

# HONDA

## VF400F

### SHOP MANUAL





**HONDA**  
**VF400F**

# 1. GENERAL INFORMATION

|                         |     |
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## GENERAL SAFETY

### WARNING

*If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in a closed area. The exhaust contains poisonous carbon monoxide gas.*

### WARNING

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

### WARNING

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

### WARNING

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

## SERVICE RULES

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





## SPECIFICATIONS

| ITEM       |                                |                          | SPECIFICATIONS                                            |
|------------|--------------------------------|--------------------------|-----------------------------------------------------------|
| DIMENSIONS | Overall length                 |                          | 2,085 mm (82.1 in)                                        |
|            | Overall width                  |                          | 750 mm (29.5 in)                                          |
|            | Overall height                 |                          | 1,160 mm (45.7 in)                                        |
|            | Wheelbase                      |                          | 1,415 mm (55.7 in)                                        |
|            | Seat height                    |                          | 780 mm (30.7 in)                                          |
|            | Foot peg height                |                          | 338 mm (13.3 in)                                          |
|            | Ground clearance               |                          | 140 mm ( 5.5 in)                                          |
|            | Dry weight                     |                          | 175 kg (386 lb)                                           |
|            | Curb weight                    |                          | 193 kg (425 lb)                                           |
| FRAME      | Type                           |                          | Double cradle                                             |
|            | Front suspension, travel       |                          | Telescopic fork, 140 mm (5.5 in)                          |
|            | Rear suspension, travel        |                          | Swingarm/Shock absorber, 110 mm (4.3 in)                  |
|            | Front suspension air pressure  |                          | 0–40 kPa (0–0.4 kg/cm <sup>2</sup> , 0–6 psi)             |
|            | Rear suspension air pressure   |                          | 100–300 kPa (1.0–3.0 kg/cm <sup>2</sup> , 14–43 psi)      |
|            | Front tire size                |                          | 100/90-16 54H Tubeless                                    |
|            | Rear tire size                 |                          | 110/90-18 61H Tubeless                                    |
|            | Cold tire pressures            | Driver only              | Front 225 kPa (2.25 kg/cm <sup>2</sup> , 32 psi)          |
|            |                                |                          | Rear 225 kPa (2.25 kg/cm <sup>2</sup> , 32 psi)           |
|            |                                | Driver and one passenger | Front 225 kPa (2.25 kg/cm <sup>2</sup> , 32 psi)          |
|            |                                |                          | Rear 280 kPa (2.80 kg/cm <sup>2</sup> , 40 psi)           |
|            | Front brake, lining swept area |                          | Single disc 24 cm <sup>2</sup> (3.7 sq in)                |
|            | Rear brake, lining swept area  |                          | Single disc 24 cm <sup>2</sup> (3.7 sq in)                |
|            | Fuel capacity                  |                          | 17 liters (4.5 US gal, 3.7 Imp gal)                       |
|            | Fuel reserve capacity          |                          | 3 liters (0.8 US gal, 0.7 Imp gal)                        |
|            | Caster angle                   |                          | 26°30'                                                    |
|            | Trail                          |                          | 91 mm (3.6 in)                                            |
|            | Front fork oil capacity        |                          | Right: 285 cc (9.6 oz), Left: 300 cc (10.1 oz)            |
| ENGINE     | Type                           |                          | Water cooled 4-stroke, DOHC engine                        |
|            | Cylinder arrangement           |                          | 4 cylinders 90°V                                          |
|            | Bore and stroke                |                          | 55 x 42 mm (2.17 x 1.65 in)                               |
|            | Displacement                   |                          | 399 cm <sup>3</sup> (24.3 cu in)                          |
|            | Compression ratio              |                          | 11.0 : 1                                                  |
|            | Valve train                    |                          | Silent, multi-link chain drive and OHC with rocker arms   |
|            | Maximum horsepower             |                          | (DIN) 40.5 kW (55 PS)/11,500 min <sup>-1</sup> (rpm)      |
|            | Maximum torque                 |                          | 35 N·m (3.6 kg-m)/10,500 min <sup>-1</sup> (rpm)          |
|            | Oil capacity                   |                          | 3.0 liters (3.2 US qt, 2.6 Imp qt) after disassembly      |
|            |                                |                          | 2.6 liters (2.8 US qt, 2.3 Imp qt) after draining         |
|            | Coolant capacity               |                          | 2.0 liters (2.1 US qt, 1.8 Imp qt)                        |
|            | Lubrication system             |                          | Forced pressure and wet sump                              |
|            | Air filtration                 |                          | Paper filter                                              |
|            | Cylinder compression           |                          | 900–1,400 kPa (9.0–14.0 kg/cm <sup>2</sup> , 128–199 psi) |
|            | Intake valve                   | Opens                    | 8° (BTDC)                                                 |
|            |                                | Closes                   | 42° (ABDC)                                                |
|            | Exhaust valve                  | Opens                    | 40° (BBDC)                                                |
|            |                                | Closes                   | 5° (ATDC)                                                 |
|            | Valve clearance                | (Cold)                   | IN: 0.10 mm (0.004 in)<br>EX: 0.15 mm (0.006 in)          |
|            | Engine weight                  | (Dry)                    | 59 kg (130 lb)                                            |
|            | Idle speed                     |                          | 1,300 ± 100 min <sup>-1</sup> (rpm)                       |



## TORQUE VALUES

### ENGINE

| Item                        | Thread<br>dia. (mm) | Torque |         |       | Remarks                                              |
|-----------------------------|---------------------|--------|---------|-------|------------------------------------------------------|
|                             |                     | N·m    | kg·m    | ft·lb |                                                      |
| Connecting rod cap nut      | 7                   | 20-24  | 2.0-2.4 | 15-18 | Apply engine oil                                     |
| Cylinder head bolt          |                     |        |         |       |                                                      |
| Bore (eight bolts)          | 8                   | 30-34  | 3.0-3.4 | 22-25 | UBS tension bolts                                    |
| Outside (four bolts)        | 8                   | 21-25  | 2.1-2.5 | 15-18 | UBS                                                  |
| Camshaft holder bolts       | 6                   | 10-14  | 1.0-1.4 | 7-10  |                                                      |
| Flywheel bolt               | 10                  | 50-60  | 5.0-6.0 | 36-43 | UBS                                                  |
| Starting clutch bolt        | 10                  | 50-60  | 5.0-6.0 | 36-43 | UBS, Apply locking agent                             |
|                             | 8                   | 26-30  | 2.6-3.0 | 19-22 |                                                      |
| Lower crankcase bolt        | 8                   | 21-25  | 2.1-2.5 | 15-18 |                                                      |
|                             | 6                   | 10-14  | 1.0-1.4 | 7-10  |                                                      |
| Rocker arm shaft bolt       | 22                  | 45-55  | 4.5-5.5 | 33-40 |                                                      |
| Cam sprocket bolt           | 7                   | 18-20  | 1.8-2.0 | 13-15 |                                                      |
| Cylinder head cover bolt    | 6                   | 8-12   | 0.8-1.2 | 6-9   |                                                      |
| Clutch center lock nut      | 20                  | 60-70  | 6.0-7.0 | 43-51 |                                                      |
| Cam chain guide bolt A      | 6                   | 10-14  | 1.0-1.4 | 7-10  |                                                      |
| B                           | 6                   | 10-14  | 1.0-1.4 | 7-10  |                                                      |
| Oil filter                  | —                   | 15-20  | 1.5-2.0 | 11-15 |                                                      |
| Tappet adjusting nut        | 5                   | 8-12   | 0.8-1.2 | 6-9   |                                                      |
| Spark plug                  | 12                  | 12-16  | 1.2-1.6 | 9-12  |                                                      |
| Oil pressure switch         | —                   | 15-20  | 1.5-2.0 | 11-15 |                                                      |
| Oil drain bolt              | 12                  | 35-40  | 3.5-4.0 | 25-29 | Apply sealing agent (Three-Bond #1215 or equivalent) |
| Gearshift return spring pin | 8                   | 20-30  | 2.0-3.0 | 15-22 |                                                      |
| Oil bolt                    | 10                  | 20-25  | 2.0-2.5 | 15-18 |                                                      |
| Neutral switch              | 10                  | 10-14  | 1.0-1.4 | 7-10  |                                                      |
| Drive sprocket              | 6                   | 8-12   | 0.8-1.2 | 6-9   |                                                      |

### FRAME

| Item                              | Thread<br>dia. (mm) | Torque |          |       | Remarks          |
|-----------------------------------|---------------------|--------|----------|-------|------------------|
|                                   |                     | N·m    | kg·m     | ft·lb |                  |
| Steering stem nut                 | 24                  | 90-120 | 9.0-12.0 | 65-87 |                  |
| Front fork top bridge             | 7                   | 9-13   | 0.9-1.3  | 7-9   |                  |
| Front fork bottom bridge          | 8                   | 18-25  | 1.8-2.5  | 13-18 |                  |
| Front axle                        | 12                  | 55-65  | 5.5-6.5  | 40-48 |                  |
| Front axle holder nut             | 8                   | 18-25  | 1.8-2.5  | 13-18 |                  |
| Rear axle nut                     | 14                  | 80-100 | 8.0-10.0 | 58-72 |                  |
| Front engine hanger bolt          | 10                  | 35-45  | 3.5-4.5  | 25-33 |                  |
| Rear engine hanger bolt           | 10                  | 35-45  | 3.5-4.5  | 25-33 |                  |
| Upper                             | 10                  | 35-45  | 3.5-4.5  | 25-33 |                  |
| Lower                             | 10                  | 35-45  | 3.5-4.5  | 25-33 |                  |
| Sub-frame socket bolt             | 8                   | 35-45  | 3.5-4.5  | 25-33 | Apply engine oil |
| Upper                             | 8                   | 35-45  | 3.5-4.5  | 25-33 |                  |
| Lower                             | 8                   | 35-45  | 3.5-4.5  | 25-33 |                  |
| Sub-frame drain bolt              | 6                   | 7-8    | 0.7-0.8  | 5-6   |                  |
| Rear shock absorber mounting bolt |                     |        |          |       |                  |
| Upper                             | 10                  | 40-50  | 4.0-5.0  | 29-36 |                  |
| Lower                             | 10                  | 40-50  | 4.0-5.0  | 29-36 |                  |



| ITEM         |                                       | SPECIFICATION                                                                        |           |
|--------------|---------------------------------------|--------------------------------------------------------------------------------------|-----------|
| ENGINE       | Cylinder numbering                    | No. 1 – Left rear<br>No. 2 – Left front<br>No. 3 – Right rear<br>No. 4 – Right front |           |
|              | Carburetor type/throttle bore         | KEIHIN CV/30 mm (1.18 in)                                                            |           |
|              | Identification number                 | VD40A                                                                                |           |
|              | Pilot screw initial setting           | 2-1/4 turns out                                                                      |           |
| CARBURE-TION | Float level                           | 6.8 mm (0.27 in)                                                                     |           |
|              | Clutch                                | Wet, multi-plate                                                                     |           |
|              | Transmission                          | 6-speed                                                                              |           |
|              | Primary reduction                     | 2.533                                                                                |           |
| DRIVE TRAIN  | Final reduction                       | 3.066                                                                                |           |
|              | Gear ratio I                          | 2.733                                                                                |           |
|              | Gear ratio II                         | 1.850                                                                                |           |
|              | Gear ratio III                        | 1.478                                                                                |           |
|              | Gear ratio IV                         | 1.240                                                                                |           |
|              | Gear ratio V                          | 1.074                                                                                |           |
|              | Gear ratio VI                         | 0.931                                                                                |           |
|              | Gear shift pattern                    | Left foot operated return system, 1–N–2–3–4–5–6                                      |           |
|              | Ignition                              | Full transistor ignition                                                             |           |
| ELECTRICAL   | Ignition timing "F" mark              | 15° BTDC at idle                                                                     |           |
|              | Full advance                          | 37° BTDC at 2,800 min <sup>-1</sup> (rpm)                                            |           |
|              | Starting system                       | Starting motor                                                                       |           |
|              | Alternator                            | 270 W/5,000 min <sup>-1</sup> (rpm)                                                  |           |
|              | Battery capacity                      | 12 V – 12 AH                                                                         |           |
|              | Spark plug                            |                                                                                      |           |
|              |                                       | NGK                                                                                  | ND        |
|              | Standard                              | DPR8EA-9                                                                             | X24EPR-U9 |
|              | For cold climate<br>(Below 5°C, 41°F) | DPR7EA-9                                                                             | X22EPR-U9 |
|              | For extended<br>high speed riding     | DPR9EA-9                                                                             | X27EPR-U9 |
|              | Spark plug gap                        | 0.8–0.9 mm (0.031–0.035 in)                                                          |           |
|              | Firing order                          | 1–4–3–2                                                                              |           |
|              | Fuse/Main fuse                        | 15 A/30 A                                                                            |           |
|              |                                       |                                                                                      |           |
| LIGHTS       | Headlight (high/low beam)             | 60/55 W                                                                              |           |
|              | Tail/stoplight                        | 5/21 W x 2                                                                           |           |
|              | Front turn signal                     | 21 W                                                                                 |           |
|              | Rear turn signal                      | 21 W                                                                                 |           |
|              | Instrument lights                     | 3.4 W x 4                                                                            |           |
|              | Neutral indicator                     | 3.4 W                                                                                |           |
|              | Turn signal indicator                 | 3.4 W x 2                                                                            |           |
|              | High beam indicator                   | 3.4 W                                                                                |           |

## GENERAL INFORMATION



**HONDA**  
**VF400F**

## TOOLS

### SPECIAL

\*These tools are designed and have not used before.

| TOOL NAME                     | TOOL NUMBER   | REFERENCE PAGE                     |
|-------------------------------|---------------|------------------------------------|
| *Valve guide driver           | 07943-KE70000 | 10-13                              |
| *Carburetor adjusting wrench  | 07908-KE70000 | 3-11                               |
| Compression gauge attachment  | 07501-MB00101 | 3-13                               |
| Valve adjusting wrench        | 07908-MB00100 | 3-10                               |
| Oil filter wrench             | 07912-6110000 | 2-3                                |
| Oil pressure gauge attachment | 07510-4220100 | 2-4                                |
| Valve guide reamer            | 07984-MA60000 | 10-12, 10-14                       |
| Valve guide driver/remover    | 07942-MA60000 | 10-13                              |
| Snap ring pliers              | 07914-3230001 | 7-5, 7-7, 14-22, 14-28, 16-6, 16-7 |
| Hex. wrench, 6 mm             | 07917-3230000 | 14-21, 14-27                       |
| Fork seal driver attachment   | 07947-KA20200 | 14-27                              |
| Ball race remover             | 07953-3330000 | 14-31                              |
| Steering stem driver          | 07946-MB00000 | 14-31, 14-32                       |
| Steering stem driver          | 07946-3710601 | 14-31                              |
| Bearing driver attachment     | 07945-3330300 | 14-32                              |
| Bearing driver attachment     | 07946-3290000 | 14-32                              |
| Steering stem socket          | 07916-3710100 | 14-33                              |
| Oil seal driver attachment    | 07965-MA60100 | 15-13, 15-16                       |
| Oil seal driver               | 07965-KE80100 | 15-13, 15-16                       |
| Oil seal driver attachment    | 07965-KE80200 | 15-13, 15-14, 15-16                |
| Bearing remover set           | 07936-8890100 | 15-23                              |
| Vacuum gauge tester           | 07404-0020000 | 3-11                               |
| Oil pressure gauge            | 07506-3000000 | 2-4                                |

### COMMON

| TOOL NAME                          | TOOL NUMBER   | REFERENCE PAGE           |
|------------------------------------|---------------|--------------------------|
| Valve adjusting wrench             | 07708-0030300 | 3-10                     |
| Valve spring compressor            | 07757-0010000 | 10-10, 10-15             |
| Universal holder                   | 07725-0030000 | 7-11, 7-21, 9-2, 9-4     |
| Clutch center holder               | 07725-0050000 | 7-14, 7-17               |
| Lock nut wrench socket, 17 x 27 mm | 07716-0020300 | 7-14, 7-17               |
| Extension bar                      | 07716-0020500 | 7-14, 7-17, 14-30, 14-33 |
| Bearing driver handle C            | 07746-0030100 | 13-6                     |
| Bearing driver attachment, 25 mm   | 07746-0030300 | 13-6                     |
| Float level gauge                  | 07410-0010000 | 4-9                      |
| Bearing remover shaft              | 07746-0050100 | 14-16, 15-5              |



# HONDA

## VF400F

### GENERAL INFORMATION

| TOOL NAME                             | TOOL NUMBER   | REFERENCE PAGE            |
|---------------------------------------|---------------|---------------------------|
| Bearing remover head, 15 mm           | 07746-0050400 | 14-16                     |
| Bearing driver attachment, 42 x 47 mm | 07746-0010300 | 14-17, 15-7               |
| Bearing driver pilot, 15 mm           | 07746-0040300 | 14-17                     |
| Bearing driver handle A               | 07749-0010000 | 14-17, 14-32, 15-7, 15-24 |
| Fork seal driver                      | 07747-0010100 | 14-27                     |
| Lock nut wrench socket, 30 x 32 mm    | 07716-0020400 | 14-30, 14-33              |
| Pin spanner                           | 07702-0020000 | 14-31                     |
| Bearing remover head, 17 mm           | 07746-0050500 | 15-5                      |
| Bearing driver pilot, 17 mm           | 07746-0040400 | 15-7                      |
| Bearing driver pilot, 20 mm           | 07746-0040500 | 15-7                      |
| Bearing driver attachment, 37 x 40 mm | 07746-0010200 | 15-24                     |
| Flywheel puller                       | 07733-0020000 | 9-2                       |

### VALVE SEAT CUTTER

| TOOL NAME                      | TOOL NUMBER   | REFERENCE PAGE |
|--------------------------------|---------------|----------------|
| Valve seat cutter, 22 mm 45°   | 07780-0010701 | 10-15          |
| Valve seat cutter, 22 mm 60°   | 07780-0014202 | 10-15          |
| Valve seat cutter, 22 mm 32°   | 07780-0012601 | 10-15          |
| Valve seat cutter, 19 mm 32°   | 07780-0012700 | 10-15          |
| Valve seat cutter holder, 5 mm | 07781-0010400 | 10-15          |



## CABLE & HARNESS ROUTING

Note the following when routing cables and wire harnesses.

A loose wire, harness or cable can be a safety hazard. After clamping, check each wire to be sure it is secure.

- Do not squeeze wires against the weld or end of its clamp when a weld-on clamp is used.

- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Tighten the bands so that only the insulated surfaces contact the wires or wire harnesses.

- Route harnesses so they are not pulled that or have excessive slack.

- Protect wires and harnesses with electrical tape or tube if they are contact a sharp edge or corner. Clean the attaching surface thoroughly before applying tape.

- Do not use wires or harnesses with a broken insulator. Repair by wrapping them with a protective tape or replace them.

- Route wire harnesses to avoid sharp edges or corners.

- Also avoid the projected ends of bolts and screws.

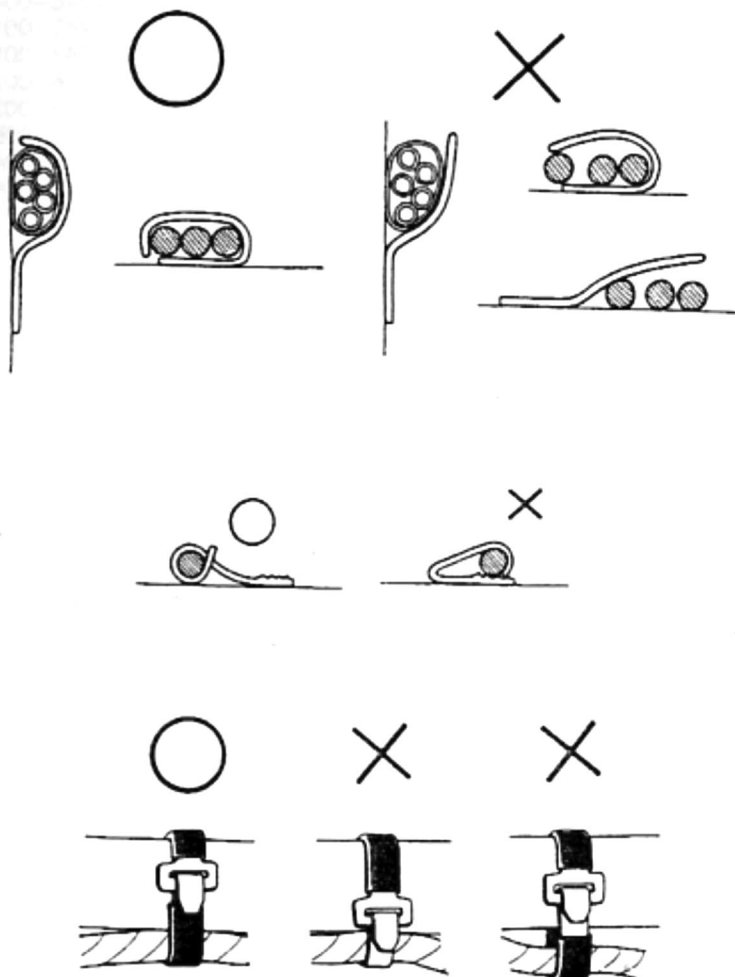
- Keep wire harnesses away from the exhaust pipes and other hot parts.

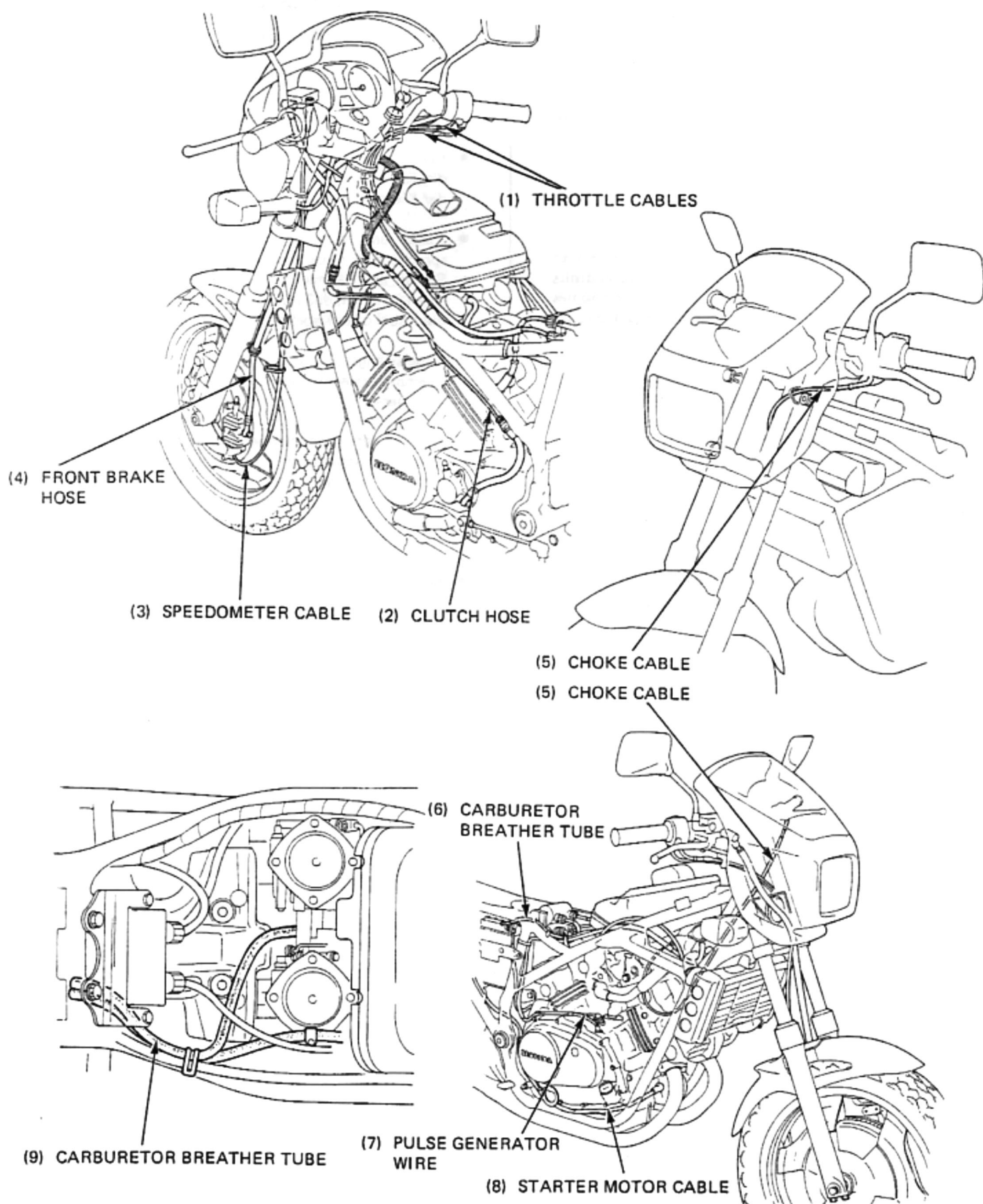
- Be sure grommets are seated in their grooves properly.

- After clamping, check each harness to be certain that it is not interfering with any moving or sliding parts.

- After routing, check that the wire harnesses are not twisted or kinked.

- Wire harnesses routed along the handlebars should not be pulled taut, have excessive slack, be pinched, or interfere with adjacent or surrounding parts in all steering positions.







(1) 6-P COUPLER (BLACK)  
(PULSE GENERATOR)

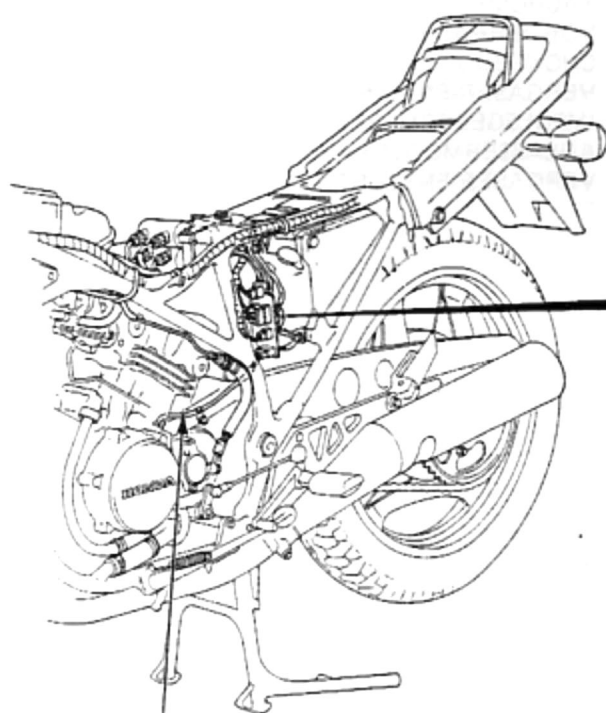
(3) 6-P COUPLER (WHITE)  
(REGULATOR/  
RECTIFIER)

(2) 4-P MINI COUPLER  
(WHITE)  
(IGNITION COIL)

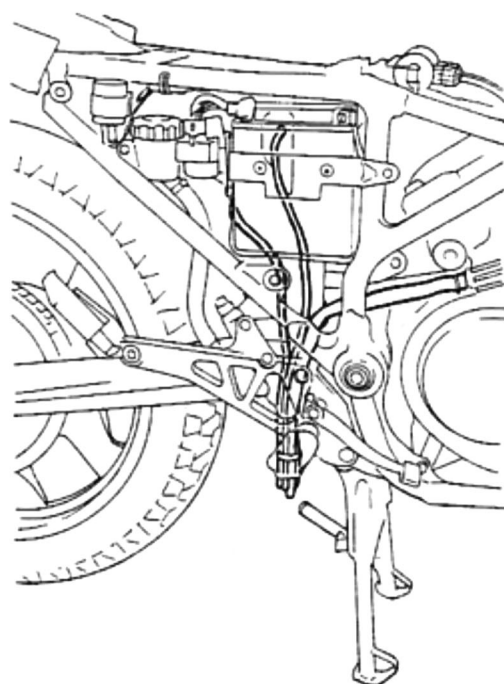
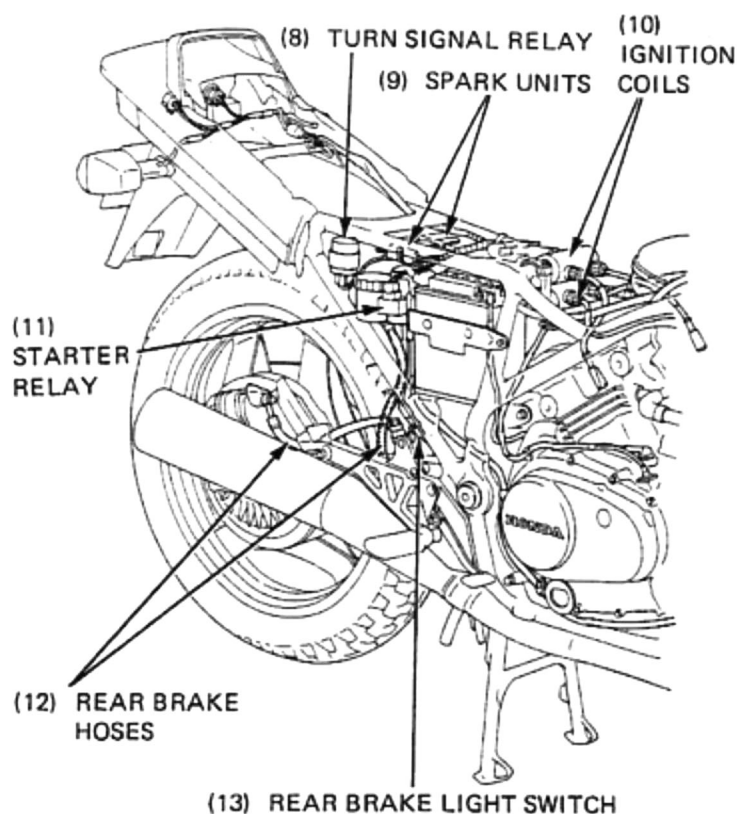
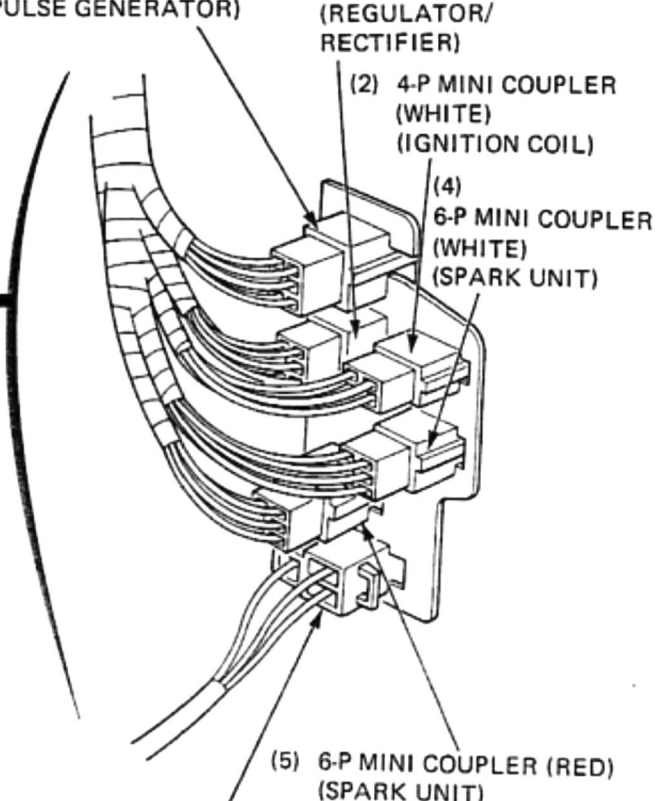
(4) 6-P MINI COUPLER  
(WHITE)  
(SPARK UNIT)

(5) 6-P MINI COUPLER (RED)  
(SPARK UNIT)

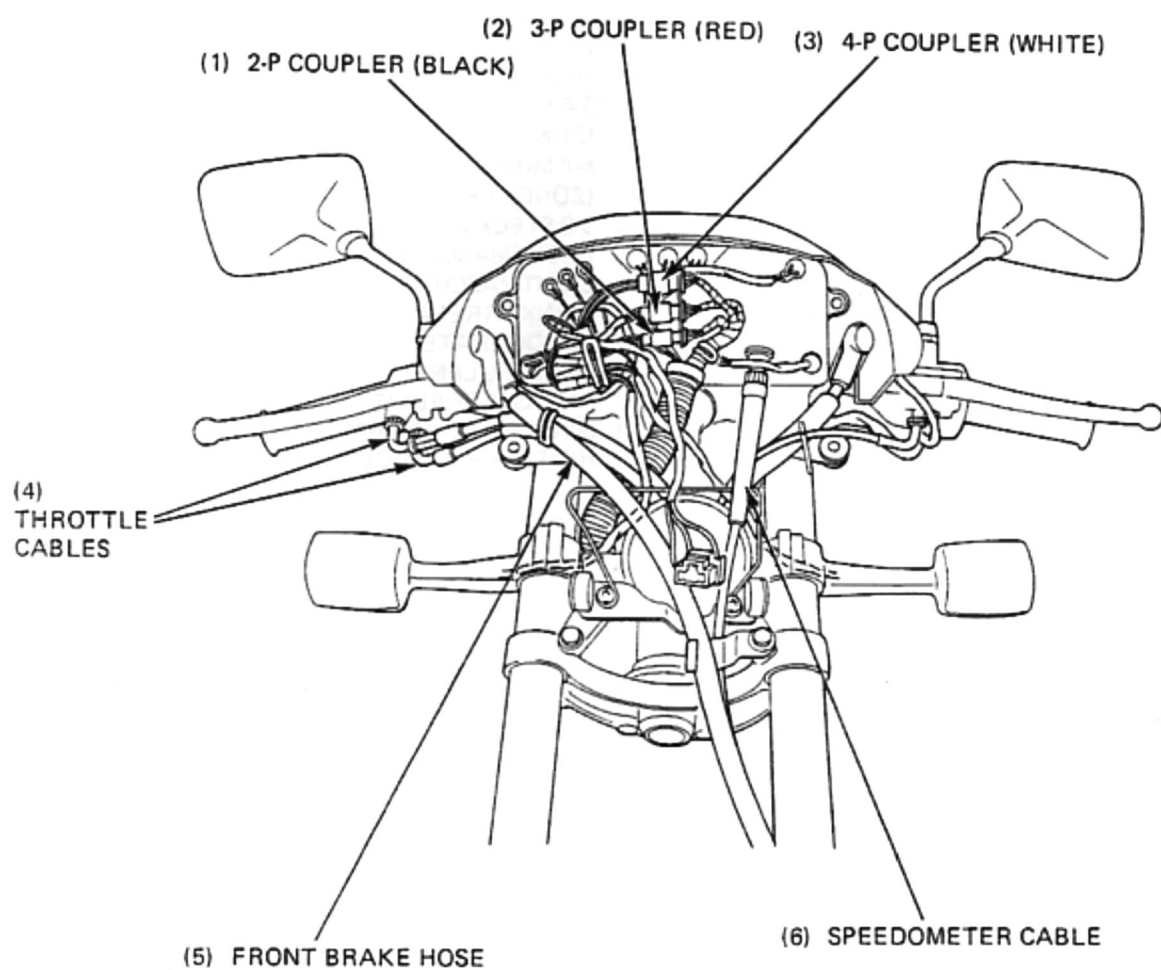
(6) 3-P COUPLER (WHITE)  
(ALTERNATOR)



(7) ALTERNATOR WIRE









|                            |     |                           |      |
|----------------------------|-----|---------------------------|------|
| SERVICE INFORMATION        | 2-1 | OIL STRAINER CLEANING     | 2-4  |
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| ENGINE OIL & FILTER CHANGE | 2-3 | LUBRICATION POINTS        | 2-11 |
| OIL PRESSURE CHECK         | 2-4 |                           |      |

## SERVICE INFORMATION

### GENERAL

- The lubrication system can be serviced with the engine in the frame.
- Be careful not to enter foreign materials into the engine when servicing the oil pump.
- Replace the oil pump as an assembly if necessary.
- Clutch assembly removal is required when replacing the oil pump drive chain and sprocket (Page 7-13).

### SPECIFICATIONS

#### Engine oil

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Oil capacity       | 2.2 lit. (2.3 US qt, 1.9 Imp qt) after draining<br>2.6 lit. (2.8 US qt, 2.3 Imp qt) when replacing oil and oil filter<br>3.0 lit. (3.2 US qt, 2.6 Imp qt) after disassembly                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Oil recommendation | <p>Use HONDA 4-STROKE OIL or equivalent.<br/>API SERVICE CLASSIFICATION: SE or SF.<br/>VISCOSITY:<br/>SAE 10W-40</p> <p>Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range.</p> <div> <p><b>OIL VISCOSITIES</b></p> <p>The chart shows temperature ranges in degrees Celsius (°C) on the x-axis (from -10 to 40) and degrees Fahrenheit (°F) on the bottom x-axis (from 20 to 100). Single grade oils are shown as horizontal bars: 10W (approx. -10 to 0°C), 20W (approx. 0 to 10°C), 20 (approx. 10 to 20°C), 30 (approx. 20 to 30°C), and 40 (approx. 30 to 40°C). Multi-grade oils are shown as horizontal bars: 20W-40 (approx. -10 to 30°C), 20W-50 (approx. -10 to 35°C), 15W-40 (approx. -10 to 30°C), 15W-50 (approx. -10 to 35°C), 10W-40 (approx. -10 to 30°C), and 10W-30 (approx. -10 to 20°C).</p> </div> |
| Oil pressure       | 540 kPa (5.4 kg/cm <sup>2</sup> , 77 psi) at 7,000 min <sup>-1</sup> (rpm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

#### Oil pump service data

|                     | STANDARD                      | SERVICE LIMIT      |
|---------------------|-------------------------------|--------------------|
| Rotor tip clearance | 0.15 mm (0.006 in)            | 0.20 mm (0.008 in) |
| Pump body clearance | 0.15-0.21 mm (0.006-0.008 in) | 0.35 mm (0.014 in) |
| Pump end clearance  | 0.04-0.09 mm (0.002-0.004 in) | 0.12 mm (0.005 in) |

### TORQUE VALUES

|                       |                                                                                              |
|-----------------------|----------------------------------------------------------------------------------------------|
| Engine oil drain plug | 35-40 N·m (3.5-4.0 kg·m, 25-29 ft·lb)                                                        |
| Exhaust chamber       | 12-16 N·m (1.2-1.6 kg·m, 9-12 ft·lb)                                                         |
| Oil pressure switch   | 15-20 N·m (1.5-2.0 kg·m, 11-14 ft·lb) — Apply 3-BOND® or its equivalent to the bolt threads. |

### TOOLS

#### Special

|                               |               |                              |
|-------------------------------|---------------|------------------------------|
| Oil pressure gauge            | 07506-3000000 | ] or commercially available. |
| Oil pressure gauge attachment | 07510-4220100 |                              |
| Oil filter wrench             | 07912-6110000 |                              |



## **TROUBLESHOOTING**

### **Oil level too low**

1. External oil leaks
2. Worn piston rings
3. Worn valve guide or seal

### **Oil contamination**

1. Oil or filter not changed often enough
2. Head gasket faulty
3. Worn piston rings

### **Low oil pressure**

1. Oil level low
2. Pressure relief valve stuck open
3. Plugged oil pick-up screen
4. Oil pump worn
5. External oil leaks
6. Incorrect oil being used

### **High oil pressure**

1. Pressure relief valve stuck open
2. Plugged oil filter, gallery, or metering orifice
3. Incorrect oil being used

### **No oil pressure**

1. Oil level low
2. Oil pump drive chain broken
3. Oil pump faulty
4. Internal oil leakage
5. Damaged oil pump drive chain



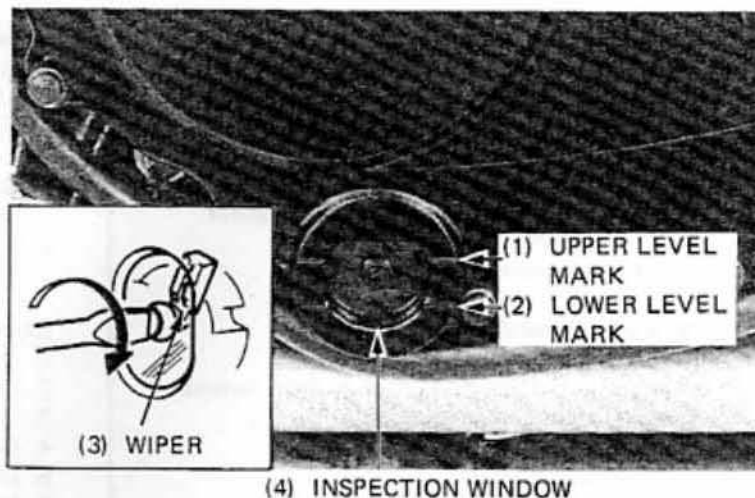
## ENGINE OIL LEVEL

Run the engine and allow to idle for 2–3 minutes. Stop the engine and support the motorcycle on the center stand. Check the oil level at the engine oil inspection window on the right side cover after a few minutes.

If the level is below the lower level mark on the inspection window, remove the filler cap and fill to the upper level mark.

Check the oil pressure with the warning indicator switch after the engine starts. The indicator should go off after one or two seconds.

If it does not, check the oil pump function and/or oil circuit.



## ENGINE OIL & FILTER CHANGE

### NOTE:

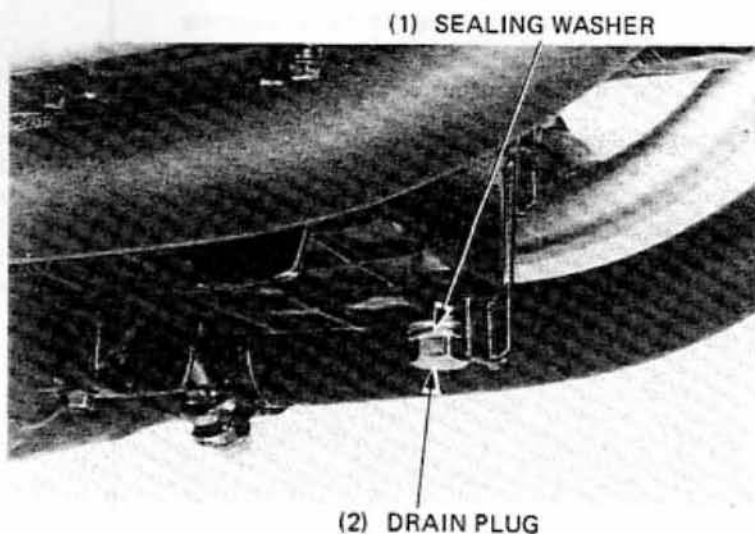
Change engine oil with the engine warm and the motorcycle on its center stand to assure complete and rapid draining.

Stop the engine

Remove the oil filler cap and engine oil drain plug and drain the oil.

Remove the oil filter with a filter wrench and let the remaining oil drain out. Discard the oil filter.

Make sure that the sealing washers on the drain plug is in good condition and install the plug.



After completely draining the oil replace the oil filter with new one.

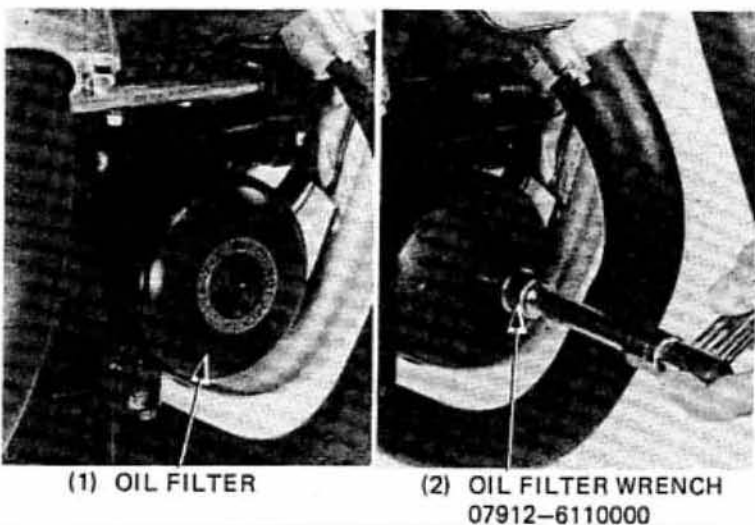
**TORQUE: 15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)**

Fill the crankcase with 2.6 liter (2.8 US qt, 2.3 Imp qt) of the recommended oil (page 2-1).

Start the engine and let it idle for 2–3 minutes, then stop the engine.

Make sure that the oil level is at the upper level mark in the inspection window.

Make sure that there are no oil leaks.





## OIL PRESSURE CHECK

Warm the engine up to normal operating temperature (approximately 80°C/176°F).

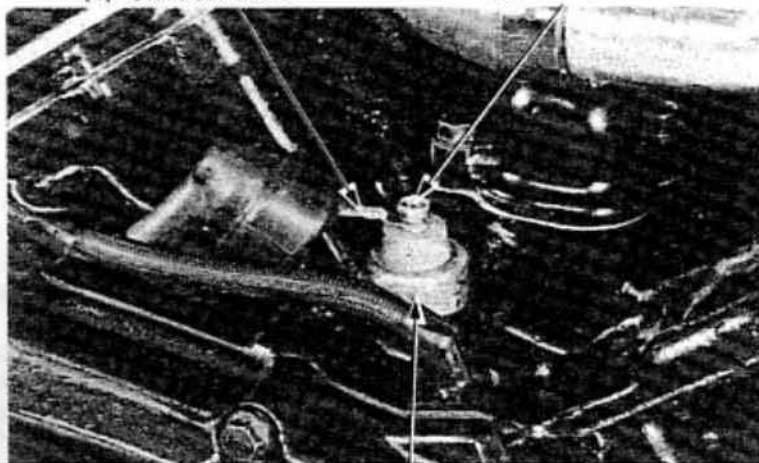
Stop the engine and disconnect the oil pressure switch wire.

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

Check the oil level.

(1) SWITCH WIRE

(2) SCREW



(3) OIL PRESSURE SWITCH

Start the engine.

Check the oil pressure at 7,000 rpm.

### OIL PRESSURE:

540 kPa (5.4 kg/cm<sup>2</sup>, 77 psi) at 7,000 min<sup>-1</sup>  
(rpm) (80°C/176°F)

Stop the engine.

Apply 3-BOND® sealant or equivalent to the pressure switch threads and install.

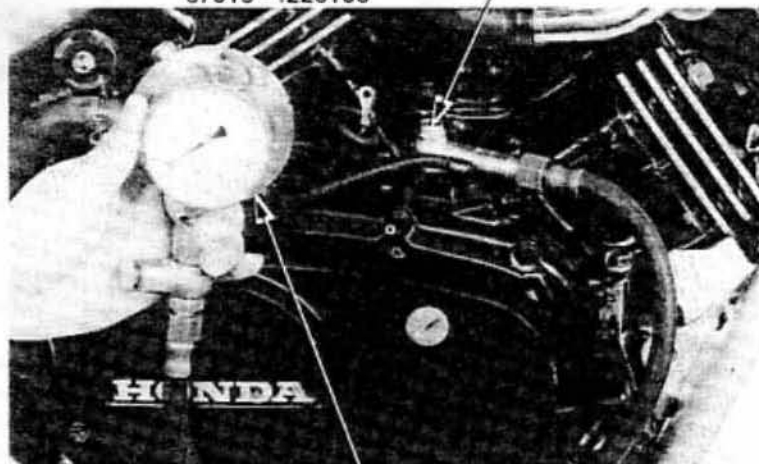
**TORQUE: 15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)**

Connect the oil pressure switch wire.

Start the engine.

Check the oil pressure warning light goes out after one or two seconds.

If the oil pressure warning light stays on, stop the engine immediately and determine the cause.

(1) OIL PRESSURE GAUGE ATTACHMENT  
07510-4220100(2) OIL PRESSURE GAUGE  
07506-3000000

## OIL STRAINER CLEANING

### NOTE:

The oil strainer can be removed with the engine mounted in the frame.

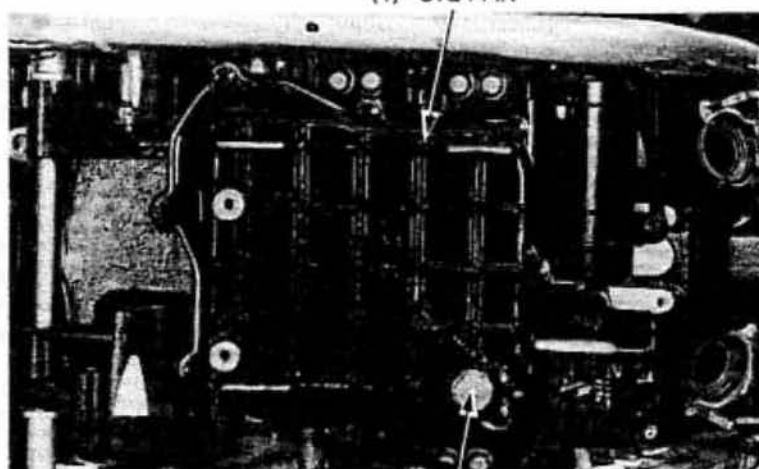
Remove the exhaust pipes and muffler assembly (page 5-4).

Drain the engine oil (page 2-3).

Remove the eight oil pan bolts and oil pan.

Remove the oil pan gasket.

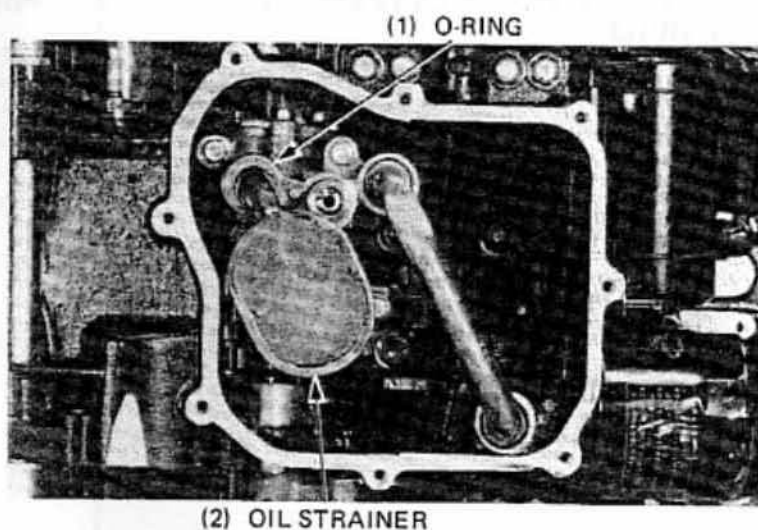
(1) OIL PAN



(2) DRAIN PLUG



Remove and clean the oil strainer.  
Check the operation of the pressure relief valve.  
Make sure the O-ring is in good condition whenever the oil strainer is removed.  
Install the oil strainer and oil pan.  
Install the exhaust pipe.  
Fill the crankcase with the recommended oil (page 2-1).

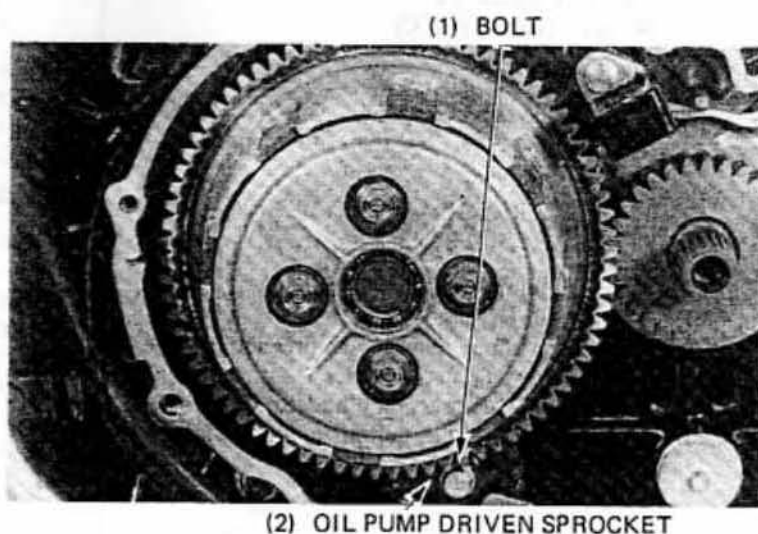


## OIL PUMP REMOVAL

### NOTE:

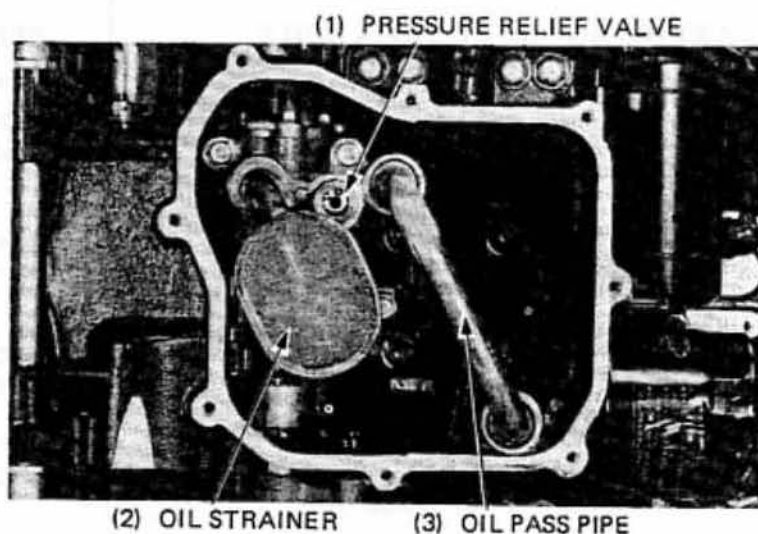
The oil pump can be removed with the engine mounted in the frame.

Remove the exhaust pipe and muffler assembly (page 5-4).  
Drain the engine oil (page 2-3).  
Remove the right crankcase cover (page 7-11).  
Remove the oil pump driven sprocket mounting bolt and the sprocket from the oil pump shaft.



Remove the oil strainer.

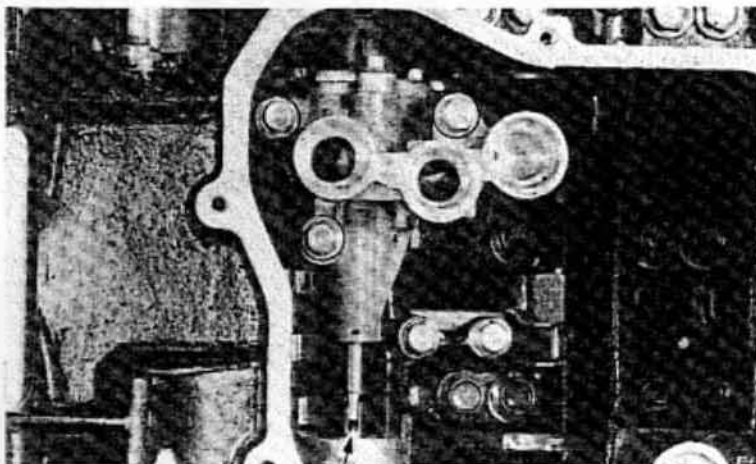
Remove the O-ring, pressure relief valve and oil pass pipe.  
Make sure the O-ring is in good condition.





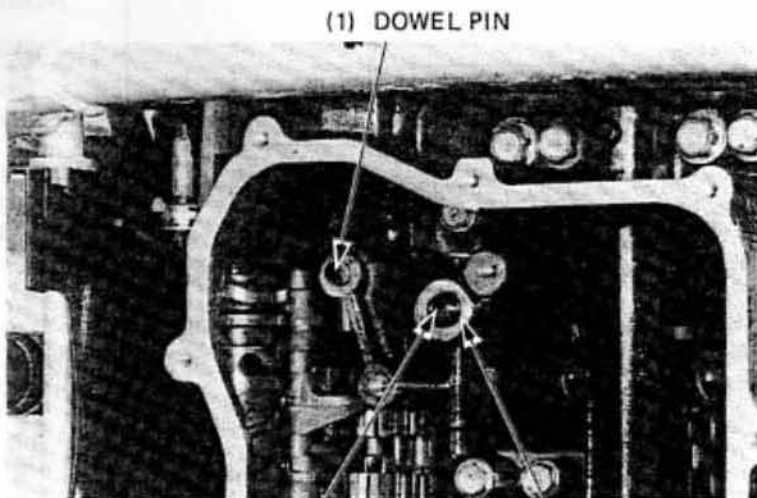


Temporarily install the oil pump driven sprocket onto the oil pump shaft and turn it until the cut-out of the water pump shaft is vertical. Remove the three oil pump mounting bolts. Remove the oil pump by pulling it.



(1) CUT-OUT IN WATER PUMP SHAFT

Remove the dowel pin, oil pass tube and O-ring.



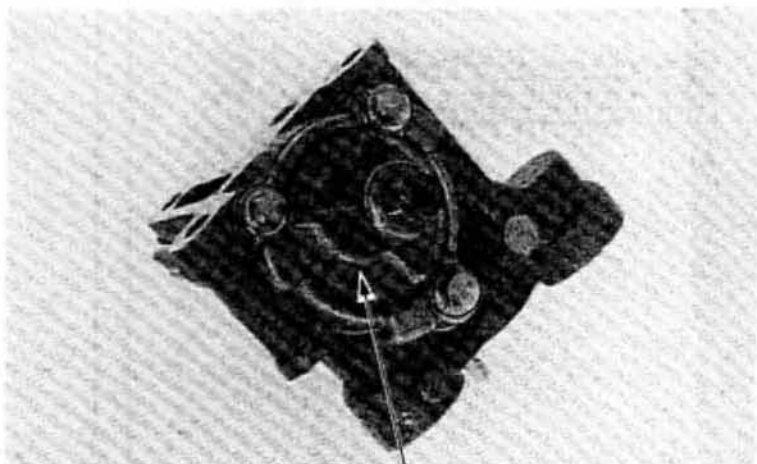
(1) DOWEL PIN

(2) OIL PASS TUBE

(3) O-RING

## DISASSEMBLY

Remove the three pump cover bolts and cover.



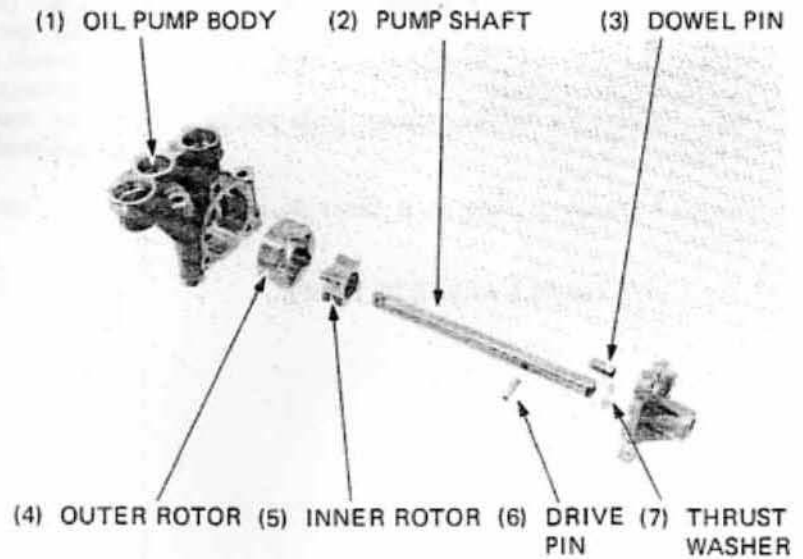
(1) OIL PUMP COVER



## LUBRICATION

Remove the dowel pin and thrust washer.

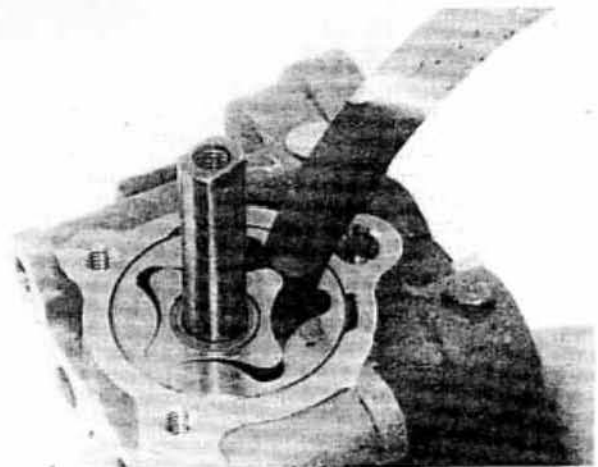
Remove the oil pump shaft from the pump body.  
Remove the drive pin from the pump shaft.  
Remove the inner and outer rotors from the pump body.



## INSPECTION

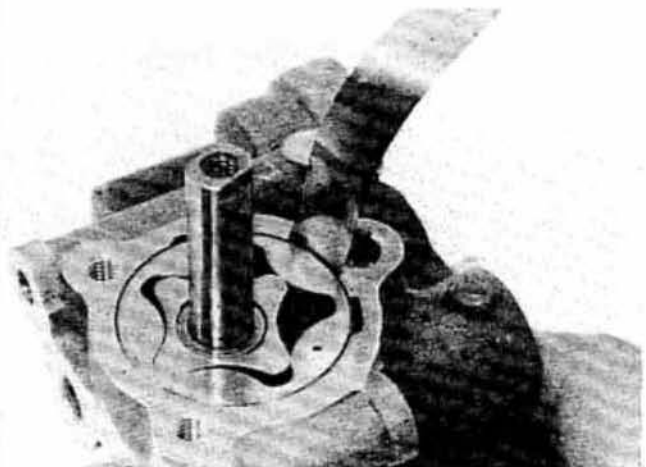
Measure the rotor tip clearance.

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



Measure the pump body clearance.

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

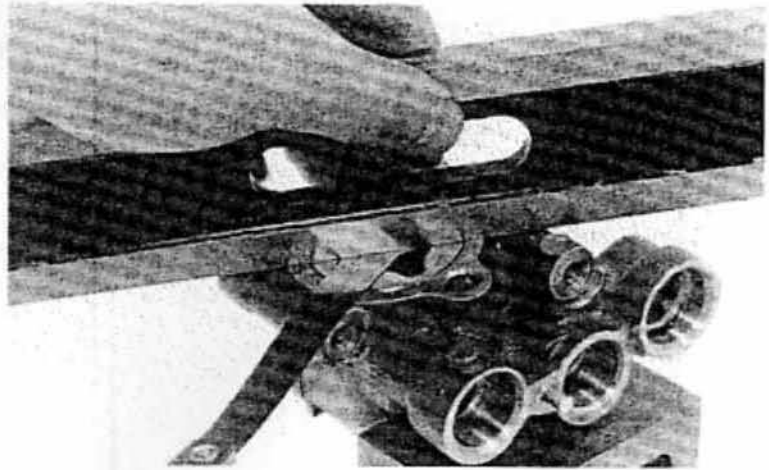






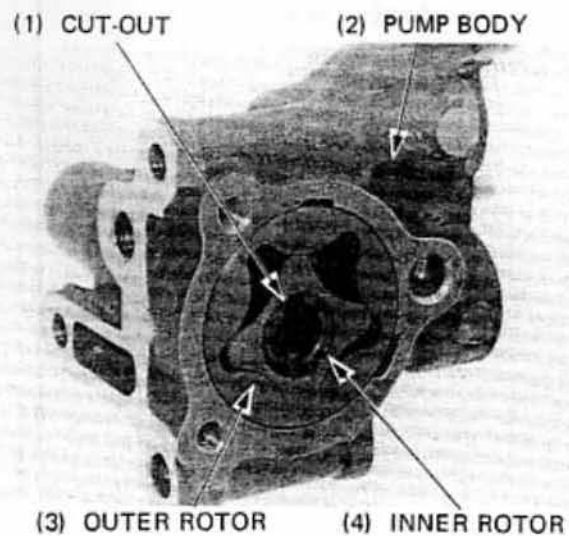
Remove the oil pump shaft and measure the pump end clearance.

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

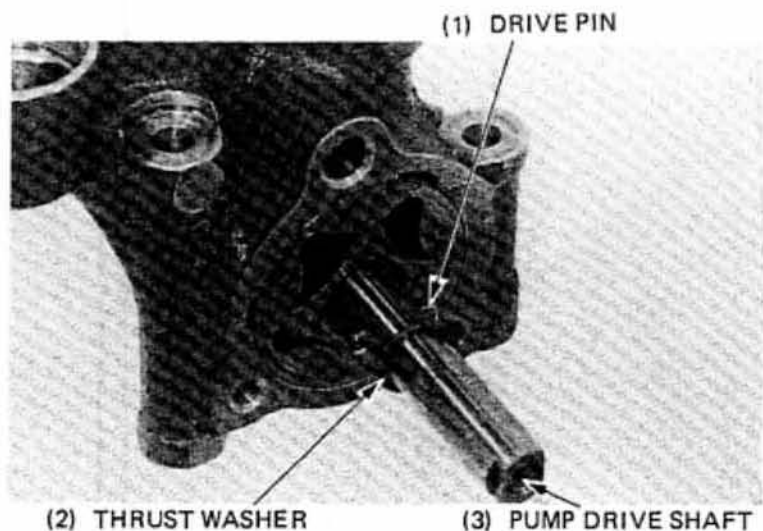


## ASSEMBLY

Install the inner and outer rotor into the body with the cut-out of the inner rotor facing out.

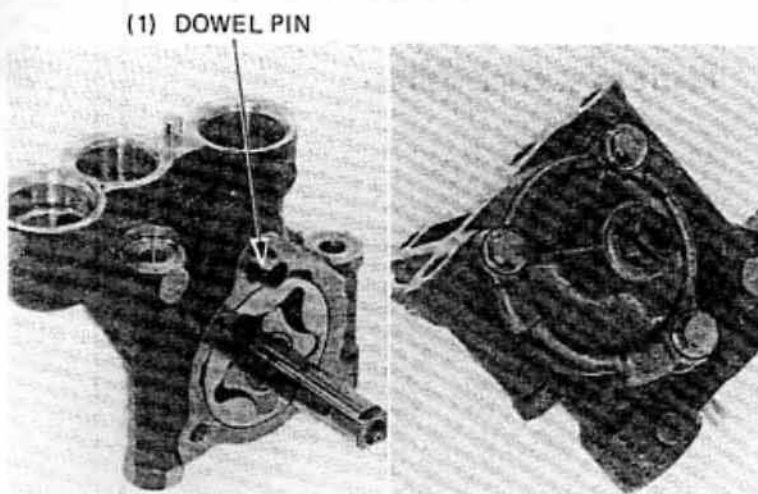


Insert the drive pin into the hole in the pump shaft and install the pump shaft into the pump aligning the drive pin with the cut-out of the inner rotor. Install the thrust washer over the pump shaft.

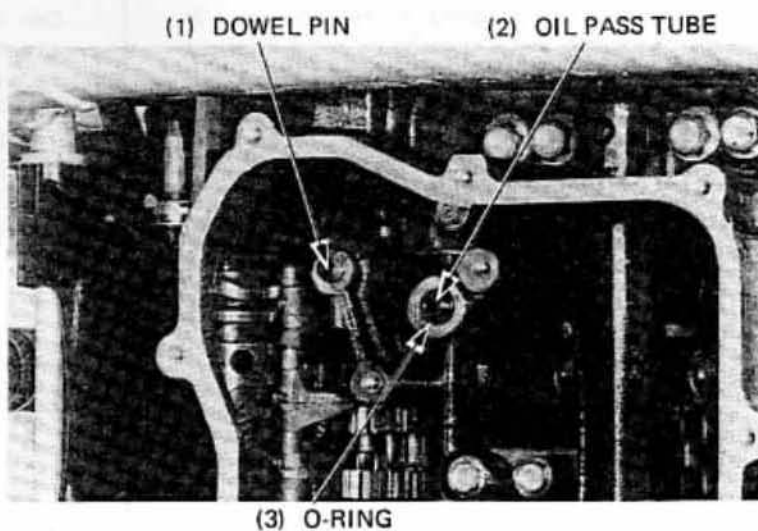




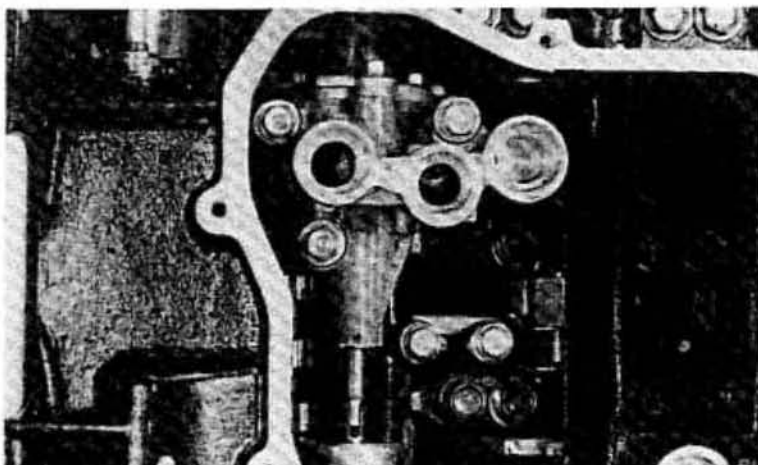
Install the dowel pin onto the pump body.  
Install the pump cover and tighten the three bolts.  
Make sure that the pump shaft rotates smoothly by turning the shaft.



Install the dowel pin, oil pass tube and O-ring.



Install the oil pump and tighten it with three bolts.  
Make sure that the oil pump shaft rotates freely by turning the pump shaft.



## LUBRICATION



**HONDA**  
**VF400F**

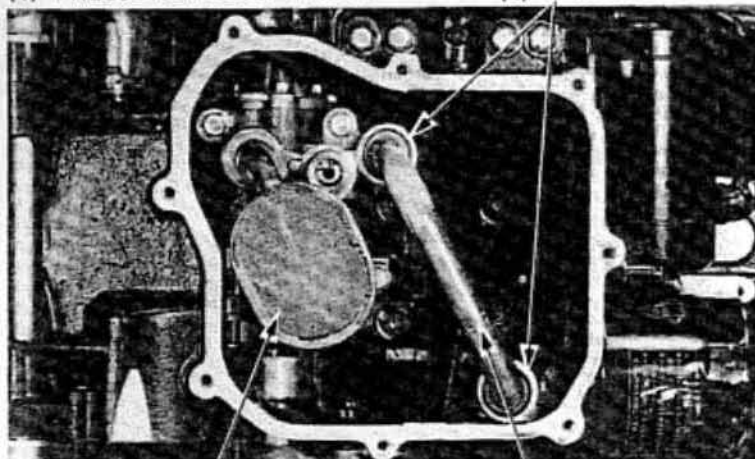
Install the O-rings over both ends of the oil pass pipe.  
Install the oil pass pipe.  
Install the pressure relief valve and oil strainer.

### NOTE:

Be careful not to fall the O-ring.

Install the oil pan.

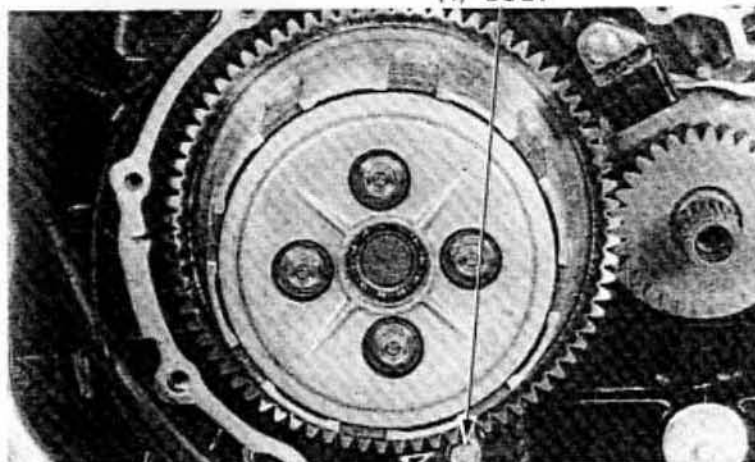
(1) PRESSURE RELIEF VALVE (2) O-RINGS



(3) OIL STRAINER (4) OIL PASS PIPE

Install the oil pump driven sprocket over the oil pump shaft and tighten it with the washer and bolt.  
Install the right crankcase cover.  
Install the exhaust pipe and muffler assembly in the reverse order of removal.  
Fill the crankcase with the recommended oil (page 2-1).

(1) BOLT



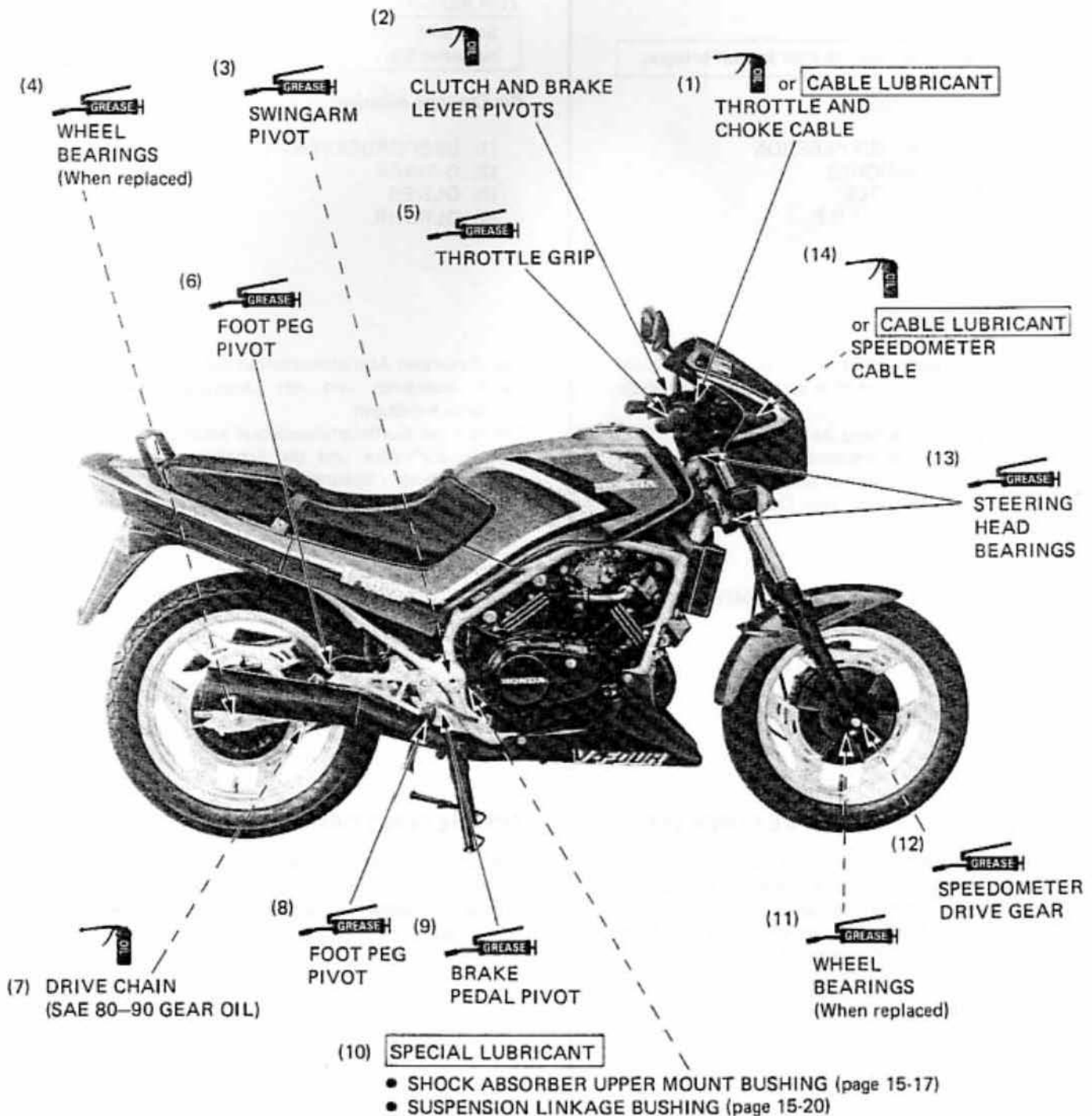
(2) OIL PUMP DRIVEN SPROCKET

## CONTROL CABLE LUBRICATION

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



## LUBRICATION POINTS





|                            |     |                           |      |
|----------------------------|-----|---------------------------|------|
| SERVICE INFORMATION        | 2-1 | OIL STRAINER CLEANING     | 2-4  |
| TROUBLESHOOTING            | 2-2 | OIL PUMP                  | 2-5  |
| ENGINE OIL LEVEL           | 2-3 | CONTROL CABLE LUBRICATION | 2-10 |
| ENGINE OIL & FILTER CHANGE | 2-3 | LUBRICATION POINTS        | 2-11 |
| OIL PRESSURE CHECK         | 2-4 |                           |      |

## SERVICE INFORMATION

### GENERAL

- The lubrication system can be serviced with the engine in the frame.
- Be careful not to enter foreign materials into the engine when servicing the oil pump.
- Replace the oil pump as an assembly if necessary.
- Clutch assembly removal is required when replacing the oil pump drive chain and sprocket (Page 7-13).

### SPECIFICATIONS

#### Engine oil

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Oil capacity       | 2.2 lit. (2.3 US qt, 1.9 Imp qt) after draining<br>2.6 lit. (2.8 US qt, 2.3 Imp qt) when replacing oil and oil filter<br>3.0 lit. (3.2 US qt, 2.6 Imp qt) after disassembly                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Oil recommendation | <p>Use HONDA 4-STROKE OIL or equivalent.<br/>API SERVICE CLASSIFICATION: SE or SF.<br/>VISCOSITY:<br/>SAE 10W-40</p> <p>Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range.</p> <div> <p><b>OIL VISCOSITIES</b></p> <p>The chart shows temperature ranges in degrees Celsius (°C) on the x-axis (from -10 to 40) and oil grades on the y-axis. Single-grade oils (10W, 20W, 30, 40) are shown as horizontal bars. Multi-grade oils (20W-40, 20W-50, 15W-40, 15W-50, 10W-40, 10W-30) are shown as horizontal bars with arrows indicating their operating range.</p> </div> |
| Oil pressure       | 540 kPa (5.4 kg/cm <sup>2</sup> , 77 psi) at 7,000 min <sup>-1</sup> (rpm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

#### Oil pump service data

|                     | STANDARD                      | SERVICE LIMIT      |
|---------------------|-------------------------------|--------------------|
| Rotor tip clearance | 0.15 mm (0.006 in)            | 0.20 mm (0.008 in) |
| Pump body clearance | 0.15-0.21 mm (0.006-0.008 in) | 0.35 mm (0.014 in) |
| Pump end clearance  | 0.04-0.09 mm (0.002-0.004 in) | 0.12 mm (0.005 in) |

### TORQUE VALUES

|                       |                                                                                              |
|-----------------------|----------------------------------------------------------------------------------------------|
| Engine oil drain plug | 35-40 N·m (3.5-4.0 kg·m, 25-29 ft·lb)                                                        |
| Exhaust chamber       | 12-16 N·m (1.2-1.6 kg·m, 9-12 ft·lb)                                                         |
| Oil pressure switch   | 15-20 N·m (1.5-2.0 kg·m, 11-14 ft·lb) — Apply 3-BOND® or its equivalent to the bolt threads. |

### TOOLS

#### Special

|                               |               |                              |
|-------------------------------|---------------|------------------------------|
| Oil pressure gauge            | 07506-3000000 | ] or commercially available. |
| Oil pressure gauge attachment | 07510-4220100 |                              |
| Oil filter wrench             | 07912-6110000 |                              |



## **TROUBLESHOOTING**

### **Oil level too low**

1. External oil leaks
2. Worn piston rings
3. Worn valve guide or seal

### **Oil contamination**

1. Oil or filter not changed often enough
2. Head gasket faulty
3. Worn piston rings

### **Low oil pressure**

1. Oil level low
2. Pressure relief valve stuck open
3. Plugged oil pick-up screen
4. Oil pump worn
5. External oil leaks
6. Incorrect oil being used

### **High oil pressure**

1. Pressure relief valve stuck open
2. Plugged oil filter, gallery, or metering orifice
3. Incorrect oil being used

### **No oil pressure**

1. Oil level low
2. Oil pump drive chain broken
3. Oil pump faulty
4. Internal oil leakage
5. Damaged oil pump drive chain





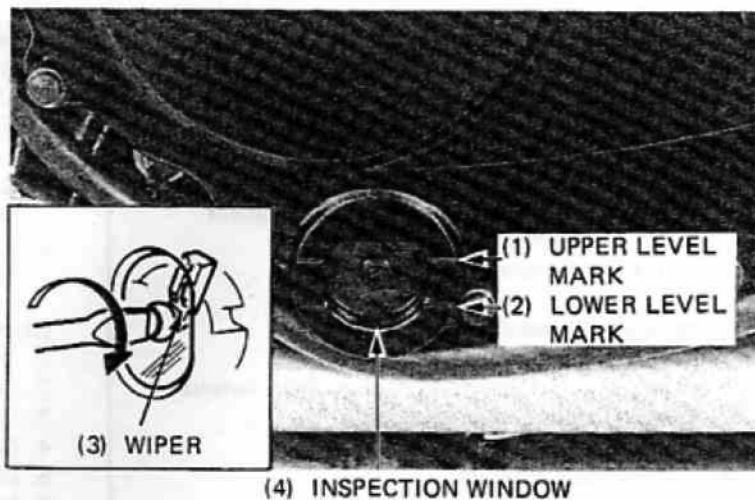
## ENGINE OIL LEVEL

Run the engine and allow to idle for 2–3 minutes. Stop the engine and support the motorcycle on the center stand. Check the oil level at the engine oil inspection window on the right side cover after a few minutes.

If the level is below the lower level mark on the inspection window, remove the filler cap and fill to the upper level mark.

Check the oil pressure with the warning indicator switch after the engine starts. The indicator should go off after one or two seconds.

If it does not, check the oil pump function and/or oil circuit.



## ENGINE OIL & FILTER CHANGE

### NOTE:

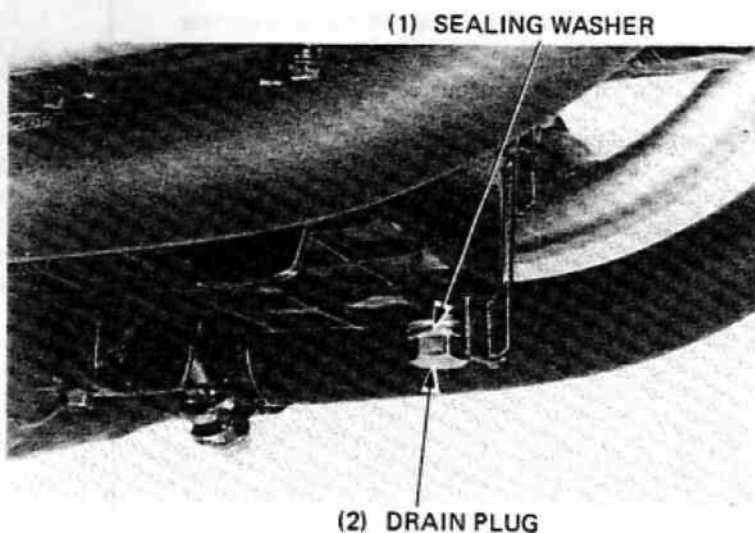
Change engine oil with the engine warm and the motorcycle on its center stand to assure complete and rapid draining.

Stop the engine

Remove the oil filler cap and engine oil drain plug and drain the oil.

Remove the oil filter with a filter wrench and let the remaining oil drain out. Discard the oil filter.

Make sure that the sealing washers on the drain plug is in good condition and install the plug.



After completely draining the oil replace the oil filter with new one.

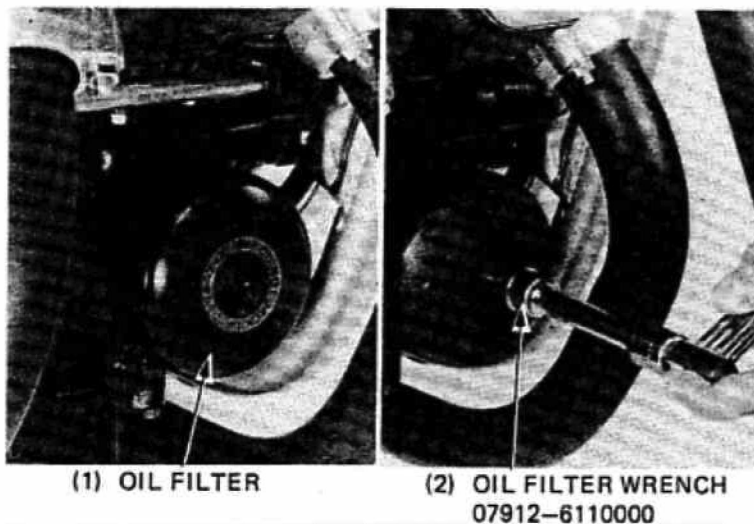
**TORQUE: 15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)**

Fill the crankcase with 2.6 liter (2.8 US qt, 2.3 Imp qt) of the recommended oil (page 2-1).

Start the engine and let it idle for 2–3 minutes, then stop the engine.

Make sure that the oil level is at the upper level mark in the inspection window.

Make sure that there are no oil leaks.







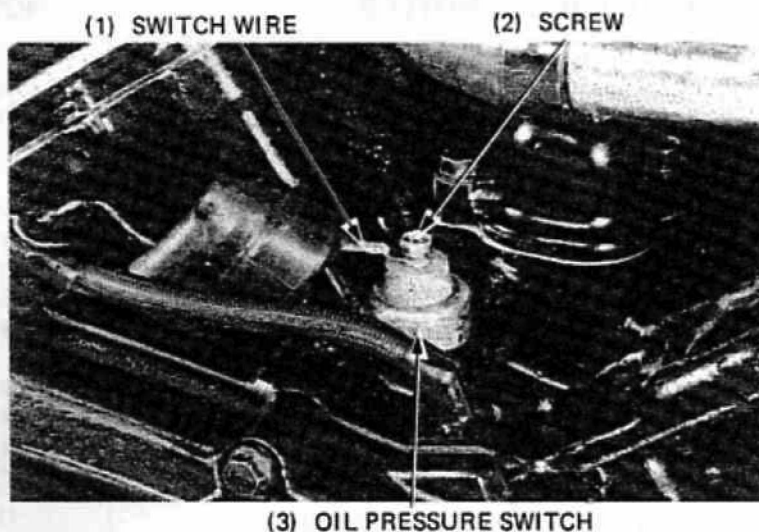
## OIL PRESSURE CHECK

Warm the engine up to normal operating temperature (approximately 80°C/176°F).

Stop the engine and disconnect the oil pressure switch wire.

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

Check the oil level.



Start the engine.

Check the oil pressure at 7,000 rpm.

### OIL PRESSURE:

540 kPa (5.4 kg/cm<sup>2</sup>, 77 psi) at 7,000 min<sup>-1</sup>  
(rpm) (80°C/176°F)

Stop the engine.

Apply 3-BOND® sealant or equivalent to the pressure switch threads and install.

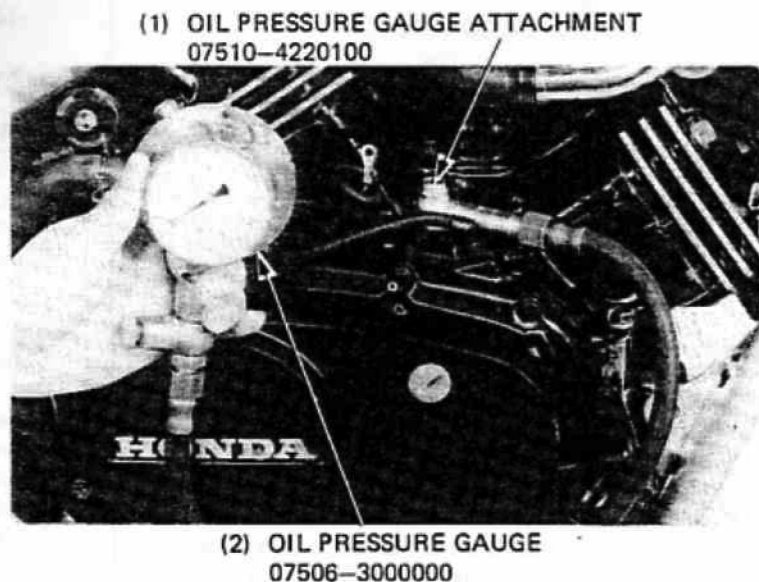
**TORQUE:** 15–20 N·m (1.5–2.0 kg·m, 11–14 ft·lb)

Connect the oil pressure switch wire.

Start the engine.

Check the oil pressure warning light goes out after one or two seconds.

If the oil pressure warning light stays on, stop the engine immediately and determine the cause.



## OIL STRAINER CLEANING

### NOTE:

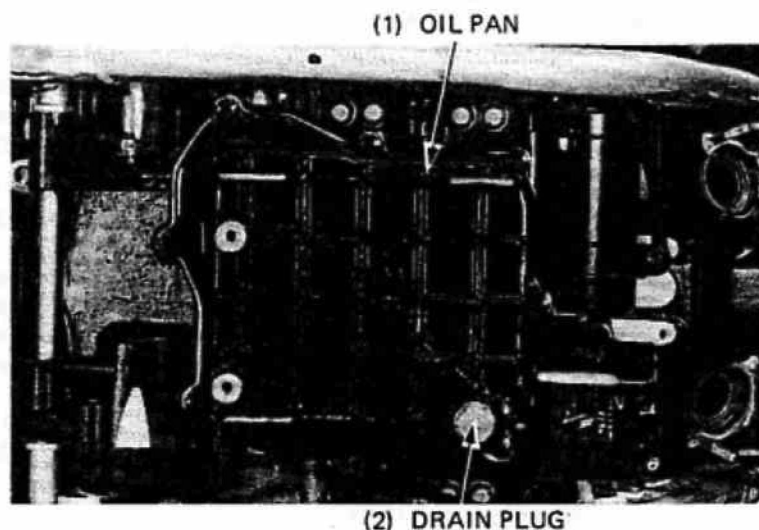
The oil strainer can be removed with the engine mounted in the frame.

Remove the exhaust pipes and muffler assembly (page 5-4).

Drain the engine oil (page 2-3).

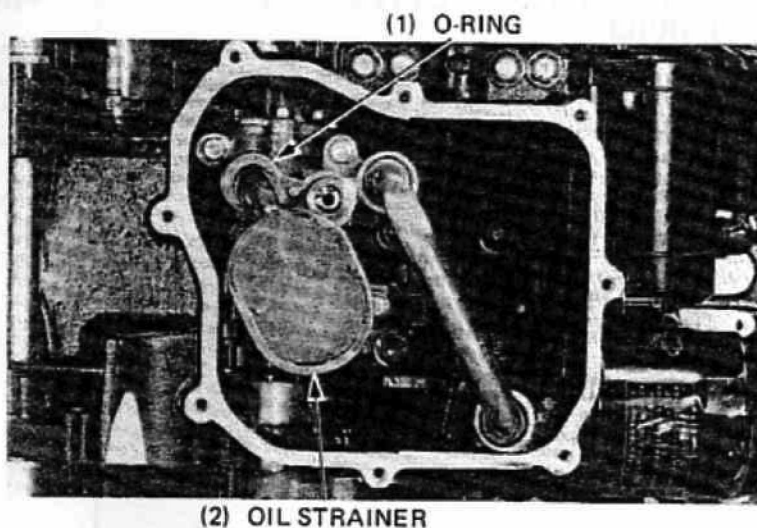
Remove the eight oil pan bolts and oil pan.

Remove the oil pan gasket.





Remove and clean the oil strainer.  
Check the operation of the pressure relief valve.  
Make sure the O-ring is in good condition whenever the oil strainer is removed.  
Install the oil strainer and oil pan.  
Install the exhaust pipe.  
Fill the crankcase with the recommended oil (page 2-1).

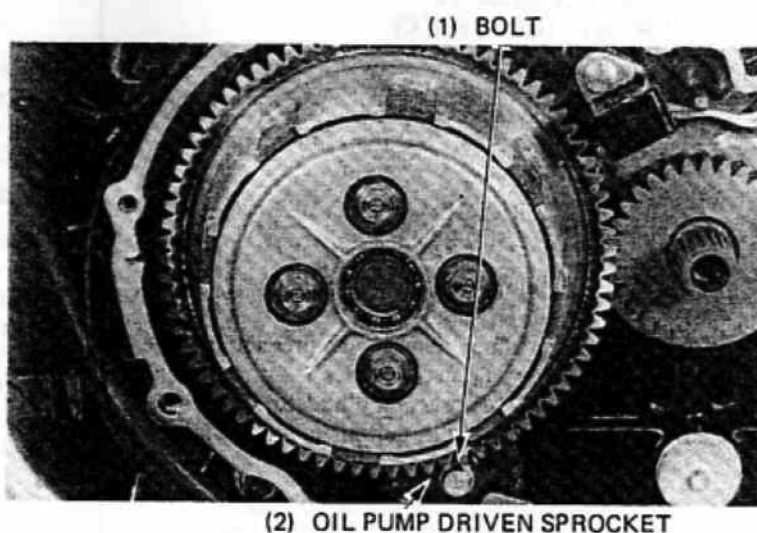


## OIL PUMP REMOVAL

### NOTE:

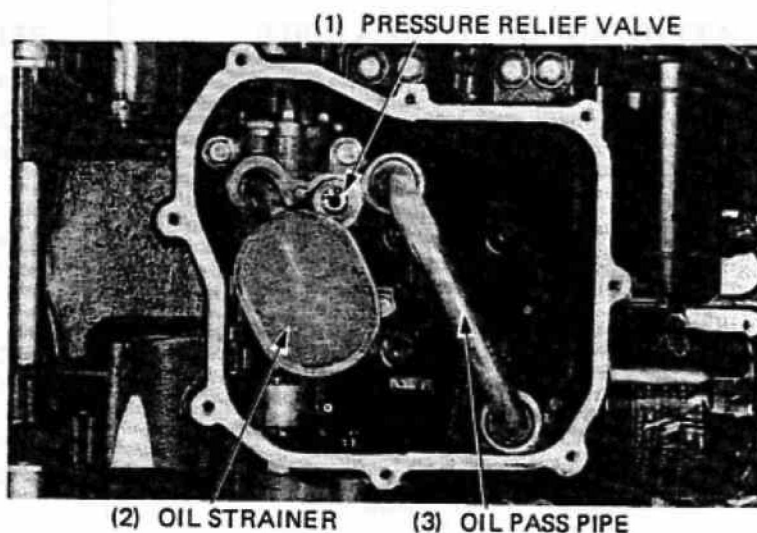
The oil pump can be removed with the engine mounted in the frame.

Remove the exhaust pipe and muffler assembly (page 5-4).  
Drain the engine oil (page 2-3).  
Remove the right crankcase cover (page 7-11).  
Remove the oil pump driven sprocket mounting bolt and the sprocket from the oil pump shaft.



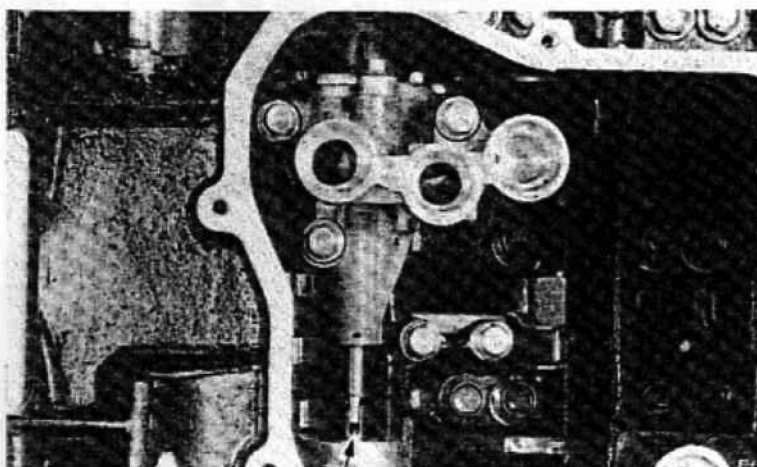
Remove the oil strainer.

Remove the O-ring, pressure relief valve and oil pass pipe.  
Make sure the O-ring is in good condition.



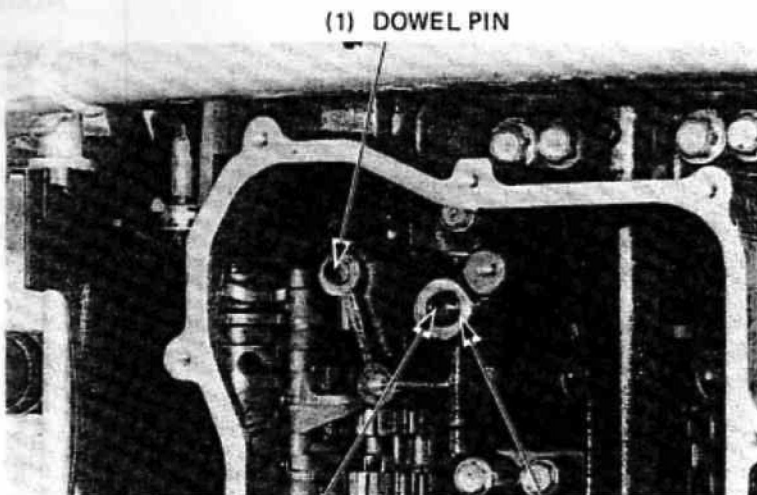


Temporarily install the oil pump driven sprocket onto the oil pump shaft and turn it until the cut-out of the water pump shaft is vertical. Remove the three oil pump mounting bolts. Remove the oil pump by pulling it.



(1) CUT-OUT IN WATER PUMP SHAFT

Remove the dowel pin, oil pass tube and O-ring.



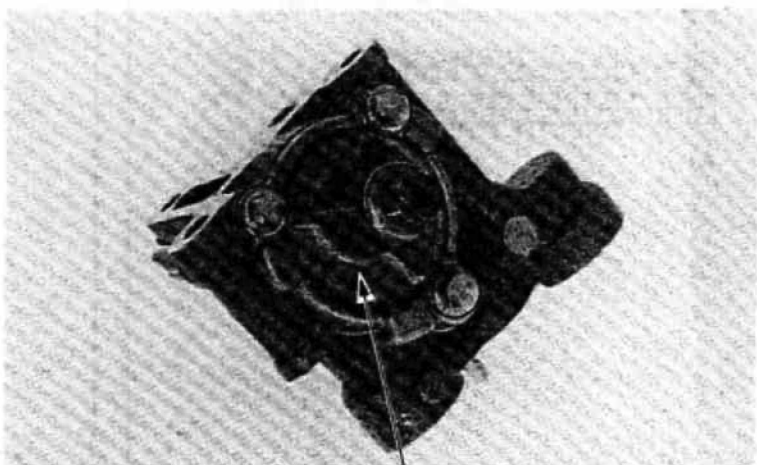
(1) DOWEL PIN

(2) OIL PASS TUBE

(3) O-RING

## DISASSEMBLY

Remove the three pump cover bolts and cover.



(1) OIL PUMP COVER

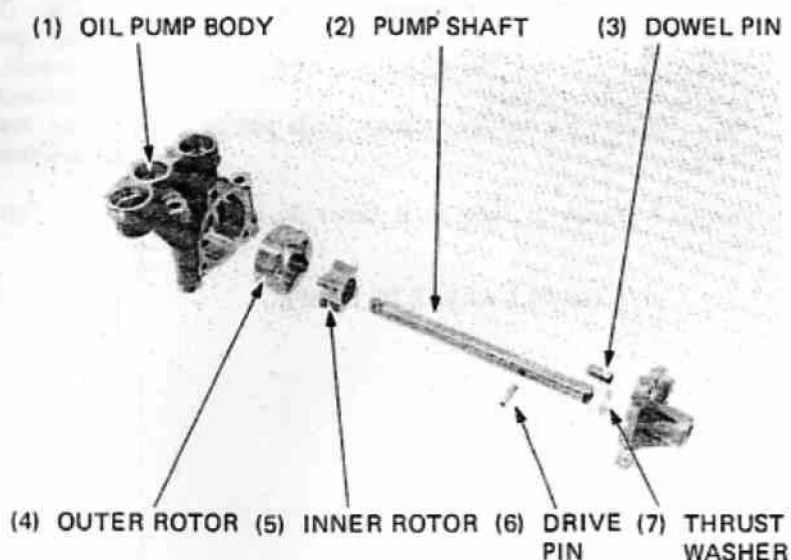
## LUBRICATION



**HONDA**  
**VF400F**

Remove the dowel pin and thrust washer.

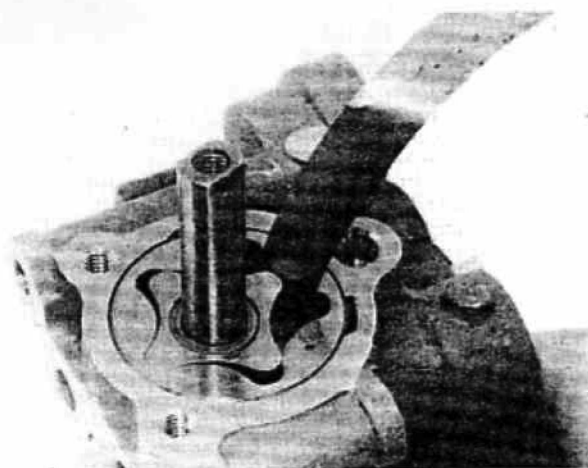
Remove the oil pump shaft from the pump body.  
Remove the drive pin from the pump shaft.  
Remove the inner and outer rotors from the pump body.



## INSPECTION

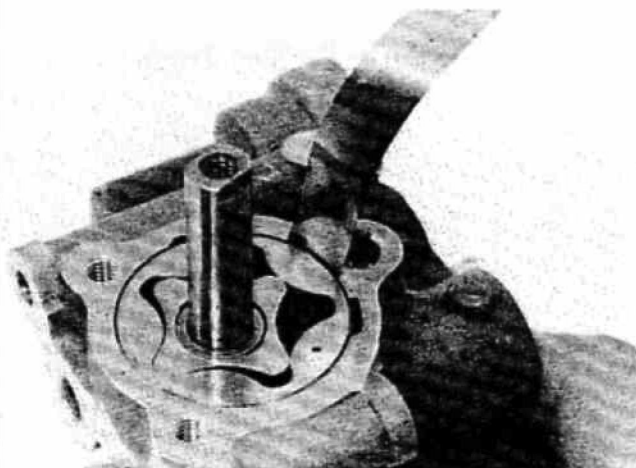
Measure the rotor tip clearance.

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



Measure the pump body clearance.

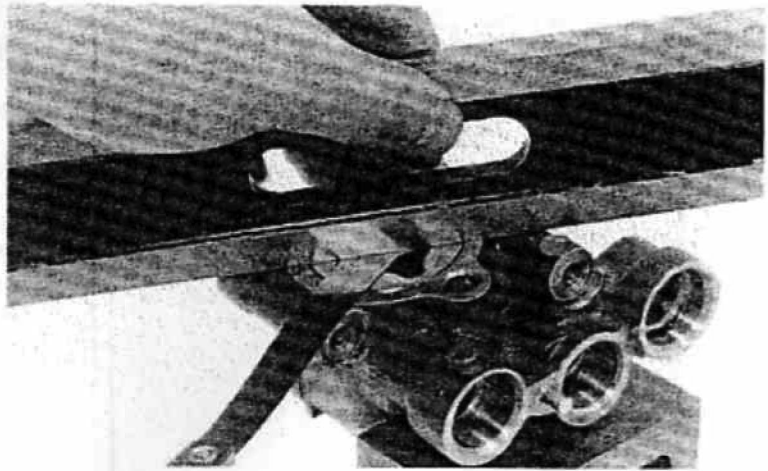
**SERVICE LIMIT: 0.35 mm (0.014 in)**





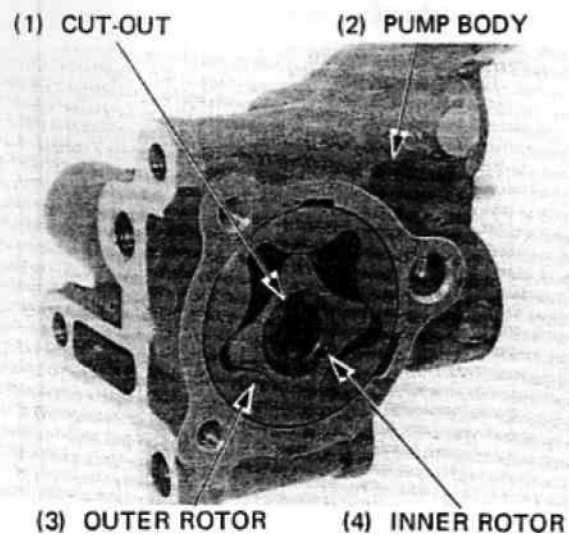
Remove the oil pump shaft and measure the pump end clearance.

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

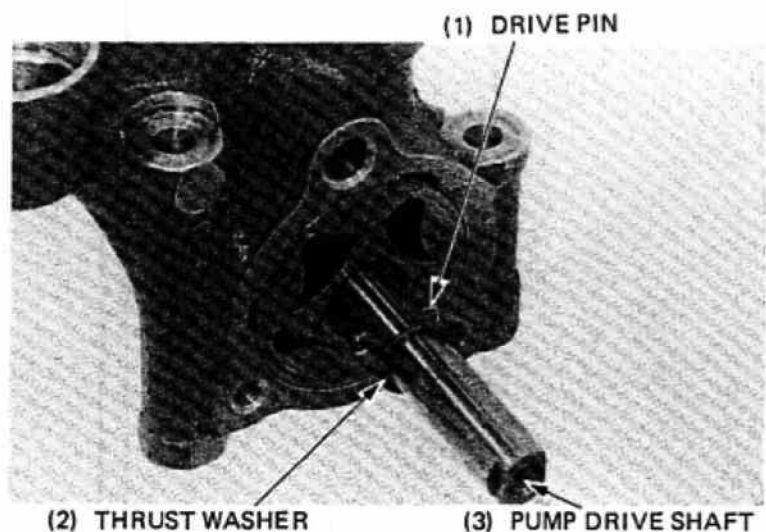


## ASSEMBLY

Install the inner and outer rotor into the body with the cut-out of the inner rotor facing out.



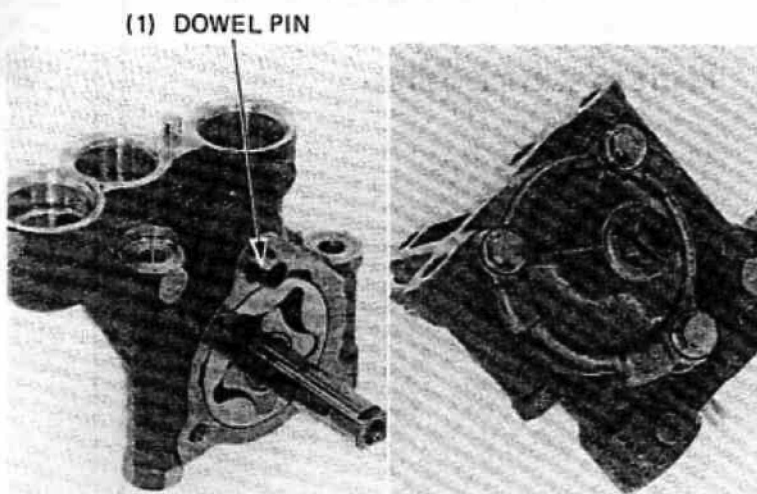
Insert the drive pin into the hole in the pump shaft and install the pump shaft into the pump aligning the drive pin with the cut-out of the inner rotor. Install the thrust washer over the pump shaft.



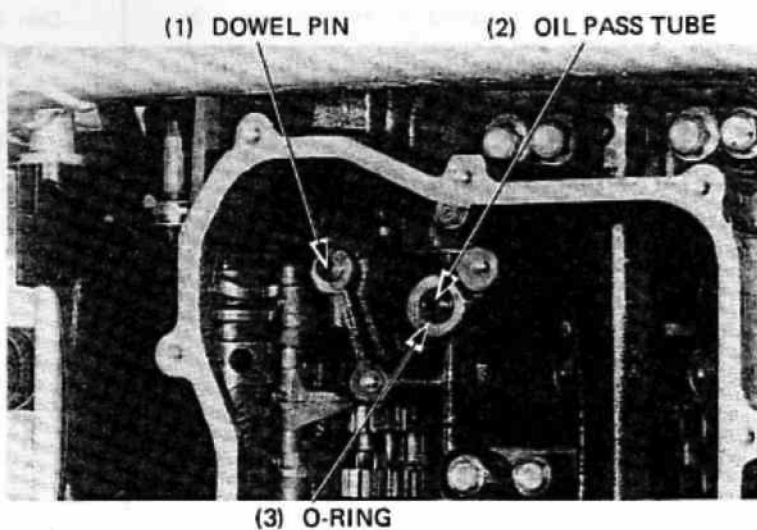




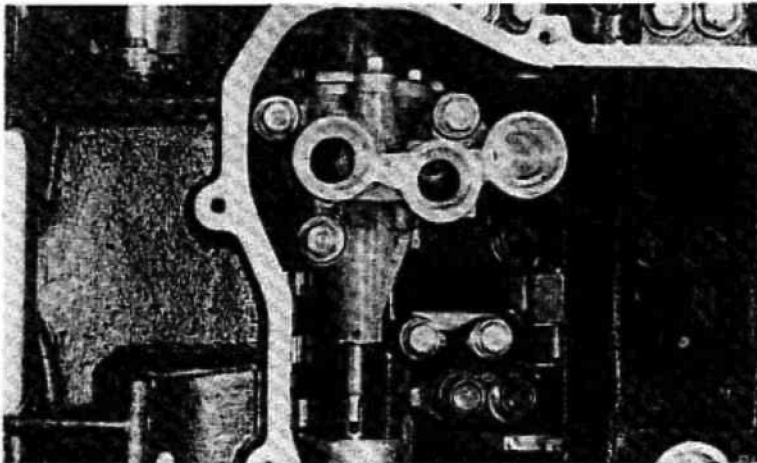
Install the dowel pin onto the pump body.  
Install the pump cover and tighten the three bolts.  
Make sure that the pump shaft rotates smoothly by turning the shaft.



Install the dowel pin, oil pass tube and O-ring.



Install the oil pump and tighten it with three bolts.  
Make sure that the oil pump shaft rotates freely by turning the pump shaft.



## LUBRICATION



**HONDA**  
**VF400F**

Install the O-rings over both ends of the oil pass pipe.

Install the oil pass pipe.

Install the pressure relief valve and oil strainer.

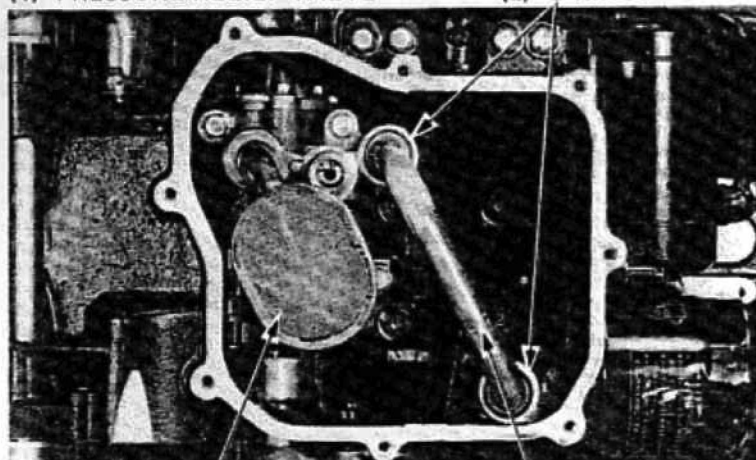
### NOTE:

Be careful not to fall the O-ring.

Install the oil pan.

(1) PRESSURE RELIEF VALVE

(2) O-RINGS



(3) OIL STRAINER

(4) OIL PASS PIPE

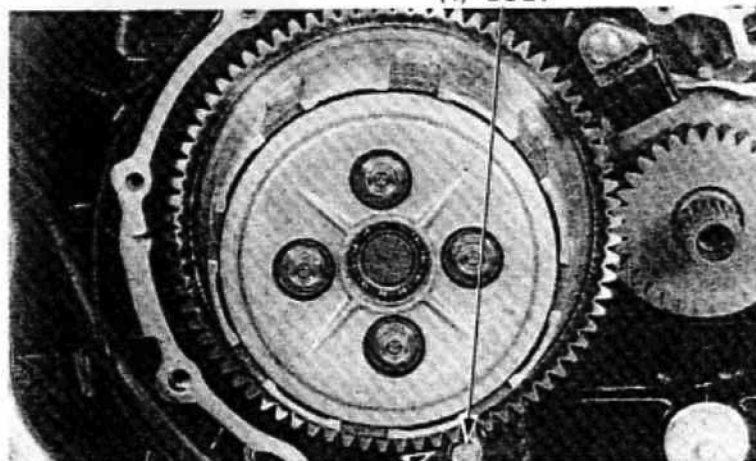
Install the oil pump driven sprocket over the oil pump shaft and tighten it with the washer and bolt.

Install the right crankcase cover.

Install the exhaust pipe and muffler assembly in the reverse order of removal.

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

(1) BOLT



(2) OIL PUMP DRIVEN SPROCKET

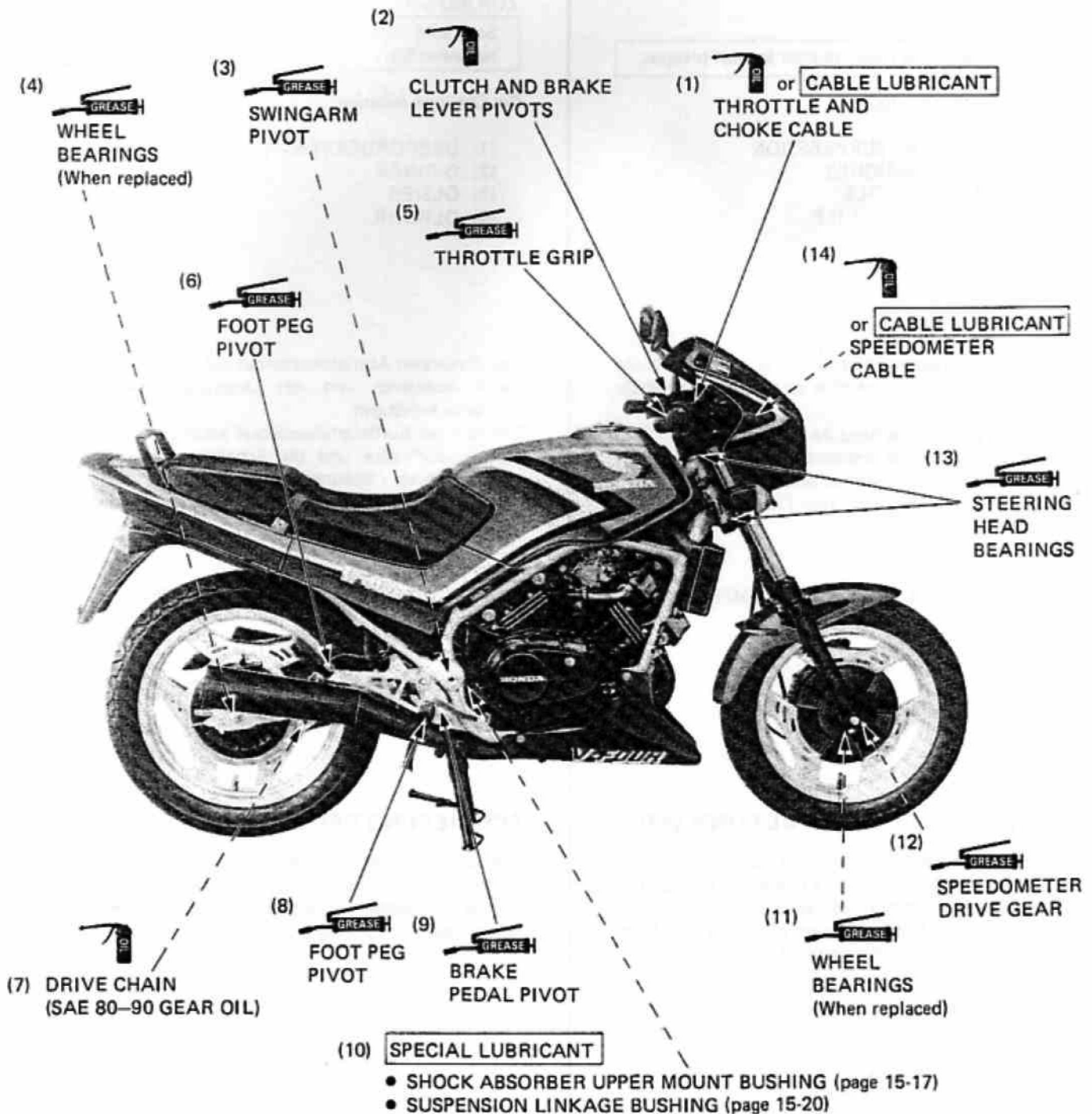
## CONTROL CABLE LUBRICATION

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





## LUBRICATION POINTS



## MAINTENANCE



**HONDA**  
**VF400F**

### Ignition timing

At idle: 15° BTDC  
Advance starts: 15° BTDC at 1,700 min<sup>-1</sup> (rpm)  
Full advance: 37° BTDC at 2,800 min<sup>-1</sup> (rpm)

### Valve clearance

Cold (Below 35°C, 95°F)  
Intake: 0.10–0.14 mm (0.004–0.006 in)  
Exhaust: 0.11–0.15 mm (0.004–0.006 in)

### Idle speed:

1,300 ± 100 min<sup>-1</sup> (rpm)

### Carburetor synchronization:

All carburetors within 60 mm (2.4 in) Hg

### Cylinder compression:

1,200 ± 200 kPa (12.0 ± 2.0 kg/cm<sup>2</sup>, 171 ± 28 psi)

### Throttle grip free play:

2–6 mm (1/8–1/4 in)

### <CHASSIS>

Drive chain slack: 15–25 mm (5/8–1 in)

### Tire:

| Tire size                                          |                          | Front          | Rear           |
|----------------------------------------------------|--------------------------|----------------|----------------|
|                                                    |                          | 100/90-16 54H  | 110/90-18 61H  |
| Cold tire pressure, kPa (kg/cm <sup>2</sup> , psi) | Driver only              | 225 (2.25, 32) | 225 (2.25, 32) |
|                                                    | Driver and one passenger | 225 (2.25, 32) | 280 (2.80, 40) |
| Tire brand                                         | Bridgestone              | L305           | G510           |
|                                                    | Dunlop                   | F11            | K527           |

Suspension air pressure: Front, 0–40 kPa (0–0.4 kg/cm<sup>2</sup>, 0–6 psi)  
Rear, 100–300 kPa (1.0–3.0 kg/cm<sup>2</sup>, 14–43 psi)

## TOOLS

### Special

Vacuum gauge 07404–0020000  
Carburetor pilot screw wrench 07908–KE70000  
Valve adjusting wrench 07908–MB00100  
Compression gauge attachment 07510–MB00101

### Common

Valve adjusting wrench 07708–0030300



## MAINTENANCE SCHEDULE

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

I: INSPECT AND CLEAN, ADJUST, LUBRICATE, OR REPLACE IF NECESSARY.

C: CLEAN, R: REPLACE, A: ADJUST, L: LUBRICATE

| ITEM |                                    | FREQUENCY               | WHICHEVER<br>COMES<br>FIRST<br>↓ | ODOMETER READING (NOTE 3)       |                         |                          |                           | REFER TO<br>PAGE |
|------|------------------------------------|-------------------------|----------------------------------|---------------------------------|-------------------------|--------------------------|---------------------------|------------------|
|      |                                    |                         |                                  | 1,000 km<br>(600 mil)           | 6,000 km<br>(3,600 mil) | 12,000 km<br>(7,200 mil) | 18,000 km<br>(10,800 mil) |                  |
| *    | FUEL LINES                         |                         |                                  |                                 | I                       | I                        | I                         | 3-4              |
|      | FUEL STRAINER                      |                         |                                  | C                               | C                       | C                        | C                         | 3-4              |
| *    | THROTTLE OPERATION                 |                         |                                  | I                               | I                       | I                        | I                         | 3-5              |
| *    | CARBURETOR-CHOKE                   |                         |                                  |                                 | I                       | I                        | I                         | 3-6              |
| *    | AIR CLEANER                        | NOTE 1                  |                                  |                                 |                         |                          | R                         | 3-6              |
|      | SPARK PLUGS                        |                         |                                  |                                 | R                       | R                        | R                         | 3-8              |
| *    | VALVE CLEARANCE                    |                         |                                  | I                               | I                       | I                        | I                         | 3-8              |
|      | ENGINE OIL                         | YEAR                    |                                  | R                               | R                       | R                        | R                         | 2-3              |
|      | ENGINE OIL FILTER                  | YEAR                    |                                  | R                               |                         | R                        |                           | 2-3              |
| *    | CARBURETOR IDLE SPEED              |                         |                                  | I                               | I                       | I                        | I                         | 3-12             |
| *    | CARBURETOR-SYNCHRONIZATION         |                         |                                  | I                               | I                       | I                        | I                         | 3-11             |
|      | RADIATOR COOLANT                   |                         |                                  |                                 | I                       | I                        | R*                        | 3-12             |
| *    | RADIATOR CORE                      |                         |                                  |                                 | I                       | I                        | I                         | 3-12             |
| *    | COOLING SYSTEM HOSES & CONNECTIONS |                         |                                  | I                               | I                       | I                        | I                         | 3-13             |
|      | DRIVE CHAIN                        | NOTE 2                  |                                  | I-L EVERY<br>1,000 km (600 mil) |                         |                          |                           | 3-13             |
|      | BATTERY                            | MONTH                   |                                  | I                               | I                       | I                        |                           | 3-15             |
|      | BRAKE FLUID                        | MONTH: I<br>2 YEARS: *R |                                  | I                               | I                       | I                        | *R                        | 3-16             |
|      | BRAKE PAD WEAR                     |                         |                                  |                                 | I                       | I                        | I                         | 3-16             |
|      | BRAKE SYSTEM                       |                         |                                  | I                               | I                       | I                        | I                         | 3-17             |
| *    | BRAKE LIGHT SWITCH                 |                         |                                  | I                               | I                       | I                        | I                         | 3-17             |
| *    | HEADLIGHT AIM                      |                         |                                  | I                               | I                       | I                        | I                         | 3-18             |
|      | CLUTCH FLUID                       | MONTH: I<br>2 YEARS: *R |                                  | I                               | I                       | I                        | *R                        | 3-18             |
|      | CLUTCH SYSTEM                      |                         |                                  | I                               | I                       | I                        | I                         | 3-18             |
| *    | SUSPENSION                         |                         |                                  | I                               | I                       | I                        | I                         | 3-18             |
| *    | NUTS, BOLTS, FASTENERS             |                         |                                  | I                               | I                       | I                        | I                         | 3-20             |
| **   | WHEELS                             |                         |                                  | I                               | I                       | I                        | I                         | 3-20             |
| **   | STEERING HEAD BEARING              |                         |                                  | I                               | I                       | I                        | I                         | 3-20             |

\* 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 THAT THESE ITEMS BE SERVICED ONLY BY AN AUTHORIZED HONDA DEALER.

NOTES: 1. SERVICE MORE FREQUENTLY WHEN RIDING IN DUSTY AREAS.

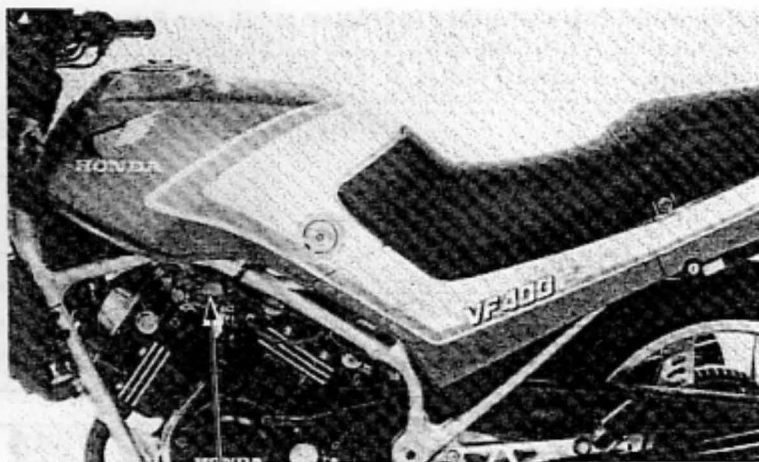
2. SERVICE MORE FREQUENTLY WHEN RIDING IN RAIN OR AT FULL THROTTLE.

3. FOR HIGHER ODOMETER READINGS, REPEAT AT THE FREQUENCY INTERVAL ESTABLISHED HERE.



## FUEL LINES

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



(1) FUEL LINES

## FUEL STRAINER

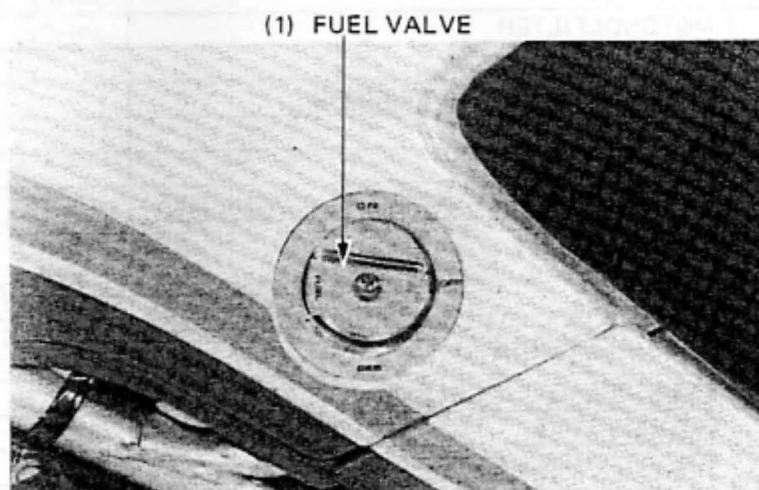
### WARNING

*Gasoline is flammable and is explosive under certain conditions. Do not smoke or allow flames or sparks near the equipment while draining fuel.*

Turn the fuel valve OFF.

Remove the fuel strainer cup.

Remove the O-ring and filter screen from the fuel valve body.



(1) FUEL VALVE

Wash the cup and filter screen in clean non-flammable or high flash point solvent.

Reinstall the screen, aligning the index marks on the fuel valve body and filter screen. Install a new O-ring into the fuel valve body. Reinstall the fuel cup, making sure the new O-ring is in place.

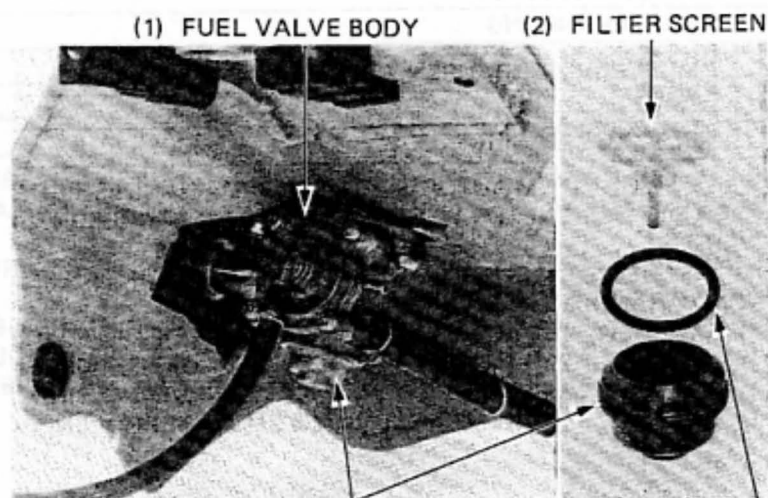
Hand tighten the fuel cup and torque to specification.

### CAUTION

*Do not overtighten the fuel cup.*

**TORQUE: 3–5 N·m (0.3–0.5 kg-m, 2–4 ft-lb)**

After installing and filling the tank, turn fuel valve ON and check that there are no fuel leaks.



(1) FUEL VALVE BODY

(2) FILTER SCREEN

(3) FUEL STRAINER CUP

(4) O-RING



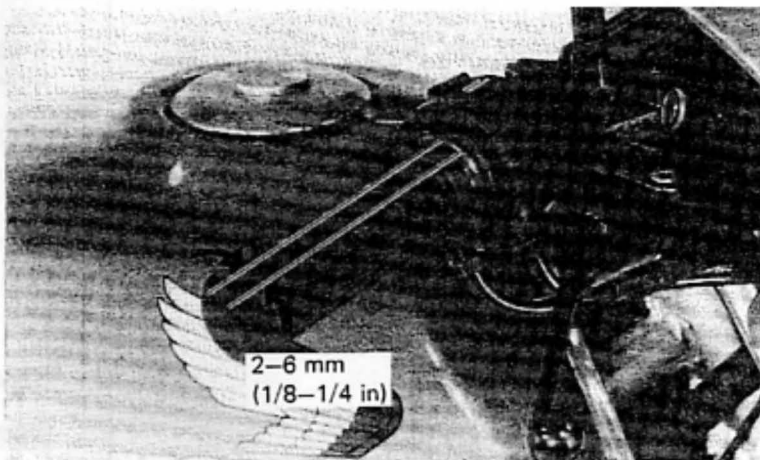
## THROTTLE OPERATION

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.

Lubricate the throttle cables (page 2-10), if throttle operation is not smooth.

Measure throttle grip free play at the throttle grip flange.

**FREE PLAY: 2-6 mm (1/8-1/4 in)**



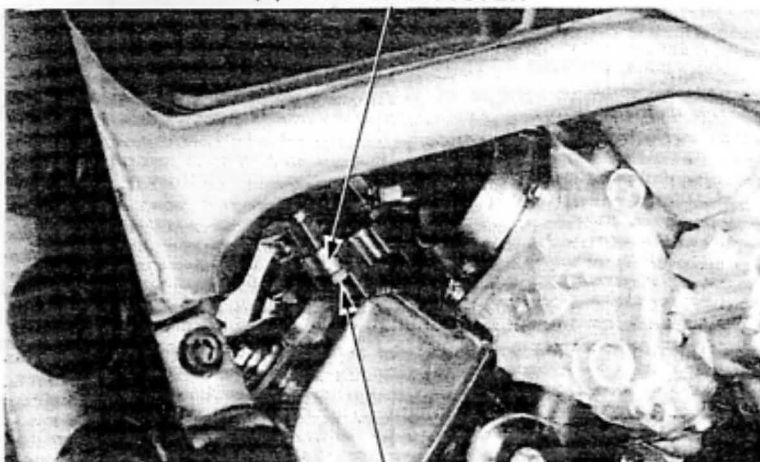
Adjustment can be made at either end of the throttle cable. Minor adjustments are made with the upper adjuster and major adjustments are made with the lower adjuster.

