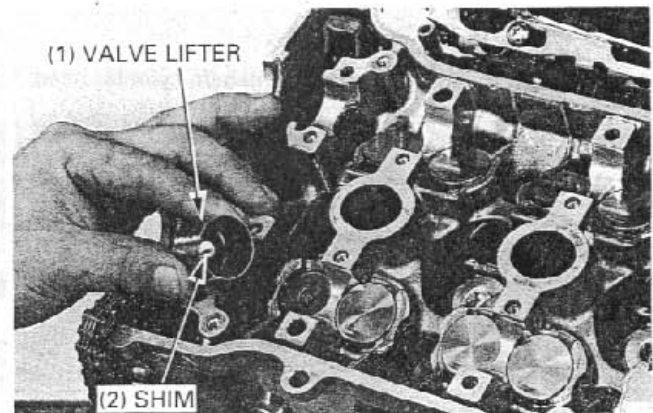
- Suspend the cam chain with a piece of wire to prevent the chain from falling into the crankcase.
- It is not necessary to remove the dowel pins from the camshaft holders.



Remove the valve lifters and shims.

### NOTE

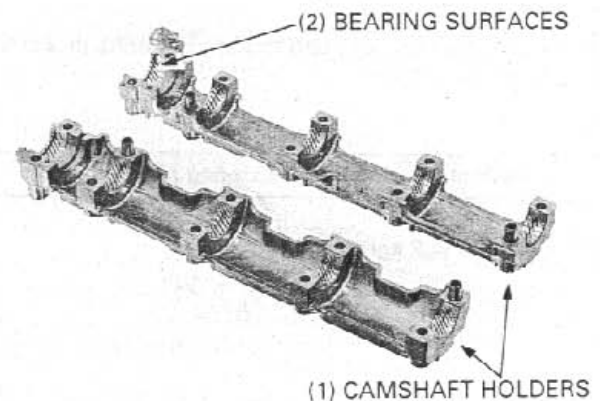
- Be careful not to damage the valve lifter bore.
- Shim may stick to the inside of the valve lifter. Do not allow the shims to fall into the crankcase.
- Mark all valve lifters and shims to ensure correct reassembly in their original locations.
- The valve lifter can be easily removed with a valve lapping tool or magnet.
- The shims can be easily removed with a tweezers or magnet.



## INSPECTION

### CAMSHAFT HOLDER

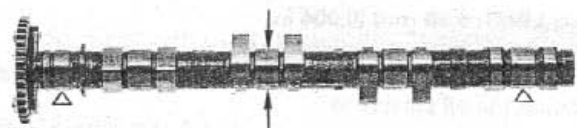
Inspect the bearing surface of the camshaft holder for scoring, scratches, or evidence of insufficient lubrication. Inspect the oil orifices of the holders for clogging.



### CAMSHAFT RUNOUT

Support both ends of the camshaft with V-blocks and check the camshaft runout with a dial gauge.

**SERVICE LIMIT: 0.10 mm (0.004 in)**



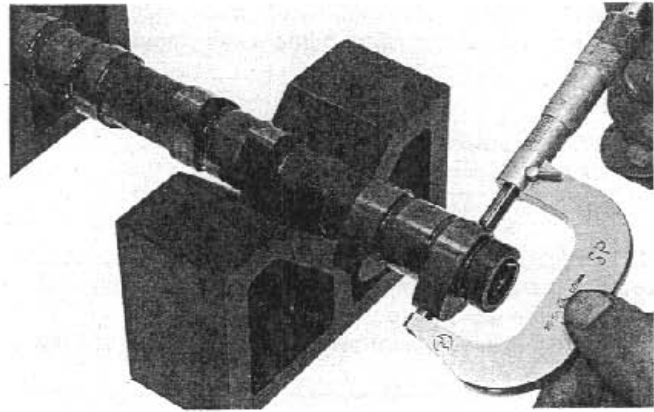
## CYLINDER HEAD/VALVES

### CAM LOBE HEIGHT

Using a micrometer, measure each cam lobe height.

### SERVICE LIMITS:

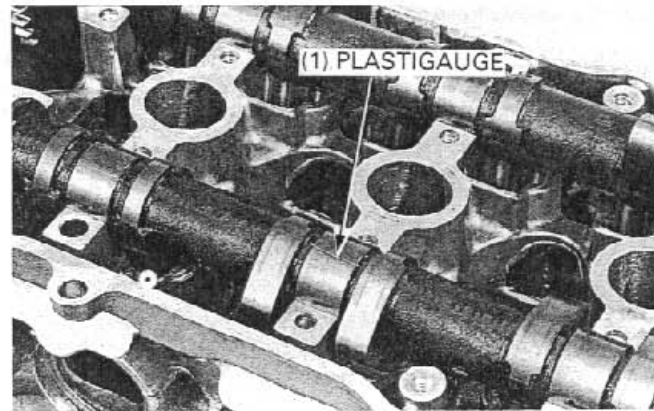
|                             |                     |
|-----------------------------|---------------------|
| IN: Except California type: | 36.01 mm (1.418 in) |
| California type:            | 34.91 mm (1.374 in) |
| EX: Except California type: | 35.77 mm (1.408 in) |
| California type:            | 35.07 mm (1.381 in) |



### CAMSHAFT OIL CLEARANCE

Wipe any oil from the journals of the camshaft, cylinder head and camshaft holders.

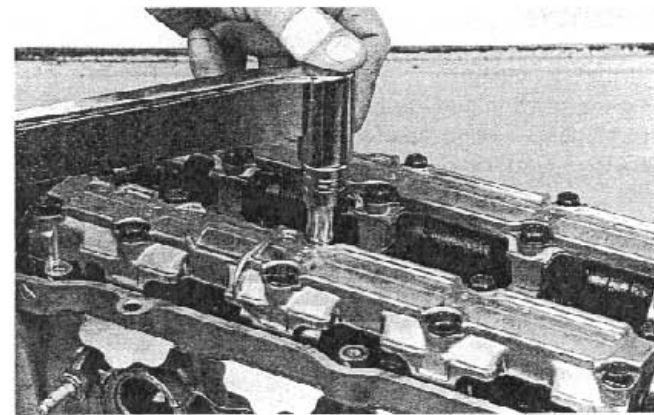
Lay a strip of plastigauge lengthwise on top of each camshaft journal.



Install the camshaft holders and tighten the bolts in a criss-cross pattern in 2-3 steps.

### NOTE

- Do not rotate the camshaft when using plastigauge.



**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

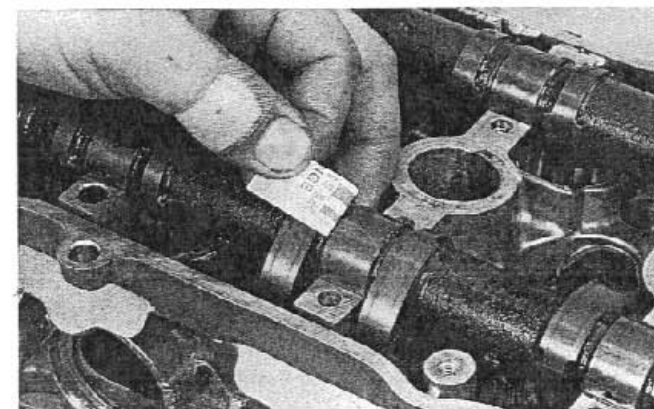
Remove the camshaft holders and measure the width of each plastigauge.

The widest thickness determines the oil clearance.

**SERVICE LIMIT: 0.10 mm (0.004 in)**

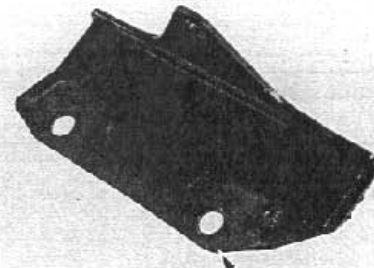
When the service limits are exceeded, replace the camshaft and recheck the oil clearance.

Replace the cylinder head and camshaft holders as a set if the clearance still exceeds the service limit.



**CAM CHAIN GUIDE B**

Inspect the cam chain guide for wear or damage.



(1) CAM CHAIN GUIDE B

**CYLINDER HEAD REMOVAL**

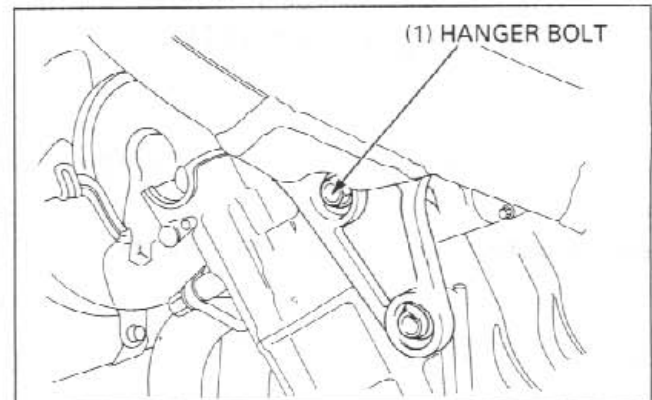
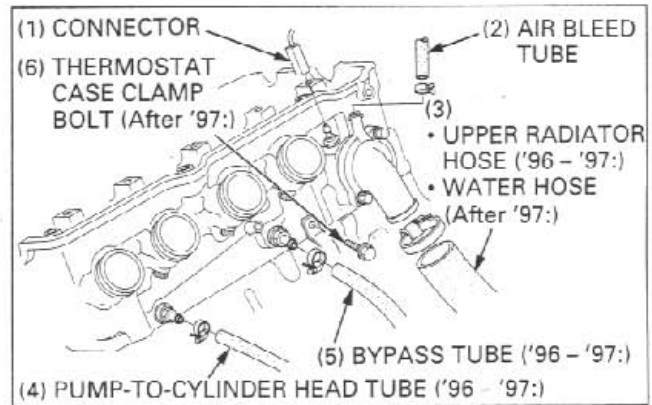
**Disconnect the following:**

- Camshaft (page 8-3)
- Coolant temperature sensor connector
- Air bleed tube
- Upper radiator hose ('96 - '97:)
- Water hose (After '97:)
- Water pump-to-cylinder head hose ('96 - '97:)
- Bypass hose ('96 - '97:)
- Thermostat case clamp bolt (After '97:)

Remove the lower radiator hose and push radiator as far forward as possible when removing cylinder head.

Remove the cam chain tensioner mounting cap nut and sealing washer.  
Remove the cam chain tensioner.

Remove the left upper engine hanger bolt.





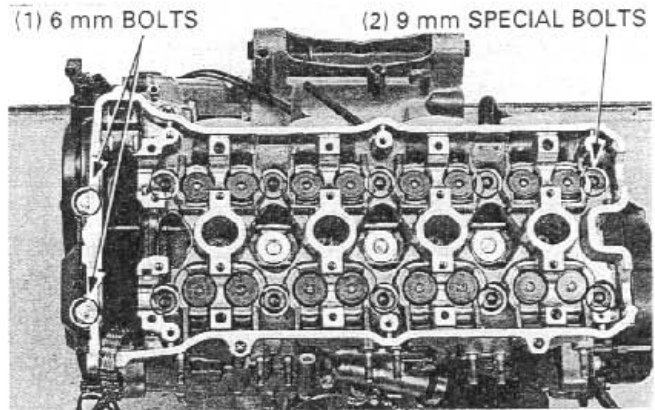
## CYLINDER HEAD/VALVES

Remove the two 6 mm flange bolts.  
Remove the ten 9 mm special bolts.

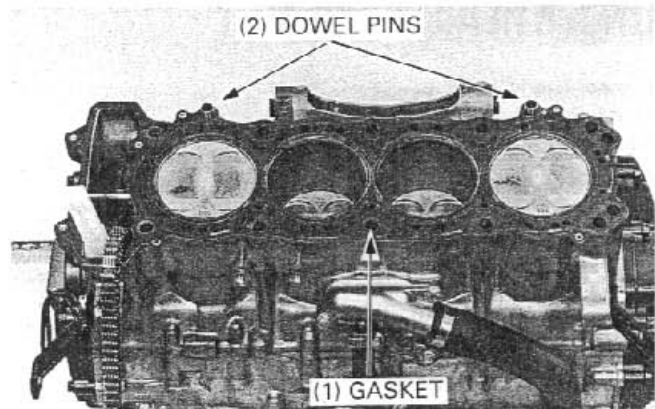
### NOTE

- Loosen the 9 mm special bolts in a crisscross pattern in 2 – 3 steps.

Remove the cylinder head.

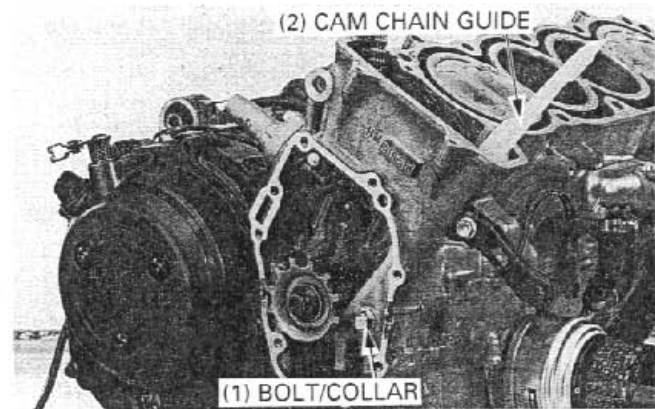


Remove the dowel pins and cylinder head gasket.



Remove the ignition pulse generator rotor cover (page 17-7).

Remove the bolt, cam chain guide and collar.



## CYLINDER HEAD DISASSEMBLY

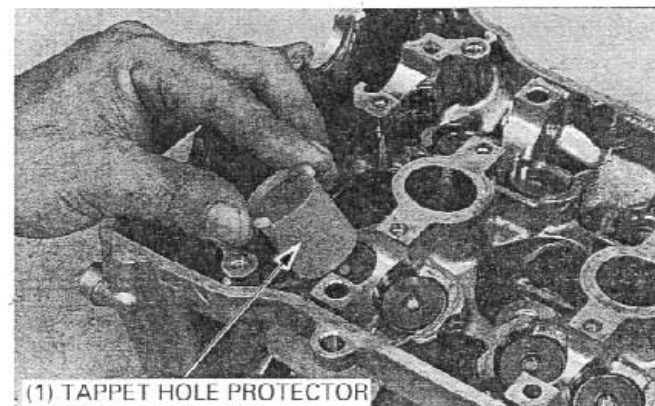
Remove the spark plugs from the cylinder head.

Install the tappet hole protector into the valve lifter bore.

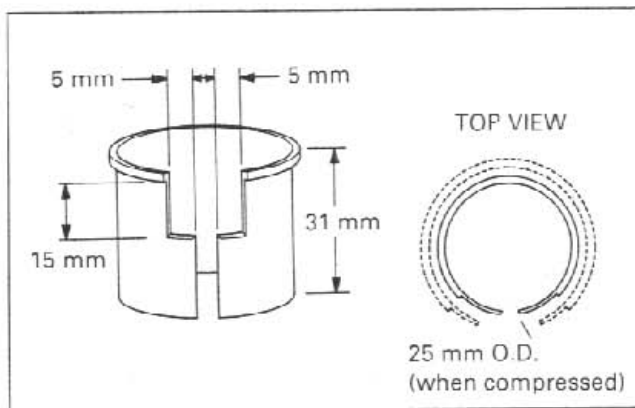
### TOOL:

Tappet hole protector

07HMG – MR70002



An equivalent tool can easily be made from a plastic 35 mm film container as shown.



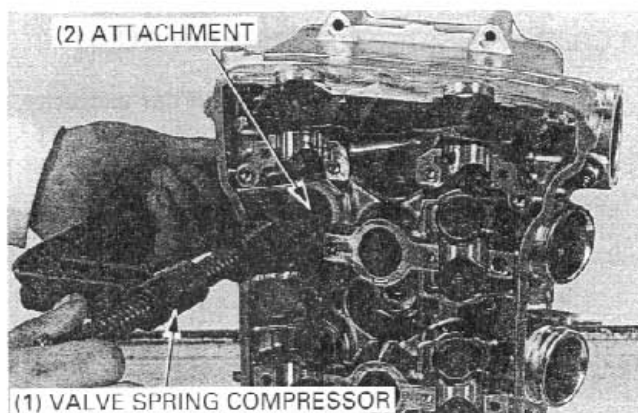
Remove the valve spring cotters using the special tools as shown.

**TOOLS:**

- Valve spring compressor 07757 - 0010000
- Valve spring compressor attachment 07959 - KM30101

**CAUTION**

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

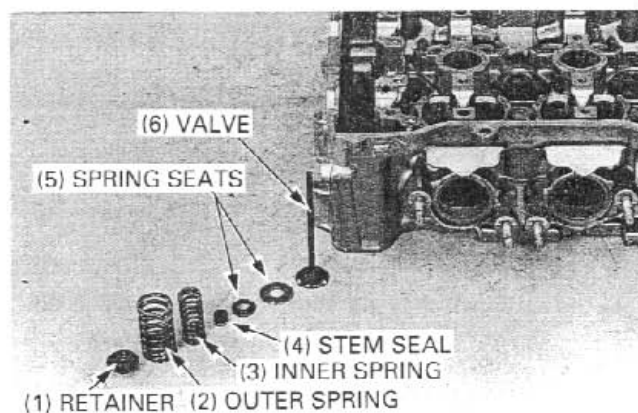


Remove the following:

- Spring retainer
- Outer and inner valve springs
- Valve
- Stem seal
- Inner and outer valve spring seats

**NOTE**

- Mark all parts during disassembly so they can be placed back in their original locations.



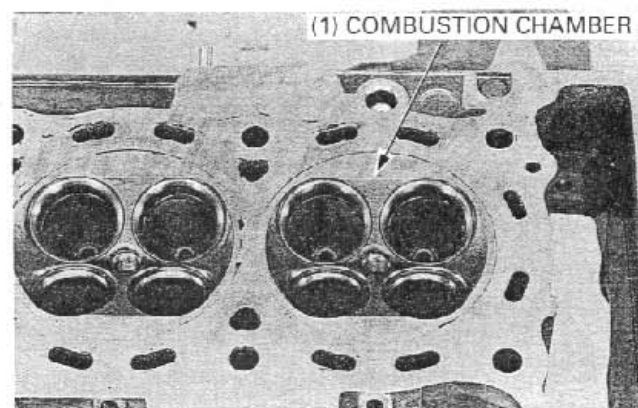
## CYLINDER HEAD INSPECTION

### CYLINDER HEAD

Remove carbon deposits from the combustion chambers. Check the spark plug hole and valve areas for cracks.

**NOTE**

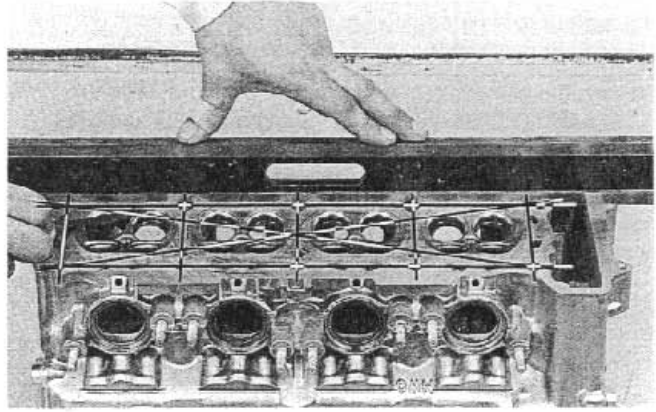
- Avoid damaging the gasket surface.



## CYLINDER HEAD/VALVES

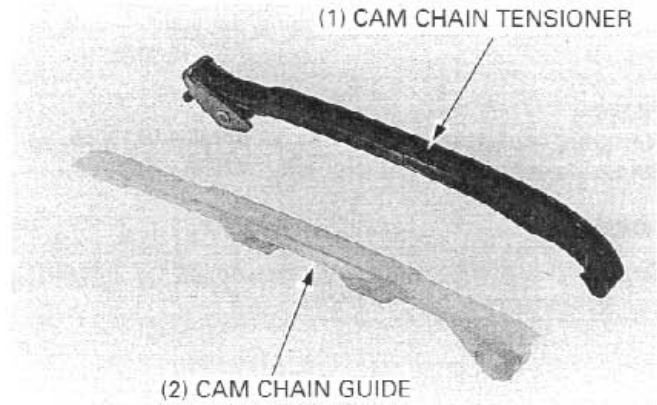
Check the cylinder head for warpage with a straight edge and feeler gauge.

**SERVICE LIMIT: 0.10 mm (0.004 in)**



## CAM CHAIN TENSIONER/CAM CHAIN GUIDE

Inspect the cam chain tensioner and guide for excessive wear or damage, replace if necessary.



## VALVE SPRING

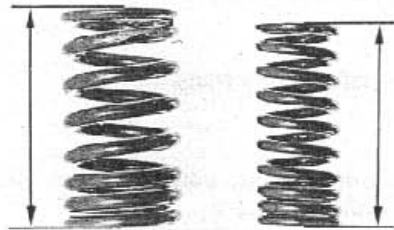
Measure the free length of the inner and outer valve springs.

**SERVICE LIMITS:**

**Inner: 34.07 mm (1.341 in)**

**Outer: 37.79 mm (1.488 in)**

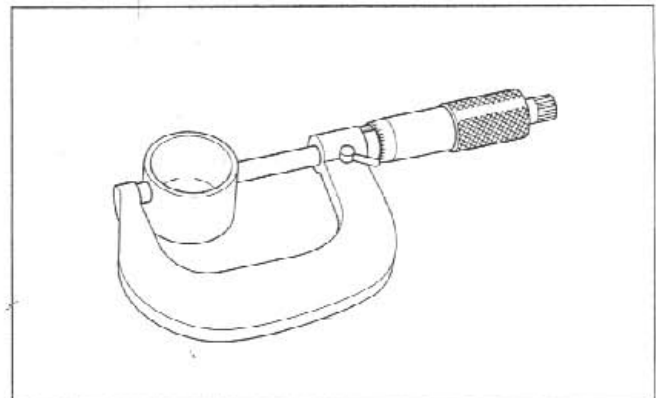
Replace the springs if they are shorter than the service limits.



## VALVE LIFTER

Inspect each valve lifter for scratches or abnormal wear. Measure the each valve lifter O.D.

**SERVICE LIMIT: 25.97 mm (1.022 in)**

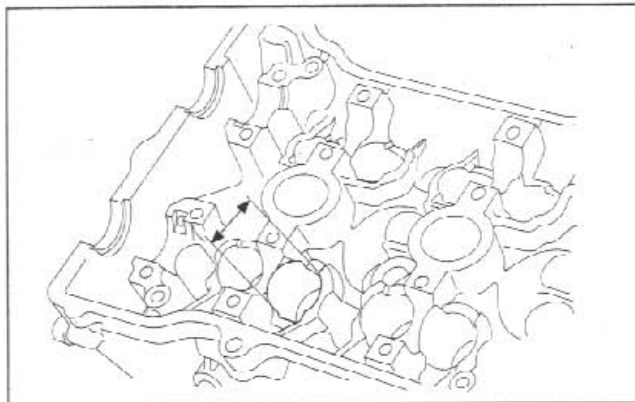


## VALVE LIFTER BORE

Inspect each valve lifter bore for scratches or abnormal wear.

Measure the each valve lifter bore I.D.

**SERVICE LIMIT: 26.04 mm (1.025 in)**



## VALVE/VALVE GUIDE

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

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

### SERVICE LIMITS:

**IN: 4.465 mm (0.1758 in)**

**EX: 4.455 mm (0.1754 in)**

Ream the guides to remove any carbon deposits before checking clearances.

Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

### TOOL:

Valve guide reamer, 4.5 mm      07HMH – ML00101 or  
07HMH – ML0010A  
(U.S.A. only)

Measure and record each valve guide I.D.

**SERVICE LIMIT: IN/EX: 4.540 mm (0.1787 in)**

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

### STANDARDS:

**IN: 0.010 – 0.037 mm (0.0004 – 0.0015 in)**

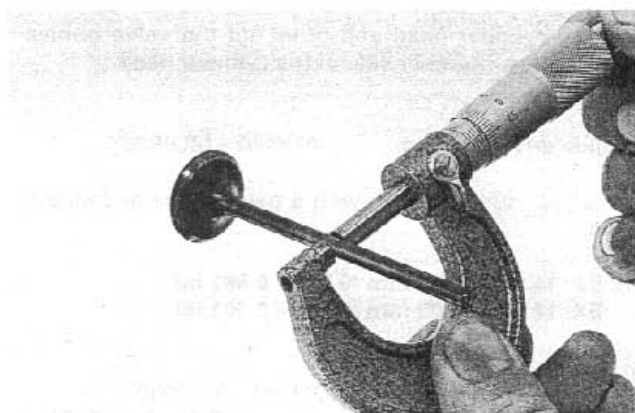
**EX: 0.020 – 0.047 mm (0.0008 – 0.0019 in)**

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

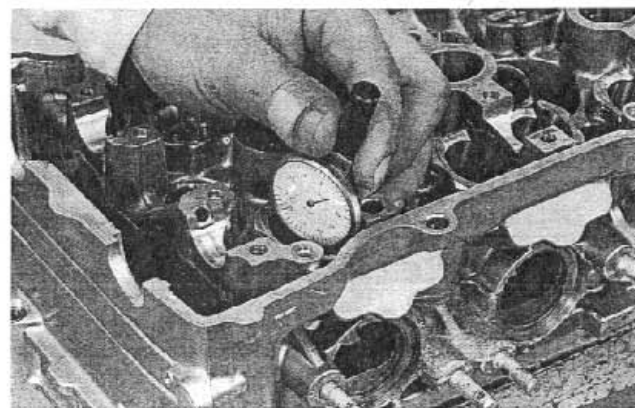
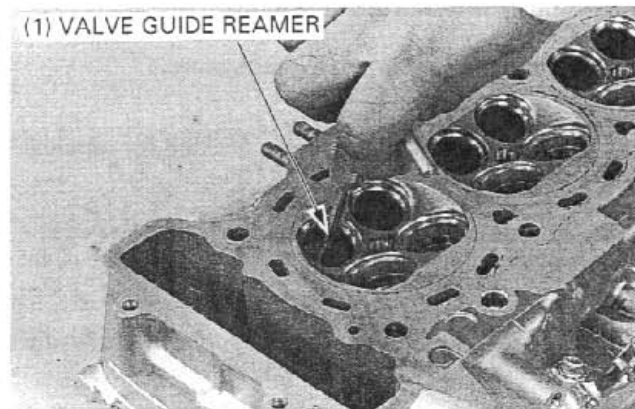
If the stem-to-guide clearance is out of standard with the new guides, replace the valves and guides.

### NOTE

- Reface the valve seats whenever the valve guides are replaced (page 8-15).



(1) VALVE GUIDE REAMER



## VALVE GUIDE REPLACEMENT

Chill the replacement valve guides in the freezer section of a refrigerator for about an hour.  
Heat the cylinder head to 100 - 150°C (212 - 300°F) with a hot plate or oven.

**▲ WARNING**

- To avoid burns, wear heavy gloves when handling the heated cylinder head.

**CAUTION**

- Do not use a torch to heat the cylinder head; it may cause warping.

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

**TOOL:**  
Valve guide driver, 4.5 mm      07HMD - ML00101

Adjust the tool setting depth with a pair of vernier calipers as shown.

**DEPTH: IN: 14.60 - 14.80 mm (0.575 - 0.583 in)**  
**EX: 14.80 - 15.00 mm (0.583 - 0.591 in)**

**TOOL:**  
Adjustable valve guide driver      07743 - 0020000  
(Not available in U.S.A.)

Drive in the guide from the top of the head.

Let the cylinder head cool to room temperature.

**U.S.A. only:**

Use the same valve guide driver that was used for removal and follow these steps:

- Mark the guide with a line at the correct height as specified in the Service Manual
- Chill the guides
- Drive in the valve guide to the line
- Check the projection height with calipers to verify the guides are within specification

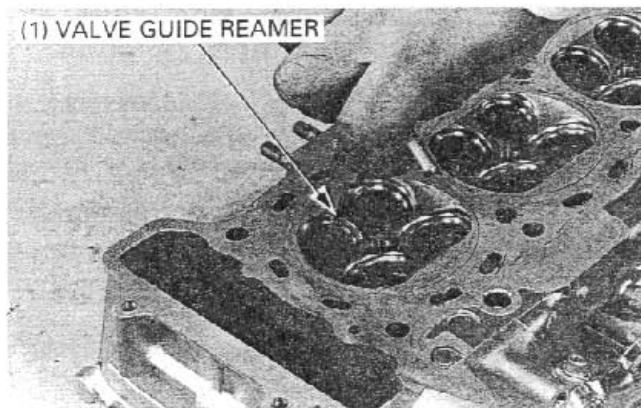
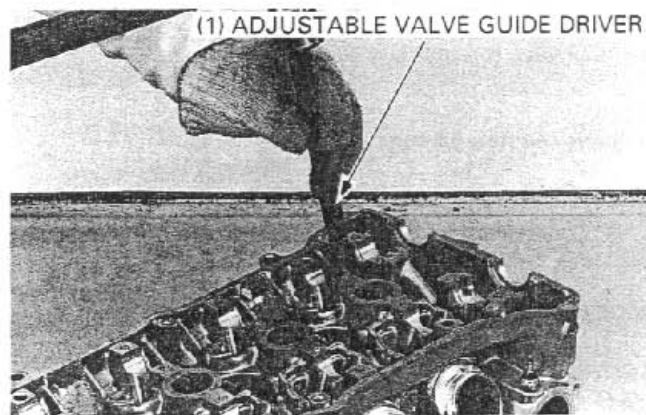
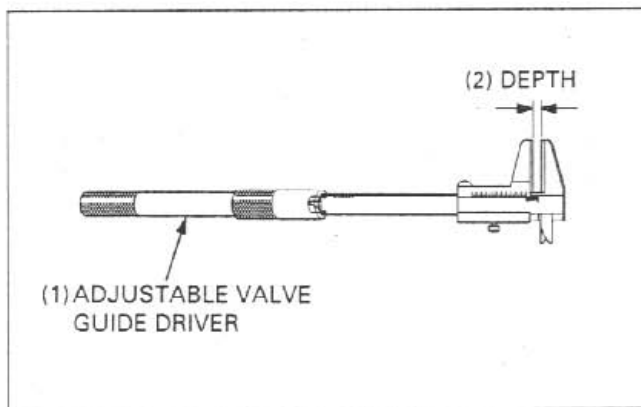
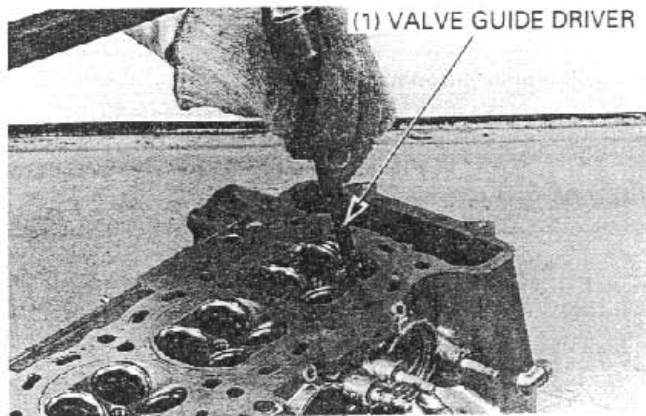
Ream the new valve guide after installation.  
Insert the reamer from the combustion chamber side of the head and also always rotate the reamer clockwise.

**TOOL:**  
Valve guide reamer, 4.5 mm      07HMH - ML00101 or  
07HMH - ML0010A  
(U.S.A. only)

**NOTE**

- Use cutting oil on the reamer during this operation.

Clean the cylinder head thoroughly to remove any metal particles.  
Reface the valve seat (see next page).



## VALVE SEAT INSPECTION/REFACING

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

Apply a light coating of Prussian Blue to the valve seats. Lap the valves and seats using a rubber hose or other hand-lapping tool.

Remove and inspect the valves.

### CAUTION

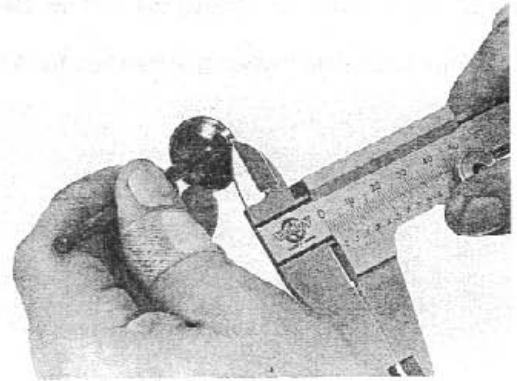
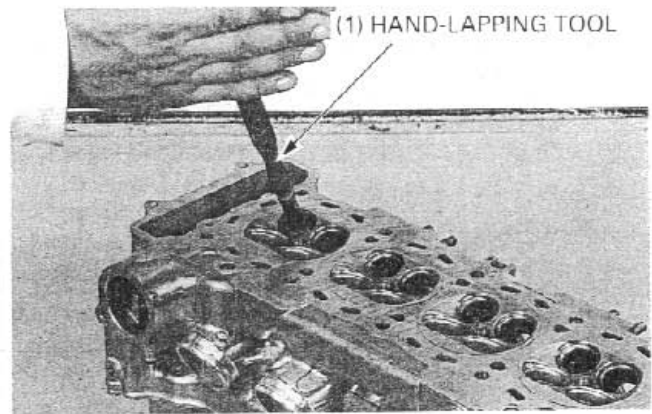
- *The valves cannot be ground. If a valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.*

Inspect the width of each valve seat.

**STANDARD:** 0.90 – 1.10 mm (0.035 – 0.043 in)

**SERVICE LIMIT:** 1.5 mm (0.06 in)

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

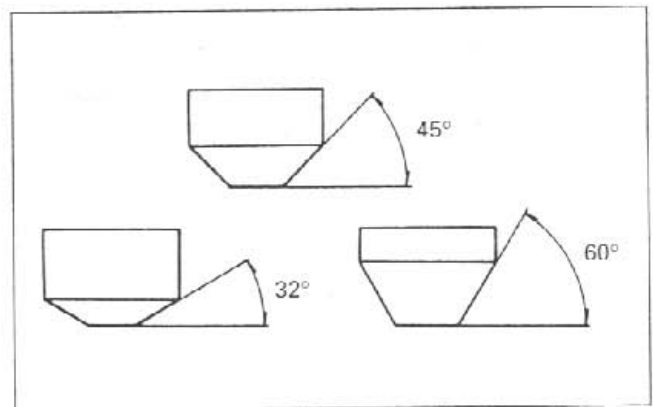


## VALVE SEAT REFACING

Valve seat cutters/grinders or equivalent valve seat refacing equipment are recommended to correct worn valve seats.

### NOTE

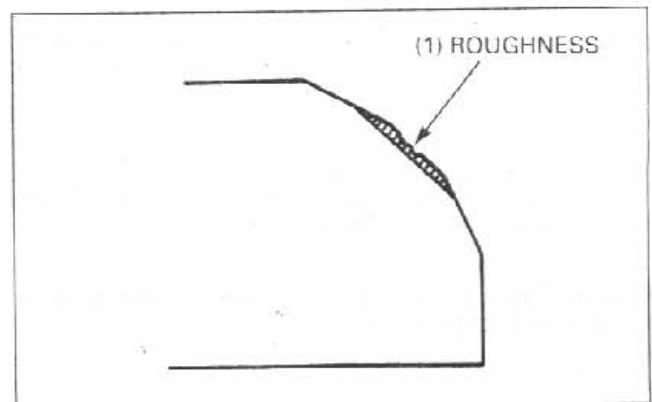
- Follow the refacing manufacture's operating instructions.



Use a 45-degree cutter to remove any roughness or irregularities from the seat.

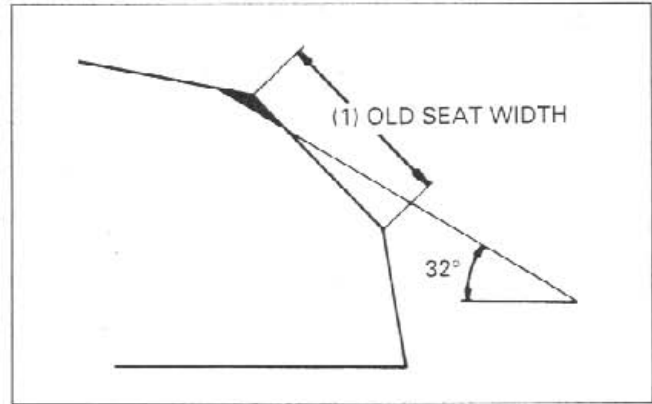
### NOTE

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

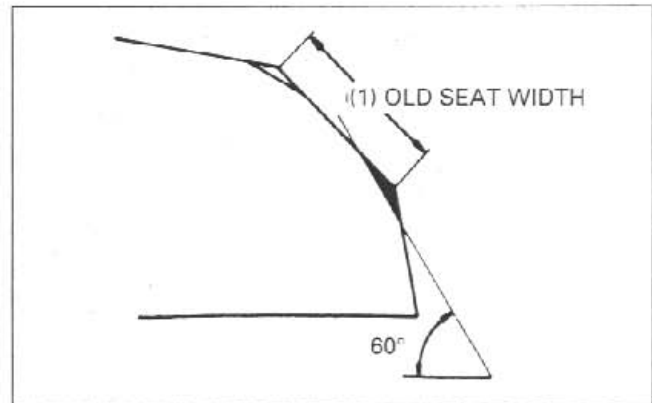


## CYLINDER HEAD/VALVES

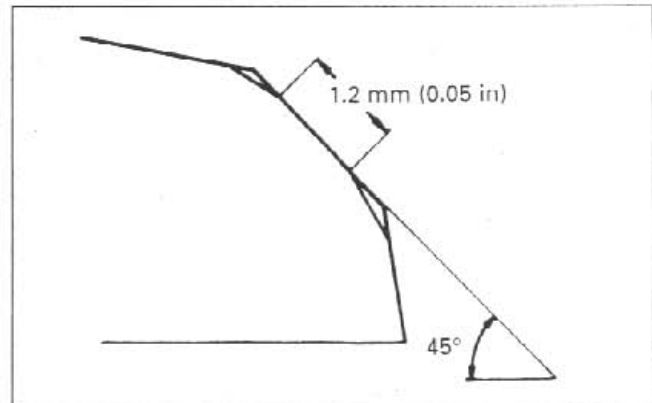
Use a 32-degree cutter to remove the top 1/4 of the existing valve seat material.



Use a 60-degree cutter to remove the bottom 1/4 of the old seat. Remove the cutter and inspect the area you have refaced.



Install a 45-degree finish cutter and cut the seat to the proper width. Make sure that all pitting and irregularities are removed. Refinish if necessary.

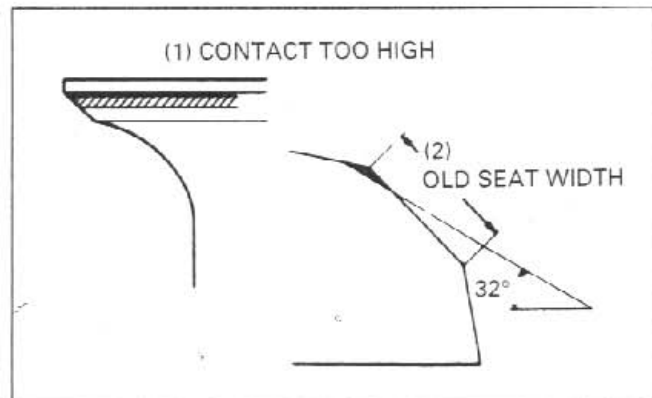


Apply a thin coating of Prussian Blue to the valve seat. Press the valve through the valve guide and onto the seat to make a clear pattern.

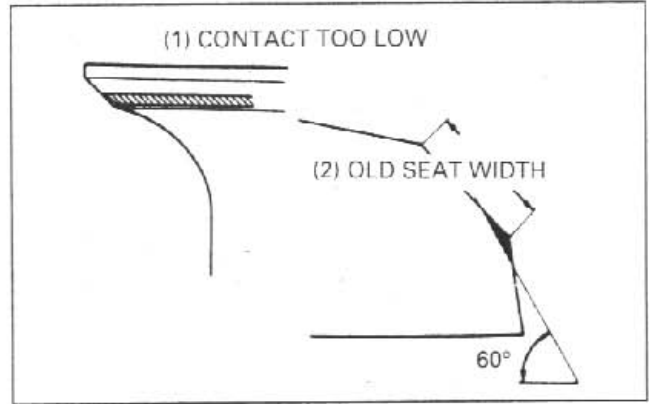
### NOTE

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

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



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

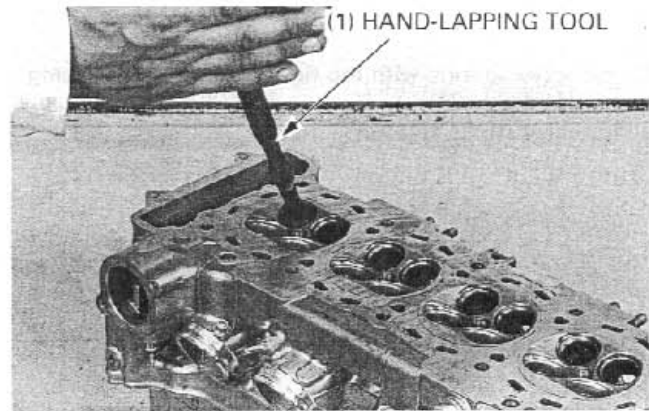


Refinish the seat to specifications, using a 45-degree finish cutter.  
After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

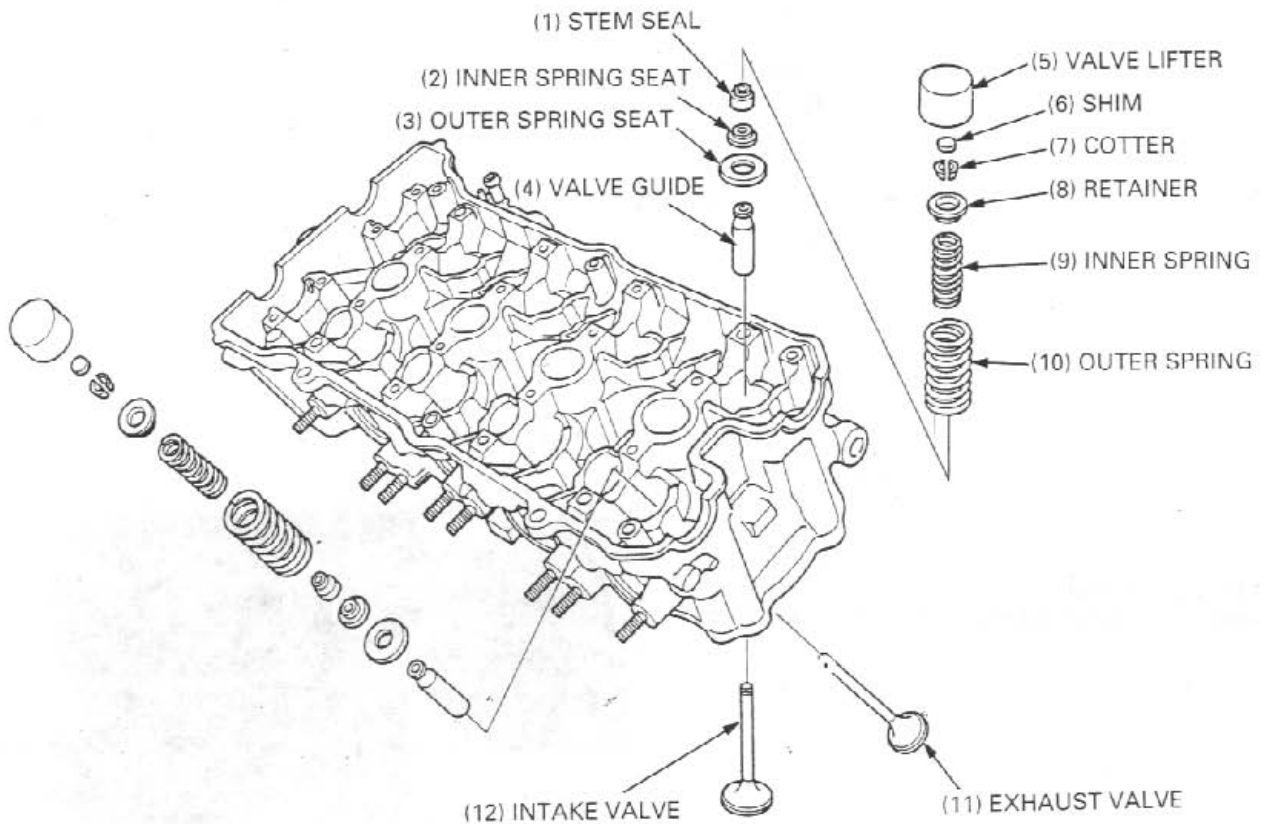
After lapping, wash all residual compound off the cylinder head and valve.

**NOTE**

- Do not allow lapping compound to enter the guides.



**CYLINDER HEAD ASSEMBLY**





## CYLINDER HEAD/VALVES

Clean the cylinder head assembly with solvent and blow through all oil passages with compressed air.

Install the inner and outer valve spring seats.  
Install the new stem seals.

### NOTE

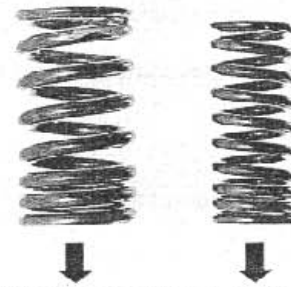
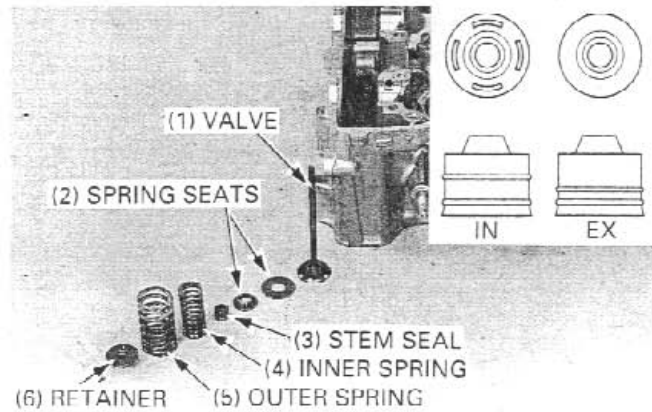
- The intake stem seal has identification projection on the outer surface. Install each stem seal in their proper position.

Lubricate the valve stems with molybdenum disulfide oil and insert the valve into the valve guide.

To avoid damage to the stem seal, turn the valve slowly when inserting.

Install the valve springs with the tightly wound coils facing the combustion chamber.

Install the valve spring retainer.



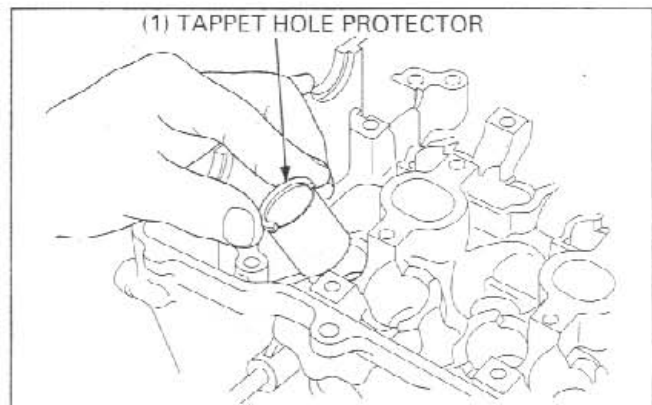
(1) FACING THE COMBUSTION CHAMBER

Install the tappet hole protector into the valve lifter bore.

### TOOL:

Tappet hole protector

07HMG - MR70002  
(Not available in U.S.A.)



Install the valve cotters using the special tool as shown.  
To prevent loss of tension, do not compress the valve spring more than necessary.

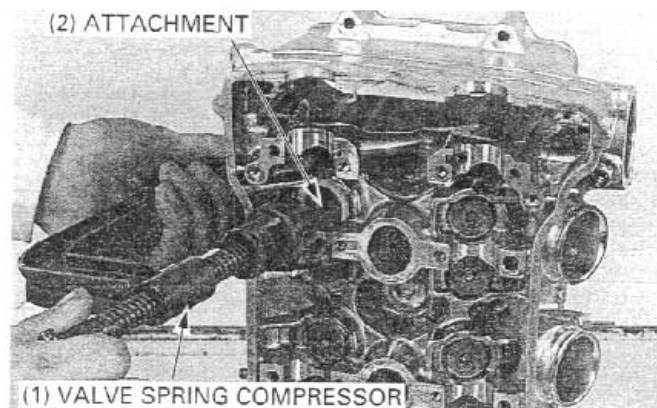
### TOOL:

Valve spring compressor

07757 - 0010000

Valve spring compressor attachment

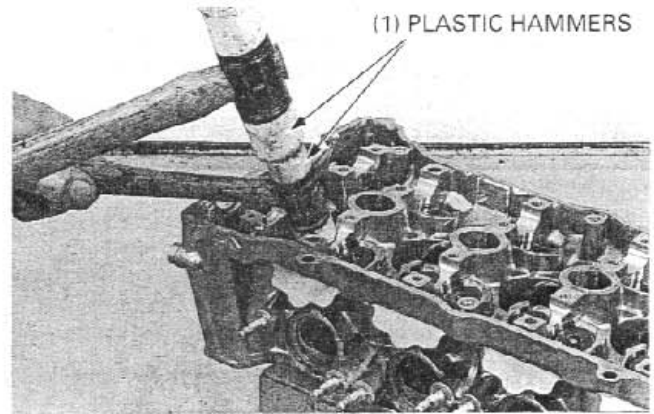
07959 - KM30101



Tap the valve stems gently with two plastic hammers as shown to seat the cotters firmly.

### CAUTION

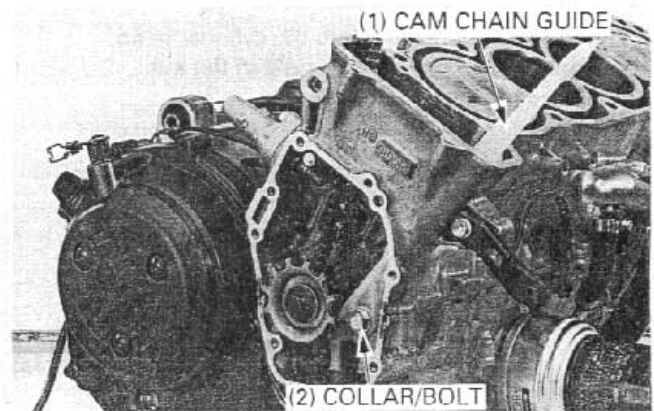
- Support the cylinder head above the work bench surface to prevent possible valve damage.



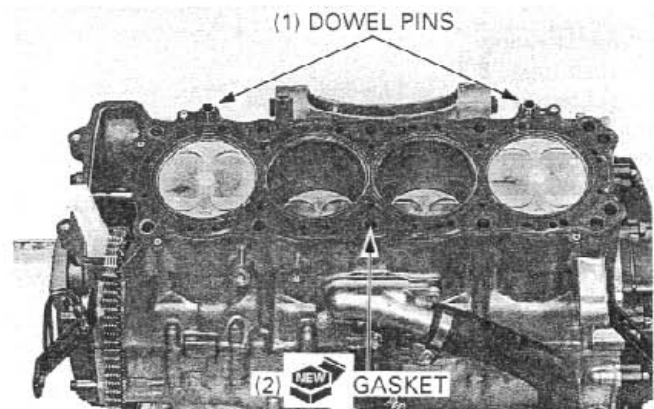
## CYLINDER HEAD INSTALLATION

Install the collar onto the cam chain guide pivot. Install the cam chain guide and tighten the bolt.

Install the ignition pulse generator rotor cover (page 17-9).



Install the dowel pins and a new cylinder head gasket as shown.



Install the cylinder head.

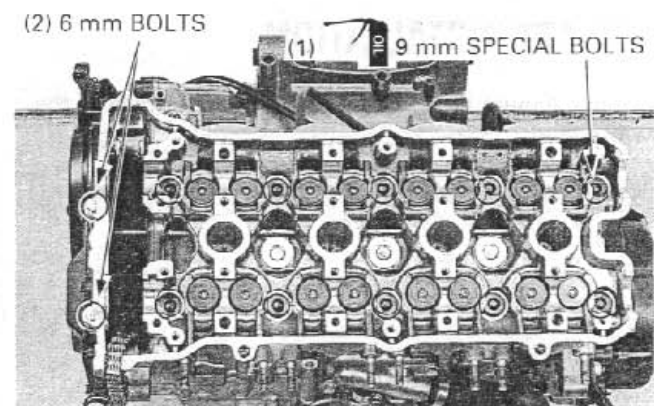
Apply oil to the threads and seating surface of the 9 mm special bolts/washers and install them.

Install the two 6 mm flange bolts.

Tighten the 9 mm special bolts in a crisscross pattern in 2-3 steps to the specified torque.

**TORQUE: 47 N·m (4.8 kgf·m, 35 lbf·ft)**

Tighten the 6 mm flange bolts.

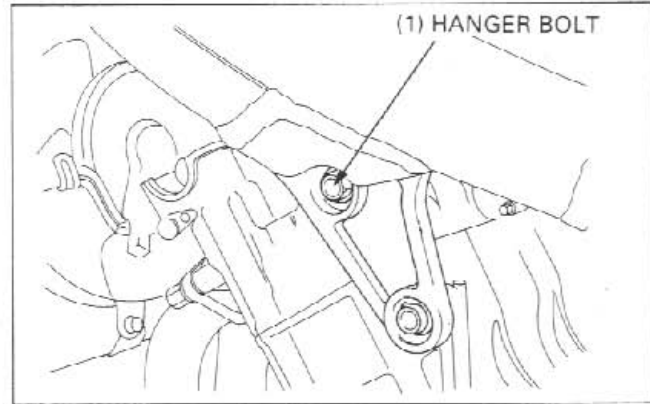


## CYLINDER HEAD/VALVES

Install the left upper engine hanger bolt.  
Tighten the hanger bolt to the specified torque.

### TORQUE:

LEFT: 39 N·m (4.0 kgf·m, 29 lbf·ft)

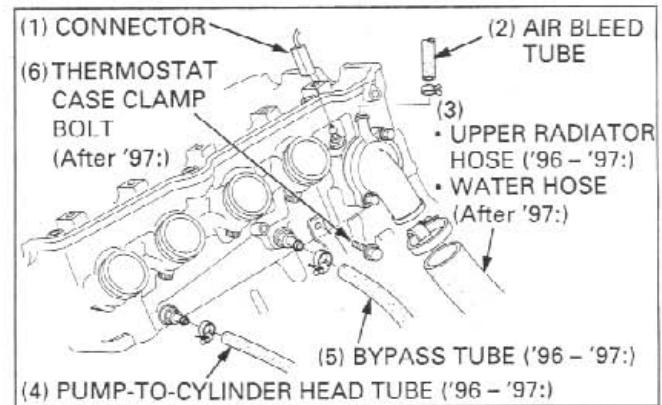


Install the cam chain tensioner into the cylinder head.  
Install the new sealing washer and tighten the nut.



### Install the following:

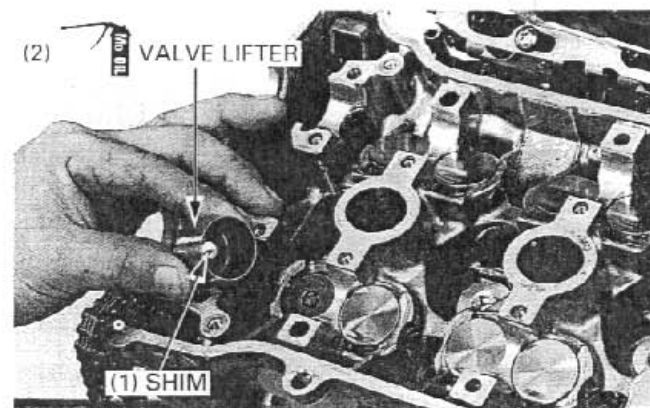
- Camshaft (page 8-3)
- Coolant temperature sensor connector
- Air bleed tube
- Upper radiator hose ('96 - '97:)
- Water hose (After '97:)
- Water pump-to-cylinder head hose ('96 - '97:)
- Bypass hose ('96 - '97:)
- Thermostat case clamp bolt (After '97:)



## CAMSHAFT INSTALLATION

Apply molybdenum disulfide oil to the outer surface of the each valve lifter.

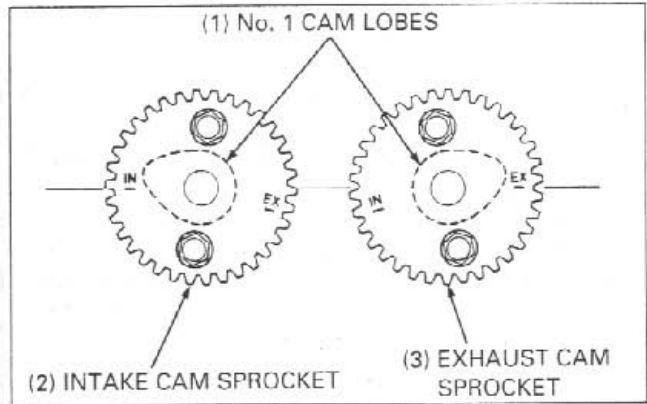
Install the shims and valve lifters into the valve lifter bores.



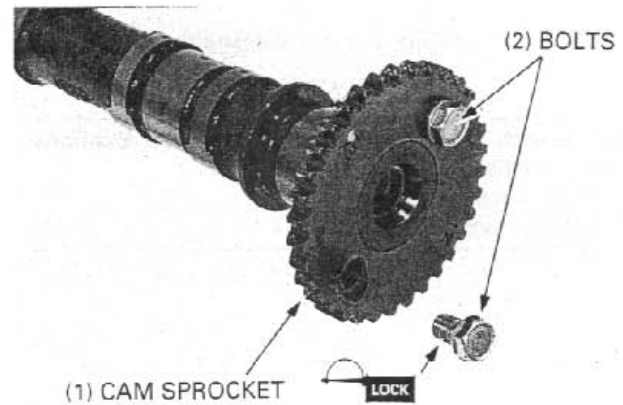
If the cam sprockets are removed, install the cam sprockets onto the camshafts.

**NOTE**

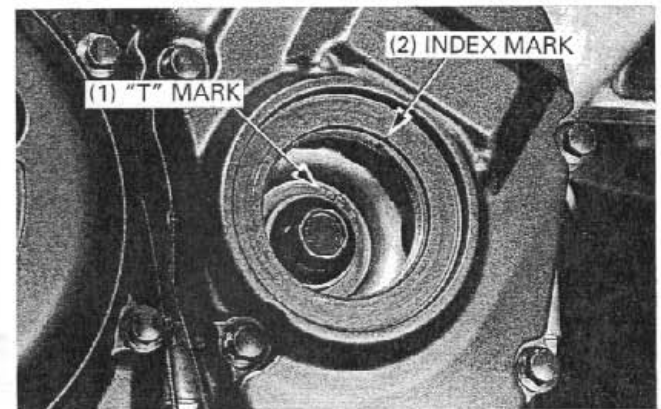
- Install the intake cam sprocket with the timing mark (IN) facing outward and the No.1 cam lobes facing up and out as shown.
- Install the exhaust cam sprocket with the timing mark (EX) facing outward and the No. 1 cam lobes facing up and out as shown.



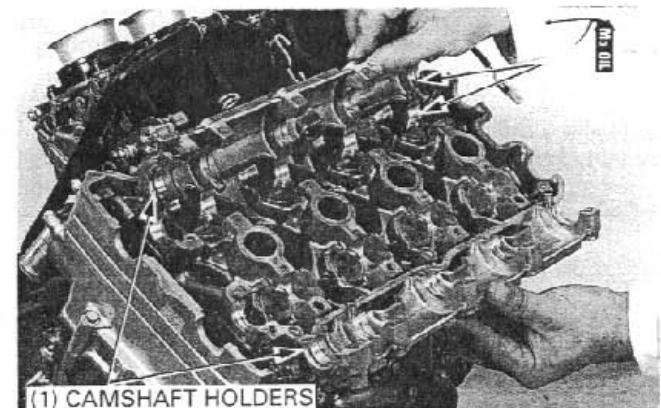
Clean and apply a locking agent to the cam sprocket bolt threads. Temporarily install the cam sprocket bolts.



Turn the crankshaft clockwise and align the "T" mark on the ignition pulse generator rotor with the index mark on the ignition pulse generator rotor cover.



Apply molybdenum disulfide oil to the camshaft journals of the cylinder head and camshaft holder.

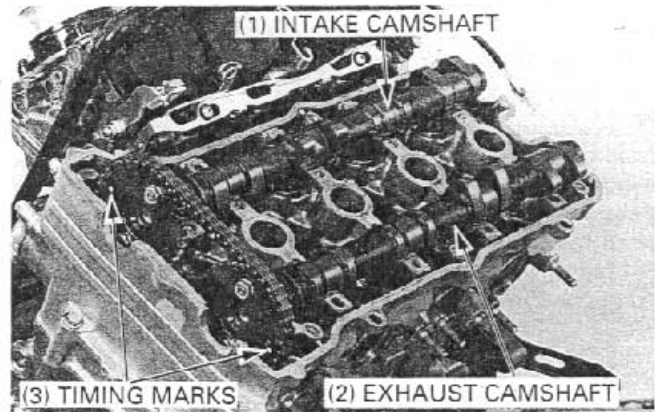


## CYLINDER HEAD/VALVES

Install the cam chain over the cam sprockets and then install the intake and exhaust camshafts.

### NOTE

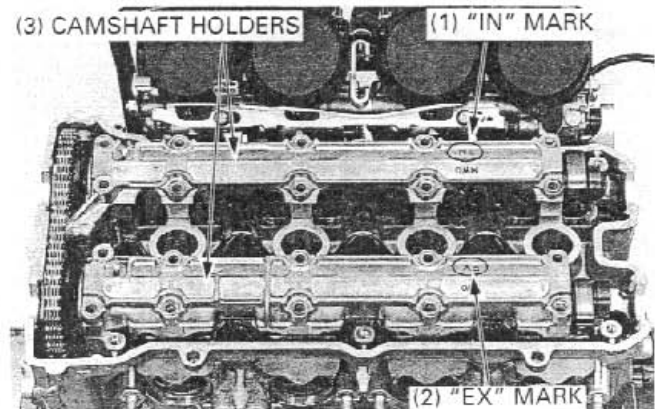
- Install the each camshaft to the correct locations with the identification marks.  
"IN": Intake camshaft  
"EX": Exhaust camshaft
- Make sure that the timing marks on the cam sprockets are facing outward and flush with the cylinder head upper surface as shown.



Install the camshaft holders onto the camshafts.

### NOTE

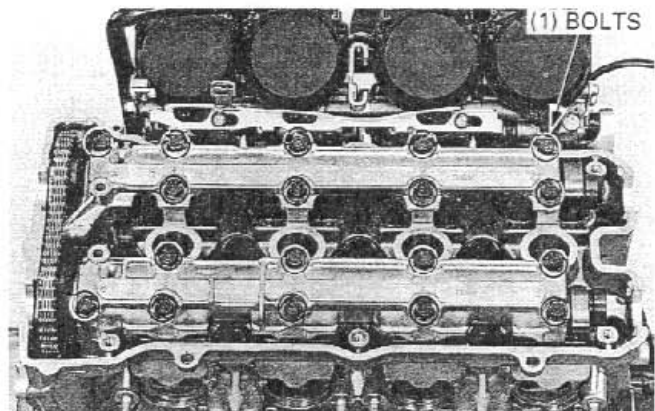
- Install the each camshaft holder to the correct locations with the identification marks.  
"IN": Intake camshaft holder  
"EX": Exhaust camshaft holder



Temporarily install the eighteen holder bolts until the cam holders lightly contact the cylinder head surface.

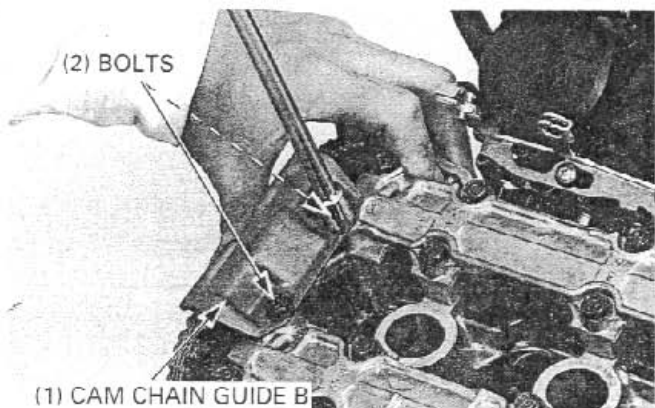
### CAUTION

- *Tightening the camshaft holder bolts on only one-side might cause a camshaft holder to break.*



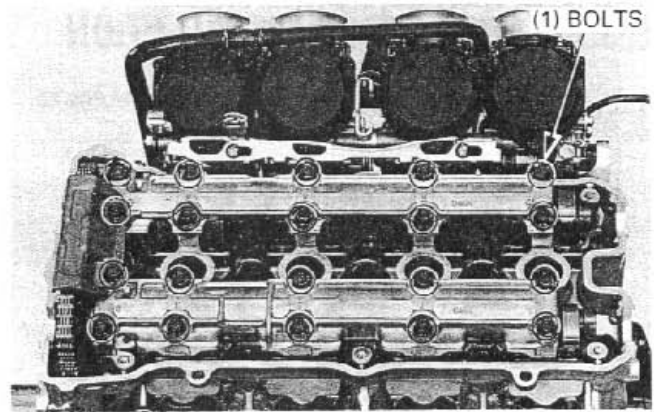
Install the cam chain guide B, cam chain guide mounting bolt and remaining camshaft holder bolts.

While pushing the cam chain guide B to the direction of the camshaft holder, temporarily tighten the holder bolts.



Tighten all camshaft holder bolts in the numerical order casted on the camshaft holder.

**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

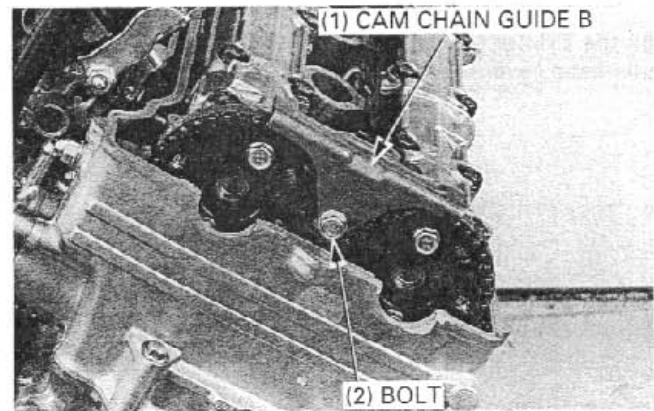


In case the cam sprockets were removed, tighten the cam sprocket bolts to the specified torque.

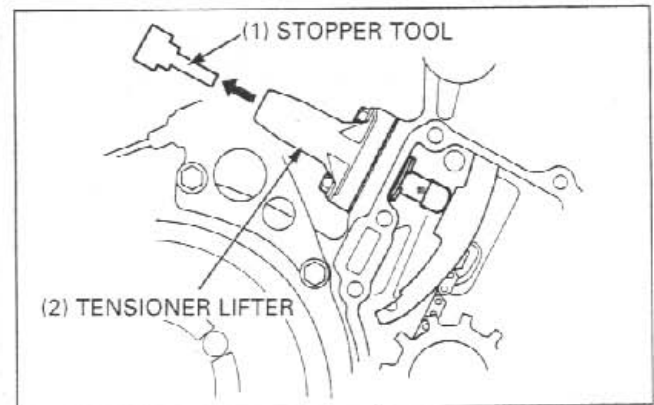
**TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)**

Turn the crankshaft clockwise one full turn (360°) and tighten the other cam sprocket bolts.

Tighten the cam chain guide B bolt.

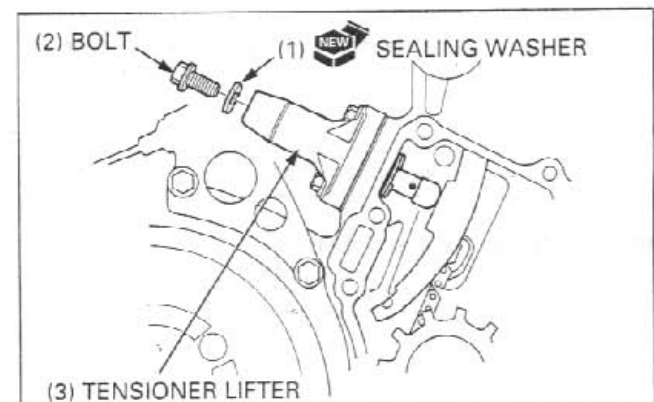


Remove the stopper tool from the cam chain tensioner lifter.



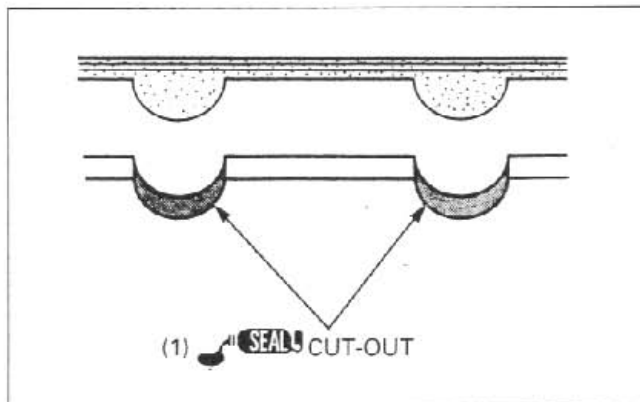
Install a new sealing washer and tighten the sealing bolt.

Recheck the valve timing.



## CYLINDER HEAD COVER INSTALLATION

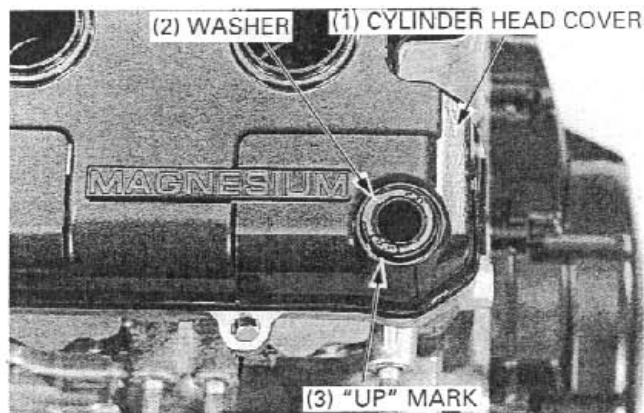
Apply sealant to the cylinder head semi-circular cut-outs as shown.



Install the cylinder head packing into the groove of the cylinder head cover.



Install the cylinder head cover onto the cylinder head. Install the washers with their "UP" mark facing up.

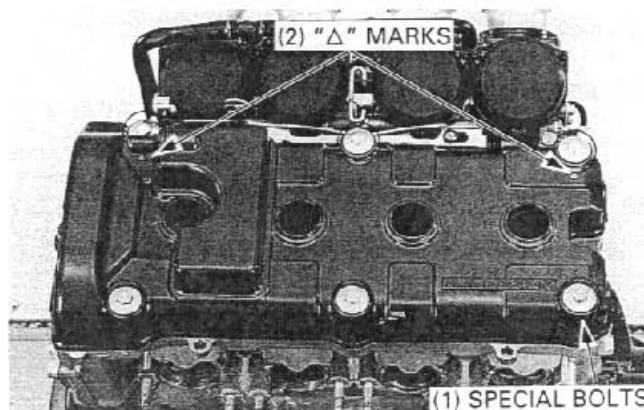


Install and tighten the cylinder head cover special bolts to the specified torque.

### NOTE

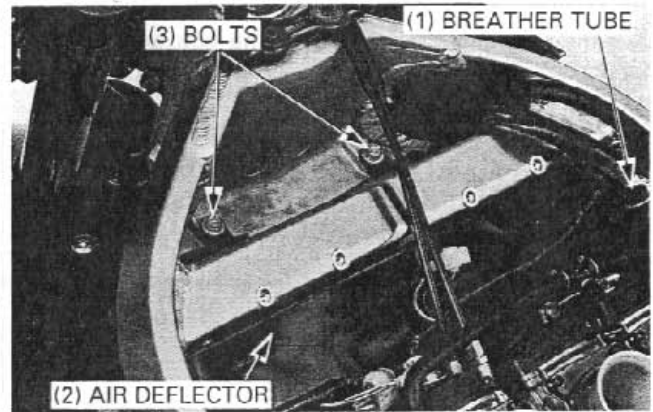
- Tighten the "Δ" marked side bolts first.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



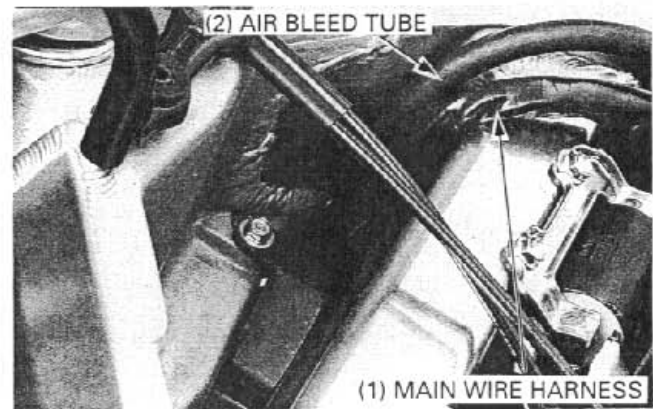
Connect the breather tube.

Install the air deflector and tighten the bolts.



#### NOTE

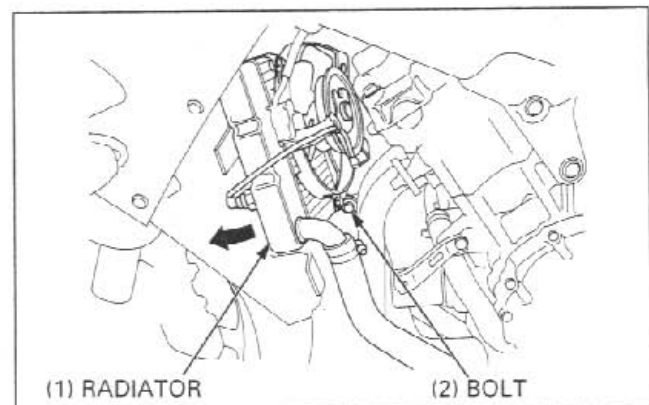
- While installing the air deflector, route the main wire harness and air bleed tube properly as shown.



Install and tighten the radiator lower mounting bolt.

Install the following:

- Ignition coil assembly (page 17-6)
- Air cleaner housing (page 5-4)
- Middle/lower cowl (page 2-6)
- Fuel tank (page 2-2)

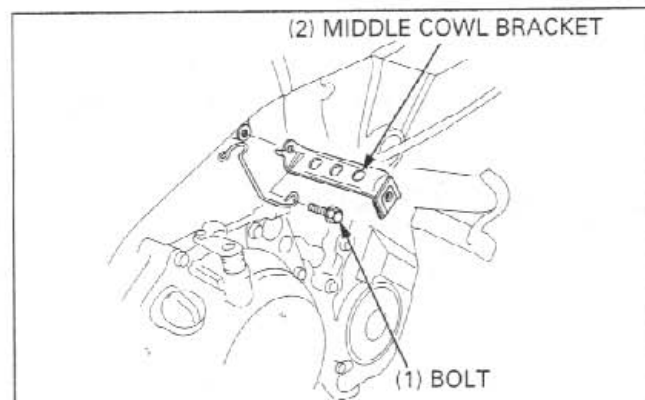


## CAM CHAIN TENSIONER LIFTER

### REMOVAL

Remove the right middle cowl (page 2-6).

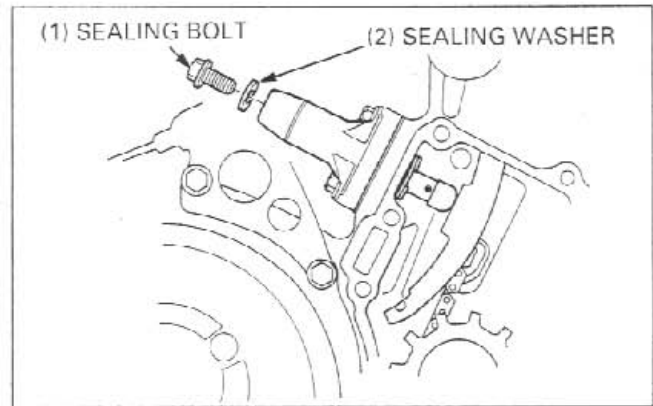
Remove the bolt and right middle cowl bracket.



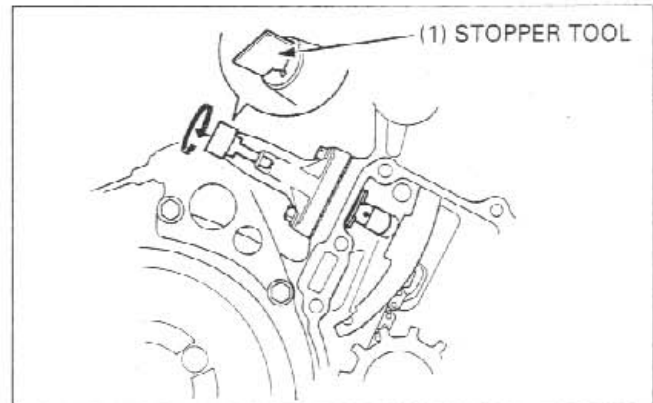


## CYLINDER HEAD/VALVES

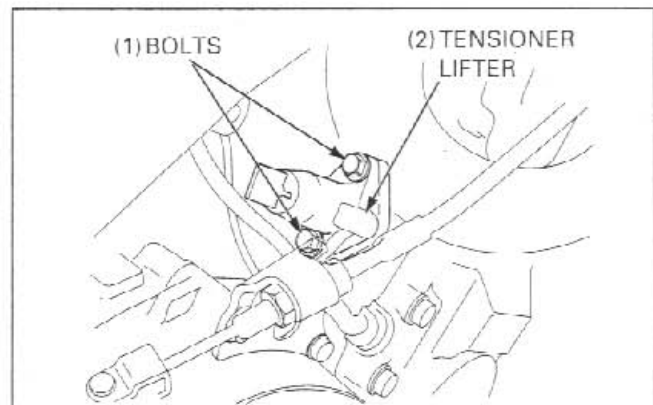
Remove the cam chain tensioner sealing bolt and sealing washer.



Turn the tensioner shaft fully in (clockwise) and secure it using the stopper tool to prevent damaging the cam chain. See page 8-6 for detail of the tool.



Remove the bolts and cam chain tensioner lifter. Remove the gasket.

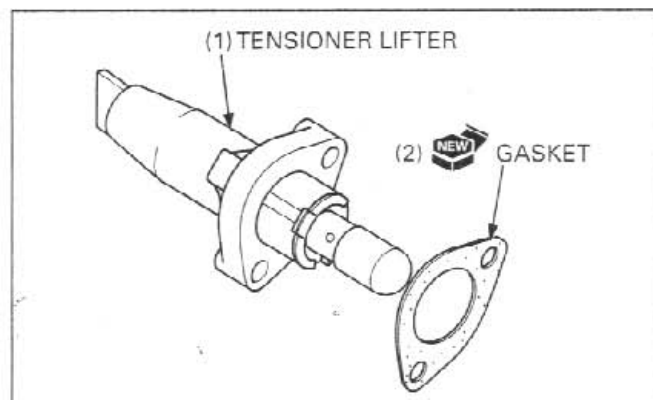


## INSTALLATION

Install the new gasket onto the cam chain tensioner lifter.

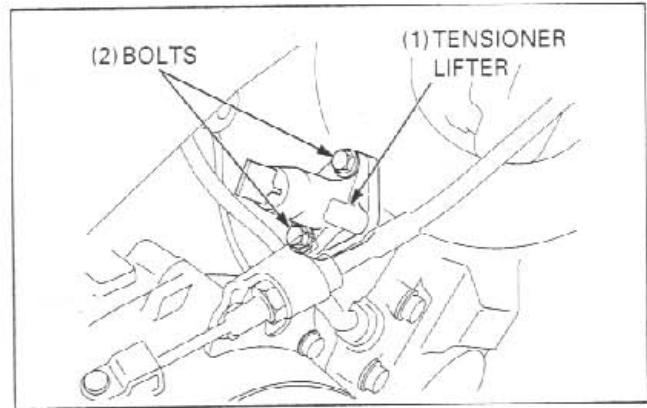
### NOTE

- Note the direction of the gasket.



Install the cam chain tensioner lifter into the crankcase and tighten the mounting bolts to the specified torque.

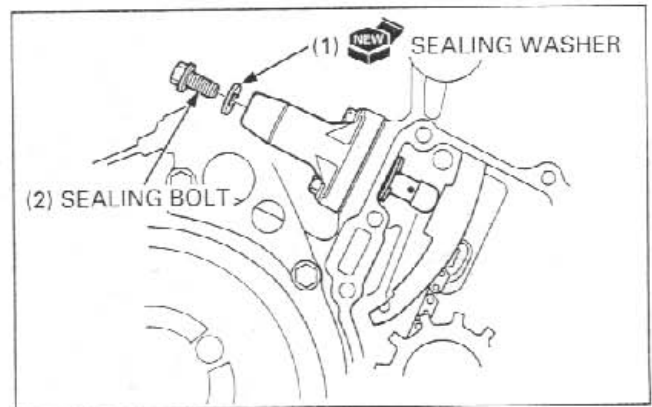
**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

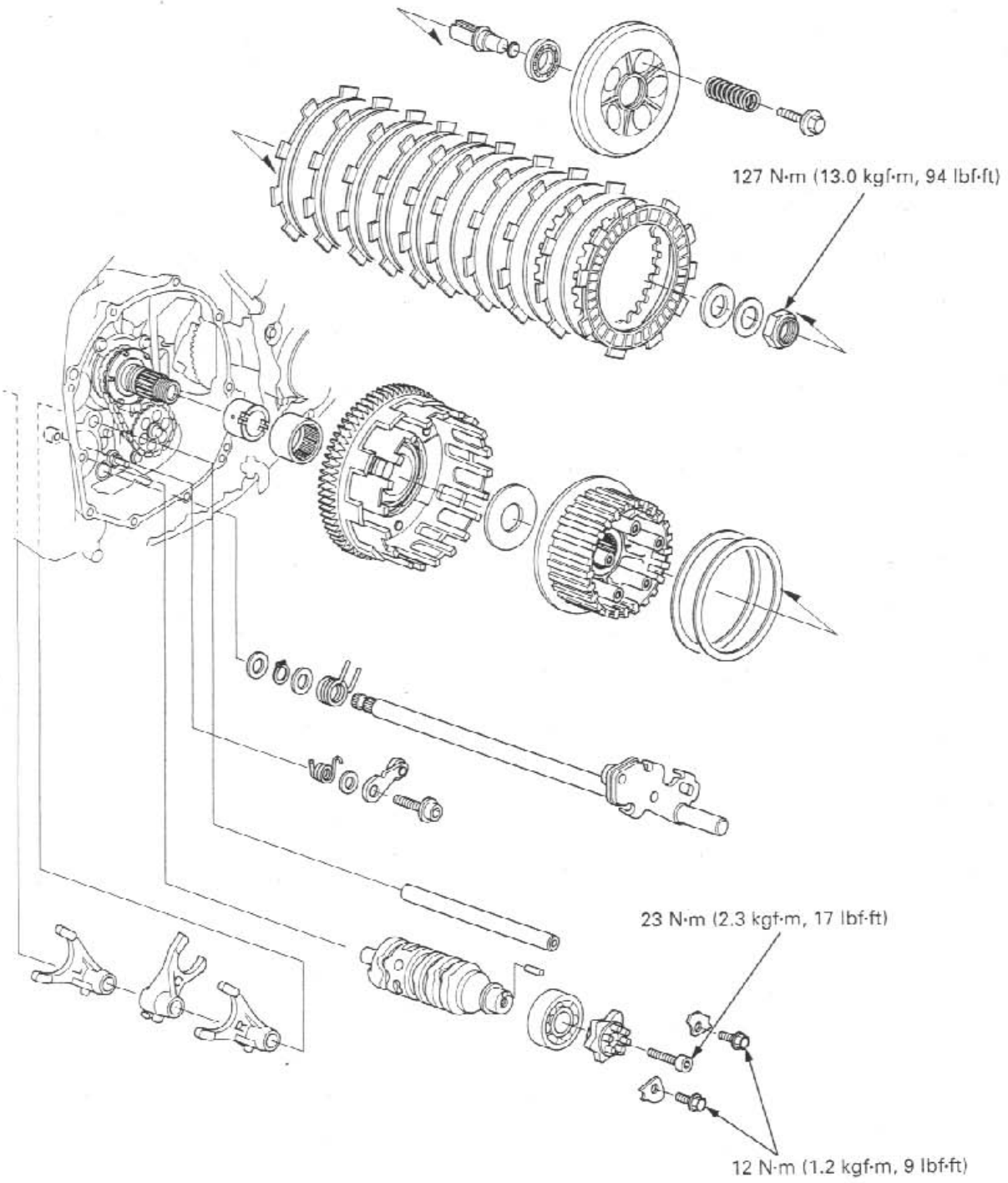


Remove the stopper tool.

Install a new sealing washer and tighten the sealing bolt securely.

Install the removed parts in the reverse order of removal.





# 9. CLUTCH/GEARSHIFT LINKAGE

|                               |     |                                    |      |
|-------------------------------|-----|------------------------------------|------|
| SERVICE INFORMATION           | 9-1 | CLUTCH                             | 9-4  |
| TROUBLESHOOTING               | 9-2 | GEARSHIFT LINKAGE                  | 9-11 |
| RIGHT CRANKCASE COVER REMOVAL | 9-3 | RIGHT CRANKCASE COVER INSTALLATION | 9-16 |

## SERVICE INFORMATION

### GENERAL

- This section covers service of the clutch, gearshift linkage, shift drum and shift forks. All service can be done with the engine installed in the frame.
- Transmission oil viscosity and level have an effect on clutch disengagement. When the clutch does not disengage or the motorcycle creeps with clutch disengaged, inspect the transmission oil level before servicing the clutch system.

### SPECIFICATIONS

Unit: mm (in)

| CLUTCH/GEARSHIFT LINKAGE             |                 | STANDARD                              | SERVICE LIMIT                     |
|--------------------------------------|-----------------|---------------------------------------|-----------------------------------|
| ITEM                                 |                 |                                       |                                   |
| Clutch lever free play               |                 | 10 – 20 (3/8 – 3/4)                   | —                                 |
| Clutch spring free length            | '96 – '97:      | 50.2 (1.98)                           | 49.2 (1.93)                       |
|                                      | After '97:      | 48.8 (1.92)                           | 47.0 (1.85)                       |
| Clutch disc thickness                | '96 – '97:      | 2.62 – 2.78 (0.103 – 0.109)           | 2.3 (0.09)                        |
|                                      | After '97:      | 2.92 – 3.08 (0.11 – 0.12)             | 2.6 (0.102)                       |
| Clutch plate warpage                 |                 | —                                     | 0.30 (0.012)                      |
| Clutch outer guide                   | I.D.            | 24.9935 – 25.0035 (0.98399 – 0.98451) | 25.016 (0.9849)                   |
|                                      | O.D.            | 34.975 – 34.991 (1.3770 – 1.3776)     | 34.965 (1.3766)                   |
| Mainshaft O.D. at clutch outer guide |                 | 24.980 – 24.993 (0.9835 – 0.9840)     | 24.96 (0.983)                     |
| Shift fork, fork shaft               | Fork            | I.D.                                  | 12.000 – 12.021 (0.4724 – 0.4733) |
|                                      |                 | Claw thickness                        | 5.93 – 6.00 (0.233 – 0.236)       |
|                                      | Fork shaft O.D. | 11.957 – 11.968 (0.4707 – 0.4712)     | 11.95 (0.470)                     |

9

### TORQUE VALUES

|                                   |                                 |   |
|-----------------------------------|---------------------------------|---|
| Right crankcase cover SH bolt     | 12 N·m (1.2 kgf·m, 8.7 lbf·ft)  |   |
| Clutch center lock nut            | 127 N·m (13.0 kgf·m, 94 lbf·ft) | Apply oil to the threads<br>Stake the nut |
| Gearshift pedal spring stopper    | 22 N·m (2.2 kgf·m, 16 lbf·ft)   |   |
| Shift drum center bolt            | 23 N·m (2.3 kgf·m, 17 lbf·ft)   | Apply a locking agent to the threads      |
| Shift drum bearing set plate bolt | 12 N·m (1.2 kgf·m, 8.7 lbf·ft)  | Apply a locking agent to the threads      |

### TOOLS

|                        |                 |   |
|------------------------|-----------------|---|
| Clutch center holder   | 07724 – 0050002 | Equivalent commercially available in U.S.A. |
| Driver                 | 07749 – 0010000 |   |
| Attachment, 37 x 40 mm | 07746 – 0010200 |   |
| Attachment, 42 x 47 mm | 07746 – 0010300 |   |
| Pilot, 35 mm           | 07746 – 0040800 |   |

## TROUBLESHOOTING

### Hard to shift

- Incorrect clutch adjustment
- Improper oil viscosity
- Bent shift fork
- Bent shift fork shaft
- Bent fork claw
- Damaged shift drum cam groove
- Loose stopper plate bolt
- Damaged stopper plate and pin
- Damaged gearshift spindle

### Transmission jumps out of gear

- Worn shift drum stopper arm
- Weak or broken shift arm return spring
- Loose stopper plate bolt
- Bent shift fork shaft
- Damaged shift drum cam groove
- Damaged or bent shift forks
- Worn gear engagement dogs or slots

### Gearshift pedal will not return

- Weak or broken gearshift spindle return spring
- Bent gearshift spindle

### Clutch lever too hard to pull in

- Damaged, kinked or dirty clutch cable
- Damaged clutch lifter mechanism
- Faulty clutch lifter bearing
- Clutch lifter piece installed improperly

### Clutch slips when accelerating

- Incorrect clutch adjustment
- Worn clutch disc
- Weak clutch springs
- Transmission oil mixed with molybdenum or graphite additive

### Motorcycle creeps with the engine idling

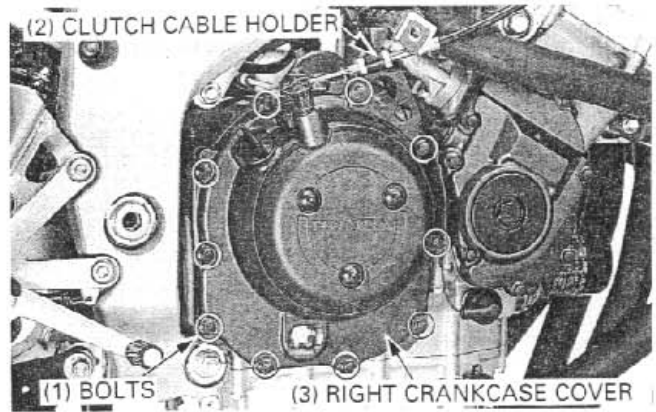
- Incorrect clutch adjustment
- Clutch plate warped
- Loose clutch lock nut
- Oil level too high
- Improper oil viscosity
- Damaged clutch lifter mechanism
- Clutch lifter piece installed improperly

## RIGHT CRANKCASE COVER REMOVAL

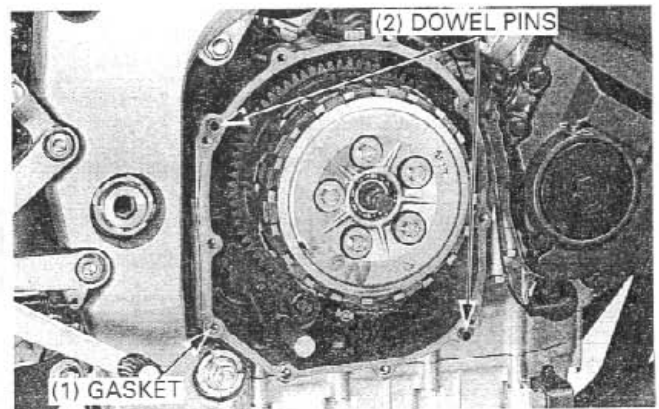
Drain the engine oil (page 3-12).

Remove the clutch cable holder SH bolts and clutch cable holder, then disconnect the clutch cable from the clutch arm.

Remove the right crankcase cover SH bolts and right crankcase cover.

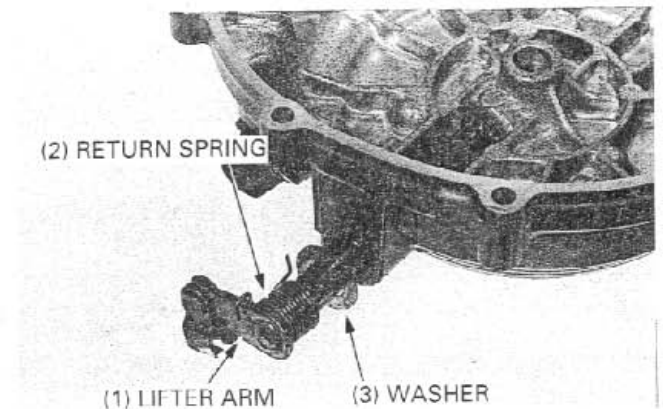


Remove the gasket and dowel pins.

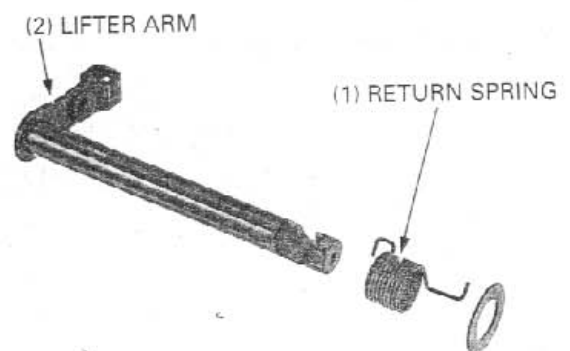


## CLUTCH LIFTER INSPECTION

Remove the clutch lifter arm, return spring and washer.

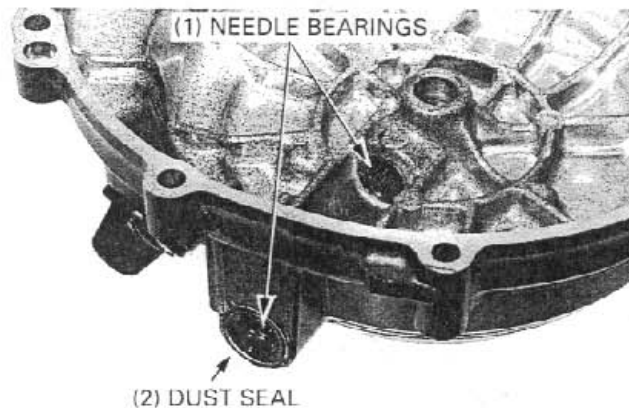


Check the return spring for fatigue or damage.  
Check the clutch lifter arm shaft for wear or bending.



## CLUTCH/GEARSHIFT LINKAGE

Check the needle bearings for wear, damage or loose fit.  
Check the dust seal for fatigue or damage.

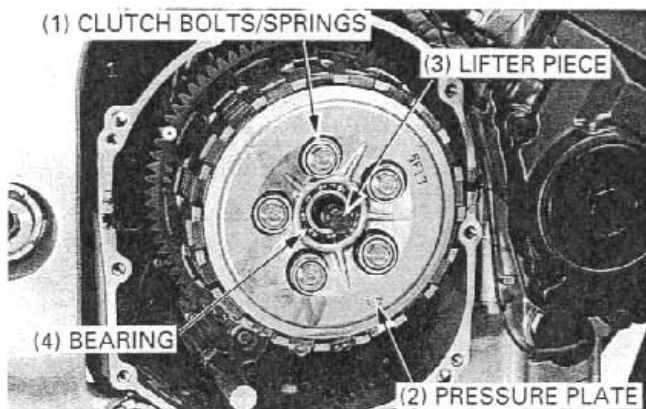


## CLUTCH

### REMOVAL

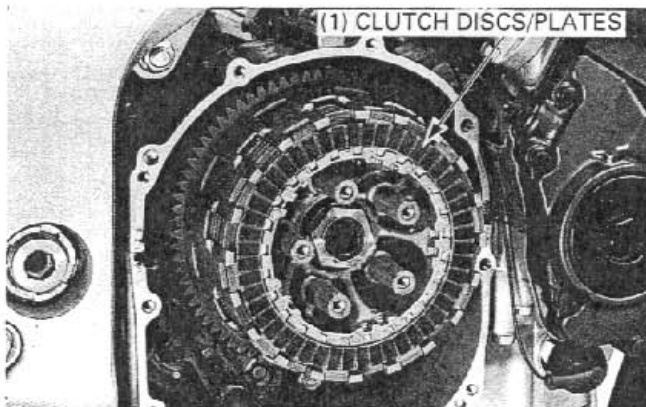
Remove the clutch flange bolts, springs and pressure plate.

Remove the clutch lifter piece and bearing.



Remove the following:

- Clutch disc C (After '97:)
- Clutch discs B
- Clutch plates
- Clutch disc A
- Judder spring
- Spring seat



Unstake the clutch center lock nut.



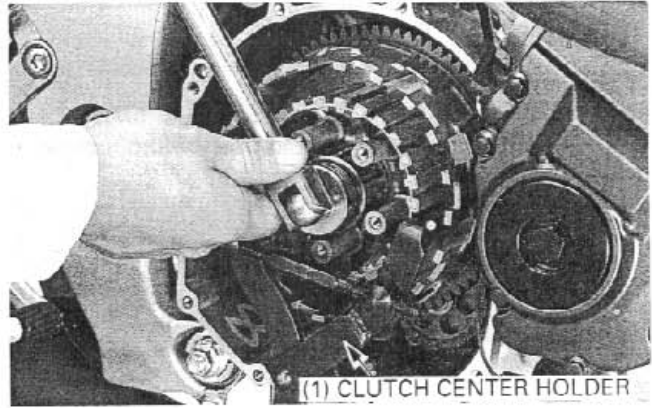
Hold the clutch center with the clutch center holder, then remove the lock nut.

**TOOL:**

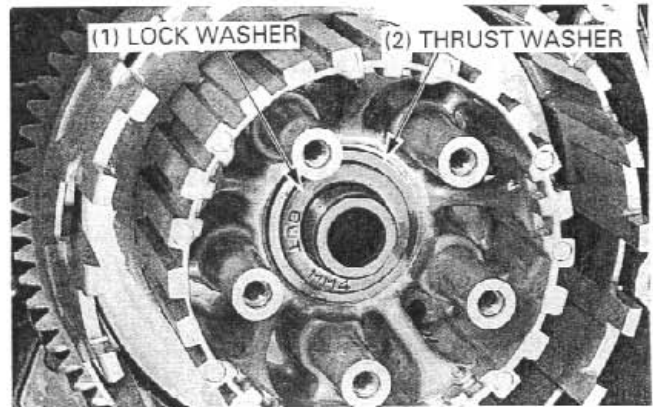
**Clutch center holder**

**07724 - 0050002**  
(Equivalent commercially available in U.S.A.)

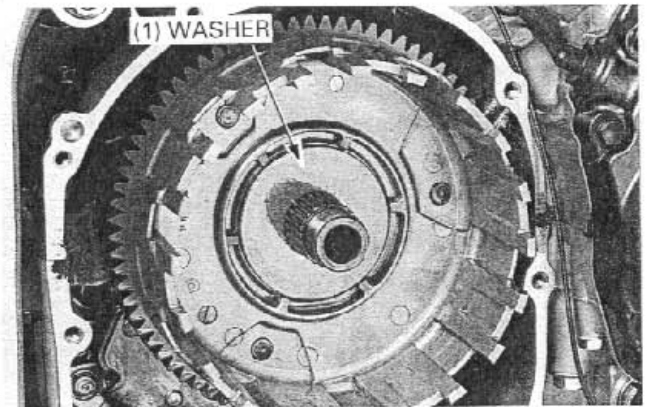
Discard the lock nut.



Remove the lock washer, thrust washer and clutch center.



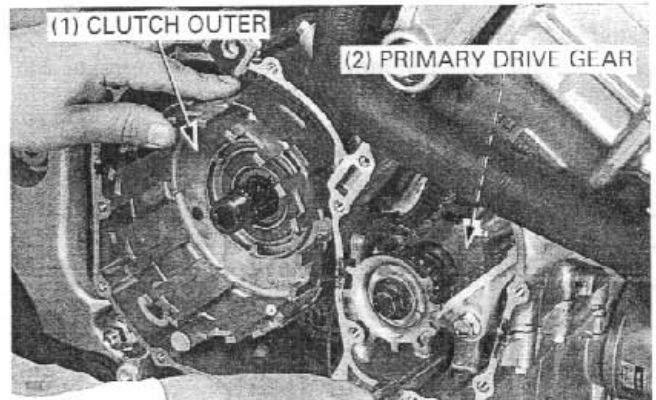
Remove the washer.



Remove the ignition pulse generator rotor cover (page 17-7).

Align the primary drive gear and sub-gear tooth with a screwdriver as shown.

Pull out the clutch outer and outer guide.





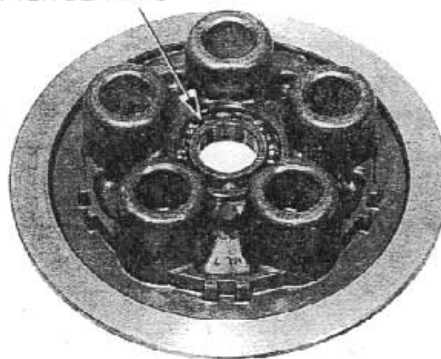
## INSPECTION

### Clutch lifter bearing

Turn the inner race of the lifter bearing with your finger. The bearing should turn smoothly and freely without excessive play.

If necessary replace the bearing.

(1) LIFTER BEARING



### Clutch spring

Measure the clutch spring free length.

### SERVICE LIMIT:

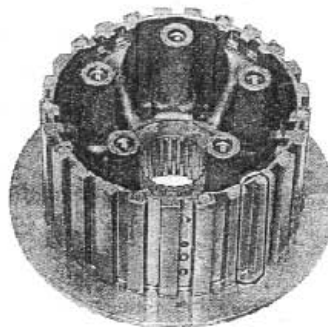
|            |                   |
|------------|-------------------|
| '96 - '97: | 49.2 mm (1.93 in) |
| After '97: | 47.0 mm (1.85 in) |



### Clutch center

Check the grooves of the clutch center for damage or wear caused by the clutch plates.

Replace if necessary.



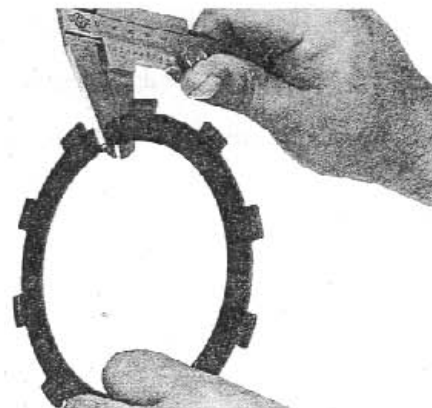
### Clutch disc

Replace the clutch discs if they show signs of scoring or discoloration.

Measure the disc thickness of each disc.

### SERVICE LIMIT:

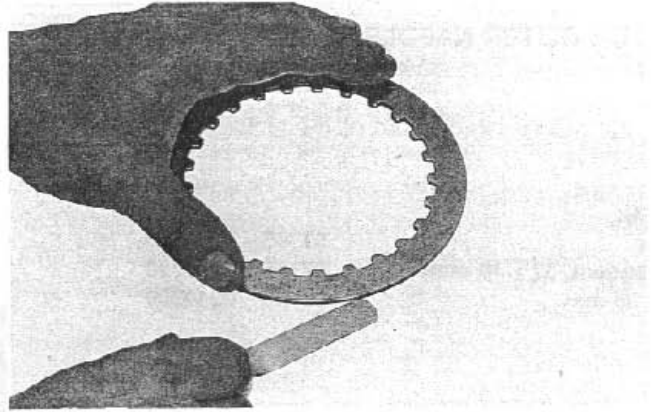
|            |                   |
|------------|-------------------|
| '96 - '97: | 2.3 mm (0.09 in)  |
| After '97: | 2.6 mm (0.102 in) |



## Clutch plate

Check each disc plate for warpage on a surface plate using a feeler gauge.

**SERVICE LIMIT: 0.30 mm (0.012 in)**

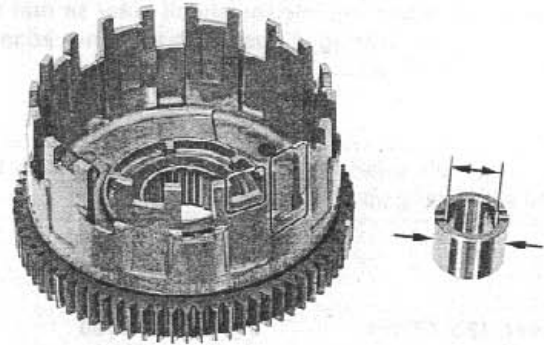


## Clutch outer/clutch outer guide

Check the slots of the clutch outer for damage or wear caused by the clutch discs. Replace if necessary.

Measure the O.D. and I.D. of the clutch outer guide.

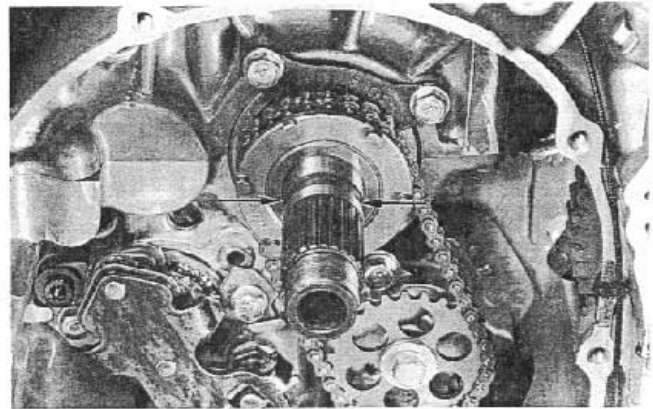
**SERVICE LIMITS: O.D.: 34.965 mm (1.3766 in)  
I.D.: 25.016 mm (0.9849 in)**



## Mainshaft

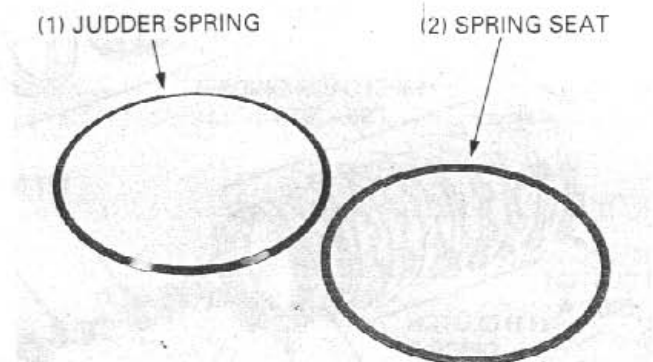
Measure the mainshaft O.D. at clutch outer guide sliding surface.

**SERVICE LIMIT: 24.96 mm (0.983 in)**



## Judder spring/spring seat

Check the spring and seat for damage or warpage.



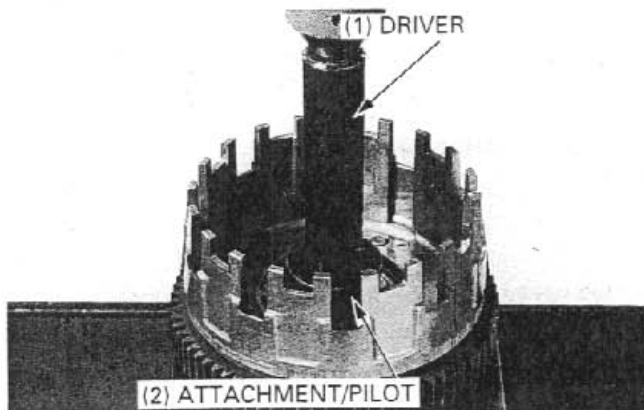
## CLUTCH/GEARSHIFT LINKAGE

### CLUTCH OUTER NEEDLE BEARING REPLACEMENT

Press the needle bearing out of the clutch outer using the special tools.

#### TOOLS:

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



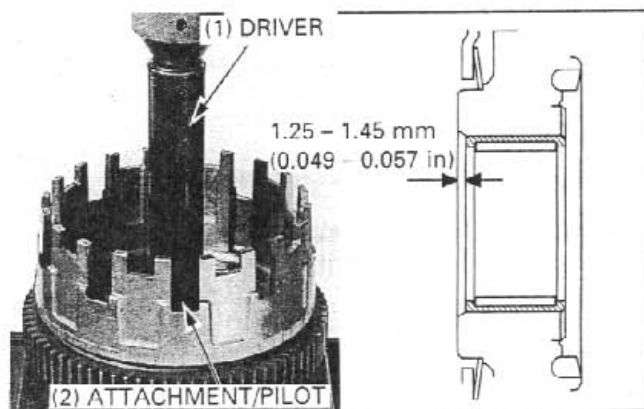
Press a new needle bearing into the clutch outer so that the casing of the needle bearing is flush with the inner edge of the clutch outer as shown.

#### NOTE

- Press the needle bearing into the clutch outer with the marked side facing up.

#### TOOLS:

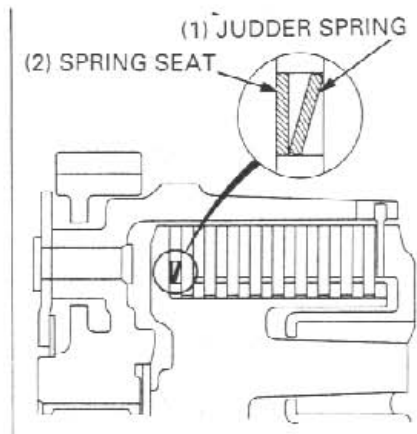
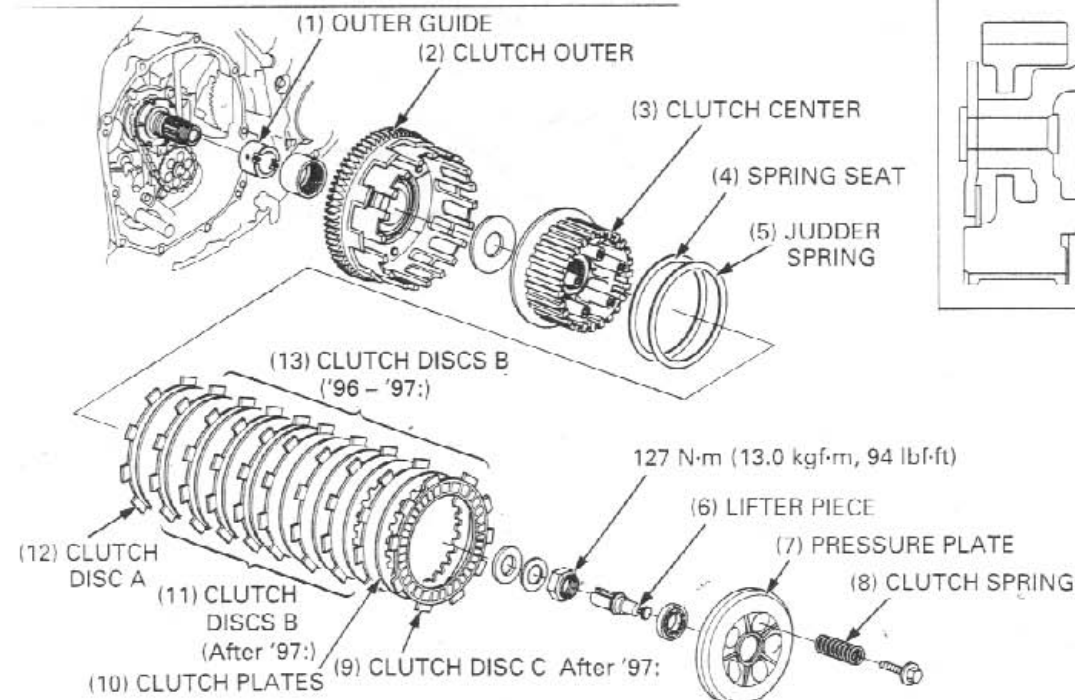
|                        |                 |
|------------------------|-----------------|
| Driver                 | 07749 - 0010000 |
| Attachment, 42 x 47 mm | 07746 - 0010300 |
| Pilot, 35 mm           | 07746 - 0040800 |



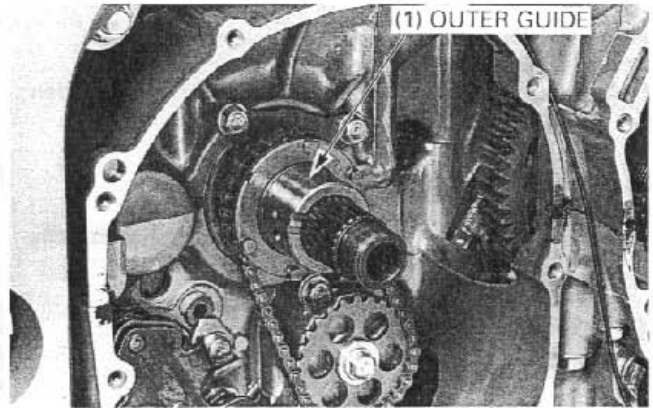
### INSTALLATION

#### NOTE

- The following illustrations are based on the '96 and '97 models. The models after '97 are equipped with eight clutch discs.

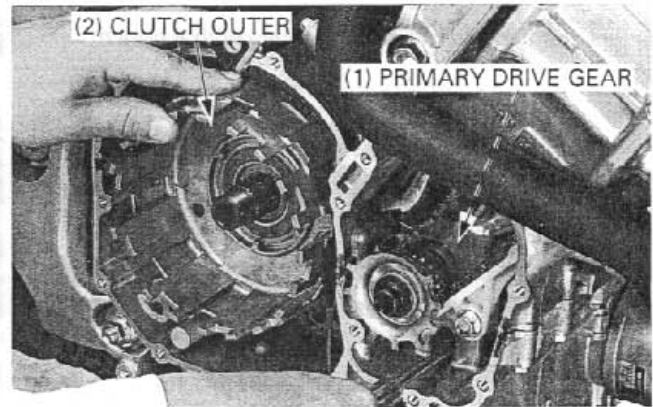


Install the clutch outer guide onto the mainshaft.

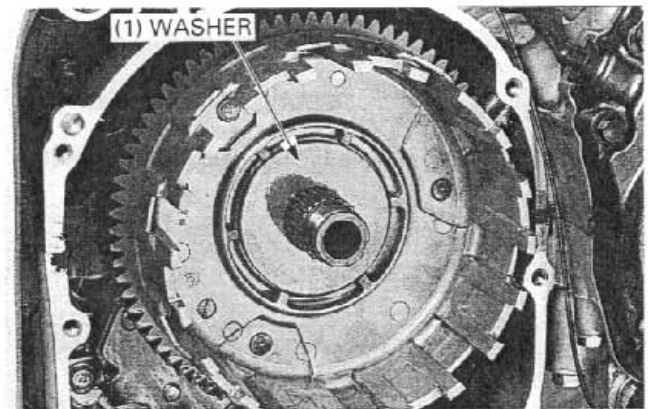


Align the primary drive gear and sub-gear teeth with a screwdriver as shown.

Install the clutch outer.



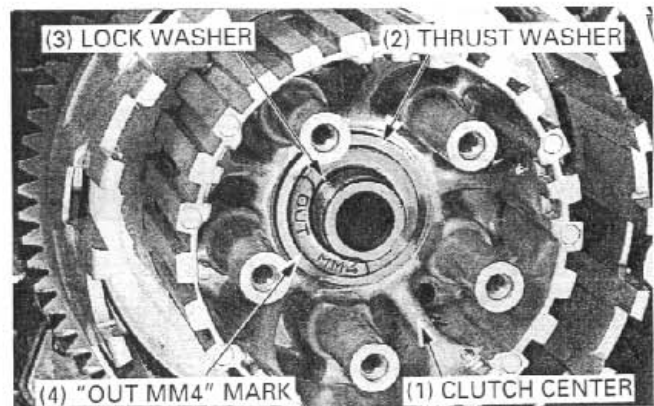
Install the washer onto the clutch outer.



Install the clutch center.

Install the thrust washer.

Install the lock washer with its "OUT MM4" mark facing out.



## CLUTCH/GEARSHIFT LINKAGE

Install the new lock nut.

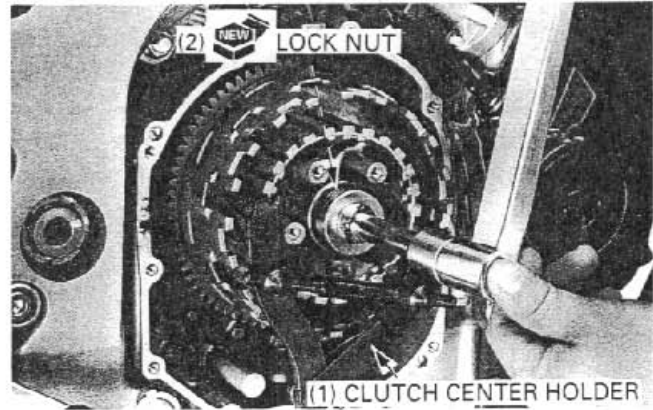
Hold the clutch center with the clutch center holder, then tighten the lock nut to the specified torque.

### TOOL:

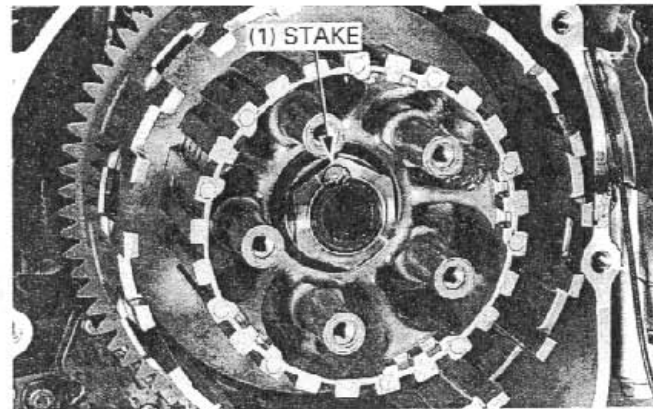
Clutch center holder

07724 - 0050002  
(Equivalent commercially available in U.S.A.)

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



Stake lock nut into the mainshaft groove with a punch.



Coat the clutch discs and plates with clean engine oil.

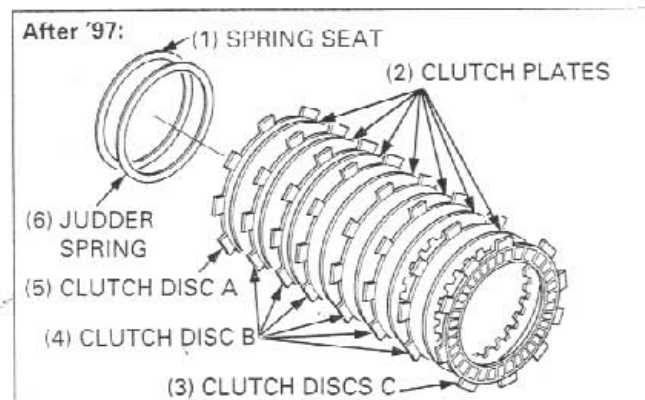
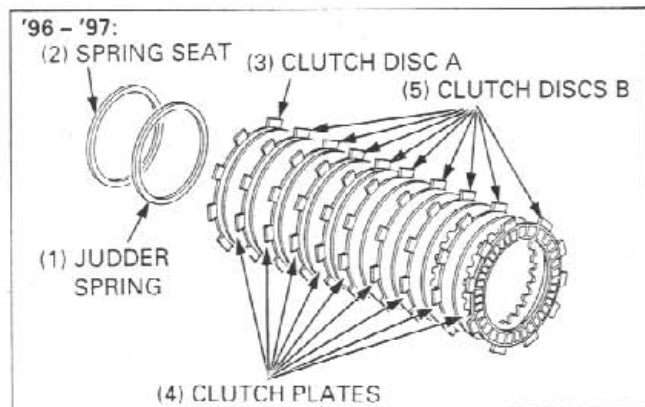
Install the spring seat and judder spring onto the clutch center as shown.

Install the clutch disc A (larger I.D. disc) into the clutch outer.

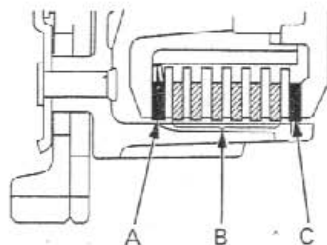
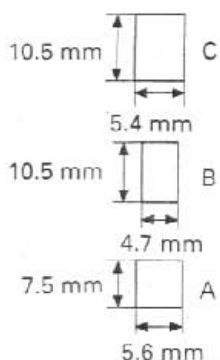
Stack the clutch discs and plates alternately.

### NOTE

- The illustrations below are based on the after '97 models.
- Note the direction of the judder spring.
- Install the outer clutch discs B ('96 - '97:) and C (after '97:) in the shallow slots on the clutch outer.

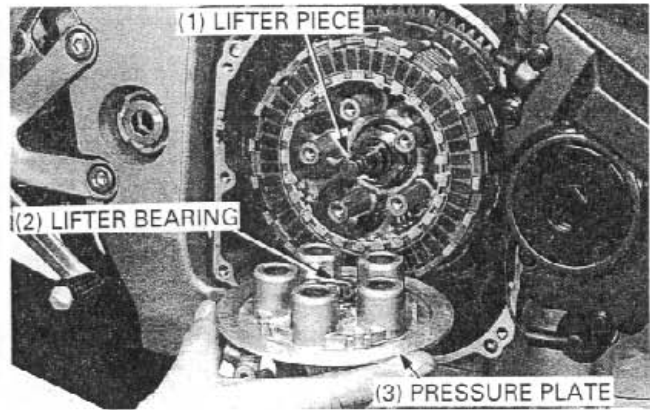


CLUTCH DISC



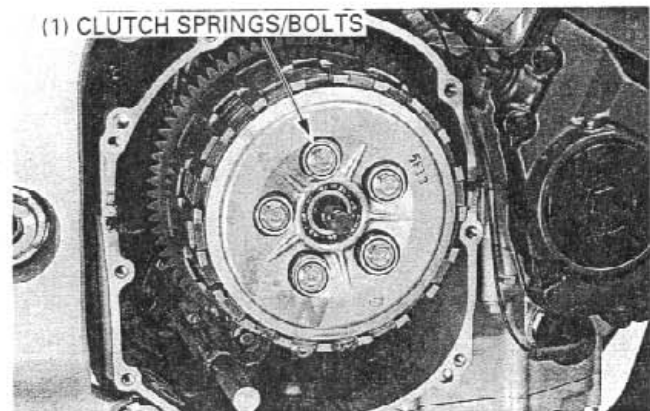
Install the lifter bearing into the pressure plate.

Install the clutch lifter piece into the mainshaft.  
Install the pressure plate.



Install the clutch springs and flange bolts.  
Tighten the bolts in a crisscross pattern in 2-3 steps.

Install the right crankcase cover (page 9-16).



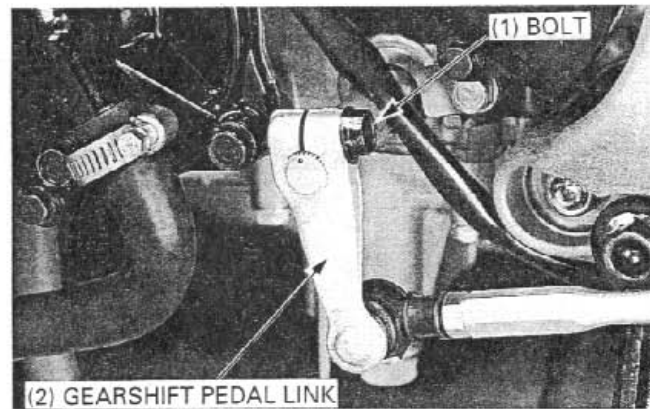
## GEARSHIFT LINKAGE

### GEARSHIFT LINKAGE REMOVAL

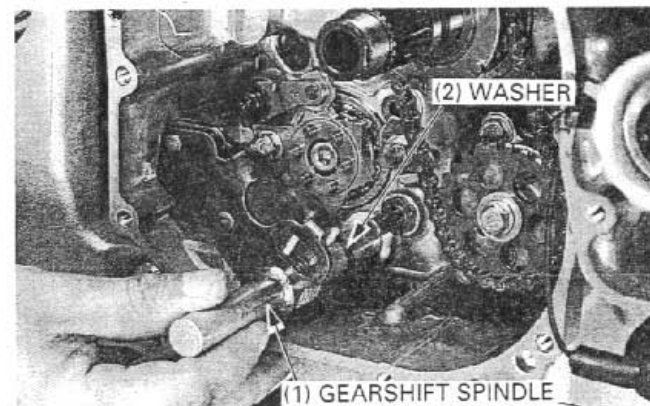
Remove the following:

- Right crankcase cover (page 9-3)
- Clutch assembly (page 9-4)

Remove the bolt and gearshift pedal link.



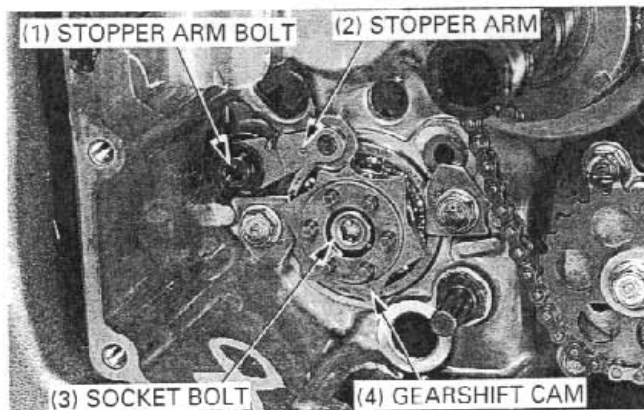
Pull the gearshift spindle assembly and thrust washer out of the crankcase.



## CLUTCH/GEARSHIFT LINKAGE

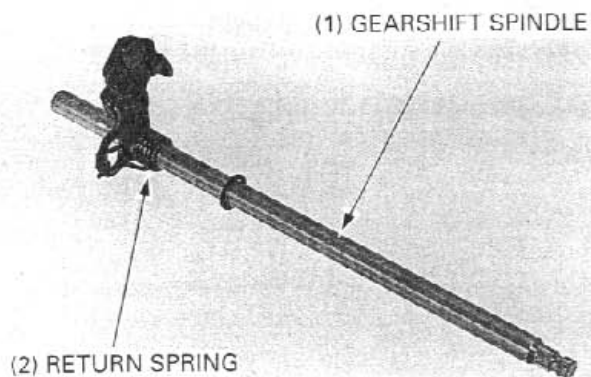
Remove the following:

- Stopper arm bolt
- Stopper arm
- Return spring
- Washer
- Socket bolt
- Gearshift cam
- Dowel pin



## GEARSHIFT LINKAGE INSPECTION

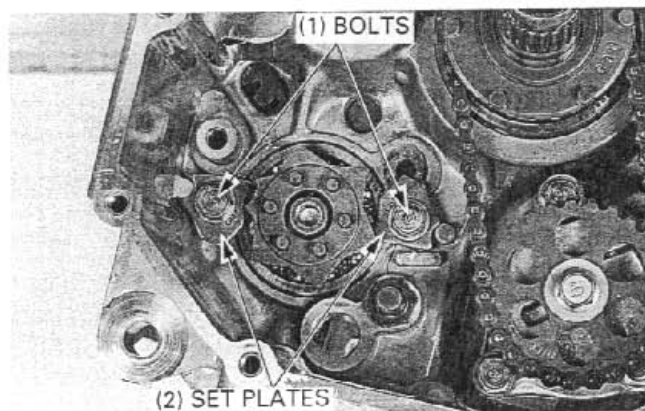
Check the gearshift sprindle for wear, damage or bending.  
Check the return spring for fatigue or damage.



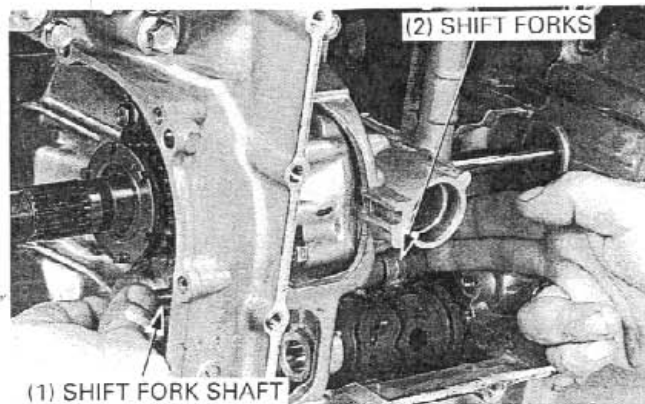
## SHIFT DRUM/SHIFT FORK REMOVAL

Remove the gearshift linkage (page 9-11).

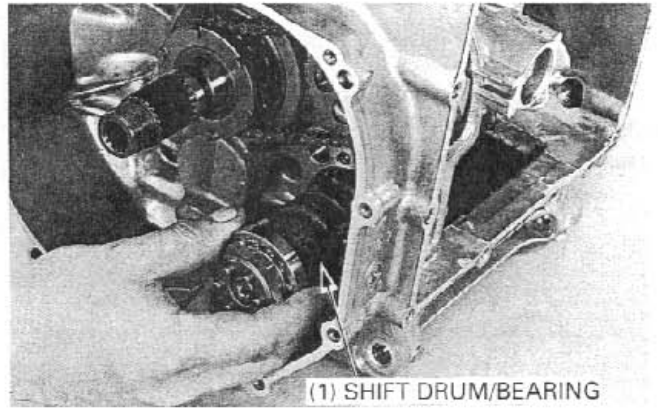
Remove the bolts and shift drum bearing set plates.



Remove the shift fork shaft and shift forks.



Remove the shift drum bearing and shift drum.



### SHIFT DRUM/SHIFT FORK INSPECTION

Check the shift fork and fork shaft for wear or damage.

Measure the I.D. of the shift fork.

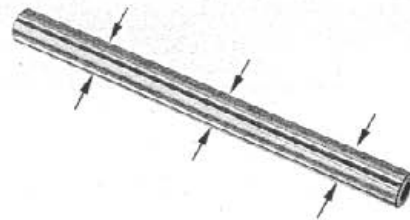
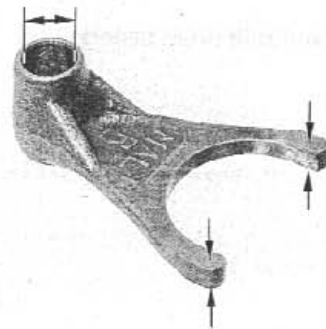
**SERVICE LIMIT: 12.03 mm (0.474 in)**

Measure the shift fork claw thickness.

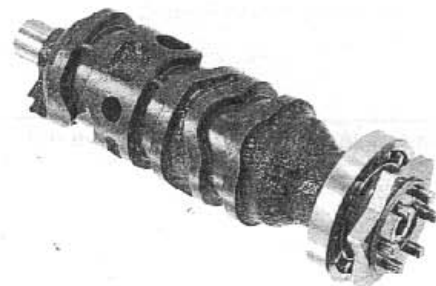
**SERVICE LIMIT: 5.9 mm (0.23 in)**

Measure the O.D. of the shift fork shaft.

**SERVICE LIMIT: 11.95 mm (0.470 in)**



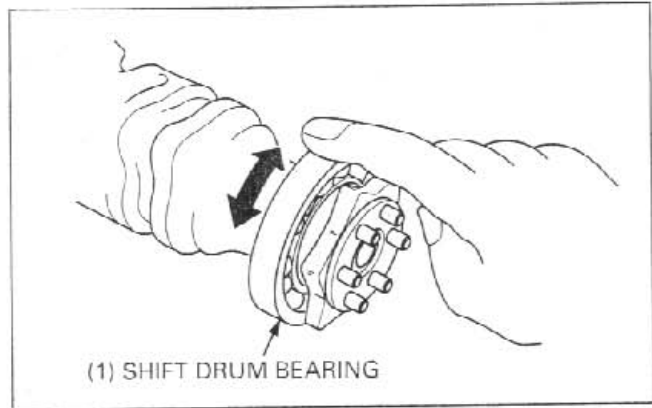
Inspect the shift drum grooves for wear or damage.





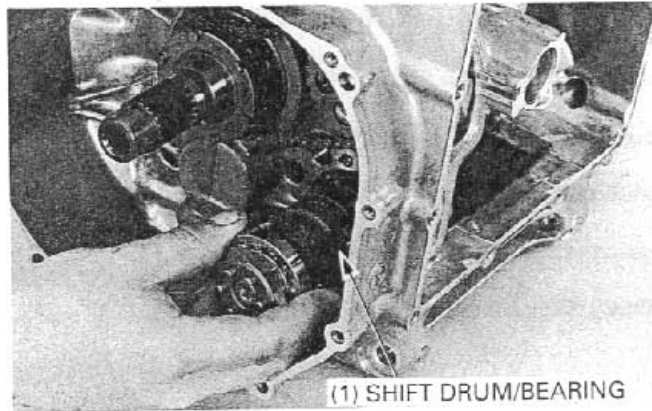
## CLUTCH/GEARSHIFT LINKAGE

Turn the outer race of the shift drum bearing with your finger.  
The bearing should turn smoothly and freely without excessive play.  
If necessary replace the bearing.



## SHIFT DRUM/SHIFT FORK INSTALLATION

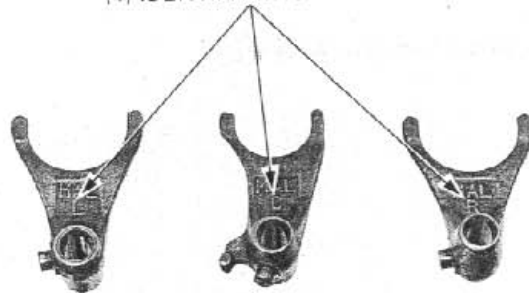
Install the shift drum and shift drum bearing.



### NOTE

- The shift forks have location marks.  
"R" for right  
"C" for center  
"L" for left

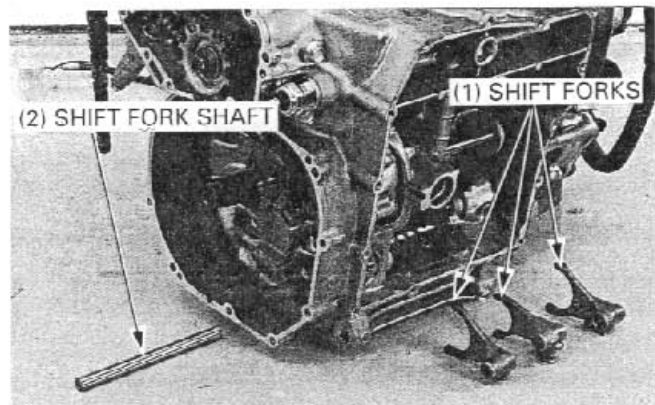
### (1) IDENTIFICATION MARKS



Apply molybdenum disulfide oil to shifter fork groove of the shift gears.  
Install the shift forks on the transmission.  
Install the shift fork shaft.

### NOTE

- Face the shift fork identification marks to the right.

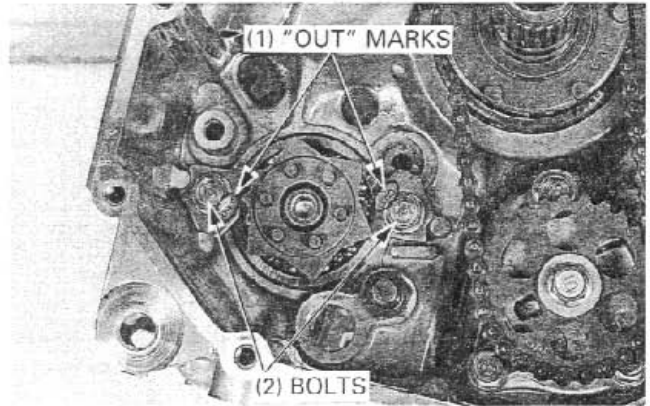


Install the bearing set plates with their "OUT" marks facing out.

Apply a locking agent to the threads of the set plate bolts.  
Install and tighten the set plate bolts to the specified torque.

**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

Install the gearshift linkage (see below).

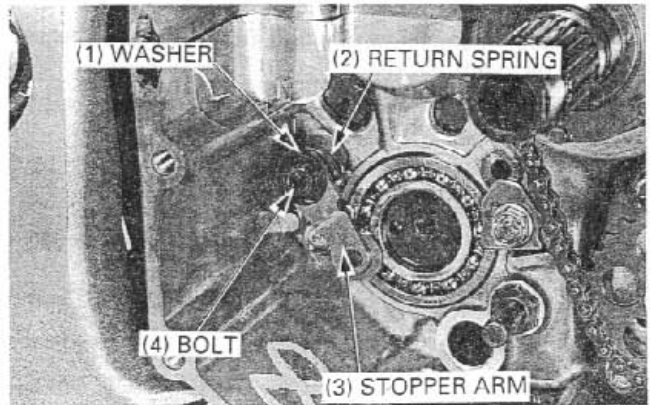


## GEARSHIFT LINKAGE INSTALLATION

Install the following:

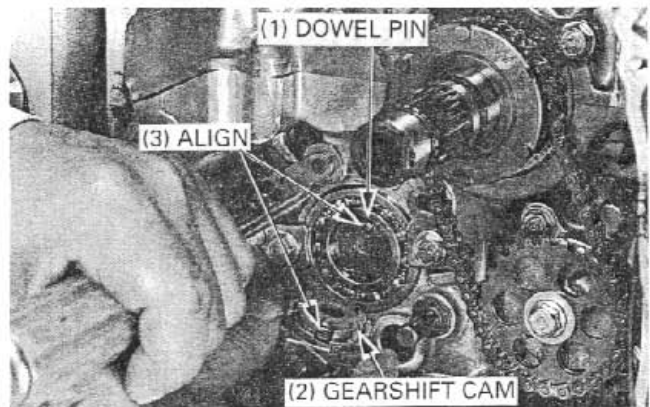
- Washer
- Return spring
- Stopper arm

Tighten the stopper arm bolt.



Install the dowel pin onto the shift drum.

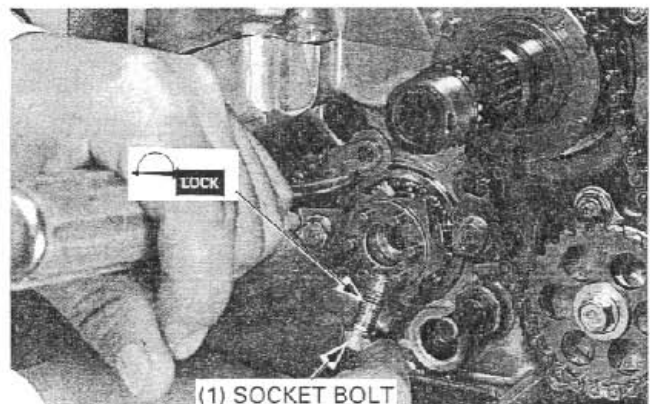
Install the gearshift cam while holding the stopper arm using a screwdriver as shown.



Apply a locking agent to the gearshift cam socket bolt threads.

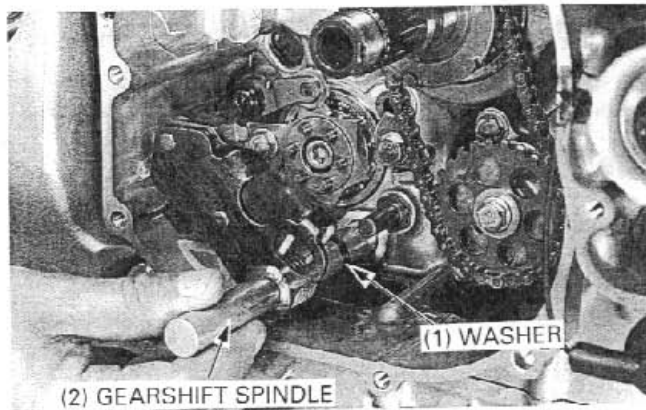
Install and tighten the socket bolt to the specified torque.

**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**

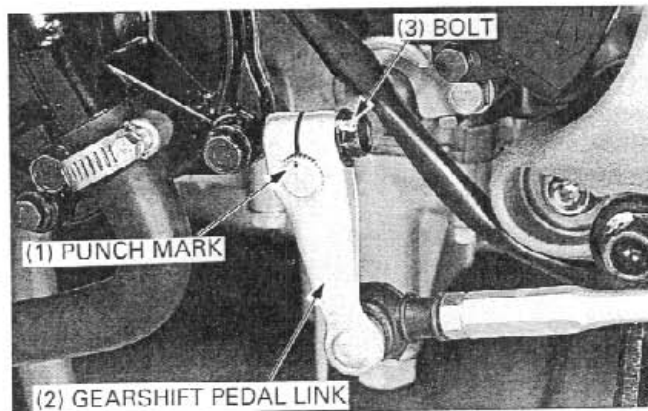


## CLUTCH/GEARSHIFT LINKAGE

Install the thrust washer and gearshift spindle assembly into the crankcase while aligning the spring ends with the crankcase stopper pin.



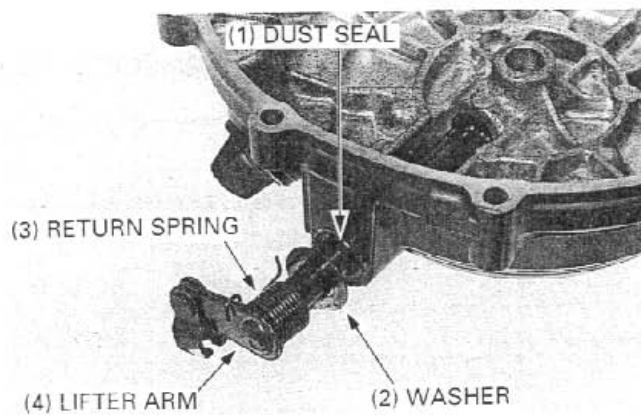
Install the gearshift pedal link aligning its slit with the punch mark on the gearshift spindle. Install and tighten the pinch bolt.



## RIGHT CRANKCASE COVER INSTALLATION

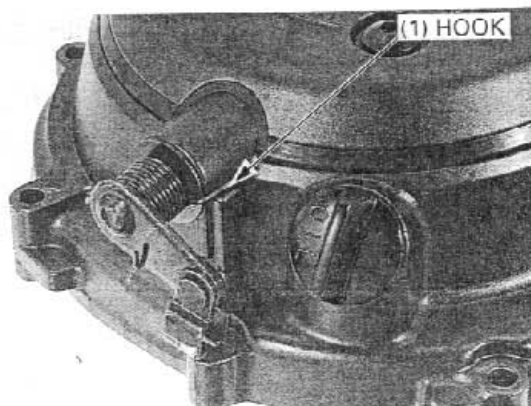
Install the following:

- Dust seal
- Washer
- Return spring
- Clutch lifter arm

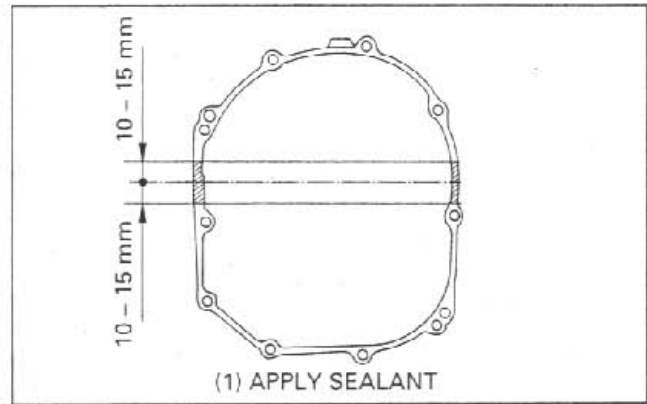


### NOTE

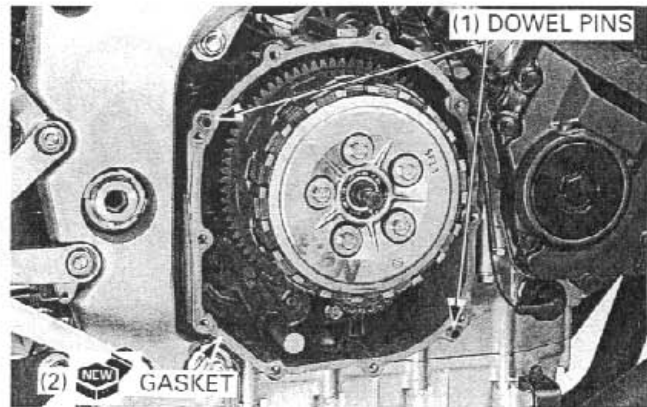
- Hook the return spring end onto the right crankcase cover.



Apply a sealant to the mating surfaces of the crankcase as shown.



Install the dowel pins and new gasket.

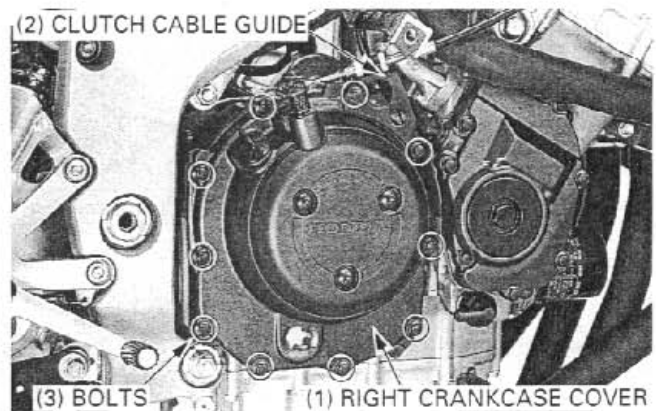


Install the right crankcase cover.

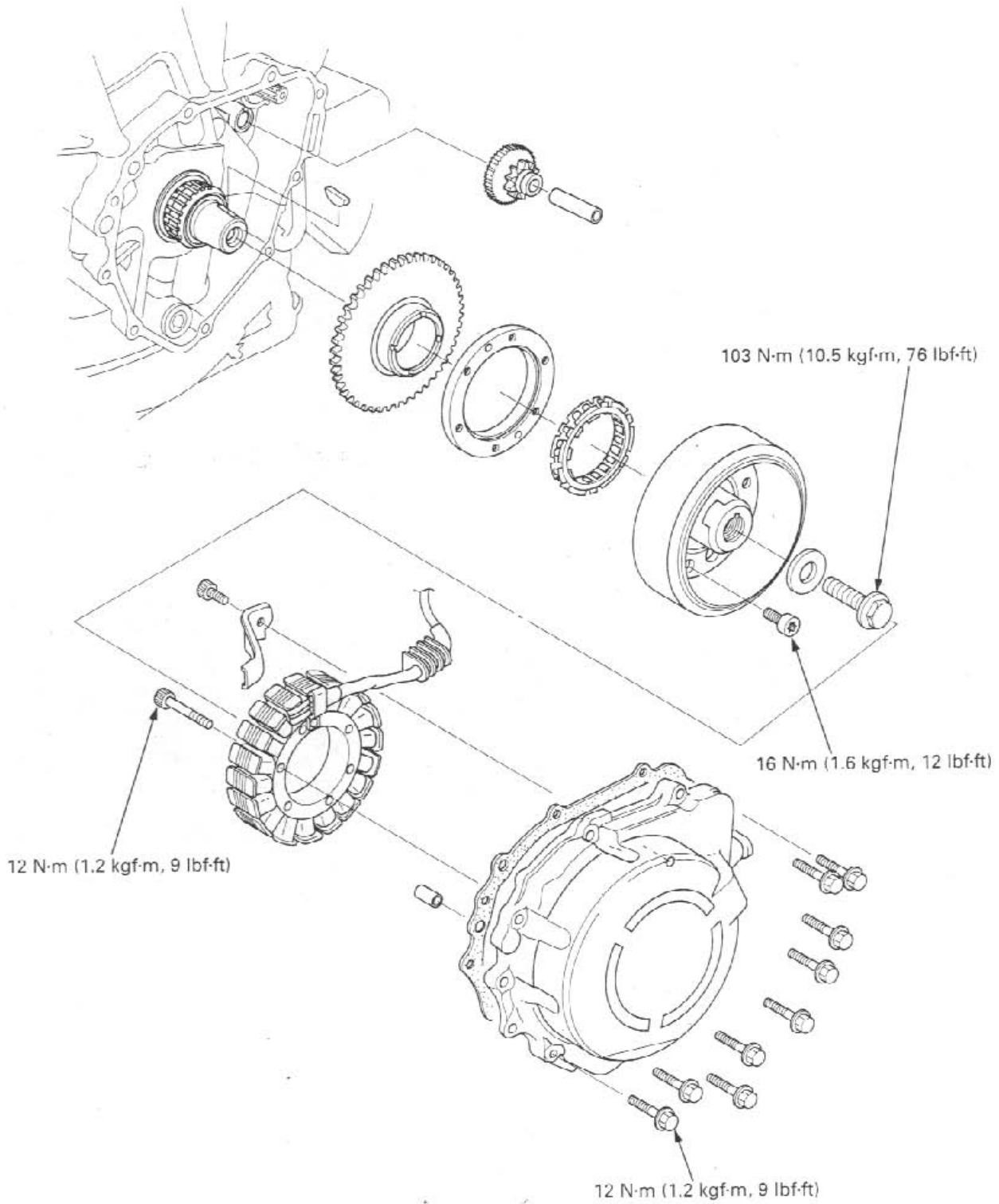
Connect the clutch cable to the clutch lifter arm and set the bracket, then install and tighten the right crankcase cover SH bolts to the specified torque.

**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

Pour the recommended engine oil (page 3-12).



# ALTERNATOR/STARTER CLUTCH



# 10. ALTERNATOR/STARTER CLUTCH

|                          |      |                               |      |
|--------------------------|------|-------------------------------|------|
| SERVICE INFORMATION      | 10-1 | FLYWHEEL REMOVAL              | 10-4 |
| TROUBLESHOOTING          | 10-1 | STARTER CLUTCH                | 10-5 |
| ALTERNATOR COVER REMOVAL | 10-2 | FLYWHEEL INSTALLATION         | 10-7 |
| STATOR                   | 10-3 | ALTERNATOR COVER INSTALLATION | 10-8 |

## SERVICE INFORMATION

### GENERAL

- This section covers service of the alternator, flywheel and starter clutch. All service can be done with the engine installed in the frame.
- Refer to section 16 for alternator stator inspection.

### SPECIFICATIONS

Unit: mm (in)

| ITEM                          | STANDARD                          | SERVICE LIMIT   |
|-------------------------------|-----------------------------------|-----------------|
| Starter driven gear boss O.D. | 51.699 – 51.718 (2.0354 – 2.0361) | 51.684 (2.0348) |

### TORQUE VALUES

**10**

|                                    |                                 |                                      |
|------------------------------------|---------------------------------|--------------------------------------|
| Left crankcase cover SH bolt       | 12 N·m (1.2 kgf·m, 9 lbf·ft)    |                                      |
| Flywheel bolt                      | 103 N·m (10.5 kgf·m, 76 lbf·ft) | Apply oil to the threads             |
| Stator mounting socket bolt        | 12 N·m (1.2 kgf·m, 9 lbf·ft)    |                                      |
| Starter one-way clutch socket bolt | 16 N·m (1.6 kgf·m, 12 lbf·ft)   | Apply a locking agent to the threads |

### TOOLS

|                 |                                    |   |
|-----------------|------------------------------------|---|
| Flywheel holder | 07725 – 0040000                    | Equivalent commercially available in U.S.A. |
| Rotor puller    | 07733 – 0020001 or 07933 – 3950000 |   |

## TROUBLESHOOTING

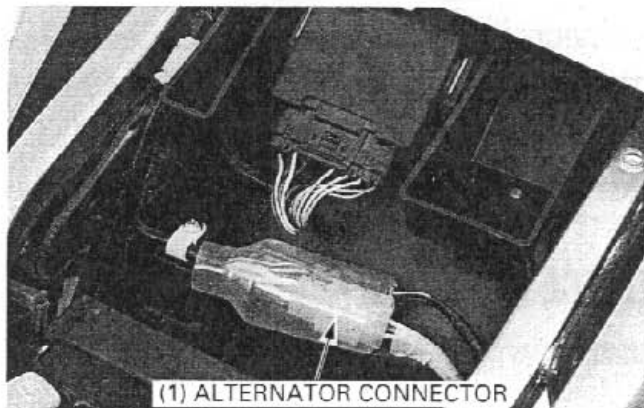
### Engine does not turn

- Faulty starter clutch
- Damaged idle gear/shaft

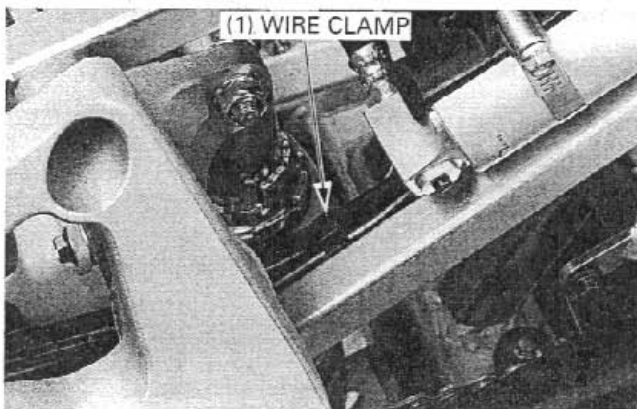
## ALTERNATOR COVER REMOVAL

Remove the seat and middle/lower cowl (Section 2).

Disconnect the alternator 3P (White) connector.



Release the alternator wire from the wire clamp.



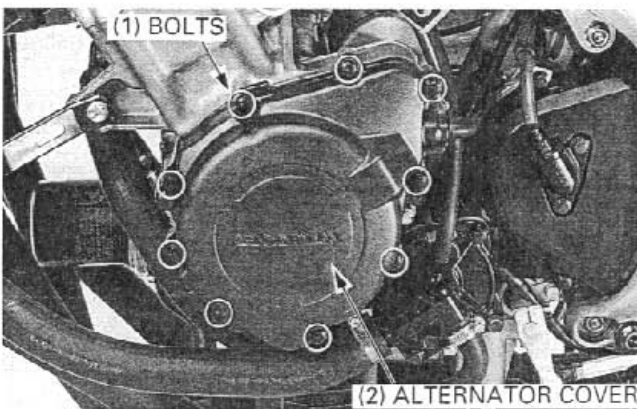
Remove the alternator cover SH bolts and alternator cover.

### CAUTION

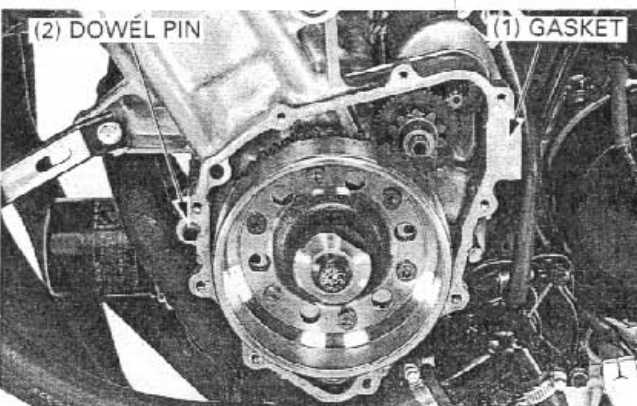
- *The alternator cover (stator) is magnetically attached to the flywheel, be careful during removal.*

### NOTE

- The engine oil will run out when the alternator cover is removed. Set a clean oil pan under the engine and add the recommended oil to the specified level after installation.



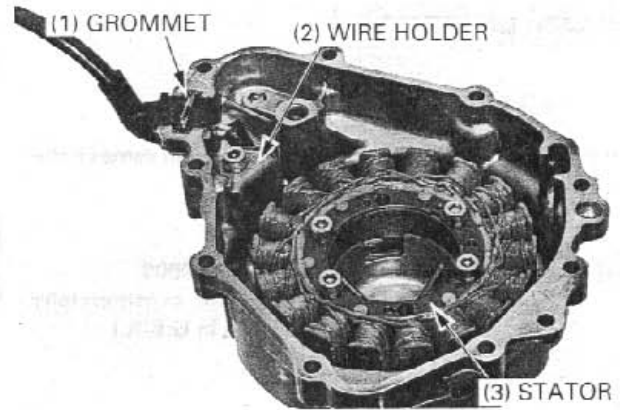
Remove the gasket and dowel pin.



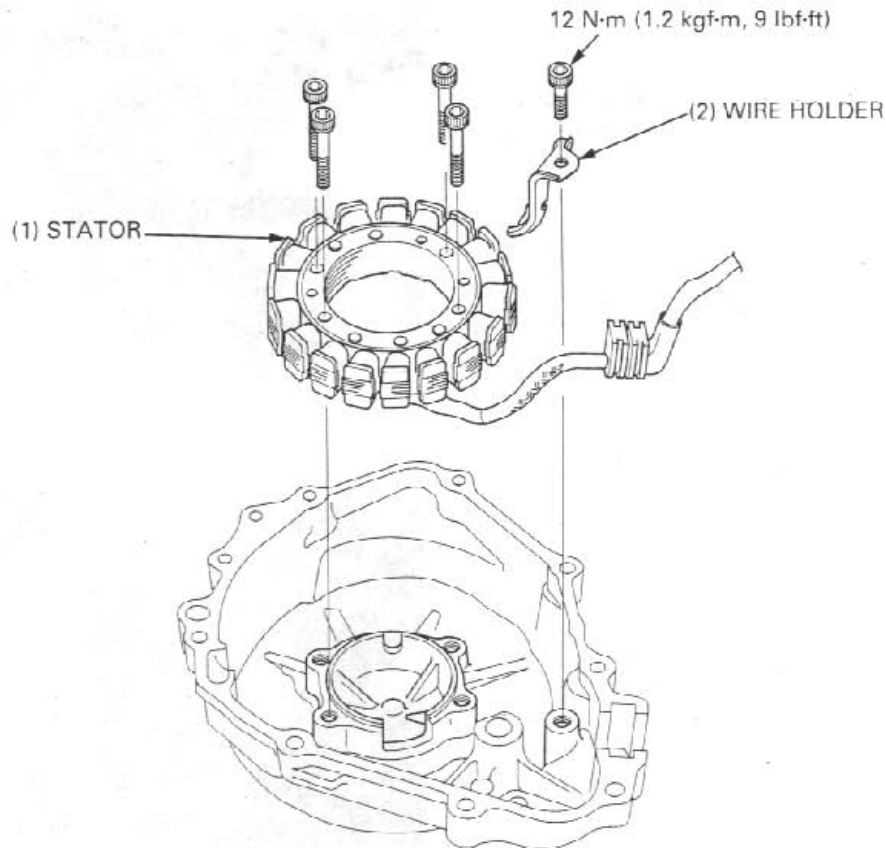
## STATOR

### REMOVAL

Remove the alternator wire grommet from the alternator cover.  
 Remove the socket bolt and stator wire holder.  
 Remove the socket bolts and stator.



### INSTALLATION

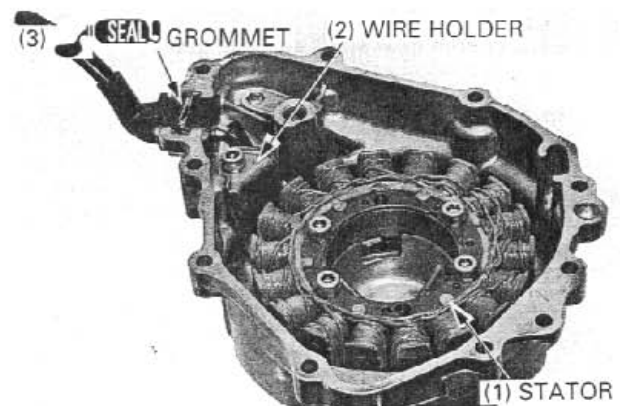


Install the stator into the alternator cover.

Apply sealant to the wire grommet, then install the wire grommet into the alternator groove securely.  
 Install and tighten the socket bolts to the specified torque.

**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

Install the wire holder and tighten the socket bolt.





## FLYWHEEL REMOVAL

Remove the alternator cover (page 10-2).

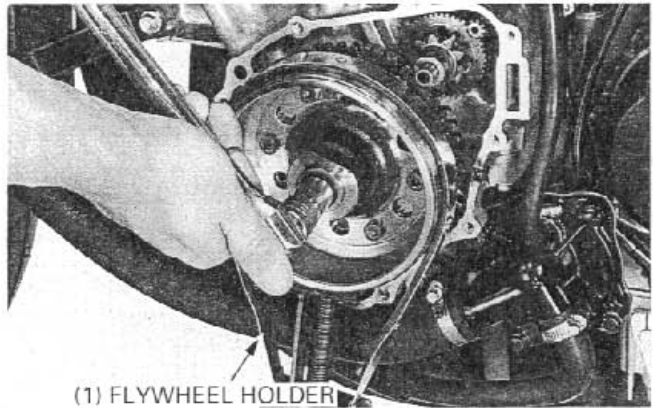
Hold the flywheel using the flywheel holder, then remove the flywheel bolt.

**TOOL:**

Flywheel holder

07725 - 0040000  
(Equivalent commercially available in U.S.A.)

Remove the washer.

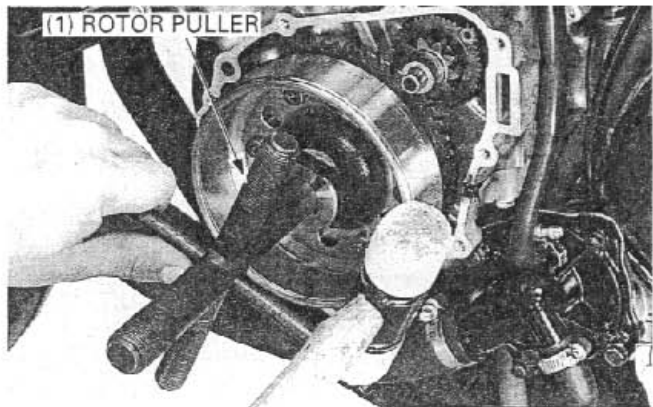


Remove the flywheel using the special tool.

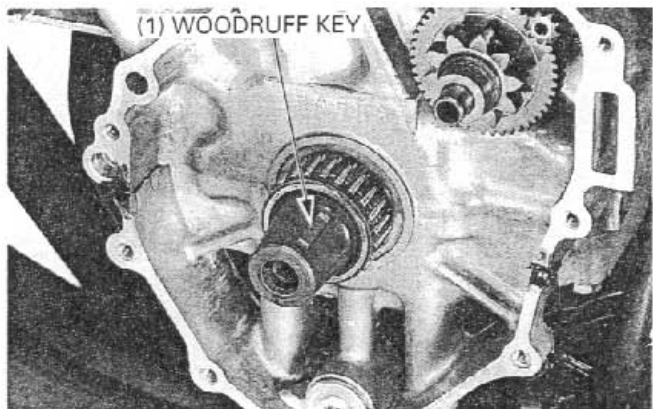
**TOOL:**

Rotor puller

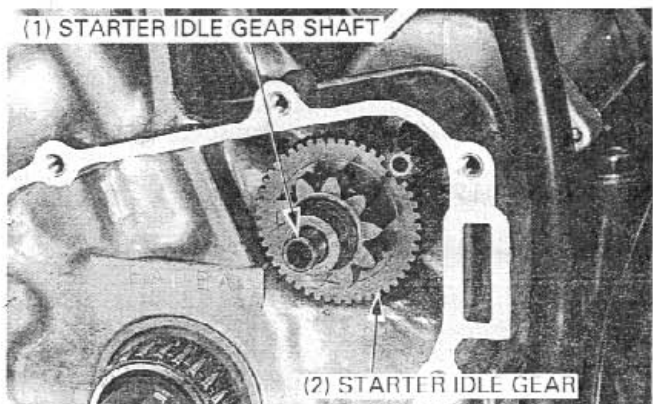
07733 - 0020001 or  
07933 - 3950000



Remove the woodruff key.



Remove the starter idle gear shaft and idle gear.

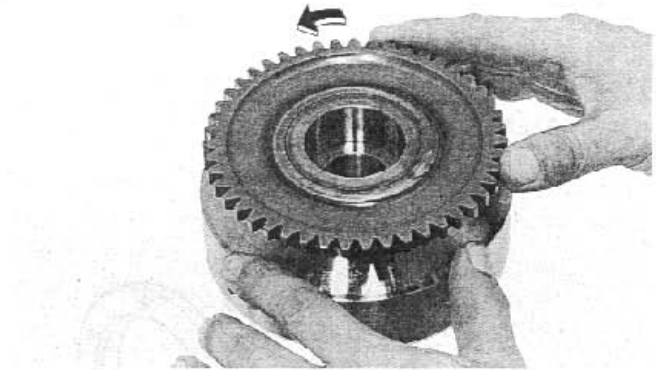


## STARTER CLUTCH

### INSPECTION

Check the operation of the one-way clutch by turning the driven gear.

You should be able to turn the driven gear counterclockwise smoothly, but the gear should not turn clockwise.



### DISASSEMBLY

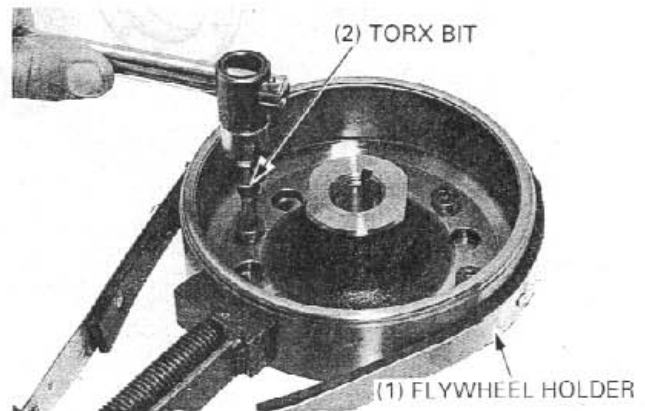
Remove the starter driven gear by turning it counterclockwise.

Hold the flywheel with a flywheel holder, and remove the starter clutch mounting torx bolts.

#### TOOL:

Flywheel holder                      07725 - 0040000

Remove the starter one-way clutch assembly.

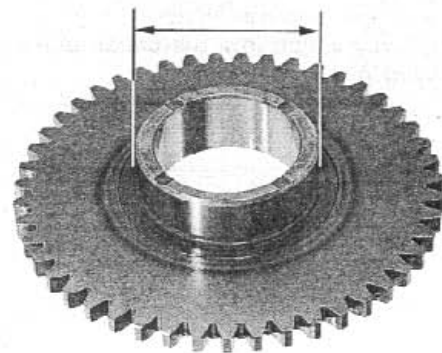


### INSPECTION

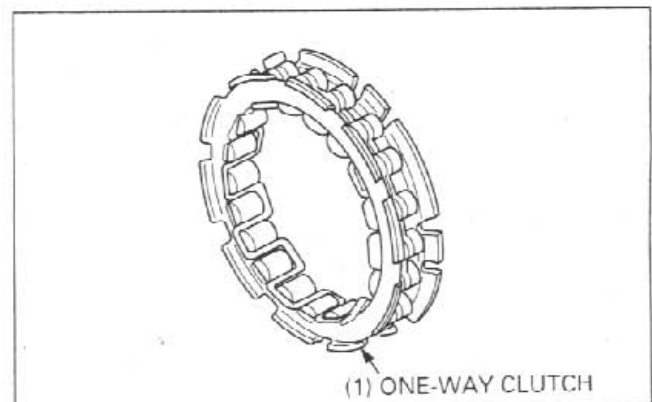
Check the starter driven gear for abnormal wear or damage.

Measure the starter driven gear boss O.D.

**SERVICE LIMIT: 51.684 mm (2.0348 in)**

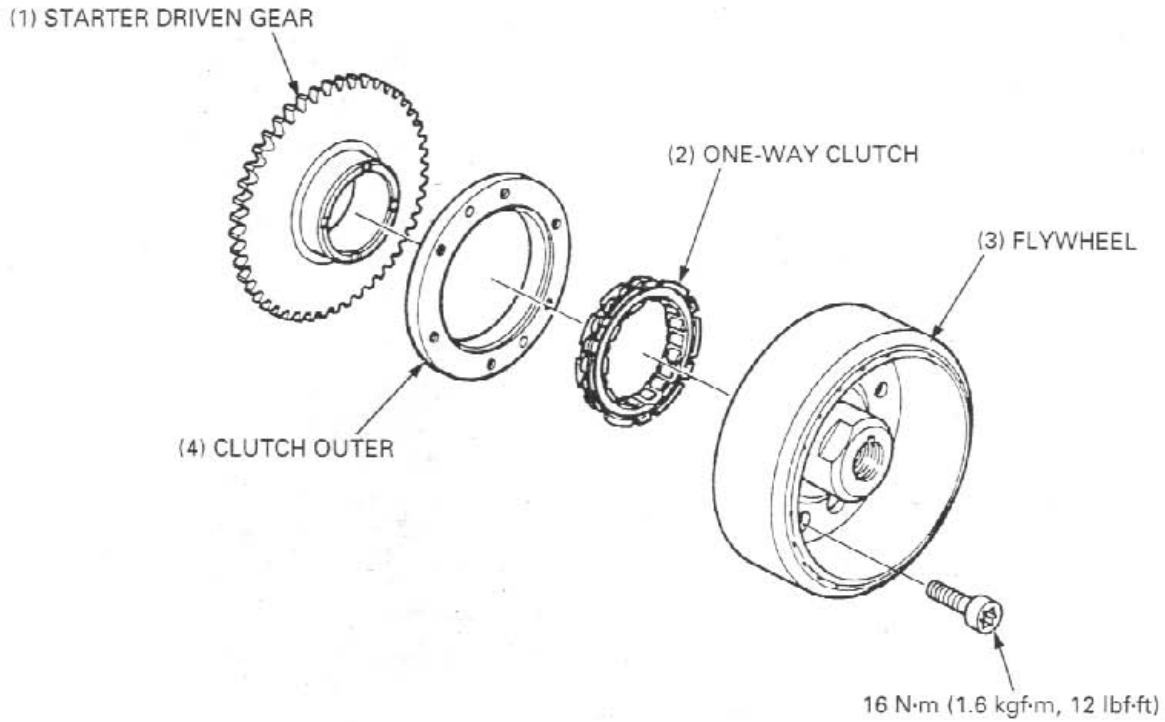


Check the one-way clutch for wear or damage and replace if necessary.

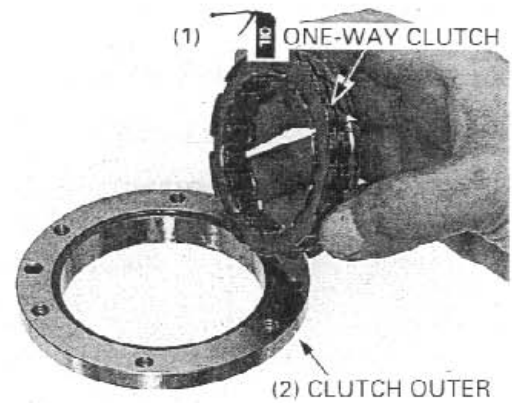


# ALTERNATOR/STARTER CLUTCH

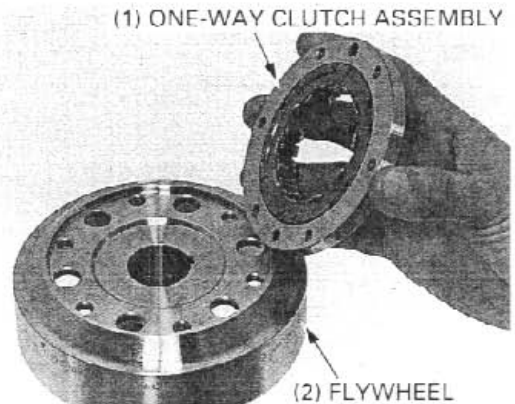
## ASSEMBLY



Apply oil to the starter one-way clutch.  
Install the one-way clutch into the clutch outer with the flange side facing in.



Install the starter one-way clutch assembly onto the flywheel.



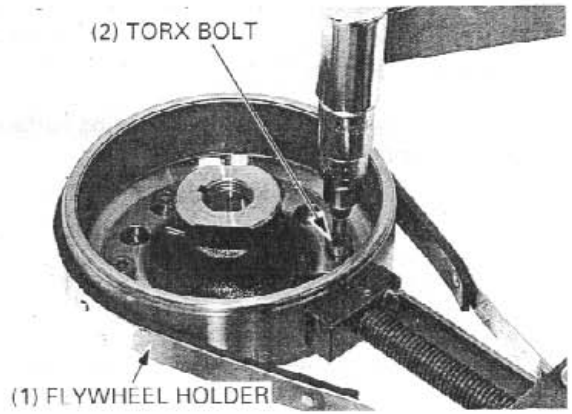
Apply a locking agent to the starter clutch outer mounting bolt threads.  
Hold the flywheel with a flywheel holder, and tighten the starter clutch mounting torx bolts.

**TOOL:**

Flywheel holder

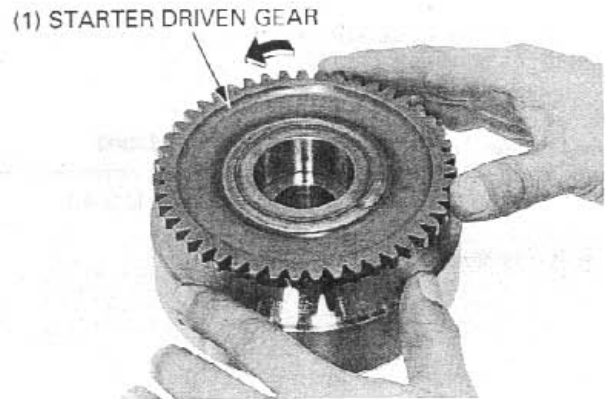
**07725 - 0040000**  
(Equivalent commercially available in U.S.A.)

**TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)**



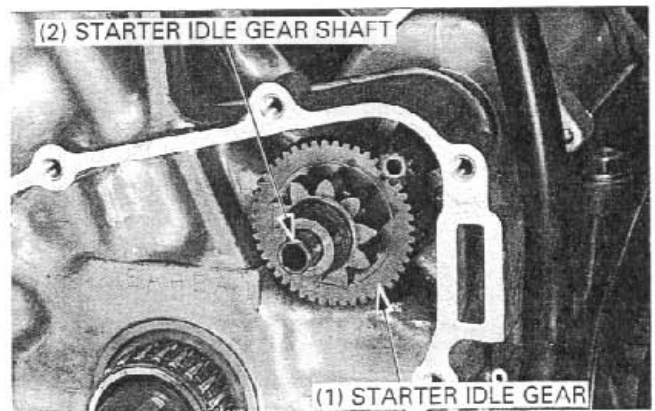
Install the starter driven gear into the one-way clutch.

Recheck the one-way clutch operation.  
You should be able to turn the driven gear counterclockwise smoothly, but the gear should not turn clockwise.

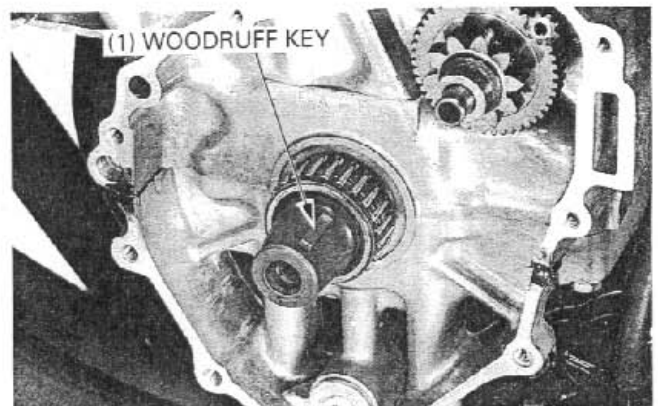


**FLYWHEEL INSTALLATION**

Apply oil to the starter idle gear and gear shaft, and install them.



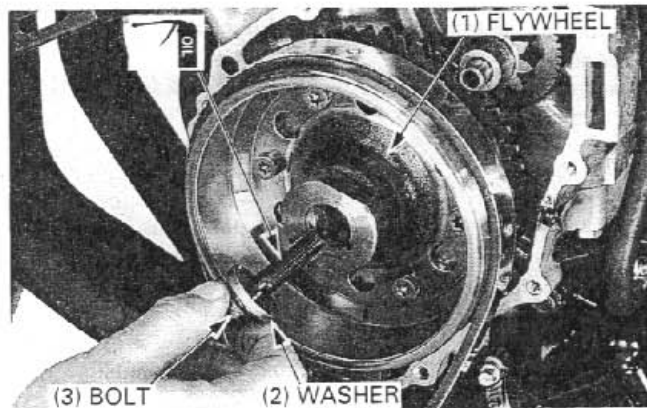
Clean any oil from the crankshaft taper.  
Install the woodruff key on the crankshaft.



## ALTERNATOR/STARTER CLUTCH

Install the flywheel aligning the key way in the flywheel with the woodruff key on the crankshaft.

Apply oil to the flywheel bolt threads and seating surface. Install the washer and flywheel bolt.



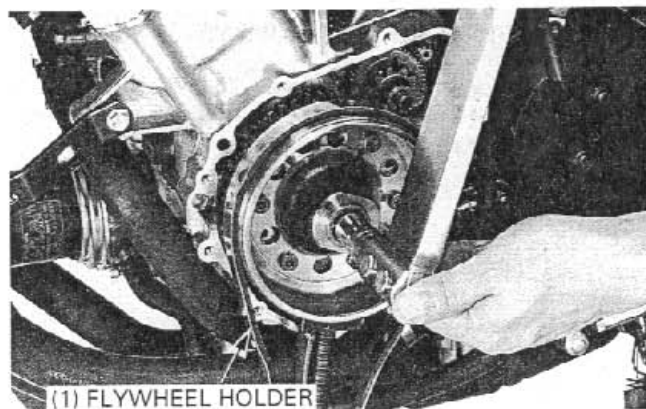
Hold the flywheel using the flywheel holder, then tighten the bolt to the specified torque.

### TOOL:

Flywheel holder

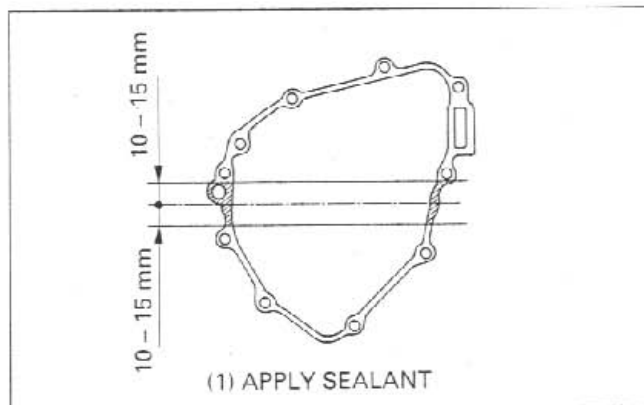
07725 - 0040000  
(Equivalent commercially  
available in U.S.A.)

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

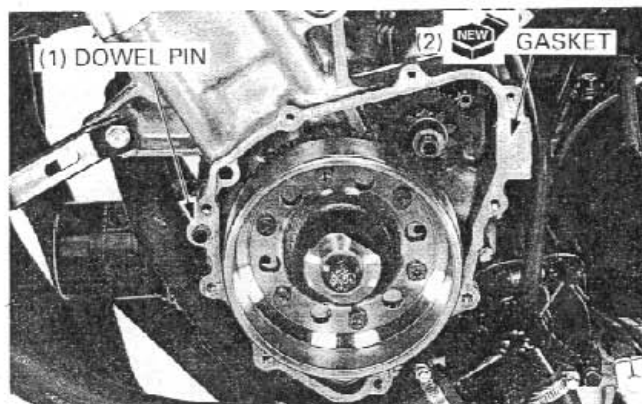


## ALTERNATOR COVER INSTALLATION

Apply sealant to the mating surface of the crankcase as shown.



Install the dowel pin and new gasket.



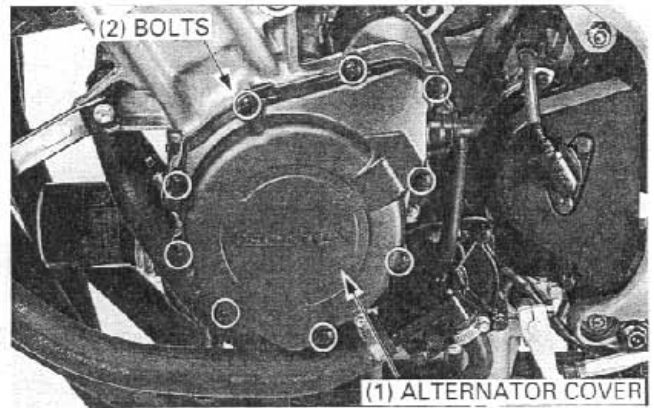
Install the alternator cover.

**CAUTION**

- *The alternator cover (stator) is magnetically attached to the flywheel, be careful during installation.*

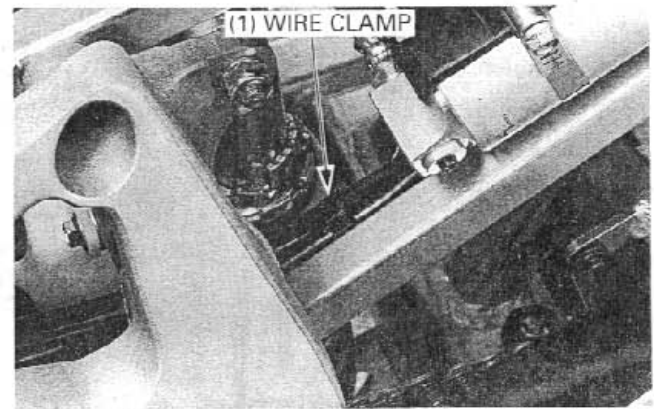
Install and tighten the SH bolts to the specified torque.

**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**



Route the alternator wire properly (page 1-21).

Clamp the alternator wire with a wire clamp.

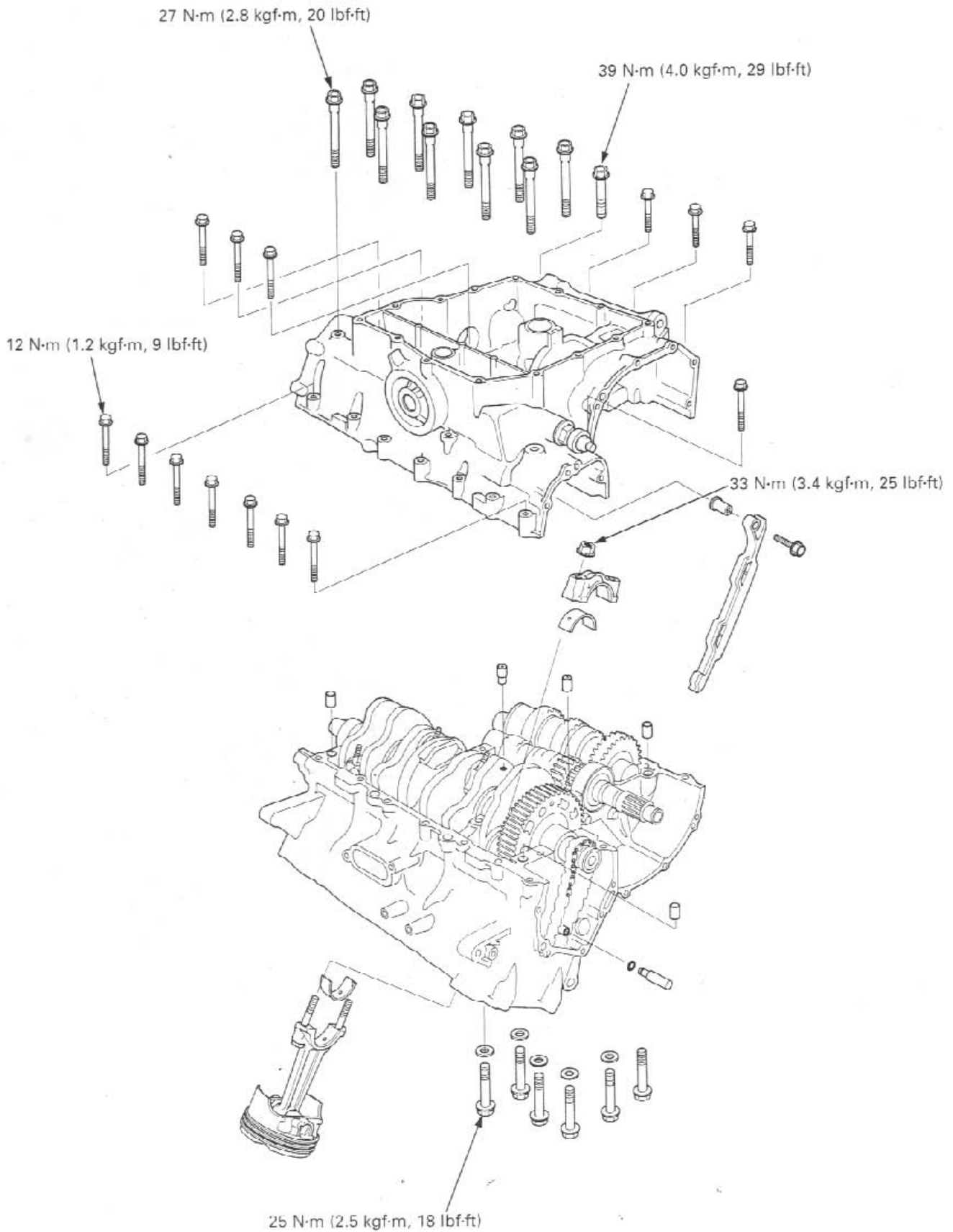


Connect the alternator 3P (White) connector.

Add the recommended oil up to proper level (page 3-12).  
Install the seat, lower and middle cowl (Section 2).



# CRANKCASE/PISTON/CYLINDER



# 11. CRANKCASE/PISTON/CYLINDER

|                      |      |                       |       |
|----------------------|------|-----------------------|-------|
| SERVICE INFORMATION  | 11-1 | PISTON/CONNECTING ROD | 11-4  |
| TROUBLESHOOTING      | 11-2 | CRANKCASE COMBINATION | 11-12 |
| CRANKCASE SEPARATION | 11-3 |                       |       |

## SERVICE INFORMATION

### GENERAL

- This section covers crankcase separation for service of the crankshaft and piston.
- The following parts must be removed before separating the crankcase.
  - Alternator/flywheel (Section 10)
  - Clutch/gearshift linkage (Section 9)
  - Cylinder head (Section 8)
  - Engine (Section 6)
  - Oil pump (Section 4)
- Mark and store the disassembled parts to ensure that they are installed in their original locations.
- Mark and store the bearing inserts to ensure that the parts are installed in the correct locations during reassembly. If the inserts are improperly installed, they will block the oil hole, causing insufficient lubrication and eventual engine seizure.
- The connecting rod bearing inserts are select fit and are identified by color codes. Select replacement bearings from the code tables. After installing new bearings, recheck them with a plastigauge to verify clearance. Apply molybdenum disulfide oil to the crank pin during assembly.

### SPECIFICATIONS

| ALTERNATOR/STARTER CLUTCH     |                                   | Unit: mm (in)   |  |
|-------------------------------|-----------------------------------|-----------------|--|
| ITEM                          | STANDARD                          | SERVICE LIMIT   |  |
| Starter driven gear boss O.D. | 51.699 – 51.718 (2.0354 – 2.0361) | 51.684 (2.0348) |  |

| CRANKCASE/PISTON/CYLINDER              |                                      |   | Unit: mm (in)                   |              |  |
|--|--------------------------------------|---|---------------------------------|--------------|--|
| ITEM                                   |                                      | STANDARD                                | SERVICE LIMIT                   |              |  |
| Cylinder                               | I.D.                                 | 71.000 – 71.015 (2.7953 – 2.7963)       | 71.10 (2.795)                   |              |  |
|  | Out of round                         | —                                       | 0.10 (0.004)                    |              |  |
|  | Taper                                | —                                       | 0.10 (0.004)                    |              |  |
|  | Warpage                              | —                                       | 0.05 (0.002)                    |              |  |
| Piston, piston rings                   | Piston mark direction                | "IN" mark facing toward the intake side | —                               |              |  |
|  | Piston O.D.                          | 70.965 – 70.985 (2.7939 – 2.7947)       | 70.90 (2.791)                   |              |  |
|  | Piston O.D. measurement point        | 15 mm (0.6 in) from bottom of skirt     | —                               |              |  |
|  | Piston pin bore I.D.                 | 17.002 – 17.008 (0.6694 – 0.6696)       | 17.03 (0.670)                   |              |  |
|  | Piston pin O.D.                      | 16.993 – 17.000 (0.6690 – 0.6693)       | 16.98 (0.669)                   |              |  |
|  | Piston-to-piston pin clearance       | 0.002 – 0.015 (0.0001 – 0.0006)         | —                               |              |  |
|  | Piston ring-to-ring groove clearance | Top                                     | 0.030 – 0.065 (0.0012 – 0.0026) | 0.08 (0.003) |  |
|  |                                      | Second                                  | 0.015 – 0.045 (0.0006 – 0.0018) | 0.07 (0.003) |  |
|  | Piston ring end gap                  | Top                                     | 0.28 – 0.38 (0.011 – 0.015)     | 0.5 (0.02)   |  |
|  |                                      | Second                                  | 0.40 – 0.55 (0.016 – 0.022)     | 0.7 (0.03)   |  |
| Oil (side rail)                        |                                      | 0.2 – 0.7 (0.01 – 0.03)                 | 0.9 (0.04)                      |              |  |
| Cylinder-to-piston clearance           |                                      | 0.015 – 0.050 (0.0006 – 0.0020)         | —                               |              |  |
| Connecting rod small end I.D.          |                                      | 17.016 – 17.034 (0.6699 – 0.6706)       | 17.04 (0.671)                   |              |  |
| Connecting rod-to-piston pin clearance |                                      | 0.016 – 0.041 (0.0006 – 0.0016)         | —                               |              |  |
| Crankpin oil clearance                 |                                      | 0.030 – 0.052 (0.0012 – 0.0020)         | 0.06 (0.002)                    |              |  |



### TORQUE VALUES

|                                     |                               |                                      |
|-------------------------------------|-------------------------------|--------------------------------------|
| Crankcase bolt, 10 mm               | 39 N·m (4.0 kgf·m, 29 lbf·ft) |                                      |
| 9 mm                                | 27 N·m (2.8 kgf·m, 20 lbf·ft) | Apply oil to the threads             |
| 8 mm                                | 25 N·m (2.5 kgf·m, 18 lbf·ft) |                                      |
| 6 mm                                | 12 N·m (1.2 kgf·m, 9 lbf·ft)  |                                      |
| Connecting rod nut                  | 33 N·m (3.4 kgf·m, 25 lbf·ft) | Apply oil to the threads             |
| Lower crankcase sealing bolt, 20 mm | 29 N·m (3.0 kgf·m, 22 lbf·ft) | Apply a locking agent to the threads |
| 18 mm                               | 44 N·m (4.5 kgf·m, 33 lbf·ft) | Apply a locking agent to the threads |

### TROUBLESHOOTING

#### Cylinder compression is too low, or engine is hard to start

- Blown cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder or piston
- Bent valve, or bent and deteriorated valve seat

#### Cylinder compression is too high, or engine overheats or knocks

- Carbon deposits on the cylinder head and/or piston crown

#### Piston sounds

- Worn cylinder, piston and/or piston ring
- Worn piston pin hole and piston pin
- Worn connecting rod small end

#### Excessive smoke

- Worn, stuck or broken piston ring
- Worn valve stem seal

#### Excessive noise

- Worn connecting rod big end bearing
- Bent connecting rod
- Worn crankshaft main journal bearing
- Worn transmission bearing

#### Engine vibration

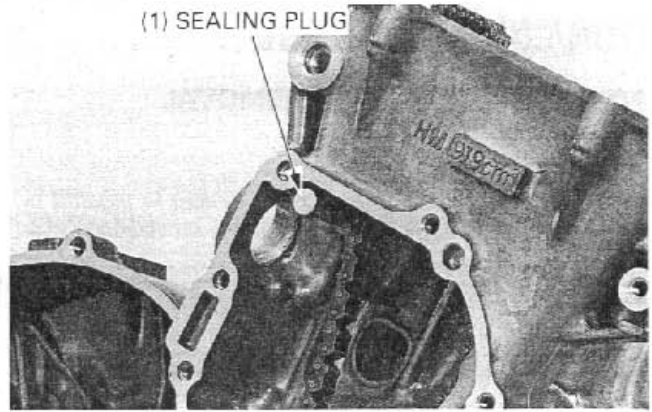
- Excessive crankshaft runout

# CRANKCASE SEPARATION

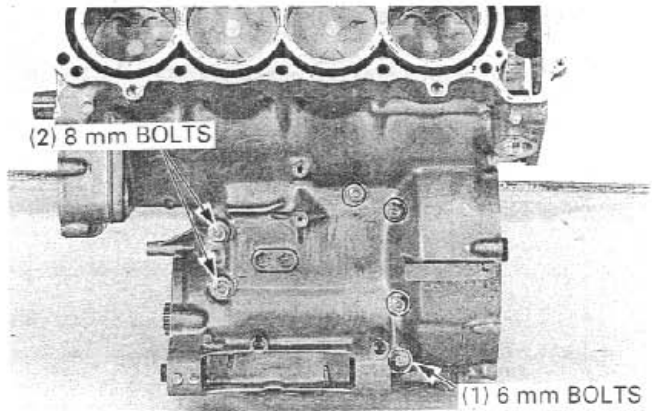
**NOTE**

- Refer to Service information (page 11-1) for removal of necessary parts before separating the crankcase.

Remove the sealing plug and O-ring.

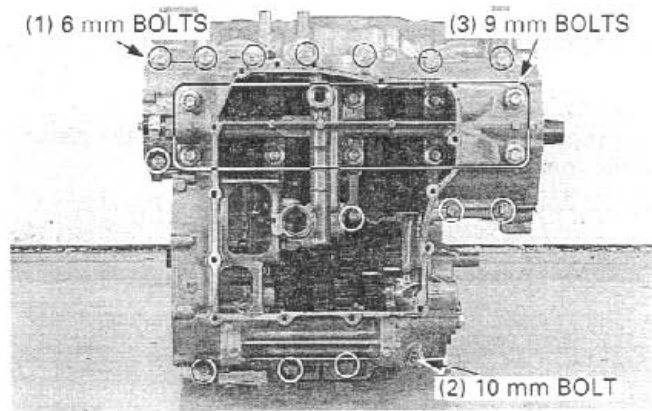


Remove the upper crankcase 6 mm bolts/sealing washers and 8 mm bolts/sealing washers.

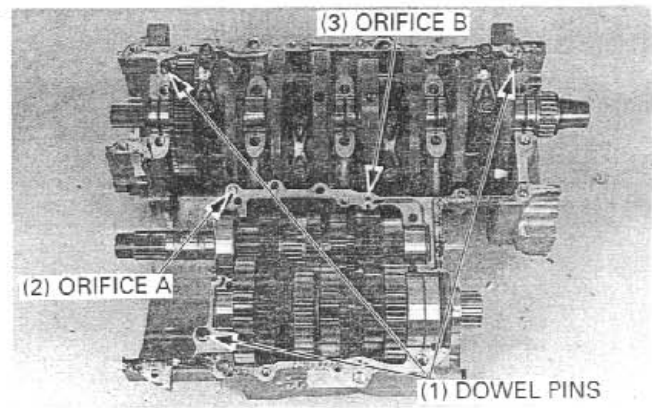


Remove the lower crankcase 6 mm bolts and 10 mm bolt. Loosen the lower crankcase 9 mm bolts in a crisscross pattern in 2 - 3 steps, then remove the bolts and sealing washers.

Separate the lower crankcase from the upper crankcase.



Remove the dowel pins and oil orifices A and B.



## PISTON/CONNECTING ROD

### PISTON/CONNECTING ROD REMOVAL

#### CAUTION

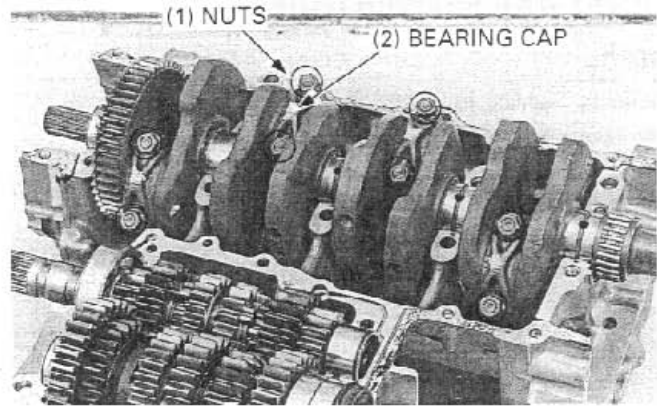
- Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

#### NOTE

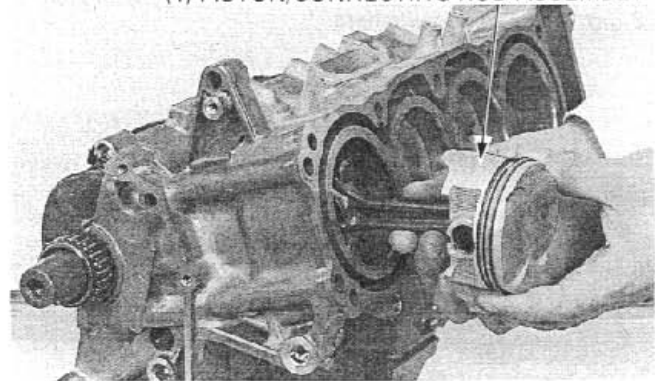
- Mark all parts during removal so they can be replaced in their original locations.

Remove the cap nuts and connecting rod bearing cap.

Remove the piston/connecting rod assembly from the top of the cylinder.



(1) PISTON/CONNECTING ROD ASSEMBLY



### PISTON REMOVAL

Remove the piston pin clip with pliers.  
Press the piston pin out of the piston and remove the piston from the connecting rod.

(1) PISTON PIN CLIP



### PISTON DISASSEMBLY

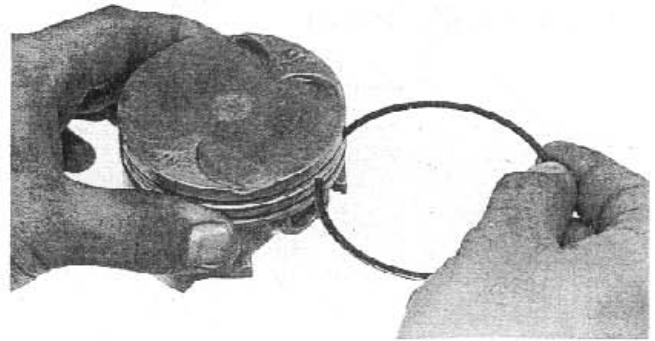
Remove the piston rings.

#### NOTE

- Do not damage the piston rings during removal.



Remove any carbon deposits from the piston ring grooves, using an old piston ring as shown.



## PISTON INSPECTION

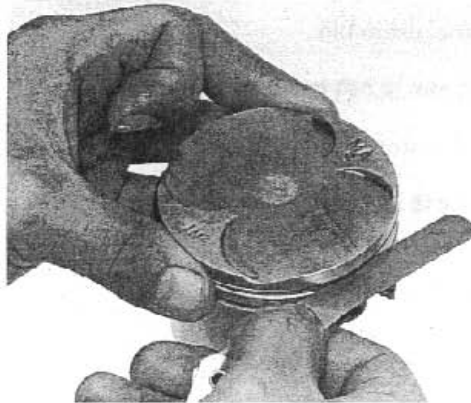
Temporarily install the piston rings to their proper position with the mark facing up.

Measure the piston ring to-ring groove clearance with the rings pushed into the grooves.

### SERVICE LIMITS:

**Top: 0.08 mm (0.003 in)**  
**Second: 0.07 mm (0.003 in)**

Inspect the piston for wear or damage.



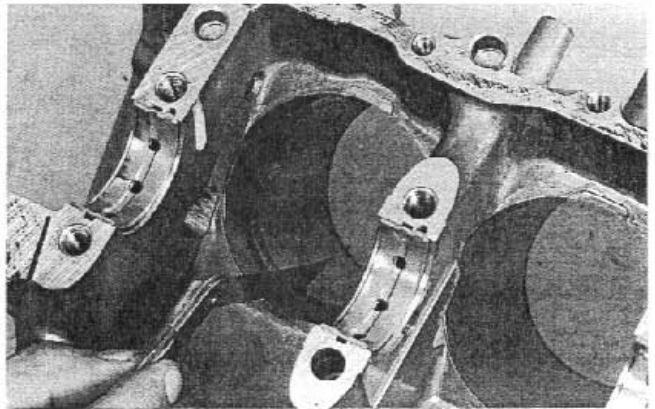
Insert the piston ring squarely into the bottom of the cylinder and measure the ring end gap.

### NOTE

- Push the rings into the cylinder with the top of the piston to be sure they are squarely in the cylinder.

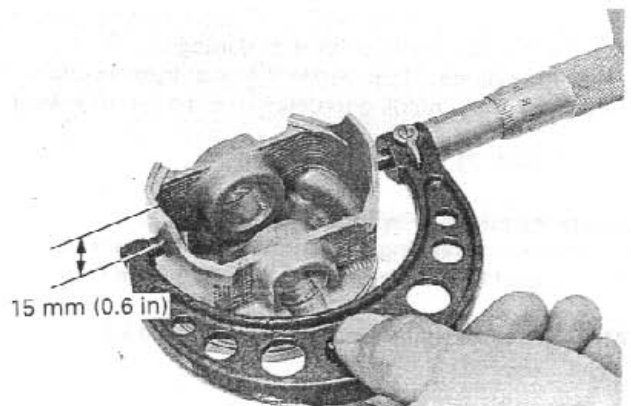
### SERVICE LIMITS:

**Top: 0.5 mm (0.02 in)**  
**Second: 0.7 mm (0.03 in)**  
**Oil (side rail): 0.9 mm (0.04 in)**



Measure the diameter of the piston at 15 mm (0.6 in) from the bottom and 90 degrees to the piston pin hole.

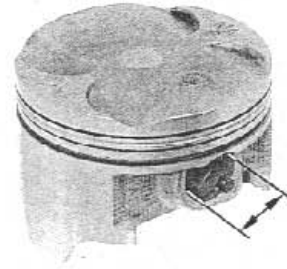
**SERVICE LIMIT: 70.90 mm (2.791 in)**



## CRANKCASE/PISTON/CYLINDER

Measure the piston pin bore.

**SERVICE LIMIT: 17.03 mm (0.670 in)**

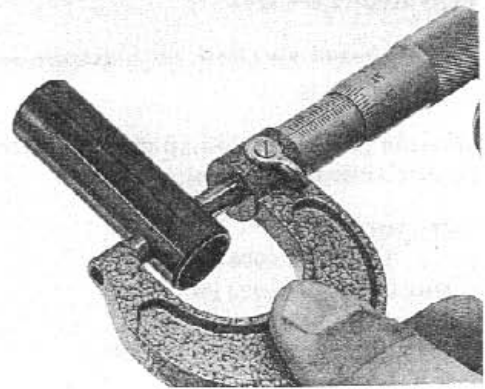


Measure the O.D. of the piston pin.

**SERVICE LIMIT: 16.98 mm (0.669 in)**

Calculate the piston-to-piston pin clearance.

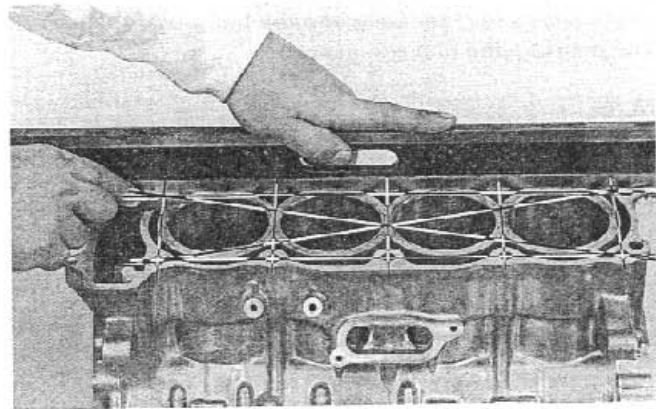
**STANDARD: 0.002 – 0.015 mm (0.0001 – 0.0006 in)**



## CYLINDER INSPECTION

Inspect the top of the cylinder for warpage.

**SERVICE LIMIT: 0.05 mm (0.002 in)**

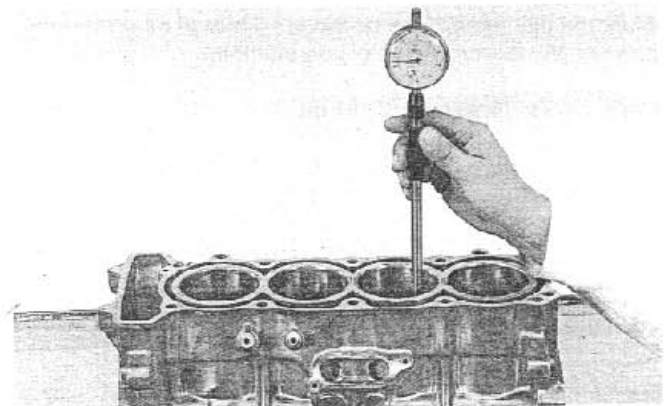


Inspect the cylinder bore for wear or damage.  
Measure the cylinder I.D. in X and Y axis at three levels.  
Take the maximum reading to determine the cylinder wear.

**SERVICE LIMIT: 71.10 mm (2.795 in)**

Calculate the piston-to-cylinder clearance.  
Take a maximum reading to determine the clearance.  
Refer to page 11-5 for measurement of the piston O.D.

**STANDARD: 0.015 – 0.050 mm (0.0006 – 0.0020 in)**



Calculate the taper and out of round at three levels in X and Y axis, Take the maximum reading to determine them.

**SERVICE LIMITS:**

- Taper: 0.10 mm (0.004 in)**
- Out of round: 0.10 mm (0.004 in)**

The cylinder must be rebored and an oversize piston fitted if the service limits are exceeded.

The following oversize pistons are available:

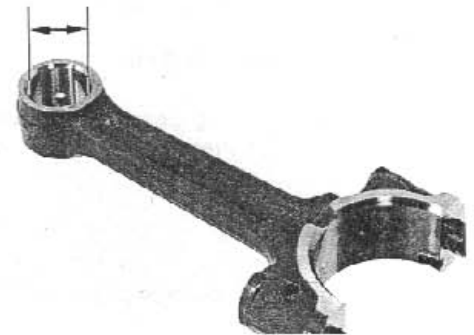
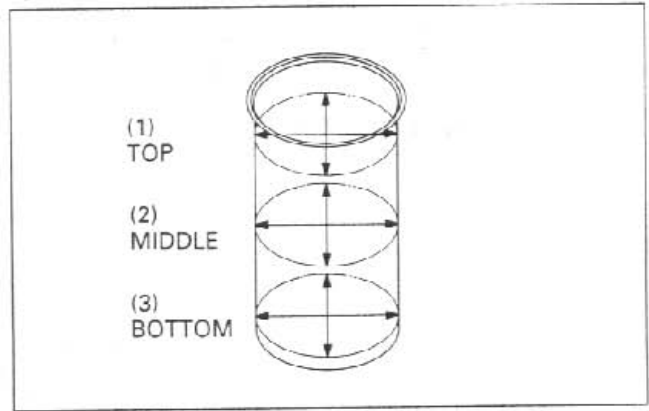
|            |  |
|------------|--|
| '96 - '97: | 0.50 mm (0.020 in)<br>1.00 mm (0.039 in) |
| After '97: | 0.25 mm (0.010 in)                       |

The piston to cylinder clearance for the oversize piston must be: 0.015 - 0.050 mm (0.0006 - 0.0020 in).

**CONNECTING ROD INSPECTION**

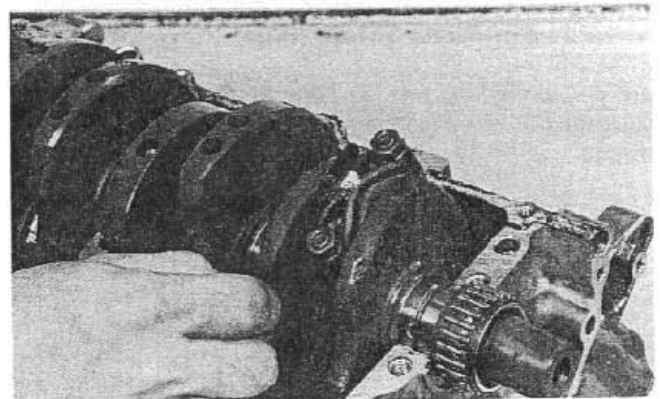
Measure the connecting rod small end I.D.

**SERVICE LIMIT: 17.04 mm (0.671 in)**



Temporarily install the connecting rod to the crankshaft. Install the bearing inserts and bearing cap, and tighten the bolts. Measure the connecting rod side clearance.

**SERVICE LIMIT: 0.30 mm (0.012 in)**

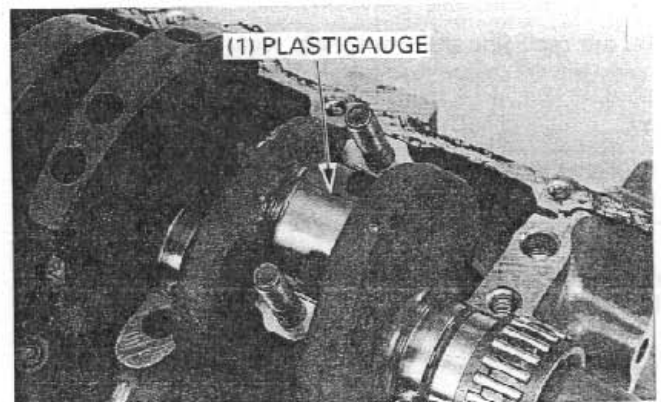


**CRANKPIN BEARING INSPECTION**

Wipe all oil from the bearing inserts and crankpins. Put a piece of plastigauge on each crankpin.

**NOTE**

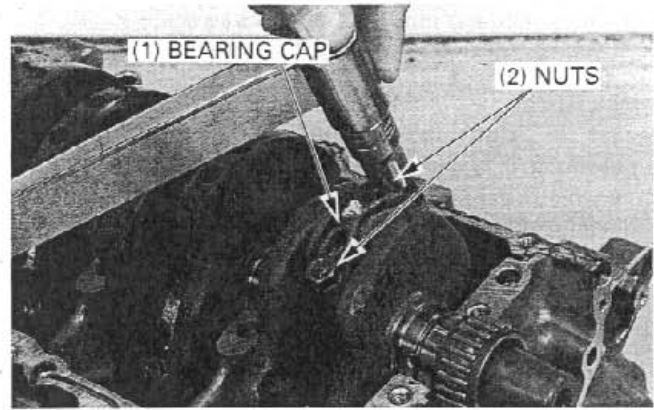
- Do not put the plastigauge over the oil hole in the crankpin.
- Do not rotate the crankshaft during inspection.



## CRANKCASE/PISTON/CYLINDER

Install the bearing caps and connecting rods on the correct crankpins, and tighten the cap nuts to the specified torque.

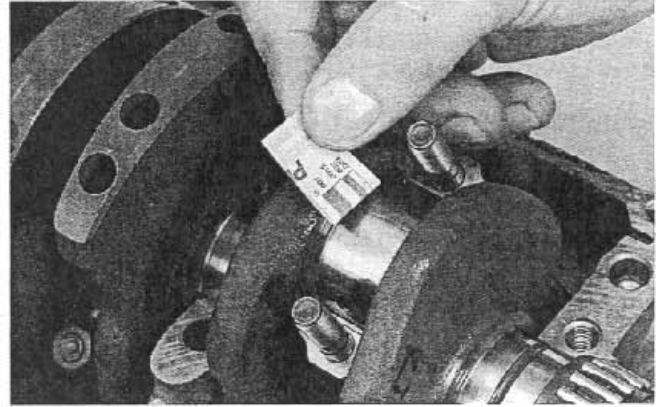
**TORQUE: 33 N·m (3.4 kgf·m, 25 lbf·ft)**



Remove the connecting rod caps and measure the compressed plastigauge on each crankpin.

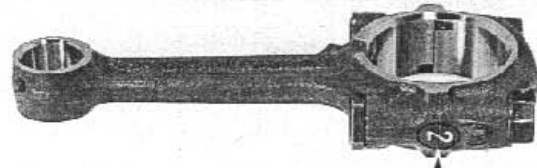
**SERVICE LIMIT: 0.06 mm (0.002 in)**

If the connecting rod bearing clearance is beyond tolerance, select a replacement bearing.



## CRANKPIN BEARING SELECTION

Record the connecting rod I.D. code number (1, 2 or 3) or measure the I.D. with the bearing cap installed without bearing inserts.



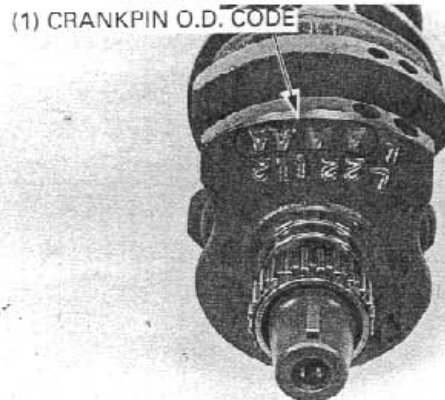
(1) CONNECTING ROD I.D. CODE

If you are replacing the crankshaft, record the corresponding crankpin O.D. code number (A, B or C)

### NOTE

- Numbers (A, B or C) on the crank weight are the codes for the crankpin O.D.s starting from the left.

If you are reusing the crankshaft, measure the crankpin O.D. with the micrometer.



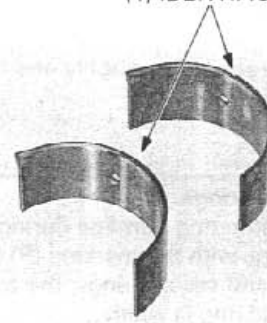
(1) CRANKPIN O.D. CODE

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

**BEARING THICKNESS:**

- A (Blue): Thick
- B (Black): ▲
- C (Brown) ▲▼
- D (Green) ▼
- E (Yellow) Thin

(1) IDENTIFICATION COLOR



**CRANKPIN BEARING SELECTION TABLE**

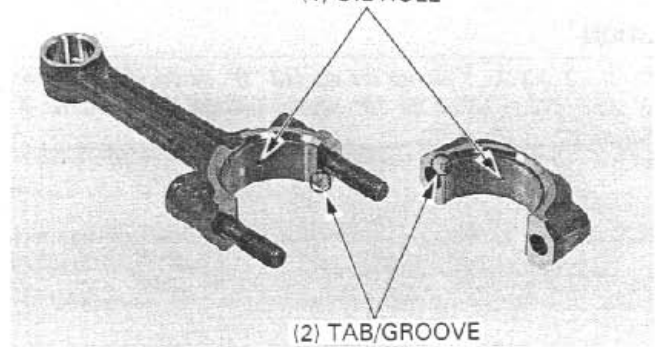
|                              |   | CONNECTING ROD I.D. CODE LETTER            |  |  |              |
|------------------------------|---|--|--|--|--------------|
|                              |   | 1  | 2  | 3  |              |
|                              |   | 39.000 – 39.006 mm<br>(1.5354 – 1.5357 in) | 39.006 – 39.012 mm<br>(1.5357 – 1.5359 in) | 39.012 – 39.018 mm<br>(1.5359 – 1.5361 in) |              |
| CRANKPIN O.D.<br>CODE LETTER | A | 36.497 – 36.503 mm<br>(1.4369 – 1.4371 in) | E<br>(Yellow)                              | D<br>(Green)                               | C<br>(Brown) |
|                              | B | 36.491 – 36.497 mm<br>(1.4367 – 1.4369 in) | D<br>(Green)                               | C<br>(Brown)                               | B<br>(Black) |
|                              | C | 36.485 – 36.491 mm<br>(1.4364 – 1.4367 in) | C<br>(Brown)                               | B<br>(Black)                               | A<br>(Blue)  |

Install the bearing inserts into the connecting rod and bearing cap.

**NOTE**

- Align the oil hole between the connecting rod and bearing, and also align the bearing tabs with the groove in the connecting rod and bearing cap.

(1) OIL HOLE



(2) TAB/GROOVE



## PISTON ASSEMBLY

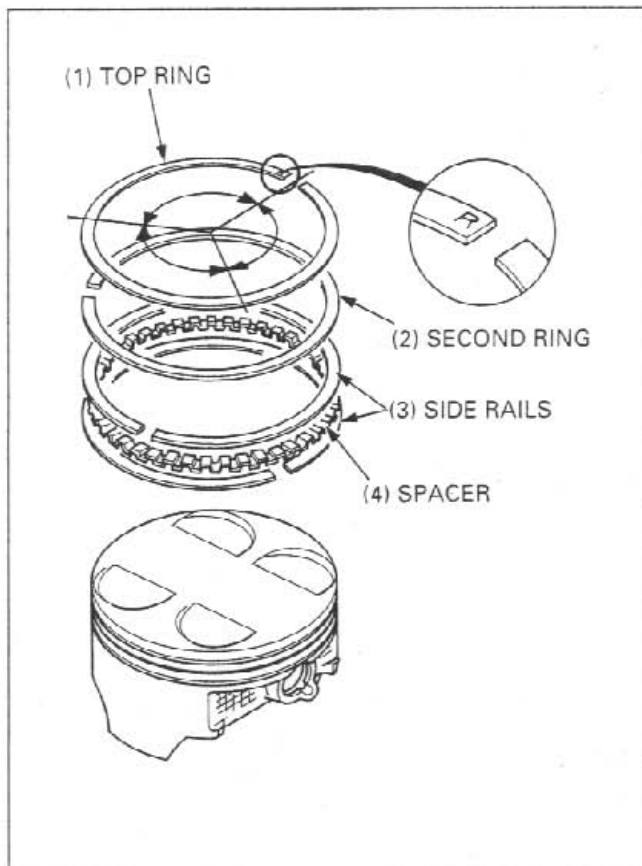
Clean the piston ring grooves thoroughly and install the piston rings.

### NOTE

- Apply oil to the piston rings.
- Avoid piston and piston ring damage during installation.
- Install the piston rings with the marking (R) facing up.
- Do not mix the top and second rings; the top ring is narrower than the second ring in width.

Space the piston ring end gaps 180 degrees apart. Do not align the gaps in the oil rings (side rails).

After installation, the rings should rotate freely in the ring grooves.



## PISTON INSTALLATION

### CAUTION

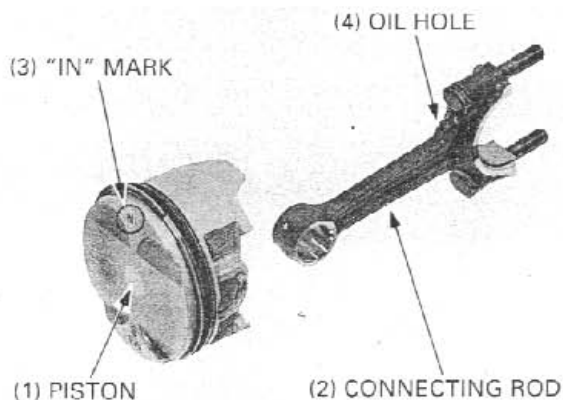
- The No. 2 and No. 3 pistons are marked "B" on the piston crown as shown. Never install the "B" pistons into the No. 1 and No. 4 cylinders.



Apply molybdenum disulfide oil to the connecting rod small end. Assemble the piston and connecting rod.

### NOTE

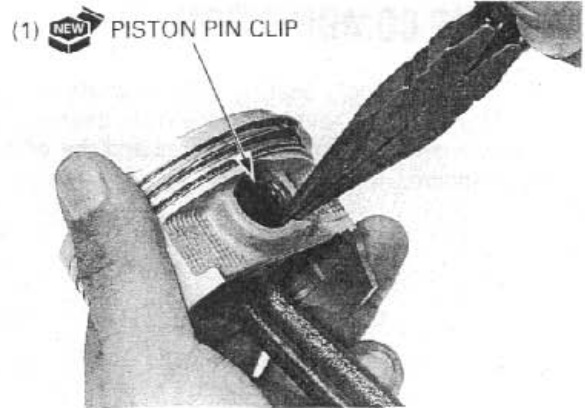
- Install the connecting rod with its oil hole side facing the "IN" mark on the piston crown.



Apply oil to the piston pin outer surface.  
Install the piston pin, and secure it using a new piston pin clips.

**NOTE**

- Do not align the piston pin clips end gap with the piston cut-out.



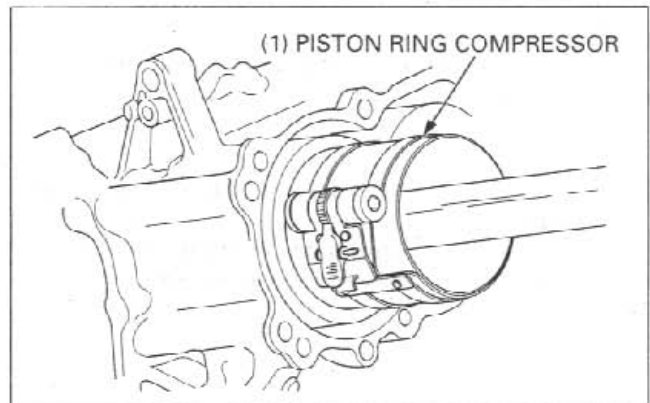
Install the piston/connecting rod assembly into the cylinder using a commercially available piston ring compressor tool.

**CAUTION**

- While installing the piston, being careful not to damage the top surface of the cylinder, especially around the cylinder bore.
- Be careful not to damage the cylinder sleeve and crankpin with the connecting rod bolt threads.

**NOTE**

- Install the piston/connecting rod assembly with the piston "IN" mark facing to the intake side.

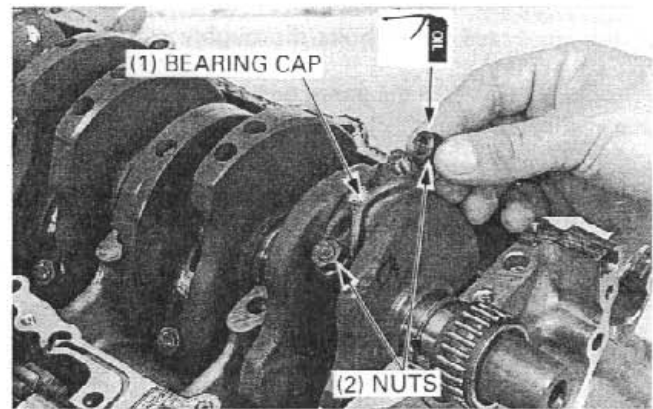


Use the handle of a plastic hammer to tap the piston into cylinder.

**NOTE**

- Make sure ring compressor tool sits flush with the top surface of the cylinder.

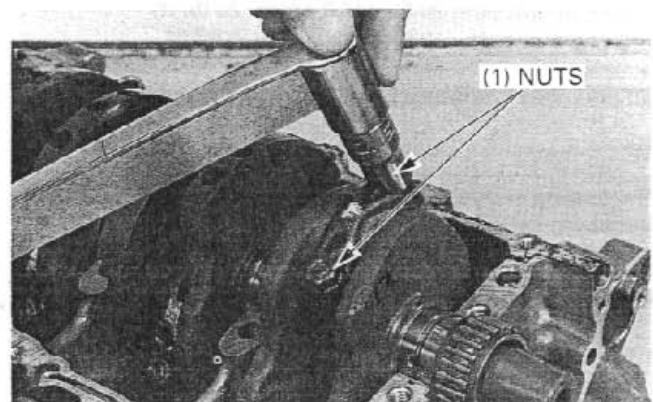
Apply molybdenum disulfide oil to the crankpin bearing surfaces.  
Install the bearing cap.



Apply oil to the connecting rod nut threads and seating surfaces.

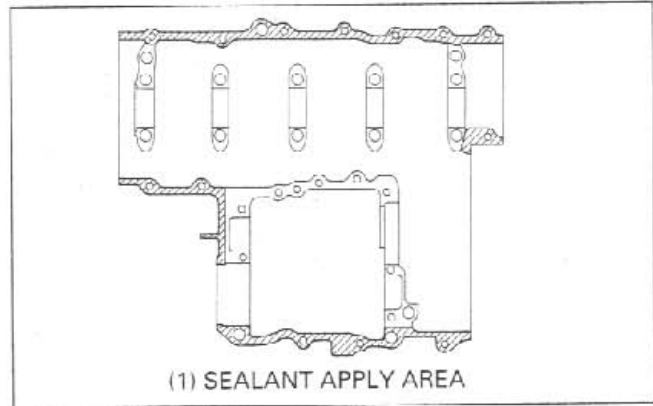
Install the nut and tighten the nuts gradually and alternately.

**TORQUE: 33 N·m (3.4 kgf·m, 25 lbf·ft)**



## CRANKCASE COMBINATION

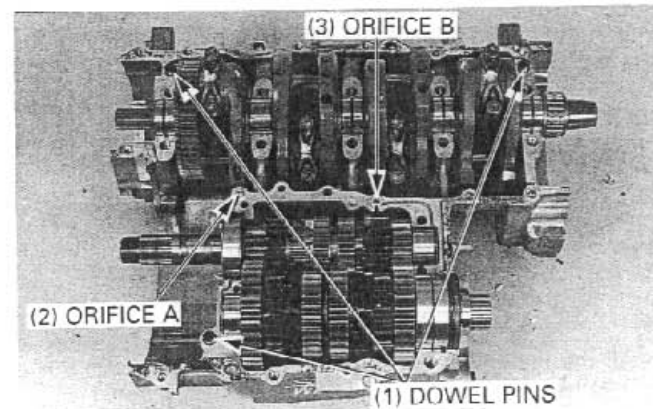
Apply a light, but thorough, coating of liquid sealant to the crankcase mating surface, except to the main bearing journal bolt (lower crankcase bolt, 9 mm) area and the oil passage area as shown.



Install the three dowel pins.  
Install oil orifices A and B into the crankcase as described below.

**NOTE**

- Install oil orifice A with its smaller oil hole side facing the lower crankcase.
- Install oil orifice B by aligning its cut-out with the upper crankcase groove and oil hole facing to the rear.



Clean the crankcase 9 mm bolts thoroughly with solvent and blow them dry.  
Apply clean engine oil to the 9 mm bolt threads and seating surface and install them.

Loosely install all the lower crankcase bolts.  
Make sure the upper and lower crankcase are seated securely.

From the inside to outside, tighten the lower crankcase 9 mm bolts in a crisscross pattern in 2 – 3 steps.

**TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)**

Tighten the 10 mm bolt, and then the 6 mm bolts.