Adjust by loosening the lock nut and turning the adjuster.

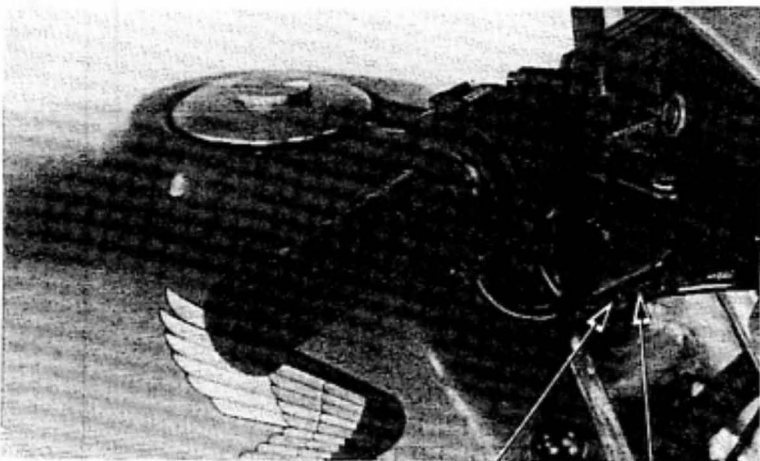
Tighten the lock nut and recheck throttle operation.

Install the fuel tank, if removed.

(1) LOWER ADJUSTER



(2) LOCK NUT



(1) LOCK NUT

(2) UPPER  
ADJUSTER





## CARBURETOR CHOKE

Check for smooth choke lever operation.

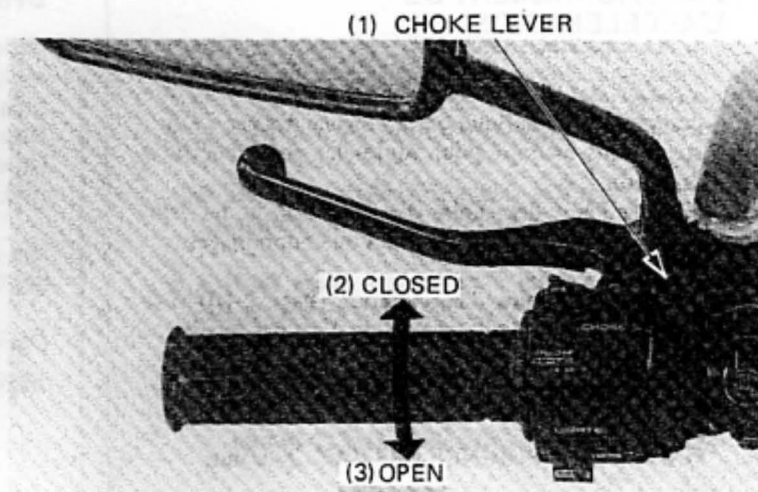
Lubricate the choke cable, if the operation is not smooth.

Pull the choke lever on the handlebar all the way back to fully open. Make sure the choke valve is open by trying to move the choke lever on the carburetor.

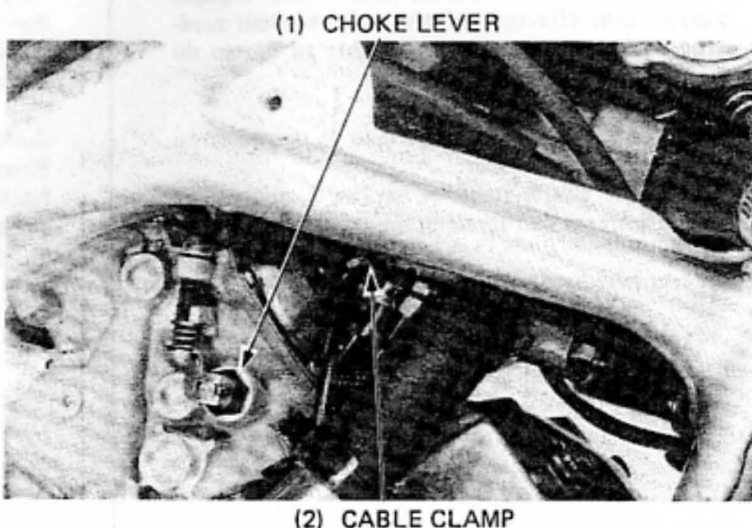
There should be no free play.

Adjust if necessary, by loosening the choke cable clamp on the carburetor and moving the choke cable casing so the choke lever is fully open.

Tighten the clamp.



Push the choke lever up all the way to fully closed. Make sure the choke valve is fully closed by checking for free play in the cable between the lever on the carburetor and cable casing.



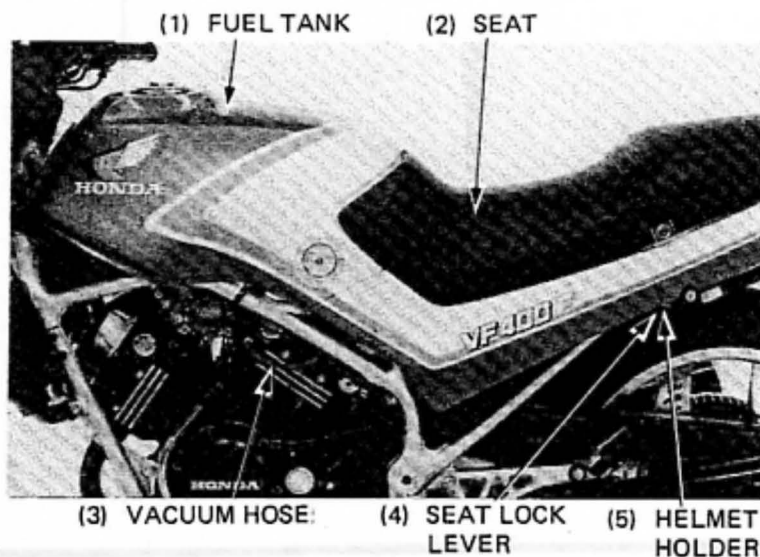
## AIR CLEANER

Remove the right and left frame side covers by pulling them.

Unlock the helmet holder and remove the seat by pulling the seat lock lever.

Turn the fuel valve OFF, and disconnect the fuel and vacuum hoses.

Remove the fuel tank.

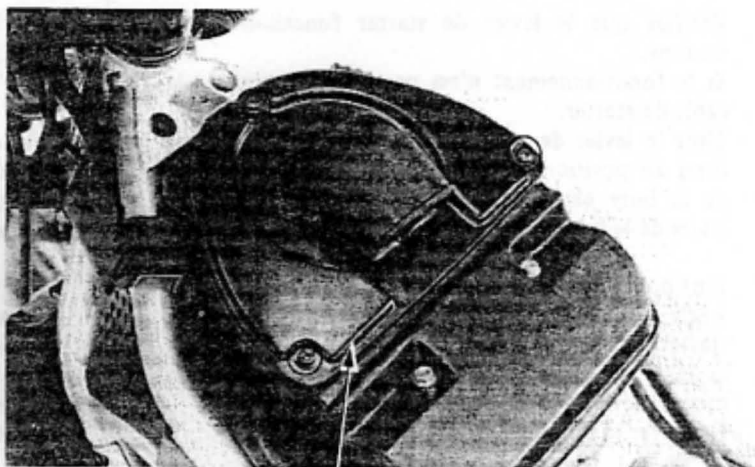






Loosen the three attaching screws and remove the air cleaner case cover.

Remove the air cleaner element from the case.



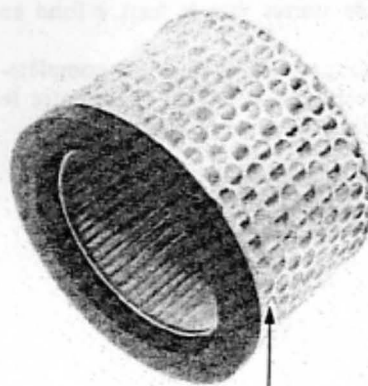
(1) AIR CLEANER CASE COVER

Discard the element in accordance with the maintenance schedule.

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

#### CAUTION

*Because the paper filter is viscous type which contains oil, do not clean it by blowing with air.*

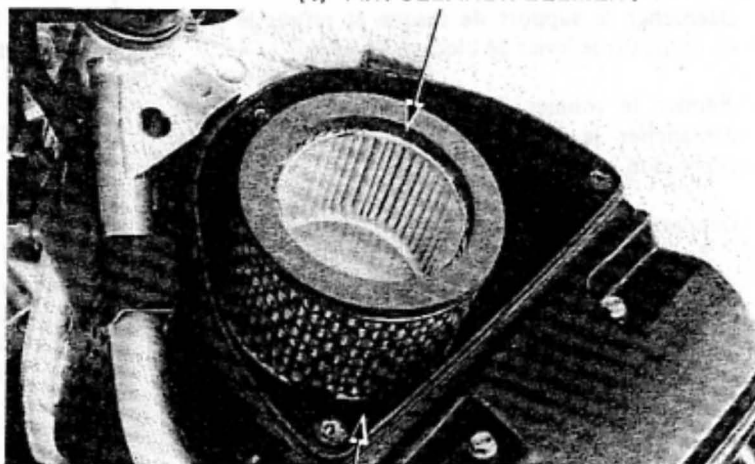


(1) AIR CLEANER ELEMENT  
(VISCIOUS TYPE)

Install a new element into the air cleaner case. Install the air cleaner case cover and secure it with the three attaching screws.

Install the fuel tank and seat in the reverse order of removal.

Install the right and left frame side covers.



(2) AIR CLEANER CASE



## SPARK PLUGS

### RECOMMENDED SPARK PLUGS

|                                       | NGK      | ND        |
|---------------------------------------|----------|-----------|
| Standard                              | DPR8EA-9 | X24EPR-U9 |
| For cold climate<br>(Below 5°C, 41°F) | DPR7EA-9 | X22EPR-U9 |
| For extended<br>high speed riding     | DPR9EA-9 | X27EPR-U9 |

Disconnect the spark plug caps.

Clean any dirt from around the spark plug bases.

Remove and discard the spark plugs.

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

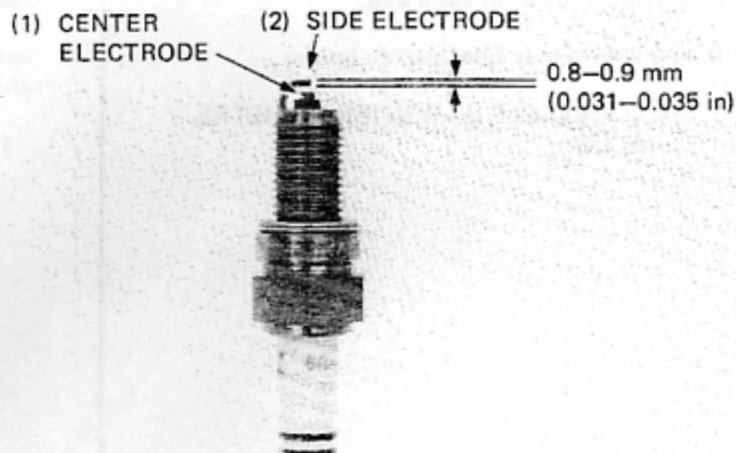
**SPARK PLUG GAP: 0.8–0.9 mm (0.031–0.035 in)**

Adjust by bending the side electrode carefully.

With the plug washer attached, thread each spark plug in by hand to prevent cross-threading. Continue tightening by hand until the spark plug bottoms.

Then, tighten the spark plugs another 1/2 turn with a spark plug wrench to compress the plug washer.

Connect the spark plug caps.



## VALVE CLEARANCE

### NOTE:

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

Swing the motorcycle to the right and left to drain the oil remaining in the cylinder head into the crankcase.

Remove the right and left frame side covers by pulling them.

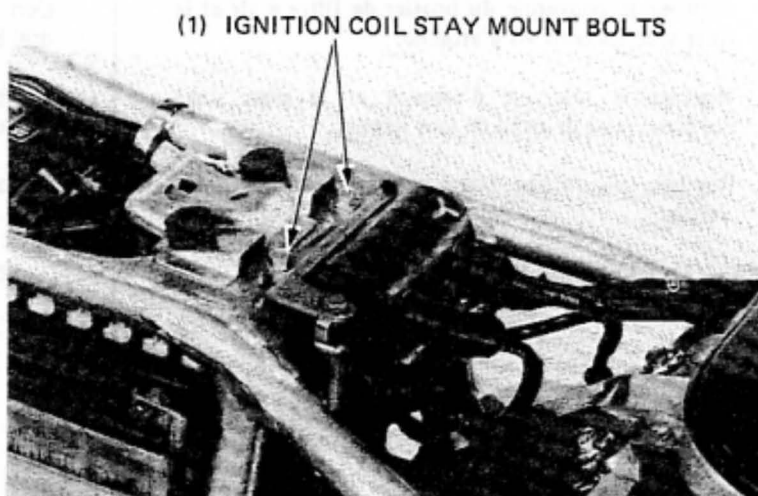
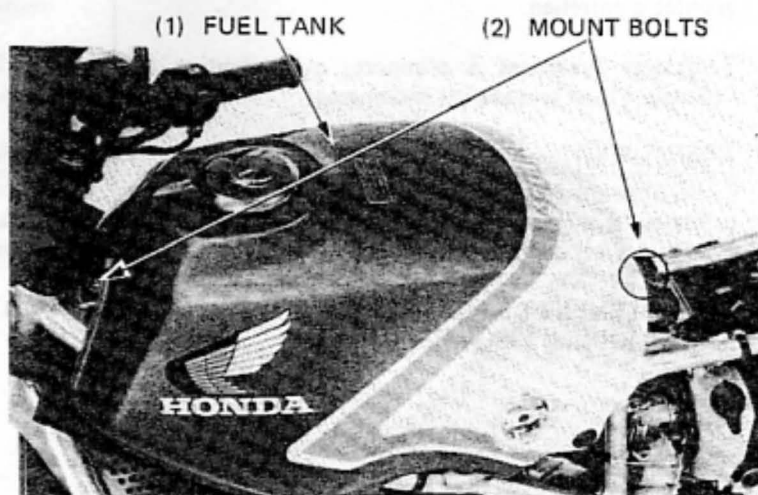
Unlock the helmet holder and remove the seat by pulling the seat lock lever.

Remove the fuel tank mount bolts.

Turn the fuel valve OFF and disconnect the fuel and vacuum hoses.

Remove the fuel tank.

Remove the ignition coil stay mount bolts and remove the coil with its stay.

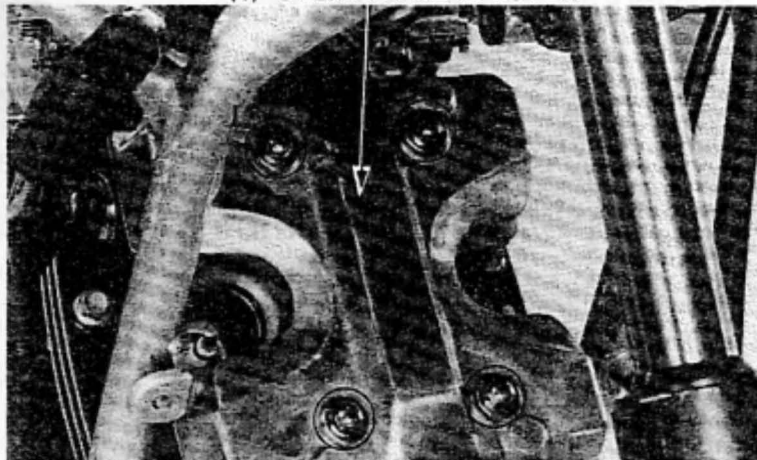




Remove the radiator (page 6-5).

Remove the cylinder head cover mount bolts and remove the front and rear cylinder head covers.

(1) CYLINDER HEAD COVER

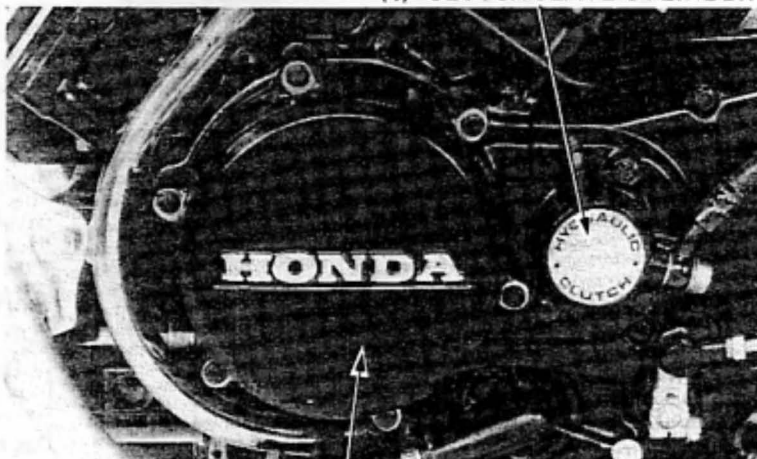


Remove the clutch slave cylinder.

Loosen the six bolts and remove the alternator cover.

Remove the inspection hole cap from the right crankcase cover by loosening it.

(1) CLUTCH SLAVE CYLINDER



(2) ALTERNATOR COVER



Rotate the crankshaft counterclockwise and align the "TR" mark on the flywheel with the index mark on the right crankcase cover.

Make sure that the No. 1 piston is at TDC (Top Dead Center) on the compression stroke. If not, turn the crankshaft counterclockwise 360 degrees (one turn) and re-align the "TR" mark with the index mark.

Measure the intake and exhaust valve clearances for the No. 1 cylinder.

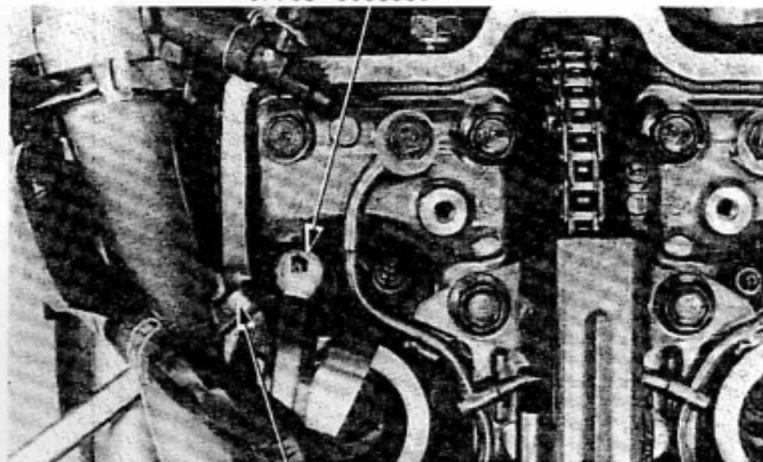
#### VALVE CLEARANCES:

INTAKE: 0.10–0.14 mm (0.004–0.006 in)

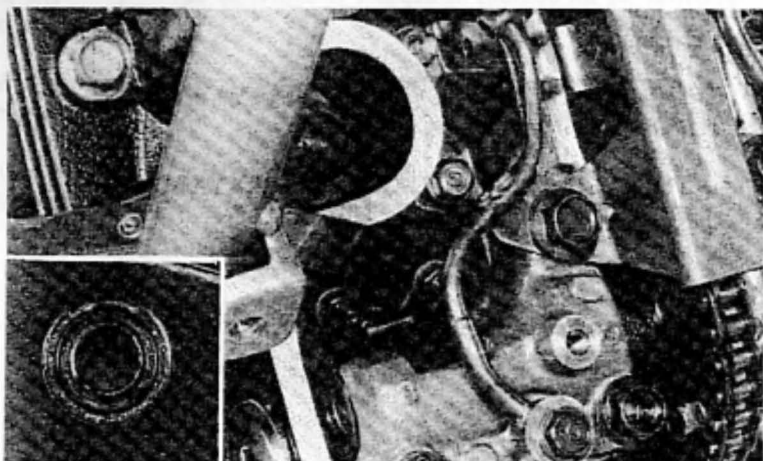
EXHAUST: 0.11–0.15 mm (0.004–0.006 in)



(1) VALVE ADJUSTING WRENCH  
07708-0030300



(2) VALVE ADJUSTING WRENCH  
07908-MB00100



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

Hold the adjusting screw and tighten the lock nut.

Recheck the valve clearance.

Rotate the crankshaft counterclockwise 90 degrees to align the "TF" mark with the index mark and check the valve clearances for the No. 4 cylinder.

Adjust using the procedures for the No. 1 cylinder.

Rotate the crankshaft counterclockwise 270 degrees to align the "TR" mark with the index mark and check the valve clearances for the No. 3 cylinder.

Adjust using the procedures for the No. 1 cylinder.

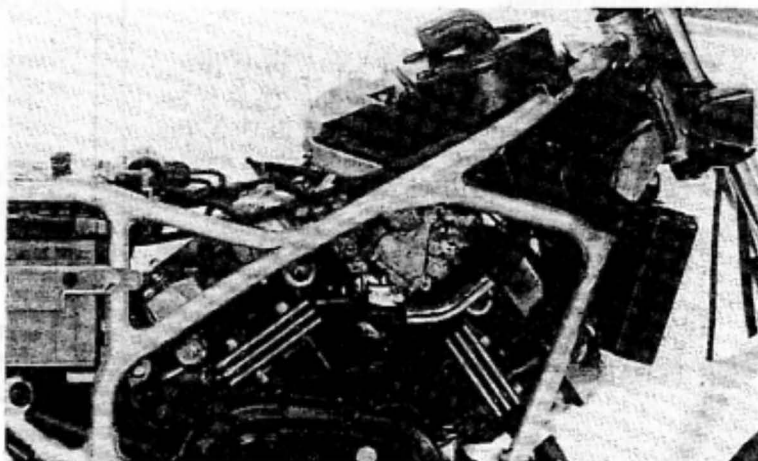
Rotate the crankshaft counterclockwise to align the "TF" mark with the index mark and check the valve clearances for the No. 2 cylinder.

Adjust using the procedures for the No. 1 cylinder.

Install the removed parts in the reverse order of removal.

Check the engine oil level.

Fill the radiator with clean coolant to the specified level.







## CARBURETOR-SYNCHRONIZATION

### NOTE:

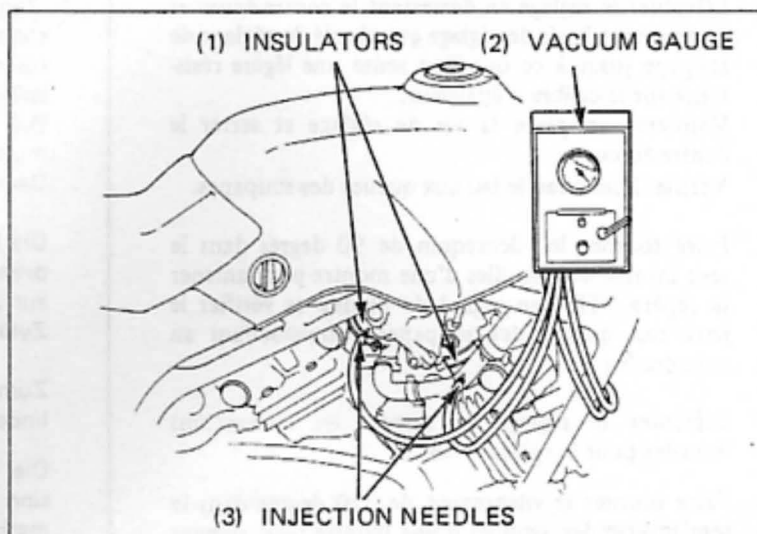
Synchronize the carburetors with the engine at normal operating temperature, transmission in neutral and motorcycle on the center stand.

Install the injection needles into the rubber hoses of the vacuum gauge.

Stick the injection needles into the carburetor insulators.

### CAUTION

- Do not stick the injection needle into one point repeatedly and also do not stick the injection needle 20 mm (0.79 in) or more from the end of the needle.
- Use commercially available injection needle of No. 21 or 22 gauge.



Start the engine and adjust the idle speed.

**IDLE SPEED:  $1,300 \pm 100 \text{ min}^{-1}$  (rpm)**

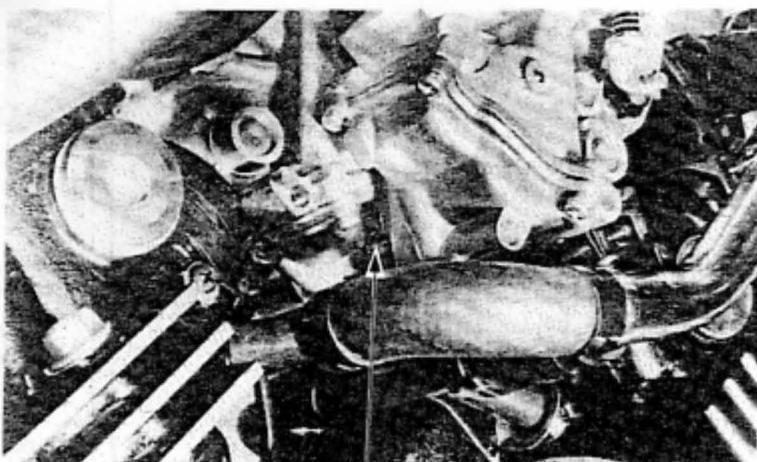
Check that all carburetors are within 60 mm (2.4 in) Hg.

Adjust as follows:

Turn each pilot screw clockwise until it seats lightly and back it out to the specification.

**INITIAL OPENING: 2-1/4 turns out**

Synchronize to specification by turning the adjusting screws with carburetor adjusting wrench (07908-KE70000).



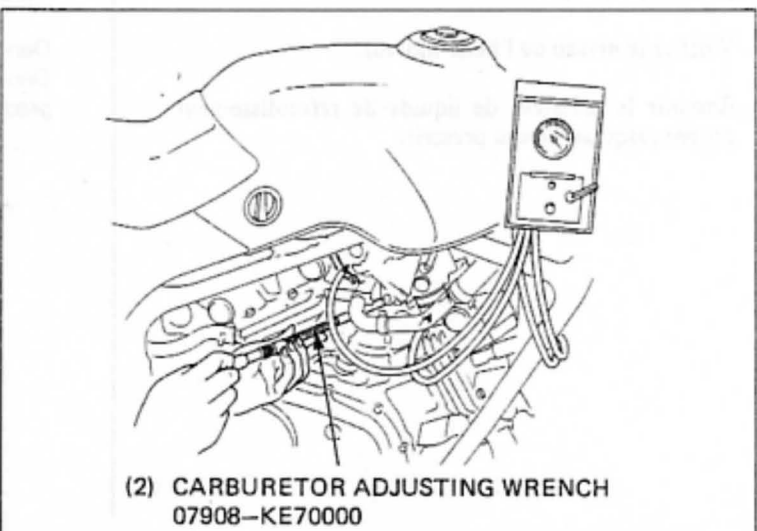
(1) ADJUSTING SCREW

### NOTE:

The No. 4 carburetor cannot be adjusted; it is the base carburetor.

Recheck the idle speed and synchronization.

Remove the injection needles from the insulators and apply soapy water to the insulators.





## CARBURETOR-IDLE SPEED

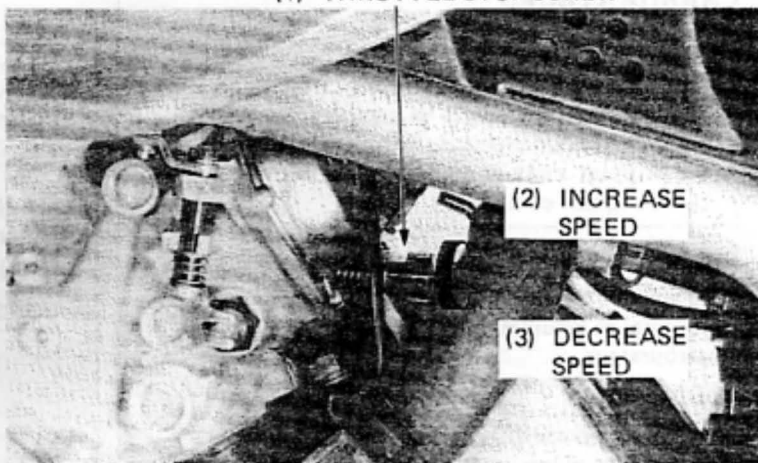
### NOTE:

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

Warm up the engine, shift to NEUTRAL, and place the motorcycle on its center stand.  
Turn the throttle stop screw as required to obtain the specified idle speed.

**IDLE SPEED:  $1,300 \pm 100 \text{ min}^{-1}$  (rpm)**

(1) THROTTLE STOP SCREW



## RADIATOR COOLANT

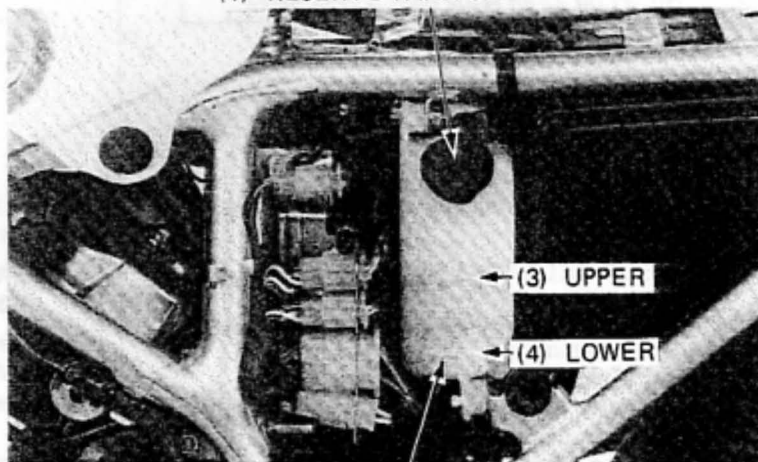
Remove the frame left side cover.

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.

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

Reinstall the cap and frame side cover.

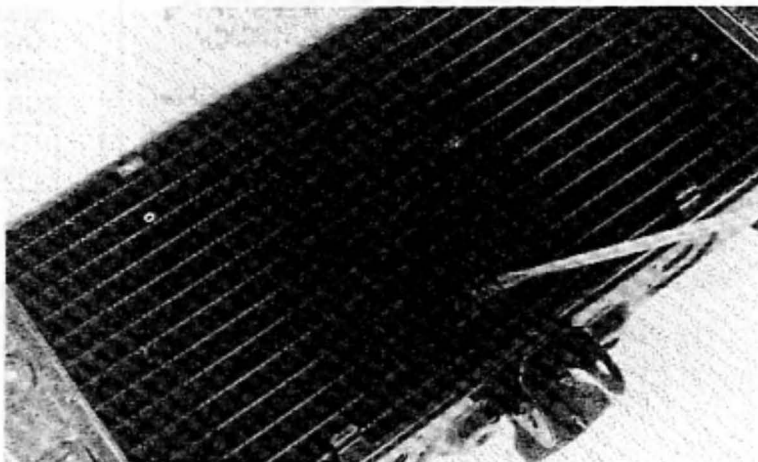
(1) RESERVE TANK CAP



(2) RESERVE TANK

## RADIATOR CORE

Check the air passages for clogging or damage. Straighten bent fins and collapsed core tubes. Remove insects, mud or any obstruction with compressed air or low water pressure. Replace the radiator if the air flow is restricted over more than 20% of the radiating surface.





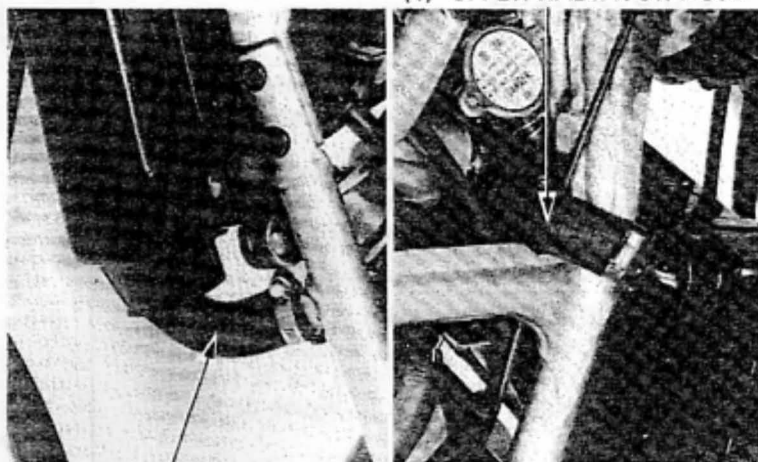


## COOLING SYSTEM HOSES & CONNECTIONS

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

Check the tightness of all hose clamps.

(1) UPPER RADIATOR HOSE



(2) LOWER RADIATOR HOSE

## CYLINDER COMPRESSION

Warm up the engine.

Stop the engine, then disconnect the spark plug caps and remove the spark plugs.

Insert the compression gauge.

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

### NOTE:

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

### COMPRESSION PRESSURE:

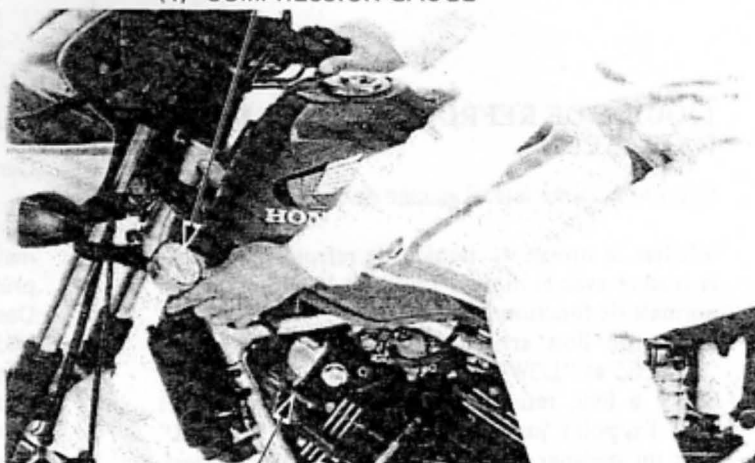
$1,200 \pm 200 \text{ kPa}$  ( $12.0 \pm 2.0 \text{ kg/cm}^2$ ,  
 $171 \pm 28 \text{ psi}$ )

If compression is low, check for the following:

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

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

(1) COMPRESSION GAUGE



(2) COMPRESSION GAUGE ATTACHMENT  
07510-MB00101

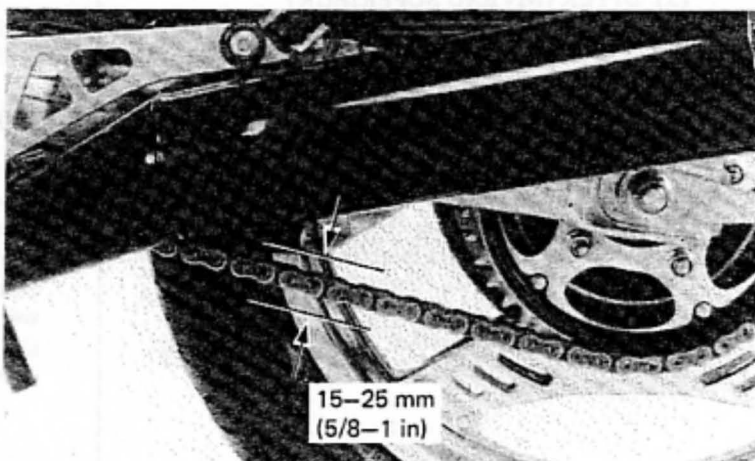
## DRIVE CHAIN

Turn the engine off, place the motorcycle on its center stand and shift the transmission into neutral. Check slack in the drive chain lower run midway between the sprockets.

**SLACK:** 15–25 mm (5/8–1 in)

### CAUTION

*Excessive chain slack, 50 mm (2 in) or more, may damage the frame.*





## Adjust as follows:

Loosen the axle nut.

Loosen the adjusting bolt lock nuts.

Turn both adjusting bolts an equal number of turns until the correct drive chain slack is obtained.

## CAUTION:

*Make sure that the same alignment marks on both adjusting plates align with the ends of the swingarm.*

Tighten the adjusting bolt lock nuts.

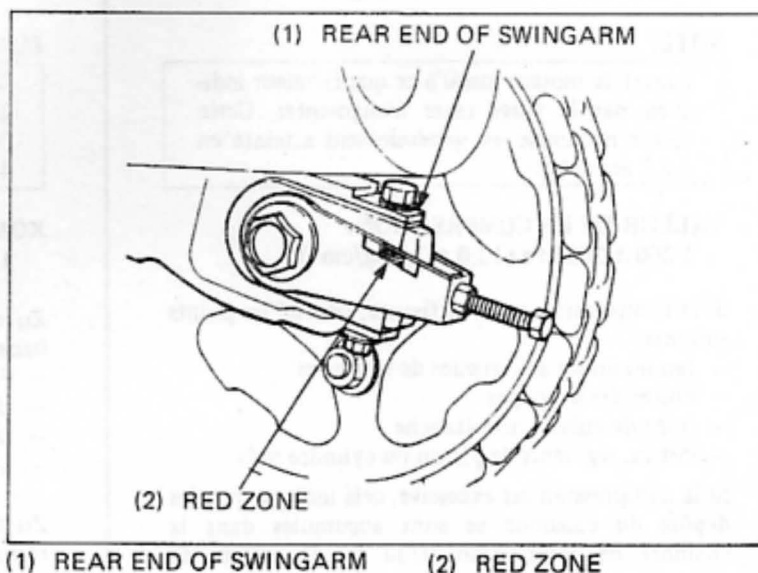
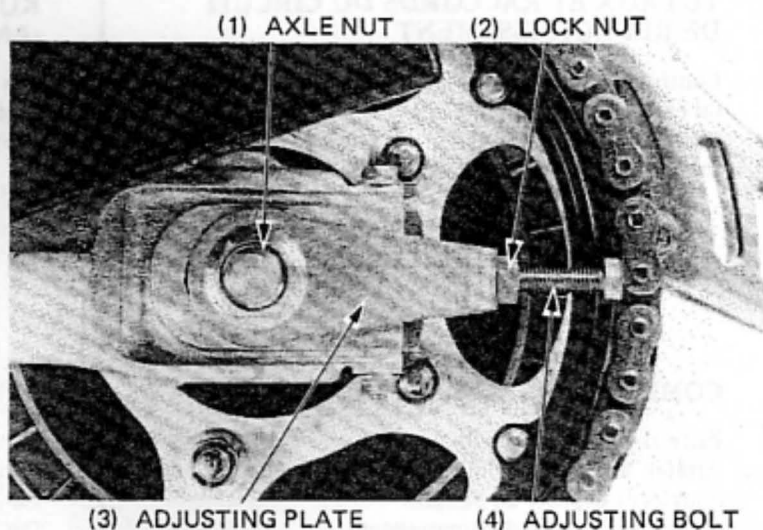
Tighten the rear axle nut.

**TORQUE: 80–100 N·m (8.0–10.0 kg-m,  
58–72 ft-lb)**

Recheck chain slack and free wheel rotation.

Lubricate the drive chain with SAE 80 or 90 gear oil.

Check the chain wear label. If the red zone on the label align, or is beyond, the rear end of the swingarm after the chain has been adjusted, the chain must be replaced.



## Lubrication and cleaning:

The drive chain on this motorcycle is equipped with small O-rings between the link plates. The O-rings can be damaged by steam cleaner, high pressure washer and certain solvents.

Clean the chain with kerosene. Wipe dry and lubricate with SAE #80 or 90 gear oil. Commercial chain lubricants may contain solvents which could damage the rubber O-rings.

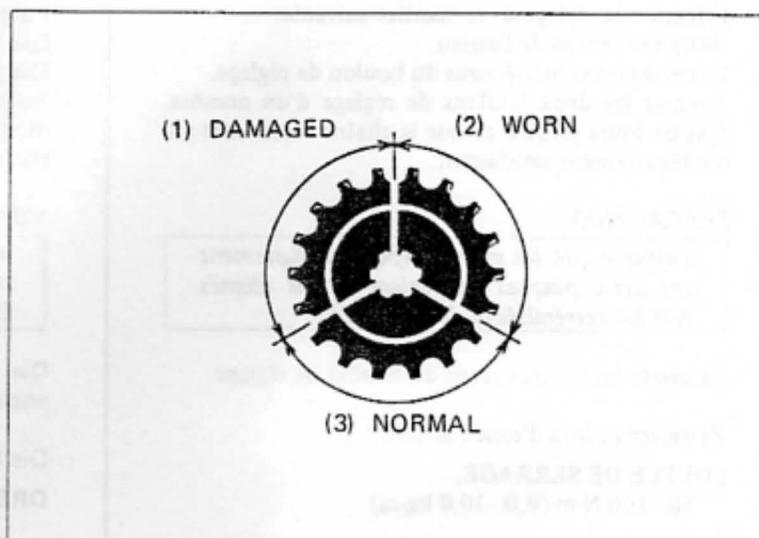


### Drive chain and sprocket inspection:

Inspect the drive chain and sprockets for damage or wear. A drive chain with damaged rollers, loose pins, or missing O-rings must be replaced. Replace any sprocket which is damaged or excessively worn.

### NOTE:

Never install a new drive chain on worn sprockets or a worn drive chain on new sprockets. Both chain and sprockets must be in good condition or the replacement chain or sprockets will wear rapidly.



## BATTERY

Remove the right frame side cover and inspect the battery fluid level.

When the fluid level nears the lower level, remove the battery and add distilled water to the upper level line as follows:

Remove the battery holder bolt, then swing the holder out of the way.

Disconnect the negative cable at the battery, then disconnect the positive cable.

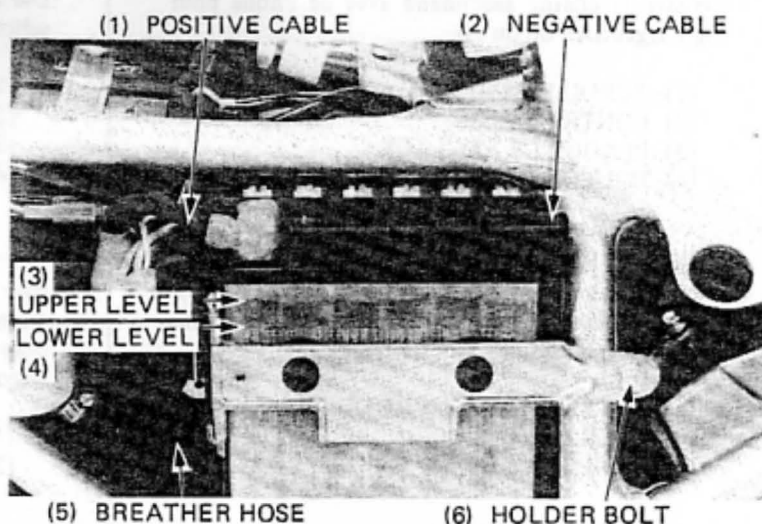
Disconnect the battery breather hose from the battery.

Pull the battery out, remove the filler caps and add distilled water to the upper level line.

Reinstall the filler caps and the battery.

### NOTE:

Add only distilled water. Tap water will shorten the service life of the battery.



### WARNING

*The battery electrolyte contains sulphuric acid. Protect your eyes, skin, and clothing. If electrolyte gets in your eyes, flush them thoroughly with water and get prompt medical attention.*

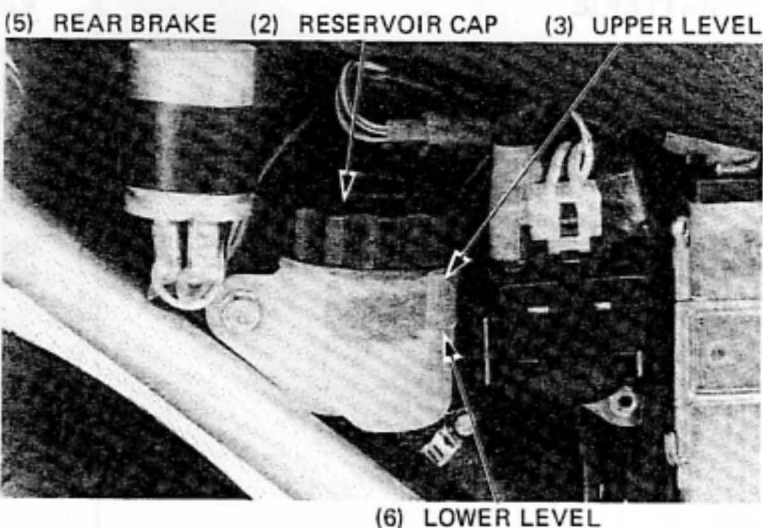
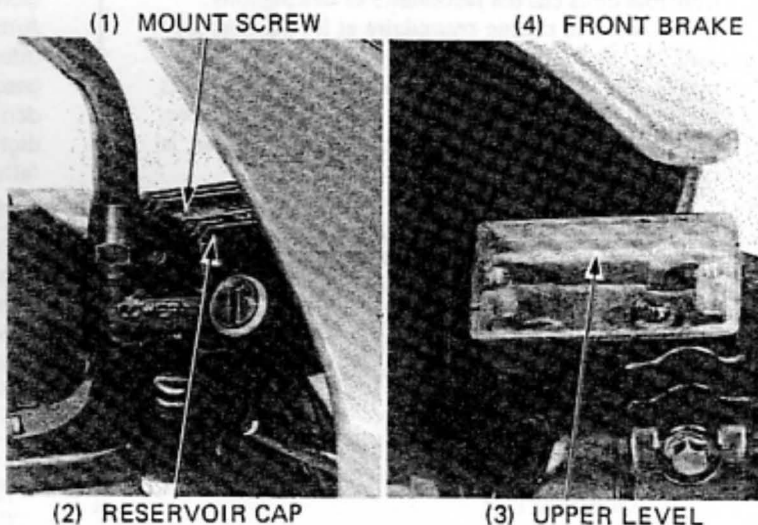
## BRAKE FLUID

Check the brake fluid reservoir level.  
If the level nears the lower level mark, fill the reservoir with **DOT-3 BRAKE FLUID** to the upper level mark.  
Check the entire system for leaks, if the level is low.

### CAUTION

- Do not remove the cover until the handlebar has been turned so that the reservoir is level.
- Do not mix different types of fluid, as they are not compatible.

Refer to section 16 for brake bleeding procedures.



## BRAKE PAD WEAR

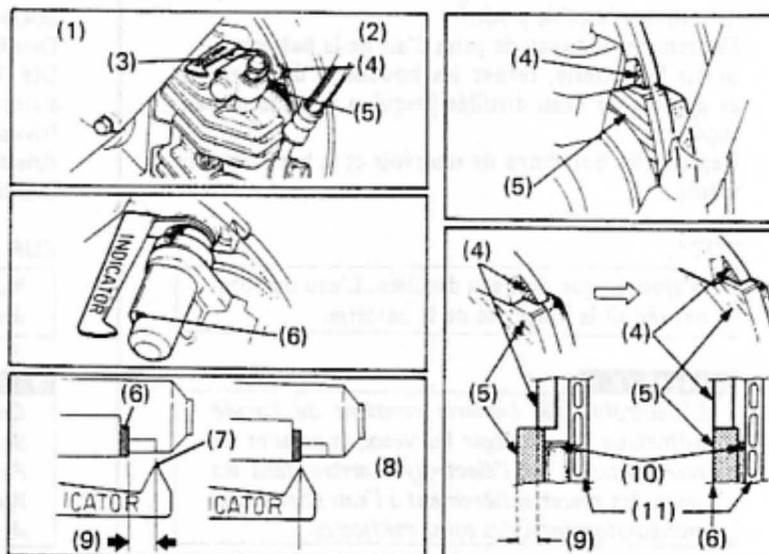
Check the inside and outside brake pads for wear after operating the brake lever (or depressing the brake pedal) several times.

**Inside pad:** Replace the pads with new ones if the indicator pointer aligns with the wear limit as shown.

**Outside pad:** Replace the pads with new ones if the surface B (the back surface of the pad) aligns with the surface A.

- (1) INSIDE PAD
- (2) OUTSIDE PAD
- (3) INDICATOR
- (4) SURFACE A
- (5) SURFACE B
- (6) WEAR LIMIT
- (7) POINTER
- (8) REPLACE
- (9) SERVICE RANGE
- (10) PADS
- (11) DISCS

(12) FRONT







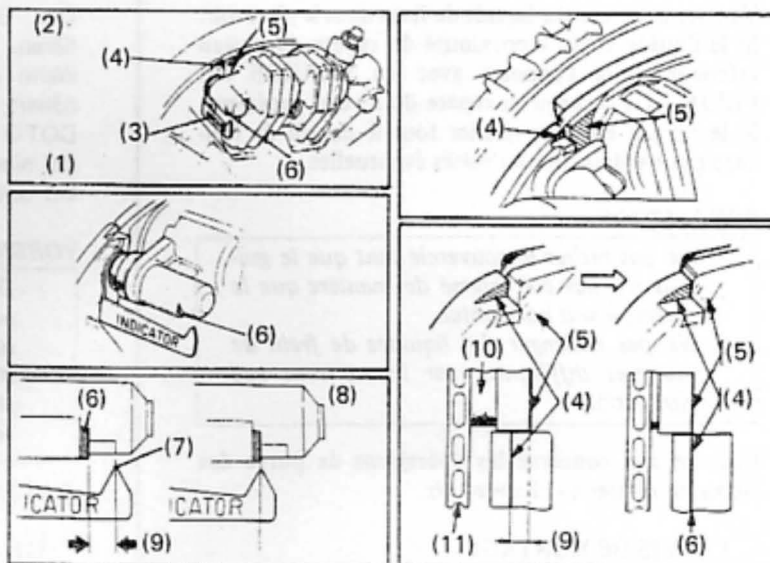
- (1) INSIDE PAD
- (2) OUTSIDE PAD
- (3) INDICATOR
- (4) SURFACE A
- (5) SURFACE B
- (6) WEAR LIMIT
- (7) POINTER
- (8) REPLACE
- (9) SERVICE RANGE
- (10) PADS
- (11) DISCS

## BRAKE SYSTEM

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

Replace hoses and fittings as required.

### (12) REAR



## BRAKE PEDAL HEIGHT

Adjust brake pedal height so the pedal is 10–20 mm (3/8–3/4 in) below the top of the foot peg.

### CAUTION

*Incorrect brake pedal height can cause brake drag.*

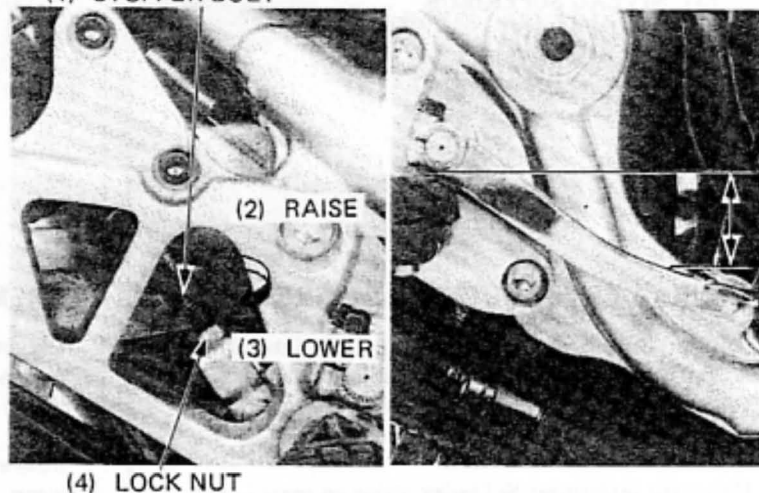
### To Adjust:

Loosen the stopper bolt lock nut and turn the stopper bolt.  
Retighten the lock nut.

### NOTE:

After adjusting the brake pedal height, check the rear brake light switch and brake pedal free play and adjust if necessary.

### (1) STOPPER BOLT

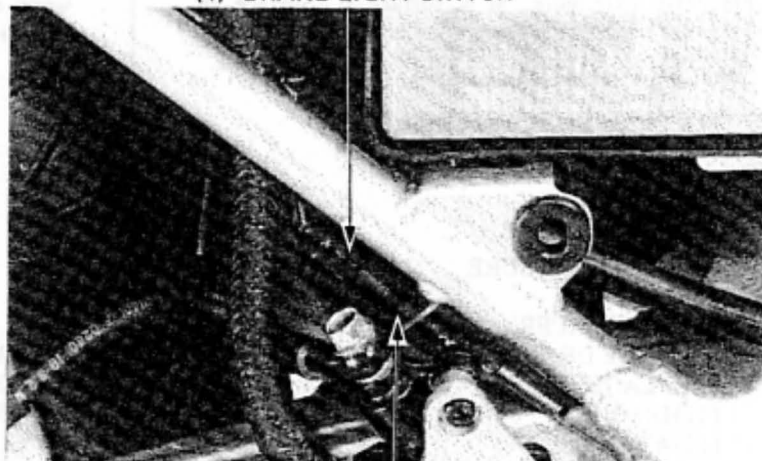


## BRAKE LIGHT SWITCH

Adjust the brake light switch so that the brake light will come on when the brake engagement begins. Adjust by holding the switch body and turning the adjusting nut. Do not turn the switch body.

Turn the adjusting nut clockwise if the brake light comes on too late.

### (1) BRAKE LIGHT SWITCH



### (2) ADJUSTING NUT





## HEADLIGHT AIM

Adjust the headlight vertically by turning the vertical adjusting screw under the headlight.

Adjust the headlight horizontally by turning the horizontal adjusting screw at the right side of the headlight.

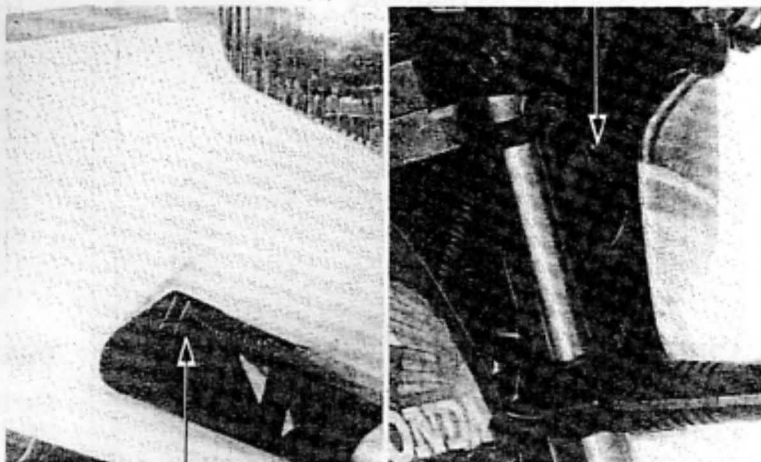
### NOTE:

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

### WARNING

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

(1) HORIZONTAL ADJUSTING SCREW



(2) VERTICAL ADJUSTING SCREW

## CLUTCH

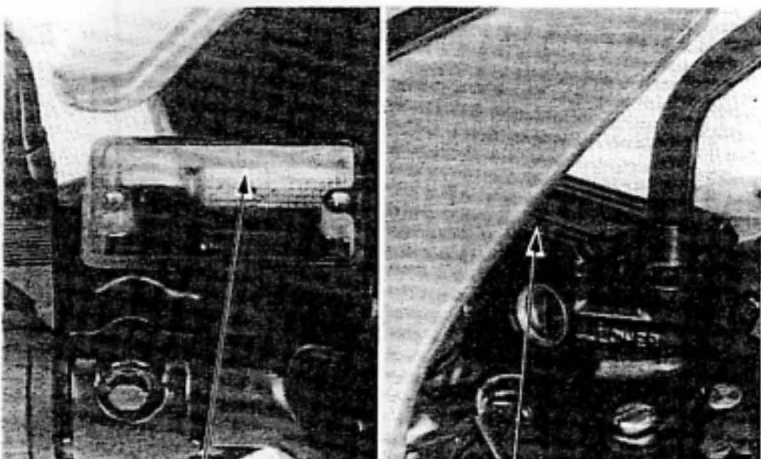
Check the clutch fluid reservoir level.

If the level nears the lower level mark, fill the reservoir with **DOT-3 BRAKE FLUID** until the level is between the upper and lower level mark.

Check the entire system for leaks, if the level is low.

### CAUTION

- Do not remove the cover until the handlebar has been turned so that the reservoir is level.
- Do not mix different types of fluid, as they are not compatible.



(1) UPPER LEVEL MARK

(2) RESERVOIR CAP

## SUSPENSION

### WARNING

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

### FRONT

Check the action of the front forks by compressing them several times.

Check the entire fork assembly for leaks or damage. Replace damaged components which cannot be repaired.

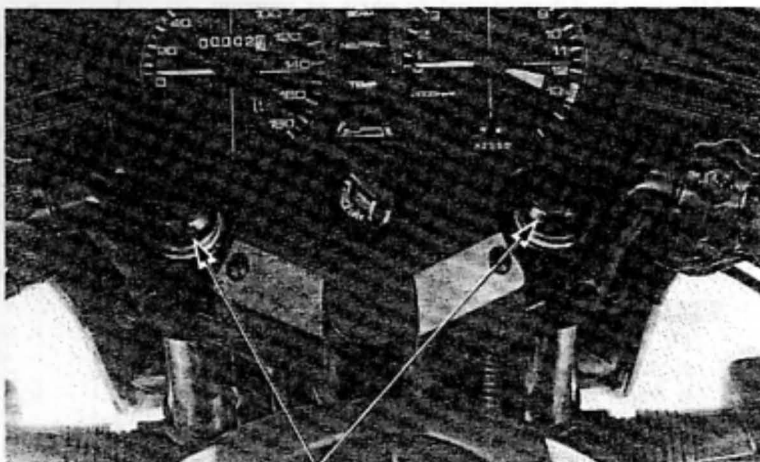
Tighten all nuts and bolts.



Check the front fork air pressure when the forks are cold.  
Place the vehicle on its center stand.  
Remove the air valve cap and measure the air pressure.

## AIR PRESSURE:

0–40 kPa (0–0.4 kg/cm<sup>2</sup>, 0–6 psi)



(1) AIR VALVE CAPS

## REAR

Place the motorcycle on its center stand.  
Move the rear wheel sideways with force to see if the swingarm bearings are worn.  
Replace the bearings if there is any looseness (page 15-21).  
Check the shock absorber for leaks or damage.  
Tighten all rear suspension nuts and bolts.

Remove the frame left side cover.  
Remove the valve cap and measure the shock absorber air pressure.

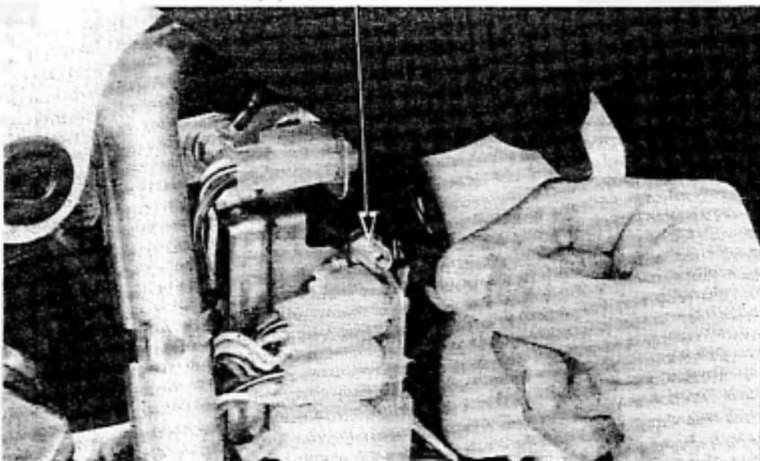
## REAR SHOCK ABSORBER AIR PRESSURE:

100–300 kPa (1.0–3.0 kg/cm<sup>2</sup>, 14–43 psi)

## NOTE:

Check the air pressure when the shock absorber is cold.

(1) AIR VALVE





## NUTS, BOLTS, FASTENERS

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

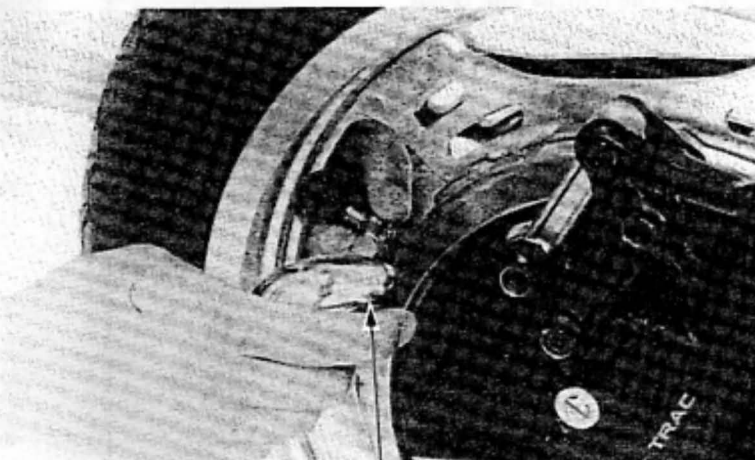
Check all cotter pins, safety clips, hose clamps and cable stays.

## WHEELS

### NOTE:

Tire pressure should be checked when tires are COLD.

Check the tires for cuts, imbedded nails, or other sharp objects.



(1) AIR PRESSURE GAUGE

### RECOMMENDED TIRES AND PRESSURES:

| Tire size                                                |                          | Front            | Rear             |
|----------------------------------------------------------|--------------------------|------------------|------------------|
|                                                          |                          | 100/90-16<br>54H | 110/90-18<br>61H |
| Cold tire pressure<br>kPa (kg/<br>cm <sup>2</sup> , psi) | Driver only              | 225 (2.25, 32)   | 225 (2.24, 32)   |
|                                                          | Driver and one passenger | 225 (2.25, 32)   | 280 (2.8, 40)    |
| Tire brand                                               | BRIDGE-STONE             | L305             | G510             |
|                                                          | DUNLOP                   | F11              | K527             |

Check the front and rear wheels for trueness (Section 14 and 15).

Measure the tread depth at the center of the tires.

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

#### Minimum tread depth:

Front: 1.5 mm (1/16 in)

Rear: 2.0 mm (3/32 in)

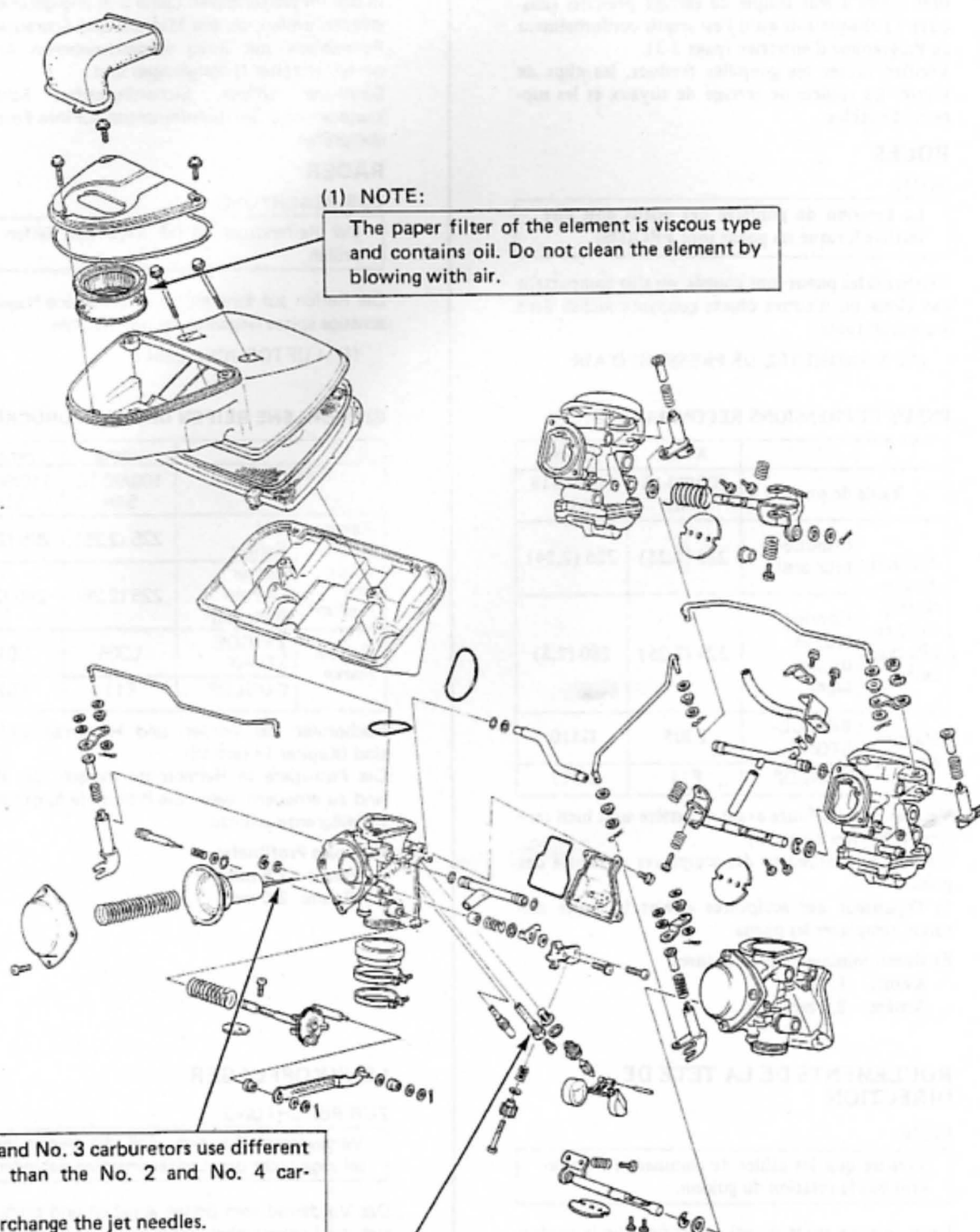
## STEERING HEAD BEARINGS

### NOTE:

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

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

If the handlebar moves unevenly, binds, or has vertical movement, adjust the steering head bearing by turning the steering head adjusting nut (page 14-33).



(1) NOTE:

The paper filter of the element is viscous type and contains oil. Do not clean the element by blowing with air.

(2) NOTE:

The No. 1 and No. 3 carburetors use different jet needles than the No. 2 and No. 4 carburetors. Do not interchange the jet needles.

(3) NOTE:

Be careful not to contaminate and damage the needle jet holder.

# 4. FUEL SYSTEM



**HONDA**  
**VF400F**

|                             |     |                         |      |
|-----------------------------|-----|-------------------------|------|
| SERVICE INFORMATION         | 4-1 | CARBURETOR ASSEMBLY     | 4-11 |
| TROUBLESHOOTING             | 4-2 | CARBURETOR INSTALLATION | 4-15 |
| CARBURETOR REMOVAL          | 4-3 | AIR CLEANER             | 4-16 |
| VACUUM CHAMBER              | 4-4 | FUEL TANK               | 4-16 |
| FLOAT, FLOAT VALVE AND JETS | 4-6 | AUTOMATIC FUEL VALVE    | 4-17 |
| CARBURETOR SEPARATION       | 4-9 |                         |      |

## SERVICE INFORMATION

### GENERAL

#### WARNING

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

- When disassembling fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- The float bowls have drain screws that can be loosened to drain residual gasoline.

### TOOLS

#### Common

Float gauge

07401-0010000

### SPECIFICATIONS

| Item                        | Specifications                      |
|-----------------------------|-------------------------------------|
| Carburetor type             | KEIHIN CV                           |
| Throttle bore               | 30 mm (1.18 in)                     |
| Venturi bore                | 27 mm (1.06 in)                     |
| Identification No.          | VD40                                |
| Float level                 | 6.8 mm (0.27 in)                    |
| Main jet                    | #85                                 |
| Idle speed                  | 1,300 ± 100 min <sup>-1</sup> (rpm) |
| Throttle grip free play     | 2-6 mm (0.08-0.24 in)               |
| Pilot screw initial opening | 2-1/4 turns out                     |





## **TROUBLESHOOTING**

### **Engine cranks but won't start**

1. No fuel in tank
2. No fuel to carburetors
3. Engine flooded with fuel
4. No spark at plug (ignition system faulty)
5. Air cleaner clogged
6. Intake air leak
7. Improper choke operation
8. Improper throttle operation

### **Hard starting or stalling after starting**

1. Improper choke operation
2. Ignition malfunction
3. Carburetor faulty
4. Fuel contaminated
5. Intake air leak
6. Idle speed incorrect

### **Rough idle**

1. Ignition system faulty
2. Idle speed incorrect
3. Incorrect carburetor synchronization
4. Carburetor faulty
5. Fuel contaminated

### **Misfiring during acceleration**

1. Ignition system faulty

### **Backfiring**

1. Ignition system faulty
2. Carburetor faulty

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

1. Fuel system clogged
2. Ignition system faulty

### **Lean mixture**

1. Clogged fuel jets
2. Faulty float valve
3. Float level low
4. Fuel cap vent blocked
5. Fuel strainer screen clogged
6. Restricted fuel line
7. Air vent tube clogged
8. Intake air leak
9. Restricted or faulty fuel pump

### **Rich mixture**

1. Clogged air jets
2. Vacuum piston stuck closed
3. Faulty float valve
4. Float level too high
5. Choke stuck or clogged
6. Dirty air cleaner

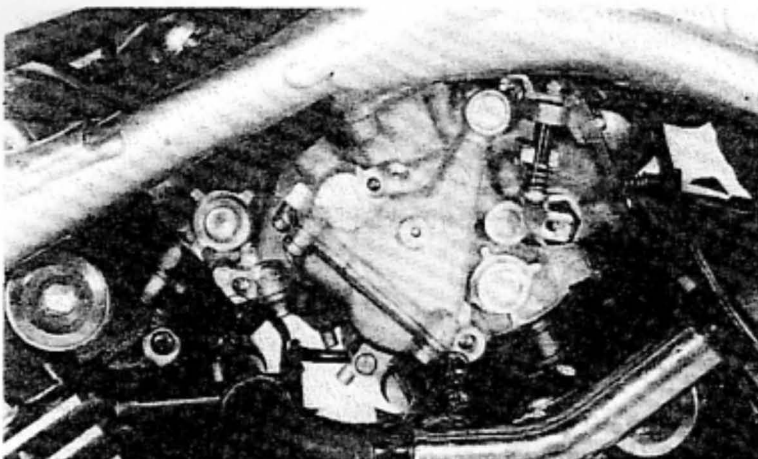


## CARBURETOR REMOVAL

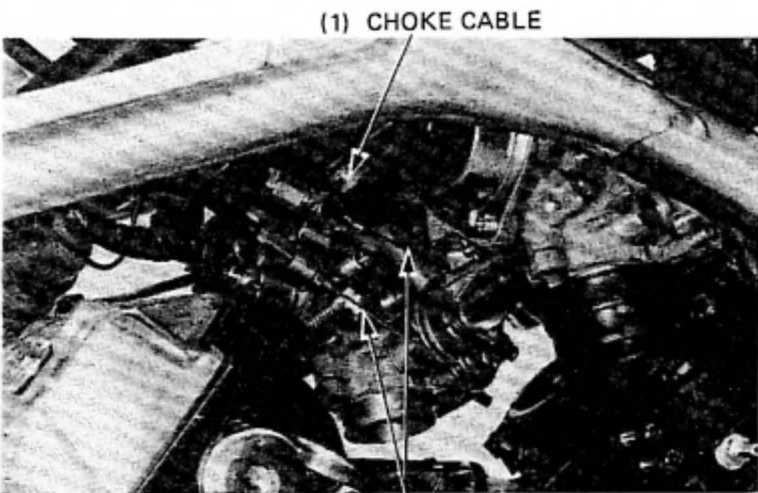
Turn the fuel valve off.  
Remove the left and right side covers.  
Remove the seat and fuel tank.  
Remove the two air cleaner mounting bolts and the air cleaner case.



Loosen the carburetor bands at the cylinders.  
Pull the carburetors up.



Disconnect the choke and throttle cables from the carburetor.



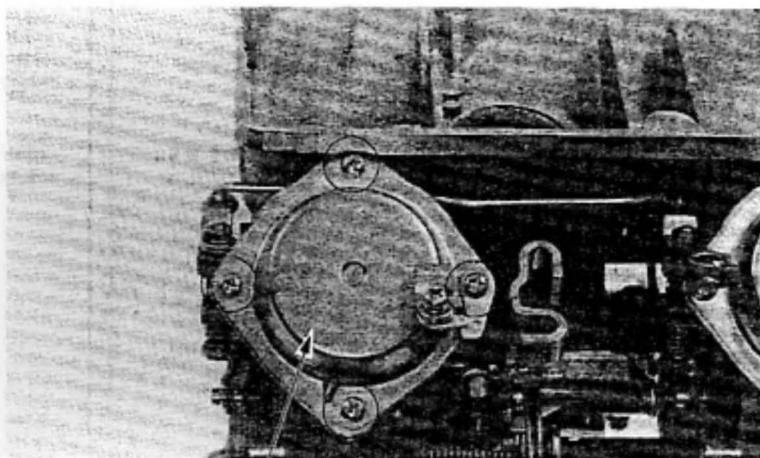
(2) THROTTLE CABLES



## VACUUM CHAMBER

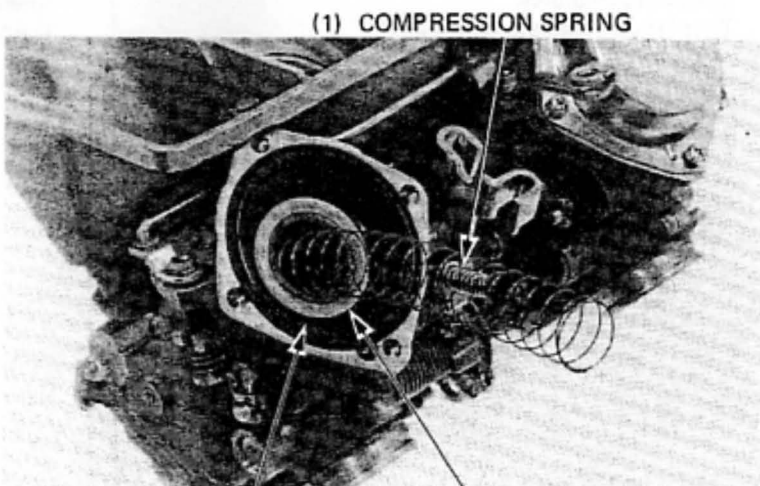
### REMOVAL

Remove the four vacuum chamber cover screws and cover.



(1) VACUUM CHAMBER COVER

Remove the compression spring, diaphragm and vacuum piston.



(1) COMPRESSION SPRING

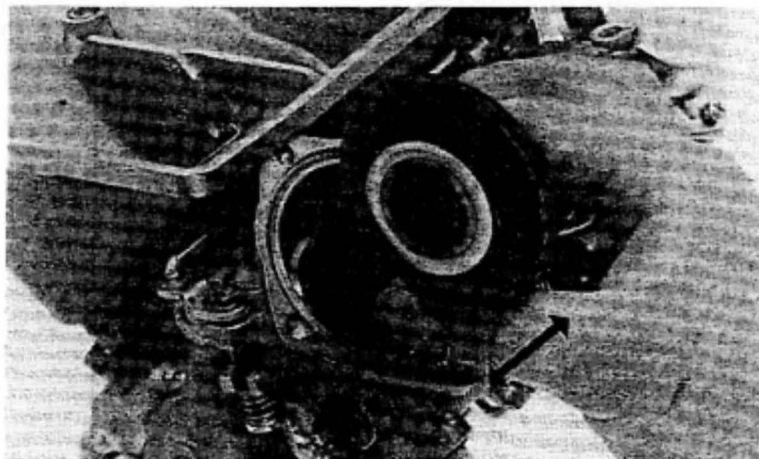
(2) DIAPHRAGM

(3) VACUUM PISTON

### VACUUM PISTON INSPECTION

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

Make sure the piston moves up and down freely in the chamber.



**VACUUM PISTON DISASSEMBLY**

Push the jet needle holder in and turn it 60 degrees. Then remove the jet needle holder, spring and jet needle from the piston.

**JET NEEDLE INSPECTION**

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

Check for a torn diaphragm or other deterioration.

**CAUTION**

*Do not interchange the jet needles between the front and rear carburetors when assembling.*

**JET NEEDLE SETTING MARK**

FRONT: 99P

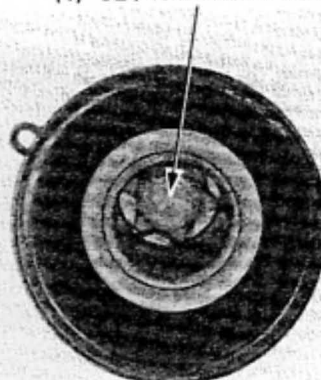
REAR: 99Q

**VACUUM CHAMBER ASSEMBLY**

Assemble the vacuum chamber in the reverse order of disassembly, but install the vacuum chamber cover as follows:

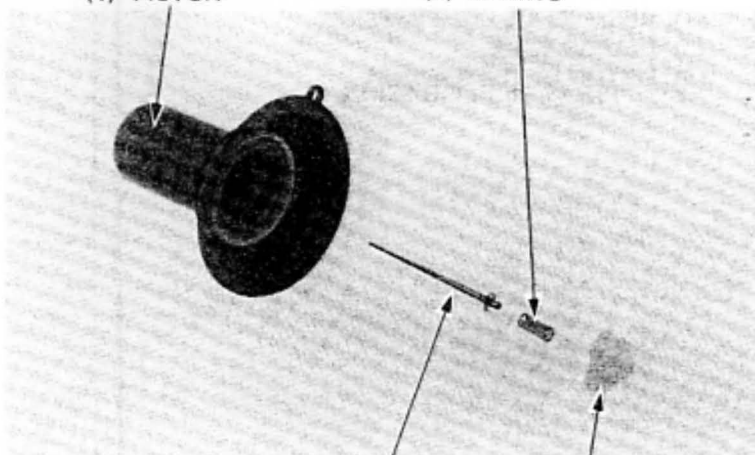
Install the chamber cover, aligning its cavity with the hole in the carburetor, and secure with the four screws.

(1) JET NEEDLE HOLDER

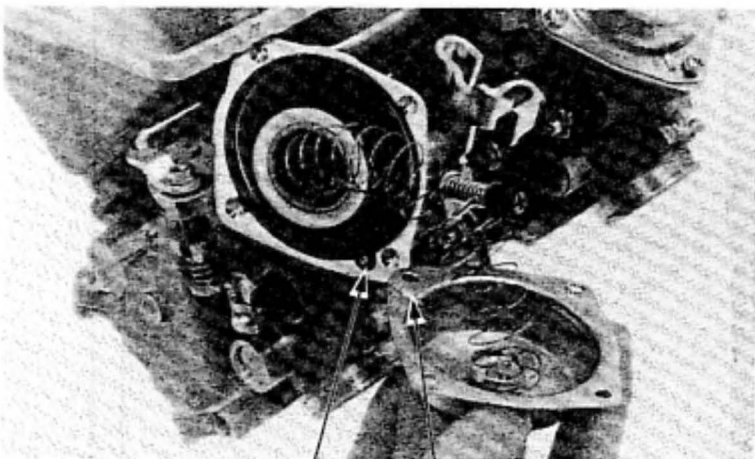


(1) PISTON

(2) SPRING



(3) JET NEEDLE (4) NEEDLE HOLDER



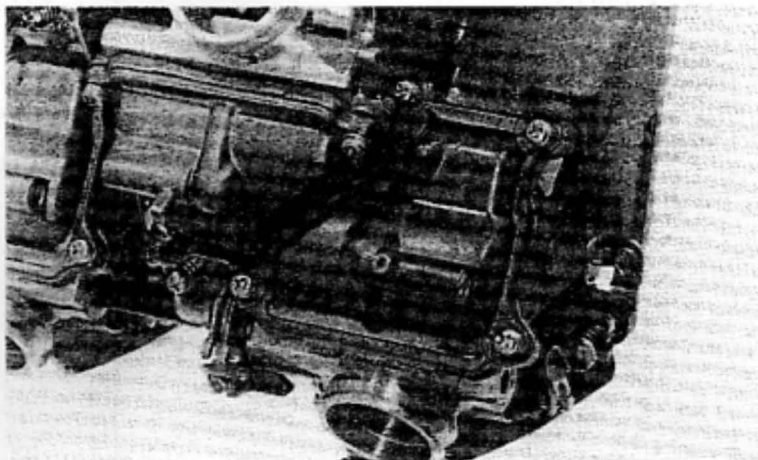
(1) HOLE (2) CAVITY



## FLOAT, FLOAT VALVE AND JETS

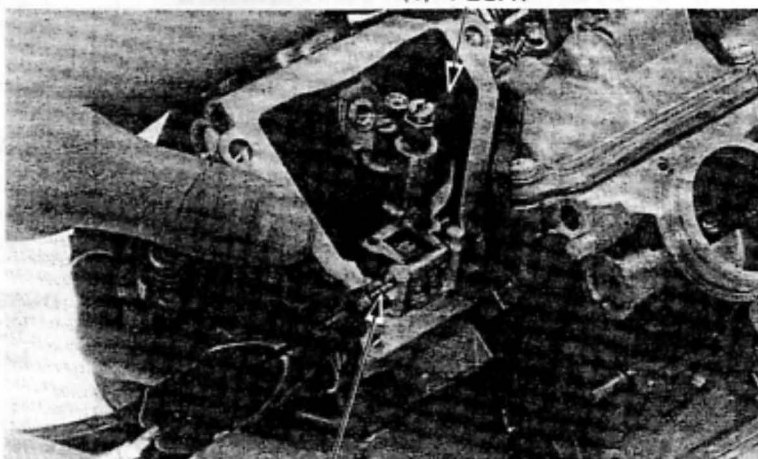
### REMOVAL

Remove the four float chamber screws and the float chamber.



Remove the float pin, float and float valve.

(1) FLOAT



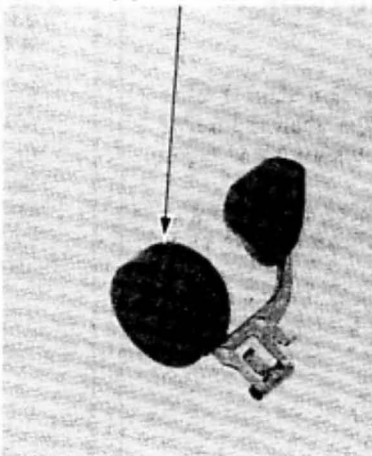
(2) FLOAT PIN

### FLOAT AND FLOAT VALVE INSPECTION

Check the float for deformation or fuel inside the float.

Inspect the float valve for grooves and nicks.

(1) FLOAT



(2) FLOAT VALVE



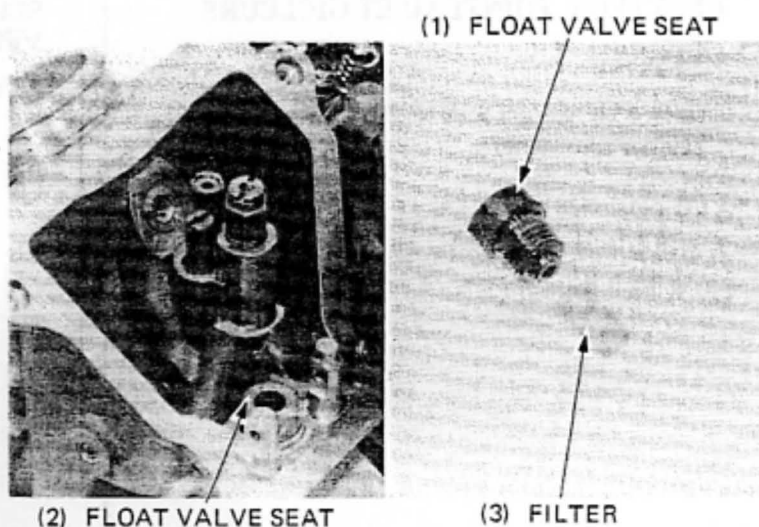
(3) VALVE SEAT





# FLOAT VALVE SEAT INSPECTION

Remove the float valve seat and filter.  
Inspect the float valve seat and filter for grooves, nicks, clogging or damage.



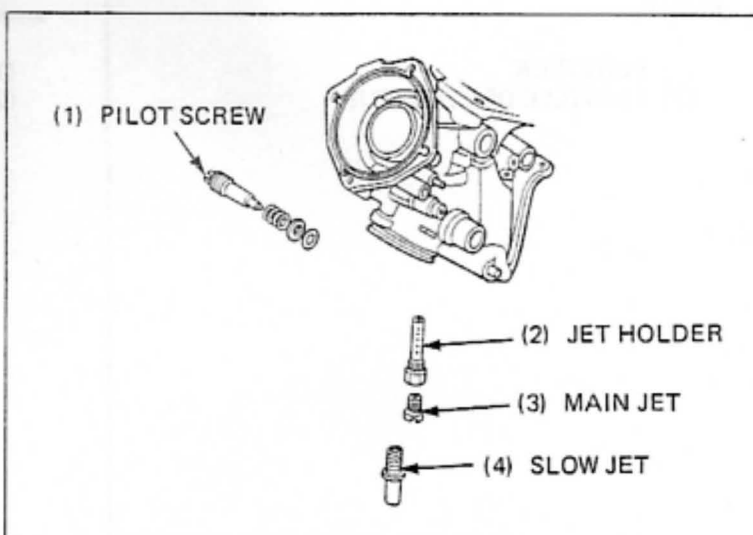
Remove the main jet, jet holder, slow jet and pilot screw.

## NOTE:

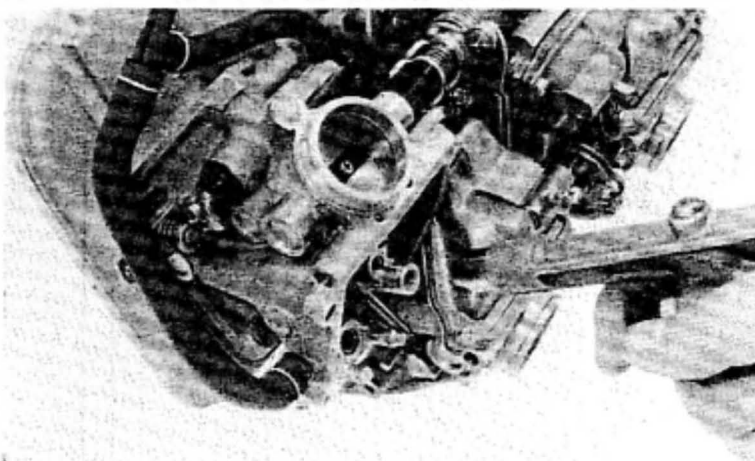
Before removing the pilot screw, turn it in and carefully count the number of turns until it seats lightly.

## CAUTION

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



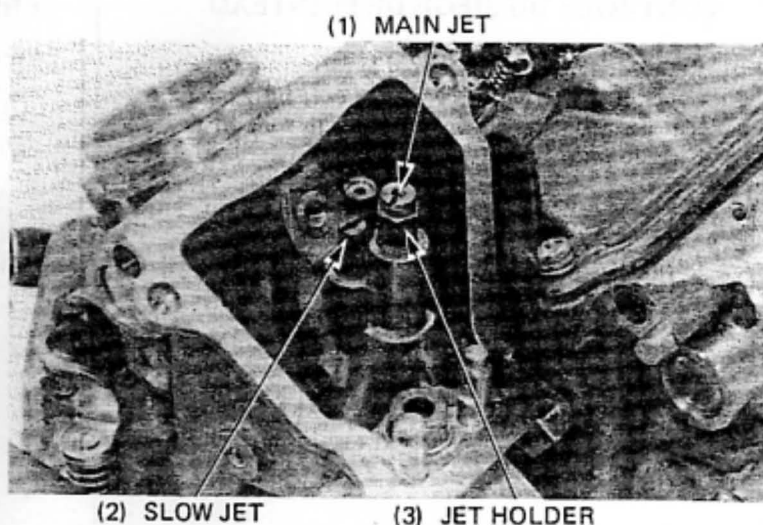
Blow clean all jet and body opening with compressed air.





## INSTALLATION

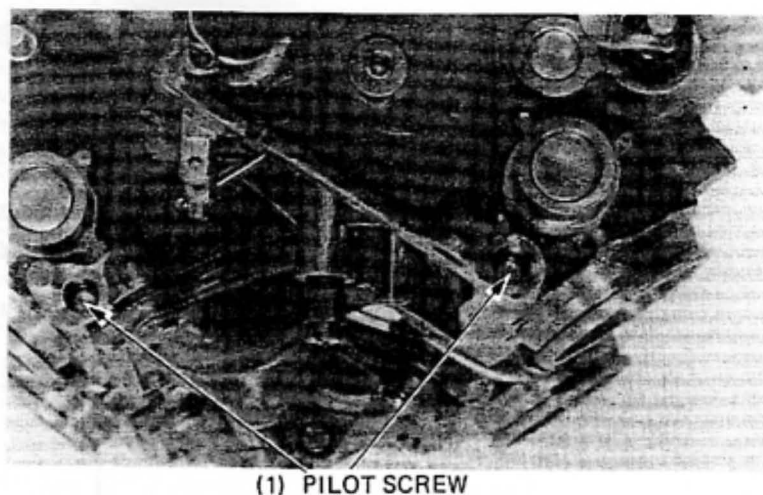
Install the jet holder and main jet.  
Install the slow jet.



Install the pilot screws and return them to their original position as noted during removal.

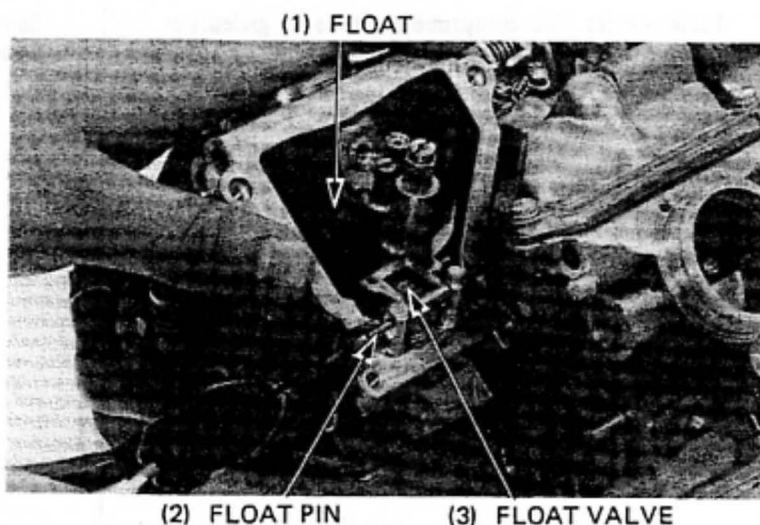
If new pilot screw are installed, turn each pilot screw clockwise until it seats lightly and back it to the specification.

**PILOT SCREW OPENING: 2-1/4 turns**



Inspect the operation of the float valve.

Install the float valve, float and float pin.





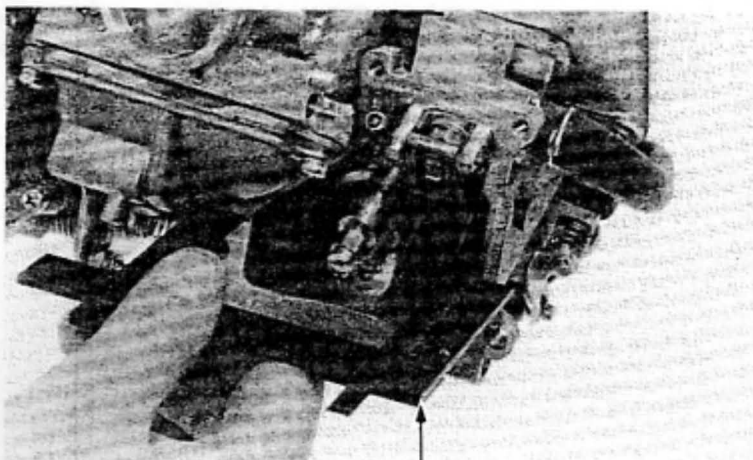
## FLOAT LEVEL

Measure the float level with the carburetor inclined  $15^{\circ}$ – $45^{\circ}$  from vertical and the float tang just contacting the float valve.

**FLOAT LEVEL: 6.8 mm (0.27 in)**

Adjust the float level by carefully bending the float tang.

Install the float chamber and secure it with the four screws.

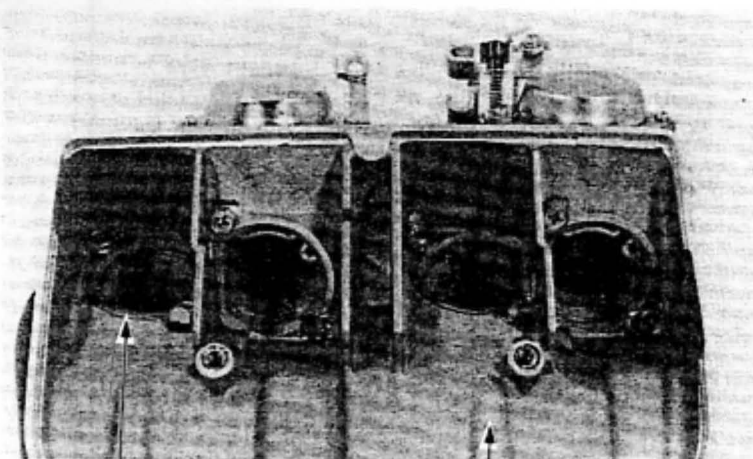


(1) FLOAT LEVEL GAUGE  
07401-0010000

## CARBURETOR SEPARATION

Bend the lock plate tabs down and remove the eight bolts.

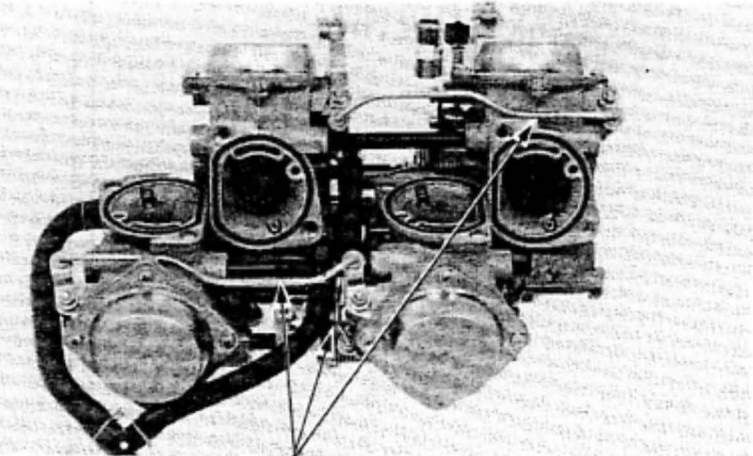
Remove the air cleaner base from the carburetor.



(1) LOCK PLATE

(2) AIR CLEANER BASE

Remove the cotter pins and washers and remove the choke links.



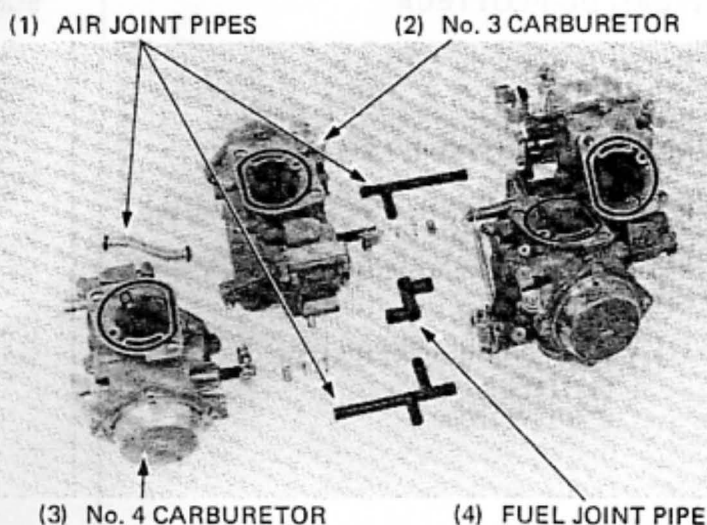
(1) CHOKE LINKS



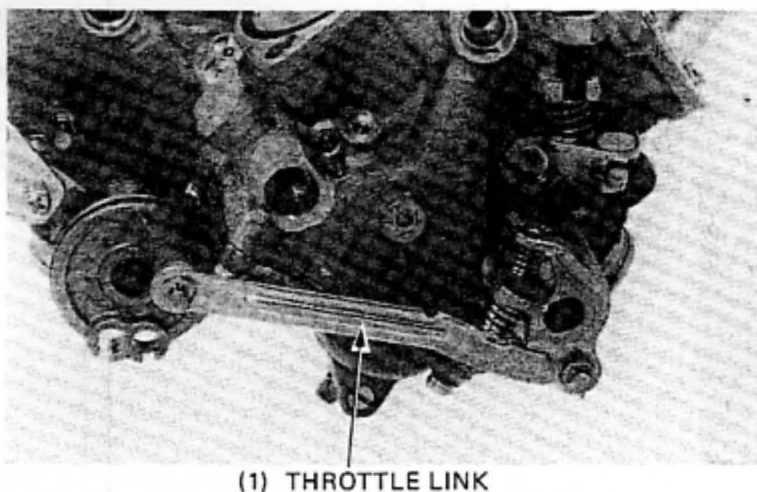
Carefully separate the No. 3 carburetor from the assembly. Then separate the No. 4 carburetor.

## CAUTION

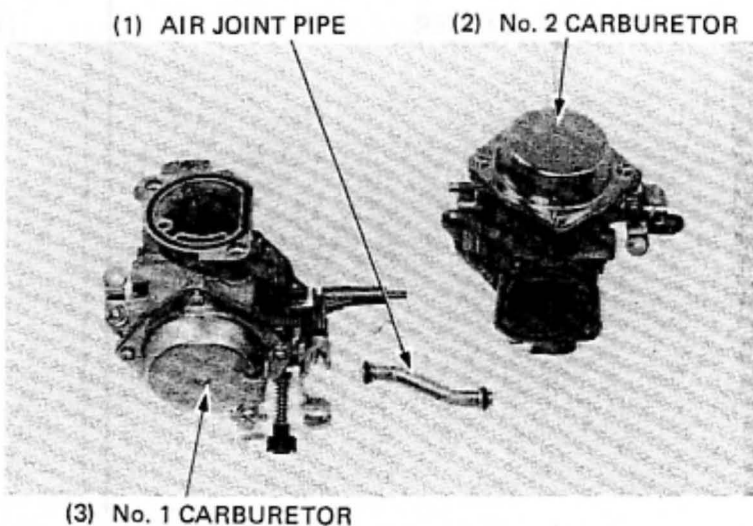
*Separate the carburetors horizontally to prevent damage to the joint pipes.*



Disconnect the throttle link from the No. 1 and 2 carburetors by removing the cotter pins.

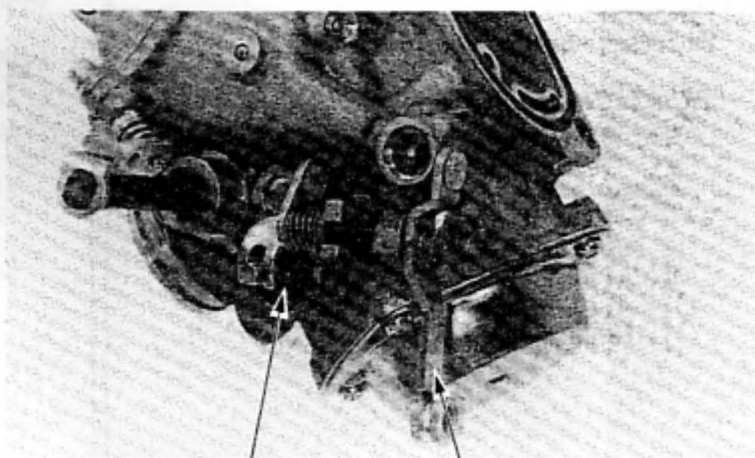


Carefully separate the No. 1 and No. 2 carburetors.



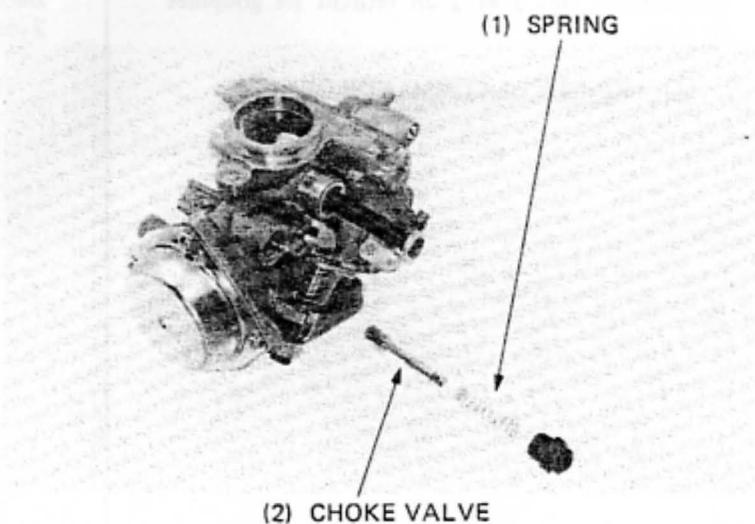


Remove the choke lever.  
Remove the choke valve nut, spring and valve.



(1) CHOKE VALVE NUT (2) CHOKE LEVER

Check the choke valve and spring for nicks, grooves, or other damage.



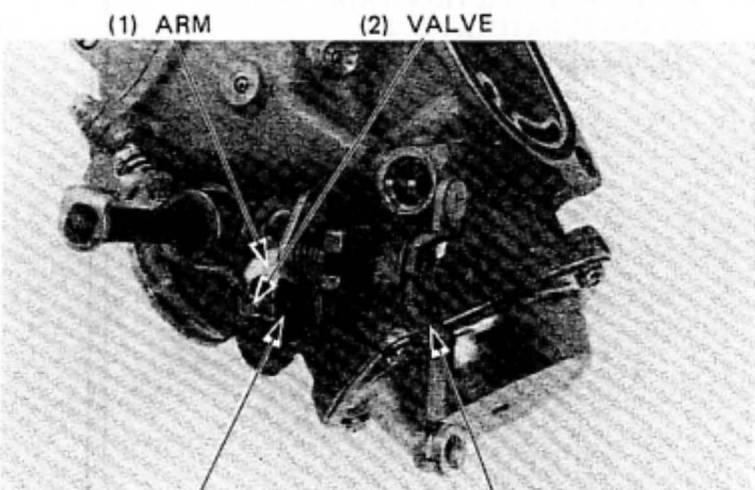
(1) SPRING (2) CHOKE VALVE

## CARBURETOR ASSEMBLY

Install the choke valve, spring and nut.

Tighten the nut while hooking the arm to the groove in the choke valve.

Install the choke lever.

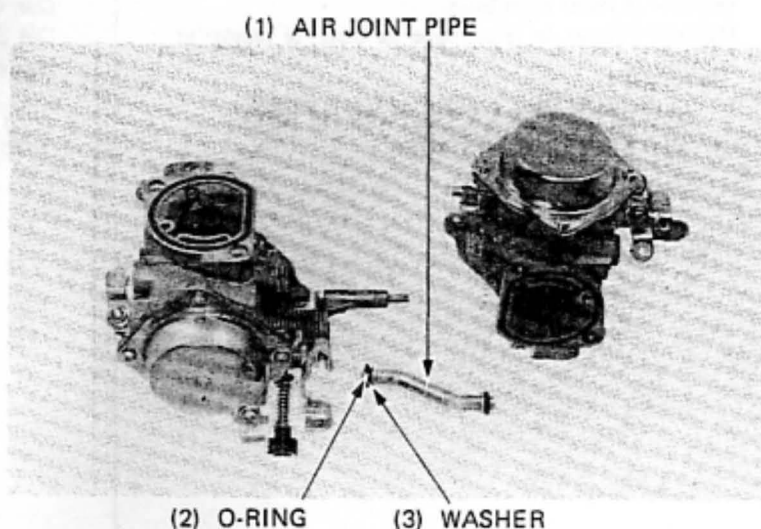


(1) ARM (2) VALVE (3) NUT (4) CHOKE LEVER

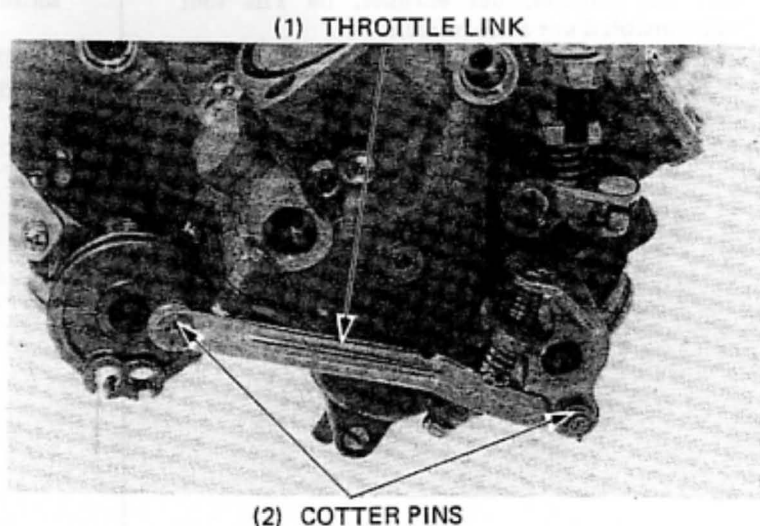




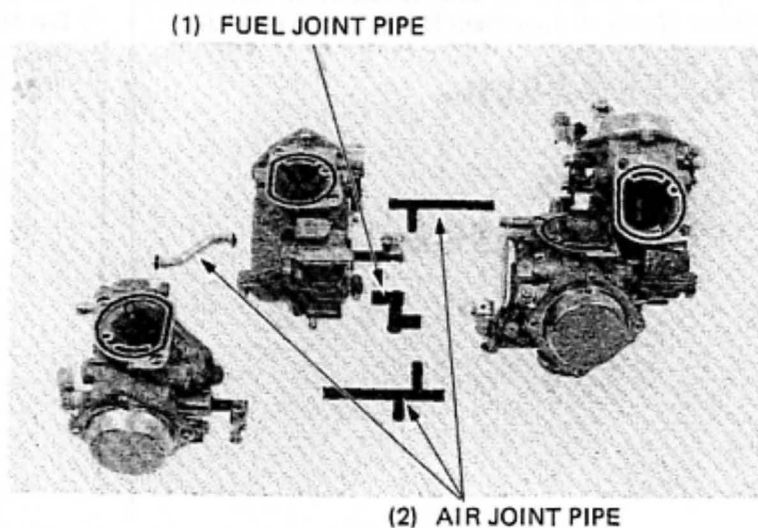
Coat new O-rings with oil.  
Install the O-rings and washers on the air joint pipe.  
Install the air joint pipe to the No. 1 and No. 2 carburetors.



Reconnect the throttle link between the No. 1 and No. 2 carburetors, using new cotter pins.



Coat new O-rings with oil and install them on the fuel and air joint pipes.  
Put the No. 3 and No. 4 carburetors together with the joint pipes.



## FUEL SYSTEM



**HONDA**  
**VF400F**

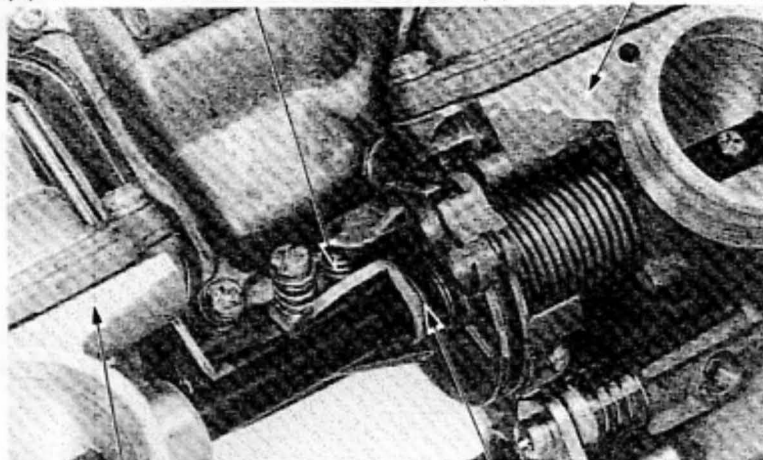
Loosen the synchronization adjusting screws until there is no tension.

Install the synchronization springs.

Install the thrust springs between the throttle valve shafts.

Make sure the fuel joint and air joint pipes are securely installed.

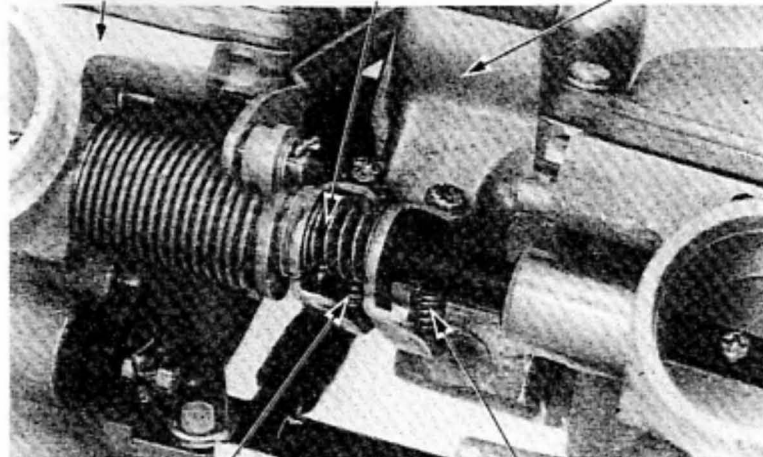
(1) No. 3 SYNCHRONIZATION SPRING (2) No. 1 CARBURETOR



(3) No. 3 CARBURETOR

(4) THRUST SPRING

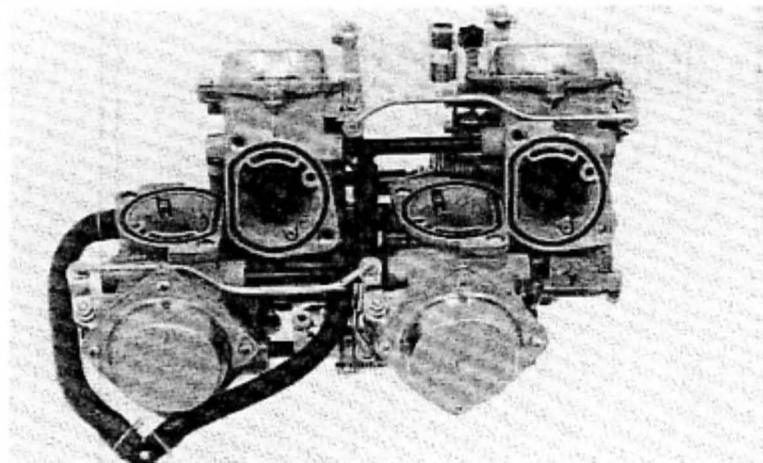
(1) No. 2 CARBURETOR (2) THRUST SPRING (3) No. 4 CARBURETOR



(4) No. 2 SYNCHRONIZATION SPRING

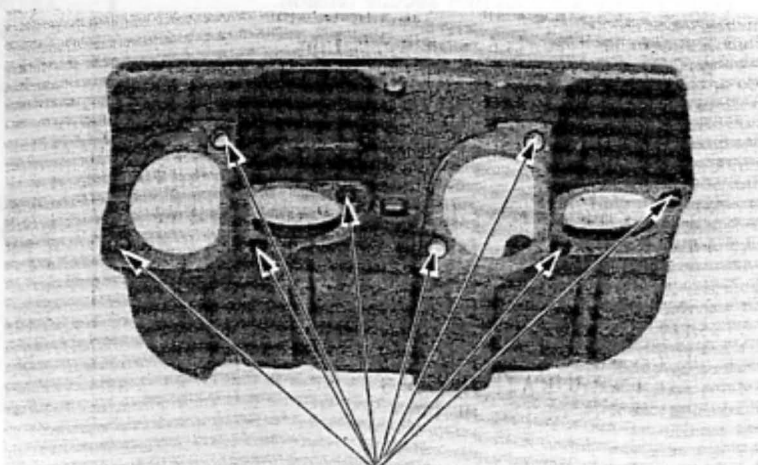
(5) No. 4 SYNCHRONIZATION SPRING

Install the choke links using the washers and new cotter pins.





Install the dowel pins onto the air cleaner base.

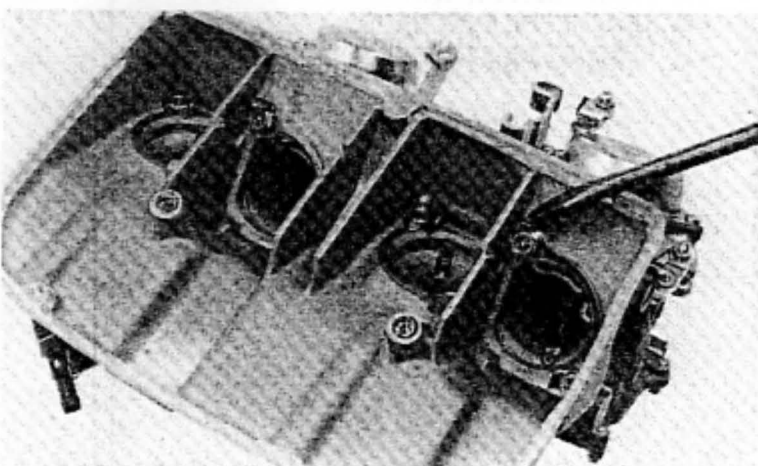


(1) DOWEL PINS

Place the air cleaner base over the carburetors aligning the dowel pins with the carburetor holes.

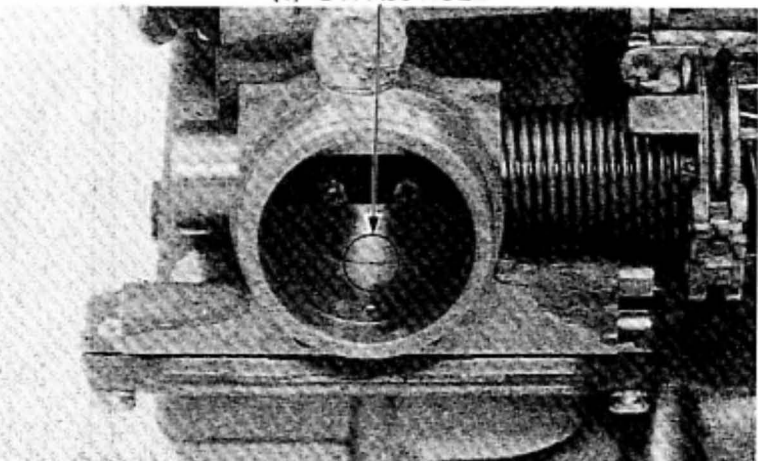
Install the new lock plates and the eight bolts.

Tighten the bolts and secure them by bending the lock plate tabs up.



Turn the throttle stop screw to align the No. 1 throttle valve with the edge of the bypass hole.

(1) BYPASS HOLE

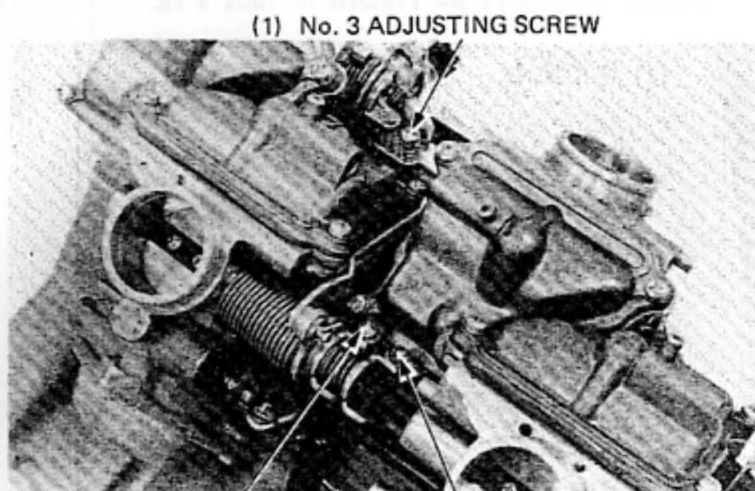




Align each throttle valve with the bypass hole edge by turning the synchronization adjusting screws.

Check the throttle linkage and throttle valve operation by opening and closing the throttle lever.

Check the choke linkage and choke valve operation by moving the choke arm.



(1) No. 3 ADJUSTING SCREW

(2) No. 2 ADJUSTING  
SCREW

(3) No. 4 ADJUSTING  
SCREW

## CARBURETOR INSTALLATION

Install the carburetors in the reverse order of removal.

After installation, perform the following inspections and adjustments.

- Throttle operation (page 3-5)
- Carburetor choke (page 3-6)
- Carburetor idle speed (page 3-12)
- Carburetor synchronization (page 3-11)



## FUEL SYSTEM

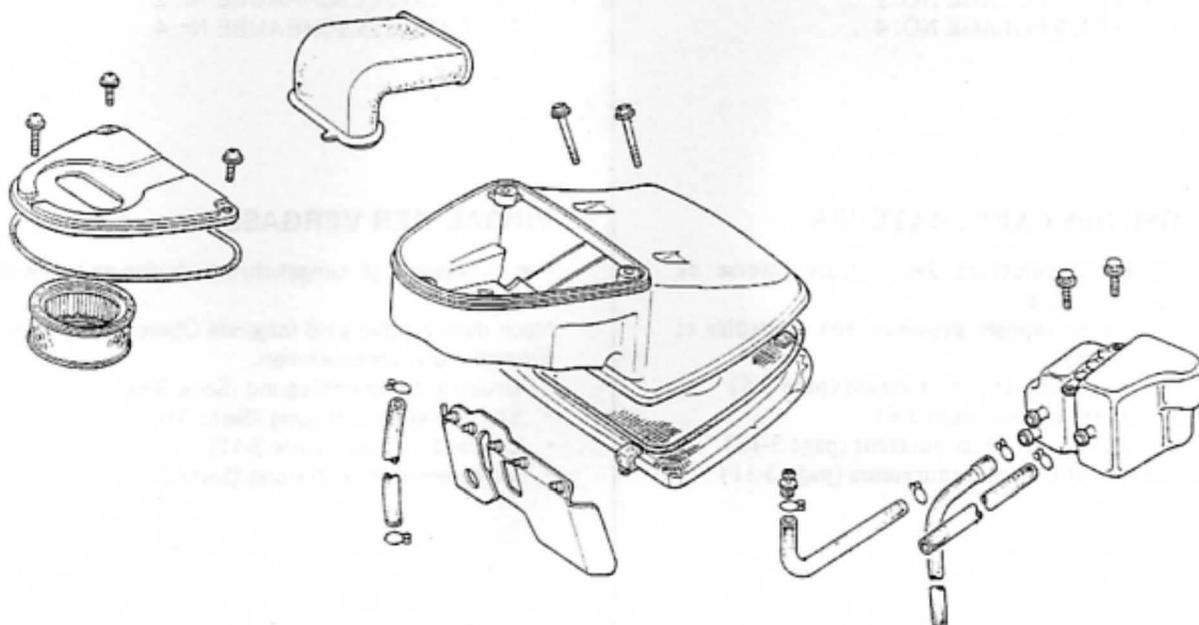
### AIR CLEANER

#### CASE/CHAMBER

Check the air cleaner case seal rubbers for deterioration.

#### CRANKCASE VENTILATION SYSTEM

Check that the breather tube is not restricted.



### FUEL TANK

#### WARNING

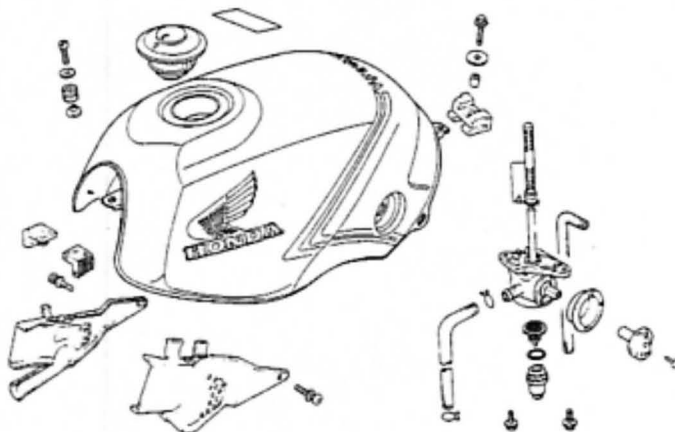
*Do not allow flames or sparks near gasoline.  
Wipe up spilled gasoline at once.*

Check the vent hole of the filler cap for blockage.

Make sure there are no fuel leaks.

Check the fuel strainer (page 3-4).

Check the automatic fuel valve (page 4-17).







## AUTOMATIC FUEL VALVE

### **WARNING**

*Keep gasoline away from open flames or sparks. Wipe up spilled gasoline at once.*

Turn the fuel valve off.

Place the clean container under the fuel line.

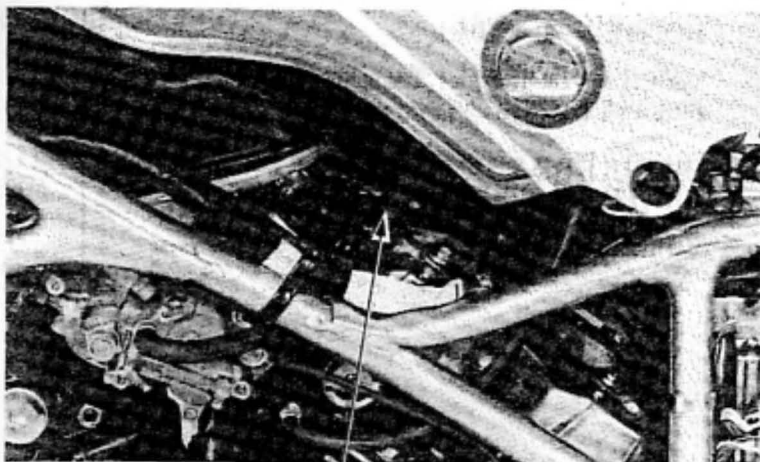
Disconnect the fuel line at the carburetor.

Drain the remaining gasoline in the fuel valve and fuel line.

Turn the fuel valve on.

If gasoline does not flow out of the fuel line, the automatic fuel valve is functional.

If gasoline flows out, check the vacuum hose and the diaphragm.



(1) FUEL LINE

## DIAPHRAGM INSPECTION

Perform the following inspections to check the automatic fuel valve operation.

Disconnect the vacuum hose from the No. 1 cylinder intake port and connect a hand vacuum pump to the vacuum hose.

Operate the vacuum pump.

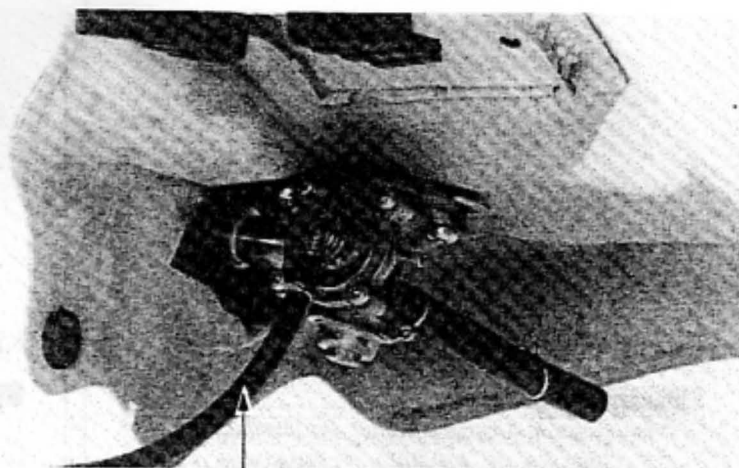
Gasoline should flow out of the fuel line.

Remove the vacuum pump from the vacuum hose.

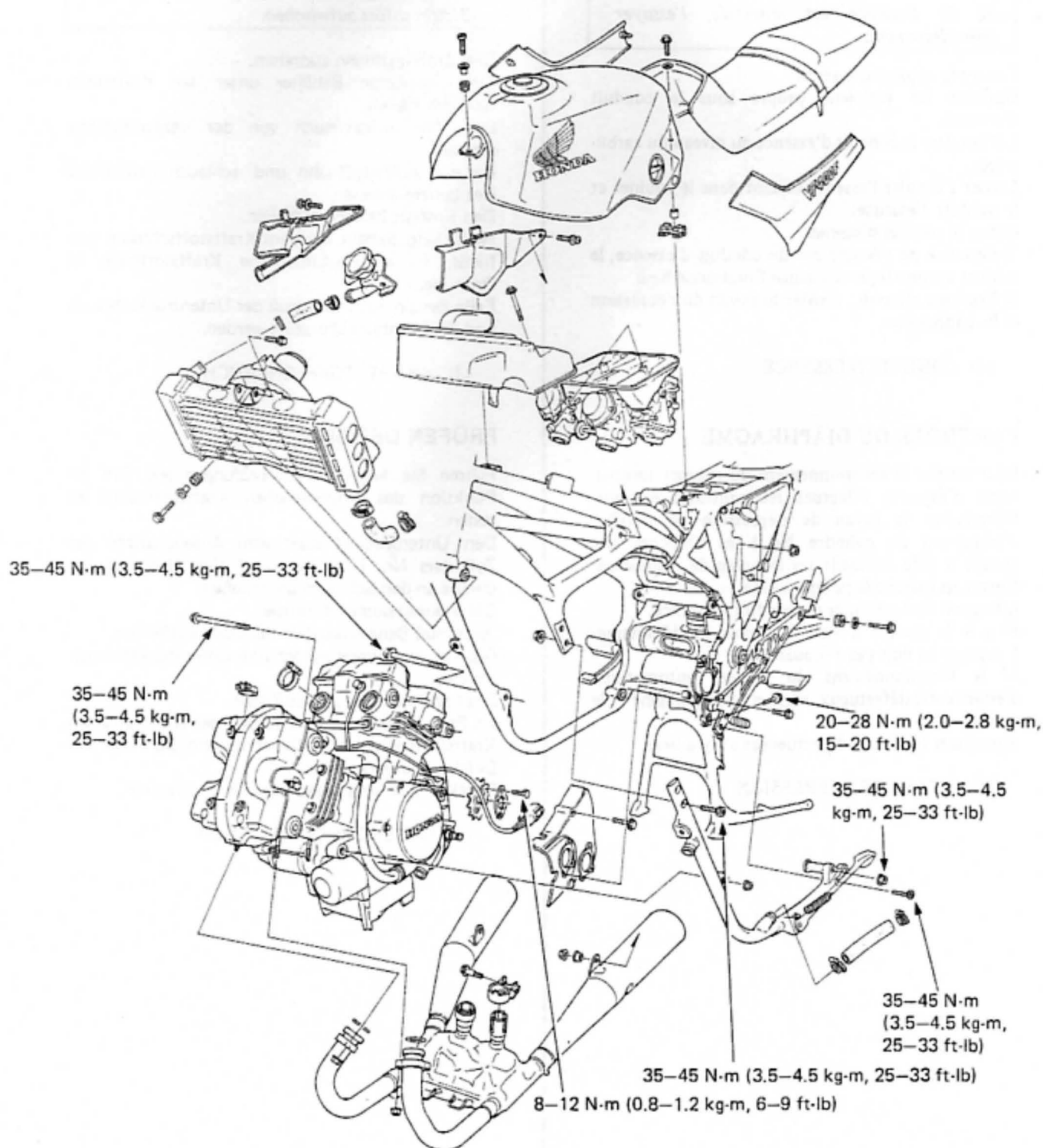
Gasoline should not flow out.

If the operation of the automatic fuel valve is defective, check the diaphragm and spring.

Replace the defective parts as necessary.



(1) VACUUM HOSE





|                     |     |
|---------------------|-----|
| SERVICE INFORMATION | 5-1 |
| ENGINE REMOVAL      | 5-2 |
| ENGINE INSTALLATION | 5-9 |

## SERVICE INFORMATION

### GENERAL

- A floor jack or other adjustable support is required to support and maneuver the engine.
- The following parts or components can be serviced with the engine installed in the frame:

- |                     |                 |
|---------------------|-----------------|
| • Clutch            | • Alternator    |
| • Gearshift linkage | • Starter motor |
|                     | • Carburetors   |

### SPECIFICATIONS

|                                  |                                                   |
|----------------------------------|---------------------------------------------------|
| Engine dry weight                | Approximately 59 kg (130 lb)                      |
| Engine oil capacity              | 3.0 lit (3.2 US qt, 2.6 Imp qt) after disassembly |
|                                  | 2.6 lit (2.8 US qt, 2.3 Imp qt) after draining    |
| Coolant capacity                 | Approximately 1.6 lit (1.7 US qt, 1.4 Imp qt)     |
| Radiator and engine Reserve tank | Approximately 0.4 lit (0.4 US qt, 0.4 Imp qt)     |

### TORQUE VALUES

|                          |       |                                       |
|--------------------------|-------|---------------------------------------|
| Front engine hanger bolt |       | 35-45 N·m (3.5-4.5 kg-m, 25-33 ft-lb) |
| Rear engine hanger bolt  | Upper | 35-45 N·m (3.5-4.5 kg-m, 25-33 ft-lb) |
|                          | Lower | 35-45 N·m (3.5-4.5 kg-m, 25-33 ft-lb) |
| Sub-frame socket bolt    | Upper | 35-45 N·m (3.5-4.5 kg-m, 25-33 ft-lb) |
|                          | Lower | 35-45 N·m (3.5-4.5 kg-m, 25-33 ft-lb) |
| Sub-frame drain bolt     |       | 7-8 N·m (0.7-0.8 kg-m, 5-6 ft-lb)     |
| Pre-chamber (oil pan)    |       | 12-16 N·m (1.2-1.6 kg-m, 9-12 ft-lb)  |

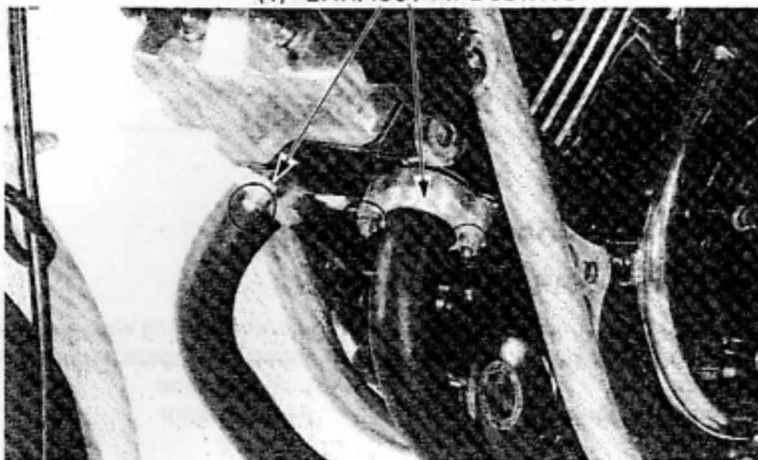


## ENGINE REMOVAL

Place the motorcycle on its center stand.

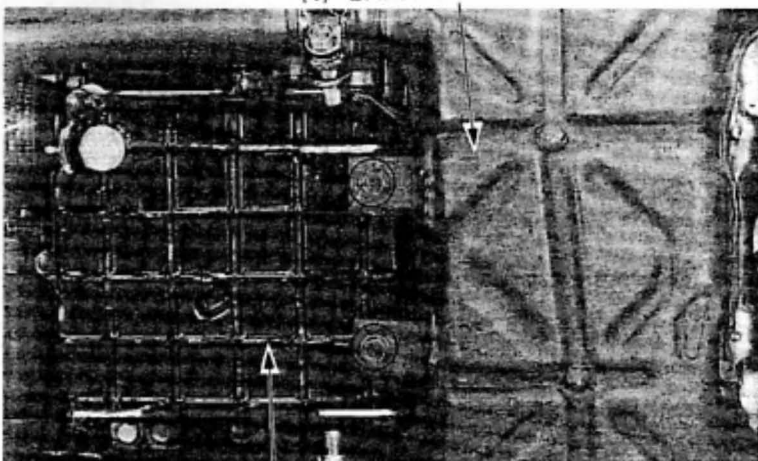
Remove the exhaust pipe joints by removing the four nuts.

(1) EXHAUST PIPE JOINTS



Remove the exhaust chamber mount bolts from the oil pan.

(1) EXHAUST CHAMBER



(2) OIL PAN

Remove the clutch slave cylinder.

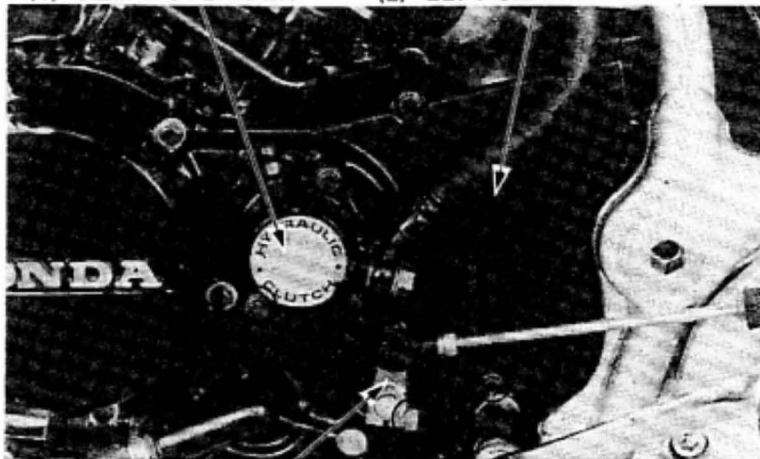
### NOTE:

- It is not necessary to disconnect the clutch oil line.
- To prevent the clutch system from air contamination, and the slave cylinder piston from falling, squeeze the clutch lever immediately after removing the slave cylinder, and tie the lever to the handle grip with a string.

Remove the gearshift arm and the left crankcase cover.

(1) SLAVE CYLINDER

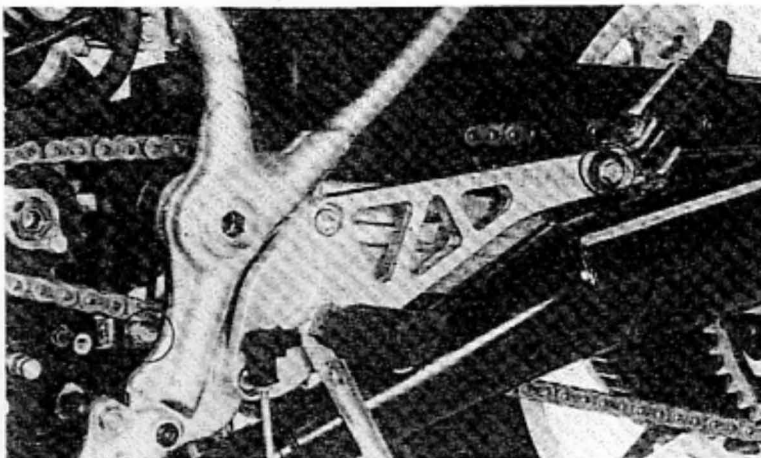
(2) LEFT CRANKCASE COVER



(3) GEARSHIFT ARM



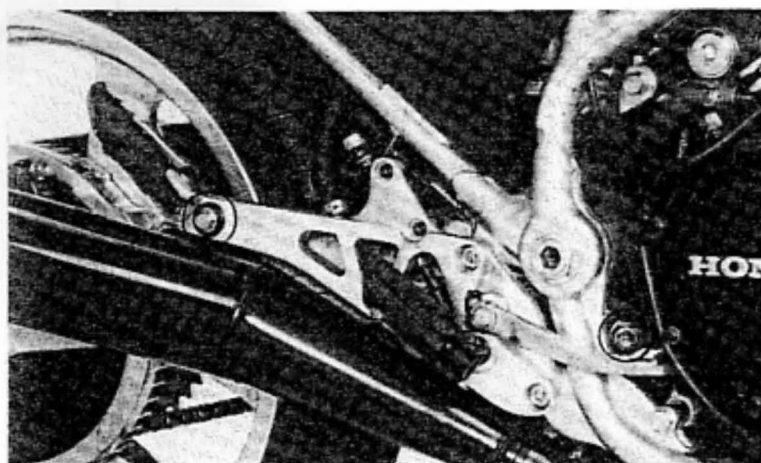
Loosen the left rear exhaust pipe clamp bolt.  
Remove the left muffler mount bolt.



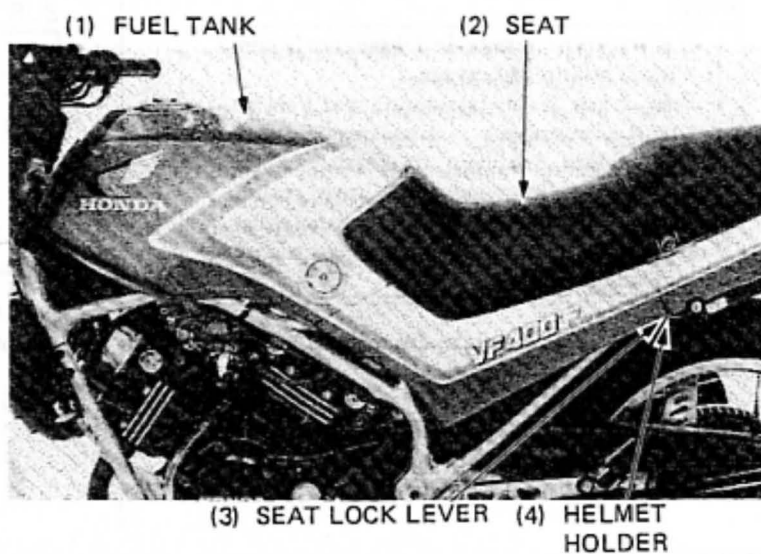
Loosen the right rear exhaust pipe clamp bolt.  
Remove the right muffler mount bolt.

Remove the exhaust pipe/muffler assembly.

Drain the engine oil into a clean oil drain pan.



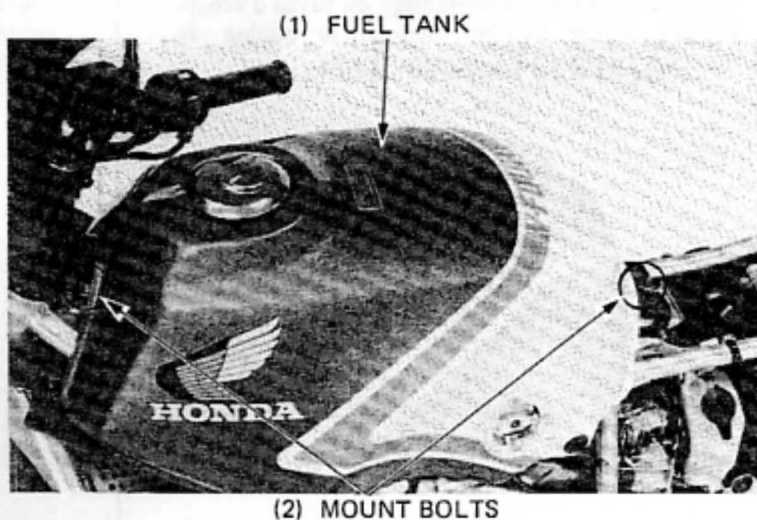
Remove the left and right frame side cover.  
Unlock the helmet holder and remove the seat by  
pulling the seat lock lever.





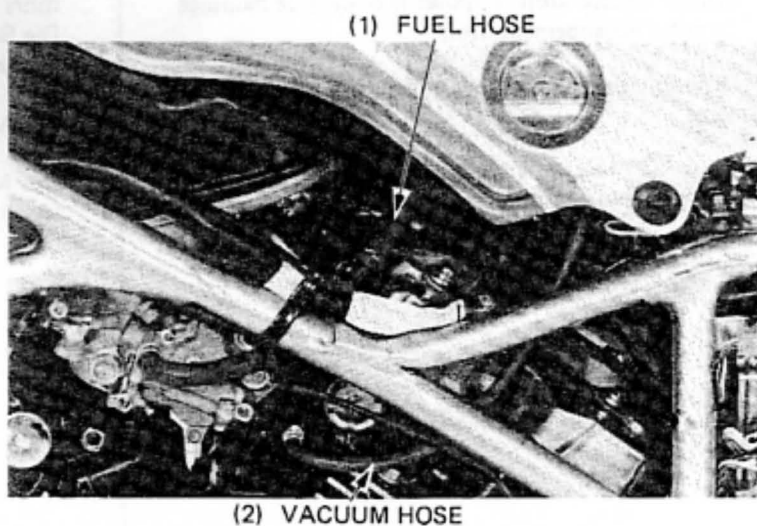


Turn the fuel valve off.  
Remove the fuel tank mount bolts.



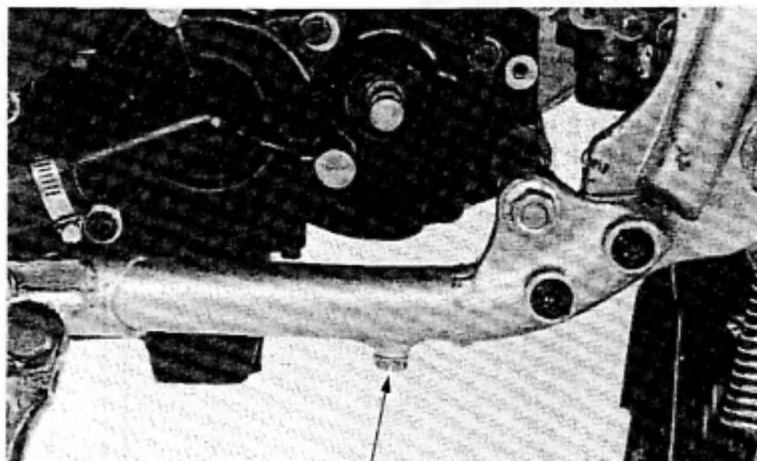
Lift the fuel tank and disconnect the fuel and vacuum hoses from the automatic fuel valve.

Pull the fuel tank rearward and remove it.



Remove the radiator cap.

Drain the coolant from the radiator by removing the drain plug at the frame.

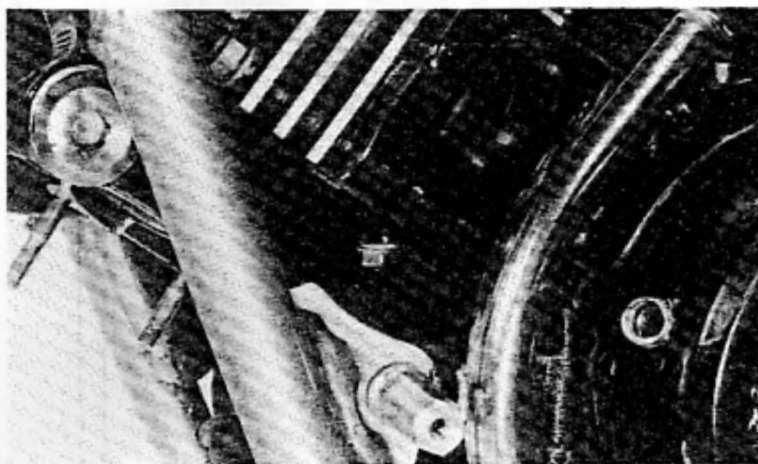


## ENGINE REMOVAL/INSTALLATION

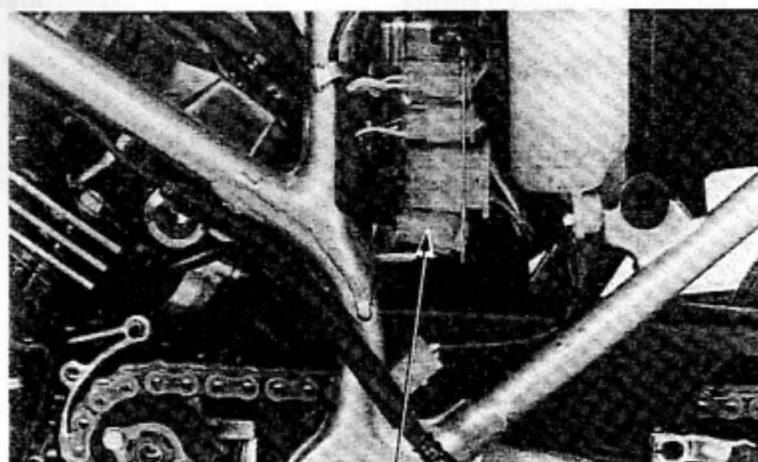


**HONDA**  
**VF400F**

Drain the coolant from the engine by removing the drain bolts at the engine.

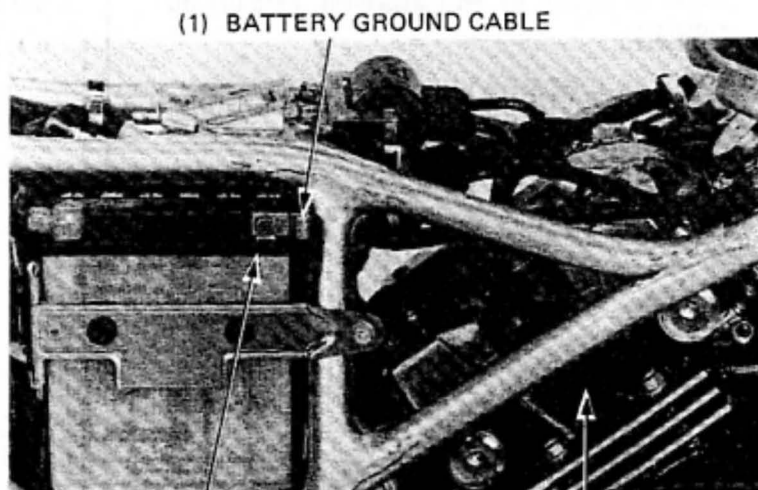


Disconnect the alternator wire coupler.



(1) ALTERNATOR WIRE COUPLER

Remove the spark plug caps from all cylinders. Disconnect the ground cable from the battery.



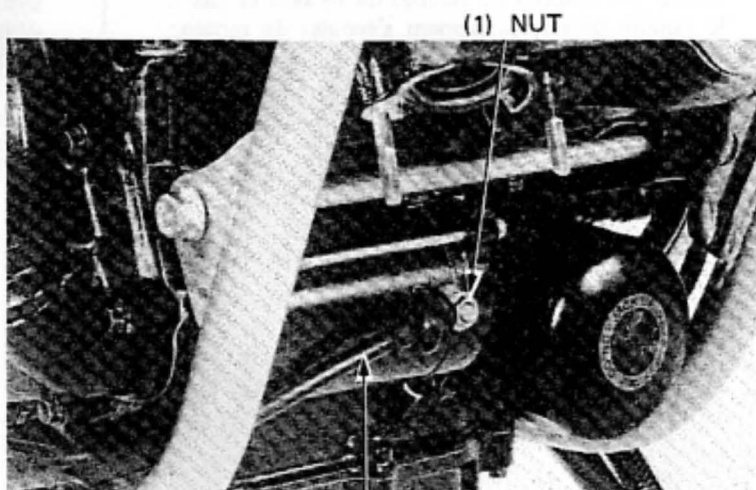
(1) BATTERY GROUND CABLE

(2) BATTERY GROUND  
TERMINAL

(3) SPARK PLUG CAP

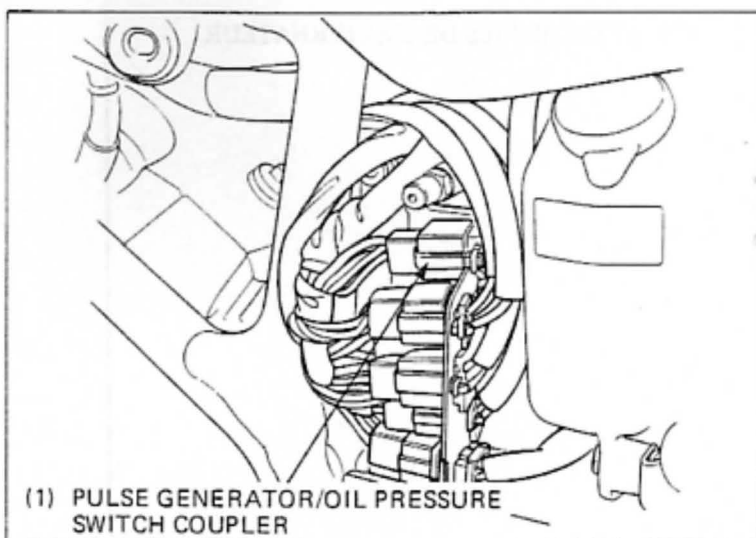


Disconnect the starter motor cable from the starter motor by removing the nut.



(2) STARTER MOTOR CABLE

Disconnect the pulse generator/oil pressure switch wire coupler.



Remove the two mount bolts and remove the air cleaner case upward.



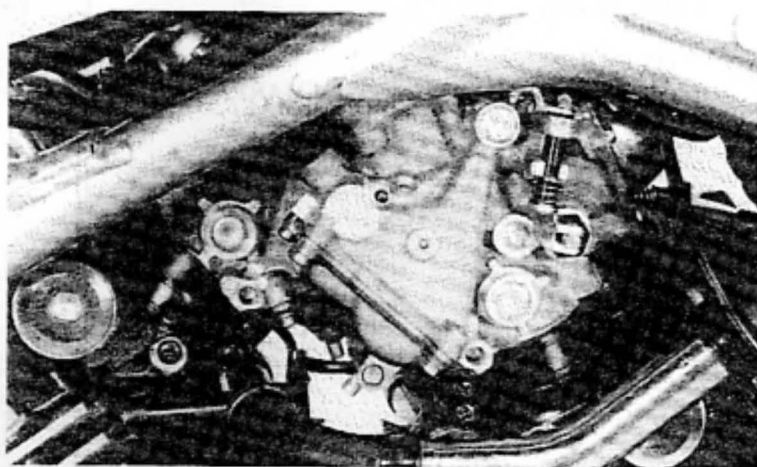


**HONDA**  
**VF400F**

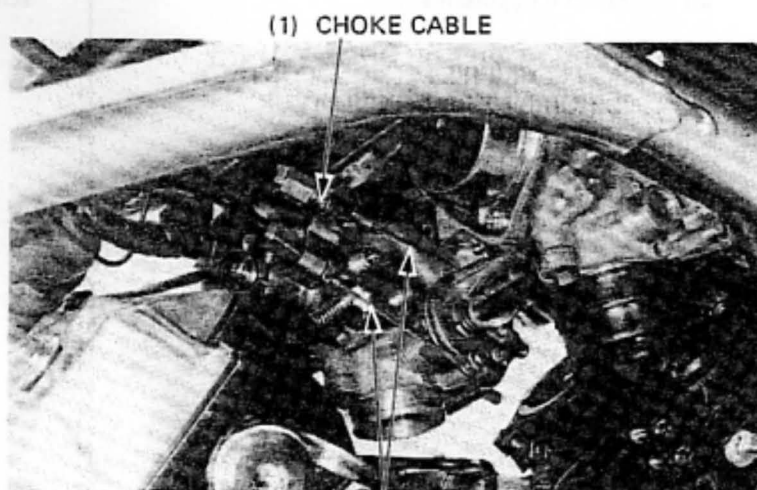
## ENGINE REMOVAL/INSTALLATION

Loosen all carburetor insulator bands.

Pull the carburetors up and remove them from the engine.



Disconnect the choke and throttle cables from the carburetor.

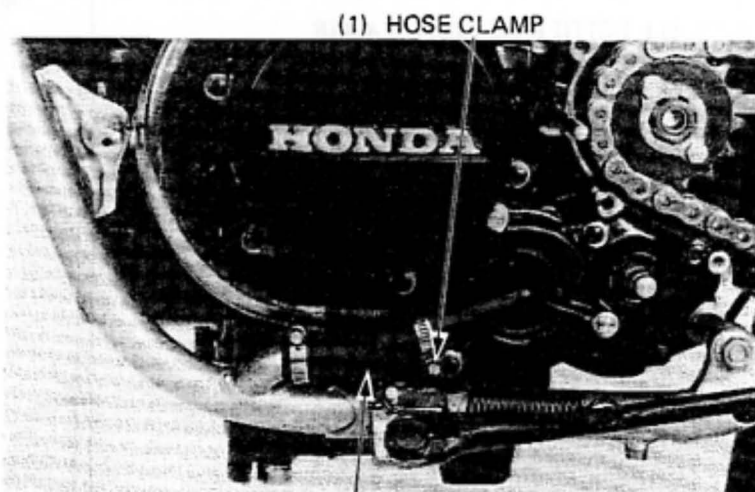


(1) CHOKE CABLE

(2) THROTTLE CABLES

Remove the radiator (page 6-5).

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

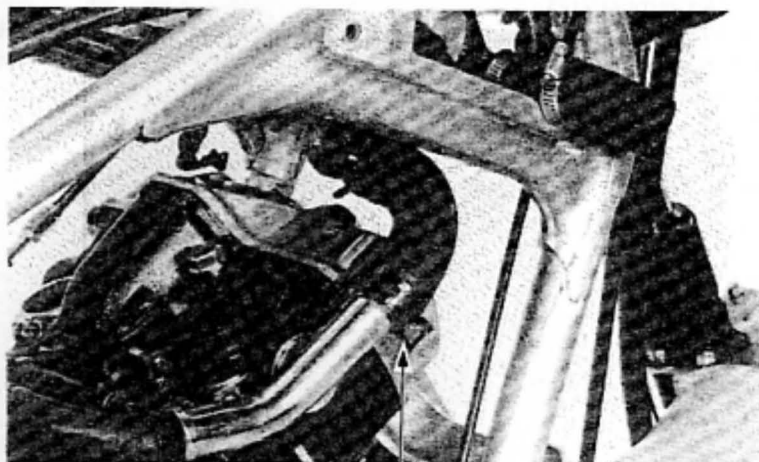


(1) HOSE CLAMP

(2) LOWER RADIATOR HOSE



Loosen the upper radiator hose clamp and disconnect the upper radiator hose from the engine.



(1) HOSE CLAMP

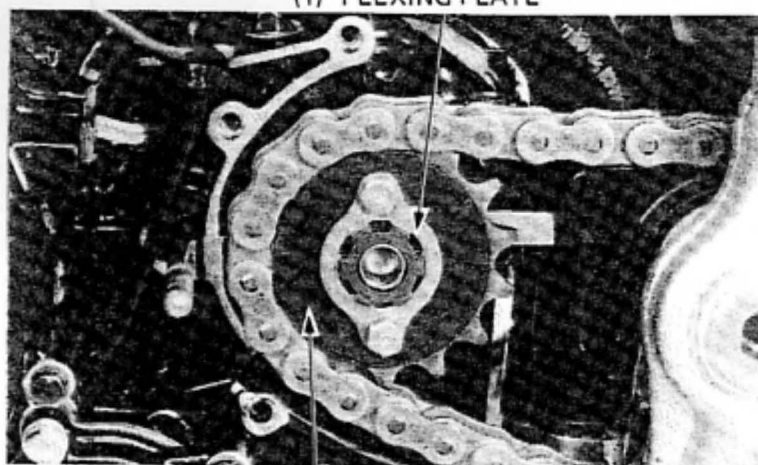
Loosen the rear axle nut and drive chain adjusting bolts to loosen the drive chain.

Remove the two drive sprocket mounting bolts.

Turn the flexing plate about 30 degrees and remove it from the countershaft.

Remove the drive sprocket.

Move the drive chain rearward.



(2) DRIVE SPROCKET

## NOTE:

Support the bottom of the engine with a jack or other adjustable support.

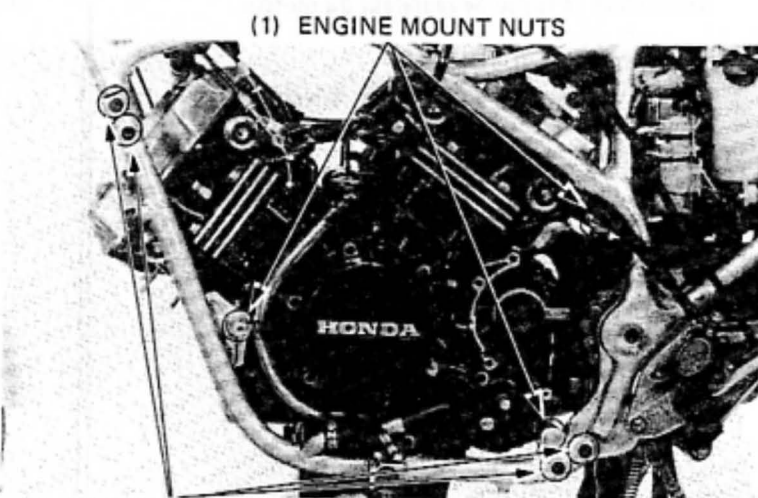
## CAUTION:

*Be careful not to bind the wires and cables under the engine when removing the engine.*

Remove the three engine mount nuts.  
Remove the four sub-frame mount bolts.  
Remove the three engine mount bolts.  
Remove the sub-frame.  
Remove the engine from the left side.

## NOTE:

Do not lose the engine mount collar.



(2) SUB-FRAME MOUNT BOLTS





## ENGINE INSTALLATION

Check the engine mount rubbers for damage and replace if necessary.

Install the engine mount rubbers.

Engine installation is essentially the reverse of removal.

Use a floor jack or other adjustable support to carefully maneuver the engine into place.

### CAUTION

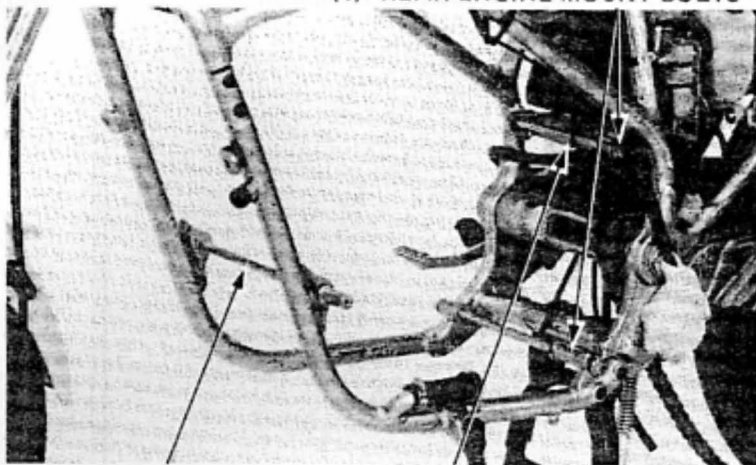
- When installing the clutch slave cylinder, temporarily install it to the left crankcase cover, release the clutch lever from the handle grip by removing the string, and then tighten the slave cylinder mount bolts.
- Do not forget to install the engine mount collar.
- Carefully align mounting points with the jack to prevent damage to mounting bolt threads, wire harnesses and cables.

Tighten all fasteners to the torque values given on page 5-1.

### NOTE:

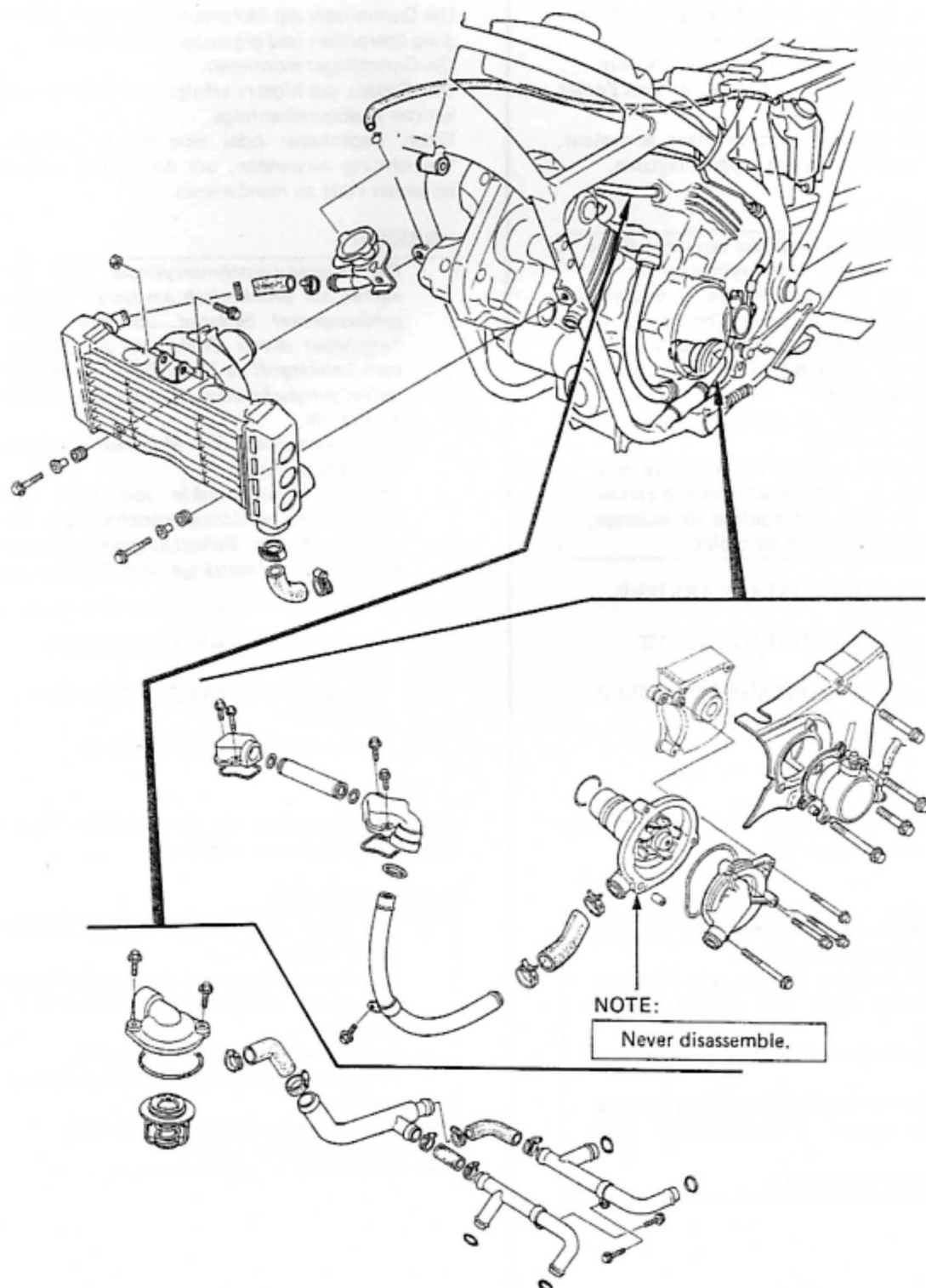
- Route the wires and cables properly (pages 1-8 thru 1-11).
- Fill the crankcase to the proper level with the recommended oil (page 2-1).
- Fill the cooling system (page 6-3).
- Perform the following inspection and adjustments:
  - Throttle operation (page 3-5).
  - Clutch (page 3-18).

(1) REAR ENGINE MOUNT BOLTS



(2) FRONT ENGINE MOUNT BOLT

(3) ENGINE MOUNT COLLAR



NOTE:

Ne jamais démonter.

ZUR BEACHTUNG:

Niemals zerlegen.



# 6. COOLING SYSTEM

|                     |     |                      |     |
|---------------------|-----|----------------------|-----|
| SERVICE INFORMATION | 6-1 | THERMOSTAT           | 6-4 |
| TROUBLESHOOTING     | 6-1 | RADIATOR/COOLING FAN | 6-5 |
| SYSTEM TESTING      | 6-2 | WATER PUMP           | 6-9 |
| COOLANT REPLACEMENT | 6-3 |                      |     |

## SERVICE INFORMATION

### GENERAL

#### WARNING

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

- Use only distilled water and ethylene glycol in the cooling system. A 50–50 mixture is recommended for maximum corrosion protection. Do not use alcohol-based antifreeze.
- Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system service can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- Refer to Section 20 for fan motor thermostatic switch and temperature sensor inspections.

### SPECIFICATIONS

|                                     |                                                                                                                                                                                    |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Radiator cap relief pressure        | 75–105 kPa (0.75–1.05 kg/cm <sup>2</sup> , 10.7–14.9 psi)                                                                                                                          |
| Freezing point (Hydrometer test):   | 55% Distilled water + 45% ethylene glycol: –32°C (–25°F)<br>50% Distilled water + 50% ethylene glycol: –37°C (–34°F)<br>45% Distilled water + 55% ethylene glycol: –44.5°C (–48°F) |
| Coolant capacity:                   |                                                                                                                                                                                    |
| Radiator and engine                 | 1.6 liters (1.7 US qt, 1.4 Imp qt)                                                                                                                                                 |
| Reserve tank                        | 0.4 liters (0.4 US qt, 0.4 Imp qt)                                                                                                                                                 |
| Total system                        | 2.0 liters (2.1 US qt, 1.8 Imp qt)                                                                                                                                                 |
| Thermostat                          | Begins to open: 80° to 84°C (176° to 183°F)<br>Valve lift: Minimum of 8 mm at 95°C (0.315 in at 203°F)                                                                             |
| Boiling point (with 50–50 mixture): | Unpressurized: 107.7°C (226°F)<br>Cap on, pressurized: 125.6°C (258°F)                                                                                                             |

## TROUBLESHOOTING

### Engine temperature too high

1. Faulty temperature gauge or gauge sensor
2. Thermostat stuck closed
3. Faulty radiator cap
4. Insufficient coolant
5. Passages blocked in radiator, hoses, or water jacket
6. Fan blades bent
7. Faulty fan motor

### Engine temperature too low

1. Faulty temperature gauge or gauge sensor
2. Thermostat stuck open

### Coolant leaks

1. Faulty pump mechanical seal
2. Deteriorated O-rings



## SYSTEM TESTING

### COOLANT

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

### RADIATOR CAP INSPECTION

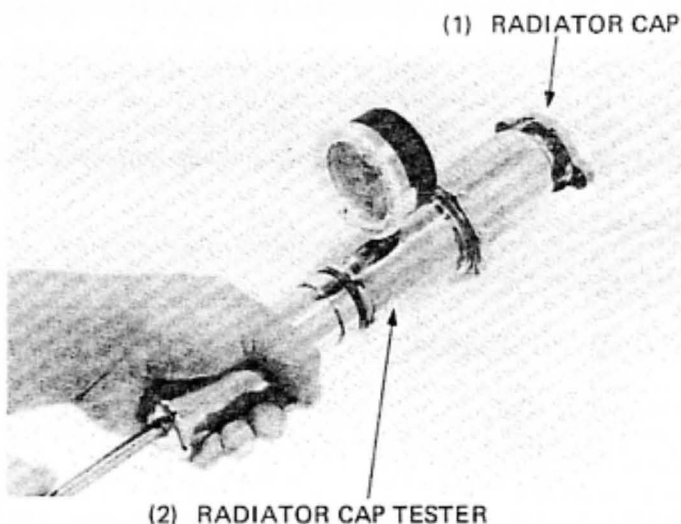
Pressure test the radiator cap. Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low. It must hold specified pressure for at least six seconds.

#### NOTE:

Before installing the cap on the tester, apply water to sealing surfaces.

#### RADIATOR CAP RELIEF PRESSURE:

75–105 kPa (0.75–1.05 kg/cm<sup>2</sup>, 10.7–14.9 psi)

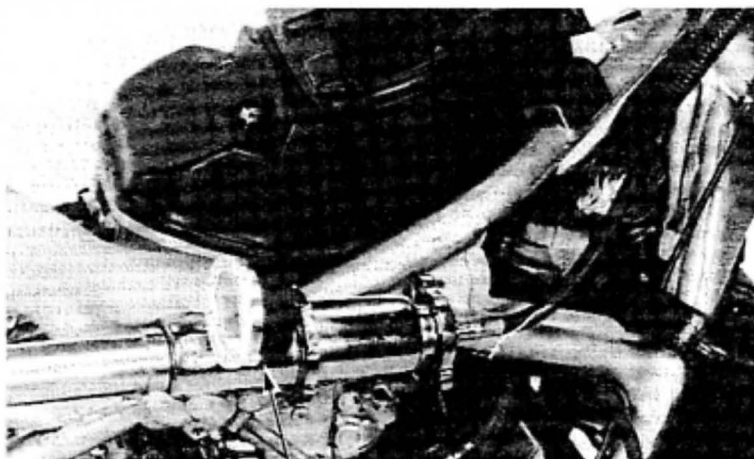


Pressurize the radiator, engine and hoses, and check for leaks.

#### CAUTION

*Excessive pressure can damage the radiator. Do not exceed 1.05 kg/cm<sup>2</sup> (14.9 psi).*

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



(1) RADIATOR CAP TESTER



## COOLANT REPLACEMENT

### CAUTION

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

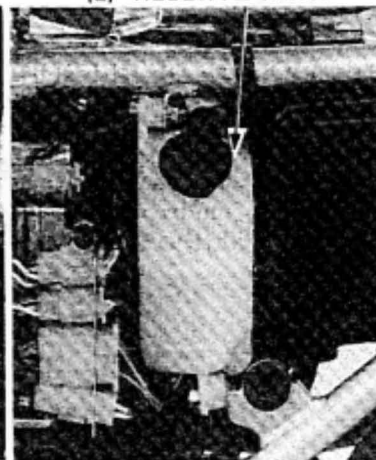
Remove the frame side covers, seat and fuel tank.  
Remove the right front side cover by removing the mount screw.

Remove the radiator cap.

(1) RADIATOR CAP



(2) RESERVE TANK



(3) RADIATOR FILLER NECK

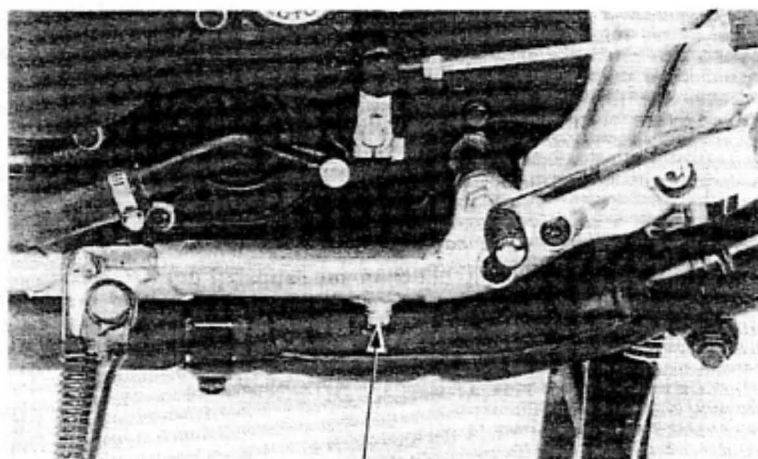
Drain the coolant from the radiator by removing the drain plug at the frame.

Drain the coolant from the engine by removing the drain bolts from the cylinder heads.

Lean the motorcycle to the right side and drain the remaining coolant.

Remove the two reserve tank mount bolts and drain the coolant from the reserve tank.

Reinstall the drain plug, drain bolts and reserve tank.



(1) DRAIN PLUG

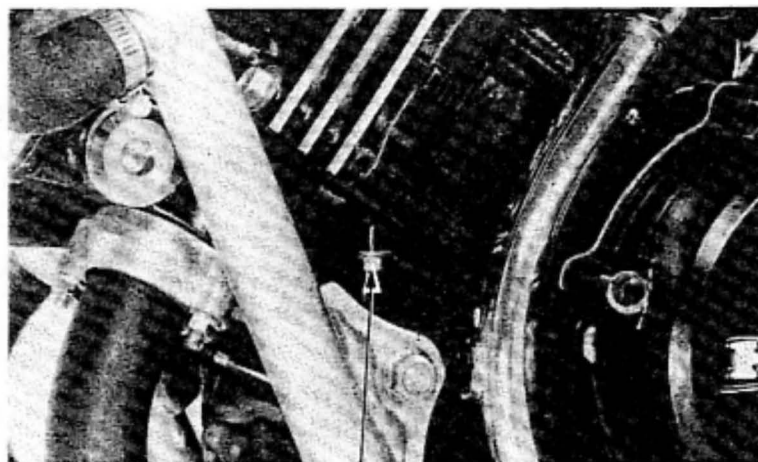
Fill the system with a 50-50 mixture of distilled water and ethylene glycol.

Bleed air from the radiator.

- Start the engine and run until there are no air bubbles in the coolant, and the level stabilizes.
- Stop the engine and add coolant up to the proper level if necessary.
- Reinstall the radiator cap.
- Check the level of coolant in the reserve tank and fill to the correct level if the level is low.

### NOTE:

Check the cooling system for leaks after replacing the coolant.



(1) DRAIN BOLT





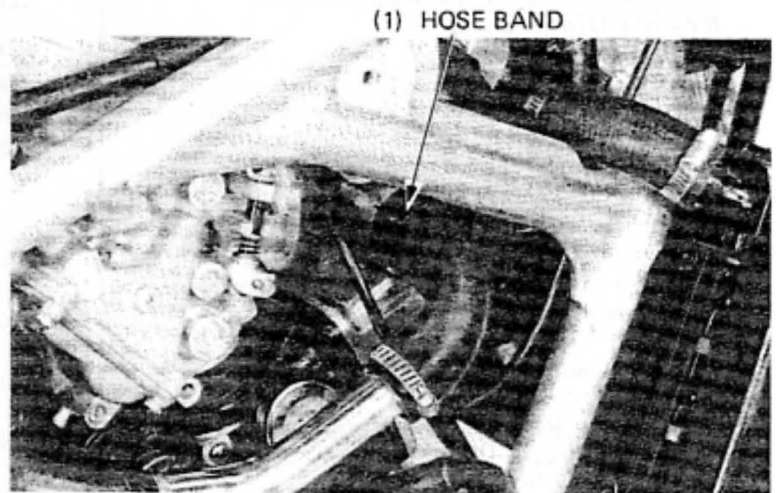
## COOLING SYSTEM

### THERMOSTAT

#### REMOVAL

Turn the fuel valve OFF.  
Remove the seat, frame side covers and fuel tank.  
Drain the coolant (page 6-3).

Loosen the hose band and disconnect the upper radiator hose from the thermostat.



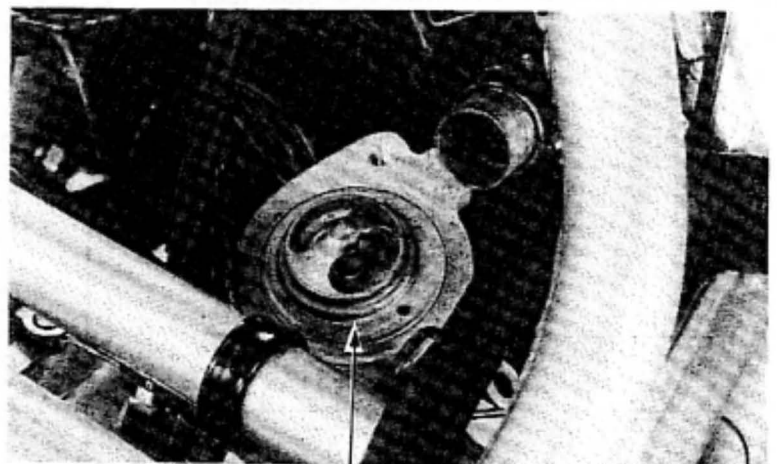
Remove the thermostat case mount bolt.

Remove the thermostat case cover by removing the two bolts.



(2) THERMOSTAT CASE

Remove the thermostat from the case.





## COOLING SYSTEM

### INSPECTION

Inspect thermostat visually for damage.  
Suspend the thermostat in heated water to check its operation.

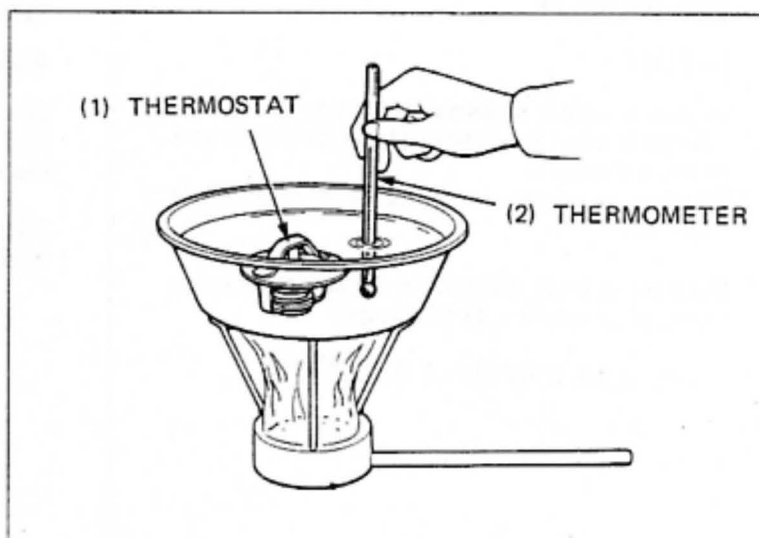
#### NOTE:

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

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

#### Technical Data

|               |                                                                            |
|---------------|----------------------------------------------------------------------------|
| Start to open | 80° to 84°C (176° – 183°F)                                                 |
| Valve lift    | 8 mm (0.31 in) minimum<br>when heated to 95°C (203°F)<br>for five minutes. |



### INSTALLATION

Install the thermostat in the reverse order of removal.

Fill the cooling system (page 6-3).

#### NOTE:

Do not forget to install the ground wire together with the thermostat case cover mount bolt.

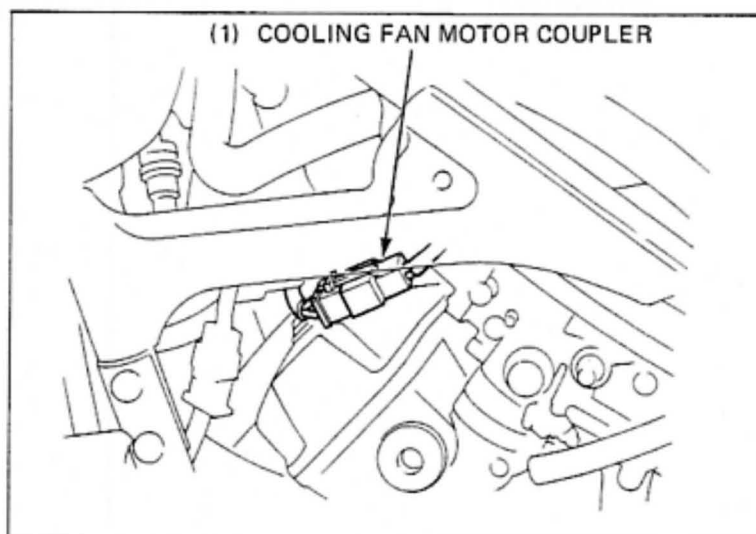
## RADIATOR/COOLING FAN

### REMOVAL

Remove the front side cover.

Drain the coolant (page 6-3).

Disconnect the cooling fan motor coupler.

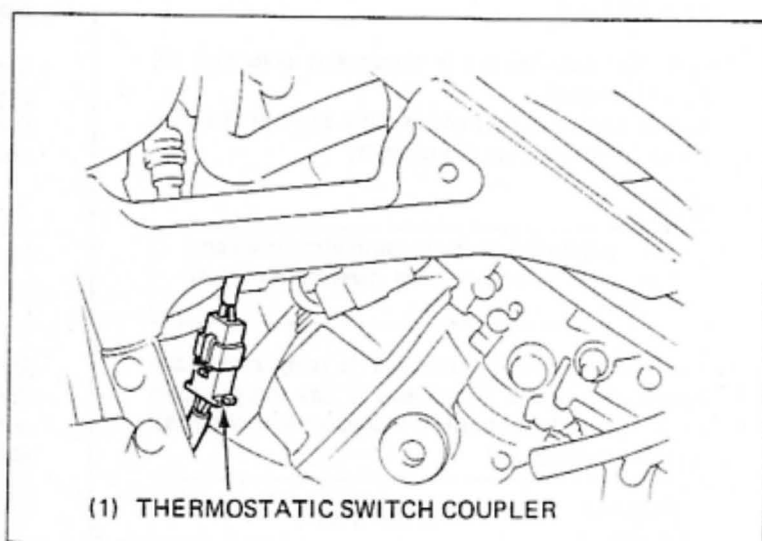


## COOLING SYSTEM

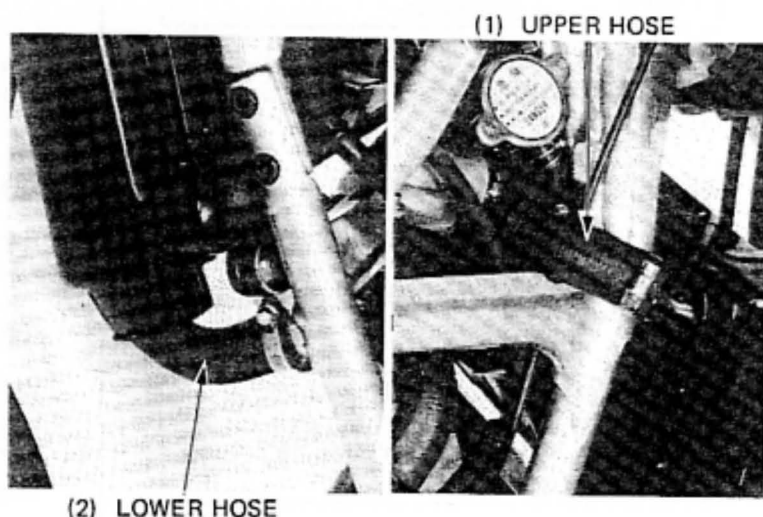


**HONDA**  
**VF400F**

Disconnect the thermostatic switch coupler.



Loosen the hose bands and disconnect the upper and lower radiator hoses from the radiator.

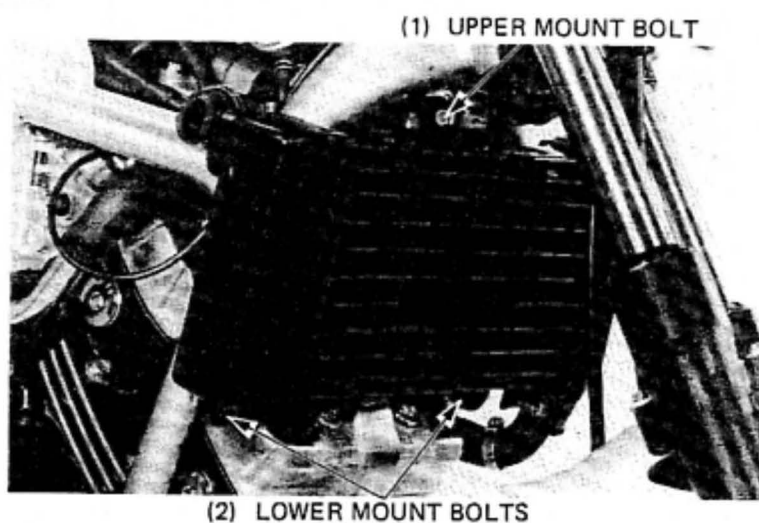


Remove the radiator upper and lower mount bolts.

Remove the radiator.

### CAUTION

*Be careful not to damage the radiator fins.*

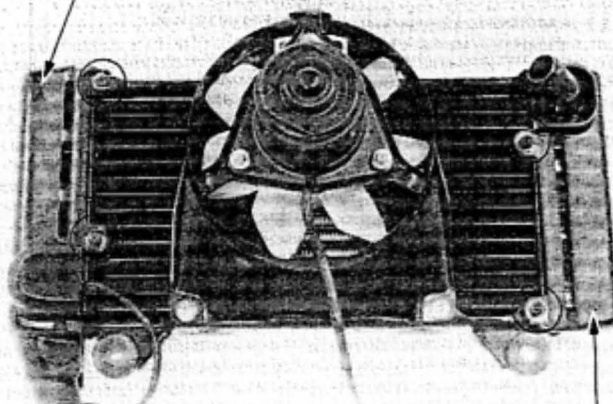




## DISASSEMBLY

Remove the four attaching screws and remove the left and right radiator side covers.

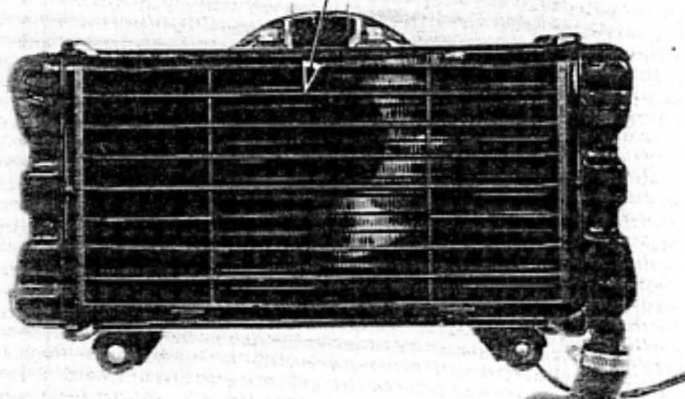
(1) RIGHT RADIATOR SIDE COVER



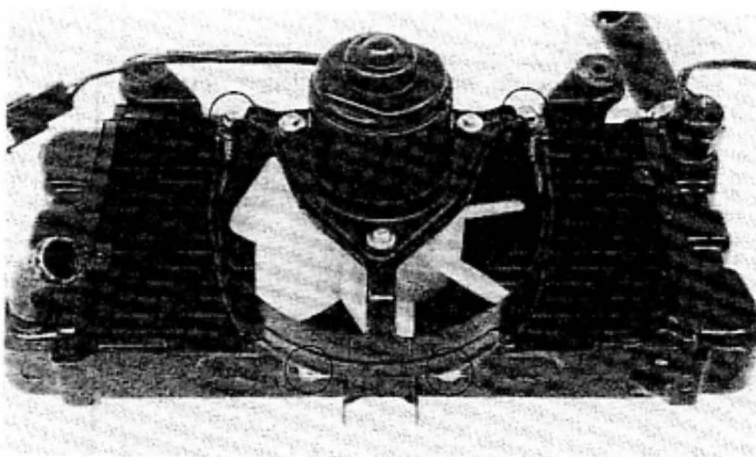
(2) LEFT RADIATOR SIDE COVER

Remove the radiator grille.

(1) RADIATOR GRILLE

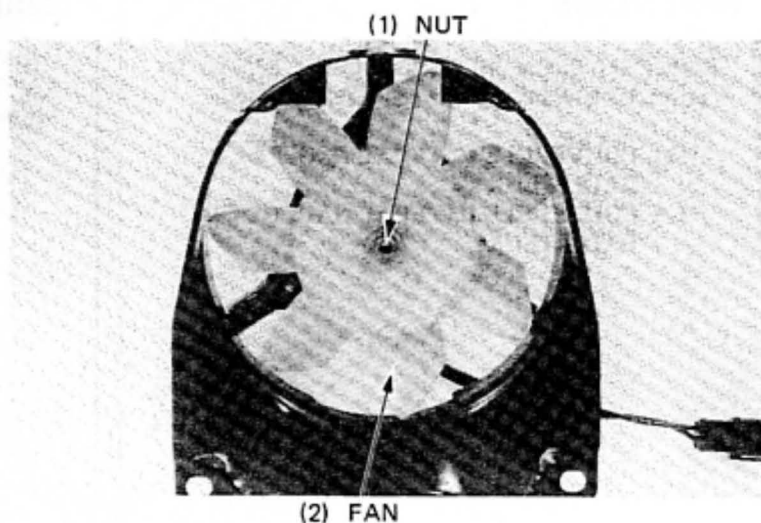


Remove the fan shroud with the fan and motor by removing the four bolts.

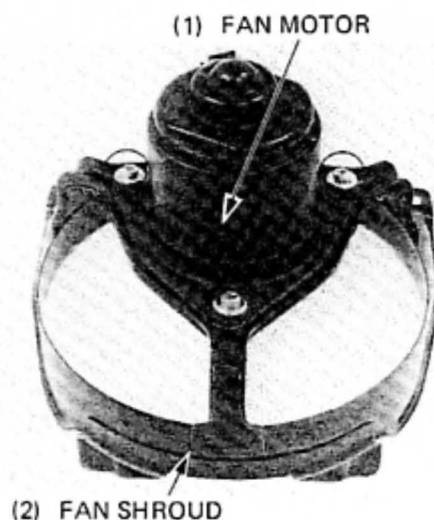




Remove the fan from the motor by removing the nut.



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



### RADIATOR INSPECTION

Inspect the radiator soldered joints and seams for leaks.

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

### ASSEMBLY/INSTALLATION

Assemble and install the radiator in the reverse order of removal.

After installation, fill the cooling system (page 6-3).





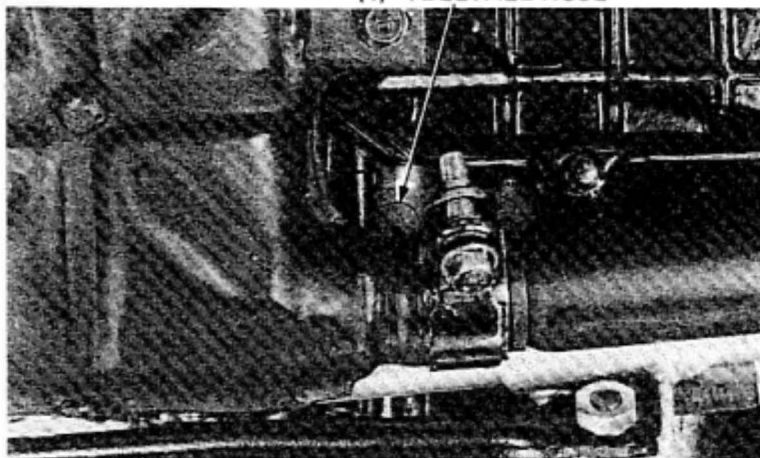
## WATER PUMP

### MECHANICAL SEAL INSPECTION

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

Replace the water pump as an assembly if the mechanical seal is leaking.

(1) TELLTALE HOSE



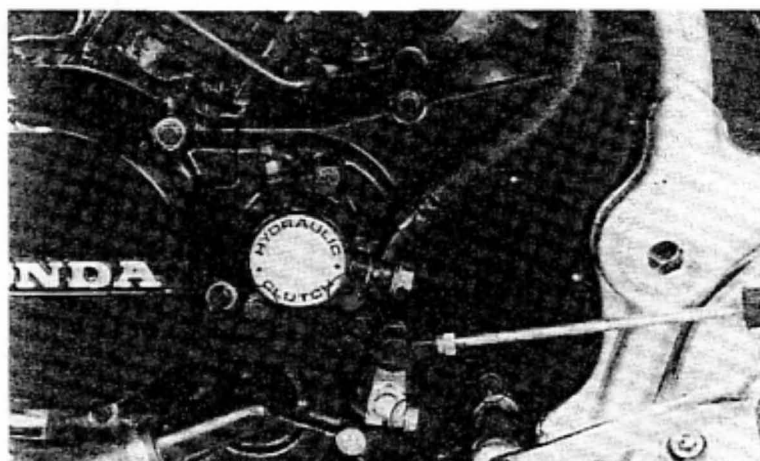
### REMOVAL

Drain the coolant (page 6-3).

Remove the clutch slave cylinder.

#### NOTE:

- It is not necessary to disconnect the clutch oil line.
- To prevent the clutch system from air contamination, and the slave cylinder piston from falling, squeeze the clutch lever immediately after removing the slave cylinder, and tie the lever to the handle grip with a string.



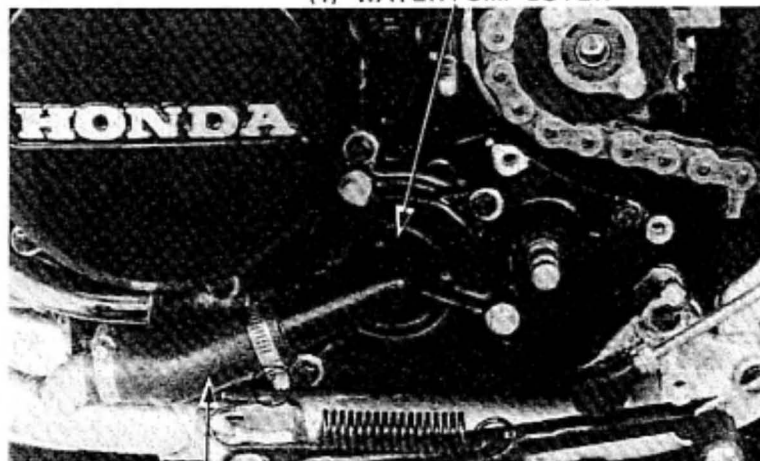
Remove the gearshift arm from the shift spindle.

Remove the left crankcase rear cover.

Loosen the hose band and disconnect the water hose from the water pump cover.

Remove the four bolts and the water pump cover.

(1) WATER PUMP COVER

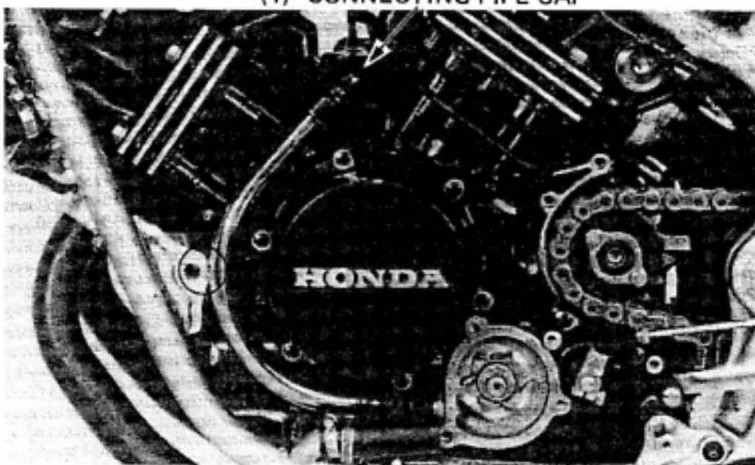


(2) WATER HOSE



Remove the water pipe clamp bolt.  
Remove the water pipe from the water pipe connecting cap.

(1) CONNECTING PIPE CAP

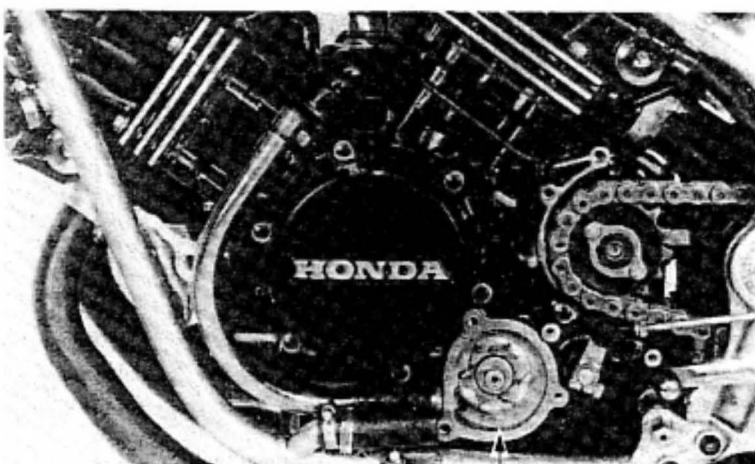


Pull off the water pump from the crankcase.

Remove the water pipe from the water pump.

## NOTE:

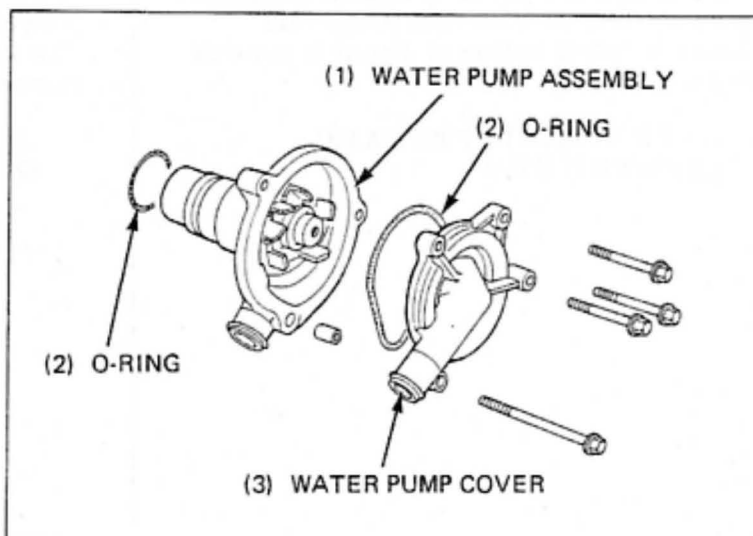
The further disassembly of the water pump cannot be performed.



(1) WATER PUMP

## INSPECTION

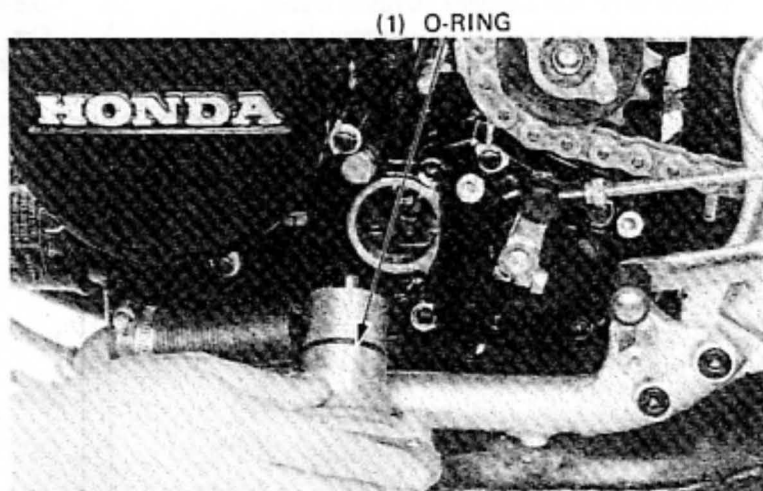
Check the water pump for mechanical seal leakage and bearing deterioration.  
Replace the water pump as an assembly if necessary.



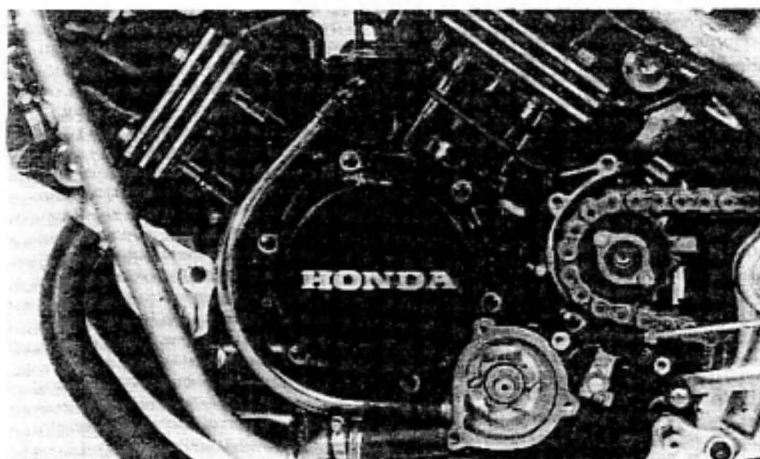


### INSTALLATION

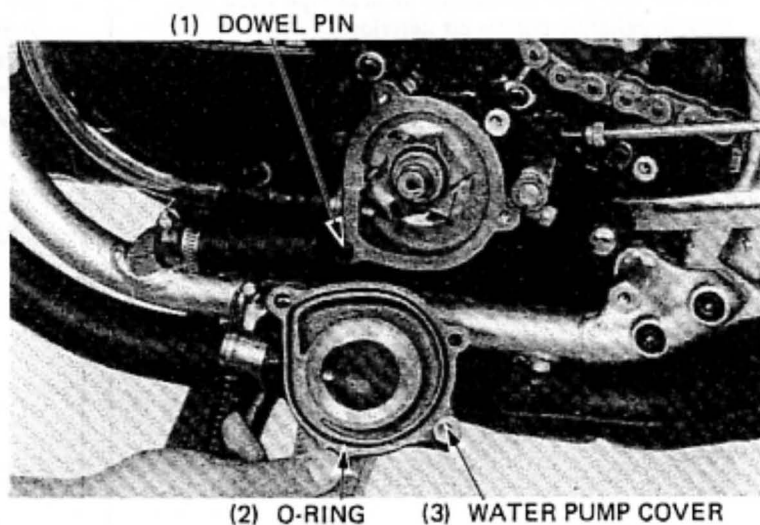
Apply a coat of clean engine oil to a new O-ring and install it in the water pump groove. Align the water pump shaft groove with the oil pump shaft and insert the water pump in the crankcase.



Insert a new O-ring over the end of the water pipe. Connect the water pipe to the pump hose and water pipe cap.



Install the dowel pin onto the water pump and install a new O-ring in the groove of the water pump cover.



## COOLING SYSTEM

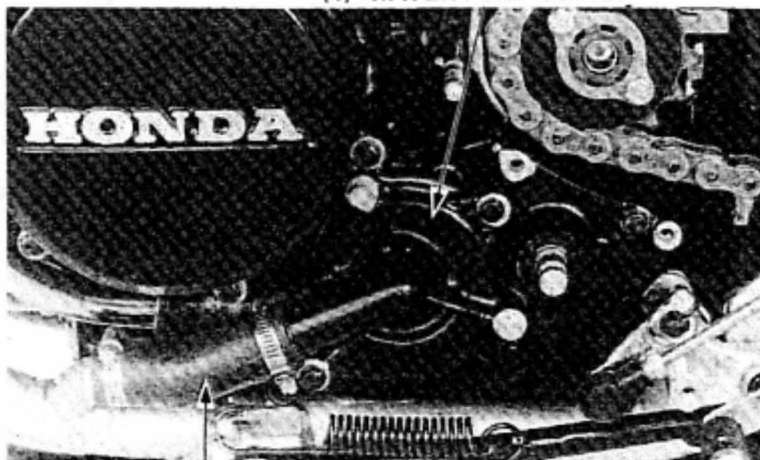


**HONDA**  
**VF400F**

Install the water pump cover and tighten it with the four bolts.

Connect the water hose to the pump cover and secure it with the hose band.

(1) WATER PUMP COVER



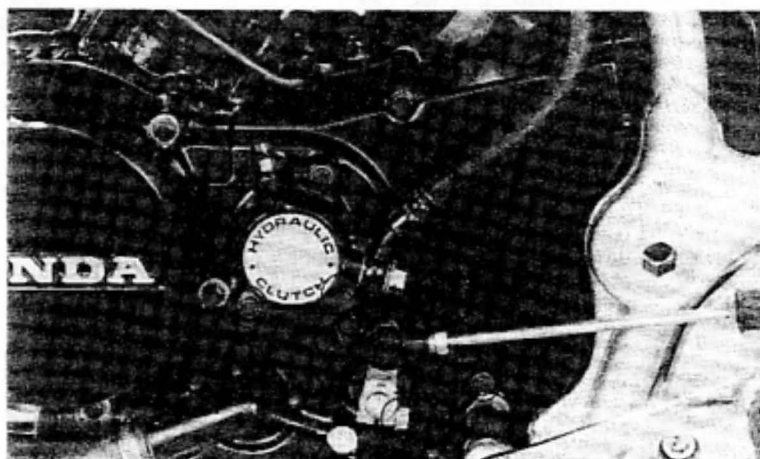
(2) WATER HOSE

Install the left crankcase rear cover.

Install the clutch slave cylinder.

### NOTE:

When installing the clutch slave cylinder, temporarily install it to the left crankcase cover, release the clutch lever from the handle grip by removing the string, and then tighten the slave cylinder mount bolts.



Install the gearshift arm.

Fill the cooling system (page 6-3).



指定トルク：2.5—3.5kg-m

指定トルク：0.5—0.7kg-m

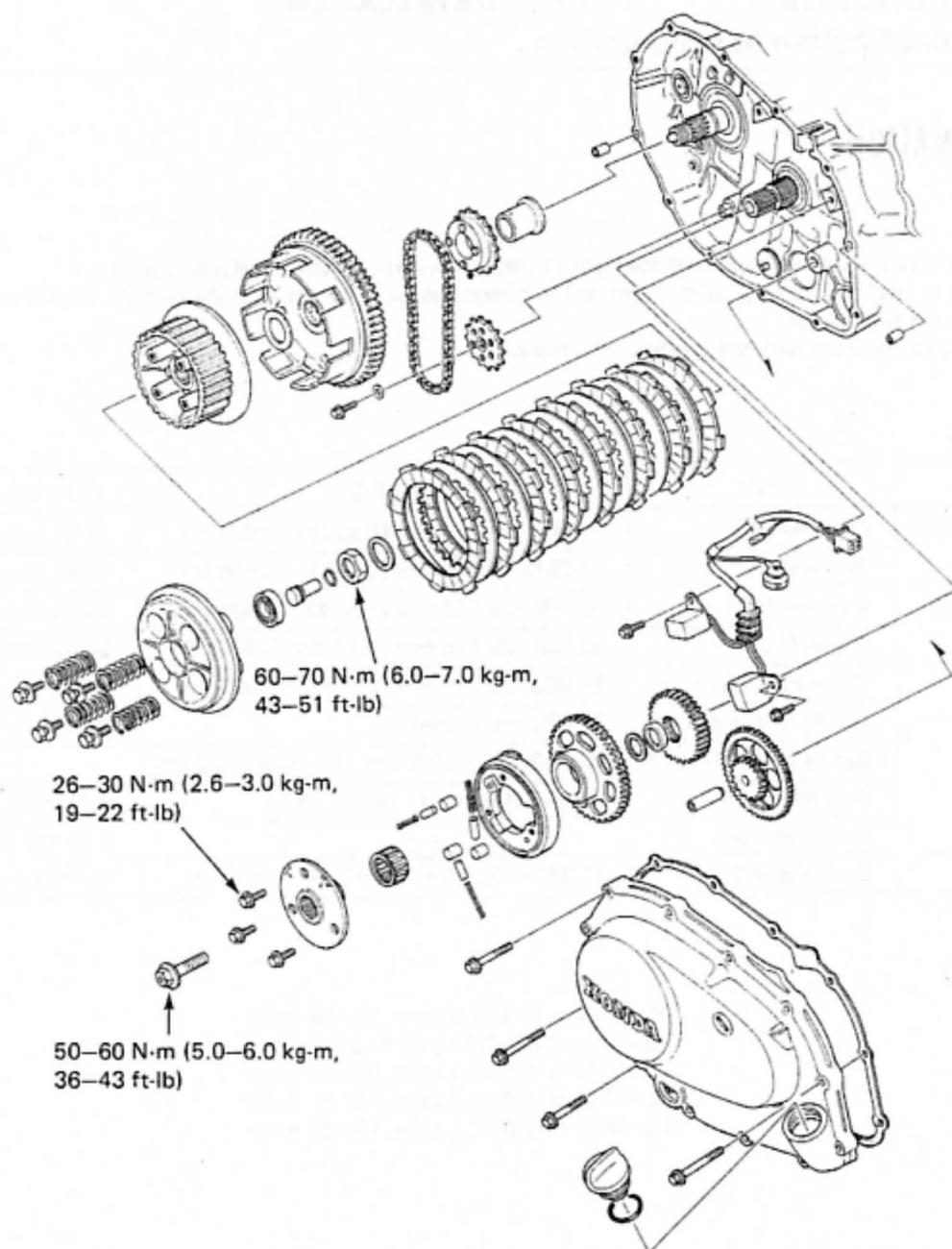
指定トルク：2.5—3.5kg-m





**HONDA**  
**VF400F**

CLUTCH  
EMBAYAGE  
KUPPLUNG



# 7. CLUTCH SYSTEM



**HONDA**  
**VF400F**

|                                           |      |                                       |      |
|-------------------------------------------|------|---------------------------------------|------|
| SERVICE INFORMATION                       | 7-1  | STARTER CLUTCH DISASSEMBLY            | 7-10 |
| TROUBLESHOOTING                           | 7-2  | CLUTCH DISASSEMBLY                    | 7-12 |
| CLUTCH FLUID REPLACEMENT/<br>AIR BLEEDING | 7-3  | CLUTCH ASSEMBLY                       | 7-15 |
| CLUTCH MASTER CYLINDER                    | 7-4  | STARTER CLUTCH ASSEMBLY               | 7-18 |
| CLUTCH SLAVE CYLINDER                     | 7-7  | RIGHT CRANKCASE COVER<br>INSTALLATION | 7-20 |
| RIGHT CRANKCASE COVER REMOVAL             | 7-10 |                                       |      |

## SERVICE INFORMATION

### GENERAL

- This section covers removal and installation of the clutch hydraulic system, clutch and starter clutch.
- DOT-3 brake fluid is used for the hydraulic clutch and is referred to as clutch fluid in the section. Do not use other types of fluid as they are not compatible.
- Clutch maintenance can be done with the engine in the frame.

### SPECIFICATIONS

|                        |                       | STANDARD                                | SERVICE LIMIT       |
|------------------------|-----------------------|-----------------------------------------|---------------------|
| Clutch master cylinder | Cylinder I.D.         | 14.000–14.043 mm (0.5512–0.5524 in)     | 14.06 mm (0.553 in) |
|                        | Piston O.D.           | 13.957–13.984 mm (0.5495–0.5506 in)     | 13.94 mm (0.549 in) |
| Clutch slave cylinder  | Cylinder I.D.         | 38.100–38.162 mm (1.5000–1.5024 in)     | 38.18 mm (1.503 in) |
|                        | Piston O.D.           | 38.036–38.075 mm (1.4975–1.4990 in)     | 38.02 mm (1.497 in) |
| Clutch                 | Outer bushing I.D.    | 29.000–29.021 mm (1.1417–1.1426 in)     | 29.06 mm (1.144 in) |
|                        | Spring free length    | 35.420 mm (1.3945 in)                   | 34.0 mm (1.34 in)   |
|                        | Spring preload/length | 19.8–24.2 kg/23.3 mm (44–53 lb/0.92 in) | —                   |
|                        | Disc thickness        | 2.90–3.00 mm (0.114–0.118 in)           | 2.6 mm (0.10 in)    |
|                        | Plate warpage         | —                                       | 0.30 mm (0.012 in)  |
| Starter clutch         | Driven gear O.D.      | 41.975–42.200 mm (1.6526–1.6614 in)     | 41.96 mm (1.652 in) |

### TORQUE VALUES

|                        |                                       |
|------------------------|---------------------------------------|
| Clutch hose oil bolts  | 25–35 N·m (2.5–3.5 kg·m, 18–25 ft·lb) |
| Clutch lever pivot nut | 5–7 N·m (0.5–0.7 kg·m, 4–5 ft·lb)     |
| Starter clutch bolt    | 50–60 N·m (5.0–6.0 kg·m, 36–43 ft·lb) |
| Clutch center lock nut | 60–70 N·m (6.0–7.0 kg·m, 43–51 ft·lb) |
| Starter clutch cover   | 26–30 N·m (2.6–3.0 kg·m, 19–22 ft·lb) |

### TOOLS

|                  |               |
|------------------|---------------|
| Special          |               |
| Snap ring pliers | 07914–3230001 |

|                            |               |
|----------------------------|---------------|
| Common                     |               |
| Universal holder           | 07725–0030000 |
| Extension bar              | 07716–0020500 |
| Lock nut wrench 17 x 27 mm | 07716–0020300 |
| Clutch center holder       | 07725–0050000 |



## **TROUBLESHOOTING**

### **Clutch lever soft or spongy**

1. Air bubbles in hydraulic system
2. Low fluid level
3. Hydraulic system leaking

### **Clutch lever too hard**

1. Sticking piston(s)
2. Clogged hydraulic system

### **Clutch slips**

1. Hydraulic system sticking
2. Discs worn
3. Spring weak

### **Clutch will not disengage**

1. Air bubbles in hydraulic system
2. Low fluid level
3. Hydraulic system leaking
4. Hydraulic system sticking
5. Plates warped

### **Motorcycle creeps with clutch disengaged**

1. Air bubbles in hydraulic system
2. Low fluid level
3. Hydraulic system leaking
4. Hydraulic system sticking
5. Plates warped

### **Excessive lever pressure**

1. Hydraulic system sticking
2. Lifter mechanism damaged

### **Clutch operation feels rough**

1. Outer drum slots rough
2. Sticking piston(s)

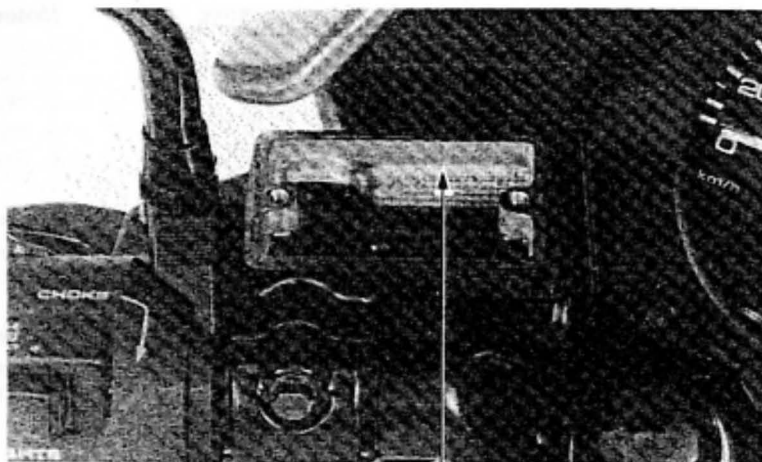


## CLUTCH FLUID REPLACEMENT/ AIR BLEEDING

Check the fluid level with the fluid reservoir parallel to the ground.

### CAUTION

- Install the diaphragm on the reservoir when operating the clutch lever. Failure to do so will allow clutch fluid to squirt out of the reservoir during clutch operation.
- Avoid spilling fluid on painted surfaces. Place a rag over the fuel tank whenever the system is serviced.



(1) UPPER LEVEL

## CLUTCH FLUID DRAINING

Connect a bleed hose to the bleed valve. Loosen the slave cylinder bleed valve and pump the clutch lever.

Stop operating the lever when no fluid flows out of the bleed valve.

## CLUTCH FLUID FILLING

### NOTE:

Do not mix different types of fluid since they may not be compatible.

Close the bleed valve, fill the reservoir, and install the diaphragm.

To prevent piston overtravel and clutch fluid seepage, keep a 20 mm (3/4 in) spacer between the handlebar grip and lever when bleeding the clutch system. Pump up the system pressure with the lever until there are no air bubbles in the fluid flowing out of the reservoir small hole and lever resistance is felt. Then bleed the system.

## AIR BLEEDING

### NOTE:

- Check the fluid level often while bleeding the clutch to prevent air from being pumped into the system.
- Use only **DOT 3 brake fluid** from a sealed container.
- Do not mix brake fluid types and never reuse the fluid which has been pumped out during bleeding, or the efficiency of the clutch system will be impaired.

(1) BLEED HOSE

(2) BLEED VALVE



(3) DIAPHRAGM



## CLUTCH



**HONDA**  
**VF400F**

- 1) Squeeze the clutch lever, open the bleed valve 1/2 turn then close the valve.

### NOTE:

Do not release the clutch lever until the bleed valve has been closed again.

- 2) Release the clutch lever slowly and wait several seconds after it reaches the end of its travel.

Repeat the above steps until bubbles cease to appear in the fluid at the end of the hose.

Tighten the bleed valve.

Fill the fluid reservoir to the upper level.

(1) BLEED HOSE

(2) BLEED VALVE



## CLUTCH MASTER CYLINDER

### DISASSEMBLY

Drain clutch fluid from the hydraulic system.  
Remove the rear view mirror and clutch lever.  
Disconnect the clutch switch wires and remove the clutch hose.

### CAUTION

*Avoid spilling clutch fluid on painted surfaces.  
Place a rag over the fuel tank whenever the clutch system is serviced.*

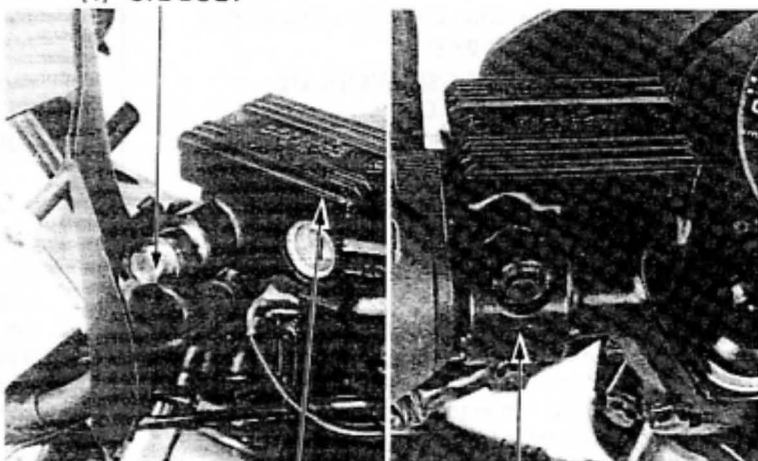
### NOTE:

When removing the oil bolt, cover the end of the hose to prevent contamination and secure the hose.

Remove the master cylinder.

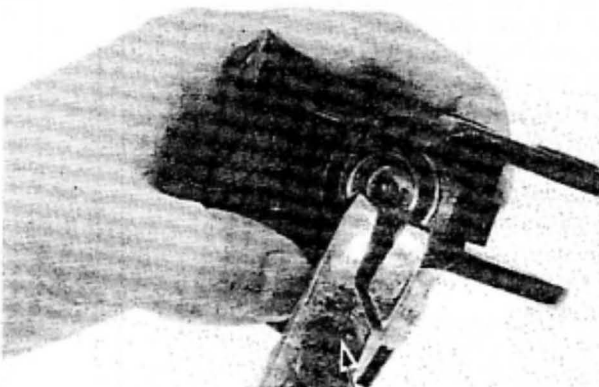
Remove the push rod, boot and snap ring from the master cylinder body.

(1) OIL BOLT



(2) MASTER CYLINDER

(3) HOLDER



(1) SNAP RING PLIERS  
07914-3230001 OR EQUIVALENT



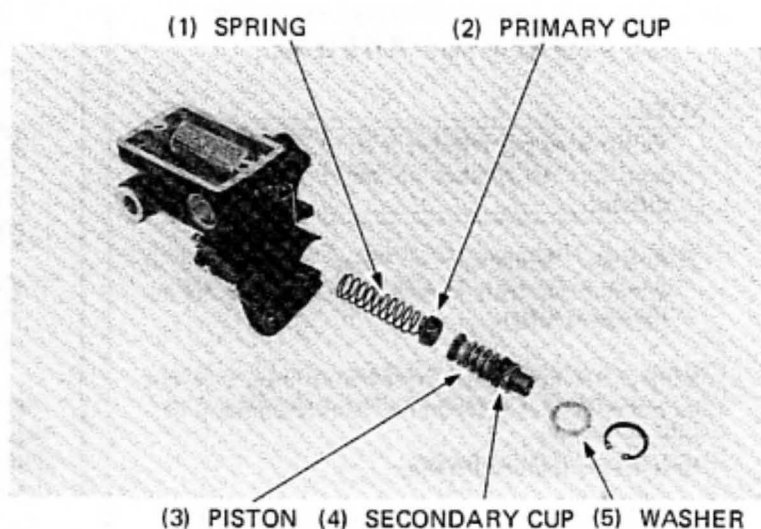
## CLUTCH



**HONDA**  
**VF400F**

Remove the following:

- piston and secondary cup.
- primary cup and spring.
- Clutch switch, if necessary.

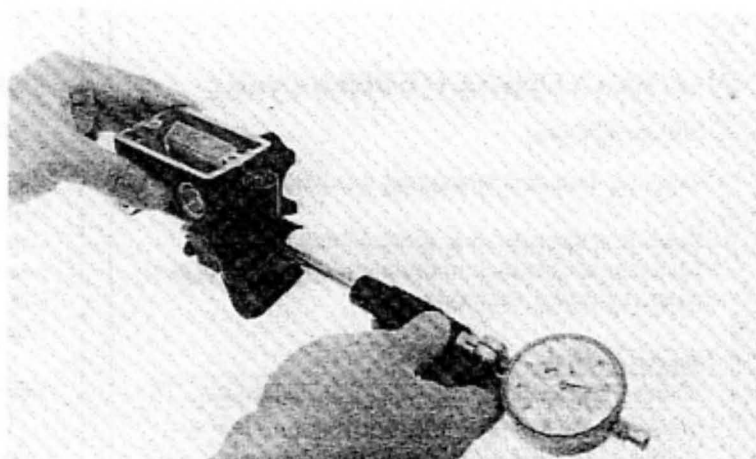


### MASTER CYLINDER I.D. INSPECTION

Measure the master cylinder I.D.

Check the master cylinder for scores, scratches or nicks.

**SERVICE LIMIT: 14.06 mm (0.553 in)**

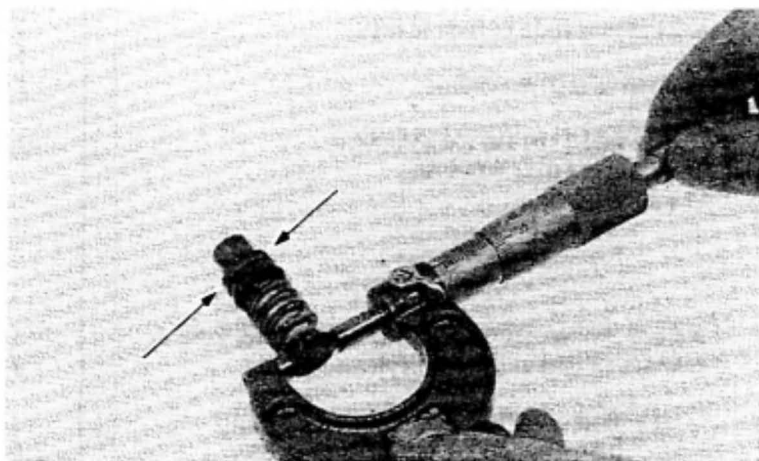


### MASTER PISTON O.D. INSPECTION

Measure the master piston O.D.

**SERVICE LIMIT: 13.94 mm (0.549 in)**

Check the primary and secondary cups for damage before assembly.



## CLUTCH



**HONDA**  
**VF400F**

### ASSEMBLY

#### CAUTION

*Handle the master piston, spring, primary cup and secondary cup as a set.*

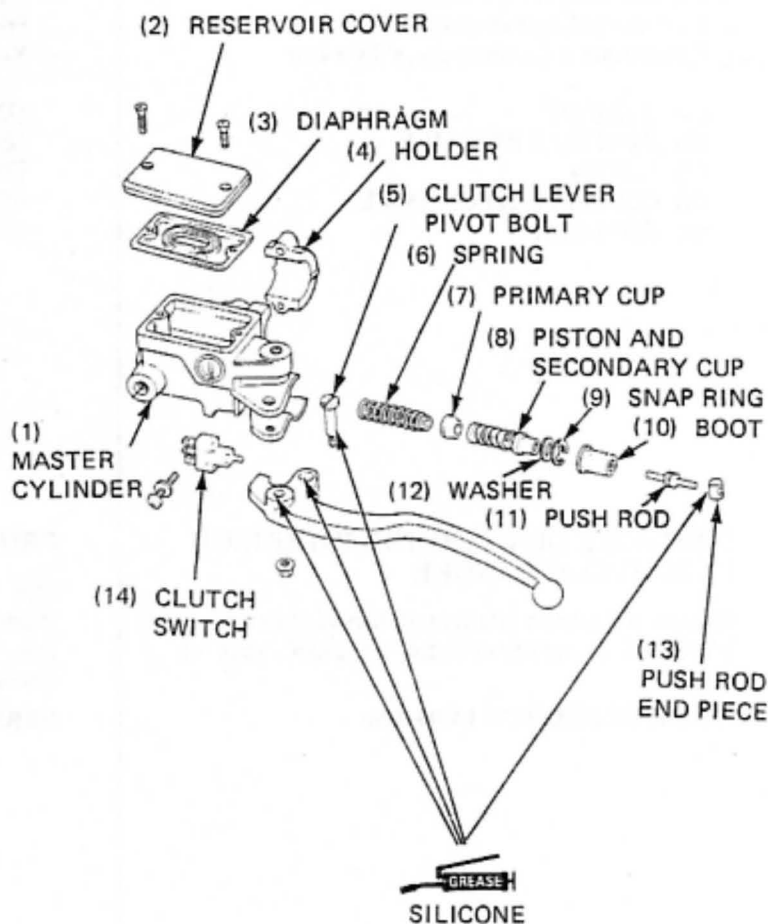
Coat all parts with clean brake fluid before assembly.

Install the spring, primary cup and piston.

#### CAUTION

*When installing the cups, do not allow the lips to turn inside out.*

Install the snap ring making sure it is seated firmly in the groove. Then install the boot and push rod. Install the clutch switch, if it was removed.



### INSTALLATION

Place the master cylinder on the handlebar and install the holder with the "UP" mark facing up and the two mounting bolts.

Align the holder mating surface with the handlebar punch mark.

Tighten the top bolt first, then the bottom bolt.

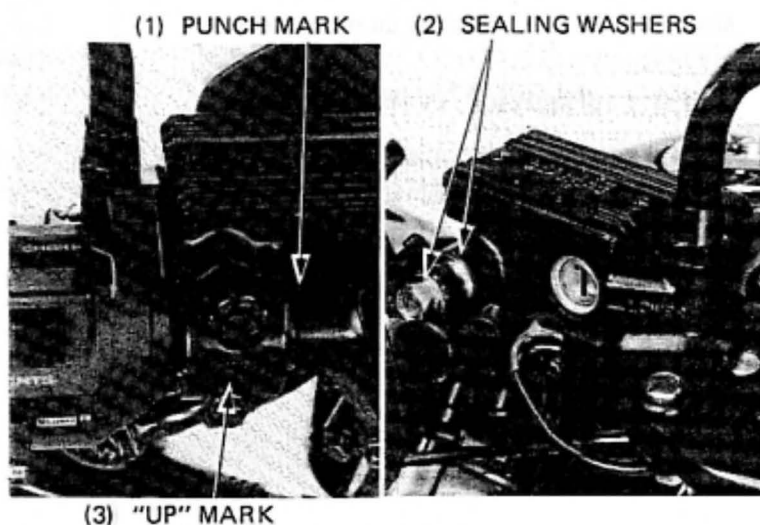
Install the oil hose with the bolt and its two sealing washers.

**TORQUE: 25–35 N·m (2.5–3.5 kg·m, 18–25 ft·lb)**

Install the push rod end piece into the clutch lever hole and install the clutch lever.

Connect the clutch switch wires to the switch terminals.

Fill the reservoir and bleed the clutch system (page 7-3).





## CLUTCH SLAVE CYLINDER

### DISASSEMBLY

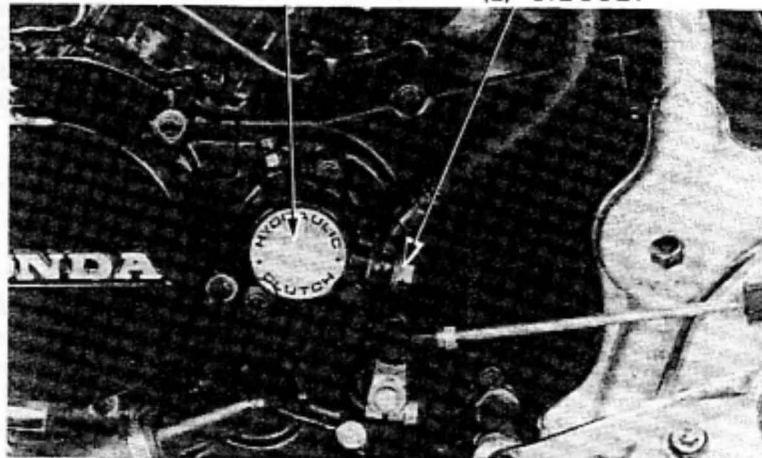
Place a container under the slave cylinder, remove the oil bolt and disconnect the clutch hose.

#### NOTE:

Avoid spilling clutch fluid on painted surfaces.

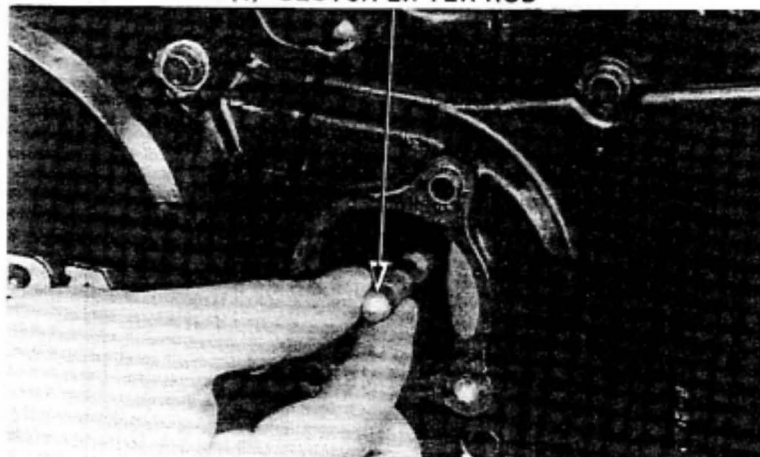
Remove the slave cylinder.

(1) CLUTCH SLAVE CYLINDER (2) OIL BOLT



Remove the clutch lifter rod.

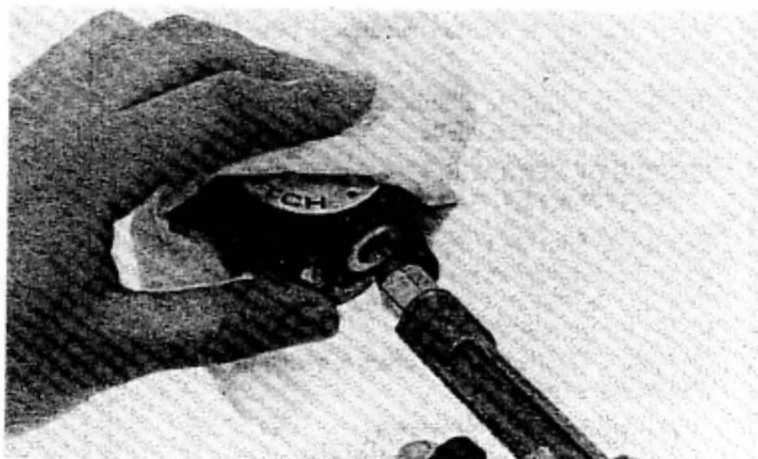
(1) CLUTCH LIFTER ROD



Remove the piston from the cylinder.

If piston removal is hard, place a shop towel over the piston to cushion the piston when it is expelled, and position the cylinder with the piston down.

Apply compressed air to the fluid inlet to remove the piston. Use the air in short spurts.





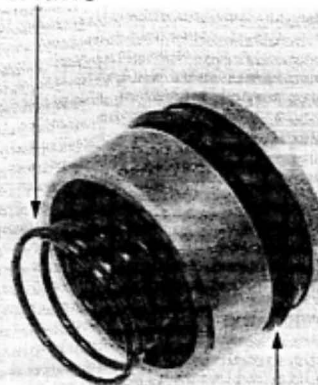
Remove the spring from the slave cylinder.

Remove the oil and piston seals.

Clean the piston groove with clutch fluid.

Check the piston spring for weakness or damage.

(1) SPRING



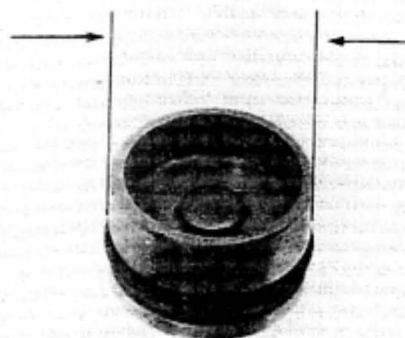
(2) PISTON SEAL

### PISTON O.D. INSPECTION

Check the piston for scoring or scratches.

Measure the outside diameter of the piston with a micrometer.

**SERVICE LIMIT: 38.02 mm (1.497 in)**

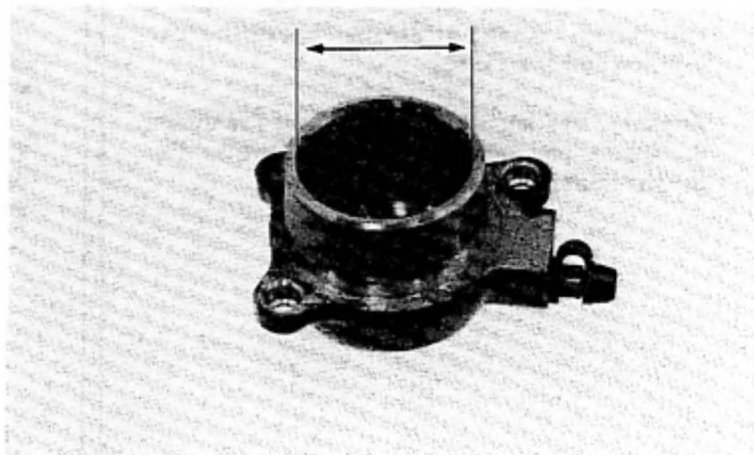


### CYLINDER I.D. INSPECTION

Check the slave cylinder for scoring or scratches.

Measure the inside diameter of the cylinder bore.

**SERVICE LIMIT: 38.18 mm (1.503 in)**



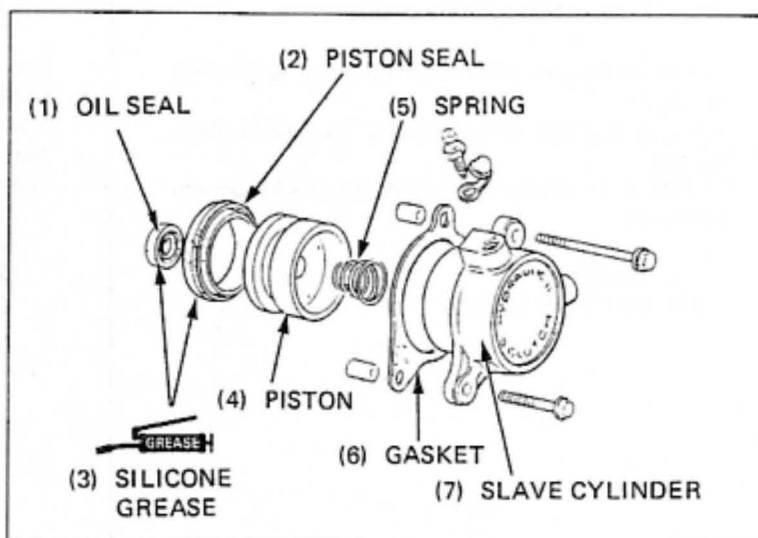


### ASSEMBLY

Assemble the slave cylinder in the reverse order of disassembly. The oil seals must be replaced with new ones whenever they have been removed.

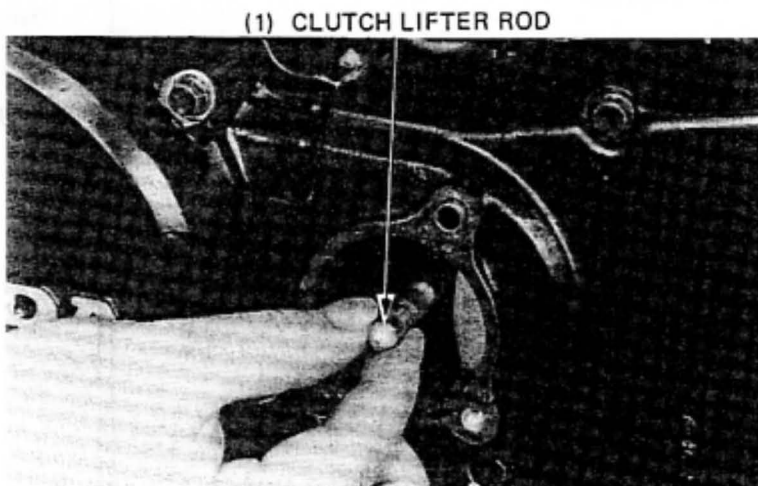
Lubricate the piston and piston seal with a medium grade of Hi-Temperature silicone grease or brake fluid before assembly.

Be certain the piston seal is seated in the piston groove. Place the piston in the cylinder with the seal end facing out.

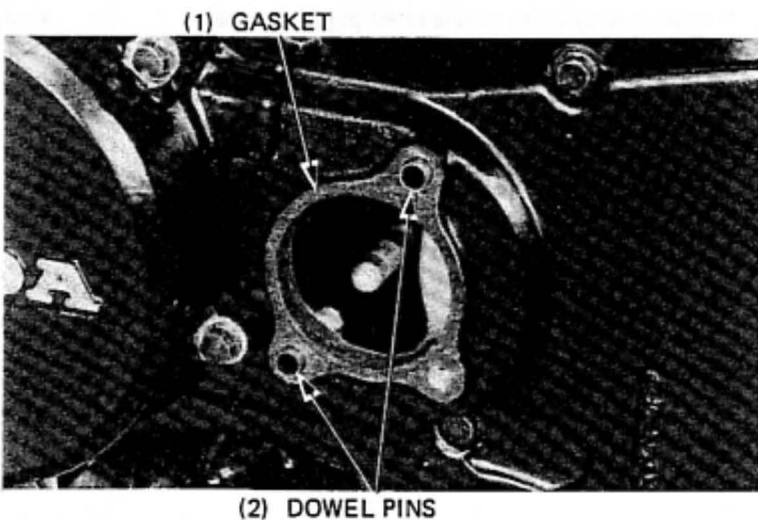


### INSTALLATION

Install the clutch lifter rod with its dent side (gold plating side) facing to the slave cylinder.



Install the two dowel pins and gasket onto the left crankcase rear cover.





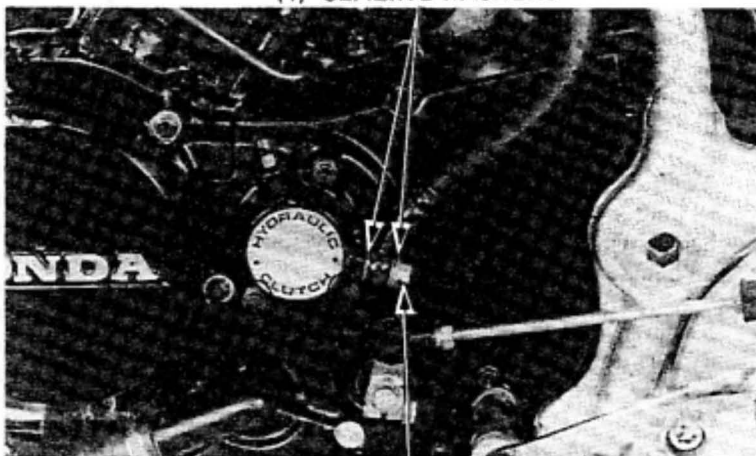


Install the insulator and slave cylinder.  
 Connect the clutch hose with the oil bolt and the two sealing washers.

**TORQUE:** 25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)

Fill the clutch fluid reservoir and bleed the clutch system (page 7-3).

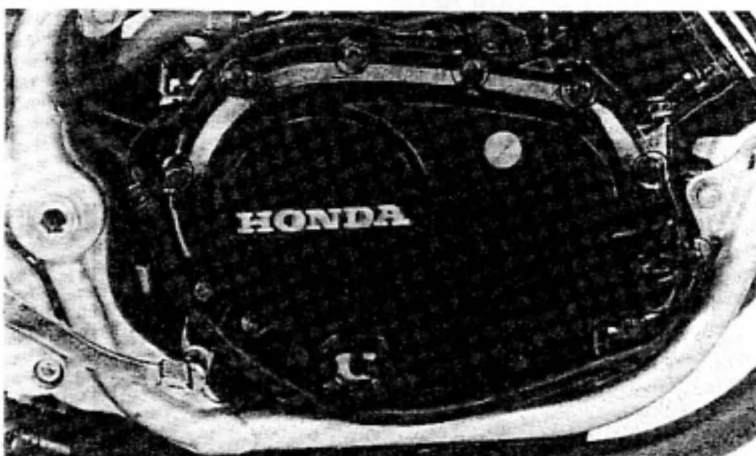
(1) SEALING WASHERS



(2) OIL BOLT

## RIGHT CRANKCASE COVER REMOVAL

Drain the engine oil.  
 Remove the right crankcase cover.  
 Remove the gasket and dowel pins.

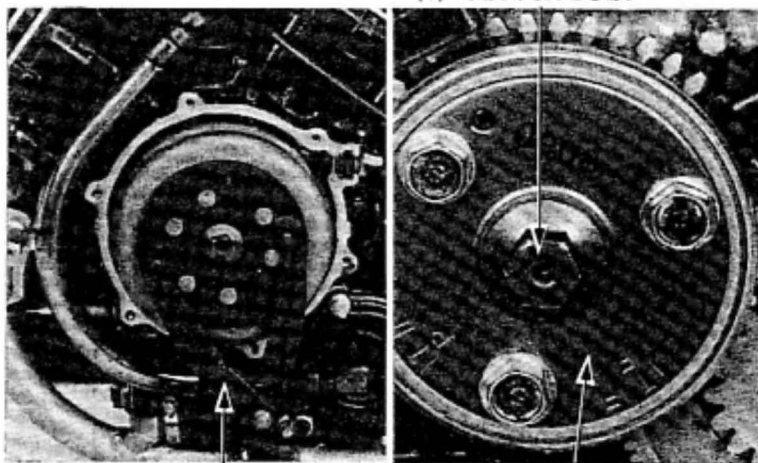


## STARTER CLUTCH DISASSEMBLY

Remove the right crankcase cover.  
 Remove the alternator cover and hold the flywheel with universal holder, or shift the transmission into the 6th gear and apply the rear brake.

Remove the starter clutch bolt.  
 Remove the starter clutch assembly.  
 Remove the thrust washer and collar.

(1) CLUTCH BOLT



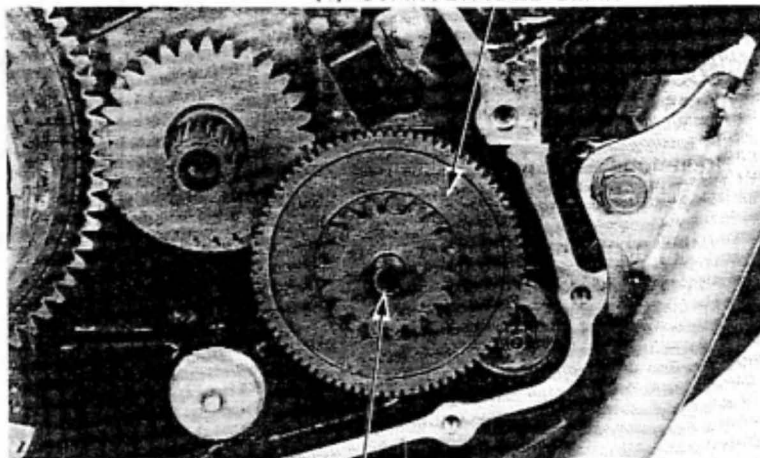
(2) UNIVERSAL HOLDER  
 07725-0030000

(3) STARTER CLUTCH



Remove the starter idle gear shaft and gear.

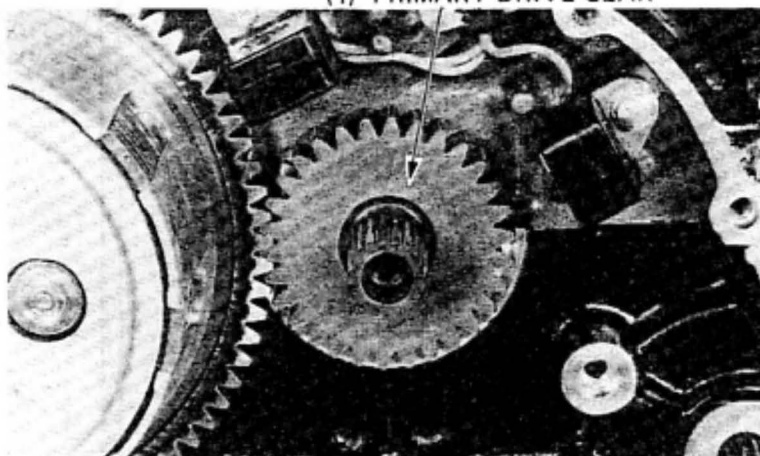
(1) STARTER IDLE GEAR



(2) IDLE GEAR SHAFT

Remove the primary drive gear.

(1) PRIMARY DRIVE GEAR

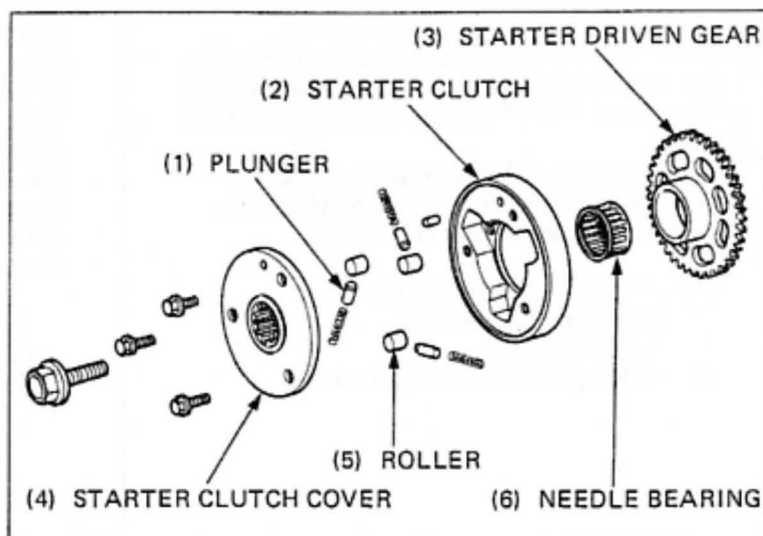


Remove the starter driven gear and needle bearing from the starter clutch.

Inspect the rollers for smooth operation.

Remove the starter clutch cover by removing the three bolts.

Remove the clutch rollers, plungers and springs.

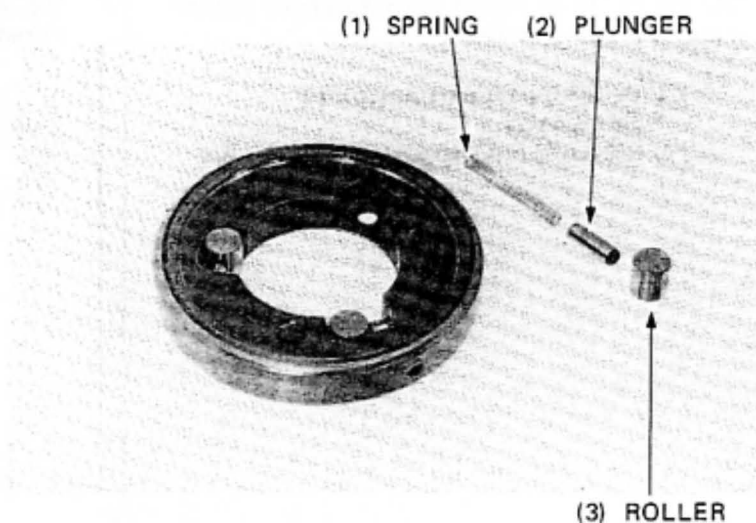


## CLUTCH



**HONDA**  
**VF400F**

Check the rollers for excessive wear, and the springs for weakness or damage.

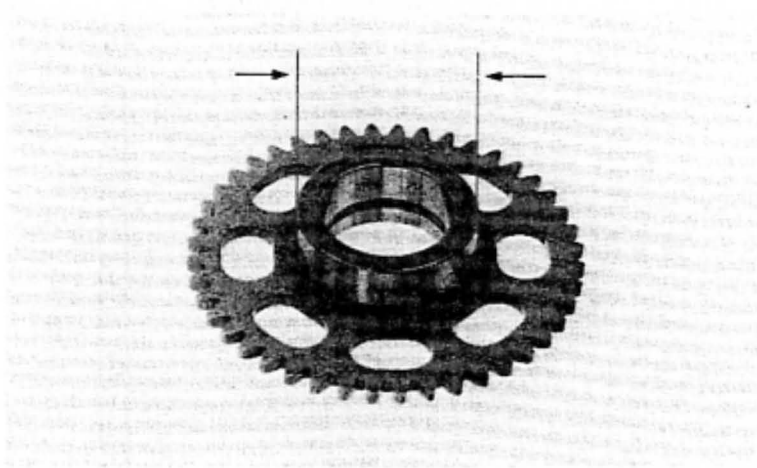


### STARTER DRIVEN GEAR INSPECTION

Inspect the driven gear for damage or excessive wear.

Measure the driven gear O.D.

**SERVICE LIMIT: 41.96 mm (1.652 in)**



## CLUTCH DISASSEMBLY

### CAUTION

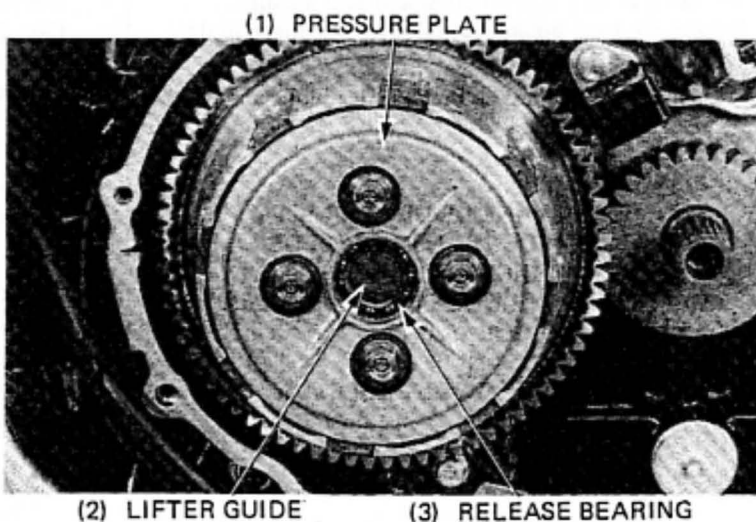
*To prevent the clutch system from air contamination, squeeze the clutch lever immediately after removing the clutch pressure plate, and tie the lever to the handle grip with a string.*

Remove the bolts and clutch springs.

### NOTE:

Loosen the bolts in crisscross pattern and 2-3 steps.

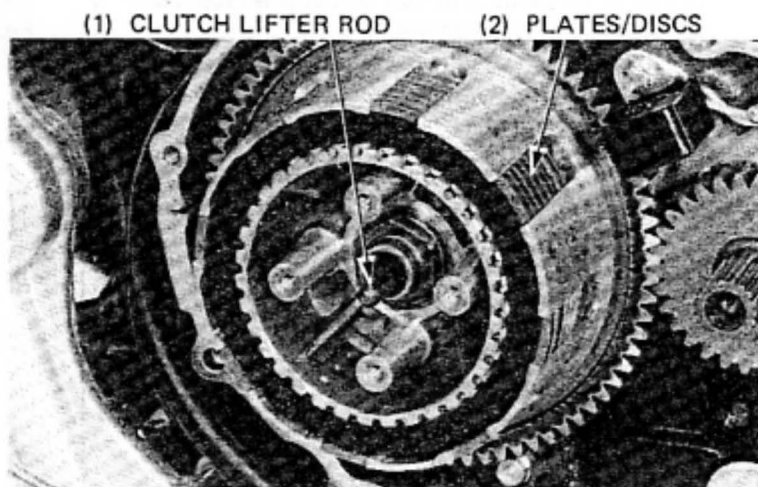
Remove the clutch pressure plate with the lifter guide and release bearing.



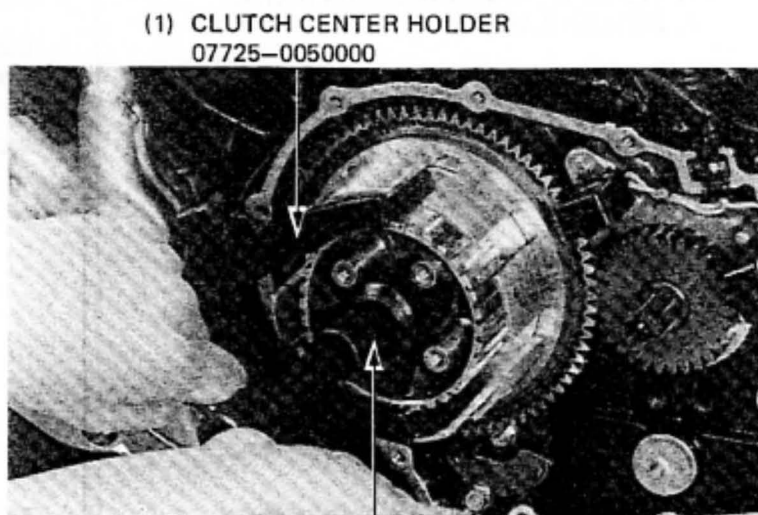


## CLUTCH

Remove the clutch lifter rod, clutch plates and discs.

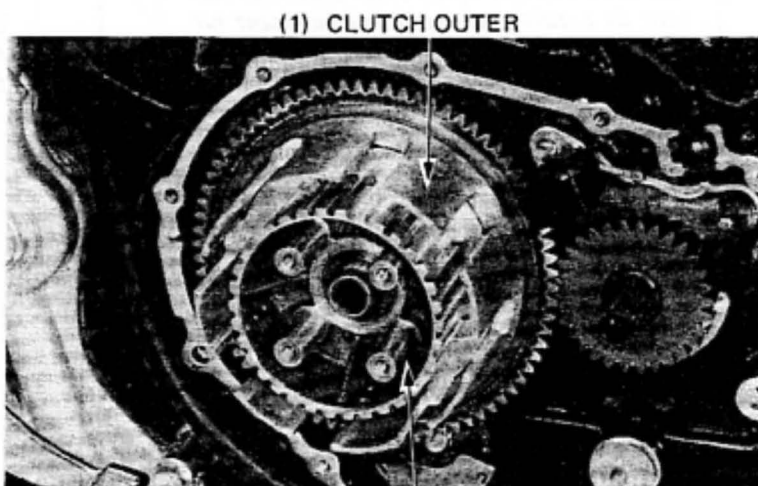


Hold the clutch center with a clutch center holder and remove the lock nut. Remove the lock washer.



(2) LOCK NUT WRENCH, 17 x 27 mm  
07716-0020300  
EXTENSION BAR 07716-0020500

Remove the clutch center, thrust washer and clutch outer.



(2) CLUTCH CENTER

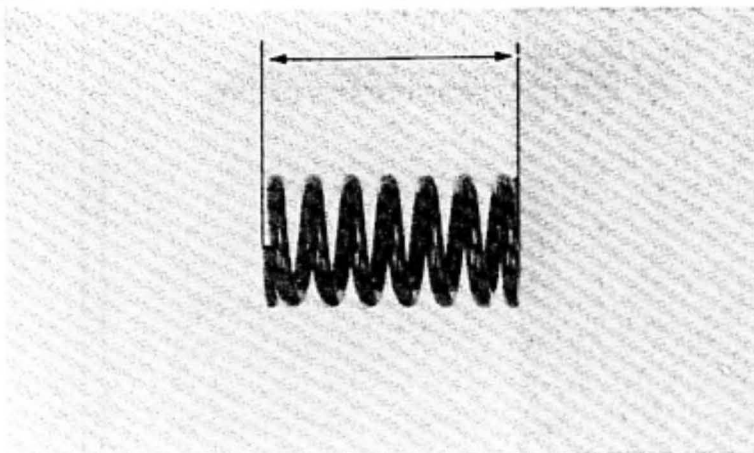


### INSPECTION

#### • CLUTCH SPRING

Measure the clutch spring free length.

**SERVICE LIMIT: 34.0 mm (1.34 in)**



#### • CLUTCH DISC

Replace the clutch discs if they show signs of scoring or discoloration.

Measure the thickness of each disc.

**SERVICE LIMIT: 2.6 mm (0.10 in)**

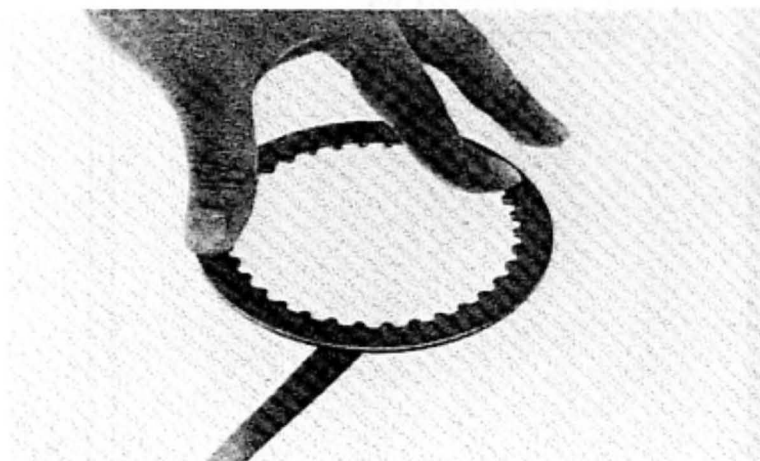
Replace any discs that are thinner than the service limit.



#### • CLUTCH PLATE

Check for plate warpage on a surface plate, using a feeler gauge.

**SERVICE LIMIT: 0.30 mm (0.012 in)**





## CLUTCH

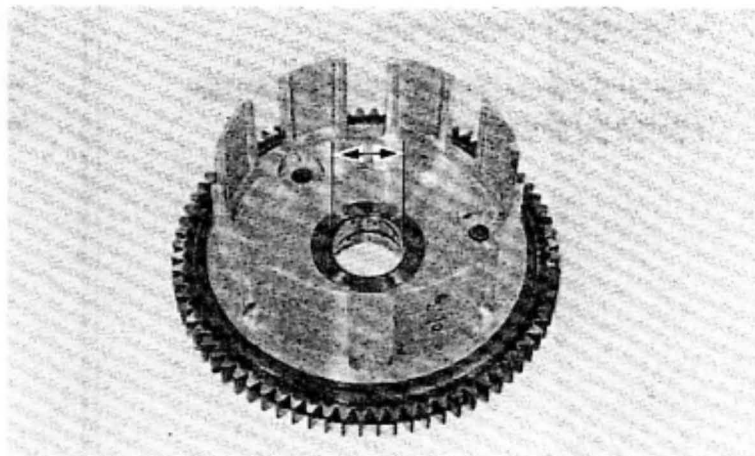


**HONDA**  
**VF400F**

### • CLUTCH OUTER

Check the slots in the clutch outer for nicks, cuts or indentations made by the friction discs. Measure the I.D. of the clutch outer bushing.

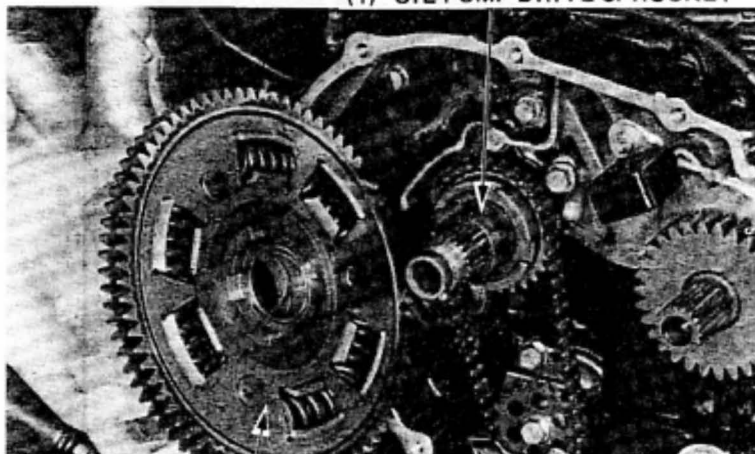
**SERVICE LIMIT: 29.06 mm (1.144 in)**



## CLUTCH ASSEMBLY

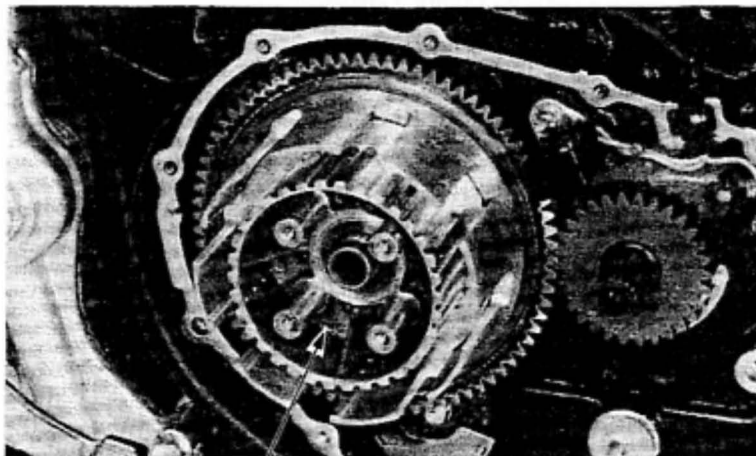
Install the clutch outer onto the main shaft, aligning the lugs on the clutch outer boss with the grooves in the oil pump drive sprocket flange.

(1) OIL PUMP DRIVE SPROCKET



(2) CLUTCH OUTER

Install the thrust washer and clutch center.