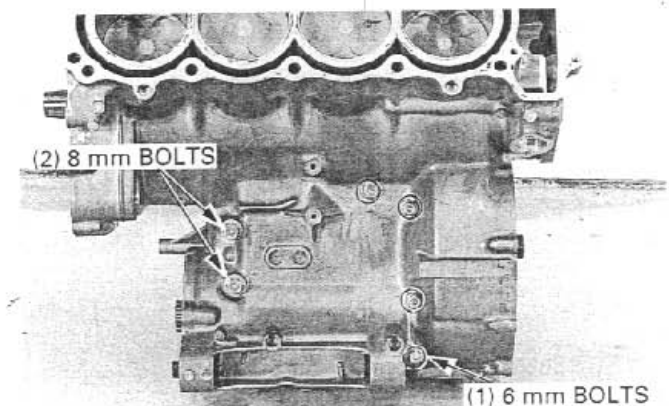
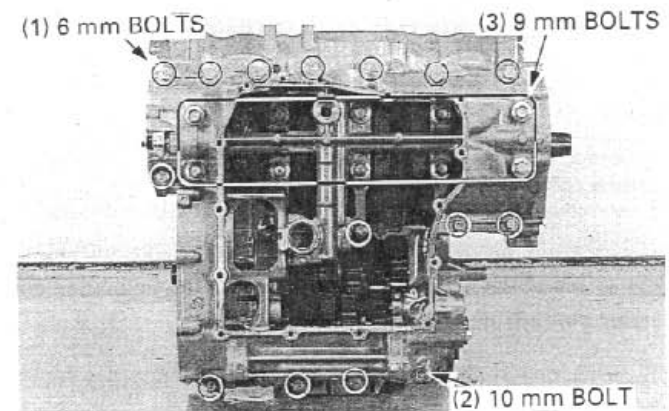
**TORQUE: 10 mm bolt: 39 N·m (4.0 kgf·m, 29 lbf·ft)**  
**6 mm bolt: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

Install the upper crankcase bolts and sealing washers.

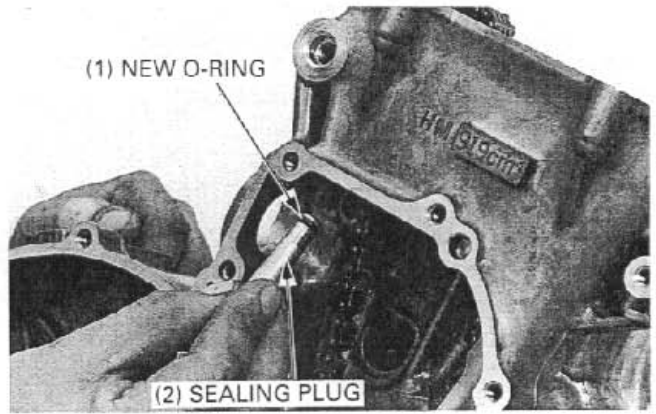
**NOTE**

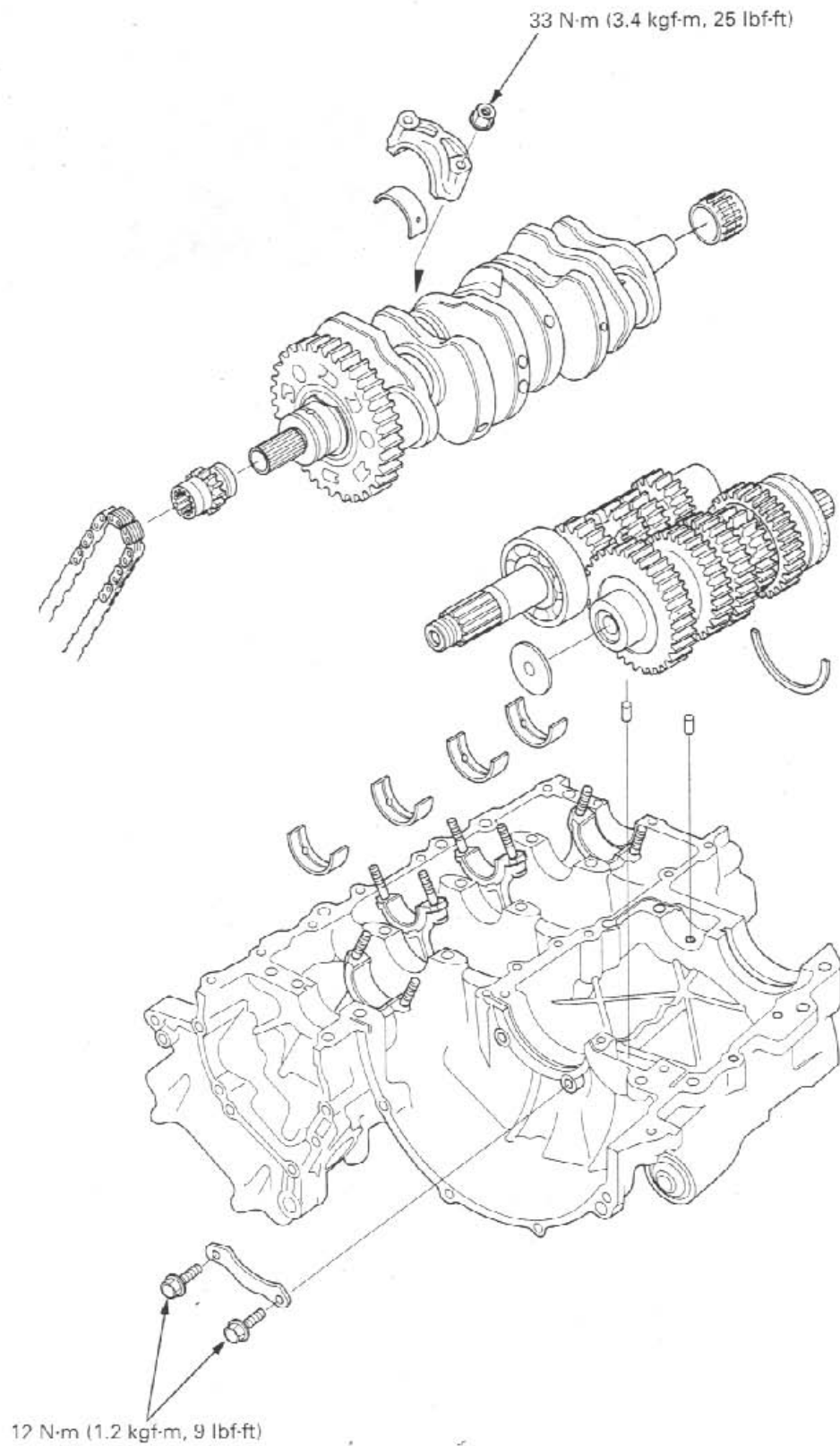
- The sealing washer locations are indicated on the upper crankcase using the "Δ" mark.

**TORQUE: 8 mm bolt: 25 N·m (2.5 kgf·m, 18 lbf·ft)**  
**6 mm bolt: 12 N·m (1.2 kgf·m, 9 lbf·ft)**



Install the new O-ring and sealing plug.





# 12. CRANKSHAFT/TRANSMISSION

|                     |      |              |      |
|---------------------|------|--------------|------|
| SERVICE INFORMATION | 12-1 | CRANKSHAFT   | 12-3 |
| TROUBLESHOOTING     | 12-2 | TRANSMISSION | 12-9 |

## SERVICE INFORMATION

### GENERAL

- The crankcase must be separated to service the crankshaft and transmission. Refer to section 11 for crankcase separation/assembly.
- Be careful not to damage the crankshaft main journal and journal bearing while removing or installing the crankshaft.
- Mark and store the disassembled parts to ensure that they are installed in their original locations.
- Mark and store the bearing inserts to ensure that the parts are in their correct locations during reassembly. If the inserts are improperly installed, they will block the oil hole, causing insufficient lubrication and eventual engine seizure.
- The main journal bearing inserts are a select fit and are identified by color codes. Select replacement bearings from the code tables. After installing new bearings, recheck them with a plastigauge to verify clearance. Apply molybdenum disulfide oil to the main journal during assembly.

### SPECIFICATIONS

Unit: mm (in)

| ITEM         |                            | STANDARD                        | SERVICE LIMIT                     |               |
|--------------|----------------------------|---------------------------------|-----------------------------------|---------------|
| Crankshaft   | Side clearance             | 0.05 – 0.20 (0.002 – 0.008)     | 0.30 (0.012)                      |               |
|              | Runout                     |                                 | 0.30 (0.012)                      |               |
|              | Main journal oil clearance | 0.017 – 0.035 (0.0007 – 0.0014) | 0.04 (0.002)                      |               |
| Transmission | Gear I.D.                  | M5, 6                           | 28.000 – 28.021 (1.1024 – 1.1032) | 28.04 (1.104) |
|              |                            | C1                              | 24.000 – 24.021 (0.9449 – 0.9457) | 24.04 (0.946) |
|              |                            | C2, 3, 4                        | 31.000 – 31.025 (1.2205 – 1.2215) | 31.04 (1.222) |
|              | Bushing O.D.               | M5, 6                           | 27.959 – 27.980 (1.1007 – 1.1016) | 27.94 (1.100) |
|              |                            | C2                              | 30.955 – 30.980 (1.2187 – 1.2197) | 30.93 (1.218) |
|              |                            | C3, 4                           | 30.950 – 30.975 (1.2185 – 1.2195) | 30.93 (1.218) |
|              | Bushing I.D.               | M5                              | 24.985 – 25.006 (0.9837 – 0.9845) | 25.02 (0.985) |
|              |                            | C2                              | 27.985 – 28.006 (1.1018 – 1.1026) | 28.02 (1.103) |
|              | Gear-to-bushing clearance  | M5, 6                           | 0.020 – 0.062 (0.0008 – 0.0024)   | 0.10 (0.004)  |
|              |                            | C2                              | 0.020 – 0.070 (0.0008 – 0.0028)   | 0.11 (0.004)  |
|              |                            | C3, 4                           | 0.025 – 0.075 (0.0010 – 0.0030)   | 0.11 (0.004)  |
|              | Mainshaft O.D.             | M5                              | 24.967 – 24.980 (0.9830 – 0.9835) | 24.96 (0.983) |
|              |                            | Clutch outer guide              | 24.980 – 24.993 (0.9835 – 0.9840) | 24.96 (0.983) |
|              | Countershaft O.D.          | C2                              | 27.967 – 27.980 (1.1011 – 1.1016) | 27.96 (1.101) |
|              | Bushing-to-shaft clearance | M5                              | 0.005 – 0.039 (0.0002 – 0.0015)   | 0.08 (0.003)  |
| C2           |                            | 0.005 – 0.039 (0.0002 – 0.0015) | 0.08 (0.003)                      |               |

### TORQUE VALUES

|                                  |                               |  |
|----------------------------------|-------------------------------|--|
| Connecting rod nut               | 33 N·m (3.4 kgf·m, 25 lbf·ft) | Apply oil to the threads and seating surface |
| Mainshaft bearing set plate bolt | 12 N·m (1.2 kgf·m, 9 lbf·ft)  | Apply a locking agent to the threads         |

### TOOLS

|                       |                 |
|-----------------------|-----------------|
| Driver, 40 mm I.D.    | 07746 - 0030100 |
| Attachment, 25 mm     | 07746 - 0030200 |
| Attachment "B" collar | 07964 - MB00200 |

## TROUBLESHOOTING

### Excessive noise

- Worn connecting rod big end bearing
- Bent connecting rod
- Worn crankshaft main journal bearing
- Worn transmission bearing

### Hard to shift

- Improper clutch operation
- Incorrect transmission oil weight
- Incorrect clutch adjustment
- Bent shift fork
- Bent fork shaft
- Bent fork claw
- Damaged shift drum cam groove
- Bent shift spindle

### Transmission jumps out of gear

- Worn gear dogs and slots
- Bent fork shaft
- Broken shift drum stopper
- Worn or bent shift forks
- Broken shift linkage return spring

### Engine vibration

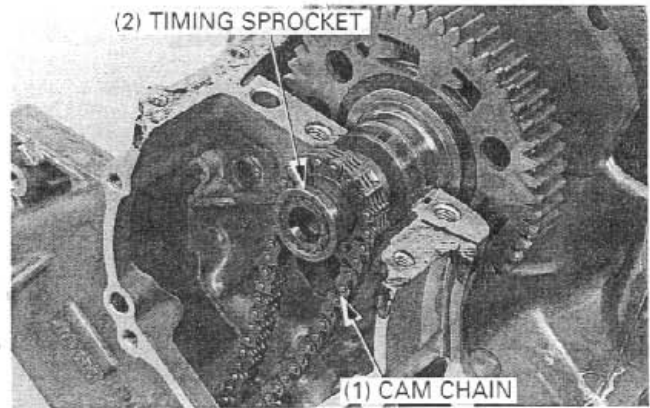
- Excessive crankshaft runout

## CRANKSHAFT

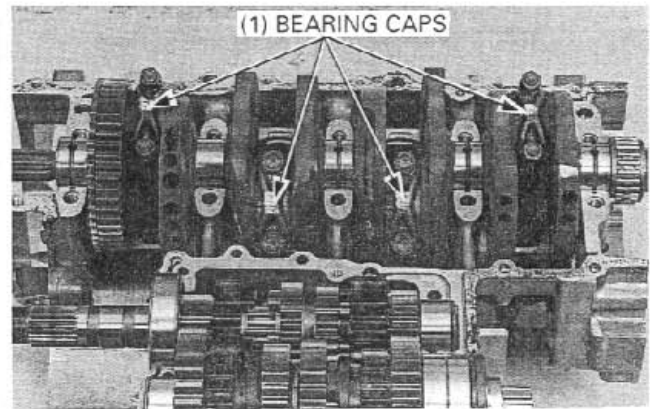
### REMOVAL

Separate the crankcase halves (page 11-3).

Remove the cam chain and timing sprocket.



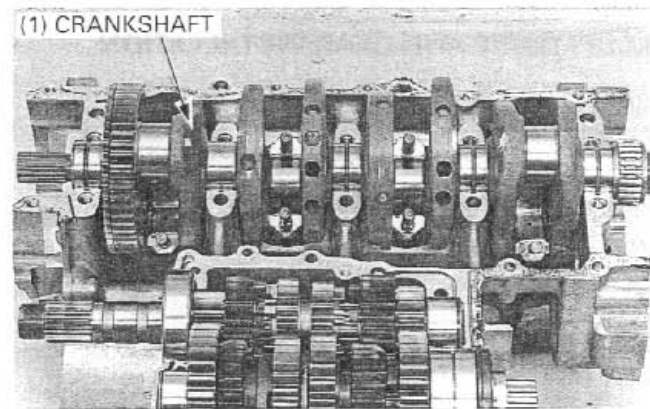
Remove the connecting rod bearing cap nuts and bearing caps.



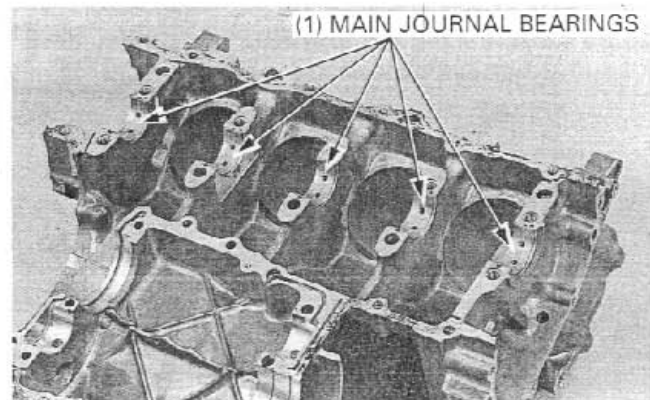
### CAUTION

- *Before removal, position all the pistons at TDC (Top Dead Center) to prevent damaging the crankpin with the connecting rod bolt threads.*

Remove the crankshaft.



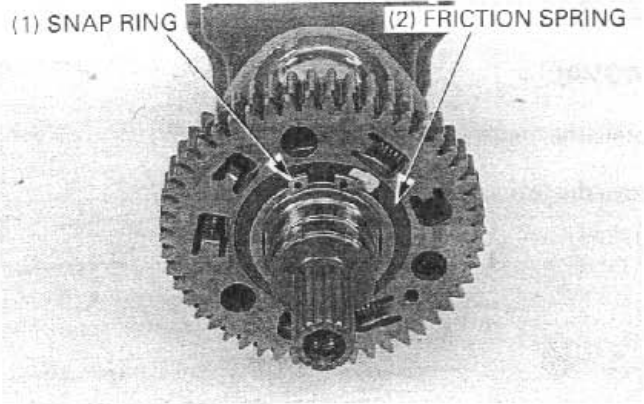
Remove the main journal bearings from both the crankcases.



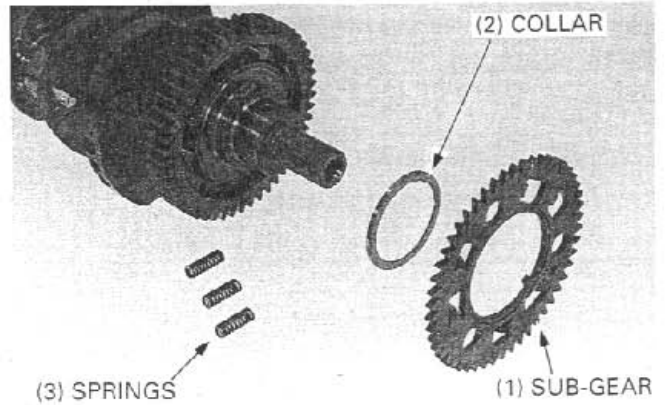


**PRIMARY DRIVE SUB-GEAR REMOVAL**

Remove the special snap ring and friction spring.

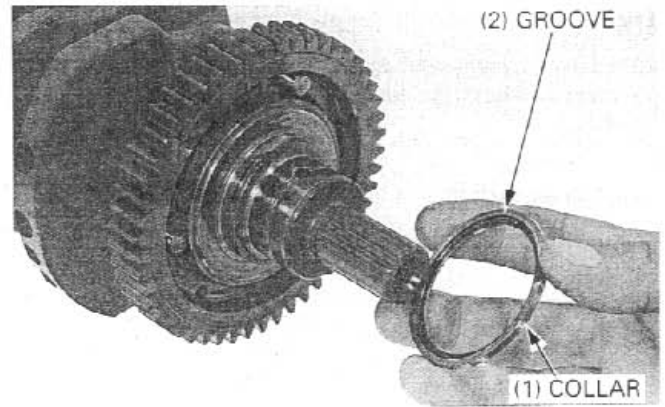


Remove the primary drive sub-gear, collar and springs.

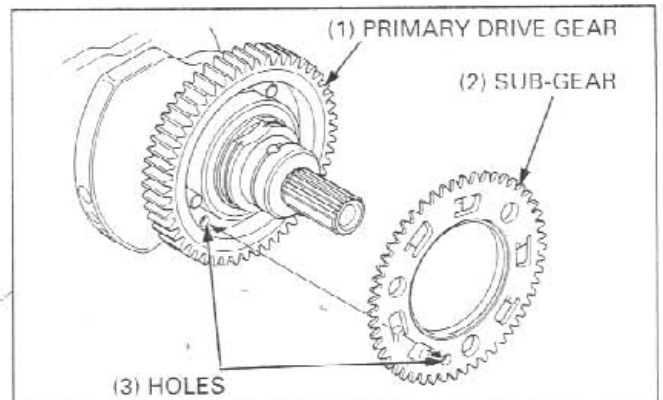


**PRIMARY DRIVE SUB-GEAR INSTALLATION**

Install the collar with its groove side facing in.



Install the primary drive sub-gear onto the primary drive gear, aligning the holes between the gear.

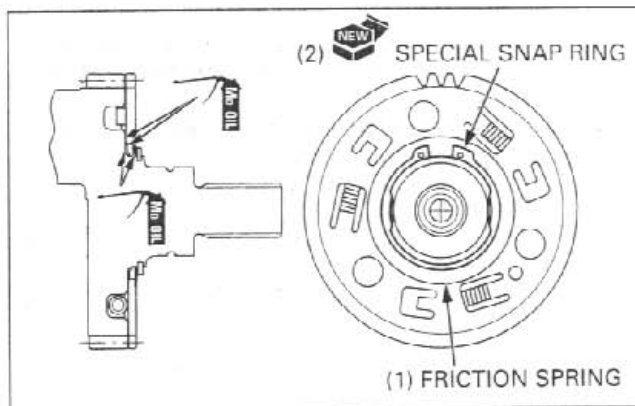


Apply molybdenum disulfide oil to the area shown in the illustration.

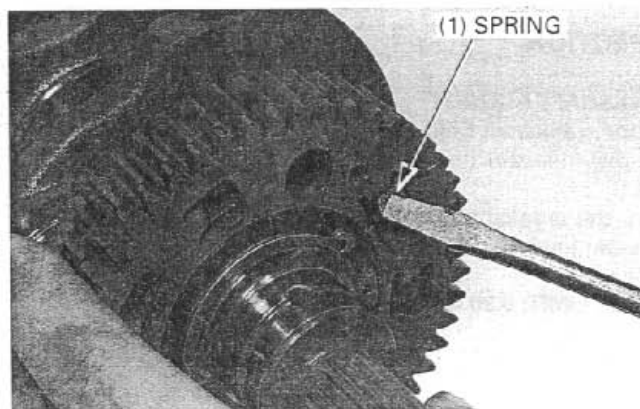
Install the friction spring and new special snap ring.

**CAUTION**

- You must use the new special snap ring. Using a snap ring other than specified or reusing the snap ring can cause severe engine damage.
- Install the new special snap ring with its large tab facing to the right and the chamfered side facing in.
- Make sure the new special snap ring end gap is aligned with the right angle of the crankshaft cut-outs as shown.



Install the springs into the primary drive gear as shown.

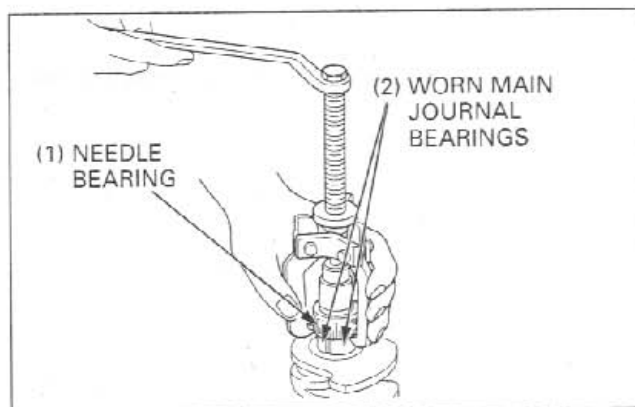


**STARTER CLUTCH NEEDLE BEARING REPLACEMENT**

Remove the needle bearing with a commercially available universal bearing puller.

**CAUTION**

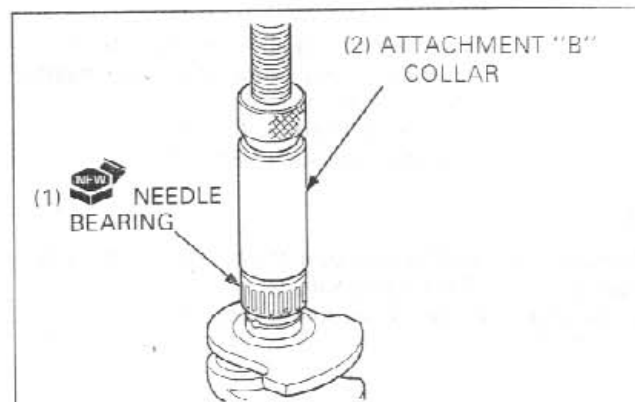
- To protect the crankshaft main journal from the bearing puller claws, cover the main journal properly; worn main journal bearings are usable as protectors.



Press a new needle bearing onto the crankshaft using a hydraulic press and special tool.

**TOOL:**

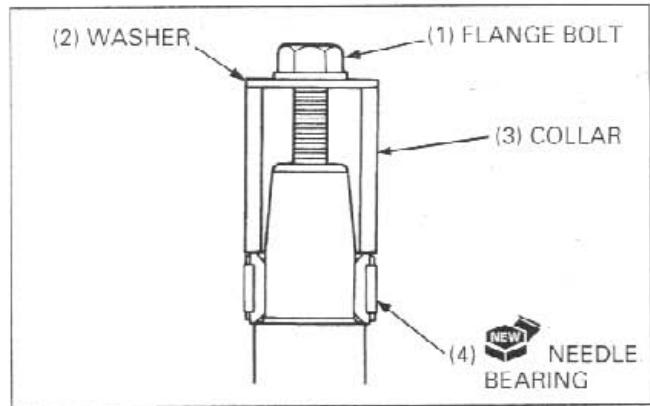
Attachment "B" (collar) 07964 - MB00200



## CRANKSHAFT/TRANSMISSION

If the special tool is not available, prepare a suitable collar, washer and 8 mm flange bolt (example; flywheel bolt) for the bearing installation.

Assemble the above items, and screw the bolt gradually, then install the new needle bearing.



## INSPECTION

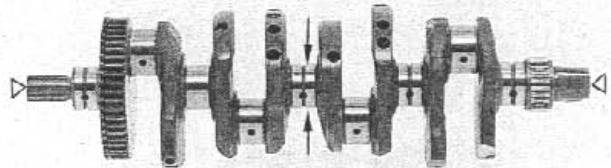
### CRANKSHAFT RUNOUT

Hold the crankshaft both end.

Set a dial indicator on the center main journal of the crankshaft.

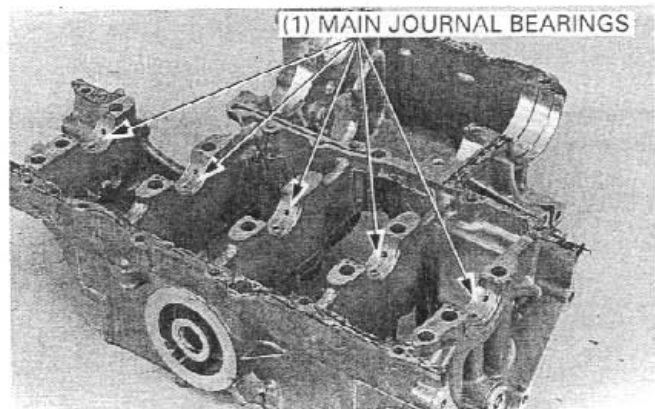
Rotate the crankshaft two revolutions and read runout at the center journal.

**SERVICE LIMIT:** 0.30 mm (0.012 in)



### MAIN JOURNAL BEARING

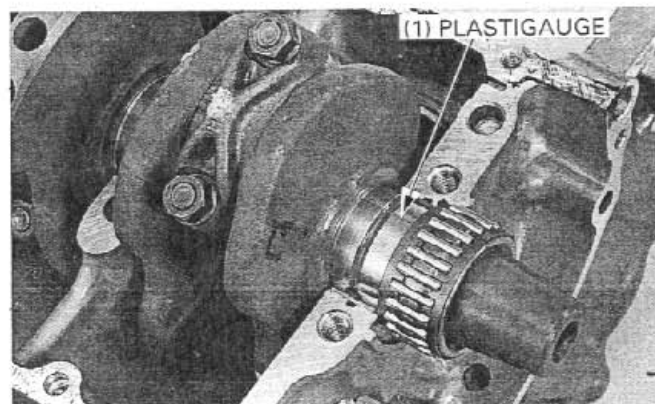
Inspect the main journal bearing inserts for damage or separation.



Inspect the bearing inserts for unusual wear or damage. Reinstall the upper crankcase's main journal bearing inserts, then carefully lower the crankshaft in place. Wipe the oil from the bearing inserts and journals. Put a piece of plastigauge on each journal.

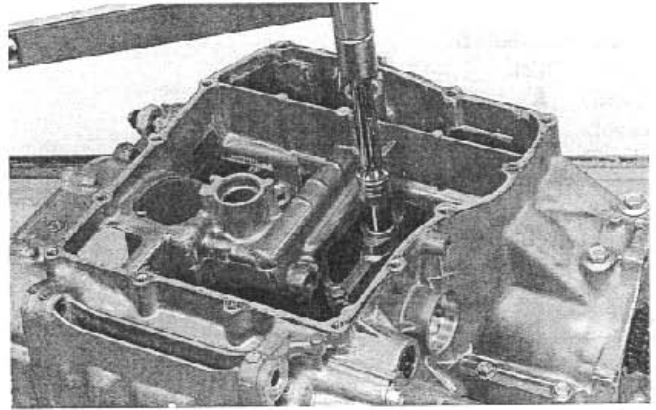
### NOTE

- Do not put the plastigauge over the oil hole in the main bearing journal of the crankshaft.
- Do not rotate the crankshaft during inspection.



Assemble the crankcase halves.  
Tighten the 9 mm bolts to the specified torque.

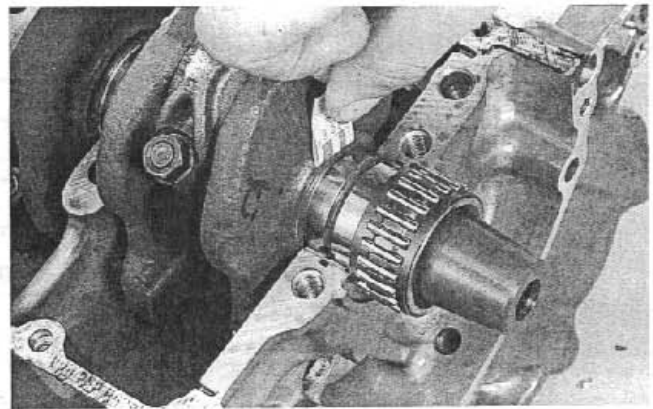
**TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)**



Remove the 9 mm bolts and lower crankcase.  
Measure the compressed plastigauge on each journal.

**SERVICE LIMIT: 0.04 mm (0.002 in)**

If main bearing clearance is beyond tolerance, select a replacement bearing.

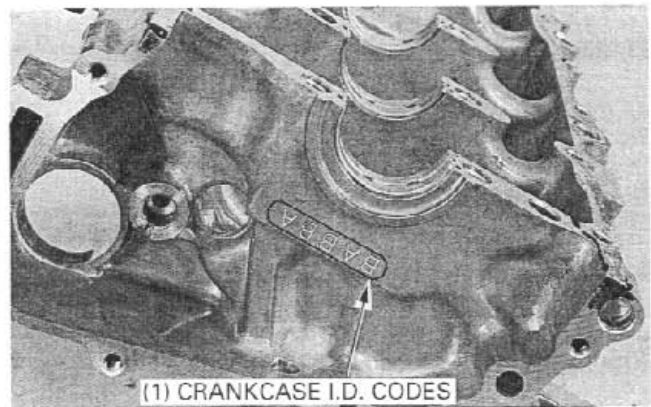


### MAIN JOURNAL BEARING SELECTION

Record the crankcase I.D. letters from the pad on the left side of the upper crankcase as shown.

#### NOTE

- The letters (A, B or C) on the upper crankcase are the codes for the journal I.D.s from left to right.

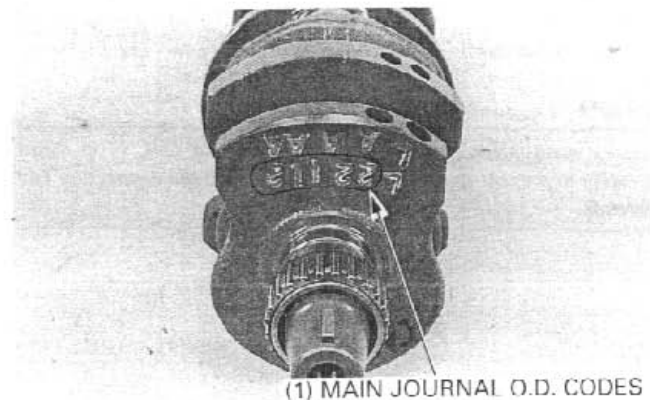


Record the corresponding main journal O.D. code numbers from the crank weight.

#### NOTE

- The numbers (1, 2 or 3) on the crank weight are the codes for the main journal O.D.s from left to right.

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



## CRANKSHAFT/TRANSMISSION

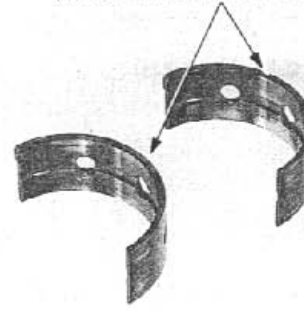
### BEARING THICKNESS:

A (Black): Thick  
 B (Blown): ▲  
 C (Green):  
 D (Yellow): ▼  
 E (Pink): Thin

### CAUTION

- After selecting new bearings, recheck the clearance with a plasti-gauge. Incorrect clearance can cause severe engine damage.

(1) IDENTIFICATION COLOR



### MAIN JOURNAL BEARING SELECTION TABLE

|                                |   | CRANKCASE I.D. CODE LETTER                 |  |  |              |
|--------------------------------|---|--|--|--|--------------|
|                                |   | A  | B  | C  |              |
|                                |   | 37.000 – 37.006 mm<br>(1.4566 – 1.4569 in) | 37.006 – 37.012 mm<br>(1.4569 – 1.4572 in) | 37.012 – 37.018 mm<br>(1.4572 – 1.4574 in) |              |
| CRANKSHAFT O.D.<br>CODE LETTER | 1 | 34.000 – 34.006 mm<br>(1.3386 – 1.3388 in) | E<br>(Pink)                                | D<br>(Yellow)                              | C<br>(Green) |
|                                | 2 | 33.994 – 34.000 mm<br>(1.3383 – 1.3386 in) | D<br>(Yellow)                              | C<br>(Green)                               | B<br>(Brown) |
|                                | 3 | 33.988 – 33.994 mm<br>(1.3381 – 1.3383 in) | C<br>(Green)                               | B<br>(Brown)                               | A<br>(Black) |

### INSTALLATION

Install the main journal bearings into the upper and lower crankcase.

#### NOTE

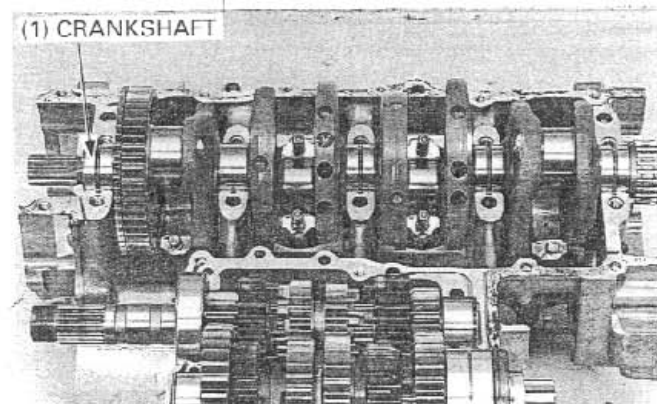
- The bearing tabs should be aligned with the grooves in the case.

Apply molybdenum disulfide oil to the upper and lower main journal bearings.

Install the crankshaft.

### CAUTION

- Before installation, position all the pistons at TDC (Top Dead Center) to prevent damaging the crankpin with the connecting rod threads.

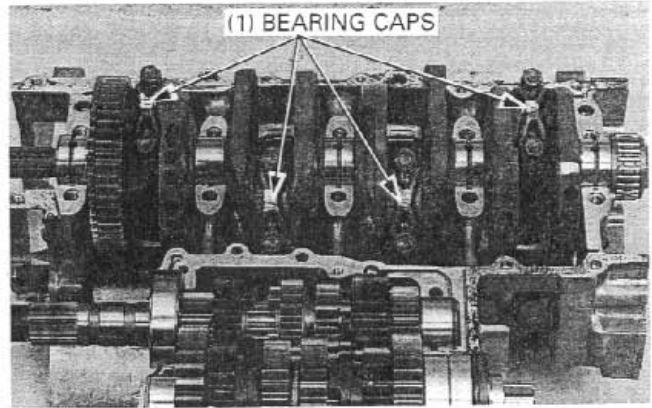


Install the connecting rod bearing caps.

Apply oil to the connecting rod nut threads and seating surfaces.

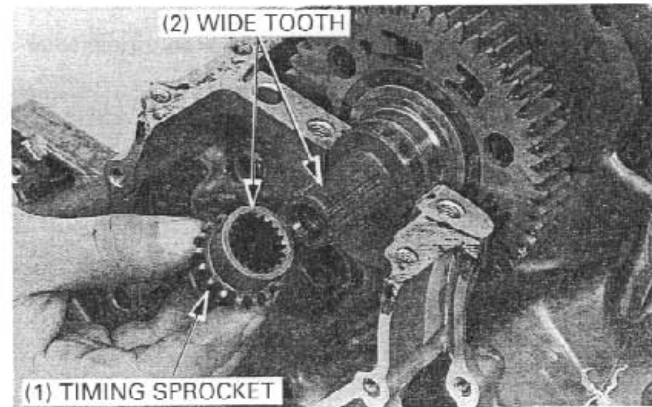
Install and tighten the nuts gradually and alternately.

**TORQUE: 33 N·m (3.4 kgf·m, 25 lbf·ft)**



Install the timing sprocket by aligning the wide teeth between the crankshaft and sprocket.  
Install the cam chain.

Assemble the upper and lower crankcase (page 11-12).

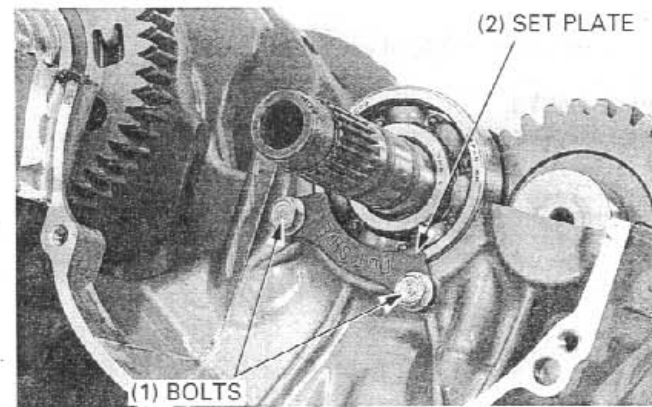


## **TRANSMISSION**

### **REMOVAL/DISASSEMBLY**

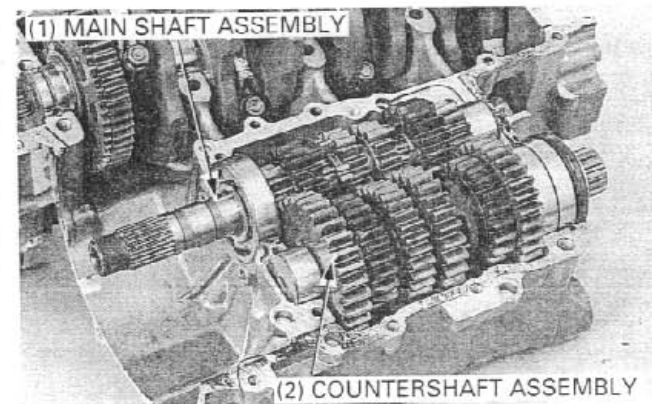
Separate the crankcase halves (page 11-3).

Remove the bolts and mainshaft bearing set plate.



Remove the mainshaft and countershaft assembly.

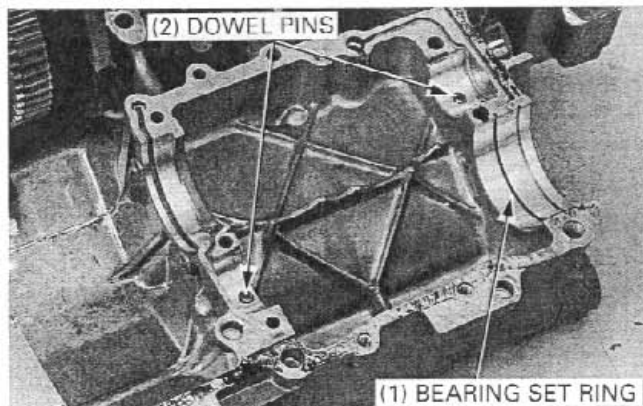
Remove the orifice plate from the countershaft.



## CRANKSHAFT/TRANSMISSION

Remove the countershaft bearing set ring and dowel pins.

Disassemble the mainshaft and countershaft.



Check the gear dogs, dog holes and teeth for abnormal wear or lack of lubrication.

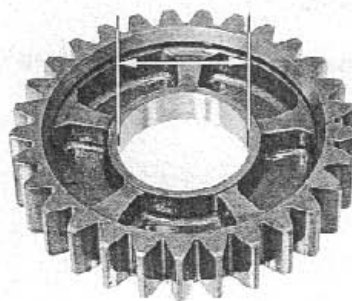
Measure the I.D. of each gear.

### SERVICE LIMITS:

M5, M6: 28.04 mm (1.104 in)

C1: 24.04 mm (0.946 in)

C2, C3, C4: 31.04 mm (1.222 in)



Measure the I.D. and O.D. of each gear bushing.

### SERVICE LIMITS:

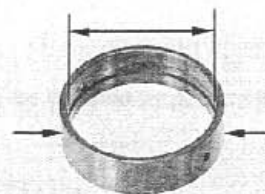
O.D.: M5, M6: 27.94 mm (1.100 in)

C2: 30.93 mm (1.218 in)

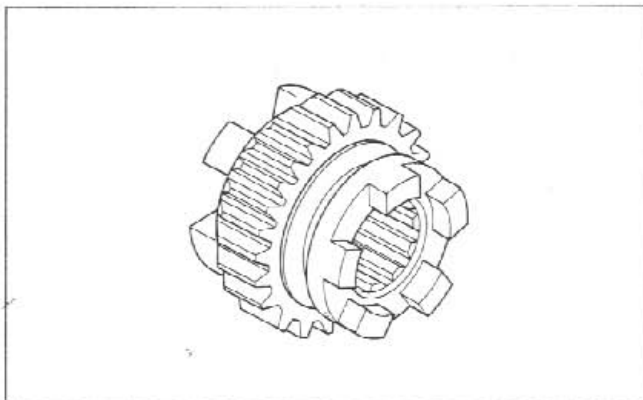
C3, C4: 30.93 mm (1.218 in)

I.D.: M5: 25.02 mm (0.985 in)

C2: 28.02 mm (1.103 in)



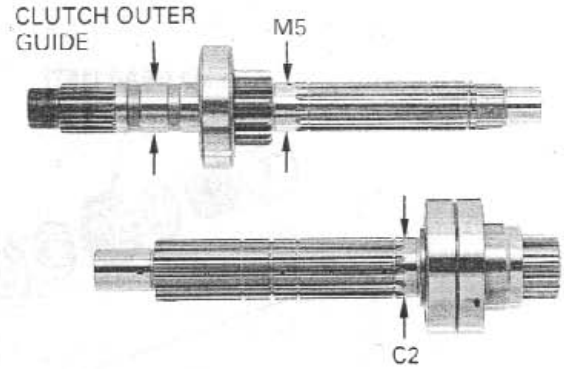
Check the shift fork groove of the shifter gear for excessive wear or damage.



Measure the O.D. of the mainshaft and countershaft.

**SERVICE LIMITS:**

- M5: 24.96 mm (0.983 in)
- Clutch outer guide: 24.96 mm (0.983 in)
- C2: 27.96 mm (1.101 in)



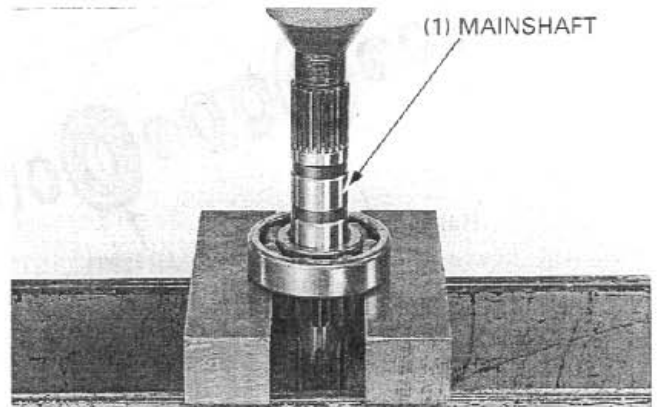
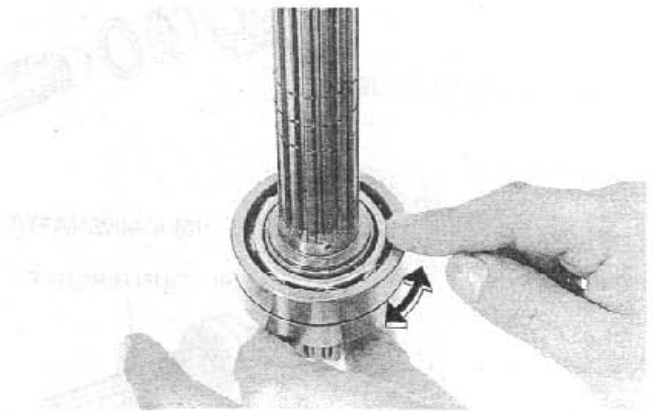
**BEARING REPLACEMENT**

**NOTE**

- Do not try to remove the countershaft bearing from the shaft. If the bearing is worn or damaged, replace the countershaft as an assembly.

Turn the outer race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing inner race fits tightly on the shaft. Remove and discard the mainshaft bearing, if the race does not turn smoothly, quietly, or fits loosely on the mainshaft. Replace the countershaft, collar, and bearing as an assembly, if the race does not turn smoothly, quietly, or fits loosely on the countershaft.

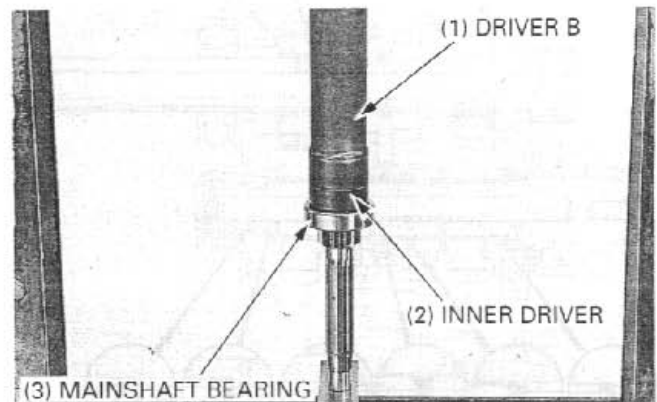
Press out the mainshaft from the bearing using a hydraulic press.



Install a new mainshaft bearing onto the mainshaft by pressing the mainshaft bearing inner race using the special tool.

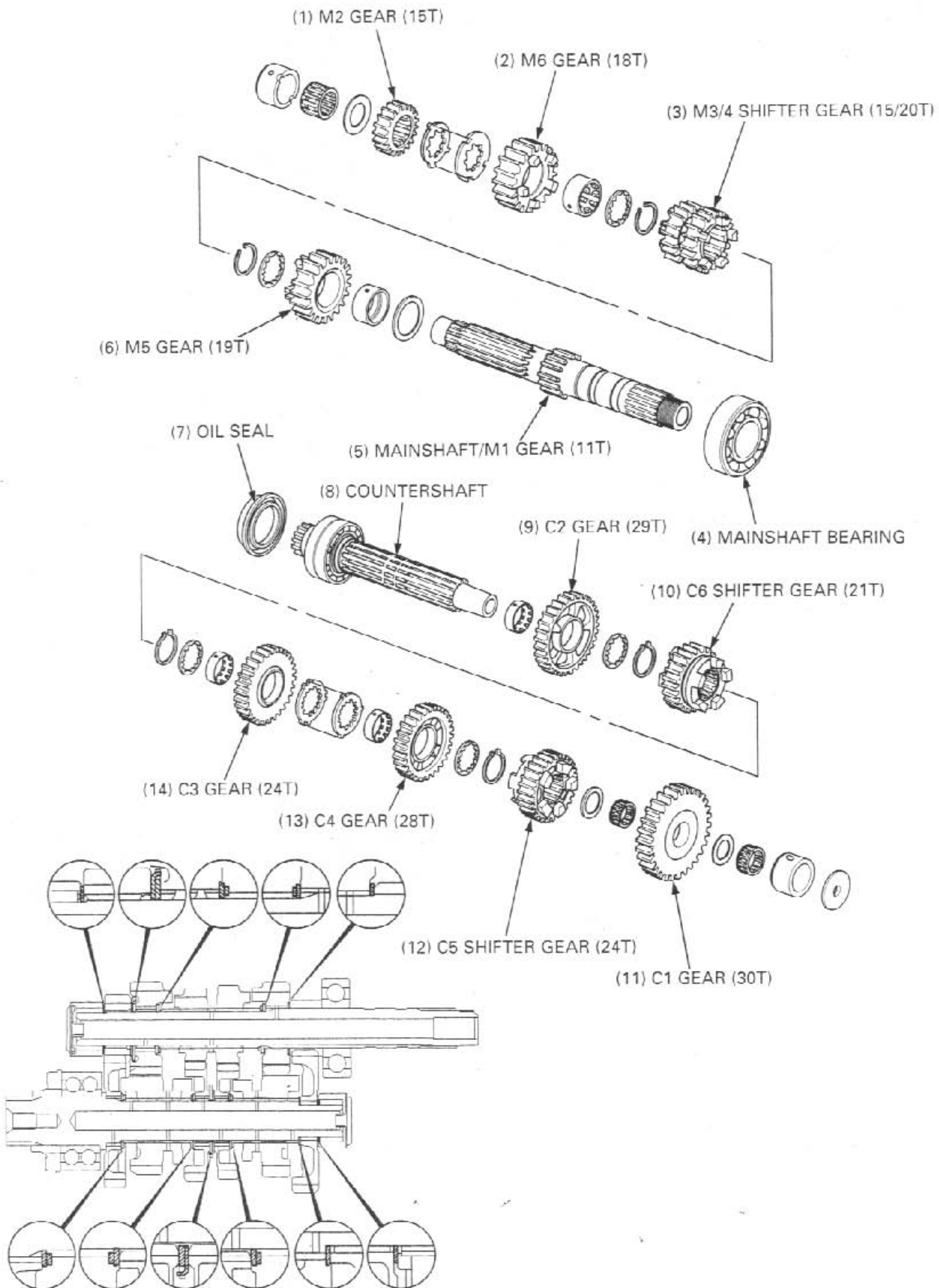
**TOOLS:**

- Driver, 40 mm I.D. 07746 - 0030100
- Inner driver, 25 mm 07746 - 0030200



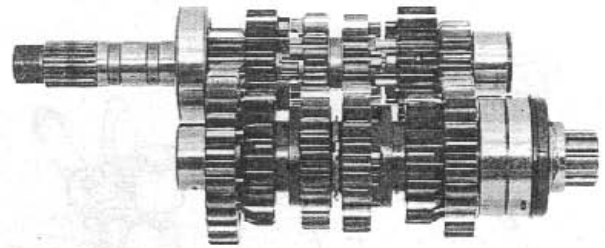


ASSEMBLY



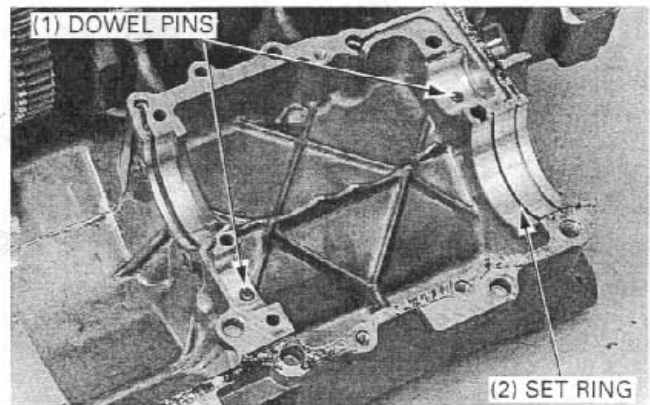
Assemble the transmission gear and shafts.  
Coat each gear with clean engine oil and check for smooth movement.

Apply molybdenum disulfide oil to the shift fork grooves in the M3/4, C5 and C6 gear.

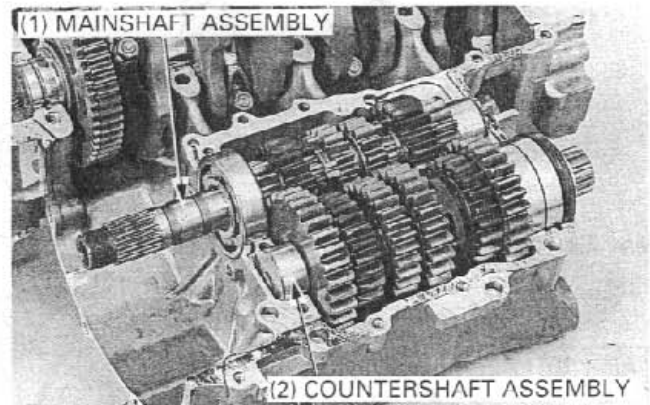


## INSTALLATION

Install the dowel pins on the upper crankcase holes.  
Install the set ring into the groove of the crankcase.



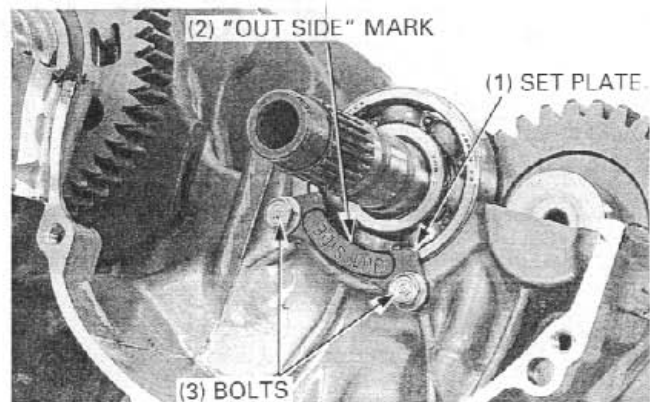
Install the mainshaft and countershaft by aligning the countershaft bearing groove with the set ring on the crankcase, and aligning the bearing cap holes with the dowel pins.



Apply a locking agent to the mainshaft bearing set plate bolt threads.  
Install the mainshaft bearing set plate with its "OUT SIDE" mark facing out and tighten the bolts to the specified torque.

**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

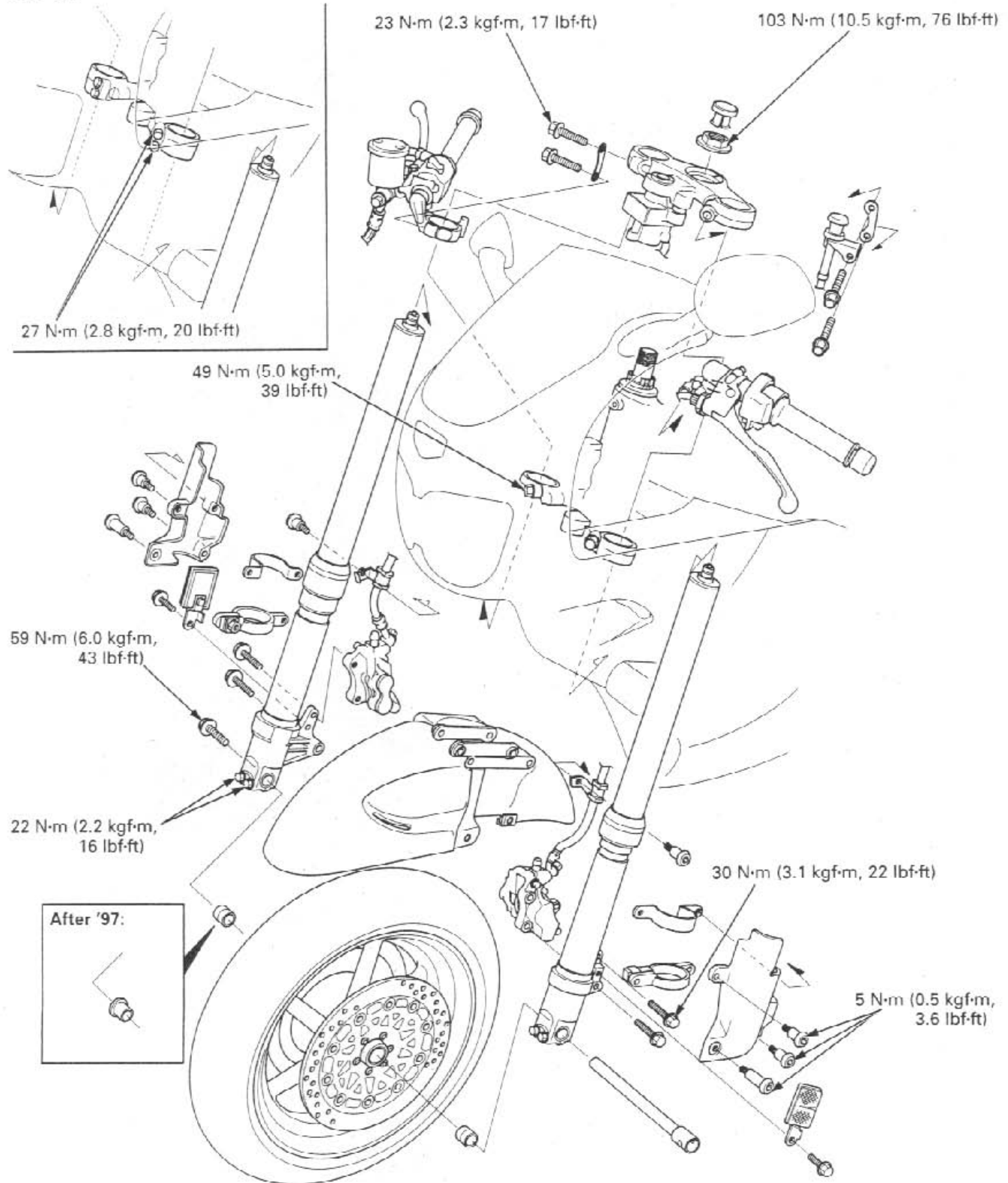
Assemble the crankcase (page 11-12).



# FRONT WHEEL/SUSPENSION/STEERING

After '97:

'96 - '97:



# 13. FRONT WHEEL/SUSPENSION/STEERING

|                     |      |               |       |
|---------------------|------|---------------|-------|
| SERVICE INFORMATION | 13-1 | FRONT WHEEL   | 13-8  |
| TROUBLESHOOTING     | 13-2 | FORK          | 13-14 |
| HANDLEBARS          | 13-3 | STEERING STEM | 13-23 |

## SERVICE INFORMATION

### GENERAL

#### ▲ 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.

- When servicing the front wheel, fork or steering stem, support the motorcycle using a safety stand or hoist.
- Refer to section 15 for brake system information.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "TUBELESS TIRE APPLICABLE".

### SPECIFICATIONS

Unit: mm (in)

| FRONT WHEEL/SUSPENSION/STEERING |                               |                               |   | STANDARD                                    | SERVICE LIMIT |
|---------------------------------|-------------------------------|-------------------------------|---|---|---------------|
| ITEM                            |                               |                               |   |   |               |
| Minimum tire tread depth        |                               |                               |   |   | 1.5 (0.06)    |
| Cold tire pressure              | Up to 90 kg (200 lb) load     |                               |   | 250 kPa (2.50 kgf/cm <sup>2</sup> , 36 psi) |               |
|                                 | Up to maximum weight capacity |                               |   | 250 kPa (2.50 kgf/cm <sup>2</sup> , 36 psi) |               |
| Axle runout                     |                               |                               |   |   | 0.20 (0.008)  |
| Wheel rim runout                | Radial                        |                               |   |   | 2.0 (0.08)    |
|                                 | Axial                         |                               |   |   | 2.0 (0.08)    |
| Fork                            | Spring free length            | '96 - '97:                    | 248.2 (9.77)  |   | 243.2 (9.57)  |
|                                 |                               | After '97:                    | 250.2 (9.85)  |   | 245.2 (9.65)  |
|                                 | Spring direction              |                               | With the tapered end facing down                                  |   |               |
|                                 | Tube runout                   |                               |   |   | 0.20 (0.008)  |
|                                 | Recommended fork fluid        |                               | Pro-Honda Suspension Fluid SS-8                                   |   |               |
|                                 | Fluid level                   |                               | 114 ± 4 (4.5 ± 0.2)   |   |               |
|                                 | Fluid capacity                | '96 - '97:                    | 561 ± 2.5 cm <sup>3</sup> (19.0 ± 0.02 US oz, 19.7 ± 0.09 Imp oz) |   |               |
|                                 |                               | After '97:                    | 540 ± 2.5 cm <sup>3</sup> (18.3 ± 0.02 US oz, 19.0 ± 0.09 Imp oz) |   |               |
|                                 | Pre-load adjuster setting     |                               | 12 mm (0.5 in) from top of fork cap                               |   |               |
|                                 | Rebound adjuster setting      |                               | 1 turn from full hard   |   |               |
| Compression adjuster setting    | '96 - '97:                    | 1 turn from full hard         |   |   |               |
|                                 | After '97:                    | 1.5 turn from full hard       |   |   |               |
| Steering head bearing preload   |                               | 1.0 - 1.5 kgf (2.2 - 3.3 lbf) |   |   |               |

## FRONT WHEEL/SUSPENSION/STEERING

### TORQUE VALUES

|                                |  |                                      |
|--------------------------------|--|--------------------------------------|
| Steering stem nut              | 103 N·m (10.5 kgf·m, 76 lbf·ft)  |                                      |
| Top thread A                   | See page 13-28   |                                      |
| Top thread B                   | See page 13-28   |                                      |
| Fork top bridge pinch bolt     | '96 - '97: 23 N·m (2.3 kgf·m, 17 lbf·ft)<br>After '97: 22 N·m (2.2 kgf·m, 16 lbf·ft) |                                      |
| Fork bottom bridge pinch bolt  | '96 - '97: 49 N·m (5.0 kgf·m, 36 lbf·ft)<br>After '97: 27 N·m (2.8 kgf·m, 20 lbf·ft) |                                      |
| Front axle bolt                | 59 N·m (6.0 kgf·m, 43 lbf·ft)  |                                      |
| Front axle holder bolt         | 22 N·m (2.2 kgf·m, 16 lbf·ft)  |                                      |
| Front brake disc mounting bolt | 20 N·m (2.0 kgf·m, 14 lbf·ft)  | ALOC bolt                            |
| Fork cap                       | '96 - '97: 23 N·m (2.3 kgf·m, 17 lbf·ft)<br>After '97: 22 N·m (2.2 kgf·m, 16 lbf·ft) |                                      |
| Fork socket bolt               | '96 - '97: 20 N·m (2.0 kgf·m, 14 lbf·ft)<br>After '97: 34 N·m (3.5 kgf·m, 25 lbf·ft) | Apply a locking agent to the threads |

### TOOLS

|                             |                 |   |
|-----------------------------|-----------------|---|
| Steering stem socket        | 07916 - 3710101 | or 07916 - 3710100 Not available in U.S.A.                  |
| Ball race remover set       | 07946 - KM90001 | Not available in U.S.A.                                     |
| — Driver attachment, A      | 07946 - KM90100 | See page 13-27  |
| — Driver attachment, B      | 07946 - KM90200 |   |
| — Driver shaft assembly     | 07946 - KM90300 |   |
| — Bearing remover, A        | 07946 - KM90401 |   |
| — Bearing remover, B        | 07946 - KM90500 |   |
| — Assembly base             | 07946 - KM90600 |   |
| Steering stem driver        | 07946 - MB00000 |   |
| Fork seal driver, 45 mm     | 07KMD - KZ30100 | or 07KMD - KZ3010A (U.S.A. only)<br>Not available in U.S.A. |
| Driver                      | 07749 - 0010000 |   |
| Attachment, 42 x 47 mm      | 07746 - 0010300 |   |
| Pilot, 20 mm                | 07746 - 0040500 |   |
| Bearing remover shaft       | 07746 - 0050100 |   |
| Bearing remover head, 20 mm | 07746 - 0050600 |   |

## TROUBLESHOOTING

### Hard steering

- Faulty or damaged steering head bearings
- Insufficient tire pressure
- Steering head bearing adjustment nut too tight

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

- Unevenly adjusted right and left fork legs
- Bent fork
- Bent axle
- Wheel installed incorrectly
- Faulty steering head bearings
- Bent frame
- Worn wheel bearing
- Worn swingarm pivot components

### Front wheel wobbling

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

### Wheel turns hard

- Faulty wheel bearing
- Bent front axle
- Brake drag

### Soft suspension

- Insufficient fluid in fork
- Weak fork springs
- Tire pressure too low

### Hard suspension

- Incorrect fluid weight
- Bent fork tubes
- Clogged fork fluid passage

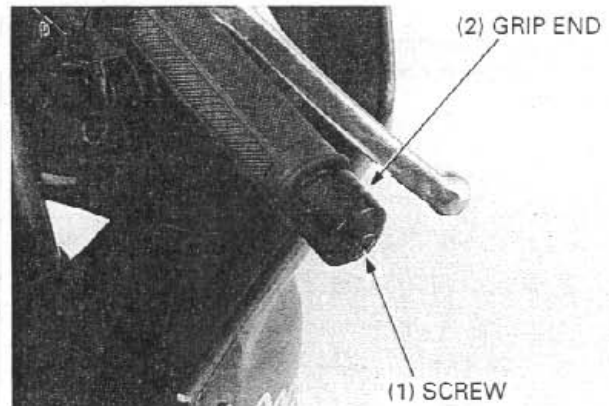
### Front suspension noisy

- Insufficient fluid in fork
- Loose fork fasteners

## HANDLEBARS

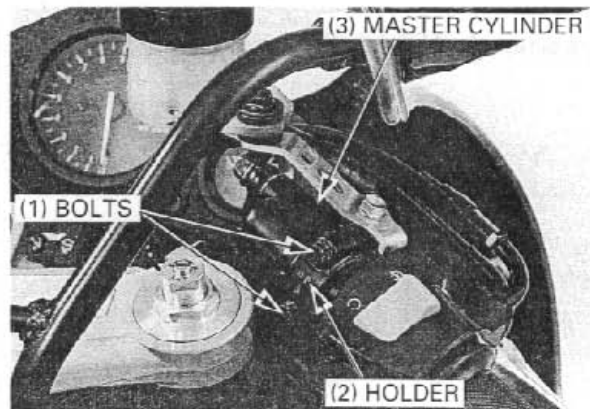
### REMOVAL

Remove the screw and the handlebar grip end.  
Discard the screw.

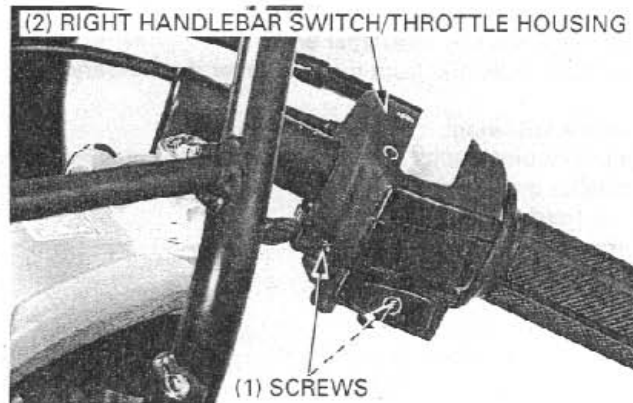


Disconnect the front brake switch wires connectors from the switch.

Remove the master cylinder holder bolts, holder and master cylinder assembly.



Remove the right handlebar switch/throttle housing screws.



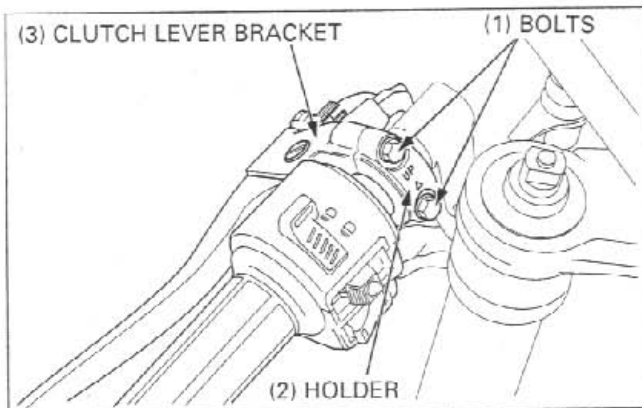
Disconnect the throttle cables from the throttle pipe and remove the housing.

Remove the throttle pipe from the right handlebar.

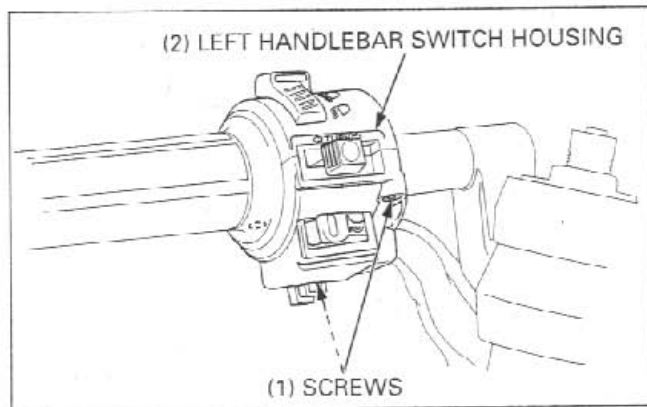


## FRONT WHEEL/SUSPENSION/STEERING

Disconnect the clutch switch wire connectors from the switch. Remove the clutch lever holder bolts, holder and clutch lever bracket assembly.



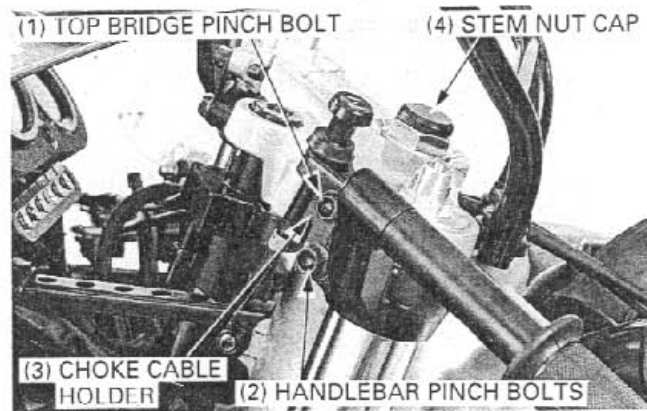
Remove the screws and left handlebar switch.



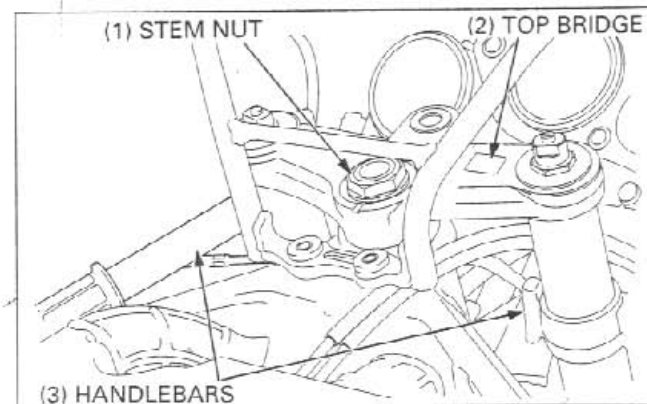
Remove the screw and handlebar end. Remove the handle grip from the handlebar if necessary.

Remove the following:

- Top bridge pinch bolts
- Handlebar pinch bolts
- Holder brackets
- Choke cable holder
- Steering stem nut cap



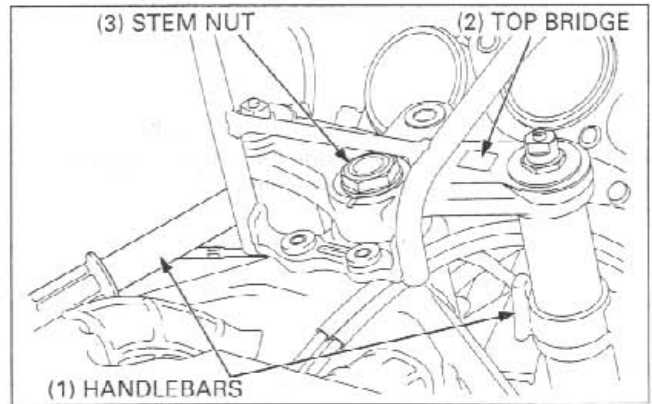
Remove the steering stem nut. Remove the top bridge and handlebars.



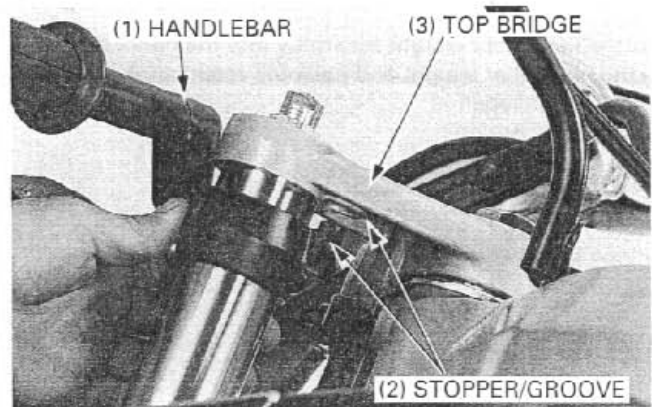
## INSTALLATION

Temporarily install the handlebars onto the fork pipes. Install the top bridge and tighten the steering stem nut to the specified torque.

**TORQUE: 103 N·m (10.3 kgf·m, 76 lbf·ft)**



Align the stopper on the handlebar boss with the groove in the top bridge.



Install the following:

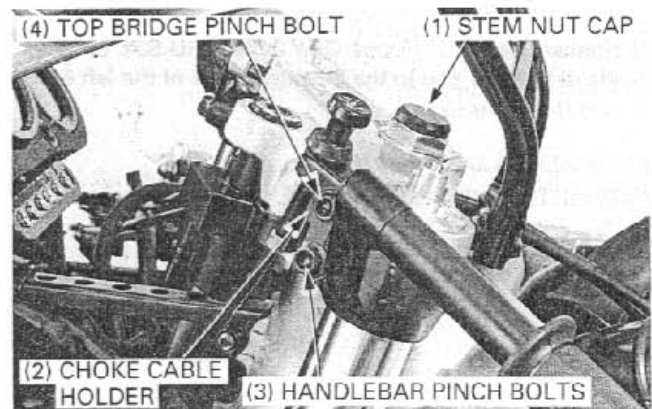
- Holder brackets
- Choke cable holder
- Top bridge pinch bolts
- Handlebar pinch bolts

Tighten the top bridge pinch bolts to the specified torque.

**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**

Tighten the handlebar pinch bolts.

Install the steering stem nut cap.

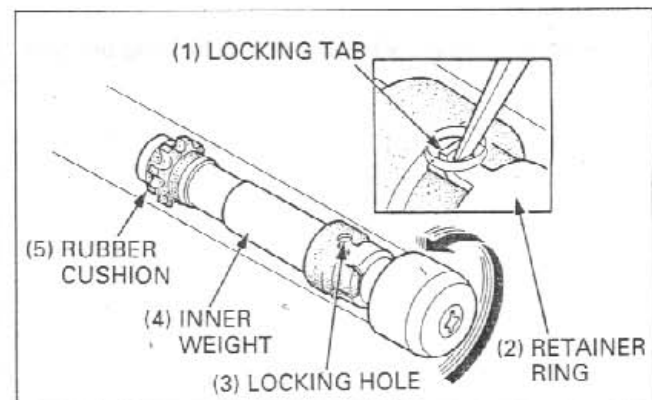


## HANDLEBAR WEIGHT REPLACEMENT

Remove the grip from the handlebar. Straighten the weight retainer tab by the screwdriver or punch. Temporarily install the grip end and screw, then remove the handlebar weight by turning the grip end.

### NOTE

- Apply lubricant spray (CRC 5-56 or an equivalent) through the tab looking hole to the rubber for easy removal.

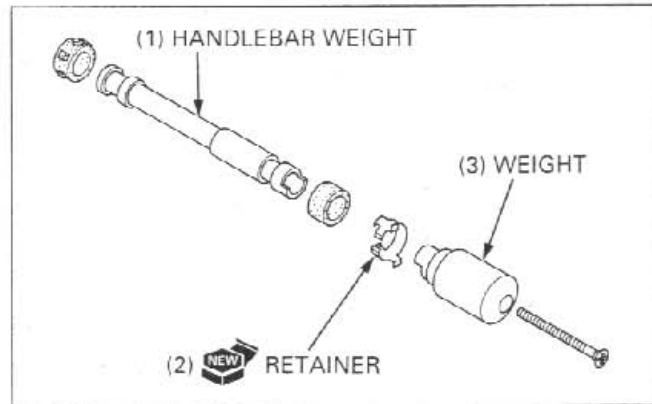




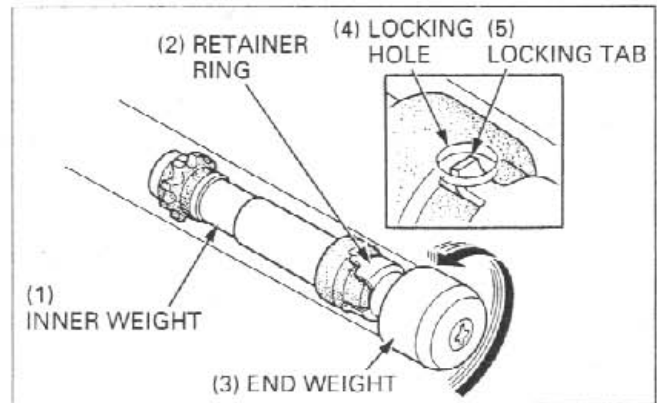
## FRONT WHEEL/SUSPENSION/STEERING

Remove the grip end front the handlebar weight.  
Discard the retainer.

Install the new retainer onto the handlebar weight.  
Install the grip end onto the handlebar weight aligning its boss with the slot in the handlebar weight.  
Install a new mounting screw.



Insert the handlebar weight assembly into the handlebar.  
Turn the handlebar weight and hook the retainer tab with the hole in the handlebar.

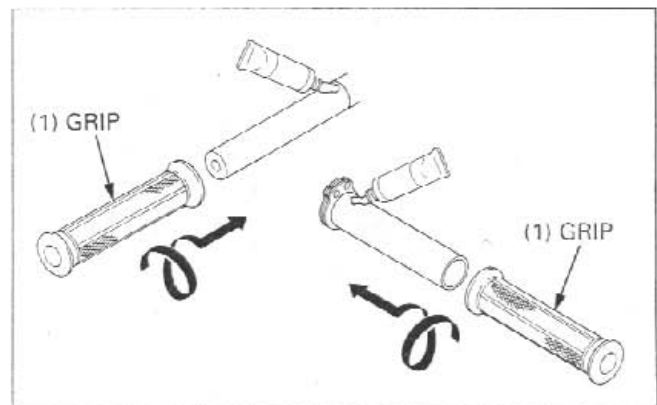


Apply Honda Bond A or Honda Grip Cement (U.S.A. only) to the inside of the grip and to the clean surfaces of the left handlebar and throttle grip.

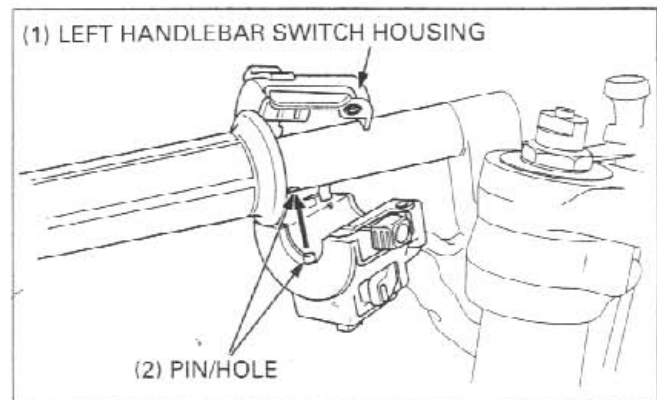
Wait 3 – 5 minutes and install the grip.  
Rotate the grip for even application of the adhesive.

### NOTE

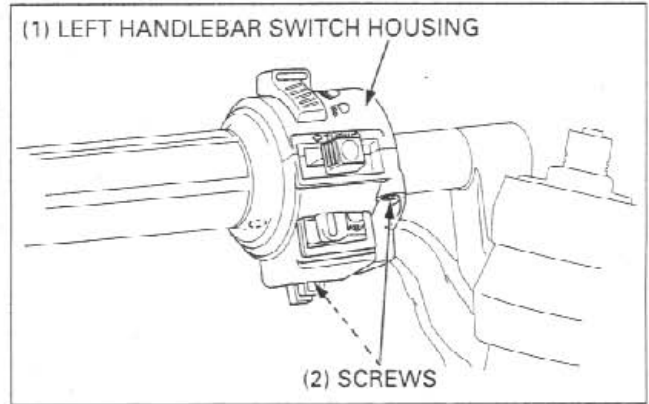
- Allow the adhesive to dry for an hour before using.



Install the left handlebar switch aligning its locating pin with the hole in the handlebar.

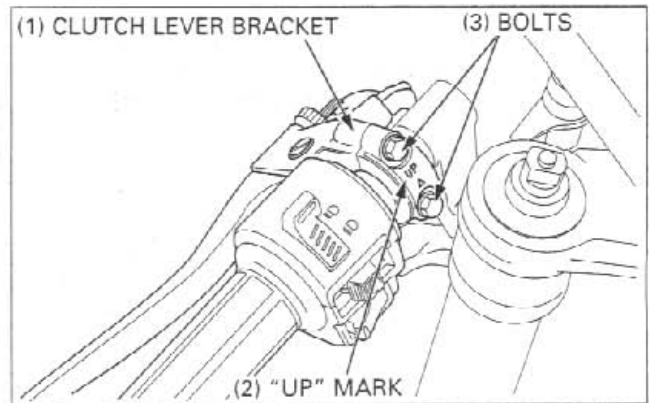


Tighten the forward screw first, then the rear screw.

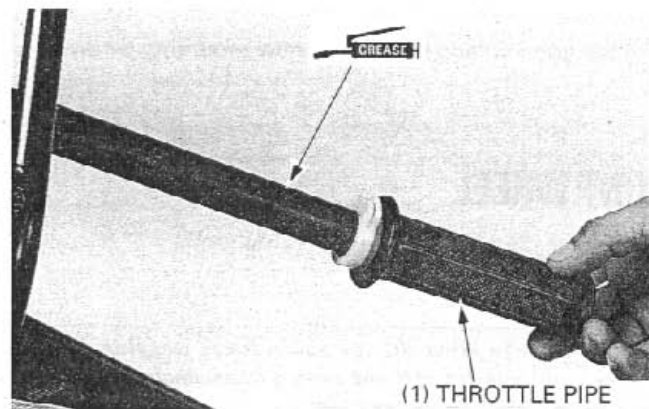


Install the clutch lever bracket assembly by aligning the end of the bracket with the punch mark on the handlebar. Install the clutch lever bracket holder with the "UP" mark facing up. Tighten the upper bolt first, then the lower bolt.

Connect the clutch switch wires.

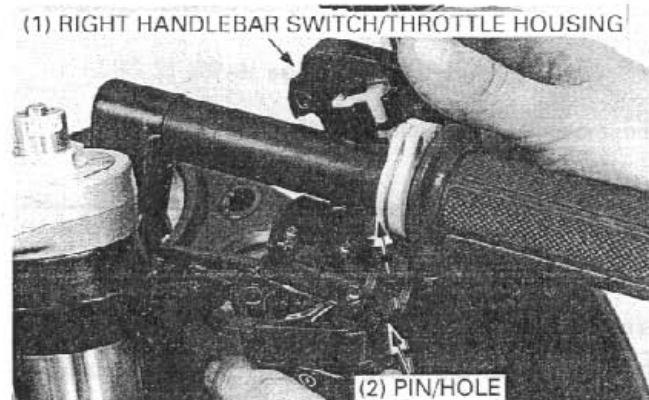


Apply grease to the sliding surface of the throttle pipe. Install the throttle pipe on the right handlebar.



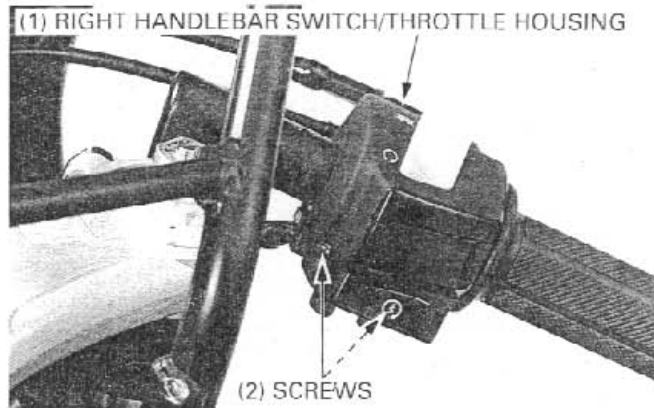
Apply grease to the throttle cable ends. Connect the throttle cables to the throttle pipe.

Install the right handlebar switch/throttle housing by aligning its locating pin with the hole in the handlebar.



## FRONT WHEEL/SUSPENSION/STEERING

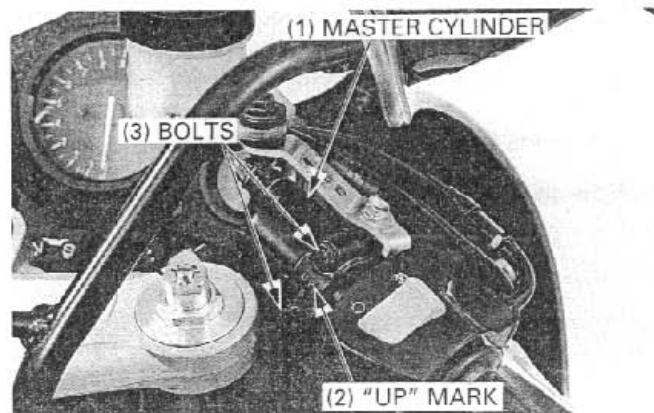
Tighten the upper screw first, then the lower screw.



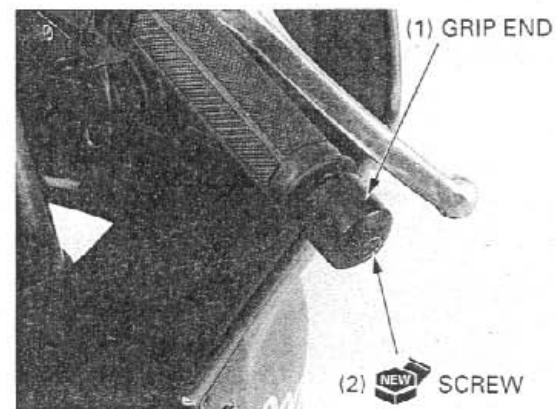
Install the master cylinder by aligning the end of the master cylinder with the punch mark on the handlebar. Install the master cylinder holder with the "UP" mark facing up.

Tighten the upper bolt first, then the lower bolt.

Connect the brake switch wires.



Install the grip end and tighten the new mounting screw.



## FRONT WHEEL

### REMOVAL

#### ⚠ 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.

Support the motorcycle securely using a safety stand or a hoist.

Remove the bolts and reflectors (page 15-16).

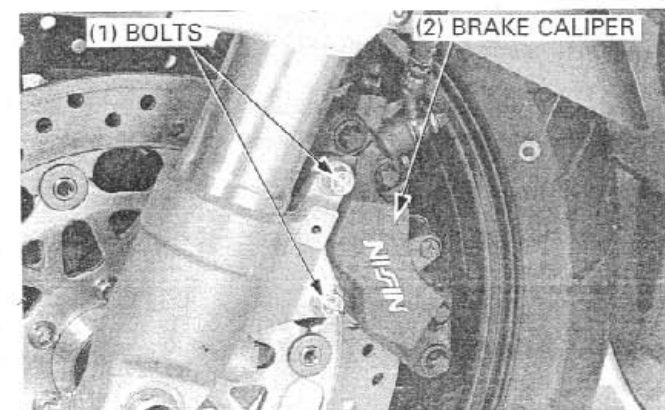
Remove the mounting bolts and brake calipers.

#### CAUTION

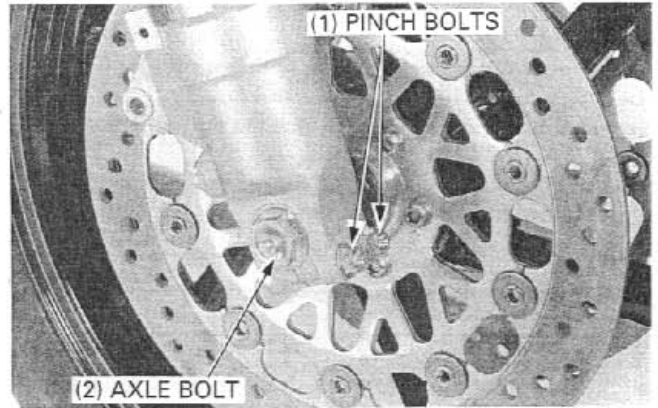
- Support the brake caliper with a piece of wire so that it does not hang from the brake hose. Do not twist the brake hose.

#### NOTE

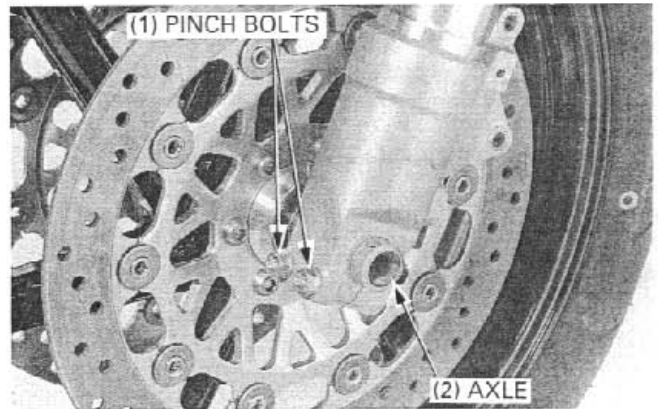
- Do not operate the brake lever after the brake calipers are removed.



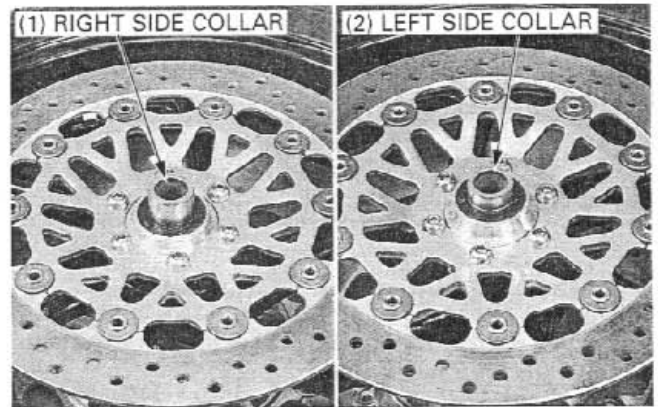
Loosen the right front axle pinch bolts.  
Remove the axle bolt.



Loosen the left front axle pinch bolts.  
Remove the axle and the front wheel.



Remove the side collars.

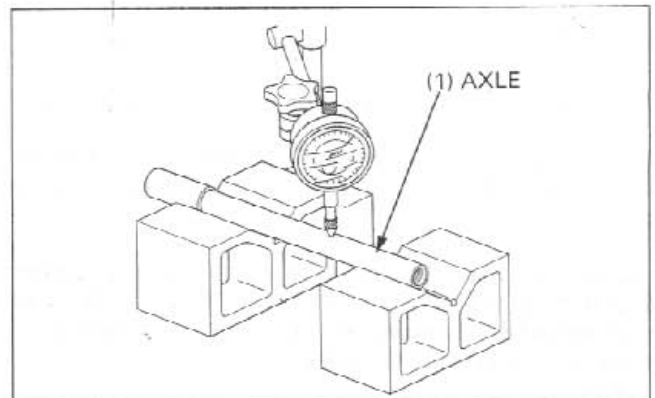


## INSPECTION

### Axle

Set the axle in V-block and measure the runout.  
Actual runout is 1/2 the total indicator reading.

**SERVICE LIMIT: 0.20 mm (0.008 in)**



## FRONT WHEEL/SUSPENSION/STEERING

### Wheel bearing

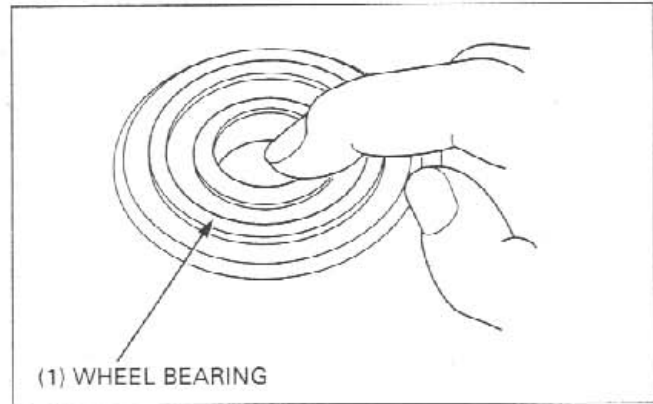
Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

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

### NOTE

- Replace the bearings in pairs.

Install the new bearings into the hub using the special tools (page 13-12).



### Wheel rim runout

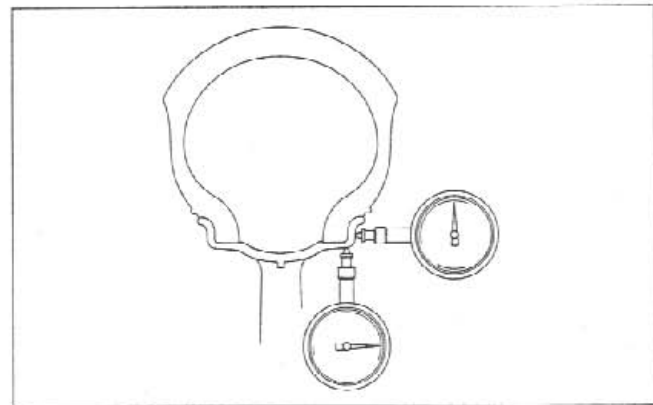
Check the rim runout by placing the wheel in a turning stand. Spin the wheel by hand, and read the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

### SERVICE LIMITS:

Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)



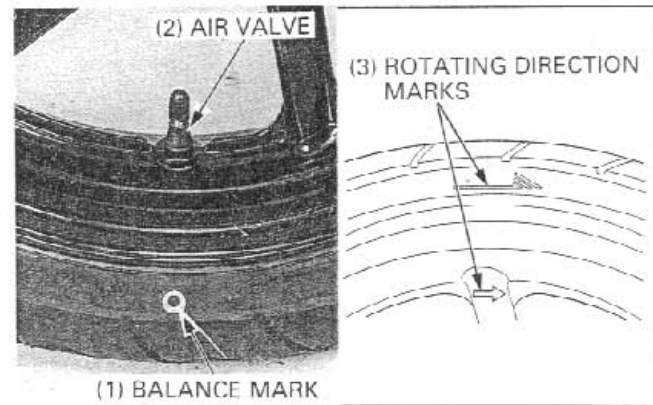
### Wheel balance

### CAUTION

- *Wheel balance directly affects the stability, handling and over all safety of the motorcycle. Always check balance when the tire has been removed from the rim.*

### NOTE

- For optimum balance, the tire balance mark (a paint dot on the side wall) must be located next to the valve stem. Remount the tire if necessary.
- Note the rotating direction marks on the wheel and tire.



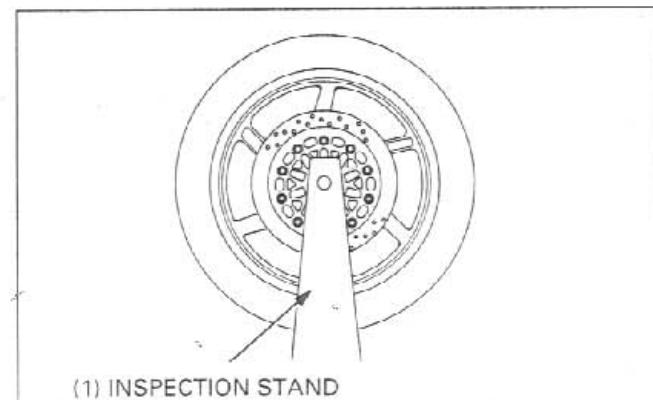
Remove the dust seals from the wheel.

Mount the wheel, tire and brake discs assembly in an inspection stand.

Spin the wheel, allow it to stop, and mark the lowest (heaviest) point of the wheel with a chalk.

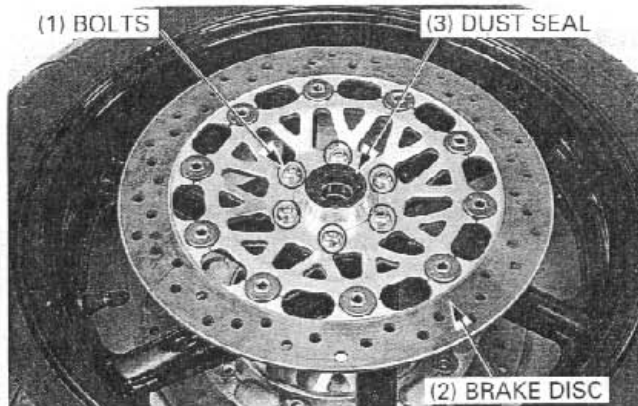
Do this two or three times to verify the heaviest area. If the wheel is balanced, it will not stop consistently in the same position.

To balance the wheel, install wheel weights on the highest side of the rim, the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun. Do not add more than 60 grams to the wheel.



**DISASSEMBLY**

Remove the bolts and brake discs.  
Remove the dust seals.

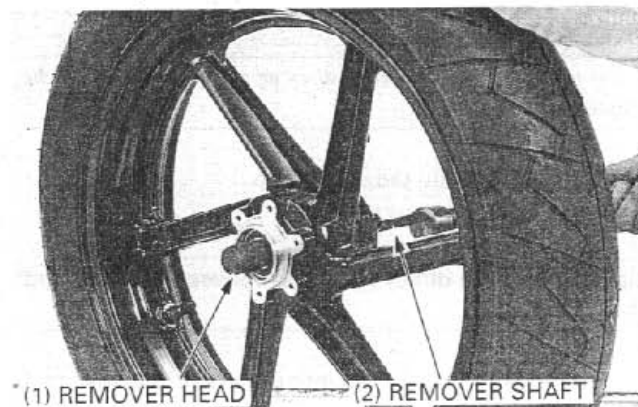


Install the bearing remover head into the bearing.  
From the opposite side, install the bearing remover shaft and drive the bearing out of the wheel hub.  
Remove the distance collar and drive out the other bearing.

**TOOLS:**

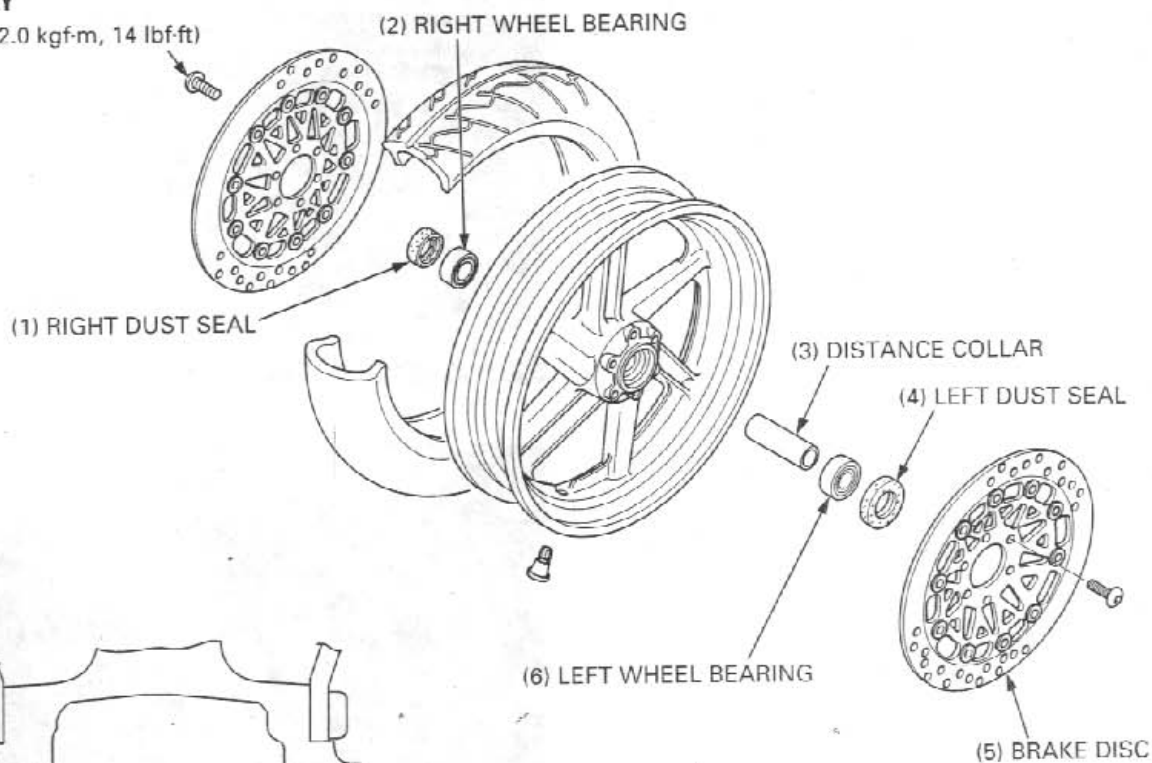
Bearing remover head, 20 mm 07746 - 0050600  
(Equivalent commercially available in U.S.A.)

Bearing remover shaft 07746 - 0050100  
(Equivalent commercially available in U.S.A.)



**ASSEMBLY**

20 N-m (2.0 kgf-m, 14 lbf-ft)



## FRONT WHEEL/SUSPENSION/STEERING

### CAUTION

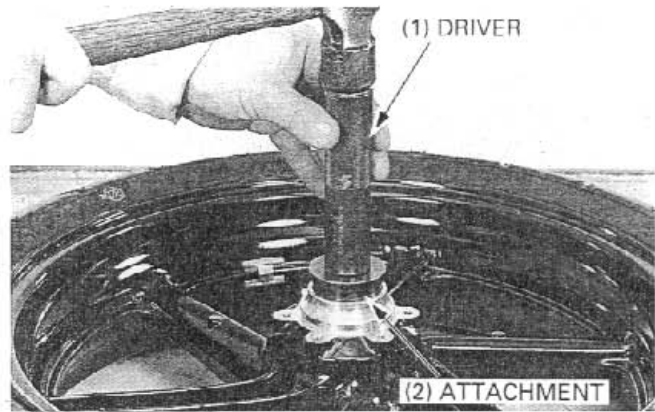
- Never install the old bearings. Once the bearings has been removed, the bearing must be replaced with new ones.

Drive in a new right bearing squarely.

Install the distance collar, then drive in the left bearing using the special tools.

### TOOLS:

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



### WARNING

- Do not get grease on the brake discs or stopping power will be reduced.

Install the brake discs on the wheel hub.

### NOTE

- Align the rotating direction marks between the disc and wheel.

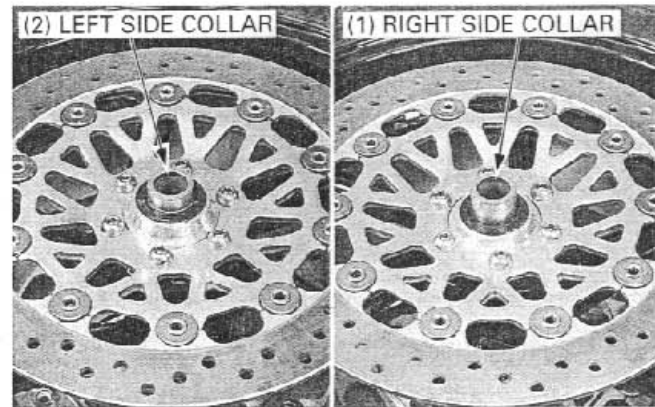
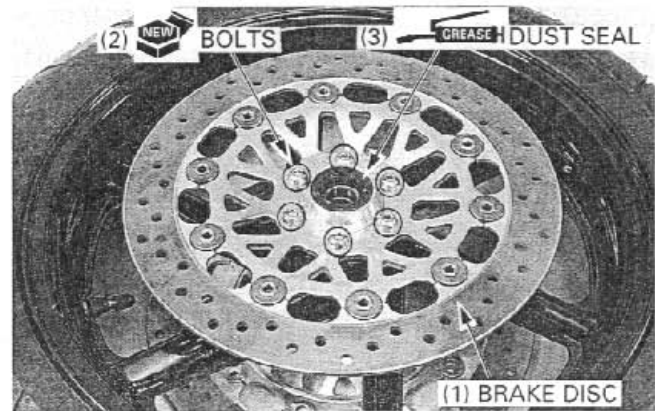
Install and tighten the new mounting bolts to the specified torque.

**TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)**

Apply grease to the dust seal lips, then install the dust seals into the wheel hub.

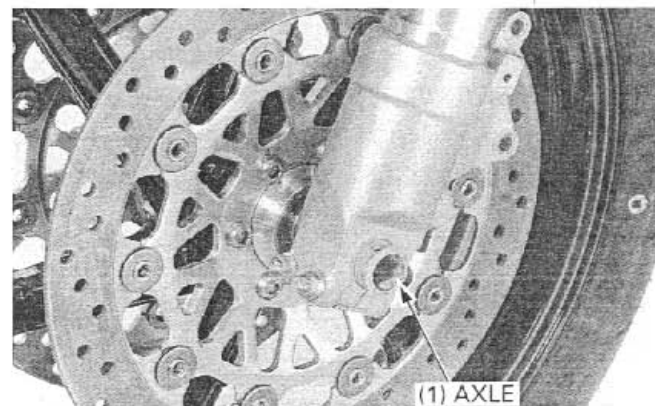
## INSTALLATION

Install the side collars.



Install the front wheel between the fork legs.

Apply thin layer of grease to the front axle surface.  
Install the front axle from the left side.

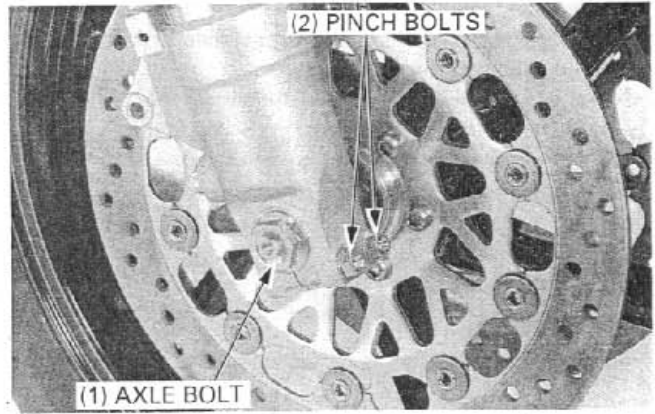


Hold the axle and tighten the axle bolt to the specified torque.

**TORQUE: 59 N·m (6.0 kgf·m, 43 lbf·ft)**

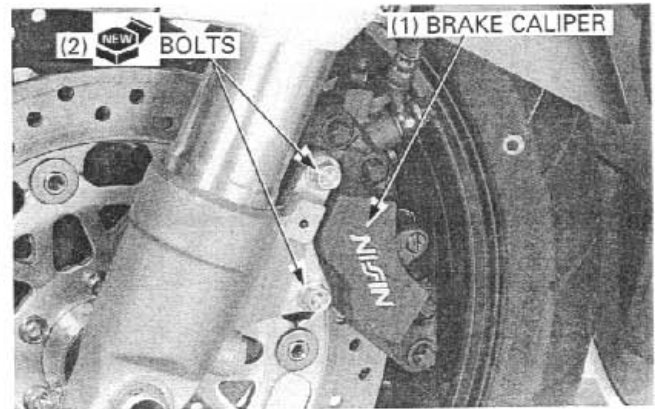
Tighten the right axle pinch bolts to the specified torque.

**TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)**

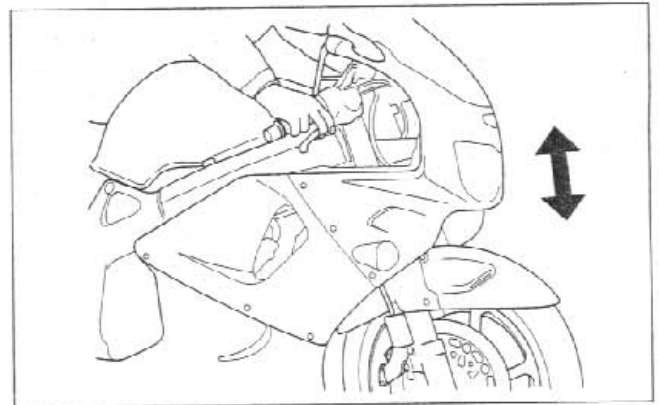


Install the brake calipers and tighten the new mounting bolts to the specified torque.

**TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)**

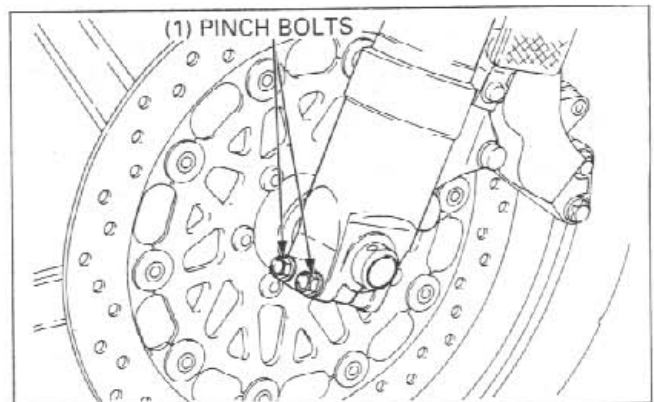


With the front brake applied, pump the fork up and down several times to seat the axle and check brake operation.



Tighten the left axle pinch bolts to the specified torque.

**TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)**

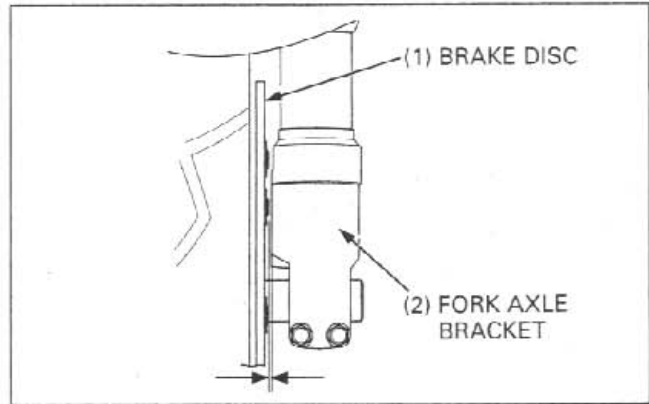




## FRONT WHEEL/SUSPENSION/STEERING

Check the clearance between the brake disc and fork axle bracket on each side after installation.

The clearance should be at least 0.7 mm (0.03 in).

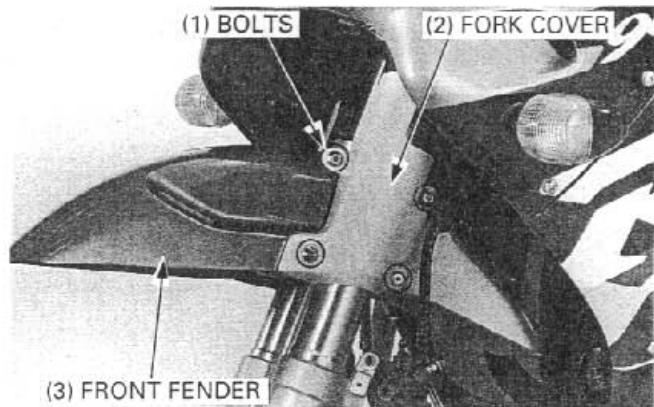


## FORK

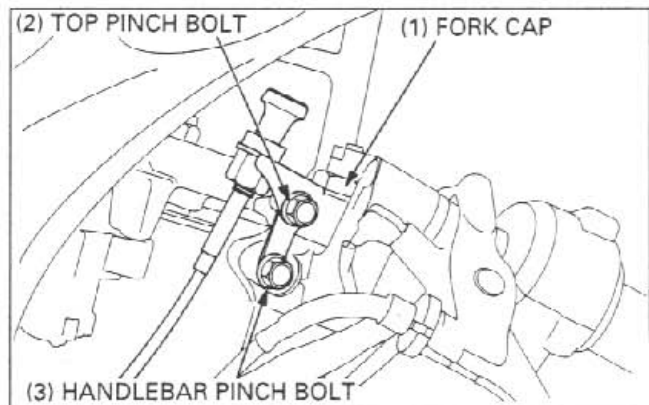
### REMOVAL

Remove the front wheel (page 13-8).

Remove the bolts, fork covers, front fender and stays.



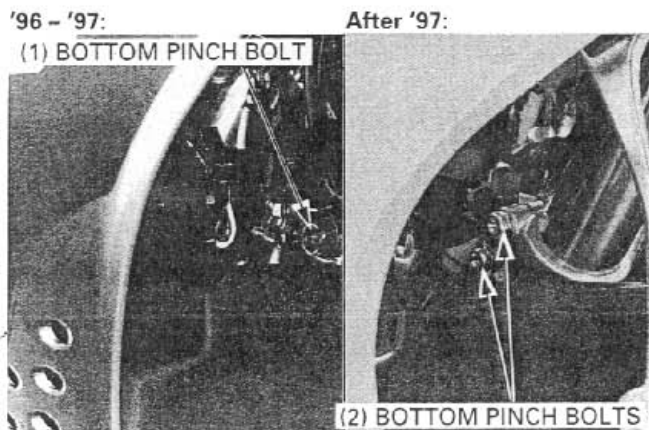
Loosen the top bridge pinch bolt and handlebar pinch bolt. When the fork leg will be disassembled, loosen the fork cap, but do not remove it yet.



Loosen the fork bottom pinch bolt(s) and remove the fork tube from the fork top bridge, handlebar and steering stem.