(1) CLUTCH CENTER

## CLUTCH

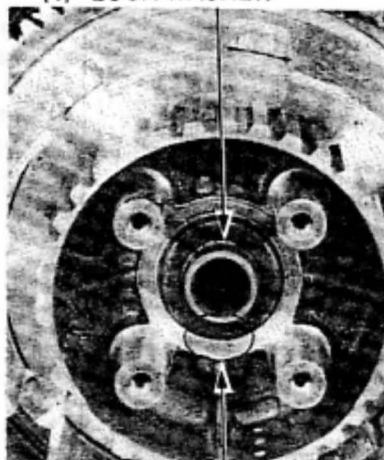


**HONDA**  
**VF400F**

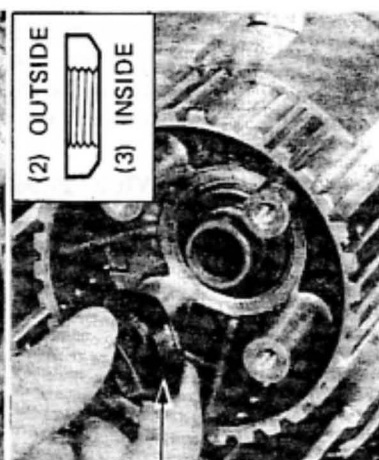
Install the lock washer with the "OUTSIDE" mark facing out.

Install the lock nut with the chamfered side facing in.

(1) LOCK WASHER



(4) "OUTSIDE" MARK



(5) LOCK NUT

Install the clutch center holder to hold the clutch center.  
Tighten the lock nut.

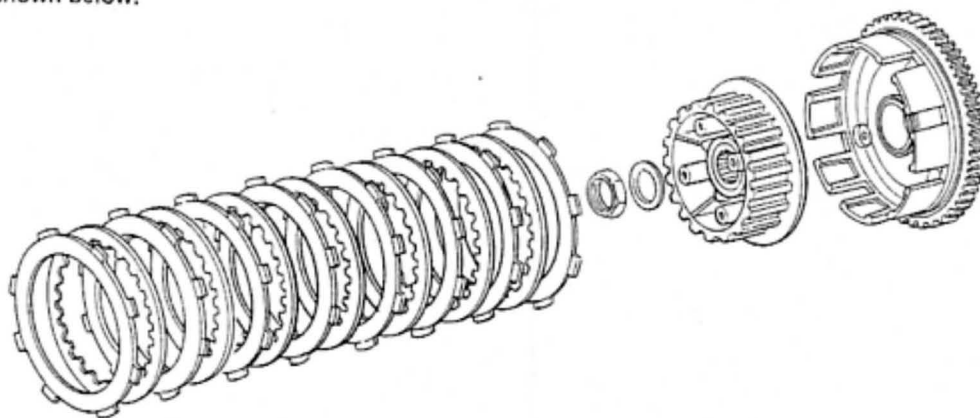
**TORQUE: 60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)**

(1) CLUTCH CENTER HOLDER  
07725-0050000



(2) LOCK NUT WRENCH, 17 x 27 mm  
07716-0020300  
EXTENSION BAR 07716-0020500

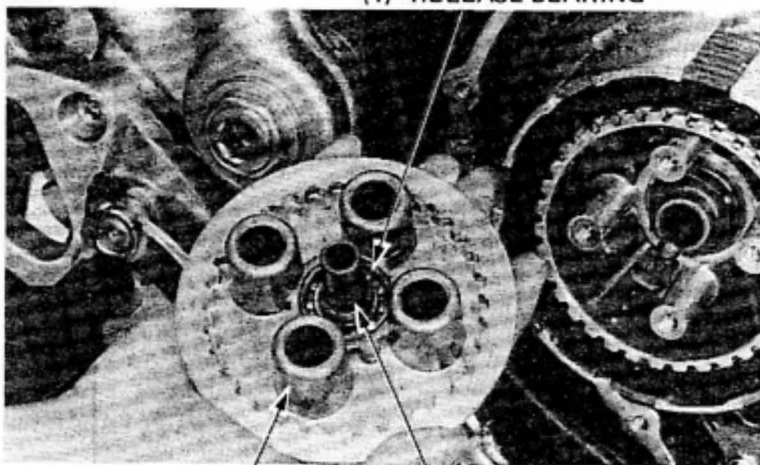
Coat the discs and plates with clean engine oil and install them as shown below.





Install the release bearing and lifter guide into the clutch pressure plate.

(1) RELEASE BEARING

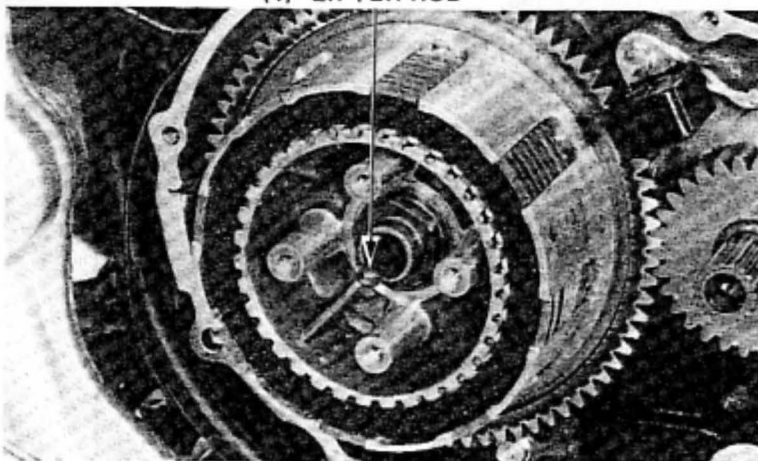


(2) PRESSURE PLATE

(3) LIFTER GUIDE

Insert the lifter rod into the mainshaft with its dent side (gold plating side) facing to the slave cylinder.

(1) LIFTER ROD

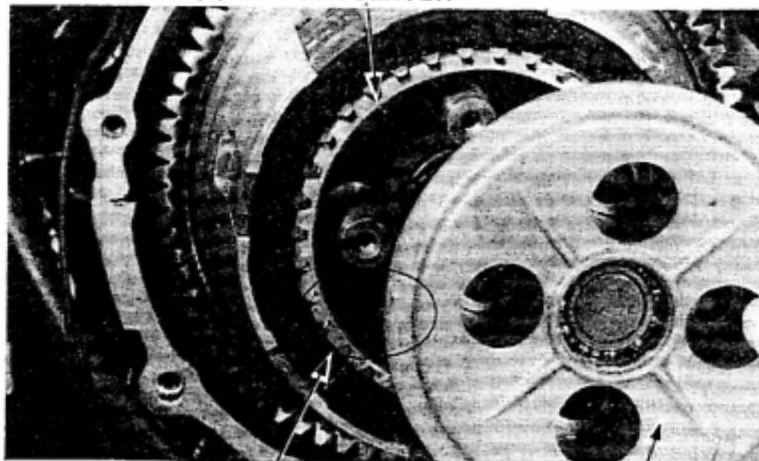


Install the pressure plate, aligning the "O" marks on the pressure plate and clutch center.

**NOTE:**

Before installing the pressure plate, release the clutch lever by removing the string.

(1) CLUTCH CENTER



(2) "O" MARKS

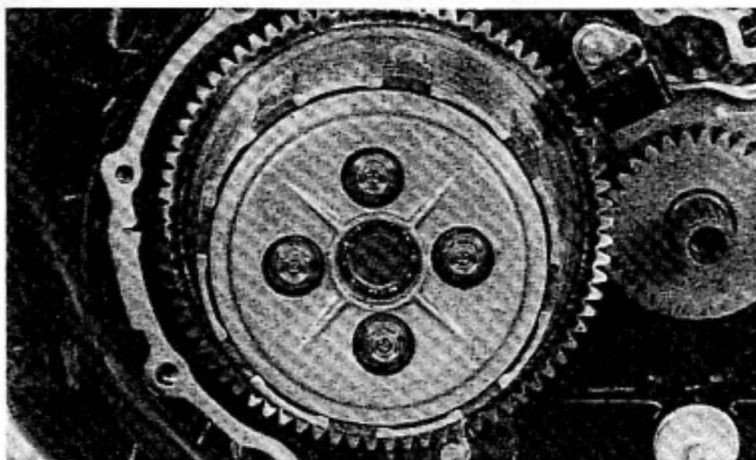
(3) PRESSURE PLATE

## CLUTCH



**HONDA**  
**VF400F**

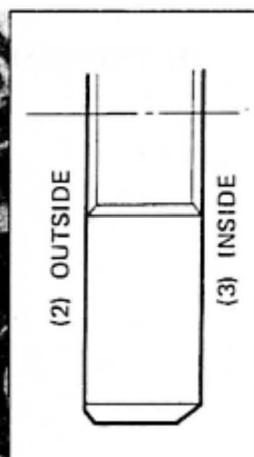
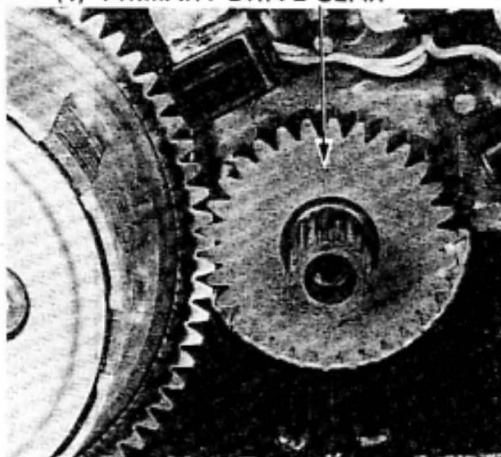
Install the clutch springs and bolts and tighten the bolts in a crisscross pattern and in 2-3 steps.



## STARTER CLUTCH ASSEMBLY

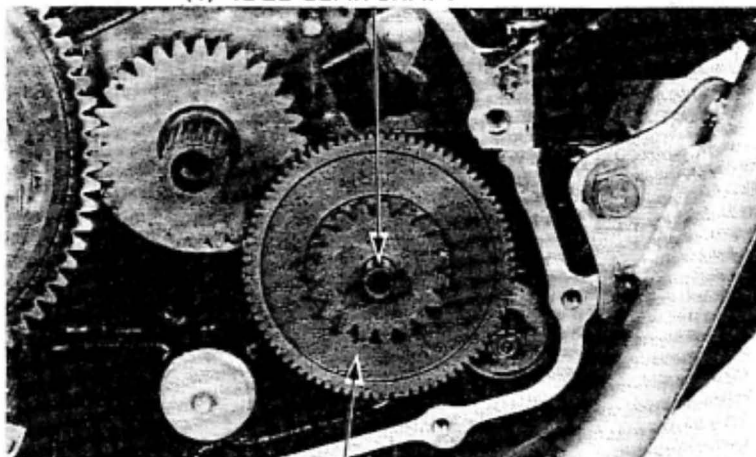
Install the primary drive gear onto the crankshaft with the large camfered side facing in.

(1) PRIMARY DRIVE GEAR



Install the starter idle gear and shaft.

(1) IDLE GEAR SHAFT



(2) STARTER IDLE GEAR

## CLUTCH



**HONDA**  
**VF400F**

Install the springs, plungers and rollers into the starter clutch.

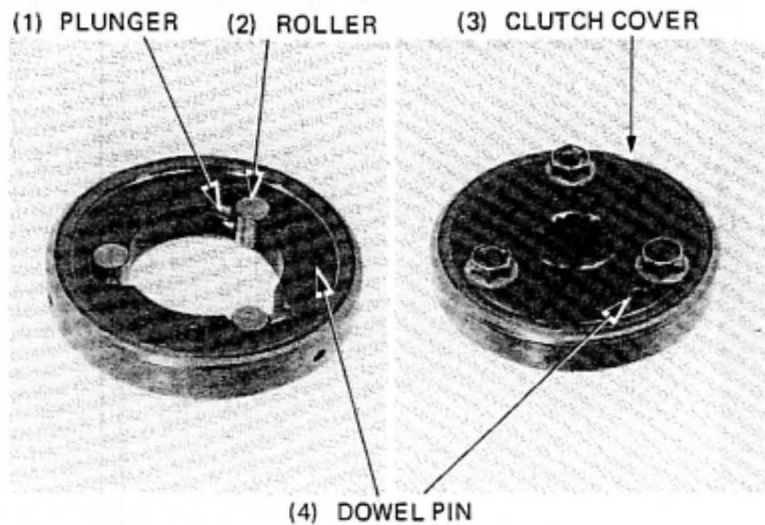
Install the dowel pin.

Install the starter clutch cover aligning the dowel pin hole with the dowel pin and tighten the bolts.

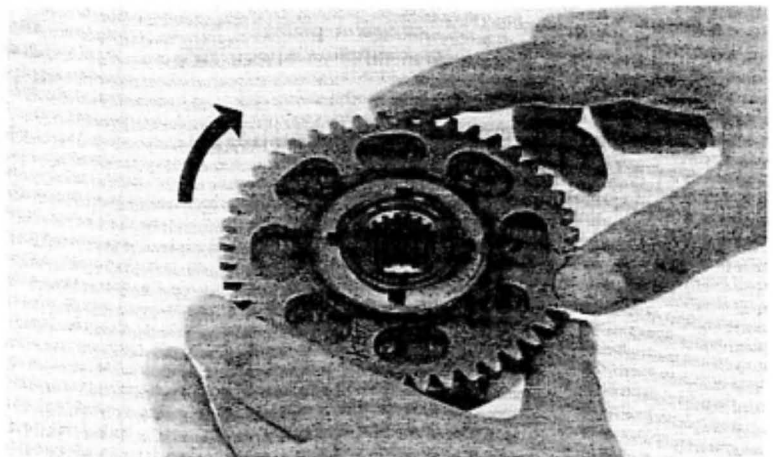
**TORQUE: 26–30 N·m (2.6–3.0 kg·m, 19–22 ft·lb)**

### NOTE:

Apply a locking agent to the bolt threads.

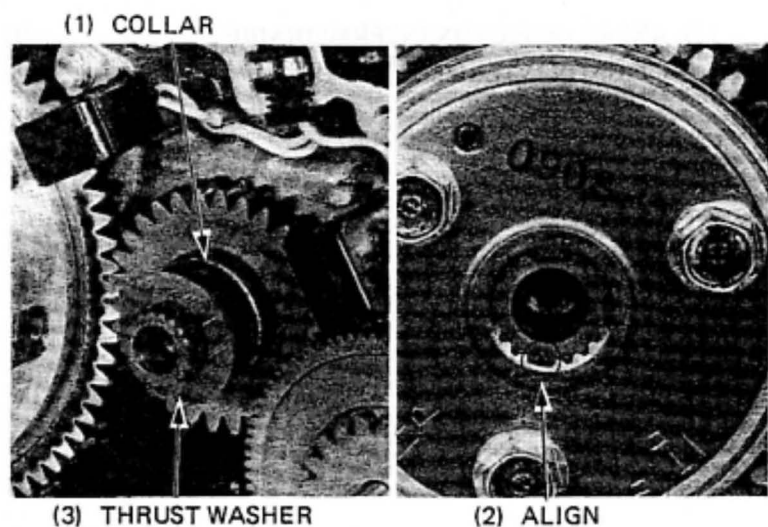


Install the starter driven gear by turning it clockwise.



Install the collar and thrust washer.

Install the starter clutch aligning the wide groove in the starter clutch with the side tooth on the crankshaft.





## CLUTCH



**HONDA**  
**VF400F**

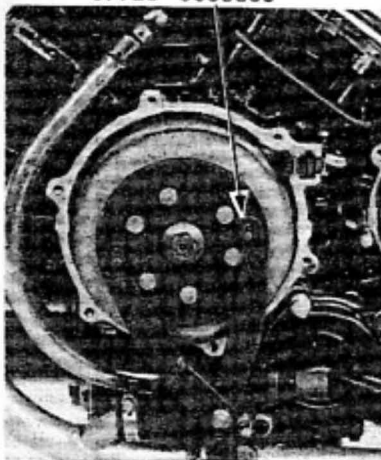
Hold the flywheel with universal holder, or shift the transmission into the 6th gear and apply the rear brake.

Tighten the starter clutch bolt.

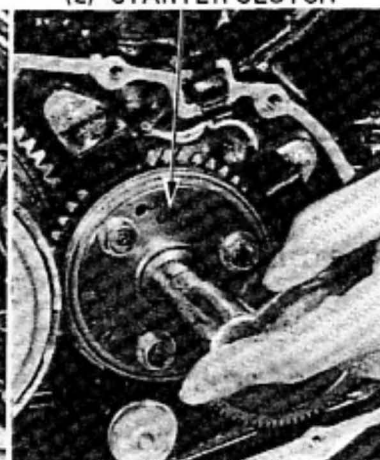
**TORQUE: 50–60 N·m (5.0–6.0 kg-m, 36–43 ft-lb)**

Install the alternator cover.

(1) UNIVERSAL HOLDER  
07725-0030000

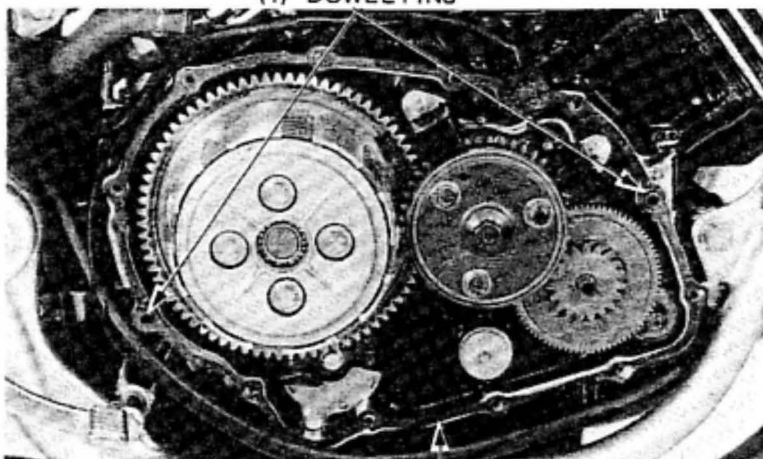


(2) STARTER CLUTCH

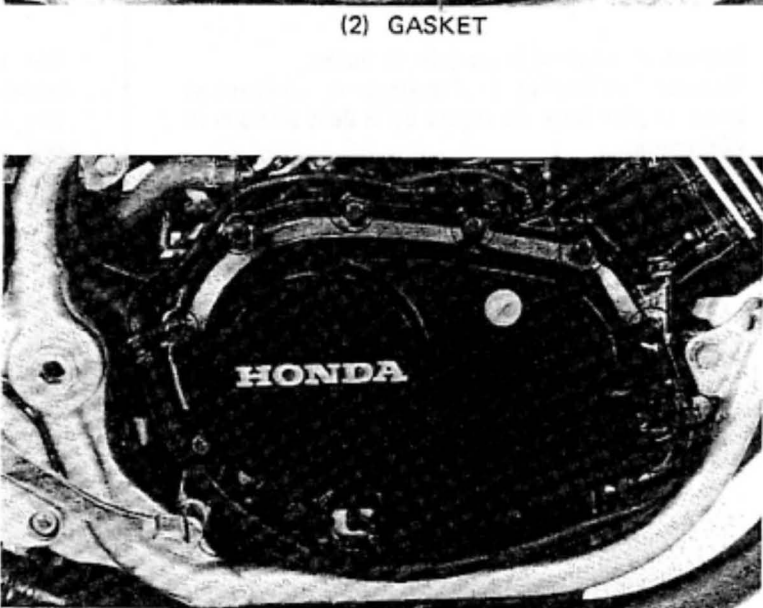


Install the dowel pins and a new gasket.

(1) DOWEL PINS

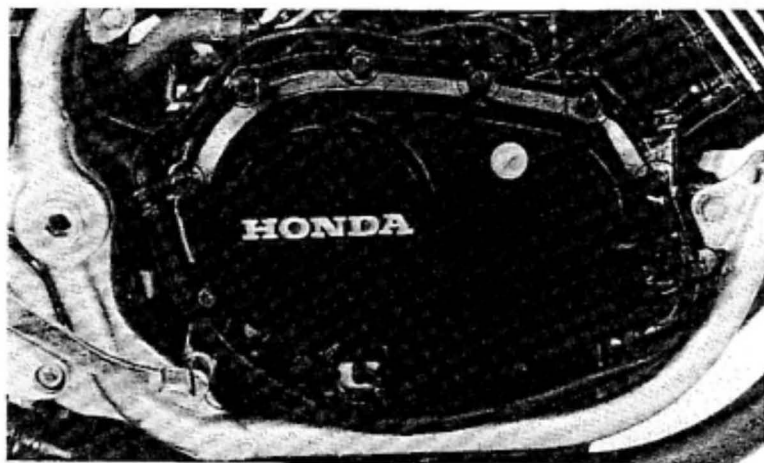


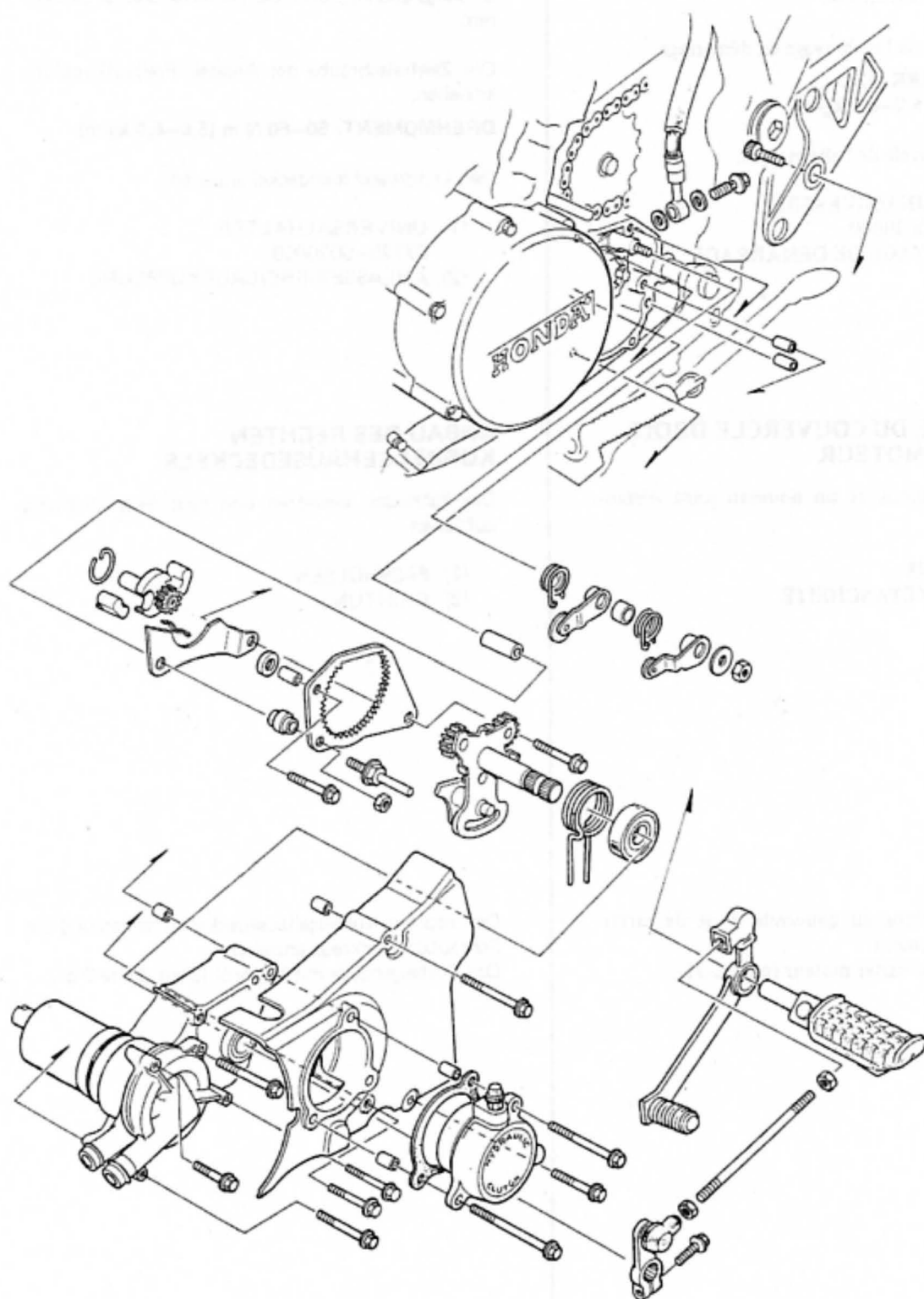
(2) GASKET



Install the right crankcase cover in a crisscross pattern.

Fill the crankcase with oil (page 2-3).







**HONDA**  
**VF400F**

# 8. GEARSHIFT LINKAGE

|                                |     |
|--------------------------------|-----|
| SERVICE INFORMATION            | 8-1 |
| TROUBLESHOOTING                | 8-1 |
| GEARSHIFT LINKAGE REMOVAL      | 8-2 |
| GEARSHIFT LINKAGE INSTALLATION | 8-5 |

## SERVICE INFORMATION

### GENERAL

- The gearshift spindle and stopper arms can be serviced with the engine in the frame.
- If the shift forks, drum and transmission require servicing, remove the engine and separate the crankcase.

## TROUBLESHOOTING

### Hard to shift

1. Air bubbles in the clutch hydraulic system
2. Shift forks bent
3. Shift claw bent
4. Shift drum cam grooves damaged

### Transmission jumps out of gear

1. Gear dogs worn
2. Shift shaft bent
3. Shift drum stopper broken
4. Shift forks bent



## GEARSHIFT LINKAGE REMOVAL

Shift the transmission into neutral.

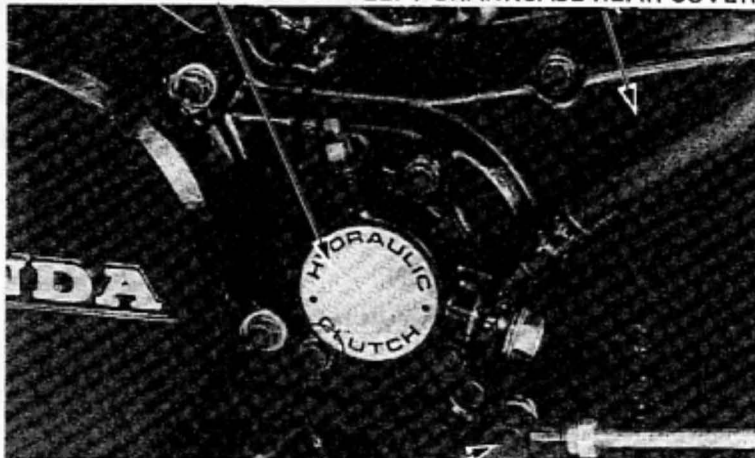
Remove the clutch slave cylinder.

### NOTE:

To prevent the clutch system from air contamination, and the slave cylinder piston from falling, squeeze the clutch lever immediately after removing the slave cylinder, and tie the lever to the handle grip with a string.

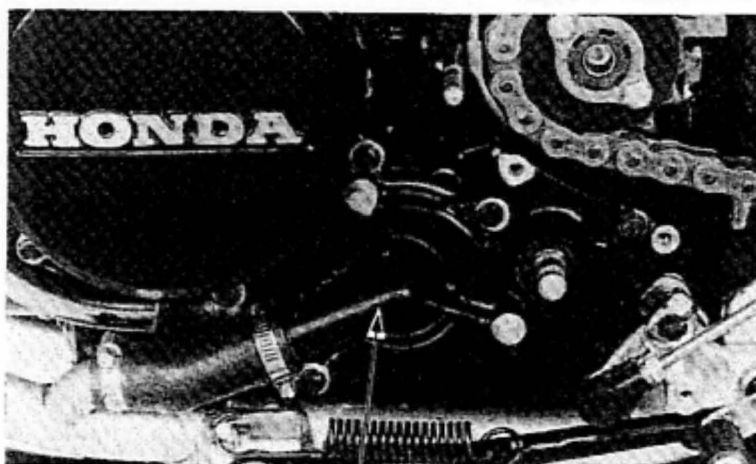
Remove the gearshift arm and left crankcase rear cover.

(1) CLUTCH SLAVE CYLINDER (2) LEFT CRANKCASE REAR COVER



(3) GEARSHIFT ARM

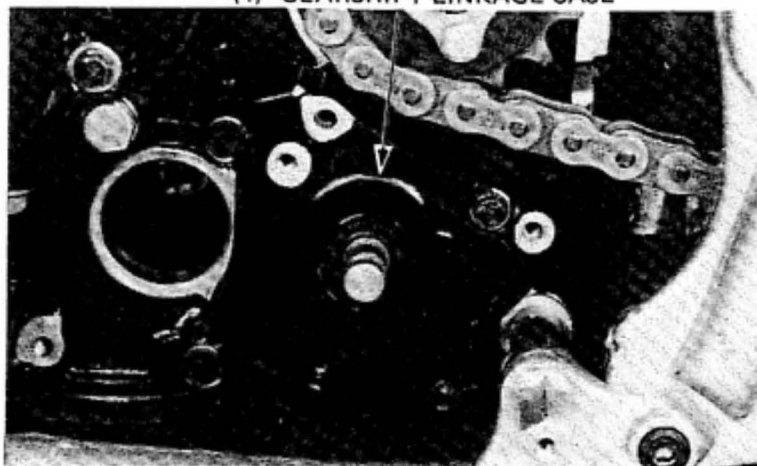
Remove the water pump (page 6-9).



(1) WATER PUMP

Remove the shift linkage case bolts.

(1) GEARSHIFT LINKAGE CASE



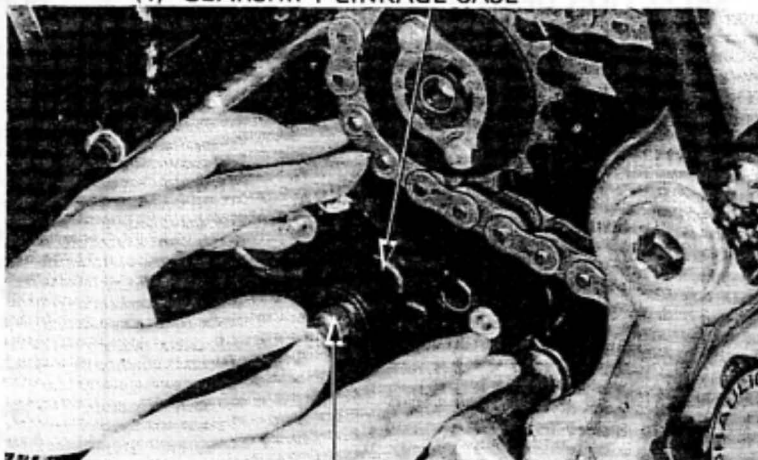
## GEARSHIFT LINKAGE



**HONDA**  
**VF400F**

Remove the gearshift linkage case while pushing the gearshift spindle in.

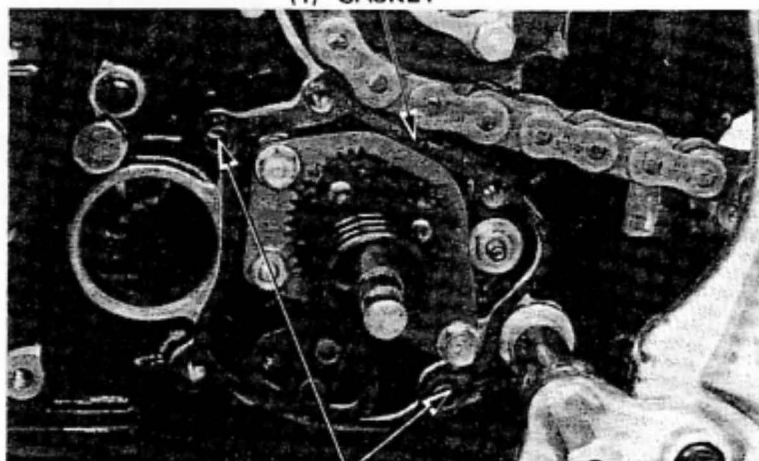
(1) GEARSHIFT LINKAGE CASE



(2) GEARSHIFT SPINDLE

Remove the gasket and dowel pins.

(1) GASKET

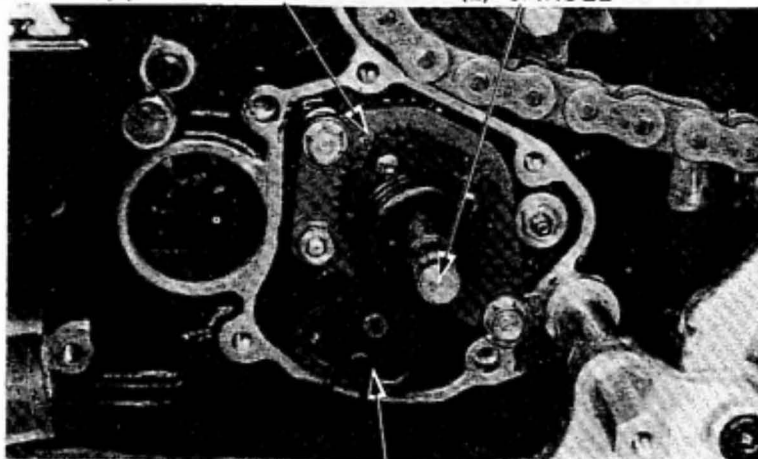


(2) DOWEL PINS

Remove the one nut and two bolts and remove the spindle guide plate and spring as a set.

(1) GUIDE PLATE

(2) SPINDLE

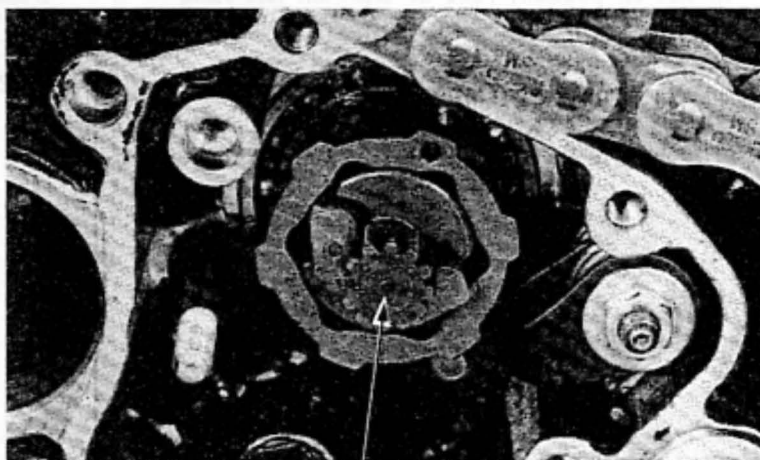


(3) SPRING



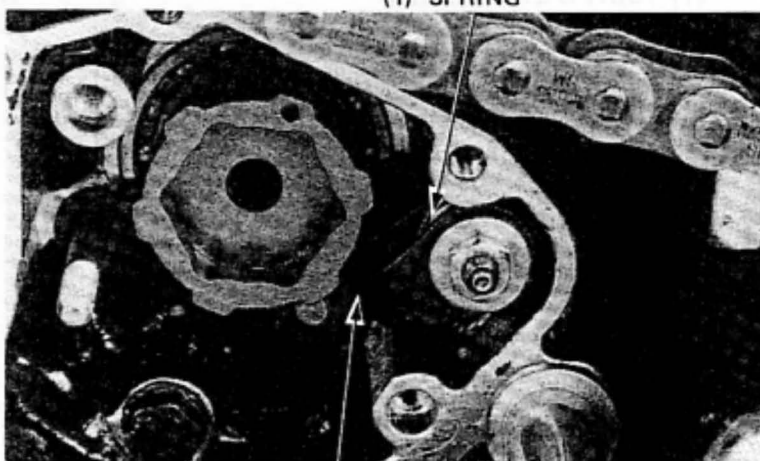


Remove the drum shifter.



(1) DRUM SHIFTER

Remove the neutral stopper arm and spring by removing the nut.



(1) SPRING

(2) NEUTRAL STOPPER ARM

Remove the drum stopper arm and spring.



(1) SPRING

(2) DRUM STOPPER ARM

## GEARSHIFT LINKAGE



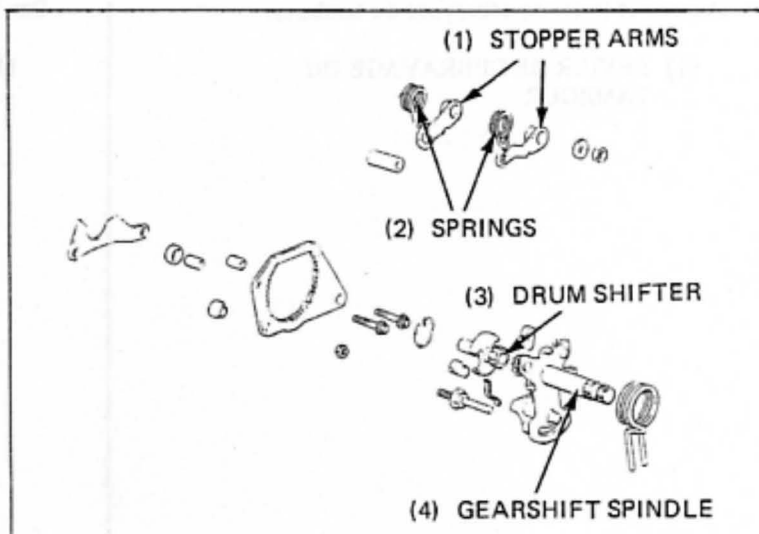
**HONDA**  
**VF400F**

### INSPECTION

Check the stopper arms and springs for damage.  
Check the planet gear of the gearshift spindle for wear or damage.

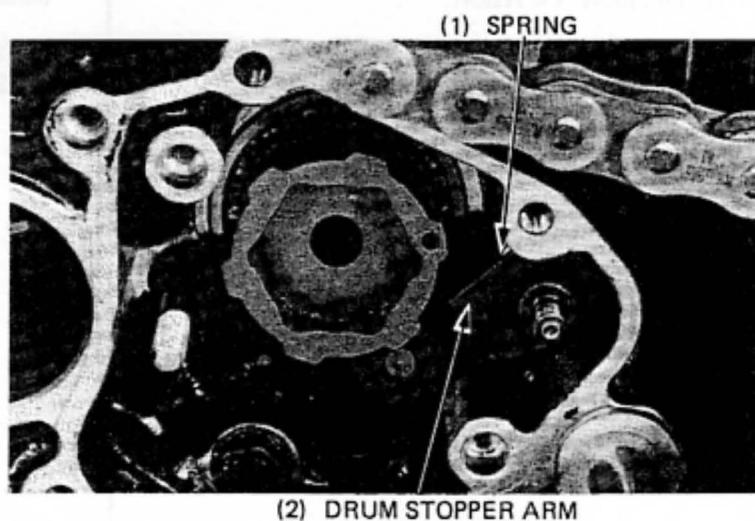
Check the drum shifter for wear or damage.

Check the ball bearing in the linkage case for damage or excessive play.



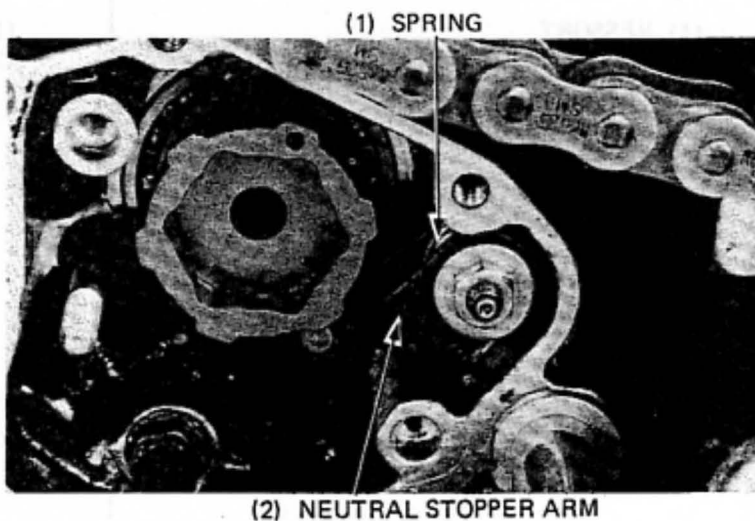
### GEARSHIFT LINKAGE INSTALLATION

Install the drum stopper arm and spring.



Move the gearshift drum to the neutral position.

Install the neutral stopper arm and spring.  
Install the washer and nut, and tighten the nut.



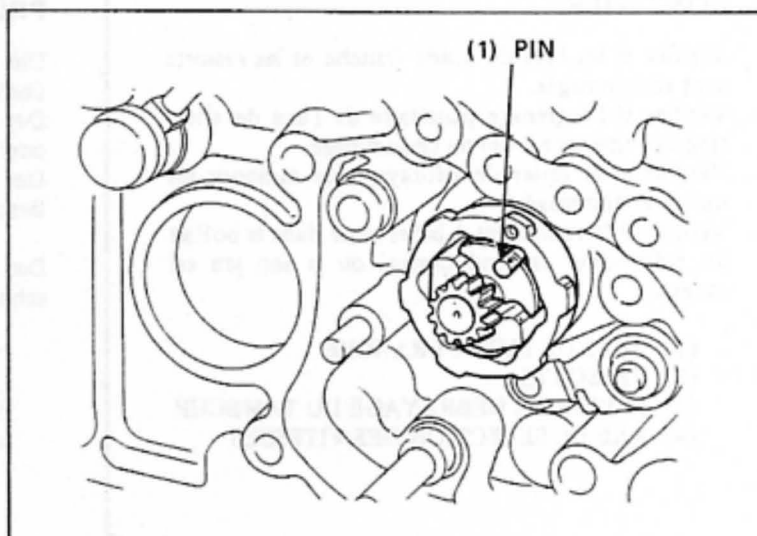
## GEARSHIFT LINKAGE



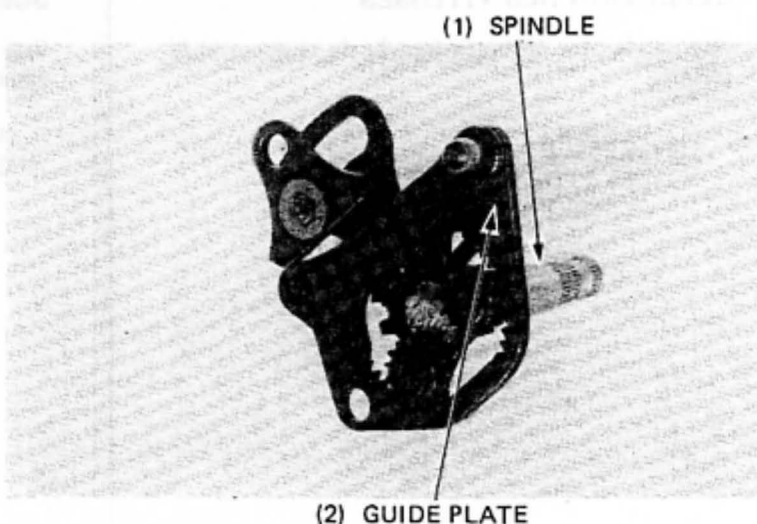
**HONDA**  
**VF400F**

Install the collar.

Install the drum shifter assembly as shown in the figure and install a taper pin to prevent the shifter assembly from turning.



Assemble the spindle and guide plate.



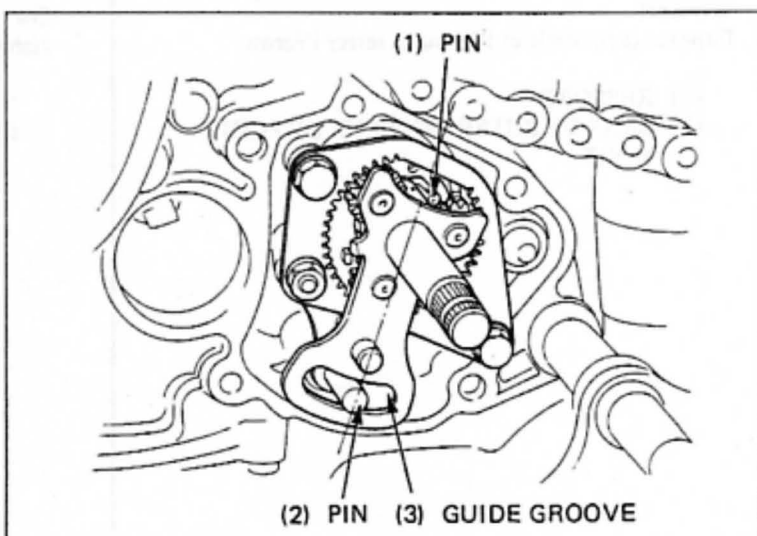
Install the spindle assembly.

### NOTE:

- Align the center of the guide groove in the shift spindle with the center of the pin.
- Be careful not to shift the drum shifter from the neutral position.

Tighten the bolts and nut.

Remove the taper pin from the shifter assembly.

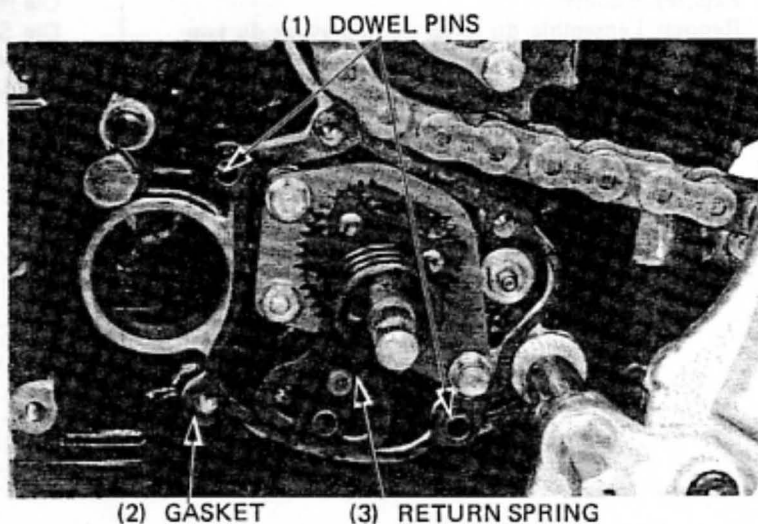


## GEARSHIFT LINKAGE

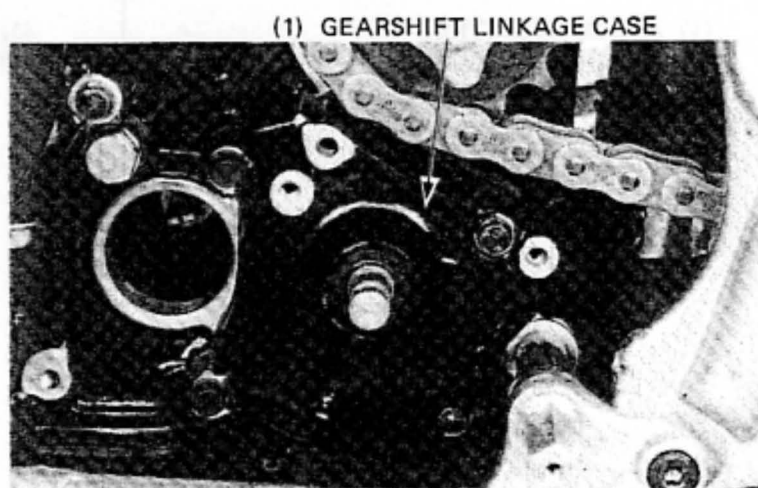


**HONDA**  
**VF400F**

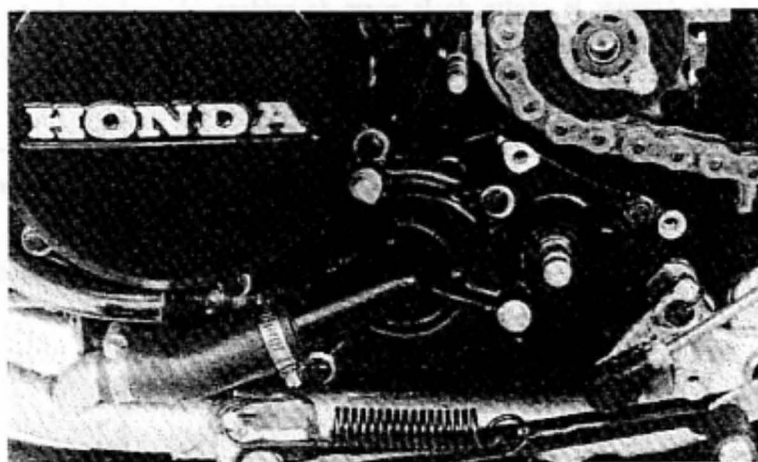
Install the return spring.  
Install the dowel pins and a new gasket.



Install the gearshift linkage case.  
Check the operation of the gearshift linkage.



Install the water pump (page 6-11).



## GEARSHIFT LINKAGE



**HONDA**  
**VF400F**

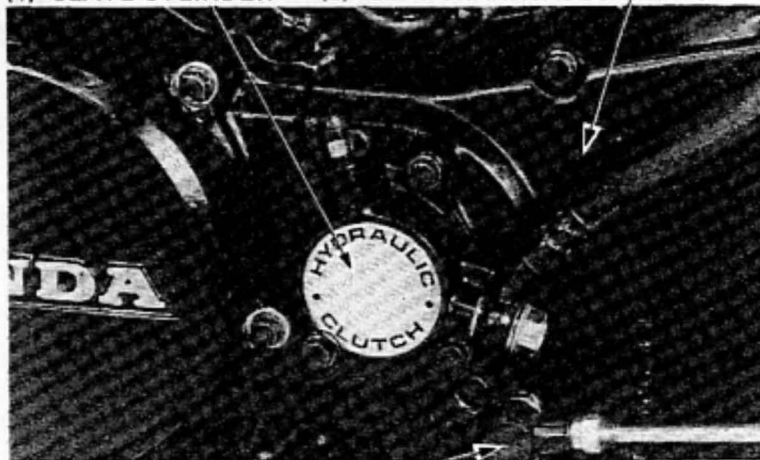
Install the left crankcase rear cover.

Install the clutch slave cylinder and gearshift arm.

### NOTE:

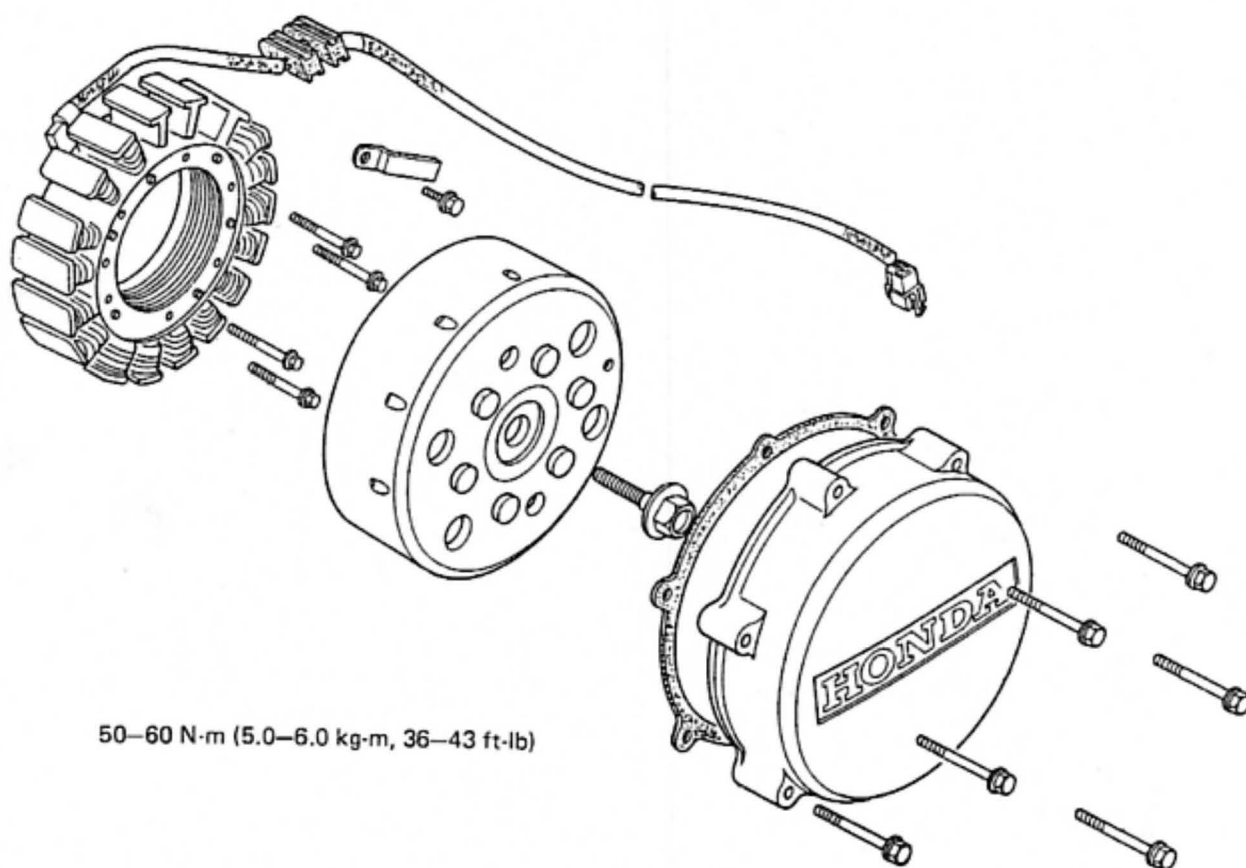
When installing the clutch slave cylinder, temporarily install it to the left crankcase rear cover, release the clutch lever by removing the string, and then tighten the slave cylinder bolts.

(1) SLAVE CYLINDER (2) LEFT CRANKCASE REAR COVER



(3) GEARSHIFT ARM





50–60 N·m (5.0–6.0 kg·m, 36–43 ft·lb)



|                       |     |
|-----------------------|-----|
| SERVICE INFORMATION   | 9-1 |
| FLYWHEEL REMOVAL      | 9-2 |
| STATOR REMOVAL        | 9-3 |
| STATOR INSTALLATION   | 9-3 |
| FLYWHEEL INSTALLATION | 9-4 |

## SERVICE INFORMATION

### GENERAL

- This section covers removal and installation of the alternator.  
Refer to section 17 for troubleshooting and inspection of the alternator.

### TORQUE VALUE

Flywheel bolt 50—60 N·m (5.0—6.0 kg·m, 36—43 ft·lb)

### TOOLS

|                  |               |
|------------------|---------------|
| Common           |               |
| Universal holder | 07725-0030000 |
| Flywheel puller  | 07733-0020000 |



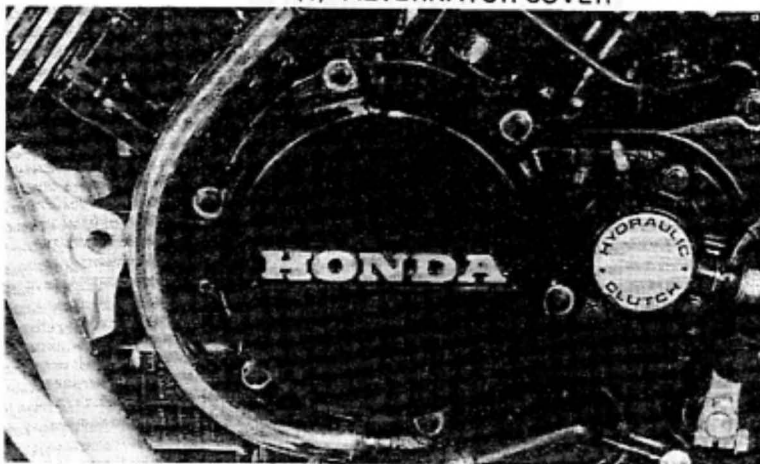
## FLYWHEEL REMOVAL

Place a container under the alternator cover to catch engine oil.

Remove the clutch slave cylinder (page 7-7).

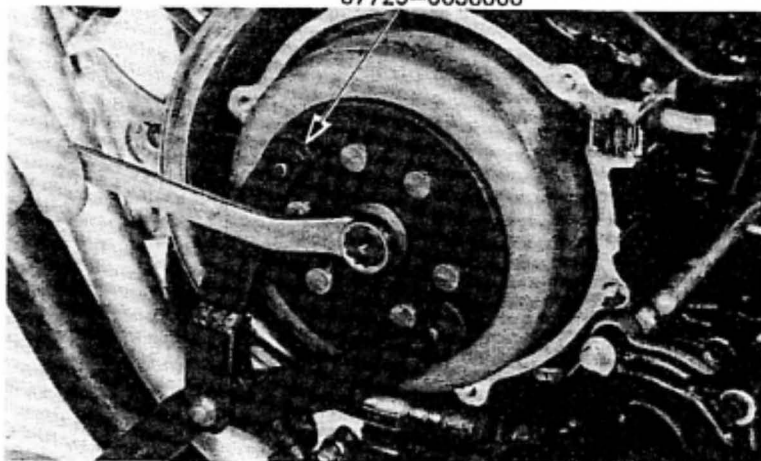
Remove the alternator cover.

(1) ALTERNATOR COVER



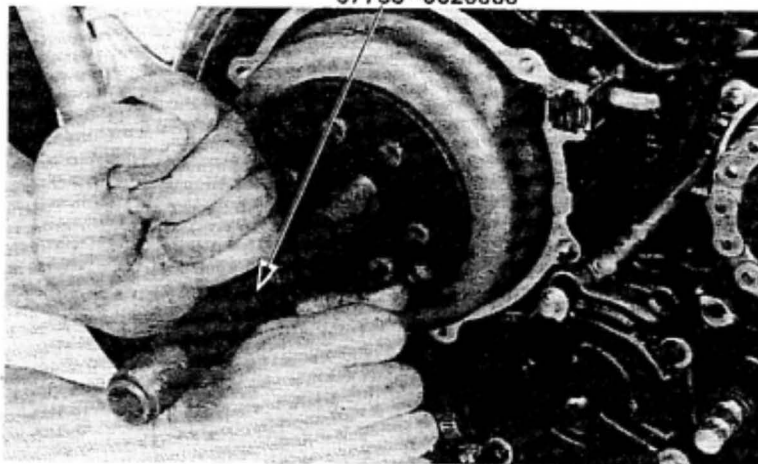
Hold the flywheel with universal holder and remove the flywheel bolt.

(1) UNIVERSAL HOLDER  
07725-0030000



Remove the flywheel with the rotor puller.  
Remove the woodruff key from the crankshaft.

(1) FLYWHEEL PULLER  
07733-0020000

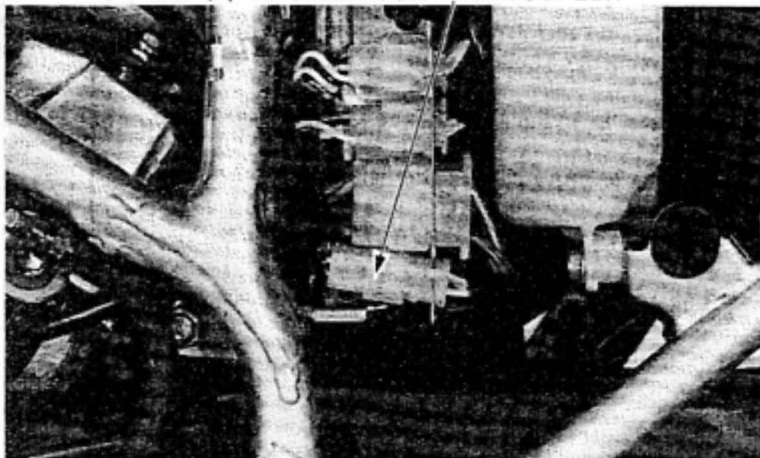




## STATOR REMOVAL

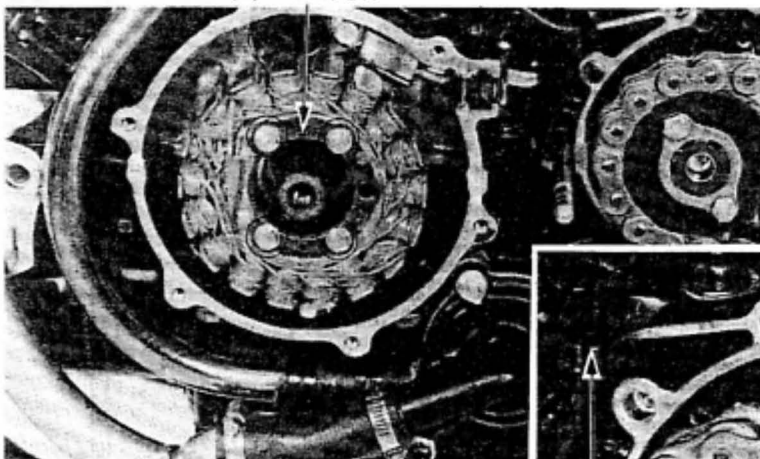
Remove the frame left side cover.  
Disconnect the alternator wire coupler.

(1) ALTERNATOR WIRE COUPLER



Remove the alternator wire from the clamp.  
Remove the stator by removing four bolts, being careful not to damage the stator coil.

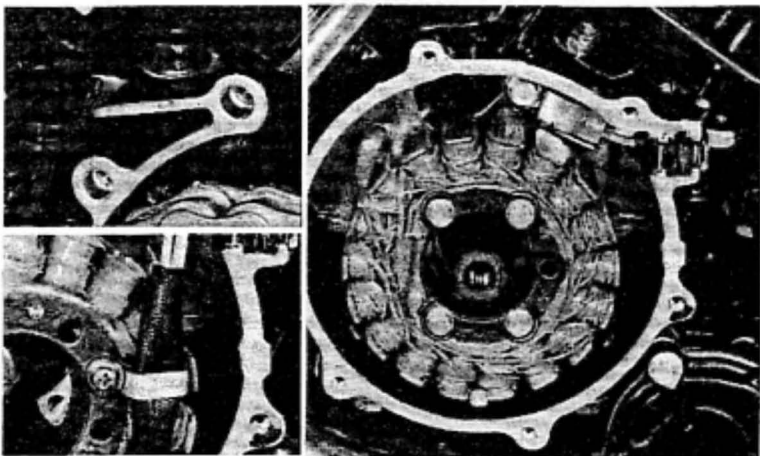
(1) STATOR



(2) CLAMP

## STATOR INSTALLATION

Install the wire clamp to the back of the stator with the screw.  
Route the alternator wire properly, secure it with clamp and connect the alternator wire coupler to the main harness.  
Install the frame left side cover.





## FLYWHEEL INSTALLATION

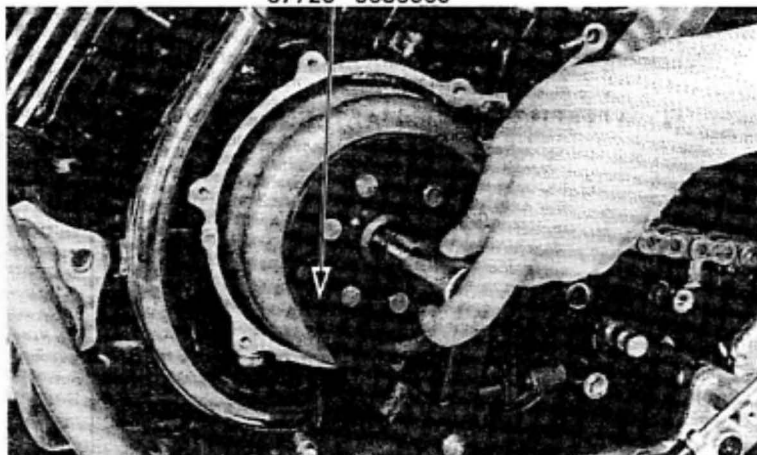
Clean the inside of the flywheel.

Check the taper portion of the crankshaft and clean or repair as necessary.

Install the flywheel onto the crankshaft.  
Hold the flywheel with the universal holder and tighten the flywheel bolt.

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

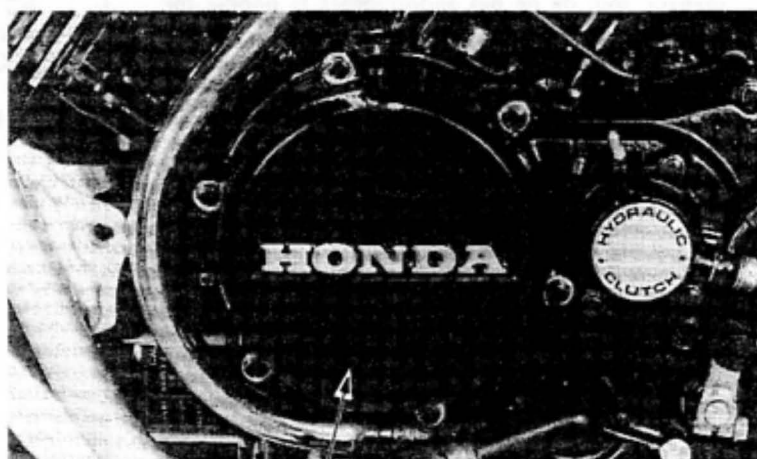
(1) UNIVERSAL HOLDER  
07725-0030000



Install the alternator cover.

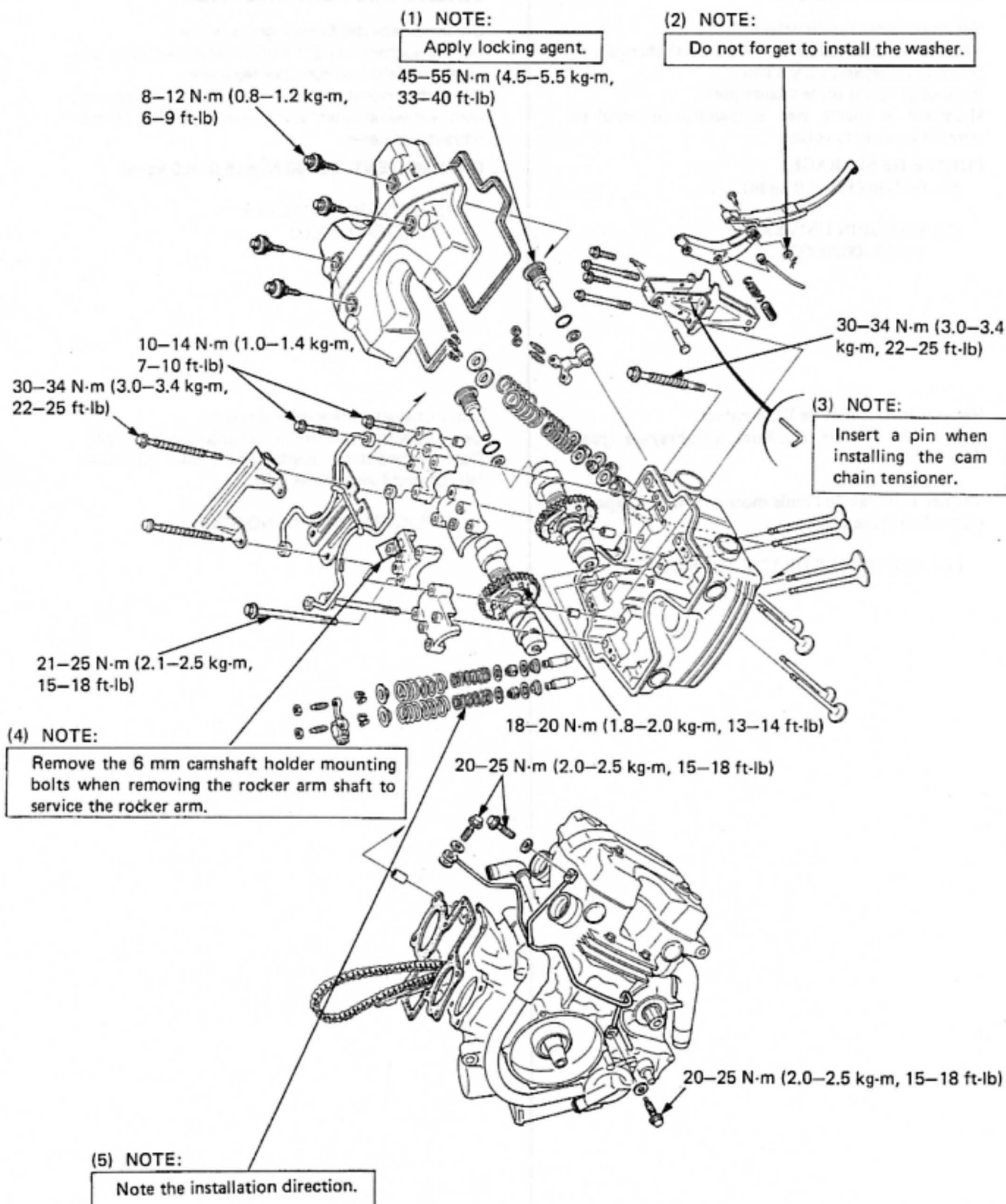
Install the clutch slave cylinder (page 7-9).

Check the engine oil level and add if necessary (page 2-3).



(1) ALTERNATOR COVER





# 10. CYLINDER HEAD / VALVE



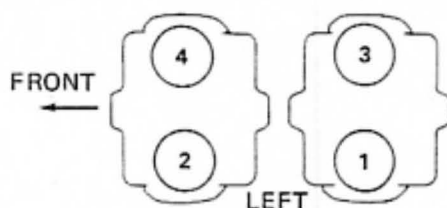
**HONDA**  
**VF400F**

|                           |       |                                    |       |
|---------------------------|-------|------------------------------------|-------|
| SERVICE INFORMATION       | 10-1  | VALVE SEAT INSPECTION/<br>REFACING | 10-14 |
| TROUBLESHOOTING           | 10-2  |                                    |       |
| CAMSHAFT REMOVAL          | 10-3  | CYLINDER HEAD ASSEMBLY             | 10-15 |
| CYLINDER HEAD REMOVAL     | 10-7  | CYLINDER HEAD INSTALLATION         | 10-17 |
| CYLINDER HEAD DISASSEMBLY | 10-9  | CAMSHAFT INSTALLATION              | 10-19 |
| VALVE GUIDE REPLACEMENT   | 10-13 |                                    |       |

## SERVICE INFORMATION

### GENERAL

- If the cam sprockets of either front or rear cylinder are removed, the valve timing of both cylinders must be checked during reinstallation.
- Camshaft lubricating oil is fed through the external oil lines. Be sure the oil lines are not clogged.
- During assembly, apply molybdenum disulfide to the camshaft holder surfaces to provide initial lubrication.
- The cylinder numbering is given below:



### SPECIFICATIONS

|                      |                         |                      |                                   | STANDARD                                                 | SERVICE LIMIT        |
|----------------------|-------------------------|----------------------|-----------------------------------|----------------------------------------------------------|----------------------|
| Compression pressure |                         |                      |                                   | 900—1,400 kPa<br>(9—14 kg/cm <sup>2</sup> , 128—199 psi) | —                    |
| Camshaft             | Cam height              |                      | IN                                | 34.884—35.044 mm (1.3734—1.3797 in)                      | 34.81 mm (1.370 in)  |
|                      |                         |                      | EX                                | 34.884—35.044 mm (1.3734—1.3797 in)                      | 34.92 mm (1.375 in)  |
|                      | Runout                  |                      |                                   | —                                                        | 0.05 mm (0.002 in)   |
|                      | Oil clearance           | Both sides tightened | Inside                            | 0.110—0.190 mm (0.0043—0.0075 in)                        | 0.194 mm (0.0076 in) |
|                      |                         |                      | Outside                           | 0.06—0.126 mm (0.0024—0.0050 in)                         | 0.130 mm (0.0051 in) |
|                      |                         | One side tightened   |                                   | 0.045—0.106 mm (0.0018—0.0042 in)                        | 0.110 mm (0.0043 in) |
| Rocker arm           | Rocker arm I.D.         |                      |                                   | 12.000—12.018 mm (0.4724—0.4731 in)                      | 12.05 mm (0.474 in)  |
|                      | Shaft O.D.              |                      |                                   | 11.966—11.984 mm (0.4711—0.4718 in)                      | 11.93 mm (0.470 in)  |
| Valve                | Valve stem O.D.         |                      | IN                                | 4.975—4.990 mm (0.1959—0.1965 in)                        | 4.97 mm (0.196 in)   |
|                      |                         |                      | EX                                | 4.955—4.970 mm (0.1951—0.1957 in)                        | 4.94 mm (0.195 in)   |
|                      | Valve guide I.D.        |                      |                                   | 5.000—5.012 mm (0.1969—0.1973 in)                        | 5.04 mm (0.198 in)   |
|                      | Stem-to-guide clearance | IN                   | 0.010—0.037 mm (0.0004—0.0015 in) | 0.07 mm (0.003 in)                                       |                      |
|                      |                         | EX                   | 0.030—0.050 mm (0.0012—0.0020 in) | 0.10 mm (0.004 in)                                       |                      |
|                      | Valve seat width        |                      |                                   | 0.9—1.1 mm (0.035—0.043 in)                              | 1.5 mm (0.06 in)     |
| Valve spring         | Free length             |                      | Inner                             | 33.4 mm (1.31 in)                                        | 31.7 mm (1.25 in)    |
|                      |                         |                      | Outer                             | 38.0 mm (1.50 in)                                        | 36.7 mm (1.44 in)    |
| Cylinder head        | Warpage                 |                      |                                   | —                                                        | 0.1 mm (0.004 in)    |



## TORQUE VALUES

|                     |           |                                       |
|---------------------|-----------|---------------------------------------|
| Cylinder head cover |           | 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)    |
| Cam sprocket        |           | 18–20 N·m (1.8–2.0 kg-m, 13–14 ft-lb) |
| Rocker arm shaft    |           | 45–55 N·m (4.5–5.5 kg-m, 33–40 ft-lb) |
| Cylinder head       |           | 30–34 N·m (3.0–3.4 kg-m, 22–25 ft-lb) |
| Camshaft holder     | bolt A    | 30–34 N·m (3.0–3.4 kg-m, 22–25 ft-lb) |
|                     | bolt B    | 21–25 N·m (2.1–2.5 kg-m, 15–18 ft-lb) |
|                     | 6 mm bolt | 10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)  |
| Oil pass pipe       |           | 20–25 N·m (2.0–2.5 kg-m, 15–18 ft-lb) |

## TOOLS

### Special

|                                    |               |
|------------------------------------|---------------|
| Valve guide driver/remover, 5.0 mm | 07942-MA60000 |
| Valve guide driver                 | 07943-KE70000 |
| Valve guide reamer, 5.0 mm         | 07984-MA60000 |
| Valve adjusting wrench             | 07908-MB00100 |

### Common

|                         |               |
|-------------------------|---------------|
| Valve adjusting wrench  | 07708-0030300 |
| Valve spring compressor | 07757-0010000 |

|                              |               |
|------------------------------|---------------|
| Valve seat cutter, 45° 22 mm | 07780-0010701 |
| Valve seat cutter, 60° 22 mm | 07780-0014202 |
| Valve seat cutter, 32° 22 mm | 07780-0012601 |
| Valve seat cutter, 32° 19 mm | 07780-0012700 |
| Valve seat cutter holder     | 07781-0010400 |

10

## TROUBLESHOOTING

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

### Low compression

- Valves
  - Incorrect valve adjustment
  - Burned or bent valves
  - Incorrect valve timing
  - Broken valve spring
- Cylinder head
  - Leaking or damaged head gasket
  - Warped or cracked cylinder head
- Cylinder and piston (Refer to Section 12)

### Compression too high

- Excessive carbon build-up on piston or combustion chamber

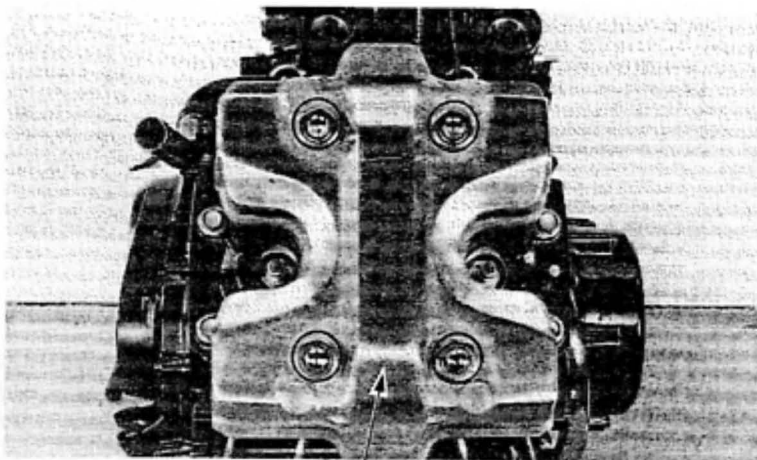
### Excessive noise

- Incorrect valve adjustment
- Sticking valve or broken valve spring
- Damaged or worn camshaft
- Loose or worn cam chain
- Worn or damaged cam chain tensioner
- Worn cam sprocket teeth
- Worn rocker arm and/or shaft



## CAMSHAFT REMOVAL

Remove the four cylinder head cover bolts and the cover.

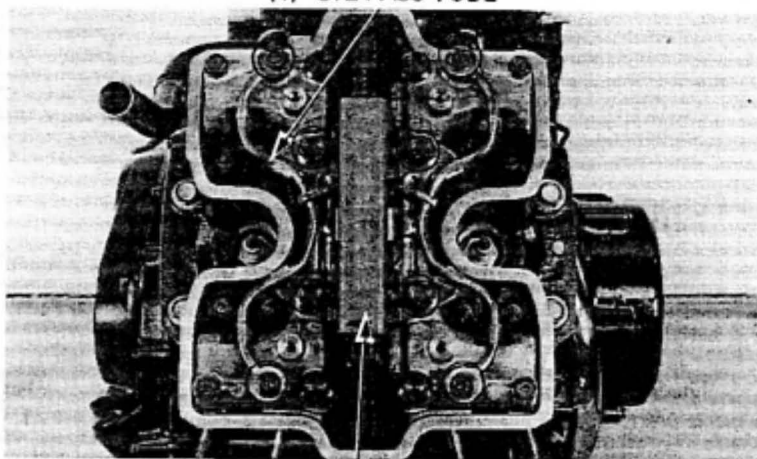


(1) CYLINDER HEAD COVER

Remove the four cam chain guide mounting bolts and the cam chain guide.

Remove the four bolts attaching the oil pass tube and the tube.

(1) OIL PASS TUBE

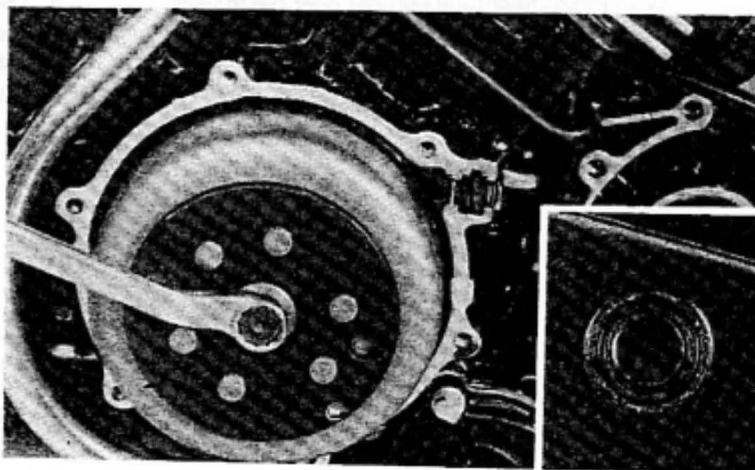


(2) CAM CHAIN GUIDE

Remove the timing hole cap from the right crankcase cover.

Remove the alternator cover (page 9-2).

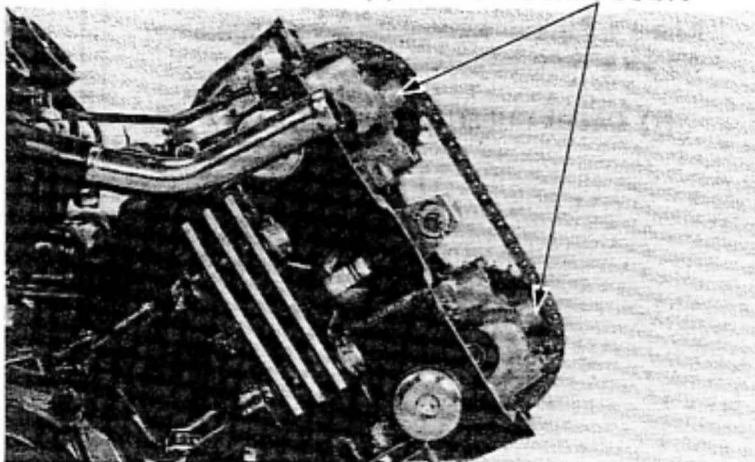
Turn the crankshaft counterclockwise and align the "TF" mark for the front cylinder, or "TR" mark for the rear cylinder, with the index mark.





Remove the intake and exhaust cam sprocket bolts. Turn the crankshaft counterclockwise 360° and remove the other cam sprocket bolts.

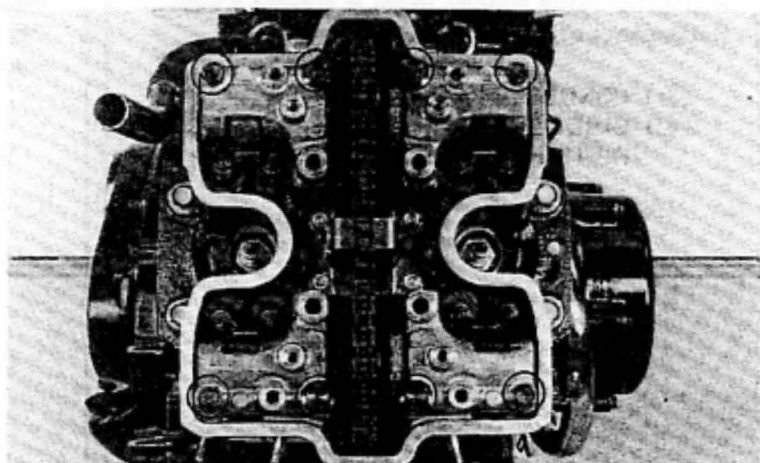
(1) CAM SPROCKET BOLTS



Slide the cam sprockets with the cam chain off the camshaft sprocket flange. Remove the camshaft holder bolts and holders.

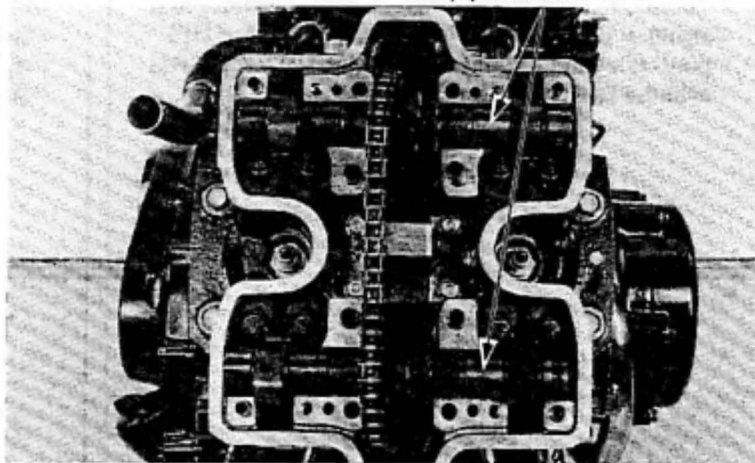
**NOTE:**

Mark all disassembled parts to ensure correct reassembly.



Remove the camshafts, cam chain, cam sprockets and dowel pins from the cylinder head.

(1) CAMSHAFTS

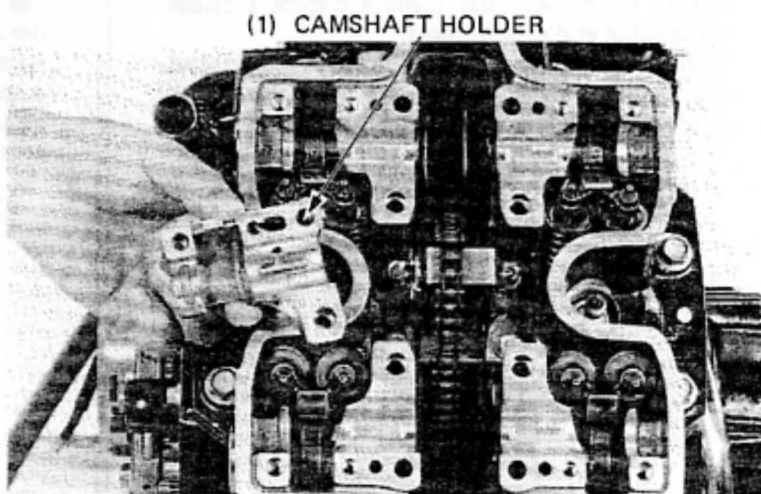






### CAMSHAFT/CAM HOLDER INSPECTION

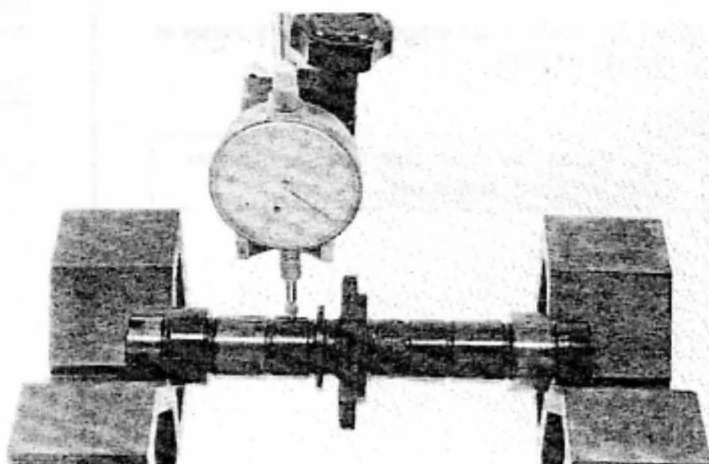
Inspect the camshaft and holder journal surfaces for scoring scratches, or evidence of insufficient lubrication.



### CAMSHAFT RUNOUT

Check camshaft runout with a dial indicator. Support both ends of the camshaft with V-blocks. Use 1/2 of the total indicator reading to determine runout.

**SERVICE LIMIT: 0.05 mm (0.002 in)**



### CAM INSPECTION

Using a micrometer, measure each cam lobe. Check for wear or damage.

**SERVICE LIMITS:**

IN: 34.81 mm (1.370 in)

EX: 34.92 mm (1.375 in)





Wipe any oil from the journals.

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

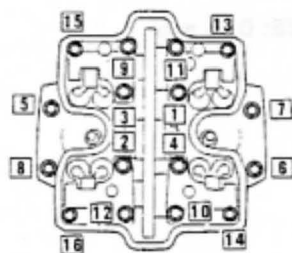
Install the camshaft holders and tighten in the sequence shown.

**NOTE:**

Do not rotate the camshaft when using plastigauge.

**TORQUE:**

- 1-8 30-34 N·m (3.0-3.4 kg-m, 22-25 ft-lb)
- 9-12 21-25 N·m (2.1-2.5 kg-m, 15-18 ft-lb)
- 13-16 10-14 N·m (1.0-1.4 kg-m, 7-10 ft-lb)



Remove the camshaft holders and measure the width of each plastigauge. The widest thickness determines the oil clearance.

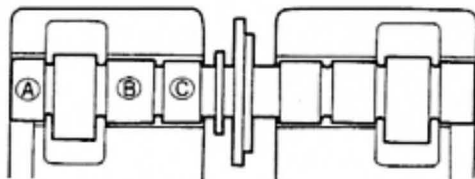
**SERVICE LIMIT:**

A: 0.110 mm (0.0043 in)

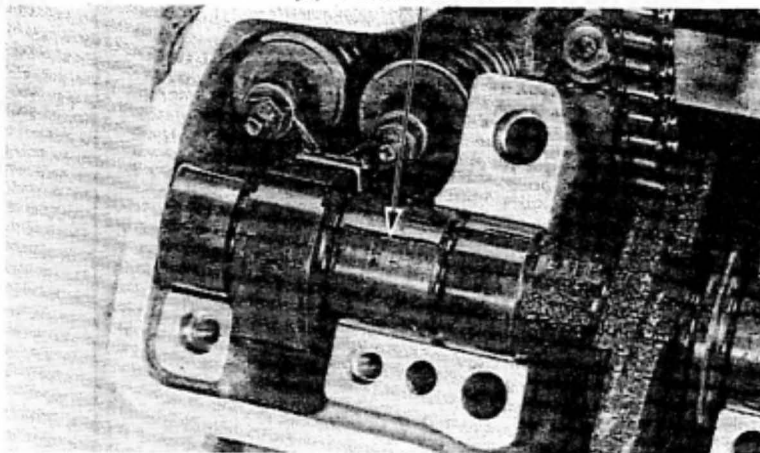
B: 0.130 mm (0.0051 in)

C: 0.194 mm (0.0076 in)

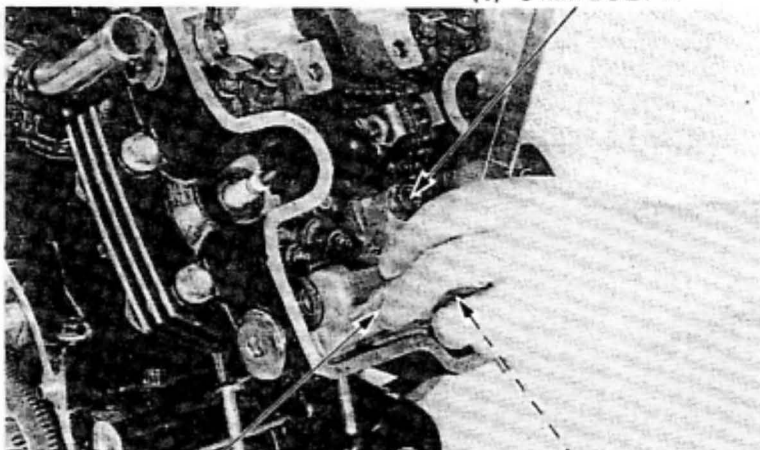
When the service limits are exceeded, replace the camshaft and recheck the oil clearance. Replace the cylinder head and camshaft holders if the clearance still exceeds service limits.



(1) PLASTIGAUGE

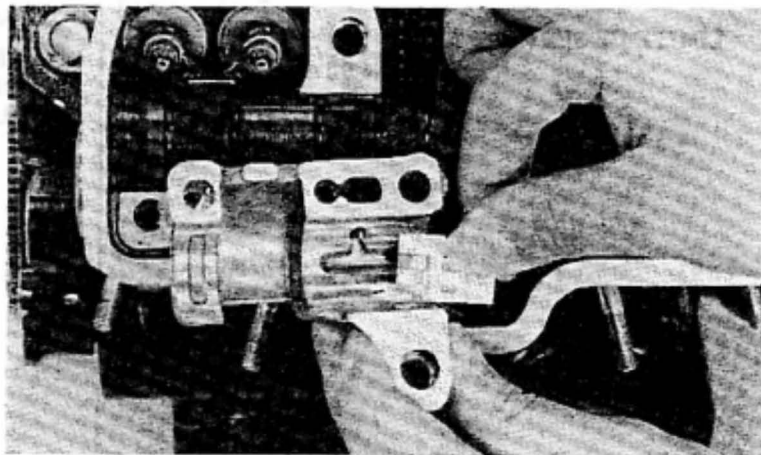


(1) 8 mm BOLT A



(2) 6mm BOLT

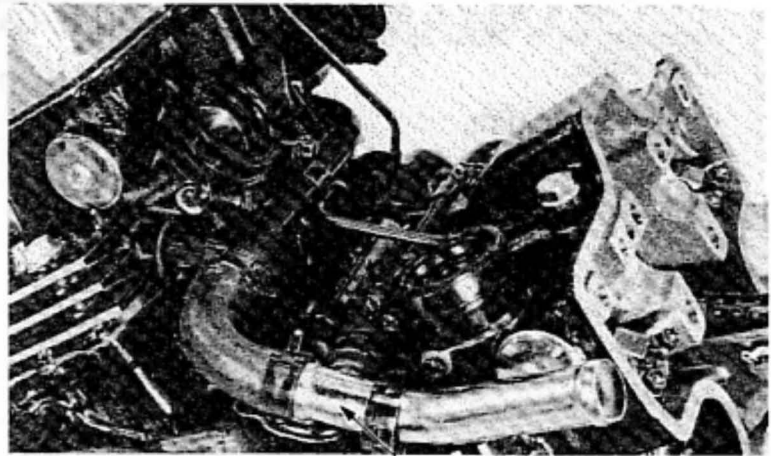
(3) 8mm BOLT B





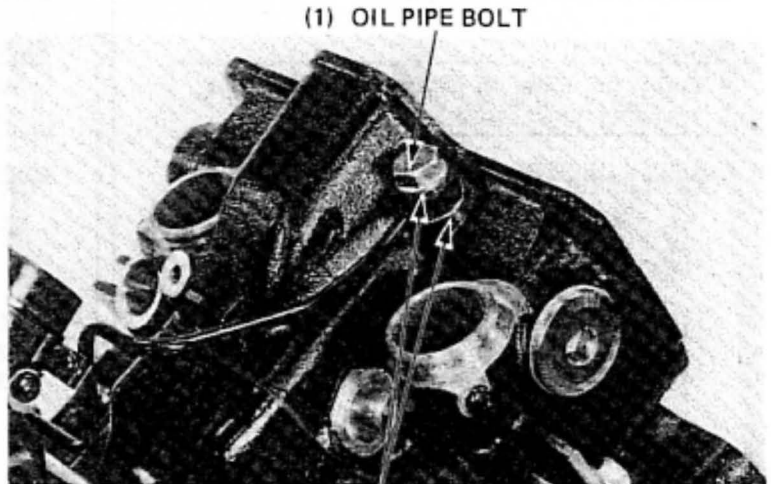
## CYLINDER HEAD REMOVAL

Remove the two bolts attaching the water pipe and the pipe and hose assembly being careful not to damage the O-rings.



(1) WATER PIPE/HOSE

Remove the oil pipe bolt and sealing washers from the cylinder head.



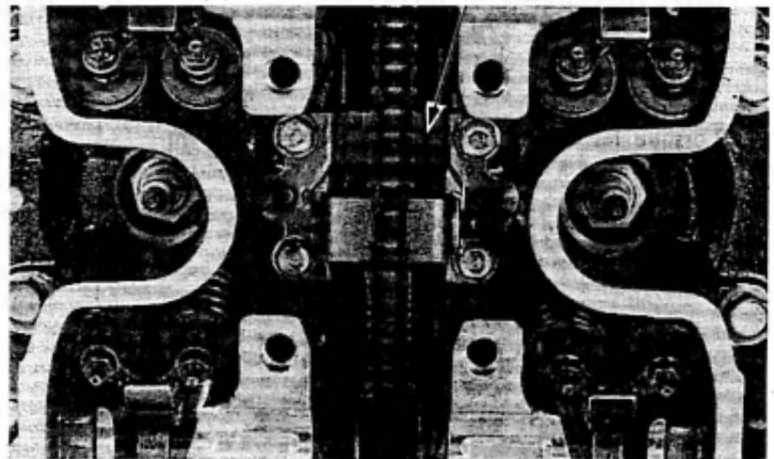
(1) OIL PIPE BOLT

(2) SEALING WASHERS

Remove the front and rear cam chain tensioner base mounting bolts.

Pull the cam chain tensioner base up.

(1) CAM CHAIN TENSIONER BASE



## CYLINDER HEAD/VALVE

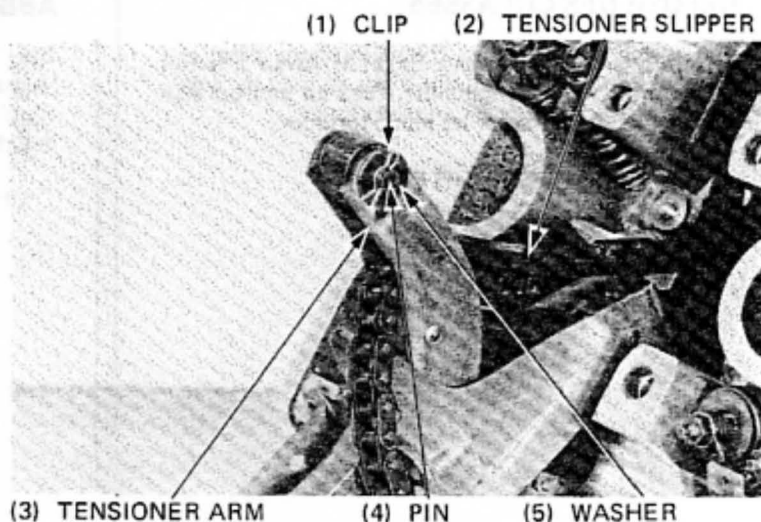


**HONDA**  
**VF400F**

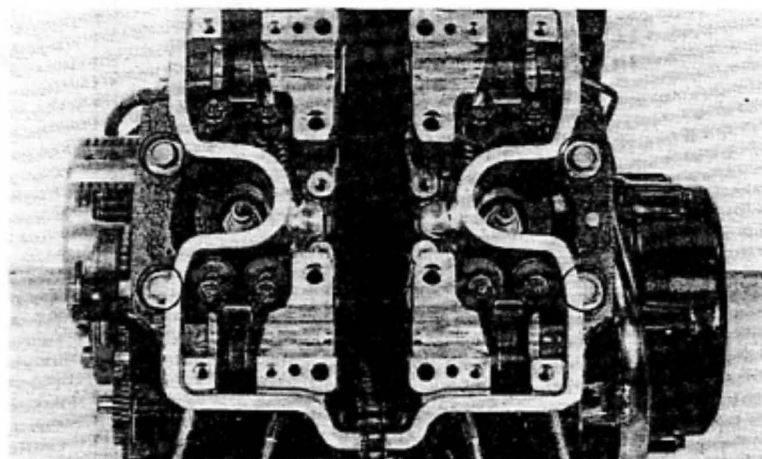
Remove the slipper clip, washer and pin and remove the tensioner slipper from the tensioner arm. Remove the tensioner base.

### NOTE:

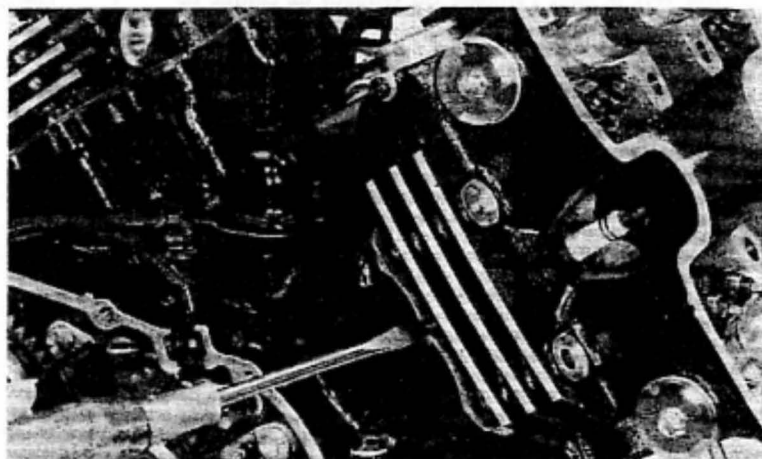
Be careful not to fall the clip, pin, washer or cam chain into the crankcase.



Remove the four cylinder head bolts.



Remove the cylinder heads using a screwdriver at the pry points.



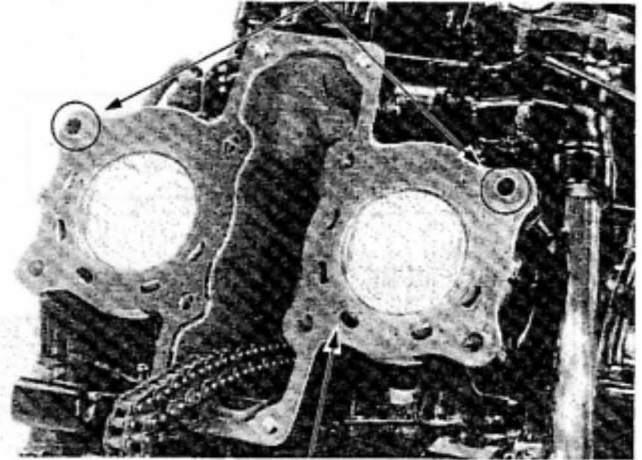


**HONDA**  
**VF400F**

## CYLINDER HEAD/VALVE

Remove the front and rear cylinder head gaskets and dowel pins.

(1) DOWEL PINS



(2) CYLINDER HEAD GASKET

## CAM CHAIN GUIDE AND CAM CHAIN TENSIONER INSPECTION

Inspect the cam chain guide and tensioner for damage or excessive wear.

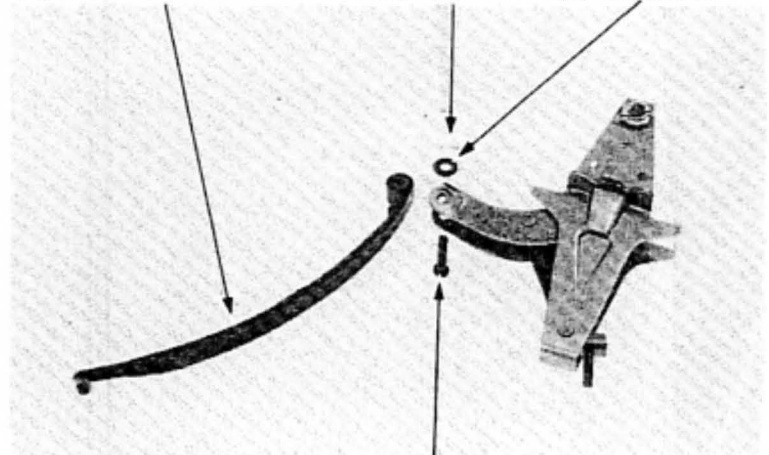
Inspect the cam chain tensioner slipper for damage or excessive wear.

Inspect the spring for good tension.

(1) TENSIONER SLIPPER

(2) CLIP

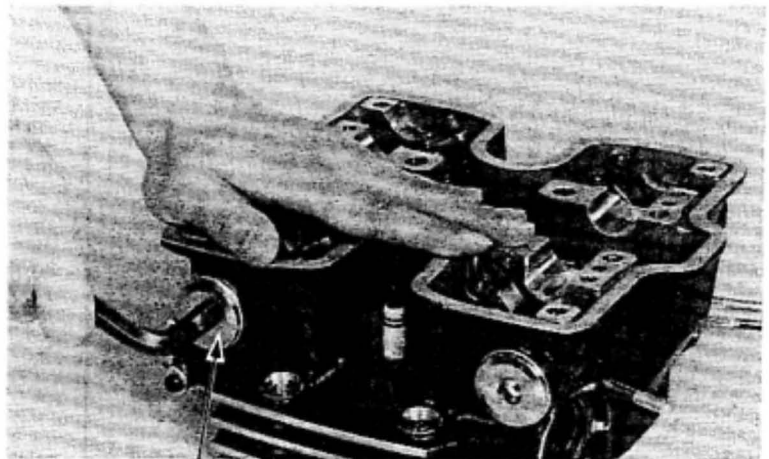
(3) WASHER



(4) PIN

## CYLINDER HEAD DISASSEMBLY

Remove the rocker arm shaft and rocker arms.



(1) ROCKER ARM SHAFT

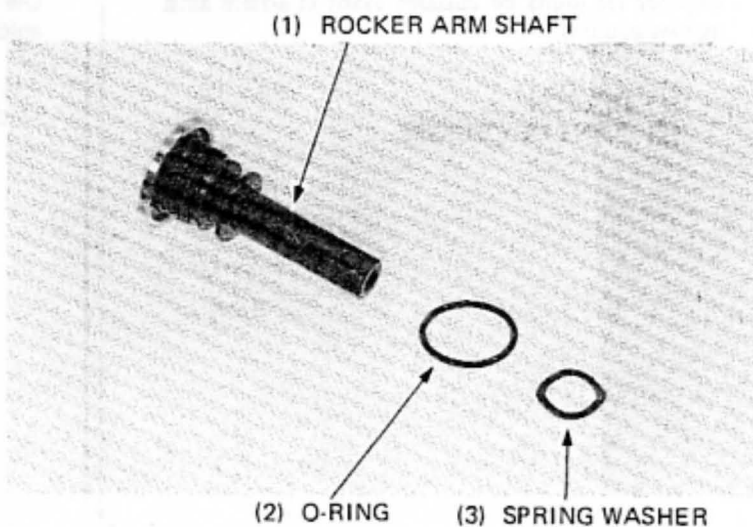


## CYLINDER HEAD/VALVE



**HONDA**  
**VF400F**

Remove the rocker arm spring washer and O-ring from the shaft.



Remove the valve spring cotters, retainers, springs and valves.

### CAUTION

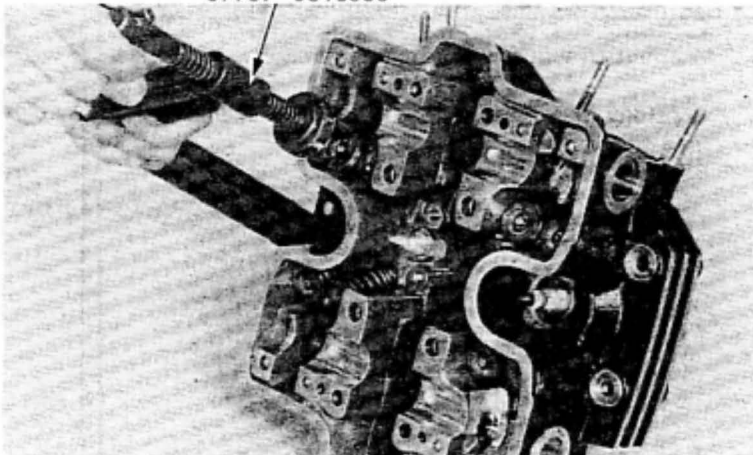
- To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.
- Thread the large retainer on the compressor attachment, so the compressor will not touch the cylinder head.

### NOTE:

Mark all disassembled parts to ensure correct reassembly.

Remove the valve stem seals.

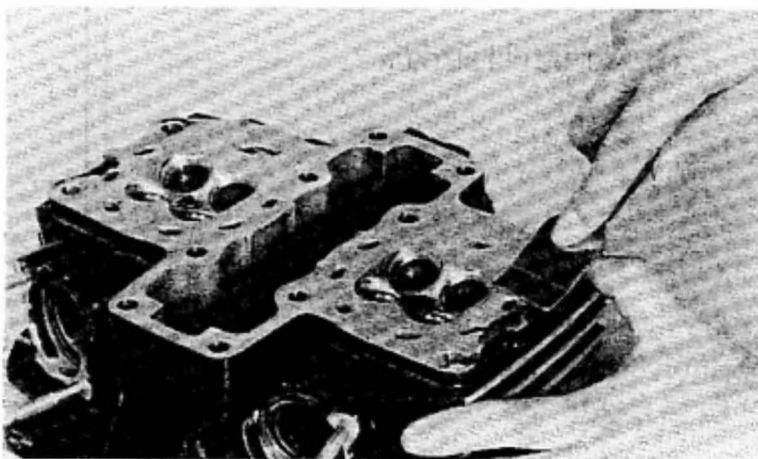
(1) VALVE SPRING COMPRESSOR  
07757-0010000



Remove carbon deposits from the combustion chamber and clean off the head gasket surfaces.

### NOTE:

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

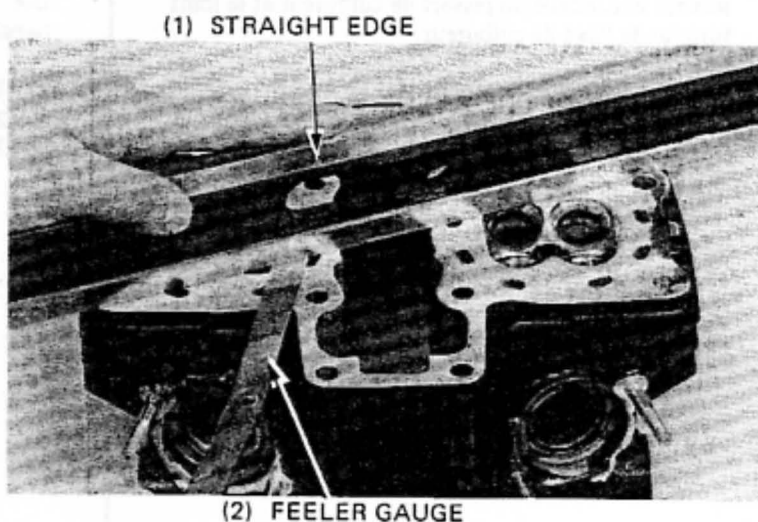




### CYLINDER HEAD INSPECTION

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

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

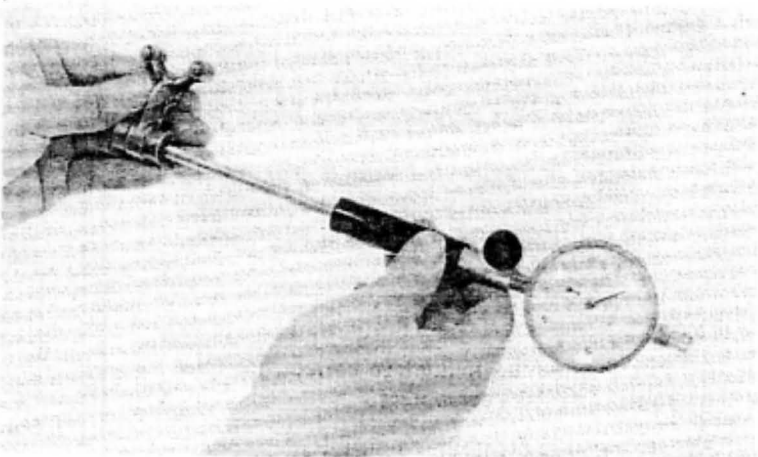


### ROCKER ARM INSPECTION

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

Measure the I.D. of each rocker arm.

**SERVICE LIMIT: 12.05 mm (0.474 in)**



### ROCKER ARM SHAFT AND SPRING INSPECTION

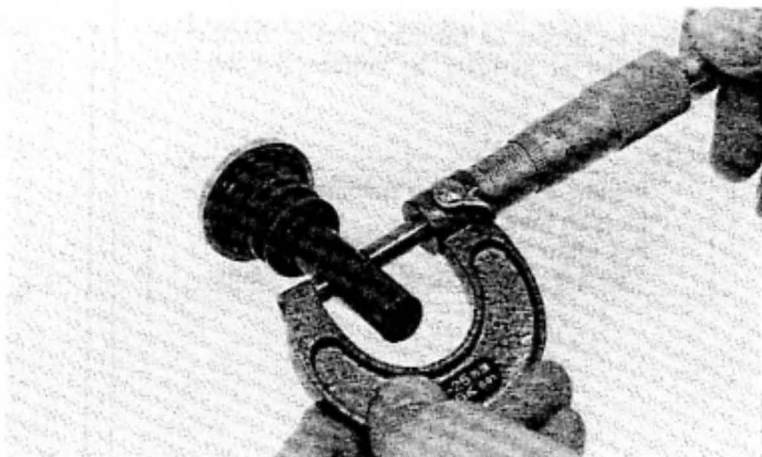
Measure each rocker arm shaft O.D.

**SERVICE LIMIT: 11.93 mm (0.470 in)**

Inspect the shaft for wear or damage and calculate the shaft to rocker arm clearance.

**SERVICE LIMIT: 0.12 mm (0.005 in)**

Inspect the rocker arm shaft spring for wear or damage.





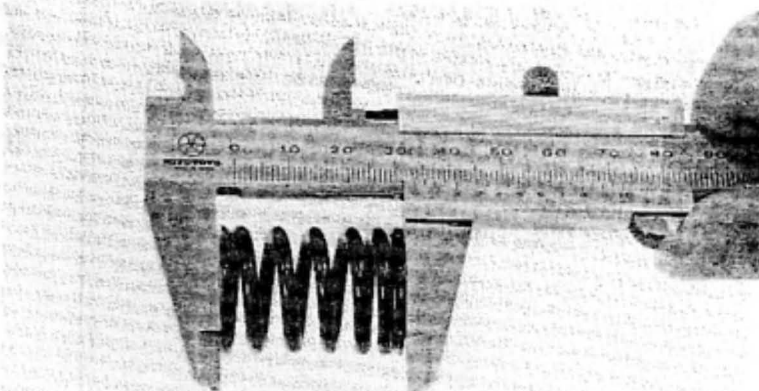
## VALVE SPRING INSPECTION

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

**SERVICE LIMIT:**

INNER (IN, EX): 31.7 mm (1.25 in)

OUTER (IN, EX): 36.7 mm (1.44 in)



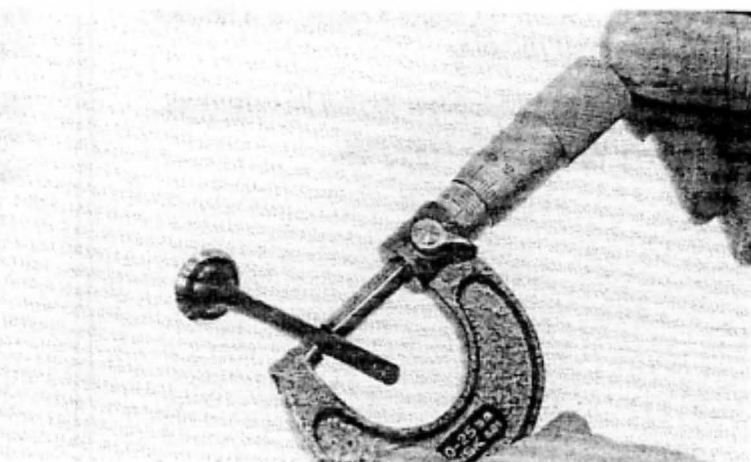
## VALVE STEM-TO-GUIDE CLEARANCE

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

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

**SERVICE LIMITS:** IN: 4.97 mm (0.196 in)

EX: 4.94 mm (0.195 in)



**NOTE:**

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

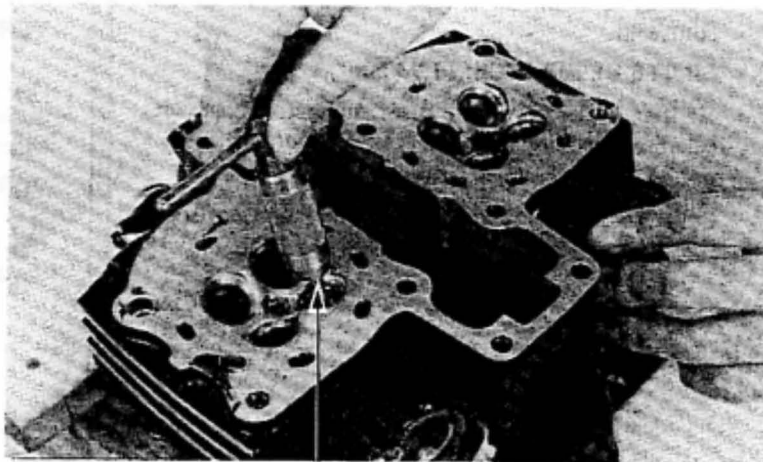
Measure and record each valve guide I.D. using a ball gauge or inside micrometer.

**SERVICE LIMIT:** 5.04 mm (0.198 in)

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

**SERVICE LIMIT:** IN: 0.07 mm (0.003 in)

EX: 0.10 mm (0.004 in)



(1) VALVE GUIDE REAMER  
07984-MA60000



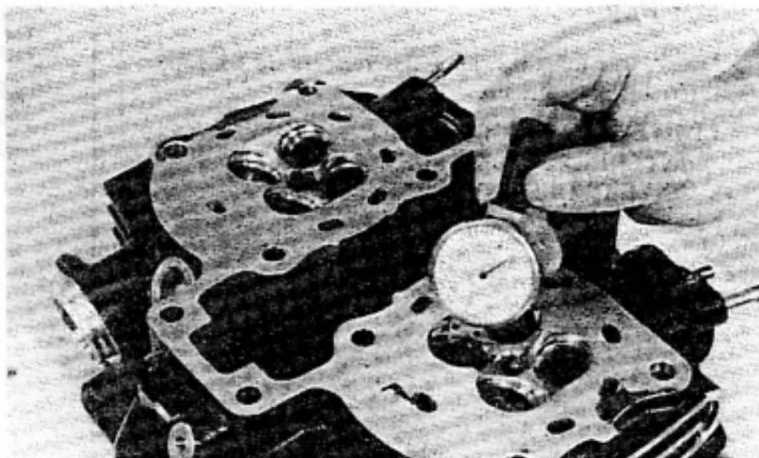
## NOTE:

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

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

## NOTE:

Reface the valve seats whenever the valve guides are replaced (page 10-14).



## VALVE GUIDE REPLACEMENT

Heat the cylinder head to 100°C (212°F).

## CAUTION

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

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

## CAUTION

When driving the valve guide out, be careful not to damage the head.

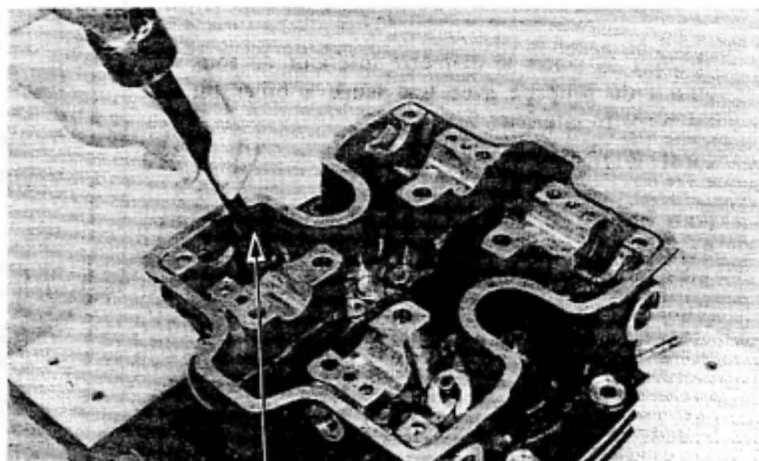


(1) VALVE GUIDE DRIVER  
07942-MA60000

Drive new guides in from the rocker arm side of the cylinder head.

## NOTE:

Cylinder head heat should still be at 100°C (212°F) for installation of the new guides.



(2) VALVE GUIDE DRIVER  
07943-KE70000



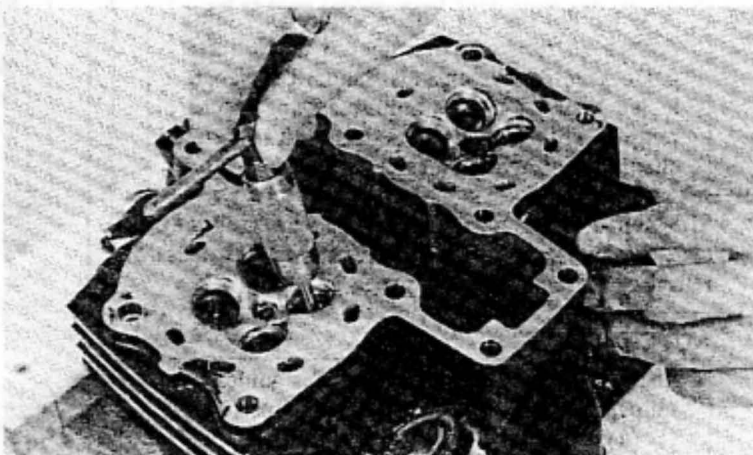


Ream the new valve guides after installation.

**NOTE:**

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

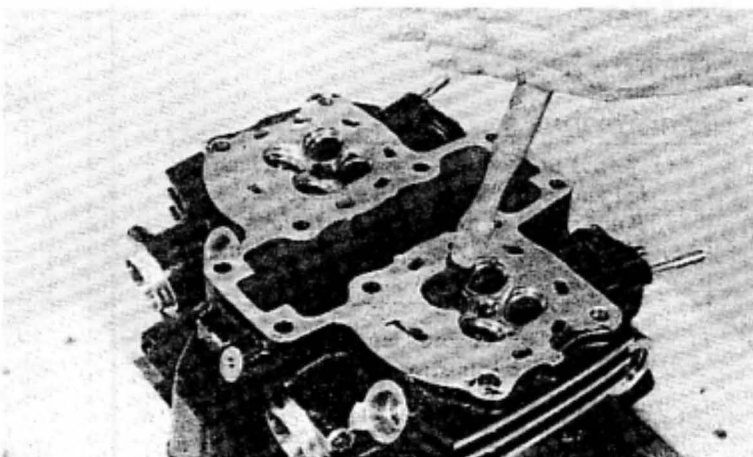
Reface the valve seat and clean the cylinder head thoroughly to remove any metal particles.



## VALVE SEAT INSPECTION/REFACING

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

Apply a light coating of prussian blue to each valve face. Lap each valve and seat using a rubber hose or other hand-lapping tool.



Remove the valve and inspect the face.

**CAUTION**

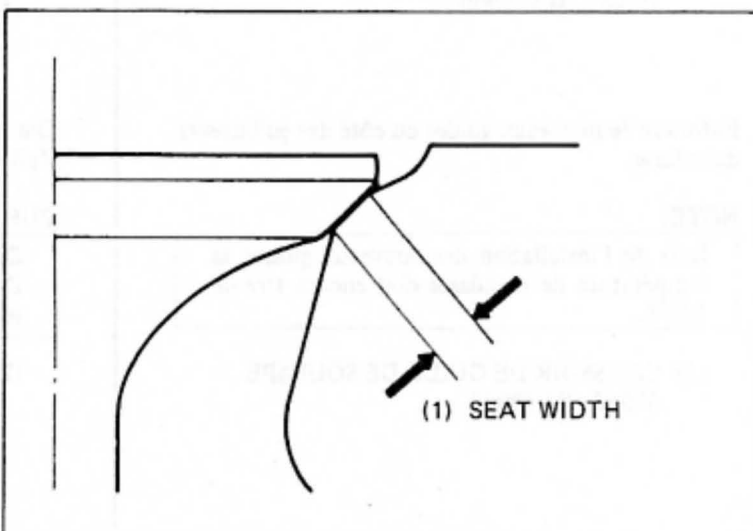
*The valves cannot be ground. If the valve face is rough, worn unevenly, or contacts the seat improperly, the valve must be replaced.*

Inspect the valve seat.

**STANDARD:** 0.9–1.1 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.







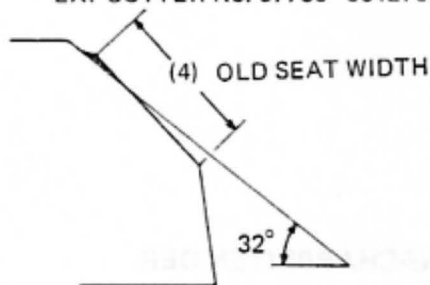
## NOTE:

Follow the refacer manufacturer's operating instructions.

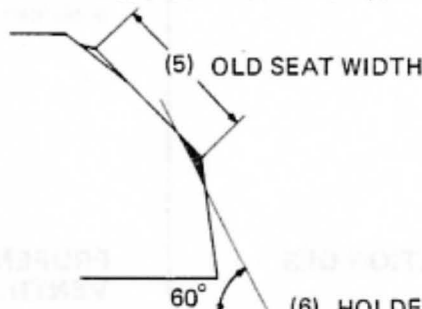
After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

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

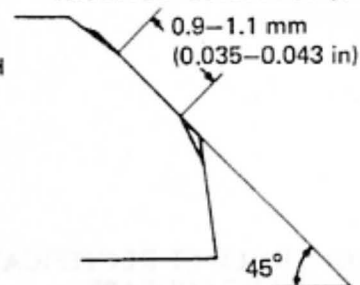
- (1) IN: CUTTER No. 07780-0012601 (22 $\phi$ )  
EX: CUTTER No. 07780-0012700 (19 $\phi$ )



- (2) IN, EX: CUTTER  
No. 07780-0014202 (22 $\phi$ )



- (3) IN, EX: CUTTER  
No. 07780-0010701 (22 $\phi$ )



- (6) HOLDER No. 07781-0010400 (5.0 mm)

## CYLINDER HEAD ASSEMBLY

## NOTE:

Install new valve stem seals when assembling.

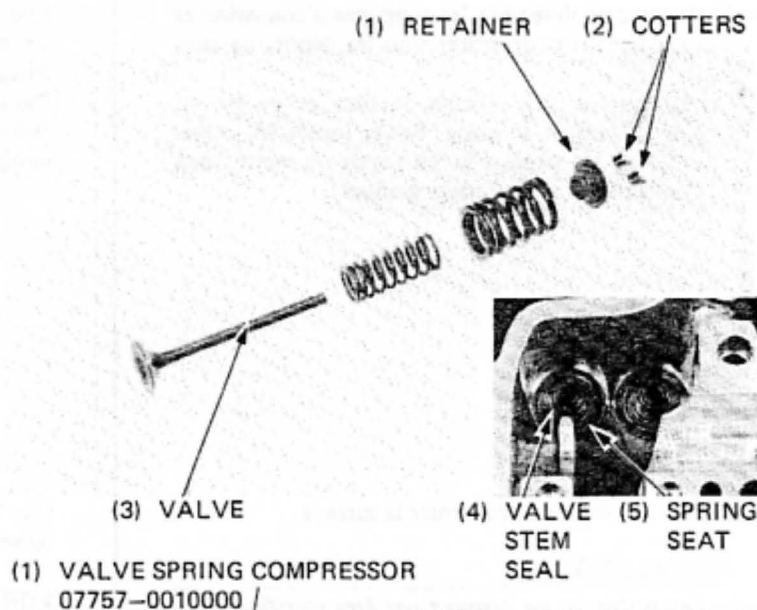
Lubricate each valve stem with molybdenum disulfide grease and insert the valve into the valve guide. To avoid damage to the stem seal, turn the valve slowly when inserting.

Install the valve springs and retainers. The springs tightly wound coils should face in.

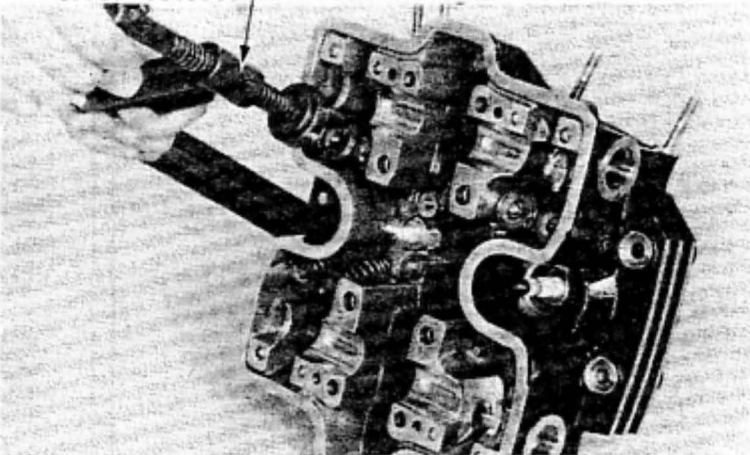
Install the valve cotters.

## CAUTION

- To prevent loss of tension, do not compress the valve spring more than necessary to install the valve cotters.
- Thread the large retainer on the compressor attachment, so the compressor will not touch the cylinder head.



- (1) VALVE SPRING COMPRESSOR  
07757-0010000

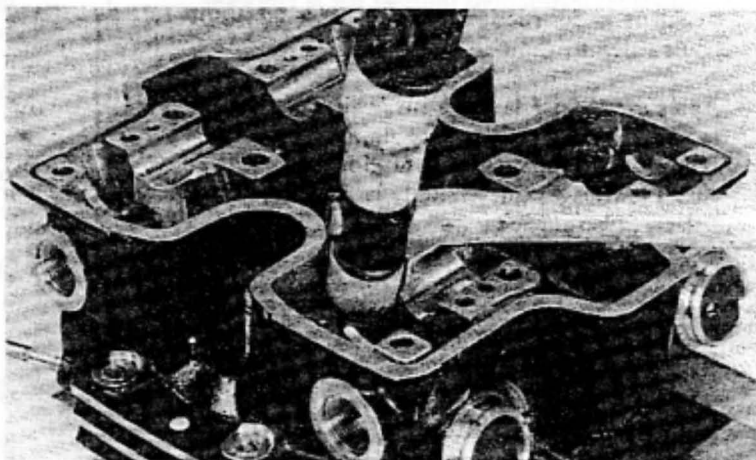




Tap the valve stems gently with a soft hammer to firmly seat the cotters.

**NOTE:**

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

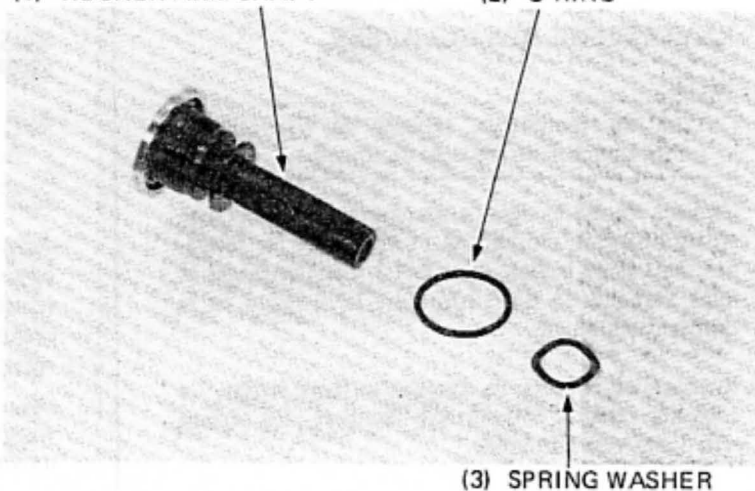


Install the O-ring and spring washer onto the rocker arm shaft.

Apply engine oil to the rocker arm shaft and install the rocker arm.

(1) ROCKER ARM SHAFT

(2) O-RING

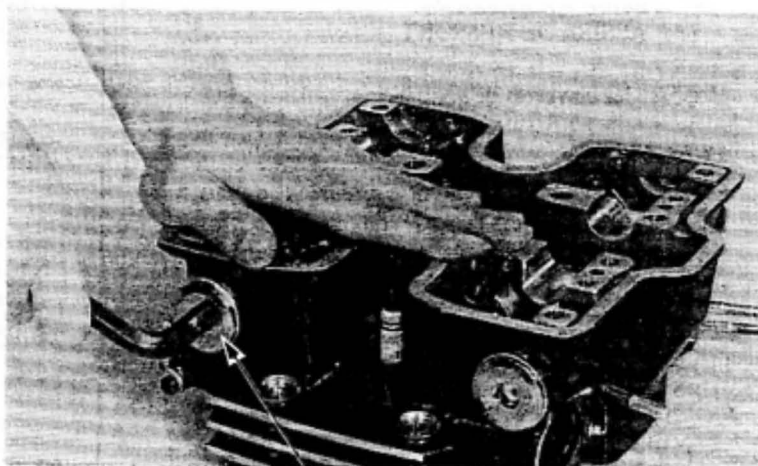


(3) SPRING WASHER

Install and tighten the rocker arm shaft bolt.

**TORQUE:**

45–55 N·m (4,5–5,5 kg·m, 33–40 ft·lb)



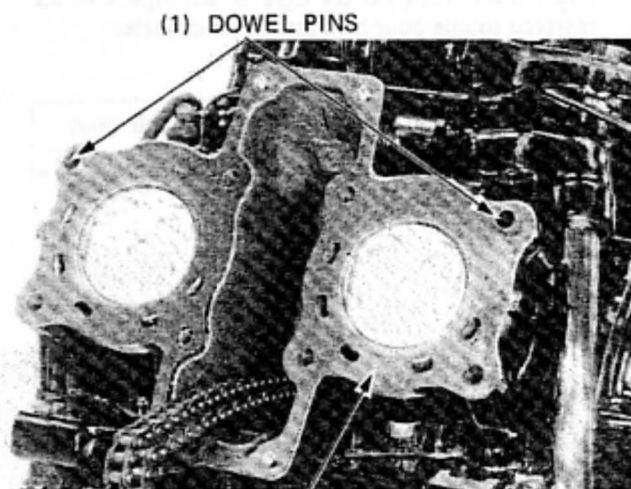
(1) ROCKER ARM SHAFT



## CYLINDER HEAD INSTALLATION

Clean the cylinder head surface of any gasket material.

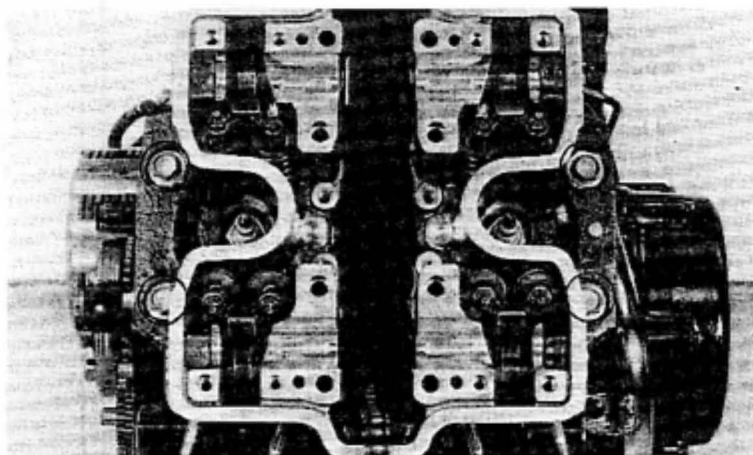
Install the dowel pins and new head gaskets.



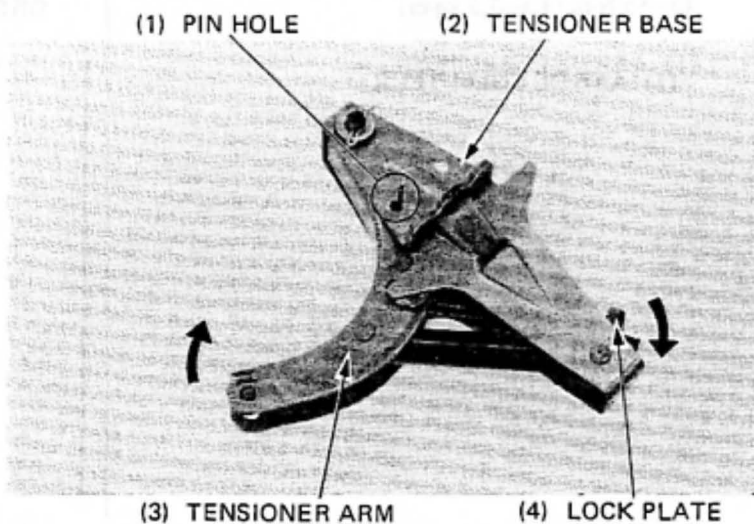
(1) DOWEL PINS

(2) CYLINDER HEAD GASKET

Install the cylinder head and head bolts but do not torque the bolts yet.



With the cam chain tensioner raised in the direction of the arrow, insert a pin or piece of wire through into the hole in the tensioner base and tensioner.



(1) PIN HOLE

(2) TENSIONER BASE

(3) TENSIONER ARM

(4) LOCK PLATE

## CYLINDER HEAD/VALVE

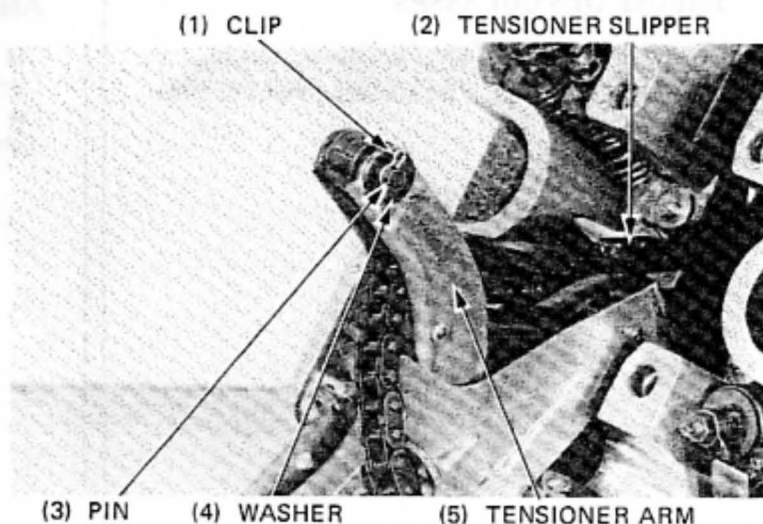


**HONDA**  
**VF400F**

Pass the cam chain through the cam chain tensioner and install the tensioner slipper as shown.

### NOTE:

- Check that the lower end of the slipper fits in the slipper base correctly.
- Be careful not to drop the washer or clip into the crankcase.

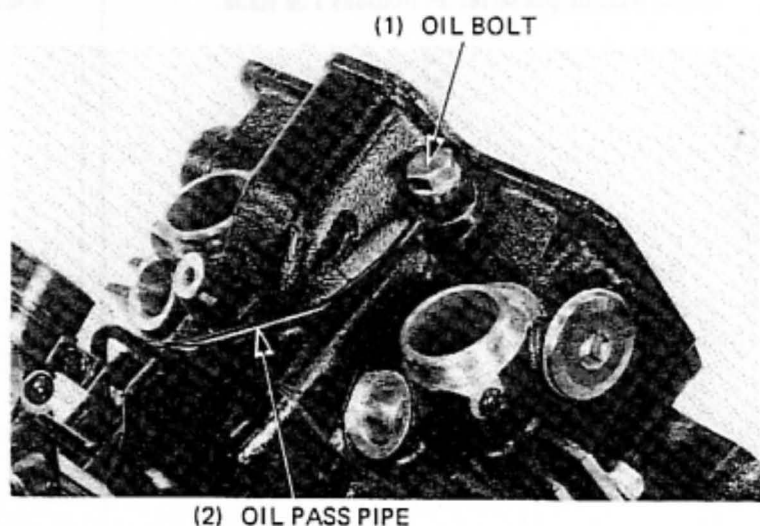


Install the oil pass pipe to the cylinder head with the oil bolt.

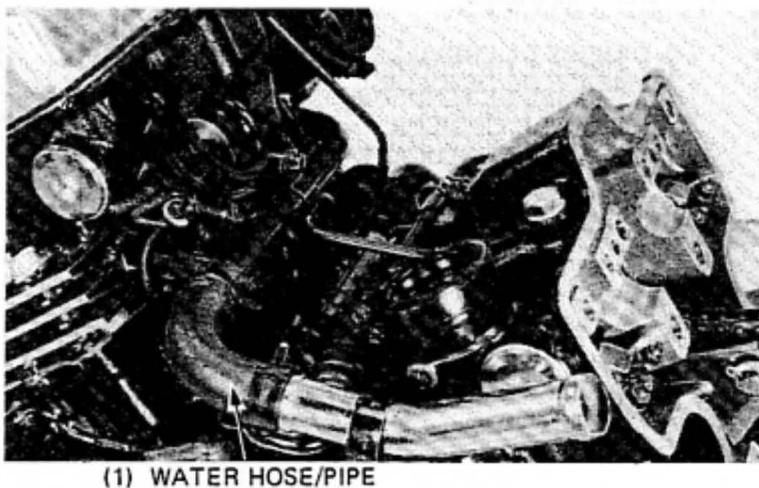
**TORQUE: 20–25 N·m (2.0–2.5 kg·m, 15–18 ft·lb)**

### NOTE:

- Check the oil pass pipe and oil bolt for clogging, cracks or other damage.
- Do not forget to install the sealing washers.



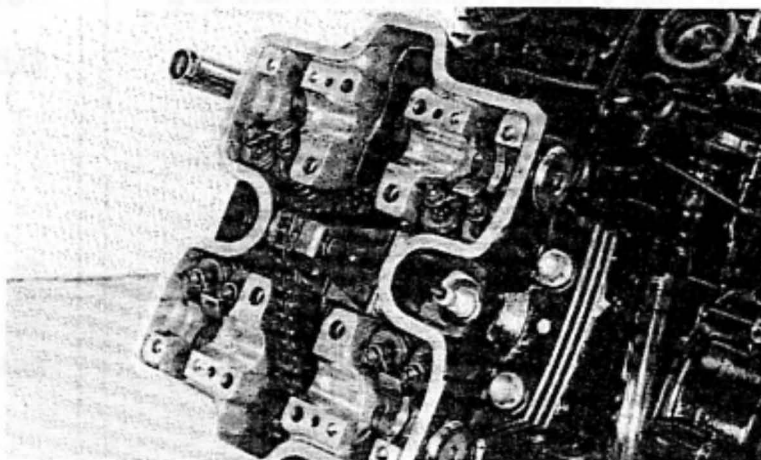
Install new O-rings onto the ends of the water pipe. Install the water hose and pipe to the cylinder head with the two bolts.





## CAMSHAFT INSTALLATION

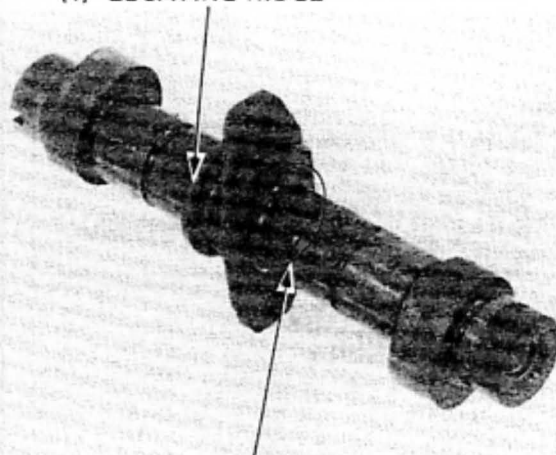
Lubricate the cylinder head cam bearing surfaces with molybdenum disulfide grease.



Check the camshaft marks so that you install each camshaft in its correct location.

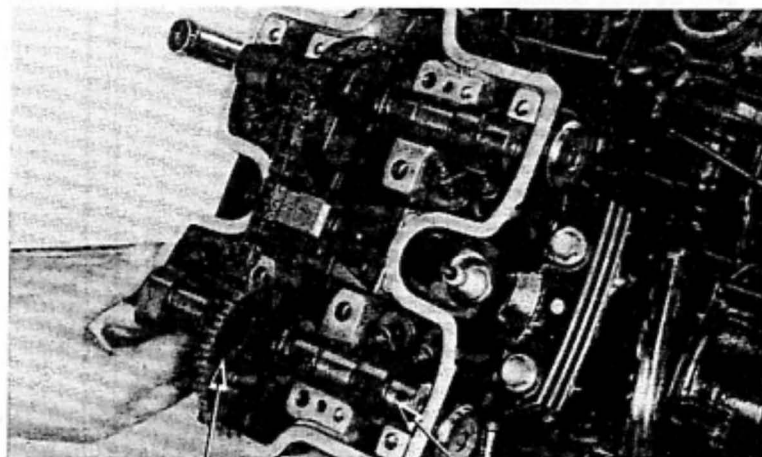
- EX-F: Front cylinder exhaust  
(Place with the locating ridge toward left side)
- EX-R: Rear cylinder exhaust  
(Place with the locating ridge toward right side)
- IN-F: Front cylinder intake  
(Place with the locating ridge toward left side)
- IN-R: Rear cylinder intake  
(Place with the locating ridge toward right side)

(1) LOCATING RIDGE



(2) INDEX MARK

Install each camshaft and cam sprocket in its correct location through the cam chain.



(1) CAM SPROCKET

(2) CAMSHAFT



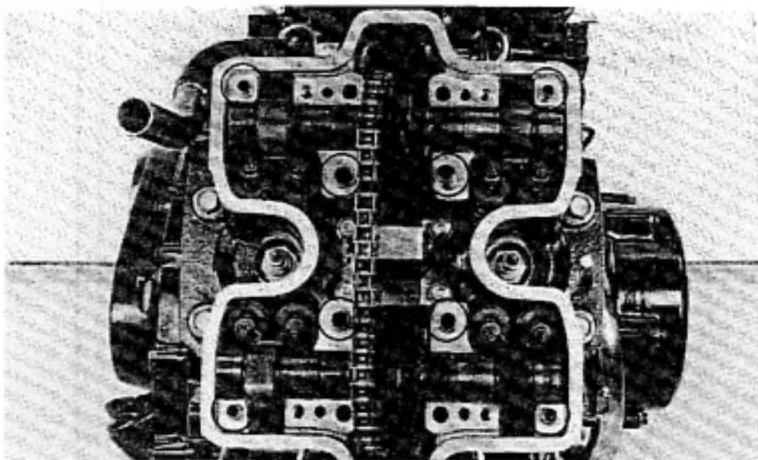
## CYLINDER HEAD/VALVE



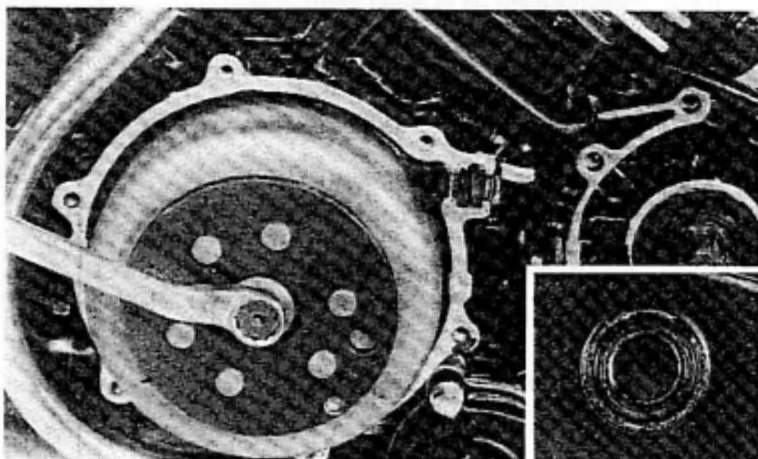
**HONDA**  
**VF400F**

Install the eight dowel pins to each cylinder head.

Place the camshaft holders in the same locations noted during removal. The groove in the bottom of the holder must align with the camshaft locating ridge.



Turn the crankshaft counterclockwise until the "TR" mark on the flywheel align with the crankcase mating surface.



Turn the rear cylinder camshafts so that the intake and exhaust cam lobes of the No. 1 cylinder face out.

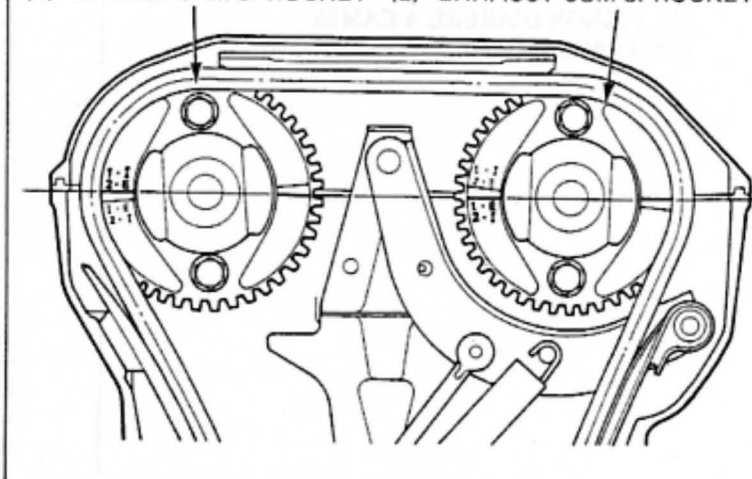
Align the "1.E, 2.I" index line of the exhaust cam sprocket with the top of the cylinder head.

Align the "1.I, 2.E" index line of the intake cam sprocket with the top of the cylinder head.

Install the rear cylinder cam chain over the cam sprockets.

Slide the sprockets onto the camshaft flanges, and install the sprocket bolts in the exposed holes.

(1) INTAKE CAM SPROCKET (2) EXHAUST COM SPROCKET



## CYLINDER HEAD/VALVE



**HONDA**  
**VF400F**

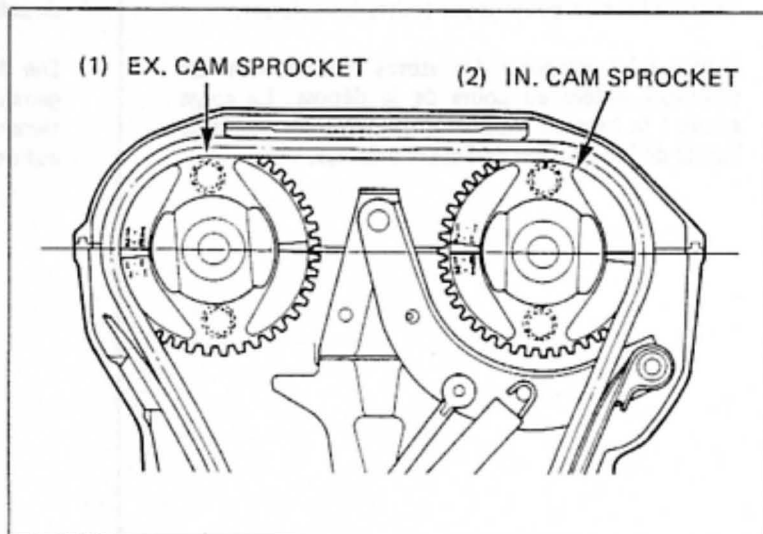
Turn the front cylinder camshafts so that the intake cam lobe of the No. 4 cylinder faces down and the exhaust cam lobe of the No. 4 cylinder faces up.

Align the "1.I, 2.E" index line of the exhaust cam sprocket with the top of the cylinder head.

Align the "1.E, 2.I" index line of the intake cam sprocket with the top of the cylinder head.

Install the front cylinder cam chain over the cam sprockets.

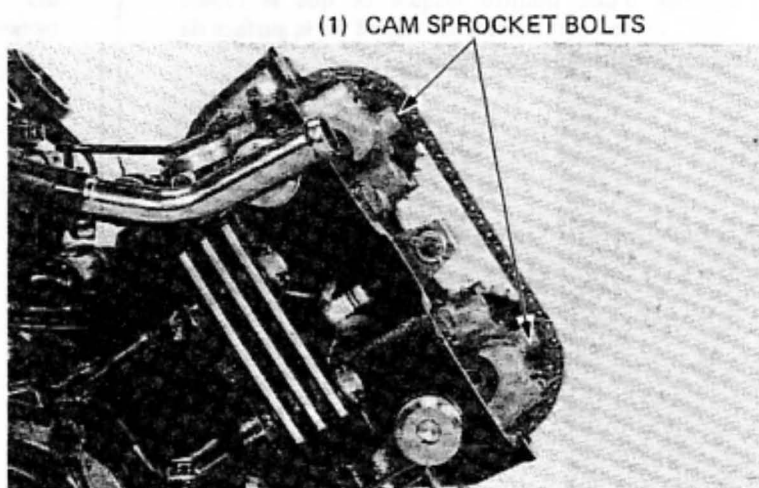
Slide the sprockets onto the camshaft flanges, and install the sprocket bolts in the exposed holes.



Turn the crankshaft counterclockwise 360 degrees and install the remaining cam sprocket bolts of the front and rear cylinders.

Tighten the cam sprocket bolts.

**TORQUE:** 18–20 N·m (1.8–2.0 kg-m, 13–14 ft-lb)



Install the oil pipe.

Install the cam chain guide.

Tighten the all cylinder head bolts in the sequence show in the figure.

### **TORQUE:**

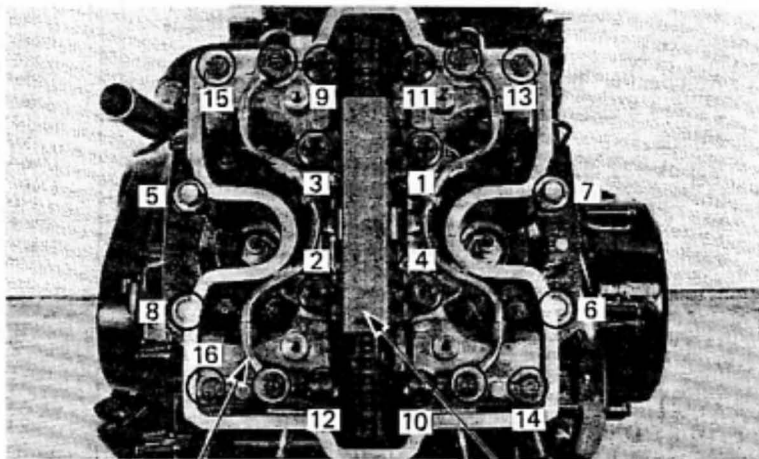
**1** – **8** 30–34 N·m (3.0–3.4 kg-m, 22–25 ft-lb)

**9** – **12** 21–25 N·m (2.1–2.5 kg-m, 15–18 ft-lb)

**13** – **16** 10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

Install the oil pass pipe.

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

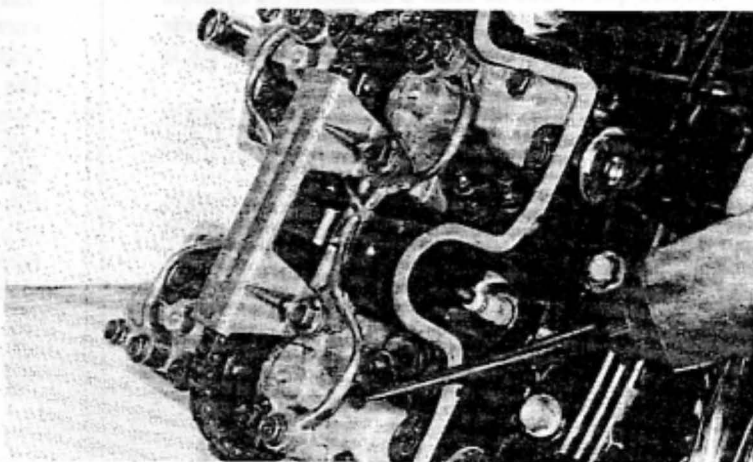


(1) OIL PIPE

(2) CAM CHAIN GUIDE



Adjust the valve clearance (page 3-8).  
Lubricate the cam lobes with engine oil.



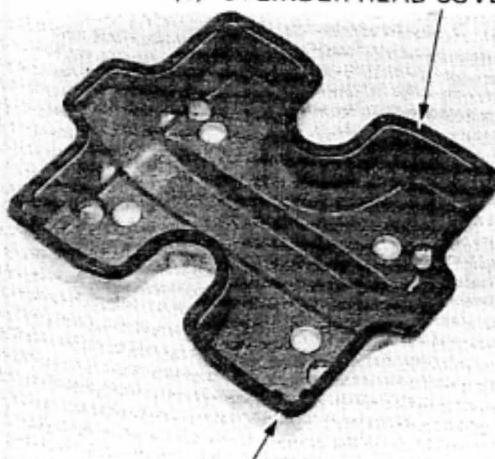
Check the cylinder head cover gasket for damage or deterioration.

**NOTE:**

Clean the gasket before applying sealant.

Apply sealant to the cylinder head cover gasket.

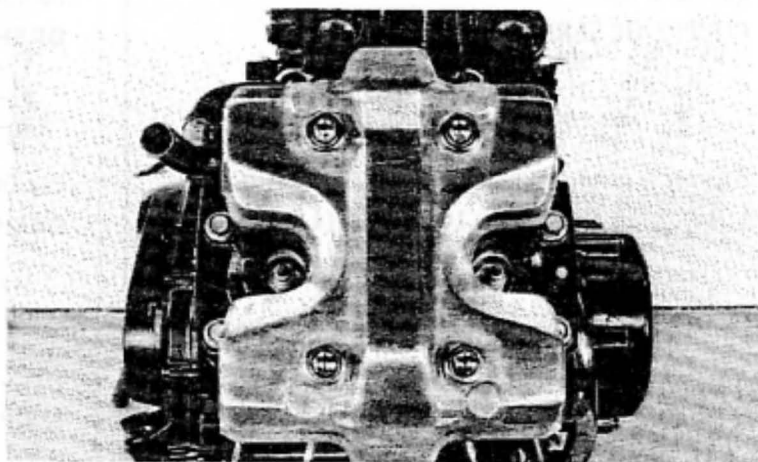
(1) CYLINDER HEAD COVER GASKET

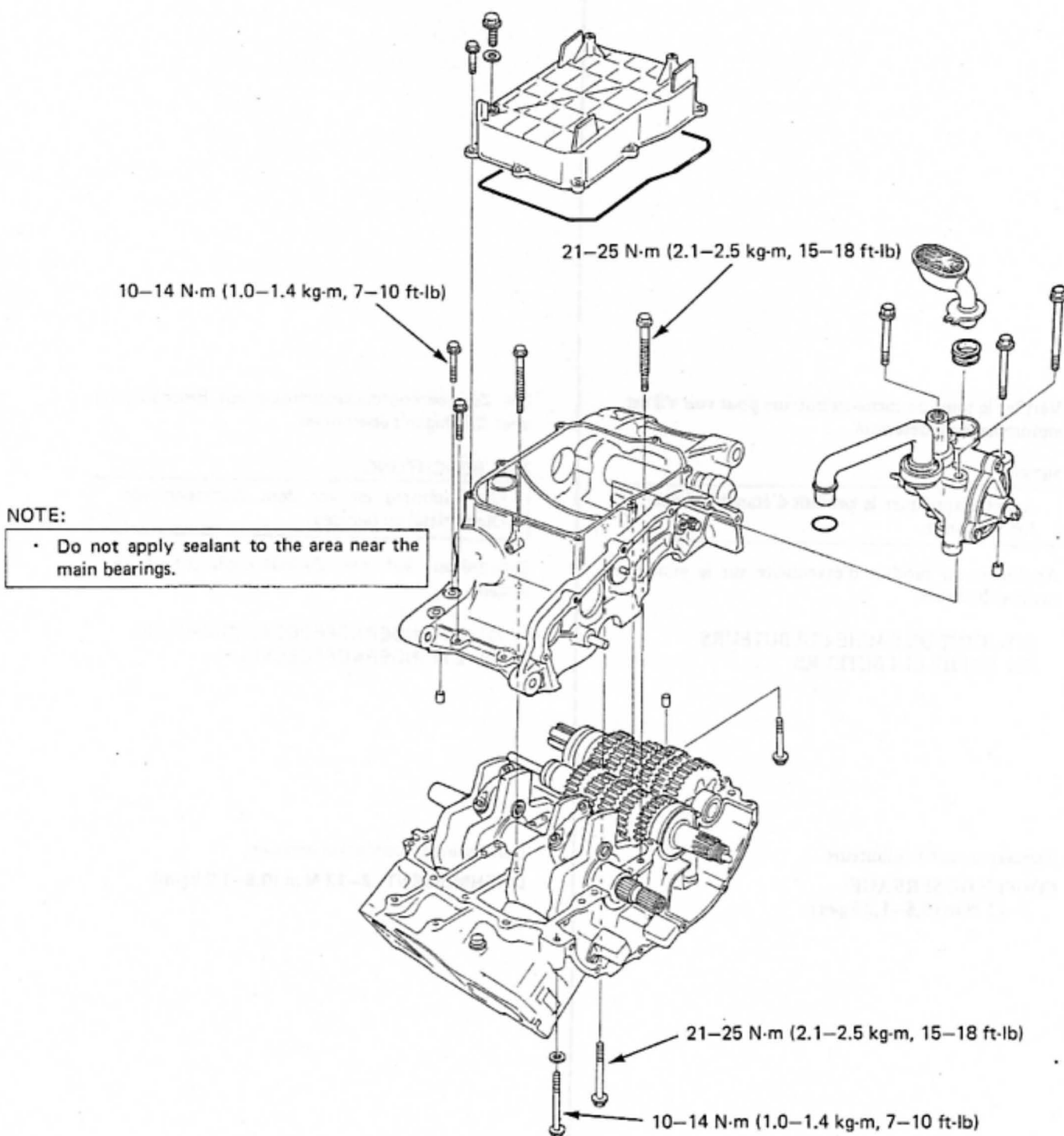


(2) CYLINDER HEAD COVER

Install the cylinder head cover.

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





NOTE:

Ne pas appliquer de liquide d'étanchéité à proximité des paliers principaux.

ZUR BEACHTUNG:

Keine Dichtmasse auf den Bereich in der Nähe der Hauptlager auftragen.



|                       |      |
|-----------------------|------|
| SERVICE INFORMATION   | 11-1 |
| CRANKCASE DISASSEMBLY | 11-2 |
| CRANKCASE ASSEMBLY    | 11-5 |

## SERVICE INFORMATION

### GENERAL

- To service the piston, crankshaft, connecting rod and transmission, the crankcase halves must be separated.
- The following parts must be removed before disassembling the crankcase.
  - Oil pan Refer to section 2
  - Oil pump Refer to section 2
  - Water pump Refer to section 6
  - Clutch/starter clutch Refer to section 7
  - Gear shift linkage Refer to section 8
  - Alternator Refer to section 9
  - Cylinder heads Refer to section 10
  - Starter motor Refer to section 19

### TORQUE VALUES

|            |                                       |
|------------|---------------------------------------|
| 8 mm bolt: | 21-25 N·m (2.1-2.5 kg·m, 15-18 ft·lb) |
| 6 mm bolt: | 10-14 N·m (1.0-1.4 kg·m, 7-10 ft·lb)  |

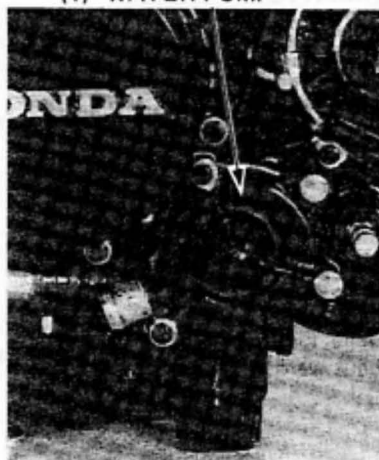


**CRANKCASE DISASSEMBLY**

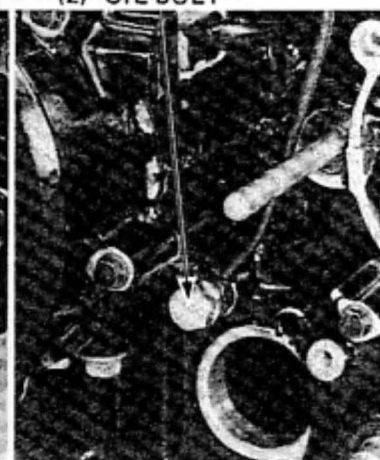
Remove the two bolts mounting the water pump assembly and the water pump assembly from the crankcase.

Remove the oil bolt.

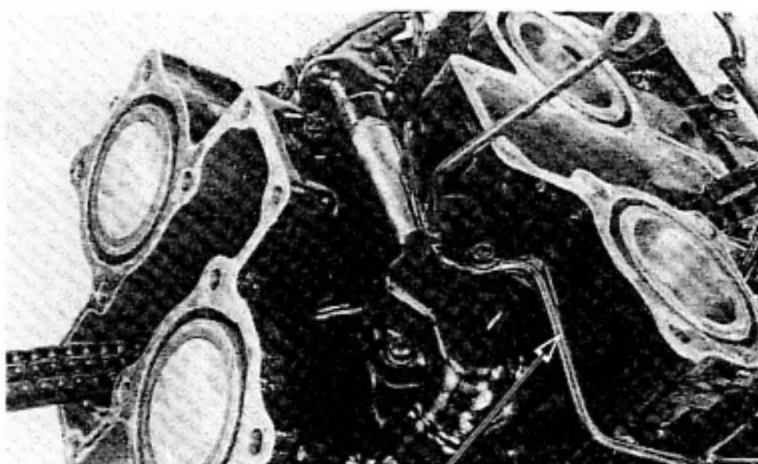
(1) WATER PUMP



(2) OIL BOLT

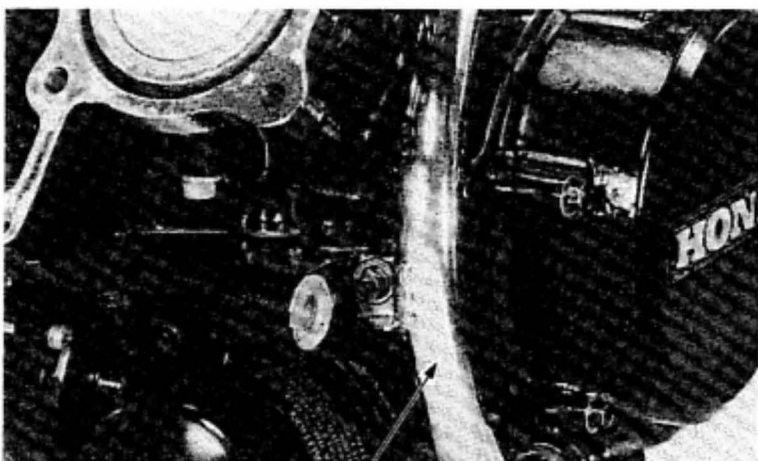


Remove the oil pass pipe mounting bolt and the oil pass pipe.



(1) OIL PASS PIPE

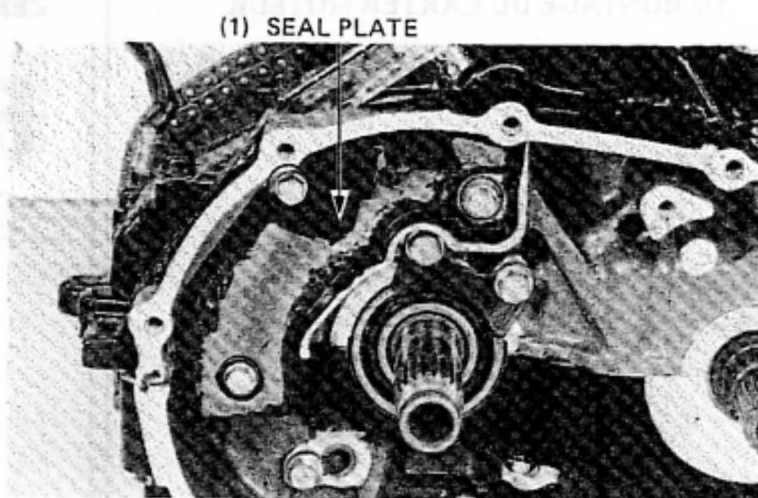
Remove the water pipe mounting bolt and the water pipe.



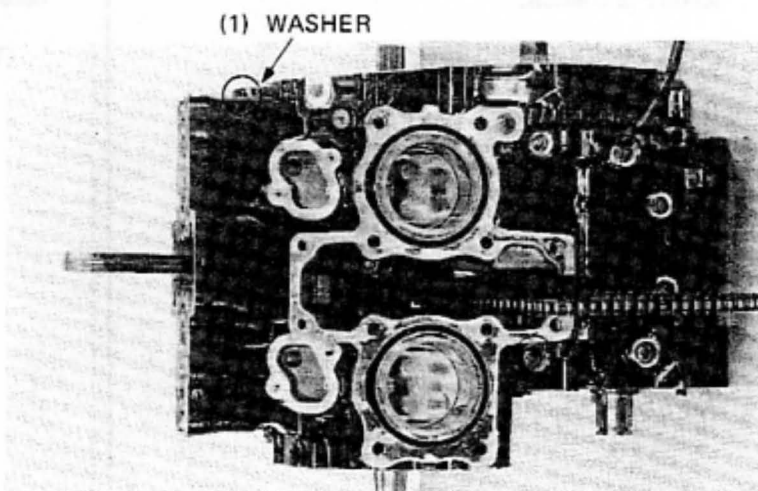
(1) WATER PIPE



Remove the seal plate.



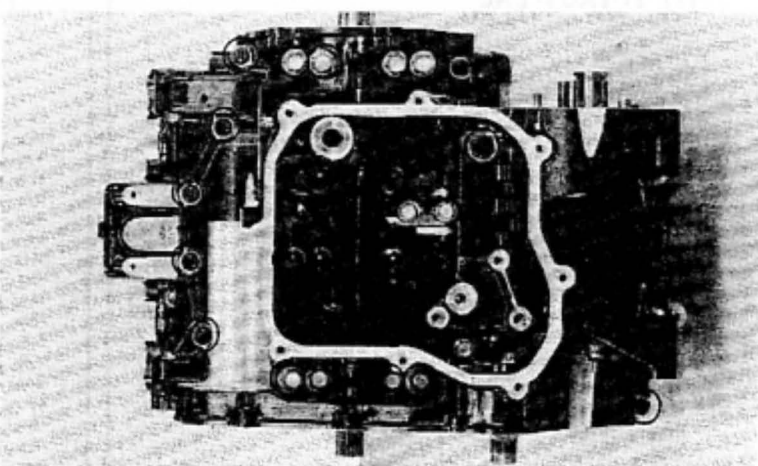
Remove the seven upper crankcase bolts.



Turn the engine over and remove the nine lower crankcase bolts and fourteen crankshaft main journal bolts.

## NOTE:

Remove the bolts in two or more steps and in a crisscross pattern to prevent damage to the crankcase.

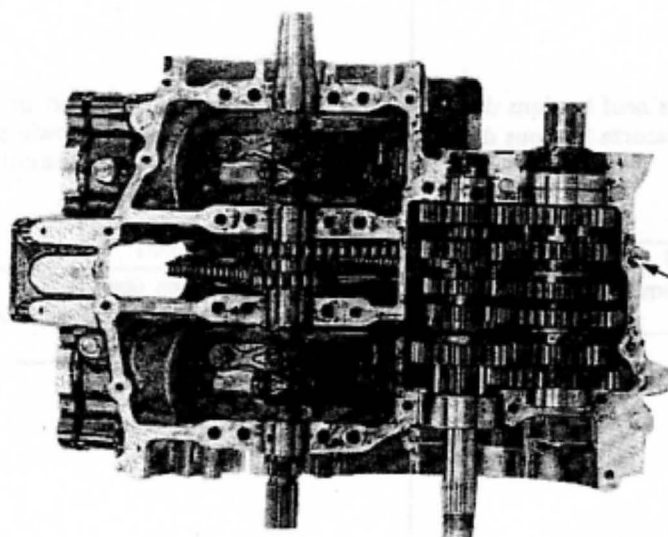
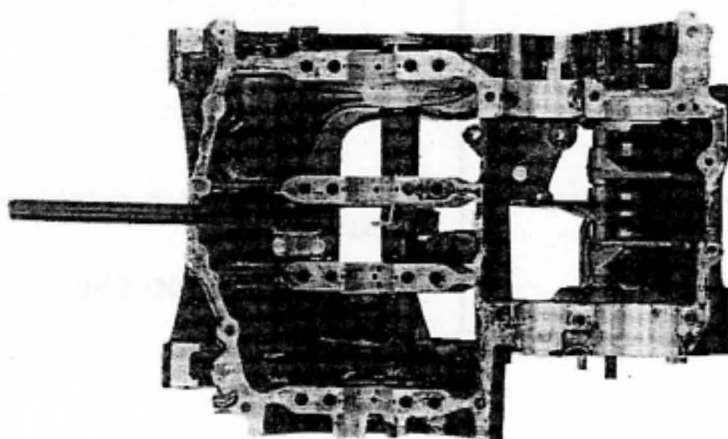




Separate the lower crankcase from the upper crankcase.

NOTE:

- Do not pry the crankcase mating surface.
- Tap the crankcase lightly to loosen the crankcases.



(1) DOWEL PIN



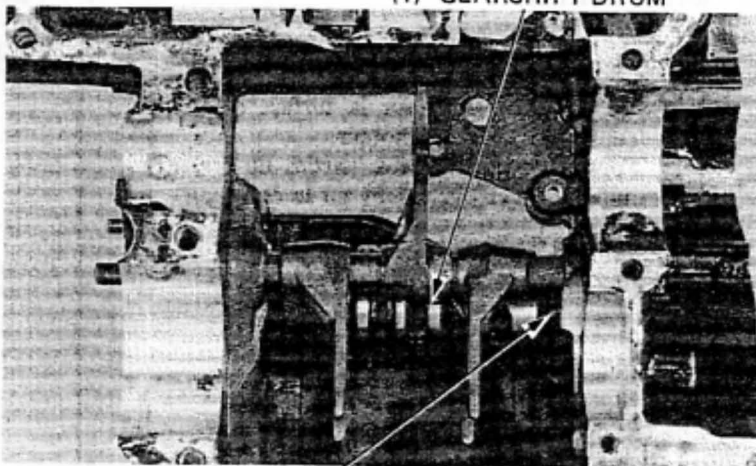
## CRANKCASE ASSEMBLY

Clean the crankcase mating surfaces.

Turn the gearshift drum until the neutral switch is pushed by the drum.

Apply molybdenum disulfide grease to the crankshaft main bearings.

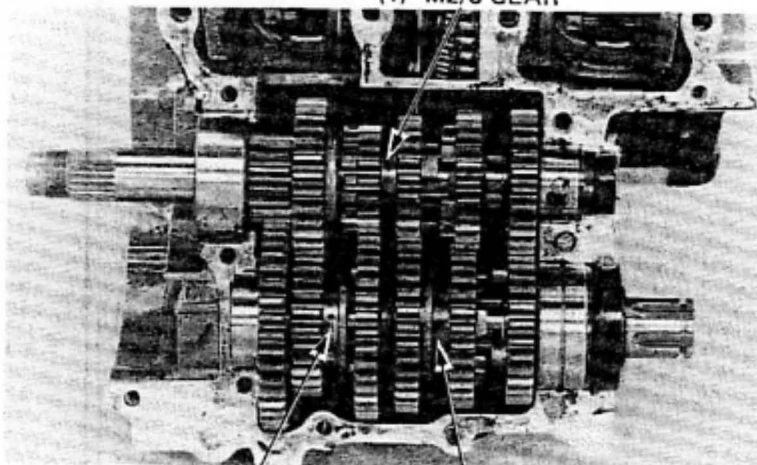
(1) GEARSHIFT DRUM



(2) NEUTRAL SWITCH

Move the C6, C4 and M2/3 gears to the neutral position.

(1) M2/3 GEAR



(2) C6 GEAR

(3) C4 GEAR

Apply liquid sealant to the mating surface of the upper crankcase.

### CAUTION

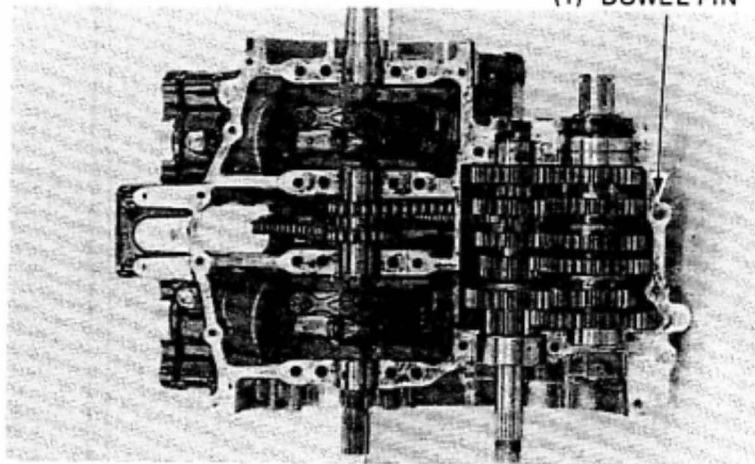
*Do not apply sealant to the area near the main bearings.*

Install the dowel pin.

### NOTE:

Make sure the oil control orifice is not clogged.

(1) DOWEL PIN



## CRANKCASE

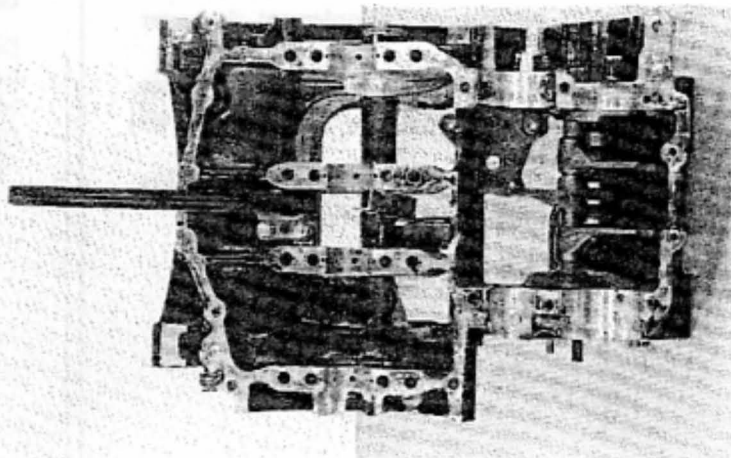


**HONDA**  
**VF400F**

Apply liquid sealant to the mating surface of the lower crankcase.

### CAUTION

*Do not apply sealant to the area near the main bearings.*



Assemble the crankcase halves, aligning the shift fork claws with the gears.

Tighten the crankshaft main journal bolts to the specified torque diagonally beginning with inner bolts first.

**TORQUE:** 21–25 N·m (2.1–2.5 kg-m, 15–18 ft-lb)

Tighten the lower crankcase bolts to the specified torque diagonally starting with inner bolts first.

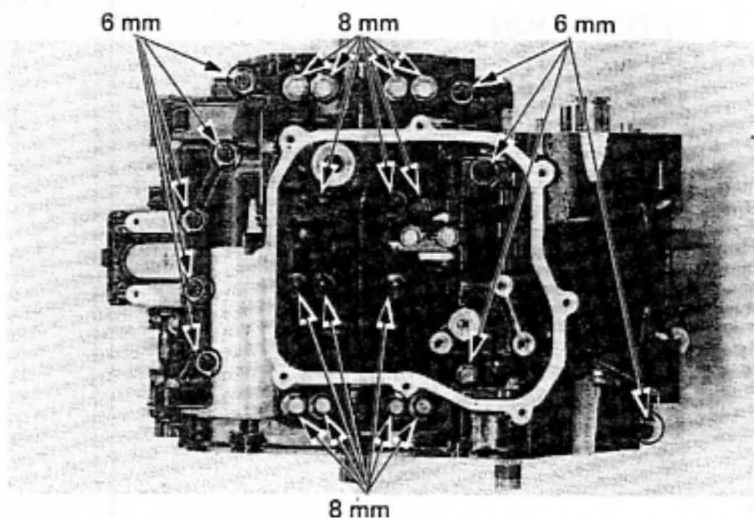
### TORQUE:

8 mm BOLT:

21–25 N·m (2.1–2.5 kg-m, 15–18 ft-lb)

6 mm BOLT:

10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)



Tighten the upper crankcase bolts to the specified torque.

### TORQUE:

8 mm BOLT:

21–25 N·m (2.1–2.5 kg-m, 15–18 ft-lb)

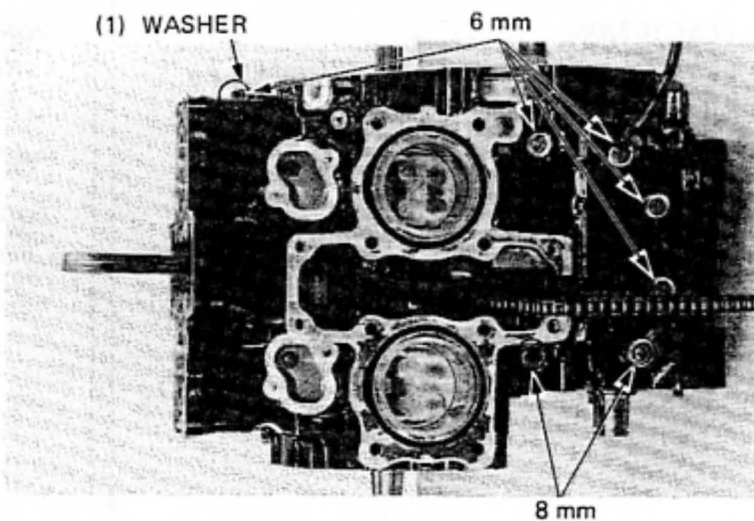
6 mm BOLT:

10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

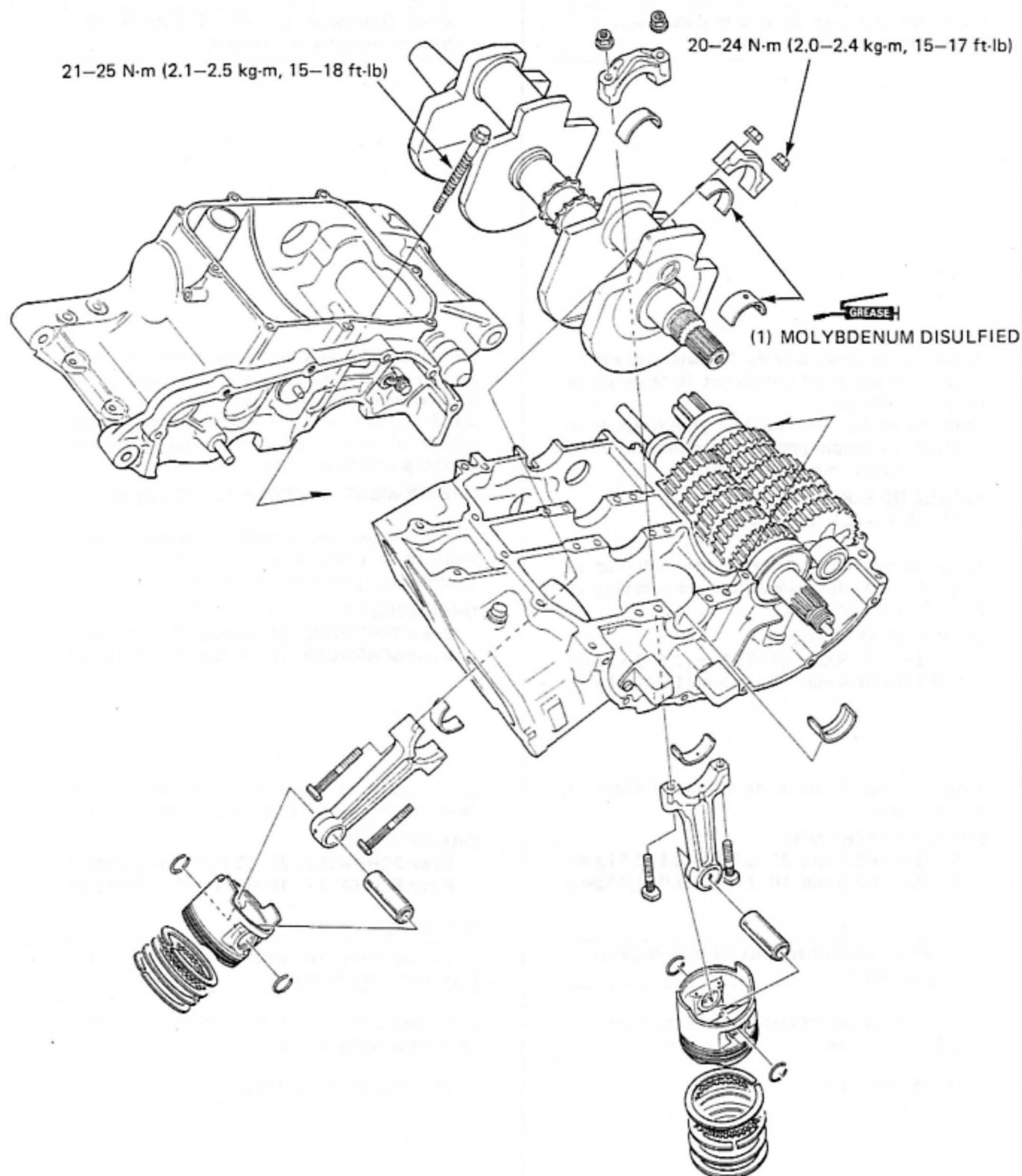
### NOTE:

Tighten the bolts in two or more steps and in a crisscross pattern.

Install the removed parts in the reverse order of removal.







(1) BISULFURE DE MOLYBDENE

(1) MOLYBDÄN-DISULFID-FETT



**HONDA**  
VF400F

# 12. CRANKSHAFT/PISTON

|                        |      |                             |       |
|------------------------|------|-----------------------------|-------|
| SERVICE INFORMATION    | 12-1 | BEARING INSPECTION          | 12-7  |
| TROUBLESHOOTING        | 12-2 | BEARING SELECTION           | 12-9  |
| CONNECTING ROD REMOVAL | 12-3 | CRANKSHAFT INSTALLATION     | 12-11 |
| PISTON REMOVAL         | 12-4 | PISTON AND ROD INSTALLATION | 12-12 |
| CRANKSHAFT REMOVAL     | 12-6 |                             |       |

## SERVICE INFORMATION

### GENERAL

- All bearing inserts are select fit and are identified by color code. Select replacement bearings from the code tables. After installing new bearings, recheck them with plastigauge to verify clearance.
- Apply molybdenum disulfide grease to the main journals and crankpins during assembly.
- Before removing the piston and connecting rod assemblies, clean the top of the cylinder of any carbon deposits.
- For servicing the piston, connecting rod and crankshaft, the crankcase assembly must be separated (Section 11).

### SPECIFICATIONS

|            | ITEM                                   |                  | STANDARD                            | SERVICE LIMIT        |
|------------|----------------------------------------|------------------|-------------------------------------|----------------------|
| Crankshaft | Connecting rod big end side clearance  |                  | 0.10–0.30 mm (0.004–0.012 in)       | 0.4 mm (0.016 in)    |
|            | Runout                                 |                  | —                                   | 0.03 mm (0.001 in)   |
|            | Crankpin oil clearance                 |                  | 0.028–0.052 mm (0.0011–0.0020 in)   | 0.07 mm (0.003 in)   |
|            | Main journal oil clearance             |                  | 0.028–0.052 mm (0.0011–0.0020 in)   | 0.07 mm (0.003 in)   |
| Cylinder   | I.D.                                   |                  | 55.000–55.015 mm (2.1654–2.1659 in) | 55.10 mm (2.169 in)  |
|            | Warpage                                |                  | —                                   | 0.10 mm (0.004 in)   |
| Piston     | Ring-to-groove clearance               | Top              | 0.015–0.045 mm (0.0006–0.0018 in)   | 0.10 mm (0.004 in)   |
|            |                                        | Second           | 0.015–0.045 mm (0.0006–0.0018 in)   | 0.10 mm (0.004 in)   |
|            | Ring end gap                           | Top              | 0.18–0.33 mm (0.007–0.013 in)       | 0.50 mm (0.02 in)    |
|            |                                        | Second           | 0.18–0.33 mm (0.007–0.013 in)       | 0.50 mm (0.02 in)    |
|            |                                        | Oil (Slide rail) | 0.2–0.9 mm (0.008–0.035 in)         | 1.1 mm (0.04 in)     |
|            | Piston O.D.                            |                  | 54.960–54.990 mm (2.1638–2.1650 in) | 54.85 mm (2.159 in)  |
|            | Piston-to-cylinder clearance           |                  | 0.01–0.055 mm (0.004–0.002 in)      | 0.10 mm (0.004 in)   |
|            | Piston pin bore                        |                  | 15.002–15.008 mm (0.5906–0.5909 in) | 15.06 mm (0.593 in)  |
|            | Piston pin O.D.                        |                  | 14.994–15.000 mm (0.5903–0.5906 in) | 14.98 mm (0.590 in)  |
|            | Piston-to-piston pin clearance         |                  | 0.002–0.014 mm (0.0001–0.0006 in)   | 0.04 mm (0.002 in)   |
|            | Connecting rod small end I.D.          |                  | 15.016–15.034 mm (0.5912–0.5919 in) | 15.08 mm (0.594 in)  |
|            | Piston pin-to-connecting rod clearance |                  | 0.016–0.040 mm (0.0006–0.0016 in)   | 0.060 mm (0.0024 in) |
| Cam chain  | Length at 16 kg (353 lb) tension       |                  | 287.44–288.06 mm (11.317–11.341 in) | 289.68 mm (11.40 in) |

### TORQUE VALUE

Crankpin: 20–24 N·m (2.0–2.4 kg·m, 15–17 ft·lb)



## TROUBLESHOOTING

### Excessive noise

1. Crankshaft
  - Worn main bearing
  - Worn rod bearing
2. Piston and Connecting Rod
  - Worn piston or cylinder
  - Worn piston pin or pin hole
  - Worn rod small end

### Low compression or uneven compression

1. Worn cylinder or piston ring

### Excessive smoke

1. Worn cylinder, piston or piston rings
2. Improperly installed piston rings
3. Damaged piston or cylinder

### Overheating

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

### Knocking or abnormal noise

1. Worn pistons and cylinders
2. Excessive carbon build-up on piston head.



## CONNECTING ROD REMOVAL

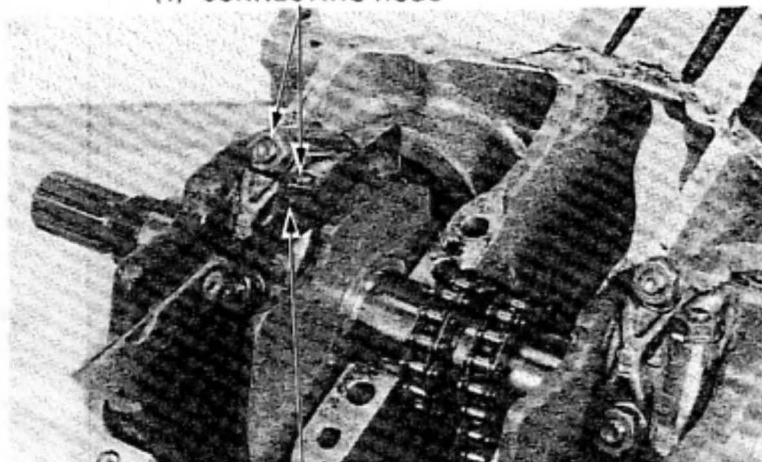
Separate the crankcase assembly (Section 11).

Remove the transmission.

Check the connecting rod side clearance.

**SERVICE LIMIT: 0.40 mm (0.016 in)**

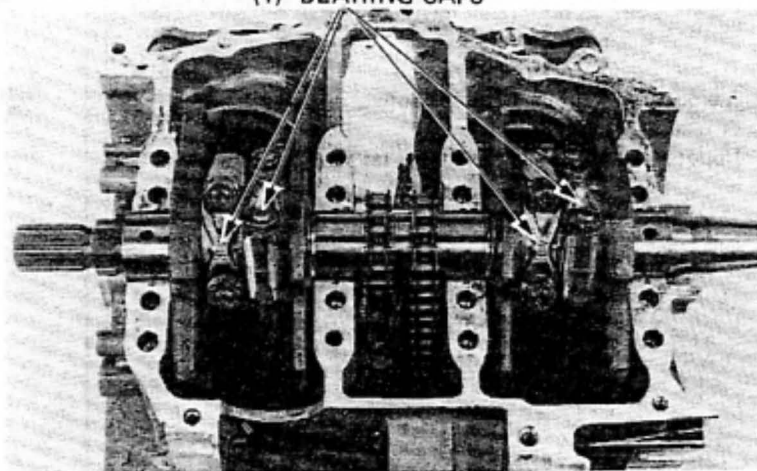
(1) CONNECTING RODS



(2) FEELER GAUGE

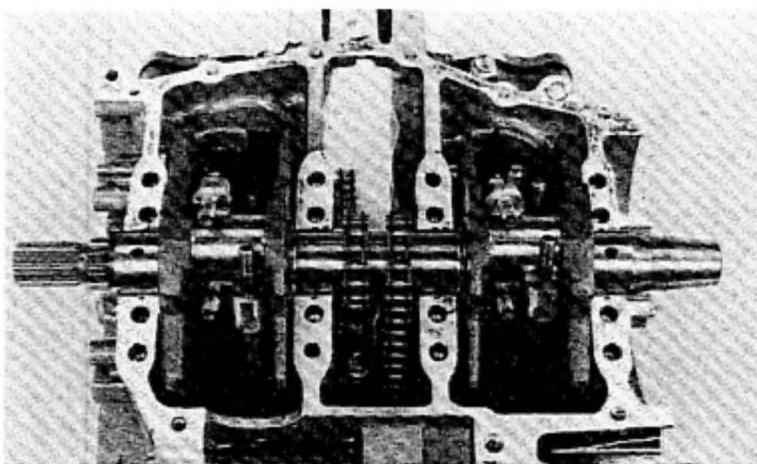
Remove the connecting rod bearing caps and note their locations.

(1) BEARING CAPS



Push the connecting rods and piston out through the top of the cylinder bores.

Mark the rods, pistons, bearings and caps as you remove them to indicate the correct cylinder and position on the crankpins.

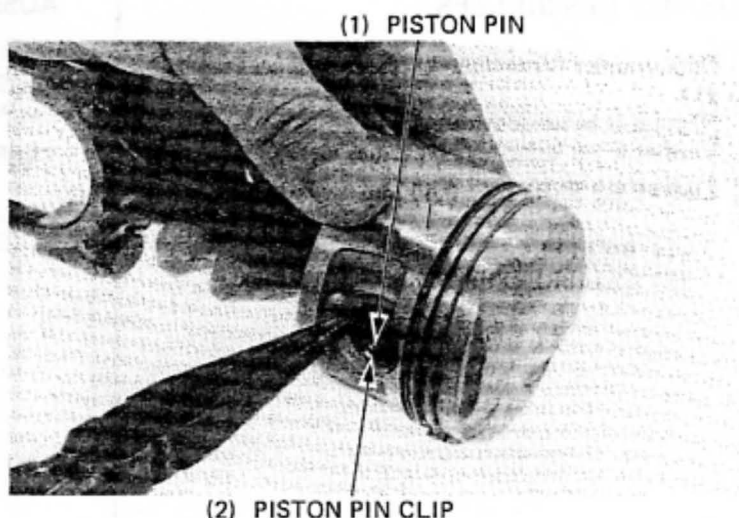




## PISTON REMOVAL

Remove the piston pin clips. Push the piston pin out and remove the piston.

Mark the piston pins to indicate their correct piston position.



## PISTON/PISTON RING INSPECTION

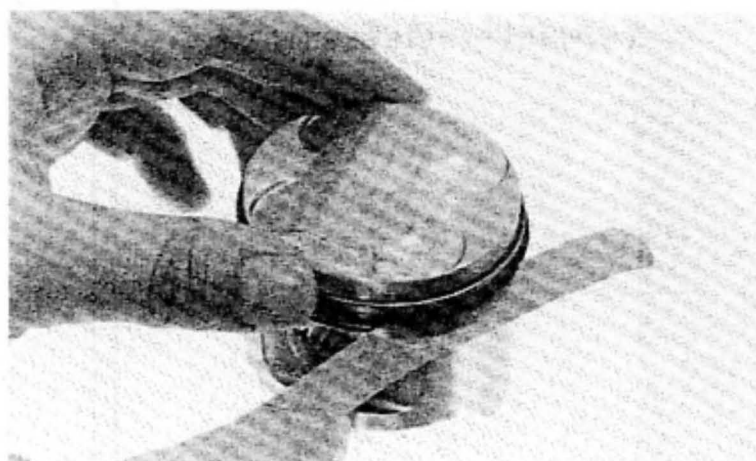
Measure the piston ring-to-groove clearance.

**SERVICE LIMIT:** 0.10 mm (0.004 in)  
(TOP/SECOND)

Remove the piston rings and mark them to indicate the correct cylinder and piston position.

Clean the piston crown, removing all carbon deposits.

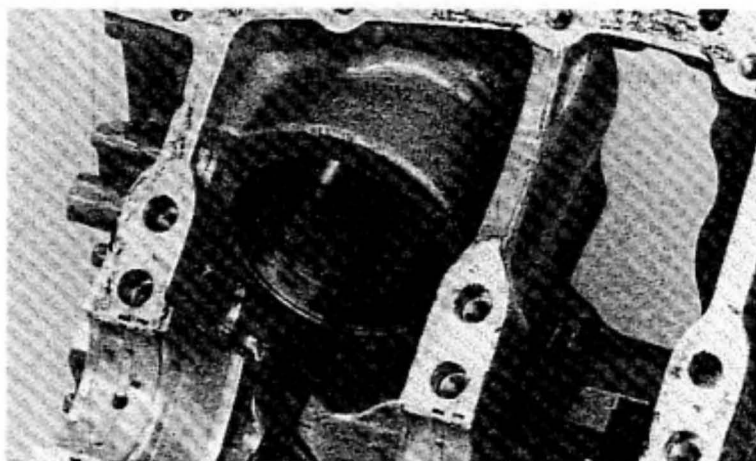
Inspect the piston for cracks or other damage and the ring grooves for excessive wear and carbon build-up.



Using a piston, push the ring into the cylinder squarely and measure the end gap.

### SERVICE LIMITS:

**TOP:** 0.50 mm (0.020 in)  
**SECOND:** 0.50 mm (0.020 in)  
**OIL (Side rail):** 1.1 mm (0.04 in)







Measure the piston O.D.

**NOTE:**

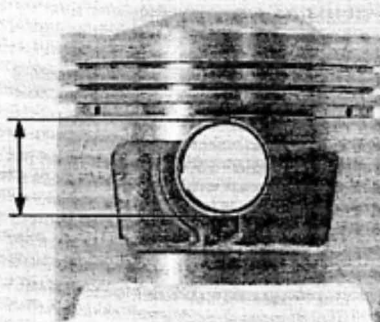
Take measurements 10 mm (0.4 in) from the bottom, and 90° to the piston pin hole.

**SERVICE LIMIT: 54.85 mm (2.159 in)**



Measure each piston pin hole I.D.

**SERVICE LIMIT: 15.06 mm (0.593 in)**

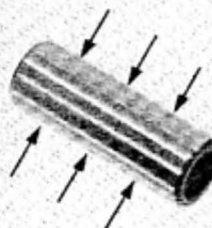


Measure each piston pin O.D.

**SERVICE LIMIT: 14.98 mm (0.590 in)**

Calculate the piston pin-to-piston clearance.

**SERVICE LIMIT: 0.04 mm (0.002 in)**



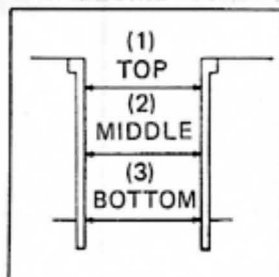


Inspect the cylinder bores for wear or damage.  
Measure the cylinder I.D. at three levels in X and Y axis.

**SERVICE LIMIT: 55.10 mm (2.169 in)**

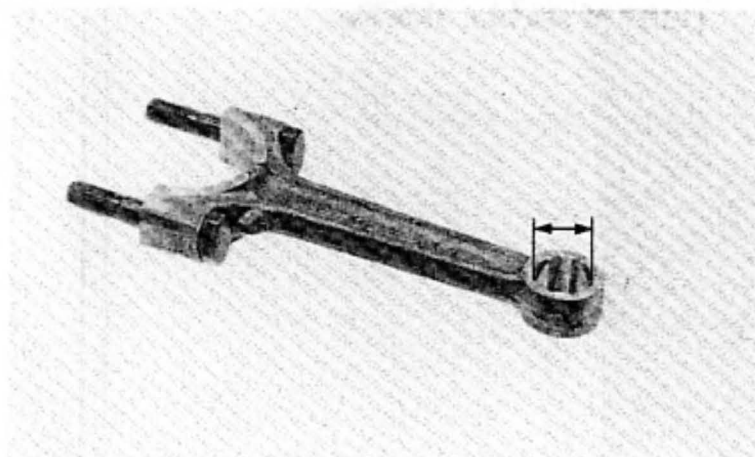
Calculate the piston-to-cylinder clearance.

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



Measure the connecting rod small end I.D. If the reading exceeds the service limit, replace the rod.

**SERVICE LIMIT: 15.08 mm (0.594 in)**



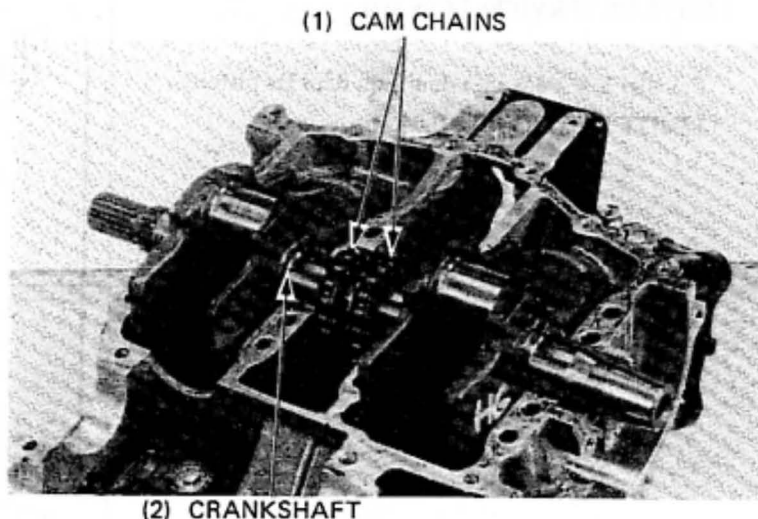
## CRANKSHAFT REMOVAL

Separate the crankcase (page 11-2).

Remove the transmission.

Remove the connecting rods and pistons (page 12-3).

Remove the crankshaft and cam chains.



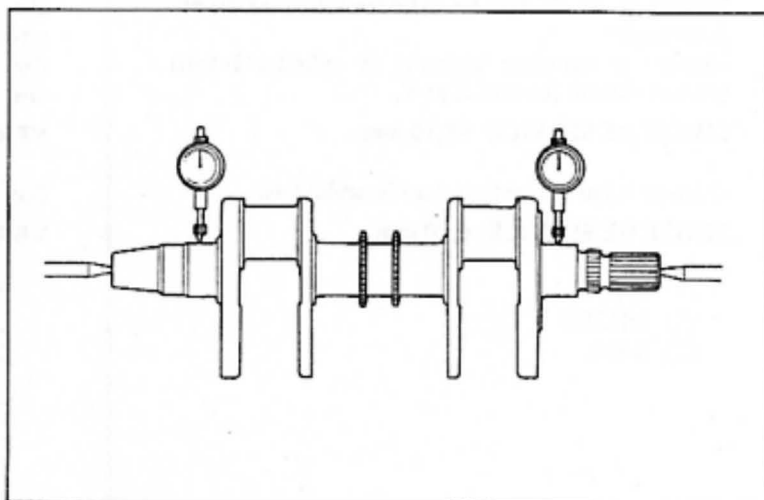


## CRANKSHAFT INSPECTION

Set the crankshaft on a stand or Vee blocks.  
Set a dial indicator on the center main bearing journal. Rotate the crankshaft two revolutions and read the runout.

Actual runout is 1/2 of the total indicator reading.

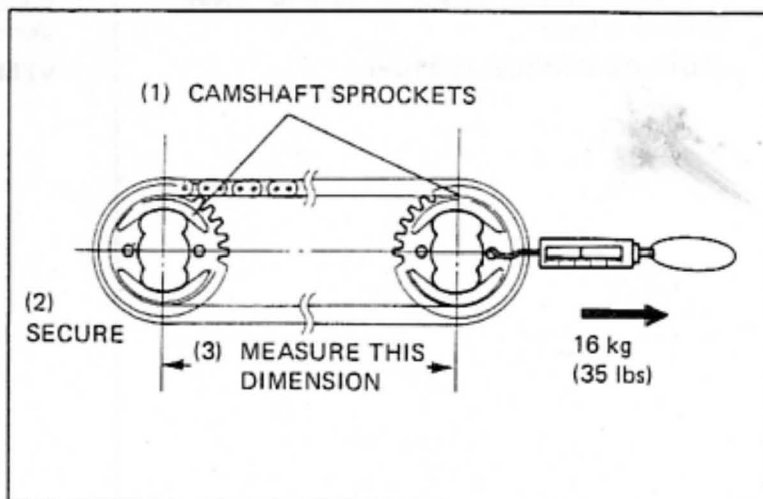
**SERVICE LIMIT: 0.03 mm (0.001 in)**



## CAM CHAIN LENGTH INSPECTION

Place the cam chain on the camshaft sprockets.  
Secure one camshaft sprocket and apply 16 kg (35 lbs) of tension to the other.  
Measure the distance between the sprocket centers as shown.

**SERVICE LIMIT: 289.68 mm (11.40 in)**



## BEARING INSPECTION

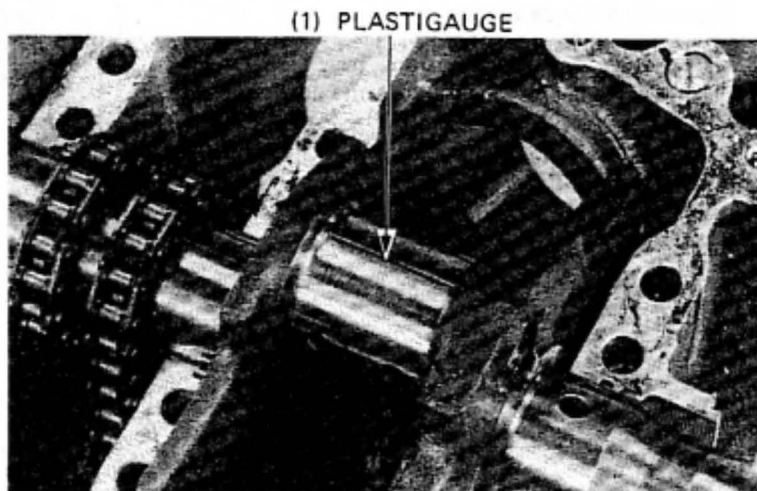
## CRANKPIN BEARING

Inspect the bearing inserts for unusual wear or damage.

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.



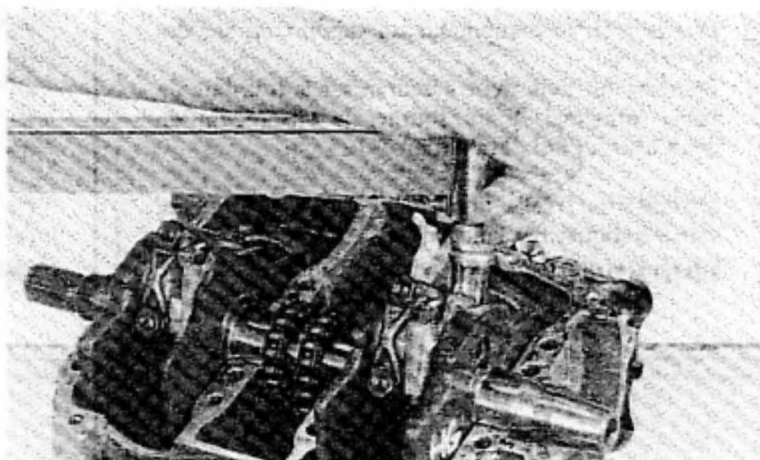


Install the bearing caps and connecting rods on the correct crankpins, and tighten them evenly.

**TORQUE: 20–24 N·m (2.0–2.4 kg-m, 15–17 ft-lb)**

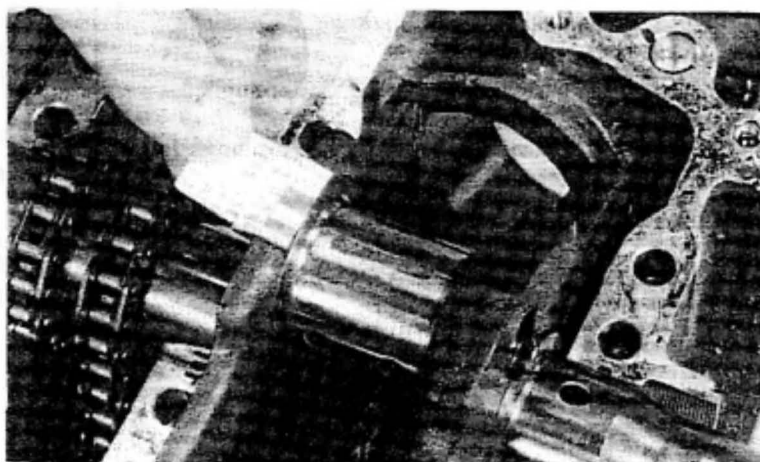
**NOTE:**

Do not rotate the crankshaft and connecting rods during inspection.



Remove the caps and measure the compressed plastigauge on each crankpin.

**OIL CLEARANCE SERVICE LIMIT:**  
0.07 mm (0.003 in)



### MAIN BEARING

Inspect the bearing inserts for unusual wear or damage.

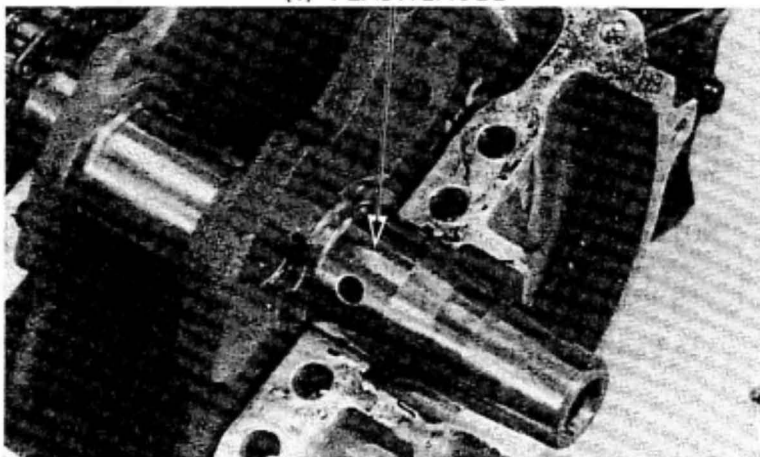
Reinstall the upper crankcase's main bearing inserts, then carefully lower the crankshaft in place.

Wipe all 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.

(1) PLASTIGAUGE





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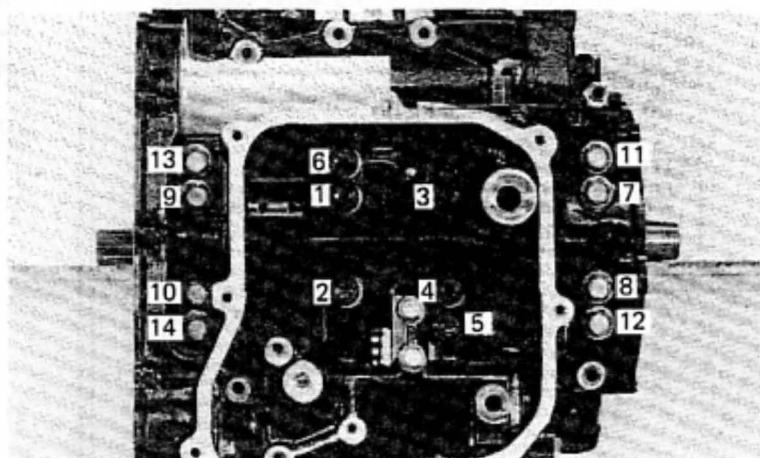
## CRANKSHAFT/PISTON

Install the main bearings on the correct journals in the lower crankcase, then assemble and tighten the bolts evenly in 2–3 steps in the sequence shown.

**TORQUE: 21–25 N·m (2.1–2.5 kg·m, 15–18 ft·lb)**

### NOTE:

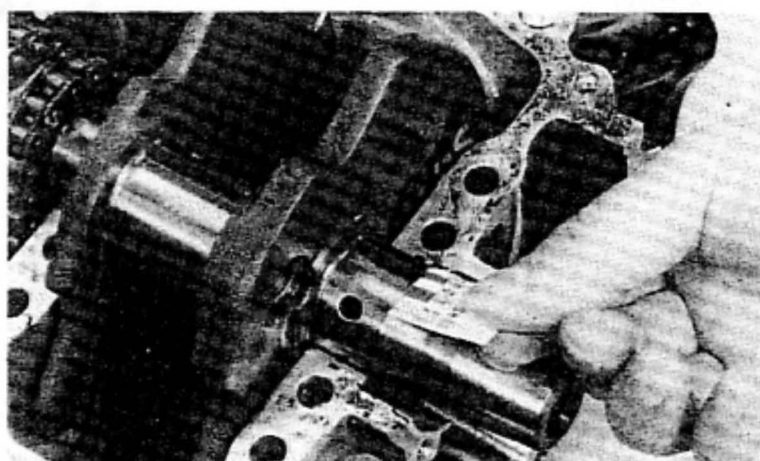
Do not rotate the crankshaft during inspection.



Remove the lower crankcase and measure the compressed plastigauge on each journal.

### OIL CLEARANCE SERVICE LIMIT:

0.07 mm (0.003 in)



## BEARING SELECTION

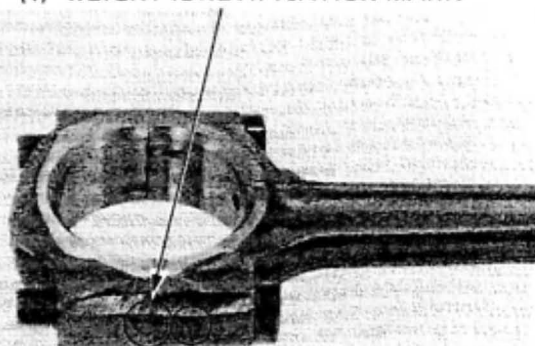
### CONNECTING ROD BEARING

If rod bearing clearance is beyond tolerance, select replacement bearings as follows:

The code numbers (1, or 2) stamped on each connecting rod identifies its inside diameter (I.D.). The code letters (A, B or C) stamped on each connecting rod indicates its weight identification mark.

| Weight g (lbs)        | Letter |
|-----------------------|--------|
| 211–215 (0.465–0.474) | A      |
| 215–223 (0.474–0.492) | B      |
| 223–227 (0.492–0.500) | C      |

(1) WEIGHT IDENTIFICATION MARK



(2) I.D. CODE NUMBER





The code letters (A or B) stamped on each crankshaft counter weight identifies the outside diameter (O.D.) of its crankpin.

Cross reference the crankpin and rod codes to select the correct replacement bearing.

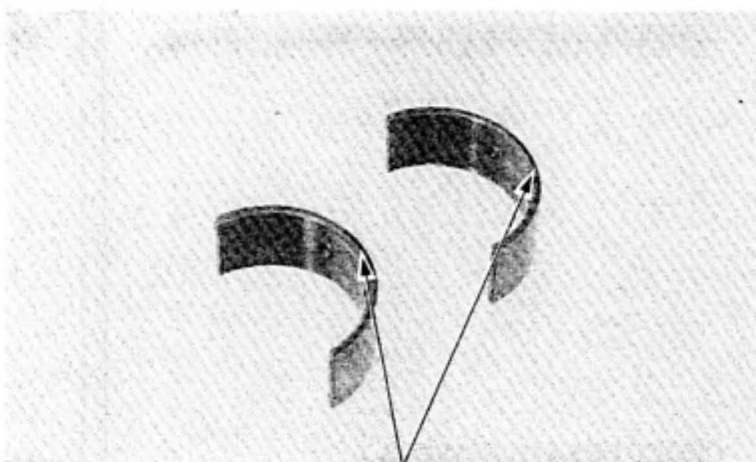
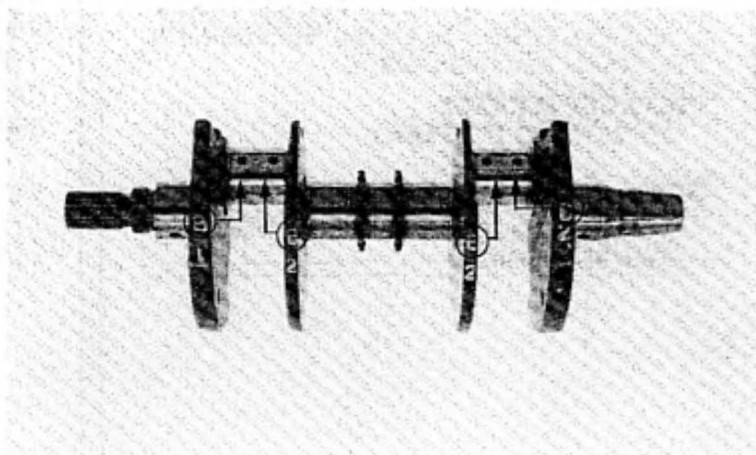
|                                         |   | CONNECTING ROD<br>I.D. CODE NO.                |                                                |
|-----------------------------------------|---|------------------------------------------------|------------------------------------------------|
|                                         |   | 1                                              | 2                                              |
| CRANK-<br>PIN<br>O.D.<br>CODE<br>LETTER | A | 29.992–<br>30.000 mm<br>(1.1808–<br>1.1811 in) | 33.000–<br>33.008 mm<br>(1.2992–<br>1.2995 in) |
|                                         | B | 33.008–<br>33.016 mm<br>(1.2995–<br>1.2998 in) | 33.008–<br>33.016 mm<br>(1.2995–<br>1.2998 in) |

## BEARING INSERT THICKNESS

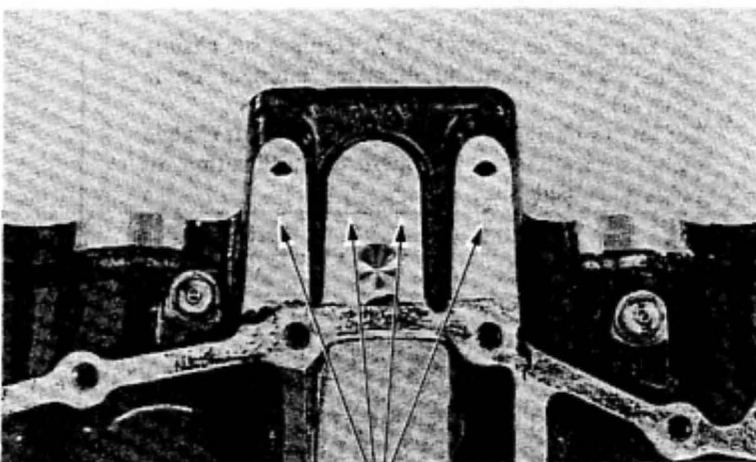
A (Brown): 1.494–1.498 mm (0.0588–0.0590 in)  
 B (Green): 1.490–1.494 mm (0.0587–0.0588 in)  
 C (Yellow): 1.486–1.490 mm (0.0585–0.0587 in)

## MAIN BEARING

The code letters (A or B) stamped on the rear portion of the upper crankcase identifies the inside diameter (I.D.) of each main bearing journal.



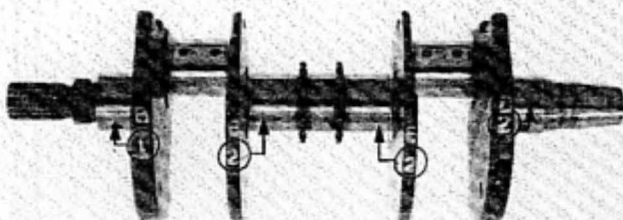
(1) COLOR CODES



(1) I.D. CODE LETTERS



The code numbers (1 or 2) stamped on each crankshaft counter weight identifies the outside diameter (O.D.) of its main journal.

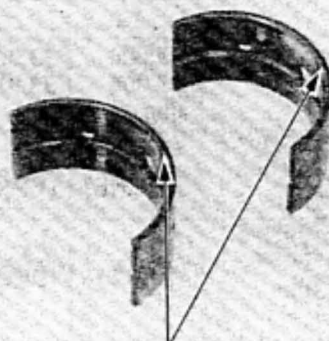


Cross reference the crankcase and crank journal codes to select the correct replacement bearing.

|                                          |   | MAIN JOURNAL<br>O.D. CODE NO.                  |                                                |
|------------------------------------------|---|------------------------------------------------|------------------------------------------------|
|                                          |   | 1                                              | 2                                              |
|                                          |   | 33.000—<br>33.008 mm<br>(1.2992—<br>1.2995 in) | 33.008—<br>33.016 mm<br>(1.2995—<br>1.2998 in) |
| CRANK-<br>CASE<br>I.D.<br>CODE<br>LETTER | A | C<br>(Yellow)                                  | B<br>(Green)                                   |
|                                          | B | B<br>(Green)                                   | A<br>(Brown)                                   |

## BEARING INSERT THICKNESS

A (Brown): 1.498—1.502 mm (0.0590—0.0591 in)  
 B (Green): 1.494—1.498 mm (0.0588—0.0590 in)  
 C (Yellow): 1.490—1.494 mm (0.0587—0.0588 in)



(1) COLOR CODE

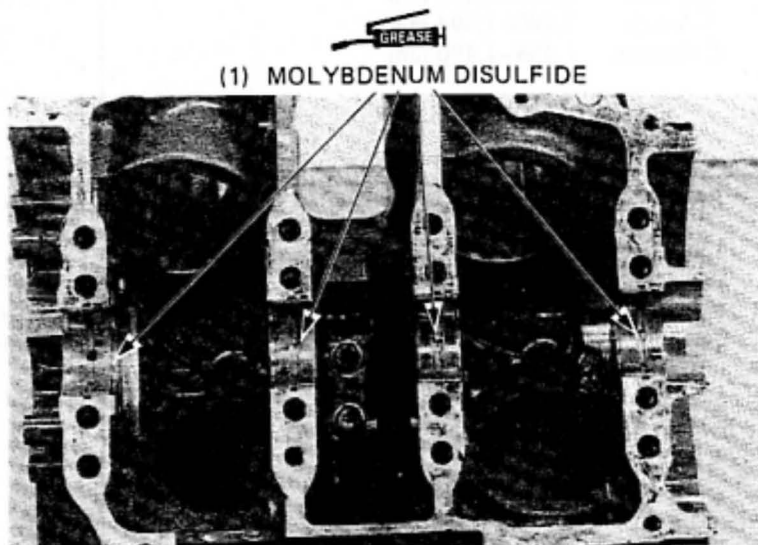
## CRANKSHAFT INSTALLATION

Install the main bearings into the upper and lower crankcases.

Apply molybdenum disulfide grease to the main bearings.

Install the cam chains to the crankshaft.

Install the crankshaft over the upper crankcase.



(1) MOLYBDENUM DISULFIDE

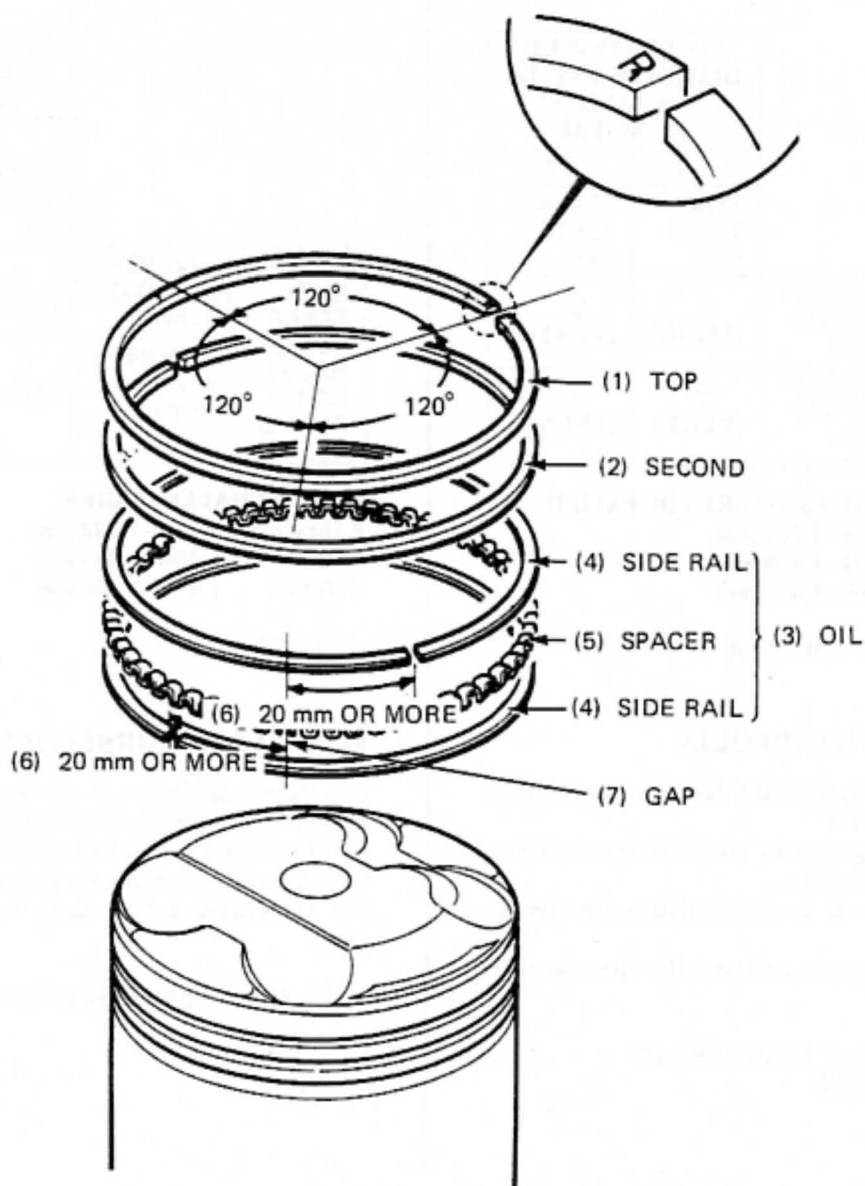
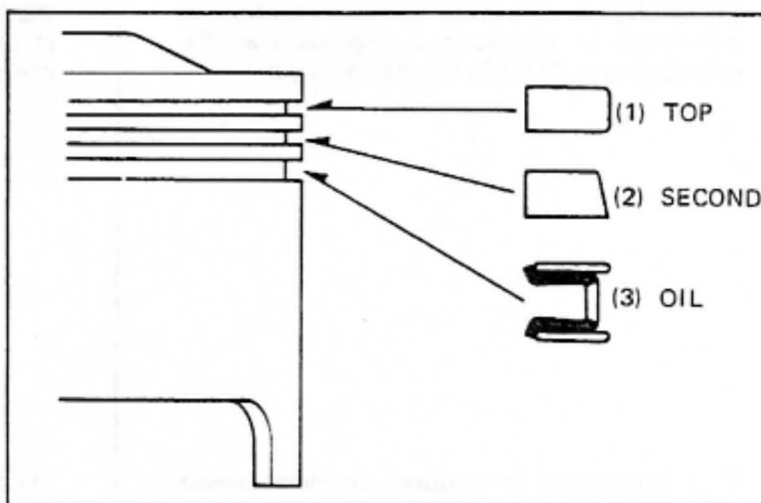


## PISTON AND ROD INSTALLATION

Clean the piston domes, ring lands, and skirts.  
 Carefully install the piston rings onto the piston.

### NOTE:

- Be careful not to damage the piston and rings during assembly.
- All rings should be installed with the markings facing up.
- Space the ring end gaps 120 degrees apart.
- Do not align the side rail gaps.
- After installing the rings they should rotate freely, without sticking.



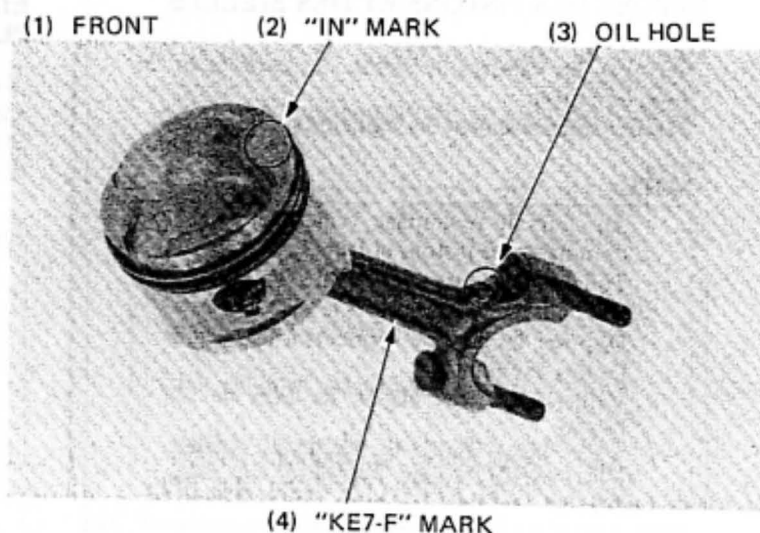


Coat the rod's small end and piston pin hole with molybdenum disulfide grease.

## FRONT CYLINDER

Note that the front cylinder connecting rods are marked "KE7-F".

Install the pistons on the front connecting rods so that the intake "IN" mark is facing the same direction as the oil hole in the rod.



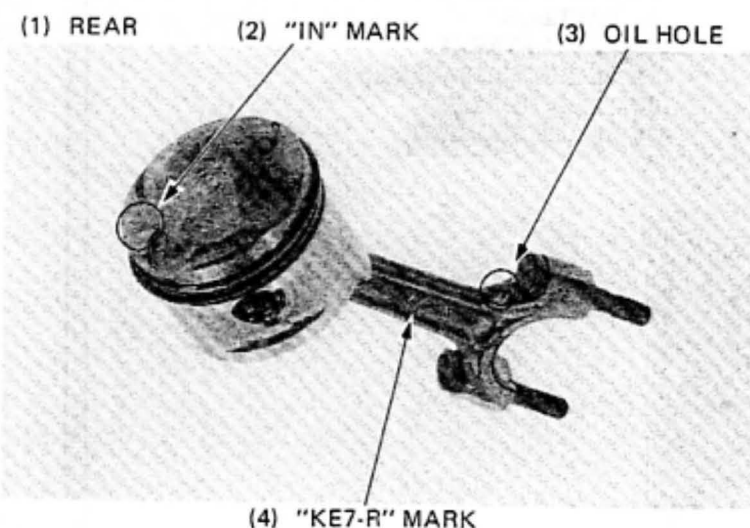
## REAR CYLINDER

Note that the rear cylinder connecting rods are marked "KE7-R".

Install the pistons on the rear cylinder connecting rods so that the intake "IN" mark is facing opposite the oil hole in the rod.

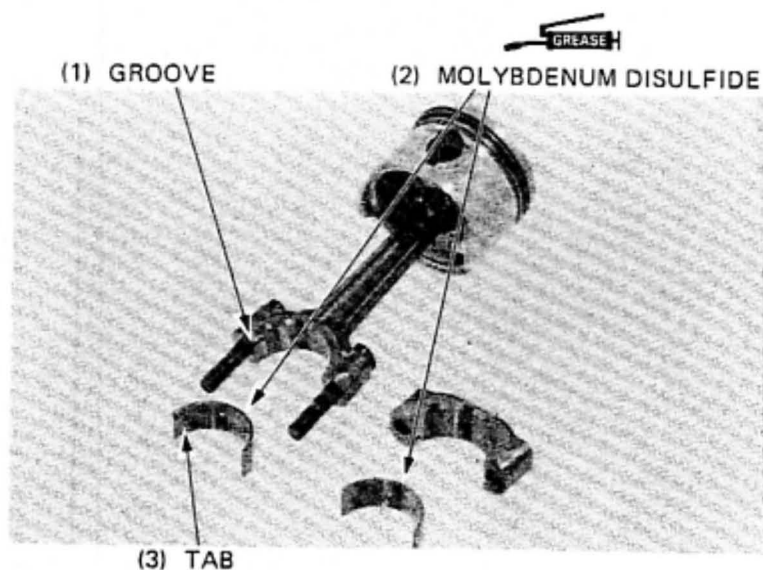
### NOTE:

- Do not interchange the pistons, piston pins or connecting rods.
- Make sure that the piston pin clips are properly seated.



Install the bearing inserts on the connecting rods and bearing caps, aligning the tabs on the inserts with the grooves in the rods and caps.

Apply molybdenum disulfide grease to the connecting rod bearings.



## CRANKSHAFT/PISTON



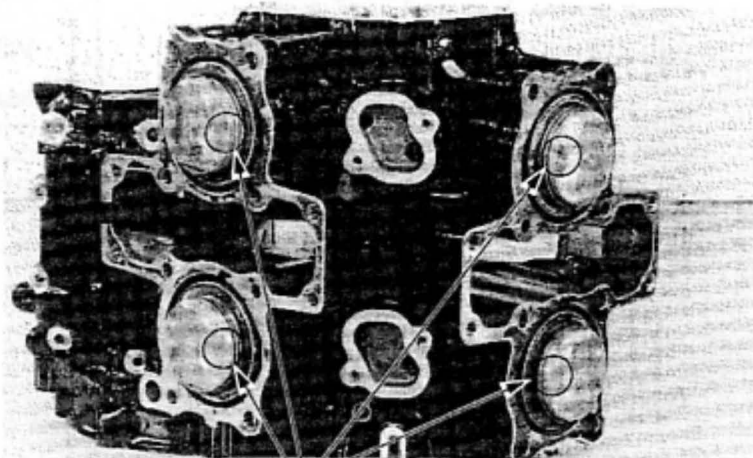
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Coat the cylinders, piston rings/grooves and pistons with oil. To prevent damaging the crankshaft, slip short sections of rubber hose over the rod bolts before installation.

Install the rod and piston assemblies into the cylinders from the top of the crankcase. Be sure each assembly is returned to its original position as noted during removal.

### NOTE:

The piston intake "IN" marks should be facing each other as shown.



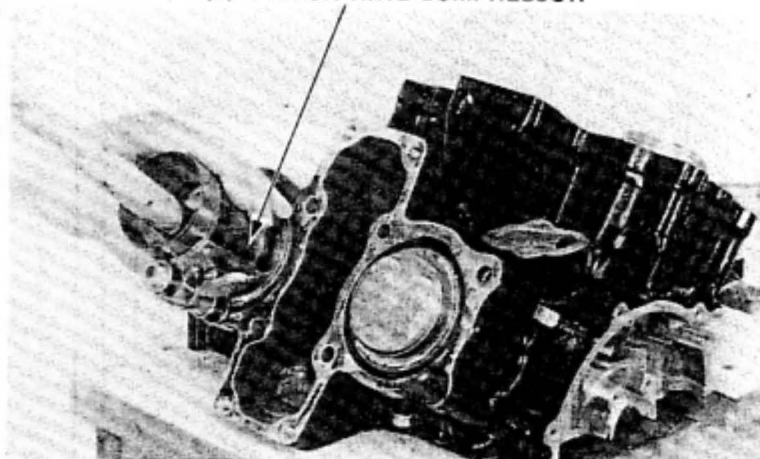
(1) "IN" MARKS

Compress the piston rings with a ring compressor and insert the piston and rod into the cylinder until the rod seats on the crankpin.

### NOTE:

Be careful not to damage the pistons or rings during assembly.

(1) PISTON RING COMPRESSOR



Flip the upper crankcase over.

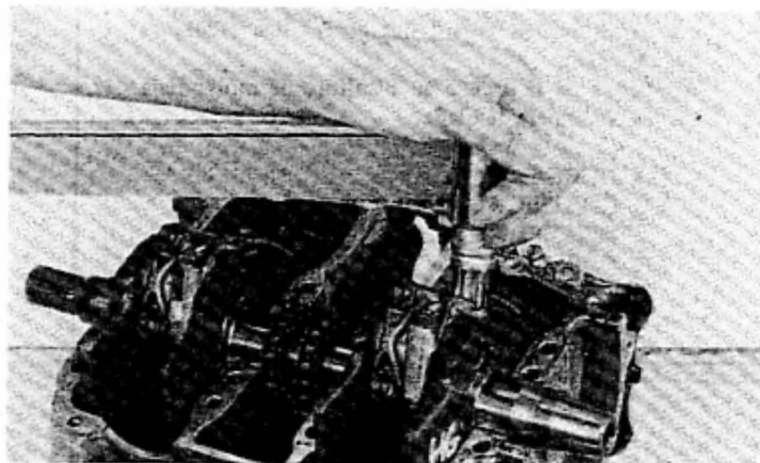
Install and torque the connecting rod caps.

**TORQUE: 20–24 N·m (2.0–2.4 kg-m, 15–17 ft-lb)**

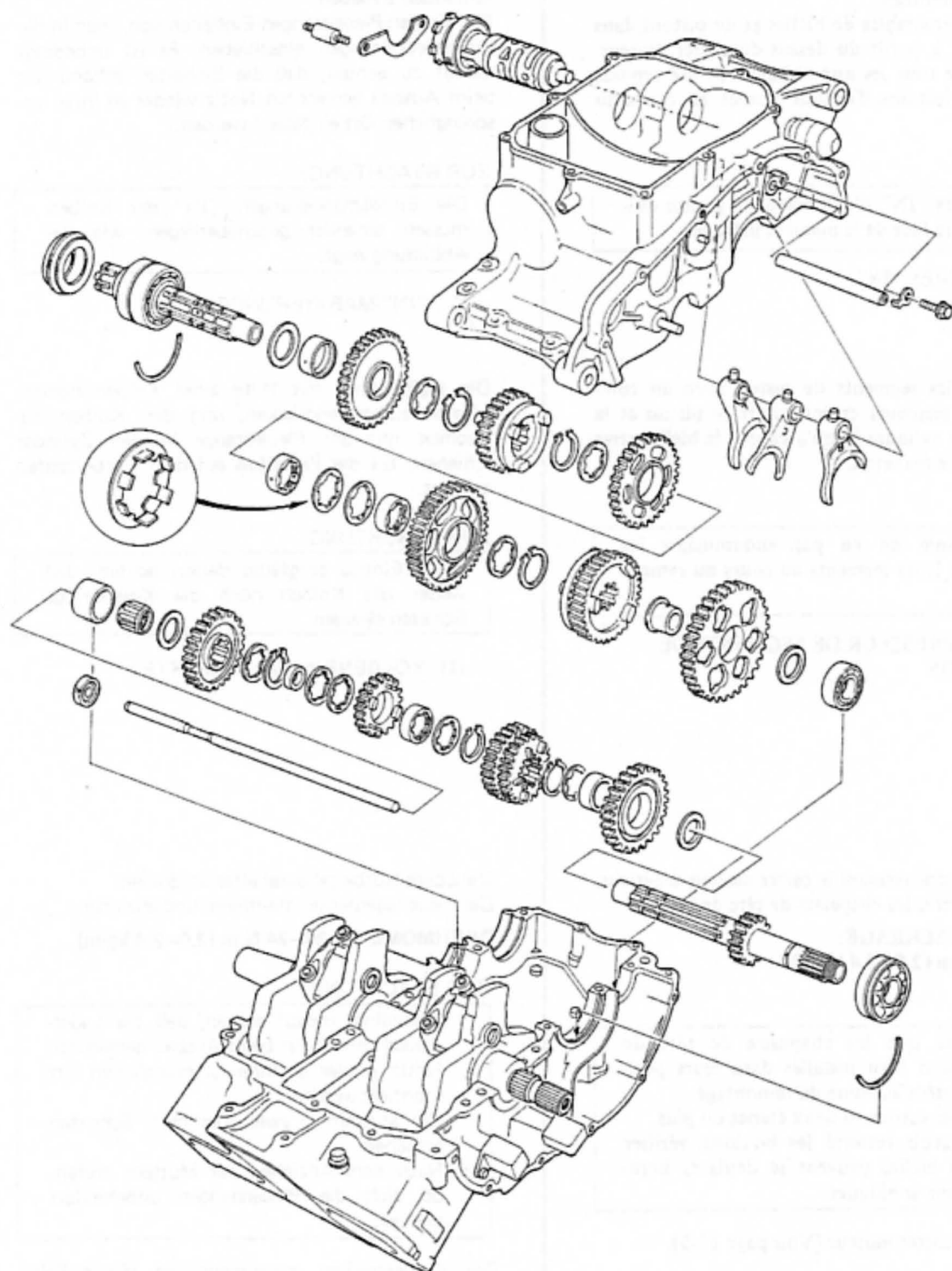
### NOTE

- Be sure the bearing caps are installed in their correct location as marked during removal.
- Tighten the nuts in two or more steps.
- After tightening the bolts, check that the rods move freely without binding.

Assemble the crankcase (See page 11-5).









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# 13. TRANSMISSION

|                           |       |
|---------------------------|-------|
| SERVICE INFORMATION       | 13-1  |
| TROUBLESHOOTING           | 13-2  |
| TRANSMISSION DISASSEMBLY  | 13-3  |
| SHIFT FORK AND SHIFT DRUM | 13-6  |
| TRANSMISSION ASSEMBLY     | 13-10 |

## SERVICE INFORMATION

### GENERAL

- The gearshift linkage can be serviced with the engine in the frame (Section 8).
  - For internal transmission repairs, the crankcase must be separated (Section 11).
- Note the installation directions and positions of the thrust washers when assembling the mainshaft and countershaft.

### SPECIFICATIONS

|              |                   |                 | STANDARD                            | SERVICE LIMIT       |
|--------------|-------------------|-----------------|-------------------------------------|---------------------|
| Transmission | Backlash          |                 | 0.044–0.140 mm (0.0017–0.0055 in)   | 0.30 mm (0.012 in)  |
|              | Gear I.D.         | M4, M6 gear     | 25.000–25.021 mm (0.9843–0.9851 in) | 25.05 mm (0.986 in) |
|              |                   | C1 gear         | 20.000–20.021 mm (0.7847–0.7882 in) | 20.05 mm (0.789 in) |
|              |                   | C2, C3, C5 gear | 28.000–28.021 mm (1.1024–1.1032 in) | 28.05 mm (1.104 in) |
|              | Gear bushing O.D. | M4 gear         | 24.959–24.980 mm (0.9826–0.9835 in) | 25.07 mm (0.987 in) |
|              |                   | M6 gear         | 24.959–24.980 mm (0.9826–0.9835 in) | 24.92 mm (0.981 in) |
|              |                   | C1 gear         | 19.959–19.980 mm (0.7858–0.7866 in) | 19.92 mm (0.784 in) |
|              |                   | C2, C3, C5 gear | 27.959–27.980 mm (1.1007–1.1016 in) | 27.92 mm (1.099 in) |
|              | Gear bushing I.D. | M6 gear         | 21.985–22.006 mm (0.8655–0.8664 in) | 22.07 mm (0.867 in) |
|              |                   | C1 gear         | 17.005–17.023 mm (0.6695–0.6702 in) | 17.08 mm (0.672 in) |
|              |                   | C5 gear         | 25.020–25.041 mm (0.9850–0.9859 in) | 25.11 mm (0.989 in) |
|              | Mainshaft O.D.    | at M6 gear      | 21.959–21.980 mm (0.8645–0.8654 in) | 21.92 mm (0.863 in) |
| Shift fork   | Claw thickness    | at C1 gear      | 16.983–16.994 mm (0.6686–0.6691 in) | 16.97 mm (0.668 in) |
|              |                   | at C5 gear      | 24.959–24.980 mm (0.9826–0.9835 in) | 24.94 mm (0.982 in) |
| Shift fork   | I.D.              |                 | 5.93–6.00 mm (0.233–0.236 in)       | 5.60 mm (0.220 in)  |
|              | I.D.              |                 | 12.000–12.021 mm (0.4724–0.4733 in) | 12.04 mm (0.474 in) |
| Fork shaft   | O.D.              |                 | 11.966–11.984 mm (0.4711–0.4718 in) | 11.90 mm (0.469 in) |

### TOOLS

|                   |               |
|-------------------|---------------|
| Common            |               |
| Driver C          | 07746–0030100 |
| Attachment, 25 mm | 07746–0030300 |

**TROUBLESHOOTING****Hard to shift**

1. Bent gearshift fork
2. Improper clutch system
3. Bent gearshift fork shaft
4. Bent gearshift claw
5. Worn shift drum cam groove
6. Worn guide pin

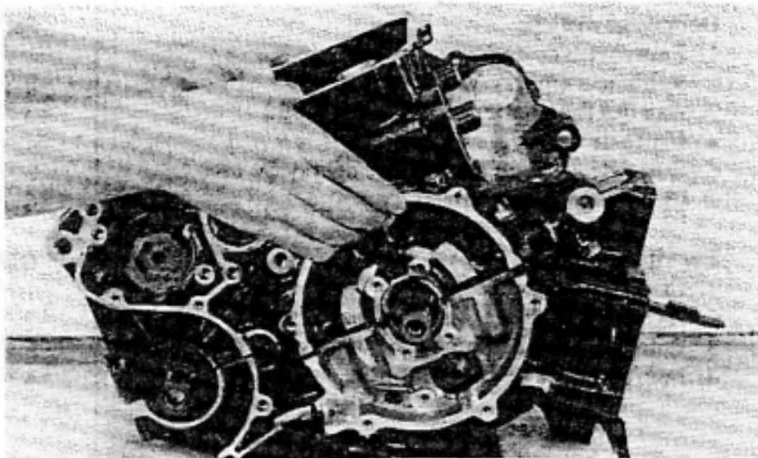
**Transmission jumps out of gear**

1. Worn gear dogs
2. Bent gearshift fork shaft
3. Damaged shift drum stopper
4. Bent gearshift fork



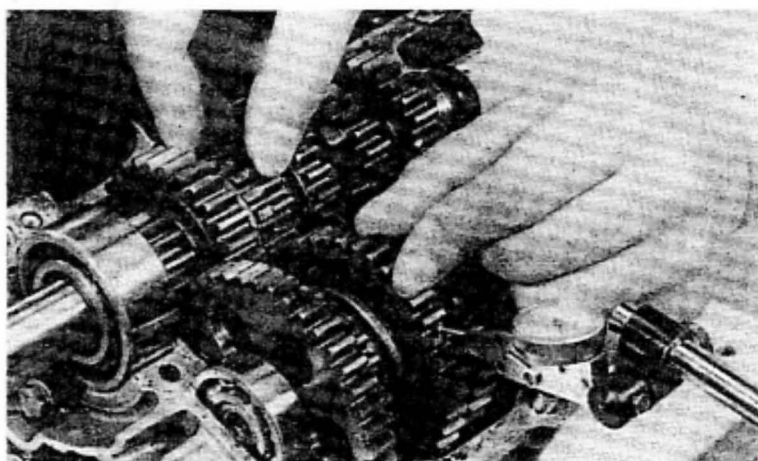
## TRANSMISSION DISASSEMBLY

Separate the crankcase (Section 11).



Inspect the backlash of each gear.

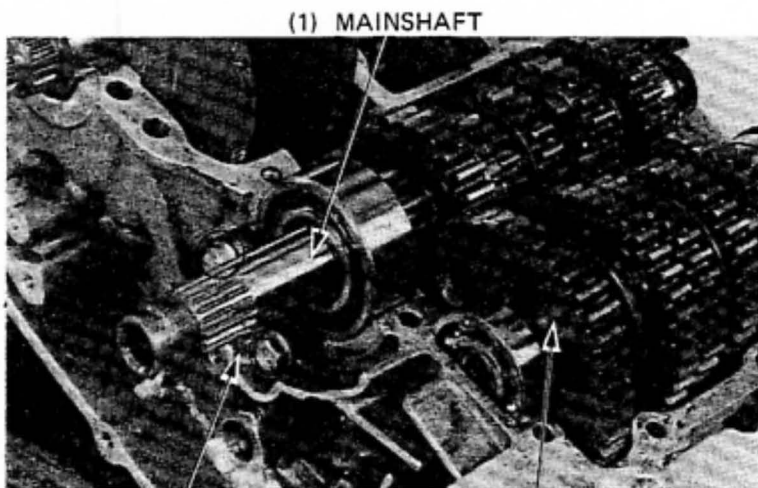
**SERVICE LIMIT: 0.30 mm (0.012 in)**



Remove the bearing setting plate.

Remove the mainshaft assembly and countershaft assembly.

Remove the oil seal.



(2) BEARING SETTING PLATE

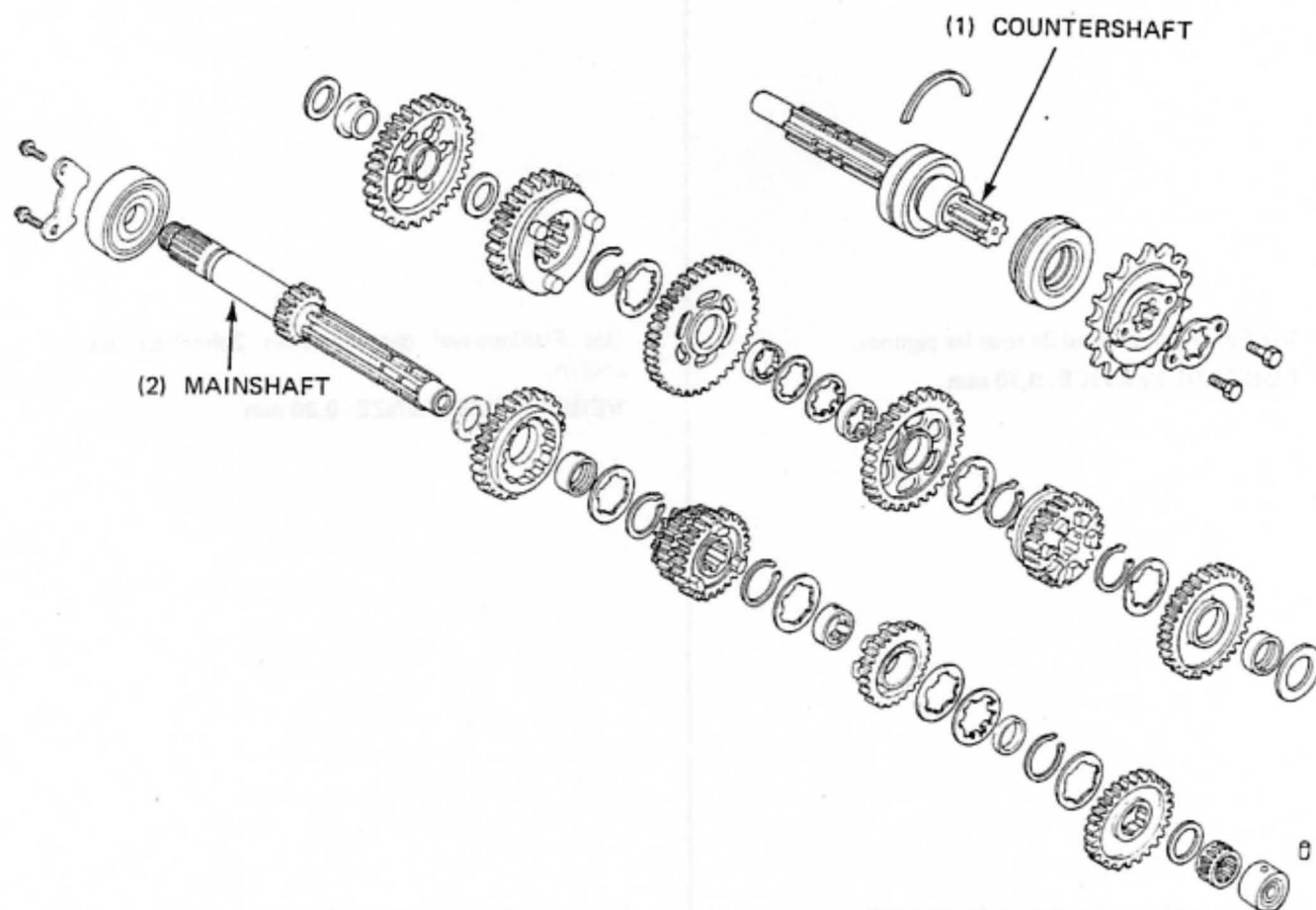
(3) COUNTERSHAFT



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## TRANSMISSION

Disassemble the mainshaft and countershaft.



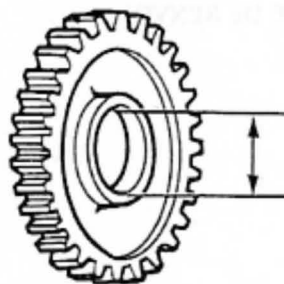
### TRANSMISSION INSPECTION

Check gear dogs, dog holes and gear teeth for excessive or abnormal wear, or evidence of insufficient lubrication.

Measure the I.D. of each gear.

#### SERVICE LIMIT:

|                  |                     |
|------------------|---------------------|
| M4, M6 gear:     | 25.05 mm (0.986 in) |
| C1 gear:         | 20.05 mm (0.789 in) |
| C2, C3, C5 gear: | 28.05 mm (1.104 in) |







Measure the O.D. of each gear bushing.

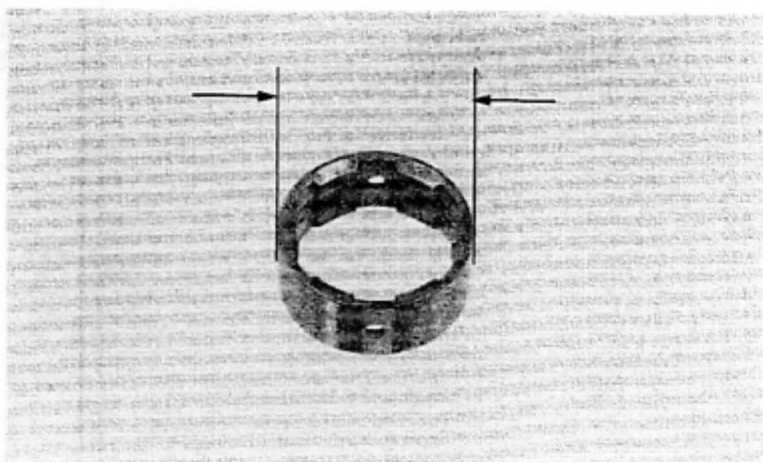
**SERVICE LIMIT:**

|                  |                     |
|------------------|---------------------|
| M4 gear:         | 25.07 mm (0.987 in) |
| M6 gear:         | 24.92 mm (0.981 in) |
| C1 gear:         | 19.92 mm (0.784 in) |
| C2, C3, C5 gear: | 27.92 mm (1.099 in) |

Measure the I.D. of each gear bushing.

**SERVICE LIMIT:**

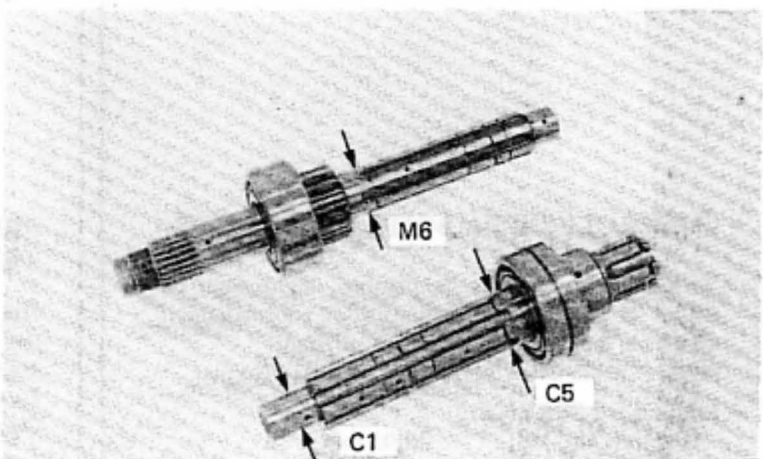
|          |                     |
|----------|---------------------|
| M6 gear: | 22.07 mm (0.867 in) |
| C1 gear: | 17.08 mm (0.672 in) |
| C5 gear: | 25.11 mm (0.989 in) |



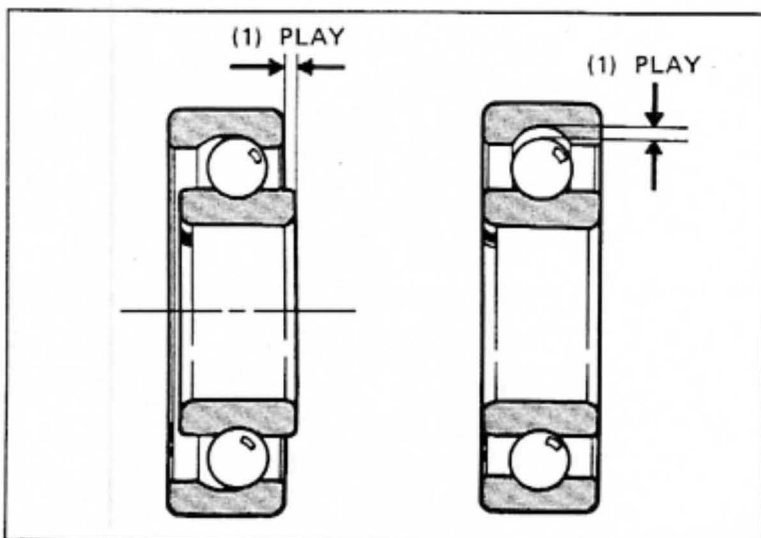
Measure the O.D. of mainshaft and countershaft.

**SERVICE LIMIT:**

|                       |                     |
|-----------------------|---------------------|
| Mainshaft (at M6):    | 21.92 mm (0.863 in) |
| Countershaft (at C1): | 16.97 mm (0.668 in) |
| Countershaft (at C5): | 24.94 mm (0.982 in) |

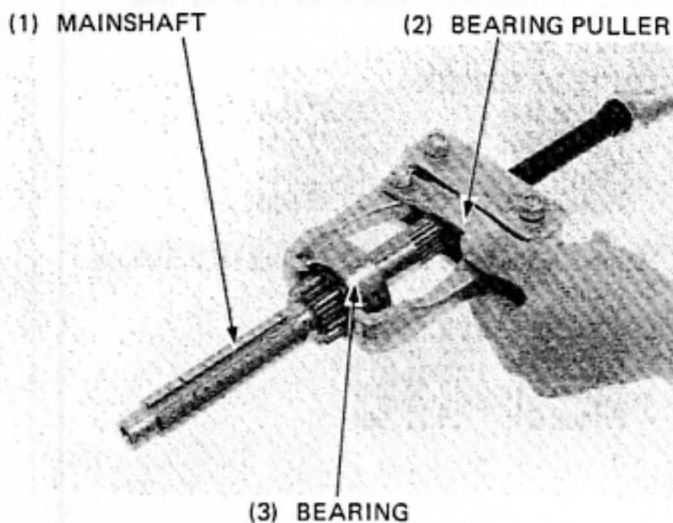


Check the mainshaft and countershaft bearings for excessive play.  
If the countershaft bearing is damaged or has excessive play, the countershaft must be replaced.



**MAINSHAFT BEARING REPLACEMENT**

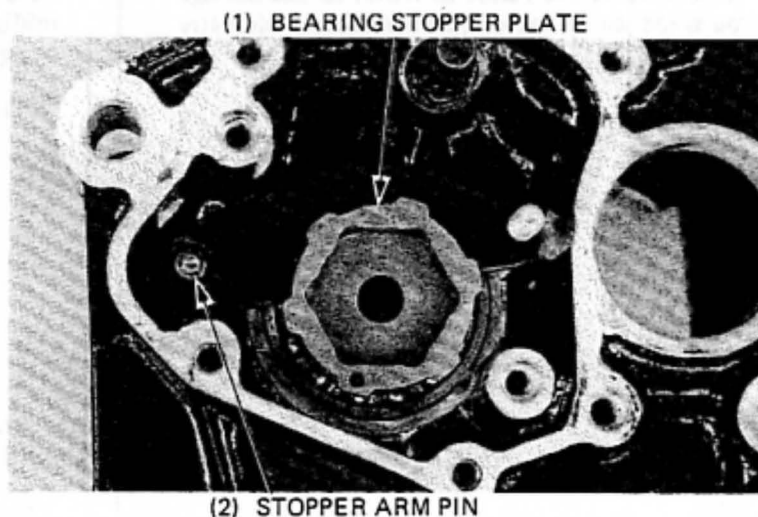
Remove the mainshaft bearing with a bearing puller.



Drive a new bearing onto the mainshaft.

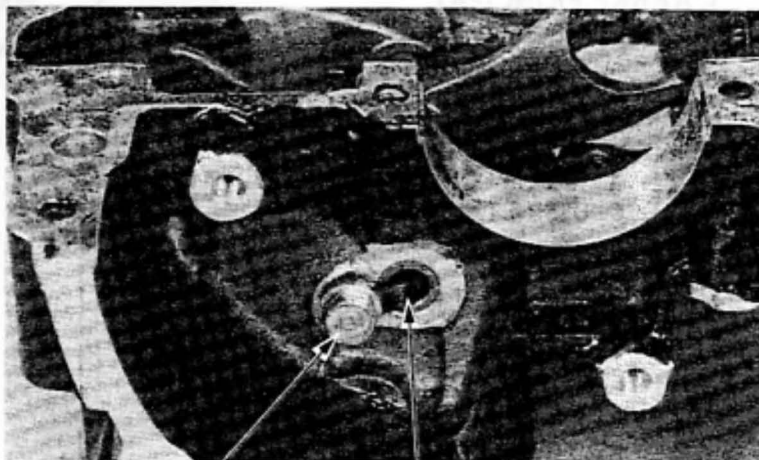
**SHIFT FORK AND SHIFT DRUM****REMOVAL**

Remove the gearshift linkage (Section 8).  
Remove the stopper arm pin, using two 6 mm nuts.  
Remove the bearing stopper plate.



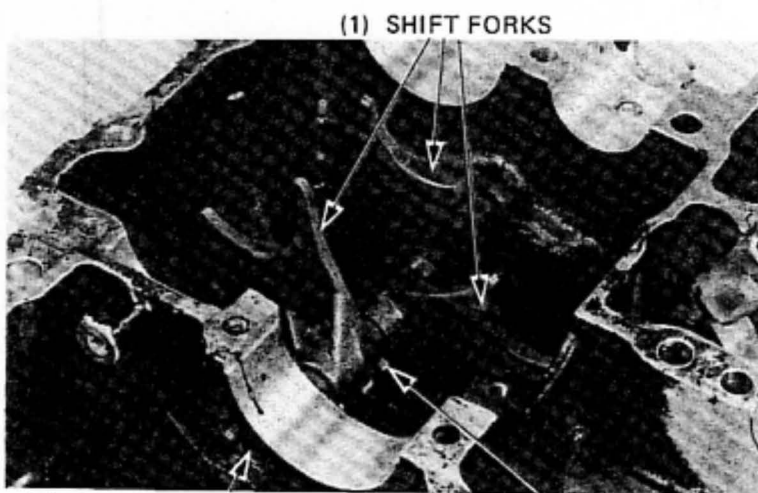


Remove the shift fork shaft stopper by removing the bolt.



(1) BOLT (2) SHIFT FORK SHAFT STOPPER

Remove the shift fork shaft and shift forks.  
Remove the shift drum.