### CAUTION

- *Keep the master cylinder upright.*



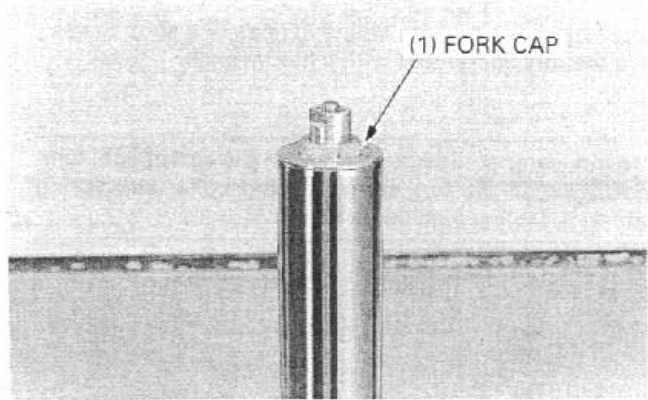
**DISASSEMBLY**

**CAUTION**

- *Be careful not to scratch the fork tube or damage the dust seal.*

Turn the pre-load adjuster counterclockwise fully to loosen the spring pressure.

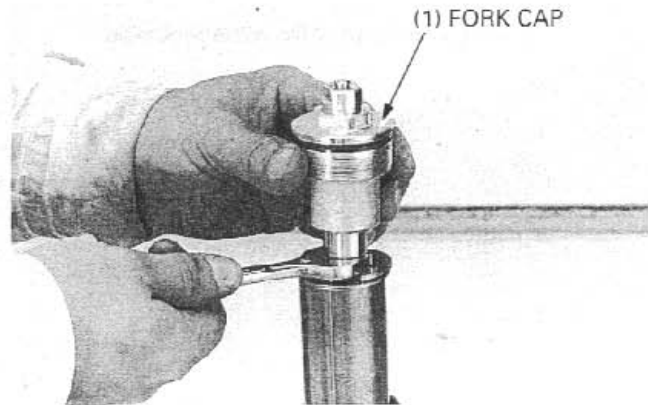
Remove the fork cap from the fork tube.



Hold the rebound damping adjuster with a 14 mm spanner, then loosen and remove the fork cap from the damper rod.

**CAUTION**

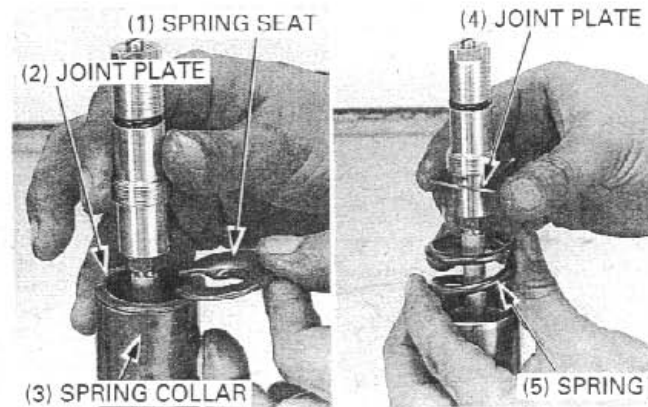
- *Do not remove the rebound damping adjuster from the damper rod, or fork damping force will be change.*



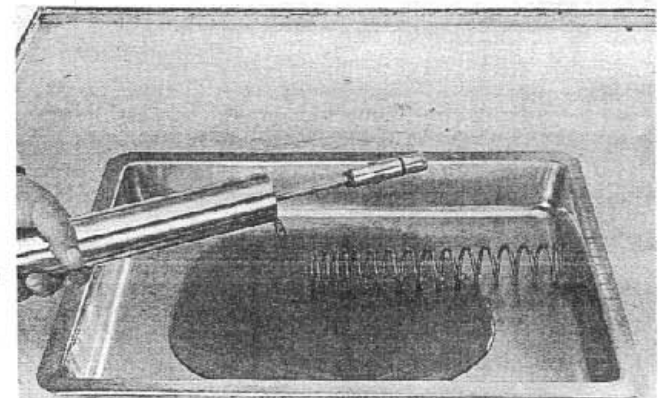
Push the spring collar down and remove the spring seat.

Remove the following:

- Spring joint plate
- Spring collar
- Spring joint plate
- Fork spring



Pour out the fork fluid by pumping the fork tube up and down several times.

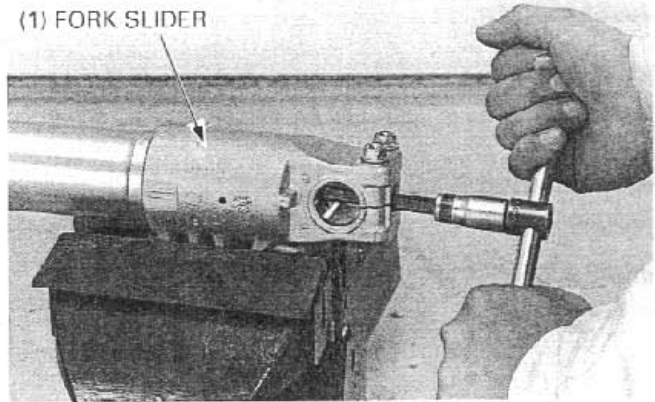


## FRONT WHEEL/SUSPENSION/STEERING

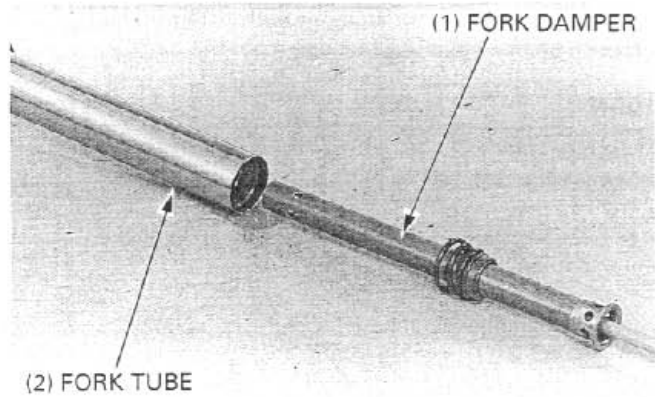
Hold the fork slider in a vice with soft jaws or a shop towel. Remove the fork socket bolt with a hex wrench.

### NOTE

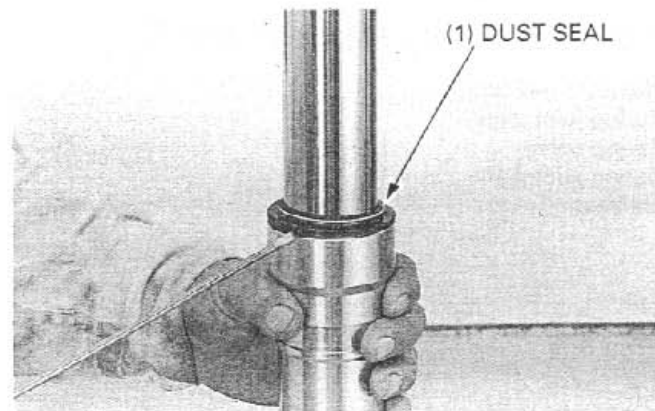
- If the fork damper turns together with the socket bolt, temporarily install the fork spring, spring collar and spring seat.



Remove the fork damper assembly from the fork tube.



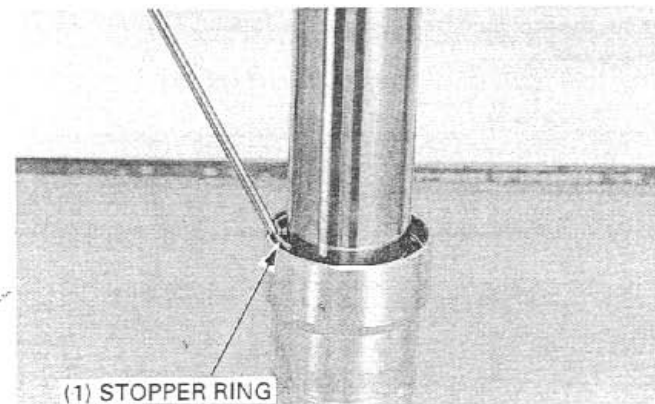
Remove the dust seal.



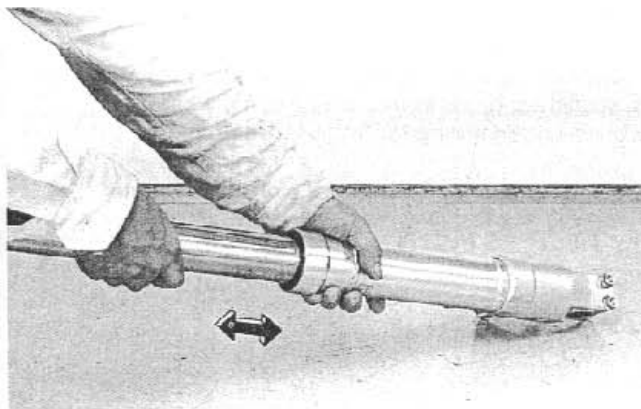
Remove the oil seal stopper ring.

### CAUTION

- *Do not scratch the fork tube sliding surface.*



Pull the fork tube out until you feel resistance from the slider bushing. Then move it in and out, tapping the bushing lightly until the fork tube separates from the fork slider. The slider bushing will be forced out by the fork tube bushing.

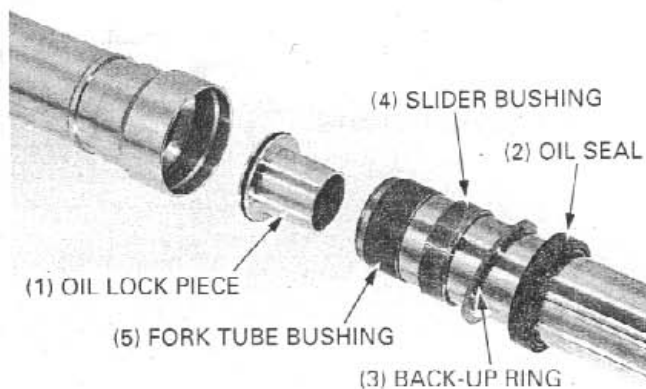


Remove the oil lock piece and O-ring from the fork slider.

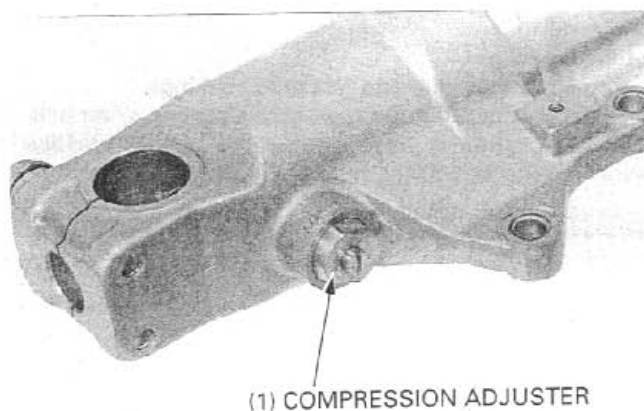
Remove the oil seal, back-up ring and slider bushing from the fork tube.

**NOTE**

- Do not remove the fork tube bushing unless it is necessary to replace it with a new one.



Remove the compression adjuster from the fork slider.



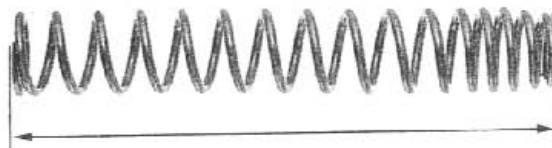
**INSPECTION**

**Fork spring**

Measure the fork spring free length.

**SERVICE LIMIT:**

|            |                    |
|------------|--------------------|
| '96 - '97: | 243.2 mm (9.57 in) |
| After '97: | 245.2 mm (9.65 in) |

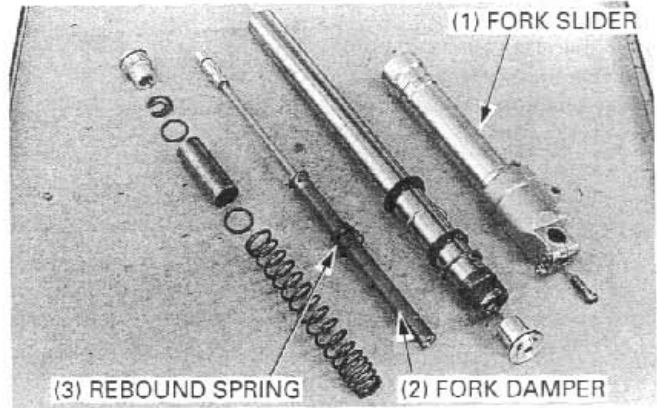


## FRONT WHEEL/SUSPENSION/STEERING

### Fork tube/slider/piston

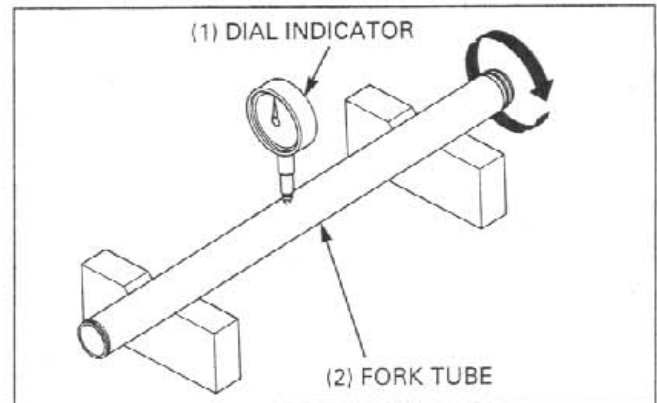
Check the fork tube, fork slider, and fork damper for score marks, scratches, or excessive or abnormal wear. Check the rebound spring for fatigue or damage.

Replace any components which are worn or damaged.



Place the fork tube in V-block and measure the runout. Actual runout is 1/2 the total indicator reading.

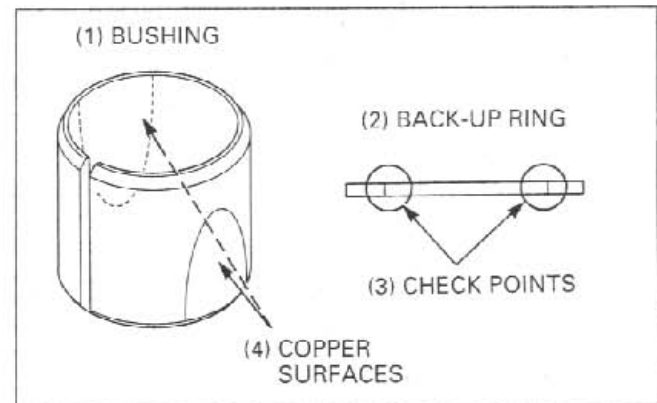
**SERVICE LIMIT: 0.20 mm (0.008 in)**



### Fork tube bushing

Visually inspect the slider and fork tube bushings. Replace the bushings if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more than 3/4 of the entire surface.

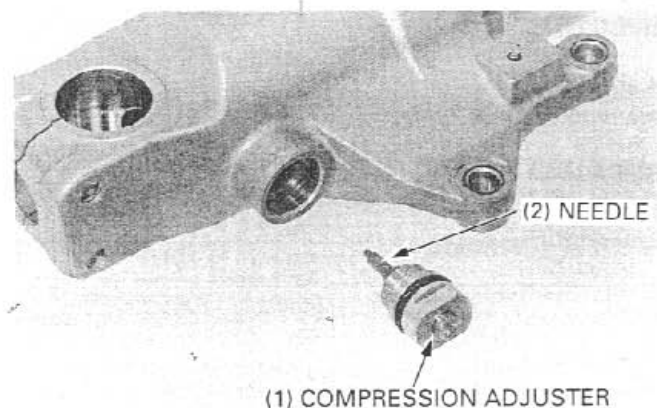
Check the back-up ring; replace it if there is any distortion at the points shown.



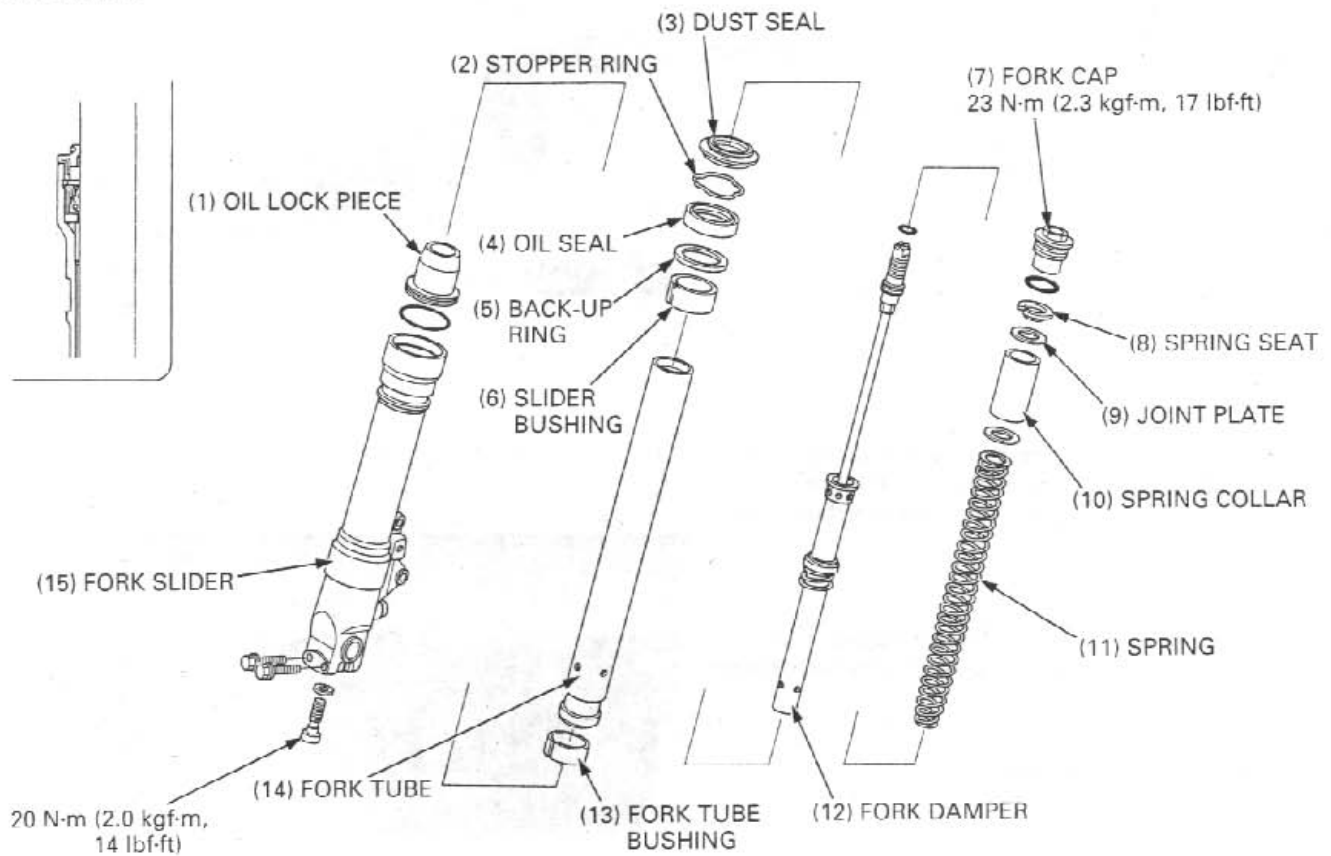
### Compression adjuster

Check the needle of the compression adjuster for wear or damage.

Replace the compression adjuster if necessary.

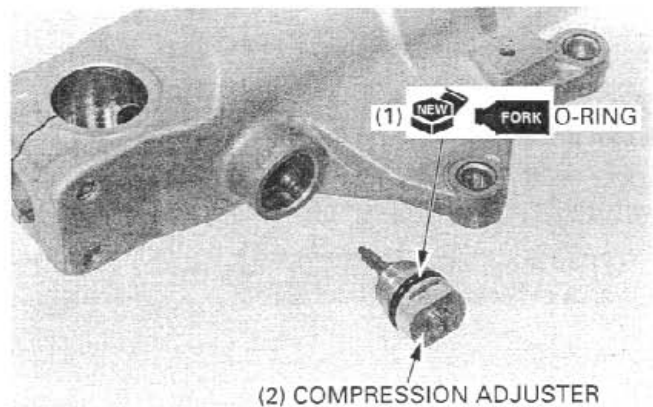


ASSEMBLY



Before assembly, wash all parts with a high flash or non-flammable solvent and wipe them dry.

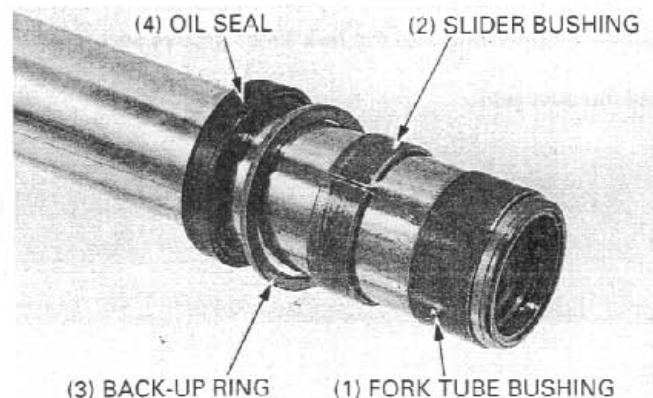
Apply fork fluid to the new O-ring and install it onto the compression adjuster.  
 Install the compression adjuster into the fork slider and tighten it.



Install a new fork tube bushing if the bushing has been removed.  
 Install the slider bushing, back-up ring and a new oil seal.

NOTE

- Install the oil seal with its marked side facing up.



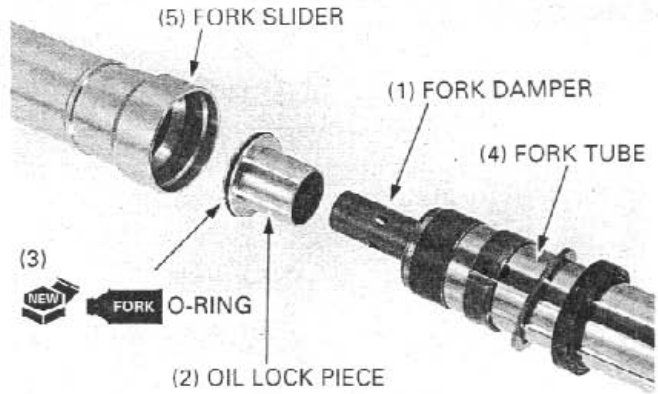
## FRONT WHEEL/SUSPENSION/STEERING

Install the fork damper into the fork tube.

Apply fork fluid to a new O-ring and install it into the groove of the oil lock piece.

Install the oil lock piece onto the fork damper end.

Install the fork tube into the fork slider.

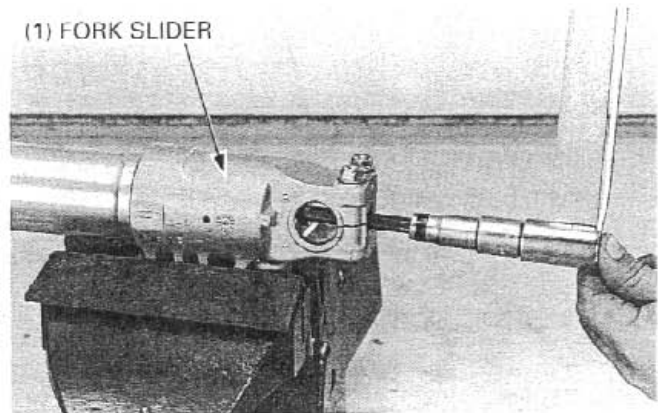


Hold the fork slider in a vise with soft jaws or a shop towel. Apply a locking agent to the fork socket bolt threads. Install the socket bolt with a new sealing washer, then tighten the bolt to the specified torque.

### NOTE

- If the fork damper turns together with the socket bolt, temporarily install the fork spring, spring collar and spring seat.

**TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)**

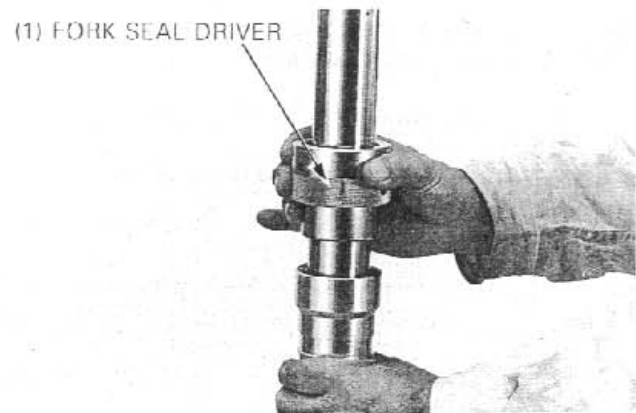


Drive the oil seal in using the special tools.

### TOOL:

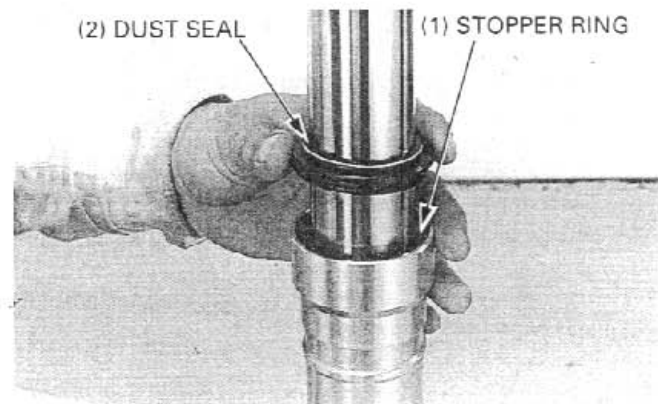
Fork seal driver

07KMD - KZ30100 or  
07KMD - KZ3010A  
(U.S.A. only)



Install the stopper ring into the fork slider groove securely.

Install the dust seal.



Pour the specified amount of recommended fork fluid into the fork tube.

**RECOMMENDED FORK FLUID: Pro Honda Suspension Fluid SS-8**

**FORK FLUID CAPACITY:**

|            |   |
|------------|---|
| '96 - '97: | 561 ± 2.5 cm <sup>3</sup> (19.0 ± 0.02 US oz, 19.7 ± 0.09 Imp oz) |
| After '97: | 540 ± 2.5 cm <sup>3</sup> (18.3 ± 0.02 US oz, 19.0 ± 0.09 Imp oz) |

Pump the damper rod several times until the fork fluid flows out from the oil hole on the rebound damping adjuster.

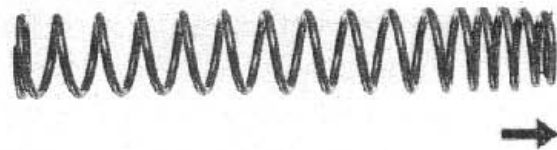
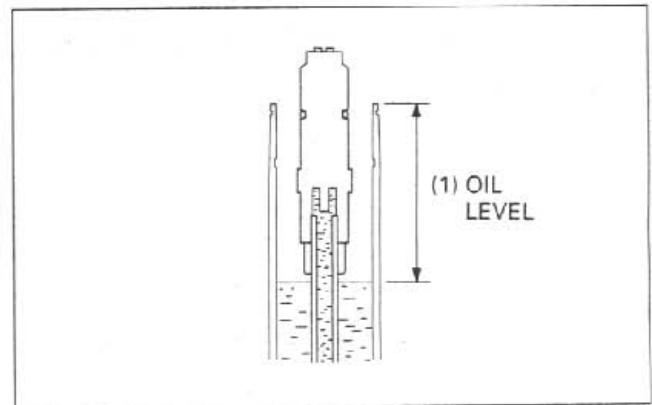
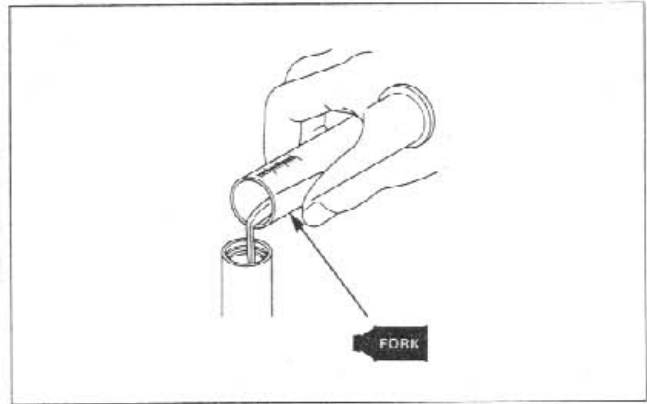
Measure the oil level from the top of the fork tube while compressing the tube all the way after stroking the fork tube slowly more than 5 times and the damper rod more than 10 times.

**NOTE**

- Be sure the oil level is the same in the both forks.

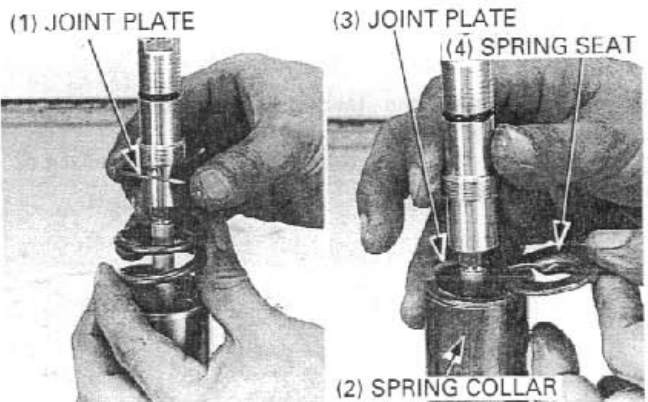
**FORK OIL LEVEL: 114 ± 4 mm (4.5 ± 0.2 in)**

Pull the fork tube and damper rod up and install the fork spring with the tapered end facing down.



(1) FORK SPRING

Install the spring joint plate, spring collar and spring joint plate. Push the spring collar down and install the spring seat.

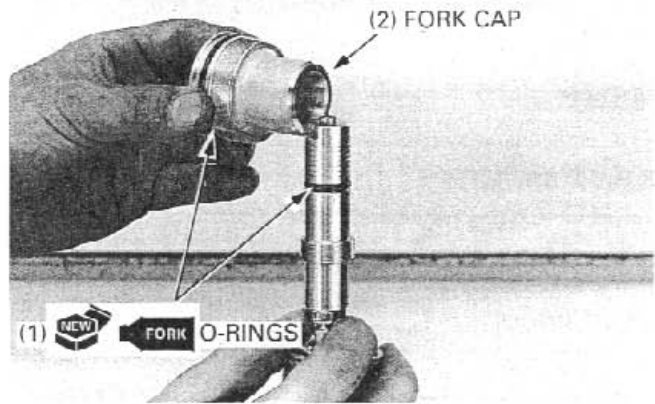




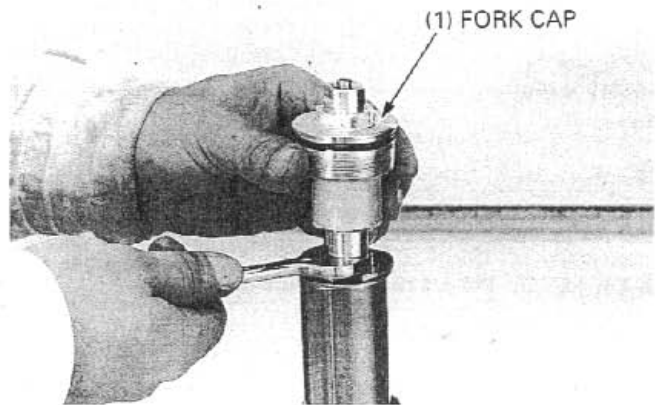
## FRONT WHEEL/SUSPENSION/STEERING

Install new O rings onto the fork cap and rebound damping adjuster.  
Apply fork fluid to the new O-rings.

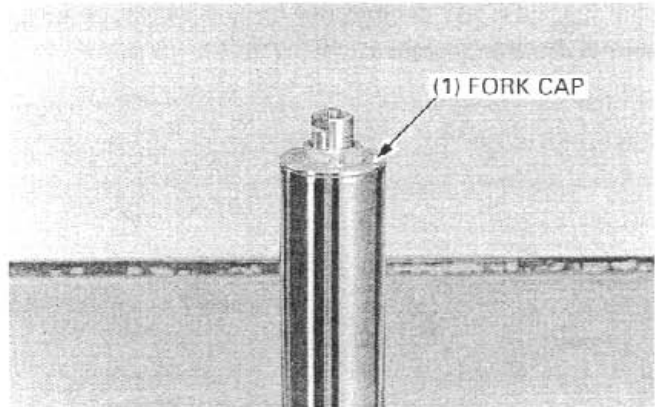
Install the fork cap onto the rebound damping adjuster.



Hold the rebound damping adjuster and screw the fork cap onto the damping adjuster.



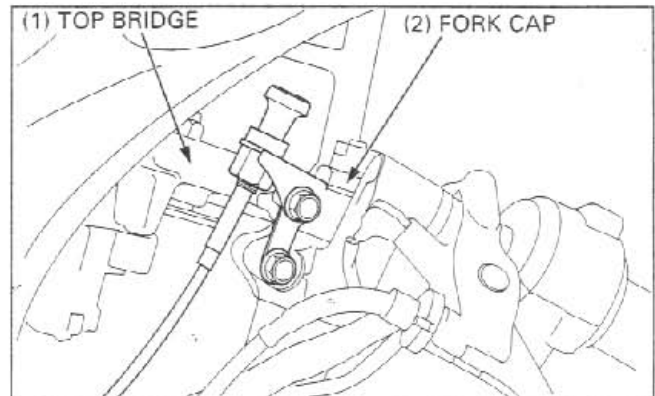
Screw the fork cap into the fork tube.



## INSTALLATION

Install the fork legs into the steering stem, handlebar bracket and fork top bridge.

Align the top end of the fork tube with the upper surface of the top bridge as shown.

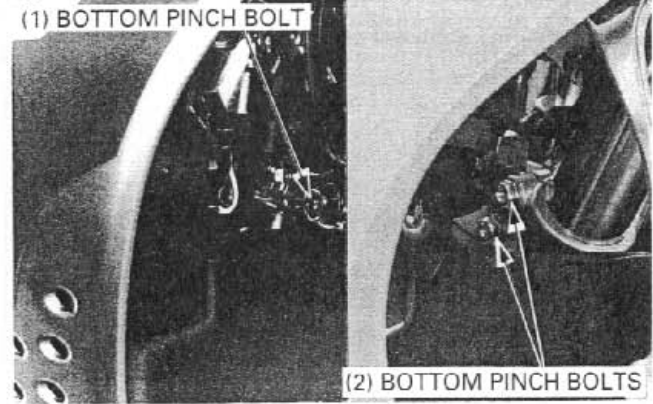


'96 - '97:

After '97:

Tighten the bottom bridge pinch bolt(s) to the specified torque.

**TORQUE: 49 N·m (5.0 kgf·m, 36 lbf·ft)**



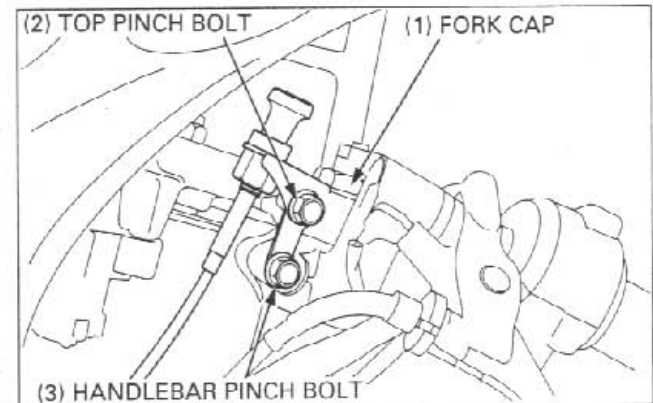
Tighten the fork cap to the specified torque (if it was removed).

**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**

Tighten the top bridge pinch bolt to the specified torque.

**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**

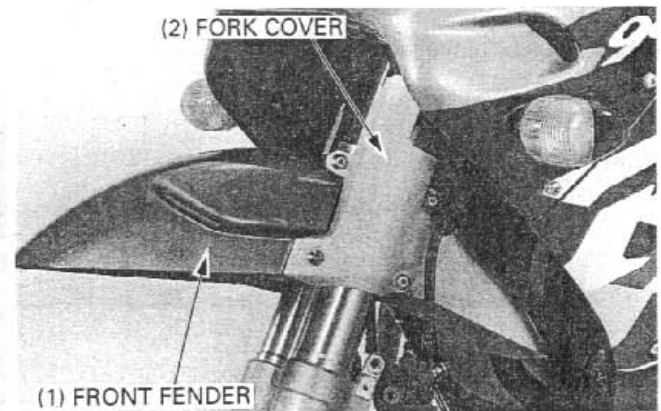
Tighten the handlebar pinch bolt.



Install the front fender stay onto the fork, then install the front fender and fork cover (page 2-13).

**TORQUE: 5 N·m (0.5 kgf·m, 3.6 lbf·ft)**

Install the front wheel (page 13-12).

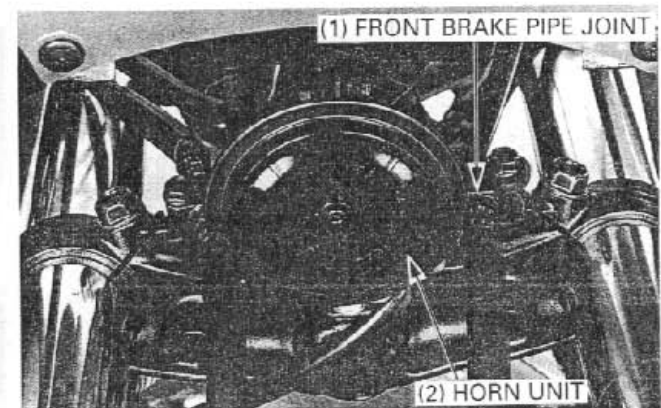


## STEERING STEM

### REMOVAL

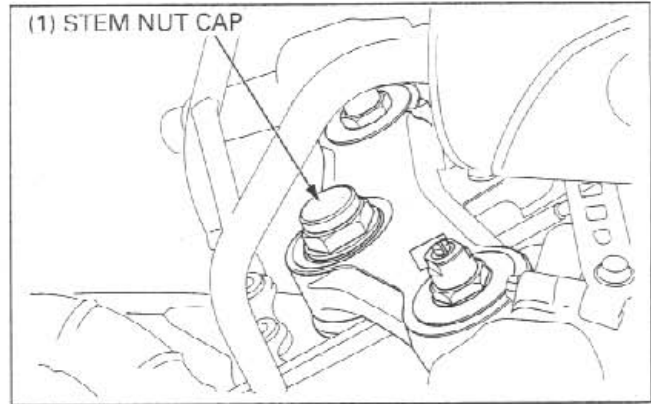
Remove the front wheel (page 13-8).  
Remove the front fender (page 2-13).

Remove the bolts and front brake hose joint.  
Remove the bolt and horn unit.



## FRONT WHEEL/SUSPENSION/STEERING

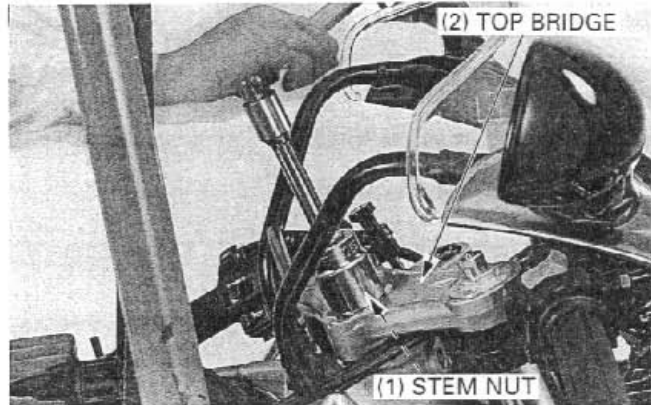
Remove the steering stem nut cap.



Loosen the steering stem nut.

Remove the fork legs (page 13-14).

Remove the stem nut and the top bridge.



Straighten the tabs of the lock washer.

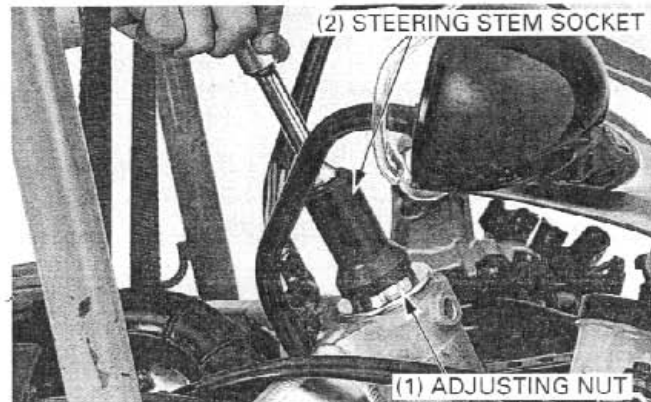
Remove the lock nut and lock washer.



Remove the steering stem bearing adjusting nut using the special tool.

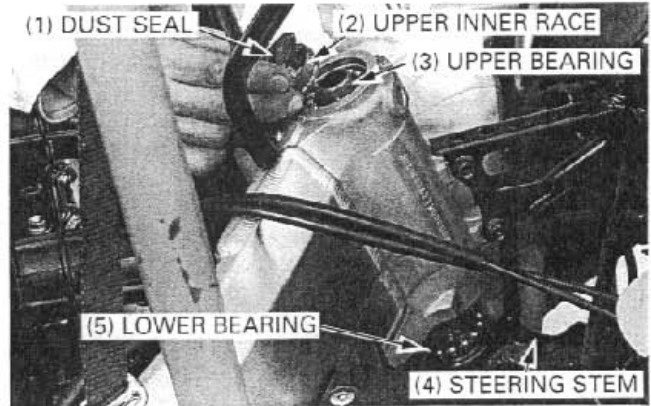
**TOOL:**  
Steering stem socket

07916 - 3710101 or  
07916 - 3710100



Remove the following:

- Dust seal
- Upper bearing inner race
- Upper bearing
- Steering stem
- Lower bearing



**BEARING REPLACEMENT**

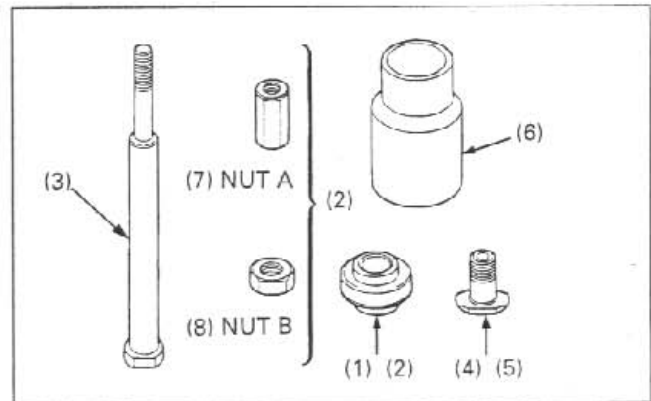
**NOTE**

- Always replace the bearings and races as a set.

Replace the races using the Ball Race Remover Set as described in the following procedure.

**TOOLS:**

|                              |   |
|------------------------------|---|
| <b>Ball race remover set</b> | <b>07946 - KM90001</b><br>(Not available in U.S.A.) |
| — Driver attachment, A (1)   | 07946 - KM90100                                     |
| — Driver attachment, B (2)   | 07946 - KM90200                                     |
| — Driver shaft assembly (3)  | 07946 - KM90300                                     |
| — Bearing remover, A (4)     | 07946 - KM90401                                     |
| — Bearing remover, B (5)     | 07946 - KM90500                                     |
| — Assembly base (6)          | 07946 - KM90600                                     |



Install the ball race remover into the head pipe as shown.

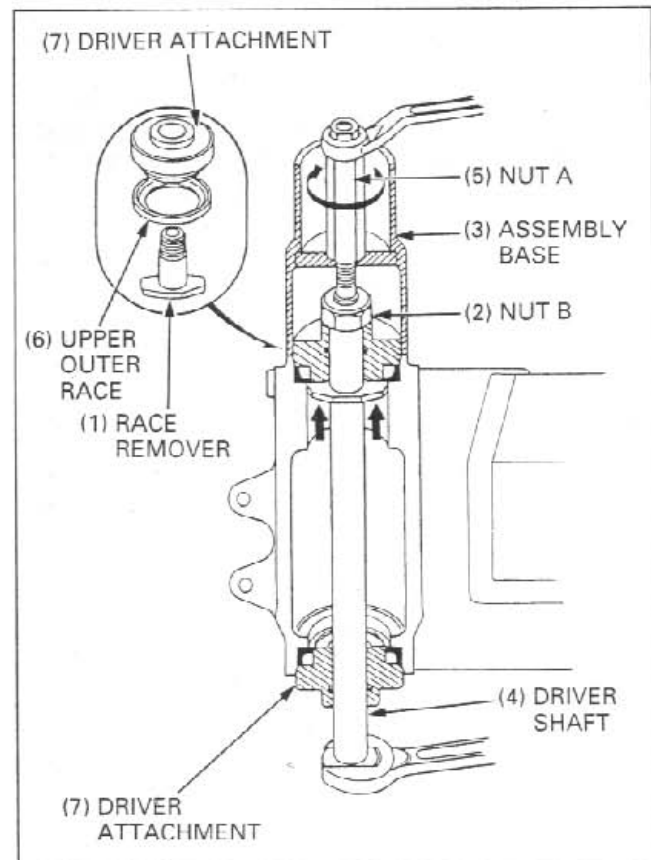
Align bearing remover A with the groove in the steering head.

Lightly tighten nut B with a wrench.

**NOTE**

- Note the installation direction of the assembly base.

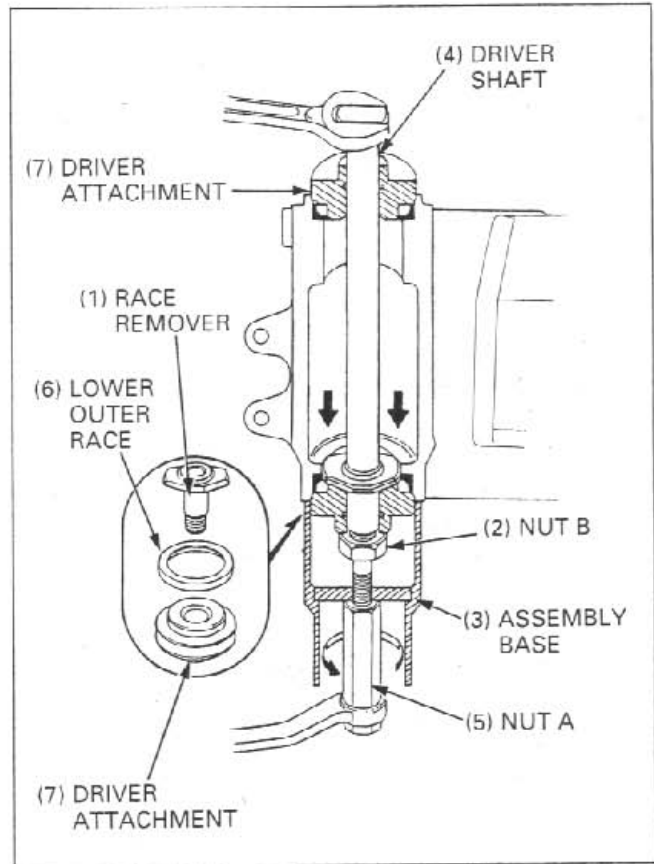
Holding the driver shaft with a wrench, turn nut A gradually to remove the upper outer race.



## FRONT WHEEL/SUSPENSION/STEERING

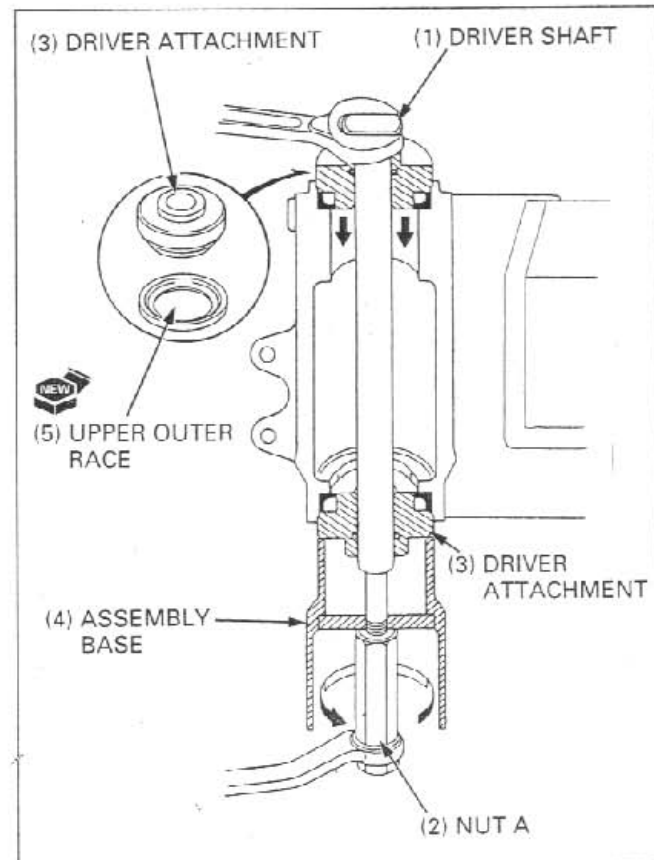
Install ball race remover B as shown and remove the lower outer race using the same procedure as for the upper outer race.

Align the bearing remover with the groove in the steering head.



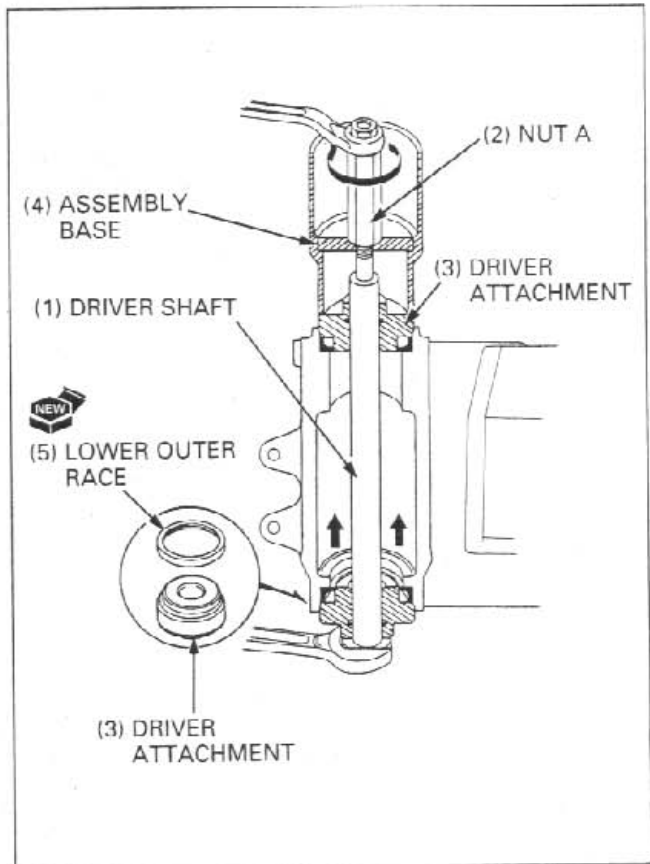
Install a new upper outer race and the ball race remover as shown.

Hold the driver shaft with a wrench and turn nut A gradually until the groove in driver attachment A aligns with the upper end of the steering head. This will allow you to install the upper outer race.



Install a new lower outer race and ball race remover as shown.

Holding the driver shaft with a wrench, turn nut A gradually until the groove in driver attachment B aligns with the upper end of the steering head. This will allow you to install the lower outer race.



**U.S.A. only:**

**NOTE**

- Always replace the bearings and races as set.

Replace the steering bearing outer races using the special tools listed below.

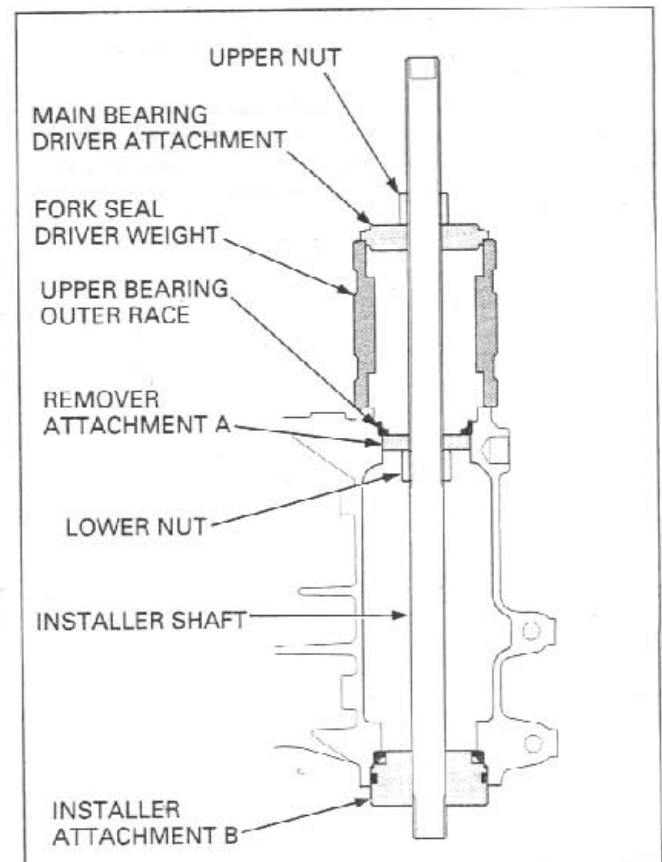
**TOOLS:**

|                                |               |
|--------------------------------|---------------|
| Main bearing driver attachment | 07946-ME90200 |
| Fork seal driver weight        | 07947-KA50100 |
| Oil seal driver                | 07965-MA60000 |
| Installer shaft                | 07VMF-KZ30200 |
| Installer attachment A         | 07VMF-MAT0100 |
| Installer attachment B         | 07VMF-MAT0200 |
| Remover attachment A           | 07VMF-MAT0300 |
| Remover attachment B           | 07VMF-MAT0400 |

Install the spacial tools into the steering head pipe as shown.

Align remover attachment A with the groove in the steering head.

While holding the installer shaft with the wrench, turn the upper nut gradually to remove the upper bearing outer race.

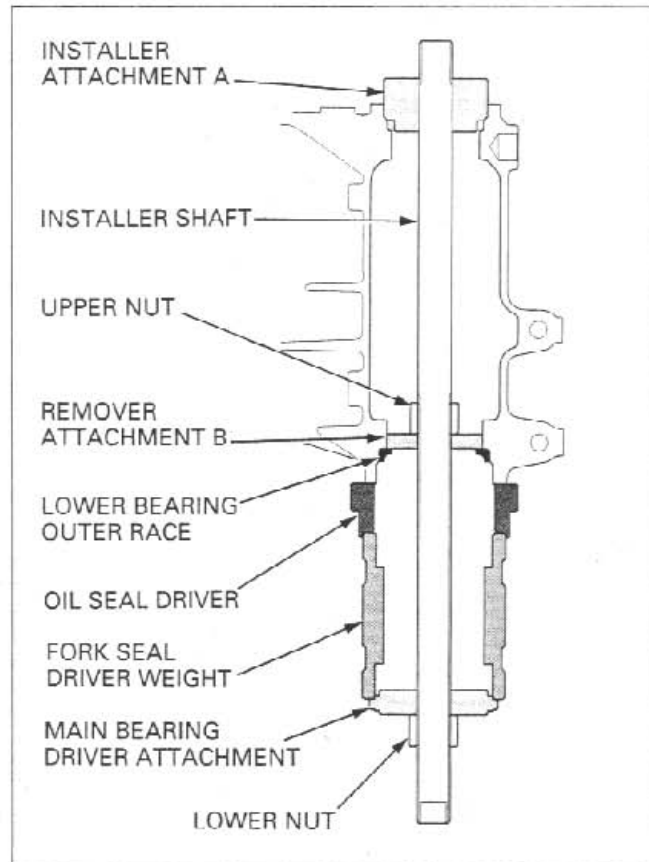


## FRONT WHEEL/SUSPENSION/STEERING

Install the special tools into the steering head pipe as shown.

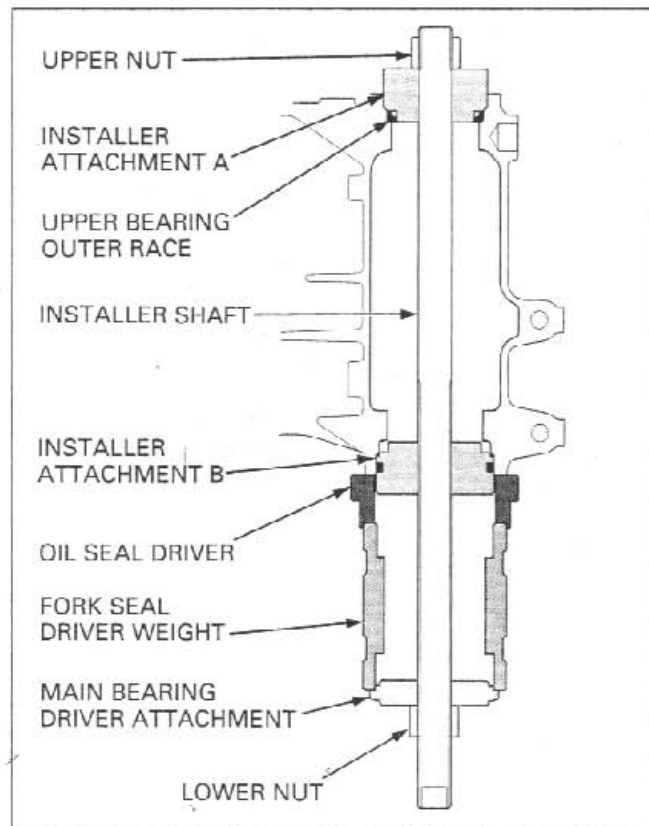
Align remover attachment B with the groove in the steering head.

While holding the installer shaft with the wrench, turn the lower nut gradually to remove the lower bearing outer race.



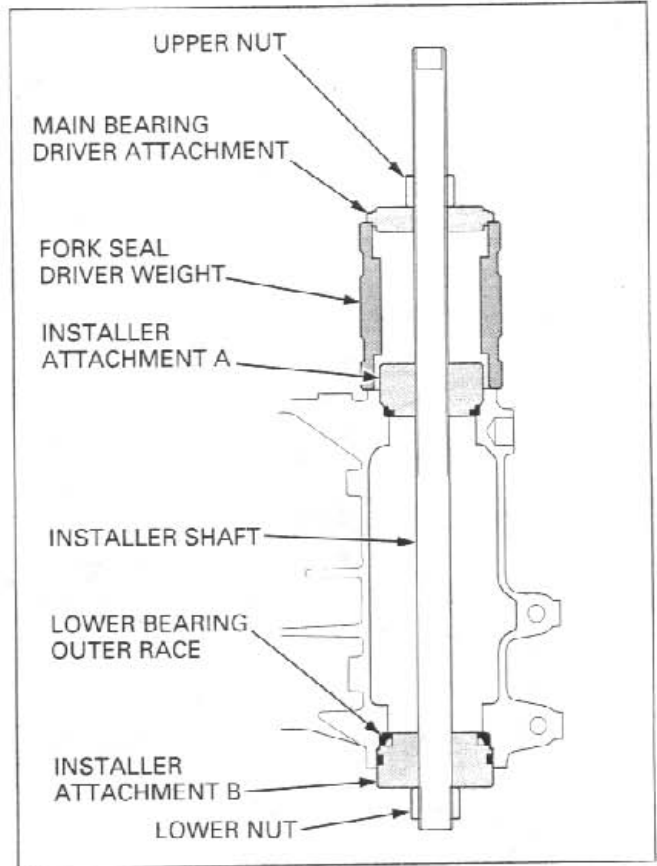
Install a new upper bearing outer race and the special tools as shown.

While holding the installer shaft with the wrench, turn the lower nut gradually until the groove in installer attachment A aligns with the upper end of the steering head. This will allow you to install the upper bearing outer race.



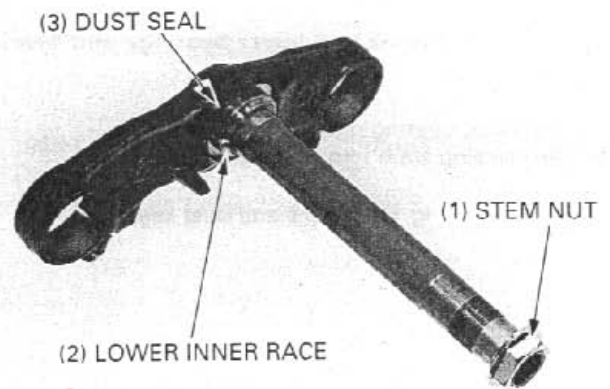
Install a new lower bearing outer race and the special tools as shown.

While holding the installer shaft with the wrench, turn the upper nut gradually until the groove in installer attachment B aligns with the lower end of the steering head. This will allow you to install the lower bearing outer race.



Temporarily install the steering stem nut onto the stem to prevent the threads from being damaged when removing the lower bearing inner race from the stem.

Remove the lower bearing inner race with a chisel or equivalent tool, being careful not to damage the stem. Remove the dust seal.



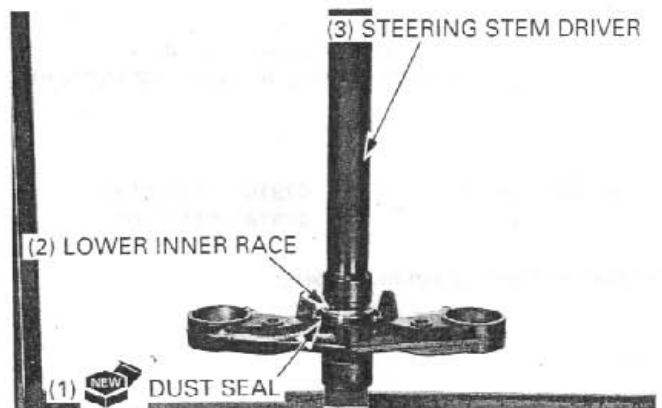
Apply grease to new dust seal lips and install it over the steering stem.

Install a new lower bearing inner race using a special tool and a hydraulic press.

**TOOL:**

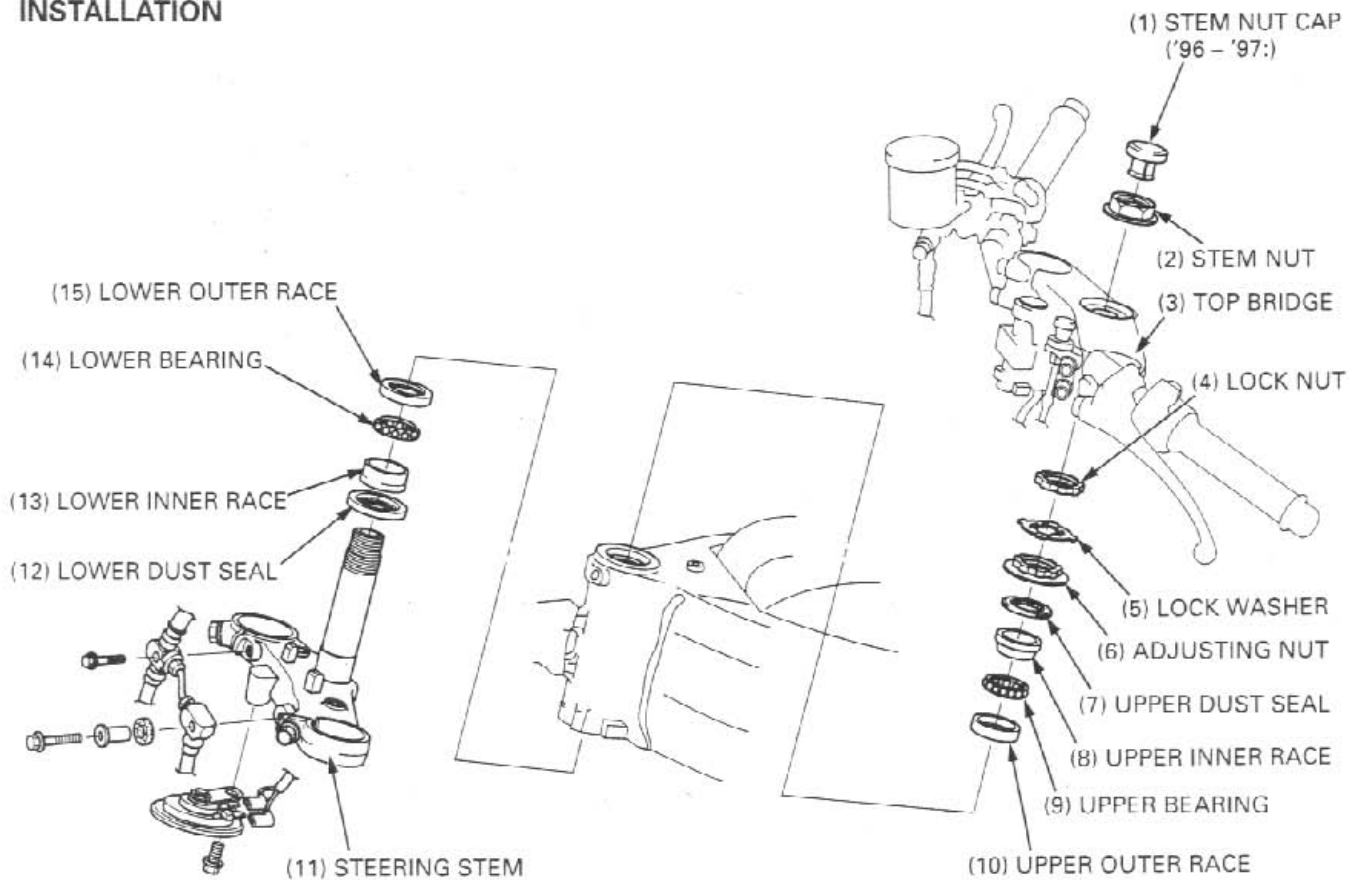
Steering stem driver

07946-MB00000





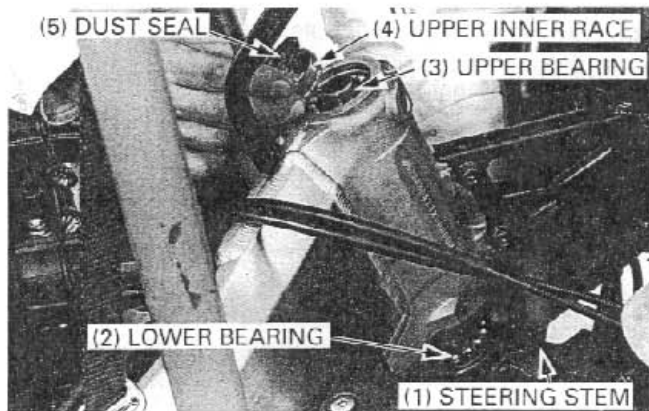
## INSTALLATION



Apply grease to upper and lower bearings and bearing races.

Install the lower bearing onto the steering stem. Insert the steering stem into the steering head pipe.

Install upper bearing, inner race and dust seal.

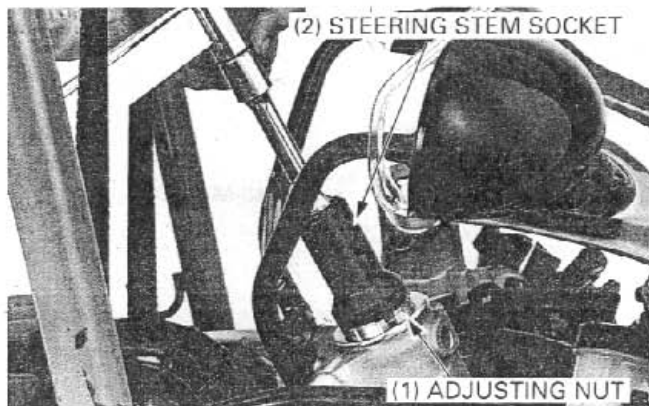


Apply oil to the bearing adjustment nut threads. Install and tighten the stem bearing adjusting nut to the initial torque.

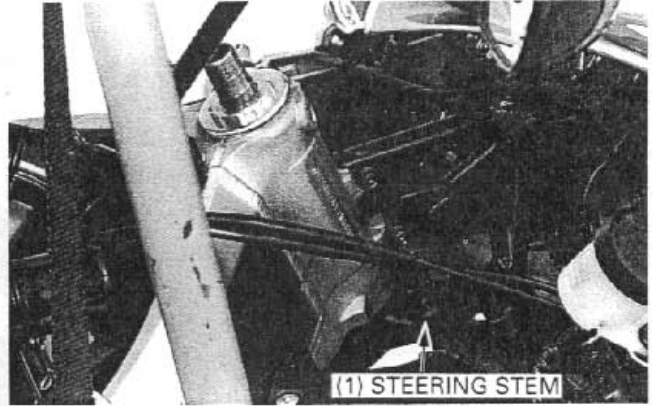
**TOOL:**

Steering stem socket 07916 - 3710101 or 07916 - 3710100

**TORQUE:** 25 N·m (2.5 kgf·m, 18 lbf·ft)



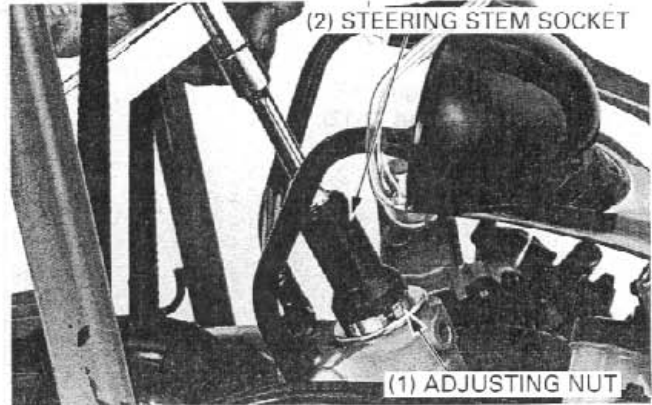
Move the steering stem right and left, lock-to-lock, five times to seat the bearings.  
 Make sure that the steering stem moves smoothly, without play or binding; then loosen the bearing adjusting nut.



Retighten the bearing adjusting nut to the specified torque.

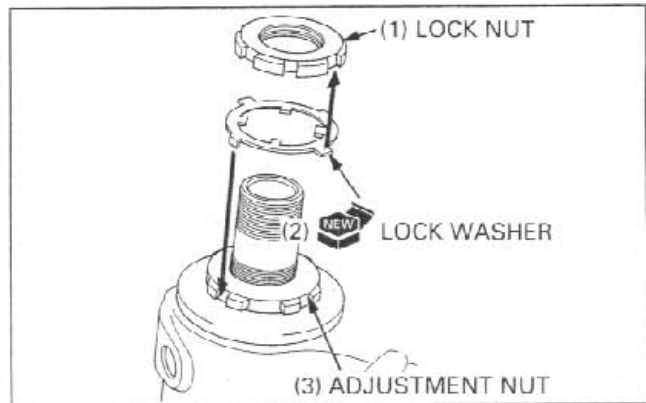
**TORQUE: 25 N-m (2.5 kgf-m, 18 lbf-ft)**

Recheck that the steering stem moves smoothly without play or binding.



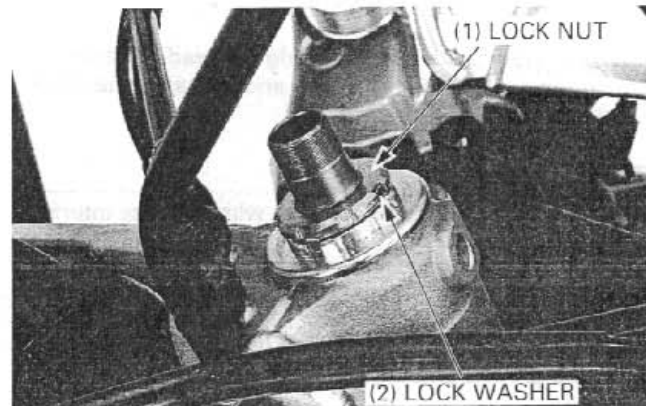
Install the new lock washer onto the steering stem.

Align the tabs of the lock washer with the grooves in the adjustment nut and bend two opposite tabs (shorter) down into the adjustment nut groove.



Install and finger tighten the lock nut.  
 Hold the lock nut and further tighten the lock nut within 1/4 turn (90°) enough to align its grooves with the lock washer tabs.

Bend the lock washer tabs up into the lock nut groove.



## FRONT WHEEL/SUSPENSION/STEERING

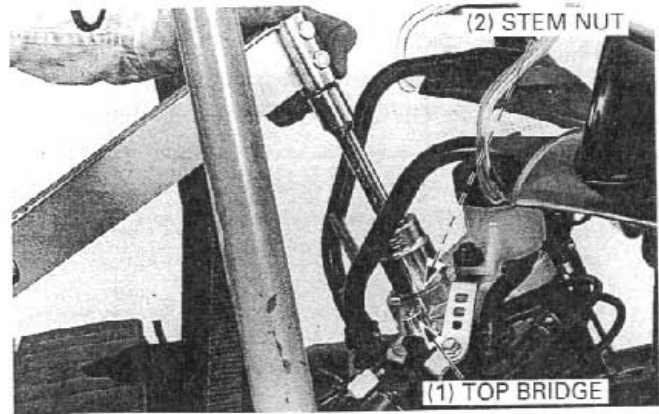
Install the top bridge.

Install the fork legs (page 13-22).

Install the steering stem nut.

Tighten the steering stem nut to the specified torque.

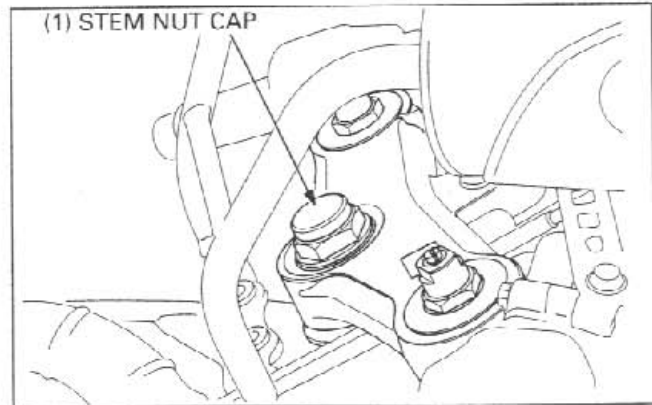
**TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)**



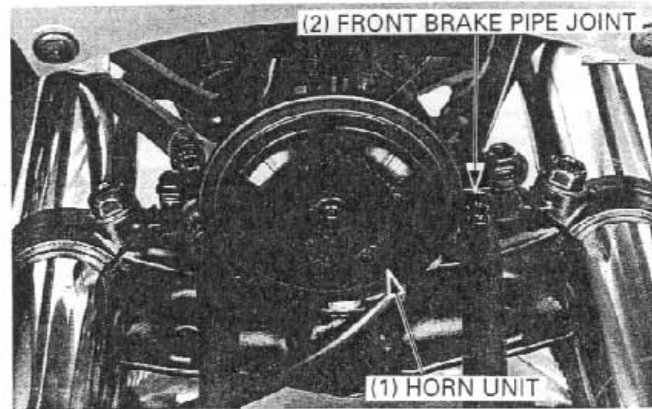
Install the steering stem nut cap.

Install the front fender (page 2-13).

Install the front wheel (page 13-12).



Install the horn unit and tighten the bolt.  
Install the front brake pipe joint and collar.  
Install and tighten the mounting bolts.



### STEERING HEAD BEARING PRE-LOAD

Remove the upper cowl (page 2-7).

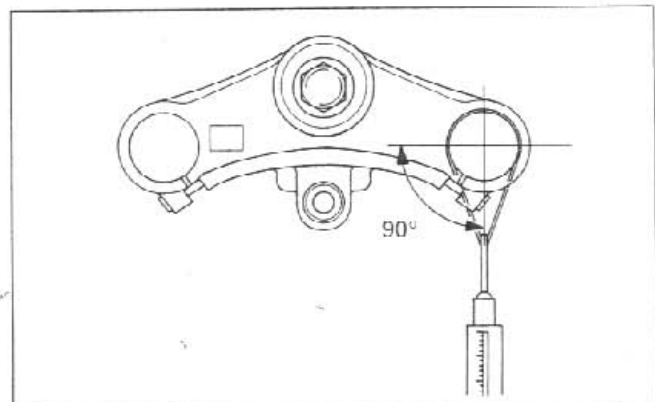
Support the motorcycle using a safety stand or hoist and raise the front wheel off the ground.

Position the steering stem to the straight ahead position.  
Hook a spring scale to the fork tube and measure the steering head bearing pre-load.

#### NOTE

- Make sure that there is no cable or wire harness interference.

The pre-load should be within 1.0 – 1.5 kgf (2.2 – 3.3 lbf).  
If the readings do not fall within the limits, lower the front wheel to the ground and adjust the steering bearing adjusting nut.

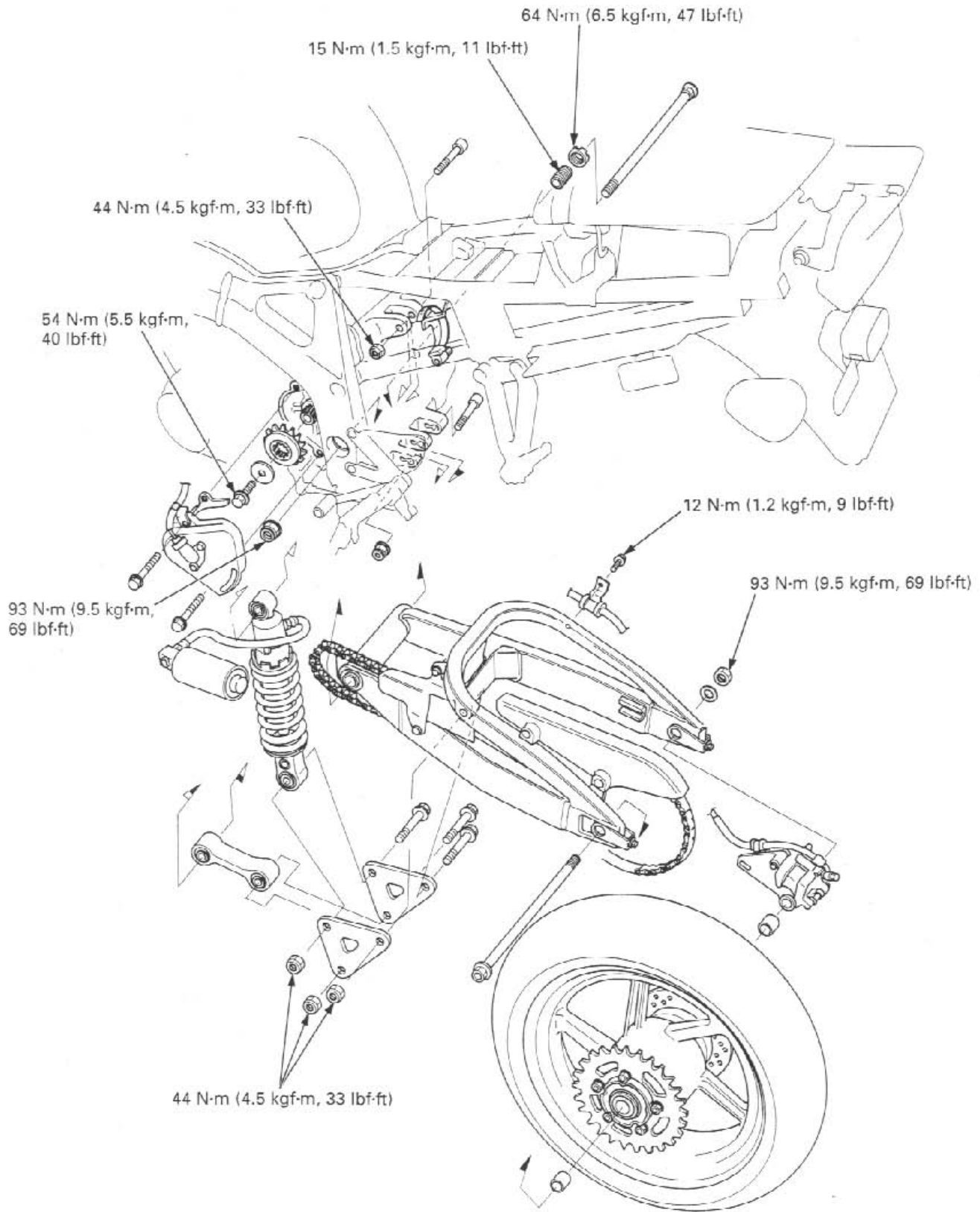


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MEMO

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# REAR WHEEL/SUSPENSION



# 14. REAR WHEEL/SUSPENSION

|                     |      |                    |       |
|---------------------|------|--------------------|-------|
| SERVICE INFORMATION | 14-1 | SHOCK ABSORBER     | 14-9  |
| TROUBLESHOOTING     | 14-2 | SUSPENSION LINKAGE | 14-14 |
| REAR WHEEL          | 14-3 | SWINGARM           | 14-16 |

## SERVICE INFORMATION

### GENERAL

#### ⚠ 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.
- 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 (page 14-11).

- When servicing the rear wheel, support the motorcycle using a safety stand or hoist.
- Refer to section 15 for brake system information.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "TUBELESS TIRE APPLICABLE".
- Use genuine Honda replacement bolts and nuts for all suspension pivot and mounting point.

### SPECIFICATIONS

Unit: mm (in)

| REAR WHEEL/SUSPENSION    |                               |            | STANDARD                                    | SERVICE LIMIT |
|--------------------------|-------------------------------|------------|---|---------------|
| ITEM                     |                               |            |   |               |
| Minimum tire tread depth |                               |            | —   | 2.0 (0.08)    |
| Cold tire pressure       | Up to 90 kg (200 lb) load     |            | 290 kPa (2.90 kgf/cm <sup>2</sup> , 42 psi) | —             |
|                          | Up to maximum weight capacity |            | 290 kPa (2.90 kgf/cm <sup>2</sup> , 42 psi) | —             |
| Axle runout              |                               |            | —   | 0.20 (0.008)  |
| Wheel rim runout         | Radial                        |            | —   | 2.0 (0.08)    |
|                          | Axial                         |            | —   | 2.0 (0.08)    |
| Shock absorber           | Spring free length            | '96 - '97: | 172.6 (6.80)                                | 169.1 (6.66)  |
|                          |                               | After '97: | 167.7 (6.60)                                | 164.3 (6.47)  |
|                          | Spring direction              |            | With the tapered end facing up              |               |
|                          | Pre-load adjuster setting     | '96 - '97: | 2nd position                                |               |
|                          |                               | After '97: | 3rd position                                |               |
|                          | Rebound adjuster setting      |            | 1 turn from full hard                       |               |
|                          | Compression adjuster setting  |            | 1 turn from full hard                       |               |
| Drive chain              | Size/link                     | DID        | DID525HV GC&B - 120ZB                       |               |
|                          |                               | RK         | RKGB525ROZ1 - 120LJF                        |               |
| Drive chain              | Slack                         |            | 30 - 40 (1.2 - 1.6)                         | 50 (1.97)     |

**TORQUE VALUES**

|                                   |                                 |           |
|-----------------------------------|---------------------------------|-----------|
| Rear axle nut                     | 93 N·m (9.5 kgf·m, 69 lbf·ft)   |           |
| Rear brake disc mounting bolt     | 42 N·m (4.3 kgf·m, 31 lbf·ft)   | ALOC bolt |
| Driven sprocket nut               | 108 N·m (11.0 kgf·m, 80 lbf·ft) | U-nut     |
| Shock absorber upper mounting nut | 44 N·m (4.5 kgf·m, 33 lbf·ft)   | U-nut     |
| Shock arm plate nut               | 44 N·m (4.5 kgf·m, 33 lbf·ft)   | U-nut     |
| Shock link nut                    | 44 N·m (4.5 kgf·m, 33 lbf·ft)   | U-nut     |
| Swingarm pivot adjusting bolt     | 15 N·m (1.5 kgf·m, 11 lbf·ft)   |           |
| Swingarm pivot lock nut           | 64 N·m (6.5 kgf·m, 47 lbf·ft)   |           |
| Swingarm pivot nut                | 93 N·m (9.5 kgf·m, 69 lbf·ft)   |           |
| Drive chain slider bolt           | 9 N·m (0.9 kgf·m, 6.5 lbf·ft)   |           |
| Drive sprocket bolt               | 54 N·m (5.5 kgf·m, 40 lbf·ft)   |           |
| Rear brake hose mounting bolt     | 12 N·m (1.2 kgf·m, 8.7 lbf·ft)  |           |

**TOOLS**

|                                      |                 |  |
|--------------------------------------|-----------------|--|
| Swingarm locknut wrench              | 07908 - 4690003 |  |
| Bearing remover set                  | 07936 - 3710001 |  |
| — Remover handle                     | 07936 - 3710100 |  |
| — Remover head, 20 mm                | 07936 - 3710600 |  |
| — Remover weight                     | 07741 - 0010201 | or 07936 - 3710200<br>07936 - 371020A (U.S.A. only)<br>Not available in U.S.A. |
| Pin driver                           | 07GMD - KT80100 | Not available in U.S.A.  |
| Needle bearing remover               | 07HMC - MR70100 | Not available in U.S.A.  |
| Needle bearing remover set           | 07LMC - KV30100 | Not available in U.S.A.  |
| Driver shaft                         | 07946 - MJ00100 | Not available in U.S.A.  |
| Driver                               | 07749 - 0010000 |  |
| Attachment, 37 x 40 mm               | 07746 - 0010200 |  |
| Attachment, 42 x 47 mm               | 07746 - 0010300 |  |
| Attachment, 52 x 55 mm               | 07746 - 0010400 |  |
| Attachment, 24 x 26 mm               | 07746 - 0010700 |  |
| Pilot, 17 mm                         | 07746 - 0040400 |  |
| Pilot, 20 mm                         | 07746 - 0040500 |  |
| Pilot, 28 mm                         | 07746 - 0041100 |  |
| Bearing remover shaft                | 07746 - 0050100 |  |
| Bearing remover head, 20 mm          | 07746 - 0050600 |  |
| Shock absorber compressor            | 07GME - 0010000 |  |
| Shock absorber compressor attachment | 07NME - MY70100 | Not available in U.S.A.  |

**TROUBLESHOOTING****Soft suspension**

- Weak shock absorber spring
- Incorrect suspension adjustment
- Oil leakage from damper unit
- Tire pressure too low

**Hard suspension**

- Damaged shock absorber mounting bearing
- Bent damper rod
- Damaged swingarm pivot bearings
- Bent swingarm pivot
- Incorrect suspension adjustment
- Tire pressure too high

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

- Bent rear axle
- Axle alignment/chain adjustment not equal on both sides

**Rear wheel wobbling**

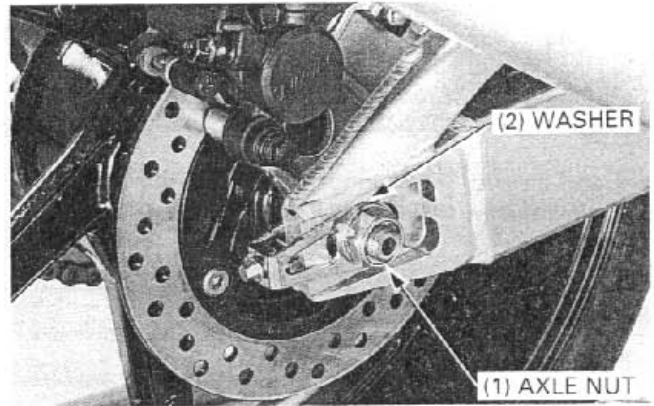
- Bent rim
- Worn rear wheel bearings
- Faulty tire
- Unbalanced tire and wheel
- Tire pressure too low
- Faulty swingarm pivot bearings

## REAR WHEEL

### REMOVAL

Support the motorcycle securely using a hoist or equivalent.

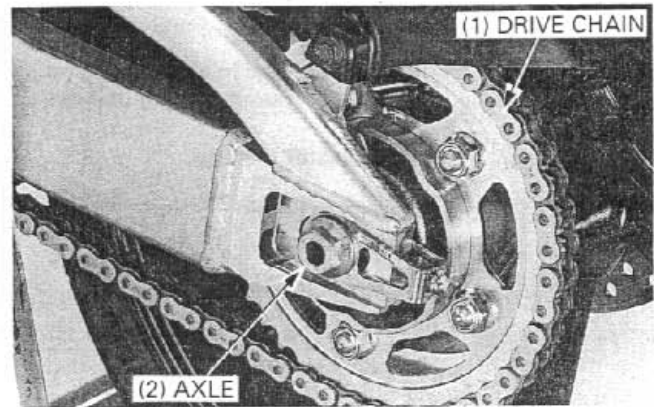
Remove the axle nut and washer.



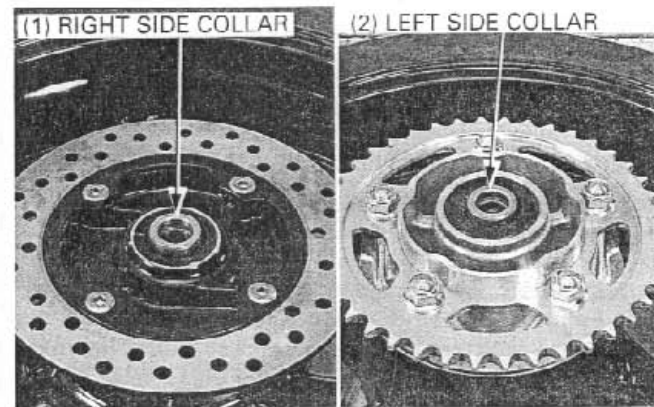
Push the rear wheel forward.

Derail the drive chain from the driven sprocket.

Remove the axle from the left side and remove the rear wheel.



Remove the side collars.

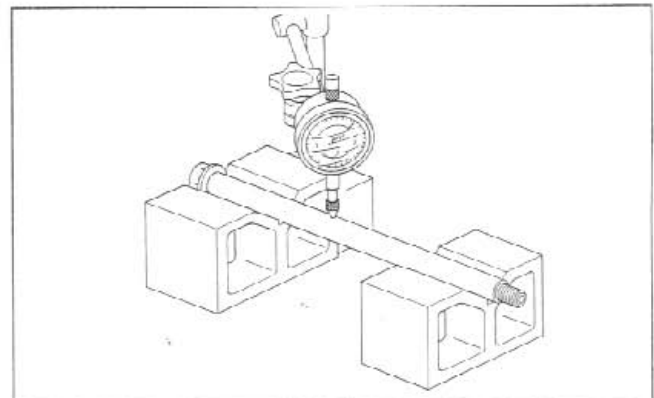


### INSPECTION

#### Axle

Place the axle in V-blocks and measure the runout.  
Actual runout is 1/2 the total indicator reading.

**SERVICE LIMIT: 0.20 mm (0.008 in)**





## REAR WHEEL/SUSPENSION

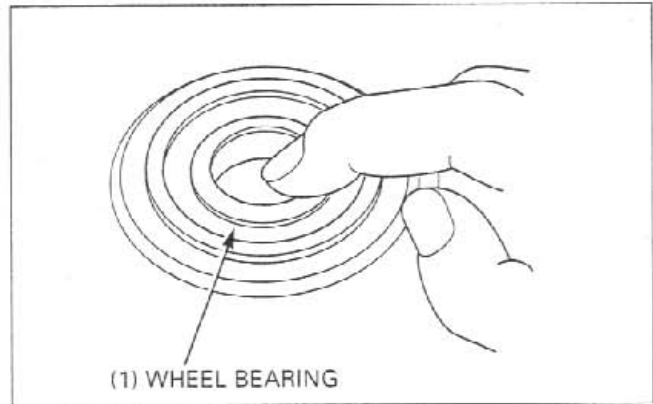
### Wheel bearing

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

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

#### NOTE

- Replace the wheel bearings in pairs.

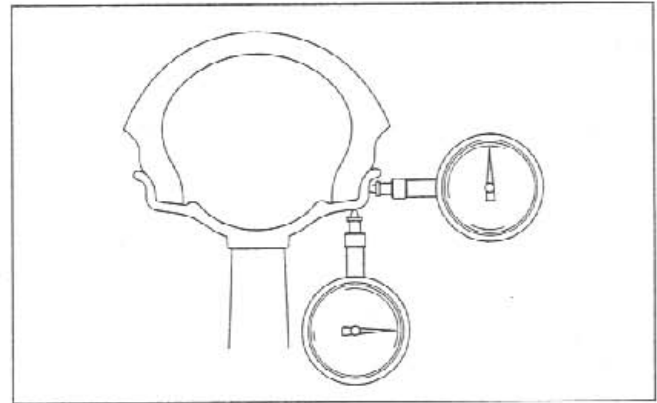


### Wheel rim runout

Check the rim runout by placing the wheel in a turning stand. Spin the wheel slowly and read the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

**SERVICE LIMITS:** Radial: 2.0 mm (0.08 in)  
Axial: 2.0 mm (0.08 in)

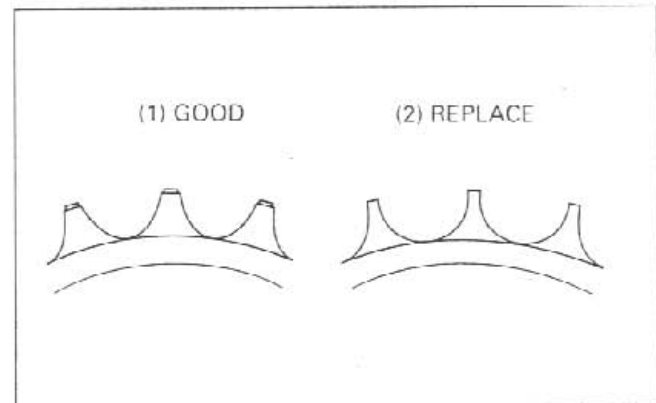


### Driven sprocket

Check the condition of the final driven sprocket teeth. Replace the sprocket if worn or damaged.

#### NOTE

- If the final driven sprocket requires replacement, inspect the drive chain and drive sprocket.
- Never install a new drive chain on a worn sprocket or a worn chain on new sprockets. Both chain and sprocket must be in good condition or the replacement chain or sprocket will wear rapidly.

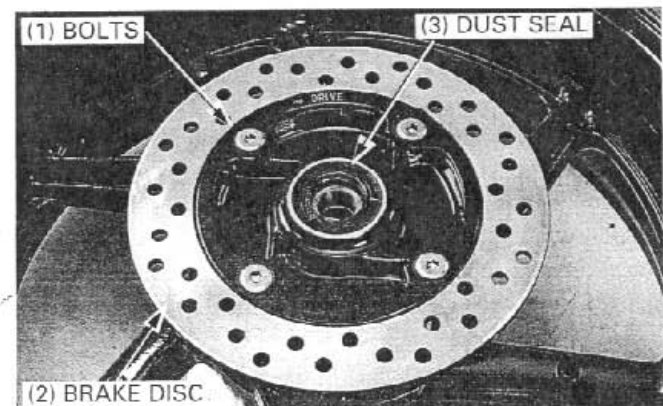


### Wheel balance

See page 13-10 for wheel balance.

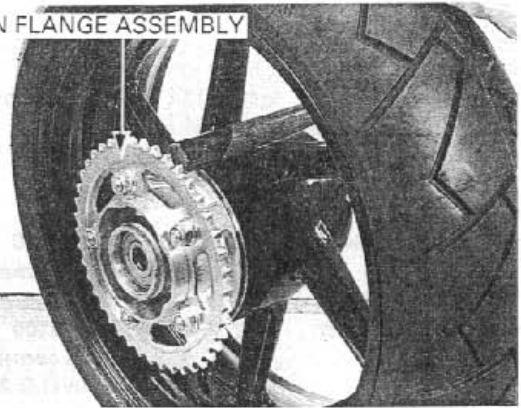
## DISASSEMBLY

Remove the bolts and brake disc.  
Remove the right dust seal.



Remove the driven flange assembly from the left wheel hub.

(1) DRIVEN FLANGE ASSEMBLY

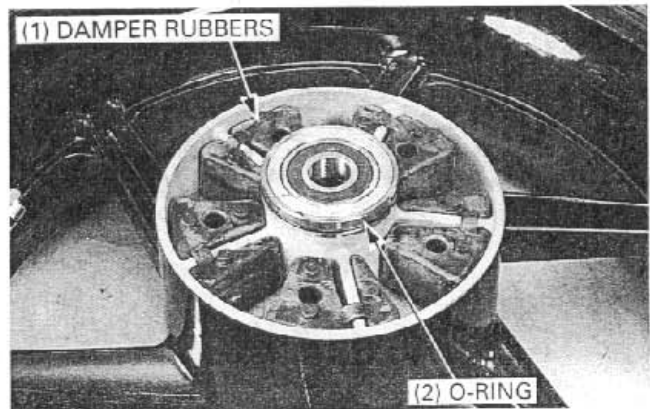


NOTE

- If you will be disassemble the driven flange, loosen the driven sprocket nuts before removing the driven flange from the wheel hub.

Remove the wheel damper rubbers.  
Remove the O-ring.

(1) DAMPER RUBBERS



**Driven flange bearing removal**

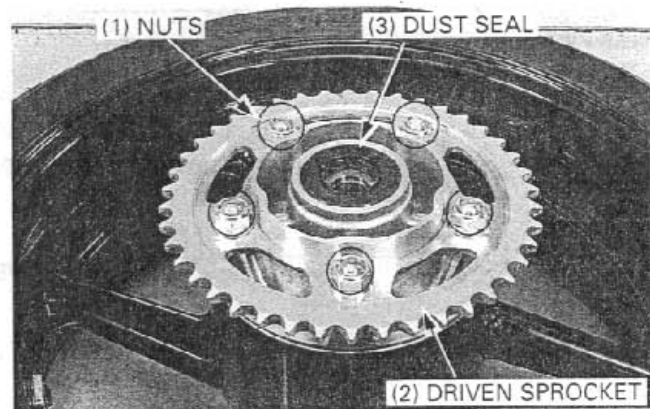
Loosen the driven sprocket nuts.

Remove the driven flange from the wheel hub, then remove the driven sprocket nuts and sprocket.

Remove the dust seal.

(1) NUTS

(3) DUST SEAL

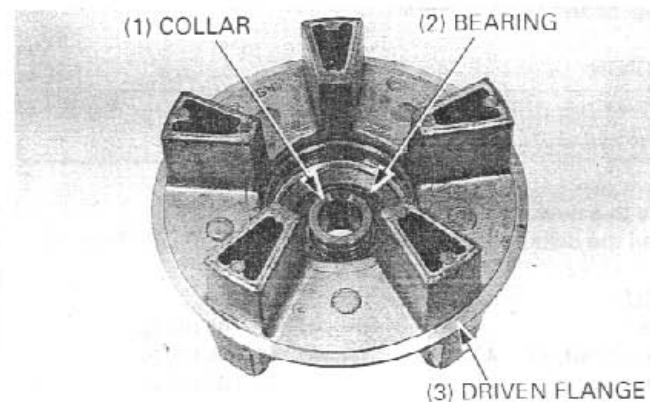


Remove the driven flange collar.

Drive out the driven flange bearing.

(1) COLLAR

(2) BEARING



## REAR WHEEL/SUSPENSION

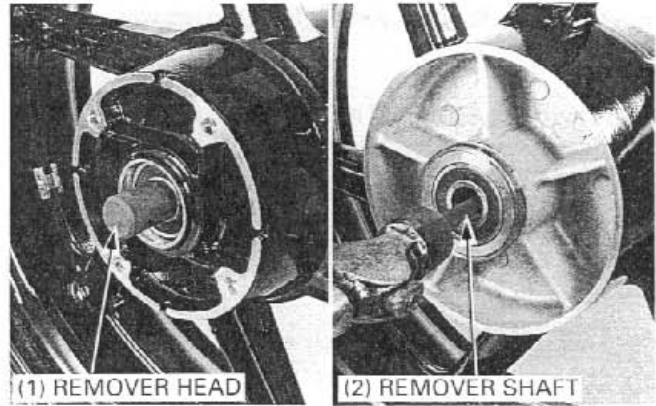
### Wheel bearing removal

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

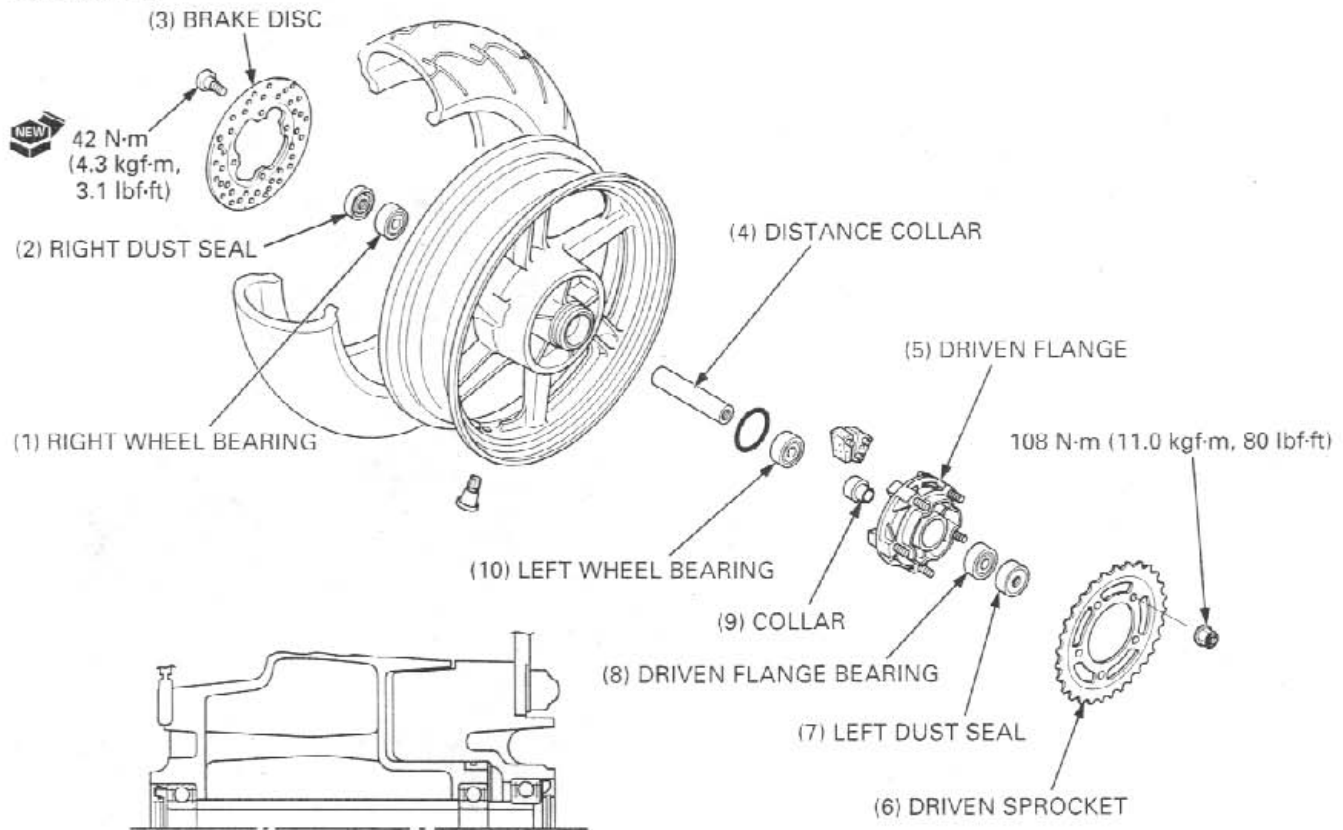
### TOOLS:

Bearing remover head, 20 mm    07746 - 0050600  
(Equivalent commercially available in U.S.A.)

Bearing remover shaft    07746 - 0050100  
(Equivalent commercially available in U.S.A.)



### ASSEMBLY



### Wheel bearing installation

#### CAUTION

- Never install the old bearings, once the bearings has been removed, the bearing must be replaced with new ones.

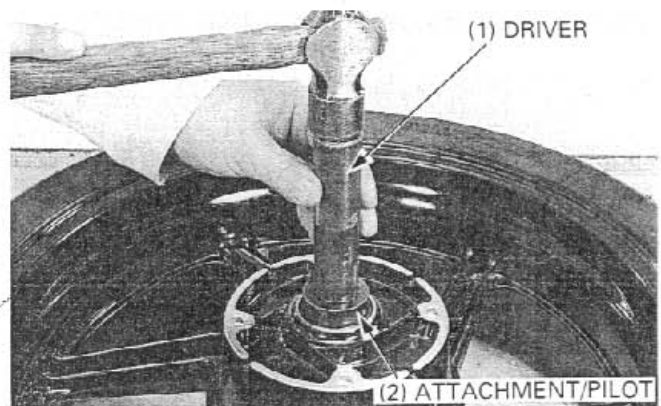
Drive in a new right bearing squarely.  
Install the distance collar, then drive in the left side bearing.

### TOOLS:

Driver    07749 - 0010000

Attachment, 42 x 47 mm    07746 - 0010300

Pilot, 20 mm    07746 - 0040500

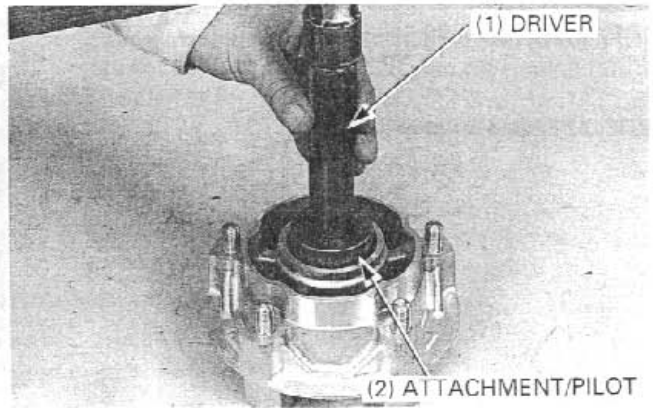


**Driven flange bearing installation**

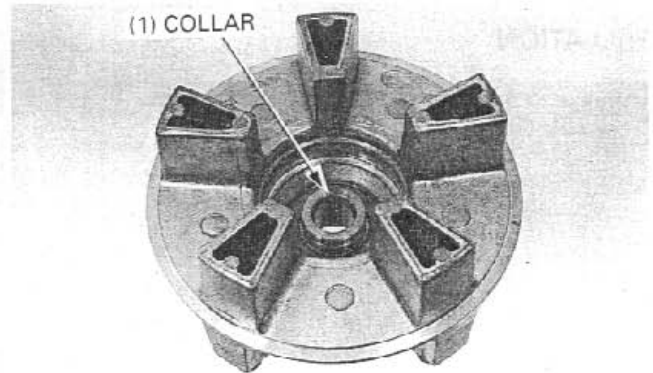
Drive the new driven flange bearing into the driven flange using the special tools.

**TOOLS:**

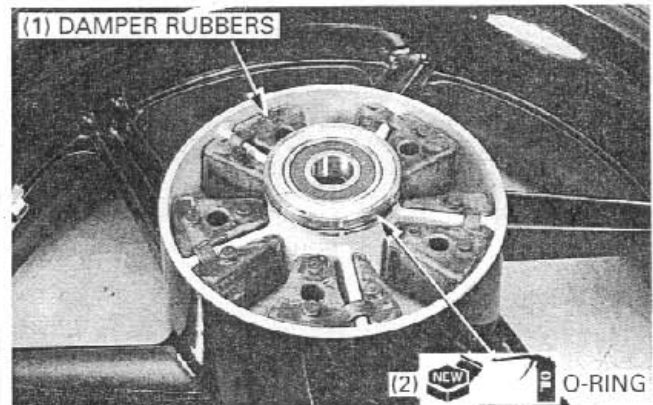
|                        |                 |
|------------------------|-----------------|
| Driver                 | 07749 - 0010000 |
| Attachment, 52 x 55 mm | 07746 - 0010400 |
| Pilot, 20 mm           | 07746 - 0040500 |



Install the driven flange collar.



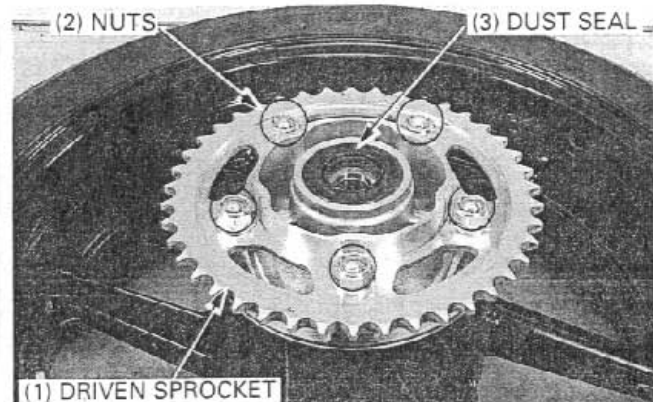
Install the wheel damper rubbers into the wheel hub.  
Apply oil to the new O-ring and install it into the groove of the wheel hub.



Install the driven flange assembly into the left wheel hub.  
If the driven sprocket was removed, install the driven sprocket and tighten the nuts.

**TORQUE: 108 N·m (11.0 kgf·m, 80 lbf·ft)**

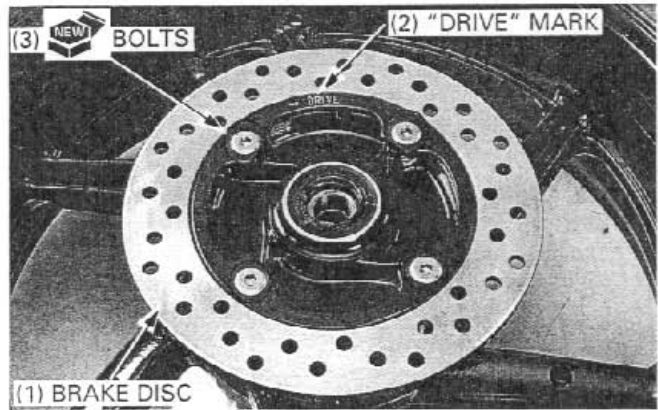
Apply grease to the dust seal lips, then install it into the driven flange.



## REAR WHEEL/SUSPENSION

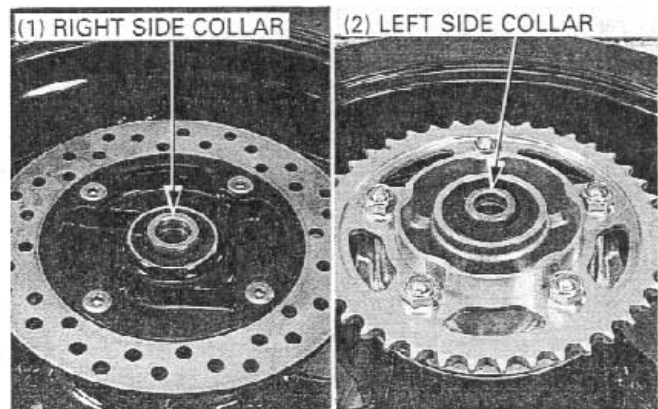
Install the brake disc with its "DRIVE" mark facing out.  
Install and tighten the new bolts to the specified torque.

**TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)**

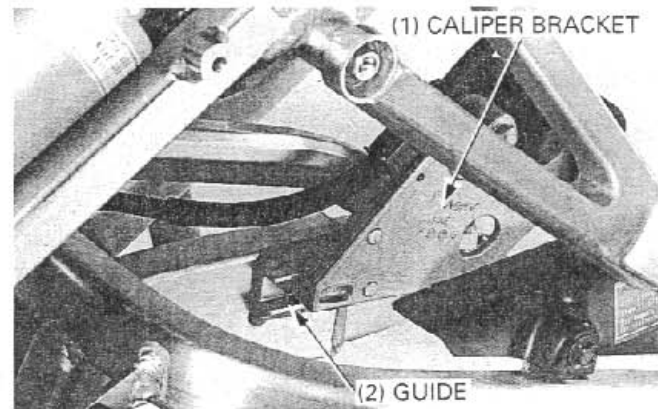


## INSTALLATION

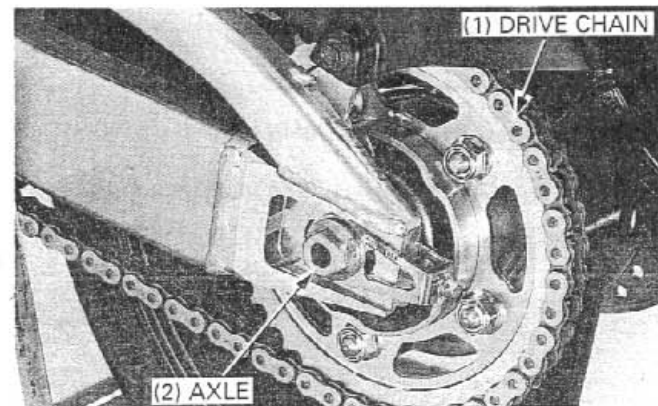
Apply grease to the side collar inside and grooves.  
Install the side collars.



Install the rear brake caliper bracket onto the guide of the swingarm.



Place the rear wheel into the swingarm.  
Install the drive chain over the driven sprocket.  
Install the axle from the left side.

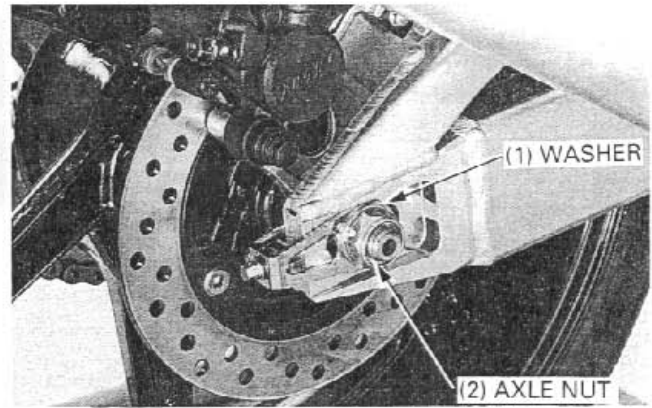


Install the washer and loosely install the axle nut.