(1) SHIFT FORKS  
(2) SHIFT FORK SHAFT (3) SHIFT DRUM

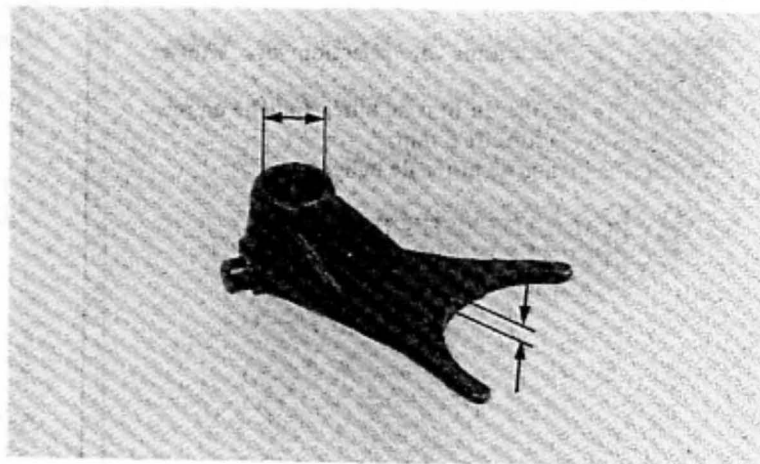
### SHIFT FORK AND SHIFT DRUM INSPECTION

Inspect the shift forks for bent or distortion.  
Measure the shift fork I.D.

**SERVICE LIMIT: 12.04 mm (0.474 in)**

Measure the shift fork claw thickness.

**SERVICE LIMIT: 5.60 mm (0.220 in)**

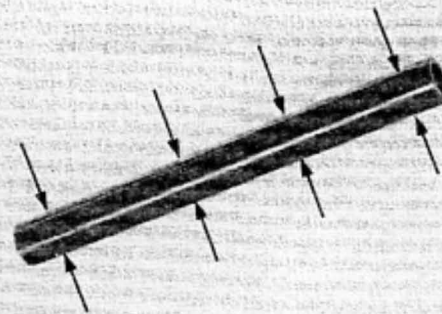




Check the shift fork shaft for bent, scratches or scoring.

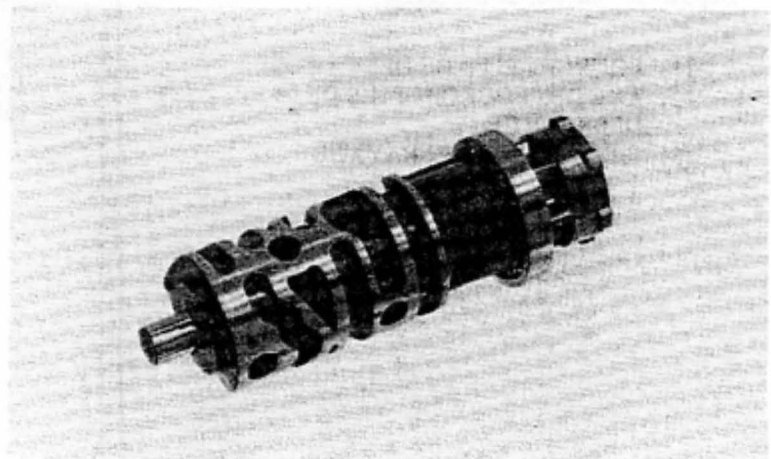
Measure the shift fork shaft O.D.

**SERVICE LIMIT: 11.90 mm (0.469 in)**

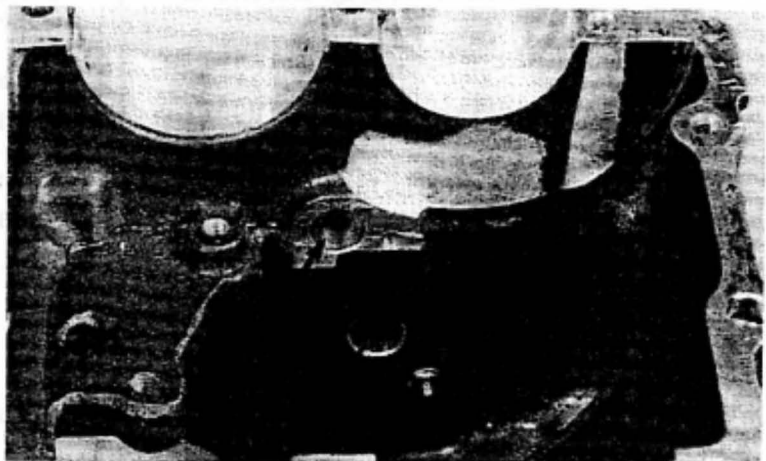


Inspect the shift drum end for scoring, scratches, or evidence of insufficient lubrication.

Check the shift drum grooves for damage.

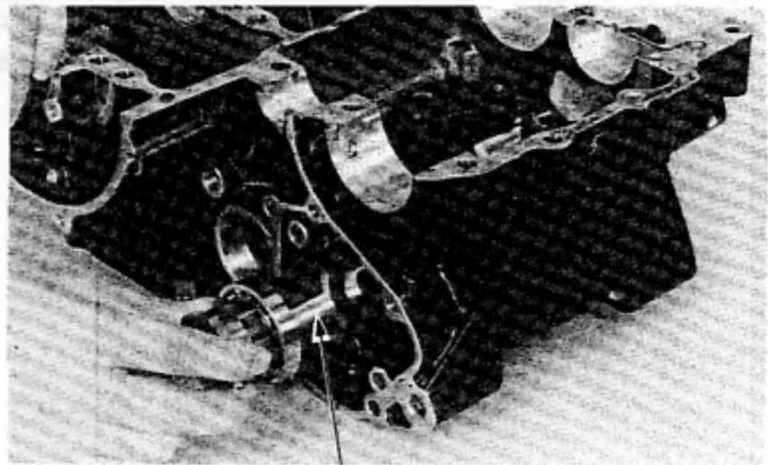


Inspect the shift drum hole and shift fork shaft hole for scoring or scratches.



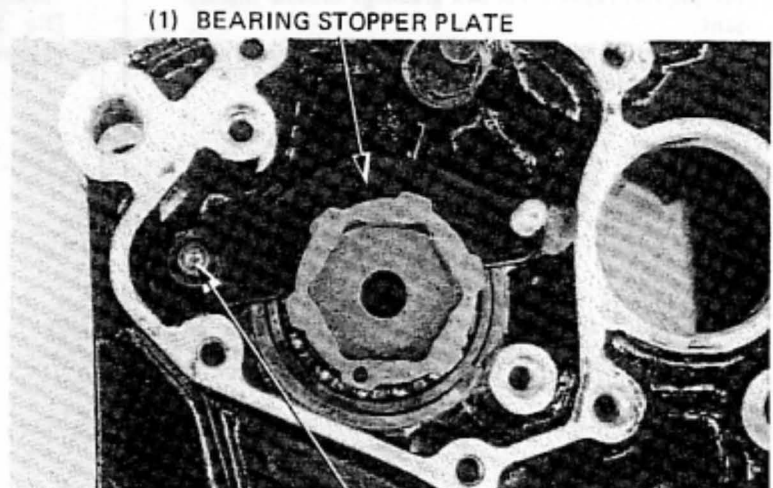
**INSTALLATION**

Install the shift drum.



(1) SHIFT DRUM

Install the bearing stopper plate and stopper arm pin and tighten the stopper arm pin, using two nuts.



(2) STOPPER ARM PIN

Install the shift forks and shift fork shaft.

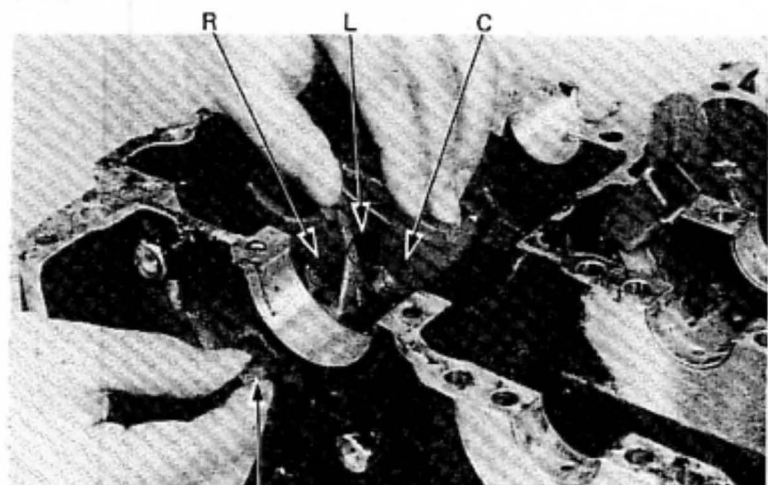
**NOTE:**

Install the shift forks so that their marks face toward the right side of the engine.

Right shift fork: "R" mark

Center shift fork: "C" mark

Left shift fork: "L" mark



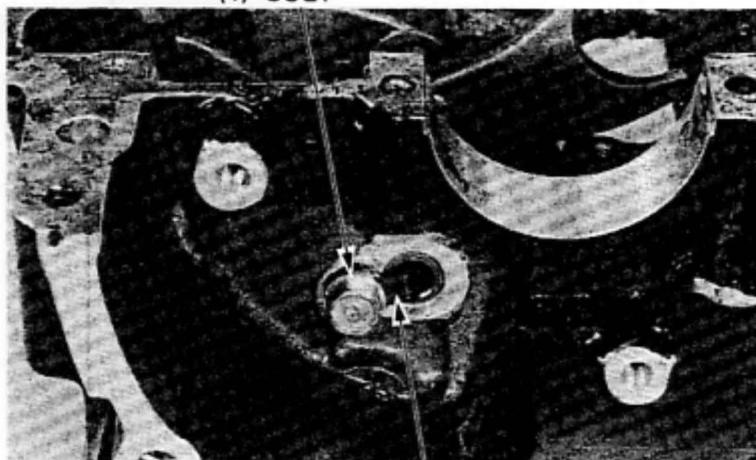
(1) SHIFT FORK SHAFT





(1) BOLT

Install the shift fork shaft stopper with the bolt.



(2) SHIFT FORK SHAFT STOPPER

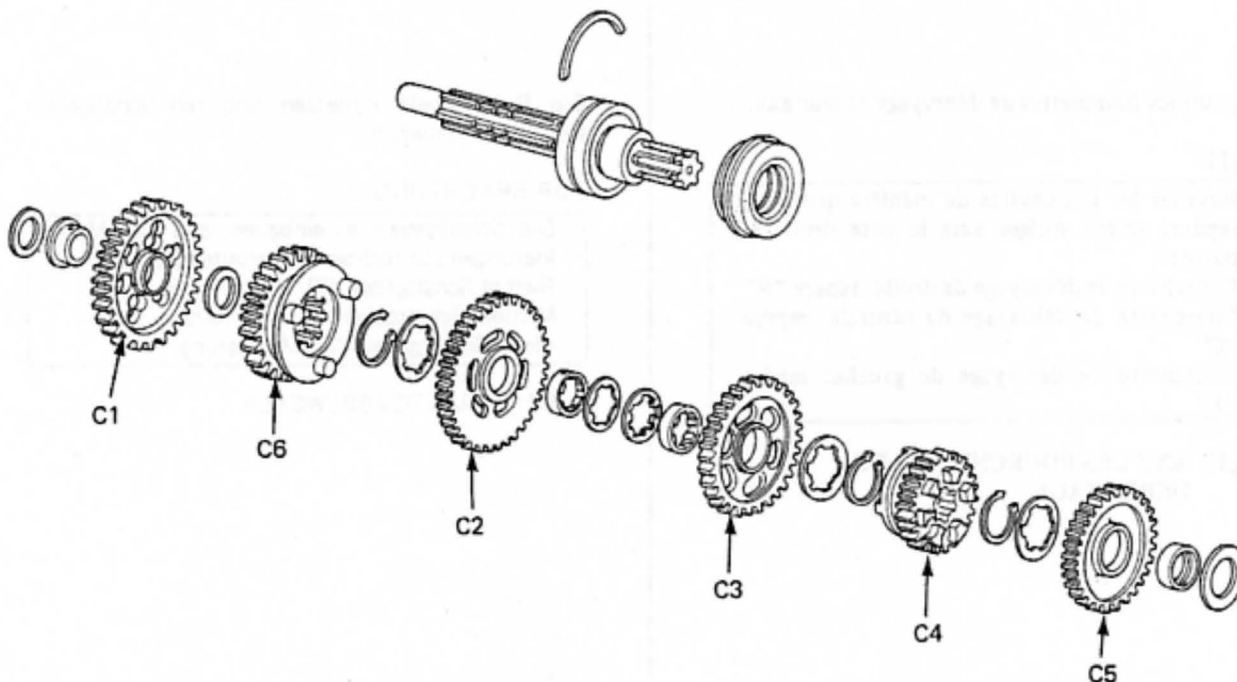
## TRANSMISSION ASSEMBLY

### COUNTERSHAFT

Apply molybdenum disulfide grease to the sliding surfaces of the countershaft and each gear. Assemble the countershaft.

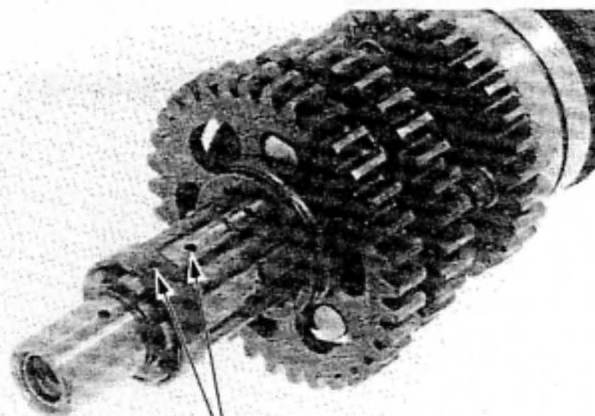
#### NOTE:

- Check the gears for freedom of movement or rotation on the shaft.
- Check that the snap rings are seated in the grooves.





Install the C2 and C3 gear bushings with the oil holes in the bushings and shaft aligned.



(1) OIL HOLES

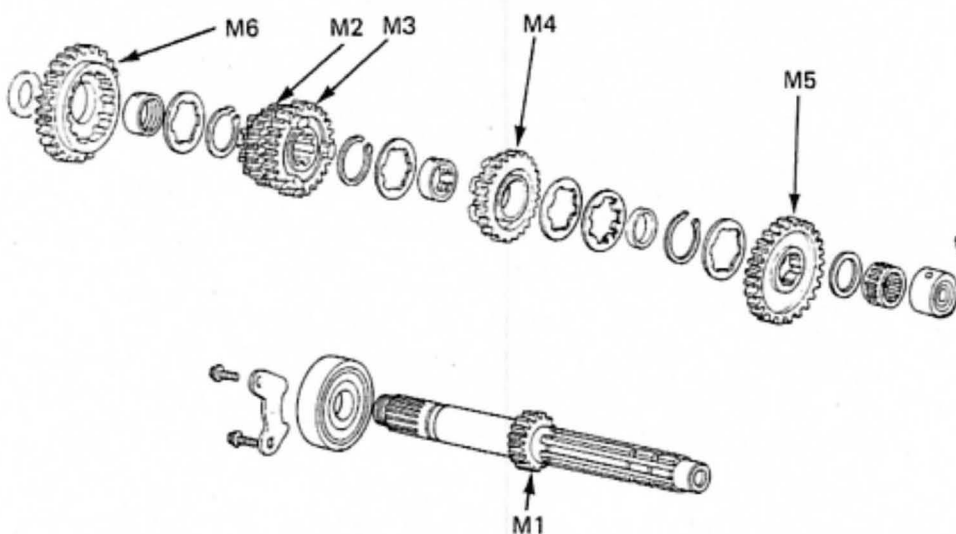
### MAINSHAFT

Apply molybdenum disulfide grease to the sliding surfaces of the mainshaft and each gear.

Assemble the mainshaft.

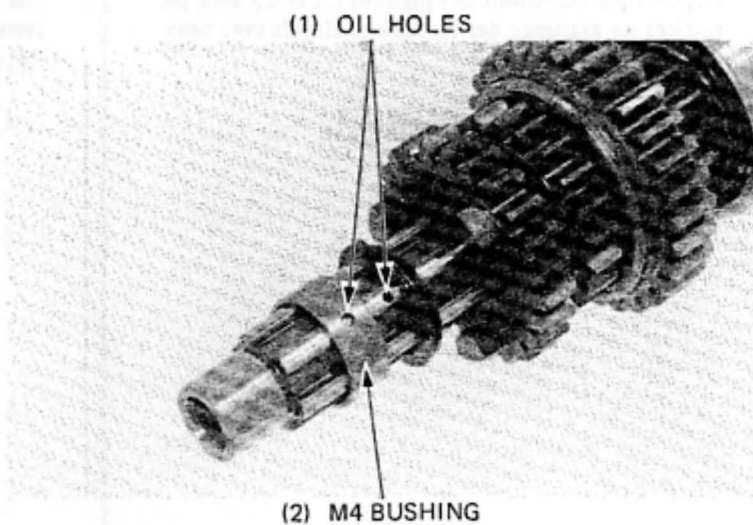
#### NOTE:

- Check the gears for freedom of movement or rotation on the shaft.
- Check that the snap rings are seated in the grooves.

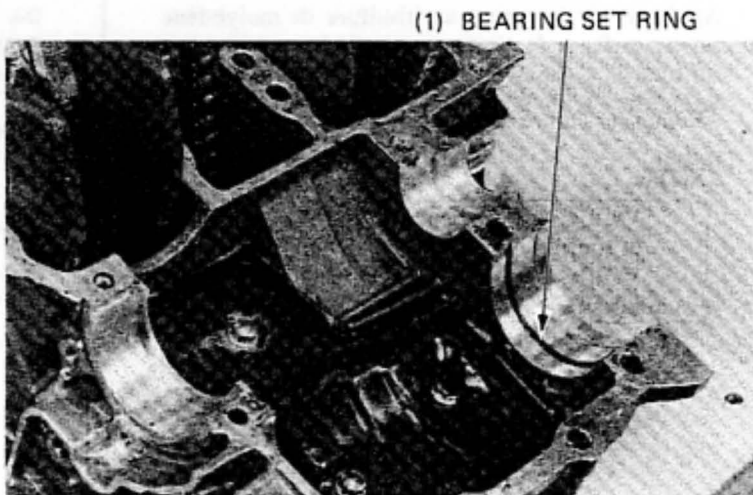




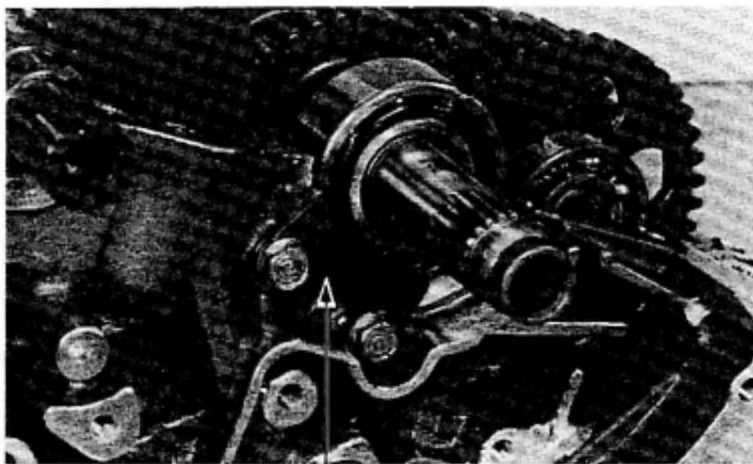
Align the oil hole in the M4 bushing with the oil hole in the mainshaft.



Install the bearing set ring onto the upper crankcase.



Install the mainshaft and countershaft onto the upper crankcase, aligning their locating points with the dowel pin and bearing set ring. Install the bearing setting plate.



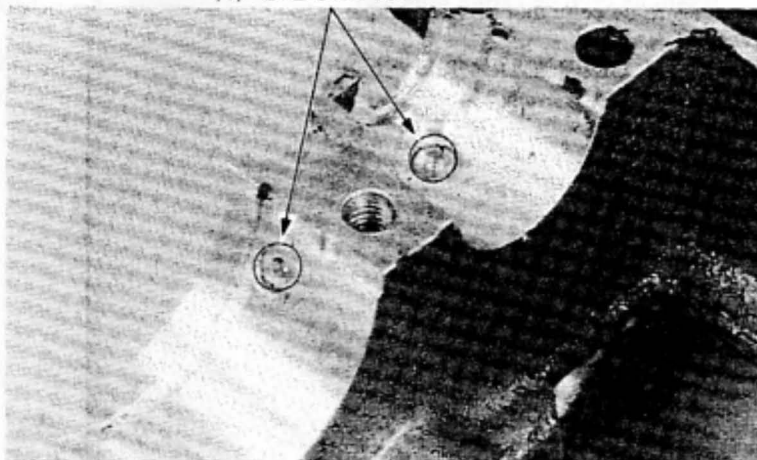


**NOTE:**

Before installing the lower crankcase, check that the oil orifices are clear.

Install the lower crankcase (Section 11).

(1) OIL ORIFICE





|                         |                      |       |
|-------------------------|----------------------|-------|
| SERVICE INFORMATION     | 14-1 IGNITION SWITCH | 14-8  |
| TROUBLESHOOTING         | 14-2 HANDLEBARS      | 14-9  |
| HEADLIGHT               | 14-3 FRONT WHEEL     | 14-14 |
| INSTRUMENTS             | 14-5 FRONT FORKS     | 14-20 |
| FUSE HOLDER REPLACEMENT | 14-7 STEERING STEM   | 14-30 |

## SERVICE INFORMATION

### GENERAL

- Do not remove the rivets, nuts and pins from the rim, spoke plate and hub, since they cannot be disassembled.
- Never ride on the spokes or apply force to the wheel to insure built-in accuracy.
- Avoid damaging the rim since it is made of aluminum alloy.

### SPECIFICATIONS

|                           |        | STANDARD                                      | SERVICE LIMIT    |
|---------------------------|--------|-----------------------------------------------|------------------|
| Axle shaft runout         |        | —                                             | 0.2 mm (0.01 in) |
| Front wheel rim runout    | Radial | —                                             | 2.0 mm (0.08 in) |
|                           | Axial  | —                                             | 2.0 mm (0.08 in) |
| Fork spring free length   |        | 546.5 mm (21.52 in)                           | 536 mm (21.1 in) |
| Fork tube runout          |        | —                                             | 0.2 mm (0.01 in) |
| Front fork fluid capacity | Right  | 285 cc (9.6 oz)                               | —                |
|                           | Left   | 300 cc (10.1 oz)                              | —                |
| Front fork air pressure   |        | 0–40 kPa (0–0.4 kg/cm <sup>2</sup> , 0–6 psi) | —                |

### TORQUE VALUES

|                         |                                         |
|-------------------------|-----------------------------------------|
| Handlebar               | 40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)   |
| Front axle shaft        | 55–65 N·m (5.5–6.5 kg-m, 40–47 ft-lb)   |
| Front axle holder       | 18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)   |
| Front fork socket bolt  | 15–25 N·m (1.5–2.5 kg-m, 11–18 ft-lb)   |
| Front fork cap          | 15–30 N·m (1.5–3.0 kg-m, 11–22 ft-lb)   |
| Fork top pinch bolts    | 9–13 N·m (0.9–1.3 kg-m, 7–10 ft-lb)     |
| Fork bottom pinch bolts | 18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)   |
| Steering stem nut       | 90–120 N·m (9.0–12.0 kg-m, 65–88 ft-lb) |
| Caliper link            | 30–35 N·m (3.0–3.5 kg-m, 22–25 ft-lb)   |
| Front fork stabilizer   | 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)      |

### TOOLS

| Special                     |                  | Common                      |               |
|-----------------------------|------------------|-----------------------------|---------------|
| Hex. wrench, 6 mm           | 07917–3230000    | Pin spanner                 | 07702–0020000 |
| Steering stem driver        | 07946–MB00000    | Driver                      | 07749–0010000 |
|                             | or 07946–3710601 | Attachment, 42 x 47 mm      | 07746–0010300 |
| Ball race remover           | 07953–3330000    | Pilot, 15 mm                | 07746–0040300 |
| Fork seal driver attachment | 07947–KA20200    | Fork seal driver            | 07747–0010100 |
| Snap ring pliers            | 07914–3230001    | Lock nut wrench, 30 x 32 mm | 07716–0020400 |
| Bearing driver attachment   | 07945–3330300    | Extension bar               | 07716–0020500 |
| Bearing driver attachment   | 07946–3290000    | Bearing remover shaft       | 07746–0050100 |
|                             |                  | Bearing remover head, 15 mm | 07746–0050400 |





## **TROUBLESHOOTING**

### **Hard steering**

1. Steering bearing adjustment nut too tight
2. Faulty steering stem bearings
3. Damaged steering stem bearings
4. Insufficient tire pressure

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

1. Bent forks
2. Bent front axle
3. Wheel installed incorrectly

### **Front wheel wobbling**

1. Bent rim
2. Worn front wheel bearings
3. Faulty tire
4. Axle nut tightened improperly
5. Distorted spoke plate

### **Soft suspension**

1. Weak fork springs
2. Insufficient fluid in forks
3. Fork air pressure incorrect

### **Hard suspension**

1. Incorrect fluid weight in forks
2. Fork air pressure incorrect
3. Bent fork tubes
4. Clogged fluid passage
5. Clogged anti-dive orifice

### **Front suspension noise**

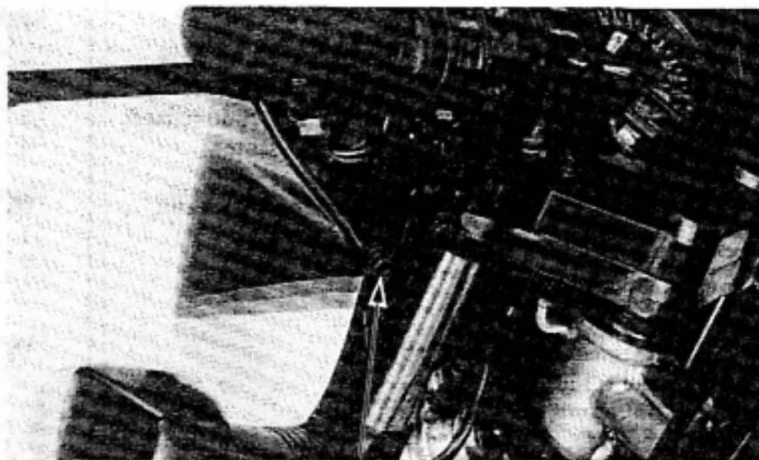
1. Worn slider or guide bushings
2. Insufficient fluid in forks
3. Loose front fork fasteners
4. Lack of grease in speedometer gearbox



## HEADLIGHT

### BULB REPLACEMENT

Remove the right and left fairing attaching bolts and open the fairing.

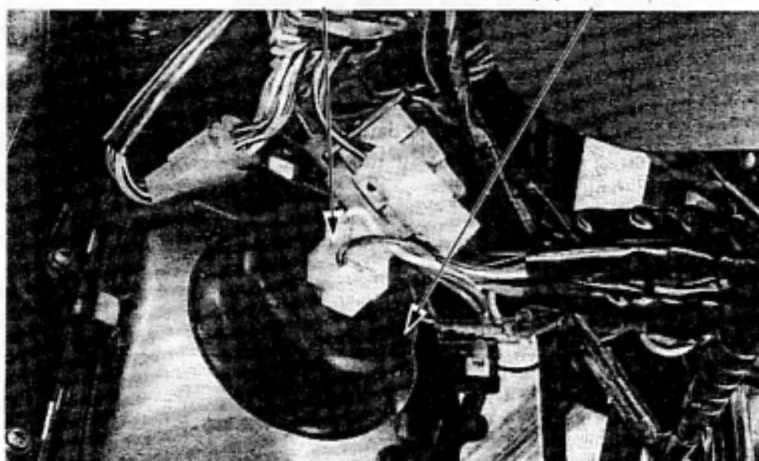


(1) FAIRING ATTACHING BOLT

Remove the headlight coupler and rubber seal.

(1) HEADLIGHT COUPLER

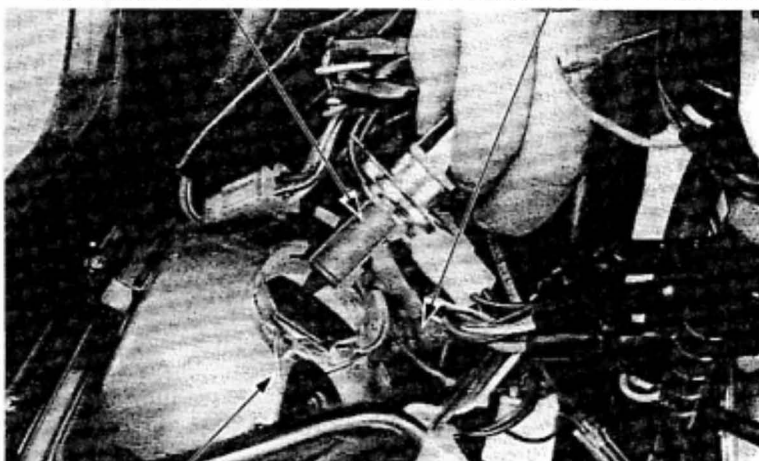
(2) RUBBER SEAL



(1) HEADLIGHT BULB

(2) POSITION LIGHT SOCKET

Remove the clip and replace the headlight bulb.  
Pull the position light socket out.  
Replace the position light bulb.



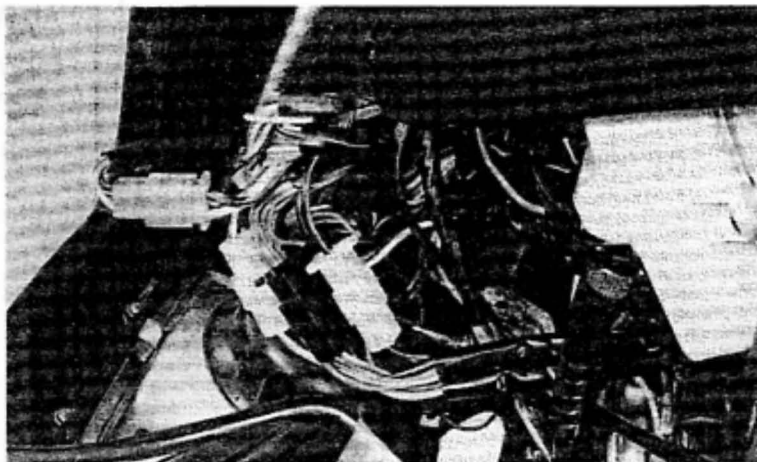
(3) HEADLIGHT CLIP



## REMOVAL

Open the fairing (page 14-3).

Disconnect the wire connectors and couplers.

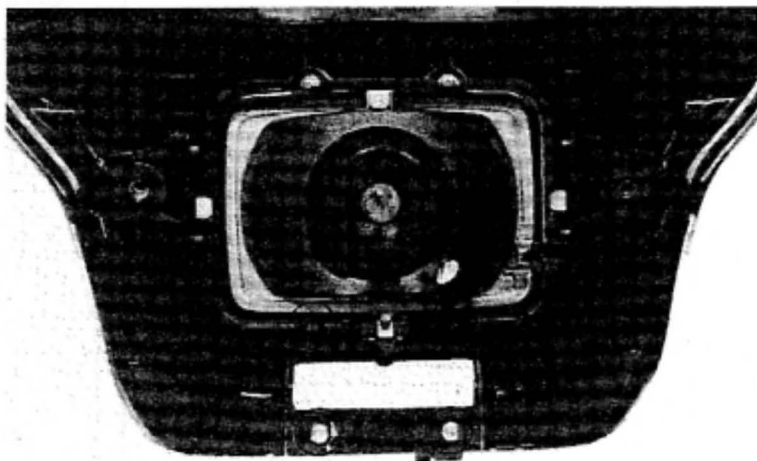


Remove the fairing hinge bolts and remove the fairing.



(1) FAIRING HINGE BOLT

Remove the headlight with its bracket from the fairing by removing the six screws.





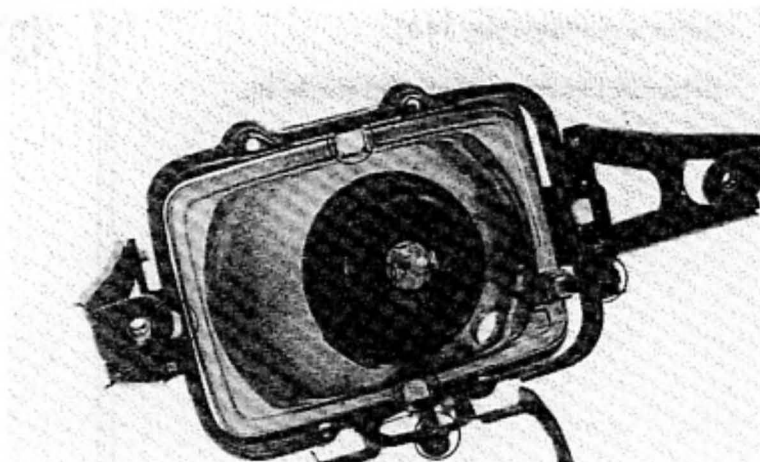
Remove the two headlight adjusting screws and four headlight attaching screws and remove the headlight from the bracket.

## INSTALLATION

Install the headlight in the reverse order of removal.

### NOTE

After installing, adjust the headlight aim (Page 3-18).



## INSTRUMENTS

### BULB REPLACEMENT

Open the fairing (page 14-3).  
Remove the bulb sockets from the instrument and replace the instrument bulbs.

### NOTE

When replacing the speed warning light bulb or water temperature gauge illumination bulb, remove the speedometer.



### REMOVAL

Open the fairing (page 14-3).  
Disconnect the speedometer cable.  
Disconnect the instrument wire connectors and couplers.  
Remove the instrument by removing the three nuts.

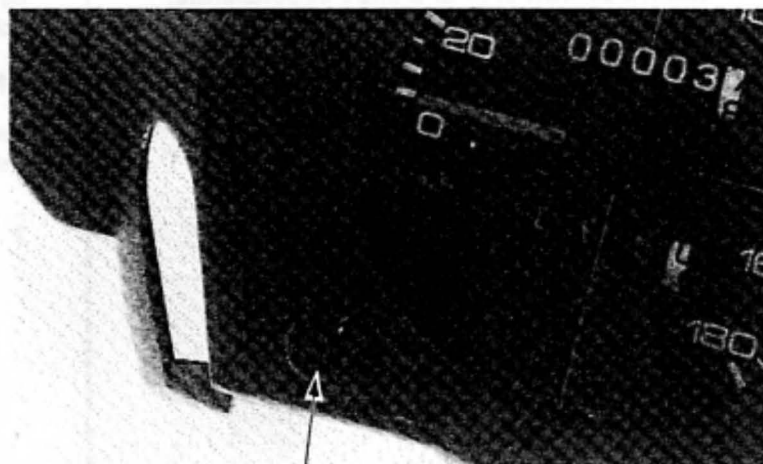


(1) SPEEDOMETER CABLE



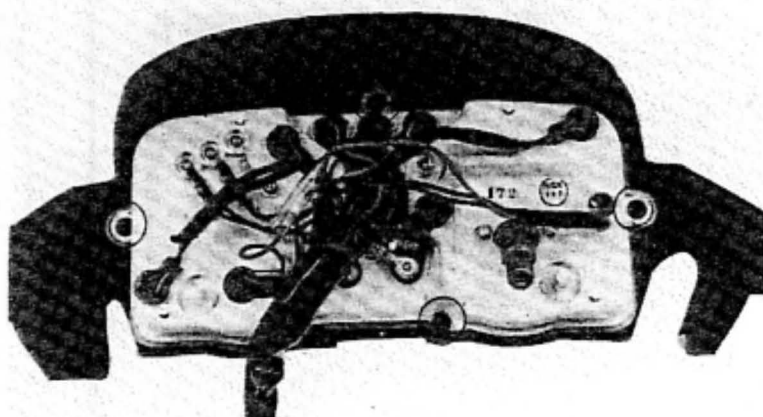
## DISASSEMBLY

Remove the trip meter reset knob by removing the set screw.

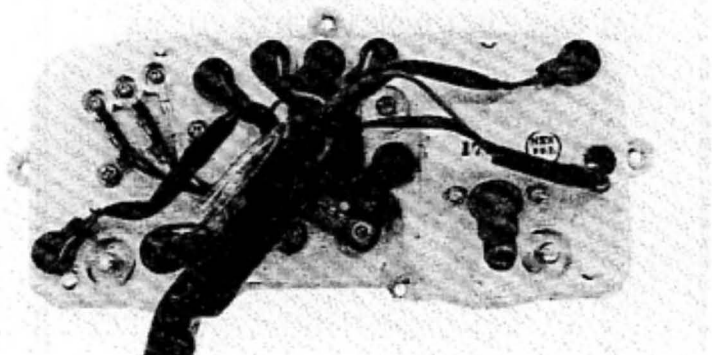


(1) TRIP METER RESET KNOB

Remove the four screws and remove the meter visor and lens.



Remove the each meter and gauge by removing the screws and nuts.





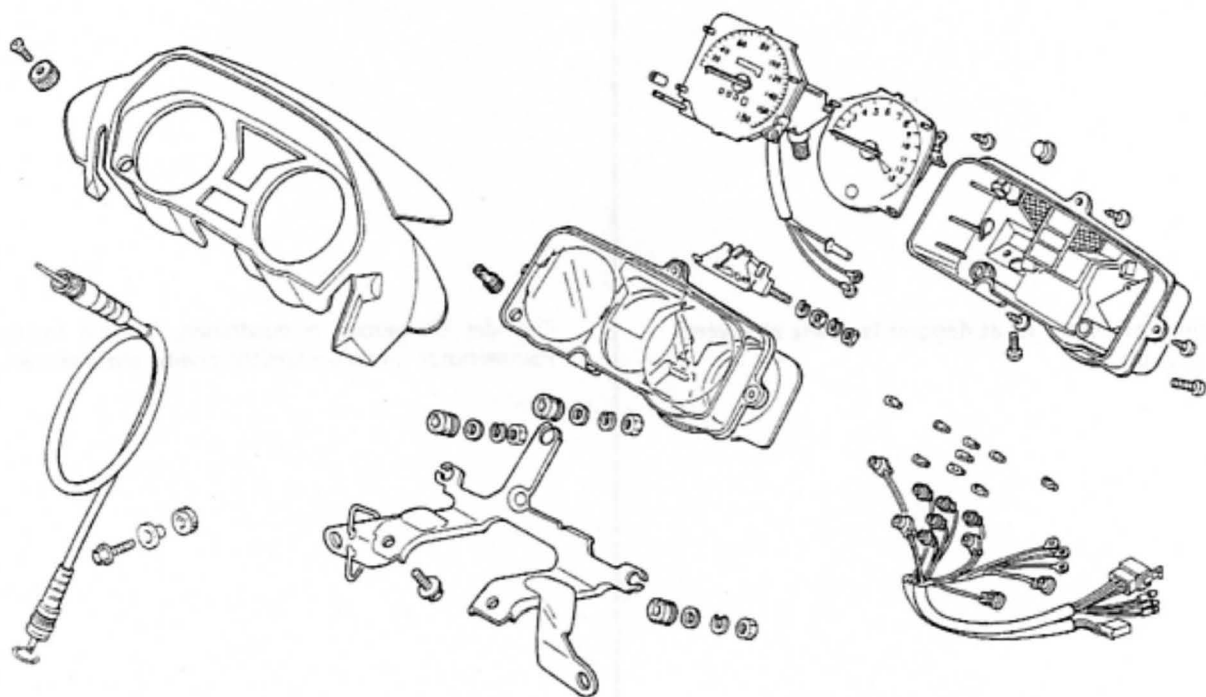


**HONDA**  
**VF400F**

## FRONT WHEEL/SUSPENSION

### INSTRUMENT ASSEMBLY/ INSTALLATION

Assemble and install the instruments in the reverse order of disassembly and removal.



### FUSE HOLDER REPLACEMENT

Remove the ignition switch cover.  
Open the fairing (page 14-3).  
Disconnect the fuse holder wire coupler.



(1) IGNITION SWITCH COVER

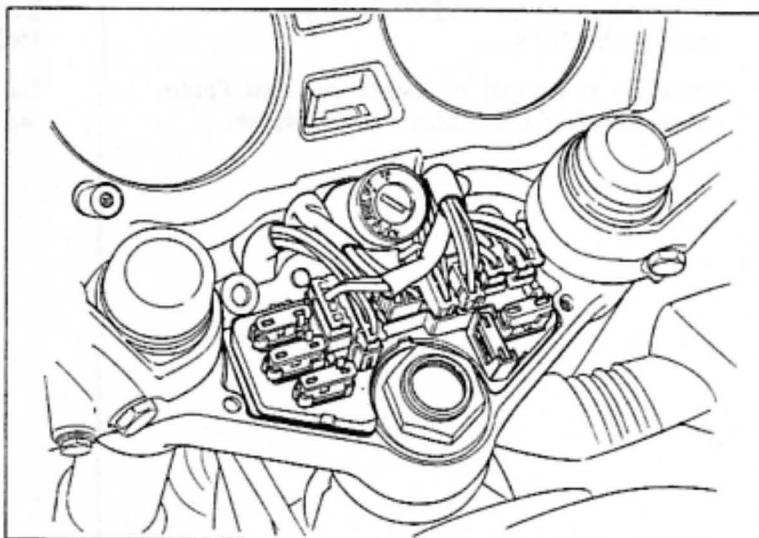


Remove the fuse holder from the top bridge.

Install the fuse holder in the reverse order of removal.

## NOTE

Be sure to route the fuse holder wire properly (page 1-8 thru 1-11).



## IGNITION SWITCH

### REMOVAL/INSTALLATION

Open the fairing (page 14-3).

Disconnect the ignition wire coupler.

Remove the two bolts and remove the ignition switch.

Install the ignition switch in the reverse order of removal.

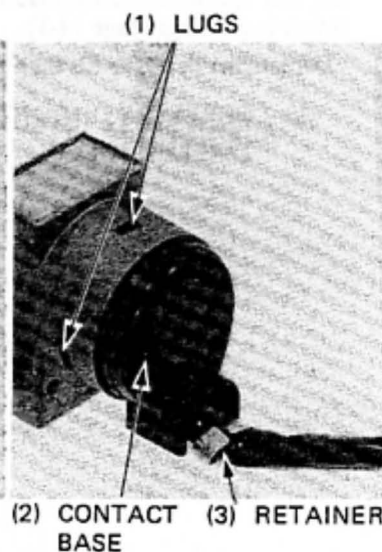


### DISASSEMBLY/ASSEMBLY

Pry open the retainer.

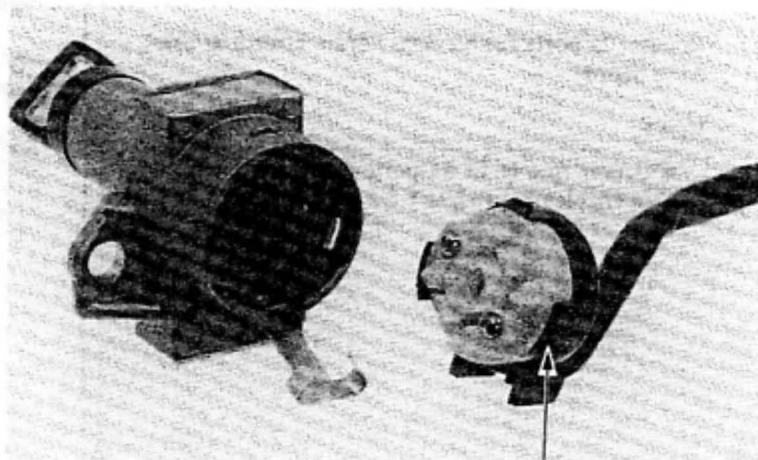
Insert the ignition key and turn it so it is partway between the ON and OFF detent positions.

Push in the lugs, that are locked in the slots, then pull the contact base from the switch.





Assemble the ignition switch in the reverse order of disassembly.



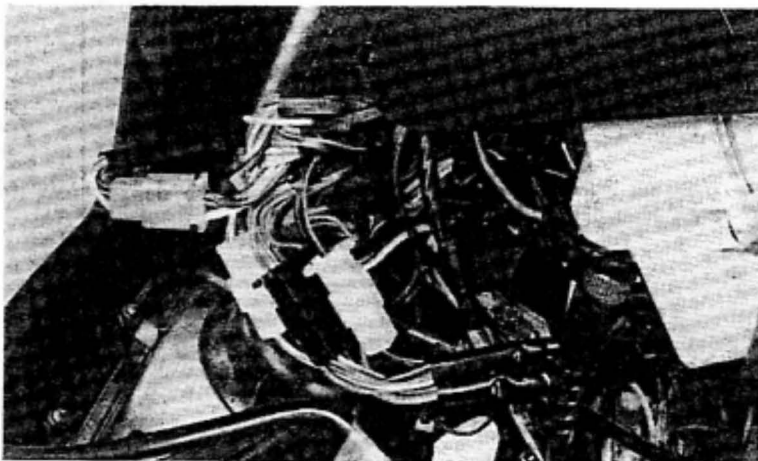
(1) CONTACT BASE

## HANDLEBARS

### REMOVAL

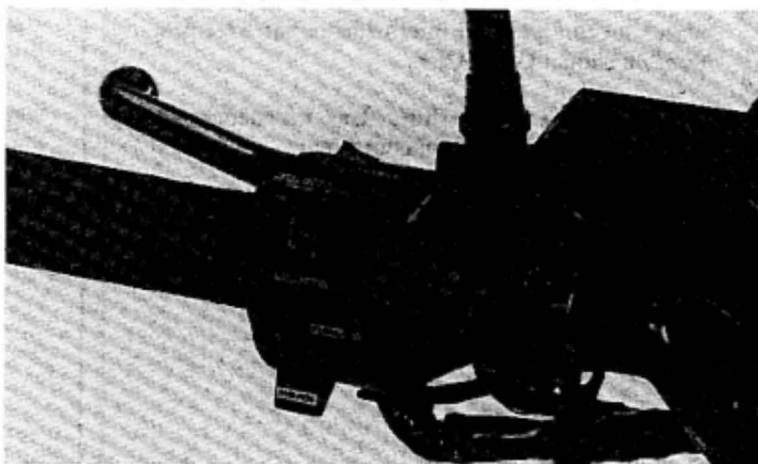
Open the fairing (page 14-3).

Disconnect the handlebar switch wire couplers.



Disconnect the wires from the clutch switch.

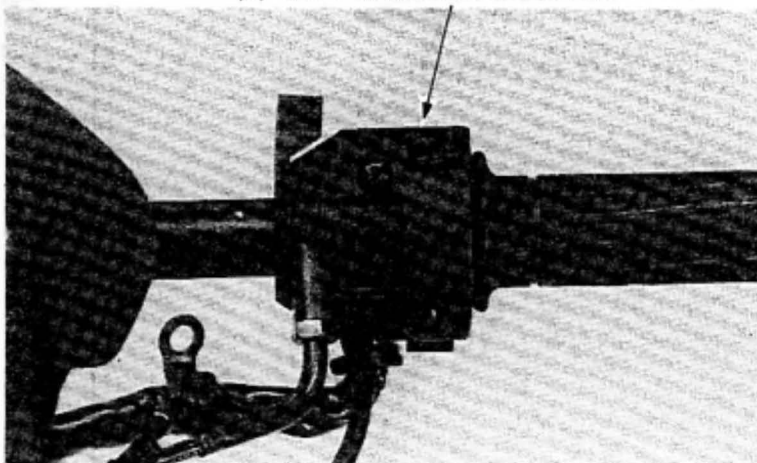
Remove the two 6 mm flange bolts and remove the clutch master cylinder holder and master cylinder.



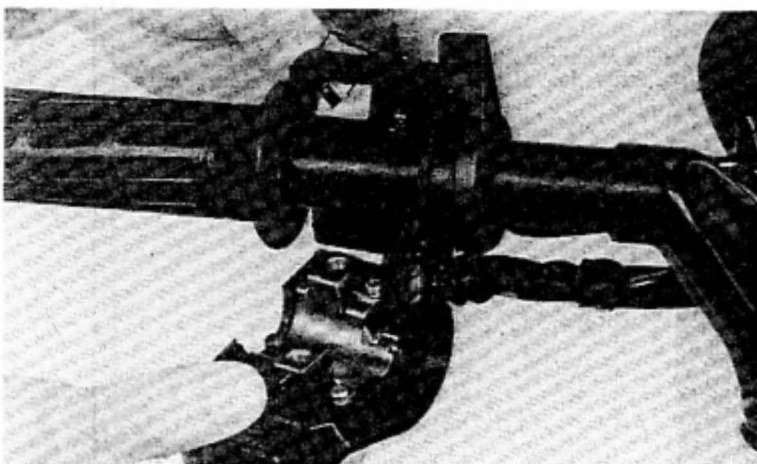


Remove the two screws and separate the left handlebar switch housing.

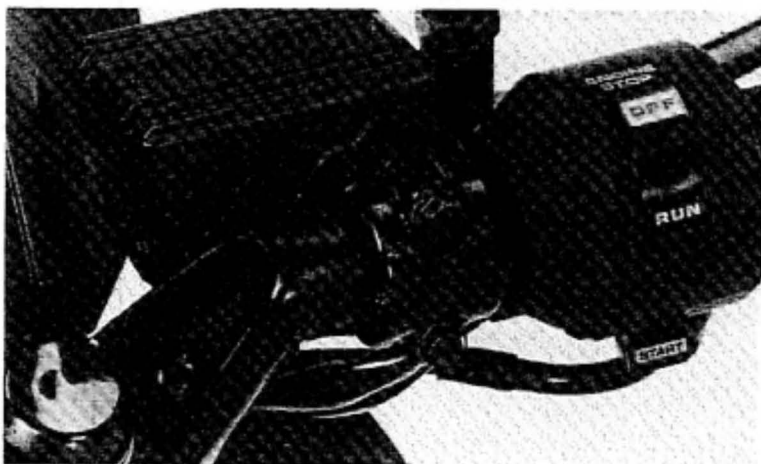
(1) LEFT HANDLEBAR SWITCH



Remove the choke cable from the choke lever.  
Remove the left handlebar switch.



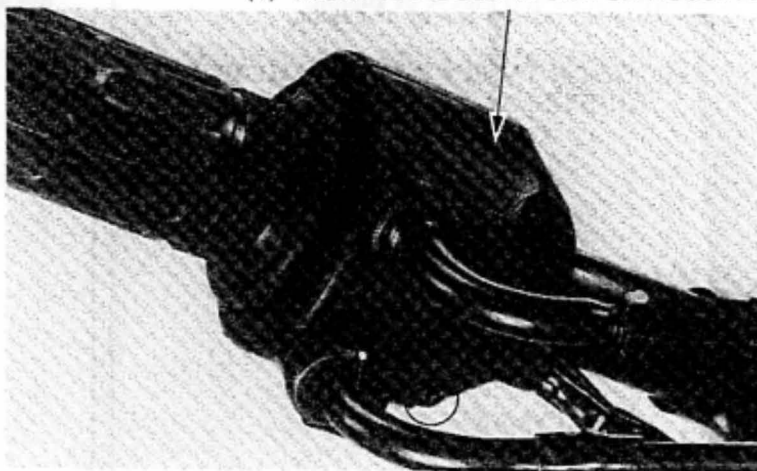
Disconnect the front brake switch wires.  
Remove the two 6 mm flange bolts and remove  
the front brake master cylinder and holder.





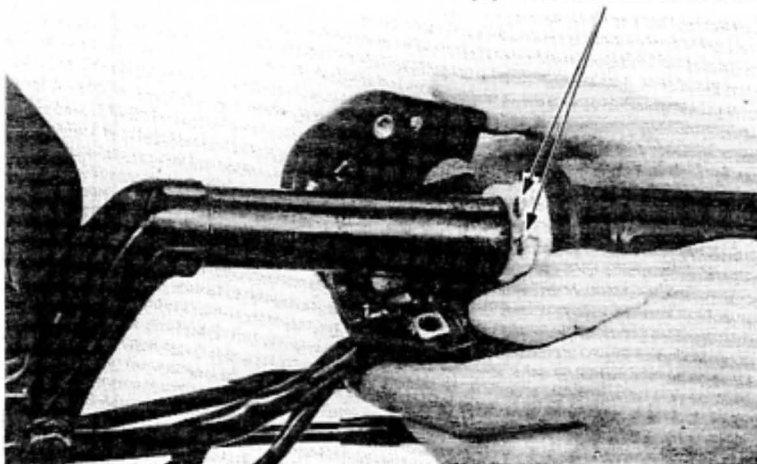
Remove the two screws and separate the right handlebar switch housing.

(1) RIGHT HANDLEBAR SWITCH HOUSING



Remove the throttle cables from the throttle grip.  
Remove the throttle grip.  
Remove the right handlebar switch housing.

(1) THROTTLE CABLES



Remove the handlebar stopper rings.  
Loosen the handlebar pinch bolts and remove the handlebars from the front forks.

## INSTALLATION

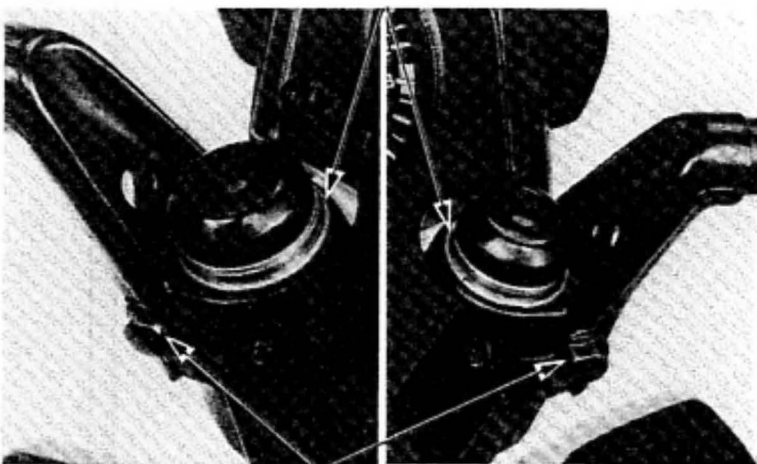
Install the handlebars onto the fork tubes and on the fork top bridge, aligning the locating pin on the bottom of the handlebar with the slit of the top bridge.

Tighten the handlebar pinch bolts.

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

Install the handlebar stopper rings onto the fork tubes.

(1) STOPPER RINGS

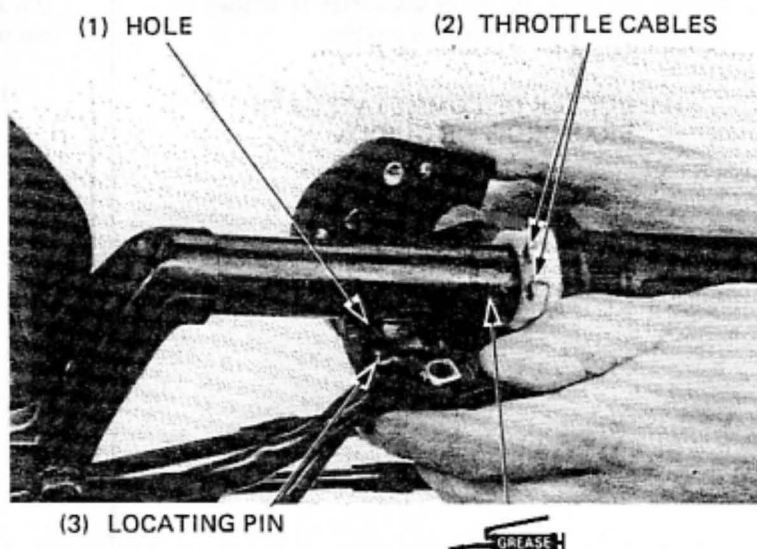


(2) HANDLEBAR PINCH BOLTS





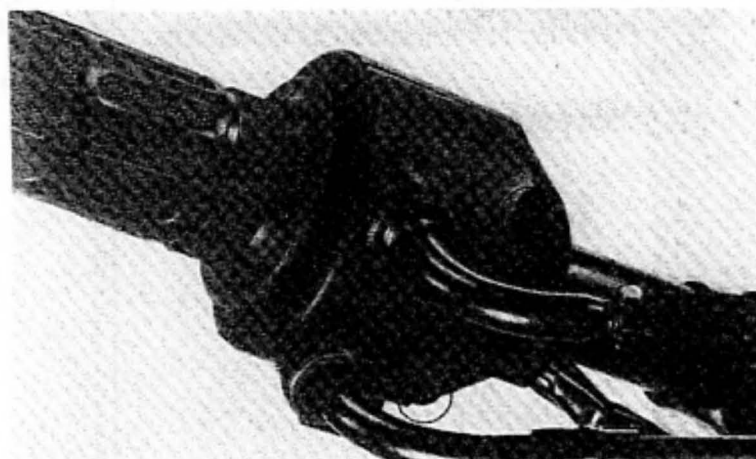
Apply grease to the throttle grip sliding surface and slide the throttle grip over the handlebar. Connect the throttle cables to the throttle grip. Install the right handlebar switch housing onto the handlebar, aligning the locating pin with the hole in the handlebar.



Tighten the two housing screws.

## NOTE

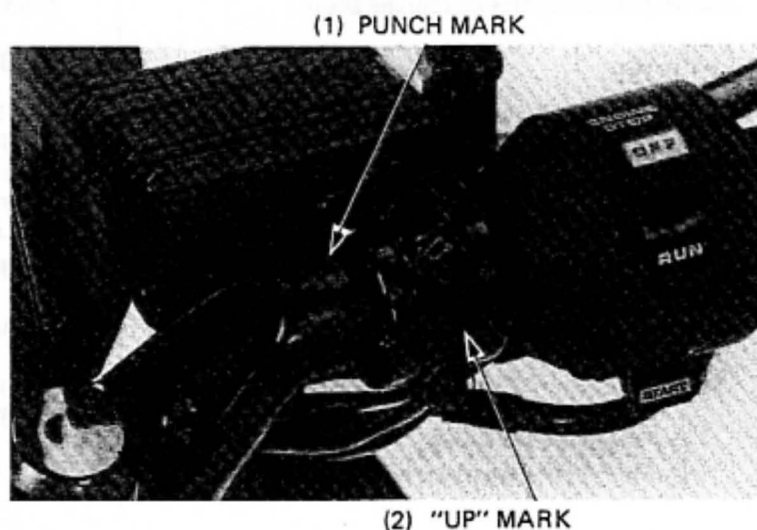
Tighten the forward screw first, then tighten the rear screw.



Place the front brake master cylinder on the handlebar and install the master cylinder holder with the "UP" mark facing up.

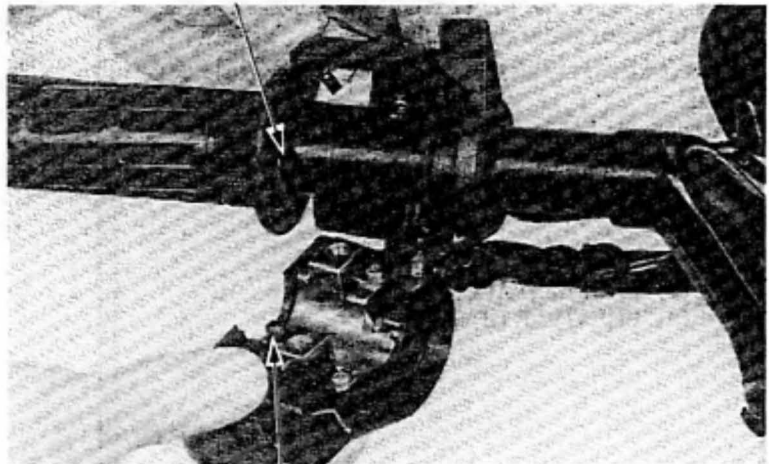
Align the holder mating surface with the punch mark on the handlebar, and tighten the upper bolt first then tighten the lower bolt.

Connect the front brake switch wires.





(1) HOLE



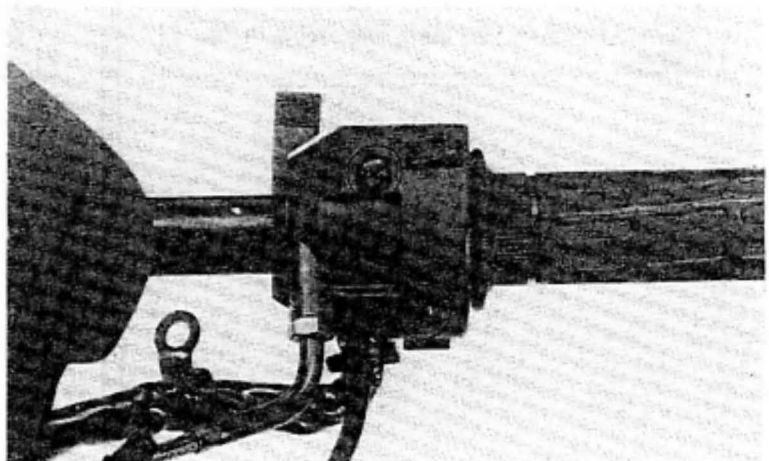
(2) LOCATING PIN

Connect the choke cable to the choke lever.  
Install the left handlebar switch housing, aligning the locating pin with the hole in the handlebar.

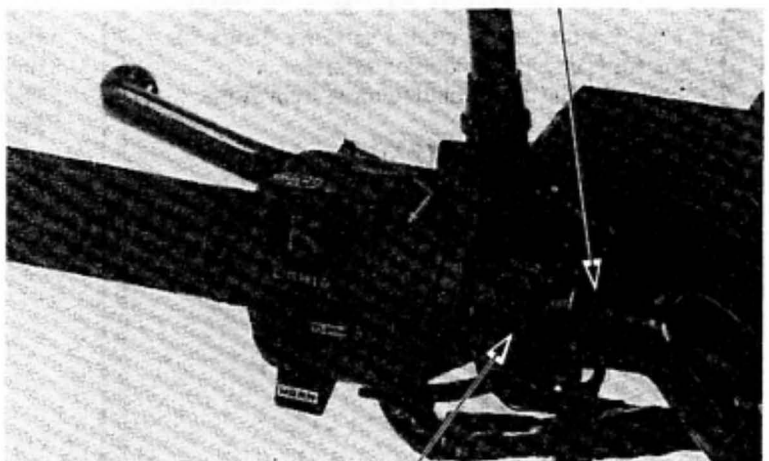
Tighten the two housing screws.

**NOTE**

Tighten the upper screw first, then tighten the lower screw.



(1) PUNCH MARK



(2) "UP" MARK

Place the clutch master cylinder on the handlebar and install the master cylinder holder with the "UP" mark facing up.

Align the holder mating surface with the punch mark on the handlebar, and tighten the upper bolt.

Connect the clutch switch wires.

Connect the left and right handlebar switch wire connectors.

Close the fairing and secure it with the two bolts.

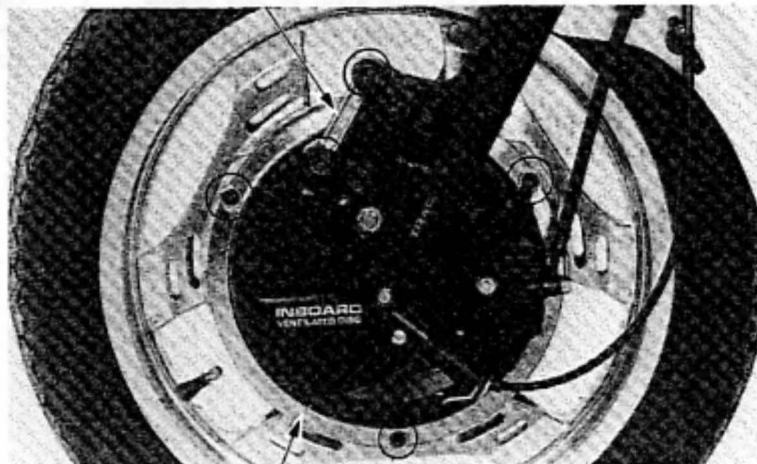


## FRONT WHEEL

### REMOVAL

Remove the socket bolts and the caliper link.  
Remove the cap nuts and bolts attaching the front  
brake disc cover.

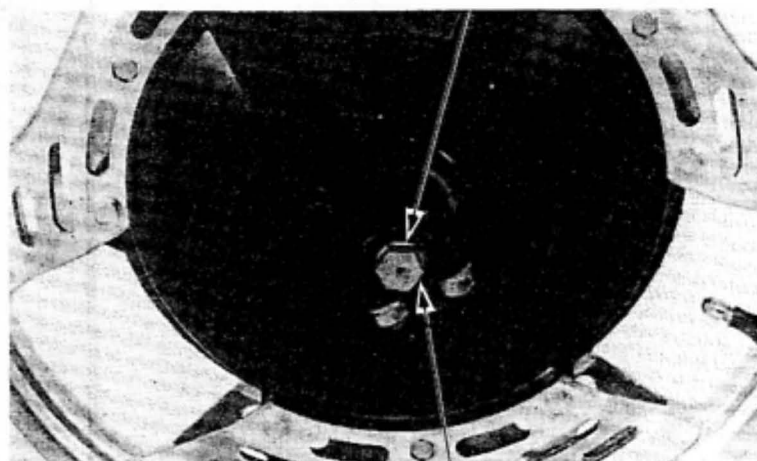
(1) CALIPER LINK



(2) DISC COVER

Support the bottom of the engine with a jack and  
raise the front wheel off the ground.  
Loosen the axle holder nuts.  
Loosen and remove the axle shaft.

(1) AXLE SHAFT

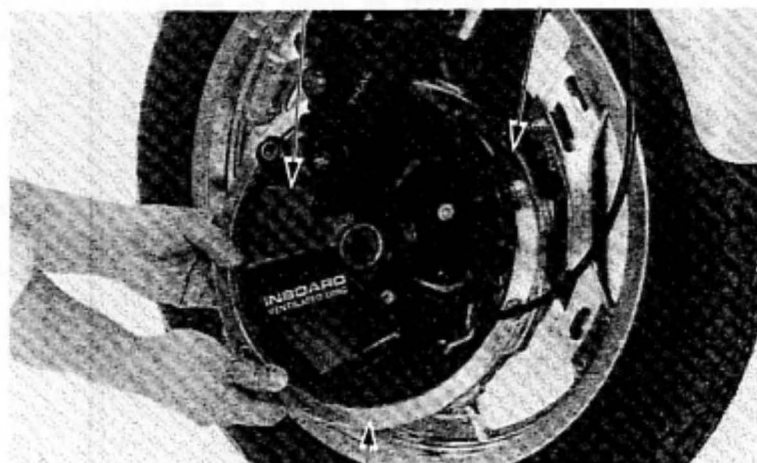


(2) AXLE HOLDER

Remove the disc cover and caliper assembly to-  
gether with the disc.

(1) CALIPER ASSEMBLY

(2) DISC



(3) DISC COVER

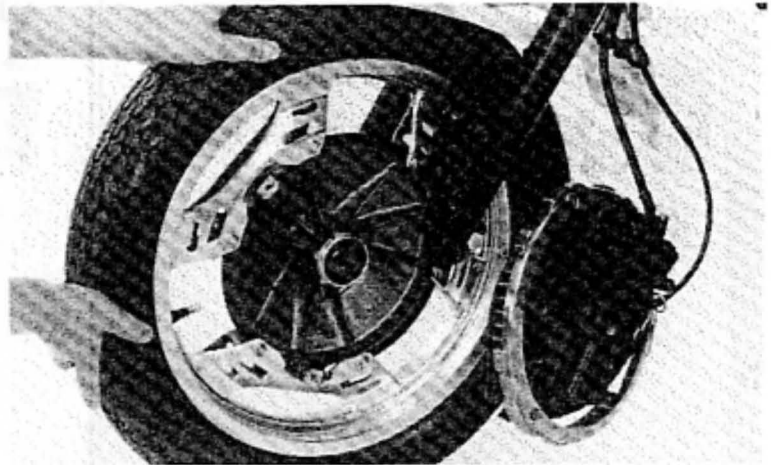


## FRONT WHEEL/SUSPENSION

Remove the front wheel.

### CAUTION

*Do not allow the caliper assembly to hang with the brake hose.  
Hang the caliper assembly with a string or support it with a stand.*

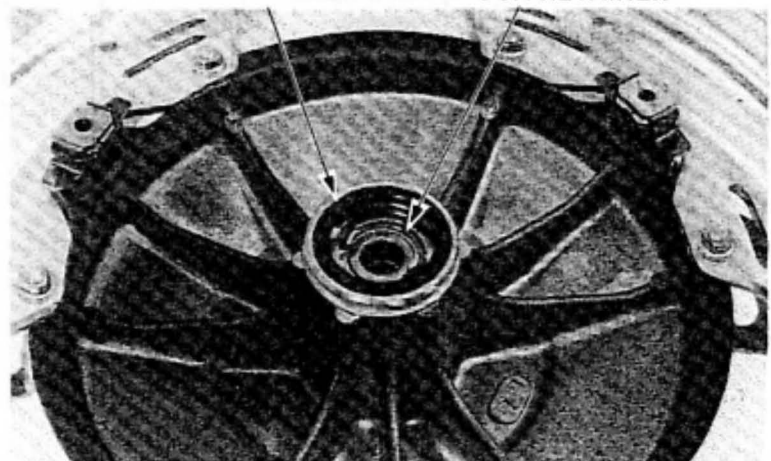


### DISASSEMBLY

Remove the oil seal from the left side.  
Remove the speedometer gear box retainer.

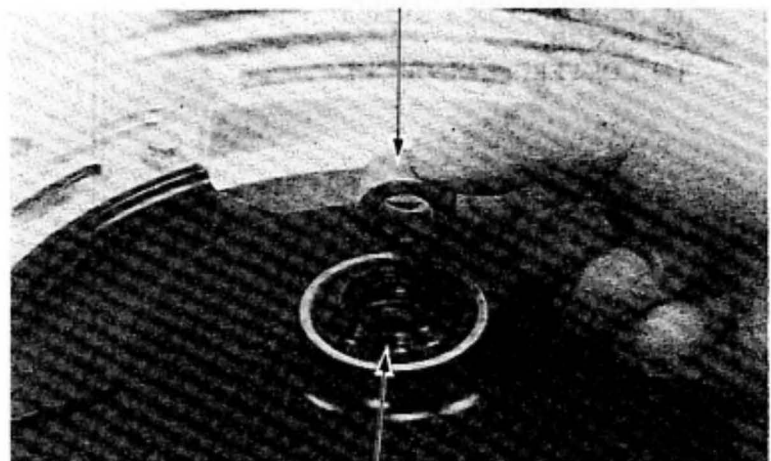
(1) OIL SEAL

(2) SPEEDOMETER GEAR  
BOX RETAINER



Remove the right side collar and the oil seal.

(1) RIGHT SIDE COLLAR



(2) OIL SEAL



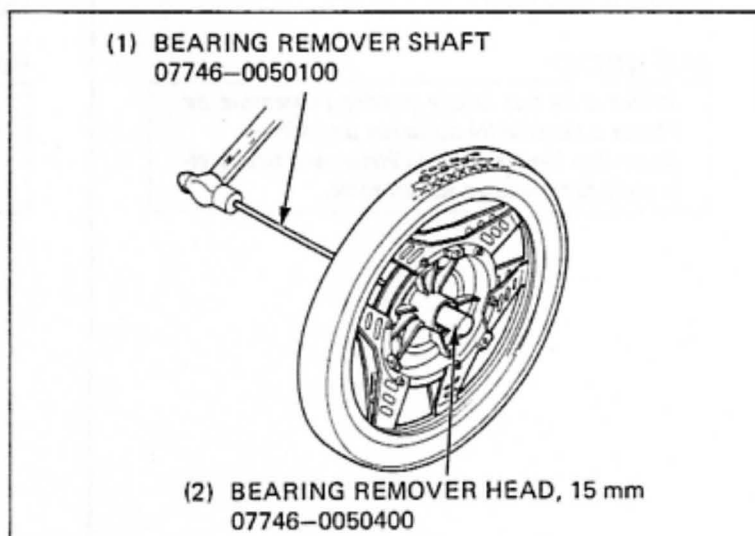
### WHEEL BEARING INSPECTION

Check wheel bearing play by placing the wheel in a truing stand and spinning the wheel by hand. Replace the bearings with new ones if they are noisy or have excessive play.

### WHEEL BEARING REMOVAL

If the bearing must be replaced, remove it with bearing remover.

Remove the wheel bearings and distance collar.



### WHEEL INSPECTION

Check the rim runout by placing the wheel in a truing stand. Spin the wheel slowly and read the runout using a dial indicator.

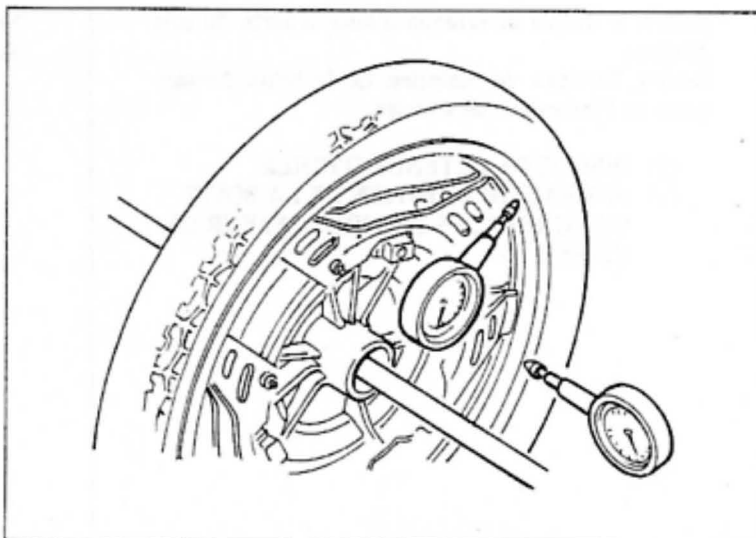
#### SERVICE LIMITS:

RADIAL RUNOUT: 2.0 mm (0.08 in)

AXIAL RUNOUT: 2.0 mm (0.08 in)

#### NOTE

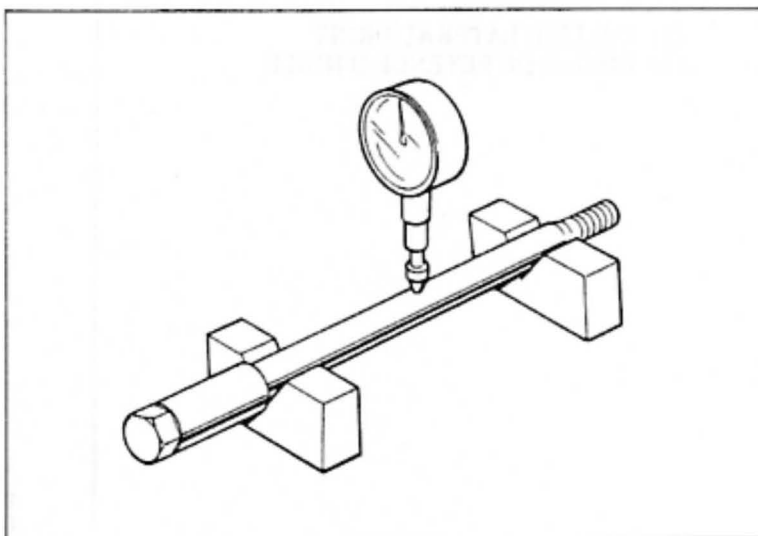
The wheel cannot be repaired and must be replaced with a new one if the service limits are exceeded.



### AXLE INSPECTION

Set the axle in V blocks and measure the runout.

SERVICE LIMIT: 0.2 mm (0.01 in)





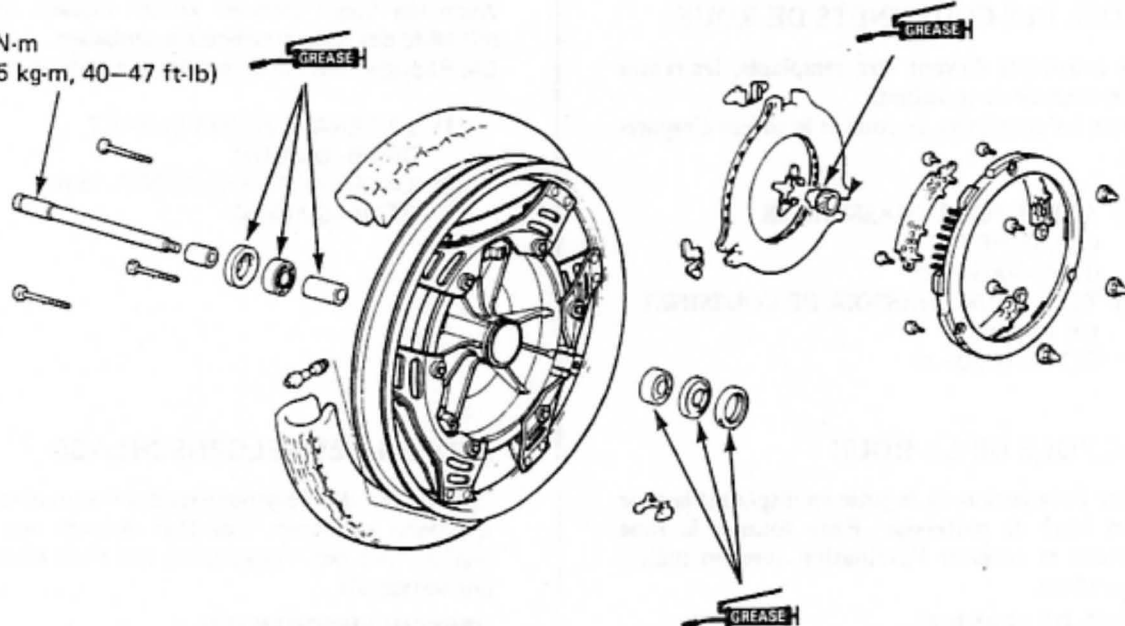


**HONDA**  
**VF400F**

## FRONT WHEEL/SUSPENSION

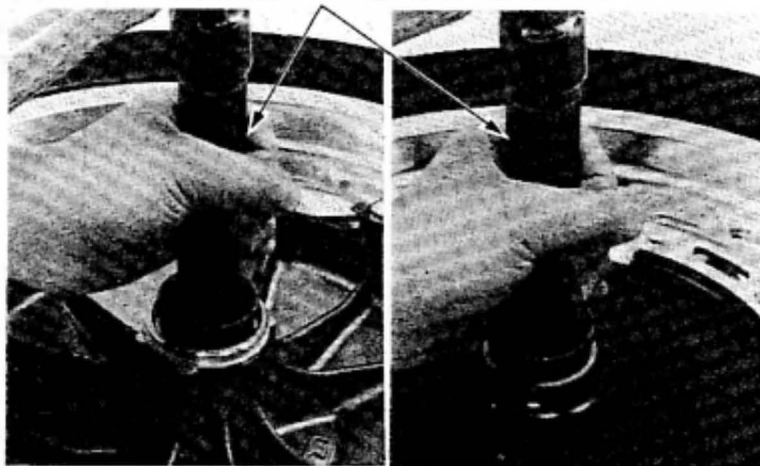
### ASSEMBLY

55–65 N·m  
(5.5–6.5 kg·m, 40–47 ft·lb)



- (1) DRIVER  
07749-0010000  
ATTACHMENT, 42 x 47 mm  
07746-0010300  
PILOT, 15 mm  
07746-0040300

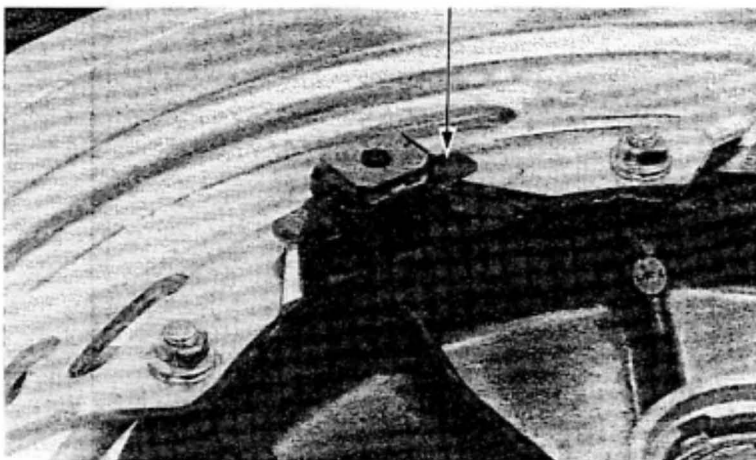
Pack all bearing cavities with grease.  
Drive in the left bearing squarely first with the sealed side facing out.  
Install the distance collar into place.  
Drive the right bearing in squarely, making sure that it is fully seated and that the sealed side is facing out.





Install the disc plate spring as shown.

(1) DISC PLATE SPRING

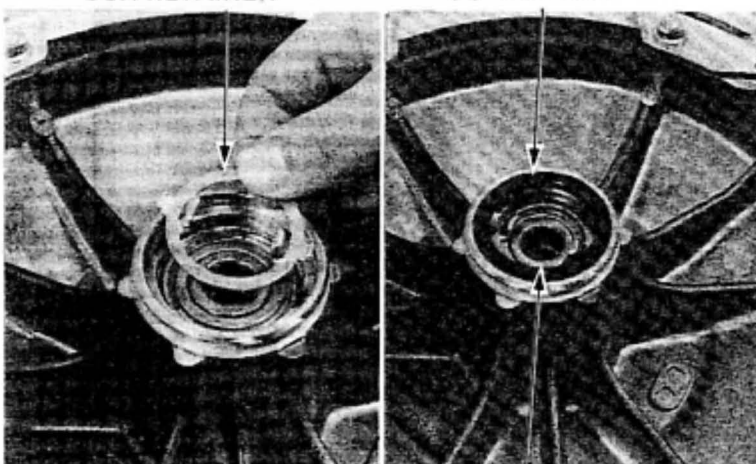


Install the speedometer gear retainer in the left side of the wheel hub, aligning its tangs with the slots in the hub.

Coat new oil seal lip with grease and install the oil seal.

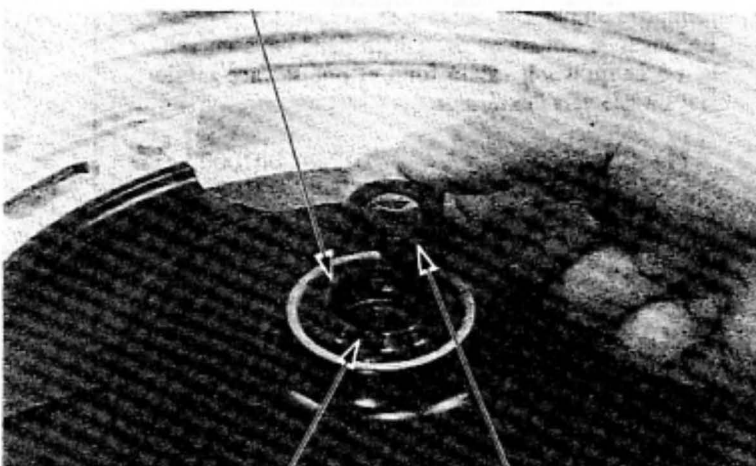
(1) SPEEDOMETER GEAR BOX RETAINER

(2) OIL SEAL



Coat new oil seal lip with grease and install the oil seal into the right side hub of the wheel. Install the right side collar.

(1) OIL SEAL



(2) RIGHT SIDE COLLAR



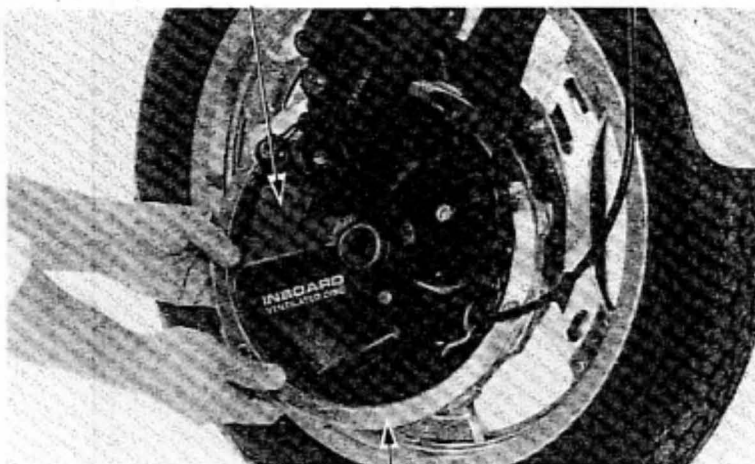
(1) CALIPER ASSEMBLY

INSTALLATION

Install the disc cover and caliper assembly with the brake disc.

NOTE

- Align the brake disc with the disc plate spring on the wheel.
- Align the grooves in the speedometer gear box of the caliper assembly with the tangs of the speedometer gear retainer.



(2) DISC COVER

Install the axle shaft.  
Install the axle holder with the arrow pointing forward.  
Tighten the axle shaft.

**TORQUE:** 55–65 N·m  
(5.5–6.5 kg-m, 40–47 ft-lb)

Tighten the axle holder nuts.

**TORQUE:** 18–25 N·m  
(1.8–2.5 kg-m, 13–18 ft-lb)

NOTE

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

(1) FRONT AXLE SHAFT



(2) AXLE HOLDER

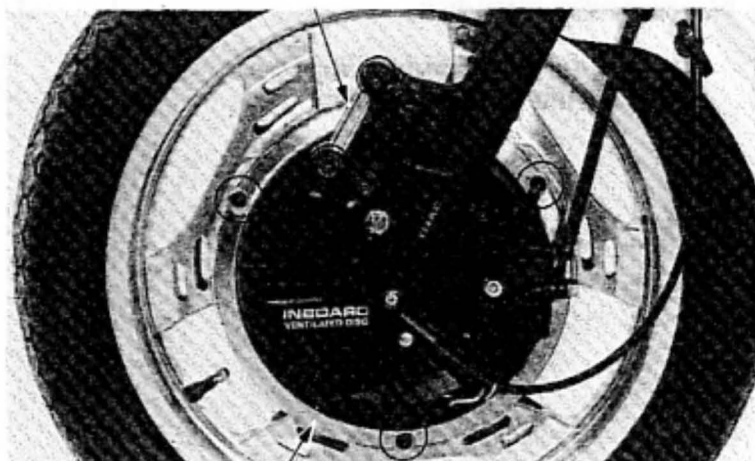
(3) ARROW

(1) CALIPER LINK

Install the caliper link and tighten the socket bolts.

**TORQUE:** 30–35 N·m  
(3.0–3.5 kg-m, 22–25 ft-lb)

Secure the disc cover with the bolts and cap nuts.



(2) DISC COVER

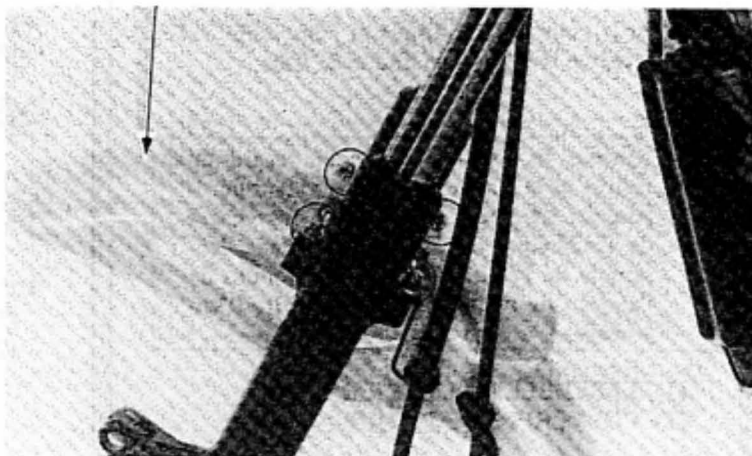


## FRONT FORKS

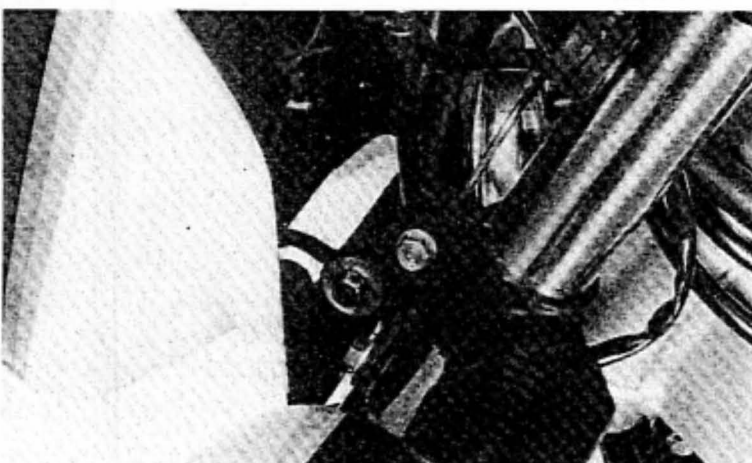
### REMOVAL

Remove the handlebar stopper rings, loosen the handlebar pinch bolts and remove the handlebars. Remove the front wheel (page 14-14). Remove the front fender by removing the four bolts.

(1) FRONT FENDER



Loosen the turn signal mount bolts.  
Loosen the fork bottom pinch bolts.



Loosen the fork top pinch bolts.  
Pull each fork tubes out of the top and bottom bridges.



**DISASSEMBLY**

Hold the fork tube in a vise, with soft jaws or a shop towel and remove the fork tube cap.

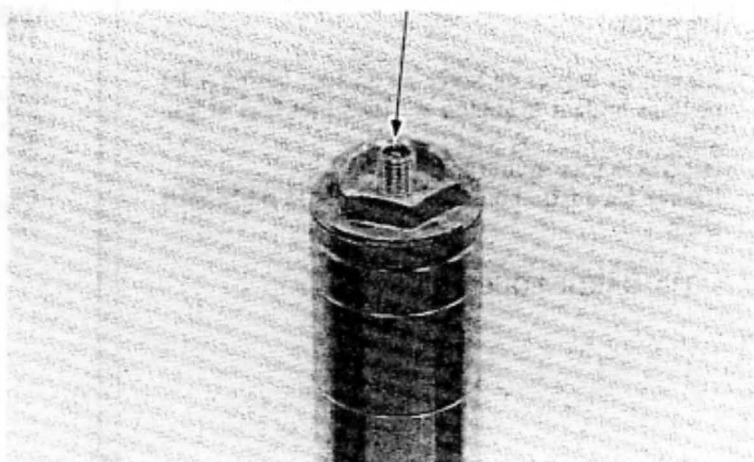
**CAUTION**

*Do not damage the sliding surface.*

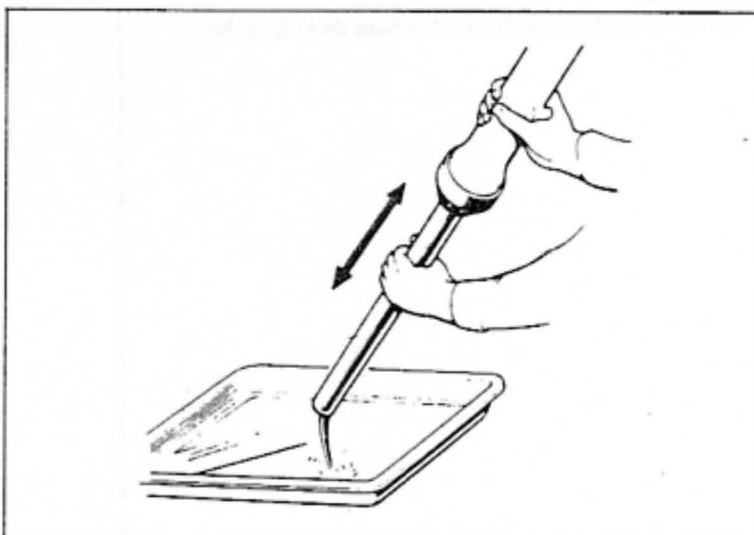
**NOTE**

The fork cap will jump out when it is removed.

(1) FORK CAP



Remove the fork spring.  
Drain the fork fluid by pumping the fork up and down several times.

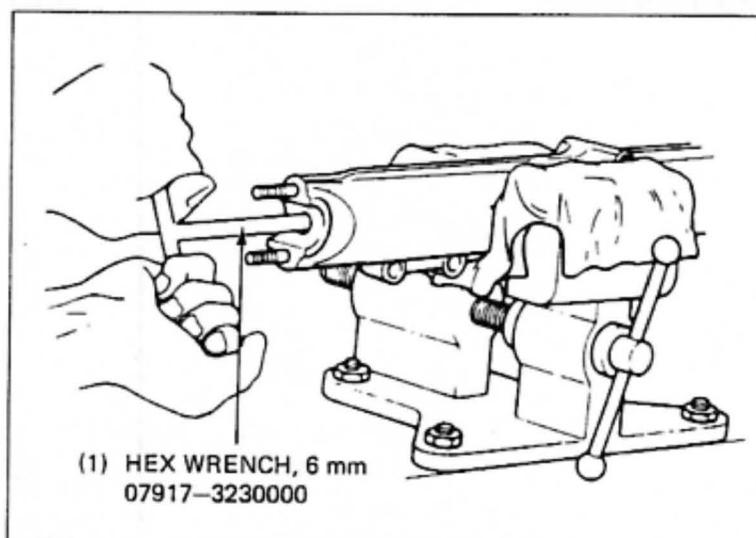


Hold the fork slider in a vise with soft jaws or a shop towel.

Remove the socket bolt with a hex wrench.

**NOTE**

Temporarily install the spring and fork cap if difficulty is encountered in removing the socket bolt.



(1) HEX WRENCH, 6 mm  
07917-3230000



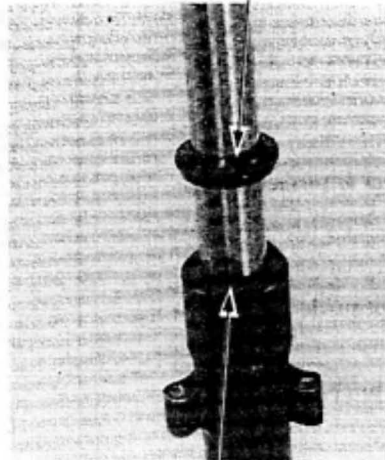


**HONDA**  
**VF400F**

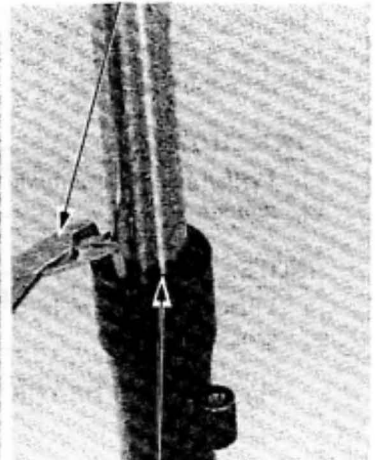
## FRONT WHEEL/SUSPENSION

Remove the dust seal, grease holder and washer.  
Remove the snap ring.

(1) DUST SEAL



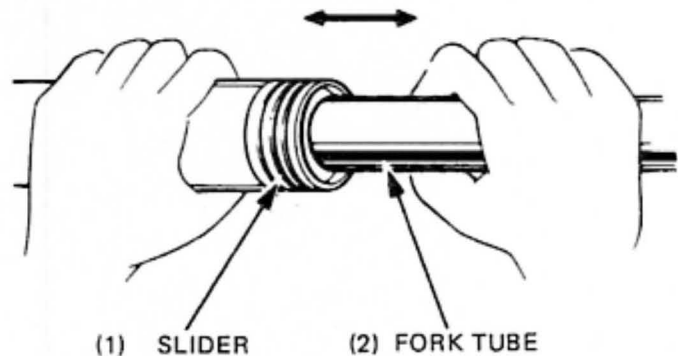
(2) SNAP RING PLIERS  
07914-3230001



(3) GREASE HOLDER

(4) SNAP RING

Move the fork tube in and out until it separates from the slider.



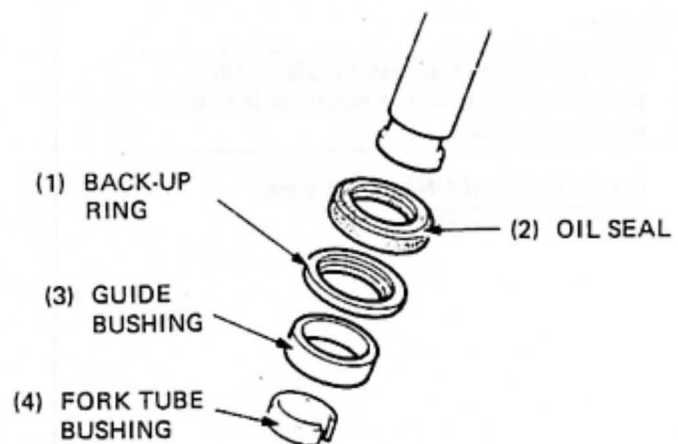
(1) SLIDER

(2) FORK TUBE

Remove the oil seal, back-up ring and guide bushing from the fork tube.

### NOTE

Do not remove the fork tube bushings unless it is necessary to replace it with a new one.



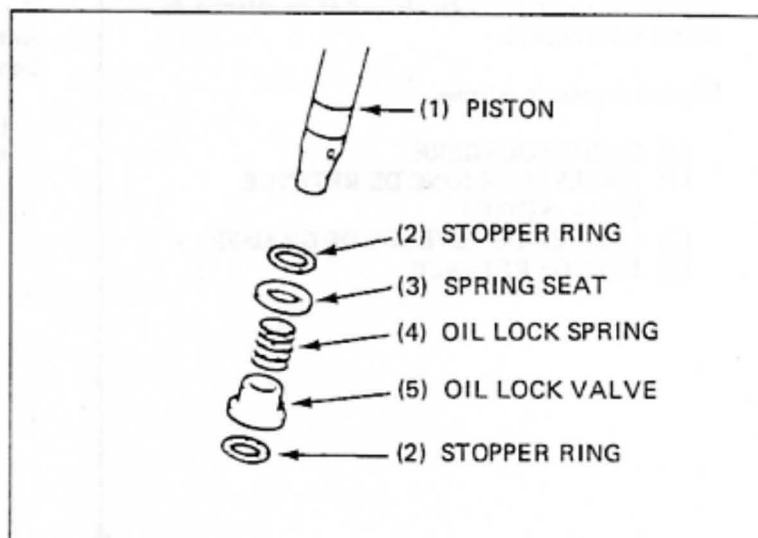


## FRONT WHEEL/SUSPENSION

Remove the stopper rings from the left fork and remove the spring seat, oil lock spring and oil lock valve.

Remove the piston from the fork tube.

Remove the oil lock piece from the slider.

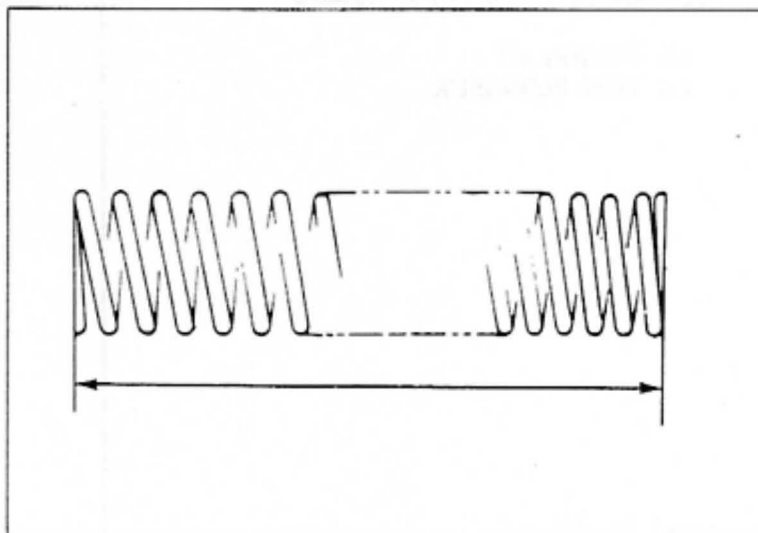


## INSPECTION

### FORK SPRING FREE LENGTH

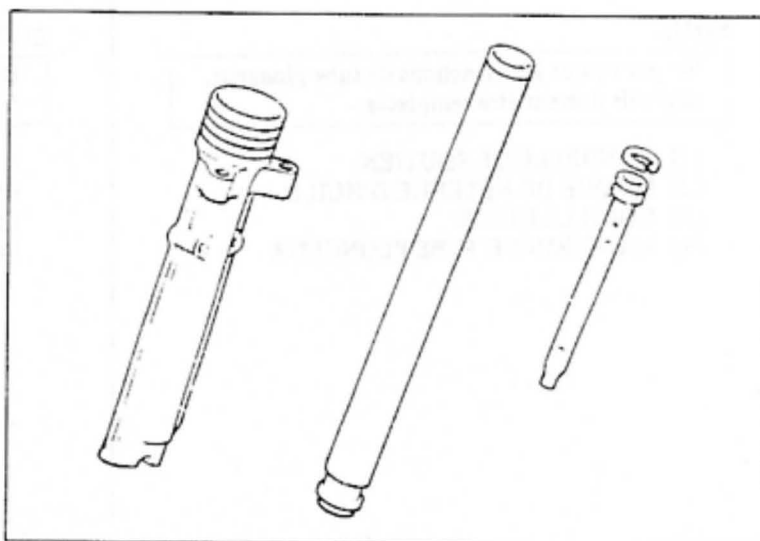
Measure the fork spring free length.

**SERVICE LIMIT: 436 mm (21.1 in)**



### FORK TUBE/FORK SLIDER/PISTON

Check the fork tube, fork slider and piston for score marks, scratches, or excessive or abnormal wear. Replace any components which are worn or damaged.



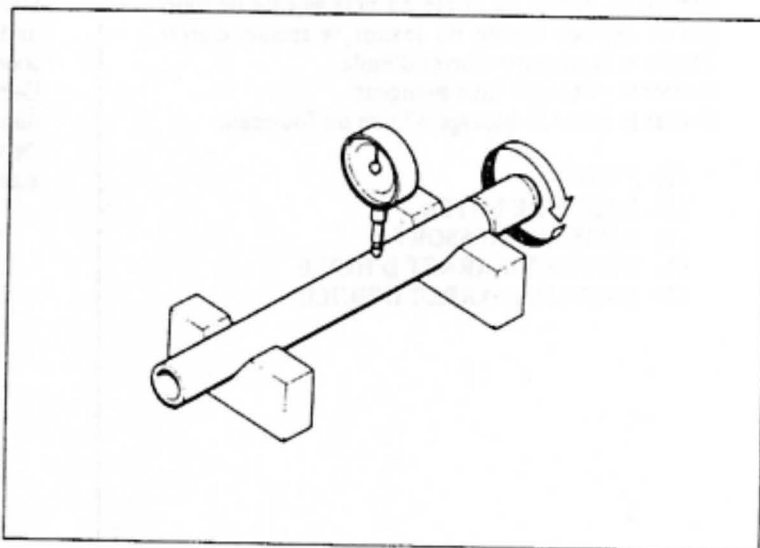


## FORK TUBE

Install the front wheel (page 14—19).

Set the fork tube in V blocks and check its runout.

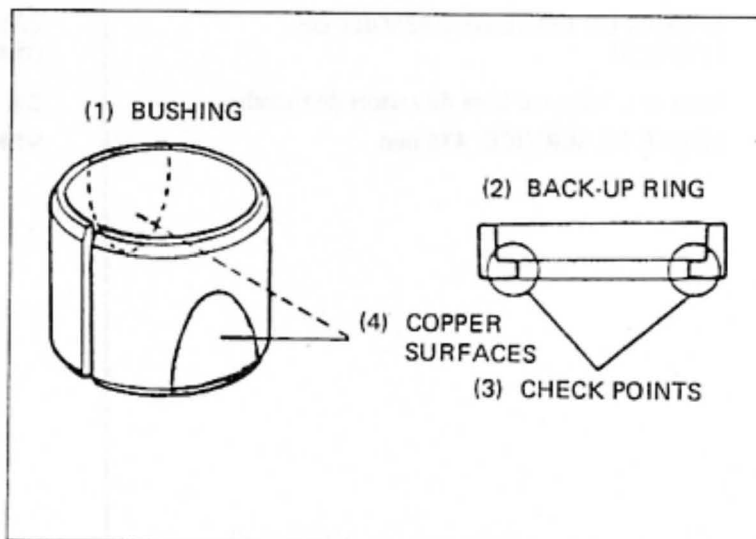
**SERVICE LIMIT: 0.20 mm (0.008 in)**



## BUSHING/BACK-UP RING

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.

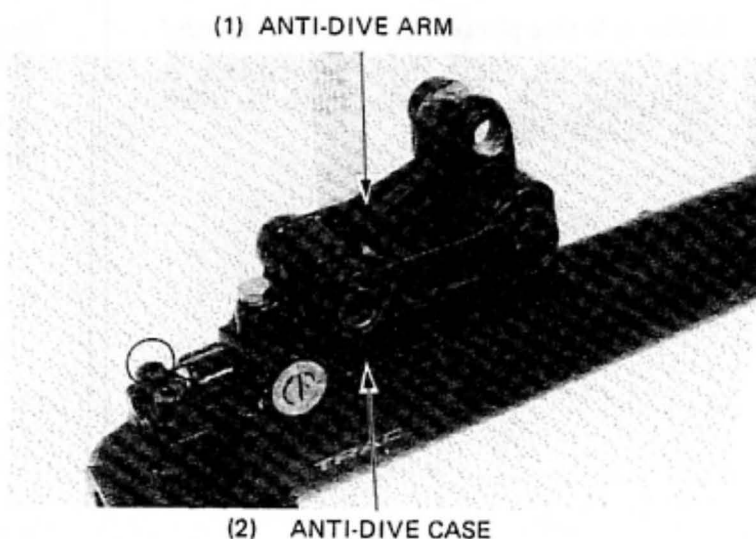


## ANTI-DIVE DISASSEMBLY

### NOTE

The anti-dive can be disassembled with the front fork installed, after draining the fork fluid.

Remove the socket bolts and anti-dive arm.  
Remove the socket bolts and remove the anti-dive case.

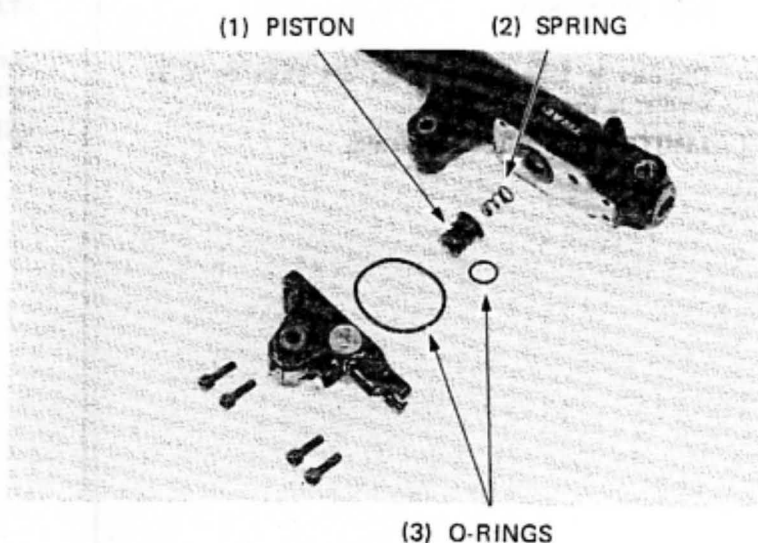


## FRONT WHEEL/SUSPENSION

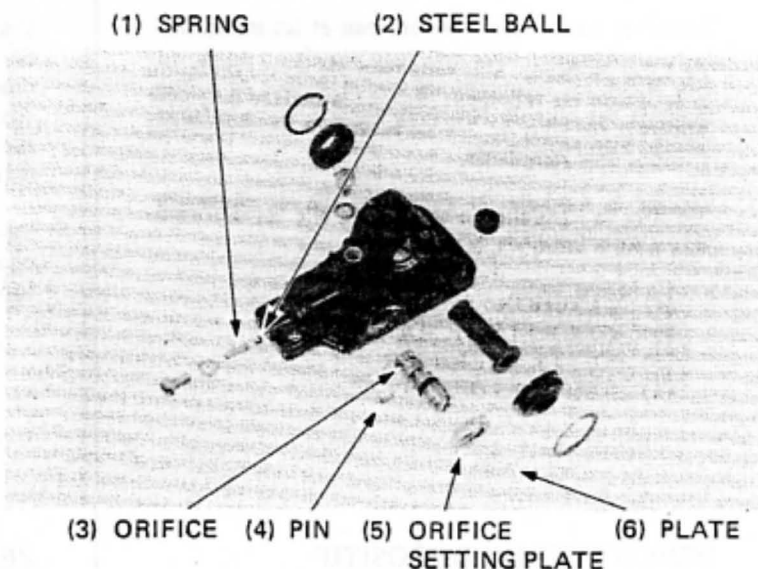


**HONDA**  
**VF400F**

Remove the O-rings, piston and spring.  
Check the piston for wear, and the spring for damage.



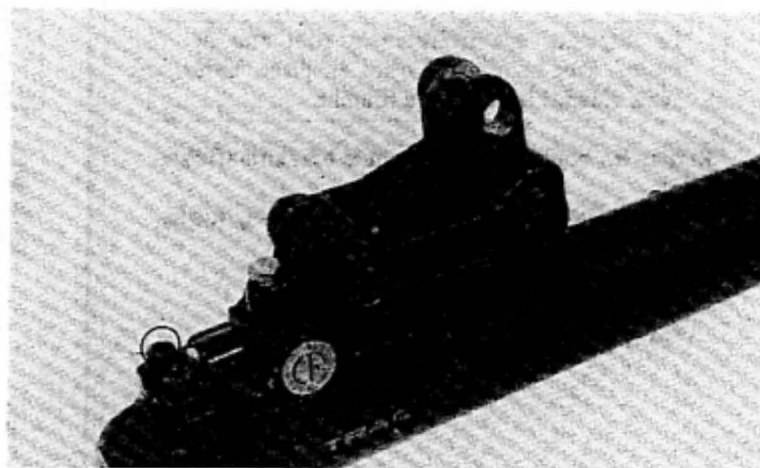
Remove the pin from the back of the anti-dive case.  
Remove the clip and orifice setting plate and remove the orifice.  
Remove the check valve spring and steel ball.  
Check the orifice for clogging, and the valve spring for damage.



Assemble the anti-dive case in the reverse order of disassembly.

### NOTE

- Apply a Thread Lock Agent to the threads of the screws and socket bolts before assembly.
- Apply ATF to the piston and piston O-ring.
- Apply silicone grease to the pivot bolt collar.
- Check that the piston moves smoothly.

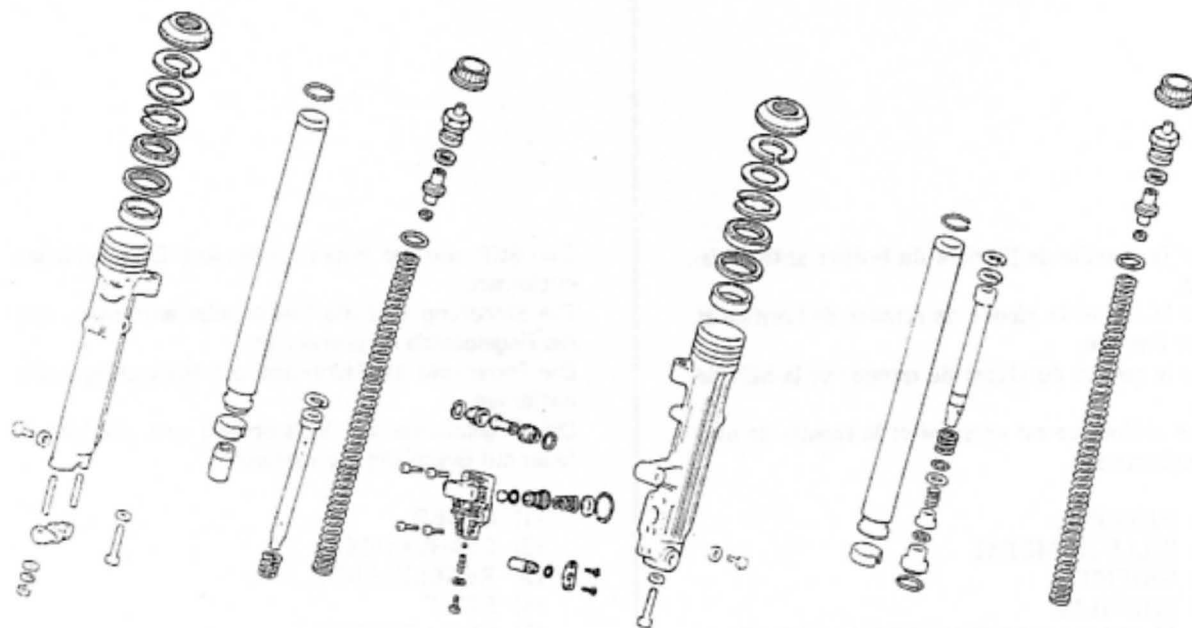


Push the arm and check the piston stroke.

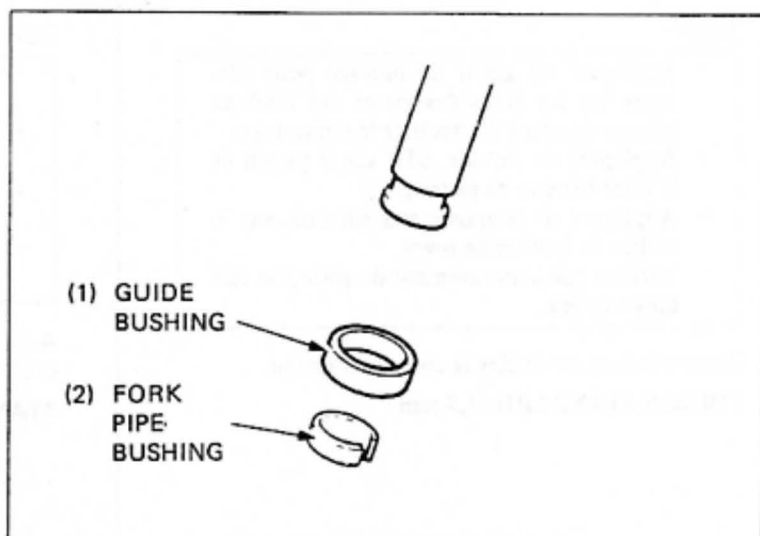
**STANDARD STROKE: 2.5 mm (0.098 in)**

**ASSEMBLY**

Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them off completely.



Install new bushings onto the fork tube.  
Install the rebound spring and piston into the fork tube.





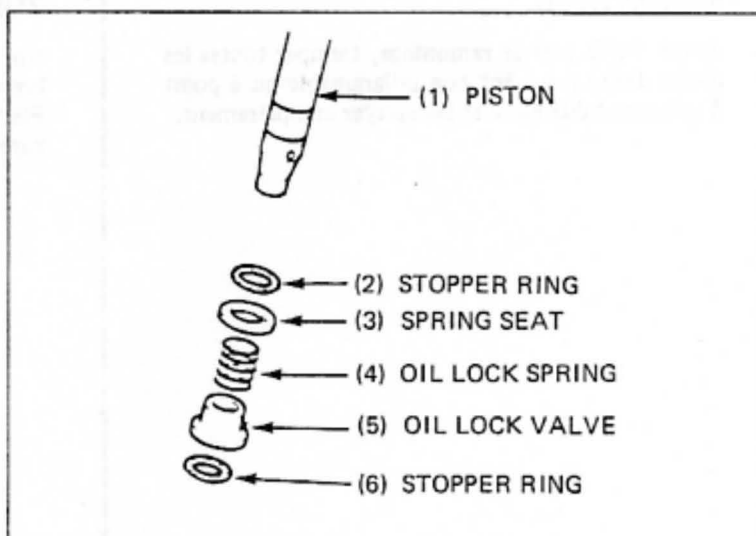
## FRONT WHEEL/SUSPENSION



**HONDA**  
**VF400F**

Install the oil lock valve, oil lock spring and spring seat into the left front fork tube and secure them with the stopper ring.

Install the oil lock piece to the end of the piston.  
Install the fork tube into the slider.



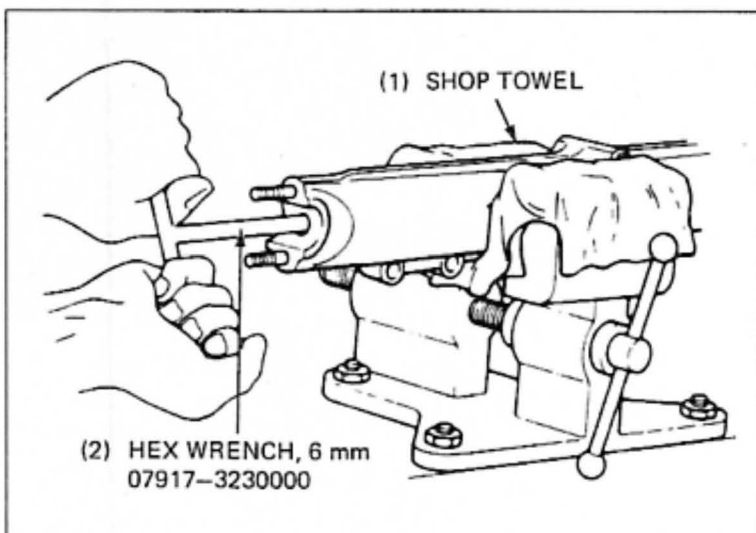
Place the fork slider in a vise with soft jaws or a shop towel.

Apply a locking agent to the socket bolt and thread it into the piston. Tighten with a 6 mm hex wrench.

### NOTE

Temporarily install the fork spring and fork cap bolt to tighten the socket bolt.

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

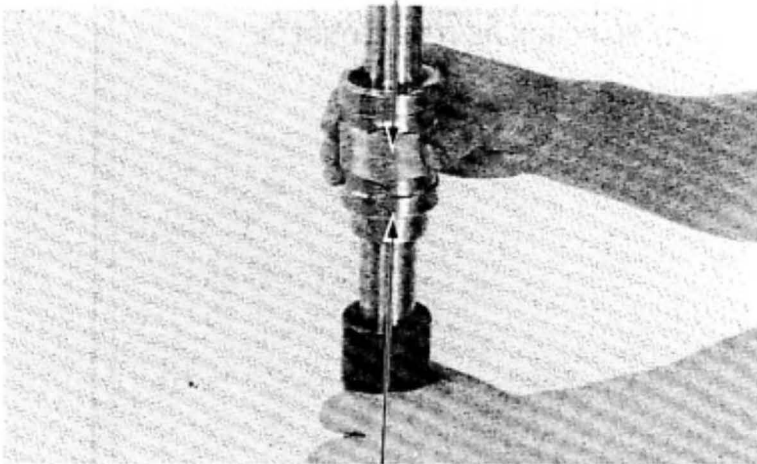


(1) FORK SEAL DRIVER  
07747-0010100

Install the guide bushing and back-up ring over the fork tube.

Coat a new oil seal with ATF and install it over the fork tube.

Drive the seal in with seal driver until the snap ring groove in the slider appears completely.

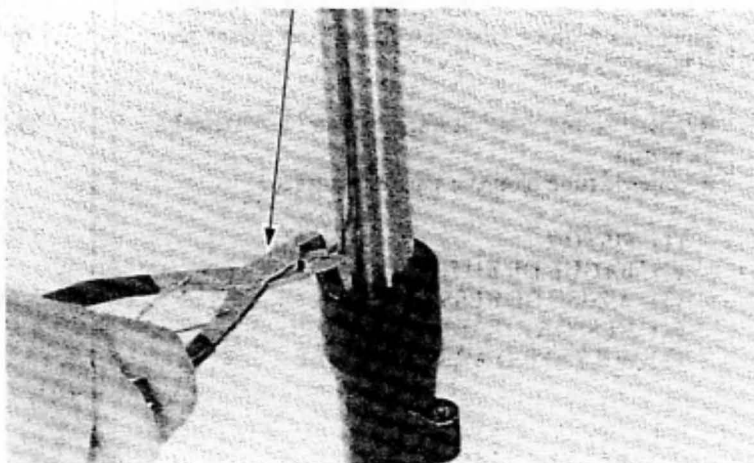


(2) FORK SEAL DRIVER ATTACHMENT  
07947-KA20200



(1) SNAP RING PLIERS  
07914-3230001

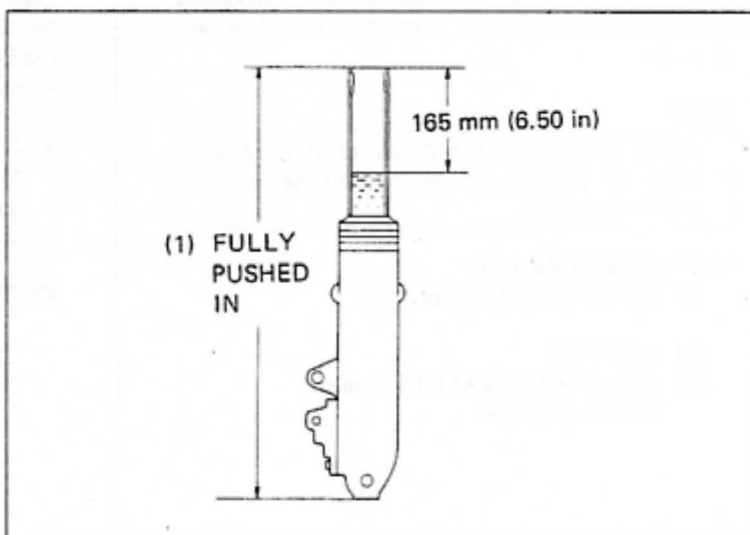
Install the snap ring.  
Install the washer, grease holder and dust seal.



Push the fork tube in fully.  
Pour the specified amount of ATF into the fork tube.

**CAPACITY:**

Right fork: 285 cc (9.6 oz)  
Left fork: 300 cc (10.1 oz)

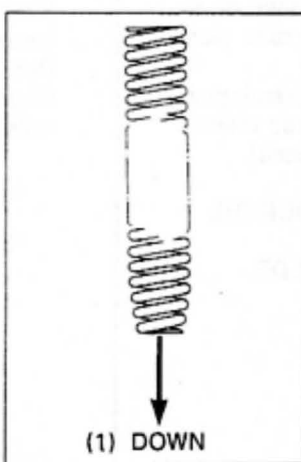


Install the fork spring, noting the installation direction as shown.

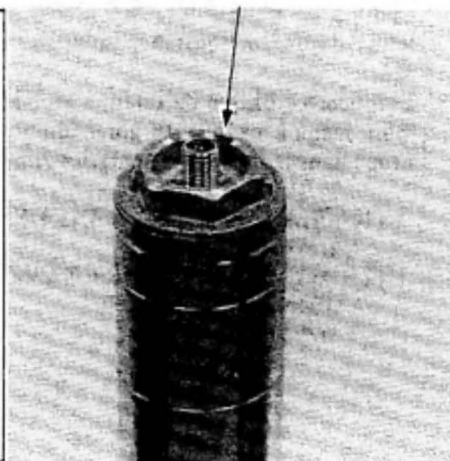
Hold the fork tube in a vise with soft jaws or a shop towel and tighten the fork cap.

**CAUTION**

*Do not damage the sliding surface.*



(2) FORK CAP





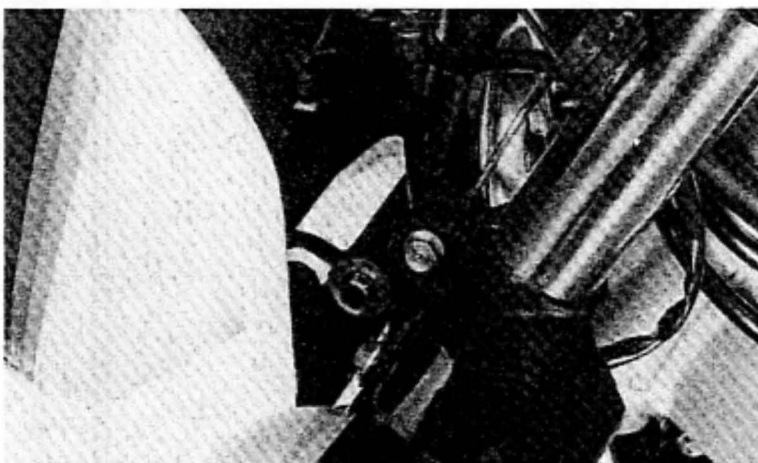
Install the fork tube and align the groove in the fork tube with the upper surface of the top bridge.



(1) GROOVE

Tighten the fork bottom bridge pinch bolts.

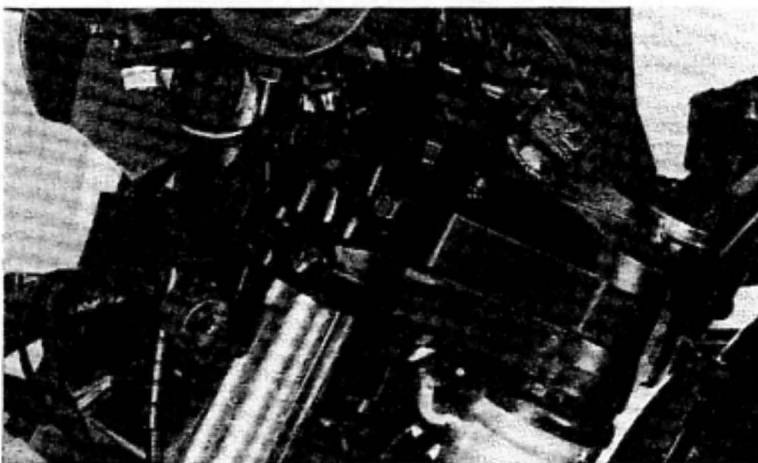
**TORQUE:** 18–25 N·m  
(1.8–2.5 kg·m, 13–18 ft·lb)



Tighten the fork top bridge pinch bolts.

**TORQUE:** 9–13 N·m  
(0.9–1.3 kg·m, 7–10 ft·lb)

Install the handlebars (page 14–11).





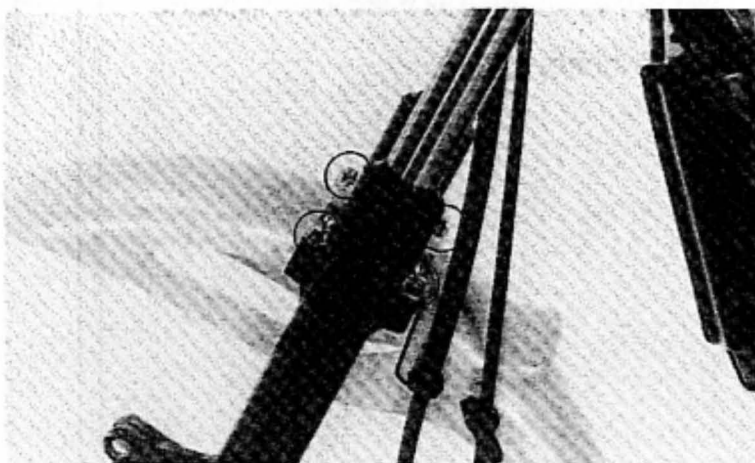
Install the front fender and tighten the four bolts.  
Install the front wheel (page 14-19).  
Fill the fork tubes with air.

## RECOMMENDED PRESSURE:

0-40 kPa (0-0.4 kg/cm<sup>2</sup>, 0-6 psi)

## CAUTION

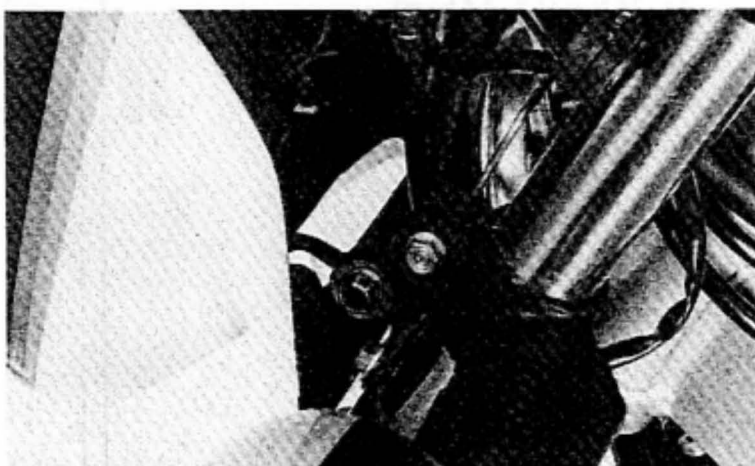
- Use only a hand-operated air pump to fill the fork tubes. Do not use compressed air.
- Maximum pressure is 300 kPa (3 kg/cm<sup>2</sup>, 43 psi). Do not exceed this or fork tube component damage may occur.



## STEERING STEM

### REMOVAL

Open the fairing and remove it by removing the two pivot bolts.

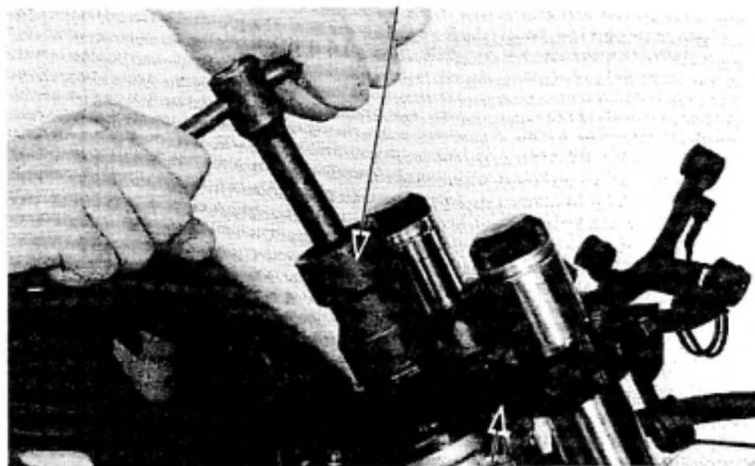


- (1) LOCK NUT WRENCH, 30 x 32 mm 07716-0020400  
EXTENSION BAR 07716-0020500

Remove the instrument (page 14-5).  
Remove the fuse holder (page 14-7).  
Remove the ignition switch (page 14-8).  
Remove the front wheel (page 14-14).

Remove the steering stem nut.

Remove the front forks (page 14-20).  
Remove the fork top bridge.



(2) FORK TOP BRIDGE

## FRONT WHEEL/SUSPENSION



**HONDA**  
**VF400F**

Remove the steering head top thread and remove the steel balls.

### NOTE

Be careful not to lose the steel balls.