Adjust the drive chain slack (page 3-17).

Tighten the axle nut to the specified torque.

**TORQUE: 93 N·m (9.5 kgf·m, 69 lbf·ft)**



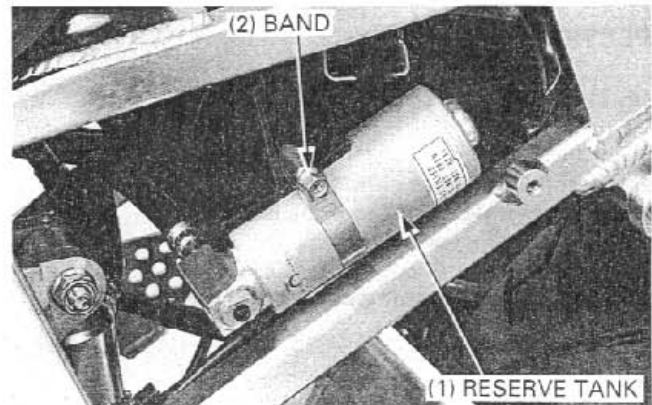
## SHOCK ABSORBER

### REMOVAL

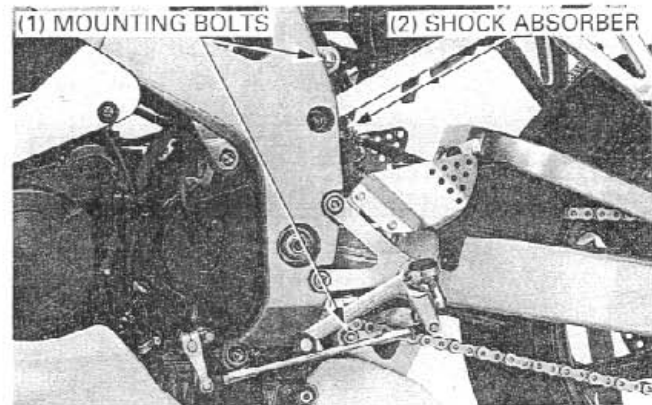
Support the motorcycle securely using a hoist or equivalent.

Remove the side covers (page 2-3).

Remove the reserve tank band.



Remove the upper and lower mounting bolts and shock absorber.



### DISASSEMBLY

#### NOTE

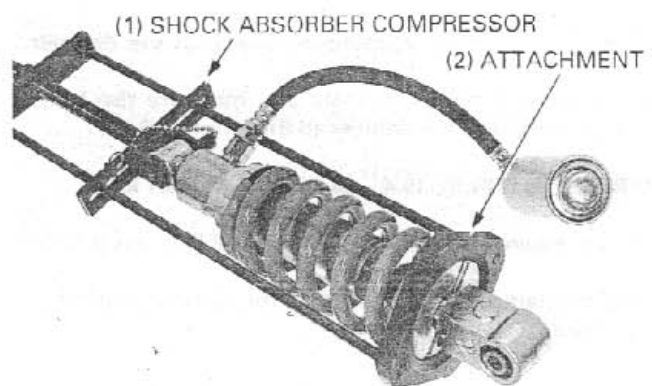
- Make sure the spring adjuster is set to the softest position before disassemble the shock absorber.

Install the shock absorber compressor and attachment onto the shock absorber as shown.

#### TOOLS:

Shock absorber compressor 07GME - 0010000

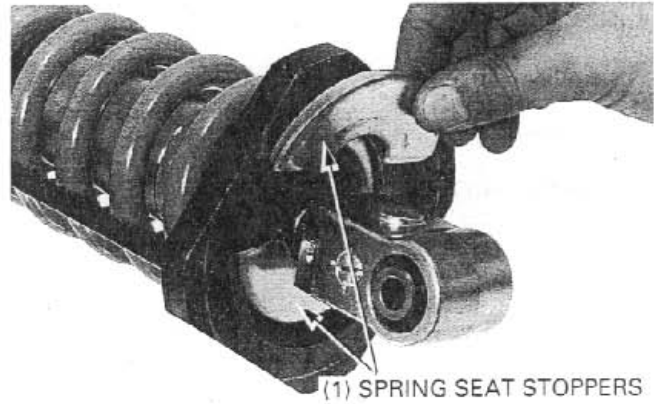
Shock absorber compressor attachment  
07NME - MY70100



Turn the compressor screw and compress the spring.

## REAR WHEEL/SUSPENSION

Remove the spring seat stoppers.  
Remove the special tools and remove the spring seat, spring and spring adjuster.



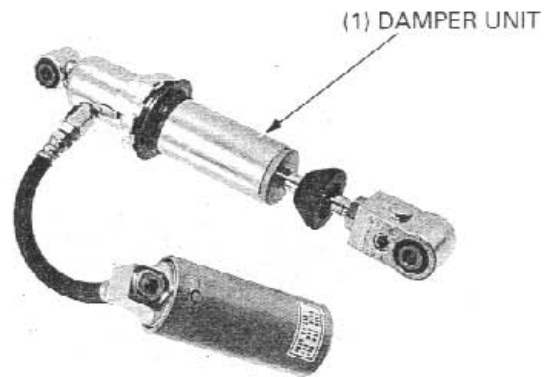
## INSPECTION

Visually inspect the damper unit for damage.

Check for the:

- Damper rod for bend or damage
- Damper unit for deformation or oil leaks
- Bump rubber for wear or damage

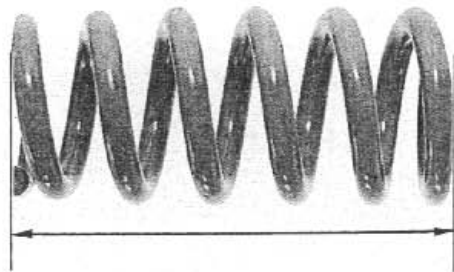
Inspect all the other parts for wear or damage.



Measure the spring free length.

### SERVICE LIMIT:

|            |                    |
|------------|--------------------|
| '96 - '97: | 169.1 mm (6.66 in) |
| After '97: | 167.7 mm (6.60 in) |



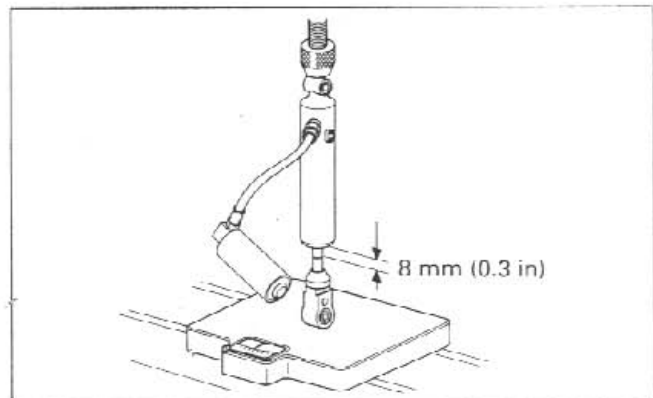
Mark the 8 mm (0.3 in) position as shown of the damper rod.

Place the damper rod on a scale and measure the force required to compress the damper to the 8 mm (0.3 in).

**COMPRESSION FORCE: 15.4 – 20.0 kg (34.0 – 44.1 lbs)**

If the force required is less than 14.9 kg (32.8 lbs), gas is leaking.

Examine the damper rod and replace the damper unit if it is bent or scored.



**SHOCK ABSORBER DISPOSAL PROCEDURE**

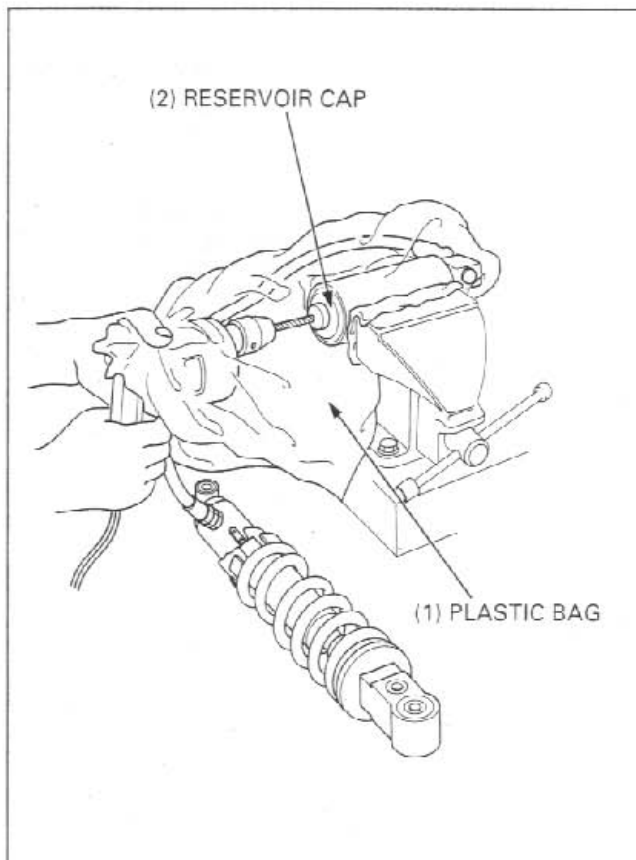
Center punch the reservoir tank end to mark the drilling point.

Wrap the damper unit inside a plastic bag.  
Support the reservoir tank in a vise as shown.  
Through the open end of the bag, insert a drill motor with a sharp 2 – 3 mm (5/64 – 1/8 in) drill bit.

**▲ WARNING**

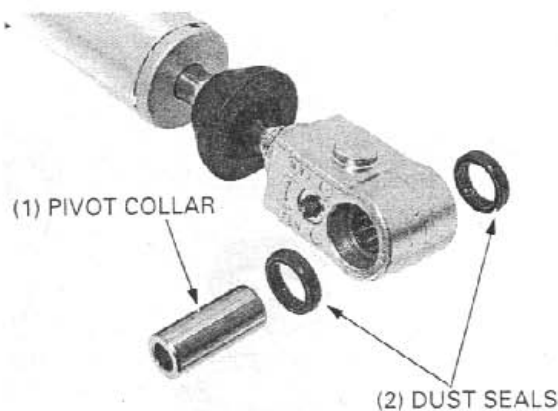
- Do not use a dull drill bit which could cause a build-up of excessive heat and pressure inside the damper, leading to explosion and severe personal injury.
- The shock absorber contains nitrogen gas and oil under high pressure. Do not drill any farther down the damper case than the measurement given above, or you may drill into the oil chamber; oil escaping under high pressure may cause serious personal injury.
- Always wear eye protection to avoid getting metal shaving in your eyes when the gas pressure is released. The plastic bag is only intended to shield you from the escaping gas.

Hold the bag around the drill motor and briefly run the drill motor inside the bag; this will inflate the bag with air from the motor and help keep the bag from getting caught in the bit when you start.



**LOWER JOINT NEEDLE BEARING REPLACEMENT**

Remove the pivot collar and dust seals.



Set the damper in a hydraulic press.

**CAUTION**

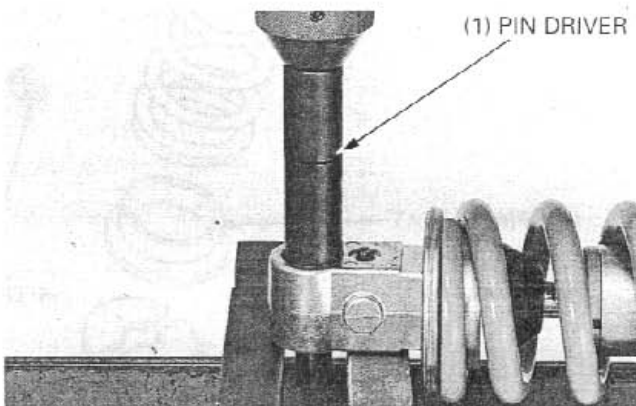
- Place the damper with the rebound damping adjuster facing up.

Press the needle bearing out from the lower joint.

**TOOL:**

Pin driver

07GMD – KT80100  
(Not available in U.S.A.)



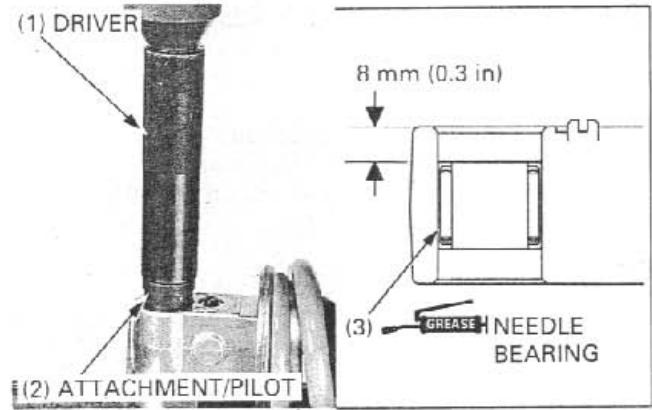


## REAR WHEEL/SUSPENSION

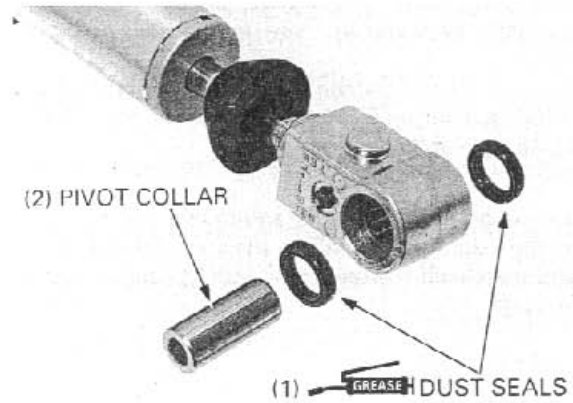
Pack a new needle bearing with multi-purpose grease. Press the needle bearing into the lower joint so that the needle bearing casing is lower 8 mm (0.3 in) below the end of the lower joint as shown.

### TOOLS:

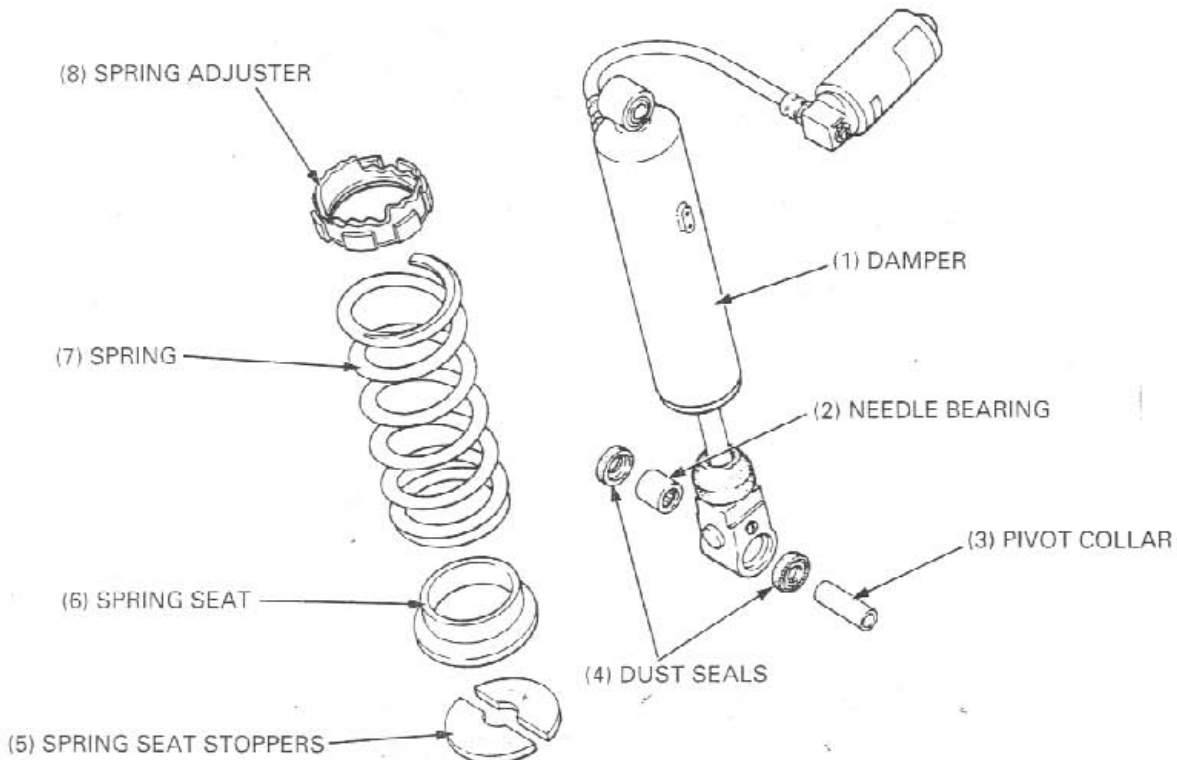
|                        |                 |
|------------------------|-----------------|
| Driver                 | 07749 - 0010000 |
| Attachment, 24 x 26 mm | 07746 - 0010700 |
| Pilot, 17 mm           | 07746 - 0040400 |



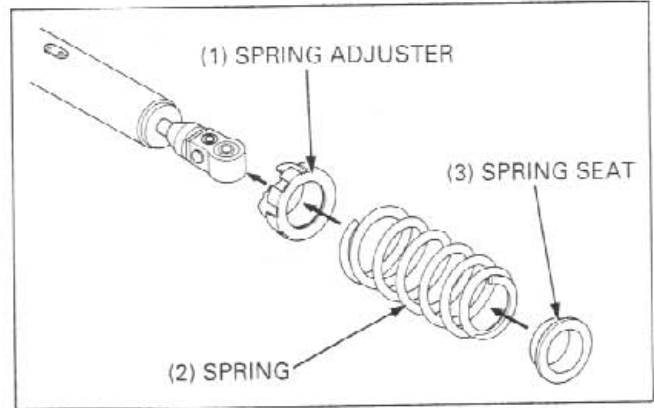
Apply grease to the dust seal lips. Install the dust seals and pivot collar.



## ASSEMBLY



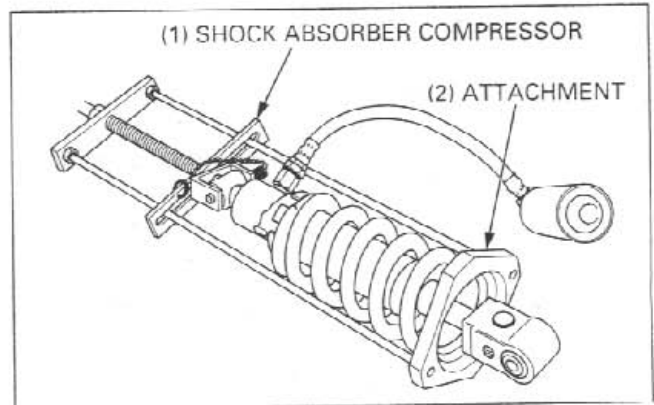
Install the spring adjuster onto the damper unit.  
Install the spring with its tapered end facing up.  
Install the spring seat.



Install the shock absorber compressor and attachment onto the shock absorber as shown.

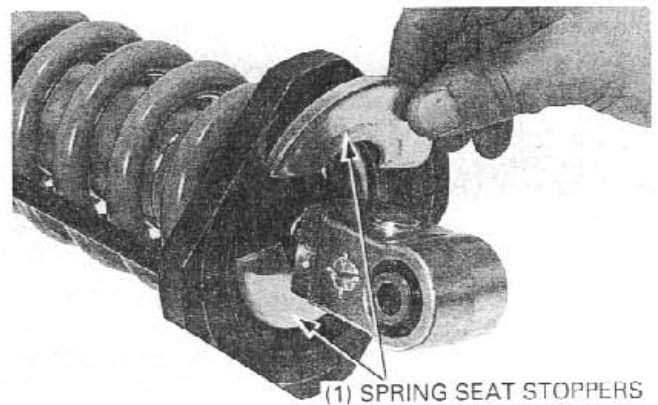
**TOOLS:**  
Shock absorber compressor      07GME - 0010000  
Shock absorber compressor attachment      07NME - MY70100

Turn the compressor screw and compress the spring.



Install the spring seat stoppers securely.

Remove the tools.

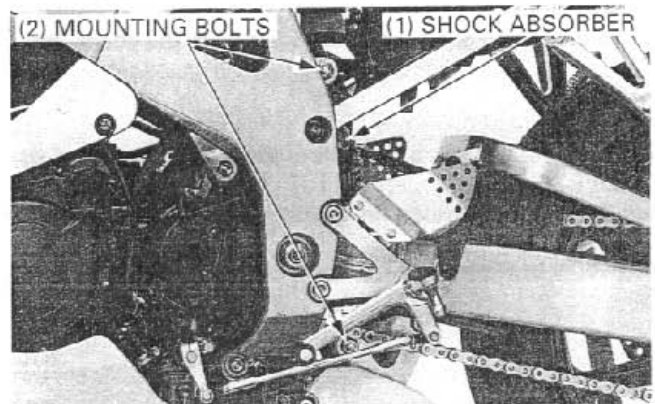


## INSTALLATION

Install the shock absorber into the frame with the rebound damping adjuster facing to the right.  
Route the reservoir hose properly.

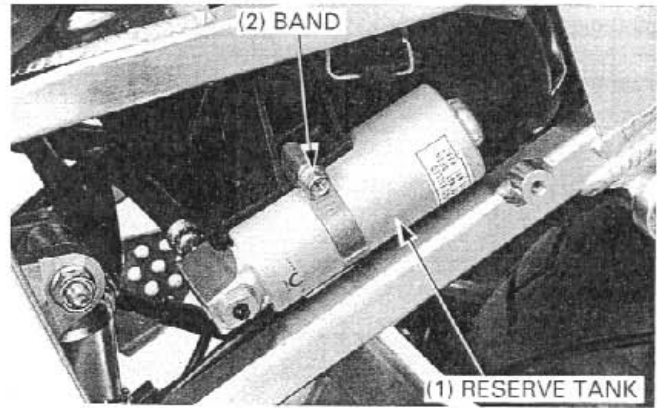
Install and tighten the upper and lower mounting bolts/nuts to the specified torque.

**TORQUE: 44 N-m (4.5 kgf-m, 33 lbf-ft)**



## REAR WHEEL/SUSPENSION

Position the reservoir as shown and secure it with a band.



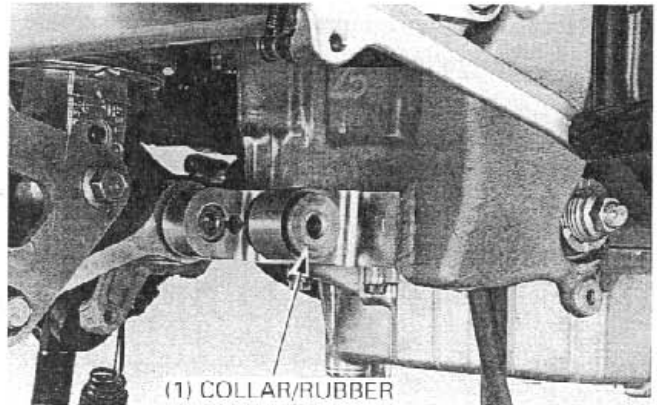
## SUSPENSION LINKAGE

### REMOVAL/DISASSEMBLY

Support the motorcycle securely using a hoist or equivalent.

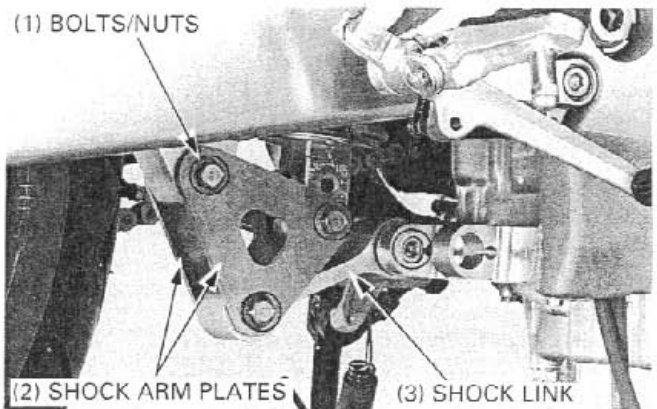
Remove the exhaust pipe (page 2-15).

Remove the exhaust pipe mounting collar and rubber.



Remove the following:

- Shock absorber lower mounting bolt/nut
- Shock arm plate bolt/nut (shock link side)
- Shock arm plate bolt/nut (swingarm side)
- Shock arm plates
- Shock link socket bolt/nut
- Shock link



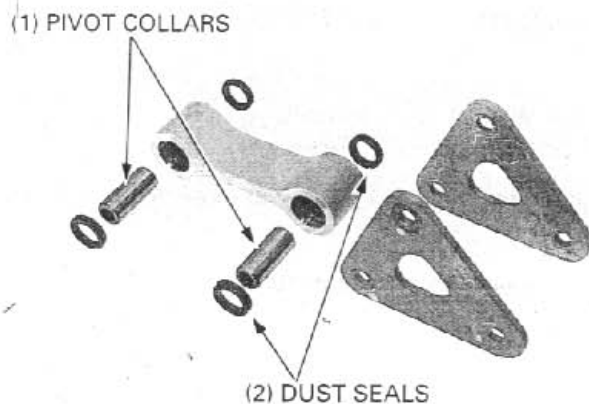
Remove the pivot collars and dust seals from the shock link.

### INSPECTION

Check the dust seals and collars for wear, damage or fatigue.

Check the needle bearings for damage or loose fit.

If the needle bearings are damaged, replace them.



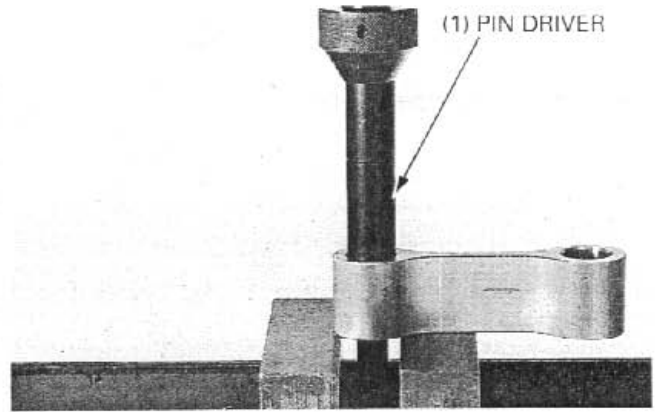
**SHOCK LINK NEEDLE BEARING REPLACEMENT**

Press the needle bearing out of the shock link using special tools and a hydraulic press.

**TOOL:**

Pin driver

07GMD - KT80100  
(Not available in U.S.A.)



Pack the new needle bearing with multi-purpose grease. Press the new needle bearing into the shock link so that the needle bearing surface is lower 5.2 - 5.7 mm (0.20 - 0.22 in) from the end of the shock link surface.

**NOTE**

- Press the needle bearing into the shock link with the marked side facing out.

**TOOLS:**

Driver

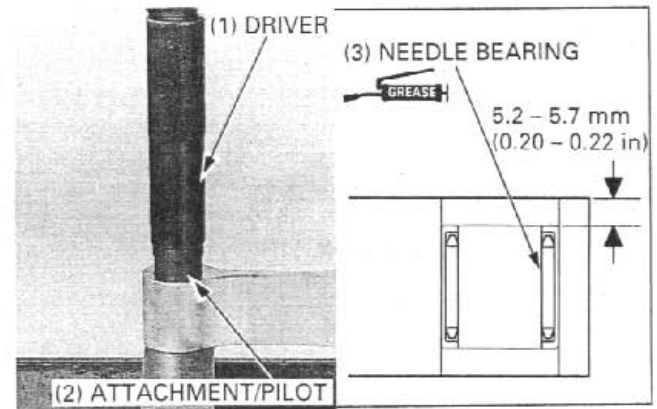
07749 - 0010000

Attachment, 24 x 26 mm

07746 - 0010700

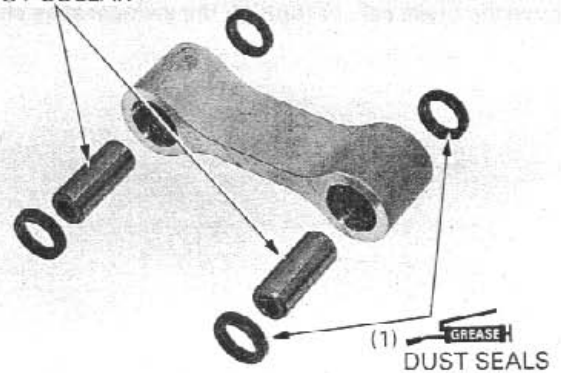
Pilot, 17 mm

07746 - 0040400



Apply grease to the dust seal lips, then install the dust seals and pivot collars.

(2) PIVOT COLLAR



**INSTALLATION**

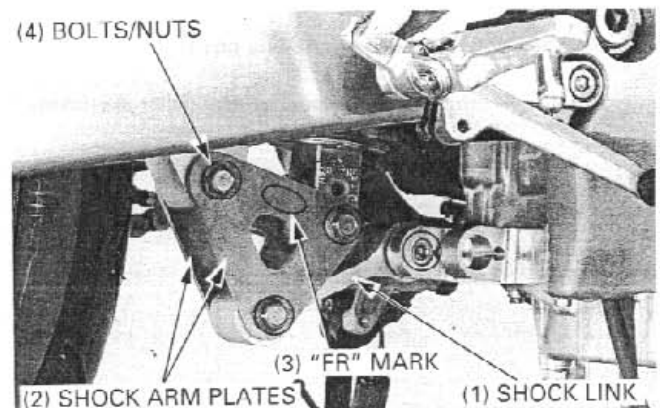
Install the following:

- Shock link
- Shock link socket bolt/nut
- Shock arm plates with their "FR" mark facing to the front
- Shock arm plate bolt/nut (swingarm side)
- Shock arm plate bolt/nut (shock link side)
- Shock absorber lower mounting bolt/nut

Tighten all nuts to the specified torque.

**TORQUE:** 44 N-m (4.5 kgf-m, 33 lbf-ft)

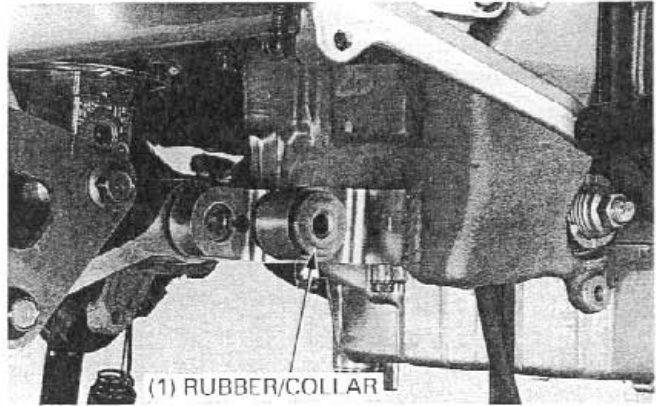
(4) BOLTS/NUTS



## REAR WHEEL/SUSPENSION

Install the muffler mounting rubber and collar.

Install the exhaust pipe (page 2-17).



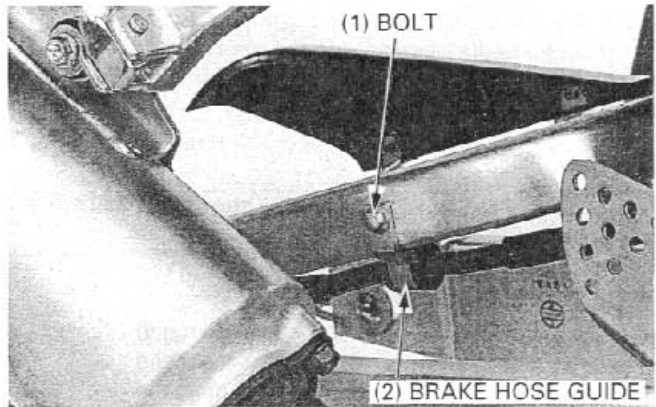
## SWINGARM

### REMOVAL

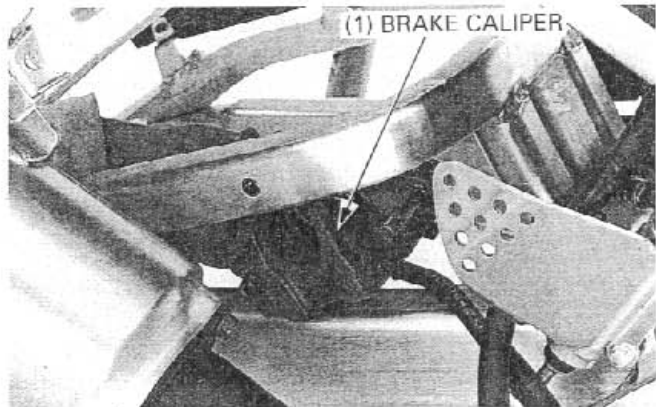
Remove the rear wheel (page 14-3).

Remove the rear brake pads (page 15-6).

Remove the brake hose guide bolt.

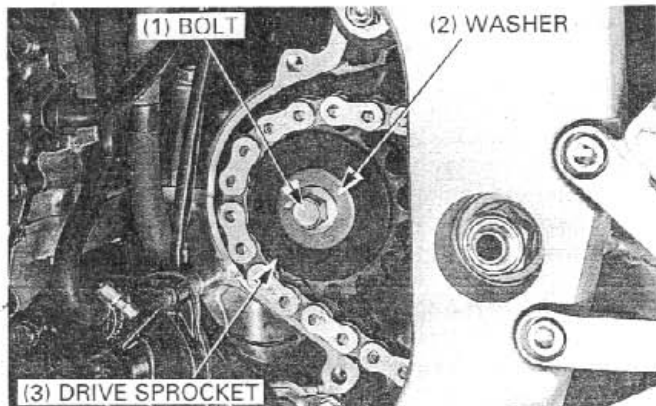


Remove the brake caliper through the swingarm as shown.

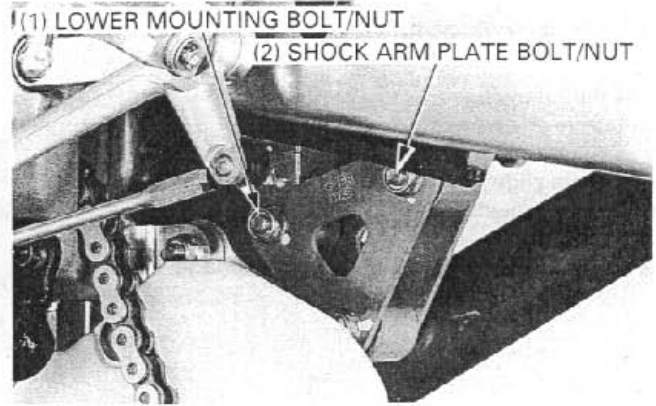


Remove the SH bolts and drive sprocket cover.

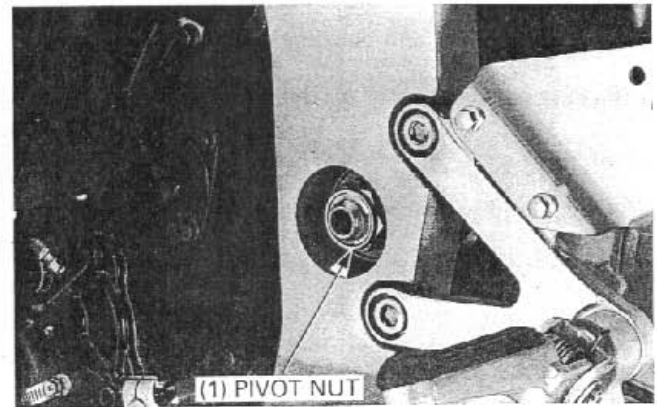
Remove the drive sprocket bolt, washer and drive sprocket.



Remove the shock absorber lower mounting bolt/nut.  
Remove the shock arm plate bolt/nut (swingarm side).

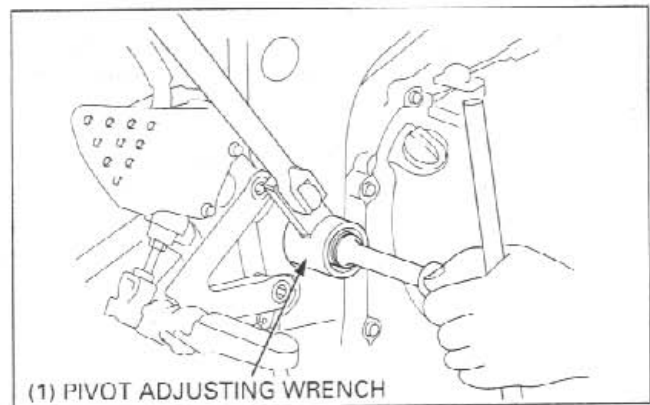


Remove the swingarm pivot nut.

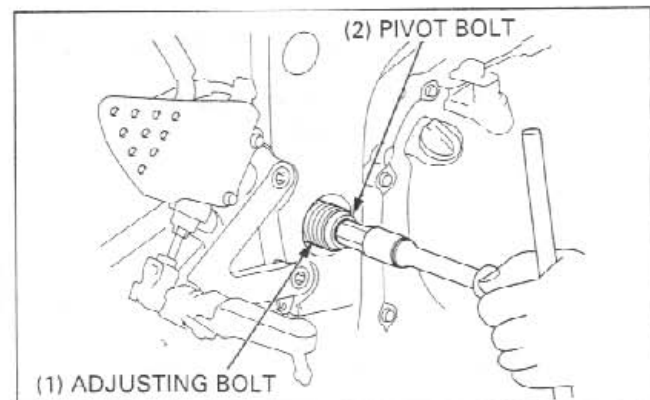


Remove the swingarm pivot lock nut while holding the pivot bolt.

**TOOL:**  
Swingarm locknut wrench      07908 - 4690003



Loosen the swingarm adjusting bolt by turning the pivot bolt.  
Remove the pivot bolt and swingarm.



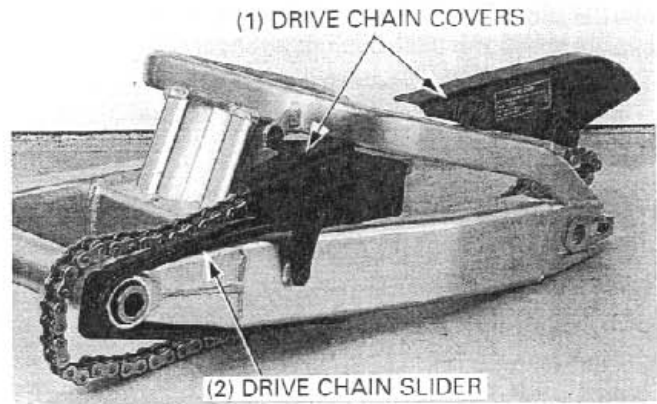
## REAR WHEEL/SUSPENSION

### DISASSEMBLY/INSPECTION

Remove the following:

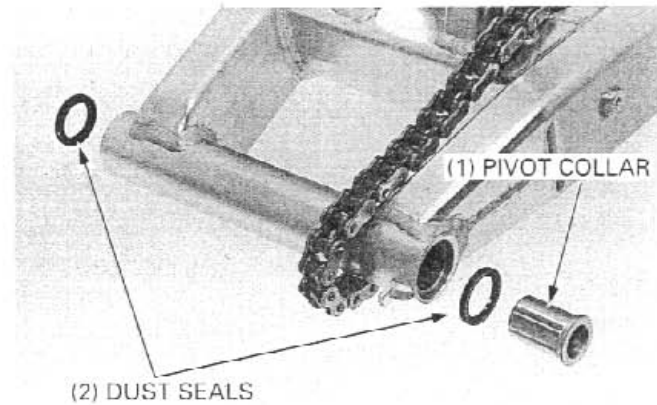
- Front drive chain cover
- Drive chain cover
- Drive chain slider
- Drive chain adjusters

Check the drive chain slider for wear or damage.



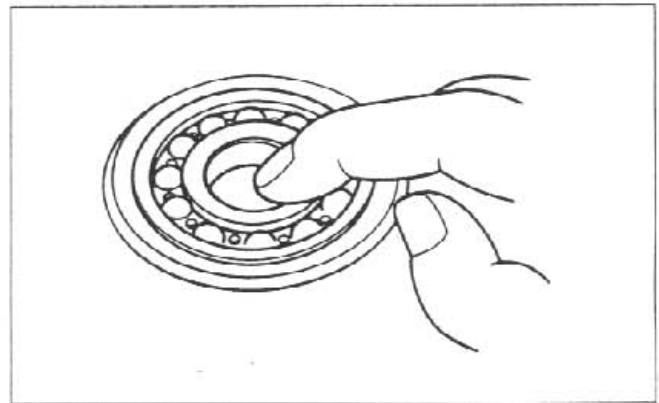
Remove the pivot collar and dust seals from the swingarm pivot.

Check the dust seals and collar for damage or fatigue.



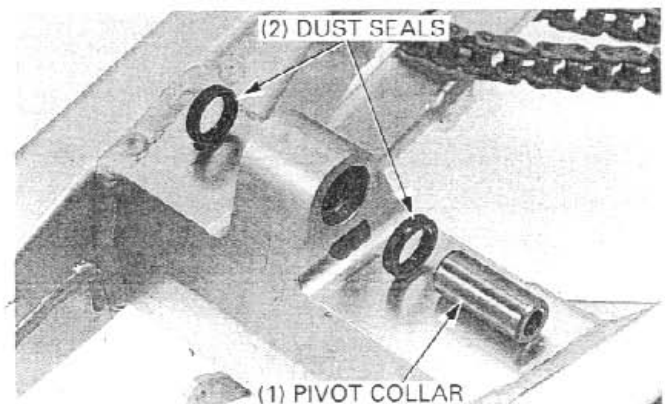
Turn the inner race of right pivot bearings with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

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



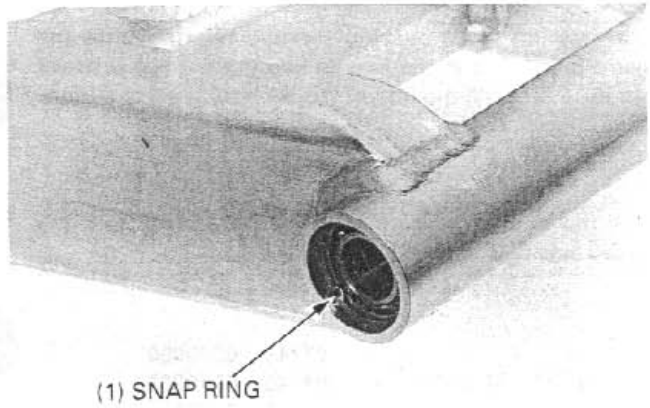
Remove the pivot collar and dust seals from the shock link pivot.

Check the dust seals and collar for damage or fatigue. Check the needle bearing for damage.



**PIVOT BEARING REPLACEMENT**

Remove the snap ring.



Remove the right pivot bearings (radial ball bearings) from the swingarm pivot using the special tools.

**TOOLS:**

**Bearing remover set**

— Remover handle

— Remover set

— Sliding weight

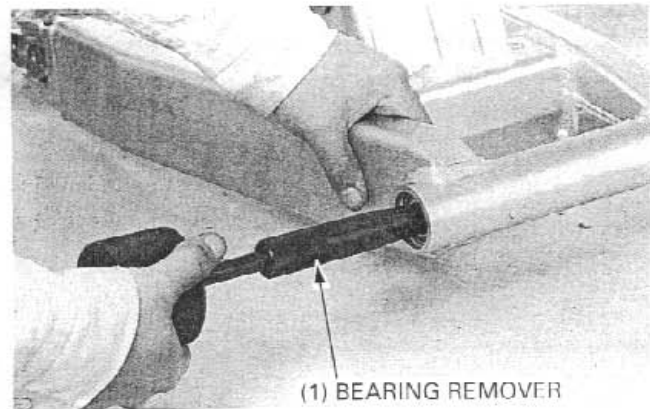
07936 - 3710001

07936 - 3710100

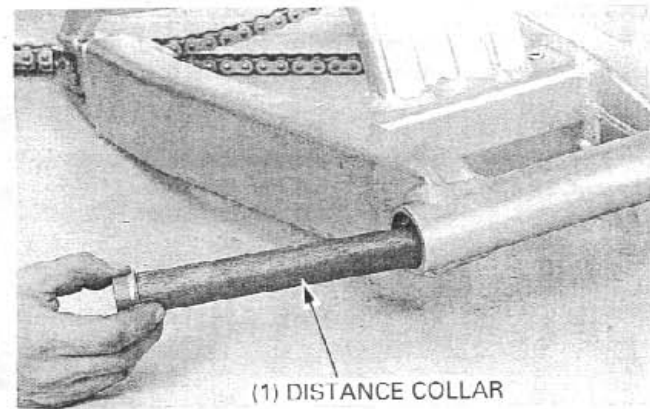
07936 - 3710600

07741 - 0010201 or

07936 - 3710200



Remove the distance collar.



Press the left pivot bearing (needle bearing) out of the swingarm pivot using the special tools.

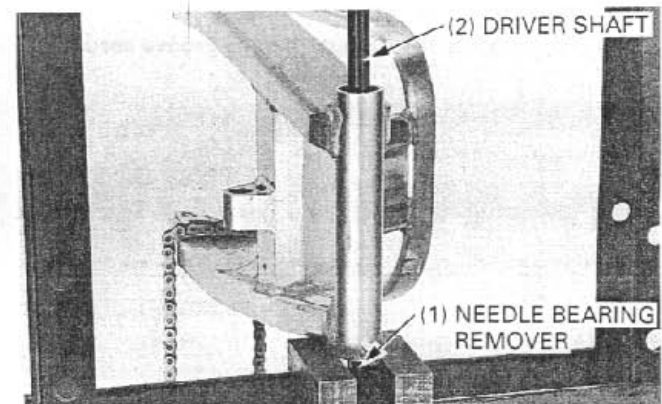
**TOOLS:**

**Needle bearing remover**

**Driver shaft**

07HMC - MR70100

07946 - MJ00100





## REAR WHEEL/SUSPENSION

Press a new left pivot bearing (needle bearing) into the swingarm pivot so that the needle bearing surface is lower 4.0 mm (0.16 in) from the end of the swingarm pivot surface using the special tools.

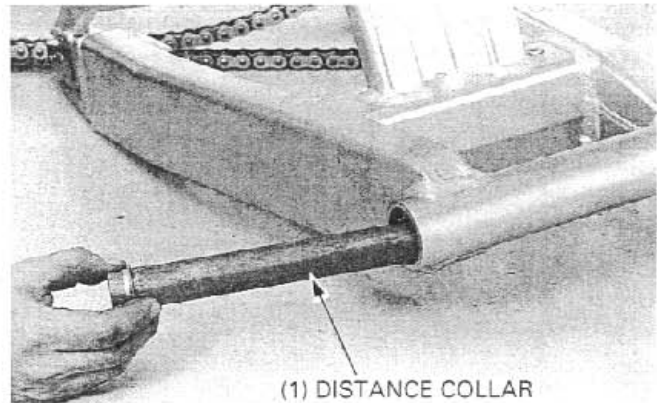
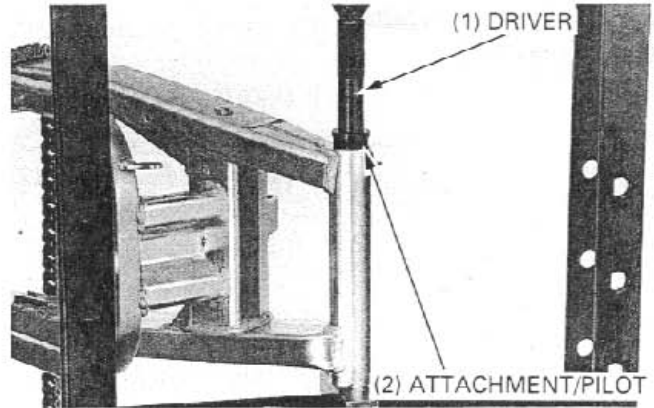
### NOTE

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

### TOOLS:

|                        |                 |
|------------------------|-----------------|
| Driver                 | 07749 - 0010000 |
| Attachment, 37 x 40 mm | 07746 - 0010200 |
| Pilot, 28 mm           | 07746 - 0041100 |

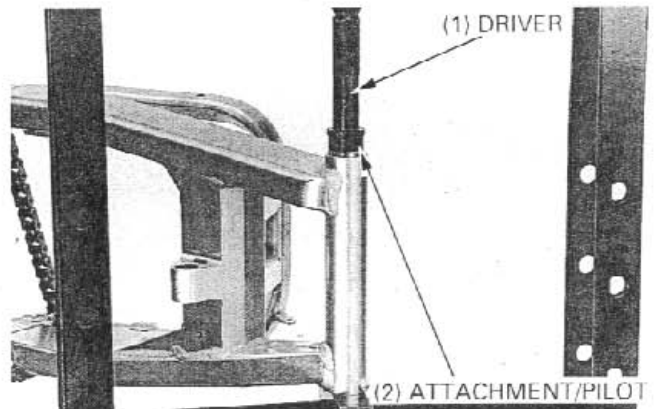
Install the distance collar.



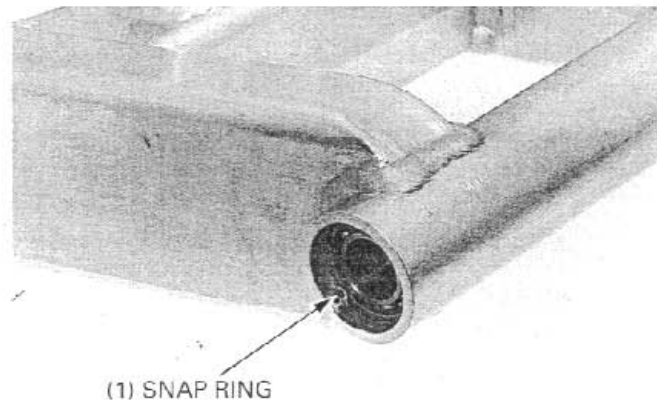
Press new right pivot bearings (radial ball bearing) into the swingarm pivot one at a time using the special tools.

### TOOLS:

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



Install the snap ring into the swingarm pivot groove securely.

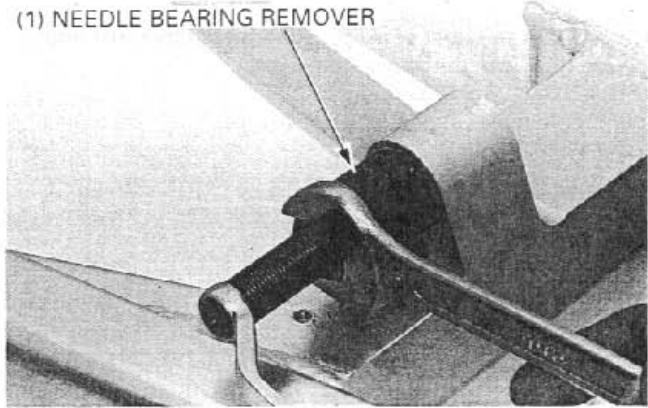


**SHOCK LINK PIVOT BEARING REPLACEMENT**

Remove the needle bearing out of the shock link using special tool.

**TOOL:**

Needle bearing remover 07LMC - KV30100



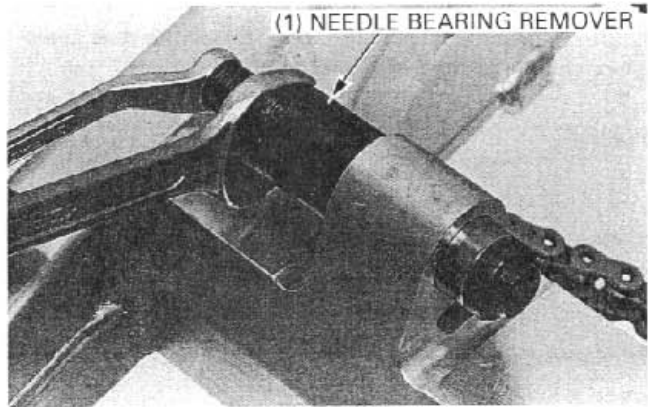
Pack a new needle bearing with multi-purpose grease. Install a new needle bearing into the shock link so that the needle bearing surface is lower 5.5 - 6.0 mm (0.22 - 0.24 in) from the end of the shock link surface.

**NOTE**

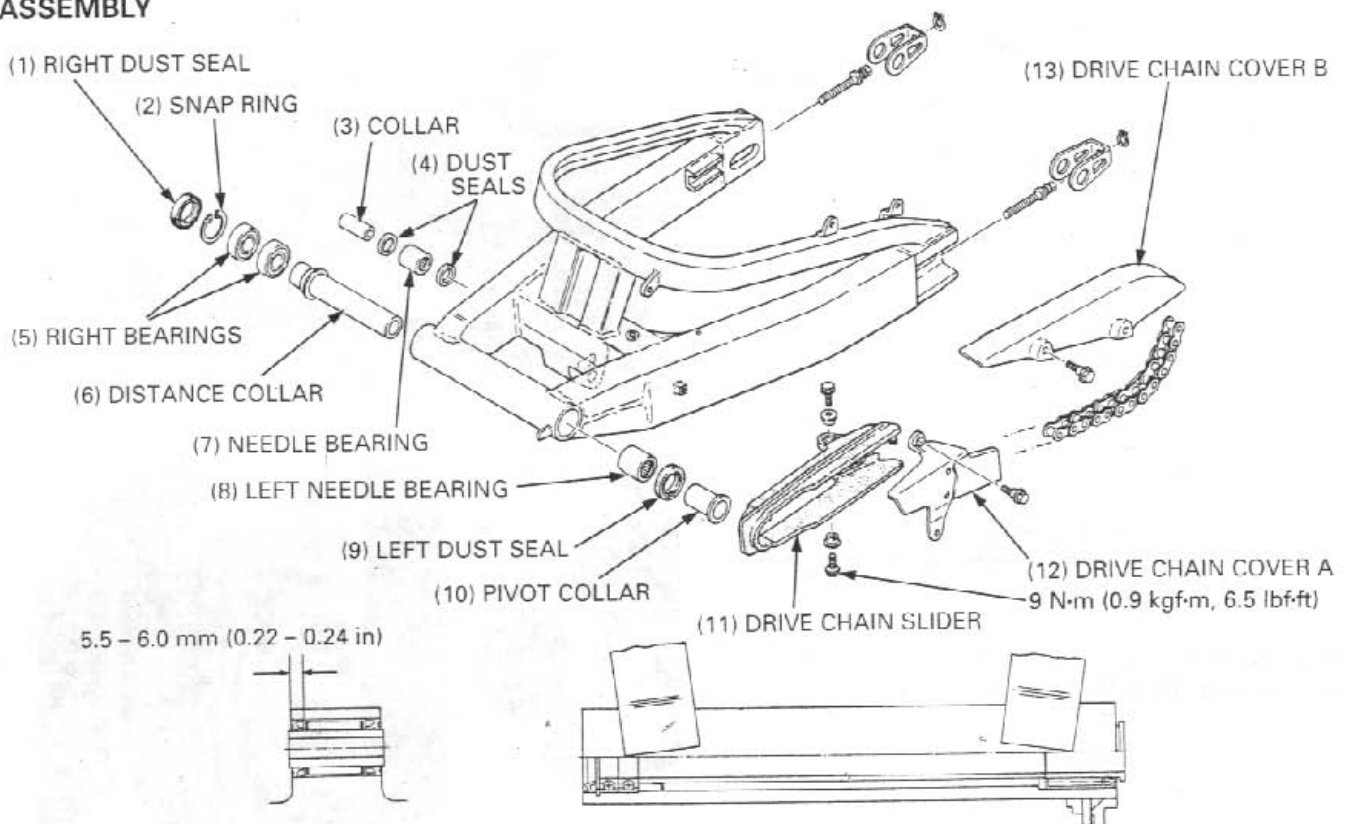
- Press the needle bearing into the shock link with the marked side facing out.

**TOOL:**

Needle bearing remover 07LMC - KV30100

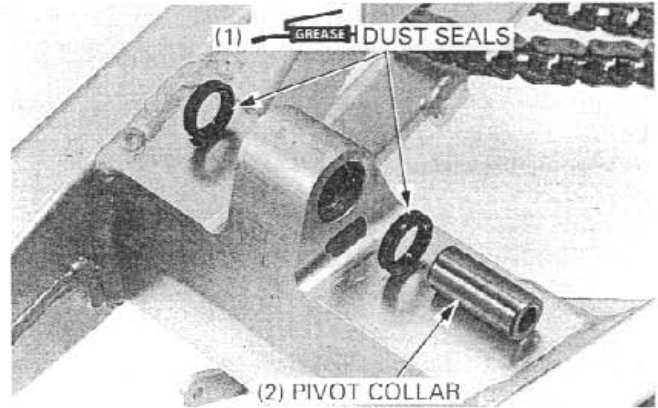


**ASSEMBLY**

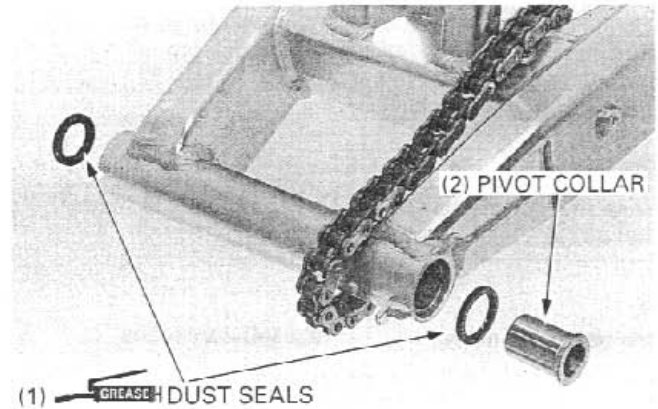


## REAR WHEEL/SUSPENSION

Apply grease to the dust seal lips, then install the dust seals and pivot collar into the shock link pivot.



Apply grease to the dust seal lips, then install the dust seals and pivot collar into the swingarm pivot.



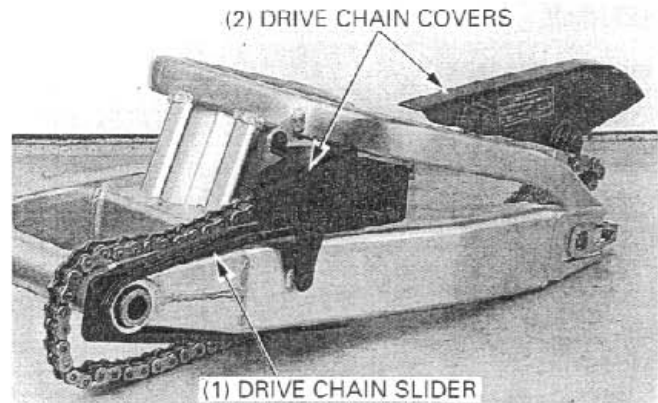
Install the drive chain slider.  
Apply a locking agent to the drive chain slider bolt threads.  
Install the collars and bolts, then tighten the bolts to the specified torque.

**TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)**

Install the following:

- Drive chain adjusters
- Drive chain cover
- Front drive chain cover

Install the drive chain (page 3-19).

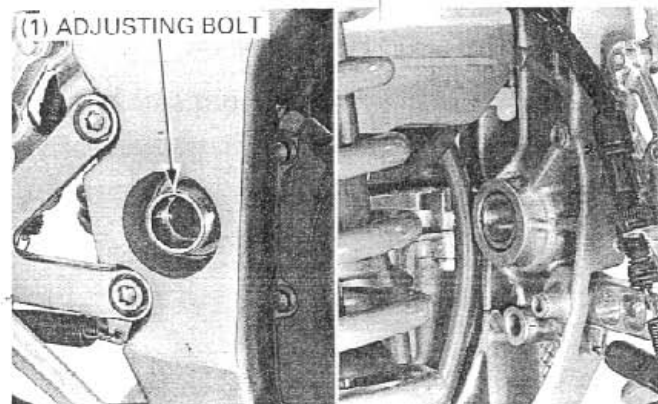


## INSTALLATION

Install the swingarm adjusting bolt.  
Be sure that the tip of the bolt does not protrude inward.

### NOTE

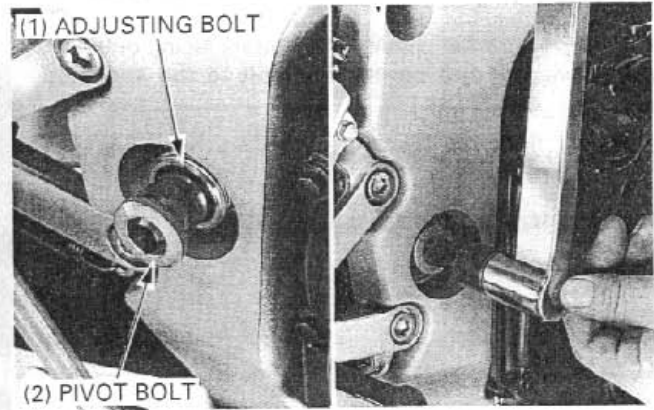
- If the end of the adjusting bolt does protrude, it will not be possible to install the swingarm.



Apply thin coat of grease to the swingarm pivot bolt surface. Install the swingarm and pivot bolt.

Turn the swingarm pivot adjusting bolt completely in by hand. Push the pivot bolt's hex shank into the adjusting bolt's socket head. Tighten the swingarm pivot adjusting bolt with the pivot bolt.

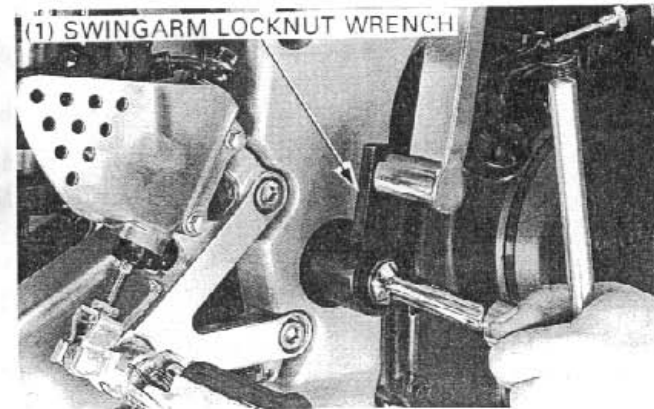
**TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)**



Install and tighten the swingarm pivot adjusting bolt lock nut fully by hand, then tighten the lock nut to the specified torque while holding the pivot bolt using the special tool.

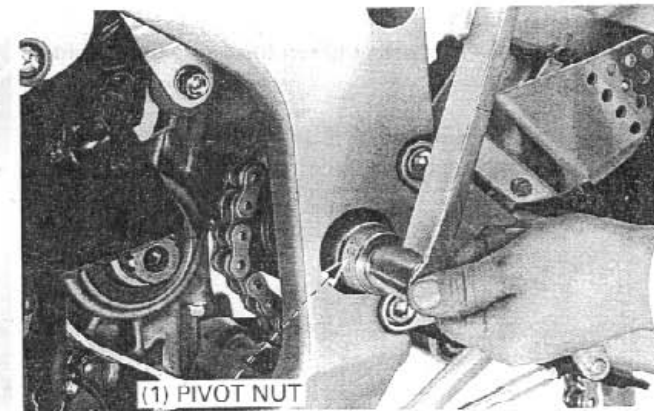
**TOOL:**  
 Swingarm locknut wrench      07908 - 4690003

**TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)**



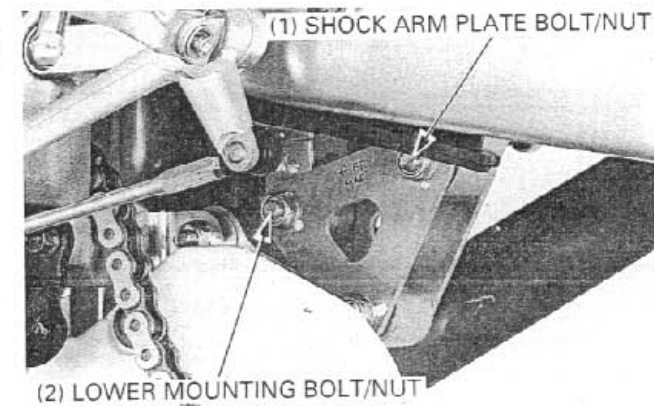
Tighten the swingarm pivot nut to the specified torque.

**TORQUE: 93 N·m (9.5 kgf·m, 69 lbf·ft)**



Install and tighten the shock arm plate bolt/nut (swingarm side) and sock absorber lower mounting bolt/nut to the specified torque.

**TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)**

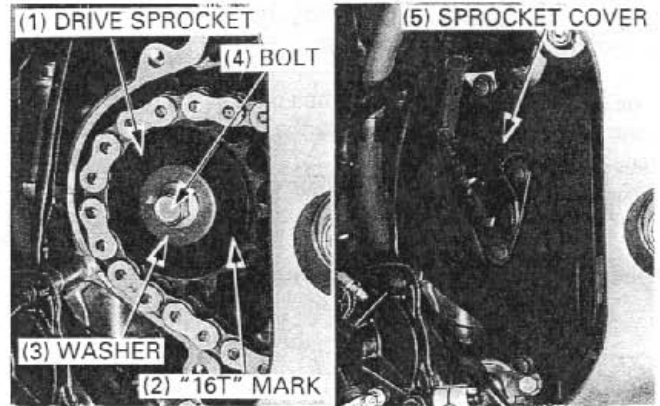


## REAR WHEEL/SUSPENSION

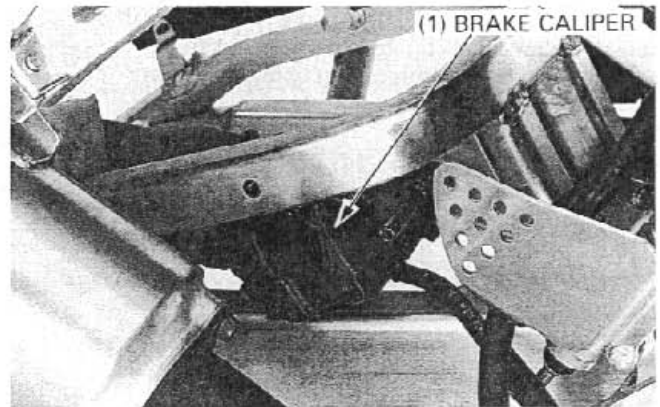
Install the drive sprocket with its "16T" mark facing outward. Install the washer and tighten the bolt to the specified torque.

**TORQUE: 54 N-m (5.5 kgf-m, 40 lbf-ft)**

Install the guide plate and drive sprocket cover and tighten the SH bolts.

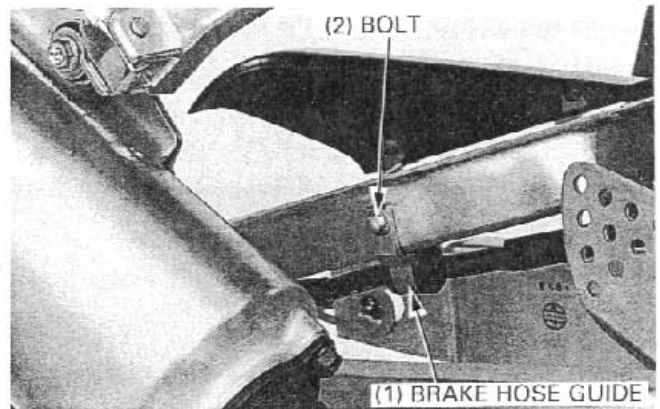


Install the brake caliper into the swingarm as shown.



Route the brake hose properly, tighten the brake hose guide bolt.

Install the rear brake pads (page 15-6).  
Install the rear wheel (page 14-8).

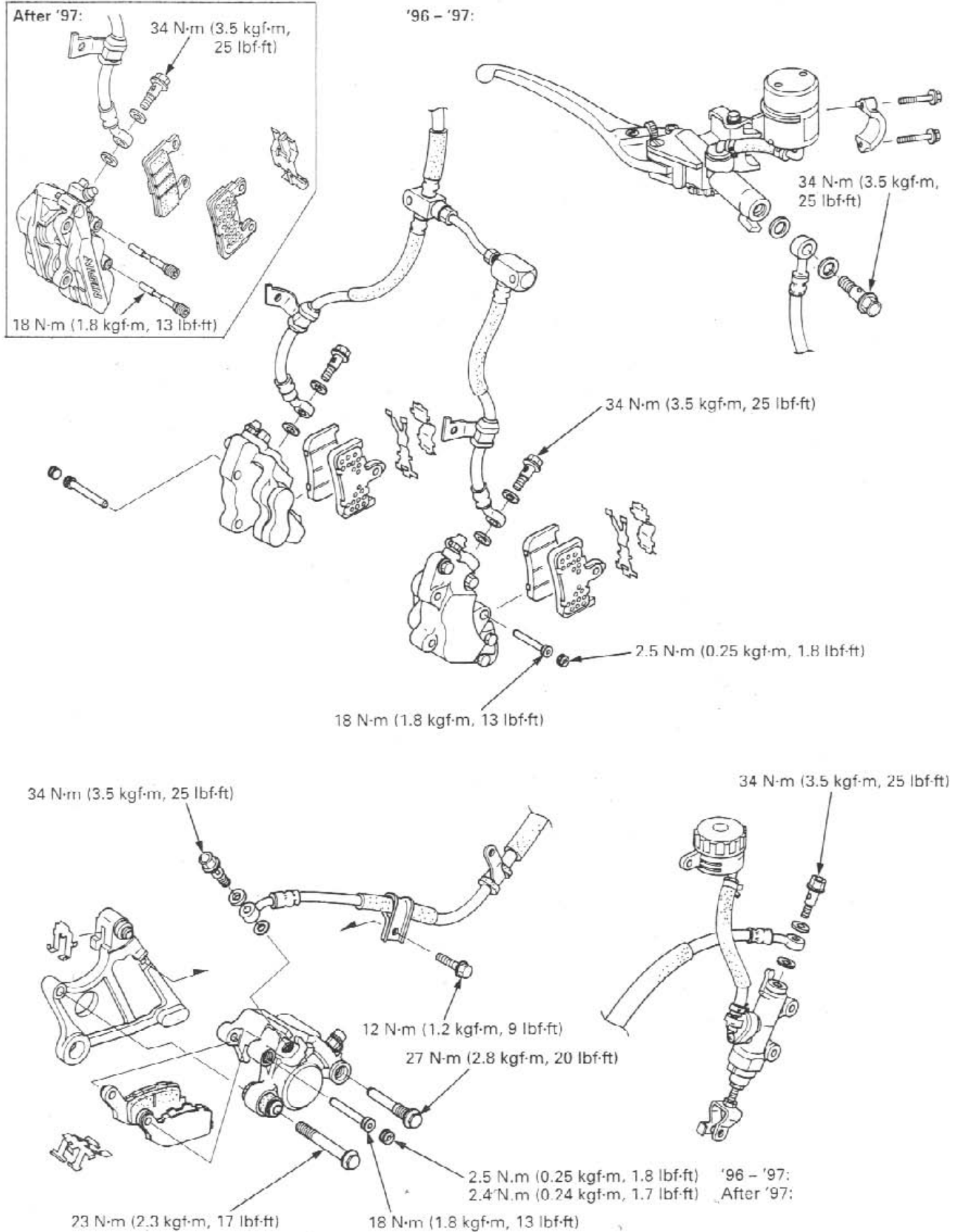


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MEMO

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# HYDRAULIC BRAKE



|  |       |                      |       |
|--|-------|----------------------|-------|
| SERVICE INFORMATION                      | 15-1  | REAR MASTER CYLINDER | 15-14 |
| TROUBLESHOOTING                          | 15-2  | FRONT BRAKE CALIPER  | 15-18 |
| BRAKE FLUID REPLACEMENT/<br>AIR BLEEDING | 15-3  | REAR BRAKE CALIPER   | 15-26 |
| BRAKE PAD/DISC                           | 15-5  | BRAKE PEDAL          | 15-29 |
| FRONT MASTER CYLINDER                    | 15-10 |                      |       |

## SERVICE INFORMATION

### GENERAL

#### ⚠ 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.
- Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the front reservoir is horizontal first.
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels 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 they may not be compatible.
- Always check brake operation before riding the motorcycle.

### SPECIFICATIONS

| ITEM       |                       | STANDARD                          | SERVICE LIMIT                     |                                   |
|------------|-----------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Front      | Specified brake fluid | DOT 4                             | —                                 |                                   |
|            | Brake disc thickness  | 4.5 (0.18)                        | 3.5 (0.14)                        |                                   |
|            | Brake disc runout     | —                                 | 0.30 (0.012)                      |                                   |
|            | Master cylinder I.D.  | '96 - '97:                        | 14.000 - 14.043 (0.5512 - 0.5529) | 14.055 (0.5533)                   |
|            |                       | After '97:                        | 15.870 - 15.913 (0.6248 - 0.6265) | 15.925 (0.627)                    |
|            | Master piston O.D.    | '96 - '97:                        | 13.957 - 13.984 (0.5495 - 0.5506) | 13.945 (0.5490)                   |
|            |                       | After '97:                        | 15.827 - 15.854 (0.6231 - 0.6242) | 15.815 (0.623)                    |
|            | Caliper cylinder I.D. | A                                 | '96 - '97:                        | 30.230 - 30.280 (1.1902 - 1.1921) |
|            |                       |                                   | After '97:                        | 32.03 - 32.08 (1.261 - 1.263)     |
|            |                       | B                                 | '96 - '97:                        | 27.000 - 27.050 (1.0630 - 1.0650) |
|            |                       |                                   | After '97:                        | 33.96 - 34.01 (1.337 - 1.339)     |
|            | Caliper piston O.D.   | A                                 | '96 - '97:                        | 30.148 - 30.198 (1.1869 - 1.1889) |
|            |                       |                                   | After '97:                        | 31.965 - 31.998 (1.2585 - 1.2598) |
|            |                       | B                                 | '96 - '97:                        | 26.935 - 26.968 (1.0604 - 1.0617) |
| After '97: |                       |                                   | 33.895 - 33.928 (1.3344 - 1.3357) |                                   |
| Rear       | Specified brake fluid | DOT 4                             | —                                 |                                   |
|            | Brake disc thickness  | 5.0 (0.20)                        | 4.0 (0.16)                        |                                   |
|            | Brake disc runout     | —                                 | 0.30 (0.012)                      |                                   |
|            | Master cylinder I.D.  | 15.870 - 15.913 (0.6248 - 0.6265) | 15.925 (0.6270)                   |                                   |
|            | Master piston O.D.    | 15.827 - 15.854 (0.6231 - 0.6242) | 15.815 (0.6226)                   |                                   |
|            | Caliper cylinder I.D. | 38.18 - 38.23 (1.503 - 1.505)     | 38.24 (1.506)                     |                                   |
|            | Caliper piston O.D.   | 38.115 - 38.148 (1.5006 - 1.5019) | 38.107 (1.5003)                   |                                   |



## HYDRAULIC BRAKE

### TORQUE VALUES

|  |  |                                       |
|--|--|---------------------------------------|
| Front brake caliper mounting bolt      | 30 N·m (3.1 kgf·m, 22 lbf·ft)  | ALOC bolt: replace with a new one.    |
| Front brake pipe mounting bolt         | 17 N·m (1.7 kgf·m, 12 lbf·ft)  |                                       |
| Front brake caliper assembly torx bolt | '96 - '97: 32 N·m (3.3 kgf·m, 24 lbf·ft)<br>After '97: 23 N·m (2.3 kgf·m, 17 lbf·ft)       | Apply a locking agent to the threads. |
| Front oil cup mounting nut             | 6 N·m (0.6 kgf·m, 4.3 lbf·ft)  | ALOC bolt: replace with a new one.    |
| Brake lever pivot bolt                 | 1 N·m (0.1 kgf·m, 0.7 lbf·ft)  |                                       |
| Brake lever pivot nut                  | 6 N·m (0.6 kgf·m, 4.3 lbf·ft)  |                                       |
| Brake hose oil bolt                    | 34 N·m (3.5 kgf·m, 25 lbf·ft)  |                                       |
| Pad pin                                | 18 N·m (1.8 kgf·m, 13 lbf·ft)  |                                       |
| Pad pin plug                           | '96 - '97: 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)<br>After '97: 2.4 N·m (0.24 kgf·m, 1.7 lbf·ft) |                                       |
| Brake caliper bleeder                  | 6 N·m (0.6 kgf·m, 4.3 lbf·ft)  |                                       |
| Rear brake hose guide bolt             | 12 N·m (1.2 kgf·m, 9 lbf·ft)   |                                       |
| Rear master cylinder joint nut         | 18 N·m (1.8 kgf·m, 13 lbf·ft)  |                                       |
| Rear master cylinder hose joint screw  | 1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)   |                                       |
| Rear brake caliper pin bolt            | 27 N·m (2.8 kgf·m, 20 lbf·ft)  |                                       |
| Rear brake caliper bolt                | '96 - '97: 23 N·m (2.3 kgf·m, 17 lbf·ft)<br>After '97: 22 N·m (2.2 kgf·m, 16 lbf·ft)       |                                       |
| Rear caliper clamp bolt                | 9 N·m (0.9 kgf·m, 6.5 lbf·ft)  | ALOC bolt: replace with a new one.    |
| Step holder mounting bolt              | 26 N·m (2.7 kgf·m, 20 lbf·ft)  |                                       |
| Footpeg mounting bolt                  | 44 N·m (4.5 kgf·m, 33 lbf·ft)  | ALOC bolt: replace with a new one.    |

### TOOL

|                  |                 |   |
|------------------|-----------------|---|
| Snap ring pliers | 07914 - SA50001 | or 07914 - 3230001<br>Not available in U.S.A. |
|------------------|-----------------|---|

## TROUBLESHOOTING

#### Brake lever/pedal soft or spongy

- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master cylinder piston cups
- Worn brake pad/disc
- Contaminated caliper
- Caliper not sliding properly (rear)
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Contaminated master cylinder
- Bent brake lever/pedal

#### Brake lever/pedal hard

- 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

#### Brake grab or pull to one side

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

#### Brake drag

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

## BRAKE FLUID REPLACEMENT/AIR BLEEDING

### ▲ 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.

### CAUTION

- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

## BRAKE FLUID DRAINING

For the front brake, turn the handlebar to the left until the reservoir is parallel to the ground, before removing the reservoir cap.

For the rear brake, remove the reservoir cap.

Connect a bleed hose to the caliper bleed valve. Loosen the bleed valve and pump the brake lever or pedal. Stop pumping the lever when no more fluid flows out of the bleed valve.

## BRAKE FLUID FILLING

Fill the reservoir with DOT 4 brake fluid from a sealed container.

### CAUTION

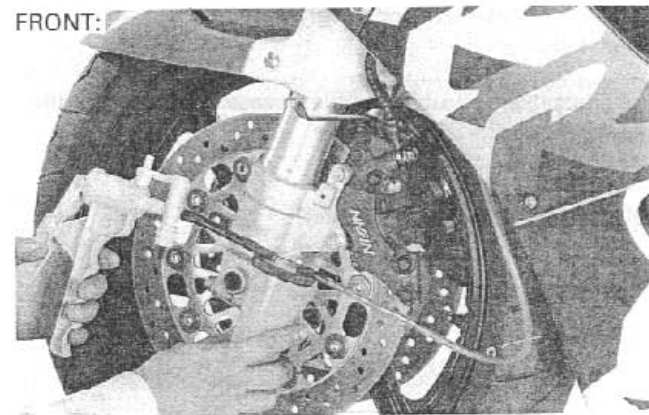
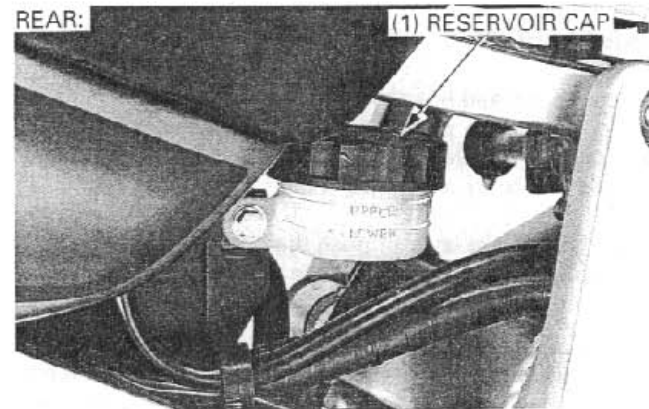
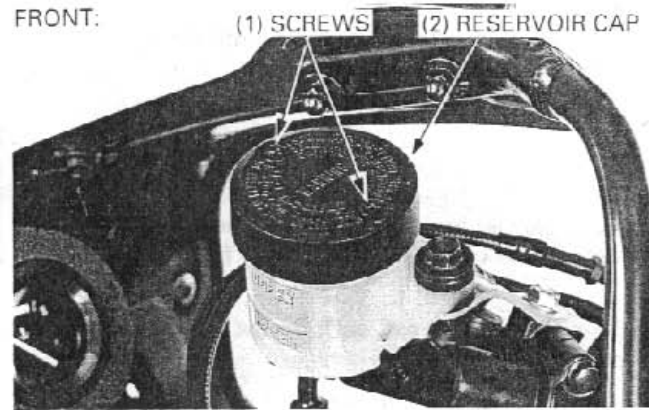
- Use only DOT 4 brake fluid from a sealed container.
- Do not mix different types of fluid. There are not compatible.

Connect a commercially available brake bleeder to the bleed valve.

Pump the brake bleeder and loosen the bleed valve, adding fluid when the fluid level in the master cylinder reservoir is low.

### NOTE

- Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.



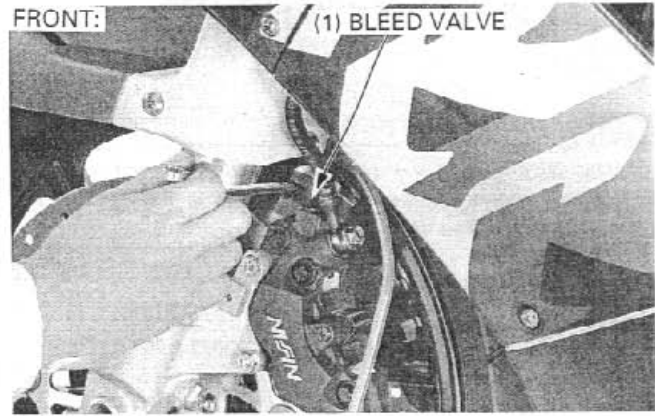
## HYDRAULIC BRAKE

Repeat the previous step procedures until air bubbles do not appear in the plastic hose.

### NOTE

- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.
- If a brake bleeder is not available, fill the master cylinder and operate the brake lever or pedal to fill the system.

Close the bleed valve. Next, perform the available BLEEDING procedure.



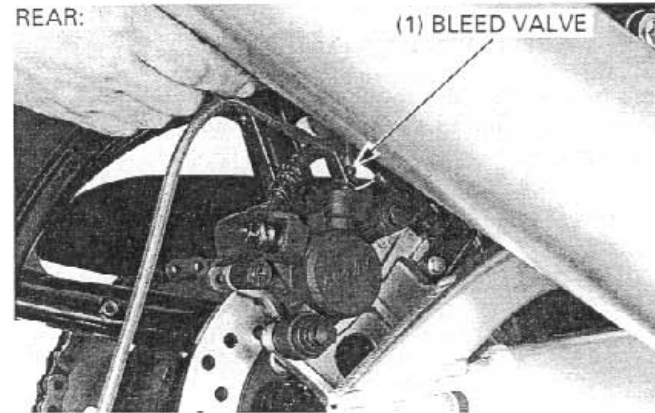
## BRAKE BLEEDING

Connect a clear bleed hose to the bleed valve. Pump up the system pressure with the lever or pedal until there are no air bubbles in the fluid flowing out of the master cylinder and lever resistance is felt.

1. Squeeze the brake lever or push the brake pedal, open the bleed valve 1/2 turn and then close the valve.

### NOTE

- Do not release the brake lever or pedal until the bleed valve has been closed.



2. Release the brake lever or pedal until the bleed valve has been closed.

Repeat steps 1 and 2 until bubbles cease to appear in the fluid coming out of the bleed valve.

Tighten the bleed valve.

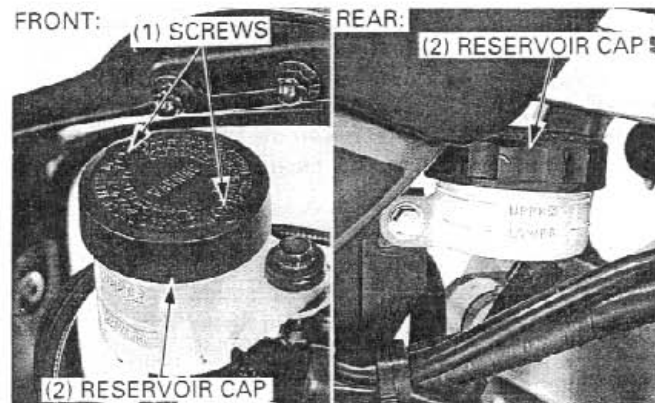
**TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)**

Fill the fluid reservoir to the upper level.

Reinstall the diaphragm and diaphragm plate.

On the front brake, install the reservoir cap, and tighten the screws.

On the rear brake, install the reservoir cap securely.



## BRAKE PAD/DISC

### FRONT BRAKE PAD REPLACEMENT

'96 - '97:

#### ▲ WARNING

- After the brake pad replacement, check the brake operation by applying the brake lever.

#### NOTE

- Always replace the brake pads in pairs to assure even disc pressure.

Remove the bolt and reflector (page 15-18).

Remove the brake pad cover.

Remove the pad pin plug and loosen the pad pin.

Remove the bolts and brake caliper.

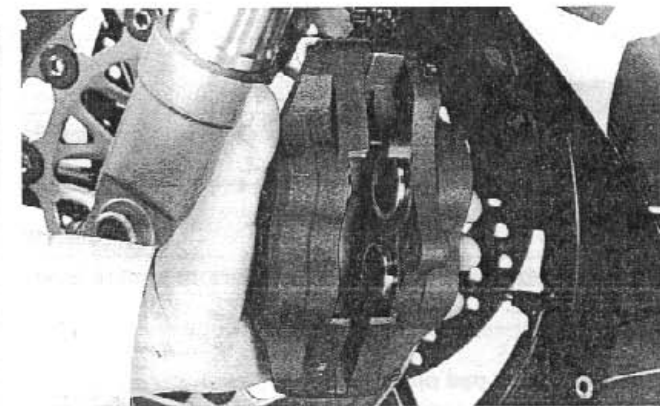
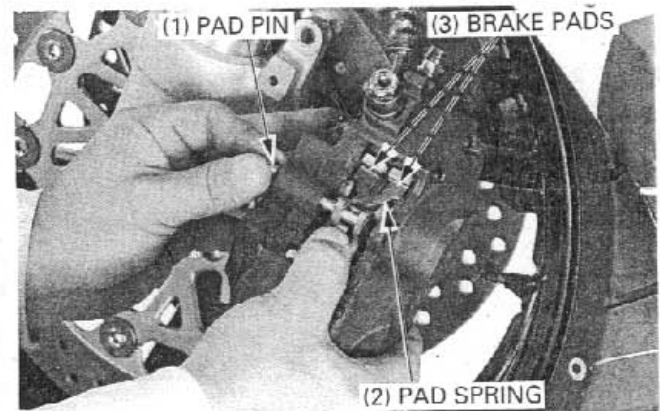
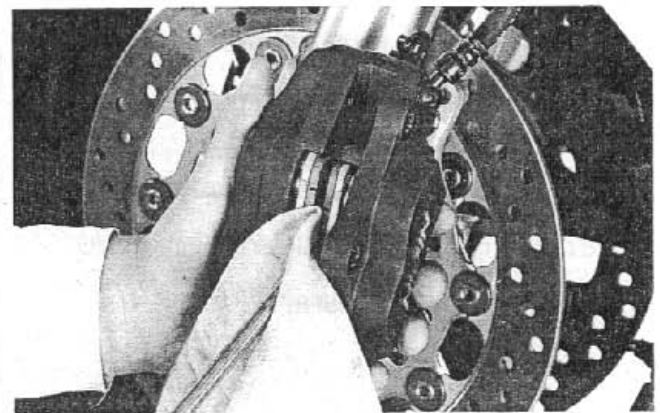
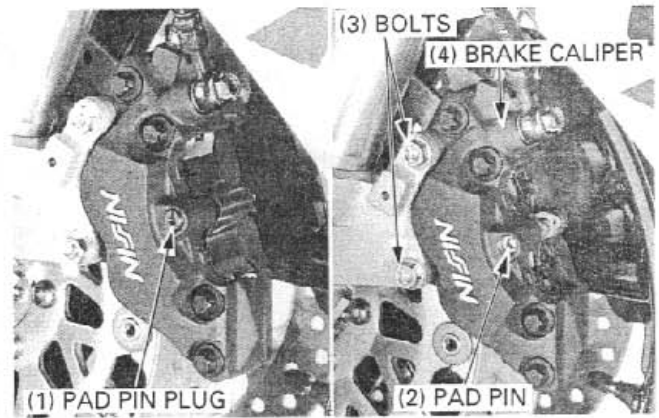
Push the caliper pistons all the way in to allow installation of new brake pads.

#### NOTE

- Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.

Remove the pad pin, pad spring and brake pads.

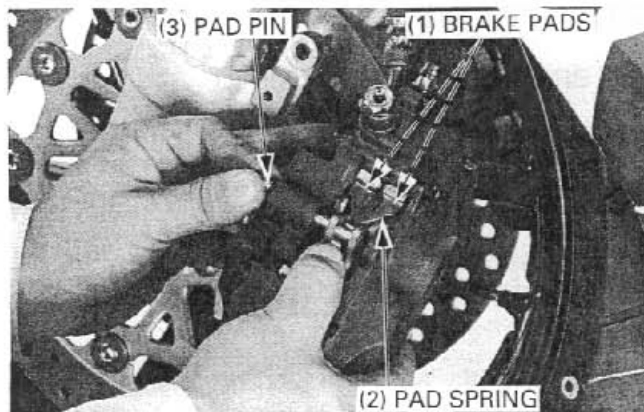
Clean the inside of the caliper especially around the caliper pistons.



## HYDRAULIC BRAKE

Install the new brake pads.  
Install the pad spring aligning its tabs with the grooves in the caliper as shown.

Push the pad spring, then install the pad pin.



Install the brake caliper to the fork leg so the disc is positioned between the pads.

### CAUTION

- Be careful not to damage the pads.

Install and tighten the new brake caliper mounting bolts.

**TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)**

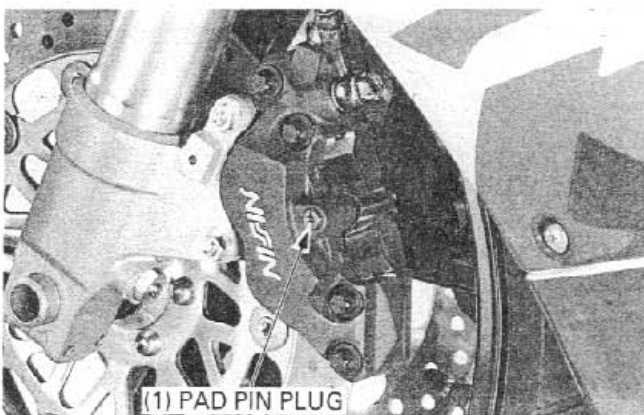
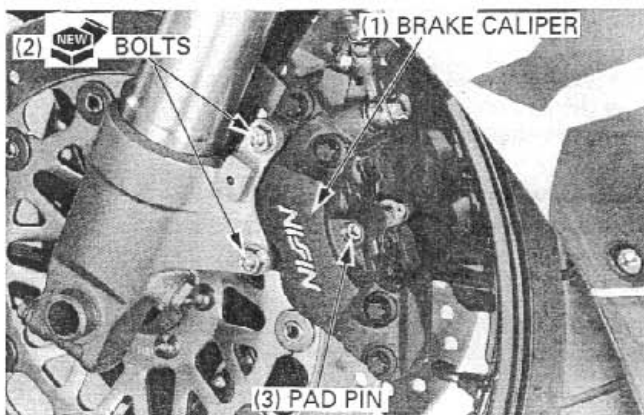
Tighten the pad pin.

**TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)**

Install and tighten the pad pin plug.

**TORQUE: 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)**

Install the reflector (page 15-22).



**After '97:**

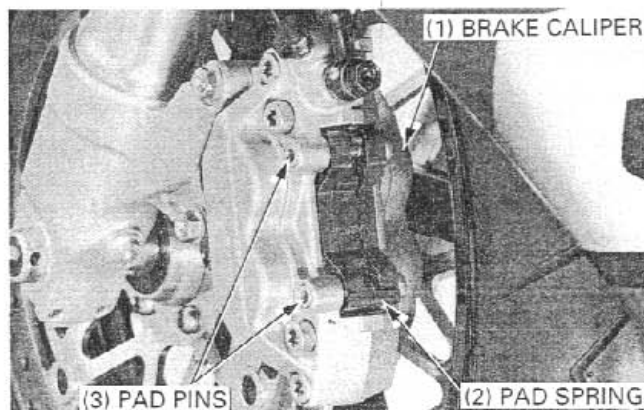
### WARNING

- After the brake pad replacement, check the brake operation by applying the brake lever.

### NOTE

- Always replace the brake pads in pairs to assure even disc pressure.

Remove the brake pad pins.  
Remove the pad pin spring.

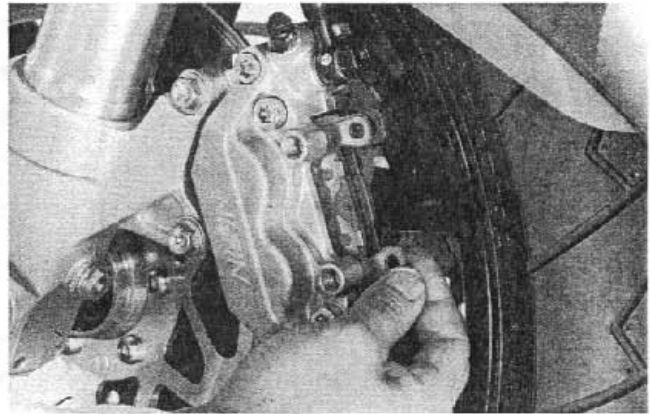


Push the caliper pistons all the way in to allow installation of new brake pads.

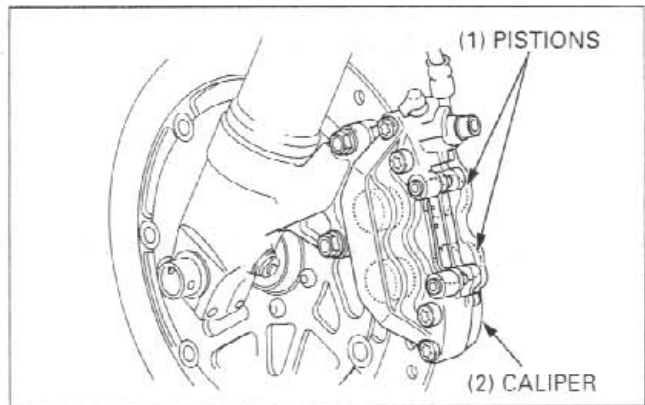
**NOTE**

- Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.

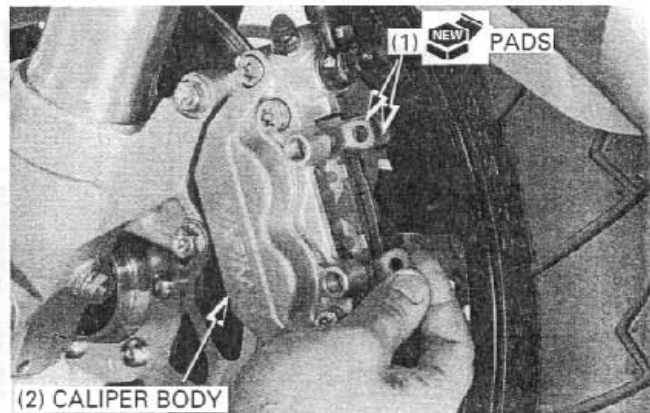
Remove the brake pads.



Clean the inside of the caliper especially around the caliper pistons.



Install the new brake pads.



Install the pad spring aligning its tabs with the groove in the caliper and install the lower pad pin as shown.

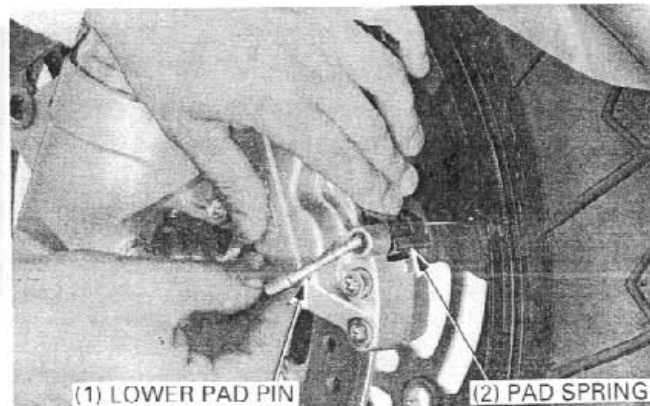
Then install the upper pad pin by pushing the pad spring tab to facilitate installation of it.

**CAUTION**

- Be sure to install the pad spring so that the "UP" mark on it faces upward.

**NOTE**

- Be sure to install the lower pad pin before installing the upper pad pin.



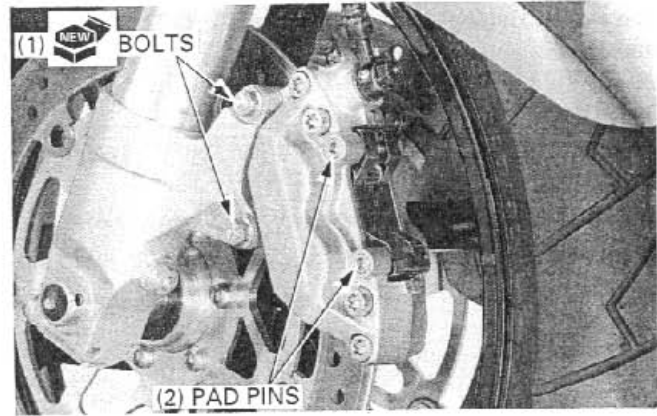
## HYDRAULIC BRAKE

Tighten the new brake caliper mounting bolts

**TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)**

Tighten the pad pins.

**TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)**



## REAR BRAKE PAD REPLACEMENT

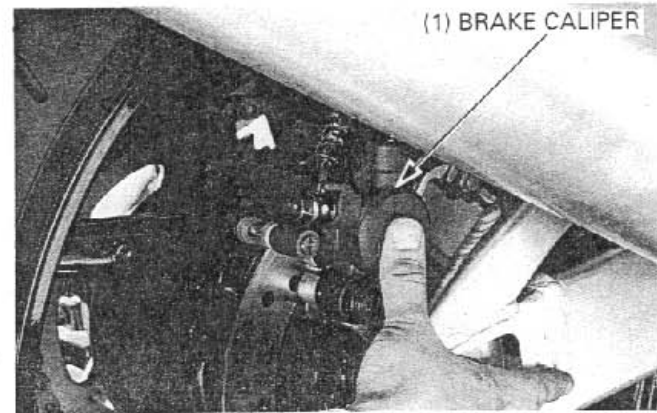
### NOTE

- Always replace the brake pads in pairs to assure even disc pressure.

Push the caliper pistons all the way in by pushing the caliper body inward to allow installation of new brake pads.

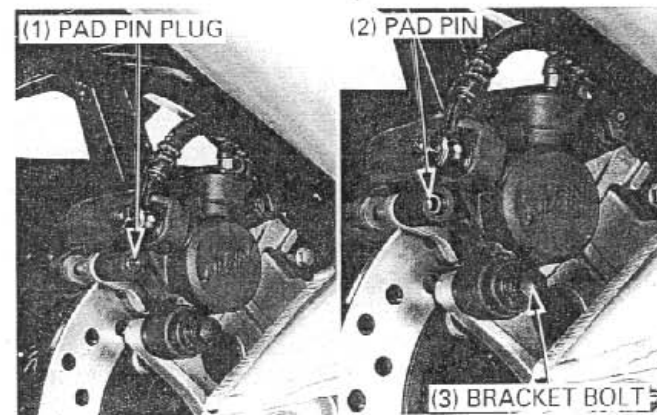
### NOTE

- Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.

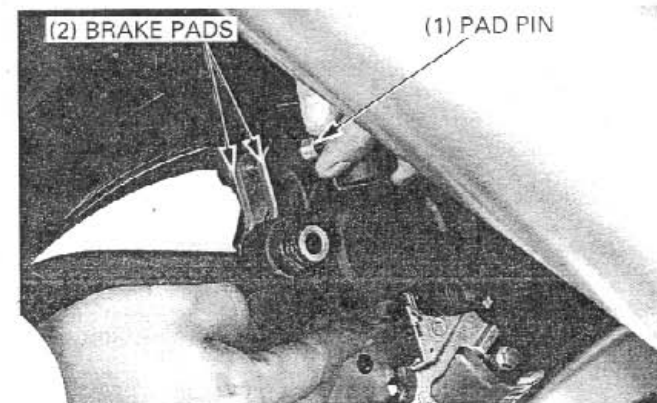


Remove the pad pin plug and loosen the pad pin.

Remove the caliper bracket bolt.

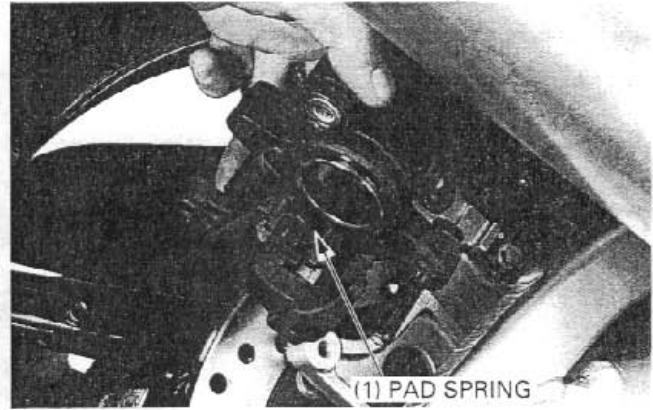


Pivot the caliper up.  
Remove the pad pin and brake pads.



Make sure the brake pad spring is in place.  
Install the new brake pads.

Lower the caliper while pushing the pads against the pad spring so that the pad ends are positioned onto the retainer on the caliper bracket.



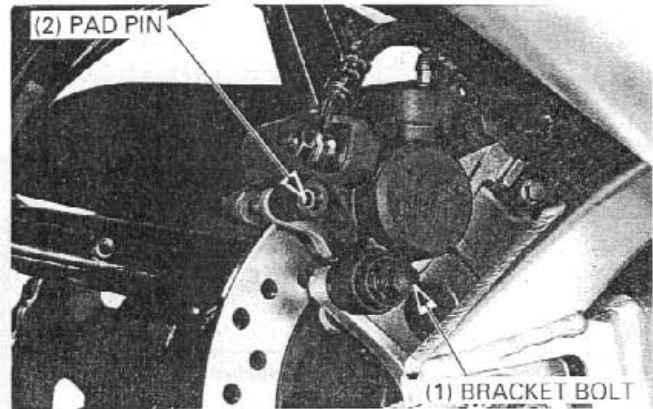
Install and tighten the caliper bracket bolt.

**TORQUE:**

|            |                               |
|------------|-------------------------------|
| '96 - '97: | 23 N·m (2.3 kgf·m, 17 lbf·ft) |
| After '97: | 22 N·m (2.2 kgf·m, 16 lbf·ft) |

Tighten the pad pin.

**TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)**



Install and tighten the pad pin plug.

**TORQUE:**

|            |                                  |
|------------|----------------------------------|
| '96 - '97: | 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft) |
| After '97: | 2.4 N·m (0.24 kgf·m, 1.7 lbf·ft) |



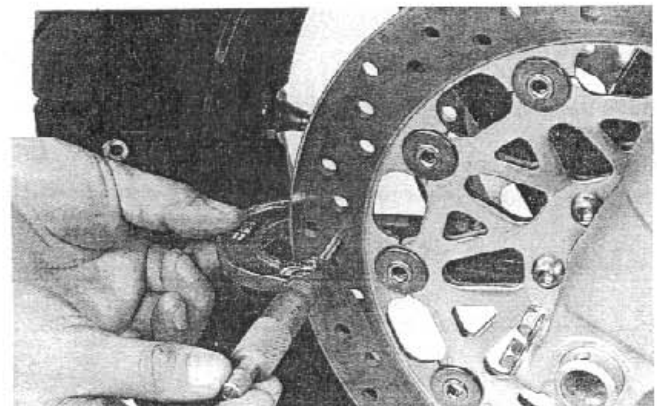
**BRAKE DISC INSPECTION**

Visually inspect the brake disc for damage or cracks.

Measure the brake disc thickness with a micrometer.

**SERVICE LIMITS: FRONT: 3.5 mm (0.14 in)**  
**REAR: 4.0 mm (0.16 in)**

Replace the brake disc if the smallest measurement is less than the service limit.





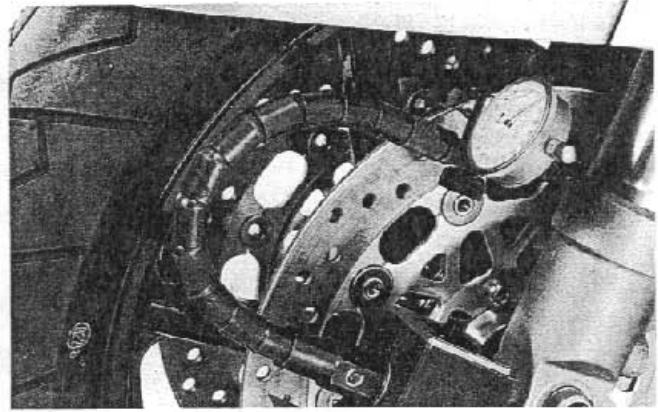
## HYDRAULIC BRAKE

Measure the brake disc warpage with a dial indicator.

**SERVICE LIMIT: 0.30 mm (0.012 in)**

Check the wheel bearings for excessive play, if the warpage exceeds the service limit.

Replace the brake disc if the wheel bearings are normal.



## FRONT MASTER CYLINDER

### REMOVAL

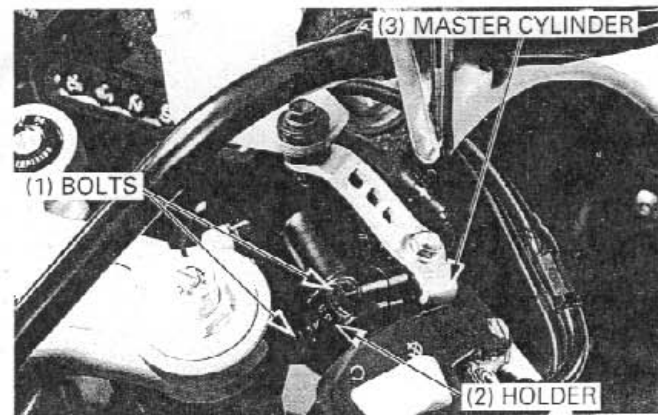
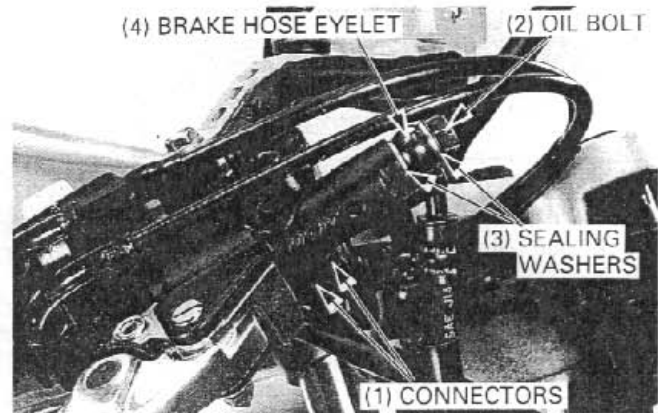
Drain the front hydraulic system (page 15-3).

Disconnect the brake light switch wire connectors. Remove the brake hose oil bolt, sealing washers and brake hose eyelet.

### CAUTION

- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

Remove the bolts from the master cylinder holder and remove the master cylinder assembly.

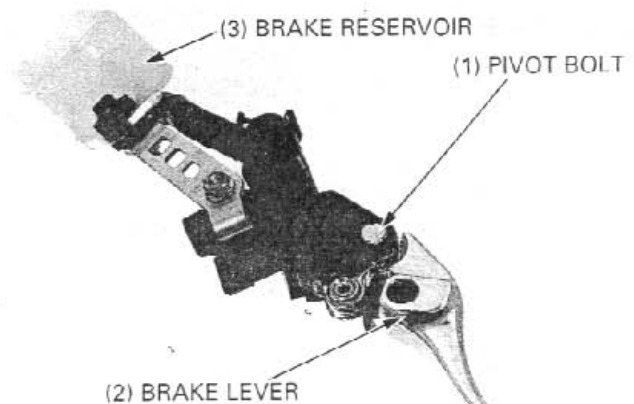


### DISASSEMBLY

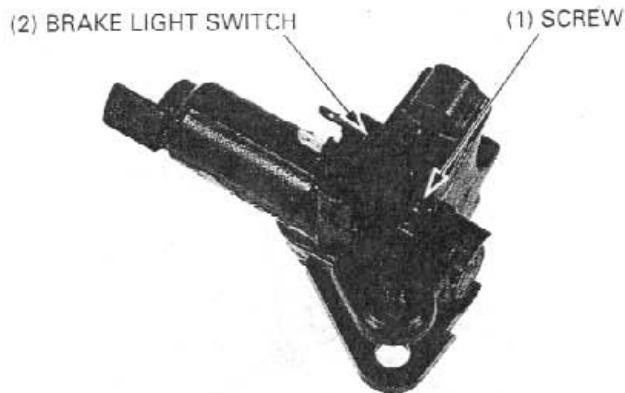
Remove the pivot bolt/nut and brake lever assembly.

Remove the dust cover and snap ring.

Remove the bolt and brake reservoir from the master cylinder.



Remove the screw and brake light switch.



Remove the boot.

Remove the snap ring from the master cylinder body using the special tool as shown.

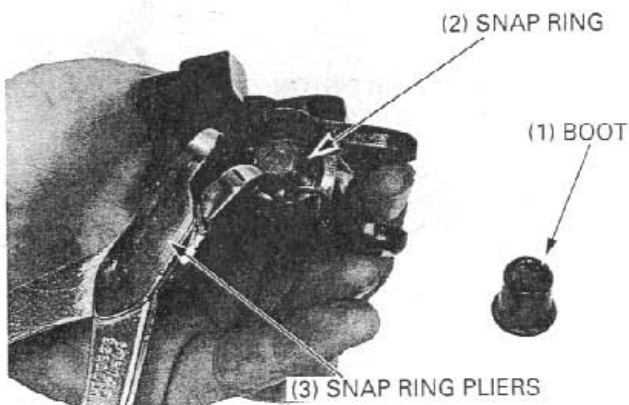
**TOOL:**

Snap ring pliers

07914 - SA50001 or  
07914 - 3230001

Remove the master piston and spring.

Clean the inside of the cylinder and reservoir with brake fluid.



**INSPECTION**

Check the piston boot, primary cup and secondary cup for fatigue or damage.

Check the master cylinder and piston for abnormal scratches. Measure the master cylinder I.D.

**SERVICE LIMIT:**

|            |                       |
|------------|-----------------------|
| '96 - '97: | 14.055 mm (0.5533 in) |
| After '97: | 15.925 mm (0.627 in)  |

Measure the master cylinder piston O.D.

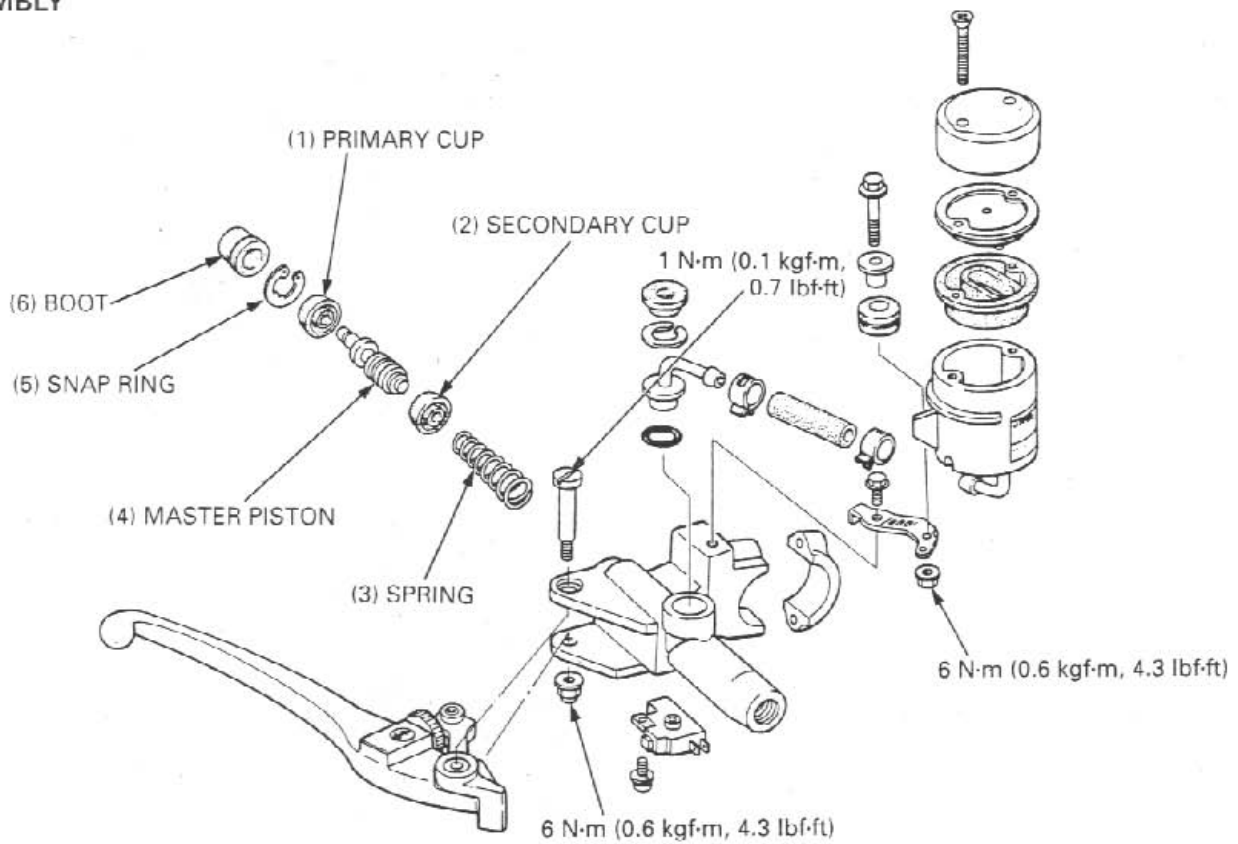
**SERVICE LIMIT:**

|            |                       |
|------------|-----------------------|
| '96 - '97: | 13.945 mm (0.5490 in) |
| After '97: | 15.815 mm (0.623 in)  |



# HYDRAULIC BRAKE

## ASSEMBLY



### CAUTION

- *Keep the piston, cups, spring, snap ring and boot as a set; do not substitute individual parts.*

Coat all parts with clean brake fluid before assembly. Dip the piston in brake fluid.  
Install the spring to the piston.  
Install the piston assembly into the master cylinder.

### CAUTION

- *When installing the cups, do not allow the lips to turn inside out.*

Install the snap ring using the special tool.

### CAUTION

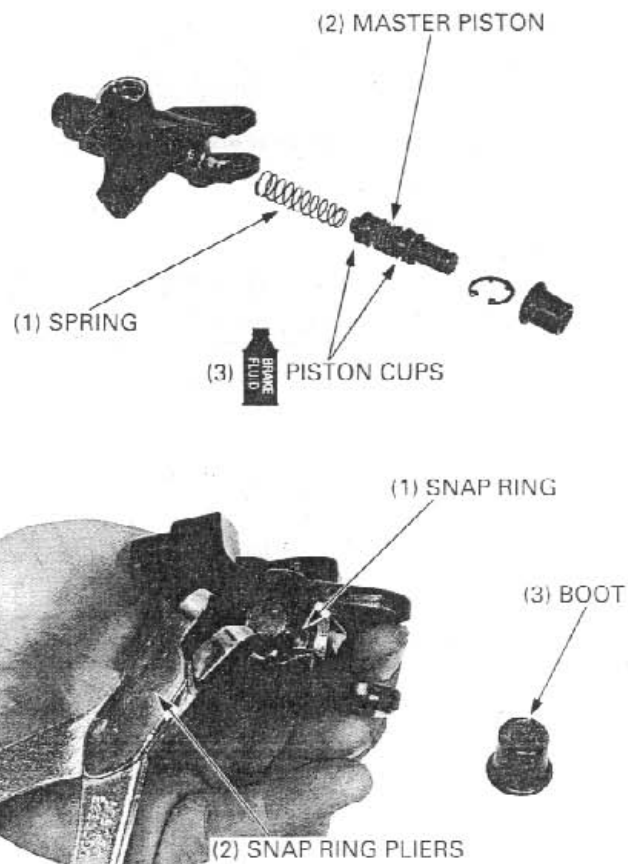
- *Be certain the snap ring is firmly seated in the groove.*

### TOOL:

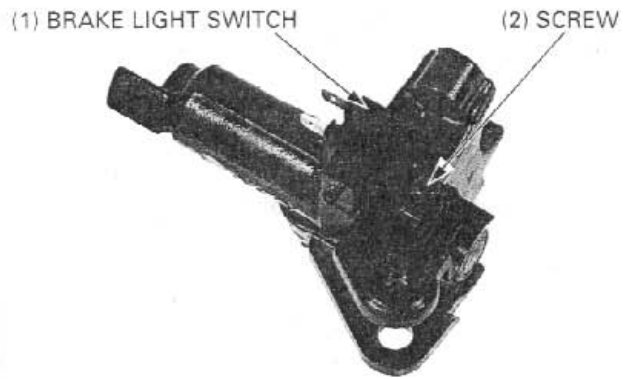
Snap ring pliers

07914 - SA50001 or  
07914 - 3230001

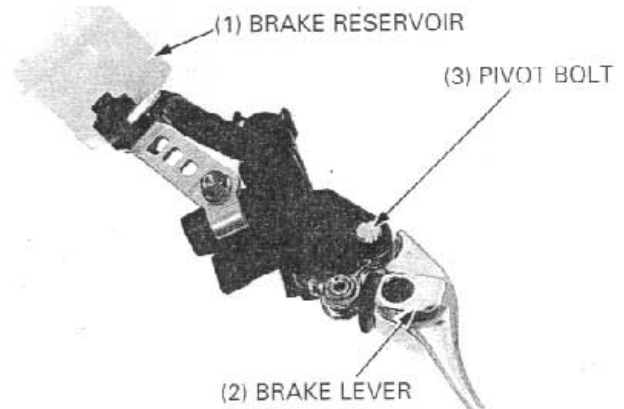
Install the boot.



Install the brake light switch and tighten the screw.



Install the master cylinder reservoir joint into the master cylinder and secure the joint with a snap ring. Install the dust cover. Install and tighten the reservoir mounting bolt.



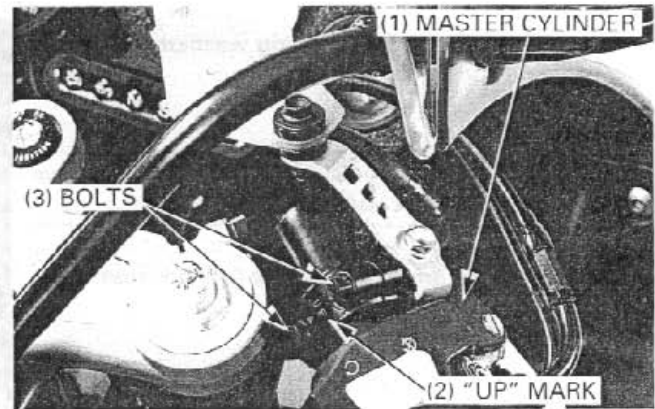
Install the brake lever assembly, tighten the pivot bolt.

**TORQUE: 1 N-m (0.1 kgf-m, 0.7 lbf-ft)**

Hold the pivot bolt and tighten the pivot nut.

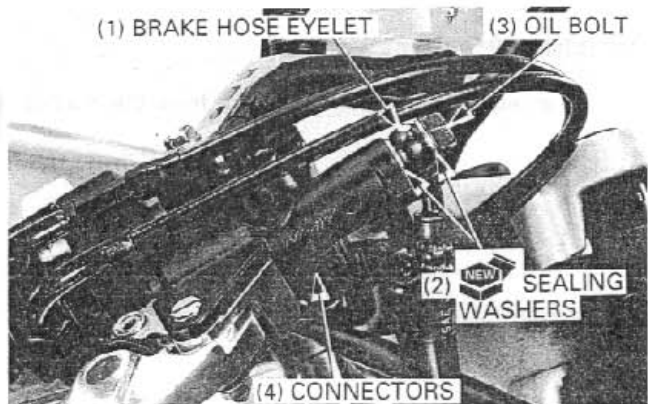
**TORQUE: 6 N-m (0.6 kgf-m, 4.3 lbf-ft)**

Place the master cylinder assembly on the handlebar. Align the end of the master cylinder with the punch mark on the handlebar.



Install the master cylinder holder with the "UP" mark facing up. Tighten the upper bolt first, then the lower bolt.

Install the brake hose eyelet with the oil bolt and new sealing washers. Adjust the brake hose angle, then tighten the oil bolt to the specified torque.



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

Connect the brake light switch wire connectors.

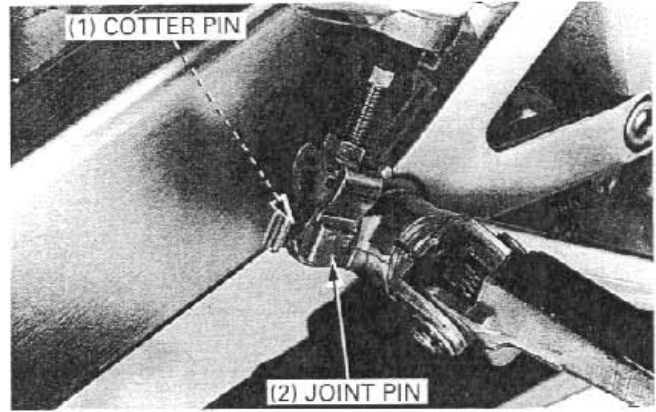
Fill the reservoir to the upper level and bleed the brake system (page 15-3).

## REAR MASTER CYLINDER

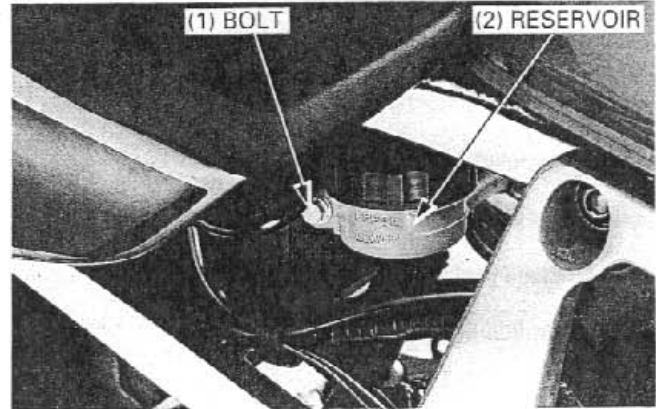
### REMOVAL

Drain the rear hydraulic system (page 15-3).

Remove and discard the brake pedal joint cotter pin.  
Remove the joint pin.



Remove the bolt and rear brake reservoir from the frame.

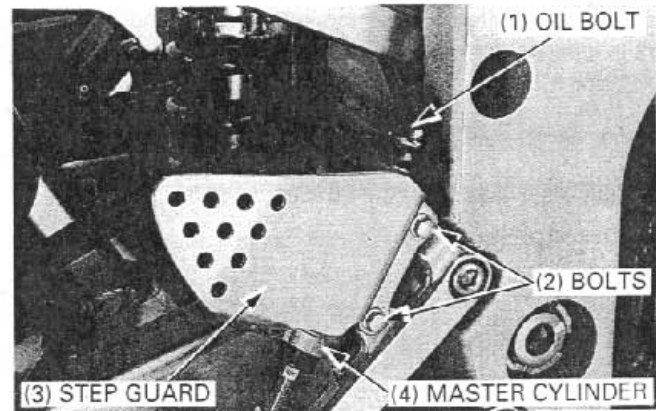


Remove the brake hose oil bolt, sealing washers and brake hose.

### CAUTION

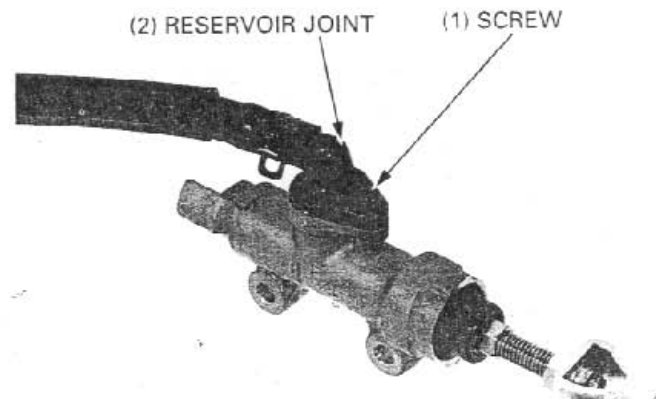
- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

Remove the bolts, step guard and master cylinder assembly.



### DISASSEMBLY

Remove the screw and reservoir hole joint from the master cylinder.



Remove the boot.

Remove the snap ring from the master cylinder body using the special tool as shown.

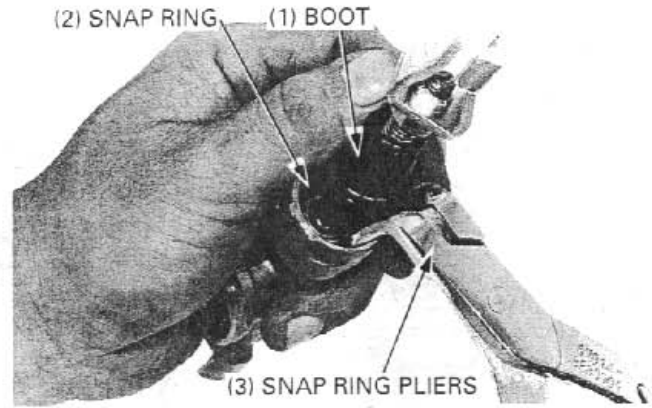
**TOOL:**

Snap ring pliers

07914 - SA50001 or  
07914 - 3230001

Remove the push rod, master piston and spring.

Clean the inside of the cylinder with brake fluid.

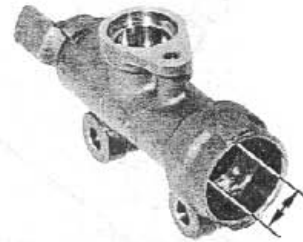


**INSPECTION**

Check the piston boot, primary cup and secondary cup for fatigue or damage.

Check the master cylinder and piston for abnormal scratches.  
Measure the master cylinder I.D.

**SERVICE LIMIT: 15.925 mm (0.6270 in)**

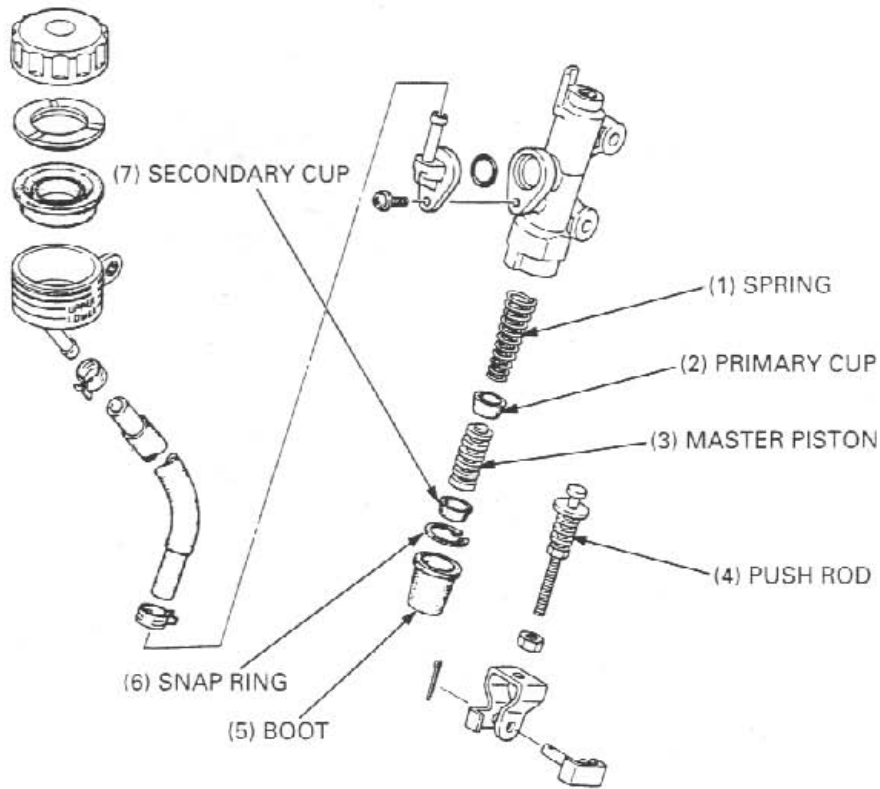


Measure the master cylinder piston O.D.

**SERVICE LIMIT: 15.815 mm (0.6226 in)**



## ASSEMBLY



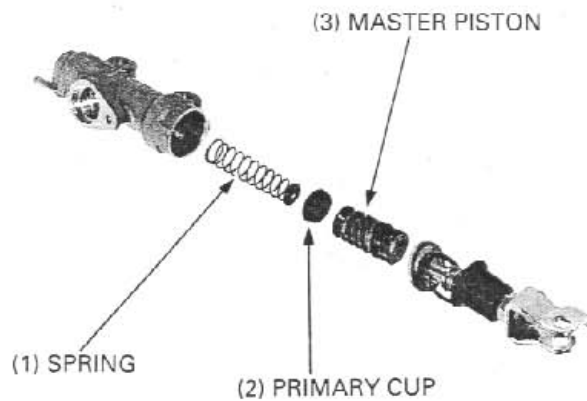
### CAUTION

- *Keep the piston, cups, spring, snap ring and boot as a set; do not substitute individual parts.*

Coat all parts with clean brake fluid before assembly. Dip the piston in brake fluid.  
Install the spring to the piston.  
Install the piston assembly.  
Apply grease to the piston contact area of the push rod.

### CAUTION

- *When installing the cups, do not allow the lips to turn inside out.*



Install the push rod into the master cylinder.  
Install the snap ring using the special tool.

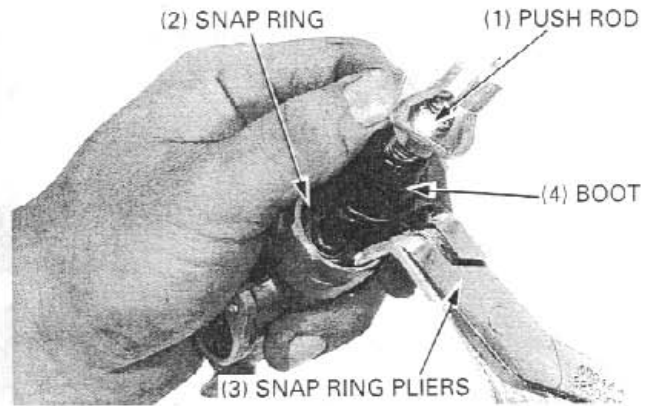
**CAUTION**

- Be certain the snap ring is firmly seated in the groove.

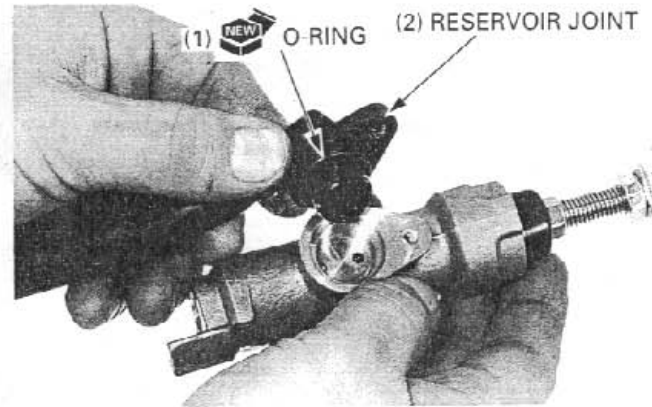
**TOOL:**

Snap ring pliers 07914 - SA50001 or  
07914 - 3230001

Install the boot.

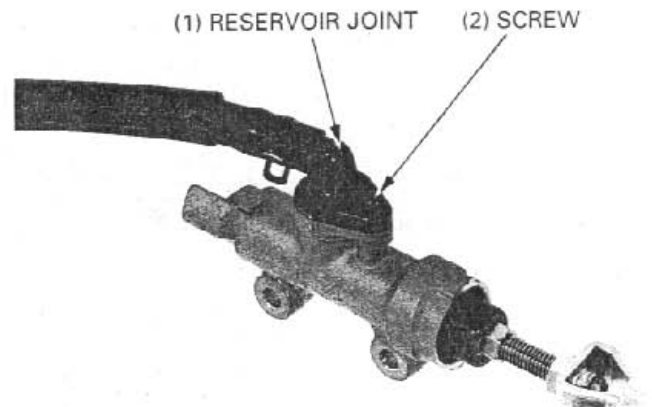


Apply brake fluid to a new O ring and install it onto the reservoir joint.  
Install the reservoir joint into the master cylinder.



Install and tighten the screw.

**TORQUE:** 1.5 N-m (0.15 kgf-m, 1.1 lbf-ft)



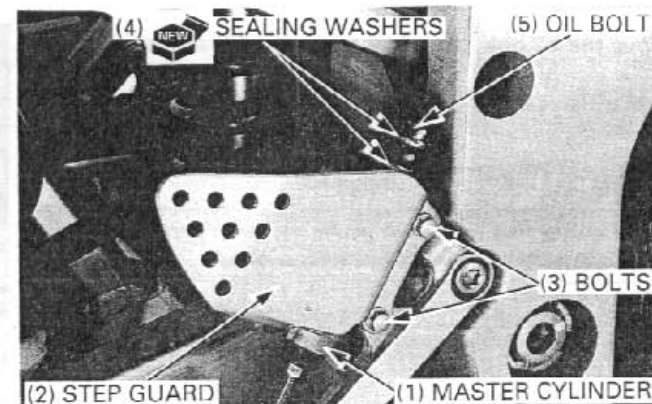
**INSTALLATION**

Place the master cylinder onto the frame.  
Install the step guard and tighten the bolts.

Install the brake hose with the oil bolt and new sealing washers.

Push the eyelet joint against the stopper, then tighten the oil bolt to the specified torque.

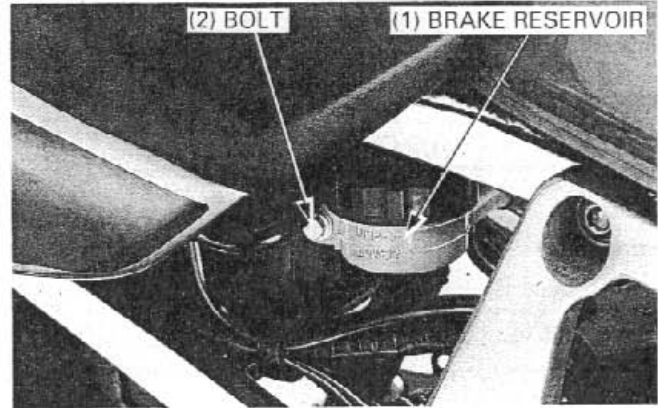
**TORQUE:** 34 N-m (3.5 kgf-m, 25 lbf-ft)





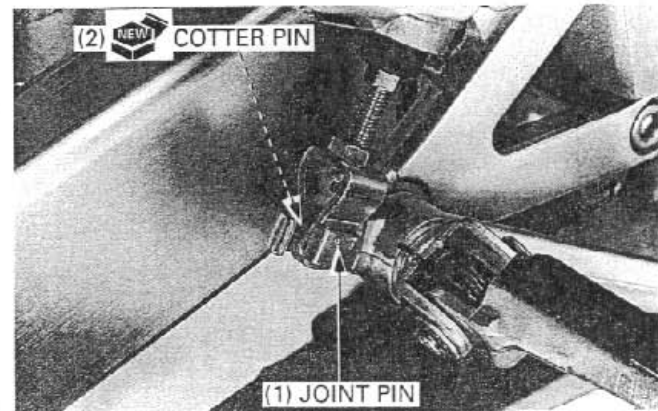
## HYDRAULIC BRAKE

Install and tighten the brake reservoir mounting bolt.



Connect the brake pedal to the push rod lower joint. Install the joint pin and secure it with a new cotter pin.

Fill the reservoir to the upper level and bleed the brake system (page 15-3).



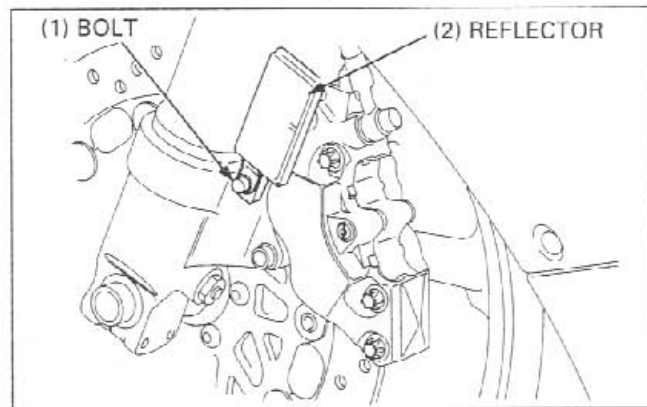
## FRONT BRAKE CALIPER

'96 - '97:

### REMOVAL

Drain the front brake hydraulic system (page 15-3).

Remove the bolt and reflector.

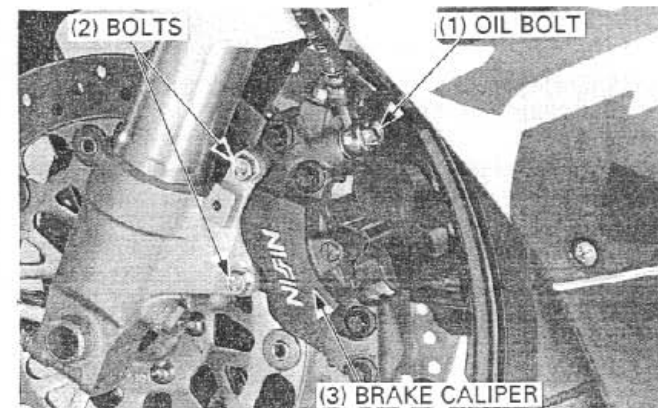


Remove the oil bolt, sealing washers and brake hose eyelet joint.

Remove the caliper mounting bolts and the brake pads (page 15-5).

### CAUTION

- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

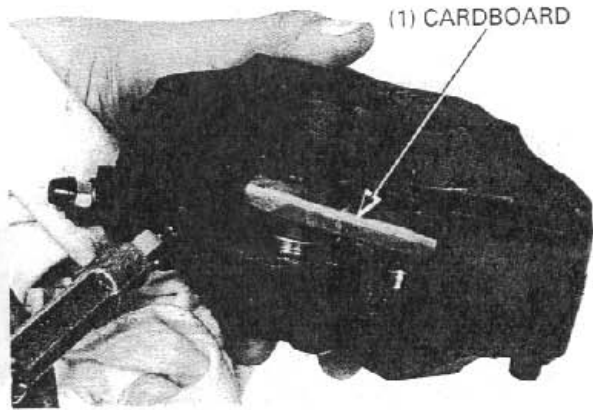


**DISASSEMBLY**

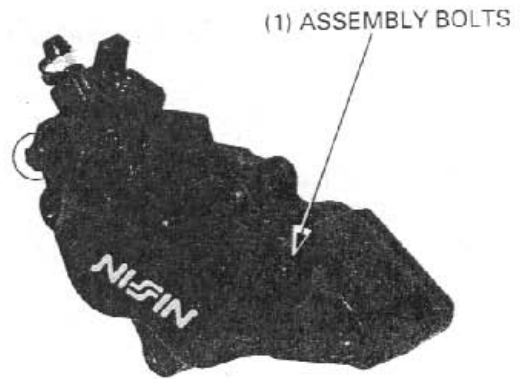
Install corrugated cardboard or soft wood sheet between the pistons.  
Apply small squirts of air pressure to the fluid inlet to remove the pistons.

**▲ WARNING**

- Do not use high pressure air or bring the nozzle too close to the inlet.



Remove the four caliper assembly bolts and separate the caliper halves.

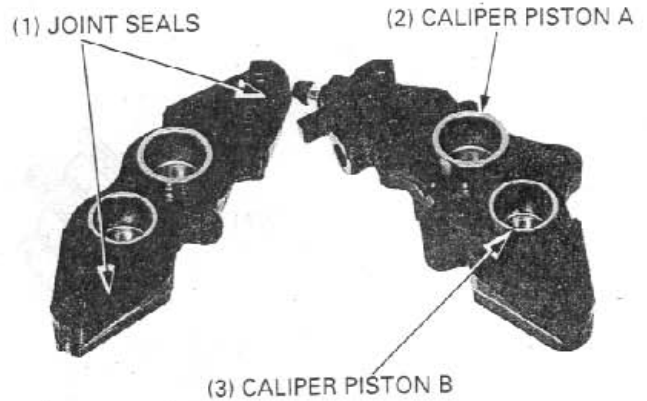


Remove the following:

- Joint seals
- Caliper piston A
- Caliper piston B

**NOTE**

- Mark the pistons to ensure correct reassembly.

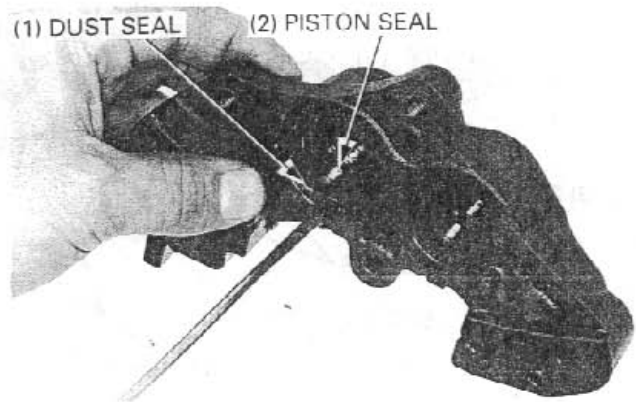


Push the dust seals and piston seals in and lift them out.

**CAUTION**

- Be careful not to damage the piston sliding surface.

Clean the seal grooves with clean brake fluid.



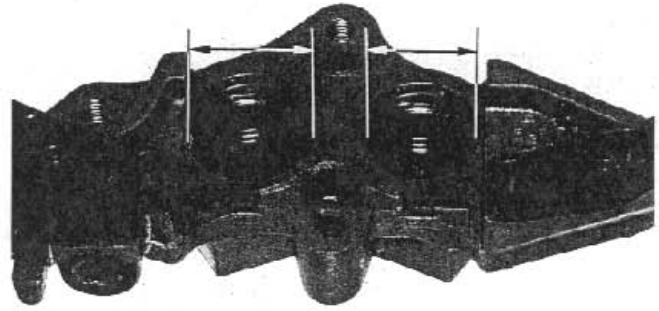
# HYDRAULIC BRAKE

## INSPECTION

Check the caliper cylinder for scoring or other damage.

Measure the caliper cylinder I.D.

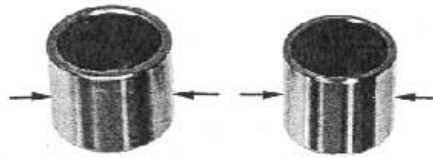
**SERVICE LIMITS: A: 30.29 mm (1.193 in)**  
**B: 27.06 mm (1.065 in)**



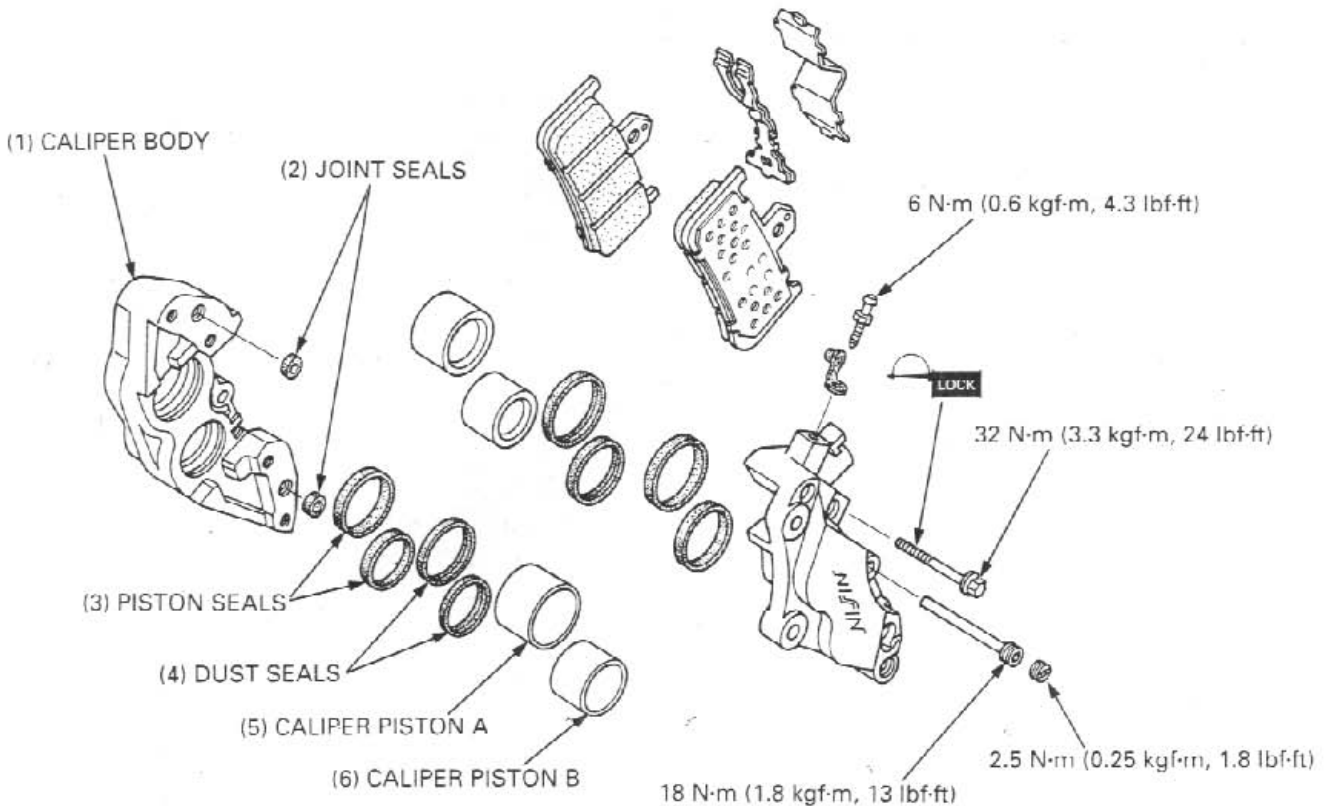
Check the caliper pistons for scratches, scoring or other damage.

Measure the caliper piston O.D.

**SERVICE LIMITS: A: 30.140 mm (1.1866 in)**  
**B: 26.927 mm (1.0610 in)**



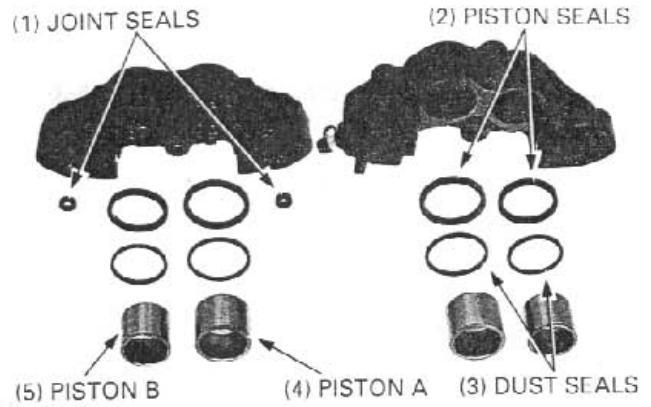
## ASSEMBLY



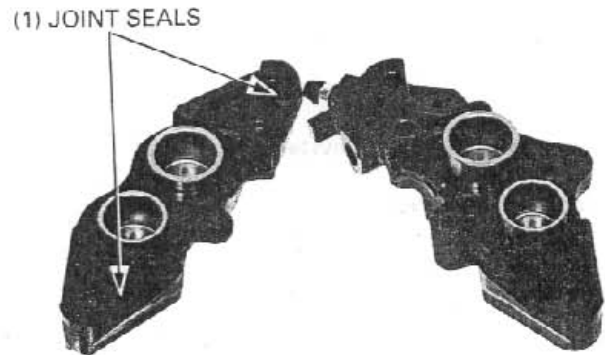
Coat the new piston seals with clean brake fluid.  
Coat the new dust seals with silicone grease.

Install the piston and dust seal into the groove of the caliper body.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinder with their opening ends toward the pad.



Install the joint seals into the fluid passage on caliper.



Apply a locking agent to the threads of the caliper assembly bolts.  
Assemble the caliper halves and install and tighten the caliper assembly bolts.

**TORQUE: 32 N-m (3.3 kgf-m, 24 lbf-ft)**

**INSTALLATION**

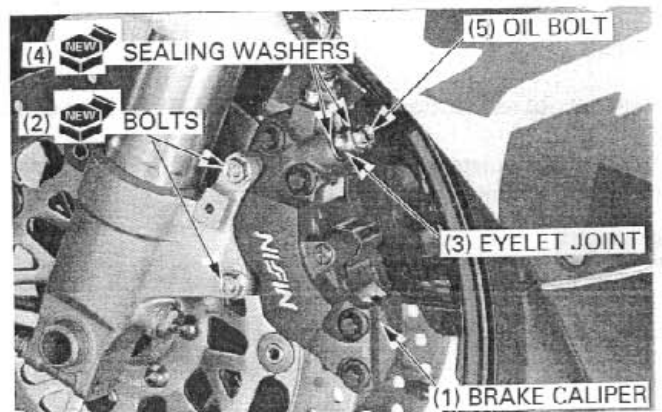
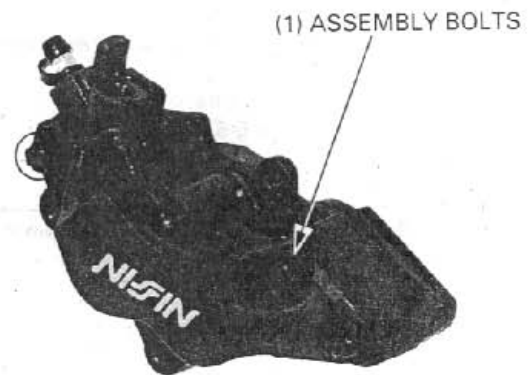
Install the brake pads and caliper onto the fork leg (page 15-6).

Install and tighten the new caliper mounting bolts.

**TORQUE: 30 N-m (3.1 kgf-m, 22 lbf-ft)**

Install the brake hose eyelet to the caliper body with two new sealing washers and oil bolt.  
Push the brake hose eyelet to the stopper on the caliper, then tighten the oil bolt to the specified torque.

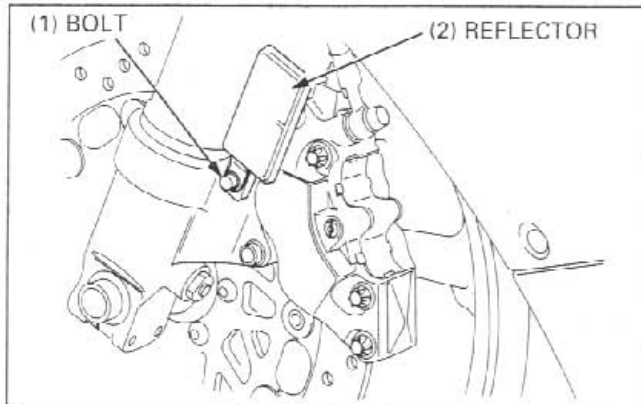
**TORQUE: 34 N-m (3.5 kgf-m, 25 lbf-ft)**



## HYDRAULIC BRAKE

Install the reflector and tighten the bolt.

Fill and bleed the front brake hydraulic system (page 15-3).

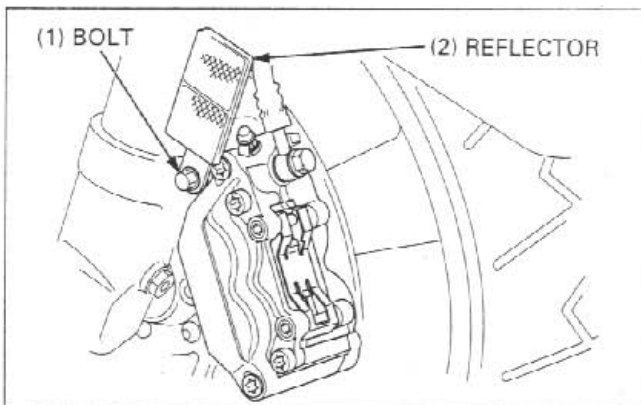


After '97:

### REMOVAL

Drain the front brake hydraulic system (page 15-3).

Remove the bolt and reflector.



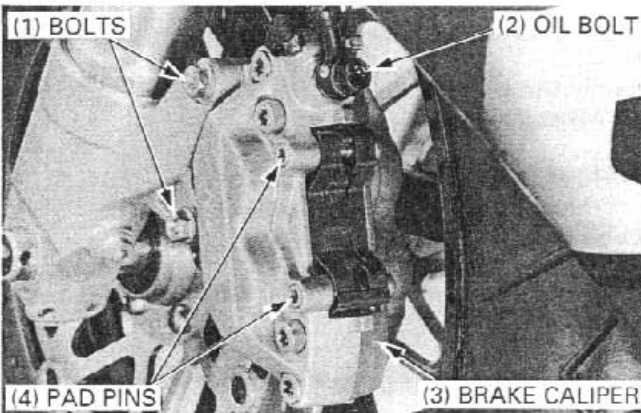
Remove the oil bolt, sealing washers and brake hose cyclet joint.

Remove the caliper mounting bolts.

Remove the brake pads (page 5-6).

### CAUTION

- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*



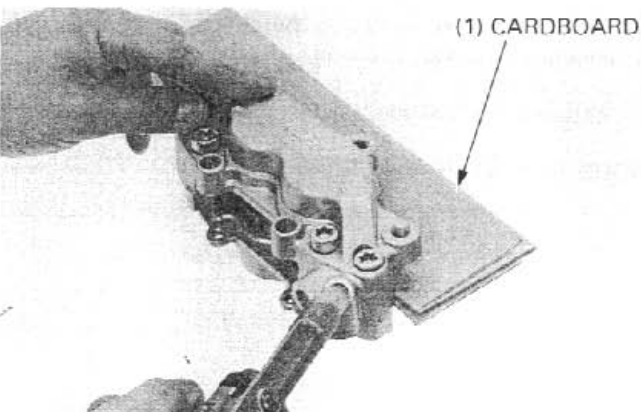
### DISASSEMBLY

Install corrugated cardboard or soft wood sheet between the pistons.

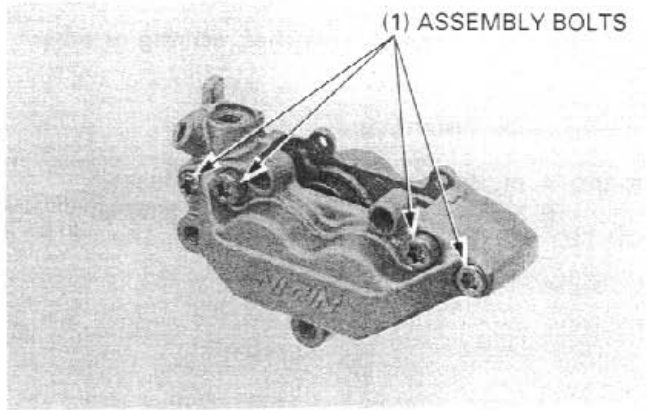
Apply small squirts of air pressure to the fluid inlet to remove the pistons.

### WARNING

- *Do not use high pressure air or bring the nozzle too close to the inlet.*



Remove the four caliper assembly bolts and separate the caliper halves.

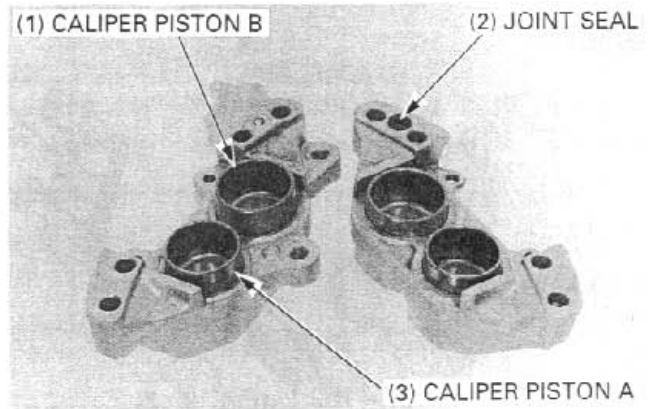


Remove the following:

- Joint seals
- Caliper piston A
- Caliper piston B

**NOTE**

- Mark the pistons to ensure correct reassembly.

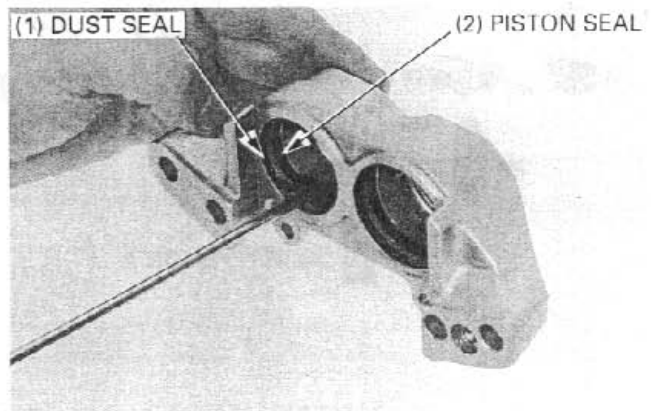


Push the dust seals and piston seals in and lift them out.

**CAUTION**

- *Be careful not to damage the piston sliding surface.*

Clean the seal grooves with clean brake fluid.

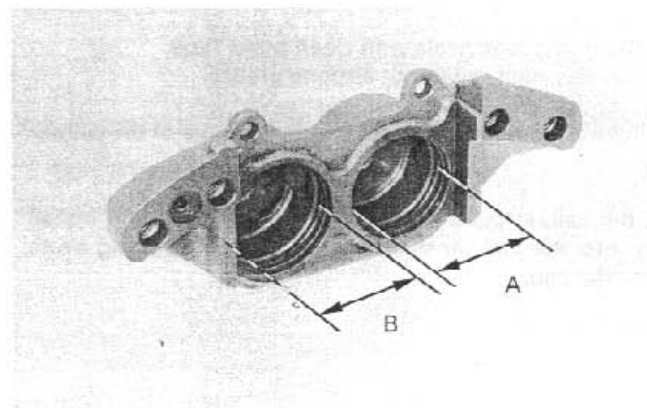


**INSPECTION**

Check the caliper cylinder for scoring or other damage.

Measure the caliper cylinder I.D.

**STANDARD: A: 32.03 – 32.08 mm (1.261 – 1.263 in)**  
**B: 33.96 – 34.01 mm (1.337 – 1.339 in)**

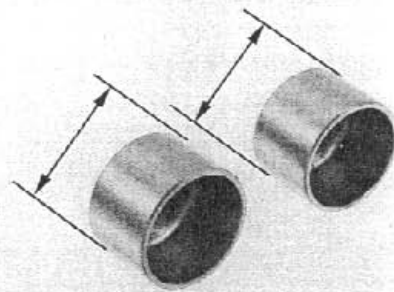


# HYDRAULIC BRAKE

Check the caliper pistons for scratches, scoring or other damage.

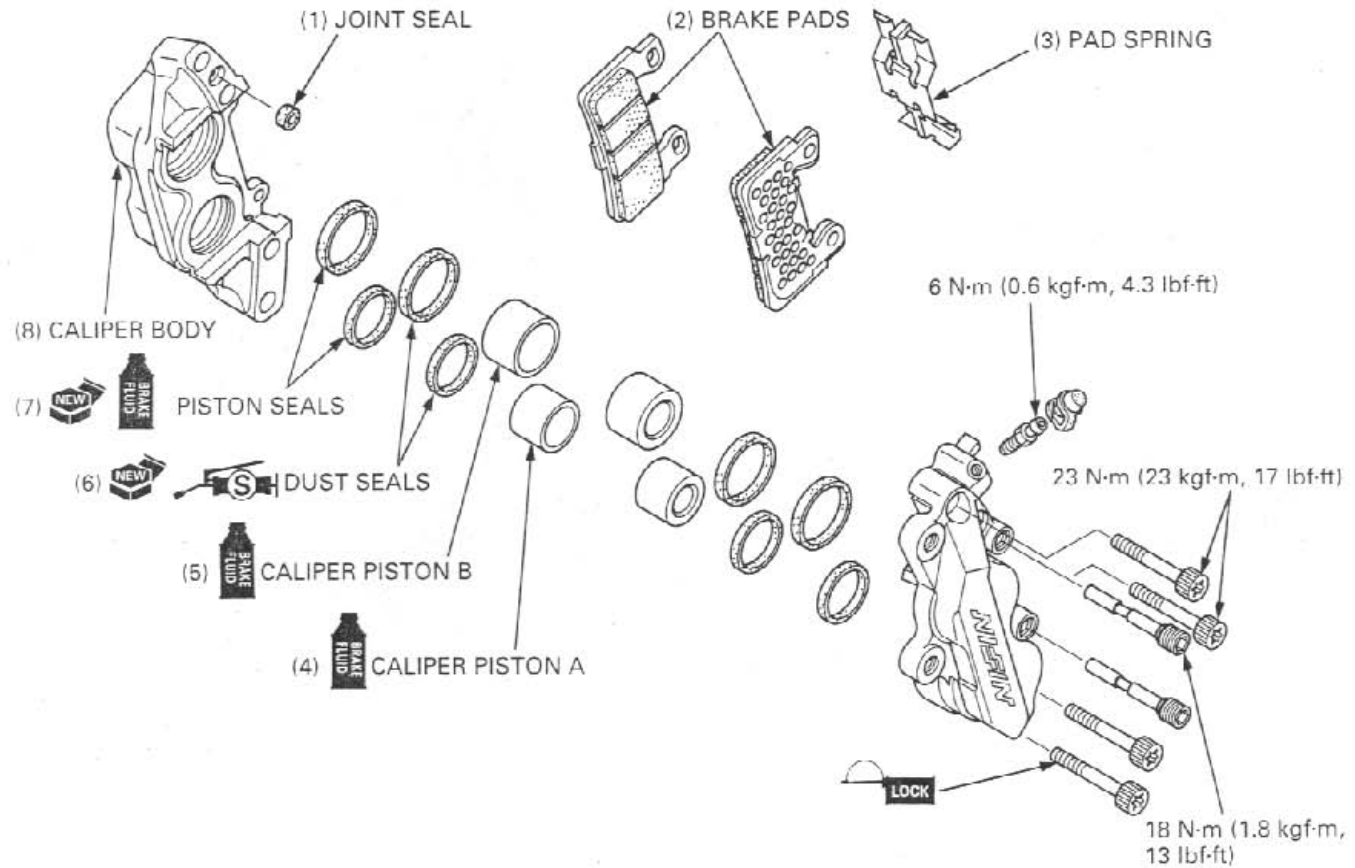
Measure the caliper piston O.D.

**STANDARD: A: 31.965 – 31.998 mm (1.2585 – 1.2598 in)**  
**B: 33.895 – 33.928 mm (1.3344 – 1.3357 in)**



(1) PISTON B (2) PISTON A

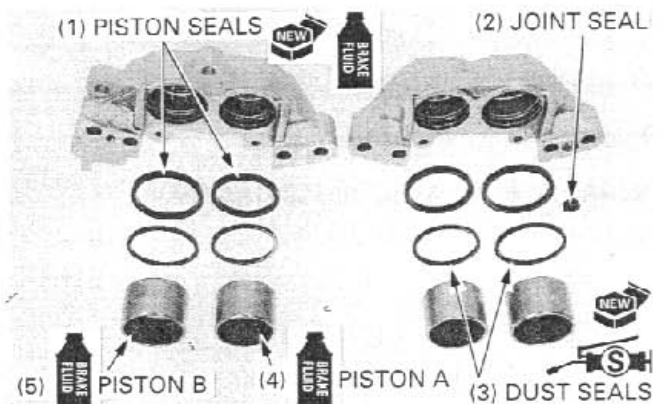
## ASSEMBLY



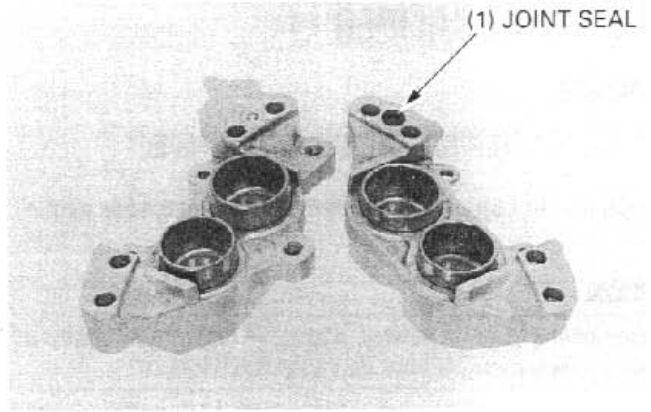
Coat the new piston seals with clean brake fluid.  
Coat the new dust seals with silicone grease.

Install the piston and dust seal into the groove of the caliper body.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinder with their opening ends toward the pad.



Install the joint seal into the fluid passage on caliper.



Apply a locking agent to the threads of the caliper assembly bolts.  
 Assemble the caliper halves and install and tighten the caliper assembly bolts.

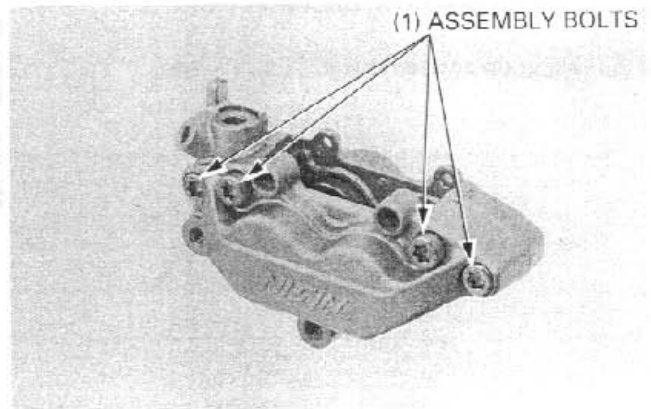
**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**

**INSTALLATION**

Install the caliper onto the fork leg (page 15-6).

Install and tighten the new caliper mounting bolts.

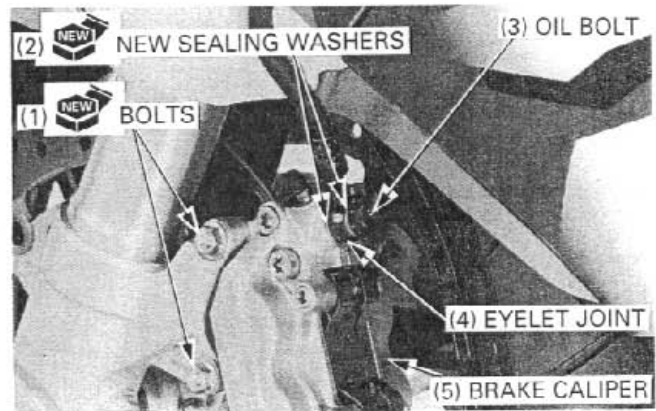
**TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)**



Install the brake hose eyelet to the caliper body with two new sealing washers and oil bolt.  
 Push the brake hose eyelet to the stopper on the caliper, then tighten the oil bolt to the specified torque.

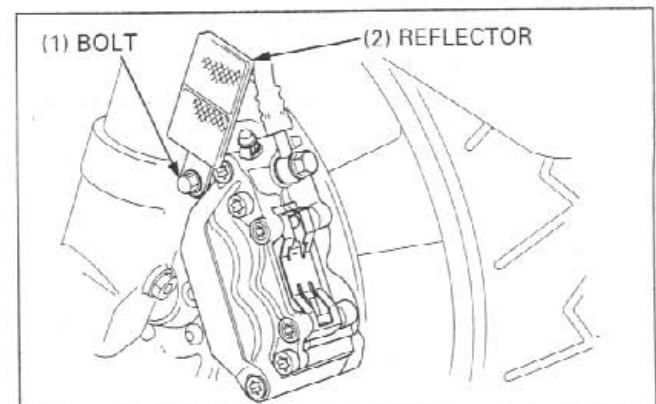
**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

Install the brake pads (page 15-7).



Install the reflector and tighten the bolt.

Fill and bleed the front brake hydraulic system (page 15-3).





## REAR BRAKE CALIPER

### REMOVAL

Drain the rear brake hydraulic system (page 15-3).

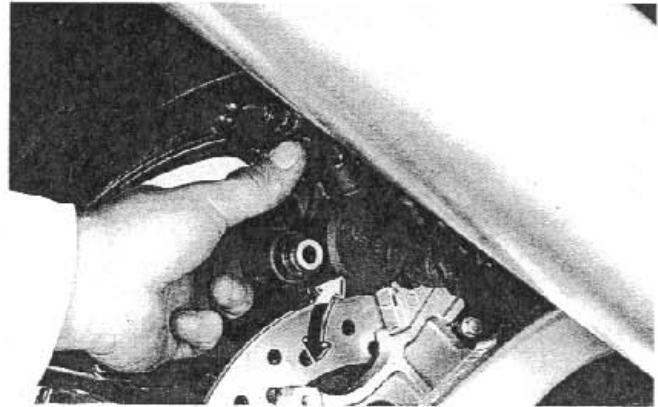
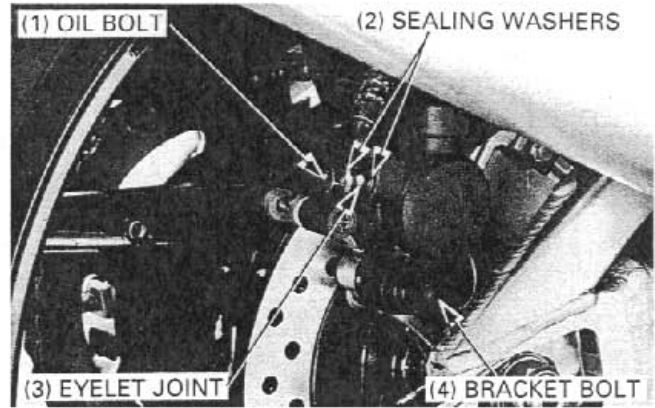
Remove the oil bolt, sealing washers and brake hose eyelet joint.

### CAUTION

- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

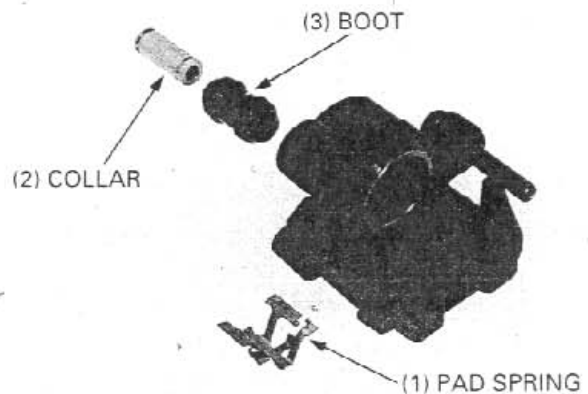
Remove the caliper bracket bolts and the brake pads (page 15-8).

Pivot the caliper up and remove it.



### DISASSEMBLY

Remove the pad spring, collar and boot from the caliper body.



Place a shop towel over the piston.  
Position the caliper body with the piston down and apply small squirts of air pressure to the fluid inlet to remove the piston.

**WARNING**

- Do not use high pressure air or bring the nozzle too close to the inlet.

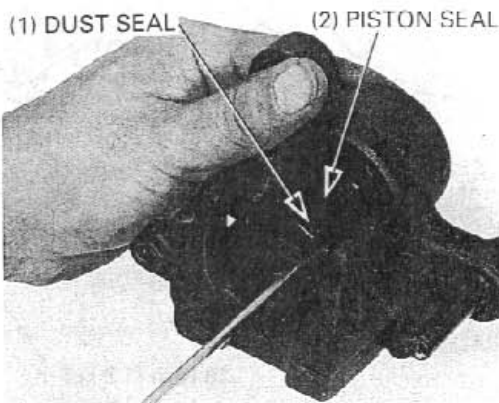


Push the dust seal and piston seal in and lift them out.

**CAUTION**

- Be careful not to damage the piston sliding surface.

Clean the seal grooves with clean brake fluid.

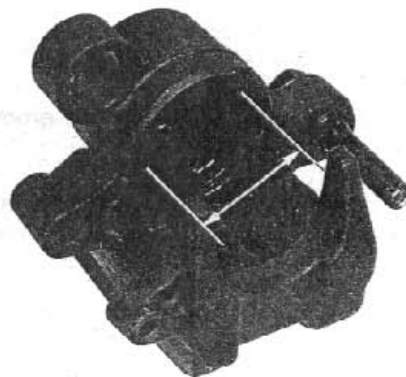


**INSPECTION**

Check the caliper cylinder for scoring or other damage.

Measure the caliper cylinder I.D.

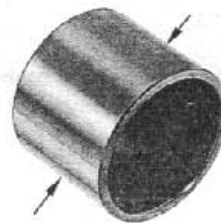
**SERVICE LIMIT: 38.24 mm (1.506 in)**



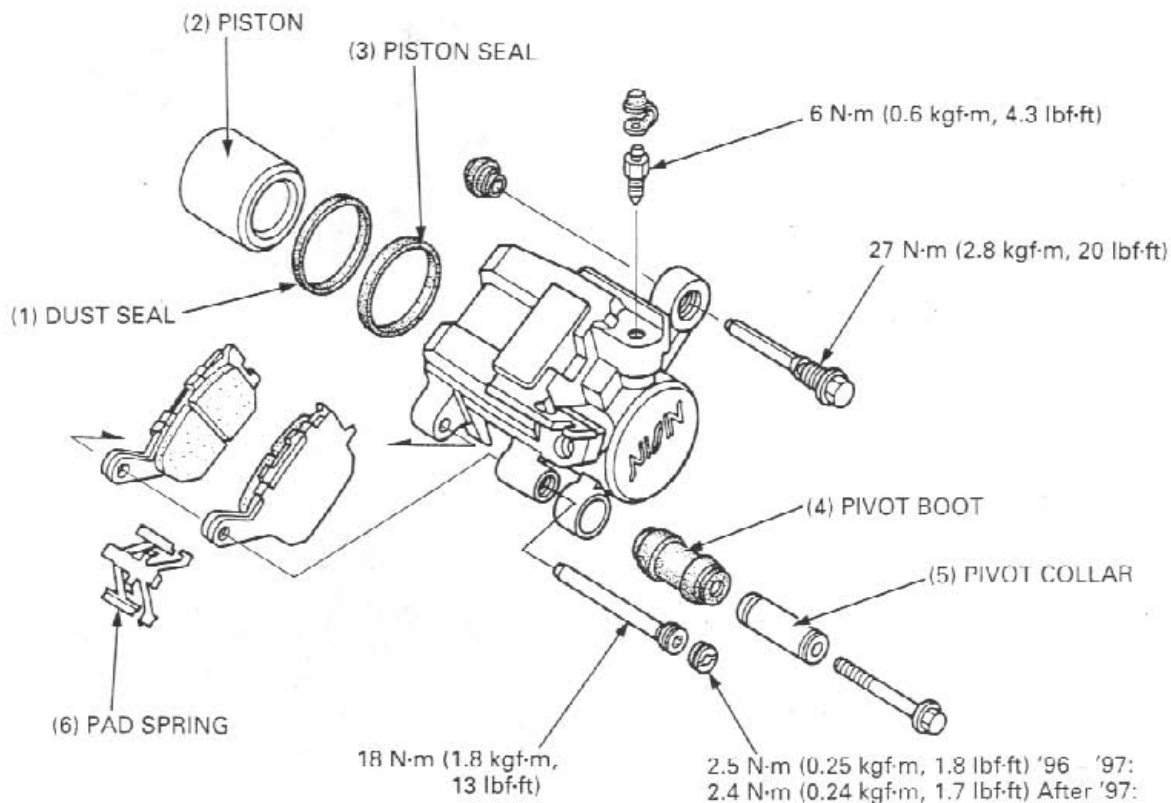
Check the caliper pistons for scratches, scoring or other damage.

Measure the caliper piston O.D.

**SERVICE LIMIT: 38.107 mm (1.5003 in)**



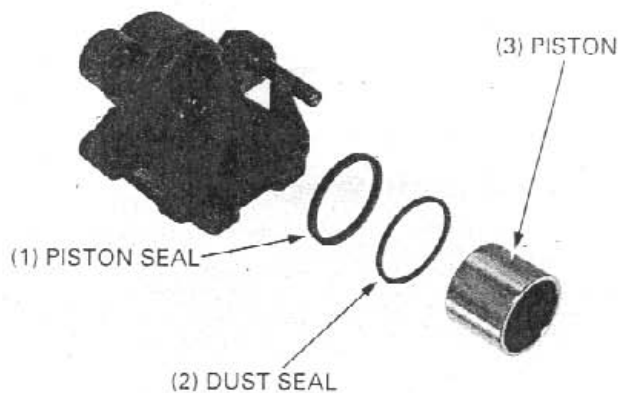
## ASSEMBLY



Coat the new piston seal with clean brake fluid.  
Coat the new dust seal with silicone grease.

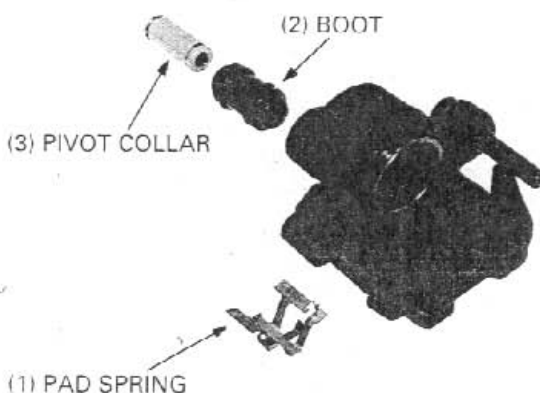
Install the piston seal and dust seal into the groove of the caliper body.

Coat the caliper piston with clean brake fluid and install it into the caliper cylinder with its opening end toward the pad.

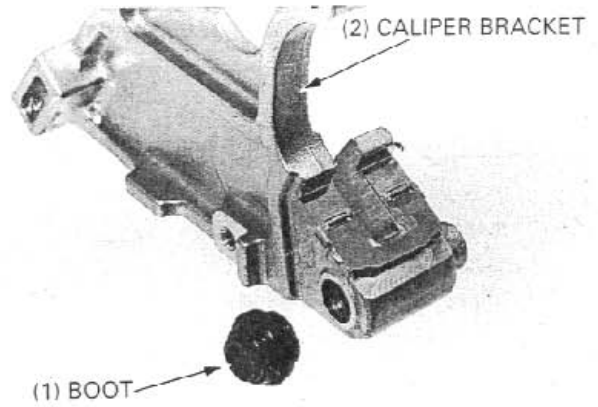


Install the pad spring into the caliper body.  
If the caliper and bracket pin boots are hard or deteriorated, replace them with new ones.

Apply silicone grease to the inside of the bracket pin boot.  
Install the bracket pin boot and collar into the caliper.



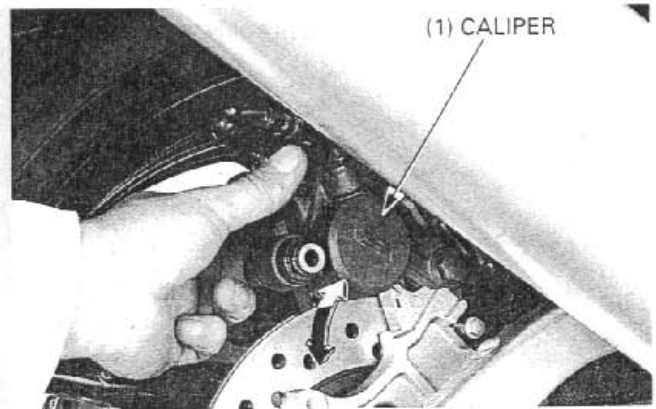
Install the caliper pin boot into the bracket.



## INSTALLATION

Apply silicone grease to the caliper pin and install the caliper onto the bracket.

Install the brake pads (page 15-6).

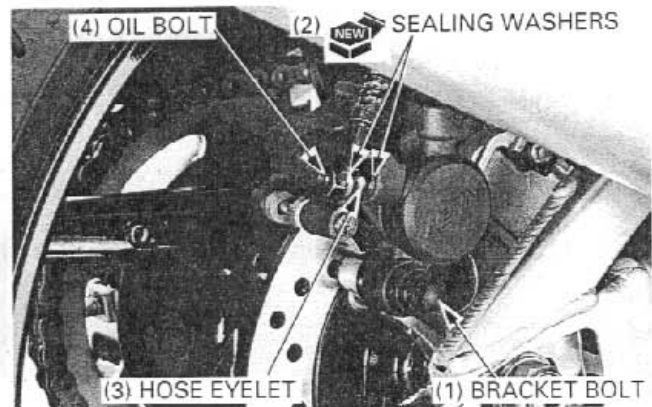


Install and tighten the caliper bracket bolt to the specified torque.

### TORQUE:

|            |                               |
|------------|-------------------------------|
| '96 - '97: | 23 N·m (2.3 kgf·m, 17 lbf·ft) |
| After '97: | 22 N·m (2.2 kgf·m, 16 lbf·ft) |

Install the brake hose eyelet to the caliper body with two new sealing washers and oil bolt. Push the brake hose eyelet to the stopper on the caliper, then tighten the oil bolt to the specified torque.



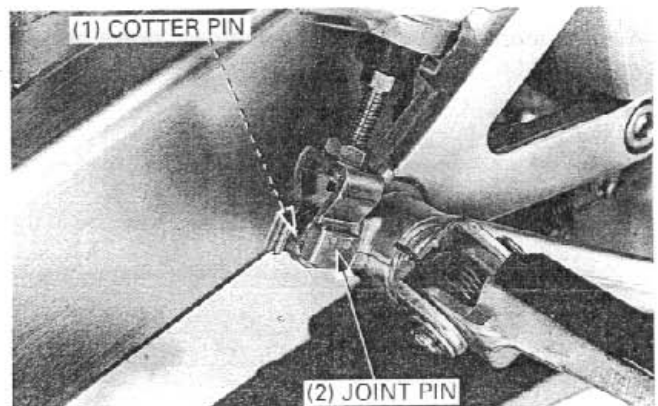
**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

Fill and bleed the rear brake hydraulic system (page 15-3).

## BRAKE PEDAL

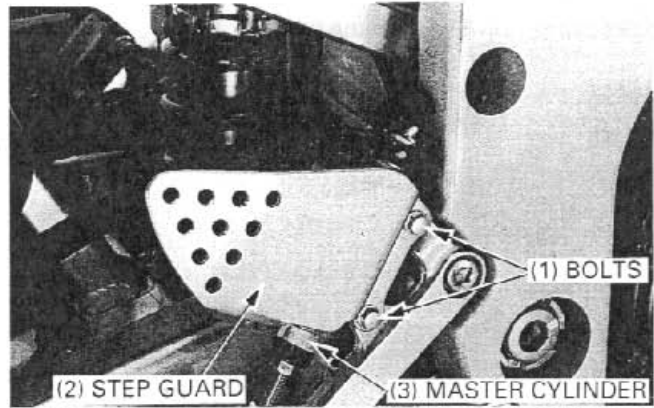
### REMOVAL

Remove and discard the brake pedal joint cotter pin. Remove the joint pin.

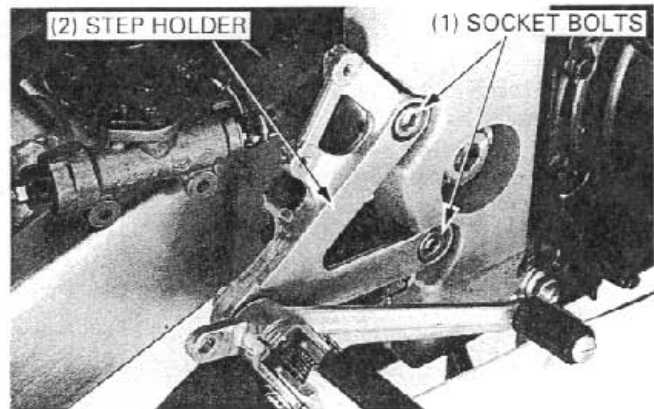


## HYDRAULIC BRAKE

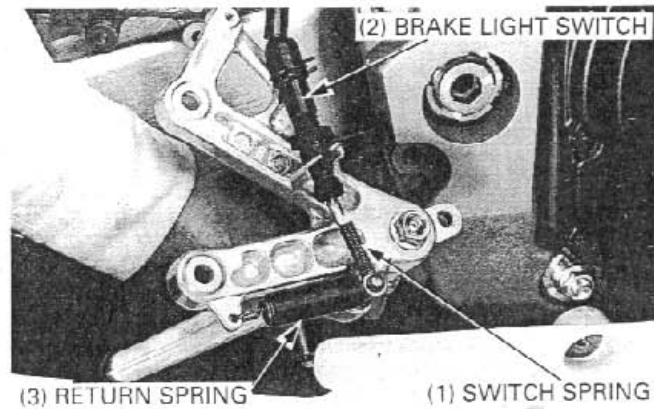
Remove the bolts, step guard and master cylinder assembly.



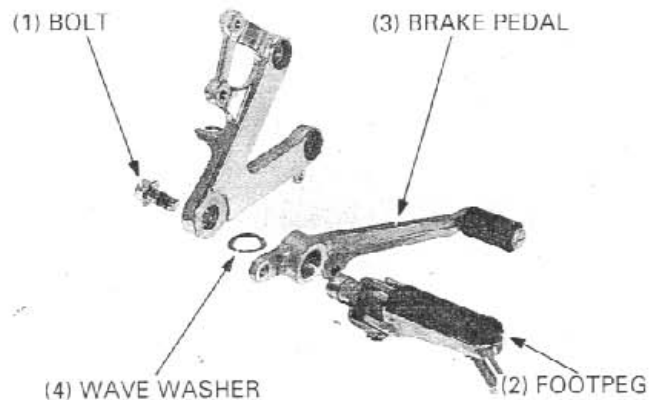
Remove the socket bolts and right step holder assembly.



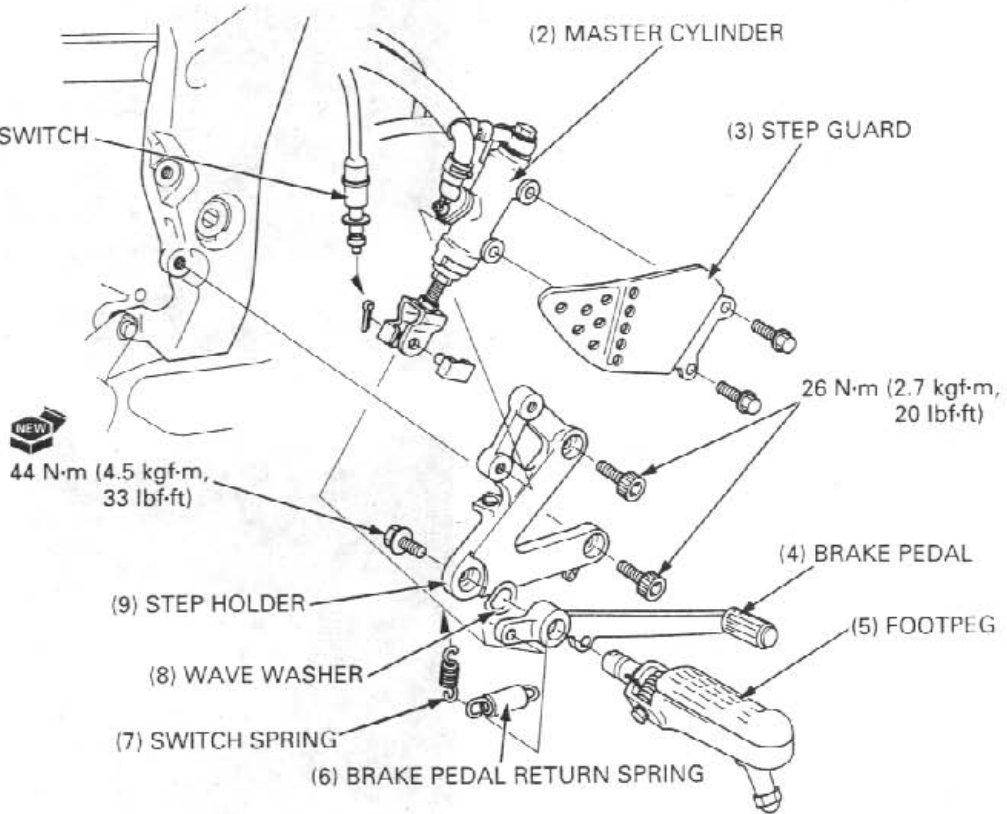
Unhook the return spring and remove the brake light switch from the step holder.  
Unhook the brake pedal return spring.



Remove the footpeg mounting bolt, footpeg, brake pedal and wave washer.

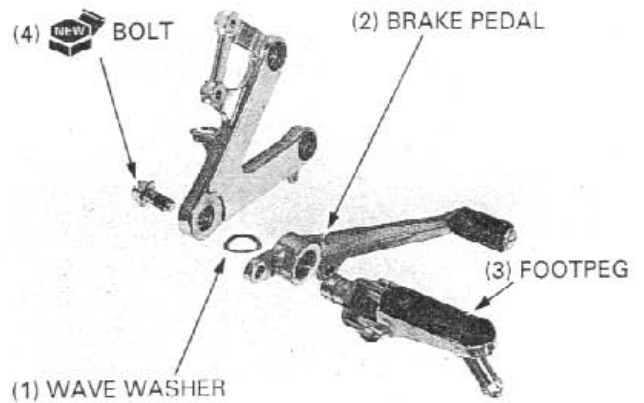


INSTALLATION



Apply grease to the sliding surface of the brake pedal and footpeg.  
Assemble the brake pedal, right footpeg and wave washer.

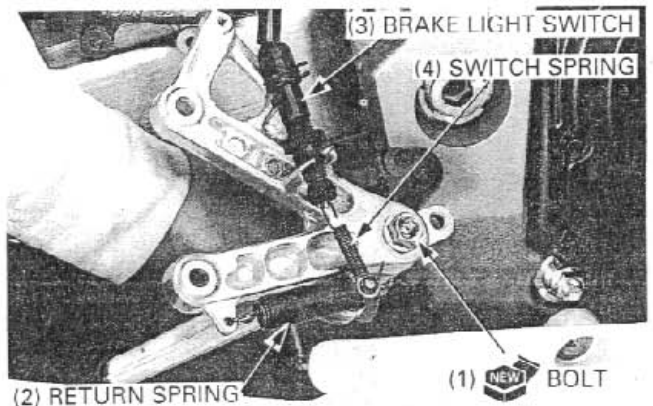
Install the right footpeg assembly onto the step holder aligning the cut-outs between the footpeg and holder.



Install a new footpeg mounting bolt and tighten it to the specified torque.

**TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)**

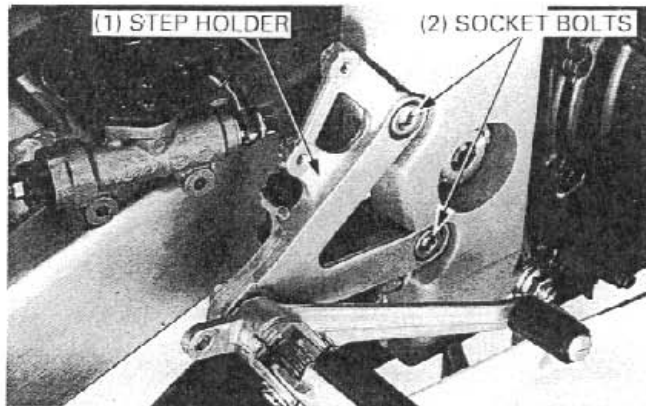
Hook the brake pedal return spring.  
Install the brake light switch and hook the switch spring.



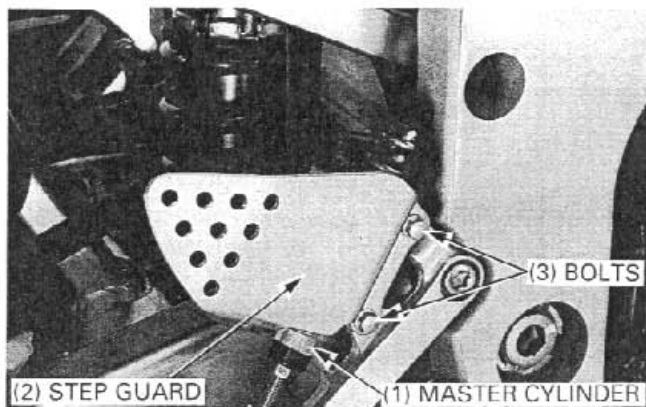
## HYDRAULIC BRAKE

Install the right step holder assembly onto the frame.  
Install and tighten the right step holder socket bolts to the specified torque.

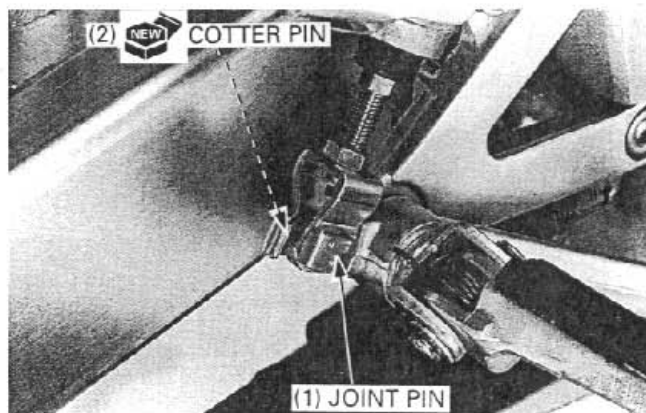
**TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)**



Install the master cylinder and step guard, then tighten the mounting bolts.



Connect the brake pedal to the push rod lower joint.  
Install the joint pin and secure it with a new cotter pin.



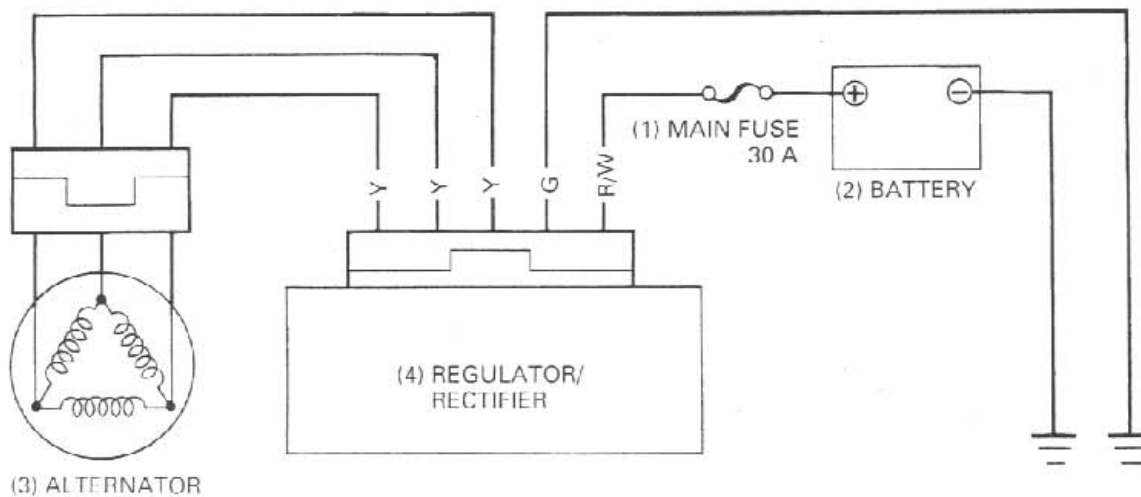
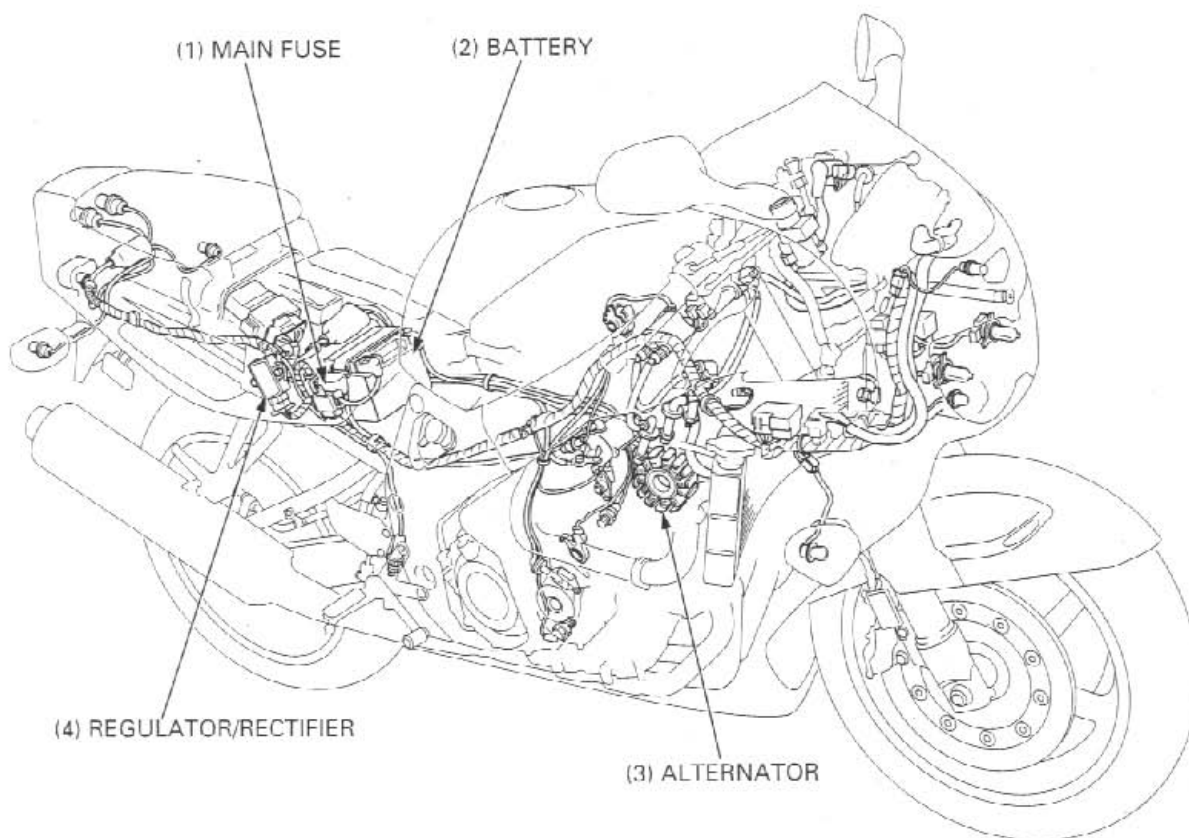
---

MEMO

---



SYSTEM DIAGRAM



Y ..... YELLOW  
 G ..... GREEN  
 R ..... RED  
 W ..... WHITE

|                     |      |                            |      |
|---------------------|------|----------------------------|------|
| SYSTEM DIAGRAM      | 16-0 | CHARGING SYSTEM INSPECTION | 16-6 |
| SERVICE INFORMATION | 16-1 | ALTERNATOR CHARGING COIL   | 16-8 |
| TROUBLESHOOTING     | 16-3 | REGULATOR/RECTIFIER        | 16-8 |
| BATTERY             | 16-5 |                            |      |

## SERVICE INFORMATION

### GENERAL

#### ▲ 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.**
- 
- 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 space. For maximum service life, charge the stored battery every two weeks.
  - For a 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.
- 
- The battery can be damaged if overcharged or undercharged, or if left to discharge for long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2 - 3 years.
  - Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging 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 occurring.
  - 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 initially charged.
  - When checking the charging system, always follow the steps in the troubleshooting flow chart (page 16-3).

## BATTERY/CHARGING SYSTEM

### Battery charging

This model comes with a maintenance-free (MF) battery. Remember the following about MF batteries.

- Use only the electrolyte that comes with the battery
- Use all of the electrolyte
- Seal the battery properly
- Never open the seals again

### CAUTION

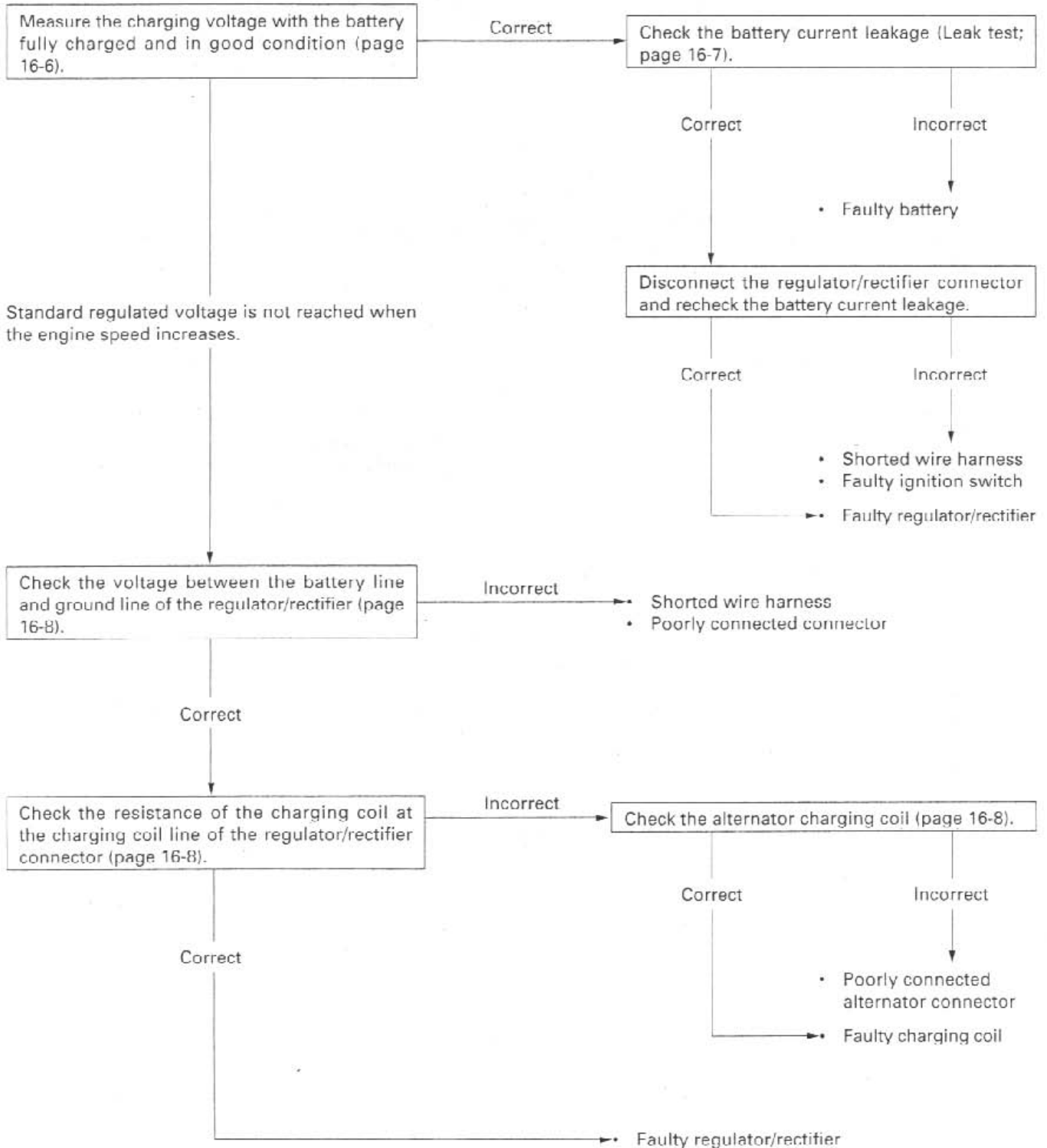
- For battery charging, do not exceed the charging current and time specified on the battery. Use of excessive current or charging time may damage the battery.

### SPECIFICATIONS

| ITEM                                  |                                      | SPECIFICATIONS          |                |
|---------------------------------------|--------------------------------------|-------------------------|----------------|
| Battery                               | Capacity                             | 12 V – 8 Ah             |                |
|                                       | Current leakage                      | 0.1 mA max.             |                |
|                                       | Voltage<br>(20°C/68°F)               | Fully charged           | 13.0 – 13.2 V  |
|                                       |                                      | Needs charging          | Below 12.3 V   |
|                                       | Charging current                     | Normal                  | 0.9 A/5 – 10 h |
| Quick                                 |                                      | 4.0 A/0.5 h             |                |
| Alternator                            | Capacity                             | 384 W/5,000 rpm         |                |
|                                       | Charging coil resistance (20°C/68°F) | 0.1 – 0.3 Ω             |                |
| Regulator/rectifier regulated voltage |                                      | 13.5 – 15.5 V/5,000 rpm |                |

# TROUBLESHOOTING

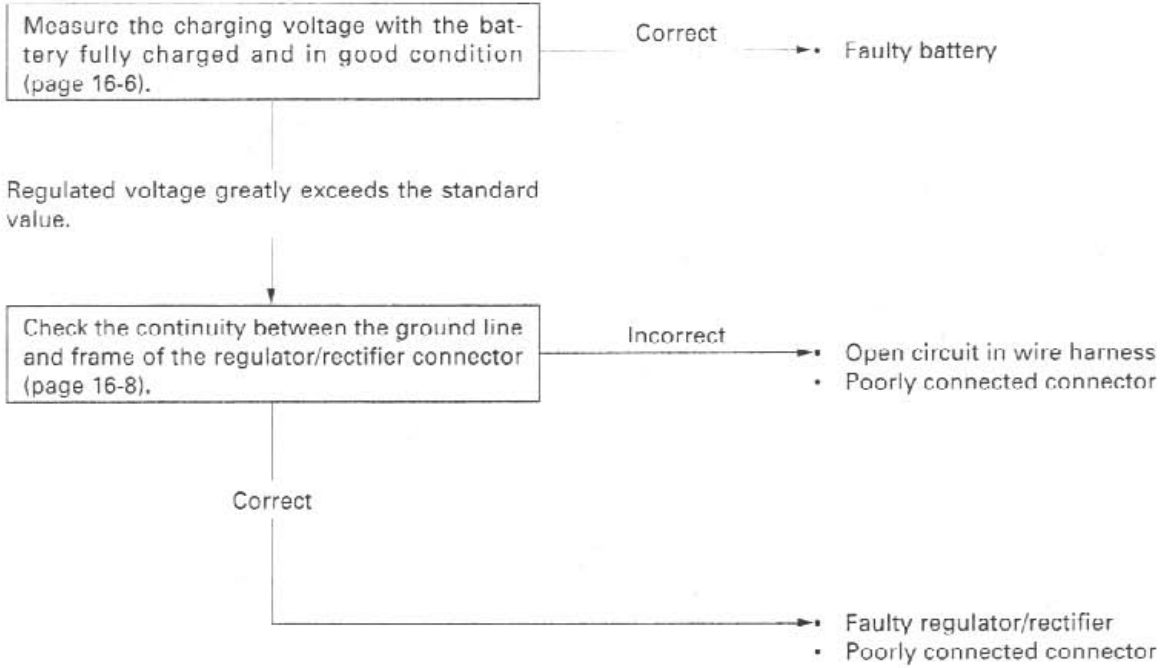
## 1. Battery undercharging (Voltage not raised to regulated voltage).



## BATTERY/CHARGING SYSTEM

---

### 2. Battery overcharging (regulated voltage too high).



# BATTERY

## REMOVAL

Remove the seat (page 2-2).

Remove the battery holder band.  
 Disconnect the negative cable and then the positive cable,  
 and remove the battery.

## INSTALLATION

Install the battery in the reverse order of removal with the  
 proper wiring as shown.

### NOTE

- Connect the positive terminal first and then the negative cable.

After installing the battery, coat the terminals with clean  
 grease.  
 Reinstall the removed parts.

## VOLTAGE INSPECTION

Measure the battery voltage using a digital multimeter.

**VOLTAGE: Fully charged: 13.0 – 13.2 V**  
**Under charged: Below 12.3 V**

### TOOL:

Digital multimeter

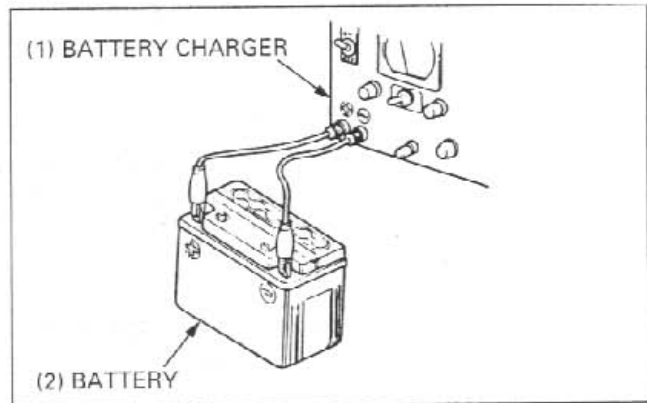
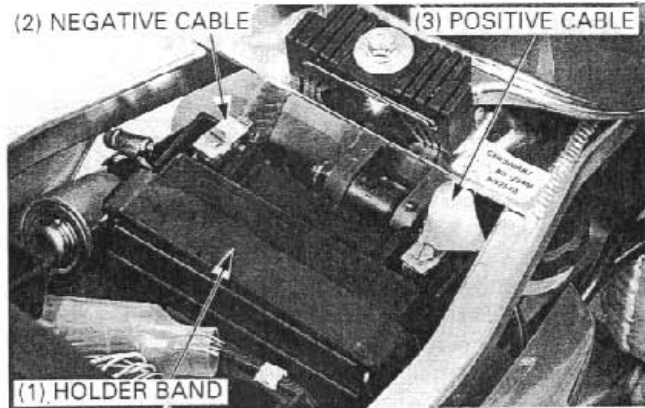
Commercially available  
 in U.S.A.

## BATTERY CHARGING

### ▲ WARNING

- The battery gives off explosive gases; keep sparks, flames, and cigarettes away. Provide adequate ventilation when charging.
- Turn power ON/OFF at the charger, not at the battery terminal.

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



|                  | Normal       | Quick    |
|------------------|--------------|----------|
| Charging current | 0.9 A        | 4.0 A    |
| Charging time    | 5 – 10 hours | 0.5 hour |

### CAUTION

- Quick-charging should only be done in an emergency; slow charging is preferred.
- For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.

## CHARGING SYSTEM INSPECTION

### NOTE

- When inspecting the charging system, check the system components and lines step-by-step according to the troubleshooting on page 16-3.
- Measuring circuits with a large capacity that exceeds the capacity of the tester may cause damage to the tester. Before starting each test, set the tester at the highest capacity range first, then gradually lower the capacity ranges until you have the correct range.
- When measuring small capacity circuits, keep the ignition switch off. If the switch is suddenly turned on during a test, the tester fuse may blow.

## REGULATED VOLTAGE INSPECTION

### ▲WARNING

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

### NOTE

- Be sure the battery is in good condition before performing this test.

Warm up the engine to normal operating temperature. Stop the engine, and connect the multimeter as shown.

### CAUTION

- *To prevent a short, make absolutely certain which are the positive and negative terminals or cable.*
- *Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.*

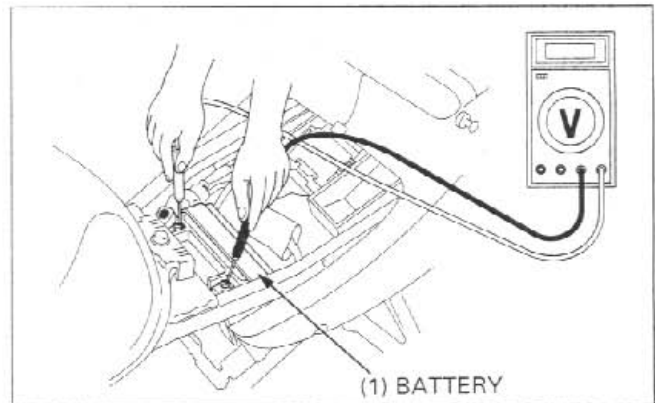
Restart the engine. Turn the headlight on Hi beam, measure the voltage on the multimeter when the engine runs at 5,000 rpm.

**Standard: 13.0 – 15.5 V at 5,000 rpm**

The battery is normal if the specified regulated voltage is displayed on the multimeter.

### NOTE

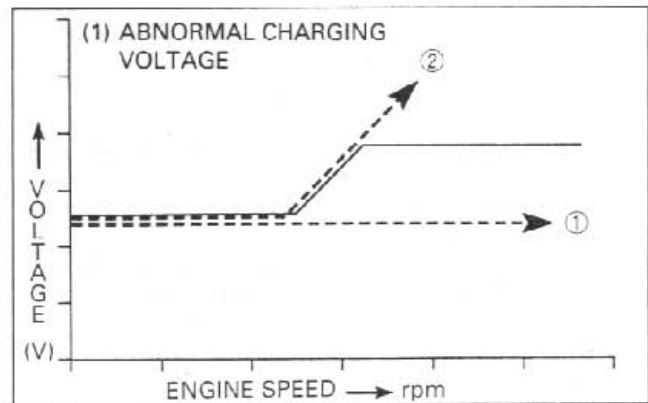
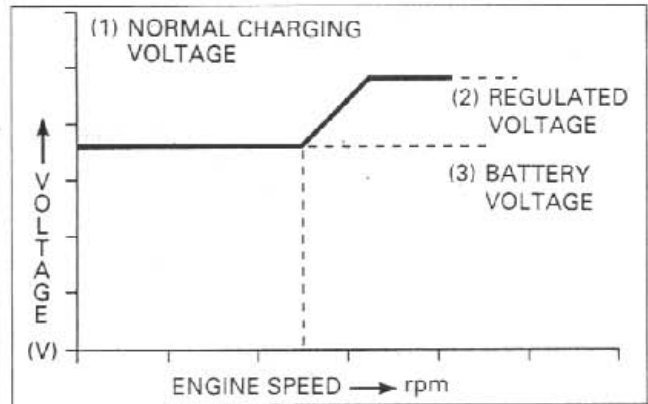
- The speed at which the voltage starts to rise cannot be checked as it varies with the temperature and loads of the generator.



A frequently discharged battery is an indication that it is deteriorated even if it proves normal in the regulated voltage inspection.

The charging circuit may be abnormal if any of the following symptoms is encountered.

1. Voltage not raised to regulated voltage (page 16-4):
  - Open or short circuit in the charging system wire harness or poorly connected connector.
  - Open or short of the alternator.
  - Faulty regulator/rectifier.
2. Regulated voltage too high (page 16-5):
  - Poorly grounded voltage regulator/rectifier.
  - Faulty battery.
  - Faulty regulator/rectifier.

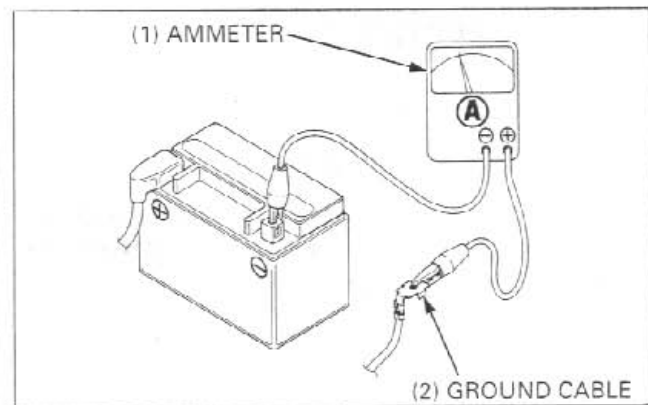


### CURRENT LEAKAGE INSPECTION

Turn the ignition switch off and disconnect the negative battery 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, check for current leakage.

**NOTE**

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



**SPECIFIED CURRENT LEAKAGE: 1 mA max.**

If current leakage exceeds the specified value, a shorted circuit is likely.  
 Locate the short by disconnecting connections one by one and measuring the current.



**ALTERNATOR CHARGING COIL**

**NOTE**

- It is not necessary to remove the stator coil to make this test.

**INSPECTION**

Remove the seat (page 2-2).

Disconnect the regulator/rectifier (alternator) 3P connector.

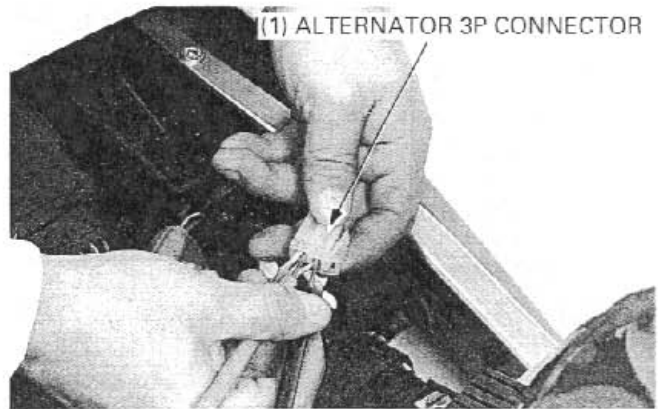
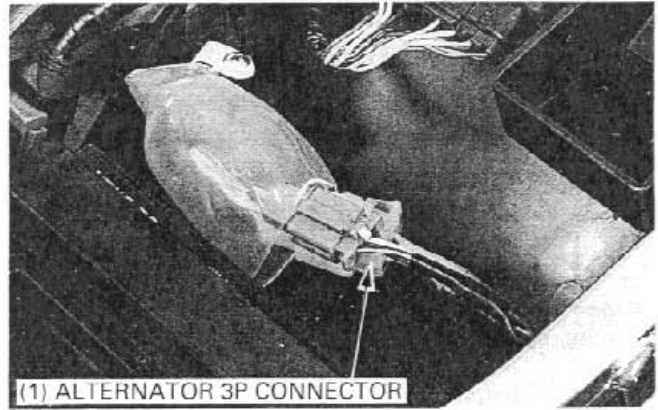
Check the resistance between all three Yellow terminals.

**STANDARD: 0.1 – 0.3 Ω (at 20°C/68°F)**

Check for continuity between all three Yellow terminals and Ground.

There should be no continuity.

Replace the alternator stator if readings are far beyond the standard, or if any wire has continuity to ground. Refer to section 10 for stator removal.

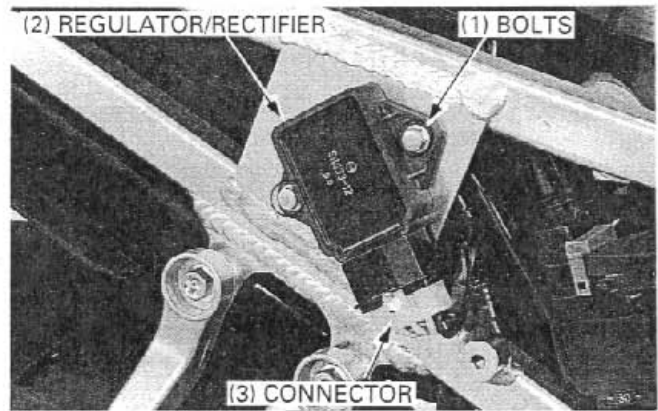


**REGULATOR/RECTIFIER**

**SYSTEM INSPECTION**

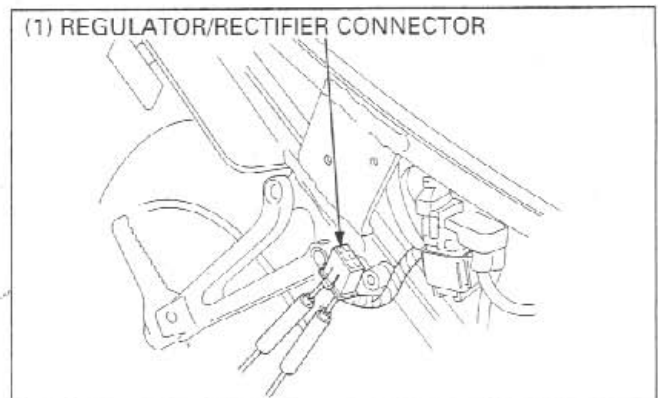
Remove the right side cover (page 2-6).

Remove the regulator/rectifier mounting bolts/nuts and disconnect the regulator/rectifier connector, and check it for loose contact or corroded terminals.



If the regulated voltage reading (see page 16-6) is out of the specification, measure the voltage between connector terminals (wire harness side) as follows:

| Item                  | Terminal                     | Specification                   |
|-----------------------|------------------------------|---------------------------------|
| Battery charging line | Red/White (+) and ground (-) | Battery voltage should register |
| Charging coil line    | Yellow and Yellow            | 0.1 – 0.3 Ω (at 20°C/68°F)      |
| Ground line           | Green and ground             | Continuity should exist         |

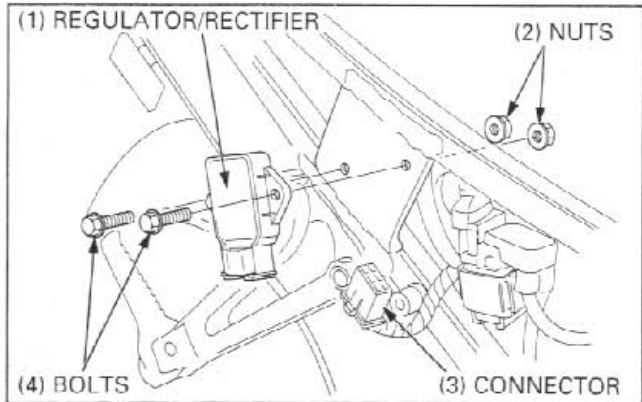


If all components of the charging system are normal and there are no loose connections at the regulator/rectifier connectors, replace the regulator/rectifier unit.

### **REMOVAL/INSTALLATION**

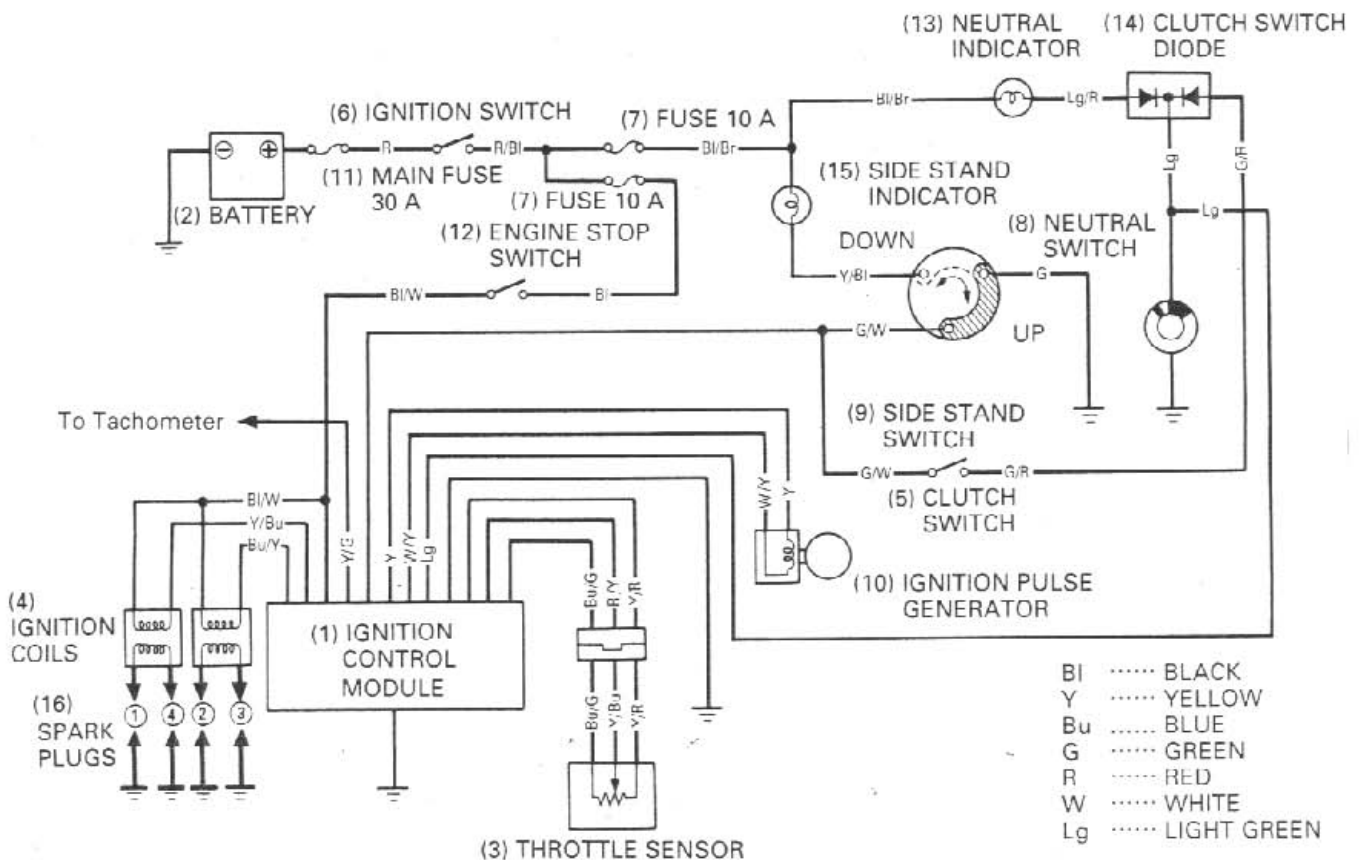
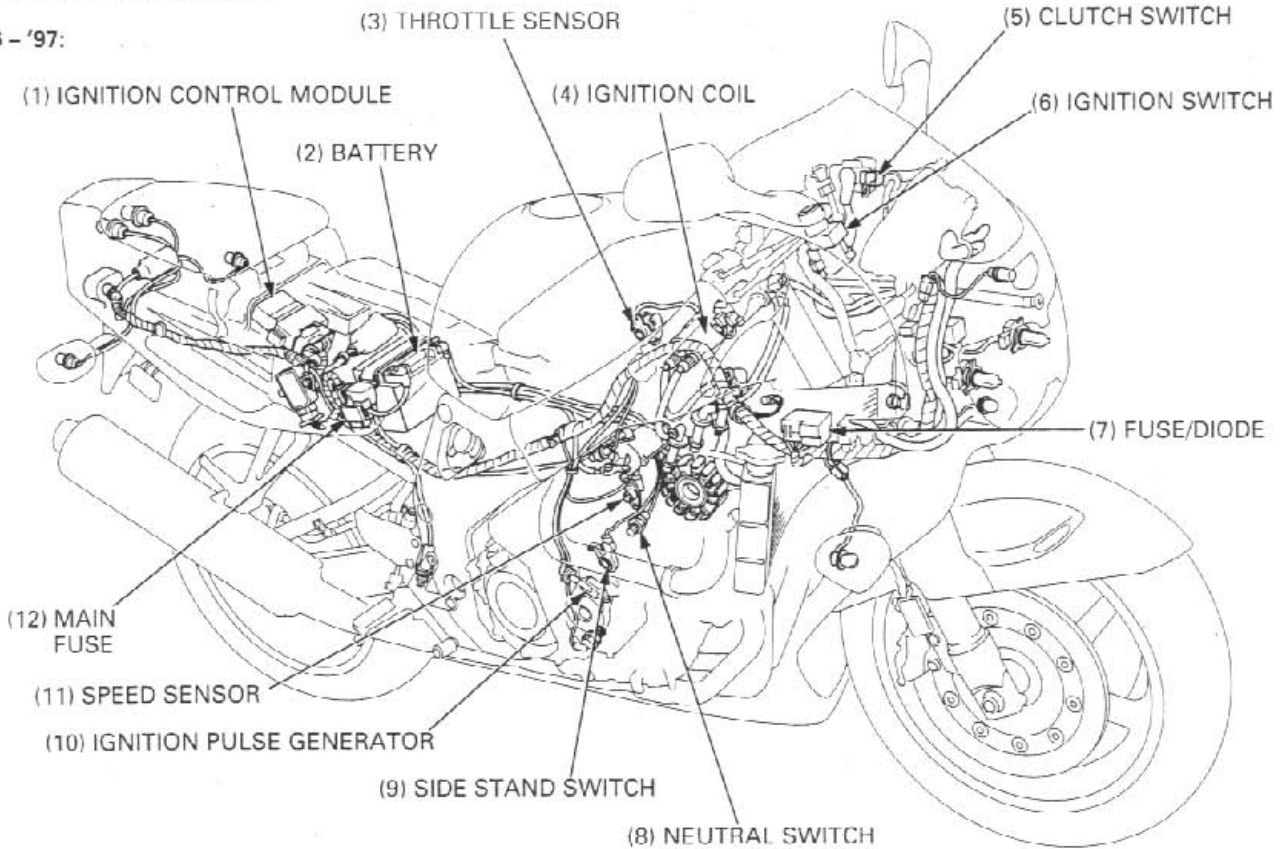
Remove the regulator/rectifier unit mounting bolts and nuts. Disconnect the connector and remove the regulator/rectifier unit.