(1) STEERING HEAD TOP THREAD

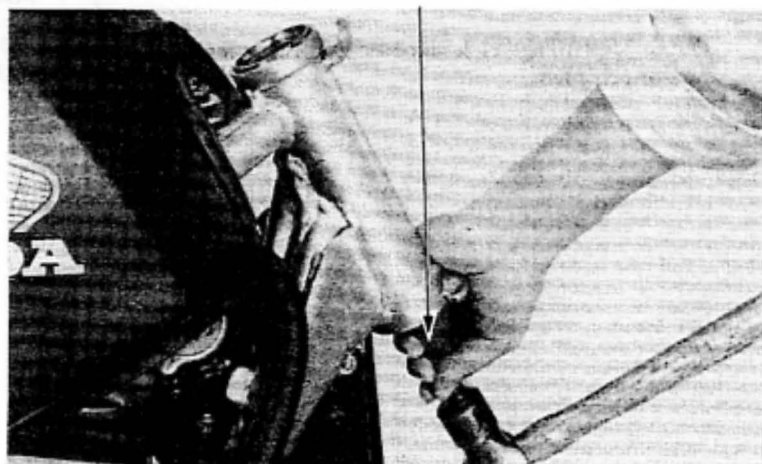


(2) PIN SPANNER  
07702-0020000

(1) BALL RACE REMOVER  
07953-3330000

## BEARING REPLACEMENT

Remove the upper ball race.



(1) STEERING STEM DRIVER  
07946-MB00000 or 07946-3710601

Remove the lower ball race.

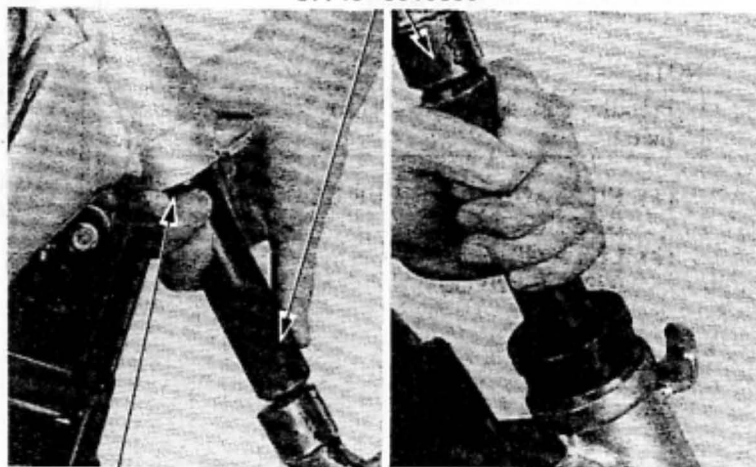






(1) DRIVER  
07749-0010000

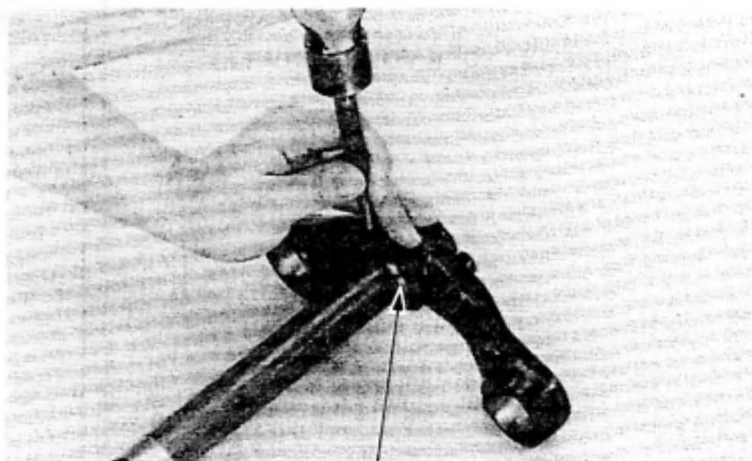
Drive the lower ball race into the steering head.  
Drive the upper ball race into the steering head.



(2) BEARING DRIVER  
ATTACHMENT  
07945-3330300

(3) BEARING DRIVER  
ATTACHMENT  
07946-3290000

Remove the lower cone race.



(1) LOWER CONE RACE

(1) STEERING STEM DRIVER  
07946-MB00000 or 07946-3710601

Install a new washer and dust seal and then  
drive a new lower cone race in.



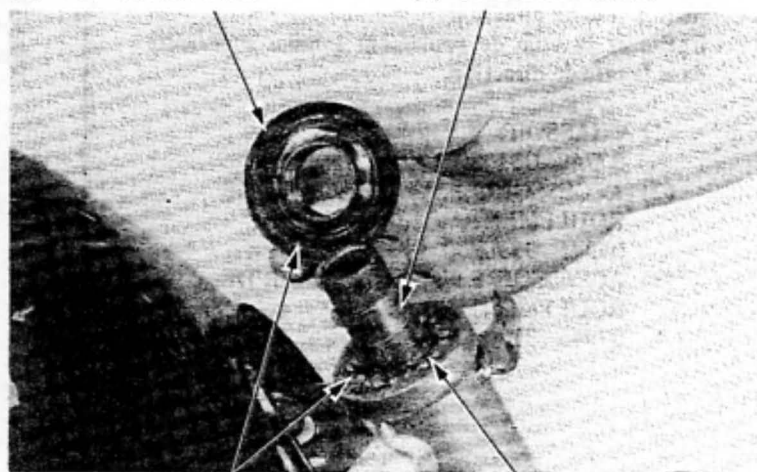


Pack the upper ball race with grease and install the 18 steel balls.

Pack the lower ball race with grease and install the 19 steel balls.

Install the steering stem in the steering head and install the top cone race and top thread.

(1) TOP CONE RACE (2) STEERING STEM



(3) STEEL BALLS

Tighten the top thread to the initial torque.

**TORQUE:** 25–35 N·m  
(2.5–3.5 kg-m, 18–25 ft-lb)

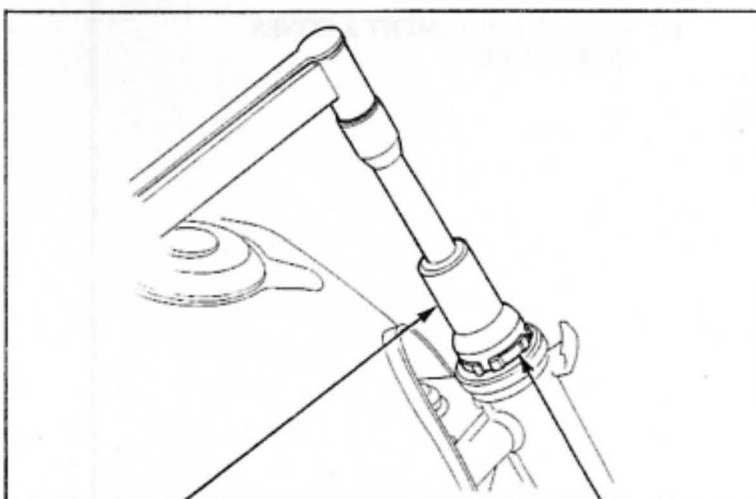
Turn the steering stem lock-to-lock several times to seat the steel balls.

Loosen the top thread, then tighten it to the final torque.

**TORQUE:** 18 N·m (1.8 kg-m, 13 ft-lb)

Turn the top thread back 1/4 turn.

Make sure that there is no vertical movement and the stem rotates freely.



(1) STEERING STEM SOCKET  
07916-3710100

(2) TOP THREAD

Temporarily install the front forks.

Install the fork top bridge and tighten the stem nut.

**TORQUE:** 90–120 N·m  
(9.0–12.0 kg-m, 65–88 ft-lb)

Install the front fork properly (page 14–29).

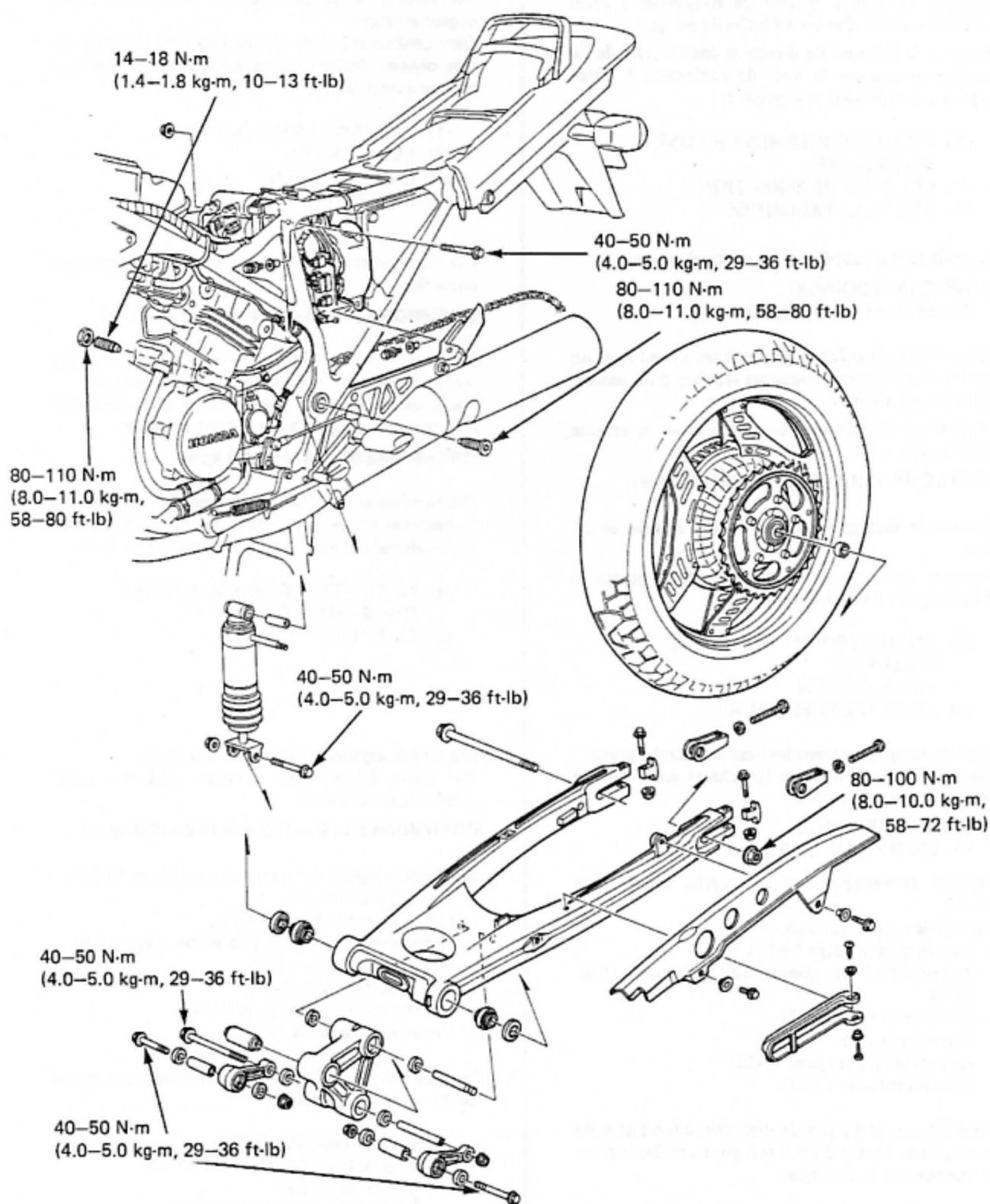
Install the following parts:

- handlebars (page 14–11).
- fuse holder and ignition switch (page 14–8).
- instrument (page 14–7).
- headlight (page 14–5).
- front fender (page 14–30).
- front wheel (page 14–19).

Turn the steering handle lock-to-lock 2–3 times to check the steering operation.



(1) LOCK NUT WRENCH, 30 x 32 mm 07716-0020400  
EXTENSION BAR 07716-0020500





|                     |       |
|---------------------|-------|
| SERVICE INFORMATION | 15-1  |
| TROUBLESHOOTING     | 15-2  |
| REAR WHEEL          | 15-3  |
| SHOCK ABSORBER      | 15-12 |
| SWING ARM           | 15-21 |

## SERVICE INFORMATION

### GENERAL

- The rear wheel uses a tubeless tire. For tubeless tire repairs, refer to the TUBELESS TIRE MANUAL.
- Do not remove the rivets, nuts and pins from the rim spoke plate and hub, since they cannot be disassembled.
- Never ride on the spoke plate or apply force to the wheel to insure built-in accuracy.
- Avoid damaging the rim since it is made of aluminum alloy.

### SPECIFICATIONS

|                       |        | STANDARD | SERVICE LIMIT    |
|-----------------------|--------|----------|------------------|
| Axle runout           |        | —        | 0.2 mm (0.01 in) |
| Rear wheel rim runout | Radial | —        | 2.0 mm (0.08 in) |
|                       | Axial  | —        | 2.0 mm (0.08 in) |

### TORQUE VALUES

|                          |            |                                         |
|--------------------------|------------|-----------------------------------------|
| Rear shock absorber      | Upper      | 40-50 N·m (4.0-5.0 kg-m, 29-36 ft-lb)   |
|                          | Lower      | 40-50 N·m (4.0-5.0 kg-m, 29-36 ft-lb)   |
| Swing arm pivot bolt     | Right side | (Tighten in specified sequence)*        |
|                          | Left side  | (Tighten in specified sequence)**       |
| Swing arm pivot lock nut |            | 80-110 N·m (8.0-11.0 kg-m, 58-80 ft-lb) |
| Rear axle nut            |            | 80-100 N·m (8.0-10.0 kg-m, 58-72 ft-lb) |
| Shock arm pivot bolt     |            | 40-50 N·m (4.0-5.0 kg-m, 29-36 ft-lb)   |
| Shock link bolt          |            | 40-50 N·m (4.0-5.0 kg-m, 29-36 ft-lb)   |
| Final driven sprocket    |            | 60-70 N·m (6.0-7.0 kg-m, 43-51 ft-lb)   |

\* Tighten to 25 N·m (2.5 kg-m, 18 ft-lb) first and loosen, then tighten to 15 N·m (1.5 kg-m, 11 ft-lb).

\*\* Tighten to 40 N·m (4.0 kg-m, 29 ft-lb) first and loosen, then tighten to 14-18 N·m (1.4-1.8 kg-m, 10-13 ft-lb).

### TOOLS

#### Special

|                            |               |
|----------------------------|---------------|
| Oil seal driver            | 07965-KE80100 |
| Oil seal driver attachment | 07965-KE80200 |
| Oil seal driver attachment | 07965-MA60100 |
| Bearing remover set        | 07936-8890100 |

#### Common

|                             |               |
|-----------------------------|---------------|
| Attachment, 37 x 40 mm      | 07746-0010200 |
| Attachment, 42 x 47 mm      | 07746-0010300 |
| Pilot, 17 mm                | 07746-0040400 |
| Pilot, 20 mm                | 07746-0040500 |
| Driver                      | 07749-0010000 |
| Bearing remover shaft       | 07746-0050100 |
| Bearing remover head, 17 mm | 07746-0050500 |



## **TROUBLESHOOTING**

### **Oscillation**

1. Bent rim
2. Loose wheel bearings
3. Faulty tire
4. Loose axle
5. Tire pressure incorrect
6. Swing arm bearings worn
7. Worn tires

### **Soft suspension**

1. Weak spring
2. Insufficient fluid in shock absorber
3. Shock absorber air pressure incorrect

### **Hard suspension**

1. Incorrect fluid weight in shock absorber
2. Bent shock absorber
3. Shock absorber air pressure incorrect

### **Suspension noise**

1. Shock case binding
2. Loose fasteners





## REAR WHEEL

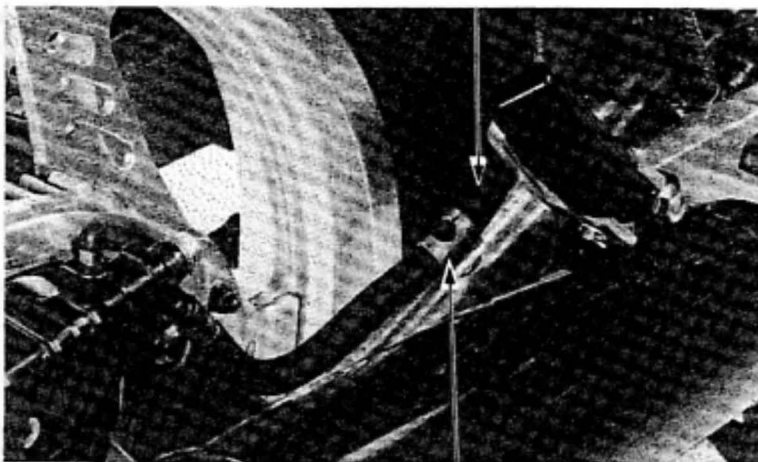
### REMOVAL

Place the motorcycle on its center stand.

Remove the rear brake hose from the clamp.

Remove the drive chain cover.

(1) REAR BRAKE HOSE



(2) CLAMP

Loosen the drive chain adjusting bolts lock nuts and the adjusting bolts.

Remove the chain adjuster stopper mount bolts and nuts.

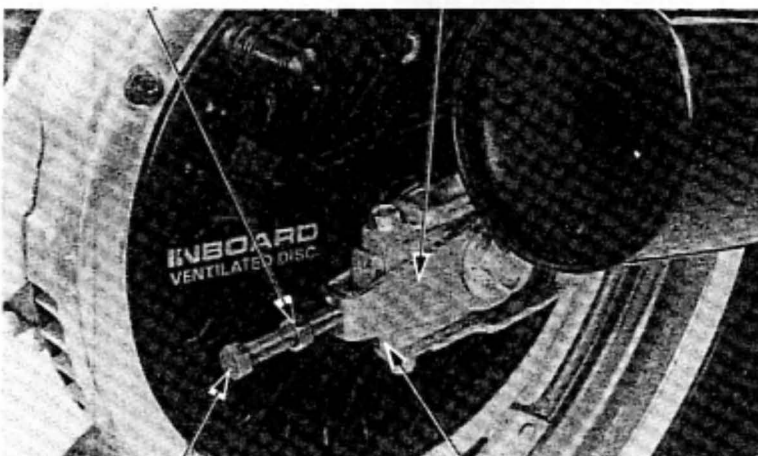
Loosen the rear axle nut.

Swing the chain adjusters down.

Move the rear wheel forward and remove the drive chain from the driven sprocket.

(1) LOCK NUT

(2) CHAIN ADJUSTER



(3) ADJUSTING BOLT

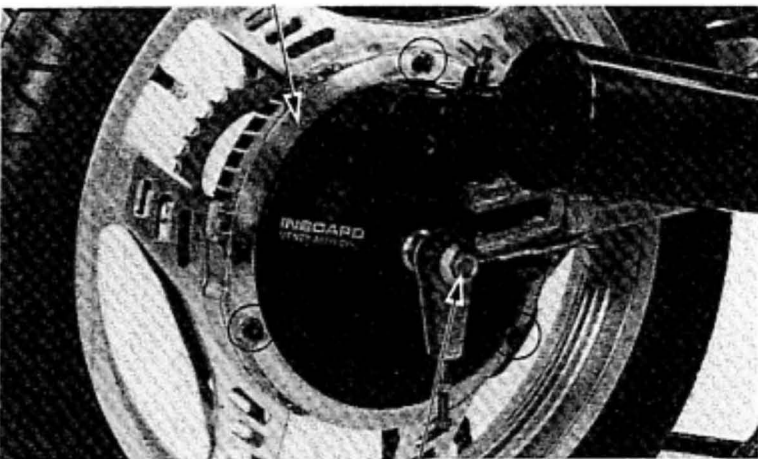
(4) ADJUSTER STOPPER

Remove the cap nuts and bolts attaching the disc cover.

Remove the axle shaft from the swing arm by sliding the rear wheel rearward.

Remove the axle nut, axle shaft and collar from the wheel.

(1) DISC COVER



(2) AXLE SHAFT

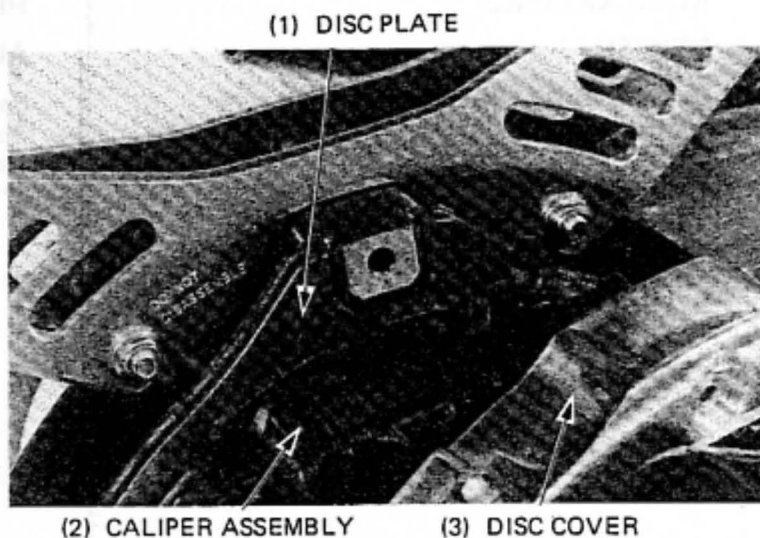


## REAR WHEEL/SUSPENSION

Remove the disc cover, caliper assembly and disc plate from the rear wheel.

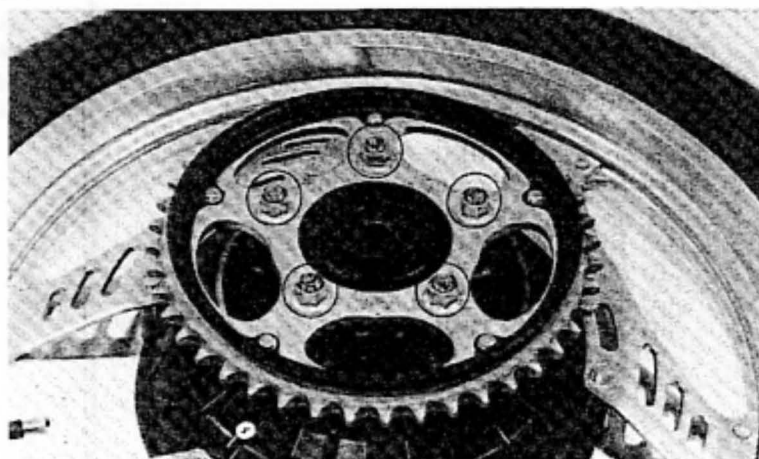
### NOTE

Do not allow the caliper assembly to hang with the brake hose. Hang the caliper assembly with a string or support it with a stand.

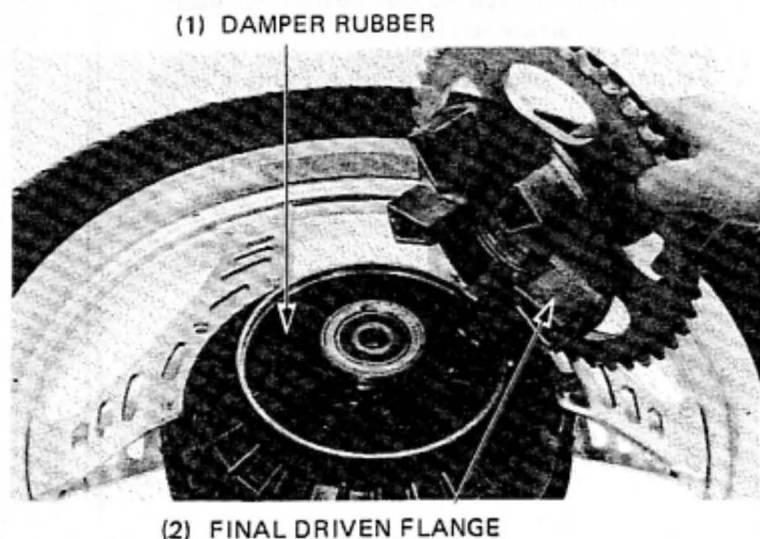


## DISASSEMBLY

Loosen the driven sprocket nuts.



Remove the driven flange from the wheel hub with the driven sprocket.  
Remove the damper rubbers.





**HONDA**  
**VF400F**

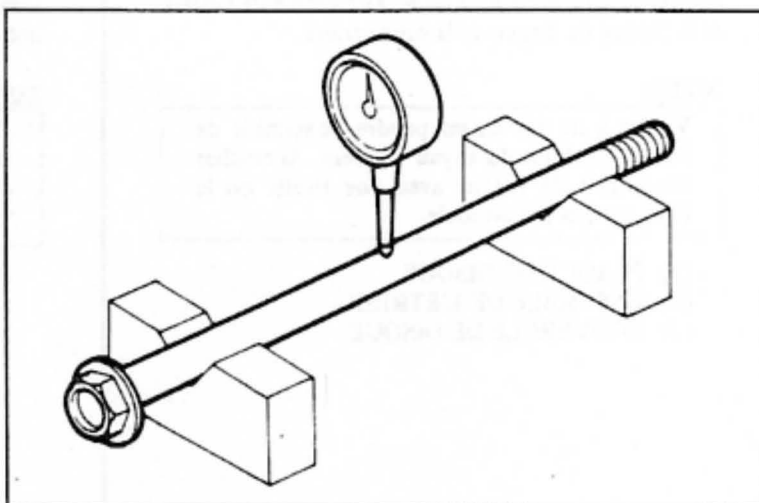
## REAR WHEEL/SUSPENSION

### INSPECTION

#### AXLE

Set the axle in V blocks and read the axle runout with a dial indicator.

**SERVICE LIMIT:** 0.2 mm (0.01 in)



#### REAR WHEEL BEARING

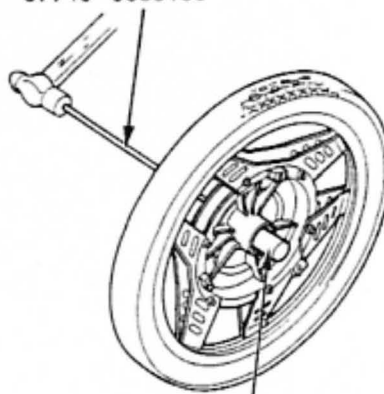
Check the wheel bearing play by rotating the wheel by hand. Replace the bearings with new ones if they are noisy or have excessive play.

If the bearings must be replaced, remove them with tools as shown.

#### NOTE

Never reinstall old bearings; once the bearings are removed, they must be replaced with new ones.

(1) BEARING REMOVER SHAFT  
07746-0050100



(2) BEARING REMOVER HEAD, 17 mm  
07746-0050500

#### REAR WHEEL RIM RUNOUT

Check the rim for runout by placing the wheel in a truing stand. Spin the wheel slowly, and read the runout using a dial indicator.

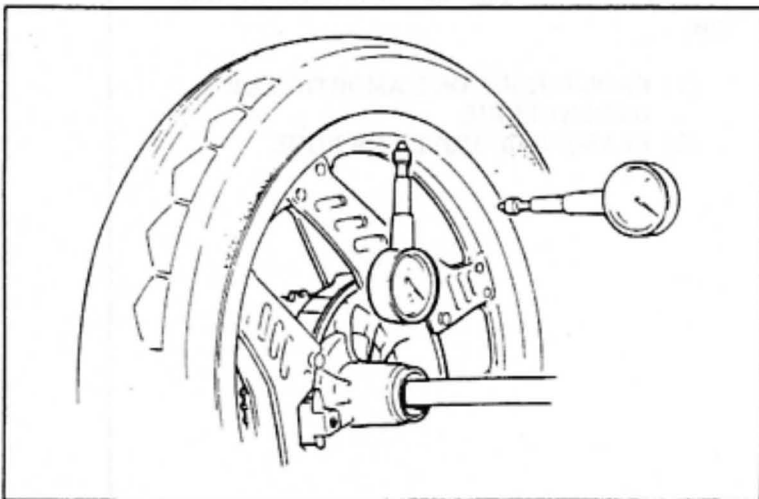
#### SERVICE LIMITS:

**RADIAL RUNOUT:** 2.0 mm (0.08 in)

**AXIAL RUNOUT:** 2.0 mm (0.08 in)

#### NOTE

The wheel cannot be serviced and must be replaced if the above limits are exceeded.





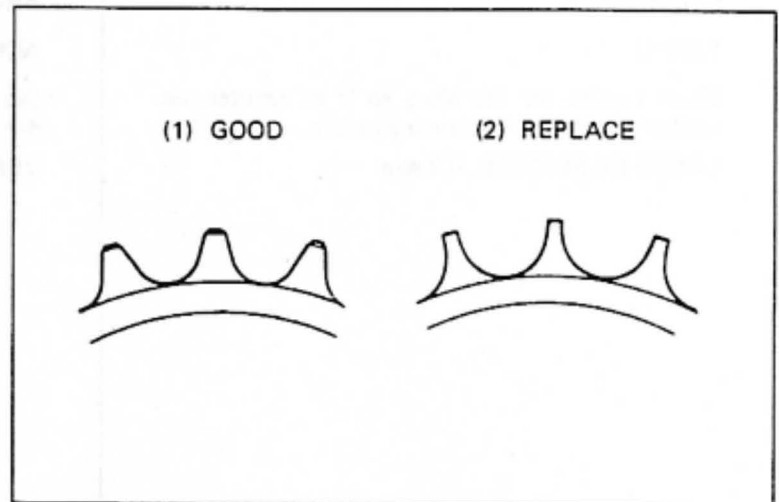
## REAR WHEEL/SUSPENSION

### FINAL DRIVEN SPROCKET

Check the condition of the final driven sprocket teeth. Replace the sprocket if worn or distorted.

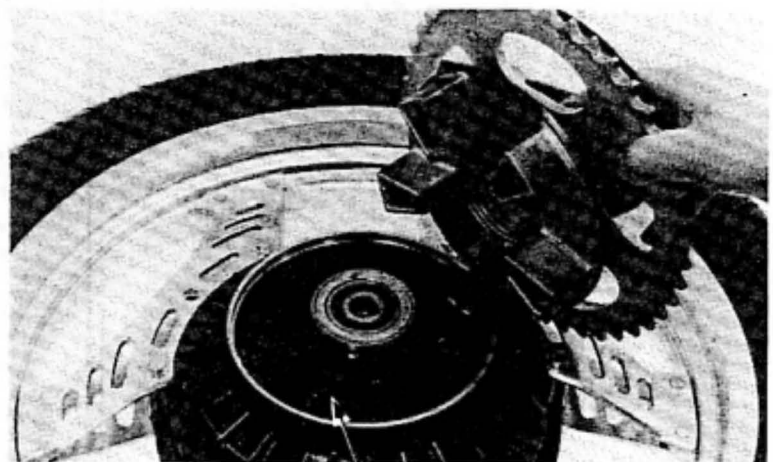
#### NOTE

If the final driven sprocket requires replacement, inspect the drive chain and drive sprocket.



### DAMPER RUBBERS

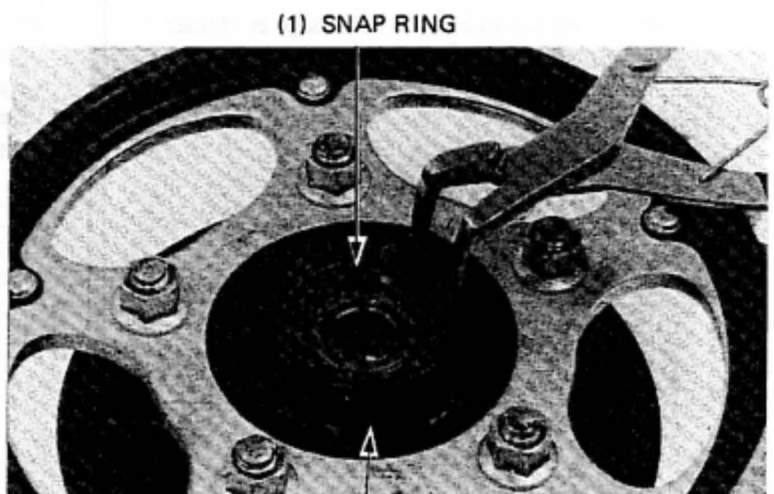
Replace the damper rubbers if they are damaged or deteriorated.



(1) DAMPER RUBBER

### WHEEL BEARING REPLACEMENT

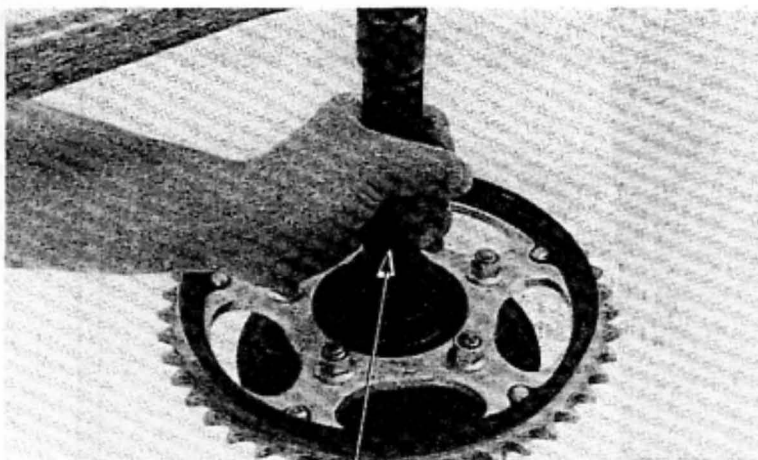
Remove the snap ring and drive the final driven flange side bearing out.  
Remove the bearings from the wheel hub.



(2) FINAL DRIVEN FLANGE



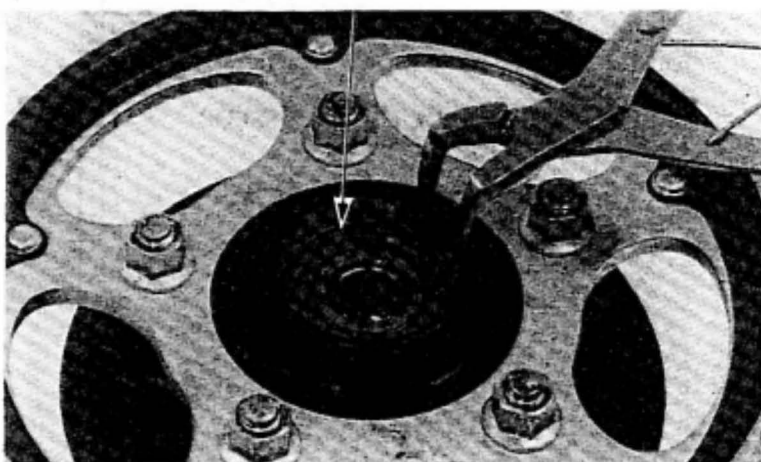
Pack all bearing cavities with grease.  
Drive the final driven flange bearing in squarely with the sealed end facing out.



- |                        |               |
|------------------------|---------------|
| (1) DRIVER             | 07749-0010000 |
| ATTACHMENT, 42 x 47 mm | 07746-0010300 |
| PILOT, 20 mm           | 07746-0040500 |

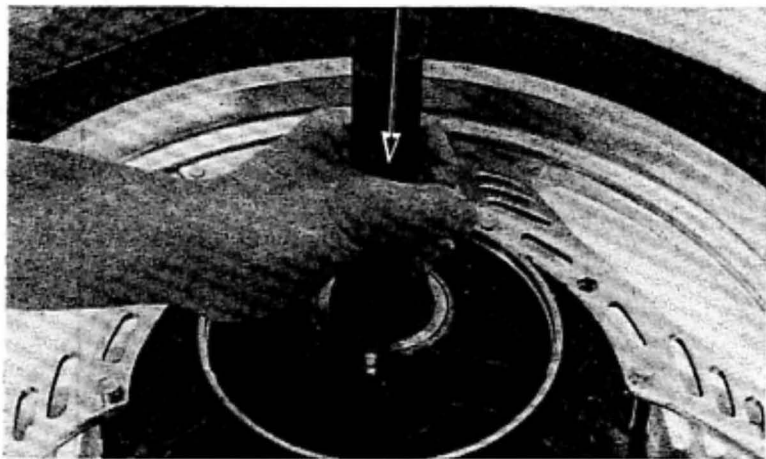
(1) SNAP RING

Install the snap ring.



- |                        |               |
|------------------------|---------------|
| (1) DRIVER             | 07749-0010000 |
| ATTACHMENT, 42 x 47 mm | 07746-0010300 |
| PILOT, 17 mm           | 07746-0040400 |

Drive the left side bearing into the wheel hub first with the sealed end facing out.  
Install the distance collar into place.  
Drive the right side bearing in squarely with the sealed end facing out.



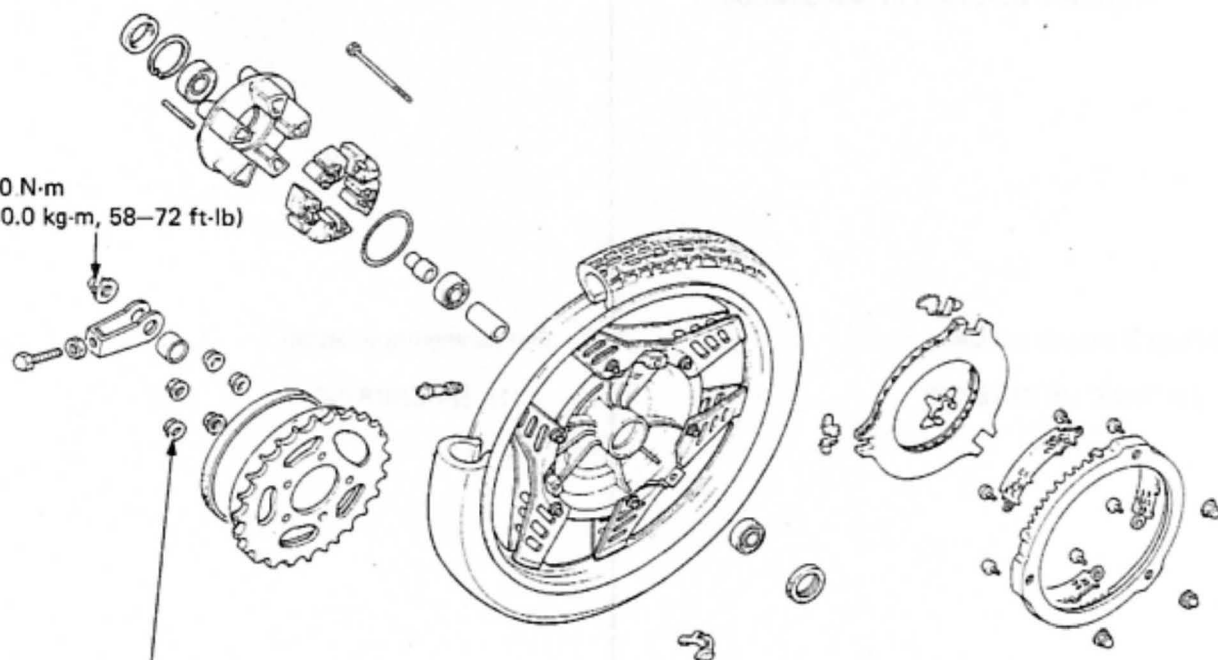




ASSEMBLY

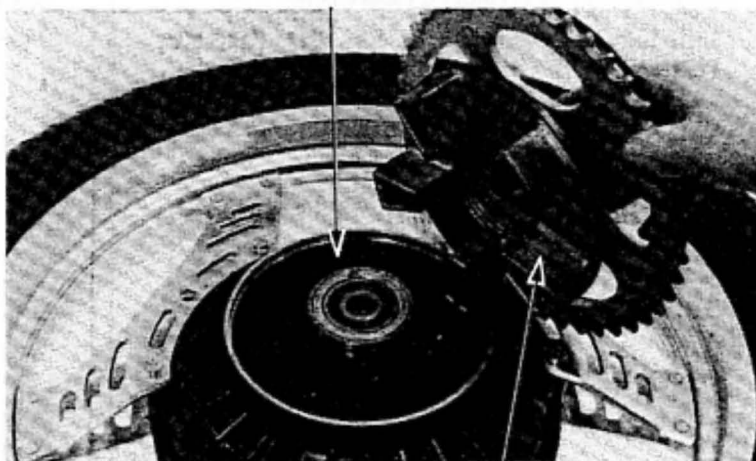
80–100 N·m  
(8.0–10.0 kg-m, 58–72 ft-lb)

60–70 N·m  
(6.0–7.0 kg-m, 43–51 ft-lb)



Install the damper rubbers.  
Install the final driven flange.

(1) DAMPER RUBBER



(2) FINAL DRIVEN FLANGE

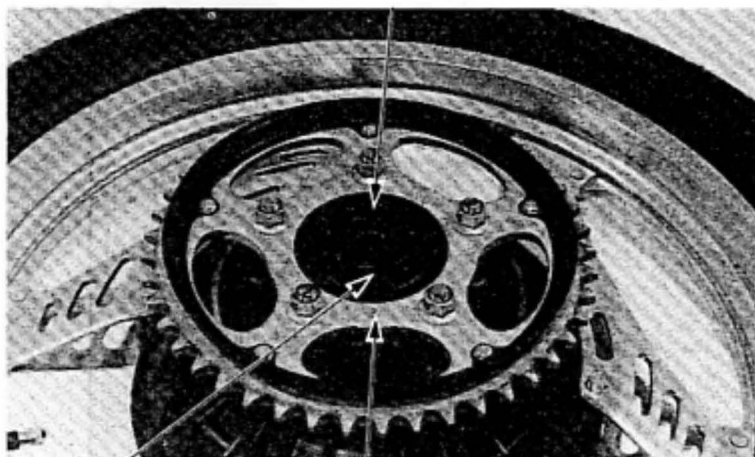


(1) LEFT OIL SEAL

Tighten the final driven sprocket nuts.

**TORQUE:** 60–70 N·m  
(6.0–7.0 kg-m, 43–51 ft-lb)

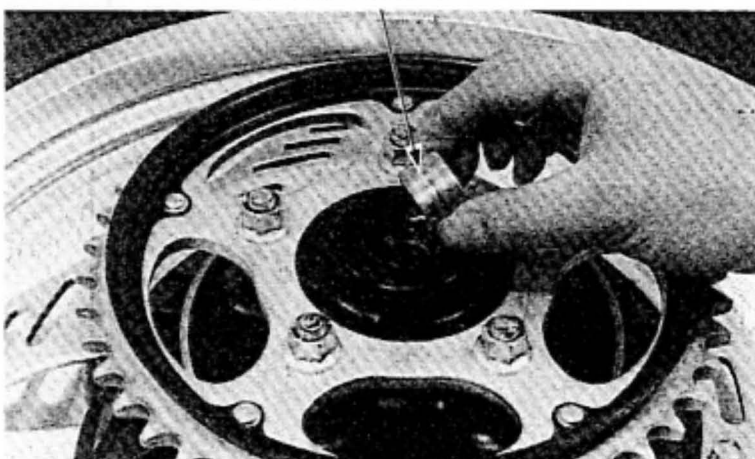
Coat oil seal lip with grease and install the left oil seal.



(2) FINAL DRIVEN SPROCKET

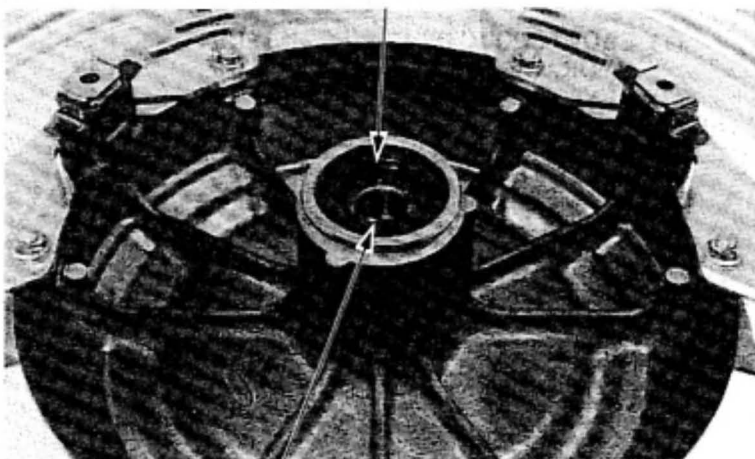
(1) LEFT SIDE COLLAR

Install the left side collar.



(1) RIGHT OIL SEAL

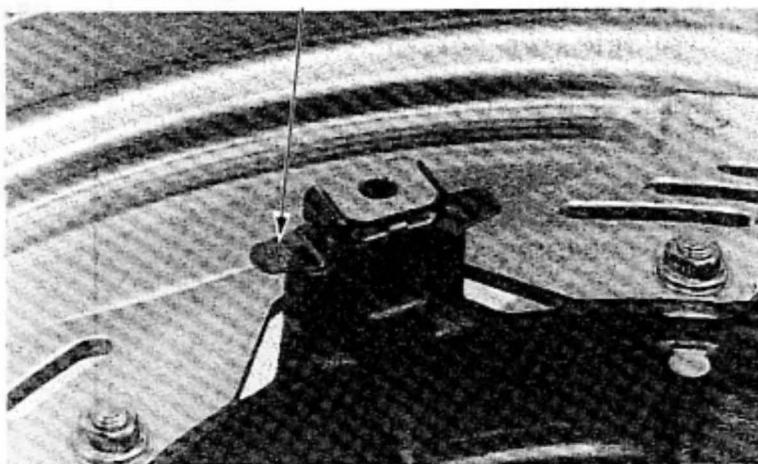
Coat oil seal lip with grease and install the right oil seal.



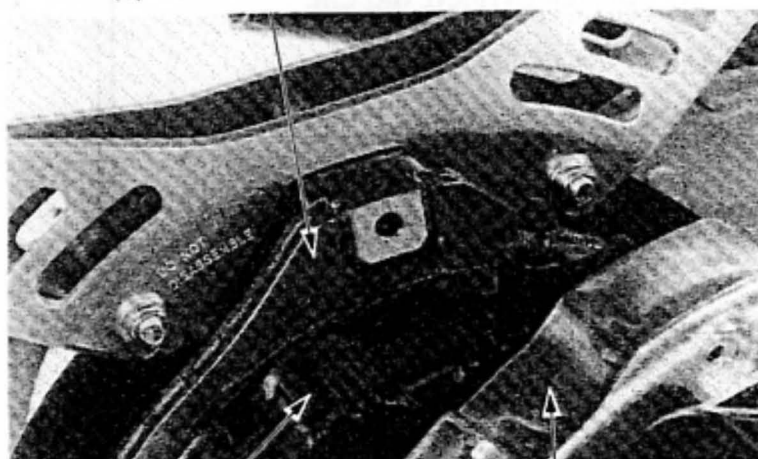


Install the disc plate spring as shown.

(1) DISC PLATE SPRING



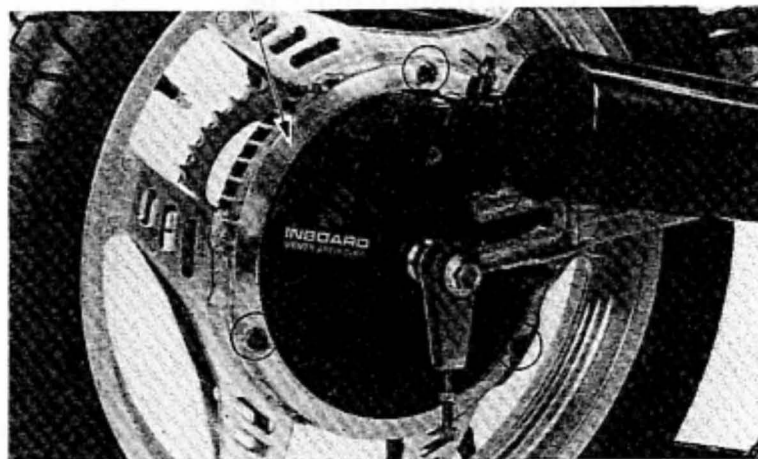
(1) DISC PLATE



(2) CALIPER ASSEMBLY

(3) DISC COVER

(1) DISC COVER



### INSTALLATION

Install the caliper assembly onto the wheel, aligning the cutouts with the lugs on the wheel.  
Install the disc cover.

Install the axle shaft, right side collar and axle nuts.

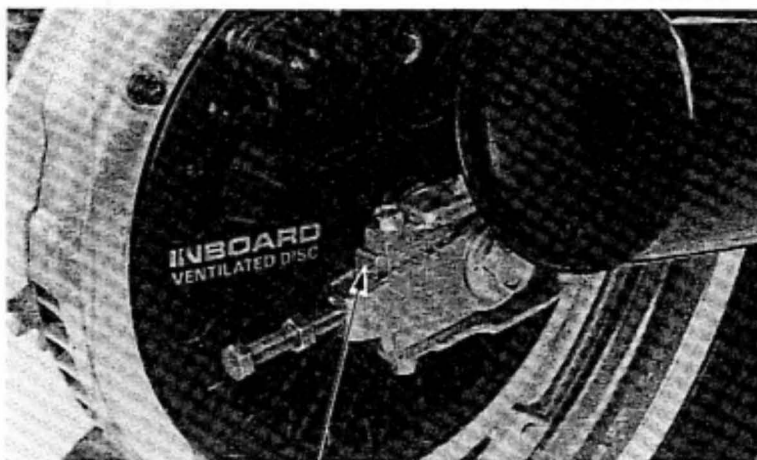
Install and tighten the bolts and cap nuts to secure the disc cover.



Install the axle shaft into the grooves in the swing arm.

Slide the wheel forward and install the drive chain over the final driven sprocket.

Install the drive chain adjuster stoppers.



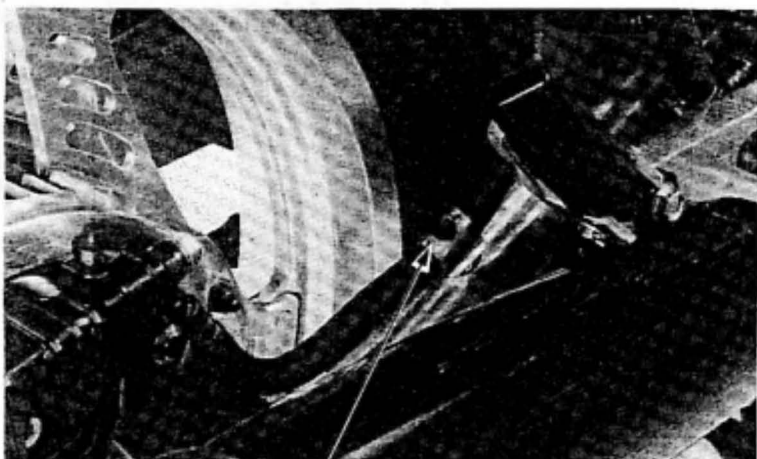
(1) ADJUSTER STOPPER

Install the rear brake hose into the clamp.

Adjust the drive chain (page 3-13).

Tighten the rear axle nut.

**TORQUE:** 80–100 N·m  
(8.0–10.0 kg·m, 58–72 ft·lb)



(2) CLAMP



**HONDA**  
**VF400F**

## REAR WHEEL/SUSPENSION

### SHOCK ABSORBER

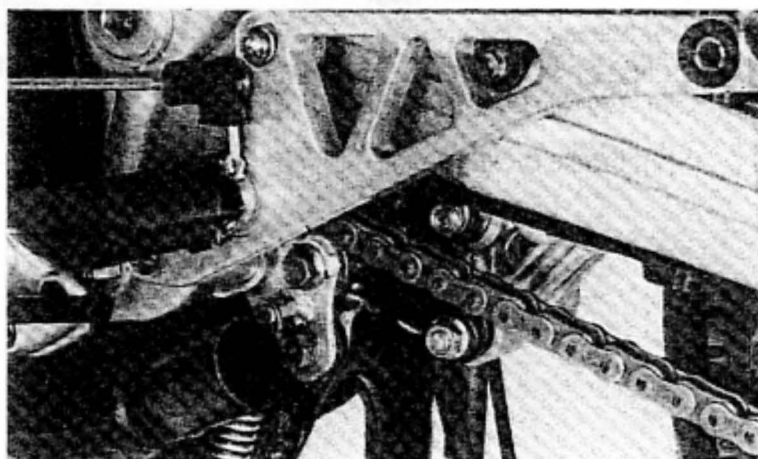
#### REMOVAL

Place the motorcycle on its center stand.  
Remove the seat and frame side covers.  
Remove the mufflers.

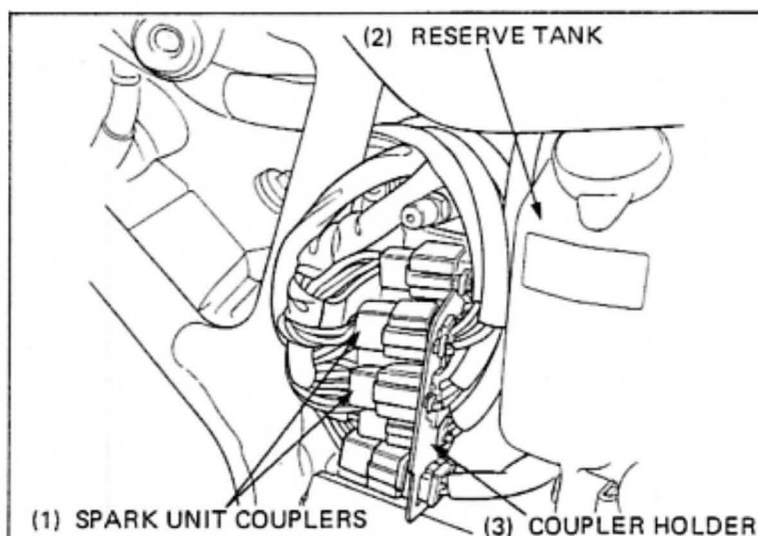


(1) MUFFLER

Remove the rear shock absorber lower mount bolt.



Disconnect the spark unit couplers.  
Remove the coupler holder.  
Disconnect the hose from the reserve tank.  
Remove the reserve tank by removing the two bolts.







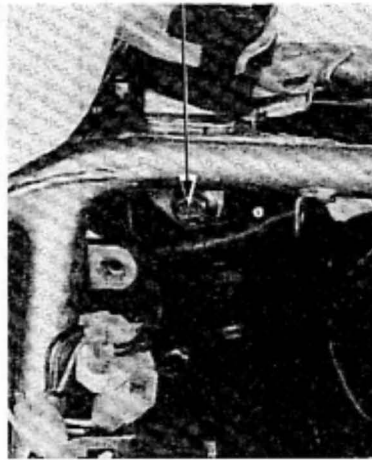
**HONDA**  
**VF400F**

## REAR WHEEL/SUSPENSION

(1) UPPER MOUNT BOLT

(2) REAR SHOCK ABSORBER

Remove the rear shock absorber upper mount bolt.  
Remove the rear shock absorber from the left side.

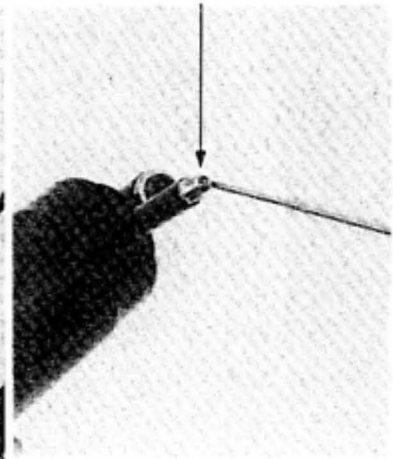
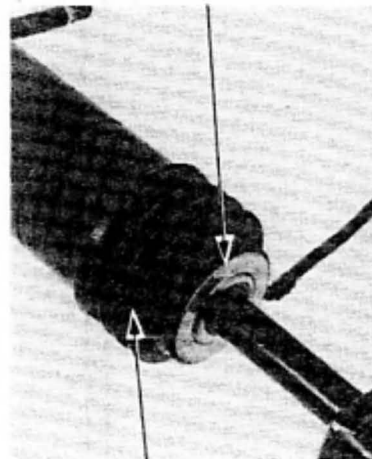


## REAR SHOCK ABSORBER OIL SEAL REPLACEMENT

Remove the boot clip and boot.  
Remove the air valve cap and release the air pressure by pushing the valve core.

(1) BOOT CLIP

(2) VALVE CORE

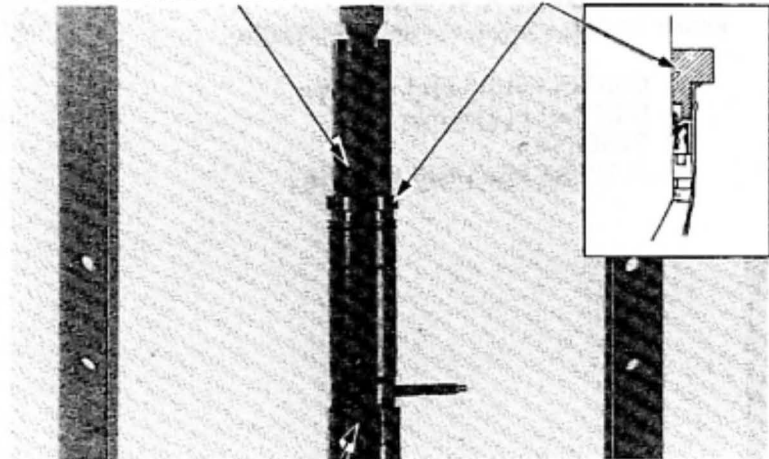


(3) BOOT

(1) OIL SEAL DRIVER ATTACHMENT 07965-KE80200

(2) OIL SEAL DRIVER 07965-KE80100

To remove the stopper ring, press down on the back-up plate and oil seal.



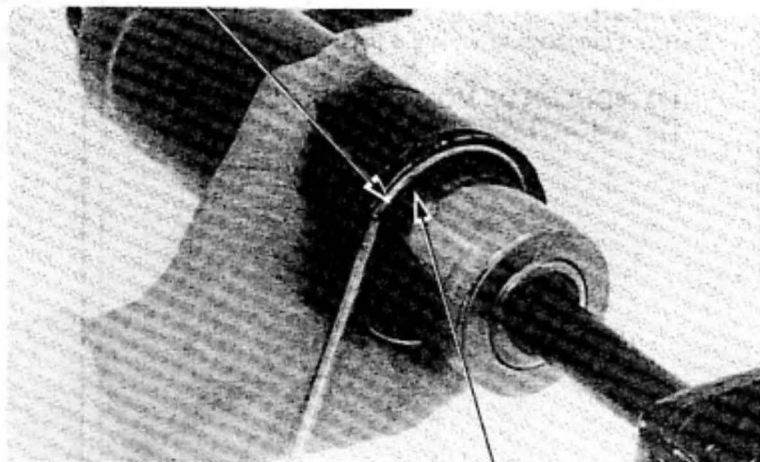
(3) OIL SEAL DRIVER ATTACHMENT 07965-MA60100



**REAR WHEEL/SUSPENSION**

**(1) STOPPER RING**

Remove the stopper ring and back-up plate.



**(2) BACK-UP PLATE**

Pour about 300 cm<sup>3</sup> (10.1 oz) of damper oil (ATF or equivalent) in a clean container.

Remove the air valve and connect a air hose to the air filler pipe.

Place the shock absorber in a hydraulic press with an OIL SEAL DRIVER ATTACHMENT positioned as shown.

Place the air hose in the oil and press the shock absorber several times until the damper is filled with the oil.

**NOTE**

- Do not over-press the shock absorber.
- This shock absorber stroke is 38.7 mm (1.52 in).

Place the shock absorber up right in an oil pan. Let the shock absorber stand for 5 minutes to allow air to escape.

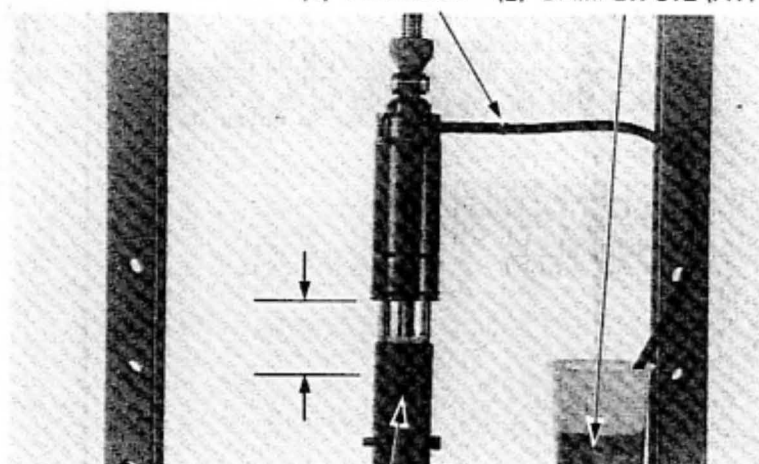
Disconnect the air hose and reinstall the air valve in the air filler pipe.

Place the shock absorber in the hydraulic press using the oil seal driver attachment.

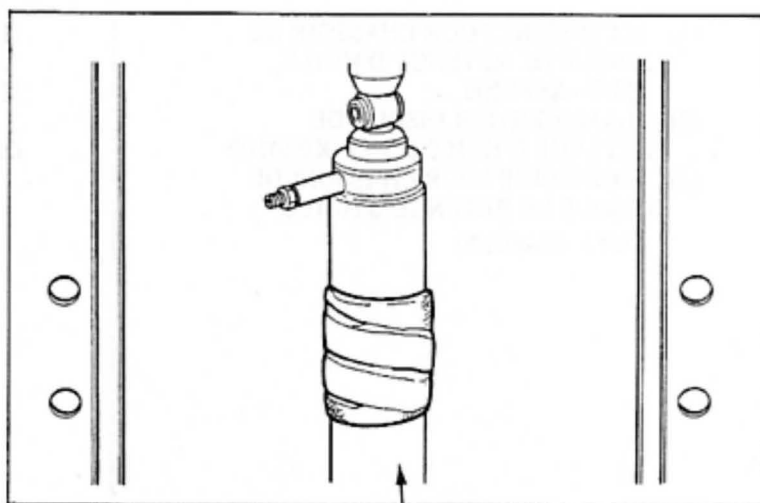
Wrap a shop towel around the shock absorber. Press the oil seal out by compressing the shock absorber.

Leave the shock absorber for another 5 minutes to let any remaining ATF drain out.

**(1) AIR HOSE (2) DAMPER OIL (ATF)**



**(1) OIL SEAL DRIVER ATTACHMENT  
07965-KE80200**



**(1) OIL SEAL DRIVER ATTACHMENT  
07965-KE80200**

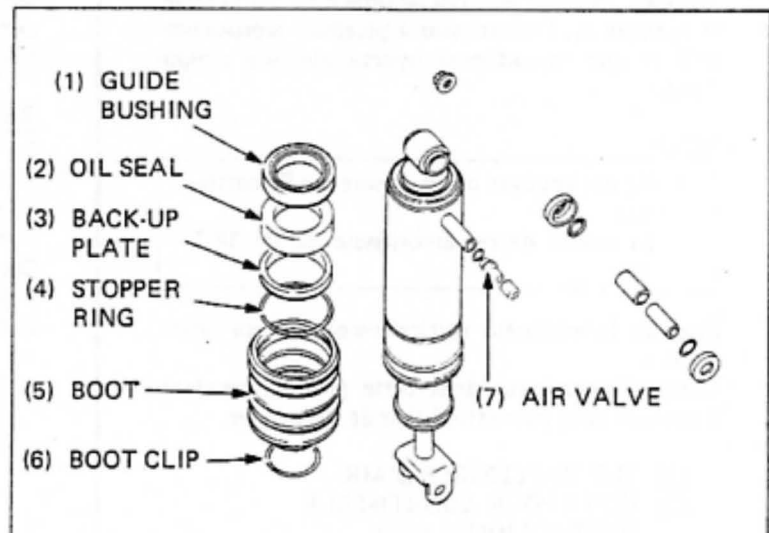
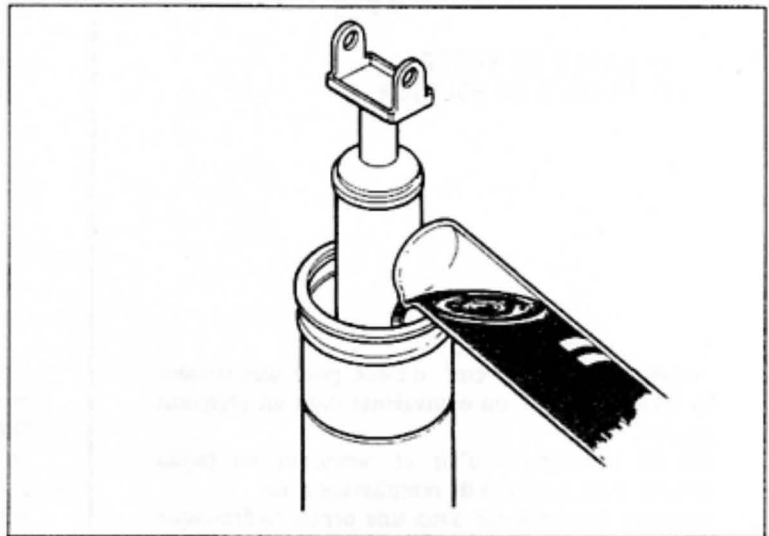


## REAR WHEEL/SUSPENSION

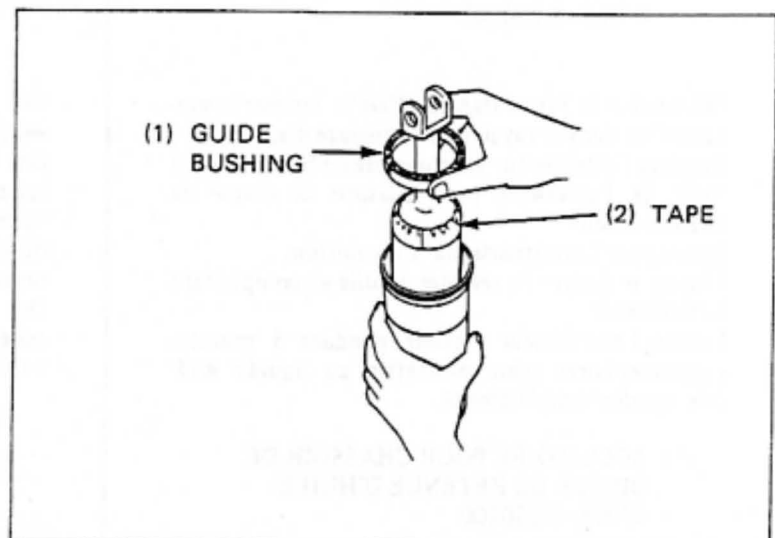
Turn the shock absorber upside down as soon as all the ATF has drained from the outer case. Fill the damper case with the specified amount of ATF.

**SPECIFIED AMOUNT:**

120 cc (4.06 US oz, 3.38 Imp oz)



Install the guide bushing into the damper case. Wrap a piece of tape around the groove at the end of the shock absorber.



## REAR WHEEL/SUSPENSION



**HONDA**  
**VF400F**

Dip the oil seal in ATF and install it onto the damper.

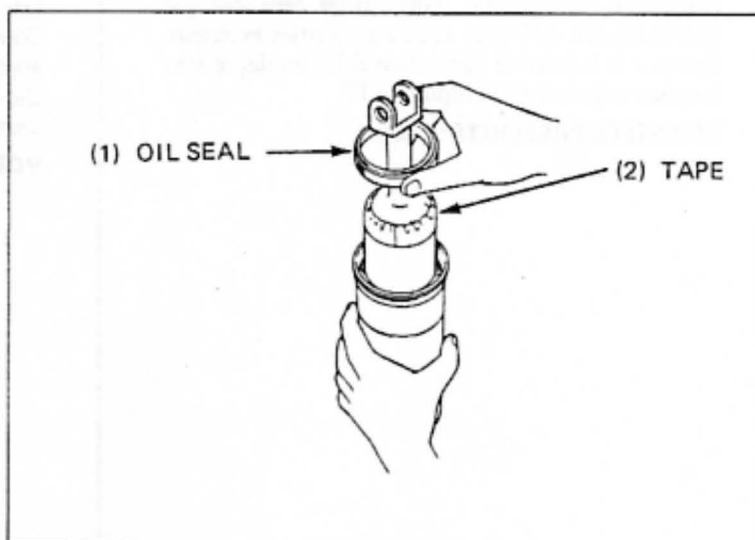
### CAUTION

*Be careful not to damage the oil seal during installation.*

Remove the air valve and connect an air hose to the air filler pipe.

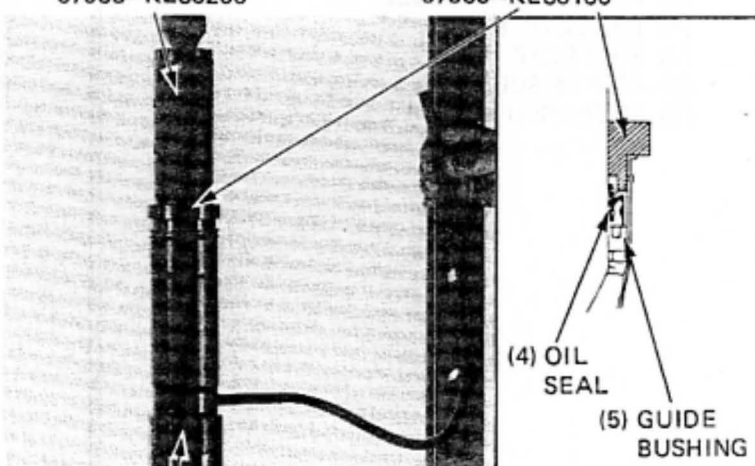
Place the shock absorber in the hydraulic press using the oil seal driver attachment.

Press the oil seal into the shock absorber with a hydraulic press until the oil seal driver stops at the edge of the outer case.



(1) OIL SEAL DRIVER  
ATTACHMENT  
07965-KE80200

(2) OIL SEAL DRIVER  
07965-KE80100



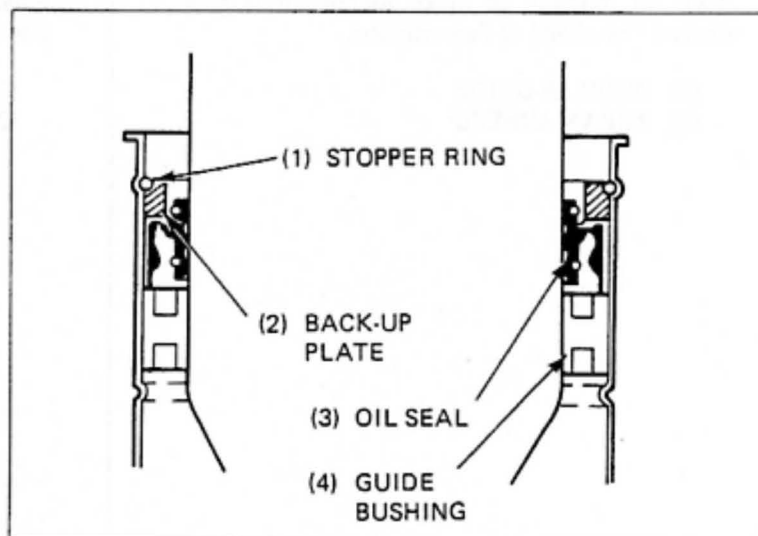
(3) OIL SEAL DRIVER ATTACHMENT  
07965-MA60100

Install the back-up plate.

Install the stop ring, being certain that it is fully seated in the ring groove in the outer case.

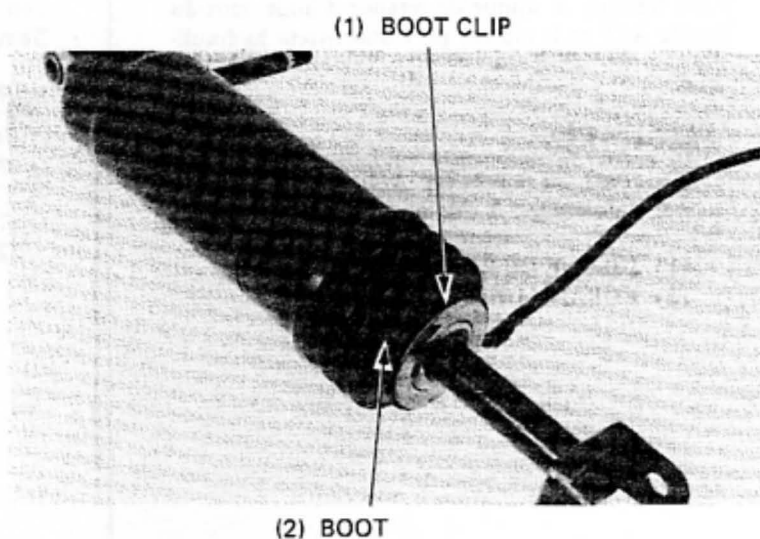
### WARNING

*Do not forget to install the stop ring; the shock can come apart without this ring.*





Remove the air hose and install the air valve.  
Install the boot and boot clip.



## INSTALLATION

Apply paste grease (containing more than 45 % of molybdenum) to the upper and lower mounting bushings.

### NOTE

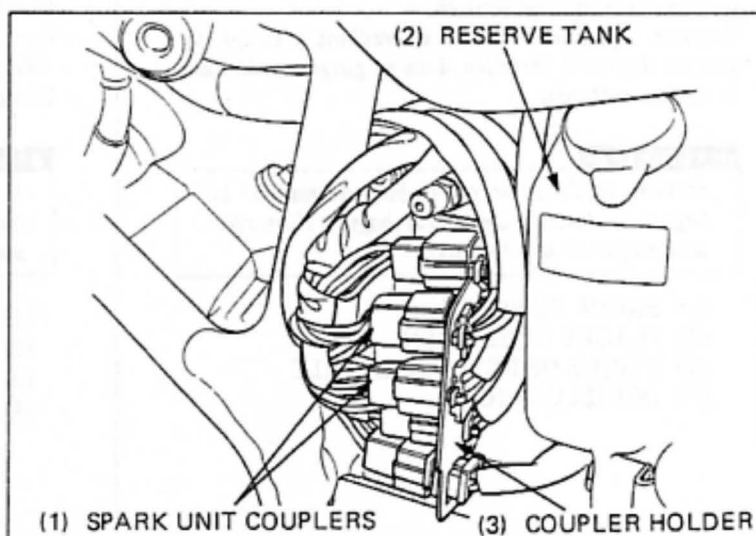
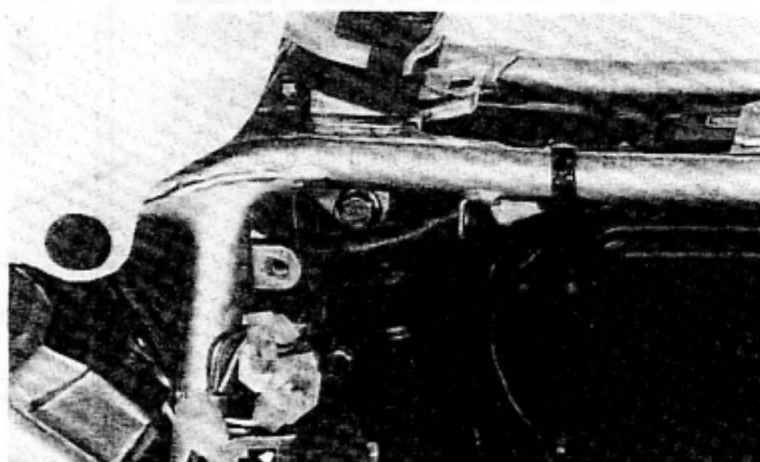
Use paste grease (containing more than 45% of molybdenum) as follows:

- MOLYKOTE G-n PASTE manufactured by Dow Corning, U.S.A.
- Locol Paste manufactured by Sumico Lubricant, Japan.
- Other lubricants of equivalent quality.

Install the shock absorber in the frame and tighten the upper mount bolt.

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

Install the coupler holder.  
Connect the spark unit couplers.  
Install the radiator reserve tank and connect the hose.







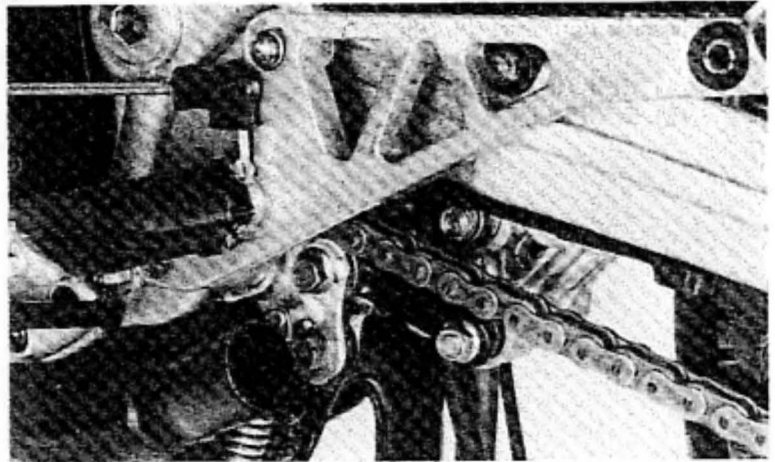
**HONDA**  
**VF400F**

## REAR WHEEL/SUSPENSION

Install the shock absorber lower mount bolt and nut.

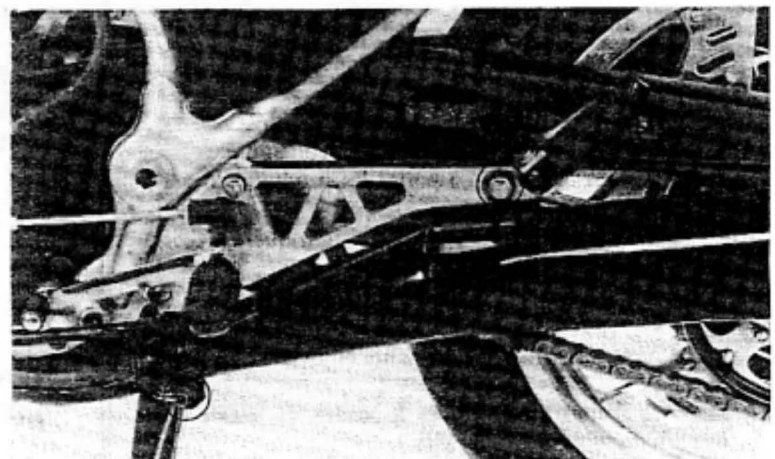
**TORQUE:** 40–50 N·m

(4.0–5.0 kg-m, 29–36 ft-lb)



Install the mufflers.

Tighten the muffler clamp bolts.

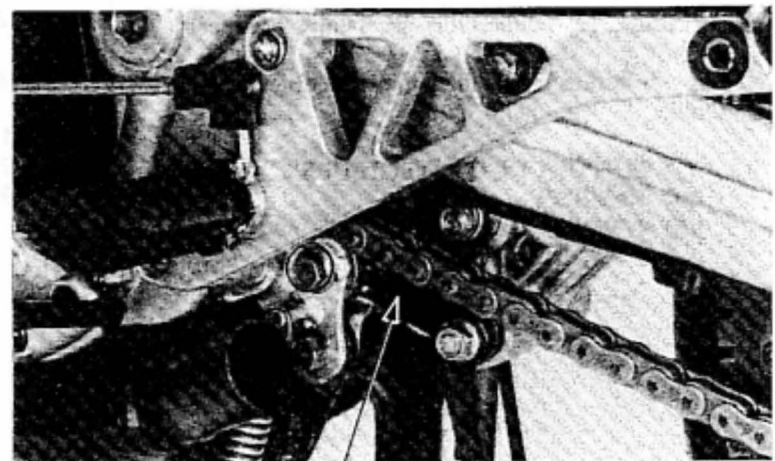


## SHOCK ABSORBER LINKAGE REMOVAL

Remove the left and right mufflers.

Remove the shock absorber lower mount bolt and nuts.

Remove the left shock link mount bolt and nut.

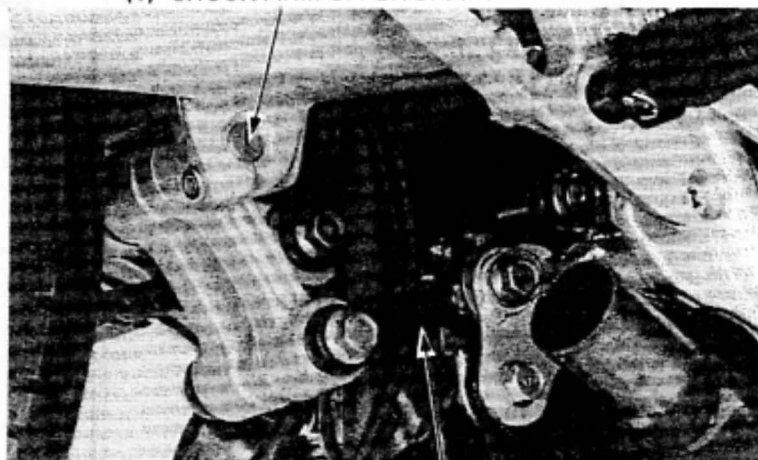


(1) LEFT SHOCK LINK



Remove the right shock link mount bolts and nut.  
Remove the shock arm upper shaft by removing the socket bolt.  
Remove the shock arm and shock links.

(1) SHOCK ARM UPPER SHAFT



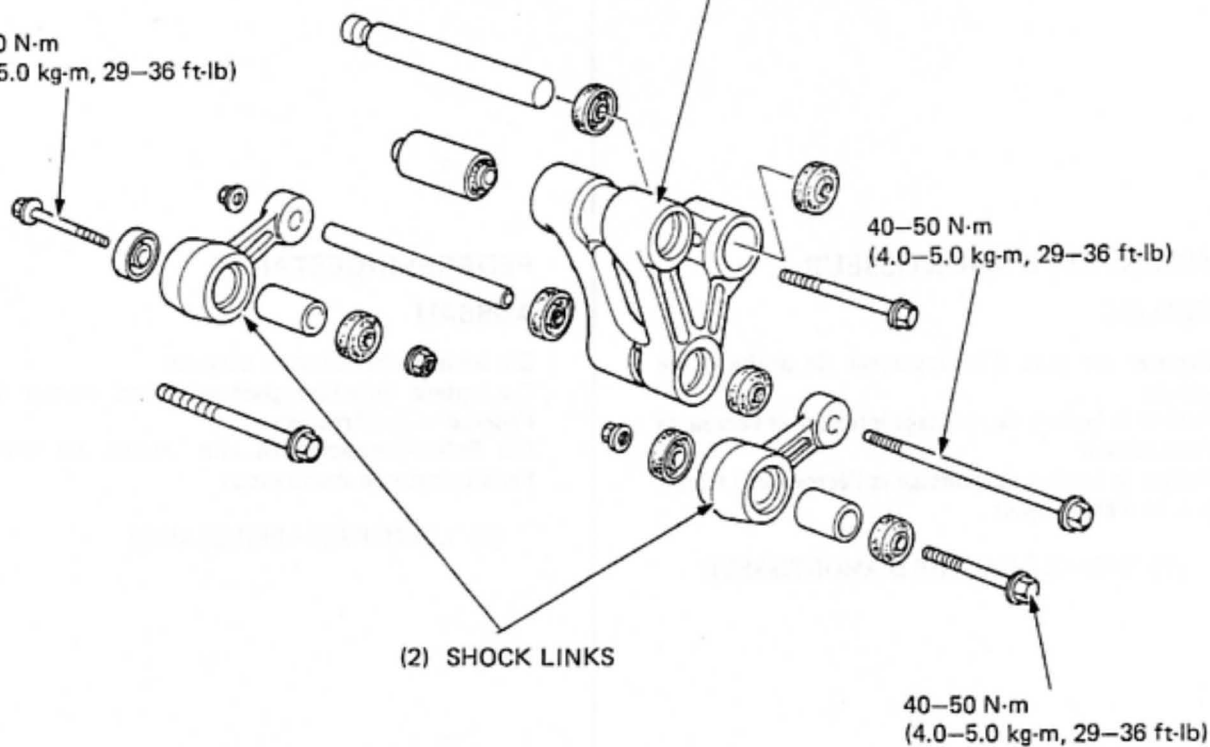
(2) RIGHT SHOCK LINK

## LINKAGE BUSHING INSPECTION

Check the linkage bushings for wear or damage.  
Inspect the dust seals for damage.  
Replace parts as necessary.

(1) SHOCK ARM UPPER SHAFT

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



(2) SHOCK LINKS

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



**HONDA**  
**VF400F**

## REAR WHEEL/SUSPENSION

Apply paste grease (containing more than 45% molybdenum) to the bushings and dust seals.

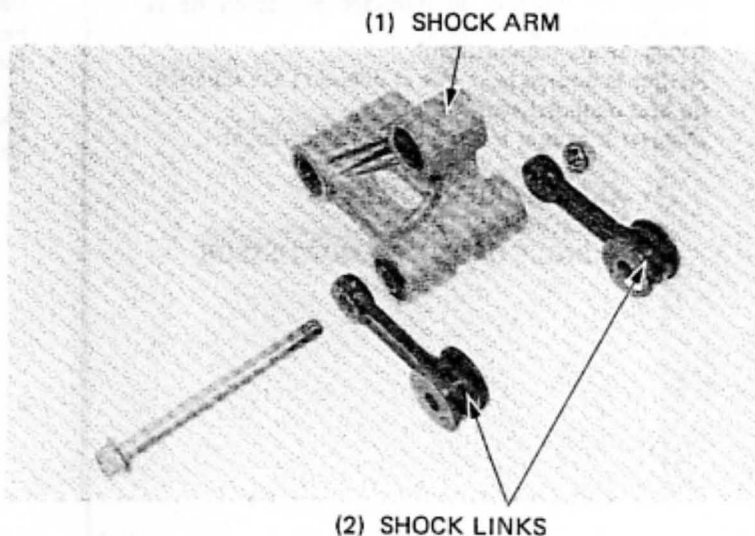
### NOTE

Use paste grease (containing more than 45% of molybdenum) as follows:

- MOLYKOTE G-n PASTE manufactured by Dow Corning, U.S.A.
- Locol Paste manufactured by Sumico Lubricant, Japan.
- Other lubricants of equivalent quality.

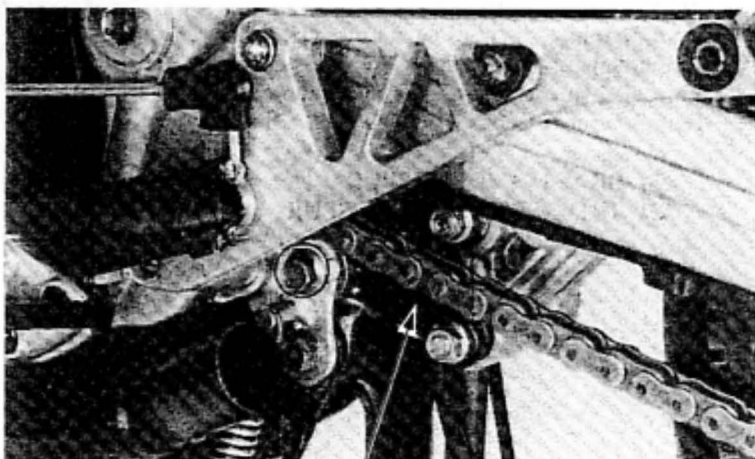
Install the shock links to the shock arm.

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



Install the left shock link to the frame and tighten the mount bolt.

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



(1) LEFT SHOCK LINK

Install the right shock link to the frame and tighten the mount bolt.

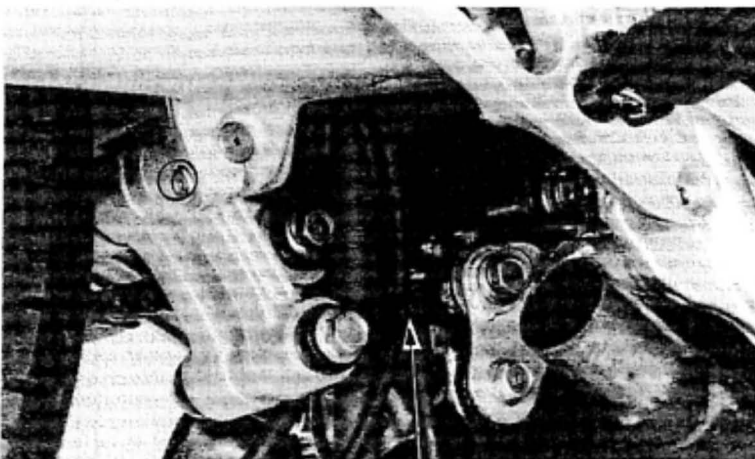
**TORQUE:** 40–50 N·m  
(4.0–5.0 kg·m, 29–36 ft-lb)

Connect the shock arm and swing arm with the shock arm upper shaft and secure with the socket bolt.

Install the shock absorber lower mount bolt and nut.

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

Install the mufflers.



(1) RIGHT SHOCK LINK

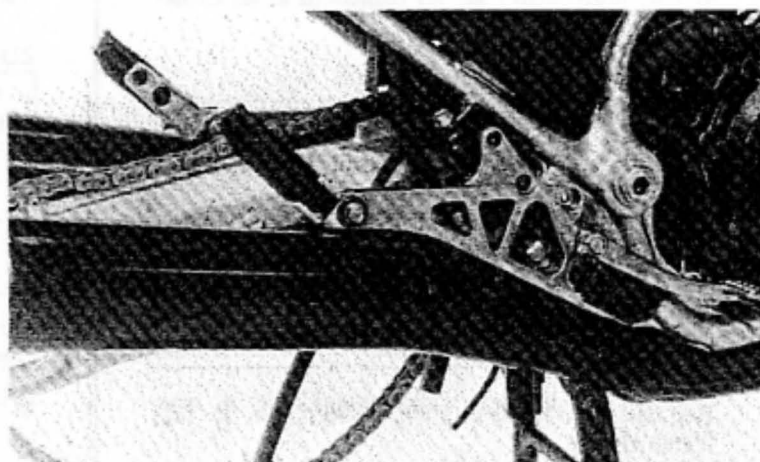


**REAR WHEEL/SUSPENSION**

**SWING ARM**

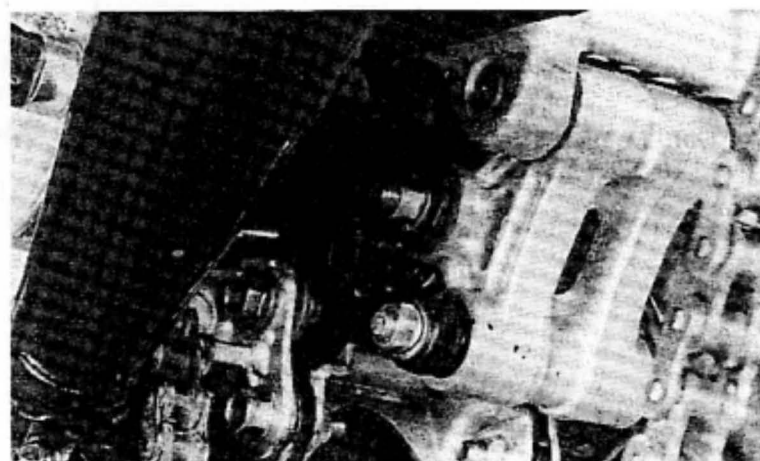
**REMOVAL**

Remove the rear wheel (page 15-3).



Remove the mufflers.

Remove the rear shock absorber lower mount bolt.  
Remove the shock link-to-arm bolts.



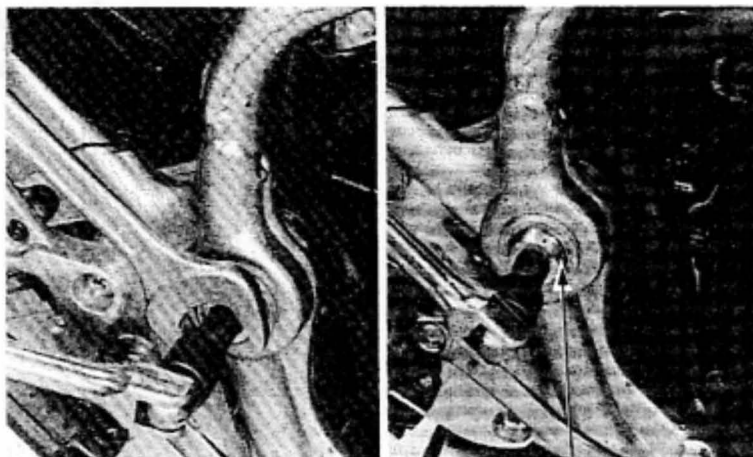
Remove the left swing arm pivot bolt.



(1) LEFT SWING ARM PIVOT BOLT

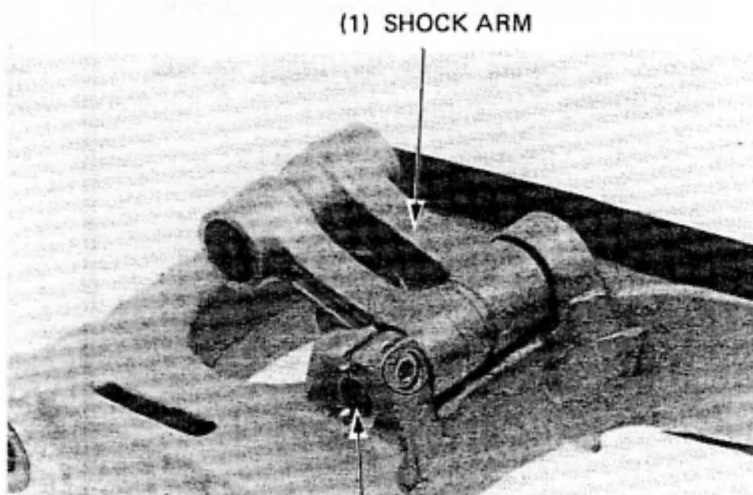


Remove the lock nut and remove the right swing arm pivot bolt.  
Remove the swing arm.



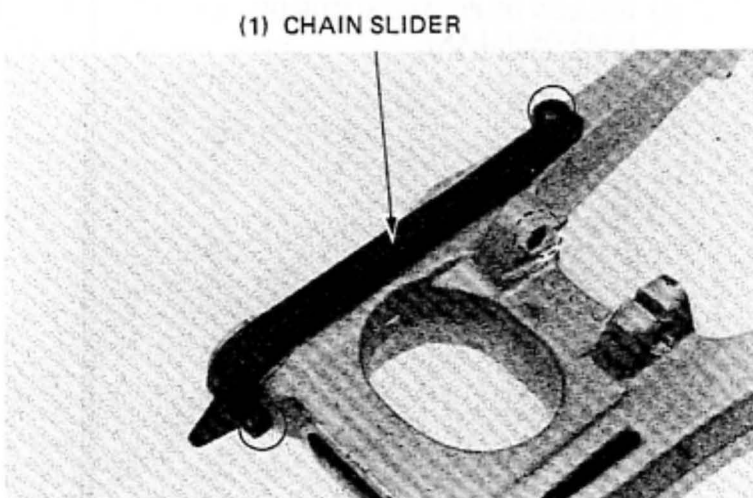
(1) PIVOT BOLT

Remove the shock arm from the swing arm by removing the shock arm upper shaft and socket bolt.



(2) SHOCK ARM UPPER SHAFT

Remove the dust seals.  
Remove the three screws and the chain slider.



(1) CHAIN SLIDER

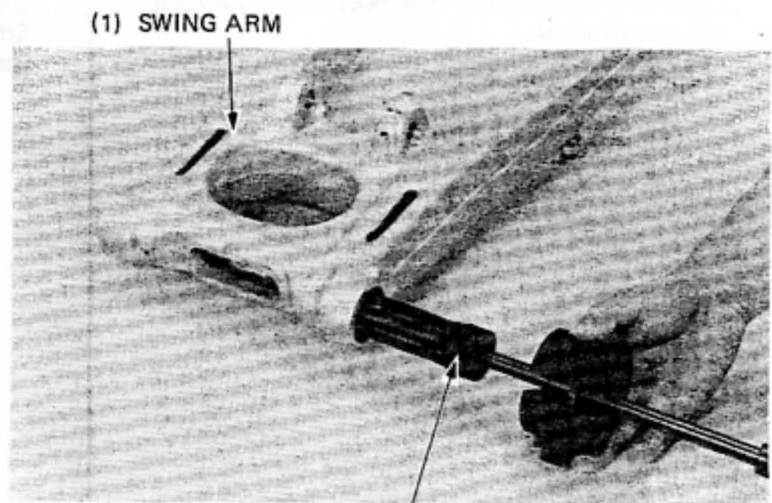




**HONDA**  
**VF400F**

## REAR WHEEL/SUSPENSION

If the pivot bearings must be replaced, remove them with a bearing remover and remove the grease holders.

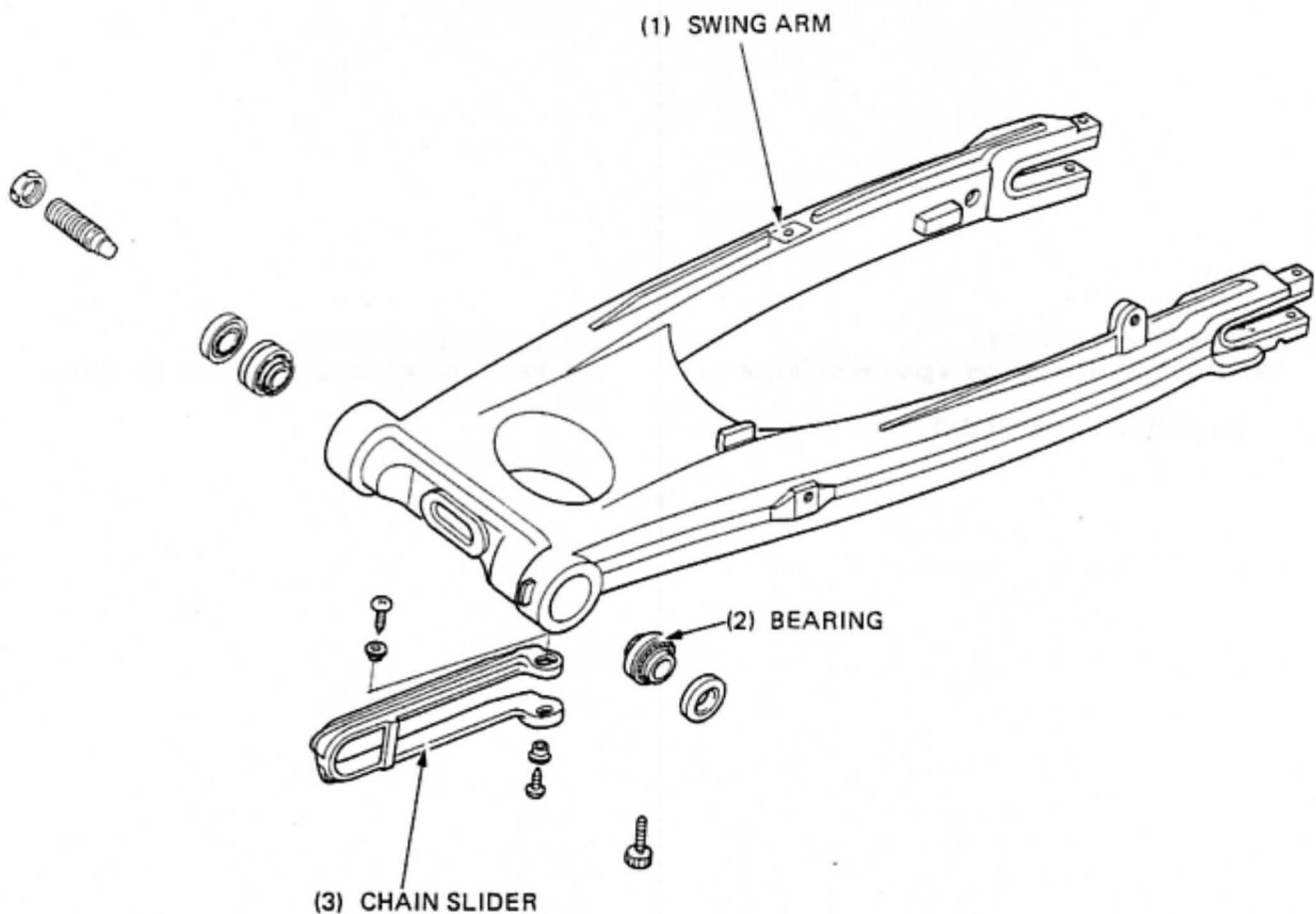


(1) SWING ARM

(2) BEARING REMOVER SET  
07936-8890100

## INSPECTION

Check the swing arm for cracks or damage.  
Check the pivot bearings for excessive play.  
Check the chain slider for wear or damage.





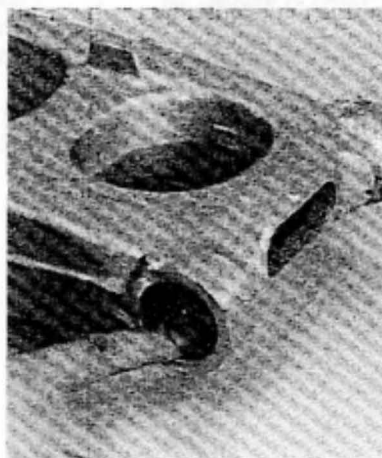
## INSTALLATION

If the bearings have been removed, install them as follows:

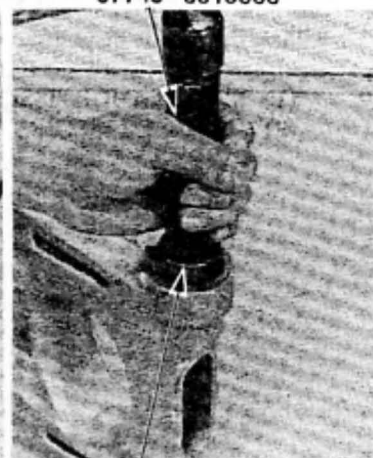
Install the grease holder and apply grease.  
Drive the bearing race into the swing arm.

### NOTE

- Be sure to use new grease holder and bearing race.
- Drive the bearing race squarely.



(1) DRIVER  
07749-0010000

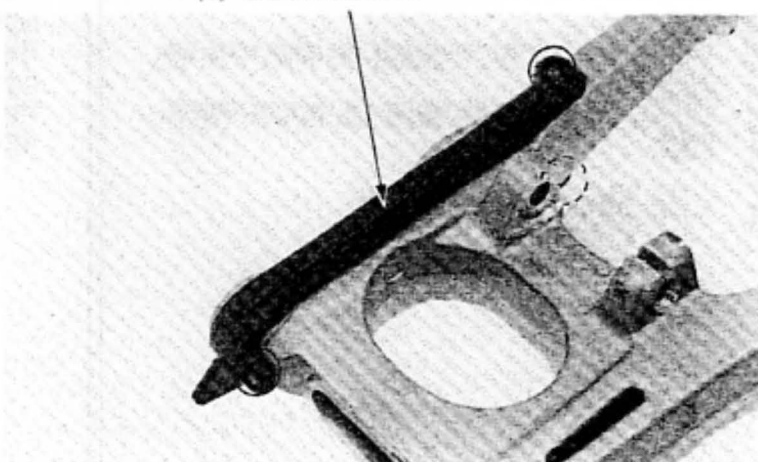


(2) ATTACHMENT, 37 x 40 mm  
07746-0010200

Pack bearing cavities with grease and install the bearings into the swing arm.

Install the dust seals.  
Install the chain slider.

(1) CHAIN SLIDER



Install the swing arm in the frame.  
Install the right and left pivot bolts.

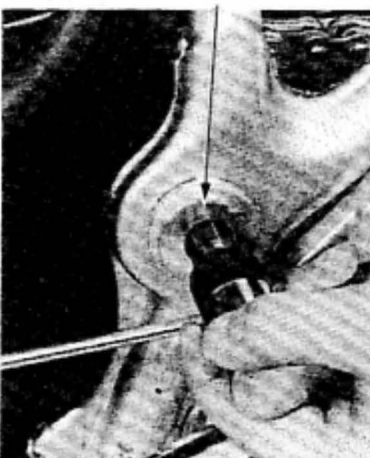
Tighten the left pivot bolt to 40 N·m (4.0 kg-m, 29 ft-lb) and loosen it. Then, tighten the left pivot bolt to the specified torque.

**TORQUE: 14–18 N·m**  
(1.4–1.8 kg-m, 10–13 ft-lb)

Tighten the right pivot bolt first to 25 N·m (2.5 kg-m, 18 ft-lb) and loosen it, then tighten it to the final torque.

**TORQUE: 15 N·m (1.5 kg-m, 11 ft-lb)**

(1) LEFT PIVOT BOLT



(2) RIGHT PIVOT BOLT



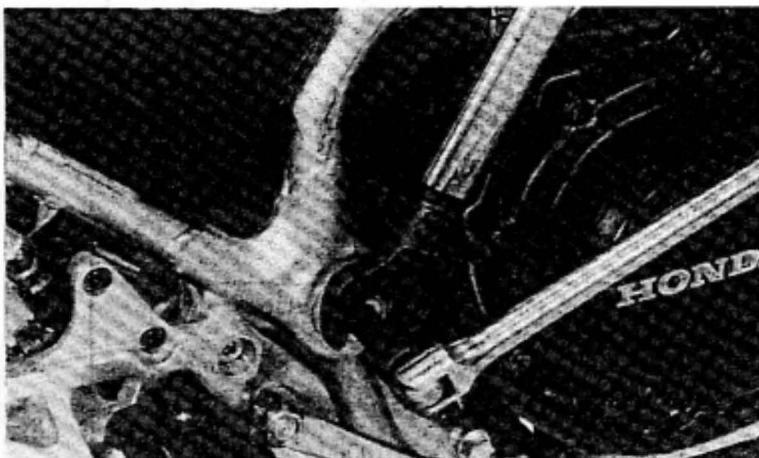
## REAR WHEEL/SUSPENSION



**HONDA**  
**VF400F**

Tighten the right pivot bolt lock nut.

**TORQUE: 80–110 N·m**  
(8.0–11.0 kg-m, 58–80 ft-lb)



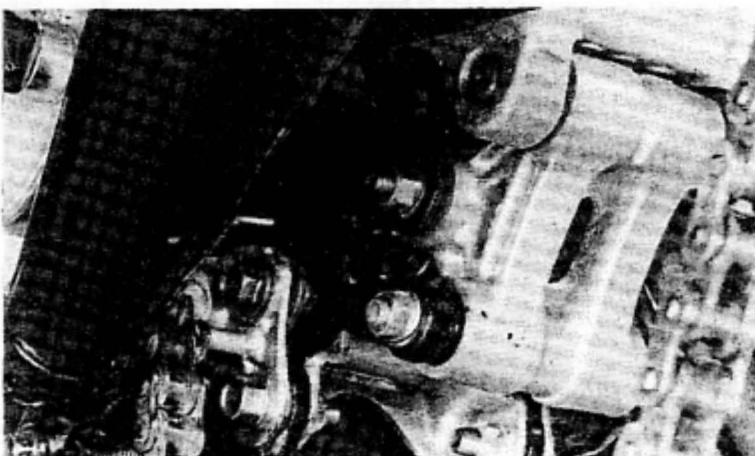
Tighten the shock link-to-shock arm bolts.

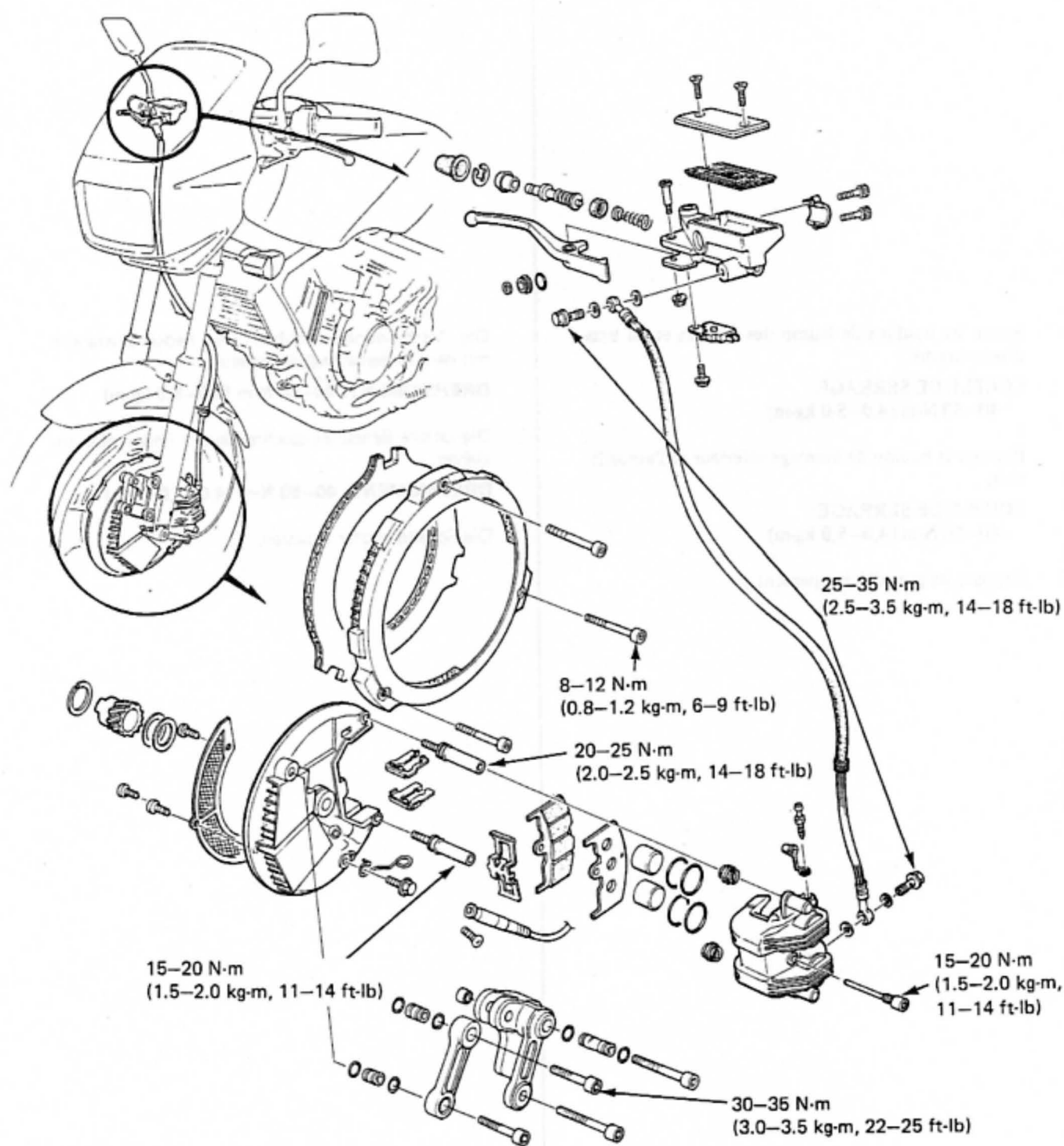
**TORQUE: 40–50 N·m**  
(4.0–5.0 kg-m, 29–36 ft-lb)

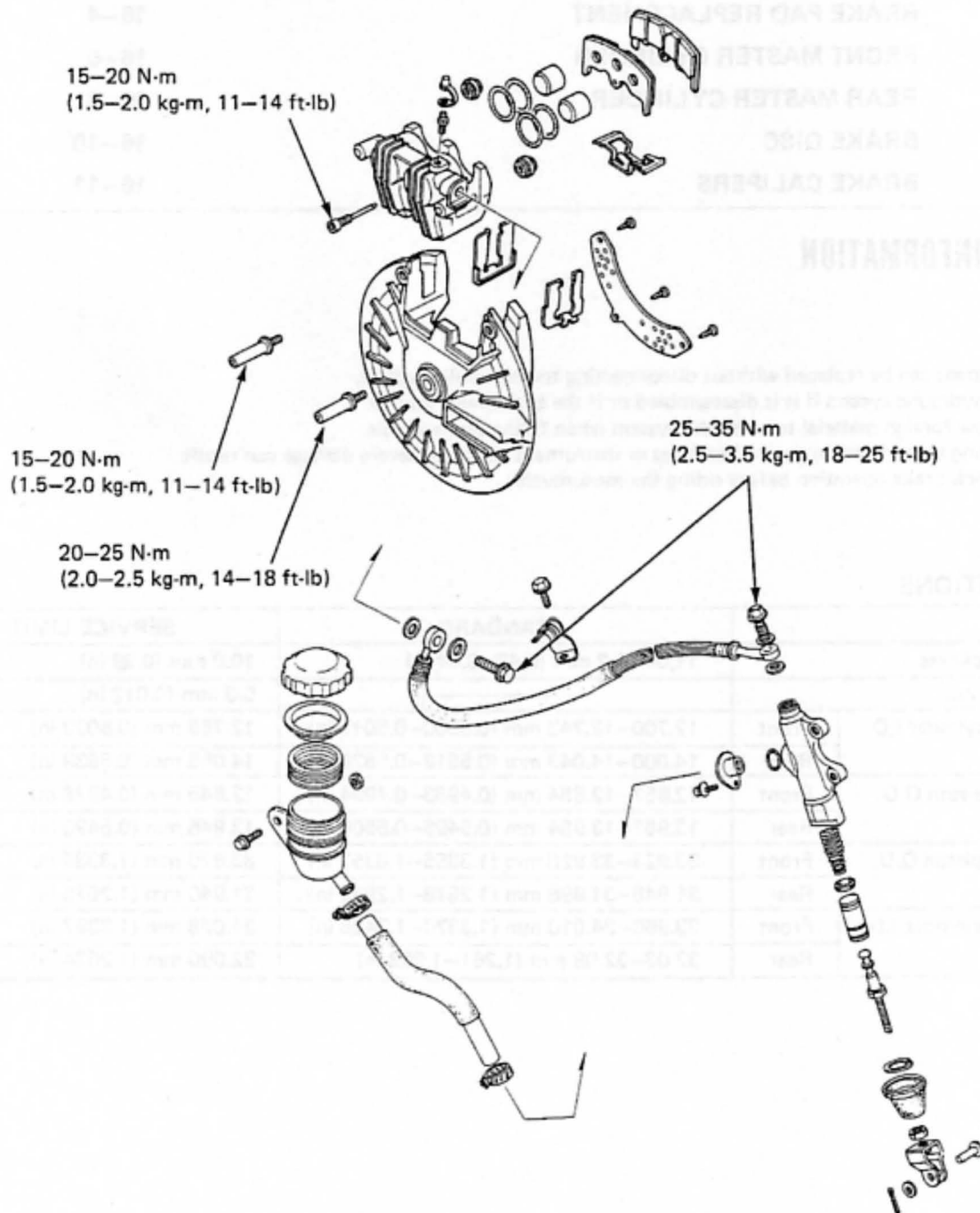
Install the shock absorber lower mount bolt.

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

Install the mufflers.









# 16. HYDRAULIC BRAKE



**HONDA**  
**VF400F**

|                                      |       |
|--------------------------------------|-------|
| SERVICE INFORMATION                  | 16-1  |
| TROUBLESHOOTING                      | 16-2  |
| BRAKE FLUID REPLACEMENT/AIR BLEEDING | 16-3  |
| BRAKE PAD REPLACEMENT                | 16-4  |
| FRONT MASTER CYLINDER                | 16-6  |
| REAR MASTER CYLINDER                 | 16-8  |
| BRAKE DISC                           | 16-10 |
| BRAKE CALIPERS                       | 16-11 |

## SERVICE INFORMATION

### GENERAL

- The brake pads can be replaced without disconnecting the hydraulic system.
- Bleed the hydraulic system if it is disassembled or if the brake feels spongy.
- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling brake fluid on painted surfaces or instrument lenses, as severe damage can result.
- Always check brake operation before riding the motorcycle.

### SPECIFICATIONS

|                       |       | STANDARD                            | SERVICE LIMIT         |
|-----------------------|-------|-------------------------------------|-----------------------|
| Disc thickness        |       | 11.0–11.2 mm (0.43–0.44 in)         | 10.0 mm (0.39 in)     |
| Disc runout           |       | —                                   | 0.3 mm (0.012 in)     |
| Master cylinder I.D.  | Front | 12.700–12.743 mm (0.5000–0.5017 in) | 12.755 mm (0.5022 in) |
|                       | Rear  | 14.000–14.043 mm (0.5512–0.5529 in) | 14.055 mm (0.5533 in) |
| Master piston O.D.    | Front | 12.657–12.684 mm (0.4983–0.4994 in) | 12.645 mm (0.4978 in) |
|                       | Rear  | 13.957–13.984 mm (0.5495–0.5506 in) | 13.945 mm (0.5490 in) |
| Caliper piston O.D.   | Front | 33.923–33.928 mm (1.3355–1.3357 in) | 33.870 mm (1.3335 in) |
|                       | Rear  | 31.948–31.998 mm (1.2578–1.2598 in) | 31.940 mm (1.2575 in) |
| Caliper cylinder I.D. | Front | 33.960–34.010 mm (1.3370–1.3425 in) | 34.028 mm (1.3397 in) |
|                       | Rear  | 32.03–32.08 mm (1.261–1.263 in)     | 32.090 mm (1.2634 in) |



#### TORQUE VALUES

|                     |       |                                       |
|---------------------|-------|---------------------------------------|
| Brake hose oil bolt |       | 25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb) |
| Pad pin bolt        |       | 15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb) |
| Disc cover          |       | 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)    |
| Caliper pin bolt    | Upper | 20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb) |
|                     | Lower | 15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb) |

#### TOOLS

|                  |               |
|------------------|---------------|
| Special          |               |
| Snap ring pliers | 07914–3230001 |

#### TROUBLESHOOTING

##### Poor brake performance

1. Air bubbles in hydraulic system
2. Pads glazed or worn excessively
3. Pads or disc contaminated
4. Hydraulic system leaking



## BRAKE FLUID REPLACEMENT/ AIR BLEEDING

Check the fluid level with the fluid reservoir parallel to the ground.

### CAUTION

- *Install the cover on the reservoir whenever operating the brake lever or pedal. Failure to do so will allow brake fluid to squirt out of the reservoir during brake operation.*
- *Avoid spilling fluid on painted surfaces. Place clean shop towels over the fuel tank whenever the system is being serviced.*



## BRAKE FLUID DRAINING

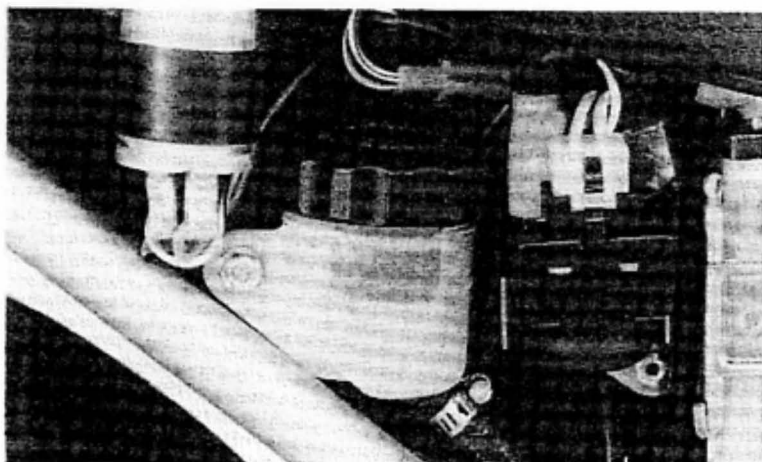
Connect a bleed hose to the bleed valve to avoid spilling fluid.

### WARNING

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

Loosen the caliper bleed valve and pump the brake lever or pedal.

Stop operating the lever or pedal when fluid stops flowing out of the bleed valve.



## BRAKE FLUID FILLING

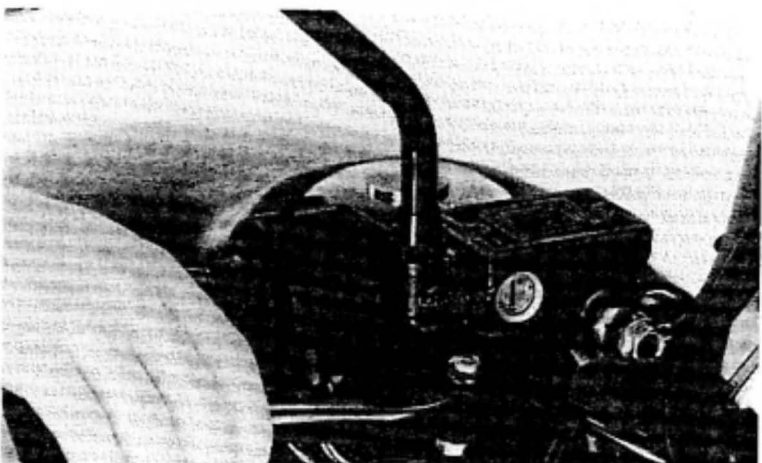
### NOTE

Do not mix different types of fluid since they may not be compatible.

Close the bleed valve, fill the reservoir, and install the cover.

To prevent piston overtravel and brake fluid seepage, keep a 20 mm (3/4 in) spacer between the handlebar grip and lever when bleeding the front brake system. When bleeding the rear brake system depress the pedal only as far as its normal travel.

Pump up the system pressure with the lever or pedal until there are no air bubbles in the fluid flowing out of the reservoir small hole and lever or pedal resistance is felt.





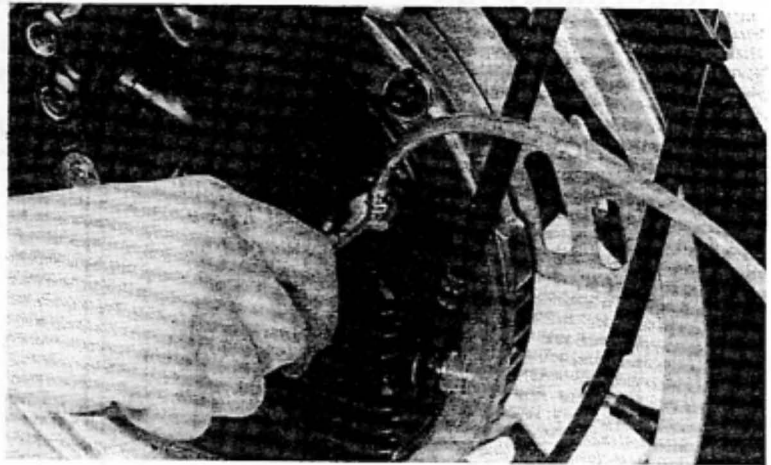
## AIR BLEEDING

## NOTE

Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.

## CAUTION

- Use only DOT 3 brake fluid from a sealed container.
- Do not mix brake fluid types and never reuse the contaminated fluid which has been pumped out during brake bleeding, because this will impair the efficiency of the brake system.



- 1) Connect a bleeder tube to the bleeder valve.
- 2) Squeeze the brake lever or depress the brake pedal, open the bleed valve 1/2 turn and then close the valve.

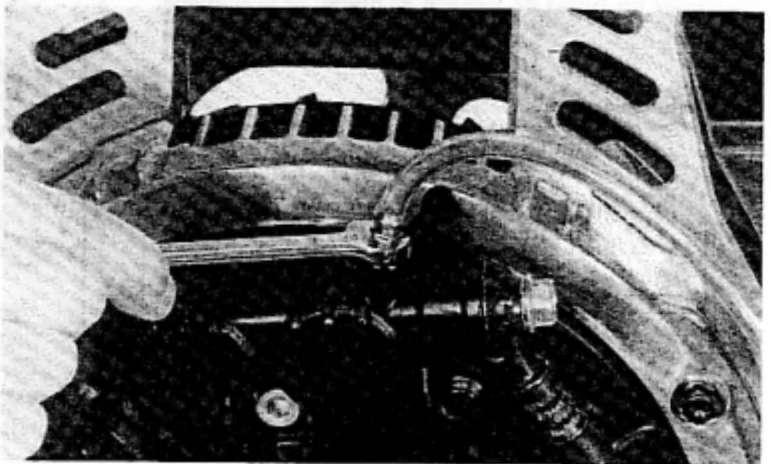
## NOTE

Do not release the brake lever or pedal until the bleed valve has been closed.

- 3) Release the brake lever or pedal slowly and wait several seconds after it reaches the end of its travel.

Repeat steps 1 and 2 until bubbles cease to appear in the fluid at the end of the hose.

Fill the fluid reservoir to the upper level mark.



## WARNING

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

## BRAKE PAD REPLACEMENT

## NOTE

Following procedures are for the front brake pad replacement, the rear brake replacement, however, can be performed in the same manner as front brake pad.

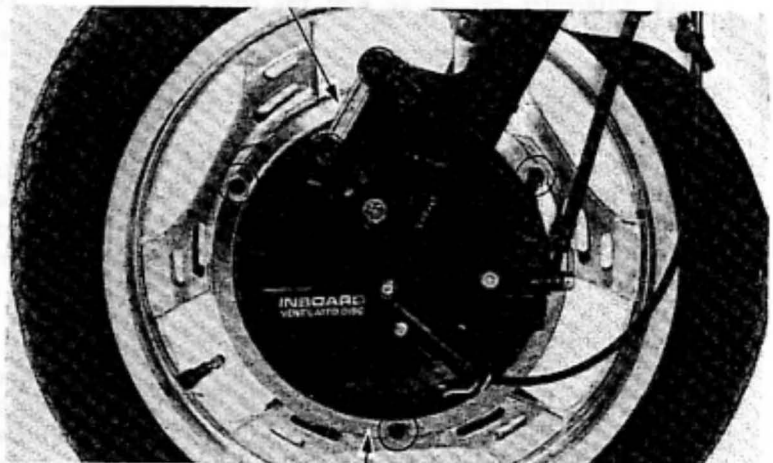
Remove the disc cover.

## NOTE

On the front brake, remove the disc cover after removing the caliper link.

Push the caliper against the disc to push the pistons into the cylinders.

(1) CALIPER LINK



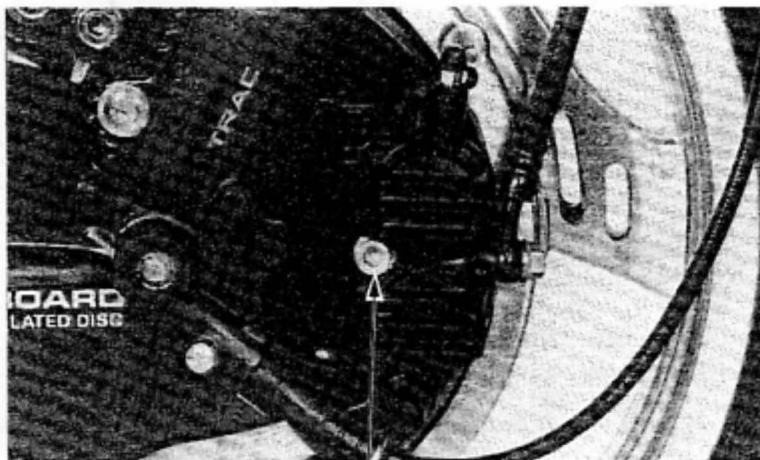
(2) DISC COVER

## HYDRAULIC BRAKE



**HONDA**  
**VF400F**

Remove the pad pin bolt.



(1) PAD PIN BOLT

Remove the pads.

Install new pads.

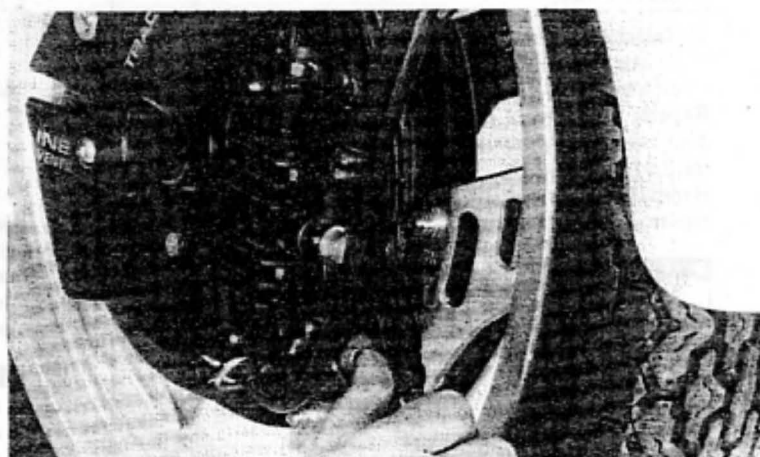
Install the pad pin bolt.

**TORQUE:** 15–20 N·m

(1.5–2.0 kg-m, 11–14 ft-lb)

### NOTE

- Be sure to replace the pads as a set.
- Check the brake fluid level after replacement.



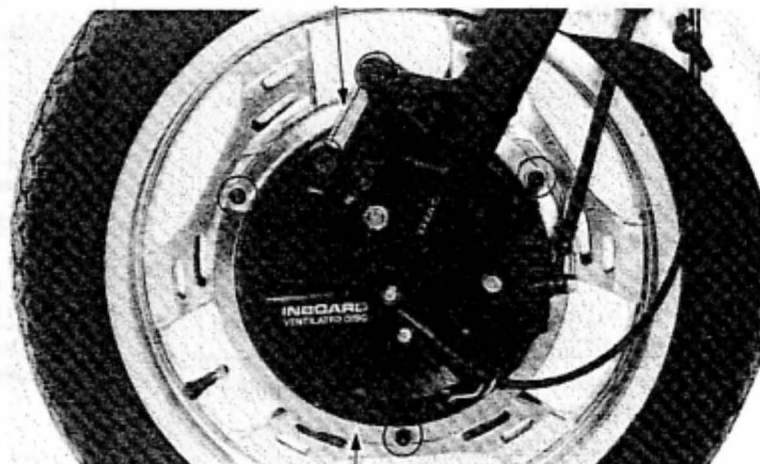
(1) CALIPER LINK

Install the disc cover.

On the front brake, install the caliper link and tighten the bolts.

**TORQUE:** 30–35 N·m

(3.0–3.5 kg-m, 22–25 ft-lb)



(2) DISC COVER





## FRONT MASTER CYLINDER

### DISASSEMBLY

Drain brake fluid from the hydraulic system.  
Remove the brake lever and rear view mirror from the master cylinder. Disconnect the brake hose.