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



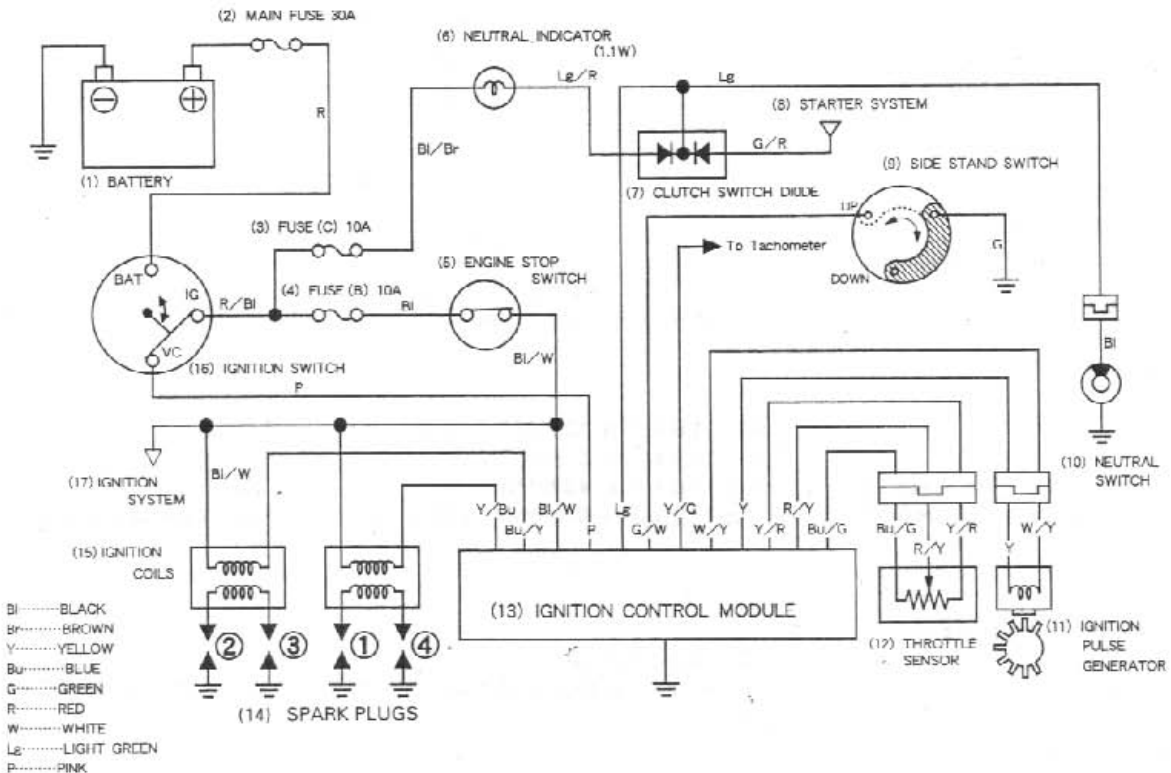
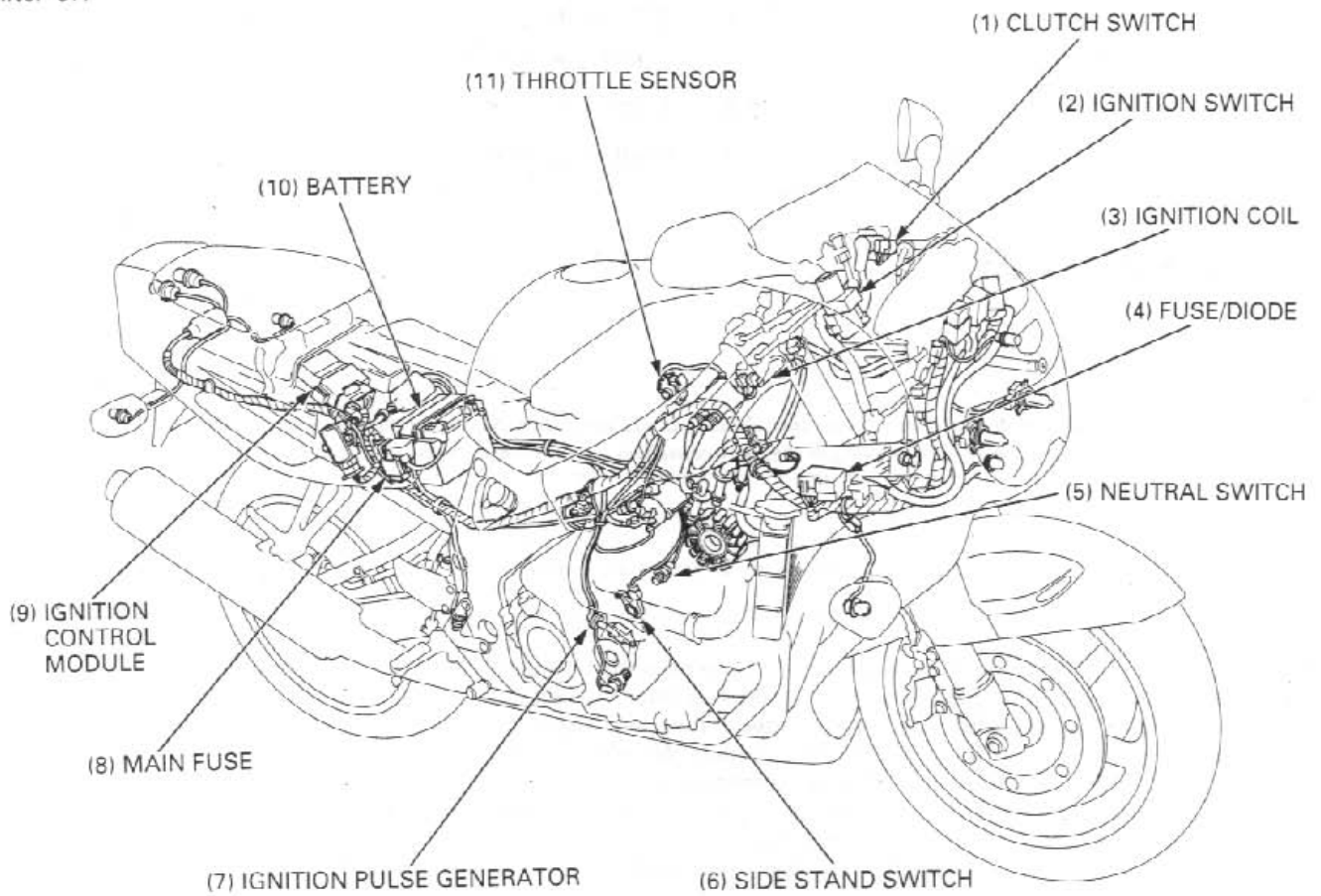
SYSTEM DIAGRAM

'96 - '97:



# 17. IGNITION SYSTEM

After '97:



|                            |      |                          |       |
|----------------------------|------|--------------------------|-------|
| SYSTEM DIAGRAM             | 17-0 | IGNITION COIL            | 17-6  |
| SERVICE INFORMATION        | 17-2 | IGNITION PULSE GENERATOR | 17-7  |
| TROUBLESHOOTING            | 17-3 | THROTTLE SENSOR          | 17-10 |
| IGNITION SYSTEM INSPECTION | 17-4 | IGNITION TIMING          | 17-11 |

## SERVICE INFORMATION

### GENERAL

#### ▲ WARNING

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

#### 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.*
- When servicing the ignition system, always follow the steps in the troubleshooting sequence on page 17-3.
- The ignition timing does not normally need to be adjusted since the Ignition Control Module (ICM) is factory preset.
- The Ignition Control Module (ICM), may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn off the ignition switch before servicing.
- A faulty ignition system is often related to poor connections. 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 at the spark plug.
- Use spark plug of the correct heat range. Using spark plug with an incorrect heat range can damage the engine.

### SPECIFICATIONS

| ITEM                                  |          | SPECIFICATIONS                    |          |
|---------------------------------------|----------|-----------------------------------|----------|
| Spark plug                            |          | NGK                               | DENSO    |
|                                       | Standard | CR9EH 9                           | U27FER 9 |
|                                       | Optional | CR8EH 9                           | U24FER 9 |
| Spark plug gap                        |          | 0.80 – 0.90 mm (0.031 – 0.035 in) |          |
| Ignition coil peak voltage            |          | 100 V minimum                     |          |
| Ignition pulse generator peak voltage |          | 0.7 V minimum                     |          |
| Ignition timing                       | "F" mark | 10° BTDC at idle                  |          |

### TORQUE VALUES

|   |                               |   |
|---|-------------------------------|---|
| Crankshaft hole cap                         | 18 N·m (1.8 kgf·m, 13 lbf·ft) | Apply grease to the threads             |
| Spark plug                                  | 12 N·m (1.2 kgf·m, 9 lbf·ft)  |   |
| Ignition pulse generator rotor special bolt | 59 N·m (6.0 kgf·m, 43 lbf·ft) |   |
| Ignition pulse generator cover SH bolt      | 12 N·m (1.2 kgf·m, 9 lbf·ft)  | Apply sealant to the threads (2 places) |

### TOOLS

Imrie diagnostic tester (model 625) or  
Peak voltage adaptor

07HGJ 0020100 with  
Commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

## TROUBLESHOOTING

- Inspect the following before diagnosing the system.
  - Faulty spark plug
  - Loose spark plug cap or spark plug wire connection
  - Water got into the spark plug cap (leaking the ignition coil secondary voltage)
- If there is no spark at either cylinder, temporarily exchange the ignition coil with the other good one and perform the spark test. If there is spark, the exchanged ignition coil is faulty.
- "Initial voltage" of the ignition primary coil is the battery voltage with the ignition switch ON and engine stop switch at RUN (The engine is not cranked by the starter motor).

## No spark at all plugs

| Unusual condition             |  | Probable cause (Check in numerical order)   |
|-------------------------------|--|---|
| Ignition coil primary voltage | No initial voltage with ignition and engine stop switches ON. (Other electrical components are normal) | <ol style="list-style-type: none"> <li>Faulty engine stop switch.</li> <li>An open circuit in Black/White wire between the ignition coil and engine stop switch.</li> <li>Faulty ICM (in case when the initial voltage is normal while disconnecting ICM connector).</li> </ol>   |
|                               | Initial voltage is normal, but it drops down to 2 – 4 V while cranking the engine.                     | <ol style="list-style-type: none"> <li>Incorrect peak voltage adaptor connections.</li> <li>Undercharged battery.</li> <li>No voltage between the Black/White (+) and Body ground (-) at the ICM multi-connector or loosen ICM connection.</li> <li>An open circuit or loose connection in Green wire.</li> <li>An open circuit or loose connection in Yellow/Blue and Blue/Yellow wires between the ignition coils and ICM.</li> <li>Short circuit in ignition primary coil.</li> <li>Faulty side stand switch or neutral switch.</li> <li>An open circuit or loose connection in No. 7 related circuit wires.               <ul style="list-style-type: none"> <li>Side stand switch line: Green/White wire.</li> <li>Neutral switch line: Light Green and Light Green/Red wire.</li> </ul> </li> <li>Faulty ignition pulse generator (measure the peak voltage).</li> <li>Faulty ICM (in case when above No. 1 – 9 are normal).</li> </ol> |
|                               | Initial voltage is normal, but no peak voltage while cranking the engine.                              | <ol style="list-style-type: none"> <li>Faulty peak voltage adaptor connections.</li> <li>Faulty peak voltage adaptor.</li> <li>Faulty ICM (in case when above No. 1, 2 are normal).</li> </ol>  |
|                               | Initial voltage is normal, but peak voltage is lower than standard value.                              | <ol style="list-style-type: none"> <li>The multimeter impedance is too low; below 10 M<math>\Omega</math>/DCV.</li> <li>Cranking speed is too low (battery undercharged).</li> <li>The sampling timing of the tester and measured pulse were not synchronized (system is normal if measured voltage is over the standard voltage at least once).</li> <li>Faulty ICM (in case when above No. 1 – 3 are normal).</li> </ol>  |
|                               | Initial and peak voltage are normal, but does not spark.   | <ol style="list-style-type: none"> <li>Faulty spark plug or leaking ignition coil secondary current ampere.</li> <li>Faulty ignition coil.</li> </ol>   |
| Ignition pulse generator      | Peak voltage is lower than standard value.   | <ol style="list-style-type: none"> <li>The multimeter impedance is too low; below 10 M<math>\Omega</math>/DCV.</li> <li>Cranking speed is too low (battery undercharged).</li> <li>The sampling timing of the tester and measured pulse were not synchronised (system is normal if measured voltage is over the standard voltage at least once).</li> <li>Faulty ICM (in case when above No. 1 – 3 are normal).</li> </ol>  |
|                               | No peak voltage.   | <ol style="list-style-type: none"> <li>Faulty peak voltage adaptor.</li> <li>Faulty ignition pulse generator.</li> </ol>  |
| Ignition switch (After '97:)  | There is a continuity between Black and Pink terminals in either of the directions.                    | <ol style="list-style-type: none"> <li>Faulty ignition switch.</li> <li>Specified tester is not used.</li> </ol>  |
|                               | There is no continuity between Black and Pink terminals in either of the directions.                   | <ol style="list-style-type: none"> <li>Blown fuse (B) 10 A.</li> <li>Faulty engine stop switch.</li> <li>Faulty ignition switch.</li> <li>Specified tester is not used.</li> </ol>  |

### IGNITION SYSTEM INSPECTION

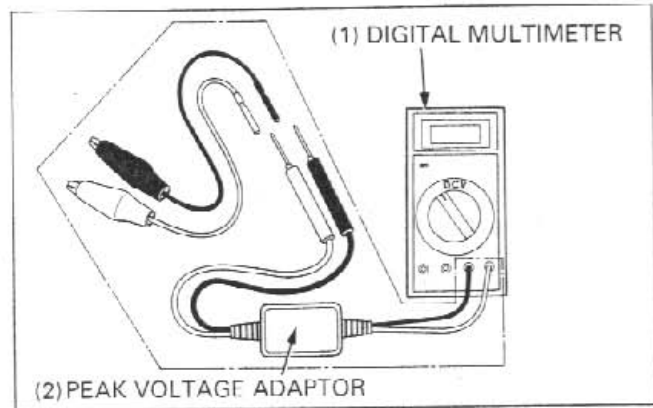
#### NOTE

- If there is no spark at any plug, check all connections for loose or poor contact before measuring each peak voltage.
- Use recommended digital multimeter or commercially available digital multimeter with an impedance of 10 M $\Omega$ /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If using Imrie diagnostic tester (model 625), follow the manufacturer's instructions.

Connect the peak voltage adaptor to the digital multimeter, or use the Imrie diagnostic tester.

#### TOOLS:

Imrie diagnostic tester (model 625) or  
Peak voltage adaptor 07HGJ - 0020100 with  
Commercially available digital multimeter (impedance 10 M $\Omega$ /DCV minimum)

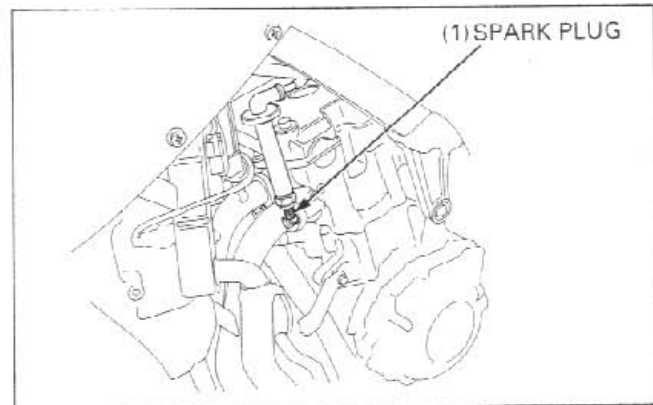


### IGNITION COIL PRIMARY PEAK VOLTAGE

#### NOTE

- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that the spark plugs are installed correctly.

Shift the transmission into neutral and disconnect the all spark plug caps from the spark plugs.  
Connect a known good spark plugs to the spark plug caps and ground the spark plugs to the cylinder as done in a spark test.



With the ignition coil primary wire connected, connect the peak voltage adaptor or Imrie tester to the ignition coil.

**CONNECTION:**

- No. 1/4 coil: Black/White terminal (+) – Body ground (-)
- No. 2/3 coil: Blue/Yellow terminal (+) – Body ground (-)

Turn the ignition switch "ON" and engine stop switch to "RUN".

Check for initial voltage at this time.

The battery voltage should be measured.

If the initial voltage cannot be measured, check the power supply circuit (refer to troubleshooting, page 17-3).

Crank the engine with the starter motor and read ignition coil primary peak voltage.

**PEAK VOLTAGE: 100 V minimum**

**▲ WARNING**

- Avoid touching the spark plugs and tester probes to prevent electric shock.

If the peak voltage is abnormal, check for an open circuit or poor connections in Yellow/Blue and Black/White wires. If not defects are found in the harness, refer to the troubleshooting chart on page 17-3.

**IGNITION PULSE GENERATOR PEAK VOLTAGE**

**NOTE**

- Check cylinder compression and check that the spark plugs are installed correctly.

Remove the seat (page 2-2).

Disconnect the multi-connector from the ICM. Connect the peak voltage adaptor or Imrie tester probes to the connector terminals of the wire harness side.

**TOOLS:**

- Imrie diagnostic tester (model 625) or
- Peak voltage adaptor 07HGJ – 0020100 with
- Commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

**CONNECTION:**

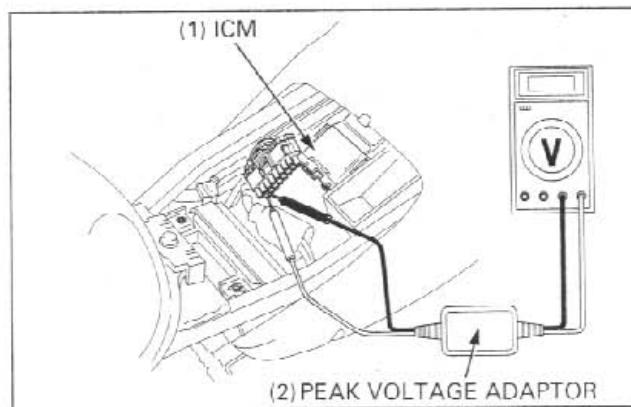
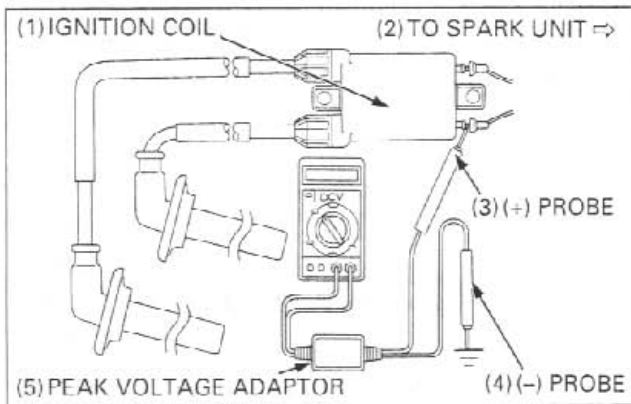
- Yellow terminal (+) – White/Yellow (-)

Crank the engine with the starter motor and read the peak voltage.

**PEAK VOLTAGE: 0.7 V minimum**

**▲ WARNING**

- Avoid touching the spark plugs and tester probes to prevent electric shock.





## IGNITION SYSTEM

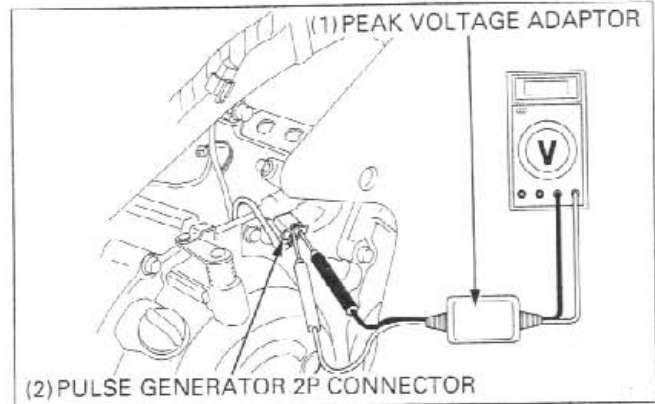
If the peak voltage measured at ICM multi connector is abnormal, measure the peak voltage at the pulse generator connector.

Remove the fuel tank (page 2-2).

Disconnect the ignition pulse generator 2P (Black) connector and connect the tester probes to the terminal (Yellow and White/Yellow).

In the same manner as at the ICM connector, measure the peak voltage and compare it to the voltage measured at the ICM connector.

- If the peak voltage measured at the ICM is abnormal and the one measured at the ignition pulse generator is normal, the wire harness has an open circuit or loose connection.
- If both peak voltages measure are abnormal, check each item in the troubleshooting chart. If all items are normal, the ignition pulse generator is faulty. See section 10 for ignition pulse generator replacement.



## IGNITION COIL

### REMOVAL/INSTALLATION

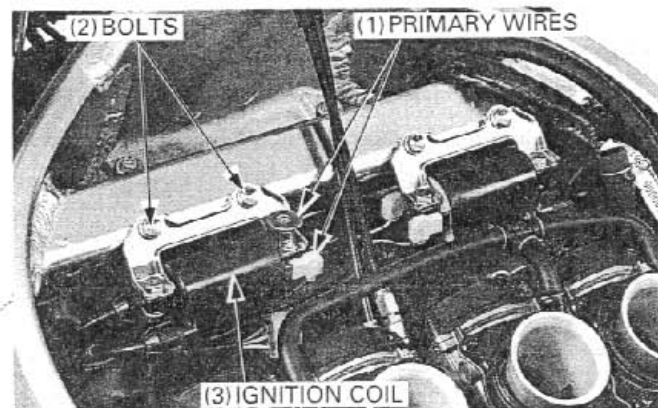
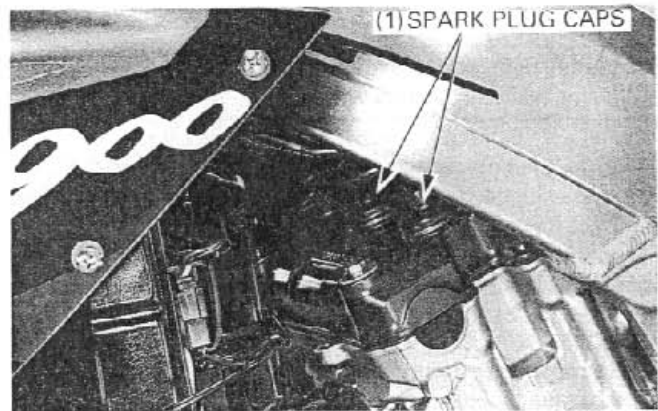
Remove the following:

- Air cleaner housing (page 5-4)
- Middle cowl (page 2-6)

Disconnect the spark plug caps from the plugs.

Disconnect the primary wires from the ignition coils. Remove the bolts and ignition coils.

Installation is in the reverse order of removal.



## IGNITION PULSE GENERATOR

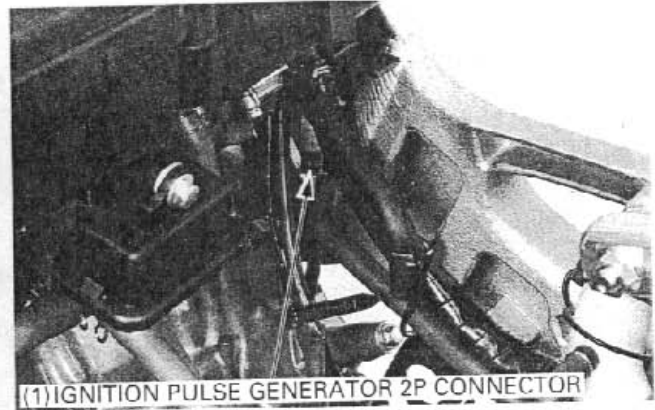
### REMOVAL

Remove the following:

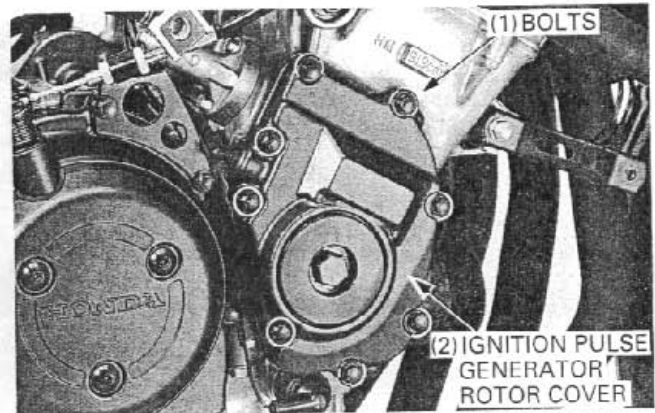
- Fuel tank (page 2-2)
- Middle/lower cowl (page 2-6)

Disconnect the ignition pulse generator 2P (Black) connector.

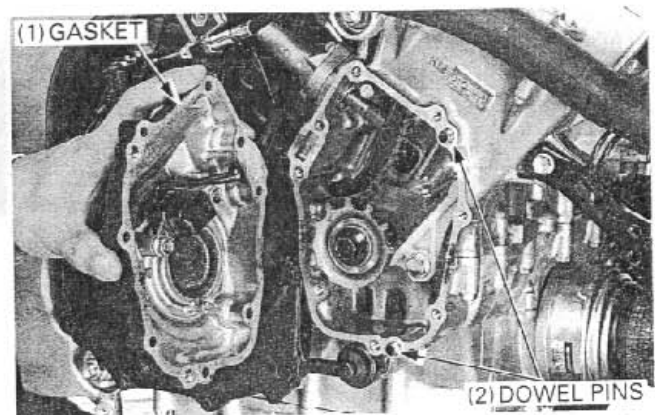
Release the wire from the wire clamp.



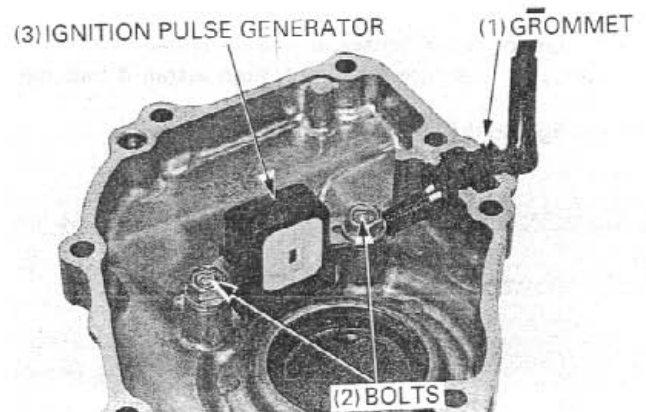
Remove the SH bolts and ignition pulse generator rotor cover.



Remove the gasket and dowel pins.



Remove the wire grommet from the cover.  
Remove the bolts and ignition pulse generator.

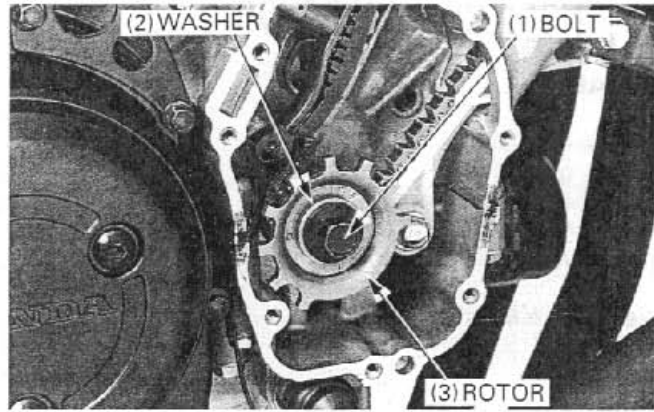


## IGNITION SYSTEM

Shift the transmission into 6th gear and apply rear brake.  
Remove the ignition pulse generator rotor bolt.

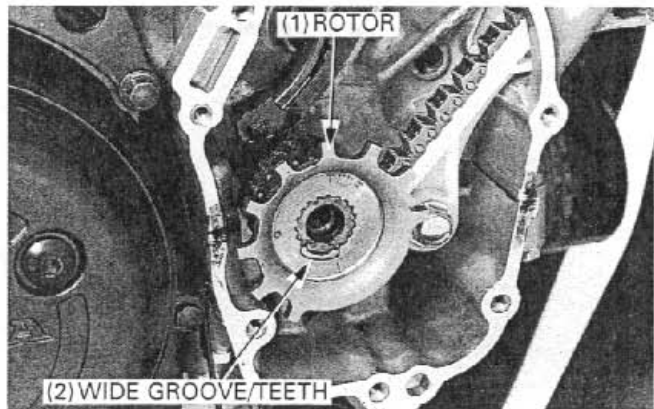
### NOTE

- If the engine is out of the frame, remove the alternator cover (page 10-2) and hold the flywheel with the flywheel holder (07725 - 0040000), then remove the bolt.



## INSTALLATION

Install the ignition pulse generator rotor by aligning the wide groove with the wide teeth of the crankshaft.

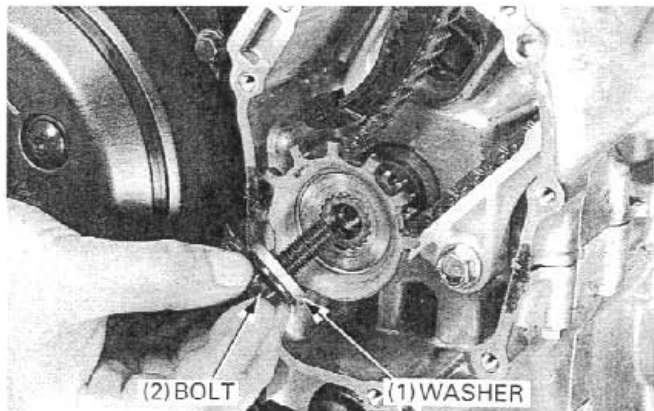


Install the washer and rotor bolt.  
Shift the transmission into 6th gear and apply rear brake.  
Tighten the ignition pulse generator rotor bolt.

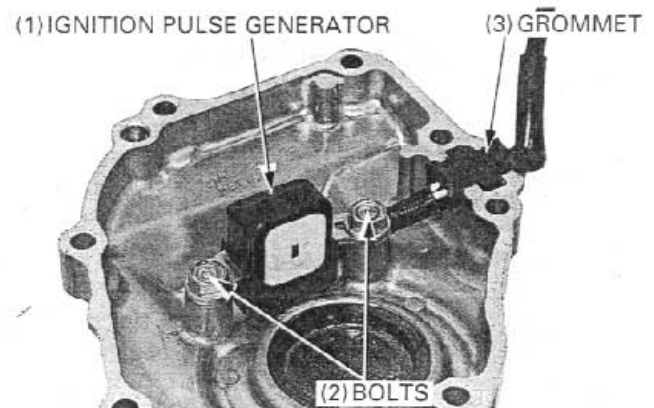
### NOTE

- If the engine is out of frame, remove the alternator cover (page 10-2) and hold the flywheel with the flywheel holder (07725 - 0040000), then tighten the bolt.

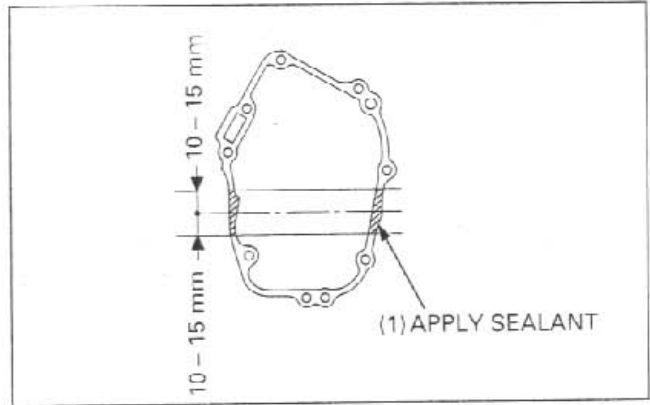
**TORQUE: 59 N·m (6.0 kgf·m, 43 lbf·ft)**



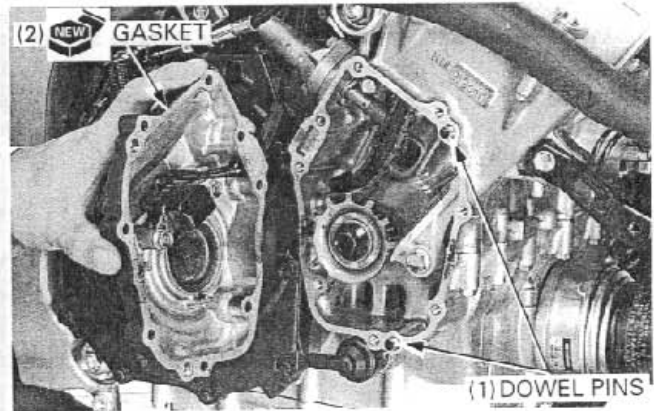
Install the ignition pulse generator into the cover.  
Apply sealant to the wire grommet, then install it into the groove of the cover.  
Install and tighten the ignition pulse generator bolts.



Apply liquid sealant to the mating surface of the crankcase as shown.

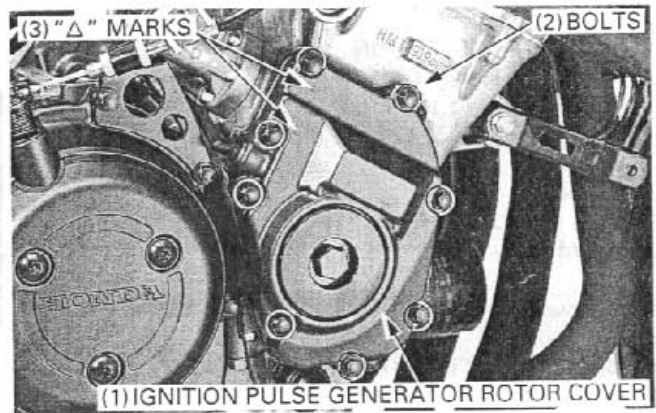


Install the dowel pins and a new gasket.



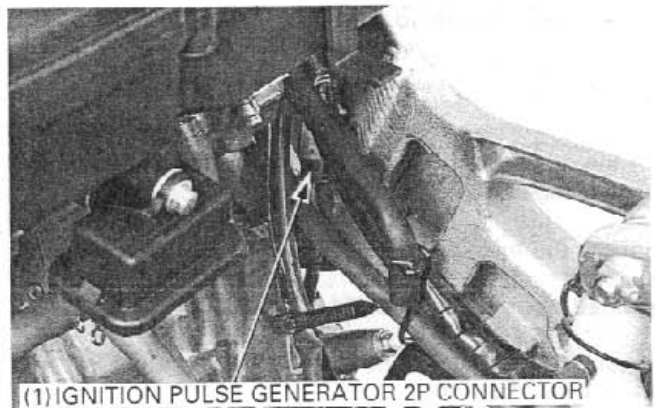
Apply sealant to the threads of the two bolts indicated by "Δ" mark on the cover.  
Install the ignition pulse generator rotor cover and tighten the SH bolt to the specified torque.

**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**



Route the ignition pulse generator wire properly, connect the 2P (Black) connector.  
Clamp the wire with the band.

Install the removed parts in the reverse order of removal.

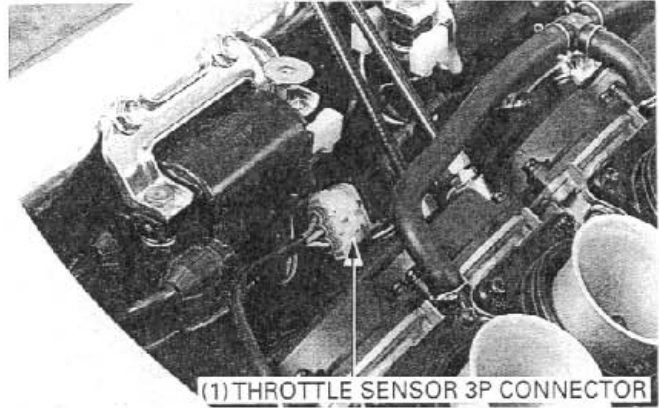


# THROTTLE SENSOR

## INSPECTION

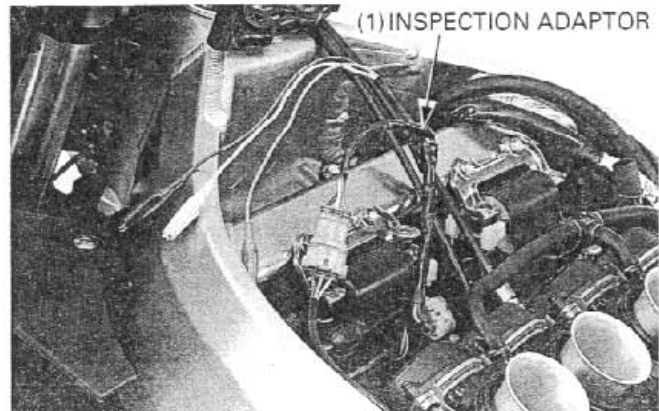
Remove the air cleaner housing (page 5-4).

Disconnect the throttle sensor 3P connector.  
Check the connector for loose or corroded terminals.



Connect the inspection adaptor between the throttle sensor connectors.

**TOOL:**  
Inspection adaptor                      07GMJ - ML80100

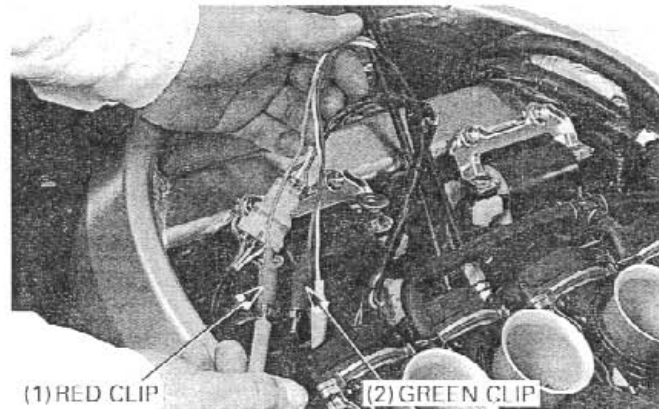


## INPUT VOLTAGE INSPECTION

Turn the ignition switch ON.  
Measure and record the input voltage at the inspection adaptor terminals using a digital multimeter.

**CONNECTION:**  
Red clip (+) - Green clip (-)  
Standard: 4.5 - 5.5 V

If the measurement is out of specification, check the following:  
— Loose connection of the ICM multi-connector  
— Open circuit in wire harness



## OUTPUT VOLTAGE INSPECTION

Set a digital multimeter to the inspection adaptor terminals.

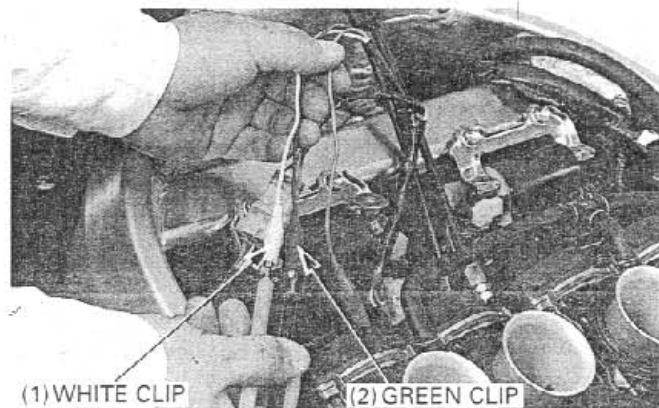
**CONNECTION:**  
White clip (+) - Green clip (-)

Turn the ignition switch ON and measure and record the output voltage with the throttle fully open.

Compare the measurement to the result of the following calculation.

$$\text{Measured input voltage} \times 0.824 = V_o$$

The sensor is normal if the measurement output voltage value is within  $V_o \pm 10\%$ .



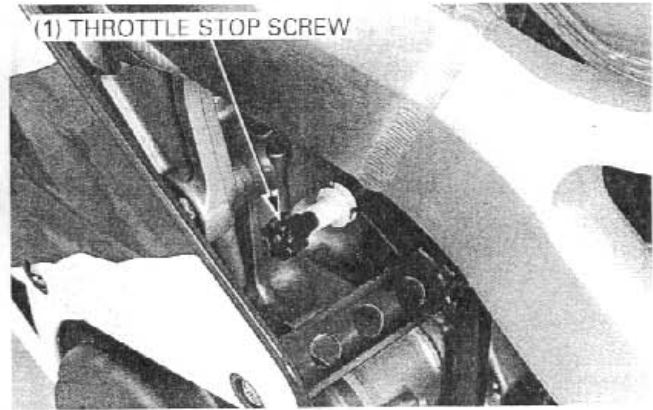
Turn the throttle stop screw counterclockwise fully, and measure and record the output voltage with the throttle fully closed.

Compare the measurement to the result of the following calculation.

**Measured input voltage X 0.1 = Vc**

The sensor is normal if the measurement output voltage value is within  $Vc \pm 10\%$ .

Using an analog meter, check that the needle of the voltmeter swings slowly when the throttle is opened gradually.

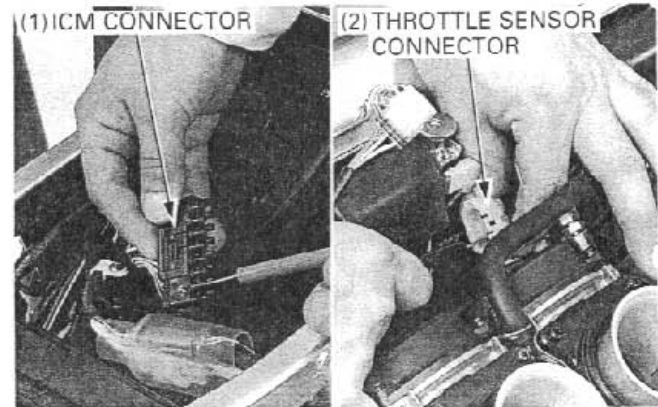


### CONTINUITY INSPECTION

Disconnect the ICM multi-connector and throttle sensor 3P connector.

Check for continuity between the ICM and throttle sensor.

If there is no continuity, check the open or short circuit in wire harness.



## IGNITION TIMING

### ▲ WARNING

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

### NOTE

- Read the instructions for timing light operation.

Warm up the engine.

Stop the engine and remove the crankshaft hole cap.

Connect the timing light to the No. 1 spark plug wire.

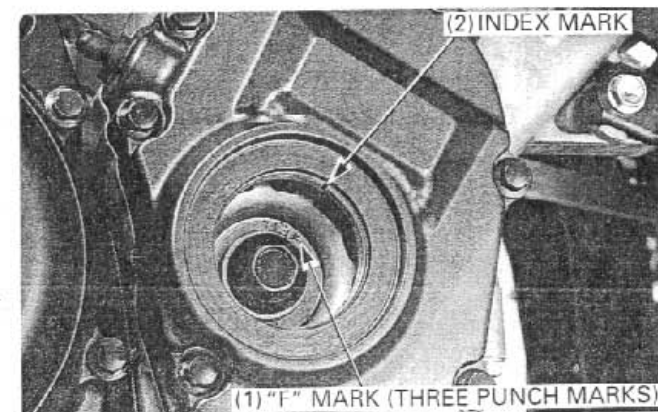
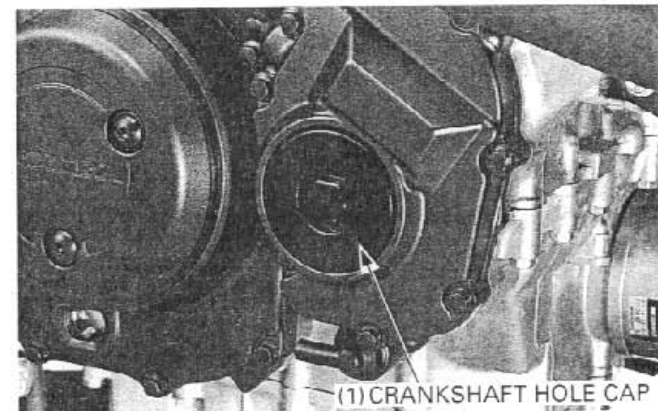
Start the engine and let it idle.

### IDLE SPEED:

|                         |                 |
|-------------------------|-----------------|
| Except California type: | 1,100 ± 100 rpm |
| California type:        | 1,200 ± 100 rpm |

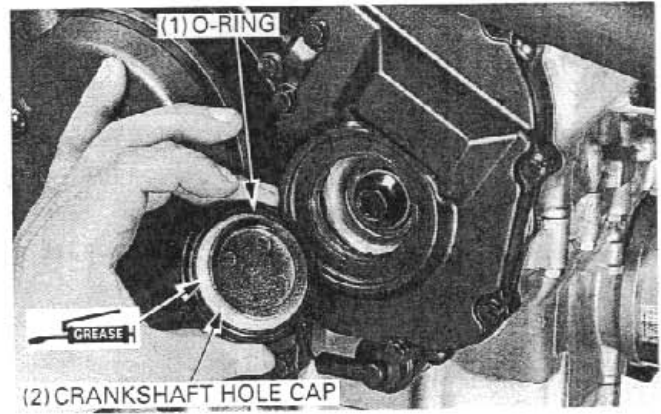
The ignition timing is correct if the "F" mark (three punch marks) aligns with the index mark on the ignition pulse generator rotor cover.

Increase the engine speed by turning the throttle stop screw and make sure the "F" mark begins to move counterclockwise when the engine speed at approximately 1,600 min<sup>-1</sup> (rpm).



## IGNITION SYSTEM

Check the O-ring is in good condition, replace if necessary. Apply oil to the O-ring and install and tighten the timing hole cap.



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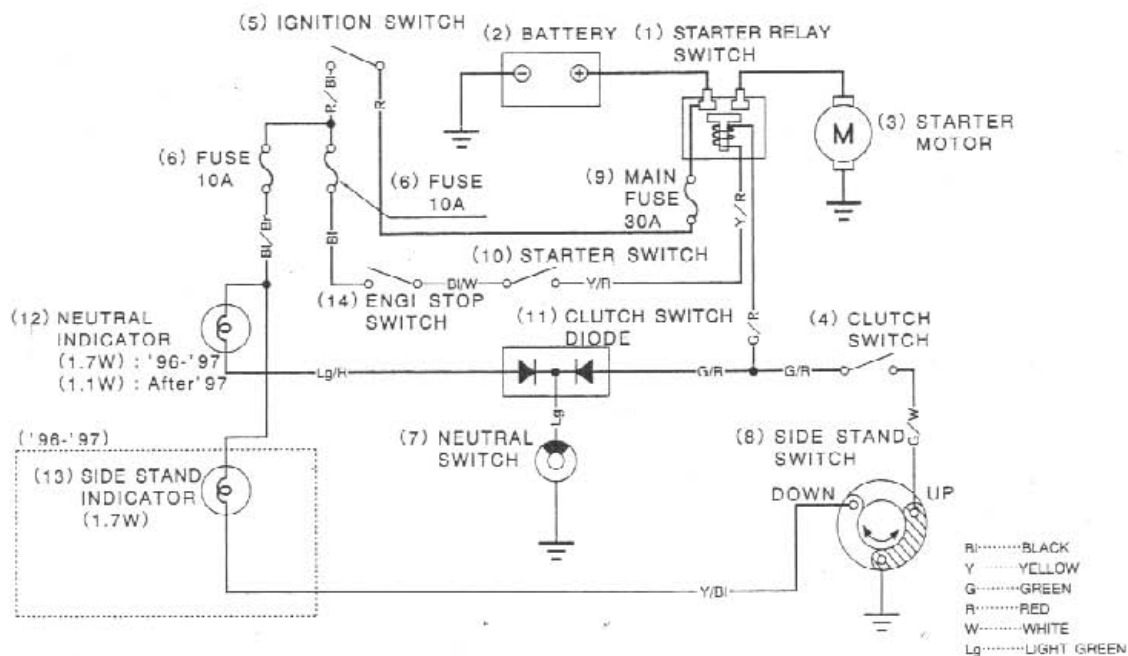
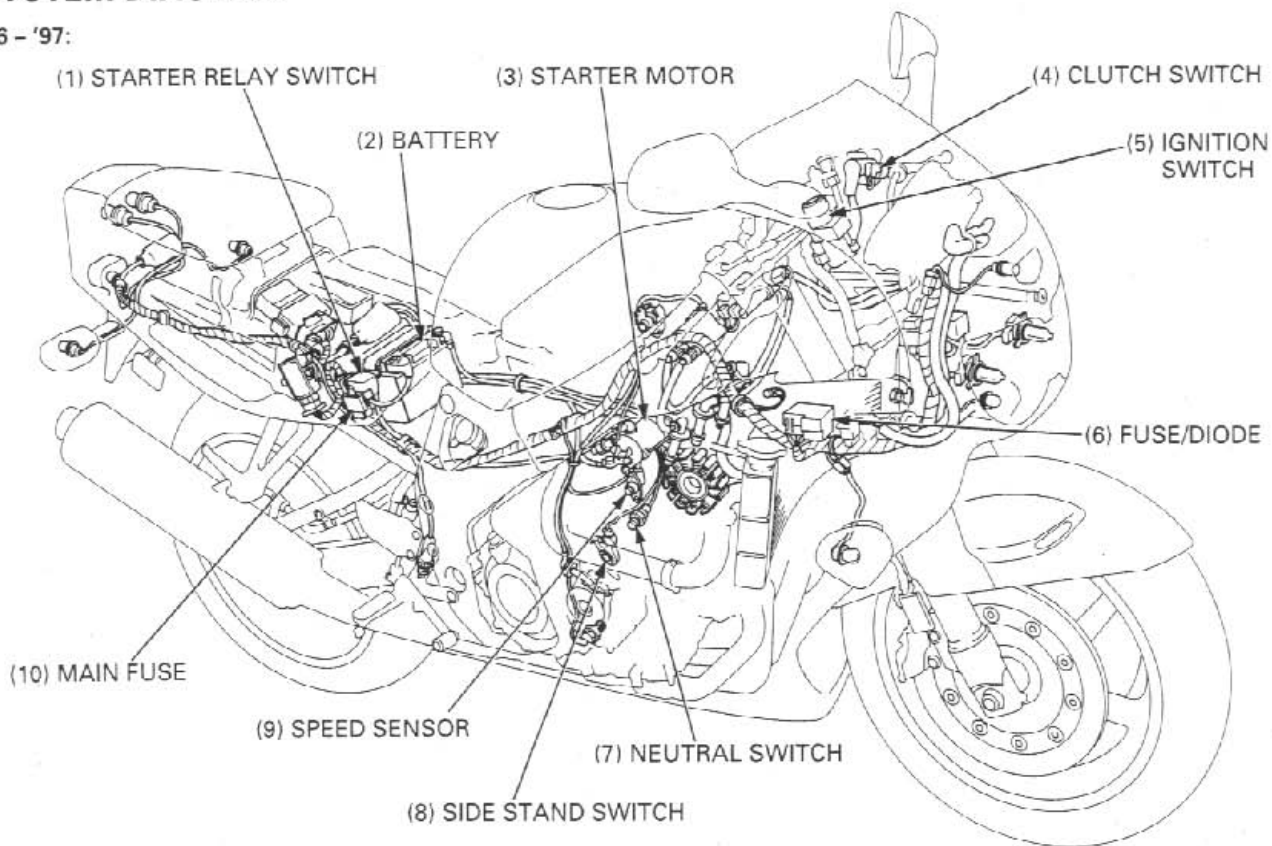
MEMO

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# SYSTEM DIAGRAM

'96 - '97:



|                     |      |                      |       |
|---------------------|------|----------------------|-------|
| SYSTEM DIAGRAM      | 18-0 | STARTER MOTOR        | 18-4  |
| SERVICE INFORMATION | 18-1 | STARTER RELAY SWITCH | 18-10 |
| TROUBLESHOOTING     | 18-2 | DIODE                | 18-11 |

## SERVICE INFORMATION

### GENERAL

- The starter motor can be removed with the engine in the frame.
- For the starter drive and driven gear removal/installation, see section 10.

### SPECIFICATION

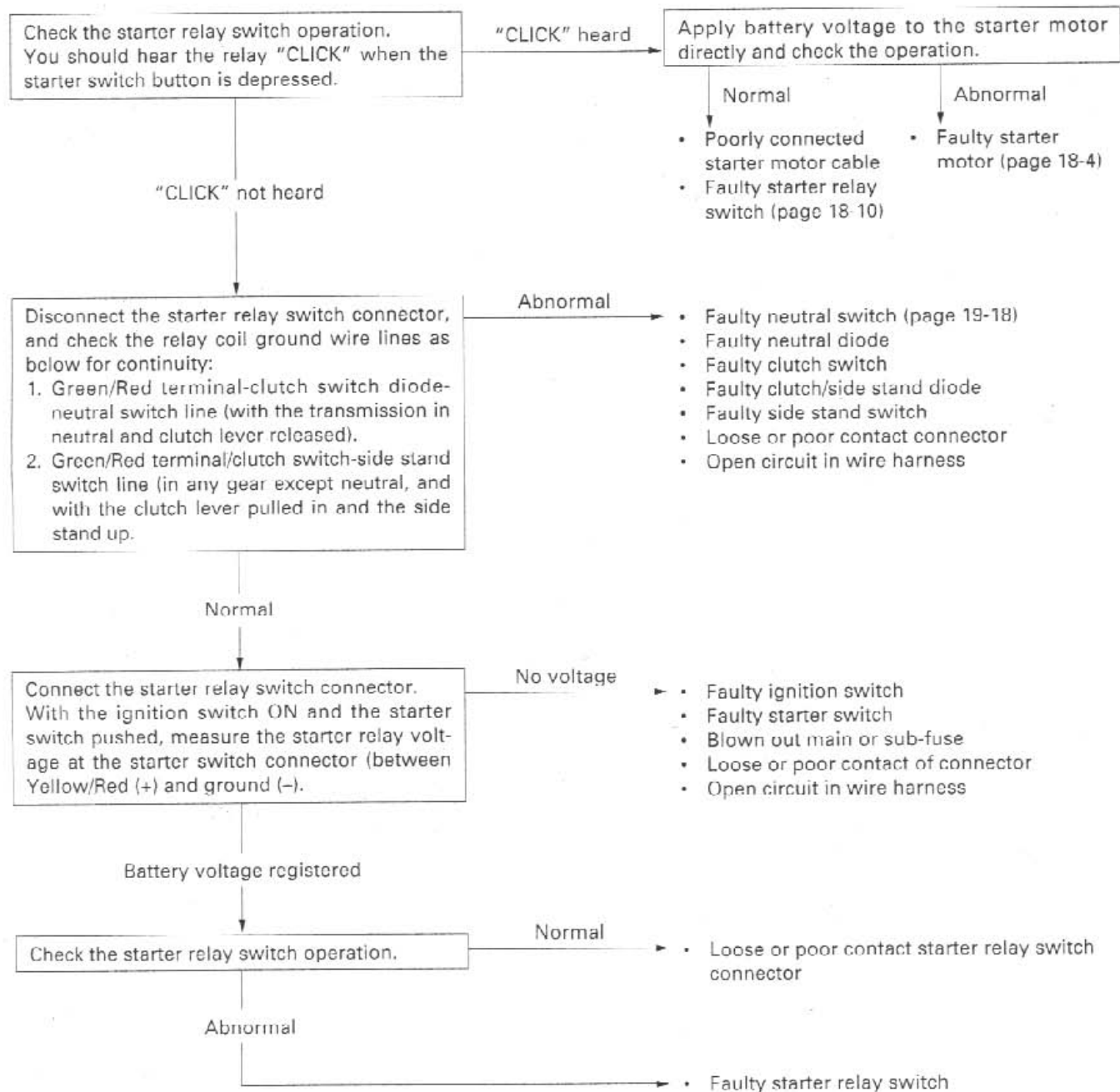
Unit: mm (in)

| ITEM                       | STANDARD                  | SERVICE LIMIT |
|----------------------------|---------------------------|---------------|
| Starter motor brush length | 12.0 – 13.0 (0.47 – 0.51) | 4.5 (0.18)    |

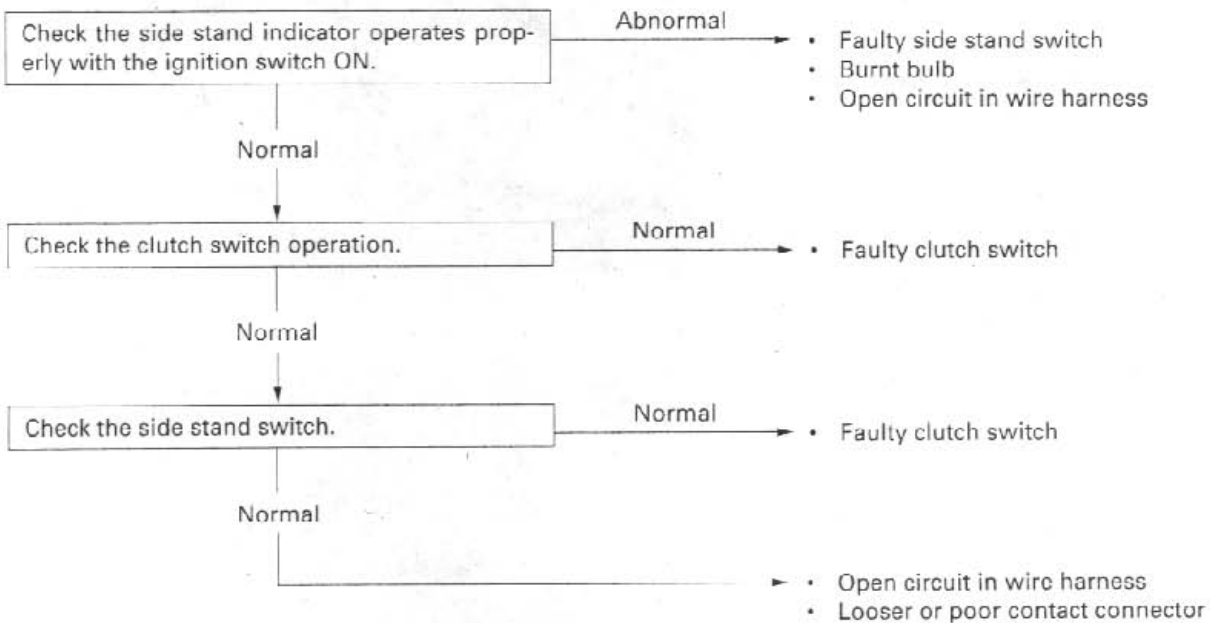
# TROUBLESHOOTING

## Starter motor does not turn

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



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.



#### Stater motor turns engine slowly

- Low battery voltage
- Poorly connected battery terminal cable
- Poorly connected starter motor cable
- Faulty starter motor
- Poor 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 drive gear

#### Starter relay switch "Clicks", but engine does not turn over

- Crankshaft does not turn due to engine problems

# STARTER MOTOR

## REMOVAL

**▲ WARNING**

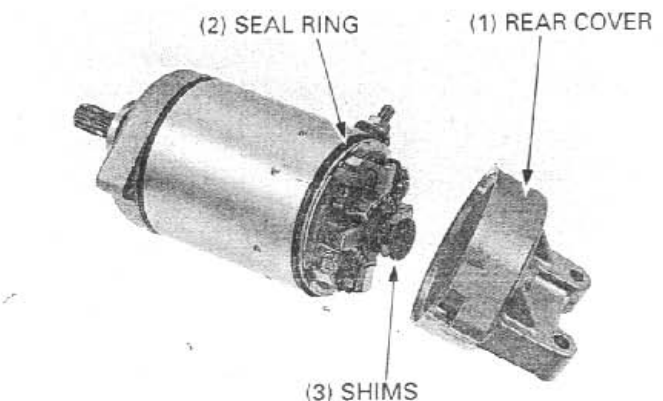
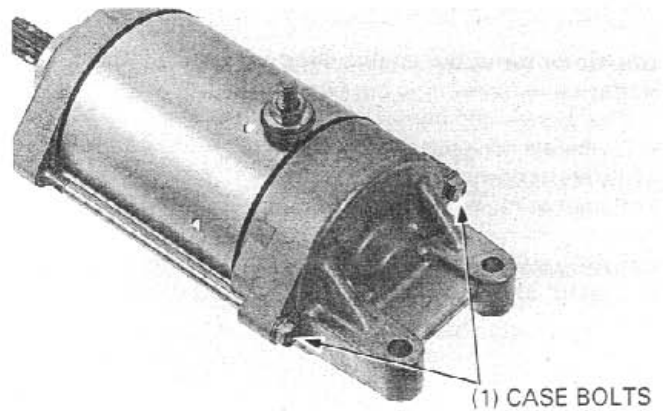
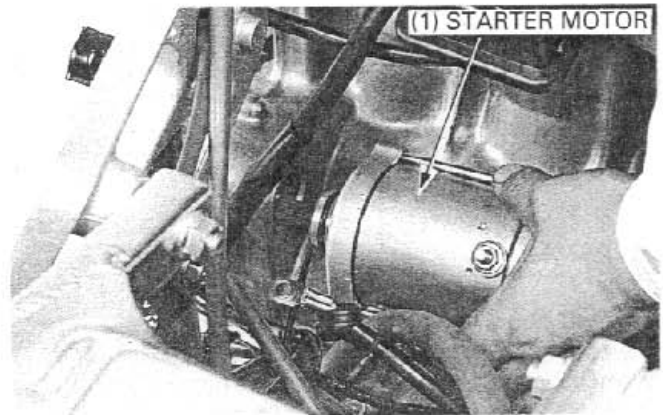
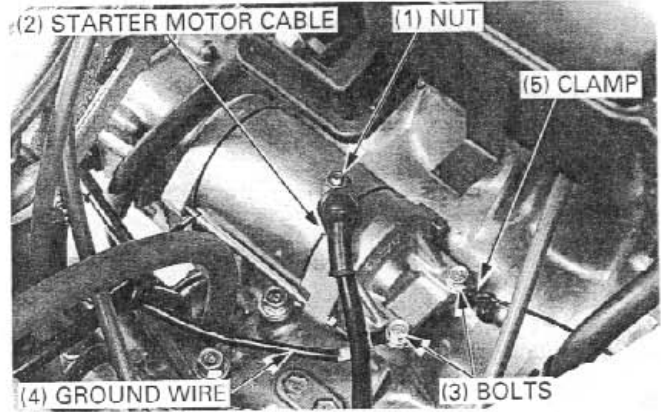
- *With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.*

Remove the fuel tank (page 2-2).

Remove the nut and the starter motor cable from the starter motor.

Remove the starter motor mounting bolts, ground wire, wire clamp.

Pull the starter motor out of the crankcase.



## DISASSEMBLY

**NOTE**

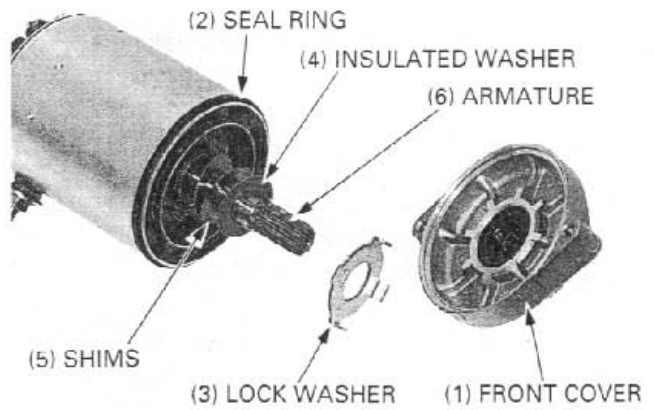
- Record the location and number of shims.

Remove the following:

- Starter motor case bolts

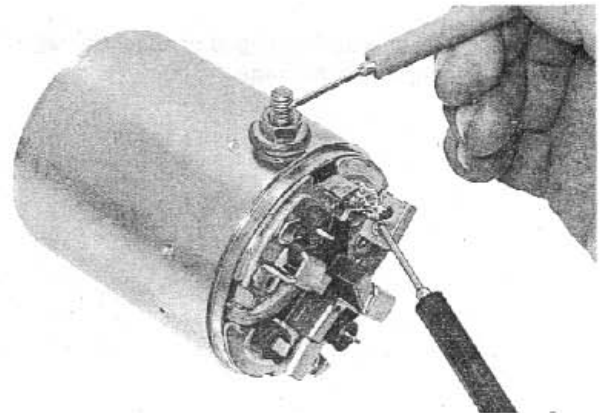
- Rear cover assembly
- Seal ring
- Shims

- Front cover assembly
- Seal ring
- Lock washer
- Insulated washer
- Shims
- Armature

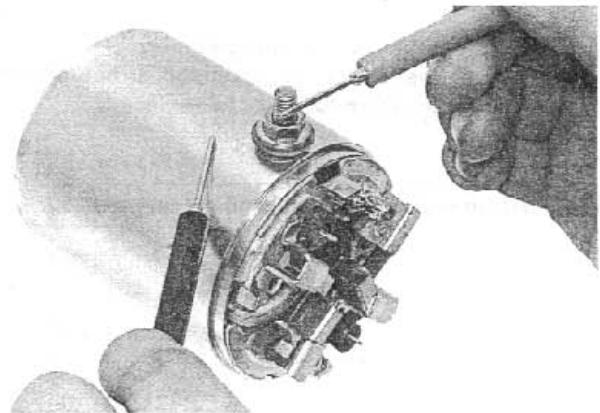


**INSPECTION**

Check for continuity between the cable terminal and the brush wire (the indigo colored wire or the insulated brush holder).  
There should be continuity.

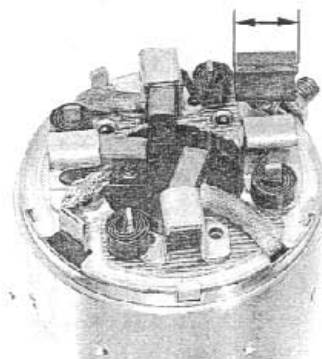


Check for continuity between the motor case and the cable terminal.  
There should be no continuity.



Inspect the brushes for damage and measure the brush length.

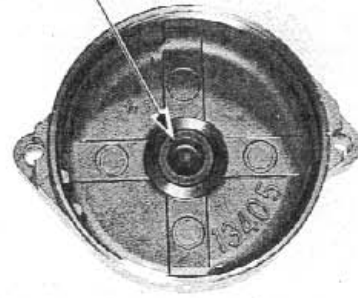
**SERVICE LIMIT: 4.5 mm (0.18 in)**



## ELECTRIC STARTER

Check the bushing of the rear cover for wear or damage.

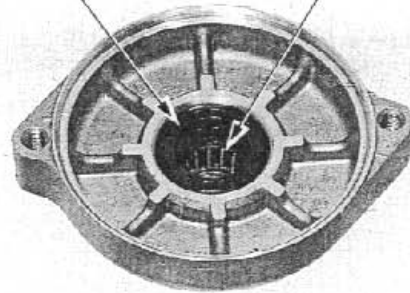
(1) BUSHING



Check the front cover oil seal for fatigue or other damage.  
Check the needle bearing for damage.

(1) OIL SEAL

(2) NEEDLE BEARING

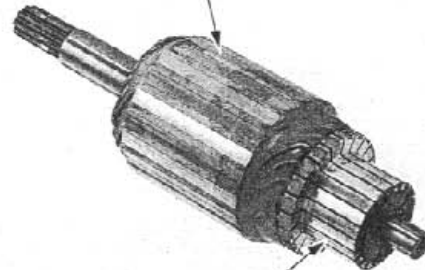


Inspect the commutator bars for discoloration.  
Bars discolored in pairs indicate grounded armature coils,  
in which case the starter motor must be replaced.

### NOTE

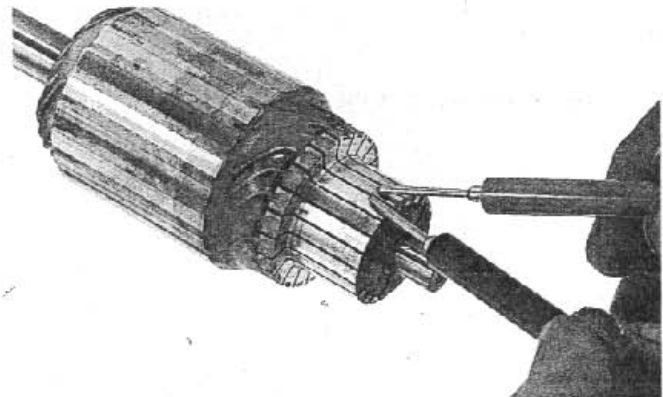
- Do not use emery or sand paper on the commutator.

(1) ARMATURE

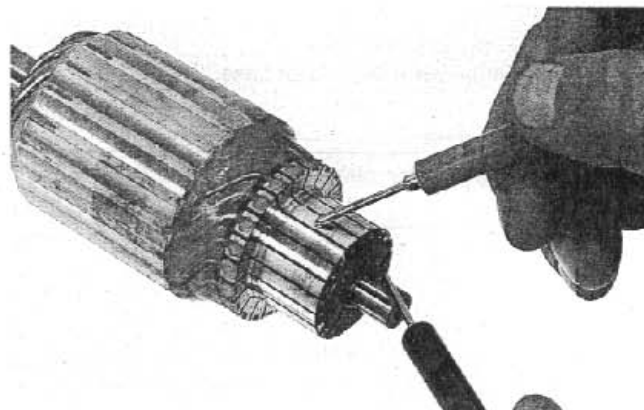


(2) COMMUTATOR BARS

Check for continuity between individual commutator bars;  
there should be continuity.

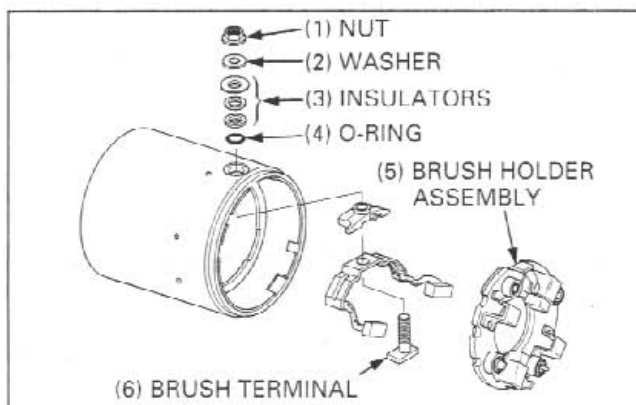


Also, check for continuity between individual commutator bars and the armature shaft; there should be no continuity.

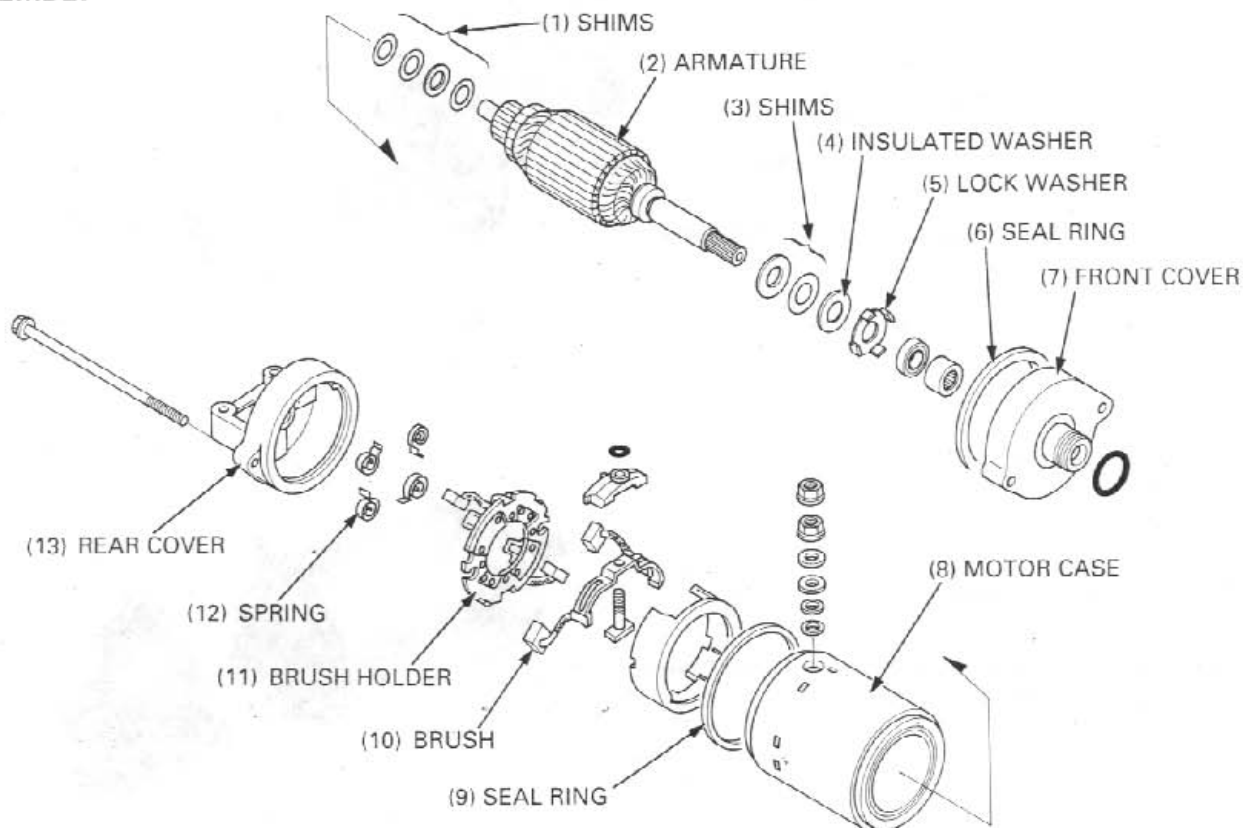


Remove the following:

- Nut
- Washer
- Insulators
- O-ring
- Brush holder assembly
- Brush/terminal



**ASSEMBLY**



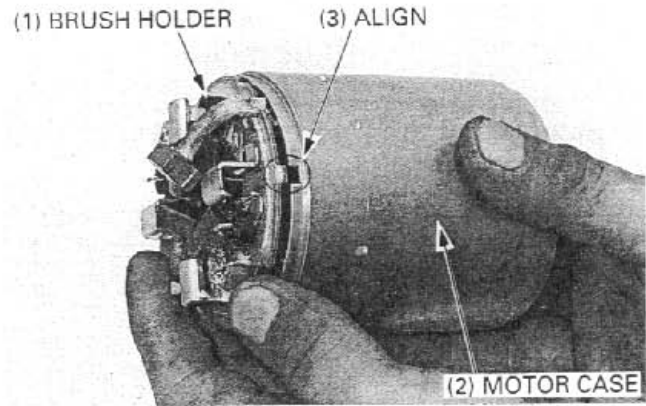


## ELECTRIC STARTER

Set the brushes on the brush holder.  
Install the brush holder onto the motor case.

### NOTE

- Align the terminal holder plate boss with the groove of the motor case.

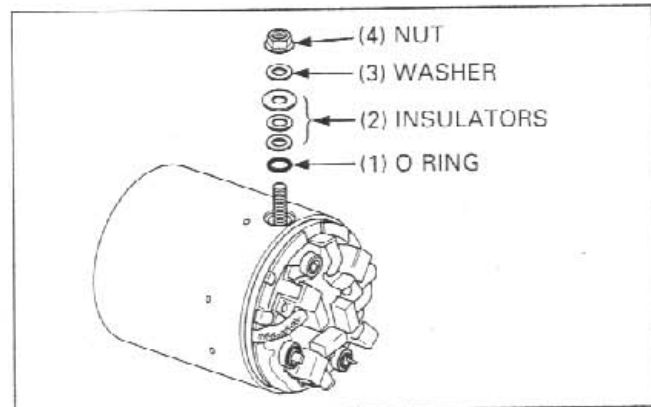


Install the following:

- O-ring
- Insulators
- Washer
- Nut

### NOTE

- Install the insulators properly as noted during removal.



Install the armature in the motor case.

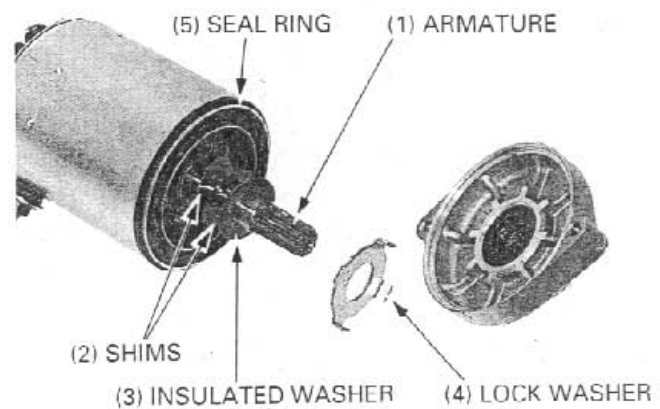
Install the shims on the armature shaft.

### NOTE

- Install the shims properly as noted during removal.

Install the insulated washer and lock washer on the armature shaft.

Install the seal ring onto the motor case.

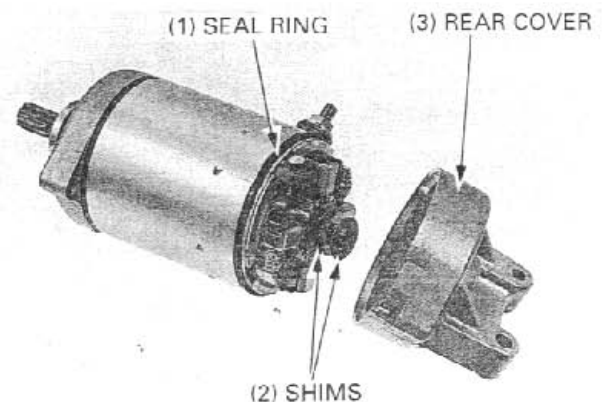


Install the seal ring on the motor case.  
Install the shims on the armature shaft.

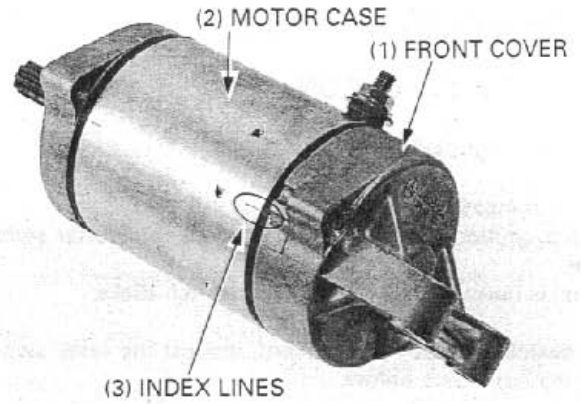
### NOTE

- Install the shims properly as noted during removal.

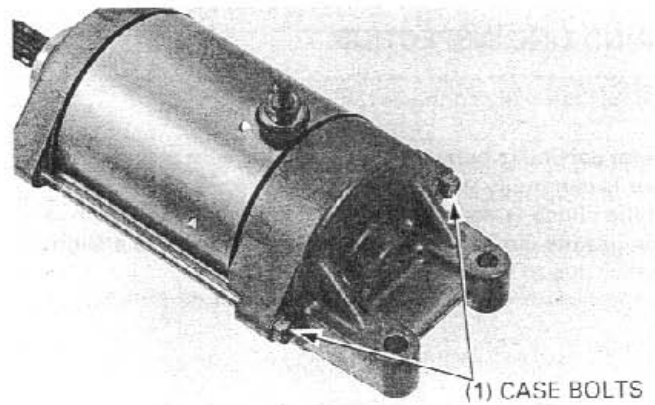
Assemble the motor case and rear cover, aligning the brush holder boss with the groove in the rear cover.



Install the front cover to the motor case.  
Make sure the index lines are aligned.



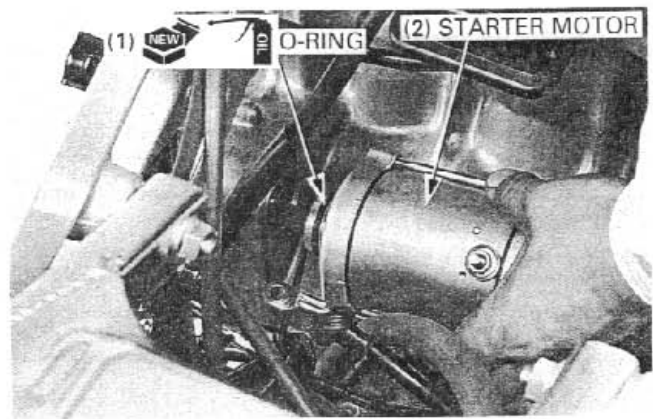
Install and tighten the case bolts securely.



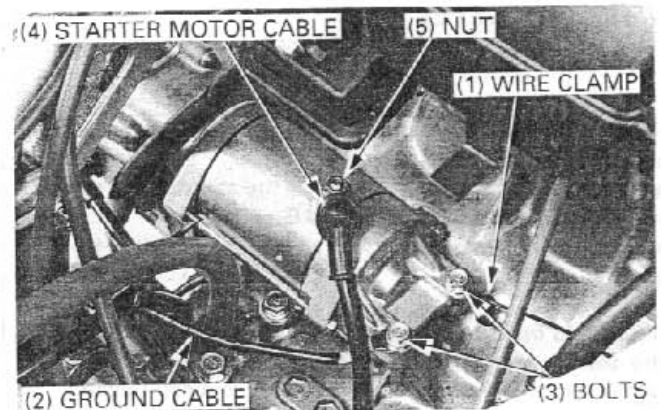
## INSTALLATION

Apply clean engine oil to the new O-ring.  
Install a new O-ring onto the starter motor boss.

Install the starter motor into the crankcase.



Route the starter motor cable and ground cable.  
Install the cables and wire clamp, then tighten the bolts and nut securely.



## STARTER RELAY SWITCH

### OPERATION INSPECTION

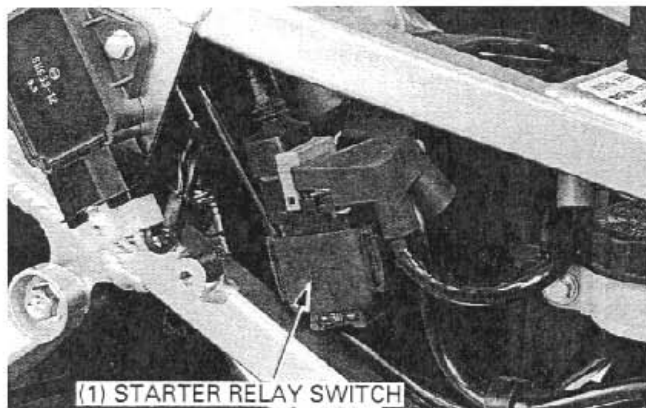
Remove the right side cover (page 2-3).

Shift the transmission into neutral.

Turn the ignition switch ON and depress the starter switch button.

The coil is normal if the starter relay switch clicks.

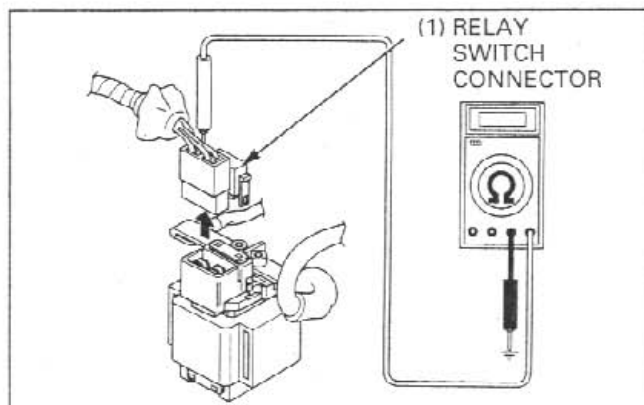
If the switch "CLICK" is not heard, inspect the relay switch using the procedure below.



### GROUND LINE INSPECTION

Disconnect the relay connector.

Check for continuity between the Green/Red wire and ground. If there is continuity when the transmission is in neutral or when the clutch is disengaged and the side stand switch is up, the ground circuit is normal (in neutral, there is a slight resistance due to the diode).

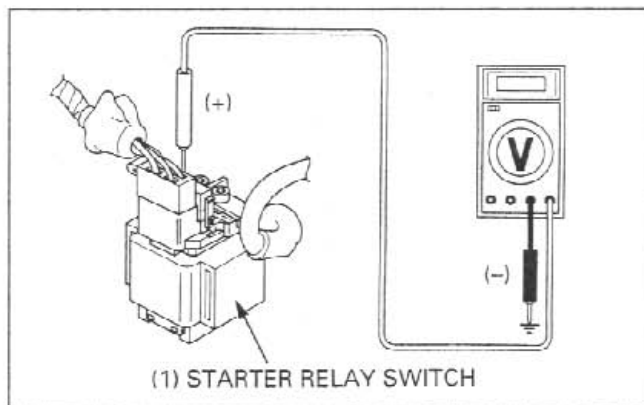


### VOLTAGE INSPECTION

Connect the starter relay switch connector.  
Shift the transmission into neutral.

Measure the voltage between the Yellow/Red wire (+) and ground at the starter relay switch connector.

There should be battery voltage only when the starter switch button is depressed with the ignition switch is ON.



### CONTINUITY INSPECTION

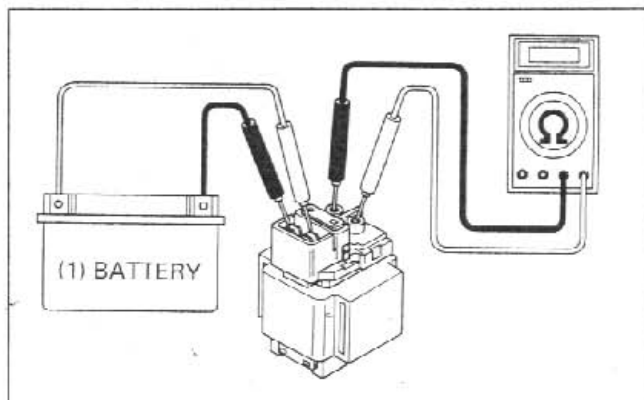
Disconnect the starter relay connector and cables.

Connect an ohmmeter to the starter relay switch large terminals.

Connect a fully charged 12 V battery to the starter relay switch connector terminals (Yellow/Red and Green/Red).

Check for continuity between the starter relay switch terminals.

There should be continuity while 12 V battery is connected to the starter relay switch connector terminals and there should be no continuity when the battery is disconnected.

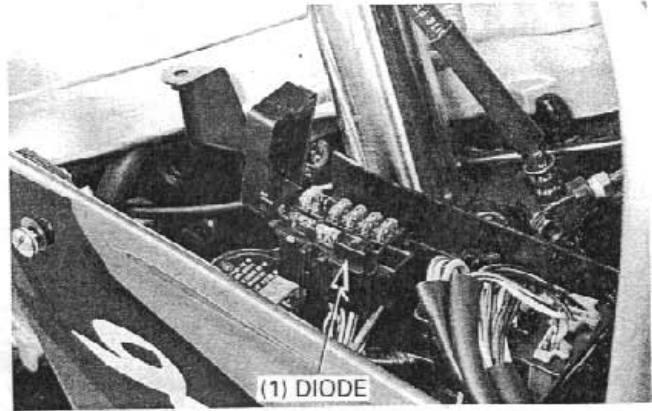


## DIODE

### REMOVAL

Remove right upper cowl inner cover (page 2 8).

Open the fuse box and remove the diode.



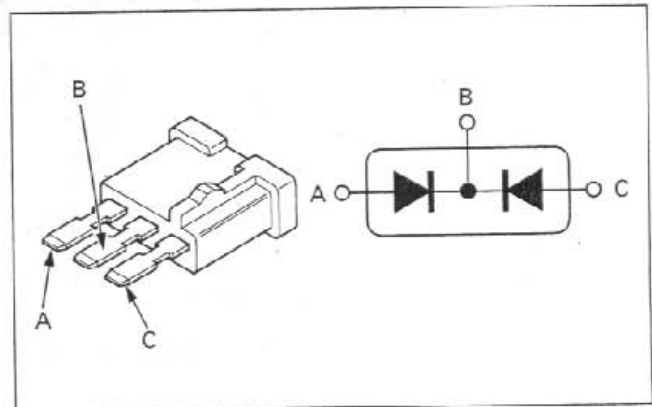
### INSPECTION

Check for continuity with an ohmmeter.

**Normal direction: Continuity**  
**Reverse direction: No continuity**

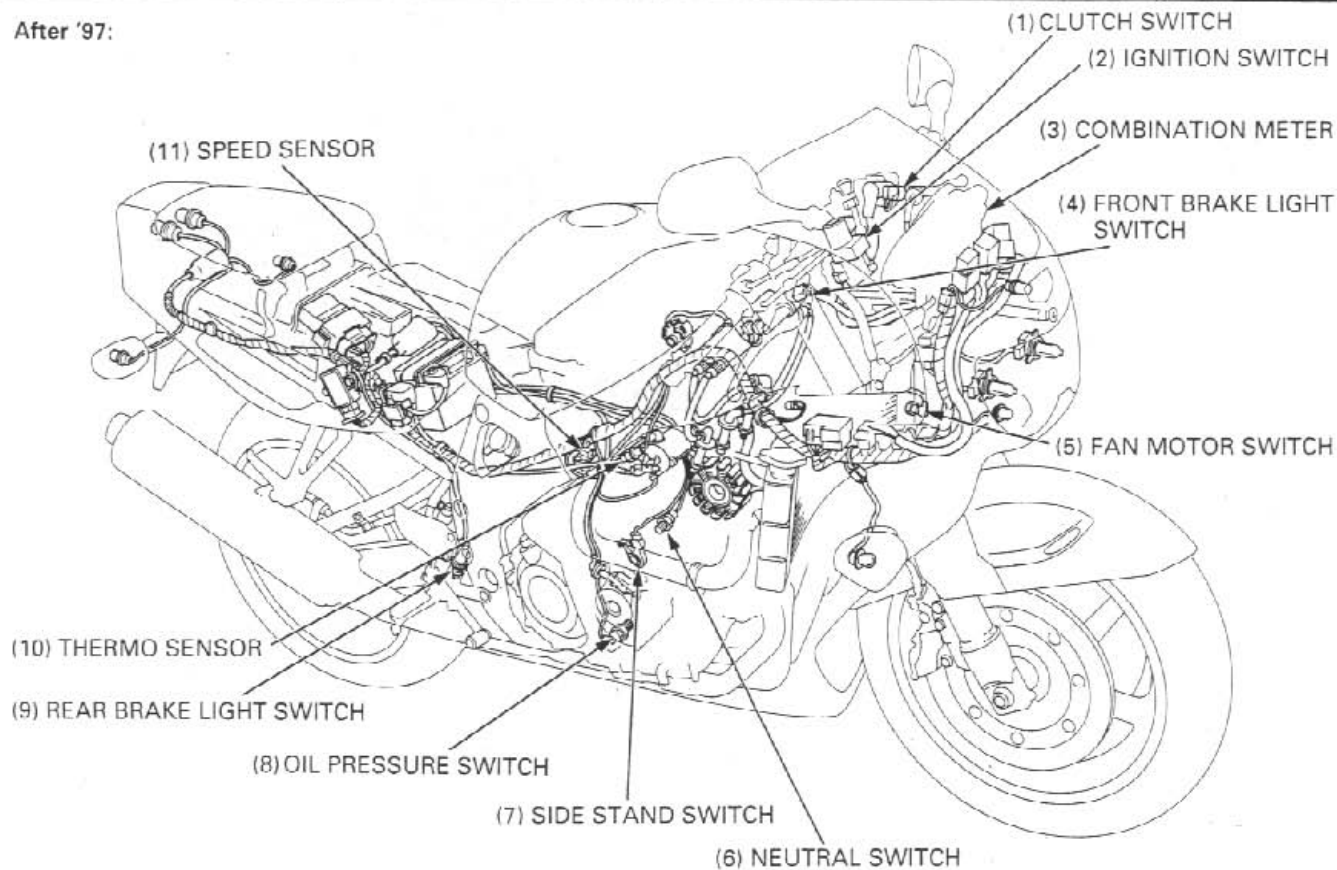
### INSTALLATION

Install the diodes in the reverse order of removal.

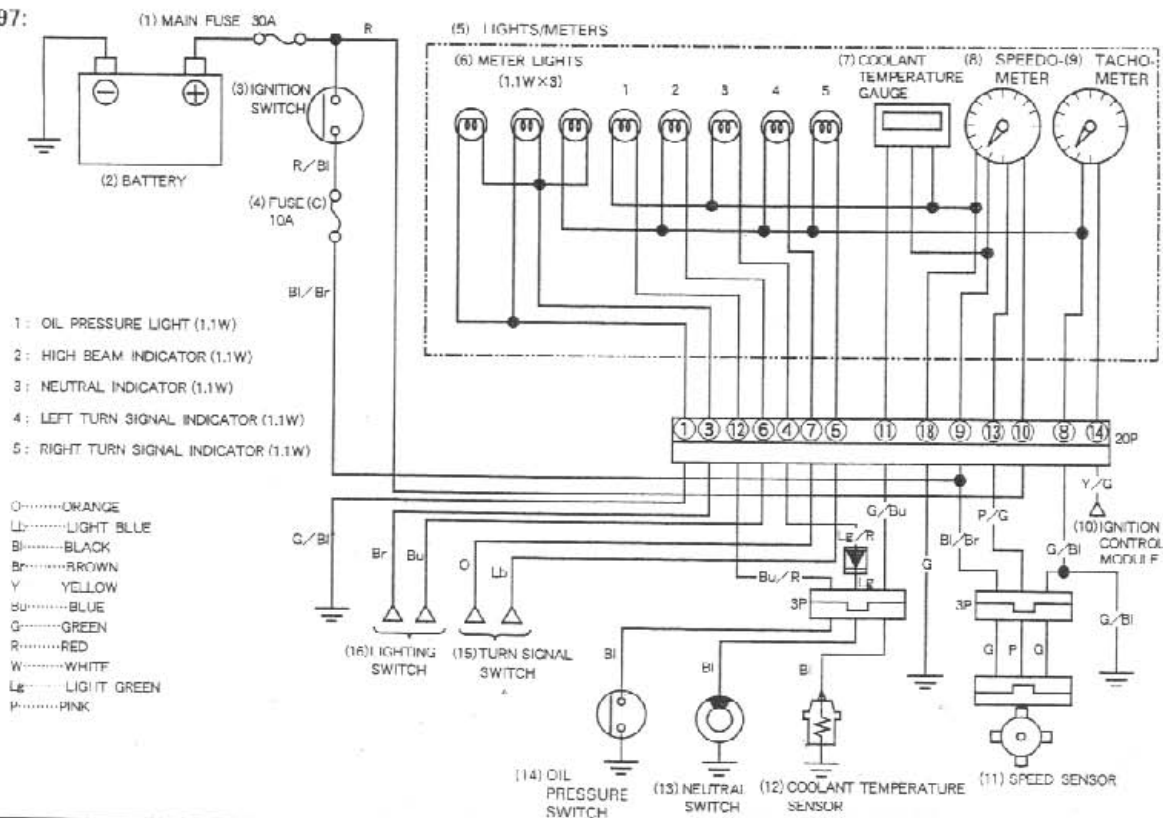


# LIGHTS/METERS/SWITCHES

After '97:



After '97:



# 19. LIGHTS/METERS/SWITCHES

|                                      |       |                          |       |
|--------------------------------------|-------|--------------------------|-------|
| SERVICE INFORMATION                  | 19-1  | COOLING FAN MOTOR SWITCH | 19-20 |
| TROUBLESHOOTING                      | 19-3  | OIL PRESSURE SWITCH      | 19-21 |
| HEADLIGHT                            | 19-4  | IGNITION SWITCH          | 19-22 |
| POSITION LIGHT                       | 19-5  | HANDLEBAR SWITCHES       | 19-23 |
| TURN SIGNAL                          | 19-6  | BRAKE LIGHT SWITCH       | 19-24 |
| LICENSE LIGHT                        | 19-7  | CLUTCH SWITCH            | 19-24 |
| TAIL/BRAKE LIGHT                     | 19-7  | NEUTRAL SWITCH           | 19-24 |
| COMBINATION METER                    | 19-8  | SIDE STAND SWITCH        | 19-25 |
| SPEEDOMETER/SPEED SENSOR             | 19-13 | HORN                     | 19-26 |
| TACHOMETER                           | 19-17 | TURN SIGNAL RELAY        | 19-26 |
| COOLANT TEMPERATURE GAUGE/<br>SENSOR | 19-18 |                          |       |

## SERVICE INFORMATION

### GENERAL

#### ▲ WARNING

- A halogen headlight bulb becomes very hot while the headlight is ON, and remain hot for a while after it is turned OFF. Be sure to let it cool down before servicing.
- Use an electric heating element to heat the water/coolant mixture for the fan motor switch inspection. Keep all flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.

- Note the following when replacing the halogen headlight bulb.
  - Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause it to fail.
  - 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.
- The following color codes are used throughout this section.

|            |                 |                  |            |
|------------|-----------------|------------------|------------|
| Bu = Blue  | G = Green       | Lg = Light Green | R = Red    |
| Bl = Black | Gr = Gray       | O = Orange       | W = White  |
| Br = Brown | Lb = Light Blue | P = Pink         | Y = Yellow |

SPECIFICATIONS

| ITEM  |                                 | SPECIFICATIONS           |                  |
|---|---------------------------------|--------------------------|------------------|
| Bulbs   | Headlight (High/low beam)       | 12 V - 45/45 W x 2       |                  |
|   | Position light                  | 12 V - 5 W               |                  |
|   | Brake/tail light                | 12 V - 32/3 cp           |                  |
|   | Front turn signal/running light | 12 V - 32/3 cp           |                  |
|   | Rear turn signal light          | 12 V - 32 cp             |                  |
|   | License light                   | 12 V - 4 cp              |                  |
|   | Instrument light                | '96 - '97:               | 12 V - 1.7 W x 3 |
|   |                                 | After '97:               | 1.1 W x 2        |
|   | Turn signal indicator           | '96 - '97:               | 12 V - 1.7 W x 2 |
|   |                                 | After '97:               | 12 V - 1.1 W x 2 |
|   | High beam indicator             | '96 - '97:               | 12 V - 1.7 W     |
|   |                                 | After '97:               | 12 V - 1.1 W     |
|   | Neutral indicator               | '96 - '97:               | 12 V - 1.7 W     |
|   |                                 | After '97:               | 12 V - 1.1 W     |
|   | Oil pressure indicator          | '96 - '97:               | 12 V - 1.7 W     |
| After '97:  |                                 | 12 V - 1.1 W             |                  |
| Side stand indicator                              | '96 - '97:                      | 12 V - 1.7 W             |                  |
| Coolant temperature gauge light                   | After '97:                      | 12 V - 1.1 W             |                  |
| Fuse  | Main fuse                       | 30 A                     |                  |
|   | Sub fuse                        | 10 A x 4, 20 A x 1       |                  |
| Fan motor switch                                  | Start to close (ON)             | 98 - 102°C (208 - 216°F) |                  |
|   | Stop to open                    | 93 - 97°C (199 - 207°F)  |                  |
| Coolant temperature sensor resistance (20°C/68°F) |                                 | 45 - 60 Ω                |                  |

TORQUE VALUES

|                                 |                                |                                       |
|---------------------------------|--------------------------------|---------------------------------------|
| Side stand mounting bolt        | 10 N·m (1.0 kgf·m, 7.2 lbf·ft) |                                       |
| Side stand lock nut             | 29 N·m (3.0 kgf·m, 22 lbf·ft)  |                                       |
| Side stand switch mounting bolt | 10 N·m (1.0 kgf·m, 7.2 lbf·ft) | ALOC bolt: replace with a new one.    |
| Side stand bracket bolt         | 44 N·m (4.5 kgf·m, 33 lbf·ft)  | ALOC bolt: replace with a new one.    |
| Ignition switch mounting bolt   | 25 N·m (2.5 kgf·m, 18 lbf·ft)  | Apply a locking agent to the threads. |
| Coolant temperature sensor      | 10 N·m (1.0 kgf·m, 7.2 lbf·ft) | Apply sealant to the threads.         |
| Neutral switch                  | 12 N·m (1.2 kgf·m, 8.7 lbf·ft) |                                       |
| Oil pressure switch             | 12 N·m (1.2 kgf·m, 8.7 lbf·ft) | Apply sealant to the threads.         |

# TROUBLESHOOTING

## SPEED SENSOR/SPEEDOMETER

The odometer/trip meter operate normally, but the speedometer does not operate

- Faulty speedometer or printed circuit board (After '97:)

The speedometer operates normally, but the odometer/trip meter does not operate

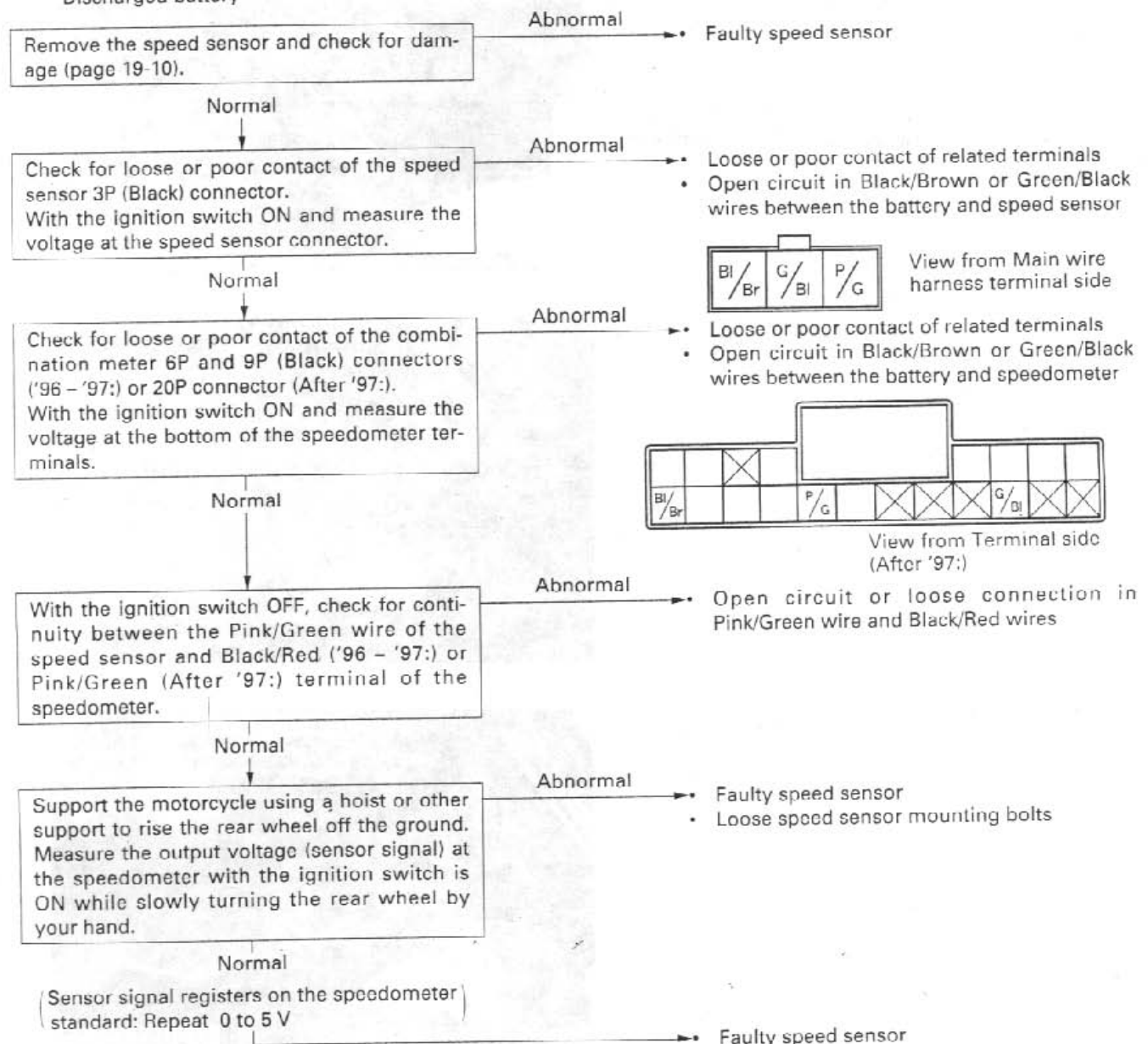
- Faulty odometer/trip meter or printed circuit board (After '97:)

NOTE (After '97:)

The odometer/trip meter does not operate at under 12 V battery voltage.

The speedometer operate is abnormal

- Check for the following before diagnosing.
  - Blown main or sub fuses
  - Loose or corroded terminals of the connectors
  - Discharged battery





# HEADLIGHT

## BULB REPLACEMENT

**▲ WARNING**

- *A halogen headlight bulb becomes very hot while the headlight is ON, and remain hot for a while after it is turned OFF. Be sure to let it cool down before servicing.*

Push the retaining tabs and remove the headlight bulb sockets.  
Remove the dust cover.

Unhook the bulb retainer and remove the headlight bulb.

**CAUTION**

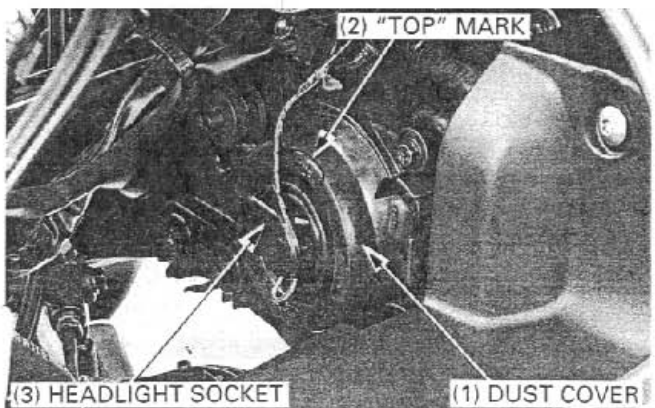
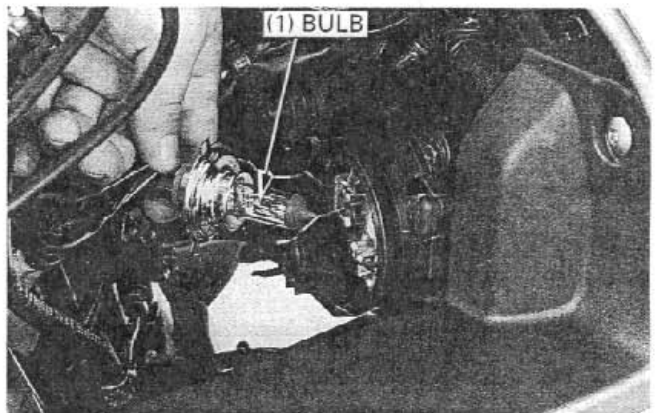
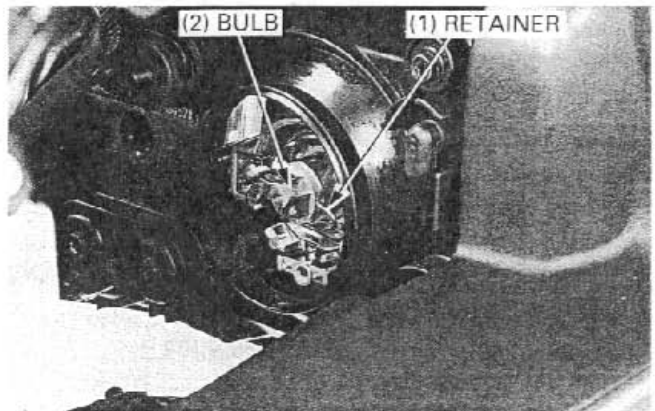
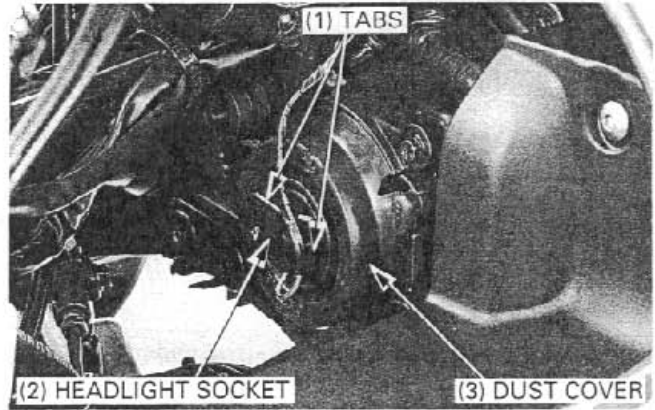
- *Avoid touching halogen headlight bulbs. Finger prints can create hot spots that cause a bulb to break.*

If you touch the bulb with your bare hands, clean it with cloth moistened with denatured alcohol to prevent early bulb failure.

Install a new bulb aligning its tabs with the groove in the headlight unit.

Install the dust cover tightly against the headlight with the "TOP" mark facing up.

Connect the headlight sockets.

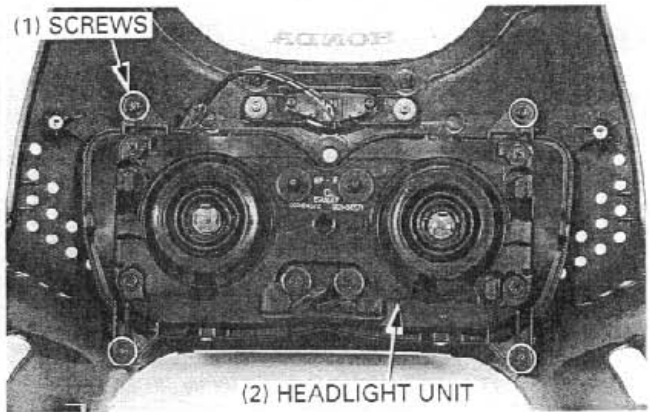


**REMOVAL/INSTALLATION**

Remove the upper cowl (page 2-7).

Remove the four screws and headlight unit.

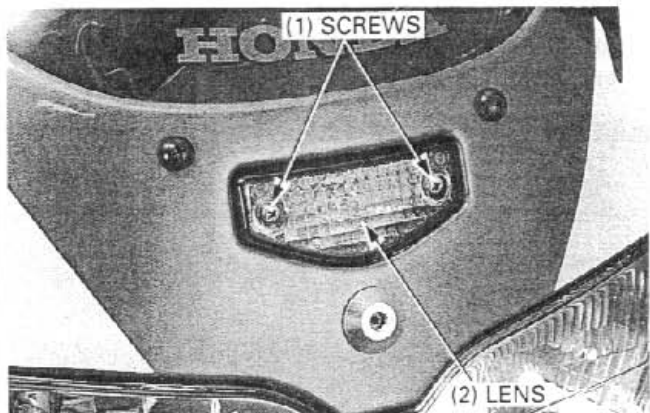
Installation is in the reverse order of removal.



**POSITION LIGHT**

**BULB REPLACEMENT**

Remove the screws and position light bulb lens.



Remove the bulb from the socket and replace it.

Install the position bulb lens in the reverse order of removal.

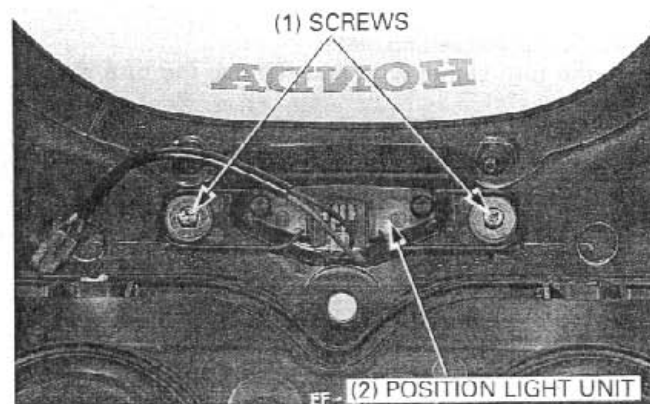


**REMOVAL/INSTALLATION**

Remove the upper cowl (page 2-7).

Remove the screws and position light unit.

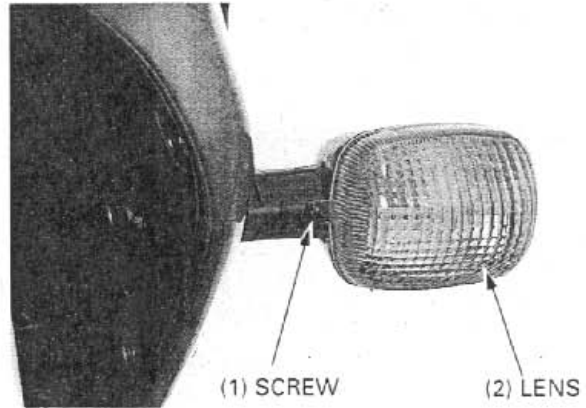
Installation is in the reverse order of removal.



## TURN SIGNAL

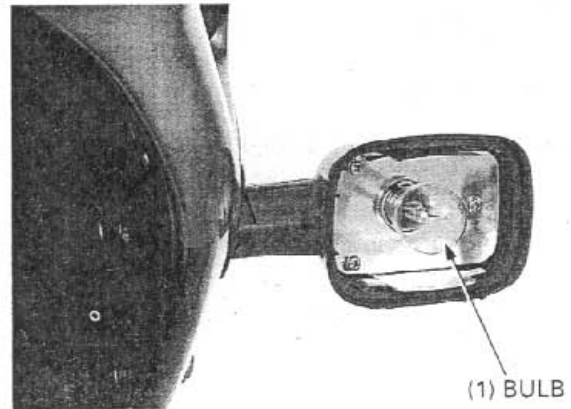
### BULB REPLACEMENT

Remove the screw and turn signal lens.



While pushing in, turn the bulb counterclockwise to remove it and replace with a new one.

Install the turn signal light lens in the reverse order of removal.

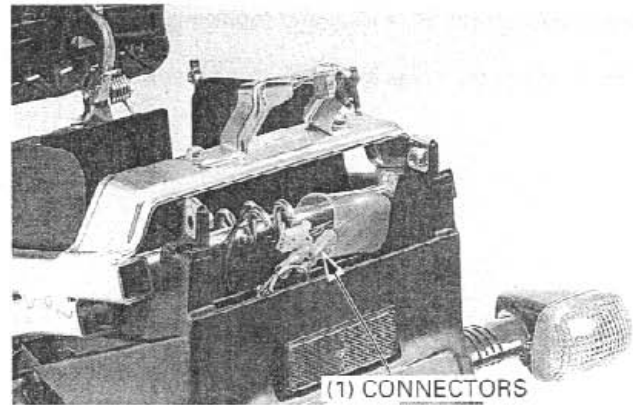


### REMOVAL/INSTALLATION

For front turn signal unit removal, remove the inner covers (page 2-9).

For rear turn signal removal, remove the side covers (page 2-3).

Disconnect the turn signal connectors.

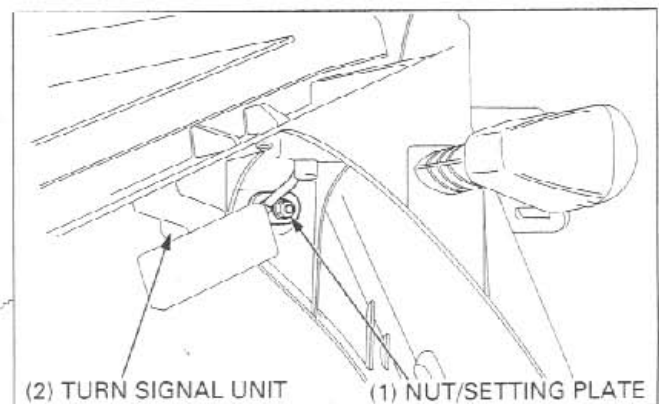


Remove the nut and setting plate.  
Release the turn signal wire and remove the turn signal unit.

Install the turn signal unit in the reverse order of removal.

#### NOTE

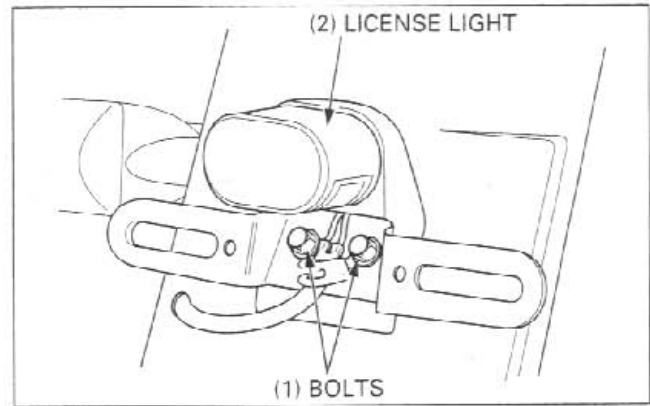
- Route the turn signal wire properly (page 1-21).



## LICENSE LIGHT

### BULB REPLACEMENT

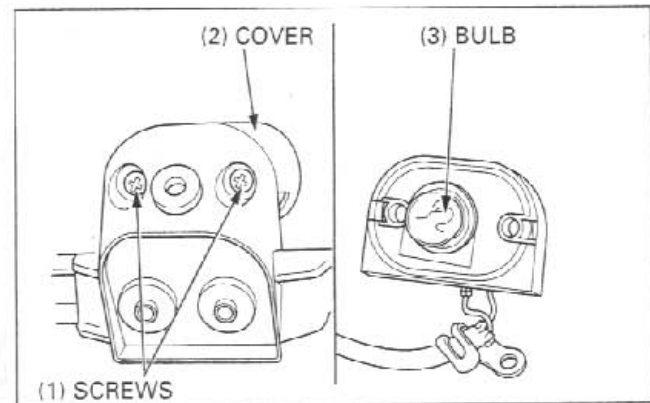
Remove the license light bracket bolts and the license light assembly.



Remove the screws, license light cover and lens.

While pushing in, turn the bulb counterclockwise to remove it and replace with a new one.

Install the turn signal light lens in the reverse order of removal.

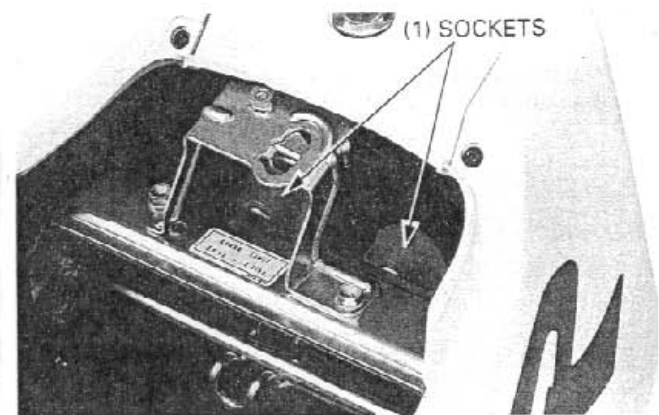


## TAIL/BRAKE LIGHT

### BULB REPLACEMENT

Open the pillion seat using the ignition key.

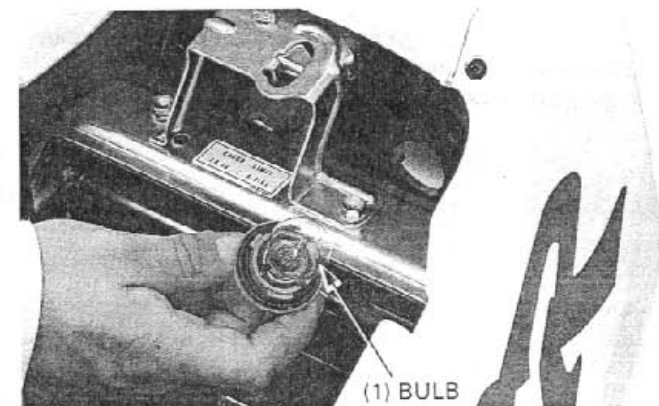
Remove the tail/brake light socket by turning it counterclockwise.



While pushing in, turn the bulb counterclockwise to remove it and replace with a new one.

Install the tail/brake light lens in the reverse order of removal.

Refer to page 2-5 for tail/brake light unit removal/installation.

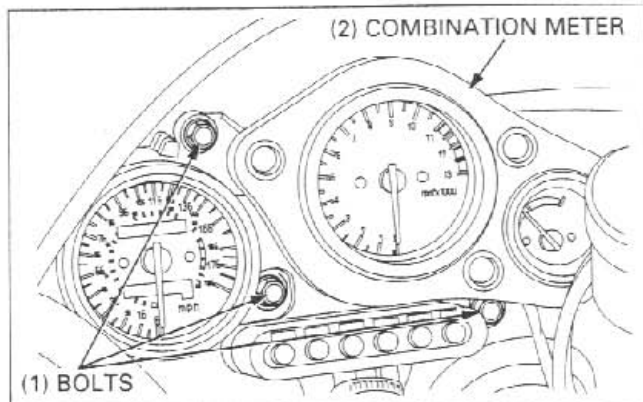


## COMBINATION METER

### REMOVAL

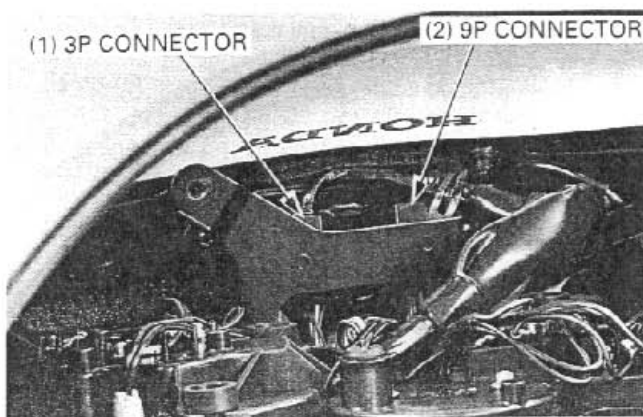
'96 - '97:

Remove the three combination meter mounting bolts.



Disconnect the combination meter 3P (Black) and 9P (Black) connectors.

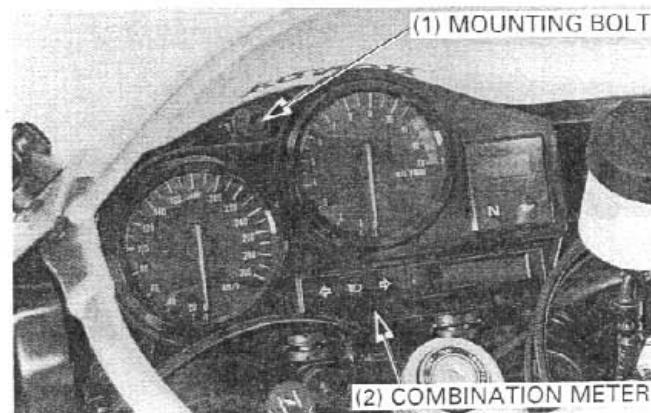
Remove the combination meter assembly.



After '97:

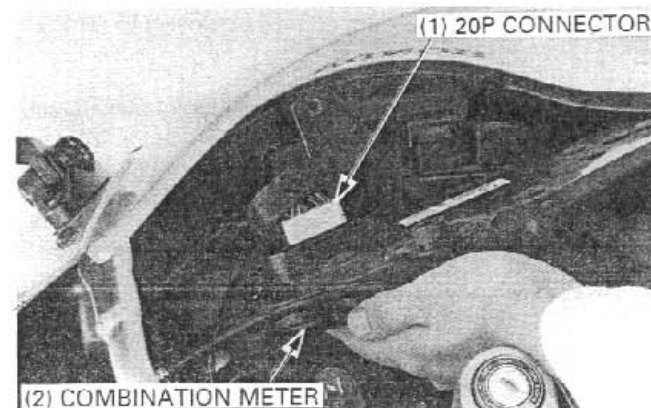
Remove the mounting bolt.

Pull out the combination meter.



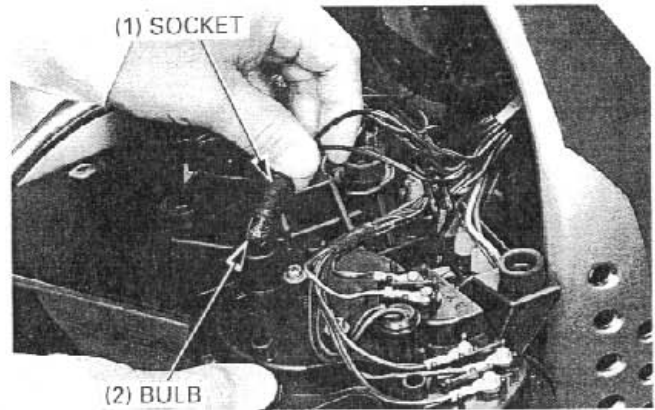
Push the connector lock pin and disconnect the 20P connector from combination meter.

Remove the combination meter.

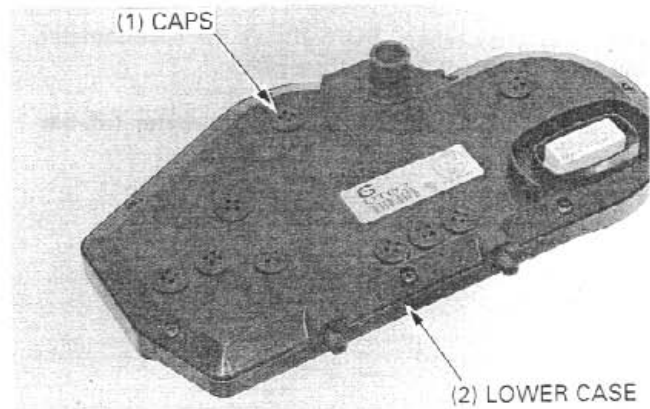


**BULB REPLACEMENT****'96 - '97:**

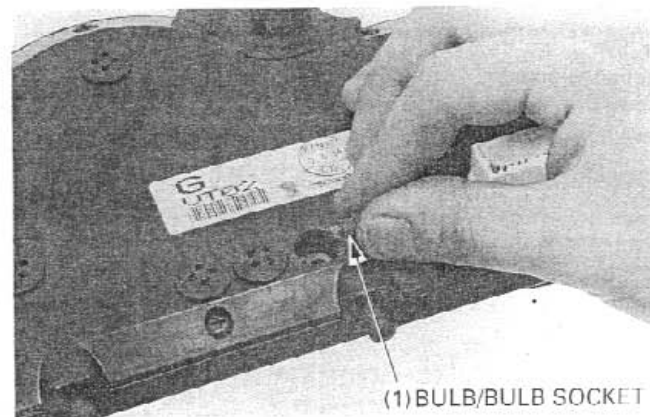
Pull the indicator lamp socket out of the combination meter. Remove the bulb from the socket and replace it with a new one.

**After '97:**

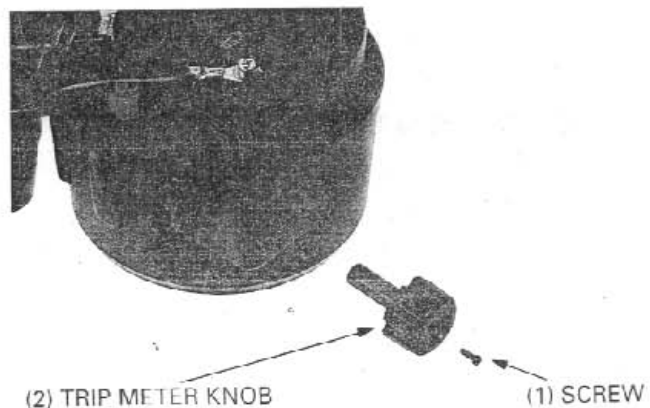
Pull the indicator lamp cap out of combination meter lower case.



Turn the bulb socket 45° counterclockwise remove it from the lower case, then replace the bulb.

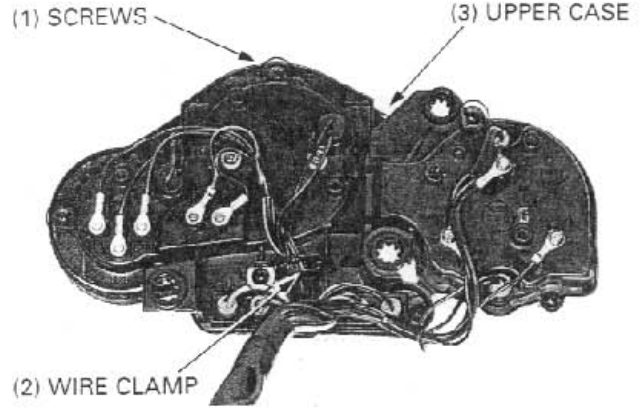
**DISASSEMBLY****'96 - '97:**

Remove the screw and trip meter knob.



## LIGHTS/METERS/SWITCHES

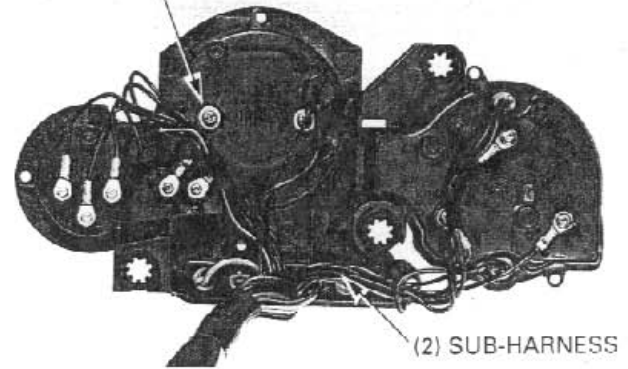
Remove the six self-tapping screws, wire clamp and upper case.



Remove the screw/washers, then remove the speedometer, tachometer and coolant temperature meter.

(1) SCREW/WASHERS

Remove the bulb sockets and combination meter sub-harness.

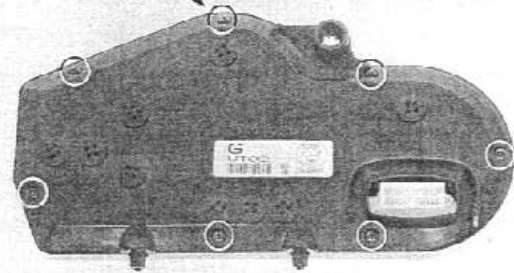


**After '97:**

Remove the screws.

Remove the combination upper case.

(1) SCREWS

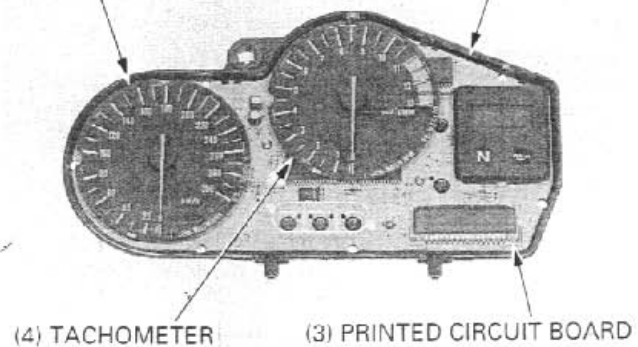


Remove the speedometer, tachometer and printed circuit board from the lower case.

(1) SPEEDOMETER

Remove the bulb sockets from the printed circuit board (page 19-12).

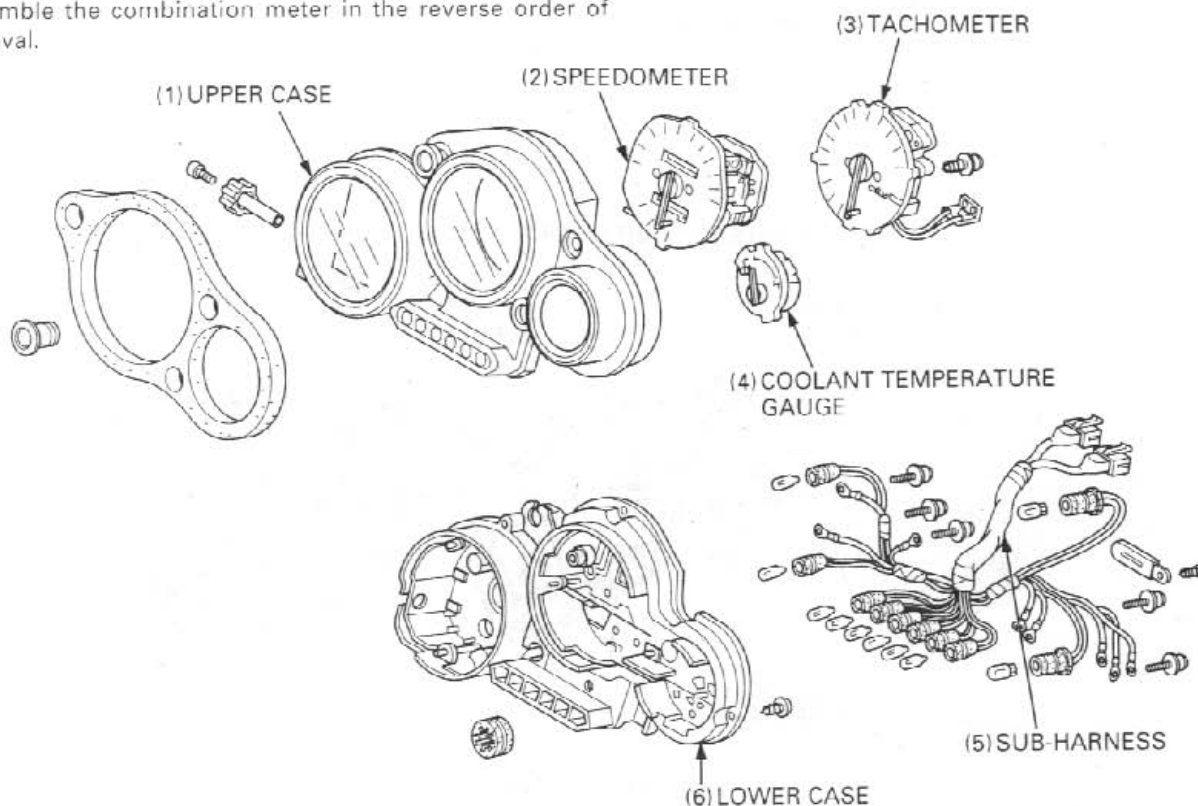
(2) LOWER CASE



## ASSEMBLY

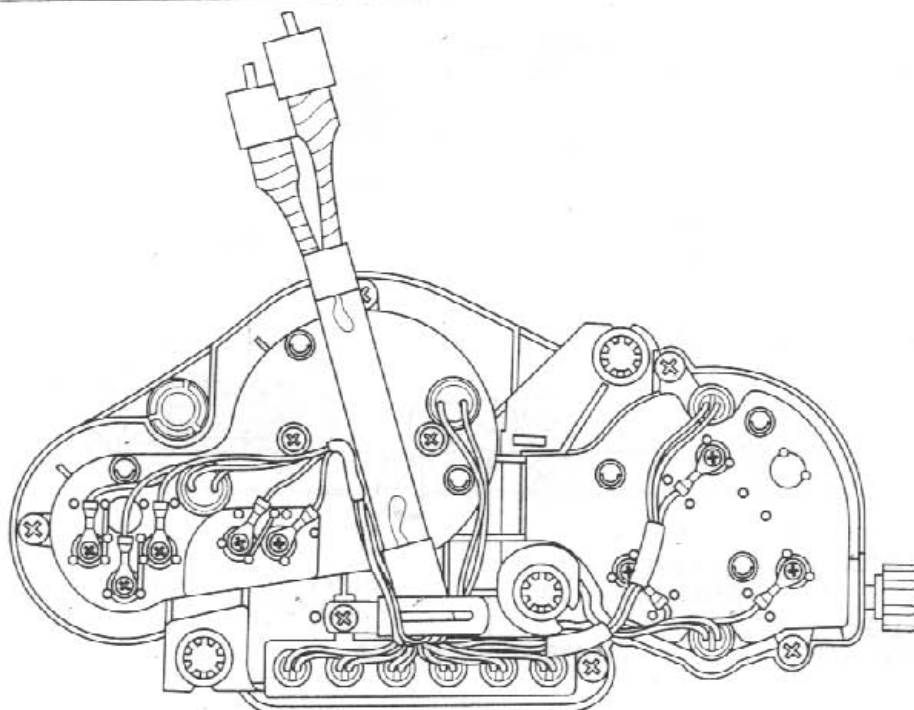
'96 - '97:

Assemble the combination meter in the reverse order of removal.



## NOTE

- Connect the terminals and install the sockets according to the color codes indicated on the lower case.
- Route the sub-harness as shown in the illustration.

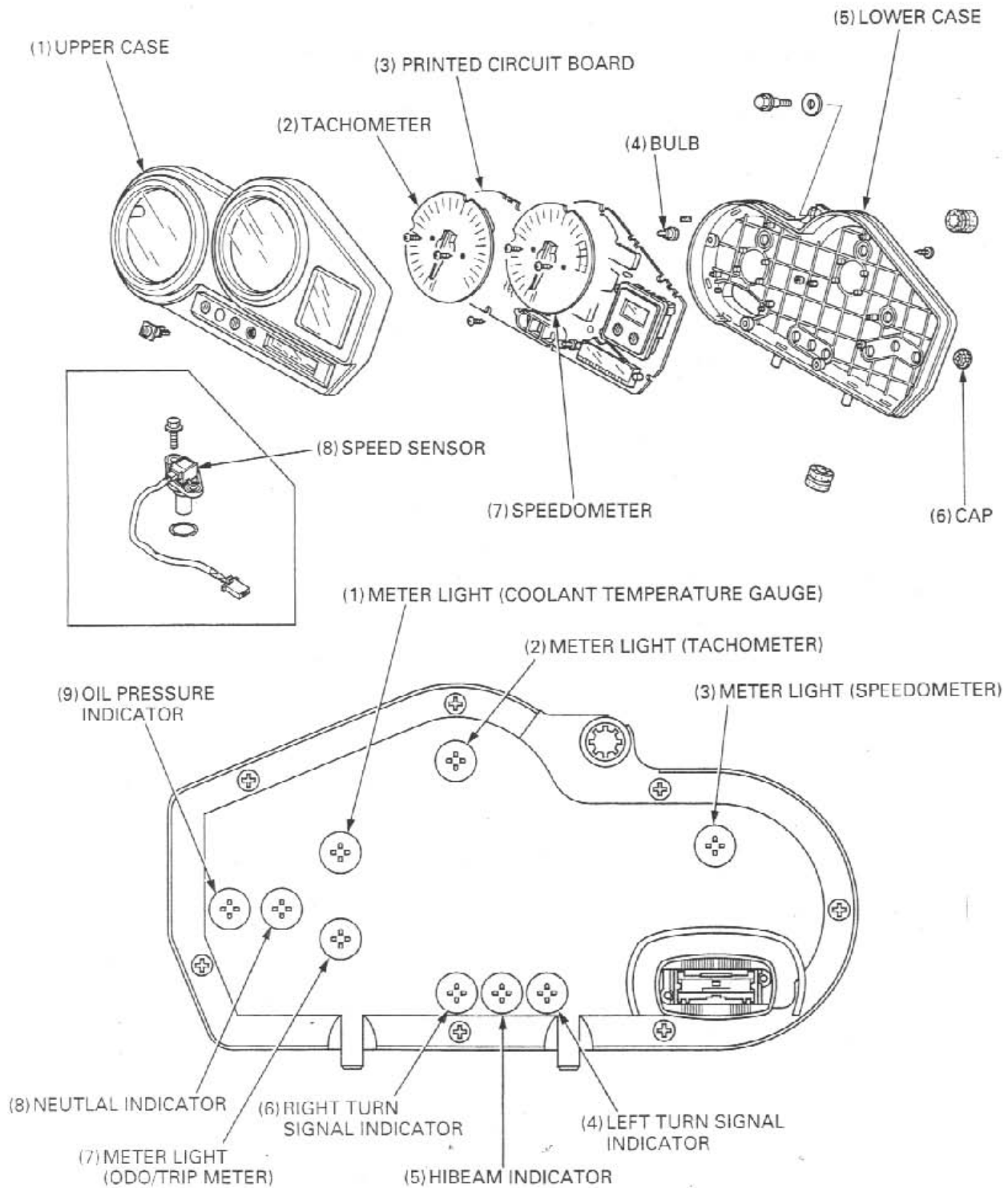




ASSEMBLY

After '97:

Assemble the combination meter in the reverse order of removal.

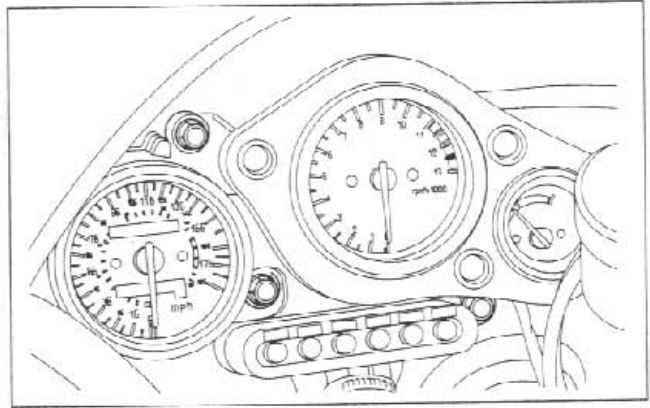


**INSTALLATION****'96 - '97:**

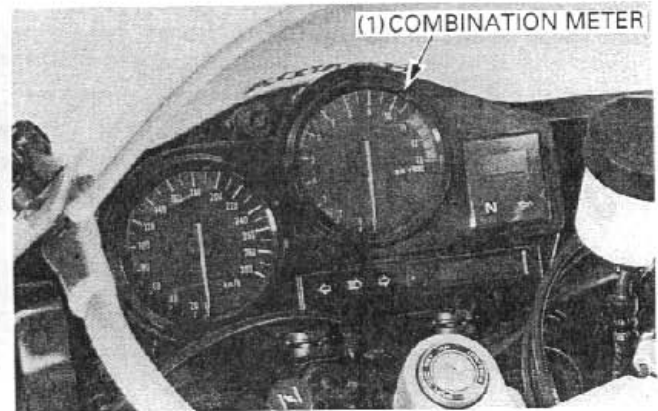
Install the combination meter in the reverse order of removal.

**NOTE**

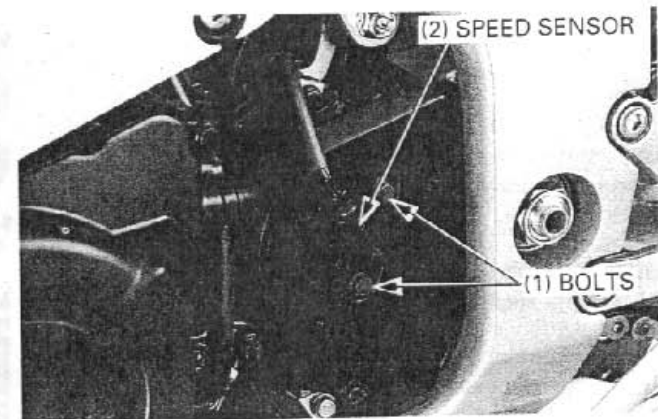
- Route the combination meter wire properly (page 1-21).

**After '97:**

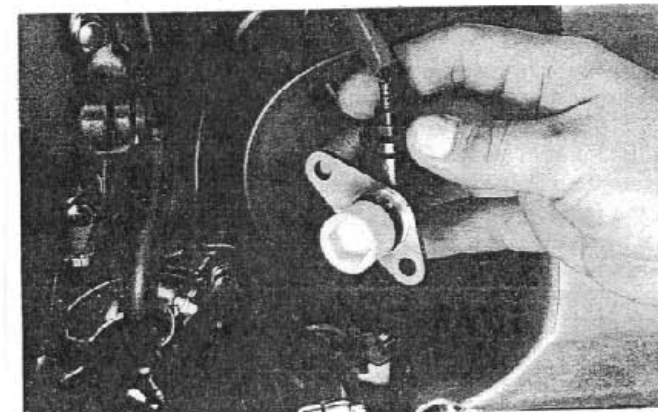
Install the combination meter in the reverse order of removal.

**SPEEDOMETER/SPEED SENSOR****SENSOR INSPECTION****'96 - '97:**

Remove the bolts and speed sensor.

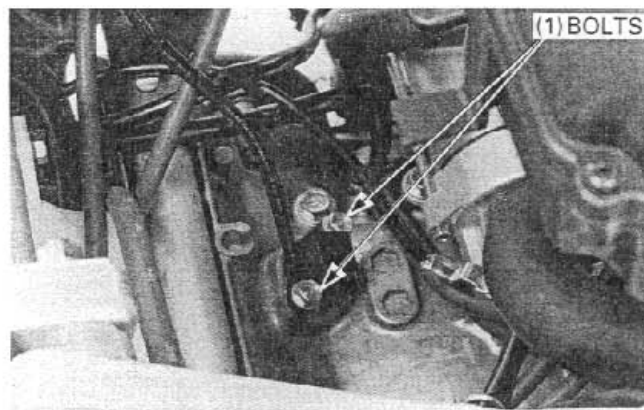


Check the speed sensor for damage.  
 Check the speed sensor for smooth operation.  
 If the speed sensor does not turn smoothly, replace with a new one.

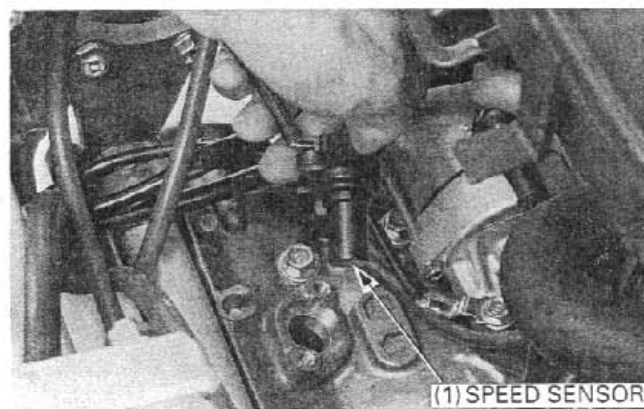


**After '97:**

Remove the fuel tank (page 2-2).  
Remove the bolts and speed sensor.



Check the speed sensor for damage.



## OUTPUT SIGNAL INSPECTION

**'96 - '97:**

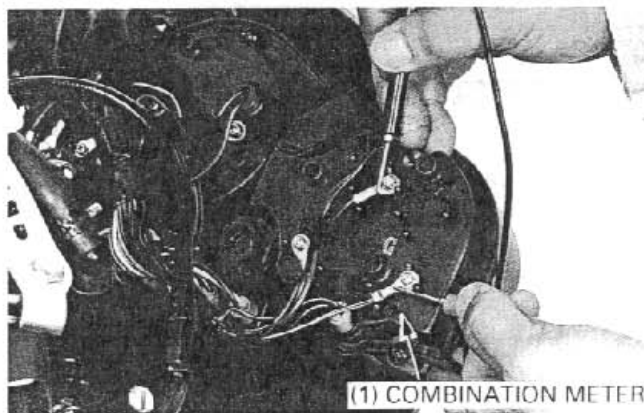
Remove the upper cowl (page 2-7).

Turn the ignition switch ON.  
Measure the voltage at the combination meter terminals with the ignition switch is ON while slowly turning the rear wheel by hand.

**CONNECTION:** Black/Red (+) - Green/Black (-)

**STANDARD:** Repeat 0 to 5 V

If the measurement is out of specification, inspect the open circuit in wire harness.



**After '97:**

Remove the combination meter.

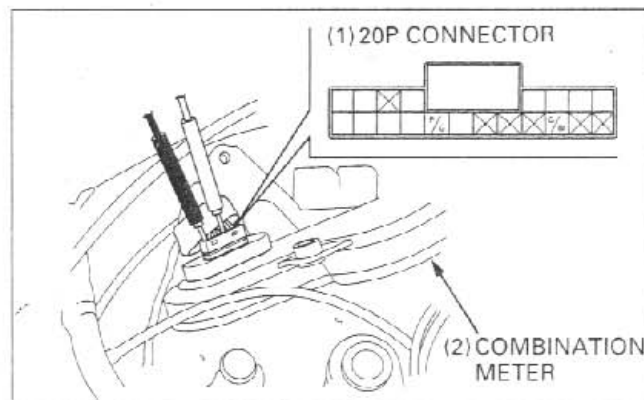
Support the motorcycle using a hoist or other support to rise the rear wheel off the ground.

Turn the ignition switch ON.  
Measure the voltage at the combination meter 20P connector with the ignition switch is ON while slowly turning the rear wheel by hand.

**CONNECTION:** Pink/Green (+) - Green/Black (-)

**STANDARD:** Repeat 0 to 5 V

If the measurement is out of specification, inspect the open circuit in wire harness.



**WIRE HARNESS INSPECTION**

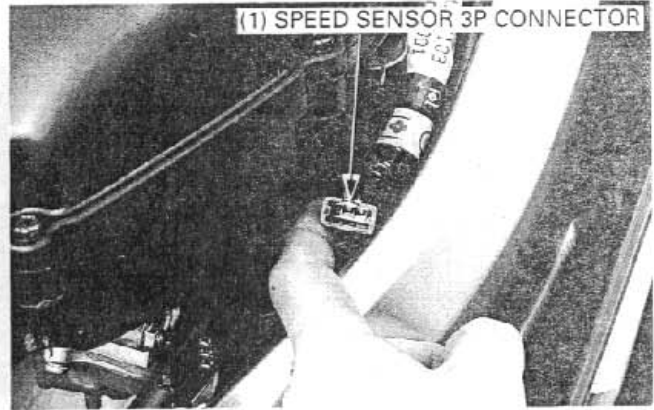
'96 - '97:

Remove the fuel tank (page 2-2).

Disconnect the speed sensor 3P connector.  
Turn the ignition switch is ON and measure the voltage at the 3P connector wire harness side.

**CONNECTION:** Black/Brown (+) - Green/Black (-)  
**STANDARD:** Battery voltage

If there is no voltage, replace or repair the wire harness.



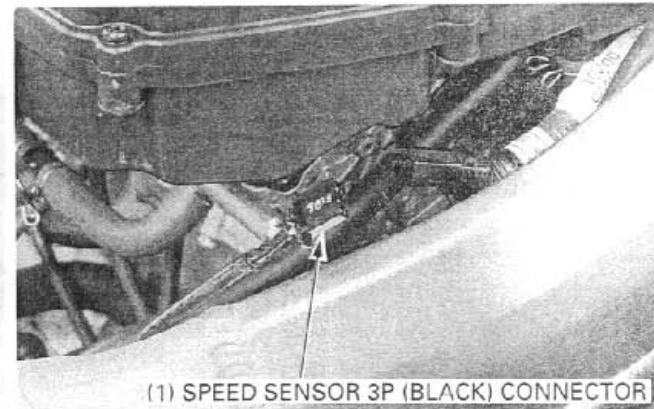
After '97:

Remove the fuel tank (page 2-2).

Disconnect the speed sensor 3P (BLACK) connector.  
Turn the ignition switch is ON and measure the voltage at the 3P connector wire harness side.

**CONNECTION:** Black/Brown (+) - Green/Black (-)  
**STANDARD:** Battery voltage

If there is no voltage, replace or repair the wire harness.

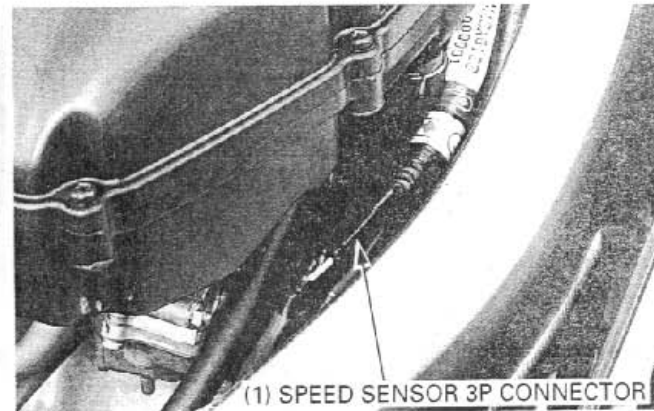


**REMOVAL/INSTALLATION**

'96 - '97:

Remove the fuel tank (page 2-2).

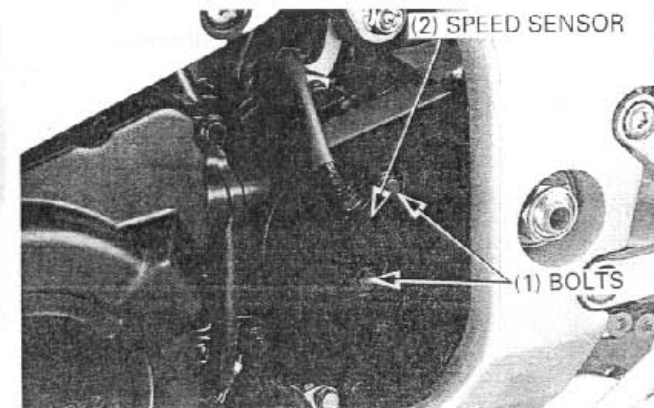
Disconnect the speed sensor 3P connector.



Remove the bolts and speed sensor.

**NOTE**

- Release the sensor wire from the wire clamp on the drive sprocket cover.

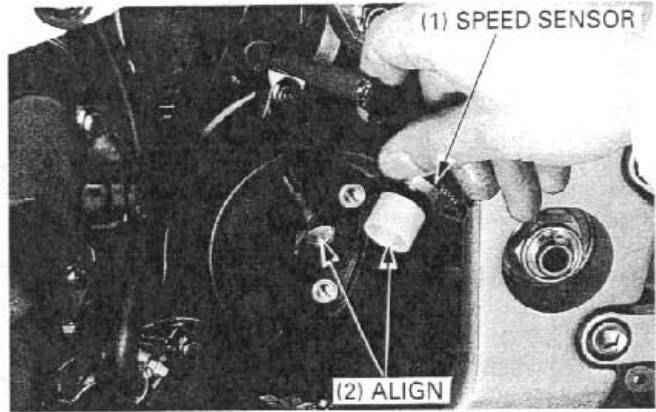


## LIGHTS/METERS/SWITCHES

Install the speed sensor in the reverse order of removal.

### NOTE

- Align the hexagonal portion of the speed sensor with the drive sprocket bolt head.

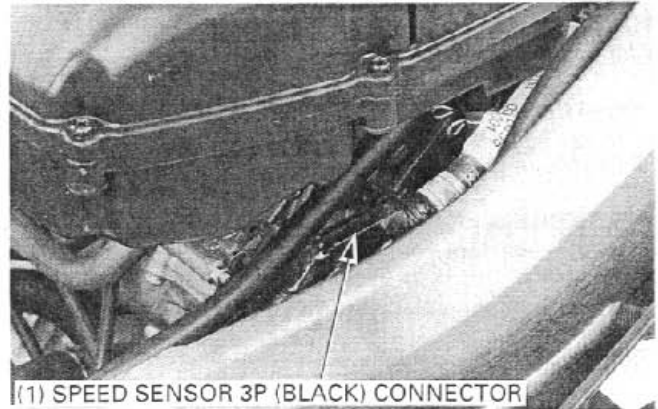


## REMOVAL/INSTALLATION

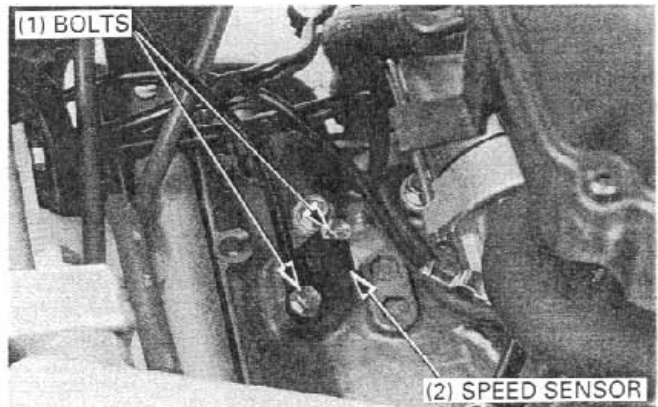
After '97:

Remove the fuel tank (page 2-2).

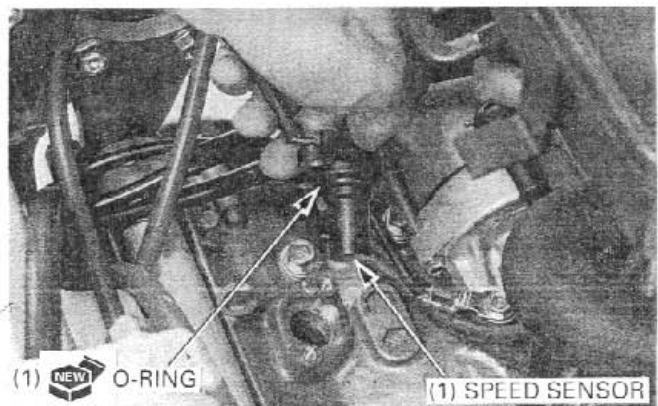
Disconnect the speed sensor 3P connector.



Remove the bolts and speed sensor.



Install the speed sensor in the reverse order of removal.



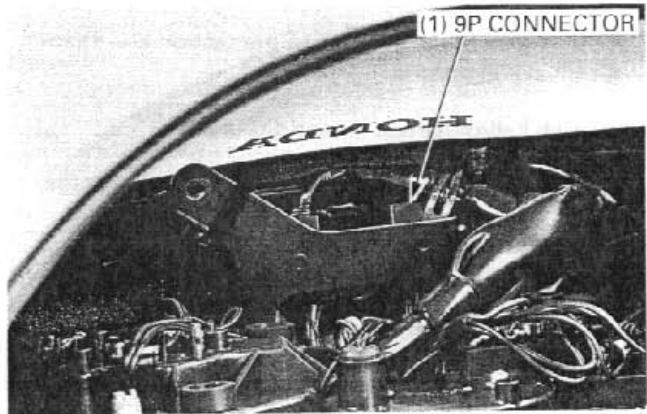
## TACHOMETER

### INSPECTION

'96 - '97:

Remove the combination meter from the bracket (page 19-7).

Check for loose or poor contact terminals of the tachometer.



Connect the peak voltage adaptor to the tachometer Black/Yellow terminal and ground.

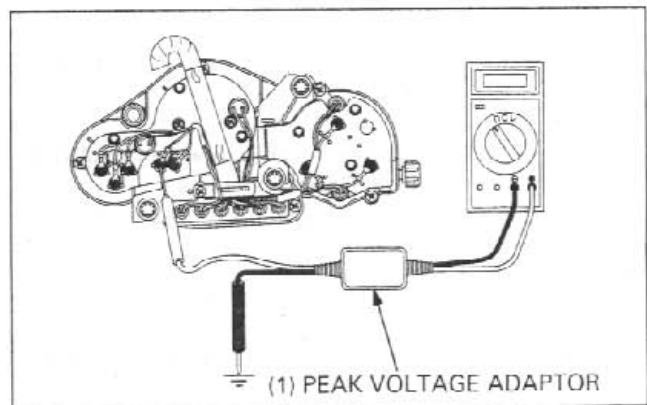
**CONNECTION: Black/Yellow (+) and Ground (-)**

Start the engine and measure the tachometer input voltage.

**PEAK VOLTAGE: 10.5 V minimum**

If the value is normal, replace the tachometer.

If the measured value is below 10.5 V, replace the ignition control module (ICM).



If the value is 0 V, perform the following:

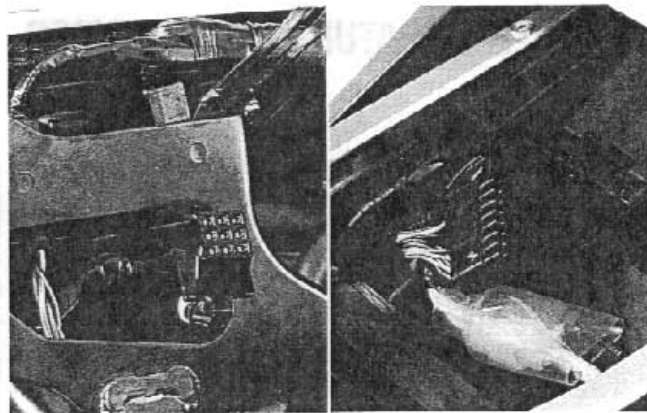
Remove the seat (page 2-2) and disconnect the ICM multi-connector.

Check for continuity between the tachometer terminal and the ICM multi-connector Black/Yellow terminals.

If there is no continuity, check the wire harness for an open circuit.

If there is continuity, replace the tachometer unit.

For tachometer replacement, see 19-7; combination meter disassembly and assembly.

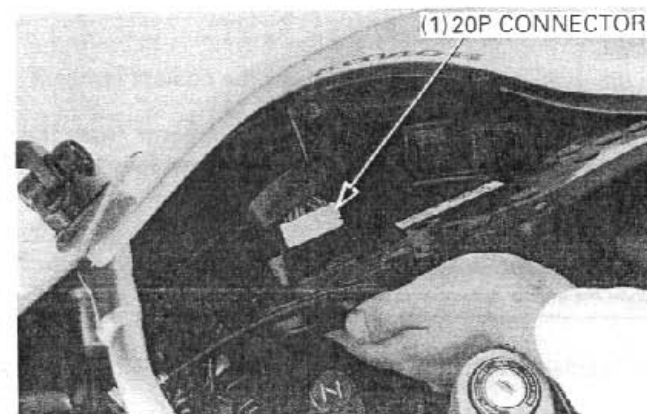


### INSPECTION

After '97:

Remove the combination meter mounting bolt from the meter (page 19-8).

Check for loose or poor contact 20P connector of the combination meter.



## LIGHTS/METERS/SWITCHES

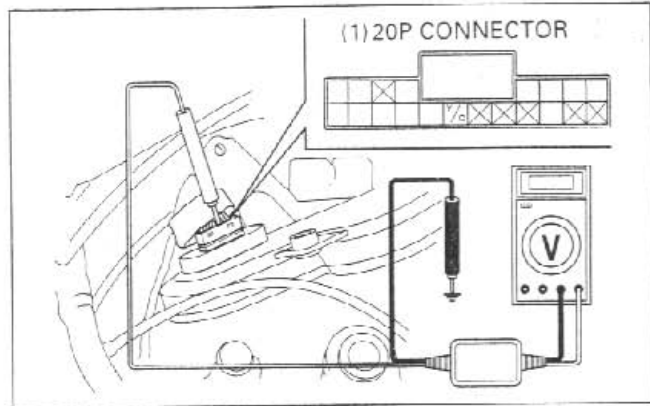
Connect the peak voltage adaptor to the tachometer Black/Yellow terminal and ground.

**CONNECTION: Yellow/Green (+) and Ground (-)**

Start the engine and measure the tachometer input voltage.

**PEAK VOLTAGE: 10.5 V minimum**

If the value is normal, replace the tachometer.  
If the measured value is below 10.5 V, replace the ignition control module (ICM).

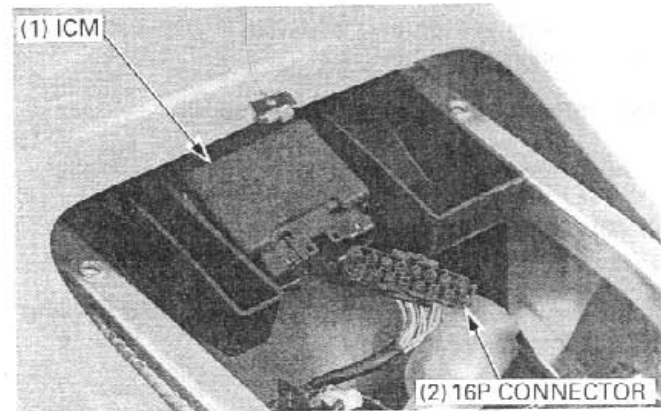


If the value is 0 V, perform the following:  
Remove the seat (page 2-2) and disconnect the ICM 16P connector.

Check for continuity between the tachometer terminal and the ICM 16P connector Yellow/Green terminals.  
If there is no continuity, check the wire harness for an open circuit.

If there is continuity, replace the tachometer unit.

For tachometer replacement, (page 19-12) combination meter disassembly and assembly.



## COOLANT TEMPERATURE GAUGE/SENSOR

### INSPECTION

Remove the fuel tank (page 2-2).

Disconnect the thermo sensor wire connector from the sensor.  
Ground the thermo sensor wire with a jumper wire.

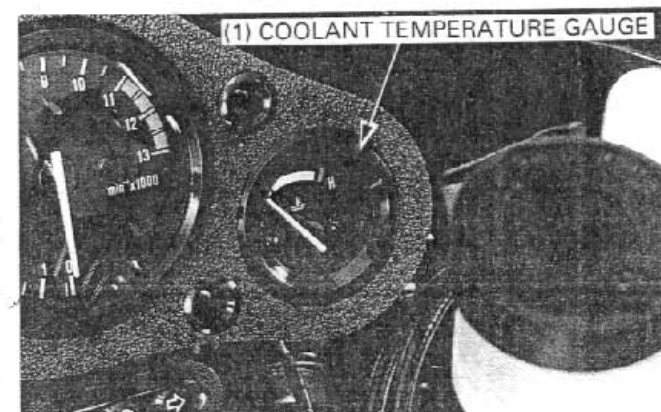
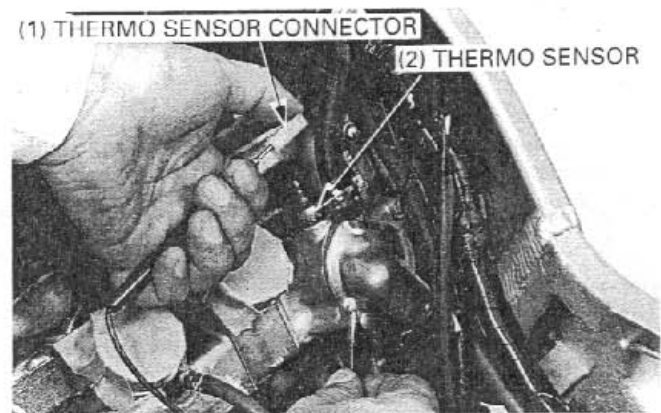
'96 - '97:

Turn the ignition switch ON and check the coolant temperature gauge.  
Disconnect the thermo sensor wire connector from the ground immediately if the gauge needle moves fully to H.

### CAUTION

- Immediately disconnect the sensor wire connector from the ground when the needle moves to H (hot) to prevent damage to the gauge.

If the needle moves, check the thermo sensor unit.



**After '97:**

Turn the ignition switch ON and check the coolant temperature gauge.

Disconnect the thermo sensor wire connector from the ground immediately if the gauge indicator moves to "270°F".

**CAUTION**

- *Immediately disconnect the sensor wire connector from the ground when the gauge indicator moves to "270°F" (hot) to prevent damage to the gauge.*

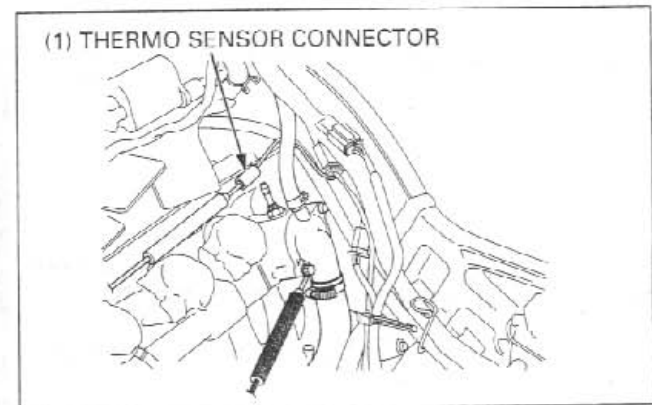
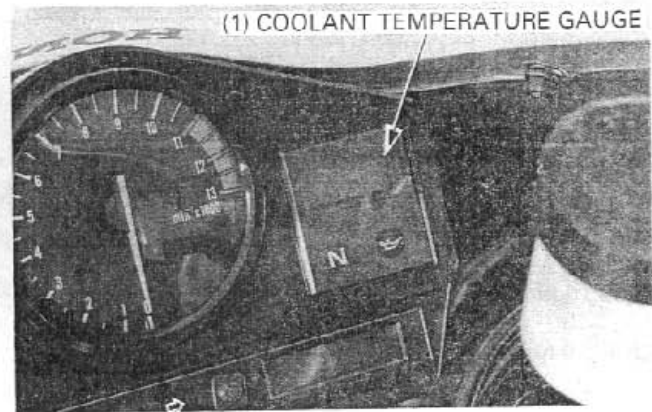
If the indicator moves, check the thermo sensor unit.

If the indicator does not move, check for voltage between the sensor wire connector and ground.

If the voltage is measured, faulty coolant temperature gauge unit.

If there is no voltage, check for voltage between the Black/Brown and Green/Blue wire terminals.

If there is no voltage, faulty coolant temperature gauge unit. If the voltage is measured, check the wire harness.



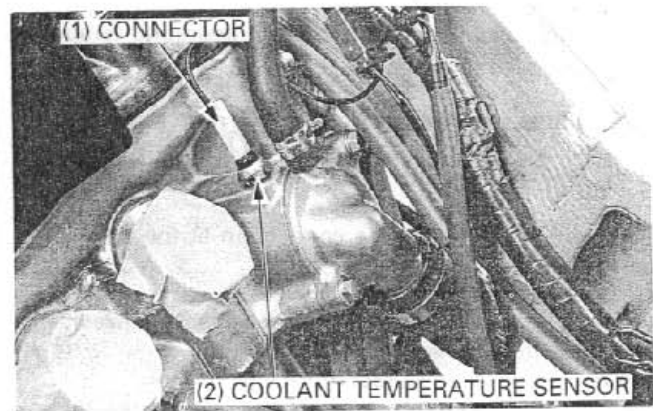
**THERMO SENSOR UNIT INSPECTION**

**⚠ WARNING**

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

Drain the coolant (page 6-3).

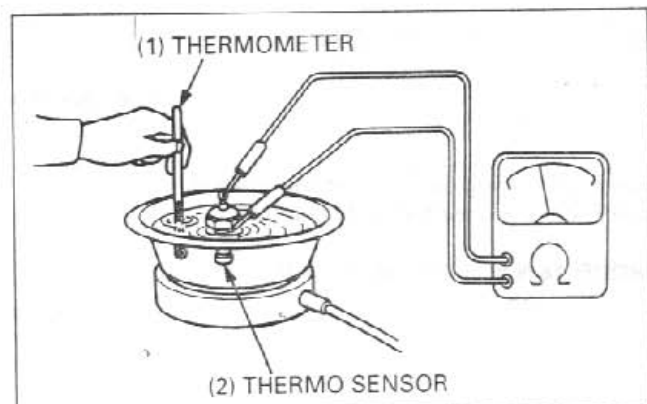
Disconnect the wire connector from the coolant temperature sensor and remove the sensor.



Suspend the thermo sensor in a pan of coolant (50 – 50 mixture) an electric heating element and measure the resistance through the sensor as the coolant heats up.

**NOTE**

- Soak the thermo sensor in coolant up to its threads with at least 40 mm (1.57 in) from the bottom of the pan to the bottom of the sensor.
- Keep the temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect readings. Do not let the thermometer or thermo sensor touch the pan.





## LIGHTS/METERS/SWITCHES

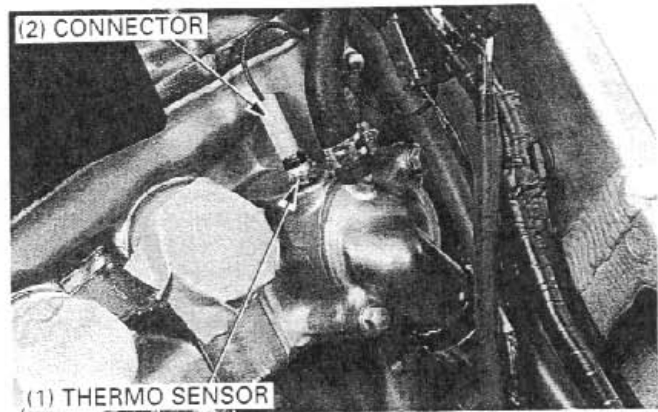
|             |             |               |
|-------------|-------------|---------------|
| Temperature | 80°C (68°F) | 120°C (248°F) |
| Resistance  | 45 – 60 Ω   | 10 – 20 Ω     |

Replace the sensor if it is out of specification by more than 10% at any temperature listed.

Apply sealant to the thermo sensor threads.  
Do not apply sealant to the sensor head.  
Install and tighten the thermo sensor.

**TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)**

Connect the thermo sensor connector.  
Fill the system and bleed the air (page 6-4).



## COOLING FAN MOTOR SWITCH

### INSPECTION

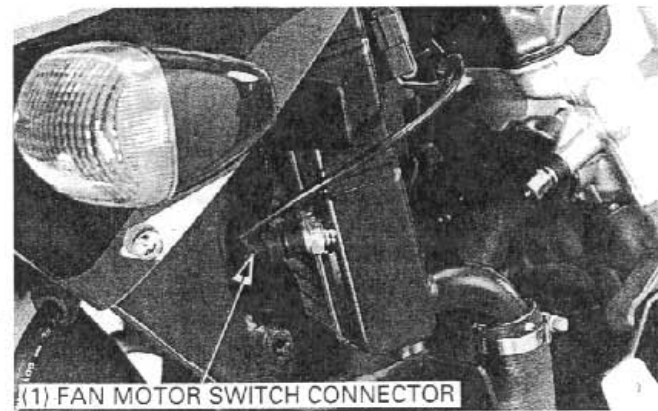
Check for a blown fuse before inspection.

#### Fan motor does not stop

Turn the ignition switch OFF, disconnect the connector from the fan motor switch and turn the ignition switch ON again.

If the fan motor does not stop, check for a shorted wire between the fan motor and switch.

If the fan motor stops, replace the fan motor switch.



#### Fan motor does not start

Before testing, warm up the engine to operating temperature.

Disconnect the connector from the fan motor switch and ground the connector to the body with a jumper wire.  
Turn the ignition switch ON and check the fan motor.

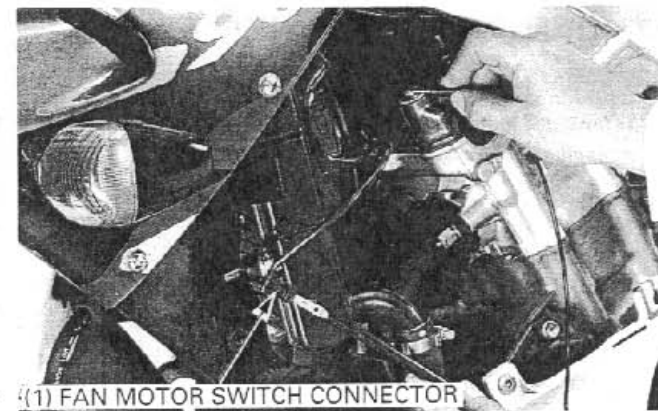
If the motor starts, check the connection at the fan motor switch terminal.

If it is OK, replace the fan motor switch.

If the motor does not start, check for voltage between the fan motor switch connector and ground.

If battery voltage is measured, replace fan motor.

If there is no battery voltage, check for poor connection of the connector or broken wire harness.

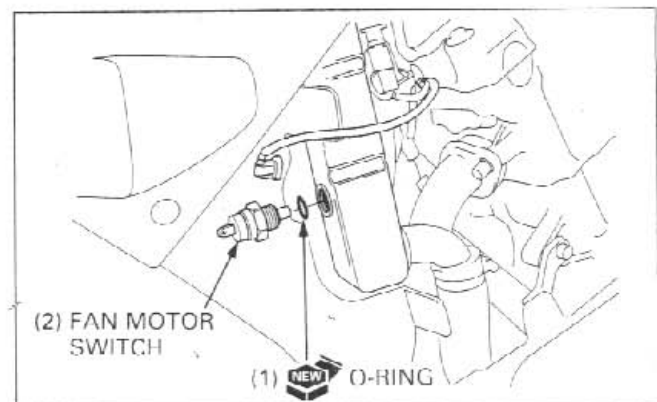


### REMOVAL/INSTALLATION

Disconnect the fan motor switch connector and remove the switch.

Install a new O-ring onto the fan motor switch.  
Install and tighten the fan motor switch.

**TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)**

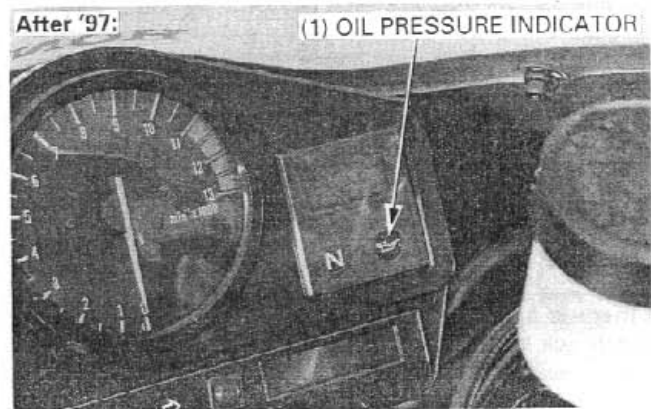
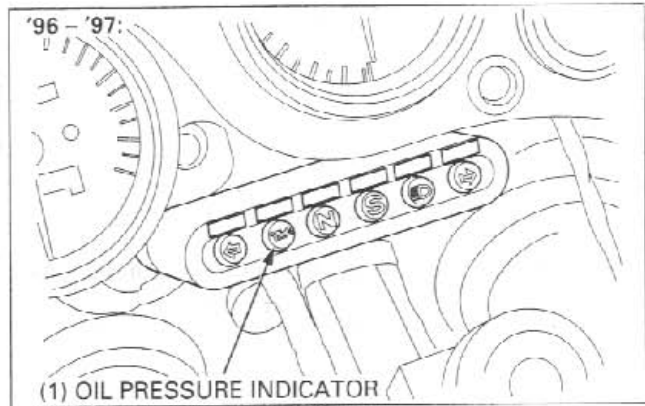


## OIL PRESSURE SWITCH

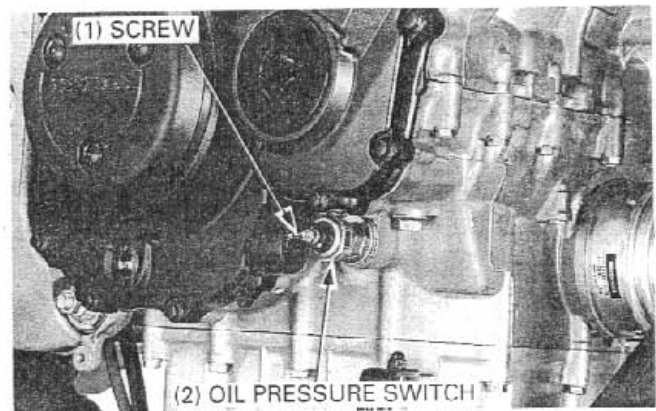
### INSPECTION

If the oil pressure indicator stays on while the engine running, check the engine oil level before inspection.

Make sure that the oil pressure indicator come on with the ignition switch ON.



If the indicator does not come on, inspect as follow:  
Remove the middle/lower cowl (page 2-6).  
Remove the dust cover.  
Remove the screw and oil pressure switch terminal.

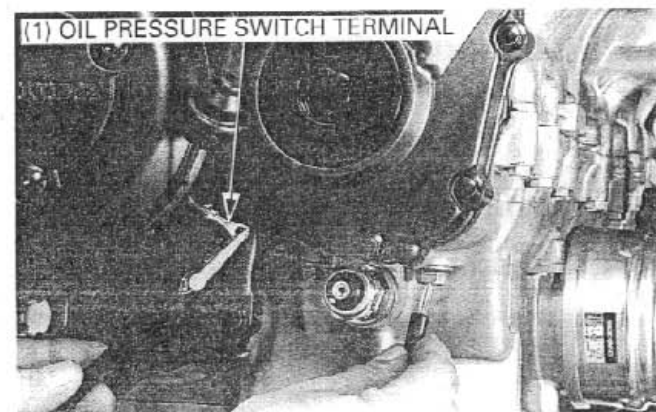


Short the oil pressure switch wire terminal with the ground using a jumper wire.

The oil pressure warning indicator comes on with the ignition switch is ON.

If the light does not comes on, check the sub-fuse (10 A) and wires for a loose connection or an open circuit.

Start the engine and make sure that the light goes out.  
If the light does not go out, check the oil pressure (page 4-3).  
If the oil pressure is normal, replace the oil pressure switch (page 4-3).



# IGNITION SWITCH

## INSPECTION

Remove the right inner panel (page 2-8).

Disconnect the ignition switch wire 6P (Black) connectors.

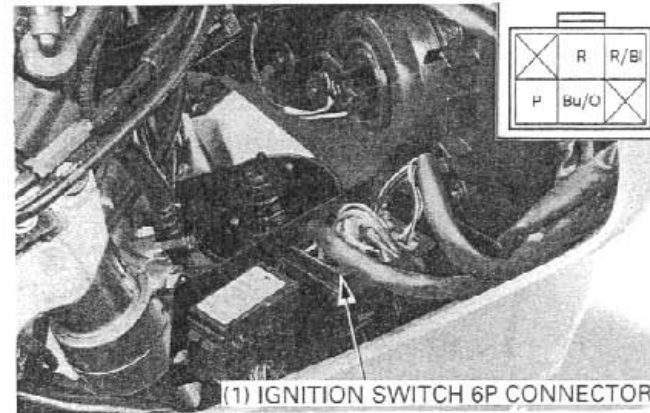
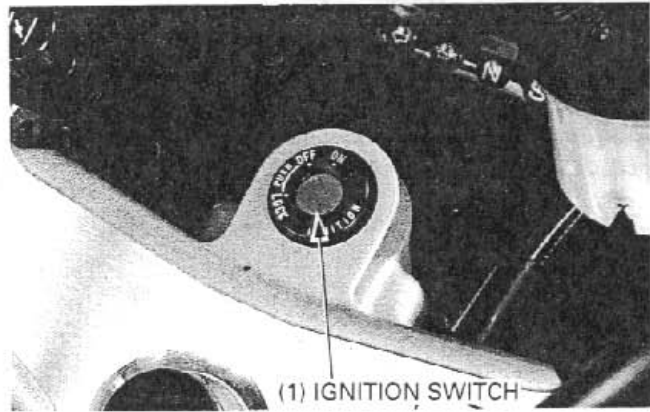
Check for continuity between the wire terminals of the ignition switch connector in each switch position. Continuity should exist between the color coded wires as follows:

## IGNITION SWITCH

|       | BAT | FAN  | IG   | *S | KEY                 |
|-------|-----|------|------|----|---------------------|
| ON    | ○   | ○    | ○    |    | KEY ON              |
| OFF   |     |      | ○    | ○  | KEY OFF             |
| LOCK  |     |      | ○    | ○  | KEY OFF<br>LOCK PIN |
| COLOR | R   | Bu/O | R/BI | P  | —                   |

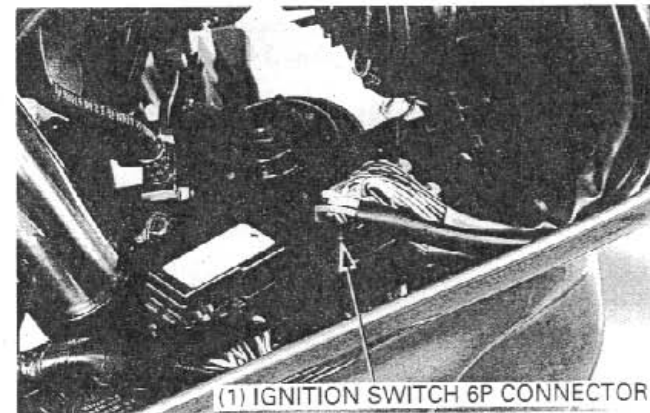
\* After '97:  
NOTE

- If there is a continuity in either direction between the Red/Black terminal and the Pink terminal with the ignition switch ON, the ignition switch is OK.



## REMOVAL/INSTALLATION

Disconnect the ignition switch wire 6P (Black) connector. Remove the wire clamp.

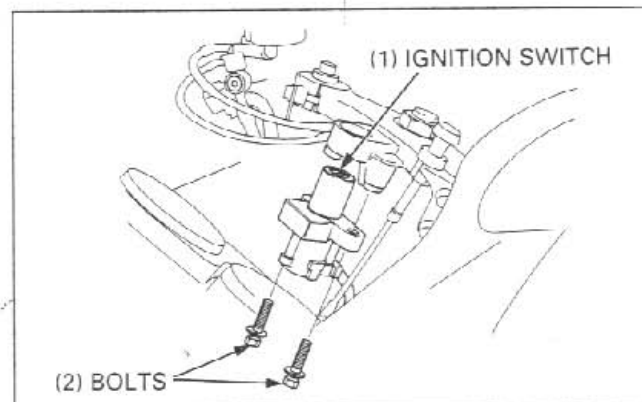


Remove the bolts and ignition switch.

Install the ignition switch in the reverse order of removal.

NOTE

- Apply a locking agent to the mounting bolt threads ('96 - '97).
- Always replace the new one when disassembled (After '97).



# HANDLEBAR SWITCHES

Disconnect the handlebar switch connectors.

Check for continuity between the wire terminals of the handlebar switch connector. Continuity should exist between the color coded wire terminals as follows:

## ENGINE STOP SWITCH

|       |    |      |
|-------|----|------|
|       | IG | BAT2 |
| OFF   |    |      |
| RUN   | ○  | ○    |
| COLOR | BI | BI/W |

## STARTER SWITCH

|       |      |     |      |      |
|-------|------|-----|------|------|
|       | BAT2 | ST  | BAT5 | HL   |
| FREE  |      |     | ○    | ○    |
| PUSH  | ○    | ○   |      |      |
| COLOR | BI/W | Y/R | Bu/W | BI/R |

## TURN SIGNAL SWITCH

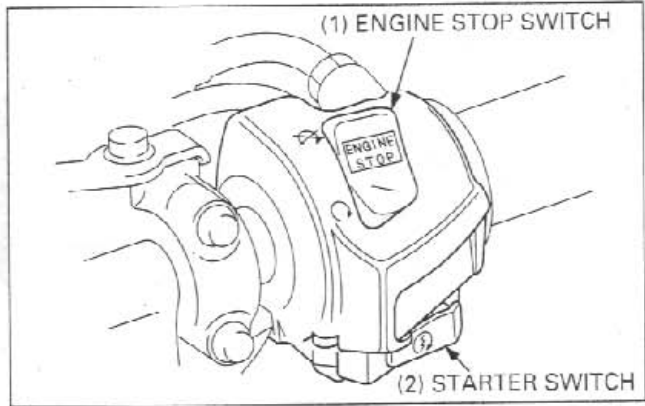
|       |    |    |   |       |      |     |
|-------|----|----|---|-------|------|-----|
|       | W  | R  | L | BAT3  | PR   | PL  |
| R     | ○  | ○  |   | ○     | ○    | ○   |
| N     |    |    |   | ○     | ○    | ○   |
| L     | ○  |    | ○ | ○     | ○    |     |
| COLOR | Gr | Lb | O | BI/Br | Lb/W | O/W |

## DIMMER SWITCH

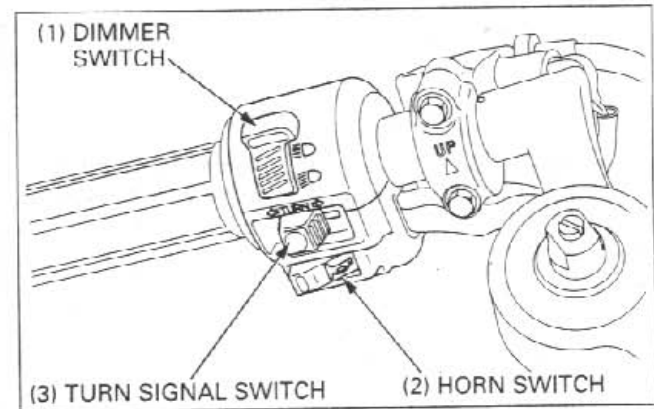
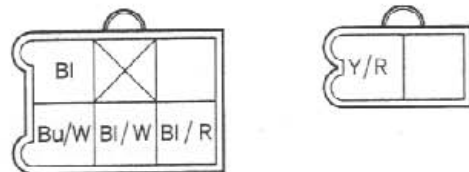
|       |      |    |    |
|-------|------|----|----|
|       | HL   | Lo | Hi |
| Lo    | ○    | ○  |    |
| (N)   | ○    | ○  | ○  |
| Hi    | ○    |    | ○  |
| COLOR | Bu/W | W  | Bu |

## HORN SWITCH

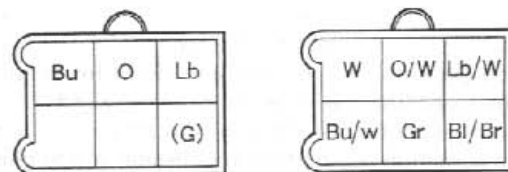
|       |    |       |
|-------|----|-------|
|       | Ho | BAT3  |
| FREE  |    |       |
| PUSH  | ○  | ○     |
| COLOR | Lg | BI/Br |



## RIGHT HANDLEBAR SWITCHES CONNECTORS



## LEFT HANDLEBAR SWITCHES CONNECTORS



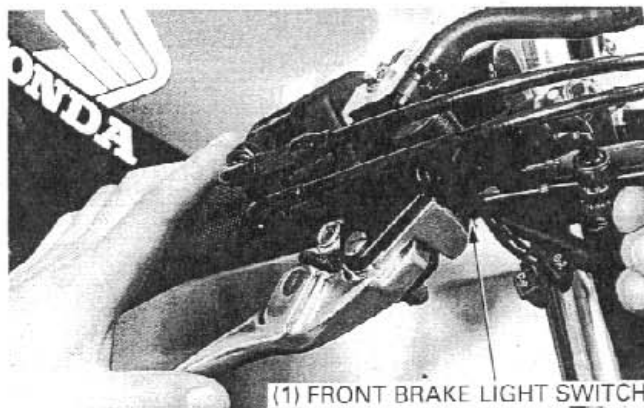
(G): Horn ground wire  
(From HO terminal)

## BRAKE LIGHT SWITCH

### FRONT

Disconnect the front brake light switch connectors.

There should be continuity with the brake lever applied, and there should be no continuity with the brake lever is released.

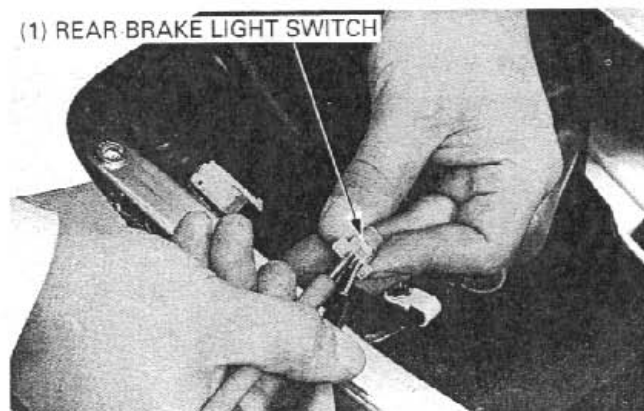


### REAR

Remove the seat (page 2-2).

Disconnect the rear brake light switch connector and check for continuity between the terminals.

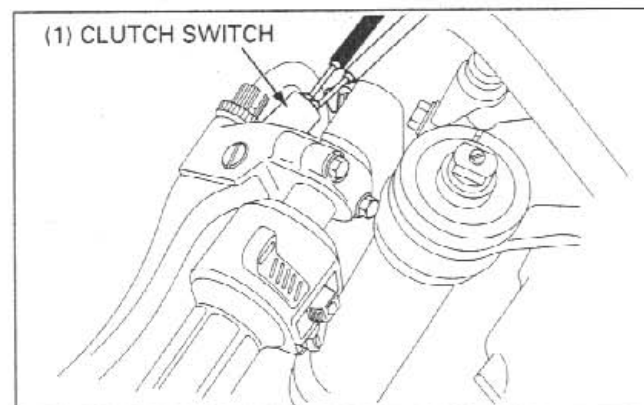
There should be continuity with the brake pedal applied, and there should be no continuity with the brake pedal is released.



## CLUTCH SWITCH

Disconnect the clutch switch connectors.

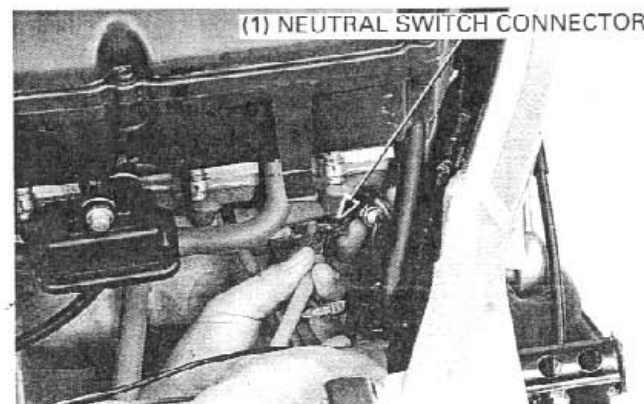
There should be continuity with the clutch lever applied, and there should be no continuity with the clutch lever is released.



## NEUTRAL SWITCH

Remove the fuel tank (page 2-2).

Disconnect the neutral switch connector. Shift the transmission into neutral and check for continuity between the Light Green wire terminal and ground. There should be continuity with the transmission is in neutral, and no continuity when the transmission is into gear.

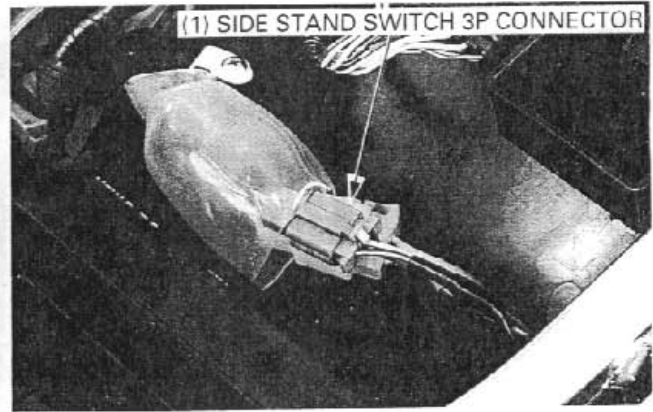


## SIDE STAND SWITCH

### INSPECTION

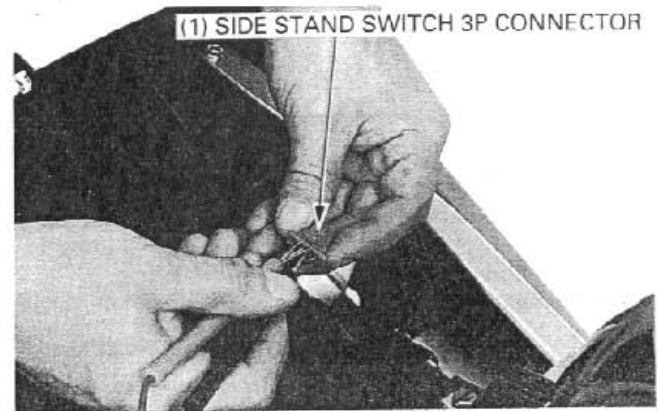
Remove the seat (page 2-2).

Disconnect the side stand switch 3P (Green) connector.



Check for continuity between the wire terminals of the side stand switch connector. Continuity should exist between the color coded wire terminals as follows:

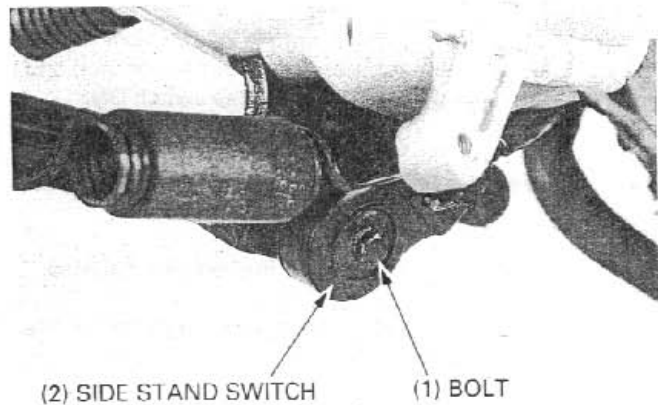
|                 | G/W   | Y/BI  | G |
|-----------------|-------|-------|---|
| Side stand down |       | ○ — ○ | ○ |
| Side stand up   | ○ — ○ |       | ○ |



### REMOVAL

Disconnect the side stand switch 3P (Green) connector.

Remove the bolt and side stand switch.

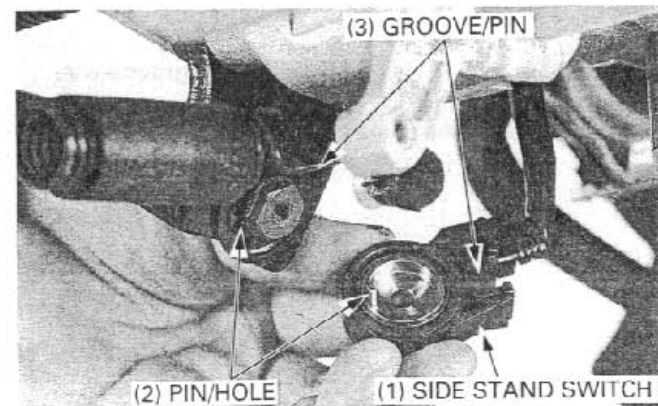


### INSTALLATION

Install the side stand switch by aligning the switch pin with the side stand hole and the switch groove with the return spring holding pin.

Secure the side stand switch with a new bolt.

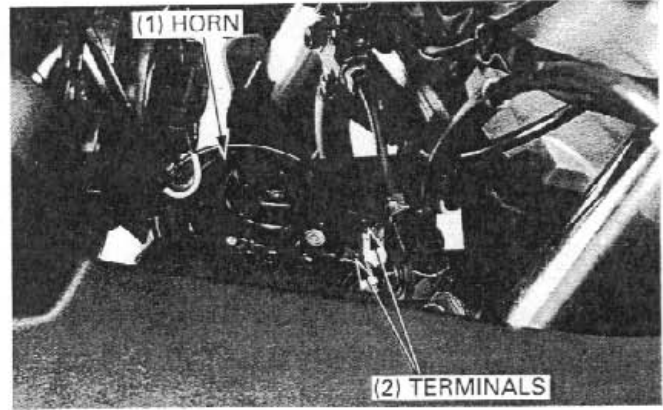
**TORQUE: 10 N-m (1.0 kgf-m, 7 lbf-ft)**



# HORN

Disconnect the wire connectors from the horn.

Connect the 12 V battery to the horn terminal directly. The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.



# TURN SIGNAL RELAY

## INSPECTION

Check the following:

- Battery condition
- Burned out bulb or non-specified wattage
- Burned fuse
- Ignition switch and turn signal switch function
- Loose connectors

If the above items are all normal, check the following:  
Disconnect the turn signal connectors from the relay.



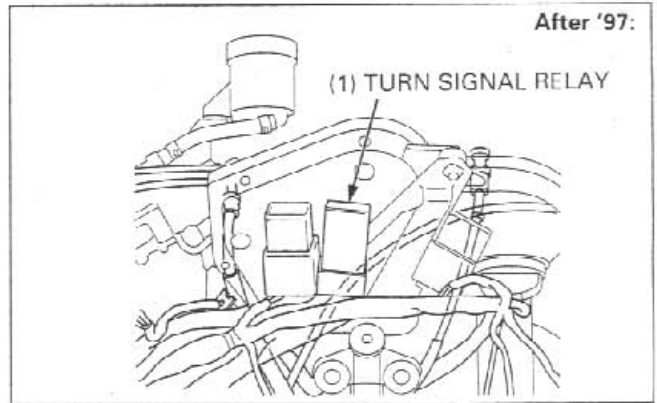
1. Short the black and gray terminals of the turn signal relay connector with a jumper wire. Start the engine and check the turn signal light by turning the switch ON.



2. Check for continuity between the green terminal of the relay connector and ground.

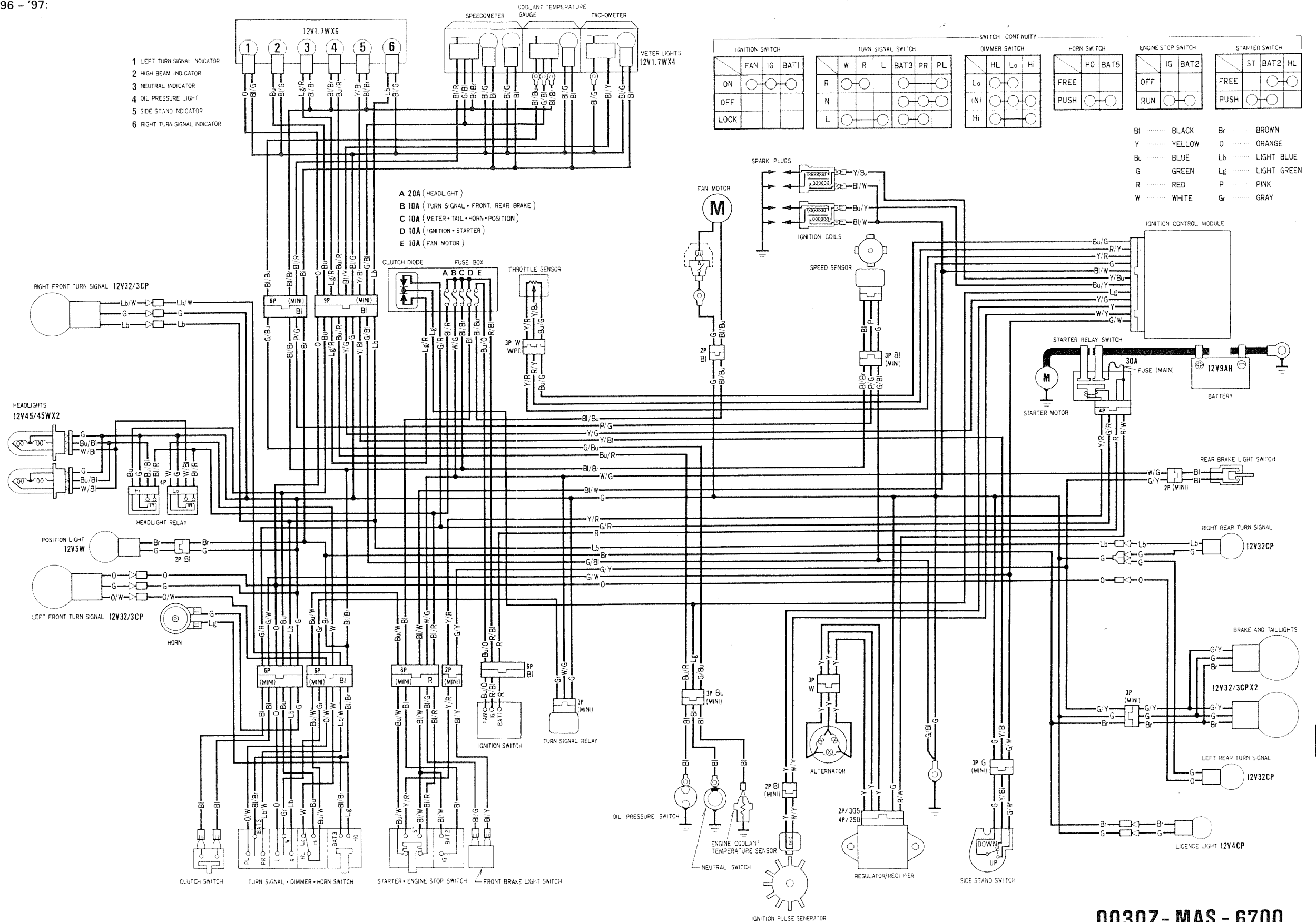


- Faulty turn signal relay.
- Poor connection of the connector.



# 20. WIRING DIAGRAM

'96 - '97:

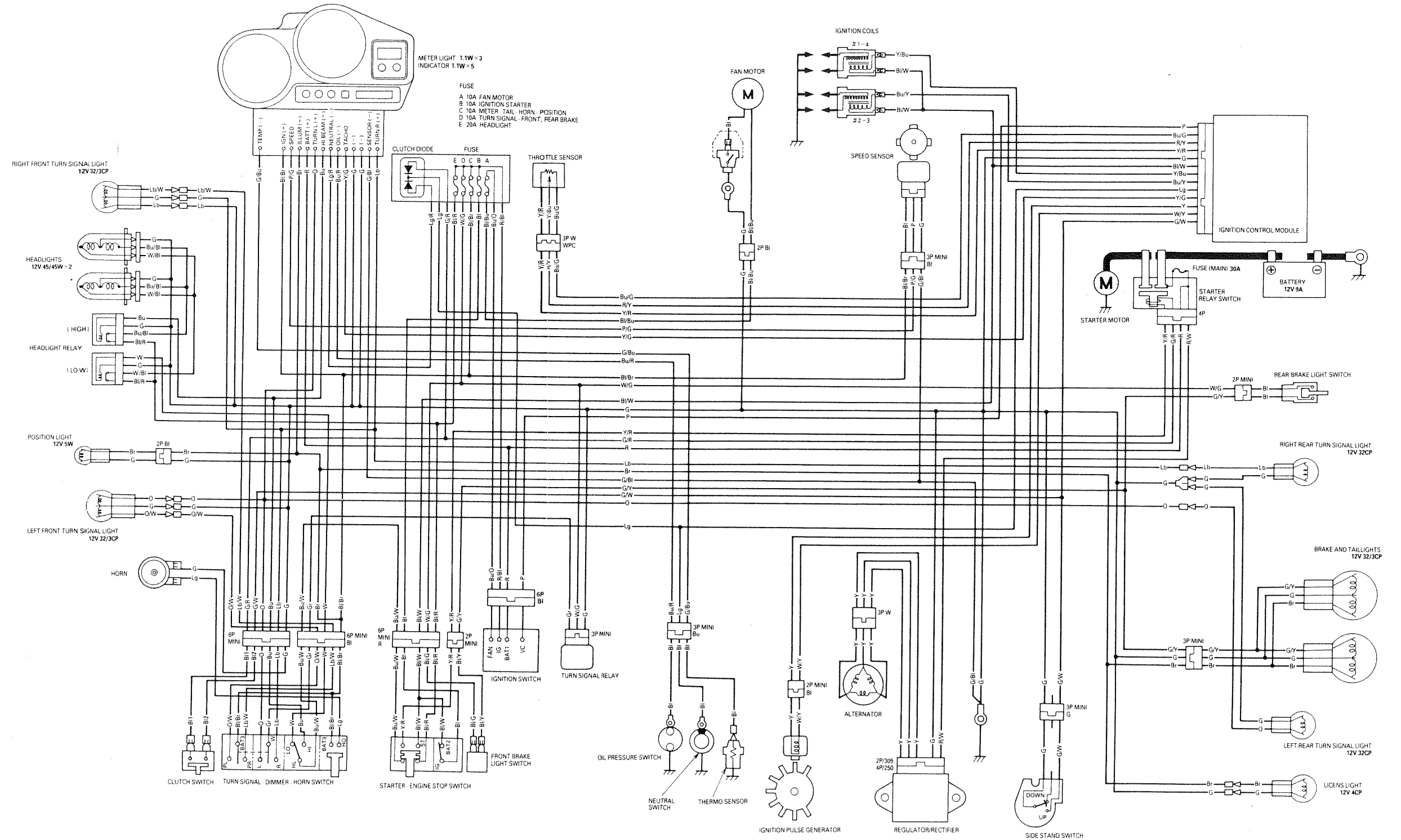


96-98 900 RR



# WIRING DIAGRAM

After '97:



SWITCH CONTINUITY

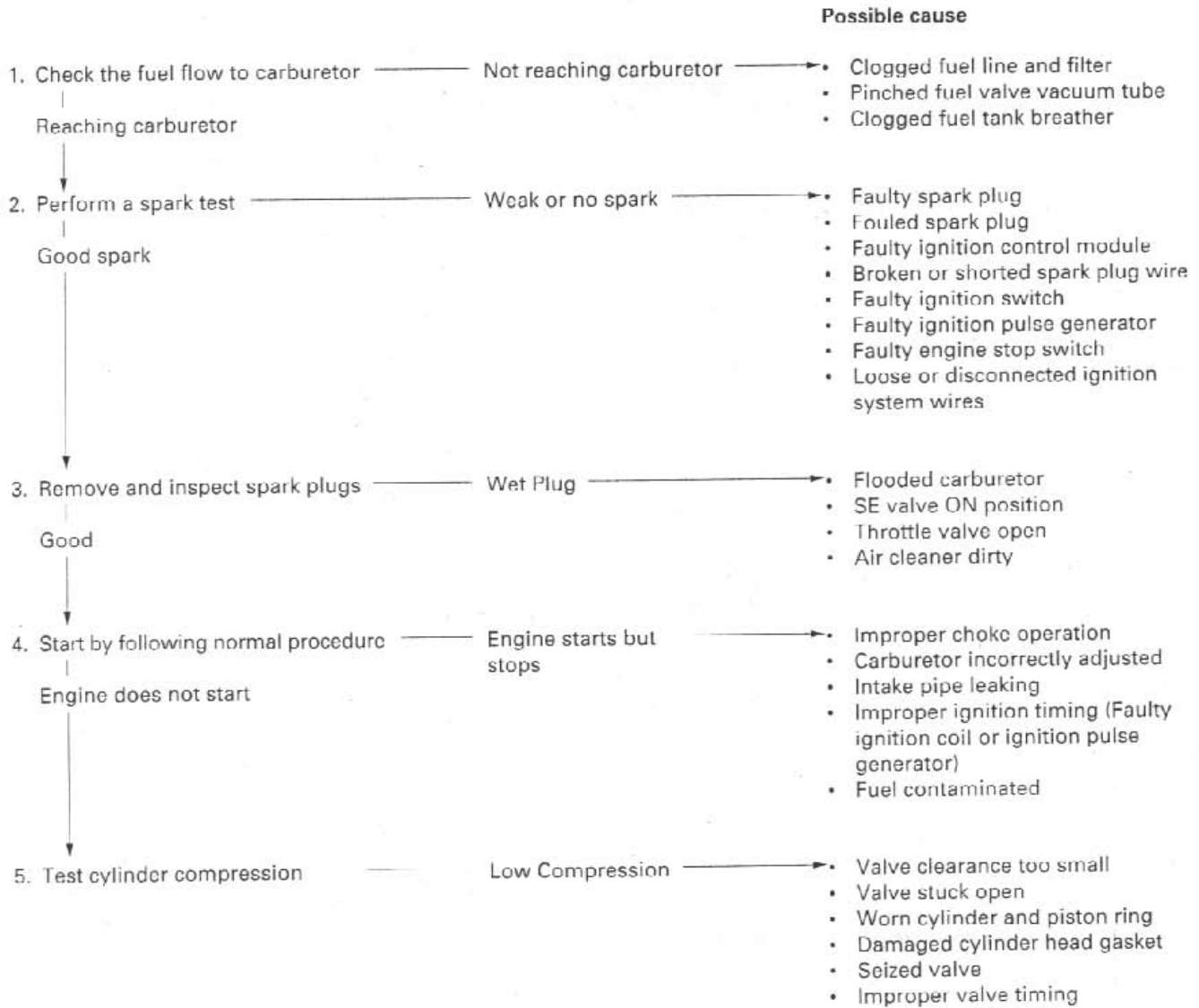
| TURN SIGNAL SWITCH |   |   |      | DIMMER SWITCH |    |    | HORN SWITCH |    | STARTER SWITCH |      |    | ENGINE STOP SWITCH |      |     | IGNITION SWITCH |      |     |        |         |         |          |
|--------------------|---|---|------|---------------|----|----|-------------|----|----------------|------|----|--------------------|------|-----|-----------------|------|-----|--------|---------|---------|----------|
| W                  | R | L | BAT3 | FR            | PL | HL | LO          | HI | ST             | BAT2 | HL | IG                 | BAT2 | FAN | IG              | BAT1 | KEY | KEY ON | KEY OFF | KEY OFF | LOCK PIN |
| ○                  | ○ | ○ | ○    | ○             | ○  | ○  | ○           | ○  | ○              | ○    | ○  | ○                  | ○    | ○   | ○               | ○    | ○   | ○      | ○       | ○       | ○        |
| ○                  | ○ | ○ | ○    | ○             | ○  | ○  | ○           | ○  | ○              | ○    | ○  | ○                  | ○    | ○   | ○               | ○    | ○   | ○      | ○       | ○       | ○        |
| ○                  | ○ | ○ | ○    | ○             | ○  | ○  | ○           | ○  | ○              | ○    | ○  | ○                  | ○    | ○   | ○               | ○    | ○   | ○      | ○       | ○       | ○        |

- Bl ... BLACK
- Y ... YELLOW
- Bu ... BLUE
- G ... GREEN
- R ... RED
- W ... WHITE
- Br ... BROWN
- O ... ORANGE
- Lb ... LIGHT BLUE
- Lg ... LIGHT GREEN
- P ... PINK
- Gr ... GRAY

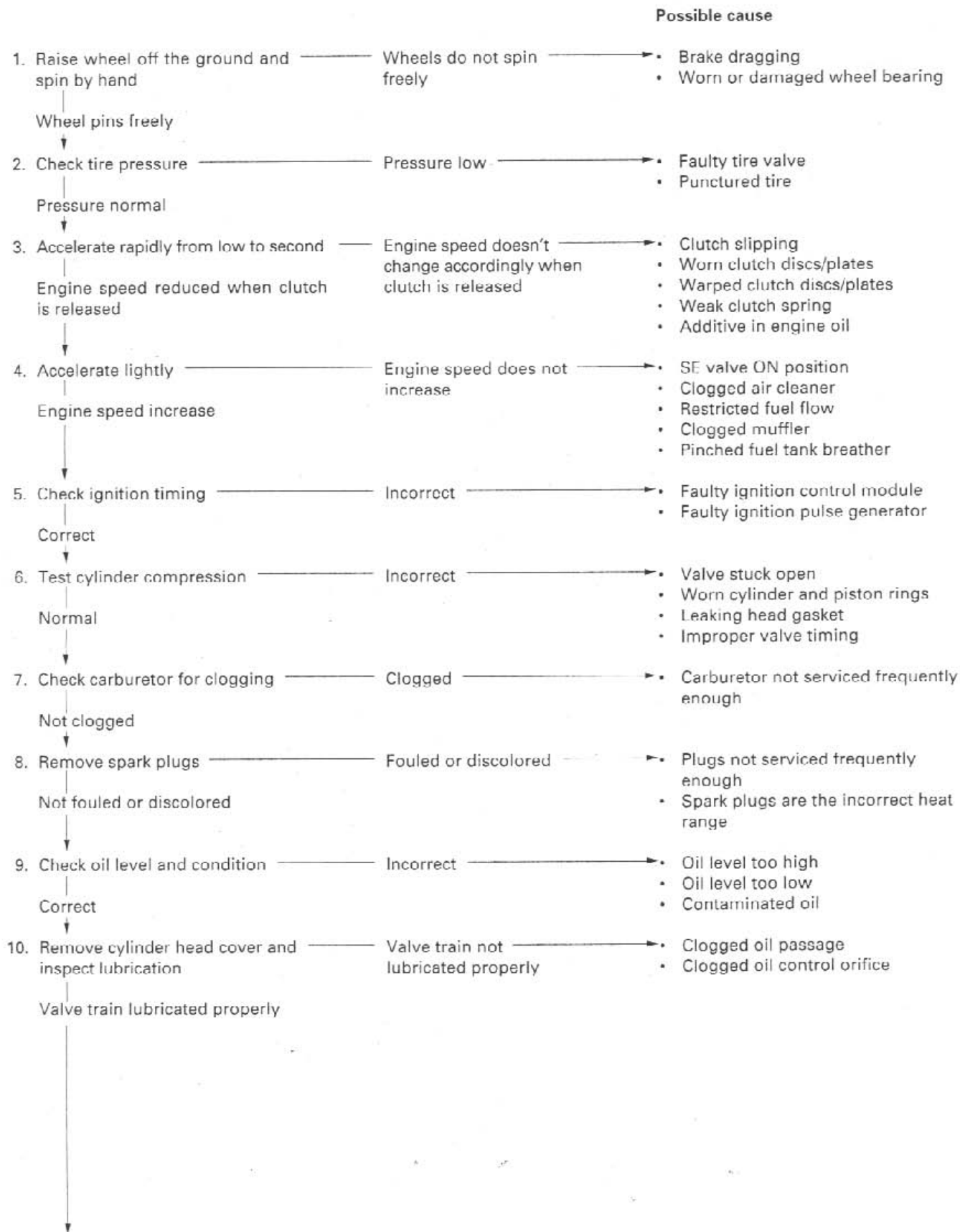
0030Z-MAS-A000

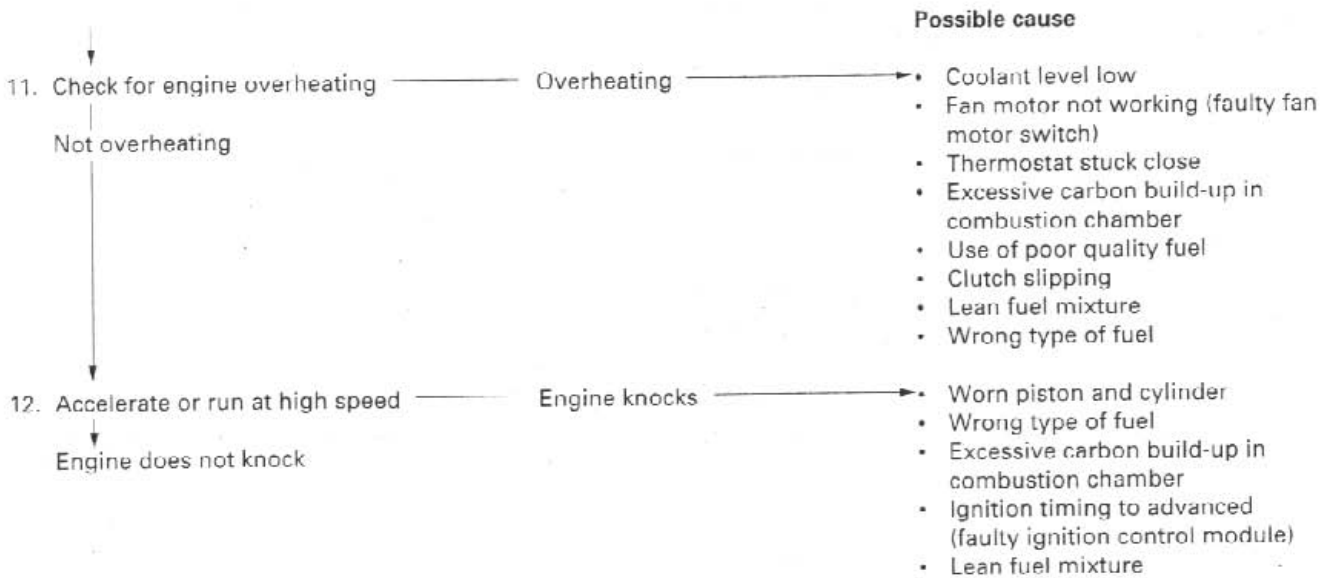
|   |      |                                |      |
|---|------|--------------------------------|------|
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## ENGINE DOES NOT START OR IS HARD TO START

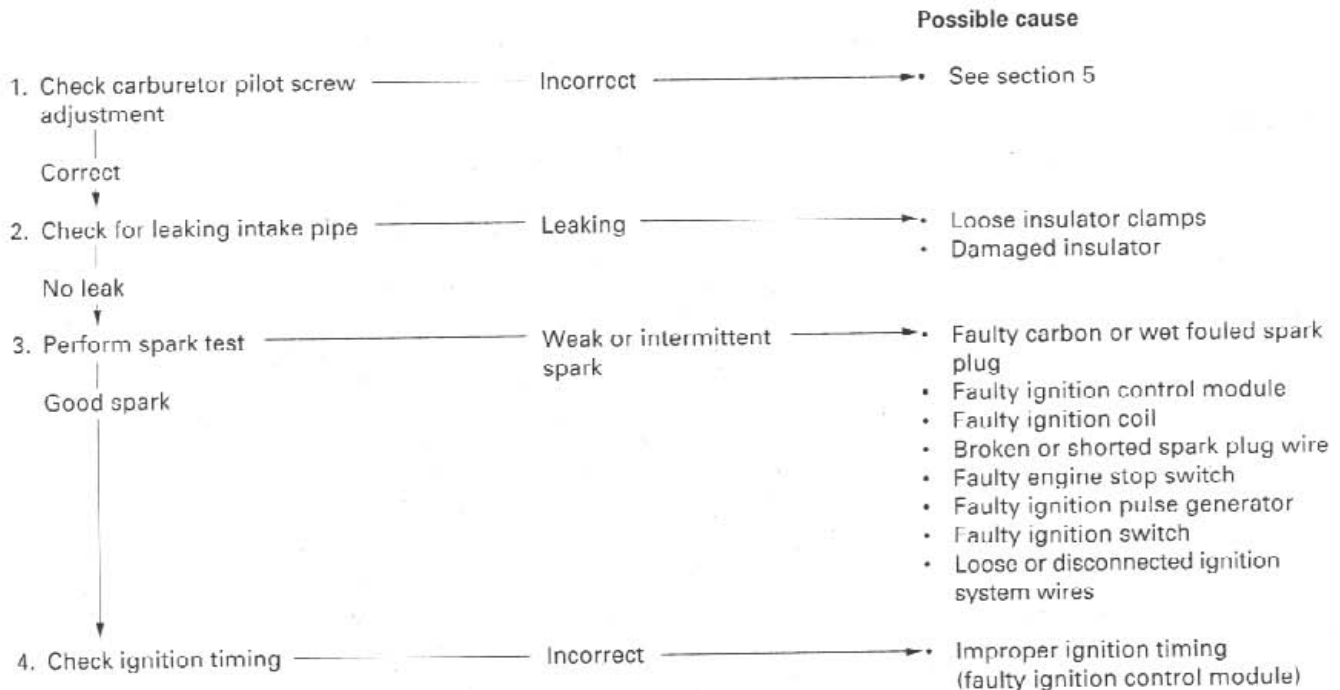


**ENGINE LACKS POWER**

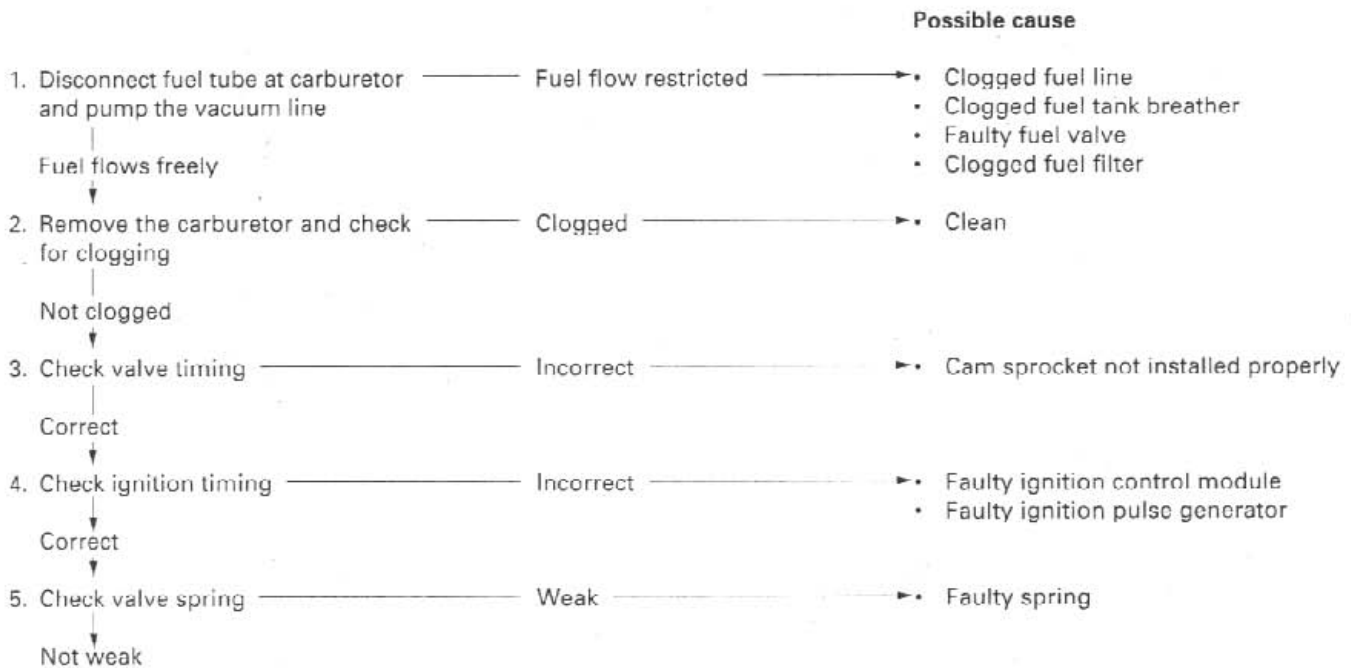




## **POOR PERFORMANCE AT LOW AND IDLE SPEED**



## POOR PERFORMANCE AT HIGH SPEED



## POOR HANDLING

|  |  | <b>Possible cause</b>   |
|--|--|---|
| 1. If steering is heavy                |  | <ul style="list-style-type: none"> <li>• Steering stem adjusting nut too tight</li> <li>• Damaged steering head bearings</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>• Improper 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>• Faulty shock absorber</li> <li>• Front and rear wheel not aligned</li> <li>• Bent fork</li> <li>• Bent swingarm</li> <li>• Bent axle</li> </ul>                              |

|   |       |   |       |
|---|-------|---|-------|
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| AIR CLEANER HOUSING   | 5-4   | FRONT FENDER  | 2-13  |
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| ALTERNATOR COVER REMOVAL                                      | 10-2  | FUEL LINE   | 3-4   |
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| BODY PANEL LOCATION   | 2-0   | GEARSHIFT LINKAGE                                     | 9-11  |
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