#### CAUTION

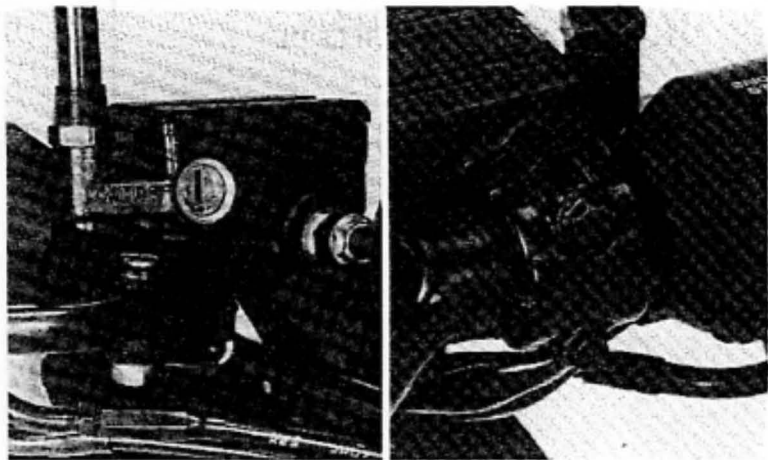
*Avoid spilling brake fluid on painted surfaces.  
Place a rag over the fuel tank whenever the  
brake system is being serviced.*

#### NOTE

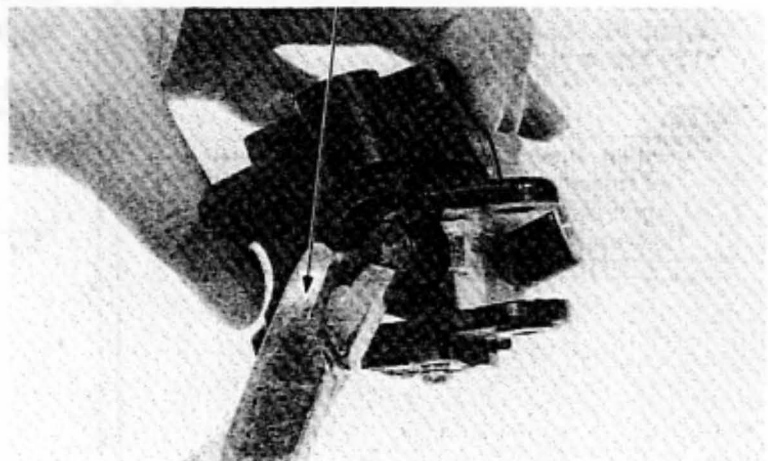
When removing the fluid hose bolt, cover the end of the hose to prevent contamination. Secure the hose to prevent fluid from leaking out.

Disconnect the front brake switch wires.  
Remove the front brake master cylinder.

Remove the piston boot and the snap ring from the master cylinder body.



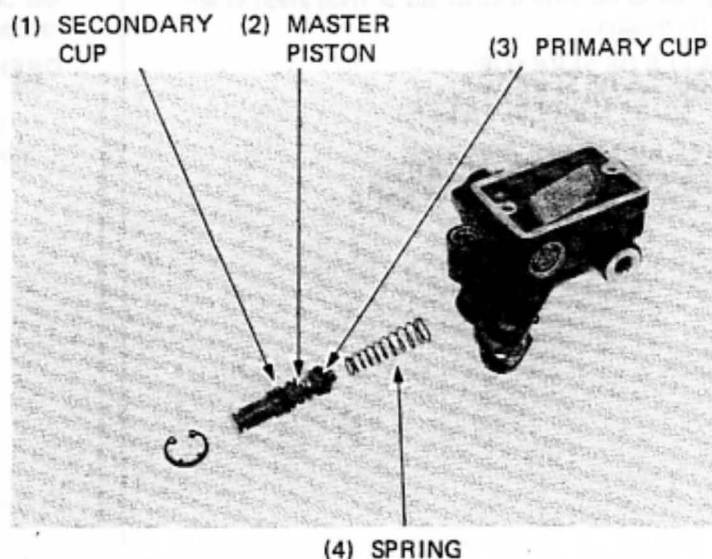
(1) SNAP RING PLIERS  
07914-3230001



Remove the secondary cup and piston. Then remove the primary cup and spring.

Remove the brake light switch from the master cylinder body, if necessary.

Clean the inside of the master cylinder and reservoir with brake fluid.



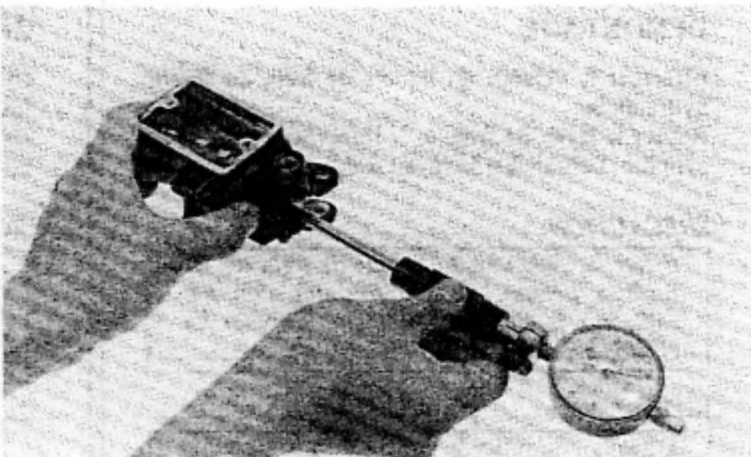


## INSPECTION

Measure the master cylinder I.D.

Check the master cylinder for scores, scratches or nicks.

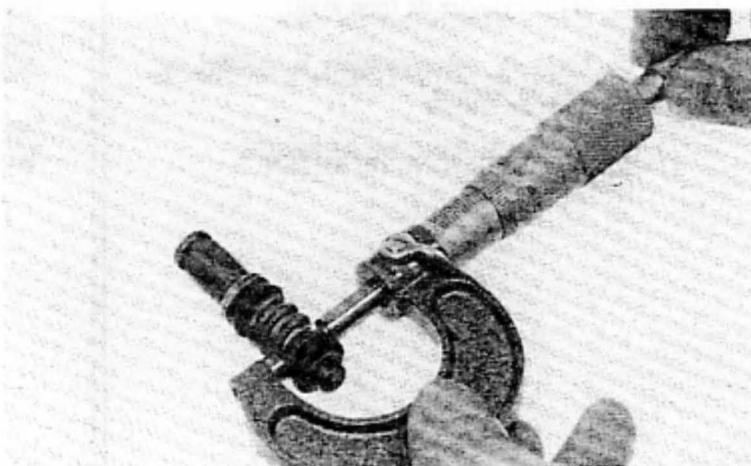
**SERVICE LIMIT: 12.755 mm (0.5022 in)**



Measure the master piston O.D.

**SERVICE LIMIT: 12.645 mm (0.4978 in)**

Check the primary and secondary cups for damage before assembly.



## ASSEMBLY

## CAUTION

*Keep the master cylinder piston, cylinder and spring as a set; don't substitute individual parts.*

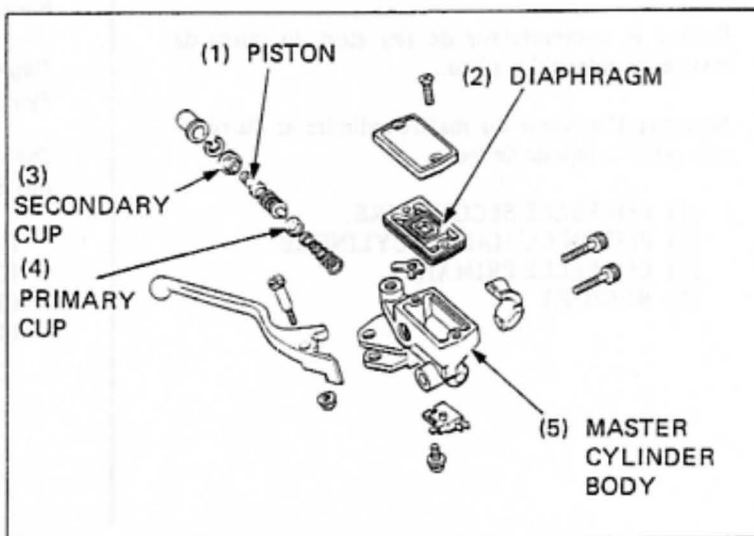
Assemble the master cylinder. Coat all parts with clean brake fluid before assembly. Install the spring and primary cup together.

Dip the piston cup in brake fluid before assembly.

## CAUTION

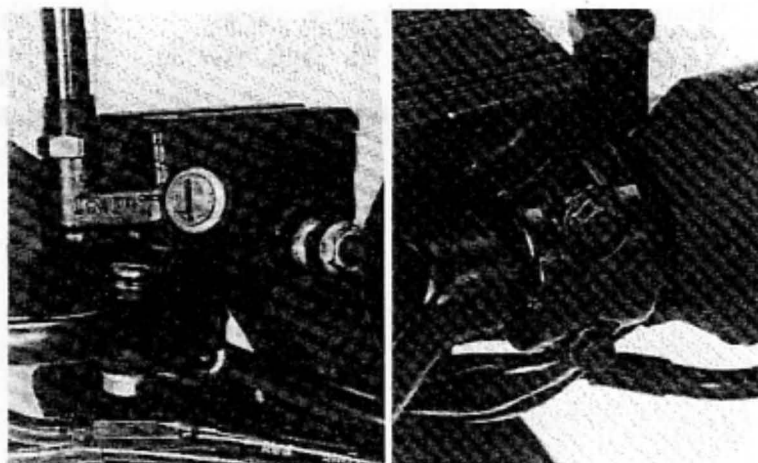
*When installing the cups, do not allow the lips to turn inside out and be certain the snap ring is firmly seated in the groove.*

Install the piston and snap ring.  
Install the boot.





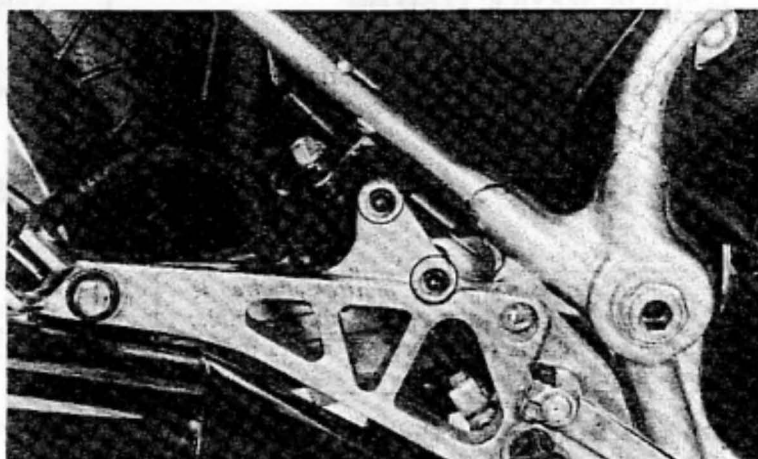
Place the front master cylinder on the handlebar and install its clamp and two mounting bolts. Align the clamp mating surface with the punch mark on the handlebar. Tighten the upper bolt first, then tighten the lower bolt. Install the fluid hose with the bolt and two sealing washers. Install the brake lever. Install the rear view mirror. Connect the front brake switch wires. Fill the reservoir to the upper level and bleed the brake system according to page 16-4.



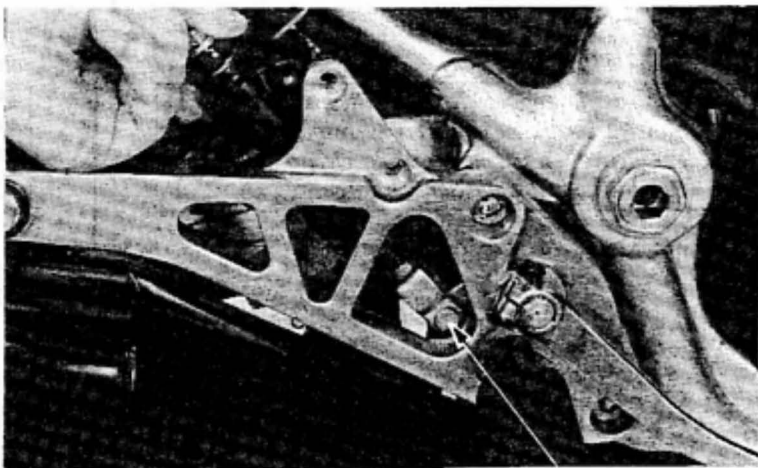
## REAR MASTER CYLINDER

### REMOVAL

Drain the rear brake hydraulic system (page 16-3). Remove the brake hose bolt and disconnect the brake hose.



Lift the master cylinder and disconnect the master cylinder push rod from the rear brake arm by removing the cotter pin, washer and joint pin. Disconnect the master cylinder hose.



(1) JOINT PIN

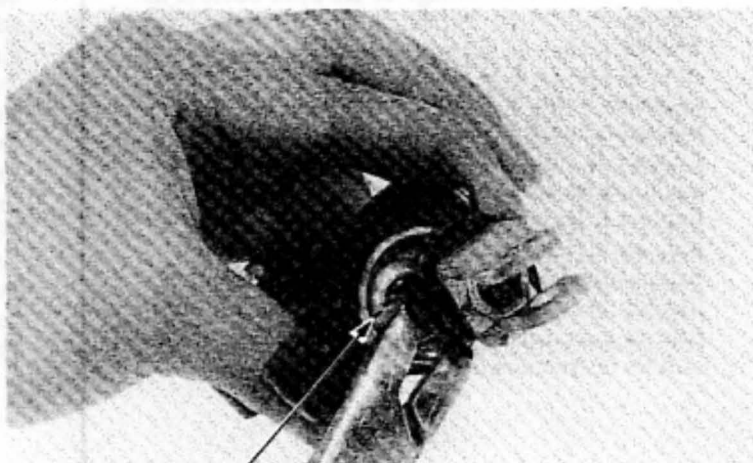


## HYDRAULIC BRAKE

### DISASSEMBLY

Remove the rubber boot.

Remove the snap ring and push rod from the master cylinder body.

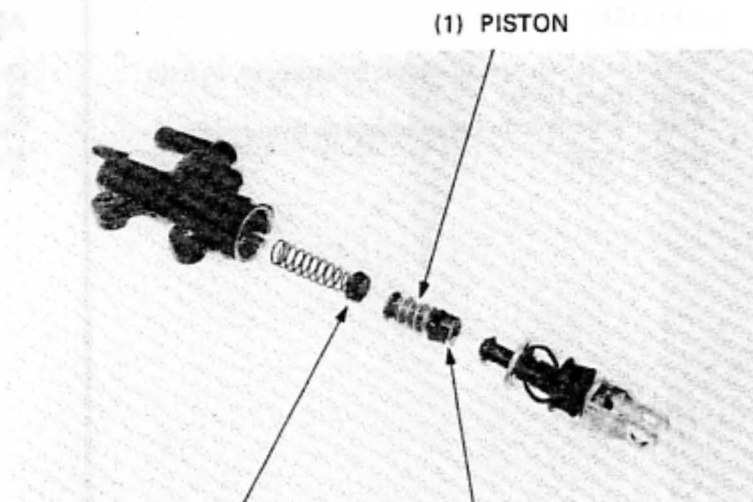


(1) SNAP RING PLIERS  
07914-3230001

Remove the master piston, primary cup and spring.

It may be necessary to apply a small amount of air pressure to the fluid outlet to remove the master piston and primary cup.

Clean all parts with brake fluid.



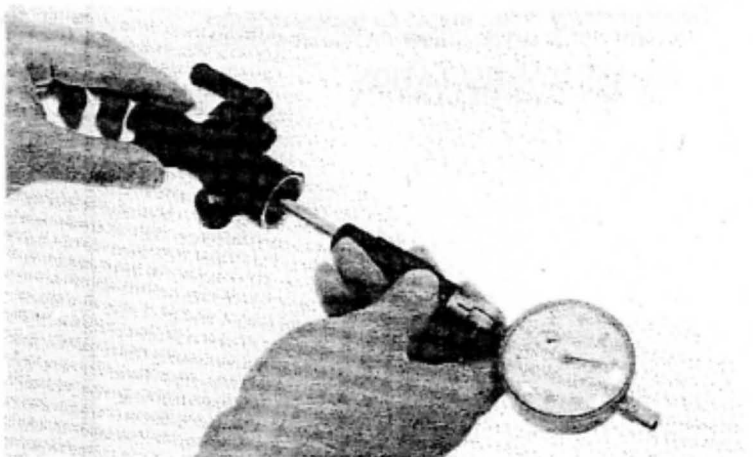
(2) PRIMARY CUP      (3) SECONDARY CUP

### CYLINDER I.D. INSPECTION

Measure the inside diameter of the master cylinder bore.

**SERVICE LIMIT: 14.055 mm (0.5533 in)**

Check for scores, scratches or nicks.







## PISTON O.D. INSPECTION

Measure the master piston O.D.

**SERVICE LIMIT: 13.945 mm (0.5490 in)**

Check the primary cup and piston cup for damage.



## ASSEMBLY

**CAUTION**

*Keep the master cylinder piston, cylinder and spring as a set; do not substitute individual parts.*

Assemble the master cylinder.

Coat all parts with clean brake fluid.

Dip the piston cup in brake fluid before assembly.

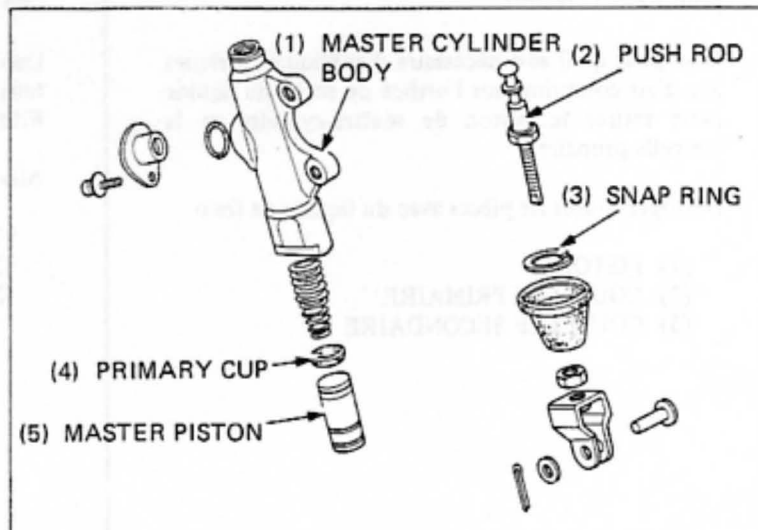
**CAUTION**

*When installing the cups, do not allow the lips to turn inside out and be certain the snap ring is seated firmly in the groove.*

Install the primary cup and piston.

Install the push rod and snap ring.

Install the rubber cover.



## INSTALLATION

Install the rear master cylinder in the reverse order of removal.

After installation, fill the reservoir and bleed the rear brake system.

## BRAKE DISC

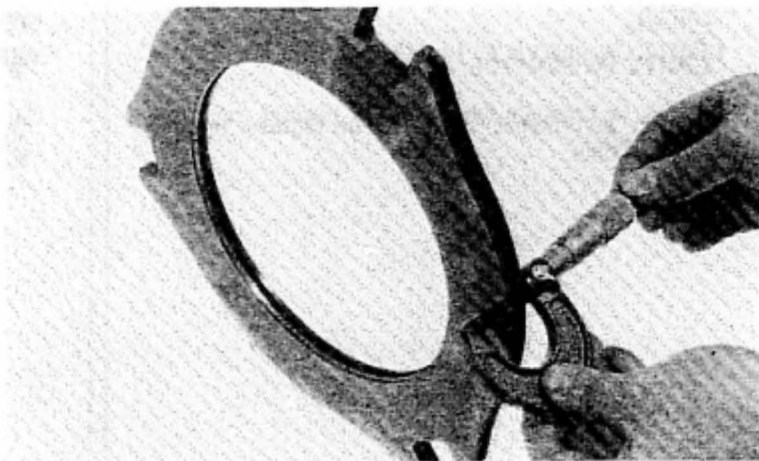
Remove the wheel (page 14-14, 15-3).

Remove the brake disc.

## DISC THICKNESS

Measure the thickness of each disc.

**SERVICE LIMIT: 10.0 mm (0.39 in)**





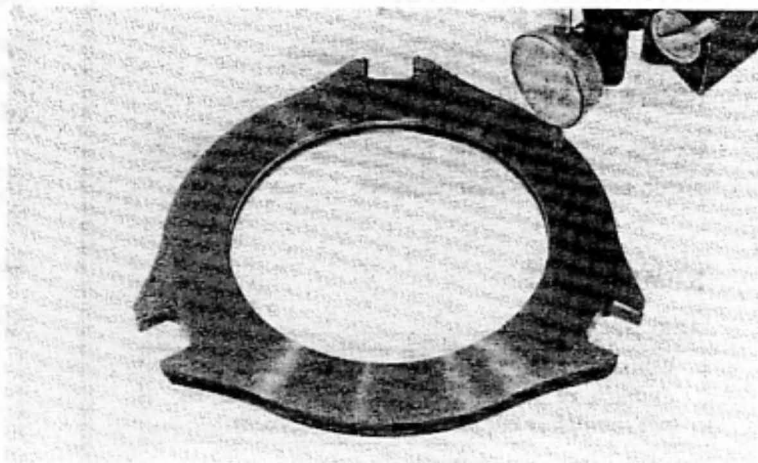


## HYDRAULIC BRAKE

### DISC WARPAGE

Measure the disc for warpage.

**SERVICE LIMIT: 0.30 mm (0.012 in)**



## BRAKE CALIPERS

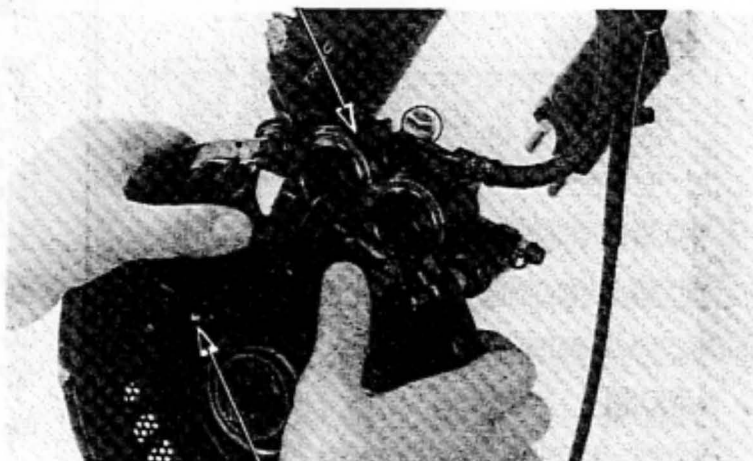
### REMOVAL

Drain the brake fluid (page 16-3).  
Remove the wheel (page 14-14, 15-3).  
Remove the brake pads (page 16-4).  
Remove the caliper from the bracket.  
Disconnect the brake hose from the caliper.

#### CAUTION

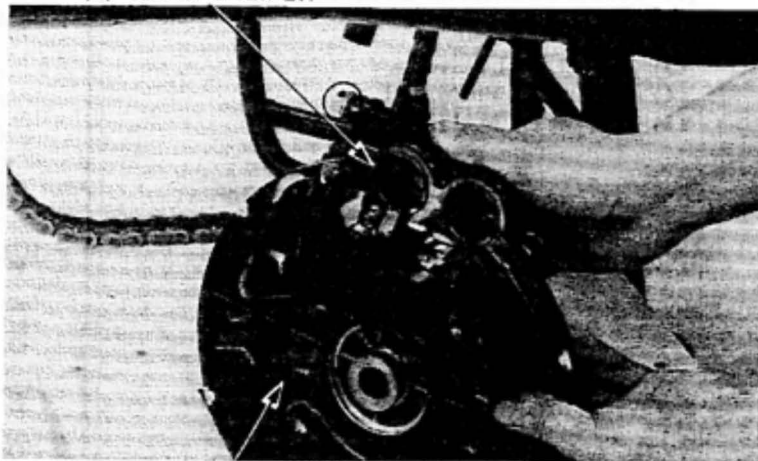
*Avoid spilling brake fluid on the painted surfaces to prevent paint damage.*

(1) FRONT CALIPER



(2) CALIPER BRACKET

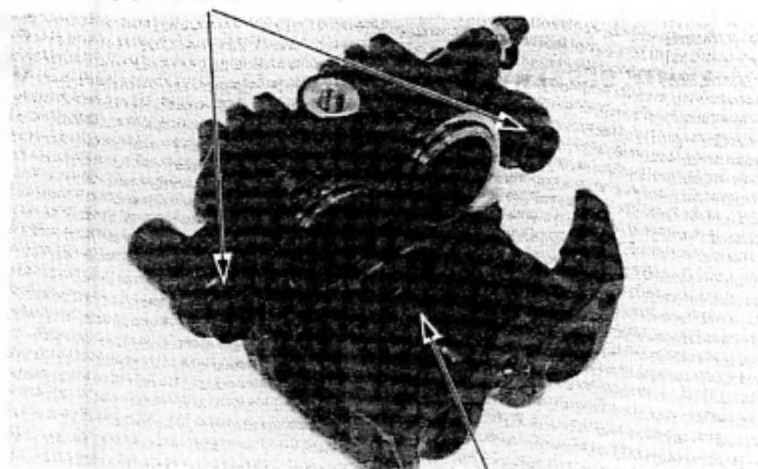
(1) REAR CALIPER



(2) CALIPER BRACKET

**DISASSEMBLY**

Remove the pad spring.  
Remove the caliper pivot collar and boots.  
Remove the pistons from the caliper.

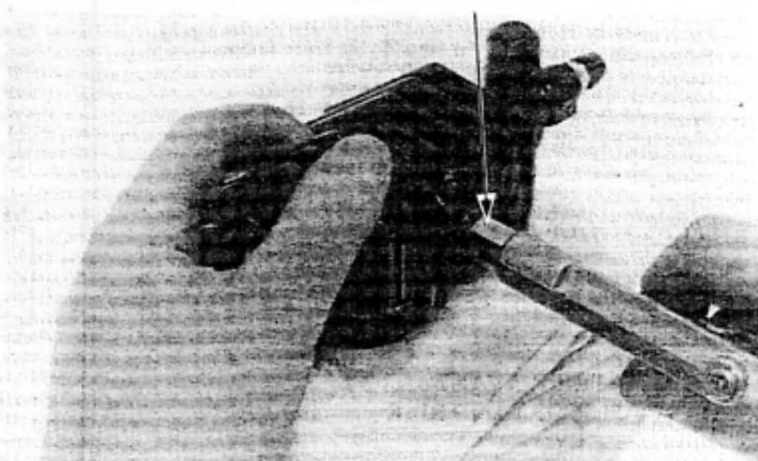
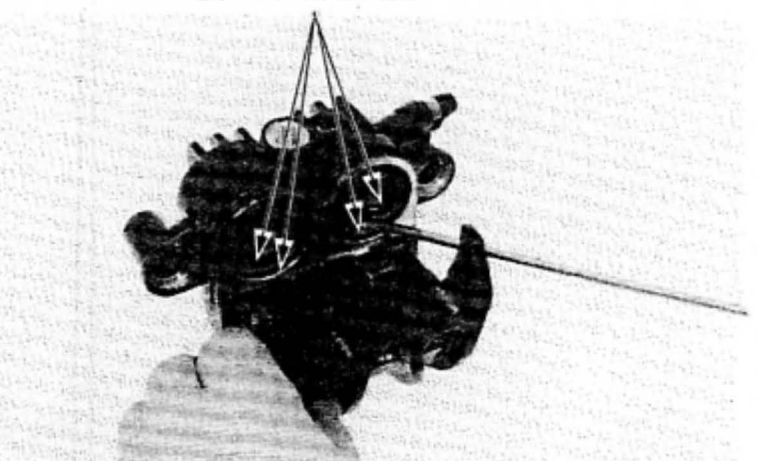
**(1) BOOTS****(2) PAD SPRING**

If necessary, apply compressed air to the caliper fluid inlet to get the piston out. Place a shop rag under the caliper to cushion the piston when it is forced out. Use the air in short spurts.

**WARNING**

*Do not bring the nozzle too close to the inlet.*

Examine the pistons and cylinders for scoring, scratches or other damage and replace if necessary.

**(1) FLUID INLET****(1) PISTON SEALS**

Push the piston seals in and lift them out, then discard them.  
Clean the piston seal grooves with brake fluid.

**CAUTION**

*Be careful not to damage the piston sliding surfaces.*

**INSPECTION**

Check the pistons and caliper cylinder for scoring, scratches or other damage.

Measure the piston O.D. with a micrometer.

**SERVICE LIMIT:**

FRONT: 33.870 mm (1.3335 in)

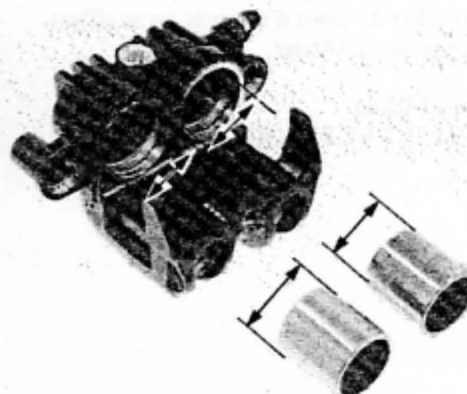
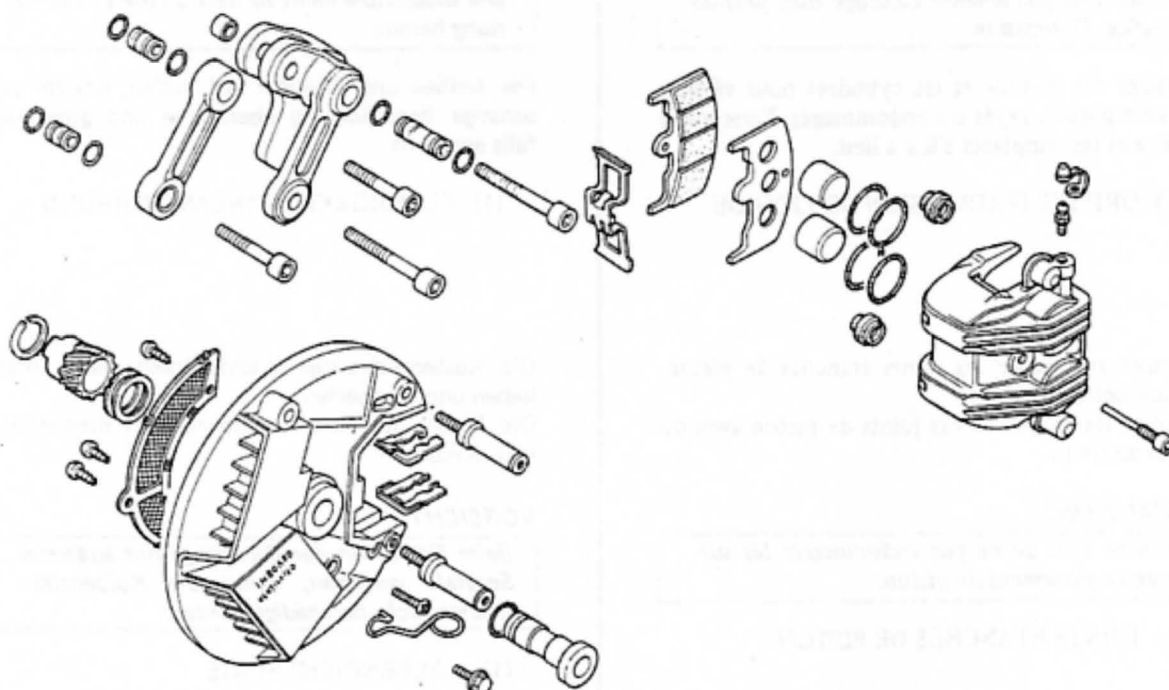
REAR: 31.940 mm (1.2575 in)

Measure the caliper cylinder I.D. with a cylinder gauge.

**SERVICE LIMIT:**

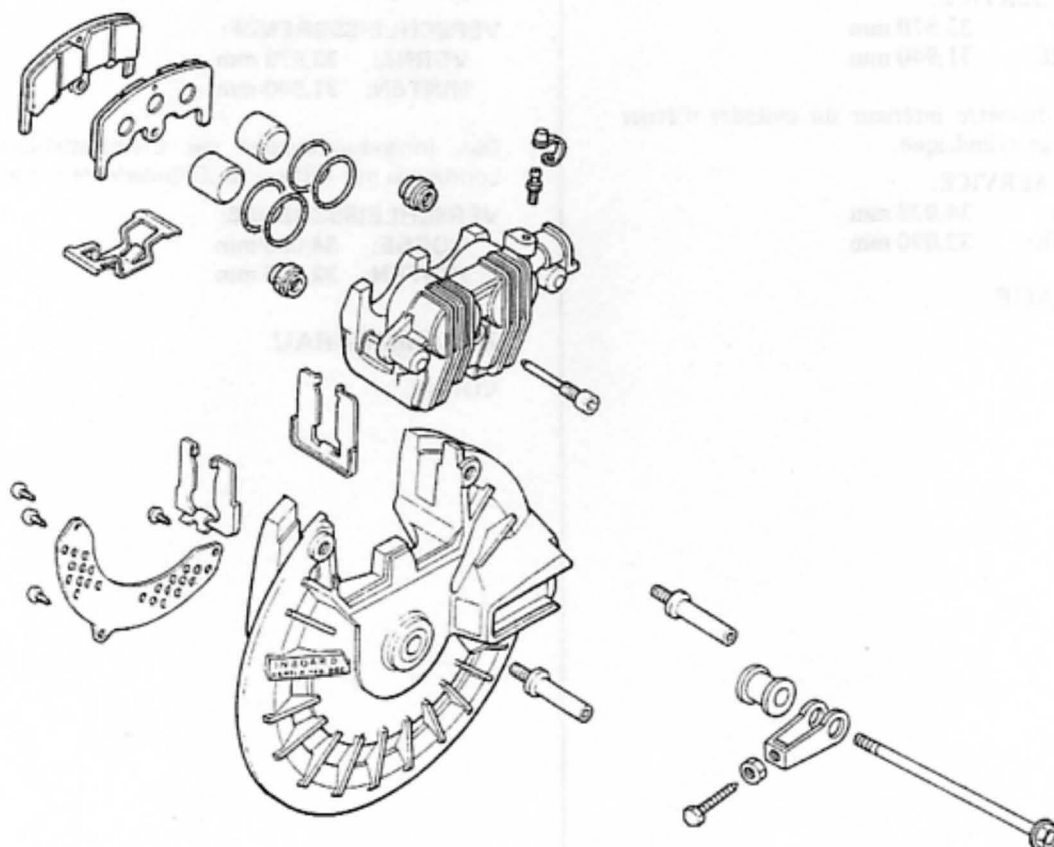
FRONT: 34.028 mm (1.3393 in)

REAR: 32.090 mm (1.2634 in)

**ASSEMBLY****FRONT**



## REAR



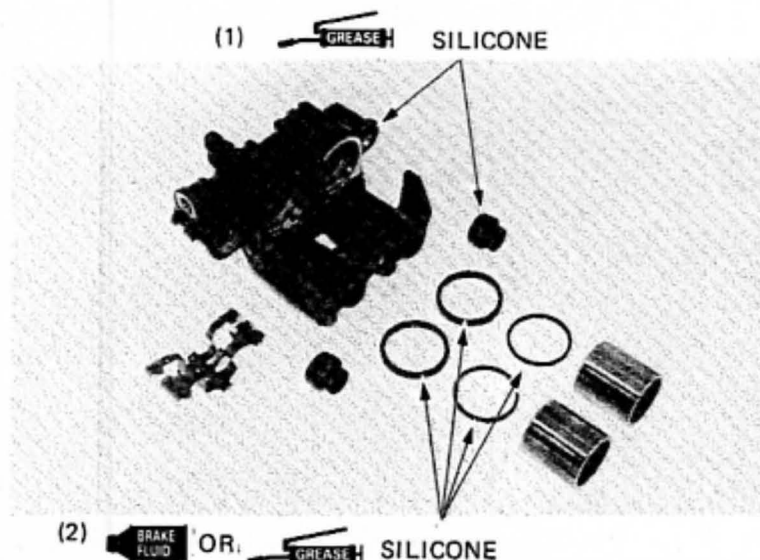
If the piston boots are hardened or deteriorated, replace them with new ones.

The piston seals must be replaced with new ones whenever they are removed. Coat the seals with silicone grease or brake fluid before assembly.

Install the pistons with the dished ends toward the pads. Then install the piston boots.

Install the collar boots and collar making sure that the boots are seated in the collar and caliper grooves properly.

Install the pad spring.

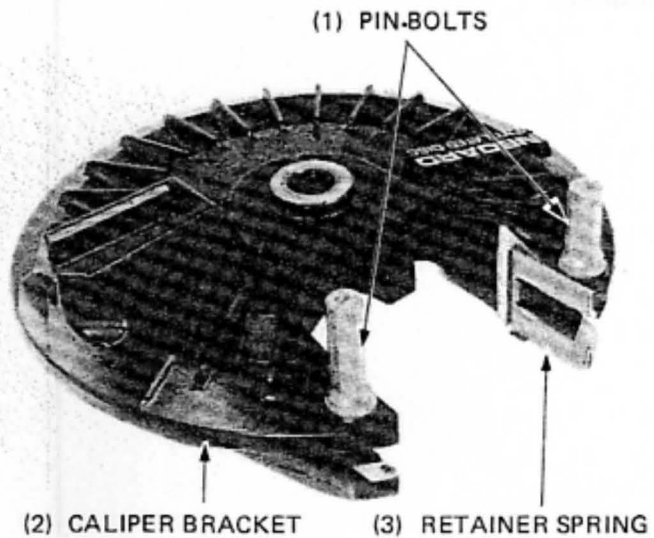




## HYDRAULIC BRAKE

Install the retainer spring onto the caliper bracket as shown.

Coat the pin bolts with silicone grease.



## INSTALLATION

Install the caliper over the pin bolts on the caliper bracket.

Connect the brake hose.

**TORQUE:** 25–35 N·m  
(2.5–3.5 kg-m, 18–25 ft-lb)

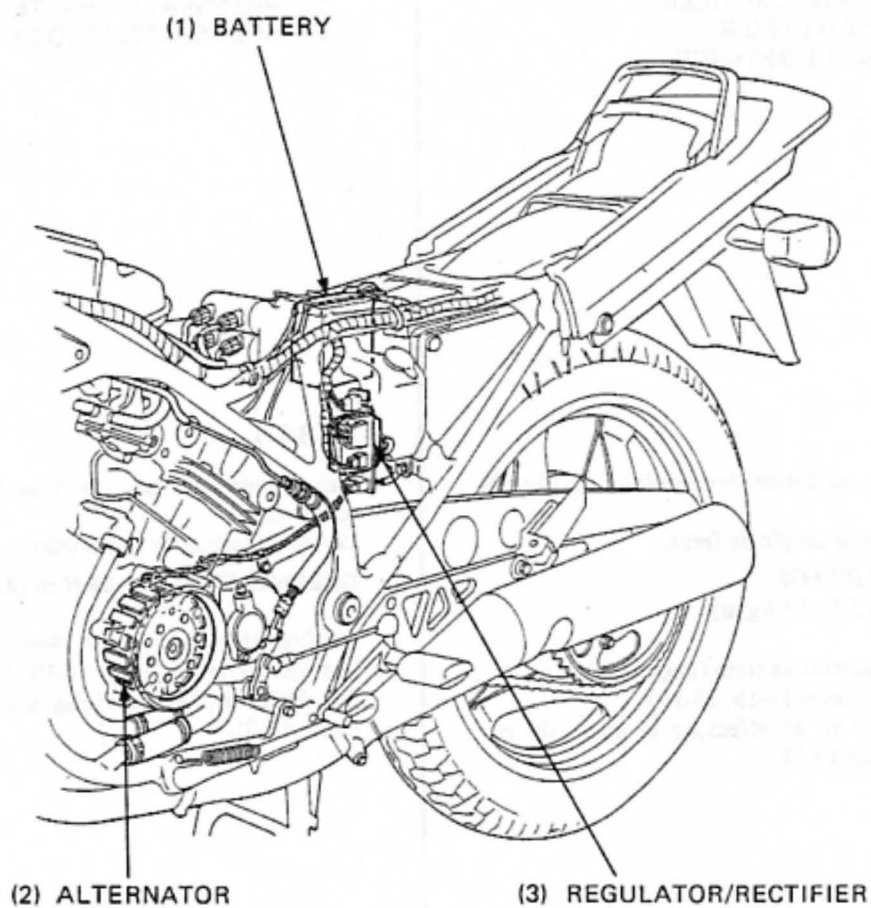
Install the brake pads (page 16–5).

Install the wheel (page 14–19, 15–10).

Fill the reservoir and bleed brake system (page 16–3).







(1) BATTERIE  
(2) ALTERNATEUR  
(3) REGULATEUR/REDRESSEUR

(1) BATTERIE  
(2) LICHTMASCHINE  
(3) REGLER/GLEICHRICHTER



# 17. BATTERY/CHARGING SYSTEM

|                     |      |
|---------------------|------|
| SERVICE INFORMATION | 17-1 |
| TROUBLESHOOTING     | 17-2 |
| BATTERY             | 17-3 |
| CHARGING SYSTEM     | 17-4 |

## SERVICE INFORMATION

### GENERAL

- Battery fluid level should be checked regularly. Fill with distilled water when necessary.
- Quick charge a battery only in an emergency; slow-charging is preferred.
- Remove the battery from the motorcycle for charging. If the battery must be charged on the motorcycle, disconnect the battery cables.

### WARNING

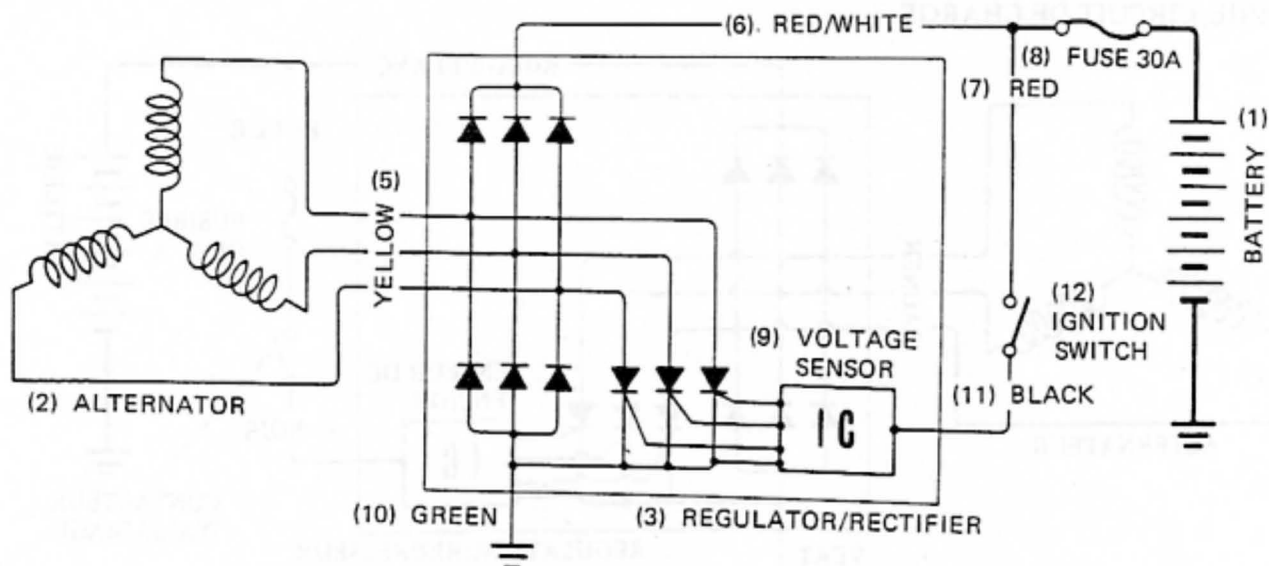
*Do not smoke or allow flames near a charging battery. The gas produced by a battery will explode if flames or sparks are brought near.*

- All charging system components can be tested on the motorcycle.
- Alternator removal is in Section 9.

### SPECIFICATIONS

|                     |                  |                                         |                      |
|---------------------|------------------|-----------------------------------------|----------------------|
| Battery             | Capacity         | 12V12AH                                 |                      |
|                     | Specific gravity | 1.280/20°C (68°F)                       |                      |
|                     | Charging rate    | 1.2 amperes maximum                     |                      |
| Alternator Capacity |                  | 2,000 rpm                               | 5,000 rpm            |
|                     |                  | 15.8A min. (No load)                    | 18.5A min. (No load) |
| Voltage regulator   |                  | Transistorized non-adjustable regulator |                      |

### BATTERY/CHARGING SYSTEM





## BATTERY/CHARGING SYSTEM

### TROUBLESHOOTING

#### No power — key turned on

1. Dead battery
  - Low fluid level
  - Low specific gravity
  - Charging system failure
2. Disconnected battery cable
3. Main fuse burned out
4. Faulty ignition switch

#### Low power — key turned on

1. Weak battery
  - Low fluid level
  - Low specific gravity
  - Charging system failure
2. Loose battery connection

#### Low power — engine running

1. Battery undercharged
  - Low fluid level
  - One or more dead cells
2. Charging system failure

#### Intermittent power

1. Loose battery connection
2. Loose charging system connection
3. Loose starting system connection
4. Loose connection or short circuit in ignition system
5. Loose connection or short circuit in lighting system

#### Charging system failure

1. Loose, broken or shorted wire or connection
2. Faulty voltage regulator/rectifier
3. Faulty alternator





## CHARGING

Remove the battery cell caps.

Fill the battery cells with distilled water to the upper level line, if necessary.

Connect the charger positive (+) cable to the battery positive (+) terminal.

Connect the charger negative (-) cable to the battery negative (-) terminal.

**Charging current: 1.2 amperes max.**

Charge the battery until specific gravity is 1.270–1.290 at 20°C (68°F).

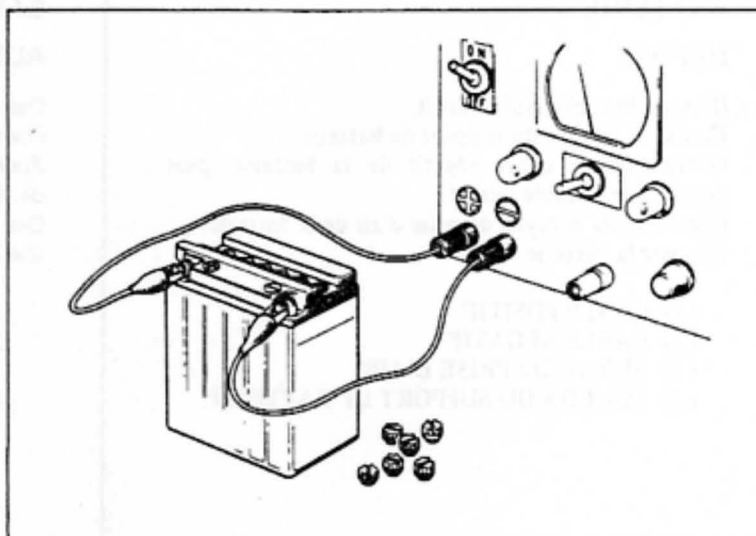
## WARNING

- Before charging a battery, remove the cap from each cell.
- Keep flames and sparks away from a charging battery.
- Turn power ON/OFF at the charger, not at the battery terminals to prevent sparks.
- Discontinue charging if the electrolyte temperature exceeds 45°C (113°F).

## CAUTION

- Quick-charging should only be done in an emergency; slow-charging is preferred.
- Route the breather tube as shown on the battery caution label.

After installing the battery, coat the terminals with clean grease.



## CHARGING SYSTEM

## CURRENT TEST

## NOTE

Be sure the battery is in good condition before performing this test.

Warm up the engine.

Remove the frame right side cover and seat.

Disconnect the black wire at the regulator/rectifier coupler.

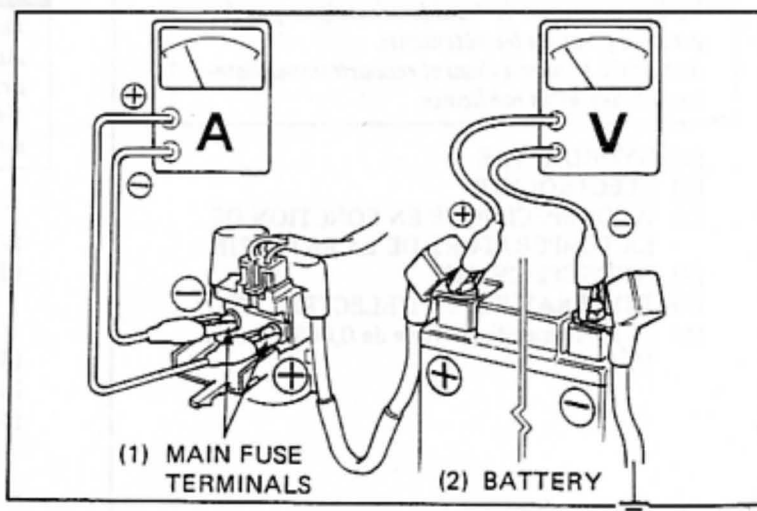
Open the main fuse cover and remove the main fuse.

Connect voltmeter and ammeter as shown.

Allow engine to idle.

Charging amperage should be a minimum of 15.8 amperes at 2,000 rpm and should be a minimum of 18.5 amperes at 5,000 rpm.

Check the stator (page 17-5 and then the regulator/rectifier (page 17-5), if the charging specifications are not met.





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## BATTERY/CHARGING SYSTEM

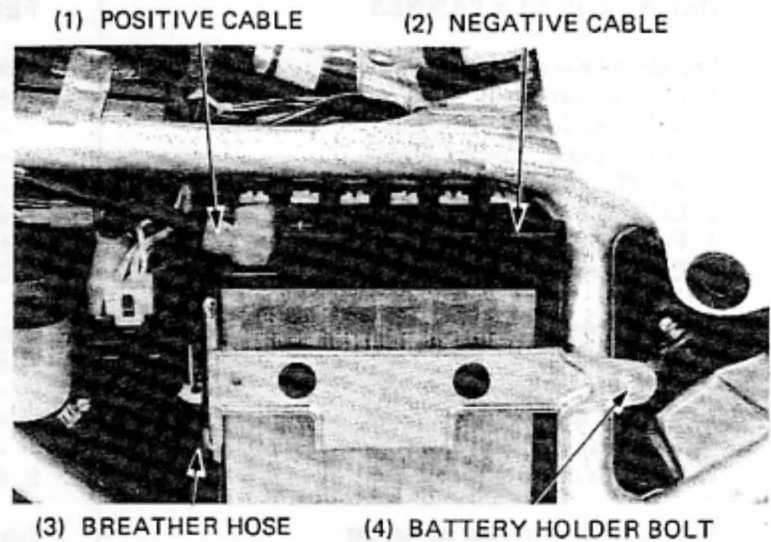
### BATTERY

#### REMOVAL

Remove the right side cover.  
Remove the battery holder bolt.

Disconnect the negative cable at the battery, then disconnect the positive cable.  
Disconnect the battery breather hose from the battery.

Remove the battery.



#### TESTING SPECIFIC GRAVITY

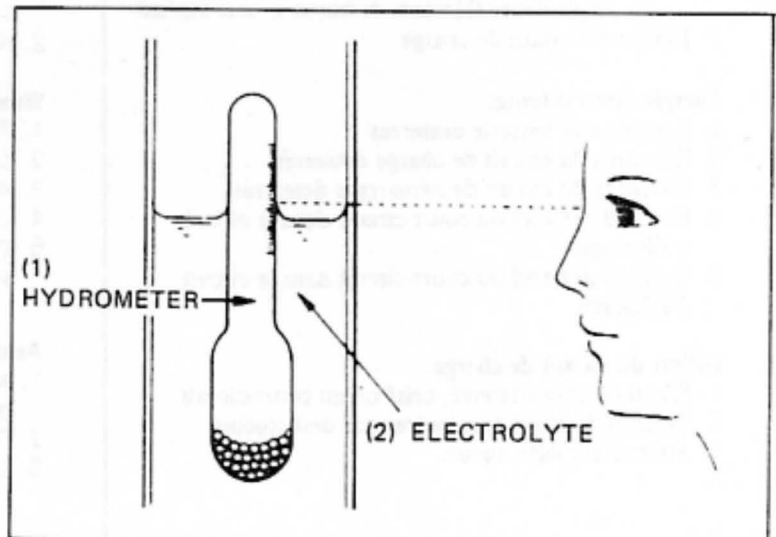
Test each cell with a hydrometer.

**SPECIFIC GRAVITY: 1.270–1.290 (20°C, 68°F)**

|             |               |
|-------------|---------------|
| 1.270–1.290 | Fully charged |
| Below 1.260 | Undercharged  |

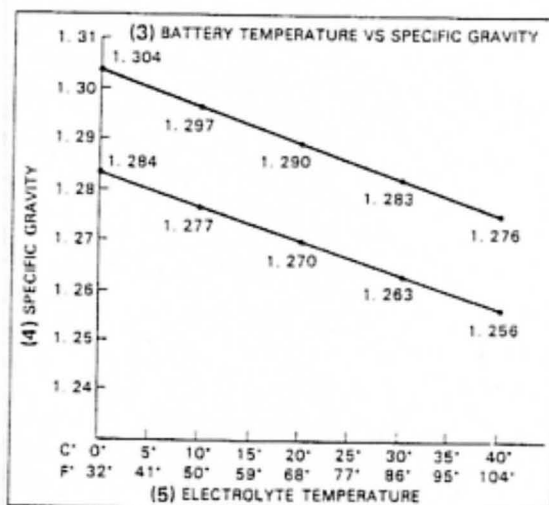
#### NOTE

- The battery must be recharged if the specific gravity is below 1.230.
- The specific gravity varies with the temperature as shown in the accompanying table.
- Replace the battery if sulfation is evident or if the space below the cell plates is filled with sediment.



#### WARNING

*The battery contains sulfuric acid. Avoid contact with skin, eyes, or clothing.  
Antidote: Flush with water and get prompt medical attention.*



(6) Specific gravity changes by 0.007 for every 10°C.





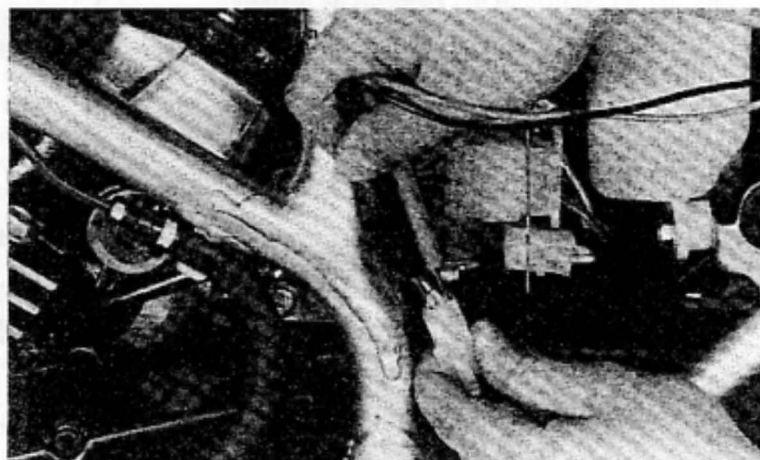
## STATOR CONTINUITY TEST

Remove the left side cover.

Disconnect the alternator and regulator/rectifier coupler.

Check for continuity between the leads, and between the leads and ground.

Replace the stator if there is no continuity between the leads, or if there is continuity between the leads and ground.



## VOLTAGE REGULATOR/RECTIFIER TEST

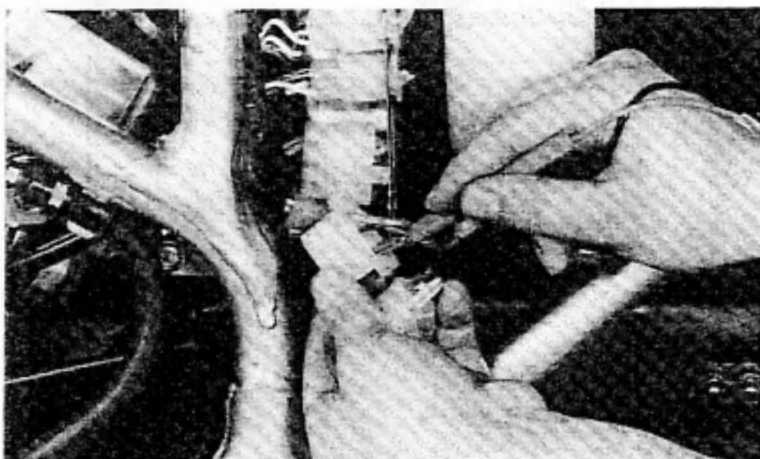
Remove the left side cover.

Disconnect the regulator/rectifier couplers.

Check for continuity between the leads with an ohmmeter.

## NOTE

The test results shown are for a positive ground ohmmeter and the opposite results will be obtained when a negative ground ohmmeter is used.

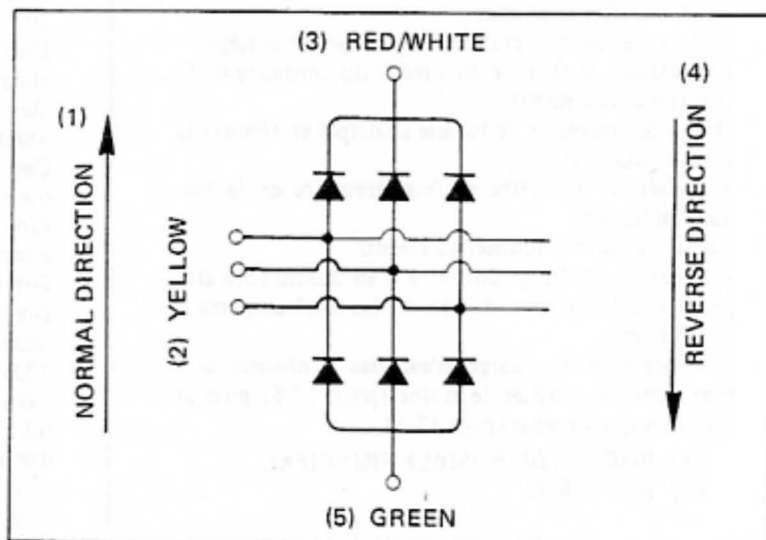


## NORMAL DIRECTION: CONTINUITY

|    | ⊕ probe   | ⊖ probe |
|----|-----------|---------|
| I  | YELLOW    | GREEN   |
| II | RED/WHITE | YELLOW  |

## REVERSE DIRECTION: NO CONTINUITY

|    | ⊕ probe | ⊖ probe   |
|----|---------|-----------|
| I  | GREEN   | YELLOW    |
| II | YELLOW  | RED/WHITE |



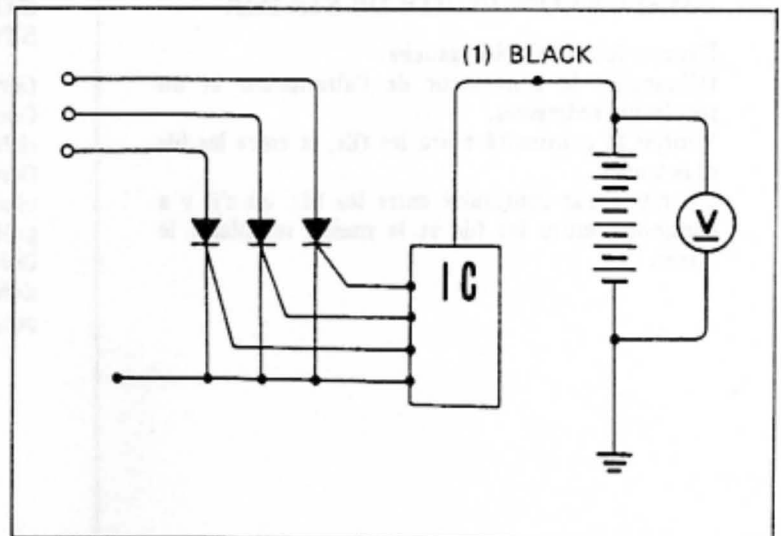


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## BATTERY/CHARGING SYSTEM

### VOLTAGE REGULATOR PERFORMANCE TEST

Connect a voltmeter across the battery.  
Check regulator performance with the engine running. The regulator must divert current to ground when battery voltage reaches 14.0 – 15.0 V.





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# 18. IGNITION SYSTEM

|                                |      |
|--------------------------------|------|
| SERVICE INFORMATION            | 18-1 |
| TROUBLESHOOTING                | 18-2 |
| IGNITION COIL                  | 18-3 |
| TRANSISTORIZED IGNITION SYSTEM | 18-4 |
| IGNITION TIMING                | 18-5 |

## SERVICE INFORMATION

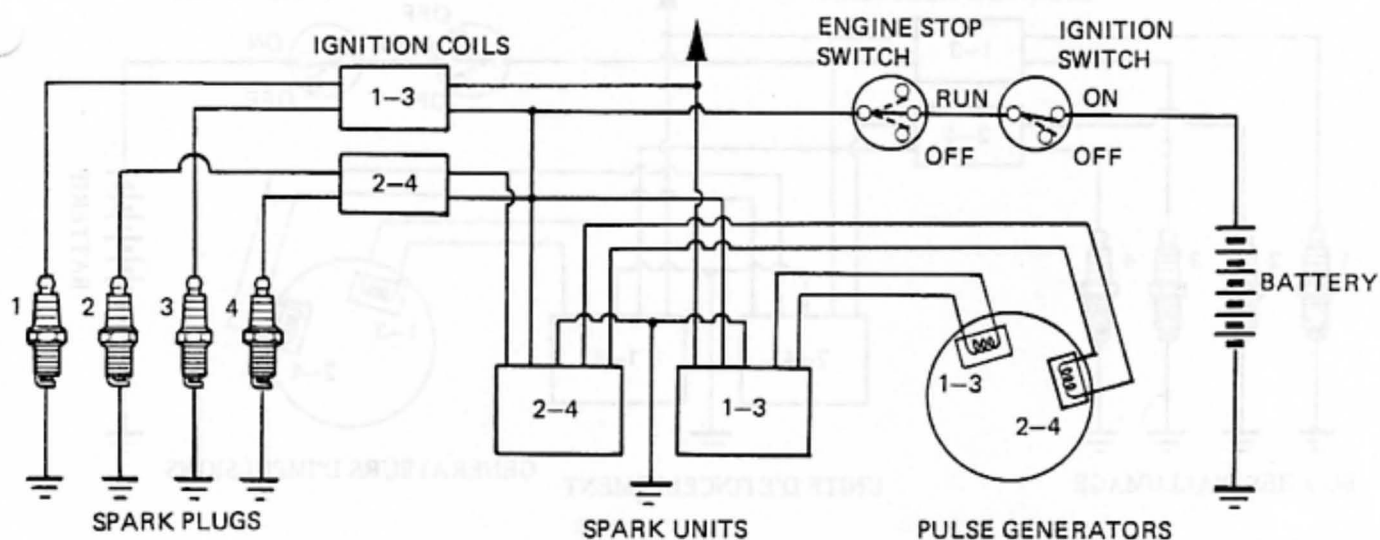
### GENERAL

- A TRANSISTORIZED IGNITION SYSTEM is used and no adjustments can be made.

### SPECIFICATIONS

| Spark plug      |  | ND                              | NGK      |
|-----------------|--|---------------------------------|----------|
|                 |  | X24EPR-U9                       | DPR8EA-9 |
|                 |  | X22EPR-U9                       | DPR7EA-9 |
|                 |  | X27EPR-U9                       | DPR9EA-9 |
| Spark plug gap  |  | 0.8–0.9 mm (0.031–0.035 in)     |          |
| Ignition timing |  | At idle 15° BTDC                |          |
|                 |  | Full advance 37° BTDC/2,800 rpm |          |

### IGNITION SYSTEM DIAGRAM



18

**IGNITION SYSTEM****TROUBLESHOOTING**

The ignition system has two sub-systems; one for the No. 1 and No. 3 cylinders and one for the No. 2 and No. 4 cylinders. Determine which sub-system is faulty, then proceed to the detailed tests below.

**Engine cranks but will not start**

- Engine stop switch OFF
- No spark at plugs
- Faulty transistorized spark unit
- Faulty pulse generator

**No spark at plug**

- Engine stop switch OFF
- Poorly connected, broken or shorted wires
  - Between ignition switch and engine stop switch
  - Between spark unit and engine stop switch
  - Between spark unit and ignition coil
  - Between ignition coil and plug
  - Between spark unit and pulse generator
- Faulty ignition coil
- Faulty ignition switch
- Faulty spark unit
- Faulty pulse generator

**Engine starts but runs poorly**

- Ignition primary circuit
  - Faulty ignition coil
  - Loose or bare wire
  - Intermittent short circuit
- Secondary circuit
  - Faulty plug
  - Faulty high tension wire

**Timing advance incorrect**

- Faulty pulse generator
- Faulty spark unit



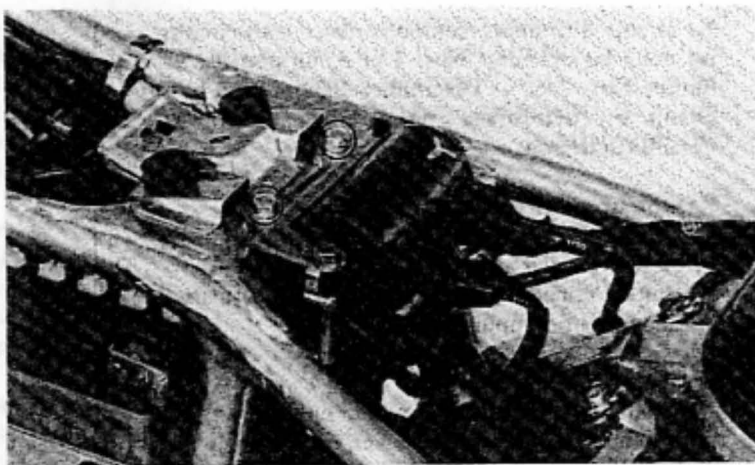


## IGNITION COIL

### REMOVAL

Remove the seat, fuel tank and disconnect the ignition coil wire leads.

Remove the two attaching bolts and remove the ignition coils with its bracket.



### CONTINUITY TEST

Measure the primary coil resistance.

**RESISTANCE:  $2.8 \Omega$**

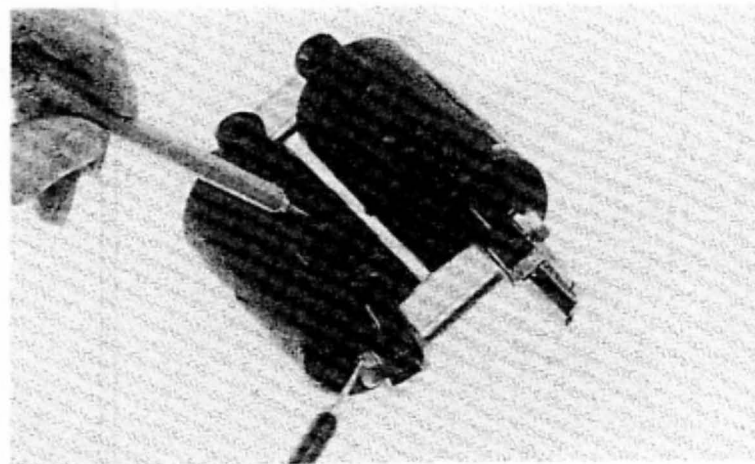
Check the continuity between the primary terminal and bracket.

There should be no continuity.



Measure the secondary coil resistance.

**RESISTANCE:  $21-28 \text{ k}\Omega$**







## TRANSISTORIZED IGNITION SYSTEM

### PULSE GENERATOR TEST

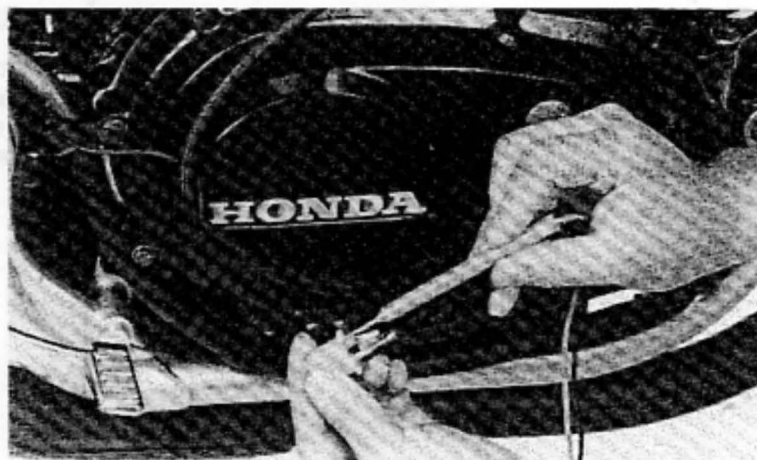
Disconnect the pulse generator coupler and measure the coil resistance.

**RESISTANCE: 315–385  $\Omega$**

2,4 cylinders: Between white and blue leads

1,3 cylinders: Between white and yellow leads

Check the continuity between each lead and ground. There should be no continuity.

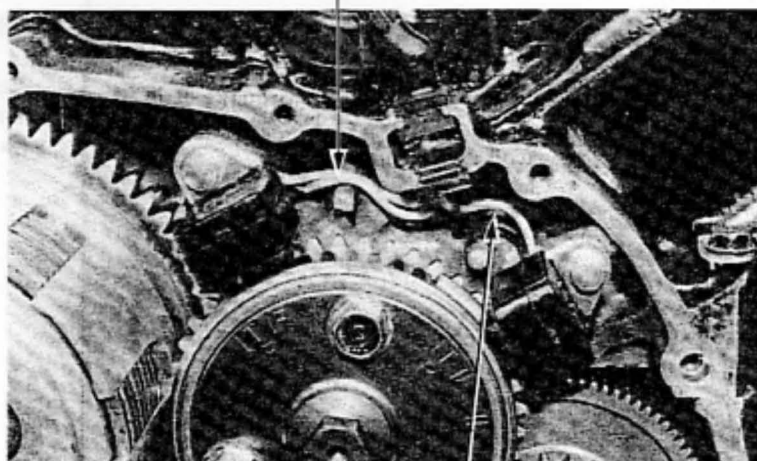


(1) WHITE AND YELLOW LEADS (1,3 CYLINDERS)

### PULSE GENERATOR REPLACEMENT

Remove the right crankcase cover.

Remove the pulse generator mounting bolts and remove the pulse generators.



(2) WHITE AND BLUE LEADS (2,4 CYLINDERS)

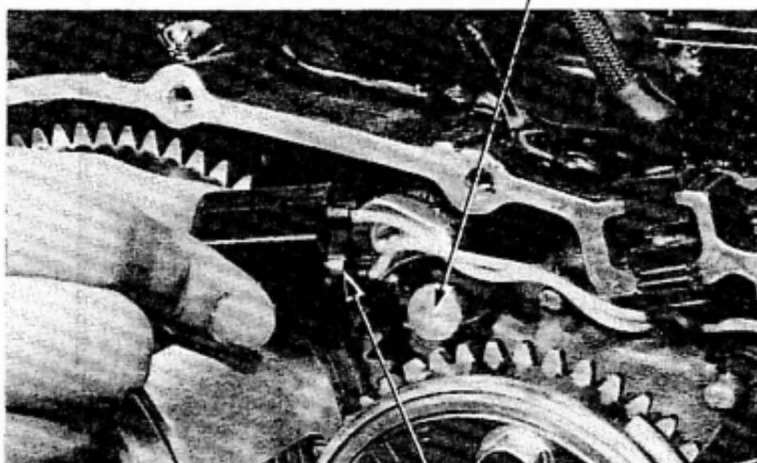
Install new pulse generators, aligning the pin on the pulse generator with the hole in the crankcase.

Install the right crankcase cover.  
Check the ignition timing.

#### CAUTION

*Be careful not to damage the pick-up on the starter clutch outer.*

(1) HOLE



(2) PIN

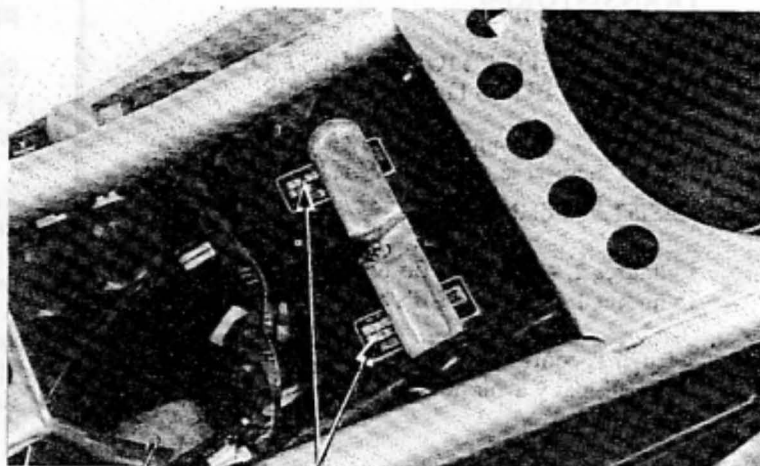


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## IGNITION SYSTEM

### SPARK UNIT

If the pulse generators, ignition coils and wiring are good, and the ignition timing is not within specification; replace the spark units with new ones and recheck the ignition timing.



(1) SPARK UNITS

(1) INSPECTION HOLE CAP

### IGNITION TIMING

#### NOTE

The ignition system is transistorized and cannot be adjusted. If the ignition timing is incorrect, check the spark units and pulse generators.

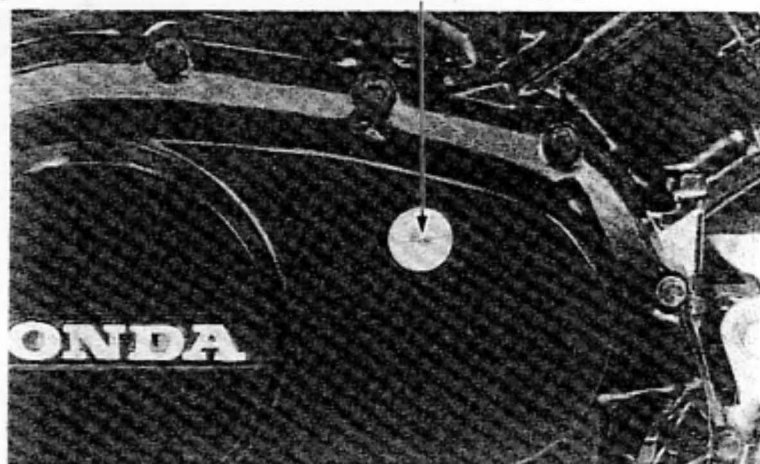
Replace parts as required.

Warm up the engine.

Connect the timing light to the high tension wire of the No. 2 or 4 cylinder.

Remove the inspection hole cap from the right crankcase cover.

Start the engine and check that the "F" mark (adjacent to "TF" mark) aligns with the index mark on the right crankcase cover at 1,300 rpm.

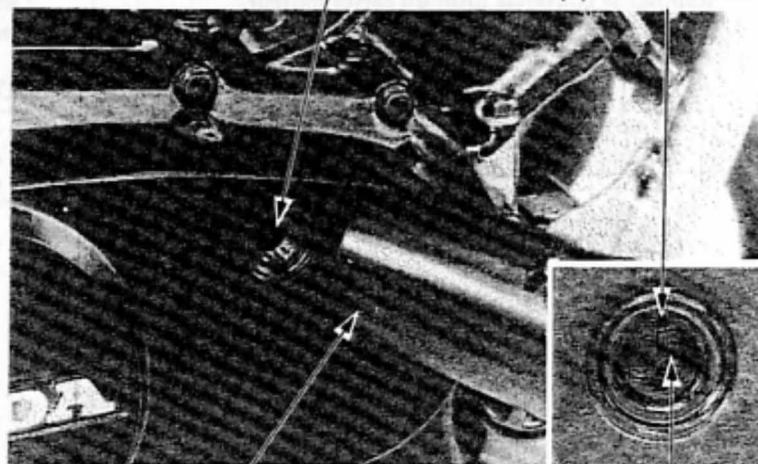


(1) INSPECTION HOLE

(2) INDEX MARK

Connect the timing light to the high tension wire of the No. 1 or 3 cylinder.

Start the engine and check that the "F" mark (adjacent to "TR" mark) aligns with the index mark on the right crankcase cover at 1,300 rpm.



(3) TIMING LIGHT

(4) "F" MARK



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# 19. ELECTRIC STARTER

|                      |      |
|----------------------|------|
| SERVICE INFORMATION  | 19-1 |
| TROUBLESHOOTING      | 19-2 |
| STARTER MOTOR        | 19-3 |
| STARTER RELAY SWITCH | 19-6 |
| CLUTCH DIODE         | 19-6 |

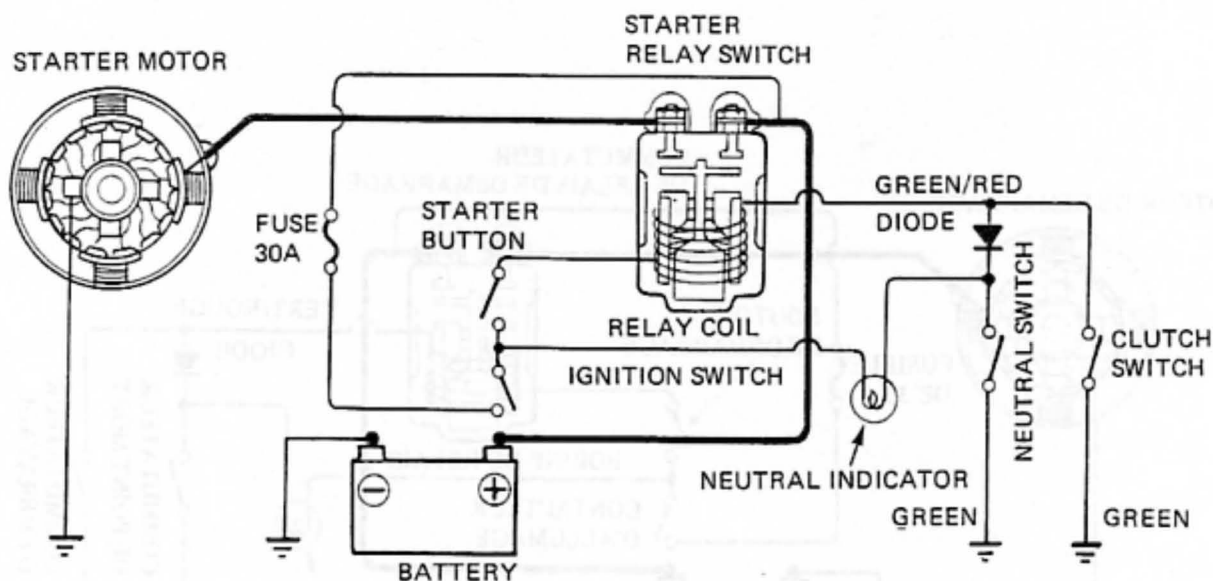
## SERVICE INFORMATION

### GENERAL

- The starter motor can be removed with the engine in the frame.

### SPECIFICATIONS

|               |                      | STANDARD                    | SERVICE LIMIT    |
|---------------|----------------------|-----------------------------|------------------|
| Starter motor | Brush spring tension | 680-920 g (24.0-32.5 oz)    | 545 g (19.2 oz)  |
|               | Brush length         | 12.0-13.0 mm (0.47-0.51 in) | 6.5 mm (0.26 in) |





## TROUBLESHOOTING

### Starter motor will not turn

1. Battery discharged
2. Faulty ignition switch
3. Faulty starter switch
4. Faulty neutral switch
5. Faulty starter relay switch
6. Loose or disconnected wire or cable
7. Clutch diode open
8. Faulty clutch switch

### Starter motor turns engine slowly

1. Low specific gravity in battery
2. Excessive resistance in circuit
3. Binding in starter motor

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

1. Faulty starter clutch
2. Faulty starter motor gears

### Starter motor and engine turns, but engine does not start

1. Faulty ignition system
2. Engine problems
  - Low compression
  - Fouled spark plugs
3. Faulty carburetors
4. No fuel in tank





## ELECTRIC STARTER

### STARTER MOTOR

#### REMOVAL

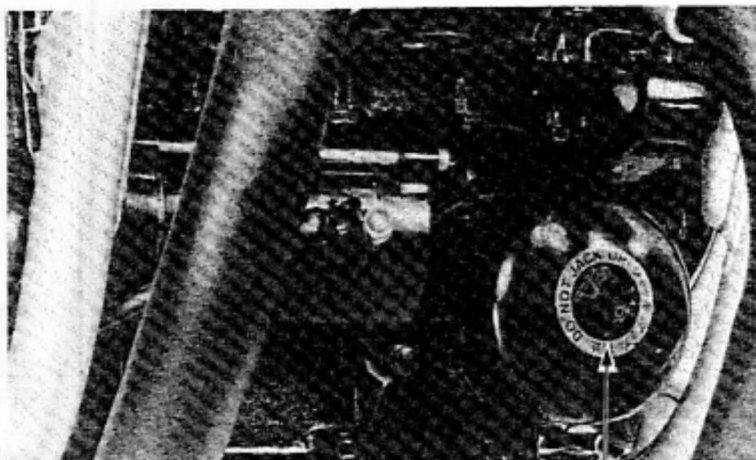
**WARNING**

*With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.*

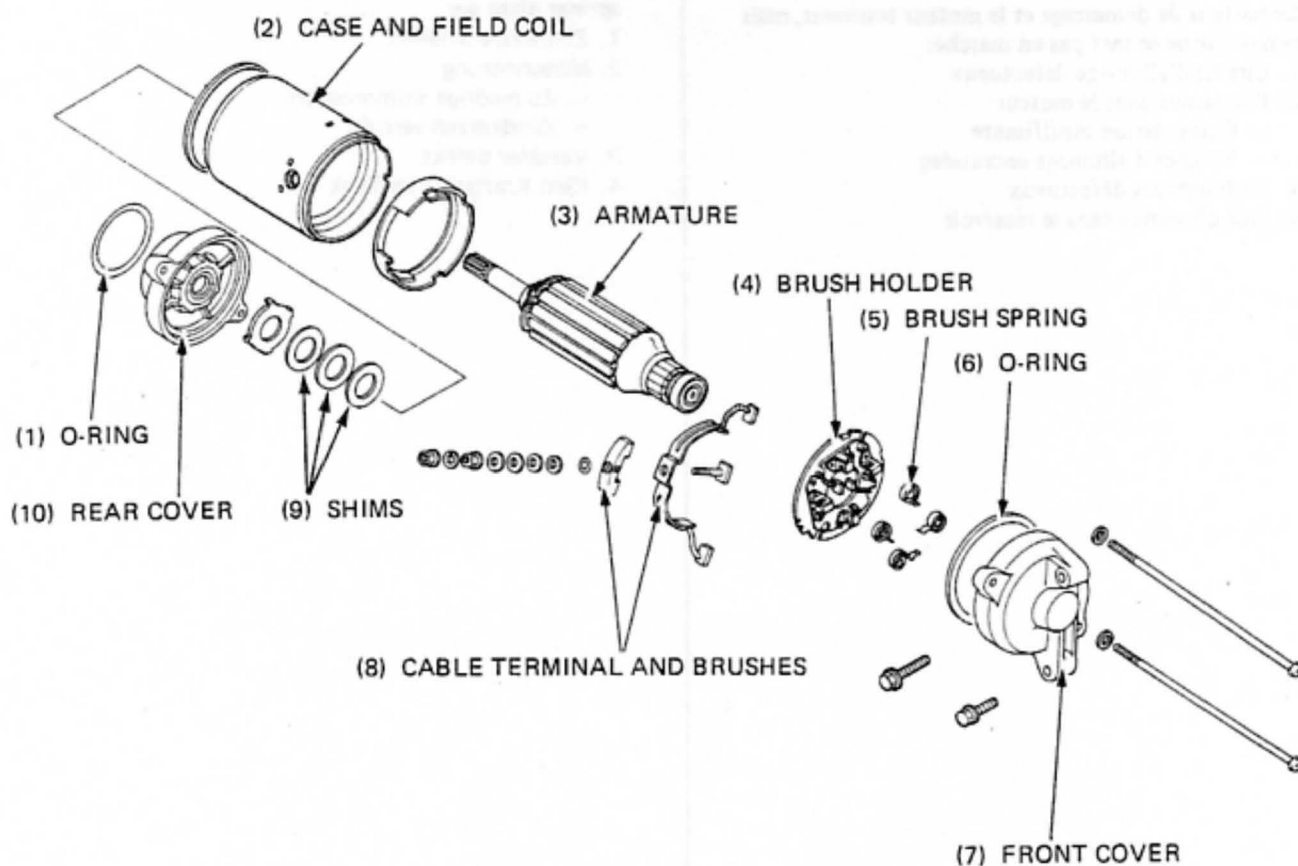
Remove the oil filter (page 2-3).

Disconnect the starter motor cable from the starter motor by removing the nut.

Remove the starter motor mounting bolts and the starter motor.



(1) OIL FILTER







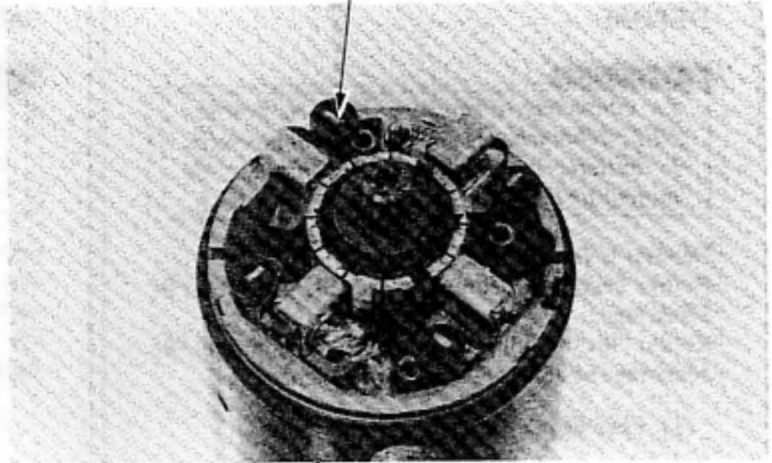
## BRUSH INSPECTION

Remove the starter motor case screws.  
Inspect the brushes and measure the brush length.  
Measure brush spring tension with a spring scale.

## SERVICE LIMITS:

|                       |                  |
|-----------------------|------------------|
| Brush length:         | 6.5 mm (0.26 in) |
| Brush spring tension: | 545 g (19.2 oz)  |

(1) BRUSH SPRING



## COMMUTATOR INSPECTION

Remove the starter motor case.

## NOTE

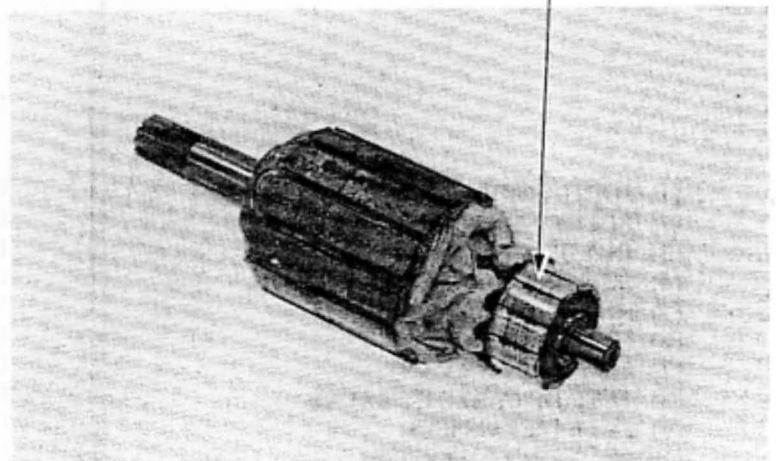
Record the location and number of shims.

Inspect the commutator bars for discoloration.  
Bars discolored in pairs indicate grounded armature coils.

## NOTE

Do not use emery or sand paper on the commutator.

(1) COMMUTATOR

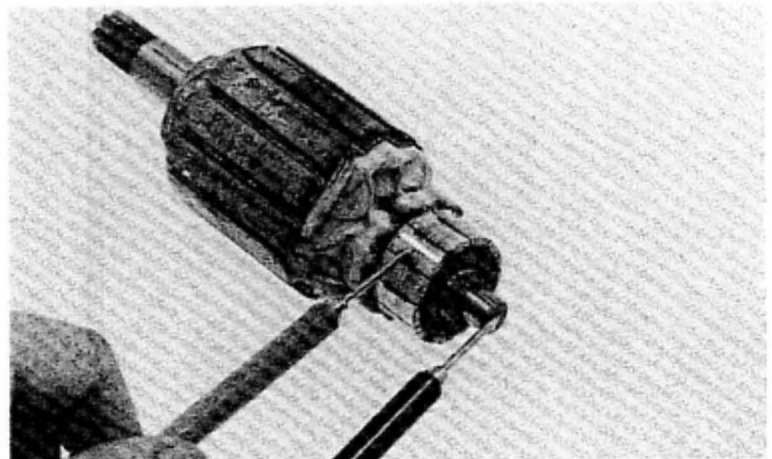
(1) CONTINUITY BETWEEN  
COMMUTATOR BAR PAIRS: NORMAL

Check for continuity between pairs of commutator bars.

There should be continuity.

Also, make a continuity check between individual commutator bars and the armature shaft.

There should be no continuity.

(2) NO CONTINUITY BETWEEN  
COMMUTATOR BARS AND ARMATURE SHAFT: NORMAL



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## ELECTRIC STARTER

### FIELD COIL INSPECTION

Check for continuity from the cable terminal to the motor case.

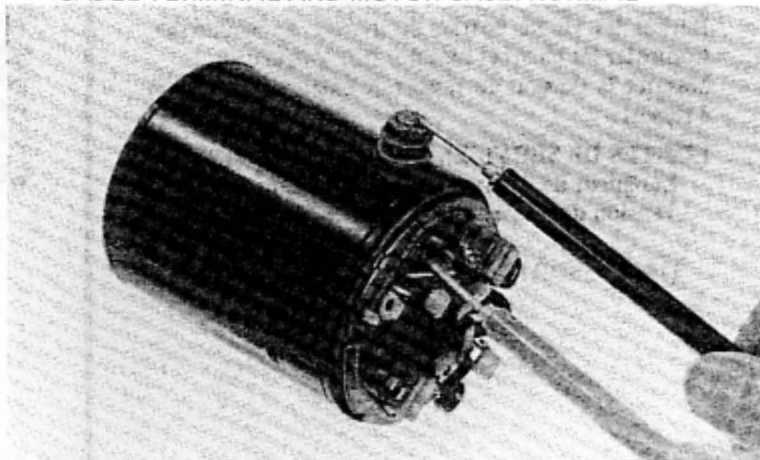
There should be continuity.

Then check for continuity from the cable terminal to the brush.

There should be continuity.

Replace the starter motor if the field coil does not have continuity or if it is shorted to the motor case.

- (1) NO CONTINUITY BETWEEN  
CABLE TERMINAL AND MOTOR CASE: NORMAL



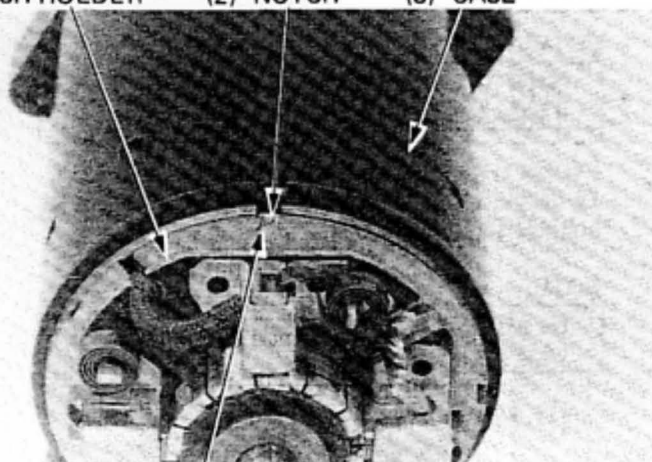
- (2) CONTINUITY BETWEEN  
CABLE TERMINAL AND BRUSH WIRE (INSULATED): NORMAL

### ASSEMBLY/INSTALLATION

Assemble the starter motor.

Align the case notch with the brush holder pin.

- (1) BRUSH HOLDER (2) NOTCH (3) CASE

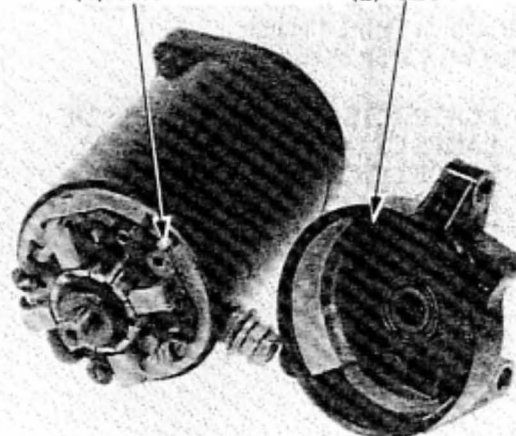


- (4) PIN

Install the rear cover aligning its slot with the brush holder pin.

Install the starter motor in the reverse order of removal.

- (1) PIN (2) SLOT





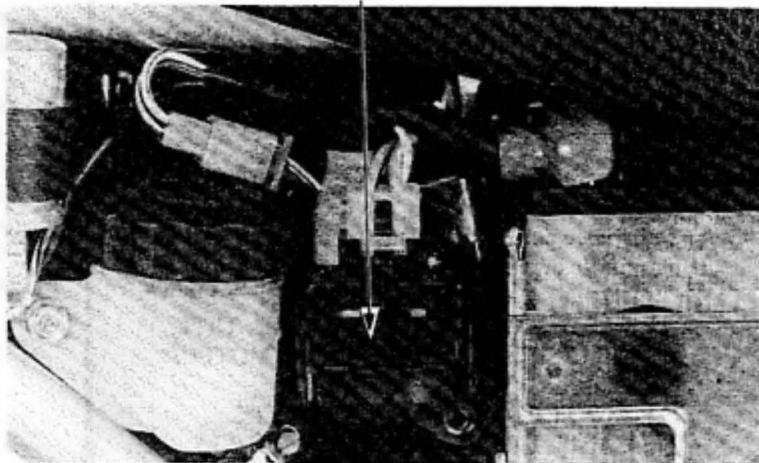
## STARTER RELAY SWITCH

### INSPECTION

Depress the starter switch button with the ignition ON.

The coil is normal if the starter relay switch clicks.

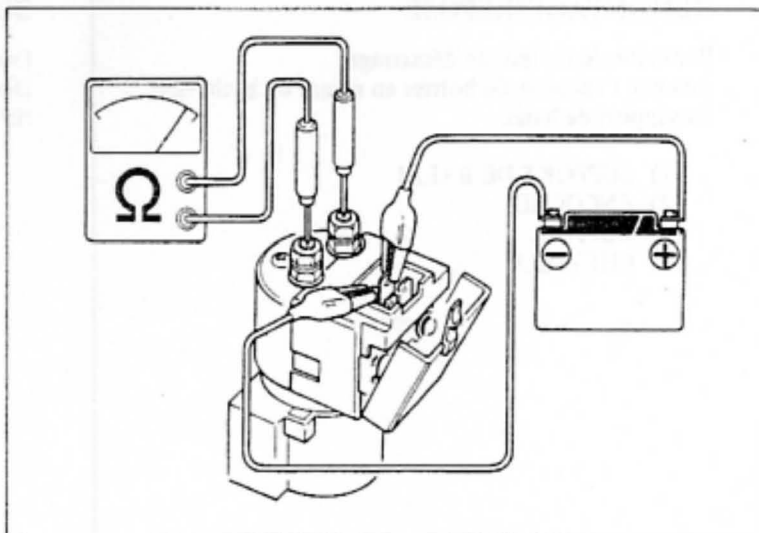
(1) STARTER RELAY SWITCH



Connect an ohmmeter to the starter relay switch terminals.

Connect a 12 V battery to the switch cable terminals.

The switch is normal if there is continuity.



## CLUTCH DIODE

### REMOVAL

Remove the fuel tank.

Remove the clutch diode from the wire harness.

### INSPECTION

Check for continuity with an ohmmeter.

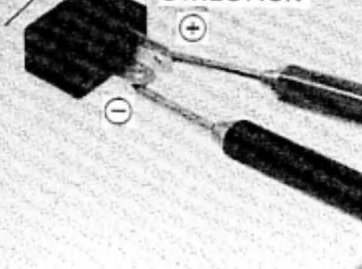
There should be continuity in the normal direction and should not be continuity in the reverse direction.

(1) CLUTCH DIODE



(2) NORMAL DIRECTION

(3) REVERSE DIRECTION





## IGNITION SWITCH

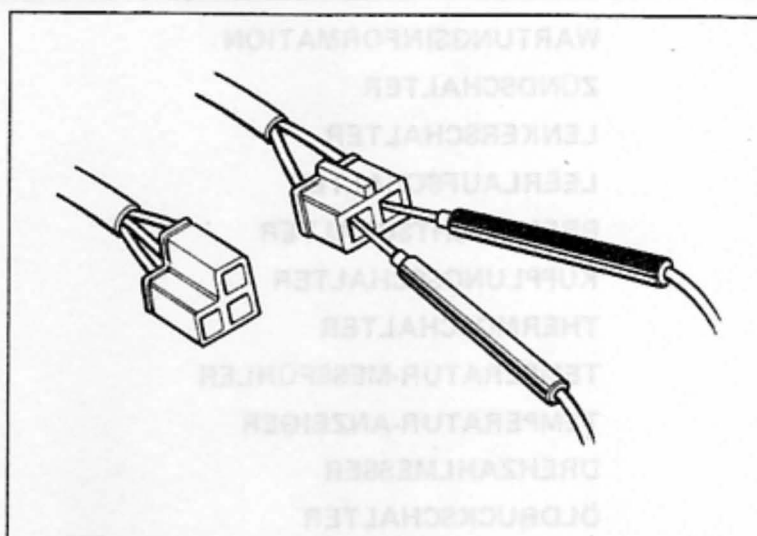
Remove the fairing and disconnect the ignition switch coupler.

Check continuity of terminals on the ignition switch coupler in each switch position.

### SWITCH POSITION

ON: R to Bl, Br/W to Br — continuity  
 OFF: No continuity  
 P: R to Br — continuity

| Terminal<br>Position | BAT1 | IG | TL1  | TL2 |
|----------------------|------|----|------|-----|
| ON                   | ○    | ○  | ○    | ○   |
| OFF                  |      |    |      |     |
| P                    | ○    |    |      | ○   |
| Color<br>code        | R    | Bl | Br/W | Br  |



## HANDLEBAR SWITCH

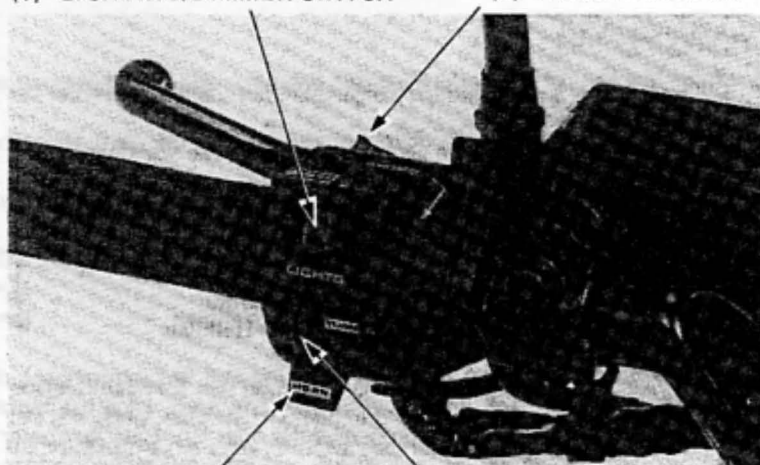
Remove the fairing and disconnect the handlebar switch couplers.

Check continuity of terminals on the handlebar switch couplers in each switch position.

### LIGHTING SWITCH

| Terminal<br>Position | BAT4  | TL   | BAT5 | HL   |
|----------------------|-------|------|------|------|
| • (OFF)              |       |      |      |      |
| P                    | ○     | ○    |      |      |
| H                    | ○     | ○    | ○    | ○    |
| Color<br>code        | Br/Bu | Br/W | Bl/R | Bu/W |

(1) LIGHTING/DIMMER SWITCH (2) PASSING SWITCH



### TURN SIGNAL SWITCH

| Terminal<br>Position | HL   | Lo | Hi |
|----------------------|------|----|----|
| Lo                   | ○    | ○  |    |
| (N)                  | ○    | ○  | ○  |
| Hi                   | ○    |    | ○  |
| Color<br>code        | Bu/W | W  | Bu |

(3) HORN SWITCH

(4) TURN SIGNAL SWITCH



### DIMMER SWITCH

| Terminal<br>Position | W  | R  | L |
|----------------------|----|----|---|
| R                    | ○  | ○  |   |
| N                    |    |    |   |
| L                    | ○  |    | ○ |
| Color<br>code        | Gr | LB | O |





### SWITCHES

#### HORN SWITCH

| Terminal<br>Position | Ho | BAT3 |
|----------------------|----|------|
| FREE                 |    |      |
| PUSH                 |    |      |
| Color code           | LG | W/G  |

#### PASSING SWITCH

| Terminal<br>Position | BAT3 | Hi |
|----------------------|------|----|
| FREE                 |      |    |
| PUSH                 |      |    |
| Color code           | W/G  | Bu |

#### STARTER SWITCH

| Terminal<br>Position | ST  | BAT2 |
|----------------------|-----|------|
| FREE                 |     |      |
| PUSH                 |     |      |
| Color code           | Y/R | Bl   |

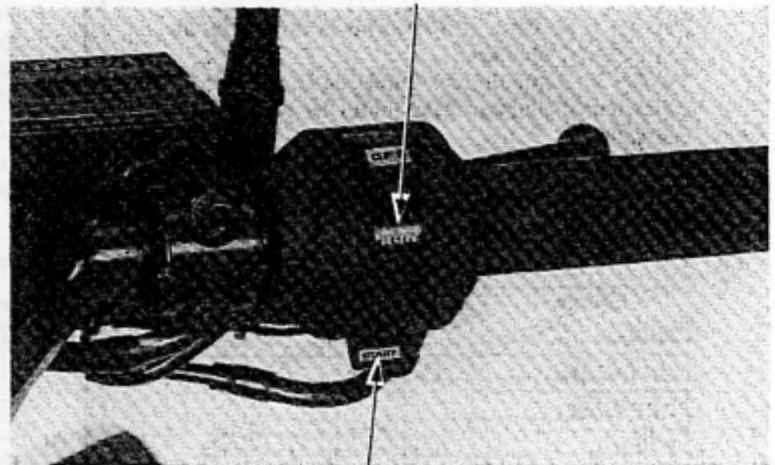
#### ENGINE STOP SWITCH

| Terminal<br>Position | IG   | BAT2 |
|----------------------|------|------|
| OFF                  |      |      |
| RUN                  |      |      |
| Color code           | Bl/W | Bl   |

#### NEUTRAL SWITCH

Disconnect the pulse generator coupler.  
Check the continuity between the black (with red and light green tubes) lead and ground. There should be continuity with the transmission in neutral, and should be no continuity with the transmission in any gear.

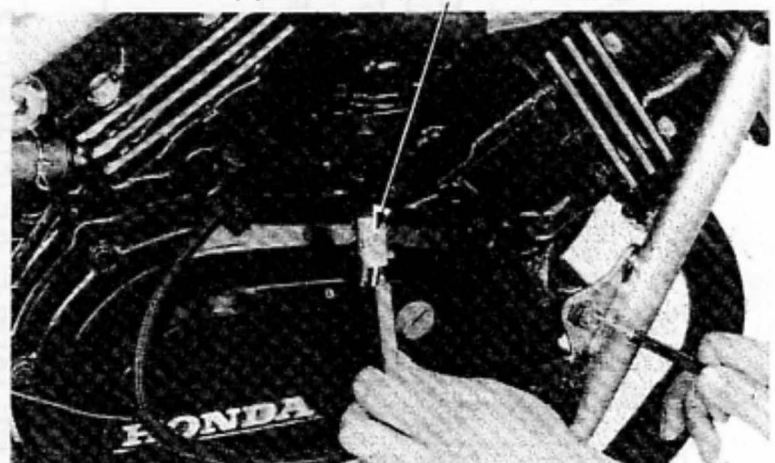
(1) ENGINE STOP SWITCH



(2) STARTER SWITCH



(1) PULSE GENERATOR COUPLER





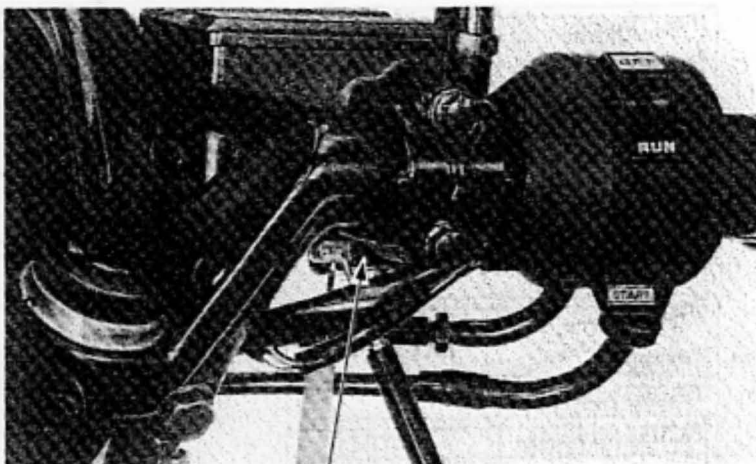


## BRAKE LIGHT SWITCH

### FRONT BRAKE SWITCH

Disconnect the front brake switch wires from the switch.

There should be continuity with the brake lever applied and no continuity with the lever released. Replace the switch if necessary.



(1) FRONT BRAKE SWITCH

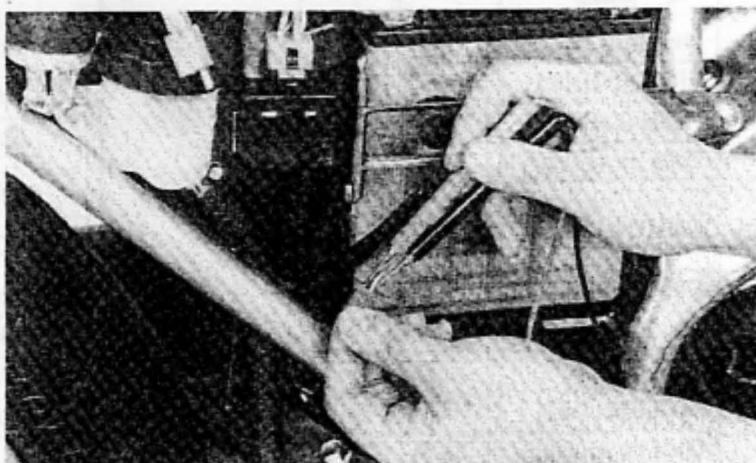
### REAR BRAKE SWITCH

Remove the right frame side cover.

Disconnect the rear brake switch coupler.

Check the continuity between the green/yellow and white/green leads.

There should be continuity with the brake pedal depressed and no continuity with the pedal released. Replace the switch if necessary.



## CLUTCH SWITCH

Disconnect the clutch switch wires from the switch. Check the continuity between the switch terminals.

There should be continuity with the clutch lever applied and no continuity with the lever released.

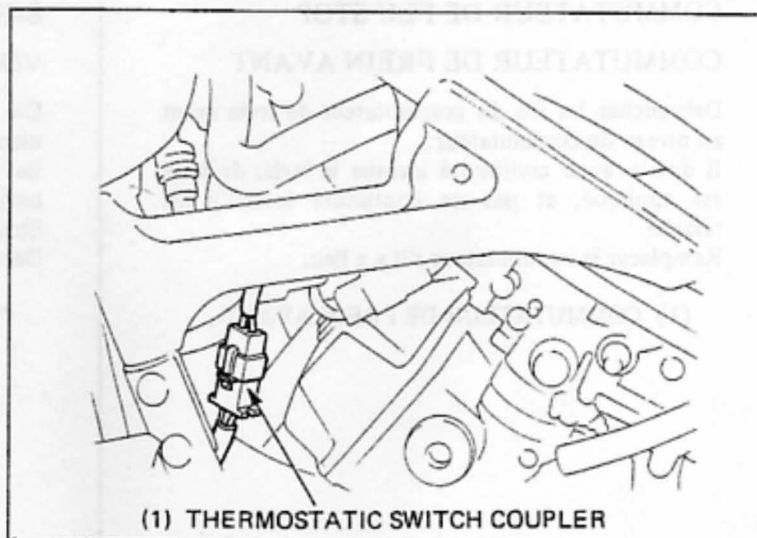


**SWITCHES****THERMOSTATIC SWITCH**

The cooling fan motor is actuated by the thermostatic switch located in the radiator.

Run the engine until coolant temperature reaches 98–102°C (208–216°F).

The fan motor should start running. The fan motor should stop when the coolant temperature drops to 93–97°C (199–207°F).



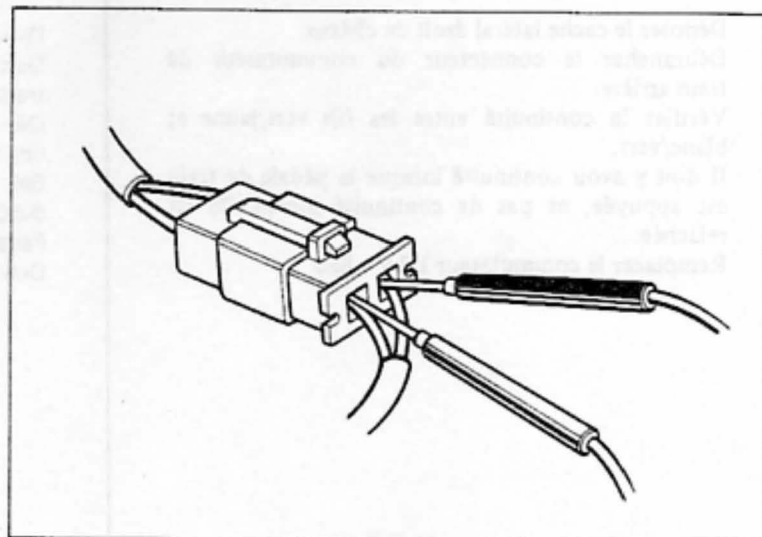
If the fan motor does not start, disconnect the thermostatic switch coupler and short its terminals with a jumper wire.

The cooling fan motor should start running.

If it starts, replace the fan thermostatic switch and retest.

If it does not start, check for battery voltage between the terminals of the fan motor coupler.

If there is no voltage, check for a blown or faulty fuse, loose terminals or connectors, or an open circuit.

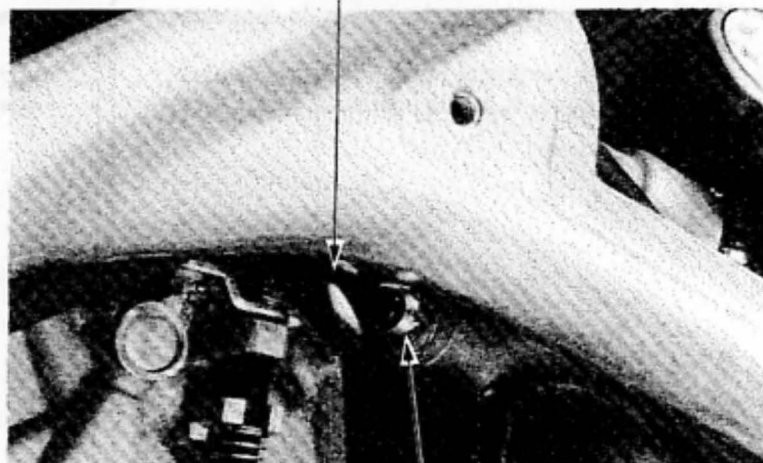


(1) GREEN/BLUE WIRE

**TEMPERATURE SENSOR**

Disconnect the green/blue wire from the temperature sensor.

Drain the coolant and remove the temperature sensor from the thermostat case.



(2) TEMPERATURE SENSOR



**HONDA**  
**VF400F**

## SWITCHES

Suspend the unit in oil over a burner and measure the resistance through the unit as the oil heats up.

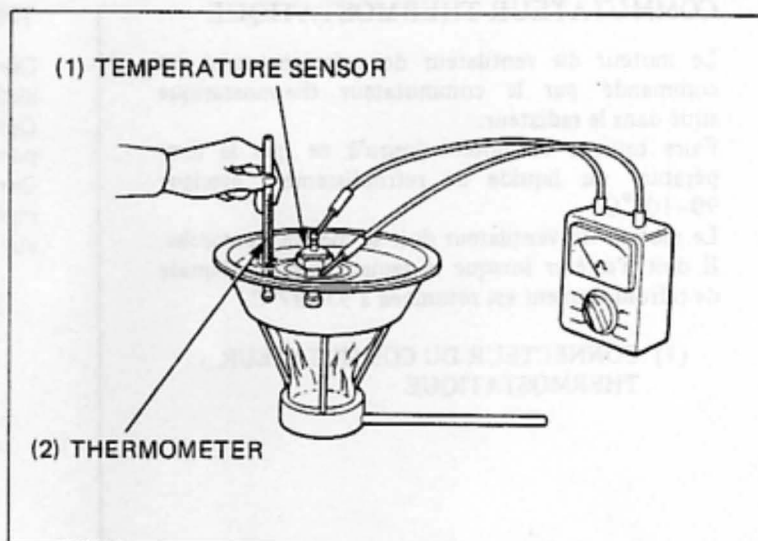
|             |       |       |       |       |
|-------------|-------|-------|-------|-------|
| Temperature | 50°C  | 80°C  | 100°C | 120°C |
|             | 122°F | 176°F | 212°F | 248°F |
| Resistance  | 154Ω  | 52Ω   | 27Ω   | 16Ω   |

### WARNING

*Wear gloves and eye protection.*

### NOTE

- Oil must be used as the heated liquid to check operation above 100°C (212°F).
- You'll get false readings if either the thermometer or temperature unit touches the pan.



## TEMPERATURE GAUGE

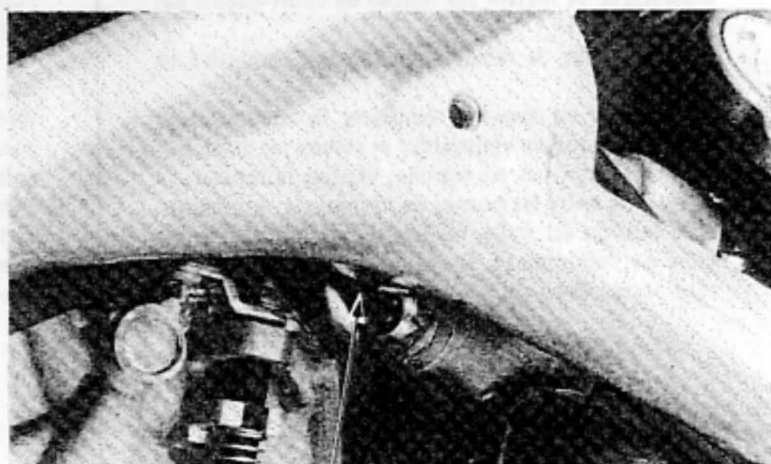
Disconnect the wire from the temperature sensor and short it to ground.

Turn the ignition switch to ON.

The temperature gauge needle should move all the way to the H.

### CAUTION

*Do not leave the temperature sensor wire grounded for longer than a few seconds or the temperature gauge will be damaged.*



(1) TEMPERATURE SENSOR WIRE

## TACHOMETER

If the tachometer does not work properly, perform the following inspection.

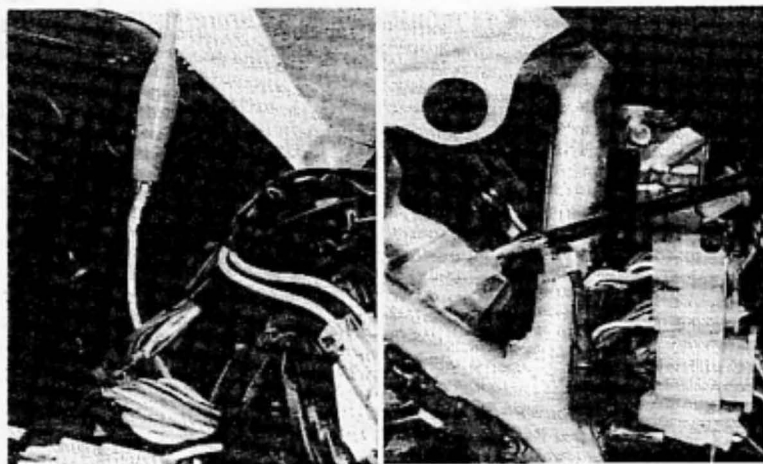
Check that spark jumps from the No. 1 or 3 cylinder spark plug.

If the spark does not jump, check the ignition system.

Remove the fairing and disconnect the yellow lead from the instrument wire coupler.

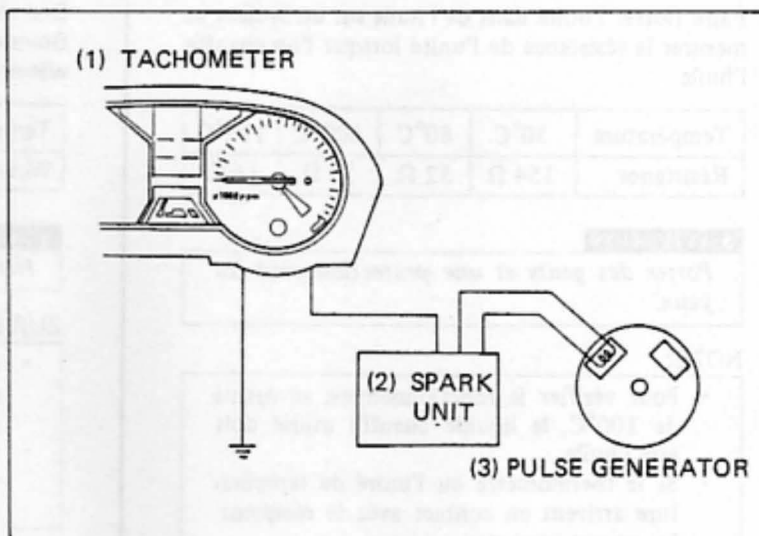
Disconnect the No. 1, No. 3 cylinder ignition coil coupler.

Check the continuity between the yellow leads of the instrument wire coupler and ignition coil coupler.





If the continuity exists, replace the tachometer with a new one and recheck.



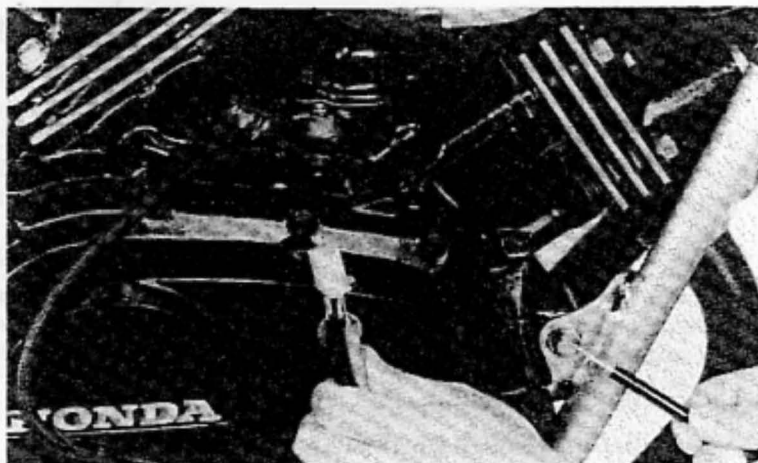
## OIL PRESSURE SWITCH

Disconnect the pulse generator coupler.  
Check continuity between the black lead (with red and blue tubes) and ground.  
There should be continuity.

Remove the black lead (with red and blue tubes) from the coupler and connect the coupler.  
Check continuity between the black lead (with red and blue tubes) and ground with the engine running.  
There should be no continuity.

### NOTE

Be sure to install the black lead in its original position of the coupler securely.



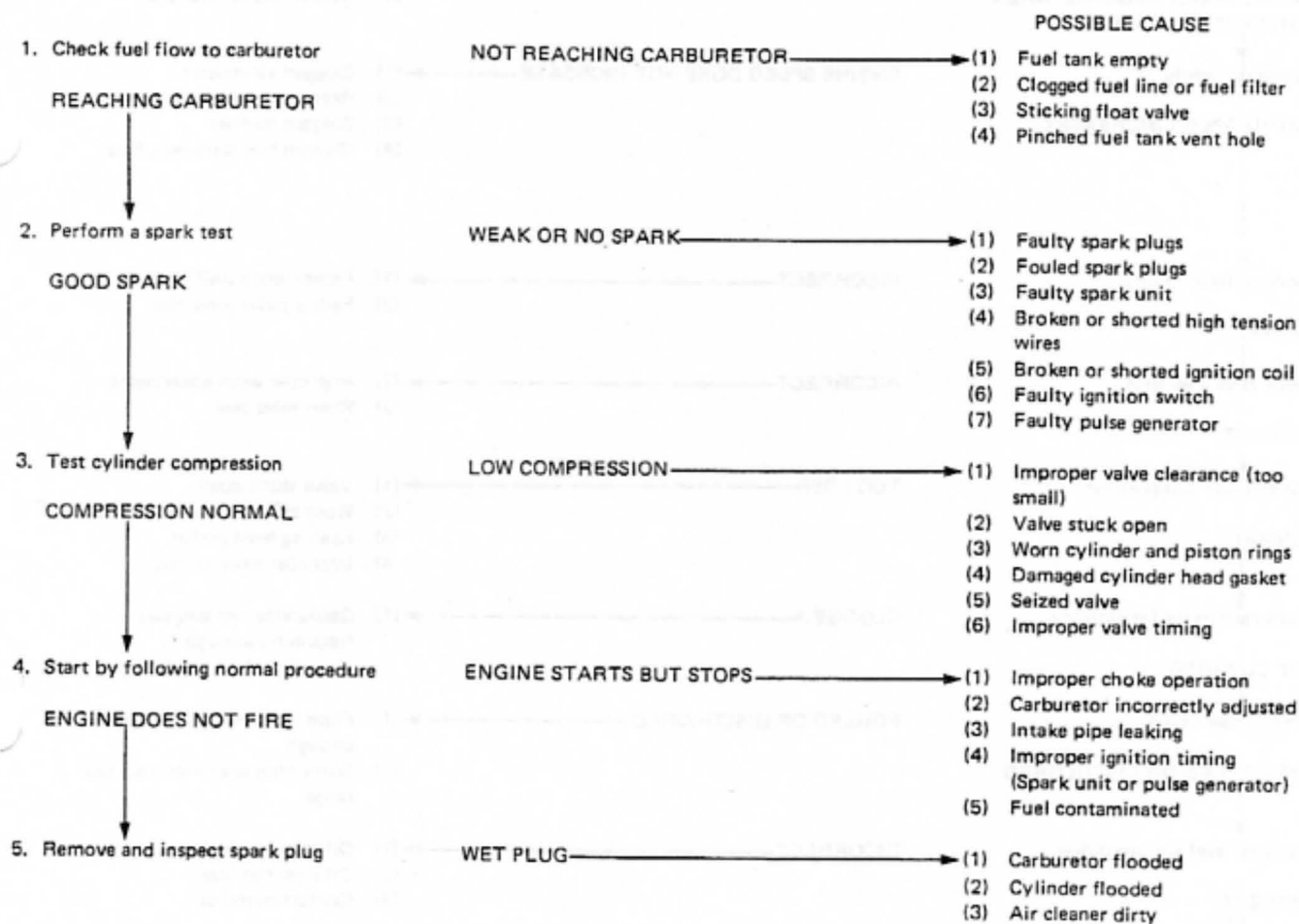




# 22. TROUBLESHOOTING

|                                           |      |
|-------------------------------------------|------|
| ENGINE DOES NOT START OR IS HARD TO START | 22-1 |
| ENGINE LACKS POWER                        | 22-2 |
| POOR PERFORMANCE AT LOW AND IDLE SPEEDS   | 22-3 |
| POOR PERFORMANCE AT HIGH SPEED            | 22-3 |
| POOR HANDLING                             | 22-3 |

## ENGINE DOES NOT START OR IS HARD TO START

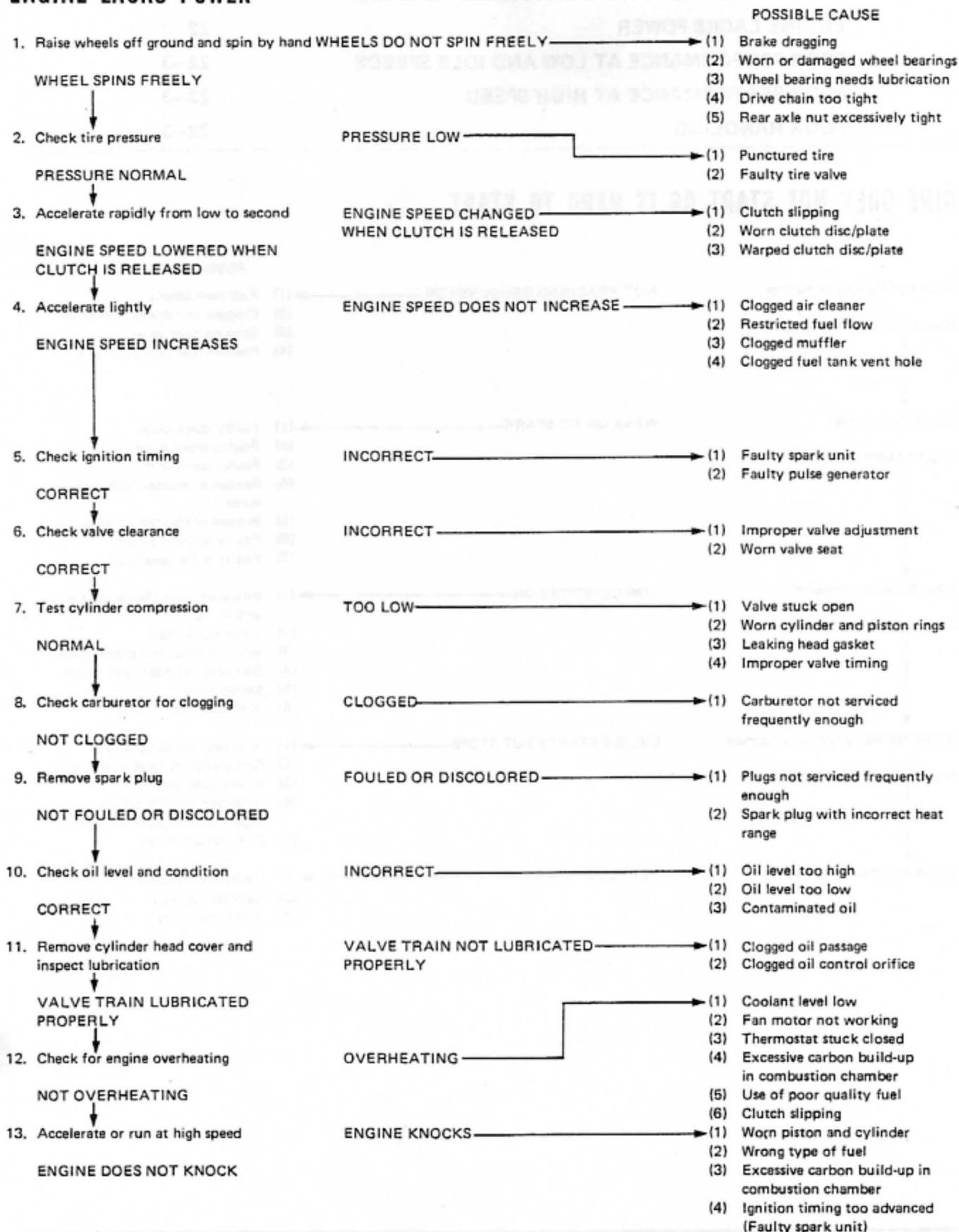






## TROUBLESHOOTING

### ENGINE LACKS POWER





## POOR PERFORMANCE AT LOW AND IDLE SPEEDS

|                                              |                            | POSSIBLE CAUSE                                                                                   |
|----------------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------|
| 1. Check ignition timing and valve clearance | INCORRECT                  | (1) Improper valve clearance<br>(2) Improper ignition timing<br>(Faulty spark unit)              |
| CORRECT                                      |                            |                                                                                                  |
| 2. Check carburetor pilot screw adjustment   | INCORRECT                  | See Fuel System Section                                                                          |
| CORRECT                                      |                            |                                                                                                  |
| 3. Check for leaking intake pipe             | LEAKING                    | (1) Deteriorated insulator O-ring<br>(2) Loose carburetor                                        |
| NO LEAK                                      |                            |                                                                                                  |
| 4. Perform spark test                        | WEAK OR INTERMITTENT SPARK | (1) Faulty, carbon or wet fouled spark plug<br>(2) Faulty spark unit<br>(3) Faulty ignition coil |
| GOOD SPARK                                   |                            |                                                                                                  |

## POOR PERFORMANCE AT HIGH SPEED

NOTE: Ignition to the No. 2 and No. 4 cylinders is cut-off at 11,300–11,800 rpm to prevent engine damage.

|                                                  |                      |                                                                                                                                       |
|--------------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| 1. Check ignition timing and valve clearance     | INCORRECT            | (1) Improper valve clearance<br>(2) Faulty spark unit<br>(3) Faulty pulse generator                                                   |
| CORRECT                                          |                      |                                                                                                                                       |
| 2. Disconnect fuel line at carburetor            | FUEL FLOW RESTRICTED | (1) Fuel tank empty<br>(2) Clogged fuel line<br>(3) Clogged fuel tank breather hole<br>(4) Clogged fuel valve<br>(5) Faulty fuel pump |
| FUEL FLOWS FREELY                                |                      |                                                                                                                                       |
| 3. Remove carburetors and check for clogged jets | CLOGGED              | Clean                                                                                                                                 |
| NO CLOGGED JETS                                  |                      |                                                                                                                                       |
| 4. Check valve timing                            | INCORRECT            | Cam sprocket not installed properly                                                                                                   |
| CORRECT                                          |                      |                                                                                                                                       |
| 5. Check valve spring tension                    | WEAK                 | Faulty spring                                                                                                                         |
| NOT WEAKENED                                     |                      |                                                                                                                                       |

## POOR HANDLING → Check tire and suspensions pressures

|                                        |                                                                                                                                                      |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. If steering is heavy                | (1) Steering stem adjuster nut too tight<br>(2) Damaged steering head bearings                                                                       |
| 2. If either wheel is wobbling         | (1) Excessive wheel bearing play<br>(2) Bent rim<br>(3) Improperly installed wheel<br>(4) Swing arm pivot bearing excessively worn<br>(5) Bent frame |
| 3. If the motorcycle pulls to one side | (1) Bent frame<br>(2) Front and rear wheels not aligned<br>(3) Bent front fork<br>(4) Bent swing arm                                                 |

